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Sears Roebuck Store, Compton, California. Architect—Stiles Clements, Los Angeles, Calif.; Contractor—L. E. Dixon Co., San Gabriel, Calif. Pozzolith Ready-Mixed Concrete supplied by S. H. Bacon Materials Co., Huntington Park, Calif.

## better quality concrete here with

# POZZOLITH\*



Cooper's Department Store, Fresno, California. Architect—Leo Roselyn Co., San Francisco, Calif.; Contractor—Harris Construction Co., Fresno, Calif. Pozzolith Ready-Mixed Concrete supplied by Stewart & Nuss, Inc., Fresno, Calif.



Jacobson's Store, Birmingham, Michigan. Architect—Arthur O. A. Schmidt, Detroit, Mich.; Contractor—E. J. Swink, Birmingham, Mich. Pozzolith Ready-Mixed Concrete supplied by Boice Builders & Supply Co., Pontiac, Mich.

● These stores are representative of many commercial structures where Pozzolith was employed to produce better quality concrete.

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November 1954 Vol. 116 No. 5

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Trinity Court

**John Knox Shear** appointed *Editor-in-Chief*.  
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COVER: Lakeview School, Mercer Island, Wash. Bassetti, Morse & Aitken, Architects. Photos: Art Hupy

## Building Types Study Number 216 — Schools

How can we provide enough schools? As every community struggles over this puzzler, it is inevitable that cost vs. quality questions get serious review. The leading article presents the primary considerations — from functional requirements, through efficiency and environmental standards, to materials and maintenance. And eleven school projects illustrate answers to such questions. "School Buildings: Quality Level and Cost," *By Charles D. Gibson* 177

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Trinity Court



## JOHN KNOX SHEAR APPOINTED EDITOR-IN-CHIEF

EFFECTIVE now, John Knox Shear, A.I.A., presently Head of the Department of Architecture at Carnegie Institute of Technology, becomes Editor-in-Chief of ARCHITECTURAL RECORD. Other members of the RECORD's staff continue in their present posts.

Mr. Shear received his degree of Master of Architecture at the school which he has headed since 1949. He held graduate fellowships for two years at Princeton University where he won his Master of Fine Arts in Architecture.

At various times between 1939 and 1949, Mr. Shear was associated as an architect with C. B. Kearfott of Bristol, Va., Sherley W. Morgan, Martin Beck, Charles and Edward Stotz of Pittsburgh, and also with Marlier and Johnstone of Pittsburgh.

Since 1949 he has engaged in practice in the Pittsburgh area as a principal with Joseph Spagnuolo and Robert Taylor as associates.

RECORD's Editor-in-Chief is known in architectural circles through his identification with A.I.A. activities and in educational circles through participation in the work of the Collegiate Schools of Architecture.

He has been introduced to the audience of ARCHITECTURAL RECORD as author of a significant series of articles on architectural education.

John Knox Shear, in his new capacity, will lead a strong and seasoned editorial staff characterized by a talent for teamwork.

— H. Judd Payne



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Editorial Director



**Emerson Goble**  
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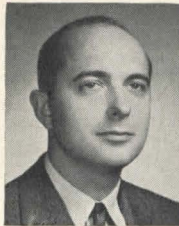
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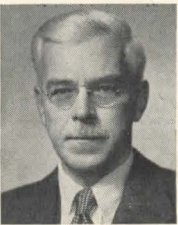
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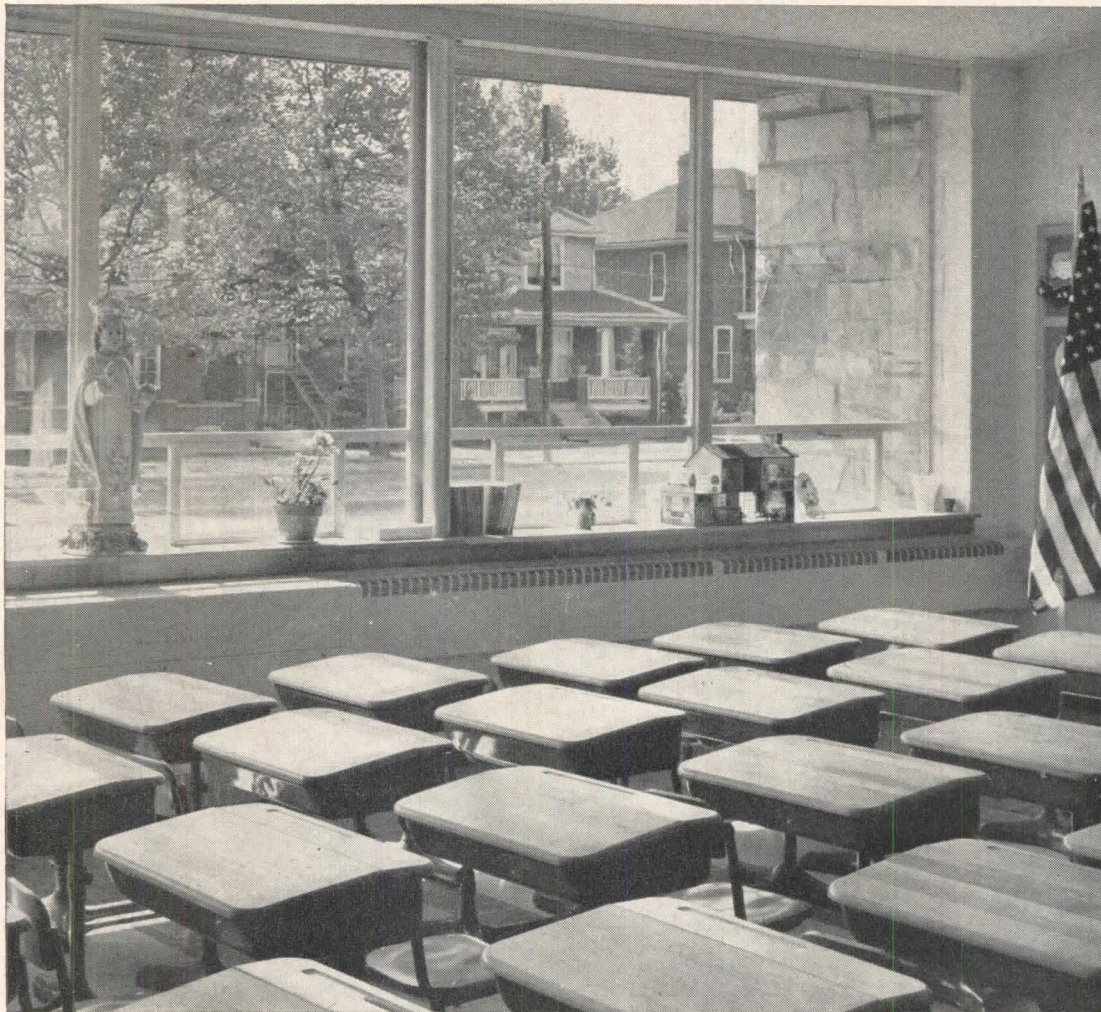
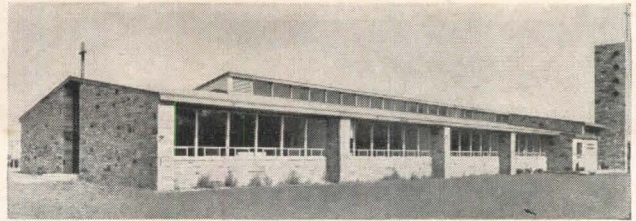


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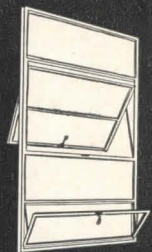
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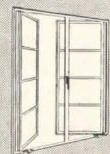
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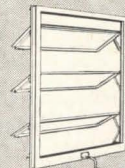
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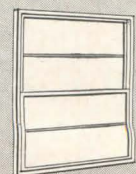
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A PREVIEW OF  
FUTURE CONSTRUCTION  
POTENTIALS WITH  
PARTICULAR REFERENCE  
TO THE YEAR **1955**

## **POSTWAR EXPANSION: CHAPTER TEN OF A SERIAL STORY**

**“Ole Man Construction, He Jes’ Keeps Rollin’ Along”**

**By** **THOMAS S. HOLDEN**, *Vice Chairman; with the collaboration of*  
**CLYDE SHUTE**, *Assistant Vice President and Manager,*  
*Statistical and Research Division, and GEORGE CLINE SMITH,*  
*Assistant Vice President and Economist*

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**ARCHITECTURAL  
RECORD**

**NOVEMBER 1954**

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# THE RECORD REPORTS

## P E R S P E C T I V E S

**NEW WRINKLES:** How about trying basements in houses? The English publication *Building Materials Digest* in a recent issue suggests that housing would profit greatly from reintroduction of the basement, "not so much for habitation in the old sense, but as a place for storage, laundry operations, drying and perhaps for heating plant."

**FREEDOM OF THE ARTS,** the President noted last month, "is a basic freedom, one of the pillars of liberty in our land." In a message recorded for the opening ceremonies of the 25th anniversary of New York's Museum of Modern Art and conveying his "warmest greetings," Mr. Eisenhower said: "For our Republic to stay free, those among us with the rare gift of artistry must be able freely to use their talent. Likewise, our people must have unimpaired opportunity to see, to understand, to profit from our artists' work. As long as artists are at liberty to feel with high personal intensity, as long as our artists are free to create with sincerity and conviction, there will be healthy controversy and progress in art. Only thus can there be opportunity for a genius to conceive and to produce a masterpiece for all mankind."

**DESIGNING FOR PEOPLE:** In a recent symposium on "Physical Facilities for Research" held at New York University, Clifford W. Rassweiler, vice chairman of the board and vice president for research and development, Johns-Manville Corporation, made a strong plea for more emphasis in research facilities as in factories on "those intangible factors of planning and design that provide the conditions most suitable for creating the proper personal attitudes — attitudes essential to increasing the productivity of the individual worker." Such matters as location, exterior appearance, working space that is "cheerful and comfortable," prefer-

ably air conditioned, and ample enough to give each man "the feeling of pride and ownership in an area of his own," attractive public areas and employe facilities — all of these things are, said Mr. Rassweiler, "particularly important when your production force is composed of men of education and high intelligence . . . when you are asking men to produce with brains rather than hands." Except for location, Mr. Rassweiler noted, the same factors apply with as much force to works laboratories as to monumental new research centers. "We must build research laboratories that are designed for maximum mechanical efficiency," Mr. Rassweiler said. "We must build research laboratories that represent economical use of the money spent. But we must not forget that the real measure of whether the money is well spent or poorly spent depends not only upon the extent to which the facility will multiply the workers' productivity mechanically, but also upon whether it will attract workers who can make an individual contribution that is worthwhile multiplying, and whether the facility will help build the worker attitude and the organization morale that create the maximum will to produce."

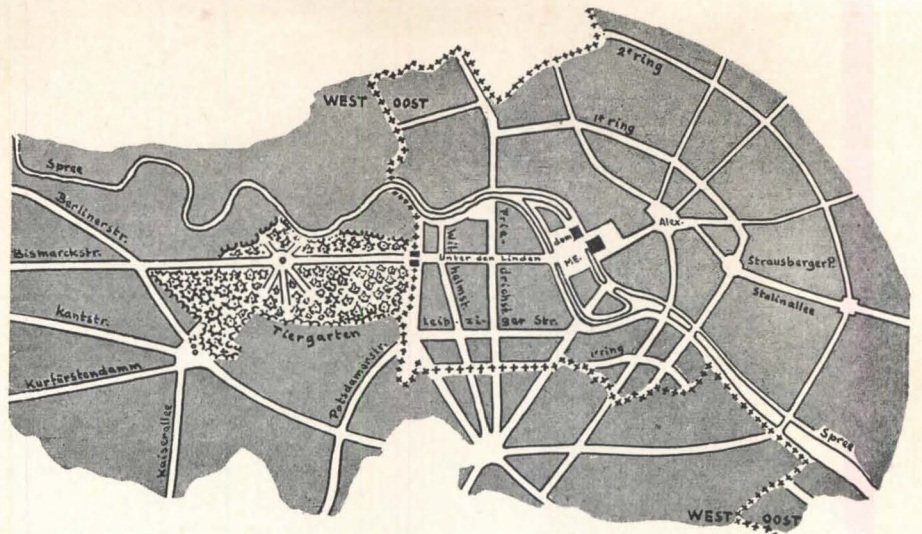
**HOW DO THE TEACHING METHODS** affect the design of school premises? — subject of an article in the Yugoslav magazine *Arhitekt* — gets the doctrinaire answer on the other side of the Iron Curtain. In the words of the English translation: "The main task of the Socialist school is to facilitate a harmonious psychophysical growth of our child who should grow to be a free and purposeful Socialist man with a great range of understanding and distaste for bureaucracy and strait-laced mentality. . . . A suitable school building is a pleasant and comfortable abode where the collective life and collective consciousness are able to develop."

**THERE'LL HAVE TO BE SOME CHANGES** made in the design of ball parks before the present lamentable trend in attendance can be reversed, according to Frank Frisch; and in an article in a recent issue of *Blue Book* he outlines some of them. "I envision a ball park of the future," dreams Frisch, "in which use will be made of every available gadget to please the customer. His car will be speedily parked in an underground garage. There'll be a nursery where Baby can be left in good hands while Mama cheers for the home team. The stands will be of cantilever construction, eliminating posts, and curved to face the infield. Seats will be spacious and cushioned with foam rubber. Johnny will have his peanuts and his Coke, but Papa will be able to take Mama to a well-appointed cocktail lounge for a nip or the whole family to a café for a pre-game dinner. As for Junior and his girl, he can take her dancing in the lounge after the game. Above the field, a vast plexiglas roof will roll out when it begins to rain. The electrified scoreboard will include pitchers' and batters' averages. An announcer will explain the points at issue whenever there's rhubarb. The players' dressing rooms, the bullpens and the dugouts will all be air conditioned." Take us out to the ball game!

**WHAT'S WRONG WITH MODERN HOUSES,** according to china impresario Carole Stupell, is — no china closets. Speaking from what personal bias may be imagined, Miss Stupell wistfully guesses that sales of china would zoom "300 per cent" if architects could manage to include real closets for china in the program of the contemporary house. The lady knows exactly what she means by closet (it's not cupboard) and in fact a while back got Architect Morris Ketchum to prepare actual plans for what she *conceives to be the beau ideal* of the type. Alas, the prototype has yet to be built.

THE RISE OF A TWO-HEADED PHOENIX:

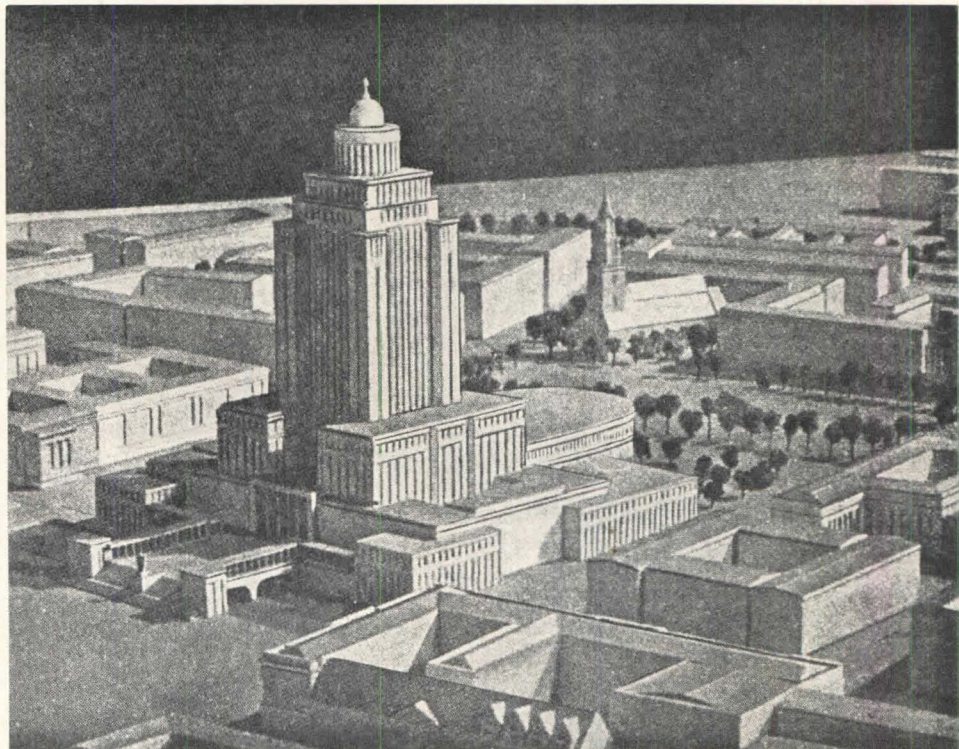
PERIODICAL  
REPORT



East Berlin



Above, left: workers' flats in Stalinallee, with state stores at either side of the columned entrance; project by Professor Paulick. Above, right: entrance to the Sports Hall in Stalinallee; project by Professor Paulick. Right: project for a 200-meter tower in Marx-Engels Platz



Above: the Soviet Embassy in Unter den Linden was built in 1951; the author calls it "a school example of neo-classicism"

## ARCHITECTURE IN POSTWAR BERLIN

EAST AND WEST seem no nearer to meeting in the rebuilding of Berlin than they did in Kipling's India. The Dutch journal *Bouw* carried in its July 31 issue a critical study of German architecture, in both the Eastern and Western sectors, since the war; the report was written by R. C. Hekker.

The problem of two or more esthetic theories in mutual opposition is not new to Germany, says Mr. Hekker; this is an area, he observes, which has been a battlefield of architectural philosophies since mediaeval times, the defeat of the Bauhaus movement by the Third Reich's neo-classicists being only the most recent of violent changes.

This city was also, of course, a virtual battlefield of World War II — 32 per cent of its housing was destroyed; before

the war Berlin real estate was valued at 15½ billion marks, of which 4½ billion "disappeared." The mess to be cleaned up after the war consisted of 75 million cu metres of rubble.

### *In the East*

In 1950 the "German Democratic Republic" passed a rebuilding law, under which local communities might outline reconstruction plans subject to government approval. The fundamental standards for city planning, as set up by the government, are: to oppose too large a spread of cities where unreasonable expense of construction and maintenance can be anticipated; to achieve a "characteristic" skyline at the center of the city by means of large civic squares, special buildings and tower structures;

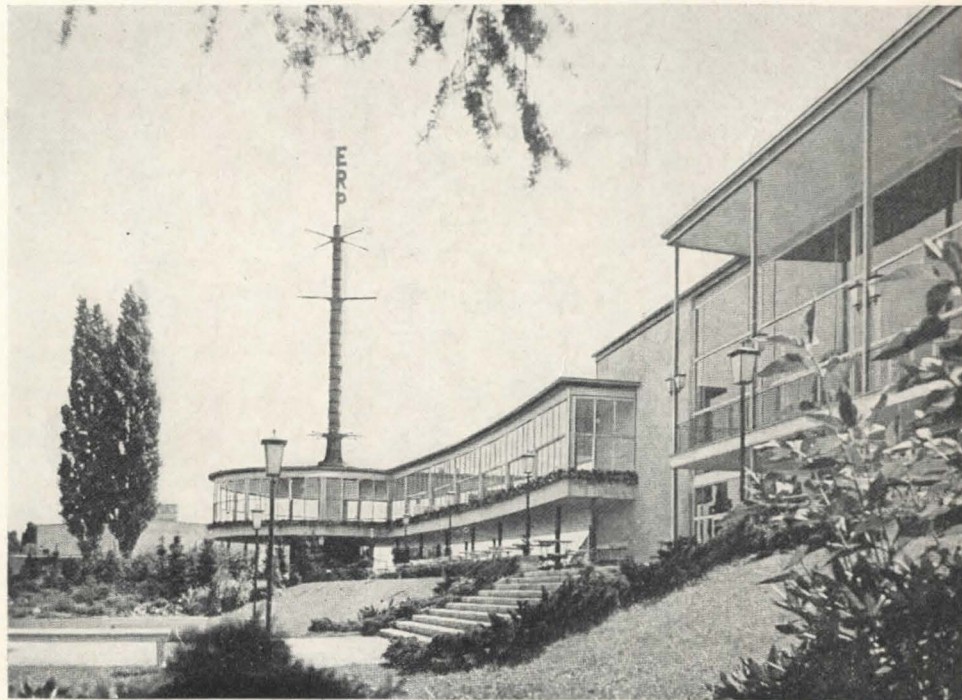
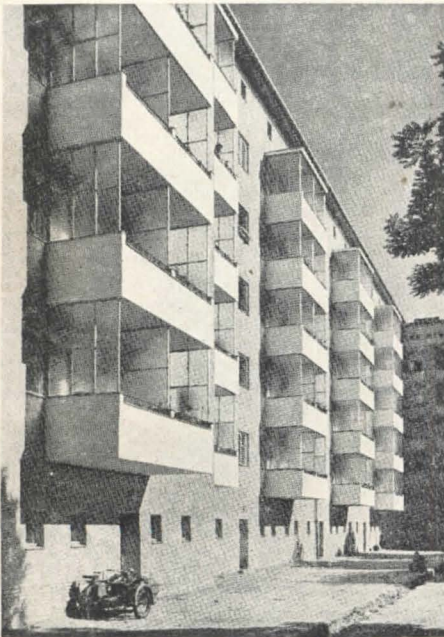
to decrease building heights and density toward the outskirts; to direct traffic along roads moving around the center. Only city plans in which the more important streets and squares have been developed may be submitted.

Another requirement for these plans is the preservation of local character: the architecture must be "democratic in content" and "national in form." After a brief flurry of disagreement among East German architects as to whether 19th Century Classicism or 20th Century Bauhaus best typified German architecture, the decision went to the Classicists. The Academy of the Art of Building, founded in December 1951, is the arbiter of architectural taste in the East and is firmly on the side of Classicism.

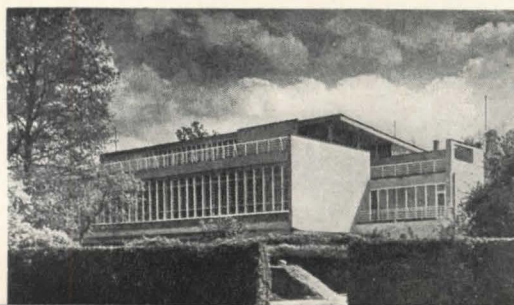
*(Continued on page 346)*

### West Berlin

*Below: a coöperative housing development built in West Berlin in 1952-53*



*Above: Marshall House was built as an exhibition center in 1950; Bruno Grimmek, architect. Below, left: a dormitory for the Free University of Berlin, finished in 1953; Herm. Fehling, architect. Below, right; the Berliner Bank, also completed in 1953; the architect was Gerh. Siegmann*



## NEW PLANS AND SPECIFICATIONS SET FOR POST OFFICE DEPARTMENT'S LEASED SPACE

NEW BASIC PLANS AND SPECIFICATIONS to guide architects in the design of space to be leased for post office purposes have been prepared by the Post Office Department and distributed to its field offices.

This represents an entirely new approach toward the problem of assuring that the Post Office gets at least its minimum requirements in property that it leases, old or new. Heretofore, the plans had been loosely drawn, and there were no specifications to guide private architects designing buildings to be leased to the government for post office purposes. This left many of the important decisions on specifications up to field personnel and made room for a wide variety of treatment.

The new drawings and specifications, four copies of which have been placed in each regional office of the Post Office Department, tighten up the criteria, at the same time leaving a flexibility which will enable field officials to work out some structural and other details with the private architect and the sponsor. This is achieved through a multiple-choice method of specification.

For example: flooring specifications say hard maple,  $\frac{3}{16}$ -in. asphalt tile or linoleum now will be permissible as floor covering in offices; for workroom,

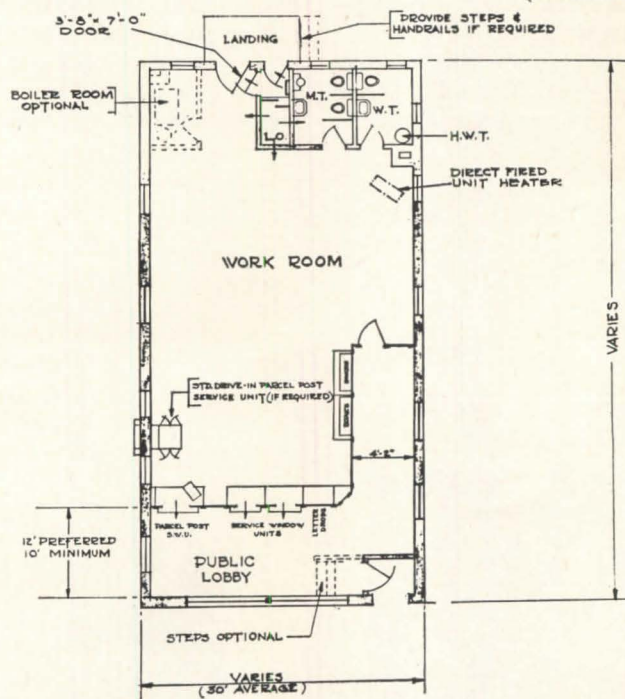
finance section, locker and swing room areas and mailing vestibules, hard maple,  $\frac{1}{2}$ -in. asphalt plank or  $\frac{3}{16}$ -in. asphalt tile will be allowed.

Sample site plans for drive-in service are included in the new layouts, indicating that more emphasis might be

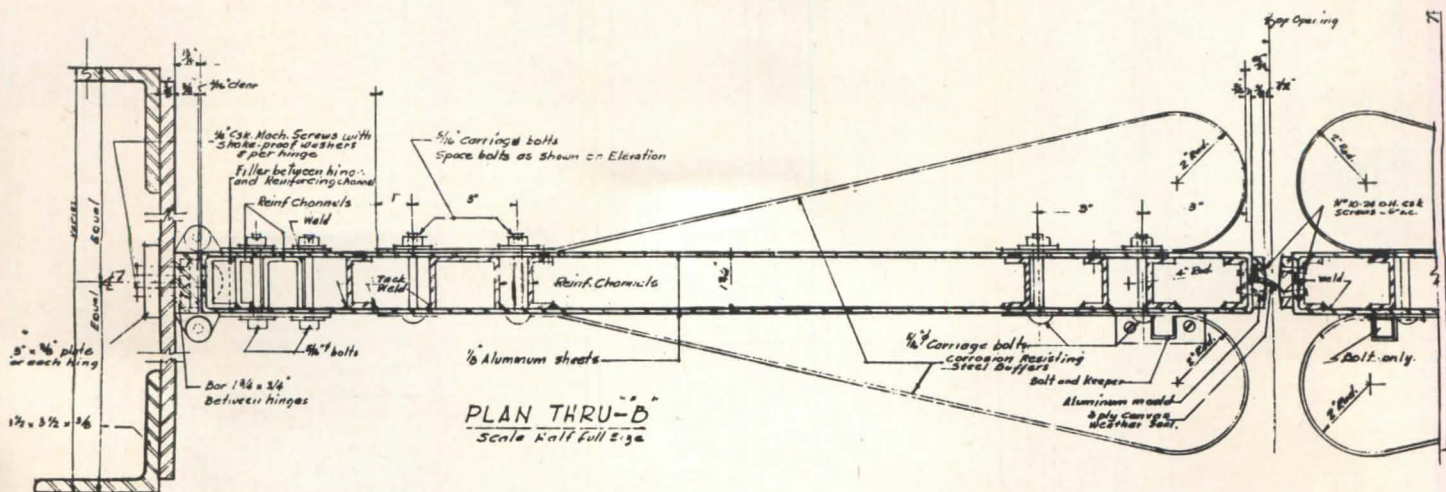
given this type of planning in the future.

### Drawings Are "Flexible"

The drawings are intended to be flexible enough for adaption to the requirements of almost any site. They  
(Continued on page 298)



TWO DRAWINGS of the many on the Post Office Department's 13 sheets of new basic plans for leased facilities. Above: typical floor plan for a 1500 to 3200 sq ft post office building. Below: from a sheet of standard details for mailing vestibule doors



**Architectural Research**

ONE MILLION DOLLARS is being sought by the American Architectural Foundation, the sum to be spent on the expansion of architectural research. Applications of the fund, suggests Douglas W. Orr, F.A.I.A., president of the foundation, might include the study of light, color, sound and solar energy as they affect architecture, and a study of the problems of decentralization of industry and commerce. An intensive canvass of A.I.A. members is now underway, and the foundation's goal is a \$100 contribution from every architect.

**With the A.I.A.**

TREKKING ARCHITECTS, led this year by Glenn Stanton, past president of the A.I.A., visited Europe and the Near East and returned to New York October 7. The month-long journey, arranged by the United States Travel Agency, Inc., took the travelers to Madrid, Granada, Cordoba, Rome, Cairo and Paris. The group included Mr. and Mrs. Charles F. Cellarius, Cincinnati; Mr. and Mrs. Edward A. Ramsey, Columbus, Ohio; Lucien E. D. Gaudreau, Baltimore; Arlington T. Hardell, Atlanta; Janet E. Hooper, New Orleans; Walter L. Moody, Los Angeles; Mr. and Mrs. John R. Fugard, Chicago; and Richard Walker, R.I.B.A., who represented the travel agency. The A.I.A. has announced plans for a repetition of this year's South

American Trek, to leave Miami February 1, 1955, and to return the first of March.

A WIDER PUBLIC APPRECIATION of outstanding architecture, as exemplified by the 1954 A.I.A. Honor Awards, is the object of a "multiple exhibition" of 25 of the chosen designs being promoted by the Institute. Portfolios of the panels, reproduced by photo-lithography, have been distributed to all A.I.A. chapters and are available to the public for \$25 a set.

THE CATHEDRAL AT CHARTRES has acquired a new stained glass window, a presentation of the A.I.A. The window, which is dedicated to St. Fulbert, Bishop of Chartres who founded the cathedral, was designed by Francois Lorin, French stained glass artist; M. Lorin has incorporated his re-creation of "Chartres blue" in a contemporary design. The A.I.A.'s Henry Adams Fund and individual architects and A.I.A. chapters donated the funds for the window.

**Conference on the Module**

AN EVALUATION of the present success of modular measure and an investigation of its possible future uses will occupy participants at a research conference scheduled for December 9 at Washington's National Academy of Sciences. The meeting will be conducted by the Building Research Institute, and is sponsored jointly by the American

Standards Association, the American Institute of Architects, the Producers' Council and the National Association of Home Builders. The conference is open to general contractors, manufacturers, builders and architects as well as other interested individuals; program and further information is available from William H. Scheick, Executive Director, Building Research Institute, 2101 Constitution Ave., Washington 25, D. C.

**Planners Meet**

THE American Society of Planning Officials held its 20th anniversary meeting September 26-30 in Philadelphia, with zoning—as always—and the new urban renewal provisions of the Housing Act of 1954 high among program items of interest. A clinic on new communities produced critiques and discussion that ranged from Radburn, N. J., to Park Forest, Ill., and included a report on the 60-odd industrial new towns built in Canada since World War II. Lewis Mumford addressed an evening session on "The Spirit of the City," as exemplified in the work of the late Scottish planner Patrick Geddes—respect for the city's geographic and historic core, for its need for continuity in space and time and for its essential variety were described by Mr. Mumford as the keys to Geddes' approach. Thomas McDonough, A.I.A., of Boston was elected as the new A.S.P.O. president, with Humphrey Carver of Central Mortgage and Housing Corporation (Canada's equivalent of H.H.F.A) as vice president and Morris Hirsh, director of the South Side Planning Commission, Chicago, treasurer.

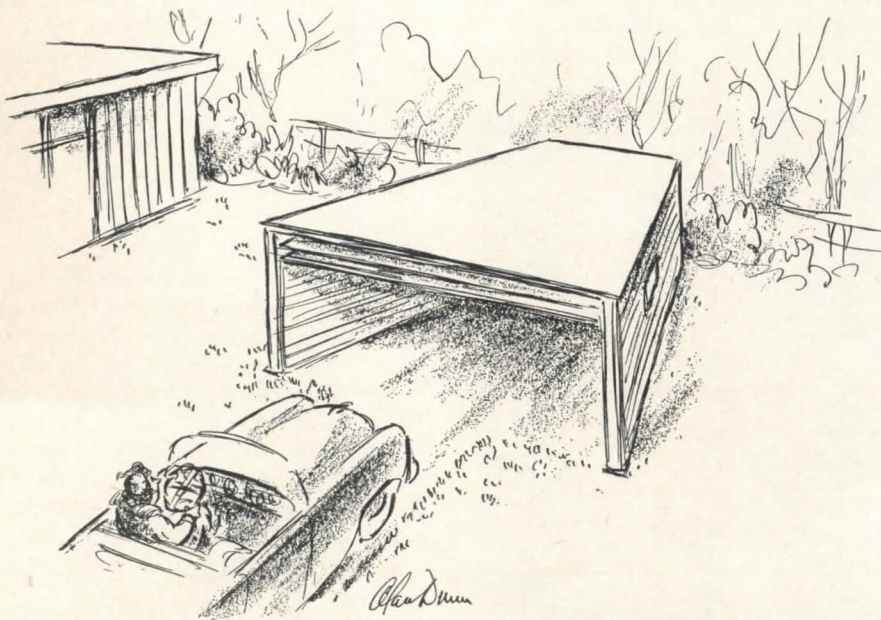
**"Balance" for Students**

THE BEAUX ARTS INSTITUTE OF DESIGN last month announced plans for *Balance*, a new publication "dedicated to the architectural student." The aims of *Balance* are listed as follows: to keep students informed of some of the latest developments in the thinking of the profession; to provide a forum for students, teachers and practitioners; and to give the news of programs, judgments and reports of juries of national competitions conducted by the B.A.I.D.

**Short Course for Architects**

CHURCH PLANNING is the subject to be surveyed at the Architects' Short Course

(Continued on page 16)



—Drawn for the RECORD by Alan Dunn

(Continued from page 15)

being sponsored for the third year by the Department of Architecture at the University of Illinois. Architects, churchmen and "specialists" will lead sessions covering such topics as stained glass, sculpture, metal work, fabrics, decorative arts, painting and financing. The course, under the direction of Prof. Robert J. Smith and Robert K. Newton, will be held in Urbana Nov. 10-12.

**Focus on Redevelopment**

URBAN RENEWAL—in the new language of the 1954 housing act—and redevelopment—in the vocabulary of the now superseded Housing Act of 1949—were the major topics on the program and in the corridors at the 21st annual conference of the National Association of Housing Officials last month in Philadelphia. The site provided part of the program, as delegates flocked to planned tours of the city's numerous redevelopment and public housing projects. A new item on the N.A.H.R.O. program this year was a workshop in industrial redevelopment conducted by Carl Feiss, now a planning and urban renewal consultant in Washington. Mr. Feiss called the 13 exclusively and 17 predominantly industrial redevelopment projects listed by the Housing and Home Finance Agency among the 175 Federally-aided projects which have reached the final planning stage "a small but important beginning," and predicted increasing interest in industrial-type redevelopment, partly in response to slightly more encouraging provisions in the new housing act. Participants in the session included representatives of three

groups described by Mr. Feiss as "the three major organizations which have concerned themselves with industrial development"—the Urban Land Institute, the Society of Industrial Realtors and the Area Development Division of the U. S. Department of Commerce.

**Competitions for Architects**

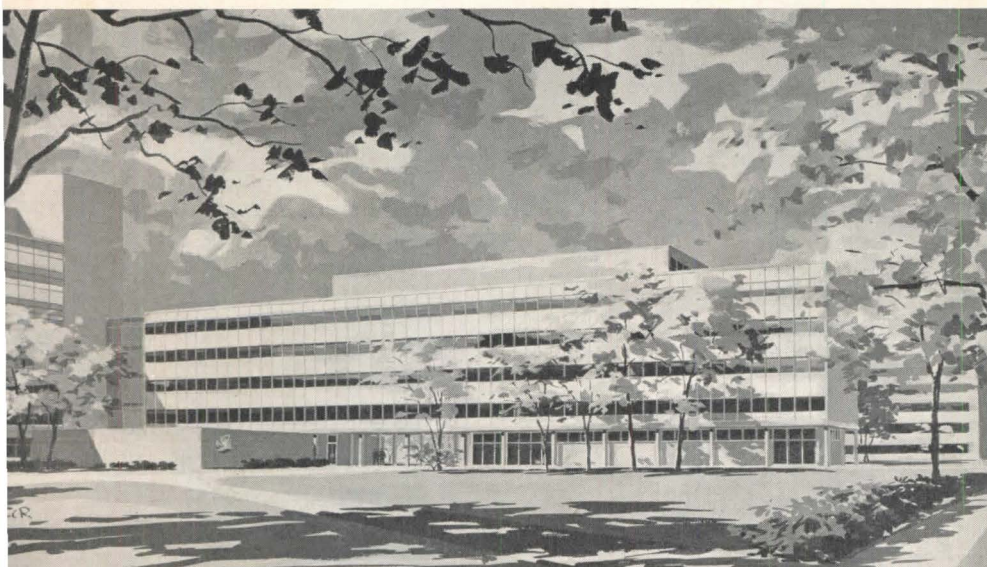
THE American Association of School Administrators is inviting entries for its annual **school architecture exhibits**, displayed at the association's regional conventions; public, private or parochial schools erected or under contract since January 1950 are eligible; entry blanks, due January 15, 1955, are available from the A.A.S.A. office at 1201 16th St. N. W., Washington, D. C. . . . The annual **house competition** sponsored by the Indianapolis Home Show, Inc., is open to architects, architectural designers, draftsmen and students; awards range from \$500 for first prize to \$25 for honorable mentions; information is available at 1456 N. Delaware St., Indianapolis 2, Ind. . . . A competition for **Catholic institution design** has been announced by the magazine *Church Property Administration*, the winners to be exhibited at the National Catholic Educational Association Convention in April; details can be obtained from the magazine at 20 W. Putnam Ave., Greenwich, Conn. . . . **Rome Prize Fellowships** are once again offered by the American Academy in Rome to students and artists in architecture and landscape architecture; the fellowships carry a stipend of \$1250, round-trip transporta-

tion to Rome and a year's residence at the Academy; the deadline for applications is January 1, 1955; additional information is available from the Executive Secretary, American Academy in Rome, 101 Park Ave., New York 17. . . . Applications for the 1955 **Brunner Scholarship** are being considered by the New York Chapter of the American Institute of Architects; the \$2400 scholarship is granted for advanced study in a "specialized field of architectural investigation"; entries are due November 15 at the chapter offices, 115 E. 40th St., New York City. . . . Two competitions recently announced by the National Association of Home Builders include a **new design contest**, for houses built by architect-builder teams, and a **neighborhood development award**; entries are due by December 10; inquiries about the awards will be handled by the N.A.H.B. Construction Department, 1028 Connecticut Ave., N. W., Washington 6, D. C. . . . The **J. C. Nichols Foundation Award**, a \$2000 grant-in-aid given in 1954-55 for graduate study in architecture, city planning, civil engineering or industrial management at Georgia Institute of Technology, is open only to students or prospective students in the Graduate Division of that school; information on requirements for the award, which is sponsored by Georgia Tech and the J. C. Nichols Foundation of the Urban Land Institute, can be obtained from the J. C. Nichols Memorial Award Committee of Georgia Institute of Technology, Howard K. Menhinick, Chairman, 225 North Ave., N. W., Atlanta, Ga.

(More news on page 20)

**COMPTON MEMORIAL LAB  
TO BE BUILT AT M.I.T.**

Planned as an extension of existing research facilities, Massachusetts Institute of Technology's projected Laboratories for Nuclear Science and Electronics will be dedicated to the memory of the late Karl T. Compton, chairman of the Institute. The \$3 million building was designed by Skidmore, Owings & Merrill. In announcing the project, Dr. James R. Killian Jr., president of M.I.T., said, "We are confident that these new facilities which will so largely strengthen M.I.T.'s education and fundamental research in these two areas of the physical sciences will be seen as a fitting memorial to M.I.T.'s ninth president"



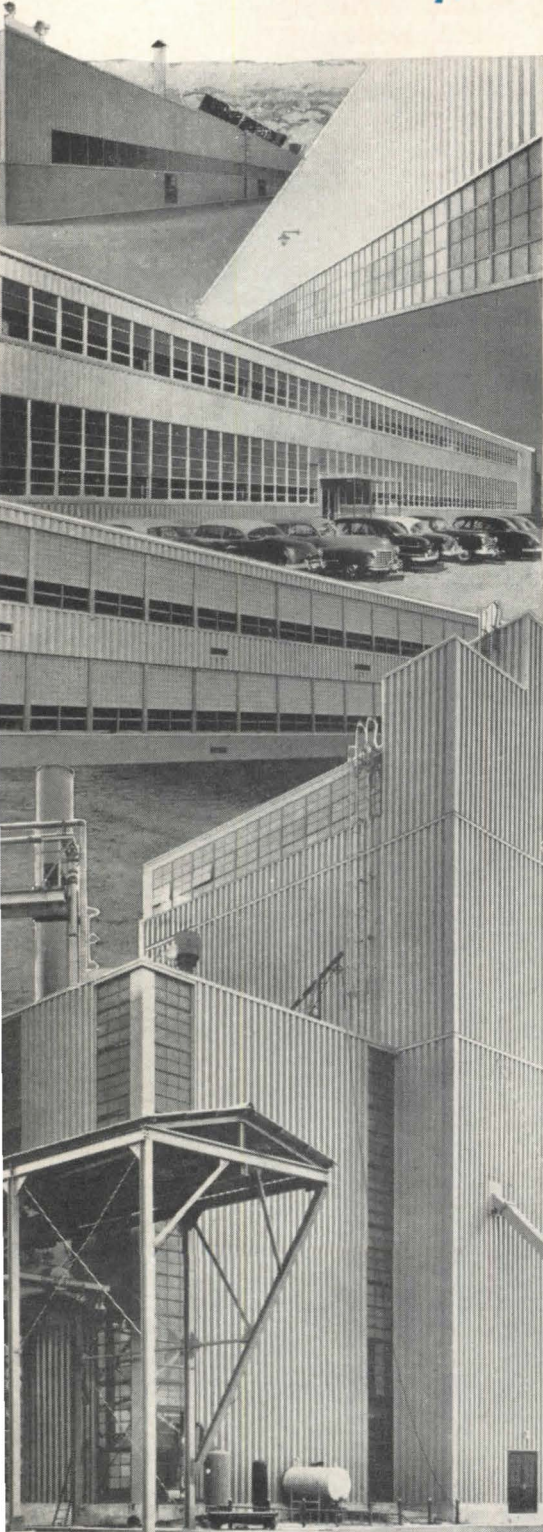
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## IS GRAND CENTRAL TERMINAL "OUTMODED" ? OWNERS CONSIDER REPLACEMENT SCHEMES

AT LEAST TWO PROPOSALS for replacing New York's Grand Central Terminal with a more "economic" structure were under consideration last month by the New York Central System — one of them based on an architectural scheme by Fellheimer and Wagner, New York architects and engineers, in which the New York, New Haven and Hartford Railroad had also expressed an interest; and the other put forward by William Zeckendorf's Webb and Knapp (I. M. Pei, architect).

A statement by Robert R. Young, chairman of the New York Central's Board of Directors, explained that the railroad had asked "certain architects and developers" to make suggestions for utilization of air rights over the terminal property. Taxes now being paid on those air rights, Mr. Young said, indicate they are the world's most valuable. Central would give no further information about identity of any others of the "certain architects and developers."

### "World's Tallest Building"

The Webb and Knapp scheme, initially announced as an 80-story structure to contain some five million sq ft of rentable office space and to be topped by an observation tower that would give it the Empire State's 23-year-old title of "the tallest building in the world," was being "restudied" and no sketches were released.

As originally proposed, the Webb and Knapp plan had been worked out to minimize the disturbance to the operation of existing terminal facilities. It contemplated construction of an elevated plaza within the confines of Forty-second Street, Vanderbilt Avenue, Forty-sixth Street and Depew Place (the overhead roadway east of Grand Central serving northbound Park Avenue traffic). The new building would have dimensions of 275 ft by 275 ft (compared with 722 by 395 of the present building) and would have floor area in excess of 60,000 sq ft a floor.

### Focus on "Mobility"

Alfred Fellheimer emphasized his firm's concern with "mobility" in and around the new building. "The present building is, in effect, a 'Chinese Wall,' he said, "and we are as concerned with achieving mobility around the building

as we are with the actual design of the building."

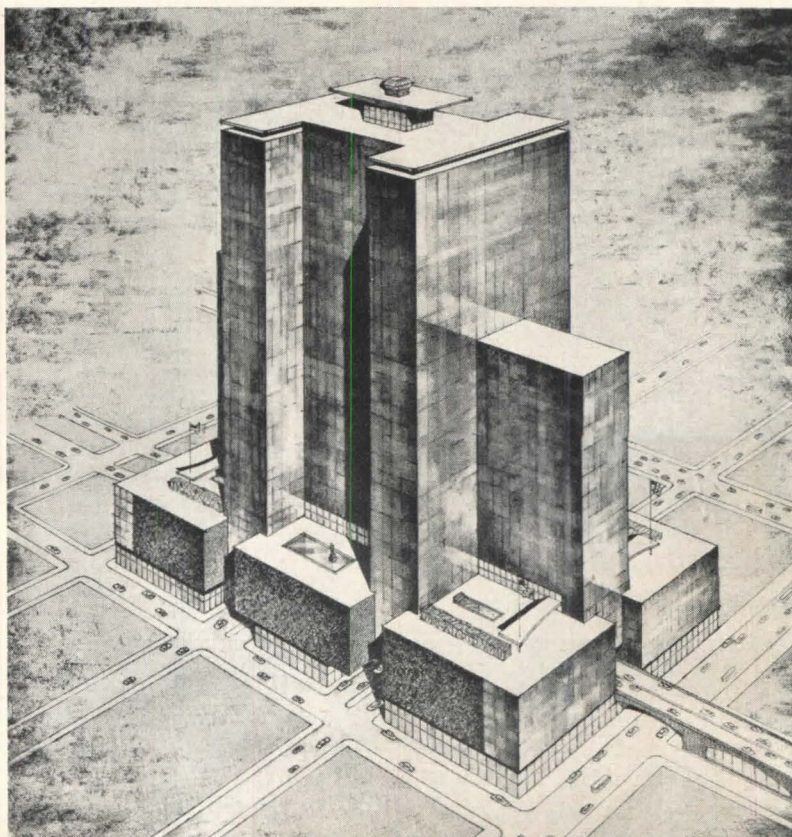
The Fellheimer and Wagner proposal would combine "the largest office building in the world" with extensive changes in the street pattern intended to relieve the perennial traffic jams and pedestrian crowding of the area. The severed east and west parts of Forty-third and Forty-fourth streets would be connected across the station at the level of Vanderbilt Avenue. Depew Place would be reconstructed as a public throughfare connecting the new street extensions. The present winding Park Avenue overpass would be rebuilt in a straight line. The population of the new office building — upwards of 30,000 people — would be able to enter from all the newly-opened streets as well as through the present entrances. The principal entrance for long-distance travelers would be a new ticket and baggage concourse off Vanderbilt Avenue, between Forty-third and Forty-fourth streets, with taxicab turnouts off both streets. An automatic parking garage within the building would offer space for 2400 cars.

Central's consideration of these — and perhaps other — proposals was beset with the controversy which is wont to accompany the more dramatic assaults of the practical upon the sentimental. Is it "practical" to destroy a monument — even a modern one? — even if the owner's tax and revenue problems and the public's convenience seem to demand it?

*Architectural Forum* has one answer and seems inclined to lead a crusade forthwith to "save Grand Central." The architect who was in charge of planning the existing building for its architects, Reed and Stern, has another. Explaining the decision of his present firm, Fellheimer and Wagner, to participate in presentation of proposals for replacing the old building, Alfred Fellheimer says:

"We carefully weighed our own pride in the present building, and its emotional and esthetic significance to people all over the world. Our reluctant but firm conclusion is that neither pride nor reverence should be permitted to clot the vitality of a great metropolis. In turn, that very vitality may guarantee that if one expression of human aspirations must be destroyed in the process of growth, it will be replaced by an even greater one."

NEW GRAND CENTRAL? Rendering of Fellheimer and Wagner proposal for scheme to replace existing terminal building (completed in 1913) looking east across Vanderbilt Avenue, with Forty-third and Forty-fourth streets in left foreground. Setback roofs are envisioned as roof gardens adjoining restaurants and stores on adjacent tower floor. Roof would provide helicopter landing field





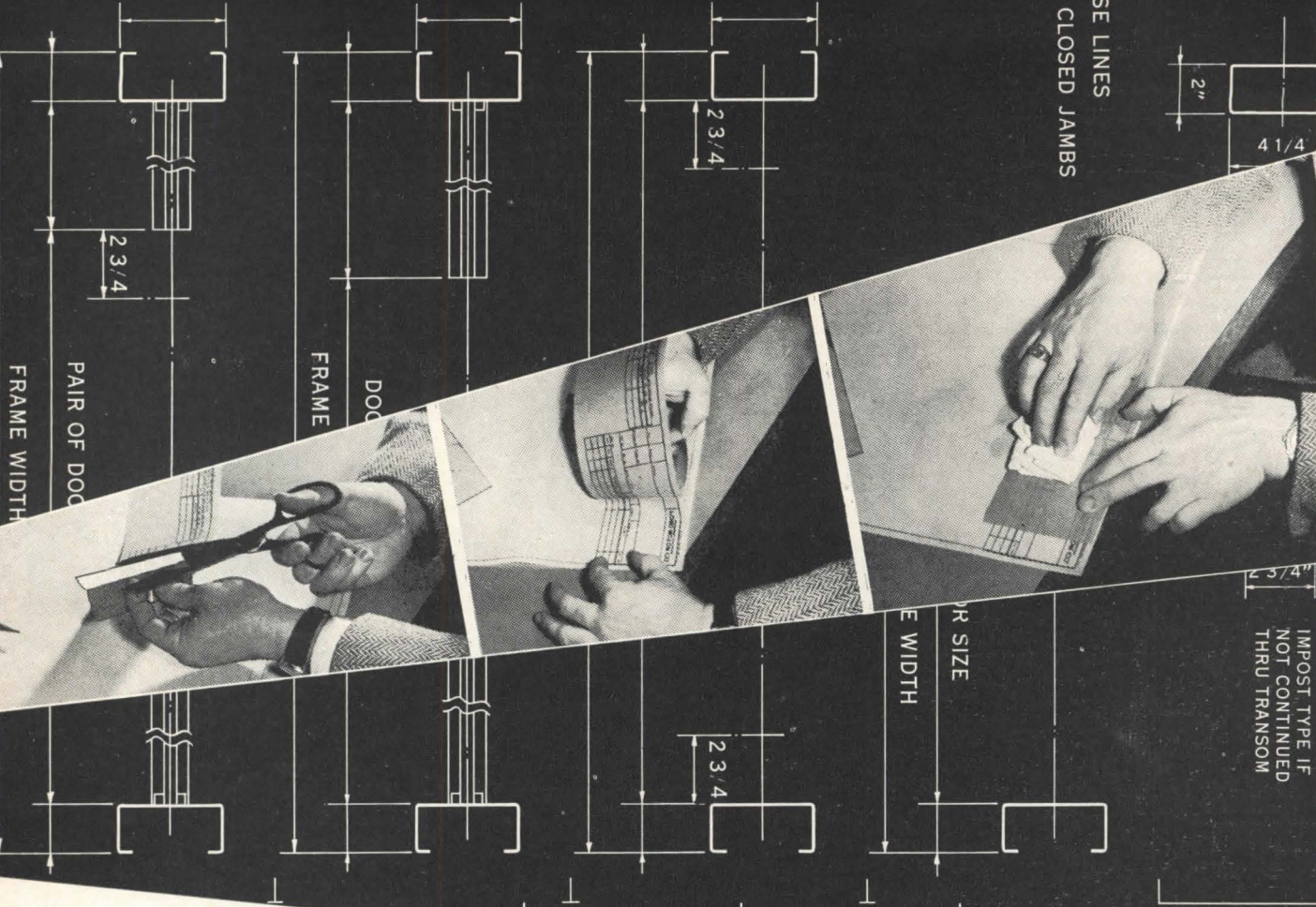
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THE BIG ISSUE IS SCHOOLS AT GULF STATES MEETING

COMMUNITY AID TO EDUCATION" was the theme of the fifth annual Gulf States Regional Conference of the American Institute of Architects, held at the end of September in Little Rock, Ark.

Among addresses heard by the 447 people attending the conference (the 212 A.I.A. members were joined by a large number of educators and other guests) was the banquet speech given by Wayne O. Reed, Assistant Commissioner of Education in the U. S. Office of Education. Noting the fact that in the next five years the country will need 720,000 new classrooms — enough to take care of the present shortage of 370,000 classrooms, replace 100,000 more as they obsolesce, and provide the 250,000 required by anticipated enrollment increases — Mr. Reed said that the annual rate of construction for the next six years must nearly triple that of the past three years if school facilities are to be adequate by 1960. This would amount, he said, to a building program costing \$28.8 billion.

Mr. Reed also said he looked forward to the time when every school building program will be preceded by an "intensive comprehensive survey": "In fact, I believe it is absolutely essential," he said. Such surveys should provide data, he noted, on such matters as current and anticipated enrollment loads, community mores and desires for education, evaluations of existing facilities and curriculum space needs in the light of modern trends.

Planning the School Program

Charles R. Colbert, New Orleans architect, delivered an address on "School Plant Programming." Mr. Colbert recommended that school programming and planning be under the direct supervision of one man only, rather than under the authority of the board of education as a whole. He suggested that particularly in larger cities a planning and programming office should be set up as an organ of the school board; in the case of a building plan which requires only a single building, the architect should be entirely responsible for the architectural program.

"A New Regional School Architecture" was the subject of a talk by architect William W. Caudill, of Bryan, Tex. Good school architecture, he said, is achieved by a balance of three factors:

educational requirements, environmental factors and economy. Mr. Caudill said that school builders often failed the economic test, and that architects and educators should work closely together to insure the proper three-way balance. He also advised architects to "learn something about children" before designing a school.



Delegates also heard Harry S. Ashmore, executive editor of the *Arkansas Gazette*, speak on "The Negro and The School" (for a review of Mr. Ashmore's book *The Negro in the Schools*, see page 46).

Edmund R. Purves, executive director of the A.I.A., reviewed accomplishments of the profession and of the A.I.A.



Participating in the California meetings were, above, left: John Bomberger, Modesto, Calif. — treasurer of the California Council of Architects, and Malcolm Reynolds, Oakland — president of the council. At the Sierra-Nevada Regional Conference, above, right: Arthur Holmes, A.I.A. convention manager; Earl Heitschmidt, first vice president of the A.I.A.; Donald Beach Kirby, regional director of the Sierra-Nevada district; and Waldo B. Christenson, Northwest regional director

REGIONAL COUNCIL FORMED AT A.I.A. MEETING

A NEW REGIONAL COUNCIL WAS organized at the Sierra-Nevada Regional Conference. The "California-Nevada-Hawaii" regional council, to be made up of presidents of 14 chapters in the region, will act as an advisory board to director Donald Beach Kirby and will coordinate A.I.A. programs among the chapters.

The major discussion at the meeting, which was held October 2 at Hoberg's Lake County, Calif., was a panel on "Octagonal Relations," a survey of institute and regional affairs. Among participants in this discussion were: Edmund R. Purves, executive director of the A.I.A.; Earl T. Heitschmidt, first vice president of the A.I.A.; Waldo B. Christenson, Northwest district regional director; Arthur B. Holmes, A.I.A. coordinator for chapter affairs and convention manager; and Walter M. Megronigle, of Ketchum, Inc., public relations counsel to the A.I.A.

Delegates also heard a panel discussion on "Building Our Chapters."

California Council Meets

The California Council of Architects also gathered at Hoberg's Lake County

to hold its ninth annual convention from September 30 through October 2.

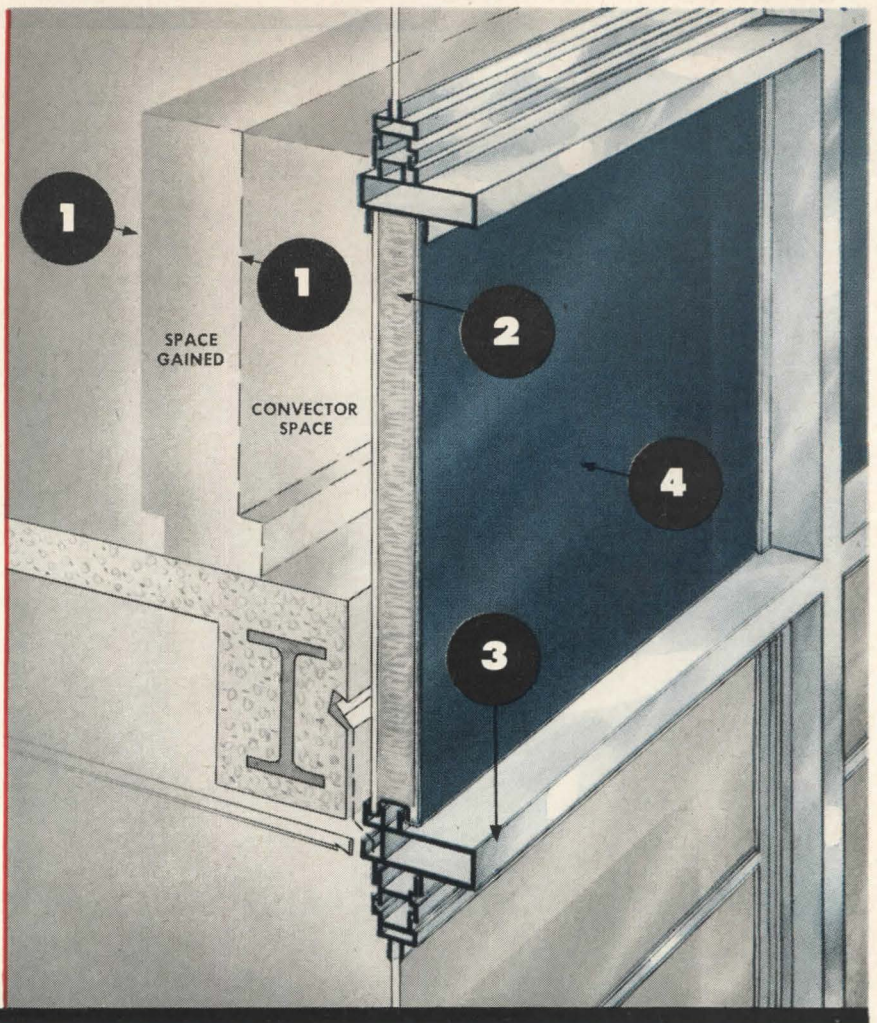
The central attraction at the convention was a large panel discussion on "Manufacturers' Literature — From Mail Basket to Waste Basket," moderated by Robert E. Burns, San Francisco attorney. The 20-member panel made the familiar comments on the desire of architects for more technical information in advertising.

At a public relations panel, of which Everett Parks, head of the council's public relations committee, was chairman, it was decided that the official annual publication *The California Architect* would become a quarterly magazine edited for the public. The first issue is scheduled for publication in April 1955; 30,000 copies of the magazine are to be distributed free in such places as "bus stations and doctors' offices."

Other panels at the convention covered residential construction, school building, hospital relations, commercial and industrial relations and governmental relations.

A total of 700-750 participants were registered at the meeting, although only 180 of these were architects.

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**T-10** (shown above): Complete insulating wall panel faced with lifetime, colorful porcelain enamel. Fiber glass core provides permanent thermal efficiency. Laminated construction maintains surface flatness... panel rigidity. Interior face... a surface for finishing as desired. Thickness: 1 and  $\frac{3}{8}$  inches to 2 inches. U-values: 0.20 to 0.14 Btu.

**T-20:** Insulated wall panel faced with porcelain enamel. Treated core provides structural and insulating qualities. Interior face of porcelain enamel or zinc-coated steel. Thickness: 1 inch to 2 inches. U-values: 0.28 to 0.15 Btu.



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Texlite's staff of registered architects and structural engineers are available for technical consultation. Texlite's skilled craftsmen and technical know-how assure maximum quality. Many of today's monumental buildings are being designed with "Texwall by Texlite."

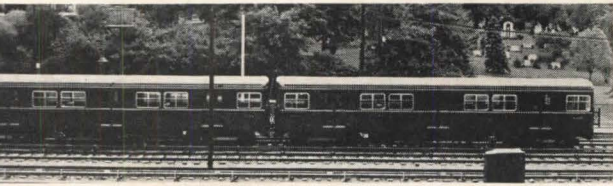
#### TEXTLITE, INC.

Manufacturers of quality porcelain enamel for the building industry

**GENERAL OFFICE:**  
3305 Manor Way, Dallas, Texas  
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Chicago, Denver, Houston, Tulsa,  
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IN OUR **75<sup>th</sup>** YEAR OF PROGRESS





*At left: cars for the new subway are painted bright red with yellow trim. Below: two of the 12 new stations—at left, the Wellesley Station; at right: the Davisville Station*



**THE SUBWAY BEAUTIFUL: TORONTO OPENS A NEW LINE**

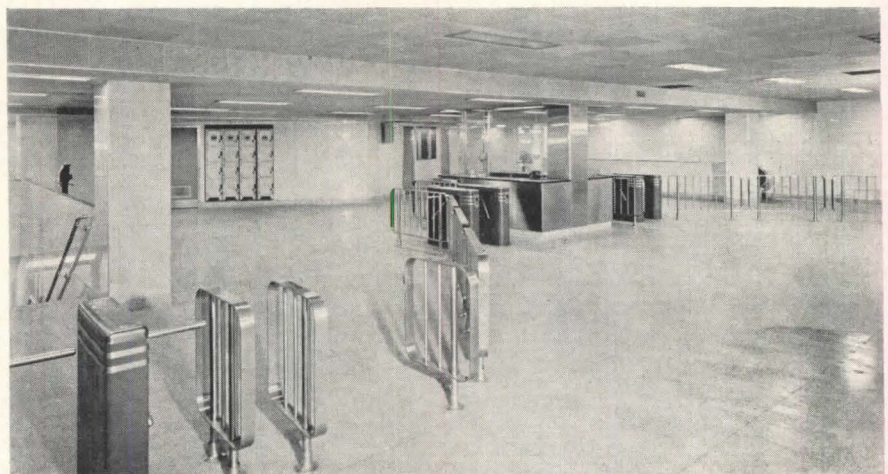
A SPANKING NEW SUBWAY was opened earlier this year by the Toronto Transportation Commission; the public, it has been reported, is responding with the enthusiasm of "a small boy with his first electric train." The project, which included 12 stations, had John B. Parkin and A. S. Mathers as architectural advisers to the Commission.

Flowers and soft colors are offered for the pleasure of the passenger. The flowers are planted along the banks of the open-cuts, used in some places instead of the deep tunnel; forsythia, lilac, weigela, japonica and verbena appear in season.

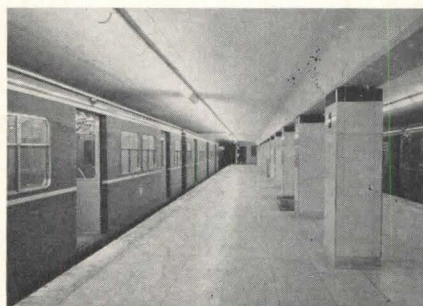
The walls of the stations are finished in opaque glass, which is yellow, green or gray. The trim colors selected were black and dark shades of red, green and blue, permitting a different color combination for each of the 12 stations. The terrazzo floors and the ceilings are slightly tinted to blend with the walls.

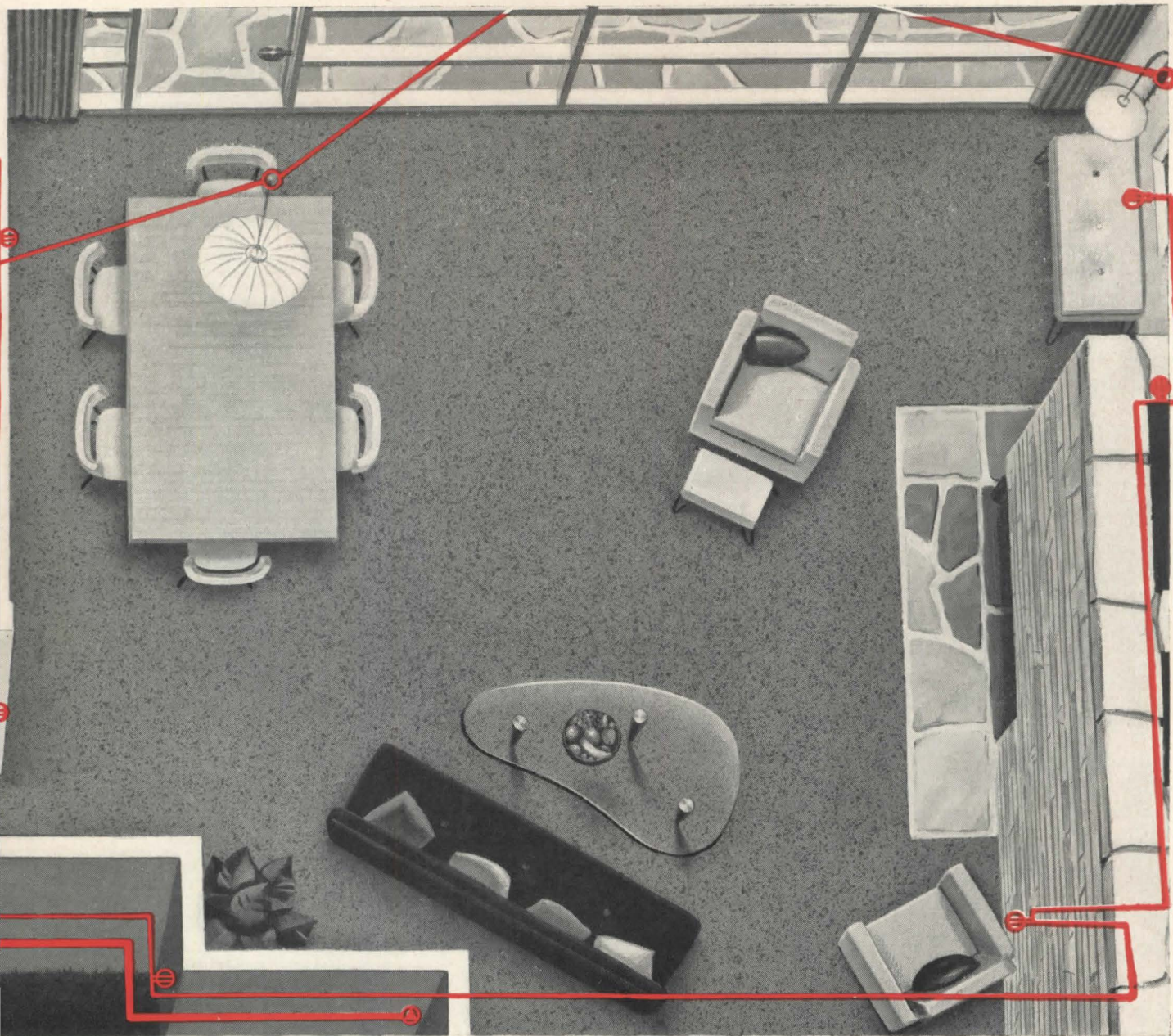
The seven stations which are built above ground are constructed with semi-glazed brick bearing walls, with supplementary concrete or steel columns. The street car and bus shelters which adjoin some of the stations are partly of corrugated glass and glass block.

*(Continued on page 30)*



*Above: control area in the College Street Station—control areas contain service rooms as well as public telephone, lockers and concessions. Below, left: continuous fluorescent fixture gives "ribbon" of light directly over the edge of the platform; platform flooring is terrazzo. Below, right: the interior of one of the new cars*





*of sound design . . .*

# **WIRING**

Today's electrically-minded homeowner demands the best of wiring and all it means . . . plenty of power just where and when it's needed for each and every appliance in the house. He will thank *you* for the functional planning which gives him this extra convenience and value *when* he buys the house and for *years afterward!*

Kennecott Copper Corporation, 161 East 42nd St., New York 17, N. Y.

**SEND FOR FREE WALL CHART** showing typical loads and circuits for home wiring systems. You'll find it a handy check list when planning electrical requirements for any home. Just write Kennecott!

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**OFFICIAL FAVORS USE OF PRIVATE ARCHITECTS**

The Hon. Robert H. Winters, Minister of Canada's Department of Public Works, said recently that the government would continue to rely on private architects; he added that the department hoped to extend its employment of private consultants.

Speaking at a meeting of the Canadian Association of Purchasing Agents in Montreal, the minister said, "By combining the services of private architects and government-employed architects, we have been able to produce a greater volume of work with a minimum of government employees. . . . It is my hope that we can now carry this technique into the field of engineering



**Read Your Favorite Column**



As you well know, a lot of chairs are not designed to provide proper posture. Spot X-rays would tell the story.

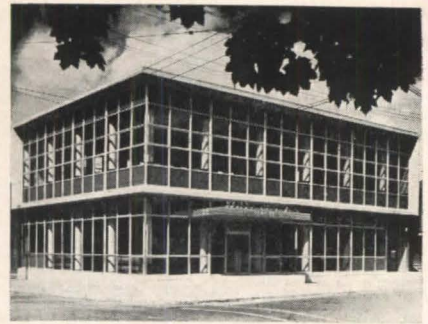
You will find that the No. 264 New Life Chair was designed with full consideration for the reader's comfortable concentration. The pitch of the back and the improved design of the saddle make it explicitly a reading chair. The 264 Chair will give you life-long satisfaction because,

***It Provides Correct and Lasting Comfort***



**JOHN E. SJÖSTRÖM COMPANY, INC.**

1722 NORTH TENTH STREET, PHILADELPHIA 22, PA.



*Building news from Quebec: above, the recently completed Caisse Populaire Notre Dame, in Hull, designed by architect René Richard; below: projected extension for the Montreal Children's Hospital (existing building is shaded in the drawing) for which McDougall, Smith & Fleming are the architects — the hospital also plans to build a nurses' home*



projects such as wharves, breakwaters, etc., and make fuller use of private consultants in that field."

Concerning the relationship of the government to the building industry, Mr. Winters said that the Department of Public Works can act both as a control and as a stimulator if its work is planned and implemented to the best advantage. "The difference between firmness and slackness in the economic condition of an industry is often not very great," he remarked, "especially where the utilization of tradesmen is concerned. \$100 million of construction superimposed on an industry already working to capacity might cause pressures harmful to the overall economy, whereas \$100 million of work added to the industry at a time when it tends to be a little slack might be just the kind of economic medicine required."

**SEASONAL UNEMPLOYMENT SCORED BY C.C.A. HEAD**

Members of the building industry were urged by Raymond Brunet, O.B.E., president of the Canadian Construction Association, to make an effort to spread construction work more evenly through-

*(Continued on page 32)*

# NEW WATER HEATER FOR THE BIG JOBS!

(Something New in Burkay)

## A.O. Smith Burkay "718" HIGH RECOVERY WATER HEATER

Now in one compact package—the gas-fired water heater of the Industry—the New A. O. Smith Burkay "718": 403 gallons per hour at 100-degree temperature rise, 420,000 BTU per hour—twice the size of former models! Here is a *big* heater for your big jobs. It opens the door to many new applications for commercial water heating. A real opportunity for you to include this outstanding water heater in your new commercial and industrial building designs. The "718" is another quality product of A. O. Smith research . . . fully guaranteed. It is ideal for large restaurants, laundries, apartment buildings, swimming pools, industrial plants, and a host of other places.

The Burkay "718" has a lot to offer, unmatched in the trade—a water heater with twice the capacity of former models, thereby reducing the expense of multiple heater connections; especially designed as a straight Recovery Heater and for the patented A. O. Smith Booster-Recovery Two-Temperature System. It incorporates in its design the time-tested, exclusive, plus features found in other A. O. Smith Burkay heaters—copper construction for clean, rust-free hot water; sturdily designed for long, service-free life; patented burner, and the special heat exchanger for remarkable operating economy and instant heat response to hot water demands.

It will pay you to see this outstanding new addition at your A. O. Smith distributor or write for full details.

**"Plenty of Hot Water Pays All Ways"**

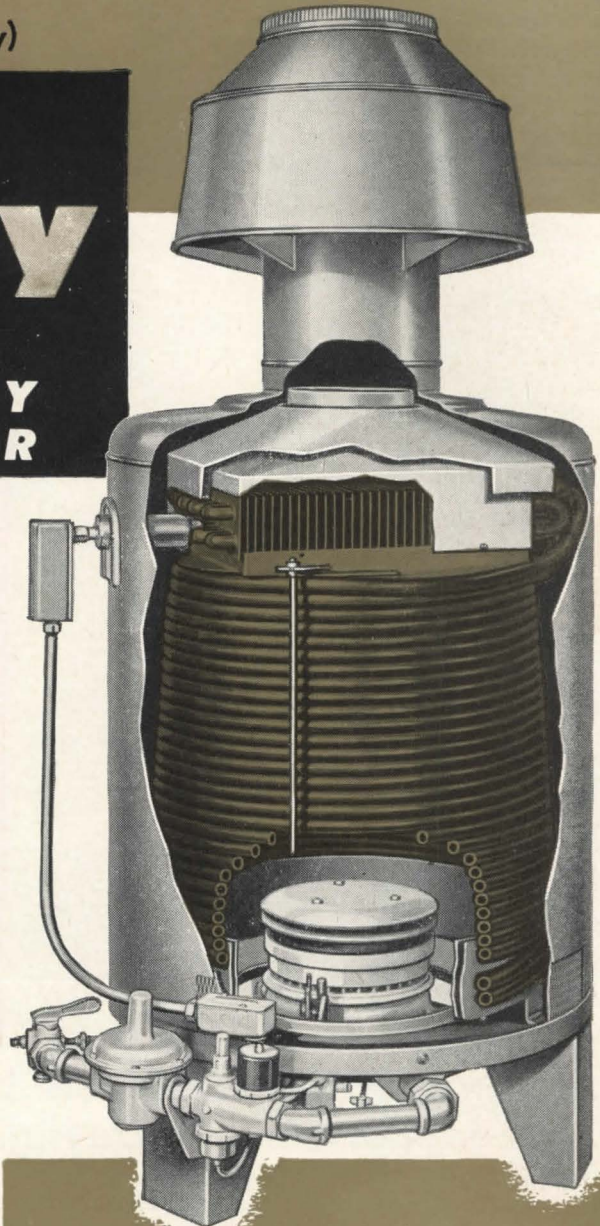
Investigate, today, the many advantages of the "Gas Way" to heat water more quickly with this clean, economical fuel!

Through research  . . . a better way

# A.O. Smith

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PERMAGLAS DIVISION • KANKAKEE, ILLINOIS



**WRITE, TODAY, FOR FULL DETAILS**

about the new

**A. O. Smith Burkay "718" Water Heater**

A. O. SMITH CORPORATION

Permaglas Division, Kankakee, Illinois, ARCH R, 11-54

Gentlemen: Please send me, today, full details on the "718."

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Company.....

Address.....

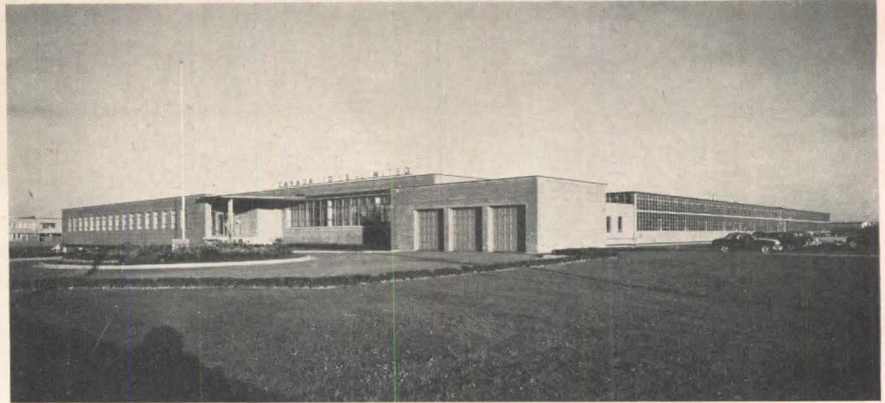
City.....Zone.....State.....

CANADA

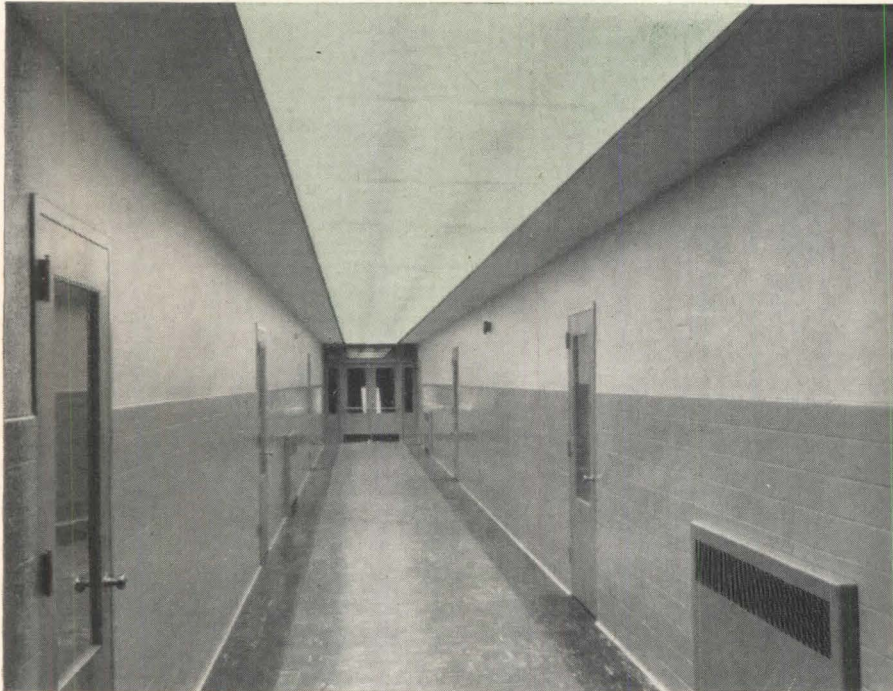
(Continued from page 30)

out the year. Mr. Brunet cited as an example the government's policy of scheduling its public works to provide maximum employment in the winter.

Pointing out that construction payroll strength in February averages less than three-fourths that of September,



The new factory for Canada Foils Ltd. was recently opened in Scarborough Township, Ont.; architects were Allward & Gouinlock of Toronto



Corridor of the new Memorial Park Elementary School in Rockland, Mass., brightly daylighted with a continuous skylight of Resolite translucent structural panels. Architect, Charles E. Cole, 2nd, A.I.A.

## Resolite Translucent Panels Specified For Modern School Daylighting

Resolite skylights and sidewalls are installed at half the initial cost of conventional glazing. They eliminate reglazing, since this fiberglass-reinforced, polyester material is shatterproof and crackproof.

Resolite needs no finishing, no maintenance. It resists weathering by heat, cold and moisture . . . is rot-proof and rust-proof.

Classrooms and corridors daylighted with Resolite are flooded with a soft, diffused light. This light has a high level of intensity and is evenly distributed (via thousands of tiny glass fibers) over an entire area.

Other advantages of Resolite include: light weight, high strength and easy installation.

For more information about Resolite school uses write:

**RESOLITE Corporation**

Box 518, Zelienople, Pa.

Mr. Brunet suggested that in many types of building construction it should be possible to time framing and wall erection to achieve enclosure by late fall, so that interior work could be done from November through March.

Mr. Brunet also remarked that owners and builders should give more consideration to the economic desirability of winter construction operations.

### MILITARY CONSTRUCTION SLATED FOR CUT IN 1955

The amount of military construction will drop by about a third in fiscal 1954-55, it has been announced by R. G. Johnson, president of the government-owned Defense Construction Ltd. Mr. Johnson estimates that his organization's spending this year may drop to \$90,000,000, a decrease of \$45,000,000 from last year's figure. This will be the second consecutive annual decline from the peak of \$220,000,000 reached in 1952-53.

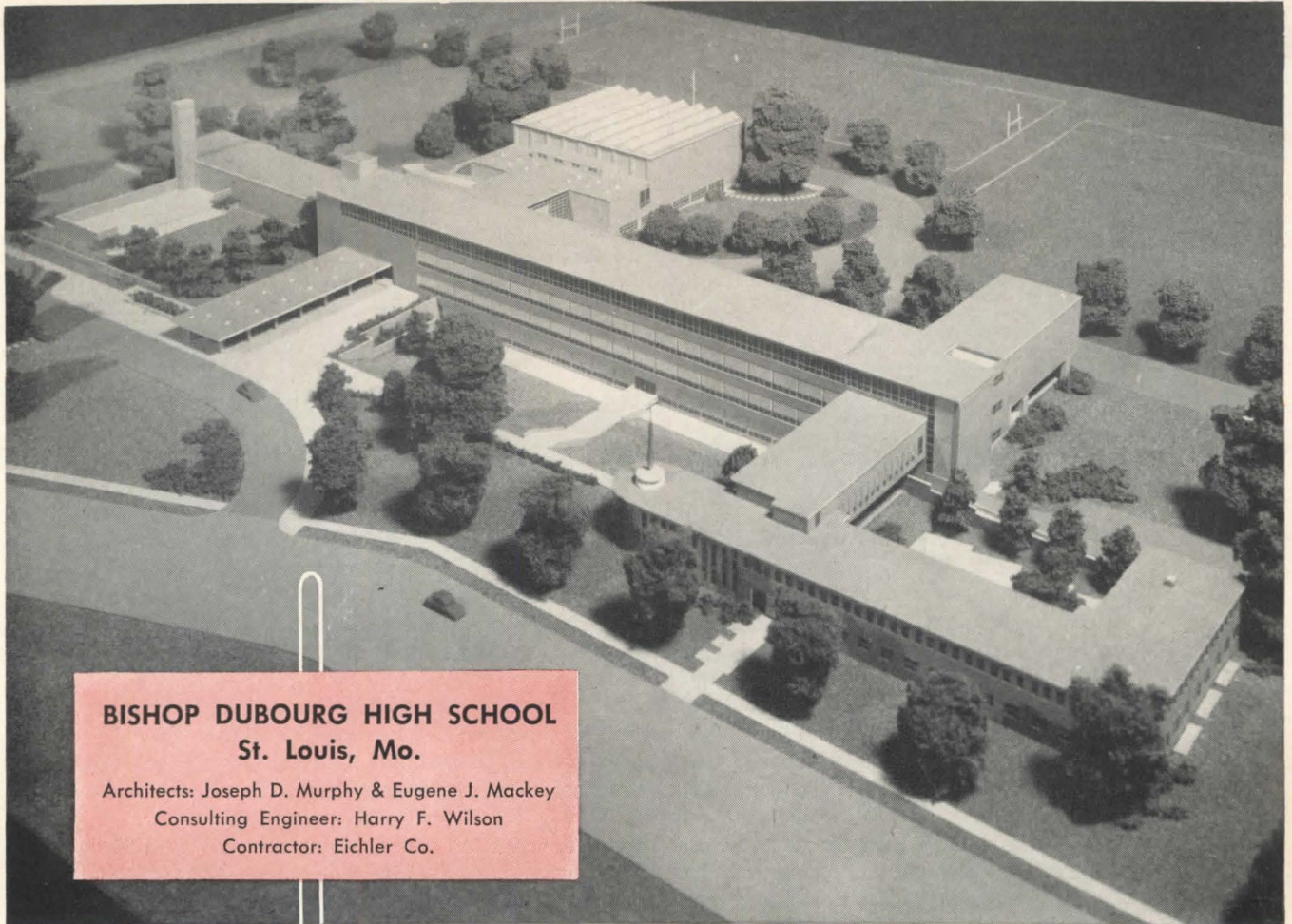
Mr. Johnson says that the reason for this drop is that most of the major Air Force projects are nearing completion.

### CONTRACT AWARD FIGURES SHOW DROP IN SEPTEMBER

Construction contract awards for September, which totalled \$180.6 million, dropped \$28.7 million below the total for September 1953, according to MacLean Building Reports. Although residential contracts rose 102 per cent, all other categories showed decreases, the most marked being a 70.1 per cent decline in engineering contracts. MacLean's blamed this fall-off on a lack of large individual projects rather than a general decline in activity.

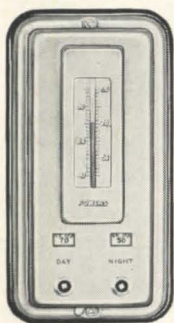
(Continued on page 36)





**BISHOP DUBOURG HIGH SCHOOL  
St. Louis, Mo.**

Architects: Joseph D. Murphy & Eugene J. Mackey  
Consulting Engineer: Harry F. Wilson  
Contractor: Eichler Co.



173 POWERS Day-Night  
Thermostats  
control 226 valves on  
Convectors and 69 Unit  
Ventilators.

**Another Outstanding Modern High School**

**POWERS** *Controlled*

Among the many economical features included in the unique four story \$3,000,000 Bishop DuBourg High School is a Powers pneumatic system of temperature control.

**Superiority of Powers Unit Ventilator Control** here will not only provide greater comfort but will hold down operating costs. Its continuous dependable operation is due to the basic simplicity of

Powers Low-Limit Airstream Thermostats. They need no auxiliary devices to supplement their accurate control of Unit Ventilator discharge temperatures. Their adjustable sensitivity gives precise control.

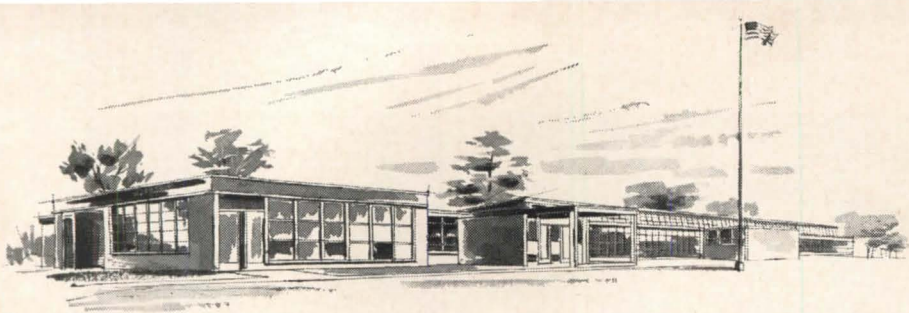


Powers control of unit ventilators and convectors results in greater comfort and fuel economy. With today's high fuel cost Powers temperature control is a more profitable investment than ever before.

When problems of temperature control arise contact Powers nearest office. Our more than 60 years of experience may be helpful to you.

(b7)

Established in 1891 • **THE POWERS REGULATOR COMPANY** • SKOKIE, ILL. • Offices in Over 50 Cities



**Architects:** *Barron, Heinberg & Brocato*

**General Contractor:** *J. E. Ratcliff*

**Acoustical Contractor:** *King & Co., Inc.*

*Ewell S. Aiken Elementary School, Alexandria, Louisiana*

## Sound conditioning makes advanced school design practical

The designers of Alexandria, Louisiana's Aiken Elementary School have combined sound conditioning and a unique design to provide improved classroom lighting and ventilation.

Clerestory windows of colored diffusing glass admit light into a corridor along the south side of the building. This light is transmitted into the classrooms through special louvered walls. Since each room is also designed with northern exposure, the result is a well-balanced lighting, free from shadows, high contrast areas, and glare.

The openness of this louvered wall construction might prove highly impractical were it not for sound conditioning. Ceilings of Armstrong Cushiontone Full Random extend from the classrooms through the louvered partition into the corridor. This permits light and air to reach the classrooms, but prevents corridor noises from disturbing busy classes and keeps classroom sounds from building up, too.

Cushiontone is an efficient, low-cost wood fiber acoustical material. Its exclusive "Full Random" pattern of perforations is smart looking and modern, subdues the "tile" effect. Cushiontone has a washable white finish which can be repainted whenever necessary without losing its noise-muffling effectiveness.

See your Armstrong Acoustical Contractor for full details on Cushiontone and Armstrong's entire line of sound-conditioning materials. For the free booklet, "How to Select an Acoustical Material," write Armstrong Cork Company, 4211 Rock St., Lancaster, Pa.

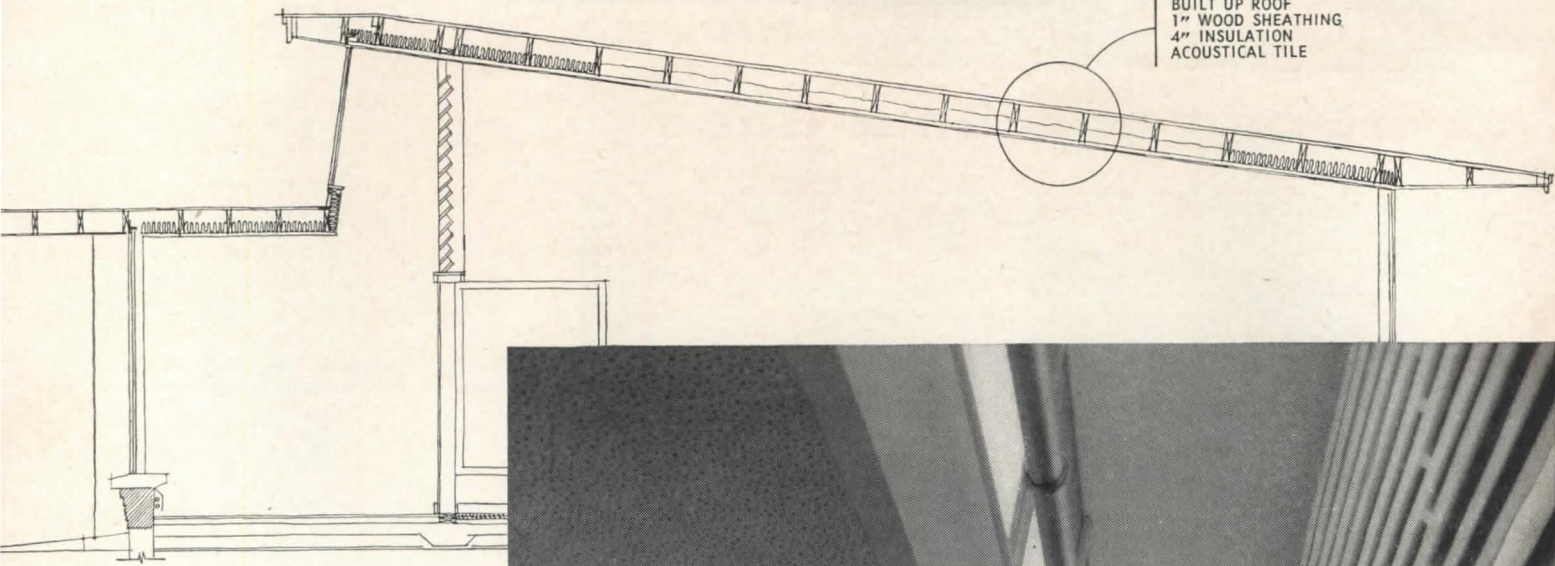


Low in both material and installation costs, Armstrong Cushiontone is often the choice where strict budgets must be met. Cushiontone's high acoustical efficiency promotes a comfortably quiet atmosphere for study that is beneficial to both student and teacher.

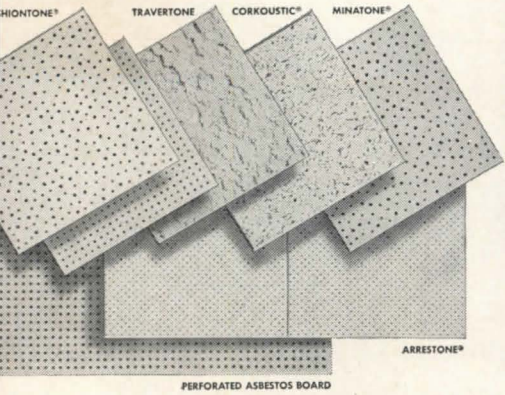
Cushiontone's Full Random pattern of perforations produces a continuous ceiling appearance instead of the usual "tiled" effect. Noise-absorbing Cushiontone can also be repainted to blend with any desired interior color scheme without loss of acoustical efficiency.



BUILT UP ROOF  
 1" WOOD SHEATHING  
 4" INSULATION  
 ACOUSTICAL TILE



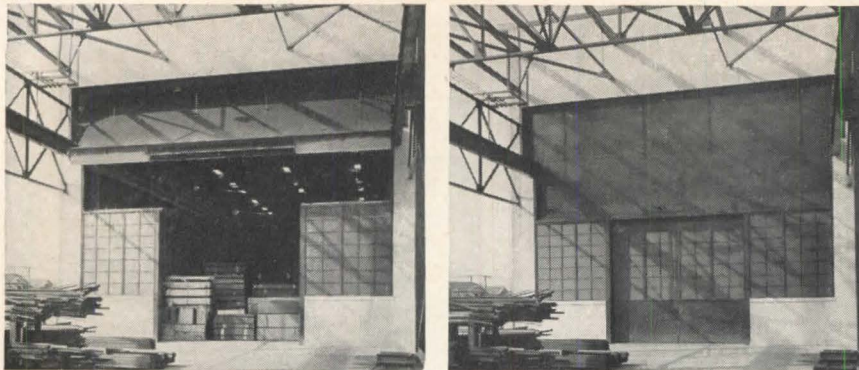
Extending from the classrooms through the louvered partitions, the Cushion-tone ceiling is dropped to a height of 8' in the corridor. This allows a maximum amount of light and air to reach the classrooms through the louvers.



**ARMSTRONG ACOUSTICAL MATERIALS**

# CRANEWAY DOORS Provide

## Open and Shut Case



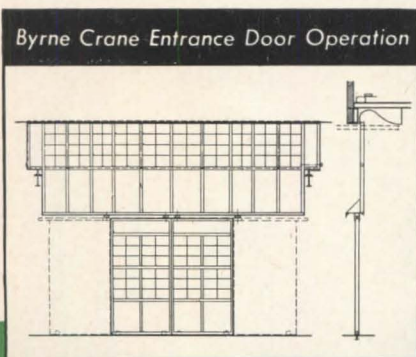
Architect—Albert Kahn Associated Architects and Engineers, Inc.  
General Contractor—Maxon Construction Company, Dayton, Ohio.

... of increased working efficiency and reduction of heating costs!

**W**hen a craneway extends from inside a building to an outside railroad siding or storage yard it's an open and shut case that Byrne can provide the finest in a dependable closure. This craneway opening shown above provides a substantial reduction in heating costs with the added advantage of increased working efficiency.

Byrne crane entrances combine upward acting doors at the crane rails with swinging or sliding doors below. The upper door is always motorized, the lower doors may be specified for manual or motor operation. Interlocks insure complete safety, with automatic or selective controls located as desired.

Crane entrance doors are furnished in steel, or aluminum which is gaining increasing acceptance as a construction material. Windows may be installed as desired for consistent architecture.



For successful development of crane entrance doors, our engineering consultation is furnished without obligation.

**FOR INFORMATION** regarding Byrne doors and facilities consult Sweet's Catalog or write direct for our brochure.

## BYRNE doors, inc.

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101 Park Ave., New York 17, N. Y.  
Cafritz Bldg., Washington 6, D. C.

## THE RECORD REPORTS

### CANADA

(Continued from page 32)

The cumulative total for the year at the end of September, however, was still \$85.5 million ahead of the total for the first nine months of 1953.

#### Contracts Awarded: Comparative Figures Compiled by MacLean Building Reports (in \$ million)

	Sept. 1954	Sept. 1953	Change
Residential	89.7	44.1	+45.7
Business	56.6	61.5	- 4.8
Industrial	10.1	16.8	- 6.6
Engineering	24.0	87.0	-62.9
Totals	180.6	209.4	-28.7

#### LOW-RENT HOUSING PLAN CONSIDERED IN MONTREAL

Plans for an \$18,789,100 low-rent housing project have been submitted by Montreal's Consultant Committee on Slum Clearance and Low Rental Housing and are now being studied by the city council.

The plan calls for about 1300 dwelling units, to range in size from three to seven rooms each; provisions for a park and playground and a large parking lot are also included. Site preparation would require the widening of four streets around the development.

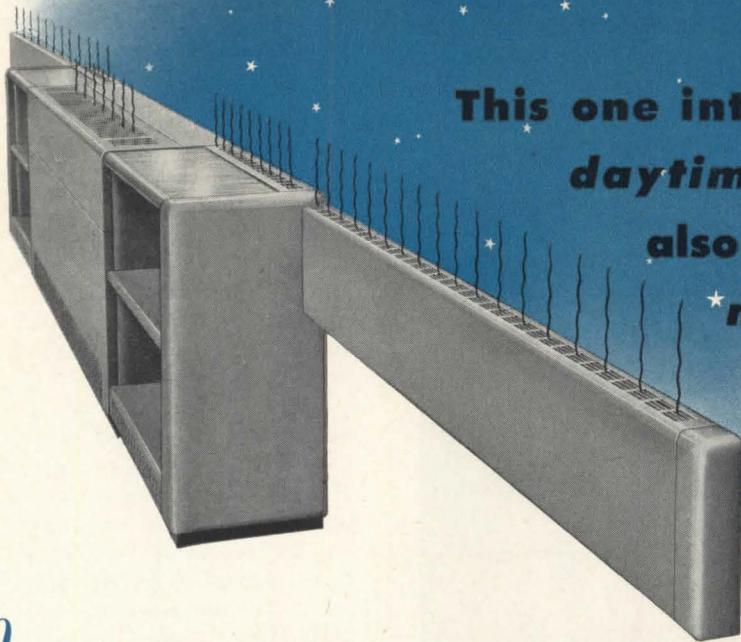
Financing of the project would be arranged under the National Housing Act, which offers a 75 per cent contribution by the Federal government.

(More news on page 38)

Plant for Ruston-Hornsby Ltd., manufacturers of diesel engines, was designed by Toronto architects Wilson & Newton; a British firm, Ruston-Hornsby established itself in Etobicoke Township to take advantage of eased currency control regulations



# Buy One and Get Two!



This one integrated system for daytime classroom comfort also maintains satisfactory nighttime temperatures without other investment!

IT IS generally agreed that classroom temperatures should be maintained at about 55° overnight and during periods of shut-down in cold weather. This permits quick recovery to comfort conditions and more stable control during the first hours of the next school day.

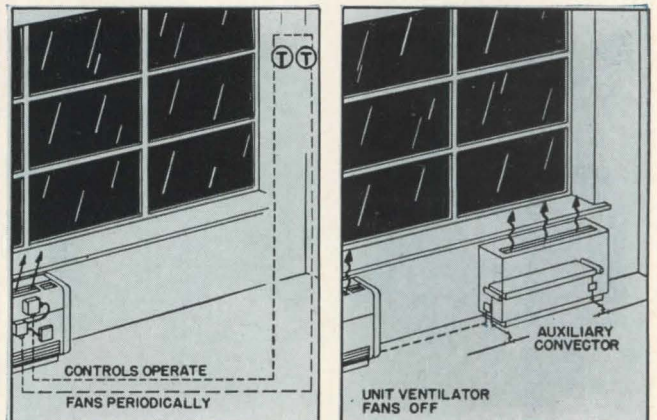
Cutting off the heat altogether, and letting the classroom temperature drop to 40° or 45°, makes the recovery difficult—particularly in restoring heat to the floor slab, walls, desks, etc.—and leads to morning room-temperature fluctuations, possible overheating, and abnormal bodily heat losses to surrounding objects.

In designing unit ventilator systems to maintain an optimum overnight temperature, either of two methods have been employed: a) operating the units as heaters (recirculation only) under thermostat control; or b) installing supplementary gravity heating with additional piping and controls.

Extensive field tests have proved that when Wind-o-line Radiation is integrated with Nesbitt Syncretizers, the combined gravity heating capacity is ample to maintain overnight temperatures of 55° in zero weather. Hence this one system that sets the standard for daytime performance eliminates the cost of separate provision in each room for maintaining overnight temperatures, and simplifies—for greater economy—the control of overnight temperatures from one location in the building.

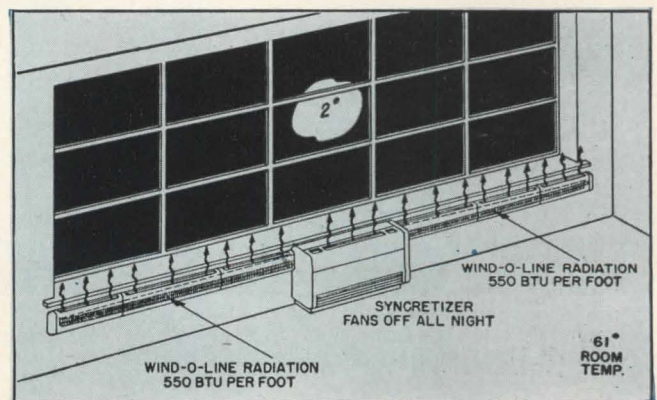
Get more for your school building dollar . . . go NESBITT.

Send for Engineering Report SL-6.



Added controls operate unit fans periodically through the night. Convector provides supplementary heat, but is not used during day.

ABOVE: THE OLD WAYS—BELOW: THE NESBITT WAY



Gravity heat of Syncretizer and Wind-o-line maintains satisfactory overnight temperatures—without additional equipment or controls.

## NESBITT *Syncretizer* WITH WIND·O·LINE

MADE AND SOLD BY JOHN J. NESBITT, INC., PHILADELPHIA 36, PA., SOLD ALSO BY AMERICAN BLOWER CORPORATION.

**FUNDS PROFERRED STATES FOR SCHOOL CONFERENCES**

IT'S UP TO THE STATES to make the next move in the Eisenhower Administration's program for solving what Secretary of Health, Education and Welfare Oveta Culp Hobby calls "the grave and complex educational problems" facing the nation, among them, as Mrs. Hobby notes, the "growing shortage" of educa-

tional facilities. Governors and chief school officers of all the states and territories have now been officially notified of the Federal grants made available by the last session of Congress under Public Law 530 "to assist each State to bring together, prior to the White House Conference on Education, educators and other interested citizens to discuss educational problems in the state and make recommendations for appropriate action

to be taken at local, state and Federal levels." The grants, apportioning the \$700,000 provided in the law according to population, range from the statutory minimum of \$5000 (Idaho, Montana, New Hampshire, New Mexico, North Dakota, Rhode Island, Utah, Vermont, Wyoming, District of Columbia, Alaska, Hawaii and the Virgin Islands) to \$61,-426 (New York). For a state or territory to receive its grant the Governor or his designated representative must "undertake to accept and use the funds authorized."

Neil H. McElroy, president and director of the Procter and Gamble Company of Cincinnati, has been named by President Eisenhower as chairman of the White House Conference on Education to be held in 1955 following the state conferences. An additional \$200,-000 was appropriated by the Congress for the White House Conference.

**Building Need: \$15 Billion**

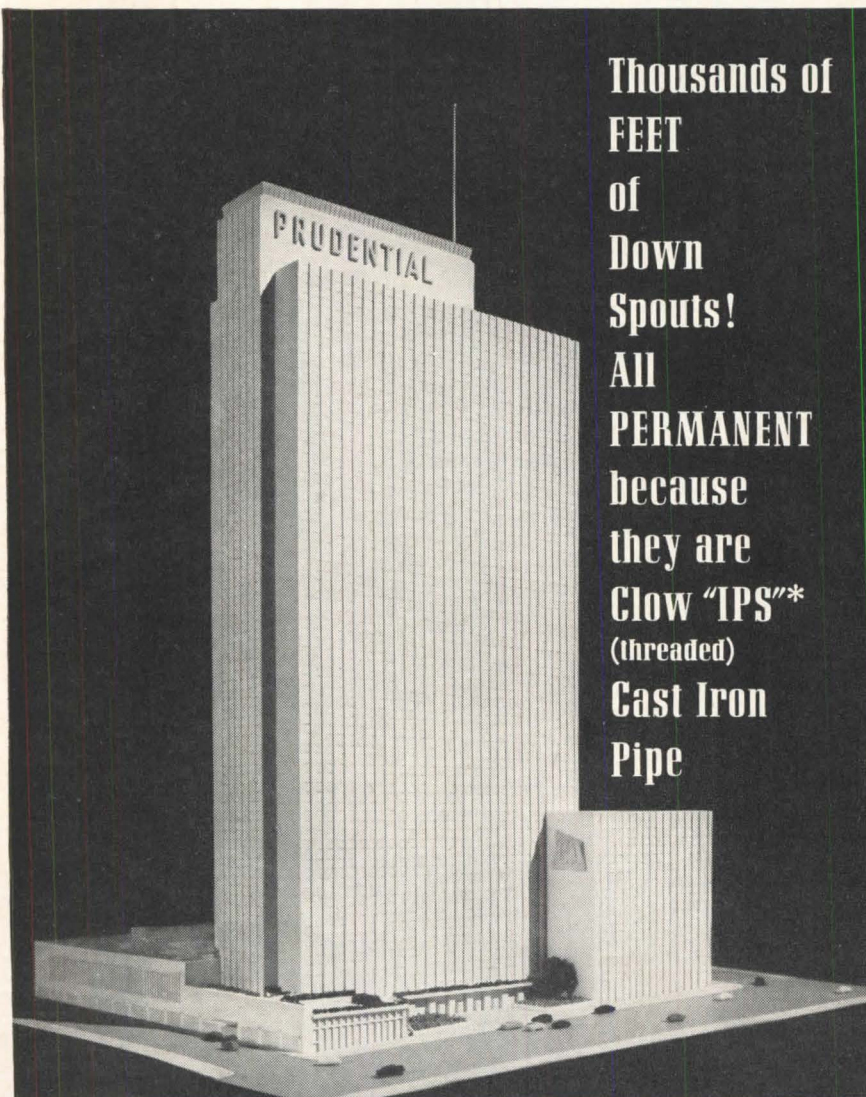
The Administration's conference program was defended by U. S. Commissioner of Education Samuel Brownell in hearings this fall of a House of Representatives education subcommittee headed by Representative Kearns of Pennsylvania. The National Education Association was once more contending that Federal funds must be made available for school building if the 720,000 classrooms and related facilities N.E.A. estimates will be needed during the next five years are to be built.

