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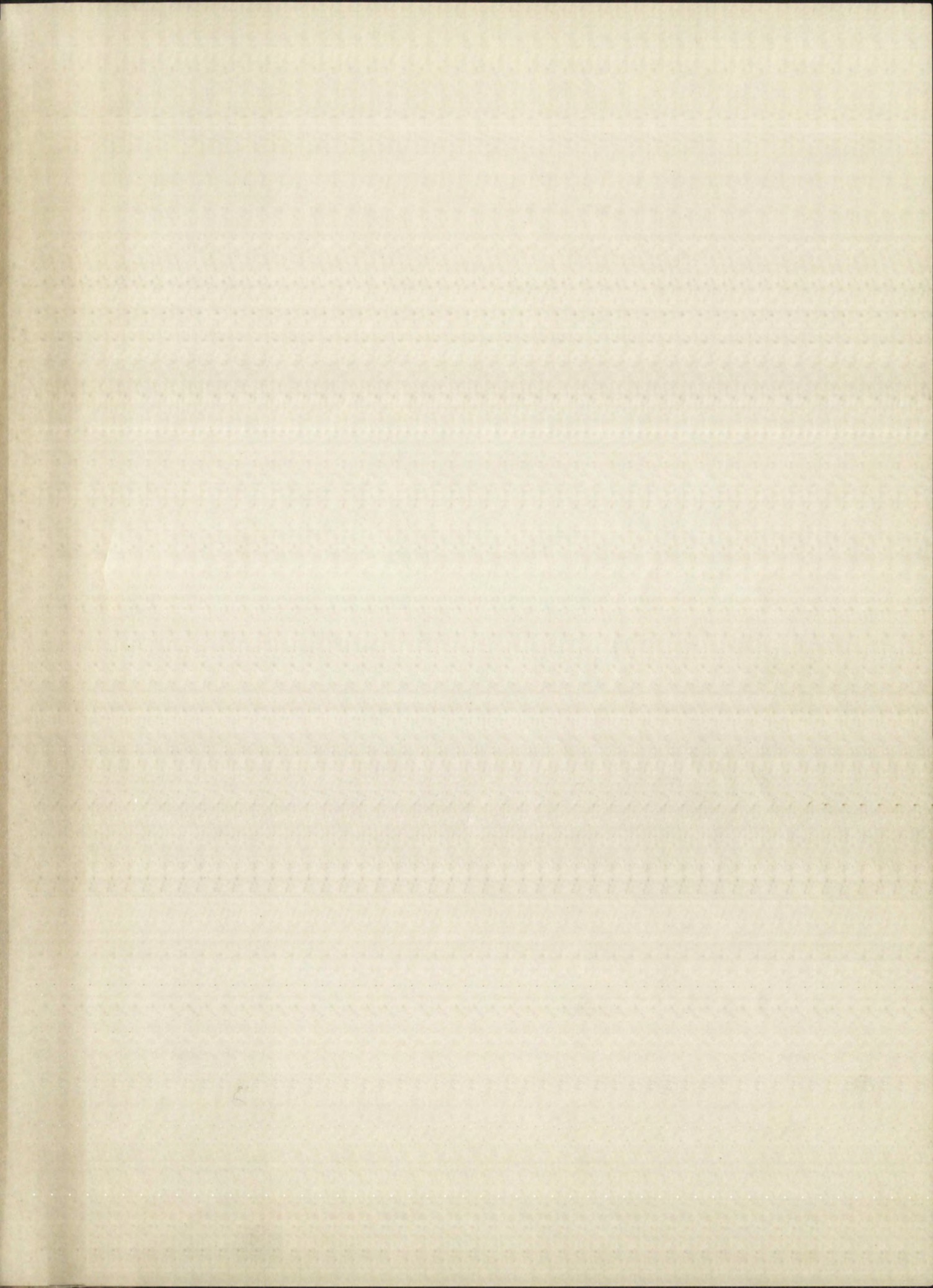
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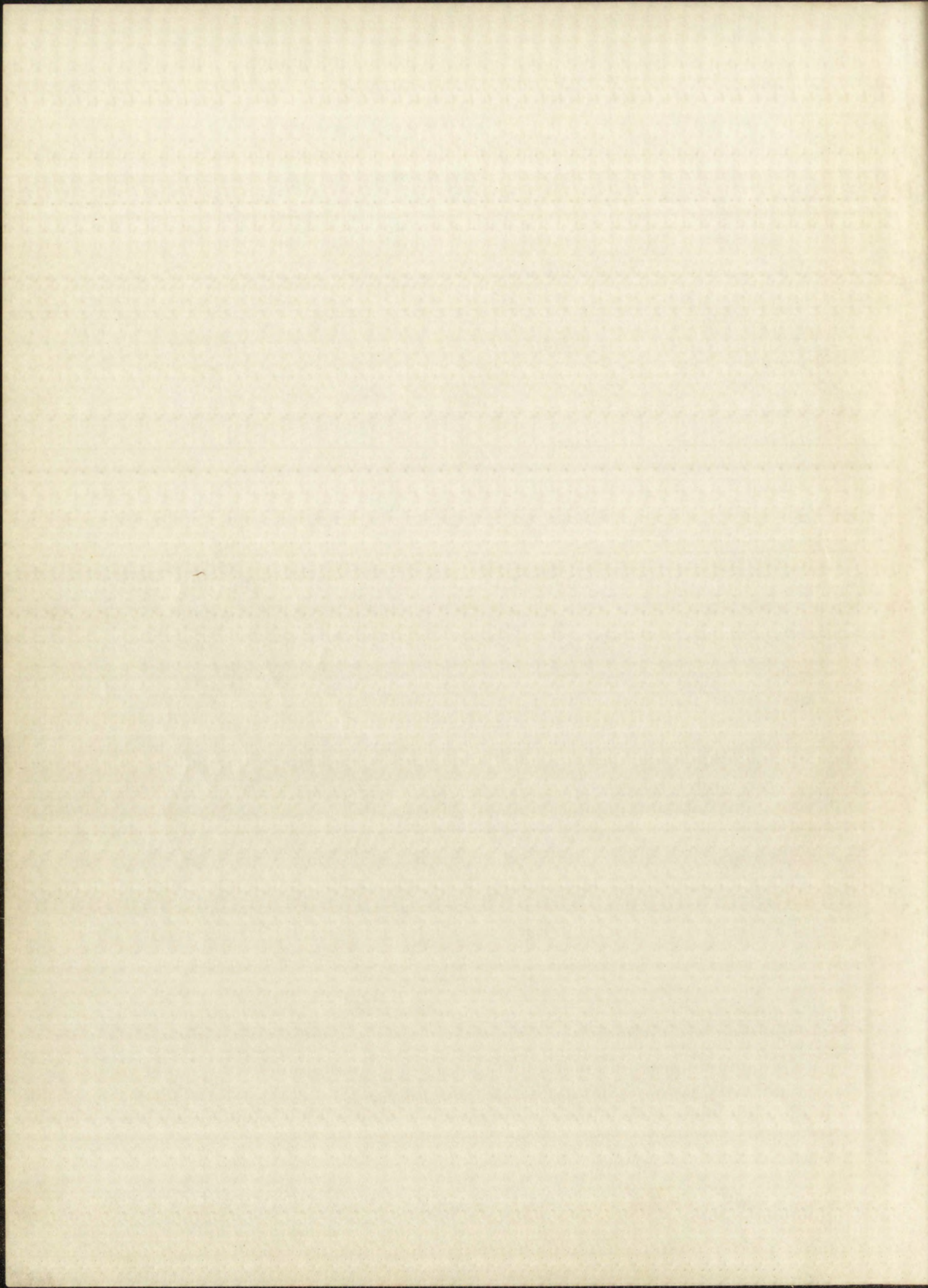
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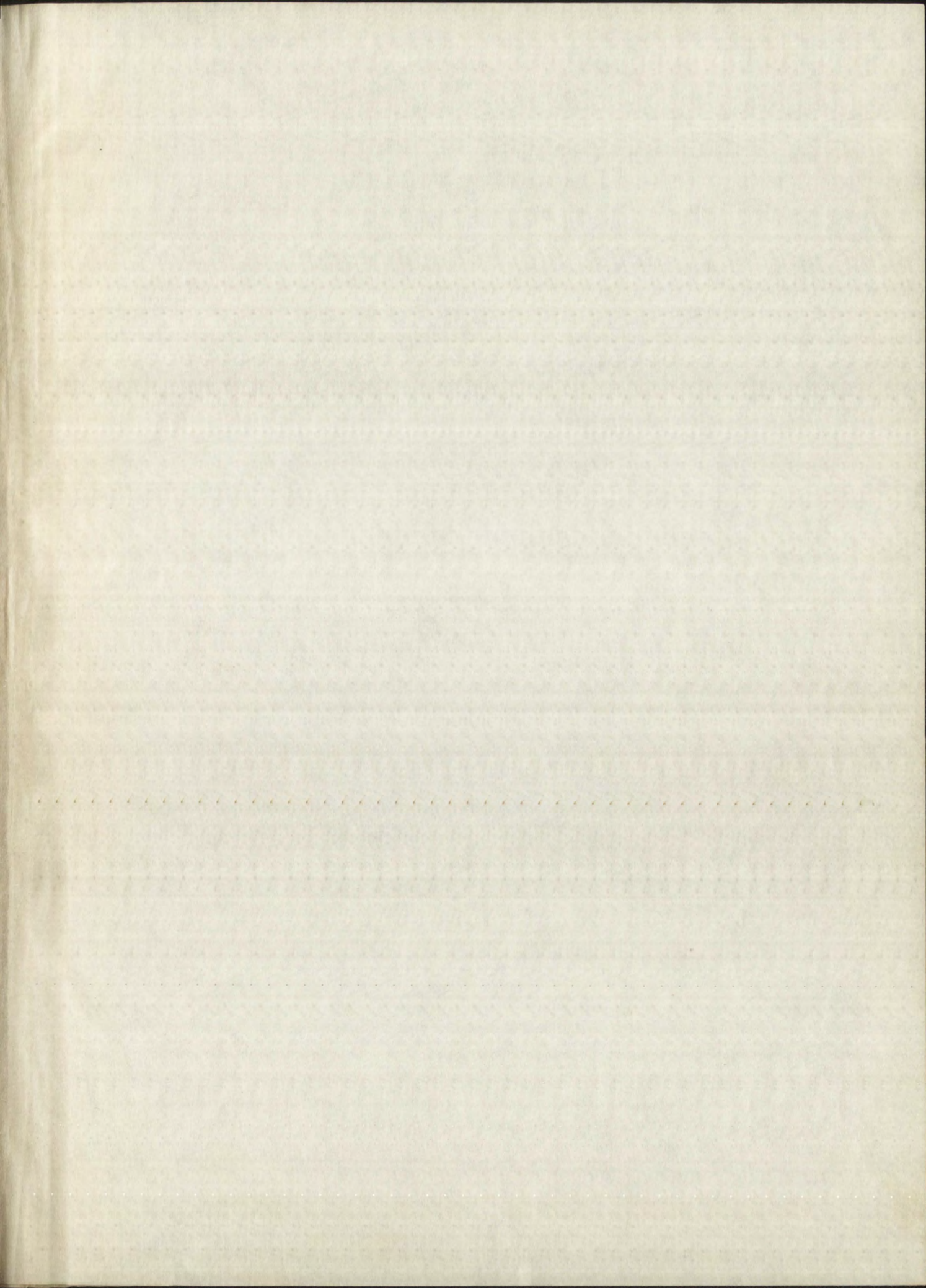
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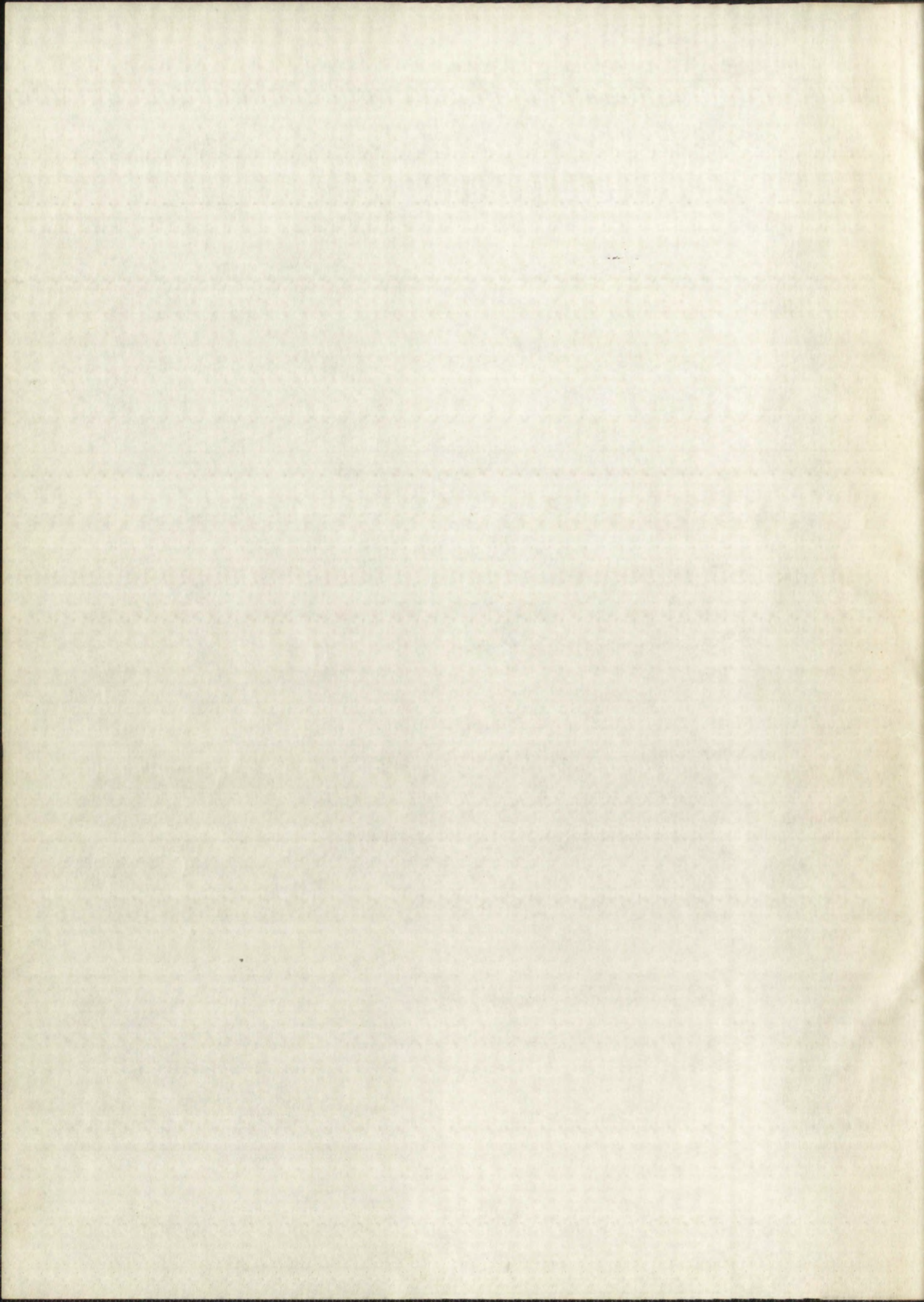
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A SURVEY OF PLAYGROUNDS AND PLAYGROUND EQUIPMENT
IN THE ELEMENTARY SCHOOLS OF NEW MEXICO



By

Richard V. Traylor

A Thesis

Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Arts in Education

University of New Mexico

1950



A SURVEY OF THE PRESENT STATE OF THE ART OF THE

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1933

1933

Richard V. Taylor

A Thesis

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Master of Arts in Education

University of New Mexico

1933

This thesis, directed and approved by the candidate's committee, has been accepted by the Graduate Committee of the University of New Mexico in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

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DATE

A SURVEY OF PLAYGROUNDS AND PLAYGROUND EQUIPMENT IN THE
ELEMENTARY SCHOOLS OF NEW MEXICO

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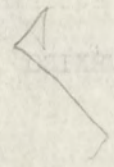
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This is a report and review of the candidate's work
and has been accepted by the Graduate Committee of the
University of New Mexico in partial fulfillment of the require-
ments for the degree of

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CHAPTER I

INTRODUCTION

Since the typical elementary pupil spends approximately one-fourth of his school day on the school ground, it is well that considerable thought and attention be given to improving playgrounds and play facilities. Inadequate space and inferior equipment create a tremendous problem, not only from the standpoint of discipline but from the standpoint of safety as well. Proper planning, selecting, and arranging of facilities will provide more adequate use of space, greater economy, and a more desirable and a safer place for pupils to play.

I. THE PROBLEM

Statement of the problem. The purpose of this study is to determine what types of playgrounds and playground equipment are being used in the elementary schools of New Mexico and to compare and evaluate the size, placement, and serviceability of these facilities according to standards set forth by the National Recreation Association and other authorities.

Delimitations of the study. This study is largely concerned with information and material gathered from the

elementary schools in municipal systems within this state, but information from two independent rural schools will be used. Private and parochial schools will not be considered in this study.

Importance of the study. Since New Mexico possesses many of the natural requirements that are essential to outdoor play and recreation, one may assume that school administrators are vitally interested in the status of playgrounds and playground facilities in the elementary schools of this state. Since physical education and recreational activities occupy a definite place in the elementary curriculum, it is essential that adequate space and facilities be provided to carry on this program.

The vast amount of land available in this state should make it possible for most schools to be desirably located and to secure ample playground space at a reasonable cost. The arid conditions throughout most of this state provide an opportunity for the intensive use of playgrounds and play facilities. In connection with the many building programs that are or soon will be in progress, school authorities responsible for the selection of school sites and playground areas should be concerned with the many possibilities in the use of the playground in carrying out the school program.

Since no study of a similar nature has been previously made, the survey should serve as a comparative guide to what other New Mexico schools have done and are doing. It will offer an opportunity to evaluate present facilities in terms of established standards for playgrounds and playground facilities. The survey should reveal some of the inadequacies that are subject to improvement and should have a definite bearing on the promotion of wholesome recreation and safety in the elementary schools of this state.

II. DEFINITION OF TERMS USED

Elementary schools. The term elementary schools refers to the first six grades in systems organized under the six-six and six-three-three plans and to the first eight grades under the eight-four plan.

Municipal schools. The term municipal schools as used in this study applies to schools in incorporated cities, towns, and villages having an average daily attendance of two hundred or more pupils.

Equipment. The word equipment is applied to permanent and stationary playground equipment, such as swings, slides, and bars.

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Equipment. The word equipment is applied to permanent and replaceable playground equipment, such as swings, slides, and bars.

Facilities. The word facilities as used in this study has a broader meaning than the word equipment. Facilities applies not only to equipment but to all types and kinds of aids in the playground program, as swings, courts, jumping pits, and balls.

Apparatus. The word apparatus as used applies to any particular piece of playground equipment, such as swings and slides.

Playground. A playground is an area set aside or designated for school use, usually for recreational or play purposes.

III. SOURCES OF THE DATA

The data in this study were obtained largely from questionnaires sent to elementary principals in municipal school districts throughout New Mexico. Replies were received from fifty-five schools, of which one included information on three additional schools and playgrounds in that system. Personal interviews and observations were made in other elementary schools for the purpose of obtaining information not supplied in the questionnaire. Additional data were secured from related literature.

Facilities - The first facility is a...
study has a...
Facilities are not only...
and kind of...
course, training, and...

Facilities - The second facility is...
position...
after.

Facilities - The third facility is...
dedicated for...
purpose.

III. SUMMARY

The data in this study...
operation...
school...
resulted...
information...
that...
in...
information...
data were...

IV. METHOD OF PROCEDURE

The normative-survey type of procedure was used in this study. Questionnaires in regard to playgrounds and playground equipment were submitted to ninety elementary principals, of which 61 per cent were returned. Personal interviews and observations were made and the information tabulated. The study includes a review of the standards set up by the National Recreation Association and others. All of these data were tabulated and arranged in comparative tables showing adequacies and inadequacies of area and equipment.

V. ORGANIZATION OF THE REMAINDER OF THE STUDY

The remainder of this study will be divided into four chapters. Chapter II is a review of related literature. Chapter III presents a detailed account of the physical aspects of playgrounds. Chapter IV is devoted to playground facilities, use, cost, and types. Chapter V sets forth a summary, conclusions, and recommendations.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

The purpose of this chapter is to review the related literature and give a brief summary of the recommendations and standards set up by the National Recreation Association and the reports of their Committees on Standards in Playground Apparatus and Standards in the Construction of Playground Apparatus.

A survey in 1921 by J. R. McGaughy¹ of the playground conditions for 3,600,000 school children indicate that for half of these children playground space of less than thirty-four square feet per pupil had been provided. For one-fourth of these children the space allotted per child was less than the space allotted in the class room. Many had no playground at all. Only 19 per cent of these children had been allotted the minimum of one hundred square feet, which was a desirable standard at this time.

The survey revealed that playgrounds in most parts of the United States were far below standards recommended by the National Recreation Association and other authorities.

With the growing demand for equipment on the

¹ J. R. McGaughy, "Know and Help Your Schools," American City Bureau, Second Report, March, 1921, p. 22.

REVIEW OF THE LITERATURE

The purpose of this chapter is to review the literature and give a brief summary of the research and standards set up by the National Recreation Association and the reports of state departments of education in this regard. Apparatus and standards in the construction of playgrounds.

