





Palm Beach Towers Hotel, Palm Beach, Fla.; Arch.—John Hans Graham & Assocs., Washington, D. C.; Struc. Engr.—Oboler & Clarke, Miami; Consltg. Engr.—Norman C. Schmid & Assocs. Palm Beach; G. C.—Taylor Construction Co., Miami; Pozzolith Ready-Mixed concrete—Burnup & Sims, and Rinker Materials, West Palm Beach.



Thunderbird Motel, Miami Beach, Fla.; Archt.—Norman Giller & Assocs., Miami Beach; Contr.—Taylor Construction Co., Miami; Engr.—Jules Channing, Miami; Pozzolith Ready-Mixed concrete—Maule Industries, Inc. & Acme Concrete Corp.

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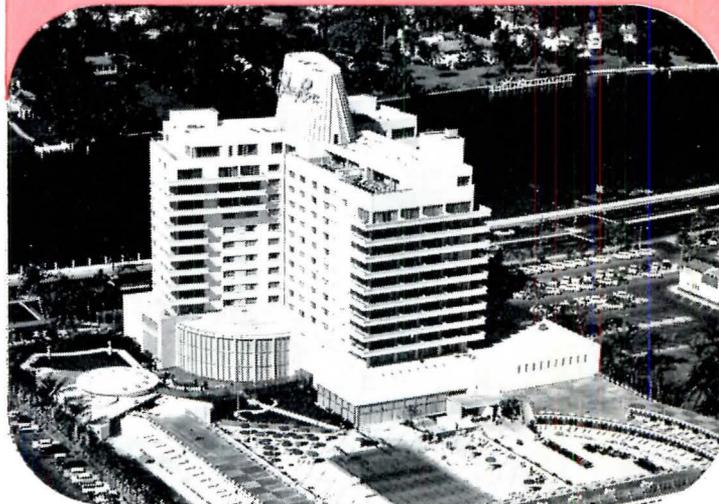
These special concrete properties, as well as improvement in overall quality, were obtained by employing Pozzolith—key to lowest water content, control of entrained air and control of rate of hardening.

More than 150,000,000 cubic yards of concrete for all types of structures have been produced with Pozzolith since 1932, to increase user's control of concrete behavior and to obtain desired properties *most advantageously*.

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Eden Roc Hotel, Miami Beach, Fla.; Archt.—Morris Lapidus, Miami Beach; Engr.—H. J. Ross Assocs., Miami; G. C.—Taylor Construction Co., Miami; Pozzolith Ready-Mixed concrete—Maule Industries, Inc.



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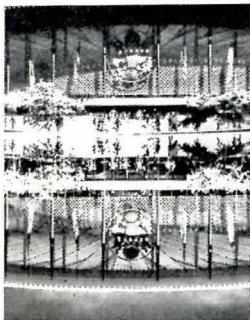


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The American Pavilion, Brussels World's Fair; Edward D. Stone, Architect; Louis Checkman photo

### An Architecture of Space and Grace

Five current projects <i>by Edward D. Stone</i> — the first major coverage of his work in some years — which typify Stone's use of continuous gridded surfaces for the exterior of his buildings.	153
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Kaufman's guests, to Cambridge to see Gropius' Harvard Graduate Center, Aalto's dormitory and Saarinen's auditorium and chapel at M.I.T. They were impressed, in varying degrees, with all of these. "But here what does architecture make? Here everything wonderful!" Rare and kindly visitors, who see the forest better than the trees.

**A HOUSE IS NOT A HOME:** An evocative little architectural tale is told in a recent issue of *The Italian Scene*, a monthly bulletin gotten out by the Cultural Division of the Italian Embassy. "Trulli-Land Snag," the item is headed, and it tells about the recent effort of a well-meaning agency to replace old trulli with new trulli — with the intent, in fact, of preserving

August Heckscher at the Centennial Dinner of the New York Chapter of the American Institute of Architects, "is through architecture and design to cause men to think through the premises by which they live; to make articulate, and finally to make massive and visible, the underlying conscience of the age. . . . The architect cannot dictate to his client; he certainly would be unwise to try to dictate to the community. The process of evoking buried strains of belief and value, of constantly reshaping the outward design so as to avoid doing violence to the inner life, is the essence of democracy. It is my own belief, indeed, that an age of great building can be an age of true freedom — that the next stage of liberalism in America will be the liberalism

**THE FUTURE OF THE CITY** (postscript on the A.I.A. convention seminar): "Many of us in the planning professions," writes Landscape Architect John O. Simonds of Washington, D. C., "have long sought that agonizingly elusive holy grail of planning, which is no more, nor any less, than a lucid and compelling concept of planning's main business. In Washington's Constitution Hall during the A.I.A. convention, we heard this concept spelled out with ringing clarity. Those attending had the great good fortune to hear the story of planning told with more heart, and mind, and soul, and muscle, than we have ever heard it told before. Congratulations and sincere thanks to panelists Clark, Feiss and Talbott and to John Knox Shear for his able chairmanship of the panel on 'The Future of the City.'"

## A New Eloquence for Architecture

Architectural history, "the art of remolding the past into harmony with our desires," is again rewritten, to show that our purified architecture needs new eloquence, needs also to express something besides structure and materials.

An article by *Joseph Hudnut*

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## Deft Remodeling of Denver Bank

The United States National Bank, Denver, Colo.; James S. Sudler, Architect

183

## Lessons in Residential Order

A house that well meets the current criteria of residential design. Residence for Dr. George W. Poland, Raleigh, N. C.; George Matsu-moto, Architect

189

## THE RECORD REPORTS: B U I L D I N G S I N T H E N E W S

### 89 AMERICAN SCHOOLS BY 79 ARCHITECTS SELECTED TO SHOW

School buildings will be the major subject of the Twentieth International Conference on Public Education to be held this month (July 8-17) in Geneva. Some 70 countries are expected to participate. The United States exhibit, arranged by Dr. Ray L. Hamon, chief of the School Housing Section of the U. S. Office of Education, will consist of individual brochures including photographs, miniature drawings and explanatory notes on each of 89 recently constructed American school buildings from 79 architectural offices. In addition, eight of these projects (shown on these pages) will be exhibited also on meter-square mounts showing the principal features.

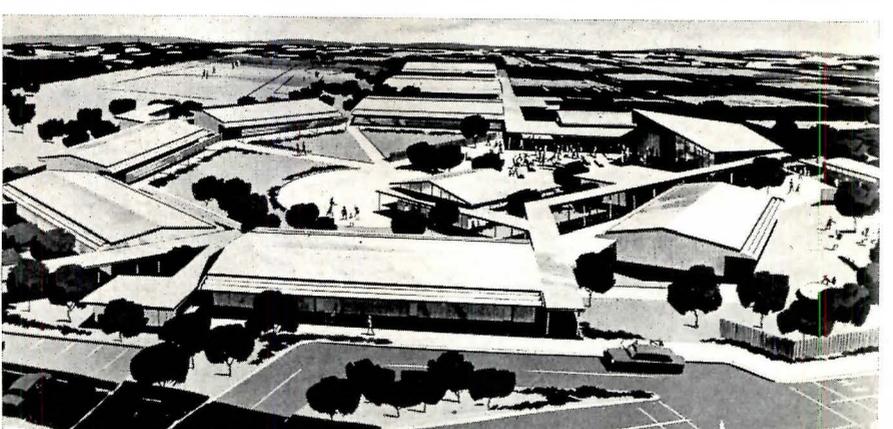
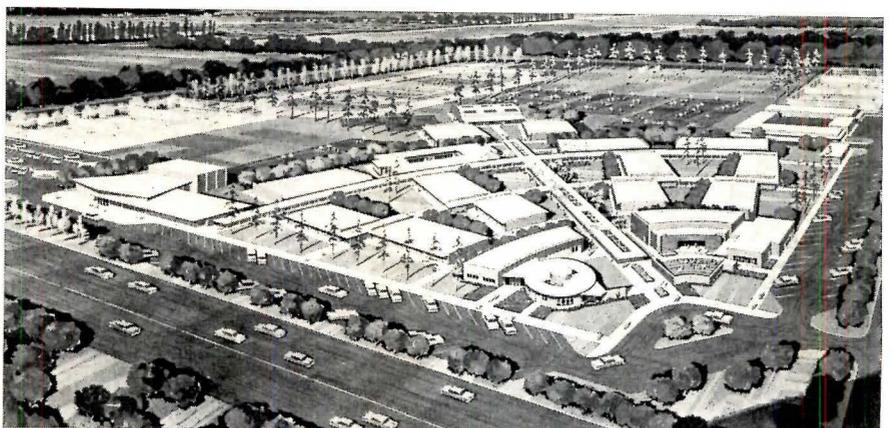
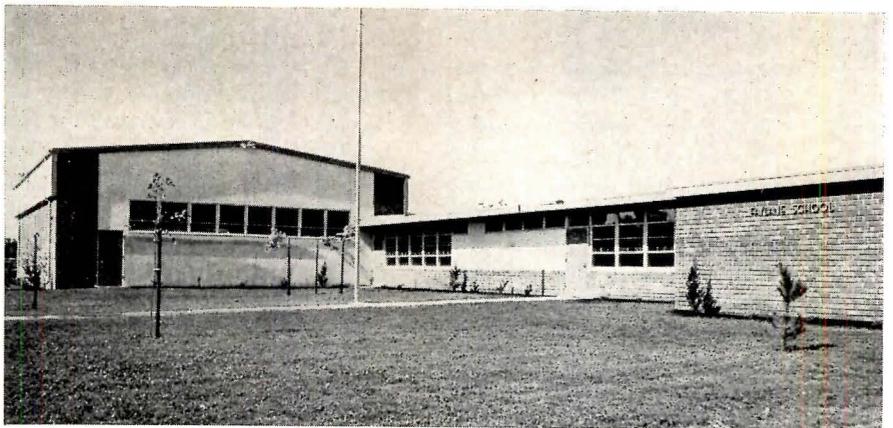
Following is a complete list of the architects whose work is represented:

Clark R. Ackley, Lansing, Mich.; Elmer H. Adams, Reading, Pa.; Warren H. Ashley, West Hartford, Conn.; Joseph Baker and Associates, Newark, Ohio; H. E. Beyster and Associates, Detroit; Guido A. Biada and Associates, Battle Creek; Everett I. Brown Co., Indianapolis; Buchart Engineering Corp., York, Pa.; Ralph Burkhard, Seattle; Cannon, Smith and Gustavson, Salt Lake City; Caudill, Rowlett, Scott and Associates, Bryan, Tex.; Childs and Smith, Chicago; Coffin and Coffin, New York; Cowan and Paddock, Yakima, Wash.; Cox, Hagman and Meyer, Los Angeles.

Daniel, Mann, Johnson and Mendenhall, Los Angeles; Dorsta and Pantazi, Indianapolis; Wilmot C. Douglas, Birmingham, Ala.; Louis J. Drokes, West Hartford; Edwards and Portman, Atlanta; Ellerbe Co., St. Paul; Epple and Seaman, Newark; Finney, Dodson, Smealie, Orrick and Associates, Baltimore; Howard T. Fisher and Associates, Chicago; Fletcher Thompson Inc., Bridgeport; Flewelling and Moody, Los Angeles; Freeland and Bird, San Diego.

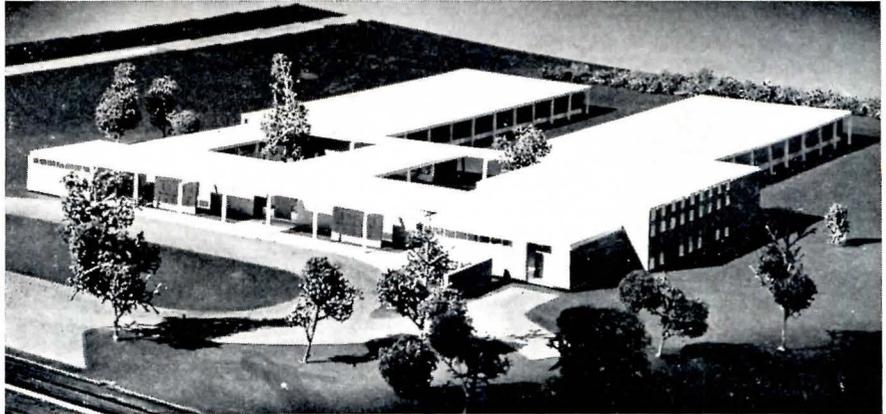
Samuel Glaser, Boston; Edmund George Good Jr., Harrisburg; Haag and D'Entremont, Jenkintown, Pa.; Donald F. Haines, San Jose; Harbeson, Hough, Livingston and Larson, Philadelphia; Helmut, Obata and Kassa-baum St. Louis; Warren Holmes Company, Lansing, Mich.; Matt E. Howard and Associates, Houston; Hunter, Campbell and Rea, Altoona; William B. Ittner, St. Louis; Charles D. James, Madera, Cal.; Paul H. Kea Associates, Hyattsville, Md.; Kelly and Gruzen, New York; Louis C. Kingscott and Associates, Kalamazoo, Mich.; A. M. Kinney Associates, Cincinnati; Kistner, Wright and Wright, Los Angeles; Vincent G. Kling, Philadelphia; Kuehne, Brooks and Barr, Austin.

LaPierre, Litchfield and Partners, New York; Charles W. Layne, Ann Arbor; Lillis and Smith, Vallejo, Cal.; Loeb, Schlossman and Bennett, Chicago; Harry T. MacDonald, Los Angeles; Masten and Hurd, San Francisco; McLeod and Ferrara, Washington, D. C.; Earl G. Meyer, Detroit; Naramore, Bain, Brady and Johanson, Seattle; O'Connor and Kilham, New York; O'Dell, Hewlett and Luckenbach, Birmingham, Mich.; Perkins and Will, Chicago; Daniel Perry, Port Jefferson, N. Y.; Frederick W. Rauber and Associates, Manitowoc, Wis.; John Lyon Reid and Partners, San Francisco; Rich and Tucker Associates, Boston; Sargent-Webster-Crenshaw and Folley, Syracuse; George F. Schatz and Associates, Cincinnati; Schmidts, Hardman and Wong, Berkeley; Charles W. and John A. Shaver, Salina, Kan.; Sherwood, Mills and Smith, Stamford; Arthur F. Sidells, Warren, Ohio; Eberle M. Smith Associates Inc., Detroit; Harwood K. Smith, Dallas; Smith and Smith, Royal Oak, Mich.; Hugh Stubbins and Associates, Cambridge; Gene Verga and R. N. Clatworthy, Los Angeles; John S. Villisvik, Yakima, Wash.; Fritz von Grossman, Milwaukee; John Carl Warnecke, San Francisco; Frederick P. Wiedersum Associates, Valley Stream, N. Y.; E. Davis Wilcox, Tyler, Tex.; Wolf and Hahn, Allentown, Pa.; Wyeth and Harman Inc., Port Huron, Mich.



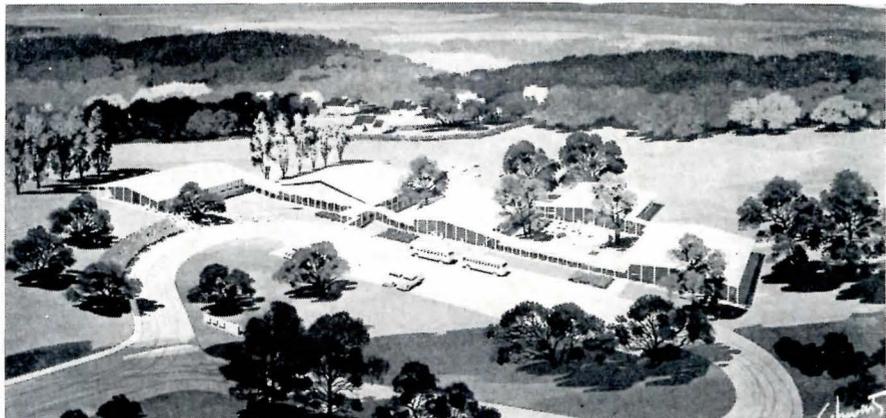
IN INTERNATIONAL SCHOOL BUILDING EXHIBITION AT GENEVA

*Left: Faylane Elementary School, Garden Grove, Cal.; Kistner, Wright and Wright*



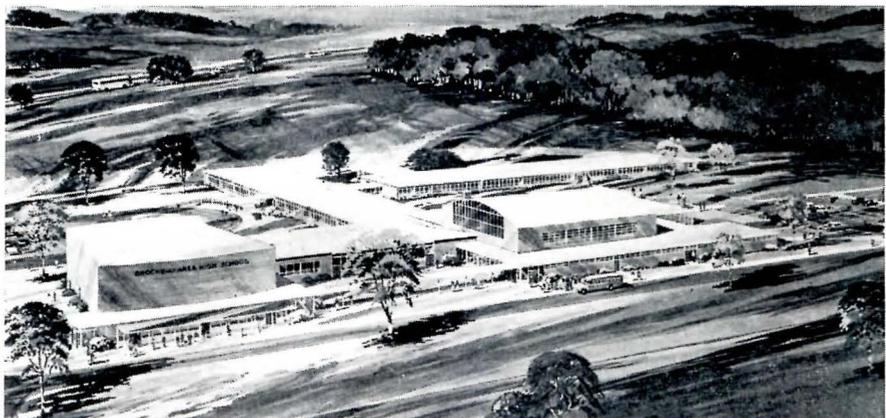
*Right: Midway Road Elementary School, DeKalb County, Ga.; Edwards and Portman*

*Left: Aviation High School, Redondo Beach, Cal.; Flewelling and Moody*



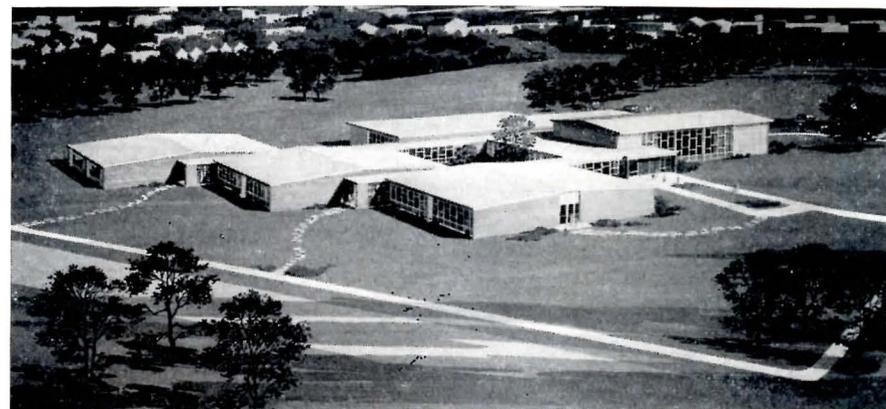
*Right: Francis Dunlavy Elementary School, Lebanon, Ohio; Joseph Baker and Associates*

*Left: Fred Ekstrand Elementary School, San Dimas, Cal.; Daniel, Mann, Johnson and Mendenhall*



*Right: Brockway Junior-Senior High School, Jefferson County, Pa.; Hunter, Campbell and Rea*

*Left: North Hagerstown High School, Washington County, Md.; McLeod and Ferrara*



*Right: Beach Avenue Elementary School, Niagara Falls, N. Y.; Sargent-Webster-Crenshaw & Folley*

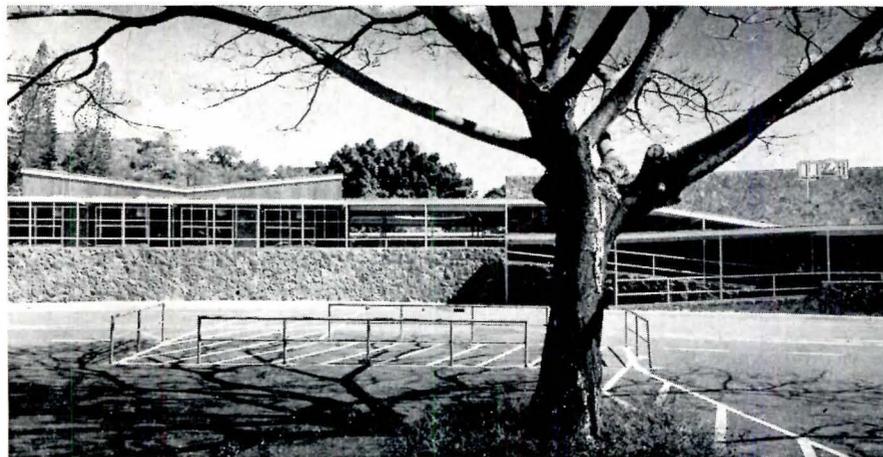
(More news on page 12)

BUILDINGS IN THE NEWS

HAWAII CHAPTER BESTOWS ANNUAL HONOR AWARDS

**HONOR AWARDS:** at its annual dinner, the Hawaii chapter of the American Institute of Architects awarded three firsts and five honorable mentions in its annual honor awards program. Included among the first place winners were: (1) the Puna-

hou School Building — Vladimir Ossipoff, F.A.I.A., architect; (2) Hilo Public Library, Hilo — Merrill, Simms and Roehrig, architects; and (3) the Allen Johnson residence — Johnson and Perkins, architects