Commissioner Brownell, acknowledging that an expenditure of \$15 billion will be required to meet even the present deficit of 370,000 elementary and secondary classrooms, reiterated the Administration position that this expense must be met largely by local and state funds.

N.E.A. insisted that sufficient evidence is at hand at all levels of government to prove the need and that legislation should be enacted forthwith without further delay for studies.

"There has been enough fact finding and research," said Rex H. Turner, chairman of N.E.A.'s Legislative Committee. "Enough documents, statistics and charts have been exhibited. It is now up to this subcommittee and Congress to act promptly on legislation which will give our children the schools they need and deserve."

Mr. Turner estimated the current  
*(Continued on page 302)*



PRUDENTIAL MID-AMERICA HOME OFFICE, CHICAGO  
ARCHITECTS: NAESS & MURPHY • PLUMBING CONTRACTOR: M. J. CORBOY CORP.  
GENERAL CONTRACTOR: GEORGE A. FULLER COMPANY.

Clow "IPS"\* (threaded) Cast Iron Pipe is corrosion-proof, requires no replacement, no upkeep. Installation is fast, economical . . . permanent. In most instances it is specified for soil, waste and vent lines, and downspouts. Now in two new sizes—1½" and 2"—besides former 3" through 10" sizes.

**JAMES B. CLOW & SONS**

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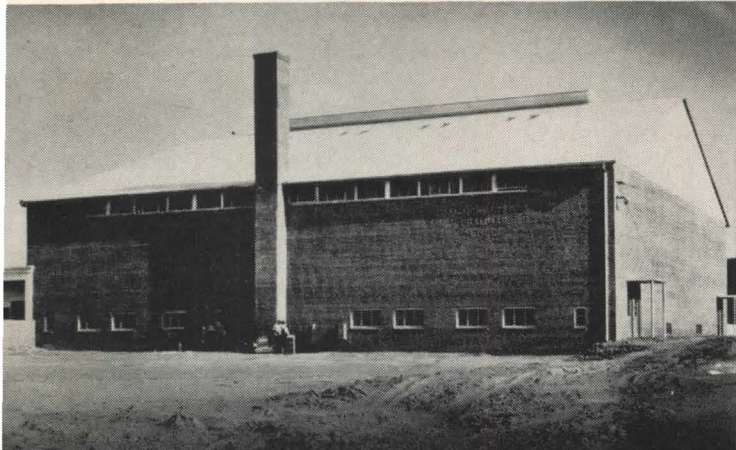


\*Iron Pipe Size, O.D.

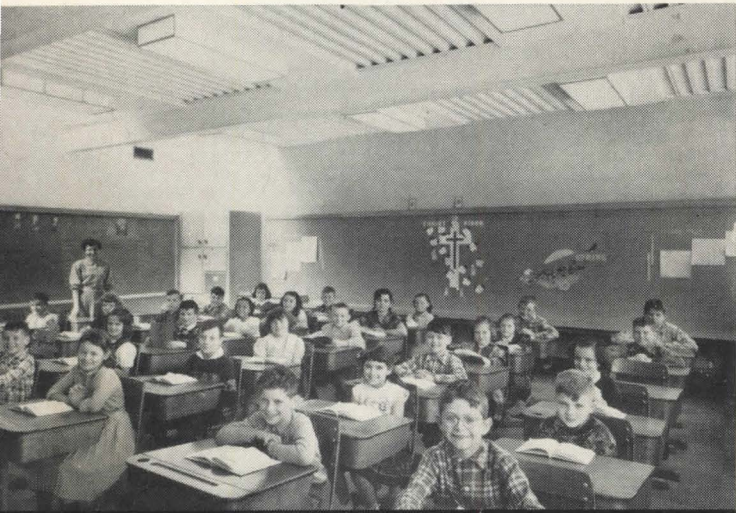
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# ROBERTSON

# products



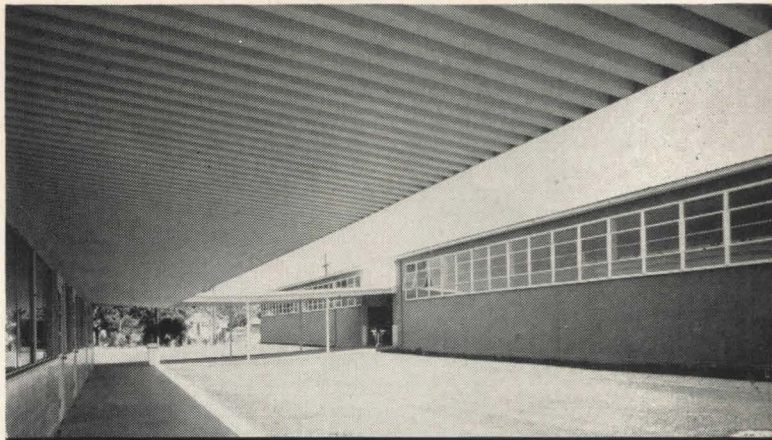
• **ROOFING AND VENTILATION** . . . Pitched roofs offer an opportunity to use Robertson Galbestos (zinc bonded asbestos protected steel) and Robertson Ventilators. This modern gymnasium designed by Gregson & Ellis, Atlanta, Ga., shows both of these cost-cutting Robertson products.



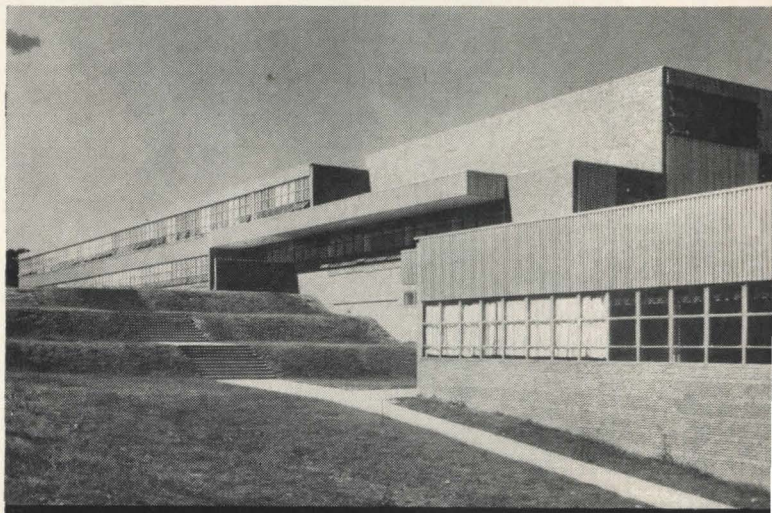
• **BI-LATERAL LIGHTING** . . . At the St. Thomas More School near Niagara Falls, Ontario (Arthur B. Scott & Associates, architects) Robertson Skylights give an assist to sash in classrooms. Robertson Q-Deck can be recognized as the roof construction.



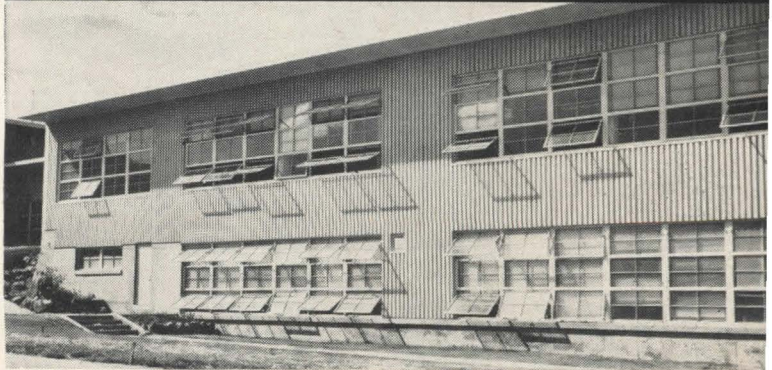
• **GLARELESS OVERHEAD LIGHTING** . . . There is no glare either to contestants or spectators when daylighting is handled like this. These are Robertson Corrugated Wire Glass Skylights at Herbert Hoover High School, San Diego, California.



• **CANTILEVERED CANOPIES** . . . Long span Robertson Q-Deck permits the long overhang desired for covered walkways. This fine example is by Gordon Stafford at his Lincoln (California) High School.



• **INSULATED WALLS — QUICK** . . . Robertson Q-Panels are dry, clean fast construction with unlimited architectural possibilities. Above, they are shown combined with masonry at the Booker T. Washington School at Shreveport, La. (Van Os & Flaxman, architects). Below, Q-Panels at the Carmichael School at Richland, Wash. (J. Gordon Turnbull, Inc., designer).



H. H. Robertson Co., 2404 Farmers Bank Bldg., Pittsburgh, Pa.

In England—Robertson Thain Ltd., Ellesmere Port

In Canada—Robertson-Irwin Ltd., Hamilton, Ont.

Please send catalogs on these **ROBERTSON PRODUCTS**

Q-DECK  Q-PANELS  GALBESTOS  SKYLIGHTS  VENTILATORS  SASH

Name.....

Address.....

CONSTRUCTION COST INDEXES

Labor and Materials

U. S. average 1926-1929 = 100

Presented by Clyde Shute, manager, Statistical and Research Division, F. W. Dodge Corp., from data compiled by E. H. Boeckh & Assocs., Inc.

NEW YORK

ATLANTA

Period	Residential		Apts., Hotels Office Bldgs. Brick and Concr.	Commercial and Factory Bldgs. Brick and Concr.		Brick and Steel	Residential		Apts., Hotels Office Bldgs. Brick and Concr.	Commercial and Factory Bldgs. Brick and Concr.		Brick and Steel
	Brick	Frame		Brick	Brick and Steel		Brick	Frame		Brick	Brick and Steel	
1930	127.0	126.7	124.1	128.0	123.6		82.1	80.9	84.5	86.1	83.6	
1935	93.8	91.3	104.7	108.5	105.5		72.3	67.9	84.0	87.1	85.1	
1939	123.5	122.4	130.7	133.4	130.1		86.3	83.1	95.1	97.4	94.7	
1940	126.3	125.1	132.2	135.1	131.4		91.0	89.0	96.9	98.5	97.5	
1946	181.8	182.4	177.2	179.0	174.8		148.1	149.2	136.8	136.4	135.1	
1947	219.3	222.0	207.6	207.5	203.8		180.4	184.0	158.1	157.1	158.0	
1948	250.1	251.6	239.4	242.2	235.6		199.2	202.5	178.8	178.8	178.8	
1949	243.7	240.8	242.8	246.4	240.0		189.3	189.9	180.6	180.8	177.5	
1950	256.2	254.5	249.5	251.5	248.0		194.3	196.2	185.4	183.7	185.0	
1951	273.2	271.3	263.7	265.2	262.2		212.8	214.6	204.2	202.8	205.0	
1952	278.2	274.8	271.9	274.9	271.8		218.8	221.0	212.8	210.1	214.3	
1953	281.3	277.2	281.0	286.0	282.0		223.3	224.6	221.3	221.8	223.0	
June 1954	285.2	278.1	293.6	301.8	295.4		217.2	216.5	221.4	223.4	223.4	
July 1954	285.6	278.3	293.9	302.1	296.6		217.9	217.4	221.5	223.5	223.6	
Aug. 1954	285.4	278.0	294.1	302.3	296.7		219.3	218.5	224.1	226.1	226.5	
	% increase over 1939						% increase over 1939					
Aug. 1954	131.0	127.1	125.0	126.6	128.0		154.1	162.9	135.6	132.1	139.1	

ST. LOUIS

SAN FRANCISCO

1930	108.9	108.3	112.4	115.3	111.3	90.8	86.8	100.4	104.9	100.4		
1935	95.1	90.1	104.1	108.3	105.4	89.5	84.5	96.4	103.7	99.7		
1939	110.2	107.0	118.7	119.8	119.0	105.6	99.3	117.4	121.9	116.5		
1940	112.6	110.1	119.3	120.3	119.4	106.4	101.2	116.3	120.1	115.5		
1946	167.1	167.4	159.1	161.1	158.1	159.7	157.5	157.9	159.3	160.0		
1947	202.4	203.8	183.9	184.2	184.0	193.1	191.6	183.7	186.8	186.9		
1948	227.9	231.2	207.7	210.0	208.1	218.9	216.6	208.3	214.7	211.1		
1949	221.4	220.7	212.8	215.7	213.6	213.0	207.1	214.0	219.8	216.1		
1950	232.8	230.7	221.9	225.3	222.8	227.0	223.1	222.4	224.5	222.6		
1951	252.0	248.3	238.5	240.9	239.0	245.2	240.4	239.6	243.1	243.1		
1952	259.1	253.2	249.7	255.0	249.6	250.2	245.0	245.6	248.7	249.6		
1953	263.4	256.4	259.0	267.6	259.2	255.2	257.2	256.6	261.6	259.7		
June 1954	265.2	258.3	264.3	273.6	265.9	257.2	249.5	263.3	270.8	265.8		
July 1954	265.9	259.3	265.2	274.9	268.3	258.5	250.9	264.0	271.9	267.8		
Aug. 1954	265.5	258.8	265.1	274.9	268.2	259.9	251.7	266.4	275.7	269.5		
	% increase over 1939						% increase over 1939					
Aug. 1954	140.9	141.8	123.3	129.4	125.3	146.1	153.4	126.9	126.1	131.3		

The index numbers shown are for combined material and labor costs. The indexes for each separate type of construction relate to the United States average for 1926-29 for that particular type — considered 100.

Cost comparisons, as percentage differences for any particular type of construction, are possible between localities, or periods of time within the same city, by dividing the difference between the two index numbers by one of them; i.e.:

$$\begin{aligned} \text{index for city A} &= 110 \\ \text{index for city B} &= 95 \end{aligned}$$

(both indexes must be for the same type of construction).

Then: costs in A are approximately 16 per cent higher than in B.

$$\frac{110-95}{95} = 0.158$$

Conversely: costs in B are approximately 14 per cent lower than in A.

$$\frac{110-95}{110} = 0.136$$

Cost comparisons cannot be made between different types of construction because the index numbers for each type relate to a different U. S. average for 1926-29.

Material prices and wage rates used in the current indexes make no allowance for payments in excess of published list prices, thus indexes reflect minimum costs and not necessarily actual costs.

These index numbers will appear regularly on this page.



# Gymnasium Grille

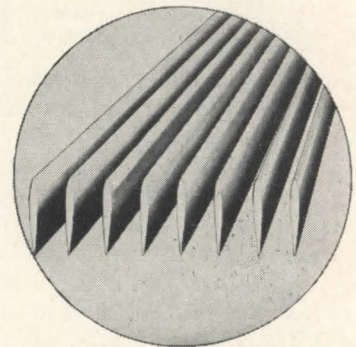
Here's a grille that's been especially customized for school and institutional application. It features *special built-in durability* to withstand gymnasium use and abuse. Made to give long efficient service under the most rugged conditions of bouncing basketballs, baseballs, jarring kicks, and bumps. Has smooth contours, no sharp corners or points. Is safety approved for school use. *Is simply so rugged it stops damage and replacement costs.*

Clean cut, compact, created to blend with the lines of modern school architecture. Available as grille face only (Model G-1) or grille face with attached volume controller (Model G-2).

The Volume Controller features the famous solid section, extruded aluminum, streamlined Airfoil louvers.

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## INTEGRATION IN THE SCHOOLS

*The Negro and the Schools.* By Harry S. Ashmore.\* *The University of North Carolina Press* (Chapel Hill, N. C.) 1954. 8½ in. by 11 in., 291 pp.

Reviewed by SAM T. HURST

In a field where knowledge and perspective are the beginning of tolerance but where emotion and tradition are overpowering, Mr. Ashmore has contributed a reference book for the great debates already raging and yet upcoming. This is not a controversial book, even though the writer suggests that the "recording of change can itself be controversial when emotions cancel out the laws of logic." Rather it is compelling in its objectivity, even perhaps dry in its devotion to statistics. It is, however, an encouragement to those who recognize that segregation as we know it must end but live so close under the shadow of white supremacy that the weight of contrary opinion becomes overwhelming.

Dedicated as he is to "bridging the world of ideas and the world of men through journalism" the author presents with clarity and without visible bias, the findings of more than forty scholars whose data are the essence of this work. It is to be hoped that some other host of dedicated men might bridge the gap between this book and the citizen, White and Negro, in whose heart, vote and pocketbook lies the ultimate answer to the problem of *The Negro and The Schools*.

Sponsored by the Fund for the Advancement of Education with the object of taking "a new and comprehensive look at the structure of bi-racial education in the United States," the project summarized by this book went forward in 1953 under the direction of the author, Harry Ashmore, and Philip Hammer.

Owen J. Roberts, former Associate Justice, United States Supreme Court and Chairman of the Board of the Fund states the principle of the study "not to undertake to argue the case for or against segregation in public education and in no sense become involved as an advocate on either side of the issues before the Supreme Court." Howard Odum, Professor of Sociology, University of North Carolina, John Griffin, Director of Community Educational Services, Emory University, Atlanta, and scholars of like stature gave to the Administrative and Field Staff of the project the quality of research necessary to insure the achievement of its high aim. Impartiality and objectivity notwithstanding, it is inevitable that this work lends the weight of evidence and the precedent of experience to support of the Supreme Court decision and the argument for integration in the public schools of the

nation. Thus, I surmise it will be a source of comfort to some and a body of fact to be conveniently ignored by others.

From the earliest attacks on its legality in 1849, bi-racial education is traced through civil war, reconstruction, world war, depression and industrialization. Always segregation is seen as a moral problem, hedged about by strong determinants, economic, social, legal and geographical. Largely, though not exclusively, it is shown as a Southern problem with Negro density and the legacy of deep feelings making it acute.

A landmark in legalized separation was the Plessy vs Ferguson case, 1896, which established by Federal sanction the "separate but equal" principle. As the public school system grew, "separate" was the doctrine while "equal" was forgotten.

For the recent effort toward equal but separate educational facilities the author credits a liberalizing of Southern attitudes, the influence of the church, and a coincident decade of liberalism in national politics. He quotes Ralph McGill, editor of the *Atlanta Constitution*: "Christianity cannot well afford to be on the wrong side of a moral force as it was in some areas when it defended slavery." I believe it should be made clear that these changing Southern attitudes have lain dormant lacking expression except under the stimulus of legal pressure. It is evident that expressions of this attitude came from many church conferences only after the Supreme Court ruling.

This book is a history, not a prologue. It does not predict the outcome of "private school" plans in the Southern states or of uneasy integration in other states. It does leave the reader with a statement of the issues of this day together with some essential facts which will help determine our direction:

1. "Certainly no white Southerner can ignore the abundant evidence that the walls of racial segregation are crumbling under persistent internal and external pressures. Yet the dominant white Southern attitude towards the process remains negative."
2. "The ratio of Negro to White population is not a final determinant of racial attitudes but it is perhaps the most powerful single influence for the practical results of de-segregation depend heavily upon it."

(Continued on page 48)

\* See NEWS section page 24

G. E. has the answer to air conditioning problems in any office, store or factory

# General Electric trained experts help Washington builder "custom-fit" air conditioning to needs of each floor



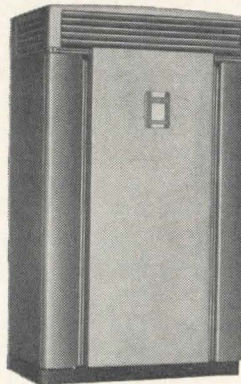
**NEW 14-STORY OFFICE BUILDING** at 1413 K Street, NW, Washington, D.C. A 15-ton G-E packaged air conditioner on the first floor, 7½-ton G-E units on the next three floors, and one 10-ton G-E conditioner on each of the top 10 floors provide dependable air conditioning throughout the entire building. Designer-builder: J. B. Shapiro. Contractors: Shapiro Engineering Corporation. Consulting Engineers: General Engineering Associates.

Floor area alone is just the beginning when it comes to criteria for determining the amount of air conditioning to provide, and the best location for supply units. That's why J. B. Shapiro, Washington designer-builder, asked his local G-E air conditioning contractor to help him plan the "weather" for Washington's first 14-story office building. G-E trained experts took into consideration all the detailed factors that account for heat gains and losses—even exposure to sunlight, elevator traffic, and nature of tenants' businesses—before making recommendations that resulted in effective, low-cost air conditioning for each floor.

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General Electric Company

Commercial & Industrial Air Conditioning Dept., Bloomfield, N. J.

# Packaged AIR CONDITIONERS

*Progress Is Our Most Important Product*

**GENERAL  ELECTRIC**

## REQUIRED READING

(Continued from page 46)

3. "Finally there is the hard fact that integration in a meaningful sense cannot be achieved by the mere physical presence of children of two races in a single classroom. No public school is isolated from the community that supports it, and if the very composition of its classes is subject to deepseated and sustained public disapproval it is hardly likely to foster the spirit of united effort essential to learning. Even those who are dedicated to the proposition that the common good demands the end of segregation in education cannot be unaware that if the transition produces martyrs they will be young children who must bear the brunt of spiritual conflict."

Reading between the lines of *THE NEGRO AND THE SCHOOL* one feels all the tensions of a great problem and comes perhaps to understand the patience, moral courage and personal sacrifice required for its solution.

### PLANNING SCHOOL BUILDINGS FOR THE WHOLE CHILD

"*Indiana and the Midwest School Building Planning Conference Proceedings.*" Bulletin of the School of Education, Indiana University, vol. xxx, nos. 5 and 7. Division of Research and Field Services (Bloomington, Ind.) 1954. 6 in. by 9 in., 123 pp, \$2.00

This bulletin presents the proceedings of the 1954 Indiana and the Midwest School Building Planning Conference—the theme of which was "Planning for the Whole Child." The conference covered two major problems: Reorganization of School Districts and The Psychological Environment, and included speeches by 22 members of the education, publishing and architectural professions, on such topics as "the need for large sites," "the community concept of school reorganization," "visual appraisal of design factors" and "low-cost school buildings."

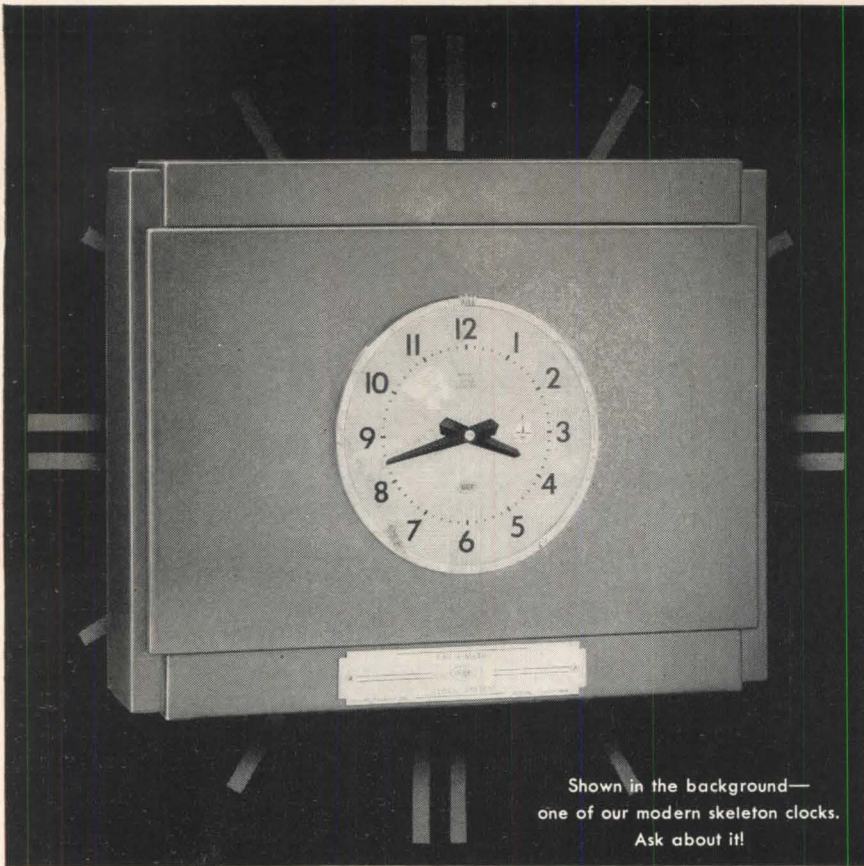
### "AIRCHITECTURE"

*Climate and Architecture.* By Jeffrey Ellis Aronin. Reinhold Publishing Corp. (New York, N. Y.) 1953. 8½ in. by 11 in., 304 pp, illus. \$12.50

"Airchitecture" is the designation which the author assigns to the designing and orienting of buildings with respect to climate. Good architecture, he asserts, must be concerned with the air, which has so much to do with making the climate in which we live.

In discussing the problem of designing buildings that are in harmony with the

(Continued on page 354)

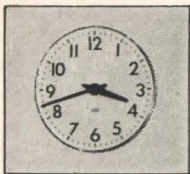


Shown in the background—  
one of our modern skeleton clocks.  
Ask about it!

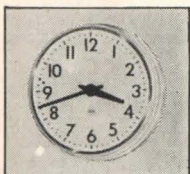
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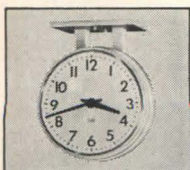
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Quality in appearance and performance have been designed into the new Far-a-matic clock controlled systems. Far-a-matic systems are available to meet all requirements—ranging from control units equipped with program mechanisms that operate signals, lights, utilities, etc.—to models designed for the smallest clock system.

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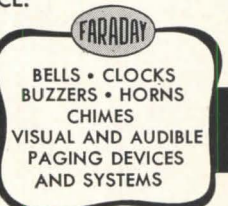
\*Patent applied for.

THE RIGHT FACE FOR ANY PLACE.

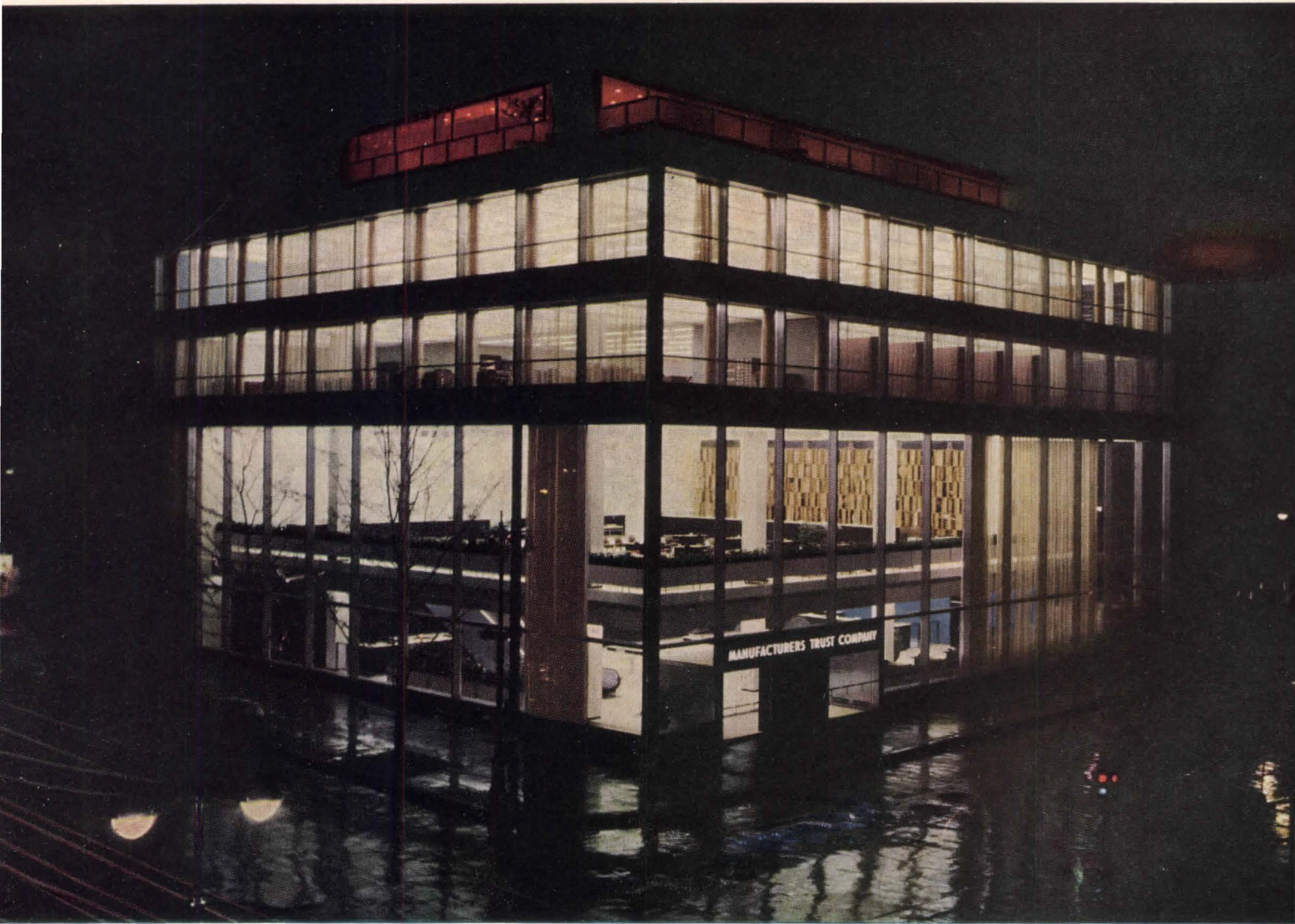
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## MANUFACTURERS TRUST COMPANY BUILDS CONVERSATION PIECE ON FIFTH AVENUE

New York's Glass-walled New Bank is Exciting Much Comment and  
Attracting Thousands of Visitors, as Owner and Architect Intended

*Skidmore, Owings & Merrill, Architects:*  
*Gordon Bunshaft, in charge of design*  
*William S. Brown, Coordination*

*Weiskopf & Pickworth, Structural Engineers*  
*Syska & Hennessy, Mechanical & Electrical Engineers*  
*Eleanor Le Maire, Interior Consultant*  
*Clarke & Rapuano, Landscape Architects*  
*George A. Fuller Construction Co., Builders*

**CONCEPT:** The new architecture is now at work for the Manufacturers Trust Company. The bank, in building a five-story, all-glass display case for a venerable business, recognized that public excitement is a tangible asset, and that truly distinctive architecture can create the most desirable kind of excitement. Not to mention that, along with its publicity value, good design also provides attractive and efficient space for carrying on a banking business. There is sufficient value here to justify the decision not to build a skyscraper, though to tell the truth this site, while extremely costly, was sufficiently restricted by both set-back regulations and deed restrictions on air-rights as to compromise its potentials for producing rental revenue from upper-floor space.

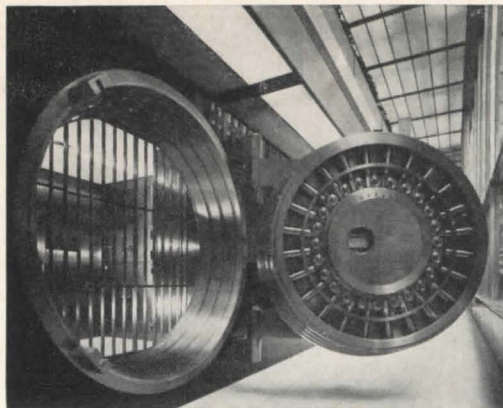
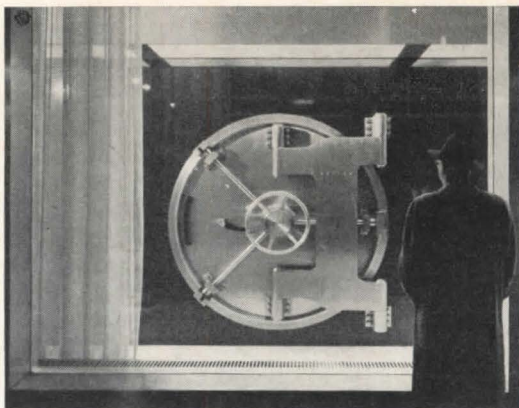
Since the building opened in October, thousands of people have yielded to its manifest invitation to enter, have remained to exclaim over its design, its lighting,

its modern sculpture, its "atmosphere," its huge vault placed as a window display. While some of the comments have indicated puzzlement, it has put the bank (and modern architecture) on everybody's tongue. It has become Fifth Avenue's conversation piece.

The more perceptive observer notes certain details which, though not as spectacular as the largest glass panels yet installed, do contribute to this building's impact. The precise pattern of vertical mullions, a pattern which changes subtly as the viewpoint moves; the horizontal rhythm of the glowing ceiling planes and the dark spandrels; the ordered precision of huge panels and of vast, bright open spaces within.

The delicate glass exterior was made possible by a system of two-directional cantilevered floor slabs supported by only eight interior columns. Since the glass curtain could *hang* in place, the mullions — thus in tension — could be of minimum cross-section.

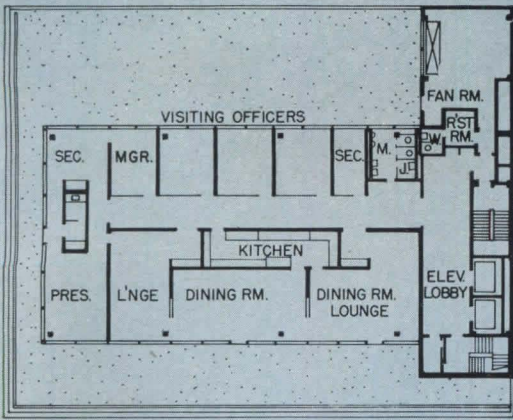




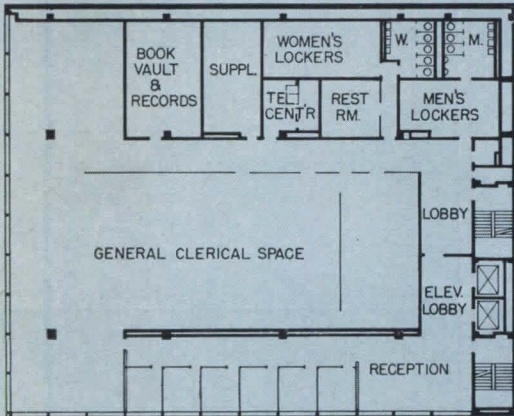
© Ezra Stoller

*The beautifully machined vault door, fashioned of stainless steel and polished bronze, was designed by Henry Dreyfuss, working closely with the architect and manufacturer's engineers. The 30-ton closure is so delicately balanced it can be swung by one finger*

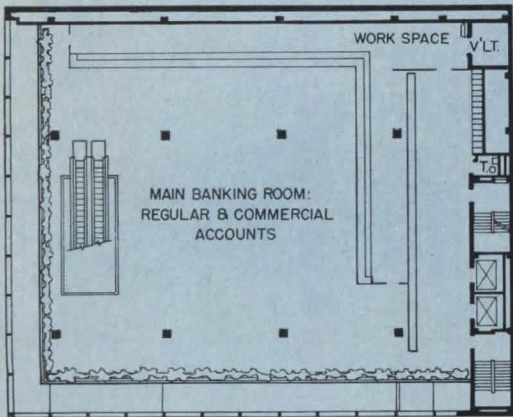




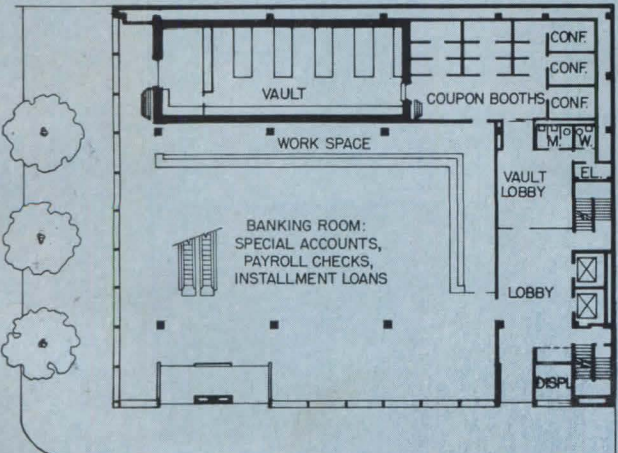
FIFTH FLOOR



THIRD FLOOR



SECOND FLOOR



FIRST FLOOR

0 10 20



**BANKING ROOM:** Interior interest centers on the second floor banking room, reached by electric stairway. This space makes a minimum of fuss about banking. The counter is here — 120 ft of it — and the officers too, but the atmosphere is one of almost classic serenity. The space is dignified yet lively; ordered but not forbidding. There is careful articulation of line, scale, color and material in floor, ceiling, counters and plant boxes; all serving as a foil for the feature at the rear.

Here, Harry Bertioia has created a spectacular backdrop for banking: the golden-yellow metallic screen, 70 ft long, which divides public and work spaces without destroying the area's essential unity.

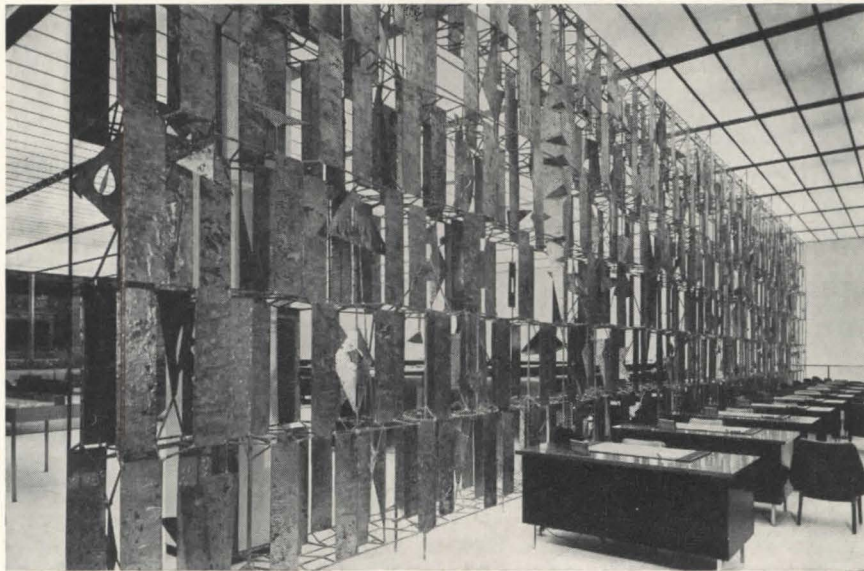
The open, flat-topped banking counter, of marble and macassar ebony, is both good looking and flexible, making provision for shifting tellers almost at will by means of movable deal plates and under-counter equipment.

The luminous ceiling surface consists of thin, milky-white, corrugated plastic sheets suspended in aluminum Ts.





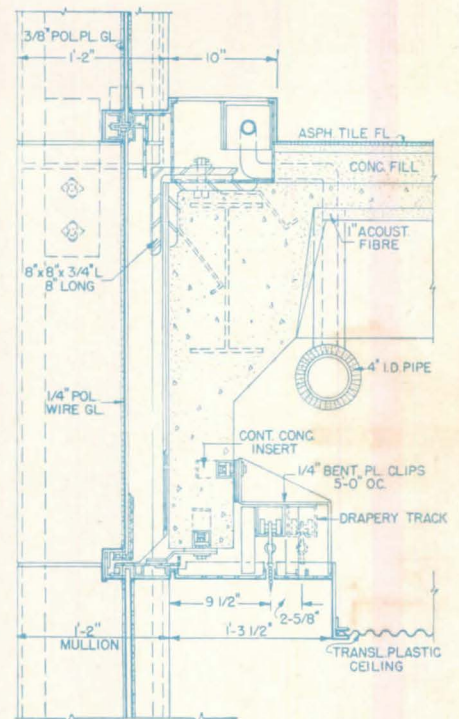
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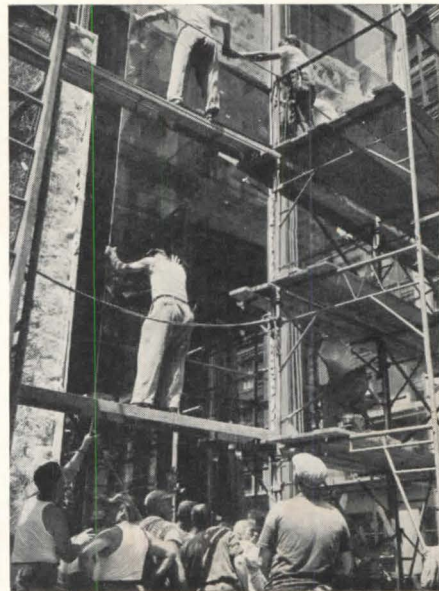
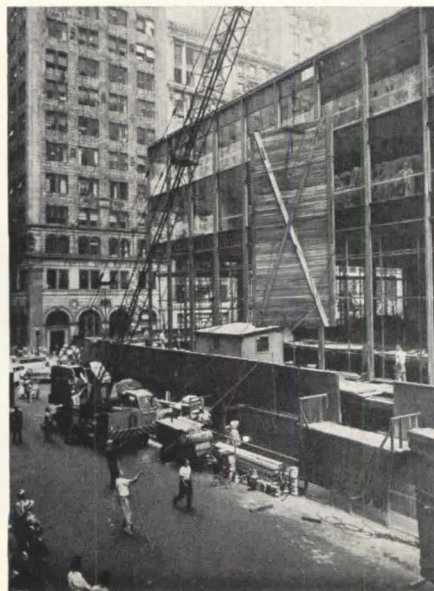
**THE GLASS SKIN:** Featuring the largest pieces of glass ever placed in a building — 10 by 22 ft, ½ in. thick, weighing 1500 lb. each — the exterior glass sheathing is a true curtain, with each aluminum panel mullion hanging from the cantilever edge above and with the glass free to “ride” in its surround as expansion and contraction occur.

Great precision was required in this building’s execution, both inside and out. Unlike traditional construction, in which a moulding covers joints, material

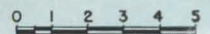
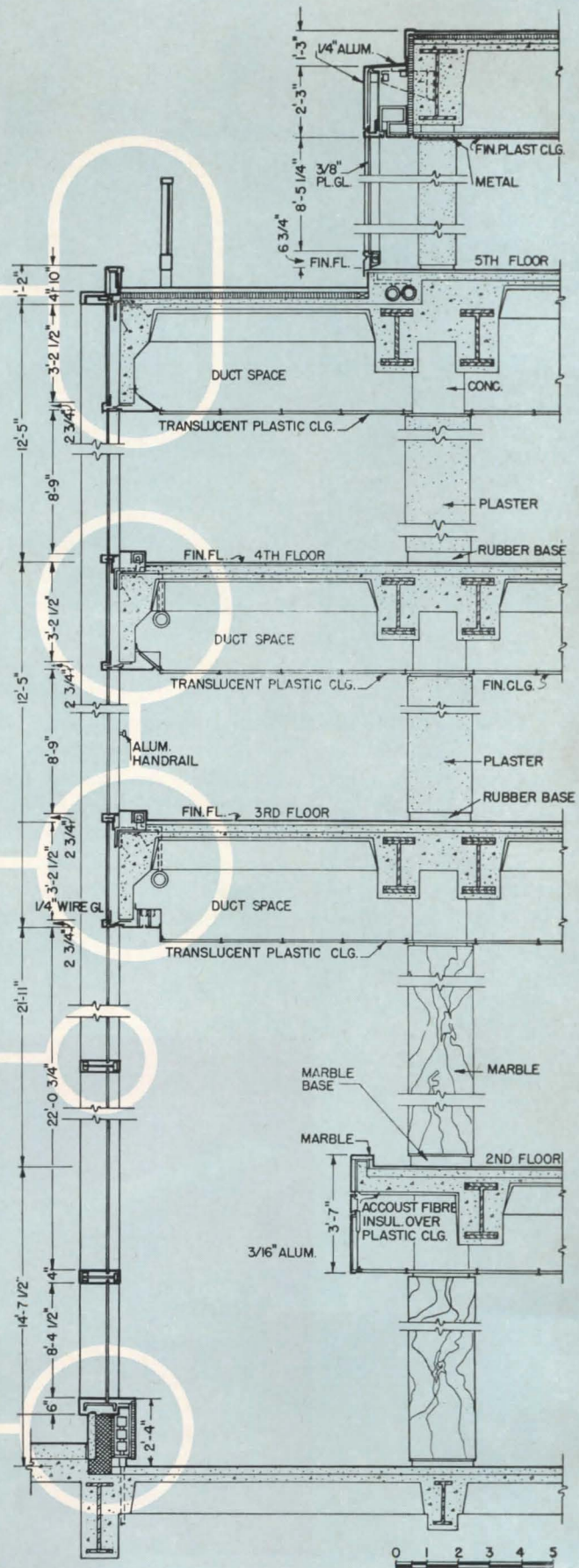
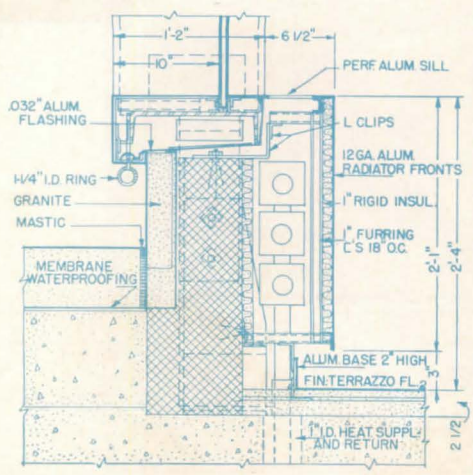
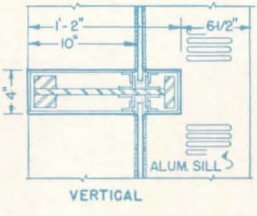
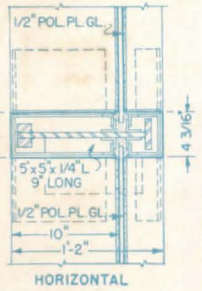
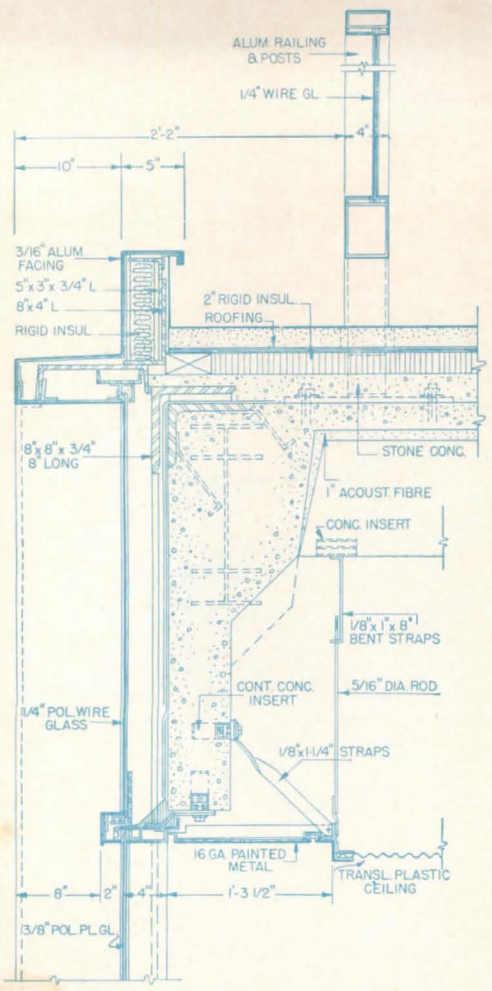
changes or joints are here typically detailed as “separation” or “cut-in fillets” which demand close tolerances, precise sizing and fitting, and careful coordination of trades on the job. The builder’s superintendent described this project as “more like jewelry than building.” The result, however, due to the architect’s attention to detail at every point and the builders’ skill in execution, is an outstanding example of the kind of refinement and precision possible in today’s construction — a far cry indeed from the crudeness of certain other times.

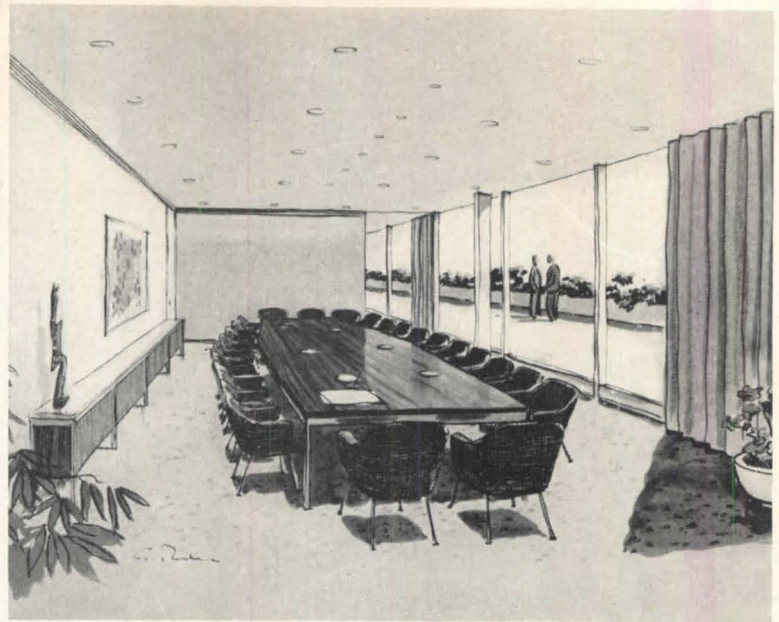
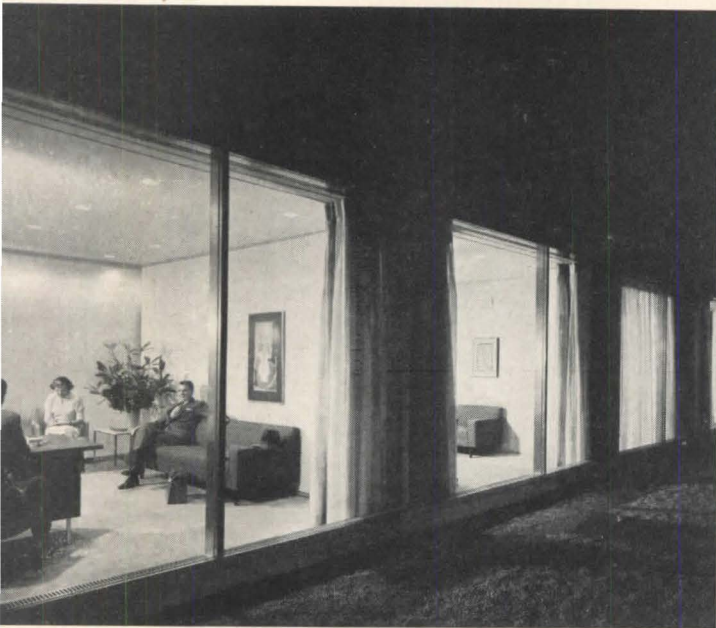


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**OTHER AREAS:** The fifth floor is devoted to both hospitality and business. An interesting feature is the group of three offices (above, left) for visiting bank officers and out-of-town customers and friends. Secretarial and telephone service goes with these offices, which orient south to the roof garden and are flanked by the manager's and president's offices (see plans, p. 152). Also on the fifth floor, the directors room (above,

right) can be converted into a dining room for special occasions. The macassar ebony table, which normally seats 25, may be contracted to accommodate 12 when small meetings are scheduled.

The employe's lounge (below) is located immediately below street level, and may be divided by the floor-to-ceiling curtain. When photos were taken, the annual exhibition<sup>m</sup> of employe's art was on display.



# TODAY'S HOUSE CLIENT IS PRACTICAL

## *Family needs and individual interests outweigh stylistic and technological considerations*

THOUSANDS OF YEARS AGO a man and a woman, tired of having the rain beat on their unprotected heads, set up housekeeping in a cave. Their friends, no doubt, soon came to call — and left quickly to seek caves of their own — *better* caves, of course.

From that day to this, would-be home owners have compared notes and pooled ideas, dreamed dreams, and worked hard to get what they wanted. In recent years they have discovered that technology has outwitted nature to the extent that they now can have any kind of house they want in any part of the world. Cape Cod cottages have sprung up in desert regions where their small rooms and low ceilings demand the utmost of air conditioning; flat roofs and window walls have become popular in areas where snow loads and below-zero temperatures are serious problems.

Common sense seems now to be on the up-grade: style is less often mentioned in client demands than good design and sensible planning. Today's house client, in all parts of the United States, is more likely to stress two or three of the items on the list at right than he is to insist on a hipped roof or a contemporary façade. Building costs are high, so he probably will request construction economies where possible. Furniture is expensive, so he most likely will want a maximum of built-ins. Servants are hard to get, and high-salaried: add to the requirements ease of maintenance and a well-arranged kitchen with easy access to dining area. These things, plus re-sale value, now are primary.

A more recent development is the increasing emphasis on simultaneous entertaining by various family groups, on adjustability to changing family needs, and on provision for family interests and hobbies. These requirements have become as basic as the ancient one of protection. House clients in Maine are asking for much the same thing as their cousins in Texas, Illinois and California. The problem for today's house architect, therefore, seems to be one of adaptation: of requirements to site and climate; of technology and materials to appropriateness and individual taste.

Here are seven houses which illustrate that point.

— *Florence A. van Wyck*

### THE EMPHASIS IS ON

Economy of construction

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Well-designed built-in furniture

---

Ease of maintenance

---

Provision for outdoor living even where climate requires protective devices

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Adjustability to changing family needs

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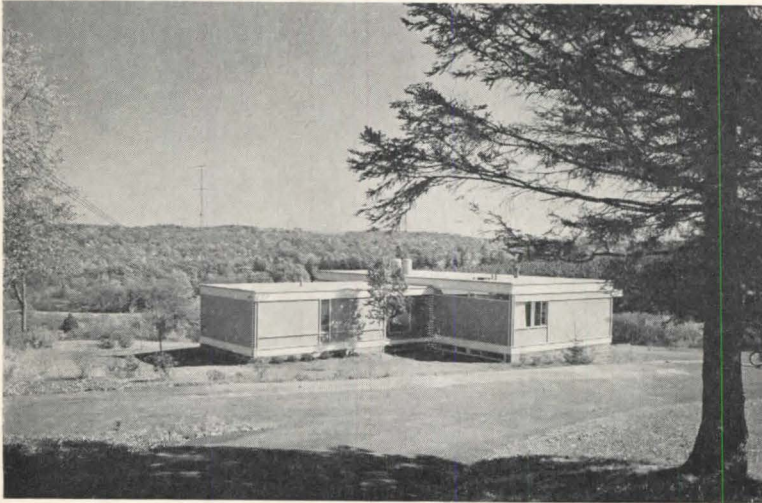
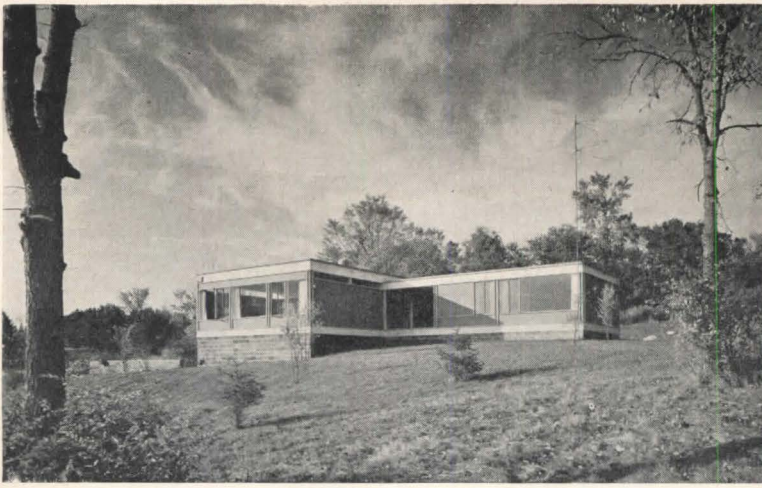
Provision for special interests and hobbies

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Provision for simultaneous entertaining by different generations

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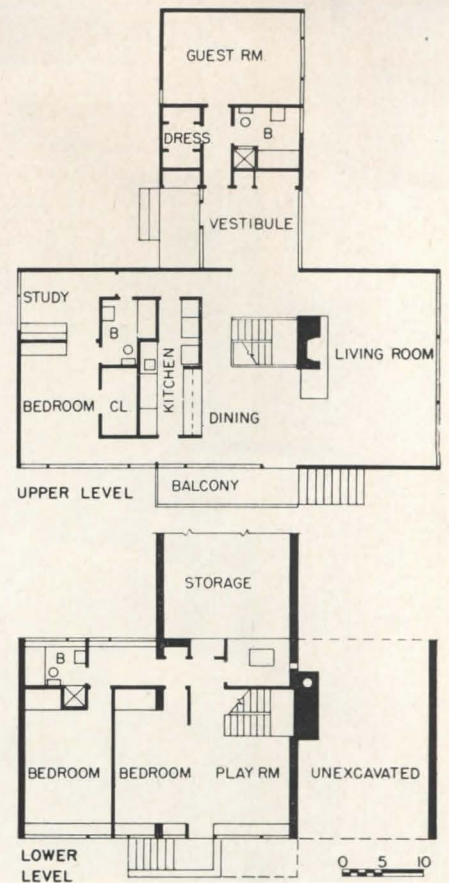
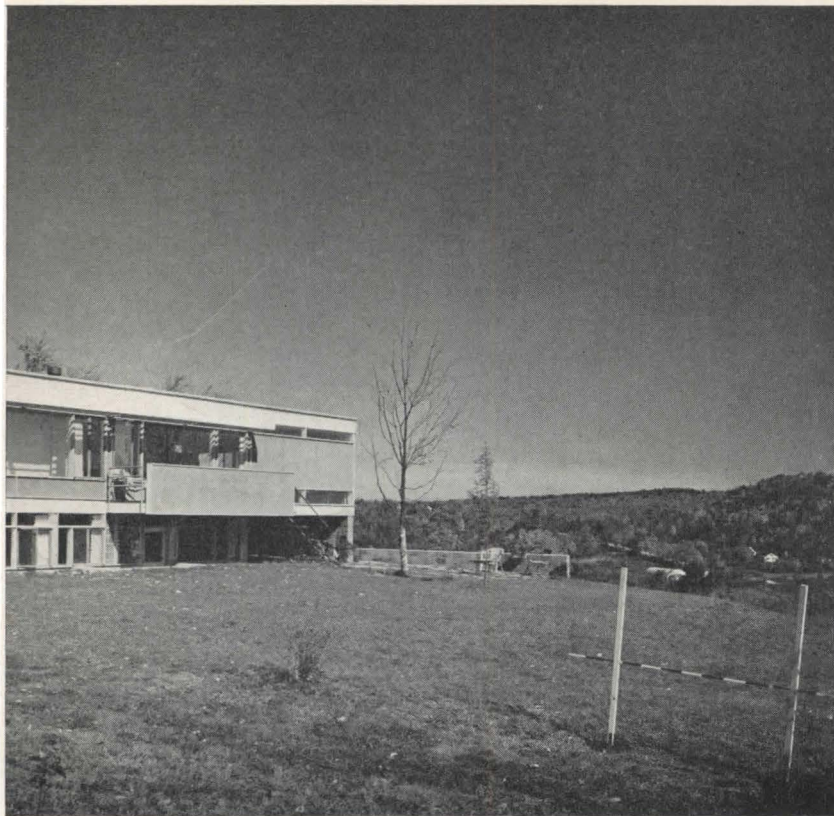
Kitchen and dining area arranged for easy access, easy entertaining



## A THREE-



*House is T-shaped, with lower floor of main element almost 3 ft below grade. Children's bedrooms and playroom are on lower level, with direct access to spacious lawn at rear of house. Balcony and steps connect upper-level living-dining area with same lawn. Lower portion of house is concrete block, upper story and wing are wood frame. Upper level is some 5 ft 6 in. above grade, has commanding view of valley and hills*



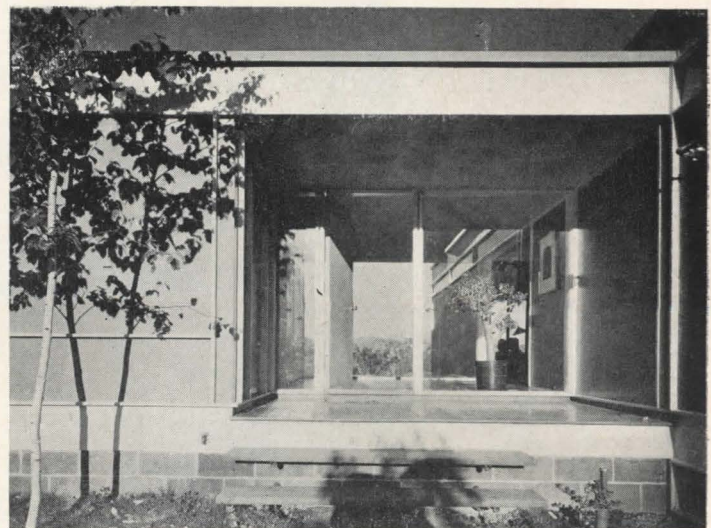
## GENERATION HOUSE WITH PRIVACY FOR ALL

*House for Dr. and Mrs. Camille H. Huvelle  
Litchfield, Connecticut*

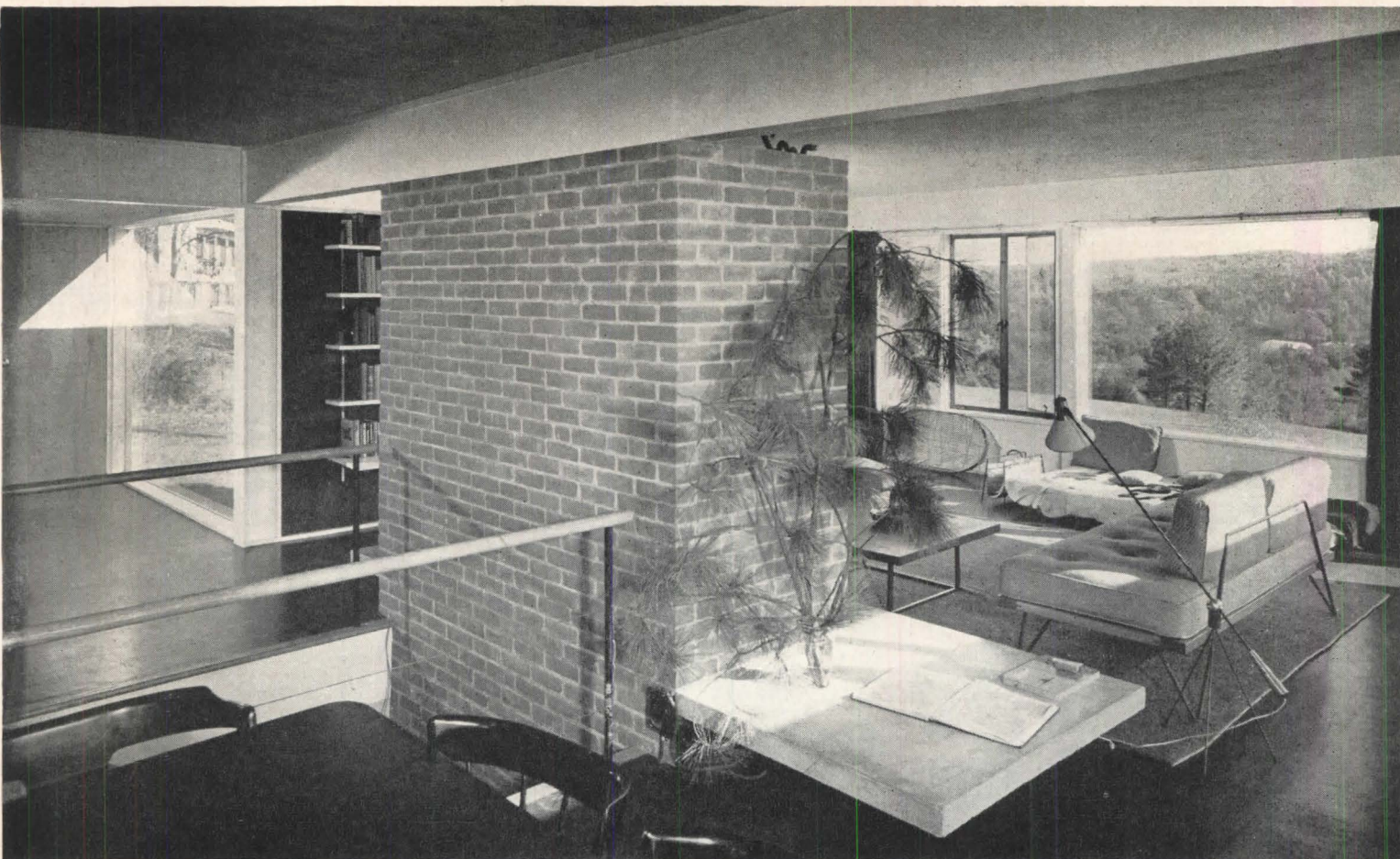
*John MacL. Johansen, Architect*

THE ACCOMMODATION OF THREE GENERATIONS, with their varying interests and activities, was the theme around which this house was designed. The children have almost the entire lower level to themselves, with their own bath and direct access to the out-of-doors on both sides of their playroom. The main portion of the upper level is the parents' special domain, including master bedroom, study-dressing room, living-dining room and kitchen. A separate wing on this level provides a guest room suite usually used by a grandparent. The location of the main entrance and the vestibule at the juncture of this wing and the main part of the house gives each member of the family complete freedom to come and go as he or she wishes, without disturbing the others. Yet the kitchen is so centrally located that the mother can keep a watchful eye on the youngsters, indoors or outdoors, at all times.

Structure is frankly expressed throughout the house. The framing system used was developed to make possible a three-dimensional composition of panels, usually related to each other in a checkerboard pattern.

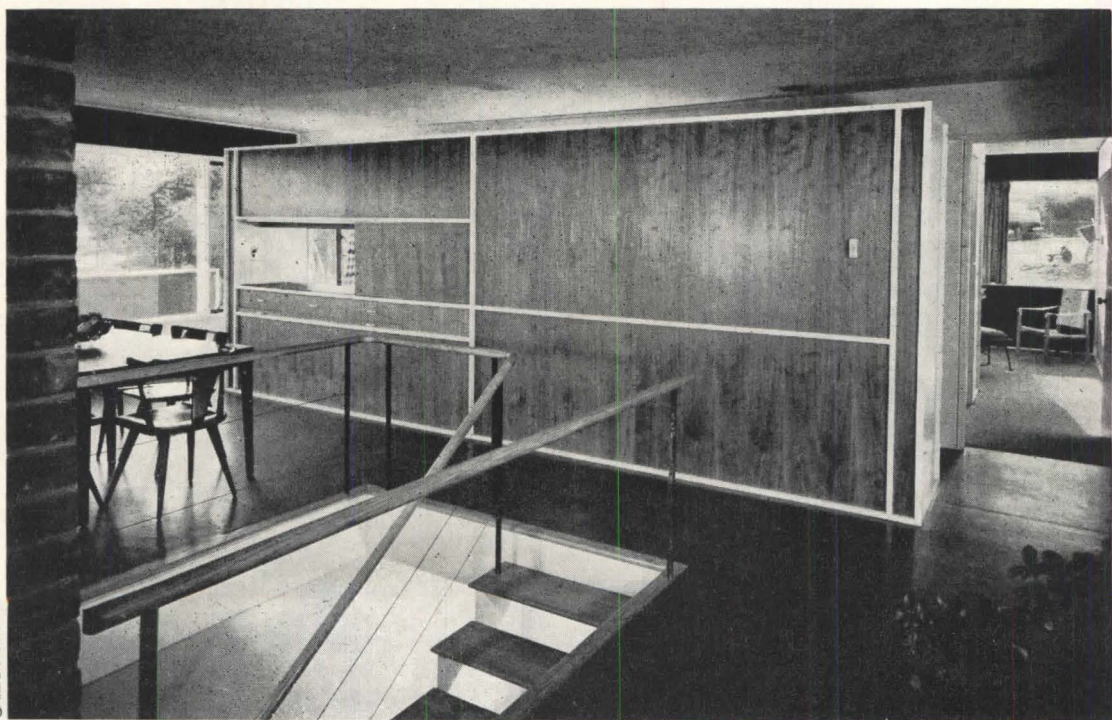


*Main entrance leads directly to all parts of house. Glass wall on far side of vestibule gives two-way view, emphasizes openness*



*Upper-level living-dining area of Huvelle house is completely open except for brick fireplace and stair well. Entrance hall (at left, above) adjoins this area, is equally handy to other parts of house*

TODAY'S HOUSE CLIENT — I (continued)

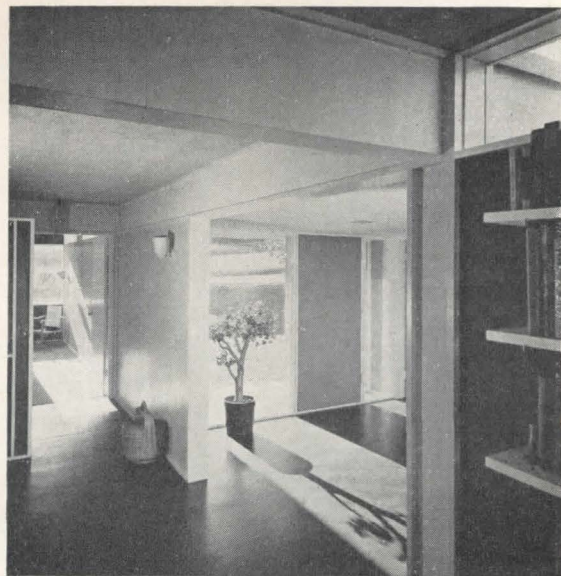
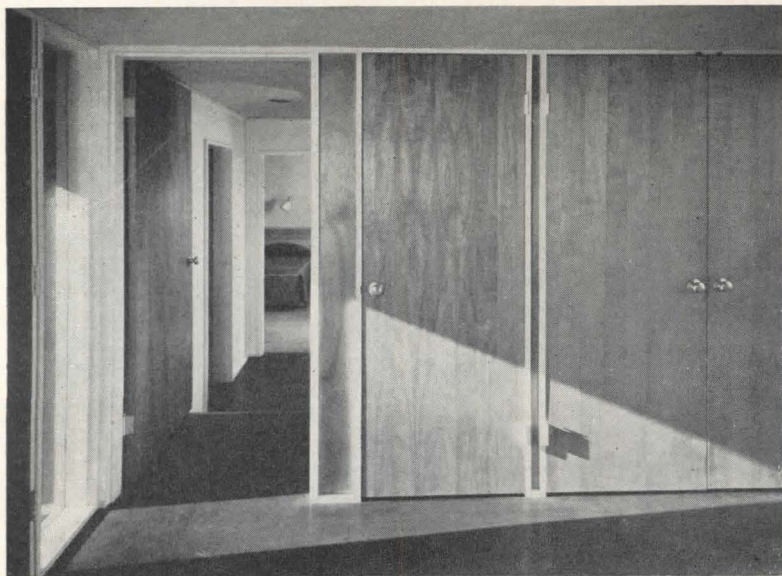


© Ezra Stoller

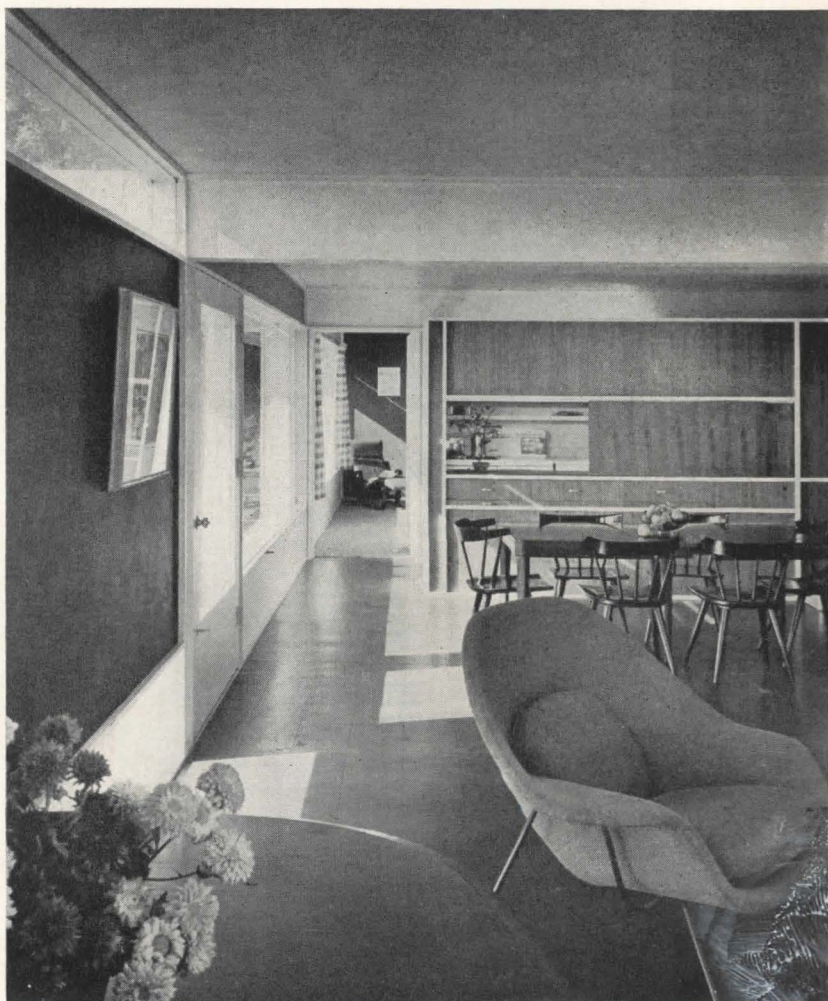
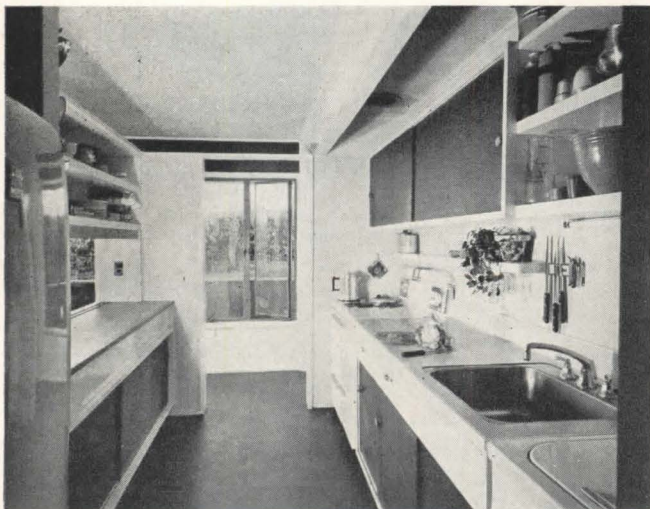
*Built-in storage cabinets separate kitchen and dining area. Stairs down to children's rooms are adjacent; master bedroom suite is behind kitchen*

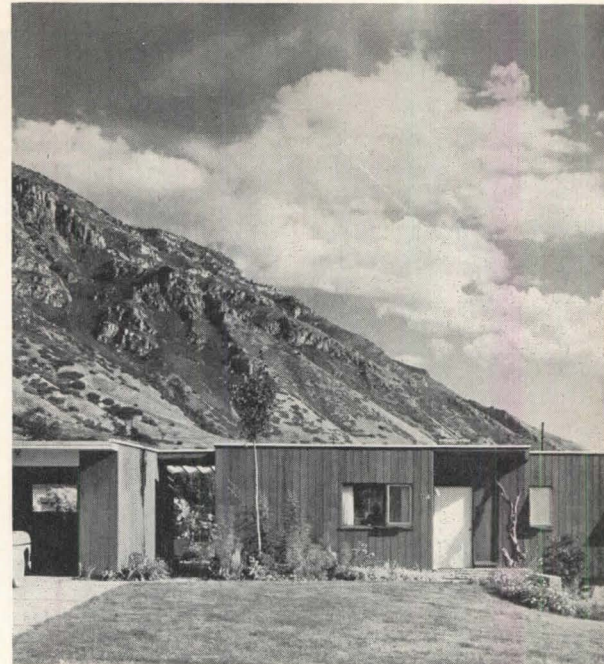
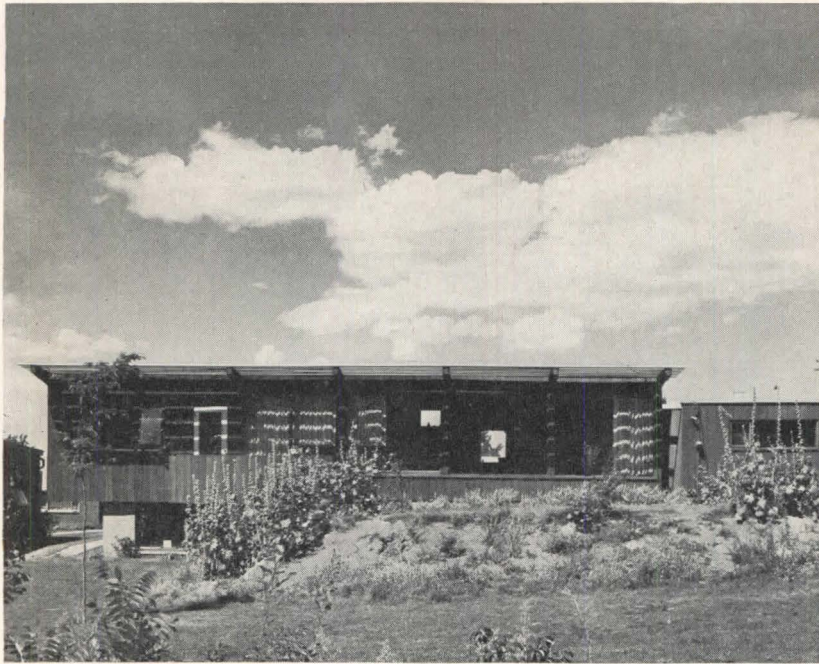


*Guest room or grandparent's suite is separated from entrance hall by large storage closets; suite includes dressing room and bath*



*Kitchen is an island in the center of house, walled on long sides by built-ins; open ends give ready access to all parts of house and admit light from glass wall of adjacent dining area. Large pass-through makes serving easy*





## ONE HOUSE: TWO FAMILY-ACTIVITY AREAS

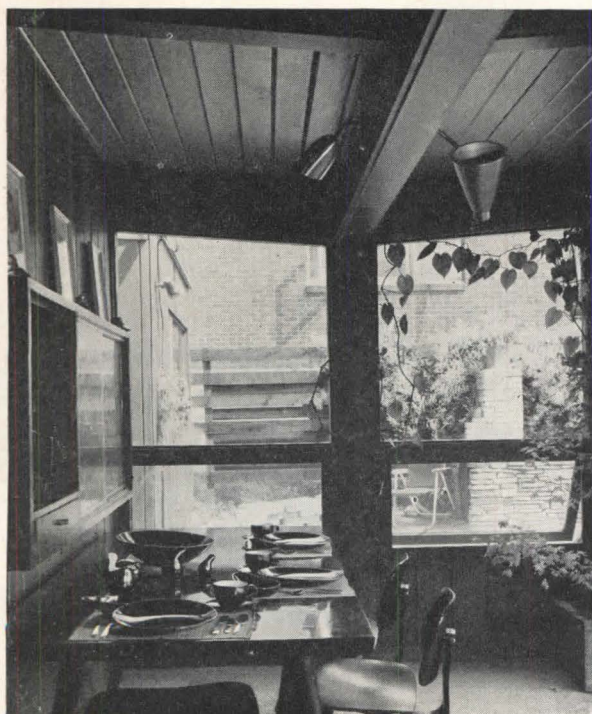
*House for Mr. and Mrs. William Rowe Smith, Provo, Utah*

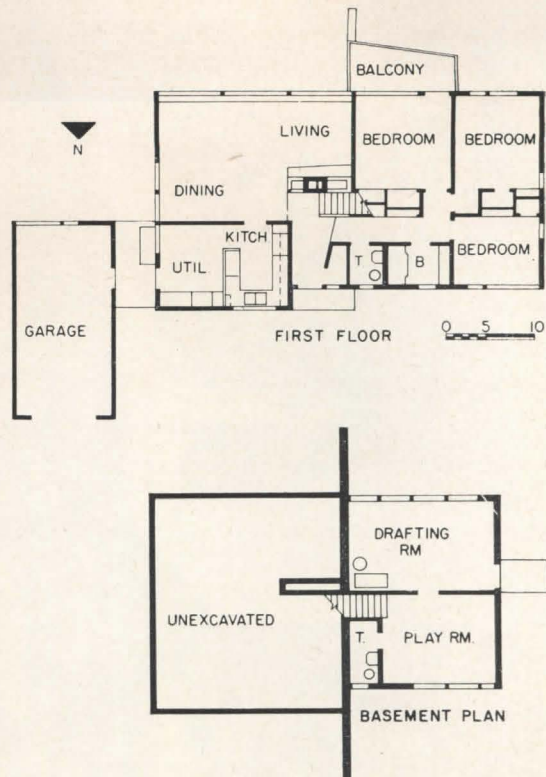
*Fred L. Markham, Architect*

*W. Rowe Smith, Associate Designer*

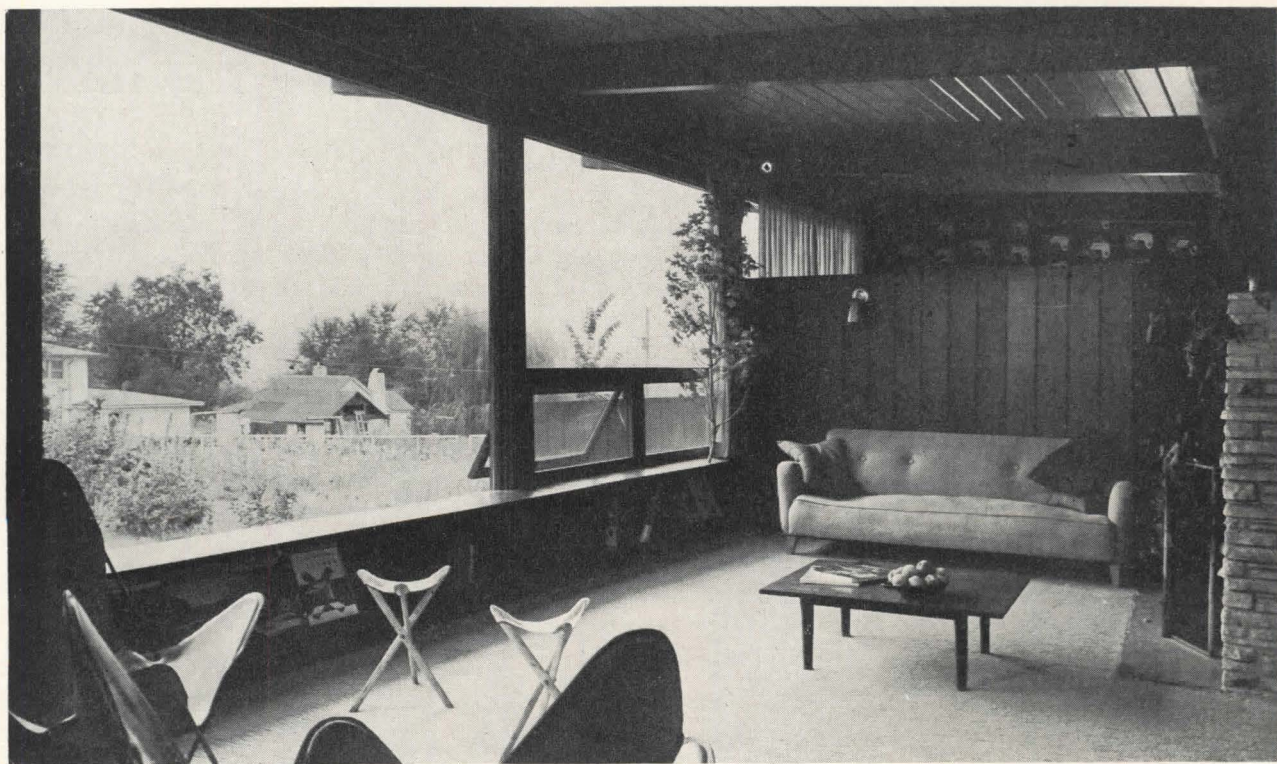
THE DIFFERING ACTIVITIES of children and adults were the major concern of Architect Smith and his wife as they planned this house. The Smiths like to entertain informally and are accustomed to having as many as 30 guests "drop in" on a Saturday night; they arranged their living-dining-kitchen area to make such entertaining as easy as possible, and placed the children's rooms at the opposite end of the house to keep adult merriment from interfering with small-fry sleep. "The entire house," Mr. Smith says, "was 'kid-proofed,' which simply means we included nothing to worry over until the kids got up to an eight-pound hammer." Floors are concrete, interior walls are redwood and sheetrock — all nicely durable materials. The basement playroom is directly accessible from both entrance hall and children's bedrooms, leaving the main living area free from youthful encroachment.

The plan worked out well for the Smiths, who report that living in the house was "a thrilling experience." The family recently has moved to Salt Lake City, where Mr. Smith now has his practice, but still fondly recalls such details as the stone fireplace, visible from the entrance hall, and the warmth of redwood walls and fir ceilings. Although the house was planned around the specific needs of one family, it was planned also to meet changing needs; its versatility made it an asset when the time came to sell.

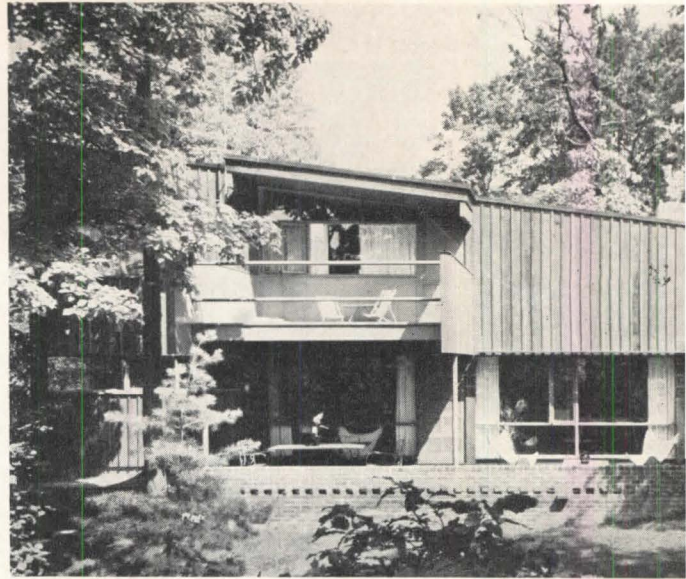




*House was planned for family with three children; children's rooms are well isolated from rest of house but handy to basement playroom. Basement area could easily be converted to recreation room*



*Living room has huge picture window on one side, stone fireplace on other. A 6-ft partition separates it from master bedroom*



*House for Mr. and Mrs. Allen Andrews  
Arlington, Va.*

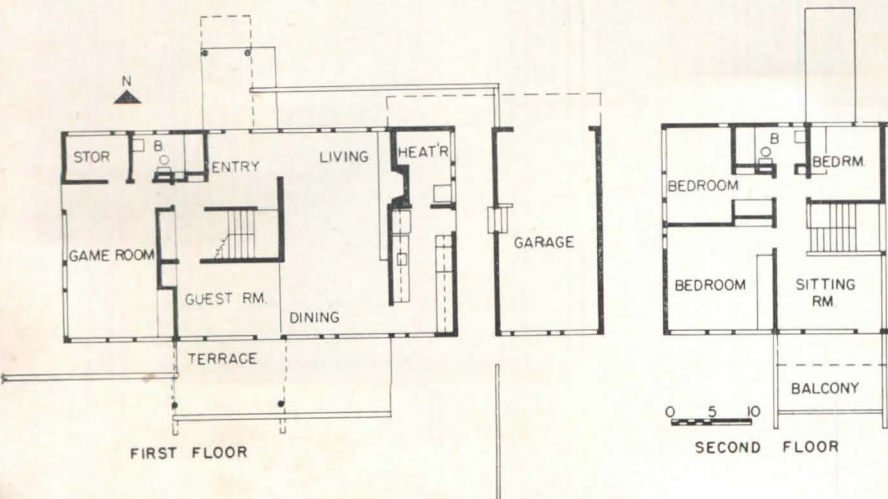
*Burchard-Lyman, Architects*

## PROVISION FOR A GROWING FAMILY'S NEEDS

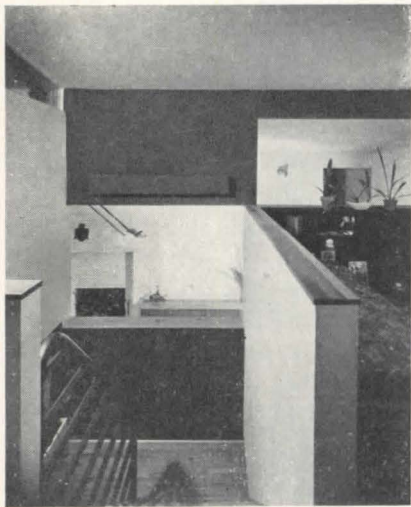
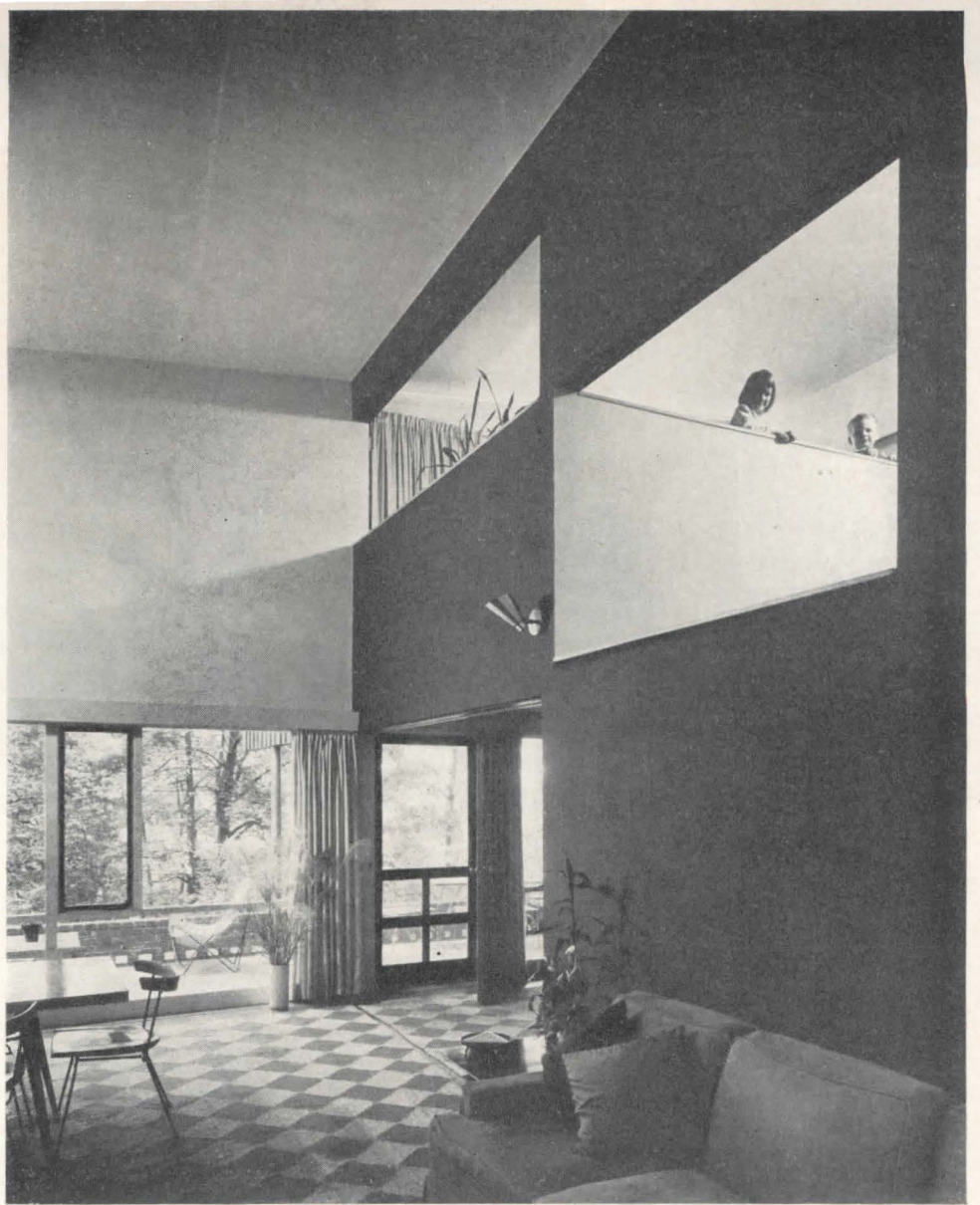
ADAPTABILITY FOR A GROWING FAMILY was the major factor in the planning of this house. The owners are a young couple with two small children; they wanted a house which would accommodate not only their own family but their parents, who visit them frequently, and up to 20 guests for buffet suppers. They also wanted a house which could be expanded or adapted to take care of additional children. The solution was a two-level house with a first-floor game room which can be

used as a playroom for the children during the daytime or as an overflow entertainment area in the evenings; this room was planned as the future master bedroom, and was provided with an adjacent bath.

The owners looked forward to many pleasant hours of outdoor living on the south side of the house where there is a distant view of Alexandria and the Potomac. A paved terrace, partially protected from the sun by the second-floor balcony, takes advantage of this view.

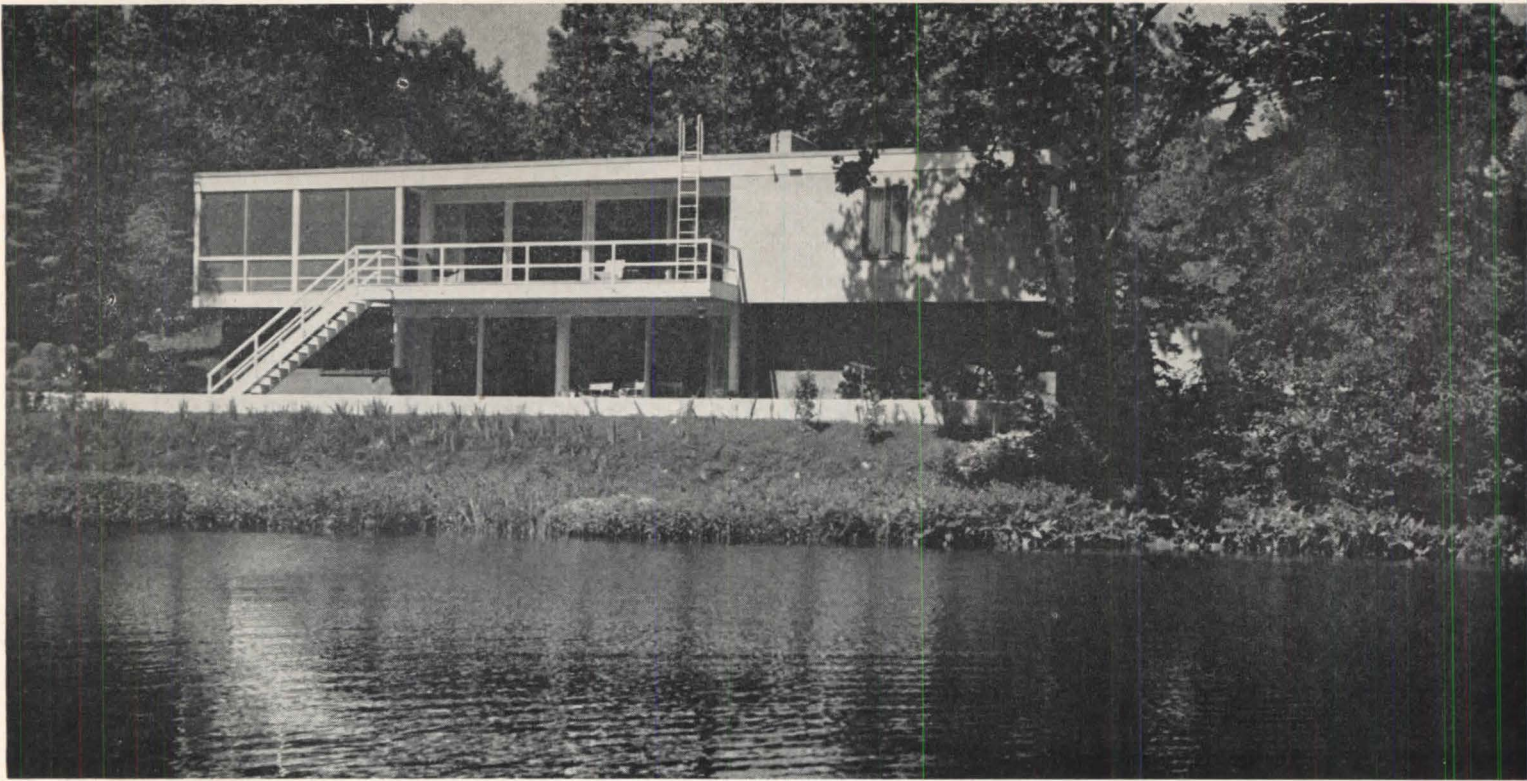


*Lower-level game room was planned as future master bedroom, so has connecting bath. House cost just over \$20,000, is worth twice that on market, architect says. Clients call it "tremendous success"*



*Balcony treatment of upper level adds considerably to spaciousness of lower level. Dining area (below left) was planned to accommodate frequent guests and large buffet suppers*



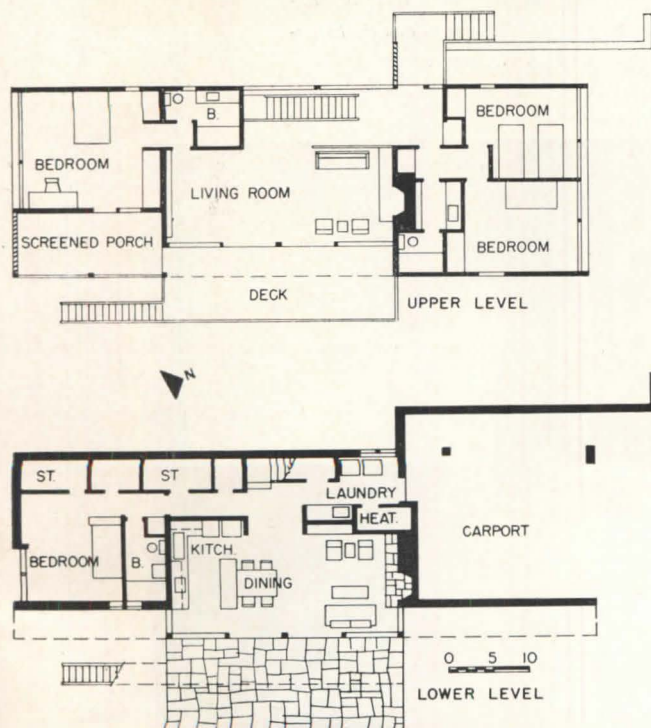


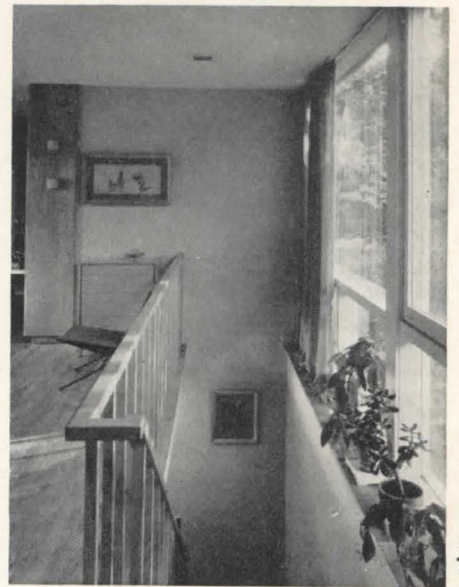
## FORMAL AND INFORMAL LIVING UNDER ONE ROOF

*House for Mr. and Mrs. Harold Loeb  
Weston, Connecticut*

*George S. Lewis, Architect,  
with Allan Gould*

TWO SEPARATE LIVING AREAS were required by the owners of this house to allow them and their son and daughter to entertain simultaneously. The two rooms were placed one above the other so that each would face the river which forms the lower boundary of the property; they were intended to be — and are — quite different in character: the lower one is informal and intimate, the upper one more formal. Since Mrs. Loeb does her own cooking and likes to have her family and guests with her while she does it, the lower-level kitchen-dining-living area has become the most used room in the house.

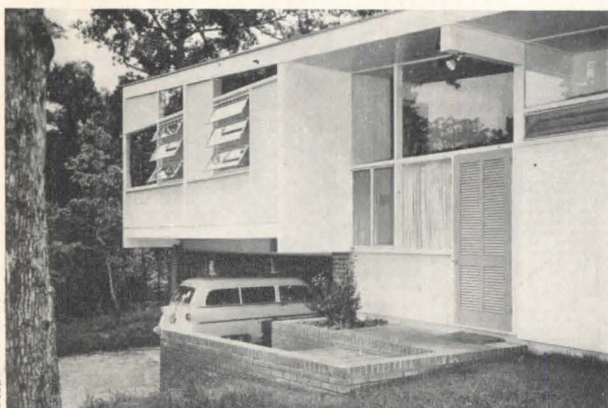
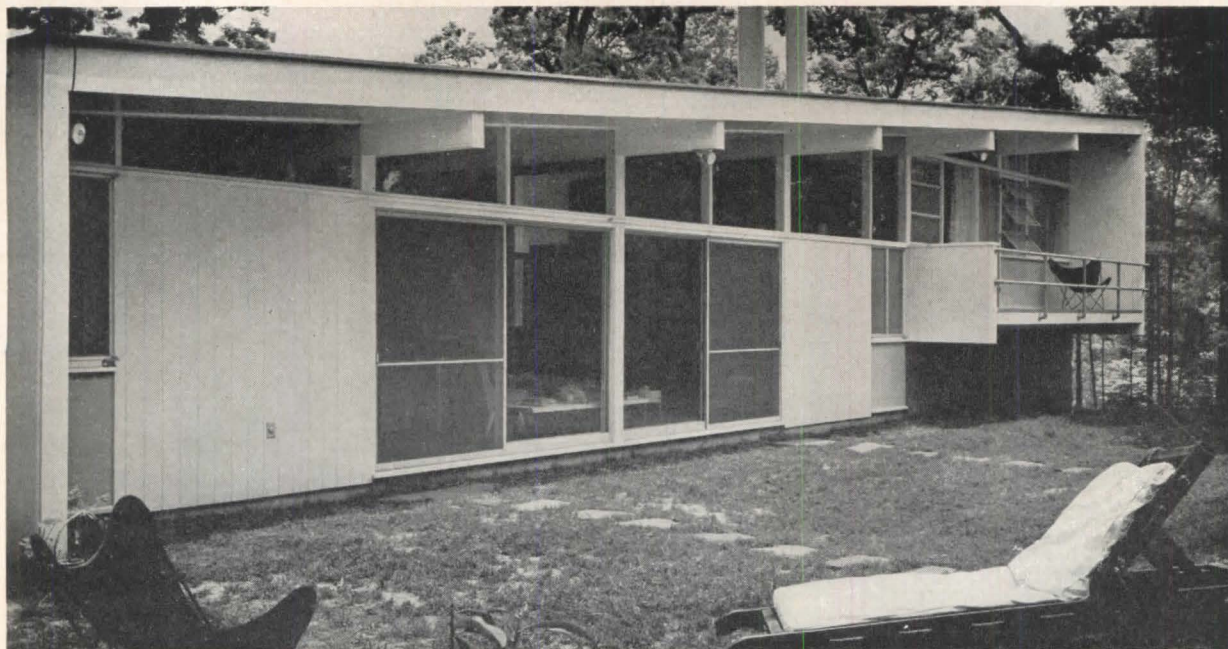




André Kertész



*Main living-dining-kitchen area is on lower level (top two pictures), where soffit of cantilevered deck draws attention downward toward terrace and river. In upper living room (left) the eye is directed more to sky. Clients argued architect into putting house at river's edge. Architect now admits that privacy gained was well worth sacrifice of view from upper part of site*



Joseph W. Molitor



## ECONOMICAL CONSTRUCTION, OPEN PLAN

*House for Mr. & Mrs. William Weber*

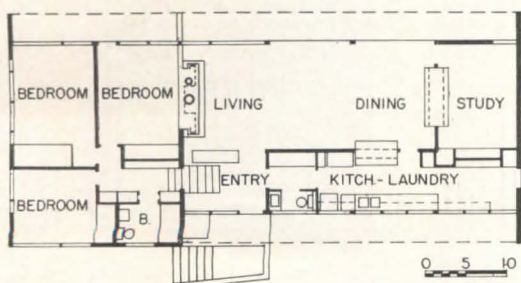
*Raleigh, North Carolina*

*William Weber, Architect*

*George Matsumoto, Consultant*

**E**CONOMY IN CONSTRUCTION was a major factor here. The owners — the architect and his wife — knew that the sloping site they had selected virtually demanded a house a story and a half in height; they also liked the idea of exposed beams and definitely wanted a guest-room study area and an open kitchen-dining area. Another basic requirement was two baths, or at least a bath and a half, to accommodate the family of parents and two children. And they wanted a built-in high-fidelity set-up.

Since the temperature in Raleigh is on the warm side for a good part of the year, the house opens to the south toward the prevailing breeze. The sloping site was used to separate bedroom and living areas. Construction is dry wall, with plywood, painted or in natural finish, used on both exterior and interior; end walls are vertical pine.

