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AN ANALYSIS OF THE FACTORS CONTRIBUTING TO SCHOOL BUILDING CONSTRUCTION IN THE CHICAGO PUBLIC SCHOOLS DURING THE YEARS 1933-1938

by

Victor Louis Vant

A Thesis Submitted to the Faculty of the Graduate School of Loyola University in Partial Fulfillment of the Requirements for the Degree of

Master of Arts

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LIFE

Victor Louis Vant was born in East Chicago, Indiana, July 10, 1942.

He was graduated from the Charles P. Steinmetz High School, Chicago, Illinois, June 1960, and from Elmhurst College, in Illinois, June 1966, with the degree of Bachelor of Arts.

From 1966 until the present time he taught English at the Charles P. Steinmetz High School in Chicago, Illinois. He began his graduate studies for the degree of Master of Arts in Administration and Supervision in the summer of 1967.

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CHAPTER I

AN INTRODUCTION TO THE STUDY OF THE FACTORS THAT INFLUENCED CHICAGO PUBLIC SCHOOL BUILDING CONSTRUCTION FROM 1934 TO 1938

The purpose of this thesis is to analyze the factors that influenced Chicago public school building construction from 1934 to 1938. This study will evaluate the influence of the federal programs of the Works Progress Administration and the Public Works Administration upon the construction of school buildings in this city; it will analyze the construction in terms of the architectural requirements of functional purposes and aesthetical quality. Functional purposes includes such considerations as site selection, fire-resistance, service systems, interior construction, and utilizati on and design of the interior. The aesthetical qualities include both the exterior and the interior aspects of the school plant.

This study will analyze these factors as they pertain to the Chicago Board of Education from the years 1934 to 1938.

"Boards of education and school superintendents have a serious obligation not only to themselves but to many generations of school children."[1]

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[1]Eric Pawley, American Institute of Architecture School Plant Studies (Washington, D. C.: American Institute of Architects, 1962), p. 1.

Since this is a prime objective, all school boards and superintendents must envision short and long range plans and objectives. The long range plans appear to be the most difficult ones to accomplish. These plans include such items as the spiral curriculum, the changing needs of the community, and school construction.

> The formulation and adoption of a well-conceived long-range program for providing needed school facilities involves at least fifteen basic issues or problems upon which school-board policy decisions are required.[2]

Of these long range plans, school construction becomes the most costly, the most difficult, and the most demanding, not only upon boards of education, but also upon the people of the community. The school superintendent should know the major problems and decisions which have to be faced by the school board and the community in providing school buildings. The superintendent becomes the key person in coping with the problems of school construction. Dr. Ray L. Hamon, chairman of a committee to develop guidelines for school plant planning, described these responsibilities:

> There are at least five rather obvious phases to the responsibility of the superintendent in connection with a school plant program (1) assemble and interpret pertinent facts on a continuous basis that indicates when a school plant program should be undertaken; (2) under direction of the board, initiate a plant program when needed; (3) establish and foster all activities essential to the development of adequate sites and of educationally adequate plans and specifications; (4) exercise leadership in the capital outlay fund raising campaigns; and (5) exercise controls for the board at all points necessary to

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[2]Wallace H. Strevell and Arvid J. Burke, Administration of the School Building Program New York City: McGraw-Hill Book Company, Inc., 1959), p. 45.

> guarantee that the completed plant incorporates the desirable results of the planning activities in so far as budgeted funds will permit.[3]

In addition to the major thrust of school planning for new buildings, superintendents and boards of education face the ever-present problems of overcrowded and inadequate facilities. The phasing out of antiquated buildings and expansion of present facilities presents many obstacles to boards of education. After World War I, Chicago, like many other large cities, experienced enrollment increases beyond current facilities so that children had to be housed in make-shift accommodations known as portables. These were movable, one room buildings, tin roofed, poorly ventilated, and unevenly heated with wood or coal burning stoves.[4]

In 1932 George D. Strayer of Columbia University reported that many school buildings in Chicago were antiquated and obsolete--forty-four of them serving from fifty to seventy-five years. He also reported a serious seat shortage in the Chicago schools.

> Thousands of pupils were required to attend school in temporary quarters such as basement rooms, rented quarters, inadequate branches, or portables without provision for ventilation or lighting, and with outside toilets.[5]

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[3]Ray L. Hamon (Chairman), Guide for Planning School Plants (Nashville, Tennessee: Peabody College, 1949), p. 11.

[4]Mr. McCahey (President of the Chicago Board of Education) and Dr. William Johnson (Superintendent of Schools, City of Chicago), Report of the Superintendent of Schools City of Chicago (Chicago, Illinois: 1936-1937), p. 312.

[5]George D. Strayer and N. L. Englehardt, Standards for Elementary School Buildings (New York City: Bureau of Publications Teachers College, Columbia University, 1933), p. 165.

From 1933 to 1938, the City of Chicago's Board of Education, eliminated 614 of these portables as indicated in the following table:

Table Showing the Rate of Elimination of Portables in Chicago

Year	Number of Portables in use
1933	692
1934	384
1935	228
1936	189
1937	112
1938	78

[6]

During the depression years, school building programs across the nation failed to meet the needs of children. Partially to fulfill this need and partially to stimulate the sagging American economy, the federal government aided school construction through the initiation in 1933 of the Federal Emergency Administration of the Public Works. This program, commonly referred to as the P.W.A., was supplemented by executive order in May, 1935 when the Works Progress Administration eas established.[7]

These two federally created programs provided services in the area of building construction. "The immediate purpose of erecting school buildings under the P.W.A. is to provide work for as many people as possible.... The long range purpose is to provide adequate, modern school housing facilities,

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[6]Mr. McCahey (President of the Chicago Board of Education) and Dr. William Johnson (Superintendent of Schools, City of Chicago), Report of the Superintendent of Schools City of Chicago (Chicago, Illinois: 1937-1938), p. 478.

[7]Public Works Administration will be referred to as P.W.A., and Works Progress Administration will be referred to as W.P.A.

for children."[8] In the September 15, 1934 issue of School and Society, J. McKeen Cattell, stated that more than half the public school construction then in the United States was being financed by the P.W.A..[9] "While the government makes what might be deemed an outright gift of thirty per cent of the total involvement in the project the balance of seventy per cent is financed by the government."[10] Grey Montrose Whipple in the Thirty-Third Yearbook of the National Society for the study of Education, advocated that Boards of Education should not be seduced by offers of reduced fees, should not judge on the basis of pleasing preliminary sketches, should resist pressure from local interests and politics, and should not select an architect because he will guarantee the cost of construction in advance.[11] Now that monies were available, local boards of education had to choose the best plan and the best architect from the available plans and architects. This step was crucial, as pointed out by Ray L. Harmon:

> The selection of an architect is a crucial step in the successful administration of a school plant program. Here must be applied all the objective impersonal deliberation and sound judgement which

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[8] J. McKeen Cattell editor, "School Building Projects Under the Public Works Program" School and Society, Vol. 38 (Sept. 2, 1933), p. 295.

[9] J. McKeen Cattell editor, "Federal Aid for School Construction" School and Society, Vol. 40 (Sept. 15, 1934), p. 398.

[10] J. McKeen Cattell editor "Public School and the National Recovery Act" School and Society, Vol. 38 (Dec. 2, 1933, p. 317.

[11] Grey Montrose Whipple, "Planning and Construction of School Buildings." Prepared by the Society's Committee on School Buildings. The Thirty-Third Yearbook of the National Society for the Study of Education, Part I.: Bloomington, Illinois: Public School Publishing Company, 1934, p. 193.

> the board and its professional advisors can command. Architects tend to specialize. Hence it will pay (1) to discover architects who have given special attention to school building planning, and (2) to select an architect whose services and buildings have given satisfaction.[12]

There were two ways in which the Chicago Board of Education developed blue print drawings. First the Chicago Board of Education employed its own architectural staff to develop plans for future buildings. These plans had to meet with federal approval before monies would be alloted for the project. Secondly, the federal government employed its own staff of architects within the various W.P.A. and P.W.A. projects. The architects would submit their plans to the boards of education for a critical analysis. In some instances the federal and local staffs held divergent points of view. "Apparently city planning and the P.W.A. plant planners have not advanced to the point where there is a complete exchange of ideas and information."[13] The school building was built to render service to children coming from the neighborhood home; this was the primary goal for both groups. Out of all the problems that may have arisen among the board architects a well balanced program was still achieved.

In contrast to this point, within a town in the midwest, a school was being erected without federal monies or good supervision. The final building

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[12]Hamon, op. cit., p. 13.

[13]Howard T. Herber Dr., The Influence of the Public Works Administration on School Building Construction in New York State 1933 - 1936 (New York City: Bureau of Publications Teachers College, Columbia University, 1938), p. 69.

demonstrated that:

> In the town of X...their new school had no way of getting an auto into the auto shop, no water in the art room, no sunlight in the toilets, no place for a private conference with the principal, no way to remove the wrong fan motor except by breaking up a concrete floor, no way of getting 16-ft. lumber in the shop except through the window, no way to get visitors out of the basketball game except through the locker room.... [14]

The W.P.A. and P.W.A. projects in the 1930's were a sign of hope to the neighborhoods in two respects: first, the community saw local people employed in useful activity; and for the first time since the depression, something was being created. It is interesting to note that only one building in downtown Chicago was built by private industry during the 1930's. This was the Field building and the only reason that it was completed was that plans had progressed so far in 1929 that it would have been a far greater waste of money to abandon the project.[15] Secondly, the ideas of building a school gave hope to the people in the community, and an answer to many of their problems through education for themselves and for their children. Therefore architecturally, the school building had to appeal to the people on two strong notes. It had to be a building which represented greater security and endurance than the portables and one which created an inviting and appealing atmosphere within the neighborhood. As Strayer aptly stated:

> Architectural fitness of the building to surroundings and surroundings to the general atmosphere of the community should be secured. The building in its environment should represent a healthful, normal place for human beings to live, mature, and work. The school building should adjust architecturally to the neighborhood, or should be in advance

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[14] Ibid., p. 71.

