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TRENDS IN RULES AND REGULATIONS GOVERNING SCHOOL BUILDING CONSTRUCTION IN THE UNITED STATES

By

William Benjamin Castetter

UNIVERSITY OF NEW MEXICO ALBUQUERQUE, N. M.

A Thesis

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Master of Arts in Education

University of New Mexico

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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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CHAPTER I

INTRODUCTION

Importance of the Study

Increased knowledge of the effects which the selection of a school site, arrangement of rooms, heating, ventilation, sanitation, and general hygiene of a school building have on the health and school progress of children has practically revolutionized our ideals in regard to the construction, sanitation, and equipment of school buildings.

It is also true that with the increasing complexity of, and expenditures for adequate school buildings, it becomes a legal right and duty of the state to guard against waste in expenditures and unsafe construction.

The above statements are evidenced by the fact that during the past twenty years over one-half of our states have enacted general state laws and some form of state approval to regulate new construction.

Legislation that has been enacted and the extent to which this legislation has been put into practice should be an important factor in determining present and future practices in school building construction. The legislation which exists is not necessarily sound, but it should be,

primarily, the point of departure toward future legislation.

A comprehensive knowledge of state regulations governing school building construction which are commonly in force should be enlightening to legislators of those states whose regulations fall below minimum standards, and should encourage those states with acceptable regulations to strive toward higher standards of school building construction.

Statement of the Problem

The purpose of this investigation is to provide a comparative basis in order to show trends in compulsory regulations governing school building construction in the United States.

Sources of the Data

The data for this investigation were obtained from the following four sources:

1. School building codes of the several states
2. Statutes and school laws of the several states
3. Replies from the chief officers of the several state educational systems
4. Reports of various studies and investigations

Definitions and Delimitations

By school building in this investigation is meant any building which is appropriated for a use prescribed or permitted by law to public schools.

By rules and regulations in this investigation is meant any provisions which have been prescribed by the several states relative to the construction, planning, equipment, and general hygiene of public school buildings.

By several states in this investigation is meant the forty-eight political subdivisions of the United States.

School building construction in this investigation is taken to mean the erection of, or alterations and additions to public school buildings.

This investigation is limited to the legislation governing school building construction during the period, 1910 to 1935. 1910 was selected as a point of departure because the information previous to this time is not of sufficient value to warrant its inclusion.

Review of Related Studies

In the literature relative to compulsory regulation of school building construction, three studies stand foremost. The first of these, published in 1920, was the work of Frank Irving Cooper, Rules and Regulations on Schoolhouse Construction in the Year 1920.[1] This study is fundamentally a survey of the laws governing schoolhouse construction during the years, 1910, 1915, and 1920. The

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[1] National Education Association, Committee on School House Planning, Report of Committee on School House Planning (Washington: National Education Association, 1925), 164 pp.

contribution of this study lies in the fact that it presents the laws regulating school building construction from the time that state legislation relative to school buildings was practically in its inception.

The second important study appeared in 1929, An Analysis of the State Building Codes of the United States, by H. M. McGowan.[2] In this study McGowan made an analysis of the statutory requirements of the several states with regard to the construction, sale of school buildings, and provisions regulating the site. Following the analysis, he made a comparison between the standards established by the several states and the standards set up by the Stevenson Score Card for Elementary Schools. He concluded that there is little uniformity in the school building codes of the several states, and that statutes appear to be created largely to meet only local problems. This investigation contributed practically nothing to the present study.

The most recent study concerning school building legislation appeared in 1935, entitled, State Control of the Location, Planning, and Erection of Public School Buildings, by C. E. Sohl.[3] This study is concerned with

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[2] H. M. McGowan, "An Analysis of the State School Building Codes of the United States," (unpublished Doctor's Thesis, Ohio State University, Columbus, 1929), 400 pp.

[3] Sohl, Charles Edwin, State Control of the Location, Planning, and Erection of Public School Buildings (Philadelphia: University of Pennsylvania Press, 1935), 373 pp.

the nature of control exerted by the various states, and the extent to which such control is exercised in respect to planning, location and erection of public school buildings. It has been particularly valuable in supplying a check on the existing legislation affecting school building construction in the United States.

Other studies have been made by Graham,[4] and Holmes,[5] but are of little value insofar as the present study is concerned.

Of the above mentioned studies, none are directly concerned with trends in school building legislation. Cooper[6] shows the regulations in force over a period of years, but this study is too limited and obsolete in nature to affect the present investigation in any way.

Procedure

The first step in the prosecution of this investigation was to trace the history of state regulations governing school building construction in the United States. A study

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[4] James Lovett Graham, "State Laws in the United States Relative to the Planning and Construction of Public School Buildings," (unpublished Master's Thesis, George Peabody College for Teachers, Nashville, 1929), 176 pp.

[5] Warren S. Holmes, "Survey of State School Building Codes," The American School Board Journal, 79:56-8, September, 1929.

[6] National Education Association, Committee on School House Planning, Report of Committee on School House Planning (Washington: National Education Association, 1925), 164 pp.

of the rules and regulations governing school building construction was made by Cooper[7] in 1920. This study takes up the history of school building legislation from 1910 and continues it until the year 1920. Studies by McGowan[8] and Sohl[9] were used to trace the regulations in force from 1920 to 1933. In tracing the history of school building legislation the investigator tried to show the various changes in legislation that have come about in the several states, and the items over which these states have exercised control in order to improve and standardize public school building construction.

An analysis of the existing laws relating to school buildings in order to determine the present status of compulsory regulations governing schoolhouse construction was the next step. Sources of data containing provisions affecting school building construction, such as statutes, school laws, state building codes, and regulations of state boards of education and health were examined and their contents

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7 National Education Association, Committee on School House Planning, Report of Committee on School House Planning (Washington: National Education Association, 1925), 164 pp.

8 H. M. McGowan, "An Analysis of the State School Building Codes of the United States," (unpublished Doctor's Thesis, Ohio State University, Columbus, 1929), 400 pp.

9 Sohl, Charles Edwin, State Control of the Location, Planning, and Erection of Public School Buildings (Philadelphia: University of Pennsylvania Press, 1935), 373 pp.

classified under the following sections according to the frequency of items mentioned:

(A) Authority of Administration

(B) Construction Requirements

(C) Interior Arrangements

(D) Heating and Ventilation

(E) Sanitation, Lighting, and Fire Protection

The analysis of the laws now in force was thus used to present the different phases of school building construction over which control is exercised, and the extent to which construction in the several states is affected by compulsory regulations.

The final step was to review both the history of compulsory regulation of school building construction and the present laws in order to arrive at conslusions as to trends in rules and regulations governing school building construction. The trends disclosed by legal changes should indicate these principles which have been discarded, and also those which have been retained through common usage and considered essential in improving and standardizing public school building construction.

CHAPTER II

HISTORY OF CONPULSORY REGULATION OF SCHOOL BUILDING CONSTRUCTION IN THE UNITED STATES

Introduction

It is the purpose of this chapter to trace briefly the history of compulsory regulation of school building construction in the United States, stressing in some detail the regulations in force during the period 1910 to 1933.

Compulsory Regulation Previous to 1910

State control of school building construction in the United States may be said to have had its definite beginning in the early years of the present century. Previous to this time the details of construction rested largely in the hands of architects and local school board members.

In the years following 1900 a movement for better standards in school building construction was developing, brought about by increased knowledge of sanitation and health, and building developments in other enterprises, along with a stimulated public regard for the safety of school children. It was not until 1902, however, that the first special legislation governing school building construction was enacted in New York.[1] Two years later this state

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[1] Englehardt, N. L., and Fred Englehardt, Planning School Building Programs (New York City: Bureau of Publications, Teachers College, Columbia University, 1930), p. 297.

enacted one of the first outstanding laws[2] governing school building construction. The law was unusually well formu-

---

[2] No schoolhouse shall hereafter be erected in any city of the third class or in any incorporated village or school district in the state, and no addition to a school building in any place shall hereafter be erected the cost of which shall exceed five hundred dollars, until plans and specifications for the same shall have been submitted to the commissioner of education and his approval endorsed thereon. Such plans and specifications shall show in detail the ventilation, heating and lighting of such buildings. Such commissioner of education shall not approve any plans for the erection of any school buildings or addition thereto, until the same shall provide at least fifteen square feet of floor space and two hundred cubic feet of air space for each pupil to be accommodated in such study or recitation room therein and no plans shall be approved by him unless provision is made therein for assuring at least thirty cubic feet of pure air every minute per pupil and the facilities for exhausting the foul or vitiated air shall be positive and independent of atmospheric changes. No tax levied by a district meeting or other competent authority in any such city, village or school district exceeding the sum of five hundred dollars shall be levied by the trustees until the commissioner of education shall certify that the plans and specifications for the same comply with the provisions of this act. All schoolhouses for which plans and detailed statements shall be filed and approved, as required by this act, shall have all halls, doors, stairways, seats, passageways, and aisles and all heating and lighting appliances and apparatus arranged to facilitate egress in case of fire or accident and to afford the requisite and proper accommodations for public protection in such cases. All exit doors shall open outwardly, and shall, if double doors be used, be fastened with movable bolts operated simultaneously by one handle from the inner face of the door. No staircase shall be constructed with wider steps in lieu of a platform, but shall be constructed with straight runs, changes in directions being made by platforms. No door shall open immediately upon a flight of stairs, but a landing at least the width of the door shall be provided between such stairs and such doorway. (Laws of N. Y., 127th Session, 1904, Vol. 1, pp. 628-29.)*

*Englehardt, N. L., and Englehardt, Fred. op. cit., p. 297.

lated, and provided for the regulation of the many important phases of construction in such a thorough manner that it seemed to have served as a guide for similar legislation in other states.

The numerous school fires which occurred during this period constituted another important factor which stimulated the development of state control of school building construction. The Collinwood, Ohio, disaster of 1908, in which 173 school children lost their lives, as well as the occurrence of 58 other school fires during the same year, prompted several states to enact measures providing for better construction and safety of public school buildings.[3]

Status of Compulsory Regulation in 1910

Compulsory regulations governing the construction of school buildings in 1910 are summarized in Figure 1. It is interesting to note here the comparatively few regulations existing at this time, and the various phases of construction over which the states assumed control. The administration of the regulations governing school building construction was vested in only two agencies, namely, state boards of education and state boards of health. Thirteen states delegated the authority to the state board of education, while nine states placed the responsibility in the hands of the state board of health.

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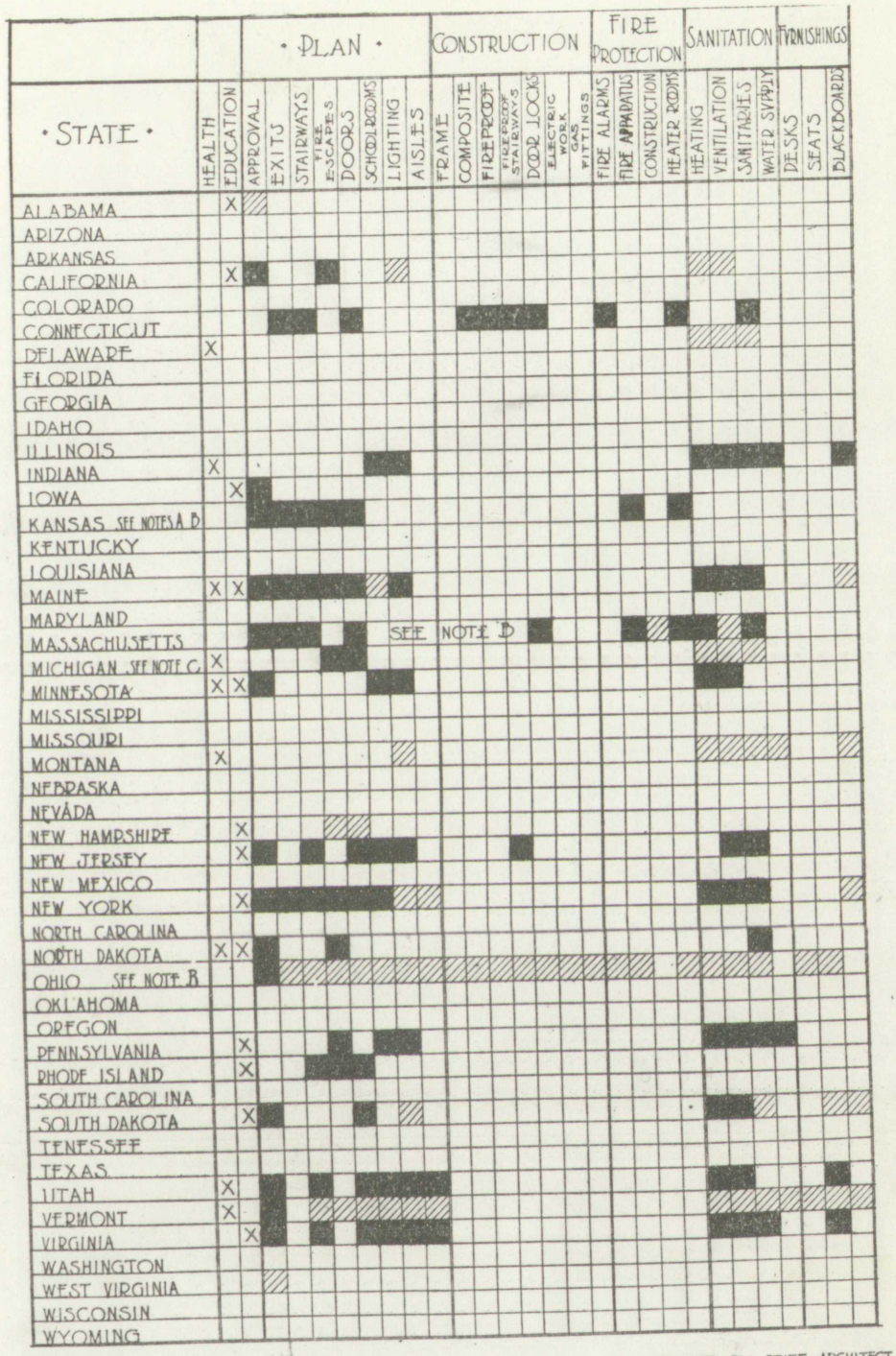
[3] Englehardt, N. L., and Fred Englehardt, op. cit., p. 296.