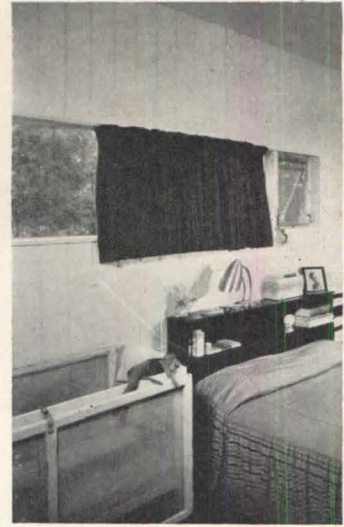




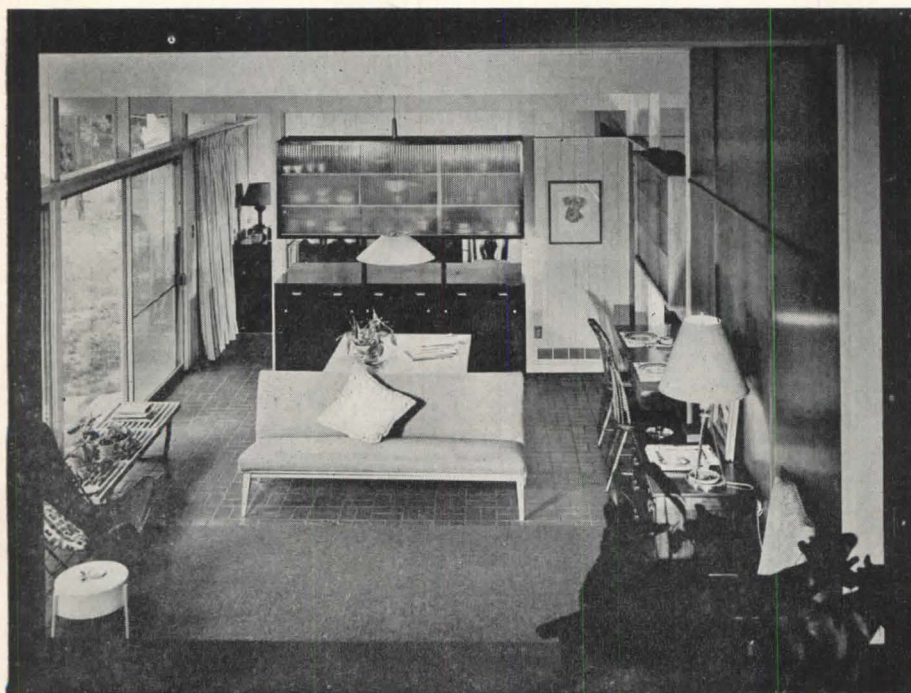


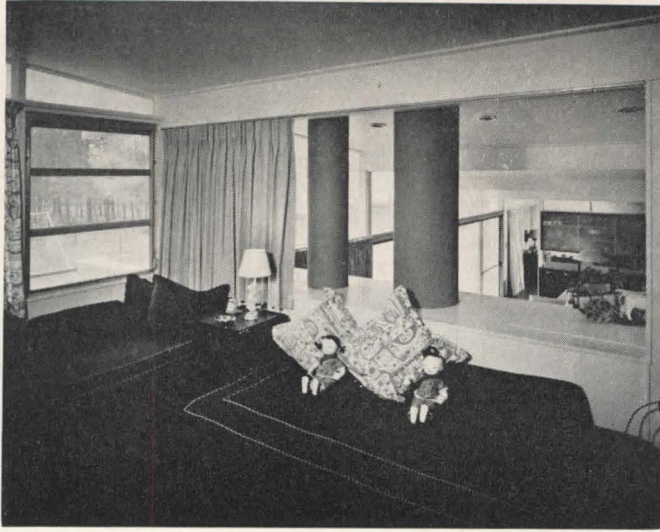
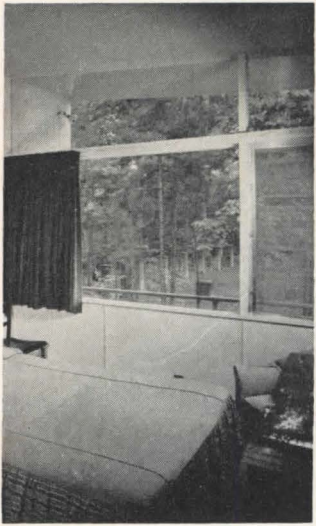
*Living room opens to terrace at rear of house, has high-fidelity speaker built into fireplace wall. Book shelves and cabinets separate living area from entrance hall and study-guest room (below)*





*Every room in the house except the study-guest room can be reached directly from entrance hall. An informal half-dozen steps lead to bedroom corridor lined with storage cabinets. Below: living room from balcony bedroom, with study in background, kitchen on right*





*Two of the three bedrooms are nicely cut off from rest of the house; the third is a balcony closed off from the living room by a curtain. Kitchen is arranged to permit simultaneous cooking, entertaining and supervision of children; the serving counter is as handy for breakfast and a quick lunch as it is for large-scale buffet suppers*

TODAY'S HOUSE CLIENT — 5 (continued)



Joseph W. Molitor





Joseph W. Molitor



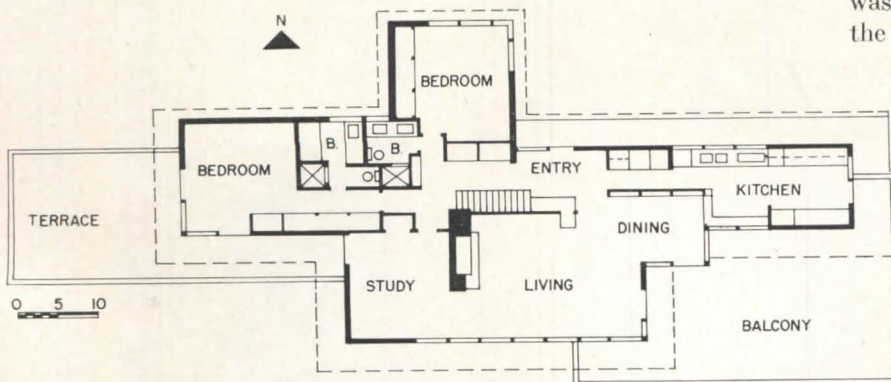
## INFORMAL ENTERTAINMENT

*House for Mr. and Mrs. Al Liss  
Middletown, N. Y.*

*Aaron L. Resnick, Architect*

*Mildred Resnick, Furnishings Consultant*

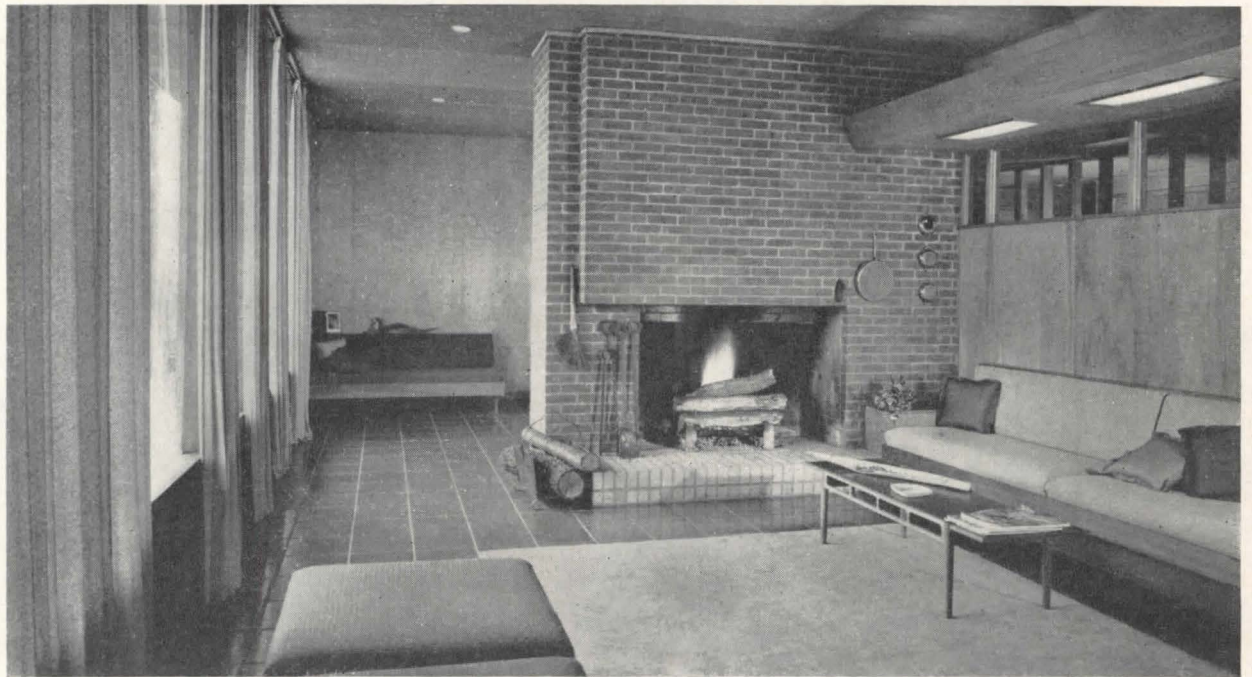
INFORMALITY AND EASE OF MAINTENANCE were the major requirements the owners of this house insisted on. Two of their three children were already married and had families of their own; Mr. and Mrs. Liss wanted plenty of room to entertain them, other relatives and friends, frequently in large groups. The kitchen was planned to make such entertainment possible, and also to provide space for Mrs. Liss's canning and freezing activities. Since the site was sloping, a two-level house was indicated; this permitted a large play area for the children on the lower level and an adjoining workshop for Mr. Liss, whose hobby is woodworking; it also permitted a huge balcony over the carport. Construction costs were low because a son of the owners, an engineer, acted as building superintendent and all of the built-in units, designed by the architect, were constructed by Mr. Liss, his son, and one carpenter.



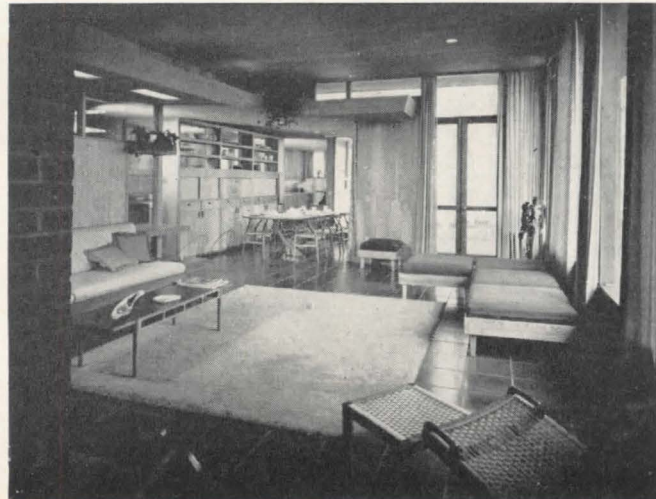
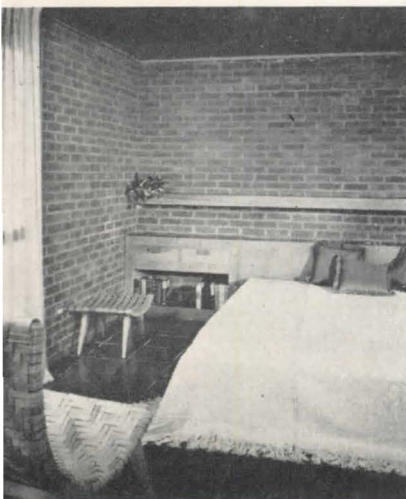


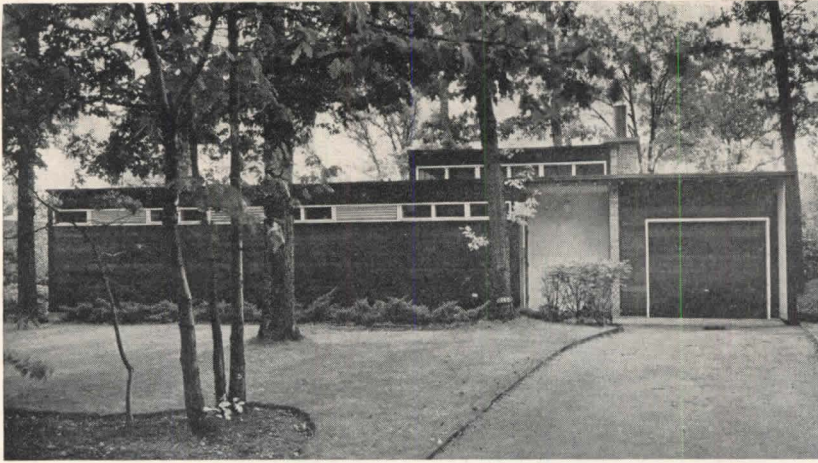
*Living-dining-kitchen area was planned to make large-scale entertaining as easy as possible. Kitchen opens directly to dining area, has separate breakfast bar and exceptionally large work space. Large gatherings can overflow into study adjoining living room*

## SPACE



*Construction materials were chosen to lighten housekeeping load: floors are concrete tile, interior walls are birch plywood or brick. As much furniture as possible was built in and designed for easy cleaning — note "mop-space" below living room couches*





laska

## LIVING-DINING

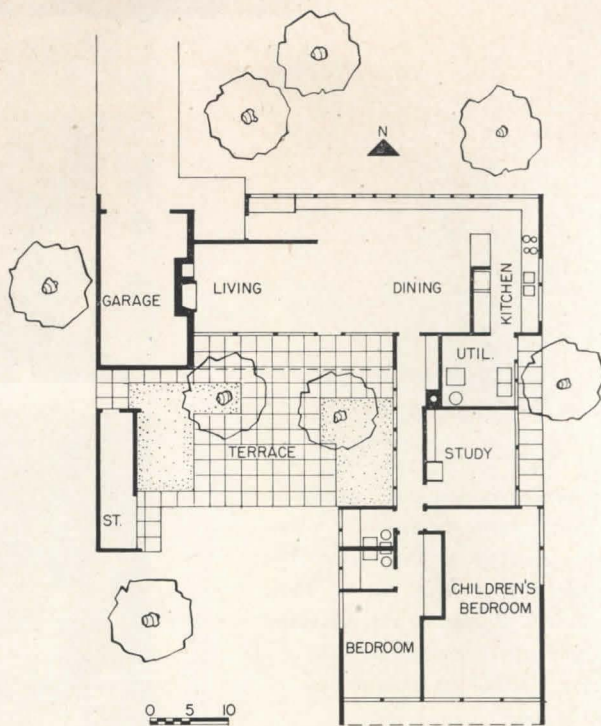
*House for  
Mr. & Mrs. Erne R. Frueh  
Highland Park,  
Illinois*

*Robert Bruce Tague,  
Architect*

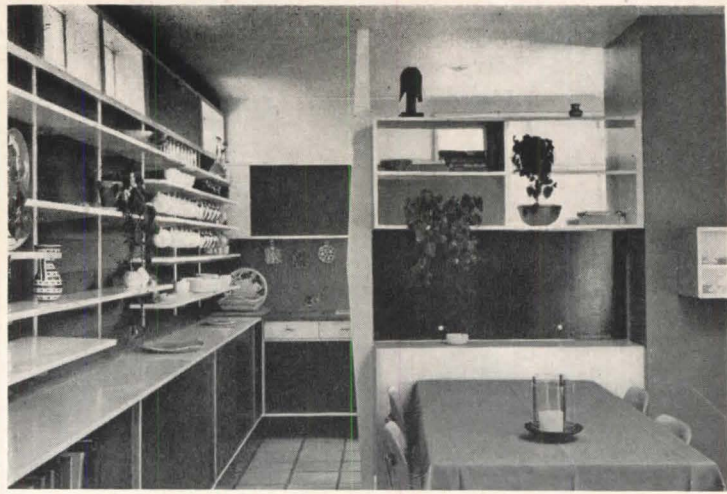


## AREA OFF PRIVATE PATIO

A LARGE LIVING-DINING AREA, opening to a private terrace, and a partially open dining-kitchen arrangement headed the list of requirements for this house. The owners, both of them interested in music, painting and literature, have two small daughters and stipulated that the children's area should be large and flexible enough to permit rearrangement as the girls mature. The house was designed accordingly and so successfully that the owners report it needs a minimum of cleaning and little redecoration, affords a great deal of privacy, is cheery even on the gloomiest days because of its large windows, and has a kitchen which "works wonderfully well." They admit, however, that the utility room is too small and that "the entrance looks right into the dining area."

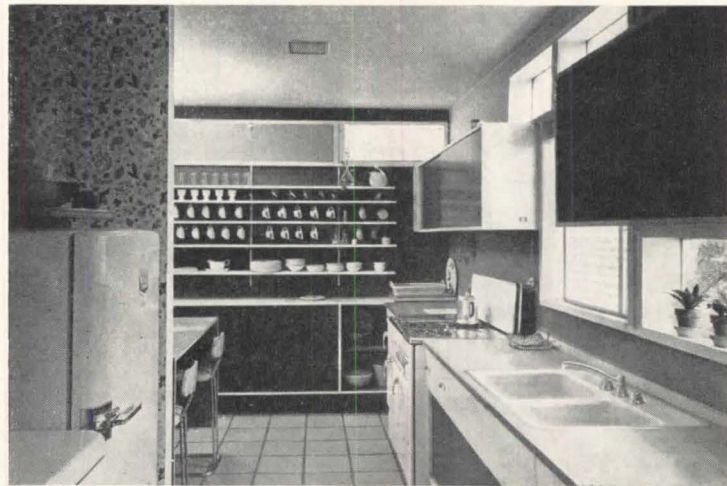


*Owners like division of living-dining area into music room and "adult play area." They also consider children's room "excellent" solution*



Idaka

*Frueh kitchen is compact, has adjoining utility area. Shelves for china continue through dining space, and eventually merge with living room book shelves. Fireplace end of living room (below) is completely shut off from rest of house but opens to secluded terrace at rear*





# SCHOOL BUILDINGS

## QUALITY LEVEL AND COST

a discussion by CHARLES D. GIBSON,

President, National Council  
on Schoolhouse Construction.  
Supervisor, School Planning,  
California State  
Department of Education

**H**OW CAN WE PROVIDE ENOUGH SCHOOLHOUSES?<sup>1</sup> From coast to coast this is the school question. Current and reliably predicted enrollments at every grade level are nearly straight-up curves. Today's schoolhousing shortage, broadly, is a direct product of a combination of a depression, wars, high birth rate and population mobility. Indirectly, its size and complexity also must be credited to factors such as poor school districting or school district organization, lack of long-range planning and inadequate financing — all perennial curses on educational programming in this country.

While no one denies the problem, some underestimate its real size; for example, by assuming it is temporary. The only excuse for such an attitude is wishful thinking. The cold statistics are available nationally from the U. S. Office of Education.<sup>1</sup> Locally, most citizens can observe children standing several deep behind each school desk and creating serious traffic problems on residential streets. We will continue to face the need for extensive school plant construction for many years. How will we meet it? Of the many answers to this question the one here discussed is: "We will meet this gargantuan need for more schoolhousing by cutting the costs of new construction." This reply has great popular appeal because it means saving money, which everyone would like to do. Yet curing schoolhousing troubles by cutting construction cost brings up some tough decisions.

### THE LEVEL OF QUALITY

The degree to which a school plant provides a proper environment for the activities that must go on in it determines its quality level; a comprehensive definition might state that quality level is the degree to which the school plant:

- (a) makes satisfactory provisions for the spaces needed to do a sound educational job now while protecting the probability that space needs of future educational programs will change;
- (b) provides for its occupants the amenities which the

<sup>1</sup> The U. S. Office of Education estimates that, if we are to catch up with schoolhousing demand by Sept. 1960, we will have to build 720,000 classrooms (including the present unbuilt backlog, replacement of obsolete facilities, and new construction for increasing enrollments). At \$40,000 per room (which includes prorata costs of site, equipment, fees and auxiliary areas such as gyms, auditoria, etc.) this amounts to some \$28.8 billion, or about 3 times the current rate of building

American public associates with a good standard of living and a physical environment which promotes working comfort and efficiency;

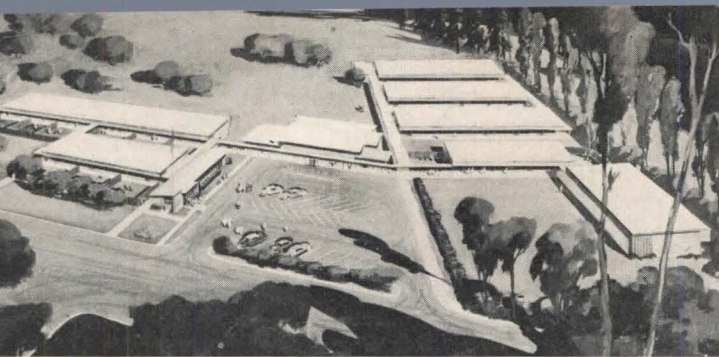
- (c) is constructed of materials which give maximum life to the buildings and ensure low maintenance costs.

Reducing the quality level of a school plant has cost implications well beyond dollar considerations alone. One dictionary defines *cost* as "a sacrifice, loss or penalty endured for a thing." Applying this definition to schoolhousing, we can ask ourselves: "What will be the sacrifice, loss or penalty in terms of the physiological, psychological and emotional welfare of its generations of occupants? What sacrifice, loss or penalty will it impose on our future leaders in terms of educational opportunities?" At least these additional cost elements are essential components of the total price of schoolhousing.

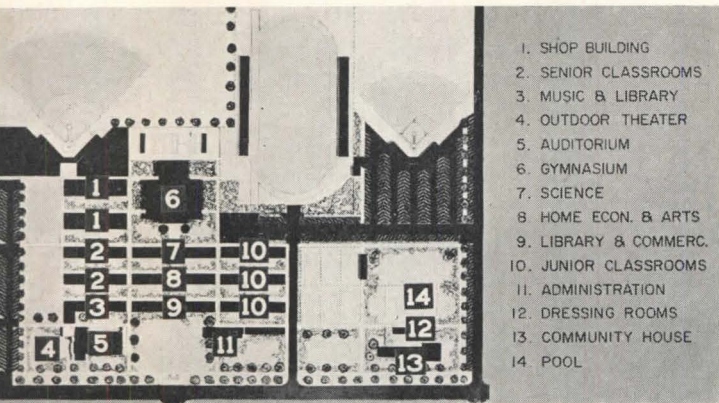
The remainder of this article is an evaluation of the quality level of the school plant as it is related to: (a) educational services; (b) occupancy; and (c) construction. In turn, the cost elements of each of these quality level considerations will be discussed as they are related to: (a) the physiological, psychological and emotional welfare of occupants; (b) educational opportunities; (c) dollars.

### EDUCATIONAL SERVICES and SCHOOL SITES

The quality level of the educational services that can be carried on in a school plant is determined by space adequacy — of site, buildings and provisions for flexibility to insure longterm functional usefulness. Proper location, size and shape of school sites controls to a large degree educational programs and opportunities. Good educational programs rely more and more on close home-school relationships. Communication between parents and teachers is essential to the understandings which are necessary if the child is to adjust satisfactorily in home and school environments; convenient school locations foster easy communication. Schools located and sized to serve neighborhoods also act as adult education centers for parent groups during and after regular school hours. In many areas, elementary schools serve more evening adult classes than high schools because their location is convenient. Convenience and



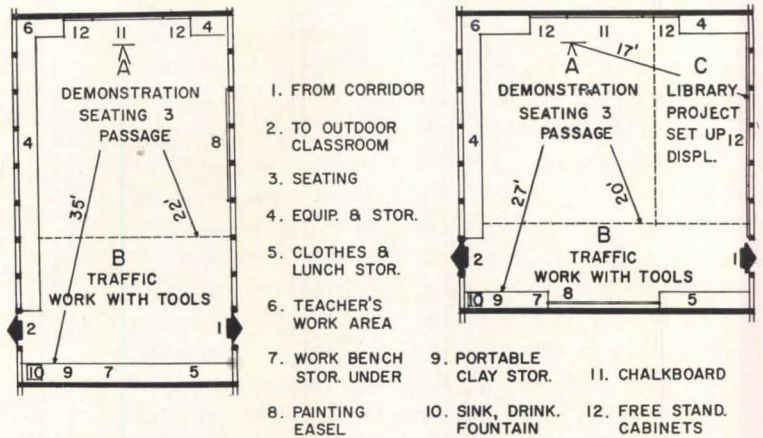
Left, Oak Grove School, La Canada, Calif.; Balch, Bryan, Perkins, Hutchason, Archts. Site planned to retain natural elegance; buildings insure thermal, visual, auditory comfort and work efficiency; decentralized student groups, centralized services, easy expansion. Below, Jr.-Sr. High School, Boulder City, Nev.; Kaufmann & Stanton, Archts. Site planned for school-community program; reduce size — cut the program. Segregating 7-8-9 grades from 10-11-12 permits smooth operation of two programs on one site



adequacy of site largely control the success of super-vised recreational programs.

The educational program planned for a site should determine its size. More often than not, false cost analysis reverses the emphasis. Program trends call for more area; school site sizes will continue to be larger. The physical education program is becoming a regular daily experience for more and more students. Many laboratory sciences need outdoor space. Building areas are becoming more decentralized. More and more students drive their own cars to school; driver education is becoming a program "must." More area is being devoted to designed landscaping which not only serves

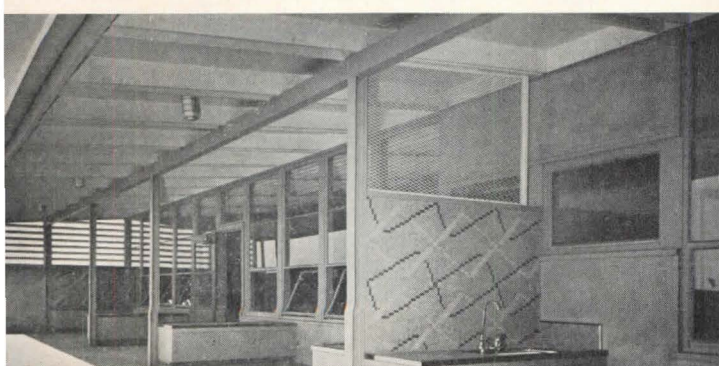
Sketches; left, impact of dimension on educational usefulness; square room far better educational investment for same area and dollar cost. Right, pie chart represents total energy resources. Amount of energy an individual uses to adjust to environment depends largely on quality level of building. "Cost" is measured in human welfare



Julius Shulman

total educational needs but also such non-esthetic functions as noise, dust and temperature control.

Proper site location, size, shape and physical features are of paramount importance in planning intelligently a single school building project or formulating a district-wide master plan. Having the school in the right place to serve a natural attendance area is the first essential. To select wisely, however, is no simple matter. School authorities must have all available information concerning total community development patterns before they can make a sound investment in a school site. Accepting a "gift" site or buying the cheap one may violate long-planned zoning patterns and help to unbalance the total economy of an area. Dollar cost should not be con-



R. C. Cleveland

Above, West Charleston School, Las Vegas, Nev.; Richard Stadelman, Archt. Connecting corridor widened to form sheltered play area; dollar cost small; educational opportunities and creature comfort great. Left, Andres Duarte School, Los Angeles County, Calif.; Allison and Rible, Archts. Corridors for outdoor classrooms and light control. Tile baffles protect privacy of work groups and classrooms. Note storage space, running water. Concrete walls reflect light into

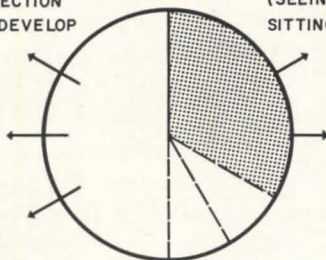
sidered until all possible sites have been evaluated in terms of educational services. A school district then should acquire the highest ranking of these evaluated sites it can possibly pay for, fully aware of the sacrifices, losses or penalties in educational services which the community is willing to make.

## EDUCATIONAL PROGRAMS and BUILDINGS

Space adequacy of school buildings is measured by how well those buildings provide for the educational program they are to serve and of which they are a part. After the building has been planned to meet program needs, reduction in its quality level reduces the quality of the educational services it can render. Educators in particular have been vulnerable to quality level reduction in school buildings because they have been inarticulate in defining program needs. Without firm, realistic and comprehensive definition of program needs, architects have been vulnerable in interpreting or defending school building design solutions. They, too, have sometimes been unsure of the need for maintaining certain levels of

OTHER DEMANDS  
ON STUDENTS  
ENERGY SUPPLY

1. STAYING ALIVE
2. TO MOVE ABOUT
3. FIGHT INFECTION
4. GROW & DEVELOP



MINIMUM ENERGY  
REQUIRED TO ADJUST  
TO THE PHYSICAL  
ENVIRONMENT OF  
THE CLASSROOM  
(SEEING, HEARING,  
SITTING, ETC.)

quality in building elements because program requirements have been hazy.

Just as the educational program determines site requirements, so it determines the requirements of the buildings to be placed on that site. Anything less than a thorough documentation of program needs will inevitably result in inadequate building space, no matter how valiantly a designer tries to avoid such a result nor how much or how little it costs in dollars. Time and competence are two more cost factors which must be applied to the price of adequate documentation of educational program needs. Far better educational space, at less cost, often results from an intelligent, organized approach to program space needs analysis. This cannot be over-emphasized. Careful scheduling of space alone may achieve far greater dollar savings than reducing the quality level of a building. Thorough program analysis helps assure a wise balance of building space; when a competitive-sports-minded administrator has to justify building space against program needs we

are more likely to find laboratory and gymnasium areas in better balance.

Master-planning of building areas on a site should begin only after the basic classroom design has been established. The program needs of the individual teaching station must be determined before it is possible to plan the proper inter-relationships of building areas. Will the proposed educational services for basic teaching stations require laboratory-type space and equipment arrangement? Will indoor-outdoor work relationships need to be provided? What kind of furniture will be used at pupil stations? There are many other questions.

Time and competence, again, must be purchased in developing the master plan of a school site if either educational service or dollar considerations are to be taken seriously. Planning must be done against policy maximum enrollment figures; against thorough knowledge of over-all community planning; against the unknown needs of a changing curriculum. Real educational opportunities for present and future generations — real dollar savings for today's and tomorrow's taxpayer — can be realized when building space is planned wisely.

In the old days when those who should know better believed it was possible to "rate" a school building on a score card, the standard of classroom space adequacy was the area it took to seat a student. Today, adequacy of a classroom is evaluated against the amount of floor space needed to permit a group of children under a teacher's guidance to carry on the range of educational activities called for in the over-all educational program of the grades to be served by the plant. Unless school building planning is done against that concept of space adequacy, the sacrifice, loss and penalty paid in educational services cannot be balanced by dollar savings.

Space flexibility is translated into school plant design in several ways. First, it means an over-all plant layout which lends itself easily and economically to expansion or contraction. Second, flexibility means that interiors of classrooms or entire building units can be changed easily and economically, as program emphasis may need to be adapted to larger or smaller classes or to different teaching techniques. Third, flexibility means that certain areas can be used for a variety of purposes. A flexible plant will remain adequate educationally for at least as long as it does structurally. It provides that the balance of educational services we strive so hard to get for today's program can be maintained in tomorrow's. If we are shortsighted enough to cut building quality level until flexibility becomes a word and not reality, we should prorate the per-pupil dollar cost of the structure over a ten-year rather than a forty-year period.

Flexibility in buildings must begin in the minds and attitudes of architects. One of the less visible assets of a building, it often gets traded-down-the-river for a pet structural or mechanical system with few, if any, currently being aware of the loss. Many a school official, desiring flexibility, has been discouraged by an architect who has a set structural system that includes six-inch bearing partition walls of reinforced concrete. The naive educator comes to believe that flexibility is expen-



Julius Shulman

Sunrise Acres School, Las Vegas, Nev.; Richard Stelman, Archt. In this entire school, as in the kindergarten shown, there is proof that amenities cost nothing but time and competence

sive. The truth is that a structural system which permits nonbearing partitions requires expensive engineering know-how; and who pays the engineer's fee? Or the mechanical engineer may protest that a pet heating system would need to be re-designed or abandoned to provide flexibility in the building. Or maybe the architect just has so much work there's no time for the required design research. Any school building designed today that doesn't provide for economical rearrangement of interior space; for interchangeable, portable storage units; for simple re-location of utility services, as the minimum elements of flexibility, is not worthy of an architect's signature nor worth whatever it cost in dollars. The dollar cost of flexibility runs from nothing to a little. The sacrifice, loss and penalty paid in educational services for its lack is immeasurable.

### OCCUPANCY REQUIREMENTS

The quality level of a school plant when appraised from the point of view of occupancy reflects a community's desired standard of living; witness the use of the term "occupancy" by planners and zoning authorities. Safety and protection of occupants is the basic requirement for schools as for most structures; getting occupants out of a building safely in an emergency is of far greater concern than saving the building. The quality level of school plants for safety is not a matter of wide choice in most communities; yet, while codes backed by police power take care of this occupancy element rather thoroughly, marginal choices remain to be made. The cost of reducing the safety quality level of a school building is brought home occasionally by disaster, although the price of safety need only be time for wise planning.

Privacy is a major quality level choice today in school design, of particular importance as enrollments rise spectacularly and the unfortunate trend is toward bigger school plants. The pressures created by putting larger and larger heterogeneous groups together in limited space are reflected in the behavior patterns of pupils and teachers. The need for elbow room, the concern for personal and property security, are physiologi-

cal, psychological and emotional factors tied up with learning readiness, work efficiency and behavior.

Whether or not there is adequate privacy is determined to a large degree by whether there is provision for: decentralizing groups and traffic patterns; freedom from interference with other class groups; uncrowded work stations for individuals and small groups; opportunity for private consultation among students, teachers, counselors, administrators and parents; storage of personal belongings; separate and dignified space for student government, publications, etc.; teachers' work and rest facilities in an "escape from children" atmosphere; toileting facilities to accommodate varying age groups. The quality level choices are many. The cost of these choices must include what one is willing to pay for a relaxed, organized and orderly teaching-learning environment. Cutting the quality level in this area means cutting the value of the dollar that pays for the instructional program.

The occupancy-rating of a school building depends, too, upon the provision and control of thermal, visual and auditory space-conditioning elements. Heating, ventilation and protection against extremes of outdoor temperature control the thermal environment, and it, in turn, controls the thermal balance of the body and hence the efficiency of the organism's performance. The research literature documents beyond any reasonable doubt the measurable effect of temperature change on work efficiency. The significance of this fact for school design is increased when one discovers the extremely small range of tolerance the human body has in its efficient relationship to the thermal environment. One interpretation of Walter B. Cannon's work as he reports it in his book, *The Wisdom of the Body*, says that, for a 100 pound child, a loss of slightly less than one Btu from those needed for a purposeful activity would reduce purposeful activity, for a time, by four per cent. The quality level choices as to degree of thermal comfort and work efficiency to be provided in a school building are made with near finality when basic design characteristics are set. Changing from a less efficient to a more efficient system of heating and ventilating is usually awkward and expensive. The sacrifice, loss or penalty paid for quality level reduction in this building element can have a direct effect on report-card grades or marks, particularly on the "pays attention to his work" items.

It isn't difficult to get agreement on the statement that quality of visual environment is important in school buildings. There is wide disagreement, however, as to what constitutes a *good* visual environment. The emphasis up to now has been on putting more and more footcandles of light on the working plane. Over-emphasis of this approach, however, has been discredited by valid research. After a level of approximately twenty footcandles has been reached, other factors than intensities take control of visual comfort and efficiency. In other words, after relatively low intensities have been reached, the amount of light on the task does not control how well we see.

A good visual environment depends upon producing

brightness-balance. One side of this balance is task brightness, the other side holds the high and low brightnesses found in a 360-degree visual field. If brightnesses are within prescribed tolerable differences (check *Guide for Planning School Plants*, published by the National Council on Schoolhouse Construction, George Peabody College, Nashville, Tenn.) a good visual environment for comfort and efficiency is established.

A rough idea of the kinds of quality level choices to be made in this area of school design today can be gleaned from the general statement that desirable brightness-balance limits maximum lighting fixture brightness to 350 footlamberts and eliminates direct, uncontrolled<sup>2</sup> viewing of the sky. These conditions can be met simply and economically with today's materials and know-how. They usually are not met because of the confusion relative to acceptable practice and because a good visual environment costs more dollars than a poor one.

The cost of an inadequate classroom visual environment in terms of educational opportunities in today's visual world is too obvious to need discussion. The physiological cost to occupants, not widely appreciated, is an energy story of dramatic proportions.

The total physical energy of the body is like one large pool supplying energy as needed for all the bodily functions. When one bodily function takes more than it should from this central pool, less energy remains to serve other functional needs. Dr. Charles Sheard when on the staff of the Mayo Clinic estimated that with good eyes and under good seeing conditions a human being uses one-fourth of his total energy resources in the visual process. With imperfect organs of sight or poor seeing conditions or both, one uses *more than one-quarter of his total* energy resources for seeing. Add to this the large percentage of school time when critical seeing tasks are being performed and the importance of providing classroom occupants the best visual environment we possibly can becomes apparent. More recent research by Blackwell at the University of Michigan is establishing the quantity and quality requirements for good lighting for various kinds of visual tasks. Dr. Mead's work at Tufts College is re-establishing, through modern research techniques, earlier findings in the area

<sup>2</sup> The new neutral-low transmission glass now available makes direct viewing of the sky through it comfortable.

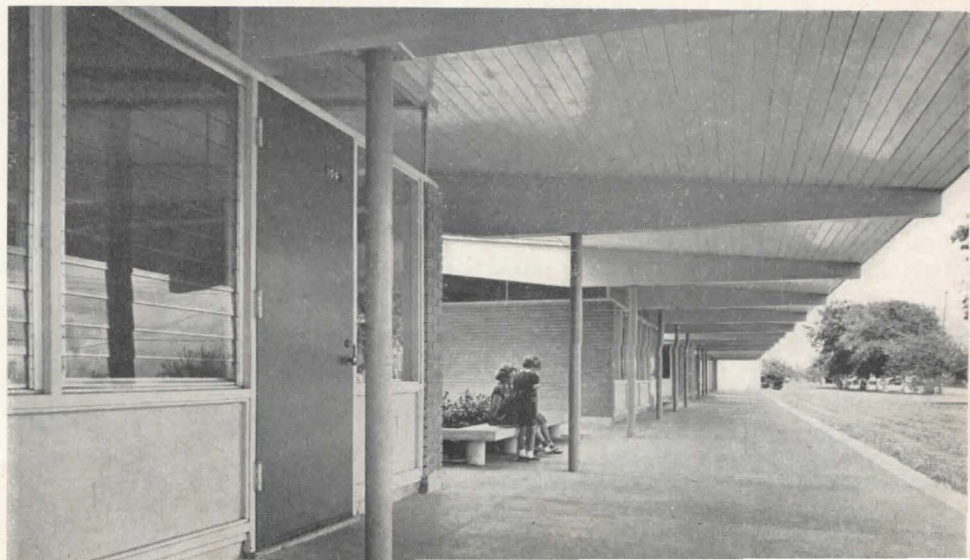
*New Austin Elementary School, Edna, Texas; Caudill, Roulett, Scott & Assoc., Archts. Quality level of structural systems depends more on how materials are put together than on increased dollar cost. Here, walls divorced from vertical supports can be placed as dictated by the demands of space to be enclosed*

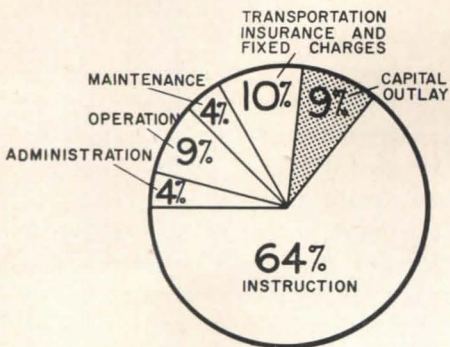
of the physiological cost of seeing. Work going on at U.C.L.A. will consider the problems of the visual, thermal and auditory environments and their integrated relationships to building design. Reduced quality level in this element of the school plant can visit serious physical handicaps upon the occupants we compel by law to use it. Unwise dollar choices here may easily impair normal growth and development patterns in children.

The auditory environment must also be properly conditioned for comfort and work efficiency. This is taken for granted in such spaces as the auditorium and speech-arts laboratories, but often it is ignored as a real problem in classroom design. The "educational opportunities loss" when sound control techniques are ignored in school buildings are reflected by distraction from work, restlessness, lack of a reasonably quiet climate for study, apparent disorder, an uncontrolled tempo of activity and the poor behavior patterns such an environment sets up. The value of the instructional dollar goes down by sizeable drops when design choices rule out adequate sound control. The great amount of verified engineering data available in this area makes it inexcusable for any architect to design a school building which ignores good sound-control practice. The physiological cost in physical energy lost by forcing attention to hearing tasks in an acoustically poor classroom is both measurable and considerable; it can be reduced virtually to zero by good planning and wise selection of materials rather than increased dollar costs.

Another important factor which helps set a good standard of living for occupancy is color, not only in conditioning the visual environment, but also because it carries as big a psychological wallop as the friendliness of a building's design. Children understand color and react to it. They may not be as sensitive to hue and chroma as some seem to think they are, but the proper selection and combination of pigments can make the difference between "belonging" and "not belonging" to many children and adults. The cost in dollars is time and competence, not materials. The whole psychological attitude of occupants toward school buildings is a matter too complex to be a part of this article. It should be of far greater concern than it apparently is for many who make quality level choices. It has far greater

Dewey Mears





Capital outlay, 9%, includes building construction; 4% has to cover all maintenance. Poor building quality means stealing funds from instructional program for increased maintenance

quality level of school plant construction. Roofs, floors, walls, finishes, hardware, doors, structural systems, etc., are available on a quality scale of from zero to one hundred. One of the basic assumptions for school planning, established by many years' observation and personal experience, states that "a poor school district cannot afford to build cheap buildings. The only place money can come from to pay the constant, excessive maintenance costs of cheap construction is out of funds intended to buy a good instructional program. If these already over-stretched funds are not used to maintain buildings, the cheap school plant soon disintegrates into a health and educational hazard for the students we compel by law to occupy it. The physical environment of the school controls to a large degree the efficiency of teachers and students living and working in that environment. Because of this fact, it must be assumed that a reasonable capital outlay investment to provide an adequate physical environment is a necessity if we are to protect the much larger operational investment we make in our schools."

A state-wide financial analysis of California school districts was made for the fiscal year 1950-51. Concerning expenditures, it was found the school dollar was spent as follows: Administration 4 per cent; Operation 9 per cent; Transportation, Insurance and Fixed Charges 10 per cent; Capital Outlay 9 per cent; Maintenance 4 per cent; Instruction 64 per cent. Following this analysis, discussion with school administrators indicated that the 4 per cent spent for maintenance usually did not bear much direct relationship to need; it was what little was left after the other budget commitments were met. Maintenance items relative to the plant, for example, sometimes had to be deferred year after year since other budget items had to be met and plant maintenance items could be deferred. Discussion also brought out the opinion that the only way the maintenance budget could be increased would be to take the increase out of the instructional program. Thus, we find that the quality level of construction affects the educational program of schools directly; the lower the essential maintenance costs, the more can be spent on the instructional program.

dollar-cost implications than most laymen appreciate.

Last to be discussed under quality level for occupancy will be utilities. High standards of cleanliness relative to the person and the environment depend upon provision of water in classrooms. Many instructional materials also require use of water. Gas and electric outlets in the right number and places to serve program needs; a separate electric circuit for audio-visual equipment needs for each classroom; inter-communication devices for direct, effective administration and to provide immediate contact with the larger community of which the classroom must be a part, so there will be the interaction which is essential to learning — these are measures of the standard of living.

Any compromise which would deny a good standard of living for occupancy as defined in the foregoing paragraphs should be made with thorough understanding of the full price paid for it. Whatever the dollar cost of the school, the expenditure of *any* money on it cannot be considered a sound investment unless the building provides a suitable environment for the activities and processes which must go on in it.

### QUALITY LEVEL and CONSTRUCTION

This is measured roughly in terms of the life expectancy of buildings and their maintenance rating. If a school building is to be useful at least until it is paid for, serious thought needs to go into the choices made in this area of design. The real issue is the cost of *moving out* rather than the cost of *moving in*.

Architects are far better able than the writer to list materials and technique choices which determine the

In our justified concern over the hows, whens and wheres of the huge schoolhousing job which is with us now and will be with us for years to come, we **MUST** remember there is much more to cost than money. "Sacrifice, loss and penalty" far beyond the reach of the dollar sign must be evaluated when quality level choices are being made. The school plant is an integral part of the educational program. It is also a positive or a negative factor in the formation of the growth and development patterns of students. Children and teachers are people, and they are extremely sensitive to and affected by the physical environment in which they live and work. As responsible officials proceed to make decisions about school plant problems they must realize that the school building has to be more than a shelter from the elements, more than a series of unrelated spaces where groups of students may be taught. They must evaluate the relative importance of *all* the design features of a school building before they finally determine what quality level of building to sponsor.

# 3 SCHOOLS BY THE SAME DESIGN TEAM

*With explanations by the Architect and Educational Consultant of some of the factors involved in their planning*

## THE TEAM

*Warren H. Ashley  
Architect*

*Marchant & Minges  
Engineers*

*Charles A. Currier  
& Associates  
Land Planners*

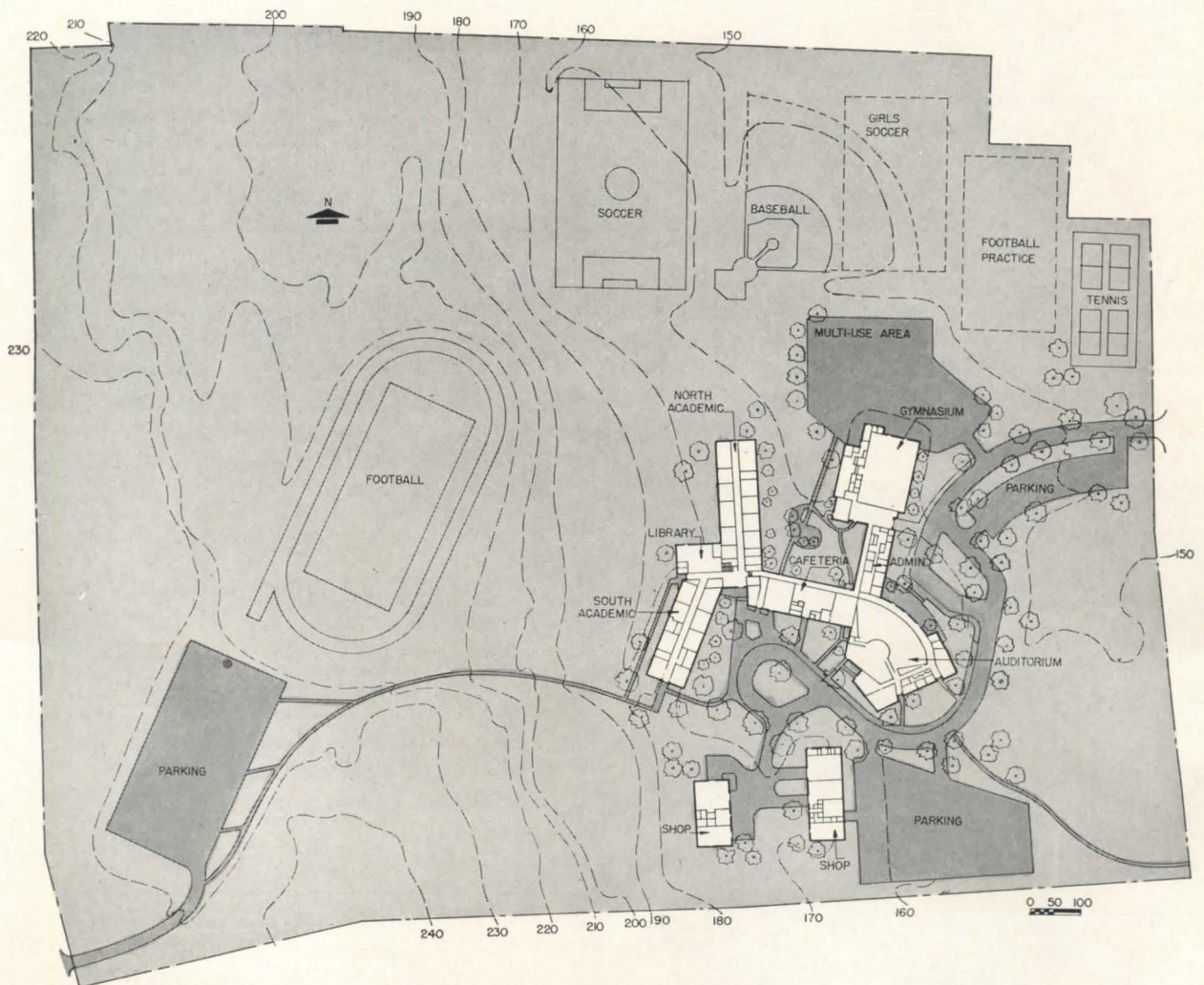
*Engelhardt,  
Engelhardt & Leggett  
Educational Consultants*

## 1—SENIOR HIGH SCHOOL, WEST SPRINGFIELD, MASS.

**Educational Consultant N. L. Engelhardt, Jr.:** "Increasing numbers of people are visualizing the school as a social, recreational and educational center for the entire community, raising the level of community goodness for family living. The old standardized lessons have given way to a broader program more in tune with the times and local requirements. Local

demands vary — each school should be tailored to meet them.

"Basic to good planning is a carefully detailed program setting forth both school and community needs, as well as an estimate of how these are liable to change in the near future. The thinking of many people is often incorporated into such a program.



1—WEST SPRINGFIELD (Continued)

“West Springfield, a town of over 20,000, is primarily industrial in nature but surrounded by large rural areas of farms and new housing. The school building committee leaned heavily in the planning process on the superintendent, Stanley Wright, who thus became a key figure in the development of the program. Emphasis in teaching would be directed towards practicality in subject matter and in terminal education, rather than in the academic subjects.

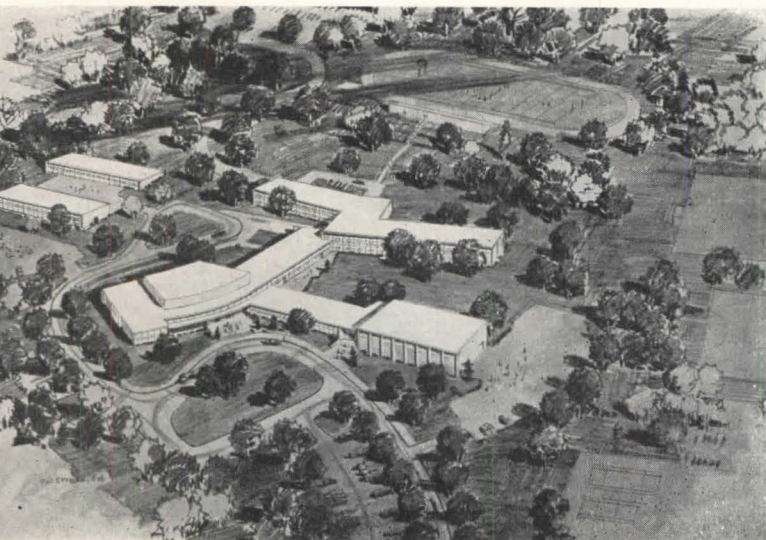
“Since two previous projects had been voted down, it was agreed that a conservative design was necessary in order to avoid argument on relatively unimportant points. The need was critical; another failure would be disastrous for the community.

“Thus, the architect’s beginning proposal for a campus type plan was revised in favor of a scheme in which the units were pushed together into a more compact grouping — this in order to secure a favorable vote in the meeting. Essentially, this is a unit plan school with the differences in scale, flexibility and economy that might be expected with a compacted plan. Much of the planned functioning of the educational program is retained despite the compromise arrangement.

“Both community and school needs emphasized vocational, recreational, and physical educational units and a large auditorium for 1000 as major units. No adequate facility for the latter existed in the town.

“The finest facilities for interscholastic basketball games were required, resulting in a large gym with spectator space, excellent accommodations for visiting teams, and adequate access and parking.

“A general program of industrial arts is offered, since neighboring Springfield offers specialized courses in its large technical school. The growing demand for agricultural instruction led to the establishment of a course and facilities for it in the program.”



**Architect Warren H. Ashley:**

“More contractors compete in the bidding when the units are smaller, more manageable. On a large two-story high school I designed, four out of 17 interested builders dropped out because of the building’s size. This school comprises approximately 140,000 sq. ft. Despite a comparative analysis based on preliminary schemes (one compact — one open) the committee chose the more conventional parti.

“In computing areas, we have held to the formula required by the Connecticut Department of Education, which stipulates that attics, pipe-tunnels, and crawl spaces be excluded; and that for rooms for boiler, janitor’s work, basement stores, fans, and for unenclosed but covered porches one half actual area be used. We include covered walkways in the latter category.

“Our educational area figure includes spaces devoted to administration, teaching, auditorium, music, gym and lockers, cafeteria and kitchen. We reason that if there is no gym, no lockers are needed — if there is no cafeteria, no kitchen is required. On the foregoing basis, this was the analysis:

**PRELIMINARY COMPARISONS**

	Closed Plan	Open Plan
Educational Area.....	108,820	108,820
Circulation, Toilets, ½ areas..	48,630	27,200
Total Area.....	157,450	136,020
Sq Ft cost.....	\$15	\$15
Building cost..	2,361,750	2,040,300
Site work.....	200,000	200,000
Fees.....	153,705	134,418
Equipment, etc...	250,000	250,000
Totals.....	\$2,965,455	\$2,624,718

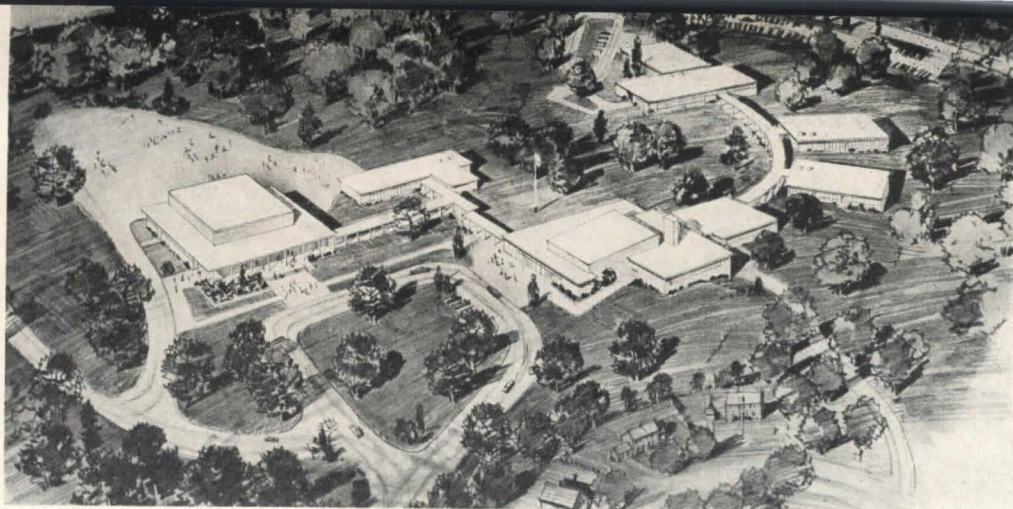
“Thus, adoption of the open plan might have saved the community \$340,700 for other purposes.”

**WEST SPRINGFIELD**

Educational Area.....	111,703
Total Area.....	154,340
Building Cost @ 10.89...	\$1,600,901
Site work.....	281,173
Fees.....	156,400
Mechanical & Electrical...	560,099
Equipment & Contingencies	311,427
Total Cost	
(@ 19.80 per sq. ft.)...	\$2,910,000

No students.....	1250
Total sq ft per student.....	123.4
Total Cost per student.....	\$2,328.00



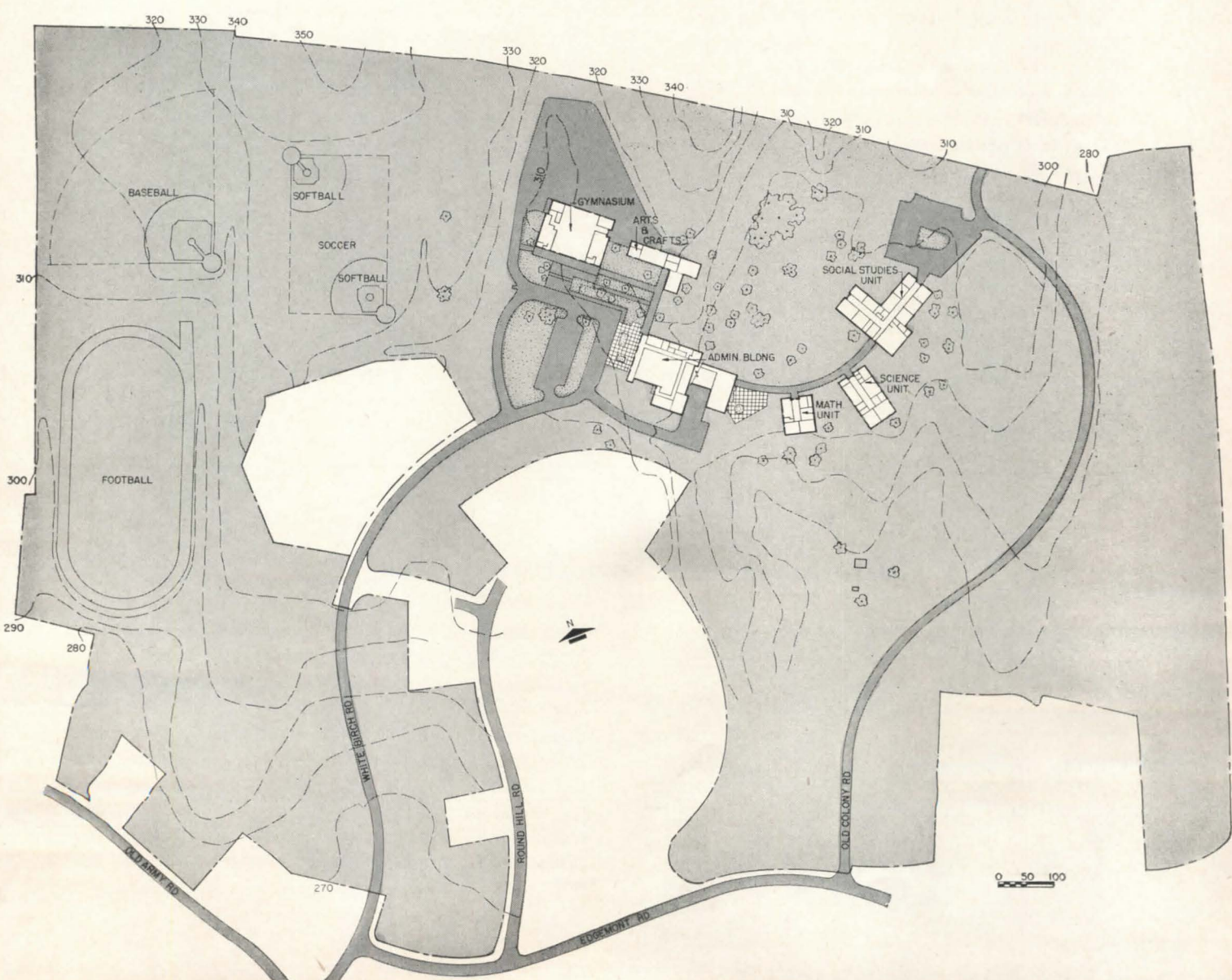


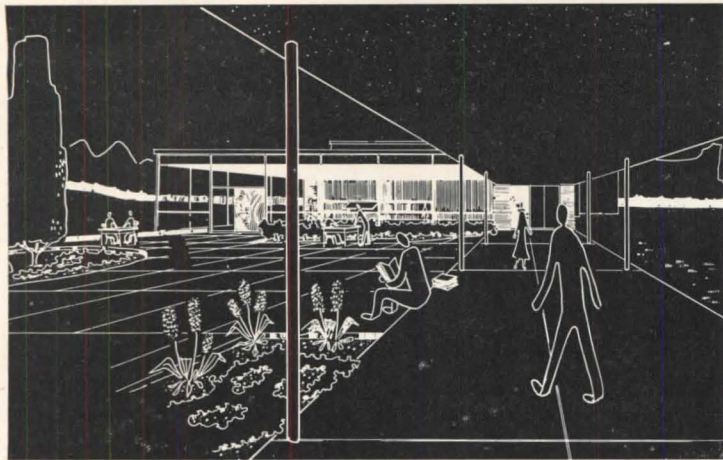
**2—EDGEMONT JUNIOR-SENIOR HIGH SCHOOL, GREENBURGH, N. Y.**

**Engelhardt:** "Edgemont has for many years sent students on tuition to neighboring Scarsdale and Bronxville High Schools, and after rejecting various plans for consolidation, decided to build its own secondary school. The community was more conscious of its needs than most—due to the long established activities of a Citizens' Committee working under the guidance of Principal William Moyle. For this reason the program was clean-cut and the referendum successful.

"Economy and simplicity were essential, since the entire bonding capacity of the district was required. Inasmuch as 93 per cent of the students would attend college, total emphasis was placed on academic subjects, with the understanding that those requiring other training would be sent on tuition to other schools.

"The beautiful 72-acre site is located in a heavily wooded residential area and is characterized by rock outcroppings and changes in level. A unit type plan





Perspective View of Cafeteria Terrace

**EDGEMONT**

Educational Area.....	56,463
Total Area.....	74,192
Building Cost, @ 12.83....	\$951,500
Site work.....	261,485
Fees.....	107,829
Mechanical & Electrical....	334,172
Equipment & contingencies....	150,000
<b>Total Cost</b>	
(@ 24.32 per sq ft)....	\$1,804,986

No. students.....	550
Total sq ft per student.....	135
Total Cost per student....	\$3281.00

**Ashley:** "The committee decided on a unit plan since maximum flexibility and economy were required. The corridor congestion and traffic past teaching areas typical of the rigid plan will be eliminated. On this beautiful site, a walk from one unit to another will provide a

pleasant interlude between classes.

"Complete flexibility of interior partitioning will free areas to meet future needs as they arise, while the addition of further units at relatively low cost will take care of increases in enrollment.

"The growing trend to separate junior

and senior high school activities is readily accommodated by the unit plan, which provides common major facilities for both groups as well as the separate spaces and home-room atmosphere so necessary in making the 12- and 14-year-olds feel that they 'belong.'"

**2—GREENBURGH (Continued)**

offered the chance to build with minimum excavation by placing the units on natural contours and adjusting elevation differences by ramps and steps in the covered passages between.

"Early in the program it was decided that recreational facilities should be devoted to participants, not spectators. There was no ambition in the direction of competitive interscholastic sports.

"Since a large auditorium was provided by the elementary school, this one was conceived as a little theater seating only 300, designed for adult amateur groups as well as for the school dramatics program.

"At present, high schools are being organized on one or the other of two concepts: the first dividing the elements by subject; the second developing broad areas against which all subject matter might conceivably apply. Many unit schools contain within each unit facilities for a cross section of important subjects — a step towards complete integration.

"At Edgemont, the units are developed in terms of integration at two levels: the workshop center, including industrial arts, homemaking, arts and crafts; and the unit devoted to English and the social studies. The demands of college preparatory training require study and drill in the subject field, so that much of the traditional departmentalization had to be retained.

"It is of interest to note that integration of subject matter and the development of the unit plan for schools complement each other by their nature."

**3—WILBERT SNOW ELEMENTARY SCHOOL, MIDDLETOWN, CONN.**



**Engelhardt:** "This is a neighborhood school, located in the geographical center of several new housing developments for families of moderate means. Middletown has a number of small schools, inadequate for modern needs and located on small plots. This school represents the first break with that pattern and provides the prototype for future building in the area.

"Based on the concept of a plant to serve both children and adults for total community service, the preliminary planning involved many people and several

agencies, including the Board of Education, the Park Department, and the Library Board.

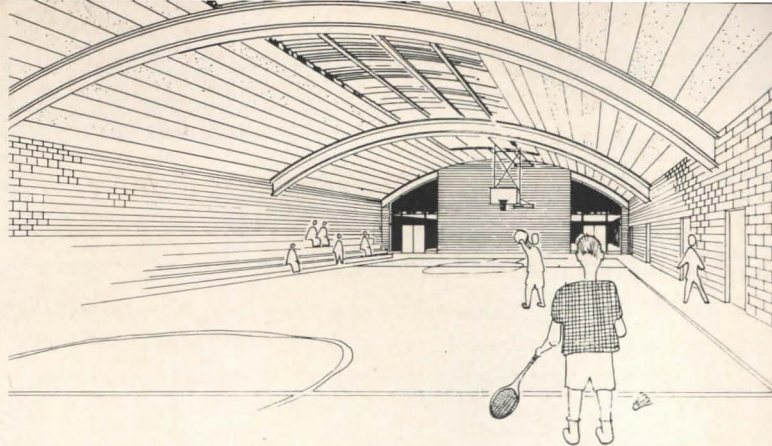
"The library is designed for joint use by students and townspeople, and will become a branch of the town library open during the evening hours when the school is closed. It is located near parking areas for public convenience.

"The city Park Department and Board of Education have established what is probably a new high in public cooperation by preparing a formal agreement concerning joint use of the school grounds — an agreement which is outstanding and might well set an example for other communities. The Park Department appropriated \$25,000 to implement its share of the site work. The agreement provides that baseball and football fields, tennis courts, and gymnasiums, as well as the locker and toilet facilities for same, shall be available to the public for use under the supervision and direction of the Park Department . . . except when in actual use by the school . . ." In addition, the site offers picnic areas, an arboretum, and hiking trails for community use.

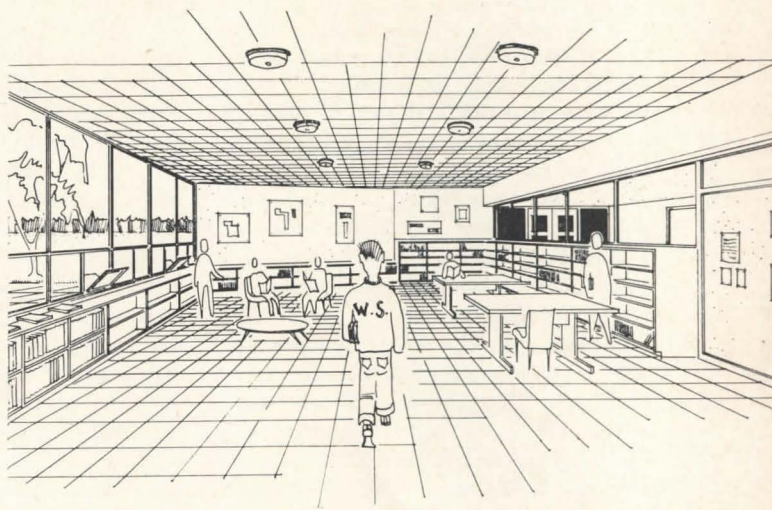
"Again, the key figure in the development of this unusual plan was the school superintendent, Creighton Magoun, who was heavily instrumental in the development of the program.

"The site is a beautiful, heavily wooded slope of 25 acres, part of an old estate. The woods will be preserved as a sanctuary for birds and small animals and will be used for nature study. What better environment for learning than the true expression of one of childhoods greatest interests — that of growing things?"

"Before the unit plan was adopted, it was presented to a citizens' meeting for discussion and approval. The unit scheme seemed proper for reasons of economy and amenity. Each basic unit of four classrooms will house two grades at present, but will lend itself admirably to a changed concept of grade levels should that occur in the future. The unit idea works particularly well for elementary schools where nearly all activity occurs in the homeroom. There are few occasions for pupils to leave except at lunch time, either to go home or to visit the cafeteria. The few complaints against children having to go outside in bad weather fail to hold up under close consideration."



Gym interior



Library area

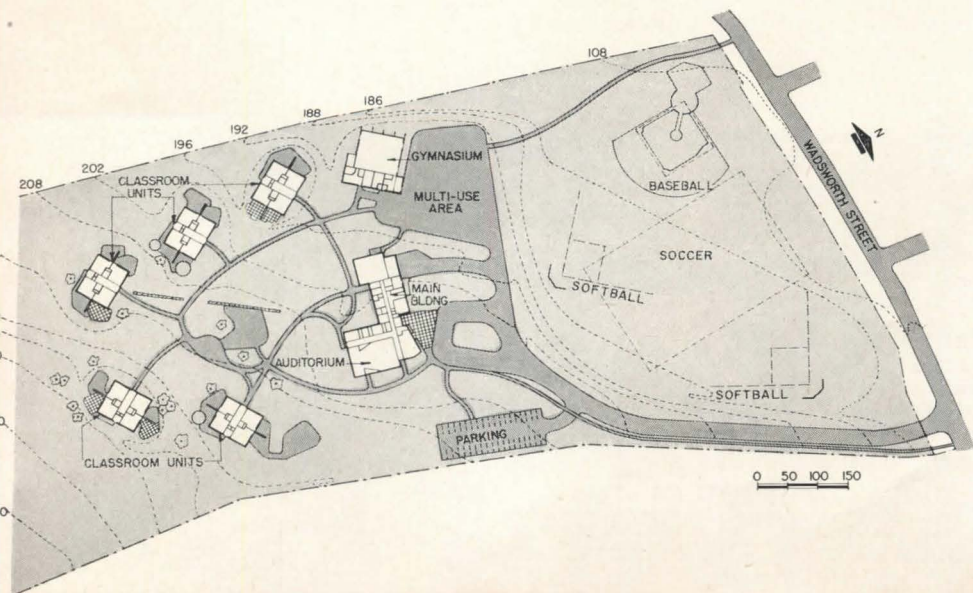
### MIDDLETOWN

Educational Area . . . . .	36,573
Total Area . . . . .	46,191
Building Cost, @ 10.39 . . . . .	\$479,998
Site work . . . . .	58,158
Fees . . . . .	45,194
Mechanical & Electrical . . . . .	202,750
Equipment & contingencies . . . . .	52,000
Total Cost (@ 18.14 per sq. ft.)	\$838,100

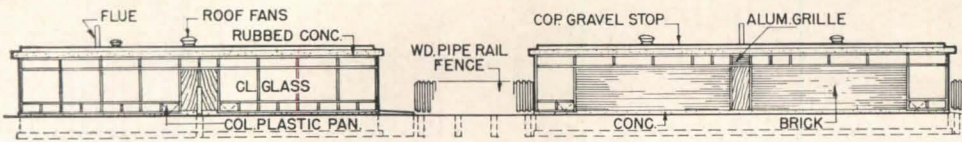
No. students . . . . .	600
Total sq. ft. per student . . . . .	.74
Total Cost per student . . . . .	\$1397

**Ashley:** "In a typical community, the school building committee is faced with the problem of constructing, under a limited budget, a school plant that will serve future as well as present needs. Even as the educational program must be flexible enough to cope with changing emphasis and new techniques, so must the physical plant be capable of meeting population changes and program revisions with a minimum of disturbance and expense.

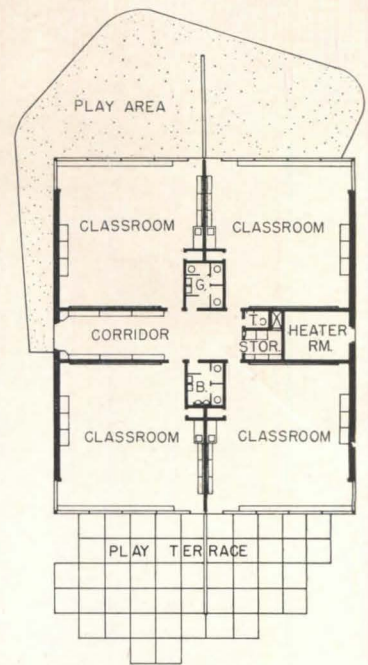
"The need for schools that are both



### 3 SCHOOLS BY THE SAME DESIGN TEAM



Illustrated on this page is a typical four classroom unit, which will be constructed by the lift-slab method. Clockwise: above, elevations; at right, the plan; right below, typical detail of exterior wall section; bottom, perspective of typical classroom interior



### 3—MIDDLETOWN (Continued)

economical to build and based on sound educational concepts is evident — and the conscientious architect is making every effort to bring school planning in line with the best thinking in the educational field. Every penny of cost is important, and every foot of the building and the plot not actually used for educational or community function is suspect.

"The campus concept is new for public schools (although colleges and private schools have long consisted of separated structures on planned grounds) and offers much in the way of amenity, flexibility, and economy. Accessibility to the outdoors is important, and the advantages of outdoor classrooms has been recognized for some time. Such areas are a 'natural' in a unit plan; experimental gardens and outdoor dining for the Home Arts group, painting and drawing outdoors for art students, outdoor work areas for shops — all these are practical, even in New England.

"A shutting-off is required for many activities, such as summer sports, basketball games, dramatic performances, and others. An adult program, contrariwise, requires opening-up, shops, science, the gym, etc. Heat and light are required, as are accessibility and parking. Isolation is less expensive than acoustic treatment, and is also the most efficient fire barrier.

"Each room should be located for best group functioning, and should be prop-

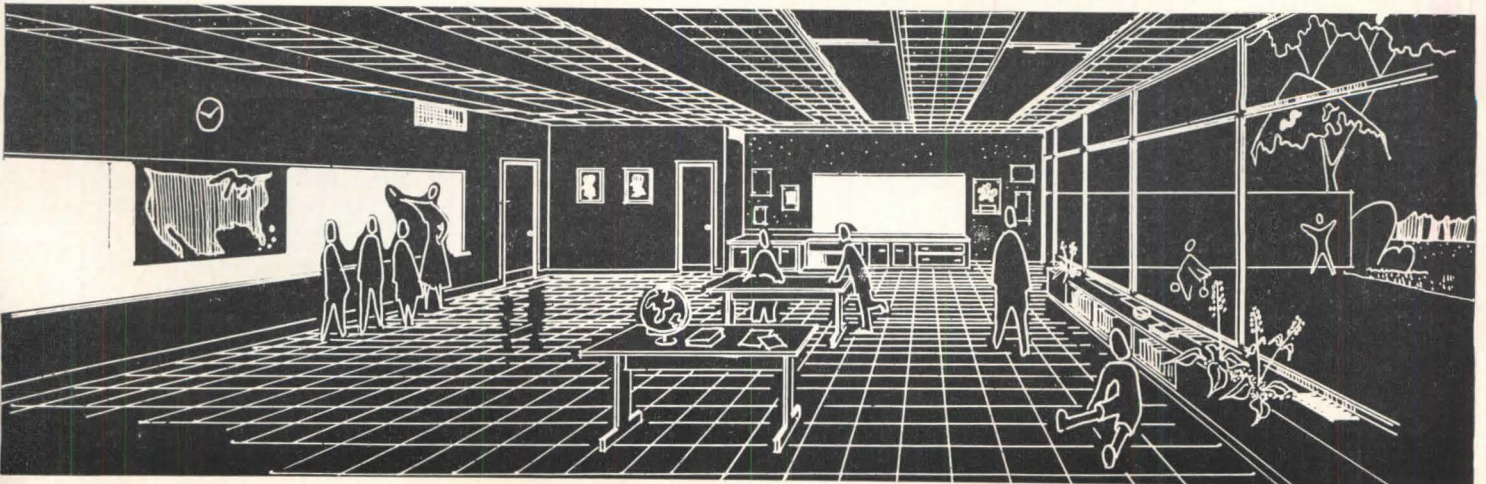
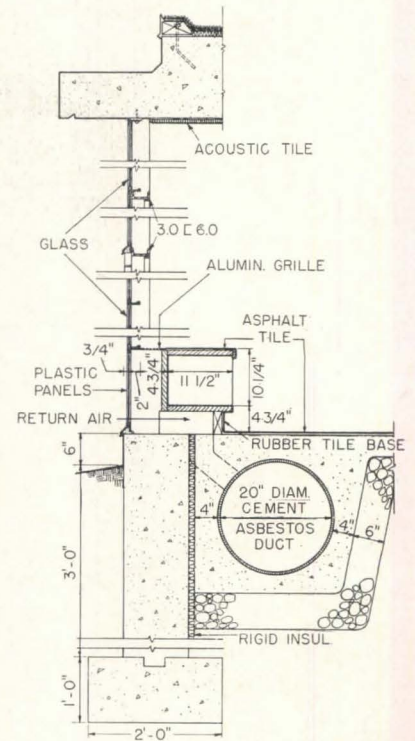
erly oriented — social rooms, gym, library, and biology rooms for sun; art rooms, science labs, shops, and health rooms for north light.

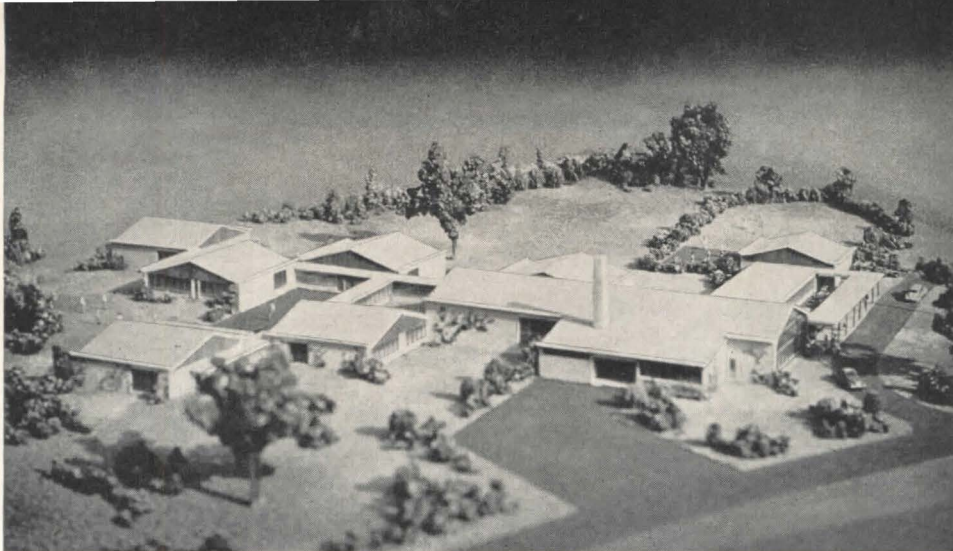
"The building of additional space in the future is easier and cheaper in self-contained independent units; does not disrupt the existing plant so seriously. A logical planning approach is to separate the components, group them accordingly to common needs, locate and orient them in accordance with function. The resulting small structures tend to possess a scale and character suitable for youth.

"Using the site for circulation dilutes cross traffic, eases the hazards of changes in level, and is cheaper than building corridor space. Units constructed in accordance with natural contours minimize excavation and foundation work. Toilets and storage areas can be located where needed, not fitted into odd corners and intersections in the plan.

"Units can be designed for special function or for economy through duplication. They can be built at once or individually as required — those for a particular age group or educational function can be added without throwing the arrangement of the school out of gear.

"By the simple device of separation, the unit plan achieves efficiency, fire safety, control, flexibility and economy; while allowing the designer greater freedom in relating each room to its neighbor and to the site as a whole."





MODEL, TOWER STREET ELEMENTARY SCHOOL

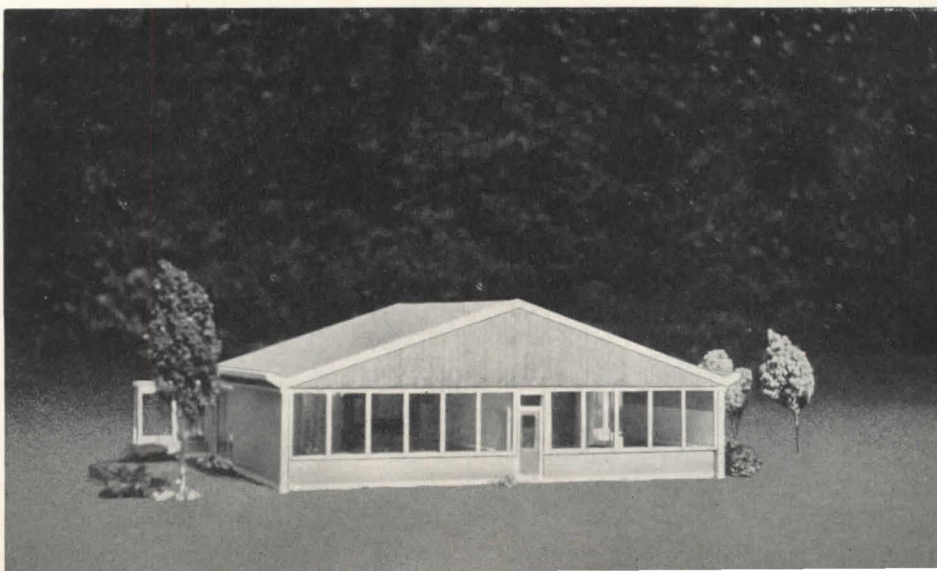
## TWO "CLUSTER" SCHOOLS FOR WESTERLY, R. I.

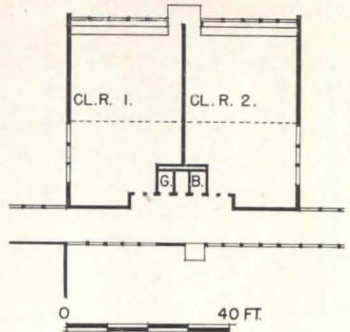
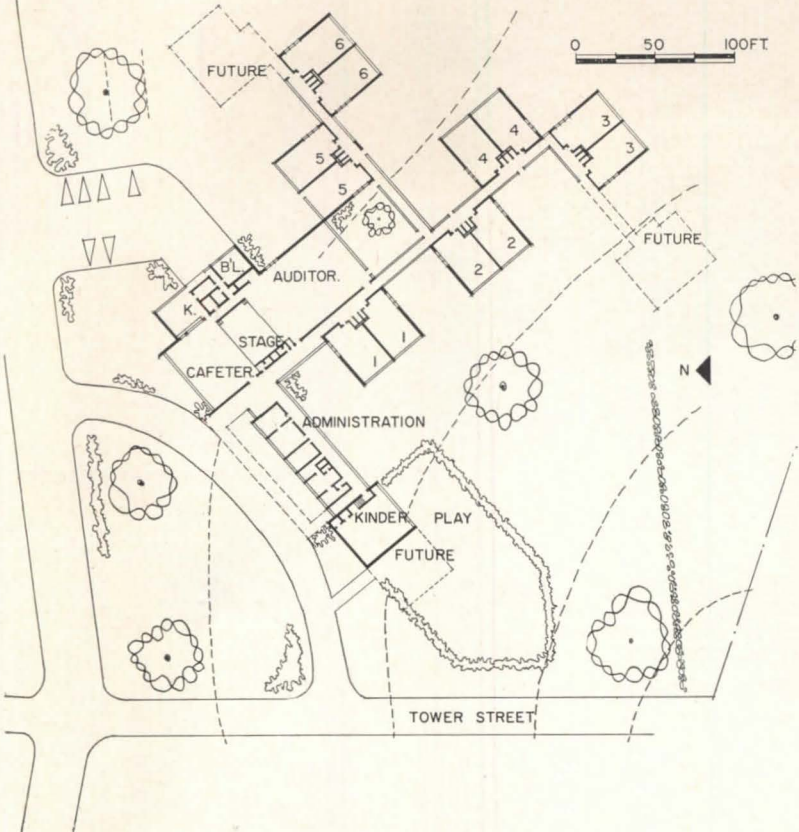
*Harriman, Willis & Hayden, Architects & Engineers*  
*Leo Doherty, Educational Consultant*

WESTERLY, R. I., had thirty-one elementary classrooms to build on two sites, one at Tower St., the other at Westminster St., where fairly good-size sites were available. The building committee had no predetermined ideas of style or solution for their problem; they were willing for the architect to investigate all possibilities. A total of 13 different schemes was developed before a basic idea for each school was agreed upon. The Westminster St. School was first tried as a single-loaded-corridor plan, with the upper three grades separated from the lower three. The wings stepped down the gently uniformly sloping lot, offsetting at regular intervals.

The Tower St. site, on the other hand, was hilly; that there would be expensive rock excavation was evident. The architects suggested a cluster scheme with each unit set at a convenient elevation and with all connected by green-house-like, lightly built, semiheated corridors which ramped freely up and down the slopes. The committee's reaction was favorable. In particular they liked the neighborhood character of the buildings, their human scale and home-like atmosphere; the scheme's adaptability to the site; repetition of small units, which would encourage small local contractors to compete for the contract; ease of future expansion by merely adding clusters (mechanical facilities are sized to accommodate additions); and the outdoor facilities: paved play spaces, teaching and assembly areas sheltered on three of four sides by buildings or corridors.

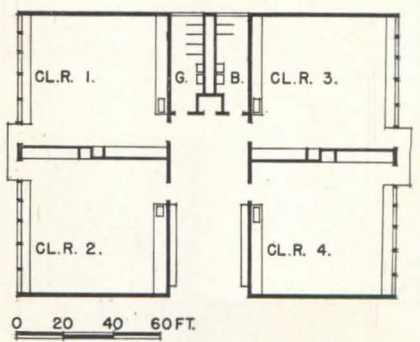
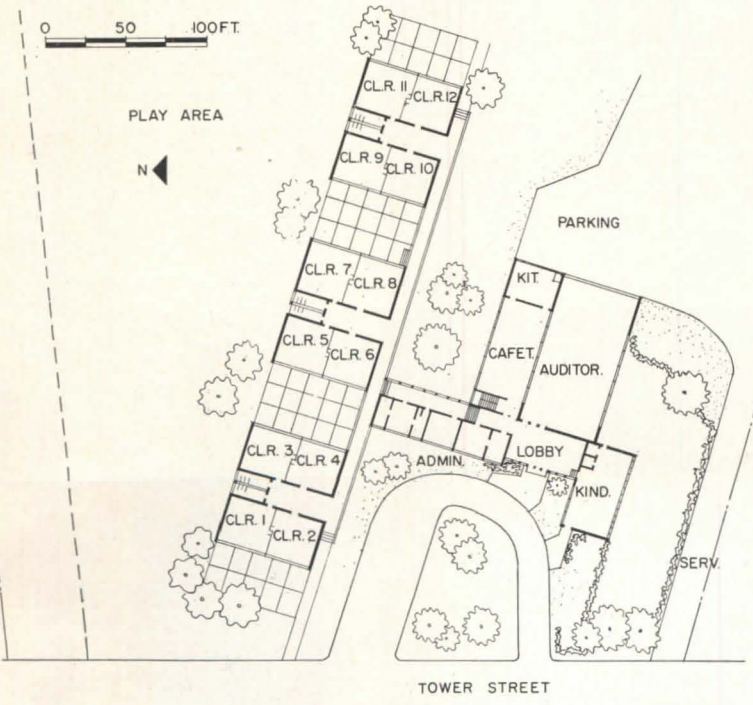
MODEL, TYPICAL TWO-CLASSROOM BUILDING





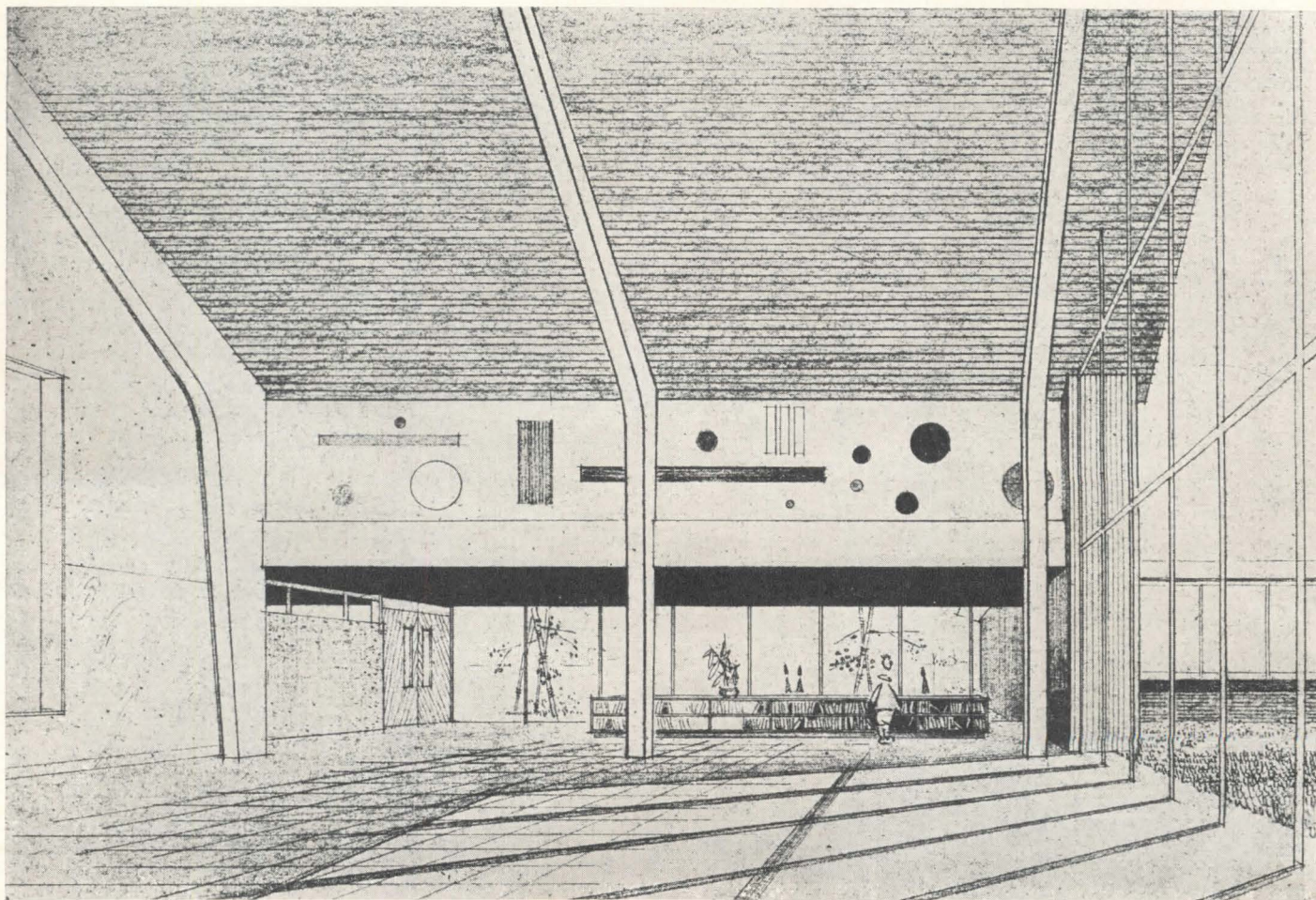
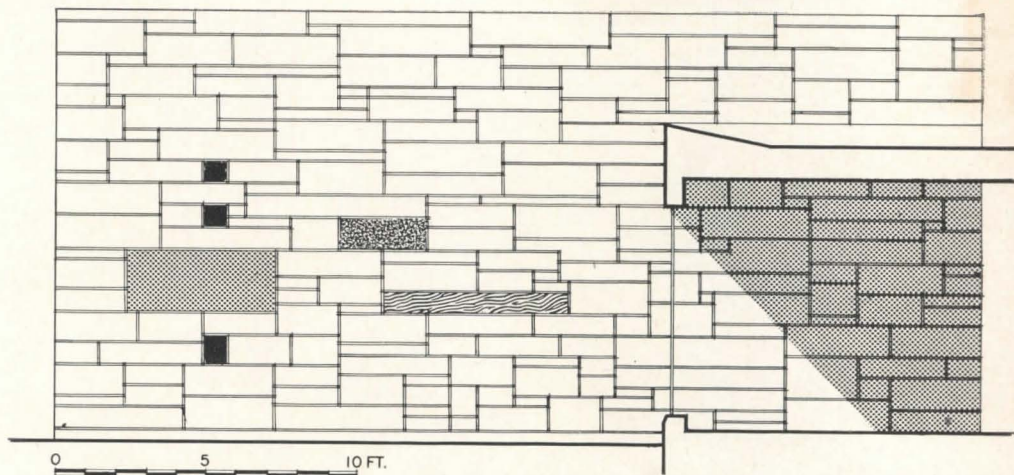
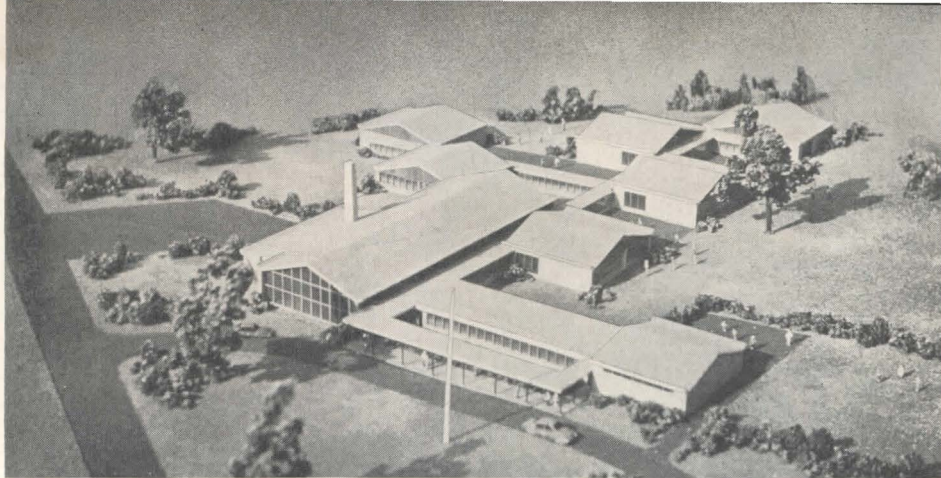
Cluster Type	Cluster Area—Sq Ft	Cl Rm Area—Sq Ft	Mech. Core & Toilets Sq Ft	Circulation Per Cl Rm Sq Ft	Connecting Corridor* Lin Ft	Total Circulation & Corridors* Sq Ft
4 Cl Rm	4560	900	80	160	270	3810
2 Cl Rm	1968	918	33	33	320	2636
2 Cl Rm vs 4 Cl Rm			- 47	- 127	+50	- 1184

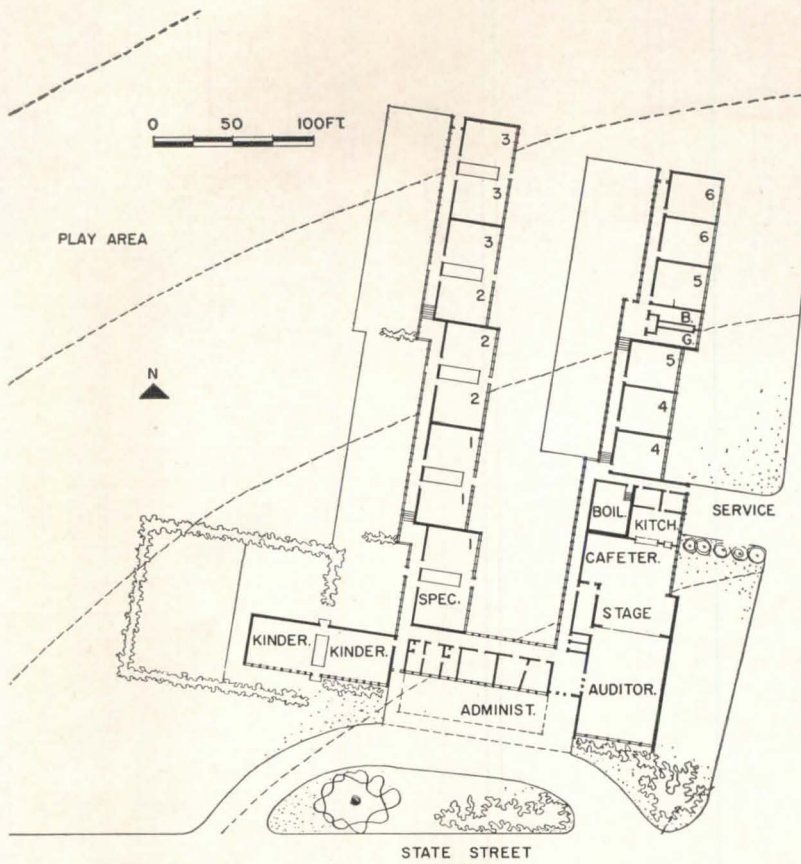
\* Based on 12-class room scheme



In developing the cluster scheme for the Tower St. School, units of two classrooms were found more flexible and efficient in use of space than 4-classroom units (see table on facing page). Among the 2-room unit advantages are: greater ease of adaptation to the site; less circulation and corridor area; simpler lighting problem; natural light (important in New England) on two sides of each classroom, providing flexibility in orientation and permitting low ceilings more in scale with the children; 2-room units need not make classrooms face each other (the 4-room units would have, thus creating distraction and hampering teaching).

At the main entrance to each school is a granite wall (right) in random ashlar of rock and seam-faced stone, with polished, colored pieces projecting from the neutral ashlar background to form a mural quite appropriate in a granite country. These will be lighted by spots from the canopy roof. Cafeteria and auditorium in each school (below) have laminated wood arches carrying a 4-in. wood deck; stage is between the two rooms, at Westminster a low-ceilinged library adjoins and becomes part of the cafeteria; the bright mural above it is to be painted by a local sign-painter



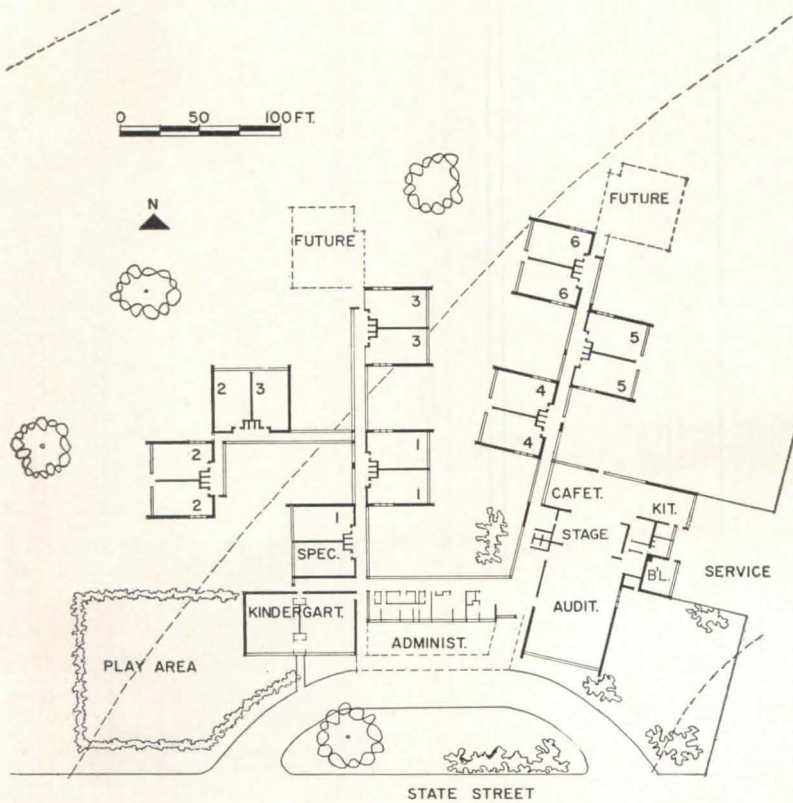


For the Westminster Street School, although the site, less rugged than that at Tower Street, was a less obviously compelling factor, a comparison was made of the initial single-loaded corridor scheme with a cluster scheme composed of two-classroom units (see tabulation below). If the comparison's results were not too far out of line, there might be an over-all saving since both schools were to be built at once and increasing the number of repetitive units might reduce the total contract cost.

Results exceeded expectations; the cluster scheme showed substan-

Type	Area Sq Ft
18 Cl. Rm.—2 Kind. Ea.	
SINGLE-LOADED CORRIDOR	38,200
CLUSTER SCHEME	34,300
CLUSTER vs. CORRIDOR	-3,900

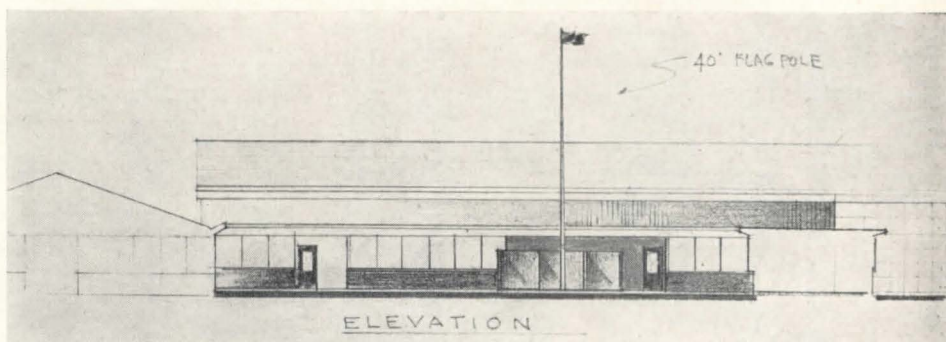
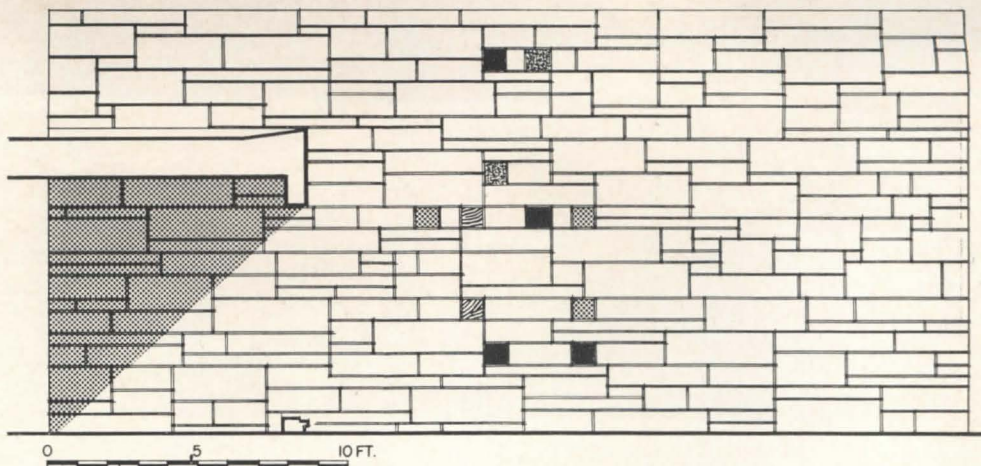
### RHODE ISLAND CLUSTER SCHOOLS: WESTMINSTER



tial area savings due to the compactness of the units as a whole and particularly of each unit's service area, with unit heaters above in the attic space; and due also to dual use of cluster circulation space and corridors as well as of library and cafeteria space. Thus, though the reasons for doing so at Westminster were somewhat different, both schools were developed as cluster schemes and were sent out for bids early in September, 1954

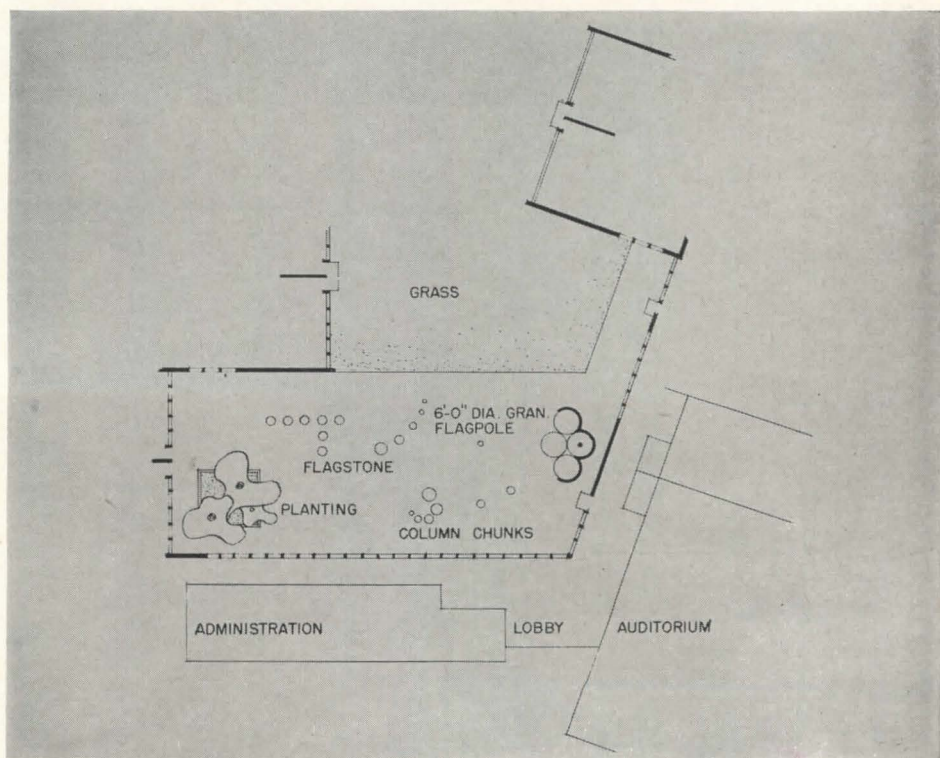


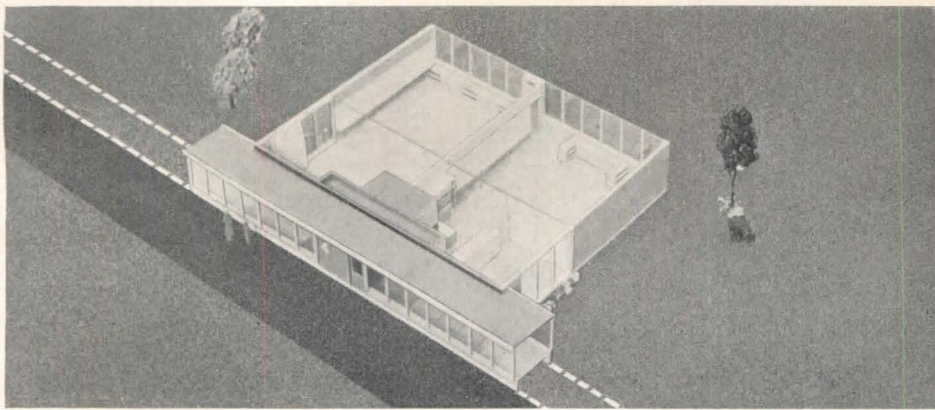
Westerly, as we have said, is a "granite town"; in past years its quarries flourished. The granite entrance wall and mural used at the Tower Street School was repeated at Westminster Street, with a different motif. At Westminster the attempt at decorative and practical use of granite was carried further. Available at a local granite yard were many discarded shapes: discs 6 ft in diameter, short chunks of columns, flat slabs, cubes and many others of no particular description. It was decided to use four of the large discs as an outdoor stage for assemblies in one of the sheltered courts; these also would become a setting for the flagpole, and they would be backed by a redwood screen shaped to their circular forms. All of this is indicated in the drawings at right and below. Other chunks of granite are being used as stepping stones, seats and play sculpture.