A survey in 1921 by the Department of the Interior conditions for 2,500,000 school children indicate that for half of these children playground space is less than fifty-four square feet per child and even provided. For one-fourth of these children the recommended per child was less than the space allotted in the class room. Many had no playground at all. Only 10 per cent of these children had been allotted the minimum of one hundred square feet, which was a desirable standard at this time. The survey revealed that playgrounds in most parts of the United States were far below standards recommended by the National Recreation Association and other authorities. With the growing demand for recreation on the

playground there have been many revisions in standards and recommendations for playground space. One of the first steps toward standardizing playground areas was taken in 1893 by the Public Elementary School Board, Whitehall, London. The committee on playgrounds recommended that a minimum of thirty square feet per child be used in establishing playground areas.² This is a relatively small figure in comparison to present day recommendations. As early as 1923 at the Recreation Congress of the Playground and Recreation Association of America it was determined that the normal amount of play space for the elementary school child should be a maximum of 200 square feet, with a minimum of 100 square feet.³ The following standards were suggested as the ideal toward which school and recreation authorities should work:

For Elementary Schools.---The minimum total area should be eight acres, including the land on which the school is located.

For Intermediate Schools.---The minimum total area should be from ten to twenty acres.

The committee setting the above standards were aware that many cities could not meet these recommendations, but it was believed that in future planning or in establishing new

² Playground and Recreation Association of America, The Normal Course of Play (New York: A. S. Barnes and Company, 1929), p. 140.

³ Ibid., p. 142.

schools some effort would be made to approach them.

The traditional school site had slightly more space than was needed for the building proper. Apparently little thought was given to selecting large playgrounds thirty or forty years ago. One would assume that those responsible for selecting school sites would have taken advantage of the large amount of available land and made more nearly adequate selections.

A study of the relative sizes of school sites prior to 1910 and down to 1926 was made by Strayer and Engelhardt⁴ in 1929. A study of several school systems showed that little attention and foresight was given to adequate space in selecting school sites prior to 1910. However, since this date, there has been a general trend toward larger school sites.

A similar study made by the National Education Association in 1926 indicated that there was very little variation in the size of elementary school sites purchased by cities during the period of 1920 to 1926. Between four and five acres seemed to be a median size.⁵ The study also

⁴ N. L. Engelhardt and Fred Engelhardt, Planning School Building Programs (New York: Bureau of Publications, Teachers College, Columbia University, 1930), pp. 132-134.

⁵ National Education Association, Educational Research Service (Washington, D. C., 1926), October 9.

shows that the number of pupils to be accommodated was not a determining factor in site selections.

An investigation reveals that very little has been done in the way of a survey of playgrounds and playground equipment in New Mexico.

Leo Lindsey Gleaves completed a study in 1941 of Physical Education Programs in the Secondary Schools of New Mexico.⁶ One chapter was devoted to outdoor areas. However, since this study was primarily from the standpoint of secondary schools, no information contained therein is pertinent.

The educational survey of New Mexico in 1947-1948 shows the distribution of pupils according to elementary school sites to be as follows:⁷

Twenty-four schools enrolling 898 pupils have sites of less than one-half acre, while 56.5 per cent of all pupils reported are in schools which have sites of less than five acres. The largest group of children are in schools having sites from two to two and one-half acres. Larger sites should be provided.

The above survey gives information on the total area

⁶ Leo Lindsey Gleaves, "An Evaluation of Health and Physical Education Programs in the Secondary Schools of New Mexico," (unpublished Master's Thesis, University of New Mexico, Albuquerque, 1941) pp. 38-44.

⁷ Report of the New Mexico Educational Survey Board, Public Education in New Mexico, Division of Surveys and Field Services, Nashville: George Peabody College for Teachers, 1948, p. 173.

shows that the number of pupils in the secondary schools has not a determining factor in site selection.

An investigation reveals that very little has been done in the way of a survey of environments and placement equipment in New Mexico.

Leo Lindsey Gleaves completed a study in 1941 of Physical Education Programs in the Secondary Schools of New Mexico.⁶ One chapter was devoted to outdoor areas.

However, since this study was primarily from the standpoint of secondary schools, no information concerning schools is pertinent.

The educational survey of New Mexico in 1947-1948 shows the distribution of pupils according to elementary school sites to be as follows:

Twenty-four schools enrolling 838 pupils have sites of less than one-half acre, while 24.8 per cent of all pupils reported are in schools which have sites of less than five acres. The largest group of children are in schools having sites from two to two and one-half acres. Larger sites should be provided.

The above survey gives information on the total area

⁶ Leo Lindsey Gleaves, "An Evaluation of Physical Education Programs in the Secondary Schools of New Mexico," (unpublished master's thesis, University of New Mexico, Albuquerque, 1941), pp. 32-33.

⁷ Report of the New Mexico Educational Survey Board, Public Education in New Mexico, Division of Surveys and Field Services, compiled by George Fawcett College for Teachers, 1948, p. 177.

of school sites, including that occupied by the building. Many once adequate sites have become inadequate due to additional buildings being erected on them. Therefore, the size of the original school site is not always an indication that a school has sufficient playground space.

In 1933 a committee was appointed by the National Recreation Association to study the problems involved in the construction of playground apparatus. In its report the committee agreed that the design, materials, and workmanship should be such as to insure the following:⁸

1. Safety -- absolute minimum of danger resulting from ordinary use
2. Durability -- capable of withstanding action of diverse climatic conditions without crystallization for the longest possible period of years
3. Serviceability -- capable of withstanding continued hard use with proper care
4. Economical maintenance -- parts easily replaced
5. Simplicity of supervision -- use readily controlled with minimum of necessary restrictions
6. Developmental and recreational value

As a further study in this field, a sub-committee on engineering problems studied the common types of playground apparatus to determine the degree to which they were meeting or fulfilling the preceding requirements and also to suggest needed changes. Some of the recommendations offered and

⁸ George D. Butler, Recreation Areas Their Design and Equipment (New York: A. S. Barnes and Company, 1947), p. 25.

of school space, including that occupied by the building.
Many such additions have been made in the past, and
additional buildings have been added in the past. The
size of the original school site is not always indicated
that a school has sufficient space.

In 1933 a committee was appointed by the National
Association of Architects to study the question involved in the
construction of a school system. The report of the
committee appeared in the form of a pamphlet, and the committee
should be known as follows:

1. Policy -- general outline of general policy in the
ordinary use
2. Land -- general outline of general policy in the
diverse fields of general policy in the ordinary use
3. Responsibility -- general outline of general policy in the
land use and general policy in the ordinary use
4. Economic -- general outline of general policy in the
land use and general policy in the ordinary use
5. Efficiency of a school system -- general outline of general
land use and general policy in the ordinary use
6. Investment and financial -- general outline of general
land use and general policy in the ordinary use

In a further study in this field, a committee was
appointed to study the general policy in the ordinary use
of the land. The committee was appointed to study the
general policy in the ordinary use of the land, and the
committee was appointed to study the general policy in the
ordinary use of the land.

George D. ...
... ..

accepted are:⁹

1. That all pipe used in construction of apparatus be of standard weight, hot-galvanized steel pipe, factory tested.
2. Only annealed or malleable iron clamps and fittings, except in base flanges, should be used, because malleable fittings on overhead construction are less liable to break under sudden thrusts and strains.
3. Methods of lubrication:
 - a. Bearings that turn fast and bear heavy weights should be equipped with alemite valves or equally effective means of lubrication.
 - b. Bearings that sway back and forth should be alemited or packed with hard grease and the fittings provided with a covered slot to renew the grease, if packed.
 - c. Ball and socket fittings, where possible, should turn in oil.

Numerous experiments with playground surfacing have been made in order to determine the most practical and satisfactory materials to use. A study was made in 1948 by Stanley W. McKee, Highland Park, Illinois,¹⁰ in an attempt to determine the best type of all-weather playground surface, in terms of safety, cost, maintenance, and utility.

Questionnaires were sent to seventy-five different school communities. Fifty-two answered, giving the following information: Forty-four of the fifty-two schools had hard surface playgrounds. Approximately 35 per cent of the schools having hard surface playgrounds had asphalt or

⁹ Ibid., p. 26.

¹⁰ Stanley W. McKee, "All-Weather Playgrounds," The Journal of the American Association for Health, Physical Education, and Recreation, 20:175-76, March, 1949.

1. That all glass used in construction of apparatus be of standard weight, hot-tempered steel pipe, factory tested.
2. Only cemented or welded joints from time to time, except in case of lenses, should be used. Lenses and glass fittings on standard construction are liable to break under sudden shocks and strains.
3. Methods of lubrication:
 - a. Bearings that turn fast and bear heavy weight should be equipped with special oil.
 - b. Bearings that turn slow and bear light weight should be lubricated with light oil.
 - c. Ball and roller bearings, where possible, should run in oil.

Numerous experiments with oil-tempered surfaces have been made in order to determine the best practice and satisfactory materials to use. A study was made in 1903 by Stanley W. Baker, Highland Park, Illinois, in an attempt

to determine the best type of all-weather playground surface, in terms of safety, cost, maintenance, and utility. Questionnaires were sent to seventy-five different school communities. Fifty-two answered, giving the following information: forty-four of the fifty-two schools had hard surface playgrounds. Approximately 55 per cent of the schools having hard surface playgrounds had asphalt or

9 Ibid., p. 26.
 10 Stanley W. Baker, "All-Weather Playgrounds," The Journal of the American Association for Physical Education, and Recreation, 20:115-16, March, 1911.

black top surfaces. Fifteen per cent of the schools had crushed rock, usually limestone, topping. It was estimated that schools with all-weather playgrounds enjoyed an average of thirty-six more days of outdoor play. The survey further indicated that approximately 45 per cent of the schools reported that if they could construct an ideal type of playground surface, they would use asphalt or black top; 15 per cent stated they would use asphalt and sod.

The following conclusions were offered as a result of McKee's study:

1. The development of all-weather playgrounds will reduce the mud problem, increase immeasurably the number of outdoor play days, and provide the school with excellent, additional play space.
2. The small school with no gymnasium and without funds to build, will find temporary relief from its gymnasium needs by constructing such a unit.
3. Thought should be given to the type of pattern (square, rectangle, etc.) that will be used so the surfaced area can be easily adapted to such physical activities as softball, hop scotch, tennis, volley ball, basketball, and playground ball.
4. Falling will not be such a problem and such accidents as knee abrasions will be less likely to occur if children are taught how to use the playground by the teacher. Injuries that occur on resilient asphalt are clean injuries and are easier to treat than those created by falling on ground.
5. Asphalt surface absorbs and holds heat; snow melts quickly; water evaporates rapidly.
6. Tanbark should be used as surfacing under swings, slides, and playground apparatus in general.
7. The cost of construction will be determined by such local conditions as labor, condition of the bed soil, grading, filling, drainage, etc.

Further study in the use of surfacing materials has

been done by C. R. Barkdoll.¹¹ Natural rock asphalt was used as a surfacing material and found to be superior to anything used. The advantage in using this material is largely due to the easy manner in which it can be handled. It is a cold-mix product which can be easily spread over the desired area and the unused material can be stacked and left until such time as needed without hardening. This material was not only found to be satisfactory as a dust preventive but also a desirable substance for a hard, smooth surface.

¹¹ C. R. Barkdoll, "Miracle Dirt," Scholastic Coach, 17:26, January, 1948.

been done by C. P. Kirkland, Jr. Kirkland was
used as a preliminary material and found to be suitable for
anything used. The covering is other than material in
largely due to the heavy nature in which it was handled.
It is a soft-silk material which can be easily covered over the
desired area and the unused material can be stacked and left
until such time as needed without warping. This material
was not only found to be satisfactory as a dust preventive
but also a desirable substance for a hard, smooth surface.

U. S. Patent, "Kirkland's Process,"
17:25, January, 1948.

U. S. PATENT

CHAPTER III

PHYSICAL ASPECTS OF THE PLAYGROUND

The lack of foresight in securing adequate playground space has been a fault not only in large cities but in smaller cities as well. This is made evident by the fact that many communities of both types are now faced with inadequate playground space and undesirable locations.

It is impossible to forecast the exact needs of the future, but it is obvious that with the growing population there is a greater need for more careful selecting and planning of future school grounds.

The purpose of this chapter is to present those facts obtained from the questionnaires relative to the physical aspects of playgrounds and to compare these findings with those made in other surveys and studies.

I. SIZE OF THE PLAYGROUND

Without sufficient space, no playground can adequately serve the demands and needs of the present school. Some of the factors that determine the needs of playground space are the present and future enrollment or the number to be accommodated on the playground, the amount and types of playground apparatus to be installed, the

amount of space needed for courts, fields, other facilities, and the educational program to be followed.

Results of the questionnaires tabulated from fifty-five elementary schools in New Mexico (Table I) indicate an average of 3.4 acres per school ground reported. Only one school had an enrollment of 100 pupils or less with a playground area of four or five acres. Thirteen schools reported enrollments between 100 and 200 pupils. The average area per playground for this group was 2.6 acres. Schools reporting enrollments of 201 to 300 numbered eleven, with an average acreage of 3.1 per school.

Recommendations for playground space are fairly well standardized as to minimum requirements. Standards for areas are given in both acres and in the number of square feet per child to be served on the playground. Comparing the New Mexico schools having enrollments of 201 to 300 pupils with the following standards given by the National Recreation Association,¹ one finds that these New Mexico playground areas of approximately three acres are larger than recommended in the table below.

¹ George D. Butler, Playgrounds, Their Administration and Operation (New York: A. S. Barnes and Company, 1936), p. 12.

amount of space needed for courts, fields, other facilities, and the educational program to be followed.

Results of the questionnaires tabulated from fifty-five elementary schools in New Mexico (Table I) indicate an average of 5.4 acres per school ground reported. Only one school had an enrollment of 100 pupils or less with a playground area of four or five acres. Thirteen schools reported enrollments between 100 and 200 pupils. The average area per playground for this group was 2.6 acres. Schools reporting enrollments of 201 to 300 numbered eleven, with an average average of 5.1 per school.

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¹ George D. Butler, Playgrounds, Their Administration and Operation (New York: A. S. Barnes and Company, 1936), p. 12.

TABLE I
PLAYGROUND AREAS OF FIFTY-FIVE ELEMENTARY
SCHOOLS IN NEW MEXICO

Number of playgrounds													
School enrollment	Less than .5 acre	*.5-1 acre	1-2 acre	2-3 acre	3-4 acre	4-5 acre	5-6 acre	6-7 acre	7-8 acre	8-9 acre	9-10 acre	10 or more acres	Ave. acre per playground
Less than 100													4.5
100-200	2	2	2	5	1	1			1				2.27
201-300			4	5								1	3.09
301-400			3	2				1	1				4.17
401-500	1	2	2		2							2	3.53
501-600	1		2	3									1.79
601-700				1				2			1		6.25
701-800				1					1				5
Totals	4	4	13	17	3	1	2	3	2	2	1	3	3.36

*Upper limit not inclusive

Child population to be served	Minimum size of playground recommended		Average square ft. per child population
	Sq. ft.	Acres	
200	100,000	2.29	500
300	111,250	2.55	371
450	133,000	3.05	296
600	151,975	3.49	253
800	194,000	4.45	243
1000	223,230	5.35	233
1200	272,000	6.25	227

The survey shows that nine schools with enrollments of 301 to 400 pupils had an average playground area of 4.2 acres. For the nine schools reporting enrollments between 401 and 500 pupils, the average per playground was 3.5 acres. The playground area for each of these groups of schools also exceed the standards given in the above table.

Six schools with enrollments between 501 and 600 pupils had an average playground area of only 1.8 acres, which indicates that these schools have approximately half as much playground space as the minimum recommended. The average playground area for the four schools reporting enrollments between 601 and 700 was approximately 6.3 acres. Only two schools reported their enrollment to be between 701 and 800. One of these schools had a playground area of seven to eight acres and the other two or three acres, the

Child population to be served	Minimum size of playground recommended	Average square ft. per child in population
200	100,000	2.25
300	111,350	2.55
400	133,000	3.05
500	151,975	3.45
600	164,000	4.45
1000	255,350	5.75
1200	275,000	6.25

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average for the two schools being five acres.

The largest number of schools represented in the present study are those having an enrollment between 100 and 200 pupils. Only thirteen or 23.63 per cent of the fifty-five playgrounds have an area equal to the minimum standard of five acres recommended for elementary school sites by Strayer and Engelhardt.²

The minimum standard for elementary schools as approved in 1946 by the National Council on School House Construction³ is five acres plus an additional acre for each 100 pupils of ultimate enrollment. This would mean that for an elementary school of 200 pupils there should be seven acres in the school site.

The above standards are for building sites rather than for the actual playground area. The amount of available playground space in a five acre building site will naturally depend upon the size of the building to be erected.

A typical plan of an elementary school and playground

² George D. Strayer and N. L. Engelhardt, Standards for Elementary School Buildings (New York: Bureau of Publications, Teachers College, Columbia University, 1933), p. 16.

³ National Council on School House Construction, Guide for Planning School Plants (Nashville, Tennessee: George Peabody College for Teachers, 1946), p. 13, cited by a Report of the New Mexico Educational Survey Board, Public Education in New Mexico (Division of Surveys and Field Services, George Peabody College for Teachers, Nashville, 1948), p. 172.

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The largest number of schools represented in the present study are those having an enrollment between 100 and 200 pupils. Only thirteen or 25.5 per cent of the fifty-five playgrounds have an area equal to the minimum standard of five acres recommended for elementary school sites by Strayer and Engelhardt.²

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² George D. Strayer and E. J. Engelhardt, Standards for Elementary School Sites (New York: Bureau of Educational Research, Teachers College, Columbia University, 1937), p. 15.

³ National Council on School House Construction, Guide for Planning School Sites (New York: Teachers College for Teachers, 1936), p. 13, cited by George Peckham, Report of the New York State Educational Survey Board, 1936 (Albany: Division of Survey and Field Service, George Peckham College for Teachers, Albany, 1943), p. 172.

drawn up for and approved by the Board of Education and Recreation Board Committee of Washington, D. C.,⁴ gives the minimum requirements of the school site as 4.34 acres, with three acres left for actual play area. This would indicate that the average elementary school should have a minimum of three acres of playground space. This standard is met by seventeen or 30.9 per cent of the fifty-five elementary playgrounds surveyed.

The totals in Table I show that thirty-eight of the fifty-five playgrounds reported, or approximately 69 per cent have less than three acres of playground space. Of these, about 40 per cent have enrollments between 401 and 800 pupils. The above information corresponds closely to that given by the New Mexico Educational Survey Board.⁵

One of the questions asked in the questionnaires was whether the playground space for the number who used it was entirely ample, satisfactory, meager, or totally inadequate. Replies show that eleven schools indicated their playgrounds were entirely ample, eighteen satisfactory, seventeen meager, and eleven totally inadequate. This information indicates that approximately half of the schools

⁴ George D. Butler, Recreation Areas, Their Design and Equipment (New York: A. S. Barnes, 1947), p. 110.

⁵ New Mexico Educational Survey, op. cit., p. 12.

shown up for and approved by the Board of Education and Recreation. The Recreation Board, consisting of Washington, D. C., gives the minimum requirements of the school site as 4.75 acres, with three acres left for natural play areas. This would indicate that the average elementary school should have a minimum of three acres of playground space. This standard is met by seventeen or 50.2 per cent of the fifty-five elementary playgrounds surveyed.

The totals in Table I show that thirty-eight of the fifty-five playgrounds reported, or approximately 69 per cent, have less than three acres of playground space. Of these, about 40 per cent have enclosures between 401 and 500 pupils. The above information corresponds closely to that given by the New Mexico Educational Survey Board.²

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² George D. Butler, Recreation Areas, Their Needs and Development (New York: J. S. Harper, 1927), p. 116.

³ New Mexico Educational Survey, op. cit., p. 12.

reported their playground space for the number who use them to be meager or totally inadequate.

Since many small communities cannot provide adequate recreation and park facilities, it has been found that through the cooperation of school and city officials the school ground can be made to serve adequately not only the school needs, but the community as well. Many of the more recently constructed school buildings adjoin plots that were set aside for city parks.

II. SURFACE FEATURES

Providing a good surface for playground areas is a matter that cannot be too strongly emphasized, since adequate space is of little value if it cannot be satisfactorily used. Dusty areas are detrimental to health; muddy, abrasive, or uneven areas may damage equipment and buildings and cause pupils injuries. A resilient, smooth surface not only adds to the appearance of the school site but makes it possible for the surface to be used the year round.

Fifty-four questionnaires were tabulated in regard to the surface features of playgrounds in the elementary schools of New Mexico. This information was given in fractional parts. For the convenience of tabulating, these parts were expressed as per cents. Seventeen schools reported

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playgrounds with surface areas from 76 to 100 per cent dirt and gravel (Table II). Fifteen schools reported that their playground surfaces were from 76 to 100 per cent hard earth, and four schools stated their play area was composed largely of sand.

The three natural types of surfaces mentioned above account for the larger part of the playground surfaces reported. These three types roughly represent three sections of the state. Schools located in the eastern or southern section would probably have surfaces composed largely of sand. Such surfaces may be fairly practical for general play during parts of the year but are likely to be too soft and dusty if used intensively. Courts and fields would probably need a harder surface than sand would provide unless sufficient clay were added to hold the sand together. Clay-sand surfaces are common and are considered quite practical for general play.

Playground surfaces composed largely of hard earth are typical of the adobe surface that comprises a large part of the central and south-central parts of this state. This type is fairly practical for courts and small play areas if properly prepared and maintained, but as a whole it does not stand up under intensive use.