NOTE A- THE PLANS FOR SCHOOL BUILDINGS IN THIS STATE MUST BE APPROVED BY STATE ARCHITECT

NOTE B THESE RULES ARE PREPARED BY DEPARTMENT OF INSPECTION OF WORKSHOPS. FACTORIES AND PUBLIC BUILDINGS

NOTE C. THESE LAWS AND REGULATIONS APPLY TO STATE BUILDINGS ONLY

■ INDICATES LAW ▨ INDICATES REGULATION

Figure 1. The Status of Compulsory Regulation of School House Construction in the United States in 1910. (Taken from Report of Committee on School House Planning, National Education Association, 1925. p.87. By Permission).

As Figure 1 discloses, the matter of planning was given more emphasis than any other phase of construction. The twenty-two states requiring the approval of plans and specifications limited their approval to such features as exits, stairways, fire escapes, doors, school rooms, lighting and aisles. Of these features, doors and lighting received most consideration. Fourteen states required approval of doors, while thirteen states provided that the lighting of school buildings must have the approval of the controlling agency. Eleven states required approval on stairways and fire escapes, and approval of classrooms was required in ten states. Of the remaining items upon which approval was required, six states made provisions for exits, and approval of aisles was necessary in only three states.

Legal provisions for the sanitation of public school buildings were enacted by eighteen out of the forty-eight states. All eighteen states had practically the same regulations governing sanitation excepting Indiana, Pennsylvania, and Vermont. These states had additional provisions governing the water supply of school buildings in their respective states. The most significant items of sanitation over which the states exercised control were drinking fountains, privies, and sanitaries.

The equipment and furnishings of school buildings received attention by law makers in nine states: Indiana,

Maine, Montana, New York, Ohio, South Dakota, Utah, Vermont, and Virginia. The provisions of these states relative to equipment and furnishings vary widely, and in only one state, Vermont, do the regulations cover all the items listed under "Furnishings" in Figure 1.* Two of the most important items, desks and seats, which are closely related to the health and progress of school children, were given little considerstion, while blackboards, an item of lesser importance, received more attention than either of the former. Five states- Vermont, Ohio, South Dakota, Utah, and Virginia- had regulations governing desks and seats, while rules relating to blackboards existed in six states, Indiana, Montana, New York, South Dakota, and Vermont.

Requirements governing the construction work of public school buildings were given but minor consideration during this period. The only phase of construction upon which emphasis was placed was that of the type of construction. Ohio provided for the regulation of three types of construction; namely, frame, composite, and fireproof, while Connecticut controlled only two types, composite and fireproof. New Jersey and Connecticut stipulated that stairways must be of fireproof construction, while rules governing fire bolts appeared in Connecticut and Massachusetts. Of the remaining items, electrical work and gas fit-

*National Education Association, op. cit., p. 87.

tings, Ohio alone considered their regulation essential.

The important matter of fire protection was likewise given but little attention. In the entire United States only seven provisions relating to fire protection existed, and of these, three belonged to Massachusetts. Details of heater rooms were regulated by Connecticut, Massachusetts, and Kansas, and the maintenance of equipment for fire prevention was compulsory in Massachusetts and Kansas.

The importance of the selection and control of school building sites was evidently not recognized at this time, as provisions relating to this phase of construction were entirely absent.

Status of Compulsory Regulation in 1915

During the period 1910-1915 there was a marked development in the amount and nature of compulsory regulation of school building construction. In this interval the total number of states controlling the construction of school buildings was increased from 22 to 29, and the administration of this control was vested in three additional agencies; namely, the state architect, the state fire marshal, and the state building inspector.[4]

As is shown in Figure 2,* many new regulations were enacted by 1915, and the increased responsibility assumed

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[4] By inspector in Wisconsin is meant the Wisconsin Industrial Commission.

*National Education Association, op. cit., p. 88.

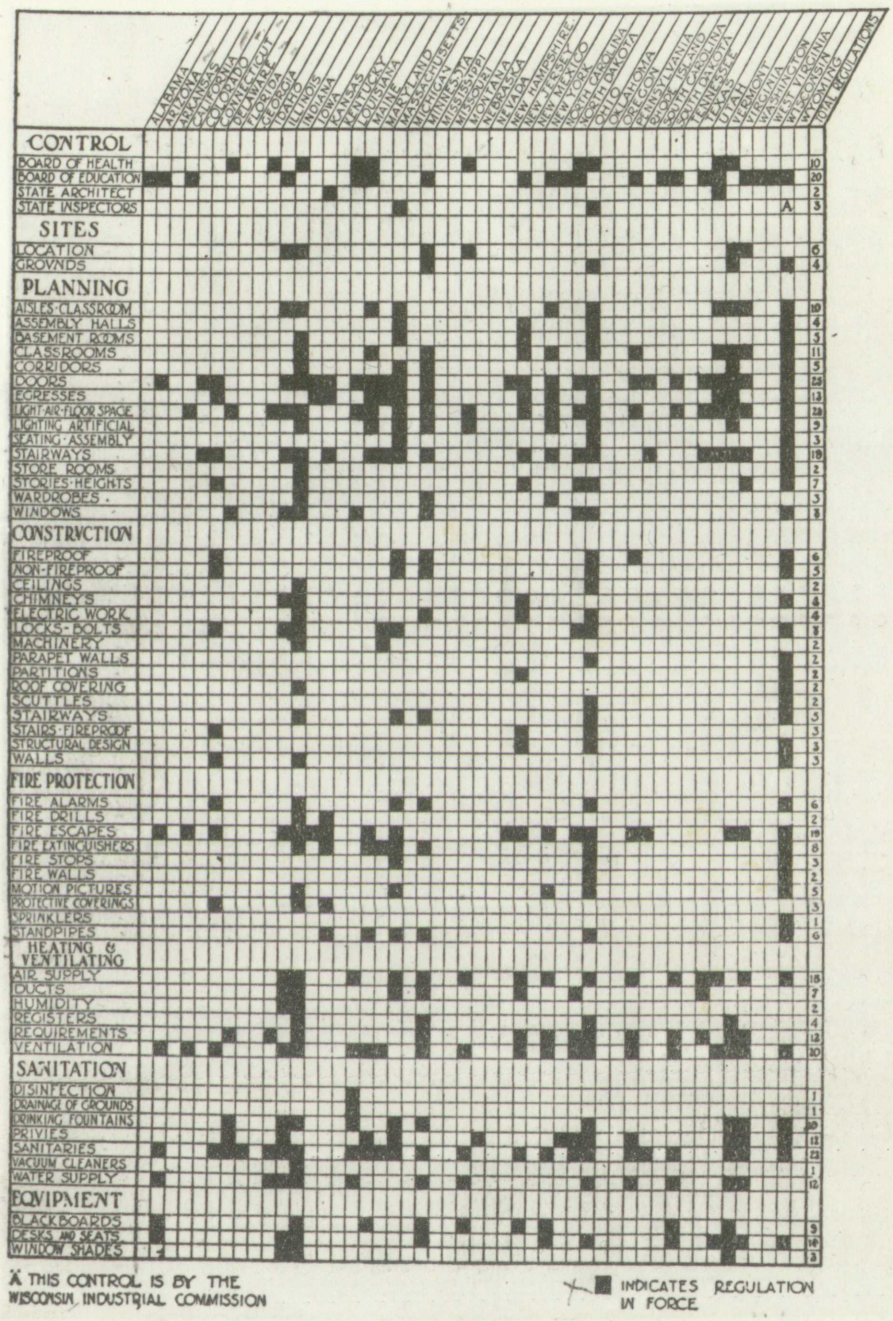

Figure 2. The Status of Compulsory Regulation of School House Construction in the United States in 1915. (Taken from Report of Committee on School House Planning, National Education Association, 1925. p.88. By Permission).

by the states is also evident. Moreover, there was a change in the character of the legislation enacted during the years 1910 to 1915. Provisions that existed during this time were more specific and meaningful than those in force heretofore, while each general phase of construction[5] was characterized by a division into smaller units for the purpose of making the regulations more effective.

The appearance of provisions relating to the selection and control of school building sites in Illinois, Indiana, Minnesota, Montana, Ohio, Vermont, Virginia, and Wisconsin marked the beginning of the regulation of an important feature in school building planning. From this beginning the matter of sites has been given considerable attention, and as a result, standards conventionally accepted now prevail.

Approval of plans for school buildings during this interval was required by eight additional states: Arizona, Colorado, Delaware, Idaho, Illinois, Maryland, Texas, and Wisconsin. With this development came the inclusion of the following new items relating to planning upon which approval was necessary: assembly halls, basement rooms, corridors, egresses, floor space, artificial lighting, seating, storerooms, height of stories, wardrobes, and windows. The

---

[5] By general phases of construction is meant the following items as listed in Figure 2: Control, Sites, Planning, Construction, Fire Protection, Heating and Ventilation, Sanitation and Equipment.

majority of regulations governing schoolhouse planning were concerned primarily with the health and safety of pupils, inasmuch as twenty-eight states made provisions for lighting, twenty-five stipulated that doors must open outward, nineteen required approval on stairways, and regulations governing boiler and heater rooms prevailed in eleven states.

Although many new features appeared in the regulations governing the general construction of school buildings in 1915, the increase in the number of states assuming control over this phase was small. The significant structural items over which control was exercised dealt wholly with matters relating to fire prevention and panic, which will be discussed more fully in the following paragraphs.

Of all the laws controlling school building construction during this period, those relating to fire prevention and panic were most significant. From the six general regulations in existence in 1910, the number increased to fifty-five by 1915, while the following new features were represented in the regulations: fire alarms, fire drills, fire extinguishers, firestops, fire walls, protective coverings, motion pictures, sprinklers, and standpipes. Of more significance, however, is the fact that nineteen states initiated the policy of compelling school districts to maintain fire escapes on buildings of two or more stories in height. While this number was small in comparison with the regulations

enacted thereafter, it paved the way, nevertheless, for some of our most important school building legislation.

The installation of apparatus for the prevention of fire and panic was made mandatory in nine states. Connecticut, Indiana, Massachusetts, Minnesota, and Wisconsin made provisions for fire alarms, while fire extinguishers were compulsory in Kansas, Maine, and Maryland. Only one state, Wisconsin, had legislation governing sprinklers. Items such as firestops, fire walls, motion pictures, protective coverings, and standpipes were given but little consideration. The regulation of these features was limited mainly to Massachusetts, Ohio, and Wisconsin, except for several provisions in Kansas and Minnesota.

The heating and ventilation of school buildings was deemed of sufficient importance in twenty-four states to be included in the regulations. Of these two phases of construction, heating was given the greater emphasis. Forty-one regulations were provided for the heating of school houses, while only twenty rules existed relative to the details of ventilation. Laws that existed during this time were designed principally to regulate the air supply to be furnished in classrooms. Other features which received attention were humidity, registers, and requirements for heating systems.

Measures adopted to regulate the sanitary features of

schoolhouses underwent a decided change during this period. Deviating from such general terms as "adequate and proper facilities for sanitation shall be provided," and "the health of school children shall be cared for," the legislation now in existence provided for specific regulation of sanitaties, privies, disinfection, drainage of grounds, drinking fountains, and water supply. With respect to the above mentioned items, considerable legislation was devoted to the erection and proper maintenance of privies and sanitaries. Features receiving less consideration were those of water supply and drinking fountains. Control over those items pertaining to water supply and drinking fountains was exercised principally in Delaware, Idaho, Illinois, Indiana, Louisians, Minnesota, Ohio, Vermont, and Virginia. Provisions for cleaning and disinfection in relation to the school plant in general also appeared during this period. These provisions, however, received recognition in only two states, Louisiana having the only law requiring disinfection, while the other state, Indiana, provided for the regulation of vacuum cleaners.

Legislation relating to furniture and equipment was as yet in its infancy. Several new states, Arizona, Illinois, and Wisconsin were added to those already controlling furniture and equipment, but the regulations in force were of such character that they could be considered little more than suggestive, at best.

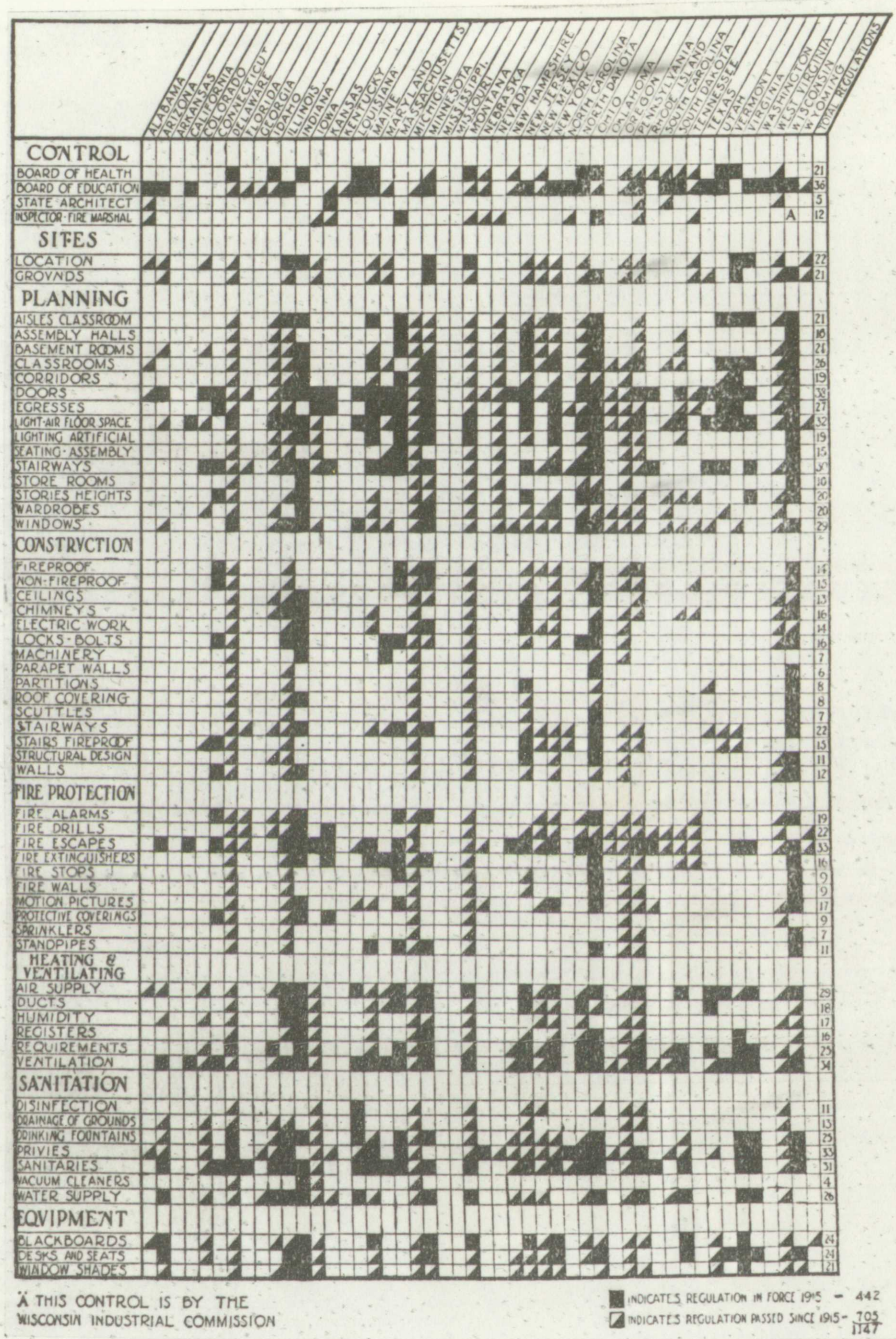

Figure 3. The Status of Compulsory Regulation of School House Construction in the United States in 1920. (Taken from Report of Committee on School House Planning, National Education Association, 1925. p.89 .. By Permission).