Perimeter Lin Ft	Partitions Lin Ft	Corridors Lin Ft
1904	2288	765
2319	1740	685
+415	-548	-80

Of the buildings other than classroom units, the auditorium and cafeteria at Westminster, like those at Tower Street, have laminated wood arches, a 4-in. wood deck, sidewalls of brick, granite, wood stud and glass, and a concrete floor slab on fill. Administration and service areas are of wood joist construction with brick, stud and glass sidewalls and a concrete slab floor. All buildings are heated by a high-temperature forced hot water system feeding individual heating and ventilating units; mains run under the corridor floors and supply what heat the corridors need. Corridors contain no lighting fixtures inside, but are illuminated at night by the outdoor flood lights which light the grounds. Details of classroom clusters and corridors are shown on the following pages





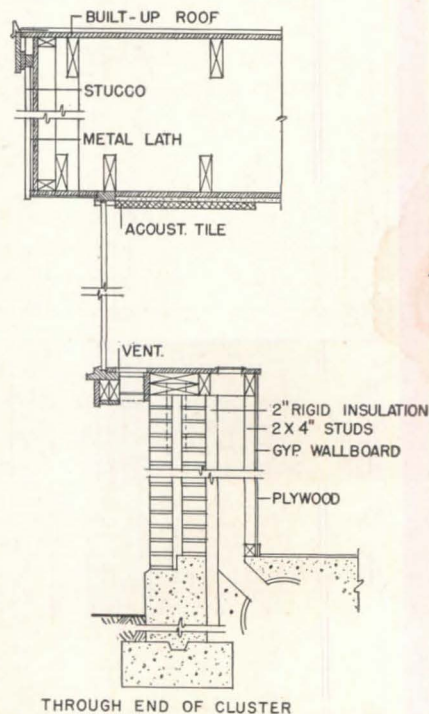
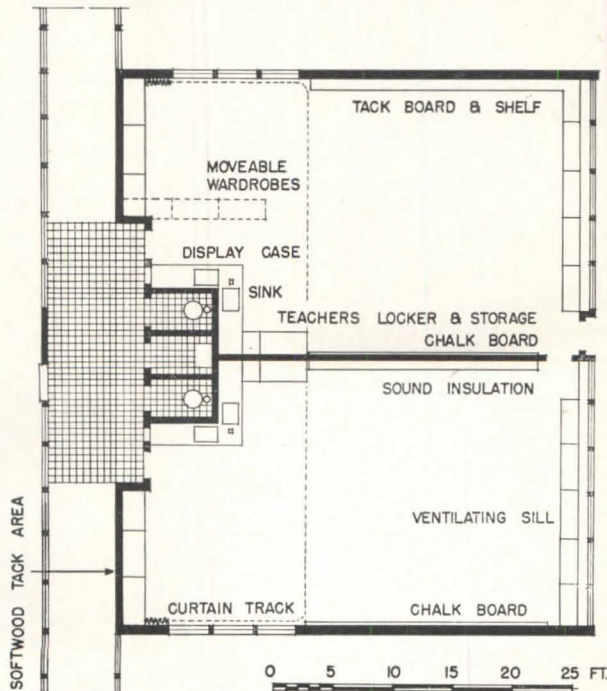
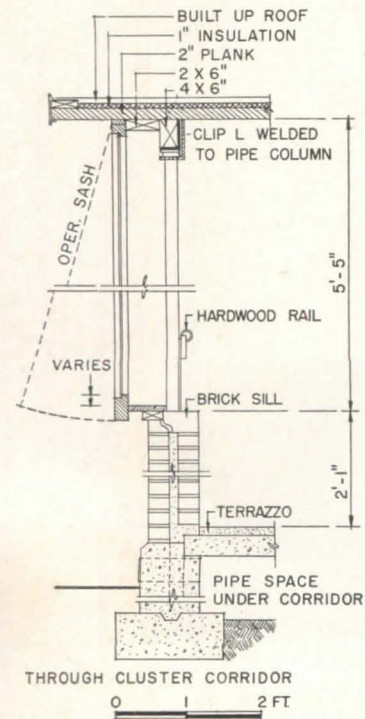
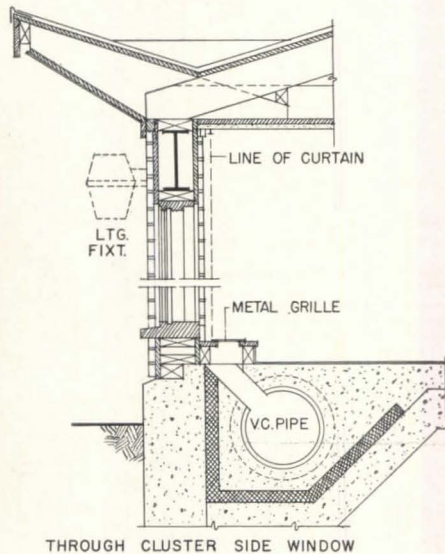
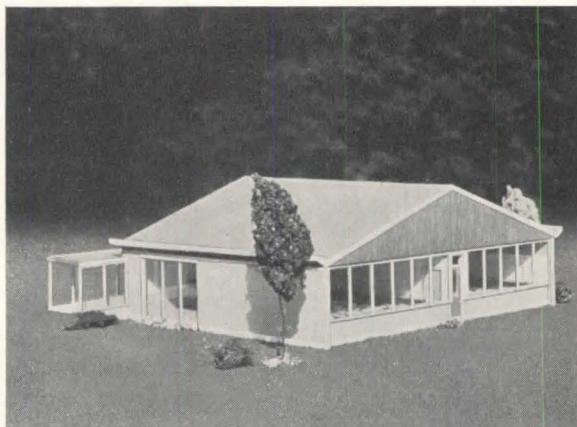
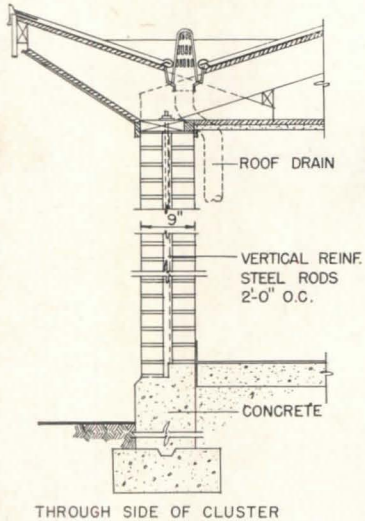
**RHODE ISLAND CLUSTER SCHOOLS: DETAILS**

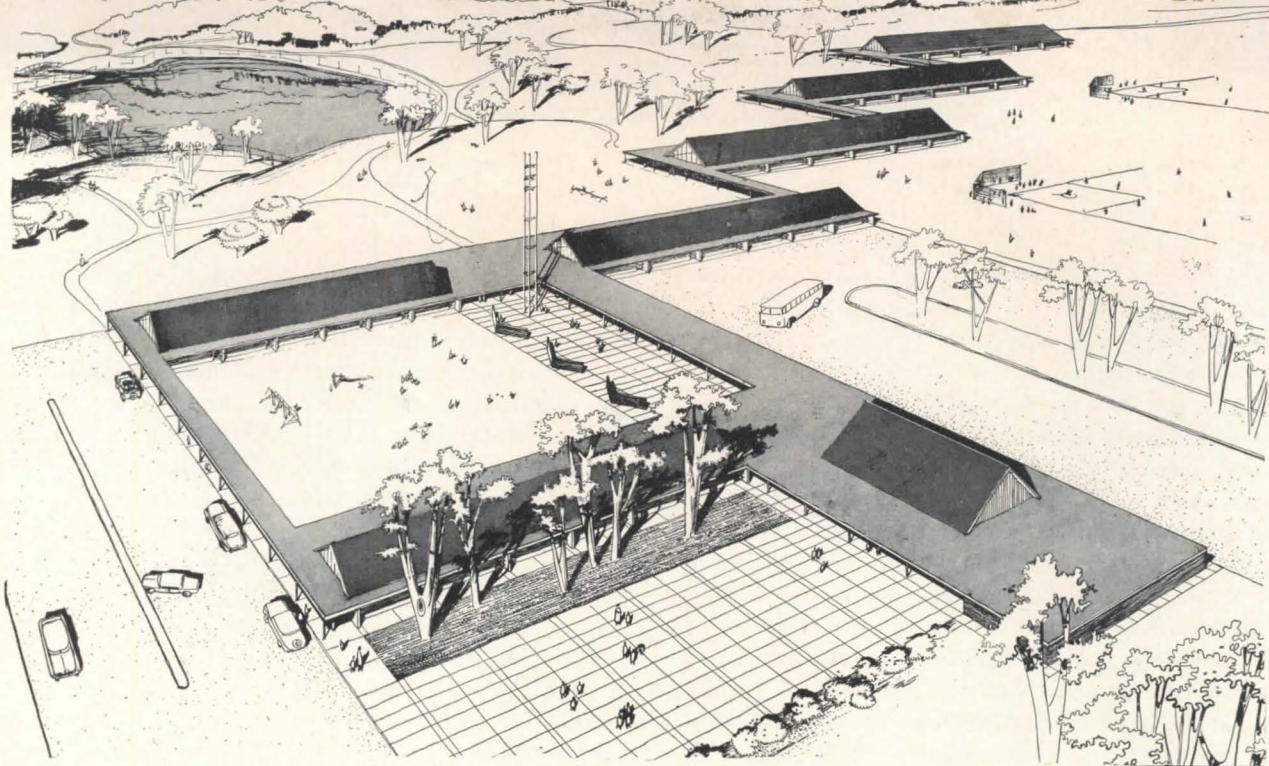
Clusters have wood roof trusses resting on 3 bearing walls — two exterior and one the central partition — and concrete slab floors. Corridor floors are pre-cast plank forming a continuous pipe space below. All heated areas have double sealed glazing in sash of a standard size

throughout, a detail which meant considerable saving in both drafting time and construction cost. Each classroom has movable wardrobes, teacher's cabinets and storage units; a floor-to-ceiling movable drape for subdivision when wanted; natural light from two sides (84 sq ft at side,

110 sq ft at end); low ceilings, white with indirect lighting in seating area; tinted with direct lights in project area; 2-sink work counter; art shelf, display panel, display cabinets.

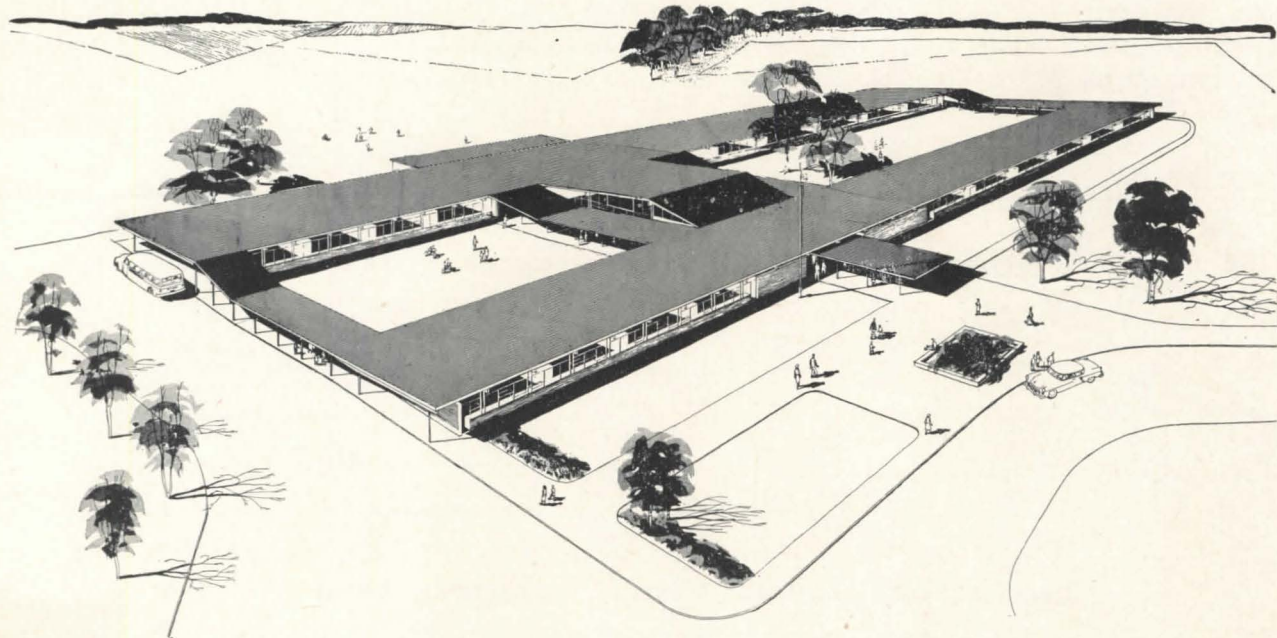
In all there are 31 classrooms (18 at Westminster, including 2 kindergartens; 13 at Tower including 1 kindergarten) and each school contains a multi-purpose room, cafeteria, lobby, administration offices, kitchen, boiler and storage rooms. Bids were opened Sept. 27, 1954; the low bid was \$960,442; at 62,031 sq ft total (Westminster 34,271; Tower 27,760) and 943,368 cu ft total, this came to \$15.42 per sq ft or \$1.02 per cu ft. These figures may be slightly reduced by taking certain alternates. Without utilities, the buildings are costing \$14.75 per sq ft, \$0.97 per cu ft.





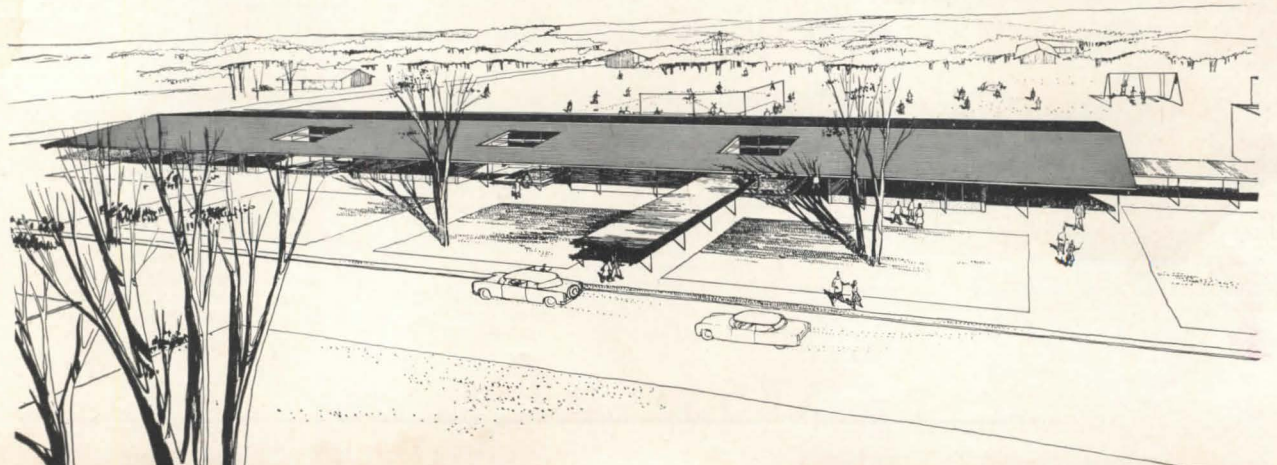
MESQUITE ELEMENTARY SCHOOL

THREE APPROACHES FOR THREE TEXAS TOWNS



GEORGETOWN ELEMENTARY SCHOOL

CAUDILL, ROWLETT, SCOTT & ASSOCIATES, ARCHITECTS



NEW AUSTIN SCHOOL, EDNA, TEXAS

**WHAT IS RESEARCH?** In one sense it is the pursuit of perfection; in architecture, working toward perfection of design techniques, development of new ways to make buildings more functional, more attractive for living and working, more economical. The pursuit ranges from such specifics as developing new lighting and ventilating ideas to finding new uses for old materials, searching out improved means of insuring safety and low maintenance costs, of improving existing structural methods and perfecting new ones — in short, research in architecture is a thought process aimed at the perfection of man's physical environment.

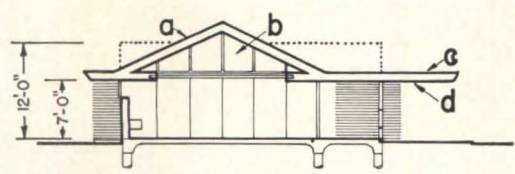
Architectural research is fundamental to the work of Caudill, Rowlett, Scott & Associates. Even the least of their more than fifty school jobs, whose costs range from about \$30,000 to well over \$1 million, is carefully studied to determine exactly which of many approaches best solves the immediate design problem. Here are three of their recent schools, all with much the same environmental and educational requirements; yet the differences between their situations have led to quite different concepts which yet achieve comparable results.

A few words about the Georgetown job may help the reader to evaluate the others. During the final stages of

Georgetown's construction one of the plumbers said, "Doesn't this school feel good?" That's about the best compliment a school can be paid; it can be a highly efficient machine for facilitating the curriculum (this one is); it can incorporate ingenious daylighting (this one does); it can be built economically of up-to-date materials using advanced techniques (this one is) — but if children don't "feel good" in it, it will have failed as schoolhouse architecture. Before Georgetown was completed those who put it together knew it would feel good; the children and teachers who now occupy it not only know the builders were right, but know also that it "works good." Here is proof that obtaining satisfactory school plant facilities and getting the most for the educational dollar are not incompatible.

Some ways in which Georgetown got full dollar value: its classroom wings ride the contours, avoiding excessive cuts and fills; the building has no padding, no false ceilings, no hidden structure, no expensive heated halls; the heating system is economically integrated with the structure, which even forms the walls of the ducts; overhangs eliminate first cost and maintenance of shades or blinds; repetitive structural units permitted expedient, economical construction methods.

**FLORENCE BLACK ELEMENTARY SCHOOL, MESQUITE, TEXAS**



- FEATURES**  
 A—Rigid steel frames 24 ft o.c.  
 B—Glass gables distribute light  
 C—Outdoor corridor & sun control  
 D—7-ft eaves, residential scale  
 E—Cubage saved over rectangular section: 25%

**AREA (SQ FT)**

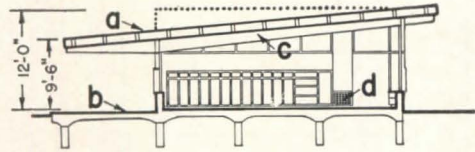
Enclosed, heated @ 1	28,518
Covered corridors @ 1/2	9,136
<b>Total area</b>	<b>37,654</b>

**CONSTRUCTION COSTS**

General contract	\$296,721
Site development	22,885
Kitchen equipment	13,830
Movable cl rm equipment	3,723
<b>Total cost</b>	<b>\$337,159</b>

Contract let: February 1953; cost per sq ft.....\$8.95

**GEORGETOWN ELEMENTARY SCHOOL, GEORGETOWN, TEXAS**



- FEATURES**  
 A—Large sun-control overhang  
 B—Outside corridor  
 C—Laminated wood girders  
 D—Hot air heating unit  
 E—Cubage saved over rectangular section: 10%

**AREA (SQ FT)**

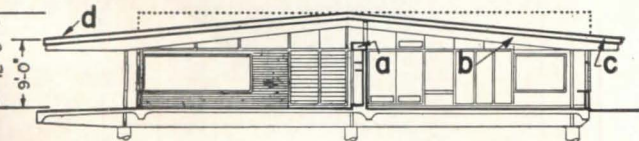
Enclosed, heated @ 1	23,254
Covered corridors @ 1/2	9,473
<b>Total area</b>	<b>32,727</b>

**CONSTRUCTION COSTS**

General contract	\$256,418
Site development	19,800
<b>Total cost</b>	<b>\$276,218</b>

Contract let: May, 1952; cost per sq ft.....\$8.44

**NEW AUSTIN ELEMENTARY SCHOOL, EDNA, TEXAS**



- FEATURES**  
 A—Integrated utility core  
 B—Laminated wood girders  
 C—4-in. wood deck, 14-ft span  
 D—Outdoor corridor & sun control  
 E—Triad plan grouping of classrooms  
 F—Cubage saved over rectangular section: 13%

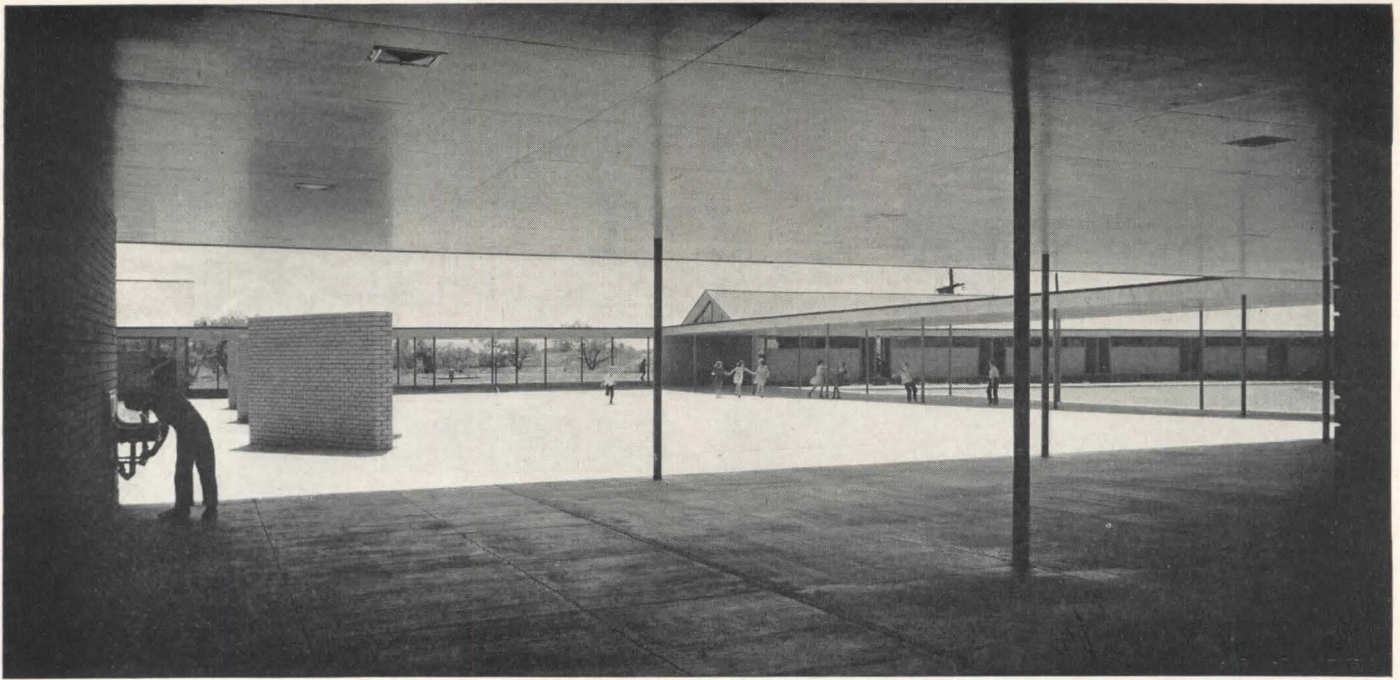
**AREA (SQ FT)**

Enclosed, heated @ 1	9,548
Covered corridors @ 1/2	3,232
<b>Total area</b>	<b>13,032</b>

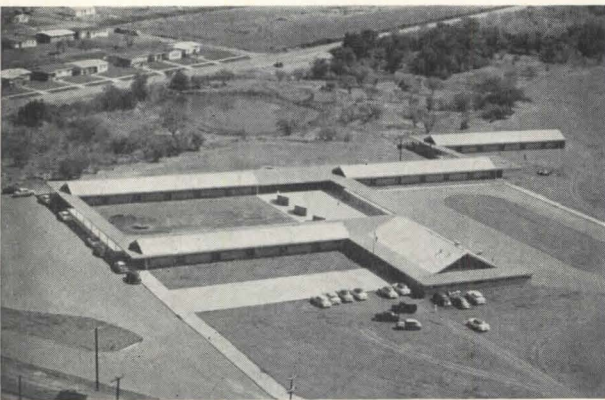
**CONSTRUCTION COSTS**

<b>Total general contract</b>	<b>\$124,590</b>
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Contract let: March, 1953; cost per sq ft.....\$9.56

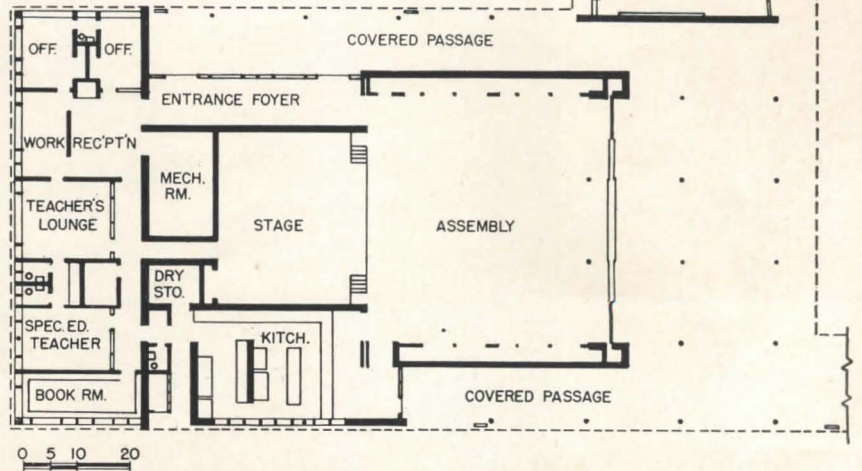
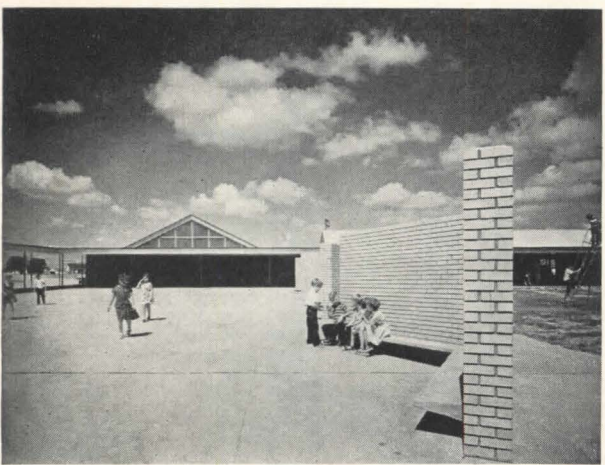
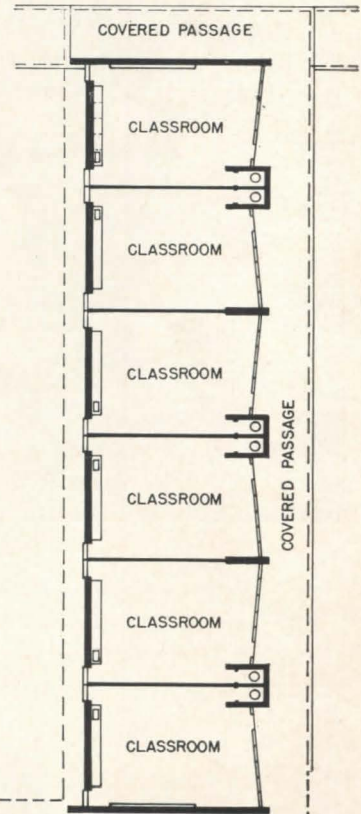


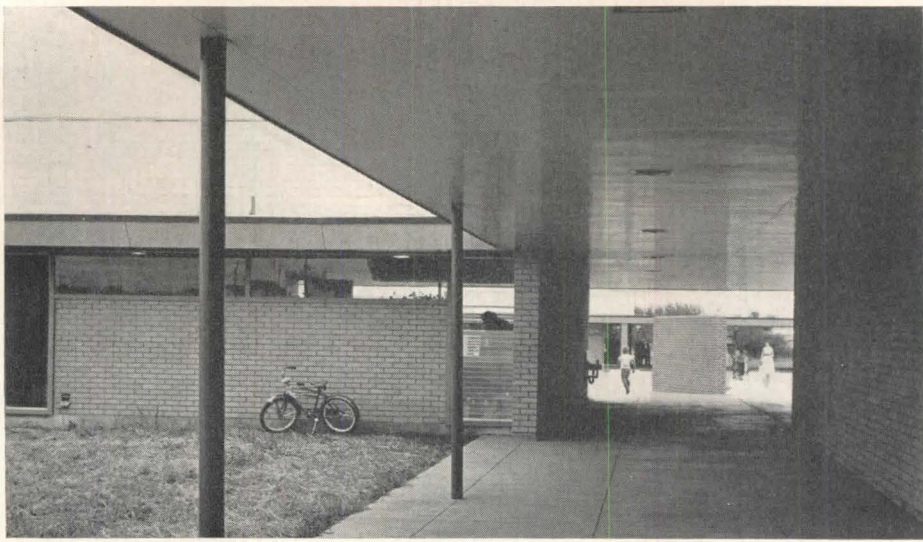
Ulric Meise



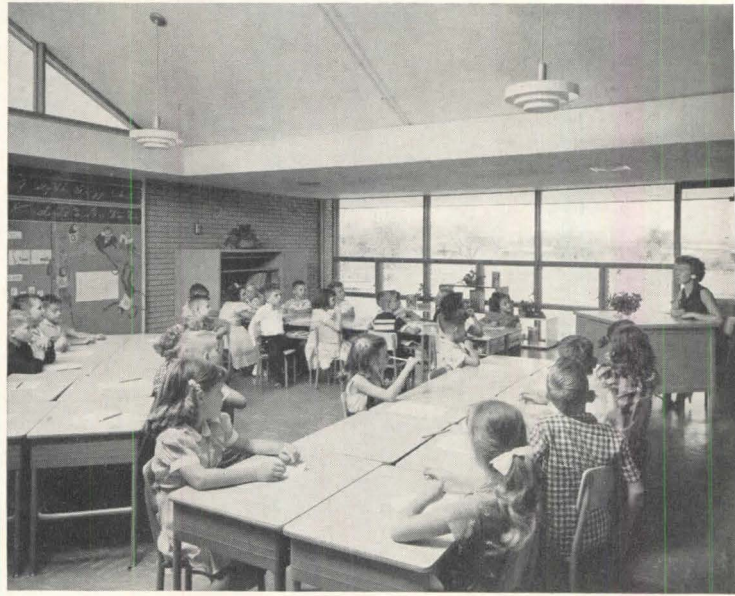
**FLORENCE BLACK ELEMENTARY SCHOOL,  
MESQUITE, TEXAS**

*Flexibility of the Mesquite school is assured by the elimination of interior bearing partitions in classroom wings; school population growth can be accommodated by adding more classroom wings to the present chassis, whose administrative unit is so placed and sized, and utilities are so designed, that the new wings will complete rather than overload the plant*



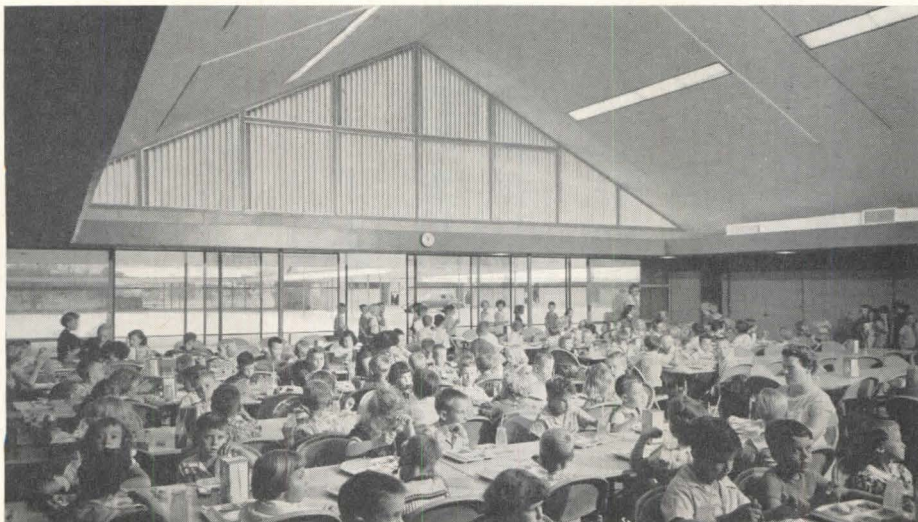


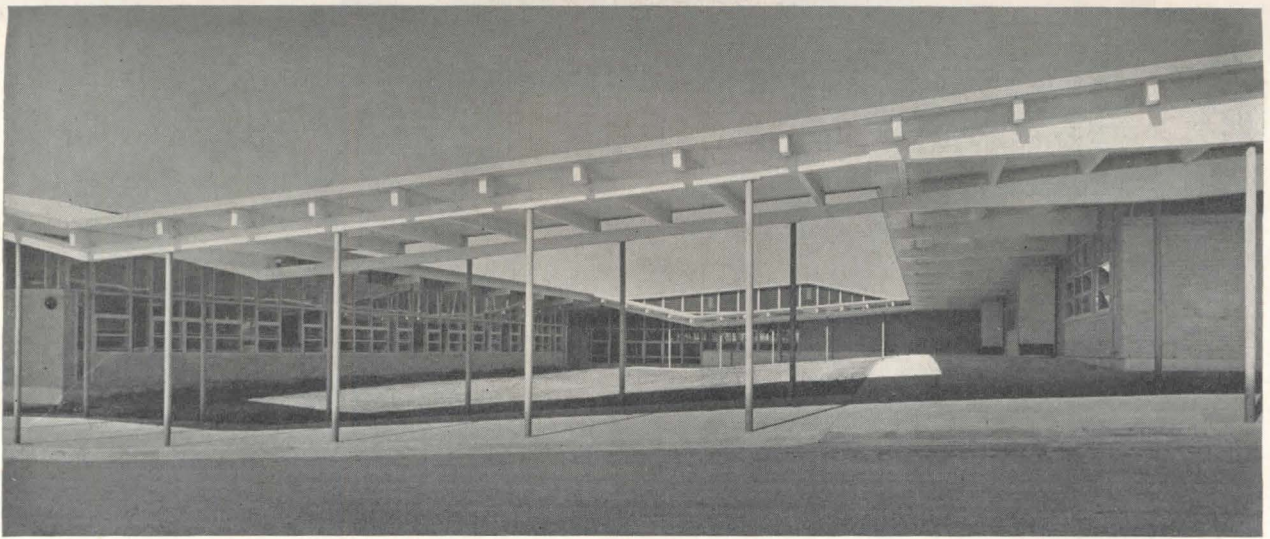
*At Mesquite, Caudill, Rowlett & Scott have ingeniously used solid walls and dwarf walls to achieve scale, to direct traffic and as windbreaks separating outdoor areas (see also preceding page)*



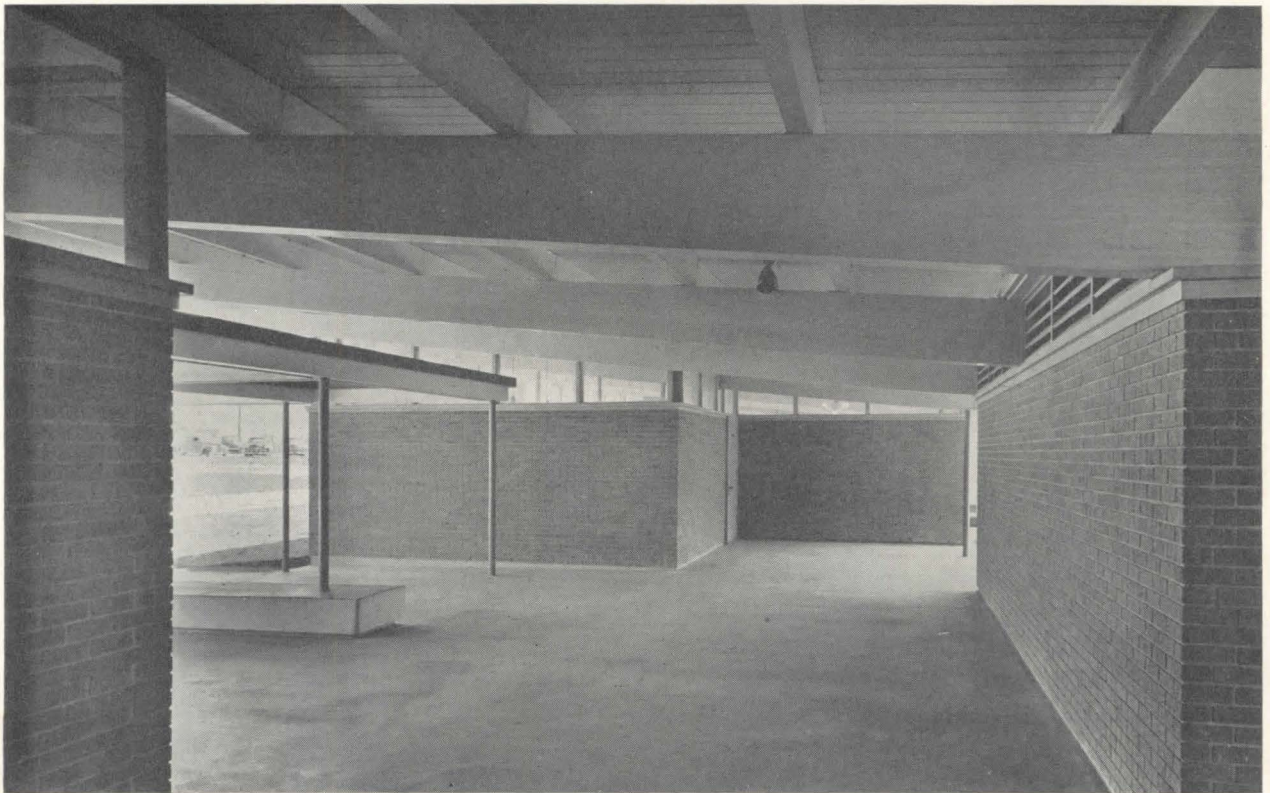
*Above, classroom; right, classroom; below, multipurpose room in main unit, for assembly, eating, physical ed; large stage, not visible, is for audio visual classes; overflow seating is accommodated by opening the glass wall*

Ulric Maisei

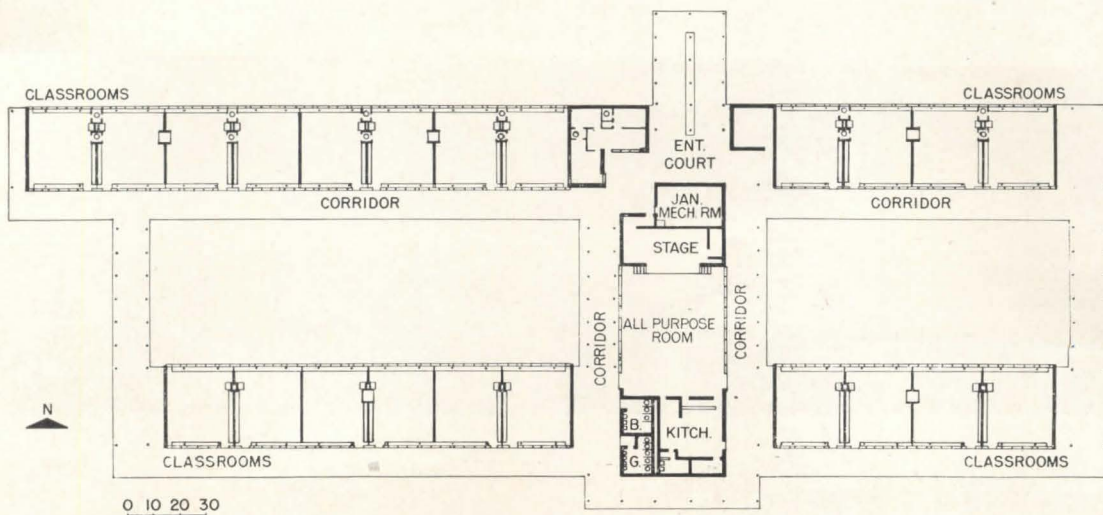


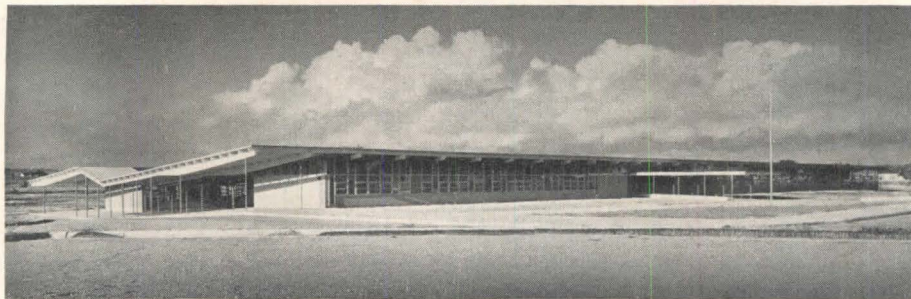


GEORGETOWN ELEMENTARY SCHOOL, GEORGETOWN, TEXAS

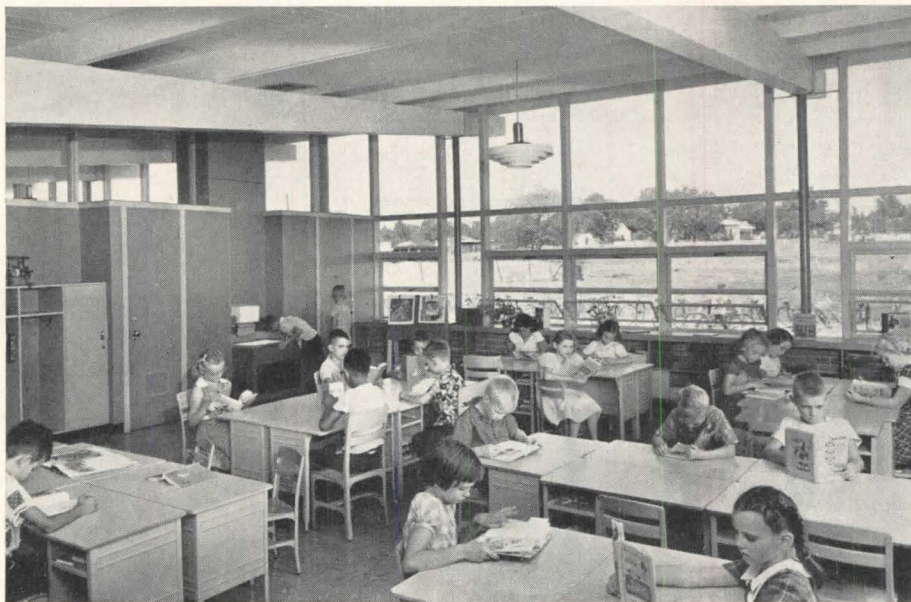


Dewey G. Mears



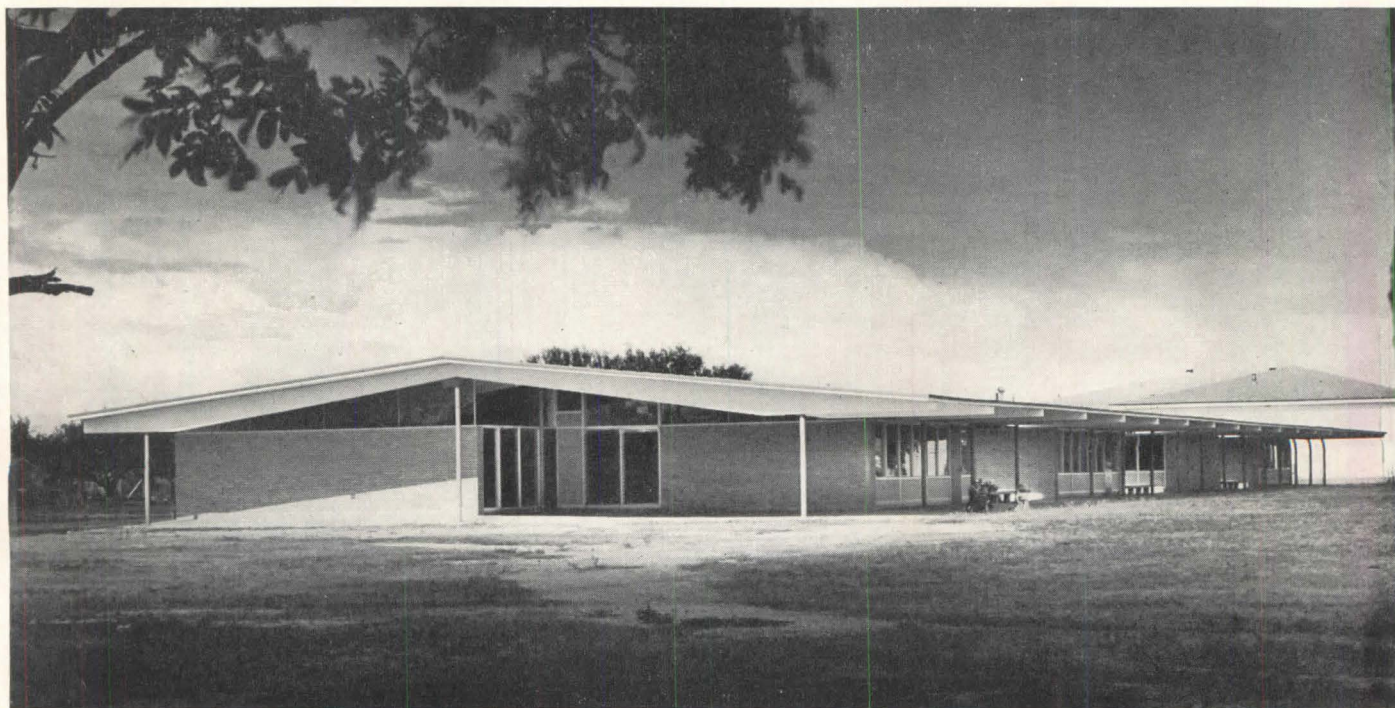


*At Georgetown, laminated wood girders, exposed wood purlins and roof deck cover even the walks which, rambling up and down grade, enclose courts between wings*

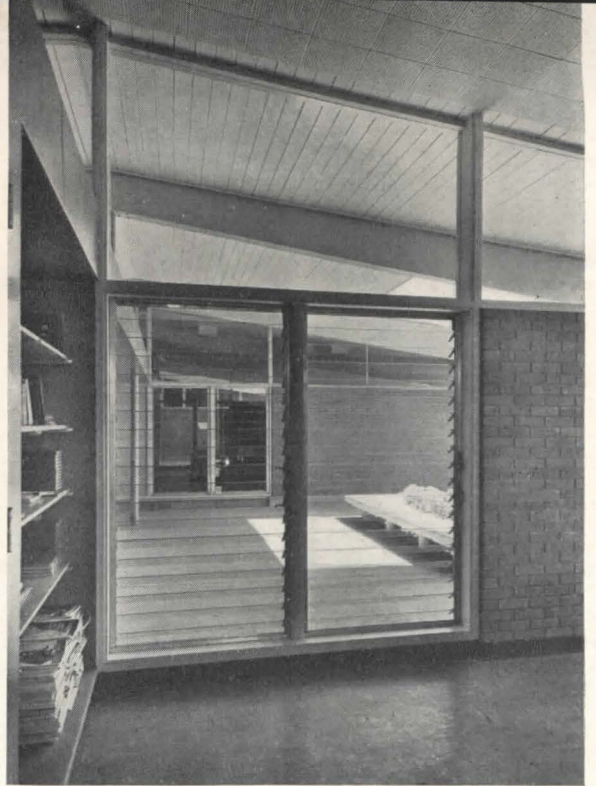
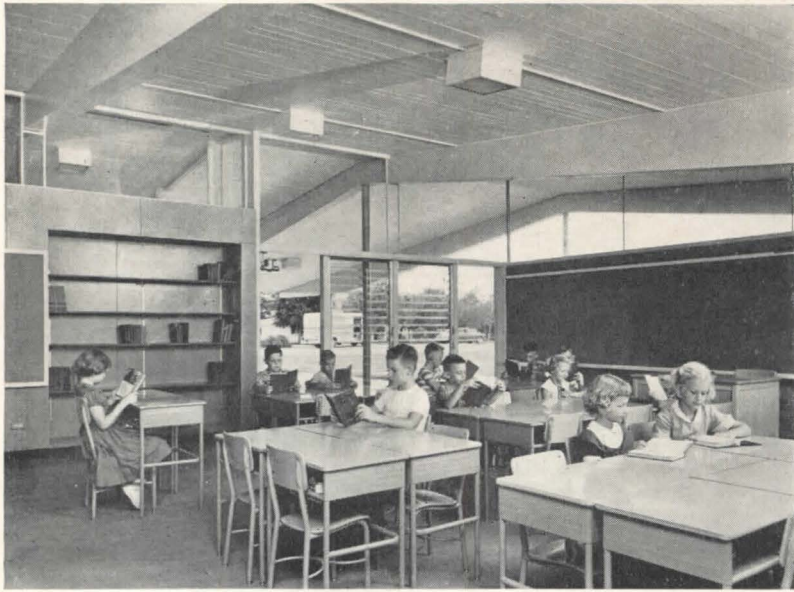


Dewey G. Mears

*Similar construction at Edna's New Austin School produces an umbrella roof*

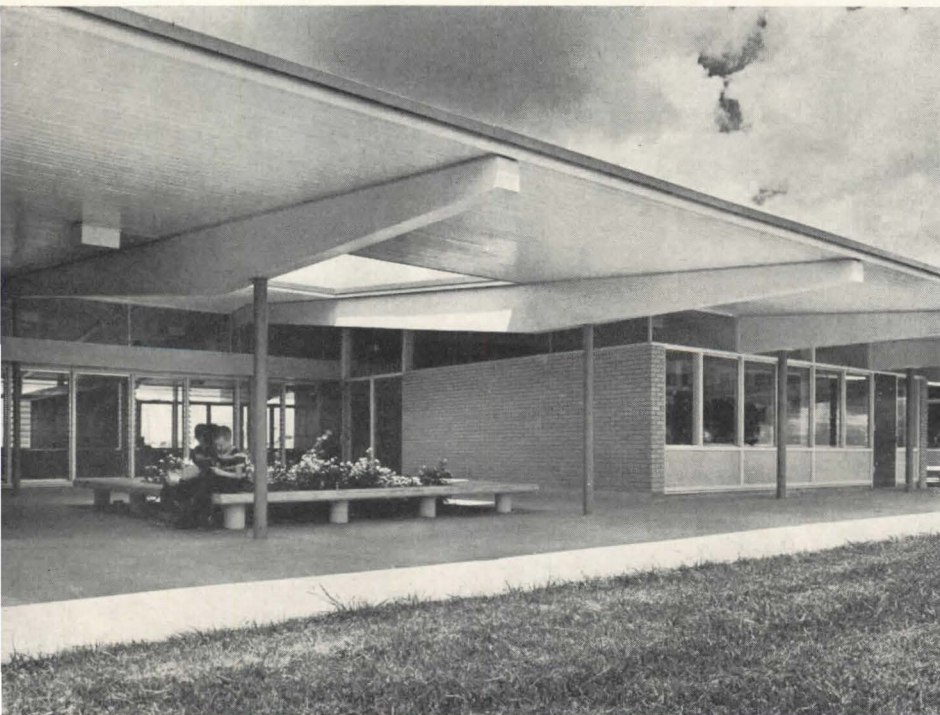
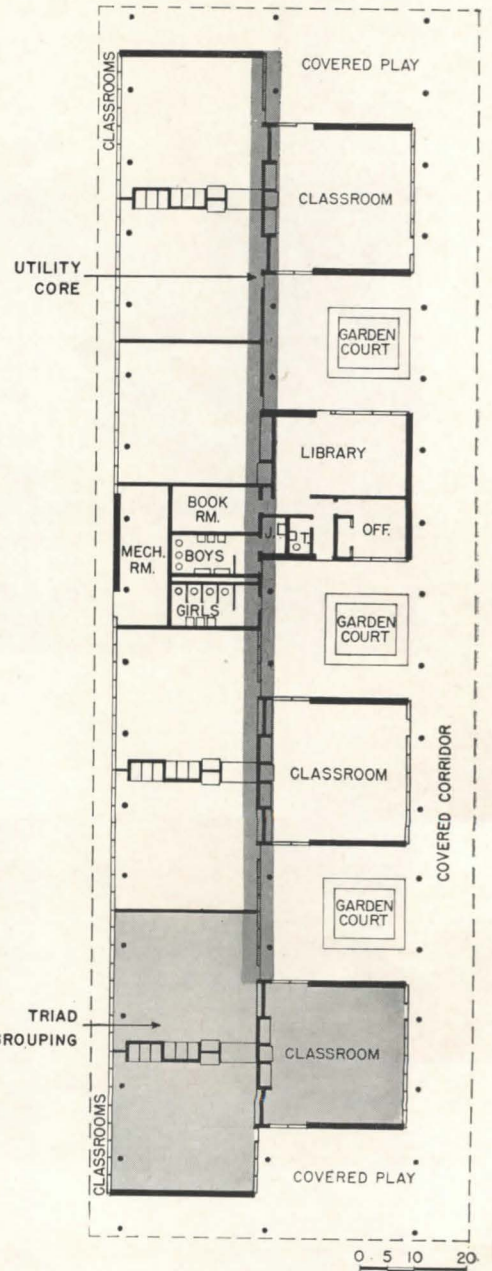


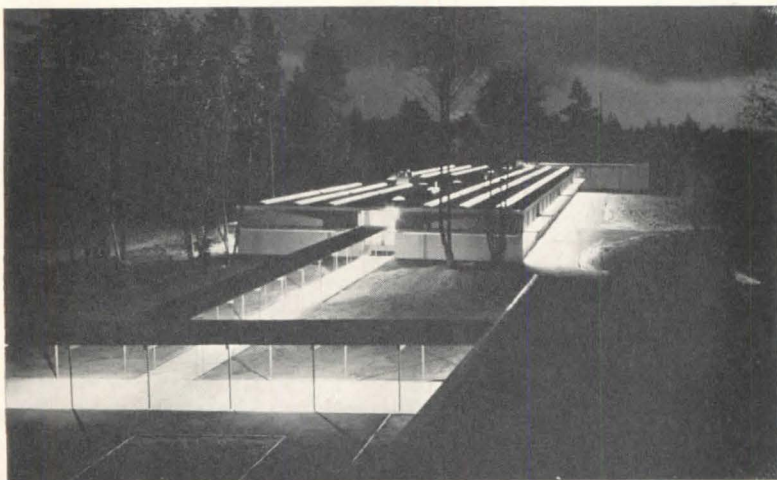
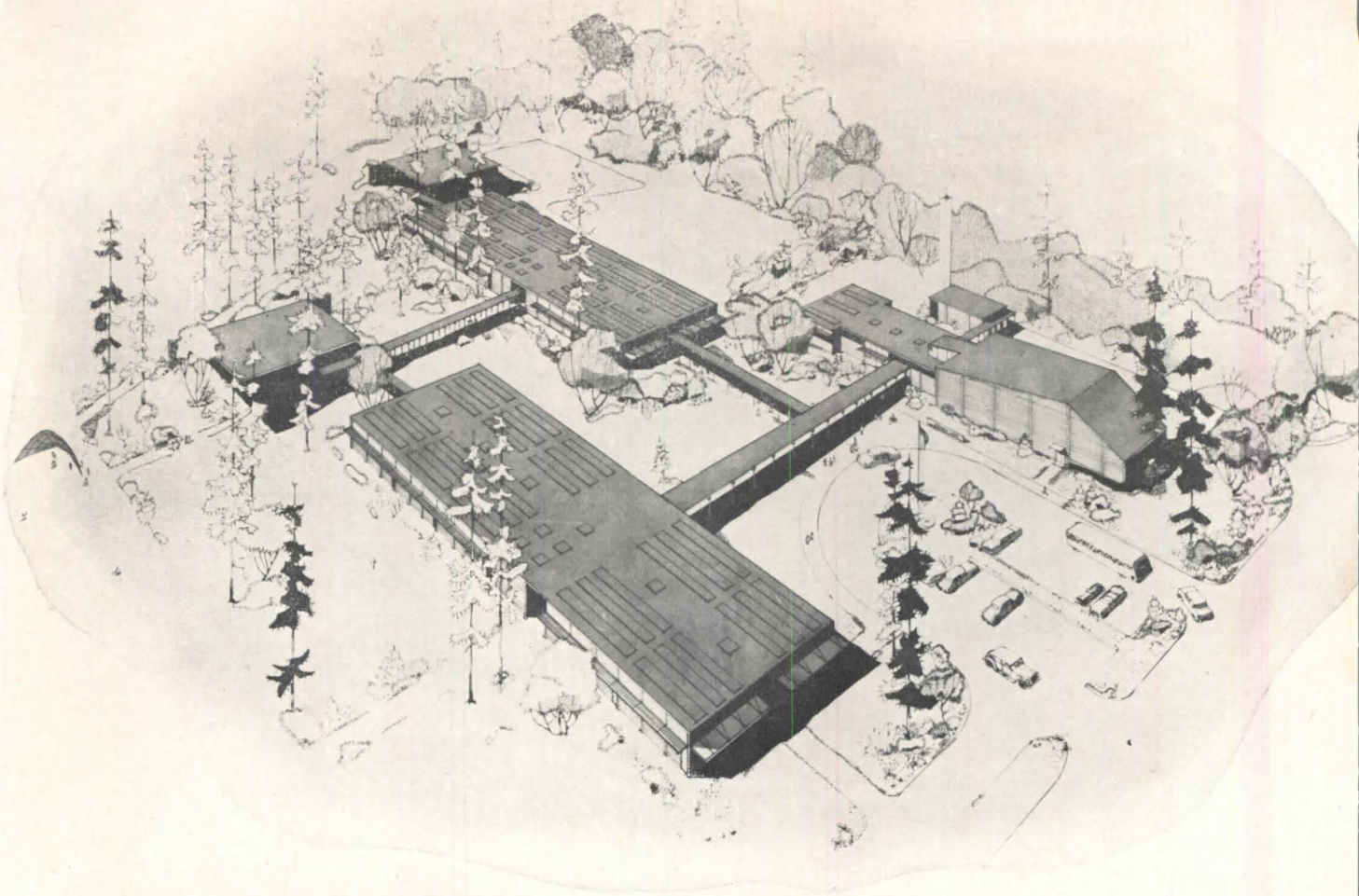




**NEW AUSTIN SCHOOL, EDNA, TEXAS**

What Caudill, Rowlett, Scott and Assoc. call a "triad" plan is used at Edna. Its purpose: to provide complete through ventilation for all classrooms, eliminate interior corridors while retaining advantages of a double-loaded corridor scheme, provide outdoor classrooms and play spaces sheltered from the hot sun. In addition to an existing plant, this is connected to the old buildings only by a covered walkway at one end.





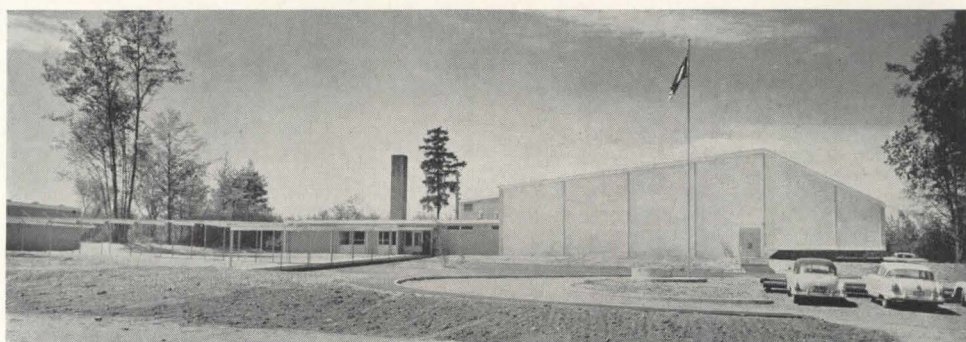
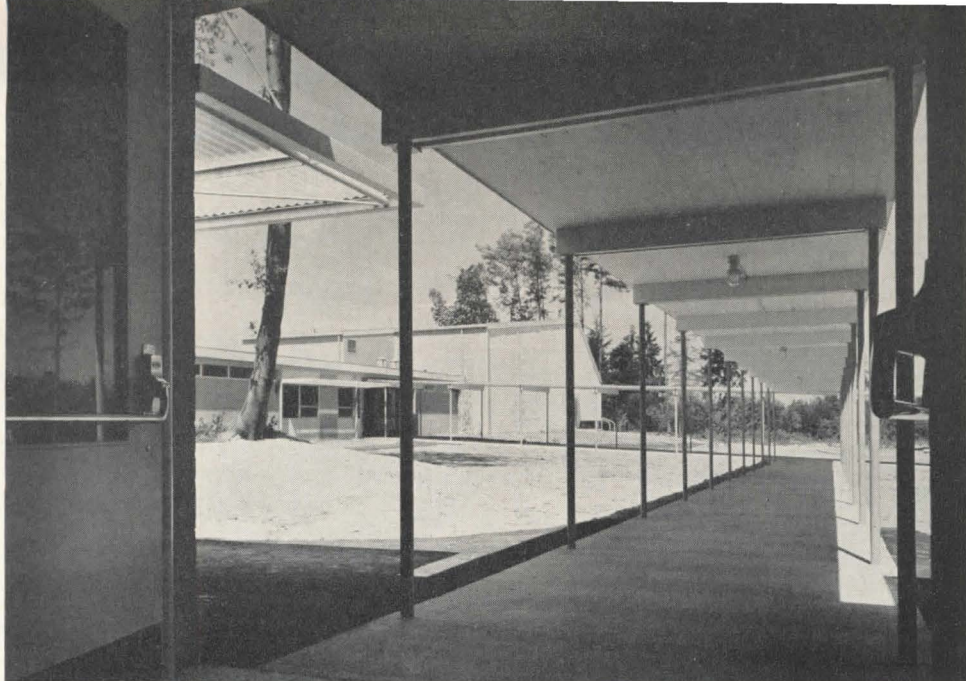
## AN AWARD WINNER

*Architects: Bassetti, Morse & Aitken*

*Engineers: Structural, Stevenson & Rubens; Mechanical, G. S. Troberg; Electrical, B. B. Lezin; Civil, H. W. Merritt; Acoustical, P. A. Jacobsen*

*Landscape Architects: Eckbo, Royston & Williams*

*Color Consultants: Mary Bassetti, Emily Morse*



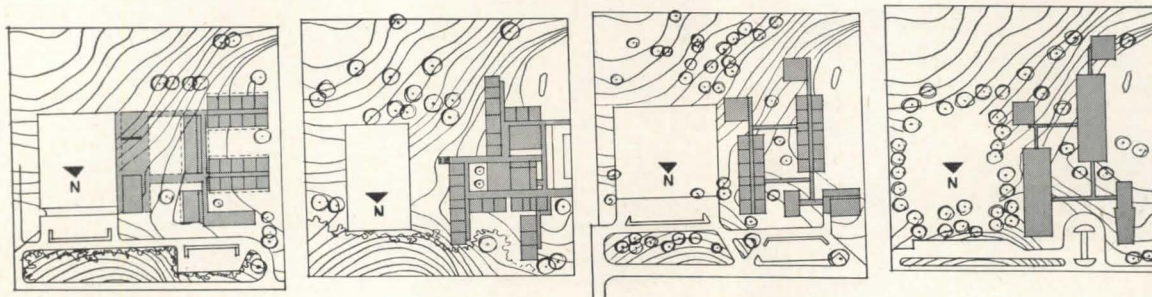
Art Hupy

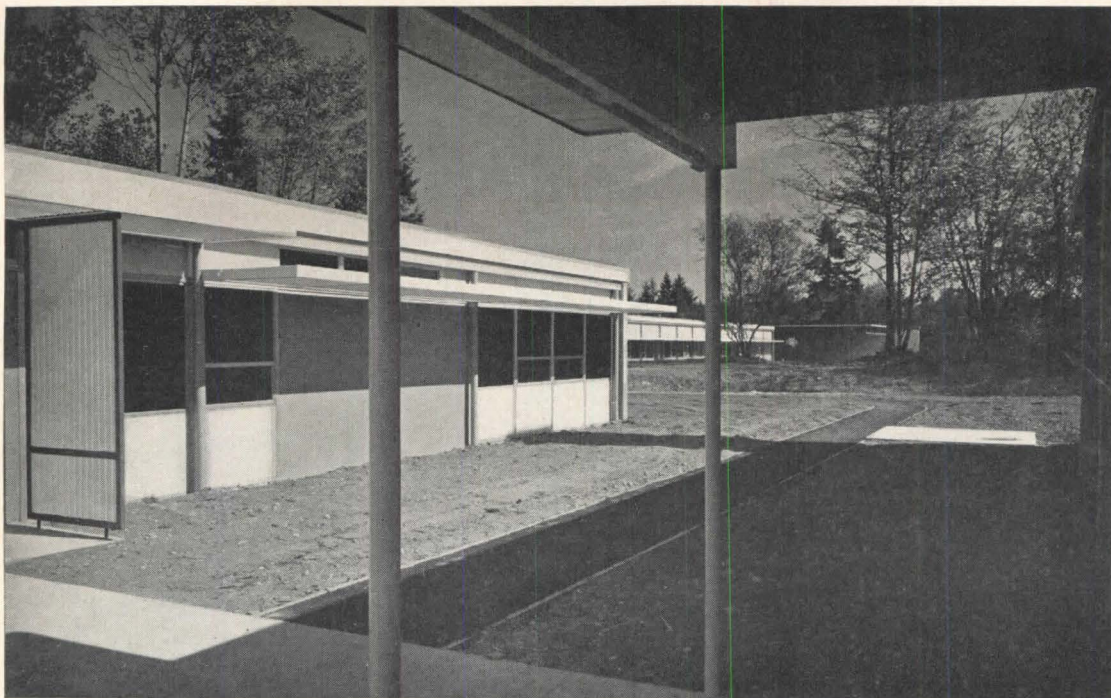
## LAKEVIEW SCHOOL, MERCER ISLAND, WASH.

**T**HE ARCHITECTS tell us that, in designing this school (which won an Award of Merit at last June's A.I.A. convention), the emphasis was first on fitting the site, second on designing for the Puget Sound climate, third on directness and simplicity in plan and structure. "Limited funds and community distrust of ostentation had a most salutary effect." The architects strove to integrate space requirements, structure, hearing, seeing and mechanical aids to comfort. They are as satisfied as good designers ever are with scale and proportions of

classrooms, interior of the multipurpose room, variety of exterior courts and views (which will be even more evident when the future classroom building and playshed are built) and with the gay, varied colors. All this came hard, as the result of painstaking study and re-study. Planned for 20 classrooms eventually, 10 now (300 pupils), the school meets pre-stated educational requirements for: rectangular rooms ( $\frac{2}{3}$  for seating,  $\frac{1}{3}$  project space), no work alcoves or outdoor classrooms (yet doors out from all classrooms), compact plan.

*A few of many site development studies; final plan at right*

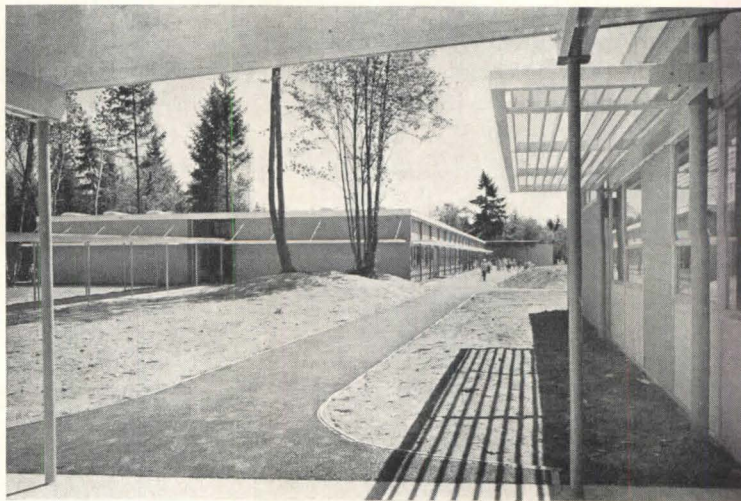
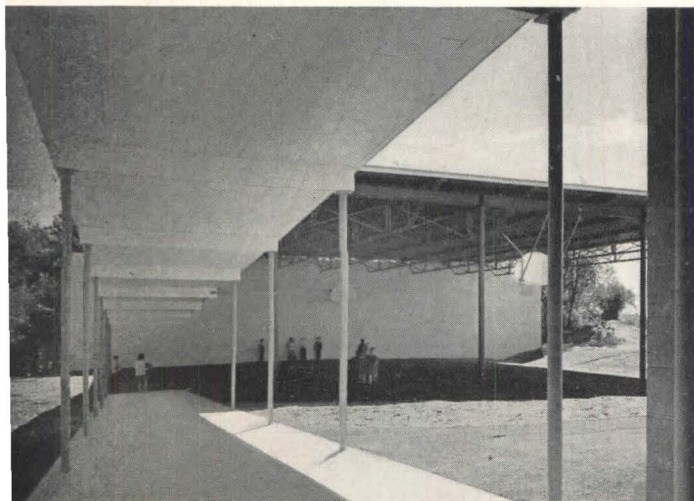




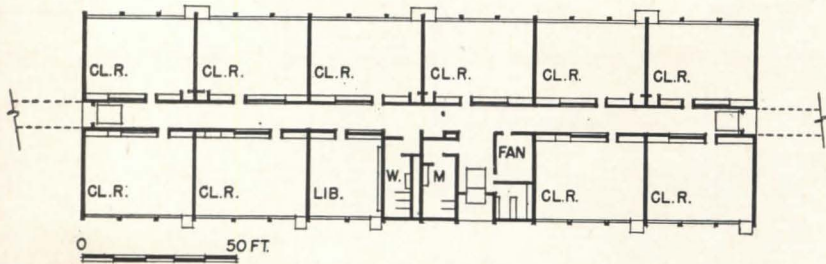
Art Hupy

Lakeview School is an example of economy of means in its over-all plan and its details. The basic elements are simple: classrooms, multi-purpose section, administration, library, covered play shed, mechanical plant. Each has its own appropriate form, loosely or closely connected to the others as its use dictates. Outdoor areas between buildings are also carefully designed as to size and use, relating closely to the building entrances. No design element, building or outdoor area, is larger than necessary. Elements which work tightly together are joined. Units separated yet connected by covered walks were easily adapted to the sloping site.

The first stage of construction, now built, contains ten classrooms, library, multi-purpose and music rooms, administration, boiler and electrical buildings, covered play shed, well, underground storage tank, sewage disposal system. Including mechanical, electrical, plumbing and site work, this cost \$300,900, or \$11.50 per sq ft. At present costs, when the remaining ten classrooms now planned for are built, unit cost should drop to \$10.50 per sq ft. Included in these figures are many items not normally part of the charges: paving, walks; well, pump house and buried water tank; 60 by 60 ft covered play shed, etc. Cost of these was \$47,300, over 15 per cent of the total.

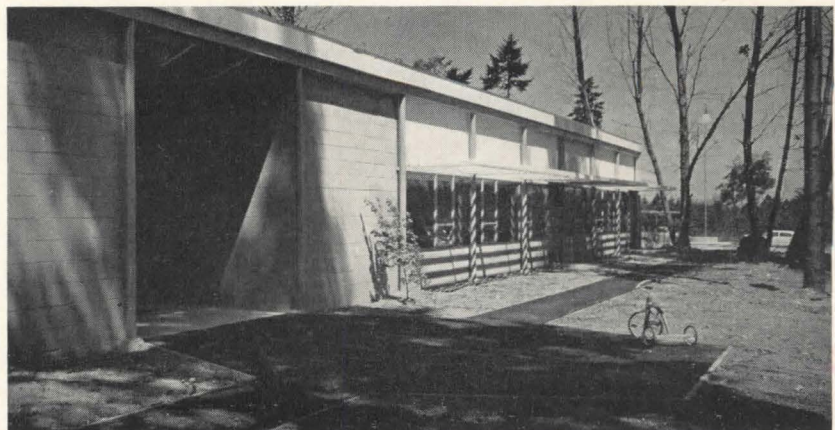


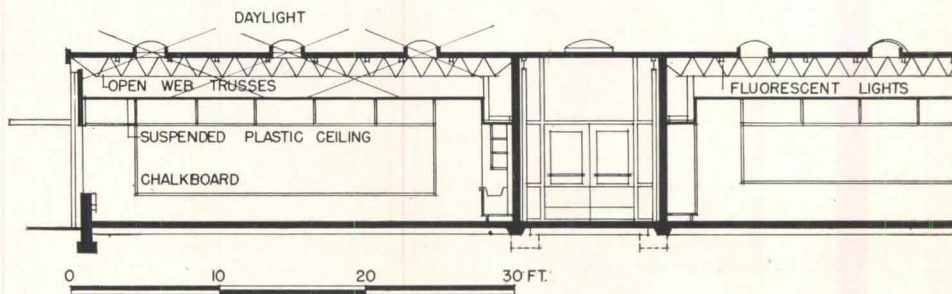
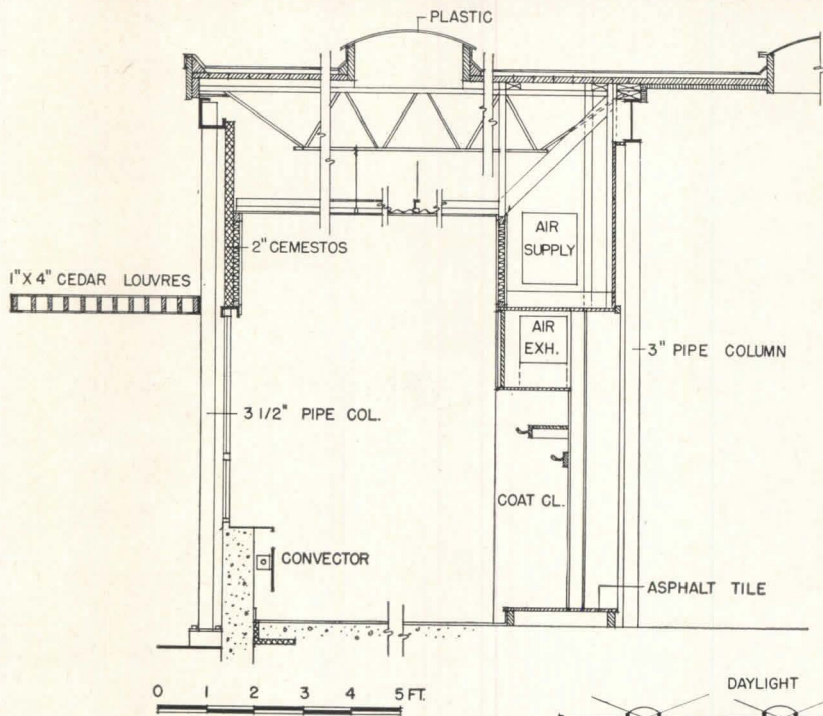
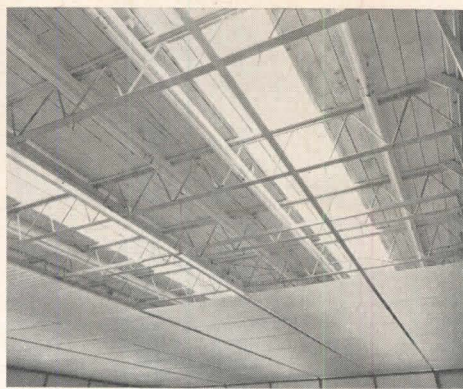
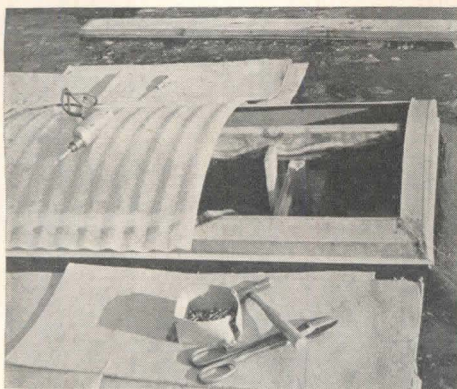
Among principles followed in designing the building and producing working drawings: clear, careful, minimum drawings to get low bids; fit topography and site conditions; simplify shapes; use few different types of materials; as few separate buildings as possible, with double-loaded corridors and similar activities grouped; good wearing materials — masonry, concrete, cement-asbestos board, asphalt tile; no gadgets, few mechanical contrivances; minimum wood trim and cabinets; repetitive parts and details; multi-use of assembly and play spaces; space-saving in administration unit; minimum equipment for stages



Above, classroom corridor; below, exterior of classroom building, a simple box with straight walls except for the weather-shielding recessed entrance. Structure, as for all buildings, is light steel frame on concrete slab, block walls, insulated wood roof deck

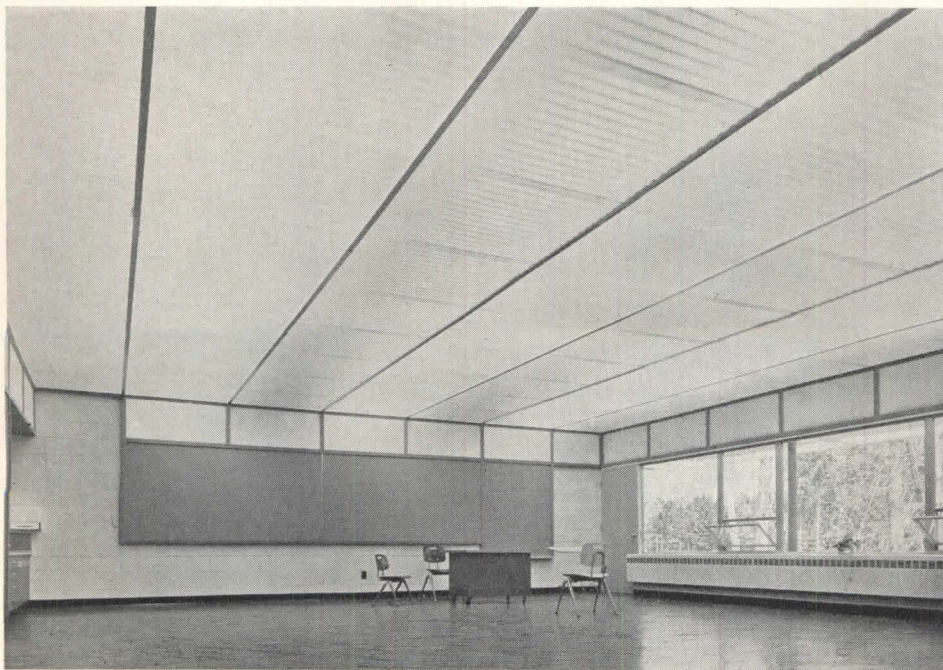
Photos on facing page show classroom building, administrative unit, play shed, and the carefully proportioned outdoor spaces which they delimit. Maintenance and operating economies are expected from the lighting system (see following page), split heating system (widely spaced floor coils plus fin-tube radiation), painted block walls, aluminum sash



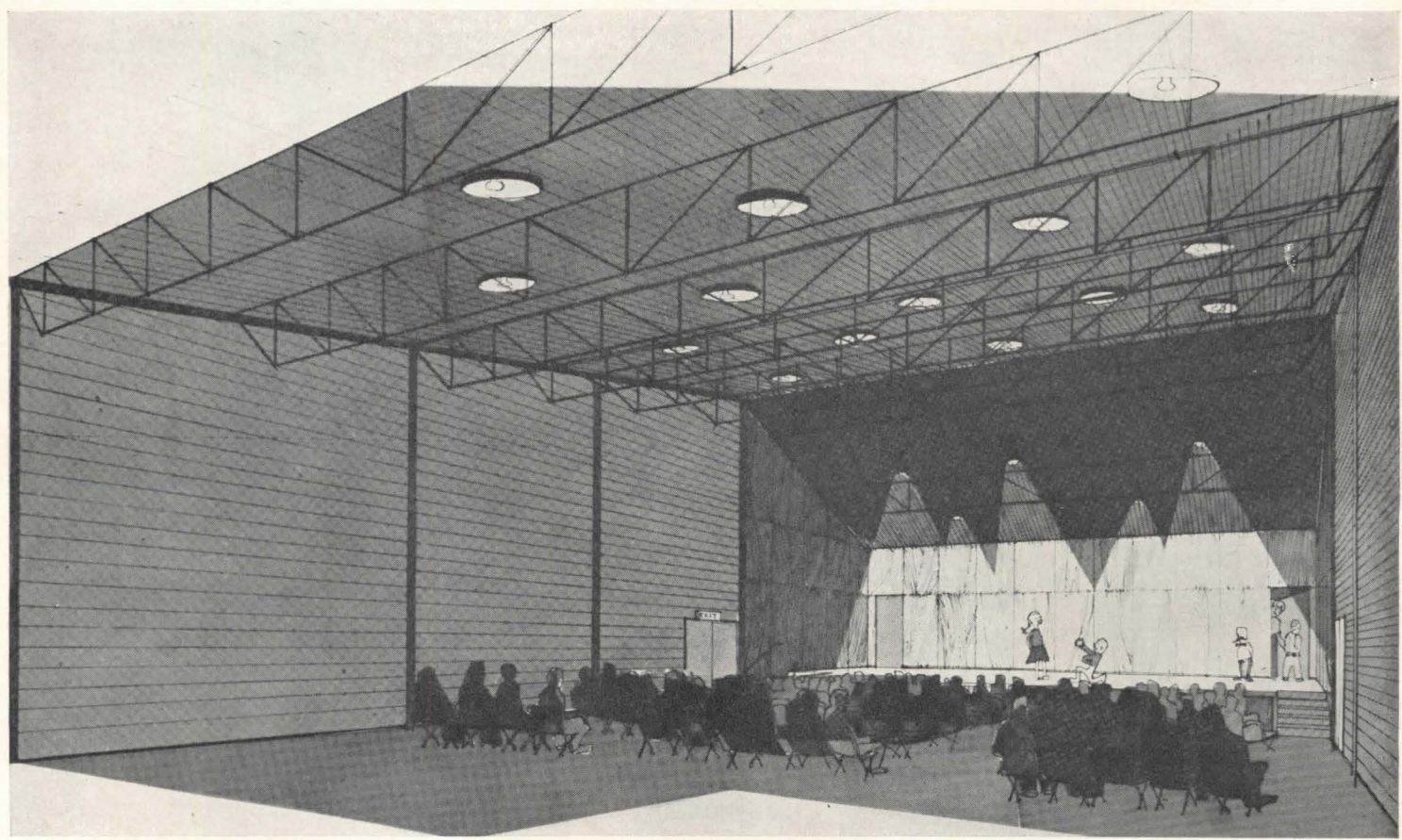
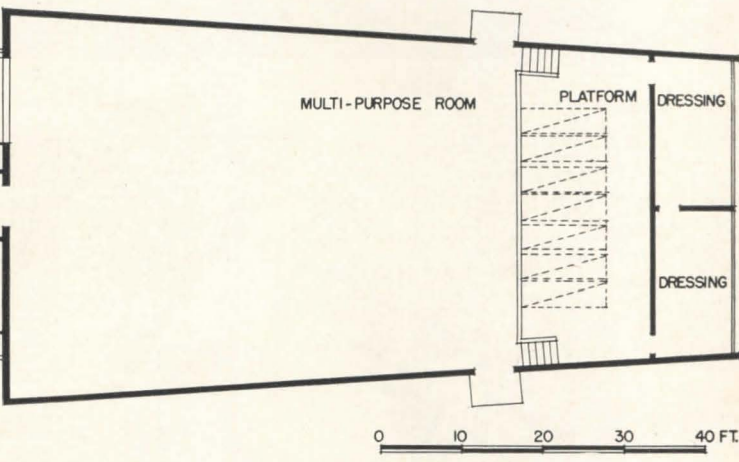
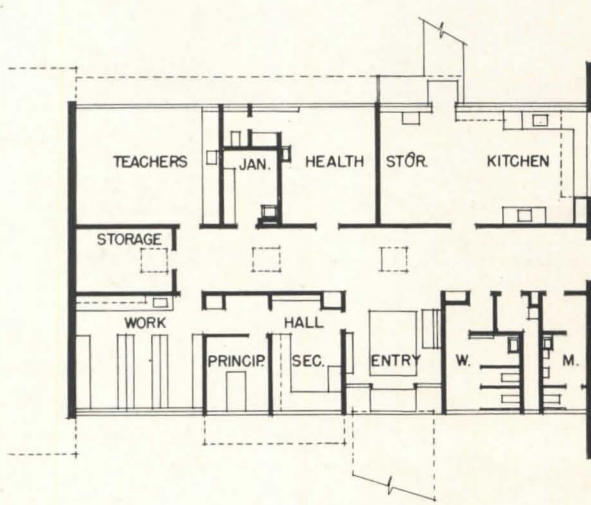
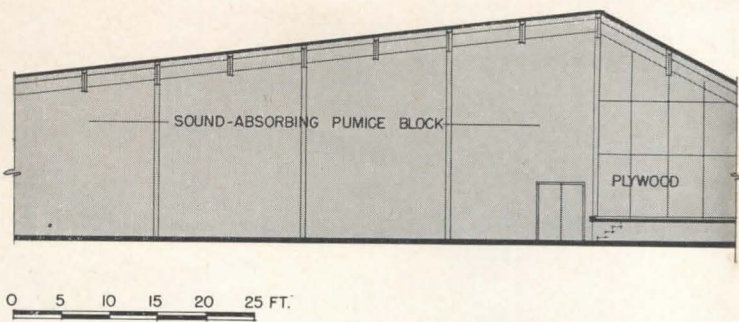
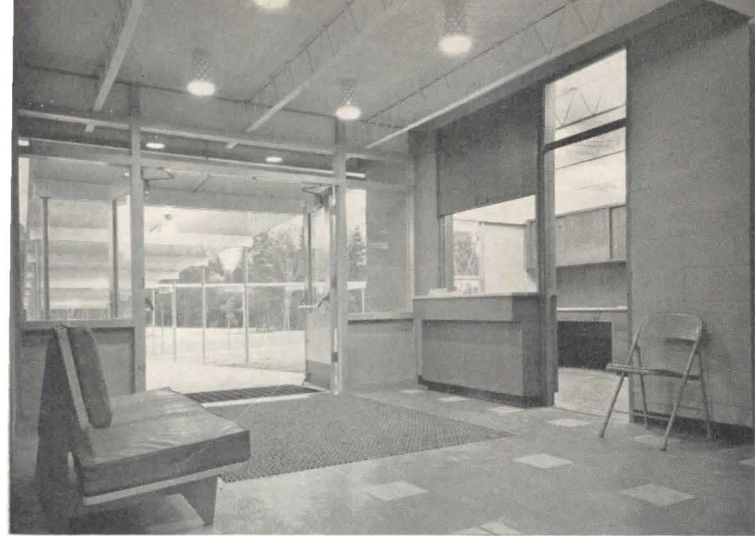


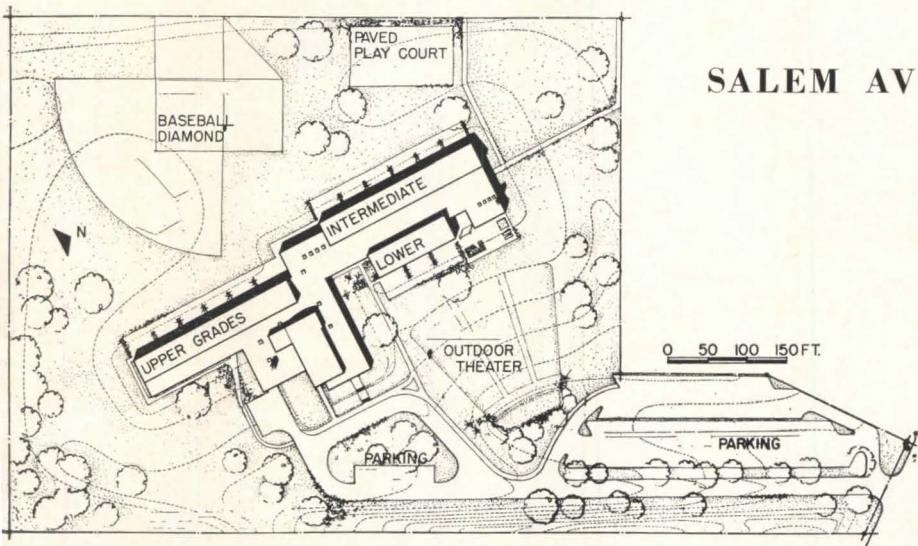
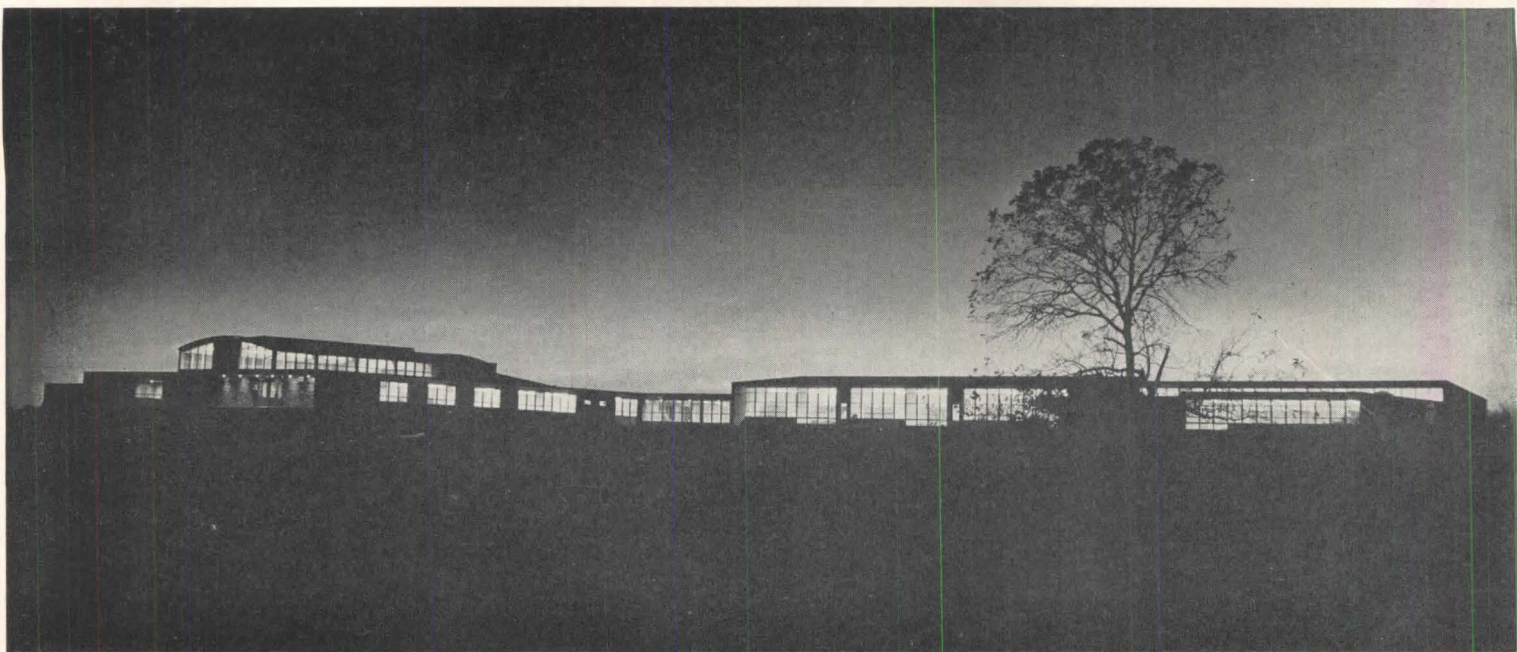
On facing page is the Administration — Multi-purpose Building. On this page are construction details and completed appearance of the natural and artificial lighting systems. Built into and making use of the classroom ceilings and roofs, this is another example of economy of means. Both types of light come from the same major source, a diffusing plastic ceiling 8½ ft above the floor. The wood

Art Hupy



plank roof 2½ ft higher contains three parallel strip skylights full length of each classroom; crossways of the skylights are attached. In addition to even, 40 foot-candle lighting (without artificial lights even on gray days), the low ceiling provides a non-monumental, human scale. Initially the installation was expensive; in 20 years its low operating cost is expected to compare favorably with an incandescent system. Meanwhile, the school offers children a good visual environment

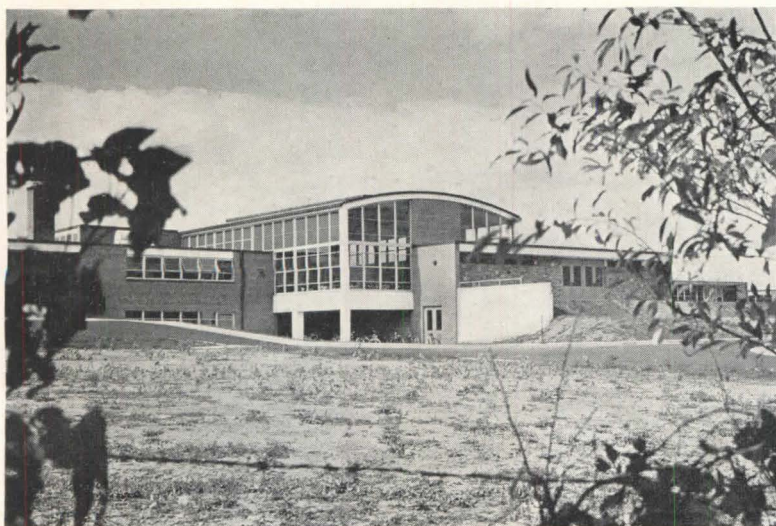




## SALEM AVENUE ELEMENTARY SCHOOL,

*Architects:* **McLeod & Ferrara:**  
**Stewart E. Duval,**  
**Casper S. Neer,**  
*Associates*

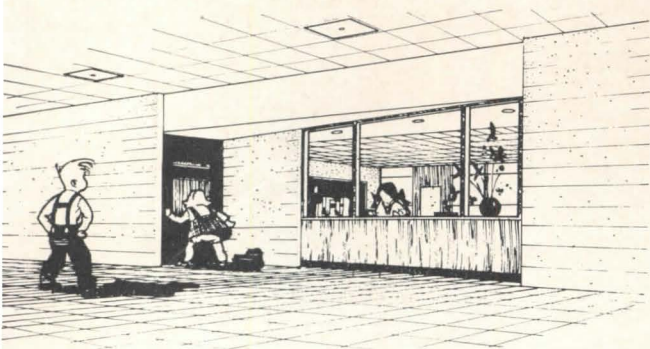
*Salem Avenue School contains 15 classrooms, a library, kindergarten, general purpose room (exterior photo below) and kitchen*



Fred J. Maroon

**W**INNER OF A SPECIAL award in the most recent *School Executive* competition and most favorably commented on at the Atlantic City exhibit conducted by the American Association of School Administrators, this is an example of full development of an urban school site. Relatively small, far from level, the site was difficult to utilize well. Good orientation, separation of the age-groups indoors and out (even to providing a private play yard for the kindergarten, and a substantial amount of parking space were achieved. The fire-resistant, steel-framed building has a poured gypsum roof deck, brick and painted stucco exterior walls, painted cinder block partitions, acoustical tile ceilings, Korina doors and cabinet work. Color is gaily used. The building (K-6) accommodates 450 students, cost \$627,895 (excluding land, furniture or fees); contains 46,055 sq ft or 658,199 cu ft. Unit costs: \$1,395 per pupil; \$13.62 per sq ft; \$0.95 per cu ft.