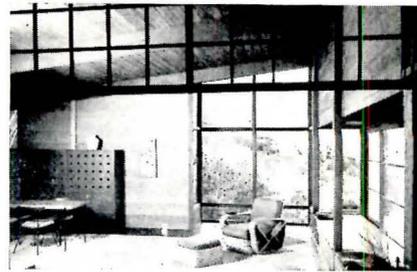
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**HONORABLE MENTIONS:** runners-up in the program included (4) the Glen Baker residence — Johnson and Perkins, architects; (5) the William Barlow residence — Harry Seckel, architect; (6) Kamehameha School Buildings — Merrill, Simms and Roehrig, architects; (7) Waikiki Kapahulu Library, Honolulu — Lemmon, Freeth, Haines and Jones, architects; and (8) Honolulu Junior Chamber of Commerce Building — Frank Haines and Gordon Bailey, architects. Serving on the jury, which was composed of 1956 award winners, were George J. Wimberley as chairman, Frank Slavsky and Alfred Preis, all of the Hawaii chapter  
(More news on page 16)

# ARCHITECTS' OFFICE . . .

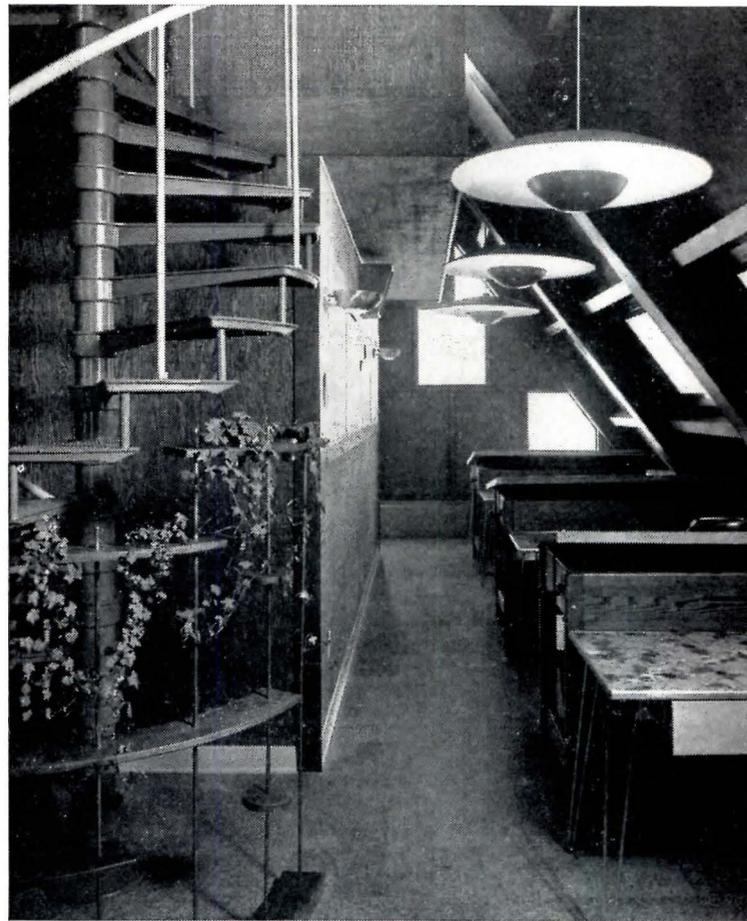
## the flooring spec: Armstrong Cork Tile

### MODERN TEXTURE

For their new offices, The Griffith Co., Architects, chose 6" x 12" Armstrong Cork Tile. Its rich, large-particle texture is an ideal complement to the dominant wood tones of the interior. A distinctive effect in perfect harmony with the interesting modern lines of the office was achieved with the use of the oblong tiles.

Offices of The Griffith Co., Architects,  
Fort Dodge, Iowa

architect: Stanford Griffith



### NATURAL BEAUTY

The rugged character of the sportsman's world is reflected in the New York showroom of one of America's largest makers of sportswear. To achieve an outdoor effect, important to the merchandising of the company's products, the architect specified sandblasted pine and flagstone—and a floor of Armstrong Cork Tile.

White Stag Manufacturing Company Showrooms,  
New York City

architect: Gerhard E. Karplus, A.I.A.



Armstrong Cork Tile, a floor of classic beauty, is made with unusually large cork particles for a rich, deep-textured effect. It is exceedingly comfortable and quiet underfoot. A new plastic finish resists scuffing and simplifies maintenance. Armstrong Cork Tile is made in two shades, a variety of sizes, and four gauges:  $\frac{3}{32}$ ",  $\frac{1}{8}$ ",  $\frac{3}{16}$ ", and  $\frac{5}{16}$ ". It may be used over suspended floors or on grade when installed according to Armstrong specifications.

Armstrong makes all types of resilient floors; therefore, unbiased recommendations can be made for every flooring need. For information, samples, complete specifications, design and color scheme assistance, call the Architectural-Builder Consultant in your nearest Armstrong District Office or write direct to Armstrong Cork Company, Floor Division, 807 Rock Street, Lancaster, Pennsylvania.



## Armstrong FLOORS

Approximate Installed Prices per Sq. Ft. (Over concrete, minimum area 1000 sq. ft.)

Decoray®  
Linoleum Tile  
Asphalt Tile,  
 $\frac{1}{8}$ " (A, B, C, D)  
Linoleum,  
light gauge  
Asphalt Tile,  
 $\frac{3}{16}$ " (A, B)

20¢  
to  
35¢

Linoleum,  
standard gauge  
Asphalt Tile,  
 $\frac{3}{16}$ " (C, D)  
Linoleum,  $\frac{1}{8}$ "  
("Battleship")  
Greaseproof  
Asphalt Tile  
Cork Tile,  $\frac{3}{32}$ "

35¢  
to  
45¢

Corlon®  
(Sheet Vinyl)  
Linoleum,  $\frac{1}{8}$ "  
Cork Tile,  $\frac{1}{8}$ "  
Excelon® Tile  
(Vinyl-Asbestos)  
 $\frac{1}{8}$ "

45¢  
to  
60¢

Rubber Tile,  $\frac{1}{8}$ "  
Cork Tile,  $\frac{3}{16}$ "  
Linotile®  
Corlon  
(Hydrocord®  
Back)  
Linoleum  
(Cushion-Eze®  
Back\*\*)

60¢  
to  
70¢

Custom Corlon  
Tile (Homogeneous Vinyl)  
 $\frac{3}{32}$ ",  $\frac{1}{8}$ "  
Cork Tile,  $\frac{5}{16}$ "  
Rubber Tile,  
 $\frac{3}{16}$ "  
Corlon  
(Cushion-Eze  
Back)

70¢  
to  
90¢

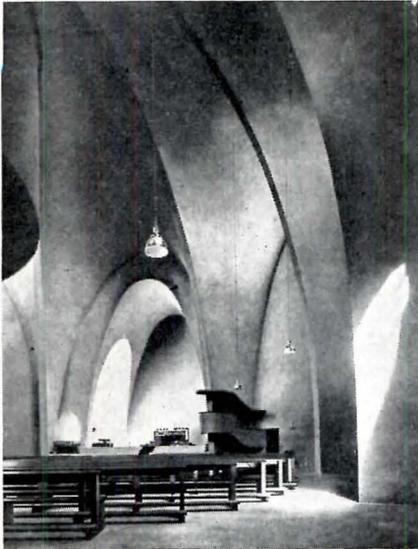
Custom Vinyl Cork  
Tile  
Imperial® Custom  
Corlon Tile

95¢  
to  
\$1.30

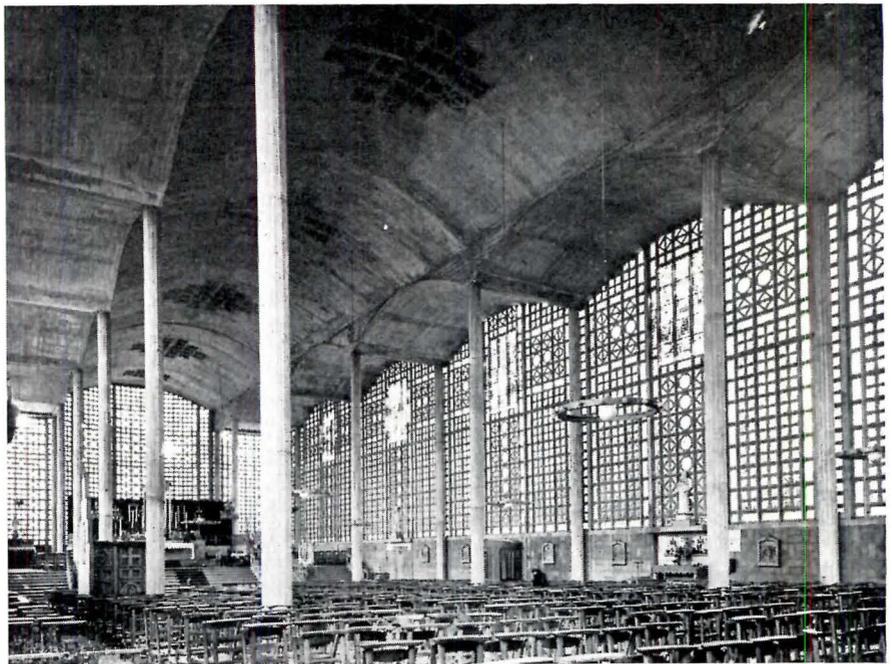
\*TRADE-MARK  
\*\*PATENT PENDING

# THE RECORD REPORTS

(Continued from page 12)



Left: Church of St. Engelbert, Köln-Riehl, 1932; Domenikus Böhm, architect — “if St. Engelbert,” says the museum’s catalog, “manifests ‘tradition’ [in] the apparent



complexity of its ribs and their ‘Gothic’ rise . . . the drama of the interior is contemporary.” Right: Notre Dame du Raincy, Paris, 1923; Auguste Perret,

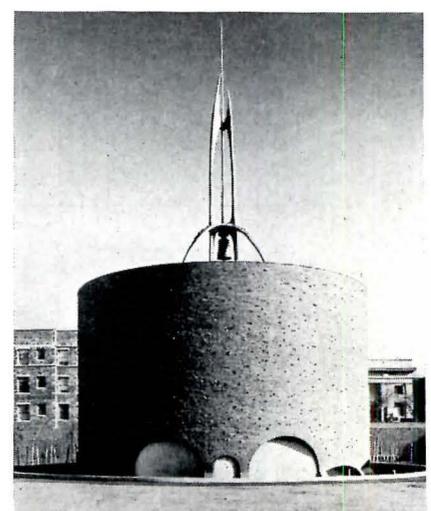
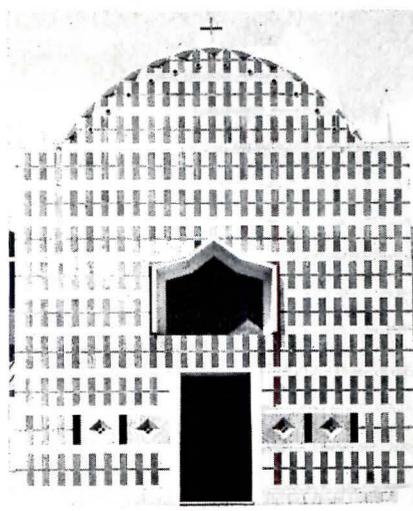
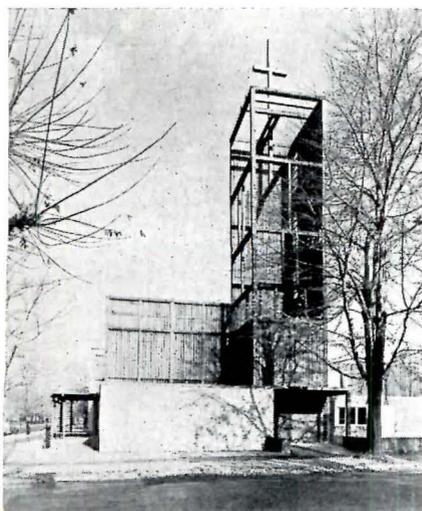
architect — “the classical elements are present, yet throughout the effect is of reinforced concrete, brilliantly engineered for a space as Perret understood it”

## DEVELOPMENT OF MODERN CHURCH TRACED IN EXHIBIT

Under the auspices of its Department of Circulating Exhibitions, the Museum of Modern Art opened its new exhibit, “Modern Church Architecture,” May 5 at the University of Illinois. This is the first exhibit on religious buildings to be organized by the department.

The exhibit shows 24 modern churches, ranging in time from Anatole de Baudot’s Church of St. Jean de Montmartre, built in 1894, to Frank Lloyd Wright’s Beth Sholom Synagogue, still under construction in Philadelphia. Ten U. S. churches are included  
(Continued on page 356)

Right: Church of the Miraculous Virgin, Mexico, 1956; Felix Candela, architect — “the rhythm of shapes and the forms acting within them generate new architectural experiences in space.” Below, left: Central Lutheran Church, Portland, Ore., 1951; Pietro Belluschi, architect — “sensitively balanced throughout.” Below, center: Church of St. Anthony, Recoaro-Terme, Italy, 1950; Guiseppe Vacarro, architect — “façade of red and colored inlaid marble reminiscent of the medieval and Renaissance churches of Tuscany.” Below, right: Kresge Chapel, M.I.T., 1955; Eero Saarinen, architect — “a protective sanctuary, affords complete physical separation from the outside world”



(More news on page 16B)

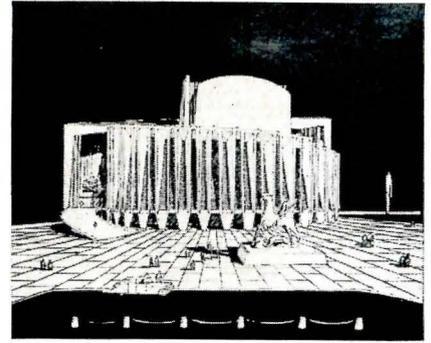
**The State of Construction**

A decline of nine per cent compared with the same month last year was registered in April figures on valuation of contracts awarded for future construction in the United States as reported by F. W. Dodge Corporation. The decline offset the large increase in March and kept the cumulative total for the first four months of 1957 at the same level as last year. Both nonresidential and residential construction were affected. For details see page 384.

**What's Wrong with Specs?**

The Producers' Council, holding its annual spring meeting, and the Construction Specifications Institute, holding its first annual convention, heard some sharp criticism of the current state of specification writing at a joint luncheon held in Washington May 13. Addressing the delegates on "The Human Side of Specifications," Kenneth M. Wilson, of the Wisconsin architectural and engineering firm E. F. Klinger & Associates, called for greater clarity and brevity in the writing of specifications. "Today," he said, "specifications no longer complement drawings. Drawings, which from time immemorial have been the universal language of man, are now designed to complement the specifications. With this transposition, we have seen our specifications grow in length

*APOLOGIES to second- and third-prize winners in international competition for National Opera House for Sydney, Australia, whose entries were incorrectly identified in news story on winners (AR, April 1957, page 16). At right, they are (top) second-prize entry by Philadelphia architects Joseph Marzella, W. W. Cunningham, William Weissman, Milton Brecher, Leon Loschetter, Robert L. Geddes and George Qualls; (below), third-prize entry by Bossevain and Osmond of London*



and, unfortunately, in confusion as to their true intent as well." Mr. Wilson urged that specification writers be more specific about the materials they want — "Unpleasant as it may be, failure to accept responsibility for the work of their own hands is at least one of the underlying reasons for our confusing specifications of today"; that specifications be "combined" with well-detailed drawings; and that architects and engineers follow up with sharp field supervision. In a joint afternoon session, producers and specifiers attended a panel discussion on "Construction Specifications"; the speakers included Norman Hunter, president of C.S.I.; Walter Taylor, the American Institute of Architects' director of research and education; David Miller, a director of the Producers' Council; Frank Crimp,

A.I.A., a director of C.S.I.; and William Scheick, executive director of the Building Research Institute. Earlier, in an independent morning session, C.S.I. had presented its highest award, honorary membership, to Colonel Alfred W. Sikes, Chicago engineer.

**Coming Up**

The American Society of Landscape Architects will hold its 58th annual meeting at the Sheraton-Palace Hotel in San Francisco July 8-10. In addition to the business sessions and seminars, there will be field trips to see important works of landscape architects in the San Francisco Bay Region and chapter displays of work in landscape architecture, including the traveling photographic exhibit, "Landscape Architecture Today" (AR, Jan. 1957, page 16), prepared by the California Redwood Association with the advice and assistance of Northern California landscape architects.

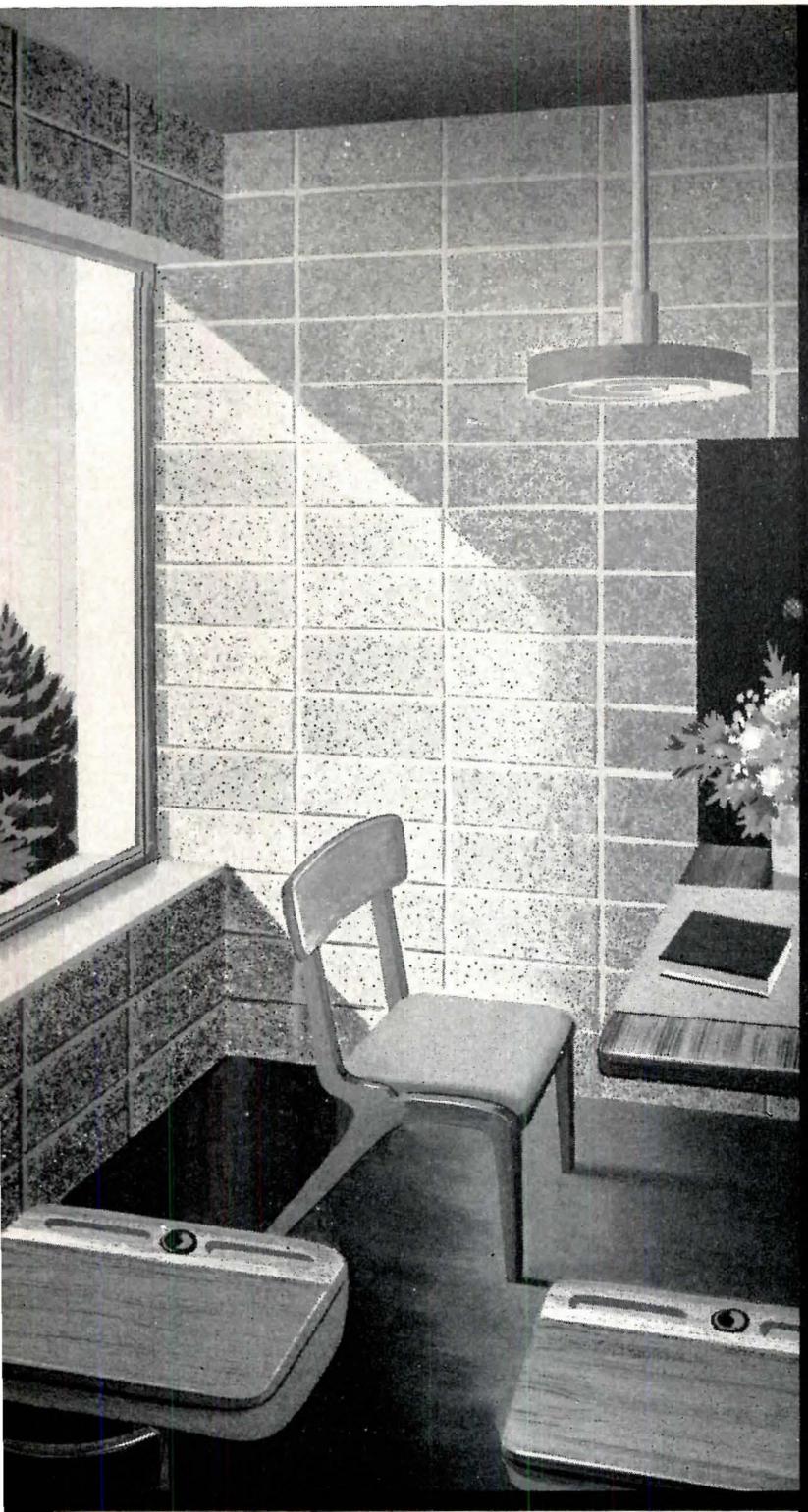
A World Conference on Prestressed Concrete will be held in San Francisco July 29-August 2 under the sponsorship of the University of California and concurrently with the third annual meeting of the Prestressed Concrete Institute. More than 150 engineers from some 41 foreign countries are expected to be among the 900 delegates to the conference. Speakers from a dozen nations will, according to Conference Chairman T. Y. Lin of the University, "spearhead the conference's primary purpose of

(Continued on page 24)



— Drawn for the RECORD by Alan Dunn

"Save the Capitol! — save the Robie house! — What about me?"