[15] Chad Wallin, The Builder's Story (Chicago: The Builders Association of Chicago, Inc., 1966), p. 76.

of the development of the neighborhood.[16]

Also reinforcing George D. Strayer's contention about architecture's forceful atmosphere was the statement by Wolf Von Eckhardt; "The finest living and aesthetic experience in the life of many American children came to them in their schools."[17]

Thus when the federal government offered aid through the P.W.A. and W.P.A. school building construction projects, school administrators, boards of education, and planning committees had innumerable factors to consider before their communities would qualify for these benefits. Basically, they had to decide upon and choose the best types of school plans to meet the needs of the people in the communities. They had to determine the educational objectives of the community, the desirability of redistricting, the formation of suitable attendance areas, the development of an educational program, and the selection of sites.[18] Great care and planning had to be exercised since their responsibility was to the future as well as to the present generations.

> The long period of service which may rightly be expected from modern school buildings, and the vast expenditures which are involved in capital outlays for educational purposes in this nation, make it imperative that these building programs be so planned and executed that the various communities involved will secure a maximum return for their investment in the form of school buildings well adapted

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[16]Strayer, op. cit., p. 12.

[17]Wolf Von Eckardt, Mid-Century Architecture in America (Baltimore: The Johns Hopkins Press, 1961), p. 23.

[18]Harmon, op. cit., p. 4.

to the educational programs which they are expected to house.[19]

During the year 1934, a new policy was initiated concerning the construction of elementary school buildings to eliminate the use of portables. Without the use of federal grants and aids this policy could not have been considered.

> As part of its drive against the use of portables, the Board of Education has authorized construction of two types of small elementary school buildings of seven and ten rooms each. These small schools are strictly modern, pleasing in appearance, and represent the initial unit of an ultimate school much larger. The wings of the building to be constructed later have been so planned that the entire structure, when fully developed, will be an integrated unit. Heretofore, outlying communities customarily have had to wait many years until there was a sufficient number of pupils to fill a large school building, the pupils meanwhile attending school in twelve to twenty portables. The policy of erecting small units has taken hundreds of these children out of poorly ventilated, unevenly heated, tin-roofed temporary quarters and placed them in strictly modern fireproof quarters.[20]

School building problems are among the most troublesome which school administrators and boards of education have been called upon to solve for their communities. "In the past," during the years of 1930 to 1934, "few administrators had specific training to meet the school building problems."[21] The main reason for the lack of training has been the paucity of school

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[19]Frank M. Misner Dr., Extra Costs and Incidental Costs in the Erection of School Buildings (New York City: Bureau of Publications Teachers College, Columbia University, 1934), p. 2.

[20]Mr. McCahey (President of the Chicago Board of Education) and Dr. William Johnson (Superintendent of Schools, City of Chicago) Report of the Superintendent of Schools City of Chicago (Chicago, Illinois, 1934-1935), p. 286.

[21]Misner, op. cit., p. 21.

construction.

> In the period between 1927 and 1930 annual expenditures for school construction in the United States seemed to be stabilized at slightly less than $400,000,000 per year. Beginning in 1930, however, a rapid decline in these expenditures began, so that by 1933 expenditures for capital outlays have reached the low figure of $154,000,000. . . . School building construction has been largely suspended. As a result, it is estimated that approximately 250,000 children are attending school on a part time basis and approximately 150,000 children are housed in temporary or portable shacks.[22]

When the City of Chicago accepted aid from the federal government in the 1930's for the building of their schools, many of the buildings in use had served the children of the city long and faithfully for fifty, sixty, seventy, and even eighty years. At one time these schools had provided the proper facilities for a current curriculum. During the 1930's the trends in modern education changed, and the schools were no longer physically able to meet the needs of education. "Education is a continuous process from birth to death."[23] Just as we change during our lifetime so do our needs and our demands upon education change.

This brief sketch of the problems and conditions which faced all school boards can aid in focusing on Chicago Public School building construction and in analyzing some of the features that influenced its program. In Chapter II

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[22] Ibid.

[23] Hamon, op. cit., p. 1.

a definition of architecture will be given, followed by a discussion of the problems of school construction including such topics as site selection, fire resistance, interior construction, and service systems. In Chapter III a discussion of the utilization and design of the school plant will be given. In Chapter IV the aesthetical values of school construction will be discussed: the school plant exterior and the school plant interior. Chapter V will present a summary and conclusions of this study, and also a discussion of three recommendations pertinent to school construction today.

CHAPTER II

THE FUNCTIONAL ASPECTS OF SCHOOL BUILDING ARCHITECTURE OF THE PERIOD

If architecture is to be considered praiseworthy, it must possess two criteria-functional capacity and aesthetical quality. To be considered functional, architecture must serve man in some useful manner. In general, the aesthetical qualities of architecture are fulfilled when the design is pleasing to the eye.

Each new school plant should be "constructed" three times. The first building plans should be drawn by administrative staffs with educational objectives which fully describe and specify the educational program to be instituted. The second plans should be undertaken by an architect having in mind architectural specifications and working drawings which interpret the educational needs of the program. The final building plans should be reviewed by skilled craftsmen, envisioning a completed building constructed according to the exact instructions of the architect. This process can eliminate much of the misdirection connected with the erection of school plants.

The greatest wastes in school construction generally results from the lack of sufficient attention to the first step-educational planning. Eric Pawley described the greatest waste in school construction existed:

> ...because many educators failed to give a well-thought-out description of their educational program. In fact, many school architects reported that they were not given a written description of any school program, old or new. The only information they obtained from school officials before they started to work were two small bits: approximate number of children to be housed and the approximate amount of money available.[24]

With Pawley's statement in mind we will now focus on certain aspects of school construction in Chicago in the 1930's to determine how the educational planning fulfilled the functional qualities of good architecture.

The first consideration in determining the functional qualities of architecture is site selection. "Planning for buildings in a school district requires consideration of land areas in use as well as those available for development as a growing or shifting population makes necessary increased school facilities."[25] However, the location of these areas violated the criteria of a good building program. School sites should not be located upon or near a major traffic artery but should be readily accessible through well paved streets and sidewalks.[26] Out of the forty-eight projects completed from 1934 to 1938, with the aid of grants from the Public Works Administration totaling $4,576, 454 in Chicago, twenty-four of them were situated on or within one block of major arteries.[27] They are:

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[24]Pawley, op. cit., p. 18.

[25]Strayer, op. cit., p. 9.

[26]Ibid.

[27]McCahey, 1937-1938, op. cit., p. 479.

1. Chappell School . . . . . 5145 N. Leavitt Street
2. DuSable High . . . . . 4934 S. Wabash Avenue
3. Dunbar Vocational School . . . . . 3000 S. South Parkway
4. Emmet School . . . . . 5500 W. Madison Street
5. Esmond School . . . . . 1865 W. Montvale Avenue
6. Farren School . . . . . 5055 S. State Street
7. Goudy School . . . . . 5120 N. Winthrop Avenue
8. Jamieson School . . . . . 5650 N. Mozart Street
9. Kellogg School . . . . . 9241 S. Leavitt Street
10. Lane Technical . . . . . 2501 W. Addison Street
11. LeMoyne School . . . . . 851 W. Waveland Avenue
12. Locke School . . . . . 2845 N. Newcastle Avenue
13. Lyon School . . . . . 2941 N. McVicker Avenue
14. Nettlehorst School . . . . . 3252 N. Broadway Avenue
15. Oakenwald School . . . . . 4071 S. Lake Park Avenue
16. Phillips High . . . . . 244 E. Pershing Road
17. Prescott School . . . . . 1632 W. Wrightwood Avenue
18. Riverdale School . . . . . 13233 S. Prairie Avenue
19. Ross School . . . . . 6059 S. Wabash Avenue
20. Pyerson School . . . . . 646 N. Lawndale Avenue
21. Sauganash School . . . . . 6040 N. Kilpatrick Avenue
22. Sherman School . . . . . 5116 S. Morgan Street
23. Volta School . . . . . 4950 N. Avers Avenue
24. Wells High . . . . . 936 N. Ashland Avenue

Before the building is designed, the planning board should seek a residential area which is relatively free from business and traffic disorders.

> The neighborhood should be distinctly residential in character. The school building should be at least two city blocks from trolley lines and highway arteries. It should be at least two blocks from a factory, garage, or warehouse. The site should be large enough to permit a border of campus at least 100 feet deep between curb lines and building lines. The intensity of noise decreases rapidly with distance and the open air is the most perfect sound absorbent known.[28]

Wells High School is one example of poor site selection. Wells is located at 936 N. Ashland Avenue at the intersection of Ashland Avenue and Augusta Boulevard, two streets very heavily traveled. It should also be

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[28]Strayer, op. cit., p. 29.

mentioned that there was no provision made for a campus or athletic field.

A second example of poor site selection is Dunbar Vocational High School, 3000 S. South Parkway, which is in the immediate proximity of three major arteries: South Parkway, Hyde Park Boulevard, and 31st Street. There, too, no allocations of land for a campus or athletic field exists.

Goudy Elementary School, 5120 N. Winthrop Avenue, is a third example of inadequate foresight in planning. Goudy is located on Foster Avenue near Broadway Avenue, both major thoroughfares. Disruptive traffic noises are augmented by the Howard Street elevated train, and playground facilities are so limited that motor vehicles are prohibited the use of the 5100 block of Winthrop Avenue during the noon hour. Thus, the school planners failed to meet the site selection criteria as outlined by George D. Strayer.

> There should be a maximum of freedom from all business and traffic distractions. Freedom from traffic friction sounds and airplane motor noises should be sought. The noises or odors of industry are deterrents to good school work and should be borne in mind in site location.[29]

The school is a place for learning and is hindered by the negative responses to the situation. For these reasons the site committee has failed in providing non-sequitor land locations for the construction of schools in these twenty-four areas for these twenty-four different schools.

