**A 1947 View of —**

# Ventilation Requirements in Schools

*H. H. Linn**

An extensive program of school building planning is under progress throughout the country, which is certain to result in a very substantial building development in the near future. The program, in the aggregate, and over the next ten years, will call for total expenditures running up into the billions of dollars. The present high building costs are focusing attention on the need for scrutinizing proposed projects to eliminate needless expense. In many of our states, statutory requirements or state departmental regulations call for certain costly building provisions that are not based on scientifically proved need, but that rest on assumptions set up many years ago. One such costly provision deals with the subject of ventilation.

Although they are in the minority so far as all 48 states are concerned, there still are a number of states which require that new school buildings must be designed to provide an air supply of 30 cubic feet per minute per pupil which necessitates the use of mechanical equipment. The continued use of this standard requirement of 30 cubic feet per pupil is needless for it originally was based on the false premise that organic poisons as measured by the amount of carbon dioxide in the air of an occupied schoolroom could become toxic unless removed by the introduction of copious quantities of fresh air. This theory, that the essential problem of ventilation was chemical in nature, necessitating a high rate of air change for good ventilation, was so generally accepted by hygienists (and heating and ventilating engineers) up to the turn of the twentieth century that the states of Massachusetts, New Jersey, and New York in 1902, 1903, and 1904 respectively enacted laws making the 30-cubic-foot standard a mandatory requirement for new school buildings of a certain size, or in communities of a certain class. By 1925 there were twenty states that had laws or regulations specifically calling for this air supply standard, and two other states had requirements worded in different language but being essentially the same in effect.

And yet, interestingly enough, during the first quarter of this century when the mechanical ventilating requirements were being made mandatory because of the 30-cubic-foot standard predicated on a false theory, evidence gathered by more recent hygienists and students quite definitely proved the toxic theory to be a myth.

In place of this theory, it was demonstrated that the essential problem of ventilation is physical in nature with two major objectives:

1. Providing comfort for the occupants of a building by removing excess heat given off by the human body at a proper rate, and
2. Maintaining an acceptable odor level.

Possibly a third objective should be mentioned, the provision of an atmosphere free from objectionable dust, gases, and bacteria. This third objective, however, is closely tied up with objective number 2 — maintaining an acceptable odor level.

### Rescind 30 Cubic Feet Requirement

The acceptance of this more modern view of ventilation ought to result in the rescinding of the mandatory requirement of 30 cubic feet of air per person per minute, which calls for mechanical ventilation. (This, however, is not to be interpreted to mean that there is no place for mechanical apparatus in connection with school ventilation.) Yet today there still are many states in which the obsolete 30-cubic-foot standard continues to require the installation of mechanical ventilating equipment in school classrooms, because of existing laws, or departmental recommendations. The situation, however, is better now than it was in 1925 as a number of states since then have modified their ventilation requirements.

Two states in which new school building codes or standards have been issued in recent years have recognized the inappropriateness of the 30-cubic-foot standard and have used other measures for determining ventilation requirements. The Connecticut School Building Code[1] adopted in 1941 stipulates that:

> Ventilating systems shall be figured to provide, and heating systems to allow for, the introduction of fresh outdoor air as follows:
>
> Classrooms, laboratories (exclusive of fume-hood), libraries, auditoriums and all rooms where occupancy may be readily estimated (except as noted below):
>
> 15 cu. ft. per min. per person *but* in no case less than 4 air changes per hour.
>
> Toilet rooms, locker and dressing rooms, cloak rooms, kitchens, and food laboratories 6 complete changes per hour.
>
> Note: In certain rooms (notably auditoriums) having a positive supply of warmed air, the above requirements may be varied to meet conditions.

The West Virginia Standards for Schoolhouse Construction[2] specify that:

> Air changes shall be provided by ventilating and heating system load calculations as follows:
>
> In regular classrooms a minimum of 10 cubic feet of fresh air per child per minute or five air changes for each 2-hour period.
>
> In all rooms where gases and odors, either injurious or annoying, are liberated by operations performed therein, and in toilet rooms and motion picture booths, as suggested in 3 below, positive ventilation of at least six air changes per hour is recommended during such times as these operations are being carried on.

### New Requirements in New York

New York State amended its former law requiring the 30-cubic-foot standard, and since April 13, 1940, has had the following general statutory provision: "The Commissioner of Education shall not approve the plans for the erection of any school building or addition thereto or remodeling thereof unless the same shall provide facilities for heating and ventilation adequate to maintain healthful and comfortable conditions in the classrooms and study halls." This law has been supplemented by the Commissioner's regulations on heating and ventilation approved by the Board of Regents November 16, 1945, which refer to the air supply in the following language:

> 1. In classrooms, provision for air change shall be made which, in the judgment of the Department, will provide a minimum air change of 10 cubic feet per minute per occupant. For effective thermal operation in mild weather a design of 15 cfm. is desirable.
> 2. In rooms planned for close assembly a minimum air change of 10 cfm. per occupant shall be provided in order to remove odors. Additional air change, depending largely upon wall exposure, may be required for effective thermal operation in mild weather.
> 3. In rooms where there is danger of toxic substances occurring in large concentrations, or where odors are likely to be strong, or where overheating is likely to occur, special ventilating equipment adequate to relieve the situation and entirely independent of the ventilating system serving the rest of the building, shall be installed.

The significance of the new ventilation demands of the three states just referred to lies in the fact that the fresh air supply for classrooms in general is deemed adequate if it provides 10 to 15 cubic feet of air per person per minute — an amount that can be provided by window ventilation without the use of elaborate mechanical equipment. The smaller fresh air supply also reduces the heating plant requirements and subsequent operating expense. Proper temperature levels of course are associated with the air supply requirements as also are such factors as air movement and relative humidity. The relative humidity factor, however, generally has to be ignored in the school during the heating season so far as any practical control over it is concerned. But this generally is not serious since the importance of relative humidity as a factor in the thermal comfort of pupils is not very great under the usual school classroom conditions in the wintertime.

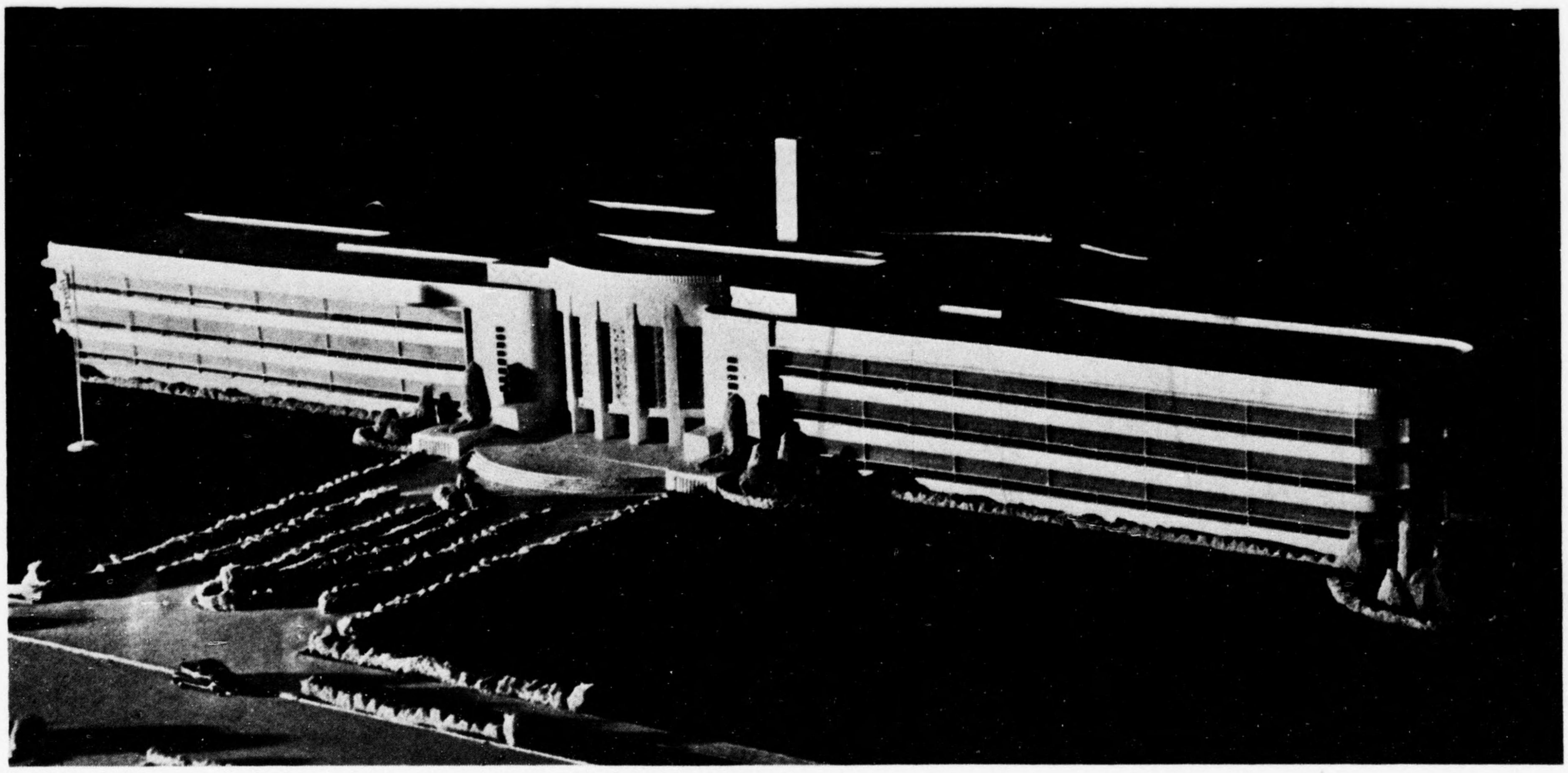
### Mechanical Ventilation Problem

The writer does not propose to enter into a discussion of all the physiological factors inherent in proper ventilation (and heating), or of the highly technical aspects of physical plant specifications required to attain acceptable ventilation standards, but rather to call attention to some of the questions confronting the school administrators and

*Professor of Education, Teachers College, Columbia University, New York 27, N. Y.

[1]Connecticut State Department of Education, *School Building Code*, p. 67.

[2]West Virginia Council on Schoolhouse Construction, *Standards for Schoolhouse Construction*, p. 56.



Architect's Model, Council Bluffs Senior High School, Council Bluffs, Iowa.
Raymond A. Orput & Associates, Architects & Engineers, Rockford, Illinois.

# An Iowa School Featuring Modular Construction

*Raymond A. Orput*[1]

Today those of us responsible for school-building projects — school boards, superintendents of schools, and architects — are at war. The warfare is against constantly increasing prices on the one hand, and constantly increasing demand for more flexible educational facilities on the other.

In meeting this condition in the proposed Council Bluffs Senior High School building design and materials are not sacrificed to this threatening trend. Monolithic concrete is used, since in larger buildings the economy of re-using of forms for concrete work is more evident than in a smaller structure.

A first glance at the design of the new Council Bluffs Senior High school building reveals two facts and raises two questions. The facts provoking the questions are a monolithic concrete structure with vast continuing expanses of corrugated glass panels. Why? The answer is modular construction, with prefabricated form panels, horizontally run and corrugated glass panels throwing light to the vision-weak inside aisles of the classroom, thus eliminating Venetian blinds or shades.

The running concrete panels between floors are exactly 48 in. wide exclusive of sills, hence standard 4 ft. by 8-ft. plywood sheets can be used without special fabrication of forms for these great continuous bands. Skilled labor on this work will be confined to carpenters and cement finishers who are correspondingly more numerous at the present time among building tradesmen than bricklayers and also work on a lower hourly wage scale. Also, a much greater percentage of common labor is employed on this type of work than ordinary masonry. The continuous corrugated glass bands not only permit maximum light but also permit modular variations in room sizes which may be subject to change at any time during the life of the building.

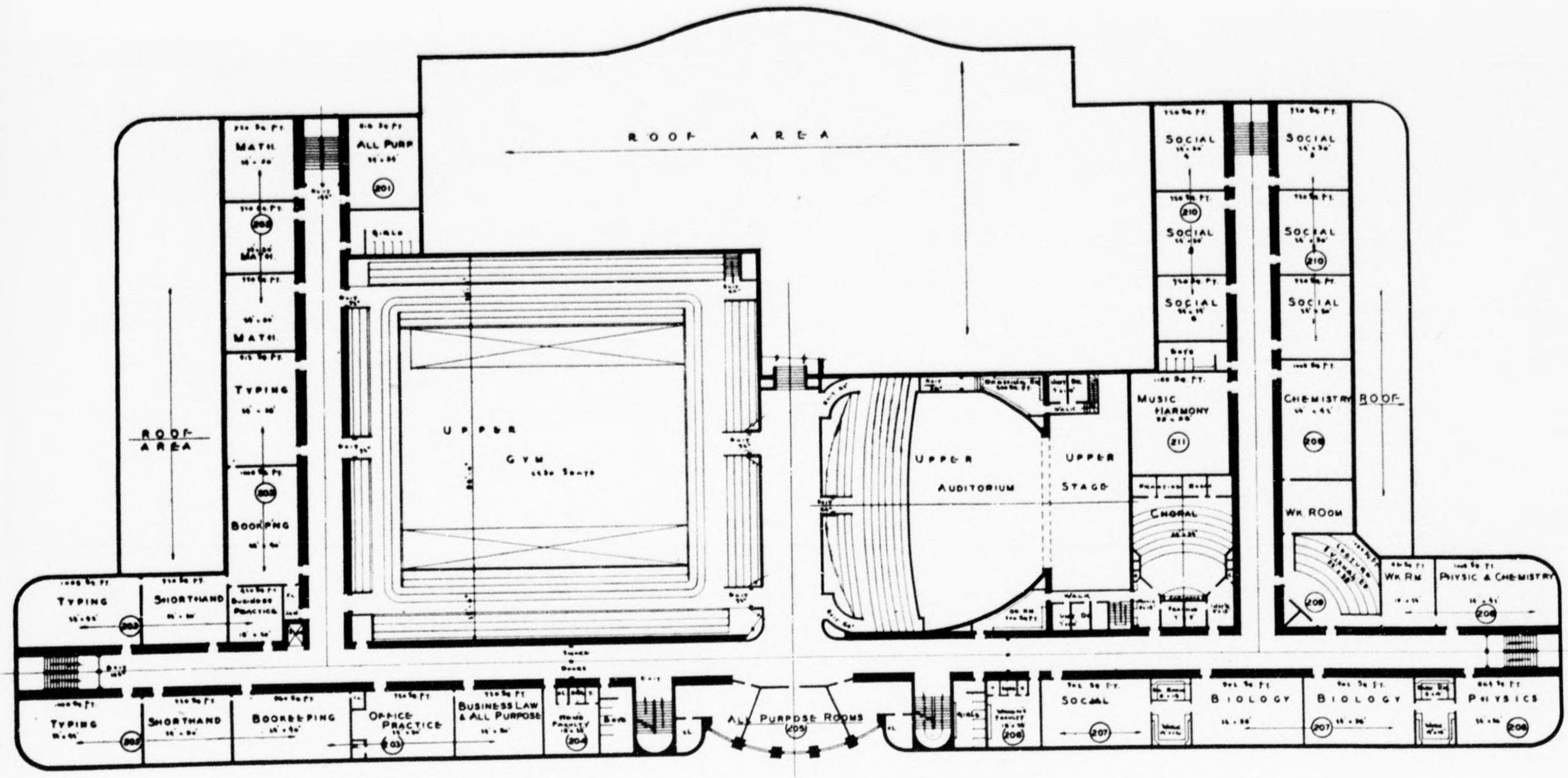
The question may be asked: "How are these running bands of concrete supported?" The answer is by the periodic occurrence of separating bullnose columns accentuated in the design and by invisible interior supports bypassed by the structural glass. In meeting the insistent demand of economy, beauty in architectural design must be achieved through the skillful use of materials and massing of structures, or the architectural design of schoolhouses will merely lapse into the ugly and commonplace industrial types of building. The Council Bluffs building skillfully meets this new demand by the sheer beauty of the materials used and arranged in effective masses in design.

Providing for a student capacity of 2000 students, in developing the plan, the typical H or U-shaped structure is avoided as impractical from the standpoint of cubic contents, which is an important cost controlling factor. The key to the whole plan solution is to be found in the first floor plan. On this floor will be found the practical arts departmentalized yet integrated so that the shops, homemaking, and fine arts are readily accessible to each other in a complementary manner.

The location of the administrative and health offices on this floor; the grouping of the three major mass areas, the gymnasium, auditorium, and swimming pool around a grand foyer; the functional aspects of the band room, "Little Theatre," choral and harmony rooms, all accessible to the stage of the auditorium permits of bringing together all the community and most likely adult educational activity on the main floor with easy access to the public. It also will provide efficient administrative control of these varied activities by those entrusted with its supervision.

On the second floor are to be found the science, commercial, and mathematics departments. These departments all are complementary to each other and are well integrated in the plan. With southern and eastern exposure the science department is oriented to make effective use of these areas. The science department has been developed on the basis of a "weighted average" with the vocational shop accommodations, taking into cognizance the importance of scientific education in the modern high school. The visual education room which is well located makes an effective use

[1] Rockford, Ill.

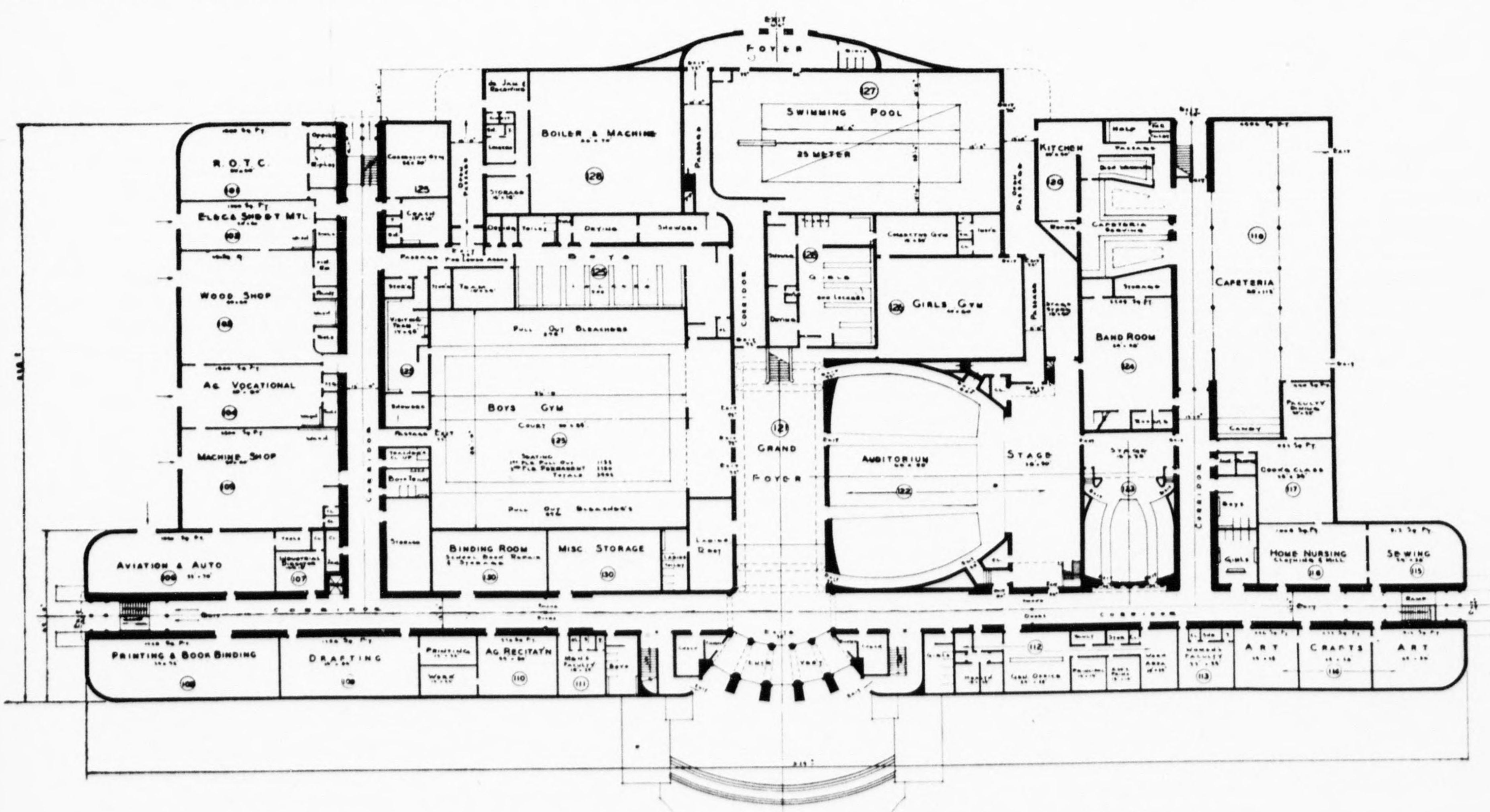


**Second Floor Plan, Council Bluffs Senior High School, Council Bluffs, Iowa. Raymond A. Orput & Associates, Architects & Engineers, Rockford, Illinois.**

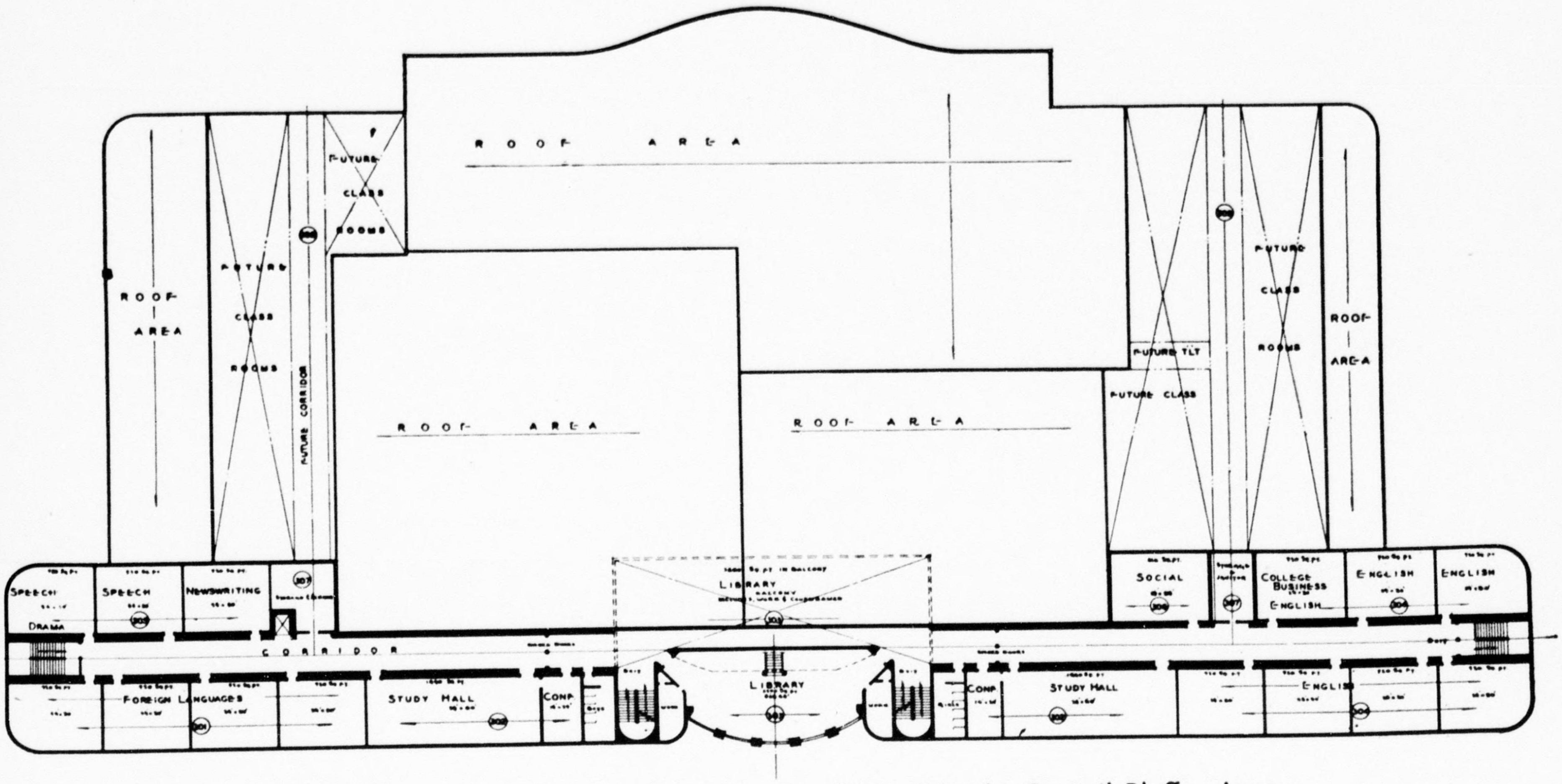
of a main corridor axis interior corner by providing a space readily available for important audio-visual activities.

The strictly academic elements of the building are to be oriented around the library. The mezzanine feature of the main library centrally located on the third floor provides unusual facilities for students' use at a minimum of cost and sacrifice of academic space. Situated between conference rooms and study halls it is readily accessible to all classrooms and will serve not only as a depository for books but also for reference materials of all kinds; particularly maps, globes, films and charts. Its location insures freedom from distraction yet is also an element of beauty and utility.

The building will be constructed on a 30-acre tract that will allow for adequate facilities for student participation in physical activity and makes possible the control of the area



**First Floor Plan, Council Bluffs Senior High School, Council Bluffs, Iowa. Raymond A. Orput & Associates, Architects & Engineers, Rockford, Illinois.**




**Third Floor Plan, Council Bluffs Senior High School, Council Bluffs, Iowa. Raymond A. Orput & Associates, Architects & Engineers, Rockford, Illinois.**

by school authorities. The gymnasium will seat 3400, the auditorium 1500, and the swimming pool will provide a 25-meter pool for record swimming match events. The ready accessibility of the girls' and boys' gymnasium to the athletic fields make possible a happy, practical intercommunicating opportunity for interchangeable indoor and outdoor classes as weather conditions permit. The design also provides an artistic central element in the handling of the swimming pool entrance which is located on the main axis of the building and creates a commanding view from the athletic fields. The swimming pool entrance at grade is planned to provide for year-round usage and so arranged that the public may also use the facilities in summer.

*(Reprinted from the July, 1947, issue of The American School Board Journal)*

# Answering your questions about the Dictaphone School Rental-at-cost Plan!

**Q. What is the purpose of this plan?**

**A.** This modern plan makes it possible for schools and colleges to expand their Business Education Departments at a nominal rental cost. They can secure the latest Dictaphone electronic models, new permanent practice records, textbooks and teaching aids, without a capital expenditure!

**Q. Why is it important that my students learn to use Dictaphone equipment?**

**A.** They will become familiar with the latest machines—with all the new improvements—now in popular use in business offices everywhere. As graduates of the Dictaphone Business Practice Course, they will be eligible for the top-pay-

against the rental fee.

**Q. How can I be sure that the equipment you send me will be up-to-date?**

**A.** All the machines and educational supplies, furnished under the Rental Plan, will be new and will be replaced each year by the very latest machines and educational accessories.

**Q. What do these accessories consist of?**

**A.** With the rental of each transcribing machine for training purposes, Dictaphone Corporation will provide the following educational package: 1) A set of eighteen full-length Dictaphone Permanent Practice Records, 2) The Dictaphone Business Practice Textbook, 3) The Dictaphone

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**Q. Is there any trade-in allowance given for the Dictaphone equipment we have?**

**A.** Under the Rental Plan, schools and colleges may trade in their obsolete equipment at our regular trade-in allowance — which may be credited against the rental fee.

**Q. How can I be sure that the equipment you send me will be up-to-date?**

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**Q. Sounds like an excellent plan—economical, practical and profitable for my students. To whom do I write for further information?**

**A.** Write your nearest local Dictaphone Office, or

# DICTAPHONE CORPORATION

**EDUCATIONAL DIVISION**

**420 Lexington Avenue** **New York 17, N. Y.**

# *Important New Literature on School Architecture*

**Manual of Schoolhouse Planning**

Boards, approximately 200 pp. Published by the board of education of New York City, 110 Livingston St., Brooklyn 2, N. Y.

This is the fourth edition of the basic material used by the administrative and teaching staffs and by the architects of the New York City board of education for planning elementary schools, junior high schools, vocational high schools, and academic and specialized high schools.

The book was prepared by a committee, headed by Dr. N. L. Engelhardt, and shows in various aspects both the force of his direction and the vast experience of New York City school authorities whose planning and construction of buildings in normal times includes two or three high schools annually and five or six elementary buildings.

The present book rather modestly claims that it is not an exhaustive or authoritative treatise on school planning but merely a manual, or a condensed statement of the New York City board of education policies developed out of experience and intended to guide in analyzing architectural problems and planning and constructing buildings which will as fully as possible meet present and future educational needs.

The book is divided into three parts, preceded by a general statement of the philosophy underlying the New York City school plant. The authors hold, for example that

The ideal school is the cultural center of its area, and in structure, equipment, and setting should be worthy of its role. Since it must serve not its pupils alone, but all members of the community, it cannot be modeled upon a set pattern, but must vary with the cultural and recreational needs of the neighborhood it is to serve. The possibility of adjustment to meet changing conditions should be considered in designing such a school.

The elementary school houses pupils ranging from nursery school age through the sixth or eighth grade. It aims to provide the best possible environment to promote child growth and to permit continuity and interrelationship of learning, in accordance with the objectives of democratic education. . . .

In contrast to the purposes of the elementary school building, the authors state that the junior high school should meet the following ideal situation:

The junior high school is a separate organization of the school system which has been specifically planned to meet the needs of early adolescent boys and girls. The organization includes grades seven, eight, and nine, with a range in pupil ages between 12 and 16 years. The three-year program of the junior high is regarded primarily as a period of exploration and guidance during which the pupil is given broad experiences in social living, in the arts, elementary sciences, physical activities, creative expression, manual arts, and academic fields.

How completely and effectively these objectives may be realized depends in large part on the adequacy of the physical plant and its facilities. In addition to regular classrooms, such a program calls for many special rooms,

be a *secondary* school to serve the needs on this level. These needs are determined to some extent by the requirements of particular trade courses. There is a certain atmosphere which may be created by physical surroundings and which influences behavior in preparation for industrial life. But in addition to this, the vocational school must prepare students for a future life in which the earning of a livelihood is but one phase. The generally accepted forty-hour week is but a part of the total activities of the worker. Influential and important as these forty hours are on the character of the balance of the week, the provisions for their practical fulfillment must not be made the single goal in school layout.

A school of any type is not built for a day. We need think back but a few years to realize that flexibility must be a prime characteristic of shops. New words may be taught in any classroom but new industrial techniques very often require change of equipment and very definitely a change in the training of potential workers. Proper lighting for every square foot of every shop and adequate provision for additional electrical demands should be a part of initial construction.

The well-planned vocational high school provides facilities to meet the objectives of general education, plus those for training in an industrial field area. It is not a traditional high school plus shops, or shops plus classrooms, but an integrated whole to prepare its students for social, personal, and vocational competency.

New York City considers the academic high school plant as of importance not merely to the students immediately served in the day classes, but also to the community as a whole:

The academic high school plant must be planned in terms of the needs of those it serves and thus be a functioning part of our educational program. This principle leads to a consideration of what persons are to be served, and what needs are to be met. Primarily our neighborhood high schools should serve the youth of the community and secondarily those adults who need the school plant as a community center.

Because the neighborhood high school plant should be available to the adults of the community we must plan accordingly. Facilities and equipment are needed to make it a community center where adults, as well as youth, can learn with their hands as well as from books, in forums, and in co-operative and intercultural activities. The recreational needs of the community in the late afternoons and evenings warrant special consideration.

We should try to achieve beauty as well as utility in the construction of buildings, inside and outside. Functional architecture is essential for any school plant but it need not be bleak and repellent. Grace, comeliness, and a warm atmosphere can be achieved without ostentation or expensive embroidery.

The paragraph just quoted reflects splendidly the attitude of New York City toward the design of its school buildings.

The second part of the manual is devoted to the planning of the buildings as a whole and outlines in detail the entire process from the study of the social and economic survey of the community to be served to the final estimates and letting of contracts.

Part III outlines in detail the planning of the instructional, administrative, and service units of

The present Manual should be in the hands of every administrative office of a large city board of education; it will provide endless helpful data for the experienced schoolhouse architect.

**You Want to Build a School?**

By Charles W. Bursch and John L. Reid. Cloth, 128 pp., $3.50. Reinhold Publishing Corp., New York 18, N. Y.

The senior author of this welcome book is chief of the California State Department's Division of Schoolhouse Planning, and the co-author is an architect of many years' experience in the planning of school buildings. The book, as such, is addressed to school authorities responsible for the erection of new school buildings and, in a secondary way, to architects and engineers. Throughout, basic principles of planning are stated in a form intended to suggest the need of studying educational building needs in terms of a local educational philosophy, school population growth, instructional and service programs, economic ability, and total community situation. Challenges are constantly laid down for original solutions of both the over-all problems of school planning, as well as those of classroom planning and equipment.

Minimum standards are barely referred to in the current belief that state and local code requirements will provide these minimum data. Chapter 2 discusses the people officially and civically responsible for the planning process and beneficiaries of the resulting buildings; Chapter 3 describes the laws to be observed and the legal documents and contracts which are necessarily used in the progress of a building project; Chapter 4 outlines the planning procedures and the management of the actual construction; Chapter 6 urges methods for helping teaching staffs understand the possibilities of a new school plant and adjusting methods to efficient use. A final chapter compares the federal and leading state plans for aiding local school authorities in building programs. The California practices and regulations and the enabling law are used as a basis of comparison. The book is a genuinely helpful addition to the growing postwar literature in this field.

**Minnesota Manual for Public School Buildings and Grounds**

By I. O. Friswold. Paper, 94 pp. State Department of Education, St. Paul, Minn.

This is a tentative revision of the Minnesota state bulletin which, apart from the state codes controlling constructional and fire safety, sanitation and health, sets up the controlling standards for the planning, construction, and equipment of new public school buildings in the state. During the past four decades and longer, Minnesota has been looked to for leadership in school architecture, and the present document will help maintain this leadership. The chapters provide specific information on (1) the school-plant authority and service of the state department, (2) the practical and legal conduct of a local school-building program, (3) the selection and development of an adequate site, (4) the over-all problems of planning the school building, (5) the planning of classrooms and other instructional and service rooms, (6) the construction and mechanical equipment, and (7) the planning of special details for safety, economy, and convenience.

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> How completely and effectively these objectives may be realized depends in large part on the adequacy of the physical plant and its facilities. In addition to regular classrooms, such a program calls for many special rooms, such as science laboratories, library, gymnasium, music and art rooms, and a variety of shops. Furthermore, it is of primary importance that the educational program and internal administrative organization of the junior high school be taken into consideration in the initial planning of such a building. The location of various special units must be made with respect to their functional use in the total school program. It is essential in multistoried buildings that there be an efficient distribution of instructional units so as to balance the live load on different floors and to reduce vertical traffic to a minimum. Corridors and stairways should provide for the unrestricted movement of pupils, and floor levels should be planned on a continuous, unbroken elevation. Such facilities as the cafeteria, gymnasium, auditorium, and library which may serve the community after school hours should be located with regard to accessibility and convenience to the public. However, the demands of the regular school program should receive first consideration in the final planning.

The special problems of planning the vocational school to meet the purposes of instruction carried on is stated as follows:

> A vocational high school is, first of all, a school in which the majority of its students receive their final formal education. It must, therefore, in all its aspects, ities to meet the objectives of general education, plus those for training in an industrial field area. It is not a traditional high school plus shops, or shops plus classrooms, but an integrated whole to prepare its students for social, personal, and vocational competency.

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Part III outlines in detail the planning of the instructional, administrative, and service units of buildings and provides a definite method for setting up space relationships and the total number of units for given numbers of students.

New York City has done a magnificent job in redesigning its elementary school classrooms to meet the new methods of instruction and to achieve the purposes of a progressive type of education. It is notable that although the Manual includes typical plans of classrooms and of other units, that it anticipates for each new building special planning of shops and of such other large units as the auditorium, the cafeteria, etc.

Part IV outlines the standards of construction, of heating and ventilation, plumbing and drainage work, and electrical work.

It is notable that the Manual is produced in mimeographed form and is considered distinctly temporary in usefulness. New York City is convinced that the only standards of school planning and construction are those which are distinctly valuable to meet the program of the present time. It holds further that standards must be constantly revised to meet the constantly changing conditions.

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Mr. Friswold has departed from his earlier manuals in discussing for each topic the underlying principles of design, the educational and safety problems, and the need for considering the future use of buildings. Because the manual is an official guide specific standards and minimum requirements are in each case set up. It is at this point that the manual represents vast growth in educational practice, in requirements for safety and efficiency, particularly in basic construction, in lighting, electrical facilities, and acoustics. The climatic conditions which Minnesota buildings must withstand are perhaps responsible for some of the conservatism which the manual expresses on the design of classrooms and other instructional units, and the liberal requirements in such features as gymnasiums and ventilation. The manual abandons the absolute requirements for unilateral lighting of classrooms, but does not seem to encourage experiments in varied classroom ceiling heights. Minnesota's postwar school plant will be greatly improved through the new standards set up in the manual.

#### A Study of Public School Building Needs in Troy, Ohio

By W. R. Flesher and T. C. Holy. Paper, 95 pp. Bureau of Educational Research, Ohio State University, Columbus, Ohio.

Each new volume of the rapidly increasing collection of community school-building surveys prepared by the Ohio Bureau of Educational Research, Ohio State Uni-

(Concluded on page 70)


**HERE'S WHY**

# REO

**IS THE SAFEST SCHOOL BUS ON THE ROAD—**

First complete school bus, unit-engineered in chassis and body • Extra-strong steel framework, welded and riveted • All-steel, streamlined body • Fully insulated—not sprayed or painted • Steel floor covered with plywood and linoleum • Double section windows with lower half stationary • Single window sections available • 70-inch headroom • Padded book racks • Swivel driver's seat • Emergency door warning buzzer and light • Left rear and center rear emergency doors available • LifeGuard Tubes are standard equipment • For details or demonstration write **SCHOOL BUS DIVISION, REO MOTORS, INC., LANSING 20, MICHIGAN**

**FOR SAFETY AND ECONOMY—STANDARDIZE ON**

# REO SAFETY SCHOOL BUS

**MEETS NATIONAL SAFETY STANDARDS**

importance of the physical plant in a modern educational program, (2) the city of Owensboro, (3) the school buildings and needs, (4) the existing plant, and (5) the financial situation of the city. The program proposed is based upon the evidence presented in the first four chapters and recommends (1) sites to be obtained, (2) needed new construction projects and additions, (3) method of financing.

The report recommends that the board obtain title to sites for two junior high schools and three elementary schools, and that the sites for three existing schools be extended and improved. The program is intended to provide space for anticipated enrollments at every level for the next ten years. Recommendations are offered for a method of financing, to include (1) bond issue sales, (2) levying of a tax of 20 cents for the establishment of a building fund, (3) issuance of school revenue bonds, the proceeds to pay the cost of the first four projects, (4) issuance of additional revenue bonds in the amount of $500,000 to pay for the fifth and sixth construction projects, (5) sale of the present Central Junior High School building and site, (6) issuance of revenue bonds in the amount of $200,000 for the seventh construction project, (7) sale of the present Lincoln School property to provide money for finishing the last project.

## PUBLICATIONS FOR BUSINESS EXECUTIVES

**Bigger Profits With Better Menus**

Paper, 80 pp., $1.50. New York State Restaurant Association, Inc., New York, N. Y.

A helpful manual, telling how to plan and design effective selling menus for lunchrooms. A section is given to "Appetite Teasers." Another section on "Prices Are Pitfalls" gives the basis for analyzing the menu to avoid haphazard pricing. Other sections suggest special menus for children and breakfast menus. Also included is a checklist of words commonly misspelled. The main recommendations apply to school cafeterias.

**Economical and Efficient Pupil Transportation**

By Maurice R. Stapley. Paper, 22 pp., 50 cents. Bulletin of School of Education, Indiana University, Bloomington, Ind.

The suggested procedures make use of the best experience in Indiana and elsewhere of (1) determining the most efficient school and transportation unit, (2) making a pupil survey, (3) planning the routes, (4) fixing policies of economical bus ownership and operation, (5) planning, equipping, and operating the bus garage, (6) selecting, training, and managing the drivers. In Indiana, operating costs drop sharply when buses carry more than 20 pupils and reach almost ideal economy when loads range from 71 to 80 passengers. The most costly routes are those of 5 to 10 miles' length and the best economy is achieved by routes 30 miles or more per trip. School-owned equipment is generally to be preferred for economy and convenience. For economy, it is frequently advisable to transport children to a school outside the district of residence.

**School Enrollment of the Civilian Population, October 1946**

Paper, 9 pp. Current Population Reports of the Bureau of the Census, U. S. Department of Commerce, Washington 25, D. C.

Significant changes in school enrollment are taking place in the United States. While the total enrollment of persons between 6 and 24 years of age has dropped from 1940 when it was 26,373,939 to 26,294,000 in 1946, there is a considerable growth in the percentage enrolled and in the enrollment of children between 6

(Concluded from page 68)

versity, is a source of satisfaction for two reasons: Each of the studies is completely objective and purely factual. In addition, the surveyors have a very practical point of view in that they are anxious to promote education in the best possible manner, and are aware of the problems of complete community support necessary for raising the additional funds and establishing a continuous program of maintaining both the improved educational system and the new structures.

The recently completed report on Troy is a fine example of the work done by Drs. Flesher and Sessions, under the general consultantship of Dr. T. C. Holy. The report indicates that Troy, which is growing slowly, should change its school organization from an 8–4 to a 7–5 plan, with kindergartens added. The existing high school, which is fair in its educational arrangement and physical condition, should be considerably enlarged to permit of shopwork, home economics, music, and art instruction and should be improved in its science and laboratory departments. The Heywood School, erected in 1930, may be continued without major alterations. The Forest School, a very old building, may be continued temporarily, with additions of an auditorium-gymnasium, a kindergarten, administrative offices, and a vastly improved heating plant. The Kyle School should be abandoned and replaced with a kindergarten and seven-grade school on a better located site. The Edwards School may be continued temporarily. The Culbertson Heights area which is a growing section needs an entirely new building. The recommended program of improvements and new construction will require a bond issue of $800,000 which the community can very well handle.

### Building Exits Code

Eighth Edition. Paper, $1. National Fire Protection Association, Boston, Mass.

Includes recommendations for school building exits.

### Public School Buildings in Owensboro, Kentucky, 1946

Prepared by the University Bureau of School Service. Paper, 67 pp., 50 cents. Published by the Bureau of School Service, University of Kentucky, Lexington, Ky.

This report of the survey, conducted by Dr. Ralph Cherry, of the College of Education, University of Kentucky, is divided into five parts and discusses (1) the

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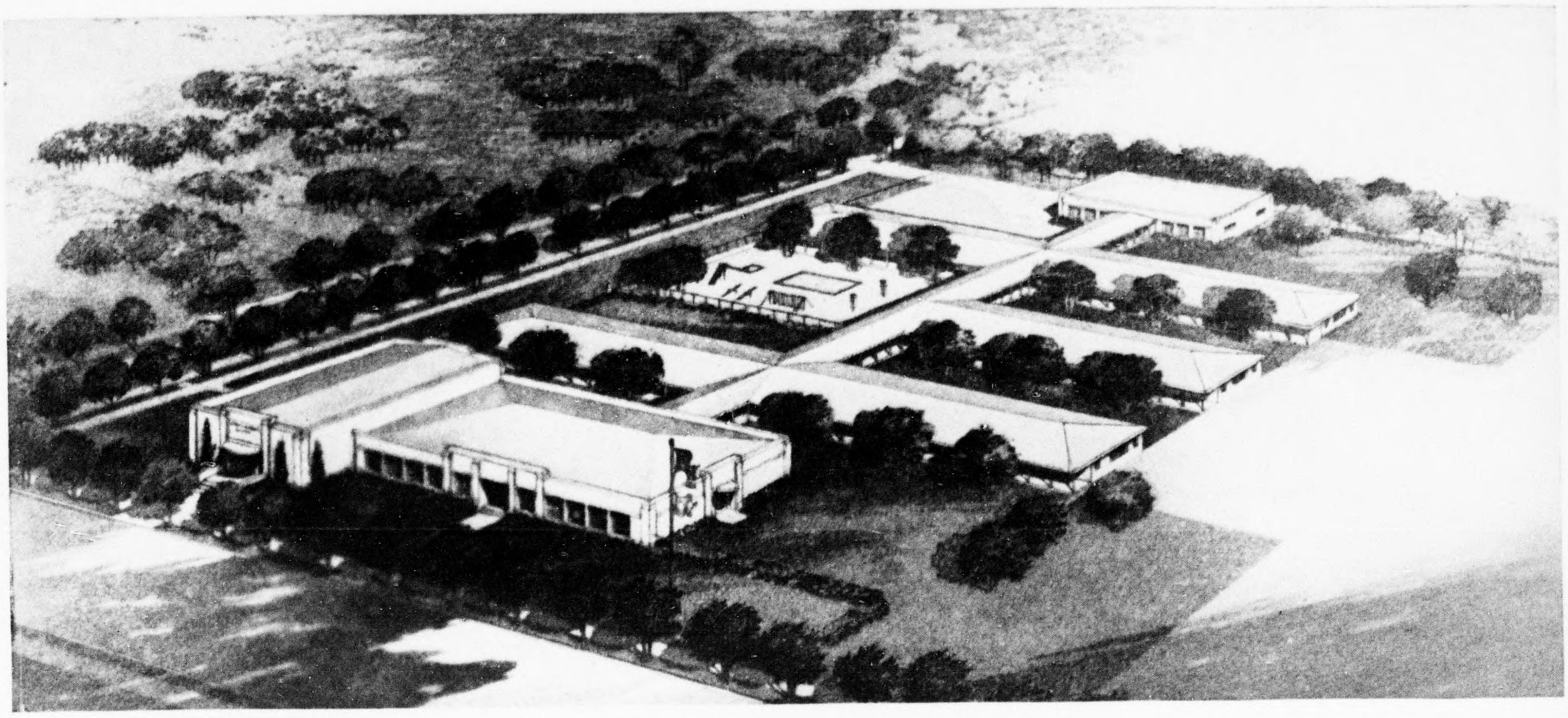
### A Study of Public School Building Needs in Franklin, Ohio

By W. R. Flesher. Paper, 93 pp. Published by the Bureau of Educational Research, Ohio State University, Columbus, Ohio.

This study of probable school-building needs in the Franklin Exempted Village School District takes up population growth and residential growth, transportation facilities, school-district boundary lines, elementary and secondary school programs, school organization, trends in school enumeration and school enrollments, basic data regarding the school plant, evaluation of school buildings, utilization of the school plant, ability to support a school-building program, tax-rates, per pupil costs, and financial factors. The report concludes with a series of recommendations and a summary of the proposed building program, with some of its implications.

The village is growing in population and two of its elementary school buildings are old, unsatisfactory, and not fireproof; the high school and Central elementary school are in need of classrooms and special service rooms and of general remodeling. The total expenditures necessary amount to $979,000, of which $350,000 is already available.



Air View of the Henry M. Mingay School, Burbank, California.

# New Type of Elementary School for Burbank, California

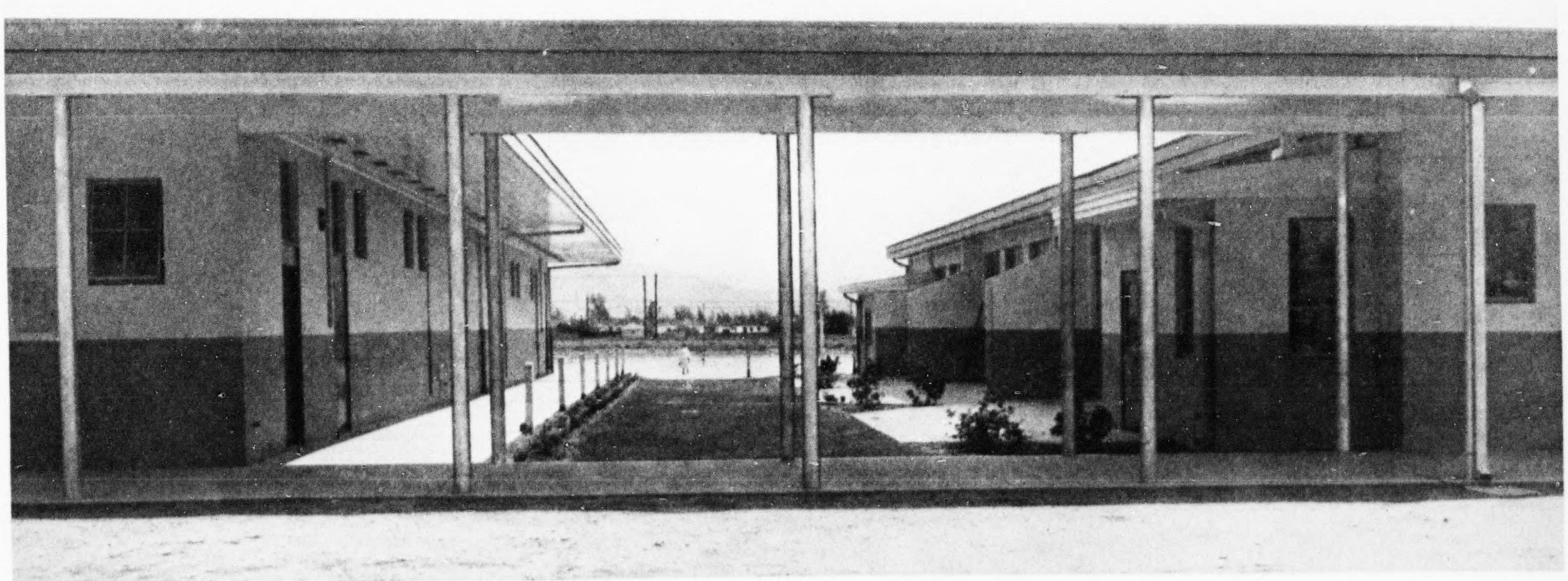
*G. H. Schulte*[1]

The description of a new school development requires some introductory remarks concerning the various factors which should be considered in its planning, as these factors have some bearing on the successful operation of the school and on its particular function in the school district.

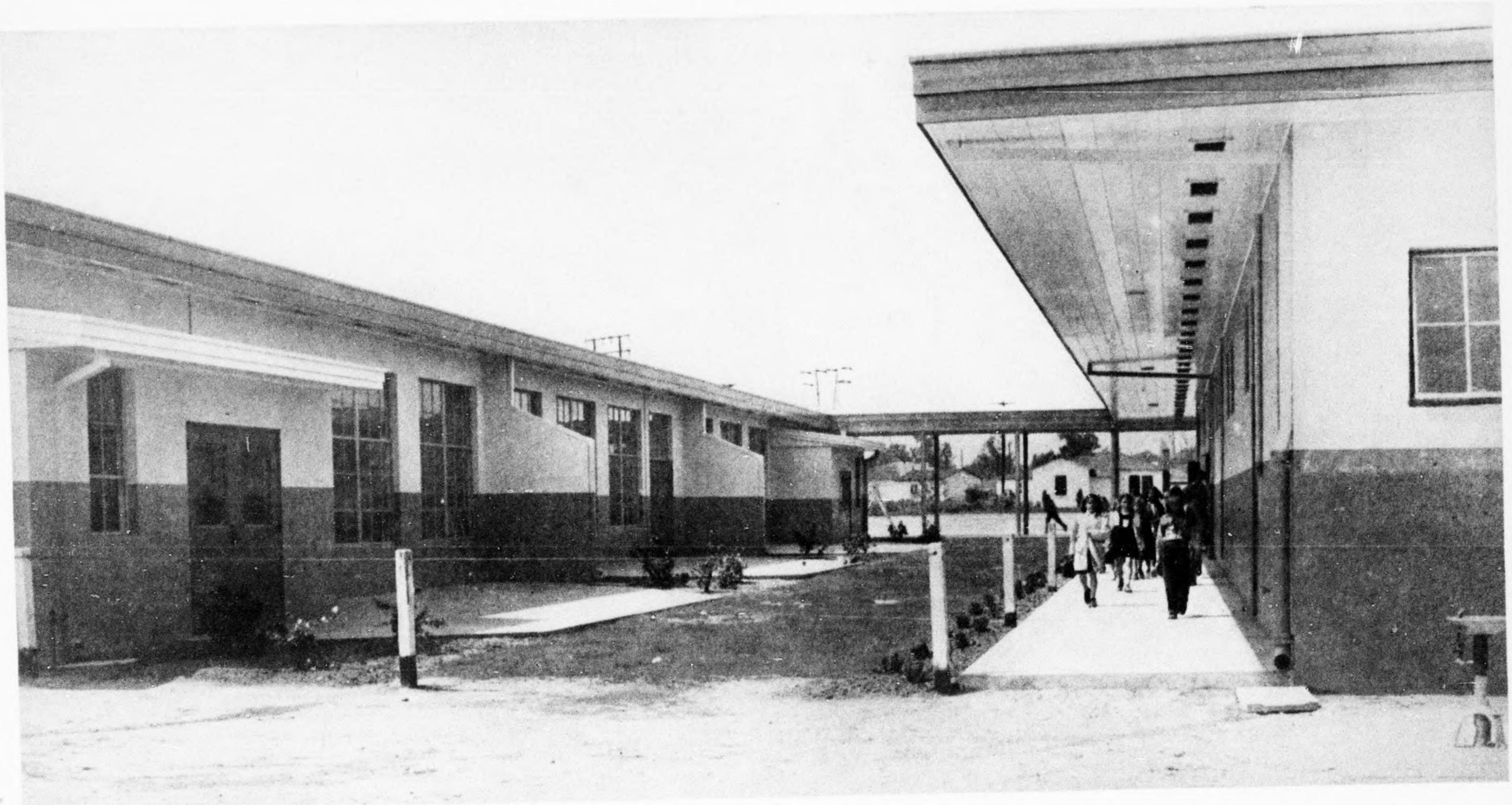
The city of Burbank is located in the San Fernando Valley in the metropolitan district of Los Angeles, in Southern California. The motion picture and airplane industries have caused a rapid growth of the city to the present population of over 60,000, nearly half of the increase having occurred in the past five years. The city birth rate is considerably above that of the county and state. Housing development has lagged behind population increase with school facilities a poor third in the race. Dwellings are nearly all of the bungalow type on standard fifty foot lots.

The entire population is remarkable for its youth — it consists largely of young couples many of whom have children of preschool and primary school age. There are many cases where both parents are employed, and nursery school and child care centers are an increasing part of the school district's function. The young parents are keenly interested in public

[1]Structural Engineer, Burbank Unified School District, Burbank, Calif.



A typical instruction and play court with covered way, Henry M. Mingay School, Burbank, California.



**Another view of a typical court and covered way as seen from the playground, Henry M. Mingay School, Burbank, California.**

school affairs and are solidly behind the board of education in its effort to build up the quantity and quality of its schools.

Elementary schools in the district have previously been of the conventional type of brick masonry or frame and stucco construction, one and two stories in height, with a central corridor, starting off as plain, rectangular structures, and growing by various sporadic additions as enrollment increased.

It is a well-advertised fact that the climate is particularly adapted for outdoor living and during the school year from September to June there are seldom more than a dozen rainy days to prevent the use of outdoor facilities. The attendance area which this new type of school serves is near the west city limit. A study of school enrollment and facilities has been completed recently by the school district by means of which it is hoped to be able to predict the enrollment and the necessary facilities at any stage of the city's growth. From the data prepared the ultimate capacity of each school can be predicted and planned for in advance, and new schools can be planned in an orderly manner.

The tendency in Southern California has been toward a recognition of its climatic advantages in planning outdoor activities for school children, and outdoor classrooms are increasingly popular. Visits were made to existing schools of this type, and their advantages and disadvantages were discovered by interviewing administrators, teachers, and caretakers. After due consideration, the superintendent's recommendation of the new type was adopted by the board of education, and preliminary drawings were prepared for an elementary school with an ultimate enrollment of six hundred pupils. The school site contains slightly over five acres, which is somewhat smaller than is ideal for a school of this size.

The perspective drawing (Illustration No. 1) shows the proposed ultimate development of the project. In the foreground is the administration building with three classrooms, flanked by an auditorium. Behind them are wings of three classrooms each to the right and left of a covered way which leads from the main building to a library-cafeteria, completing the group. The proposed location of the cafeteria at the edge of the site is to permit the use of a central kitchen to serve both the elementary school and the junior high school adjoining. A separate enclosed playground is shown for the use of the kindergarten pupils.

The administration building is of the ordinary rectangular type with corridors on both central axes. Flanking the main entrance are the offices of the principal, secretary, and school nurse. Nearest the auditorium there is a general-use room with shelving for summer storage of books, and wordrobes and closets for costumes and similar storage. It is to be used for conferences, PTA meetings, and as a dressing room in connection with stage plays. Across the corridor is a teachers' room with kitchenette, which may also be used for serving refreshments at minor social functions. A large storage room, a janitors' room, and three standard classrooms occupy the remainder of the building.

The classroom wings at right angles to the central covered way are a new feature in this school district. They extend almost exactly east and west, so that their main lighting is from the north. They have wide, overhanging eaves which shade the windows from direct sunlight, and no window covering is required except for darkening classrooms during motion picture projection.

There is a space of forty feet between the wings and in these courts or patios there is a cement-paved work space in front of each classroom, with projecting walls and shrubbery separating the paved areas. Along the north side of each patio is a cement walk protected by the overhang of the main roof, and providing access from the covered way to the individual classrooms. Between the walk and the paved areas is lawn.

In the design of the classroom wings no particular thought was given to bilateral lighting, but transoms were provided in the south wall under the roof overhang for cross ventilation. By painting the wood ceiling of the overhang white, it was found that considerable reflected light was admitted through the transoms. In this climate ventilation of the attic space is also necessary, and it is provided by means of screened openings in the ceiling of the overhang, through which air is drawn. The air is exhausted through the screened sides of a continuous monitor at the ridge of the low-pitched roof. The ceiling vents are noticeable in Illustrations No. 2 and No. 3.