## A WAYLITE SURFACE

# *needs no acoustical treatment*

In addition, it has high thermal insulative qualities . . . offers many decorative possibilities . . . it is low in cost . . . fire-safe

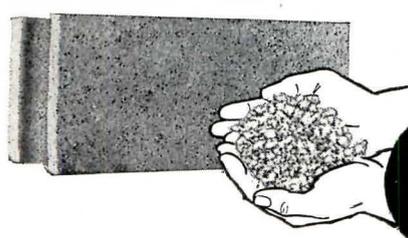
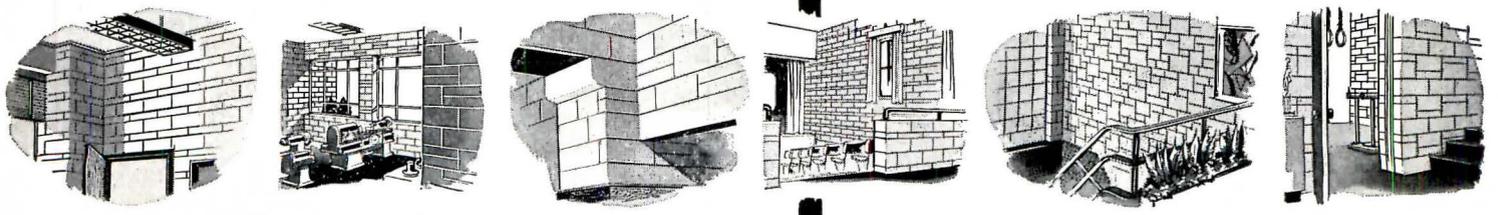
A large number of schools are being built these days of Waylite concrete masonry units.

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.

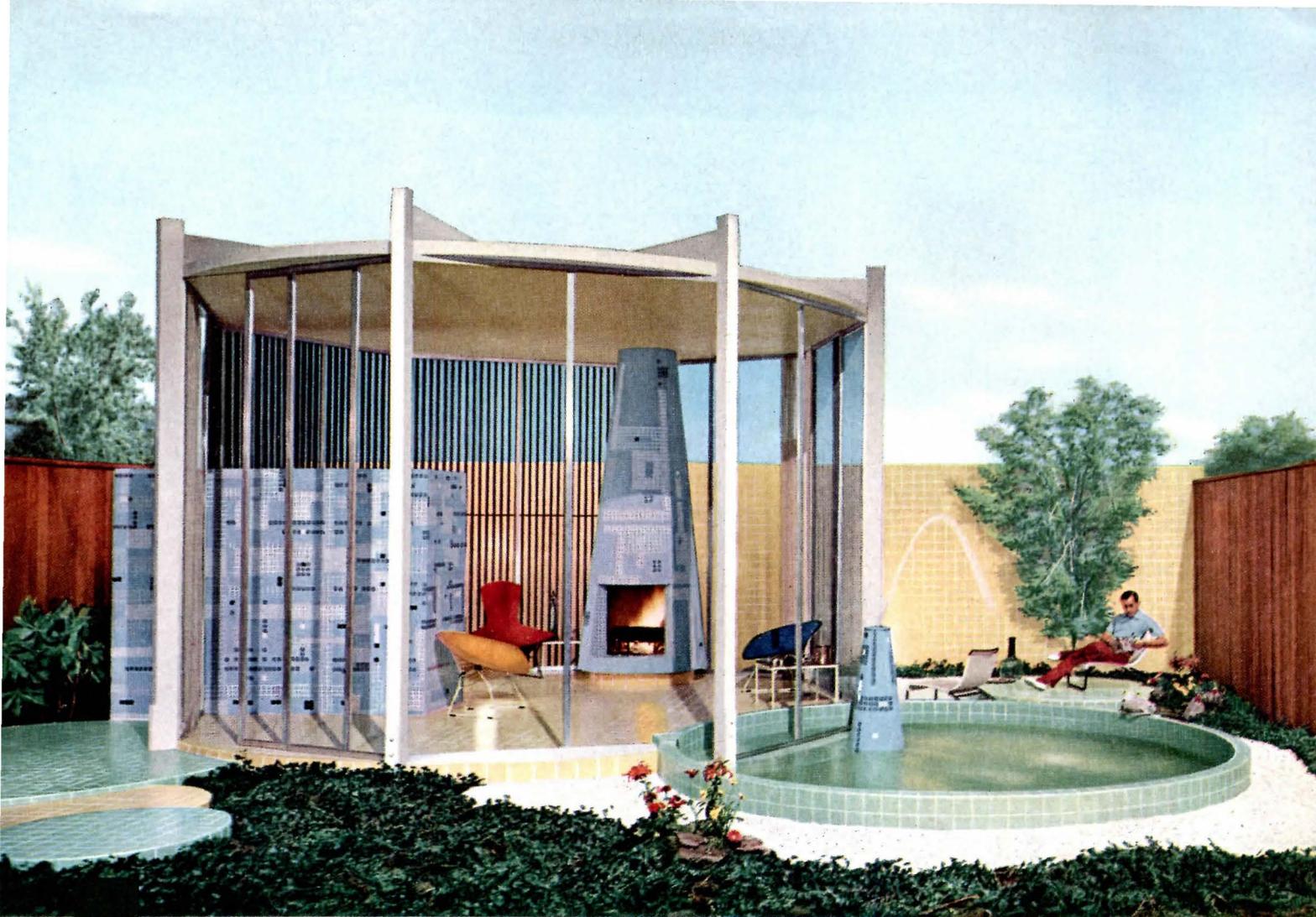
Exposed Waylite is not only comfortable to the ear, but it is pleasing to the eye. The unit patterns shown give some idea of the varied decorative effects that can be easily achieved. The natural surface of Waylite units is attractive in color and texture. Units may be painted—or pigmented during manufacture.

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**  
MASONRY UNITS



*Design for Summer Pavilion by Worley K. Wong, A.I.A. & John Carden Campbell*

## "A CERAMIC TILED SUMMER PAVILION...BEAUTIFUL ... PRACTICAL ... EASILY MAINTAINED"

*Campbell & Wong*

Campbell & Wong took time-tested ceramic tile applications and added the vital elements of superior design. Result: a graceful summer pavilion for casual outdoor living.

This same imaginative beauty can be utilized in countless other designs for today's trend to outdoor patio living. Lifetime ceramic tile is the ideal material: it's proof against sun, rain, fire and foot traffic.

Inside the home, too, more and more architects and builders are taking advantage of tile's unique design potential and long-range economy—in baths, kitchens, laundries,

utility rooms, recreation rooms and foyers. Tile is the most work-free material on the market. It eliminates the need for waxing, painting or any other refinishing.

Remember ceramic tile in your next residential, institutional or commercial project. It is produced in a myriad of colors, shapes, sizes and surface textures—the widest range of any surfacing material. Today's modern lower cost adhesive installation techniques are giving ceramic tile wider application than ever. Ask your ceramic tile contractor to tell you more about these new methods.

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# THE RECORD REPORTS

## MEETINGS AND MISCELLANY

(Continued from page 21)

pooling scientific, engineering and manufacturing knowledge and experience." There will also be some 50 papers on materials and techniques, precast prestressed buildings and bridges, prestressed wharves, piles, pavements, thin shells and slabs, research and design and construction in various countries. The American Institute of Architects is among the cooperating societies, which also include the American Association of State Highway Officials, American Concrete Institute, American Society of Civil Engineers, Associated General Contractors of America, Association of American Railroads, International Institute for Prestressing, National Science Foundation, Portland Cement Association and Structural Engineers Association of California.

Plastics for Roof Construction will be the theme of the next meeting of the Building Research Institute's Plastics Study Group, scheduled for September 17-18 in St. Louis. The program will include reports on field experience with plastic materials, complete with cost data on field installations of plastics used as vapor barriers, insulation, flashing, roof surfacing materials and skylights; also a field trip to the new Monsanto Chemical Inorganic Chemicals Laboratory in St. Louis, in the construction of which more than 80 different applications of plastics were made. The meeting is open to architects, engineers and any interested persons in the construction industry. Registration and other information from: Harold Horowitz, Technical Secretary, Building Research Institute, 2101 Constitution Avenue, Washington 25, D. C.

The First International Seminar on Hospital Construction will be held in Geneva September 9-19 under the joint sponsorship of the International Hospital Federation of the International Union of Architects, with the assistance of the World Health Organization. Object is the pooling of the experience of architects, administrators, engineers and doctors responsible, at various levels, for the construction and operation of hospitals and allied establishments. While the present seminar, planned to be the first in a series, is intended primarily for technicians from countries in the Eastern Mediterranean area, North Africa and the Near and

(Continued on page 28)



YALE named architect Paul Rudolph (above left) chairman of Architecture Department of its School of Architecture and Design and, as dean of the School, Gibson A. Danes (above center), who has been chairman of Art Department at U.C.L.A.



MEMPHIS A.I.A. gave its first Gold Medal to Pietro Belluschi, M.I.T.'s dean of Architecture and Planning, shown (right above) with Chapter President A. L. Aydelott. Dean Belluschi was cited as "architect, statesman, educator and writer"



PRODUCT LITERATURE AWARDS for 1957 (AR, April 1957, page 262) were

handed out at luncheon held during A.I.A.'s Centennial Convention in Washington. At left, VIP's on that occasion: (left to right) John R. Magney, A.I.A., Jury of Awards chairman; Elliott R. Selinger, Grant Pulley and Hardware Co.; Theodore I. Coe, A.I.A. technical secretary; Fred M. Hauserman, Producers' Council president; W. L. Dabrymple, U. S. Gypsum Co.; Maxwell Caskie, Reynolds Metals Co. Other top award winner was Douglas Fir Plywood Assn.



BOSTON ARCHITECTURAL CENTER scholarship winners—Peter F. DiMeo, Cabot, Cabot & Forbes Co. employe, Boston Society of Architects Traveling Scholarship; Leon Bailey, also Cabot, Cabot & Forbes, special scholarship for one year's study at M.I.T.; Leonard Saulnier, of Shepley, Bulfinch, Richardson & Abbott, Ames Scholarship



NATIONAL SAFETY COUNCIL citation went to George Erdenberger, Model Section chief at Voorhees, Walker, Smith and Smith, New York architects, for record of 67 man-years of work without a day's loss due to accident. Mr. Erdenberger is shown above (center) with firm's Perry Coke Smith (left) and Stephen F. Voorhees, senior partner



ARNOLD W. BRUNNER PRIZE in Architecture (\$1000) of National Institute of Arts and Letters was given this year to architect John Carl Warnecke (left above) of San Francisco. Center: Architectural League of New York's new president, Dean Olindo Grossi



HOTEL OF THE FUTURE was topic of William B. Tabler, architect of three newest Hilton hotels in U. S., at Chicago meeting of American Institute of Real Estate Appraisers. Above, Mr. Tabler shows mass model of Pittsburgh Hilton to Hilton VP Robert J. Caverly

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Stevan Dohanos, famed artist, designed this handsome den using walnut Craftwall wood paneling.

## THE RECORD REPORTS

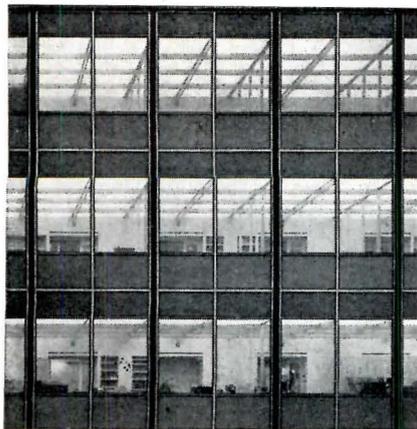
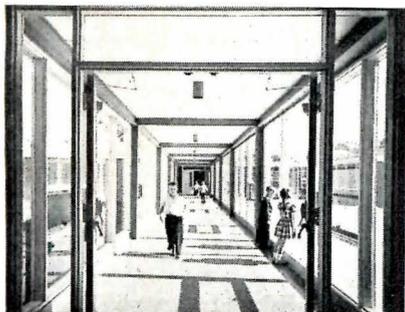
### MEETINGS AND MISCELLANY

(Continued from page 24)

Middle East, it is open to persons concerned with hospital construction from all countries. For details: First International Seminar on Hospital Construction, P. O. Box 239, Geneva 2 (Cormavin), Switzerland.

#### Designing with the Sun

"Living with the Sun" is the title of an international architectural competition which seeks a design for "a residence which will control, adapt, store and utilize directly and indirectly the sun's energy to create a livable and pleasant climate for man's domestic activities."

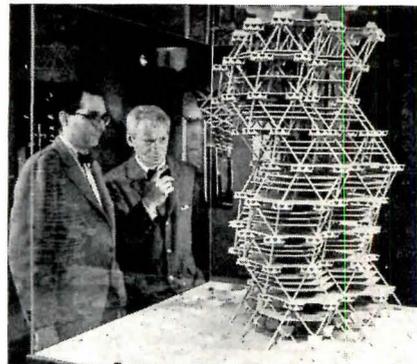


The competition, which is sponsored by the Association for Applied Solar Energy and the Phoenix Association of Home Builders and approved by the American Institute of Architects and the International Union of Architects, closes August 15; registration of applicants closed June 1. Professional adviser is James M. Hunter, F.A.I.A., 1126 Spruce Street, Boulder, Colo. First prize will be \$2500 and the architectural contract for building of the residence, which will be erected as soon as possible after the judging on a one-acre site near Phoenix. At the discretion of the jury, a second award of \$1500, a third award of \$1000 and a fourth and fifth award of \$500 each may be made. Jurors, who will meet September 14-15 at Grand Canyon, are Dean Pietro Belluschi of M.I.T.'s School of Architecture and Planning; Architect Carlos Contreras of Mexico City; Thomas Creighton, editor of *Progressive Architecture*; James W. Elmore, Phoenix architect and associate professor of architecture at Arizona State College in Tempe; and Nathaniel Owings, of Skidmore, Owings and Merrill.

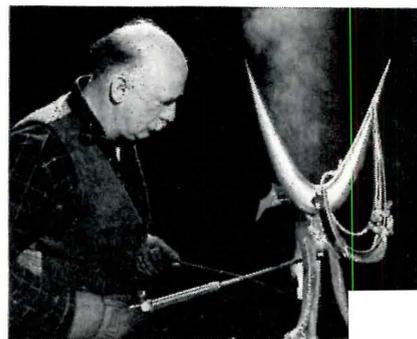
#### Other current competitions

Architects and engineers as well as electrical contractors, electrical wholesale distributors, and electrical utility personnel — principal or employe in all cases — are eligible to compete in the 1957 International Lighting Competition sponsored by the magazines *Electrical Construction and Maintenance*, *Electrical Wholesaling and Electrical World*, with the cooperation of the National Lighting Bureau (National Electrical Manufacturers Association). Cash awards of \$100, \$50, and three of \$25 each are offered for outstanding lighting installations in each of six categories — industrial, store, office, institutional, outdoor lighting and residential lighting. The competition closes October 25. Inquiries to: Berlon C. Cooper, chairman,

*ARCHITECTURAL PHOTOGRAPHERS* held exhibit of members' work as feature of their association's recent convention, awarded prizes for the three photographs at left: top, Frank Lotz Miller's photograph of Tulane dormitory, Andry & Fietel, Ferret & Wolf, Ricciuti & Associates, Architects; center, Louis Reens' photograph of West Bridgewater, Mass., Elementary School, The Architects Collaborative, Architects; bottom, Mason Pawlak's photograph of General Motors Technical Center, Detroit, Eero Saarinen and Associates, Architects



*STRUCTURE FOR TOMORROW* — Louis Kahn (right), Philadelphia architect and planner, with Prof. Alan R. Solomon, director of Cornell art museum, inspecting Kahn's model of "tomorrow's municipal office building," project sponsored by Universal Atlas Cement Co. Building would utilize triangular frames of precast, prestressed concrete; hollow concrete sections provide arteries for air conditioning, heating and other service lines and a central core consolidates elevators and stairways



*ALUMINUM SCULPTURE* for aluminum award — the emblem of the 1957 R. S. Reynolds Memorial Award, presented at A.I.A. Centennial Convention to the three young Spanish architect winners (*AR*, May 1957, page 16B), was sculpture by Theodore Roszak, shown above at work on emblem — rivets and tack welds form temporary fastenings. Later all parts were permanently brazed and welded into a single structural unit

1957 International Lighting Competition, 330 West 42nd Street, New York 36, New York.

Parents' Magazine has announced its eighth annual Builders' Competition for the Best Homes for Families with Children. This one is for builders, but architects may wish to suggest entry of eligible houses they have designed. Houses must have been built and sold between July 1, 1956 and June 30, 1957 and must be owner-occupied by families with one or more children, cost \$25,000 or less.

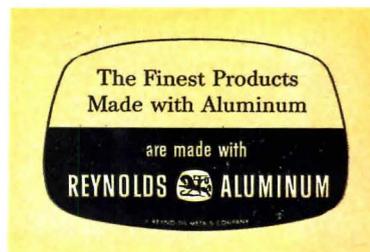
(More news on page 32)



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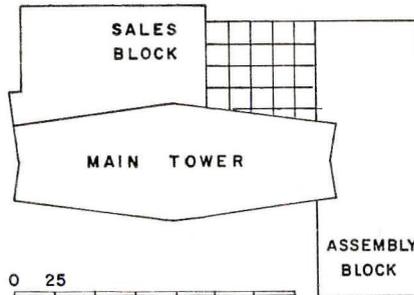
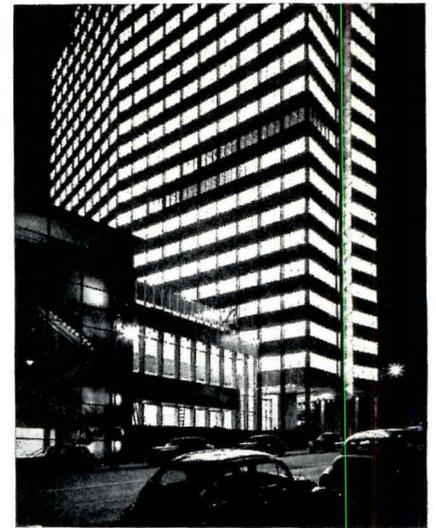
See "Circus Boy", Reynolds dramatic adventure series, Sunday's, NBC-TV Network.



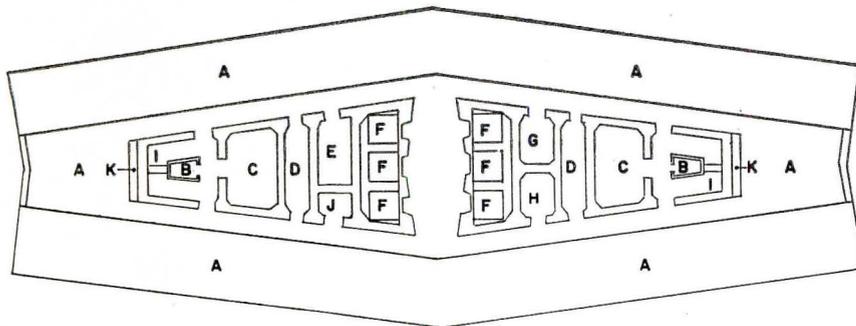
NEW LANDMARK FOR BRITISH COLUMBIA: B.C. ELECTRIC TOWER

A diamond-shaped central core of reinforced concrete to house all services and provide almost the entire structural support of the building is the key to the scheme evolved for the new Head Office of the B.C. Electric Company in Vancouver. Sharp & Thompson, Berwick, Pratt were the architects, Fred N. Severud the structural engineer, John Laing & Son (Canada) Ltd. the general contractors. Tom Ingledow, vice president and executive engineer of B.C. Electric, personally directed the project for the company. After three years of planning, the building was constructed in 18 months and officially opened on March 28 of this year. It houses more than 1000 employes, provides a total floor area of 368,758 sq ft; estimated cost was \$6.5 million.

The building covers only two thirds of the site at ground level, and extends above the third floor as a tower occupying only a quarter of the site. Tower floors are cantilevered from the central core, with only light structural members on the outside walls to provide rigidity. Shape of the core resulted from compressing elevator shafts, stairs, wash-



21-story tower is one of three structurally independent components comprising the new Head Office of B.C. Electric. With the one-story assembly block and the three-story sales block, the building covers only two thirds of the site at ground level, one quarter above the third floor. Adjacent is the company's recently completed Dal Grauer Substation (visible at extreme left in photo at right above)



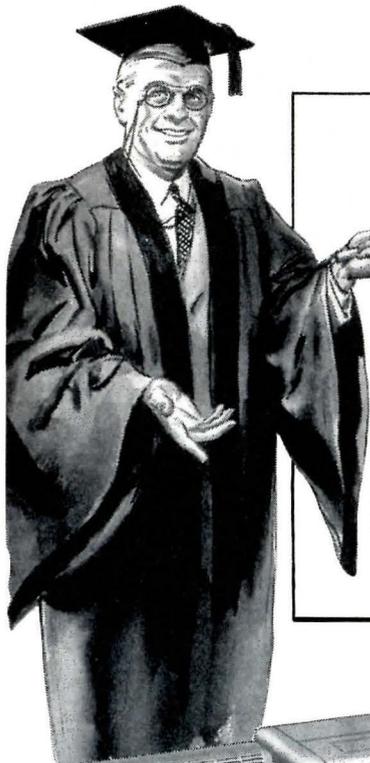
rooms, heating and ventilating ducts, piping and other services into the least possible space; the core is surrounded by rectangular blocks of office space, all outside space, with no employe more than 15 ft from a window. The central core extends two and a half stories above the top floor to house the elevator equipment and air conditioning apparatus.

