Section B.—Trends in School Architecture and Design [2]

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Schools of Last Century

Architectural design of school buildings, in a broad sense, may be viewed as an expression of the attitude of people toward education. Changes in design over the years and variations in treatments among places reflect gross shifts in the positions which education has held in society. To be able to recognize basic alterations as contrasted to mere improvements in building design, it is almost essential for one to review the history of school architecture and to evaluate new changes in the light of new educational emphases.

Reviewing the architectural history a hundred years ago, one finds many educators of that period describing schoolhouses as shabby and neglected structures. Barnard (5) wrote:

> Go where he would, in city or country, he encountered the district school-house, standing in disgraceful contrast with every other structure designed for public or domestic use. Its location, construction, furniture, and arrangements seemed intended to hinder, and not promote, to defeat and not perfect, the work which was to be carried on without and within its walls.

Mann (16), in his report of the Massachusetts Board of Education, stated that the sums expended for the erection and repair of schoolhouses "fell but little short of seven hundred thousand dollars" during the five-year period. This report went on to say that "in regard to this great change in schoolhouses it would hardly be too much to call it a revolution. . . ." In New York State at this time there were approximately 9,368 school buildings of which 7,685 were of framed wood; 446 of brick; 523 of stone; and 707 of logs. Only 1,541 of these schools had suitable playgrounds according to Young (21).

Many of the schoolhouses of about 1845 were located on the principal highways with little or no playground, and lacked shade, trees, and restful, quiet environment. Reports of the state of Connecticut indicate that classrooms were 7 feet in height, 17½ feet wide, and 18½ feet long, holding thirty children. One report stated that eighty pupils were housed in a room 19½ feet square. Another showed that sixty or seventy pupils were housed in a room 7 feet high and 17 feet square. Many of the buildings were twenty to forty years old.

In 1832 the American Institute of Instruction said that ". . . if we were called upon to name the most prominent defect in the schools of our country, that which contributes most, directly and indirectly, to retard the progress of public education, and which most loudly calls for a prompt and thorough reform, it would be the want of spacious and convenient

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[3] Assisted by Roger L. Downing and Andrew L. McIntosh.

schoolhouses." The schoolhouses prior to 1850 were badly located, exposed to noise and dust. They were small, badly lighted, not properly ventilated, and poorly warmed. The seats and desks were not comfortable or conveniently arranged. There were few or no blackboards, maps, or other apparatus and fixtures. There were no trees or shrubbery, no well, no sink or basin or towels, and no toilet facilities.

Barnard (5), in a book concerned primarily with the design of schoolhouses from the point of view of educational use, gave considerable emphasis to ventilation, heating, and sanitary facilities. He also recommended seats and desks to be made to fit young children and not adults. He listed apparatus which should be included in every classroom. He stated that every recitation room should be lined with blackboards. He recommended slates for every scholar, a clock, a linear measure, compass box, and "articles which the pupils can touch, see, examine, experiment with, copy on the slate or blackboard." Barnard also wished to make the schoolhouse a depository of the district library "open to teachers, children, and adults generally of the district, for reference and reading. . . ." He went on to say that "the farmer, mechanic, manufacturer, and in fine, all the inhabitants of a district, of both sexes, and in every condition and employment of life, should have books which will shed light and dignity on their several vocations, help them better to understand the history and condition of the world and country in which they live, their own nature, and their relations and duties to society, themselves and their creator."

However, the use of the schoolhouse by adults was limited to the library, as is indicated in the following: "In small villages, or populous country districts, at least two school-rooms should be provided, and as there will be other places for public meetings of various kinds, each room should be appropriated and fitted up exclusively for the use of the younger or the older pupils." In 1858, Johonnot (14) wrote a book which was the first real effort to apply the principles of architectural science to the construction of schoolhouses. Johonnot (15) broadened his efforts in 1871.