*"Space-framed" display units (above) in the widened exhibition portion of the corridor*

## HAGERSTOWN, Md.

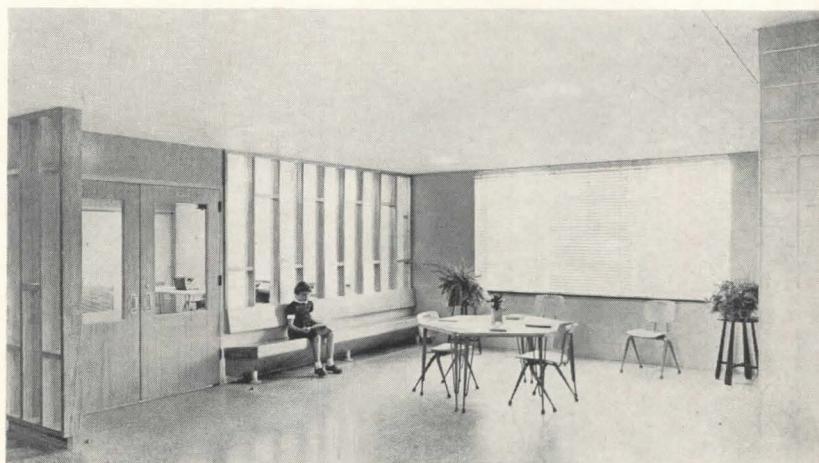
*Educational Consultants:*

*Engelhardt, Engelhardt & Leggett*

*Engineers:*

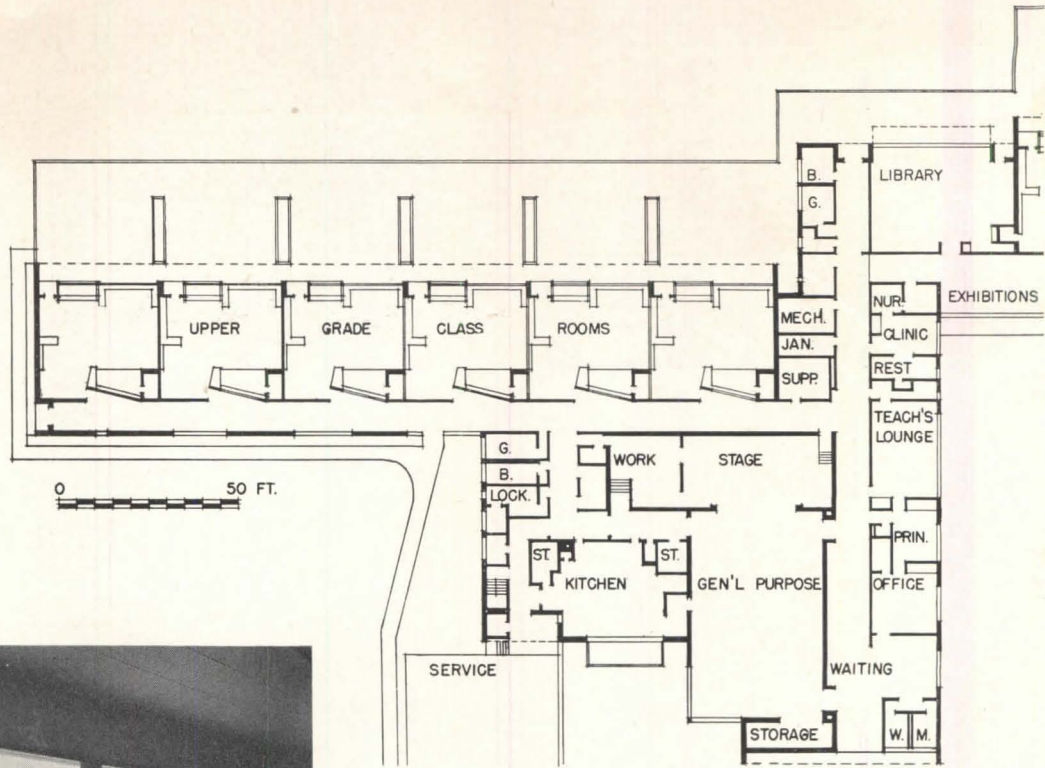
*Structural, J. G. Loehler;*

*Mechanical, C. Warren Bogan*

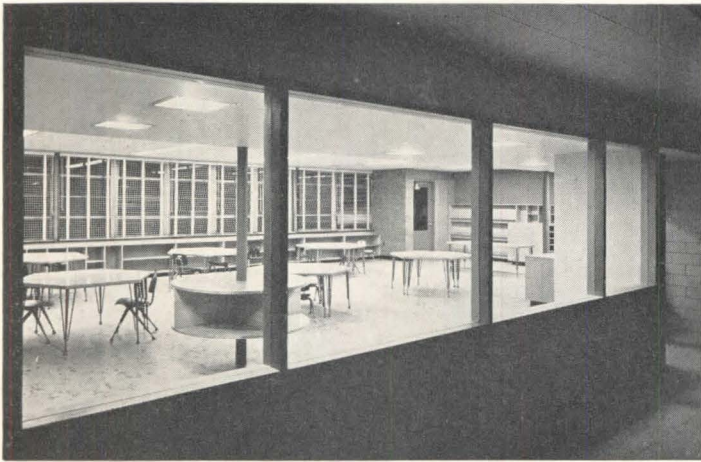


*Above, waiting room, administration area; below, multipurpose room with rigid steel frames*

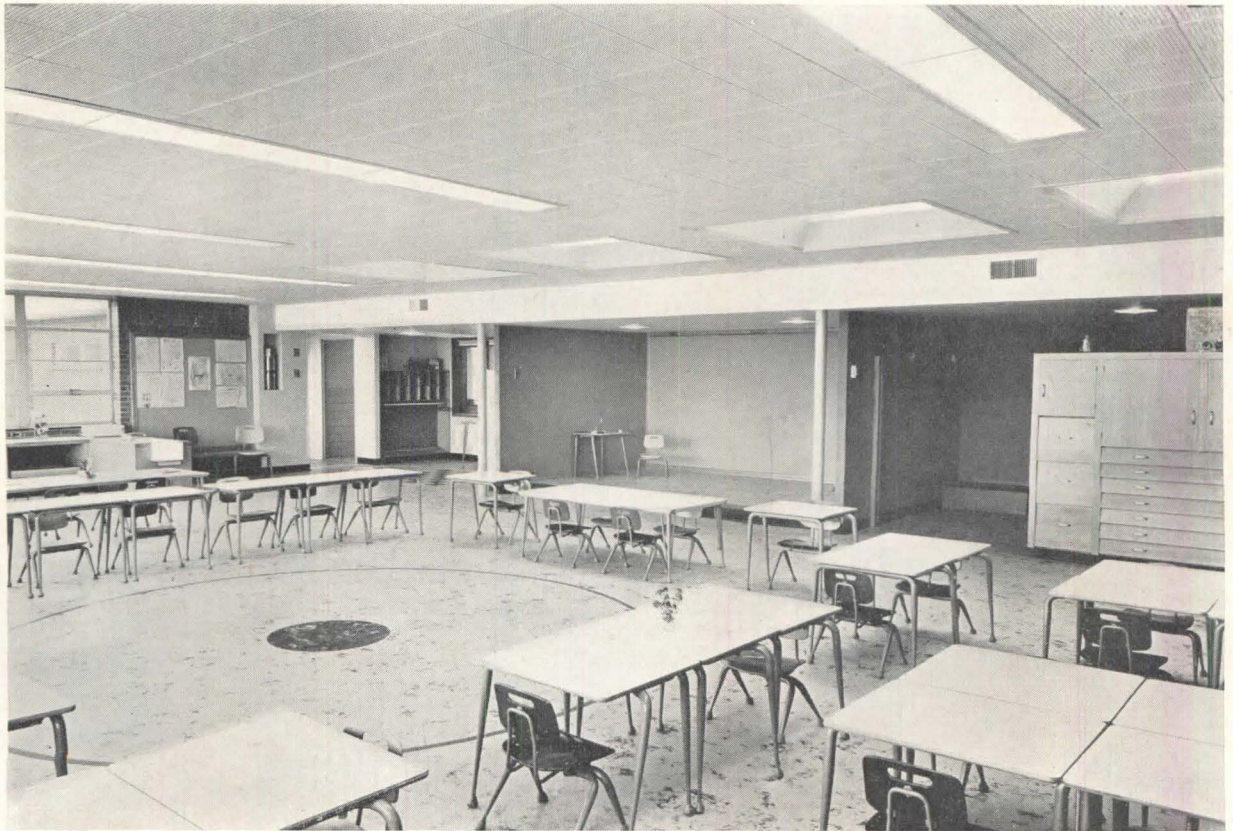


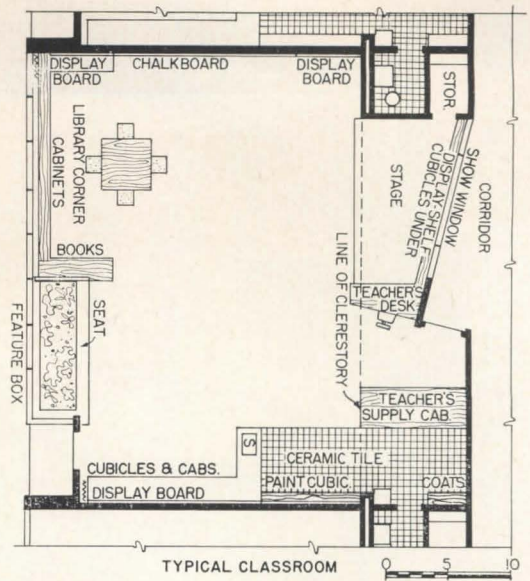
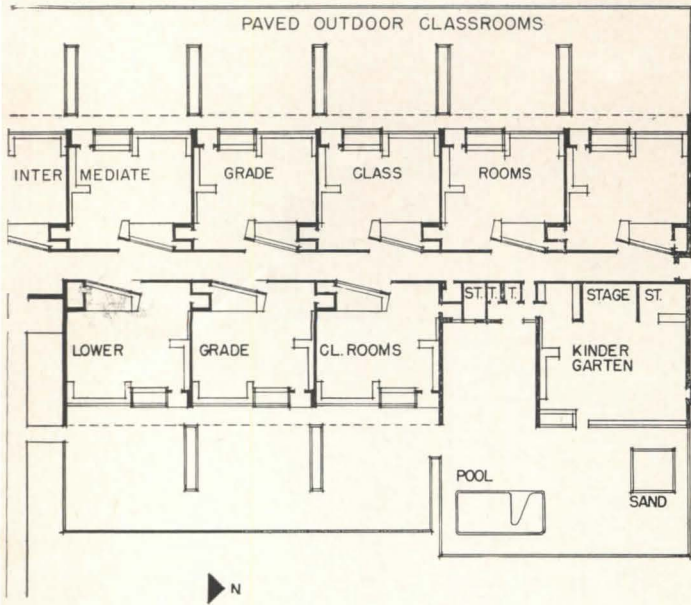


Fred J. Maroon

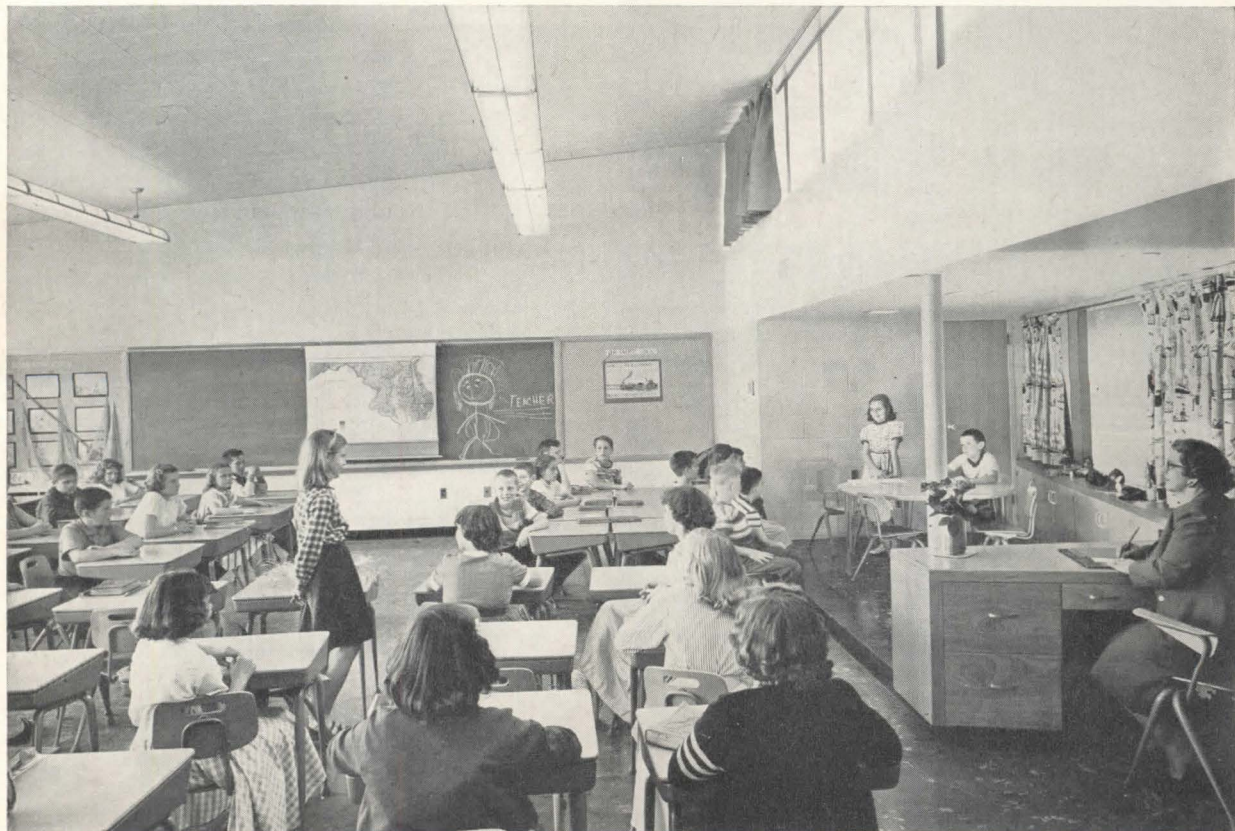
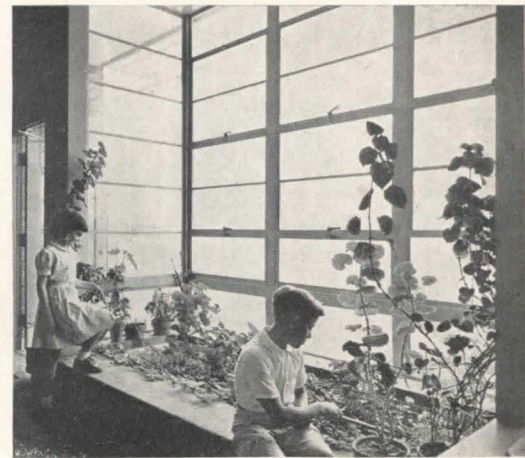
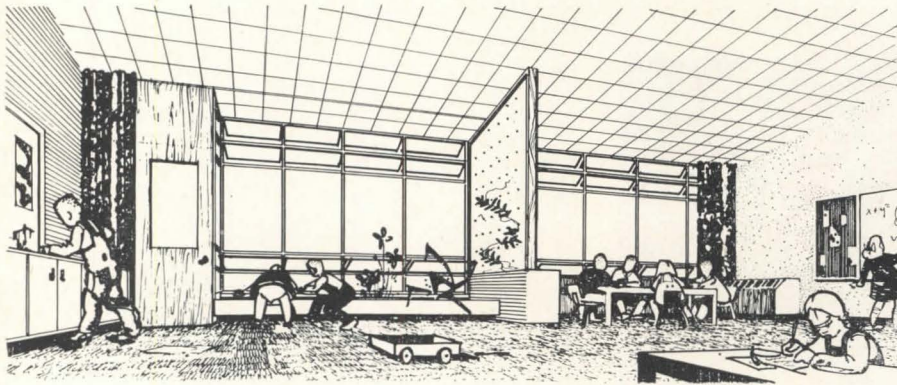


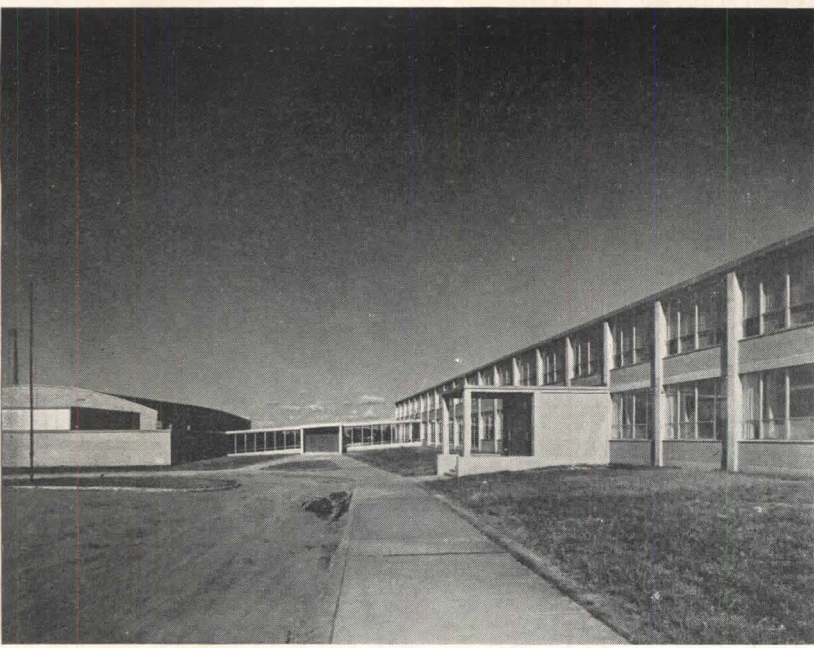
*Photo at left shows library, viewed from corridor. Below is kindergarten; alcoves at rear are for (left to right) coats, stage, storage space. Note daylighting plastic domes used in this deep room*





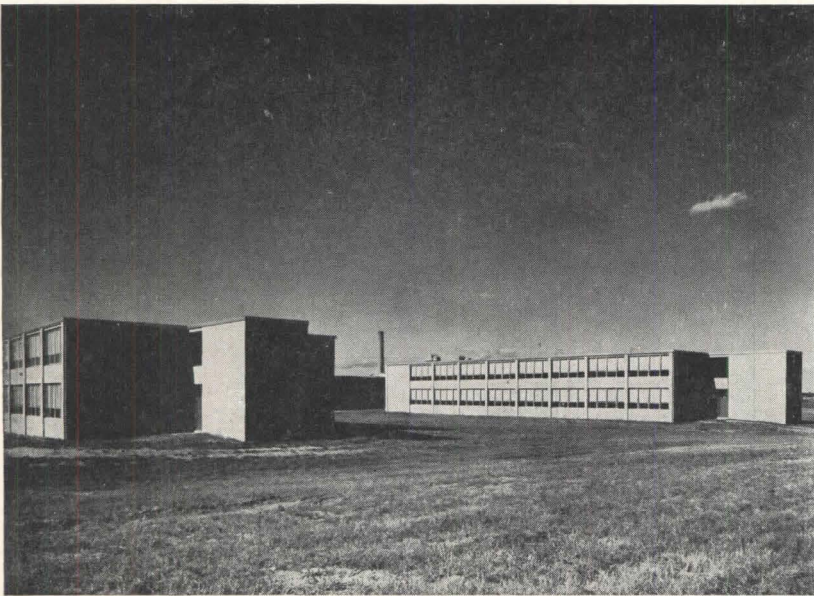
Above, plan; below, photos and drawing of typical classroom. Low-ceilinged area adjoins corridor; clerestories light inner side of squarish rooms



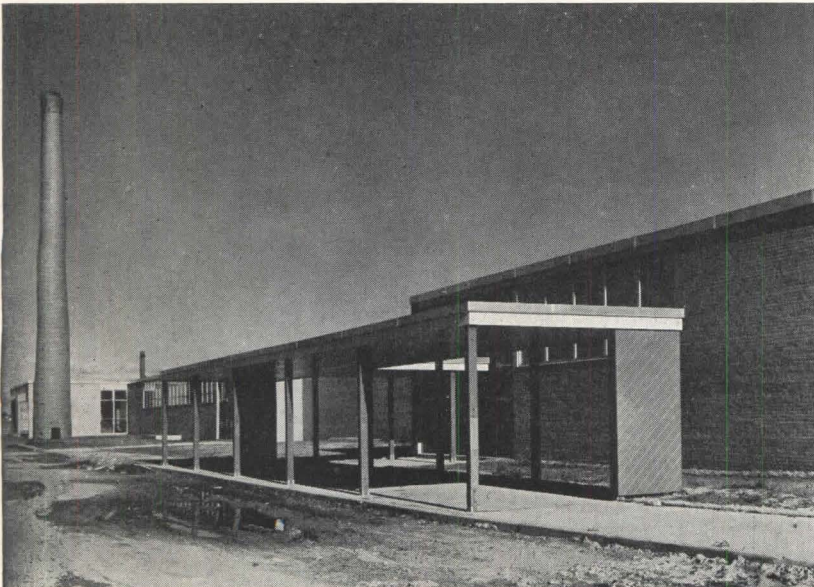


*Magney, Tusler & Setter,  
Architects & Engineers*

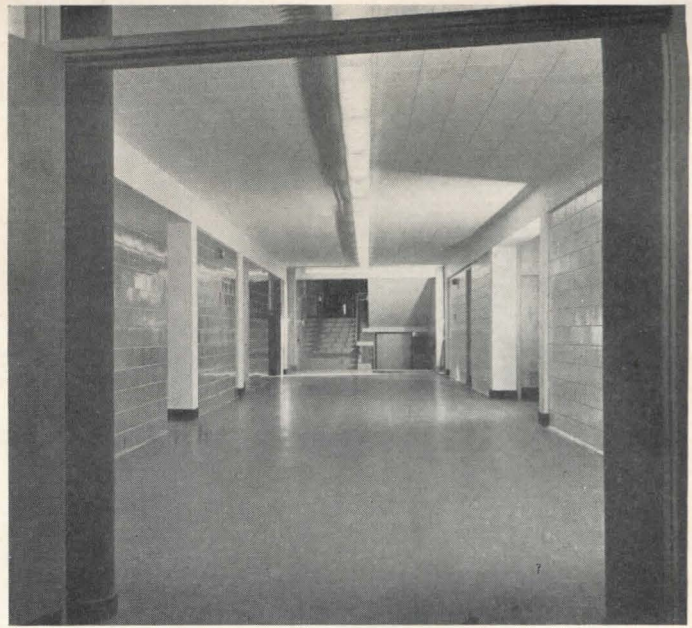
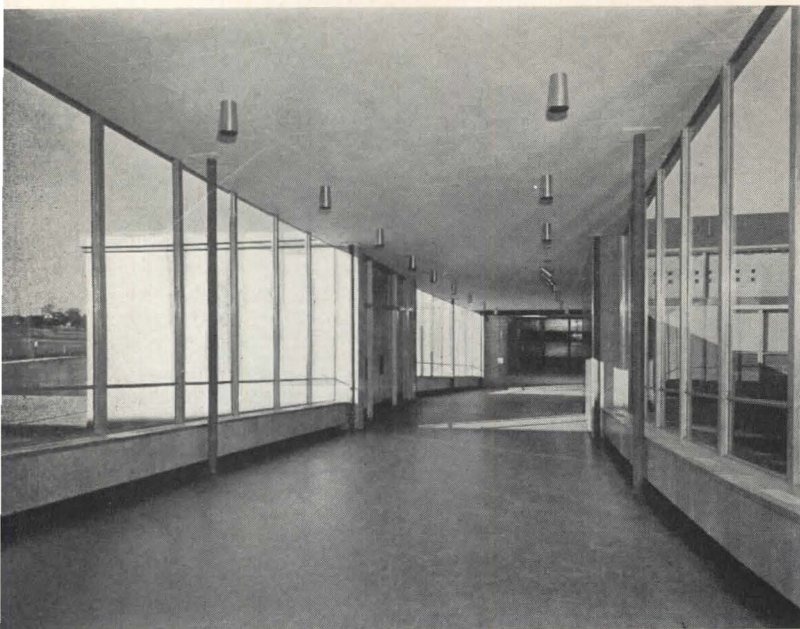
**JUNIOR-SENIOR HIGH SCHOOL, RAMSEY CO., MINN.**



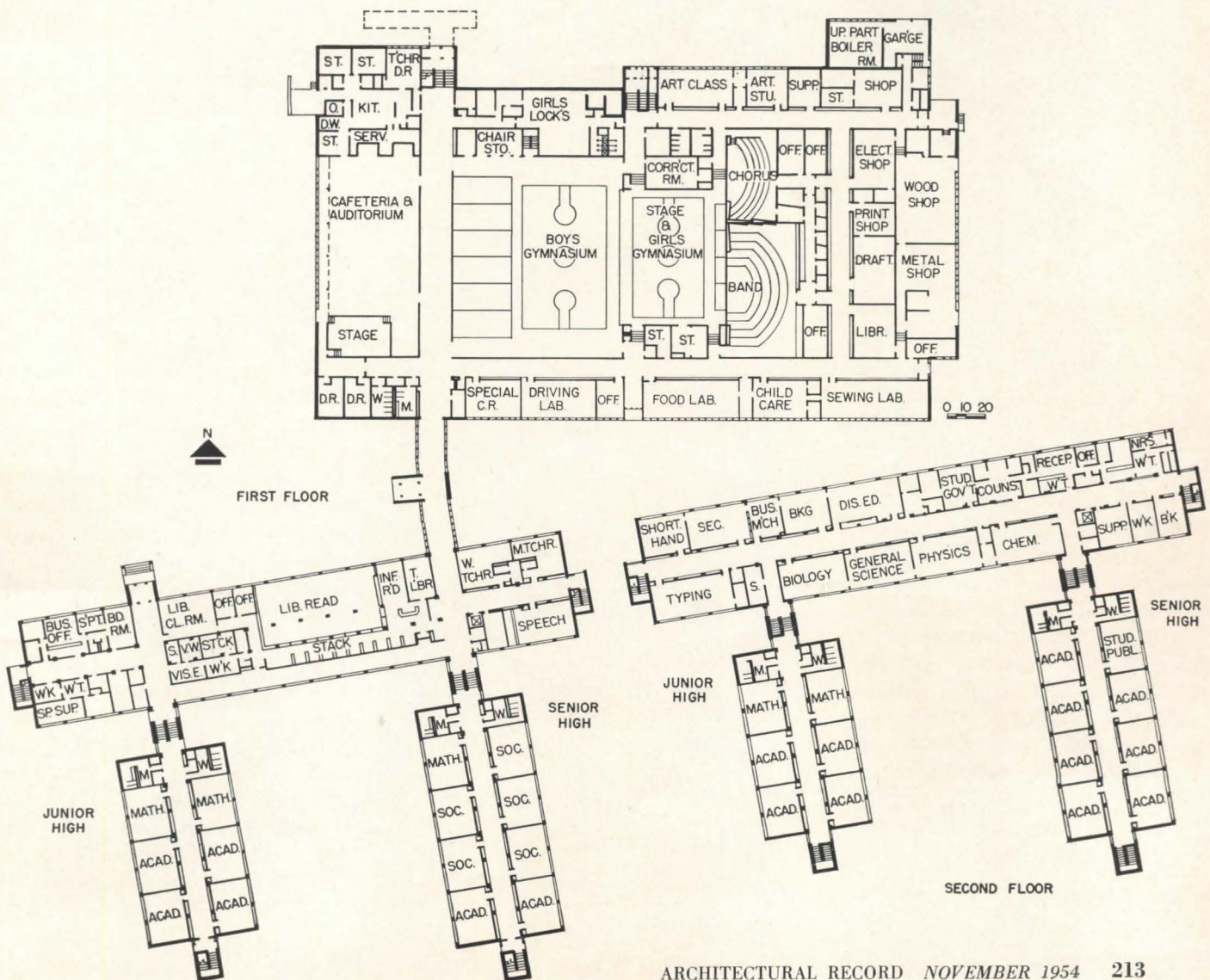
ANOTHER WINNER of a special award in the 1954 *School Executive* competition, the Alexander Ramsey Junior-Senior High School is organized in four wings, one for junior high, one for senior, one containing gymnasium, cafeteria and shops with their related facilities, and a central unit housing the facilities common to both age groups. This last, and the classroom wings are two stories, built of reinforced concrete with the first floor slab laid on grade. Gymnasium building, steel-framed, is described on subsequent pages.

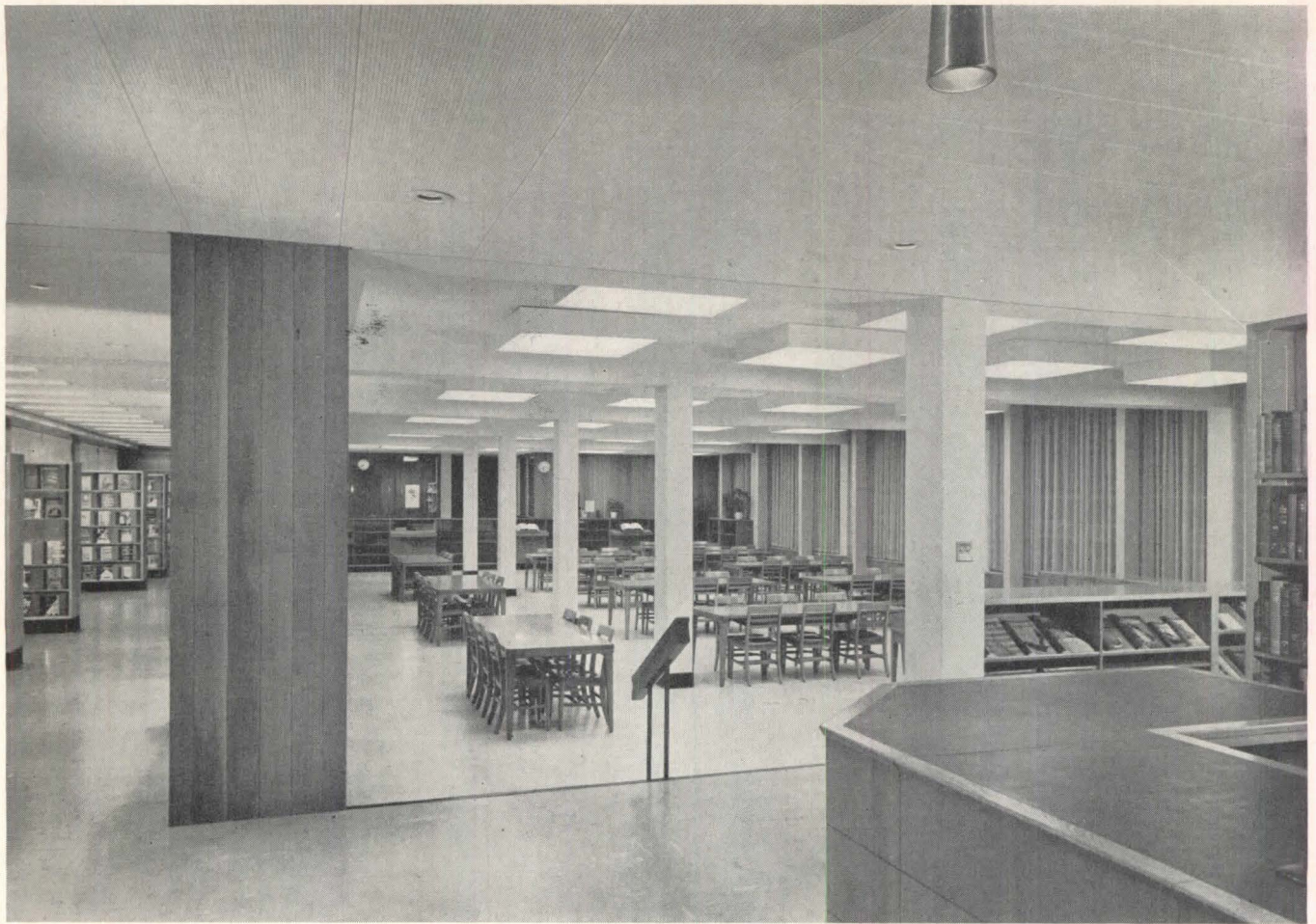


This is the first new high school in Ramsey County, a fast-growing suburban residential area just north of St. Paul, in 25 years. Prior to the school's opening in September, 1953, students were transported to St. Paul's high schools. Part of a \$4¼ million school building program, the Ramsey high school is designed for 1,500 pupils; will serve community needs as well (there is no community auditorium in the district); occupies a 40-acre site with full athletic facilities. Its cost was \$2,548,045 (total), for 206,621 sq ft or 2,648,155 cu ft.



*The careful organization of the school plant into separate units (which not only facilitates their functioning but also brings the plant into humanly manageable scale) emphasizes the importance of the corridors*



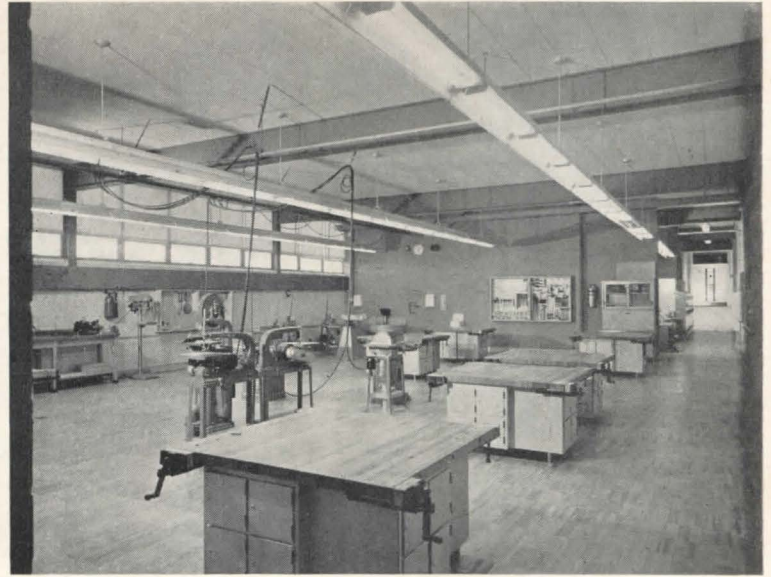


Ver Kellik

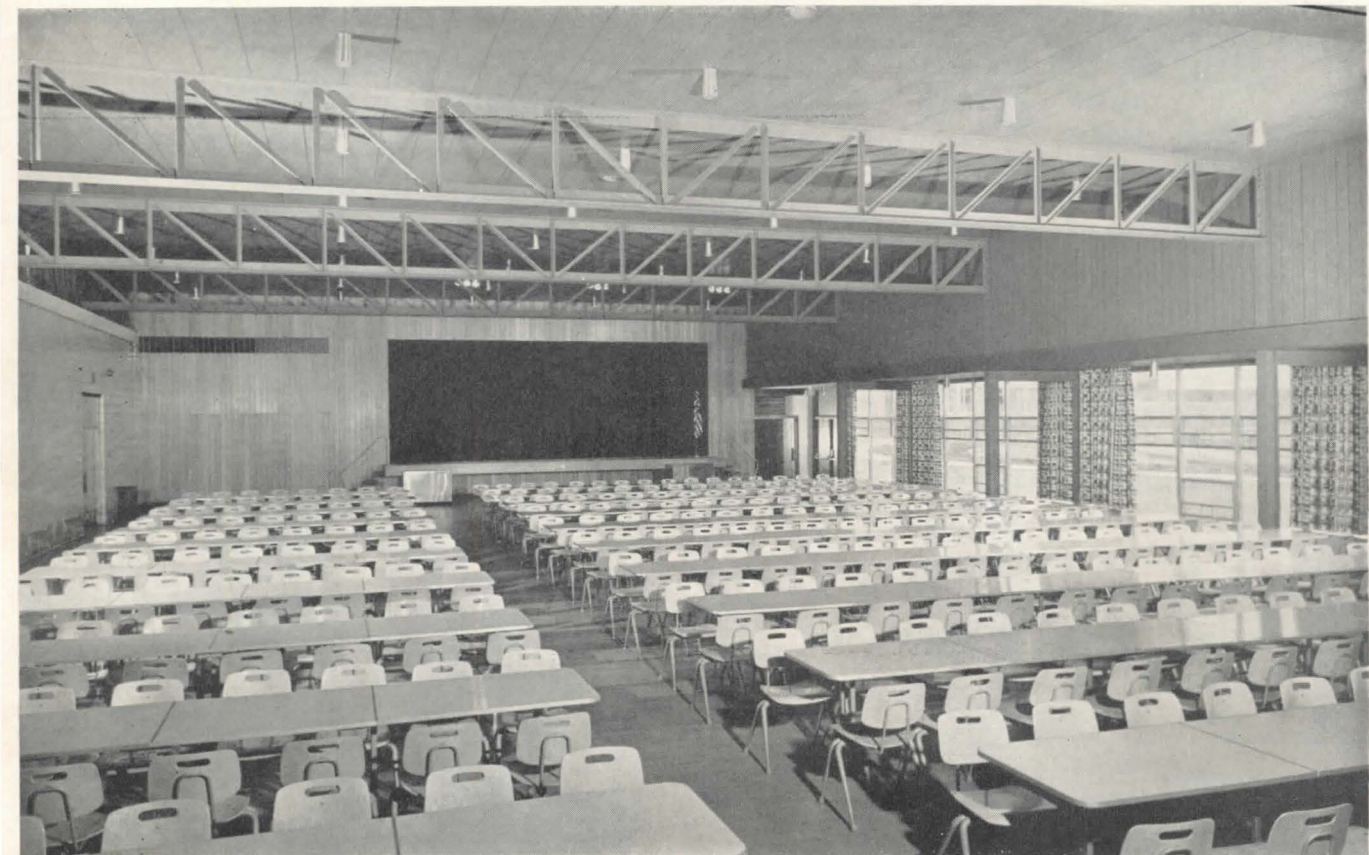
Library, shown on this page, has special area (right) for periodicals and research easily supervised from the librarian's station. Throughout the school, which was designed on a modular basis, finish materials were selected for durability as well as appearance; stair treads and floors in heavy-use areas are terrazzo; glazed structural units are used in corridor walls. Acoustic tile is extensively employed. Heating-ventilating system is fin-tube radiation plus mechanical ventilation, with supplies in peripheral tunnels and vertical risers 8 ft on centers



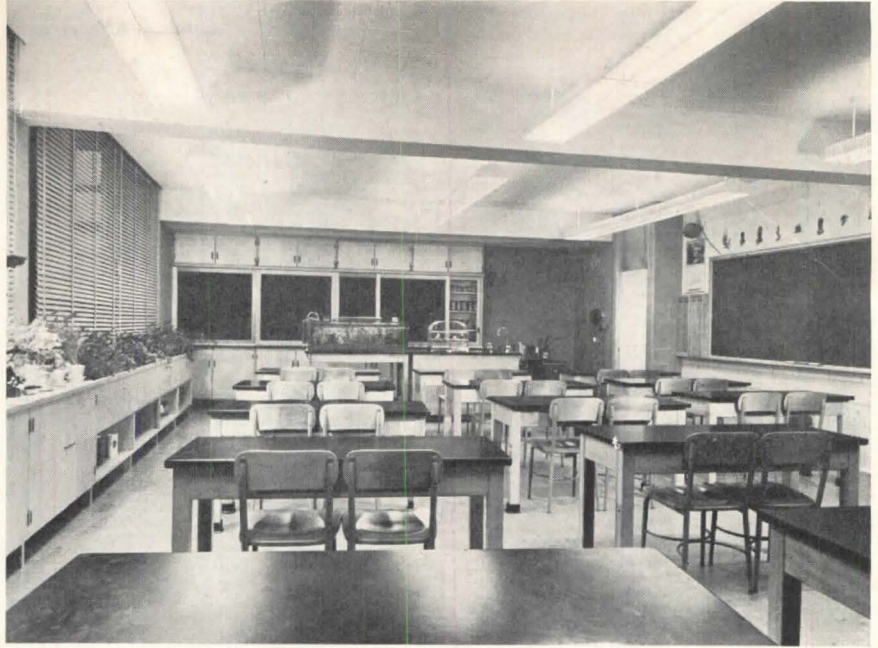
*Gymnasium — cafeteria — shop building is steel-framed; six rigid frames span the gym space. Shops are along outside walls; gym-*



*nasium bleachers seat 1500 and when chairs are set up on court floor for a stage performance, capacity is increased to 3000. Stage is also girl's gymnasium. One special classroom has been set aside for driver education. Cafeteria (below) is also an auditorium.*



Ver Keijik



*The two classroom wings contain 12 and 16 classrooms, respectively; rooms in all 3 academic buildings are much the same as the science room at right. Below is the band room in the gymnasium building; its angled walls are surfaced with acoustic absorbents; the entire area is organized in plan and detailed in construction to minimize the difficulties that noise might produce*

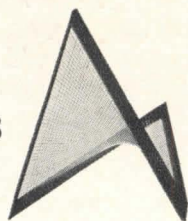




# THIN SHELLS

In two previous articles on thin shells their structural behavior, their commonly used forms and their stress analysis were presented from an intuitive viewpoint. ("Structural Behavior and Forms," July, and "Effects of Loads and Forces," September.) In this final article some typical and some extraordinary realizations of thin shell design are presented, and material and construction problems are considered.

## ARTICLE 3 EXAMPLES HERE AND ABROAD



By Mario G. Salvadori  
Professor of Civil Engineering  
Columbia University

THE FIRST APPLICATION of thin shell construction to reinforced concrete goes back to 1910. But it was only in the 1920's when Carl Zeiss of the Zeiss Works in Jena, Germany built a small barrel roof on 4 columns, that construction of this type began to expand rapidly under the guidance of U. Finsterwalder and F. Dischinger. Their studies led to the Zeiss-Dywidag patents on thin shell barrels, in which the reinforcing bars were placed along the theoretical lines of principal stress. The Dywidag patent rights for the United States were acquired by Roberts and Schaefer, who were responsible for the first reinforced concrete barrel shell hangars built in the United States in the 1930's. Ammann and Whitney promoted thin shell design independently in the United States and have produced a large number of original shell designs since 1930.

The original development of *saddle surfaces* is mainly due to the studies of French and Italian engineers (among them Aimond in Paris and Baroni in Milan), who popularized this type of shell starting in the late 1920's in France and in the early 1930's in Italy. Torraja has used them in Spain and Candela in Mexico since 1940.

*Prestressed concrete* was used in thin shell design by Professor Magnel of Belgium and popularized in the United States by the Preload Corporation.

*Tile roofs* of the thin shell type are extremely popular in European countries, particularly in Italy and Germany, and have been built in a variety of forms since 1920.

*Steel shells* have been commonly used in tank construction the world over for the last 50 years and *wooden roofs* are popular both in Great Britain and the United States.

This brief historical survey shows that thin shells are anything but new, and

that a wider use of this method of construction is justified not only on theoretical grounds but on the basis of past performance. In what follows we shall concentrate our attention on reinforced concrete roofs, and give only a few examples of the use of other materials.

### Barrels

The first shells built of reinforced concrete were of the barrel type, and for many years this shape was virtually the exclusive form adopted for shell roofs.

Cylindrical shells are classified as short or long barrels since these two types differ essentially in structural behavior. Short barrels have a length  $L$  not greater than their radius  $R$  and quite often much less than this (down to  $R/5$  or  $R/10$ ). They hang from arches (or ribs) in the form of circles, ellipses, parabolas, or in the shape of the "funicular line" of the dead load of the roof. (This shape minimizes bending stresses in the arches.) They have been used frequently for hangar construction in the United States with spans up to 340 ft, and ribs spaced at about 30 ft. Their thickness varies with the span but is usually  $3\frac{1}{2}$  in. for spans up to 280 ft with increase in thickness to 5 or 6 in. near the ribs. The same type of short repeated barrel has also been used successfully to cover large halls and arenas. An interesting variation of the short ribbed barrel consists in cantilevering the shell outward from two consecutive stiffeners, creating an element which is separated by expansion joints from adjoining identical elements.

In an original application of ribbed barrels, the Onondaga County War Memorial, Syracuse, N. Y., the arches are supported by "gallows" in order to increase their span while reducing their thrust. The short barrel shell with stiffeners may also be used to cover non-

rectangular areas as in the Livestock Coliseum at Montgomery, Alabama.

The twin hangar built in Marseilles, France, in 1952, which is of the short barrel type, has barrels arched in the short direction so that stiffening ribs are unnecessary. The shells span 305 ft and have a thickness of about 2.4 in. This design appears to be an improvement over the usual, ribbed short barrel, which inefficiently utilizes the potential structural properties of shells: the short shell acts more like a flat slab supported by the arches, because of the small span and the large curvature.

The long barrel shell, which also hangs from stiffeners, behaves like a beam of curved cross-section and can be used to cover large areas. Spans of up to 328 ft in length with a radius of 41 ft have been employed. There are also barrels of intermediate size. For example, a hangar in Munich, Germany, has a barrel 236 ft long with a radius of 65 ft.

"Funicular curves" are most common in large short barrels, while long barrels usually have circular cross-sections, although elliptical cross-sections are adopted at times to increase the enclosed volume.

A particular type of barrel developed in Germany combining somewhat the advantages of shell construction with simplicity of forms is the polygonal "hipped plate" barrel. These barrels develop fairly large bending stresses and, therefore, cannot be classified as pure membranes. In a hangar now being planned the "hipped plate" barrels are combined so as to create a corrugated surface which cantilevers out from the structure and is supported by means of tension cables. This combination of thin shell, *hipped plate*, *steel cable* construction presents most interesting possibilities structurally and economically.

In the applications presented so far,

half-cylinders are often the standard roof element, but interesting structures have been built by means of portions of cylinders combined in a variety of ways. Cylindrical shells with considerable rise, meeting at right angles have been adopted at the St. Louis, Mo. airport.

The "butterfly shell" consists of two cylindrical sectors cantilevered from a row of central supports. It is a standard element in railroad platform roofs. It can also be successfully used to build hangars, in which the central portion is for services and the cantilevered roof provides airplane shelter area. Moreover a butterfly roof built by means of repeated elements permits the introduction of large glass areas and hence the easy daylighting of large buildings. The problem of daylighting has also been brilliantly solved by cutting the barrel with a vertical plane, which is completely covered with glass or which is left open, as in the Nervi shell at Chianciano.

In Mexico Candela employed a large, unsymmetrical cylindrical sector to roof a private house. For a factory he combined half-cylinders at different heights and placed glass surfaces at the ends of the cylinders.

The same problem may be solved also by means of inclined cylinders generated by a half-circle sliding along an inclined line. It is possible in this manner to obtain a shed type structure of the multiple barrel type, although this solution does not seem the most economical.

The direct inclusion of glass in barrels, which is permissible in view of the low shell stresses, is currently accepted, and in some cases up to 50 per cent of the shell area consists of glass. In all shell regions where stresses are compressive, glass bricks can be incorporated in the shell without difficulty, giving freedom of light patterns in daytime and at night, since concealed lights are also easily incorporated in the shell. This can be said, of course, of any shell and not only of cylindrical roofs.

### Shells of Revolution

Domes of circular or polygonal shape, in which a thin shell is carried by meridional arches, are typical of church construction and are also used to cover large halls up to 400-ft diameter. In at least one structure of this type the dome is supported by "gallows" rather than by columns to create the necessary hoop force around the boundary of the shell without relying exclusively on tensile steel. But it is in industrial tank con-

struction that spherical domes have become most popular. Diameters of up to 150 ft with rises of  $\frac{1}{2}$  in. to  $\frac{1}{10}$  in. and thicknesses of 2 in. at the top increasing to 5 in. at the boundary are quite common.

The unribbed dome of revolution, circular or elliptical in cross-section, has been recently adopted by two outstanding architects. Saarinen conceived the M.I.T. building as a spherical sector, cut by a triangular vertical prism, obtaining an elegant form of monumental appearance: the diameter of the shell is 170 ft and its thickness is  $3\frac{1}{2}$  in. for 80 per cent of the dome area and 24 in. at the supports. The shell is thicker than might be anticipated since the cuts disturb the membrane stresses, introducing bending stresses throughout most of the shell.

Noyes has adopted an elliptical shell of revolution with either two or four inclined cuts in his design of houses and campus type schools which have diameters up to 45 ft with a thickness of 2 in.

### Special Shapes

Hyperbolic paraboloids for covering large factory areas were built by Baroni in Milan, Italy in the 1930's with great economy of forms. In his applications, Baroni, following the French approach, coupled four very flat hyperbolic paraboloid sectors, obtaining a structure limited by triangles at the boundaries. These triangles are trusses capable of taking the shear forces of the shell and of transmitting them to the columns by means of direct stresses.

The hyperbolic paraboloid sectors used by Baroni can also be turned upside down and supported on a single central column, or combined in a variety of ways.

In contrast, the hyperbolic paraboloids built by Candela to cover the Cosmic Ray Laboratory of the Ciudad Universitaria in Mexico City have a very high rise and are limited by parabolic arches 16 ft apart, with a span of 33 ft. Their thickness of  $\frac{5}{8}$  in. required for the penetration of cosmic rays perhaps makes this the thinnest shell built of reinforced concrete. Flat, single, complete conoids have been recently built by Candela, but the sector of conoid is ideal for shed roof construction and has been extremely popular in France and Italy during the last three decades.

It is also possible for a sector of hyperbolic paraboloid (of the type used by Candela) to be cantilevered out and supported on one of its bounding parab-

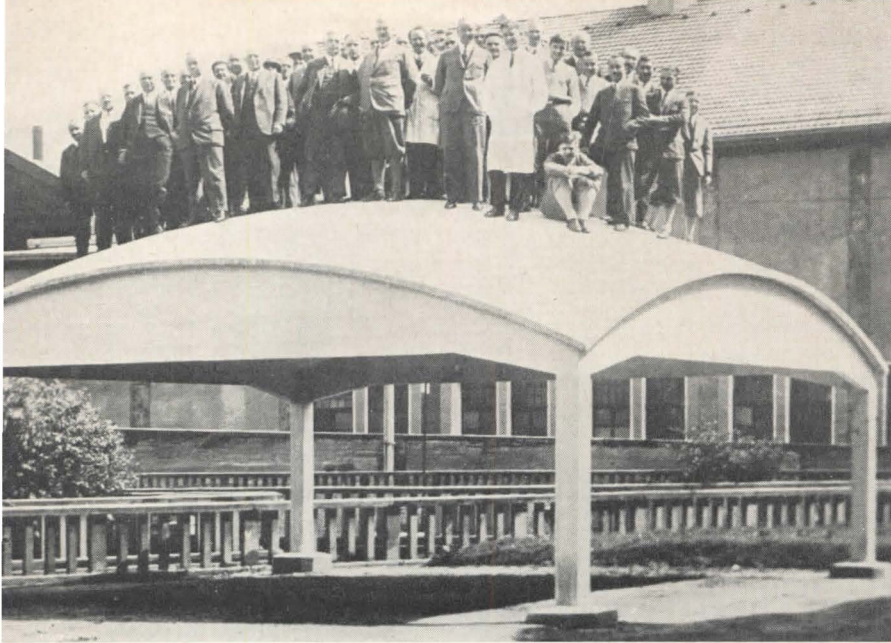
las. A solution of this type was adopted by Torraja in the Madrid race track roof.

Although in this article thin shells have been referred to exclusively as roofs, it is interesting to notice that perhaps the most daring application of thin shells occurs in dam construction. A new type of double curvature dam has been developed in recent years by engineers Oberti and Rocha on the basis of mathematical and model studies. Its dramatic applications in the Alps show heights of up to 883 ft, spans of up to 500 ft and thicknesses varying from 10 ft at the top to 50 ft at the bottom. Such structures are considered thin in view of the tremendous pressure supported. Another "hydraulic" application of concrete thin shells, by now very well known the world over, is the lovely ketch built by Mr. Nervi with a shell only  $\frac{1}{2}$  in. thick.

### Materials

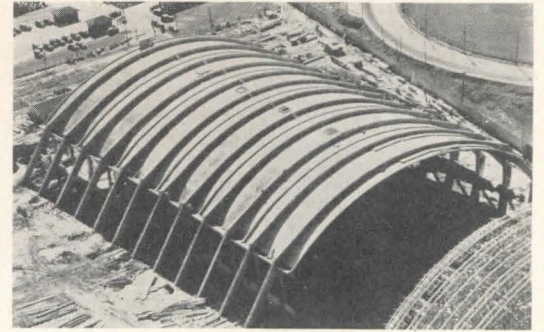
**Concrete.** The use of reinforced concrete is standard for large shells. The reinforcement consists usually of steel bars, but welded steel net of mesh sizes varying between 2 and 4 in. is becoming more and more popular in view of the ease with which it is put in place. The complicated arrangement of reinforcement along the lines of principal stress, typical of the early Zeiss-Dywidag patents, has been practically abandoned. For relatively small shells and even for large shells of small thickness (up to 3 in.), pneumatically applied concrete is gaining popularity over poured concrete. It results in a more homogeneous, stronger, monolithic construction, which allows smaller thicknesses and a reduction of the dead load of the shell, in most cases the most important load on the roof. Pneumatically applied concrete can be placed rapidly and sets rapidly, with the additional advantage of freeing the forms for re-use. Quite often it is possible to lower the forms 36 hours after spraying a 1-in. thickness of concrete, and to use the 1-in. shell as a form on which to spray the additional concrete required by the final design.

Prestressing is widely used in this country for the construction of thin shell concrete tanks for liquid storage since complete impermeability is essential in this type of structure. It is interesting to notice that almost all of the structures recently built by Dyckerhoff and Widmann in Germany and elsewhere combine thin shells with prestressing.



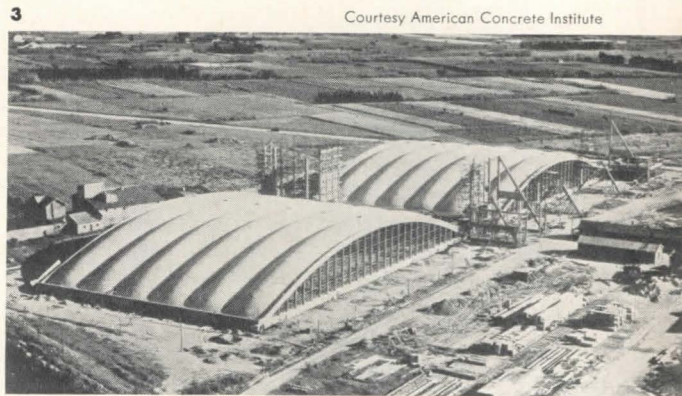
Courtesy A. L. Parme, Portland Cement Association

Courtesy Roberts & Schaefer Co.



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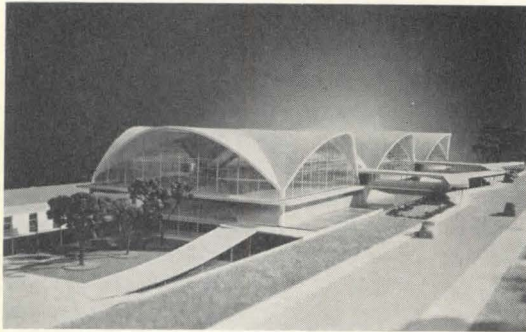
1. Small barrel roof built in the 1920's by Carl Zeiss in Jena, Germany. 2. Hockey arena in City of Quebec; Caron and Rinfret, Architects; Roberts & Schaefer Co., Consultants for shell roof. 3. Short barrel roofs for twin hangars in Marseilles, before being jacked up into place. 4. Airport Terminal Building, St. Louis, Mo.; Hellmuth, Yamasaki & Leinweber, Architects; William C. E. Becker, Structural Engineer; Roberts & Schaefer Co., Consultants for shell. 5. Alabama State Coliseum, Montgomery; Sherlock, Smith & Adams, Architects & Engineers; Ammann & Whitney, Structural Engineers. 6. House in Mexico, Félix Candela, Architect. 7. Factory in Mexico; Félix Candela and Raúl Fernandez, Architects. 8. Garage in Nürnberg, Germany.



Courtesy American Concrete Institute

Lens-Art

4



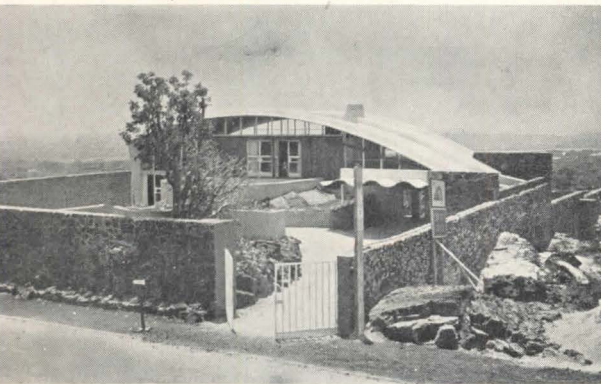
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Horace Perry



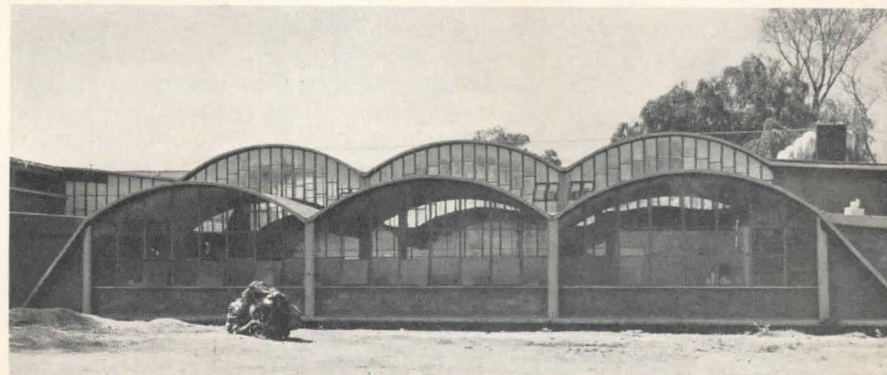
Courtesy American Concrete Institute

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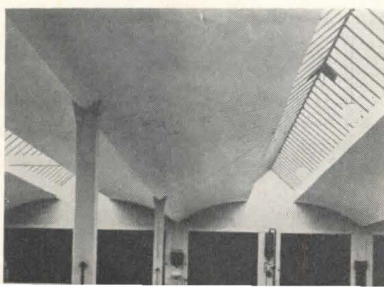


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Photo by Armando Salas Portuga from I. E. Myers, author of "Mexico's Modern Architecture"



8



Concrete really will be used to its best capacity and in its most rational manner when prefabricated, prestressed elements will become standard in the construction of thin shells.

*Tile.* Flat slabs combining tiles with reinforced concrete, in which the reinforcement is reduced to steel wires (diameter less than 0.1 in) and the concrete ribs are poured in forms created by the tiles, have been used in Europe for the last 40 years. During the last 20 years this method of construction has been adapted to shells in Germany, Italy and France.

Sheds of the conoidal type, incomplete cylinders, multiple barrel roofs, and spherical domes spanning 25 to 50 ft have been economically built with hollow tiles less than 6 in. thick. The amount of steel for a flat dome covering a water tank 59.5 ft in diameter with a rise of 7 ft is only 0.48 lb per sq ft.

One of the most interesting applications of a tile thin shell roof is the flower market built in 1953 in Pescia, Italy, a flat barrel with large cuts, supported by arches forming buttresses. The span is 90 ft, the hollow tile thickness 8 in.

*Steel and Aluminum.* Tanks of steel sheet are commonly used in industry in the shape of cylinders with spherical or elliptical heads, of complete or incomplete spheres, and of "drops," presenting the interesting property of a constant stress under static hydraulic pressure. But steel shells were used also in France in 1929 for movable hangars in the form of barrels hanging from stiffeners. (The interesting saddle roof designed by Nowicki for the North Carolina State Fair Pavilion is a metal structure in which cables constitute the essential structural elements and thus cannot be classified as a thin shell.) The recently built LeTourneau semisphere, 310 ft in diameter and 85 ft high, capable of covering an area of 71,000 ft and seating 12,000 people, is made out of aluminum sheet  $\frac{1}{8}$  in. thick. It is probably the thinnest shell in the world to-day.

*Wood.* Although wood lacks the continuity typical of concrete or metal, curved surfaces can be easily built out of this material, particularly if they are of the ruled type. Outstanding wooden structures are in existence which cover large areas with spans of hundreds of feet, but none is of the "membrane stress" type, since numerous ribs stiffen the shell. (Lamella construction, not considered here, is of this type.)

*Plastics.* The writer is unaware of large shells in which plastics are used as structural materials, but would like to call the attention of the architect to the possibilities presented by these materials in the field of shell construction. Plastics with the strength of steel are at present available which can be molded into the most complicated shapes, welded and attached to other materials. They can be transparent or opaque. Plastics used in airplane construction are typical. While it may be uneconomical at the present time to build a complete structure of these materials, large plastic surfaces could be incorporated wherever the lighting problem or the shape problem becomes important. It is easy to predict that the increased production of plastics well adapted to construction purposes will add interesting possibilities to thin shell design.

### Construction Problems

The greatest single obstacle to the expansion of reinforced concrete shell construction is the high cost of building forms. In the case of large barrels, complex scaffolding made out of wood or steel tubing must be erected and supported on jacks. Once a pour is completed, the heavy scaffolding is lowered by the jacks, shifted to a new location and jacked up again. This complicated operation must be repeated for each pour and it is rarely that the scaffolding can be used more than four to six times on the same job. The form structure must then be dismantled and shipped to a new site, if made of steel tubing, or disposed of if made of timber. The surface on which the concrete is poured is always made out of disposable timber.

The cost of materials and labor involved in building, shifting and dismantling the forms may be as much as one third of the total cost of the concrete structure even when the forms are used many times over on the same job. When the forms are used only once, this ratio may be higher.

The cost of forms for large shells of the barrel type, spanning 250 to 300 ft, varies between \$4.00 and \$6.00 per sq ft. Using the forms an average of six times, this gives a minimum cost of 67 cents per sq ft. In multiple barrel factory roofs, in which simple forms are used a great number of times, this cost is said to be at least 30 cents per sq ft. Hence any solution lowering the cost of forms is to be welcomed.

In one of the solutions successfully

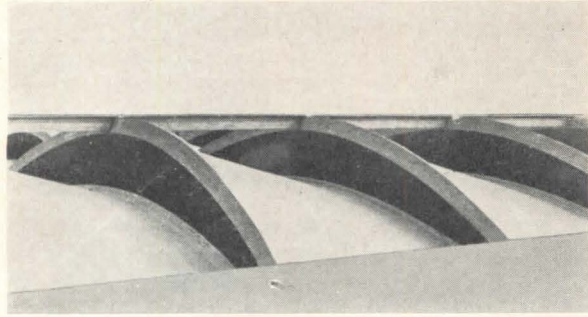
adopted by Dyckerhoff and Widmann (Germany) the heavy reinforcement of the shell is erected without scaffolding, and the concrete is poured against small movable forms which hang from the reinforcement.

For the 1952 Marseilles hangars, the numerous short, arched barrels were poured on the ground using the same form, and the barrels were then lifted in place. This combination of thin shell construction with prefabrication of the shell as a whole has economic advantages where labor costs are high and material costs low. Monolithic shells are easily transportable without danger of damage, while their pouring as a whole at ground level is practical and structurally wise.

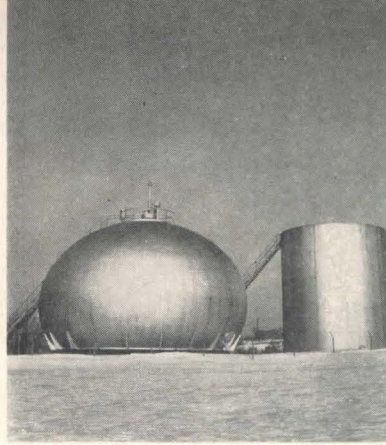
A series of barrels designed for use by the U. S. Army (15 by 30 ft) and the school shells by Eliot Noyes (45 ft in diameter) are designed so that they can be picked up and moved. The common use of heavy equipment in the United States should add further attraction of this method of construction, particularly in view of the popularity recently gained by the "lift-slab" system.

Prefabrication of small elements which are then assembled to create a thin shell has been perfected by Nervi in Italy. The Nervi element is itself a corrugated shell reinforced by layers of thin mesh and precast on the ground; the various elements are then put together on light forms, by welding the steel reinforcement and by pouring the joints. This method has the obvious advantages of prefabrication of standard elements at ground level and the elimination of heavy forms. On the other hand, it may require welding of the reinforcement and always requires local pouring of the joints. It is currently under study in the United States. Nervi's procedure is well adapted to an economy of low labor and high material costs.

Another entirely different solution of the form problem called the "Airform" method was initiated 12 years ago by the West Coast architect Wallace Neff and has been successfully applied to a variety of shells. A balloon of neoprene-nylon fabric in the shape of the shell inner surface is inflated by compressed air to a pressure of 6 lb per sq in. The steel reinforcement, usually welded mesh, is set on the balloon and concrete is shot against the neoprene form, completely engulfing the steel. Door and window frames are incorporated into the shell, by attaching them to the reinforcement.



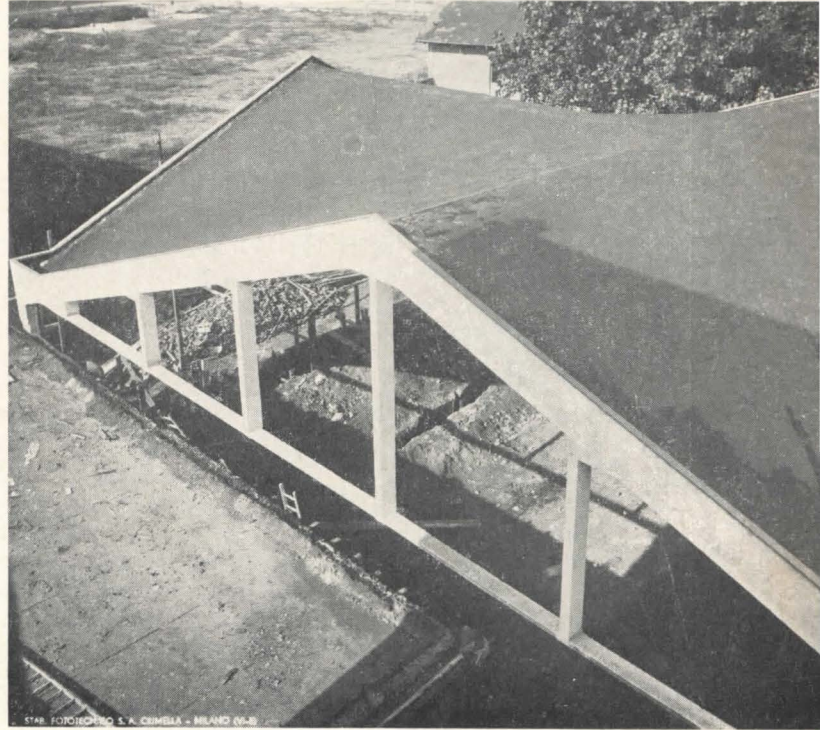
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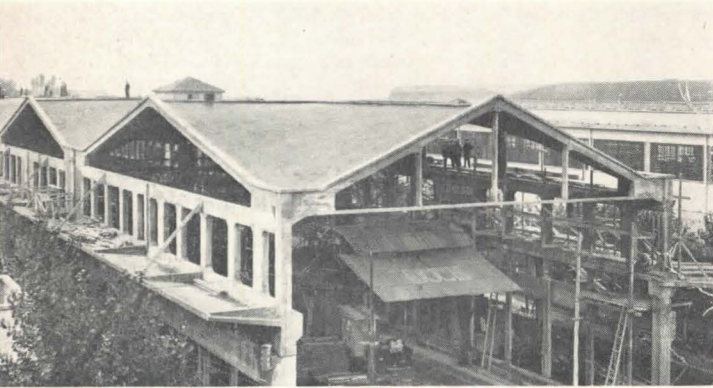
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Courtesy Standard Oil Co., N. J.

Courtesy G. Baroni, Milan, Italy



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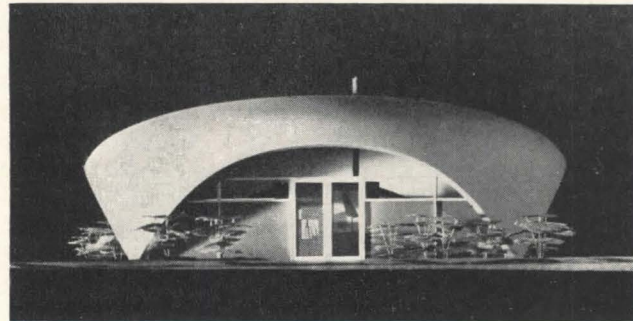


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9. Steel storage tanks for an oil company in Maine. 10. Conoids for a transportation building in Rome provide daylighting; G. Baroni, Structural Engineer. 11, 12. Hyperbolic paraboloids for a factory roof in Milan; G. Baroni, Structural Engineer. 13. Model of a proposed classroom; Eliot Noyes and Associates, Architects. 14. Hyperbolic paraboloids cover Cosmic Ray Laboratory at University of Mexico City; Félix Candela and Jorge Gonzalez Reyna, Architects. 15. Doubly curved thin shell for dam in the Alps; G. Oberti, Structural Engineer. 16. Olympic Hall, Berlin, built in 1936, has shell roof with ribs from foundation to skylight; Professor W. March, Architect; Dyckerhoff & Widmann, Structural Engineers.

13

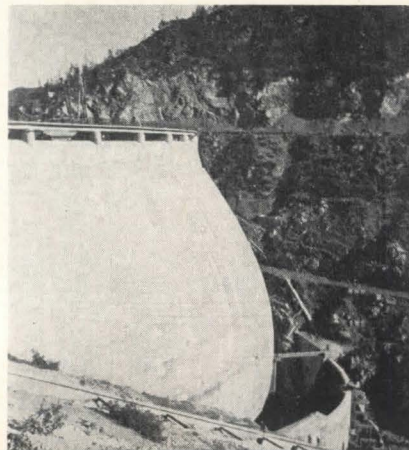
E. J. Cyr.



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Courtesy G. Oberti, Milan, Italy



16



Photo by Armando Salas Portugal from I. E. Myers

Once the concrete is set, the balloon is deflated and taken out of a door or window opening, and the shell is finished by increasing its thickness, if necessary. A variety of technical problems had to be solved before the "Airform" method became practical. For example, the lowering of temperature due to a passing cloud could decrease the air pressure in the balloon, changing its shape. To avoid this an electronic pressure gage, controlled by a thermostat, is attached to the air compressor and puts into, or takes out of the form the amount of air necessary to maintain the pressure constant within very strict limits. One-family houses, grain storage tanks, ammunition huts and other types of structures have been built by the "Airform" method, all involving thin shells of reinforced concrete. Spans of up to 100 ft have been reached with thicknesses of 2 in. of concrete. Shells built by this method have been in existence for the last 10 years. Construction projects using "Airform" are expected to be started in the near future both in the United States and abroad.

### Conclusion

When nature decided to shelter its most precious particle, the embryo, it created the egg shell, a shape of great resistance realizable with a small amount of material. A chicken egg shell will withstand a pressure of 75 lb; its diameter is approximately 1 in., its thickness about 15/1000 of an in.; its span to thickness ratio is 66 to one. A concrete barrel spanning 340 ft with a thickness of 5 in. sustains a greater unit load with a span to thickness ratio of 825 to one. The LeTourneau semisphere with a diameter of 318 ft and a thickness of 1/8 in. has a span to thickness ratio of 30,600 to one. Man has outdone nature in daring, and has produced securer shelters, since our shells are not as fragile as an egg.

The technical possibilities are here. The mathematician, the engineer, the builder have done their lot. But no building technique can be successful, even in our predominantly technical civilization, unless it is used to create a living structure, filling the deeply felt needs of the human beings who are to dwell or work in it. This is why, although the fundamentals of shell theory have existed since 1828, shells are only today being integrated into our lives.

The mission of the architect is indeed a difficult one. Artist by nature, he must become a *master craftsman* before his

dreams materialize. Craftsman by trade, he must become a technician in order to understand and make his own the achievements of the engineer. In order to design shells he must think three-dimensionally, and be a master, not a slave of geometry. He must know materials and their strength, be aware of stresses flowing in steel and concrete, be able to channel these stresses economically. He must have an eye for color and adapt his shell to its surroundings, while making sure that rain will not penetrate it, heat will not crack it, ice will not break it. He is aware of life inside his shell: he worries about acoustical responses and heat insulation. Can a single man encompass all this knowledge?

The present dichotomy between architecture and engineering is absurd and must vanish before long if we are to get the utmost out of our creations. In the statement of a leading architect, "architects are so outdistanced by engineers in inventiveness and resourcefulness that the engineers may soon take over their profession." A leading engineer objected to this remark; he felt that "engineering was potentially ahead of architecture, but that engineers were often, in his opinion, far behind architects."

There is a simple solution of this puzzling situation and it can be found at the roots of modern society. Today no one is "independent;" we all rely on each other for survival. The architect is just like any other modern man: he needs help. His main difficulty is to know *at least* the kind of help he needs. The engineer is ready to help, but on one hand his training is often so unimaginative that he does not understand the creative expressions of the architect, and on the other he is such an "exact," scientific person as to dislike problems that cannot be rigorously solved. Leaving aside the "handbook" engineer interested only in routine problems, and the "handbook" architect, who can only copy a preordained scheme, modern architecture needs the architect capable of grasping the fundamentals of structural design and the engineer willing to tackle new and unsolved architectural problems. Such persons exist, but only by rare chance do they come together. In the field of construction touched upon by these articles there is a crying need for more getting together of the brilliant architect with the daring engineer. A horizon of infinite possibilities is now open: the stay-at-home will be scared, the pioneer will feel attracted by it. The future is the pioneer's.

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6. "Circular Concrete Tanks without Prestressing," Concrete Information circular of the Portland Cement Association. Bending stresses and membrane stresses in circular cylindrical tanks under a variety of loads.
7. "Transactions of the American Society of Civil Engineers." Articles on shells starting in the 30's.
8. "Journal of the American Concrete Institute." Numerous articles on theory and practice of thin shell construction during the last 15 years.

### Errata to Article 2

Professor Salvadori was unable to read proofs on Article 2, due to his absence from the United States during the summer. The following errata contain the essential corrections in the text.

P. 213, Column 3. Line 8 from bottom of page: "T<sub>φ</sub> stresses on the cuts parallel"

P. 214, Column 1. Title of second figure: "Diagrams of Maximum Stresses Due to Snow Load"

P. 214, Column 2. Line 12 from bottom of page: "compressive and tensile stresses" should read "maximum stresses"

P. 214, Column 3. Line 5 below "Stresses in Circular Shells": delete the word "shell"

Line 2 below figure: "the radius of the parallel is R<sub>2</sub> sin φ,"

P. 215, Column 1. Eq. (9) should read:

$$-2\pi wR^2(1 - \cos \phi)/2\pi R \sin^2 \phi$$

Eq. (10) should read:

$$= -Rw \cos \phi - (-Rw \frac{1 - \cos \phi}{\sin^2 \phi})$$

Line 1 after Eq. (10): add "at the boundary" after "T<sub>φ</sub> is tensile"

P. 215, Column 2. Line 3 above Eq. (12) "along the center diagonals"

P. 216, Column 1. Line 3 below the third figure: "a force Q<sub>0</sub> toward the center"

Line 5 below the third figure: "bending stresses in its neighborhood"

Line 2 from bottom of page: "A study of the transverse shears created in the shell by boundary forces Q<sub>0</sub>"

P. 216, Column 2. Line 4 below the figure: "will be applied by the ring to the shell boundary"

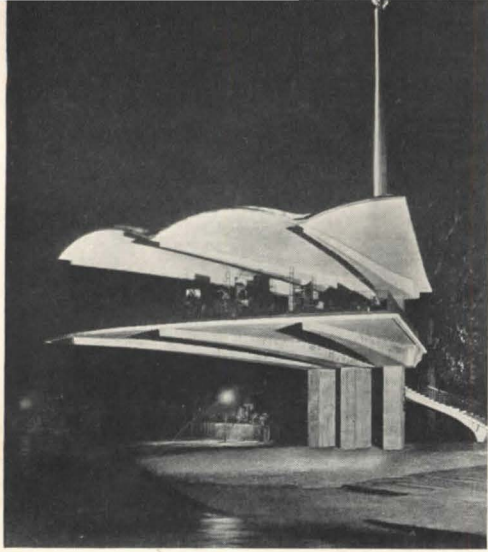
Line 11 below the figure: "have recently been obtained by the writer and his students for circular shells under conditions encountered most often in practice"

Line 4 above Eq. (14): "whose boundary is completely fixed,"

Line 4 from bottom of page: "point to point of the boundary,"

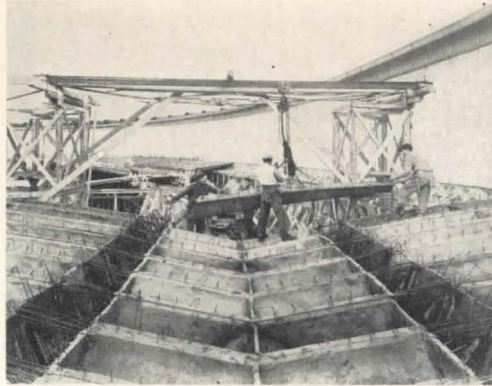
P. 217, Column 3. Line 8: Add title, "Inherent Shell Strength"

Line 11: "structures comes again"



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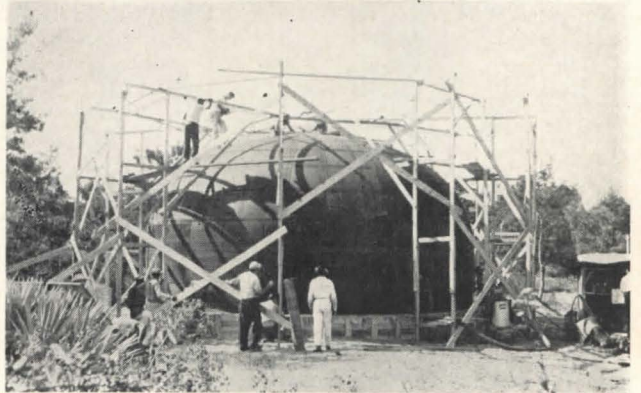
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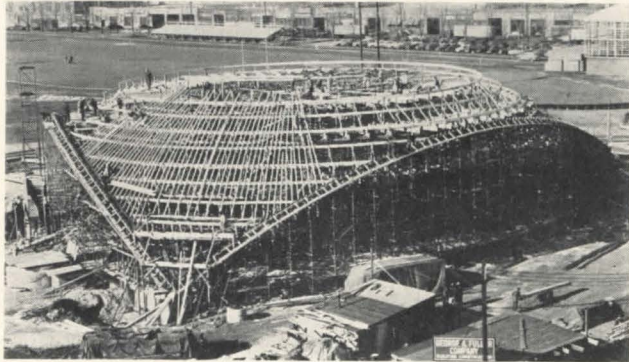
17. Platform and shell roof, which cantilever out about 50 ft, utilize prestressing in this demonstration structure for a German Fair (1951); Dyckerhoff & Widmann, Structural Engineers. 18. Placing section of "ferro-concrete," a system patented by Nervi in which corrugated elements are precast, steel reinforcement is welded and joints are poured to join them. 19. Roof of Tramway and Bus Depot, Turin, Italy, designed by Nervi and built by means of precast triangular elements of "ferro-concrete." 20. "Airform" balloon used for building concrete shell house designed by Eliot Noyes; pneumatically applied concrete is sprayed over mesh. 21. Beginning of formwork for M.I.T. auditorium by Eero Saarinen; Ammann & Whitney, Structural Engineers; George A. Fuller Co., Builders. 22. Formwork for Onondaga County War Memorial, Syracuse, N. Y.; Edgarton & Edgarton, Architects; Ammann & Whitney, Structural Engineers. 23. Dyckerhoff & Widmann method in Germany has reinforcement erected without scaffolding; concrete is then poured against small movable forms.

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Courtesy Airform International Construction Corporation

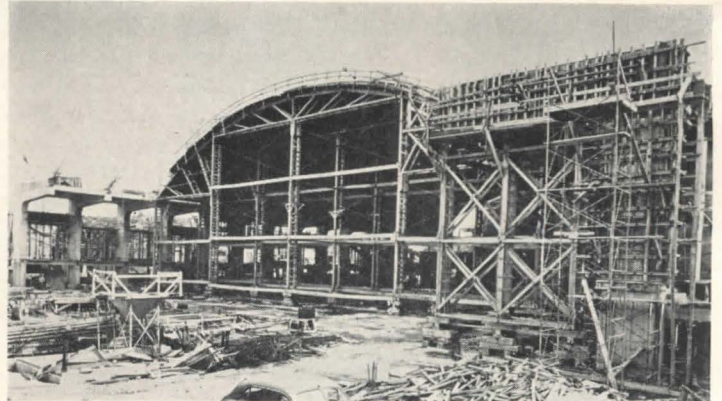


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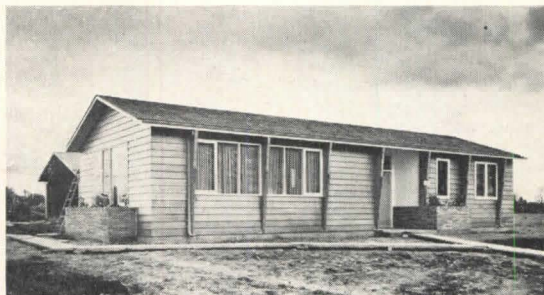


**BOOMERANG ARCHES Support Rafterless House Enclosed in 48 Hours**

"Boomerang" arches have been used by Philip C. Johnson, London, Ontario, architect, to support a rafterless house, hollow up to the roof, with no load-bearing walls inside. As reported in the September issue of *Canadian Homes & Gardens*, the London Trend House was enclosed in about 48 hr. Seven hemlock "boomerang" arches were bolted to the concrete slab foundation and braced in position, then the roof planked over and

the ends and wall openings covered with prefabricated wood panels. The house can be easily extended, and any interior materials can be used. Since the inside walls are not structural, they can be arranged as the owner or builder desires, and can be changed at any time.

Mr. Johnson predicts that if the arches were mass-produced, the 1088-sq ft house could be built for around \$10,000.


**TALLEST SKYSCRAPER | Oklahoma's TV Tower Will Rise to 1572 Feet**

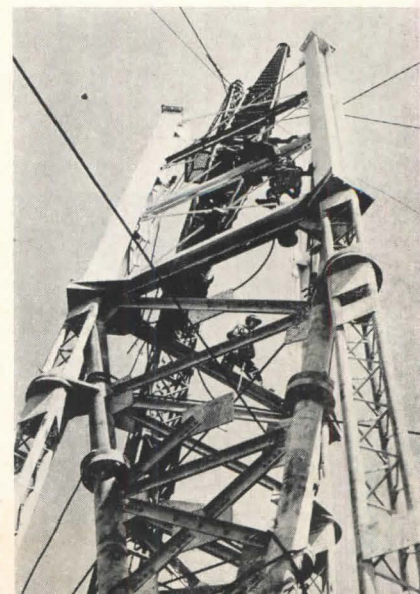
The world's highest structure, a TV tower for Station KWTW at Oklahoma City, Okla., will rise to a height of 1572 ft, including two antennas, topping the Empire State Building by 100 ft.

The tower is triangular in section, 12 ft on a side, tapering at the base to rest on circular steel slabs supported by a huge porcelain insulator capable of withstanding a crushing load of 5600 tons. The structure is guyed at the 290-, 650-, 1040- and 1340-ft levels by three pairs of prestressed galvanized bridge strand cables, making 24 guys in all.

The 675 tons of steel making up the detail elements were shop-welded and shipped to the site for field erection. Close to 11,000 lb of an iron powder electrode were used in welding flanges, platforms and wing plates to the leg sections. At the site, two legs and bracing of each section were bolted together on the ground and then hoisted into position by an "electric gin pole," which, as pictured in the foreground, is a 10-ft all-welded boom fitted with an electric winch inside its latticed structure. Once the two legs were in place and the flanges bolted, the remaining leg was hoisted and the bracing bolted to its wing plates.

The Ideco Division of Dresser-Stacey Co., Columbus, Ohio, designed and fabricated the tower. Every precaution was taken to protect it against wind, lightning and other electrical interference. "Line of sight" distance from the top of the tower to the horizon is figured at 60 miles in all directions.

(Continued on page 238)


**SHORT-SPAN CONCRETE SLABS Help Reduce Floor Dead Load**

Short-span concrete slab construction has been reported directly responsible for saving approximately 30 per cent of floor dead load in Denver, Colorado's new Mile High Center, thus reducing structural steel and foundation requirements. A cost saving was realized not only from the use of air-entrained lightweight aggregate in thin slabs, but also from the reduction on reinforcement steel area made possible by using welded wire fabric.

Severud-Elstad-Krueger, consulting engineers, considered five factors in selecting short span floor construction as the most economical and most flexible in terms of the ease with which alterations can be made:

1. There is a direct saving in the weight of the beams, columns and foundations needed to support the lessened dead load.
2. A further saving of approximately 10 per cent is realized in floor steel because the floors are designed as composite beams.
3. Short span concrete construction adds considerably to the rigidity of the completed structure.
4. The speed and ease of applying welded wire fabric helps to maintain the sequence of construction opera-

tions so that placing the steel, erecting the forms, unrolling the fabric and pouring the concrete proceeds from floor to floor without a break.

5. The completed floor slab is fireproof, eliminating the need for fireproofing hung ceilings.

**ATOMIC BLASTS and Buildings**

*A Simple Method for Evaluating Blast Effects on Buildings.* Dept. of Propulsion and Structural Research, Armour Research Foundation of Illinois Institute of Technology (Technology Center, Chicago 16, Ill.) Revised Edition, July 1954. 39 pp, illus.

Structural engineers and designers are offered in this booklet a method for estimating the approximate effect of an atomic blast on one-story steel and concrete buildings, which are closed, almost completely closed or open; and which have specific length-width-height ratios. By means of this method a measure of the displacement of the top of the building is obtained by analyzing the behavior of a model which is elastically similar to the building and which is subjected to a similar force. The motion of this model is assumed to indicate the motion of the building under the actual blast.



# A CHECK LIST FOR HOME WORKSHOPS

by Walter E. Schutz

*With people taking more time for recreation, the home workshop is becoming an important element in a good many new houses. It is also taking on new forms. Once used mostly for woodworking, the home shop now may be designed especially for one or several of a variety of activities: plastics, ceramics, art metal, model building, woodworking, cabinet making, and metalworking. On the following two pages are briefly covered some of the points that should be considered in laying out, equipping and providing services for the shops mentioned. Also some individual shop specifications are given. The Time-Saver Standards on pp. 233 and 235 show typical plans, and a table on p. 231 gives dimensions of 35 pieces of equipment together with the working space required for each.*

## Space and Facilities Requirements

The space and facilities for the home workshop are dependent on three basic factors:

1. The type of hobby,
2. The extent to which the owner participates in the hobby, and
3. The limiting mechanical features.

**1. Type of Hobby.** Leathercraft, painting, drawing, whittling or bookbinding require only a small space, perhaps 8 by 10 ft, and almost no special facilities except heating and a few electrical outlets. This type of shop can be located in almost any part of the house.

However, woodworking and metalworking on a large scale require a shop about 14 ft wide and 40 ft long to accommodate all the machines and equipment necessary.

**2. The Extent of Interest.** This is another limiting, or determining, factor. If the owner will spend only a small amount of time on the hobby, then it is reasonable to assume that he will never attempt big projects and that only a small space is necessary. However, if he spends three or four nights a week in the shop, he will want and need more room.

**3. Mechanical Features.** The type of hobby determines what other facilities must be provided. These are listed with each type of shop in the following Time-Saver Standards. They include such things as: water supply and drains, gas service, electrical outlets, adequate lighting, chimney flues, sound deadening, ventilation, moisture control, dust control and others.

All of these are controlling and limiting factors and must be definitely established before planning starts.

## Location of Machines and Equipment

Certain basic requirements must be observed in placing the machines and equipment. These are almost self-evident, but the checklist on page 231 should be followed to eliminate any conflict. As an example: the *woodworking circular saw, jointer and planer* must always be placed so that a long board or piece of stock can be passed through the machine. This means that these tools must be located in the center of the room with plenty of space in front and in back.

A *band saw* should have more room to the right than on the left. The *drill press, lathe and grinder* can be set against the wall.

## Storage

In all shops be sure to provide ample storage space. It is easier to work in a shop with plenty of storage, and also easier to keep clean and in order. This storage can take the form of open shelves, 10 or 12 in. wide, extending to the ceiling, supported every 3 ft and open in front and back. The storage also can be cabinets, 33 in. high, built like counters with shelves covered by sliding doors. These cabinets can be fitted with drawers. Open shelves or shelves with sliding doors above these cabinets are excellent.

Provide smaller shelves also — shelves 4 and 6 in. wide to take small glass jars of nails, screws and small hardware items.

The tool storage panels can be made of  $\frac{3}{8}$ -in. or  $\frac{1}{2}$ -in. plywood, with the tools resting on  $\frac{1}{4}$ -in. wood dowel pegs, set at a very slight angle. A simple way to provide a very flexible tool board is to use perforated hardboard which is supplied with heavy wire fastener brackets that will take all hand tools. The arrangement of the brackets can be changed as new tools are added.

If these storage facilities are not built in at the start, space should be left for them so that they can be installed later.

## Mechanical Facilities

**Electrical Outlets.** All electrical work must be in accordance with the National Electrical Code and all local and state codes. There should be separate circuits for the power tools and another circuit for the lights. (If a fuse on the power circuit blows, the lights will remain on, thus avoiding accidents.) If a number of tools are in the shop, and it is possible that two or more will be operated at the same time, then have separate circuits for them. Overload protection in the form of a quick-lag circuit breaker is excellent. A 15-amp circuit should have No. 14 wire, a 20-amp circuit, No. 12 wire. Since only fractional horsepower motors are used, this type of wiring is sufficient. A 220-v circuit is

## A CHECK LIST FOR HOME WORKSHOPS

never used for any of the machines, yet it may be needed for heat-treating or for some special oven. See your local code.

**Lighting.** Have general illumination as well as lights for each of the machines, individually controlled. Have several outlets in both the power and lighting circuits.

**Ventilation.** It is good practice to ventilate the shop to bring in fresh air and force out any bothersome or dangerous paint or stain odors. This is a safety precaution also.

**Dust Control.** Woodworking, especially sanding, produces fine dust that is charged electrostatically, making it adhere to anything it comes near. Provide dust collectors on such machines as sanders, lathe, saw and other chip-producing machines. These can be individually operated dust collectors of the vacuum cleaner type.

**Flues and Chimneys.** For heat-treating and for forge work it is necessary to have a flue for taking off gases and fumes. In some instances an exhaust fan connected to the vent or flue will help draw off the gases.

### Individual Shop Specifications

Later sheets in this series will show typical shops for several different hobbies. The arrangements are intended to be ideal for the area provided and the tools and equipment included.

**Woodworking Shop.** Usually considered as a general shop for all kinds of woodworking operations, from the building of large pieces of fine furniture and general carpentry to small wood novelties. A long, narrow room is best in order to have sufficient room for handling long stock through the circular saw and jointer.

A dust-tight finishing room with a vent to the outside is preferred. Provide plenty of storage space, shelves and cabinets; also include overhead lumber

rack that can be made of 1-in. galvanized pipe, suspended from the ceiling joists. Make provision for dust collection. Have separate power and lighting circuits with plenty of outlets.

**Cabinet Shop.** Used more for making fine furniture and cabinets such as found in kitchens and "built-ins." Here more assembly space should be provided, yet there should be enough room for handling long stock. In all woodworking shops, if possible, have the door in line with the saw-jointer so that stock may be passed through door for extra room. More lumber storage space is needed than general woodworking. Install cut-off radial arm in lumber rack for simple cutting of long stock. Need same electrical facilities as general shop.

**Machine Shop.** Used for making precision items such as power tools, telescopes and other items. Should have heat-treating furnace for hardening processes, connected with flue. This shop may be long or square. Best to have cutters and other precision attachments in dust-proof drawers or cases. Provide separate lighting and power circuits.

**Art Metal Shop.** Used mainly for wrought iron work and work in copper and other soft metals. More of an art shop than a precision shop; therefore do not need the heavy metal working machines. Should have a forge with flue outlet for heating iron. Since pounding is done in this shop, some noise deadening should be provided. Have separate electrical circuits for the machines and the lighting, and if the welder is used extensively, then have a separate circuit for it.

**Combination Shop.** For both metal and woodworking; combines all of the features described above. Takes maximum space, at least 14 by 40 ft, to accommodate all machines and equipment. Not too many shops of this kind — they are not particularly practical. Cost of equipping shop is very high.

**Plastics Shop.** Most of the items made in this shop are small, so less room is required. The only tools needed are a saw, such as a band or scroll saw for cutting, and a combination sander-buffer-grinder. These may be on the same circuit as the lights since little power is needed to form the plastic. It is best though, to have separate circuits. Have plenty of storage space in shelves and cabinets. Heating oven, electrically operated, does not need vent to flue.

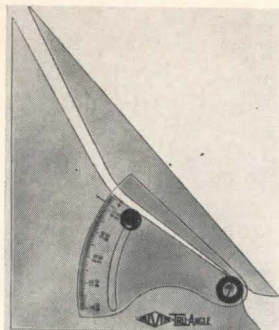
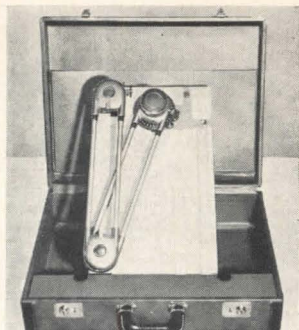
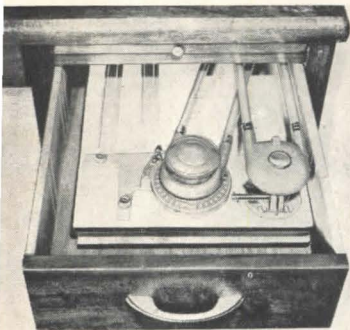
**The Model Shop.** Little space is needed. A small scroll saw powered by the same motor that runs a combination sander-buffer-grinder and drill are all the power tools required. This can be augmented as required. Have enough storage space. One electrical circuit is sufficient, but have 4 to 5 outlets for hand tools.

This shop can serve also as a home repair center. All repair parts, faucet washers, nails, screws, hand tools, extension cords and miscellaneous items can be kept here. Have plenty of shelves.

**Craft Shops.** There are many kinds of these shops and the requirements are so varied that it is impossible to give any specific data. These shops or areas are used for such creative hobbies as leathercraft, bookbinding, painting, drawing, textile painting, block printing, whittling and dozens of others. They can be treated as a group. The space need not be large and about the only requirements are adequate light and heat, including a warm floor, since usually most of these hobbies are done while seated. Sometimes these areas can be set aside as a separate room, such as a bedroom, den or activity room.

**Specialized Hobbies.** These hobbies do not fall into any one group. They are: photography, model railroading (needs extended space), ceramics and weaving (needs room for the looms and the storage of materials). Each hobby is specialized as to requirements and facilities. They can take a minimum to vast areas if desired.

## NEW OFFICE EQUIPMENT FOR ARCHITECTS AND ENGINEERS



### PORTABLE DRAFTING SYSTEM

• A portable drafting system with a drawing capacity of 22 by 34 in. will fit into a standard desk drawer and can be transferred to a carrying case for traveling. The *Desk-Topper*, which has all the features of full-size drafting machines, consists of a folding board equipped with folding legs and rubber feet, a box for instruments, a tracing paper dispenser and a 9-in. and a 15-in. engine-divided aluminum alloy scale. By the use of an accessory C clamp, the machine can be mounted on larger drawing boards or on a template in the shop. The vertically adjustable mounting permits direct layout work on sketch pads, plywood, sheet metal or any other material up to  $\frac{3}{4}$  in. thick. Five scale styles make the *Desk-Topper* practical for many types of work. *Universal Drafting Machine Corp.*, 7960 Lorain Ave., Cleveland 2, Ohio.

### ADJUSTABLE TRIANGLE

• A fluorescent adjustable triangle is precision-designed of acrylic fluorescent plastic, which has an orange tint that produces a self-illuminating orange light from all edges. Contrasting die-sunk graduations are in black. *Alvin & Co., Windsor, Conn.*

### BLUEPRINT PENCIL

• A blueprint pencil specifically designed for checking and marking on all blue or white prints and coarse tooth papers gives color markings which are resistant to oil, dirt and grime found in the shop and are unaffected by sunlight and moisture. It can be sharpened to a fine point and will not powder or smudge. An 8-color Draftsmen's Pack Assortment includes a special obliterating blue pencil for eliminating white marks on blueprints. *American Lead Pencil Co., Hoboken, N. J.*

### BLUEPRINT RACK WITH INDEX

• A blueprint rack which can hold from 12 to 18 sets of drawings, with an index which shows the location of each set, features a clamp which eliminates the need to punch holes in each set of prints and holds any thickness of set securely. The clamp is tightened or opened by a thumbscrew adjustment and permits easy insertion or removal of prints or sets of prints. Any sheet in a set can be replaced without removing other sheets. The *Glider* rack can be taken apart and reassembled, and can be enlarged by adding an extension unit to the basic unit. *Momar Industries, 4323 West 32nd St., Chicago 23, Ill.*



### NEW COPYING MACHINES

• An office-size whiteprinter, the high-volume-production, ammonia-dry copy-master features a specially designed extra-width capacity for cut sheets or roll stock of 20 in. plus. According to the manufacturer, the machine can produce a thousand or more letters or legal size copies per hour. Electronic drive provides instant and continuously variable speed change; full stop and reversal control provides for emergency return of originals. Speed dial

control automatically changes temperature in the evaporating chamber. *Peck and Harvey Sales Corp., Chicago 45, Ill.*

• An automatic photocopying machine which produces dry black-and-white photocopies within 30 sec is available in two models — the *Cormac Compact* and the *Cormac Senior* — and is also equipped with a paper dispenser, shown at the right, which automatically ejects negative sheets and has compartments for positive sheets. The lightweight

machines come in plastic cases. *Cormac Industries, Inc., 80 Fifth Ave., New York 11, N. Y.*

• A fully automatic whiteprinting machine features an automatic tracing separator. Known as the *Pease Challenger*, the "one-step" machine is reportedly fast in production, with printer and developer synchronized to a maximum of 40 rpm. *The C. F. Pease Co., 3906 N. Rockwell St., Chicago 18, Ill.*

(Continued on page 250)



## NEW HEATING COOLING SYSTEM LITERATURE

Boilers  
Heating  
Air Conditioning  
Blowers  
Controls  
Piping

### BOILERS

• Photos, drawings and specifications for both flush and enclosing jacket models of the 770 boiler-burner unit with a new higher S.B.I. rating are included in a 6-page catalog (770-10-1) published by *Fitzgibbons Boiler Co., Inc., 101 Park Ave., New York 17, N. Y.\**

• A new 8-page *Testing and Rating Code for Boiler-Burner Units* developed by the Boiler Output Committee is available from the *Heating, Piping and Air Conditioning Contractors National Association, Suite 1843, 30 Rockefeller Plaza, New York 20, N. Y.*

• *A Report to Those Concerned with the Specification, Selection, Sale of Steel Firetube Boilers* gives information on the Kewanee Reserve Plus Rating Plan for steel boilers. 8 pp, illus. *Kewanee-Ross Corp., Kewanee, Ill.\**

• *Have You Checked Your Steam Costs Lately?* is a 16-page illustrated presentation showing typical boiler plant problems and automatic boiler installations. *Orr & Semblower, Inc., Morgantown Rd., Reading, Pa.*

• The recently announced CB50-80 line of small boilers is described in Bulletin AD-135. 4 pp, illus. *Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis.\**

### METHODS OF REASONING

An approach to the scientific method of reasoning and its application to the everyday problems of industry and engineering comprise the basic subject material of this booklet. The author, P. D. Scott, experienced in training engineers and technical personnel, has explained the entire technique so that the layman as well as the technical person can quickly grasp the principles. 16 pp. \$1.00. *Cleveland Engineering Society, 2136 East 19th St., Cleveland 15, Ohio.*

### HEATING

• Paraflo warm-air, oil- or gas-fired space heaters are described in Bulletin 552. 8 pp, illus. *Dravo Corp., 1203 Dravo Bldg., Pittsburgh 22, Pa.\**

• *There Are Two Sides to Every Story* spells out the advantages of hot-water baseboard heating. Catalog 1551 on hot water equipment is also available from *C. A. Dunham Co., 400 W. Madison, Chicago, Ill.\**

• Selection, ordering and installation of baseboard heating equipment are covered in a 12-page illustrated catalog issued by *Shaw-Perkins Mfg. Co., 201 E. Carson St., Pittsburgh 19, Pa.\**

• In Bulletin 1603 the background, application and performance characteristics of Nelex Mineral Insulated Heater Units are described. 8 pp, illus. *Nelson Electric Mfg. Co., 217 No. Detroit, Tulsa, Okla.*

• *Ideas and Facts* is a series on heating and air conditioning for industrial, domestic and commercial installations. *Electrol Burner Mfg. Co., 21 Union Ave., Rutherford, N. J.*

### AIR CONDITIONING

• Three new bulletins are available on Chrysler Airtemp waterless air conditioning: one on home installations, another for commercial uses and a third on packaged central stations for big installations. *Airtemp Div., Chrysler Corp., Dayton 1, Ohio.\**

• Air conditioning and refrigeration applications for the Acme line of Flow-Cold packaged liquid chillers are described in a 4-page illustrated catalog. A 4-page catalog covering five models of Acme cooling towers is also issued by *Acme Industries, Inc., Jackson, Mich.\**

• *Burnham Cooling Installation Manual* is a guide to the new Hide-Away line of central air conditioners. 42 pp, illus. *Burnham Corp., Irvington, N. Y.*

### BLOWERS

• Bulletins MD-101 and CTB-103 cover "MD" fans and turbo-pressure blowers, respectively. *Chicago Blower Corp., 9867 Pacific Ave., Franklin Park, Ill.*

### CONTROLS

• A condensed catalog of boiler water level controls and safety devices has been prepared by *McDonnell & Miller, Inc., 3500 No. Spaulding Ave., Chicago 18, Ill.\**

• A 12-page illustrated catalog, Bulletin S-6, covering the Lawler Type S thermostatic temperature regulator, has been issued by *Lawler Automatic Controls, Inc., Mt. Vernon, N. Y.*

• A new catalog of Perfex automatic controls for heating, air conditioning and appliances (28 pp, illus.) has been published by *Perfex Corp., 500 W. Oklahoma Ave., Milwaukee 7, Wis.*

### COMPOSITE BULLETINS

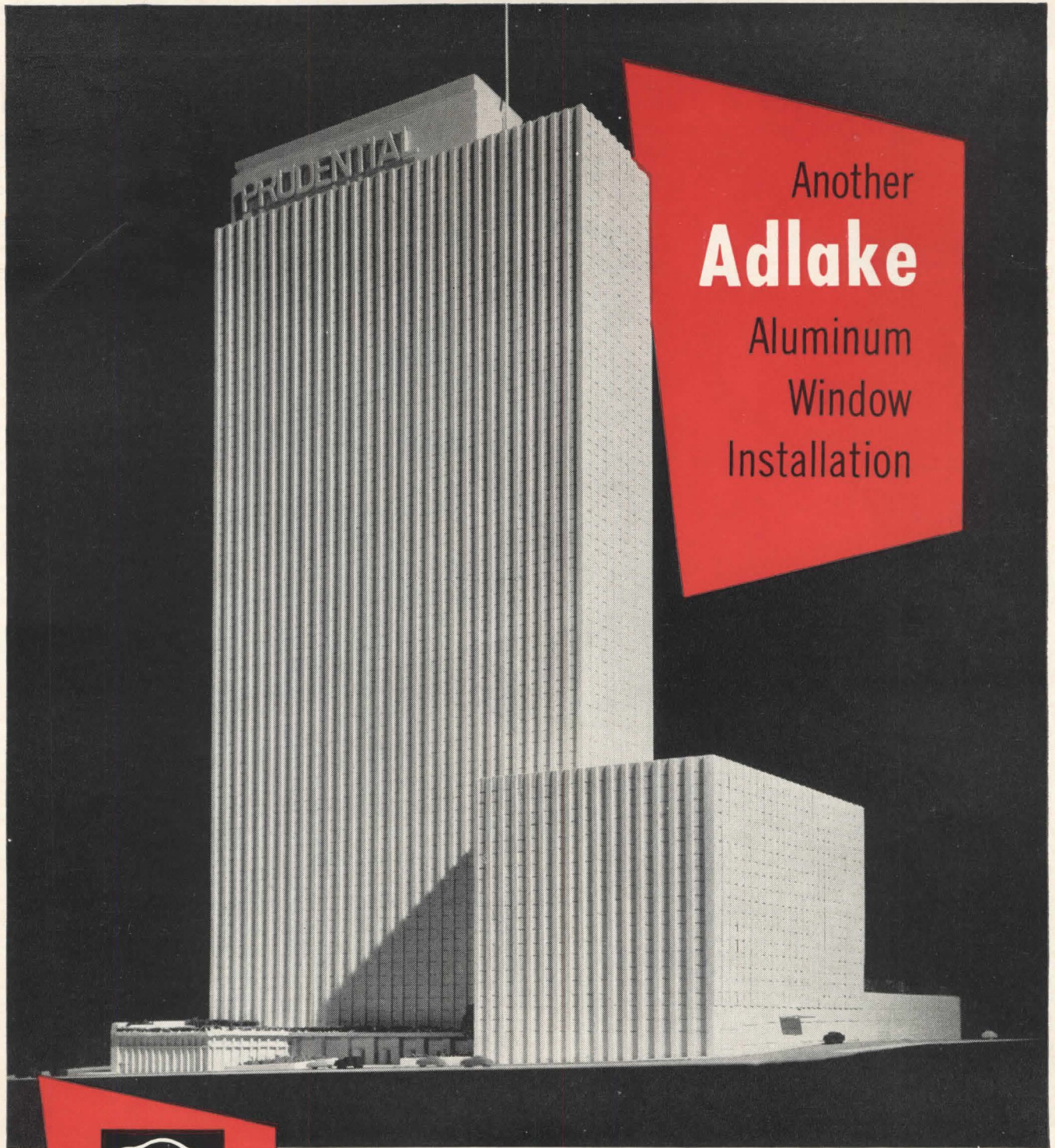
• Six new bulletins are available from Crane. Bulletin DS-352 covers packaged water chillers and Bulletin DS-361 covers reciprocating compressors for air conditioning units. Bulletin DS-362 presents information on self-contained air conditioners. Bulletin DS-372A describes Torridor high-capacity blower-type unit heaters. Bulletin DS-303 covers the new Climate Changer line for heating and cooling air. Bulletin PB-290 is a revised Product Bulletin, indexing all Trane heating, air conditioning, ventilating and heat transfer equipment. *The Trane Co., La Crosse, Wis.\**

### PIPING

• A catalog of copper water tube, red brass and copper pipe for plumbing, heating, air conditioning and other construction and industrial purposes is offered in 30 illustrated pages by *The Reading Tube Corp., Empire State Bldg., New York 1, N. Y.*

(Continued on page 292)

\*Other product information in *Sweet's Architectural File, 1954*



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**Adlake**  
 Aluminum  
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 Installation

Prudential Insurance Company of America, Chicago  
 General Contractors—George A. Fuller Company

Architects—Naess and Murphy

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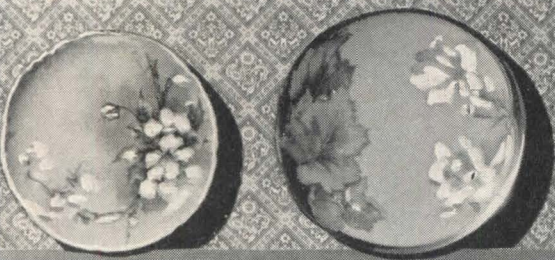
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# How to Design for a Touch of Colonial America...Economically



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## HARDWOOD PLYWOOD PANELING

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Craftwall offers many new design opportunities. It's made in seven woods, four styles and three sizes. Stock items in hardwood moldings and trim to match are made for doors, windows . . . the entire room.

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Illustrated is Cherry Craftwall Style 300 . . . size 32 x 64-in., v-grooved, cross-scored, and pegged . . . used in combination with paper. Roddiscraft matching hardwood trim. One of the many designs possible with Craftwall.

# Roddiscraft

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**HOME WORKSHOPS: 1**

By Walter E. Schutz

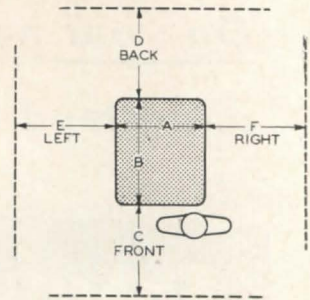
**Space Requirements for Machines and Equipment**

The table below shows the area of the most popular machines and the equipment used in the home workshop.

These are the minimum dimensions of machines and the minimum distances

allowable between machines and surrounding units.

There is quite a bit of variation in the size of storage shelves, tool accessory panels, bench extensions, nail and screw cabinets and similar built-in units. Usually these are built to fit the space available and special individual requirements.



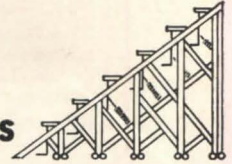
Machine or Unit	Area In Inches		Spacing Requirements In Feet			
	A	B	C	D	E	F
	Width	Depth	Front	Back	Left	Right
1. Circular Saw	48	27	12	12	6	6
2. Jointer	18	42	12	12	2	1
3. Band Saw	34	15	4	4	1	6
4. Scroll Saw	16	38	3	0	2	2
5. Woodworking Lathe	56	12	3	0	2	0
6. Drill Press	14	28	3	0	2	2
7. Comb. Belt and Disc Sander	30	20	3	2	2	3
8. Wood Shaper	21	15	4	0	4	4
9. Planer	30	16	12	12	3	1
10. Radial Arm Saw	22	25	4	0	10	10
11. Comb. Sander-Buffer-Grinder	16	16	3	3	2	2
12. 10-in. Metalworking Lathe	58	26	3	0	2	2
13. Tool Grinder	22	12	3	0	1	1
14. Milling Machine	34	26	3	0	3	3
15. Metal Shaper	18	36	4	0	2	2
16. Power Hack Saw	14	24	2	0	6	6
17. Arc Welder	14	28	6	0	4	4
18. Punch Press	12	16	3	0	2	2
19. Sheet Metal Brake	24	10	4	4	1	1
20. Shear	24	24	4	4	1	1
21. Slip Roll	20	12	3	3	1	1
22. Nibbler	18	24	2	0	3	3
23. Shear Clamp Head	12	18	4	0	3	3
24. Metal Cutting Band Saw	20	26	4	4	2	4
25. Heat-treating Furnace	30	30	4	0	0	0
26. Forge	36	36	4	0	0	0
27. Heating Oven for Plastics	24	18	2	0	0	0
28. Kiln	36	48	3	0	0	0
29. Potter's Wheel	24	30	3	0	2	2
30. Woodworking Bench	72	30	6	0	3	2
31. Metalworking Bench	60	28	4	0	2	2
32. Tool and Accessory Panel	60	48 high				
33. Storage Shelves (open)	48	12				
34. Storage Cabinets	48	18				
35. Counters	48	18	33 in. high			

You wouldn't specify plumbing like this  
or furniture like this.



On your next school job...

...instead of old-fashioned bleachers like this



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**The modern Space-saving — Work-saving answer to economical spectator seating**

● **REQUIRES MINIMUM SPACE**

When not in use, Amweld Easi-Fold Bleachers fold flat against the wall. Occupy less floor space than any other bleacher.

● **SAFE—CANNOT COLLAPSE IN USE**

In use, live load is transferred to floor. Special braces lock supports in place — eliminate any possibility of accidental collapse.

● **ONE MAN CAN OPERATE**

Amweld Easi-Fold Bleachers roll out smoothly — are perfectly balanced for easy opening and closing.

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No complicated maze of supporting members. Open space underneath seats provides place to hang coats and hats during game and make "after game" cleaning easy.

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With only 25 moving parts, there are fewer

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**AMERICAN  
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340 DIETZ ROAD • WARREN, OHIO



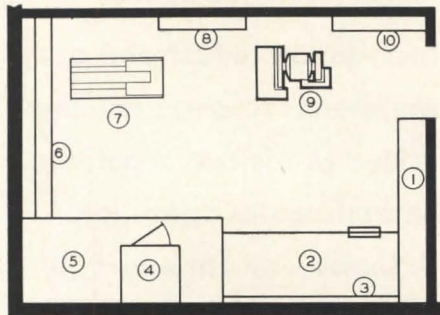
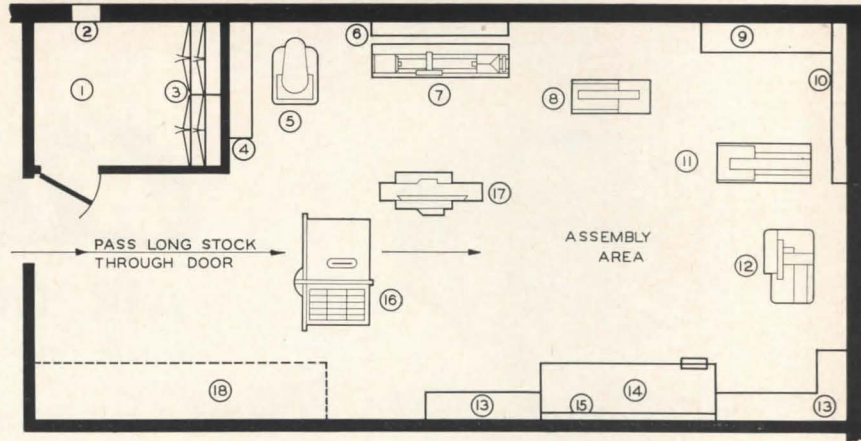
**HOME WORKSHOPS: 2**

By Walter E. Schutz

**WOODWORKING SHOP**

Circular saw and jointer must be in center with adequate room front and rear, since the entire length of board must be passed over them; door opening gives extra space. Finishing room (1) has swinging door, normally closed to keep dust out. Vent finishing room with exhaust fan.

1. Finishing room
2. Exhaust fan
3. Cabinets for finishing materials
4. Panel for drill press accessories
5. High speed drill press
6. Panel for lathe accessories
7. Woodworking lathe, 12-in.
8. Band saw, 12-in.
9. Storage cupboard and shelves
10. Panel for scroll saw accessories
11. Scroll saw, 24-in.
12. Combination disc and belt sander
13. Storage shelves and drawers
14. Bench with woodworking vise
15. Panel for hand tools
16. Tilting arbor circular saw, 10-in.
17. Jointer, 6-in.
18. Overhead lumber storage rack



**PLASTICS SHOP**

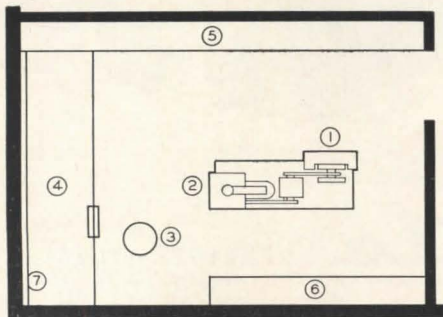
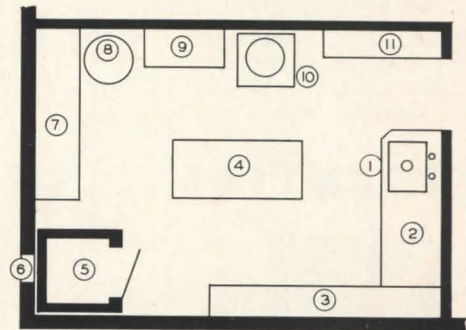
This same layout, less oven, is adaptable to a small jewelry shop, or even a small wood-working shop

1. Storage shelves with drawers
2. Bench with woodworking vise
3. Panel for hand tools
4. Electric oven for plastics molding
5. Storage cabinet with shelves below for sheet plastics
6. Storage shelves to ceiling for small items
7. Scroll saw, 16-in.
8. Panel for scroll saw accessories
9. Combination disc sander-buffer-grinder-drill
10. Panel for storing combination accessories

**CERAMICS SHOP**

If kiln is gas-fired a flue must be provided. Water supply and drain are necessary. Only "machine" is a potter's wheel

1. Sink with hot and cold water
2. Sink counter
3. Storage shelves to ceiling
4. Table
5. Kiln
6. Flue (if kiln is gas-fired)
7. Storage shelves to ceiling
8. Slip barrel
9. Wedging table
10. Potter's wheel
11. Storage shelves and drawers

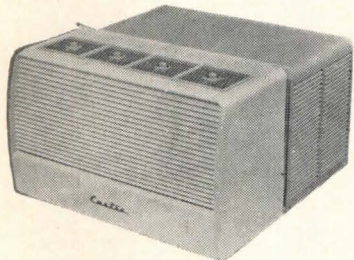


**MODEL-BUILDING SHOP**

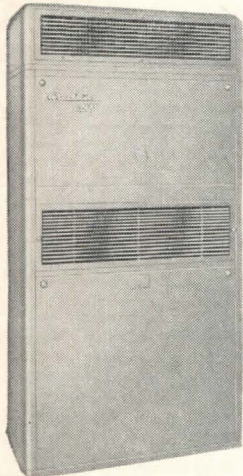
This identical layout can be used also as a home repair center. As a model-building shop it has plenty of storage shelves and all the machines usually used.