Dirt and gravel surfaces were reported by the largest number of schools. This type of surface is also typical of

playgrounds with surface areas from 1/2 to 100 sq. ft. and gravel (Table 1). Fifteen schools reported that playground surfaces were from 1/2 to 100 sq. ft. and four schools stated their play area was enclosed largely of sand.

The three natural types of surfaces mentioned above account for the larger part of the playground area reported. These three types usually represent three sections of the state. Schools located in the eastern or northern section would probably have surface composed largely of sand. Such surfaces are fairly practical for general play during parts of the year but are not suitable for play and dusty if used intensively. Schools in the central and south-central sections probably need a harder surface than sand and would probably unless sufficient clay were added to hold the sand together. Clay-sand surfaces are common and are considered quite practical for general play.

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TABLE II
SURFACE AREAS OF FIFTY-FIVE ELEMENTARY PLAYGROUNDS
IN NEW MEXICO

Surface	Number of playgrounds			
	25 per cent or less area	26-50 per cent area	51-75 per cent area	76-100 per cent area
Grass	1	1	1	4
Concrete	1			
Oil or asphalt	2	2		2
Sand		1		4
Sand and gravel				3
Hard earth		4	1	15
Gravel	1	2		2
Dirt and gravel		3		17
Rocky				1
Cinders	1			
Flagstone		1		

the natural surface of the north and northwestern sections of the state. Like the above types of surfaces, dirt and gravel may in certain areas be fairly practical for general play, but without special care and upkeep it will not remain satisfactory.

Seven schools reported that their playground surface was largely or partly planted to grass. For a general play area, turf is considered as probably the best. It is especially recommended for the general play area of small children. The arid condition that prevails throughout most of this state makes it difficult for schools to provide and maintain grass surfaces. Relatively few schools have sufficient water to keep more than a small portion of the playground area in grass. This portion in many cases is not used as a part of the regular playground space. Most of the schools which have a part of the playground area in grass have access to surface irrigation water. This probably accounts for the fact that they are able to keep the grass growing under intensive use.

It must be kept in mind that different types of surfaces are desirable for different sections of the state. Some of the factors to be considered before determining the most suitable surface for a given area are the following:⁶

1. Climate conditions -- especially the effects of freezing and thawing
2. Extreme heat and rainfall

⁶ Butler, op. cit., p. 9.

3. Natural soil conditions
4. Location and size of area
5. Type of activities to be carried on
6. Intensity of use
7. Suitability for night lighting
8. Local tastes and preferences
9. Availability of materials
10. Initial cost and maintenance cost

Qualities desirable in a playground surface include resilience, good drainage, freedom from dust, durability, non-abrasiveness, cleanliness, firmness, smoothness, general utility, and good appearance. Natural or existing surfaces, as previously mentioned, are sometimes satisfactory for play or can be made so by adding suitable materials. When an area has a surface unsuitable for play, an entirely new surface must be built up on all or a part of it. Cutting and filling are usually required, and existing soil may have to be removed from the entire area before surfacing materials are applied.

Numerous experiments have been made in recent years in an attempt to find suitable materials to use in surfacing. A large variety of materials are now being employed, among which are rock asphalt, cut-back tar, hot-mix asphalt, asphaltic oil with sawdust, stone chips or spruce shavings, pre-mixed asphalt laid cold, and many patented or trade-marked products. It is difficult to say which of these materials is best suited to the surface areas of the school grounds in this state, as much will depend upon the type of

10. Initial cost and maintenance cost
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3. Natural soil conditions

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soil, climatic conditions, and other factors previously mentioned. All have certain advantages over a natural soil surface. Once the surface has been prepared and the material applied, the cost of maintenance is very little and the playground can be used immediately after rain and throughout the year.

A committee of recreation executives⁷ appointed by the National Recreation Association recommended that part of all school grounds be surfaced with materials preferably of a bituminous nature, thus permitting play under all weather conditions.

A recent study of surfacing of elementary school playgrounds in forty school districts in California indicated an overwhelming preference for bituminous areas for courts and other such areas where there is intensive play.⁸ As a result of this study the committee recommended that a large part of the elementary school ground be treated with a bituminous pavement.

A large playground surfacing project was undertaken in Long Beach, California, in 1939. The following is an account of the project:⁹

⁷ Ibid., p. 11.

⁸ Ibid., p. 12.

⁹ Loc. cit.

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⁹ Ibid., p. 13.

In laying the surfacing turf was stripped from the surface, and the ground was disked and then treated with a mixture of ten parts of Diesel oil to one part of cresylic acid, three-fourths of a gallon being applied per square yard. The ground was then graded and rolled firmly, with one-inch screeds set for strips of surfacing approximately 10 feet wide. Next came the application of the paving, consisting of the following mixture for each one hundred square feet of area: Number 7 gravel, $8\frac{1}{2}$ cubic feet; river silt, $2\frac{1}{2}$ cubic feet; emulsified asphalt, $13\frac{1}{2}$ gallons.

This project was termed a success and highly commended by all teachers and principals in these districts.

Apparently such surfacing materials are being used to some extent in this state. Information obtained in this study indicates that two schools had 76 to 100 per cent of their playground surface in oil or asphalt, two schools reported having 26 to 50 per cent of the play area in oil or asphalt, and two schools indicated their playground area was approximately one-fourth oil or asphalt.

In an elementary school the writer has been able to observe a surfacing project of two areas, each approximately eighty by ninety feet. The surface of these areas was covered about three inches deep with hot-mix asphalt. The area treated was primarily an experiment, but it has proved successful and has been a valuable aid in keeping down dust and mud, as well as providing a desirable place for pupils to play games that cannot be satisfactorily played on the part of the playground not surfaced. The surfaced area has been under intense use for the past three years and at the

present time is still more serviceable as a year-round play area than the other part of the playground. The total cost of the project, excluding the labor, was approximately one and seven-tenths cents per square foot.

Concrete is recommended as the most durable and practical material for small courts such as volley ball, shuffleboard, and tennis courts. The initial cost of concrete has probably prohibited most schools from using this material. Only one school in this study reported having a playground area of 25 per cent or less in concrete. No doubt many schools have concrete courts and slabs which were not reported as part of the general playground area.

A summary of the information on playground surfaces from fifty-four elementary schools of this state indicate that a large percentage of the playgrounds are covered with dirt and gravel. Maximum use of the playground cannot be attained with this type of surface. Proper surfacing with a substance suitable to the type of surface and the locality will greatly improve the serviceability of the playground.

Contour of the ground. In order to determine the general contour of school ground areas in this state, each elementary principal was asked to indicate what part of his school ground was level, gently sloping, sloping to steep, rough, and steep. For the convenience of tabulating, parts were expressed as per cents as shown in Table III.

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Contour of the ground. In order to determine the general contour of school ground areas in this state, elementary principals were asked to indicate what part of the school ground was level, gently sloping, rising to a peak, rough, and steep. For the convenience of tabulating, grades were expressed as per cents as shown in Table III.

TABLE III
 PERCENTAGES OF SURFACE AREAS OF FIFTY-SEVEN
 ELEMENTARY PLAYGROUNDS IN NEW MEXICO

Contour of ground	Number of playgrounds			
	25 per cent or less area	26-50 per cent area	51-75 per cent area	76-100 per cent area
Level		4		32
Gently sloping		2		11
Sloping to steep				1
Roll		3		3
Steep		1		

A summary of this information indicated that thirty-two schools reported 76 to 100 per cent of their play area was level, and four playgrounds were reported as being approximately 50 per cent level. For maximum use a playground must be reasonably level and still have sufficient slope to insure adequate drainage. Eleven schools characterized their playgrounds as being gently sloping and two were partly so. In most locations a gentle slope would prove quite valuable in keeping the playground properly drained. One playground was reported as being sloping to steep, one steep, and six playgrounds had rough areas.

The location of the building on the site may sometimes interfere with an otherwise desirable playground area. However, this is a matter to be considered before the site is selected. Frequently playgrounds with rough or steep areas can be adequately leveled by use of road machinery which is usually available in most communities. State highway maintenance machinery, city machinery, and quite often contractors who are working on road jobs nearby can be hired at a reasonable rate to use their machinery on a project of this kind.

III. LOCATIONS

The location of a playground in relation to the school building is an important factor from the standpoint

A summary of this information indicated that the two schools reported to be 100 per cent of their playground was level, and four playgrounds were reported as being approximately 50 per cent level. For maximum use a playground must be reasonably level and will have sufficient slope to insure adequate drainage. Eleven schools characterized their playgrounds as being fairly sloping and two were partly so. In most locations a gentle slope would prove quite valuable in keeping the playground properly drained. One playground was reported as being sloping to steep, one steep, and six playgrounds had poor drainage. The location of the building of the first six schools referred to with an oblique drainage was also poor. However, drainage is better as to construction of the site is selected. Frequently drainage is not in the proper areas can be adequately leveled by use of road machinery which is usually available in such communities. State highway maintenance machinery, city machinery, and other often contractors who are working on road jobs nearby can be hired at a reasonable rate to use their machinery for a project of this kind.

III. LOCATION

The location of a playground is related to the school building is an important factor from the standpoint

of safety and convenience. The lack of sufficient play space near the building has made it necessary for some schools to secure additional playgrounds in lots or fields nearby.

Safety. Additional playground space which is secured in adjacent lots creates a problem of safety. In order to determine the location of the playground in relation to that of the school building, the following questions were asked in this survey: (1) How many sides of the playground are adjacent to a street, highway, or railroad? (2) Is the playground separated from the building by a street, highway, or railroad?

In the replies to the first question, it is evident that most school grounds are bordered by a street on two or more sides. Ten schools reported that one side of their playground adjoined a highway and one school stated that two sides of their playground were parallel to a highway. Two playgrounds had a railroad on one side, while one was adjacent to an irrigation ditch.

Further information in this study shows that less than 15 per cent of the playgrounds are completely surrounded by a fence or wall (Table IV). However, about 60 per cent of the playgrounds have a fence or wall on one or two sides, which indicates that playgrounds adjacent to streets, and especially those adjacent to highways and railroads, are

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TABLE IV
TYPES OF PLAYGROUND BOUNDARIES
IN ELEMENTARY SCHOOLS OF NEW MEXICO

Playground border	Number of schools					Total No. play- grounds
	25 per cent or less	26-50 per cent	51-75 per cent	76-100 per cent		
Fence	6	4	4	13	27	
Wall	4	3		1	8	
Hedge	2	1			3	
Trees	6	5	2	8	21	
Sidewalk	11	5	1	6	23	
City street	2			2	4	
Irrigation ditch		1			1	

probably separated by a fence or wall. As a safety measure it is assumed that some type of barrier should be erected between a playground and a public highway and railroads. It is very probable that the highways as well as the railroads are fenced or have some means of separation from the playgrounds.

In the thirty-four replies to the second question, seven schools indicated that their playground was divided by a street and one school reported that the playground was divided by a highway.

Schools that have playgrounds divided in the above manner are faced with the responsibility of seeing that pupils go safely to and from the playground. An organized method of crossing the street or highway should be worked out with the aid of safety patrol members and the local traffic officers. The designated crossing place should be laned or striped with orange or white paint. Stop or slow signs should be erected to warn motorists of the crossing.

Divided playground areas not only present a constant safety problem, but take up additional time in going to and from the playground.

How playgrounds are surrounded. As previously mentioned, the larger percentage of playgrounds reported in this study are fenced on two or more sides. No data are

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How playgrounds are surrounded. As previously mentioned, the larger percentage of playgrounds reported in this study are fenced on two or more sides. No data are

available to determine what kind of fencing is used. Most authorities are agreed that school grounds should be fenced. Fences from six to seven feet high of chain-link, diamond-mesh seem to be the most desirable from the standpoint of utility and permanence.

The National Recreation Association gives the following reasons for fencing playgrounds:¹⁰

1. Prevents children from running into the street.
2. Prevents possibility of injury to passerby from batted balls.
3. Protects playground from vandalism.
4. Protects and prevents trespassing on neighboring property.
5. Simplifies the problem of maintenance and control.
6. Minimizes the problem of discipline.
7. Is a factor in beautifying.
8. Adds to the playground a degree of individuality.

Further information in the present study indicates that twenty-one playgrounds have a part or all of the playground bordered by trees. Trees on one or two sides of a playground will not only furnish shade and protection but will add to the attractiveness of the school site. The lack of water as well as proper protection in many schools has prevented the growth of trees and hedges. Although hedges are not so useful as trees, they nevertheless add to the beautification of the school grounds.

¹⁰ George D. Butler, Playgrounds, Their Administration and Operation (New York: A. S. Barnes and Company, 1936), p. 23.

available to determine what kind of fencing is used. Most authorities are agreed that school grounds should be fenced. Fences from six to seven feet high of chain-link, diamond-mesh seem to be the most desirable from the standpoint of utility and permanence.

The National Recreation Association gives the

following reasons for fencing playgrounds:¹⁰

1. Prevents children from running into the street.
2. Prevents possibility of injury to passerby from batted balls.
3. Protects playground from vandalism.
4. Protects and prevents trespassing on neighboring property.
5. Simplifies the problem of maintenance and control.
6. Minimizes the problem of discipline.
7. Is a factor in beautifying.
8. Adds to the playground a degree of individuality.

Further information in the present study indicates

that twenty-one playgrounds have a part or all of the playground bordered by trees. Trees on one or two sides of a playground will not only furnish shade and protection but will add to the attractiveness of the school site. The lack of water as well as proper protection in many schools has prevented the growth of trees and hedges. Although hedges are not so useful as trees, they nevertheless add to the beautification of the school grounds.

¹⁰ George D. Butler, Playgrounds, Their Administration and Operation (New York: A. S. Barnes and Company, 1930), p. 27.

Ernest O. Fox recommends that all schools have three parts, an approach area, living area, and a service area.¹¹ The approach area is the decorative area or the part serving as a setting for the building. This area is usually located in front of the building or at the entrance and is planted to grass, flowers, shrubs, etc., to add to the attractiveness of the site. The living area may be defined as the building proper, such as rooms and offices. The service area includes all portions of the playground that are actually used. The approach area is a part of the playground area, but since it is not generally used for a playground, it has been defined as a separate part.

Serviceability of playgrounds. The extent to which a playground can be used will be determined largely by the weather conditions and the type of surface.

This study indicates that thirty-nine schools reported a total of 454 days during the school year that the playground could not be used due to snow. This is an average of approximately eleven days per school (Table V). However, since New Mexico covers such a large area and has a great range in altitudes, one would expect to find a wide diversity of climatic conditions among the schools reporting

¹¹ Ernest O. Fox, "The Development of Public School Grounds," American School Board Journal, 104:28-29, January, 1942.

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 diversity of climatic conditions among the schools resulting

TABLE V
DAYS PLAYGROUNDS COULD NOT BE USED IN FIFTY-THREE
ELEMENTARY SCHOOLS OF NEW MEXICO
DUE TO WEATHER CONDITIONS

Weather condition	Number of schools	Number of days	Average days per school
Snow	39	454	11.60
Rain	28	170	6.07
Mud	25	255	10.20
Wind and dust	30	495	16.50
Rain and mud	2	30	15.00
Irrigation	3	59	19.60
None	3	0	.00
Totals	53	1,463	27.60

The data also show that schools in the north and northwestern sections of the state report a larger number of days in which the playground could not be used because of snow than do those in other sections of the state.

Twenty-eight schools reported a total of 170 days during which the playground could not be used because of rain. Some schools reported little if any loss of use, the average being approximately six days per school.

A total of 255 days or an average of approximately ten days per school reporting were lost due to mud on the playground. This again depends a great deal upon the location of the school within the state. Schools in the east or southeast whose playground surfaces are largely of sand and which also have less snow and rain naturally report fewer days lost due to muddy playgrounds.

Wind and dust seem to be the greatest cause for playground loss of use. Thirty schools reported a total of 495 days so lost, or an average of approximately sixteen days per school. Here again, climatic conditions and the type of surface areas are to be considered. Schools located in farming areas or in sections of the state where the surface area is largely sandy or sandy-loam are likely to report a large number of days that playgrounds cannot be used due to wind and dust.

Surfacing playground areas may help to keep down dust.

The data also show that schools in the north and
 northwestern sections of the state report a larger number
 of days in which the playground could not be used because of
 snow than do those in other sections of the state.
 Twenty-eight schools reported a total of 145 days
 during which the playground could not be used because of
 rain. These schools reported little if any loss of use, the
 average being approximately six days per school.
 A total of 955 days or an average of approximately
 ten days per school reporting were lost due to use of the
 playground. This again shows a great deal more loss
 located at the school within the state. Schools in the
 east or southern states playground surfaces are largely of
 sand and which also have less snow and rain naturally report
 fewer days lost due to unsatisfactory playgrounds.
 Wind and dust seem to be the greatest cause for
 playground loss of use. Thirty schools reported a total of
 495 days so lost, or an average of approximately sixteen days
 per school. Here again, climatic conditions and the type of
 surface areas are to be considered. Schools located in
 farming areas or in sections of the state where the surface
 area is largely sandy or sandy-loam are likely to report a
 large number of days that playgrounds cannot be used due to
 wind and dust.
 Surfacing playground areas may help to keep down dust.

However, as indicated above, much of the dust comes from adjoining fields and areas during windy weather. If the playground surface itself is dusty, this is a matter that could and should be corrected. It should be treated regularly with some kind of dust binder. Calcium chloride, which absorbs moisture from the air and retains it in the surface, is commonly used for this purpose.¹² It is available in either liquid or crystal form and two or three applications per year are usually sufficient.

Three schools reported an average loss of twenty days of playground use due to irrigation. These schools are located in areas where surface irrigation is used to water the lawns. Three other schools reported that there were no days out of the year that the playground could not be used. These latter schools are located in sections of the state where there is comparatively little rain and snow and the playground surface is of such material to permit use the year-round.

The information on the number of days that playgrounds cannot be used due to weather conditions indicates that each school loses an average of twenty-seven days of playground use during the school year. It further indicates that the

¹² George D. Butler, Recreation Areas, Their Design and Equipment (New York: A. S. Barnes and Company, 1947), p. 174.

However, as indicated above, much of the best women from adjoining fields and areas during windy weather. If the playground surface itself is dusty, this is a matter that could and should be corrected. It should be treated regularly with some kind of dust binder. Certain surfaces, which absorb moisture from the air and retain it in the surface, is commonly used for this purpose. It is available in either liquid or crystal form and two or three applications per year are usually sufficient.

Three schools reported an average loss of twenty days of playground use due to inclement weather. These schools are located in areas where surface protection is used to water the lawn. These other schools reported that there were no days out of the year that the playground could not be used. These latter schools are located in sections of the state where there is comparatively little rain and snow and the playground surface is of such material as gravel or the year-round.

The information on the number of days that playgrounds cannot be used due to weather conditions indicates that each school loses an average of twenty-seven days of playground use during the school year. It further indicates that the

location and the type of surface area of playgrounds are determining factors in their use. It is evident that proper care and preparation of the surface area will increase the serviceability of the playground.

location and the type of surface area at the site are
determining factors in such cases. It is evident that water
also and preparation of the surface area with respect to
serviceability of the playground.

CHAPTER IV

PLAYGROUND FACILITIES

The fully equipped playground should provide ample space and facilities for every pupil to participate in some type of activity. Play provides an opportunity for exercise and a much needed outlet for energy. Fields, courts, and apparatus make it possible for pupils to enter into a variety of activities without becoming tired of any particular sport or apparatus. Sufficient equipment also helps to distribute the pupils over the entire area of the playground, minimizes discipline problems, requires less supervision, and provides greater novelty and wholesome recreation for the group as a whole.

The purpose of this chapter is to show what types of playground equipment and other facilities are being used in elementary schools of this state; to give estimated costs of playground equipment; to present information on locations and arrangement of playground courts, fields, and apparatus; and to show what types of equipment and apparatus are preferable as to use and safety.

I. TYPE AND LOCATION OF FACILITIES

Types of playground equipment. A tabulation of the

PLAYGROUND FACILITIES

The fully equipped playground should provide ample space and facilities for every child to participate in some type of activity. Play provides an opportunity for exercise and a much needed outlet for energy. Fields, courts, and apparatus make it possible for pupils to enter into a variety of activities without becoming tired of any particular sport or apparatus. Sufficient equipment and space should be provided for the pupils over the entire area of the playground, that lines, designing problems, routines, and exercises, and provide greater novelty and wholesome recreation for the pupils as a whole.

The purpose of this chapter is to show what types of playground equipment and other facilities are being used in elementary schools of this state; to give estimated costs of playground equipment; to present information on locations and arrangement of playground areas, fields, and apparatus; and to show what types of equipment and apparatus are available as to use and safety.

1. TYPE AND LOCATION OF FACILITIES

Types of playground equipment. A tabulation of the

different types of playground apparatus used on the fifty-eight elementary school grounds covered by this study indicates that most schools have confined their selections to two or three types of apparatus. This is probably due to the following factors: (1) the lack of adequate playground space; (2) lack of sufficient funds; (3) undesirable surface areas; and (4) the lack of knowledge on the part of those responsible for making apparatus selections.

This study shows that fifty-six of the fifty-eight playgrounds have some type of playground apparatus (Table VI). Six schools reported that the only playground equipment used was of the expendable type such as playground balls and jumping ropes. One school reported that playground apparatus had proved too hazardous and had been removed; another stated that playground apparatus was considered too dangerous.