Plan of typical tower floor and photo of typical general office space it produces. Key to plan: a. working area; b. janitor supplies; c. lavatory; d. ducts; e. elevator machinery; f. elevators; g. freight elevator; h. mail conveyor; i. stairway; j. transformer vault; k. coat storage

Exteriors are curtain walls of gray porcelain enameled steel panels with fiberglass insulation and 50,000 sq ft of double-paned glass with insulating airspace, fitted in a grid of aluminum extrusions; Italian glass mosaic tile covers lower exterior and service penthouse. Metal partitions, movable at 39-in. intervals, make interior office walls.



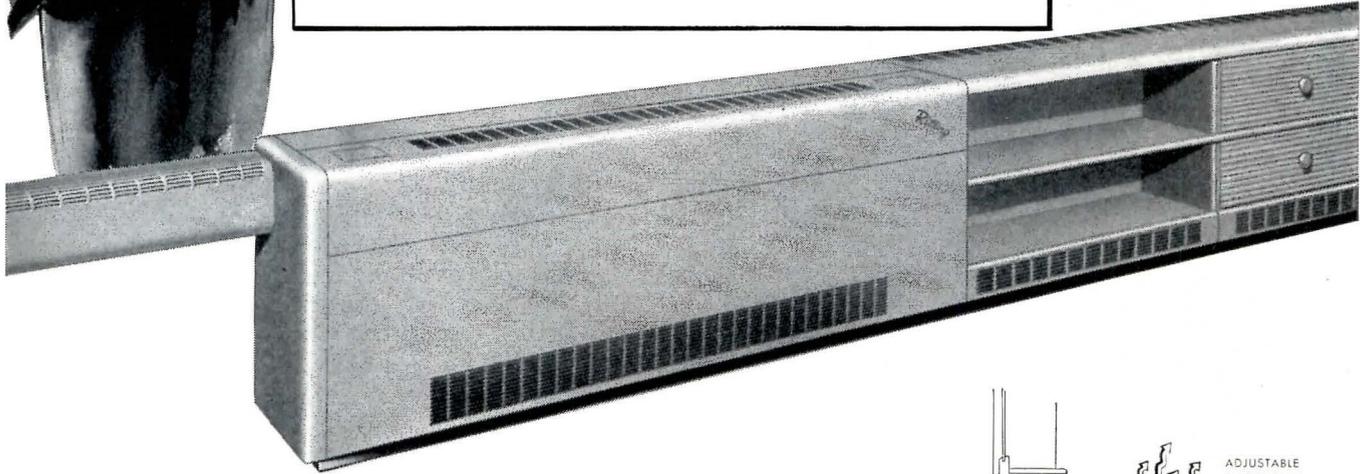
(More news on page 40)



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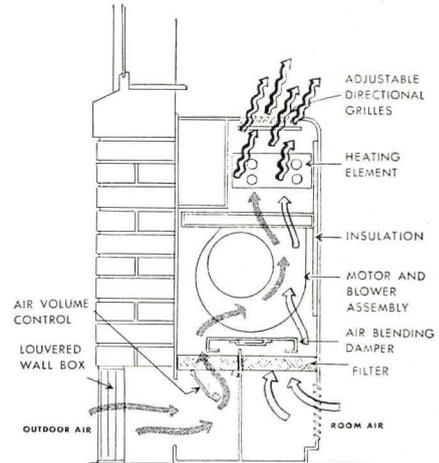
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woods from the forests of the world are used, there is a spirited graciousness — a strength and beauty that dwell in every ripple of its meticulously finished grain. And yet, beautiful wood is the essence of peace; it brings serenity to a room in a way that is all its own. Now, Stem brings you, through the magic of modern factory methods, all the nobility, splendor and lifetime permanence of the finest veneer that tradition knows. And you can afford to be generous with this wood, for the cost is low.

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# RARE WOODS FROM STEM



## THE RECORD REPORTS NEWS FROM CANADA

(Continued from page 40)

student trained in a West African office could pass the general examination in his own country, then, upon moving to London or Toronto, could qualify professionally by passing a local examination there.

George Whale, chairman of the Toronto Chapter, did not comment upon

Mr. Cross's proposals, but it was evident from the applause that they had been heard by a receptive audience.

### 1957 HIGH OF \$6.7 BILLION EXPECTED IN CONSTRUCTION

Construction in 1957 will reach a new high of \$6.7 billion, according to the latest estimate of the Dominion Bureau of Statistics. This is five per cent above last year's total, and would have been more were it not for credit restrictions

and a slowdown in house building.

Hospitals and stores, plus major developments in power, gas and oil facilities, will lead the parade of new projects.

Meanwhile, while the general level of business activity remains slightly above that of 1956, there is increasing evidence of spottiness. The pressure of rising costs has produced a profit squeeze in fields where intense competition prevails, notably in chemicals and consumer durables. Residential construction, of course, is a soft spot. Other dubious quantities are lumber, non-ferrous metals and textiles.

An important stimulating influence in the economy is the continued high level of capital expenditures, although there is some evidence now of a tendency to level off.

(Continued on page 46)



## Get crisper cleaner drawings with **CASTELL**

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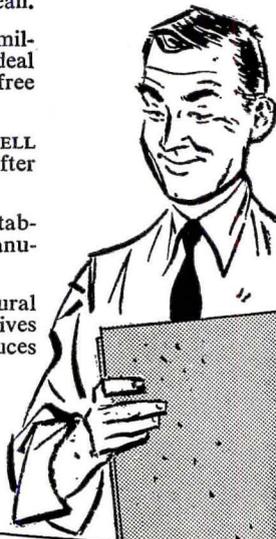
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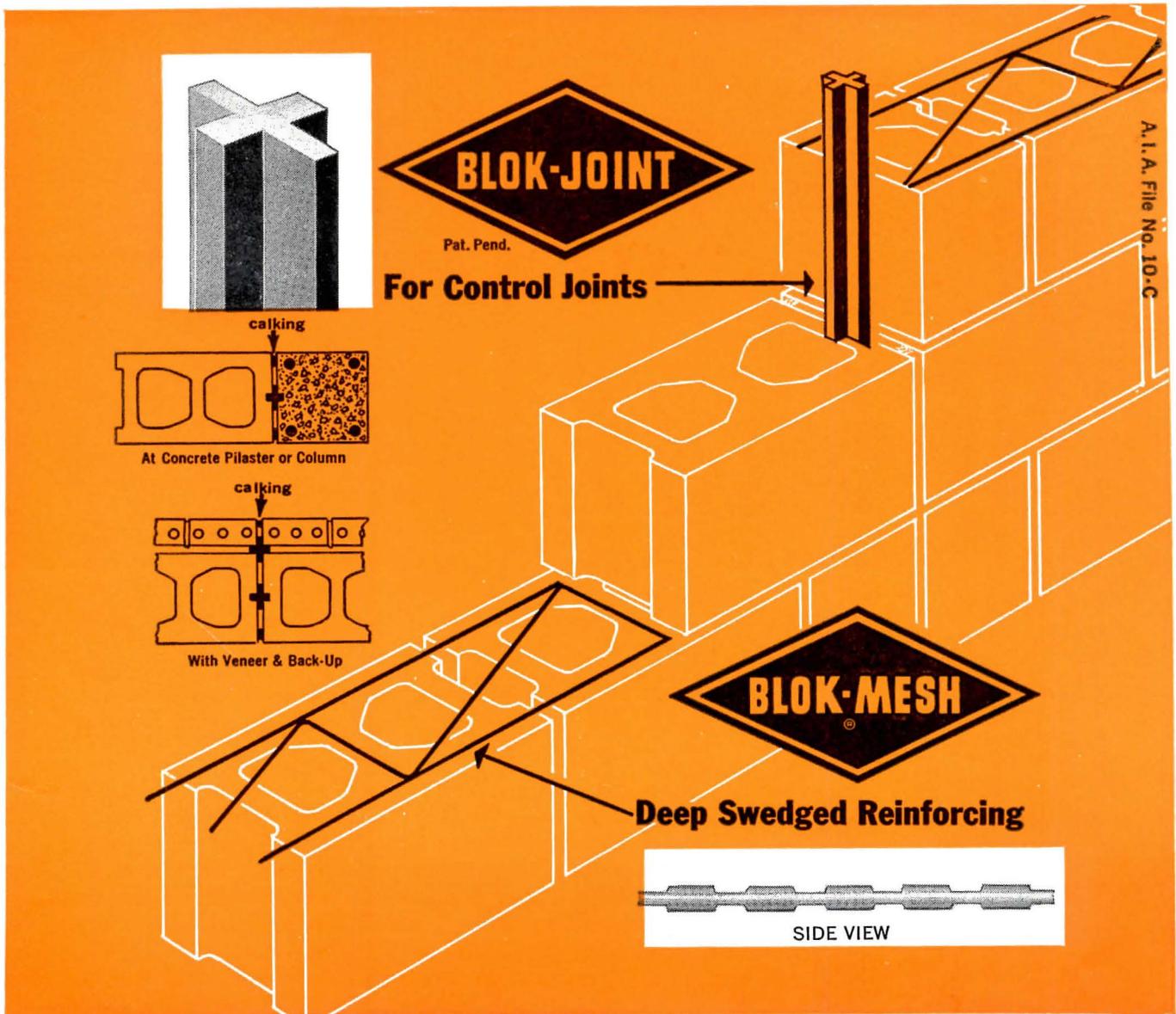
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*LIBBY, MCNEILL & LIBBY of Canada Ltd. completed this new administration building in Chatham, Ont., last year at a unit cost of one dollar per cu ft (not including furnishings). It has a structural steel frame, is two stories high throughout, with laboratory, cafeteria and plant washrooms on the first floor; general and executive offices, conference rooms and office machines room are on the second floor. The building is connected to an existing plant behind it by means of a stairway and corridor which join levels and provide direct access from the plant to cafeteria, washrooms and general offices. Main objective in planning was flexibility, achieved in the structural design by an open span on the general office and in the mechanical and electrical design by use of a cellular steel floor system and luminous ceilings which, in the general office, have air conditioning plenum above. All partitions are movable. Architect: Joseph W. Storey, Chatham; mechanical engineer: R. W. Dixon; electrical engineer: McGregor-Anderson*



## It Takes Both For MORE STRENGTH & PROTECTION IN MASONRY WALLS

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The **secure interlock** provided by Blok-Joint adds to the lateral stability of the wall. It allows for contraction *and* expansion while maintaining a firm joint.

**Blok-Joint** is effective in single block walls, with brick and block backup and at pilasters and columns.

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tar to get a real bite on the reinforcing yet requires no more area in joint than other types of superficial deforming.

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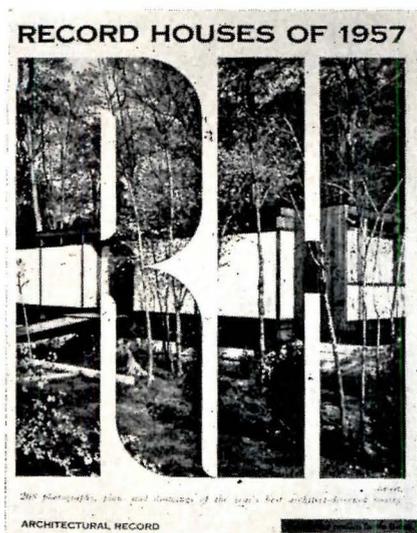


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*Record Houses of 1957.* By the editors of ARCHITECTURAL RECORD. F. W. Dodge Corp. (N. Y.), 1957. 286 pp., 268 photographs, plans and drawings. Preface by Russell Lynes

“ . . . high and superb and all-of-a-piece ”  
Philip Johnson, Architect

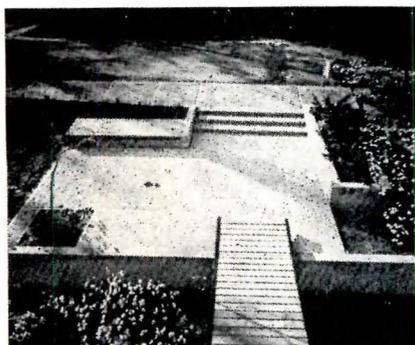


© Ezra Stoller

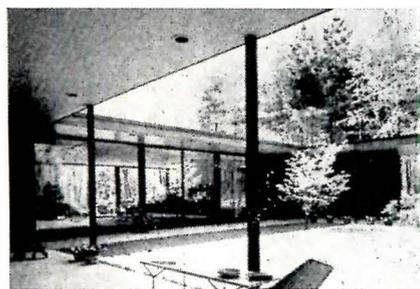
## DOMESTIC MANNERS IN AMERICAN ARCHITECTURE

By ELIZABETH B. KASSLER

George Matsumoto, Architect



© Joseph W. Molitor



© Ezra Stoller

Eliot Noyes, Architect

Fired by the idea of producing an inexpensive paper-cover manual which architects might use to show a client the extraordinary variety of cause and effect that is currently possible in our domestic architecture, the editors of ARCHITECTURAL RECORD present their second annual selection of “the year’s best architect-designed houses.” This is by no means a reprint, as most of the twenty-five houses are published for the first time, while a few came to light in other magazines. Each house is allotted four handsome pages. This section is followed by a detailed comparison of the separate design elements (entrances, built-ins, terraces, etc.) and prefaced with a lively article on “The American at Home — 1957” by Russell Lynes, student of the American scene and managing editor of *Harper’s*.

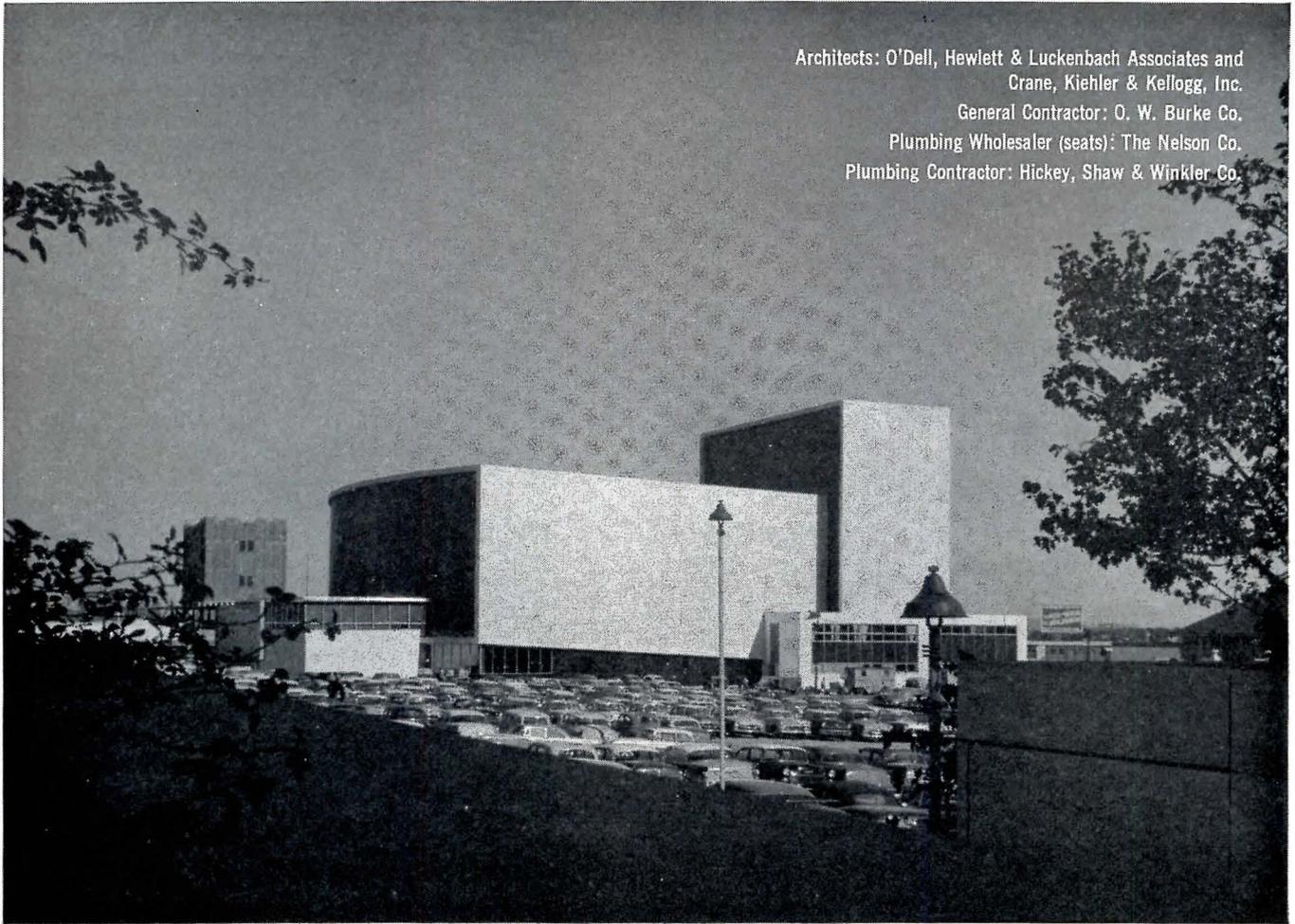
It is a happy circumstance that the astute and witty Mr. Lynes extends his trollopian concern for the domestic manners of the Americans to the houses which embody them. He takes as a text a quotation from the doughty 19th century phrenologist-octagonalist, Orson Squire Fowler: “Beautiful birds build tasty nests . . . a fancy man will build a fancy cottage, a practical man, a convenient house; a substantial man, a solid edifice; a weak man, an illy arranged house; an aspiring man, a high house, and a superior man, a superb villa.” Anyone interested in architecture as a social art must hope that the sequence is also reversible — that high houses and superb villas will nurture an aspiring and superior breed of man as surely as the beautiful bird must issue from a tasty nest. Or was Fowler faulty in his ornithological premises, we in our sociological?

Some of these Record Houses (George Matsumoto’s, for instance, and Philip Johnson’s) are indeed high and superb and all-of-a-piece. Others might themselves be characterized as tasty nests, with here some lovely golden straws or twisted twigs, there a borrowed feather or a chic bright ribbon, and nothing much to hold the ingredients together as architecture.

But the simile is limited. To judge from most of these houses, the nesting instinct is strictly for the birds. Neither warmth nor cosiness is necessarily adduced by natural materials and open fireplaces.

(Continued on page 62)

Architects: O'Dell, Hewlett & Luckenbach Associates and  
Crane, Kiehler & Kellogg, Inc.  
General Contractor: O. W. Burke Co.  
Plumbing Wholesaler (seats): The Nelson Co.  
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Detroit's new Henry and Edsel Ford Auditorium

## Dream job for architects

"Only the finest" said the budget-makers for the Henry and Edsel Ford Auditorium recently completed in Detroit. Architects, engineers and specification writers literally went *to the ends of the earth* for the most resplendent materials money could buy . . . Blue Pearl Granite from beneath the faraway lands of Norway . . . Pal Deo wood paneling from the South American jungles.

But seat selection? "Only the finest" in industrial seats turned out to be Olsonite white No. 10CC.