Interior arrangement of elementary classrooms has undergone several experimental

**TABLE 1. Method of Estimating Costs of Sample Salary Schedule for Teachers**

| *Name* | *Position* | *Years of training above H. S.* | *Date of birth* | *Dependent spouse* | *Number of dependent children* | *Present Salary 1946–47* | *Estimated Salary 1947–48* | *1948–49* | *1949–50* | *1950–51* | *1951–52* | *1952–53* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H. Brink | Teacher | 3 | 11–11–10 | No | – | $ 2,600 | $ 2,700 | $ 2,800 | $ 2,900 | $ 3,000 | $ 3,100 | $ 3,200 |
| M. Bryan | Teacher | 2 | 7–23–02 | Yes | – | 1,900 | 2,000 | 2,100 | 2,200 | 2,300 | 2,500[a] | 2,600 |
| A. Childs | Teacher | 4 | 8–22–14 | Yes | 3 | 3,600 | 3,700 | 3,800 | 3,900[M] | 3,900 | 4,000[a] | 4,100 |
| R. Frazier | Teacher | 2 | 12– 4–92 | No | – | 2,200 | 2,300 | 2,400 | 2,500 | 2,600 | 2,800[a] | 2,900 |
| B. Haskins | Teacher | 2 | 10– 4–80 | No | – | 2,182 | 2,282 | 2,382 | 2,482 | 2,582[R] | 2,300[b] | 2,400 |
| [c]New Teacher | Teacher | | | | | | | | | 2,300 | 2,400 | 2,500 |
| [d]*Total* | | | | | | $12,482 | $12,982 | $13,482 | $13,982 | $16,682 | $17,100 | $17,700 |

[M]Maximum salary for present training.
[R]Retiring at end of the school year.
[a]Assumption is that each of these individuals has completed an additional year of training. Allowance is therefore made for one increment in addition to increment to which teacher would otherwise have been entitled.
[b]Salary allowed for a new teacher to replace the one retiring.
[c]Allowance is made for one new teacher beginning with the 1950–51 school year.
[d]Totals do not include costs of the family differential, estimated to be $500 for A. Childs plus $300 for M. Bryan or a total of $800 for the first year (assuming that an allowance is granted annually amounting to $300 for a dependent spouse plus $100 for each of two dependent children).

are not very reliable. Under more stable conditions, cost estimates may be helpful if forecast as far ahead as five to ten years. Although an estimate will not be entirely accurate under even the best of conditions, it should serve to indicate the approximate peak in salary costs as well as the approximate figure at which such costs will become stabilized.

In addition to estimating the costs of the proposed schedule, it is often desirable to estimate also the costs of the existing schedule. The second estimate can then be subtracted from the first to provide an estimate of the net costs of the new schedule over and beyond the salary costs to which the community is already committed.

Inasmuch as cost estimates are greatly affected by the assumptions on which they are based, it is essential that an explicit statement of assumptions accompany every estimate of salary costs.

For a "preparation-type" schedule, assumptions are necessary with regard to the number of teachers who will take additional training

For a "position-type" schedule, fewer assumptions are needed because a teacher's classification for salary purposes is determined by the specific position held.

Once the basic assumptions have been made, it is possible to estimate the costs of the salary schedule. A separate forecast can be made for a single year. Although a formula might be used to estimate costs for the group as a whole, it is considered preferable to estimate costs for one individual at a time since this method is less liable to gross error and can be more readily explained.

In order to secure a complete estimate, it is desirable to prepare a supplementary estimate including salaries of additional teachers who may be needed in future years.

The method for estimating costs of the basic schedule is illustrated in Table 1.

## Financial Ability to Support the Salary Schedule

Studies of financial ability should be undertaken to determine the extent of effort re-

ahead, long-term obligations doubtless will be on the increase and will represent an added financial burden for the community. In more normal times, the reduction in debt payments as obligations are liquidated over the years has often been more than sufficient to offset additional costs of the salary schedule.

After an anlysis has been made of long-term obligations, the proposed salary costs can be considered in relationship to available financial resources. Unless state aid or other types of nonlocal revenues increase, the additional salary costs will necessarily be met by revenues from the property tax, which provides the bulk of local school revenue in practically all communities. The analysis should therefore show how the debt payments and proposed salary costs will affect the tax rate on property from year to year.

But is the required tax rate too heavy for the people to bear? This question may be partially answered by studying the trends in the support of education by the community. Over a period of years, has the tax rate for education increased or decreased? What has happened to the percentage of tax receipts devoted to education? If the community is not doing proportionately as much for education today as it did in years gone by, is there any reason why it cannot be expected to exert more effort to support education?

Comparisons with similar communities are helpful in this phase of the analysis. It may

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Inasmuch as cost estimates are greatly affected by the assumptions on which they are based, it is essential that an explicit statement of assumptions accompany every estimate of salary costs.

For a "preparation-type" schedule, assumptions are necessary with regard to the number of teachers who will take additional training and thus move to a higher salary classification, the size of staff, the beginning salaries for teachers new to the system, the amount of teacher turnover, the age of teachers at retirement, the increase in the family dependency load, and the stability of present administrative policies (a marked change in class size, for example, might affect salary costs).

For a "merit-type" schedule, assumptions should be stated also with reference to the proportion of teachers whose rating will entitle them to classification in the higher salary brackets.

For a "position-type" schedule, fewer assumptions are needed because a teacher's classification for salary purposes is determined by the specific position held.

Once the basic assumptions have been made, it is possible to estimate the costs of the salary schedule. A separate forecast can be made for a single year. Although a formula might be used to estimate costs for the group as a whole, it is considered preferable to estimate costs for one individual at a time since this method is less liable to gross error and can be more readily explained.

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The method for estimating costs of the basic schedule is illustrated in Table 1.

## Financial Ability to Support the Salary Schedule

Studies of financial ability should be undertaken to determine the extent of effort required by the community to finance the estimated costs of the proposed schedule. Since prediction is difficult at best and is made still more uncertain by the element of community choice, it may be desirable to prepare several different analyses, each of which assumes a different set of circumstances.

The simplest question to be asked is whether the salary schedule can be financed provided: (*a*) the size of the school staff stays the same as it is now; (*b*) other school and municipal costs stay the same; and (*c*) financial resources stay the same.

In order to answer this question, several analyses may be necessary. An analysis of long-term obligations of the community may help to reveal the extent to which the financial resources of the community are already encumbered. Such an analysis can readily be made if all bond issues are listed and the amount due annually on principal and interest is computed for each. The individual sums may then be added to provide the total annual debt payments. During the period just financial burden for the community. In more normal times, the reduction in debt payments as obligations are liquidated over the years has often been more than sufficient to offset additional costs of the salary schedule.

After an anlysis has been made of long-term obligations, the proposed salary costs can be considered in relationship to available financial resources. Unless state aid or other types of nonlocal revenues increase, the additional salary costs will necessarily be met by revenues from the property tax, which provides the bulk of local school revenue in practically all communities. The analysis should therefore show how the debt payments and proposed salary costs will affect the tax rate on property from year to year.

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Comparisons with similar communities are helpful in this phase of the analysis. It may be enlightening to see how the rank of one community in a group of similar communities varies on the following criteria: proportion of local taxes devoted to education; total property taxes levied locally per pupil; assessed valuation per pupil; tax rate for education; total tax rate; and current expenditures per pupil.

When the suggested analyses have been made, sufficient data should be at hand to make it possible to determine the extent of effort required to finance the new salary schedule provided there is no significant change in size of staff, other school and municipal expenditures, and financial resources. Refinements can be introduced as necessary to take account of possible changes in these three factors.

Although studies of financial ability are essential to indicate the extent of effort required, the fundamental question is not whether a community *can* finance an adequate schedule, but rather whether the community desires to do so.

**Through Community and School Planning —**

# A Suburban Community Meets Its School Building Needs

*O. E. Domian*[1]

To build or not to build — that has been a problem facing many school communities during recent years. Building restrictions during the World War II period, the necessity of securing approval of Civilian Production Administration after the war ended, the scarcity of materials and the high construction costs have all tended to keep schoolhouse construction at a minimum. In a few communities the pressure of rapidly increasing enrollments has overwhelmed all these handicaps and forced a building program. The schools of St. Louis Park are an example of that condition.

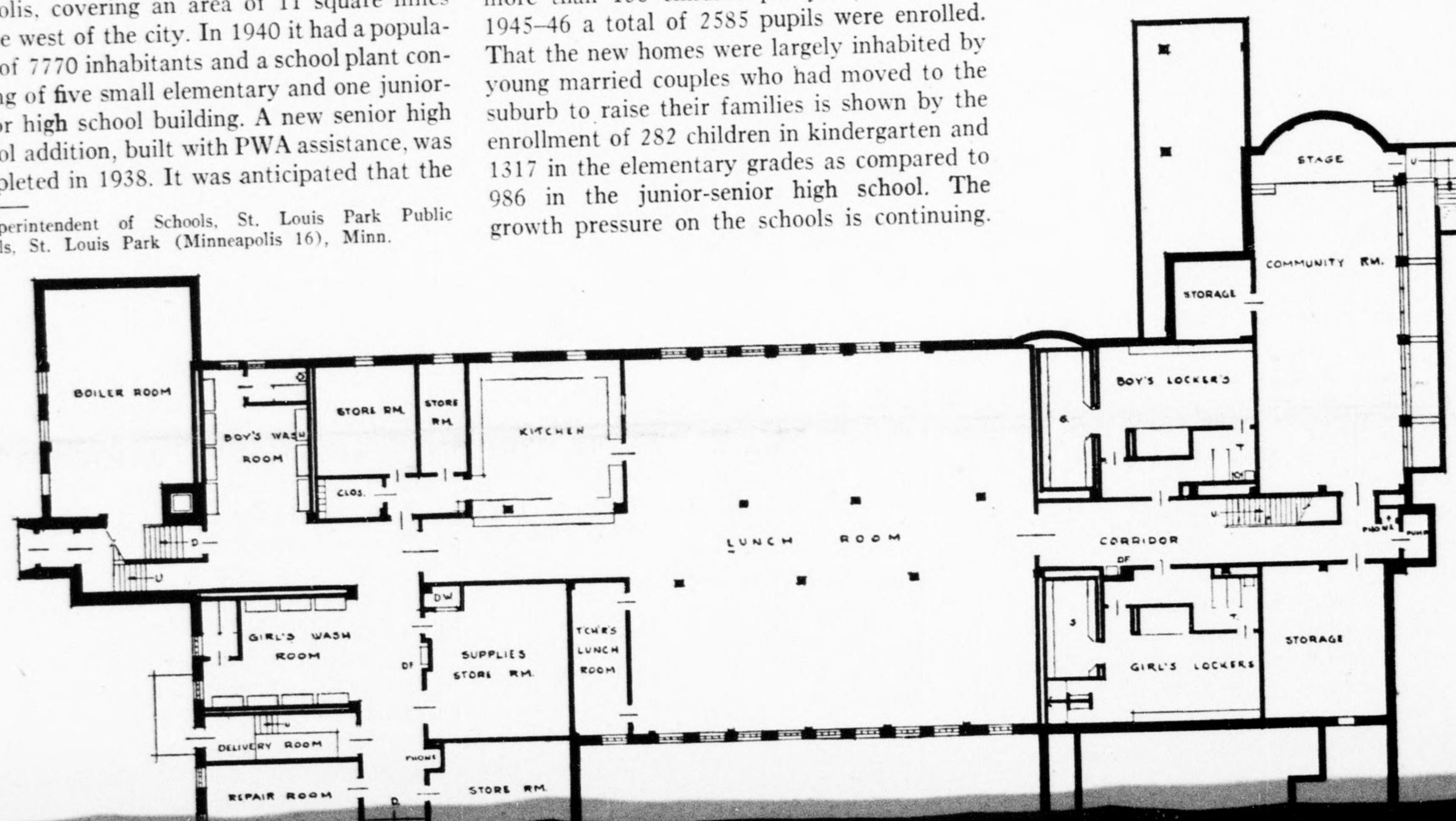
St. Louis Park is the largest suburb of Minneapolis, covering an area of 11 square miles to the west of the city. In 1940 it had a population of 7770 inhabitants and a school plant consisting of five small elementary and one junior-senior high school building. A new senior high school addition, built with PWA assistance, was completed in 1938. It was anticipated that the school plant facilities would be adequate for years to come, as evidenced by the fact that the board of education, with the approval of the voters, gave the old high school building to the village for a village hall.

[1]Superintendent of Schools, St. Louis Park Public Schools, St. Louis Park (Minneapolis 16), Minn.

### Community and School Growth

But the completion of the high school seemed to be the signal for a rapid spurt in population. That year (1937–38) the school enrollment totaled 1371, with 106 in kindergarten, 661 in elementary grades, and 604 in junior-senior high school. Each succeeding year brought a growth in enrollment, averaging more than 150 children per year, so that in 1945–46 a total of 2585 pupils were enrolled. That the new homes were largely inhabited by young married couples who had moved to the suburb to raise their families is shown by the enrollment of 282 children in kindergarten and 1317 in the elementary grades as compared to 986 in the junior-senior high school. The growth pressure on the schools is continuing. The completion of the 1946–47 school year will see the largest increase in enrollment for any single year. The senior class which were graduated last June numbered 131 students compared to an incoming kindergarten group in September, 1946, of 321 children. New home permits, despite all building restrictions and shortages, totaled 866 for the first 11 months of 1946. The present population is estimated to be in excess of 18,000 people.

The large increase in enrollments made various makeshifts necessary to house the children. All available space in the elementary buildings, including basement rooms, was converted into classrooms. Six rooms in the old



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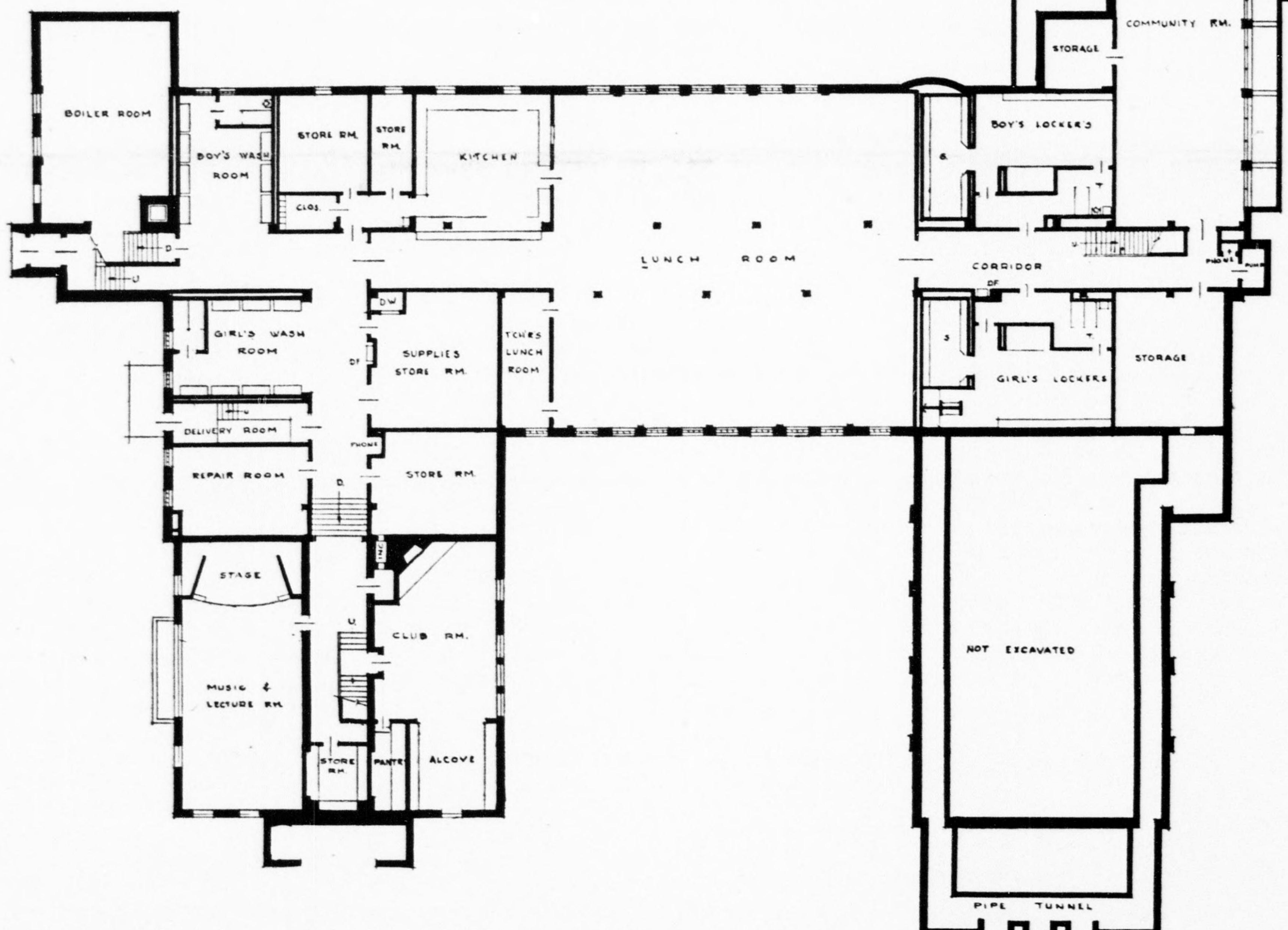
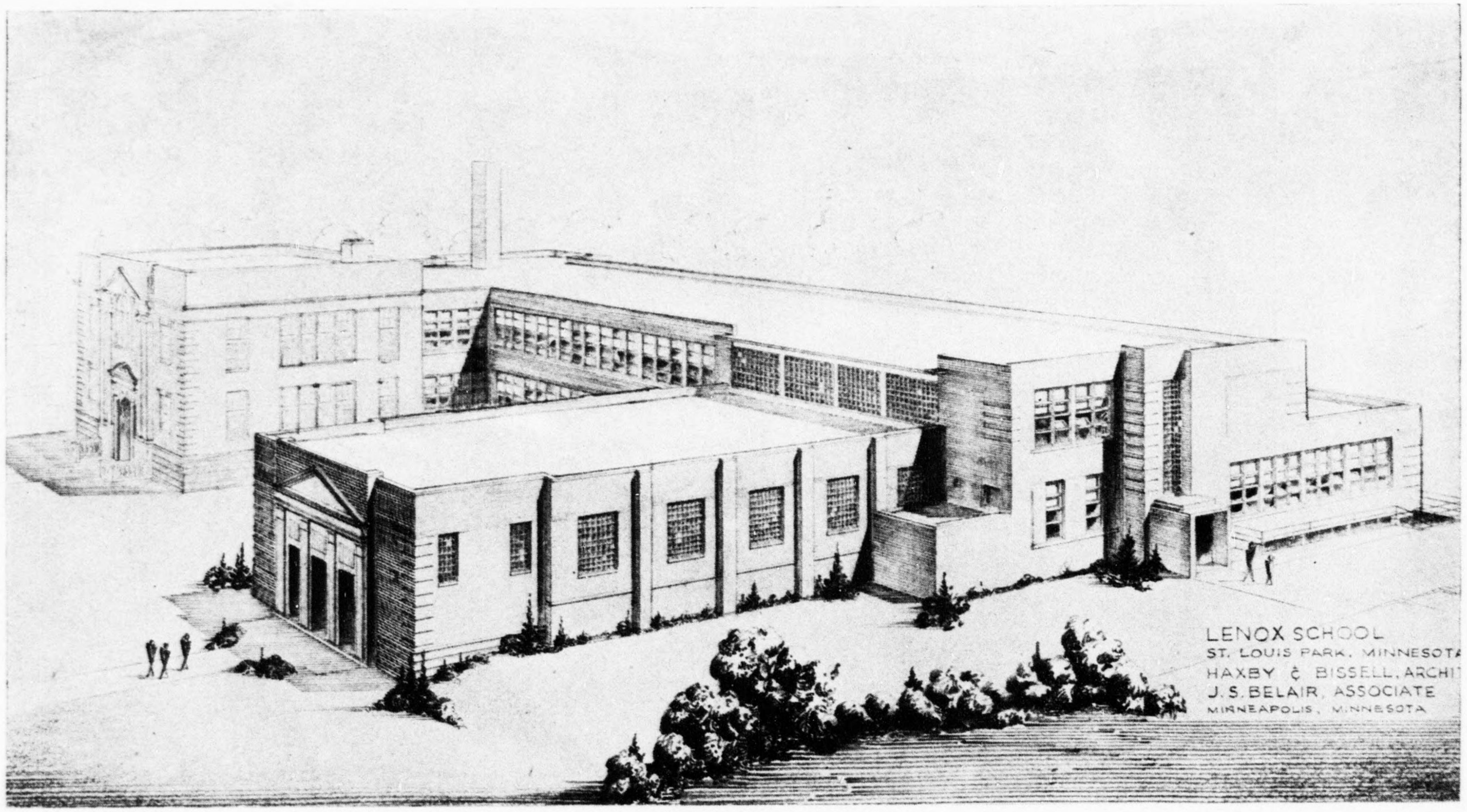



Basement Floor Plan, Lenox School, St. Louis Park, Minnesota. — Haxby & Bissell, Architects; J. S. Belair, Associate, Minneapolis, Minnesota.




Architect's Perspective, Lenox School, St. Louis Park, Minnesota. — Haxby & Bissell, Architects; J. S. Belair, Associate, Minneapolis, Minnesota.

high school building which had been given to the village were rented. Four classrooms in the junior-senior high school building were taken over for elementary classes. Four grade rooms were constructed in the upper portion of the junior high school gymnasium. This past summer the three-instructor industrial-arts department was crowded into the first floor of the industrial-arts building and the second floor was converted into eight temporary classrooms for elementary pupils. As the suburb is predominantly homes and has no commercial buildings which could be converted to school purposes, all adjustments have had to be made within the existing school plant.

appeared to crystallize around the plan of expanding the existing elementary buildings, developing each one into a complete, modern school plant planned and equipped to serve all the elementary children and the adults of the neighborhood. The board, having tentatively agreed to such a plan, called a meeting of the officers of all Parent-Teacher Associations and all other public groups, and secured approval of these representative citizens.

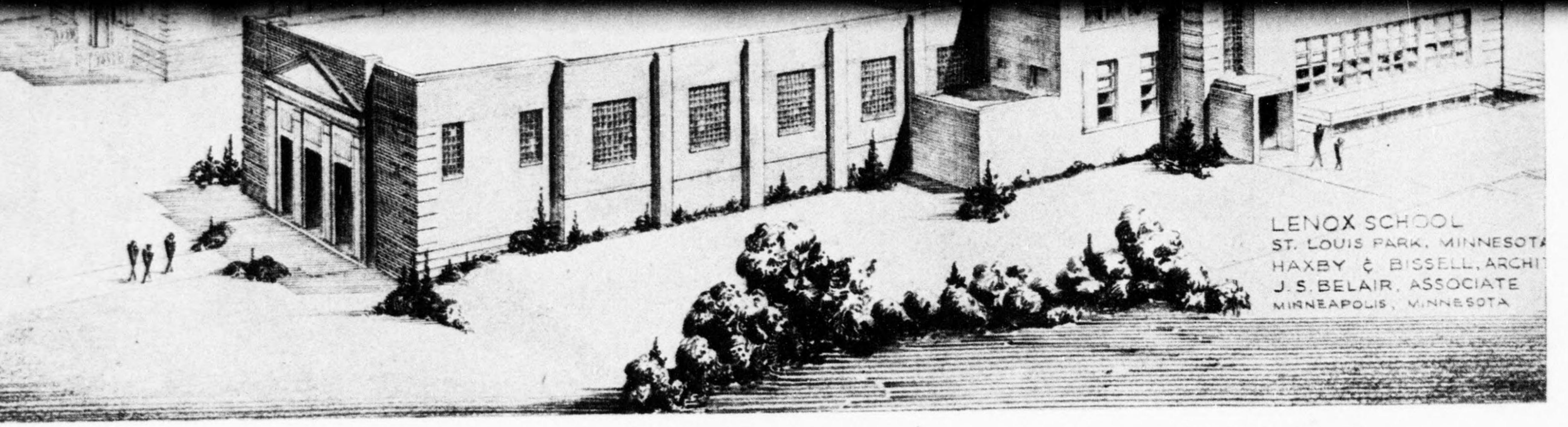
Plans were then completed to present the whole program to the voters and secure approval of a $950,000 bond issue for expansion. An attractive two-color pamphlet, presenting the ... the plan for ...

Remove some of the elementary children from the Junior High School by September, 1946, and all of them by September, 1947. The vacated rooms will be used by the Junior High School classes.

### Bonds Readily Sold

On November 20, 1945, the voters approved the program by a favorable vote of more than 5 to 1. This complete approval was especially gratifying as the bond election for the high school building, which was constructed with the aid of a PWA grant, had carried by only 16 votes.

After receiving the approval of the ...




Architect's Perspective, Lenox School, St. Louis Park, Minnesota. — Haxby & Bissell, Architects; J. S. Belair, Associate, Minneapolis, Minnesota.

high school building which had been given to the village were rented. Four classrooms in the junior-senior high school building were taken over for elementary classes. Four grade rooms were constructed in the upper portion of the junior high school gymnasium. This past summer the three-instructor industrial-arts department was crowded into the first floor of the industrial-arts building and the second floor was converted into eight temporary classrooms for elementary pupils. As the suburb is predominantly homes and has no commercial buildings which could be converted to school purposes, all adjustments have had to be made within the existing school plant.

All of these arrangements were only temporary solutions. Some type of building program was needed to adequately house all the children. Various plans were recommended to the board of education. An elaborate addition to the high school plant, to be used by grade children, at one time received favorable consideration. Building a separate large unit for all children in grades 4, 5, and 6, leaving the five existing grade buildings as primary schools, was a second suggestion. A third plan urged expanding each of the grade buildings to a sufficient size to house all the children of the neighborhood from kindergarten through the sixth grade.

### Complete Neighborhood Service

The various possibilities were explained at all the Parent-Teacher meetings and community reaction to each plan was secured. Board of education and community sentiment appeared to crystallize around the plan of expanding the existing elementary buildings, developing each one into a complete, modern school plant planned and equipped to serve all the elementary children and the adults of the neighborhood. The board, having tentatively agreed to such a plan, called a meeting of the officers of all Parent-Teacher Associations and all other public groups, and secured approval of these representative citizens.

Plans were then completed to present the whole program to the voters and secure approval of a $950,000 bond issue for expansion. An attractive two-color pamphlet, presenting the need, the plan for expansion, and the method of financing, was distributed to each home. No specific building blueprints were submitted; the plan for expansion was given in these terms:

Construct a 16-room addition to Lenox School plus nurse's room, library, lunchroom, and auditorium-gymnasium — to be ready by September, 1946.

Construct additions to each of the other four elementary schools as rapidly as possible.

Each of the five schools will be developed into a complete modern elementary building.

Each of the five schools will be planned and equipped to serve both the children and the community.

Each of the five schools will be planned to care for children from kindergarten through the sixth grade. This will make it possible for children to remain in their own neighborhood school throughout their elementary training.

The order of constructing the additions to the five schools will be determined by the need for additional rooms in each area.

Vacate the Lincoln School by September, 1946.

Remove some of the elementary children from the Junior High School by September, 1946, and all of them by September, 1947. The vacated rooms will be used by the Junior High School classes.

### Bonds Readily Sold

On November 20, 1945, the voters approved the program by a favorable vote of more than 5 to 1. This complete approval was especially gratifying as the bond election for the high school building, which was constructed with the aid of a PWA grant, had carried by only 16 votes.

After receiving the approval of the voters, steps were immediately taken to complete the sale of the bonds. Because of favorable interest rates it was decided to issue the entire amount of bonds at once, investing the proceeds in United States Treasury bonds until the money was needed to pay for construction. The low interest rates and the expectation of considerable future growth in assessed valuation were the reasons for spreading the bond issue over a 25-year period. The maturities were set at $30,000 each year from 1949 to 1965 inclusive, and $65,000 each year from 1967 to 1971 inclusive. The bonds were sold with 1.75 per cent coupon rate for the 1949 to 1965 maturities and 1.50 per cent coupon rate for the 1966 to 1971 maturities, plus a premium of $570, making a net interest cost of 1.58 per cent. The proceeds of the bond sale were immediately invested with an interest return slightly in excess of the interest being paid on the school bonds.

## The Lenox School

Plans and specifications for the Lenox School, the first unit of the expansion program, were well along toward completion, but a new requirement had to be satisfied — getting approval from the Civilian Production Administration. It was a new agency and necessarily took time to set up procedures and plans of operation. Approval was finally received, so that construction bids were opened on April 9, 1946.

The construction bids, which were rather shocking, ran as follows:

*General Contract*

| | | | |
|---|---|---|---|
| Company A | $283,195 | Company D | 324,670 |
| Company B | 304,085 | Company E | 339,612 |
| Company C | 314,458 | Company F | 346,600 |

*Mechanical Contract*

| | | |
|---|---|---|
| Company A | $ 74,877 | |
| Company B | 74,900 | (included escalator clause) |
| Company C | 77,580 | (included escalator clause) |
| Company D | 79,863 | |

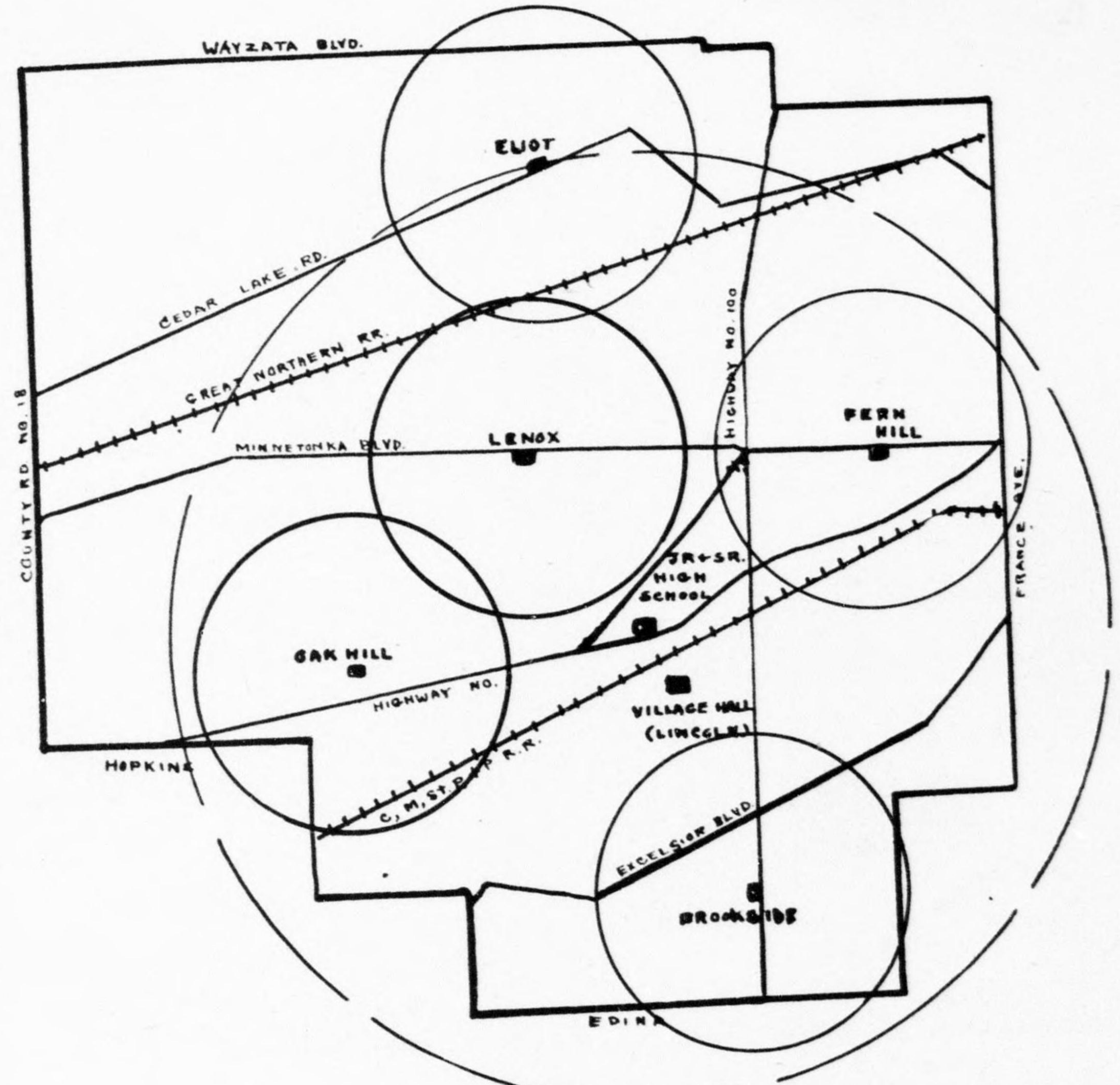
*Electrical Contract*

| | | | |
|---|---|---|---|
| Company A | $ 32,485 | Company C | 34,600 |
| Company B | 33,405 | Company D | 35,507 |

On the basis of the three low bids the cost of the project approximated $400,000. The amount and percentage for each contract were as follows:

| | | *Per cent* |
|---|---|---|
| General contract | $283,195 | 72.5 |
| Mechanical contract | 74,877 | 19.2 |
| Electrical contract | 32,485 | 8.3 |
| | $390,557 | 100.0 |

Previous to World War II a school building, similar to Lenox and planned by the same architects, had been constructed at a cost of 33 cents per cubic foot. In planning the expansion program it had been estimated that building costs had increased 40 per cent to approximately 47 cents per cubic foot. On the basis of a cubage of 630,000 cubic feet of new construction and estimating $15,000 for remodeling in the existing building it meant an actual cost of slightly less than 60 cents per cubic foot. The board felt that the pressure of increased enrollments did not permit post-




The school plant of St. Louis Park, Minnesota, consists of a high school centrally located and five elementary schools. The village hall is partially used for school purposes.

## Contracts Finally Let

The contracts were eventually signed and the contractors began the difficult task of securing the necessary materials. The existing four-room building was vacated so that by June 1, 1946, construction could begin. Delays have been numerous. Plumbing materials, especially soil pipe, have been particularly difficult. During the summer an acute shortage of cement held up work for a time. Bricklayers have been hard to find as many were asking for "extra pay" arrangements. Millwork strikes

just as soon as the Lenox School nears completion.

## Details of Building

The Lenox School (Haxby & Bissell, architects; J. S. Belair, associate) will be a modern elementary school with adequate facilities to serve the children and the community. There will be two complete kindergarten rooms and 18 elementary classrooms, making the building large enough to house all the children in the neighborhood from kindergarten through the sixth grade. Additional facilities include a

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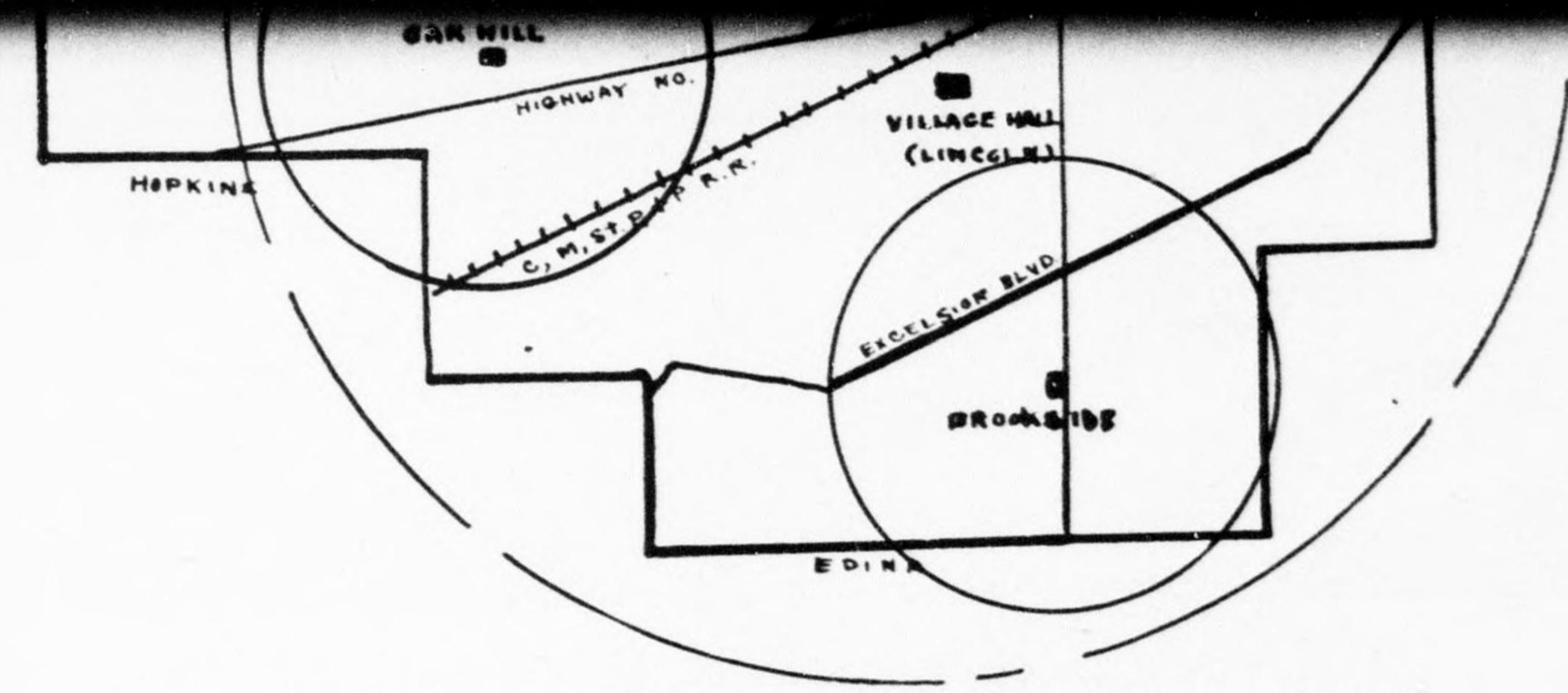
The board proceeded to accept the low bids but encountered some delay in signing contracts. The low bidders were not at all sure that their bids were high enough, and seriously considered forfeiting their 5 per cent deposit. That the contractors might have saved money by forfeiting their bid deposits is evidenced by the bids for an elementary school which were recently opened in another Minneapolis suburb. The costs in this instance rose 72 cents per cubic foot plus an escalator clause permitting an additional 10 per cent increase.

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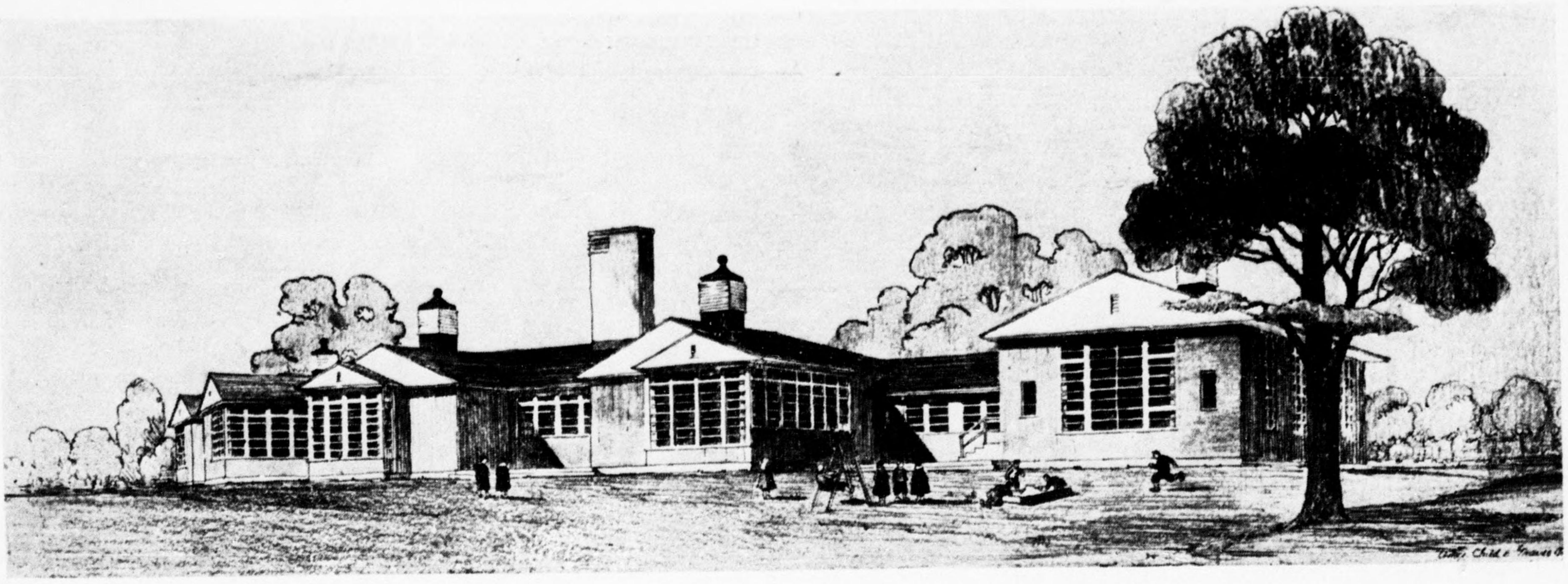
Basement space is utilized to supply facilities for community and school purposes. The music and lecture room has a small stage and 90 seats on a sloping floor. It will be used for movies, chorus work, and a place to present dramatizations to other grade groups. In the evening it will serve as a convenient place for adult meetings of various types. The clubroom on the other side of the corridor will become a place for instrumental music instruction during the day and a scout and campfire meeting room after school and evenings. A large fireplace, a small kitchen, adequate cupboard space for storage of scout material, and an adjacent storeroom for musical instruments help to make the room thoroughly usable. The community room at



The Margaret Thacher School. Ames, Child & Graves, Architects, Boston, Mass.

# Margaret Thacher School

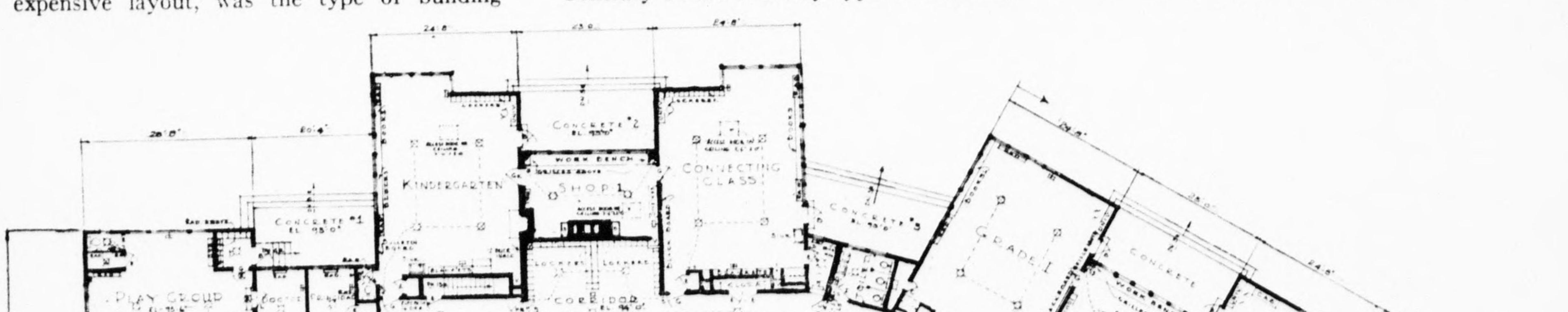
## *Ames, Child, and Graves, Architects, Boston*

The plans as drawn show a new building to house the younger grades of the Margaret Thacher School of Milton Academy — the location is at the crest of the southward slope of the Academy grounds near Upton House.

The school is a single story informal flexible type of building in which each classroom faces east or south and is directly available to the outdoor play spaces. A one-story building with classrooms all having the same exposure, though necessarily a somewhat more expensive layout, was the type of building chosen as being more suited to the needs and uses of an elementary school. A single story structure also has a much better relation to the child size and will tend to make the pupil more responsive.

The designs call for an average of 38 sq. ft. per pupil in each classroom. The ordinary rigid fixed desk schoolroom required only from 6 to 8 sq. ft. per pupil. This is another reason why an elementary school costs far more per pupil than a grade school.

Contrary to the ordinary type of classroom where fixed desks are used and light comes from only one side, these classrooms face east and south and are lighted from two sides giving them a maximum of sunlight. A room lighted in this manner has a more homelike atmosphere and as the child takes part in the different activities of the classroom and moves about, the light changes and gives a new and refreshing outlook on the work at hand. There are bay windows with glass all the way to the floor in the kindergarten and the connecting class. Provision is made also




First Floor Plan, Margaret Thacher School. Ames, Child & Graves, Architects, Boston, Mass.

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO.

for the storage of blankets, books, and play apparatus in each classroom.

The classrooms of the three lowest grades each have adjoining toilets and a sink in the room. Spaces are provided off the hallway near each classroom for individual open lockers in an area large enough to prevent congestion during the undressing and dressing period. Each teacher is provided with a closet just off her classroom.

The school is supplied with plenty of shops. These are spaces where certain members of the class can be segregated from the rest for special work that might be disturbing to the others. The shops in the upper grades are for use in the real sense of the word for activities such as carpentry, modeling, and painting.

The auditorium, which is in reality an all-purpose room, has a seating capacity of 150. There is a movable partition between it and the play-group room so that these two rooms can be thrown together for larger gatherings. The auditorium with adjoining kitchen can serve as a dining room at lunch time. Temporary tables can be moved in when it is used for this purpose. Storage space for chairs and tables is provided.

The play-group space is in two levels allowing a possibility of dividing these children into two groups. Between the levels are storage spaces for toys, blocks, and blankets. The upper portion will serve as a stage when the two rooms are thrown together.

Other elements provided are an entrance hall with direct access to auditorium, teachers' room, doctor's office, and principal's office with desk space for an attendant opposite the entrance door. The doctor's office and teachers' room are each provided with a toilet.

Special features are a covered porch for storage of bicycles, a drying room in the basement access to which is by a stairway near the entrance hall, and concrete play platforms just off each classroom. These platforms are so arranged as to get the maximum sun and yet be sheltered from the wind.

The building is heated by an independent boiler plant, stoker fired, using bituminous coal for fuel. The boiler is located in the basement and generates steam to the various heating elements throughout the building. The laws of the Commonwealth of Massachusetts required a complicated ventilating system consisting of univents in each classroom as well as individual vent flues and vent flue radiators from each classroom. Mechanical ventilation is required from each toilet through vent ducts leading to an exhaust fan and the air discarded through roof ventilators.

This building was let out for bids in September, 1941, at a time when materials were being diverted to the defense work and private work was becoming uncertain and costly.

The total figure including architects' fee was $70,106 at a cost of 31½ cents per cubic foot. Deductions amounting to $5,000 could have been made without damaging the design or materially affecting the building.

*(Reprinted from the March, 1947, issue of The American School Board Journal)*

# A Complete Neighborhood School Plant

### The Riverside School, Elmira, New York

The construction of a new school in the city of Elmira, N. Y., to replace the old Riverside School, had been felt as a pressing need for several years. The original building had been erected in 1889, and during the half century of its existence this section of the city had not only grown, but also the changing demands of the educational system and of community uses had made its facilities entirely inadequate.

Therefore, one of the city's first projects as a part of its participation in the PWA program was to provide a suitable building to serve this district. Mr. Robert T. Bickford, registered architect, was engaged by the board of education, and under his supervision the building was designed and constructed.

The school property faces a residential street of average, well-kept homes. The neighborhood is composed of established property owners. On the east, and adjoining the school grounds, is a large public park containing ample play space and playground equipment. The park contains no concessions or commercial facilities, and therefore provides an excellent area for the use of children.


**Entrance Detail, Riverside School, Elmira, New York. — Robert T. Bickford, Architect, Elmira, New York.**

The problem confronting the architect had several important considerations. Lack of available space in other schools made it necessary to retain the existing building during the construction of the new one. Present-day educational methods required that several special purpose rooms be provided, and these must be properly related to the age groups of the students using them. Other facilities were necessary which would serve for community activities and at the same time contribute to the primary function of providing adequate educational facilities.

Because the building was to be started at the beginning of winter, the architect decided on the steel skeleton-frame type of construction, with reinforced concrete foundations and floor systems and a steel roof deck. This method permitted the outside shell of the building to be completed in the least possible time, and thereby enclose the building so that the interior work could be carried on during the severe winter weather.

The exterior design of the school is an interesting adaptation of American classic architecture with a distinctly modern feeling. Walls are of variegated soft tones of red brick trimmed with Indiana limestone. The windows are wood, with the exception of the shower rooms which are of aluminum, and in the boiler room where they are of steel. All exterior doors and frames are also made of steel.

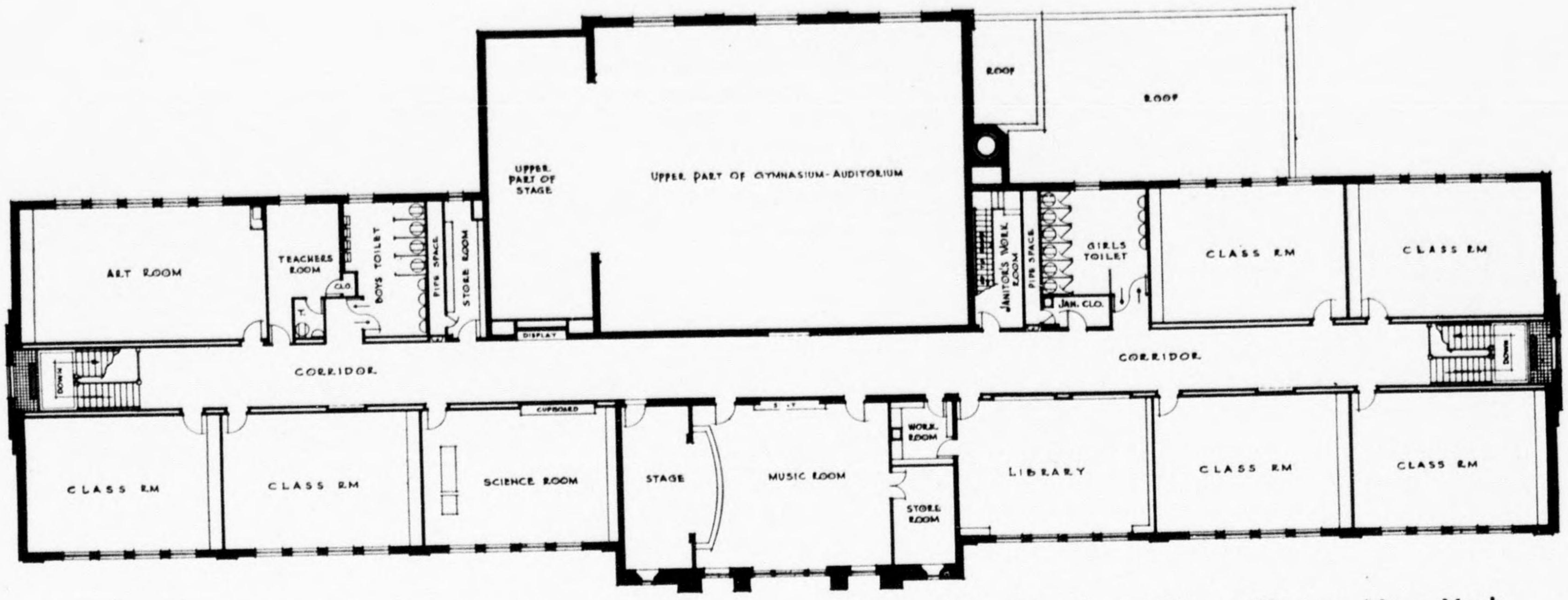
The entrance vestibules are lined with soft brown Appalachian marble surmounted by a plaster cornice. In the floors are recessed mats surrounded by quarry tile borders.

All interior partitions are built of cinder blocks with a lime plaster finish. Classroom floors are of maple to harmonize pleasantly with the birch wardrobes and bookcases. Corridors have quarry tile floors in variegated shades of buff blending into dull reds. The corridor walls have a cream-toned glazed brick wainscot shoulder height.

Flanking the main entrance lobby are the offices. To the right is the administrative suite of a business office, a supply room, and the principal's office. The location, being central, allows for the control of the gymnasium directly across the corridor, and also for most efficient general administration. The communication and signal systems are controlled from this point. Being near the main entrance allows the principal to carry on all necessary contacts with the public with a minimum of disturbance to both students and teachers.

On the left of the entrance lobby is the medical examiner's suite, consisting of a waiting room, a consultation room, and a completely equipped examination room. This suite provides ample facilities for all of the normal clinical activities, both medical and dental.

Adjoining the two office groups on the first floor are six standard, 40-pupil classrooms, in addition to a large first-grade room, a kindergarten unit, toilets, teachers' room, and janitors' closets.




Second Floor Plan, Riverside School, Elmira, New York. — Robert T. Bickford, Architect, Elmira, New York.

All classrooms are equipped with built-in wardrobes for the pupils and a private locker and bookcase for the teacher. Additional bookshelves are provided near the teacher's desk for storage of active texts and reference books. All blackboards are of natural slate with sections of corkboard near the classroom door for the posting of bulletins. There is a continuous rack around the top of the blackboard from which can be displayed specimens of the students' work. The lighting fixtures are controlled by a photoelectric relay which automatically turns on the lights whenever the daylight is insufficient.

The kindergarten is a large room with its own exit to the outdoors' kindergarten playground. At the far end is a large fireplace with bookshelves on either side. At the opposite end of the room are a coatroom, a storage room, and a toilet room. These rooms are grouped around an alcove with a large opening toward the classroom to allow adequate teacher control of the entire group. The storage room is equipped with shelves to receive activity materials, in addition to cupboards with space for storage of each child's personal supplies. This type of individualized storage has been found to be of material assistance in teaching the children to be orderly.

The combination auditorium-gymnasium is located opposite the front entrance and opens also toward the park. This location is central for carrying out its educational functions, and in addition makes it easily accessible to the public without the necessity of entering any other part of the building. By means of careful development of the grounds in relation to the quiet dignity of the building, a spaciousness has been achieved that is in pleasing harmony with the park approach.

The room itself is ample for all games, including basketball; and when used for civic purposes has a seating capacity of approximately 400. The auditorium seating is of the folding type, and when not in use is stored on trucks housed under the stage. The ceiling is of acoustic material, and the walls, above the glazed brick wainscot, are of painted cinder blocks laid in a random ashlar pattern. The combination of the ceiling and wall materials gives a proper acoustical balance so that both music and speech are heard without distortion. The stage, which is of proper size for the presentation of school plays, has a ceiling equipped for the suspension of backdrops and scenery. Footlights and border lights are provided and all lighting is controlled by a standard dimming arrangement, which permits the diversified effects required in the presentation of a school play.

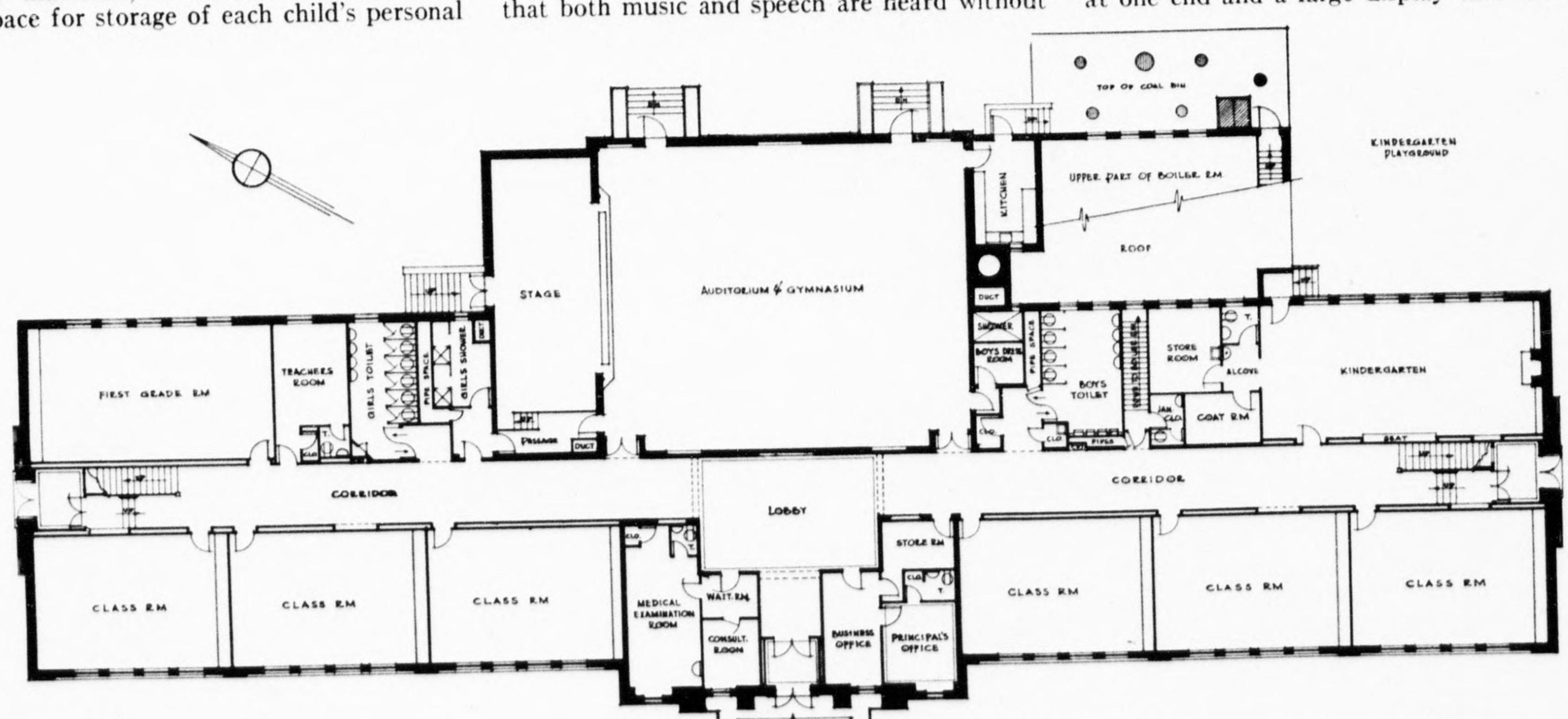
The floor of the main room is marked for various types of games.