Information from this study indicates that 88 per cent of the playgrounds have swings. A total of 378 swings was listed in fifty-six schools, with an average of approximately seven swings on each playground. The next most widely used type of apparatus was the slide. Some schools reported slides of different sizes for various age groups. The average number of see-saws or teeters for the thirty-five schools listing them was four. Twenty-eight schools had horizontal bars on their playgrounds. This type

different types of playground equipment used in the fifty-eight elementary schools previously covered by this study indicated that most schools have continued with old equipment to two or three types of equipment. This is probably due to the following factors: (1) the lack of adequate playground space; (2) lack of sufficient funds; (3) inadequate maintenance; and (4) the lack of knowledge on the part of these responsible for making equipment selections.

This study shows that fifty-six of the fifty-eight playgrounds have some type of playground equipment (Table VI). Six schools reported that the only playground equipment used was of the portable type with no permanent balls and jumping tables. The school reported that playground equipment had broken, too old, and had been removed; another stated that playground equipment was considered too dangerous.

Information from this study indicates that 75 per cent of the playgrounds have swings. A total of 274 swings was listed in fifty-six schools, with an average of approximately seven swings in each playground. The most widely used type of equipment was the slide. These schools reported slides of different sizes for various age groups. The average number of see-saws or teeter-totters in thirty-five schools listing them was four. Twenty-eight schools had horizontal bars or rope playgrounds. This type

TABLE VI

TYPES OF PLAYGROUND FACILITIES FOUND IN FIFTY-EIGHT
ELEMENTARY SCHOOLS OF NEW MEXICO

Facility	Number of items	Number of playgrounds represented	Per cent of playgrounds represented
Swings	378	56	96.50
Slides	59	36	62.00
See-saws	151	35	60.30
Horizontal bars	53	28	48.28
Climbing structures	27	20	34.48
Merry-go-round	22	18	31.00
Horizontal ladder	17	13	22.40
Giant stride	10	9	15.52
Ocean wave	2	2	.03
Traveling rings	1	1	.02
Baseball diamond	101	51	87.90
Basketball courts	96	47	81.00
Volley ball courts	42	24	41.38
Sand boxes	18	13	22.41
Tennis courts	8	4	.07
Skating rinks	3	2	.03
Play houses	4	1	.02
Football fields	2	2	.03

TYPES OF LITERATURE: FICTION AND NON-FICTION A SUMMARY OF THE TYPES

Facility	Number of	Number of	Number of
	Books	Books	Books
Wines	10	10	10
Alcohol	10	10	10
Sea-horse	10	10	10
Horizontal horse	10	10	10
Clipping in horse	10	10	10
Harry-go-round	10	10	10
Horizontal ladder	10	10	10
Glant stride	10	10	10
Ocean wave	10	10	10
Traveling ring	10	10	10
Backball diamond	10	10	10
Backball square	10	10	10
Volley ball court	10	10	10
Band boxes	10	10	10
Tennis courts	10	10	10
Shooting ring	10	10	10
Flag house	10	10	10
Football field	10	10	10

of apparatus can be easily constructed and with very little cost, which probably accounts for so many being in use.

Climbing structures, a type of playground apparatus which is becoming more popular in this state, were found on twenty playgrounds. These structures are made in various shapes and sizes and will accomodate a large number of children on a relatively small space.

Merry-go-rounds were found on eighteen playgrounds. The initial cost of this apparatus has probably prevented a number of schools from installing it. Playgrounds having horizontal ladders numbered thirteen. Nine indicated that there was a giant stride on their playground. However, other schools stated that this apparatus had been installed but had been removed because of the danger involved in its use.

Elementary principals were asked the following questions in this survey: Do you feel that your playground equipment for the number who use it is entirely ample, sufficient, meager, or totally inadequate? Replies to the above question indicate that only three principals felt that their playground equipment was entirely ample. Sixteen stated that their equipment was sufficient; twenty-six felt that their equipment was meager for the number who used it, and ten principals said their playground equipment was totally inadequate. This would indicate that approximately 65 per cent of the playgrounds did not have sufficient

of apparatus can be easily constructed and with very little cost, which probably accounts for its being in use. Climbing apparatus, a type of play equipment, which is becoming more popular in this state, were found in twenty playgrounds. These structures are made in various shapes and sizes and will accommodate a large number of children on a relatively small space. Forty-four playgrounds were found to contain climbing apparatus. The initial cost of this apparatus has probably prevented a number of schools from installing it. Playground having horizontal ladders numbered thirteen. This indicated that there was a slight variety in their playgrounds. However, other schools stated that this apparatus had been installed but had been removed because of the danger involved in its use. Elementary principals were asked the following questions in this survey: Do you feel that your playground equipment for the number who use it is entirely adequate, sufficient, meager, or totally inadequate? Replies to the above question indicate that only three principals felt that their playground equipment was entirely adequate. Fifteen stated that their equipment was sufficient; twenty-six felt that their equipment was meager for the number who used it, and ten principals said their playground equipment was totally inadequate. This would indicate that approximately 62 per cent of the playgrounds did not have sufficient

playground apparatus. The lack of this equipment may be due to any or several of the factors mentioned at the opening of this chapter.

It is difficult to determine just how much playground equipment can and should be placed on the playground. This can be determined only by the available space and the number and size of the children to be served. It is evident that too many pieces of apparatus on a playground is as bad as not having enough. The National Recreation Association made a survey in 1937 to determine the types of playground apparatus having the greatest practical value. As a result the following list of apparatus was recommended as the minimum standard for the average playground:¹

- Swings -- frame 12' high (set of six)
- Slide -- 8' high approximately 16' long
- Horizontal ladder
- Giant stride
- Balance beam
- Horizontal bar
- Traveling rings
- See-saws (set of 3 or 4)
- Low climbing structure

Local conditions and needs will naturally change this list. If space is available, additional equipment such as a sand box and a small slide may be added to the above list.

Homemade equipment. Increased prices in playground

¹ George D. Butler, Recreation Areas, Their Design and Equipment (New York: A. S. Barnes and Company, 1947), p. 20.

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minimum standard for the average playground:

- Swings -- frame 12' high (set of six)
- Slide -- 8' high approximately 16' long
- Horizontal ladder
- Round strider
- Balance beam
- Horizontal bar
- Traveling rings
- See-saw (set of 2 or 4)
- Low climbing structure

Local conditions and needs will naturally change this list. If space is available, additional equipment such as a sand box and a small slide may be added to the above list.

Homemade equipment. Increased prices in playground

equipment have made it necessary for many schools to seek some means of making available funds go farther. Some schools find that considerable saving can be made by having part or all of the equipment made by local workmen. Information from this study indicates that approximately 30 per cent of all playground equipment found in the elementary schools was homemade.

In order to determine how satisfactory homemade equipment has been for those who have used it, principals were asked to state whether such equipment had been satisfactory, only partly satisfactory, or unsatisfactory. The replies indicated that eighteen principals had found homemade equipment to be satisfactory, while fifteen stated that such equipment had proved to be only partly satisfactory. Seven principals who had had experience in the use of homemade equipment considered it unsatisfactory. Approximately 40 per cent indicated that they had not used this type of equipment and could not make any comment in regard to the matter.

Principals were also asked to state their opinion in regard to safety, cost, and the durability of homemade equipment. Other responses were procured from personal interviews. Eleven made favorable replies concerning the above factors. Most of them felt that homemade equipment or handmade equipment could be made at a saving and would

equipment have made it necessary for some schools to seek
 some means of making available their equipment. Some
 schools find that considerable saving can be made by having
 part or all of the equipment sent to local women.
 Information from this study indicates that approximately
 30 per cent of all elementary equipment found in the
 elementary schools was borrowed.

In order to determine how satisfactory borrowing
 equipment has been for those who have used it, questions
 were asked to state whether such equipment had been
 satisfactory, only partly satisfactory, or unsatisfactory.
 The results indicated that satisfaction was found
 in borrowed equipment to be satisfactory, while fifteen stated
 that such equipment had proved to be only partly satisfactory.
 Seven principals who had had experience in the use of home-
 made equipment considered it satisfactory. Approximately
 40 per cent indicated that they had not used this type of
 equipment and could not make any comment in regard to the
 matter.

Principals were also asked to state their opinion in
 regard to safety, cost, and the durability of borrowed
 equipment. Other responses were given in their personal
 interviews. Eleven were favorable replies concerning the
 above factors. Most of them felt that borrowed equipment
 or homemade equipment could be made of a lasting and would

be satisfactory if made according to set regulations. Twenty-two principals gave unfavorable replies in regard to homemade equipment. Some of the comments concerning this matter are as follows:

Factory-made apparatus is more satisfactory since it carries a guarantee as to structure and strength.

It is my opinion that a school is justified in paying extra, if necessary, in order to get factory-made equipment. The ultimate cost is less and it is safer.

I find it is cheaper in the long run to buy factory-made equipment; it is safer, more durable, and has a neater appearance.

The quality and cost of both labor and material would not justify having equipment made. Money and time can usually be saved by purchasing equipment ready to use.

There are some types of equipment that can be hand-made with a saving, but as a whole, I prefer factory-made equipment.

Some types of equipment such as bars, ladders, balance beams, and sand boxes can be made satisfactorily for school use. In addition, several new types of play facilities that can be made locally have been devised and put into use by the New York Housing Authority at Fort Greene, Brooklyn.² They are based on the children's interest in watching building construction and in climbing and playing on building materials. The following types have been installed: a tunnel which is a piece of sewer pipe

² National Recreation Association, The Conduct of Playgrounds (New York: National Recreation Association, 1948), p. 49.

be satisfactory if made according to the regulations.
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homemade equipment. Some of the comments concerning this
matter are as follows:

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It is my opinion that a school is justified in paying
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equipment. The ultimate cost is less and it is safer.
I find it is cheaper in the long run to buy factory-
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The quality and cost of both labor and material
would not justify having equipment made. Money and time
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² National Recreation Association, The Benefits of
Playgrounds (New York: National Recreation Association,
1948), p. 42.

four feet long and three feet in diameter, set into the ground in a concrete base; play logs of oak, twelve feet long and one and one-half feet thick raised a foot from the ground; the dodger, an arrangement of low walls of cinder blocks stretched to the length of thirty-seven feet, with wings of different sizes extending from its backbone wall; and the what not, a pyramid of steps ending in a wall which measures about nine by six feet, and on which children play as they would on a front stoop. Numerous other facilities are also being used, such as old cars and airplanes.

Although the types of play facilities mentioned above are being tried in parks and other recreational areas, it is possible that they may come to be widely used on the school ground.

If a school plans to have play apparatus made, it should be made according to set standards and recommendations, preferably those given by the National Recreation Association.³

Courts, fields, and other playground facilities.

Every playground should provide sufficient space for a game area where such group games as baseball and soccer can be played. Fifty-one of the fifty-eight schools in this study

³ National Recreation Association, "Report of the Committee on Standards in Construction of Playground Apparatus," (New York: The Association, 1933) 4 pp.

four feet long and three feet in diameter, set into the ground in a concrete base; play lots of oak, twelve feet long and one and one-half feet thick raised a foot from the ground; the doggy, an arrangement of low walls of plaster blocks attached to the length of thirty-seven feet, with wings of different sizes extending from its backbone wall; and the what not, a pyramid of steps ending in a wall which measures about nine by six feet, and on which children play as they would on a front stoop. Numerous other facilities are also being used, such as old cars and airplanes. Although the types of play facilities mentioned above are being tested in parks and other recreational areas, it is possible that they may come to be widely used in the school ground.

If a school plans to have play apparatus made, it should be made according to set standards and recommendations, preferably those given by the National Recreation Association.²

Courts, fields, and other play areas facilities.
Every playground should provide sufficient areas for a game area where such group games as baseball and soccer can be played. Fifty-one of the fifty-eight schools in this study

² National Recreation Association, "Report of the Committee on Standards in Construction of Playgrounds Apparatus," (New York: The Association, 1933), p. 2.

stated that their playgrounds provided such an area. The seven schools that do not have baseball diamonds are probably primary schools which have not given much attention to this activity. Forty-seven schools had basketball courts and twenty-four reported that their playgrounds each had one or more volley ball courts. These courts, like baseball diamonds, are probably not provided in some of the primary schools where only pre-first, first, and second-grade pupils use the playground. Thirteen schools reported that they had provided sand boxes on their playgrounds for primary children.

No data were obtained as to the number and kinds of miscellaneous expendable playground items such as jumping ropes, playground balls, and horse shoes. Three schools reported that such items comprise the largest part of their playground equipment. This is probably true of a number of schools, especially where funds have not been available for buying permanent equipment.

Location and arrangement. For the greatest possible use of all available playground space, careful consideration should be given to locations and arrangement of apparatus as well as fields and courts. Most fields and courts are laid out with the long axis north and south to provide the most satisfactory playing conditions. Special areas should be

stated that their playgrounds provided each an area, and even schools that do not have baseball diamonds probably provide areas which have not given much attention to this activity. Forty-seven schools had baseball areas and twenty-four reported that their playgrounds each had one or more volley ball courts. These courts, like baseball diamonds, are probably not provided in any of the primary schools where only pre-first, first, and second-grade pupils use the playground. Thirteen schools reported that they had provided sand boxes on their playgrounds for primary school children.

No data were obtained as to the number of kinds of miscellaneous expendable playground items such as ropes, playground balls, and horse shoes. Three schools reported that such items comprise the largest part of their playground equipment. This is probably true of a number of schools, especially where funds have not been available for buying permanent equipment.

Location and arrangement. For the greatest possible use of all available playground space, careful consideration should be given to location and arrangement of equipment as well as fields and courts. The fields and courts should be out with the long axis north and south to provide the most satisfactory playing conditions. Special areas should be

set aside for fields and courts if the playground is large enough for such a division. Surface areas of fields should be of such material as to permit the most satisfactory use. Basketball, volley ball, and other courts should have a hard, smooth, resilient surface that will permit intensive use under all kinds of weather conditions. They should be clearly marked with a permanent paint.

Playground apparatus should be concentrated in one area unless sufficient space and apparatus are available for separating younger and older groups. Frequently it has been found that apparatus designed for primary children can be satisfactorily arranged in one area and larger pieces in another. These areas should be located so that children using them will not need to cross courts or fields going to or from different types of apparatus. Revolving and swinging types of devices such as swings, traveling rings, and giant strides are generally placed along the fence or in a far corner of the area where there will be less danger of pupils running into them. If the lines of motion of the various pieces of apparatus and the pupils using them are parallel, the likelihood of accidents is reduced. Also, apparatus set in line presents a more pleasing appearance than if the pieces were set at various angles. A low fence or railing separating this from other play areas might help to discourage other types of play in this section.

and aside for fields and courts if the playground is large enough for such a division. Unless space of fields and courts be of such material as to permit the use of material used in basketball, volleyball, and other courts should have hard, smooth, resilient surface that will permit intensive use under all kinds of weather conditions. They should be closely worked with a permanent paint.

Playground apparatus should be concentrated in one area unless sufficient space and equipment are available for separating younger and older groups. Frequently it has been found that apparatus designed for primary children can be satisfactorily arranged in one area and larger areas in another. These areas should be located as far apart as safety then will not need to cross roads or fields going to or from different types of apparatus. Reversing and swinging types of devices such as swings, revolving rings, and slides should be generally placed along the fence or in a far corner of the area where there will be less danger of running into them. In the lines of motion of the various pieces of apparatus and the points where they are located, the likelihood of accidents is reduced. Also, apparatus in line presents a more pleasing appearance than if the pieces were set at various angles. A few forms of rolling apparatus that from other types might be considered as dangerous other types of play in this section.

Although placing apparatus in a particular location of the playground is advantageous, it must be kept in mind that an overcrowded area can prove hazardous. Usually too many pieces of apparatus are placed in an area unless some recognition is given to space requirements approved by authorities in this field. Space requirements approved by the National Recreation Association are given in Table VII. The spaces given in this table are sufficient under normal conditions. Different sizes of apparatus may require more or less space.

Intensive use of apparatus will necessitate special care and preparation of the area under swings, around slides, and bars. The surface under swings should be covered with four or five inches of sand, sawdust, or tanbark to provide a soft landing place. It is difficult to keep this material on the surface without some type of box or frame to hold it. It is recommended that a box five feet long and three feet wide constructed of two-inch planks be sunk into the ground at the foot of the slide and filled with one of the above materials. Such a frame or box may also be used for the bars.

II. ESTIMATED COSTS AND MAINTENANCE

In order to determine roughly the amount of money invested in playground equipment in the elementary schools

Although placing apparatus in a particular location of the playground is advantageous, it must be kept in mind that an overcrowded area can prove hazardous. Usually too many pieces of apparatus are placed in an area unless some recognition is given to space requirements approved by authorities in this field. Space requirements approved by the National Recreation Association are given in Table VII. The spaces given in this table are sufficient under normal conditions. Different sizes of apparatus may require more or less space.

Intensive use of apparatus will necessitate special care and preparation of the area under drainage, around slides, and bars. The surface under swings should be covered with four or five inches of sand, sawdust, or bark to provide a soft landing place. It is difficult to keep this material on the surface without some type of box or frame to hold it. It is recommended that a box five feet long and three feet wide constructed of two-inch planks be sunk into the ground at the foot of the slide and filled with one of the above materials. Such a frame or box may also be used for the bars.

II. ESTIMATED COSTS AND MAINTENANCE

In order to determine roughly the amount of money invested in playground equipment in the elementary schools

TABLE VII

SPACE REQUIREMENTS FOR PLAYGROUND
APPARATUS AND AREAS*

Type of apparatus	Dimensions of apparatus		Approximate use space requirements in feet	Space in square feet
	Length in feet	Height in feet		
Balance beams	12	.5	6 x 20	120
Climbing structure (average)	10	10	20 x 20	400
Giant stride	--	12	30 x 30	900
Horizontal bar	6	5.5-7.5	12 x 20	240
Jungle gym (junior)	6.5	7	12 x 15	180
Merry-go-round	10 (diam.)	3.5	22 x 22	484
Sand box	6 x 10 (min.)	1	12 x 16	192
See-saws (set of 4)	12	2	20 x 20	400
Slide	16	8	12 x 30	360
Slide (small)	8	4.5	8 x 16	128
Swings (set of 3)	15 at top	12	25 x 35	875
Swings (set of 6)	30 at top	12	25 x 50	1,250
Swings (set of 4)	18 at top	10	20 x 30	600
Traveling rings (line)	36 at top	12	20 x 60	1,200
Baseball	75' diamond		250 x 250	62,500
Basketball	40 x 60		50 x 70	3,500
Hop scotch	5 x 12.5		10 x 20	200
Soccer	100 x 200		125 x 240	30,000
Softball	45' diamond		175 x 175	30,625
Volley ball	25' x 50'		40 x 70	2,800
Dodge ball	40' circle		60 x 60	3,600

*National Recreation Association, 1947, p. 29.

studied, each principal was asked to give the approximate cost of his playground apparatus. The total of the estimates for the schools reporting was \$24,875. This amount represents estimates from forty-one schools, an average of approximately \$600.00 per playground (Table VIII). This is a rather conservative figure in view of current costs, since the prices of equipment have increased almost 100 per cent during the past four or five years.

Principals were also asked to estimate the amount of money spent on playground equipment during the past two years. The total amount reported for this period was \$8,310.00, which is approximately 33 per cent of the total cost of all equipment. This would seem to indicate that almost one-third of the equipment now in use has been purchased during the past two years. However, one-third of the total cost may not necessarily represent a third of the equipment, since present prices are much higher and the cost of individual items may vary greatly.

This study shows that approximately 50 per cent of the schools in this survey have not spent any money for playground apparatus during the past two years. Using the average yearly amount (Table VIII) spent on playground apparatus by the elementary schools and comparing the cost with enrollment, \$.16 per pupil is being spent annually on playground apparatus. This may be due to the increased

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TABLE VIII

ANALYSIS OF PLAYGROUND EQUIPMENT EXPENDITURES IN
FORTY-ONE ELEMENTARY SCHOOLS OF NEW MEXICO

Total cost of equipment		\$24,875.00
Amount of tax money used		18,763.75
Per cent of tax money used	75.40	
Amount spent from 1947-1949		8,310.00
Per cent of total cost spent from 1947-1949	33.40	
Per cent of factory-made equipment	71.04	
Amount spent annually per pupil enrolled		.16
Average investment per pupil enrolled		1.00

FEDERAL BUREAU OF INVESTIGATION

TABLE VIII

ANALYSIS OF PLANT AND EQUIPMENT INVESTMENT IN
FOOTWEAR MANUFACTURING INDUSTRY

1947-1949		1950-1952	
Total cost of equipment		Total cost of equipment	
Amount of tax money used		Amount of tax money used	
Per cent of tax money used		Per cent of tax money used	
Amount spent from 1947-1949		Amount spent from 1950-1952	
Per cent of total cost spent		Per cent of total cost spent	
From 1947-1949		From 1950-1952	
Per cent of factory-wide		Per cent of factory-wide	
equipment		equipment	
Amount spent annually per		Amount spent annually per	
unit enrolled		unit enrolled	
Average investment per		Average investment per	
unit enrolled		unit enrolled	
1947-1949		1950-1952	
13,157.75		13,157.75	
2,310.00		2,310.00	
72.90		72.90	
57.10		57.10	
71.00		71.00	
1.10		1.10	
1.30		1.30	

costs and the scarcity of playground apparatus. However, most types of apparatus have been available for the past two years.

Further information from this study indicates that the total amount invested in playground apparatus was approximately one dollar per pupil enrolled.

The following is a list of playground apparatus recommended for the average playground by the National Recreation Association.⁴ The prices are an average of those listed by local dealers for 1948 and 1949.