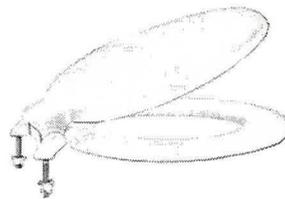
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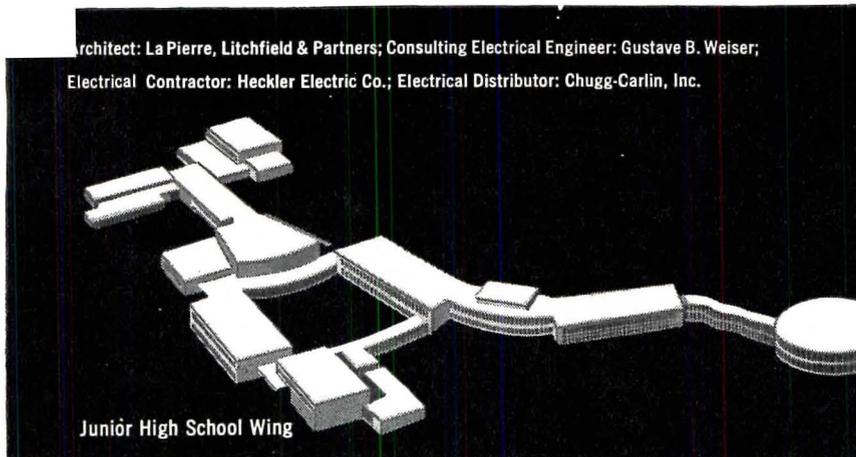


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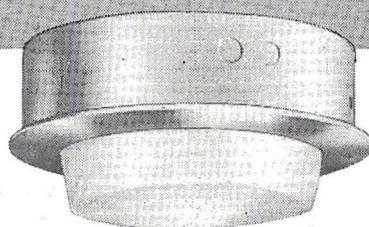


Juniór High School Wing

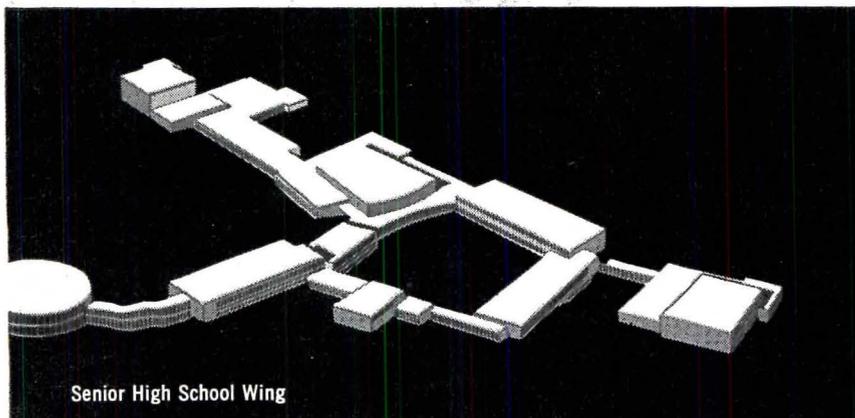
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## REQUIRED READING

(Continued from page 58)

It is the details, the richly varied "design elements" that dominate this book — and rightly, considering the avowed purpose of the publication. If your client is a dour, unimaginative type who needs a shaking-up, present him with a copy of this book and the chances are that he'll be properly shaken, — if not by Matsumoto's flower-moated entrance court or the classic Edward Barnes platform, then perhaps by Mario Corbett's bathroom-with-a-view, or Eliot Noyes' romantic outdoor Connecticut corridors, or Paul Kirk's stepped terraces and lofty inside garden. The book has something of everything, something for everyone.

### A LOOK BACK AT CALIFORNIA

*Here Lived the Californians.* By Oscar Lewis. Rinehart & Company, Inc. (N. Y.), 1957. 265 pp, illus. \$7.95.

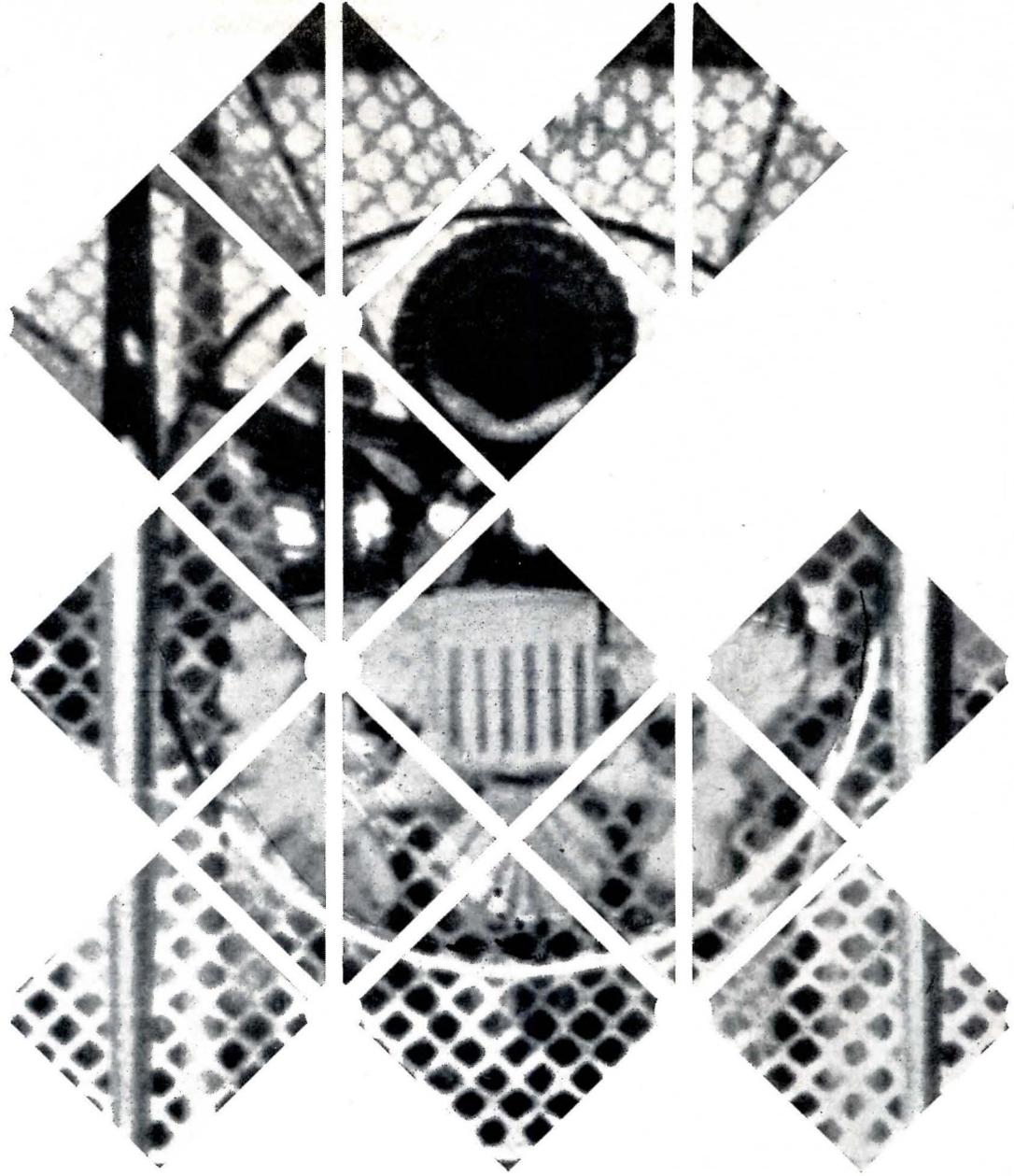
From the merely picturesque to the eccentric, from the domestic to the magnificent, this richly illustrated informal history surveys California architecture through the last century to about 1910. Except for the contemporary California-style house, which this book does not cover, practically every kind of residence, both indigenous and imported, may be found here.

There is a house that was finished but never lived in, and there is a house that was lived in but never finished. Fire destroyed all but the shell of the first, Jack London's stone castle, only a few days before he was to move in, and his death soon afterwards stopped the rebuilding plans. As for the house that was never finished, its story seems peculiarly appropriate to a land of mysticism and flourishing cults. In the 1880's the wealthy widow of a Winchester Arms heir bought property not far from San Francisco on which a large house was being built. Mrs. Winchester had lost not only her husband but also her two children, and on a spiritualist's advice that she herself would live only so long as construction continued, she for her remaining thirty-eight years had carpenters add wings, build rooms within rooms, stairways that led nowhere, and doors that opened onto empty space. The rooms in the resulting sprawling structure have not even been counted.

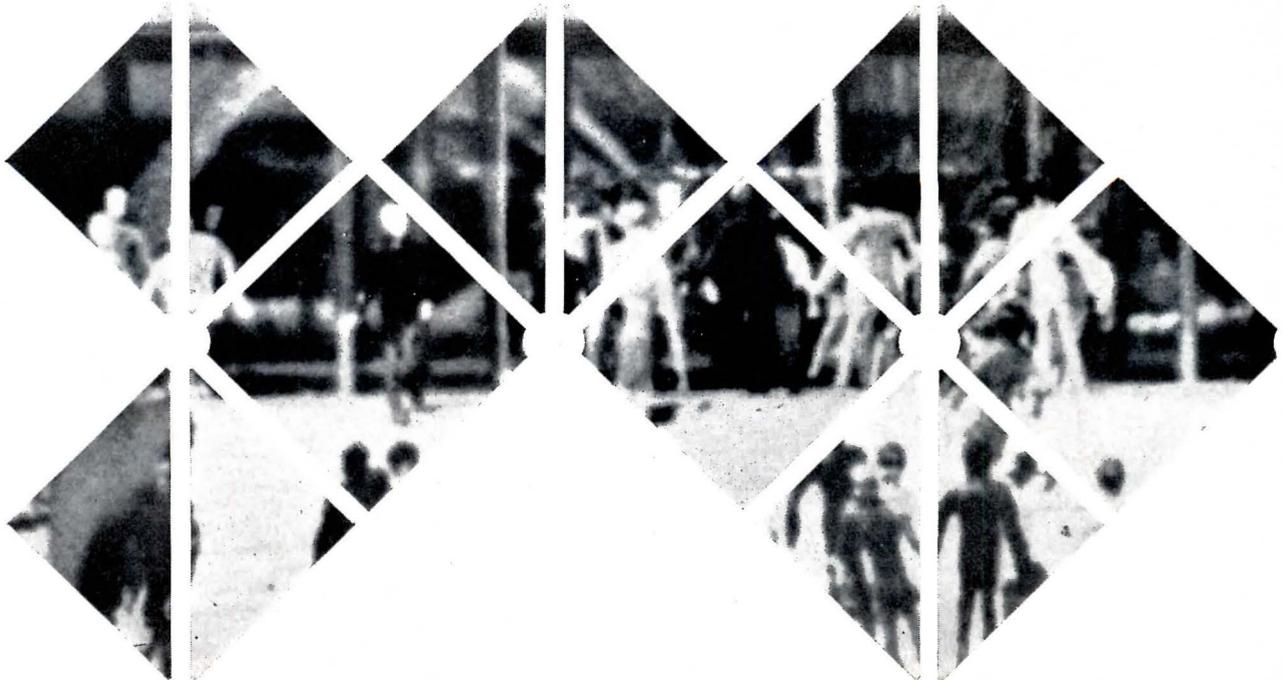
On the more serious side, it is striking how many of the houses of a state that has been part of the Union hardly more than a hundred years have lasted

(Continued on page 378)

JULY 1957 ARCHITECTURAL RECORD

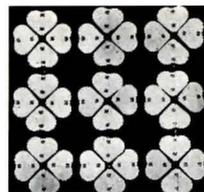


# EDWARD D. STONE



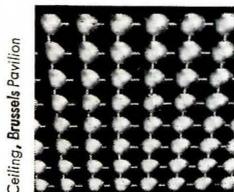
## AN ARCHITECTURE OF SPACE AND GRACE

ACROSS THE NATION and around the world, the recent years have seen a significant multiplication of buildings by architect Edward D. Stone. And they are buildings of great beauty. There are hospitals, hotels, colleges, houses, museums, and buildings for the government. This is the measure of the rare individual who can win the respect of such diverse people as hospital boards and housewives. Architects have responded as well as laymen; a large part of his work has come to him through referral by other architects. Stone, a native of Arkansas, has been steadfast to his image of architecture as a fine art. Architecture to him is individual creative expression, and he has resisted being catalogued as a disciple of any contemporary school. The evolution of Stone's work has been a highly interesting process. His identity was firmly established in the 1930's by such buildings as the Museum of Modern Art and the Goodyear house. Even in his earliest work, however, he was not completely satisfied with the geometric, pared-down, objective ideals of the day. To these, he added a more subjective and extended concern for buildings inside and out, in the large massing and in the small details. Texture and color tempered the bold outline. Rationalization and order were important, but space was the ultimate concern — triggered in appreciation by its visual qualities. Gradually, these qualities have been reaching maturity in his long roster of works, which will be presented subsequently.



Ceiling, U. of Arkansas, 1948

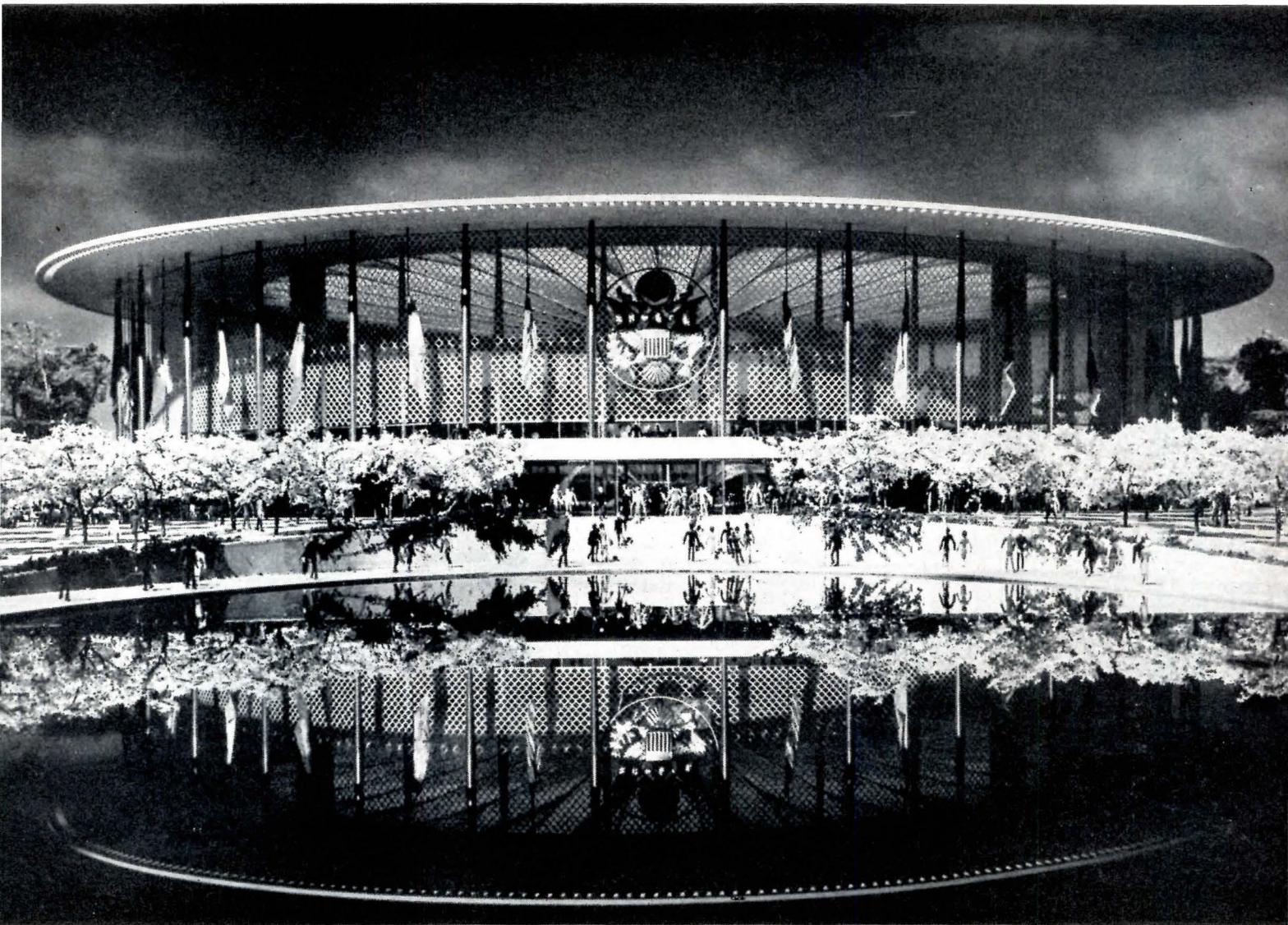
For the past twenty years, he has been experimenting with the principle of patterned sunlight in walls and striated, filtered light in ceilings and roofs. These experiments had their culmination in the New Delhi Embassy presented some three years ago. His innovation of the veiled exterior wall continues to be a salient characteristic of his work. One of Mr. Stone's greatest satisfactions is reporting a comment of Frank Lloyd Wright's that the Embassy was one of the beautiful buildings of our time.



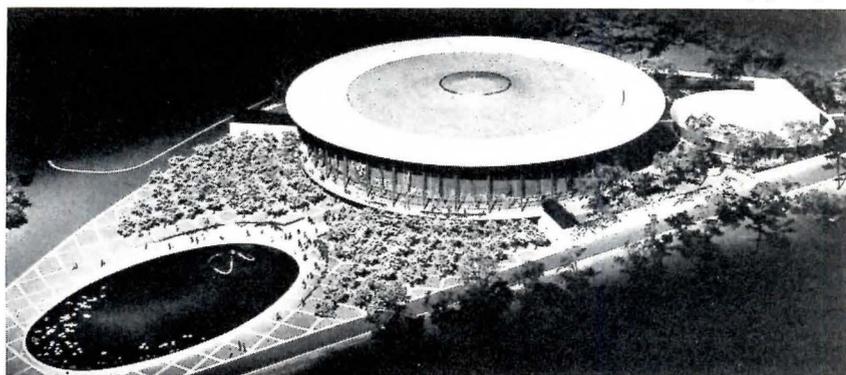
Ceiling, Brussels Pavilion

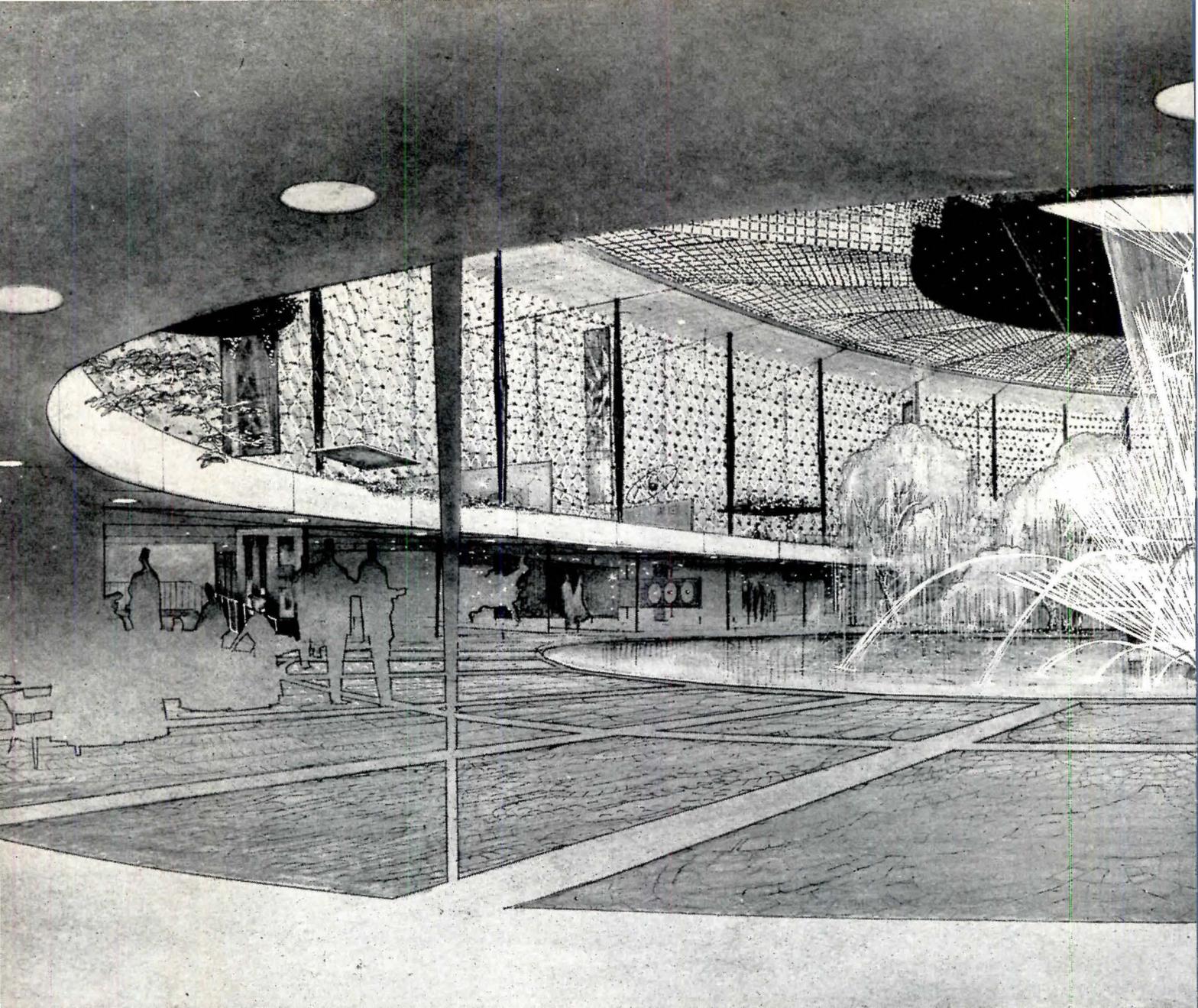
The buildings on the following pages are among his latest projects, and constitute Stone's first major publication in some time. They are varied in concept, but unified by their screened surfaces. Behind the lace of these screens is an architecture of grace and space. The exteriors have great dignity and warmth. They are formal and balanced; there is a nebulous hint of the past. Within are private sanctuaries — a world of patterned shadows and water gardens, vibrant with rich materials. Stone has been intrigued with the principle of the interior court, the cloistered garden and atrium. And his work for some years has rejected the corridor in favor of a central dramatic space. These new buildings seem to be a happy meeting ground of a number of polarities: the conservative and the experimental; the classic and the romantic; the austere and the highly decorated.