Small shower and dressing rooms are provided for both boys and girls. A small kitchen is available for the preparation of light lunches when desired for community activities.

On the second floor of the building are 6 more classrooms. There are also an art room, a science room, a music room, and a library, in addition to toilets, teachers' room, and storage rooms.

The art room has ample light and contains storage cupboards for all kinds of materials and equipment. Suitable means of display are provided for the work of the students.

The science room has an instructor's table at one end and a large display case for speci-




First Floor Plan, Riverside School, Elmira, New York. — Robert T. Bickford, Architect, Elmira, New York.

mens along the side. Additional storage space for supplies is available directly across the hall so that the instructor may have adequate material accessible for projects.

The music room with its adjoining stage is designed to serve both for musical and dramatic instruction, and for small community meetings which would not require the use of the auditorium. A room opening off from the main room is provided for the storage of music and for the student's instruments. The ceiling of the music room is treated with acoustical materials and the walls are ornamented with appropriate plaster designs which give it a definite musical character in keeping with its primary purpose.

The library, too, has a dual function. It houses reference material for the students and teachers, and also serves as the neighborhood branch of the city's main public library. The bookshelves have a capacity of about 2500 volumes. There are racks for magazines and periodicals, and all the necessary equipment for a small, efficient library. Opening off from the library near the charging desk is a workroom. New books are delivered to this room where they are unpacked and marked. There are large storage cupboards and a sink, which permit the repairing of books thereby keeping the maximum number of volumes in a serviceable condition.

The other rooms of the building were each given careful study. The teachers' rooms are furnished simply but in good taste. There are adequate storage rooms on each floor to accommodate the supplies required for the various types of instruction. Janitor's facilities are ample and arranged for efficient maintenance of the building.

The unit system of steam heating is employed and is supplied by two stoker-fed boilers. Service access to the building is arranged to cause no interference with other activities.

The school was built at a total cost of $247,706 or about 36 cents per cubic foot. This includes the demolition of the old building, landscaping and sidewalks, and furniture and equipment.

The character of the design of the building blends harmoniously with the residential atmosphere of its surroundings. Its use has created a development of neighborly interests and a feeling of community pride in its acquisition.

Superintendent of Schools, Oscar F. Kerlin, under whose administration this school was constructed in 1939, has this to say of the Riverside School: "The structure was designed only after a careful study of all the functions we wished the school to perform. After four years' use we can say that it has met perfectly all our requirements and expectations. The principal and teachers agree with me upon this point."

**Construction and Equipment Details**

Exterior trim, *Indiana Limestone*.
Roof, *Truscon "Ferrobord"* roof deck; built-up pitch and gravel.
Insulations, roof, *Celotex*.
Floors, classroom, maple; gymnasium, maple.
Acoustical material, music room, cork tile.
Corridor and stair treads, quarry tile.
Windows, boiler room, *Detroit Steel Products*.
Heating, split system, thermostatic control.
Boilers, *International Heater*.
Stokers, *Iron Fireman*.
Unit heaters, *Nesbitt*.
Temperature control, *Johnson Service*.
Ash hoist, *Gillis & Geoghegan*.
Lighting, indirect with automatic and manual control.
Program clocks, *International*.
Intercommunicating telephones, *International*.
Photoelectric equipment, *"Electric Eye" General Electric*.
Sanitary installation, *Standard Sanitary*.
Blackboards, slate.
Gymnasium equipment, *American Seating*.
Laboratory stools, demonstration table, and aquaria, *Kewanee Mfg. Co.*

*(Reprinted from the September, 1944, issue of The American School Board Journal)*

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The Bulletins are published weekly throughout the school year (thirty issues) to aid teachers and students in keeping abreast of geography behind current news events.

# GEOGRAPHIC
## SCHOOL BULLETINS
of
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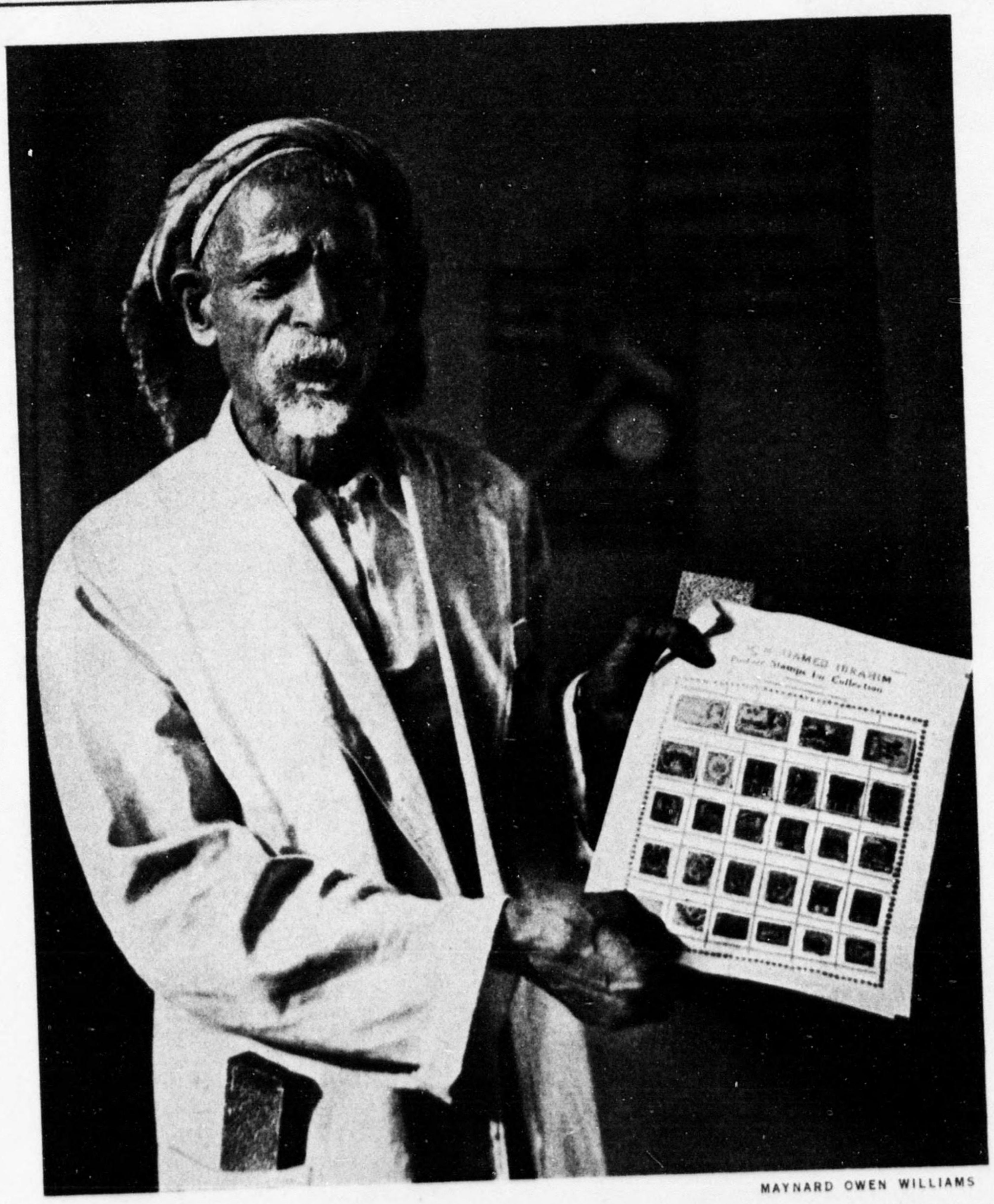
VOLUME XXVI January 5, 1948 NUMBER 12







MAYNARD OWEN WILLIAMS

THE WORLD-WIDE APPEAL OF STAMPS: A HADHRAMAUT ARAB IN SINGAPORE PEDDLES THEM TO THE CITY'S CHINESE, EAST INDIAN, AND OCCIDENTAL RESIDENTS (Bulletin No. 4)

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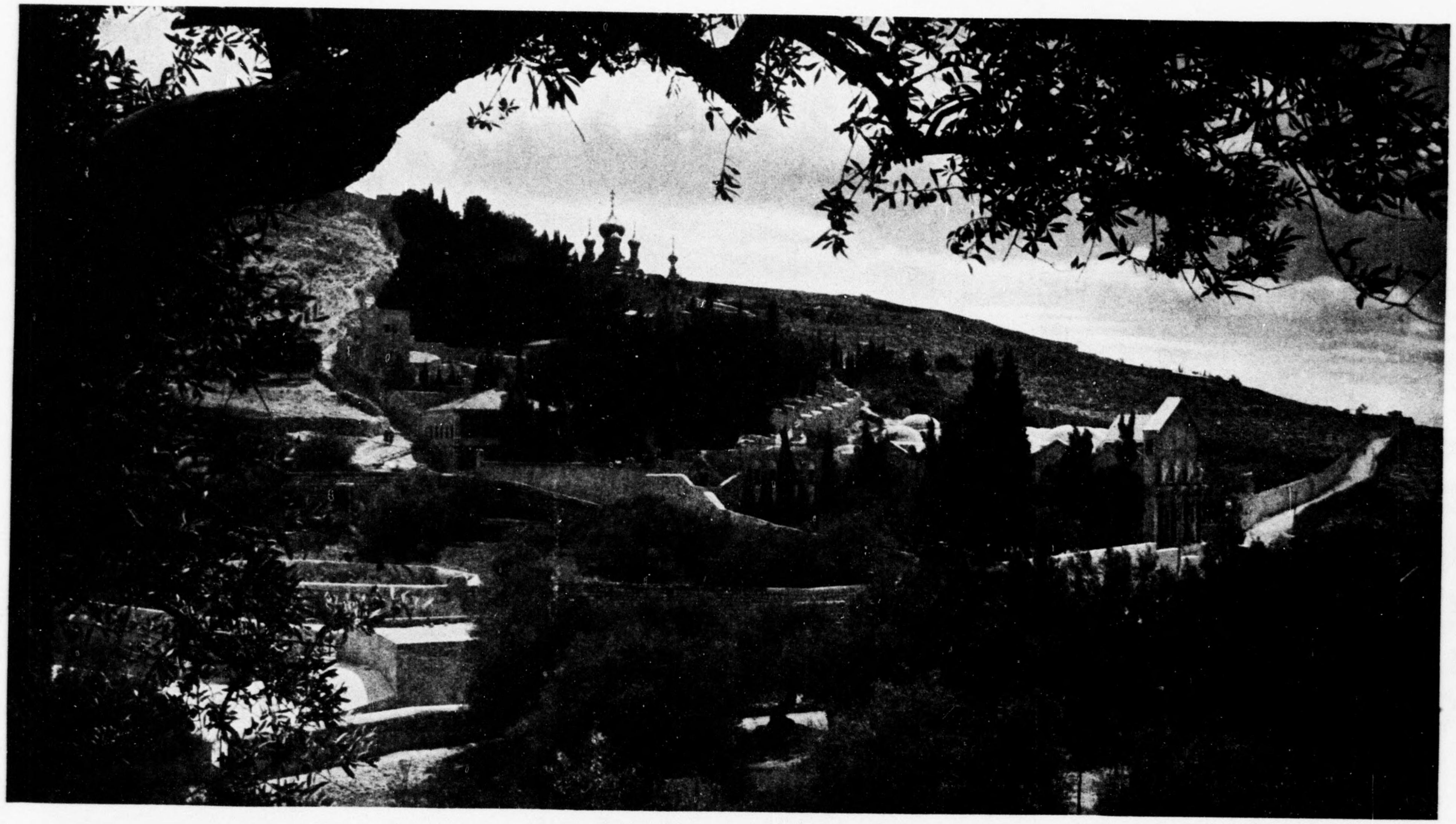

AMERICAN COLONY PHOTOGRAPHERS

**CHURCHES OF TWO CHRISTIAN RELIGIOUS SECTS SHARE THE GARDEN OF GETHSEMANE, BIBLICAL SHRINE**

Among ancient olive trees that may have witnessed Christ's betrayal, modern churches honor the Saviour. This garden spot on the westward slopes of the Mount of Olives, overlooking Jerusalem across the Kidron Valley, is preserved by two religious denominations as a sacred landmark. On the site of a third- or fourth-century basilica, Franciscan Fathers have erected a columned modern church at the edge of walled road. Farther up the incline gleam the golden domes of the Orthodox church built by the Russian Czar Alexander III in 1888. Apricot, fig, and hawthorn, and very old olive trees grow on the rugged limestone slopes traditionally held to be the olive orchard where Judas betrayed Christ. This site, sacred to Christians, will fall within the international zone on the partitioning of Palestine (Bulletin No. 1).

Bulletin No. 1, January 5, 1948

# Palestine Division Affects Bible Landmarks

WHEN the partition of Palestine, voted by the United Nations, is accomplished, where will the Bible shrines and landmarks fall?

Galilee and Phoenicia in the north, Samaria and Judaea in the center, and Philistia and Edom in the south were the large political divisions of the Holy Land 2,000 years ago. The names of regions to be divided under direction of the new world organization bear little relation to the ancient titles of these Near East areas.

## Jerusalem's Walls Encircle Shrines of Three Religions

The projected international zone in the hills of Judaea includes Jerusalem, city of 157,000 people, and a surrounding area reaching east and south to include Mt. Olivet (illustration, inside cover) and Bethlehem. The town where Christ was born is now an Arab community of 9,000.

Many shrines sacred to three great religions fall within this trusteeship zone. Among the most revered are the Wailing Wall of the Jews and the Moslems' Dome of the Rock, the latter sometimes incorrectly called the Mosque of Omar. These structures stand on the rugged mound known as the Rock (also called Mount Moriah) within the eastern edge of the walled Old City. The Wailing Wall, where Jews mourn and pray, is believed to be a remnant of Solomon's Temple, which stood on the Rock.

The Church of the Holy Sepulchre, foremost shrine of Christians, stands within the walled Holy City, on the presumed site of Jesus's tomb.

Other famous landmarks in the neighborhood of Jerusalem are the Garden of Gethsemane, Bethany, Job's Well, and the pools of Bethesda and Siloam.

The Holy Land of the Old Testament ranged "from Dan even to Beersheba." The site of Dan, close to the source of the Jordan River, is in the northeasternmost tip of modern Palestine. Capernaum and Bethsaida, on the shores of the Sea of Galilee, were also in this region of eastern Galilee, which is now assigned to the proposed Jewish state.

## Planned Cities Rise in Modern Palestine

Beersheba today is an Arab town 45 miles southwest of Jerusalem. Center of the Edom district of Bible times, its position is in the far north of Palestine's big southern triangle of desert land. Most of this desert is apportioned to the Jewish state as a colonization area. It holds the Negeb, where shepherds watched their flocks, and Gath of the Philistines.

The third sector of the Jewish state is the fertile coastal plain from south of Jaffa to north of Haifa. Under British mandate, Jewish immigrants have developed scores of communities in this Mediterranean region. These planned modern settlements include Tel Aviv, city of 174,000 Jews; Petah Tiqva, a town of 20,000 inhabitants, east of Tel Aviv; and such collective farms as Giv' at Brenner, Deganya (illustration, next page), and Gan Shemmel. During Bible times, geographic names in this district

ENTERED AS SECOND-CLASS MATTER APRIL 27, 1943, POST OFFICE, WASHINGTON, D. C., UNDER ACT OF MARCH 3, 1879.

SUBSCRIPTION TWENTY-FIVE CENTS FOR THIRTY WEEKLY ISSUES DURING THE SCHOOL YEAR. IN CANADA, FIFTY CENTS.

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Jaffa itself is to be made an Arab enclave (an area entirely surrounded by foreign territory).

The northernmost sector assigned to the Arabs, in fertile western Galilee and Phoenicia, contains Nazareth, where Christ spent His childhood and youth; and the site of Cana, where He performed His first miracle by turning water into wine. The southern Arab patch borders the Mediterranean coast and Egypt. It contains Gaza, Ashkelon, and Ashod, strongholds of the Israelites' enemies, the Philistines. Herod was born at Ashkelon. At Gaza, Samson pulled down the temple.

The largest Arab section surrounds the Jerusalem zone and covers most of the hill country of Samaria and Judaea. Familiar Bible names in this region include Tirzah, Shiloh, Shechem, Jericho, Hebron, and the Wilderness of Judaea. Jordan River and Dead Sea form its east border.

NOTE: The Holy Land today and in Biblical times is shown in insets on the National Geographic Society's map of Bible Lands and the Cradle of Western Civilization. Write the Society's headquarters, Washington, D. C., for a price list of maps.

For further information, see "An Archeologist Looks at Palestine," in the December, 1947, issue of the *National Geographic Magazine;* "Palestine Today," October, 1946; "American Fighters in Bible Lands," March, 1946; "Bombs over Bible Lands," August, 1941; and "Bedouin Life in Bible Lands," January, 1937*. *(Issues marked with an asterisk are included in a special list of Magazines available to teachers in packets of ten for $1.00.)*

ROYAL AIR FORCE, LEVANT

**FROM THE SOUTHERN END OF OVAL GALILEE THE JORDAN (left) FLOWS PAST JEWISH COLONIES**

**The river leaves the lake near Deganya, a pioneer agricultural settlement of Hebrews. Light fields and dark orchards follow the Jordan southward. At the foot of the lake lies the baked-mud Arab village of Samakh. All this area goes to the new Jewish state.**

# CORRECTION

THIS DOCUMENT
HAS BEEN REPHOTOGRAPHED
TO ASSURE LEGIBILITY

Bulletin No. 1, January 5, 1948

# Palestine Division Affects Bible Landmarks

WHEN the partition of Palestine, voted by the United Nations, is accomplished, where will the Bible shrines and landmarks fall?

Galilee and Phoenicia in the north, Samaria and Judaea in the center, and Philistia and Edom in the south were the large political divisions of the Holy Land 2,000 years ago. The names of regions to be divided under direction of the new world organization bear little relation to the ancient titles of these Near East areas.

## Jerusalem's Walls Encircle Shrines of Three Religions

The projected international zone in the hills of Judaea includes Jerusalem, city of 157,000 people, and a surrounding area reaching east and south to include Mt. Olivet (illustration, inside cover) and Bethlehem. The town where Christ was born is now an Arab community of 9,000.

Many shrines sacred to three great religions fall within this trusteeship zone. Among the most revered are the Wailing Wall of the Jews and the Moslems' Dome of the Rock, the latter sometimes incorrectly called the Mosque of Omar. These structures stand on the rugged mound known as the Rock (also called Mount Moriah) within the eastern edge of the walled Old City. The Wailing Wall, where Jews mourn and pray, is believed to be a remnant of Solomon's Temple, which stood on the Rock.

The Church of the Holy Sepulchre, foremost shrine of Christians, stands within the walled Holy City, on the presumed site of Jesus's tomb.

Other famous landmarks in the neighborhood of Jerusalem are the Garden of Gethsemane, Bethany, Job's Well, and the pools of Bethesda and Siloam.

The Holy Land of the Old Testament ranged "from Dan even to Beersheba." The site of Dan, close to the source of the Jordan River, is in the northeasternmost tip of modern Palestine. Capernaum and Bethsaida, on the shores of the Sea of Galilee, were also in this region of eastern Galilee, which is now assigned to the proposed Jewish state.

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Bulletin No. 2, January 5, 1948

# New Port at Matarani Is South Peru Gateway

THE newly dedicated port of Matarani, Peru, opens another gateway to the mountain land of the Incas.

The $4,000,000 development makes use of one of the few sheltering coves in southern Peru, whose rocky Pacific coast is not naturally hospitable to shipping.

## Rich in Inca Ruins

Now vessels can unload directly at the dock, a convenience lacking at near-by Mollendo, Matarani's predecessor as the regional shipping point. Because Mollendo does not have a protected harbor, ships had to anchor a mile offshore and transfer passengers and cargo to lighters (illustration, next page).

From the coast a railroad winds high into the Andes, where the Inca Indians developed a notable civilization long before the arrival of the Spaniards. Massive stone walls of fortifications, palaces, and temples remain as evidence of their architectural ability. These walls contain no mortar, but the stones fit so tightly that a knife cannot be inserted between many of them.

On the railroad, 500 miles from the coast, stands Cuzco, the ancient Inca capital which held 200,000 residents when Francisco Pizarro and his men invaded it. Although planes now land at the Cuzco airport, Indian life has changed little. Women carry corn to market in blankets on their backs, and the llama continues as the beast of burden.

## Continent's Largest Lake

High in the mountains to the northwest is the 2,000-year-old forgotten city of Machu Picchu, a cradle of Inca civilization. Machu Picchu was not known to the Spaniards but was reached in 1912 by an expedition of the National Geographic Society and Yale University led by former Senator Hiram Bingham.

Between Cuzco and the coast, the winding railroad passes near Lake Titicaca, which forms part of the boundary between Peru and landlocked Bolivia. This is South America's largest lake, and, at nearly two and a half miles above sea level, is the highest body of water in the world on which steamboats operate. The water, although very cold even in midsummer, never freezes.

## Climate Varies with Elevation

Nearer the coast, the railroad serves Arequipa, southern Peru's commercial center at the foot of a snow-covered peak called El Misti. Factories produce textiles, soap, and leather goods. Through the surrounding mountains extends the country's principal sheep-grazing area.

The climate is vertical in southern Peru. Matarani and other coastal settlements bake in a nearly constant rainless heat. Inland, the north-south ranges of mountains rise to successively higher elevations, each zone having a cooler temperature and greater rainfall. Prevailing winds come overland from the east, not from the ocean, and rain clouds usually drop all their moisture before reaching the coastal plain.

NOTE: Peru is shown on the Society's map of South America.

For additional information, see "Finding the Tomb of a Warrior-God," in the April, 1947, issue of the *National Geographic Magazine;* "The Pith of Peru," August, 1942*; "The Incas: Empire Builders of the Andes," February, 1938; "Air Adventures in Peru," January, 1933; and "Lure of Lima, City of Kings," June, 1930.

See also, in the GEOGRAPHIC SCHOOL BULLETINS, January 20, 1947, "Peru Taps New Oil Field East of Andes;" and "A Slice of Ecuador's Oriente Now Part of Peru's Montaña," October 8, 1945.

R. GUZMÁN MARQUINA

**MOLLENDO IS WEDGED BETWEEN THE DEVIL (OF BURNING SANDS AND MOUNTAINS) AND THE DEEP BLUE SEA**

The Pacific Ocean breaking against the cliffs at this south Peru port is blue but not so deep. Small boats (lighters) transfer goods from steamers to shore. Newly dedicated Matarani, a deepwater port just north of Mollendo, may usurp most of the latter's trade hinterland which includes Arequipa, Cuzco, and the Lake Titicaca region. Winds from inland (rather than from the ocean) account for the dry coastal strip. The other side of the range is greener.

Bulletin No. 3, January 5, 1948

# The Urge to Explore Thrived in 1947

SEVERAL governments supported explorative research in various parts of the earth's polar regions in 1947 and numerous institutional and private research groups took expeditions to every quarter of the globe.

Rear Admiral Richard E. Byrd's fourth Antarctic expedition was a U. S. Navy project testing ships, men, food, and equipment under polar conditions. Termed the largest exploratory venture in history, it took 13 ships and 4,000 men to the Antarctic through the January-March summer. Its aerial surveys covered a third of the polar continent (map, next page).

## Operation High Jump One of Many Arctic Ventures

Antarctica's first women visitors were two of the 22 members of the Ronne Antarctic Research Expedition. Settling on the Palmer Peninsula in March for a full year's stay, this group by December had mapped a Texas-size area, much of which was previously unexplored. Based near the Ronne party was one of five units of the British Falkland Islands Dependency Survey. Australia, Argentina, and Chile were also active in Antarctica.

In Arctic and sub-Arctic areas, the U. S. Navy's Operation High Jump was but one of many expeditions to study weather and train men. Russians and Danes each sent forth two or more Arctic survey parties. British junkets to Iceland and Jan Mayen Island trained future leaders in exploration. Geological and botanical surveys were made in the Hudson Bay area.

Ten scientists and a crew aboard the ketch *Atlantis* formed the National Geographic Society-Columbia University-Woods Hole Oceanographic Institution Expedition to the Mid-Atlantic Ridge. Swedish oceanographers, using a new method, pulled up ocean-bottom cores 66 feet long. U. S. Coast and Geodetic Survey crews recorded towering undersea peaks in the north Pacific Ocean and the Bering Sea. During the year the Department of Interior's Fish and Wildlife Service expanded its "navy" of research ships all the way to the Palau Islands and the Philippines.

Dr. Thor Heyerdahl, Norway, and five companions on a big balsa-and-bamboo raft made a 4,300-mile, 101-day drift from Peru to the Tuamotu Archipelago. The purpose was to show that ancestors of the Polynesians may have reached the South Sea Islands from South America in similar fashion, drifting with the Pacific's currents.

## Mt. McKinley Conquered Fourth Time

World interest on May 20 centered on the sun eclipse, total in a narrow path across South America and Africa. Most comprehensive of the many observing parties was the Army Air Forces-National Geographic Society camp at Bocaiuva, Brazil, 400 miles north of Rio de Janeiro.

History's fourth recorded conquest of 20,300-foot Mt. McKinley found Bradford Washburn in June repeating his 1942 success. In his party of eight, testing Army equipment and taking cosmic ray counts, was Mrs. Washburn, first woman to reach the summit.

Human skeletons unearthed on Kodiak Island, Alaska, and near Mexico City came from strata that indicated man's presence in the New World as much as 20,000 years ago, offsetting views of a much more recent first migration from Asia to America.

In Chiapas State, southern Mexico, signs of a crude culture believed to predate that of Mayas, Olmecs, and Zapotecs were found in a large shell mound opened by a National Geographic Society-Smithsonian Institution survey party under Dr. Philip Drucker. In the same state, native Indians led the United Fruit Company-Carnegie Institution archeologists working on the Zazaleu project to remnants of 11 eighth-century Maya temples.

Motilene Indians living along the Colombia-Venezuela border, discouraged expedition visitors early in the year by raining arrows on them. The Roncador-Xingu expedition, a larger-scale, four-year exploration of Brazil's "wild west" supported privately as well as by the Brazilian government, continued its practical study of upper Amazon resources, transportation routes, and settlement sites for immigrants.

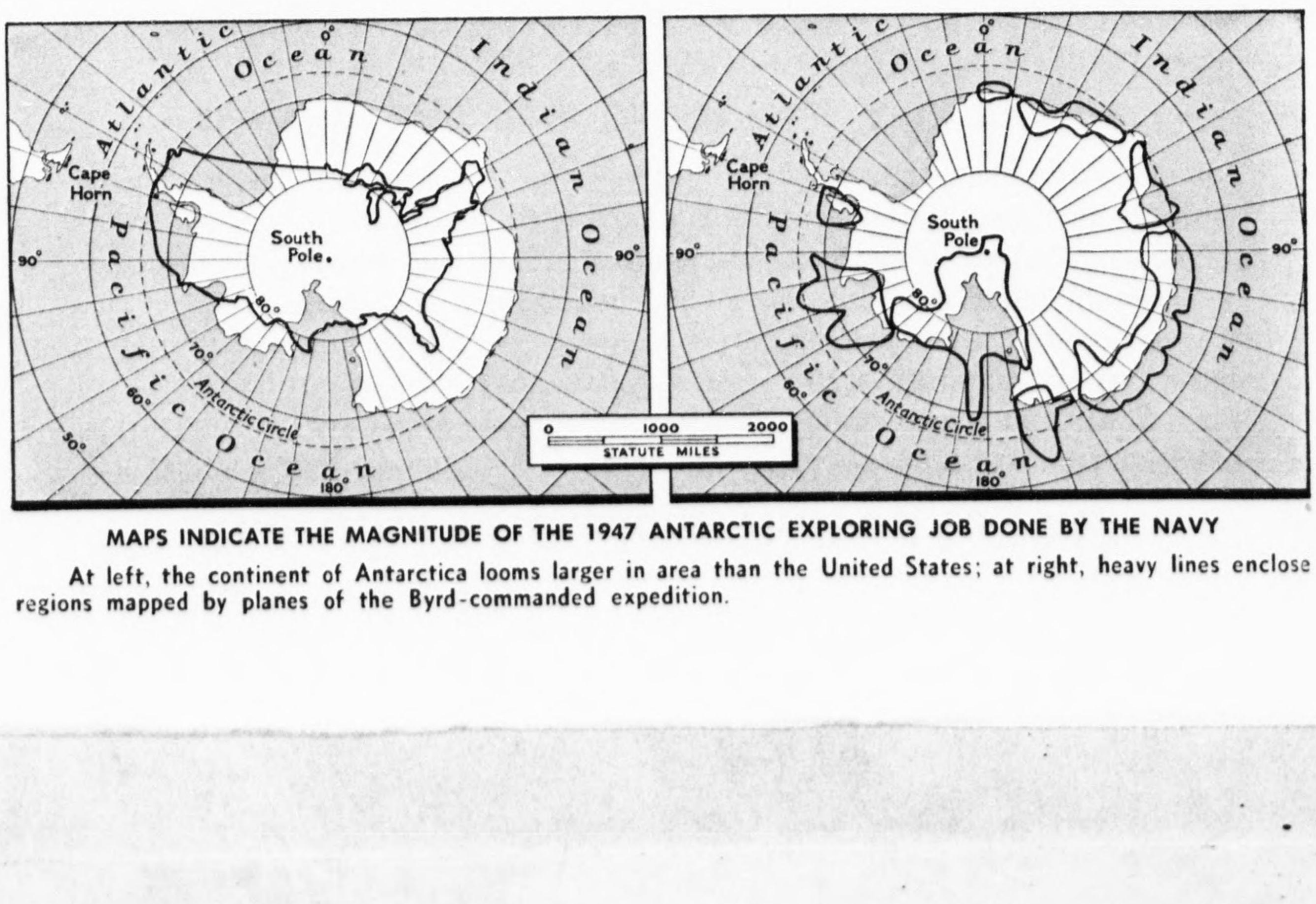
Similarly practical in purpose but at the opposite end of the climate scale were two snow survey expeditions in the Himalaya Mountains for the new Dominion of India. They marked the start of an exhaustive study of India's water resources and were directed by an American, Dr. J. E. French.

British archeologists, uncovering pottery showing Chinese influence at Alexandria, Egypt, worked at the supposed site of the tomb of Alexander the Great, which has so far evaded discovery. Explorers near Cairo noted stone symbols of a ruler of Egypt 1,000 years before Tut-Ankh-Amen.

In the sands of southern Iraq, native researchers uncovered remains of a large Babylonian temple of 6,000 years ago. The site, 14 miles from Ur of the Chaldees, is that of Eridu, perhaps the oldest of all cities.

Oil, coal, and metals were objectives of 930 Soviet expeditions from East Prussia to the Kurils. In the Ural Mountains, petroleum geologists took fossils of dragonflies with three-foot wingspread from the Permian ooze. Skeletons of ancient monsters were found in the Gobi Desert.

NOTE: For additional information, see "Our Navy Explores Antarctica," in the *National Geographic Magazine* for October, 1947; "Eclipse Hunting in Brazil's Ranchland," September, 1947; and "On the Trail of La Venta Man," February, 1947.




**MAPS INDICATE THE MAGNITUDE OF THE 1947 ANTARCTIC EXPLORING JOB DONE BY THE NAVY**

At left, the continent of Antarctica looms larger in area than the United States; at right, heavy lines enclose regions mapped by planes of the Byrd-commanded expedition.

Bulletin No. 5, January 5, 1948

# Milan Sets Italy's Pace in Art and Commerce

MILAN (Milano), a center of recent Italian labor disturbances, has added great industrial development to a historic appreciation of the arts.

With Turin (Torino) and Genoa (Genova), Milan forms a powerful manufacturing and commercial triangle in northwest Italy. The weaving of textiles—cotton, silk, linen, wool, rayon, and jute fabrics—normally occupies thousands of Milanese. Art in weaving tulles, velvets, and fancy fabrics is high. As early as the 14th century Milan silk was famous.

## Postwar Shortages Hamper Production

Another noteworthy product of Milan's workers was exceptionally fine armor. This was made largely for export, as, in those days, Milan's rulers hired foreign soldiers to do their fighting, while the natives remained at home and cultivated their arts and crafts. Milan craftsmen today are skilled workers in gold, silver, bronze, and leather.

Through prewar years, when plants turning out automobiles, locomotives, chemicals, electrical goods, boilers, pumps, and milling machinery roared at top speed, Milan became a city of a million and a quarter people. Since World War II however, lack of coal and transportation and curbs on foreign trade have reduced production far below its record volume.

Milan's Gothic cathedral (illustration, next page) is one of the world's largest churches. Forty thousand people can crowd into this impressive white marble edifice. Of some 3,500 statues which adorn it, inside and out, only 40 were damaged in wartime raids on the city's industries. Its 15th-century windows of priceless stained glass were carefully removed and stored during the war, and as carefully replaced afterward.

In May, 1946, Arturo Toscanini conducted the first postwar concert in Milan's 168-year-old La Scala Theater, where he had gained his first fame. The Allied Military Government had given priority to reconstruction of this damaged landmark, recognizing its distinguished part in music and opera.

## Canals Tie Lakes and Rivers into Network

Raphael, da Vinci, and the Lombard and Venetian masters of art are represented in Milan's churches and galleries. Leonardo da Vinci's "The Last Supper" has been a magnet drawing countless travelers to Milan from afar. Although the city was founded in ancient times, its relics of antiquity are few because it was several times reduced to ashes.

Milan lies in the fertile valley of the Po River, with the Alps shutting it in on the north and west and the Apennines on the south. Canals connect the city with the Ticino River flowing from Lake Maggiore to the Po, with the Po itself, and with Lake Maggiore and Lake Como. It is Italy's most important rail junction. From it highways lead to the lake region.

It has been said of Milan that it is the only Italian town which is, in the modern sense, a great city. "She alone is as thoroughly alive, as full of business . . . as restless as the great cities of the North . . . a monstrous confusion of old and new . . . wealth and extreme poverty."

Through the 14th and 15th centuries Milan was a republic dominated by the Visconti and Sforza families. Directing its successful commerce, they became patrons of art and science. For Ludovico Sforza, Leonardo da Vinci drew plans for flame throwers, grenades, tanks, and flying machines—weapons which were to materialize in the 20th century. Religious art was Leonardo's recreation.

Milan's prewar industry, commerce, and finance, like that of New York and many other large cities, were directed largely by men who had made their start in villages and on farms. Careers of the Horatio Alger pattern were plentiful in the city that established the pace for Italian finance and industry.

NOTE: Milan may be located on the Society's Map of Europe and the Near East.

For further information, see "Hunting Castles in Italy," in the *National Geographic Magazine* for September, 1935.

DONALD MCLEISH

FROM ONE OF THE CATHEDRAL'S TAPERING SPIRES, A MARBLE ANGEL STANDS WATCH OVER MILAN

Bulletin No. 4, January 5, 1948

# Stamps Illustrate the Story of Geography

As a compact interpreter of geography, the postage stamp has no pictorial equal. It throws in historic sidelights for good measure.

The dictionary defines geography as "the science of the earth and its life . . . the description of land, sea, and air, and the distribution of plant and animal life, including man and his industries." Postage stamps illustrate all these aspects of geography. So varied are stamp illustrations that a few connecting words can link them together in a continuous story of a country.

## Queen Victoria Adorned First "Adhesive"

Postage stamps often bear pictures of outstanding physical features of a country—its rivers, lakes, and mountains. Views of its important public buildings, portraits of its ruler (illustration, next page), and pictures of objects typifying the occupations and industries of its people present a graphic history of a nation.

Stamps are of various shapes. A few are triangular, some are round, but most of them are the familiar rectangles (illustration, cover). The first stamp issued—the one-penny stamp bearing a portrait of Queen Victoria which Britain brought out in 1840—was a rectangle.

The first stamps, like today's, were gummed on the backs so that they could be stuck on envelopes. Postage stamps are called "adhesives" by philatelists—people who make a study of their shape, size, color, watermarks, and all qualities which distinguish them from each other.

Portraits of heads of state are widely used as stamp pictures. The first United States stamps bore a portrait of the first president, George Washington, and one of Benjamin Franklin, first postmaster general. Franklin's picture appeared on the 5¢ stamp, Washington's on the 10¢.

Portraits of all the presidents of the United States through Franklin D. Roosevelt, with the exception of Herbert Hoover (the only living ex-president), have appeared on United States stamps. A president is not so honored during his lifetime.

## Scenic Glories from Coast to Coast Appear on Stamps

Many stamps bear maps—the first tool for the study of geography. A recent issue shows a map of Florida on the green ground of which is poised a large white flamingo. This marks the opening of the Everglades National Park at which President Truman officiated on December 6.

In a series of National Park stamps previously issued, mountains, lakes, rivers, and cataracts vividly depict the country's scenic beauties from Acadia, off the Maine coast (recently nearly destroyed by fire), to Yosemite, on the slopes of California's Sierra Nevada Mountains.

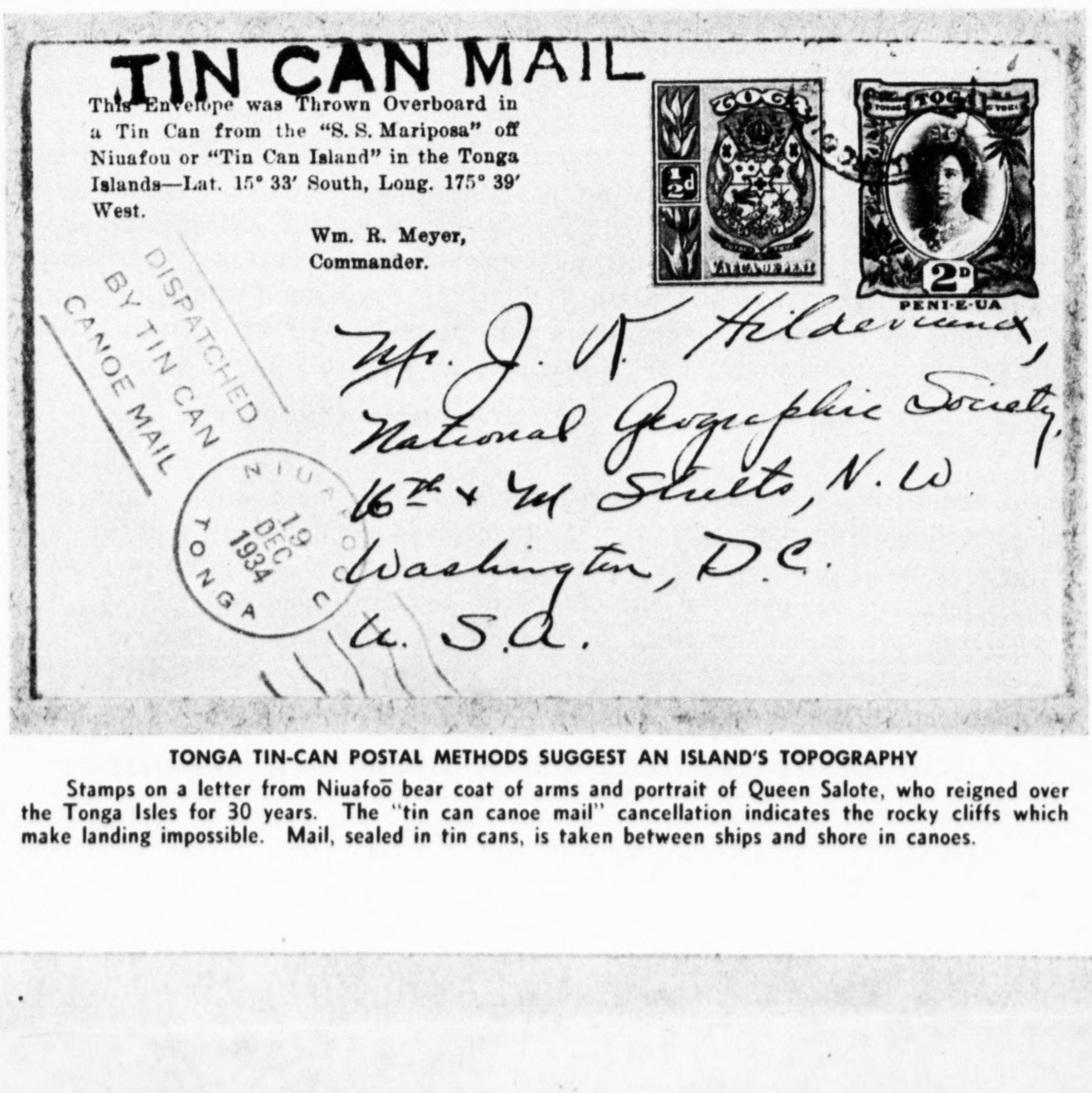
Postage stamps have noted geographic changes and discoveries, and historic events from the founding of Rome down to the present. In 1929, Italy issued a stamp showing the legendary she-wolf and Romulus to commemorate the 2,682nd birthday of their capital. Stamps picturing events in the life of Columbus have been issued in lands he discovered.

To raise special funds, governments sometimes issue semipostals. These are postage stamps sold for a fraction over their face, or franking, value. The Dominican Republic brought out a series of stamps to raise money for a mausoleum for Columbus in San Domingo City (now Ciudad Trujillo). Norway issued a stamp to help finance the flight of Amundsen and Ellsworth over the North Pole from Spitzbergen to Alaska in 1926.

Stamps have commemorated the founding of nations, the birthdays of their leaders, of explorers, artists, scientists, and soldiers. They celebrate accession of territory by conquest or purchase, settlement of disputed boundaries, and scientific achievements. Stamps commemorate the Louisiana Purchase, Edison's electric lamp, and Byrd's Antarctic Expedition II. In 1947 both the United States and Canada issued stamps in honor of the 100th birthday of Alexander Graham Bell, inventor of the telephone.

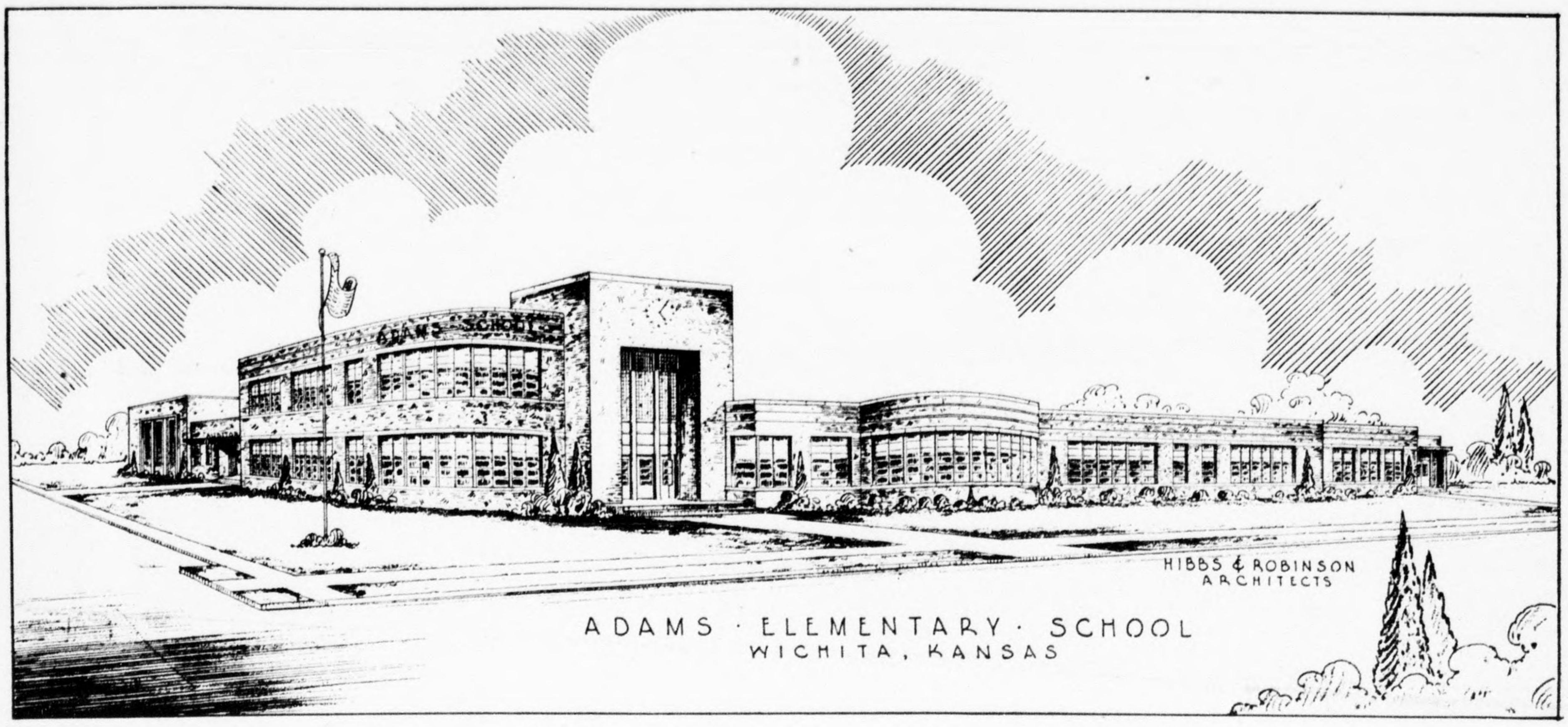
The United States government issued its first stamps in 1847. For the two previous years, a dozen cities supplied stamps to indicate that postage had been prepaid. Some of these postmaster stamps, or "provisionals," were adhesives. Others were stamped or printed on the envelopes. Cities which issued provisionals include Alexandria, Virginia; Annapolis and Baltimore, Maryland; Lockport, New York; and New Haven, Connecticut. These stamps are prized by collectors. Some of them have sold for as much as $15,000.

Another rarity is the stamp of a country no longer existing as a political unit. Nations with such operetta-style names as Livonia, Moldavia, and Roumelia have left postage stamps as souvenirs of their existence.




**TONGA TIN-CAN POSTAL METHODS SUGGEST AN ISLAND'S TOPOGRAPHY**

**Stamps on a letter from Niuafoō bear coat of arms and portrait of Queen Salote, who reigned over the Tonga Isles for 30 years. The "tin can canoe mail" cancellation indicates the rocky cliffs which make landing impossible. Mail, sealed in tin cans, is taken between ships and shore in canoes.**




Architect's Drawing, Adams Elementary School, Wichita, Kansas. — Hibbs & Robinson, Architects, Wichita, Kansas.

# Planned for Adequacy and Flexibility

*Wade C. Fowler*[1]

The new Adams School has been planned with the idea that a modern program of elementary education demands adequate space and flexibility in classroom arrangement. It is believed that the building and its equipment should facilitate the wholesome total development of youthful personalities. The larger classrooms, the workrooms, the health room, the activity and physical education rooms are provided in order that a well-rounded program may be possible. It is hoped that the initiative of the best teachers may be used without restriction in the facilities that will be provided.

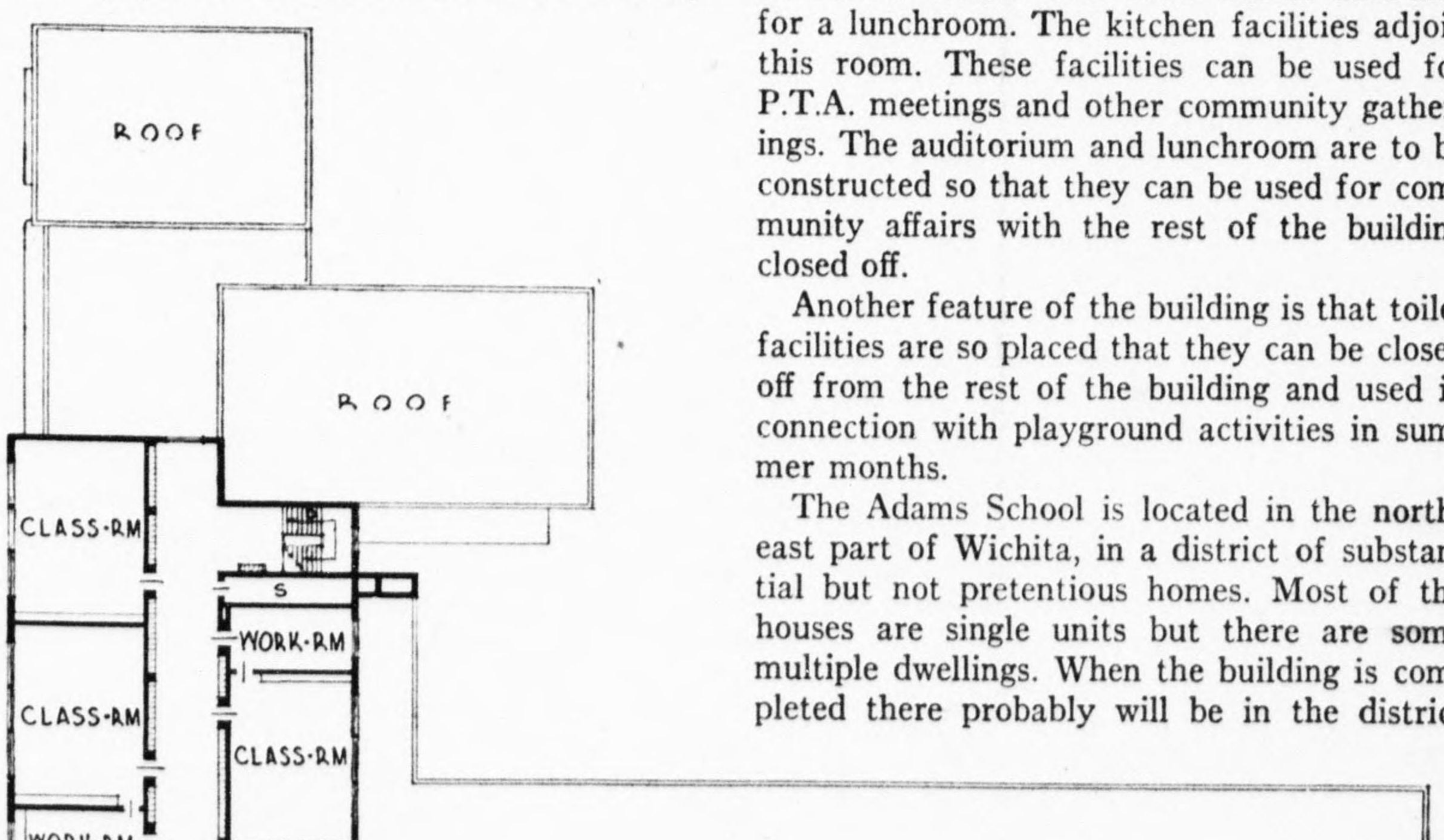
The site includes an area of about five acres. The main entrance will be facing south, the auditorium entrance will face west. This gives the effect of a front entrance on two streets. Rounded corners with glass brick will give a modernistic appearance and an abundance of light.

Classrooms are slightly larger than the average and in addition have a workroom for each two classrooms. In general, the workroom is between two classrooms with entrances to each. The kindergarten and first-grade rooms will be provided with wardrobes. Grades two to six inclusive will have hall lockers. The health center adjoins the office and will have a large reception room accommodating both the principal's office and the health center. Cabinets, files, and other facilities will be provided in the reception room. The activity room is one which will provide for visual education, art, and science projects and other types of activities.

The physical education room is to be 36 by 48 ft. This will provide space for physical education when the weather is unsuitable for outdoor activities. This room will be used also for a lunchroom. The kitchen facilities adjoin this room. These facilities can be used for P.T.A. meetings and other community gatherings. The auditorium and lunchroom are to be constructed so that they can be used for community affairs with the rest of the building closed off.

Another feature of the building is that toilet facilities are so placed that they can be closed off from the rest of the building and used in connection with playground activities in summer months.

The Adams School is located in the northeast part of Wichita, in a district of substantial but not pretentious homes. Most of the houses are single units but there are some multiple dwellings. When the building is completed there probably will be in the district




Second Floor Plan, Adams Elementary School, Wichita, Kansas. — Hibbs & Robinson, Architects, Wichita, Kansas.

[1]Superintendent of Schools, Wichita, Kans.

three to four hundred new homes many of which will be occupied by returned veterans and their families.

This building project is a part of a building program in the Wichita Public Schools made possible by the issuance of $5,680,123 in bonds. A total of 12 projects will be provided for in the total bond issue.

It is estimated that the Adams building will cost $285,000 to $315,000.

### PROPOSED CONSTRUCTION DETAILS OF THE ADAMS ELEMENTARY SCHOOL, WICHITA, KANSAS

*Exterior facing:* buff face brick
*Exterior walls:* 13-inch brick bearing walls
*Interior construction:* reinforced concrete floors, interior columns, and beams
*Windows:* steel, projected architectural
*Doors:* wood
*Corridors:* terrazzo floors, glazed-tile wainscots
*Stairs:* terrazzo, with nonslip inserts
*Classroom and auditorium floors:* asphalt tile on concrete
*Gymnasium floor:* maple
*Acoustic ceilings:* low-density, rigid insulation board
*Toilet rooms:* terrazzo floors, glazed-tile walls
*Heating and ventilation:* low pressure steam boiler, with radiant heating in kindergarten and first grades; direct radiation in special rooms, and unit ventilators in all classrooms
*Temperature control:* Thermostats in all classrooms
*Toilet rooms:* fan-driven exhaust ventilation
*Electrical equipment:* fluorescent lighting, electric program clocks, fire alarm system
*Toilets:* jet action, with seat controlled, concealed tanks
*Urinals:* stall type, with timed flushing tanks
*Drinking fountains:* vitreous basins, gang type
*Toilet partitions:* marble
*Washbowls:* vitreous basins, with individual soap dispensers, and individual paper towel fixtures
*Additional installations:* sinks and drinking fountains in each workroom
*Clothing storage:* lockers in corridors for all rooms, except kindergartens and first grades, which will have special cloakrooms
*Storage cabinets:* wood cabinets for books and teaching materials in each classroom and each workroom
*Incinerator* in boiler room
*Fire control:* complete fire alarm system and portable fire extinguishers

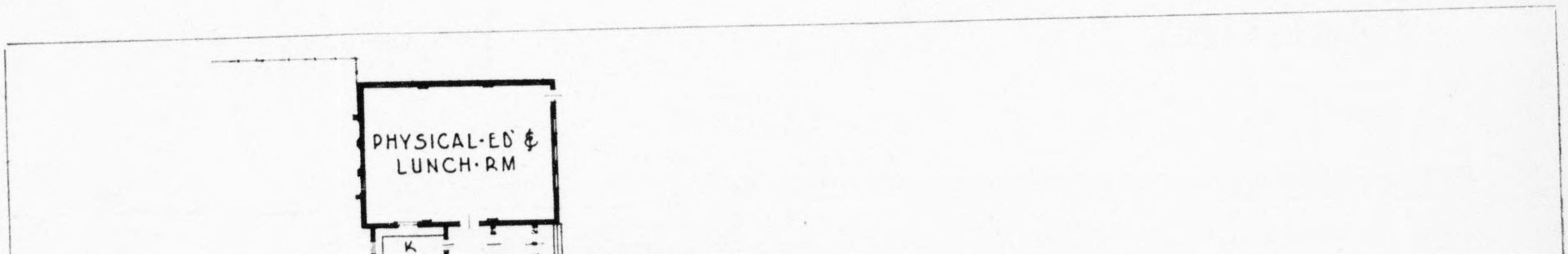
## INDIANAPOLIS POSTWAR BUILDING PROGRAM

An $8,000,000 postwar school-building program was approved by the Indianapolis board of school commissioners at its first meeting in 1947.

The program, which calls for four new school plants, includes a high school, and additions to six existing structures. More than 7000 elementary and high school students, about 12 per cent of the school population, is affected by the new facilities. The proposals approved were embodied in a report by the board's building committee, headed by Clarence Farrington, newly elected board president. The report is the result of a one year's study by the committee of population shifts in the city affecting school enrollments, and age and condition of school and library buildings.

The board's policy will be to co-operate with the city park board so that community, civic, and recreational activities may be provided in connection with school functions. This policy, already in effect, will be applied to the rebuilding of School No. 63. In this building and in all future buildings, the recreational department will use a part of the school facilities during out-of-school hours and in vacation periods. Each building will include a wing, housing a large community room suitable for educational and civic forums and community social gatherings. Home-economics laboratories and industrial-arts shops will be available, while a gymnasium, locker and shower rooms, an office for the director, a public health clinic, and toilet facilities will be so arranged that they may be used without disturbing the academic classes.

The high school building, which is to replace the present Emmerich Manual Training High School, located in an industrial area, will be relocated on a new site.