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Status of Compulsory Regulation in 1920

Figure 3* shows the status of compulsory regulation of school house construction in 1920. Inspection of this Figure reveals that no new features[6] were added to the regulations already in existence, but the number of states accepting the responsibility for the regulation of school building construction and the extent to which the various states assumed control increased considerably. A passage from a National Education Association publication[7] well summarizes the legislation that existed in relation to school building construction during this period:

> The few states that had no regulations in 1920 on the planning and construction of school buildings were Arkansas, Mississippi, Missouri, and Washington. While forty-four states had some regulations in this field in 1920, the fragmentary condition of these regulations may be seen from the following facts:
>
> There are fifty-eight items included in Chart 34* (1920). Only one state, Delaware, had regulations on every item. Only sixteen states had regulations on half or more of the items. These states with the number of items involved are:

Delaware	58	New Jersey	32
Idaho	29	New Mexico	31
Illinois	53	New York	42
Indiana	41	Ohio	52
Maine	36	Oregon	47
Michigan	56	Pennsylvania	42
Minnesota	37	West Virginia	37
Montana	56	Wisconsin	47

---

*National Education Association, op. cit., p. 89.

[6] Feature is taken to mean any item of construction such as doors, chimneys, walls, stairways, etc.

[7] National Education Association, op. cit., p. 86.

*Ibid. p. 89.

Of these sixteen states, control is exercised by the board of education in every case with only one exception.

The number of states having regulations on some of the more important items are as follows:

Planning of		Fire Protection	
Classroom aisles	20	Fire alarms	19
Basement rooms	20	Fire drills	22
Corridors	25		
Story heights	20	Sites	
Windows	29	Location of	
		Sites	22
Construction of		Grounds	21
Stairways	22		

Before proceeding further, reference is made to Table I, which shows the development of compulsory regulation of school building construction from 1910 to 1920 inclusive. The data cited in the table helps to clarify the discussion devoted to this period, in addition to revealing possible trends in future school building legislation.

TABLE I*

DEVELOPMENT OF COMPULSORY REGULATION OF SCHOOL BUILDING CONSTRUCTION IN THE UNITED STATES FROM 1910 TO 1920 INCLUSIVE

Descriptive Statement	Number of States		
	1910	1915	1920
Controll by			
Board of Education.....	13	20	36
Board of Health.....	9	10	21
State Architect.....	No Data	2	5
State Inspectors.....	No Data	5	17
Regulations Regarding			
Sites.....	--	6	22
Grounds.....	--	4	21
Planning.....	23	29	42
Construction.....	4	11	28
Heating and Ventilation	--	4	25
Fire Protection.....	4	21	36
Sanitation.....	18	25	39
Equipment.....	9	14	28
No State Jurisdiction..	24	13	4

Status of Compulsory Regulation from 1920 to 1933

During the years 1920-1933 there was a continued development in the legislation governing school building construction. In this interval there appeared many important changes, especially in the years following 1925.

*Condensed from data given by Cooper. National Education Association, Report of Committee on School House Planning (Washington: National Education Association, 1925), pp. 85-86.

Of the changes effected, most noteworthy were those designed to regulate the location and planning of school buildings. In 1928 legal provisions relating to the location of school buildings existed in Idaho, Pennsylvania, Tennessee, and Texas. Idaho specified that the building should be located near the center of population, but situated in such a manner so as to be free from disturbing noises. Tennessee and Texas required that school buildings be placed in an area affording natural drainage.[8]

Regulations for obtaining land to be used as sites for school buildings and clear titles to the same were provided by thirty out of the 48 states, the remaining states leaving this function to unspecified agencies. The most important items represented in the regulations pertaining to school buildings sites are contained in the list below:[9]

Provisions	States
Sites must be 350 to 500 feet from the railroad or noise-making industry	Arizona, Connecticut, Indiana, Maine, and Minnesota.
Grounds must be dry and have good walks	Arizona, Connecticut, Indiana, Minnesota, Nebraska, and Utah.
Definite area of site	Connecticut, Del., Idaho, Iowa, Md., Minn., Neb., Penna., Tenn., and Washington.

---

[8] Adapted from McGowan, H. M., "An Analysis of the State School Building Codes of the United States," (unpublished Doctor's Dissertation, Ohio State University, Columbus, 1929), p. 36.

[9] Ibid., p. 37.

Location of site Iowa, Ky., Minn., Mont., Okla.

That there was a tendency for the majority of states to regulate new construction by setting up requirements for plans and specifications is evident from the data contained in the following paragraph.

In 1928 thirty-four states required the submission of plans for new school buildings, as well as additions to, and repairs of old buildings. Of the thirty-four states that made the submission of plans compulsory, there were ten different agencies authorized to grant approval: namely, the state architect, the state board of education, state department of education, state superintendent, state board of health, county superintendent, state superintendent of education and state board of health, state board of health and state board of accountancy, supervisor of plans, division of workshops and public buildings.[10] Table II shows specific items upon which approval was required in ten of the thirty-four states mentioned above.

There was also inclination on the part of state authorities to prescribe detailed regulations relating to fire protection and panic, as is shown in the summary given below:

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[10] H. M. McGowan, loc. cit.

Regulations	Number of States
Doors to open outward	25
Panic bolts on exit doors	8
Fireproof construction of two story building	5
Fire gongs provided	6
Two story buildings equipped with fire escapes	19
Two exit doors required	12
Doors not to open on stairways	9
Width of stairway	7
Risers, treads, and handrails	7
Width of corridors	7

In addition to the provisions cited in the foregoing summary, six states--Arizona, Minnesota, New Jersey, Ohio, Utah, and Wisconsin--prohibited the construction of classrooms in basements except for laboratory or physical education purposes.

Variety of practice in the remaining regulations governing school building construction during this period makes a tabular comparison practically impossible. The data, however, indicate that the majority of these remaining regulations were concerned with the lighting and ventilation of school buildings inasmuch as sixteen states[11] specified the amount of cubic air space to be provided in each classroom, while provisions as to the amount of floor space to be furnished per pupil existed in seventeen states.[12]

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[11] Arizona, Connecticut, Delaware, Idaho, Indiana, Maine, Montana, Nebraska, New Jersey, North Dakota, New York, Oklahoma, Pennsylvania, South Carolina, Utah, and Virginia.

[12] Connecticut, Delaware, Kentucky, Maine, Michigan, Montana, Nebraska, New Jersey, North Dakota, New York, Oklahoma, Pennsylvania, South Carolina, South Dakota, Texas, Virginia, and Wisconsin.

In addition to the above mentioned regulations, three states--Ohio, Pennsylvania, and Wisconsin--had requirements relating to artificial lighting and exposure.

TABLE II*

SIGNIFICANT STRUCTURAL ITEMS UPON WHICH STATE APPROVAL WAS REQUIRED IN 1928

Regulations	Connecticut	Delaware	Idaho	Illinois	Michigan	Montana	R. Island	S. Dakota	Texas	Washington	Total
1. Capacity for students				x			x				2
2. Corridors		x									1
3. Cubage of buildings		x									1
4. Fire provisions										x	1
5. Floor elevation	x										1
6. Heating			x	x	x	x	x	x	x	x	8
7. Lighting				x	x	x	x	x	x	x	7
8. Longitudinal and cross section	x										1
9. Orientation of buildings	x										1
10. Plan of each floor	x										1
11. Plan of site	x										1
12. Roof plan	x										1
13. Toilets			x	x			x			x	4
14. Ventilation			x	x	x	x	x	x	x	x	8
15. Water supply			x	x			x			x	4

*
Adapted from McGowan, H. M., "An Analysis of the State School Building Codes of the United States," (unpublished Doctor's Dissertation, Ohio State University, Columbus, 1929), p. 36.

The following extract from a study by Holmes[13] gives a picture of the extent to which the several states exercised control over school building construction in 1929:

The following states have no legal school building code:

Arizona	Nebraska
Arkansas	Oregon
Florida	Rhode Island
Kansas	West Virginia

The following states exercise but meager control of school building construction:

California. Recently established a school building department to assist rural sections and small towns in the construction of from 1-6 room buildings. Certain suggestions and plans furnished without legal authority.
Iowa. No central organization. Only county superintendent must approve plans.
Tennessee. Issues a catalog of plans for rural schools. Department of education is authorized to form standards.
Washington. Districts of third class only must have plans approved.
Louisiana. Recommends to schools the adoption of the National Education Standards of school building.
New Hampshire. Plans may be submitted to the department of education.
Mississippi. Publishes a small pamphlet of information on replanning of small schools. Urges the selection of a competent architect.
Wyoming. Through an attempt to elevate rural schools by means of a set of standards the Department of instruction exercises indirect assistance.
Alabama. Assists rural school through the dissemination of typical building plans.
South Dakota. Remote control over rural construction is exercised by the Department of instruction through state aid to schools complying with certain regulations.

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[13] Holmes, Warren S., Op. cit., p. 56.

Colorado. No building code. Exerts indirect control through a plan of recognizing standards of excellence.
Montana. Publishes a bulletin of illustrated plans. Board of health also distributes plans.
Nevada. Prepares and distributes plans for rural school buildings.

States not listed above have acceptable plans for controlling school building construction.

Summary and Conclusions.

Sufficient evidence is presented in this chapter to warrant the conclusion that requirements governing school building construction in the United States have greatly increased from the period 1900 to 1933. The practice of enacting legislation of a general nature has been largely eliminated, consequently the regulations governing school building construction are becoming increasingly specific. Not only have the majority of the states assumed supervisory responsibility for school buildings, but they have established various central agencies in order to effect desirable standards in school building construction. That the factors cited above have played an important part in establishing present practices in public school building construction, an examination of the following chapter will disclose. In fact, improvements made during the period 1900-1933 indicate that control over school building construction will continue to increase, and that it will spread more generally among the states of the Union.

CHAPTER 111

PRESENT STATUS OF COMPULSORY REGULATION OF SCHOOL HOUSE CONSTRUCTION IN THE UNITED STATES

Introduction

In Chapter 11 the history of compulsory regulation of schoolhouse construction was presented, and important changes and developments in school building legislation shown. The purpose of this chapter is to pursue one step further the development of compulsory regulation of schoolhouse construction in order to disclose prevailing practices and trends in rules and regulations governing school building construction.

Authority of Administration

In Table 111 are presented the various state agencies controlling school building construction in the United States. This table indicates that control is vested in 19 different agencies, each of which shares responsibility or is delegated authority over certain specific aspects of school building construction or inspection. Divergence of control is greatest in Pennsylvania, where five agencies administer the details pertaining to school building programs. A comparable situation exists in Ohio, where minimum requirements for heating,

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1 Department of Health, Department of Labor and Industry, State Art Commission, State Council of Education, Superintendent of Public Instruction.

TABLE III

STATE AGENCIES CONTROLLING SCHOOL BUILDING CONSTRUCTION IN THE UNITED STATES

Authority of Administration	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Florida	Georgia	Idaho	Indiana	Illinois	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Mass.	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Jersey	N. Hampshire	New Mexico	New York	N. Carolina	N. Dakota	Ohio	Oklahoma	Oregon	Penna.	R. Island	S. Carolina	S. Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Va.	Wisconsin	Wyoming	Total
1. Administrative Bldg. Council											x																																				1
2. Commissioner of Labor													x																																			1
3. Department of Education				x																x			x						x			x											x				7
4. Dept. of Industrial Relations																																x																1
5. Dept. of Labor and Industry																													x						x												2
6. Department of Public Safety																			x																												1
7. Department of Welfare										x																																					1
8. Industrial Commission																																													x		1
9. State Architect				x								x		x																																		3
10. State Art Commission																																				x												1
11. State Board of Education	x				x	x							x	x		x											x	x	x	x				x		x	x						x		x		x	16
12. State Board of Health		x			x		x		x	x			x	x	x	x				x	x						x	x			x			x				x	x				x	x	x	x	x	24
13. State Board of Regents										x																				x																		2
14. State Council of Education																																				x												1
15. State Department of Health	x			x			x					x																						x		x												6
16. State Fire Marshall	x										x	x	x	x										x										x	x		x											11
17. State Insurance Commissioner																														x																		2
18. State Commissioner of Charities and Correctness																																			x												1
19. State Commissioner or Superintendent of Education	x								x			x								x									x																		26
20. Statutory											x		x	x																	x		x	x		x										x		18

ventilation, safety, and construction are enforced by four agencies; namely, the Department of Industrial Relations, the Board of Building Standards, the Attorney General, and the Department of Education. Likewise, the Virginia approval of new construction is delegated to the division superintendent and the state superintendent of public instruction, while the state board of health has supervisory responsibility over matters pertaining to sanitation.