1. Combination sander-grinder-buffer-drill mounted on stand
2. Scroll saw, 16-in. (both combination unit and scroll saw are run from same motor, as shown)
3. Stool
4. Bench with woodworking vise
5. Storage shelves to ceiling, some drawers for small items
6. Storage shelves to ceiling
7. Panel for hand tools

1854 • 1954  
*our 100<sup>TH</sup> year*  
 OF SUCCESSFUL MANUFACTURING EXPERIENCE



NEW Attractive Window Units in 3 models,  
 for commercial and residential use



Package Units—2, 3, 5, 7½ and 10 tons.  
 Choice of Open or Semi-hermetic  
 Compressors . . . and 15 ton packaged  
 central type units.

# Curtis

## AIR CONDITIONING

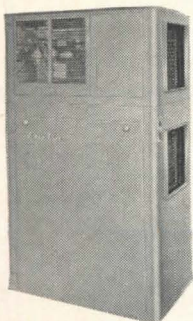
Units Are Your Assurance of Client Satisfaction

The Curtis line is precision-built to assure a long life of trouble-free service. You can specify Curtis air conditioning equipment with the assurance that it will never let you down.

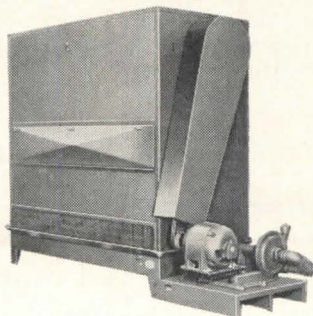
- ✓ Installation is fast and easy.
- ✓ Maintenance costs are low.
- ✓ Priced to meet competition.
- ✓ Smooth, quiet operation.
- ✓ A Curtis Unit for every job—  
 a complete range of sizes and types.

See Curtis data in Sweets Catalog File, and write for your free copy of NEW Curtis Architects' Air Conditioning Manual.

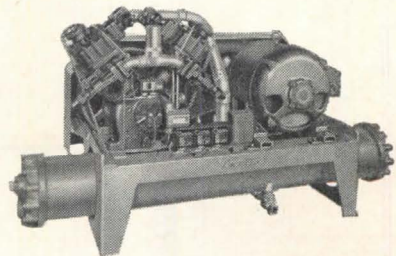
### RESIDENTIAL . . . INDUSTRIAL . . . COMMERCIAL



Residential Cooling and Heating Units



Air handling units, cooling towers,  
 and evaporative condensers



Water Cooled Condensing Units—  
 through 80 tons

# Curtis

REFRIGERATING MACHINE DIVISION

of Curtis Manufacturing Company  
 1986 Kienlen Avenue, St. Louis 20, Missouri

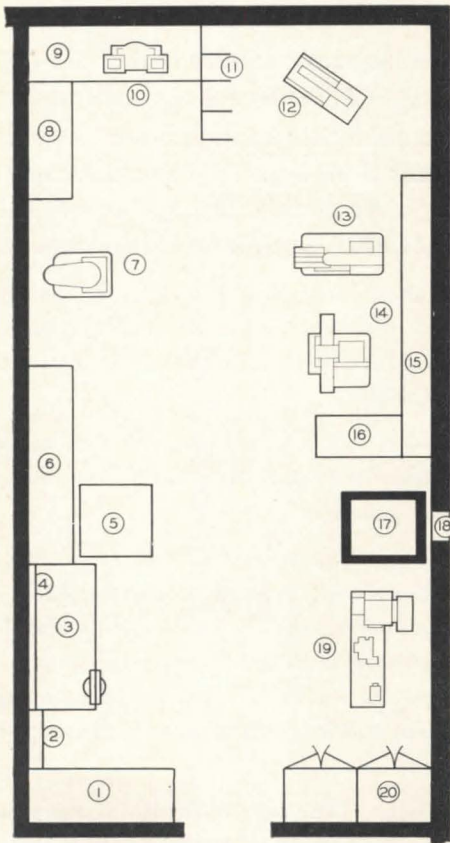
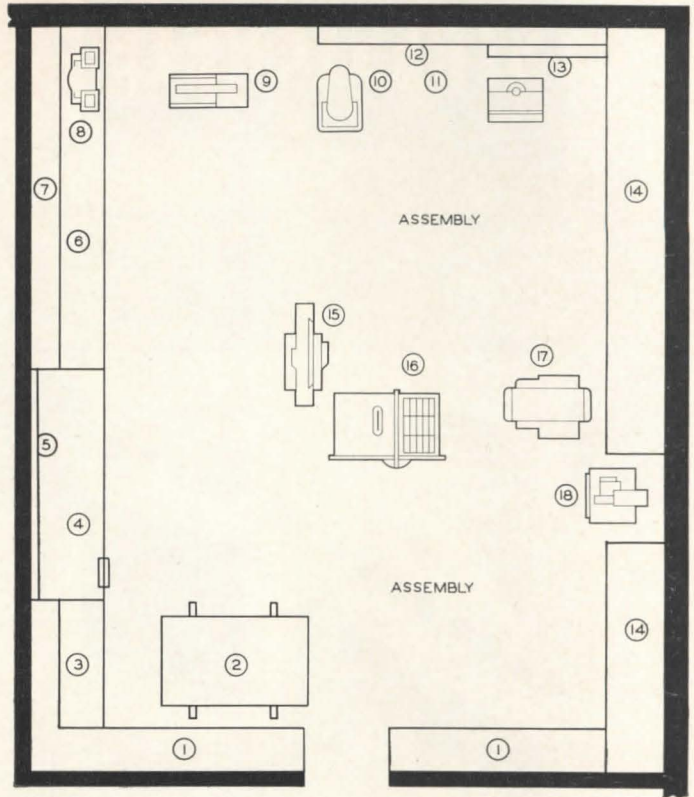
HOME WORKSHOPS: 3

By Walter E. Schutz

CABINET SHOP

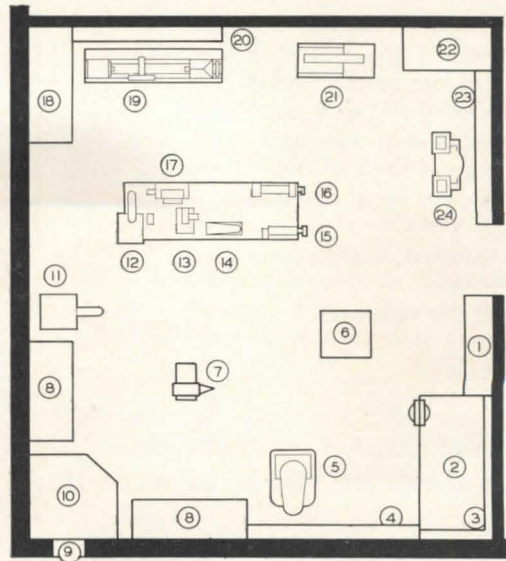
Cabinets take considerable space for gluing and assembly, so more shop area and benches, (4) and (6), should be provided than for wood working. Lumber racks (14) should easily take 12-in. boards. Circular saw (16) jointer (15) and planer (17) must have plenty of room for passing through full-length stock. Cut-off saw (18) is built into lumber rack for simple handling of stock. Provide bench-high counters on both sides to support boards

1. Storage shelves, to ceiling
2. Table-high layout and gluing board on movable horses
3. Hardware storage shelves, drawers below bench for nails, screws
4. Bench with wood-working vise
5. Panel for hand tools
6. Bench-high storage cabinet, some drawers
7. Storage shelves to ceiling
8. Bench tool grinder
9. Band saw, 12-in.
10. Floor-type, high-speed drill press, 15-in.
11. Spindle shaper
12. Panel for drill press accessories
13. Panel and drawers for shaper accessories
14. Lumber racks
15. Jointer, 6-in.
16. Tilting arbor circular saw, 10-in.
17. Planer, 12-in.
18. Radial arm saw, 10-in.



MACHINE SHOP

1. Storage cabinet with shelves
2. Small parts storage, drawers
3. Bench with metalworking vise
4. Panel for hand tools
5. Movable table on casters
6. Storage shelves
7. Slow speed drill press, 15-in.
8. Storage cabinet
9. Bench-high drawer cabinet
10. Tool grinder
11. Vertical "stand-up" rack for storing metal
12. Metal-cutting band saw, 20-in.
13. Metal shaper
14. Milling machine
15. Storage cabinet, shelves, drawers
16. Bench-high counter
17. Heat-treating furnace
18. Flue
19. Metalworking lathe, 29-in.
20. Storage cabinet

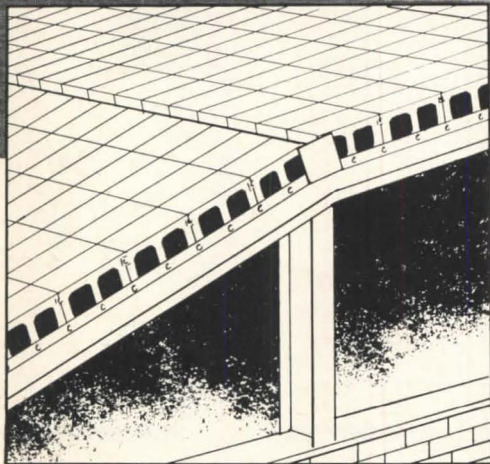
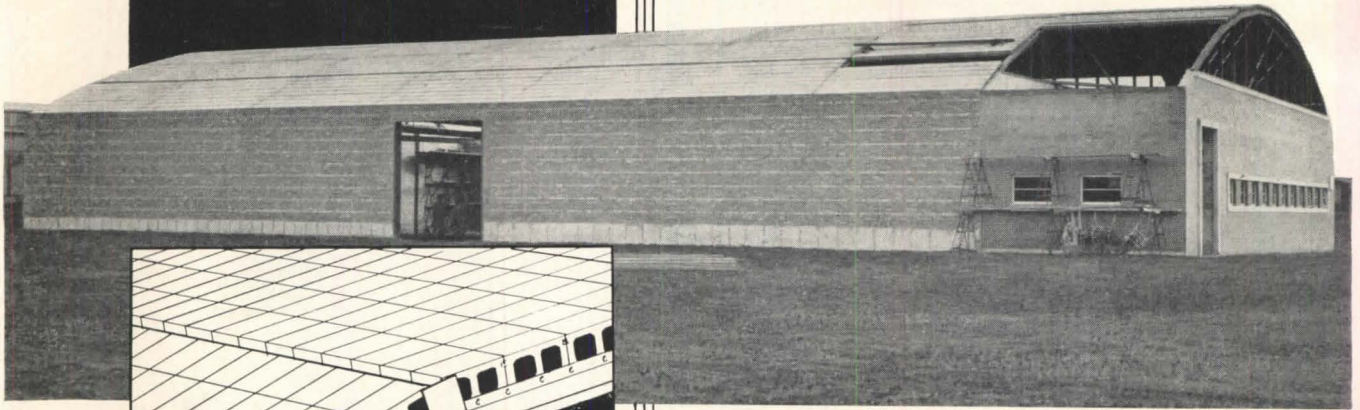


ART METAL SHOP FOR WROUGHT IRON

1. Storage shelves for small parts
2. Bench with metalworking vise
3. Panel for hand tools
4. Panel for drill press accessories
5. Slow-speed drill press, 15-in.
6. Movable table on casters
7. Anvil on block
8. Storage cabinet
9. Flue for forge
10. Forge
11. Arc welder
12. Nibbler
13. Punch press
14. Shear clamping head
15. Shear
16. Slip roll
17. Metal brake, 12-in.
18. Storage shelves
19. Wood-working lathe for metal spinning
20. Panel for lathe accessories
21. Metal-cutting band saw, 20-in.
- 22, 23. Storage shelves
24. Tool grinder

# CLIENTS PROFIT when you specify STRESTCRETE

Squirt Bottling Company Plant at 53rd and Millard  
Chicago, Illinois  
Architect: WILLIAM ALDERMAN  
Engineer: WOLFE SAGALOVITCH



## STRESTCRETE LICENSEES

- **ADAMS CONCRETE PRODUCTS CO.**  
1418 Ecorse Road, Ypsilanti, Michigan
- **ANCHOR CONCRETE PRODUCTS, INC.**  
Wabash Ave. at 2450 William St., Buffalo 6, N. Y.
- **ATLAS BUILDING PRODUCTS CO.**  
P. O. Box 601, El Paso, Texas
- **BASALT ROCK CO., INC.**  
8th and River Streets, Napa, California
- **BEST BLOCK COMPANY**  
E. Keefe Ave. & N. Fratney St., Milwaukee 1, Wis.
- **CLEVELAND BUILDERS SUPPLY CO.**  
1276 West Third Street, Cleveland 13, Ohio
- **ILLINOIS BRICK COMPANY**  
228 North La Salle Street, Chicago 1, Illinois
- **LA BRIQUE DU NORD, LIMITEE**  
Rouyn, Quebec, Canada
- **PLASTICRETE CORPORATION**  
College Highway, Hamden 14, Connecticut
- **ROCKLITE PRODUCTS**  
Ventura Boulevard, Ventura, California

**Fifteen thousand square feet** of pre-assembled 6" STRESTCRETE Roof Slabs were used in forming the modern, firesafe 100-foot parabolic steel arch roof of the Squirt Bottling Company Plant in Chicago. An additional 2,500 square feet of 10" STRESTCRETE Slabs form the mezzanine floor.

The resultant roof is light in weight, high in strength . . . spans of 18' with a dead load loss of less than 40 PSF . . . for STRESTCRETE is 19% lighter than other rectangular precast slabs.

This type of roof structure gave the plant maximum unobstructed floor area and resulted in a lower fire insurance rate being allowed.

As structural iron workers erected the arches, STRESTCRETE Slabs were rapidly placed and welded. A \$3,000 saving was effected, since welding end plates of the slabs to the arches affords lateral support without purlins. Ceiling appearance is neat, with high sound absorption and an insulation factor 15% greater than combustible construction.

For all types of commercial, industrial and public buildings—specify STRESTCRETE Floor and Roof Slabs that can be rapidly installed by a nominal labor force. You'll save design time, speed construction and hasten occupancy.



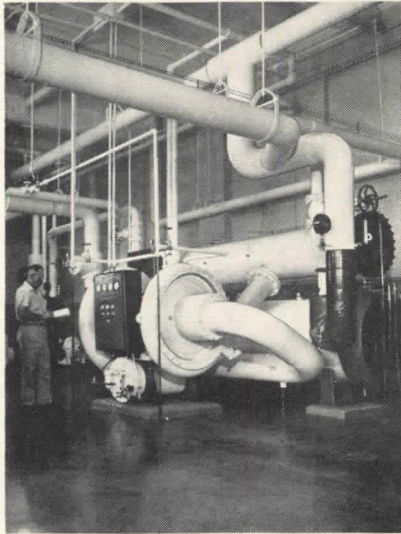
*For detailed information—consult the STRESTCRETE Licensee nearest you. Planning assistance if desired*

# STRESTCRETE

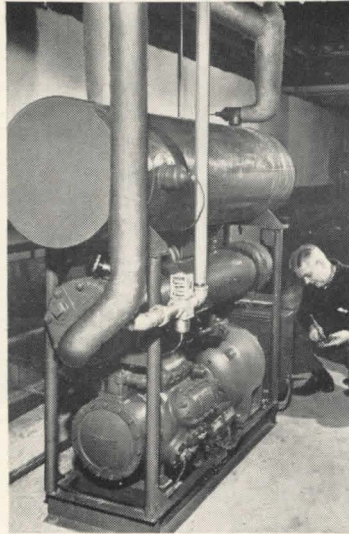
Licensed under U. S. Patent  
\*Trade Mark Reg.

## FLOOR and ROOF SLABS

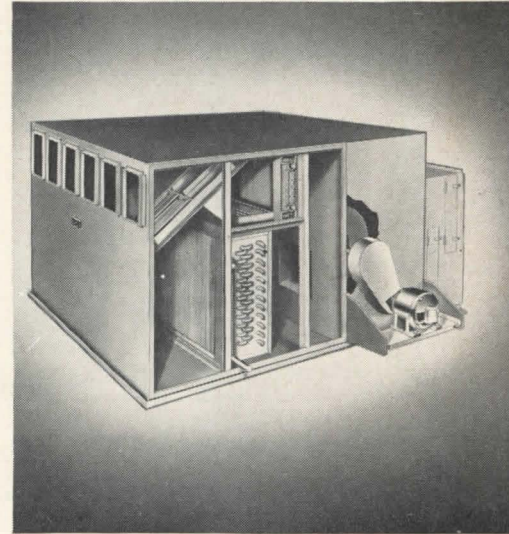
# multi-room air conditioning Units



**Trane CenTraVac** supplies chilled water for UniTrane and TRANE Climate Changer units in large systems. Starts, stops, modulates automatically, with power consumption in almost direct proportion to load. Eight models, 45 to 400 tons.



**Trane Cold Generator** for smaller installations using UniTrane units or TRANE Climate Changers, or both. Delivers chilled water from one compact package. Engineered, built, tested and refrigerant-charged at the TRANE factory. 10 to 100 tons.



**Trane Multi-Zone Climate Changers** are air handling units which can heat, cool, humidify, dehumidify, ventilate and filter air (singly or in combination) for as many as six different zones at once. 28 models, 450 to 23,400 cfm.



In six of New York's newest skyscrapers TRANE Custom-Air systems are installed. The Custom-Air system utilizes UniTrane room units combined with a central source of ventilation air to give complete air conditioning comfort plus individual tenant control of room temperature. Installations include 99 Park Ave.; 579-589 Fifth Ave.; 7 Park Ave.; 261 Madison Ave.; 720 Fifth Ave.; 460 Park Ave.

*one source  
one  
responsibility*

Specify

# TRANE UniTrane Units

*for personalized climate control*

MANUFACTURING ENGINEERS OF AIR CONDITIONING, HEATING, VENTILATION AND HEAT TRANSFER EQUIPMENT

The Trane Company, La Crosse, Wis. • East. Mfg. Div., Scranton, Penn. • Trane Co. of Canada, Ltd., Toronto  
90 U.S. and 15 Canadian Offices

(Continued from page 239)

**PNEUMATIC TUBES** | *Large Automatic System Is Expandable, Changeable*

A pneumatic tube system with an "electromechanical brain" will expedite the flow of papers, small drugs, prescriptions, case history records and laboratory specimens to all parts of the 10-story Milwaukee County Hospital in Wisconsin. The dial-operated system, both automatic and selective, will permit the sender to forward his message or article to any of 59 initially planned sending and receiving stations, which will be installed in patient areas as well as service departments.

The new system, claimed by International Standard Trading Corp. to be the largest fully automatic 4-in.-tubing system in the world, will be installed so that new stations can be added and existing stations changed with a minimum of effort. Should a minor failure occur in any part of the system, the "brain," a relay panel which determines the course of the tubes and provides the appropriate space interval between traveling tubes, will flash alarm signals to a supervisor or other attendant.

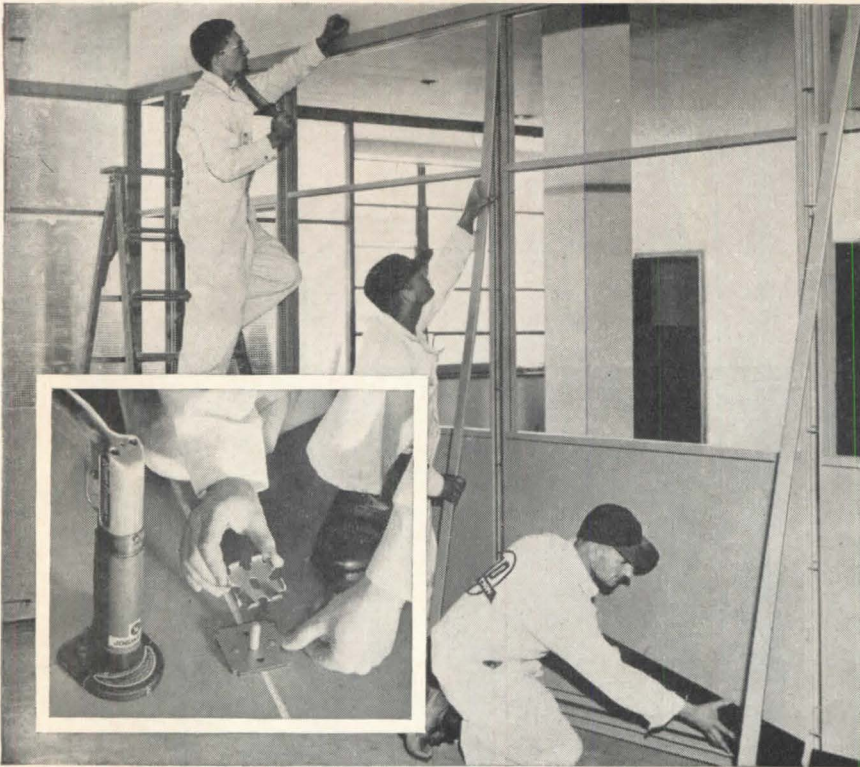
**STORAGE BATTERIES** to Last 17 Years

Storage batteries with a life of more than 17 years have been announced by *The Electric Storage Battery Company* as the result of years of research on improved battery grid alloys. The long-life batteries will have hundreds of industrial applications, including emergency lighting, switchgear control, fire alarm systems, telephone stand-by, railway signal control and other stationary power applications requiring stand-by current.

**INDUSTRIAL TELEVISION** For Conveyors

Industrial television was cited as one of the major developments in the conveyor industry by B. G. Schneider, assistant chief engineer, Chain Belt Co., at the 50th Anniversary Meeting of the Milwaukee Section of the ASME. "By industrial television, control through an operator's observation is greatly extended," he said, "and moreover it can be extended into areas of extreme heat, cold, chemical fumes, or other conditions which normally exclude the presence of an observer."

(Continued on page 246)



**"We reduce erection costs and install MOBILWALLS faster when we anchor with *Ramset*"**

That's the experience of Virginia Metal Products, Inc., of Orange, Virginia, one of the leading producers of movable steel partitions. Frequently up against a tight time schedule, they find it far quicker and less costly to use RAMSET SYSTEM than conventional methods. Just set steel studs into concrete floors, walls and ceilings, with a split-second RAMSET JOBMASTER. Slip anchors over the studs, set the partition section into place and tighten with nuts. The job is done, in less than 1 minute per anchor. Erection is finished sooner so that space can be occupied, and cost savings are passed on to the owner.

These same advantages of RAMSET speed and economy can be gained for almost any work involving fastening into steel or concrete, for new buildings or modernization. Three RAMSET JOBMASTER tools are available for light, medium or heavy work, with 65 Tru-Set Fasteners in six different types to match the specific job requirements.

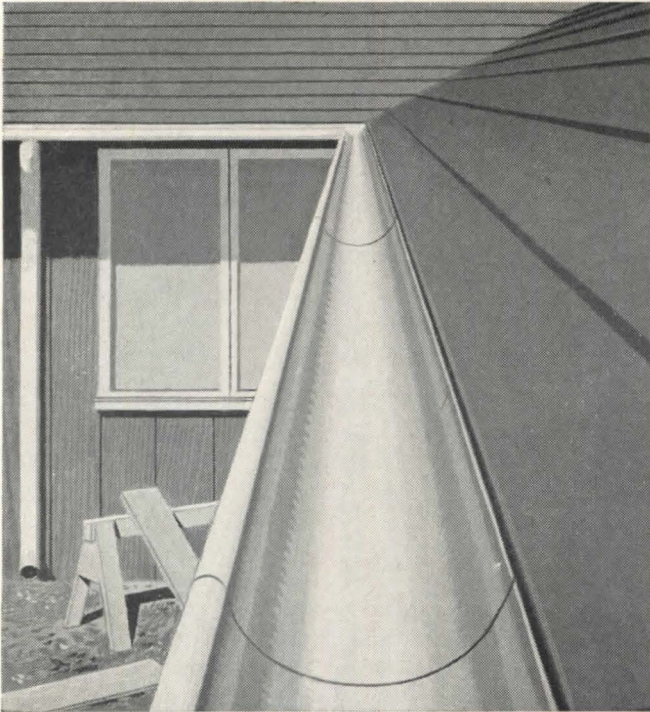
If you'd like to know more about how RAMSET saves time, money, and trouble, for fastening into steel or concrete, call your local dealer or ask for illustrated manual *Modern Fastening Methods*.

**Ramset Fasteners, Inc.** Ramset Division  
Olin Industries, Inc.  
12147 BEREA ROAD • CLEVELAND 11, OHIO

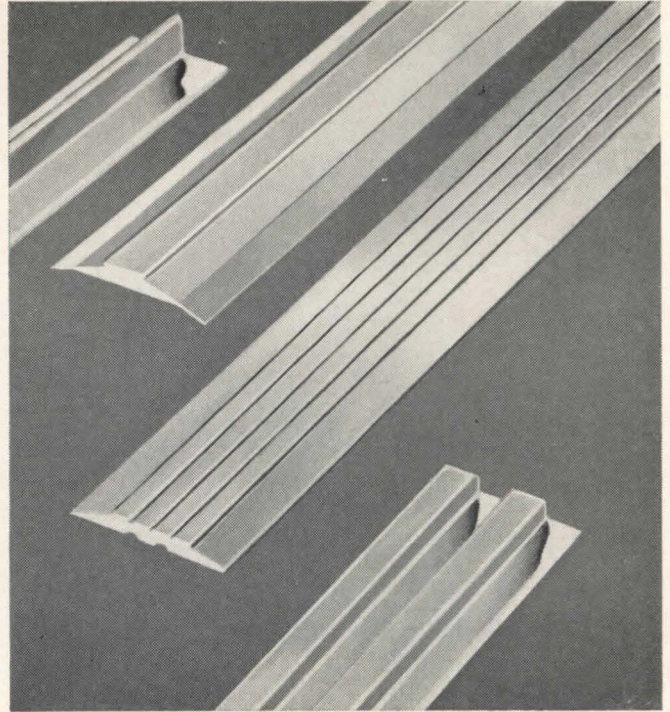
**FIRST IN POWDER ACTUATED FASTENING**



# with ALUMINUM PRODUCTS!



**Aluminum gutters and downspouts** add sales appeal because they resist corrosion and never develop ugly red rust stains. They never require protective painting. Light weight, easy to install.



**Aluminum weatherstripping** adds sales appeal because it gives weather protection for the life of the house—can never deteriorate with rust, can never corrode. Strong and flexible for tight seal.

**EVERY IMPROVEMENT** you make with aluminum products provides *extra sales appeal* for the houses you build—because aluminum offers a combination of advantages no other material can match.

Among these advantages are light weight, strength, corrosion resistance, economy, and modern beauty.

We do not make any of the products shown here, because serving manufacturers with basic aluminum is our primary business.

Due in great part to our vast expansion, there is now a plentiful supply of building products.

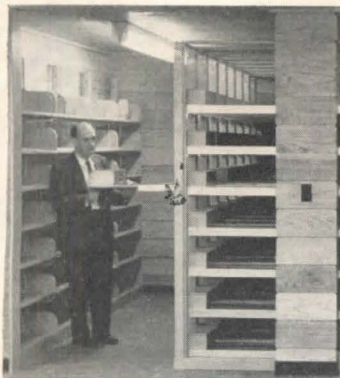
We now have the capacity to produce 30% of all the primary aluminum made in this country.

Engineering assistance on any original architectural or building idea or specification is available from our qualified aluminum engineers. Or for names of building products manufacturers who will be glad to work with you, contact any Kaiser Aluminum office listed in your telephone directory.

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General Sales Office, Palmolive Bldg., Chicago 11, Ill.; Executive Office, Kaiser Bldg., Oakland 12, California.

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Library Equipment Division

# Hamilton

MANUFACTURING COMPANY

Two Rivers, Wisconsin



(Continued from page 242)

REVIEWS | **Books and Handbooks**

*Estimating Production and Construction Costs*, by Louis Dallavia. The Dallavia Co. (2110 Elmen, Houston 19, Tex.) 1954. 8½ by 11 in.; 274 pp, illus. \$15.00.

A feature of this handbook of construction costs is the 160 tables which cover general production operations of earthwork, reinforced concrete, structural steel, masonry and rough and finish carpentry. An introduction explains the "revolutionary new method of calculating construction costs for any general construction in any place at any time."

*Structural Engineers' Handbook Library*, by George A. Hool and W. S. Kinne, revised by R. R. Zipprodt. McGraw-Hill Book Company, Inc. (330 West 42nd St., New York 36, N. Y.) 1954. 6 vols., 3763 pp, illus. \$41.00.

This engineering library has been revised to cover every phase of structural engineering, from foundation and substructure work to the erection of a concrete building. Each section has been prepared by one of 63 noted authorities in the field. The titles of each of the six volumes indicate the worth of the library:

- Foundations, Abutments and Footings.*
- Structural Members and Connections.*
- Stresses in Framed Structures.*
- Steel and Timber Structures.*
- Movable and Long-span Steel.*
- Reinforced Concrete and Masonry Structures.*

*Bibliography on Prestressed Concrete.* American Concrete Institute (18263 W. McNichols Rd., Detroit 19, Mich.) 1954. 87 pp. \$2.00.

The entire library on prestressed concrete—covering history, theory, methods, applications, etc., and including all works published here and abroad—is cataloged in this neatly arranged book. Starting with the first paper published in 1896, the bibliography lists subsequent works chronologically, with entries alphabetized by author within each year.

*AITC Timber Construction Standards.* American Institute of Timber Construction (1757 K St., N.W., Washington 6, D. C.) 1954. \$2.00.

Provides comprehensive standards covering design, fabrication and erection of engineered timber construction, and standard practices of the industry.



**SMOG** | *A Study on Its Major Causes*

*The Smog Problem in Los Angeles County* by Stanford Research Institute. Western Oil and Gas Association (510 West Sixth St., Los Angeles 14, Calif.) 1954. 134 pp, illus.

In Los Angeles, one of the most smog-visited areas in the world, research by Stanford Research Institute has indicated that conditions which affect smog incidence there include (1) topography, (2) the fact that substances responsible for smog are always present in the atmosphere, and (3) an abnormally large amount of ozone in the air to oxidize chemical materials.

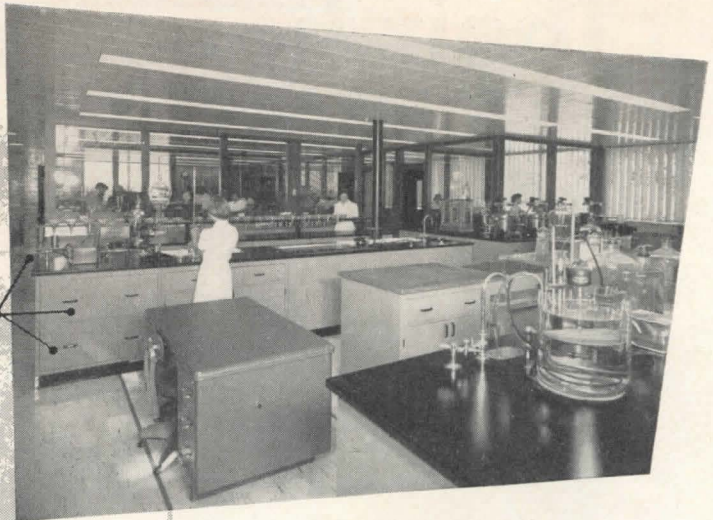
With conditions of strong sunlight, stagnant air and temperature inversion, smog develops rapidly, most often to full density in mid-morning. Chemical materials are emitted to the atmosphere in the approximate amount of 3100 tons daily. Of 1500 tons of hydrocarbons discharged daily, 1180 tons come from automobiles, 52 tons from service stations and 224 tons from gasoline production, refining and marketing. Backyard incinerators contribute nearly 400 tons of organic material each day.

The SRI research has been concentrated on the problems of eye irritation, visibility reduction and crop damage. The report is divided into two parts: "The General Picture," which concludes with a list of questions which must be answered before a solution to the smog problem is reached; and "The Scientific Story," which presents six scientific papers on the subject.

The Semi-annual Technical Conference of the Air Pollution Control Association is being held in Los Angeles from November 4 to 6.

**CLAY TILE** | *ASA to Write Standards For Thin-setting Installation*

Standard specifications for the thin-setting method of installing clay tile will be established by the American Standards Association, tile contractors were told at the Miami, Fla., convention of the Tile Contractors' Association of America. A proposed set of standards, to be used until the ASA specification is issued, has been incorporated into a *Use of Materials Bulletin*, issued by the FHA. The proposed standards include adhesives, preparation of wall surface, installation of wall tile, preparation of floors, and installation of floor tile.

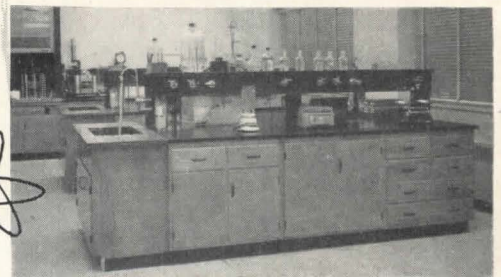


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you can name  
you can design!**



You find Hamilton laboratory installations everywhere—in high and trade schools, colleges, and throughout industry—comprising both standard equipment and highly specialized custom-built units.

With such versatile equipment available—and such extensive planning experience at your disposal, through Hamilton Engineers—you're set for any project that comes up. Call on us right at the start, won't you? There is no obligation.



Laboratory Equipment Division

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Two Rivers, Wisconsin

# Their house drew 10,000



## What made Westfield at Natick, Mass. pay off for Campanelli Bros., Inc.?

Let Mr. Nicholas Campanelli, president, tell you in his own words.

"We expected many people at our Westfield opening . . . but nothing like *this* huge crowd that descended on us! They inspected the whole house . . . but spent *most* of their time *in the kitchen*.

"It was the G-E Kitchen-Laundry that held them there. Folks were *amazed* to learn that payments for these appliances are no more than the average monthly phone bill, when included in the regular home mortgage!

"It sold many of them right on the spot . . . and *sold us for good* on G. E. We're planning 600 more houses in the next two years, and we're

relying on the G-E Kitchen-Laundry to do a lot of selling for us."

**It can work for you, too.** You can put General Electric to work just as Campanelli Bros. have done so successfully.

Install sales-appealing General Electric Kitchen-Laundry appliances in *your* homes . . . include their price in the regular home mortgage . . . and make available to the prospect these worksaving wonders at a price he can *easily* afford!

If you're not selling all you *should* . . . all you want to sell . . . why not get in touch with your G-E distributor right away! General Electric Company, Appliance Park, Louisville 1, Ky.



This is the G-E Kitchen-Laundry that delighted so many househunters on opening day. Included are the G-E Refrigerator, G-E Range, G-E Dishwasher, G-E Cabinets and G-E Automatic Washer.

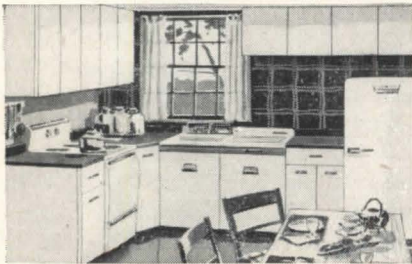


These are the Campanelli brothers (left to right: Nicholas, president; Joseph, treasurer; Alfred, vice-president; Michael, secretary). Within the past two years, Campanelli Bros., Inc. has completed 629 G-E equipped homes and has 406 under construction . . . all to be G-E equipped, as well. For *them*, G. E. pays solid dividends in faster home sales.

**on opening day!** *will yours?*

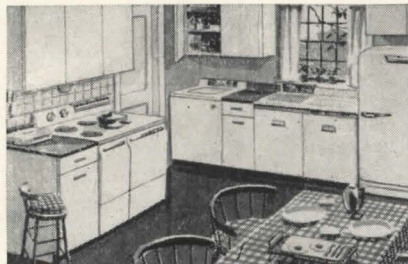


**G. E. has a Kitchen-Laundry for your homes—regardless of price range!**  
(See your G-E distributor for answers to your kitchen problems.)



**IN YOUR \$9,995 HOUSES**

Include G-E Refrigerator, G-E Range, G-E Dishwasher, G-E Disposall,® G-E Cabinets. Add as little as \$3.26 monthly to mortgage payments.



**IN YOUR \$12,500 HOUSES**

Include G-E Refrigerator, G-E Range, G-E Disposall, G-E Dishwasher, G-E Automatic Washer, G-E Cabinets. Add as little as \$5.31 monthly to payments.



**IN YOUR \$16,000 HOUSES**

Include G-E Refrigerator, G-E Range, G-E Dishwasher, G-E Disposall, G-E Automatic Washer, G-E Dryer, G-E Cabinets. Add as little as \$6.31 monthly to payments.

HOME BUREAU

**GENERAL**  **ELECTRIC**

(Continued from page 227)

**SCHOOL EQUIPMENT**

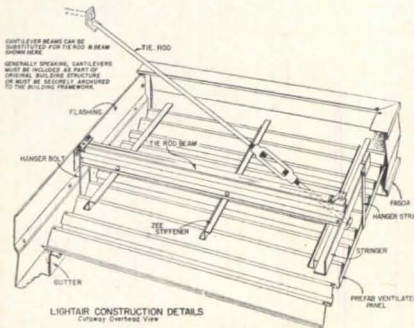
• The *Moduwall Live-wall* increases classroom flexibility by making possible changeable arrangements of classroom equipment. Natural finish hardwood standards are bolted to the wall, and chalkboards, tackboards, shelving, pegboards, teachers' closets, etc., are fastened to them by means of metal holders. The number and kind of wall hangings can be arranged in each class-

room to meet the needs of the teacher and the class, and the heights adjusted to the size of the children. *Moduwall, Inc., 175 Fifth Ave., New York 10, N. Y.*



• A *chair and desk combination* eliminates the front legs of the chair, allowing maximum leg room for the student, and provides spacious knee room by the upward slant of the bottom of the desk. The 20- by 24-in. lifting desk top is available in either natural maple or maple-grain high-pressure plastic. The light weight of the unit permits easy moving, and the four points of contact with the floor simplify cleaning of classrooms. The *Brunswick Book Box Combination* comes in five graduated sizes of 21, 23, 25, 27 and 29 in. from desk top to floor. *The Brunswick-Balke-Collender Co., 623 S. Wabash, Chicago, Ill.*

**MARQUEE**

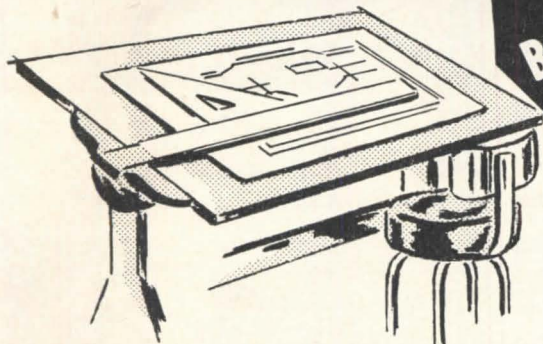


• In the *LightAir Marquee* each W-shaped leaf acts as a simple girder giving necessary strength to accept static loads up to 60 psf and winds in excess of 100 mph. Each leaf, at right angles to the building, also acts as a primary drainage channel directly to the gutter. The W shape of each leaf, with lips which overlap the next leaf, provides air circulation and protects against sun, rain and snow. The ventilated aluminum marquees, offered in 6-in. and 12-in. module leaves, can be cantilevered in almost any projection. Special fascia details are available permitting protected and concealed lighting behind outer fascia. The manufacturer has complete design details. *Shurtleff Co., 1313 L St., Lincoln, Neb.*

(Continued on page 254)



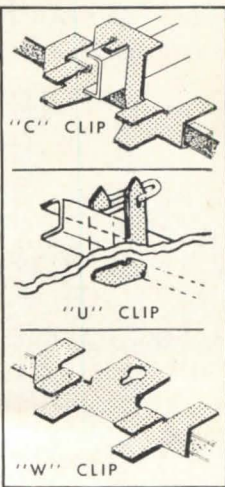
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They find, as you will, **BURSON CLIPS** speed up construction, lower installation costs, insure greater fire safety and assure lasting beauty.

The next time your plans call for acoustical tile or other types of gypsum lath suspended ceiling construction be sure you specify **BURSON CLIPS**.



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THE NEW DAY-BRITE  
LIFETIME INDUSTRIAL SERIES—  
ONLY INDUSTRIALS WITH FULL  
8-FOOT, ONE-PIECE, PORCELAIN  
ENAMELED REFLECTORS

THE LIFETIME

# CFI-10

WITH 10% UPWARD COMPONENT

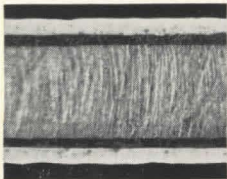
flint-hard, indestructible bond of metal and finish that is unaffected by time, heat, moisture and other harmful elements.

No baked enamel finish can assure you the non-yellowing, noncorrosive reflection surface that porcelain enamel does. There are no tiny surface pores in porcelain enamel. Any dirt or stain is external and is easily wiped away.

Because of its undisputed superiority,

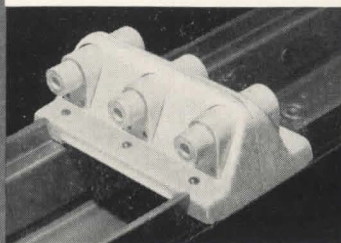
specially formulated porcelain enamel with a reflector factor of 85% or more is the one and only finish Day-Brite uses on the reflection surfaces of the CFI-25 and the CFI-10

... to make them in fact — as well as in name — a *Lifetime* industrial lighting value.

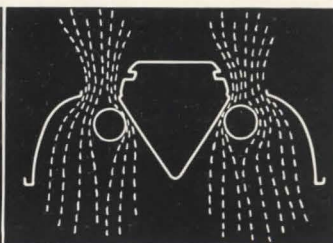


Microphoto shows how metal and porcelain enamel fuse together to form lifetime bond.

Sets a new high standard for industrial lighting fixtures! 10% uplighting reduces glare and lessens brightness contrasts. Full 8-foot, one-piece, porcelain enameled reflectors featuring new super-rigid ribbed construction. Runs line up perfectly, *stay perfect*. Available for 8 ft. Slimline, 4 ft. Rapid Start and the newly developed 8 ft. High-Output Rapid Start lamps. Engineered and built to give a *lifetime of service*.



**SPRING-LOADED SOCKETS.** Firm lamp contact, firm seating. Metal clad for positive alignment and protection against breakage. Individually replaceable.



**COOLER, CLEANER OPERATION.** Diagram demonstrates "up-draft" action through apertures. Constant flow of air keeps dust from settling, reduces operating temperature.



**FAST, SIMPLE MAINTENANCE.** Reflectors on or off in seconds, fasten to channel by hand-operated 2" wing-nuts. Porcelain enamel wipes clean quickly, is noncorrosive.

**INDUSTRY!**  
COMPLETE QUALITY STORY



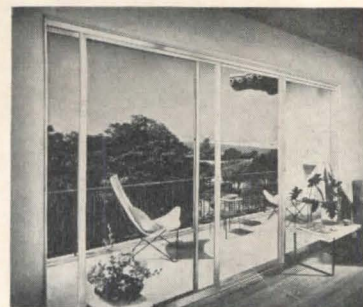
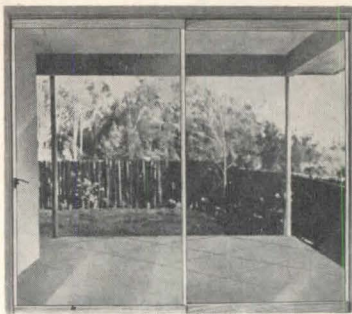
Day-Brite Lighting, Inc., 5405 Bulwer Ave., St. Louis 7, Mo. In Canada: Amalgamated Electric Corp., Ltd., Toronto 6, Ontario.

(Continued from page 250)

**SLIDING DOORS**

• A sliding glass doorwall is packaged for low-cost delivery so that the knocked-down unglazed door and frame fits into a carton 5 by 8 in. in girth with a length corresponding to the greatest dimension of the door unit. The package contains everything required for the assembled aluminum and hardwood ash door except the glass. Sizes available range from 6 ft by 6 ft 10 in. to 16 ft by 6 ft 10 in. The average unit can be

assembled and glazed by a two-man crew in about 30 min. *Horizon Door Co., 1424 Flower St., Glendale 1, Calif.*



• All-aluminum sliding glass doors are constructed of sealed, heavy-duty aluminum extrusions with corners of rigidly secured, heavy-gage fittings. An alumi-lite finish gives a smooth appearance and provides corrosion resistance even under extreme salt air conditions. *Ador Sales, Inc., 1631 Beverly Blvd., Los Angeles 26, Calif.*

• Steel frames for sliding glass doorwalls, completely weather-sealed, are available with two, three or four panels, all 6 ft 10 in. high. Known as the "Gardena" series, the new frames can be specified for either right or left venting. *Steelbill, Inc., 18001 So. Figueroa, Gardena, Calif.*

**MAGNETIC DOOR CATCH**



• A magnetic door catch that fits between cabinet door and shelf has a powerful magnet which floats on a spring to cushion the door as it closes and hold it away from the cabinet frame. The catch is engineered to eliminate slamming and to assure perfect alignment with maximum holding power. *The Stanley Works, New Britain, Conn.*

**GLASS-SEALING TAPE**

• No. 162 Elastic Compound Tape can be used to seal glass in frames and channels of steel and aluminum window sash and thermopane-type glass in refrigerated display cases. The jet-black, rubbery tape releases readily from its backing, says the manufacturer, holds its shape and will not flow out when seams are riveted or bolted. *Presslile Engineering Co., 3798 Chouveau Ave., St. Louis 10, Mo.*

(Continued on page 258)

the **KOH-I-NOOR** lead holder

with the amazing *Adapto-Clutch*

for leads of **ALL DIAMETERS!**

KOH-I-NOOR's Lead Holder with the ADAPTO-CLUTCH feature is the first in the world that takes drawing leads of all degrees in all diameters!

The ADAPTO-CLUTCH takes all leads from 9H to 6B. The ADAPTO-CLUTCH holds all degrees tightly. The ADAPTO-CLUTCH is guaranteed slip-proof against vertical pressure and turn-proof in all lead sharpeners and machines.

**THE No. 5616 HOLDER WITH THE ADAPTO-CLUTCH TAKES LEADS OF ALL DEGREES AND ALL DIAMETERS!**

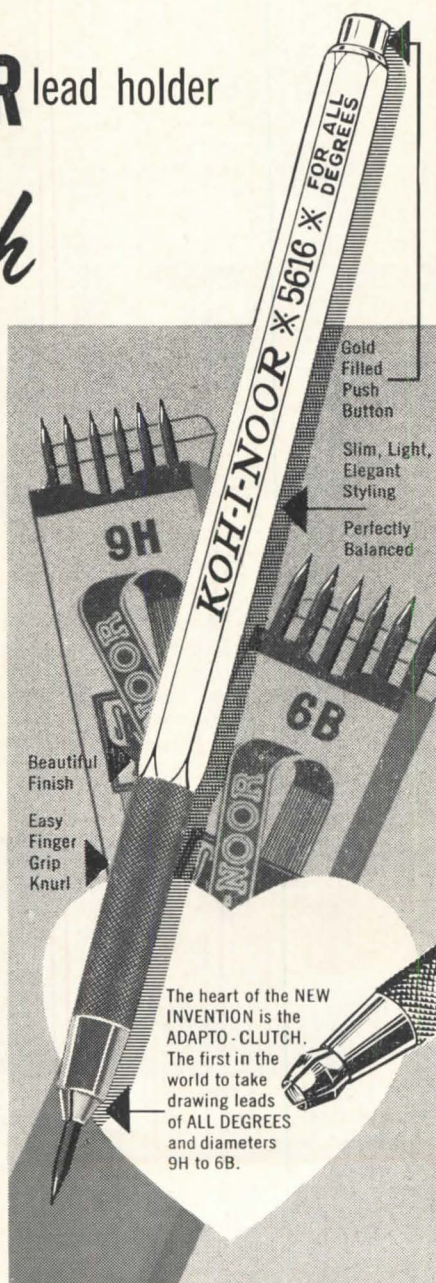
See and buy this sensational New No. 5616 holder today . .

.. **\$1.50** each  
(No Fed. excise tax)

Packed in individual Slide Boxes.

**FOR BEST RESULTS,  
ALWAYS USE KOH-I-NOOR #2200 LEADS, AVAILABLE IN 17 DEGREES.**

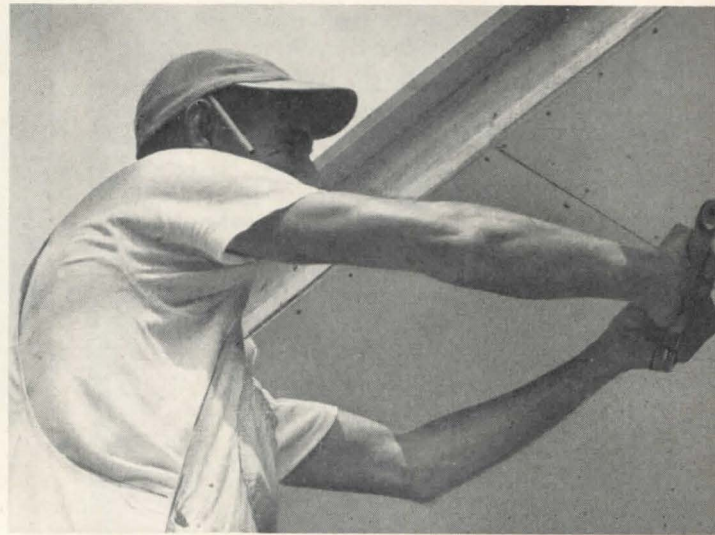
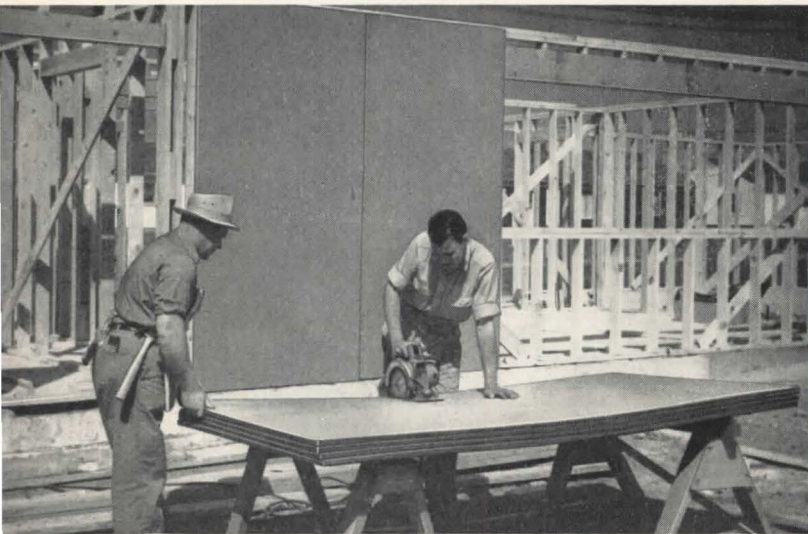
**KOH-I-NOOR PENCIL COMPANY**  
BLOOMSBURY, NEW JERSEY



# soffit and \$3330 on new 144 room motel



Holiday Inn Hotel, Oklahoma City  
Architect: Ned A. Cole, Austin, Texas  
Consulting Architects and Engineers: Hudgins,  
Thompson, Ball and Associates, Oklahoma City, Oklahoma



**1 Insulite Sheathing saved \$2000**—cut application costs \$80 per thousand square feet compared with wood on this Holiday Inn Hotel job. Two men can sheath 1,000 square feet in a half-day or less. Reduces application time as much as 43%. Insulite Sheathing has great bracing strength. Waterproofed throughout with asphalt. Eliminates need for building paper. Reduces cutting and matching loss.

**2 Primed Graylite saved \$1330 on soffits** compared with cost of plywood. Made of the same material as tough weather-resistant Bildrite, Primed Graylite is prime coated at the factory. Paint flows on easily, smoothly. Asphalt impregnated. Resists warping, buckling. No delamination problem. Available in  $\frac{1}{2}$ " and  $\frac{3}{4}$ " thickness and 4' widths. Lengths from 6' to 12' reduce waste.

See how Insulite can help keep costs down, quality up on your next job—on sidewalls, roofs, party walls, ceilings, floors, soffits, gable ends and more. Write Insulite, Minneapolis 2, Minnesota for "architect's portfolio."

INSULITE AND BILDRITE ARE REGISTERED TRADE MARKS.

Build and insulate with double-duty  
**INSULITE**

*The original structural insulation board*



INSULITE DIVISION, Minnesota and Ontario Paper Company, Minneapolis 2, Minnesota

(Continued from page 254)

**GARAGE DOOR**

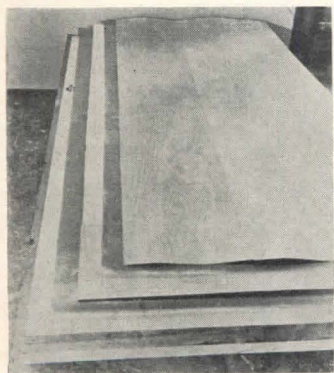
• A self-lifting overhead garage door, fabricated in leather-grain embossed aluminum, opens entirely on the inside of the garage, requiring only 6 in. of overhead space and 6 in. clearance from door to the car's rear bumper. A spiral cable drum and torsion spring facilitate opening the door. Produced in the standard 7-ft-high, 8-ft-wide size, the door is packed in a single carton. Reynolds Metal Co., 2500 So. Third St., Louisville, Ky.

**CARPORT**



• A carport that can be attached to the side of a house or stand free is also recommended by the manufacturer for use as a dining porch, breezeway or cabaña. Called *AlumaPorte*, it consists of a 20- by 10-ft roof of interlocking aluminum slats, reinforced by steel rafters and supported by steel posts. The roof is available in nine baked enamel colors, striped or solid. Orchard Brothers, Inc., 63 Meadow Rd., Rutherford, N. J.

**FIRE DOORS**

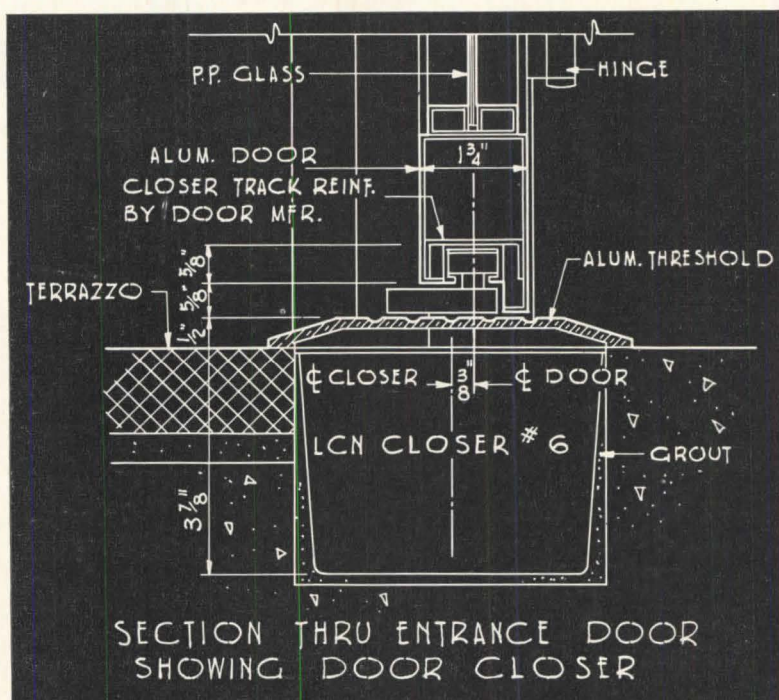


• A new mineral core material is now being used in Weldwood Fire Doors. Known as *Weldrok*, the lightweight "synthetic stone" is a low-density material of cellular construction which is incombustible, inert, dimensionally stable, provides a large measure of heat and sound insulation, has high struc-

tural strength in relation to its weight, is immune to termites, decay and fungus, and does not harm wood tools. Awarded the Underwriters' Laboratories label for B and C openings, the Weldwood Fire Door with Weldrok core is 1¾ in. thick and has maximum dimensions of 3 ft 6 in. by 7 ft. Available in a wide variety of face veneers, the door is composed on one side (from top to bottom in picture) of face veneer, phenolic resin glue film, crossbanding, phenolic resin glue film and Weldrok. U. S. Plywood Corp., 55 West 44th St., New York 36, N. Y.

• Wood-faced fire doors for home and commercial installations have been approved by Underwriters' Laboratories for use in vertical shafts as a fire barrier, giving a minimum of 1 hr fire protection. The *Roddiscraft B Label Fire Door* is faced on both sides with plywood veneer and has a core of a special non-combustible asbestos compound. The lightweight door is produced in all available wood species and in standard door sizes with widths up to 3½ ft and heights up to 7 ft. Roddis Plywood Corp., Marshfield, Wis.

(Continued on page 260)



**CONSTRUCTION DETAILS**

for LCN Floor Type Door Closer, Shown on Opposite Page

The LCN Series 2-4-6 Closer's Main Points:

1. Full rack-and-pinion, two-speed control of the door
2. Mechanism concealed; lever arm disappears under door
3. Door hung on regular butts, its weight carried independently of closer
4. Closer easily adjusted or serviced without taking door down
5. Installed with or without threshold; may be flush with threshold or with floor
6. Used with wood or metal doors and frames

Complete Catalog on Request—No Obligation  
or See Sweet's 1954, Sec. 17e/L

**LCN CLOSERS, INC., PRINCETON, ILLINOIS**



Skidmore, Owings & Merrill, Architects and Engineers

# MODERN DOOR CONTROL BY *LCN* · CLOSERS CONCEALED IN FLOOR

NEW PLANT OF SAWYER BISCUIT COMPANY DIVISION OF  
UNITED BISCUIT COMPANY OF AMERICA, MELROSE PARK, ILLINOIS

LCN CLOSERS, INC., PRINCETON, ILLINOIS

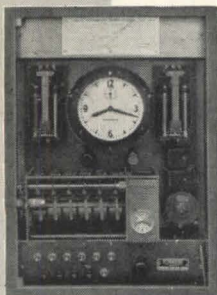
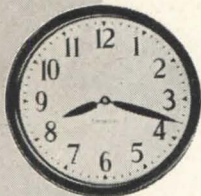
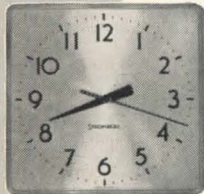
*Construction Details on Opposite Page*



when schoolbells sound

**Stromberg time**

Teachers rely on them —  
Clocks are constantly accurate —  
Student movement flows smoothly.



For new schools or to replace systems now in use, Stromberg clock and program time control has many advantages. There are several types to choose from, including:

**ELECTRONIC** — no special wiring  
**AUTOSET** — minute impulse  
**SYNCHRONOUS** — central control

The program units can accommodate multiple signals at intervals ranging from one minute to 24 hours. Each unit is automatically checked and synchronized every hour with a Master Unit. All time systems are protected against failure through a jewelled spring power reserve in the Master Unit.

**STROMBERG** . . . the most reliable time and signal equipment made, noted for its quality and dependable service for half a century. For complete details,

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**STROMBERG TIME CORPORATION**

*Subsidiary of General Time Corporation*

THOMASTON



CONNECTICUT

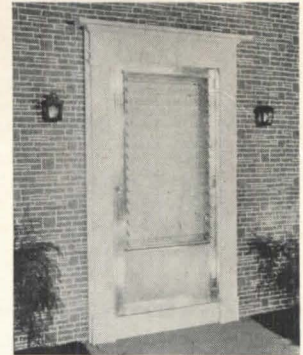
if it's time • it's Stromberg

Ask, too, about  
Fire Alarm Equipment  
Attendance Recorders  
Time Stamps

**A-E-H PRODUCTS**

(Continued from page 258)

DOORS



• The *Jalousie Storm Door*, with 4-in. louvers designed to provide weather-proof overlapping, is a full inch thick with a frame of 1-in. tubular extruded aluminum sections for added strength and rigidity. Stainless steel weather-stripping along the vertical edges of the louvers gives an added measure of protection. The aluminum screen panel, which mounts on the inside of the door, has a resting ledge which maintains the screen in true vertical alignment. *The Eagle-Picher Co., 900 American Bldg., Cincinnati 1, Ohio.*



• A *lightweight aluminum door* that has the appearance of a solid aluminum unit actually features a "sandwich" construction of an impregnated, moisture-resistant honeycomb core and hard-board reinforcing. Suitable for exterior as well as interior use, the door will be available in either butt hung or offset pivot models. The doors are offered with a solid panel or with window-lites and louvered openings. All windows are mounted with a foam vinyl to cushion the glass against slamming and jarring. *The Kawneer Co., Niles, Mich.*

(Continued on page 265)

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Allen Dean, 2-4919

FLORIDA, St. Petersburg, C. W. McIntyre, 7-5778

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Walter Garrard, Leo Sudderth...Exchange 8664

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E. J. Busch .....Museum 3-2500

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T. J. O'Brien .....8-0339

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Leo J. Freitas .....Dixon 9748

TEXAS, Corpus Christi  
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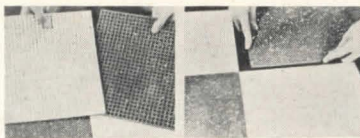
## AEH PRODUCTS

(Continued from page 260)

### NEW FLOORING

• New asphalt tile and plastic floor covering products introduced by Armstrong Cork include a Terrazzo Corlon vinyl plastic flooring in six patterns, two patterns in a Woodtone asphalt tile, 14 patterns in Service Gauge Excelon plastic asbestos tile and one new pattern in Custom Cork Tile. *Armstrong Cork Co., Lancaster, Pa.*

• *Self-Adhering Tile* is a new rubber tile which can be applied over practically any type of sub-floor, according to the manufacturer, without using any adhesive. The adhesive is applied to the tile in an even coat during manufacture and is sealed air-tight by a sheet of polyethylene plastic which is removed before installation. The tiles are available in 52 colors and styles. *Robbins Floor Products, Inc., Tusculumbia (Muscle Shoals), Ala.*



• *Vinyl floor tiles*, also by *Robbins Floor Products*, molded in 9- or 12-in. squares, have waffle-shaped undersides that conform to wood, concrete or tile surfaces without use of adhesives. The air pockets absorb sound, provide insulation and make the tile resilient. For installation the blocks are fitted tightly edge to edge in any desired pattern.

• The newest addition to the line of Amtico Permalife vinyl floor tile is *Mosaic Design*. This pattern supplements the recently announced Terrazzo Design and the plain and marbled colors already available. *American Billrite Rubber Co., Inc., Trenton 2, N. J.*

### FIREPROOFING CONCRETE FLOOR

• A new method of fireproofing a *Cofar* concrete floor consists of applying vermiculite acoustical plastic directly to the underside sheets of *Cofar*. *Cofar* is a corrugated steel sheet which serves both as a form for concrete and as reinforcement. Both Granco and the Vermiculite Institute participated in tests on the new method at the Underwriters' Laboratories. *Granco Steel Products Co., Granite City, Ill.*

(Continued on page 268)

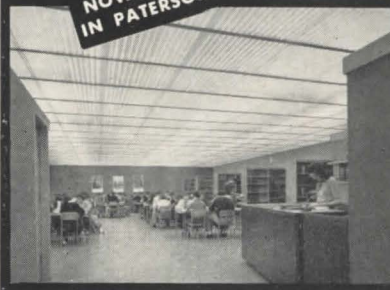
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THE ORIGINAL TRANSLUCENT FIBERGLAS PANELS

Alsynite offers unlimited design possibilities. Wherever translucent beauty is desired, use Alsynite.

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NOW OPERATING  
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**ALSYNITE** provides perfect glareless lighting in this prize-winning Seattle school.



**ALSYNITE** offers a range of 19 beautiful, permanent colors, corrugated and flat.



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Send illustrated specifications folder on Alsynite without obligation.

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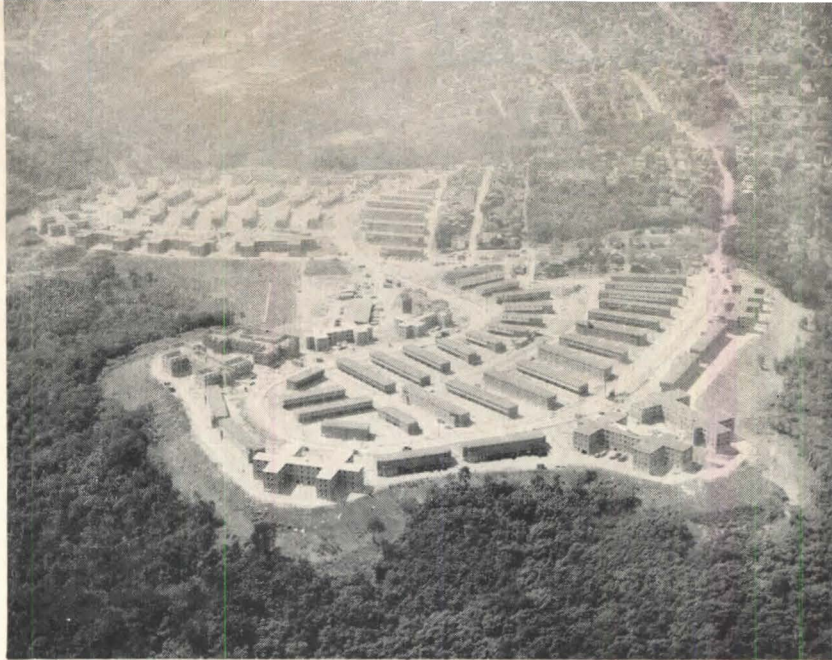
COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_



**\$5-million Bigelow Apartments**, at the top of Pittsburgh's famed Golden Triangle tower 20 stories, contain 465 units all air conditioned. Steeltex Floor Lath provides reinforcement for all floors. Arthur E. Tennyson, Architect. Martin C. Knabe, Structural Engineer. Behrman & Passel, Contractors.



**\$13-million low rent public housing project**, St. Clair Village, 79 buildings, 723 units in 3-story buildings, 366 units in 2-story row houses. Concrete floors poured over Steeltex. Marks, Fisher & Simboli, Architects. George Levinson, Design Engineer. Ragnar Benson, Inc., Contractors.

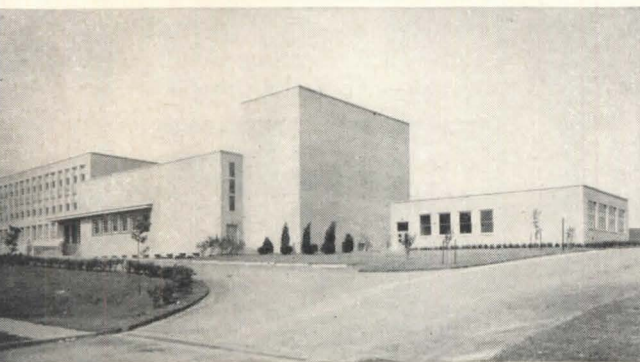
## Why building designers in for reinforcing concrete

Pittsburgh, City of Vision, is one of the most progressive cities in America today. Once dirty and smoky and threatened constantly with floods, Pittsburgh, now undergoing a renaissance, is one of the country's cleanest cities.

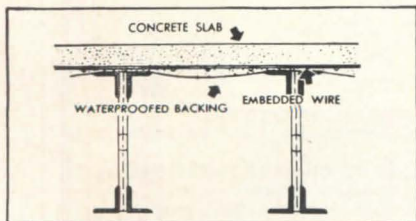
A vast network of dams in the headwaters of the Allegheny and Monongahela make damaging floods virtually impossible. A stream purification program is well under way. A new \$5-million-per-mile east-west parkway, partially completed and in use, will speed traffic through the city's heart without cross streets or traffic lights. New skyscrapers, new research centers, new industrial plants, new parks, new off-street parking garages have brought about a boom in new apartments and public housing, new schools and hospitals, new shopping centers.

When buildings of this type are being designed, poured concrete decks are most desirable and when you pour concrete, it is only natural to specify Steeltex Floor Lath, the galvanized steel wire reinforcing which carries its form on its back (see cross section below left).

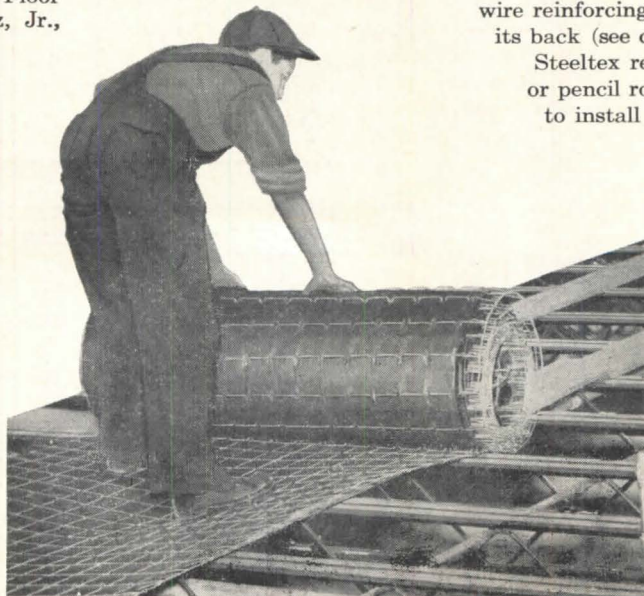
Steeltex requires no additional form or pencil rod reinforcing. It costs less to install than other types of forms



**New 3-story addition to Shaler Township High School** added 20 classrooms, upped accommodations from 750 to 1400 students, cost \$1.35 million, has gym, auditorium, three shops, offices and locker. Steeltex Floor Lath on all floors. Charles M. & Edward Stotz, Jr., Architects. Geo. H. Chilli, Contractor.



**NOTE:** In the cross section the weight of the wet concrete forces the backing away, which permits the galvanized steel mesh to assume its proper position in the slab. Steeltex floor lath also performs two other functions: It permits work on the floor below while pouring is in progress and retains moisture to assist proper curing.



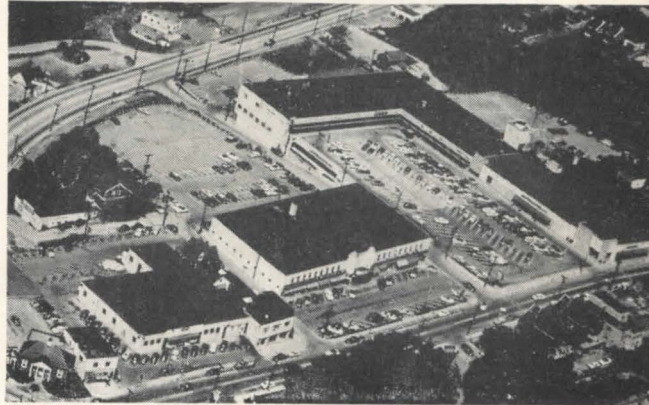
**One man can roll out a 125' roll of Steeltex in a few minutes. Steeltex provides both waterproof form and steel reinforcement for concrete floors, roofs.**



The \$3.5-million nurses home at University of Pittsburgh towers 14 stories, completely air conditioned, contains library, recreation room, reception rooms, cafeteria seating 400—comfortable living quarters for 600. Steeltex in upper floors. Ingham, Boyd & Pratt, Architects. Trimble Company, Contractors.



St. Clair Hospital, Mt. Lebanon Township, Pa., serving the growing South Hills area has 116 beds—cost \$1.34 million. Steeltex used in floors. Kuhn & Newcomer, Architects. R. A. Zern, Structural Engineer. H. Busse, Contractor.



Brentwood-Whitehall Shopping Center built on two levels has 25 shops in 210,000 square feet—80% are air conditioned—parks 1,000 cars. All floors reinforced with Steeltex. Forsyth & Blezard, Architects. Leland Cook, Structural Engineer. Landau Bros., Contractors.

## Pittsburgh specify STEELTEX<sup>®</sup> floors and roofs

and reinforcement for concrete because Steeltex can be rolled out like a carpet, stretched with a special tool, and clipped tightly in place by one man (see photo below left).

Steeltex with its waterproofed backing also prevents waste of concrete by reducing leakage to a minimum from the freshly poured slab—craftsmen can continue working on the floor below without getting splattered. Expensive clean-up time is eliminated.

Steeltex insures a strong floor because embedment of steel reinforcing takes place automatically (see note below left). Steeltex allows concrete to cure slowly, properly—guards against excessive cracking—can be installed over any type of joist—will support ample safe loads from 109 to 886 lbs. per square foot depending on spacing of joists and thickness of slab. No wonder Steeltex has been the choice of architects, engineers, contractors, and building owners alike, not only in Pittsburgh but wherever concrete slabs are poured over joists.

If your building plans call for poured concrete floors, roofs, plaster walls or ceilings, masonry veneer or Portland cement (Stucco) exteriors, there's a type of Steeltex reinforcing that will do the job better, faster, with less effort at lower overall cost.

For complete details see the Steeltex catalog in Sweet's or write for your free copy of a new 24-page illustrated booklet "Pittsburgh Steeltex. Backbone of Concrete, Plaster, Mortar." It's yours for the asking.



Mammoth decks in this fabulous \$10-million terminal building at \$42-million Greater Pittsburgh Airport, were poured on Steeltex Floor Lath. Last year 2.5-million people including travelers spent \$20 million at ticket counters, restaurants, nightclub, theater, hotel and shops. Joseph Hoover, Architect. Leland Cook, Structural Engineer. Dick Construction Co., Contractors.

# STEELTEX<sup>®</sup>

manufactured by the

## Pittsburgh Steel Products Company

a subsidiary of Pittsburgh Steel Company

Pittsburgh 30, Pa.

### Here are other recent buildings in Pittsburgh and vicinity using Steeltex:

- Amberson Gardens
- Bedford Dwellings
- Center-Negley Apartments
- Greentree Apartments
- Hebron Grade School
- Kennilworth Apartments
- Pennsylvania College for Women (Administration Building)
- Shadyside Presbyterian Church (Chapel)
- St. Augustine's High School
- Talbot Towers (Housing Project)
- Union Railroad (Office Building)
- Westinghouse Educational School
- Westinghouse Electric Corporation (Atomic Project Buildings)

# This Window STOPS WIND

Testing Laboratories report extruded aluminum Fleetlite most airtight of all operating windows.

# DUST

Mohair weatherstripping and snug interlocking double sash seal out dust.

# NOISE

Double windows protect hospitals, dormitories, offices, hotels and other buildings from outside noise.

# HEAT

Air space between outside and inside sash insulates against heat, makes air conditioning practical.

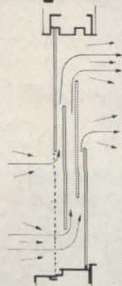
# COLD

Complete weatherstripping and double sash blocks cold, saves fuel costs.

## Yet Opens Instantly - Easily

All Sashes are cleaned from the inside.  
No Maintenance, Nothing to Store.

Sash adjustable for indirect screened ventilation



- Lists and data on major installations  
1. Hospitals 2. Dormitories 3. Hotels 4. Offices
- Chart of Standard Window Sizes
- Typical Installation Details
- Samples of Extrusions

Gentlemen: Please rush the material checked above.

Name.....  
Address.....  
City.....



FLEET OF AMERICA, INC., 407 Dun Building, Buffalo 2, New York

(Continued from page 265)

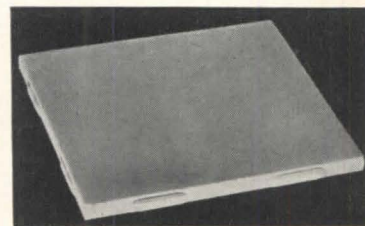
### PLASTIC-COATED HARDBOARD

• A prefinished, plastic-coated hardboard wall panel is produced in tile patterns, solid tones and selected wood grains 16 in. square and 1/8 in. thick. The Barclay Square is precision-grooved on all four sides and is applied with a specially designed metal lock strip, which is invisible after the panels have been linked. The squares are packaged 18 to a package weighing less than 28 lb, in order to guard against damage. Barclay Mfg. Co., Inc., 385 Gerard Ave., New York, N. Y.

### WALL AND CEILING TILE



• Decorative wall and ceiling tiles have full 28-gage steel bases finished in non-tarnish 24-karat gold plate, natural and antique copper, bronze, brass and high-gloss chrome, all of which are highly burnished, then coated with a tarnish-resistant baked clear enamel. Standard basic tile sizes are 4 1/4, 6 and 8 1/2 in. The installed tile has a thickness from wall of 3/32 in. and weighs about 1 psf. Roselle Tile Co., 3411 Stone Way, Seattle 3, Wash.



• Self-spaced ceramic tile ensures perfect uniformity in tile installation. Two small projections, called "lugs," which extend exactly 1/32 in. from each of the four edges of the 4 1/4-in. tile, guarantee neater installation with uniform 1/16-in. grout lines when adjoining tiles are placed together. Royal Tile Mfg. Co., Fort Worth, Tex.

(Continued on page 272)

there's a **VIKING** man  
ready to serve you  
as close to you  
as your telephone

**ATLANTA, GA.**

Crawford and Slaten Co.,  
Mr. J. Cousart

**BOSTON, MASS.**

Viking Automatic Sprinkler Co.,  
Mr. J. M. Cashman

**BUFFALO, N. Y.**

Viking Automatic Sprinklers, Inc.,  
Mr. H. B. Kirkman

**CHICAGO, ILL.**

Viking Automatic Sprinkler Co.,  
Mr. H. F. Grenning, Mr. C. W.  
Hauth, Mr. H. Hartel

**CINCINNATI, OHIO**

Viking Sprinkler Co.,  
Mr. W. H. Bihlman

**CLEVELAND, OHIO**

Viking Sprinkler Co.,  
Mr. O. H. Gellhaus

**DALLAS, TEXAS**

Texas Automatic Sprinkler Co.,  
Mr. J. E. Bush,  
Mr. Rainey Westberry

**DENVER, COLORADO**

Walton Viking Co.,  
Mr. B. W. Young

**DETROIT, MICH.**

Viking Sprinkler Co.,  
Mr. W. I. MacGinnis

**GRAND RAPIDS, MICH.**

Viking Sprinkler Co.  
of Western Mich., Mr. G. C. Hansen

**HASTINGS, MICHIGAN**

The Viking Corporation,  
Mr. J. W. Radford,  
Mr. Frank A. Rider

**HIGH POINT, N. C.**

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Mr. G. T. Gregory

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**HUNTINGTON, W. VA.**

C. W. Hutchinson, Inc.,  
Mr. C. W. Hutchinson

**INDIANAPOLIS, IND.**

Viking Sprinkler Co.,  
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Mr. T. J. Kainz

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**LOS ANGELES, CALIF.**

California Viking Sprinkler Co.,  
Mr. R. L. Thorsdale, Jr.

**LOUISVILLE, KY.**

Viking Sprinkler Co.,  
Mr. P. A. Stevens

**MEMPHIS, TENNESSEE**

Texas Automatic Sprinkler Co.,  
Mr. F. E. Westberry

**NEW ORLEANS, LA.**

Texas Automatic Sprinkler Co.,  
Mr. L. E. Edwards

**NEW YORK, N. Y.**

Viking Sprinkler Co.,  
Mr. G. B. Higgins

**N. LITTLE ROCK, ARKANSAS**

Texas Automatic Sprinkler Co.,  
Mr. L. D. McCraw

**OKLAHOMA CITY, OKLA.**

Texas Automatic Sprinkler Co.,  
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**OMAHA, NEB.**

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Mr. J. H. Keelan, Jr.

**PORTLAND, OREGON**

Viking Automatic Sprinkler Co.,  
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**SAN FRANCISCO, CALIF.**

California Viking Sprinkler Co.,  
Mr. R. C. Pinkham

**SEATTLE, WASHINGTON**

Viking Automatic Sprinkler Co.,  
Mr. R. L. Thorsdale,  
Mr. L. R. Carlson

**TORONTO, ONTARIO**

Viking Automatic Sprinklers  
(Canada) Ltd., Mr. R. G. Wallace

**TULSA, OKLAHOMA**

Texas Automatic Sprinkler Co.,  
Mr. D. W. Smith

**VANCOUVER, B. C.**

Viking Automatic Sprinkler Co.,  
Mr. H. McDonald

**WASHINGTON, D. C.**

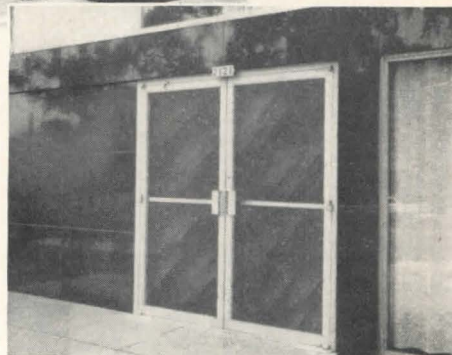
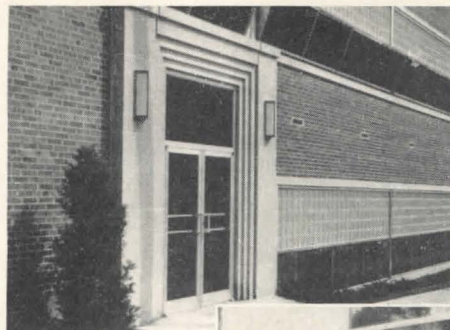
Viking Sprinkler Co.,  
Mr. T. F. Smith

add that extra

Beauty  
with...



ALUMINUM  
ENTRANCES!



- STRIKING APPEARANCE
- PRECISION BUILT
- SIMPLY DESIGNED
- STURDY CONSTRUCTION
- ALUMINATED FINISH

Custom or stock design, MARMET extruded aluminum narrowline doors are not only striking in appearance, but are clean-cut design permitting great structural strength without bulk, providing maximum light or glass area. In their construction only the finest extruded aluminum is used: alloy 6063-T5 (63S-T5).

Component parts such as rods, screws and nuts are made of complimentary materials, machine cut and fit for accuracy and tightness, snap on glazing bead—no exposed screws, weatherstripping and adjustable astragal. Complete installation hardware is included.

Write for complete catalog 55-1



**SAVE  
SPACE...**



**dispense  
and dispose**

**in one  
recessed  
unit**

**specify  
Scott-  
designed  
fixtures**

Saving space is an important element in washroom design. Modern, functional, Scott-designed Fixtures help eliminate traffic-jams—make for cleaner, easier maintenance.

A full-color booklet on functional washroom design and planning is now available. For your free copy, mail this coupon today.

**SCOTTISSUE<sup>®</sup>**  
**TOWELS**  
Symbol of  
the right kind  
of washroom



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Dept. AR-9, Chester, Pa.

Please send me your full color booklet.

Name \_\_\_\_\_

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Company \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

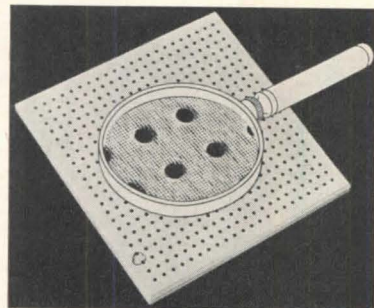
**A-E PRODUCTS**

(Continued from page 268)

#### INSULATED CEILINGS

• *Steel-Pride suspended thermal-insulated ceilings* are formed by suspending a supporting grid system of inverted interlocking T-shaped sections either from structural members of a new construction or from an already existing ceiling and then resting prepainted steel panels and  $\frac{3}{4}$ -in.-thick bats of fiberglass insulation on the flanges of the grid bays. *Steel Service Mfg. Co., Steubenville, Ohio.*

#### ACOUSTICAL TILE



• A *linen-finish drilled wood-fiber acoustical tile* has a finely knurled texture that gives the appearance of a woven fabric, reflects light without showing dull spots or high-glare areas, and can be repainted without danger of affecting a ceiling's acoustical efficiency. *Linen-finish Acoustifibre* is available in standard 12- by 12-in., 12- by 24-in. and 24- by 24-in. sizes,  $\frac{1}{2}$ ,  $\frac{5}{8}$  and  $\frac{3}{4}$  in. thick. *National Gypsum Co., 325 Delaware Ave., Buffalo 2, N. Y.*

• *Colored fiber acoustical tile* comes in four blends, with the bevels as well as the tile colored to create a monolithic effect. Repeated washing or painting has no effect on the sound-conditioning efficiency of the material. *Vari-tex* cane fiber tile is produced in thicknesses of  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$  and 1 in., in sizes of 12 by 12 in. and 12 by 24 in. *The Celotex Corp., 120 So. LaSalle St., Chicago 3, Ill.*

#### ACOUSTICAL TILE MASTIC

• *Accu-mastic*, developed for the installation of acoustical tile, is reported to form a strong, permanent bond in a few days yet remain soft and pliable enough so that stresses can move the tile a fraction of an inch without rupturing the bond. It is claimed that this flexibility is retained even near heating ducts and pipes. The product is offered in 5-gal. kits and 1-gal. cans. *Dicks-Pontius Co., Dayton, Ohio.*

(Continued on page 276)





Smart flooring for  
your practical clients . . .

## **MATICO ARISTOFLEX**

low-cost vinyl-plastic  
tile flooring

Smart clients are usually practical . . . that's why they like MATICO ARISTOFLEX vinyl-plastic tile... the flooring that's both smart and practical. Available in low-cost standard gauge, as well as 1/8" thicknesses, Aristoflex is ideal for almost every type of installation. Vinyl-plastic throughout (no felt backing), it can be used on, above, or below grade... it resists acid, alkali, petroleum and grease . . . is easy to maintain . . . and comes in 12 clear, bright colors. Yes, when next you specify tile flooring be sure to consider luxurious, long-lasting MATICO Aristoflex!

Write Department 8-11 for full details and specification data today.



**MASTIC TILE CORPORATION OF AMERICA**

Joliet, Ill • Long Beach, Calif. • Newburgh, N. Y.

Manufacturers of Aristoflex • Confetti • Parquetry • Asphalt Tile • Cork Tile • Plastic Wall Tile

(Continued from page 272)

**HARDWOOD PANELS**

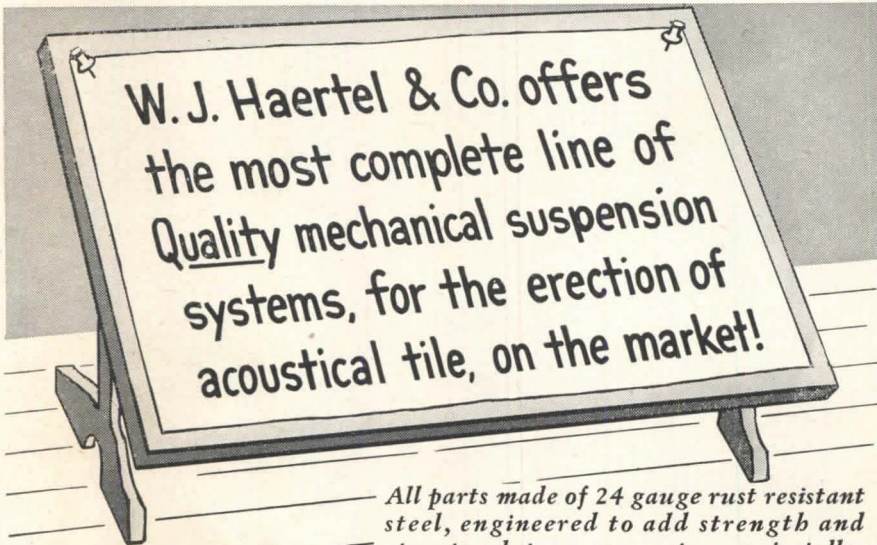
• *Temper-Treated Forest Board* panels are claimed to be extremely durable for both indoor and outdoor applications and to need no prime coat. Made of Douglas Fir fiber pressed into 4-ft panels up to 16 ft long, the hardboard is available in thicknesses of 1/8, 3/16 and 1/4 in. *Forest Fiber Products Co., Forest Grove, Ore.*

**PLYWOOD SHEATHING**

• A *plywood sheathing* guaranteed for the life of any house is made possible by the development of a new formula phenol-formaldehyde glue which has water, weather and mold resistance. *Lifetime Sheathing* has sealed edges which completely enclose the panel at its most vulnerable points. Available in 4- by 8-ft panels ranging in thickness from 5/16 to 3/4 in., the sheathing comes in packages strapped for easy handling. *Georgia-Pacific Plywood Co., 270 Park Ave., New York, N. Y.*

**ACOUSTICAL FORM BOARD**

• *Acoustical Form Board* performs four functions in the roof and ceiling structure: it serves as a permanent roof deck form, as an incombustible interior ceiling and as an acoustical ceiling and also provides roof insulation. The lightweight, porous board can be installed by the standard poured-in-place methods using bulb tees and reinforcing mesh with gypsum concrete. It has a noise reduction coefficient of 0.75 and is available in sizes of 32 by 48 by 1/2, 1 and 2 in. and 24 in. by purlin spacings up to 96 in. *Owens-Corning Fiberglas Corp., Toledo 1, Ohio.*

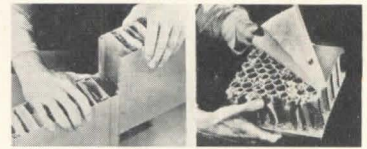


*All parts made of 24 gauge rust resistant steel, engineered to add strength and structural permanence to any installation, producing a true and level ceiling.*



**SECURITEE SYSTEMS** our top quality line. The most flexible system on the market. Comes in three types, standard, 3/4 or 1 1/2.

**BUILDING PANELS**

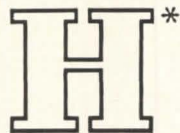


• *Prefabricated building panels* made of honeycomb cores of kraft impregnated with Bakelite phenolic resins sandwiched between thin aluminum sheet facings are strong, lightweight and moisture-proof, according to the manufacturer. The honeycomb core also provides insulation and resistance to outside temperature. Panels are available in natural aluminum which may be painted, and also in baked enamel in a wide selection of colors. A typical roof panel 3 in. thick measures 4 ft by 4 ft and weighs 75 lb. *Modern Metal Craftsmen, Inc., 2000 N.E. 146 St., No. Miami, Fla.*

**NEW**



**JACKSON SYSTEM** in two styles—for acoustical tile cemented to plasterboard or for erection of perforated asbestos board.

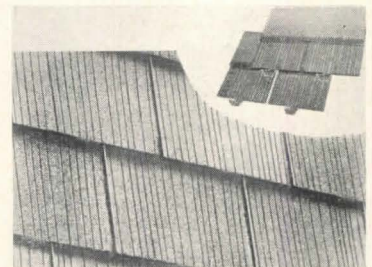


**H SYSTEMS** in three types, allowing installation on 2', 3', or 4' centers. With 1/2", 5/8" and 3/4" transverse tee sections.



**SECURITEE LINE SYSTEMS** our latest addition. In two styles, concealed or exposed. We have literature in process. Write for an early mailing.

**INTERLOCKING SHINGLE**



• An *interlocking, asphalt strip shingle*, reportedly highly wind-resistant, is called *Lok-Tab* because it is "locked" to the roof. A center butt lock allows the corners of each tab to lift enough to form a channel through which high winds can flow off harmlessly, but not enough to allow blasts to rip off the roofing. The shingles are 24 by 18 in., with a 2-in. headlap and an 8-in. exposure. *The Ruberoid Co., 500 Fifth Ave., New York 36, N. Y.*

(Continued on page 280)

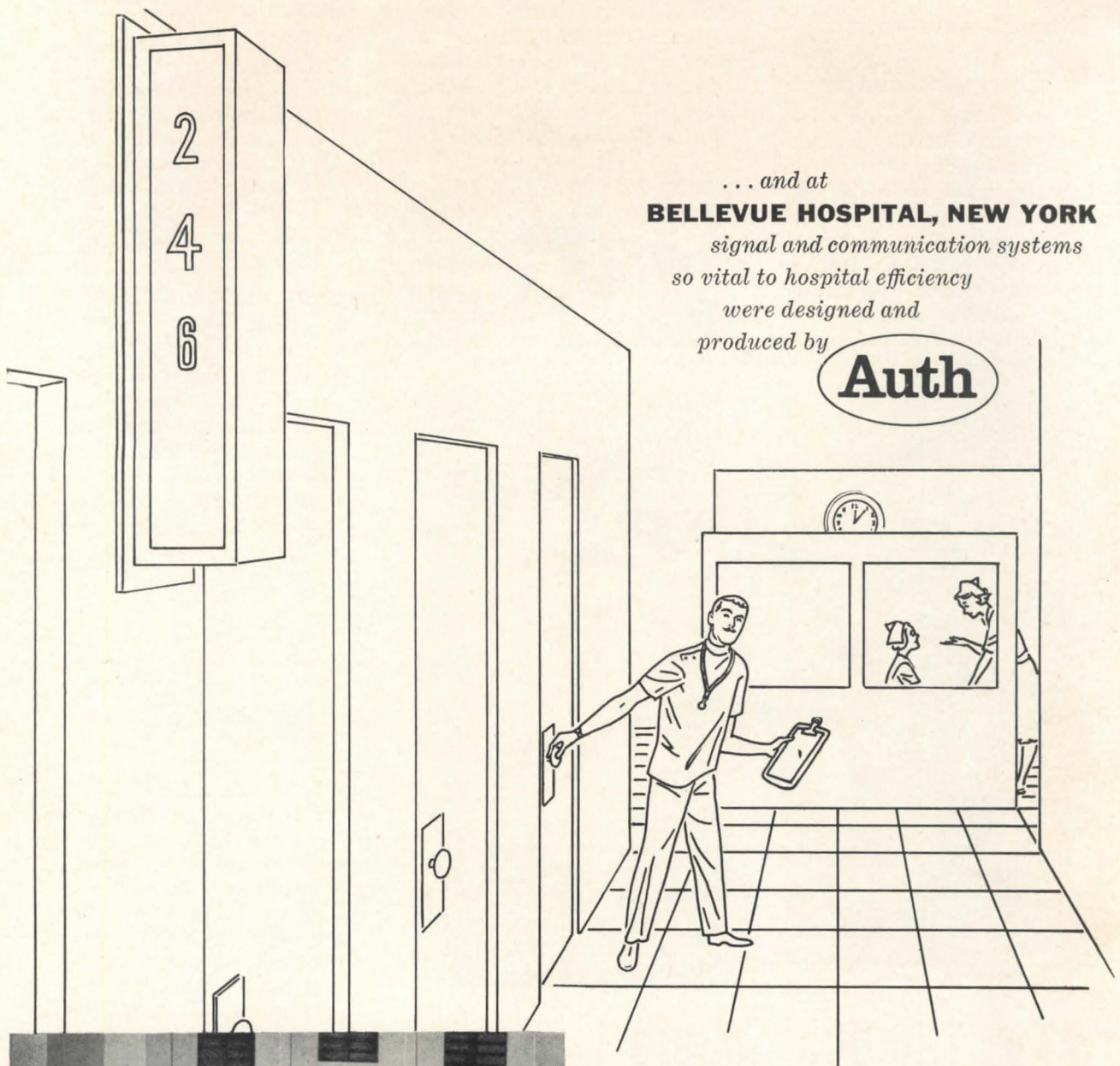
\*T.M. REG  
U. S. PAT  
OFF

**W. J. HAERTEL & CO.**

832 W. Eastman St.,  
Chicago 22, Ill.

Please send me, without obligation, technical literature on each of the above systems.

Name \_\_\_\_\_  
 Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



... and at  
**BELLEVUE HOSPITAL, NEW YORK**  
 signal and communication systems  
 so vital to hospital efficiency  
 were designed and  
 produced by



At Bellevue the Auth flashing annunciator type Doctors' Paging System locates doctors quickly and soundlessly. This Auth system eases the work of busy switchboard operators, by freeing them from time-consuming loudspeaker paging. Once the call is activated, the operator can forget it until the doctor answers. For literature, write to *Auth Electric Company, Inc.* Long Island City 1, New York.



TIME and COMMUNICATION

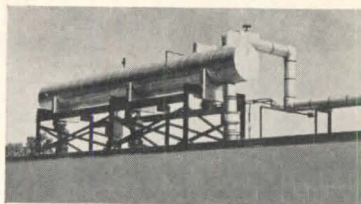
SYSTEMS

(Continued from page 276)

**SHEET ALUMINUM JACKETING**

• Protection for insulated pipelines and equipment both inside the plant and outdoors is provided by a sheet aluminum jacketing called *Al-Cor-Jac*. Corrugated for strength, expansion and contraction, the material is vapor-, weather-, vermin- and fireproof. When used over 85 per cent magnesia, or where wet conditions exist, a vapor-proof barrier is included. Jacketing is

available in two forms: with vapor barrier, in rolls 100 ft long by 48 in. wide; and without barrier, in rolls 200 ft long by 48 in. wide. *Aljon Manufacturing Co., Inc., Chestnut St. and Highland Pkwy., Roselle, N. J.*



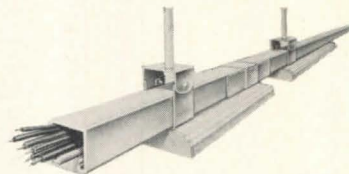
**STEEL SWIMMING POOL**

• All-steel swimming pools in a range of four sizes — from 33 by 16 ft to 105 by 35 ft — are now being produced by U. S. Steel Corp. Fabricated and installed by the American Bridge Division's engineers, the leak- and seep-proof pools have bottom and side plates like bridge girders. *U. S. Steel Corp., Pittsburgh, Pa.*

**GALVANIZING PROCESS**

• *Galvicon*, applied by brush or spray method, offers a new approach for protecting iron and steel surfaces from corrosion. It combines with the base metal, creating an electrochemical union and thus offering true cathodic protection. It is available in 1/2-pint, 1-qt, 1-gal and 2-gal cans. *Galvicon Corp., 40 W. 29th St., New York 1, N. Y.*

**CHANNELS FOR WIRING**



• *Unistrut channel and fittings* have been approved by Underwriters' Laboratories for wiring lighting installations and for supplementary power wiring of machines, hand tools, motors and other lighting rows. Wires are laid in the channel and a simple closer strip snapped in place to close the channel slot. Fixtures can be attached at any point to provide spaced or continuous installations. Supplementary lines can be tapped from the channel for other uses. *Unistrut Products Co., 1013 W. Washington Bld., Chicago 7, Ill.*

**RUBBER FOR ROADS**

• *Surfa-Sealz Pellets*, synthetic rubber pellets about the size of pencil erasers, can be tossed into a mixing mill at an asphalt plant and break down in 60 sec, spreading rubber evenly through the mix. The manufacturers forecast that the pellets will break the bottleneck that has prevented the widespread use of rubber roads. The previous high costs of shipping pre-mixed asphalt and rubber will be lowered by the transportation possibilities offered by the pellets, which can be shipped in bags or drums and stored at the asphalt plant. *Naugatuck Chemical Div., U. S. Rubber Co., Naugatuck, Conn.*

(Continued on page 284)



**SCRUGGS-VANDERVOORT-BARNEY SERVICE BUILDING**  
St. Louis, Mo.

Contractor:  
Frazier-Davis Construction Co.,  
St. Louis  
Engineers:  
Abbott, Merkt & Co., New York

**126,000 Square Ft.**  
**...spanned with**  
**LACLEDE STEEL JOISTS**

Framing large areas presents no problem with these lightweight, open-web joists. Here, for example, is the 126,000-square-foot Service Building for Scruggs-Vandervoort-Barney, one of St. Louis' leading department stores. Scheduled for completion in early fall, this is one of many buildings throughout the nation erected with Laclede Straight Chord Steel Joists—the choice of more and more contractors for fast, economical construction.

**OTHER LACLEDE PRODUCTS**

Multi-Rib Reinforcing Bars • Steel Pipe • Welded Wire Fabric Form and Tie Wire • Spirals • Conduit • Corrugated Steel Centering • Electrical Weld and Gas Weld Tubing



**LACLEDE STEEL COMPANY**  
St. Louis, Mo.

Norman Oklahoma High School, winner of the First Honor Award, 86th Annual Convention of the A.I.A. (1954). Associated architects: Caudill, Rowlett, Scott & Associates; Perkins & Will. First presented to architects and engineers in Architectural Record.

Photographer: Hedrich-Blessing.

**F**ive hundred and twenty dollars pays for one page of advertising in Architectural Record at the 12-time rate *and* delivery of facts on your products to those architects and engineers *verifiably* responsible for planning over \$1 billion of building monthly at current rates of construction.

Contract award figures as reported by F. W. Dodge Corporation, publishers of *Architectural Record*, point to an unprecedented \$14.9 billions of architect-engineer-planned work in 1954 — not counting public works, utilities and farm building.

Based on periodic statewide checks of Dodge Reports against Architectural Record's own subscriber galleys over 85% (\$12.6 billions) of this huge building volume is coming from the boards of the Record's own architect and engineer subscribers.\*

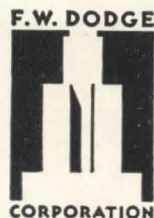
This low-cost coverage of building planning activity—*documented by Dodge Reports*—is one reason why more advertisers—again in 1954—are placing more pages of advertising in Architectural Record than in any other architectural magazine (47% more than in Magazine A—61% more than in Magazine B).

Here are two more reasons why year after year more advertisers place more pages of advertising in Architectural Record than in any other architectural magazine:

**1. Editorial Quality**—Architectural Record, winner of 31 awards for editorial excellence, is edited specifically for architects and engineers—covers nonresidential and residential buildings, large and small, that constitute the practice of architects and engineers—times and balances its editorial content with the aid of Dodge Reports to be of constant maximum value to architects and engineers in terms of the work on their boards.

**2. Reader Preference**—Architects and engineers have steadily voted Architectural Record their preferred magazine in 60 out of 67 readership studies SPONSORED BY BUILDING PRODUCT MANUFACTURERS AND ADVERTISING AGENCIES.

*\*Ask us for recent statewide checks showing the percentage of the total dollar volume of each major type of building that is verifiably planned by Architectural Record's own architect and engineer subscribers.*



**Architectural  
Record** "Workbook of the  
active architect  
and engineer"

119 West 40th Street  
New York 18, N. Y.

(Continued from page 280)

**PEG-BOARD WALL FASTENERS**

• An anchor kit for attaching *Masonite Peg-Board* panels to concrete, brick or any other smooth wall surface contains 10 anchors, 10 bolts and a can of adhesive, sufficient for attaching a panel up to 4 by 4 ft. No special tools are required. Surfaces to which the anchors adhere include Presdwood, plaster or gypsum wallboard. *Masonite Corp., 111 W. Washington St., Chicago 2, Ill.*

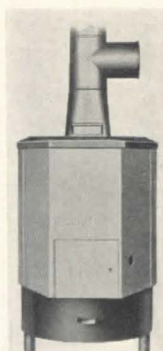
**RELAY PANEL**

• A special *ASCO relay panel* has been designed for use in cooking schools, restaurants, institutions, etc., where gas-fired equipment is used, to shut off automatically the flow of gas to ovens, broilers, etc., should electrical power fail or drop below a minimum voltage level. Thus, in the event of voltage failure, gas burners will not be left on. Once power is restored, gas service can be reactivated by a key-operated contact. *Automatic Switch Co., 390 Lakeside Ave., Orange, N. J.*

**ELECTRIC TRANSFER SWITCH**

• The *Zenith*—a mechanically held, electrically operated transfer switch which is locked through a toggle action—eliminates springs, latches and other delicate mechanisms. The switch operates by electrically held relays which effect automatic control, transferring from normal source to emergency power upon circuit failure and returning upon resumption of normal power. *Zenith Electric Co., Dept. ADN, 152 W. Walton St., Chicago 10, Ill.*

**AUTOMATIC INCINERATOR**



• An outdoor, automatic gas-fired incinerator, Model 254 includes an automatic clock-dial which turns on the gas and lights the burner automatically and turns off automatically at the end of burning time. A positive-acting thermomagnetic valve controls the pilot at all times. Rated at 20,000 Btu per hour, the burner is 35 in. high by 22 in. wide by 26½ in. deep, with a top opening of 11½ by 16 in. *Incineration Division, Bousler, Inc., Cairo, Ill.*

**HOME PRECIPITATOR**

• The *Electro-Staynew home precipitator* is an electronic unit for removing airborne dust, dirt, soot, pollen and microscopic particles as small as 1,250,000th of an inch in diameter from the air. Available in two standard models, for 6 to 8 rooms and for 8 to 12 rooms, the unit can be installed in existing warm air heating or air conditioning systems. *Dollinger Corp., 11 Centre Park, Rochester 3, N. Y.*

**SINK BOWL**

• *Pacemaker sink bowls* of 18-8 stainless steel are now offered in popular sizes in the company's *Lustertone* line. The bowls, available in both single and double models, are completely sound-deadened. *Elkay Manufacturing Co., 1874 S. 54th Ave., Chicago 50, Ill.*

(Continued on page 286)



*Now* **MY BOSS IS PROUD OF THE LETTERS I WRITE!**

Since the Boss gave me an Underwood All Electric Typewriter, not only original letters, but carbon copies are sharp and clear. Just imagine you can make as many as you need with a light touch of your finger

... Because electricity does the fatiguing work.

See and try the sensational All Electric at your local Underwood Office.