Stone's standing in the architectural profession was emphasized with the commission to design the American Pavilion for the 1958 World's Fair in Brussels (right) — the showcase for America at the first major fair since the 1930's. The Department of State asked the American Institute of Architects to select an architect for this important work. A delegated A.I.A. committee selected Stone. He has worked with Commissioner General Howard S. Cullman and his deputies in the development of this great project.



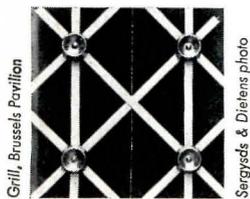
*Louis Checkman (also pages 153, 154)*





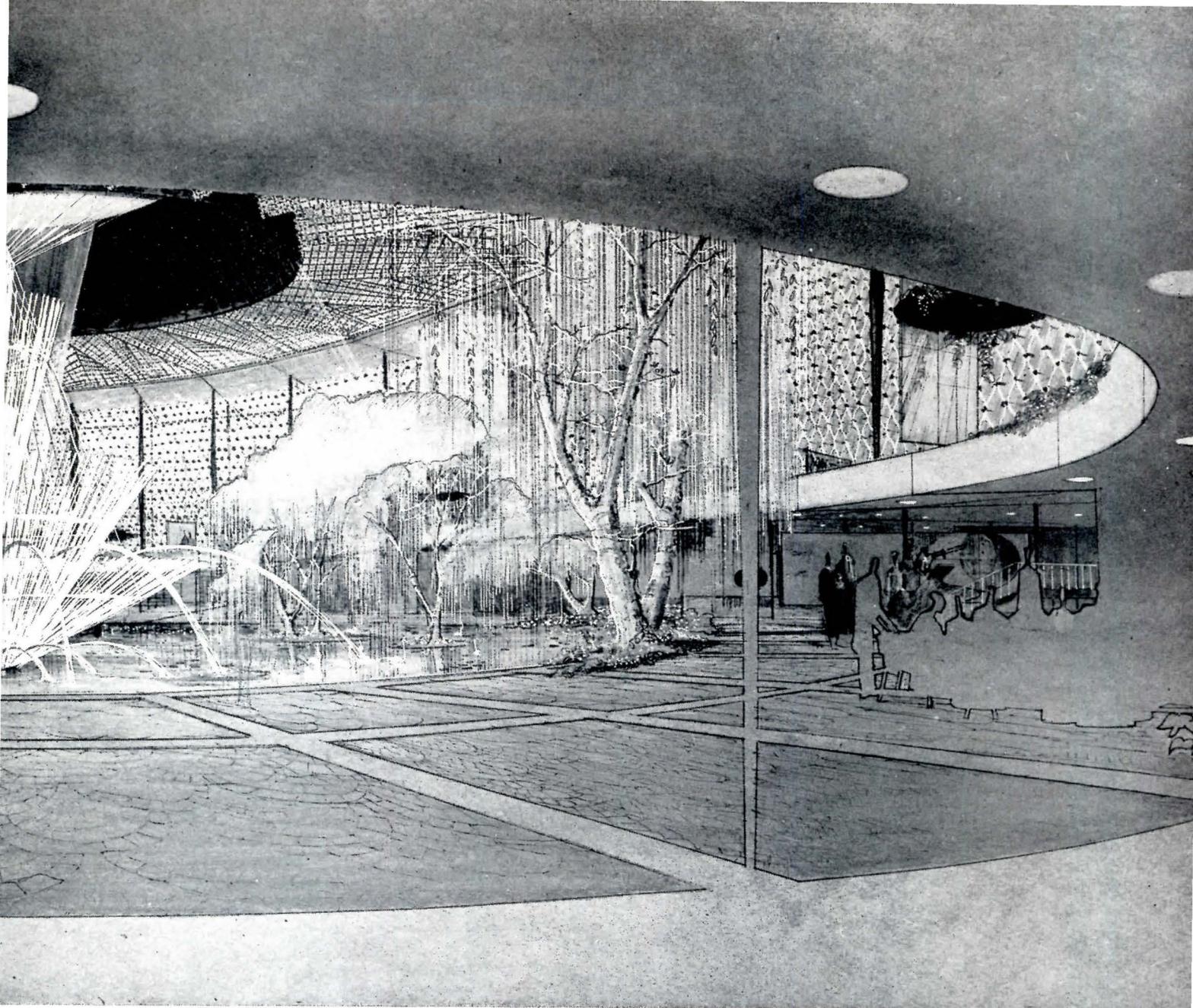
## THE AMERICAN PAVILION, BRUSSELS WORLD'S FAIR

Here, an enormous free-span roof is formed in the manner of a bicycle wheel: an outer ring of concrete is connected to an inner ring of steel by cables. Translucent plastic aluminum-core panels cover all but the center. Beneath these hangs gold anodized aluminum mesh. The 340-foot exhibition area is arranged around a water garden and gigantic willows which exist on the site. The exterior is a diagonal mesh of metal bars and transparent plastic. Its antecedent is the Coliseum in Rome, roofed with ropes and canvas. The central feature of the pavilion is undecided; this interior perspective shows one suggestion, a sculpture by Richard Lippold. Also included is a theater to seat 1100, where the U. S. will present every facet of the performing arts.

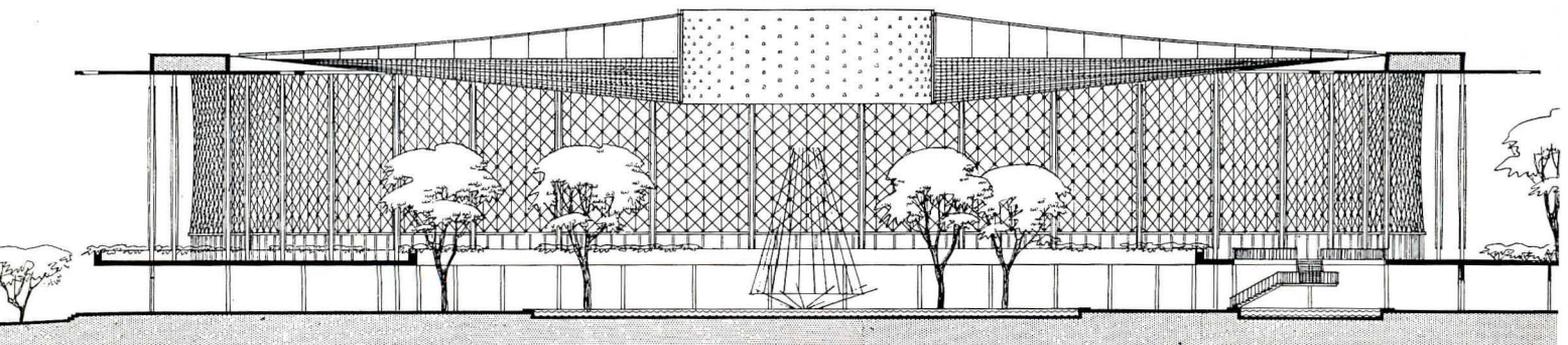


Grill, Brussels Pavilion

Sergysds & Dielens photo

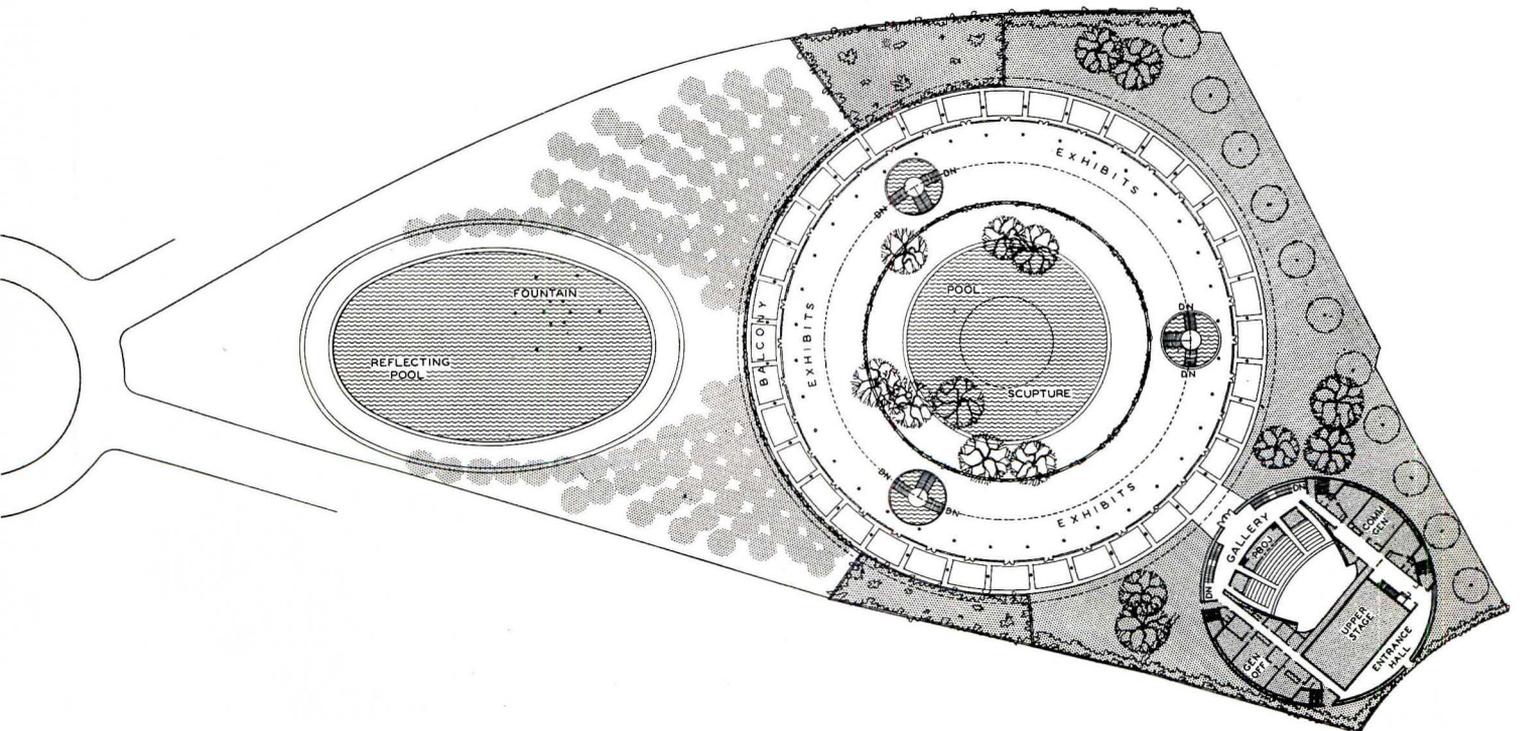
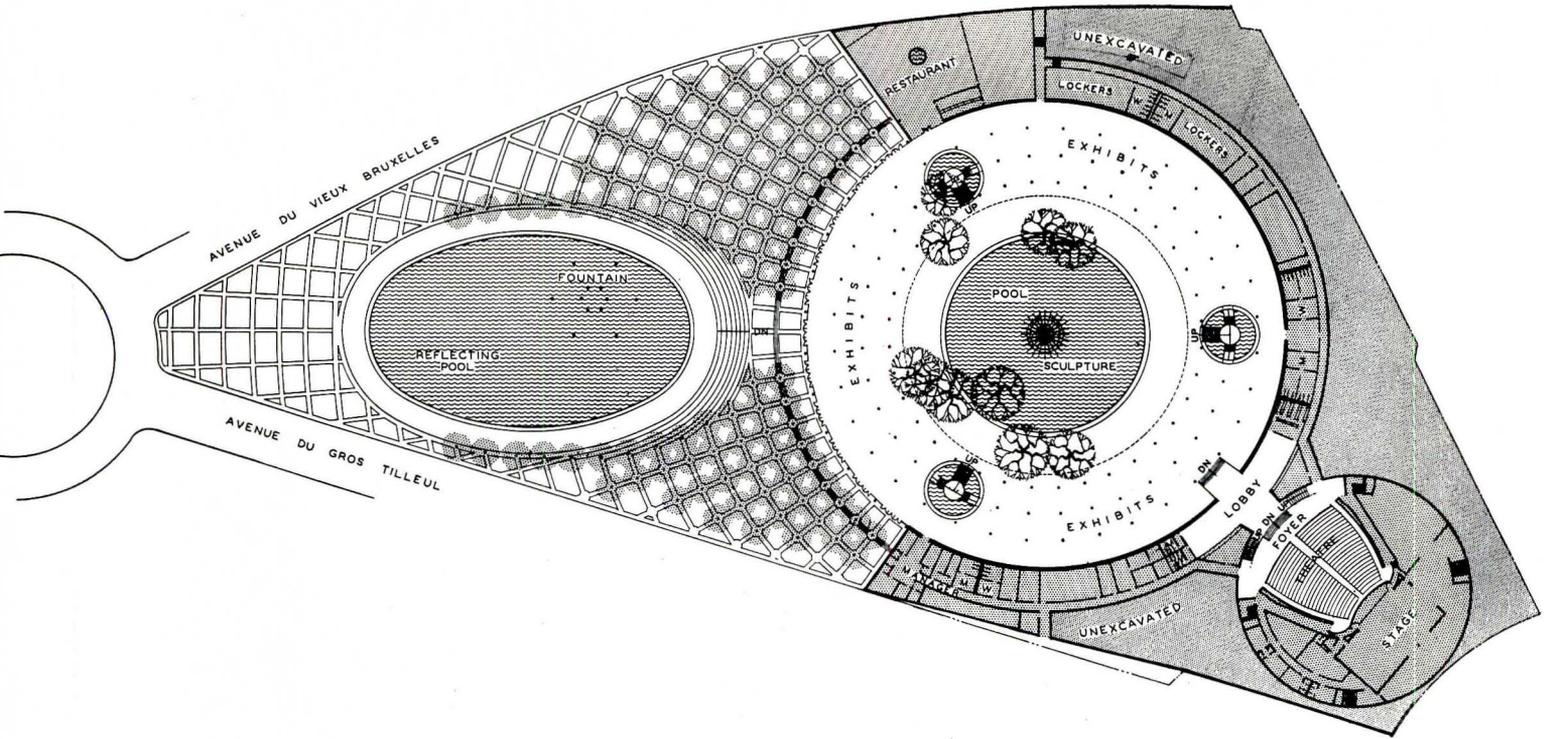


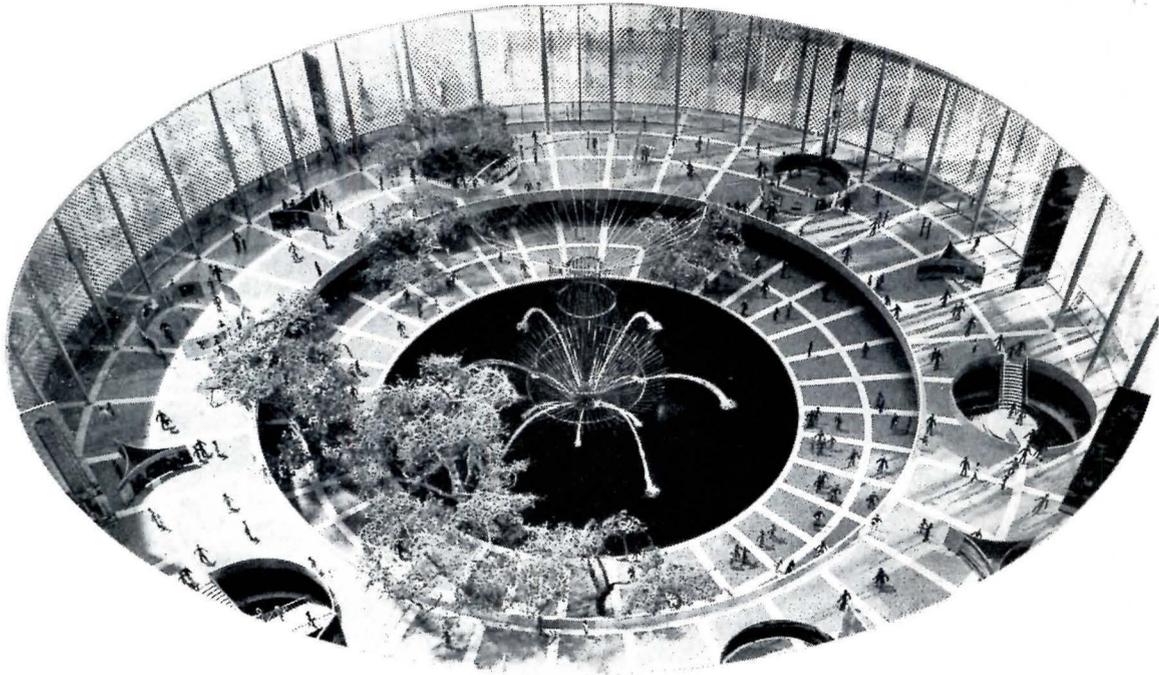
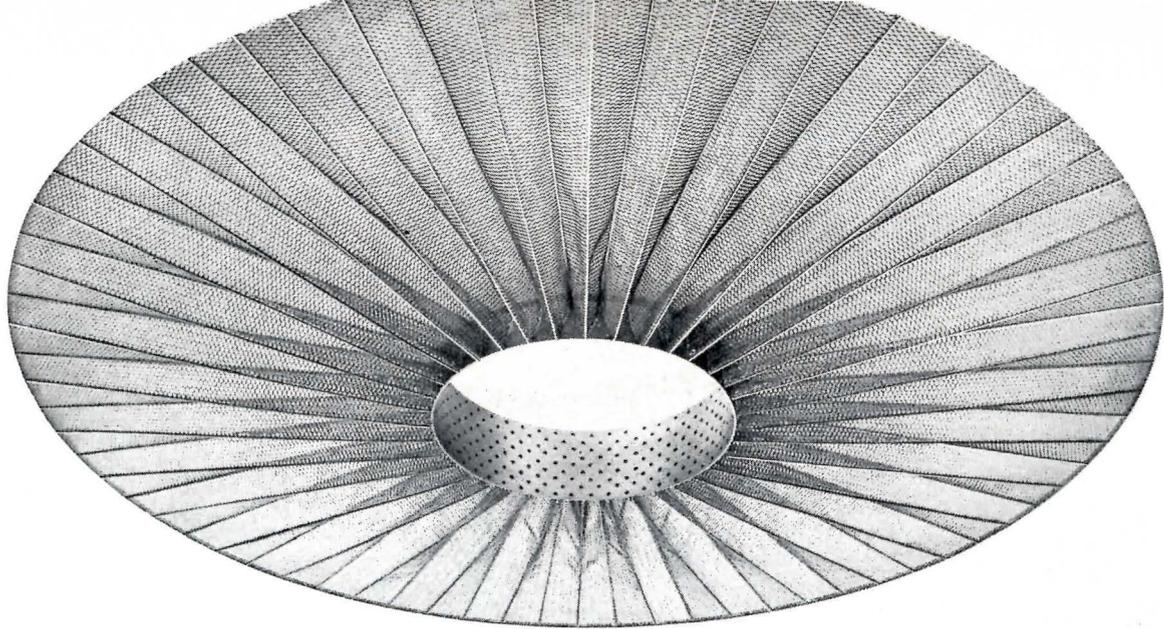
Rendering by W. Kenneth Frizzell



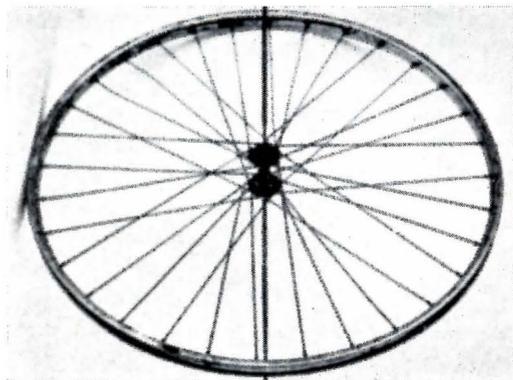
Unless otherwise noted, all drawings by David Leavitt