In order to show the responsibility assumed by the remaining agencies, the functions of each group are treated separately in the text following.

Administrative Building Council. In only one state, Indiana, does there exist an administrative building council which governs the construction of school buildings. This council,[2] composed of the secretary of the State Board of Health, Director of the Division of Public Safety, and the Chairman of the State Industrial board, promulgates and enforces practically all school building legislation. The State Board of Accounts checks all plans before final approval is given.

Commissioner of Labor. The commissioner of labor is likewise charged with responsibility in only one state, Iowa.[3]

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[2] Indiana. Laws, Statutes, etc., Rules and Regulations of the Division of Public Health (Indianapolis: Administrative Building Council, 1925), p. 1.

[3] Iowa. Laws, Statutes, etc., School Laws from the Code 1935 (Des Moines: The State of Iowa, 1935), p. 96.

General charge and supervision of the inspection and regulation of fire escapes and means of escape, and the enforcement of the law relating thereto, are subject to his direction.

The Department of Education. Control exercised by the department of education varies widely. Although most state departments of education are granted power to regulate school building construction, this power is usually delegated to other offices, consequently plenary power over construction is exercised by this department in only seven states, California, Michigan, Missouri, Nebraska, New York, Ohio, and Virginia. There is comparatively little uniformity in the functions performed by these departments. Usually the department of education places the responsibility for the regulation of schoolhouse construction in the hands of the superintendent of public instruction, who prepares rules and regulations and submits them to the department for approval, and acts in accordance with the approval given.

Industrial and Labor Departments. Various aspects of school building construction are controled by industrial and labor departments in five states.[4] The Department of Labor and Industry in Pennsylvania is authorized to formulate regulations for the construction and safety of public school buildings.[5]

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[4] Indiana, New York, Ohio, Pennsylvania, and Wisconsin.

[5] Pennsylvania. Laws, Statutes, etc., The School Laws of Pennsylvania, 1933 (Harrisburg: Department of Public Instruction, 1933), p. 256.

A somewhat similar policy is in force in Wisconsin, where the Industrial Commission is authorized by law to adopt protective measures as applied to the many phases of design, construction, equipment, and maintenance of public buildings.[6] In Ohio the Department of Industrial Relations has charge of the construction and inspection of school buildings.[7] Control is administered by requiring all school building plans and specifications to be submitted to this department for approval. It is well to mention here that requirements in Ohio are more extensive and rigid than in any other state, in matters of both construction and inspection. The method of providing for the safety of public school buildings in New York, where the Industrial Board of the New York Department of Labor has adopted a standard building code for places of public assembly, is similar to that of Ohio.

Department of Public Safety. Before a certificate of approval for the construction of a school building is issued in Massachusetts, the following features must conform to requirements prescribed by the Department of Public Safety.[8]

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[6] Wisconsin. Laws, Statutes, etc., Wisconsin State Building Code (Madison: Bureau of Purchases, 1934), p. 7.

[7] Ohio. Laws, Statutes, etc., Ohio State Building Code, School Buildings (Columbus: The F. J. Heer Printing Company, 1936), p. 3.

[8] Massachusetts. Laws, Statutes, etc., Regulations Relative to the Inspection of Buildings which are Subject to the Provisions of Chapter 143, General Laws (Boston: Department of Public Safety, 1931), p. 3.

(a) Ventilation, heating, sanitation, and lighting
(b) Location of site
(c) Fire protection
(d) Safety provisions

This department also acts as an inspectional agency in matters pertaining to the safety of school buildings.

The Department of Welfare. The state of Idaho authorizes the Department of Public Welfare to condemn any school building, school site, school outbuilding, or school drinking water supply if any of the same are found to be unfit for use because of unsanitary or other improper conditions.[9]

The State Architect. Statutory provisions relating to the duties of the state architect with respect to the construction of school buildings are found in California, Illinois, and Kansas. Illinois requires the state architect to advise the superintendent as to minimum requirements for heating, lighting, ventilation, seating, water supply, toilets, and safety against fire. In addition to the foregoing duties, he is required to assist in the condemnation of unsafe or insanitary school buildings.[10]

In Kansas the statutes provide that all plans and specifications must be submitted and approved by the state architect before a contract is let.[11]

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[9] Idaho. Laws, Statutes, etc., School Laws of the State of Idaho (Boise: Superintendent of Public Instruction, 1933) p. 92.

[10] Illinois. Laws, Statutes, etc., The Rural One-Teacher Schools of Illinois (Springfield: Superintendent of Public Instruction, 1932), p. 8-9.

[11] Letter from W. T. Markham to William B. Castetter. Topeka, Kansas: Office of the Superintendent of Public Instruction, February 14, 1937.

Before a contract for the erection of a school building is valid in California, approval of plans by the state architect and the division of architecture is necessary.[12]

The State Art Commission. The exterior design and proposed location of all public school buildings except in cities of first or second class are subject to examination and approval of the State Art Commission in Pennsylvania.[13]

The State Board of Health. The duties of the state board of health in relation to the construction of school buildings are found in the school laws of twenty-four states. The functions of this group vary widely, but their activities are usually confined to the supervision of such features as the location of sites, water supply, toilets and urinals, sewage disposal, drainage, and drinking facilities. In addition to the above mentioned activities, the responsibility for periodic inspection of school buildings is usually assigned to this board.

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12 California. Laws, Statutes, etc., 1933 Supplement to the School Code of the State of California (Sacramento: Superintentent of Public Instruction, 1933), p. 54-7.

13 Pennsylvania. Laws, Statutes, etc., Administrative Code of the Commonwealth of Pennsylvania (Harrisburg: Department of property and supplies, 1936), p. 139.

The State Board of Regents. In Idaho and New York the board of regents exercise indirect control over the construction of school buildings.[14] The Idaho law reads as follows:

> The State Board of Regents in cooperation with the Department of Public Welfare, shall standardize sanitary appliances, school equipment, school furniture, and supplies and school buildings.

A similar policy is in effect in New York where the State Board of Regents has adopted rules and regulations governing the submission of plans, construction requirements, and safety of school buildings.[15]

The State Council of Education. The State Council of Education in Pennsylvania is authorized to prescribe rules and regulations for the sanitary equipment and inspection of school buildings, and to issue and have available for distribution rules and regulations in regard to school house construction.[16]

The State Fire Marshal. As is shown in Table 1, the state fire marshal is empowered by sixteen states to regulate certain aspects of school building construction. Duties of the state marshal are usually restricted to the regulation of such features as the erection and inspection of fire escapes,

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[14] Idaho. Laws, Statutes, etc., Idaho Bulletin of Education. Number 4, June, 1927 (Boise: State Board of Education, 1927), p. 3.

[15] New York. Laws, Statutes, etc., Education Law (Albany: The University of the State of New York Press, 1927), p. 148.

[16] Pennsylvania. Laws, Statutes, etc., The School Laws of Pennsylvania, 1933 (Harrisburg: Department of Public Instruction, 1933), p. 308.

fire protection, and condemnation of school buildings.

In Indiana, the State Fire Marshal has rather wide powers in relation to school building construction. Here he is vested with the power to prescribe regulations for the construction and maintenance of school buildings. In addition to the foregoing, all plans and specifications must be submitted for his approval.[17] Laws of Texas, Oklahoma, Michigan, Illinois, and Alabama are practically the same with regard to the fire marshal. Each have regulations placing the inspection and approval of fire escapes under the jurisdiction of the state fire marshal.

Superintendent of Public Instruction. Control of school building construction is usually held simultaneously by the chief state educational officer and the state board of education. An extract from the New Mexico statute is typical:

> No public school building shall be built, old building remodeled to the extent of one thousand dollars or more except the State Board of Education shall give its approval. For the purpose of this regulation the State Superintendent of Public Instruction shall be the agent of the State Board of Education with power to approve or disapprove all applications for permission to build or remodel.*

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[17] Indiana. Laws, Statutes, etc., Rules and Regulations of the Division of Public Health (Indianapolis: Administrative Building Council, 1928) p. 23.

* New Mexico. Laws, Statutes, etc., Regulations of the New Mexico State Board of Education Relative to the Building and Remodeling of School Buildings (Santa Fe: State Board of Education, 1920), p. 1.

Powers delegated to this office in New Jersey[18] and California,[19] however, are much more extensive. The duties of the Commissioner of Education in New Jersey include the appointment of an inspector of buildings, the enforcement of all regulations prescribed by the State Board of Education in regard to the construction of school buildings, and the condemnation of any school building deemed unfit by him for school purposes.

In California the Superintendent of Public Instruction exercises indirect control over school building programs through the Division of Schoolhouse Planning. Under his direction the Division regulates all matters pertaining to the construction of buildings to be used for school purposes.

State Insurance Commissioner. In North Carolina all plans and specifications for school buildings must be approved by the State Insurance Commissioner. This approval, however, is limited to provisions pertaining to safety.[20]

State Commissioner of Charities and Correctness. The authority granted to the Commissioner of Charities and

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[18] New Jersey. Laws, Statutes, etc., Building Code of the State of New Jersey (Trenton: Department of Public Instruction, 1925), p. 5-8.

[19] California. Laws, Statutes, etc., School Code of the State of California, 1931, (Sacramento: Superintendent of Public Instruction, 1931), p. 120-21.

[20] North Carolina. Laws, Statutes, etc., The Public School Law of North Carolina, 1927 (Raleigh: Superintendent of Public Instruction, 1927), Sec., 6453.

Correctness in New Jersey to regulate the planning and construction of school buildings is well expressed in the following quotation:[21]

> The Commissioner of Charities and Correctness shall, upon the request of the Commissioner of Education, cause to be prepared standard plans and specifications for school buildings to contain one, two, four, six, eight, twelve, sixteen, twenty, and twenty-four rooms. The Commissioner of Education shall, upon receipt of such plans, cause blueprints to be made of the plans, and shall have printed copies of the specifications and shall loan copies to any district upon its application. The Commissioner of Charities and Corrections shall also, upon the request of the Commissioner of Education, cause to be made a thorough examination of any school building and to report to the Commissioner of Education his findings in regard thereto.

Compulsory Regulations Governing the General Construction of School Buildings

Table IV presents briefly the results of the analysis of the regulations governing the general construction of school buildings in the United States. No attempt has been made to give all the variations of the regulations, but classifications as broad and general as the data would permit.

Employment of Architect. Provisions for the employment of an architect are found in seven states.[22] The Arizona provisions, however, are more extensive than those of any other state.[23] The law requires that an architect be employed for the

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[21] New Jersey. Laws, Statutes, etc., New Jersey School Laws, 1931 (Trenton: MacCrellish and Quigley, 1931), p. 134.

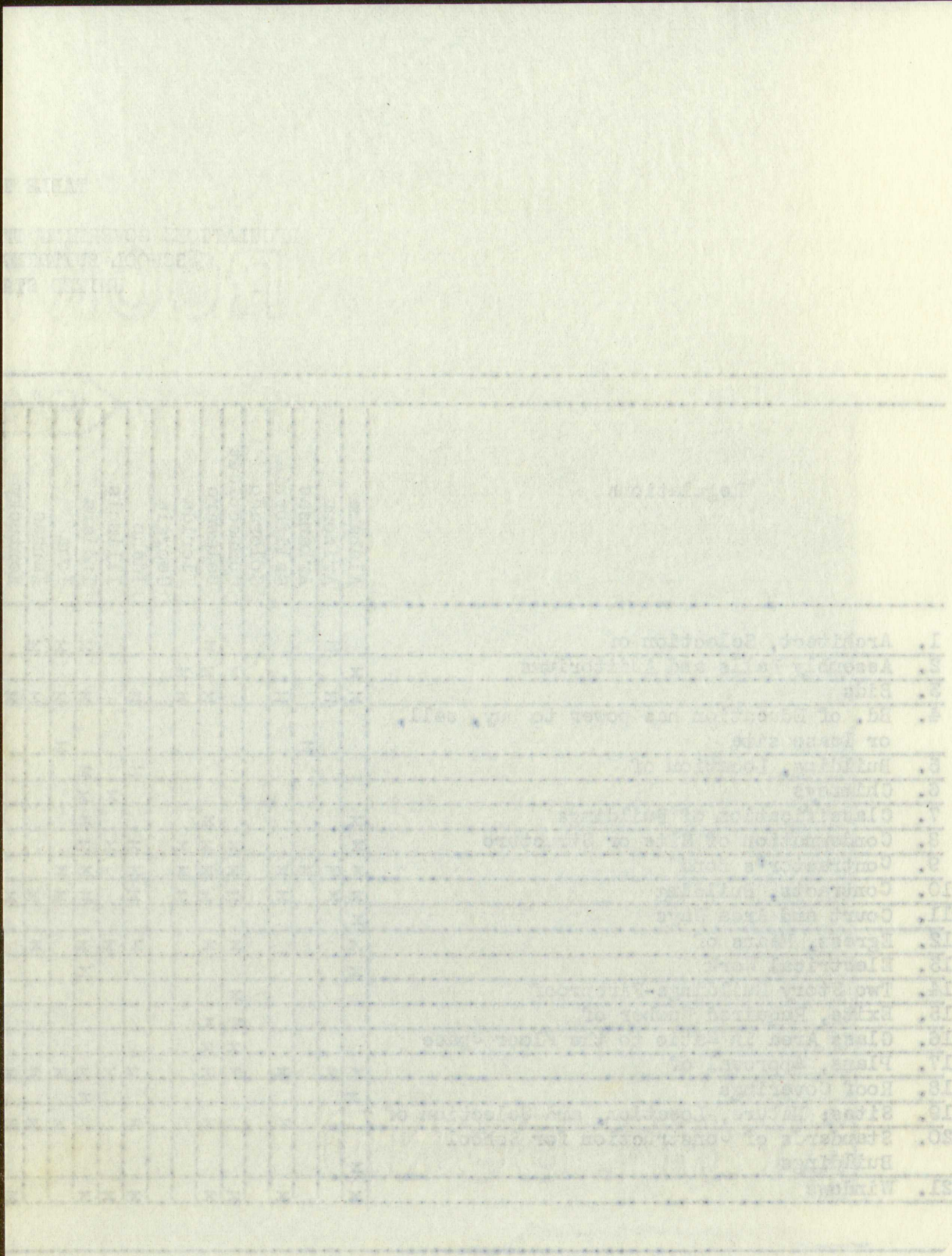
[22] Arizona, Deleware, Indiana, Kansas, North Dakota, Utah.