During the period immediately following the Civil War, there was a tendency toward the architectural development of schoolhouses. As Johonnot stated (15):

> For the past few years architectural science has made rapid and decided progress. . . . Evidences of this progress may be seen in the superior elegance of the modern public edifices and private residences of our cities and villages. . . . Of all the buildings, however, the last to feel this progressive impuse were schoolhouses.
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> The old log school-houses can be remembered by most of the older inhabitants. It was a necessity of primitive times, and was on an equality with the dwellings of the people. A better kind of structure has succeeded it, though we find in the last report of the Superintendent of New York (1870) that one hundred and twenty log schoolhouses are still in existence in the Empire State.
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> The reports of the Superintendents of several States within the past few years, show that an improvement has gone on in many sections, indicating a genuine educational revival. And yet a large proportion of the schoolhouses in the country are but illy adapted to meet the high requirements of modern educational ideas. Even the newer and costlier houses are often built without proper knowledge of the wants and neces-

sities of the school, while a very large number of the older houses are utterly unfit for human occupancy.

The buildings to which Johonnot referred were of poor construction. The foundations were weak. The building materials were of the cheapest kind. The seats were without backs and often were too high to permit the feet to touch the floor. The rooms were crowded and the ceilings were low. There was no ventilation except that which was offered through small windows. In many cases there were no privies. The buildings were generally located at corners where several roads met, with no playground space except the streets even in country places where land was cheap.

These conditions led to emphasis on health, comfort, convenience, and cost. These elements were prerequisite to the proper development of an educational program, but because of their importance little was written about the design in terms of facilities for enhancement of the educational program. About this time New York State passed the law giving the right of eminent domain for school sites. This permitted the establishment of schools on the most favored sites. Recommendations were that schools have at least one acre of land. Out-buildings were recommended by Johonnot (15), but Eveleth (10) showed plans for buildings in which toilets were made an integral part of the main structure.

The architectural designs of the schoolhouses of this period were of American origin. The city schools were two and three stories in height and extremely plain on the exterior. An English writer (18) in discussing American schools stated that ". . . the architectural character is that of a detached, well-built warehouse. The architectural designs . . . are extremely plain, not particularly school-like in character, and of no special English interest. . . ."

Early Twentieth-Century School Buildings

The latter part of the nineteenth century brought revolutionary changes in schoolhouse design. The introduction of steel for supporting members, the increase in use of brick bearing walls, central heating and ventilating plants, the advances in architectural design, and the need for larger buildings established a new era of school construction. Perhaps the most significant phase of this movement was the development of detailed plans and specifications for each individual building. Previously, standard plans were given to contractors with only the most abbreviated specifications.

In 1901, Wheelright (19) wrote a treatise which gives striking evidence of changes in schoolhouse architecture when comparison is made with Johonnot's book (15). It should be noted that many of the buildings of the early 1900's are in use today. The plans of the elementary-school buildings were quite similar in several respects. Play rooms and toilets for each sex were provided in basements. The first floor contained classrooms ranging from 25′ x 32′ to 28′ x 37′. Invariably the assembly room was placed on the second or third floor. An office for the principal and a manual training room were sometimes provided. Fixed seats, extensive blackboard space, and a limited amount of equipment were found in the classrooms.

The high schools built in the cities during this period contained laboratories, gymnasiums, lunchrooms, assembly rooms, and auditoriums. The gymnasiums, locker rooms, and toilets were located in the basement, as was the case in the elementary school. Architectural design of many of the buildings was transmitted from the Teutonic countries and the simple colonial boxes gradually disappeared except in rural regions during the early twentieth century.

In 1921, Donovan (6) contributed to the literature of the field. Expressing a motive for school architecture, he stated:

> There is nothing more impressive or hopeful in American democracy than the devotion of the people to education. . . . Unconsciously the spirit has been to represent truly this national devotion to education in the architecture of public schools.
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> One of the important functions of school architecture is to sell education to the public. This is accomplished by making attractive that side of education which the public sees most.

During the period 1850 to 1920, school architecture advanced from the low point of complete neglect to a high point of monumentalism. School buildings changed from small, shabby units to large, beautiful edifices, glorifying the people's devotion to education. The interior planning, however, expressed little change in educational method except, perhaps, in those elements of the schooling process associated with larger pupil population. The perfection of administrative technics for handling large schools was an important factor influencing interior planning. The suggestion of a mechanized process of education has been expressed in the not infrequent factory-like design of school buildings during the past few decades.

Recent Developments

In the last issue of the school plant volume of this REVIEW (16), several important points were made foreshadowing the possible basic changes in school architecture. These points may roughly be divided into three categories, namely: those growing out of added responsibilities of the schools, those developing through new materials and methods of construction, and those which are created by a broad recognition of the changing place of the school in the community.