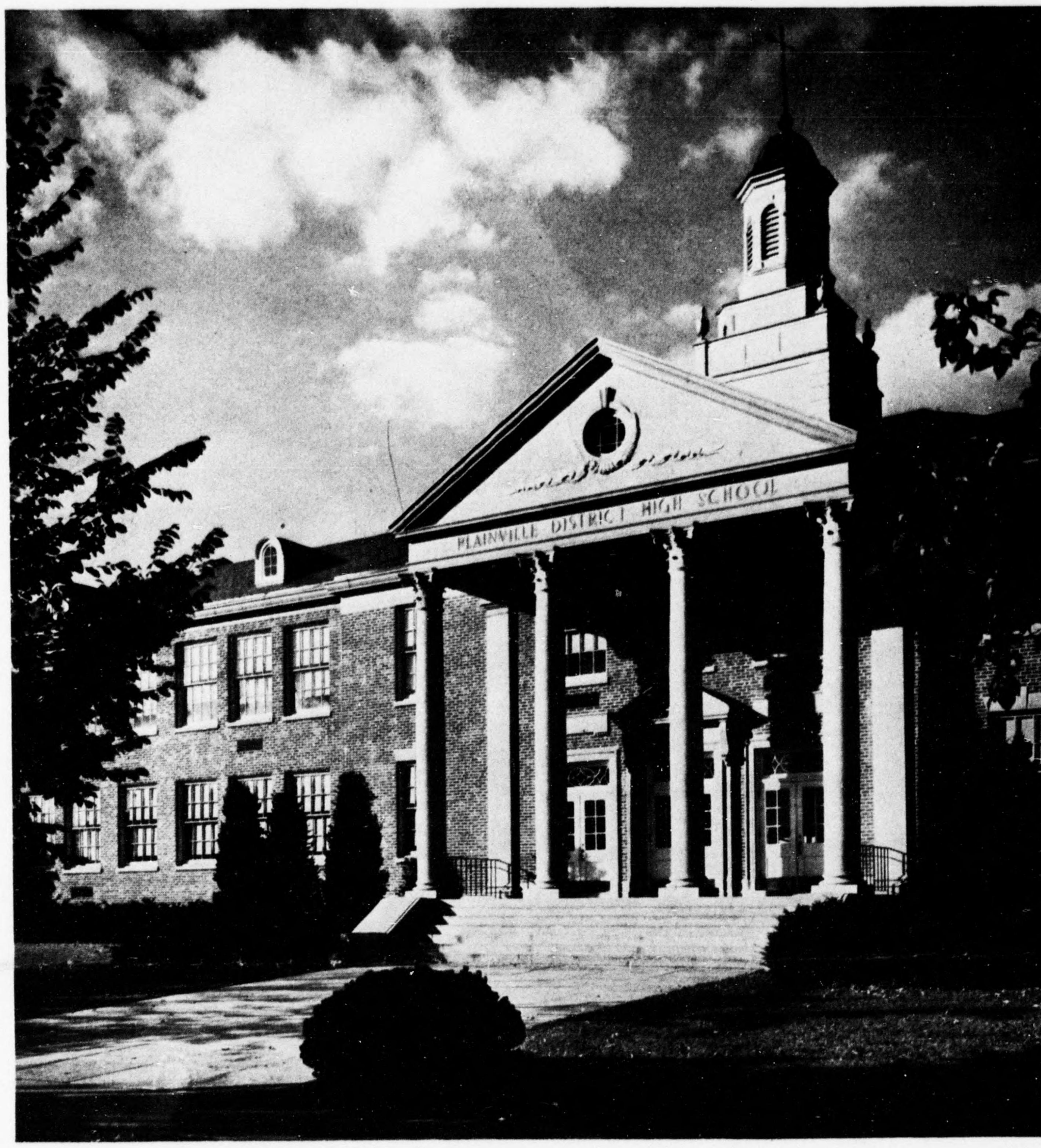

Adams Elementary School, Wichita, Kansas. — Hibbs & Robinson, Architects, Wichita, Kansas.

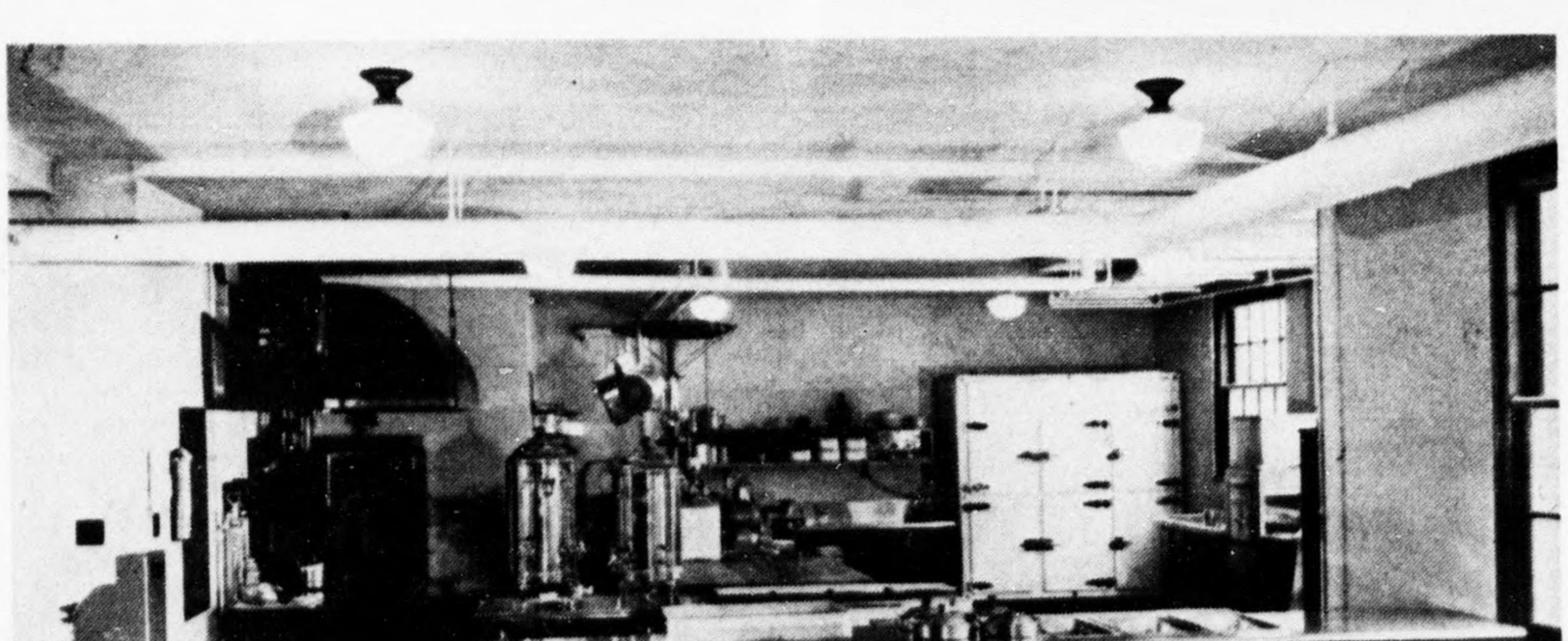
# A High School for a Residential Suburb

*The Plainville District High School*

Right
Main Entrance, Plainville District High School, Mariemont, Cincinnati, Ohio.— E. C. & G. T. Landberg, Architects, Cincinnati, Ohio.

Below
The cafeteria kitchen is extremely compact and is equipped with the latest type of hotel fixtures.



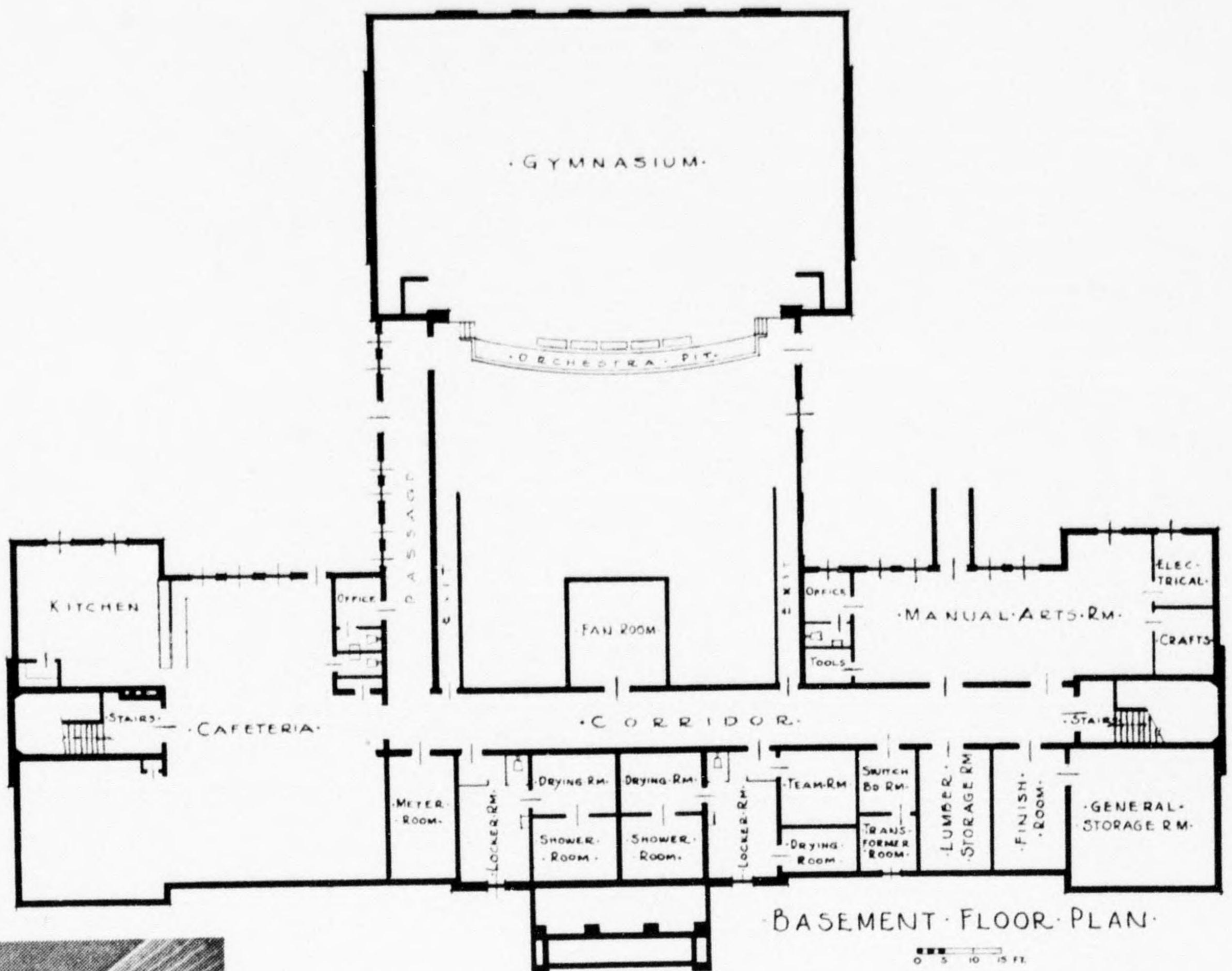
A new school building is invariably a reflection of the civic quality and educational alertness of a community. In a very real sense it is the embodiment of the efficiency and foresight of the school's administration and of the instructional service planned for the children. The new colonial-type high school building, located at Wooster Pike and Plainville Road, Mariemont, Cincinnati, Ohio, is a school plant which suggests definitely the delightful character of a modern residential suburb, as well as the fine qualities of the school which it houses.

Mariemont, a suburb of Cincinnati, is a housing development laid out in 1928 by one of Cincinnati's philanthropic citizens, as a model of what such developments should be. Twenty-five leading architects were selected from all over the country to participate in its planning and in the design of the houses and shopping center.

This new combined junior and senior high school, designed by architects E. C. & G. T.

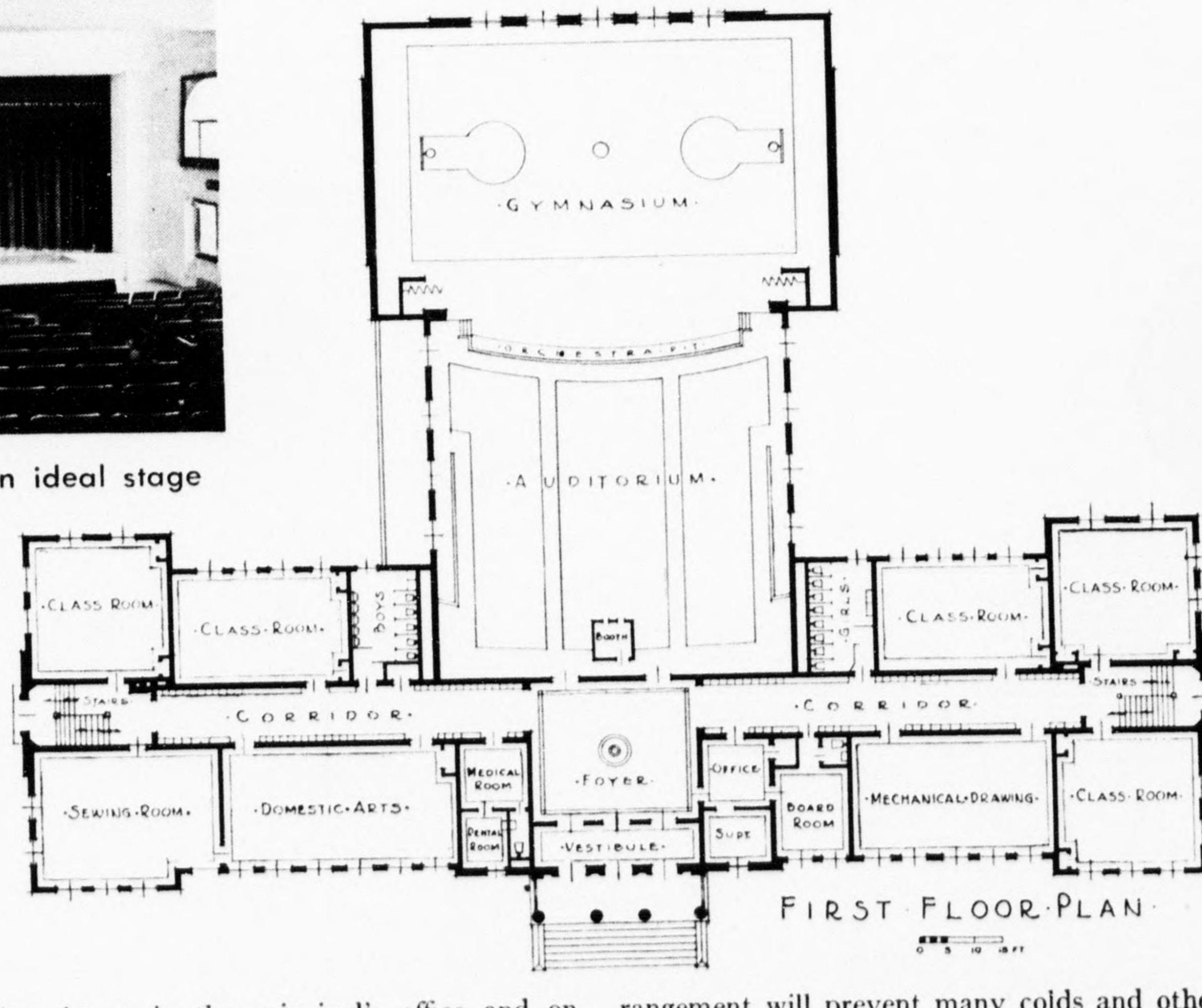
Landberg, Cincinnati, serves Mariemont and the adjoining village of Plainville. It has 22 recitation rooms, an auditorium, a gymnasium, a cafeteria, a group of shops for industrial arts, a domestic science suite, a library, a music room, laboratories, and the usual administrative and service rooms.

The design and practical layout of the building were worked out by the school staff and the architect to fully meet the educational program of the school district and to utilize the physical features of the site. The construction is of fire-resisting materials throughout, except the doors and windows. The floors are concrete, covered with various materials such as maple in the gymnasium, asphalt tile in the corridors and classrooms, and terrazzo in the entrance lobby and toilet rooms. The walls are solid brick, with Indiana limestone trim. The sloping roofs are of slate, and the flat roofs are built-up tar and gravel. The exterior sheet-metal work is copper throughout. All interior woodwork is of yellow pine, painted white or school brown with a flat varnish finish. All plastering has been done with buff sandstone finish. The corridors and toilets have glazed-brick wainscot. The steel lockers for pupils' wraps and books are built into the walls of the corridors on all floors.




Floor Plans, Plainville District High School, Mariemont, Cincinnati, Ohio. — E. C. & G. T. Landberg, Architects, Cincinnati, Ohio.

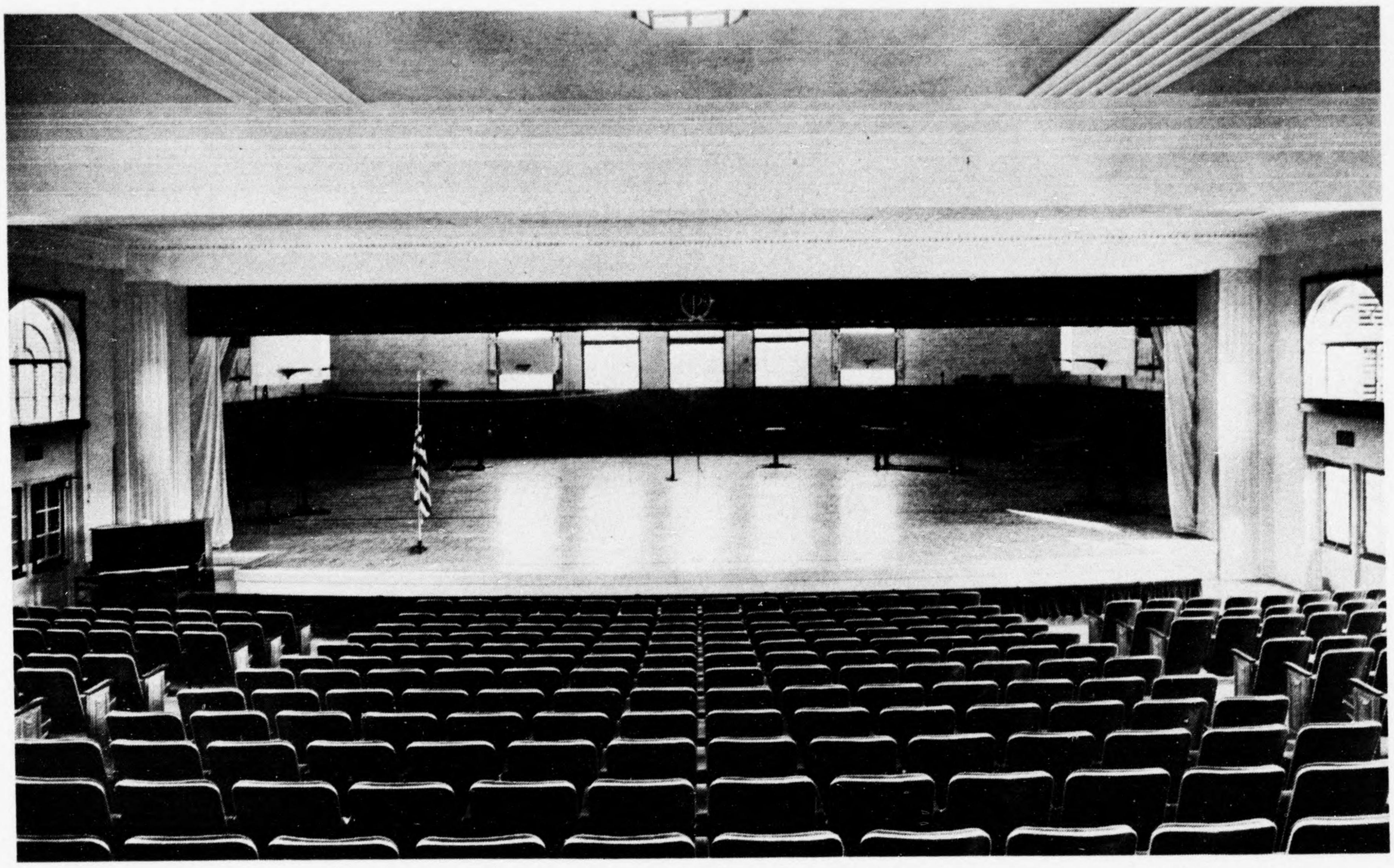
The curtains and the backdrops provide an ideal stage size for dramatics.




The 22 fully equipped instructional rooms, including the science laboratories, the music room, library and study hall, home economics, bookkeeping and stenography, also the industrial-arts shops, the cafeteria and kitchen, all provide ample facilities for a balanced curriculum for approximately 600 pupils. The erection of two wings has been planned to increase the immediate student capacity to 750, and the eventual accommodation of 1400 students has been fully studied and provided for in the initial structure.

Each room used for instructional purposes has been provided with a time clock, a telephone, and a radio outlet. In this connection, it should be added that the radio and public-address system is arranged to provide the regular broadcasted programs. When desired, announcements, instructions, etc., can be given to the classrooms through the public-address microphones in the principal's office and on the auditorium-stage.

Realizing the importance of the physical welfare of the student body, careful planning has been done to provide for both health as well as educational needs. For example, at the entrance of the cafeteria, facilities are provided so that the children may wash and dry their hands before entering the cafeteria proper. Experience has proved that this arrangement will prevent many colds and other sicknesses which can be transmitted through germs picked up on the hands. The cafeteria which is particularly roomy and well lighted has sanitary, hard-maple topped tables, tile walls, asphalt-tile floors, and a glossy-painted plaster ceiling, all materials which do not absorb dirt or germs. The modern kitchen, which adjoins, has been planned and equipped to give maximum efficiency in a minimum of



**The auditorium and the extension of the stage into the gymnasium provide an ideal arrangement for exhibition basketball games and school entertainments in which large numbers of children are engaged.**

space. The school dietitian oversees this department, assuring well-balanced, well-cooked, economically priced lunches.

On the ground floor are locker and shower rooms with provisions for the accommodation of visiting teams, a drying room for uniforms, and ample locker provisions for both the athletic teams and the physical education groups.

On the same floor, the industrial-arts department, with an office for the instructor, is planned so that north light, which is the evenest and best for shopwork, is obtained. In addition to the usual woodworking benches, there are lathes, a mortiser and jointer, a bandsaw, a circular saw, a forge, and a tool grinder. Areas in the shop are equipped with benches and special tools for electrical work and radio, leather work, bench metalwork, and forging. A dustproof finishing room is provided off the shop, and in addition a toolroom and a lumber storage room.

On the upper floors, in addition to the necessary recitation rooms with their blackboards, storage cabinets, bookcases, charts, and other equipment necessary for the proper teaching of academic subjects, are located the home-economics department, the library, the music room, the business-training suite, the art and crafts room, and mechanical drawing rooms. The science department includes the laboratories and a lecture room for physics, chemistry, biology, and general science. These special departments have been located in the building so that they may be properly coordinated to function with the other departments to which they are intimately related.

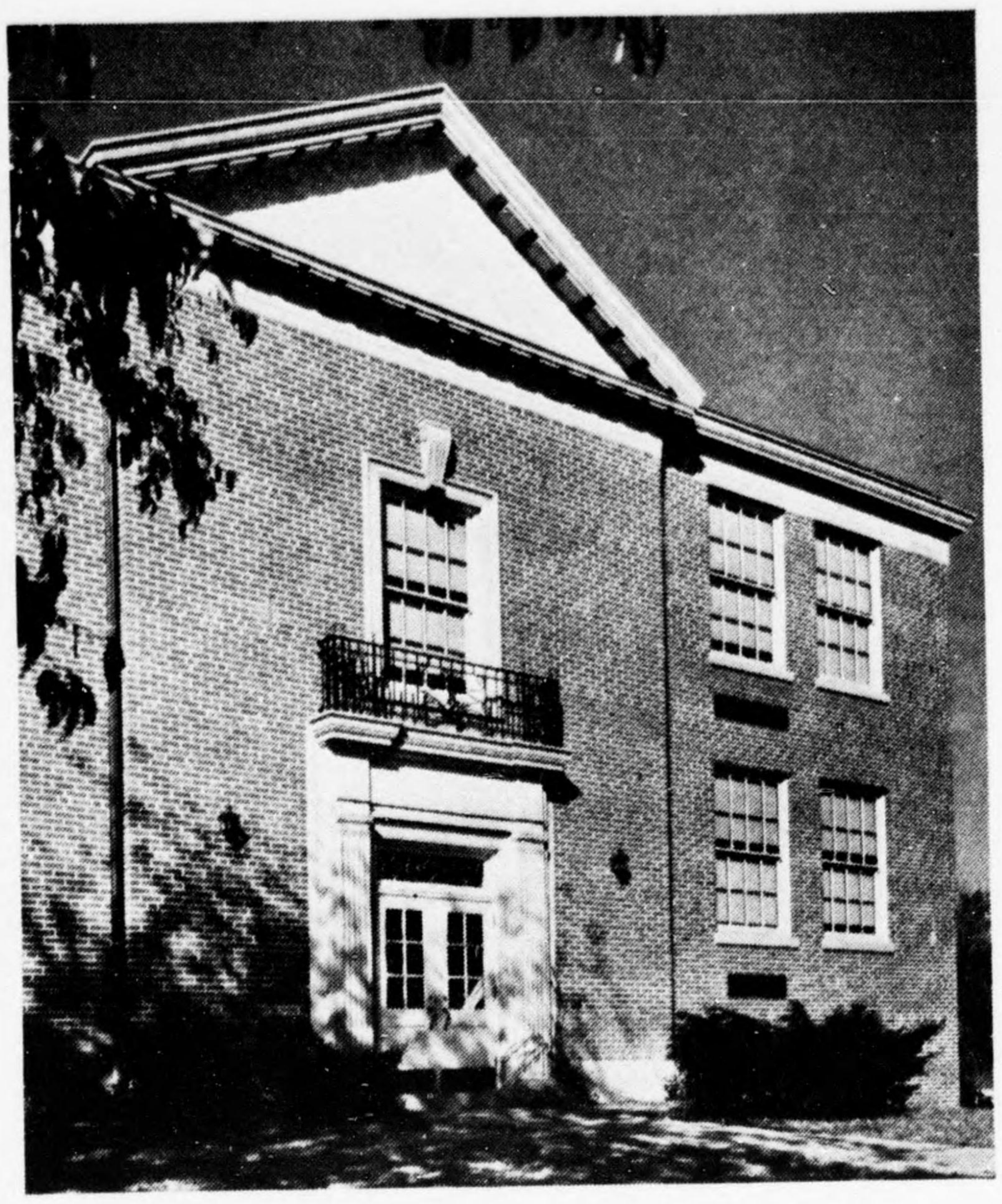
The home-economics department is arranged and equipped so that girls may be taught all of the practical details of homemaking under conditions approaching ideal home situations. The sewing room adjoining is planned with the idea of teaching practical sewing and dressmaking and clothing repair. The department as a whole stresses home management, the care of children, home nursing, budgeting, managment of income, consumer and buying problems.

The business department is planned to give the student a general grounding in business principles and practice that will be of value to all students irrespective of what life occupation they may enter. In other words, this training will be of life value to a girl even if she never enters business as a stenographer and to a boy who may follow a manufacturing or trade occupation, a profession, farming, storekeeping, or any calling where a knowledge of accounting and common business practices is necessary.

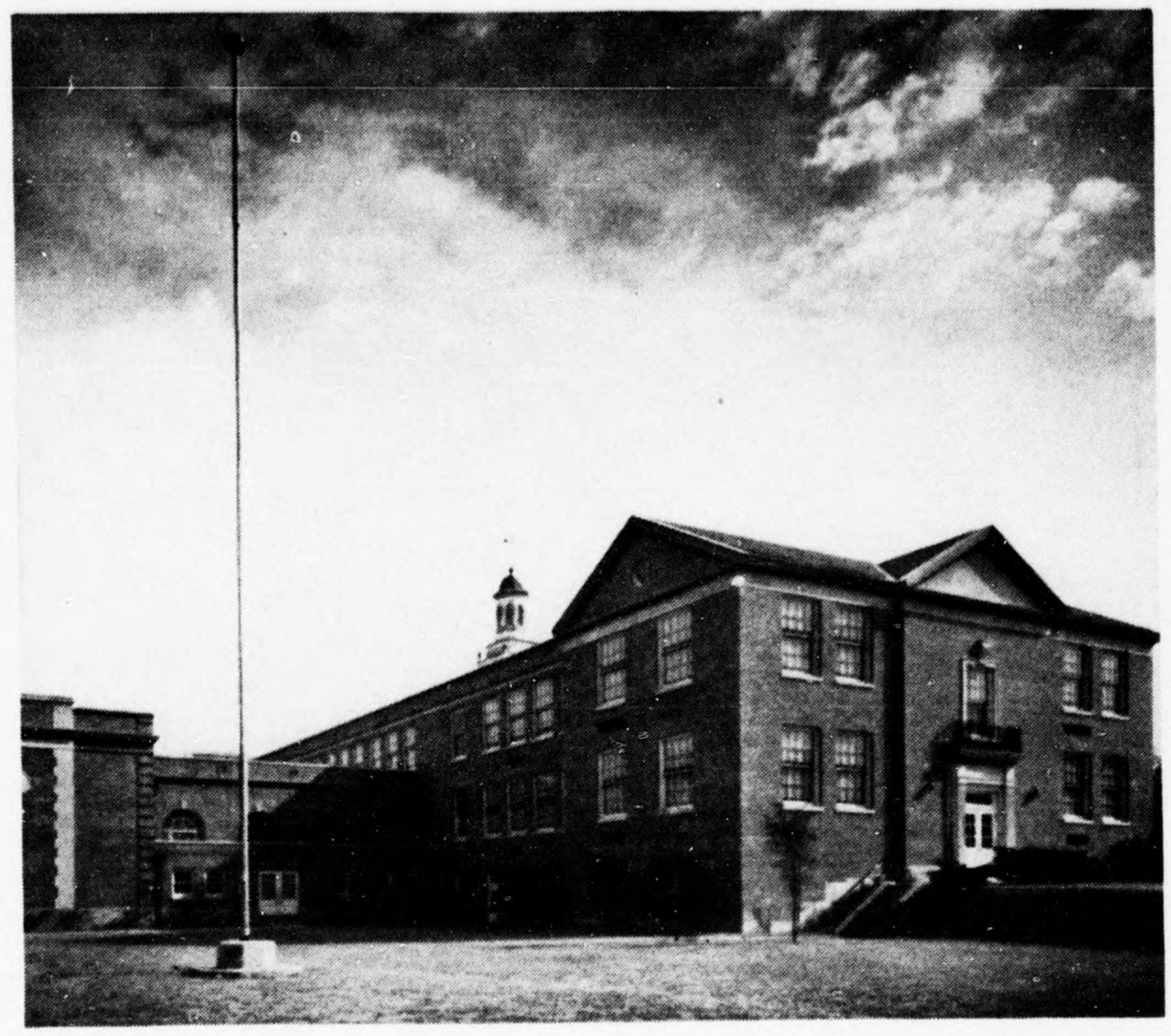
In the art and science departments, a general knowledge of the arts and sciences will be taught. The physics and chemistry departments have all essential equipment such as microscopes, balances, retorts, and other glassware; electrical equipment for transforming alternating current to direct current, battery work, and the many phases of the modern radio, telephone, X ray. The science courses provide a general survey of the subjects which enter into the complex living conditions of today.

In the music department the planning has been done with a view to teaching a general appreciation and love of good music. The experience of educators and instructors in music would indicate the value of a thorough grounding in the principles of vocal and instrumental music so that each child benefits rather than a few gifted pupils. However, there will be opportunity for those who wish to major in music to receive instruction valuable in this field. The music room is equipped at one end with a raised platform for the seating of a class, and at the other end with a broad platform for the use of the instructor and of instrumental music classes. Ample space is arranged in storage cases for sheet music and instruments. Large choral classes use the auditorium, while small classes in vocal music and music appreciation are taught in the music hall itself.

There is also provided a practical auditorium-gymnasium arrangement. The gymnasium which measures 52 by 82 feet is a continuation of the stage. By adjusting the stage hangings, several different floor arrangements can be obtained, thus giving the necessary settings for basketball, play productions, motion pictures, and lectures. The



The side and rear entrances to the building have been treated simply but effectively in the Colonial style.



A large play field with ample space for outdoor games adjoins the building at the rear and left.

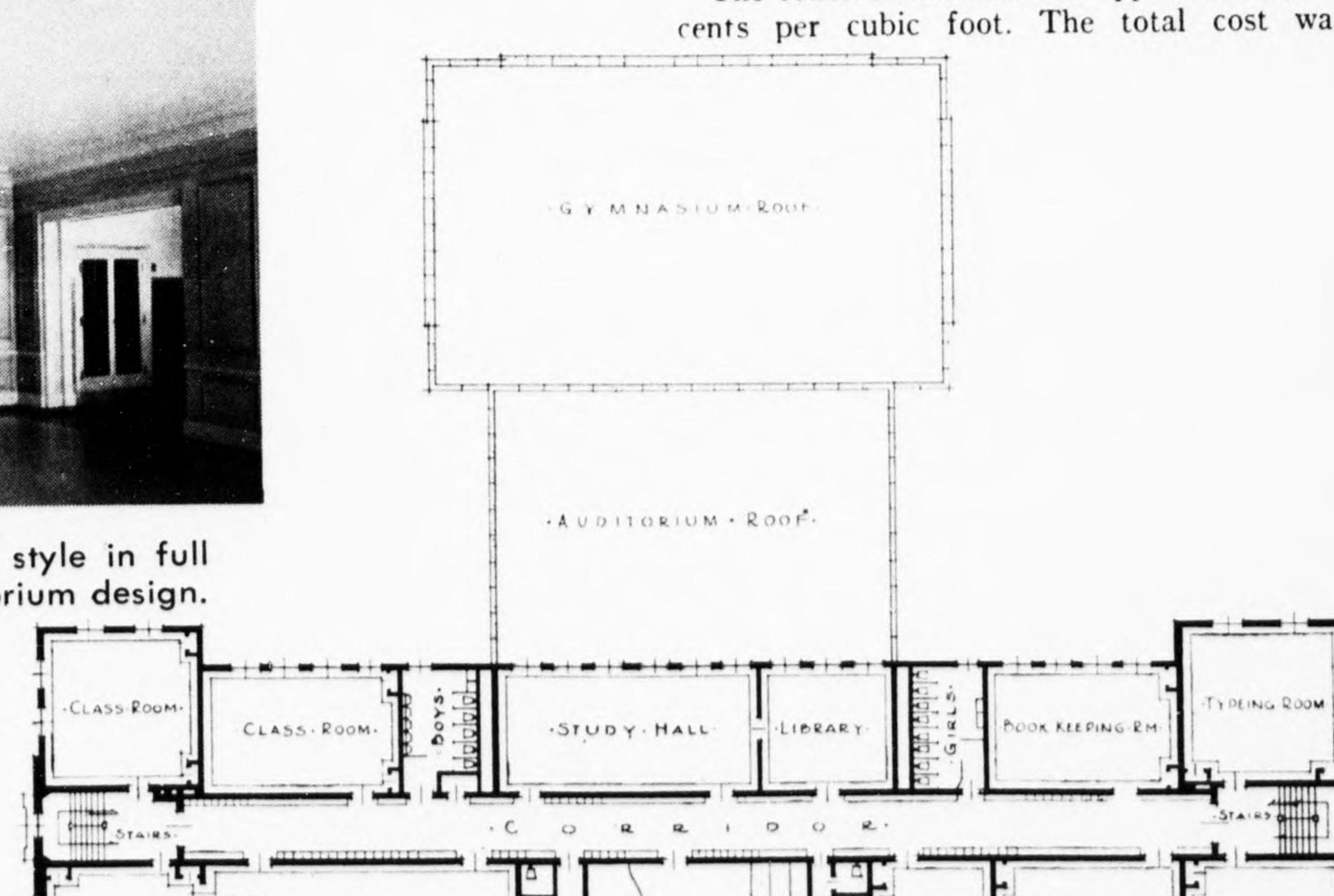
outstanding feature of the adjacent amphitheater type auditorium is the "bowl-like" floor, which has been designed to provide for the clearance of the sight lines of each spectator over the head of the persons in front. A further advantage of the arrangement of the auditorium and gymnasium is the possi-

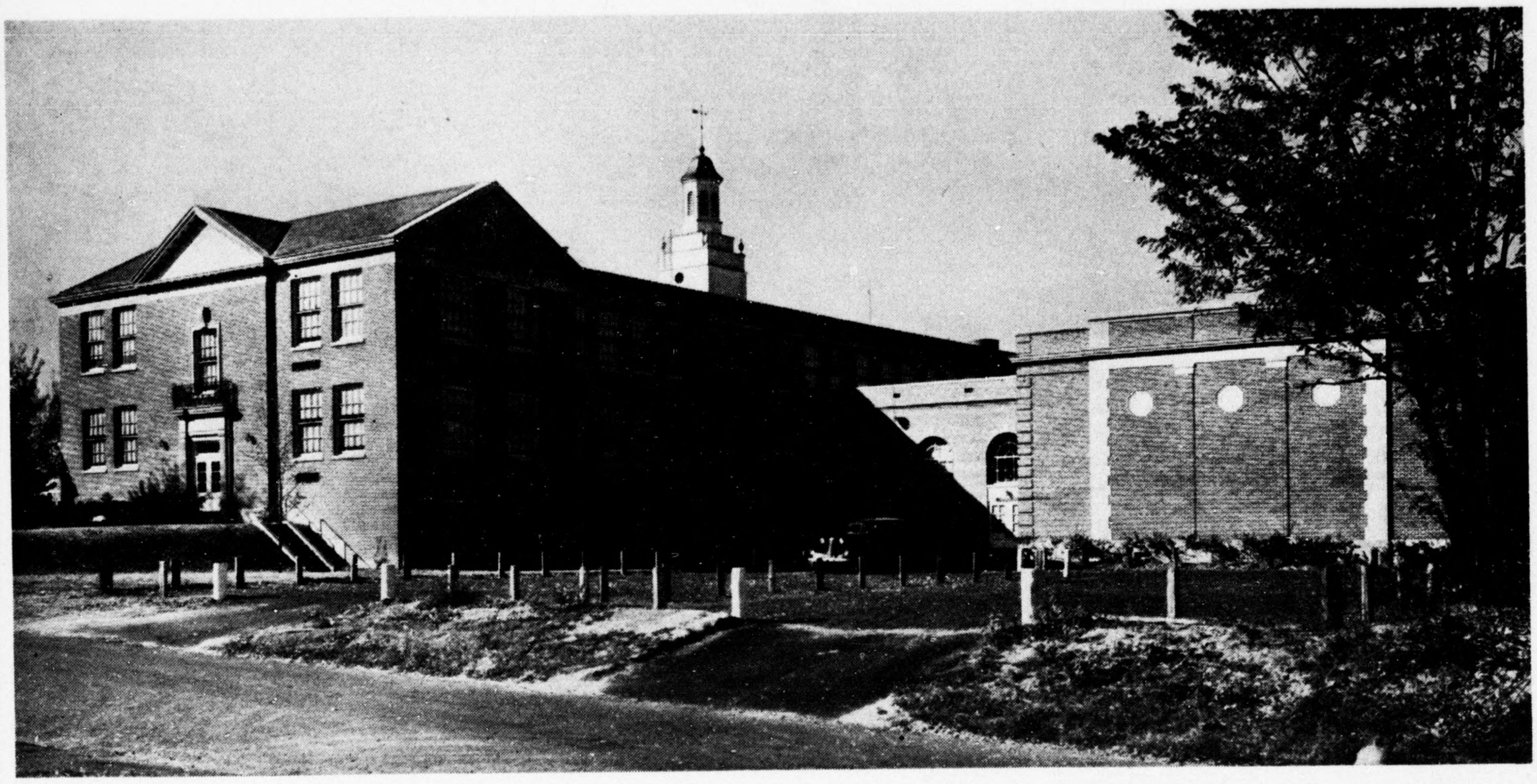
The entrance hall is finished in Colonial style in full harmony with the exterior and the auditorium design.

bility of carrying on two separate activities at the same time. For instance, an athletic group may be using the gymnasium at the time when a lecturer is addressing a group in the auditorium. Electrically operated, soundproof accordion doors which fold into pockets at each side of the proscenium opening are closed when the separate uses of the gymnasium and auditorium areas are desired. When an exceedingly large stage is needed for the production of a musicale, an opera, a pageant, or for some other entertainment, or athletic event, any part or all of the gymnasium can be used for this setting. In any of these cases the audience is seated in the comfortable auditorium with the permanent seating which provides an unobstructed view from every seat. The auditorium has a fireproof projection room from which still pictures and motion-picture films are projected.

The building is heated and ventilated by a vacuum-vapor system, with unit ventilators in the classrooms and unit heaters in the larger areas, all thermostatically controlled. The electrical work and plumbing are all in keeping with the newest school practice.

The construction cost was approximately 27 cents per cubic foot. The total cost was



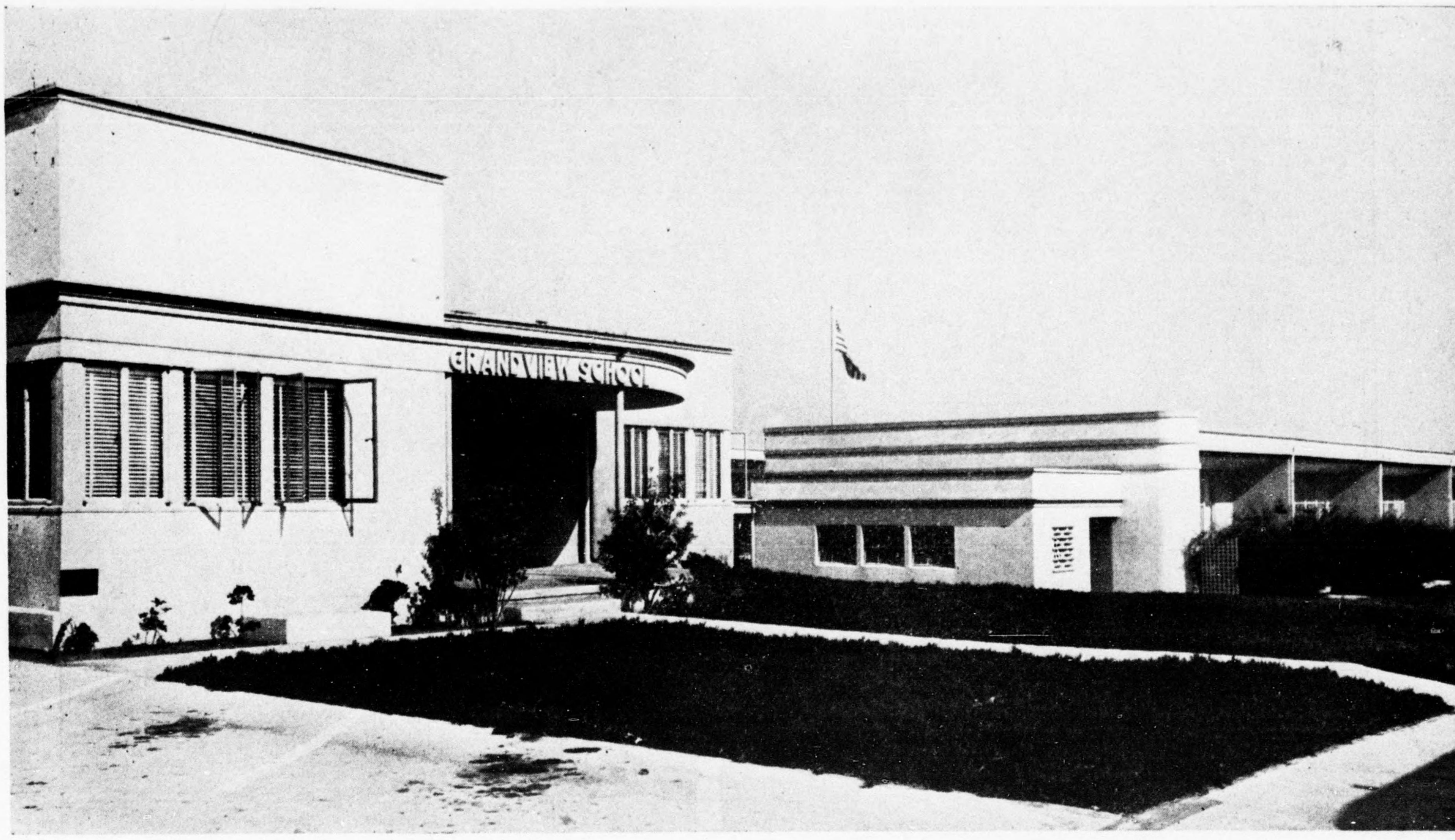


The contour of the site of the Plainville District High School, Mariemont, Cincinnati, Ohio, has been utilized to provide full length doors and windows for the cafeteria and the manual training shop. A carefully planned parking lot adjoins the gymnasium and auditorium.

$292,000, which includes the cost of land, construction, equipment, and fees.

The plans and specifications were prepared by E. C. and G. T. Landberg, registered architects, of Cincinnati, Ohio. Supervision was by the same office.

*(Reprinted from the March, 1945, issue of The American School Board Journal)*




The Grandview School as seen from the street is a low, white building finished in cement, carefully landscaped, and in every way an ornament to the residential neighborhood which it serves.

# Outdoors-Indoors Related in the Grandview Elementary School

**Walter Wurdeman and Welton Becket[1]**

The close relation of indoors and outdoors is the theme emphasized in the planning and daily use of the Grandview Elementary School, at Manhattan Beach. In design, both architectural and educational, the school is adapted to an activity program. The basic unit is a series of flexible classrooms in which are included library corners, storage closets, work counters with sinks, and flexible seating arrangements which permit the children to organize under their own leadership while the instructor supervises without "bossing."

The school building was designed to be constructed in five phases which will provide for the rapid growth of this district.

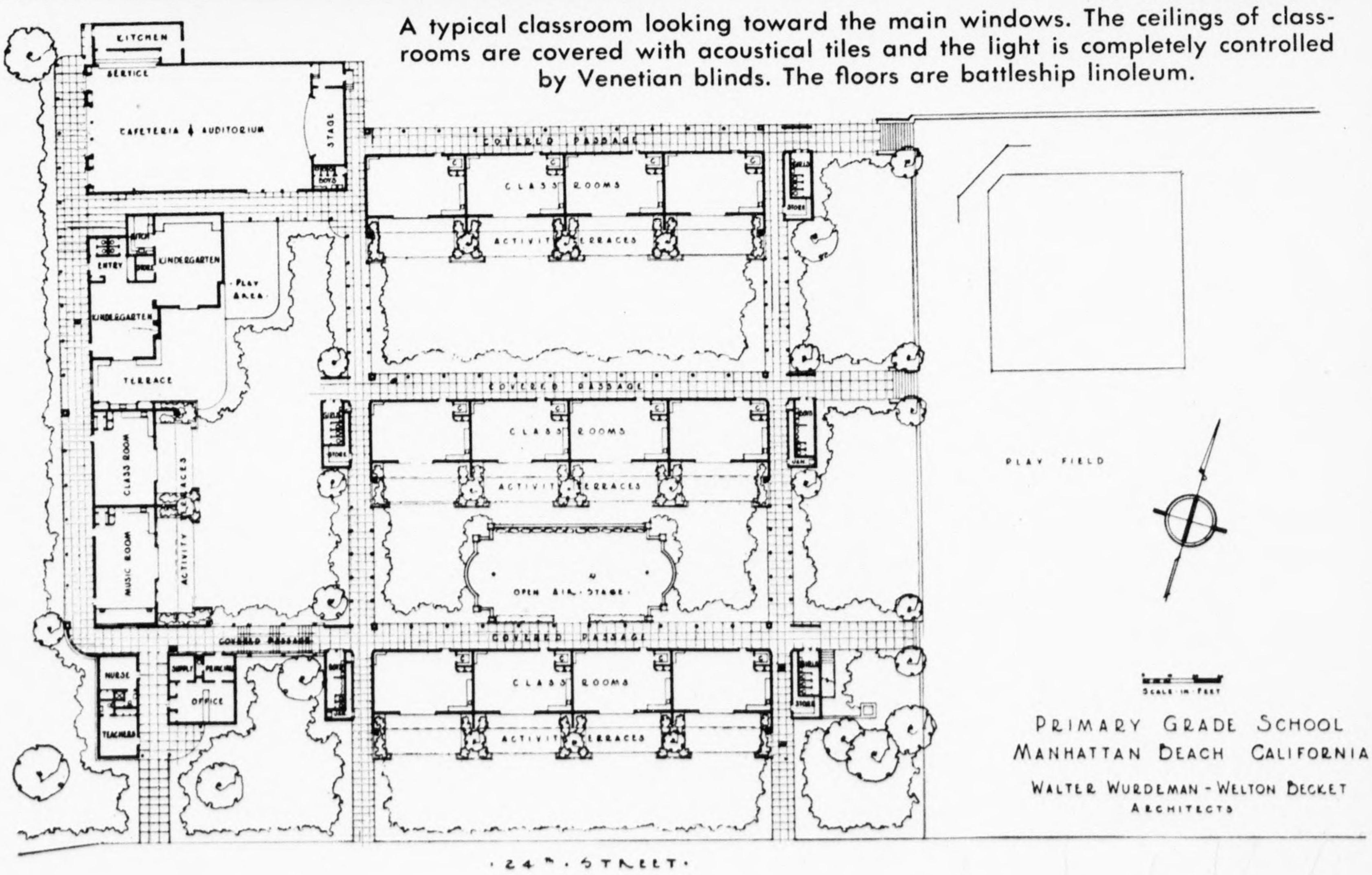
Units 1 and 2 were constructed first. They consist of eight classrooms and toilet facilities, activity spaces, and an open-air stage for large outdoor events.

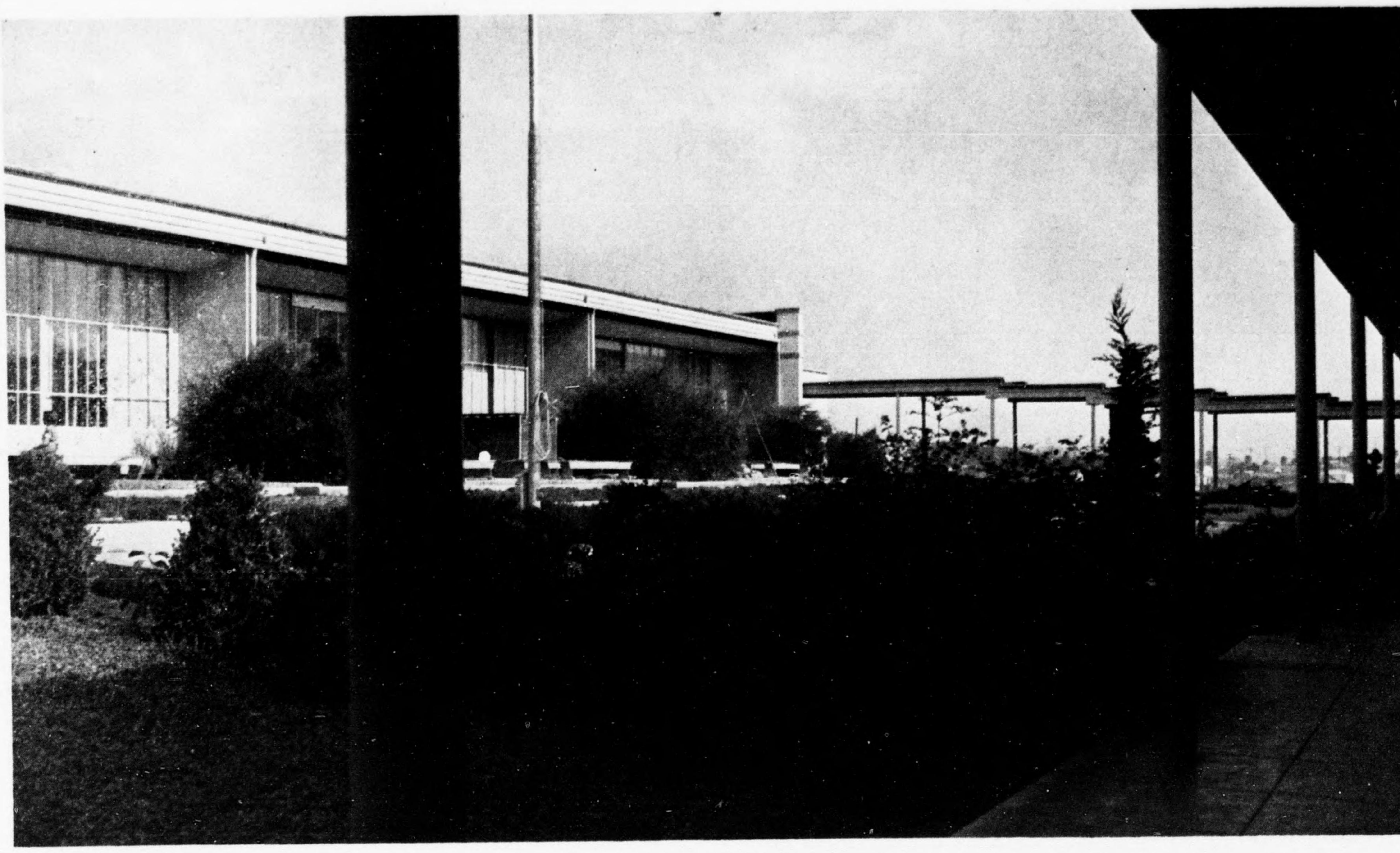
Unit 3 was the next step. This consists of the administration offices, classrooms, nurse's room, music room, and a kindergarten which has its own play area and activity terrace, outside clay sink, storage cabinets, rolling activity setup, movable library, a fireplace, and a model kitchen which is also to be used for parent-teacher and community meetings. The kindergarten adequately accommodates

A typical classroom as seen from the play court. Cross ventilation and supplementary lighting are provided by high windows on the far side of the room.

[1]Architects, A.I.A., Los Angeles, Calif.

A typical classroom looking toward the main windows. The ceilings of classrooms are covered with acoustical tiles and the light is completely controlled by Venetian blinds. The floors are battleship linoleum.





A play and study court as seen from the open corridor of the Grandview Elementary School, Manhattan Beach, Calif.

fifty pupils and its careful planning provides a maximum of light, air, and seclusion. It consists of a workroom, a restroom, and exterior playroom, all of which can be supervised by the teacher from any point in the kindergarten setup.

Units 4 and 5, when needed, are to have classrooms and a combination auditorium and cafeteria.

Access to all rooms and toilets are by means of covered passages which lead directly to a six-acre play field on a slightly lower elevation.

The close relation of indoors and outdoors in the classroom has proved extremely successful. The rooms open onto the activity terrace by means of a wide sliding steel and glass door, partially protected by a generous roof overhang, and heavily landscaped planting areas. All rooms face south and east for proper exposure, with supplementary north light through a clear-story window.

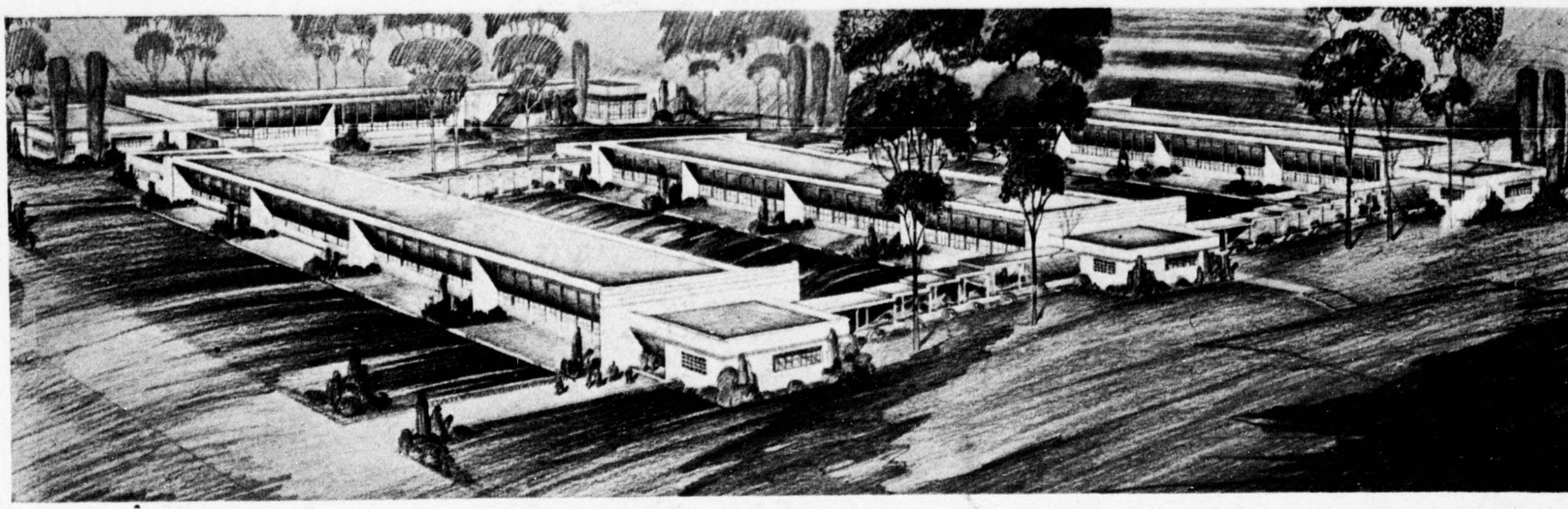
This type of activity education is still in an experimental stage but has caused widespread interest among educators and parents, the majority of whom are outspoken in their praise for this type of education.

## CONSTRUCTION DETAILS

The Grandview Elementary School occupies a site 11 acres in area, with the principal frontage on the main highway, Grandview Avenue. The school organization is limited to the kindergarten and six elementary grades. The contract for the building was let in the fall of 1938 and the building was first occupied in September, 1939.

The building is of wood-frame construction, with a concrete stucco facing, and wood exterior trim. The roofs are flat, covered with composition 8-ply material. The windows are of steel frames and the doors are also of the same material. The ceilings throughout are insulated with rock wool. The corridors and

A browsing corner in an elementary classroom. The built-in cases provide space for books and pamphlets and for current specimens of materials under study.



An aerial view of the Grandview Elementary School, Manhattan Beach, California, as it will appear when completed. — Walter Wurdeman and Welton Becket, Architects, Los Angeles, California.

Clay modeling and other art work is carried on in the work corner of each classroom.

stairways are constructed of concrete, and the classroom floors and auditorium floors are covered with hard maple flooring. The ceilings are treated with sound-absorbing tiles; the toilet rooms have tiled walls and plaster ceiling; thoughout the building the folding partitions are of steel.

The building is heated with console type heaters. The plumbing installation is of the heavy-duty school type with porcelain toilets and urinals, and steel toilet partitions.