Swings -- frame 12' high (set of six)	\$185.00
Slide -- 8' high, approximately 16' long	136.00
Horizontal ladder	56.00
Giant stride	80.00
Balance beam	15.00
Horizontal bars (3)	46.00
Traveling rings	65.00
See-saws (set of 4)	90.00
Low climbing structure	<u>134.00</u>
Total	\$807.00

The apparatus listed is believed to include the types having the greatest value. The total cost of the

⁴ National Recreation Association, "Report of the Committee on Standards in Construction of Playground Apparatus," (New York: The Association, 1933) 4 pp.

costs and the necessity of providing equipment. However, most types of apparatus have been available for the past few years.

Further information from this study indicates that the total amount invested in playground apparatus is approximately one dollar per child enrolled. The following is a list of playground apparatus recommended for the average playground by the National Recreation Association.⁴ The prices are an average of those listed by local dealers for 1945 and 1946.

Swings -- frame 12' high (set of six)	115.00
Slide -- 8' high, approximately 15' long	135.00
Horizontal ladder	45.00
Glanc slide	50.00
Balance beam	15.00
Horizontal bars (2)	40.00
Traveling rings	55.00
See-saw (set of 4)	60.00
Low climbing structure	125.00
Total	500.00

The apparatus listed is believed to include the types having the greatest value. The total cost of the

⁴ National Recreation Association, "Report of the Committee on Standards in Construction of Playgrounds and Equipment," (New York: The Association, 1937), p. 4.

recommended equipment is approximately 33 per cent more than the average estimated cost of each school's equipment. However, as previously stated, this difference could easily be due to the difference in past and present prices.

Not until recently have most administrators begun to recognize the importance of adequate playground equipment. For many years most of the money spent for playground equipment was raised by the school from plays, carnivals, and through the cooperation of the Parent-Teacher Associations and other organizations. Failure to make annual appropriations from school funds has prevented many schools from having an adequately-equipped playground.

Elementary principals were asked to indicate what per cent of the total equipment cost had been paid from funds appropriated by the school, i.e., tax money. Information submitted on this matter indicated that approximately 25 per cent of the estimated cost of all playground equipment has been derived from some source other than general school funds. Six principals stated that all of their playground equipment had been purchased with money raised from sources other than school funds.

No information is available as to the amount of money spent annually on maintenance of playground equipment. The maintenance of apparatus should be comparatively small if durable equipment has been installed in the first place.

recommended equipment is approximately 25 per cent more than the average estimated cost of each school's equipment. However, as previously stated, this difference would easily be due to the difference in cost and program plans. Not until recently have most school districts begun to recognize the importance of adequate physical equipment. For many years most of the money went for operating equipment was raised by the school from gifts, donations, and through the cooperation of the Parent-Teacher Association and other organizations. Schools have avoided annual appropriations from school funds for equipment and schools from having an adequate physical program. Elementary principals were asked to indicate what per cent of the total equipment cost had been paid from state appropriation by the school, i.e., tax money. Information submitted on this matter indicated that approximately 25 per cent of the estimated cost of all physical equipment has been derived from some source other than general school funds. Six principals stated that all of their physical equipment had been purchased with money raised from sources other than school funds. No information is available as to the extent of money spent annually on maintenance of physical equipment. The maintenance of equipment should be approximately 10 per cent of the equipment cost. This has been indicated in the Fund class.

Courts and fields require considerable time and expense in their upkeep. In order to keep the maintenance cost at a minimum and obtain the greatest possible use, routine inspections and minor repairs should be made regularly.

III. PREFERABILITY AND USE

Some of the important factors to consider before purchasing playground apparatus are the following: (1) the durability and construction of the apparatus, (2) safety features, (3) amount of space required, (4) ages of pupils to be accommodated, (5) the number to be accommodated, (6) the popularity of the apparatus with those who are to use it, and (7) physical developmental value. The extent to which the apparatus is used depends much on the above factors. Too often equipment is selected which does not serve the purpose for which it was intended. For example, equipment desirable for primary children will not be enjoyed and used equally as much by older children.

In order to determine the use and popularity of playground apparatus among elementary pupils, each principal was asked to indicate the types which are most popular with primary, intermediate, and upper-grade groups. A tabulation of this information shows that swings are the most popular type of apparatus on the playground for all three groups. However, since so many schools have swings, this may account

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for their popularity.

Information indicated that the slide was the second choice of the pupils in the primary group and third choice of intermediate children, while see-saws were second in preference for intermediate groups and third for primary. The merry-go-round was fourth choice for the primary group, but is not so popular with intermediate and upper-grade pupils. Climbing structures are popular with both primary and intermediate groups. Horizontal bars and ladders were found to be more popular with older children than with primary pupils. Since some types of apparatus were not reported on many of the playgrounds, it would be difficult to determine their popularity. An example would be the ocean wave and traveling rings, both the line and circular types. These pieces of apparatus are quite desirable for older boys and girls, and if more schools had a chance to use them no doubt they would be very popular, especially with upper-grade pupils.

This survey shows that baseball diamonds are probably the most popular of all fields and courts which are available for intermediate and upper-grade groups. The fact that baseball is played in the early fall as well as in the spring probably accounts for the great demand for the diamond. Basketball courts were very popular with both intermediates and upper-grades. Volley ball courts were also used largely

for their popularity.

Information indicated that the girls who were
choice of the pupils in the primary group and third choice
of intermediate children, while less popular were second in
preference for intermediate groups and fourth choice for primary groups.
The very-go-round was fourth choice for the primary group,
but is not as popular with intermediate and upper-grade
pupils. Climbing structures are popular with both primary
and intermediate groups. Horizontal bars and ladders were
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Basketball courts were very popular with both intermediate
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by these groups. Information indicated that primary children were about the only ones to use the sand box, a play facility that is inexpensive in its construction and which will accommodate a large number of youngsters. In Table IX are listed playground apparatus according to preference and use in the three groups.

The National Recreation Association has found that the types of playground apparatus most commonly used on the school playground are, in the order named, swings, sand box, slide, see-saw, horizontal bars, horizontal ladder, jungle-gym or climbing structures, and traveling rings.⁵ The order and use of the apparatus listed above compares favorably with the lists given in this study (Table IX), with one exception, the sand box, which is not so frequently used on playgrounds in this state as several other types of apparatus.

Mitchell and Mason list the popularity of playground apparatus in this order: swings, sand box, giant stride, horizontal bars, see-saws or teeters, and slides.⁶ The popularity and use of apparatus will no doubt change as manufacturers make improvements and place new types on the market.

⁵ National Recreation Association, "Report of the Committee on Standards in Construction of Playground Apparatus," (New York: The Association, 1933) 4 pp.

⁶ E. D. Mitchell and Bernard S. Mason, The Theory of Play (New York: A. S. Barnes and Company, 1934), p. 347.

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5 National Recreation Association, "Report of the Committee on Standards in Construction of Playgrounds," (New York: The Association, 1933) p. 10.

6 E. D. Mitchell and Bernard A. Mason, The Theory of Play (New York: E. B. Norton and Company, 1928) p. 10.

TABLE IX
PUPIL PREFERENCE IN THE USE OF PLAYGROUND APPARATUS
IN FIFTY-FIVE ELEMENTARY SCHOOLS OF NEW MEXICO

Order of Preference	Primary Pupils	Intermediate Pupils	Upper Grades
1	Swings	Swings	Swings
2	Slide	See-saw	Horizontal bars
3	See-saw	Slide	Horizontal ladder
4	Merry-go-round	Climbing structures	Merry-go-round
5	Climbing structures	Merry-go-round	See-saw
6	Horizontal bars	Horizontal bars	Giant stride
7	Sand box	Giant stride	Ocean wave
8	Giant stride	Traveling rings	Traveling rings
9	Ocean wave	Ocean wave	Slide

[illegible]

Safety in the use of playground equipment. With additional playground equipment and added play facilities, there comes a need for supervision in the use of play apparatus. Many of the accidents on the school grounds are largely due to the lack of proper supervision. For information on this matter, elementary principals were asked to indicate to what extent their playground apparatus was supervised. Approximately two-thirds stated that it was supervised at all times during its use. About one-third reported that playground equipment was supervised only part of the time while in use. It is almost impossible for those in charge of the playground program to maintain a constant watch over all activities and apparatus being used. It is evident that pupils must help to assume responsibility in the use and care of play facilities if accidents are to be avoided. Pupils as well as parents must realize that accidents do occur regardless of the amount of supervision or the type of apparatus, but that they can be kept to a minimum by proper care and precaution.

The National Recreation Association lists the following causes for playground accidents:⁷

⁷ George D. Butler, Playgrounds, Their Administration and Operation (New York: A. S. Barnes and Company, 1936),

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The National Recreation Association lists the

following causes for playground accidents:

Y. George D. Butler, Playgrounds, Their Maintenance and Operation (New York: A. E. Barnes and Company, 1930).

1. Improper layout of the playground area.
2. Improper use of apparatus and facilities.
3. Installation of dangerous apparatus and facilities.
4. Defective apparatus, facilities, and game supplies.
5. Carelessness in the use and maintenance of game areas.
6. Inadequate supervision.

It has been said that playground apparatus is a constant source of discipline problems. In order to secure the opinion of elementary principals on this statement, the following question was asked: "Does your fixed equipment, such as swings, slides, and horizontal bars, create excessive discipline problems?" Only five principals answered affirmatively, while thirty-six reported that the number of discipline problems was greatly decreased where pupils had ample playground apparatus and play facilities. Here again the amount of supervision probably influenced these decisions. The lack of supervision would probably make it possible for discipline problems to arise more often than if the use of apparatus was carefully supervised. Not only must there be playground supervision, but children should be taught the proper use and care of playground equipment. They should learn to play safely and to avoid taking chances where accidents are most likely to occur.

There are no national statistics available on deaths resulting from playground accidents, but of all accidents reported by schools to the National Safety Council for the year 1947-48 approximately 20 per cent occurred on school grounds. Organized play activities, such as baseball and

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There are no national statistics available on deaths resulting from playground accidents, but of all accidents reported by schools to the National Safety Council for the year 1947-48 approximately 20 per cent occurred on school grounds. Organized play activities, such as baseball and

football, accounted for almost 11 per cent of all accidents reported. Unorganized play activities, including those which occur on playground apparatus, were responsible for approximately 10 per cent.⁸

Principals were asked to give the number of accidents occurring on their playgrounds during the past two years due to the use of playground apparatus and the types of equipment that were the most frequent causes. Information indicates that a total of forty-five accidents have occurred on these playgrounds during the past two years as a result of using playground apparatus. Swings were the most frequent cause. Six schools reported a total of ten accidents caused by using swings (Table X). The piece of apparatus on which accidents occurred next most frequently was the slide. Horizontal bars, see-saws, and climbing structures were high on the list. The large number of accidents occurring from the use of swings is probably due largely to their popularity and to the fact that almost all schools have swings.

It has been found that the number of accidents occurring on the playground can be decreased by providing separate play areas for large and small children. The National Recreation Association suggests that if the following rules for the use of playground apparatus and play facilities are observed, the number of accidents will

⁸ Safety Education, "Play Areas," 28:17, October, 1948.

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⁸ National Recreation Association, "Play Areas," 28:17, October, 1948.

TABLE X

ACCIDENTS CAUSED BY USE OF PLAYGROUND APPARATUS
IN THIRTY ELEMENTARY SCHOOLS OF NEW MEXICO
1947 -- 1949

Type of apparatus	Number of accidents	Number of schools represented
Swings	10	6
Slides	9	7
Horizontal bars	7	4
See-saws or teeters	5	4
Climbing structures	5	1
Giant stride	3	3
Merry-go-round	2	1
Horizontal ladder	1	1
Skating	1	1
Balance beam	1	1
Wire backstop	1	1
Totals	45	30

TABLE X

ACCIDENTS CAUSED BY USE OF PLAYGROUND APPARATUS
IN THIRTY ELEMENTARY SCHOOLS OF NEW MEXICO
1947 -- 1948

Type of apparatus	Number of accidents	Number of schools represented
Swings	10	6
Slides	9	7
Horizontal bars	1	4
See-saws or rockers	1	4
Climbing structures	3	1
Giant slides	3	3
Levy-go-round	2	1
Horizontal ladder	1	1
Swirling	1	1
Balance beam	1	1
Wire basketball	1	1
Totals	42	30

be greatly reduced:⁹

1. Teach the proper use of all apparatus, such as, proper holds, methods of getting on and off, starting and stopping, and other fundamental uses of the apparatus.
2. Prohibit misuse of apparatus. This prevents accidents as well as protecting and preserving the life of the apparatus.
3. Limit the use of the apparatus to the children it is intended to serve.
4. Insist on children taking turns. Part of the value of having some types of apparatus is social, resulting from sharing and cooperation.
5. Organize safety patrols to help in this matter.
6. Teach pupils to perform carefully and accurately on apparatus.
7. Teach pupils to stay away from apparatus when it is being used by others.
8. Prohibit use when wet and slippery.

Rules for the use of swings:

1. Only one child in a swing at a time.
2. Hold on tightly at all times.
3. Sit in the swing; don't stand up or kneel.
4. All children face the same direction when swinging.
5. Remember, swinging too high is dangerous; so is twisting or swinging sideways.
6. No running under swings when pushing another child.
7. Wait until motion is stopped before leaving swing; then keep out of the way of other swings.
8. Play or stand away from the swings so you will not be struck.
9. If ball rolls under swing, wait until swing is stopped before trying to get it.
10. Persons over fifteen years are not allowed to swing.

Rules for the use of the slide:

1. Slide down feet first and keep your feet in.
2. Be sure slide is clear before starting down.
3. Climb the ladder without crawling or pushing.
4. Get up and move from the foot of slide quickly.
5. There should be no crawling or running up the slide.
6. Slide should be inspected regularly for splinters, loose screws or nails.

⁹ Butler, op. cit., pp. 336-338.

be greatly reduced?

1. Teach the proper use of all apparatus, such as proper holds, methods of assisting on and off, and stopping, and other fundamental uses of the apparatus.
2. Prohibit misuse of apparatus. This prevents accidents as well as protecting and preserving the life of the apparatus.
3. Limit the use of the apparatus to the children in intended to serve.
4. Insist on children being calm, part of the value of having some type of apparatus is mental, resulting from exertion and cooperation.
5. Organize safety patrol to help in this matter.
6. Teach pupils to control carefully and consciously the apparatus.
7. Teach pupils to stop every time apparatus when it is being used by others.
8. Prohibit use when wet and slippery.

Rules for the use of swings:

1. Only one child is to swing at a time.
2. Hold on tightly at all times.
3. Sit in the swing; don't stand up or crawl.
4. All children face the same direction when swinging.
5. Remember, swinging too high is dangerous so is twisting or swinging sideways.
6. No running under swings when pushing another child.
7. Wait until swing is stopped before leaving swing; then keep out of the way of other swings.
8. Play or stand away from the swings so you will not be struck.
9. If bell rings before swing, wait until swing is stopped before trying to get it.
10. Persons over fifteen years are not allowed to swing.

Rules for the use of the slides:

1. Slide down feet first and keep your feet in.
2. Be sure slide is clear before starting down.
3. Climb the ladder without crawling or pushing.
4. Get up and wave from the foot of slide until called.
5. There should be no crawling or pushing up the slide.
6. Slide should be inspected regularly for safety.
7. Loose rocks or nails.

LESSON 3

2 Author, pp. 111, pp. 112-113
COTTON COUNTRY

Rules for the use of see-saws or teeters:

1. Give warning to the person on the other end before getting off.
2. Keep firm hold on teeter and sit facing each other; no standing or running.
3. Hold both feet out from under the board as it approaches the ground.
4. Leaving board, first child off hold board tightly and let it fall gradually so that the child on the other end can alight safely.
5. Stay away from teeter unless you are using it.
6. Bumping the end of the board on the ground is both dangerous and destructive to the teeter.

Rules for the use of rings and bars:

1. Be sure you have a tight grip before swinging.
2. On the traveling rings, be sure the next ring is free before you try to catch it.
3. Traveling should be in one direction.
4. Dry hands assure a better grip; be sure your hands are dry.
5. If you are falling, attempt to land on your feet.
6. Heads and feet should not be put through rings.
7. High rings and bars are for children who can reach them, not for those who have to be lifted up.
8. Do not use benches or boxes as take-off boards.

Rules for the use of giant stride:

1. Hold on tightly at all times and by one rope or chain only.
2. Hold back from person in front of you.
3. The ladders are to be held on to; don't put your feet through them.
4. If other pupils are on the stride, give warning when you let go; don't throw chains forward or backward.
5. Leave the chains as they are; don't shorten or cross them.
6. When you leave the stride run out of the way immediately.

Rules for the use of the sand box:

1. Bottles and sharp instruments should not be permitted in the sand box.
2. The sand is to play in and with, not to throw or carry away.

EXTRA
COTTON CONTENT

Rules for the use of see-saw or teeter:

1. Give warning to the person on the other end before getting off.
2. Keep firm hold on teeter and not facing away from it.
3. Hold both feet out from under the board as it approaches the ground.
4. Leaving board, lift child off both feet slightly and let it fall gradually so that the child on the other end can lift safely.
5. Stay away from teeter unless you are using it.
6. Jumping the end of the board on the ground is both dangerous and destructive to the teeter.

Rules for the use of rings and ropes:

1. Be sure you have a tight grip before releasing.
2. On the traveling ring, be sure the ring is free before you try to swing it.
3. Traveling should be in one direction.
4. If hands become a better grip, be sure your hands are dry.
5. If you are falling, attempt to land on your feet.
6. Heads and feet should not be put through rings.
7. High rings and have use for children who can jump them, not for those who have to be lifted up.
8. Do not use ladders or ladders as take-all jumps.

Rules for the use of rings and ropes:

1. Hold on tightly at all times and by the rope or chain only.
2. Hold back from person in front of you.
3. The ladders are to be held on the back of your feet through them.
4. If other pupils are on the teeter, give warning when you let go; don't throw chains forward or backward.
5. Leave the chains as they are; don't shorten or stretch them.
6. When you leave the teeter, get off the way immediately.

Rules for the use of the sand box:

1. Bottles and sharp instruments should not be used in the sand box.
2. The sand is to play in and not to throw or carry away.

COTTON CONTENT

3. Lunch should be eaten elsewhere; crumbs attract insects.
4. Share the box with others; do not monopolize it.

Rules for the use of the drinking fountain:

1. Keep free from sticks, stones, paper, and rubbish.
2. Broken teeth are likely to result from pushing; don't do it.
3. Await your turn in line; there is plenty of water for all.
4. It is courteous to allow the small children to drink first.
5. Crowding or playing around the fountain may cause accidents.
6. It is unhealthy to drink large quantities of water when you are overheated.

The prevention of accidents on courts, fields, and general play areas is also important since statistics reveal that approximately one-fourth of all injuries occur to persons taking part in athletic games and organized play activities.¹⁰ The carelessness of children in running across areas for games contributes many accidents. The enforcement of such rules as the following should reduce the accidents on most playgrounds:¹¹

1. All baseball bats should be taped to prevent slipping out of player's hands. Cracked bats should not be used.
2. Players should not enter or cross ball field or game courts during a game.
3. Regulation baseball should be permitted only on

¹⁰ George D. Butler, Playgrounds, Their Administration and Operation (New York: A. S. Barnes and Company, 1936), p. 339.

¹¹ Loc. cit.

3. Lunch should be eaten after play; it is essential.
4. Share the box with others; do not monopolize it.

Rules for the use of the drinking fountain:

1. Keep free from sticks, stones, paper, and rubbish.
2. Broken bottles are likely to result from pushing.
3. Don't do it.
4. Swell your turn in line; there is plenty of water for all.
5. It is courteous to allow the small children to drink first.
6. Crowding or playing around the fountain may cause accidents.
7. It is unhealthy to drink large quantities of water when you are overheated.

The prevention of accidents on swings, slides, and

General play areas is also important since statistics reveal

that approximately one-fourth of all injuries occur to

persons taking part in athletic games and organized play

activities.¹⁰ The carelessness of children in following

across areas for games contributes many accidents. The

enforcement of such rules as the following should reduce

the accidents on most playgrounds:¹¹

1. All baseball bats should be taped to prevent slipping out of player's hands. Unchecked bats should not be used.
2. Players should not enter or cross ball field in game.
3. Regulation baseball should be permitted only on courts during a game.

¹⁰ George D. Butler, Elementary Physical Education and Recreation (New York: A. S. Barnes and Company, 1935), p. 339.

¹¹ Loc. cit.

- diamonds where there is ample room for safety.
4. Horseshoe courts should be fenced or marked off to prevent persons crossing them.
 5. Game and ball fields should not be used when wet and slippery.
 6. Players and spectators should be taught to keep their eye on the ball constantly.
 7. Throwing baseballs, pitching horseshoes, batting balls, putting the shot, and other similar activities should be restricted to the area set aside for them.

It is recommended that the above rules be presented to each group of children for study and discussion. If necessary, demonstrations in proper care and use of play facilities may be given. Rules should be posted on the bulletin board or such places where they can be seen. It is only through the cooperation of pupils and teachers that accidents and the need for supervision can be reduced to a minimum.

4. Horsemanship should be taught as a part of the physical education program.
5. Game and ball fields should be used when and where necessary.
6. Players and spectators should be taught to keep their eye on the ball constantly.
7. Throwing baseballs, catching baseballs, passing balls, putting the ball in play, and other activities should be restricted to the area set aside for this purpose.

It is recommended that the above rules be presented to

each group of children for study and discussion. It is necessary, however, in proper care and use of play facilities may be given. Rules should be posted on the bulletin board or some place where they can be seen. It is only through the cooperation of pupils and teachers that accidents and the need for supervision can be reduced to a minimum.