The addition of health clinics, general shops, gardens, and other activity centers represent added responsibilities and changing methods. The earthquake-proof construction of California schools, the use of plywood walls, insulation, and acoustic treatment illustrate changes brought about by new methods and materials available to architects. These changes, however, merely tend to improve and expand traditional school design. The classroom unit still remains. The exterior façade is still monumental with its columns, massive entrances, terraces, and bell towers. In some cases the so-called "modern" architect has shorn the façade of ornament, but he has frequently retained the monumental character by distribution of masses.

Here and there throughout the country there appear signs of another basic change in school architecture. It is primarily a movement away from the monumentalism of the past four decades. People are not using their school buildings to sell their communities. The school building is being developed as a more intimate and better integrated element of the community, a place closely associated with child and adult living. It is more of a community workplace and recreation center. Location on a main highway or on a hill as a vantage point for attraction of potential citizens has been discarded in favor of sites more intimately associated with community living.

Engelhardt and Engelhardt (9) expressed this changing attitude when they said:

> The modern school architecture, if it is to be an honest expression of the place of the school in present-day environment, must accept as its theme participation by all members of the community. It must express informality. The break with the past must be based on the elimination of institutionalism. Security must be expressed not by monumentalism, but rather by stimulation and attraction which bid all welcome to the school in times of need. Then, too, the truly modern style must express function, and the functions of the school are as varied as life. Flexibility of these functions to meet the needs of a dynamic society should be a vital consideration.

These changes were also reported in the *Architectural Record* (4):

> In 1939 and 1940 Architectural Record's Building Types studies on schools reported numerous changes in school design principles which educators advocated. In teaching practice there has come to be an increasing emphasis upon laboratory methods, in even the most static subjects; and the pupil's school life is being integrated with the community—and vice-versa. Also, the past few years have introduced a need for structural economy, and it has been recognized in many parts of the country that requirements change so rapidly that the plan must be flexible, the entire plant dynamically useful.

In contrast to the architectural motive expressed by Donovan (6) twenty years ago, it is interesting to note the emphasis in a recent letter of an educator to his architect published in *Architectural Forum* (2):

> All the architecture shall be a setting for childlife. Everywhere children and what they can do shall be the adornment of the structure. The building itself shall be the place of joy in living. But I must warn you. It must be a place which permits the joy in the small things of life, and in democratic living. These two things we must safeguard in children's lives. The building must not be too beautiful, lest it be a place for children to keep and not one for them to use. Its materials must be those not easily marred, and permitting some abuse. The finish and settings must form harmonious background with honest child effort and creation—not one which will make the children's work seem crude.
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> Above all the school must be childlike—not what adults think of children. At the same time it should be dignified, and playful, but not a playing down to children. It must be a place for living, a place for use, good hard use, for it is to be successively the home, the abiding place for a procession of thousands of children through the years. It must be warm, personal and intimate, that it shall be to each of these thousands "My school."

Campus Plan

Harrison (13) has envisioned many basic changes in schoolhouse design—"The modern school building should be a building that invites people to enter." Engelhardt and Engelhardt (9) pointed to the "campus" or "open" plan as a design trend:

> Some indication of the trend in the design of community schools is to be found in the wider acceptance of the "campus" plan. This plan calls for small separate units connected by arcades or passageways and attractively grouped. This type of arrangement is quite flexible and eliminates much of the institutional atmosphere of the large, compact structures.

Much emphasis has been given to the open plan in California. It is possible that this development has not grown so much from changing educational practice as it has from structural needs. The *Architectural Record* (3) pointed out in connection with a school at El Monte, California: "Two factors determined the choice of open plan, with departments housed in separate structures: the local soil-bearing value was very low; the buildings had to be designed to resist earthquake stresses." Engelhardt (7) recommended the campus idea and suggested that its absence is a definite limitation of the older type of school. Wright (20), in his study for his model community, Broadacre City, stated:

> The school problem is solved by segregating a group of low buildings in the interior spaces of the city where the children can go without crossing traffic. The school building group includes galleries for loan collections from the museum, a concert and lecture hall, small gardens for the children in small groups and well-lighted cubicles for individual outdoor study; there is a small zoo, large pools, and green playgrounds. This group is at the very center of the model and contains at its center the higher school adapted to the segregation of students into small groups.