The second consideration in determining the functional qualities of architecture is the safety factor of fire resistance. Basically there are

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[29] Ibid.

three classifications given to school building construction according to George D. Strayer.[30] They are:

Fireproof Construction
Non-fireproof construction
Frame construction

Fireproof construction is a structure of masonry, protected steel, or reinforced concrete. Non-fireproof construction is a structure having exterior masonry walls with floors and other interior construction wholly or in part of wood. Frame construction is a structure having wooden exterior walls or partitions.[31]

Between 1908 and 1930 as many as 387 school children died in major school fires.[32] George D. Strayer developed many guidelines in order to prevent loss of lives due to fire. His suggestions include:

> Walls of reinforced concrete; structural members of incombustible materials and adequately fireproofed; incombustible materials in all partitions of classrooms, corridors, and stairways, and in the stair carriage, floors, and roof. Openings in exterior walls above the first story, if such openings are distant in a direct line less 30 feet from a hazardous structure, shall be protected by fire doors, fire windows, or other approved device. Interior doors or windows serving as enclosures for hazardous rooms such as manual training or paint shops, kitchens, and laboratories shall be of approved fire-resistive construction. Built-in and movable equipment, trim, furniture and floor surfaces may be of combustible construction.[33]

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[30]John W. Sahlstrom Dr. Some Code Controls of School Building Construction in American Cities (New York City: Bureau of Publications Teachers College, Columbia University, 1933), p. 53.

[31]Ibid.

[32]Ibid.

[33]Strayer, op. cit., p. 29.

The schools built by the Works Project Administration and the Public Works Administration in the city of Chicago were of fireproof construction.[34] A dominant factor in the selection of fireproof construction for Chicago schools was the Chicago building code which had a separate article on school construction with provisions for stairways, stairway walls, exits, bearing walls, natural lighting, and live floor loads.[35]

The outer structure of all buildings erected with federal aid were of brick masonry construction, protected with steel reinforcements. Every building of this project eliminated wooden stairs and landings. The materials used were steel, marble, concrete, or terrazzo.[36] In all school buildings the stairs, landings, platforms, enclosing walls of stairways and hallway floorings were of fire-resistive materials.[37] All of the forty-eight schools completed by 1938 used steel, marble, concrete, or terrazzo for stairs, landings, and hallways.[38]

The third consideration in determining the functional qualities of architecture is interior construction: entrances, corridors, basements. The

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[34]An interview with Mr. Sol Samuels, Director of Architectural Planning and Development of school buildings for the Chicago Board of Education.

[35]Sahlstrom, op. cit., p. 66-67.

[36]Samuels, op. cit.,

[37]Sahlstrom. op. cit., p. 68-69.

[38]Samuels. op. cit.,

predominant reason for school entrances the importance of which is their two-fold function the flow of traffic in and out of the building. The second function is the aesthetic quality it affords the school; this aspect will be analyzed in Chapter IV.

In a sense, the number of entrances in a school building expresses the degree to which the building is being utilized for both educational and community purposes.

> A main approach should lead to the functional center of the building or groups of buildings. This entrance should be developed for ready access to the administrative offices. Entrances should be so planned that there is no congestion among the student body either on entering or leaving the building. Ready dispersal of the student body on leaving the building should be possible before reaching points of traffic danger.[39]

Each stairway should have direct access to an entrance as an emergency precaution. The auditorium, gymnasium, cafeteria, and other large rooms should be provided with entrances not only for safety from fire but for their utilization for other than dayschool activities. Special entrance provisions should be made for the heating and fuel sections of the building so that coal, ash, and garbage is handled with a minimum of labor or inconvenience to the school.

Vestibules should be designed to protect the interior of the school from unnecessary exposure to weather and temperature. Floors should be made of a waterproof material and contain some type of approved matting to prevent the tracking of mud and dirt into the school. Vestibules also serve as a momentary

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[39]Strayer, op. cit., p. 31.

resting place for those entering or leaving the building. The schools built in Chicago between 1934-1938 which were constructed within the lines of the Neo-Gothic form of architecture focalized attention upon the entrances.[40] It was a section of the school building which received considerable attention.

Corridors should carry traffic with a minimum of congestion. The width of elementary school corridors should be twelve feet without obstruction to provide sufficient capacity for emergencies.[41] Corridors are also utilized for locker space. Lockers should be recessed in corridor walls and so located that their use will not conflict with traffic. "Where lockers are inserted in corridor walls, the width of the doors when opened should be added to the corridor widths in the original planning."[42]

In the Chicago Public Schools all lockers were of the steel type and recessed. In a survey conducted at Crane Technical High School in 1937, it was recommended that 1,500 wooden lockers be replaced with new and modern steel lockers.[43]

Doorways feeding into the corridors should not conflict with the flow of

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[40]An interview with Mr. Ian A. Cambell, Principal of the Oakenwald South Intermediate and Upper Elementary School.

[41]Charles L. Spain, Arthur B. Moehlman, and Fred Frostic, The Public Elementary School Plant (Chicago: Rand McNally and Company, 1930), p. 262.

[42]Strayer, op. cit., p. 41.

[43]McCahey, 1937-1938, op. cit., p. 478.

traffic.

> No projections beyond the face of the corridor walls should be in excess of eight inches. All radiators, drinking fountains, wash-basins, fire extinguishers, or other equipment placed on corridor walls should be recessed.[44]

The walls, ceilings, and floors should be so constructed as to prevent the penetration of talking and reasonable noises of passage beyond the corridors themselves. All corridors, lobbies, and stairways should provide for rapid circulation for all groups using the building. Corridors should be well-lighted, both naturally and artificially.

> Well-planned locations of stairway windows, the utilization of secondary lights through classroom doors and transoms, and the penetration of light through lobbies are the methods most successfully used in securing corridor lighting.[45]

Entrances and corridors are to be considered most essential in that they help regulate traffic, house student lockers, protect the interior of the school from dirt, and permit air and light to pass throughout the school. If spaces exist in corridors, stairways, and elsewhere which serve no purpose, whether functional or aesthetical, the condition reflects poor school planning in failing to foresee their possible uses. The possible aesthetic and educational value of corridors will be amplified in Chapter IV.

All of the schools built in Chicago with the aid of the W.P.A. and P.W.A. were two, three, or four story structures, not including the basement.[46] The basements of school buildings should never be used for the housing of students

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[44]Hamon, op. cit., p. 120.

[45]Strayer, op. cit., p. 41.

[46]Samuels. op. cit.,

and teachers, for they are likely to be damp, the light poor, and the dust accumulating faster here than on the upper floors because of the boiler. So that basements may never be utilized for such purposes when overcrowding occurs, the construction and dimensions of the basement structure should not permit their use as classrooms.[47] In an interview with Mr. Sol Sammuels, director for school building and construction for the Board of Education in Chicago, he pointed out that no city school is using basement facilities for general classroom work. He further stated that a basement is defined as the area which exceeds three feet below ground level.

The primary function of basement areas is the housing of the heating plant, mechanical equipment, and the necessary materials for maintenance of the building. Adequate storage space should be allowed for athletic equipment, industrial arts supplies, unused furniture, and equipment and janitorial supplies and equipment. A direct connection should exist between the receiving room and the driveway and the immediate exits to the outside from the heating plant rooms. Provisions should be made for the easy removal of the largest piece of equipment, most likely the boiler, without necessitating the removal of a permanent wall.

School buildings should provide adequate facilities for protecting the health of the occupants. Therefore, our fourth consideration in determining the functional qualities of architecture is the service systems: heating and

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[47]Strayer, op. cit., p. 51.

ventilation, lighting and fenestration, sanitation. Heating and ventilating facilities must be given careful and technical consideration in planning new buildings.

> The three major purposes of heating and ventilating systems are: (1) the supplying of heat to balance losses from the human body through radiation, conduction, evaporation, and from the room through exfiltration; (2) the removal of excess heat; and (3) the dilution and removal of unpleasant body odors and in special cases direct removal of injurious or obnoxious gases, vapors, fumes, and dust.[48]

Heating plants and ventilation systems should be installed with sufficient capacity to meet the requirements of temperature, air supply, air movement, air cleaning, and humidity control within the building during the period of occupancy, under the most severe local winter conditions, without overloading the system.

> The choice of heating and ventilating systems to be installed may depend on costs, maintenance services available, size of the building or plant, designer's preference, state department of education and local standards of building, and pupil comfort desired. Each of the various systems has some advantages and disadvantages for individual installations and operation.[49]

The Chicago Public Schools experimented with more than one basic boiler system in the building program of the 1930's. Due to this factor a deeper analysis of this facet of school construction will not occur since this in itself is grounds for a study in and of its own.

Fenestration is distinctly the function of the architecture used. Conflicts may arise between the style of architecture and the educational needs of various rooms in the building.[50] Architectural needs should not

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[48] Hamon. op. cit., p. 130. [49] Ibid., p. 132.
[50] Strayer, op. cit., p. 35.

interfere with adequate lighting to any part of a building used for educational purposes.

In schoolrooms where much reading takes place, brightness is commonly created by natural and artificial light. Most schools depend upon natural lighting as the primary source to create brightness and use artificial light to supplement daylight when acceptable brightness levels cannot be maintained without it. "The minimum natural-lighting requirement is usually twenty per cent of the floor area, that is, one square foot of window space to five square feet of floor space."[51] In the schools built in Chicago by the W.P.A. and the P.W.A. the illumination requirement averaged twenty-five per cent, or one square foot of window space to four square feet of floor space.[52] All the W.P.A. and P.W.A. schools built in the 1930's are still functional and operational by today's standards, and this is a direct reflection to the fact that these school projects did go beyond minimum requirements.

A definite purpose existed in the minds of the architect and the contractor to construct high ceilings within the classroom; the purpose was achieving the desired ratio between the floor space and the window height. For example, a classroom which is twenty-four feet wide will need a ceiling which is twelve feet high to provide adequate lighting. Since a ceiling of this height might appear too great, it might suggest that more than the required amount of light will enter the classroom. It must be remembered that the window does not start at the ceiling, and it does not end at the floor

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[51]Spain, op. cit., p. 216.