[23] Arizona. Laws, Statutes, etc., School Laws of Arizona for 1931 (Phoenix: Superintendent of Public Instruction, 1931), p. 141-2.

TABLE IV

REGULATIONS GOVERNING THE CONSTRUCTION OF
SCHOOL BUILDINGS IN THE
UNITED STATES

Regulations	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Jersey	N. Hampshire	New Mexico	New York	N. Carolina	N. Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	S. Carolina	S. Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	W. Virginia	Wisconsin	Wyoming	Total
1. Architect, Selection of		x					x	x				x	x	x																		x																7
2. Assembly Halls and Auditoriums	x					x	x	x										x	x		x						x					x	x			x									x		14
3. Bids	x	x		x			x	x		x		x	x	x	x	x				x	x		x	x	x	x	x		x		x	x	x	x	x	x		x	x	x		x		x	x	x	30
4. Bd. of Education has power to buy, sell, or lease site			x										x							x	x			x						x	x		x												x		10
5. Building, Location of										x		x					x												x	x			x											x				7
6. Chimneys											x	x							x		x						x																			x		6
7. Classification of Buildings	x						x					x						x	x		x								x	x				x			x						x				12
8. Condemnation of Site or Structure	x					x	x	x		x	x	x						x		x	x	x	x		x		x	x	x		x	x			x	x	x		x				x	x	x	x	x	26
9. Contractor's Bond	x	x	x	x		x	x	x		x		x	x							x	x		x		x		x						x	x	x	x	x				x	x	x		x	x		x	26
10. Contracts, Building	x	x		x		x	x	x		x		x	x	x	x	x		x			x		x	x	x	x	x		x	x	x	x	x	x	x	x		x	x	x	x	x	x			x	x	36
11. Court and Area Ways	x																														x		x			x												5
12. Egress, Means of	x					x	x			x	x	x		x			x	x	x	x		x	x				x		x	x	x	x		x	x		x				x	x	x	x			x	x	28
13. Electrical Work	x											x								x		x											x			x											x		7
14. Two Story Buildings-Fireproof						x												x													x		x			x										x		5
15. Exits, Required Number of						x	x									x		x			x						x		x		x			x			x		x									13
16. Glass Area in Ratio to the Floor Space						x	x										x	x	x		x			x			x				x			x	x	x		x							x				13
17. Plans, Approval of	x	x		x		x	x			x	x	x	x	x	x	x	x	x	x		x	x		x	x		x		x		x	x		x	x	x	x		x	x	x	x	x	x	x	x	x	38
18. Roof Coverings	x											x																										x										x		4
19. Sites: Nature, Location, and Selection of				x		x	x			x		x	x	x	x			x							x	x									x		x												15
20. Standards of Construction for School Buildings	x																	x		x	x		x									x		x			x								x	x			10
21. Windows	x			x		x	x			x	x	x			x	x	x	x	x	x			x		x		x			x	x	x	x		x		x	x		x	x	x	x		x		x	29



construction of a school building, but it is optional whether the direct or competitive method of selection is used. The law further specifies that the architect employed shall execute a contract with the agent to prepare working drawings, details and specifications for the proposed building or structure, and to supervise its construction, unless the agent waives employment of the said architect for the employment of the work. The compensation of the architect is based upon preliminary drawings and tentative design, complete working drawings, and supervision of construction.

Laws of Delaware, Kansas, North Dakota, Indiana, and Utah are rather similar in that they require all plans and specifications for public school buildings to be drawn by an approved architect.

Assembly Halls and Auditoriums. Mandatory provisions relating to assembly halls and auditoriums prevail in fourteen states. The regulations most commonly in force are as follows:

(a) Location of auditorium; must be placed on first floor.
(b) Location and width of aisles
(c) Requirements for ventilation
(d) Number of exits
(e) Fire resistive materials must be used in construction
(f) Minimum live loads (100-125 lbs. per square foot)
(g) Doors to swing outward
(h) Exit signs provided within place of assembly

Bids. Requirements for the advertising of bids are

specified in the statutes of thirty states. In the majority of states school boards are not allowed to enter into contracts for the erection or repair of a school building without first advertising for bids in local, county, or village newspapers. Advertisements are usually required to state the time and place of awarding the contract, a brief description of the work to be performed, materials to be furnished, and that the contract will be awarded to the best and lowest bidder.

Building Contracts. Examination of Table IV reveals that thirty-seven states require school boards or their agents to enter into contracts for the construction of school buildings. The following extracts from the statutes of several states are representative of the requirements relating to contracts:

Oklahoma.[24] No expenditure involving an amount greater than two hundred dollars shall be made except in accordance with the provisions of a written contract, and no contract involving an expenditure of more than five hundred dollars for the purpose of erecting any public buildings or making improvements shall be made except upon sealed proposals and to the lowest responsible bidder.

Kentucky.[25] Contracts for the erection of school buildings and additions and repairs to buildings shall be made by the board of education after proper letting to the lowest and best responsible bidder complying with the terms of the letting, but the board may reject any or all bids.

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[24] Oklahoma. Laws, Statutes, etc., School Laws of Oklahoma, 1935 (Oklahoma City: Superintendent of Public Instruction, 1935), p. 40.

[25] Kentucky. Laws, Statutes, etc., Regulations governing the Sanitary and Protective Construction of Public School Buildings (Frankfort: Department of Education, 1935), p. 9.

Alabama.[26] The erection, enlargement, equipment, or improvement of school buildings or grounds shall be done under the direction of the governing board of education which shall have authority to make contracts or to purchase materials and employ supervisors of construction and installation. All contracts shall be let on a basis of competitive bidding. Where state funds are involved no contract shall be binding on either part if signed prior to the date of the approval of the plans and spefications by the State superintendent of Education.

The following three provisions are invariably found in laws governing contracts for the construction of school buildings:

(a) Contracts must be written.

(b) Contracts in excess of amount appropriated are not valid.

(c) Contracts are not valid if plans and specifications have not been approved by controlling agencies.

Contractor's Bond. Little uniformity is found in the laws governing bonds to be furnished by contractors for the construction or repair of school buildings. Statutes of most states relating to this phase of construction are of a general nature, and often there is much discretion left to the school board members.

In Alabama the successful bidder must furnish a performance bond and labor and material bonds, each for fifty

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[26] Alabama. Laws, Statutes, etc., Handbook on the School Building Program for School Superintendents and Boards of Education (Montgomery: Department of Education, 1936), p. 38.

percent of the amount of the contract. The bond must be approved by the board letting the contract and made by a surety company authorized to transact business in Alabama.[26]

The statutes of Florida require the contractor to furnish a bond, but the amount of the bond and the company to furnish the surety rest within the jurisdiction of the local board.[27]

Wyoming requires the contractor to furnish a bond not less than one-half of the contract price, except that where such price exceeds one hundred thousand dollars, the officers letting such contract may fix an amount which they deem sufficient to insure the completion of the contract. The bond must be approved by the officers letting the contract and filed in the office of the treasurer thereof.[28]

Condemnation of Site or Structure. Various agencies are authorized to condemn school buildings or sites.

In most instances this function is performed by the state board of health, but in Idaho and North Carolina we find two notable exceptions. The statutes of Idaho specify that the secretary of the county board of health shall provide for an examination of the sanitary and usable condition of any school building, site, outbuilding, and drinking water supply

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[26] Alabama. Laws, Statutes, etc., op. cit., p. 38.

[27] Florida. Laws, Statutes, etc., Compilation of the School Laws of the State of Florida, 1934 (Tallahassee: State Board of Education, 1934), p. 78.

[28] Wyoming. Laws, Statutes, etc., School laws of the State of Wyoming, 1933 (Cheyenne: Wyoming Labor Journal, 1933), p. 116.

at least once a year. The examining officer files a report after such examination to the Department of Public Welfare, who in turn condemns any of the foregoing reported to be unfit for use because of insanitary or other improper conditions.[29]

The State Insurance Commissioner in North Carolina is authorized to inspect and condemn any school building not having acceptable provisions for the safety of its occupants.[30]

In Oklahoma and Indiana the State Fire Marshal is given statutory power to condemn any building used for school purposes if the same has not been provided with suitable fire escapes.

Condemnation proceedings are instituted in most states because of fire hazards, impure drinking water, sewage disposal, improper installation of toilets and urinals, and location of school sites.

Approval of Plans. In thirty-eight states plans and specifications must be submitted to the controlling agencies for approval. In a few states the amount of control exercised in this manner is practically negligible,[31] but the more progressive states have extensive requirements with regard to plans and specifications. The features upon which approval is usually required are as follows: heating, ventilation, sanitation

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29 Idaho. Laws, Statutes, etc., op. cit., p. 5.

30 North Carolina. Laws, Statutes, etc., op. cit., Sec. 6453.

31 Colorado, Arkansas, Iowa, Oregon, Washington.

lighting, floor space per pupil, location of site, and safety provisions. Regulations are usually concerned with the health and safety of the pupils. Few states require approval on such matters as design, materials of construction, or installation of furniture.

Sites and Building Location. Provisions in the school laws governing school sites and the location of school buildings are rather numerous. The selection of a school site is usually determined by a majority vote of the district electorate.[32] In twelve states the district voters determine the location of the site,[33] while in fourteen others the local school board must receive permission from the electorate to select a school site. In ten states, however, the matter rests entirely in the hands of the local board. Kentucky, Maryland, and New Mexico authorize the county board to select the sites.

Control over the nature and location of school building sites is exercised in Arizona, Connecticut, Delaware, Florida, Indiana, Maryland, Missouri, Michigan, New Hampshire, New York, Tennessee, Pennsylvania, Texas, Vermont, Virginia, and West Virginia. The regulations of practically all of these states specify that the site must be located in such a manner as to secure proper drainage, and that they shall be as great a

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[32] Connecticut, Illinois, Kansas, Maine, Massachusetts, Michigan, Minnesota, Montana, Nebraska, New Hampshire, New York, and Wisconsin.

[33] Arizona, Arkansas, California, Colorado, Idaho, Montana, Nevada, New Jersey, North Dakota, Oklahoma, Oregon, Vermont, Washington, and Wyoming.

distance as possible from public highways, railroads, manufacturing plants and other sources of noise, smoke, and dirt.

The location of school buildings is mentioned in the laws of nine states.[34] Control is commonly exercised over such factors as nearness to population, relation to main highways and dangerous thoroughfares, percentage of the site to be used for the building, and minimum acreage. General requirements for the location of a school building are illustrated in the following:[35]

> Provided, that all sites shall be reasonably level, shall contain ample space for playground purposes, and shall be as free as practicable from immoral and other undesirable environmental conditions and influences. The site shall be selected so that a building may be located on a site with classroom windows facing generally east and west.

Classification of Buildings. For construction purposes the American Institute of Architects has designed the following plan of classification:

Type A--A building constructed entirely of fire resistive materials, including its roof, windows, doors, and finish.

Type B--A building of fire resistive construction in its walls, floors, stairways, and ceilings, but with wood finish, wood or composition floor surface and the wood roof construction over fire resistive ceiling

Type C--A building with masonry walls, fire resistive corridors and stairways, but with ordinary construction otherwise.

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[34] Alabama, Delaware, Idaho, Indiana, Maine, New Mexico, New York, Ohio, and Virginia.

[35] Alabama. Laws, Statutes, etc., op. cit., p. 22.

Type D--A building with masonry walls, but otherwise ordinary or joist construction and wood finish.

Type E--A frame building constructed with wood above foundation with or without slate or other semi-fireproof material on roof.

Table IV disclosed that twelve states group their school buildings according to the foregoing classification in order to effect desirable standards of construction. This classification, however, is used only to regulate the construction of school buildings grouped under types D and E.

Standards of Construction. Minimum standards for the construction of school buildings have been set up by the controlling agencies in ten states. In establishing these standards two policies have been used with considerable success. The first method used is to require all plans and specifications to meet certain standards before approval for construction is given. The second policy is in force where state aid is given for school building purposes. Under this plan state aid is refused unless the proposed building is erected in accordance with the requirements specified by the controlling agenciss.