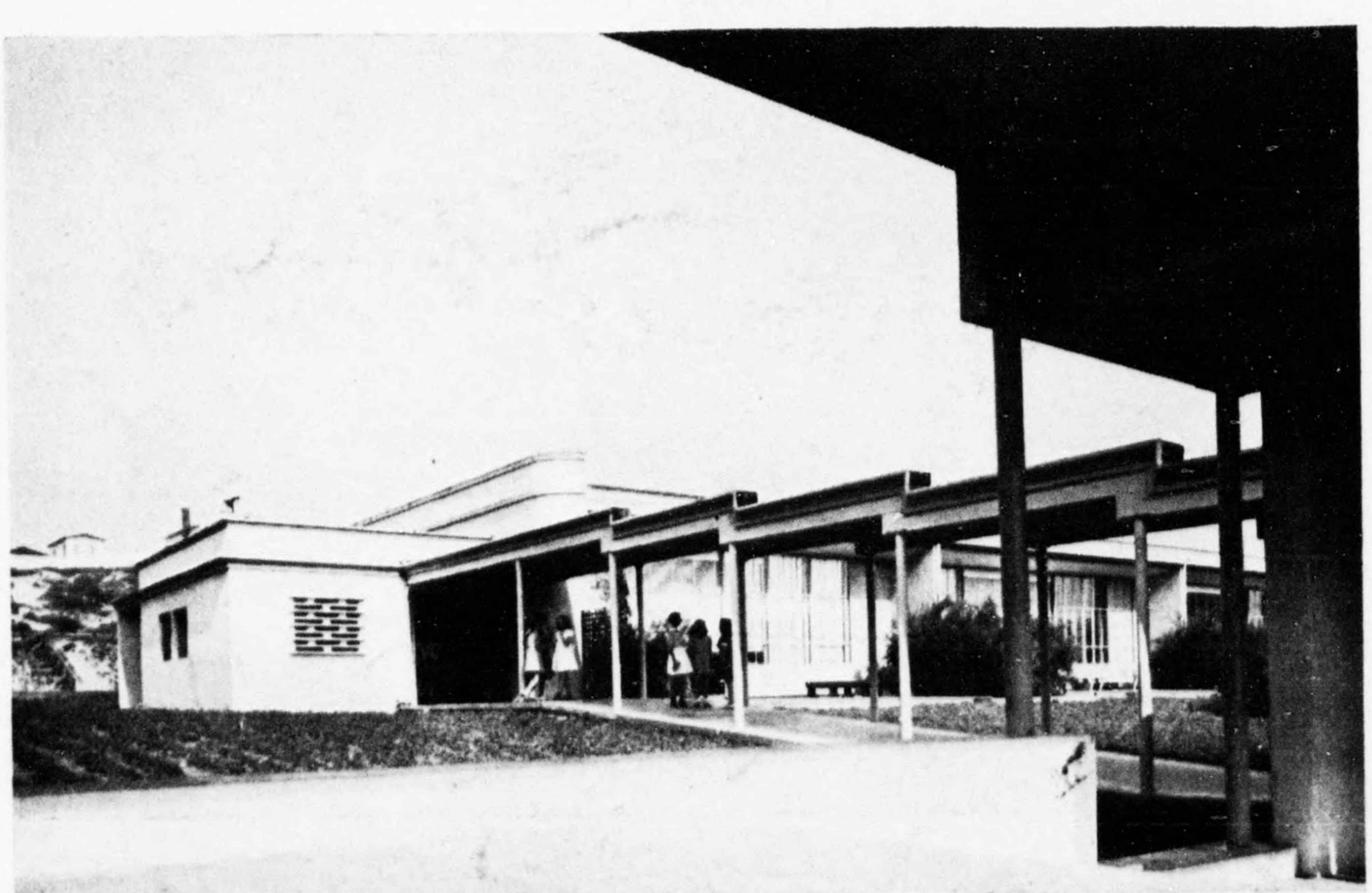
The classrooms have slate blackboards and cork bulletin boards and are fitted with wood cabinets, wardrobes, and pupil lockers. The waste receptacles are of the built-in type, constructed of wood. Each of the classrooms is wired for an intercommunicating telephone system.

The pupils' desks are of the movable type.

The window shades are Venetian blinds.

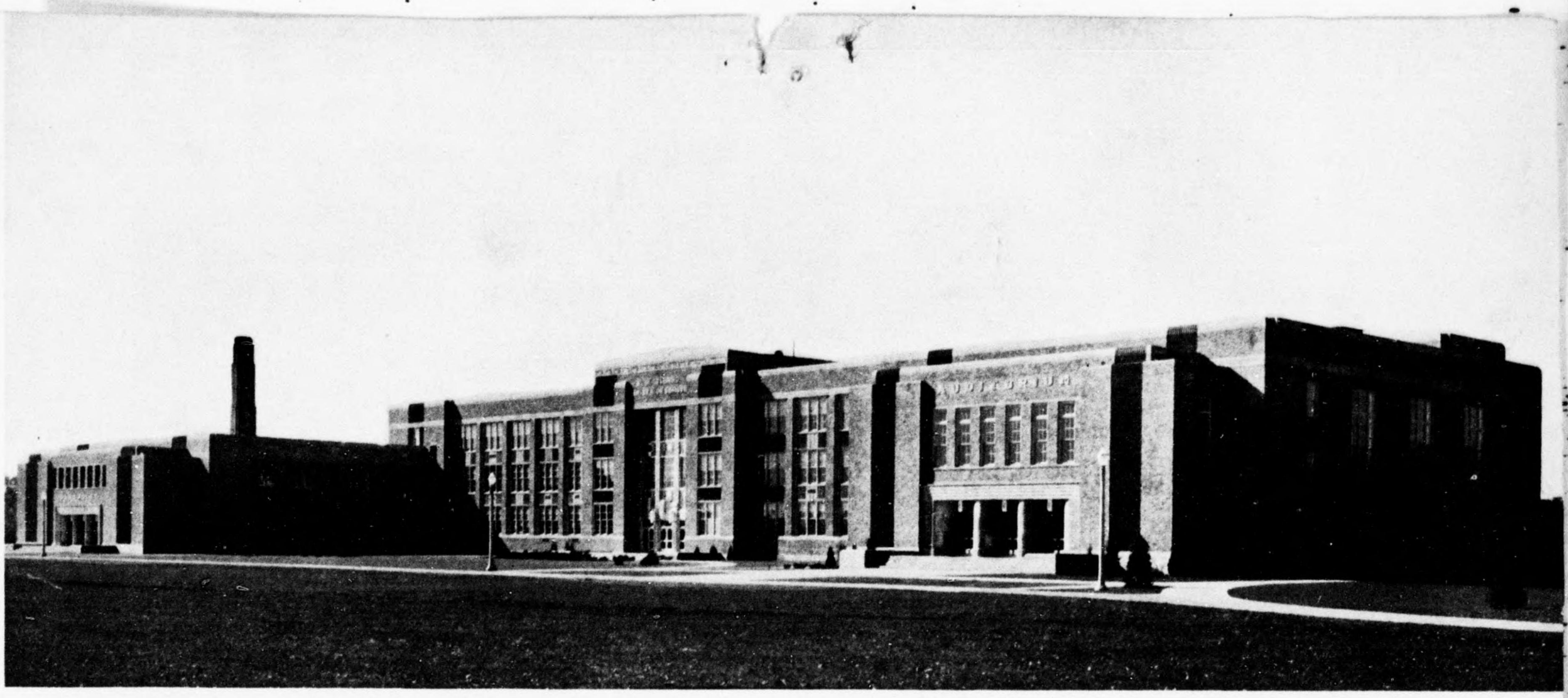
The units of the building now constructed have a total pupil capacity of 500.

The cost of the construction was $120,000, or $240 per pupil. The board of education received a WPA grant in aid and issued bonds in the amount of $50,000 to cover the cost which was not met by current tax income.



The changes in level between the several units of the building are taken care of by covered walks which frame the instructional and play courts.

*(Reprinted from the June, 1944, issue of The American School Board Journal)*



*General view of the new Senior High School, Rock Island, Illinois, showing entrances to gymnasium and auditorium.— Benjamin A. Horn, Architect, Rock Island, Illinois, and Wm. B. Ittner, Inc., Consulting Architects, St. Louis, Missouri.*

# The Rock Island Senior High School

On a 35-acre site on the brow of a hill, only six blocks from the geographical center of the city and practically in the population center of the community, is located the new senior high school of Rock Island, Ill. The site, purchased about twelve years ago, also provides space for the public-school stadium erected about ten years ago with a seating capacity of 13,000 persons. The school building was placed on the brow of a hill because of the exceptionally fine view to the west.

The main entrance to the building is on the east since that is the principal approach for most students. Sidewalks are arranged for easy access by long, sweeping curves, which reduces the temptation for cutting corners and at the same time creates an attractive pattern. Steps have been eliminated to allow students to ride their bicycles without getting off and to permit the use of mechanized snow-removal equipment. Service driveways and a large parking area are located to the southwest of the building where there is practically no pedestrian travel. The orientation of the building is such that there is a minimum of north rooms. The main auditorium and the "little theater" occupy most of the north side. The entire plan capitalizes the setting of the building and provides beautiful views over the campus to the east and toward the Mississippi River on the west.

### Design of the Building

The design of the building is in a conservative modernistic style, depending for its effect upon the proper arrangement of the masses and an honest, logical use of materials. Meaningless ornament has been avoided and the exterior in variegated gray and buff brick, and Bedford limestone has been harmonized well with the darker gray brick and the exposed concrete at the bases. On the larger wall areas bands of brickwork, produced by diagonal laying of the brick, produces a pleasing effect of light and shade. Corners have been softened by recessing the brickwork and copings, and all brick bands have been set flush to avoid overhanging shadows. The central section is raised slightly above the main cornice line to provide emphasis and to permit the installation of mechanical equipment in an attic space. The high chimney involves setbacks to add interest and beauty to this tall, troublesome structure. The entrances to the auditorium and gymnasium have been deeply recessed and the stonework has been made very bold in keeping with the large masses of masonry comprising the east walls of these units.

The characteristic simplicity of the exterior design has been employed in the main rooms, particularly the library, the auditorium, and the "little theater." Glazed brick has been widely used for the interior dadoes and walls because it is easily cleaned and its buff color is warm and satisfying. Lockers have been painted to harmonize with the brickwork, and the woodwork in a soft brown tone goes well with the brown waxed linoleum floors.


*Front Entrance Detail, Senior High School, Rock Island, Illinois.*

*One of the most interesting rooms in the Rock Island Senior High School is the little theatre, which seats 208 persons and which is in almost continuous use for classes of public speaking and dramatics, extracurricular activities of the pupils, and meetings of adult groups. Lighting, ventilation, and acoustics make the room almost ideal for small groups.*

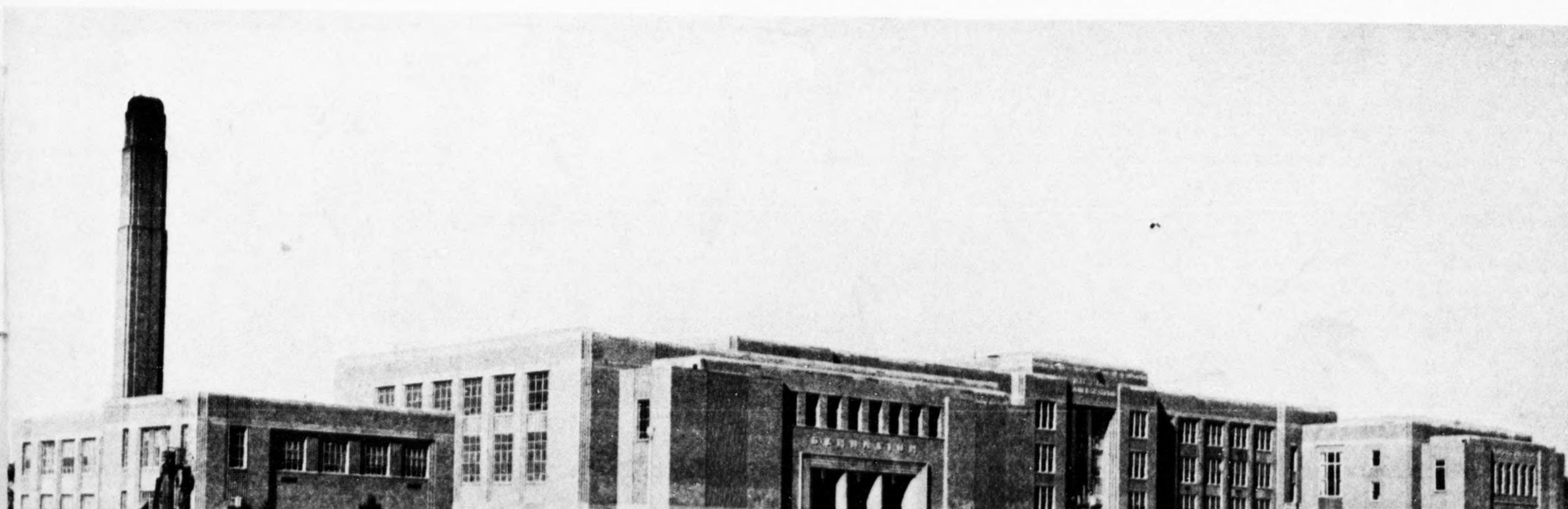
The most interesting architectural treatment has been given to the main entrances, the entire motif of which is expressed in deeply recessed windows and bright aluminum metal trim. The aluminum panels extend to the upper floors and involve the use of the metal in a highly polished form, in a natural finish, and a sandblasted finish. The main foyer continues the modernistic design of the main entrances. The floor is of gray terrazzo and a conservative use has been made of Istrian and Belgian marbles.

## The Building Proper

The building fulfills a number of important social community needs as well as providing areas and facilities for the formal instructional service of an inclusive program of secondary education. Measuring 250 feet long and 240 feet wide, the building has a capacity of 2,000 pupils.

On the ground floor are the cafeteria and kitchen and two serving rooms. The cafeteria is equipped with folding tables and chairs to permit the use of the room for school dances and other activities. Adjoining it is an activity room for school clubs. On the same floor are the corrective gymnasium, dressing rooms, general storerooms, health clinic, machine shop, and printshop.

The first floor contains the school offices, the library, the gymnasium, the auditorium, the "little theater," the woodworking shop, the mechanical drawing shop, the band room, the domestic-science rooms, the speech room, and seven classrooms.



*A view of the Rock Island Senior High School Building from the southeast.*

# Functional Planning: Bexley Designs a Modern Elementary School Building

*Novice G. Fawcett*[1]

## I

The story of the development of this plan is one with a background which must be understood in order to see its significance as an integral part of a school system which serves children from kindergarten through the twelfth grade.

Bexley is a choice suburban area, entirely surrounded by the city of Columbus, Ohio, and has a population of about 10,000 people. During the past thirty years the school district has experienced a considerable growth, developing from the stage of a county school system, housed in one building, to a city requiring kindergarten, elementary, junior, and senior high school facilities. The school now occupies four buildings, one of which is quite old and entirely removed from any center of school population; it houses only four grades. Another building, originally designed as a high school unit, was converted into an elementary school when a new high school building was erected near the center of the corporation 13 years ago. This building now houses a five-year elementary school, departmentalized sixth, seventh, and eighth grades, and all kindergarten children in the system. This is the only building of the four which has sufficient classroom space and other needed facilities to accommodate the children of preschool age. The high school building houses grades 9 to 12 inclusive and is so constructed as to limit the program largely to the academic fields. A fourth building, also centrally located, now houses a five-year elementary school and departmentalized sixth, seventh, and eighth grades. This building was originally designed to house a kindergarten, elementary, and high school.

Recently a large section of the city has developed in a location far removed from any existing elementary building. This growth resulted in a condition under which small children have been forced to walk great distances to reach an overcrowded elementary and junior high school building. These are not the only children in the city who are subject to the hazards of weather, inadequate lunch facilities, and traffic on busy thoroughfares. The real problem has been to unscramble a rather confused situation, brought about by unpredictable developments.

Since the ultimate growth of this community could be predicted with a rather high degree of accuracy, it soon became apparent that more permanent plans for the future could be developed. With these facts in mind and with the results of a survey, made by the Bureau of Educational Research at Ohio State University in 1942, available for study, the board of education was asked to appoint a committee late in 1943 to prepare an approach to the problem. The committee consisted of two board members and the superintendent of schools.

An exhaustive study was made in the light of recent developments in education. The committee soon discovered that our shifting population and limited building space had forced our schools into a type of organization which needed to be completely revamped. Our first task, therefore, was to study our community and decide what type of organization would best serve its needs and interests in the future. Because of the geographical nature of this area, the distribution of school population, and the investment in present structures, our committee recommended a kindergarten-six-two-four plan.

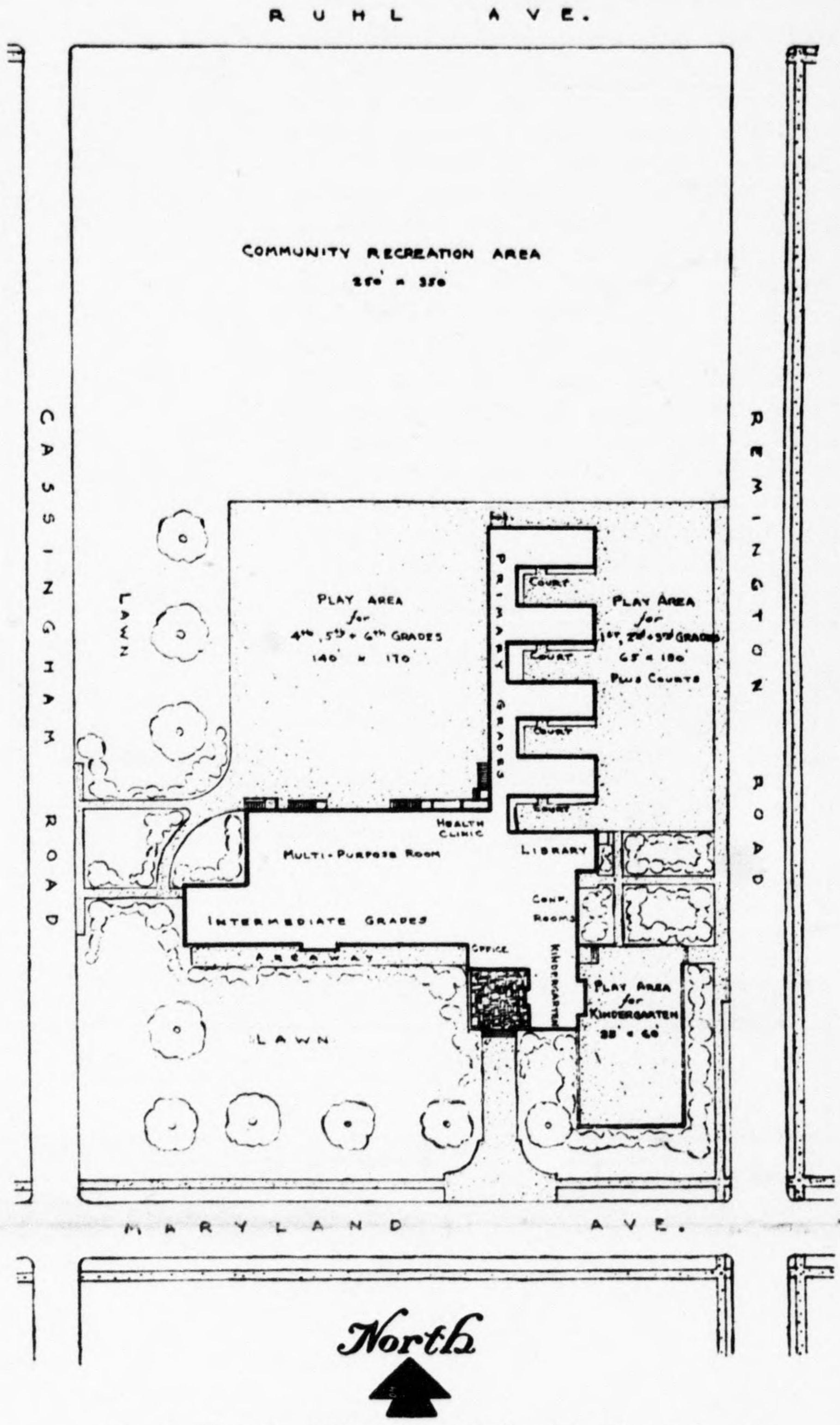



**Illustration 1. Site Plan of Bexley Elementary School, Bexley (Columbus), Ohio.**

This plan called for the closing and sale of one building and site, small additions to two buildings, the remodeling of one building, and the construction of an entirely new elementary building on a site acquired by the board of education some years previously. This plan was developed around the community-centered idea. Since there are three rather distinct geographic areas in this district, the new plan placed a unit for kindergarten through grade 6 in each area. The current plan of two so-called junior high schools (grades 6, 7, and 8) was abandoned for one seventh- and eighth-grade unit centrally located. The present high school (grades 9 through 12) needed a new addition to expand the fine industrial-arts areas and to provide adequate space for a clinic, school publications, musical organizations, and additional classrooms. A central storage unit for the entire system loomed high on the list of needed improvements, and the committee decided to recommend that such a unit be attached to the high school building. It is here that all books, materials, and equipment will be received and dispensed by truck under the direction of the superintendent of buildings and grounds.

This plan received the approval of the board of education in February, 1944, and was placed before the staff, city officials, and lay groups for further consideration and criticism. During the summer of 1944 a consulting architect was employed to draw up estimates to be used in preparing legislation to be submitted to the voters. A bond issue was presented to the voters on November 7, 1944, and was carried by a vote of approximately 78 per cent.

Our next assignment was the selection of an architect. One of the necessary qualifications was a statement of willingness on the

[1]Superintendent of Schools, Bexley City School District, Bexley (Columbus 9), Ohio.

part of architects and engineers to work with committees from the teaching staff and maintenance employees in the development of functional plans. They were to spend whatever time seemed necessary to reach a satisfactory conclusion. On December 7, 1944, the board of education appointed Sims, Cornelius, and Schooley, architects and engineers, of Columbus, Ohio. This organization agreed to employ as consultant, Mr. Lawrence B. Perkins, of Perkins, Wheeler, and Will, Chicago, Ill. The last ten months have been spent in the careful development of plans to stay within the financial limitations set by the board of education. Committees from the various buildings have served long and well in this capacity, and the architects have displayed great patience in an effort to prove that functional planning is the best way to meet educational needs and to get the most for the taxpayer's dollar.

Since the style of work to be done in all buildings except the new one is somewhat predetermined by existing structures, the remainder of this article will deal more specifically with the creation of plans for the new elementary building to be known as the Maryland School. The architects contributed the illustrations for this article, an act which has been typical of their keen interest and helpful attitude during this entire period.

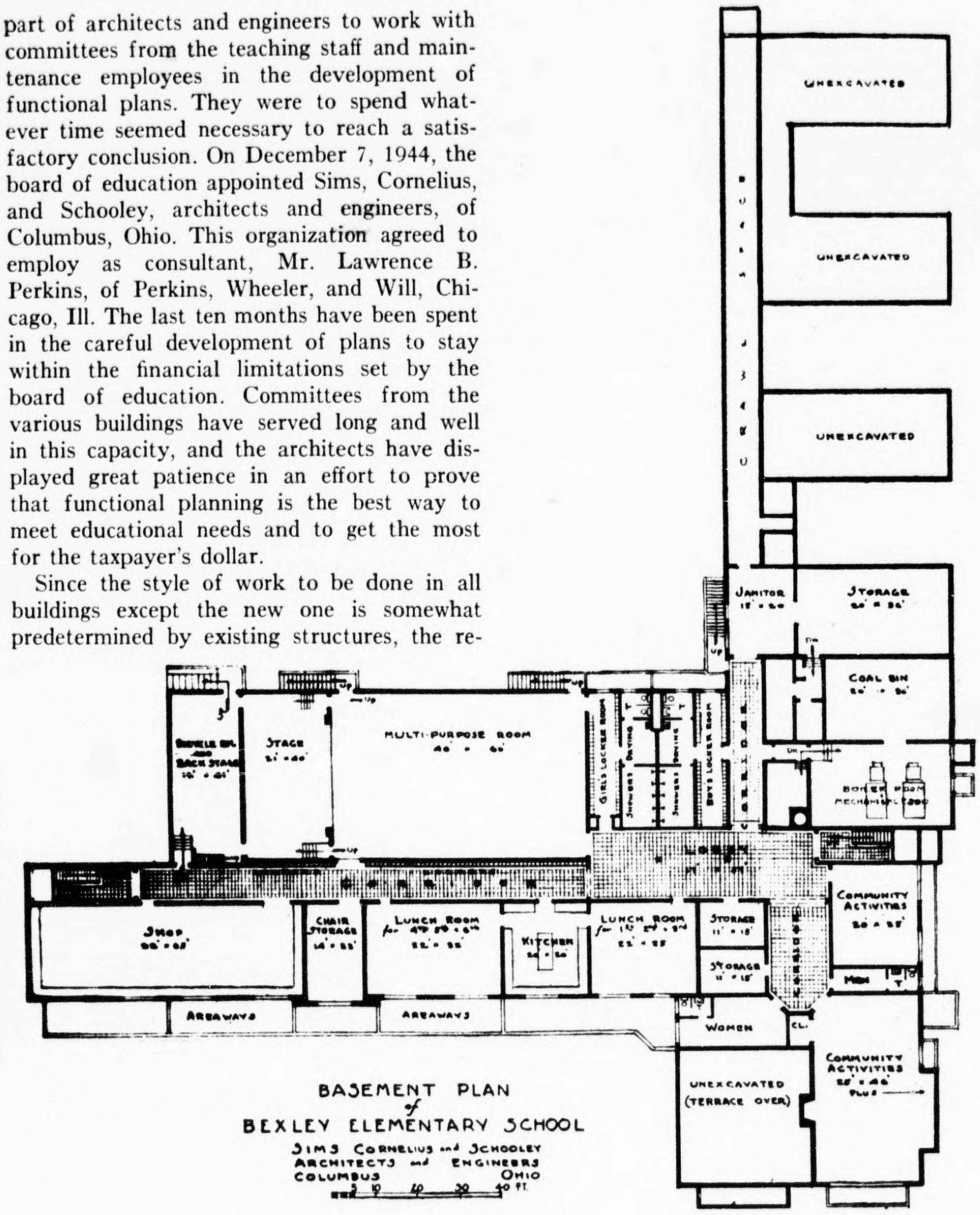



Illustration 2.

## II

The development of this plan is based on the idea that, where opportunity presents itself, a school building should be the outgrowth of careful and intelligent study on the part of the board of education, the architects, the administration, the teaching staff, and the maintenance employees. A school building is a rather permanent thing and by its very nature is less flexible than a course of study. The taxpayer who expects a building to serve a specific need in a community for thirty or forty or fifty years sometimes loses sight of the fact that education is a continuous process, subject to continuous change. Therefore, our first guiding principle was the attainment of a degree of flexibility which would lend itself best to the inevitable changes that are always taking place in education. We do not wish this flexibility, however, to impose a crudeness in design or arrangement; we want to maintain some of the aesthetic values in education in a physical environment which will serve as a stimulant to child activity and development.

To fit in with the scheme that each elementary building in our district should be a center of community interest, the committees have been ever mindful of the need of space for community recreation, dramatics, health service, scouting, etc. These factors have become integral parts of the total plan and have been given careful consideration by the architects in their efforts to create a functional interior design and an exterior style of architecture in keeping with the residential environment.

### The Maryland School

Since this section of our district is one in which we may safely anticipate some growth in population, it has been necessary for us to provide classroom space to take care of this possible expansion. A study of our plan will reveal that, with minor alterations and the elimination of some of the finer features of our building, we could meet an emergency increase in population of almost twice the

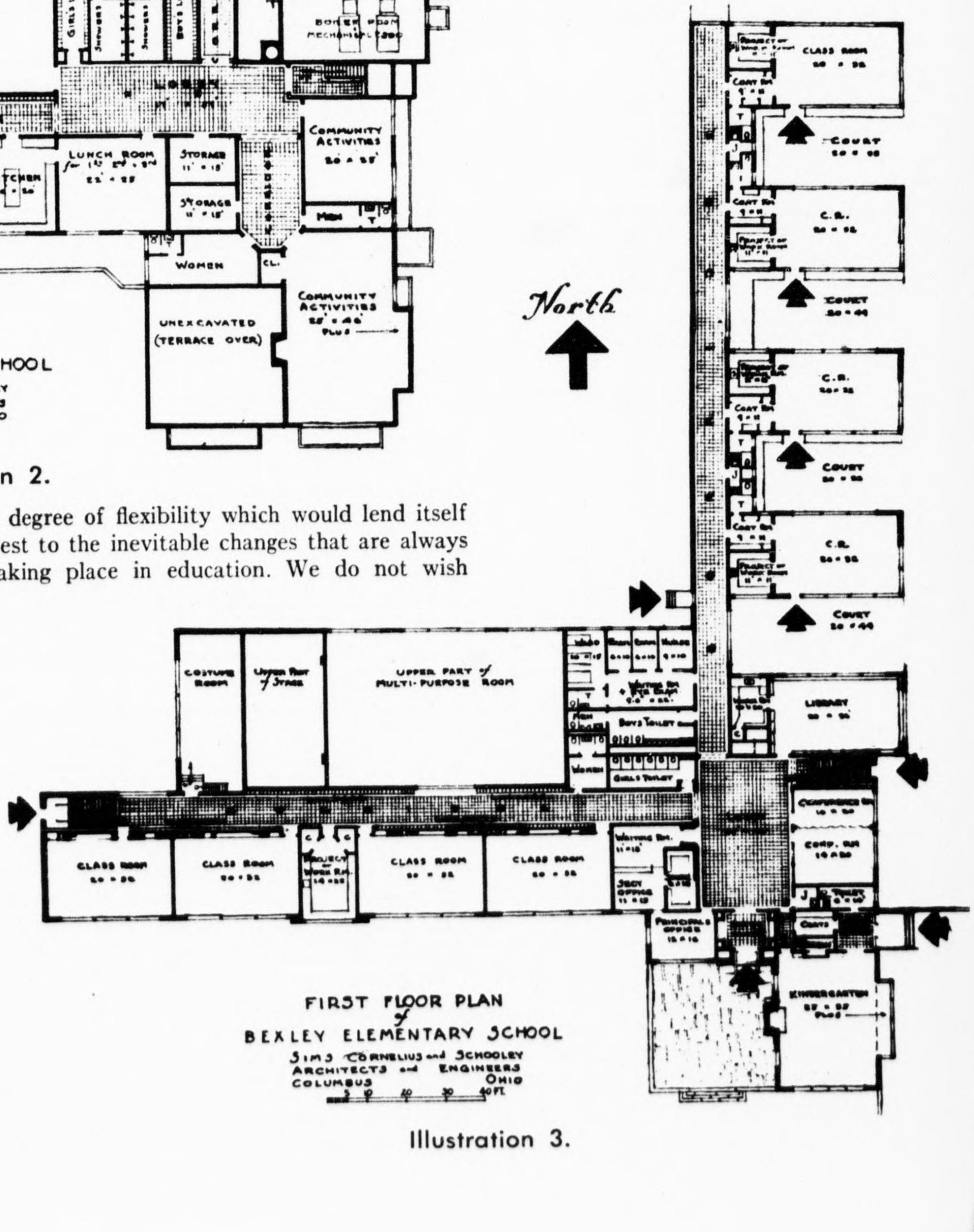



Illustration 3.

present school population in this section. Also, the plan is one to which many classrooms could be added at a minimum cost to the community.

Since every school in our district is an integral unit in our entire system, the work in this building will be closely tied in with the work in all other buildings. Therefore, the scheme entailed a central location of administrative offices, health clinic, library service center, and parental conference rooms. As we saw our problem, these services would need to be assembled around a main lobby and would constitute a kind of hub to a wheel with three spokes, each representing a rather distinct learning level in an elementary school. The first of these is the kindergarten, which operates a little more independently of the remainder of the school than do the others. The second is the primary level (grades 1, 2, and 3), and the third is the intermediate level (grades 4, 5, and 6). Each of these is being provided with its separate playground. Each playground will be an asphalt surfaced area for year-round use, located a sufficient distance from the other areas to eliminate the problem of the common playground, and yet maintain the benefit of making adjustments to larger social groups (see Illustration 1). In addition to these three specific surfaces is a large sodded surface for whole school events and community recreation.

### Recreation Room

Closely related to this phase of our health, physical education, and recreation programs is the large recreation room on the ground floor of the new building (see Illustration 2). The story of the location of this room is significant of what has happened at every turn of our whole planning pattern. It should be added at this point that our final plan is called Scheme No. 8. This scheme developed through the preparation of eight preliminary sketches by the architects in an effort to meet our functional requirements and yet stay within the financial limitations of the project.

Through continuous experimentation and study as well as through the careful selection and use of building materials it was discovered that, if the recreation room could be placed on the basement level and properly located with respect to the three learning levels and the playground, a larger room could be made available at a unit cost of approximately 55 per cent of the cost of the first-floor area. This point proved well worth consideration and became paramount in our thinking as we developed plans for a functional elementary building within an approximate financial limitation of $170,000.

Through this anticipated cut in cost it has been possible to provide a room sufficiently large to meet the need for both school and community recreation; also, this room will be used as an auditorium by providing portable seating. Both the stage and the seating area are large enough to accommodate full school assemblies and gatherings of parents to observe special programs put on by the children. On any higher learning level we could not have considered the dual-purpose room; but in an elementary school this plan is workable, more conservative, and affords more all-purpose space than could otherwise be provided.

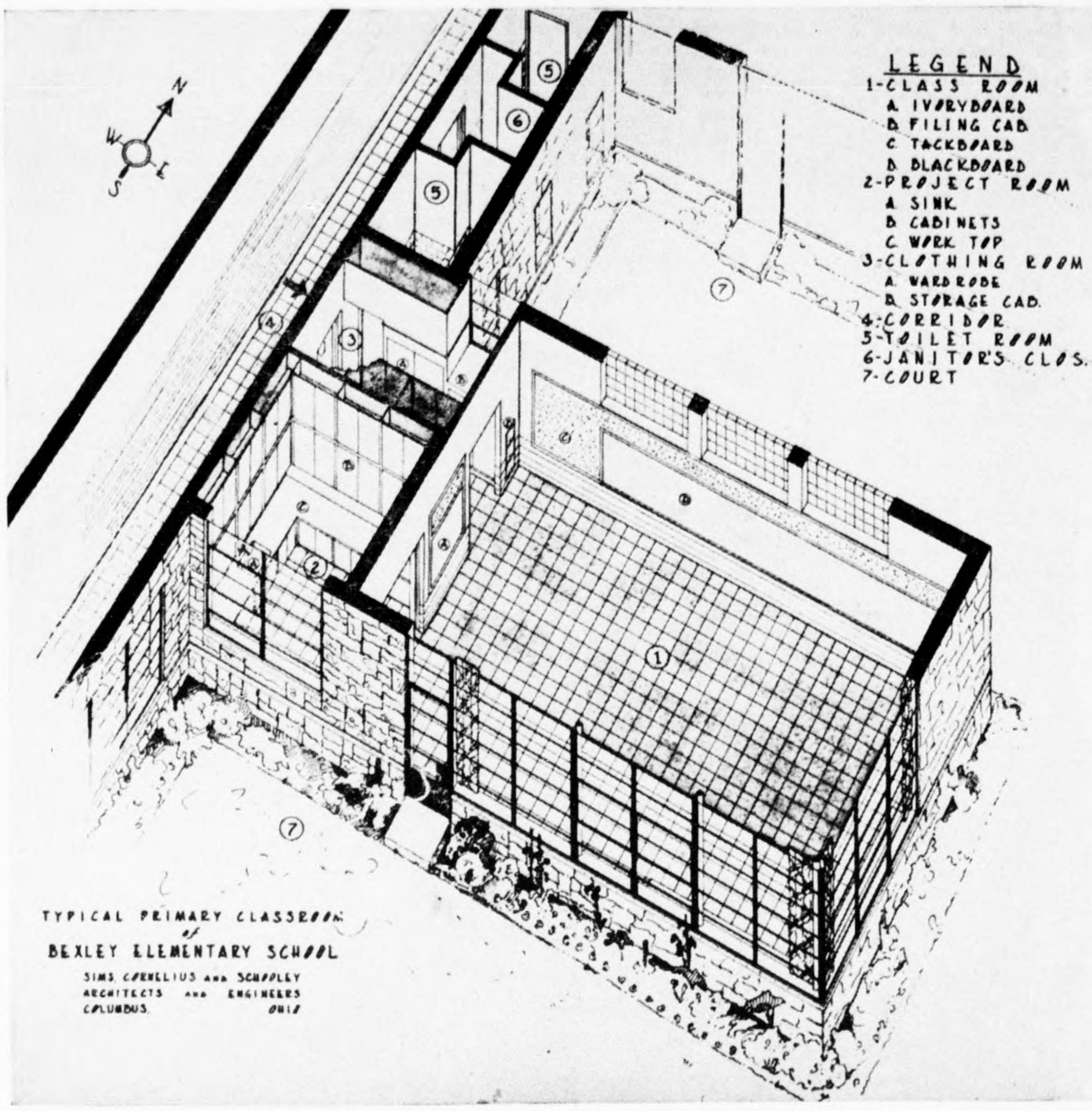



Illustration 4. Isometric View of Classroom Unit.

### Lunchroom Facilities

An examination of our lunchroom facilities (see Illustration 2) will reveal a small kitchen flanked by two separate rooms. These rooms are for children of the primary and intermediate levels and will be equipped with furniture of appropriate size and arrangement. Recent experiments with classroom feeding in one of our schools convinces us that this divided arrangement is extremely important. The noon lunch is gaining in importance and is becoming an integral part of our program of health education.

### Intermediate Classrooms

The classrooms for children in the intermediate grades are grouped around a small project room (see Illustration 3), designed for use by individual children or by groups of two or three children from any room on the intermediate level. It is important to retain access to such a space, even though the child is getting into more specific subject-matter fields and is experiencing less need for individual and small group activity than on the primary level. For creative arts and large group projects a well-lighted and spacious room is located directly below these classrooms, away from the more quiet classroom environment. Here groups of children will be able to explore interests in the arts without disturbing other groups. In case of emergency increases in school population, a temporary partition can be installed to convert this space into two classrooms until additional space can be provided.

### Primary Classrooms

If, through our planning, we make any contribution to actual classroom efficiency, we feel that it will be in the primary classroom. Our general plan is in no way original, but careful studies have been made of the more recent developments in classroom design, and we believe that some innovations of real and lasting import have been incorporated. Illustration 4 is an isometric drawing of a classroom design based upon the versatility of the modern classroom teacher, who assumes almost complete responsibility for the whole problem of child development. Since the child is closer to the home here than on the higher levels, the home atmosphere is maintained as far as possible. The necessity for going to special rooms with special teachers is eliminated. Supervisors are supplied to help the teacher with her problems, but almost all work will be done in this classroom unit to eliminate unnecessary child adjustments and needless frustrations.

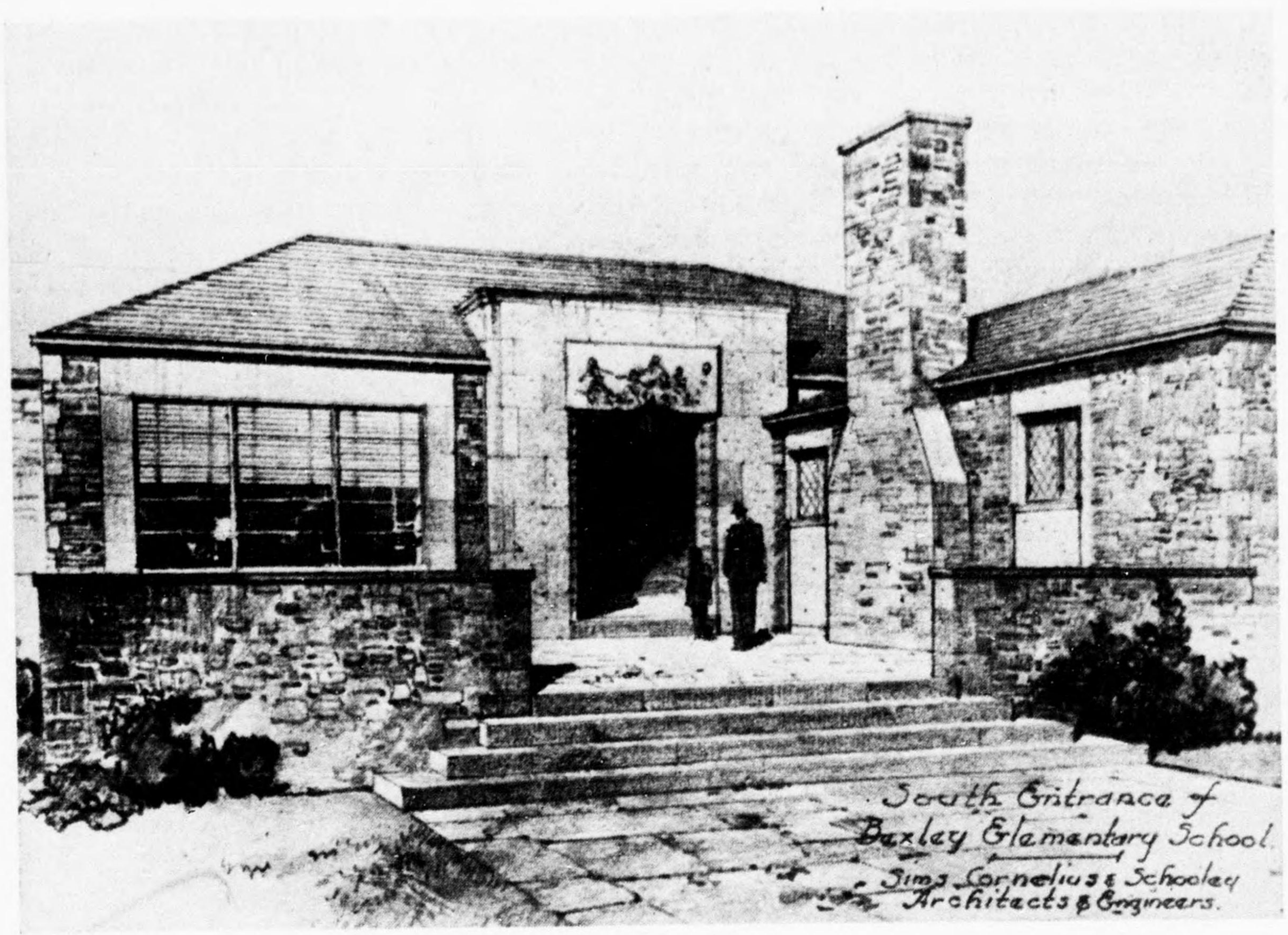



Illustration 5.

These rooms will be lighted from three sides so that bilateral lighting will be possible regardless of the position of the sun. Light from the east and south will be controlled by sections of semiopaque drapes, mounted on a track around the clear-view corner. The north light will travel through prismatic glass block with the light directed to the ceiling for diffusion. A means of shutting out north light will be provided so that each room can be darkened sufficiently for projection purposes. Sliding glass doors will separate the project room from the main classroom. This will shut out the noise from activities and retain full teacher supervision.

The group activity area will be in the northeast corner where the least natural light will be provided. Individual academic work will be conducted at tables, which can be moved to suit the need and take full benefit of the light. Group academic work can be conducted either around clusters of tables, a group of chairs, or from a seat constructed around the clear-view or bay window corner.

The care of clothing and the development of self-sufficiency are essential factors in the primary educational program. A carefully arranged clothing space is provided in the northwest corner and will be equipped to facilitate supervision and eliminate unnecessary confusion.

A common toilet for each room on the primary level is becoming a generally accepted policy in elementary school buildings. Our plan has two advantages: plumbing costs can be reduced by having one main line serve two rooms (see Illustration 3); also, by entering the toilet from the clothing room, the entrance is removed from the main classroom. This placement close to the corridor is not only more convenient but also eliminates possible embarrassment for some of the children. At the same time the teacher can give this phase of the health program careful supervision.

Other features, such as generous cupboard space, recessed filing cabinets, and an outside entrance, will add to the general utility of the room. The asphalt surface on the playground will extend from the building to the street, thereby eliminating school traffic problems. The outside area between rooms will be used for a variety of purposes during good weather.

There are two good reasons why all of these rooms are grouped along one side of a corridor: first, experience has proved that west light is less desirable in this type of room than south or east light; second, the outside wall along the west side of the corridor is a boundary for the intermediate playground and can serve as a back for handball courts and other phases of school and community recreation.

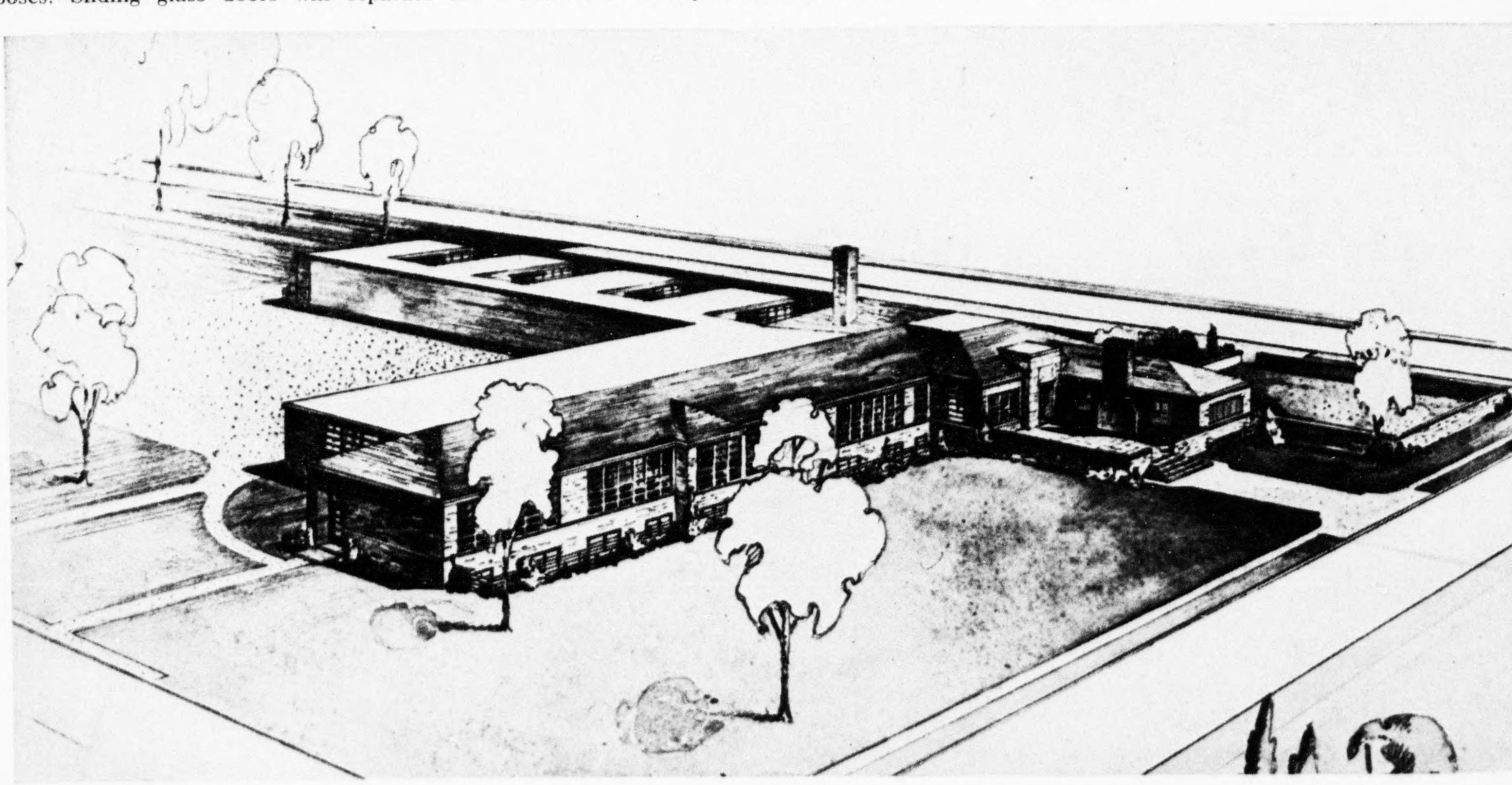


Illustration 6. General Exterior, Bexley Elementary School, Bexley (Columbus), Ohio. — Sims, Cornelius and Schooley, Architects and Engineers, Columbus, Ohio.

It has been stated that the kindergarten is a little less closely related to the entire program than are the other levels. However, many of the features described above have been utilized in the kindergarten rooms. A separate entrance is provided in addition to the entrance from the lobby. An observation booth has been located back of the north wall so that there will be a minimum of interruption for children of preschool age. The other refinements are of an interior nature and are not of special interest in an article of this type.

This building is to be done in stone to add to the beauty of the community and is designed to be in keeping with its residential environment. An exterior projection was the last step attempted and has been carefully executed by the architects in order to preserve the functional features of the interior. The general results of this type of planning can be seen by a study of Illustration 5, which is a perspective of the front entrance.

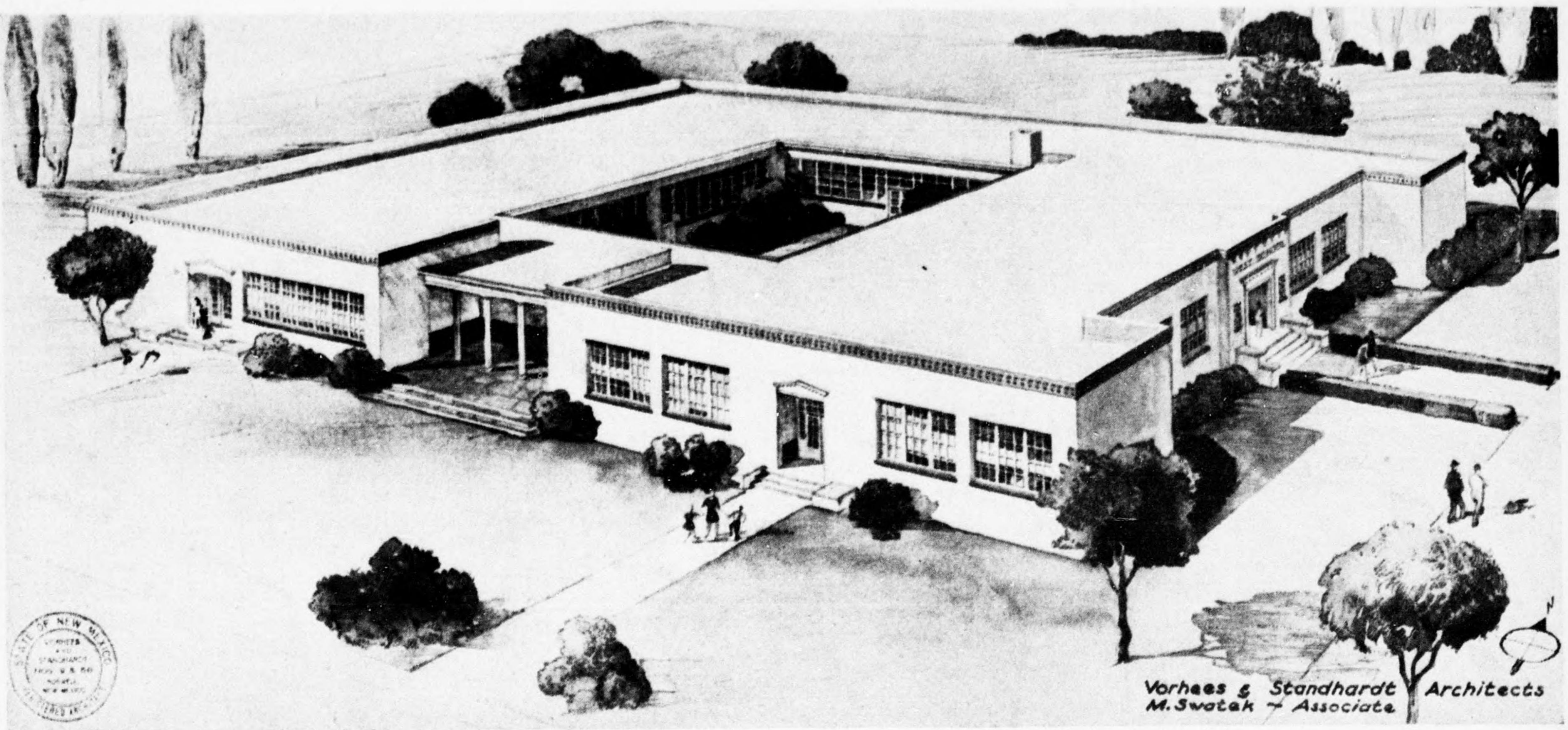
Many school buildings in this country are the result of an opposite system of planning, but we submit Illustrations 5 and 6 as proof that the functional approach does not preclude good exterior design. Illustration 6 is a general exterior or air view as the building will look when it is completed. This serves as an excellent summary to the ideas with which we have been dealing. A comparison of Illustrations 1 and 6 should give a clear understanding of our finished product.

Not much has been said in a specific way in this article about color schemes, equipment, visual education, music, and other salient features of the modern elementary school building, but much has been implied. A great deal could be written about the library as a part of our public library system, the flexibility of the conference rooms, the development of the health clinic or the administrative facilities, but space does not permit the exploration of all of these features here.

The intent of this article has been to deal with ideas in an effort to show how ideas sometime become a reality. A careful examination of the illustrations will reveal detail. For example, the size of our classrooms may be challenged, but we can defend this on the basis of providing extra activity space and small classroom enrollments.

This has been an experience in functional planning which is offered as a profitable technique to those interested in building. The board of education has been most co-operative, and supplied a committee during the entire period to work on the project and assist the superintendent in keeping them fully posted on progress. The staff has given generously of its time, and there is every reason to believe that many mistakes common to building have already been eliminated. The entire process can be adapted to public school planning only if the architects are completely open minded, creative, patient, and sound in practical thinking. We have been most fortunate in our choice and look forward to our dreams becoming reality as soon as labor and materials are available.

*(Reprinted from the January, 1946, issue of The American School Board Journal)*




The West School, Carlsbad, New Mexico, as it will appear when completed. — Vorhees & Standhardt, Architects; M. Swatek, Associate, Roswell, New Mexico.

# Carlsbad Launches Elementary School Building Program

*Irvin P. Murphy*[1]

A few months ago a check for $695,000 was delivered to the Carlsbad, New Mexico, City Board of Education by the State Treasurer in Santa Fe. The sum was paid upon receipt by the State of New Mexico of serial bonds of the same amount, issued for a maximum of 15 years, at 1½ per cent interest. The proceeds will be used for the immediate construction of elementary school classrooms, for one complete permanent schoolhouse, and for other permanent improvements — all for children in grades I through VI.

### A Fast Growing City

In the April, 1942, issue of the SCHOOL BOARD JOURNAL, Carlsbad gave readers a view of its newer school buildings, which were then almost adequate for its population of 13,000 and its average daily school attendance of 2187. During the past four years, however, the population has increased to 23,000, and the average daily attendance of pupils has risen to 3400. For 15 years past the average annual increase of population and of school attendance has been 10 per cent. The assessed valuation of the 600 square mile district has increased from a healthy $14,000,000 to $21,000,000, largely as a result of consolidations of adjoining districts and the increased wealth of the potash industry, oil development, and greater tourist travel to the famous Carlsbad Caverns.