[52]Samuels, op. cit.

level. The windows begin at approximately one to two feet below the ceiling and end approximately three to four feet above the floor. There are also areas blocked by steel and brick rising upward to support the roof; these must also be accounted for in the calculations. The window sashes may be constructed of various materials. The two that met with W.P.A. and P.W.A. approval were those constructed out of wood or steel.[53] The W.P.A. and P.W.A. contractors felt that it was more economical from an operating standpoint for the Chicago Public Schools to use wooden sashes due to the fact that the largest part of the school year occurs in the colder months and heat is lost to a greater extent with steel sashes.[54]

Artificial lighting should be provided for all spaces in a school building. During the course of a year, artificial lighting will be needed in all sections of the building because of poor natural lighting due to cloudy or stormy weather or because of the evening use of the school plant. "Artificial lighting should not be thought of merely as supplementing natural lighting, but its installation should be based upon the theory that artificial lighting can always provide an adequate substitute for natural lighting."[55]

If it becomes necessary to compromise between two artificial lighting systems, one of which produced high intensities with excessive brightness and the other producing a reasonable intensity with comfortable brightness, decisions should favor comfort.

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[53] Ibid.

[54] Spain, op. cit., p. 216.

[55] Strayer, op. cit., p. 71.

In schoolrooms used for night classes, an artificial lighting system must be installed which will produce the desired intensities and brightness conditions without daylight. In choosing a lighting system, the W.P.A. and P.W.A. kept in mind that during night use the highest brightness in the room is the immediate area of the lighting unit.

Illumination and proper color combinations in the school building will help to insure the safe care of student eyesight. Great advances were made in these respects during the 1930's. The buff walls and the cream color ceilings of the classroom, which were standards in the 1910's and 1920's, were replaced with various harmonious color combinations.[56] A flat white paint was used for the ceiling because of its high reflection factor. Warm colors were used on the north side of the building where the sunlight is limited and cool colors on the south side of the building where sunlight is often excessive.[57]

The schools that were built in Chicago during the 1930's raised their classroom light intensity from 20 foot candles per classroom, which was the old standard, to 40 foot candles per classroom.[58] The easiest way of

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[56]George B. Heckel, "Modern Trends in Schoolhouse Painting and Decoration," American School and University New York City: American School Publishing Corporation, 1929-1930), p. 131.

[57]Ibid., p. 132.

[58]Samuels, op. cit.

achieving this was to run heavier electrical wiring to each of the classrooms and then to install a larger watt bulb. In some cases it was proven that "the brightness on the inside row of desks has been raised as much as 100 per cent by doing nothing more than painting a drab ceiling with a flat white."[59] Light provided by larger window areas helps to improve seeing conditions, but in Chicago, with its dark winters, this is not always the case. A large part of the illumination has to come from an artificial source. The Chicago Board of Education in its building program of the 1930's tried to see that the lighting in the classroom was realistic in terms of visual comfort and efficiency so that the room would be given a workable and properly balanced effect.

Thus a definite consideration to the 1930's building program was lighting, both artificial and natural, to secure the best visual comfort and eye safety standards of any public building.

The raising of lighting standards was not the last of the improvements added to the school buildings. Complete, well arranged and maintained sanitary facilities are essential for the comfort and convenience of the school child. Drinking fountains should be provided in the ratio of one to every seventy-five students, with a minimum of one drinking fountain on each floor.[60] They should be located conveniently to primary rooms, gymnasiums, cafeterias, and shops. Drinking fountains should not be located in toilet

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[59]Hamon, op. cit., p. 143.

[60]Ibid., p. 155.

rooms or attached to lavatories or sinks. Where construction permits, drinking fountains should be recessed to full depth.[61]

In all of the school buildings completed in Chicago between 1933 to 1938, drinking fountains were provided at regular intervals and recessed within the corridor walls.[62]

Toilet rooms for boys and girls should be provided on all floors. Care should be taken to eliminate excessive traveling distances and ease of supervision should be considered. Convenient locations are at the end of corridors so that noise and disruptions are minimized.[63]

Lavoratories of a sanitary type should be well located and of a sufficient number. In addition to being installed in toilet rooms, they should be installed in kindergarten and primary rooms, teachers rooms, janitors' rooms, and special rooms such as the art room, science room, or work shops.

Showers are provided for two purposes in schools--they may be used after athletic periods or for neighborhood use throughout the year.[64] During the depression many people lived in substandard housing, some of which did not provide means for hot and cold running water or toilet facilities. The only inexpensive place of bathing was the nearby school which opened its

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[61] Ibid.

[62] Samuels, op. cit.

[63] Spain, op. cit., p. 364.

[64] Ibid., p. 344.

facilities to the community. Most of the shower rooms in the Chicago Public School buildings of this era were located in conjunction with the locker rooms which were adjacent to the gymnasium.[65] The boys' showers are located in a room without booths, while the girls' showers are located in separate booths with showerheads at shoulder heighth. These facilities should be located in the building, in relationship to the entire school, so that: (1) they can be readily reached from drives and parking areas of the school, (2) they are readily accessible on entering the building, and (3) they can be easily cut off from the rest of the building.[66]

Thus Chapter II has pointed out that some of the problems of school construction; site selection, fire resistance, interior construction, and service systems are some of the troublesome aspects which hinder boards of education and superintendents. Pointed out in this chapter is the problem of poor site selection in the city of Chicago. Out of the forty-eight schools built by the P.W.A. and W.P.A. in the city of Chicago, twenty-four of them are considered as poor site selections. School sites should be one city block or more from a major artery. The twenty-four schools mentioned in chapter II were situated within one block of a major artery. Another problem of school construction is building a fire-proof school. All of the schools built in Chicago from 1934 to 1938 were considered fire proof. Stairs and stairway

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[65] Samuels, op. cit.

[66] Ibid.

landings were built of reinforced concrete deeming them fire safe. A further problem of school construction is the interior construction. Entrances, corridors, and stairways should provide for rapid circulation for all groups using the building.

In summary, Chapter II has pointed out the importance of service systems. Heating and fresh ventilation should be installed so that even temperatures, an air supply, air movement, air cleaning, and humidity control are maintained within the school. Chapter II gives emphasis to some of these problems showing that educational specifications must be detailed and all inclusive in regard to the curriculum and other needs of the school.

CHAPTER III

THE FUNCTIONAL ASPECTS OF UTILIZATION AND DESIGN OF SCHOOL BUILDING ARCHITECTURE

Proper design and utilization of a school reflects the amount of effort put forth by educators and school planners. Good school architecture is not primarily a matter of money but of professional ability on the part of boards of education and professional school planners. These persons must consider such areas as assemblage spaces, administrative offices, general multi-purpose rooms and special rooms. Special rooms for any school are by no means a mere decoration; they are a functional part of the total endeavor of the school. Vocational skills which are taught early in the school experience are a step toward broader visions and understandings of others. Ideally there should be a cross stimulation between cultural and vocational learning. Therefore the scope of Chapter III is to analyze these major criteria and to draw comparison to the schools erected in Chicago between 1934 and 1938. A great part of the space in every building is mainly noninstructional but essential to the general operation: corridors, stairways, basements, storage rooms, toilet facilities, utility closets, furnace rooms, fan rooms, and the like. For this reason educational planners must cautiously distribute the remaining areas for maximum functional and educational utilization.

Assemblage spaces are recognized as educationally purposeful to the modern school program within limits. "The number and size of assemblage

spaces is proportionate to the enrollment and community usage."[67] These areas include the auditorium, gymnasium, and library.

The size of the auditorium should be determined by: (1) size of the school, (2) school policies and program, (3) extent of community use, and (4) availability of other facilities in the community.[68] Auditoriums located on the ground floor and in partial isolation from the remainder of the building will alleviate many of the problems associated with student or adult assemblage, such as safety upon leaving and entering, accessibility to the general public, sound interference with the school program, and movement of bulky stage properties. Seating should be fixed and arranged for safety, comfort, sight lines, and acoustics as well as for capacity.

All the schools built by the W.P.A. and P.W.A. in the city of Chicago did incorporate some architectural formation for an auditorium. It was one of three types constructed: a two story structure with no balcony, a two story structure with one balcony.[69]

The auditorium can be considered an intergral part of the school plant if it fulfills two major functions: organization of the school by allowing large numbers of students together to share a common idea or to learn common facts and secondly, organization of the community for recreational or educational advancement.

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[67]Strevell, op. cit., p. 151.

[68]Hamon, op. cit., p. 95.

[69]Samuels, op. cit.

The gymnasium, the main workshop of the physical education program, should be a large well-ventilated and well-lighted room suitable to the activities of the school and the community. Its use should determine its dimensions and size. The prime purpose of this room is the physical education of the students in the school, and extracurricular activities should not be allowed to influence planning to interfere this purpose. In elementary schools, a play-room, an office, and equipment storage space are essential; lockers and shower facilities are desirable. In high schools, a gymnasium, offices, apparatus storage rooms, as well as locker, shower, and dressing room facilities are essential.

The average size gymnasium built by the W.P.A. and P.W.A. contractors for the Board of Education in the 1930's was seventy six feet by ninety six feet with a ceiling twenty-two feet high (76'x96'x22').[70]

Gymnasium floors should be resilient and non-slippery. Lines outlining the game areas and courts should be painted on the floors before the finish coat is applied.

> The floor is the life of the gymnasium. Firmness with a fair degree of resilience is desired. Hardwood, especially maple, is desired. Large grained woods are to be avoided because of the danger of splintering.[71]

In some cases the gymnasium floors were built out of concrete with asphalt tiles laid on top; causing much criticism since students developed

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[70] Ibid.

[71] Strayer, op. cit., p. 143.

fallen arches due to the non-giving qualities of this type of flooring.[72] This was never the case in the Chicago Public Schools. All gymnasium floors that were built during this time were constructed with maple, or in some instances oak wood.[73] Thus the physical activity of students was felt to be a characteristic of a sound educational program even in the 1930's, and the construction of the gymnasium, with its costly materials, was found to be a definite necessity in every Chicago Public School.