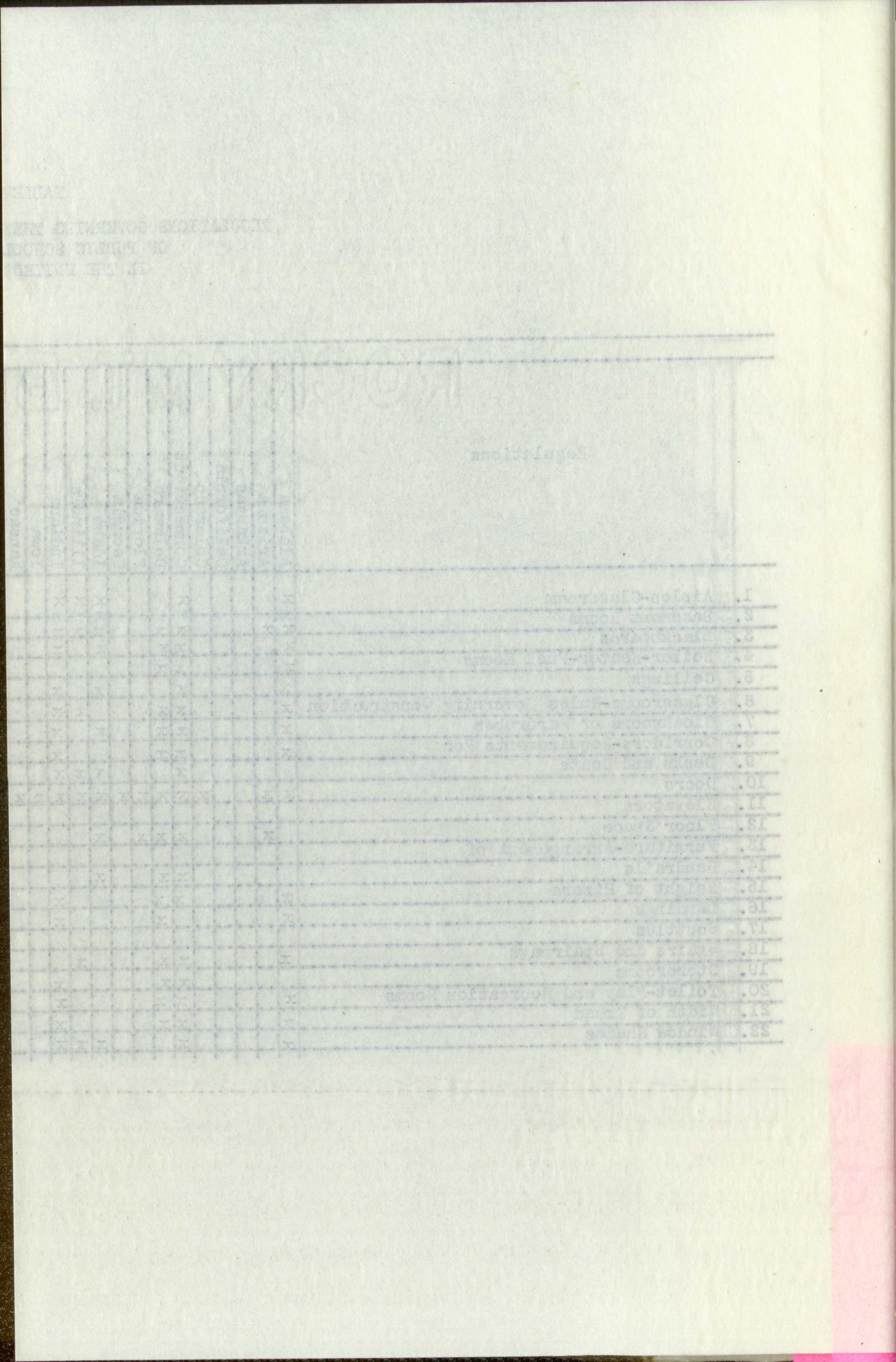
Regulations Governing the Interior Arrangements of Public School Buildings

Table V contains the results of the analysis of the

TABLE V

REGULATIONS GOVERNING THE INTERIOR ARRANGEMENTS
OF PUBLIC SCHOOL BUILDINGS
IN THE UNITED STATES

Regulations	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Jersey	New Hampshire	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Total
1. Aisles-Classroom	x					x				x	x	x							x	x	x	x							x			x			x											x		13
2. Basement Rooms	x	x				x	x			x	x	x						x	x		x						x			x			x			x						x	x	x			x		18
3. Blackboards	x					x	x			x		x			x			x		x	x									x		x			x			x										15
4. Boiler-Heater-Fuel Rooms	x					x	x								x			x	x		x						x		x	x	x		x			x		x					x					x		15
5. Ceilings	x					x				x		x			x			x	x		x						x						x			x		x						x					x		20
6. Classrooms-Rules Governing Construction	x					x	x				x	x			x			x	x		x						x			x			x			x		x						x					x		20
7. Cloakrooms or Wardrobes	x					x	x			x		x			x			x	x		x						x			x			x			x		x						x					x		19
8. Corridors-Requirements For	x					x	x					x			x			x	x		x						x			x			x			x		x						x					x		19
9. Desks and Seats						x				x	x	x						x									x			x								x						x					x		13
10. Doors	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	40
11. Elevators																																	x																x		2
12. Floor Space		x				x	x	x		x								x	x		x	x		x						x			x			x						x					x		22
13. Furniture-Arrangement of																					x												x										x					x		4
14. Handrails						x	x			x					x			x	x	x	x									x			x			x											x		17
15. Height of Risers	x					x	x				x				x			x			x									x			x			x											x	x	17
16. Landings	x						x				x				x			x	x	x	x	x								x			x			x											x		18
17. Scuttles																																	x																x		2
18. Stairs and Stairways	x					x	x				x				x			x	x	x	x	x								x			x			x											x	x	20
19. Storerooms						x	x				x				x			x			x									x			x			x											x		9
20. Toilet-Play and Recreation Rooms	x					x	x				x				x			x	x		x	x								x			x			x											x		15
21. Width of Tread	x					x	x				x				x			x			x	x								x			x			x											x	x	18
22. Window Shades	x					x				x	x	x						x			x									x																				10



compulsory regulations governing the interior arrangements of public school buildings. Although the provisions contained in the table have been arbitrarily categorized as interior arrangements, the classification, nevertheless, serves as an index to the regulations governing the more detailed phases of school building construction.

Classroom Aisles. State regulations governing aisles in class and recitation rooms are rather similar. Almost without exception the regulations provide that center aisles shall not be less than eighteen inches, and wall aisles not less than two feet four inches in width.

Basement Rooms. Basements are permitted in eighteen states, but are denied for ordinary classroom use. Shops, household-arts rooms, and luncheon rooms are generally allowed to be erected in basements.

Doors. Most states generally require at least two doors to each classroom, and that all doors must swing outward. A notable exception, however, is found in the Virginia regulations. In this state all doors are required to swing into the room rather than extrude into the corridor, unless they are recessed in alcoves.

Furniture and Equipment. Few states have adequate regulations governing the furniture and equipment of school buildings. New Jersey requires the building plan to show the seating arrangement. Texas requires fixed furniture. The Wisconsin code states that all seats, desks, and chairs (except those used by teachers) in class, recitation, or study rooms

seating more than 50 persons shall be securely fastened to the floor.[36]

New York, Pennsylvania, Wisconsin, Utah, and Virginia require a uniform amount of blackboard placed at the right and front of pupils. Of the fifteen states having regulations governing blackboards, the majority stipulate that blackboards shall be constructed of approved materials placed at a height from the floor suited to the age of the pupils, and furnished for the front and the side opposite the windows in each classroom. Little attention is given to window shades in the school laws of the several states. In Idaho all classroom windows must be provided with roller and adjustable, translucent shades of natural color, while Maryland specifies that the top of the sash shall not be less than twelve feet from the floor. In Minnesota, opaque shades are permitted in rooms where it is desirable to exclude all light.[37]

Stairs and Stairways. That the regulation of stairs and stairways has received considerable attention from legislators is evident from an examination of Table V. The general method employed in codes ranges in detail from a mere statement that there shall be good and sufficient stairways to facilitate egress, to detailed specifications as to the width of

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[36] Wisconsin. Laws, Statutes, etc., Wisconsin State Building Code (Madison, Bureau of Purchases, 1934), p. 142.

[37] Minnesota. Laws, Statutes, etc., Laws and Rules governing School Buildings and Sites (St. Paul: Department of Education, 1928) p. 32.

stairways, number of handrails, height of risers, and width of tread, and the type of construction. The following extract illustrates the stringency of the requirements for stairway construction in Ohio.[38]

> Width of stairways shall be at the rate of three feet per hundred (100) persons; when buildings accommodate from five hundred (500) to one thousand (1000) persons, two feet of additional stairway width shall be provided for every one hundred (100) persons or fraction thereof in excess of five hundred (500); when buildings accommodate more than one thousand (100) persons, one foot additional stairway width shall be provided for every one hundred (100) persons or fraction thereof in excess of one thousand (1000) persons.
>
> No stairway shall be less than three (3) feet nor more than five (5) feet wide in the clear measuring between handrails. Stairways over six (6) feet wide shall have substantial center handrails not less than three (3) feet in height. No inside or outside stairway or fire escape shall have less than three (3) nor more than eighteen (18) risers in any run. No stairway shall have winders and all treads shall be of uniform width. Stairways, stair platforms, landings and exit doors shall not be decreased in width in the direction of exit travel and a uniform width shall be maintained by rounding or beveling corners and angles.
>
> Handrails shall be provided on both sides of stairways and steps. Outside stairways and areaways shall be provided with guard rails not less than two feet six inches (2'6") high.
>
> All stairways and steps shall have a uniform rise and tread in each run. No riser shall be more than seven (7) inches in height and no tread to be less than ten (10) inches in width exclusive of the nosing, measured from tread to tread and from riser to riser.
>
> No door shall open directly upon a stairway, but shall open on a platform or landing

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[38] Ohio. Laws, Statutes, etc., Ohio State Building Code School Buildings (Columbus: The F. J. Heer Printing Company, 1936), p. 12.

> equal in length to the width of the door. No closet or storage space shall be placed in, under, over or in connection with any stairwell or stairs. Stair treads shall be covered with approved material to prevent slipping or tripping.

Nineteen other states exercise control over stairway construction, but their requirements are not nearly so rigid. As a general practice, risers are not permitted to exceed seven inches in height, while treads are usually required to be twelve inches in width. The majority of states do not permit doors to open immediately upon a flight of stairs, but require that a landing at least the width of the door be provided between the door and the first step. Connecticut, Delaware, Indiana, Kentucky, Minnesota, New Jersey, Ohio, and Wisconsin do not allow closets or storerooms to be placed under or over any stairway.

Cloakrooms and Wardrobes. Of the nineteen states exercising control over cloakrooms and wardrobes, only Idaho and Massachusetts have regulations that are specific and meaningful. Massachusetts has prescribed extensive regulations for the ventilation of cloakrooms, while in Idaho separate cloakrooms with sanitary lockers must be provided for each study classroom. The remaining states have gereral provisions relating to the heating, ventilation, or lighting of cloakrooms.

Floor and Air Space. The universal practice in the several states as to requirements for floor and air space

is well illustrated in the Pennsylvania statute.[39]

> Every school room shall have not less than fifteen square feet of floor space, and not less than two hundred cubic feet of air space per pupil.

Windows. Various provisions relating to windows are represented in the laws of twenty-nine states. Regulations governing windows in Oklahoma, Minnesota, and Massachusetts are more detailed than those of the other states. The Minnesota law specifies that all rooms shall have windows on one side only, and that window sills shall not be less than three feet from the floor. The law also states that windows shall be on the long side of the room, and that windows shall be so arranged as to admit light from the left when pupils are seated. In Oklahoma it is unlawful for windows admitting light to be placed in such a manner as to cause pupils to face them when seated at their desks.[40] Tops of windows must not be more than eight inches from the ceiling in Massachusetts.[41]

In the remaining states the provisions relating to windows are quite similar. Practically all regulations state

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[39] Pennsylvania. Laws, Statutes, etc., op. cit., p. 62.

[40] Oklahoma. Laws, Statutes, etc., School Laws of Oklahoma, 1935 (Oklahoma City: Superintendent of Public Instruction, 1935), p. 135.

[41] Massachusetts. Laws, Statutes, etc., Regulations Relative to the Inspection of Buildings which are Subject to the Provisions of Chapter 143, General Laws (Boston: Department of Public Safety, 1931), p. 11.

that light must come from the left and rear, and that the glass area of school room windows shall equal one-fifth of the floor area of the room.

Corridors. Requirements with reference to corridors exist in nineteen states. Although the analysis reveals that no single state has extensive requirements governing corridors, the following salient features are representative of the regulations prevalent in most states:

(1) Each corridor shall terminate on an egress or stairway.

(2) The minimum width of any corridor usually depends upon the length of such corridors and the number of doors leading to them, but in no case is the width of any corridor permitted to be less than five feet.

(3) All corridors must be properly lighted with artificial lighting to the amount of three foot candles recommended in most states.

(4) All corridors must be arranged to facilitate egress.

Compulsory Regulations Governing the Heating and Ventilation of Public School Buildings

That the amount of control exercised over the heating and ventilation of public school buildings is far from satisfactory is evident from an examination of Table VI. Of the fourteen items listed in the table not more than twenty-four states exercise control over any single item, and in most

TABLE VI

REGULATIONS GOVERNING THE HEATING AND VENTILATION
OF PUBLIC SCHOOL BUILDINGS IN THE
UNITED STATES

Regulations	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Jersey	New Hampshire	New Mexico	New York	N. Carolina	N. Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	S. Carolina	S. Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Total
1. Air Supply	x					x	x	x		x	x	x				x	x	x	x	x	x			x			x		x		x		x	x		x		x	x			x			x		24
2. Cubic Feet of Air Per Minute							x	x		x									x		x			x			x		x																		15
3. Cubic Feet of Air Space		x				x	x	x		x	x	x				x	x			x				x	x		x		x		x		x	x		x		x	x		x	x	x			24
4. Ducts For the Removal of Foul Air	x					x	x			x	x	x					x	x	x	x	x						x		x		x		x			x			x					x		21
5. Footwarmers											x	x							x																												3
6. Heating System Requirements	x			x		x	x			x	x	x			x		x		x	x	x						x		x		x		x		x		x			x			x		22
7. Humidity											x	x									x									x																	4
8. Means of Ventilation							x			x		x			x					x	x						x																				15
9. Registers											x	x					x				x																									x	7
10. Required Ventilation	x	x				x		x								x		x	x		x				x		x																			x	21
11. Room Temperature	x					x	x			x		x			x				x		x						x																				20
12. Smokepipes												x							x																												5
13. Thermometers-Must be provided in each Room								x																																								3
14. Unjacketed Stoves not Permitted	x									x		x					x	x																												x	11

cases this control is exercised only through approval of plans for new buildings. The following discussion will further reveal the limited responsibility assumed by the states in matters pertaining to heating and ventilation.

Room Temperature. The temperature to be maintained in class and recitation rooms is stipulated in the regulations of nineteen states. The statutes of Delaware, Idaho, Indiana, Kentucky, New Jersey, Ohio, Pennsylvania, North Dakota, South Dakota, and Vermont specify that all heating plants shall be capable of maintaining a temperature of 70 degrees Fahrenheit in zero weather. The Massachusetts regulations are somewhat different. Here the heating system must maintain a temperature of 68 degrees in all class and recitation rooms, while the minimum temperature allowed for corridors, stairs, play-rooms, gymasiums, and toilet rooms is 60 degrees. Laboratories, manual training rooms, shops, and assembly halls are required to be heated to a temperature of only 50 degrees.[42]

An unusual law governing the room temperature of school buildings is found in the Texas school building law. In this state all installations must be made under contract with the local school board that heaters will be removed without cost to the school board if they do not heat evenly to 70 degrees Fahrenheit when the weather is 20 degrees Fahrenheit outside.[43]

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[42] Massachusetts. Laws, Statures, etc., op. cit., p. 14.