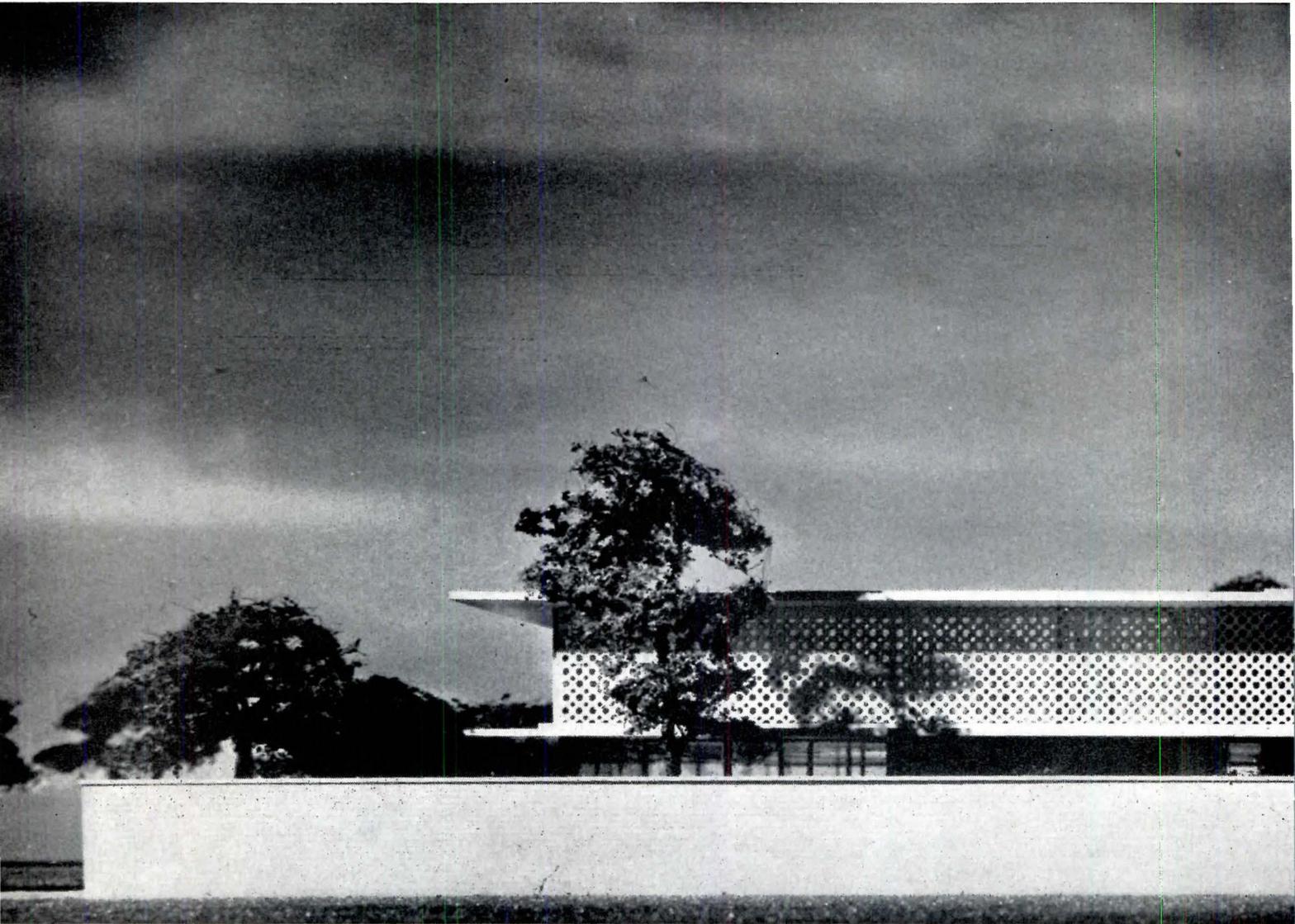
EDWARD D. STONE: BRUSSELS PAVILION





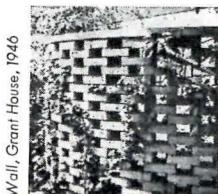
Louis Cleeckman



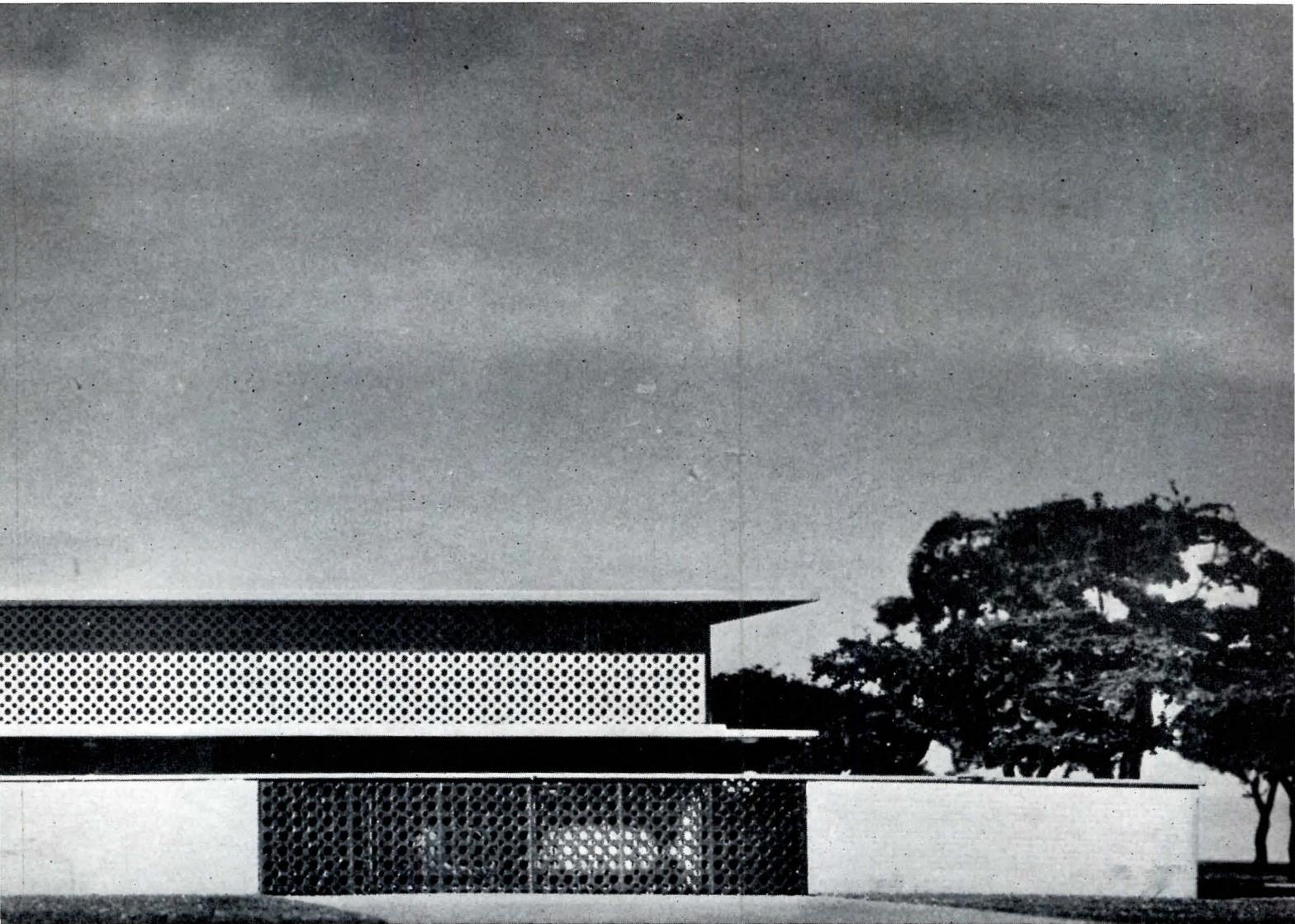


### A RESIDENCE IN DALLAS, TEXAS

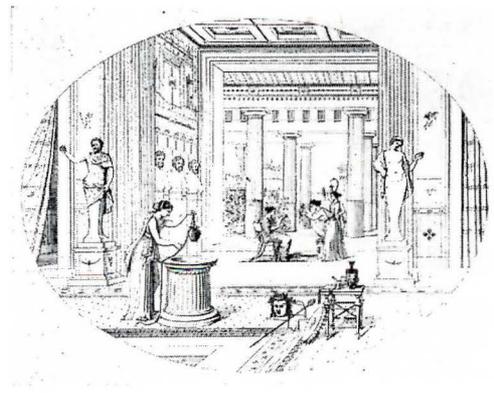
This luxurious house is conceived much in the manner of the classical houses of Pompeii, where a wall closes the house off from its surroundings. All the family life is within atrium-like rooms, with the dining room an island in a decorative pool. The entire first floor is paved in white marble. The living room is between the swimming pool and the dining area pool. Other rooms on the first floor open into cloistered gardens, enhancing the atmosphere of privacy. The second floor has a large master bedroom, flanked by terrace gardens. This entire upper level is screened by a terrazzo grill for privacy and shading from the glare of the Texas sun. At the front of the house is a large, walled-in motor court; gardens continue from the terrace at the rear.



Wall, Grant House, 1946



Louis Checkman



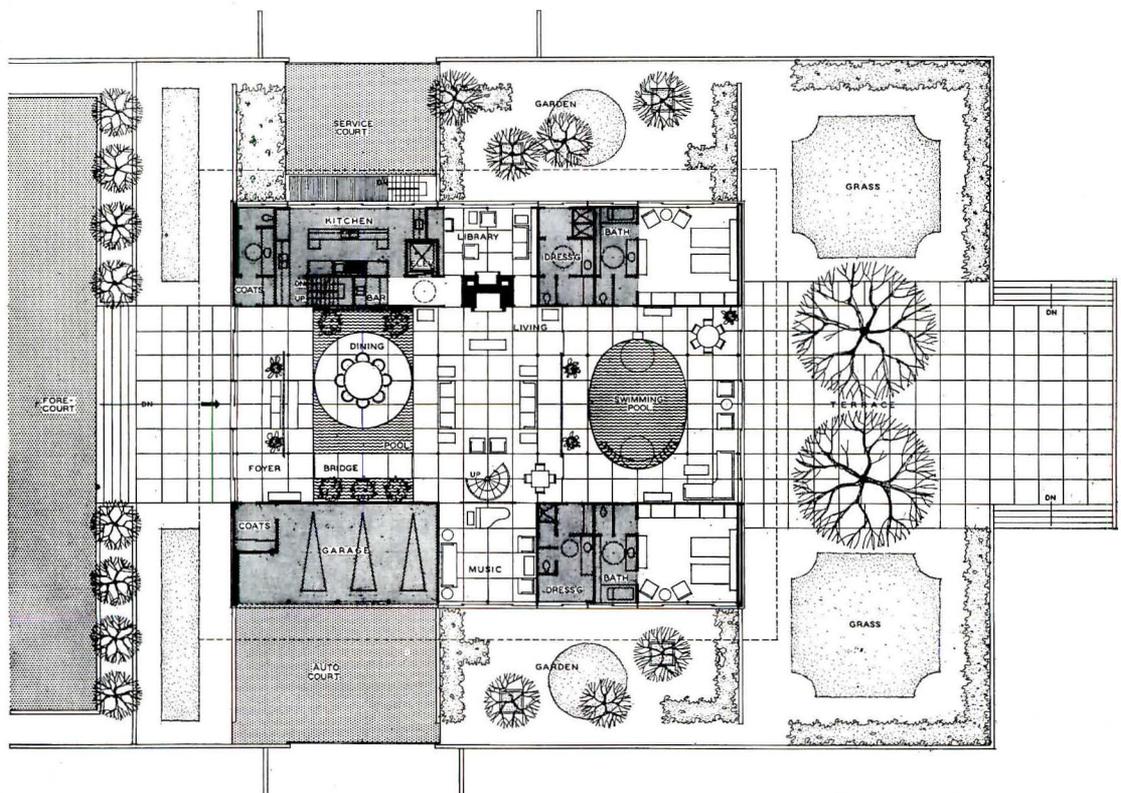
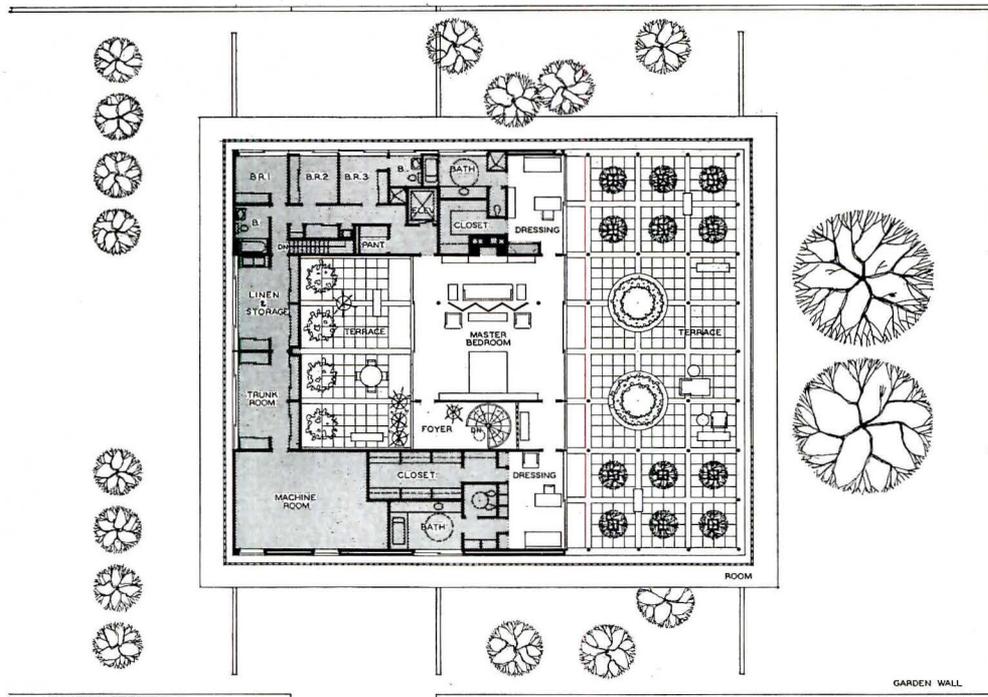
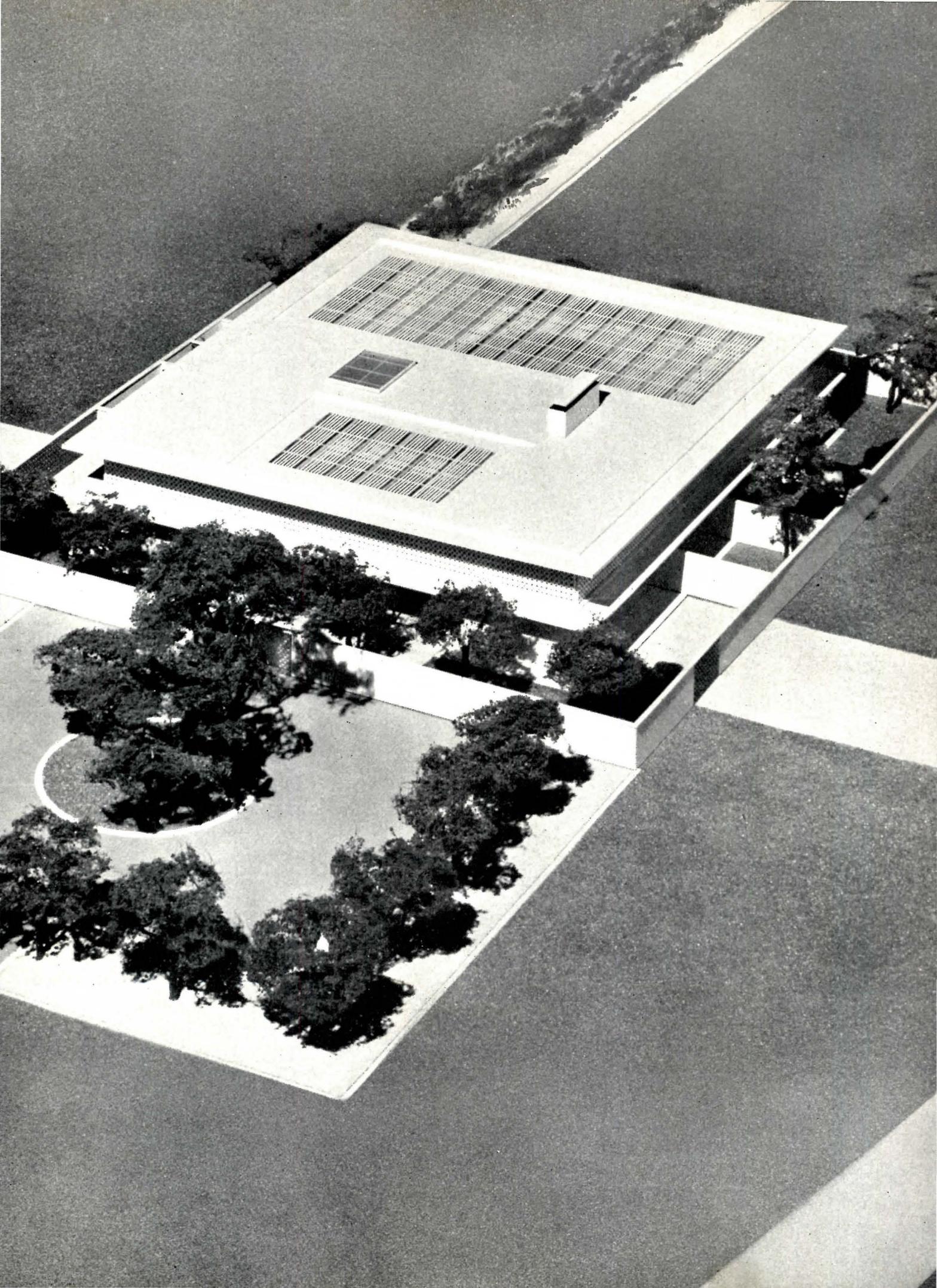
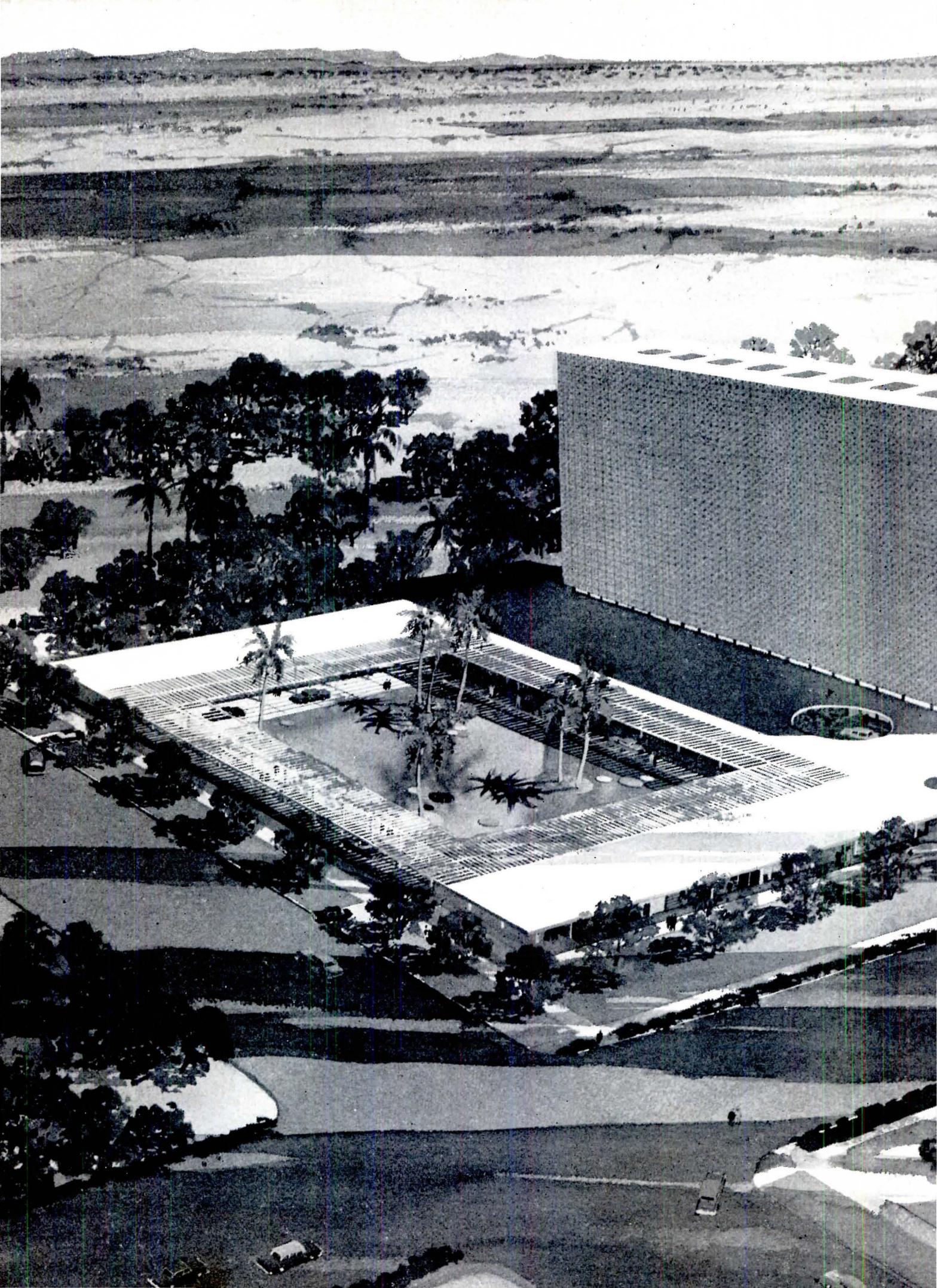
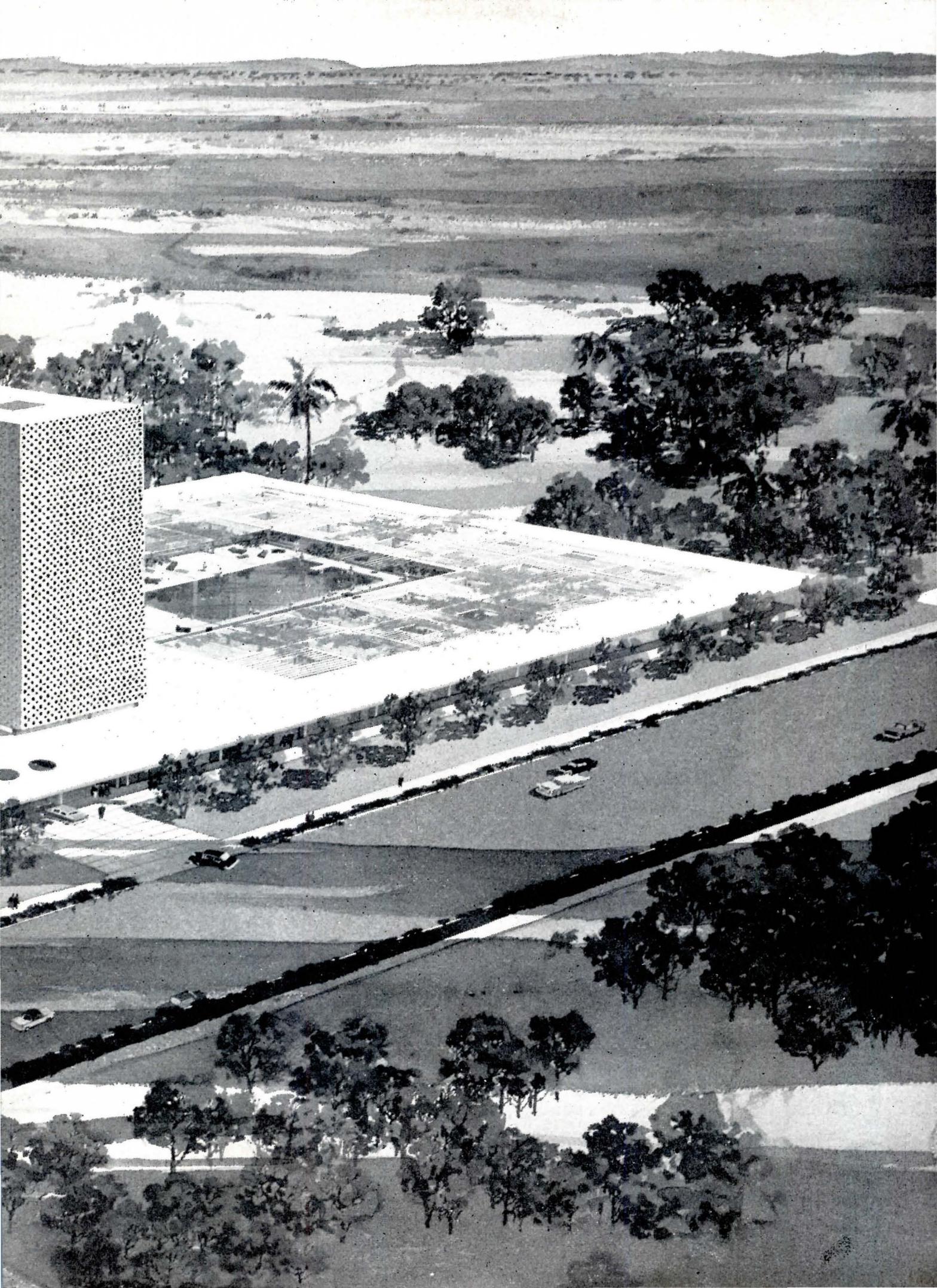
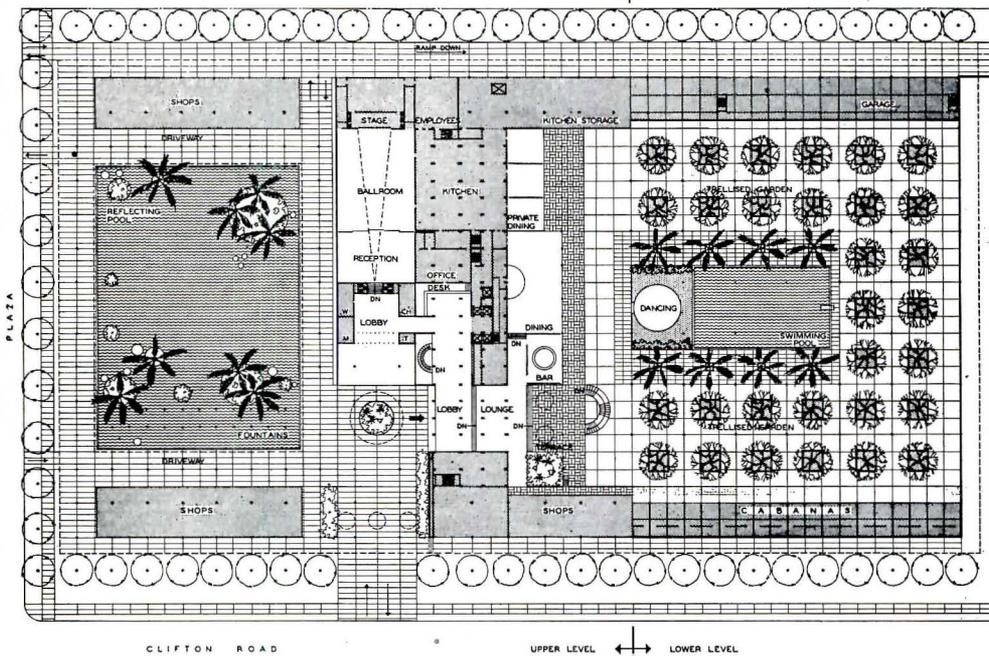
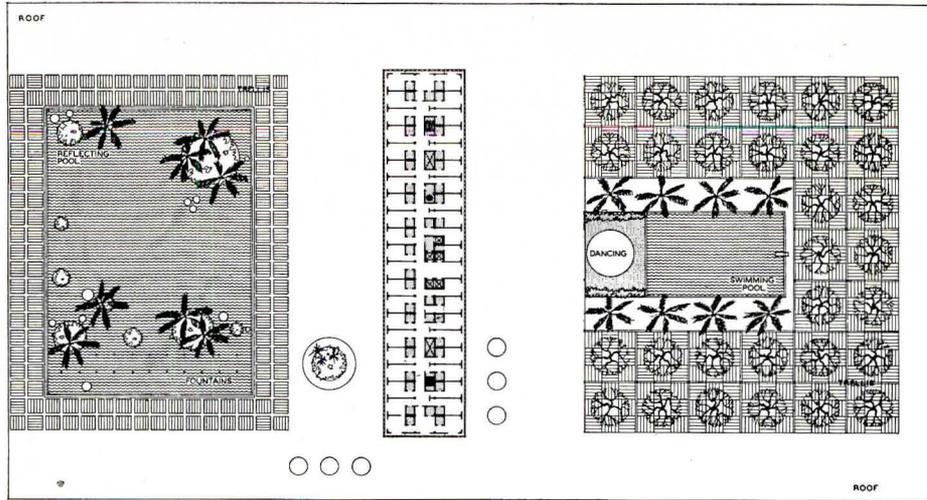