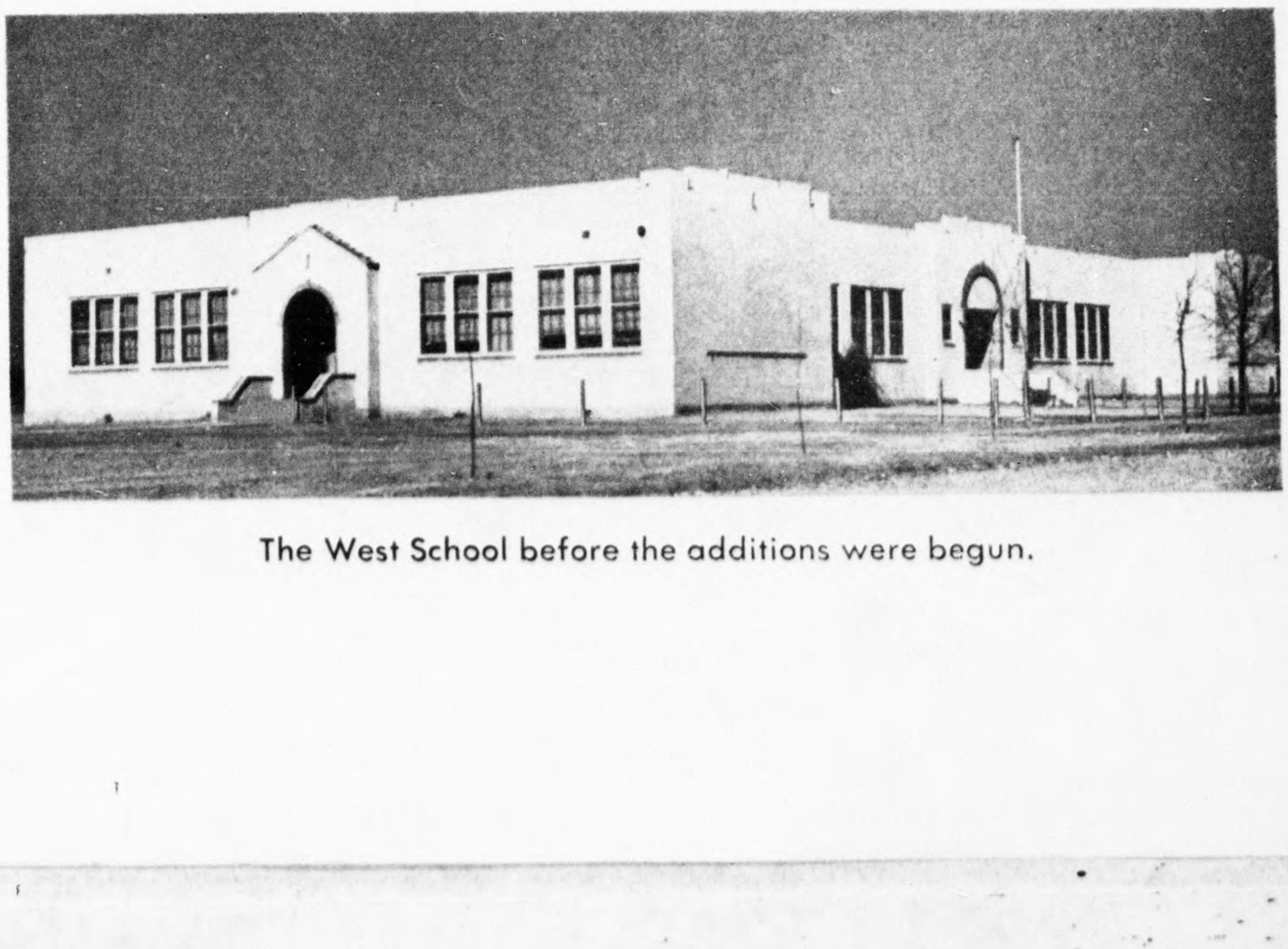
The board of education and the executive officers have been fully aware of the administrative problems and of the opportunity for expanding the educational program as a result of the steady growth of the school enrollment. In 1944, upon the recommendation of the superintendent, the board of education authorized a self-survey of the educational program and of the need for additional building facilities. This survey has since become a continuous study.[2]

[2]The self-survey includes a continuing analysis of widely pertinent situations, including the population and average daily attendance, the school plant, the Anglo-Spanish and Negro enrollments, the social and economic status of parents, the prospective college attendance of high school graduates, the possibility of a junior college from the standpoint of cost and prospective attendance, the school tax situation, with emphasis on property evaluations and income, the bonded indebtedness of the district, the teaching staff, etc. The studies represent the use of distinctly modern techniques. — *Editor.*

### The Crisis in 1945

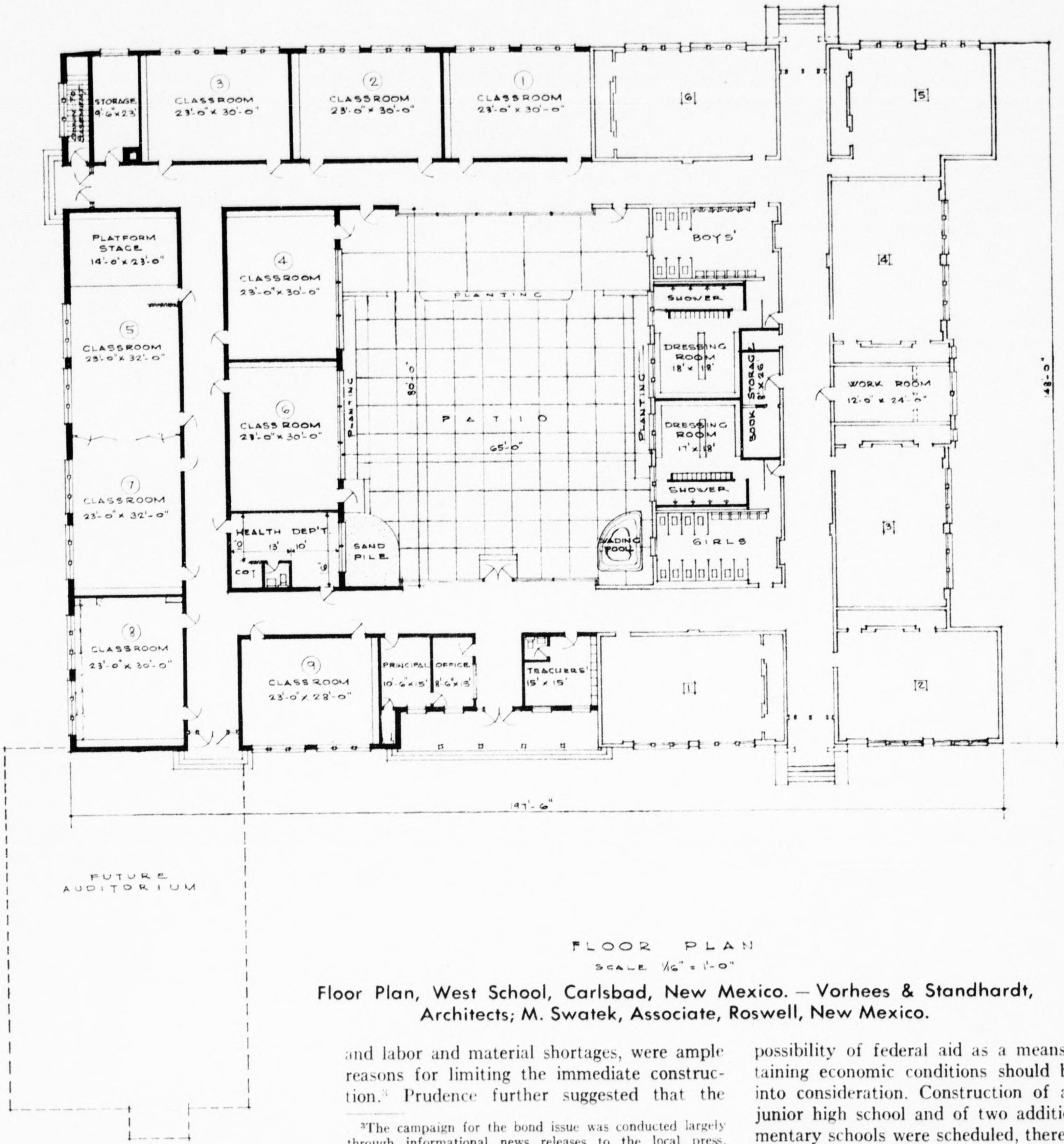
In the fall of 1945, the number of double sessions and the use of temporary buildings had increased to the point that the erection of 40 elementary classrooms could no longer be delayed. Special efforts made possible the construction of 16 classrooms, which did not relieve the situation; by December, 1945, a further total of 47 rooms was needed. An election for bonds was accordingly called, and in the spring of 1946, the taxpayers voted a bond issue of $695,000 for buildings, sites, and equipment as the first step in providing 30 permanent elementary classrooms.

A bond election for a million dollars could have been carried, but the board of education held that uncertain and high building costs,



The West School before the additions were begun.

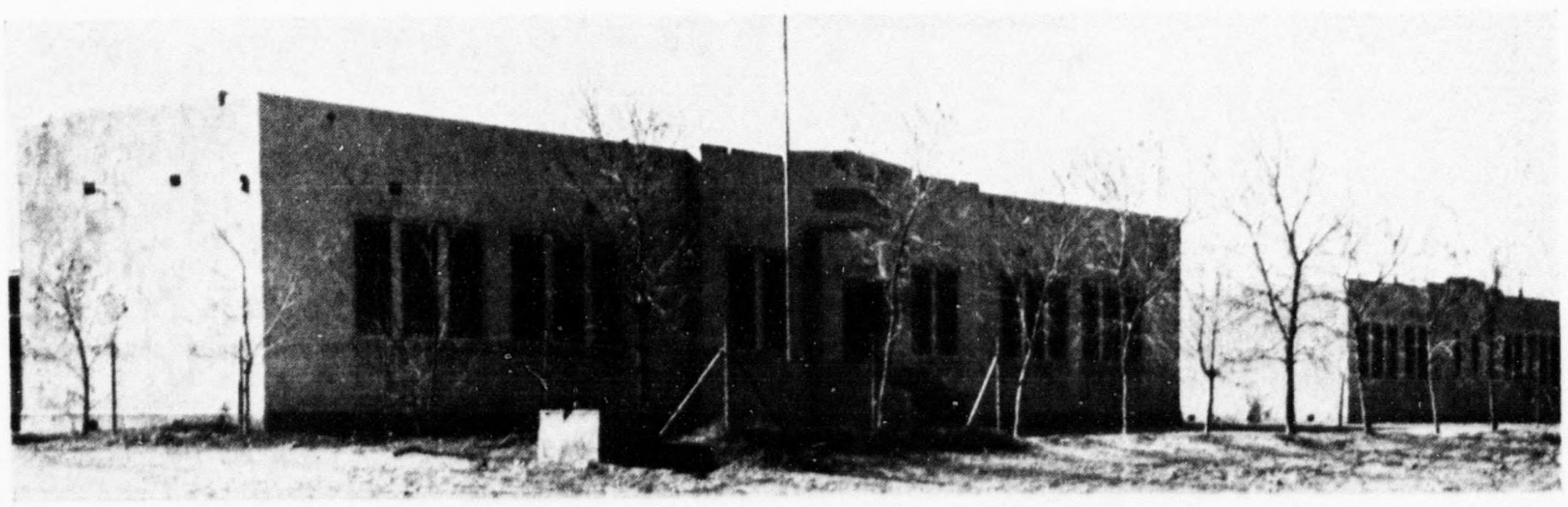
[1]Superintendent of Schools, Carlsbad, New Mexico.




**Floor Plan, West School, Carlsbad, New Mexico. — Vorhees & Standhardt, Architects; M. Swatek, Associate, Roswell, New Mexico.**

and labor and material shortages, were ample reasons for limiting the immediate construction.[3] Prudence further suggested that the possibility of federal aid as a means of sustaining economic conditions should be taken into consideration. Construction of a second junior high school and of two additional elementary schools were scheduled, therefore, for subsequent bond issues, to be voted in 1948 and 1950. Funds from these bonds would also be used for a high school annex, cafeteria student centers, auditoriums, a stadium, additional high school classrooms, an experimental farm, and the conversion of one elementary school into a central administration building.

[3]The campaign for the bond issue was conducted largely through informational news releases to the local press, and through the medium of the monthly "Informational Bulletin" which had kept the community informed on the needs of the school system and the extreme conservatism of the funds requested. — *Editor.*



**The separate buildings of the original South School, which will be joined when the new structure is completed.**

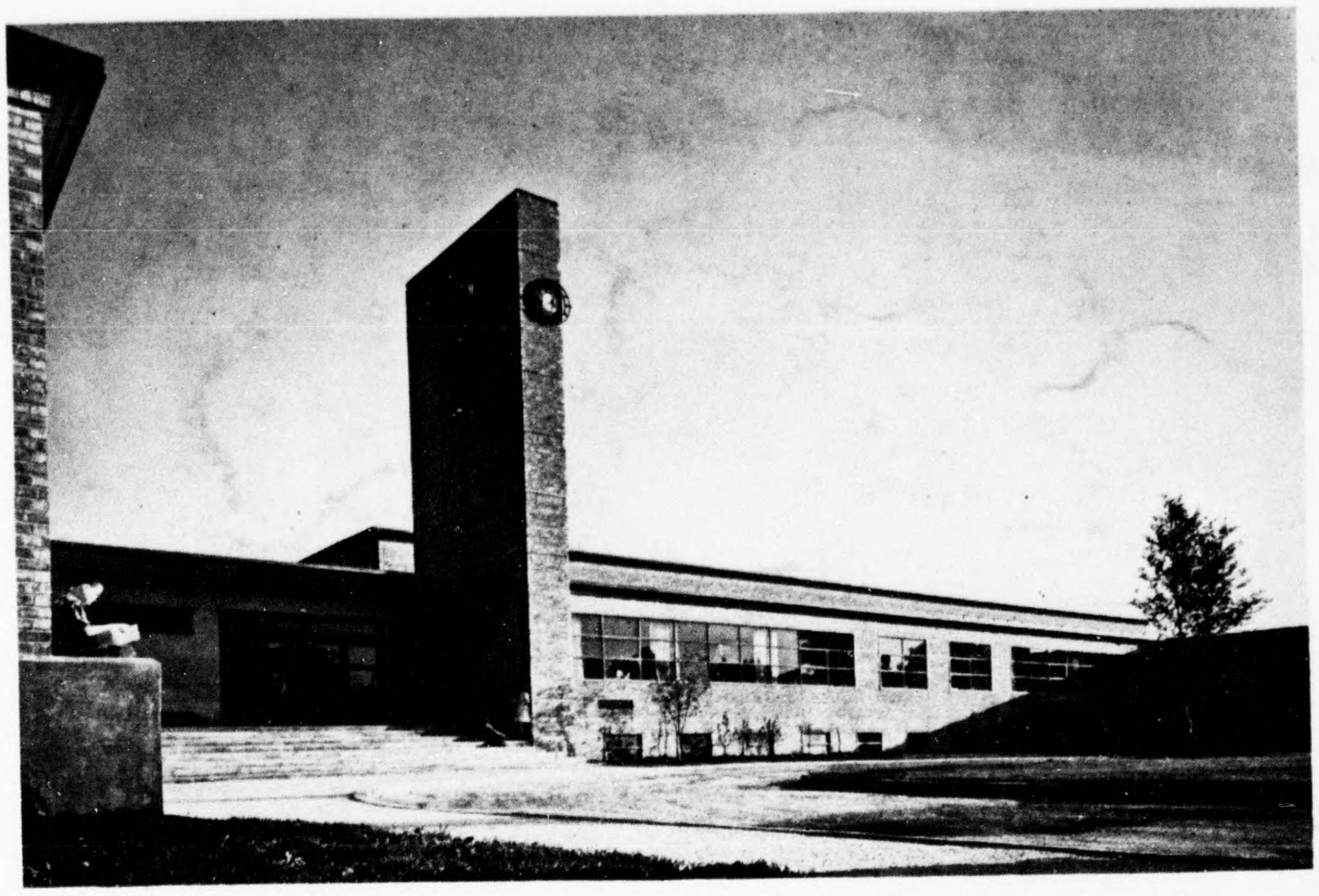
## The Immediate Construction Plan

Immediately after the bonds for $695,000 had been voted, the board of education employed an attorney and architects to proceed with the legal steps and to draw up the plans for the current program. The major projects included in the current program were:

1. An addition of six elementary rooms to the South School ............ $ 94,000
2. An addition of eight elementary rooms to the West School ............ 115,000

# When Teachers, Janitors Build Schools

## Lawrence B. Perkins, A.I.A.[1]



*Crow Island School's exterior lines are sweepingly horizontal — in keeping with the low classroom ceilings and placing of all classrooms at the same level — for safety and convenience. Only vertical element in the design is the chimney and clock tower at the main entrance. In silhouette to the left is the nursery-kindergarten wing. To the right are the central structure, housing auditorium, playroom, library, offices, and art room. At the extreme right, in shadow, is the primary wing.*

What happens when school administrators face their building problems years before they arise — when supervisors, principals, teachers, janitors (even children) join with board members and architects in creative planning?

The results — convenience, economy, original, stimulating functional design — are found in Winnetka's noteworthy Crow Island School, which has just completed its first year of service under fire.

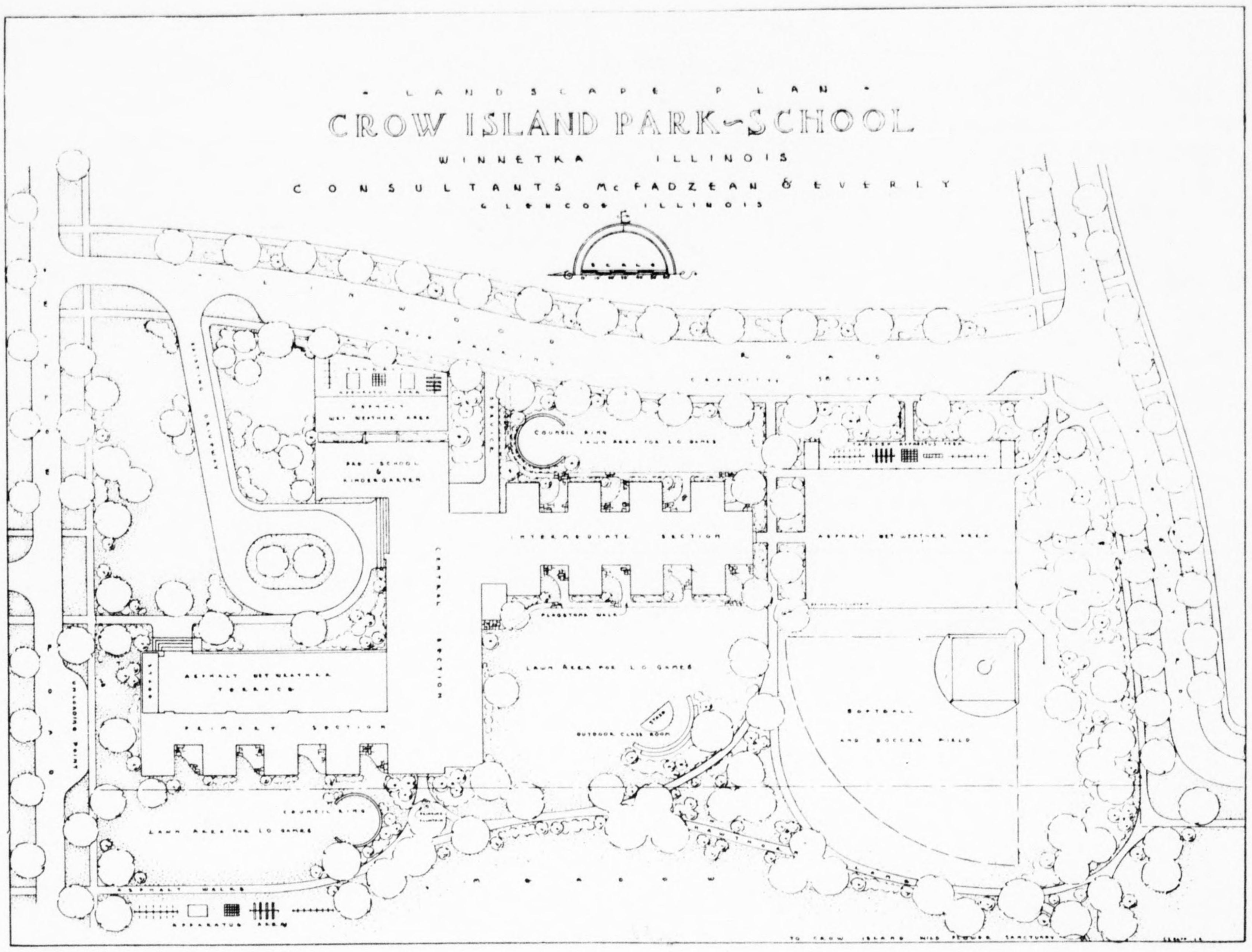
Full credit for Crow Island's pioneering, for its acceptance by pupils, teachers, and parents, belongs to Winnetka's nationally famous, imaginative, and democratic school administration.

Without the executive genius of Carleton Washburne and the creative talents of a remarkable school board, the architects could never have produced a building that so completely fills the practical needs of progressive education.

Crow Island resembles little the regimented, boxlike schoolhouse that is so familiar to school administrators. Yet it retains much of

[1]Member, Perkins, Wheeler and Will, Chicago. Associated with Eliel and Eero Saarinen in building Crow Island School, Winnetka, Ill.

*Light from two sides, low ceilings, natural pine walls, colorful spots of paint all contribute to the homey, residential atmosphere of this fifth grade classroom unit. The Welfare unit desks have been arranged by the students. The recessed lighting fixtures, designed by Stanley McCandless of the Yale University drama school, spread even, shadowless illumination at desk level.*



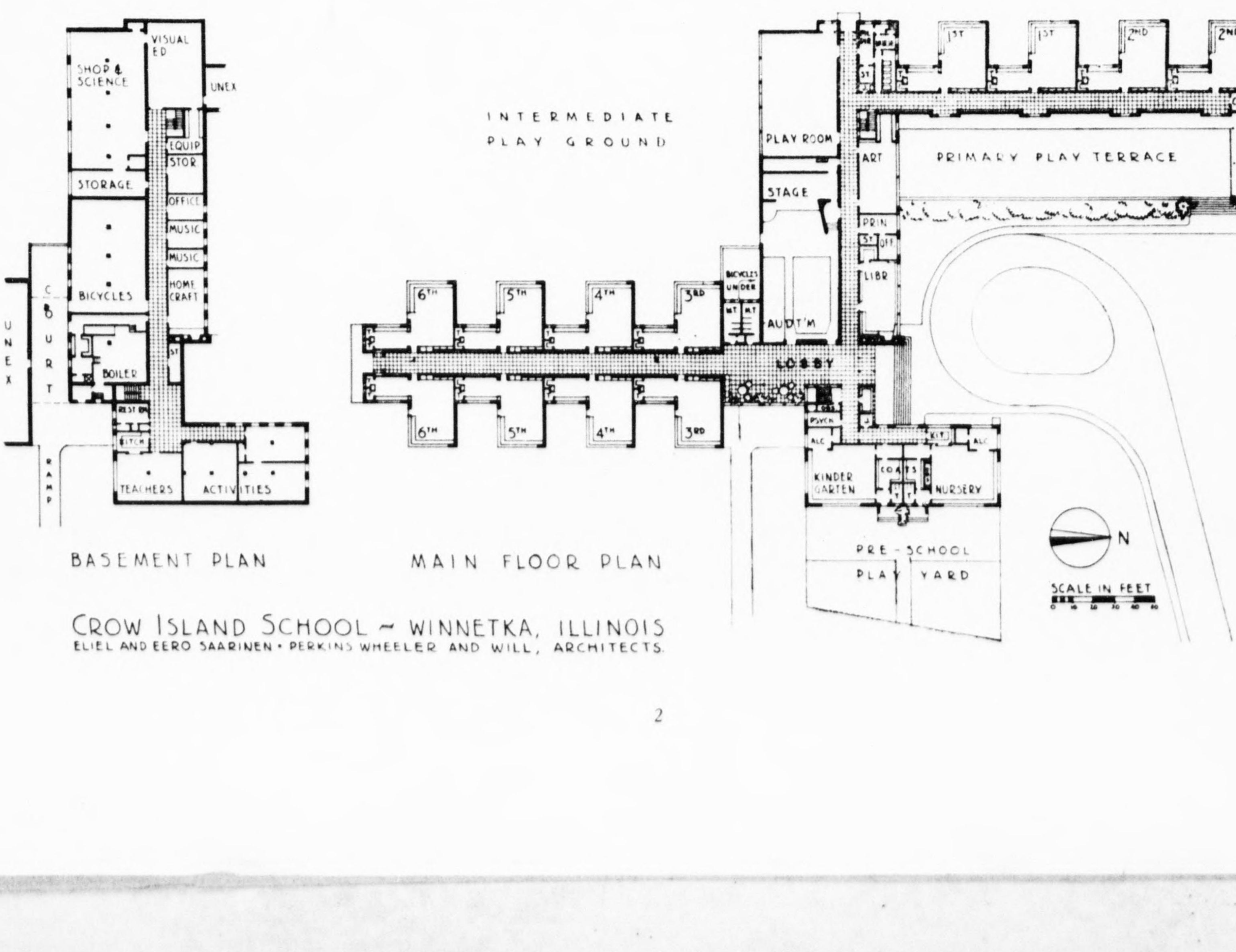

the friendly informality of America's traditional "Little Red Schoolhouse."

It is a rambling, flat-roofed, one-story structure of native common brick. Primary grades, intermediate grades, and the kindergarten-nursery schools are housed in three individual wings surrounding the central community facilities — auditorium, playroom, library, shops, art room, heating plant, etc.

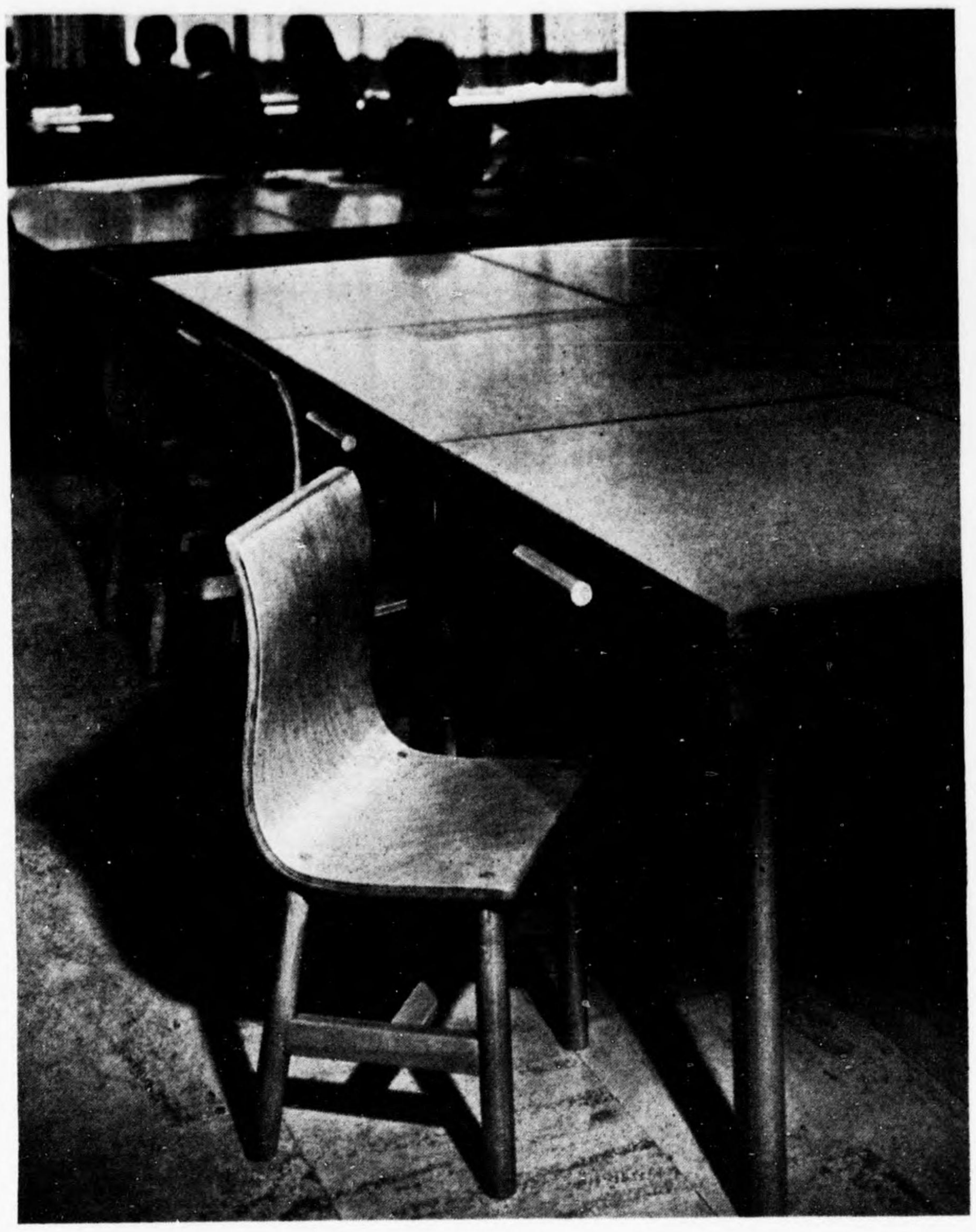
Striking at first glance is the modern design that expresses the progressive philosophy of education that permeates the building. The dominating oblong chimney, its controversial off-center clock, the sweeping horizontal lines, the free use of warm, rich colors are typical of the creative imagination of Eliel Saarinen, the noted Finnish designer, and his son Eero, who shared the architectural assignment with my own associates, E. Todd Wheeler and Philip Will, Jr., of Chicago.

But the teacher and the experienced school administrator will focus on the revolutionary Winnetka classroom unit that is the functional heart of the entire structure.[2] The unit

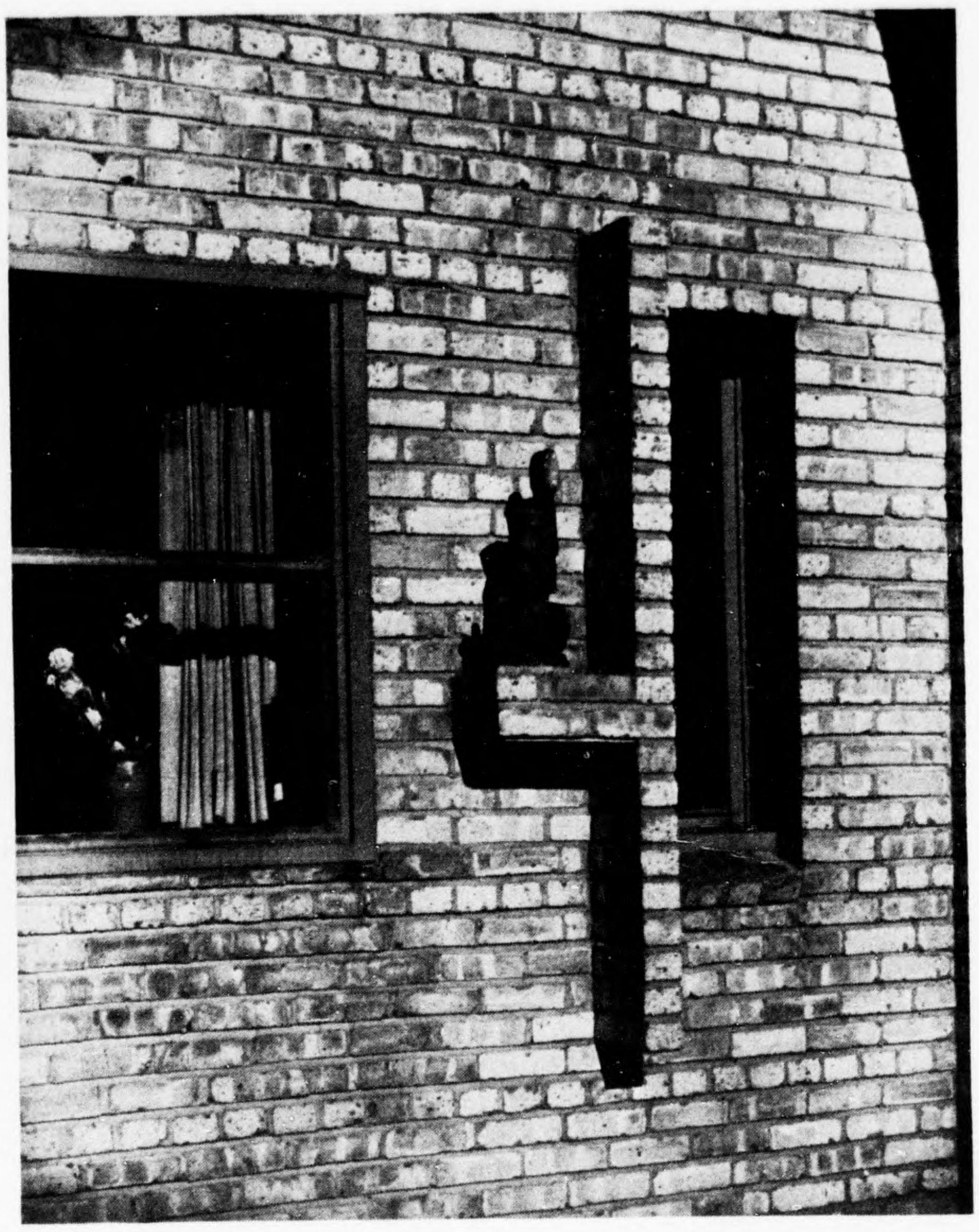
[2]Reported fully in the June, 1940, AMERICAN SCHOOL BOARD JOURNAL.




CROW ISLAND SCHOOL ~ WINNETKA, ILLINOIS
ELIEL AND EERO SAARINEN • PERKINS WHEELER AND WILL, ARCHITECTS.



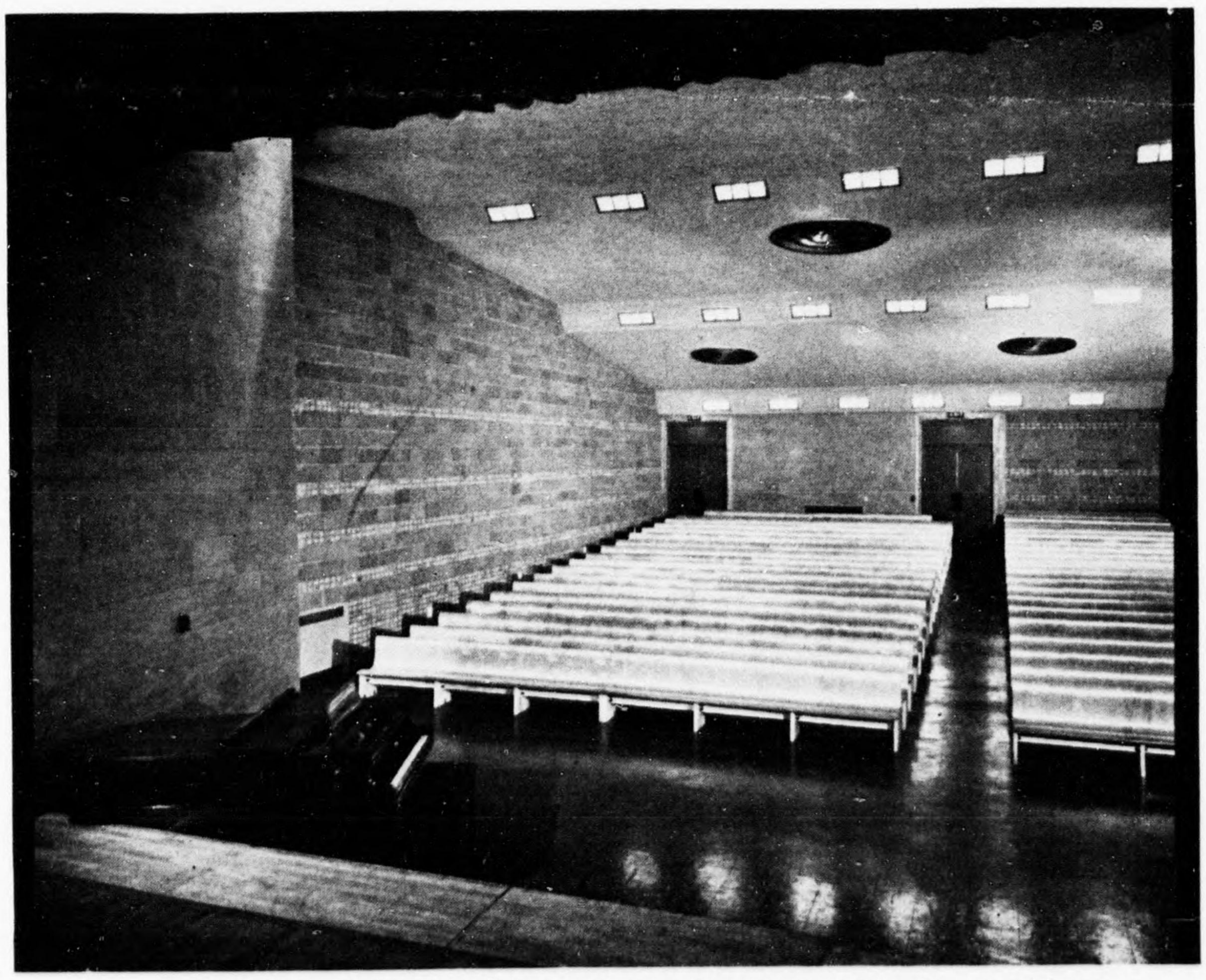
Typical elementary body-countour chair and study table in Crow Island school. Built by the Illinois Craft Project of the WPA from designs of the architects, the furniture permits maximum flexibility and comfort. The table top is of Formica.



These rabbits are representative of the colorful ceramics modeled for the school's outdoor classrooms and the main lobby by Lillian Swan (Mrs. Eero Saarinen). Each ceramic is closely related to the year's teaching program.

classroom, almost a school in itself, is the direct product of the months of preliminary research that preceded the first use of the drawing board. Most important verdict of this study was the conviction that the primary pupil simply cannot comprehend the complex social structure of a school community of 300 or 400 students. Hence the fundamental requirement that each classroom should be a complete, self-contained unit, housing all but the library, auditorium, playroom, and offices. In a more temperate climate than the Chicago area, the unit classrooms might have become independent, isolated cottages grouped around a central administrative unit on a tree-shaded campus.

Completely absent from Crow Island's classrooms are regimented rows of anchored desks, unnaturally high ceilings, and their corollary — ungainly wainscoting. In their place are individual buff, formica-topped tables, grouped to suit the day's requirements; residence-height ceilings; homey walls of natural western pine that double as room-size bulletin boards; large windows covering two whole walls, that weld the classroom to the outdoors; a story corner where the windows meet; "electric-eye" lighting that guarantees constant illumination, protects young eyes; a project area piled with blocks; an adjoining workroom with real, man-sized tools, hardy benches, cavernous drawers, and a large sink — even separate drinking fountains and toilets graded in size for each age. Just outside is a

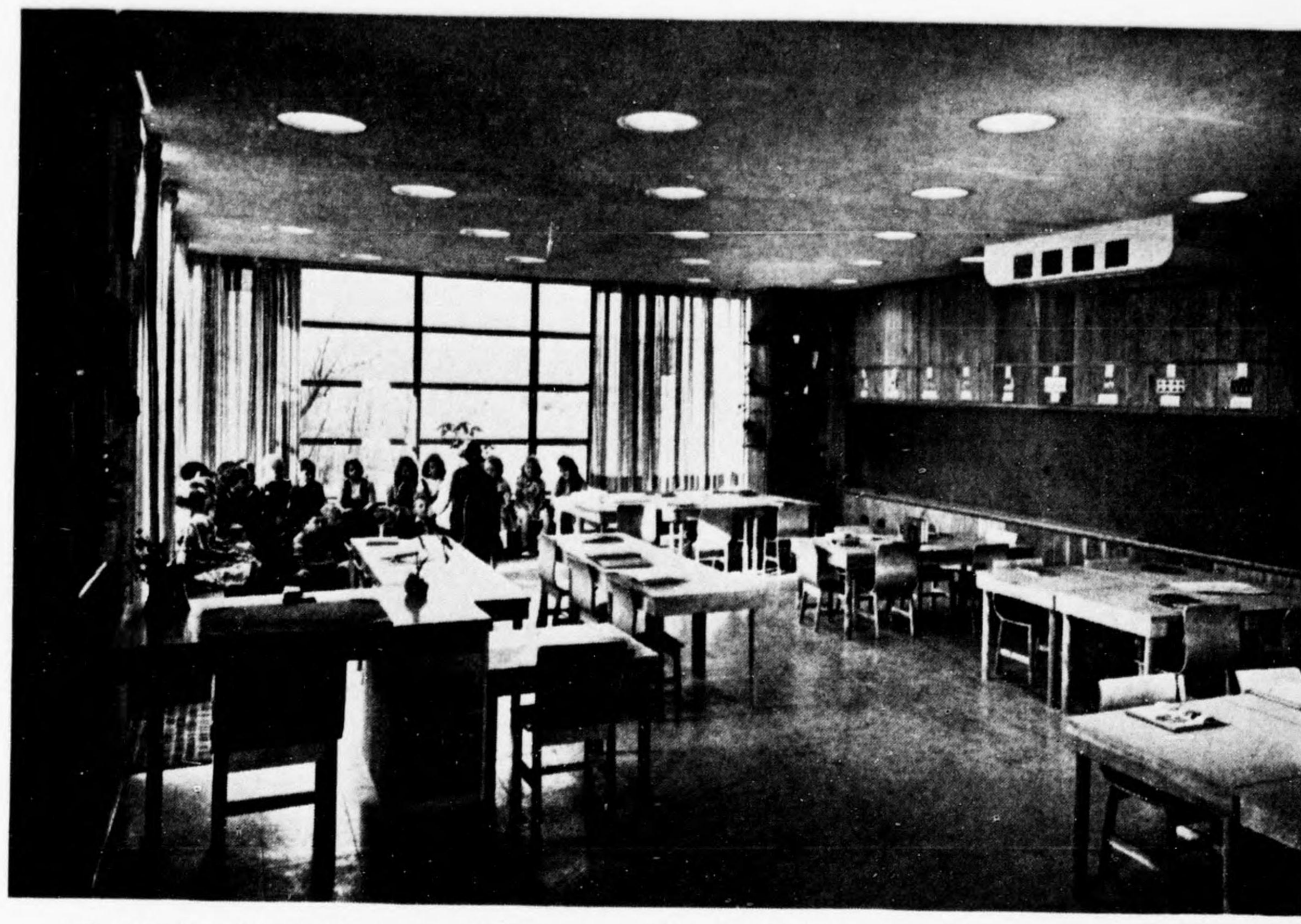


Common materials and functional design play an important part in the assembly room. The ceiling is formed of reflecting acoustical planes that distribute small voices equally well to all parts of the room. The recessed lights and ventilators become integral parts of the design. The walls are constructed of cinder concrete blocks, a simple material, banded with courses of rose-tinted common brick. To the left is an acoustivane panel of oak veneer. The seats are bent plywood. Here benches, rather than individual seats, are used so that children and parents alike may be comfortable.

sheltered area for each group that can serve as a garden project or as an outdoor classroom. (And, of course, a patient setter or terrier, waiting for master's lunch hour.)

Design of the assembled structure was influenced greatly by the school's location — adjoining Winnetka's bird sanctuary, "Crow Island Park," and the flat Skokie Marsh (now a National Park area) that borders Chicago's North Shore suburbs for more than 15 miles. Teachers suggested large, low windows, permitting constant view of the wooded park and the colorful moor. Lighting research suggested illumination from two sides instead of one. The result was corner windows 7 ft. high, 44 ft. wide. I repeat, 44 ft. wide, covering most of two walls. These windows, guarded by colorful draw curtains, permit nearly perfect union between the classroom and outdoors, stimulating always interest in nature. No better location could be found for the informal story corner than the junction of these sweeping windows.

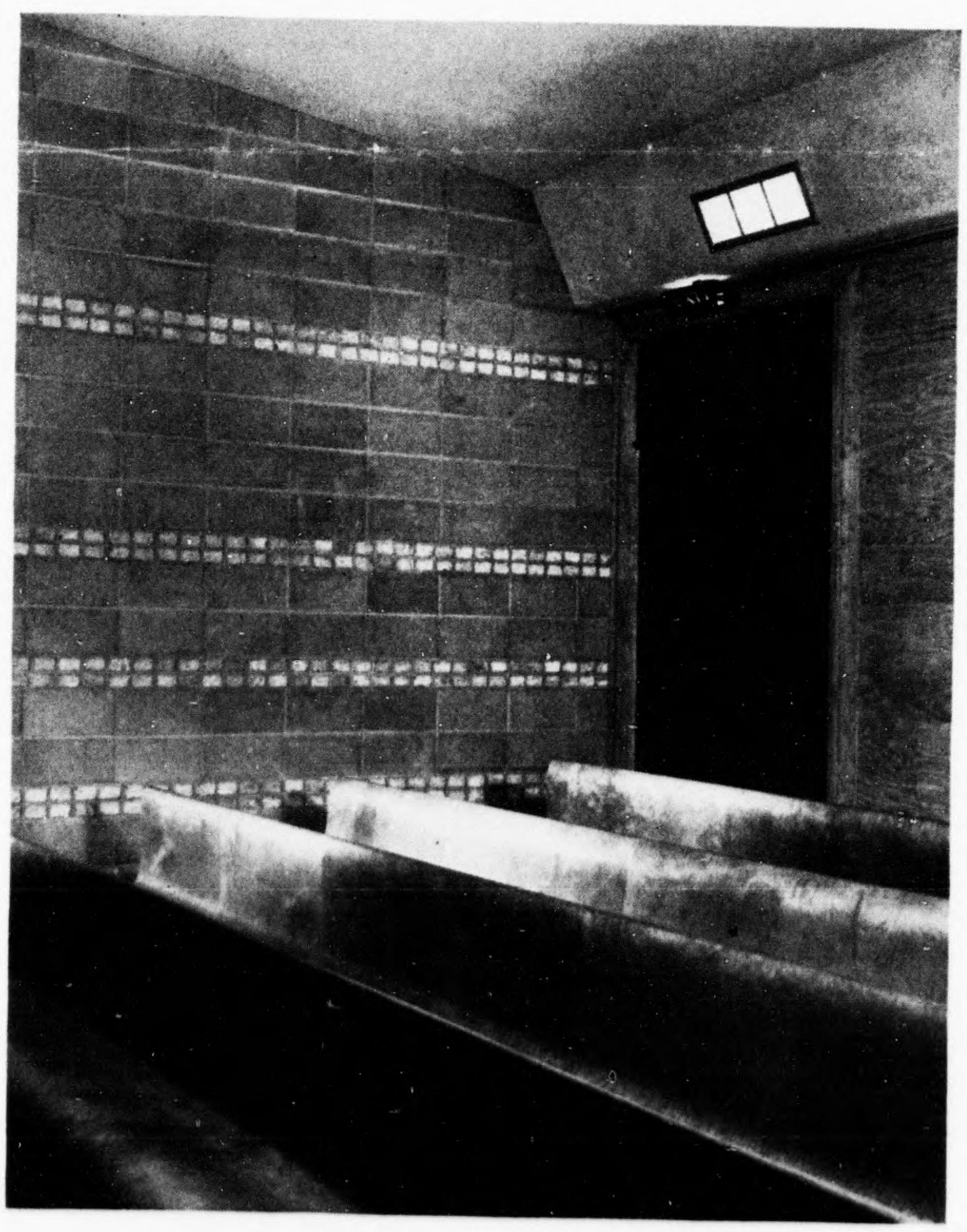
The large windows suggested other innovations. With adequate illumination no longer a problem, with light entering from two whole walls, the ceiling height could be brought down from the traditional 12 ft. to normal residence level, 9 ft. You can easily calculate the savings in construction costs and in heating. Heat lost by the large window surfaces is at least partially offset by the warm rays of the sun, which have ready access to windows while the brick exterior walls of adjoining class units serve as windbreaks. (*Note master plan.*) Installation of "magic-eye" photoelectric cell relays to turn the lighting fixtures on



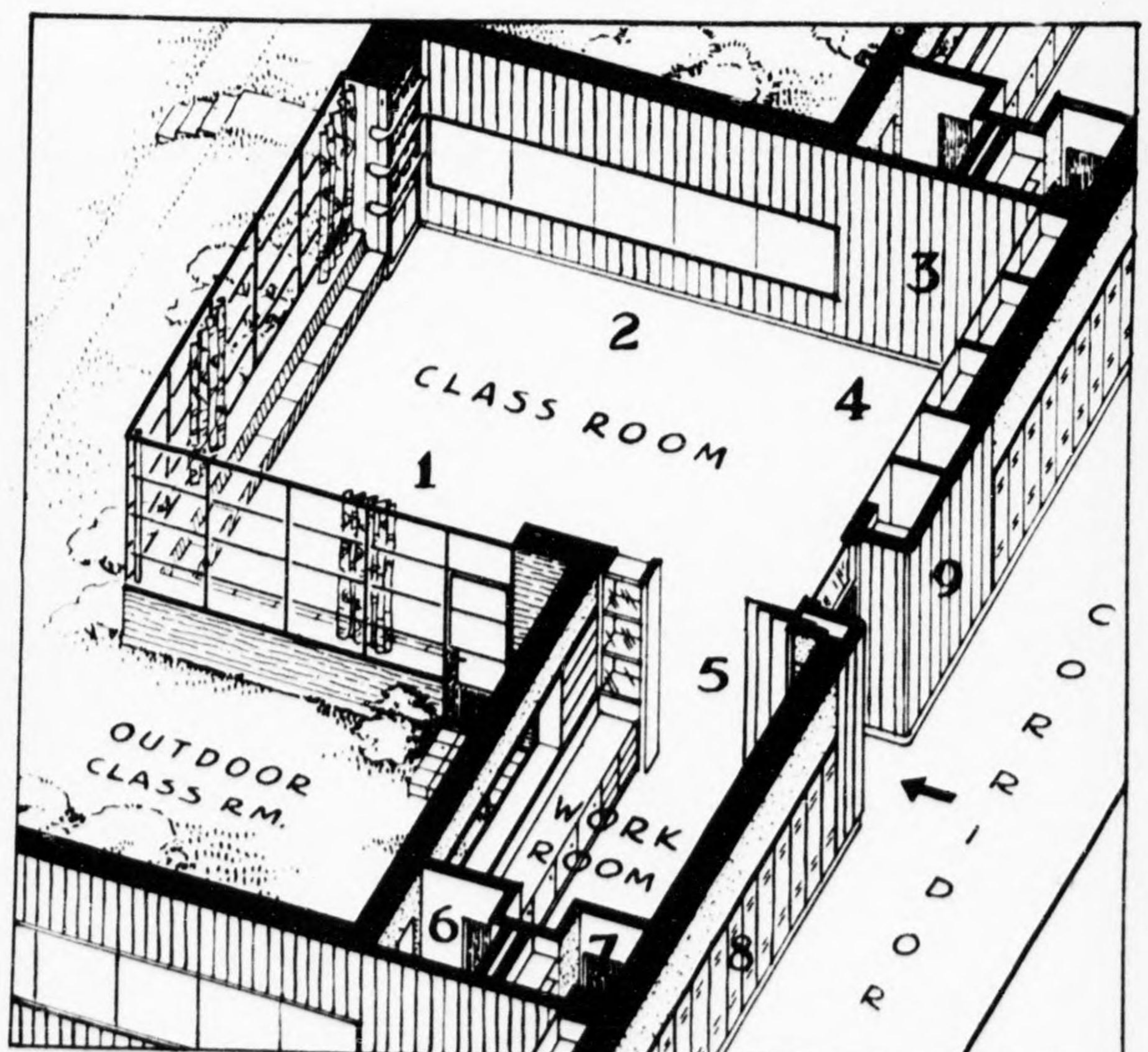
*A popular spot is the sunny story corner. This is a second year classroom. The tables and chairs — like all furniture in the school — was designed for Crow Island by the architects.*

and off in groups assures adequate illumination at all times with minimum attention from the teachers. The recessed ceiling reflectors, of the direct variety, were designed by Prof. Stanley McCandless of the Yale University Drama School, one of the many consultants in specialized fields who contributed their creative genius.

Each class has its own adjoining workroom where children may make boats, toys, furniture, or play banker or storekeeper or pilot. Constant consultation with teachers led to plenty of cabinets and large drawers, to a large, handy sink, to an individual toilet for each classroom. The latter, graduated in size from subkindergarten to sixth grade, have at-



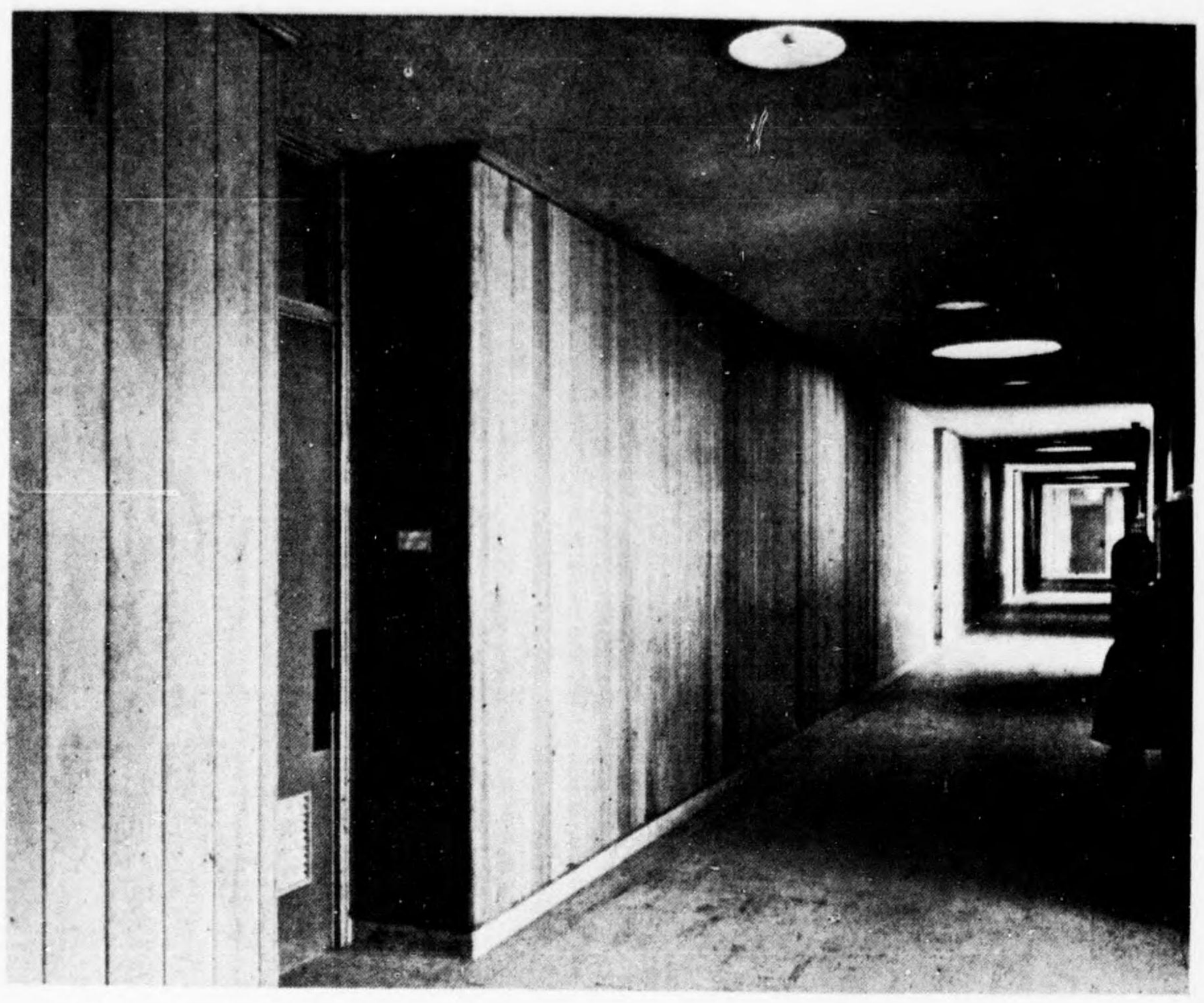
*A corner in the auditorium.*




WINNETKA·CLASSROOM·UNIT· PERKINS, WHEELER & WILL ARCHITECTS·CHICAGO

*(1) Story corner at junction of two windows that cover south and west walls. . . . (2) Desk area in which movable tables and chairs or unit desks may be adjusted to day's activities. . . . (3) Wall of Western pine planks serve as room-size bulletin boards for all forms of teaching aids and art work. . . . (4) Project area. . . . (5) Sliding doors separate main classroom from workroom, which may also serve as private conference room. . . . (6 and 7) Washroom and closet facilities. . . . (8) Recessed lockers in hall. . . . (9) Hallway walls of vertical Western pine planking, serving as bulletin board.*

*This view of the entrance foyer shows how humble, hardy materials have been used to secure decorative effect. The walls are of common brick with a face brick base course. The ceiling, acoustical plaster. Down the hall are recessed lockers, vertical pine planks in a bulletin board, and acoustical plaster.*



*Elementary hallway of Western Pine. Note asphalt tile flooring. The flush-panel doors to the classrooms are enameled in brilliant red, yellow, blue, and green. Ceiling fixtures were designed for the school.*

tracted considerable discussion. Boys and girls share the facilities in the younger groups, have separate toilet rooms beginning at age 11. Lockers for each pupil — in the central hallway outside each class — are controlled by the teacher, may be locked individually as the youngsters grow in responsibility.

Four dominant colors strike the visitor — vivid reds, yellows, blues, green. They're on each classroom door, in large solid blocks — at the suggestion of the Saarinens. Each classroom has its own dominant color, echoed from the door, and carried to the bookcases, the draw curtains, the closet interior, even to the recess above the workroom sink. These clear colors and the natural pine walls contribute much to the homey aspect of the classes — a material aid to adjustment in the earliest school years. Even the best color photographs fail to picture completely the importance of the Saarinen's colors in establishing the personality of the individual classrooms, of the theater-auditorium, of the whole school.

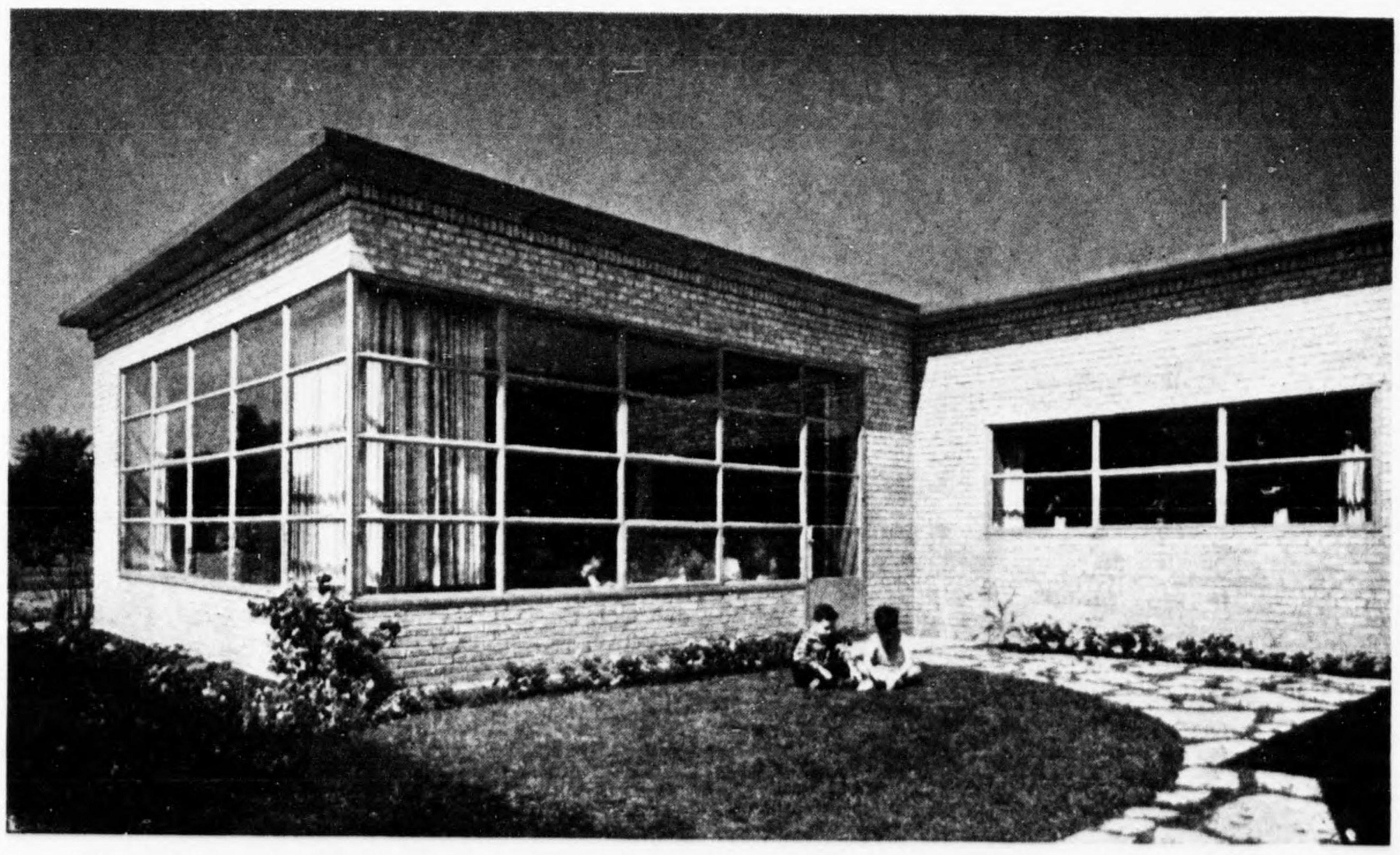
Colors are brightest in the nursery-kindergarten wing. Here bright red, yellow, and blue blocks fight for attention with brilliant red, orange, and green curtains and colorful (but hardy) rolling toys. The nursery school, accepting subkindergarten pupils on a tuition basis, has its own kitchen and milk bar. Outside is its own play area, fenced off from bullying six- and seven-year-olds.