[43] Texas. Laws, Statutes, etc., The Texas School Building Law (Austin: State Department of Education, 1931), p. 3.

In Minnesota the temperature required for school rooms is 68 degrees Fahrenheit, while in corridors and workrooms a temperature of 60 degrees Fahrenheit is deemed sufficient. The New Mexico law merely reads that a temperature ranging from 65 to 70 degrees Fahrenheit shall be maintained in all classrooms.

The Jacketed Stove. As a result of the ventilation standards which have been established during the past decade, the abuses that arose from seating pupils adjacent to unjacketed stoves have largely been eliminated. In eleven states the use of an unjacketed stove for heating classrooms is absolutely prohibited. Indiana demands a jacket of two sheets not less than three fourths of one inch apart.[44] The outer sheet is to consist of heavy galvanized iron, or other equally durable material, and to be lined with sheet asbestos; the inner jacket shall be of tin or other metal equally efficient. The jacket must extend to the floor and be not less than three inches from the stove.

In Minnesota the casing must entirely surround the heater, and no part of the radiating surface of such heater may project through the casing. The free area between the cross area and the casing is not allowed to be less than the cross section area of the heater. The casing must extend above the highest part of the radiating surface of the heater.

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[44] Indiana. Laws, Statutes, etc., op. cit., p. 8.

[45] Minnesota. Laws, Statutes, etc., op. cit., p. 33.

Ducts for the Removal of Foul Air. Regulations governing ducts for the removal of foul air cannot be conveniently summarized because of their diversity. A few general provisions may be cited: "All rooms shall be provided with efficient exit ventilating ducts of ample size placed near the floor on the side of the room nearest the inlet", (Idaho).[46] "Each room shall be equiped with a separate foul air duct of sufficient size to remove foul air at the same rate as furnished by the heating apparatus," (Maine).[47] "Outlets for foul air shall be at or near the floor level," (Vermont).[48] All fresh air rooms, heating chambers, heating and ventilation ducts and flues shall be of fire resisting construction or sheet metal of suitable gauge built with smooth interior surfaces and made tight," (Massachusetts).[49] "The facilities for exhausting the foul or vitiated air shall be positive and independant of atmospheric changes," (North Dakota).[50] "The vitiated air shall be conducted through flues or ducts to and be discharged above the roof of the building," (Ohio).[51] "The vent ducts which carry off the foul air shall be connected together in the roof space and attached to ventilators so that the foul air will be expelled through

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46 Idaho. Laws, Statutes, etc., op. cit., p. 12.

47 Maine. Laws, Statutes, etc., op. cit., p. 5.

48 Vermont. Laws, Statutes, etc., op. cit., p. 8.

49 Massachusetts. Laws, Statutes, etc., op. cit., p. 15.

50 North Dakota. Laws, Statutes, etc., op. cit., p. 137.

51 Ohio. Laws, Statutes, etc., op. cit., p. 15.

the ventilators to the outside air," (Maryland).[52] "The facilities for exhausting the foul or vitiated air shall be positive and independant of atmospheric changes," (New York).[53] "The ducts or flues may be galvanized iron, tile, cement, or brick, but the inside of the duct or flue over which the air passas to or from the room must be perfectly smooth," (Michigan).[54]

Rate of Air Change. Nothing is more conventionalized in the ventilation requirements for school buildings than the amount of fresh air per pupil per minute. Thirty cubic feet is the standard in all states listed in this column of Table VI. The Ohio law states that the ventilating system shall be capable of supplying not less than six complete changes of air per hour in each study, class, recitation, assembly, laboratory, and other room used for instruction purposes.[55] In view of the minimum air space per pupil this would mean from twenty to twenty-five cubic feet per pupil per minute.

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[52] Maryland. Laws, Statutes, etc., Standards for Maryland School Buildings, Revised October 1, 1930 (Baltimore: State Department of Education 1930), p. 9.

[53] New York. Laws, Statutes, etc., Education Law as Amended to July 1, 1928 (Albany: University of the State of New York, 1928), p. 147.

[54] Michigan. Laws, Statutes, etc., School Buildings, Equipment, and Grounds (Lansing: Superintendent of Public Instruction, 1922), p. 62.

[55] Ohio. Laws, Statutes, etc., op. cit., p. 15.

Means of Ventilation. Differences in viewpoints on ventilation have caused wide divergence in state building codes. Massachusetts approved the gravity system while Michigan and New Jersey declare it unreliable. In Delaware window ventilation is permitted except that in special cases the State Board of Education may require mechanical ventilation.[56] The kind of ventilation system used is regarded as immaterial in Minnesota so long as it furnishes not less than thirty cubic feet of air per minute for each person that the room will accommodate. This provision, however, relates only to class and recitation rooms. Auditoriums and gymnasiums must be provided with mechanical system of ventilation which will renew the air at least four times per hour.

The New York statute merely specifies that the ventilation system shall be so designed and guaranteed that when properly operated it will furnish thirty cubic feet of fresh air per minute per pupil and thirty-five percent humidity.[57] The minimum requirement in Maryland is a system in which the outside air is admitted by means of window ventilators, or a piece of glass placed at the window so as to prevent a direct draft on the children.[58] Regulations of the remaining states listed

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56 Delaware. Laws, Statutes, etc., op. cit., p. 26.

57 New York. Laws, Statutes, etc., op. cit., p. 147.

58 Maryland. Laws, Statutes, etc., op. cit., p. 9.

in this column of Table VI, stipulate that all school buildings shall have a system of ventilation by means of which each classroom shall be supplied with fresh air at the rate of not less than 30 cubic feet per minute per pupil.

Humidification. Only four states have regulations relating to the humidity of school rooms. In Illinois, Indiana, and Minnesota an evaporating dish or vessel must be installed with every furnace. Ventilating systems in New York must be capable of maintaining a relative humidity of not less than thirty-five percent.

Registers. Extensive variation is found in the regulations governing registers. Heating by floor registers is not permitted in Main and Minnesota. Illinois specifies that the cross-sectional area of the register at floor level shall not be less than 192 square inches, while in Indiana the bottom of register faces shall be at floor level, and shall equal the cross-sectional area of the flue.

In Massachusetts registers must be at least one foot greater in height than the depth of the flue. Warm air registers in Ohio are required to be placed not less than eight feet above the floor line.

Footwarmers. Footwarmers are mentioned in the regulations of three states. In Illinois footwarmers must be provided with a substantial damper, hung at the top and so arranged as to swing inward. Indiana demands that footwarmers be placed in the walls of main corridors at the floor level.

First story corridors in Massachusetts may have an approved number and class of footwarmers.[59]

Smoke Pipes. Smoke pipes passing through any combustible area in Indiana, Massachusetts, and Utah are forbidden.[60] In Ohio and Wisconsin,[61] however, the law is less stringent. Provisions of these states merely require that no smoke pipe connection between the stove and the smoke flue shall be more then five feet long, measuring horizontally.

Provision Relating to the Sanitation, Lighting, and Fire Protection of Public School Buildings

The purpose of Table Vll and the accompanying text is to set forth legal provisions relating to the sanitation, lighting, and fire protection of public school buildings. Provisional items indicated in Table Vll represent the major features included in the regulations of the several states, and serve well the purpose of illustrating common practices.

Fire Provisions. State Regulations governing the fire provisions in school house construction have been more extensive than any other item found in the school building codes. Five states, however, have no such regulations. Of the forty-three states having provisions relating to fire prevention and

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59 Massachusetts. Laws, Statutes, etc., op. cit., p. 16.

60 Ohio. Laws, Statutes, etc., Ohio State Building Code, Standard Devices (Columbus: The F. J. Heer Printing Company, 1934), p. 59.

61 Wisconsin, Laws, Statutes, etc., op. cit., p. 9.

TABLE VII

PROVISIONS RELATING TO THE SANITATION, LIGHTING, AND FIRE PROTECTION OF PUBLIC SCHOOL BUILDINGS IN THE UNITED STATES

Provisions	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Mass.	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Jersey	N. Hampshire	New Mexico	New York	N. Carolina	N. Dakota	Ohio	Oklahoma	Oregon	Penna.	R. Island	S. Carolina	S. Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Va.	Wisconsin	Wyoming	Total
1. Disinfection		x								x		x				x																			x		x		x				x	x		x		11
2. Drinking Fountains							x	x		x		x				x	x	x	x		x								x		x			x		x		x		x				x			17
3. Exit Signs													x						x														x		x	x		x		x						x	7
4. Exposure																			x														x		x													3
5. Fire Alarms						x	x					x			x				x		x												x		x				x			x						14
6. Fire Bolts	x					x	x					x	x								x						x	x	x	x		x	x		x	x	x		x		x					x		14
7. Fire Drills								x			x	x	x	x						x		x		x	x	x			x		x			x	x		x		x			x	x	x		x		20
8. Fire Escapes	x		x		x		x	x	x		x	x	x			x	x	x	x	x	x			x		x	x	x	x	x	x			x		x	x		x			x	x			x	x	31
9. Fire Extinguishers							x				x		x			x		x														x		x								x				x		10
10. Fire Stops																			x														x														x		3
11. Lighting-Regulations Governing	x		x		x	x			x	x	x			x		x	x	x	x	x	x						x		x	x	x	x	x		x		x		x		x	x	x			x		29
12. Motion Pictures					x	x						x							x														x		x	x							x			x		10
13. Number of Toilet Seats and Urinals Required							x										x	x			x												x														x		7
14. Privies	x	x			x	x	x		x		x	x	x	x	x	x	x	x	x	x	x			x	x				x	x	x			x	x	x		x		x		x	x		x		x	32
15. Public Drinking Cups Prohibited		x		x	x		x		x	x	x					x					x								x		x	x		x	x	x		x		x		x	x		x		x	21
16. Sinks												x							x														x														x		4
17. Toilets to be Clean and well Ventilated		x			x	x					x						x	x	x		x												x		x		x		x				x					15
18. Urinals-Rules Governing					x				x		x					x	x		x								x		x				x		x				x				x					14
19. Water Supply				x	x		x		x		x			x		x	x			x					x				x	x	x						x	x		x				x	x				19

panic, thirty-one exercise control over fire escapes. Twenty states specify that all school buildings one or more stories in height must be provided with proper means of egress and escape in case of fire or panic.[62] The regulations of Georgia and South Carolina state that all school buildings must be provided with easy means of exit from two opposite sides of the building, and where in case of old buildings there is only one stairway, there must be provided another stairway for exit on the opposite side of the building, or, a safe slide securely fastened to the building and extending from one or more windows on the opposite side from the stairway, and reaching to within six feet of the ground.[63] In Alabama, Massachusetts, and Mississippi all school buildings must have fire escapes. Control over fire escapes is exercised by the chief inspector of workshops in Ohio, while in Vermont all plans for fire escapes must be approved by the State Board of Health.

Fire escapes are required only when deemed necessary by the State Board of Education in New Jersey. Maryland has a similar regulation except for the provision that all escapes must be in the form of stairs.

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[62] California, Connecticut, Florida, Idaho, Indiana, Iowa, Kansas, Louisiana, Maine, Michigan, Minnesota, Nebraska, New York, North Carolina, North Dakota, Oklohoma, Utah, Virginia, Wisconsin, and Wyoming.

[63] South Carolina, Laws, Statutes, etc., op. cit., p. 203.

Fire Bolts. Table VII indicates that fourteen states have provisions governing fire bolts. Practically all regulations stipulate that doors leading toward the outside must be provided with panic bolts or such hardware as to render them capable of being locked from the outside only.

Fire Stops. School buildings of all classes of construction must be fire stopped in Massachusetts. Specifications for installing fire stopping are issued by the Department of Public Safety, while all installations must be approved by the Division of Inspection.[64] In Wisconsin fire stops must be provided at all intersections of interior and exterior walls with floors, ceilings, and roof in such a manner as to effectively cut off communication by fire through hollow concealed spaces and prevent both vertical and horizontal drafts.[65] In Ohio, school buildings of A and B grades, when built in connection with a building or buildings of a lower grade of construction, or a different class of occupancy, must be separated from other parts of the building or buildings by standard fire walls, and fireproof ceilings and floors, and all communicating openings in these walls are required to be covered by double standard firedoors.[66]

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64 Massachusetts. Laws, Statutes, etc., op. cit., p. 4-5.

65 Wisconsin. Laws, Statutes, etc., op. cit., p. 100-101.

66 Ohio. Laws, Statutes, etc., Ohio State Building Code, School Buildings (Columbus: The F. J. Heer Printing Company, 1936), p. 6.

Motion Pictures. Diversity is found in the regulations governing motion pictures in school buildings. In the ten states exercising control over the foregoing, no duplication of regulation is found. Wisconsin requires every motion picture machine using a nitro-cellulose or other inflammable material to be installed in a booth constructed entirely of fire resisting material. The ceilings of all booths must be at least seven feet in height.[67] In Delaware, motion picture machines must be installed and operated according to the specifications of the National Board of Fire Underwriters.[68] The Maryland regulation merely states that all moving picture booths shall be made fireproof with a direct fireproof vent to the outside.[69] In the remaining states the responsibility is placed in the hands of various agencies, as indicated in the following list:

Massachusetts.....	Approval by Division of Inspection
Vermont.....	Approval by Department of Health
Rhode Island.....	Approval by Local Fire Department
Indiana.....	Approval by State Fire Marshal
Pennsylvania.....	Approval by Department of Labor
Ohio.....	Approval by Chief Inspector of Buildings and Workshops

Exit Signs. Seven states require exit signs to be placed over means of exit or escape in all public school buildings. Iowa, Oregon, Vermont, and Wisconsin stipulate that all exit signs shall be illuminated by a red light. The regulations

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67 Wisconsin. Laws, Statutes, etc., op. cit., p. 130-32.

68 Delaware. Laws, Statutes, etc., op. cit., p. 26.

69 Maryland. Laws, Statutes, etc., op. cit., p. 4.

of Ohio and Massachusetts specify that the word (Exit) shall be placed in all signs.[70] Massachusetts requires the letters of the exit sign to be five inches high, while in Ohio the minimum height is six inches. Pennsylvania merely requires exit signs to be placed on all places of exit or means of escape.