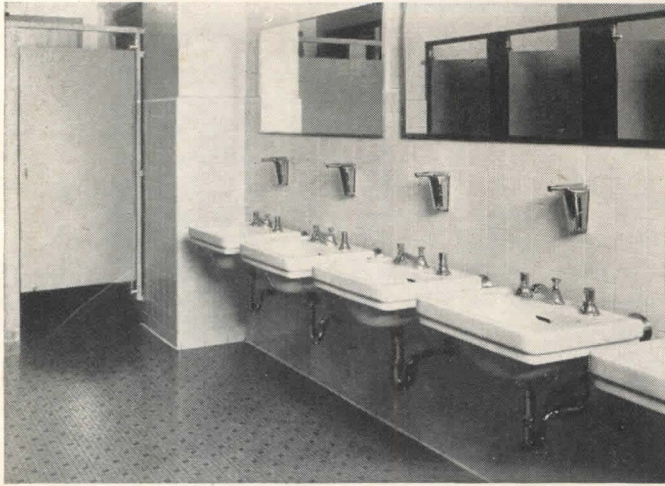
**Underwood Corporation**

One Park Avenue, New York 16, N.Y.  
Underwood Limited, Toronto 1, Canada  
Sales and Service Everywhere

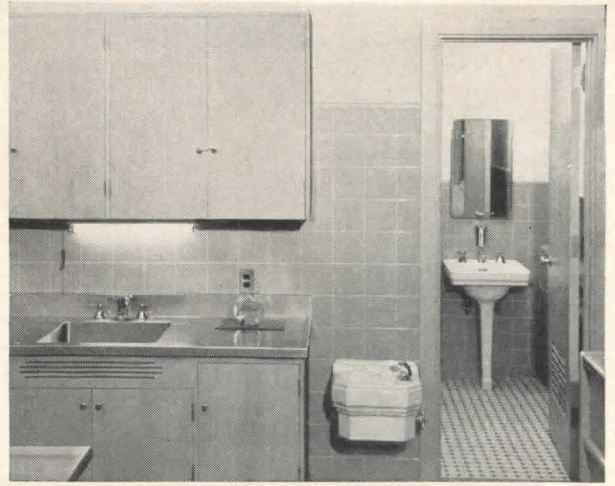


**TYPEWRITER LEADER OF THE WORLD**

Sales and Service Everywhere



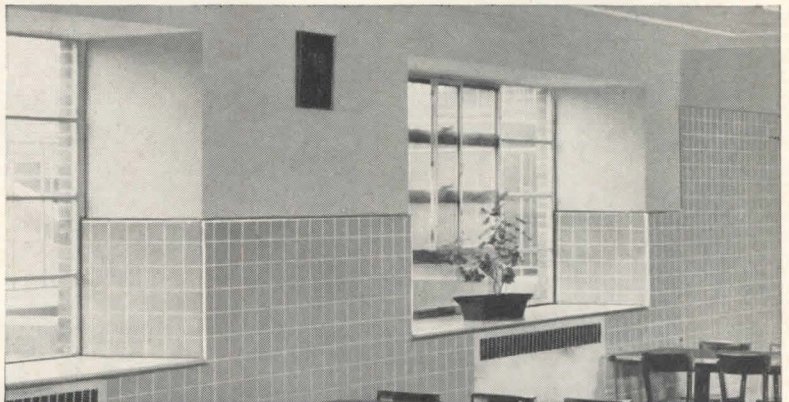
Washroom, Iona Preparatory School,  
New Rochelle, N.Y.  
Eggers & Higgins, Architects.



Classroom with attached toilet facilities,  
Windemere Blvd. Elementary School, Buffalo, N.Y.  
Duane Lyman & Associates, Architects.



Corridor, Utica Free Academy,  
Utica, N.Y.  
Kinne & Frank, Architects.



Cafeteria, Archbishop Stepinac High School,  
White Plains, N.Y.  
Eggers & Higgins, Architects.

## For better design, better design it with TILE

American-Olean Tile is an exceptional material for today's schools. It lets you specify beauty, with the practicality built-in. It requires less maintenance than any other surface, and upkeep is both easy and inexpensive. Still, it withstands almost any kind of abuse. Its beauty is permanent, because it is real clay tile!

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Please send me Booklet 205, Catalog of Tile Products.

Please send me Booklet 300 showing color photos of actual tile installations, abundant color scheme suggestions and specifications.



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Title \_\_\_\_\_  
Firm Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

(Continued from page 284)

**MOVABLE PARTITIONS**

• *Movable office partitions* are now being produced in blackboard and bulletin board panels. The new modular *Partition-ettes* are interchangeable with panels of conventional clear or frosted glass. No attachments to floors or existing structural walls are necessary. *Arnol Jamestown Div., Aelna Steel Products Corp., 730 Fifth Ave., New York, N. Y.*

**FIRE ALARM**

• A fire alarm which is only 15 in. long and weighs 3 lb produces a piercing whistle of 5 to 8 min duration which can be heard above intense industrial noise. The *Fyr-Larm* is a cylinder of compressed gas to which is attached an alarm horn connected to the interior of the cylinder through a valve which is activated when the temperature surrounding the unit rises above 136 F. Smaller units are made for home and store use. *Fyr-Larm Co., Inc., Summit, N. J.*

**FIREPROOF FABRIC**

• *Infinity Fireproof Diffusion Cloth*, a spun saran yarn, allows daylight to enter the room unimpeded and filters the glare from either light or reflections. Viewability through the window and ventilation are maintained at a high level. The material can be washed or cleaned by any method with any soap, detergent or chemical. *Edwin Raphael Co., Inc., Holland, Mich.*

**FIREPLACE SCREEN**



• A *tempered-glass fireplace screen* absorbs heat from the fire and transmits it evenly through the room and seals off drafts and room heat losses while keeping in dirt, smoke and flying sparks. A draft control regulates fuel burning and keeps clean air sweeping across the inside of the doors to remove any soot or smoke. Mounted in a frame of solid, highly polished brass, the units range in width from 23 3/8 to 50 3/8 in. and in height from 25 1/4 to 33 3/8 in. *The Thermo-Rile Mfg. Co., 323 No. Arlington St., Akron 5, Ohio.*

**PERIOD FURNITURE**



• Period furniture in the French Provincial, Louis XVI and Empire styles is offered by the *Cassard Romano Co., Inc.* Shown here is their version of a Louis XVI dining room featuring brass decorations and fluted posts and legs. *Cassard Romano Co., Inc., 305-311 E. 63rd St., New York, N. Y.*

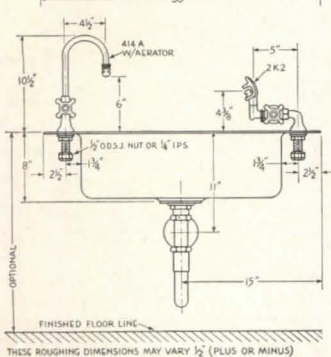
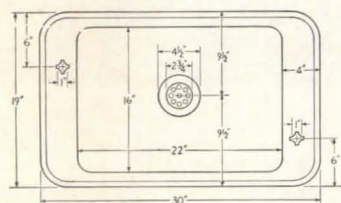
(Continued on page 288)

**Now!**  
**THE POPULAR**  
**HAWS**  
**DECK-TYPE**  
**DRINKING**  
**FOUNTAINS**

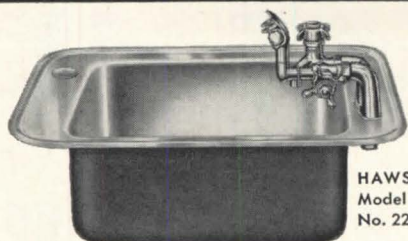


HAWS  
Model No. 2350

**in STAINLESS STEEL**



HAWS Series 2300, Model No. 2350  
(Pat. applied for)



HAWS  
Model  
No. 2255

**Now!** The HAWS stainless steel Series 2200 and 2300 with all the features that have made the white enamel cast iron HAWS Series 2000 so popular for school classrooms. Raised and sloped mounting rim that keeps water off deck or table top... VANDAL PROOF socket flanges and fittings... chrome plated sink strainer with non-removable grid... and availability with any combination of HAWS faucets and fixtures. For Acid-Resisting Enamel finish, specify HAWS Series 2000.

**Write today for illustrated Detail Sheets on 2000, 2200 and 2300 Series!**



**DRINKING FAUCET CO.**

1443 FOURTH STREET (Since 1909) BERKELEY 10, CALIFORNIA



# YOU'LL WANT TO KNOW ABOUT THE Improved Bethlehem Longspans

Bethlehem engineers have made a number of improvements in our Longspan Open-Web Steel Joists. The design has been changed, depths and span ranges have been increased, some odd depths have been eliminated, and the standard nomenclature has been changed to conform to that recently adopted by the Steel Joist Institute. A catalog fully describing the new Longspans has just been published by Bethlehem. The changes are so extensive that you will probably want to discard your old catalog and send for the new one.

## CHANGE TO WARREN-TYPE TRUSS

By changing the design of the Bethlehem Longspan Joists from a Pratt-type to a Warren-type truss, additional strength factors have been gained.

The Warren-type truss enables the joist to take the stress-reversals encountered when joists are framed into columns as stiffeners, as well as stress-reversals caused, for example, by wind uplift in a heavy storm, or by unsymmetrical loadings of either floor or roof, without the need for counter diagonals.

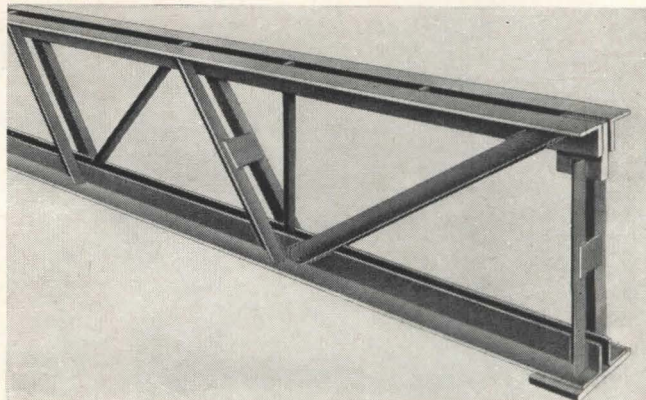
Simply stated, the new Bethlehem Longspan provides added protection against unanticipated loadings at no extra cost.

## PROVIDE CLEAR SPANS UP TO 96 FT

Modern structures such as school auditoriums and gymnasiums, garages and supermarkets demand increasingly greater clear space, unhampered by columns. By increasing the depth of the Bethlehem Longspan to 48 in. and the span range to 96 ft, the usefulness to architects of these joists has been greatly increased.

## OTHER IMPORTANT DESIGN CHANGES

By using a double-angle system of chords with separation to provide for the web, the new Bethlehem design



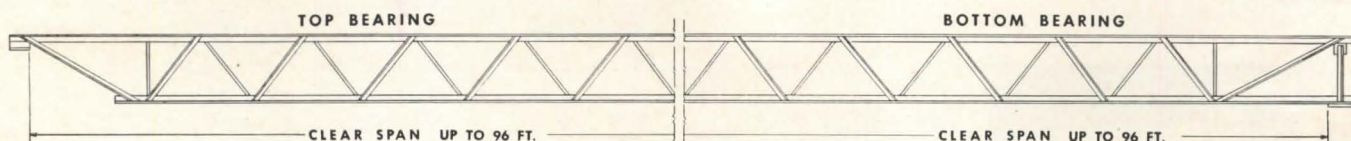
gives maximum lateral stiffness, making the joists easier to erect, and of course adding to the rigidity of the completed structure.

The separated pair of chord angles provides continuous slots in both the top and bottom chord for easy attachment of pipes, conduits and ducts, or the hanging of lighting fixtures, fans or heating units.

Pitched-top-chord Longspans now have a uniform pitch of  $\frac{1}{8}$  in. per foot, which simplifies the planning of pitched roofs. The type marks of the 18 in. and 20 in. Shortspan Joists have been changed to eliminate confusion with the Longspan series of the same depth.

## WRITE FOR OUR NEW CATALOGS

We have just published a new catalog on Bethlehem Longspan Joists, describing all of the above changes and giving the new nomenclature and designations. We have also published a new catalog on our Shortspan Joists, in which the designations of the 18 in. and 20 in. sizes have been changed. A letter or postcard addressed to us at Bethlehem, Pa., will bring you copies of both catalogs by return mail.



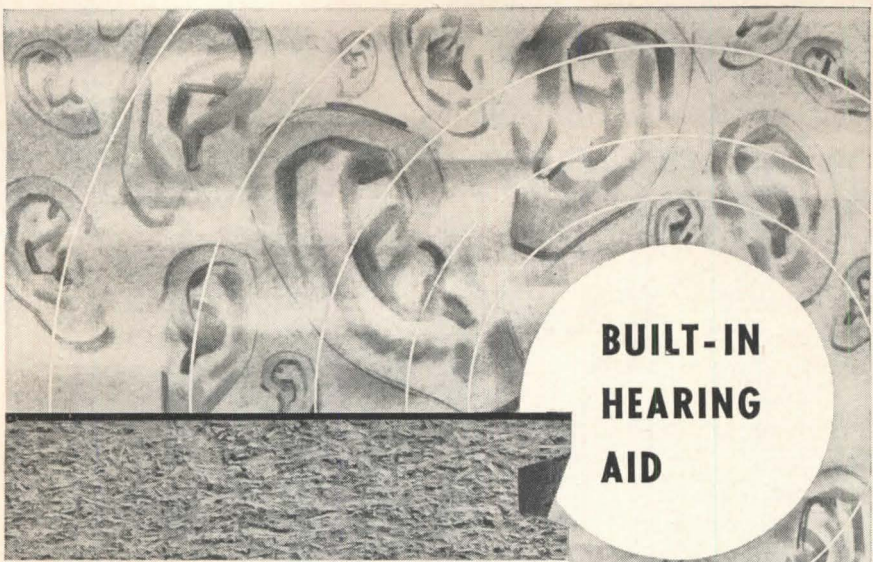
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

## BETHLEHEM LONGSPAN JOISTS



(Continued from page 286)



**BUILT-IN  
HEARING  
AID**

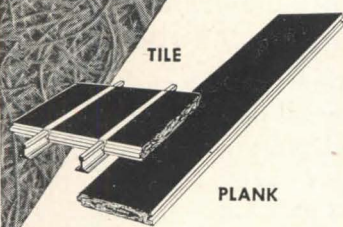
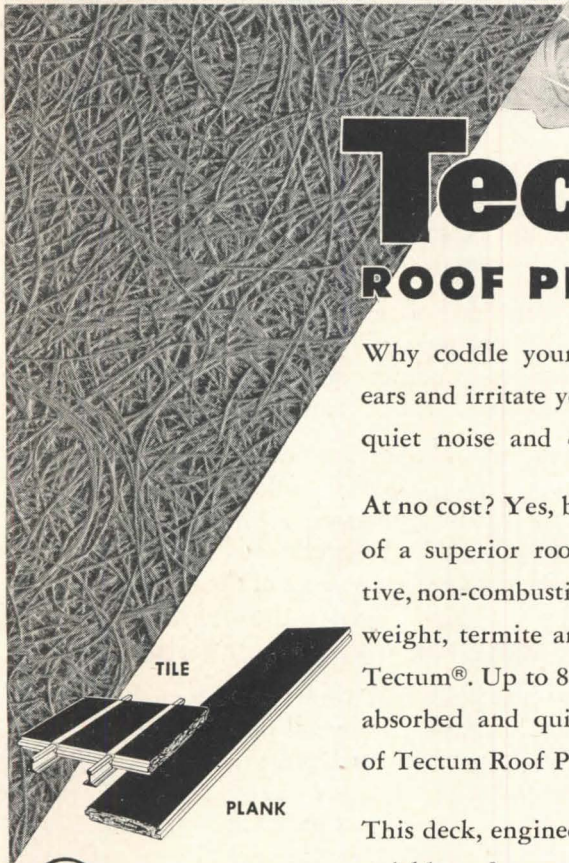
# Tectum®

## ROOF PLANK..TILE

Why coddle your eyes — yet neglect your ears and irritate your nerves, when you can quiet noise and confusion without cost?

At no cost? Yes, because all other essentials of a superior roof deck — textural, insulative, non-combustible, structural, stable, light weight, termite and fungus proof — are in Tectum®. Up to 85% of noise and clatter is absorbed and quieted by exposed ceilings of Tectum Roof Plank or Tile.

This deck, engineered for modern design, is quickly and economically erected in schools, churches, hospitals, auditoriums, commercial and industrial buildings.



**S** SEE IT NOW!  
Ask for sample and catalog,  
or refer to Section Te/2e,  
Sweet's Architectural File.

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NEWARK, OHIO

**TECTUM CORP.**  
Dept. #105, 105 S. Sixth St., Newark, Ohio

\_\_\_\_\_ Send sample and catalog.  
\_\_\_\_\_ Send sample only.

Name \_\_\_\_\_ Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_

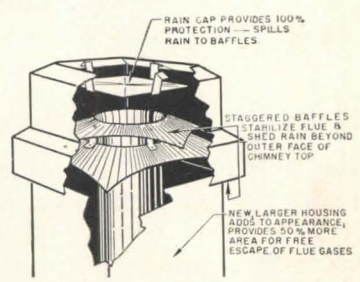
### ELECTRONIC ELEVATOR TIMER

• The *Traffic Sentinel*, the latest electronic development for operatorless elevators, automatically controls the time delay at each floor stop. An infra-red light ray across the entrance of an elevator car counts incoming and outgoing traffic and adjusts door-closing time accordingly. Westinghouse engineers say the Sentinel will speed round-trip running time of automatic elevators. For maximum safety the elevators feature also "Saf-T-Edge" doors, which reverse at the slightest pressure. *Westinghouse Electric Corp., 401 Liberty Ave., Box 2278, Pittsburgh 30, Pa.*

### ELECTRONIC THERMOSTATS

• An *electronic system to control both heating and cooling* in home developments uses two electronic thermostats, one of which is mounted outside the house. An electronic "brain" or relay amplifier automatically computes the heating, or cooling, needed to satisfy the signals from the two thermostats. *Minneapolis-Honeywell Regulator Co., Minneapolis 8, Minn.*

### CHIMNEY TOP



• A *chimney top* redesigned for the Thulman Chimney and approved by Underwriters' Laboratories is 1 in. larger in both horizontal directions and has a new rain cap and shield design. The new top is available for either one or two flues. *The Majestic Co., Inc., Huntington, Ind.*

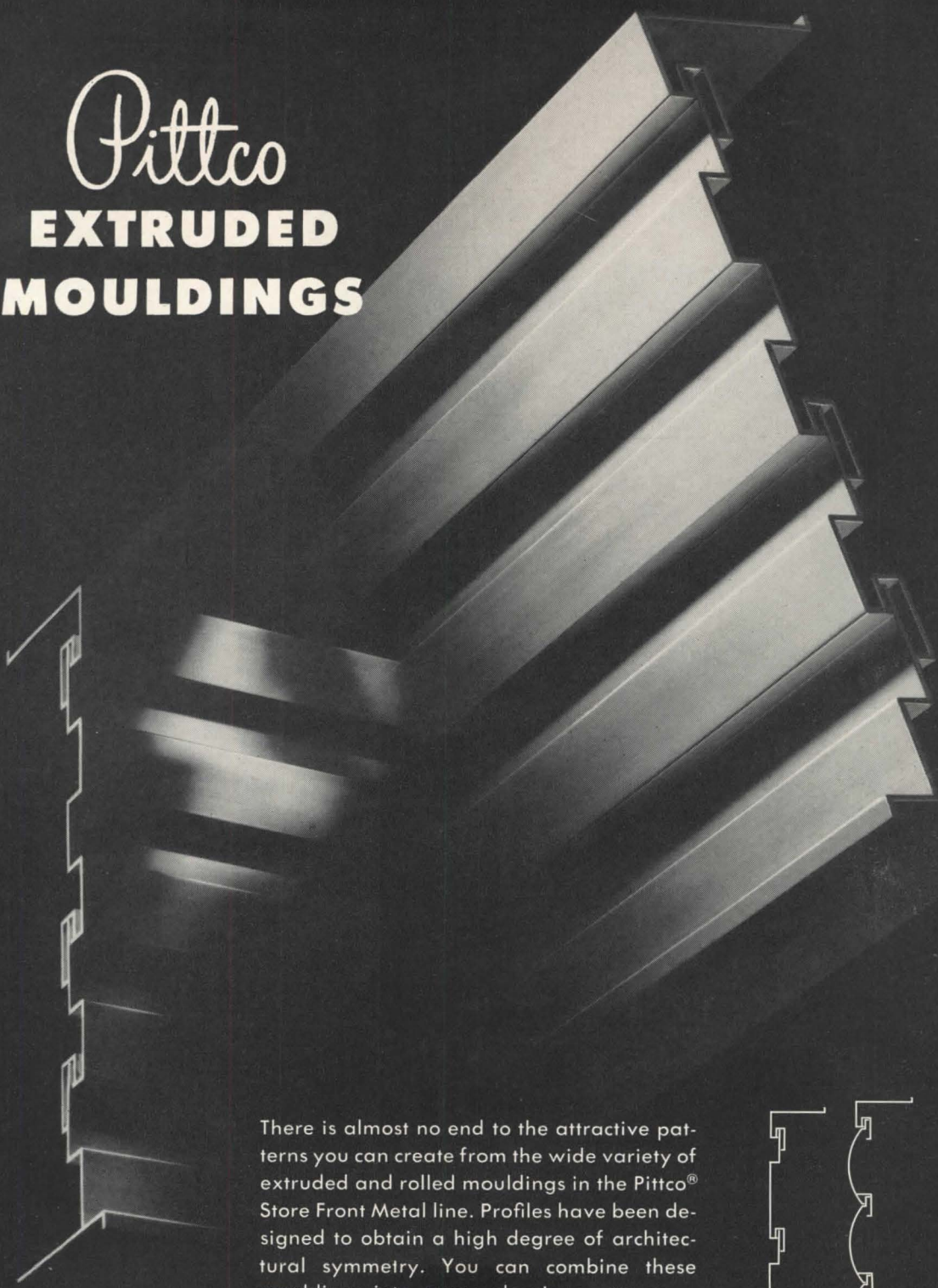
### IGNITION TRANSFORMER

• A *replacement-type ignition transformer* has a choice of three heavy-duty base plates which adapt it to most types of domestic oil burners without further modification. Designed for continuous or intermittent domestic duty on 60-cycle circuits, the new transformer is rated at 100–120 volts primary, 10,000 volts secondary, 0.250 kva, with a secondary short-circuit current of 23 ma. *General Electric, Schenectady 5, N. Y.*

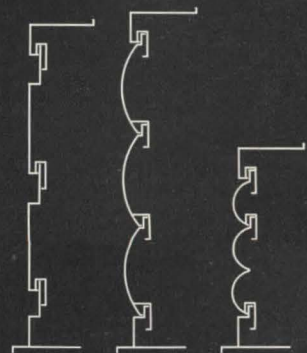
(Continued on page 290)

# Pittco

## EXTRUDED MOULDINGS



There is almost no end to the attractive patterns you can create from the wide variety of extruded and rolled mouldings in the Pittco® Store Front Metal line. Profiles have been designed to obtain a high degree of architectural symmetry. You can combine these mouldings into many pleasing patterns, a few of which are illustrated here. See your Pittco representative, or Store Front Detail Book for more detailed information.



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COUPON  
FOR YOUR  
NEW  
GUIDE TO  
MODERN  
ENTRANCE  
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REVOLVING DOOR DIVISION  
INTERNATIONAL STEEL COMPANY  
2002 Edgar Street, Evansville 7, Indiana  
Send me without obligation my personal copy of your  
New Complete Manual of Modern Entrances:

NAME AND POSITION \_\_\_\_\_  
STORE \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_



New Revolving Door Entrance at George Wienhoeber, Florist, Chicago.  
Walter H. Sobel & J. Steward Stein: Architects

## HOW TO KEEP Cut flowers AND Customers!

**CONSTANT TEMPERATURE CONTROL** — to keep costly cut flowers at their fresh and salable best — was greatly furthered by the change of entrance to the fine Chicago florist shop shown above. Drafts and dust no longer sweep in from windy Wabash Avenue. Outside cold or heat no longer rushes through, while customers struggle with stubborn swing doors. Not with revolving doors that are "always open" yet "always closed"!

These same advantages make a revolving door entrance a money-making investment for any retail establishment. Today's shoppers expect

store-wide comfort and convenience. They keep coming back to the store that's smartly modern outside . . . always refreshingly clean inside . . . in every way a pleasant, draft-free place to do business every day of the year.

When planning a retail shop or store — however large or small — you can help your client meet all these expectations by specifying a revolving door entrance. What's more, you'll help trim store operating costs as well as build traffic. Mail coupon for complete data on these doors that pay for themselves many times over.



REVOLVING DOOR ENTRANCE DIVISION  
2002 EDGAR STREET  
EVANSVILLE 7, INDIANA

**INTERNATIONAL STEEL COMPANY**

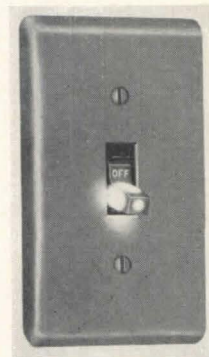
## A-E PRODUCTS

(Continued from page 288)

### MOTOR CONTROL CENTER

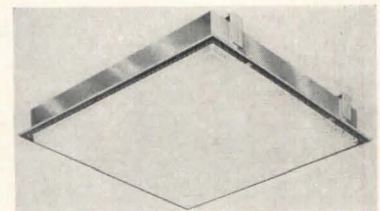
• A compact motor control center will take nine NEMA Size One starter units or six NEMA Size Two units of either the fusible or circuit breaker types in the standard 90-in. trough without reduction in pull-box space. A new center bussing arrangement frees pull-box space for wiring and increases vertical bus capacity from 300- to 600-amp capacity in standard construction up through five sections. Each standard section of the G-E Motor Control Center DA7093 is 13½ in. deep by 24 in. wide. *General Electric, Plainville, Conn.*

### ILLUMINATED LIGHT SWITCH



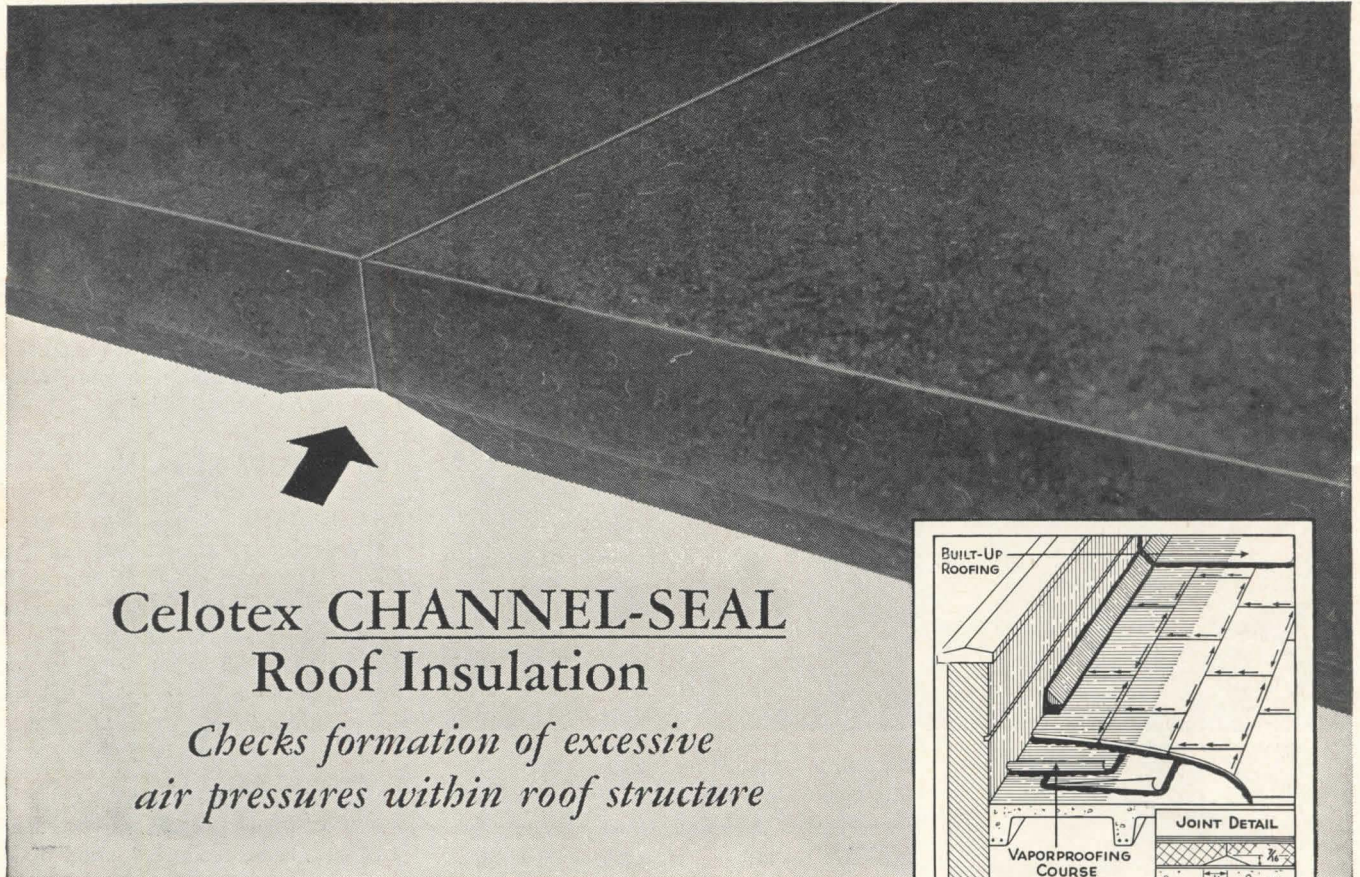
• An illuminated mercury light switch has a small neon light in the handle which glows when the switch is in the OFF position, making it practical for such locations as bathrooms, bedrooms, long hallways, entranceways, nurseries, hospital rooms, hotel rooms and attic and basement stairways. *General Electric Co., Construction Materials Div., Bridgeport 2, Conn.*

### RECESSED LIGHT



• Four-foot-square recessed light cells have translucent white Plexiglas diffusing panels to produce high-intensity, low-brightness illumination for large commercial areas. The 3800 series, designed for four, six or eight fluorescent or slimline lamps, are finished in high-reflectance white enamel. The panels are supported in a full-length piano-hinged steel frame for easy maintenance. *Sunbeam Lighting Co., 777 East 14th Pl., Los Angeles 21, Calif.*

# Exclusive channeling guards against blistering and separation of felt and insulation



## Celotex CHANNEL-SEAL Roof Insulation

*Checks formation of excessive air pressures within roof structure*

**Y**OU PROVIDE an *extra margin of safety* against roof damage due to the formation of high-pressure air concentrations, when you specify Celotex Channel-Seal Roof Insulation. Its built-in "safety release" equalizes the pressure of air trapped in the roof, gives protection no ordinary roof insulation can provide!

Each piece of Channel-Seal has bevels  $\frac{7}{16}$ " high by  $1\frac{1}{16}$ " wide on all bottom edges. When units are laid on the deck, these bevels form a network of broad, interconnecting channels extending over the entire roof.

### How "Safety Release" Works

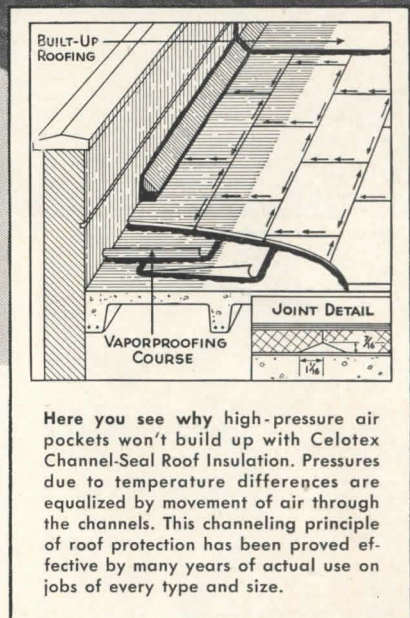
As higher pressures build up in some areas of the roof due to rising surface temperatures, they are relieved by air

movement through the channels. Thus, pressure is reduced and equalized—the risk of blistering or separation of felt and insulation is minimized.

Made of a special board of unusually high insulating efficiency, Celotex Channel-Seal Roof Insulation is available in a range of thicknesses to meet the specific insulation requirements of each job. It is asphalt-coated on both sides and all edges, for extra moisture protection in storage and on the job.

### Low Cost, Quickly Applied

Low in both initial and applied cost, Celotex Channel-Seal is remarkably rigid and tough, yet light and easy to handle. Resists damage from job handling. Smooth surface assures positive bond to both roof deck and roofing felt.



Here you see why high-pressure air pockets won't build up with Celotex Channel-Seal Roof Insulation. Pressures due to temperature differences are equalized by movement of air through the channels. This channeling principle of roof protection has been proved effective by many years of actual use on jobs of every type and size.

What's more, it is the only roof insulation made of durable, interlocking, long Louisiana cane fibres—and protected by the patented Ferox<sup>®</sup> process from dry rot and termites. Write now for full data on Channel-Seal and other types of job-proved Celotex Roof Insulation for every need. The Celotex Corporation, Dept. AR-114, 120 S. LaSalle Street, Chicago 3, Illinois.

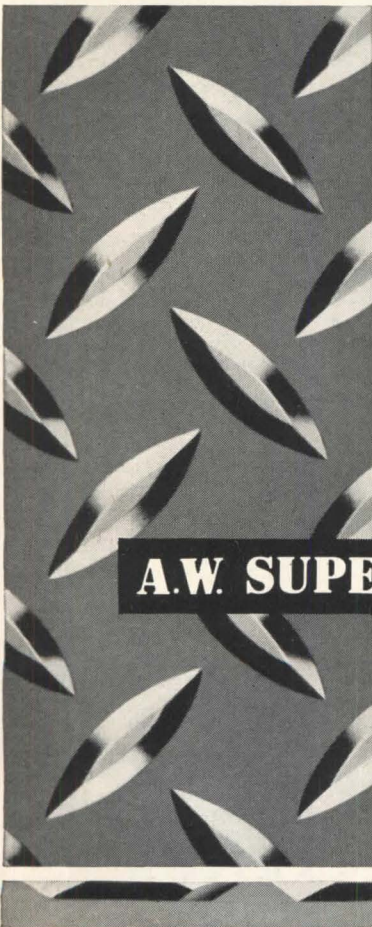
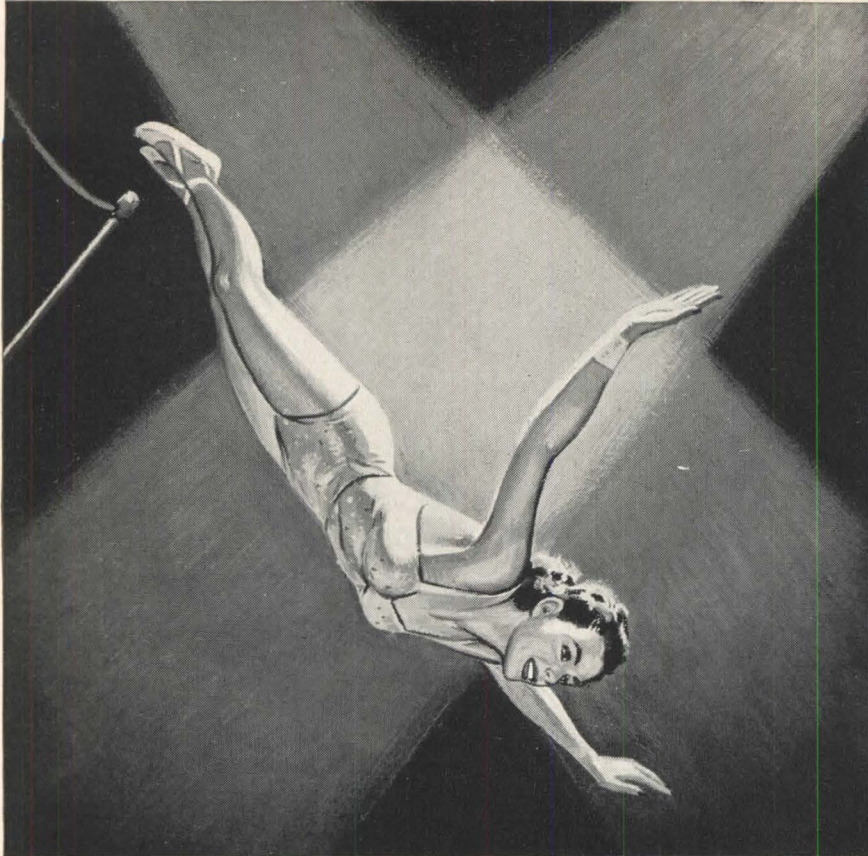
*For a better roof...  
specify genuine*

**CELOTEX**  
REG. U. S. PAT. OFF.  
**ROOF INSULATION**

THE CELOTEX CORPORATION, 120 SOUTH LA SALLE STREET • CHICAGO 3, ILLINOIS

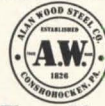
# Safer than Slippery Flooring

(Continued from page 228)



This aerialist spinning high over the center ring *knows* she's taking a risk—but training warns her to be careful. However, every day workmen are killed or hurt falling on slippery floors that *look* safe but are treacherous underfoot. Best inexpensive insurance against these accidents is A.W. SUPER-DIAMOND—the floor plate with 40 slip-stopping traction points in every step. SUPER-DIAMOND is tough, rolled steel, with an exclusive raised-diamond surface that takes rugged wear and gives maximum foot safety in return. Specify SUPER-DIAMOND when you want the best buy in low-cost accident prevention. Easy to install. Simple to maintain. Write today for the new, free SUPER-DIAMOND Booklet SD-19.

**A.W. SUPER-DIAMOND**



**Economy Rolled Steel Floor Plate**  
**ALAN WOOD STEEL COMPANY**  
 CONSHOHOCKEN, PA.

Other Products: A.W. ALGRIP Abrasive Rolled Steel Floor Plate  
 Plates • Sheet • Strip • (Alloy and Special Grades)

## ALUMINUM

- A brochure on high-strength, drawn aluminum furniture tubes and a 36-page illustrated study of aluminum extrusions are available from *Harvey Aluminum, 19200 So. Western Ave., Torrance, Calif.*

- A 24-page, illustrated catalog listing all its aluminum products has been published by *Quaker State Metals Co., Manheim Pike at Rt. 230 Bypass, Lancaster, Pa.*

- *The Aluminum Data Book, 1954 Edition*, presents 220 illustrated pages of detailed data on the properties and characteristics of aluminum. *Reynolds Metals Co., 2500 So. Third St., Louisville 1, Ky.\**

- The latest developments in the science of welding aluminum are described in *Welding Alcoa Aluminum*. Fourteen chapters discuss aluminum welding methods, performance of aluminum welds, quality control and safety. Important data are presented in 32 comprehensive tables at the end of the book. 176 pp, illus. *Aluminum Company of America, 733 Alcoa Building, Pittsburgh 19, Pa.\**

## FLOORING

- A booklet which describes vinyl floorings now being made by many of the leading flooring manufacturers is available from *Bakelite Co., 30 East 42nd St., New York 17, N. Y.*

- *Floors and Walls* is the 20-page Summer Supplement to the 1954 Gold Seal Pattern Book. *Congoleum-Nairn Inc., Kearny, N. J.\**

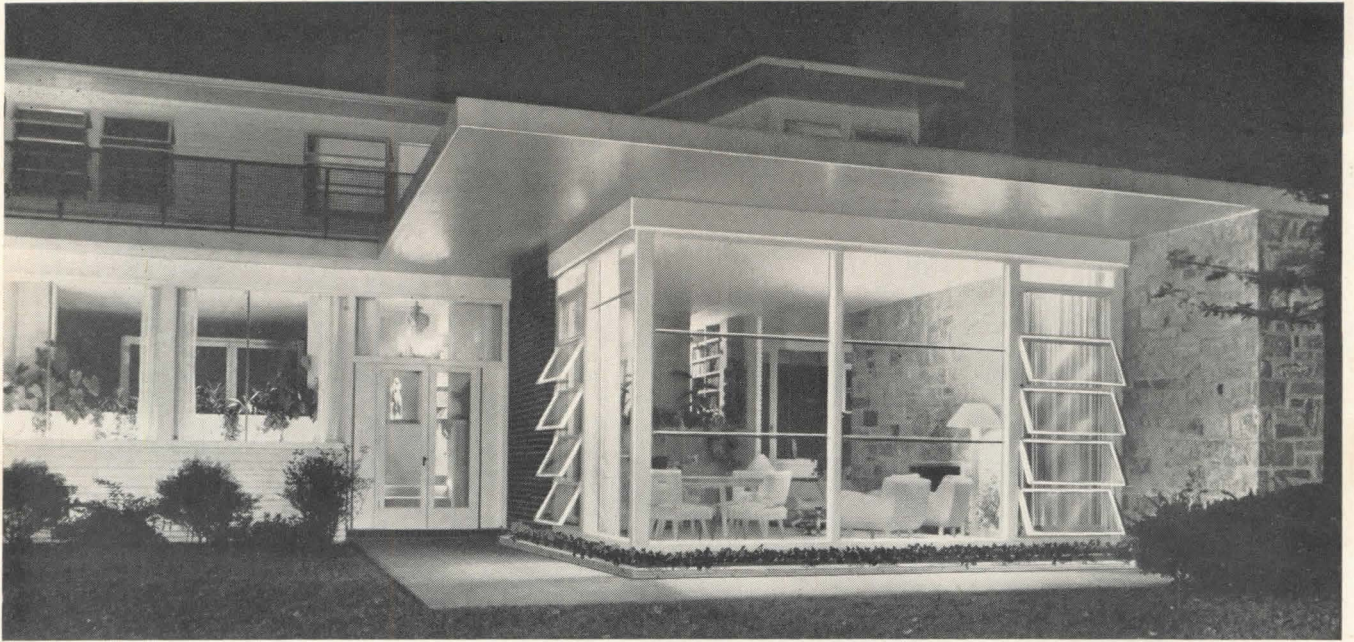
- *Tile-Tex Floor and Wall Tile Digest* presents a comprehensive coverage of Tile-Tex products. 34 pp, illus. *The Flintkote Co., Tile-Tex Div., 1232 McKinley Ave., Chicago Heights, Ill.\**

- A new full-color catalog for KenRubber flooring tile (8 pp) has just been issued by *Kentile, Inc., 58 Second Ave., Brooklyn 15, N. Y.\**

## SCAFFOLDING

- A 12-page illustrated bulletin covering the Brainard scaffolding system using a tubular steel frame has been released by *Brainard Steel Div., Griswold St., Warren, Ohio.\**

(Continued on page 294)



Architect Edward Stone of New York has tastefully combined Gate City units with picture windows in this modern dwelling.

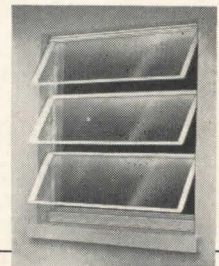
## Smart, Modern Design includes Gate City Awning Windows

The horizontal styling of these smart functional awning windows compliment your design and contribute to your client's year 'round living enjoyment.

They provide the home owner with more worthwhile advantages than any other window type... advantages he can only enjoy with **Gate City Awning Windows**.

100% ventilation control, real rain protection, easy operation, complete factory weatherstripping, dual action hardware and a choice of two superb window units, wood or aluminum.

Gate City has established a new standard for **Aluminum Awning Windows** with: ★ Self-Adjusting Sash ★ Extruded Aluminum Strip Glazing  
★ Completely Enclosed Hardware ★ Lasting Permanized Finish



Truly versatile, Gate City Awning Windows may be used with picture windows, fixed side lights and window walls... offering unlimited design possibilities.

**Gate City** AWNING WINDOWS

*Perma-treated for Long Life*

**GATE CITY SASH & DOOR CO., DEPT. AR-11**  
P. O. Box 901, Fort Lauderdale, Fla.

Gentlemen: I would like complete information on

- Gate City's Wood Awning Window  
 The New Gate City Aluminium Awning Window

Name \_\_\_\_\_

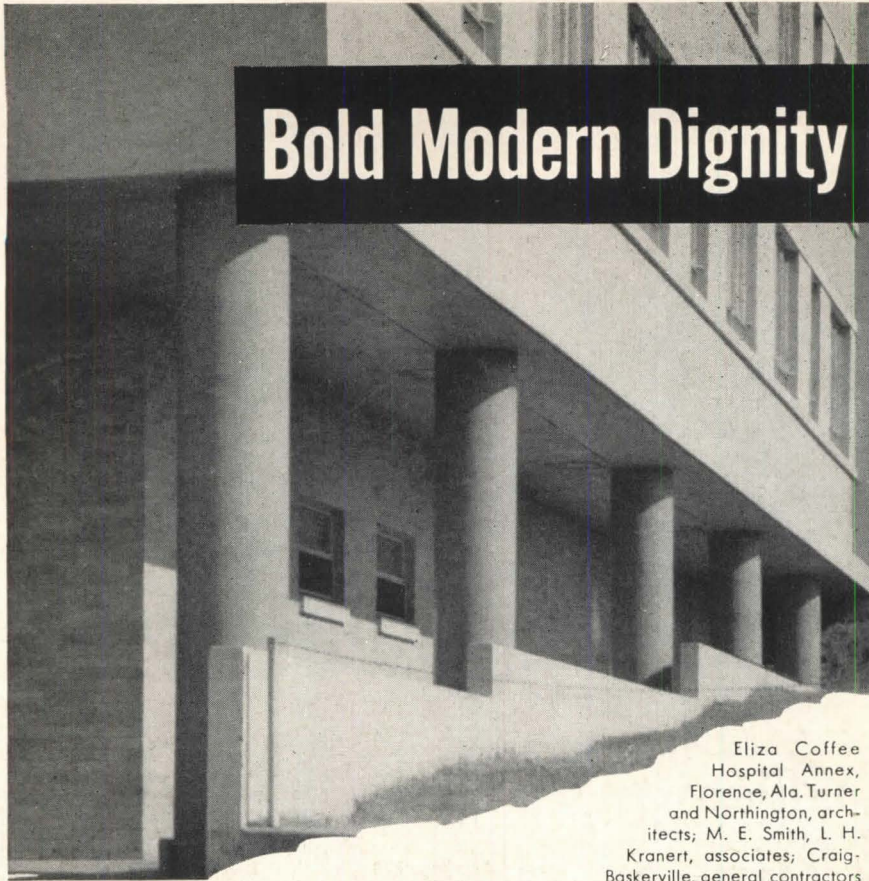
Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

"Window Craftsmen for over 40 years"

(Continued from page 292)

# Bold Modern Dignity



Eliza Coffee Hospital Annex, Florence, Ala. Turner and Northington, architects; M. E. Smith, L. H. Kranert, associates; Craig-Baskerville, general contractors



## FIBRE FORMS

### for round columns of concrete

An air of striking stateliness has been achieved for the modern Eliza Coffee Hospital Annex through the use of round columns of concrete formed with low cost SONOTUBES.

For hospitals, churches, schools . . . in fact, for any kind of building . . . distinctive design can be economically achieved with round concrete columns formed by low cost SONOTUBE Fibre Forms. Forms are easily removed.

SONOTUBES save time, labor and money and are approved by architects and engineers everywhere. Widely used by contractors because these low cost SONOTUBES take less time to erect and fewer men to handle.

Available in 31 sizes, 1" to 36" I.D. up to 50' long. Can be supplied in desired lengths or cut to requirements on the job.

DENFORM reusable capital form designed for use with Sonotubes. Write for details.

See our catalog in Sweet's

For complete technical data and prices write

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14 SOUTH PARK STREET

AKRON, IND.

BRANTFORD, ONT.



### KITCHENS

- A new specifications folder has been issued by Youngstown Kitchens for architects and home builders. 4 pp, illus. *Mullins Mfg. Corp., Warren, Ohio.\**

- *Hospital Dietary Services* is the third in a series of books by Clarence Schroeder, chief food service engineer for Hotpoint, and covers the food service requirements of small to medium-size hospitals. 70 pp, illus. (Commercial Equipment Dept.). Hotpoint has also produced a special file of counter and heavy-duty commercial electric cooking equipment for architects and kitchen consultants (Merchandising Dept., Form No. JN-500). *Hotpoint Co., 227 So. Seeley Ave., Chicago 12, Ill.\**

- *Special Features of Current Gas Ranges* is a chart of recent gas range developments currently being produced by 43 manufacturers. 10¢ for 1 to 9 copies. *American Gas Association, 420 Lexington Ave., New York 17, N. Y.*

### FURNITURE

- *Knoll Index of Contemporary Design* presents the international collection of Knoll furniture and textiles. 64 pp, illus., \$5.00. *Knoll Associates, Inc., 575 Madison Ave., New York 22, N. Y.*

- A 1955 catalog of Raymor's complete line of contemporary home furnishings and accessories, 56 pp, illus., is available from *Richards Morgenthau Co., 225 Fifth Ave., New York 1, N. Y.*

### HARDWARE

- A *Carrier Guide* for wall-hung fixtures manufactured by American Standard, Crane, Kohler, Eljer, Case and Richmond Radiator has been announced by *Jay R. Smith Mfg. Co., 1119 Morris Ave., Union, N. J.*

- Series "500" sliding door hardware for residential and light industrial usage is described in a 16-page illustrated catalog issued by *Lawrence Bros., Inc., Sterling, Ill.\**

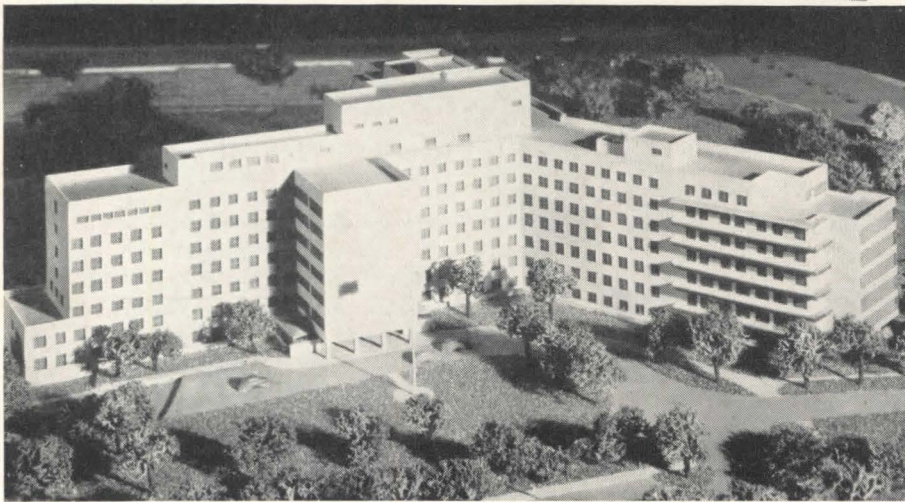
### ATOMIC ENERGY UNITS

- A source of reference on radiation and protection is available in a 56-page illustrated catalog from *Bar-Ray Products, Inc., 209 25th St., Brooklyn 32, N. Y.\** (Continued on page 296)



HUGE HOSPITAL . . . COMPACT CENTER

architects prefer **usAIRco** for the  
nation's newest, most modern  
medical buildings . . .



The new 48-room Olmos Medical Center (San Antonio) is cooled by a central station, RK 25 h.p. The RK contains all elements of a built-up system—blower section, cooling section and evaporative condenser—in one cabinet. The evaporative condenser saves 95% on water consumption costs and eliminates the need for an outside water tower. Architect is Cerf Ross Associates; Engineer: Martin E. Staley; Contractor: G. H. Dillard Co., all of San Antonio, Texas.

N.Y.'s mammoth 500-bed Nathan B. Van Etten TB Hospital in the Bronx, recently completed, is one of America's largest medical buildings, and is another prominent usAIRco installation. usAIRco equipment includes 47 heating coils, 8 unit ventilators, 6 unit air conditioners and 44 blowers. Architects: Pomerance & Breines; General Contractor for the N.Y.C. Dept. of Public Works: Gerace & Castagna; Heating Contractor: Heating Maintenance Corp. of New York.

In today's finest, most up to date medical buildings, large or small, you see the usAIRCO name on air conditioning, heating and ventilating equipment again and again. Equipment that is designed to fit any requirement, unmatched in engineering excellence, equipment backed by 30 years of manufacturing experience . . . these are the reasons for

today's trend to usAIRCO. Typical examples of architects' preference for usAIRCO products in America's outstanding medical structures are these two recent installations: N.Y.'s \$14,000,000 Nathan B. Van Etten TB Hospital, the Bronx, New York and the single story Olmos Medical Center, San Antonio, Texas.

*For descriptive literature write Dept. R-114*

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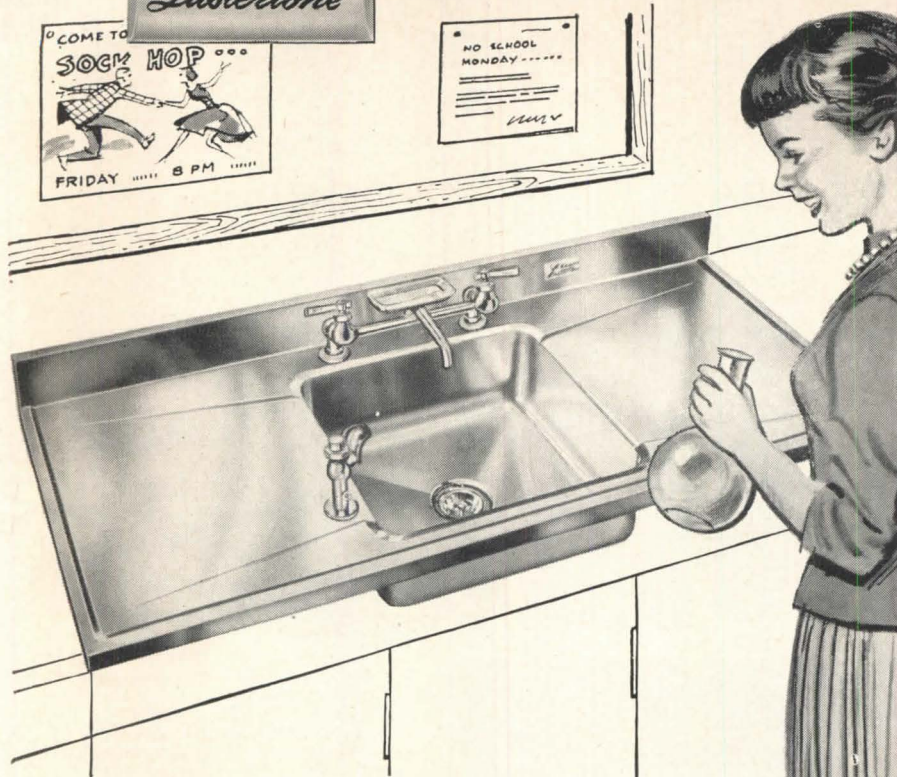
# SCHOOL DAYS ARE HERE FOREVER

(Continued from page 294)

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### WOOD

• *Installing TECO Timber Connectors* tells where and how to install five types of timber connectors used to increase the strength of joints. 12 pp, illus. *Timber Engineering Co., 1319 18th St., N.W., Washington 6, D. C.*

• *Wood Frames and Windows* is the third in a series of brochures covering phases of architectural woodwork. 8 pp, illus. *Architectural Woodwork Institute, 332 So. Michigan Ave., Chicago 4, Ill.*

• *Modern Magic* is a 12-page illustrated booklet showing the use of decorative plywood in homes. *Associated Plywood Mills, Inc., P. O. Box 672, Eugene, Ore.\**

### AIR FILTER

• A new 4-page folder describing a new lifelong air filter has been issued by *The George Evans Corp., Moline, Ill.*

### LITERATURE REQUESTED

George W. Stickle, Architect, Stickle Building, 2422 Prospect Ave., Cleveland 15, Ohio.

Reliable Engineering Corp., Architects and Engineers, 2605 Beale Ave., Altoona, Pa.

Rodolfo Hasse, Architect, Monroe 4760, Buenos Aires, Argentina.

Nestor Balbiani, Architect, General Roca 1783, Vicente Lopez, Pcia., de Buenos Aires, Argentina.

Per E. Rundberg, Architectural Designer, 390 Hibiscus Way, Terra Linda, San Rafael, Calif.

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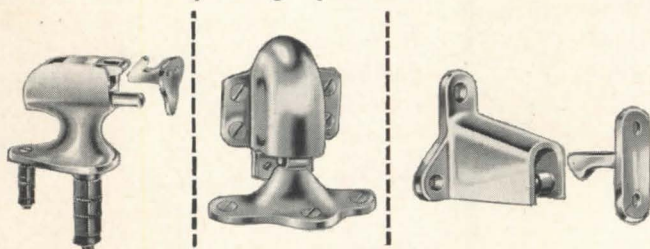


## GLYNN-JOHNSON Door Control Hardware

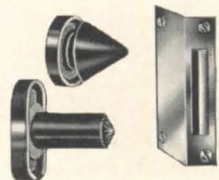
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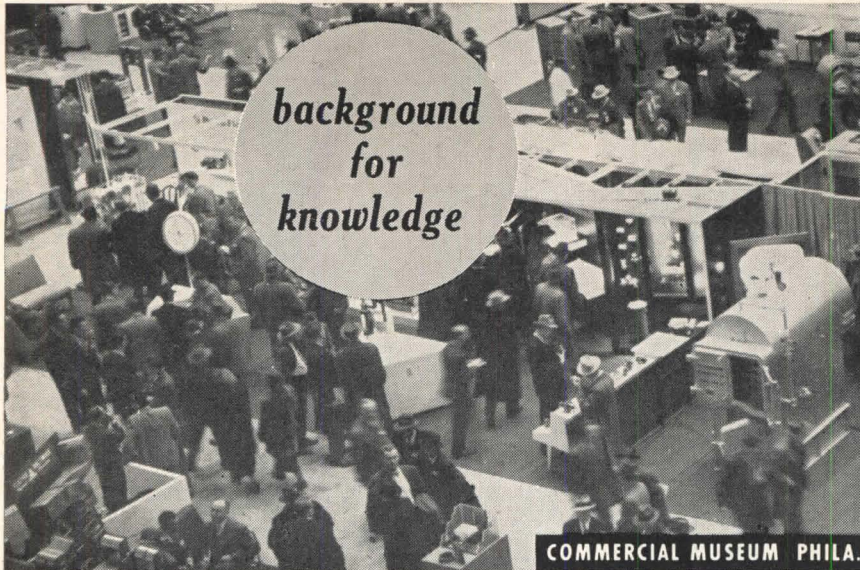
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## THE RECORD REPORTS

(Continued from page 12)

present nine schemes for building location on site in respect to street arrangement but state clearly that these are preferred, not mandatory. Architectural treatment of exteriors is being left to the discrimination of the proponent and his architect. Interior finishes, however, must conform to the standards set out in the specifications.

In practice, the Post Office field offices will trace off the schematic drawings applicable to the local situation and provide them to each proponent, who also will receive a copy of the specifications. It is proposed that the specifications will then remain a permanent part of the proponent's files.

### *Most Postal Space Affected*

The great bulk of mail handling is done in rented quarters. Of some 25,000 post office spaces, approximately 3000 are Federally owned. Since the first of this year, the Post Office Department has leased new buildings whose construction costs exceed \$40 million. About 2000 lease and rental cases are under consideration at any one time.

The specification foreword states in part: "The Department, after careful study, has prepared the attached plans and specifications in recognition of the need for standardizing the arrangement of postal facilities and establishing construction standards for nationwide use. It is believed that these plans and specifications will serve as instruments to expedite negotiations for construction of new postal facilities, assist proponents in the preparation of proposals, and facilitate the preparation of contract drawings by architects."

### *No Forced Remodeling*

The new approach is not intended to cause the unnecessary remodeling of existing serviceable buildings and equipment considered for lease. But insofar as practicable, whenever it is necessary to alter existing structures for service or other reasons, the work will be accomplished according to applicable portions of the new specifications.

### *Future Revisions as Needed*

The specifications are signed by Ormade A. Kieb, Assistant Postmaster  
(Continued on page 300)



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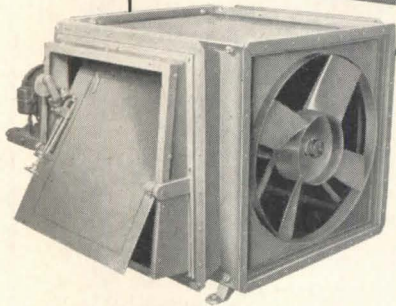
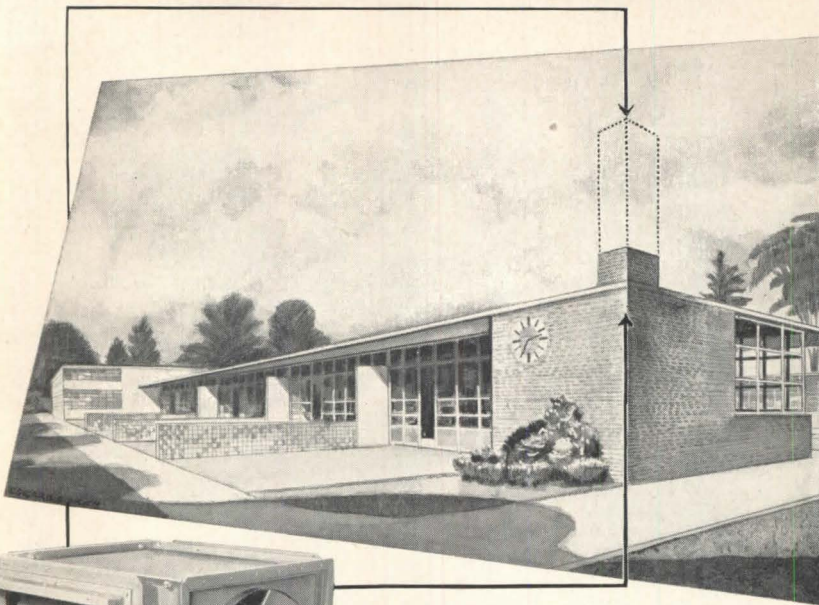
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*In confirmation of the above, there are over 500 Wing Draft Inducer installations in schools alone, in all parts of the country, with hundreds more being specified by architects and engineers as the great school building program continues.*

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## THE RECORD REPORTS

(Continued from page 298)

General, Bureau of Facilities. The drawings carry the signature of Mr. Kieb and R. D. Barnard, director, Division of Real Estate. The chief of the design and engineering section, the chief inspector, and officials of the Bureaus of Finance and Post Office Operation also gave approval to the plans.

While they are believed to cover adequately the Department's design needs for the present, the plans and specifications will be revised as new requirements occur.

### Await Lease-Purchase Moves

Post Office officials emphasized that the new standard layouts have no direct bearing on construction to be performed under the lease-purchase program. They apply, rather, to the much greater volume of building done by private owners for lease to the government, and cover only those new buildings and the remodeling of older structures where ownership remains in private hands. Under the new lease-purchase law, buildings will come into Federal government ownership upon amortization of the investment.

The Post Office Department and the General Services Administration currently are conferring on methods of administering the lease-purchase program. At this writing final details as to preparation of plans for post offices to be constructed under this new statute had not been worked out. It was known, however, that the Post Office favors a scheme whereby private architects will do the designing, at least on the larger structures.

Meanwhile, the Department is anxious to make a firm start on its lease-purchase activities. Last month this awaited approval of specific projects by the Senate Public Works committee, and formal okay by the Bureau of the Budget. Consideration of the full list of Post Office and General Services Administration projects by the Senate group when the Senate returned briefly in November was considered a possibility. Post Office spokesmen gave the impression, however, that much detail remained to be worked out concerning the package offer plan that they intend to present under the lease-purchase scheme. But once the projects are approved, they will move rapidly toward final planning and construction.



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**In addition, it has high thermal insulative qualities . . . offers many decorative possibilities . . . it is low in cost . . . fire-safe**

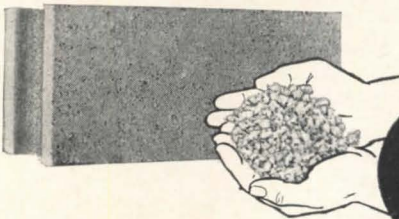
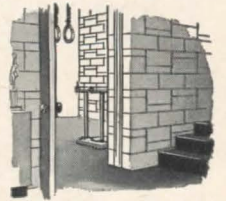
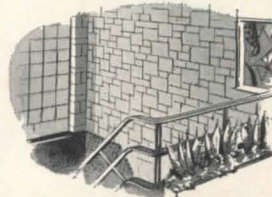
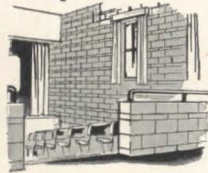
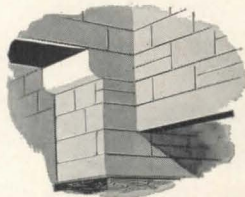
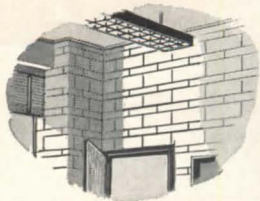
A large number of schools are being built these days of Waylite concrete masonry units.

The fact that the exposed surface of Waylite is one of the most efficient acoustical treatments known is in part responsible. Rooms that are comfortable to the ear are equally important in churches, auditoriums, offices, and many other structures.

Exposed Waylite is not only comfortable to the ear, but it is pleasing to the eye. The unit patterns shown give some idea of the varied decorative effects that can be easily achieved. The natural surface of Waylite units is attractive in color and texture. Units may be painted—or pigmented during manufacture.

Waylite concrete masonry units are structurally adequate and give a combination of four important factors: (1) high thermal insulative qualities; (2) excellent acoustical values; (3) a wide range of decorative possibilities; (4) low in cost—and fire-safe.

You will find 24 pages of engineering data on Waylite in Sweet's Catalog. Additional information is available on request. Address the Waylite Company, 20 North Wacker Drive, Chicago, Illinois or Box 30, Bethlehem, Pennsylvania.



**WAYLITE**  
M A S O N R Y U N I T S

WASHINGTON

(Continued from page 38)

rate of school construction must be nearly tripled to keep pace with the increasing student load — this in spite of the fact that the current rate is breaking all records.

There was no disagreement as to requirements, but Commissioner Brownell said a new analysis of the situation is needed and the conferences are intended to provide it.

“The solution of the problem,” he declared, “is dependent upon continuance of large-scale school construction for at least 10 years, including action in individual school districts and states, regardless of what action is taken in Washington.” Commissioner Brownell also said there is evidence that all states have the resources and authorization to spend more money for school building purposes than they actually do. Recent Federal tax laws have provided states with a greater margin of tax capacity than heretofore.

The Kearns subcommittee also heard more than a dozen state school officials, all of whom recommended Federal aid for financing school construction.

READY DESIGN CRITERIA ON NEW MILITARY HOUSING

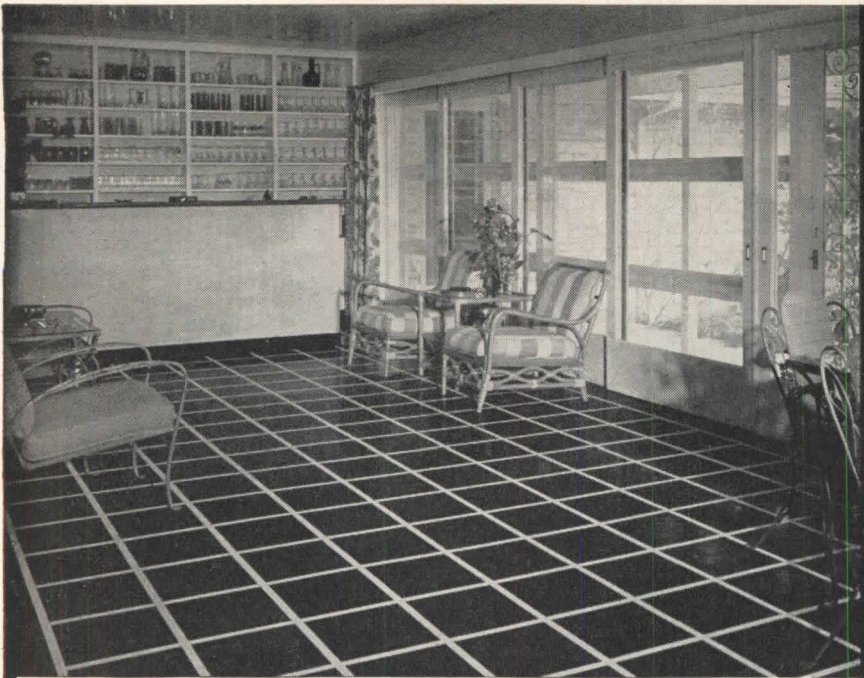
Design requirements and other criteria for the \$175 million permanent military housing program authorized by the last session of Congress are being prepared by the Department of Defense with the Washington, D. C., architectural firm of Keyes, Smith, Satterlee and Lethbridge as consultants.

The Department says design requirements and schematic drawings will be worked up primarily for the larger projects “that must be tailored to sites”; otherwise the construction agency involved in actual building can negotiate with a private firm for design work to be reviewed by the Department. Present plans call for the Department to supply guidance only.

Of the \$75 million actually appropriated to start the new program, the three services have received allotments as follows: Air Force, \$37,500,000; Army, \$26,250,000; Navy, \$11,250,000.

Congress tied strong strings to the appropriation: it said that before any

(Continued on page 304)



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Wright Rubber Tile

The modern beauty and serviceability of Wright Rubber Tile flooring make it as pleasing to the eye as it is to the pocket-book.

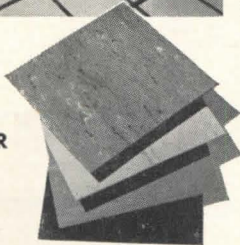
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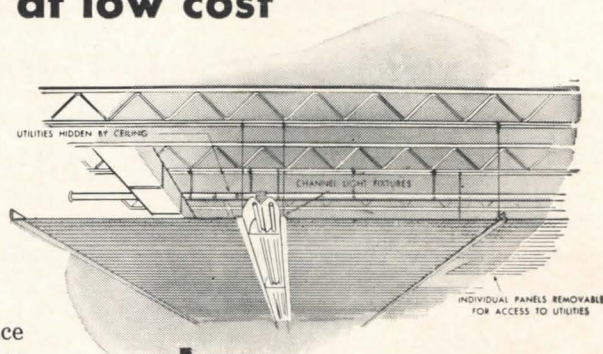


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**THE RECORD REPORTS**

**WASHINGTON**

*(Continued from page 302)*

such permanent military housing could be built, the Secretary of Defense must certify that it is impractical to build Wherry Act housing; that adequate rental housing is not available in the immediate vicinity of the military installation concerned; and that the needed housing cannot be acquired under any other provision of the law.

Of the restrictions, Defense officials regard the Wherry Act proviso as the most troublesome: it has been suggested that the only way to document the "impracticability" of Wherry housing in a given situation is to program it and carry it through to the bid-asking stage; if none were received, this would provide the "documentation."

The total authorization of \$175 million is intended ultimately to provide 11,967 units of military housing, most of it in one-to-four bedroom houses for enlisted men and company-grade officers. An upper cost limit of \$20,000 per unit was set in the legislation.

**ALLOCATE AIRPORT FUNDS:  
NO AID FOR TERMINALS**

Land acquisition, construction and improvement of runways, lighting and other ground improvements constitute the bulk of the projects among 164 listed by the Civil Aeronautics Administration to receive the \$20,425,843 in Federal funds allowed for fiscal 1955 for the Federal-aid-to-airport-construction program. No new terminal buildings are included.

Allocation of funds set in motion the largest Federal-aid airport program since 1951. Last year's allocation was only \$11 million. The new assignment of funds means that over \$40 million will be expended, since states and local communities must match the Federal money dollar for dollar.

Commerce Secretary Sinclair Weeks, in making the announcement, said the program would benefit all segments of aviation and make employment for industries supplying construction materials and those engaged in building and improvement of airports throughout the country.

Of the \$22 million appropriated by Congress for the program this year, \$15

*(Continued on page 306)*

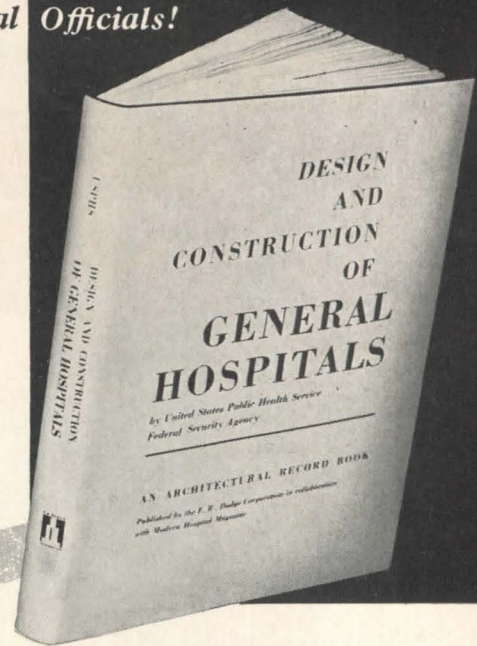
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presenting the research findings of The United States Public Health Service



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E. M. BLUESTONE, M. D., *American Journal of Public Health*

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MALCOLM T. MACEachern, M. D., *The Modern Hospital*

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ADDISON ERDMAN, A. I. A., *Journal of the American Institute of Architects*

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*Journal of the American Medical Assn.*

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  - Accessibility
  - Public Utilities
  - Nuisance Problems
  - Orientation & Exposure
  - Costs
  - Dimensions
  - Topography
  - Landscaping
- B. The Building
  - General Considerations
  - Traffic: Exterior
  - Traffic: Interior
- C. Circulation Space
  - Corridors
  - Stairways
  - Elevators

### III. ELEMENTS OF THE GENERAL HOSPITAL

- A. Main Lobby
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  - Admitting Office
  - Business Office
  - Administrator's Office
  - Medical Service Office
  - Director of Nurses' Office
  - Medical Record Room
  - Library & Conference Room
  - Staff Lounge & Locker Room

- Gift Shop
- Personal Toilets
- B. Nursing Facilities
  - Patient Areas
  - Two-bed Rooms
  - Four-bed Rooms
  - Isolation Units
  - Psychiatric Room
  - Treatment Room
  - Nurses' Station
  - Consultation Room
  - Utility Room
  - Floor Pantry
- C. Surgical Facilities
  - Operating Rooms
  - Sub-sterling Rooms
  - Scrub-up Facilities
  - Clean-up Room
  - Anesthesia Equipment Room
  - Cystoscopic Room
  - Fracture Room (Orthopedic)
  - Laboratory
  - Darkroom
  - Instrument Room
  - Surgical Supervisor's Office
  - Doctors' Locker Room
  - Nurses' Locker Room
  - Closets
  - Corridor
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## THE RECORD REPORTS

### WASHINGTON

*(Continued from page 304)*

million was required by law to be apportioned among the states according to the area-population formula set out in the Federal-aid airport law. Another \$5 million constituted a discretionary fund for use where high-priority needs could not be met out of the state apportionments. The balance of \$750,000 was for projects in Alaska, Hawaii, Puerto Rico and the Virgin Islands. A sum of \$1,250,000 was set aside for administrative purposes. There also was \$1.5 million carried over from a previous fiscal year.

Calendar 1954 has seen a dip in the program. Activity has been confined to completion of previously authorized projects. Meanwhile, the Department of Commerce has been studying the entire program to determine the role of the Federal government in it.

### NEW NAVY MATERIAL MAY AID BUILDING PRODUCTS

Navy's Bureau of Ordnance is developing a new structural material for bonding fiberglass which it believes holds great promise for construction industry use.

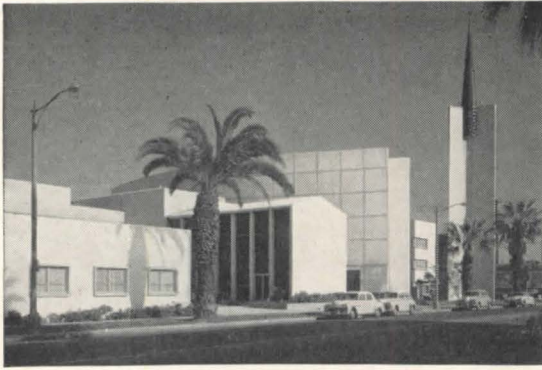
As yet unnamed, the material is said to produce laminates and tubular products of superior strength, of high resistance to the usual corrosive agents, and more suitable for use in higher temperatures.

John S. Nachtman, inventor of the material and supervisor of materials in the Bureau, has predicted that it can be used in roofing, flooring, panels, beams and molding. Researchers are confident of its superior strength, but another year of experimentation is needed to determine its cost in comparison with better known building materials.

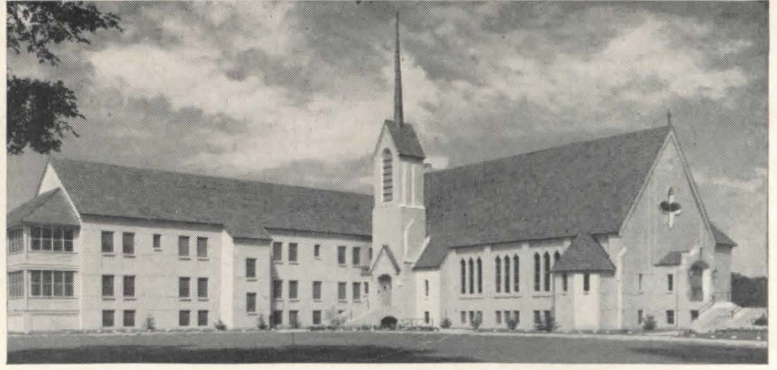
Instead of employing the conventional method of bonding fiberglass with resins and organic materials, the new process combines metals and inorganic substances. The coated fibers are bonded and compacted to form the end products.

### INDUSTRY ADVICE SOUGHT AS HHFA DIVISIONS MOVE

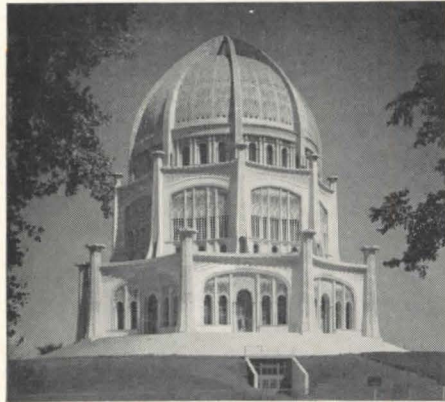
Last month's housing news was studded with reports of industry ad-  
*(Continued on page 308)*



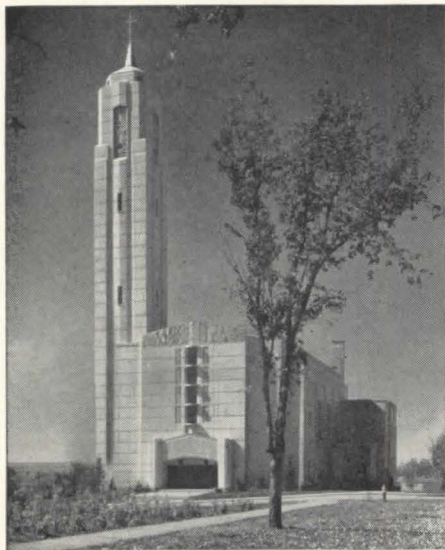
*First Baptist Church, Long Beach Cal. K. S. Wing, architect.*



*Bradford Church Monastery, Bradford, Vt. William Colleary, architect.*

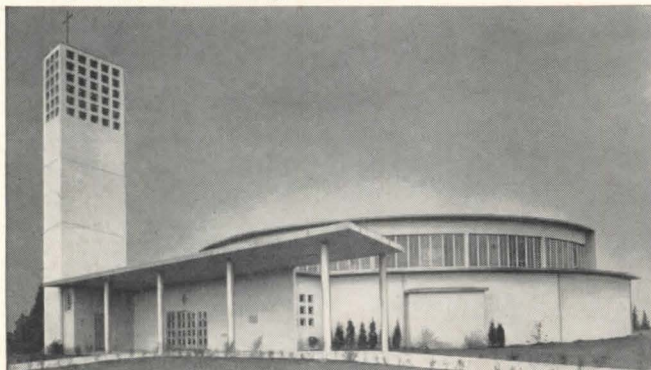


*Bahai Temple, Wilmette, Ill. Louis Bourgois, architect.*



*Cathedral of the Holy Spirit, Bismark, N. D. W. F. Kurke, architect.*

*Church of Christ the King, Seattle, Wash. Paul Thiry, architect.*



*Holy Blossom Synagogue, Toronto, Canada. Chapman & Oxley, architects.*



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### PORTLAND CEMENT ASSOCIATION

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A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

WASHINGTON

(Continued from page 306)

visory committees named and consulted by various divisions of the Housing and Home Finance Agency as they continued the process of implementing the new housing law with administrative rules and regulations.

**Wanted: "Structural Quality"**

A new 14-member advisory committee on architectural and technical standards was appointed by Commissioner Norman P. Mason of the Federal Housing Administration and held its first meeting October 7.

"This committee," said Commissioner Mason, "will help us launch a study that will lead to new FHA methods and techniques to permit us to give proper recognition to quality over and above our minimum requirements." In recent speeches, Commissioner Mason has been stressing "the new emphasis we are placing on structural quality, employing a studied and uniform system of appraisal and inspection. . . . Each of us," he told the annual meeting of the Mortgage Bankers Association of America, "has a big stake in seeing to it that we have quality construction and good design."

Walter A. Taylor, director of education and research for the American Institute of Architects, and Morgan Yost, A.I.A., of Kenilworth, Ill., are architect members of the advisory committee. Other members: Harry H. Steidle, manager, Prefabricated Home Manufacturers Institute; William B. F. Hall, General Industries, Inc., Fort Wayne, Ind., P.H.M.I. member; Douglas Whitlock, chairman of the Board, Structural Clay Products Institute; Harry C. Plummer, S.C.P.I. engineering director; Dr. Clifford F. Rassweiler, chairman, Division of Engineering and Industrial Research, National Research Council; John L. Haynes, managing director, Producers' Council; William Gillett, president, Producers' Council; Leonard G. Haeger, director of research, National Association of Home Builders; Earl W. Smith, N.A.H.B., El Cerrito, Cal.; William H. Scheick, executive director, Building Research Advisory Board; C. W. Smith, Southwest Research Institute, San Antonio; and Howard J. Uebelhack, vice president, National Plan Service, Chi-

(Continued on page 310)



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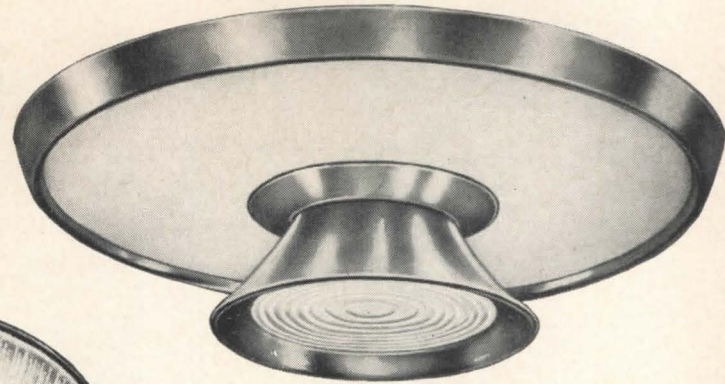
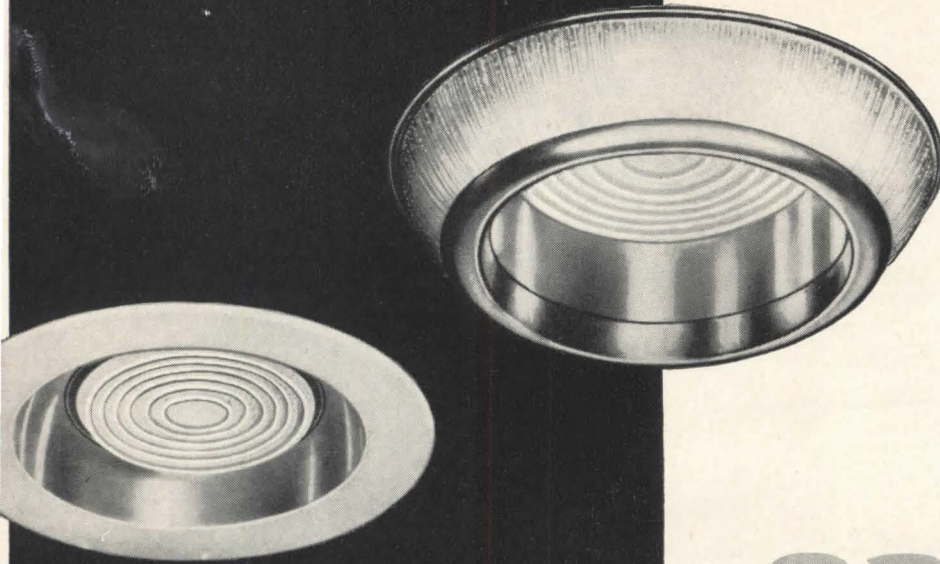
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WASHINGTON

(Continued from page 308)

cago, representing the National Retail Lumber Dealers Association.

Urban Renewal Panel Meets

The 21-member advisory committee to HHFA's Division of Slum Clearance and Urban Redevelopment was to hold its second meeting on October 29. The committee, appointed in September by HHFA Administrator Albert M. Cole to advise on the new urban renewal program and headed by Division Director James W. Follin, met for the first time September 9. Discussion centered on requirements and procedures for communities interested in developing an urban renewal program.

Edmund R. Purves, executive director of the American Institute of Architects, represents the architectural profession on the panel. Other members: Randy Hamilton, American Municipal Association; John Dickerman, National Association of Home Builders; William L. Slayton, National Association of Housing and Redevelopment Officials; Charles T. Stewart, National Association of Real Estate Boards; Lee Johnson, National Housing Conference; Reginald A. Johnson, National Urban League; John L. Haynes, Producers' Council; F. Stuart Fitzpatrick, U. S. Chamber of Commerce; Paul V. Betters, U. S. Conference of Mayors; Dennis O'Harrow, American Society of Planning Officials; Donald Herrick, American Public Works Association.

Also Harold P. Braman, National Savings and Loan League; Stephen Slipher, U. S. Savings and Loan League; Bert Seidman, American Federation of Labor; Samuel E. Neel, Mortgage Bankers Association of America; Clarence Mitchell, National Association for the Advancement of Colored People; H. R. Northrup, National Retail Lumber Dealers Association; Ben Fischer, C.I.O. Housing Committee; Col. William G. Wharton, American Society of Building Officials; Morris Miller, Committee on Housing, Municipal Law Section, American Bar Association.

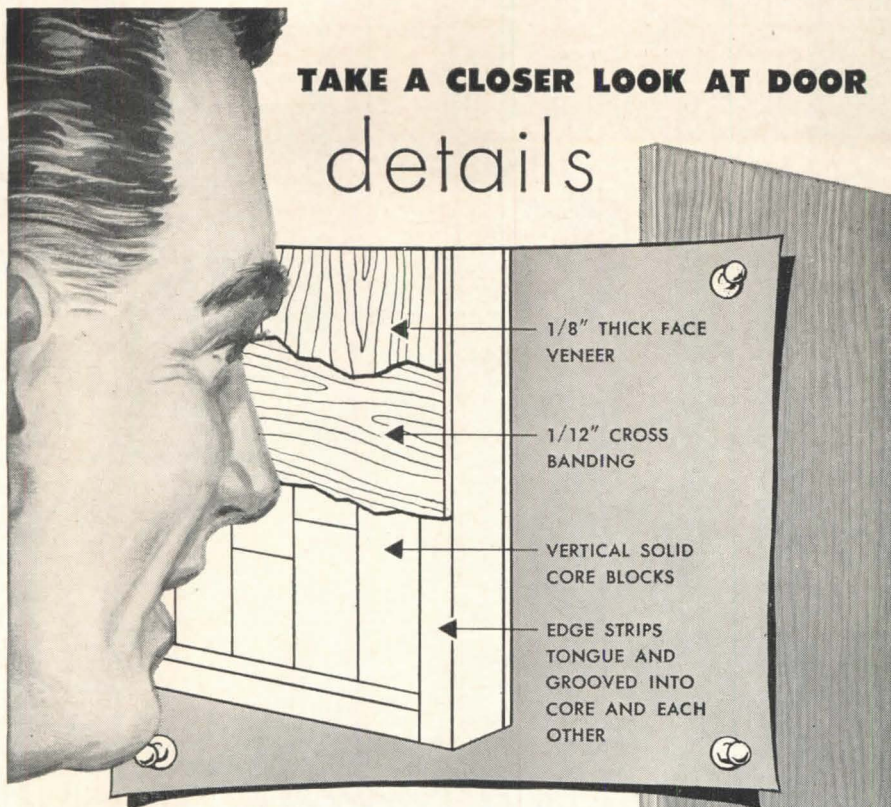
Watchdogs for Title I

The FHA program of home modernization and repair (Title I) has a new seven-man advisory committee dedi-

(Continued on page 312)

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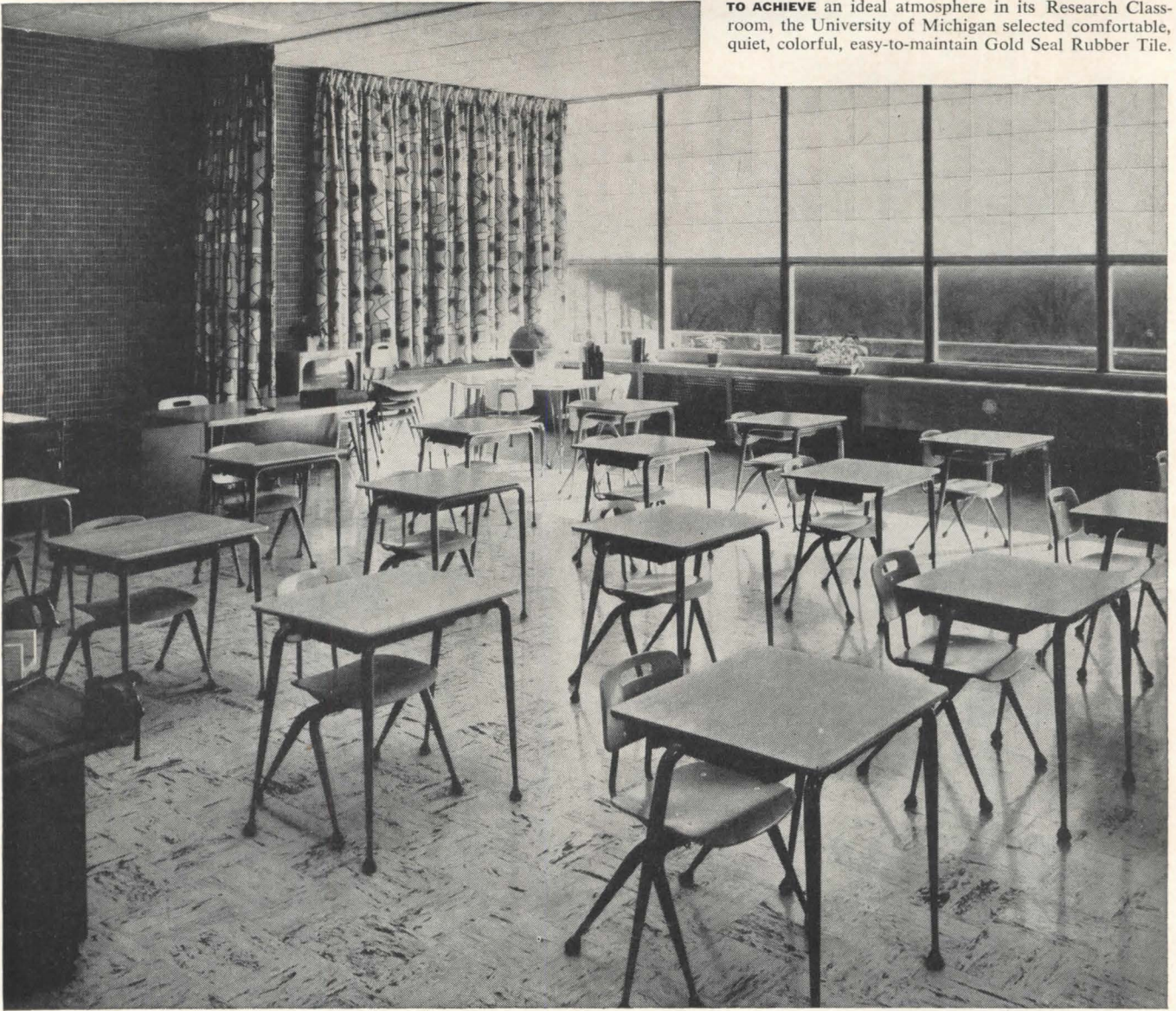
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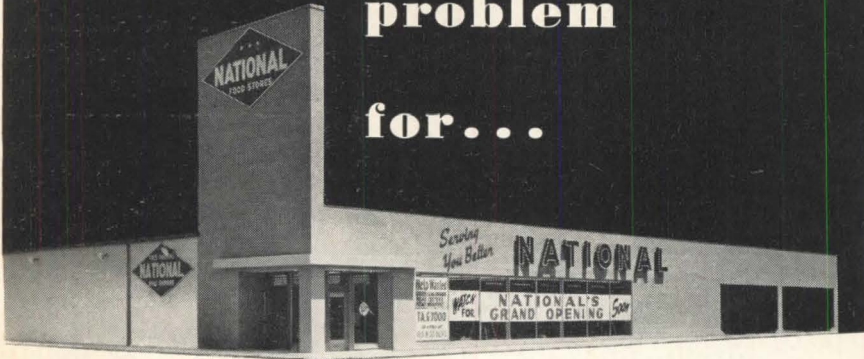
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WASHINGTON

(Continued from page 310)

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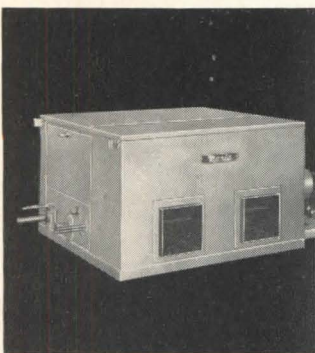
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cated to safeguarding and expanding the program.

Members, who meet with the new Title I director, Cyrus B. Sweet, former president of the National Retail Lumber Dealers Association, are: Allen R. Cobb, Irving Trust Company, New York; Fred W. Heitman, Jr., Northwest National Bank of Chicago; George P. Spiczak, Home Federal Savings and Loan Association, Chicago; R. T. Mayfield, First National Bank of Fort Worth; G. Merritt Robbins, First Banccredit Corp., St. Paul; D. Z. Albright, Security-First National Bank, Los Angeles; W. L. Johnson, Construction Finance Company, Boise, Idaho; and Joseph Wood, Johns-Manville Corp., Chicago.

"Workable Program" Defined

The most important news on the urban renewal front came from the office of Administrator Cole in the form of an 11-page circular "How Localities Can Develop a Workable Program for Urban Renewal (The Prerequisites For Certain Federal Aids)."

The new housing law provides that a community must present to the Administrator for his approval a "workable program" to eliminate slums and prevent their future development before it can qualify for Federal loans and grants for new slum clearance and urban renewal projects; for special FHA mortgage insurance to renew deteriorating neighborhoods and provide low-cost housing for displaced families; and for low-rent public housing.

Seven "essential objectives" of a "workable program" are listed and explained in the circular. As summarized by HHFA they are:

1. *Codes and ordinances.* The community must have in effect or commit itself to the adoption of a comprehensive system of codes and ordinances which prescribe adequate minimum standards of health, sanitation and safety under which dwellings may be lawfully occupied.

2. *A Comprehensive Plan for Community Development,* including as a minimum a land-use plan, a thoroughfare plan, and a zoning ordinance; and a provision for current revisions to meet

(Continued on page 314)

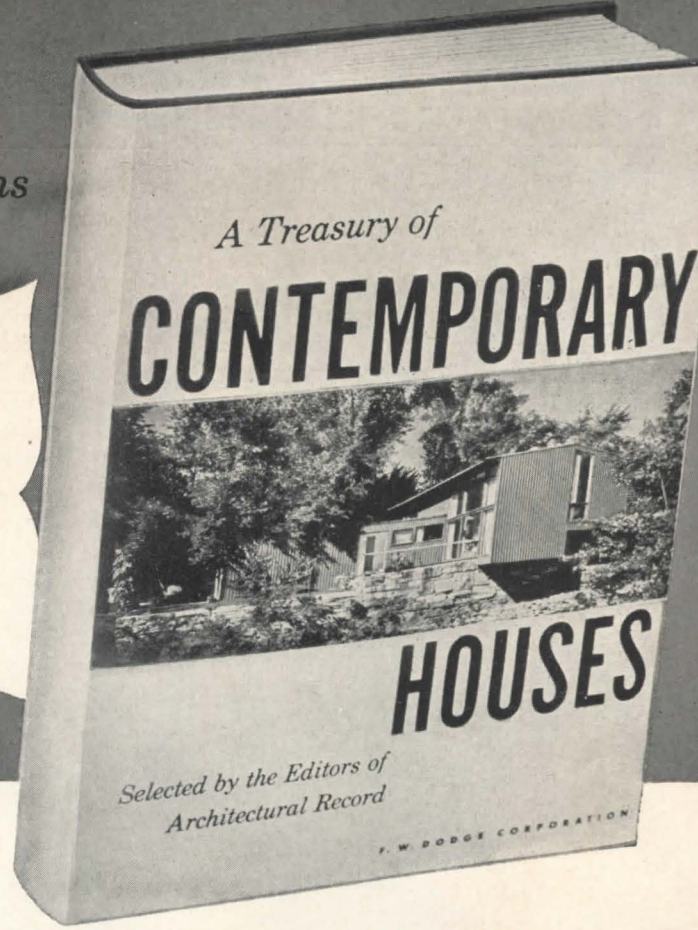
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**220 Pages • 8¾ x 11½ • Over 600 Illustrations • \$5.95**

*To convey the spirit of this book we herewith reprint in its entirety the introduction written by Emerson Goble, managing editor of Architectural Record:*

"House design today is in a state of delightful confusion. Confusion because ideas seem to change so rapidly, or maybe because there are so many ideas, so many new things to work with. Delightful because we want our houses to be delightful. You might even say that delight is the current fashion.

"Our forefathers—unnumbered generations of them—might laugh at the idea of delight being a current fashion. The age-old summary of architecture speaks of 'commodity, firmness and delight.' But it is still true that architecture has newly discovered the word, or at least has new visions of its realization.

"It is important to realize that this represents a step forward, not backward. When contemporary architecture, many years ago, began

sweeping out the sentimental litter of by-gone styles, it was going forward. It was recognizing that ancient styles, beautiful as they were in their day, were anachronisms in our time. They were merely stage settings. They did not satisfy our intellect, and if they satisfied our emotions, weren't we a little mixed up?

"So architects set about developing an architecture that would satisfy our sharpened intellects. They began developing new forms, new materials and techniques, new esthetics, new combinations of space, new ways to design houses for their purposes.

"What's new is not the negation of all that. It is rather the conscious effort to use it all for the delight of man's soul. *It's as simple as that.*

"A noteworthy result is variety. And what could be more delightful in house design than variety? Why should a modern house have to have a flat roof? Or a glass wall? Or an open kitchen? Why should it have to have its structure exposed? Why shouldn't it have anything its owners really want, including a curve or two, even a Victorian curve?

"Well, that's where modern architecture is today. That is why incidentally, there is much variety in the houses in this book. All are modern. All were considered good enough to publish in ARCHITECTURAL RECORD. All are very recent selections. But not all take their academic theory in the same doses. What's more to the point, all have ideas in them, and nowadays there is no dogma, intellectual or otherwise, against using whatever ideas may appeal to you."

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changing conditions and to serve future needs of the locality.

3. *Neighborhood Analyses.* To determine the causes and conditions of blight in neighborhood areas throughout the community, and to study the means of correction.

4. *Administrative Organization.* The community must have a firmly estab-

lished administrative responsibility and capacity for both effective enforcement of codes and ordinances and the carrying out of desired renewal projects.

5. *Financial Capacity,* to insure the community's ability to meet financial requirements under its urban renewal program, with respect to both current operating expenses and capital outlays.

6. *Housing Displaced Families,* to facilitate the rehousing of such displaced families in decent, safe and sanitary accommodations.

7. *Full-fledged Citizen Participation,* to begin at the time planning of the program is initiated and to include representatives of business, professional, labor, welfare, religious, educational and minority group interests in both the community as a whole and in slum and blighted areas.

The new requirements are not retroactive and therefore do not apply to commitments made under the old housing act.

**MPRs for Low-Cost Homes**

Minimum property requirements for low-cost homes financed under Section 203(i) of the new housing act are set forth in a 12-page booklet recently issued by FHA.

To be eligible for FHA's low-cost housing mortgage insurance, a dwelling must be a complete structure, with permanent partitions, providing at least two "livable" rooms and a bathroom, must be adequate for year-round occupancy, and must comply with established requirements for a single-family residence under standard FHA regulations. The same services and facilities are required; principal differences occur in allowance of greater latitude in lot area, room size and completeness of interior finish — to keep original costs down, the buyer may, after purchase, add landscaping, interior decorating and the finished floor. But FHA Commissioner Mason emphasized that a mortgage on a so-called "shell" house, consisting of four walls and a roof, is no longer insurable under this program.

Houses built to sell under the program must meet three requirements other than the need for housing. They are: suitability of location, appropriateness in regard to general community standards, and impracticability of financing under FHA's standard single-family house program.

**New FHA Regulations**

Safeguards against the kind of practice which produced the Federal Housing Administration "scandals" exposé earlier this year have been written into the new FHA regulations, according to Commissioner Norman P. Mason.

(Continued on page 316)



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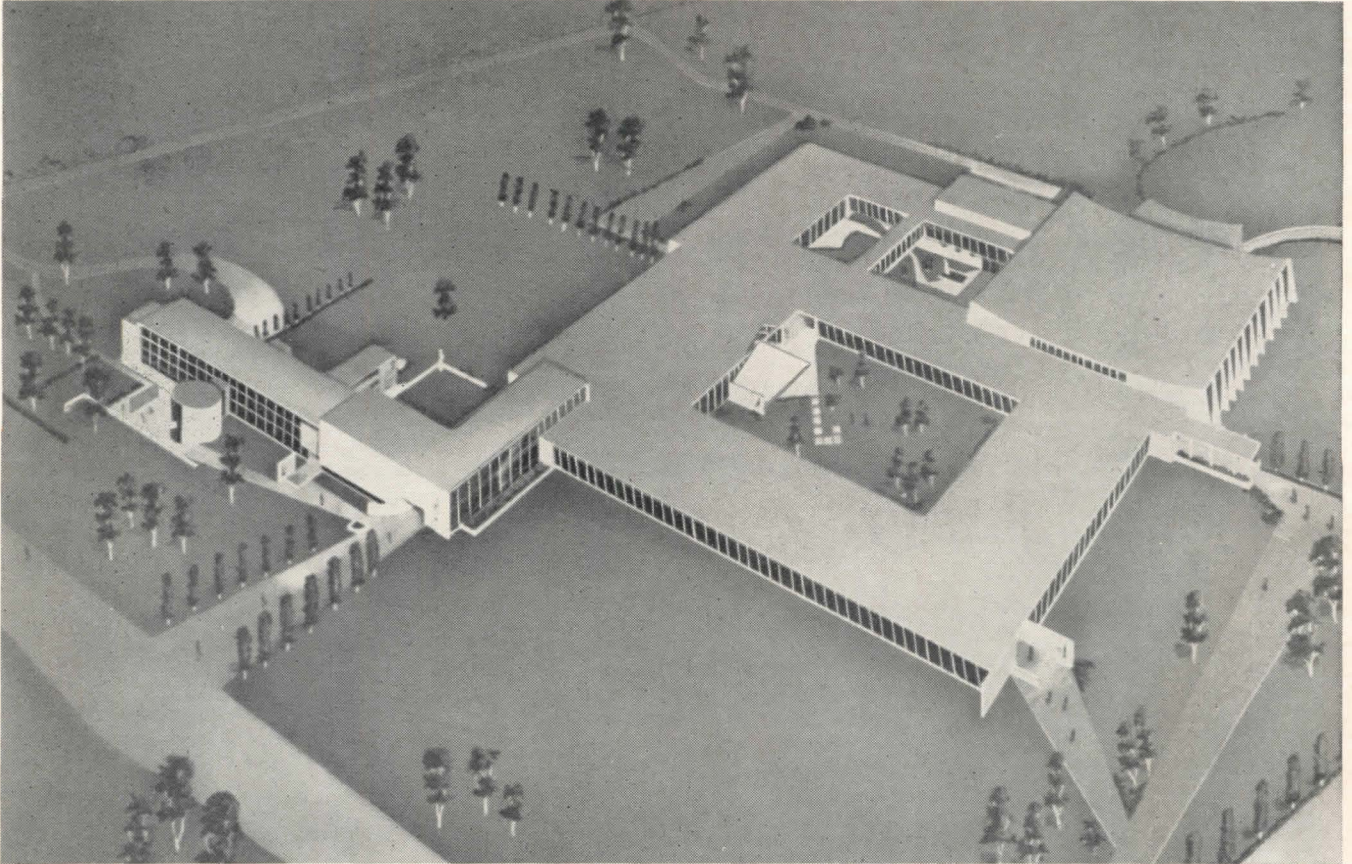


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General Contractors: J. W. Snyder, Chicago, Ill.



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In issuing the regulations on Section 207, the rental housing part of the act, Mr. Mason stressed that the rules had been tightened up sufficiently to prevent the mortgaging out on these projects and the accumulation of windfalls such as those aired in the government's own investigation of FHA and the Senate Banking Committee probe.

Under the new regulations, mortgages in most instances cover 80 per cent of the estimated value of the project. As an incentive to low-cost housing construction, this ratio is permitted to rise to 90 per cent of the value, if the property averages two bedrooms per unit or more.

A mortgagor's certificate of actual

cost now must be submitted to the agency when the property's physical improvements are completed. This must be to the satisfaction of the Commissioner and occur before final endorsement of the loan insurance.