The primary pupils skate and scrap on their own all-weather play court, which is surfaced with asphalt and protected from the winds on three sides. Like the porches of a tuberculosis sanitarium or Sun Valley's winter swimming pools, this play-yard will be warmed by the sun to 10 or 12 deg. above the surrounding park. Onto the court opens a roomy hallway plenty large for removing ski suits and galoshes.

Apparent throughout the building are the same underlying principles — warm colors, natural surroundings, comfort for teachers and pupils alike. There's the Pioneer Room, designed by activities chairman, Frances Pressler, with its rough, natural walls and fireplace, its WPA built wooden utensils. Here, on certain days each month, children of all ages will take their turns as pioneers. Dressing, cooking, washing their clothes in the manner of their forefathers. Will they be as completely removed from the trials of their grandparents as are most of today's children?

There's the library with its fireplace and built-in story corner. (With plenty of sink and storage space for bookbinding.) There's the group playroom — not gymnasium in Winnetka — for here the emphasis is on group participation in sports — not cheering the gladiators. Near by are the art room with sturdy easels and plain waxed-pine walls, sure target for thumbtacks, the health unit, and the sound-treated principal's office, a spot where you'll seldom find Principal Hazel Gethman, who is always close to children's activity, in every corner of the school. The health unit, incidentally, is just the right length for eyesight tests, includes seven cots in a quiet rest room, an office for the school nurse, and a shower for active physical directors.

Children and parents were both considered in the design of the auditorium. Obviously the same sized seats could hardly accommodate comfortably six-year-olds and their 200-pound fathers. Here the solution was benches, average in height, flexible in width. Acoustics, too, is a special problem for an



*Each Winnetka classroom unit has its own outdoor classroom and garden project area — partly turf and partly flagstone. The broad expanse of glass gives maximum light and winter sunshine-heat. The long window to the right lights the classroom's adjoining workroom.*

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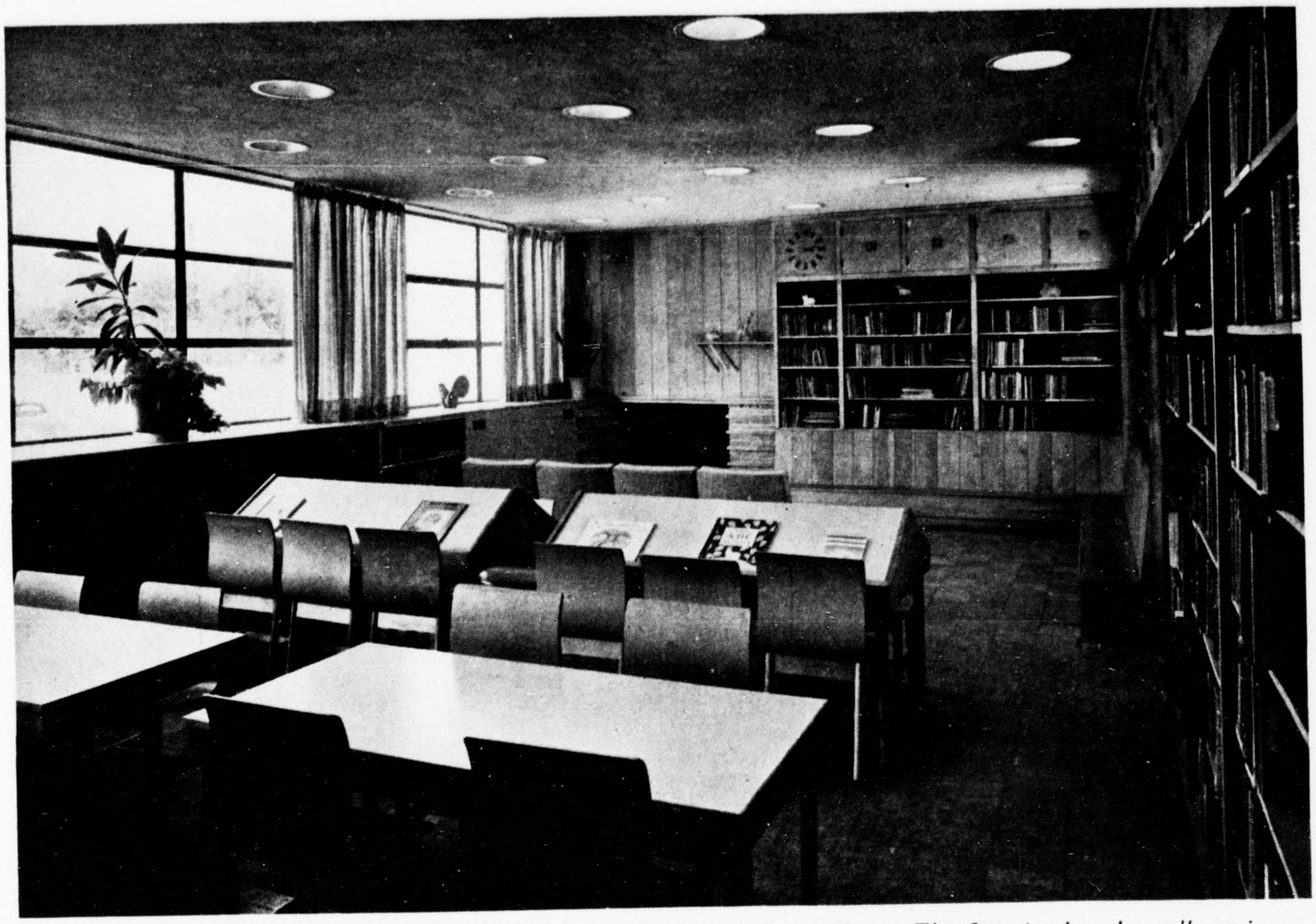
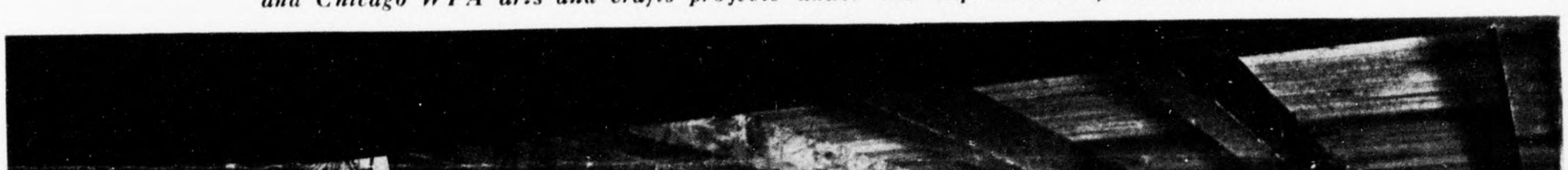


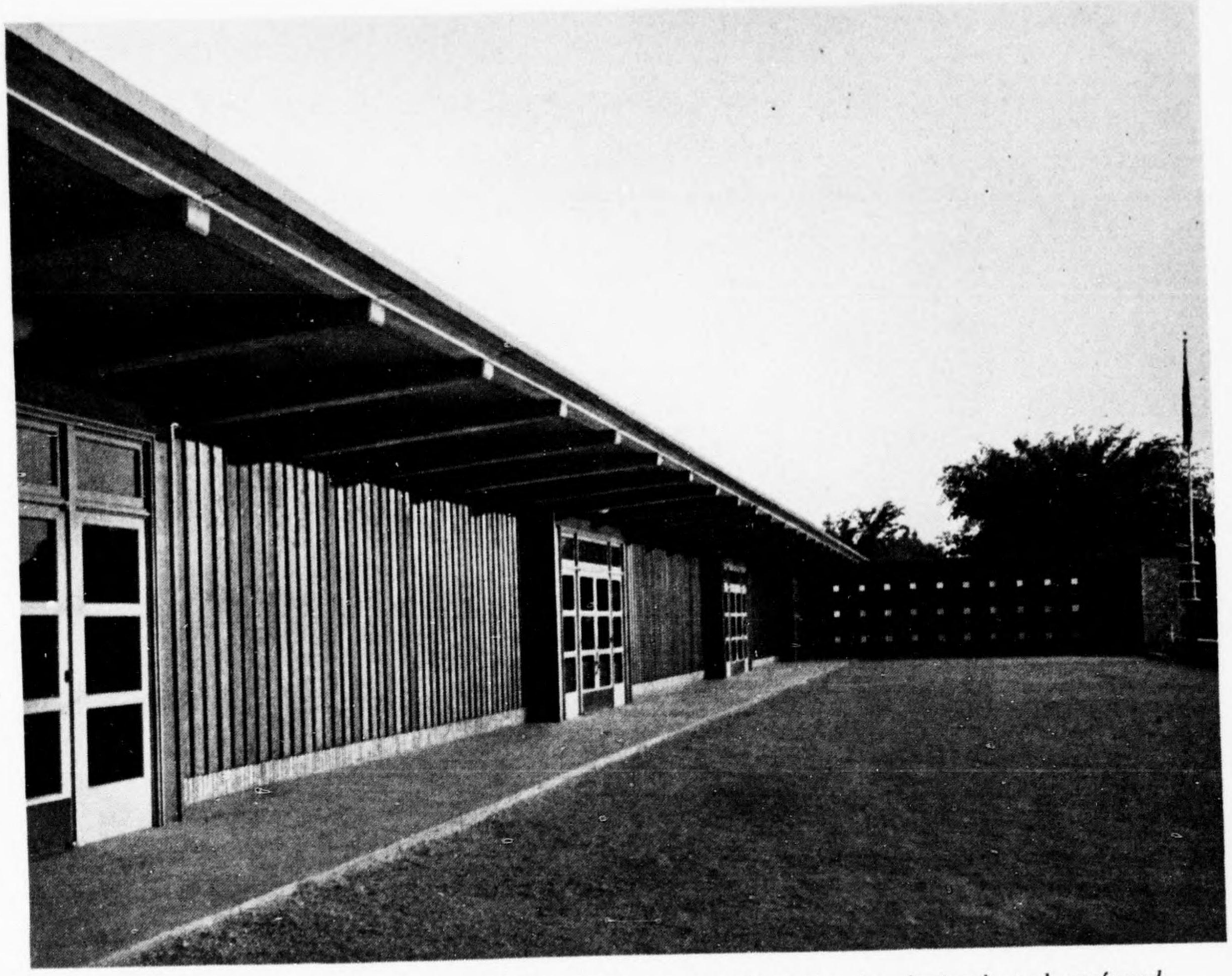
*No single room in Crow Island is homier and warmer in color than the library. The floor is elm, the walls again Western pine. One entire wall is glass, from counter book-cases to the ceiling. Furniture was built by the Milwaukee and Chicago WPA arts and crafts projects under the supervision of the architects.*



*Winnetka's suburban children won't forget the simple beginnings of American Democracy. In the Pioneer Room of Crow Island school pupils from the entire Winnetka system will come to study their third year homecraft projects in authentic pioneer atmosphere. Here spinning, churning, carding go on with the tools and clothes of the 18th century.*

auditorium to house the plays of five- to eleven-year-old actors. Natural speaking tones must reach each member of the audience with ease. Here the designers adapted the acoustic principle that made Louis Sullivan's Auditorium Theater in Chicago a remarkable opera house and concert hall. Carefully calculated ceiling surfaces reflect and project the children's voices to each section of the room. An ardent parent in the rear can hear every whisper of his child's "Snow White." This acoustically designed ceiling permits the most advanced stage illumination from concealed ceiling spotlights. Ordinary cinder-concrete blocks, broken by bands of warm-toned common brick, give the walls the proper acoustic properties, durability, and effective design.

Near the auditorium, and adjoining the kindergarten is an office-laboratory, used on alternate days by the Winnetka system psychologist and psychiatrist. Here is a screened observation room for parents and practice teachers. The nursery school has its own screened observation gallery, where practice teachers and mothers can watch the youngest undisturbed in play. Below, in the basement, are the shop, a visual-education room, a club-dining room with well-equipped kitchen for teachers, a bicycle garage, and an office for the Winnetka Educational Press — the agency that makes Winnetka's teaching aids available to other systems throughout the country.



*This allweather playard is raised above the surrounding terrain, drained, and surfaced with asphalt. The doors to the left open through the elementary hallway to the four elementary classroom units. The wood is redwood, the screen in the distance of common brick and glass brick, the cantilevered roof of concrete.*

In the basement are two examples of foresight that resulted from taking children, teachers, and janitors alike into the planning circles. In the partially excavated area beneath the main entrance steps is a steam radiator. On freezing days the radiator's heat melts outside snow and ice, freeing workers from hours of chipping away. One less broken ankle or bruised arm, to say nothing of hours freed for other maintenance duties, will certainly pay for this innovation. Another contribution to the planning by the school engineer is a large storage space for ladders, shovels, wheelbarrows, etc., in an otherwise useless foundation area.

Similar attention has been paid to the needs of every teacher, departmental supervisor, and staff worker. This careful functional planning around children, instead of set rules for school design is the result of thorough preliminary study of the problem. First inside out — from the child, to the teacher, to the classroom, to the school. Then outside in — from the location and the natural materials to the exterior design, to the landscaping, to the final fine details of each room. To Carleton Washburne and to the members of the Winnetka school board, go the credit for welding these planning approaches in the final school.

It was Robert S. Hammond, president of the Winnetka board of education, who suggested engaging architects several years before construction began. (In this case before the Crow Island School was contemplated.)

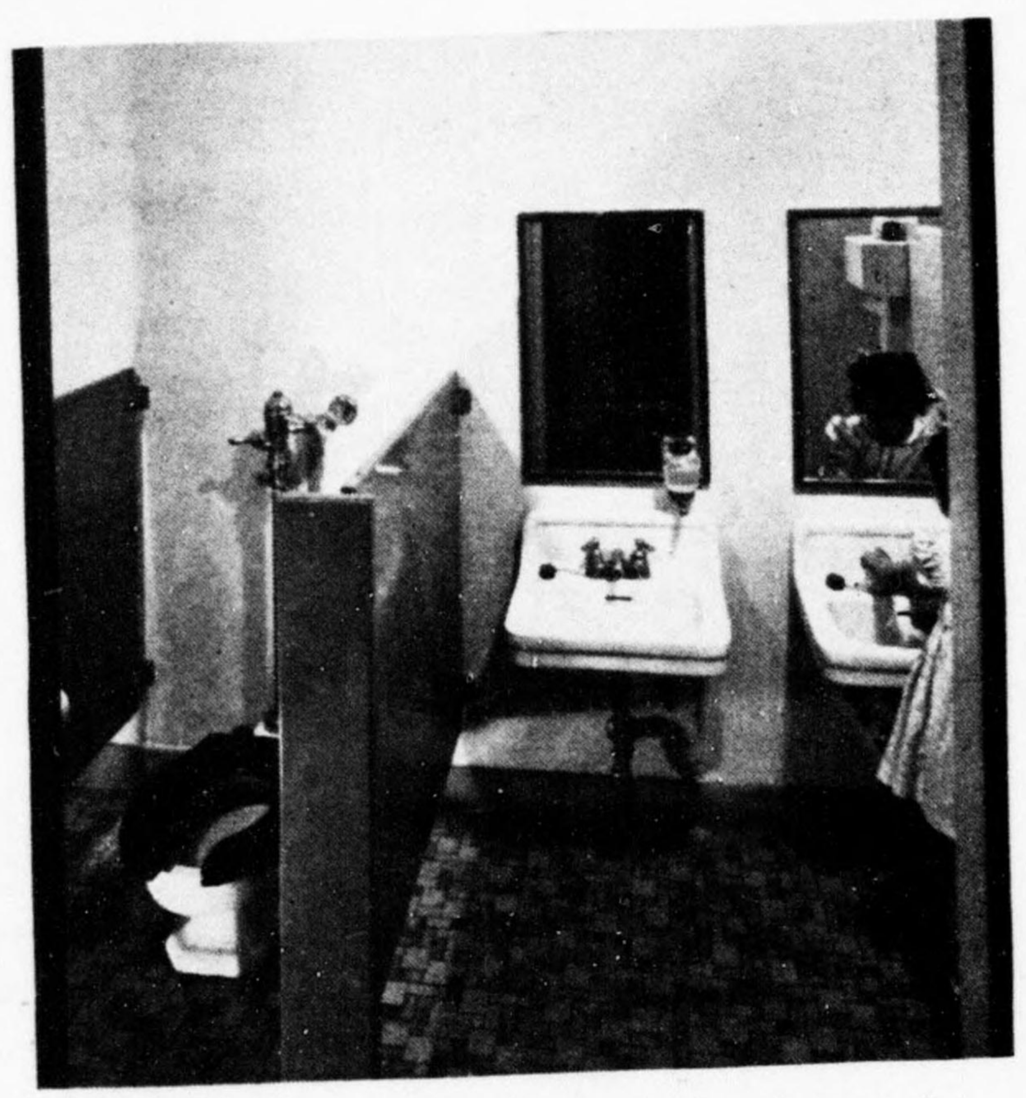
The board's committee and Mr. Washburne

*In the sixth grade boys and girls use separate washrooms for the first time. Toilet facilities are an integral part of each classroom unit.*

*Painting, modeling, and gardening are essential projects of Winnetka progressive teaching, so ample plumbing, with long basins and plenty of hot, cold, and temperate water outlets are logical. A kindergarten view, mural by the WPA.*

agreed that the new school building should be designed functionally, should therefore be modern in style. They desired an eminent modern designer, yet needed original, functional planning, close study.

They engaged two firms, Eliel and Eero Saarinen, designers of world repute, and architects of Detroit's Cranbrook Academy, and Perkins, Wheeler, and Will of Chicago. The Saarinens contributed their genius for color, form, mass, and materials. Perkins, Wheeler, and Will — a younger firm that had designed functionally modern structures — co-ordinated the many-faced problems of the school. We studied the needs (I literally went to school — at the primary levels — for months), developed the basic classroom unit, handled functional planning, engineering, and construction. Our job was aided materially by the consultation of my father, Dwight Heald Perkins, whose firm had built two previous Winnetka schools.

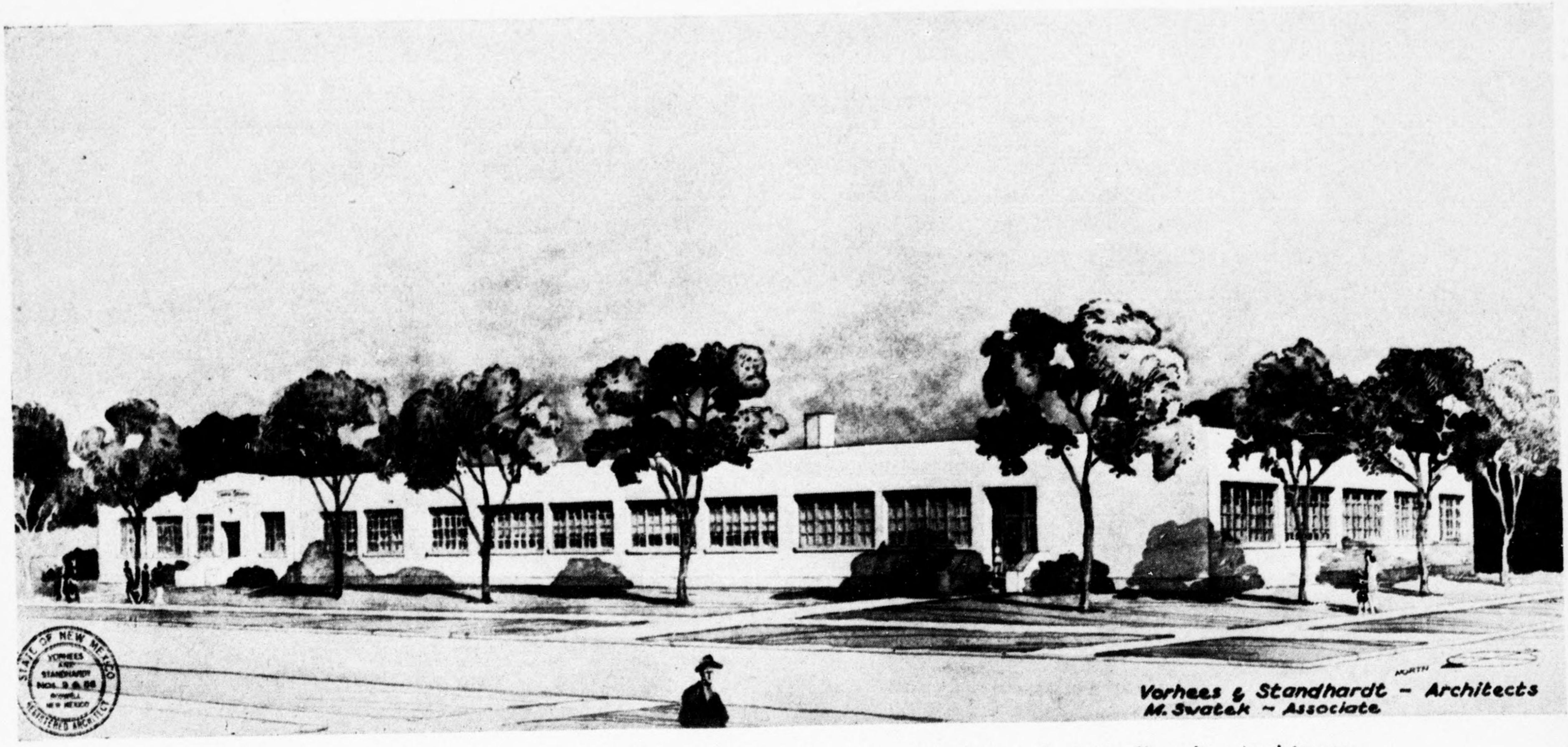


*Each washroom is scaled to the size of the classroom's occupants. Here, in the nursery school, basins are waist high.*

The solution proved a happy one in which dozens of individuals, lay and professional, worked together closely to develop a design which (I hope) may prove an abundant source of helpful ideas for school administrators throughout the country.

Crow Island's lesson for them is: "Plan ahead: let administrators, architects, principals, teachers, staff members, and pupils collaborate to develop the structure that best fits the local problem."

*(Reprinted from the September, 1941, issue of the AMERICAN SCHOOL BOARD JOURNAL)*



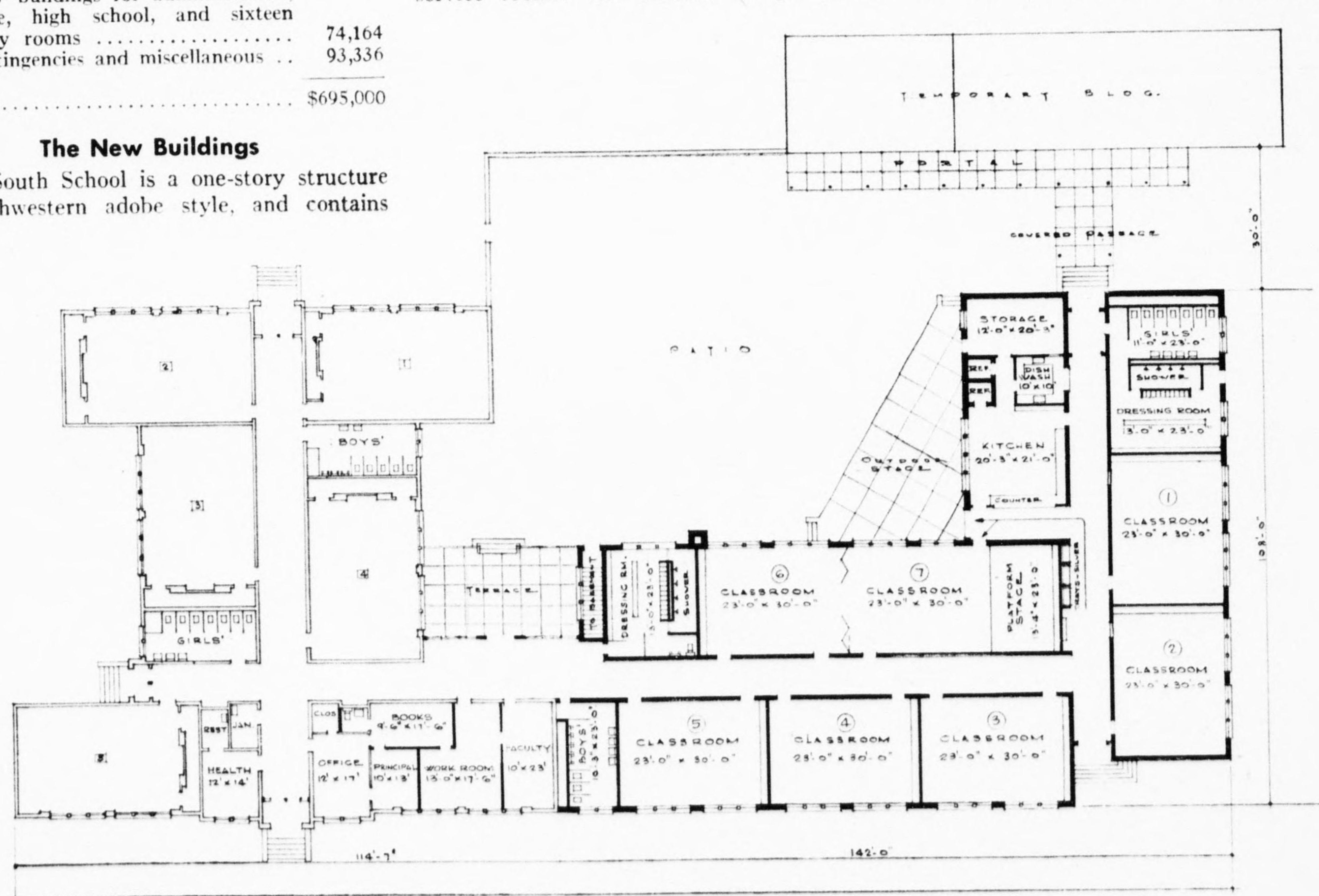

Addition to the South School, Carlsbad, New Mexico. — Vorhees & Standhardt, Architects; M. Swatek, Associate, Roswell, New Mexico.

| | |
|---|---|
| 3. The erection of a 16-room elementary school at Hillcrest ............... | 210,000 |
| 4. New equipment for all buildings .. | 57,920 |
| 5. Remodeling of the junior high school for extended instructional service | 49,800 |
| 6. Fees, eight acres of sites, and temporary buildings for administration, warehouse, high school, and sixteen elementary rooms ................... | 74,164 |
| 7. Contingencies and miscellaneous .. | 93,336 |
| Total ............................. | $695,000 |

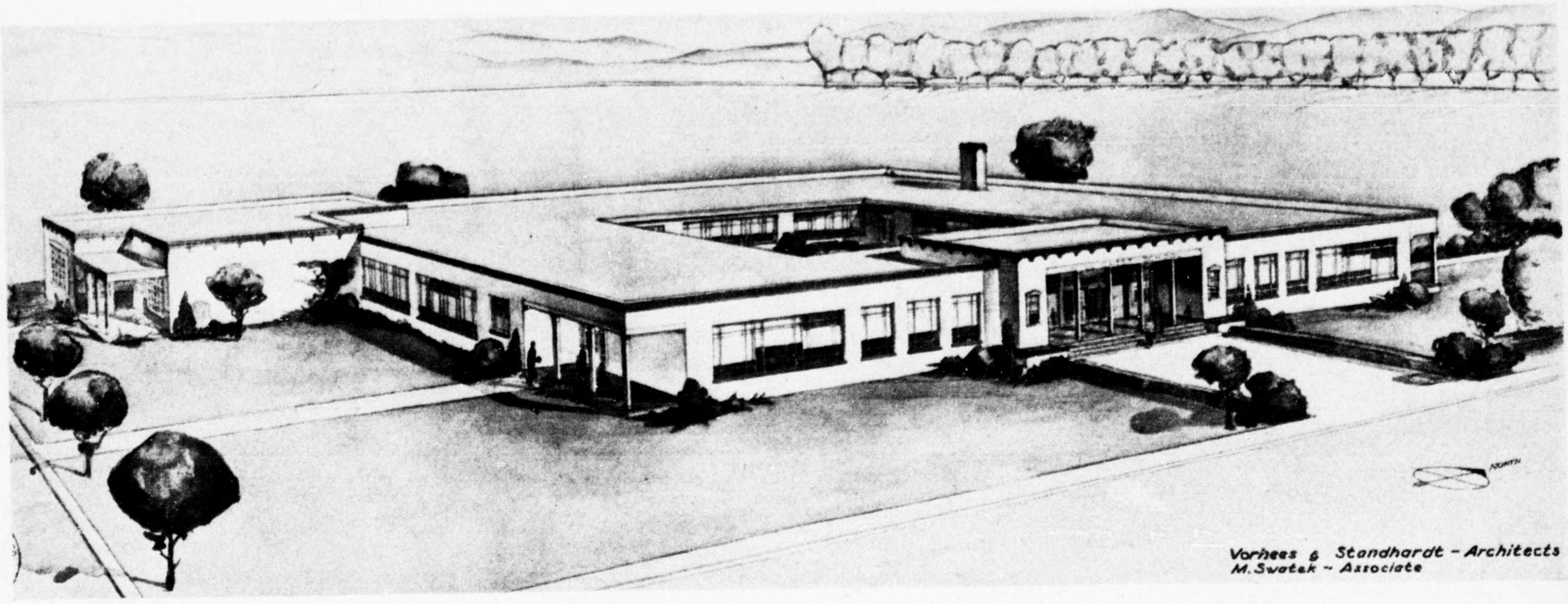
## The New Buildings

The South School is a one-story structure in Southwestern adobe style, and contains six permanent rooms, service rooms, etc. A six-room addition of the same design will be erected.

The West School, which now has six rooms, is in need of eight additional classrooms and service rooms. The exterior design will be changed to Territorial Spanish by a little "face lifting" on the original unit. A patio will be provided for assemblies and for primary grade play space. Such an arrangement is quite practical since not more than 10 per cent of the school days in the Carlsbad climate are




Floor Plan, South School, Carlsbad, New Mexico. — Vorhees & Standhardt, Architects; M. Swatek, Associate, Roswell, New Mexico.

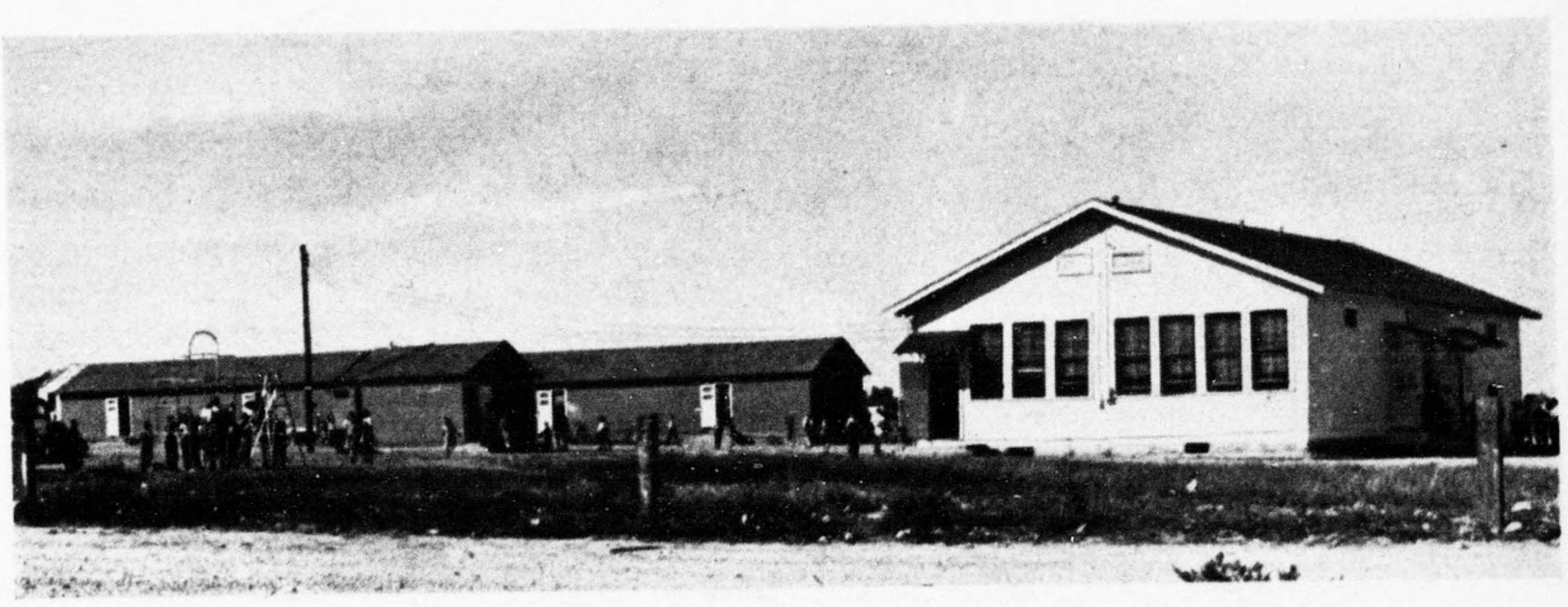



**The Hillcrest School, Carlsbad, New Mexico. — Vorhees & Standhardt, Architects; M. Swatek, Associate, Roswell, New Mexico. This building is planned to serve as a complete neighborhood center.**

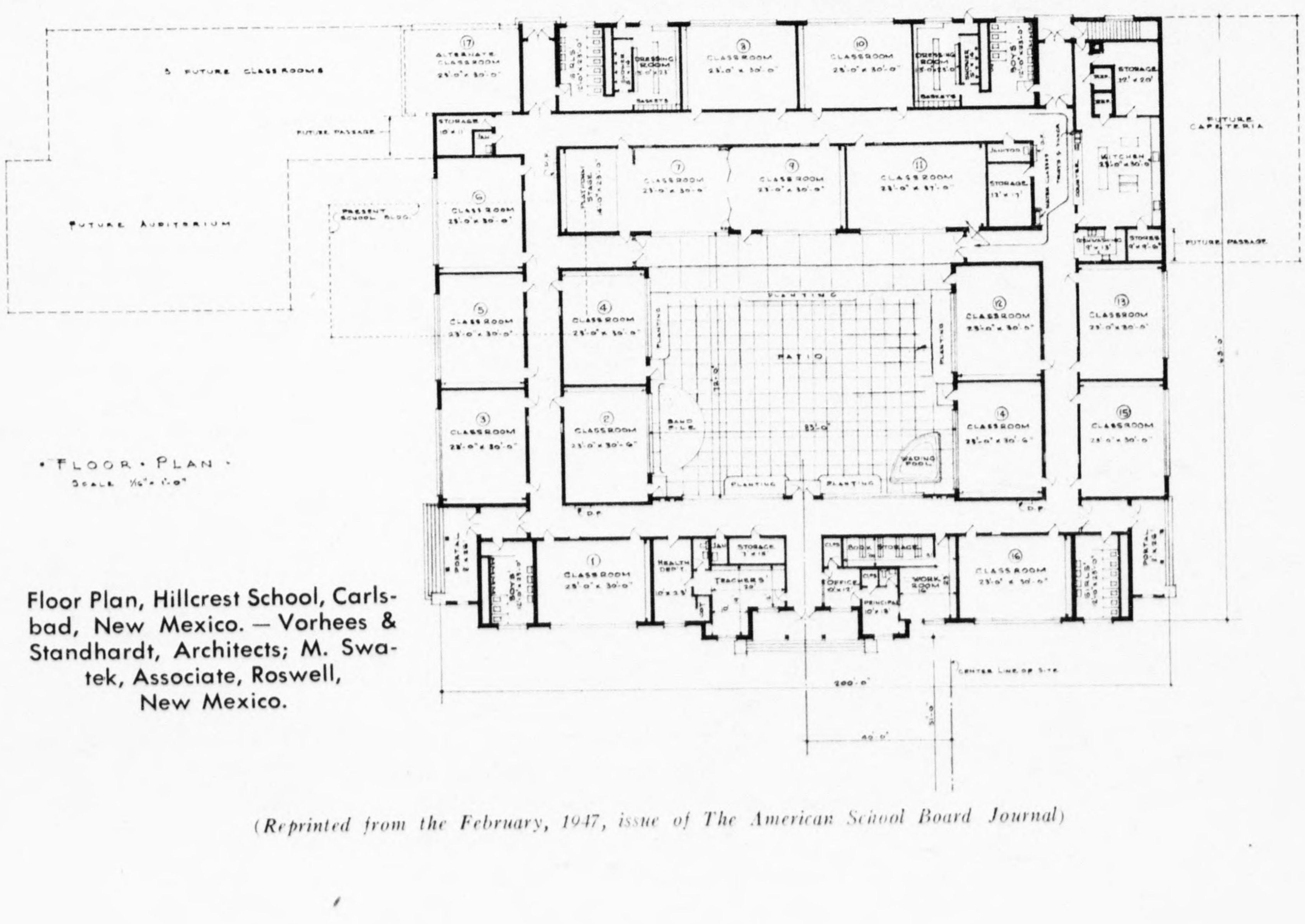
too cold for comfortable outside meetings in the patio.

The Territorial Spanish design is so popular locally that it has been considered desirable for the Hillcrest School. In this building the use of a patio will permit several years' delay in erecting a gymnasium-auditorium as a part of the permanent building.

Plans and specifications for the three buildings are practically complete, and the board is taking the necessary legal steps to ask for construction bids.



**Temporary buildings of the Hillcrest School which will be removed when the new building is in service.**




**Floor Plan, Hillcrest School, Carlsbad, New Mexico. — Vorhees & Standhardt, Architects; M. Swatek, Associate, Roswell, New Mexico.**

*(Reprinted from the February, 1947, issue of The American School Board Journal)*

# School Life

OFFICIAL JOURNAL OF THE U. S. OFFICE OF EDUCATION

Volume 30, No. 10, July 1948

CONTENTS



FEDERAL SECURITY AGENCY • U. S. Office of Education

School Life

**Published monthly except August and September**

**Purpose**
The Congress of the United States established the United States Office of Education in 1867 to "collect such statistics and facts as shall show the condition and progress of education in the several States and Territories;" to "diffuse such information as shall aid in the establishment and maintenance of efficient school systems;" and to "otherwise promote the cause of education throughout the country." SCHOOL LIFE serves toward carrying out these purposes. Its printing is approved by the Director of the Bureau of the Budget.

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# CAMPING IN EDUCATION AND EDUCATION IN CAMPING

**by John W. Studebaker, Commissioner of Education[1]**

MY INTEREST IN CAMPING is the outgrowth of some very enjoyable personal experiences as a camper and of some observations I have been privileged to make as to the values to be derived from well-organized and intelligently conducted camps as noted in the case of my own son and the children of my friends. Naturally my interest is in part the outgrowth also of what has been and continues to be my passion as well as my professional cause, namely, the cause of education in its manifold relations to the success of our American democratic form of society.

If I were an expert in camping and camp administration, as I dare say many, if not all, of the members of this Association are, I should certainly propose that the Association explore with a group of professional educators the subject of camping from the standpoint of its possible contributions to organized education. I have the notion that any careful analysis of the subject would disclose that the essential elements of a good camping situation and program are not foreign to those of a good educational program—the focusing of the camp program on things to do, on activities with a purpose; the spirit of friendliness and camaraderie between campers and camp counselors or leaders, to mention only two elements, are certainly very much to be desired in the more formal setting of the school's educational program. In other words, camping seems to me to partake of the philosophy of and to be intimately related to the program of organized education on the one hand, just as it also is related to the philosophy and the program of organized recreation on the other.

Education, recreation, camping are not discrete or separate and unrelated movements or programs but rather interrelated parts of one great concern with the development of better human persons, which is, in turn, the chief concern of this whole organization of society that we call by the name of democracy. If that be the case, then it is certainly desirable that professional educators and campers and recreationists understand each other's points of view and programs and cooperate in what might be termed a combined operation for the improvement of the human elements of the society of which we are all a part. In brief, it is my notion that education ought to do more about recreation and camping, and that camping and recreation should do more about education; that there should be more camping in education and more education in camping.

## *Kinship of Interests*

In reviewing the history of recreation and of camping in the United States under various auspices, one cannot help being impressed by the ever increasing awareness of educational objectives and of the kinship of interests. Both in education and in camping there may be noted a tendency to break away from adult-imposed and regimented programs in favor of programs solidly based on the psychology of human beings in their individual development. Perhaps lack of familiarity on the part of some recreational leaders with these newer trends in education has caused them to look askance at the assumption of greater responsibility by organized education for the development of leisure-time interests and skills among young people

[1] An address delivered before the American Camping Association, Los Angeles, Calif., March 23, 1948.

and adults alike; and on the part of some camping leaders to regard the development of school camps and camping programs as of dubious import. It should be more generally recognized that education is not just the cramming of students with knowledge of certain academic subjects, that it includes in addition to knowledge the development of a variety of interests and skills and appreciations in the major areas of human living, including vocation, citizenship, health, recreation, and various leisure-time pursuits; and requiring programs of teaching or of guided learning extending well beyond the confines of any cloistered classroom.

With larger increments of time for leisure-time interests and activities, the responsibility of education for the development of the personal cultural resources of the individual looms large indeed. If leisure time is to be used constructively, for re-creation and revitalization of the individual, then people must be *taught* so to use that time; and the schools and colleges, being society's organized instrumentality for teaching, should not dodge their responsibility. Nor are they disposed to do so. It would appear in some quarters, however, that there may be a disposition to play down and to depreciate the ability of the schools to take any major role in the provision of organized recreational opportunities for the out-of-school, leisure-time portions of the individual's time. And yet it must be admitted that the schools are, generally speaking, the best equipped of all the more ubiquitous community agencies to provide the facilities and the setting for constructive recreational activities. Indeed, modern city planners are more and more coming to mark the school as the nucleus or

# Some Implications of Scientific Methods for Secondary Education

**by Philip G. Johnson,**
**Specialist for Science, Division of Secondary Education**

ONE OF THE MAJOR goals of science teaching is a functional understanding of scientific methods. Coupled with this goal must be the mastery of useful scientific information, a growth in understanding of the interrelationships that exist between forces and materials that help to make many ordinary events predictable, and a feeling of appreciation for the methods which man has developed for probing the intricacies of natural materials and changes. While there is some disagreement on which aspect of this goal is of most importance, there is general agreement that the ability to understand and use scientific methods should be placed high in deciding what to teach and how to teach.

Science teachers are not always sensitive to what scientific methods mean in teaching practice. A brief discussion of such methods may be of help to them. It may also help teachers of other subjects to emphasize and vivify the essential nature of the methods of science.

When one looks into science laboratory manuals and pupil notebooks, observes demonstrations by science teachers, and compares these things with the methods and reports of active scientists, one is challenged by some rather obvious differences. Many science teachers and their pupils follow a rather rigid step-by-step pattern, while the active scientists appear to be searching for the practicing scientist uses methods, technics, and materials in such intertwining patterns that it is difficult to state in general terms what the scientist has been doing.

Whatever the problems of description and definition, the junior and senior high-school teachers must face the very practical question of what to teach and how to teach. They must accept a workable pattern for their planning and teaching. They must endeavor to make the pattern operate in their teaching and in the activities required of their pupils. The science teachers want the pattern to be scientific in order that the unique contributions of science may become an important part of the basis for thought and action of all youth. What patterns of scientific method can teachers use as guides for their day-to-day activities?

### Some Commonly Used Steps

It is not uncommon for science teachers to require their pupils to report experiments as follows:

I. OBJECT (or purpose):

This often begins with the word "to." It is usually followed by some such word as prove, show, study, reveal, test, demonstrate, confirm, or try. The statement is completed by indicating the subject, condition, or change involved in the experiment.

II. MATERIALS (supplies and equipment):

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With larger increments of time for leisure-time interests and activities, the responsibility of education for the development of the personal cultural resources of the individual looms large indeed. If leisure time is to be used constructively, for re-creation and revitalization of the individual, then people must be *taught* so to use that time; and the schools and colleges, being society's organized instrumentality for teaching, should not dodge their responsibility. Nor are they disposed to do so. It would appear in some quarters, however, that there may be a disposition to play down and to depreciate the ability of the schools to take any major role in the provision of organized recreational opportunities for the out-of-school, leisure-time portions of the individual's time. And yet it must be admitted that the schools are, generally speaking, the best equipped of all the more ubiquitous community agencies to provide the facilities and the setting for constructive recreational activities. Indeed, modern city planners are more and more coming to mark the school as the nucleus or focal point of systems of urban community recreation.

Please do not misunderstand me. I am not disposed to argue that organized recreation under school auspices should constitute the sole recreational opportunities provided by the community. Obviously numerous agencies, both public and private, have their parts to play in the provision of a rich and well-rounded recreational program. Obviously also there is need of cooperation in planning so as to deploy the total resources of these community agencies

(*Turn to page 11*)

relationships that exist between forces and materials that help to make many ordinary events predictable, and a feeling of appreciation for the methods which man has developed for probing the intricacies of natural materials and changes. While there is some disagreement on which aspect of this goal is of most importance, there is general agreement that the ability to understand and use scientific methods should be placed high in deciding what to teach and how to teach.

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When one looks into science laboratory manuals and pupil notebooks, observes demonstrations by science teachers, and compares these things with the methods and reports of active scientists, one is challenged by some rather obvious differences. Many science teachers and their pupils follow a rather rigid step-by-step pattern, while the active scientists appear to be searching for clues and data in an exciting variety of activities.

### Problems in Describing Scientific Methods

Anyone describing scientific methods is certain to present views which will not be accepted without reservation and perhaps negation by others. Some writers on science have expressed the view that the methods of science cannot be easily and simply described. It is their judgment that attitudes are involved to such a degree that the methods themselves defy description. Furthermore,

tion and definition, the junior and senior high-school teachers must face the very practical question of what to teach and how to teach. They must accept a workable pattern for their planning and teaching. They must endeavor to make the pattern operate in their teaching and in the activities required of their pupils. The science teachers want the pattern to be scientific in order that the unique contributions of science may become an important part of the basis for thought and action of all youth. What patterns of scientific method can teachers use as guides for their day-to-day activities?

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II. Materials (supplies and equipment):

This is usually a listing of the items or materials used. A drawing with labels may be required in addition to or as a substitute for the listing.

III. Methods (procedures):

This frequently involves the statement of the stages or steps used in carrying through the experiment.

IV. Results:

Here is often provided a table to be filled in, drawings to be made, and/or statements to be completed.

V. Conclusions:

This is commonly an interpretation of the results and a calling of attention to the general concepts or principles that are involved. Several sentences or a short paragraph are usually expected of pupils for the completion of this section.

Some teachers extend this outline to include uses or applications and some call attention to extra activities which pupils may undertake and report upon. Some teachers abbreviate the outline by combining materials and methods, while others combine results and conclusions. Many teachers follow the practice of selecting and using a laboratory manual, while others duplicate copies of instructions with blank places for pupils to complete the report.

In some of the currently available laboratory guides the object has been put in the form of a question or problem, the section devoted to methods provides spaces for results to be written in immediately following the steps of the experiment, and the division of the outline for conclusions consists of several questions with spaces for pupils to write in the answers. The outline may close with additional things to try, references to be consulted, and questions to be thought about.

Some science teachers have reached the conclusion that this series of steps or stages in formulating and reporting experiments is too time consuming, especially when the laboratory work must be confined to a single period. When there is no special laboratory time at all, the teachers often perform the experiments as demonstrations; and the steps or stages are mentioned orally by the teacher leaving the reporting of results for the pupils. In too many cases, the science teacher states and describes the steps, demonstrates the experiment, discusses the results, and interprets the significance of the experiment. When experiments are demonstrated, it is all too common to omit the related control

### *The Inductive Method of Science*

Scientists make use of several methods and a multitude of technics. One of the major methods is ordinarily called inductive. It begins with specific and particular things and seeks the qualities or conditions which are common to several, possibly all, of the particular and specific things.

Let us examine how a practicing scientist made use of the inductive method. Selman A. Waksman, a microbiologist, saw a problem which he and H. B. Woodruff expressed in 1940 as follows: "If one considers the period for which animals and plants have existed on this planet and the great numbers of disease-producing microbes that must have gained entrance into the soil, one can only wonder that the soil harbors so few bacteria capable of causing infectious diseases in man and in animals."

This wondering about a situation indicates sensing of a problem. Dr. Waksman began to experiment with soil and studied its effectiveness in destroying disease organisms. He sterilized soil and compared its effectiveness with ordinary soil for destroying typhoid bacilli. He found that moist, cultivated soil destroyed the bacilli rapidly while the sterile soil did not. He read about the experiments and conclusions of W. D. Frost and those of G. Papacostas and J. Gaté. He searched for the organisms and substances that appeared to be responsible for the destruction of bacteria. He isolated a number of antibiotics including streptomycin which was isolated in the fall of 1943. He found it was produced by certain strains of an organism known as Streptomyces griseus.

Dr. Waksman found the substance to be not very toxic to animals yet effective in aiding the destruction of disease or-

twined with the inductive method that it is difficult to identify just when one method dominates the procedure. The deductive method begins with general ideas or concepts which have been established by use of the inductive method. In the deductive method, there is an attempt to relate general concepts and principles to particular situations. The purpose of such work may be to extend the frontier of knowledge, it may be to seek solution to a problem, or it may be an attempt to further confirm one or more principles that have been conceived by the human mind. Whatever the purpose, the pattern for action in following the deductive method is reasonably consistent.

As an illustration of the scientist's use of the deductive method, let us study the report of Harold C. Urey, a chemist and a Nobel prize recipient for his work on the heavy isotope of hydrogen. In a discussion of atomic energy developments, he reported that it was a matter of general knowledge that fissionable isotopes could be prepared. Furthermore, scientists and many other persons knew that chemicals could be separated provided there were differences in their properties. They knew that isotopes, while similar in chemical properties, were at least slightly different in physical properties; therefore, it should be possible to separate isotopes by distillation, thermal diffusion, or centrifuge. However, these methods were not effective in separating uranium-235 and uranium-238.

Scientists also had known for some time about separation by electromagnetic fields and diffusion through porous materials because these were based on fundamental properties of materials. These methods required much equipment and large installations. But as these installations were ready, the methof instructions with blank places for pupils to complete the report.

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Some science teachers have reached the conclusion that this series of steps or stages in formulating and reporting experiments is too time consuming, especially when the laboratory work must be confined to a single period. When there is no special laboratory time at all, the teachers often perform the experiments as demonstrations; and the steps or stages are mentioned orally by the teacher leaving the reporting of results for the pupils. In too many cases, the science teacher states and describes the steps, demonstrates the experiment, discusses the results, and interprets the significance of the experiment. When experiments are demonstrated, it is all too common to omit the related control experiments. Such procedures leave little or nothing for the pupil to do, and as a result the pupils become mere observers rather than participants in the science activities. Certainly such discussing of experiments by the science teacher with or without actual demonstration and with meager pupil participation warrants the charge that going through these "supposed" steps of the scientific method is stultifying and unworthy of the name of science.

"If one considers the period for which animals and plants have existed on this planet and the great numbers of disease-producing microbes that must have gained entrance into the soil, one can only wonder that the soil harbors so few bacteria capable of causing infectious diseases in man and in animals."

This wondering about a situation indicates sensing of a problem. Dr. Waksman began to experiment with soil and studied its effectiveness in destroying disease organisms. He sterilized soil and compared its effectiveness with ordinary soil for destroying typhoid bacilli. He found that moist, cultivated soil destroyed the bacilli rapidly while the sterile soil did not. He read about the experiments and conclusions of W. D. Frost and those of G. Papacostas and J. Gaté. He searched for the organisms and substances that appeared to be responsible for the destruction of bacteria. He isolated a number of antibiotics including streptomycin which was isolated in the fall of 1943. He found it was produced by certain strains of an organism known as Streptomyces griseus.

Dr. Waksman found the substance to be not very toxic to animals yet effective in aiding the destruction of disease organisms causing plague, cholera, whooping cough, dysentery, undulant fever, tularemia, typhoid, and others including infections of the urinary tract. He believes that there may be other antibiotics of great value produced by micro-organisms in the soil. The search continues.

## The Deductive Method of Science

Scientists carry on their work using a second major method. This second method is usually so intimately inter-

the purpose, the pattern for action in following the deductive method is reasonably consistent.

As an illustration of the scientist's use of the deductive method, let us study the report of Harold C. Urey, a chemist and a Nobel prize recipient for his work on the heavy isotope of hydrogen. In a discussion of atomic energy developments, he reported that it was a matter of general knowledge that fissionable isotopes could be prepared. Furthermore, scientists and many other persons knew that chemicals could be separated provided there were differences in their properties. They knew that isotopes, while similar in chemical properties, were at least slightly different in physical properties; therefore, it should be possible to separate isotopes by distillation, thermal diffusion, or centrifuge. However, these methods were not effective in separating uranium-235 and uranium-238.

Scientists also had known for some time about separation by electromagnetic fields and diffusion through porous materials because these were based on fundamental properties of materials. These methods required much equipment and large installations. But as these installations were ready, the methods of separation based on fundamental principles were effective as predicted and uranium-235 and other fissionable materials were separated from similar substances to a very high degree of purity.

The preparation of plutonium is another example of how concepts were related to a specific problem and brought scientists to a solution which not only resulted in a new material but which also confirmed the general applicability of the principles.

## A Pattern for Secondary School Science Teaching

Junior and senior high school pupils should come to understand the inductive and deductive methods of scientists. Some of this understanding can come from studying the lives and contributions of the scientists of the past and of those still actively at work on theoretical and applied scientific research. Some can come from science teachers telling their students about the work of scientists. Some can come from visits to laboratories at universities, industries, and experiment stations. Some can come from observing films that reveal the life and work of scientists. Some can come from observing and participating in science club and science fair activities.

Most science educators agree that while the foregoing activities are helpful, it is the pattern of the day-to-day teaching and learning which either strengthens or undermines the student's understanding of what scientific methods are and what uses they can have in everyday life. It is not enough that pupils study the scientific methods; they should actively engage in the activities and thus truly experience the methods. How can science teachers arrange their day-to-day instruction so as to give practical emphasis to scientific methods?

1. *The science teacher can encourage pupils to sense, clarify, and state problems and questions for which there are no ready answers but for which answers are desired.*

As an example, a science teacher in approaching the topic of water can stimulate pupils to think of practical questions involving water. Such stimulation may raise questions such as the

ator during the summer or what should be done? Why do people die when they drink ocean water? To what extent can Dry Ice be used to make rain? How can clear water be unwholesome to drink?

2. *The science teacher can initiate the study of a block or unit of subject matter by the use of an interesting question or problem.*

In many cases the science teacher can use a pupil-suggested question in initiating a topic or unit. When this is not practical, the teacher can think up a question which will intrigue the pupils. For the study of machines in general science the teacher may suggest: What is the easiest way to be lazy? For respiration in biology, the teacher can ask: Is there such a thing as third wind? For the topic of hydrostatics in physics, there can be proposed: How can a steel or concrete ship float? For the subject of halogens in chemistry, the question may be: How can fluorine, a most active chemical, be transported and used? The study of similar real questions can be made to embrace the subject matter considered important but in a problem-solving climate.

3. *The science teacher can guide and assist pupils in gathering evidence related to the problem selected for study.*

The pattern for the science teacher here may well be to assist pupils rather than to tell pupils. The science teacher can arrange experimental demonstrations for pupils to observe. While the teacher manipulates the materials, the pupils can be expected to observe and then record in writing what was done and what happened. The key experiments as well as other control experiments can be included.

Further, the science teacher can or- [illegible]

in search of further evidence bearing on the problem.

The science teacher can visit various community enterprises and natural settings, talk with informed citizens, and arrange for the pupils to gather evidence by actual visits and conversations. The science teacher can study professional and trade journals and supplement the evidence collected by pupils by telling about new developments. Throughout this evidence-gathering stage, which will occupy class periods perhaps for a week or two, the science teacher can encourage pupils to observe carefully and report accurately. The science teacher can encourage the pupils to watch for weaknesses in the evidence and to hold judgment in suspense until considerable evidence is at hand.

4. *The science teacher can help pupils to study the bits of evidence and to sense relationship and general ideas or hypotheses which appear to answer the question or problem under study.*

In this stage, the science teacher can help pupils by asking questions which will assist them to select pertinent evidence and to move by simple and easy steps from the evidence toward the principle or principles underlying the answer to the problem. The science teacher can help pupils to understand that the general ideas as sensed and stated from the evidence are no better than the evidence upon which they are based and that they represent hypotheses to be tested by further study.