WILLIAMS FALLS
EZEKIEL
COTTON MOUNTAIN

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this survey, as stated in the opening chapter, is to determine what types of playgrounds and playground equipment are being used in the elementary schools of this state and to compare and evaluate these facilities according to standards and recommendations set forth by the National Recreation Association and other authorities. In this, the final chapter, conclusions will be drawn from the study and recommendations for improvement as warranted by the findings will be given.

I. SUMMARY

Within the past few years it has become evident that the average elementary school does not have sufficient playground space or playground equipment to serve adequately the increased enrollments.

This study shows that the average playground area for elementary schools surveyed in this state is 3.4 acres, which is less than the minimum standard of five acres recommended by Strayer and Engelhardt.¹ Information also reveals that a

¹ George D. Strayer and N. L. Engelhardt, Standards for Elementary School Buildings (New York: Bureau of Publications, Teachers College, Columbia University, 1933), p. 16.

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this survey, as stated in the opening chapter, is to determine what types of playground and playground equipment are being used in the elementary schools of this state and to compare and evaluate these facilities according to standards and recommendations set forth by the National Recreation Association and other authorities. In this, the final chapter, conclusions will be drawn from the study and recommendations for improvement as suggested by the findings will be given.

I. SUMMARY

Within the past few years it has become evident that the average elementary school does not have sufficient playground space or playground equipment to serve adequately the increased enrollment.

This study shows that the average playground area for elementary schools surveyed in this state is 1.5 acres, which is less than the minimum standard of 2.5 acres recommended by Stetson and Engelhardt.¹ Information also shows that 67

¹ George D. Stetson and E. L. Engelhardt, Standards for Elementary School Buildings (New York: Bureau of Publications, Teachers College, Columbia University, 1925), p. 16.

large percentage of these schools have playgrounds with surface areas largely of dirt, gravel, and other types of natural materials unsatisfactory for a desirable play area.

Approximately 60 per cent of the playgrounds have surface areas that are largely level, which is a commendable feature. However, about 15 per cent of the schools reported playground surfaces too rough and steep for satisfactory use. Most playgrounds are conveniently located in relation to the school building, with the exception of approximately 15 per cent which have a problem of safety with pupils going to and from playgrounds that are divided by streets or highways.

It was found in this study that only about 30 per cent of all playgrounds were completely enclosed by a fence or wall and that only a small percentage of the playgrounds contained trees and grass. Information indicated that the use of the playground was greatly hindered, in some areas, by the type of surface and weather conditions. An average of approximately twenty-eight days of playground use is lost annually by each school because of these conditions.

Apparently playground apparatus has been generally accepted for use in most of the elementary schools throughout this state. Only three schools reported it was not used because it was too dangerous. The average school has only about 65 per cent of the needed playground equipment. Basketball and volley ball courts, baseball

large percentage of these schools have playgrounds with
surface areas largely of dirt, gravel, and other types of
natural materials unsatisfactory for a desirable play area.
Approximately 60 per cent of the playgrounds have
surface areas that are largely level, which is a commendable
feature. However, about 15 per cent of the schools reported
playground surfaces too rough and steep for satisfactory use.
Most playgrounds are conveniently located in relation to the
school building, with the exception of approximately 15 per
cent which have a problem of safety with pupils going to and
from playgrounds that are divided by streets or highways.
It was found in this study that only about 30 per
cent of all playgrounds were completely enclosed over fence
or wall and that only a small percentage of the playgrounds
contained trees and grass. Information indicated that the
use of the playground was greatly hindered, in some degree,
by the type of surface and weather conditions. An average
of approximately twenty-eight days of playground use is lost
annually by each school because of these conditions.
Apparently playground supervision was poor generally
accepted for use in most of the elementary schools
throughout this state. Only three schools reported it was
not used because it was too dangerous. The majority of schools
has only about 25 per cent of the needed equipment.
Equipment. Basketball and volley ball courts, baseball

diamonds, and other play areas were found on most playgrounds; however, the maximum use of these facilities is not being attained because of poor surfaces.

Information indicates that most schools have only two or three types of apparatus on the playground. Swings, slides, and see-saws or teeters were found to be the most numerous as well as the most popular with school children. Approximately 95 per cent of all schools reporting had one or more swings on the playground.

The study shows that the majority of the elementary principals are of the opinion that homemade equipment is not satisfactory from the standpoint of safety and durability, and that most schools would eventually save money by purchasing factory-made equipment that is guaranteed as to structure and strength. Approximately 30 per cent of the playground equipment now in use in the elementary schools is homemade.

The total estimated cost of playground equipment for the elementary schools surveyed was less than \$25,000, of which approximately 25 per cent came from sources other than school or tax money. The typical elementary school spends approximately seventy-five dollars a year on permanent playground equipment, or approximately sixteen cents per pupil enrolled.

The study reveals that a total of forty-five

bleachers, and other play areas were found on most playgrounds; however, the maximum use of these facilities is not being attained because of poor upkeep.

Information indicates that most schools have only two or three types of equipment on the playground. Slides, swings, and see-saws or footers were found to be the most numerous as well as the most popular with school children. Approximately 25 per cent of all schools reported having one or more swings on the playground.

The study shows that the majority of the elementary principals are of the opinion that homemade equipment is not satisfactory from the standpoint of safety and durability, and that most schools would eventually save money by purchasing factory-made equipment that is constructed as to structure and strength. Approximately 30 per cent of the playground equipment now in use in the elementary schools is homemade.

The total estimated cost of playground equipment for the elementary schools surveyed was less than \$25,000, of which approximately 25 per cent came from sources other than school or tax money. The lowest elementary school reported approximately seventy-five dollars a year on playground equipment, or approximately sixteen cents per pupil enrolled.

The study reveals that a total of forty-five

accidents occurred on playgrounds during the past two years as a result of using playground equipment. It was found that swings, slides, and see-saws were the most frequent causes of accidents. However, no particular type of playground apparatus seemed to be so frequent a cause of accidents as to be unsafe if properly used.

Information from the survey also suggests that adequate playground equipment helps to reduce discipline problems as well as the amount of supervision needed on the playground.

II. CONCLUSIONS

After having carefully reviewed the information gathered in this study, the writer derives the following conclusions:

A general inadequacy in playground space and equipment exists in a large percentage of the elementary schools surveyed in this state. Apparently school administrators and authorities have failed to recognize the need and importance of these facilities, and have neglected to make adequate annual appropriations of funds to equip and maintain the playgrounds properly.

Inadequate playground surfaces found in a large percentage of the elementary schools surveyed have greatly curtailed playground use through unnecessary loss

accidents occurred on playgrounds during the past few years as a result of using playground equipment. It was found that swings, slides, and saw-horses were the most frequent causes of accidents. However, no mention is made of playground equipment needed to be as frequent a cause of accidents as to be usually if properly used. Information from this survey also indicates that adequate playground equipment helps to reduce discipline problems as well as the amount of supervision needed on the playground.

II. DISCUSSION

After having carefully reviewed the information gathered in this study, the writer derives the following conclusions:

1. A general inadequacy in playground space and equipment exists in a large percentage of the elementary schools surveyed in this state. Apparently, school administrators and authorities have failed to recognize the need and importance of these facilities, and have neglected to make adequate annual appropriations of funds to maintain the playground properly.

2. Inadequate playground maintenance is a factor in the percentage of the elementary schools surveyed which have greatly curtailed playground use during emergency days.

of time and the prevention of adequate playground programs.

The writer concludes that safety has been generally practiced in a large percentage of the elementary schools reporting, that playground apparatus is not a direct source of excessive accidents and discipline problems, and that, of the various types of playground apparatus in use, none is particularly hazardous if properly used and supervised.

III. RECOMMENDATIONS

The following recommendations are offered for the improvement of playgrounds and playground facilities in the elementary schools of New Mexico. Financial problems and natural conditions existing in many of the communities throughout the state will make it extremely difficult to work and plan toward these recommendations, but it is only through the constant effort to make improvements that playgrounds and playground facilities will meet the needs of the elementary school.

The writer recommends:

1. That in order to assure desirable and adequate playground space for future school sites, the State Board of Education, with the cooperation of school administrators, boards of education, recreation leaders, and state educational institutions, set up minimum standards and regulations relative to location and size of elementary

of time and the provision of adequate playground equipment.
The writer concludes that safety has been generally
practiced in a large percentage of the elementary schools
reporting, that playground apparatus is not a direct source
of excessive accidents and discipline problems, and that, of
the various types of playground apparatus in use, none is
particularly hazardous if properly used and maintained.

III. RECOMMENDATIONS

The following recommendations are offered for the
improvement of playgrounds and playground facilities in the
elementary schools of New Mexico. Fundamental research and
natural conditions existing in any of the communities
throughout the state will make it extremely difficult to
work and plan toward these recommendations, but it is only
through the constant effort to make improvements that
playgrounds and playground facilities will meet the needs
of the elementary school.

The writer recommends:

1. That in order to secure desirable and adequate
playground space for future school sites, the state board
of education, with the cooperation of school administrators,
boards of education, recreation leaders, and state and
educational institutions, set up certain standards and
regulations relative to location, size of elementary

school sites in this state.

2. That a state-wide educational program for the improvement of public school playgrounds be launched through the New Mexico Education Association, with the help and cooperation of all other educational agencies.

3. That school administrators cooperate with community and city recreational leaders in the combined use of all playgrounds and playground facilities in order to supplement inadequacies in playground space and play facilities.

4. That in order to increase safety and improve appearances all school grounds be fenced or surrounded by a low wall and, where possible, trees be planted to provide shade and protection.

5. That school administrators and playground directors study carefully the possibility of making more and greater use of all available playground area by making the necessary surface improvements; that playground surfaces be properly treated and prepared with the necessary materials in order to keep down dust and permit year-round use.

6. That administrators make adequate appropriations in their annual school budget for playground maintenance and equipment.

7. That those responsible for selecting playground equipment hold more constantly in mind the fact that a

definite relationship exists between the playground and the program of the school. To this end consideration should be given not only to the factors of space requirements, safety, durability, the number to be accommodated, and the popularity of the apparatus with the pupils, but also its contribution to the development of the pupil in terms of the avowed philosophy of the school.

8. That from the standpoint of safety and durability, most types of playground apparatus be factory-made; that if equipment is homemade it conform to recommended standards in materials and structure.

9. That in order to hold accidents to a minimum and obtain the greatest possible use from playground apparatus and play facilities, proper care and use of playground equipment be taught as a part of every school's health and safety program; that the use of all playground apparatus and play facilities be supervised, and that all playground equipment be inspected regularly for needed repairs.

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STENOGRAPHY

BIBLIOGRAPHY

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APPENDIX

APPENDIX

COMMON COUNCIL

ESSE 3V8E

WINTER 1913

RECEIVED

SOME MANUFACTURERS OF PLAYGROUND APPARATUS

American Playground Device Company	Anderson, Indiana
Anchor Post Fence Company	Baltimore 24, Maryland
Burke, J. E. Company, The	200 Sheridan Drive, Fond du Lac, Wisconsin
Everwear Manufacturing Company, The	P. O. Box 958, Springfield, Ohio
Fox Blocks Company	164 West 35th Street, Los Angeles 7, Calif.
Frost Steel and Wire Company, Ltd.	Hamilton, Ontario, Canada
Game-Time	Litchfield, Michigan
General Playground Equipment, Inc.	Kokomo, Indiana
Giant Manufacturing Company	Sixth Street and 12th Ave.,
Gro-Safe Manufacturing Company	P. O. Box 236, Escanaba, Michigan
Happy Hour Playground Equipment Company	Baraboo, Wisconsin
Medart, Fred, Manufacturing Company	3582 Dekalb Street, St. Louis 18, Missouri
Mitchell Manufacturing Company	P. O. Box 176, Hanover, Pennsylvania
Patterson-Williams Manufacturing Company	551-557 W. San Fernando, San Jose 10, California
Porter, J. E. Corporation	Ottawa, Illinois
Recreation Equipment Company	724 West 8th Street, Anderson, Indiana

SOME MANUFACTURERS OF PLAYING CARDS

American Playing Card Company	Indianapolis, Indiana
Another Post House Company	Baltimore 29, Maryland
Burke, J. E. Company, Inc.	300 American Drive, Riverside, California
Everway Manufacturing Company, Inc.	P.O. Box 926, Springfield, Ohio
Max Bloch Company	124 West 33rd Street, Los Angeles 7, Calif.
Front Steel and Wire Company, Ltd.	Hartford, Ontario, Canada
Game-Time	Albion, Michigan
General Playing Card Equipment, Inc.	Belmont, Indiana
Giant Manufacturing Company	2121 23rd and 13th Ave., St. Louis 8, Mo.
Geo-Safe Manufacturing Company	P.O. Box 256, Ann Arbor, Michigan
Happy Hour Playing Card Equipment Company	Porter, Wisconsin
Robert, Fred, Manufacturing Company	2525 Central Street, St. Louis 18, Missouri
Mitchell Manufacturing Company	P.O. Box 172, Haverhill, Massachusetts
Patterson-Williams Manufacturing Company	251-257 W. 3rd Street, San Jose 10, California

Porter, J. E. Corporation
Recreation Equipment Company

OTHER PLAYING CARDS
EXTRA
COTTON CONTENT

Rowles, E. W. A. Company

Arlington Heights,
Illinois

Standard Playground Equipment
Company, The

Anderson, Indiana

Trojan Playground Equipment
Manufacturing Company

St. Cloud, Minnesota

Wyatt Manufacturing Company, The
(Jayhawk Playground Equipment)

Box 569, Salina, Kansas

William H. H. H. H.
Illinois

Rowles, E. W. A. Company

Standard Playgroup Equipment
Company, The

Trojan Playgroup Equipment
Manufacturing Company

Wright Manufacturing Company, Inc.
(Tayhawk Playgroup Equipment)
Box 552, Dallas, Texas

LETTER ACCOMPANYING QUESTIONNAIRE

Box 783
 Lordsburg, New Mexico

Dear Fellow Principal:

I am very much interested in securing data on playgrounds and playground equipment being used in the elementary schools of New Mexico. It is my intention to use this information in a study being made as partial fulfillment of the degree of Master of Arts at the University of New Mexico. Dean Nanninga, of the College of Education, has approved this questionnaire.

Your cooperation in filling out and returning the following forms will be greatly appreciated.

A self-addressed envelope is enclosed for your convenience.

Yours truly,

R. V. Traylor

LETTER ACCOMPANYING QUESTIONNAIRE

UNIVERSITY OF MEXICO

UNIVERSITY OF MEXICO

UNIVERSITY OF MEXICO

Box 703
New Mexico

Dear Fellow Principals:

I am very much interested in receiving data on playgrounds and playground equipment being used in the elementary schools of New Mexico. It is my intention to use this information in a study being made as partial fulfillment of the degree of Master of Arts at the University of New Mexico. Dean Whinnings, of the College of Education, has approved this questionnaire.

Your cooperation in filling out and returning the following forms will be greatly appreciated.

A self-addressed envelope is enclosed for your convenience.

Yours truly,

E. V. Irwin

QUESTIONNAIRE

I. General Information

1. Name of system or building _____
2. Location, (city) _____ County _____
3. Grades housed _____ Approximate enrollment _____
4. Principal _____
5. Do you feel that your playground space for the number who use it is entirely ample _____; satisfactory _____; meager _____; totally inadequate _____; none _____.
6. Do you feel that your playground equipment for the number who use it is entirely ample _____; sufficient _____; meager _____; totally inadequate _____; none _____.
7. Does your fixed equipment, such as swings, slides, horizontal bars, etc., create excessive discipline problems? Yes _____; No _____
8. Does it help to lessen the number of discipline problems? Yes _____; No _____
9. How many serious accidents occurred on your playground during the last two years due to the use of playground equipment? _____
10. What kinds of equipment were the most frequent causes? _____
11. Are pupils supervised during the use of equipment? at all times _____; part time _____; none _____
12. What was the approximate total cost of your fixed equipment? _____
13. Of the above amount, approximately what per cent was purchased with school money, i. e., tax money? _____
14. Approximately how much money has been spent on equipment during the past two years? _____

QUESTIONNAIRE

1. General Information
1. Name of system or building _____
2. Location (city) _____ County _____
3. Grades housed _____ Approximate enrollment _____
4. Principal _____
5. Do you feel that your playground space for the number of pupils who use it is entirely ample _____; satisfactory _____; totally inadequate _____; none _____
6. Do you feel that your playground equipment for the number who use it is entirely ample _____; sufficient _____; totally inadequate _____; none _____
7. Does your fixed equipment, such as swings, slides, horizontal bars, etc., create excessive discipline problems? Yes _____; No _____
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10. What kinds of equipment were the most frequent causes? _____
11. Are pupils supervised during the use of equipment? at all times _____; part time _____; none _____
12. What was the approximate total cost of your fixed equipment? _____
13. Of the above amount, approximately what per cent was purchased with school money, i. e., tax money? _____
14. Approximately how much money has been spent on equipment during the past two years? _____

15. What per cent of your fixed equipment such as slides, swings, bars, etc., are factory made? _____
16. Do you find home made or hand made equipment satisfactory _____; partly satisfactory _____ unsatisfactory _____
17. Please express your opinion in regard to having your own equipment made, as to cost, safety, and durability.
- _____
- _____
- _____

II. Playground Description (Please check)

1. Surface (largely)

- | | | | |
|-------------------|-------|--------------------|-------|
| a. Grass | _____ | e. Hard earth | _____ |
| b. Concrete | _____ | f. Gravel | _____ |
| c. Oil or asphalt | _____ | g. Dirt and gravel | _____ |
| d. Sand | _____ | h. Other | _____ |

2. Contour of the Ground

- | | | | |
|-------------------|-------|----------|-------|
| a. Level | _____ | d. Rough | _____ |
| b. Gently sloping | _____ | e. Other | _____ |
| c. Steep | _____ | | |

3. List the approximate number of days the playground cannot be used annually due to:

- | | | | |
|---------|-------|------------------|-------|
| a. Snow | _____ | d. Wind and dust | _____ |
| b. Rain | _____ | e. Other | _____ |
| c. Mud | _____ | | |

4. Is the playground surrounded by (if only in part give fraction):

- | | | | |
|----------|-------|--------------|-------|
| a. Fence | _____ | d. Trees | _____ |
| b. Wall | _____ | e. Sidewalks | _____ |
| c. Hedge | _____ | f. Other | _____ |

12. What percent of your fixed equipment such as slides, swings, bars, etc., are factory made? _____
16. Do you find home made or hand made equipment satisfactory? _____; partly satisfactory _____; unsatisfactory _____
17. Please express your opinion in regard to having your own equipment made, as to cost, safety, and durability.
- _____
- _____
- _____

II. Playground Description (Please check)

1. Surface (largely)

- | | | | |
|-------------------|-------|--------------------|-------|
| a. Grass | _____ | a. Hard earth | _____ |
| b. Concrete | _____ | f. Gravel | _____ |
| c. Oil or asphalt | _____ | g. Dirt and gravel | _____ |
| d. Sand | _____ | h. Other | _____ |

2. Contour of the ground

- | | | | |
|-------------------|-------|----------|-------|
| a. Level | _____ | d. Rough | _____ |
| b. Gently sloping | _____ | e. Other | _____ |
| c. Steep | _____ | | |

3. List the approximate number of days the playground cannot be used annually due to:

- | | | | |
|---------|-------|------------------|-------|
| a. Snow | _____ | d. Wind and dust | _____ |
| b. Rain | _____ | e. Other | _____ |
| c. Mud | _____ | | |

4. Is the playground surrounded by (if only in part give location):

- | | | | |
|----------|-------|--------------|-------|
| a. Fence | _____ | d. Trees | _____ |
| b. Wall | _____ | e. Shrubbery | _____ |
| c. Hedge | _____ | f. Other | _____ |

5. How many sides are adjacent to a:

a. Street c. Highway
b. Railroad d. Other

6. Is the playground separated from the school building by a:

a. Street c. Highway
b. Railroad d. Other

7. Dimensions (approximately):

a. Length b. Width

III. Playground Equipment

1. Give the number in your school and rate each of the three groups separately according to usefulness and preferability among pupils in that group. After each group, rate by using numbers to indicate 1, 2, 3, 4, 5, etc., choice. (Example: Swings 8 Primary 3 Intermediate 2 Upper Grades 6.)

	No.	Primary	Int. Gr.	Upper Gr.
a. Swings	<u> </u>	<u> </u>	<u> </u>	<u> </u>
b. Slides	<u> </u>	<u> </u>	<u> </u>	<u> </u>
c. Seesaws or teeters. . . .	<u> </u>	<u> </u>	<u> </u>	<u> </u>
d. Ocean wave . .	<u> </u>	<u> </u>	<u> </u>	<u> </u>
e. Merry-go- rounds	<u> </u>	<u> </u>	<u> </u>	<u> </u>
f. Traveling rings	<u> </u>	<u> </u>	<u> </u>	<u> </u>
g. Giant strides. . . .	<u> </u>	<u> </u>	<u> </u>	<u> </u>
h. Climbing structures . . .	<u> </u>	<u> </u>	<u> </u>	<u> </u>
i. Horizontal bars	<u> </u>	<u> </u>	<u> </u>	<u> </u>
j. Horizontal ladders. . . .	<u> </u>	<u> </u>	<u> </u>	<u> </u>
k. Basketball courts	<u> </u>	<u> </u>	<u> </u>	<u> </u>
l. Tennis courts	<u> </u>	<u> </u>	<u> </u>	<u> </u>
m. Volley ball courts	<u> </u>	<u> </u>	<u> </u>	<u> </u>
n. Baseball diamonds . . .	<u> </u>	<u> </u>	<u> </u>	<u> </u>
o. Sand boxes . .	<u> </u>	<u> </u>	<u> </u>	<u> </u>
p. Other	<u> </u>	<u> </u>	<u> </u>	<u> </u>

5. How many sides are exposed to air?

- a. Street
- b. Railroad
- c. Highway
- d. Other

6. Is the playground separated from the school building by a:

- a. Street
- b. Railroad
- c. Highway
- d. Other

7. Dimensions (approximately):

- a. Length
- b. Width

III. Playground Surfaces

1. Give the number in your school and write each of the three groups separately according to materials and preferably assign children and groups. After each group, take by using numbers to indicate 1, 2, 3, 4, 5, etc., choice. (Example: Surface 3 Primary Intermediate 2 Upper Grades 6.)