These certificates must list the cost to the mortgagor of the architect's fees, off-site public utilities and streets not included in the general contract. The form also calls for an indication of the cost of organizational and legal work as well as some other items of expense. When the work is finished, the certificate must set out all these costs plus a builder's fee.

In addition, mortgagors are required to submit to FHA a certification of all actual costs paid for labor, materials and subcontract work under the general contract exclusive of the builder's fee and less any kickbacks, rebates, trade discounts and similar payments to the builder or mortgagor corporation.

Commissioner Mason said his new regulations would require the owners of rental housing projects to have "substantial investments" in them.

Another safeguard appearing in the new rules is the requirement that mortgage amounts be reduced if the FHA estimates of value prove to have been too high. It reads: "If the principal obligation of the mortgage exceeds the applicable statutory percentage of this total amount, the mortgage shall be reduced by the amount of such excess prior to final endorsement for insurance."

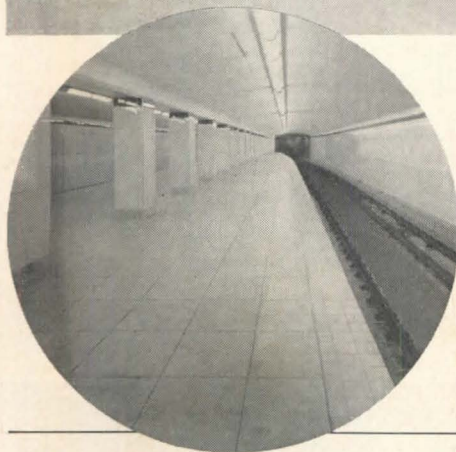
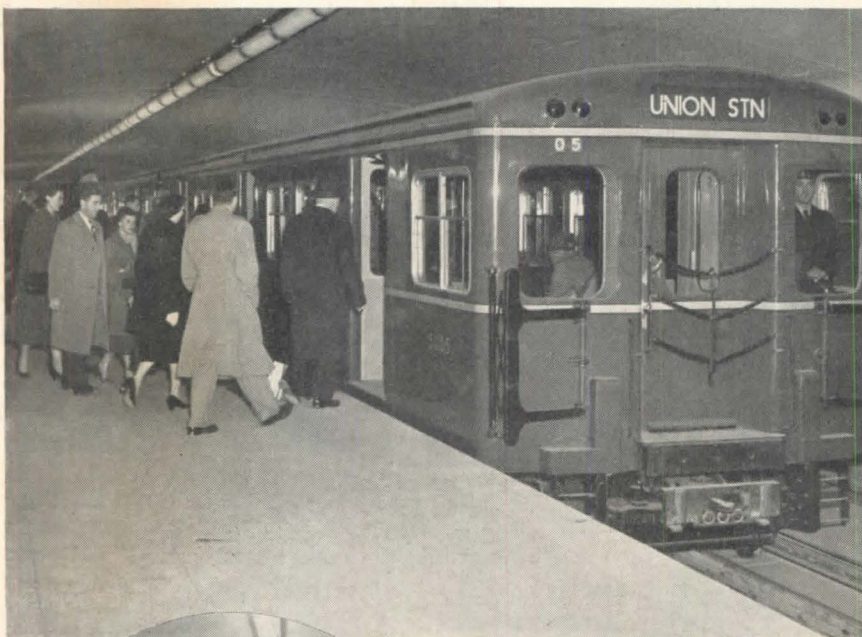
A limitation of \$5 million on any principal obligation involved in these rental projects continues in force. The per room limitation is set at \$2000, and the per family unit ceiling at \$7200. In case of elevator types, however, the Commissioner can approve increases to \$2400 and \$7500 respectively to cover added cost.

Where the mortgagor is a Federal, state, or municipal corporate group, or a limited dividend or redevelopment corporation formed under and restricted by Federal or state statutes or regulations as to rents, etc., the limit on any principal obligation can go up to \$50 million.

The new regulations specifically forbid use of 207's for hotel purposes. This results from objections voiced by hotel and motel men before Congressional committees; protests that the conversion of FHA-insured rental housing to these

(Continued on page 318)

**Where foot traffic is heavy,  
make your terrazzo *Non-slip* and *Wear-resistant*  
with ALUNDUM AGGREGATE**



**... non-slip, wet or dry!**

Everybody is in a hurry in a subway. Slipping accidents can happen, and often — but here in the new Toronto subway, Norton ALUNDUM Aggregate in terrazzo has made the station floors and ramps non-slip in all kinds of weather . . . . And, there is a money-saving factor too, because the hardness and toughness of ALUNDUM Aggregate assures years and years of life for the terrazzo even with heavy subway traffic.

Write for information or see our catalog in Sweet's

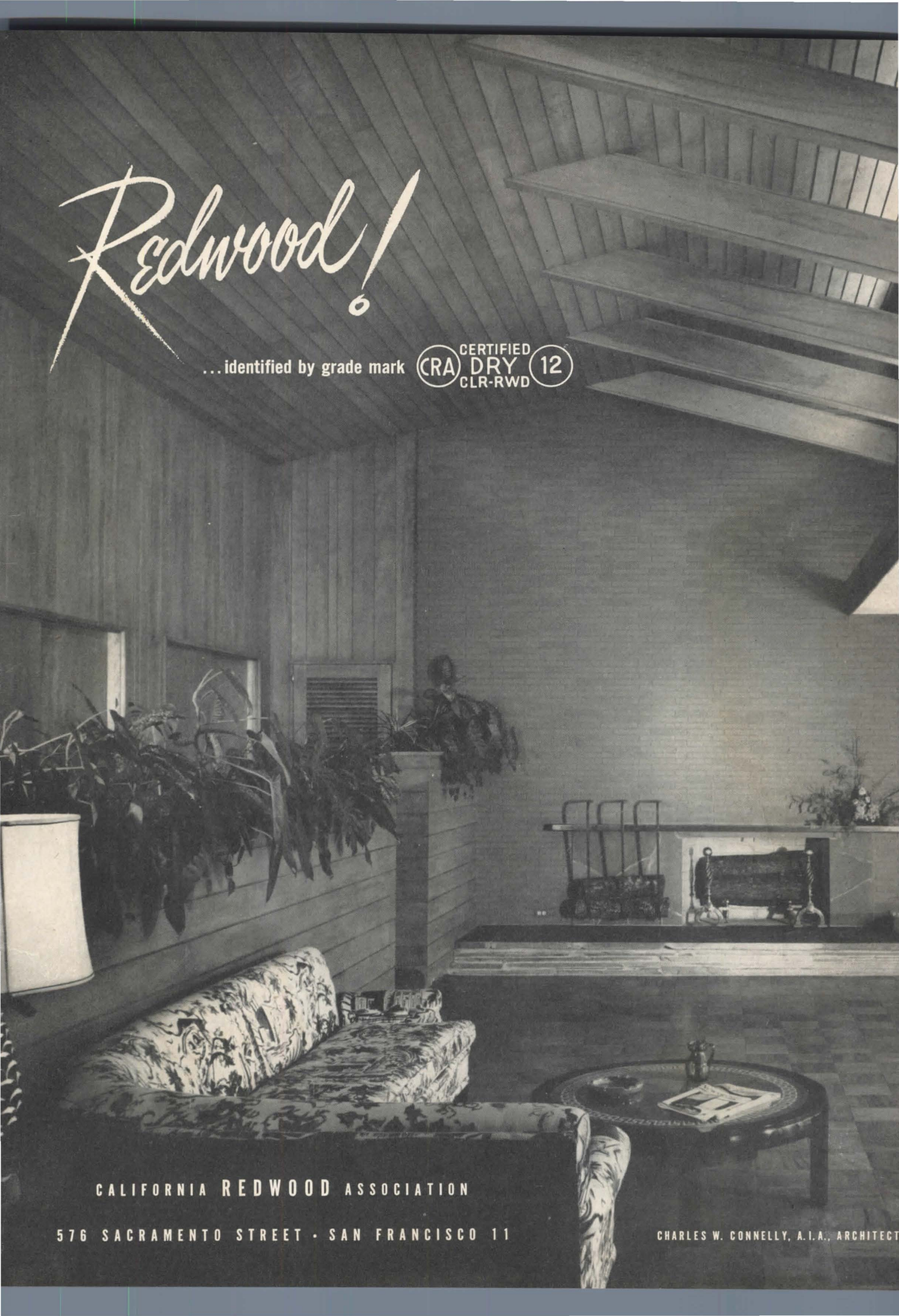


★ NORTON COMPANY ★  
WORCESTER 6, MASSACHUSETTS

*Making better products...to make other products better*

# Redwood!

...identified by grade mark  CERTIFIED DRY  CLR-RWD



CALIFORNIA REDWOOD ASSOCIATION

576 SACRAMENTO STREET • SAN FRANCISCO 11

CHARLES W. CONNELLY, A. I. A., ARCHITECT

purposes was hurting their business.

The first of the new FHA rules came in record time—just a week after President Eisenhower signed the new 1954 housing measure. Also with built-in safeguards, these guides for sales housing were designed to carry out the Administration's program to enable more American families to live in better homes, the FHA chief said. He considered the

chief new privilege to be the lower down payment requirement.

The new loan-to-value ratio permits an insured mortgage in the amount of 95 per cent of appraised value up to \$9000 plus 75 per cent of the value in excess of \$9000, up to a total mortgage value of \$20,000. Repayment terms are boosted to 30 years, bringing lower monthly payments.

The regulations also establish ceilings on fees the lender may charge the buyer of both new and existing houses. In the case of the open-end advance, the lender can charge \$25 or one per cent of the loan, whichever is lesser, plus customary costs and fees which the lender may recover.

The seller or builder is required to deliver to buyer, prior to sale, a written statement setting forth the FHA's appraised value of the property. This provision in the law worried builders very much until FHA devised a plan to aid those making sales before an FHA appraisal can be obtained. Applications based on existing sales contracts or contracts to be executed can be processed if they contain a specific amendment. Mortgages insured and commitments issued before August 2, effective date of the act, are not affected.

The contract amendment specified by FHA:

"It is expressly agreed that, notwithstanding any other provision of this contract of sale, the purchaser shall not be obligated to complete the purchase of the property described herein with a mortgage loan to be insured by the FHA or to incur any penalty by forfeiture of earnest money deposits or otherwise as a result of the exercise of his rights under this provision, if, within seven days after the seller delivers to the purchaser a written statement setting forth the appraised value of the property as determined by the FHA Commissioner (which statement the seller hereby agrees to deliver to the purchaser promptly after such appraised value determination is made available to the seller), the purchaser notifies the seller in writing that he does not desire to complete the purchase of the said property with a mortgage loan to be insured by the FHA."

This means that the sale can be closed without the FHA appraisal contingent upon the buyer's privilege of withdrawing if he wants to after he sees the FHA appraisal figure.

Builders and sellers of new homes now also must deliver to the buyer a builder's warranty that the dwelling was constructed in substantial conformity with the plans and specifications on which the FHA valuation was based.

Section 213 — the new FHA rules governing cooperative housing try to close the loopholes that have permitted so many abuses under this program in recent years. The builder, or other mortgagor of such construction, now must certify as to actual cost when each man-

(Continued on page 320)

WHY A  
NECA  
QUALIFIED  
ELECTRICAL  
CONTRACTOR?



There are good reasons for an architect or engineer to look for the seal identifying a member of the National Electrical Contractors Association. Here are just four of these reasons:

- 1 **A WRITTEN GUARANTEE**, covering parts and workmanship.
- 2 **PRACTICAL INTERPRETATION** of your plans to insure the end-result performance you specify.
- 3 **COMPETENT SUPERVISION**, on the job, by men who know electrical products, practices, standards, and codes.
- 4 **SKILLED MANPOWER**, an adequate pool of craftsmen, trained from apprenticeship up, for any size job.

And there are more good reasons why you will find it profitable to discuss your next job with your Qualified Electrical Contractor. You'll find his name under the NECA Seal in your Classified Telephone Directory.

**NATIONAL  
ELECTRICAL  
CONTRACTORS  
ASSOCIATION**

610 Ring Building  
1200 18th Street N.W.  
Washington 6, D. C.

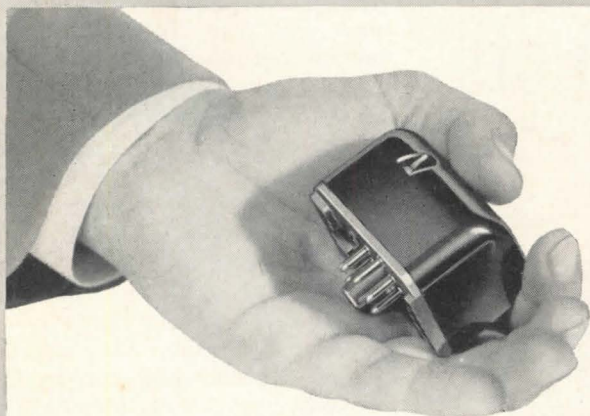




# Electronic Controls

...provide most advanced control systems known today

Hitherto unknown flexibility in control of temperature and humidity is now yours with Barber-Colman's extensive developments in electronic circuits. Fortunately, Barber-Colman started in electronics way back in 1926, when the radio-controlled garage door was pioneered. Then came process controls for textiles, electronic devices for aircraft. From the air, as it were, came the MICRORELAY used in d-c bridge circuits for planes. This ultra sensitive relay is the "heart" of the Barber-Colman amplifier—it reduces number of tubes, substantially decreases plate voltages on tubes (thus increasing tube life), provides stability, maintains control point at 0 volts, is plug-in type for easy servicing. Best of all, the Microrelay requires approximately 1000 times less power than conventional relays. Here are just a few from the wide range of Barber-Colman electronic devices:



d-c MICRORELAY . . . ultra-sensitive relay—secret of Barber-Colman's superior amplifier!

## Electronic Hot Water Controls

FOR OUTDOOR RESET

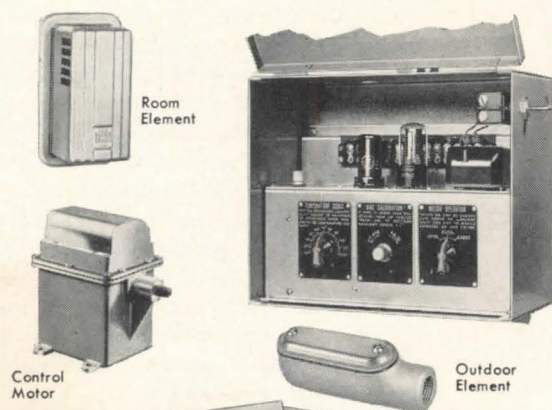


←Adjustable Ratio Electronic Control Panel

The most flexible hot water control on the market →

## Electronic Temperature Controls

FOR HEATING, VENTILATING AND AIR CONDITIONING



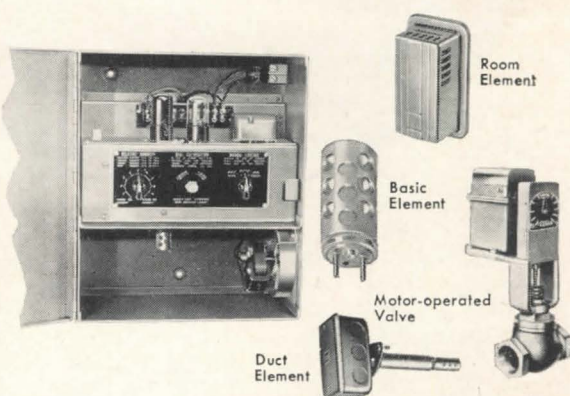
Room Element

Control Motor

Outdoor Element

## Electronic Humidity Controls

FOR HUMIDIFYING AND DEHUMIDIFYING SYSTEMS



Room Element

Basic Element

Motor-operated Valve

Duct Element



**LITERATURE KIT**—get latest data bulletins, plus application drawings in this complete electronic literature kit now available to you for the asking. Call our nearby Field Office, or write today.

**ENGINEERING ASSISTANCE**—in your nearby Barber-Colman Field Office are engineers ready and willing to help you design the very best electronic, electric, or combination electronic-electric control system for each job. Call upon these experts for assistance on control problems.

## BARBER-COLMAN COMPANY

Dept. K, 1304 Rock St., ROCKFORD, ILL., U. S. A. Field offices in principal cities

Automatic Controls • Air Distribution Products • Industrial Instruments  
Aircraft Controls • Small Motors • Overdoors and Operators • Molded Products • Metal Cutting Tools • Machine Tools • Textile Machinery

agement-type cooperative project is completed. A similar regulation has been placed in effect for rental housing projects built with FHA insurance assistance. In the case of co-ops, the mortgage amount will be calculated on the basis of 90 per cent of the estimated value of the project, or 95 per cent if there is 65 per cent (or more) veteran participation. When the job is completed, the mortgage

amount will be adjusted if necessary so that it will not exceed 90 per cent (or 95 per cent) of the actual certified cost.

Individual and row-type homes, under the sales project program, continue to be eligible for government-insured financing on a cooperative basis, with the added provision that the purchasers will now receive an FHA appraisal of value and a builder's warranty that the prop-

erty was constructed in substantial conformity with FHA-approved plans and specifications.

The increased mortgage amounts and the liberal mortgage terms of 40 years on a level annuity basis make housing under 213 possible at lower monthly carrying charges. These charges now are based on actual cost of operation, without any provision for landlord's profit or risk. Co-op housing is available to any group of 12 or more qualified persons who band together to provide housing for permanent occupancy of members of the group. They may construct individual homes which will become individually owned by the members at the completion of the project, or participate in cooperative ownership and operation of an apartment structure.

*Title I*—the new regulations on Title I home improvement loan operations also seek to prevent recurrence of recent abuses. Most important new features: lenders are required to take a 10 per cent participating risk along with FHA's 90 (formerly 100) per cent; all dealers must be approved by lenders on uniform blanks distributed by FHA; owners will no longer be able to pyramid loans beyond the \$2500 maximum allowed for a single loan; and criteria governing improvements eligible for loans have been set up.

Proceeds of a loan must finance "alterations, repairs and improvements . . . which substantially protect or improve the basic livability or utility of the property." The regulations specifically list as ineligible for Title I loans: barbecue pits, bathhouses, burglar alarms, burglar protection bars, door opening and closing devices, dumbwaiters, fire alarms or fire detecting devices, fire extinguishers, flower boxes, grading and landscaping, greenhouses, hangars (airplane), kennels, lawn sprinkling systems, outdoor fireplaces or hearths, penthouses, photo murals, radiator covers or enclosures, stands, steam cleaning of exterior surfaces, swimming pools, television antennae, tennis courts, tree surgery, valance or cornice boards, venetian blinds.

Architectural and engineering services are allowed.

**About that Backlog —**

Fee appraisers engaged in private business will be used "as a temporary measure to improve FHA service" till the mounting backlog of home buyers' applications for mortgage insurance has been erased. Commissioner Mason announced the move last month.

(More news on page 322)

# Michaels Quality Products

FOR YOUR BUILDING PROJECTS



Michaels produces aluminum, stainless steel and bronze products for the building industry. The bronze railing used in the Huber Mausoleum, New Orleans, is a typical example. And there are literally scores of other products for interior and exterior use.

Whatever you need, if it's made of stainless steel, aluminum or bronze, and irrespective of the size of the project, it will pay you to contact Michaels . . . a name well known among architects and builders for products of the highest quality. Michaels has the men and equipment to faithfully reproduce in metal the most intricate details of your designs.

Send us the specs. for your next job. We are confident you will find our prices right. And we'll be glad to refer you to any number of architects and contractors who have found Michaels a thoroughly reliable source of supply.

## The Michaels Art Bronze Co., Inc.

234 Scott Street, Covington, Ky.

Manufacturers since 1870 of many products in Aluminum, Bronze and other metals



**MICHAELS PRODUCTS**

- Bank Screens and Partitions
- Bronze Doors
- Aluminum Doors
- Elevator Doors
- Store Fronts
- Name Plates
- Grilles and Wickets
- Kick and Push Plates
- Push Bars
- Cast Thresholds
- Lettering
- Check Desks (standing and wall)
- Lamp Standards
- Marquees
- Tablets and Signs
- Extruded Thresholds
- MI-CO Parking Meters
- Museum Trophy Cases
- Inurnment Urns
- Stair Railings

Literature on any or all Michaels products will be sent on request.



## ...but how does your school design sound?

Your renderings and prints show the school board how the project will look, but what about the control of clamor in classrooms or gymnasiums?

When you're looking for a sound buy to fit the budget, remember . . .

### Only Fiberglas\* Sound Conditioning delivers all these values:

1. **Acoustical Value.** High noise reduction coefficient—up to .90—equal or superior to any material for quiet classrooms.
2. **Fire-Safety.** Easily meets all school building safety codes. Carries the Underwriters' Laboratories label service.
3. **Beauty.** The most complete fire-safe line of decorative textures, patterns and colors. High light reflection for bright, airy rooms and halls.
4. **Permanence.** Dimensionally stable as a window pane. Will not warp, buckle, expand or contract under varying temperatures and humidity. Odor-proof, rot-proof, sanitary.
5. **Maintenance.** Easily cleaned by standard maintenance methods. May be sprayed or brush-painted.
6. **Low Cost.** Actually the *lowest* cost fire-safe ceilings available. Lightweight, easy to install and maintain. Provides added thermal insulation, helps save on fuel bills.

Owens-Corning Fiberglas Corporation, Toledo 1, Ohio.

\*Fiberglas, Sonofaced, Stria and Noise-Stop are trade-marks (Reg. U. S. Pat. Off.) of Owens-Corning Fiberglas Corporation.

OWENS-CORNING

**FIBERGLAS**

TM REG. U.S. PAT. OFF.

### SOUND CONTROL PRODUCTS

- Textured, Perforated, Sonofaced\*, Stria\* Acoustical Tile
- Textured, Sonofaced Ceiling Board • Noise-Stop\* Baffles

ON THE CALENDAR

November

- 1-3 National Motel Show: exhibition of items used in the construction and maintenance of motels — Morrison Hotel, Chicago
- 1-5 National Fall Meeting, American Welding Society — Sherman Hotel, Chicago
- 3-5 Annual Convention, Texas So-

ciety of Architects — Texas Hotel, Fort Worth, Tex.

- 3-6 Annual Meeting, American Council of Commercial Laboratories — Roosevelt Hotel, New Orleans
- 6-10 Annual Convention, Structural Clay Products Institute — Hotel de Coronado, San Diego
- 6-11 The 47th Annual Convention, National Association of Real Estate Boards — Cleveland

- 7-8 Annual Meeting, Association of Urban Universities — Pittsburgh
- 8-12 The 39th National Hotel Exposition — Kingsbridge Armory, New York City
- 10-12 Short Course on Church Architecture, offered by the Department of Architecture, College of Fine and Applied Arts — University of Illinois, Urbana, Ill.
- 10-12 The 18th National Time and Motion Study and Management Clinic, Industrial Management Society — Hotel Sherman, Chicago
- 13-14 Great Lakes A.I.A. Regional Meeting
- 15-16 Annual Convention, National Building Material Distributors Association — La Salle Hotel, Chicago
- 15-16 Fifth National Conference on Standards, American Standards Association — Hotel Roosevelt, New York City
- 18-20 Conference on air conditioning and commercial refrigeration sponsored by the Air-Conditioning and Refrigeration Institute with the coöperation of Refrigeration Service Engineers Society — Minneapolis
- 18-20 Annual Convention, Florida Association of Architects — La Coquille Hotel, Palm Beach, Fla.
- 21-23 National Convention, Scarab Architectural Fraternity — School of Architecture and the Arts, Alabama Polytechnic Institute
- 28ff Annual Convention, American Municipal Association; until Dec. 1 — Philadelphia
- 28ff Annual Meeting, American Society of Mechanical Engineers; until Dec. 3 — New York
- 29ff First International Automation Exposition: exhibit on automatic machines, factories and industries under the direction of Richard Rimbach; until Dec. 3 — 242nd Coast Artillery Armory, 14th St. off Sixth Ave., New York City

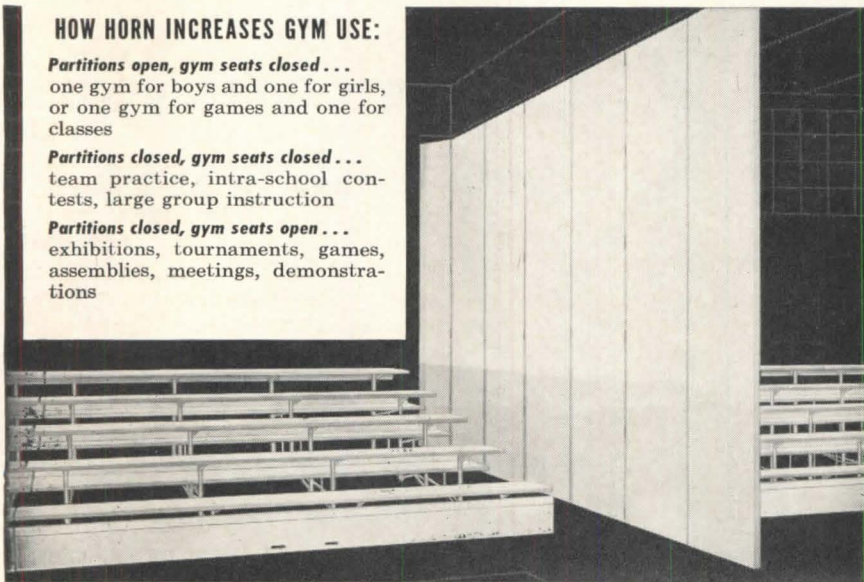
Horn Equipment... for multi-gym use with ease!

HOW HORN INCREASES GYM USE:

**Partitions open, gym seats closed...**  
one gym for boys and one for girls, or one gym for games and one for classes

**Partitions closed, gym seats closed...**  
team practice, intra-school contests, large group instruction

**Partitions closed, gym seats open...**  
exhibitions, tournaments, games, assemblies, meetings, demonstrations



Yes, now your every need for gym use can be met without back-breaking work. Just install Horn Folding Partitions and Gym Seats!


Electrically-operated Horn Partitions give you two gyms with a flick of the finger! In approximately two minutes, they unfold smoothly and silently, seal space between door and floor, lock securely in place without bolts. When the full gym is needed, they fold into compact, space-saving units... as easily as they are opened.

Spectators, even the tallest, cheer the ample leg-room and chair-height comfort of Horn Gym Seats. When folded, they use little valuable floor space and protect players with smooth, sloping surfaces.

Horn Gym Seats extend quietly in one continuous motion through the

telescoping principle. And each row automatically locks as it opens. To close, seatboards rise to an upright position and practically fold all by themselves.

Horn maintains a design engineering service to help solve your problem in gymnasium flexibility. And Horn Equipment is custom-installed by factory-trained men. Why not write for the name of your nearest Horn representative?



Seen the big, new catalog on Horn Folding Classroom Wardrobes? Send for your free copy today!



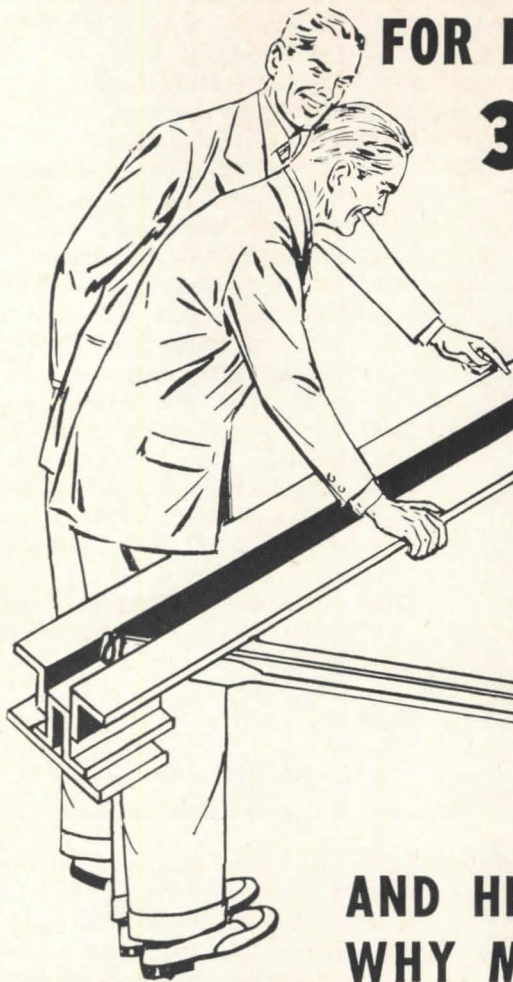
Horn School Equipment Division of  
**THE BRUNSWICK-BALKE-COLLENDER COMPANY**  
 623 South Wabash Avenue • Chicago 5, Illinois

December

- 2-7 The 21st National Exposition of Power and Mechanical Engineering, sponsored by the American Society of Mechanical Engineers — Commercial Museum, Philadelphia

(Continued on page 324)

# HERE IS STRENGTH- AS ENGINEERED BY MACOMBER FOR EACH LOAD AND SPAN 32' TO 96'



THESE LONGSPANS ARE DESIGNED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE STEEL JOIST INSTITUTE AND THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION

THE MACOMBER V SECTION USED IN TOP AND BOTTOM CHORDS OF STEEL JOISTS SINCE 1946 GIVES THE BUYER THE SAME PROVED STRENGTH OF CHORD MEMBERS IN THE WEB SYSTEM OF MACOMBER LONGSPANS.

## AND HERE IS THE CATALOG THAT SHOWS WHY MACOMBER LONGSPANS ARE THE DESIGNER'S CHOICE



YES — Macomber provides AMPLE load carrying capacity without excessive weight. This new catalog gives you design data whenever and wherever you frame in those "wide open spaces." Send for this catalog. It will give your designing-specifying team the latest — the best selection for any Longspan job. Design with Macomber Longspans. Get our estimate and you're in!

ORIGINATORS OF THE

OPEN WEB STEEL JOIST

STANDARDIZED STEEL  
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BUILDING PRODUCTS  
STEEL TRUSSES • STEEL DECK

# MACOMBER INCORPORATED

CANTON 1, OHIO

• ENGINEERING • FABRICATING AND ERECTING •

9 Conference on modular coordination, sponsored by the Building Research Institute — National Academy of Sciences Building, Washington, D. C.

1955

January

4ff 1955 Good Design Exhibition, newest edition of the continuing

exhibition sponsored by the Museum of Modern Art, New York, and the Merchandise Mart, Chicago; throughout the year — The Merchandise Mart, Chicago

7-11 First National Retail Industry Show, sponsored by the Store Modernization Institute — Madison Square Garden, New York City

16-20 The 11th Annual Convention, National Association of Home Builders — Conrad Hilton and Sherman Hotels, Chicago

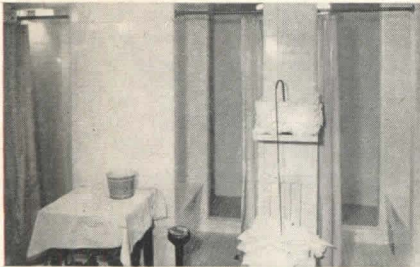
24-27 The 61st Annual Meeting, American Society of Heating and Ventilating Engineers — Benjamin Franklin and Bellevue-Stratford Hotels, Philadelphia

24-28 International Heating and Ventilating Exposition, sponsored by the American Society of Heating and Ventilating Engineers — Commercial Museum and Convention Hall, Philadelphia

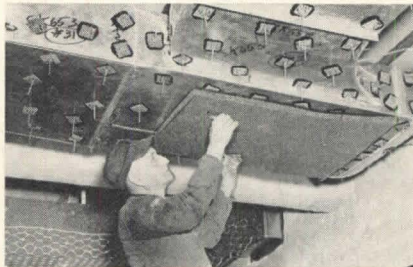
24-27 Sixth Plant Maintenance and Engineering Show — International Amphitheatre, Chicago

26-28 Annual Meeting, Society of Industrial Realtors — Shamrock Hotel, Houston

31ff Winter General Meeting, American Institute of Electrical Engineers — Statler Hotel, New York City



**Setting Genuine Clay Tile** on floors and walls of the Roosevelt Hotel, New Orleans, with the Miracle Thin-Set Method. Can be installed in hotel bathroom without losing even one night's revenue. No heavy construction equipment or bulky setting materials needed. New constructions in the Statler Hotels in Hartford, Conn. and Dallas, Texas, are being installed by the Miracle Method.



**Insulating Ducts.** Plaster applied over wire and cork which has been attached to aluminum ducts using Miracle Adhesive and Miracle Spindle Anchors. (Illustration: John Hancock Mutual Life Insurance Co. Building, Boston, Mass. Architect, Cram and Ferguson. Builder, Turner Construction Co.)

## Get Substantial Savings in Labor and Material

BY NEW MIRACLE "CONSTRUCTION BY ADHESION"® METHODS IN NEW BUILDINGS AND MODERNIZATION



**Insulating Walls and Ceiling by Miracle Surface Anchor Method.** Fibreglas insulation, Type PF-613, 2" thick — bonded to concrete ceiling using Miracle Pronged Anchors. (Illustration: Radio City Studio 3B, New York, N. Y. Contractor, William J. Scully, Inc., New York, N. Y.)



**Installing Floor Runners or Bonding Furring Strips.** Wood runners installed on concrete floors with Miracle Adhesive and Miracle Anchor Nails to support 2" solid partitions. (Illustration: Washington Circle Apartments, Washington, D.C. General Contractor, Charles H. Tompkins Company.)



**FREE:** Write today for 20-page brochure describing Miracle 'Thin-Set' method of installing clay tile. 20 full pages of facts and illustrations showing how to install clay tile quickly, permanently at minimum cost. ALSO, send for colorful, informative brochure on Miracle Anchors, which details savings in man hours and costs by use of the Miracle Anchor Method. Dept. AR

214 E. 53rd Street,

©Miracle Adhesives Corporation New York 22, N. Y.

### OFFICE NOTES

#### Offices Opened

• John K. Cross, Architect, has announced the opening of his office at 911 Kales Bldg., Detroit 26, Mich. Mr. Cross was formerly with the firm of MacKenzie and Cross, Baltimore, and with Harley, Ellington and Day, Inc., of Detroit.

• Alfred Greif Jr., A.I.A., has established offices for the practice of architecture and engineering at 5036 Poplar Ave., Memphis, Tenn.

• Linn Smith, A.I.A., announces the opening of offices at 114 S. Woodward, Birmingham, Mich.

• Allan Wallsworth, A.I.A., has recently returned to practice after a two years absence due to illness. His offices are at 2846 N. Prospect Ave., Milwaukee 11, Wis.

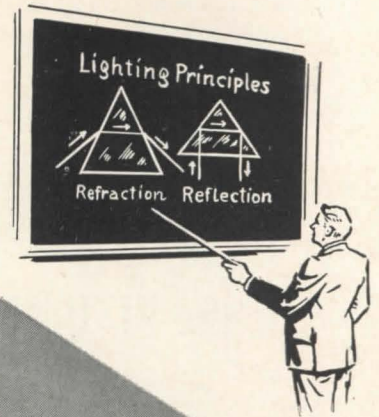
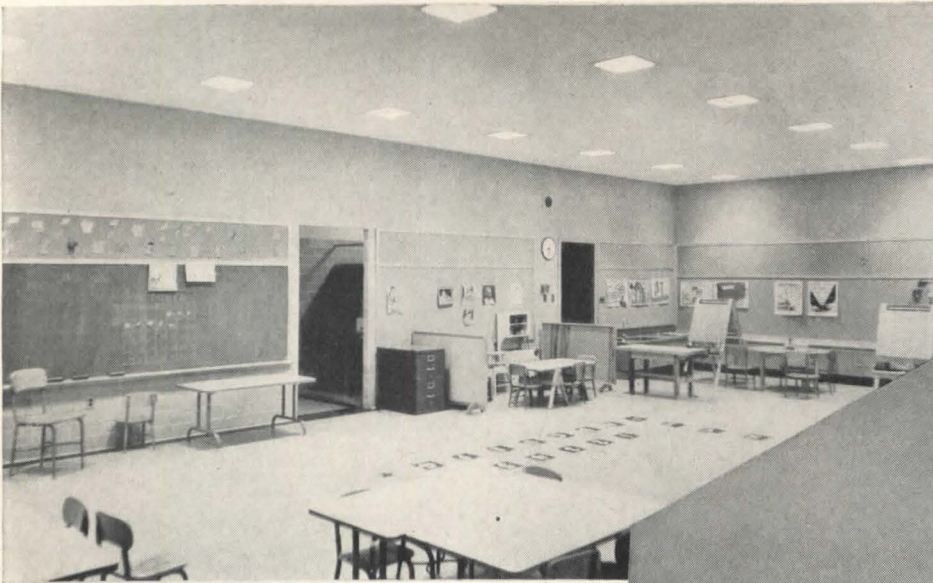
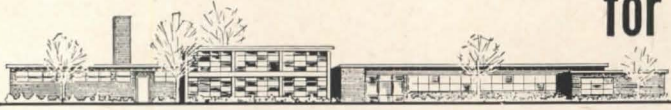
• Hachiro Yuasa, A.I.A., and Dean Price, Architect, have opened an office at 5369 Broadway, Oakland 16, Calif.

#### Firm Changes

• D. W. Budlong Jr. has been appointed Assistant Chief Engineer for the May Engineering Company, Electrical and

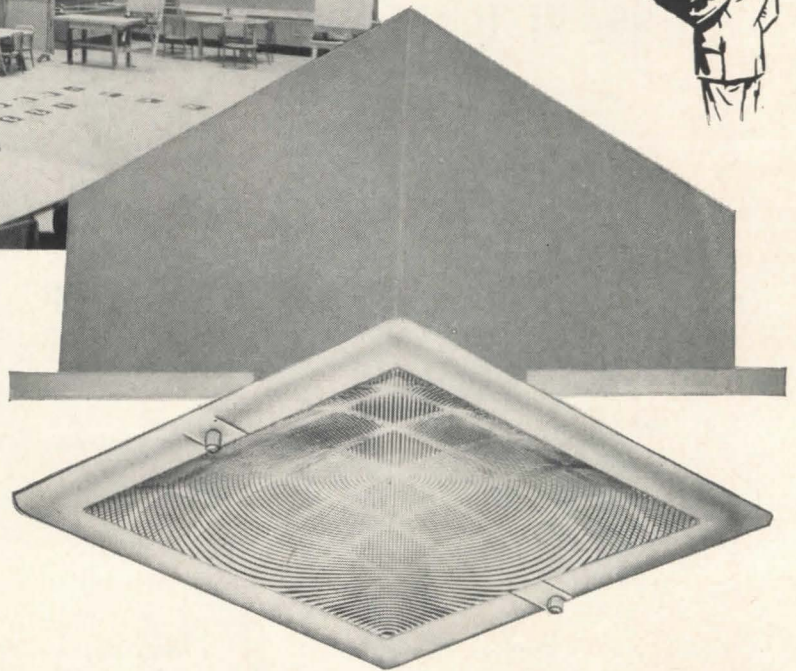
(Continued on page 326)

# HOLOPHANE Develops Scientific Lighting for the LOW CEILING CLASSROOM



## LO-BRITE\* Concave CONTROLENS\* F-1570

Reduced Brightness  
Increased Efficiency  
Greatest Visual Comfort



VISUAL COMFORT TABLE			
VCF Values for 200 Watts			
ROOM WIDTH (in feet)	ROOM LENGTH (in feet)	CEILING HEIGHT	
		10'	13'
20	20	98%	99%
	30	98%	98%
	40	97%	97%
	60	97%	97%
30	40	97%	97%
	60	97%	97%

This table indicates the percentage of normal observers who may be expected to experience visual comfort when seated in the least favorable visual position in the room.

\*Reg. U. S. Pat. Off.

The constant demand for economical construction has spurred a wide-spread trend to the one-story, low-ceilinged school . . . The lower ceilings created a new set of problems, which have challenged the foremost lighting experts. Holophane Engineers, after intensive research, presented the solution in the F-1570 Series, now in use by many new schools across the nation.

Through a new optical design, Holophane F-1570 units offer these advantages:

- (a) They take the *direct glare* out of direct lighting.
- (b) They provide the most effective lighting of the kind needed by teachers and pupils — maximum visibility with highest comfort.
- (c) They cost *less* — because they serve *longer* — at lower operating expense.



## HOLOPHANE COMPANY, INC.

Lighting Authorities Since 1898 • 342 MADISON AVENUE, NEW YORK 17, N. Y.

THE HOLOPHANE COMPANY, LTD., THE QUEENSWAY, TORONTO 14, ONTARIO

Mechanical Consulting Engineers. The firm is located in North Hollywood, Cal.

- Joseph G. Carchidi, Architect, has been admitted as a partner into the firm of Kramer & Hirsch, to be known henceforward as Kramer, Hirsch & Carchidi, Architects. The firm's address is 115 W. State St., Trenton, N. J.
- Lefebvre-Wiggins & Associates, Archi-

itects and Engineers, have opened new offices at 3882 North Teutonia Ave., Milwaukee 6, Wis. The firm was formerly known as Gregory G. Lefebvre & Donald C. Wiggins.

- Swaim & Allen, Architects, have announced the association of John C. Wellborn, A.I.A., with the firm. They are located at 331 Gazette Building, Little Rock, Ark.

- Ward Thomas, Architect, recently announced that M. H. L. Sanders Jr. has joined his office as an associate. New offices have been opened at 133 Kearny St., San Francisco, Calif.

- George Roberg Thompson, formerly city engineer for Detroit, has been appointed to the executive staff of Giffels & Vallet, Inc., L. Rossetti, of 1000 Marquette Bldg., Detroit 26, Mich.

**New Addresses**

- Edward D. Dart, Architect, Room 936, 201 N. Wells St., Chicago 6, Ill.
- James S. De Rose, Architect, 290 E. Sixth St., Clifton, N. J.
- Thomas R. Fahey, A.I.A., 4760 Stuart St., Denver 12, Colo.
- Victor Galbraith, Architect, 702 E. Oak St., Stockton, Calif.
- Donnell Jaeckle, Architect, N. First and Jackson Streets, San Jose, Calif.
- Lester J. A. Julienelle, A.I.A., 241 Orange St., New Haven, Conn.
- H. Vernon Lee, Architect, 1160 Southland Rd., Sylvan Shores, Mount Dora, Fla.

(More news on page 332)

**ADDENDA**

Through a typographical error the advertisement of the Powers Regulator Company on pages 40 and 41 of the September issue of ARCHITECTURAL RECORD failed to credit the following in connection with the Hinsdale, Ill., Sanitarium and Hospital — Architect and Engineers: Fugard, Burt, Wilkinson and Orth; Edward G. Halstead; General Contractors: E. H. Marhoefer Jr. Co.; Contractors: Thomas J. Douglass & Co. (Heating); Charles E. Gazin (Plumbing); Plumbing Fixtures: American-Standard; all of Chicago, Ill.

Since publication of the Fromkin house in its March 1954 issue (page 199), ARCHITECTURAL RECORD has been informed by Harvey L. Koizim, Attorney, of Norwalk, Conn., that the contractors for the residence were David Hall Faile and Company, Westport, Conn.

**Ask the BITUMULS MAN for**  
*specs on paving*  
**...and all uses of Asphalt**

YOU CAN HAVE the specialized experience of a field force of over 80 men in key geographical locations, and a complete library of laboratory and proved field data. We have facts on every phase of asphalt and BITUMULS® asphaltic emulsion work for building and paving.



**SPECIAL BOUND BINDER FOR SPECIFIC JOBS** combines the various basic specifications you need for any particular job into a special binder for your personal use.

**FREE SERVICE**

**AMERICAN BITUMULS & ASPHALT COMPANY**  
200 Bush Street • San Francisco 4, California

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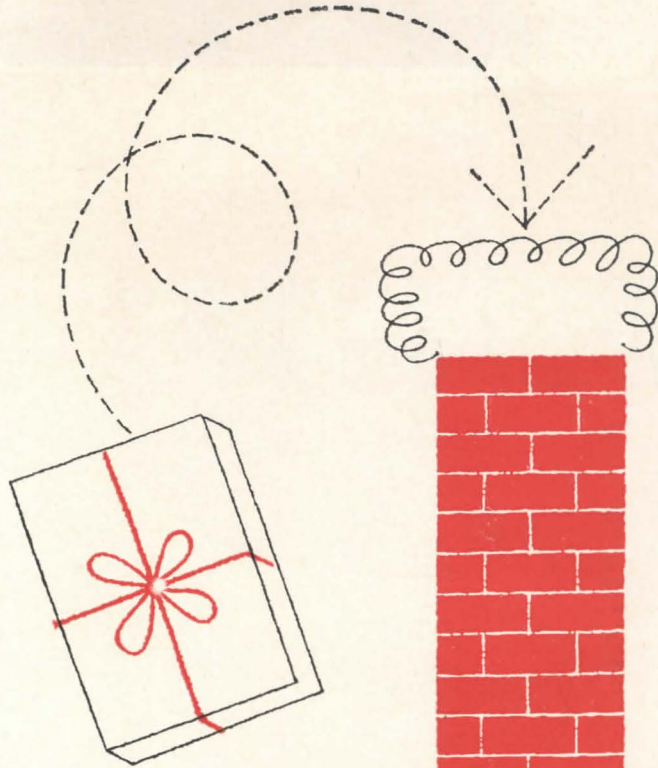
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like a  
book\**



On the following pages you'll find a  
Christmas list of books for your  
friends and associates with a stake  
in the building field



*\* for Christmas!*



Let books convey your  
Season's Greetings  
to friends,  
associates, and clients

### A TREASURY OF CONTEMPORARY HOUSES

by the Editors of *Architectural Record*

Here are 50 architect-designed contemporary houses that have been just recently completed. Selected from plans of thousands of new homes, the houses within these pages are the experts' choice, designed by some of the world's leading architects, the ultimate in modern living.

There is nothing sketchy about this book. Most of the houses are depicted in 10 or more photographs, illustrations and plans. Over 600 superb illustrations accompany a pertinent, lucid text by the editors of the world's leading architectural magazine. The story behind each house is presented simply in its essentials with no frills and no involved technical language.

*A Treasury of Contemporary Houses* has been hailed as the perfect answer to recent critics of contemporary house design. Homeowners and homelovers everywhere will find this new book a stimulating source of ideas for decoration and remodeling, and prospective homeowners would do well to invest in a copy before investing much more in a house. 218 pages, 8¾ x 11½, Illustrated, \$5.95

### TIME-SAVER STANDARDS

3rd Edition 1954

The new edition of this authoritative reference has now been completely revised and brought up-to-date.

Since 1946 *Time-Saver Standards* has served as a working partner to thousands of architects, engineers, designers, builders, and other technicians in the construction field. Users consider this book the one indispensable reference to any and every question of building principle, practice, and procedure. Small houses and towering skyscrapers have been built with its help. As a daily working tool on construction projects of every size, description, and dollar value, *Time-Saver Standards* has saved endless hours of research time, immeasurable extra work, and

many costly mistakes, as well as millions of dollars on construction costs. 888 pages, Illustrated, 9 x 12, \$12.50

### TOWARD BETTER SCHOOL DESIGN

by WILLIAM W. CAUDILL

This new book, written by America's foremost school architect and planning consultant, is a brilliant contribution to common sense and clear thinking in a field of paramount importance to every citizen: school planning and building.

Building costs, the big stumbling-block in nearly all school projects, are thoroughly analyzed from the foundation up. Granting that good schools cost money, the author shows why they often cost *too much money*. There's a fortune in sound ideas to be found here, among them: How to establish strict cost controls; how to save on the building shell; what plan-forms cost the least, and why; how to double-up on spaces; why "cheap" materials are often more expensive in the long run; how to cut expense by using large structural units and modern assembly-line construction methods; where to eliminate expensive waste space; in these and many other ways, Mr. Caudill tells where and how to economize.

To demonstrate how these methods work out in practice, the book includes many case-studies of successful schools designed by Mr. Caudill and others. Each study states the problem involved, how the right approach was used, and what solution was decided upon. All told, this book promises to be the standard reference work of school planning for years to come. 312 pages, 8¾ x 11½, Illustrated, \$12.75

### HOW TO BUILD MODERN FURNITURE

by MARIO dal FABBRO

Vol. I:  
PRACTICAL CONSTRUCTION METHODS  
Vol. II: DESIGNS AND ASSEMBLY

With more than 1500 diagrams,  
well over 100 photographs,

these two books cover every phases of furniture design and construction, from selection of the wood to application of the finish. Text is brief and clear; illustrations do most of the teaching. Each step is pictured in graphic detail, exactly as performed by expert cabinetmakers. Chairs, tables, magazine racks, cabinets, desks, bookshelves, beds, and sofas — all these and many more can be built quickly and easily, at a great saving over their retail cost. Special features include complete sections on care and use of tools — standard furniture measurements — upholstery work — and photographs of pleasing room arrangements.

The set comprises 250 pages, 8½ x 11, and is priced at only \$9.50. Either volume alone, \$6.00

### PRACTICAL HOUSES FOR CONTEMPORARY LIVING

by JEAN and DON GRAF

Displayed in this new book are forty houses with "built-in personalities" — houses that reflect their owners' tastes and living habits like a mirror reflects an image. Selected from all regions of the U. S., they represent many prevailing styles of architecture, and all price ranges from \$7500 up.

There are six categories of dwellings to satisfy virtually all shelter requirements: Houses for One Person; Houses for Small Families; Houses on Limited Plots; Houses on Irregular Sites; and Houses Unlimited (the best that money can buy). Complete plans accompany each set of photos. 194 pages, 8½ x 11¾, \$6.95

### 82 DISTINCTIVE HOUSES


selected from *Architectural Record*

This album of houses is a splendid gift item for any architect, designer, builder and present or prospective homeowner.

On display here are 82 of the finest houses published in *Architectural Record* in the past few years. Each house is depicted in superb interior and exterior photographs which dramatize its design and convey its individuality.

Created by such craftsmen as Pietro Belluschi, John H. Callender, and Paul Thiry, these 82 houses represent a wide range of localities, living habits, personal tastes, and sites. Along with the photographs are complete floor plans, site plans, drawings of structural elements, and design details. Comprising the last 100 pages are *Time-Saver Standards* for Houses, taken from recent issues of the *Record*.

*82 Distinctive Houses* exhibits contemporary home design at its finest in masterworks of America's most gifted architects. 437 pages, 8½ x 11¾, \$8.00



Good books make the best gifts

## ARCHITECTURAL PHOTOGRAPHY OF HOUSES

by ROBERT C. CLEVELAND

Lavishly illustrated with some 350 vivid photographs of fine houses, in both contemporary and traditional styles, this book reveals the expert craft of the architectural photographer.

Each photograph carries two captions, one giving important design information, the other revealing the photographic technique employed. Special features include a "portfolio of rooms" which presents splendid interior views of living rooms, bedrooms, dining rooms, playrooms, etc.; a study of the photographic methods which successfully capture the central theme and mood of a house; and an entire section of hints and pointers for the amateur cameraman. 160 pages, some 350 photographs, 8 3/4 x 11 1/2, \$7.50

## LANDSCAPE FOR LIVING

by GARRETT ECKBO

Planned with insight and written with craftsmanship, this volume examines the purposes, problems, and practices of landscape design, and recommends specific ways to achieve both beauty and utility in layout of lawns, shrubbery, trees, and gardens.

Mr. Eckbo imparts a sound understanding of landscape design by tracing its history, and outlining proven principles of symmetrical layout of grounds. Entire sections are devoted to materials, plants and planting, site conditions, structural factors, gardens, public buildings, and group housing. Included are many photographs, renderings, and diagrams of fine landscaping. 288 pages, 8 x 10 3/4, \$10.00

## MARCEL BREUER: ARCHITECT and DESIGNER

by PETER BLAKE

This masterful biography of Marcel Breuer captures the essence and spirit of one of the most gifted and influential architects of our time. It is a book that will strike a responsive chord in the heart of every architect and designer — one that will instruct, charm and inspire you, and one you will be proud to display on your library shelf. 196 photographs and drawings, 128 pages, 8 1/2 x 10 3/4, \$4.00

## PLANNING AND BUILDING THE MODERN CHURCH

by WILLIAM WARD WATKIN

Here, at long last, is a major work upon a long neglected phase of American culture, church architecture. Planning and building the modern church, as presented in this book, is a co-operative venture among architect, clergy and laymen of the church committee, each of whom contributes a special viewpoint and skill.

Chapter by chapter, Mr. Watkin examines each step in the project: selecting the architect, locating the best site, choice of basic design, deciding upon materials;

interior of pews and aisles, design of the nave, fenestration, lighting, heating, acoustics, furnishings and statuary — every question which must be considered. He also discusses factors of external environment, such as the type of neighborhood, proximity to public transport, parking areas, landscaping, and all other problems which affect the church and its congregation. 166 pages, 9 x 12, \$8.50

## MOTELS, HOTELS, RESTAURANTS and BARS

by the Editors of *Architectural Record*

Here is a carefully chosen presentation of the best material published in *Architectural Record* on these building types. Emphasis is on current design trends, techniques and structural features. Within each category, buildings of many sizes, styles, and localities are included. Some of the better-known projects include the Statler Center in Los Angeles, Hilton Hotel in Istanbul, bar and restaurant of the Hotel McAlpin in New York, and Henrici's Restaurant in Chicago. Each of the buildings and projects is profusely illustrated with photographs, plans and renderings. 215 pages, 8 3/4 x 11 1/2, \$6.95

## PLANNING STORES THAT PAY

by DR. LOUIS PARNES, A.I.A.

In this book Dr. Parnes demonstrates the amazing degree to which architecture — as expressed in counter design, layout of aisles, traffic flow, etc. — speeds and increases retail sales in department stores and specialty or chain stores. Point by point he conducts a tour of the store to illustrate the right and wrong aspects of profit-making design.

With more than 500 illustrations, this book explores each detail of the store and its equipment — entrances, arcades, show windows, furniture and fixtures, shipping and receiving services, departmental and floor layouts, display counters and cabinets, lighting — all the hundreds of features that help to sell merchandise.

This book is not only a guide to planning new stores, but also for remodelling older ones. 456 pages, 9 x 12, \$10.00

## INDUSTRIAL BUILDINGS DESIGN DATA BOOK

All of the famed Building Type Studies on Industrial Buildings published by *Architectural Record* over a ten-year period — including the extremely active war and post-war years — are reprinted in this immense 546-page volume.

More than 1100 illustrations highlight these 116 professional studies of America's finest manufacturing and processing plants, research centers, and laboratories. Everything from small machine shops to huge plants like Detroit's Willow Run is analyzed in this great compendium of plans, procedures, and job practice that represents the skill and experience of hundreds of architects and engineers.

Every conceivable problem is set forth in detail, and its solution fully explained: Steel Framing; Thermal Expansion; Foundation Design;

Heating, Ventilating and Sanitary Systems; Color Plans, etc. 546 pages, 8 3/4 x 11, \$9.00

## SCHOOLS FOR THE VERY YOUNG

by H. H. WAECHTER and E. WAECHTER

In the literature of school planning, scant attention has been paid to the pre-school — that unique building which, as a combined school and nursery, can best promote the proper training of the very young and impressionable child.

Thus *Schools for the Very Young* is the first definitive study of a building type that assumes more importance with each passing year. Opening with a brief history, this book describes the pre-school in action, noting events of a typical day. Full attention is given to classroom layout and facilities, space arrangements, indoor and outdoor play areas, and the various types of lighting, heating and ventilating systems called for by the special functions of these pre-elementary schools.

The authors also discuss the place and purpose of the pre-school in its community, and cite examples of schools designed to meet particular sets of environmental conditions. 208 pages, 7 1/2 x 10, \$6.50

## PLANNING ELEMENTARY SCHOOL BUILDINGS

by N. L. ENGELHARDT, Sr., N. L. ENGELHARDT, Jr., and STANTON LEGGETT

Written by three widely-known school planning consultants, this book is an authoritative and up-to-date guide for architects, school officials, school board members, and others responsible for building or remodeling schools.

*Planning Elementary School Buildings* is an exhaustive study of all phases of an intricate subject. The author tells how to survey the specific needs of a community, then takes up financing plans, cost estimating, site selection, basic design, choice of materials, classroom layout and equipment, the auditorium, the school library, the cafeteria, outdoor and indoor play areas, offices, and other major requirements. He also analyzes improved methods of heating, ventilating, and lighting the school, and discusses communications equipment, safety measures, sanitary facilities, and the like.

Some 250 photographs and drawings supplement the text; check-lists of essential equipment are included to simplify planning and purchasing. 820 pages, 8 3/4 x 11 1/2, \$12.50

## DESIGN FOR MODERN MERCHANDISING

by the Editors of *Architectural Record*

Here for the first time in one volume is a detailed study of the physical design of selling establishments of all types. You will find

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stores for soft goods and hard goods, food stores, department stores, wholesale showrooms, and that offspring of a booming suburban market, the shopping center.

Over 600 photographs, plans and diagrams take the reader through a vivid selection of successful selling establishments where good design has paid off in flourishing traffic and comfortable, satisfied customers. Anyone about to undertake new construction or renovation of a merchandising building will find this volume an endless, fascinating source of useful ideas.

*Design for Modern Merchandising* is valuable for owners, managers and department heads of selling establishments. It is also an important book for architects, designers, builders and investors interested in the buildings that help to sell the nation's merchandise. 254 pages, 8 3/4 x 11 1/2, Illustrated, \$8.95

## DESIGN AND CONSTRUCTION OF GENERAL HOSPITALS

by the U. S. Public Health Service

A collaborative publishing effort of *Architectural Record* and *The Modern Hospital*

For the past ten years, leading authorities on hospital design, working with the U. S. Public Health Service, *Architectural Record*, and *The Modern Hospital*, have examined, interpreted, and reported far-reaching improvements in hospital design, equipment and facilities. This book presents the fruits of their effort — a vast fund of planning information never before available in one place.

It presents prototypes of successful hospital design, complete with 30 master plans for hospitals of every size. Each

plan is accurately scaled, fully detailed, and visualized in skillful rendering. Illustrations of floor plans, site plans, and a variety of charts and tabular data help to provide step-by-step guidance in planning the general hospital. 206 pages, 8 1/2 x 11, Illustrated, \$12.00

## COMMERCIAL BUILDINGS

selected from *Architectural Record*

Traditional styles of commercial buildings, with their costly but useless adornments, have largely given way to the simpler, less expensive structural forms of contemporary design. Accompanying this great change has been the appearance of entirely new types of buildings — TV studios, airport control centers, and others — needed to keep pace with new inventions, modes of travel, and social habits.

This new book is a vivid pictorial record of this revolution in design as exemplified by scores of the best buildings erected during the past seven years. First published in *Architectural Record*, these projects clearly demonstrate the new design themes, the novel materials and structural methods, which have won wide acceptance in recent years. Each project is shown in a series of photographs, floor plans, structural features, and major details of design. 400 pages, 8 1/2 x 11. Illustrated, \$9.75

## NORTHWEST ARCHITECTURE OF PIETRO BELLUSCHI

Edited by JO STUBBLEBINE

Collected here for the first time in book form is the work of Pietro Belluschi, a major exponent of the contemporary style,

and a man who has made an historic contribution to American architecture.

Through this pictorial study of his work, which includes houses, churches, and commercial buildings of several types, the reader can fully grasp the extent of Mr. Belluschi's talent and the versatility of his art. These photographs of his work bear witness to the man's integrity, his intuitive sense of the tasteful and appropriate, his rare ability to express in wood, stone, and metal the rugged character of the Pacific Northwest and the admirable individualism of its people. 112 pages, 8 x 10 1/2, Illustrated, \$6.50

## SCHOOL PLANNING DATA BOOK

Compiled by *Architectural Record*

*School Planning* is a reprint of material published in *Architectural Record* chronicling the remarkable advances in school design achieved during the past ten years.

School buildings of every type and size, from all parts of the United States, are displayed here — with plans and construction details shown exactly as the architects developed them to suit the climatic conditions and educational needs of the particular locality. These case-studies represent the best schools built in recent years, and provide an exhaustive study of trends and techniques in every major phase of school planning and building.

These studies present widely differing new methods for the design of multi-purpose rooms and corridors; classroom shapes; modular design; bilateral and artificial lighting; and a host of other key subjects. 456 pages, 8 3/4 x 11 5/8, over 1000 illustrations, \$8.00



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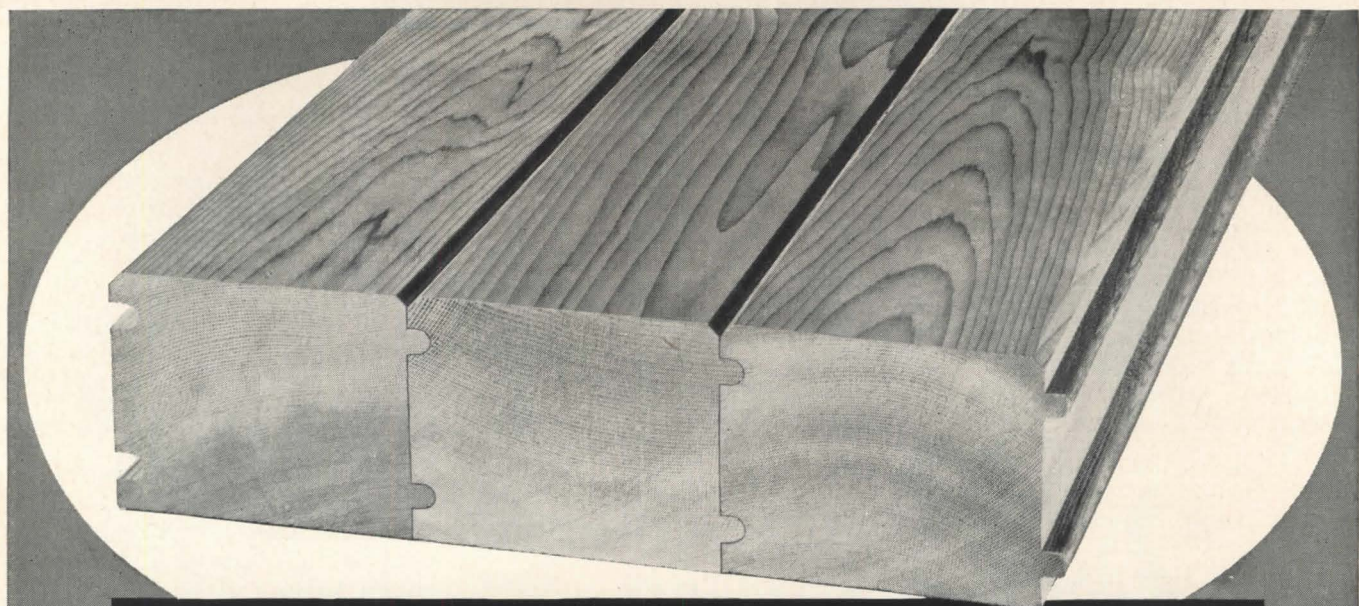
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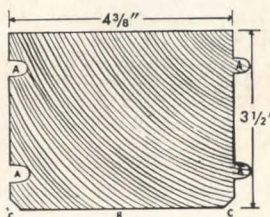
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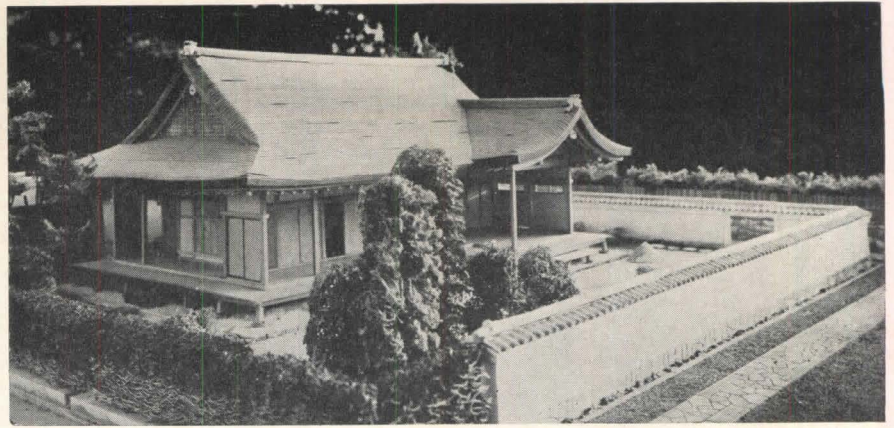
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# THE RECORD REPORTS

(Continued from page 324)

## MUSEUM GARDEN IS SITE FOR A JAPANESE HOUSE

The Japanese "House in the Garden" was a summer hit at New York's Museum of Modern Art. The house, based on 16th and 17th century designs, was built in Japan, shipped to this country and reassembled in the museum's garden under the supervision of architect Junzo Yoshimura.



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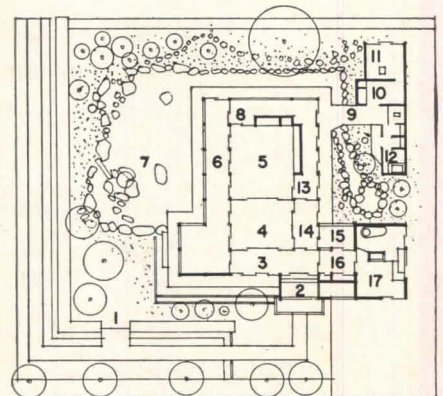
**AW. FABER-CASTELL**  
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Such a house might have been built for a scholar, priest or government official; the *shoin*, or built-in desk, is an essential part of the design. The lack of visible furniture is explained by the Japanese custom of storing beds and tables when not using them.

The particular relevance of Japanese building to Western architecture was noted in a statement by Arthur Drexler, the museum's Curator of Architecture and Design; he mentioned the post and lintel frame construction, flexible room arrangements, close relation of indoor and outdoor areas and ornamental quality of the structural system.

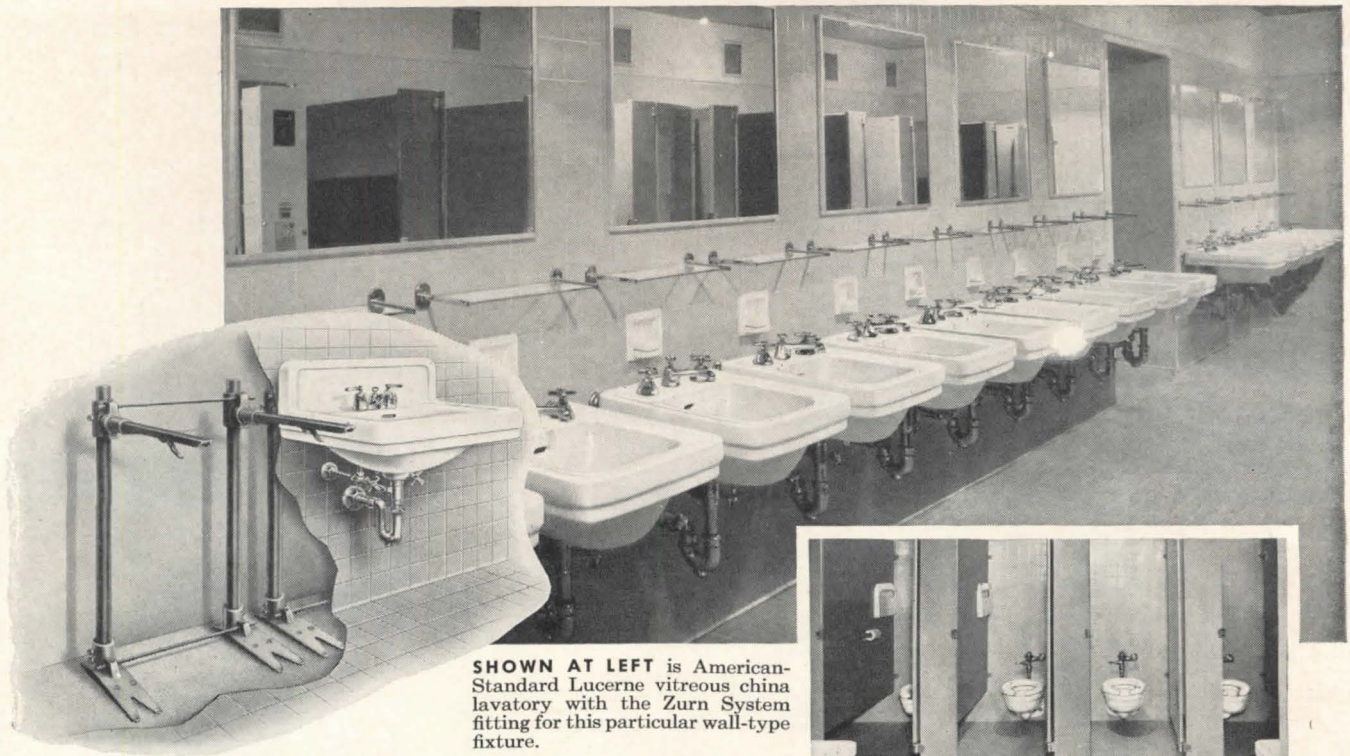
The exhibit was sponsored by the America-Japan Society in Tokyo, private citizens here and in Japan, and the museum.

(Continued on page 334)



0 6 12 18 24 30 36 FT.

- (1) Garden entrance (2) Genkan (family entrance) (3) Gallery (4) Second room (5) Shoin room (main room with shoin or desk) (6) Veranda (7) Garden (8) Side Veranda (9) Bridge to teahouse (10) Mizuya (tea house pantry) (11) Chashitsu (tea ceremony room) (12) Bath (13) Storage room (14) Gallery (15) Service veranda (16) Pantry (17) Kitchen



SHOWN AT LEFT is American-Standard Lucerne vitreous china lavatory with the Zurn System fitting for this particular wall-type fixture.

# This Combination

simplifies rest room planning  
...insures against untimely obsolescence!

## AMERICAN-Standard off-the-floor plumbing fixtures

INSTALLED WITH THE



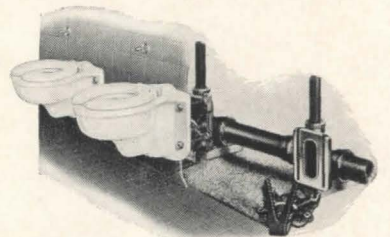
\* T. M. Reg. U. S. Pat. Off.

● Planning rest rooms around completely bare floors permits greater latitude of design. Enables you to lower ceilings. Gives you more usable floor space. And widens your choice of floor and wall construction.

But just as important to you and the builder is the fact that by specifying wall type fixtures for installation with Zurn systems, you make rest rooms look larger and more modern. And, because floors that are free of obstructions are easier to clean and maintain, your rest rooms retain their newness years longer.

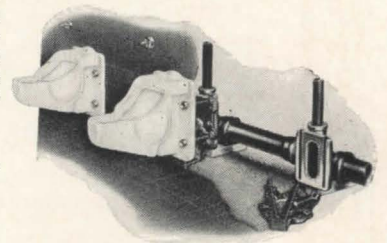
A good example of the pleasing effect of spaciousness achieved with American-Standard plumbing fixtures installed and supported by the Zurn System is shown in the large picture above. This is one of the modern rest rooms in the new Lever Brothers plant in Los Angeles, designed and constructed by the Bechtel Corporation.

American Radiator & Standard Sanitary Corp.  
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J. A. Zurn Mfg. Co.,  
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ABOVE: American-Standard Glenco toilets installed with Zurn Systems relieve the wall of all the load.

BELOW: Wall-type model of the famous Sanistand fixture—the American-Standard urinal for women. It is installed with a Zurn System fitting especially designed for this fixture.



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Fill in and mail the coupon for these two helpful booklets. They contain up-to-date information for planning modern rest rooms that stay modern. They tell you how you can save your client money on construction material, time and labor.

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Please send me the 2 booklets: "BETTER REST ROOM GUIDE" and "YOU CAN BUILD IT FOR LESS A NEW WAY."

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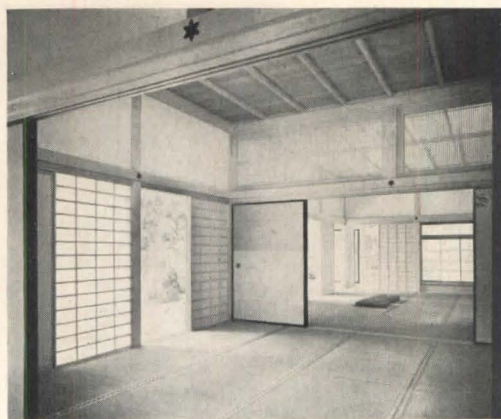
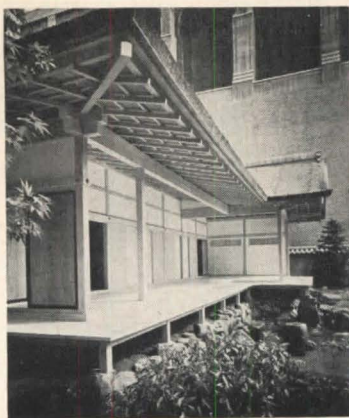
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## THE RECORD REPORTS

(Continued from page 332)

Right: the veranda overlooks the garden, designed by the architect and Tansai Sano in the sansui style, which represents the Buddhist image of Paradise. Far right: view through second room into main room. Below: shoin room; shoin (desk) at back under shoji; the tokonoma, at right, is an alcove traditionally used in Japan for display of art objects — painting done in black ink by Kaiti Higashiyama



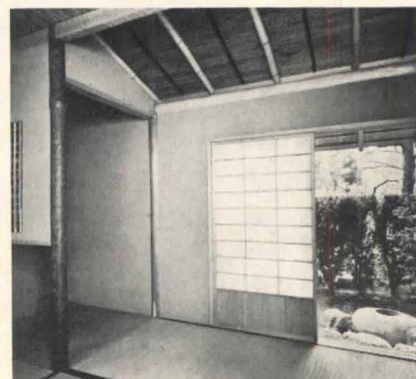
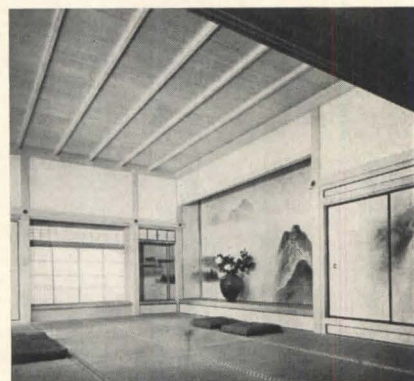
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*Above: chashitsu (tea ceremony room); as this ceremony is devoted to the contemplation and appreciation of art, this room also contains a tokonoma*



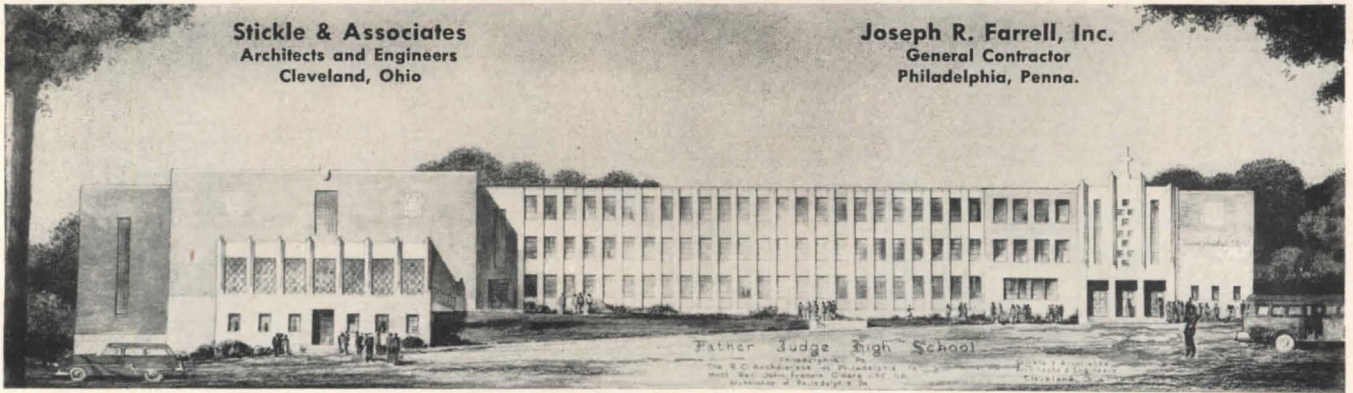
*At traditional ridget-pole raising ceremony, a Buddhist priest offers thanks on completion of heavy construction and prays that the house "shall be enclosed in eternal peace"*

(More news on page 336)



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# hydroment was specified and used in the classrooms, corridors and service areas of this new school.

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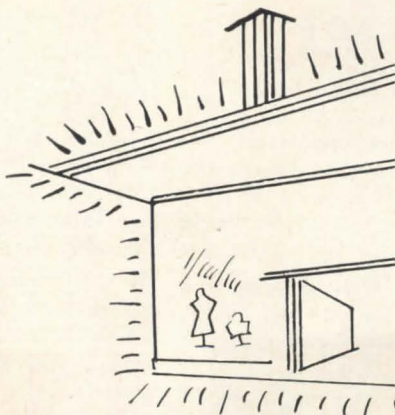
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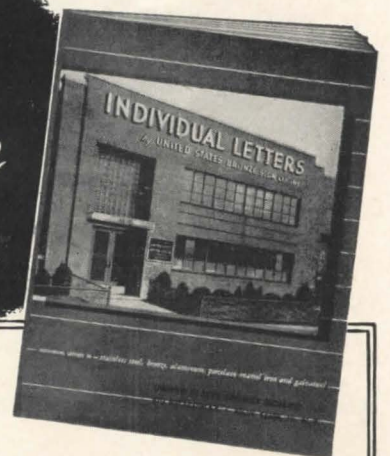
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**PRODUCERS' COUNCIL HAS ANNUAL FALL CONVENTION**

The Producers' Council held its 33rd annual fall convention this September in New York City. The theme for this year's meeting was "Better Service for a Better Building Market."

Ben John Small, A.I.A., represented the architects on a panel titled "A Criti-

cal Appraisal of Selling Methods Employed by Building Material Producers." Mr. Small entered a plea for more information and less "sales pressure" in product literature and advertising directed to the architect. He suggested as standards those used by the jury of the Building Product Literature Competition sponsored by the American Institute of Architects and the Producers'

Council: "attention-arresting quality, format, and informative or educational value to the architects."

**Air Conditioning and Design**

Possible effects of air conditioning on building design were outlined by Edwin A. Scott Jr., associate editor of the magazine *Air Conditioning*. One such change, he said, will be the disappearance of porches and patios as indoor living becomes more comfortable. Predicting the replacement of window units by central air conditioning systems, Mr. Scott said that more breezeways and attics would be built to accommodate these systems, which require large quantities of fresh air to operate. Mr. Scott also forecast a "merchandising duel" between manufacturers of air conditioning and of glass because of the effort to make air conditioning more economical by cutting down on glass areas; the victory, according to Mr. Scott, will go to the side with the best selling program.

In a luncheon address reviewing the economic and management picture for the construction industry, Joseph D. Ardleigh, executive vice president of The Research Institute of America, Inc., said that current good business conditions should continue into 1955, although isolated areas of hardship could be expected. He reported a "fair but healthy fall upturn" in business. Mr. Ardleigh also told the producers that their business should be "spurred" by the new national housing act and by the new tax depreciation ruling.

The convention concluded with a one-day workshop for chapter presidents.

**New Officers Elected**

Members chose William Gillett as their president-elect, to step into the office on January 1, 1955. Mr. Gillett is vice-president and a director of Detroit Steel Products Company. He will succeed Elliot C. Spratt of St. Joseph, Mo., in the office, while Mr. Spratt becomes a 10-year director of the council.

Other officers elected were: Fred Hauserman, Cleveland — first vice president; H. Dorn Stewart, Lancaster, Pa. — second vice president; Ted Wakfield, Vermilion, Ohio — secretary; and Fritz Close, Pittsburgh — treasurer. These men will also enter office on January 1.

Douglas Whitlock, of the Structural Clay Products Institute, Washington, D. C., was elected to honorary membership on the council's board.

The 1955 fall meeting is scheduled to take place in early October in Detroit.

(More news on page 338)



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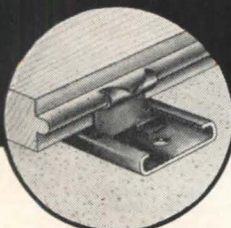
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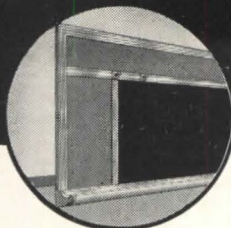
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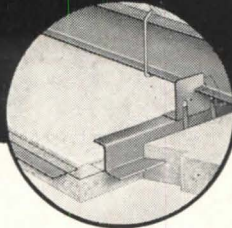
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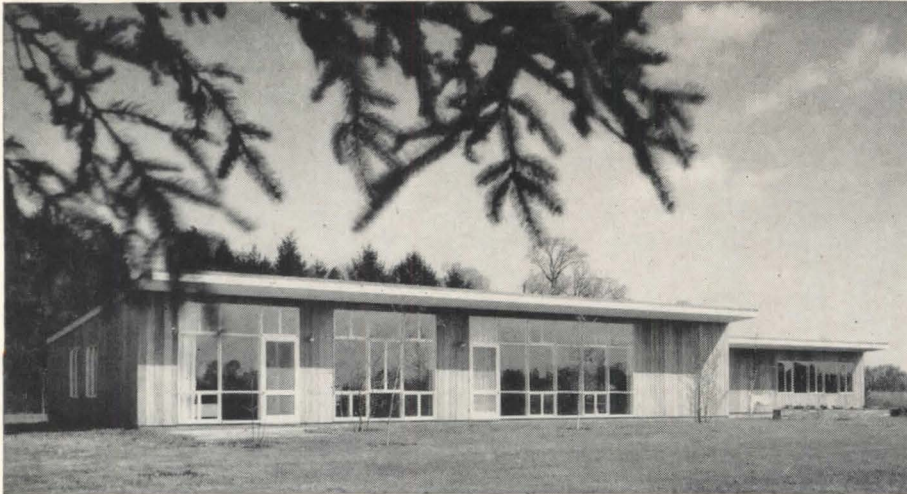
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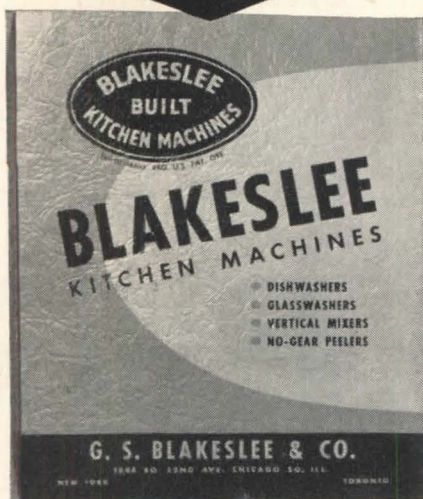
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## POSTWAR BERLIN

(Continued from page 11)

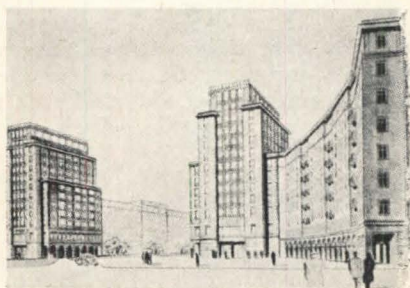
Almost all of the building effort in the Eastern Sector has been devoted to the mammoth Stalinalee project. Beginning with the 13-story tower apartments on the Strausbergerplatz, the street continues eastward and is lined with eight- and nine-story apartments; the development contains about 10,000 dwelling units. The ground floors of these buildings are usually occupied by state stores. Says Mr. Hekker: "No matter how much effort has been bestowed upon the architecture (stone flights of steps, rich entry porticos, gray or cream colored fascia tiles . . .) the whole is of such oppressing superhuman scale, of such monotonous deadly décor that after half an hour's walk one is spiritually exhausted."

Construction is mostly of concrete cast *in situ*; substitute materials, such as building boards of flax refuse and synthetic resin, are also utilized.

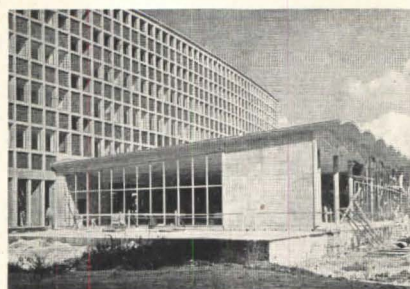
Aside from Stalinalee, very few new buildings have gone up in East Berlin. These include a new railway station (which Mr. Hekker dismisses as "insignificant"); the Thalmann subway station, similar to the monumental marble subway in Moscow; and a large Russian memorial.

Considerable work has been done toward the reconstruction of old land-

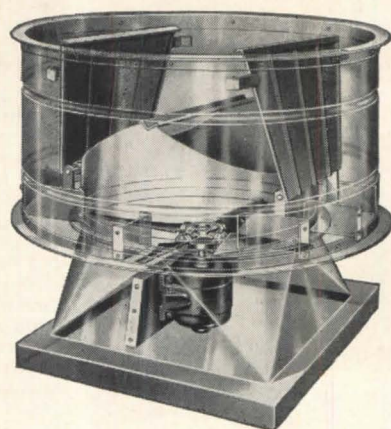
(Continued on page 350)



Above: tower apartments on Strausberger Platz, the beginning of Stalinalee; project by Professor Henselmann. Below: library at Blücher Platz, West Berlin; Jobst Kreuer, Bornemann and Wille, architects



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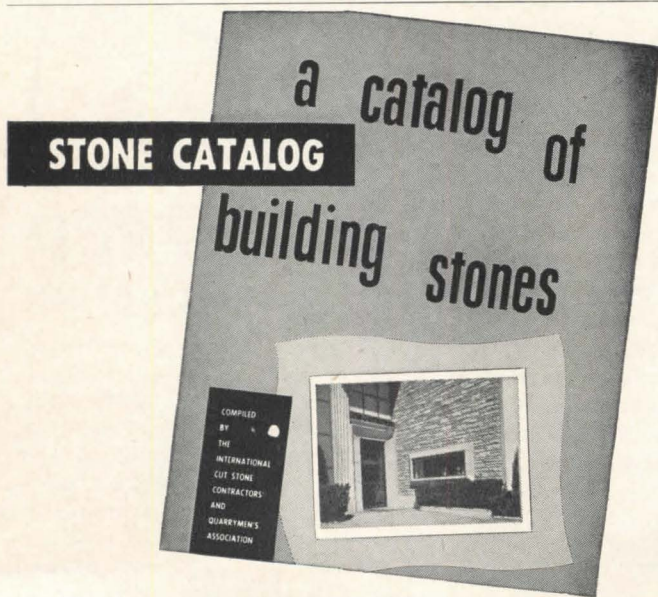
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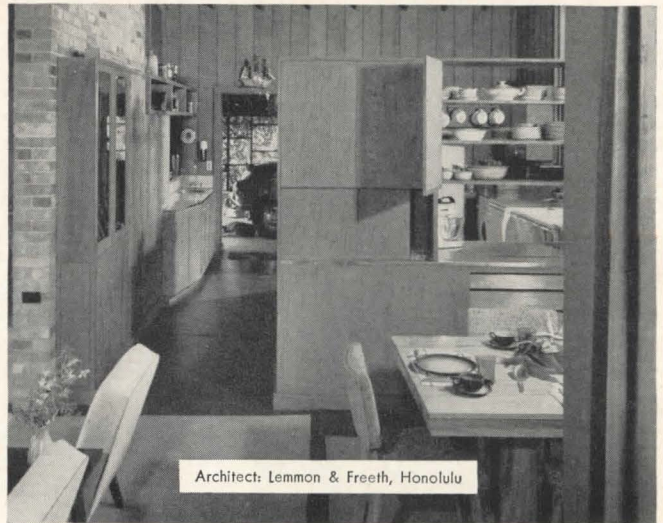
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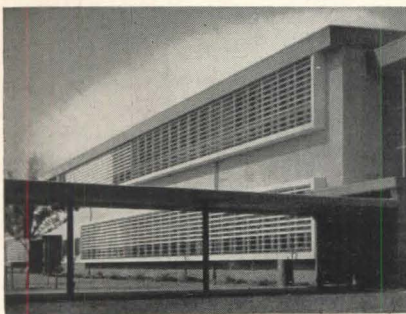
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## POSTWAR BERLIN

(Continued from page 346)

marks. This sort of work, says Mr. Hekker, has been done with a great deal more care and success in the East than in West Germany.

### In the West

The problem of reconstructing West Berlin has been complicated by its isolated position; its housing problem has been aggravated by a constant stream of refugees. In addition, the construction of large projects was made difficult by inadequate provisions for government acquisition of land. In 1953, however, machinery was set up to simplify this.

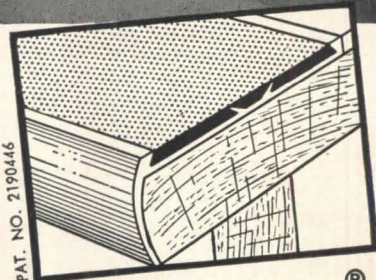
In contrast to the Eastern Zone, Mr. Hekker reports, all energy has not been expended on one large project. In addition to a number of multiple-dwelling developments, work has also been done on the repair and rebuilding of small homes. Other projects have included commercial buildings, college buildings, post offices, youth centers and homes for the aged.

The esthetic orientation of the Western architect, in Mr. Hekker's judgment, retains some traditional and Third Reich features, but is generally toward the resumption of the Bauhaus style, with a few side glances toward Sweden and Switzerland.

The difference between the East and West Zones, remarks Mr. Hekker, is particularly noticeable in the evening. "In the East," he says, "is an almost extinct and darkened city, without any display of individuality such as automobiles, neon signs or lighted window displays. In the West there is an all-embracing gaiety, stirring music, neon signs, luxurious shops and bars to no end. Although one knows that the basis for all this is not altogether healthy, one cannot avoid noticing the vital energy of a city which a few years ago was but a Pompeii."

The somewhat sorrowful summary of the report suggests, however, that a distinctive architecture is not emerging in either the East or the West. The author pessimistically concludes: "Are these marble underground stations and classical dams on the one hand, and steel and glass crates of the five-cent bazaars on the other, the symbols of a new spirit? We stand with empty hands in front of a people which wants to see the culture of its land expressed in buildings—and building ordinances and welfare control are of no help . . ."

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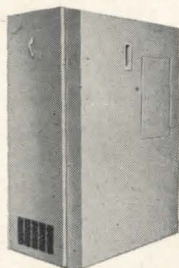
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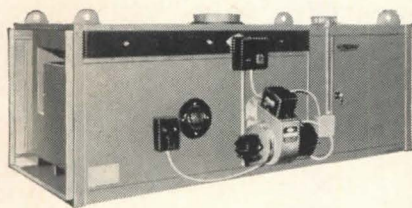


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## REQUIRED READING

(Continued from page 48)

climate, the author describes the influences of the sun, temperature, wind, precipitation, lightning and humidity on architecture, the beneficial and disadvantageous effects of these elements under given conditions, and their control through proper planning and the use of such devices as trees, windbreaks, brise-soleil and snow fences. Practical answers are offered to such questions as how to pick a site, how to provide a dry basement and a dry area around the house, how to insure comfort on hot summer nights, and how to plant the best trees for comfort, protection and beauty.

### A SHORT HISTORY OF BRIDGES

*The World's Great Bridges.* By H. Shirley Smith. Harper & Brothers (New York, N. Y.) 1954. 5¾ in. by 9¼ in., 180 pp, illus., \$3.50

Mr. Shirley Smith is a leading British bridge builder. In this short history he relates the story of man's achievements in bridge building from the Roman, Persian, and Chinese Empires through the Renaissance era, to the birth of modern masonry and suspension bridges.

The book is interesting and informative on a subject not often written about, but one could certainly wish for more and better photographs.

### A NEW REFERENCE BOOK

*A Biographical Dictionary of English Architects 1660-1840.* By H. M. Colvin. Harvard University Press (Cambridge, Mass.) 1954. 6 in. by 9 in., 821 pp, \$12.50

This book contains, in alphabetical order, biographies of over one thousand English architects and master-builders who worked in the seventeenth, eighteenth and nineteenth centuries, together with fully-documented lists of their works and an introductory essay on the building trades and the architectural profession in this period of Stuart and Georgian architecture.

This is a valuable reference book and it is to be hoped that similar biographical dictionaries will be published for other significant periods.

*Manual of Precast Concrete Construction.* By F. Thomas Collins (921 W. Las Tunas Blvd., San Gabriel, Calif.) 1954. 3rd ed. 8½ in. by 11 in., 102 pp, illus.

This enlarged edition contains, in addition to many new photographs and much additional material, a new chapter on sandwich wall panel construction.

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2. The owner is: (if owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.) F. W. Dodge Corporation, 110 West 40th St., New York 18, N. Y.

*Names and Addresses of Stockholders Owning or Holding One Percent (1%) or More of Total Amount of F. W. Dodge Corporation Stock at August 25, 1954*

Paul Abbott, % Irving Trust Co., 1 Wall St., New York, New York; May Gibson Baker, Apt. E-10, 35-34 84th Street, Jackson Heights, L. I., New York; Howard J. Barringer, 49 Lawrence Lane, Bay Shore, New York; Alan R. Breed, 5021 Macomb St., N.W., Washington, D. C.; James McV. Breed, 15 Broad Street, New York, New York; William C. Breed, Jr., 15 Broad Street, New York 5, New York; Mary F. Broadwell, 423 West 120th Street, New York, New York; Dwyer & Company, % City Bank Farmers Trust Company, 22 William Street, New York, N. Y.; Eddy & Company, % Bankers Trust Company, P.O. Box 706, Church Street Annex, New York, New York; C. A. England & Company, % Chemical Bank & Trust Company, 165 Broadway, New York, New York; Sumner Ford, 15 Broad Street, New York, N. Y.; Sumner Ford and Underwriters Trust Company, Trustees, % Trust Department, 50 Broadway, New York, New York; Irving W. Hadsell, 119 West 40th Street, New York, New York; Thomas S. Holden, 119 West 40th Street, New York, New York; Laura Morgan Jackson, "Stonewalls", Ridgefield, Connecticut; George W. Morgan, 90 Broad Street, New York 4, New York; Gerald D. Morgan, 5509 Edgemoor Lane, Bethesda, Maryland; T. Oliver Morgan, 25 Ridge Croft Road, Bronxville, New York; T. Oliver Morgan, Trustee u/w Frances M. McIntosh, 25 Ridge Croft Road, Bronxville, New York; T. Oliver Morgan, Trustee for Benefit of Laura McIntosh Kleege, 25 Ridge Croft Road, Bronxville, New York; T. Oliver Morgan, Trustee u/w Laura O. Morgan, 25 Ridge Croft Road, Bronxville, New York; T. Oliver Morgan, Trustee for Benefit of Donald Spencer McIntosh, 25 Ridge Croft Road, Bronxville, New York; T. Oliver Morgan, Trustee u/w Truman S. Morgan, 25 Ridge Croft Road, Bronxville, New York; George H. Partridge, 9 Towers East, Bronxville, New York; Jane A. Pratt, % Manufacturers Trust Company, 741 5th Avenue, New York, New York; William J. Quinn, 15 Broad Street, New York, New York; John J. Traynor, Trustee, 15 Broad Street, New York 5, New York; Marcus Wayne, 202 Lake Cove Apts., 12020 Lake Avenue, Lakewood 7, Ohio; H. A. Whitten & Company, % Chemical Bank & Trust Company, 165 Broadway, New York, New York; Chauncey L. Williams, 119 West 40th Street, New York, New York; Helen Morgan Young, 71 Summit Avenue, Bronxville, New York.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (if there are none, so state.) None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

H. JUDD PAYNE,  
Publishing Director.

Sworn to and subscribed before me this 29th day of September, 1954. [SEAL] IDA A. PETERSON, Notary Public for the State of New York. Qualified in Westchester County, No. 60-3075100. Cert. filed with Co. Clerk, New York. Commission expires March 30, 1955.



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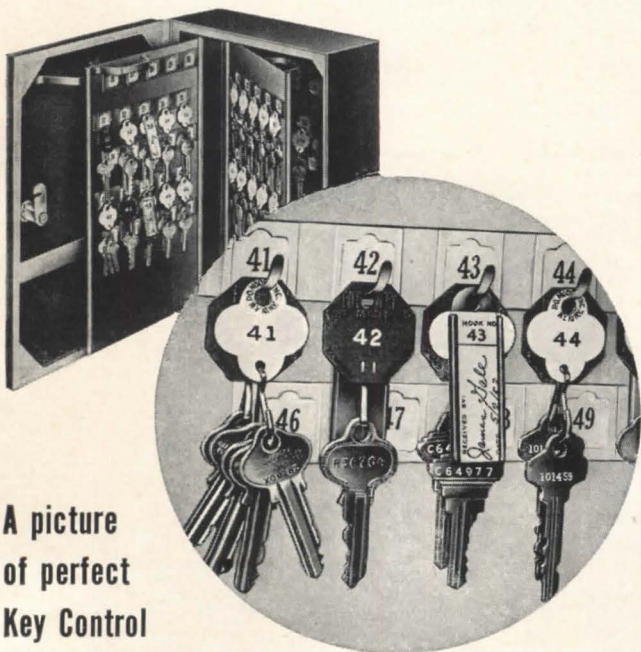


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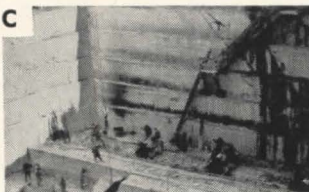
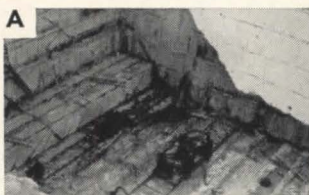
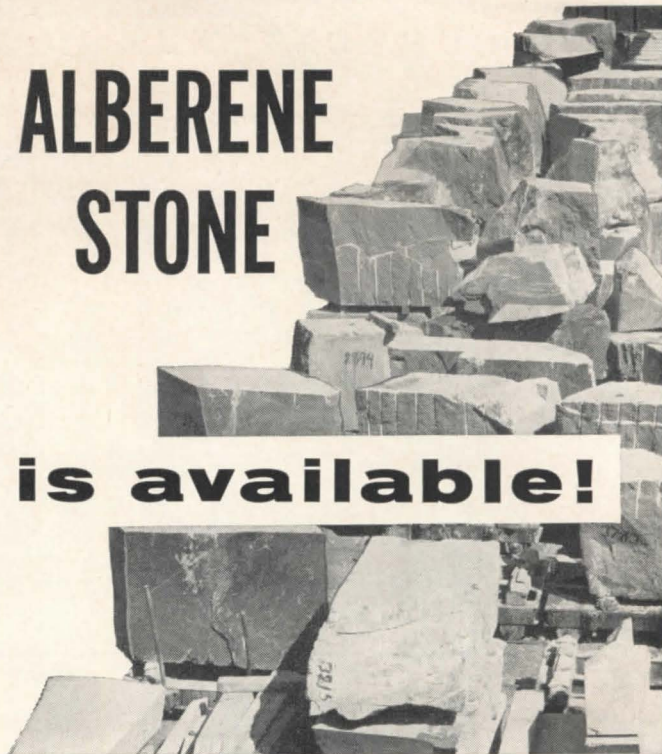
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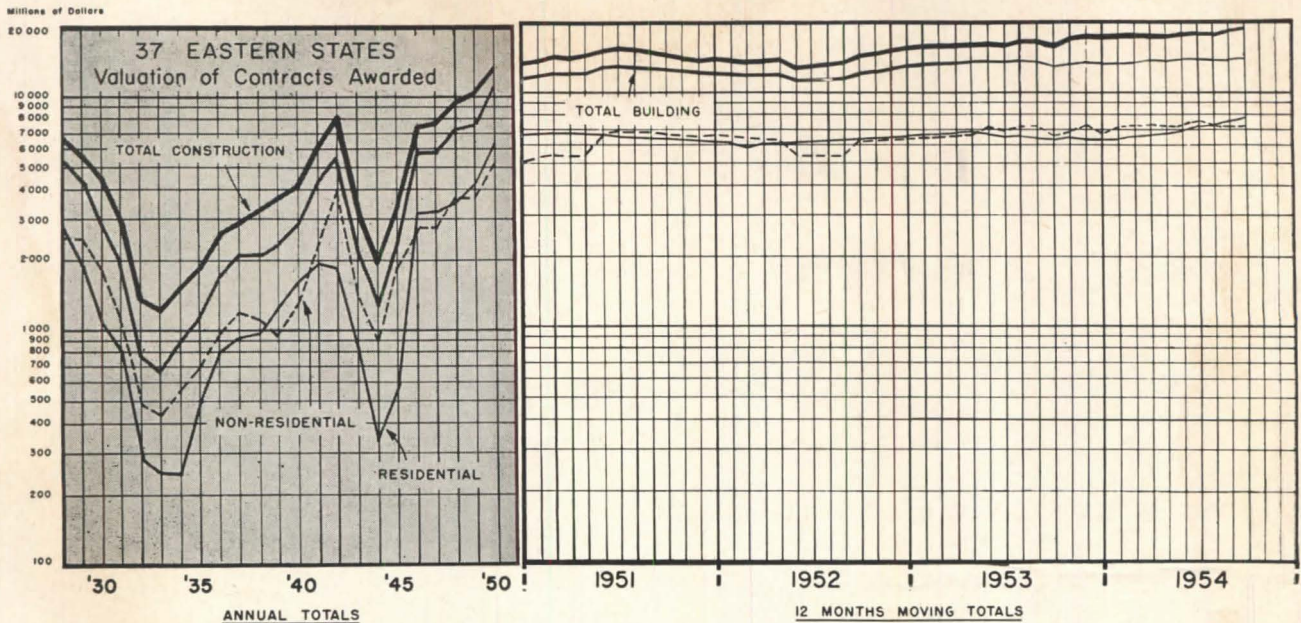
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# THE RECORD REPORTS

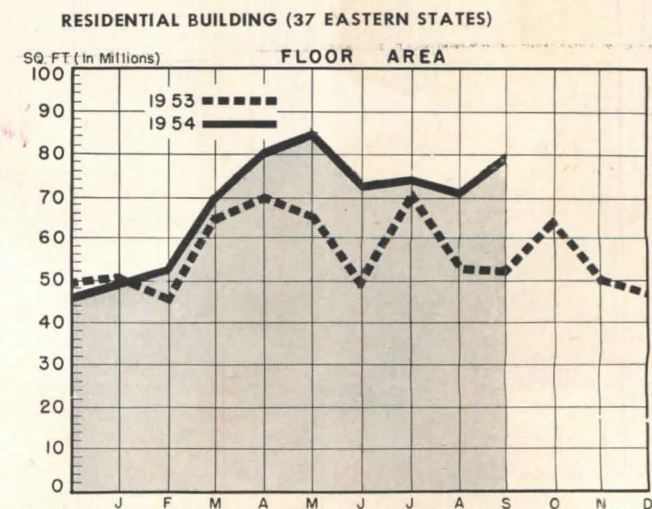
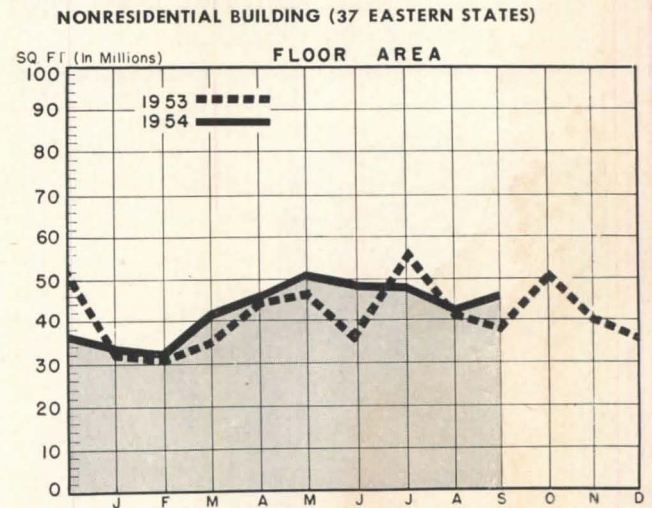
## CURRENT TRENDS IN CONSTRUCTION



### HOME BUILDING LEADS CONTINUING BOOM

WITH THREE MONTHS STILL TO GO, 1954 construction had gained more than a full month over last year, at the 1953 monthly rate; and a new annual record seemed assured. A whopping 53 per cent increase in residential construction in September over the 1953 month carried the September 1954 total to an all-time high for the month; F. W. Dodge Corporation figures on contracts for future construction in the 37 eastern states also showed a record nine-months total of \$14,477,181,000, 13 per cent ahead of the previous nine-months high in 1953. For the nine-months period, increases were registered in each of the three basic categories — nonresidential up four per cent, residential up 26 per cent and heavy engineering up five per cent. In the nonresidential category the gains were reflected in six of the eight Dodge classifications — commercial, educational and science, hospital and institutional, public, religious, and social and recreational. Manufacturing and the “miscellaneous nonresidential” classifications showed declines. The September total of \$1,816,232,000 was four per cent over September 1953.

Charts by Dodge Statistical Research Service



SCHOOLS AND COLLEGE BUILDINGS*—SELECTED YEARS							
F. W. Dodge Corporation			Contracts Awarded				
(37 Eastern States)							
Valuation (Millions of Dollars)							
Year	Annual Total	Monthly Average	Year	Annual Total	Monthly Average		
1929	330.5	27.5	1950	1076.6	89.7		
1935	150.2	12.5	1951	1184.4	98.7		
1943	48.1	4.0	1952	1305.7	108.8		
1947	316.4	26.3	1953	1556.6	129.7		
Monthly Totals							
1953			1954				
Jan.	92.0	July	155.8	Jan.	125.4	July	190.5
Feb.	91.1	Aug.	127.9	Feb.	133.4	Aug.	164.7
Mar.	118.2	Sept.	127.9	Mar.	173.3	Sept.	163.1
Apr.	133.8	Oct.	138.1	Apr.	156.6		
May	152.6	Nov.	112.8	May	172.2	9-mos.-total	
June	139.5	Dec.	166.7	June	175.0	—1454.2	

\* Schools are the subject of Building Types Study No. 216, pp. 177-216.