The elementary school library was a relatively new development in the 1930's as compared to the auditorium and gymnasium.

> So-called libraries, more generally storage rooms for supplemental books, were developed in elementary buildings in the early seventies. These libraries were organized in odd-sized rooms that happened to develop in the architectural plan, or sometimes in the principal's office. Many of them were little better than school stockrooms.[74]

In planning the library as an integral part of the school plant, its functional aspects must be determined.

> Every part of the library plan must be considered from the point of view of the use to be made of the library facilities in the given school situation. The service which the library is to offer in the total educational pattern of a school program is of paramount importance in the planning and developing of the library.[75]

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[72]Hamon, op. cit., p. 101.

[73]Samuels, op. cit.

[74]Spain, op. cit. p. 168.

[75]Hamon, op. cit., p. 90.

The library should contain an ample sized reading and circulation center with storage space and book stacks, office space for the librarian, and a conference room or rooms.

The elementary reading center should be able to seat the largest room in the school adequately, and the secondary school library should have a seating capacity of 10 to 15 per-cent of the student enrollment, not to exceed 150 seats.[76] Larger secondary school enrollments might necessitate more than one library.

> The library is preferably located on the second floor in a centralized part of the school building. When, however, the library is also used for public purposes, it is found expedient to locate this room on the first floor near the main entrance with a provision for shutting off the library itself from the rest of the building.[77]

In the high schools built in the 1930's many of the contractors and architects placed the library on the second floor directly above the vestibule. This gave the students and people of the community easy access to the library.

In addition to the auditorium, gymnasium, and library facilities must be provided for the administrative staff within the school plant.

> Administrative space must be designed for (1) meeting the public, (2) administrator-public pupil conferences, (3) routine office work, (4) inside and outside communications, (5) pupil guidance-counseling, and (6) keeping and filing records.[78]

The most desirous location for the administrative rooms is the ground

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[76] Ibid., p. 91.

[77] Strayer, op. cit., p. 125.

[78] Hamon, op. cit., p. 85-86

floor near the main entrance. The principal's office should open directly into the clerk's office, the public space, and the school corridor. Most of the administrative offices built by the W.P.A. and P.W.A. in the city of Chicago designed the principal's office to open into the three areas described above; however all did have a minimum of two openings, namely the clerk's office, and the corridor of the school.[79] Depending upon the format of the office some schools did have a separate door leading from the office to the public space, and others did not.

Adequate provisions for natural and artificial lighting, heating, and ventilation should be made for the offices of both the principal and clerk. The clerk's office should be separated from the public space by a counter which serves as a supply cabinet for records and forms, and also eliminates the problem of giving natural light to the public space.[80]

Adequate storage space for school records must be provided, and a fireproof vault of immediate access from the principal's office and from the clerk's office is essential. All the schools constructed in Chicago by the W.p.A. and the P.W.A., from 1933 to 1938, contained vaults of reinforced concrete walling with a fireproof steel door.[81]

The administrative offices should be planned to feature openness, pleasant and attractive design, and ease of access for pupils, teachers and the public in order to serve the school and community properly.

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[79]Samuels, op. cit.

[80]Spain, op. cit., p. 257.

[81]Samuels, op. cit.

The basic provisions afforded the assemblage areas and administrative offices must also be given to the general classeoom: adequate natural and artificial lighting, heating and ventilation. Prior to the 1920's educational planning allotted the classroom little more than these basic essentials in addition to seating equipment. "The small, inadequately equipped classroom of yesterday may have served well an academic program and a teacher-pupil relationship that was essentially authoritarian."[82] When the learning situation is such, the child spends his entire day in the classroom, leaving only at recess, noon, and dismissal time. He is instructed by one teacher in all subjects.

> Little attention is given in rooms of this type to adequate instructional equipment. Frequently equipment is selected after the building is completed, and often it is not well adapted to the available room space.[83]

Through the 1920's and 1930's, the educational planning of general classrooms began to include educational equipment necessary for a more creative and active learning situation. The size of the general classroom built averaged 24 feet in width and 32 feet in length.[84]

The schools built in Chicago during the 1930's did meet the standard of the average room which George D. Strayer found to be satisfactory (24'x32'x12'). Such classrooms, however, did not provide adequate space for activity programs.

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[82]Hamon, op. cit., p. 75.

[83]Spain, op. cit., p. 210.

[84]Strayer, op. cit., p. 95.

> In the old days, the standard of classroom space adequacy was the area it took to seat a student. Today, adequacy of a classroom is evaluated against the amount of floor space needed to permit a group of children under a teacher's guidance to carry on the range of educational activities called for in the over-all educational program of the grades to be served by the plant.[85]

However, the educational specifications of this era in Chicago did incorporate the storage needs in filing spaces, cupboards, and the like. Modern education in the 1930's required equipment in every classroom. This presented the problem of storage which is still not completely solved today. A breather wall could give a partial solution to this enigma. Chicago Public Schools that were constructed during the late 1920's and early 1930's have huge walls separating the classroom from the corridor, called breather walls. Plumbing, ventilation, and heat is supplied for the building through these passages. Also, recessed into these walls are the lockers on one side and the classroom cabinets on the other. The major advantage to building lockers and cabinets into the breather walls is that there are no dust ledges projecting into the room. "Projecting ledges of all kinds are to be avoided in classrooms because even superior custodial service does not reach out-of-way places, and these are always respositories for dust and carbon.[86] Secondly, it is a safety factor not to have protruding objects in the classroom or

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[85]Frank G. Lopez, "Schools for the New Needs" American Institute of Architects, Architectural Record. (F. W. Dodge Corporation, 1956), p. 5.

[86]Spain, op. cit., p. 183.

corridors; that is why most schools have their water fountains recessed into the breather walls. Also, if cabinets have to be installed within the classrooms, and it is necessary to build them away from the breather wall, then they should be carried up to the ceiling by means of a false wall, in order to give the appearance of a smooth surface.

Within the classroom the following built-in equipment was incorporated in the buildings built by the W.P.A. and the P.W.A. during the 1930's: a wardrobe closet for the teacher; a two, three, or four section cabinet with glass doors, drawers, and a small cupboard; diffusers which bring air for heating into the room (usually on top of the cabinet section) vents for removing air from the room (at floor level); corkboards; and blackboards.[87] Modern school construction in the 1900's thought it essential and innovating to have every available inch of free wall space covered with blackboards. Only since the late 1920's have trends and theories in illumination of the classrooms and beliefs in architectural school construction limited the blackboard to the front of the room and the corridor side only. The reason for this is that the chief obstruction to the proper diffusion of light is the blackboard. Another reason for eliminating the amount of space taken by blackboards is the fact that chalk dust is a sanitary handicap.

Chalkboards are placed for the pupils' benefit; therefore, it must be remembered that they should be low or high enough for the grade level of the

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[87]Samuels, op. cit.

students who will be using the classroom. Bulletin boards have taken over much of the area that was once given to blackboards. This trend started in the Chicago public schools that were built late in the 1920's and was carried through with federal W.P.A. and P.W.A. projects. Written work as well as other materials of interest can be displayed easier on a cork or bulletin board than on a chalkboard. The atmosphere, a significant factor in any classroom, is more pleasing with a broken pattern of chalkboards, bulletin boards, and painted walls, than with a dull black slate board which covers three-quarters of the classroom. The trim surrounding chalkboards and bulletin boards, and on cabinets, doors, and windows must be made of quality materials.

> All finished hardware in doors, windows, and cabinets should be rust proof and durable. Each article of hardware, like door-checks, door-stops, and locks should have permanent life, and should render dependable service during the entire life of the building. A minimum of maintenance should be involved.[88]

In the Chicago Public Schools a brass and steel compound was used on articles such as window handles, door locks, door hinges, door stops, and door handles. This was to insure long life and dependable service to the school. Brass is a compound which resists rusting, a common problem of moving parts. The steel alloy is added to the brass to help insure strength, since brass is a soft metal. Beneath each door is a metal strip which is attached to the floor. This strip is called a threshold and its purpose is to join

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[88]Strayer, op. cit., p. 43.

the classroom floor and the corridor floor; since the wood floor of the classroom cannot be perfectly matched to the terrazzo floor of the corridor, this strip must be made of a durable alloy which will withstand wear and help facilitate the cleaning of the rooms and hallways. The Chicago public schools that were built by the W.P.A. and the P.W.A. contracts used the very finest materials in this respect.[89] Locks, hinges, and door handles are still in operational service in these schools today.

Other miscellaneous built-in equipment included in Chicago school rooms during the 1930's was an electric clock, and electrical outlets for the use of radios, phonographs, projectors, and other electrical equipment.

In addition to the built-in equipment or storage space, administrative specifications must provide for educational furniture. Classroom seats are either fixed or movable. The fixed seat is generally constructed of a wooden desk and seat mounted on a metal pedestal, being rigid and inflexible. The movable seat which is constructed of either wood or wood and steel requires more floor space but offers increased flexibility to the teaching situation.

The teacher's desk is an important item. This desk should have panels on three sides which should not extend to the floor to permit sweeping; it should be adequately equipped with drawers, trays and filing equipment for record keeping.[90] The teacher's desk is usually placed in the front of the

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[89]Herber, op. cit., p. 72.

[90]Strayer, op. cit., p. 111.

classroom, and it is given a dull finish. The desks of the pupils should also have a dull finish to prevent glare and reflection of light, and should be stained so that they become impervious to hot water, soap, and disinfectants. The staining adds life to the wood. All tables and desks should be constructed of materials which are kiln dried, preferably, oak or maple, for their strength, hardness, and resistiveness to splitting.[91]

Classroom furniture should be selected for its comfort and contribution to good posture.