	Primary	Intermediate	Upper Grades
a. Gravel			
b. Sand			
c. Concrete			
d. Asphalt			
e. Rubber			
f. Travelling			
g. Other			
h. Gravel			
i. Sand			
j. Concrete			
k. Asphalt			
l. Rubber			
m. Travelling			
n. Other			
o. Gravel			
p. Sand			
q. Concrete			
r. Asphalt			
s. Rubber			
t. Travelling			
u. Other			
v. Gravel			
w. Sand			
x. Concrete			
y. Asphalt			
z. Rubber			

TABLE XI
ELEMENTARY SCHOOLS SURVEYED

No.	Location	School	County	Enrollment
1	Alamogordo	Alamogordo Elementary	Otero	955
	"	Dudley	"	145
2	Albuquerque	University Heights	Bernalillo	300
	"	Lew Wallace	"	475
	"	Longfellow	"	500
	"	Bandelier	"	608
	"	Coronado	"	491
3	Anthony	Anthony Elementary	Dona Ana	540
4	Artesia	North Side	Eddy	350
	"	Central	"	500
	"	Park	"	600
5	Aztec	Aztec Elementary	San Juan	330
6	Bernalillo	Roosevelt	Sandoval	190
7	Capitan	Capitan Elementary	Lincoln	125
8	Carlsbad	Edison	Eddy	400
	"	Eddy	"	475
	"	Airfield	"	500
9	Carrizozo	Carrizozo Elementary	Lincoln	180
10	Clayton	Central	Union	600
11	Clovis	Eugene Field	Curry	684
	"	Center	"	115
12	Dawson	Central	Colfax	200
13	Deming	Smith	Luna	675
14	Dexter	Dexter Elementary	Chaves	600
15	Encino	Encino Rural Ind.	Torrance	325
16	Estancia	Van Stone	"	300
17	Eunice	Eunice Elementary	Lea	719
18	Gallup	Central	McKinley	260
19	Hot Springs	Hot Springs Elem.	Sierra	600
20	Hurley	Hurley South Side	Grant	300
21	Hagerman	Hagerman Elem.	Chaves	400
22	Jal	Jal Elementary	Lea	450
23	Las Cruces	Lucero	Dona Ana	380
	"	Central	"	450
24	"Las Vegas	South Town School	San Miguel	550
	"	Las Vegas City	"	1030
25	Lordsburg	Central	Hidalgo	425

(Continued)

TABLE XI
ELEMENTARY SCHOOLS - CONTINUED

No.	Location	School	County	Enrollment
1	Alamogordo	Alamogordo Elementary	Imperial	222
2	"	Dudley	"	142
3	Alhambra	University Heights	Imperial	220
4	"	Law William	"	142
5	"	Longfellow	"	200
6	"	Handel	"	200
7	"	Coronado	"	201
8	Anthony	Anthony Elementary	Imperial	240
9	Artesia	North Side	Imperial	220
10	"	Central	"	200
11	"	Park	"	200
12	Atter	Atter Elementary	Imperial	220
13	Bernalillo	Boonville	Imperial	200
14	Capitan	Capitan Elementary	Imperial	220
15	Carlsbad	Wilson	Imperial	200
16	"	Edgy	"	220
17	"	Airfield	"	200
18	Carrizozo	Carrizozo Elementary	Imperial	220
19	Clayton	Central	Imperial	200
20	Chula	Chula Field	Imperial	200
21	"	Central	"	220
22	Dawson	Central	Imperial	200
23	Deming	Smith	Imperial	220
24	Dexter	Dexter Elementary	Imperial	200
25	Enino	Enino Rural H.S.	Imperial	220
26	Estancia	Van Stene	Imperial	200
27	"	Enino Elementary	"	220
28	Galup	Central	Imperial	200
29	Hot Springs	Hot Springs H.S.	Imperial	200
30	Hurley	Hurley Rural H.S.	Imperial	200
31	Imperial	Imperial H.S.	Imperial	200
32	Jal	Jal Elementary	Imperial	200
33	Las Cruces	Las Cruces	Imperial	200
34	"	Central	"	200
35	Las Vegas	South Town School	Imperial	200
36	"	Las Vegas City	"	200
37	Lordsburg	Central	Imperial	220

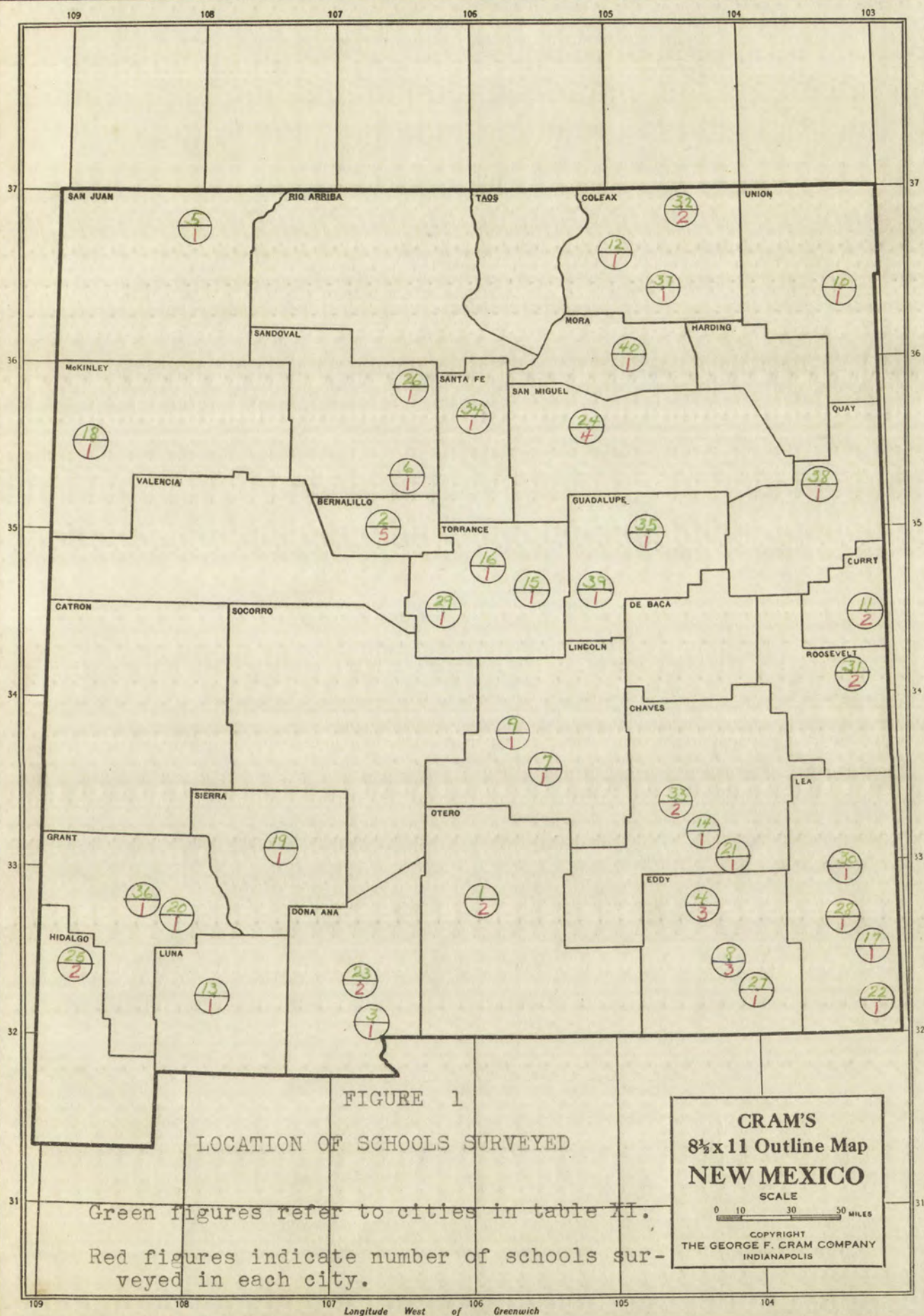
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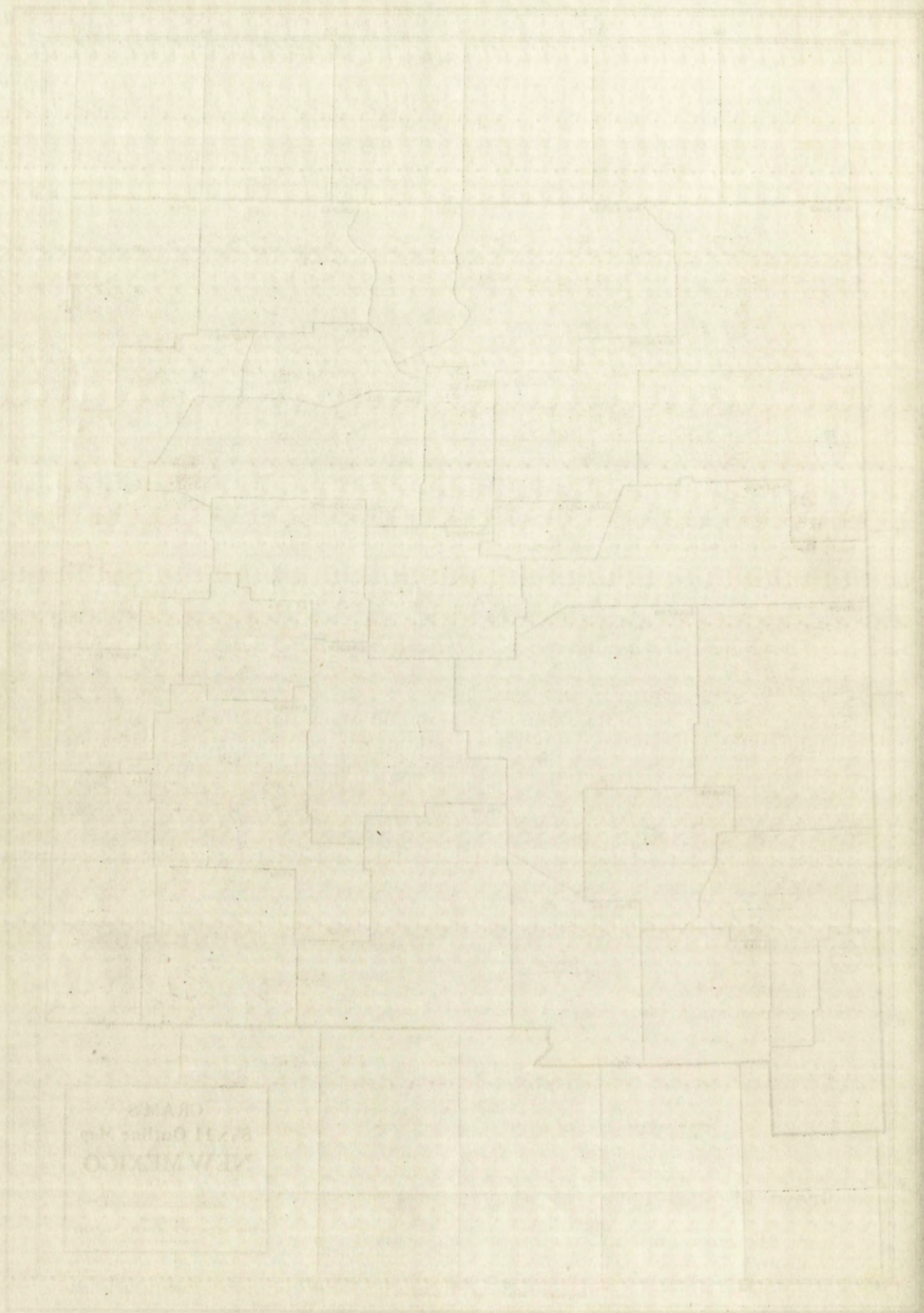
No.	Location	School	County	Enrollment
25	Lordsburg	Wilson	Hidalgo	175
26	Los Alamos	Canyon Elementary	Los Alamos	375
27	Loving	Loving Ind. Rural	Eddy	485
28	Lovington	Lovington Elem.	Lea	725
29	Mountainair	Mountainair Elem.	Torrance	325
30	Monument	Monument Elem.	Lea	90
31	Portales	Central	Roosevelt	750
	"	East Ward	"	300
32	Raton	Kearny	Colfax	325
	"	Columbia	"	325
33	Roswell	Washington Ave.	Chaves	300
	"	South Hill	"	120
34	Santa Fe	Kaune	Santa Fe	190
35	Santa Rosa	Santa Rosa Elem.	Guadalupe	630
36	Silver City	Washington	Grant	265
37	Springer	Forrester	Colfax	350
38	Tucumcari	Third St. School	Quay	545
39	Vaughn	Vaughn Elem.	Guadalupe	260
40	Wagon Mound	Wagon Mound Elem.	Mora	330

*Four separate schools reported on one questionnaire.

No.	Location	School	County	Population
25	Lordsburg	Wilson	Alameda	175
26	Los Alamos	Benjamin Elementary	Los Alamos	315
27	Loving	Loving Ind. Sch.	El Paso	405
28	Lovington	Lovington Elem.	El Paso	125
29	Mountainair	Mountainair Elem.	Township	525
30	Mountain	Mountain Elem.	El Paso	90
31	Portales	Central	Hood River	175
	"	East Ward	"	200
32	Raton	Healy	Deer	325
	"	Columbia	"	325
33	Roswell	Washington Ind.	Deer	300
	"	South Hill	"	120
34	Santa Fe	Laurel	Deer	150
35	Santa Rosa	Santa Rosa Elem.	Deer	170
36	Silver City	Washington	Grant	205
37	Springer	Springer	Deer	375
38	Townsend	Third St. School	Deer	145
39	Vaughn	Vaughn Elem.	Deer	200
40	Wagon Mound	Wagon Mound Elem.	Deer	175

*Four separate schools reported on and described.





REPORT OF COMMITTEE
ON
STANDARDS IN PLAYGROUND APPARATUS

It is almost universally agreed that apparatus has an important place on the playground because it is a body developer, the children enjoy it, it is useful in developing skills, and its presence on the playground makes possible the caring for a larger number of children than would otherwise be possible. Furthermore, it permits a variety in the program and relieves the pressure on the director otherwise caused by too much organization. Apparatus also serves as an inducement to children to enter the playground and it may serve as a means of interesting them in other types of playground activities. On the other hand, there is a considerable difference of opinion as to the relative merits of the various kinds of playground apparatus and many recreation executives believe that only a minimum amount of apparatus should be installed.

Perhaps the most important value of playground apparatus is that it provides an outlet for the well known play interests of children, such as climbing, swinging, hanging with hands and feet, sliding and balancing, and also a means of enjoying various kinds of motion. The modern town and city provides little opportunity for children to do these things which children have done since time immemorial, and in filling this need even under a less naturalistic environment, apparatus serves a very worthy function. In selecting apparatus for a given playground it is advisable to include the types which serve the various outstanding play interests. Apparatus that has a biological appeal will be found most valuable, although that which provides fun as well as that which has definite developmental possibilities should receive consideration.

Some of the factors that may influence the decision to include or omit a certain piece of apparatus on a given playground are the size of the area, the trained leadership available, intensity of use and the ages and interests of the children using it. Certain apparatus might be installed in a park or municipal playground that would not have a place on a school playground used primarily in connection with the physical education program. In the case of a large playground it may be advisable to install a set of traveling rings, for example, although in a limited area this piece of

REPORT OF COMMITTEE STANDARDS IN PLAYGROUND APPARATUS

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apparatus should perhaps be omitted altogether or the circular type of traveling rings be used. Some types of apparatus, such as the slide, may be safely used with comparatively little supervision, whereas apparatus of the gymnastic type, such as the parallel bars, requires careful and expert supervision. Climatic conditions are also a factor and such riding apparatus as swings and the merry whirl is much more popular with children in the southern states, especially in the summer, than the slide, giant stride, horizontal bar, etc.

Where limited funds make it possible to purchase only a few pieces, it is advisable to select apparatus which will accommodate the largest numbers. A slide, for example, offers greater service than a set of swings, although it does not accommodate as wide an age group. If the playground is in a neighborhood where people are interested in gymnastics, or if it is to be used by school children in connection with the physical education program, more apparatus of gymnastic type such as the horizontal bar, flying rings, etc., may well be introduced than in the park or community playground where this type of apparatus might receive little use. It is apparent that the ages of the majority of the children using a given playground are a factor in determining the selection of apparatus. The slides, swings and sand boxes appeal especially to the younger children, whereas such apparatus as the horizontal bar, giant stride and traveling rings are more popular with the older ones. Experience has shown that apparatus that is of the best construction is most satisfactory and cheapest in the long run.

In order that playground apparatus may serve its purpose most effectively the following factors should be given consideration: proper location, arrangement and erection, regular inspection, careful supervision, marking off apparatus zones, care of ground underneath apparatus and instruction in its correct use.

It is almost universally agreed that if apparatus is provided for children of pre-school age it should be erected in a section set aside for the exclusive use of this group. In some of the larger cities apparatus for children of elementary school age is erected in two separate sections of the playground, one devoted to the girls and to the boys from 7 to 10, and the other to the older boys. Two sets of apparatus are therefore required, although they need not be identical. A similar situation exists in a few cities where the playgrounds are divided on a strictly sex basis, the girls of all ages having one section and all the boys

apparatus should perhaps be called attention of the
circular type of traveling ring, used. Some types of
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identical. A similar situation exists in a few cities where
the playgrounds are divided into two sections, one for
girls of all ages having one section and all for boys

another.

On the playgrounds in most cities, however, only one set of apparatus is provided for children of school age. It is used primarily by the children from 6 to 12, although it is available for use by the older children. This arrangement not only makes for economy of space and avoids duplication of apparatus, but some workers believe that it is desirable for boys and girls to use the same apparatus. In the average community this arrangement is likely to prove satisfactory.

Types of Playground Apparatus

As pointed out, so many factors must be taken into consideration in deciding what pieces of apparatus should be erected on a given playground that it is difficult to select a set of minimum standards for general use. Before recommending such standards the following brief comments are given on several of the most common types of apparatus:

Swings

Very popular with children from 3 to 12 years or older, both boys and girls. Have considerable muscular development value, teach confidence and have social value due to taking turns. Chair swings are recommended for pre-school age children and 10' to 12' high frames for older children. In almost universal use.

Slides

Very popular with children 3 to 12 years, both boys and girls. Have some muscular development value and serve many children in quick rotation. Kindergarten slides 3' to 4' high for pre-school children and 8' high slides (about 16' long) for older children. Under certain conditions higher slides with safety platforms may be used but are not recommended for the average playground. The slide is in almost universal use.

Sand Box

Probably the most popular feature of playground for pre-school children -- also used by older children to lesser degree. Should be on every playground. Desirable to have two boxes, one for small children and the other for modeling by older children. Sand boxes should have shelter above them, either tree, roof or awning, and also a cover to be

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On the playgrounds in most cities, however, only one set of apparatus is provided for children of normal size. It is used primarily by the children from 6 to 12, although it is available for use by the older children. This arrangement not only makes for economy of space and avoids duplication of apparatus, but some workers believe that it is desirable for boys and girls to use the same apparatus. In the average community this arrangement is likely to prove satisfactory.

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Very popular with children from 3 to 12 years of age, both boys and girls. Have considerable muscular development value, teach confidence and have social value due to taking turns. Only swings are recommended for pre-school age children and 10' to 12' high frames for older children. In almost universal use.

Slides

Very popular with children 3 to 12 years, both boys and girls. Have some muscular development value and serve many children in quick rotation. Recommended slides 7' to 4' high for pre-school children and 8' high slides (about 10' long) for older children. Under certain conditions higher slides with safety platforms may be used but are not recommended for the average playground. The slide is in almost universal use.

Sand Box

Probably the most popular feature of playground for pre-school children -- also used by older children to some degree. Should be on every playground. Desirable to have two boxes, one for small children and the other for rolling by older children. Sand boxes should have shelter above them, either tree, roof or awning, and also a cover to be

put on when not in use.

Climbing Apparatus

Comparatively new type of apparatus, in several forms such as junglegym, castle tower, climb-around, etc. Very highly recommended. Popular with boys and girls of wide range of ages and accomodates a large number at one time. Have both muscular development and recreative values.

Horizontal Ladder

Popular with boys and girls of elementary school age on many playgrounds. Reasonably safe and has considerable value in physical development. Should be from 6½' to 7½' high.

Horizontal Bar

Popular with boys and to a lesser extent with girls. Valuable for physical development and for stunt use. Desirable to have height adjustable or to have more than one bar of different heights provided, at least for boys.