Alarms and Fire Fighting Apparatus. In fourteen states schools of a certain size must have fire alarms. Massachusetts, Oregon, Utah, and Wisconsin require all school buildings of more than one story to be equipped with fire alarms, gongs, or sirens. In Ohio and Kentucky school buildings of two or more rooms are required to have fire alarm systems, while in Montana the requirement is for three rooms or more. Minnesota and South Dakota stipulate that all school buildings of four or more rooms shall have an efficient fire alarm system.

All school buildings are required to have a fire alarm system in Connecticut, Delaware, and Pennsylvania, while in Indiana and Rhode Island only those school buildings in cities equipped with general fire alarm stations are required to have fire alarm systems.[71]

One chemical fire extinguisher on each floor is required in Kansas and Florida; one for each 2,000 square feet of

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[70] Massachusetts. Laws, Statutes, etc., op. cit., p. 13.

[71] Indiana. Laws, Statutes, etc., op. cit., p. 21.

floor area or less on each story above the basement in Ohio; one on each story above the first in Minnesota. In Massachusetts, pails of water or other portable apparatus, or a hose attached to a suitable water supply are required for each story above the second. In Ohio, a standpipe and a hose in the basement are sufficient, unless a 75 foot hose will not reach all parts of the building, in which event other standpipes must be constructed.[72] In Wisconsin, every building must be provided with standard chemical fire extinguishers in the proportion of one extinguisher to each 3,000 square feet, or fraction of floor area in non-fireproof buildings, or one to each 8,000 square feet, or fraction of floor area in fireproof buildings; but there must be at least one fire extinguisher on each floor including the basement.[73]

The Common Drinking Cup. The most interesting point connected with safeguarding the water supply of schools is the spread in the last decade of the revolt against the common drinking cup. As Table VII indicates, thirty-two states have forbidden the common drinking cup in public places or public institutions. In Colorado, however, public drinking cups are not prohibited if adequate provision has been made

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[72] Ohio. Laws, Statutes, etc., op. cit., p. 19.

[73] Wisconsin. Laws, Statutes, etc., op. cit., p. 144.

for sterilization of the same.[74]

Water Supply. Statutes of Connecticut, Florida, Louisiana New Mexico, New York, North Dakota, Utah, Vermont, Virginia, and Wisconsin specify that all school buildings must be adequately supplied with pure drinking water. Schoolhouses in Indiana and Idaho must be supplied with pure drinking water and the water must be from driven wells or other approved sources.[75] Only sanitary fountains are permitted for drinking purposes in the public schools of South Dakota. The water supply of all school buildings must meet the approval of the state health department in Minnesota, Montana, and South Carolina.

Drinking Fountains. Seventeen states require sanitary drinking fountains to be installed on each floor of every school building. The installation of drinking fountains in toilets is prohibited in the above mentioned states.

Disinfection. Provisions relating to cleaning and disinfection are scarcely capable of classification. Before the fall opening of school in Arizona,[76] Oklahoma,[77] and Wisconsin,[78] all school houses must be thoroughly cleansed. The cleaning consists of sweeping and scrubbing the floors and thoroughly

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[74] Colorado, Laws, Statutes, etc., School Laws of the State of Colorado, 1933 (Denver: The Bradford-Robinson Printing Company, 1933), p. 114

[75] Idaho. Laws, Statutes, etc., op. cit., p. 12.

[76] Arizona. Laws, Statutes, etc., op. cit., p. 30.

[77] Oklahoma. Laws, Statutes, etc., op. cit., p. 136.

[78] Wisconsin. Laws, Statutes, etc., Laws of Wisconsin Relating to Common Schools (Madison: State Superintendent of Public Instruction, 1936), p. 1440.

washing all woodwork, including the wooden parts of desks and seats. All out-houses or water closets must be disinfected ten days before the opening of school in Pennsylvania.[79] In Virginia, all sweepings must be removed daily; furniture and woodwork are to be wiped with a disinfectant solution once a month, and with a damp cloth once a week.[80]

Methods prescribed for cleaning and disinfecting classrooms in Indiana, Louisiana, and Texas follow: "Floor oil, some form of dust-down or sawdust treated with oil shall be used on floors before sweeping," (Indiana).[81] "All desks, wainscoting, window sills and baseboards in every schoolhouse in the state must be wiped off daily with a cloth moistened with a 1-200 bi-chloride of mercury, or 3 percent carbolic acid solution," (Louisiana.[82] "All floors shall have their surfaces made impervious to water and germs by a coat of boiling paraffin oil or other floor dressing having similar effect, applied immediately after the floor is laid," (Texas).[83]

Disinfection for contagious diseases must be carried out under the rules and regulations of either the local or

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[79] Pennsylvania. Laws, Statutes, etc., op. cit., p. 65.

[80] Virginia. Laws, Statutes, etc., op. cit., p. 38.

[81] Indiana. Laws, Statutes, etc., op. cit., p. 20.

[82] Louisiana. Laws, Statutes, etc., op. cit., p. 329.

[83] Texas. Laws, Statutes, etc., Public School Laws of the State of Texas, 1935 (Austin: State Department of Education, 1935), p. 155.

state board of health in Pennsylvania and Washington.[84]

Toilets and Urinals. Seven states stipulate the number of water closets and urinals to be installed in the toilets of school buildings. The Ohio State Building Code establishes a standard of two closets for every 50 males and four for every 50 females, while three urinals are required for every 50 males.[85] Rules of the Commissioner of Education in Maine require one toilet seat for every twenty boys, or one for every twelve girls, and one urinal for every twenty-five boys.[86]

Wisconsin and Maryland require one watercloset for every twenty females, but differ as to the number of water closets and urinals for males. In Wisconsin the law requires one water closet for every thirty-five males, while Maryland requires one for every thirty males. Maryland provides one urinal for every thirty males, while in Wisconsin the requirement is one urinal for every twenty males.

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84 Washington. Laws, Statutes, etc., op. cit., p. 387.

85 Ohio. Laws, Statutes, etc., op. cit., p. 17.

86 Maine. Laws, Statutes, etc., op. cit., p. 7-8.

The following standards of adequacy for toilet fixtures must be met in Delaware:[87]

Boy's toilet seat..... 1 for each 50 boys
Boy's urinals..... 1 for each 30 boys
Girl's toilet seat..... 1 for each 30 girls

Minnesota has devised a detailed toilet fixture schedule providing for 60 to 1000 pupils. Minnesota further requires all water closets to be either washdown, syphon, or syphon-jet type.[88]

Regulations pertaining to out-houses or privies range from the mere statement that each school district shall provide and maintain in a proper manner, a suitable number of out-houses for both sexes, to detailed specifications as to the location, number, type of construction, and disinfection of the same. In view of this fact the following discussion will be concerned with only a summary of the latter regulations.

In New Jersey all out-houses must be separated by a substantial close fence, not less than seven feet in height. The vaults under these out-houses must be built of brick and laid in cement mortar or concrete, and must not extend under the floor of said buildings, but may project beyond the rear of the buildings to facilitate the proper cleaning. The law further specifies that all out-houses shall be provided with a metal urinal trough drained into the vault of said closet.[89]

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87 Delaware. Laws, Statutes, etc., op. cit., p. 29.

88 Minnesota. Laws, Statutes, etc., op. cit., p. 40.

89 New Jersey. Laws, Statutes, etc., op. cit., p. 31-32.

The Maine law stipulates that all dirt privies shall be connected with the school room by a latticed walk at least eight feet long with separate compartments for the sexes opening from the school room or corridor. All vaults are required to have suitable concrete foundations, ventilated through the roof, to be fly-proof, and easily cleaned. Closets must have double hinged seats.[90] Water closets must be fly proof and separated by closely built fences in Idaho, Florida, and Oklahoma.[91]

Louisiana requires for closets not connected with a sewer system, a Stiles sanitary closet, cesspool, or septic tank.[92] The state boards of health in Idaho, Montana, and Vermont demand that boxes for outdoor closets be water tight, but Montana waives this regulation if the vault is dug in soil approved by the health officer.

In Vermont it is compulsory for all out-houses to be provided with a box of road dust, sawdust, or ashes, and be screened above and in the vault against flies. All vaults must be water tight, and constructed in such manner as to facilitate cleaning.[93]

Lighting. Only three states, Ohio, Pennsylvania, and

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90 Maine. Laws, Statutes, etc., op. cit., p. 9.

91 Oklahoma. Laws, Statutes, etc., op. cit., p. 136.

92 Louisiana. Laws, Statutes, etc., op. cit., p. 331.

93 Vermont. Laws, Statutes, etc., op. cit., p. 7.

Wisconsin make provisions for artificial lighting. Ohio provides for both gas and electric fixtures, while Pennsylvania and Wisconsin provide for electric fixtures only. The lighting provisions of Ohio and Pennsylvania conform to the National Electric Code; those of Wisconsin to the Wisconsin State Electric Code.

No further discussion is devoted to the legislation governing the lighting of classrooms as it has been discussed in detail in the section pertaining to the regulations governing the interior arrangements of classrooms.

Summary and Conclusions

The data that have been presented in this chapter indicate certain unmistakable trends and practices in school building legislation which influence the efficiency and educational progress of the school, and which bear directly on the health and safety of school children.

1. State control over the planning and erection of school buildings has been increasing steadily, and in the main the laws passed are such as should improve the status of schoolhouse construction.
2. There is no uniformity in the manner in which control is exercised by the several states. School laws, building codes, and the regulations of responsible authorities have established standards or practices in order to cope with building problems within their own localities.
3. Control exerted by each state varies greatly, ranging from practically none to statutes and regulations covering minute details. In the states making an effort to exercise control there is considerable uniformity in such features as ventilation, sanitation, heating, and lighting, while exceedingly wide divergencies exist with respect to other features.
4. Legislation governing school building construction is concerned almost entirely with the health and safety of pupils. However, regulations governing heating and

ventilation have not developed as rapidly as those affecting other phases of schoolhouse construction. Only one-half of our states exercise control over these important features, and the control exercised in the majority of cases is entirely inadequate.

6. There is a tendency on the part of most states to regulate schoolhouse construction by requiring all plans to be submitted to the department of education for approval. This approval, however, is usually limited to such features as heating, ventilation, sanitation, floor and air space per pupil, ceiling height, lighting, and safety from panic and fire.

7. There has been a considerable increase in the regulations governing fire provisions in schoolhouse construction. Only ten states have not as yet enacted such legislation.

8. There is also an inclination on the part of the several states to establish a state bureau of buildings within the department of education. Over one-fourth of the states maintain such divisions at the present time.

CHAPTER IV

GENERAL SUMMARY OF CONCLUSIONS

The data previously presented show trends for rules and regulations governing school building construction to be toward the following:

1. Delegation of the supervisory responsibility for school buildings to various state agencies who collaborate with the department of education.
2. Compulsory submission of plans and specifications to the controlling agencies for approval. Approval is usually limited to such features as heating, ventilation, floor and air space per pupil, ceiling height, lighting, and safety from fire and panic.
3. Increased legislation providing for the health and safety of school children. Provisions for adaptability, flexibility, changing conditions in educational procedure, and obsolescence are conspicuously lacking.
4. In those states making appropriations for the construction of new buildings, there is a definite tendency for the controlling agencies to establish minimum standards of construction. These standards must be met before any appropriations are made.
5. Provisions pertaining to fire prevention and panic are increasing both in number and rigidity. This movement should greatly decrease hazards to the life and health

of the school children.

6. There has also been inclination on the part of state officials to assume greater responsibility over the sanitary features of public school buildings. The elimination of the common drinking cup, the common pail, unjacketed heaters, footwarmers, benches, and dry sweepings is deemed adequate proof that such is the case.
7. In order to provide a uniform amount of light throughout the classrooms, most states are requiring standard widths for classrooms and standard ceiling heights.
8. Although legislation governing the heating and ventilation of school buildings is far from satisfactory, provisions pertaining to the air supply, ducts for the removal of foul air, and heater and boiler rooms have been steadily increasing.
9. The amount of control exerted by the state has been steadily increasing. On the basis of the present rate of progress, one may safety predict that within the next few years legislation governing school building construction will be enacted generally throughout the states of the union.

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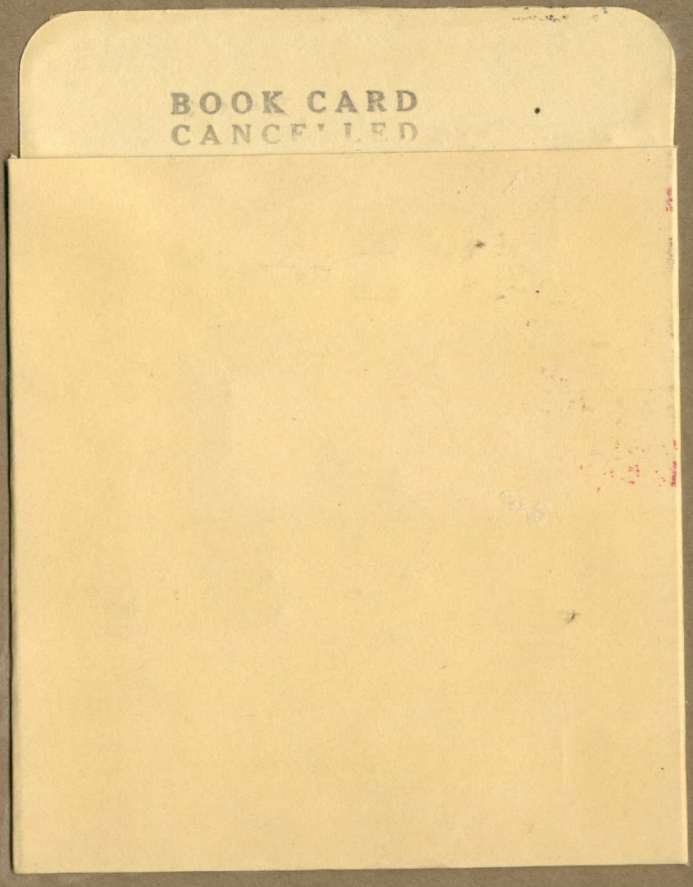

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