> Seat height should be such that the pupil's feet may rest flat on the floor and support sufficient weight to relieve pressure on the under side of the thigh at the front of the seat. When pupil's back is properly supported by the back rest, there should be three or four inches clearance between front edge of seat and inside angle of the knee. The seat should slope slightly down toward the rear, to overcome the tendency to slide forward. The seat should be shaped so as to distribute the weight over a large area without undue pressure at specific points. There should be no rail, ridge, or other obstruction at the rear of the seat which would prevent the extension of the buttocks beyond the back support.[92]

All the seating used in Chicago during this period of construction was of the fixed variety made of wood and steel.[93] This fact, along with the smaller classroom size which was discussed earlier, reflected the more formal teacher-pupil relationship existing within the educational programs in Chicago at the time.

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[91] Ibid.

[92] Hamon, op. cit., p. 86.

[93] Samuels, op. cit.

Specialized classrooms are beneficial to the operation of the elementary school but essential to the curriculum of the secondary institution. The art rooms, the music room, the science laboratory, and the vocational laboratories (foods room and various shops) within the school are different from the general classroom in two major respects. They differ in the amount of floor space and the amount and type of furniture used. For example, an art room will be on the average of two feet shorter, on the inside dimensions, than a regular classroom. The reason being that there is a greater need for cabinet space so that one wall will be entirely given over to the storing of pictures and supplies. In the Chicago Public Schools that were constructed by federal monies in the 1930's, a sink with hot and cold running water was installed in every art room.[94] Within the art rooms a wider top desk was installed in order to give the students a larger surface area to work upon, and to minimize the amount of accidents occuring with paints and water. Excellent natural lighting and artificial lighting should be provided for higher illumination levels for the suitability of color discrimination. A maximum amount of display space should be provided with a limited installation of chalkboards. Glass covered model display cases should be provided somewhere in the building for art exhibitions. The music class differs from the art room in the manner in which the students' desks are arranged. Whenever possible it is best to adjust the desks so that columns run the width of the room. With this pattern the rows going across the room are increased

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[94] Ibid.

and the columns going down the rows are shortened. In other words, the normal length of the music room is in reality the actual width of a general classroom.[95] The reason for this change in pattern is that it allows for better grouping in choral work. It is better to have vocal music surrounding the listener and spreading out width-wise, than it is for it to be coming straight forward and from the rear of the classroom.

For vocal work, tables arm chairs are sufficient, and orchestral work will require chairs and music racks; a piano is essential. Built-in cabinets should be provided for the storage of music books and instruments. The music room should be so located that sounds emanating from it will not disturb other classroom work, and therefore, it should be made as soundproof as possible.

Another specialized room is the science laboratory. In general, spacial dimensions do not differ from those of the multi-purpose classroom; however, the science room must provide facilities for demonstration, lecture, experimentation, and use of audio-visual materials. In the elementary school this can be incorporated into one room, while the secondary school may contain separate rooms for these functions.

> Four types of science facilities have been used extensively: (1) separate rooms for demonstration and lecture, and for experimentation and laboratory work by students; (2) a laboratory in which one area of the room is equipped with seats and a demonstration desk for recitation, lecture, and teacher demonstration, and another area of the same room equipped for experimentation by students; (3) a laboratory equipped with one-way facing science tables so that the entire room may be used for recitation, lecture, demonstration, or student experimentation for all the sciences usually taught in the

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[95] Spain, op. cit., p. 233.

> secondary school; and (4) a flexible laboratory for all types of science activities in which all fixed science tables, except the demonstration table, are arranged around the walls, a demonstration table and students' desk chairs are located near the front of the room. Types three and four conserve space, make programming easier, and are usually preferable even in the larger secondary schools where several science rooms are needed.[96]

The instructor's demonstration counter should include a sink, water supply, drains, gas connections, electrical outlets, upright rods with clamps, and similar required materials. Depending upon the branch of science being taught, the individual student table may or may not include similar services. If the laboratory is to serve for all of the sciences, services and fittings like those recommended for the demonstration table should be easily accessible to each student working table. It is essential that educational specifications designate the type of equipment and services to be used, so that the proper floor and wall connections at the correct locations can be installed at the time of construction.

Similar educational specifications must be established for the vocational laboratories. Home economics rooms are essential for the extension of the curriculum in cookery, sewing, personal hygiene, home sanitation, thrift, etiquette, and the like. Again, the elementary school should find one home arts room sufficient, while several rooms may be found necessary on the secondary level. One of the common secondary school arrangements in Chicago during the 1930's provided a special foods laboratory with six to eight kitchen units, each equipped to serve a group of four girls; and a separate

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[96]Hamon, op. cit., p. 59.

laboratory for clothing classes.[97] Generally, the foods classes have no desks; they are replaced with tables, chairs, stoves, sinks, and with areas reserved for the storing of provisions as well as utensils. The amount of space needed to operate within the kitchen is estimated to be about thirty square feet per student.[98] Therefore the normal class size of thirty students will need an area twice the size of a normal classroom.

> The combination homemaking room should be equipped with stoves, cabinets, table or counter working areas, serving tables, chairs, sewing machines, refrigerator, cutting tables, ironing boards, electric irons, washing machine, roll-away bed, and other equipment as may be required by the specific program to be accommodated.[99]

The entire program of homemaking education should be analyzed and provided for in relationship to the needs of the community.

The vocational shop program should also be planned to meet the specific educational needs of the local community. Shop rooms should provide facilities for planning, demonstrating, lecturing, and testing, as well as for manipulating tools and other equipment.

Educational planning should give special consideration to the safety of students and teachers.

> Particular attention should be directed toward provision of adequate areas for each activity; provision of visibility throughout the shop; arrangement of equipment to isolate machine operators from traffic and to provide adequate aisles of travel

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[97] Samuels, op. cit.

[98] Spain, op. cit., p. 244.

[99] Hamon, op. cit., p. 61.

> between various parts of the shop. Aisles of travel are particularly important from all parts of the shop to areas of common usage, such as tool rooms, storage rooms, and common machine areas. Other factors that have bearing on safety include provision for adequate natural and artificial lighting, proper painting of machines to distinguish moving parts and stationary parts, selection of proper floor materials for various shop activities, and provisions for fire protection as well as appropriate fire-extinguishing equipment, especially in areas used for spray painting.[100]

Shops should be located preferably in a wing of the building so that the working noise will not disturb other classes and also for the convenient delivery of supplies. In an interview with Mr. Sol Sammuels, it was pointed out that in the W.P.A. and P.W.A. projects the shop classes were always grouped together in one section of the building in the general high schools. In vocational high schools, such as Lane Technical and Chicago Vocational, the wings and desired floors contained the various shops. The designing of the shop classrooms in school buildings took careful consideration on the part of the planners and architects to maintain the flexibility necessary to adjust to the ever changing needs of the community. This implies the necessity of unassigned floor areas, equipment that is not an integral part of the building, an abundance of well-distributed service outlets, and design of the basic building structure and service systems to permit convenient and economical shifting of internal space divisions.

The Industrial Art shops may take anywhere from an area of thirty-five square feet per student to one hundred and thirty square feet per student

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[100] Ibid., p. 67.

depending upon the nature of the shop.[101] Watch repairing would naturally take the smallest amount of space per student, due to the inactivity of the work being performed; carpentry and airplane mechanics shops would require the maximum, due to the size of the materials and the danger involved in the work.[102] Most of the elementary schools built during this period in Chicago had one home arts room and one manual arts room; however, some of the smaller elementary school plants had one room devoted to both areas.[103] The secondary schools built in Chicago at this time offered through general shops, general-unit shops, and unit shops,[104] the following areas of industrial arts; mechanical drawing, photography, cabinet making, carpentry, ceramics, graphic arts, electricity, radio communications, foundry, forging, sheet-metal work, automotive and motor mechanics, airplane mechanics, leather work, plastic work, printing, watch repairing, tailoring, painting, and plastering.[105] W.P.A. and P.W.A. construction projects, which were created to help alleviate unemployment still demanded highly skilled craftsmen; so that

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[101] Hamon, op. cit., p. 143.

[102] Samuels, op. cit.

[103] Ibid.

[104] A general shop is one in which all industrial arts activities are carried on in one major area. A general unit shop is one in which all activities in a particular industrial area are carried on in a single shop. A unit shop is one in which a specialized activity within an industrial area is carried on in one shop.

[105] McCahey, 1937-1938, op. cit., p. 482.

during the depression, students pursued these areas of course work more so than they do today. It should be noted that three out of eight high schools built during this period were vocational schools.

This Chapter III has shown guide lines in determining proper design and utilization of rooms for a school plant. Since the majority of space within every school building is mainly non-instructional but essential to the general operation, good design and utilization produces a balanced working school. Every school built between 1934 and 1938 incorporated assemblage spaces, administration offices, general multipurpose rooms, and special rooms. It was shown that the Chicago Board of Education felt that the auditorium was an integral part of every school. Furthermore, gymnasiums and libraries strengthen the education program. The Board of Education also felt that Administration offices should contain a larger area than had been normally designated to this location, to provide for a more efficient working school. The general multi-purpose room in the W.P.A. and P.W.A. built schools had motivations such as larger breather wall, less chalk boards, and school furniture. Finally the special rooms showed a new trend in vocational courses. The great emphasis which was placed on vocational courses resulted in the building of three vocational high schools between 1934 and 1938. Thus the ability to provide proper design and utilization of a school contributes to a better educational program to meet the needs of the students.

CHAPTER IV

THE AESTHETICAL ASPECTS OF SCHOOL BUILDING ARCHITECTURE

Chapter II stated that praiseworthy architecture must possess both functional purpose and aesthetical qualities. If the design is pleasing to the eye, the aesthetical qualities of architecture, for the most part, are fulfilled. The scope of Chapter IV is to designate the aesthetical values of the school building construction during the period, 1934 to 1938.

Through the 1920's and early 1930's a new philosophy of education began to emerge. The purpose of this new education was the development of individuals who could live successfully under a democratic form of social organization. The objective of education changed from emphasis on knowledge and academic skills to emphasis on ideals, attitudes, and social skills. This new philosophy was reflected in the educational designing of the school plant.