5. *When the underlying principles have been sensed and tentatively expressed in writing, the science teacher can move directly to the application or testing phase which will consist of guiding pupils to try to use the principles in many and varied specific situations related to the principles.*

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As an example, a science teacher in approaching the topic of water can stimulate pupils to think of practical questions involving water. Such stimulation may raise questions such as the following: Does an engine really run better in damp weather or does it only seem to run better? What is the effect, if any, of drinking ice water as compared to drinking cool water? What kinds of water do service stations actually use to refill car batteries? How much, if any, soap is saved by using a softening substance? What must soil water contain to make corn grow well? What is heavy water? What is meant by a corrosive water supply? Should winter antifreeze be left in a car radiating a topic or unit. When this is not practical, the teacher can think up a question which will intrigue the pupils. For the study of machines in general science the teacher may suggest: What is the easiest way to be lazy? For respiration in biology, the teacher can ask: Is there such a thing as third wind? For the topic of hydrostatics in physics, there can be proposed: How can a steel or concrete ship float? For the subject of halogens in chemistry, the question may be: How can fluorine, a most active chemical, be transported and used? The study of similar real questions can be made to embrace the subject matter considered important but in a problem-solving climate.

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Further, the science teacher can organize equipment and instructions for experiments to be done by individuals or small groups of pupils. Audio-visual aids in the form of sound films, silent films, filmslides, lantern slides, models, charts, and pictures can be selected and displayed for the pupils to study with the further requirement that pertinent facts are to be recorded in the write-up. The science teacher can study library and textbook materials, as well as pamphlets and bulletins, and direct the pupils to study the selected materials perhaps for a week or ... teacher can encourage pupils to observe carefully and report accurately. The science teacher can encourage the pupils to watch for weaknesses in the evidence and to hold judgment in suspense until considerable evidence is at hand.

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5. *When the underlying principles have been sensed and tentatively expressed in writing, the science teacher can move directly to the application or testing phase which will consist of guiding pupils to try to use the principles in many and varied specific situations related to the principles.*

The science teacher may rely to a large extent on questions, simple applications at first and then move progressively toward more and more complex applications. Some demonstrations may be repeated for explanation and interpretation. Additional demonstrations may be performed and the pupils may be encouraged to explain them in light of the principles. In the course of this emphasis on applications the principles as proposed by the pupils may be tested and their statement refined.

Audio-visual aids may be reobserved and additional materials brought before the pupils for explanation. Informed visitors may be invited to meet with the pupils for questioning in the search for further information, explanation, and interpretation. As many and as varied applications should be studied by the pupils as may be necessary to help them understand how the general principles are derived and how they make it possible to explain and predict happenings in the everyday environment.

6. *The science teacher can encourage many pupils to continue their pursuit of evidence and applications as optional activities. Other pupils can be encouraged to express their knowledge and understanding in vivid ways.*

The science teacher can suggest additional experiments for pupils to perform and report, further reading can be encouraged, visits to places and people can be suggested. Art work, rhyming, modeling, reports, and the like can be made to appear exciting and worth while. Pupils can be made to feel that it is fun and worth while to continue their study of the problem beyond what is expected of the class as a whole.

Special attention should be given to pupil participation in science projects, science clubs, and science talent searches. It is in these individual activities that the pupil personally puts scientific methods to use. The sensing and analysis of the problem becomes his task. The searching for clues and sources of data is his responsibility. In the formulating, selecting, and testing of hypotheses, he is the young scientist. The

oughly mastered while the methods are being followed. A considerable portion of the evidence gathered will be of sufficient practical and theoretical value that all pupils should learn it thoroughly. This means that the science teacher will make good use of effective drill and test techniques.

Since the ability to observe carefully and to report accurately is an important goal, the pupils should be required to become more and more responsible for observing and reporting, and the review and test situations should include some previously unused set-ups and questions. The success of the pupils should be determined by how faithfully they report what was actually done and what truly happened. The science teacher may wish to include as a part of the examination certain sections that will attempt to measure the pupil's ability to indicate reliable sources of information pertinent to a problem, to recognize unsolved problems, to draw reasonable conclusions from experimental data, to plan experiments that will test hypotheses, to apply principles to new situations, and the like.

Helping pupils to experience the scientific methods will usually result in less subject matter being covered than what can be covered by the usual methods. The science teacher will therefore follow the inductive-deductive or problem-development method for certain sections of the course which seem best adapted to vivid experiences of the inductive and deductive types.

The science teacher may use other methods with frequent reference to the inductive and deductive methods for other parts of the course. The science teacher who believes that the ability to use the methods of science is of high importance will provide more than one

is reproducible and repeatable and that it therefore has value in probing new problems. Science studies can discipline imagination and focus attention on careful observation and honest reporting. The science teacher can furthermore encourage a desire for reliable evidence, a willingness to withhold judgment pending the finding and testing of evidence, and a determination to face the facts and make science the servant of men.

There is much confusion and vagueness concerning the best ways to teach scientific methods in secondary schools. Leaders in science education regard such confusion and vagueness as a problem for study and solution. The Office of Education invites school administrators and science teachers to send in accounts of activities and materials which appear to be influencing science teaching constructively in their schools and classes. It is planned that from such materials a preliminary manuscript may be prepared and made available for extensive study and criticism. Reactions to the preliminary manuscript can then provide bases for developing a bulletin which will reveal some of the best procedures for imbuing high school youth with an understanding of scientific methods and for helping them to apply the methods to their personal and community problems.

### References

Ratcliff, J. D. (editor) Science Yearbook of 1948. Doubleday & Company, Inc., Garden City, New York. 1948. 244 p.

A publication, the seventh in a series, which presents a survey of recent scientific developments as these have been reported in some of the popular magazines.

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Special attention should be given to pupil participation in science projects, science clubs, and science talent searches. It is in these individual activities that the pupil personally puts scientific methods to use. The sensing and analysis of the problem becomes his task. The searching for clues and sources of data is his responsibility. In the formulating, selecting, and testing of hypotheses, he is the young scientist. The reporting of the project is his experience. While only a few students may reveal unusual abilities on projects, these few students represent human resources that the school should nurture with wisdom. Projects and clubs provide a special setting for guiding pupils to use scientific methods.

## Achieving Proficiency in Scientific Methods

Wisdom in the use of scientific methods applied to particular problems requires that certain information be thoroughly understood and that the pupils be tested with previously unused set-ups and questions. The success of the pupils should be determined by how faithfully they report what was actually done and what truly happened. The science teacher may wish to include as a part of the examination certain sections that will attempt to measure the pupil's ability to indicate reliable sources of information pertinent to a problem, to recognize unsolved problems, to draw reasonable conclusions from experimental data, to plan experiments that will test hypotheses, to apply principles to new situations, and the like.

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The science teacher may use other methods with frequent reference to the inductive and deductive methods for other parts of the course. The science teacher who believes that the ability to use the methods of science is of high importance will provide more than one opportunity for pupils to experience actually on a thoughtful and sustained basis the inductive and deductive methods and will also use many other means to make these methods appreciated and understood by the pupils.

## Conclusion

The sciences have revealed and can reveal a way to solve problems—not all problems but a large number of important and practical ones. Pupils can come to understand that scientific knowledge

scientific methods in secondary schools. Leaders in science education regard such confusion and vagueness as a problem for study and solution. The Office of Education invites school administrators and science teachers to send in accounts of activities and materials which appear to be influencing science teaching constructively in their schools and classes. It is planned that from such materials a preliminary manuscript may be prepared and made available for extensive study and criticism. Reactions to the preliminary manuscript can then provide bases for developing a bulletin which will reveal some of the best procedures for imbuing high school youth with an understanding of scientific methods and for helping them to apply the methods to their personal and community problems.

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Stefferud, Alfred (editor) Science in Farming, the Yearbook of Agriculture 1943–1947. USDA. Superintendent of Documents, Washington 25, D. C. 1947. 944 p.

This volume contains a discussion of What Is Farm Research, which includes a section on the scientific method. The book is devoted largely to discussions of what agricultural research has revealed during the years 1943–47.

Weaver, Warren (editor) The Scientists Speak. Boni & Gaer, Inc., New York 16, N. Y. 1947. 269 p.

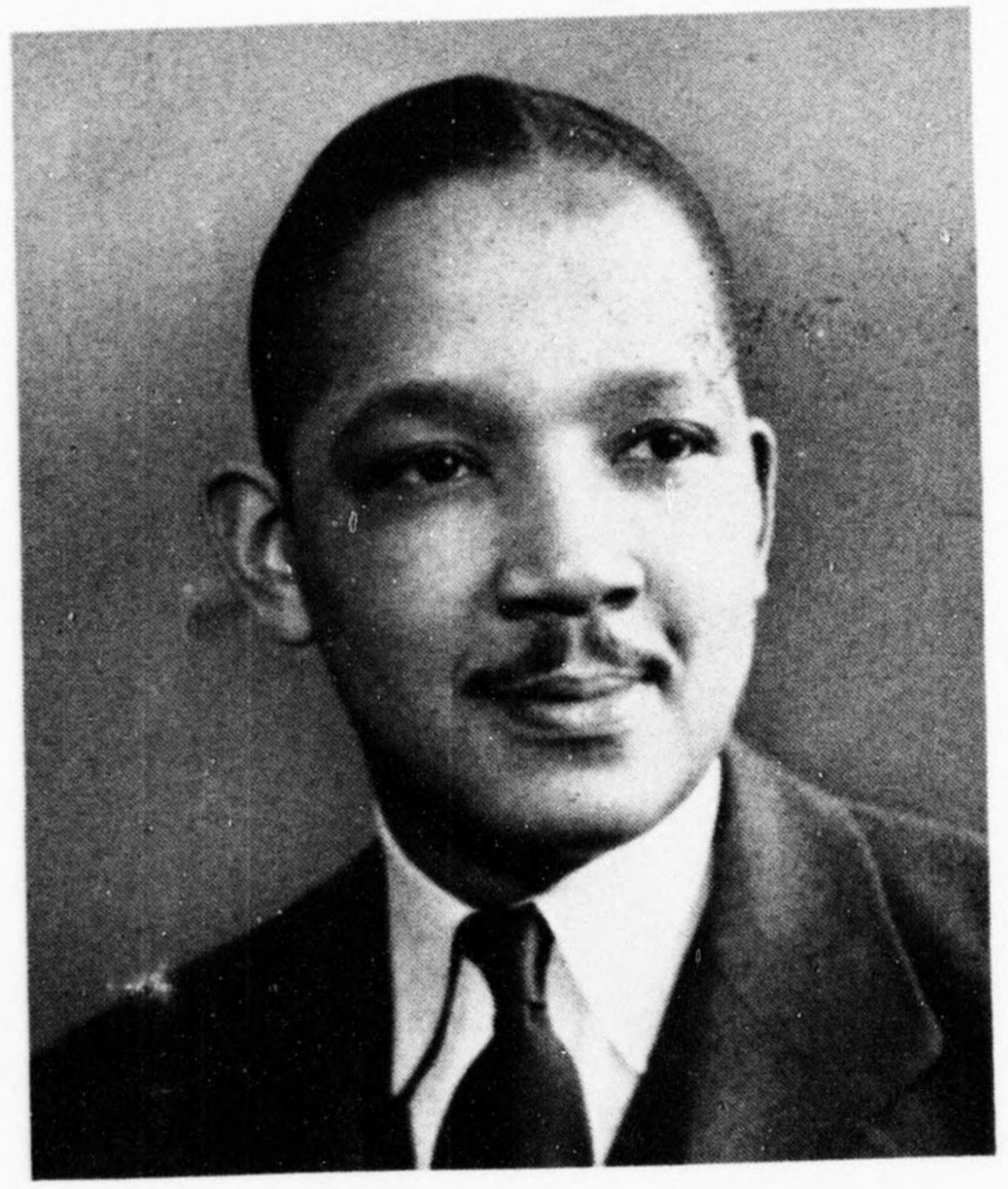
A book devoted to brief presentations of modern science by the scientists who themselves contributed to these developments. The first chapter includes a discussion of scientific methods.

# WHAT ARE GOOD TEACHERS LIKE?

by Frances V. Rummell, Specialist for Service to Organizations

*This is the second and last of two articles on teachers who were selected by their State and local administrators as "distinguished examples of the best professional talent in the Nation's classrooms today." The first article appeared in the June issue of* SCHOOL LIFE.

*It has been emphasized that the project of seeking out news about teachers was exploratory only and could make no attempt to be comprehensive.*



Clifford J. Campbell.

## Healthily Informed Public Means Healthy School

■ CLIFFORD J. CAMPBELL, 42-year-old director of Chicago's Dunbar Trade School, put himself through college by cooking in hotels, by redcapping, and by working as a sleeping-car porter.

"I gave my wife a choice once." He told me of his struggles to keep the wolf at bay. "She had come from a comfortable home in Memphis to marry me before the worst of the depression. I'd had only 2 years of college and was teaching in a junior high school. Then the bottom dropped out of our world. The school was closed and my job was gone."

Mrs. Campbell told me her side of the story. "He suggested gently that I go back home for a while, where at least I could be sure of my meals." She was such a forthright and capable looking woman that I had a good idea of what was coming. "It seemed to me that our empty piggy bank was just as much my problem as it was his," she

mechanical drawing by day and directing defense work by night, said of him, "Campbell is more than expert in subject matter. He is an administrator and an artist in human relations. It is really a pleasure to see this man work with people."

In 1942, when Campbell became director of Dunbar, he inherited, he says, "a building and a bad name." Officially, Dunbar was an elementary school; unofficially, it was the bogey held over the heads of problem children and slow learners in every school in the community. "If you don't behave you'll be sent to Dunbar"—that was a threat. Today, according to Philip L. McNamee, assistant superintendent of schools, "Dunbar stands as a monument to Campbell's talents in ad-

Campbell, now receiving an annual salary of $6,550, is proud of the record Dunbar has achieved in the field of intercultural relations; about 50 percent of his faculty are white teachers. They share his greatest enthusiasm: the record his young people make when they graduate from Dunbar as skilled craftsmen. "Every single one of our graduates is ready to step into a skilled job," he says. "We try to turn out socially adjusted, competent graduates who can handle a complete job—from making a job lay-out and estimating costs, to performing the necessary skills." He smiled and added, crossing his fingers, "So far our supply of highly skilled workers has not been able to keep up with the demand."

The varied achievements of Dunbar students reflect Campbell's own philosophy that the trade school should educate the head and the heart as well as the hand. Last spring an 18-year-old aircraft student, Charles Chillers, rehearsed his oratory to the hum of airplane engines at Dunbar, read Demosthenes, Cicero, and Webster in his social studies, and, according to an editorial in the *Chicago Defender*, "defeated the cream of the State's public, parochial, and private high school contestants in an area that would ordinarily be considered the exclusive province of the academic school."

Within the past few years other students have achieved city-wide and regional distinction in music, painting, and design; and, recently, in all-round citizenship. In April 1948, Radcliffe

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Mrs. Campbell told me her side of the story. "He suggested gently that I go back home for a while, where at least I could be sure of my meals." She was such a forthright and capable looking woman that I had a good idea of what was coming. "It seemed to me that our empty piggy bank was just as much my problem as it was his," she smiled. "I went out and got a job as a beauty operator so that I could help my husband go back to college." Then she added with a proud emphasis, "That was what really mattered." Campbell finally got his bachelor of science and his master of arts degrees.

During the war he put in a backbreaking schedule as a shop superintendent in the National Defense Training Program of the Chicago schools. William Abrams, Campbell's principal at the time he was teaching mechanical drawing by day and directing defense work by night, said of him, "Campbell is more than expert in subject matter. He is an administrator and an artist in human relations. It is really a pleasure to see this man work with people."

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men. "Every single one of our graduates is ready to step into a skilled job," he says. "We try to turn out socially adjusted, competent graduates who can handle a complete job—from making a job lay-out and estimating costs, to performing the necessary skills." He smiled and added, crossing his fingers, "So far our supply of highly skilled workers has not been able to keep up with the demand."

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Within the past few years other students have achieved city-wide and regional distinction in music, painting, and design; and, recently, in all-round citizenship. In April 1948, Radcliffe Hunter, 16-year-old Dunbar student of Commercial and Mural Art and holder of a scholarship to the Chicago Art Institute, was honored during Boys Club week by being named "Midwest Boy of the Year." Campbell commented, "You see, we hope that our boys and girls here at Dunbar will aspire to be more than skilled craftsmen. We are eager to help them open up the way to more abundant cultural pursuits. As a result, we should have well-rounded and well-adjusted citizens."

Campbell feels that it is one of his primary duties as an administrator to interpret the work of the Dunbar Trade School to prospective students, to parents, and to the community. Twice each year members of his faculty visit the elementary schools to talk with children and their parents in order to explain the meaning of vocational competency and the cultural advantages it brings. "Without public understanding and support we would operate in a social vacuum," Campbell says. "A healthily informed public means a healthy school and community-minded students."

In enthusiastic support of his desire to inform the public, his teachers engage in many and varied kinds of civic work. Campbell himself is a member of the Advisory Committee on Adult Education of the YMCA, Central branch; a member of the Board of Directors of the YMCA, Wabash Avenue branch; a special consultant to the U. S. Veterans' Administration; a guest lecturer at various universities, including his own alma mater, Northwestern; and he was recently elected a member of the Board of Directors of Chicago's Urban League.

Campbell has learned how to crowd 3 days' work into one. His average workday lasts from 7:30 a. m., when he arrives at his office, until 10 p. m., when the last shift of the day is ready to go home. No fewer than three complete shifts a day, in addition to evening classes, can accommodate the burdened Dunbar schedule. (A building erected for some 375 students must now take care of 1,650.) There is one area of Campbell's life, however, in which he permits no intrusion—the time he is with his family on Saturdays and Sundays. Not only must he relax in order to keep up his gruelling pace, but, he smiles, "I've got to have a little time to

Clarence Diebel.

istry in high school. Eugene is the fourth largest city in Oregon.

"Last summer I made more than $1,000 as a carpenter," he said.

His voice is the quiet voice of a cloistered scholar, and anybody who turns out top winners in the annual Westinghouse Science Talent Search, as he has for 3 years running, has certainly earned his letters in quiet scholarship. Not more than three or four other high schools in the country have approached this remarkable record.

But Diebel worked on a 4,500-acre ranch during his youth, where, he says, "I was a sharpshooter with a whip. I could pick a fly off a horse's back from 30 feet away." Diebel worked his way through college, hopping tables for his meals and playing the drums with dance orchestras. And when he and his wife, Marie, scraped together enough money to buy a lot, they built their own house with their own hands—a charmingly spacious six-room house with picture windows and glistening woodwork and storage space in the kitchen filled

school, when he was high on a stepladder, tinkering with the electric bell system on the school clock. "I nearly fell off the stepladder," he says wryly. "And the bell system went haywire. The bell rang at odd intervals all day. I really fixed school that day."

The third year a student of Diebel's was selected among the Nation's top 40 winners, the Eugene Register-Guard published an editorial singling out Diebel for praise. Two days later, the editor published Diebel's reply. "The prominent mention of my name calls for comment," he wrote. "Norman, Alice Kingman, and Dorothy Christensen have had during their school career about 30 teachers, and I'm only one of them * * * It is one of the satisfactions and privileges of teaching to be instrumental in recognizing and directing the abilities of all fine students. More Normans, Alices, and Dorothys are needed, and in fields other than science * * * They are in our schools today but we are able to do little for them under the present 'working conditions' of teachers. To one who enjoys teaching, this is a bitter disappointment.

"I hope the public enthusiasm that is displayed when such honors come to our schools will mean that more serious thought will be given to the rights of every boy and girl in our schools. Society must assume its responsibility of giving education the opportunity to function effectively by providing the necessary adequate financial support. Society is paying a devastating penalty when this responsibility is shirked."

That letter shows the same independence of mind that has led Diebel to defy tradition by turning down some college offers because, he says, "I like high school kids. I have a feeling for them. Any college offer would have to students."

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### *All Teachers Should Be Tops as People*

■ WHEN I MET Clarence Diebel of Eugene, Oreg., he was working as a carpenter, putting the finishing touches on a house before the school year opened. He teaches physics and chemistry in high school. Eugene is the fourth largest city in Oregon.

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"Last summer I made more than $1,000 as a carpenter," he said.

His voice is the quiet voice of a cloistered scholar, and anybody who turns out top winners in the annual Westinghouse Science Talent Search, as he has for 3 years running, has certainly earned his letters in quiet scholarship. Not more than three or four other high schools in the country have approached this remarkable record.

But Diebel worked on a 4,500-acre ranch during his youth, where, he says, "I was a sharpshooter with a whip. I could pick a fly off a horse's back from 30 feet away." Diebel worked his way through college, hopping tables for his meals and playing the drums with dance orchestras. And when he and his wife, Marie, scraped together enough money to buy a lot, they built their own house with their own hands—a charmingly spacious six-room house with picture windows and glistening woodwork and storage space in the kitchen filled with a variety of fruits and vegetables that, together, they can fresh from their own garden. This is all to say that an aura of vague impracticality does not accompany Diebel's scholarly mien.

When in 1945 Diebel decided to enter his first students in the Westinghouse Talent Search, his older son Norman proudly embarrassed him by being chosen one of the Nation's 40 finalists invited to Washington, D. C., to compete for the national scholarships. Diebel heard the exciting news at

Alice Kingman, and Dorothy Christensen have had during their school career about 30 teachers, and I'm only one of them * * * It is one of the satisfactions and privileges of teaching to be instrumental in recognizing and directing the abilities of all fine students. More Normans, Alices, and Dorothys are needed, and in fields other than science * * * They are in our schools today but we are able to do little for them under the present 'working conditions' of teachers. To one who enjoys teaching, this is a bitter disappointment.

"I hope the public enthusiasm that is displayed when such honors come to our schools will mean that more serious thought will be given to the rights of every boy and girl in our schools. Society must assume its responsibility of giving education the opportunity to function effectively by providing the necessary adequate financial support. Society is paying a devastating penalty when this responsibility is shirked."

That letter shows the same independence of mind that has led Diebel to defy tradition by turning down some college offers because, he says, "I like high school kids. I have a feeling for them. Any college offer would have to compensate for a real reluctance to leave the high school field permanently." And he shows the same independence of mind in saying, "All teachers ought to be tops as people and as students before they're even permitted in a classroom with youngsters. But if there has to be any difference in quality, then the best teachers ought to be in our elementary schools and the next best in high school."

For years he has pieced out his teacher's salary—by testing electric meters for the water board, by teaching evening classes in organic chemistry to student nurses in Eugene's Sacred Heart Hospital; and, during the war, by working summers and weekends during the school year in the Southern Pacific roundhouse. In 1944, by lettering coaches and painting on car numbers, Diebel made an extra $1,300. His teacher's salary that year was $2,258. This year he receives $3,600, the maximum salary under Eugene's new salary schedule. This summer he will teach two courses in science education at Drake University in Des Moines.

For years Diebel has been active in working for his fellow teachers. During the difficult postwar period when the Eugene teachers, like thousands of others throughout the country, were striving for satisfactory salary adjustments, Diebel served as chairman of the Eugene Teachers' Association salary schedule committee and, in 1946–47, he was elected by the association as its president. The superintendent of the Eugene schools, Clarence Hines, told me, "Diebel has given the teachers here the kind of leadership they must have if they are to achieve their place in the sun. His immediate accomplishment as president was to help put through a 26-percent teacher salary increase." Helpful as this has been, Diebel frankly says that teachers' salaries have not yet begun to catch up with the rise in the cost of living.

It was Superintendent Hines who told me of Diebel's long-time efforts in working closely with a committee of his colleagues in helping to write a noteworthy course of study, called "Democracy in Action," for use throughout all 12 grades of the Eugene schools. This course of study enables teachers—through discussion and reading—to organize their classes as "democracies" in order that students may become more expert in the techniques

eager to study above and beyond the call of duty. "He gives me a lame excuse," she laughed. "He says he 'has to go straighten up.' But I know. He's in the laboratory extra hours on end with his chemistry and physics 'bugs'—having a wonderful time."

Diebel grinned. "The laboratory on Saturday," he confessed, "is the fun part."

## Impossible To Call Roll of All Distinguished Teachers

■ CALLING THE roll of all the teachers in this country who are doing distinguished and unassuming work would be a happily impossible task. The profession is studded with courageous and mature men and women who are teaching in rural communities, in villages, in middle-sized towns, and in cities in every State in the country from Maine to California.

For example, there is Edith Deister, who teaches kindergarten in Norton, Kansas. She has a way of bringing out the shy, of giving the rebellious a safety valve, and of teaching the brash how to be gentle. In California, in San Diego's beautiful Point Loma High School, there is John C. Lamott, teacher of physics and chemistry, who told me, "I may have to keep on cutting my sons' hair and repairing their shoes, but teaching's for me." Frank Tait, director of personnel of San Diego's schools, said, "Lamott is a man's man, a splendid teacher, and so popular with students that we have trouble with far too many of them wanting to take his courses."

In New Haven, Conn., Gertrude Hart Day is immunizing little children of all races and cultures and creeds against fear and hatred by the simple expedient of letting them get to know one another. "Fear and hatred are adult diseases," Mrs. Day said to me. "Children should

cation, Northwestern University, has said about his own and other studies relating to the characteristics of a good teacher, "Conclusive criteria are hard to determine. But the best material on this question inevitably comes from the classrooms of our best teachers all over the land."

### One

I am going to be bold enough to settle for a few generalizations about the teachers interviewed. First, professionally alert, they are not sitting out the teacher crisis on remote little islands of self-containment. Several of them have had drawn-out struggles with their souls in order to stick to teaching when better-paying jobs from outside the profession tempted them. But at least all of them see teaching as the way to make a rich life, if barely a living. Whatever they doubt, it is never the importance of their work.

The most common complaint is pupil load. A few of them are almost lost in the crowds of their classes. In 1947–48 Ruth Myers of Morgantown had 61 first-graders—with 61 individual differences in home backgrounds and rates of learning. How she looked after so many, much less taught them, I cannot even guess. It may interest readers of her story in *Reader's Digest* [1] to know that fellow teachers from all over the country have written her with incredulous questions about her work load. "You must supervise two or three teachers," said one writer. Another asked whether the "61" was a typographical error.

Of course teachers—and especially good teachers—are frustrated whenever they aren't able to pitch in and do an honest teaching job; but more important, they suffer in seeing their children neglected. As another outstanding teacher, Hannah Trimble, third grade

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It was Superintendent Hines who told me of Diebel's long-time efforts in working closely with a committee of his colleagues in helping to write a noteworthy course of study, called "Democracy in Action," for use throughout all 12 grades of the Eugene schools. This course of study enables teachers—through discussion and reading—to organize their classes as "democracies" in order that students may become more expert in the techniques of inquiry and group discussion. "Students are quick to appreciate real democratic values and to sense the phony and ruthless," Diebel says.

Like many other outstanding teachers, Diebel's enthusiasm for his work lends endurance to his energy. His wife told me that on those few Saturdays during the year when he was not working for the Southern Pacific, or at his carpentry, he went to his school laboratory to work with students who were

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In New Haven, Conn., Gertrude Hart Day is immunizing little children of all races and cultures and creeds against fear and hatred by the simple expedient of letting them get to know one another. "Fear and hatred are adult diseases," Mrs. Day said to me. "Children should be given the right to protect themselves against the prejudices of adults." As executive director of the New Haven Neighborhood Project, Gertrude Day will have five intercultural nursery schools running full tilt by the opening of next school year. The 3-year-old project is underwritten by the National Conference of Christians and Jews.

Wherever good teachers are, we do know that their work speaks for itself. As Dr. Paul A. Witty, professor of edu-

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Of course teachers—and especially good teachers—are frustrated whenever they aren't able to pitch in and do an honest teaching job; but more important, they suffer in seeing their children neglected. As another outstanding teacher, Hannah Trimble, third grade teacher of Evansville, Ind., recently wrote in *The New York Times Magazine*, "We are confronted by the machinery of the Great American Public Schools, which grinds exceeding small and which operates on the assumption that 40 or 45 children placed in seats behind a closed door will resolve themselves into a thinking unit in which the learning processes will take place

[1] The Richest Woman in Morgantown, by Blake Clark. *Reader's Digest*, April 1948.

smoothly * * * Don't fool yourself! Milk can be homogenized, but not children."[2]

### Two

My second generalization—not unrelated to the first: these teachers have plenty of convictions about their profession. For example: If it is considered conventional for an elementary teacher to aspire to a high school position, and for a high school teacher to aspire to a college position, or for any classroom teacher to aspire to an administrative post, then these teachers are unconventional. Moreover, they are impatient with the mores of a profession that perpetuates, in its own ranks, the tradition, "The higher the grade the greater the professional prestige" (and consequently the salary) of the teacher. Obviously, as one of the teachers pointed out, the nonsensical end of such a philosophy simply is that more and more remedial reading courses are having to be offered in colleges.

Several of the teachers interviewed had tried various kinds of administrative posts, only to rush back to their classrooms in a year or two, at a financial loss, because they preferred working with "ideas and children." Few will deny that they have a point in wondering why the only educational jobs that are "in the money" are the administrative jobs. One teacher reminded me of a comment that he had read somewhere, "The farther away from the child, the greater the professional salary." He added rather forlornly, "Our profession has a lot of growing up to do."

These teachers are bent on doing what they can to help improve standards from the inside out. They are active in professional workshops and in a variety of research and community projects im-

We've been accused of ivory towerism too long."

### Three

Third—and this generalization may be surprising until we think it through—these teachers had nothing whatever to say about taboos on personal liberties. I wanted to find out how good teachers manage to put up with all the little indignities that, in some communities, reduce the profession to a state of nervous dissimulation or colorless neutrality. But there simply was not any active problem of the kind. The teachers felt no cramping restrictions because there weren't any. For all the freedom of social mores they enjoy, they could be doctors, lawyers, or merchant chiefs.

Further, every one of these teachers was enthusiastic about his community and the feeling of professional security and esteem (my word) he felt in belonging to it. It is straight to the point to add that in more than half the towns and cities visited the school administrators as well as townspeople asked me quite spontaneously whether the Office of Education could suggest ways in which they could honor the skillful teachers in their systems. One town had given a community-wide banquet the year before for one of these teachers. Another town had sent community representatives to a teacher's home on Christmas and overwhelmed her with professional and personal gifts. Newspaper editorials in other towns had paid tribute to two of these teachers by name. One editor said to me, "Without good teachers this country might as well go back to the horse."

There is surely a strong tie-in among these three factors: (1) There is a happy freedom from irksome personal

### Artistry in Human Relations

It is easy enough to ask a teacher, Do you show skill in community work? or, Are you working to improve your profession? or, Do you teach with democratic incentives? But we all know that a teacher may help run everything in town democratically, from civic groups to curriculum committees, and still not be able to teach for sour apples. The same goes for relationships with parents; teacher and parent may discuss "the whole child" every Monday and Wednesday during the school year and "the whole child" may still escape the teacher's understanding. As for creative ability, that, too, is the very seasoning of good teaching—but it doesn't follow that Stravinsky or Eugene O'Neill could be good teachers simply because they are creative. Good teaching seems to require a medley of interests and talents which, in sum, do not necessarily harmonize; everything depends on the arrangement—or the blending. And it takes a catalytic agent to do the blending.

All the teachers I visited shared to a remarkable degree one specific quality that is above and beyond the teacher ability yardsticks that are so frequently used, for lack of anything better, in making teacher selections. (Nobody, I think, pretends that they give the whole answer.) Right or wrong, I think of this quality as the catalytic agent. Stated very simply, it is artistry in human relations. How to measure it in a teacher candidate is one thing, but observing it in action is another. These teachers have it.

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Several of the teachers interviewed had tried various kinds of administrative posts, only to rush back to their classrooms in a year or two, at a financial loss, because they preferred working with "ideas and children." Few will deny that they have a point in wondering why the only educational jobs that are "in the money" are the administrative jobs. One teacher reminded me of a comment that he had read somewhere, "The farther away from the child, the greater the professional salary." He added rather forlornly, "Our profession has a lot of growing up to do."

These teachers are bent on doing what they can to help improve standards from the inside out. They are active in professional workshops and in a variety of research and community projects important to educational progress. One teacher said, "No amount of legislation is going to be strong enough to brace us up if we don't improve the profession all we can from within." Another said, "Law and medicine have achieved generally uniform standards for their practitioners. We teachers must work toward similar ends. We must learn to interpret our needs to the public.

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There is surely a strong tie-in among these three factors: (1) There is a happy freedom from irksome personal restrictions on the one hand and there is high-hearted community approval on the other. (2) The teachers interviewed are big-minded, socially at ease, and bear no resemblance whatever to the wallflowers and generally weak reeds too many teachers feel they have to be in public. (3) Encouraged to live their own lives in the dignity of personal freedom, and welcomed as leaders in community affairs, these teachers are therefore literally free to do an inspiring job with the community's children.

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The classroom is a gold mine for observing and practicing the principles of human relations. These teachers have a zest for the dozen-and-one times every day that they have to be quick on the intellectual trigger to keep up with the mischievous, the creative, the contradictory, the nimble-witted. They are emotionally alive to catch the overtones of social behavior—so important with the baffled, the insecure, the hypersensitive, and the frustrated. They are zealously democratic in their methods, if we consider that true democracy is respect for the individual. Finally, they are humanitarian, or they would

[2] Milk Can Be Homogenized But Not Children, by Hannah Trimble. The New York Times Magazine, May 2, 1948.

not care particularly about children's needs.

They do care, earnestly. One teacher said to me, "Please tell parents to have faith in their children. Children need understanding even more, if possible, than they need milk." Another said, "Teacher training should give us social psychology, physiology, biology, cultural anthropology. We should all be sensitized to psychiatric principles. Then we would know the various phases of a child's emotional development. We ought to know when he's physically and emotionally ready to learn, and when he's not ready."

As might be assumed, persons who are gifted in the art of human relations have a high degree of sensitivity to children's emotional problems. These teachers may not call it mental hygiene when they understand and help to condition social behavior, but what else could this teacher have been talking about when he said to me, "No normal kid is ever deliberately bad. He's goaded by something. It's up to the teacher to find out what."

Again, in varying degrees, of course, these teachers also have something of the actor, the master of ceremonies, the lovelorn columnist, the humorist, the crusader, the public relations expert. All aside, to be sure, from achievements in their own fields of scholarship. In short, in all phases of their work they take the avenue marked "Human Relations."

Consequently, they do not talk about teaching "methods." Instead, they talk in human terms of good will, of stumbling personalities, of creating an atmosphere of dignity for the child. They talk about understanding the child

## Camping in Education

(From page 3)

in accordance with community needs and in the light of the functions each is best fitted to perform. What I am insisting on is that the schools should assume a major role in the whole undertaking to plan and provide community recreation facilities and programs; that the schools must not be relegated to a minor or insignificant or exclusively auxiliary place in the recreation picture. I will readily admit that in too many communities the school authorities take a "Let-George-do-it" attitude toward recreation; but in an increasing number of communities school facilities are being employed in community recreation programs; in increasing numbers of communities recreation is not considered to be a stepchild of the board of education but an integral and important part of the total community program for the constructive employment during leisure time of the skills which have been or may be learned at school or elsewhere.

### School Camps and Camping Under School Auspices

Having now indicated that I think the schools have an important role to play in the recreation drama, let me turn more specifically to the problem of school camps and camping under school auspices, a matter which is of more immediate interest to the members of this audience. What I have to say on this score may be set out in three main topics: (1) The educational values of the camping experience; (2) the extent to which such experience can be provided under school auspices; (3) the training needed by the camp counselor-teacher if the camp experience is to be

ministrators, the American Association for Health, Physical Education and Recreation, and others.

There is, first of all, the value of learning to live together in the camp environment. Camping, which involves living together 24 hours a day, 7 days a week, provides a unique opportunity to teach the techniques of associated living. It involves the art of getting along comfortably with others, learning to take the banter of associates and to give in return, learning to find one's place in a constellation of contemporaries—learnings which cannot be obtained from books, although they are to a considerable extent possible in a school environment, and especially in connection with the more informal types of curricular and co-curricular activities of the school.

There is, next, the value of learning the self-discipline that comes with taking care of one's needs in a wilderness environment or its approximation. There are the values for health and physical fitness that are associated with the activities of every well-conducted camp with its control of the rhythms of work, rest, and play. These also can be obtained to some extent in the school but not nearly so effectively as in the camping situation.

There are the values that come with the development of hobby interests, crafts, sports, nature study, woodcraft, and the like—values which, again, are possible of attainment in the more formal setting of the school, but which the camp situation usually provides more effectively because it offers a setting superior to the school.

There are, last but not least, the mental hygiene values of objectivity of interests, of purposeful activity, of easy camaraderie with one's fellows, of con-

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Consequently, they do not talk about teaching "methods." Instead, they talk in human terms of good will, of stumbling personalities, of creating an atmosphere of dignity for the child. They talk about understanding the child and about the urgency of teaching him, by example and by precept, the principles of democratic living.

And they talk about the infinite responsibility of dealing with precious raw material that changes its size and shape, and even its voice, right before their eyes. Above everything else, these teachers are realistic about the high calling of their profession. They are poignantly aware that under their influence this raw material may also change its very destiny.

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It may be carrying coals to Newcastle to try to set forth to this audience, made up of experienced camp executives and leaders, the variety and richness of the educational values inherent in a well-organized and intelligently conducted camp. These values have been presented at length in publications of your own Association as well as in those of the National Recreation Association, the National Resources Planning Board, the American Association of School Ad-

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## *Pioneering Ventures*

In view of these and other values inherent in the program of a well-regulated camp, it is no wonder that increasing numbers of parents should seek, even at some financial strain, to afford their children camping opportunities. It is no wonder also that many educators, as well as citizens generally, should be solicitous concerning the extension of camping opportunities to more and more young people, particularly since increasing urbanization has denied so many children and youth the types of experience once afforded by a rural environmental setting.

How can this be done? That question brings me to my second topic. Perhaps some of you know that I had the temerity about 2 years ago to hazard some proposals in answer to this question, in a magazine article. In brief, I proposed that public schools should assume a greater obligation to make available camping experiences for youth by extending the school year to include a quarter during which youth might attend school camps operated as extensions of the facilities and personnel provided by local community boards of education. That article was the subject of a considerable amount of comment, most of it favorable. Naturally I was somewhat disposed, in setting forth my views, "to preach the extreme in order to attain the mean," as the old aphorism has it. Nevertheless, I believe that the idea is fundamentally sound; and that with necessary adaptations to differing climatic conditions and community settings it may well serve to point a trend dimly discernible even now in education. I am pleased to note, for example, that the American Association of School Administrators in its 1948 yearbook devoted a chapter to a consideration of what were termed "multisensory aids," including school excursions, field trips, and camping experiences. Already there are places throughout our country, especially here in California, where the schools are pioneering in providing camping experience to pupils, ranging from overnight and week-end camps in neighboring State parks and forests to

the youth of this country have to date had opportunity to experience the advantages of camping. For the most part, these youth have come either from the homes of the well-to-do or of the poor. There appears little likelihood that either the voluntary agencies or the private-for-profit camps will be able to extend their programs sufficiently in the near future to reach more than a bare additional handful of youth who might be reached. I am not at this time arguing that the taxpayer should immediately take over responsibility for providing for all the rest. But I am suggesting that there should be a marked and steady expansion of school camps and camping in the years ahead in order that more and more children from average American homes, both urban and rural, may have the opportunity to experience the advantages of camping under proper auspices. In promoting this desirable end, I trust that educators will have the cooperation and support, as they must have the guidance, of the experienced camping leaders represented in this organization.

### Training Needs

And that brings me to the third and last topic I mentioned earlier; i. e., the need for better training for camp teacher-counselors or leaders, whether for camping under school or other auspices. The key to any good camp program is the camp counselor or leader. To their training for or on the job we need, I think, to direct greater attention. What are some of the elements in an improved program for the selection and training of camping personnel? Let me quickly mention six:

1. The camp counselor should be a person of sound and broad education, a worthy representative of modern culture. He must, of course, be a person

quire something of the point of view and of the techniques of the mental hygienist and social worker, as well as those of the teacher. He needs to know enough about case study methods to appreciate the need for information concerning the interests, abilities, general health status, home background, hopes and ambitions of his youthful charges so that he may provide helpful personal, social, and educational guidance.

4. The camp counselor needs to have a full appreciation and grasp of the methods of group work, employed alike by our better teachers and recreation leaders. He will thus be conscious of the importance of morale in the total camp environment and of the methods by which a wholesome esprit de corps may be developed around the camp objectives.

5. The camp counselor needs to have a clear insight into the democratic concept of self-discipline which develops from worth-while tasks, willingly undertaken, and takes account of the necessity for rules and regulations to guarantee the rights of others.

6. And, finally, the camp counselor ought to have some appreciation of the way in which learning experiences must be organized into a curriculum, so to speak, for each camper both as an individual and as a member of a group. Here again there seems to me to be a sufficiently close relationship between the training of the teacher and that of the camp counselor to warrant greater provision in our teacher-training institutions for attention to both.

I do not know the extent to which camp counselors may at present be provided either with pre-service or in-service training to produce results implied in the preceding six points. Nor can I identify the particular problems of research which warrant investigation in

I proposed that public schools should assume a greater obligation to make available camping experiences for youth by extending the school year to include a quarter during which youth might attend school camps operated as extensions of the facilities and personnel provided by local community boards of education. That article was the subject of a considerable amount of comment, most of it favorable. Naturally I was somewhat disposed, in setting forth my views, "to preach the extreme in order to attain the mean," as the old aphorism has it. Nevertheless, I believe that the idea is fundamentally sound; and that with necessary adaptations to differing climatic conditions and community settings it may well serve to point a trend dimly discernible even now in education. I am pleased to note, for example, that the American Association of School Administrators in its 1948 yearbook devoted a chapter to a consideration of what were termed "multisensory aids," including school excursions, field trips, and camping experiences. Already there are places throughout our country, especially here in California, where the schools are pioneering in providing camping experience to pupils, ranging from overnight and week-end camps in neighboring State parks and forests to camping periods of 1 or 2 weeks' duration at various times during the year, not only in the summertime. In these pioneering ventures, teacher-training institutions have taken an increasingly active interest.

I feel sure that all of us here welcome these educational forays into territory which up to now may have seemed to be the exclusive preserve of the voluntary welfare organizations and the private entrepreneur. Fewer than 5 percent of

viding for all the rest. But I am suggesting that there should be a marked and steady expansion of school camps and camping in the years ahead in order that more and more children from average American homes, both urban and rural, may have the opportunity to experience the advantages of camping under proper auspices. In promoting this desirable end, I trust that educators will have the cooperation and support, as they must have the guidance, of the experienced camping leaders represented in this organization.

## Training Needs

And that brings me to the third and last topic I mentioned earlier; i. e., the need for better training for camp teacher-counselors or leaders, whether for camping under school or other auspices. The key to any good camp program is the camp counselor or leader. To their training for or on the job we need, I think, to direct greater attention. What are some of the elements in an improved program for the selection and training of camping personnel? Let me quickly mention six:

1. The camp counselor should be a person of sound and broad education, a worthy representative of modern culture. He must, of course, be a person of good health and character, with demonstrated ability in some one or more specialties.

2. The camp counselor should have acquired a sound philosophy of camping. He needs to view camping educationally as practice in the art of democratic living, with clear objectives and realizable goals. He must be clear as to the elements of the democratic faith which he will seek to cultivate both by precept and by example.

3. The camp counselor needs to ac-

by our better teachers and recreation leaders. He will thus be conscious of the importance of morale in the total camp environment and of the methods by which a wholesome esprit de corps may be developed around the camp objectives.

5. The camp counselor needs to have a clear insight into the democratic concept of self-discipline which develops from worth-while tasks, willingly undertaken, and takes account of the necessity for rules and regulations to guarantee the rights of others.

6. And, finally, the camp counselor ought to have some appreciation of the way in which learning experiences must be organized into a curriculum, so to speak, for each camper both as an individual and as a member of a group. Here again there seems to me to be a sufficiently close relationship between the training of the teacher and that of the camp counselor to warrant greater provision in our teacher-training institutions for attention to both.

I do not know the extent to which camp counselors may at present be provided either with pre-service or in-service training to produce results implied in the preceding six points. Nor can I identify the particular problems of research which warrant investigation in this area. But I am certain there is a place for some Federal governmental service in this field of research and cooperative leadership respecting camps and camping, involving particularly the participation of schools and colleges. The Office of Education is providing, therefore, in its plan of organization, for some professional staff members in this field. Although we have not yet been given the appropriations to implement the plan of organization, in this particular I am hopeful that in the not distant future we may be equipped to assist educators and camp leaders alike in the solution of problems associated with the more widespread and effective provision of opportunities to youth to follow the poet Bryant's adjuration to

> **"Go forth under the open sky and list**
> **To Nature's teachings."**

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## Farm Work and Youth

MOST EDUCATORS recognize the value of farm work. They know from long experience the importance of developing self-reliance, responsibility, and cooperation in children.

This year, opportunities for work on farms are offered by local offices of the State Employment Services to young people in thousands of communities throughout the country. During the war and up until January 1, this year, farm labor matters, other than workers for processing plants, were handled by the United States Department of Agriculture. But the first of this year, the Emergency Farm Labor Program of the Department was discontinued and the United States Employment Service was charged with the responsibility of recruiting workers for agriculture.

As in the past, three general types of farm work are available to youngsters who can qualify:

The summer camps operated by growers and food processors are open to youth in some areas. They provide a combination of work and play and companionship. In them, the youngster is pretty much on his own.

Older children find a limited number of jobs available for the summer months on nearby farms. In this "live-in" program children spend a few months

Employment Service. They should investigate the farm carefully with the help of the local office, and if possible pay a visit to the farm home before signing up for work.

Most of the effort with young people this year is being concentrated on local drives to obtain workers to help harvest crops on nearby farms. The work is done on a day-by-day basis and, of course, varies with types of agriculture. In this program, youngsters return to their homes every evening, can spend just a few days or several weeks picking fruits and vegetables. In some localities the workday is 5 hours, in others 8 and 10 hours. Earnings depend on prevailing wage rates in the community and, if it's piecework, on how fast he can fill his basket.

"The schools with their knowledge of youth and his personality problems," says Robert C. Goodwin, Director of the United States Employment Service, "have been of tremendous help in guiding students to profitable, healthful vacation work on farms. They have recognized the educational values inherent in farm work, have organized crews of students, have called farm work opportunities to the attention of young people, and have supervised their work on nearby farms and in youth camps. Although it is impossible to estimate the value of their work to the children, their communities, and the Nation, they are certainly responsible for saving many millions of tons of food." Last year, according to rough estimates, teachers assisted in recruiting about 265,000 of the 529,000 boys and girls placed through the Emergency Farm Labor Program of the Department of Agriculture.

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health measures have brought such catastrophes under broad control, rats have not become the friends of man. They carry many other diseases including typhus fever, spirochetal jaundice, and others with evil-sounding names.

That's not all. Rats are capable of great damage to goods and property also. It is estimated that rats damage or contaminate 200 million bushels of grain a year. That amount is about half the grain the United States plans to send to stricken Europe this year.

Commissioner Studebaker recently wrote to superintendents of schools in 32 cities throughout the country named as demonstration centers in the National Urban Rat Control Program.

Excerpts from his letter follow:

> I know that school officials can and will play an important role in this community program. Your leadership is needed because the success of the program depends upon education, upon every individual understanding the need to rid his community of rats and the actions he must take to that end. You can approach your mayor now offering support and service on the citizens committee. Rat control can be correlated with many school activities, such as social studies, health education, sanitation, conservation, and history. Science teachers are particularly fitted to assist both in the school and in the community.
>
> The Office of Education is in wholehearted accord with the aims and objectives of this program. Your participation in this community effort will be stimulating and beneficial to students and teachers alike.

Many schools are doing something about rat control. Social studies classes in particular may wish to undertake community surveys on this and related problems.

The resources of the Federal Government have been made available to communities. Information may be obtained free from the National Committee for Rat Control, U. S. Department of the Interior, Washington 25, D. C.

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Older children find a limited number of jobs available for the summer months on nearby farms. In this "live-in" program children spend a few months living and working with farm families. When the right youngster and the right farm family are brought together, the experience can be an unusually rich one.

Although the farm "live-in" program for helping qualified young people to find farm jobs is being continued by the Employment Service, the drive is not as intensive as was the wartime program of the Department of Agriculture. Students interested in living and working on farms this summer should contact the local office of their State

just a few days or several weeks picking fruits and vegetables. In some localities the workday is 5 hours, in others 8 and 10 hours. Earnings depend on prevailing wage rates in the community and, if it's piecework, on how fast he can fill his basket.

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## Rat Control in the Curriculum

EXACTLY 600 YEARS ago, the city of London suffered a blow that can be compared only with the dropping of the bomb on Hiroshima. That was the Black Death. As students of European history know, that plague, before it had run its course, decimated the population of Europe. We know now that bubonic plague, the Black Death, is carried by rats.

Although medical science and public

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The resources of the Federal Government have been made available to communities. Information may be obtained free from the National Committee for Rat Control, U. S. Department of the Interior, Washington 25, D. C.

Advice and assistance can be obtained from the following district agents of the U. S. Fish and Wildlife Service, who can also put you in touch with the expert assigned to your area:

PAUL T. QUICK, 600 Weatherly Bldg., Portland 14, Oreg., Tel: Lancaster 4111. (California, Idaho, Montana, Nevada, Oregon, Washington)

E. C. CATES, 220 W. Copper Ave., P. O. Box 1306, Albuquerque, N. Mex. Tel: Govt. 3-5509. (Arizona, Colorado, New Mexico, Utah, Wyoming)

A. E. Gray, 322 Federal Bldg., Oklahoma City 2, Okla., Tel: 73740. (Oklahoma, Kansas)

C. R. Landon, 298 Federal Bldg., P. O. Box 1941, San Antonio 6, Tex. Tel: Fannin 7141. (Texas)

G. C. Oderkirk, Experiment Station Annex, Purdue University, Lafayette, Ind., Tel: 90, ext. 2483. (Indiana, Illinois, Iowa, Michigan, Missouri, Minnesota, Wisconsin)

A. S. Hamm, 6 Post Office Bldg., P. O. Box 27, Mitchell, S. Dak., Tel: 3833. (North Dakota, South Dakota, Nebraska)

L. C. Whitehead, Extension Service, P. O. Box 5577, State College Station, Raleigh, N. C., Tel: 6421, ext. 261. (North Carolina, Florida, Georgia, Kentucky, South Carolina)

R. B. Deen, P. O. Box 305, State College, Miss., Tel: 305. (Arkansas, Alabama, Louisiana, Mississippi, Tennessee)

Walter W. Dykstra, 59 Temple Place, Boston, Mass., Tel: Liberty 2-8422. (Delaware, Maryland, Virginia, West Virginia, New Jersey, New York, Ohio, Pennsylvania, Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island)

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## Educational Meetings

*American Association of Workers for the Blind*, July 12–15, St. Paul, Minn. Secretary, Alfred Allen, American Foundation for the Blind, 15 W. Sixteenth St., New York, N. Y.

*Department of Classroom Teachers*, National Education Association, July 12–23, Oxford, Ohio. Secretary, Hilda Maehling, 1201 Sixteenth St. NW., Washington, D. C.

*Department of Elementary School Principals*, National Education Association, July 5, Cleveland, Ohio. Secretary, Eva G. Pinkston, 1201 Sixteenth St. NW., Washington, D. C.

*Future Homemakers of America*, July 7–10, Kansas City, Mo. National Adviser, Hazel Frost, Office of Education, Washington 25, D. C.

*National Education Association*, July

# Federal Aid to Elementary and Secondary Education: Summary

*Following is the summary of an analytic study of the Federal aid to education issue, its background, and relevant legislative proposals, with a compilation of arguments pro and con, statistical data, and digests of pertinent reports and surveys. The study, including this summary, was made by Charles A. Quattlebaum, education analyst, Legislative Reference Service, Library of Congress. (Copies of the complete report of 207 pages were made available only to Members of Congress, March 1948.)*

### The Problem; Its Background; Prospective Action

Probably never before have the problems of providing adequate financial support for the Nation's schools been so important or their solution so urgent as now. About the time of its establishment the Federal Government assumed a share of the responsibility for financing public education, by providing for the endowment of the common schools with public lands, the income from which is now largely depleted but is still considerable in most of the States. In later years the Federal Government has participated in the financing of public education in several ways, including direct support of agricultural and vocational education in the public schools.[1] The broad issue under consideration in this report is whether the Federal Government should directly aid the States in maintaining a fairly high minimum level of general education for the Nation's citizens, and in more nearly equalizing educational opportunity, and, if so, under what conditions and to what extent.

The extreme variations in the size, population, and wealth of the States their public schools, including payment of the salaries of the instructional staff. During the calendar year 1944 this Nation spent about 2.7 billion dollars for tobacco and about 7.1 billion dollars for alcoholic beverages. Although the comparability of available data on expenditures for education in the United States and foreign countries is questionable, there is some evidence that both the British and the Russians are spending a larger proportion of their national income for education than are the people of the United States.

The American Association of School Administrators has declared that in this country the appropriations for schools should be tripled and the number of teachers should be doubled to meet the present needs for elementary and secondary education. There appears to be ample reason to believe that these needs will greatly increase within the next decade.

Although in most other countries public education is financed and administered by the national government, in the United States it is still widely regarded primarily as a function of the States and local governments. Never-

Florida, Georgia, Kentucky, South Carolina)

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*Future Homemakers of America*, July 7–10, Kansas City, Mo. National Adviser, Hazel Frost, Office of Education, Washington 25, D. C.

*National Education Association*, July 5–9, Cleveland, Ohio, Secretary, Willard E. Givens, 1201 Sixteenth St. NW., Washington, D. C.

*National Science Teachers Association*, National Education Association, July 3–5, Cleveland, Ohio. Secretary, Hanor A. Webb, George Peabody College for Teachers, Nashville 4, Tenn.

*United Business Education Association*, National Education Association, July 5, Cleveland, Ohio. Secretary, Hollis P. Guy, 1201 Sixteenth St. NW., Washington, D. C.

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The extreme variations in the size, population, and wealth of the States and local units, the general mobility of the national population, the widely varying number of children in relation to the number of adults in different areas, and many other factors enter into a study of this national problem.

During the school year 1944–45 the people of the United States spent about 2.6 billion dollars for the operation of their public schools, including payment of the salaries of the instructional staff. During the calendar year 1944 this Nation spent about 2.7 billion dollars for tobacco and about 7.1 billion dollars for alcoholic beverages. Although the comparability of available data on expenditures for education in the United States and foreign countries is questionable, there is some evidence that both the British and the Russians are spending a larger proportion of their national income for education than are the people of the United States.

The American Association of School Administrators has declared that in this country the appropriations for schools should be tripled and the number of teachers should be doubled to meet the present needs for elementary and secondary education. There appears to be ample reason to believe that these needs will greatly increase within the next decade.

Although in most other countries public education is financed and administered by the national government, in the United States it is still widely regarded primarily as a function of the States and local governments. Nevertheless the Government of the United States has not only contributed to the support of public education throughout its history in this country, as has been pointed out, but our Federal Government has also continually carried on educational activities of its own. Within recent decades these activities (such as the Nation-wide educational services of the Department of Agriculture and the educational programs of the Armed Forces) have become very varied and extensive, including education at all

[1] During the school year 1945–46, total Federal aid to public elementary and secondary education, not counting aid for school lunches, averaged $1.56 per child 5 to 17 years of age.

levels and in practically all subject fields.

From a study of the possible nature and extent of further Federal participation in the financing of education emerge various questions and prospective courses of action. Examination of these indicates that probably the most important policies which the Federal Government might pursue in this direction with respect to education below college grade are: (1) Initiation of new educational activities entirely financed and administered by the Federal Government. (2) Increase of subsidies for the education of special groups, such as veterans, at below college level, or extension of such subsidies to other special groups. (3) Increase of support given special types of education, such as agricultural training, in the public schools, under existing or modified Federal controls. (4) Appropriation of funds to aid the States in financing their school systems as a whole, and in more nearly equalizing educational opportunities, under State and local controls.

With the last named of these possible courses of action this report is principally concerned, in accordance with Congressional request.

### *The Educational Crisis in Relation to Federal Aid*

The growing concern over the status of elementary and secondary education in this country has been evidenced by the appearance within the last several years of numerous writings dealing with the educational crisis in relation to Federal aid. Outstanding among such publications in 1947 were the reports of studies and national surveys made by the Senate Committee on Labor and Public Welfare, the House Subcommittee on Measures Relating to Education

defensible minimum of education. The youth of our country are citizens of the entire Nation as well as of the States. Democracy cannot function, much less carry its heavy international responsibilities, unless all its citizens obtain the basic education to permit intelligent participation in the life of the Nation.

Vast numbers of American children are receiving a substandard education or none at all. Because of lack of funds school systems are unable to compete with other occupations for competent personnel. Educational inequalities are prevalent. It is a national obligation to provide funds for at least a minimum defensible expenditure for education in those areas which are unable to maintain such a minimum otherwise.

#### *House Subcommittee*

Never before have the people of this Nation been so acutely aware of the need for extending educational opportunities. Through local and State action the people have assumed many additional obligations in an effort to overcome the critical inadequacy of the financial support of schools. These efforts in some cases have not kept pace even with the rising costs, the increased birth rate, and the deterioration of school property. The fundamental educational inequalities remain.

Our people must be educationally equipped to meet any challenge to our security and to maintain and improve our standard of living. The States vary widely in ability to support education. They and the Federal Government have a joint responsibility in this field. It is time for the Federal Government to assume its full share of that responsibility.

#### *New York Times (National Survey)*

The public school system of the Na-

**AID BILL IN HOUSE COMMITTEE**

S. 472, to provide Federal aid for general education, passed the Senate April 1, 1948. H. R. 2953, a companion bill, as of May 20, was on the calendar of the House Committee on Education and Labor (Congressman Hartley, chairman). It had been reported favorably by the Subcommittee on Measures Relating to Education Generally (Congressman McCowen, chairman) July 15, 1947.

percentage of its national income for schools than at any other time in recent years. Appalling educational inequalities exist among the States. The time is rapidly approaching when the Federal Government must help equalize educational opportunities in this country.

Teachers in practically all the States will receive substantially higher salaries during the school year 1947–48 than during the preceding year, the average increase being about $400 per teacher. However the teacher shortage will remain acute and the number of teachers on substandard licenses will not decline noticeably.

#### *National Education Association Research Division*

The immediate problem in school finance is postwar inflation. Increases in school support authorized by State legislatures in 1947 already have been largely absorbed by price rises. Over a period of many years Federal aid to elementary and secondary education has averaged less than 2 percent of the total cost. Some States were making over twice the effort made by others to sup-