Community Centers

In a comprehensive study of the use of high schools as community centers, Fulcomer (11) definitely indicated a trend in the use of school buildings by adults. Although many of the buildings analyzed by Fulcomer had some community use features, there were few which could be considered complete community centers.

Fulcomer (11) also studied PWA requests for community buildings aside from schools and found that:

> With the exception of the police court and detention allocations, there is not a single facility indicated in these community building plans that is not a common feature of secondary plants. In fact, such space allocations are those most frequently represented in the plans analyzed. The provision in the secondary school building of these facilities would serve both the high school students and adults to advantage, as the discussion of the community nature of many needs of both groups has already indicated.

Engelhardt (8) has expressed one of the problems of the use of schools as community centers as follows:

> There are very few communities in the United States where some integration of school and community life is not taking place. The question that each community

should raise is whether the school cannot function in the economic rehabilitation and social recreation of all its citizens, and how the community program can be best developed toward this end. The institutional character of many schools has been a barrier to widespread community and adult use. In many instances adults have so disliked the formal school program of their youth that they tend to refrain from entering school buildings again. The very atmosphere of the school is repressive to them. A discovery of the degree to which this is true in any community might well result in rethinking the existing program for the community's youth.

Hare (12) wrote on the relation of the public school to the development of the community theater.

Bibliography

1. ABRAMOVITZ, MAX. "The School Can Be an Esthetic Contribution to the Community." *American School and University, 1941.* New York: American School Publishing Corp., 1941. p. 37-39.
2. *Architectural Forum* 75: 80; August 1941.
3. ARCHITECTURAL RECORD. "High School, El Monte, Calif." *Architectural Record* 89:41-50; April 1941.
4. ARCHITECTURAL RECORD. "New Schools for Old." *Architectural Record* 89:81-87; June 1941.
5. BARNARD, HENRY. *School Architecture.* New York: A. S. Barnes and Co., 1849.
6. DONOVAN, JOHN JOSEPH, and OTHERS. *School Architecture.* New York: Macmillan Co., 1921.
7. ENGELHARDT, N. L. "Re-Thinking the Fundamentals of School-Plant Planning." *American School and University, 1939.* New York: American School Publishing Corp., 1939. p. 19-23.
8. ENGELHARDT, N. L. "The Community School: A Definition." *American School and University, 1941.* New York: American School Publishing Corp., 1941. p. 15-23.
9. ENGELHARDT, N. L., and ENGELHARDT, N. L., Jr. *Planning the Community School.* New York: American Book Co., 1940. p. 137.
10. EVELETH, SAMUEL F. *School House Architecture.* New York: George E. Woodward and Co., 1870.
11. FULCOMER, EDWIN S. *Secondary Schools as Community Centers.* American Association for Adult Education. New York: the Association (Director: Morse A. Cartwright, 60 E. 42d St., New York), 1940. p. 32-37.
12. HARE, MICHAEL M. "Bases of Design for Community Theaters." *Architectural Record* 86: 79-94; October 1939.
13. HARRISON, WALLACE KIRKWOOD, and DOBBIN, CLARENCE E. *School Buildings of Today and Tomorrow.* (Edited by R. W. Sexton.) New York: Architectural Book Co., 1931. 233 p.
14. JOHONNOT, JAMES. *Country Schoolhouses.* New York: J. W. Schermerhorn and Co., 1858.
15. JOHONNOT, JAMES. *School Houses.* New York: J. W. Schermerhorn and Co., 1871.
16. MANN, HORACE. *Annual Reports on Education, 1846.* Boston: Lee and Shepard, 1846.
17. NATIONAL EDUCATION ASSOCIATION, RESEARCH DIVISION. "The School Plant and Equipment." *Review of Educational Research* 8: 365-492; October 1938.
18. ROBSON, EDWARD ROBERT. *School Architecture.* London: J. Murray, 1874.
19. WHEELRIGHT, EDMUND MARCH. *School Architecture.* Boston: Rogers and Manson, 1901.
20. WRIGHT, FRANK LLOYD. "A New Community Plan." *Architectural Record* 77: 254; April 1935.
21. YOUNG, SAMUEL. *Annual Report of the Superintendent, New York State.* Department of Common Schools. Albany, N. Y.: Carroll and Cook, 1844.