In the article, "Architecture for School and College Buildings," Guy Study states that:

> A school building is well designed when it successfully fills it's purpose. The whole school plant should work towards the education of youth and help to cultivate appreciation of the finer things in life. School children spend many hours of their lives in school, the English-speaking peoples have always held the theory that environment has an important influence on the character of youth. If the architecture of a school building possesses all the qualities of good design - simplicity, beauty of proportion, grace of line, harmony in the selection of materials and colors, its influence upon youth

> cannot fail to be elevating. Good architecture inherently expresses dignity and nobility of character.[106]

Similarly, Charles L. Spain expresses the opinion that:

> The beautification of the school plant, both within and without the building, is also closely related to the instructional program, since one of the functions of the school plant is to exemplify the ideals of public education and furnish inspiration.[107]

The two qualifications of aesthetics which this study will consider are that of the school plant exterior (site, landscaping, masonry) and the school plant interior (color and design of corridors and rooms).

Our first consideration of the school plant exterior is the placement of the building on the site.

> The school building, because of its particular function of both molding and expressing the ideals of the community, should be so located upon the site that it will command the attention of those passing, and at the same time be most accessible to the students. An aesthetic blending of the building with its surroundings.[108]

If it does not present a picture which is pleasing to the eye, how can the student be convinced that he will find within the school walls something which is pleasing to the mind?

> The placing of the building upon the school site should not be done without consideration for the appearance of the ultimate plant. Although two factors, orientation of the building and recreational facilities, take precedence over the aesthetic aspect, there is much

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[106]Guy Study, "Architecture for School and College Building," American School and University, (1932-1933), p. 29.

[107]Spain, op. cit., p. 99.

[108]Strayer, op. cit., p. 24.

> value to be derived by children from daily seeing before them a beautiful layout dedicated to their own education. Consideration of this factor in planning does not entail additional expense, but does call for some thought at the time the plans for locating the building are drawn.[109]

The general locality of the school plant should offer the most favorable influences of nature: broad spaces, sun, shrubs, and flowers. Carl F. Pilot states in "Planning and Planting School Grounds."

> The movement for more inviting school grounds is becoming nation-wide and it is one of the finest features of our present-day life. It is a part of the general recognition of the beneficial effects of good environment upon children and young people in promoting the self-respect and the respect for society that are essential to good citizenship.[110]

Landscaping is of prime importance in the development of the school plant. The best architectural conception may be improved by the skillful use of trees, shrubs, flowers, and grass. In "Recent Trends in Landscape Architecture for School Grounds," A. R. Nichols writes,

> It is the duty of every school to make its surroundings aesthetically attractive. There is a breaking-away from the old type of barren grounds with few trees and unrelated playgrounds, and there is evidence of some definite and excellent thinking in regard to the importance and arrangement of the grounds themselves. Their buildings are being located in an orderly, logical relationship, and their grounds are being given warmth and interest by luxurious planting.[111]

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[109] Ibid.

[110] Carl F. Pilat, "Planning and Planting School Grounds," American School and University (New York: American School Publishing Corporation, 1931-1932), p. 197.

[111] A.R. Nichols, "Recent Trends in Landscape Architecture for School Grounds," American School and University (New York: American School Publishing Corporation, 1930-1931), p. 198.

Whenever possible the project engineers and the Chicago board engineers made every possible consideration to preserve the existing trees and shrub growth.[112] In all cases, after the buildings were completed in Chicago, the W.P.A. and P.W.A. workers planted trees and shrubbery in order to give the school a greater aesthetical appeal.

> Choice of plants is necessarily limited to those varieties of trees and shrubs that require minimum maintenance. Plants requiring frequent clipping or spraying are, of course, ruled out. Except under certain conditions, shrubs should be of varieties that can take considerable wear and tear and that can tolerate normal amounts of dry weather.[113]

The W.P.A. and P.W.A. landscaping workmen were aware of the fact that children make available and utilize the facilities nearest to them; therefore, the trees were of a hardy variety, and ones that would grow quickly. Many of these trees still stand today, and are of the elm family. "In any area as intensively used as a school playground drainage is an important problem."[114] In many instances the board engineers and architects thought this to be so important a matter that they either tiled the playground or had a sewer system installed under the playing area to facilitate drainage.[115] This was done at a considerable expense to both the W.P.A. and P.W.A. projects and the city of Chicago, and in most cases it is always to be avoided. The fact that both the

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[112] Samuels, op. cit.

[113] Pawley, op. cit., p. 93.

[114] Ibid.

[115] Samuels, op. cit.

city and federal architects felt it necessary to perform this type of expensive construction gives us an idea of the quality of their work in other areas.

The quality of work is similarly reflected in the building plan. In no way did the architects ever plan a building that would detract from a community. The buildings were designed to be the pillars of the neighborhood. As stated by Philip Johnson in his article entitled, "Modern Architecture for Efficiency,"

> Skill in proportioning, careful handling of the decorative elements (window and door frames, foundation and wall capping), and the selection of appropriate and beautiful surface materials are the bases of esthetic effect on modern buildings, as they are of all great architecture of the past.[116]

In all cases in Chicago the school buildings built in the 1930's were of brick and cement structures with reinforced steel skeletons. One type of brick, known as face brick was used in two colors, reddish brown and yellow. A question may arise as to what is face brick. Generally, there are two types of outside brick: face and common, face brick being more expensive. Face brick is used on the front part of a house or the part which is most exposed to the public; common brick is the brick that is used in the back part of the home, or generally the brick that is used in the rear and alley view of apartment buildings. The schools that were built in the 1930's in Chicago did

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[116]Philip Johnson, "Modern Architecture for Efficiency, American School and University (New York: American School Publishing Corporation (1932-1933), p. 32.

not use any common brick; all parts of the building used a grade of face brick.[117] The idea of the entire building being constructed out of face brick gave the school a look of quality. It alleviated the drab feeling of the past, instituting a more optomistic look toward the future.

Similar to the brick work, the school entrances gave a vision of elevation to the future of education by being selective of both aesthetical and educational aims.

> About the entrances of a school building there should be an atmosphere of invitation to participate in the learning processes. The realization that the school building affords opportunities for advancement and participation in the social order should be given to both children and adults. By appropriate insciption and architectural treatment, the entrances to a school building should create these impressions.[118]

The schools built during this period in Chicago made little use of inscription beyond that of naming the school and designating the entrances to the auditorium and gymnasium. However, the quality of material and exterior design, landscaping, and play areas measured up to a very high standard of the time.

Our second consideration in determining the aesthetical qualities is the school plant interior: the color and design of corridors and rooms. The school building should symbolize the permanence and character of the public education program it serves.

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[117] Samuels, op. cit.

[118] Strayer, op. cit., p. 30.

> The building within its setting should express the purposes of mankind in giving the maximum of opportunity to its youth and in leaving an inheritance of past human achievement upon which future generations are to build. The mere housing of school children is not sufficient. Brick and stone, and concrete and steel should be utilized to inspire ideals and to give lofty purpose to the educational program.[119]

During the depression, the effect of the new school buildings was to be one of encouragement towards the advancement of aesthetics as well as towards the improvement of general living conditions. In general, the buildings in Chicago built by the W.P.A. and P.W.A. were to maintain standards of simplicity, beauty, and architectural authenticity.

> The school environment should be really beautiful. To the initial requirements of cleanliness, order, and comfort should be added the charm of soft color, of lovely form and proportion in the school building furniture, and the helpful suggestions of beautiful pictures and casts. Such beauty has a refining influence that nothing else can supply, and the pride in lovely things possessed in common is a strong tie between the members of the school. Children respond to beauty with reverent delight, sometimes when other means fail to arouse them.[120]

In conjunction with this, it was felt that corridor walls should not be left barren and ugly. Whenever possible, decorations and historical settings were incorporated. A fine example of this is Lane Technical High School which is located at 2501 W. Addison Street. Huge murals of historical settings are painted on the corridor walls and in the lunchrooms. These settings help widen the educational horizons of the students. The only cost charged the Board of Education of the city of Chicago by the federal government was the purchase price of the paint. This represents a few dollars as compared to

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[119] Ibid.

[120] Ibid., pp. 38 and 40.

the cost it would take to do that today. Another example is a mural painted on the fire curtain in the assembly hall at Charles P. Steinmetz High School, 3030 N. Mobile Avenue, for which the W.P.A. charged the Board of Education only 135 dollars, the purchase price of the paint.[121] Today such an undertaking at Charles P. Steinmetz High School would cost the Chicago Board of Education several thousands of dollars.

Artistic murals should not be the only aesthetic consideration accorded the corridors and rooms; the entire color scheme must be carefully planned.

> Whenever we look we find color and consequent cheerfulness in the ascedency. No longer is the schoolroom treated as a penal or disciplinary institution. The tendency is to make learning a pleasure and its temple inviting.[122]

Two major considerations affecting the choice of decoration and color scheme are the sufficient provisions of light and the artistic effect. The effect of color and illumination on the conservation of eyesight was discussed in Chapter II.

The color scheme throughout the entire building should be a harmonious one. There is a relationship of relevant importance between color and climatic conditions.

> ...the choice of colors will be determined by the climate, the relative amount of sunshine during the school year, and the orientation of the building. The interior color scheme in Denver and Los Angeles would vary from that of Portland, Maine, or of

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[121] "Federal Arts Projects," Steinmetz Star, Sept. 28, 1939.

[122] Heckel, op. cit., p. 131.

> Superior, Wisconsin. In northern sections of the country decorations should be warmer in tone than in southern sections. The same rule in modified form applies to north and south exposures. To prevent undesirable light reflections, only flat colors should be used for walls, ceilings, and wood trim. Glossy woodwork particularly golden oak, is neither desirable nor artistic.[123]

As mentioned above, careful consideration should be given to the relationship of the woodwork to the wall treatment. In order that classroom harmony may be secured, wood trim should not be considered by itself but in relation to the walls. In all the Chicago Public Schools built in this period (1934 to 1938) the craftsmen incorporated rich browns, walnut, natural oak, or stained woods, in deep color combinations to produce a successful aesthetic atmosphere. Other rooms in this period did deviate from the general color scheme, but they derived their decoration and color from the purpose served: such as the kindergarten. The kindergarten did so by putting story book pictures on the walls as well as primary drawings. However, harmony must prevail in all areas: curtains, hanging murals, decorations, pictures, and equipment should all contribute to the delightful color effect of the room.