Giant Stride

Popular with both boys and girls 8 years or older. Has muscular development values. Considered too dangerous by some workers, but danger can be reduced by using knotted ropes or aluminum handles, by instructing boys and girls in its use, and by providing careful supervision. Considered standard apparatus in many cities.

Traveling Rings

Popular with older boys, and to a lesser extent with older girls. Has considerable muscular development value. New circular type has replaced the line type in many cities since it requires less space and in some cities is considered a substitute for Giant Stride.

Balance Beam

This simple apparatus, easily constructed, has value in developing poise and balance. Is considered especially valuable for girls and is used in various physical efficiency tests.

put on when not in use.

Illustration

Comparatively new type of apparatus, as several forms known as "tongues", "candle power", "light-throwing", etc., have been highly recommended. Popular with boys and girls of wide range of ages and constitutes a large number of the time. Have both muscular development and restorative value.

Horizontal ladder

Popular with boys and girls of elementary school age on many playgrounds. Especially safe and has considerable value in physical development. Should be from 3' to 12' high.

Horizontal bar

Popular with boys and to a lesser extent with girls. Valuable for physical development and for strength training. Desirable to have height adjustable on playgrounds where one bar of different heights provided, at least for boys.

Giant slide

Popular with both boys and girls 5 years or older. Has muscular development value. Deteriorated too dangerous by some workers, but danger can be reduced by using knobby ropes or aluminum handles, by fastening down and after in the use, and by providing careful supervision. Considered standard apparatus in many cities.

Twisted ladder

Popular with older boys, and to a lesser extent with older girls. Has considerable muscular development value. New circular type has replaced the old type in many places since it provides less space and is less likely to be considered a substitute for giant slide.

Swing set

This simple apparatus, easily constructed, has value in developing poise and balance. Is considered especially valuable for girls and is best in many physical efficiency tests.

See-Saws

Found on many playgrounds and on the recommended list, although many recreation executives do not approve its use. Popular with younger children. It is important to have the fulcrum low -- not more than 22" above ground.

Other Apparatus

Although other types of apparatus were considered by the committee, none of them was included in the set of standards recommended. The gymnasium frame is found on many playgrounds, but it is believed to be better, as a rule, to provide the separate pieces of apparatus rather than to combine them in a gym frame. Certain pieces of apparatus often included in the frame, such as flying rings and trapeze, are considered too dangerous.

The many types of whirling or revolving apparatus are held to have less value than the kinds recommended and to provide a greater hazard due to the cumulative power developed on them resulting from the larger number of children accommodated at one time. It is agreed that such apparatus attracts children to the playground and that under certain conditions it may be desirable to install one of these devices if properly constructed and supervised.

The committee approves the merry-go-round of the type propelled by muscular effort of the users, not as standard equipment for all playgrounds, but as supplementary equipment. It is understood that the merry-go-round will be so constructed that children may not fall under it nor through the various members which support it from the center, nor catch fingers or arms between moving parts.

Suggested Standards

The following list of apparatus is recommended as the minimum standard for the average playground. The standard suggested is not intended to serve primarily the special requirements of a school physical education program, although to a considerable extent it will meet these needs in addition to providing apparatus of the playground or fun type. It is recognized that it will often be necessary to adapt the standard to meet local conditions and special needs. The apparatus listed, however, is believed to include the various types having the greatest value.

Standards are suggested for the use of both the

found on many playgrounds and on the playground itself. Although many playgrounds exist, it is not always the case. Popular with younger children, it is important to note the injuries low -- not more than 25% above ground.

Other playgrounds

Although other types of playgrounds were mentioned in the committee, some of them were included in the list of standards recommended. The playground is found on many playgrounds, but it is not always the case. To provide the appropriate type of equipment, it is important to note the injuries low -- not more than 25% above ground. Injuries low -- not more than 25% above ground.

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Suggested standards

The following list of standards is recommended as the minimum standard for the average playground. The standard suggested is not intended to be a minimum, but a suggested standard. It is important to note the injuries low -- not more than 25% above ground. Injuries low -- not more than 25% above ground.

Standards are suggested for the list of standards.

pre-school children and those of elementary school age. One set of apparatus will serve the latter group in most communities, but standards are also suggested for the guidance of communities where it is considered desirable to provide separate apparatus for different groups of school age.

The minimum standards recommended are:

For pre-school
age children
(Under 6 years)

Chair swings (set of 6)
Sand box
Small slide
Low climbing apparatus
Swings -- frame 12' high
(set of 6)

For children of
elementary school
age, (6-12 years
and older)

Swings -- frame 12' high
(set of 6)
Slide -- 8' high
(approx. 16' long)
Horizontal ladder
Giant stride
Balance beam
Horizontal bar

Optional -- if
available funds,
space, and
attendance
justify.

Traveling rings
Climbing apparatus
See-saw (set of 3-4)

In case boys and girls of school age are to be separated on the playground and separate apparatus is to be provided for each of the sexes, the apparatus recommended in the standards should be installed for each group except that the horizontal bar may be omitted from girls' section and the balance beam from the boys. When two sets of apparatus are to be provided for the children of school age, one for all girls and for boys up to ten years old, the other for boys above ten years, practically the same types should be provided as when all the boys and girls are separated, except that the climbing device may be omitted from the older boys' section.

Other Important Considerations

In the standards suggested above there have not been included such facilities as a wading pool, tables and benches

for handcraft and games, jumping pits and standards, nor game courts and equipment. All of these facilities are important or essential but they are not commonly considered as playground apparatus. The committee recommends, however, that a pair of basketball backstops and volley ball posts be considered as essential equipment for every playground. Equally important is the provision of a generous supply of game materials such as bats, balls, jacks, bean bags, horseshoes, large building blocks, etc. Material for handcraft of various types should also be available. It is assumed that every playground provides some sort of shelter with toilet facilities. The committee also wishes to go on record as recognizing that adequate trained leadership is more important than apparatus in determining the success of a playground.

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315 Fourth Avenue
New York 10, N. Y.

M. P. # 203-4-44
Price 10 cents

For handball and tennis, tennis ball and standards, etc.
game courts and equipment. All of these facilities are
important or essential for the two sports and are considered
as playground equipment. The standard equipment, however,
that a pair of tennis rackets and a pair of tennis balls
considered as essential equipment for every playground.
Equally important is the provision of a proper supply of
game materials such as balls, bats, etc. Tennis balls,
hockey pucks, large rubber balls, etc. are also
handicraft of various types which are available. It is
assumed that every playground provides some sort of shelter
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NATIONAL RECREATION ASSOCIATION
215 North Avenue
New York 10, N. Y.

N. R. 5 202-4-44
Price 10 cents

REPORT OF COMMITTEE ON STANDARDS
IN THE
CONSTRUCTION OF PLAYGROUND APPARATUS

The accompanying report on standard specifications for the construction of playground apparatus was prepared by a committee of fourteen recreation executives, appointed by the Association at the request of a group of recreation leaders. The report, which has been approved by the committee, represents the opinion of the majority of its members rather than a unanimous opinion with respect to all the items covered by the report. On the other hand, many of the recommendations were unanimously approved by the entire committee. It is not to be regarded as a final statement on the subject but rather as a guide to both purchasers and manufacturers of playground apparatus. The report has been highly commended and most of its recommendations approved by the manufacturers to whom it has been submitted. Comments and suggestions concerning the report will be welcomed by the Committee and may be sent in care of the Association.

The need for consideration of the problems involved in the construction of playground apparatus was emphasized at a meeting of equipment manufacturers' representatives and recreation officials, held during the International Recreation Congress in Los Angeles in July, 1932. At that time a resolution was passed urging the appointment of committees on Supplies and Equipment and on Construction and Maintenance.

The members of the Committee which prepared the accompanying report were:

W. C. Batchelor, Chairman
C. E. Brewer
J. J. Downing
Charles H. English
Ernst Hermann
George Hjelte
Raymond E. Hoyt
Ernest Johnson
J. C. Kieffer
Elmer Manning
Mrs. Chester Marsh
C. F. Martin
F. S. Mathewson
R. W. Robertson

Pittsburgh, Pennsylvania
Detroit, Michigan
Brooklyn, N. Y.
Philadelphia, Pennsylvania
West Newton, Massachusetts
Westchester County, New York
Los Angeles, California
St. Paul, Minnesota
Philadelphia, Pennsylvania
New Haven, Connecticut
Westchester County, New York
Pasadena, California
Union County, New Jersey
Oakland, California

It is generally agreed that in the construction of playground apparatus, design, materials and workmanship should be such as to insure:

1. Safety -- absolute minimum of danger resulting from ordinary use.
2. Durability -- capable of withstanding action of diverse conditions without crystallization for the longest possible period of years.
3. Serviceability -- capable of withstanding continued hard use with proper care.
4. Economical maintenance -- parts easily replaced.
5. Simplicity of supervision -- use readily controlled with minimum of necessary restrictions.
6. Developmental and recreational value.

The purpose of this Committee was to study the construction of the common types of playground apparatus in use in order to determine the degree to which such apparatus is fulfilling these requirements and also to recommend any changes which in its opinion would bring better results.

The cooperation and opinions of recreation executives in American cities were sought by the Committee on a large number of detailed questions relating to the construction of those pieces of apparatus which were included in the minimum standard recommended in the report of the Committee on Apparatus Standards in 1929.

Realizing the importance of securing the advice and cooperation of the manufacturers of playground apparatus, the Committee appointed three of its members to serve as a Sub-Committee on Engineering Problems to consult with the manufacturers. The members of this Sub-Committee were C. E. Brewer, Chairman, John C. Kieffer and E. L. Manning.

In submitting its report the Sub-Committee pointed out that study of the material received from several leading manufacturers of playground apparatus disclosed a surprising uniformity of specifications in construction. The difference in measurements and material was too slight to warrant a

*Copies of this report may be secured from the National Recreation Association on request.

It is recommended that the following apparatus, devices, materials and accessories should be such as to insure:

1. Safety -- absence of danger resulting from ordinary use.
2. Reliability -- absence of likelihood of failure of any part or parts of the apparatus under conditions of normal use.
3. Serviceability -- absence of likelihood of breakdown or failure of any part or parts of the apparatus.
4. Economical maintenance -- parts easily replaced.
5. Simplicity of operation -- one handling.
6. Developmental and educational value.

The purpose of this Committee was to study the construction of the various types of apparatus, apparatus in use in order to determine the factors in which such apparatus is failing these requirements and also to recommend any changes which in the opinion would bring better results.

The cooperation and opinion of professional engineers in American cities were sought by the Committee on a large number of detailed questions relating to the construction of these pieces of apparatus which were included in the minimum standards recommended in the report of the Committee on Apparatus Standards in 1925.

Realizing the importance of securing the advice and cooperation of the manufacturers of apparatus, apparatus, the Committee appointed three of its members to serve as a sub-committee on Engineering Councils to consult with the manufacturers. The members of this sub-committee were G. E. Brown, Chairman, John G. Ricker and E. L. Manning.

In submitting the report that this sub-committee made out that study of the material received from several leading manufacturers of apparatus, apparatus disclosed a surprising uniformity of construction in apparatus. The differences in measurements and material used for apparatus varied a

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detailed controversial study. The Sub-Committee expressed the opinion that the leading manufacturers were making every effort to produce the best and safest types of playground apparatus. Therefore, its recommendations were of a general nature rather than relating to technical engineering problems.

The following recommendations based largely on the report of the Sub-Committee are offered for the guidance and consideration of both purchasers and manufacturers of playground apparatus. The Committee wishes to point out that these recommendations are made with the six points previously enumerated in mind. They include minimum standards which it is believed should be attained by all manufacturers and an effort has been made to avoid any recommendations which would cause discrimination against or work any hardship on any particular company.

1. That all pipe used in construction of apparatus be of standard weight hot galvanized steel pipe, factory tested, with standard wall thickness as follows:

Size of pipe in inches: Wall thickness in inches:

1"	.134
1 $\frac{1}{2}$ "	.14
1 $\frac{3}{4}$ "	.145
2"	.154
2 $\frac{1}{2}$ "	.204
3"	.217
4"	.237

2. Only annealed or malleable iron clamps and fittings, except in base flanges, should be used, because malleable fittings on overhead construction are less liable to break under sudden thrusts and strains. All exposed pipe, clamps or fittings should be hot galvanized to prevent rust.
3. Methods of lubrication
 - a. Bearings that turn fast and bear large weights should be equipped with alemite valves or equally effective means of lubrication.
 - b. Bearings that sway back and forth should be alemited or packed with hard grease and the fittings provided with a covered slot to renew the grease, if packed.

- c. Ball and socket fittings, where possible, should turn in oil.
4. The minimum strength for chain suspensions should be as follows:

For large swings	3,000 lbs.
For small chair swings	1,000 lbs.
For giant strides	2,000 lbs.
For other types	1,500 lbs.

(Note: There is some opinion to the effect that a lower minimum strength is sufficient but it is the opinion of the Committee that the minimum should remain as suggested here until sufficiently extensive experiments have been conducted to warrant a lower standard.)

5. The angle at which the steps to the slide extend upward from the ground should be not more than 60 degrees. Children using the slide will ascend the ladder with greater ease, less danger and less timidity if the grade of ascent is as low as possible and yet practical and economical. The angle of 60 degrees is both practical and economical.
6. That slides be provided with equilibrium platforms at least 8" in width at the top of the steps in order to give the child an opportunity to be properly seated before going down the slide. It is desirable to have the sides of the chute 6 to 8 inches higher where they are fastened to the platform and graduated downward for a distance of 3 to 4 feet from the platform.
7. The removable steel sides for portable sand boxes, with top edge either rolled or with angle iron riveted at top to prevent injury, be used instead of wood. Steel lasts longer, does not warp or splinter, is economical to maintain and is more sanitary. The steel plates should be 10 ft. x 10 in. and made of 14 gauge or 1/8 in. steel.
8. That the height of the horizontal ladder be standardized at 6½ feet on playgrounds for children. (Note: Several members of the committee believe that if the apparatus is to be used also by young people and adults, the height

of Ball and screw...
 4. The minimum...
 be as follows:

For large wings	3,000 lbs.
For small wings	1,000 lbs.
For small wings	2,000 lbs.
For other types	1,500 lbs.

(Note: There is some opinion as to the effect that a lower minimum...
 opinion of the Committee...
 to also be suggested...
 experiments have been conducted...
 standard.)

5. The angle of which the slide...
 upward from the ground...
 degrees. Different...
 ladder with...
 timidity if the...
 possible and yet...
 angle of 60 degrees...
 economical.

6. That slides be provided with...
 platform at least 6" in width...
 the steps in order to give the child...
 opportunity to be properly...
 down the slide. It is desirable...
 of the chute 6 to 8 inches...
 fastened to the platform...
 for a distance of 5 to 6 feet...

7. The reversible steel slides for portable...
 with top edge...
 riveted at top to prevent...
 of wood. Steel...
 rollers, is economical...
 satisfactory. The steel...
 in and made of 1 1/2 inch...

8. That the height of the...
 standardized at 5 feet...
 children. (Note:...
 committee believe...
 used also by...
 the height

of the ladder should be $7\frac{1}{2}$ feet.

9. That before galvanizing, the rungs of the horizontal ladder be welded or riveted through the side of the ladder or otherwise assembled, to prevent turning of rungs while in use.
(Note: Several members of the committee suggested either that the length of the ladder be reduced to 12 feet or that elliptical pipe be used on the horizontal sections.)
10. That the height of the cross pipe on the traveling rings in line be 12 ft. from the ground and that the length be 36 ft. with the space between the rings reduced accordingly.
11. That the height of steel swings (not including chair and hammock swings), traveling rings in circle and giant stride suspensions be standardized at 12 ft. above the ground. If the height of all suspensions from the ground be 12 ft., it would facilitate ordering material for repairs and replacements.
12. That all steel frames from which suspensions are hung have 3" I. D. top pipe rail, and that the supports be 2" I. D. pipe. For kindergarten swings, that the top rail be not less than 2" I. D. pipe and supports not less than $1\frac{1}{2}$ " I. D. pipe.
13. That swing frames (except chair and hammock swings) and traveling rings (in line) be supported at each end by three poles rather than by two or one as is sometimes done.
14. That teeter boards be 12 ft. in length for the purpose of standardization.
15. That the material for the teeter boards be either spruce, fir, or selected North Carolina pine made of 2 in. dressed material, rounded and saddled and provided with proper hand holds.

In conclusion the Committee wishes to thank the recreation executives and manufacturers of playground apparatus whose cooperation in this study is greatly appreciated.

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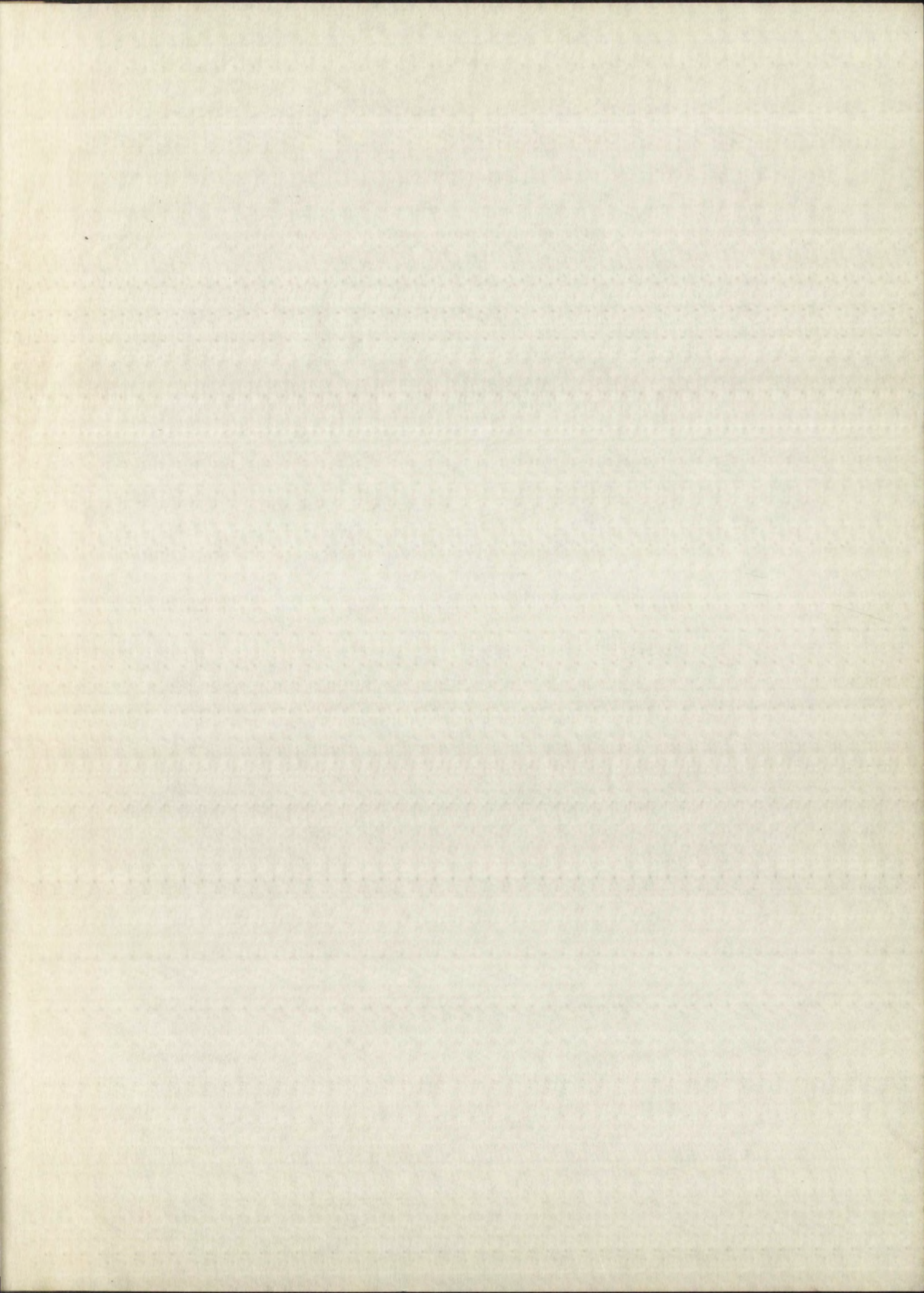
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of the ladder should be 12 feet.

9. That before re-erecting, the top of the horizontal ladder be welded or riveted through the side of the ladder or otherwise secured, to prevent turning of rungs while in use. (Note: Several members of the committee suggested either that the ladder of the ladder be reduced to 12 feet or that additional rungs be used on the horizontal sections.)
10. That the height of the cross pipe on the traveling rings in line be 12 ft. from the ground and that the length be 30 ft. with the space between the rings reduced accordingly.
11. That the height of steel rungs (not including chair and hammer wings), traveling rings in circles and glass inside suspensions be standardized at 12 ft. above the ground. If the height of all suspensions from the ground be 12 ft., it would facilitate ordering material for towers and platforms.
12. That all steel frames from which suspensions are hung have 3" I. D. top pipe rail, and that the supports be 2" I. D. pipe. For kindergarten wings, that the top rail be not less than 2" I. D. pipe and supports not less than 1" I. D. pipe.
13. That swing frames (except chair and hammer wings) and traveling rings (in line) be supported at each end by three poles rather than by two or one as is sometimes done.
14. That feeder boards be 12 ft. in length for the purpose of standardization.
15. That the material for the feeder boards be either spruce, fir, or selected North Carolina pine saws of 2 in. dressed material, rounded and nailed and provided with proper hand holes.

In conclusion the committee wishes to thank the recreation executives and manufacturers of playground apparatus whose cooperation in this study is greatly appreciated.

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