In conclusion, Chapter IV has pointed out that architecture must possess aesthetical qualities in order for it to be considered praiseworthy. School buildings must maintain a balance between form and beauty. This Chapter has shown the ideology of the new philosophy as pertaining to school architecture. This ideology includes the site, landscaping and masonry of the exterior of the school building and the color and design within the school building which

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[123] Spain, op. cit., p. 215-216.

leads to greater aesthetical balance between the animate and in-animate structures dealing with the learning process.

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

At the outset of this paper we stated that our purpose was to analyze the factors that influenced Chicago public school building construction from 1934 to 1938 and to evaluate the influence of the Federal Works Progress Administration as well as the Public Works Administration upon school construction in this city. We found that out of many long-ranged plans, boards of education consider school construction a most difficult task. Many considerations must be evaluated: (1) the acquisition of funds, (2) the educational program to be housed, (3) the architect, and (4) the materials of construction. Furthermore, exacting specifications had to be created by the administrative staff to fit the educational needs of the program.

We then listed two main criteria for praiseworthy architecture: functional purpose and aesthetical quality. The first consideration of functional capacity was good site selection which would be residential in nature and distant from traffic arteries and similar disturbances. Our second consideration of functional capacity was fire resistant materials. This topic dealt with the construction of stairs, landings, platforms, and enclosing stairway walls. Thirdly, interior construction of entrances, corridors, and basements, and their use were discussed. Next we considered the service systems of heating, ventilation, lighting, fenestration, and sanitation.

Finally, we discussed the utilization and design of the interior: assemblage areas, administrative offices, and all types of classrooms.

Our second criteria, aesthetical quality, included a critique of the exterior and interior design of the building.

From this we now conclude that these two federally supported programs made two major contributions to the city of Chicago: work for the unemployed skilled craftsman and the erection of useful public buildings. As a segment of this program, forty-eight school buildings were constructed from 1934 to 1938, eliminating sub-standard school facilities which included 614 portables. However, in twenty-four of the forty-eight instances the schools were located on or within one block of a major traffic artery, thus not fulfilling one requirement of good site selection. The reason or conditions for these locations has not been determined. Whether the fault lay with the federal or local administrators is not the concern of this study. Provisions for playgrounds and sufficiently landscaped campuses can be considered poor for many of these twenty-four schools, again due to poor site selection.

All of the schools built in Chicago from 1934 to 1938 maintained the highest codes for fire proof construction in that they were structured of masonry and reinforced steel; stairways, landings, enclosing walls of stairways, and hallways were built using steel, marble, concrete, or terrazzo which are all considered quality fire resistant materials. Interior construction performed by the W.P.A. and P.W.A. projects more than fulfilled the minimum building code standard requirements of entrance and corridor dimensions and also insured better safety and health conditions by designing basement dimensions unusable for classroom utilization.

The service systems installed by the W.P.A. and P.W.A. surpassed previous installations in many and varying degrees of operation. It must be remembered that all the portables and many of the existing antiquated structures contained no form of centralized heating. Ventilating systems in the new structures provided for sufficient air temperature, air supply, air cleaning, and humidity control where again the portables failed.

Prior to 1934, school construction lighting requirements stood on the average of one square foot of window space to five square feet of floor space. However, in the W.P.A. and P.W.A. projects the standard was raised to one square foot of window space to four square feet of floor space. Similarly, artificial lighting intensities were increased through heavier wire installation and larger wattage bulbs.

Sanitation was imrpvoed by the installation of shower facilities in all the high schools and the installation of toilet rooms on each floor in all schools. We must again note that the portables had only outside provisions for toilets and older structures usually had one washroom area located in the basement. The use of the breather wall in room-corridor construction was improved in the W.P.A. and P.W.A. projects. Wooden lockers were replaced with metal lockers; larger electrical, heating, and plumbing services were brought through the breather wall; and at the same time greater provisions for storage within the wall was supplied. Greater considerations to specialized areas and rooms were made at this time, such as the auditorium, gymnasium, library, art room, music room, science laboratory, and specifically the vocational laboratories. All high schools built between 1934 to 1938 had a minimum of six vocational shops: two home arts rooms, one

print shop, one metal shop, one general shop, and one wood working shop, whereas the vocational schools centered their entire educational program around the curriculum of the industrial arts. It was noted that three out of eight high schools built during this period were vocational schools: Lane Technical, Dunbar Vocational, and Chicago Vocational High School.

The aesthetical appeal of the school building exterior was improved by the use of face brick upon the entire building, which represented costly construction. Inscription and pictorial settings were not used extensively on the exterior which may have been an indication of the depression years. However, all buildings remained within a modified form of Gothic architectural styling but in a less ornate fashion. The interior of the school buildings incorporated warm color combinations contrasted with stained wood finishes of oak and maple to give a harmonious home-like atmosphere. Huge murals, presumably, taking extensive time and talent, were painted on corridor walls, in lunchrooms, and in auditoriums. This can be interpreted as an aesthetical and educational inspiration to the students and all members of the community.

Thus we can conclude that the Works Progress Administration and the Public Works Administration were the most significant factors contributing to school construction in the city of Chicago between 1934 and 1938.

A Chinese philosopher, Lao-tsze, stated approximately 2500 years ago, "The reality of a room is not in the four walls but in the space enclosed."[124]

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[124]Eckardt, op. cit., 3-4.

Good architecture is design in space. It is space which conditions and is conditioned by light, color, form, texture, sound, air, furniture, storage, water and power supply, and waste disposal. Good architecture works with its region and climate, encourages safety and is fire safe. It is designed to be easier to take care of and to maintain in quality condition. All these dynamic forces and elements should shape the building and through coordinate expressions become an aesthetic experience. School architecture combining all these forces and elements of design can still be functional thirty to fifty years from the time it is built. If the school building allows enough flexibility for improvements and alterations and has an adequate site for additions, it can become beneficial to many generations of school children. A proper environment for teaching and learning can be designed without added expenses. Good school architecture is not primarily a matter of money but of professional ability on the part of boards of education and architects.

The intangible aspects of school architecture include the cultural benefits of lasting satisfactions, experiences of beauty, and the understanding of life and the world around us. This includes social adjustment to our times, and more intelligent decisions of citizenship, vocations, and personal life.

Ideally, there should be continuous cross-stimulations between cultural and vocational values. Manual skills are not menial. Unless children learn early that there is not a hard and fast line between these two, they stand to lose the values of many natural and normal life experiences. The special rooms for any school plant are by no means mere decorations, but a part of the total function of education. Inclusion of vocational skills early in the

school experiences is a step towards broader visions and understandings of others.

The modern school plant, as with any modern architectural structure, must maintain an aesthetical essence: a complete balance of form and beauty. Frank Lloyd Wright sums this up by saying:

> Thus environment and building are one: Planting the grounds around the building on the site as well as adorning the building take on new importance as they become features harmonious with the space-to-be-lived-in. Site, structure, furnishing -- decoration too, planting as well -- all these become as one in organic architecture. What was once called "decorating" -- landscaping, lighting, etc. -- and modern gadgetry...all are within the building structure as features of the building itself. Therefore all are elements of this synthesis of features of habitation and harmonious with environment. This is what posterity will call "Modern Architecture.[125]

My recommendations for school administrators and architects are that they initiate (1) greater detailed and all-inclusive educational specifications as to the curriculum and needs of the plant being constructed, (2) greater amalgamation of cultural and vocational values through the educational program, (3) greater aesthetical balance between the animate and in-animate structures dealing with the learning process.

This should be a start toward good and economical school architecture; a valuable space for teaching, a valuable space for learning, and a primary educational asset.

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[125]Frank Lloyd Wright, A Treatment, Bramel House, p. 227.

BUILDING PROJECTS COMPLETED BY THE WORKS PROGRESS ADMINISTRATION AND THE PUBLIC WORKS ADMINISTRATION

1. Alcott Elementary School
2. Bradwell Elementary School
3. Bright Elementary School
4. Caldwell Elementary School
5. Chappell Elementary School
6. Dever Elementary School
7. Dunbar Vocational School
8. Du Sable High School
9. Emmet Elementary School
10. Esmond Elementary School
11. Farren Elementary School
12. Forrestville Elementary School
13. Foster Elementary School
14. Goudy Elementary School
15. Grace Elementary School
16. Hayes Elementary School
17. Hyde Park High School
18. Jamieson Elementary School
19. Jones Commercial School
20. Kellogg Elementary School
21. Kenwood Elementary School
22. Kilmer Elementary School
23. Lane Technical High School
24. Le Moyne Elementary School
25. Lewis - Chaplin Elementary School
26. Locke Elementary School
27. Lyon Elementary School
28. May Elementary School
29. Mount Greenwood Elementary School
30. Nettlehorst Elementary School
31. Newberry Elementary School
32. Norwood Park Elementary School
33. Oakenwald Elementary School
34. O'Keefe Elementary School
35. Phillips Elementary School
36. Phillips High School
37. Prescott Elementary School
38. Riverdale Elementary School
39. Rogers Elementary School
40. Ross Elementary School
41. Ryder Elementary School
42. Ryerson Elementary School
43. Sauganash Elementary School

44. Sherman Elementary School
45. Steinmetz High School
46. Vocational High School
47. Volta Elementary School
48. Wells High School

PROJECTS NOT YET COMPLETED BY 1938

1 Gage Park High School
2. Taft High School

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INTERVIEWS

Mr. Ian A. Campbell, Principal of the Oakenwald South Intermediate and Upper Elementary School.

Mr. Sol Samuels, Director of Planning and Construction for the Chicago Board of Education.