Photo opposite page, Louis Checkman







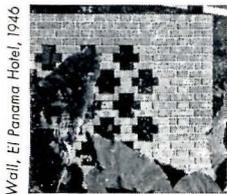


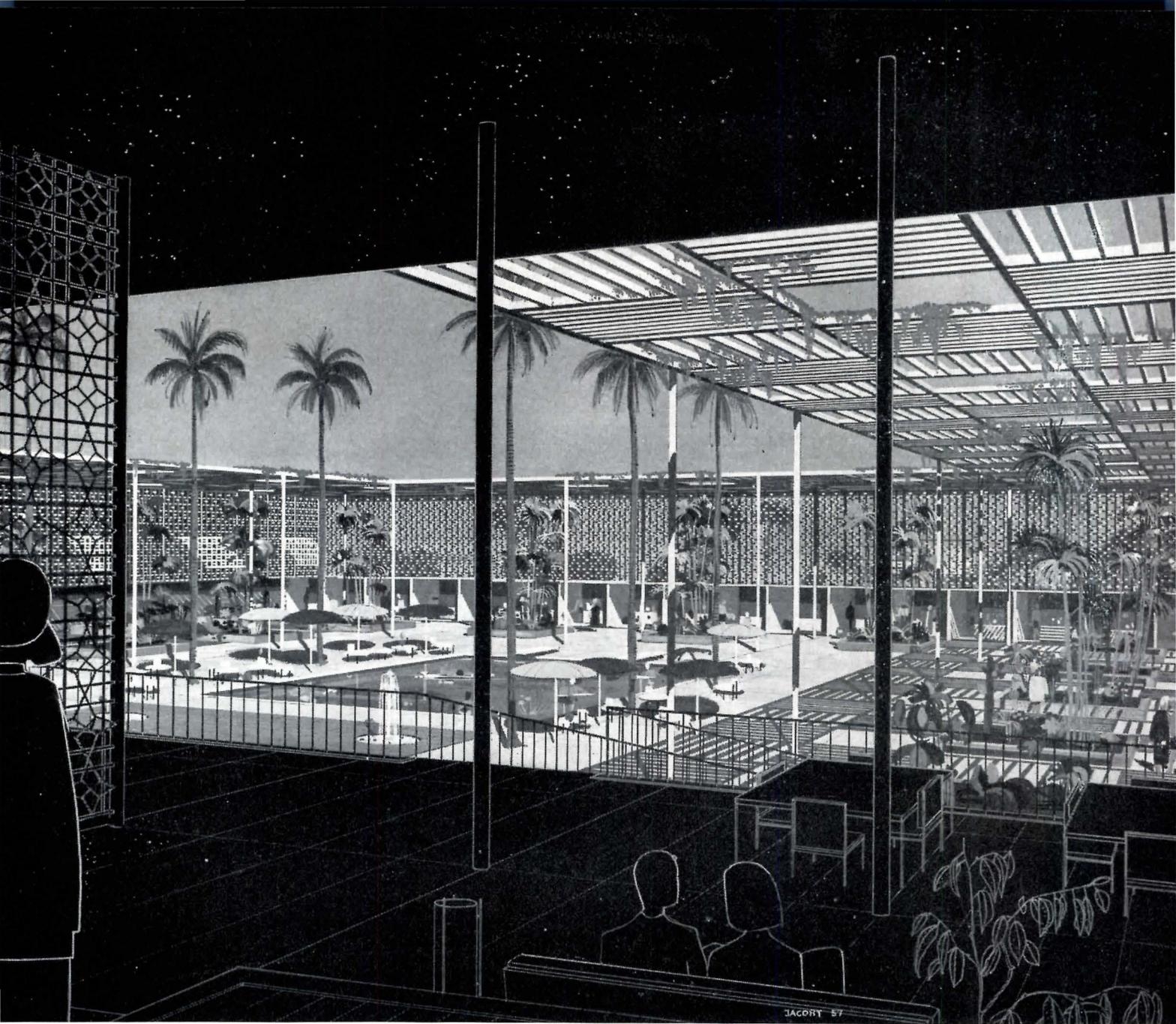
Rendering of Karachi Hotel on preceding pages by Jack Finegan

**A HOTEL FOR KARACHI, PAKISTAN**

A uniquely indigenous character has been given this building for Intercontinental Hotels, by sheathing the exterior with a Moslem-style open screen (see preceding page). Set out about three feet from the glass building wall, the screen provides shade, views, and balconies for 400 guest rooms.

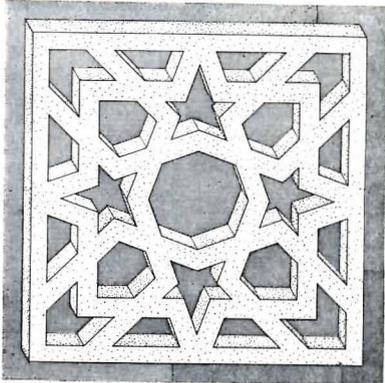
The building has all the facilities of a modern, complete hotel: large lobbies, public dining rooms, cocktail lounges indoors and out, ballrooms, reception rooms, exhibition halls, a coffee shop, swimming pool and cabañas, and a theater. A major feature of the design is a "Lath Garden" on the pool side of the hotel (right). This is a trellis extension of the lobby ceiling line out over the pool and recreation area to temper the sunlight.

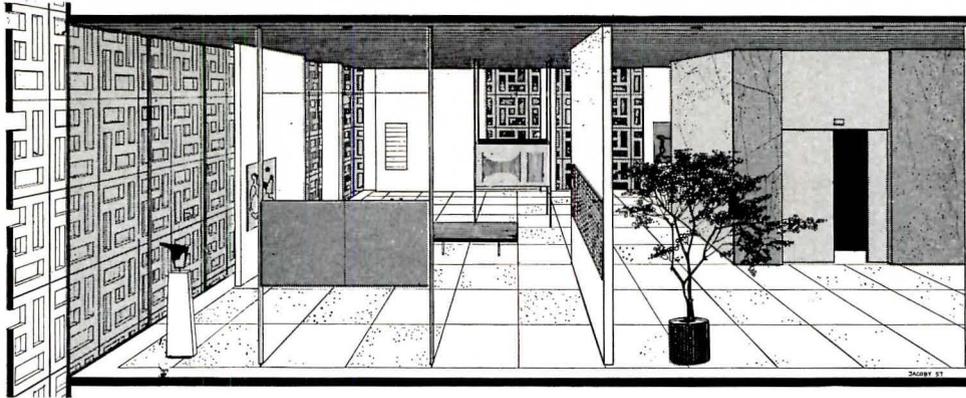




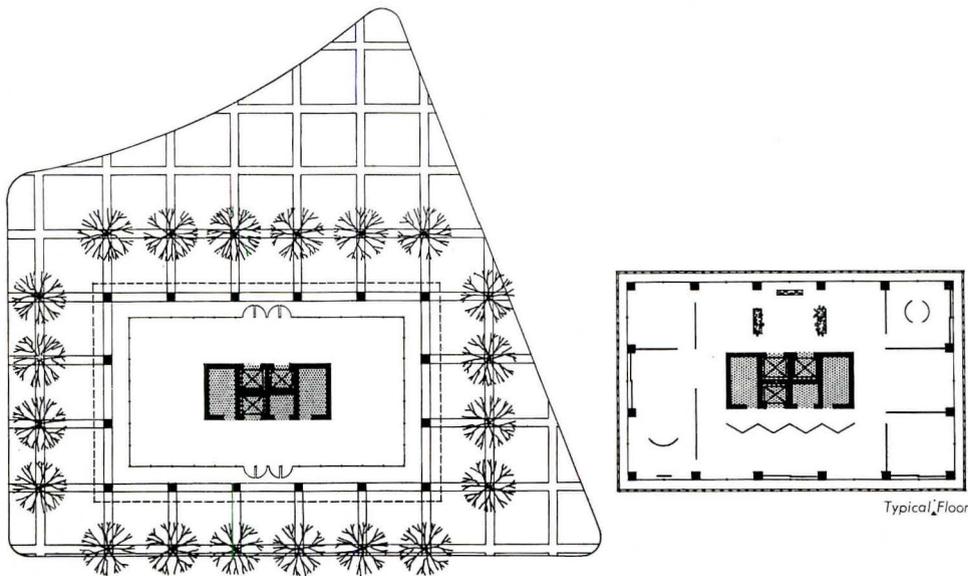
Rendering by Jacoby

Exterior Grill, Karachi





Rendering by Jacoby

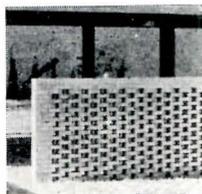


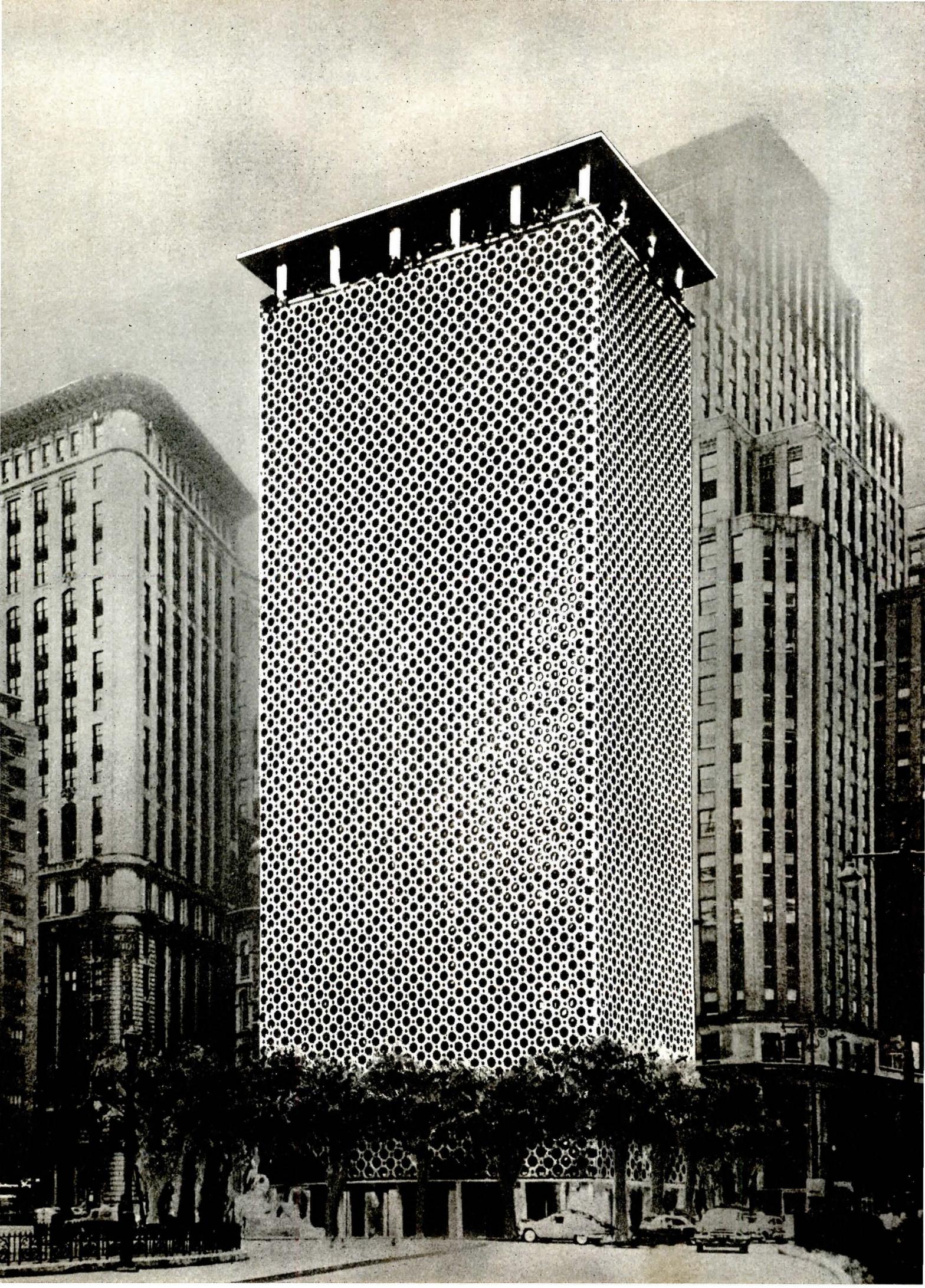
Typical Floor

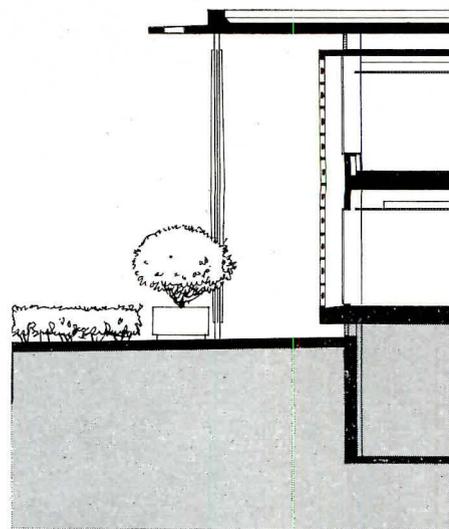
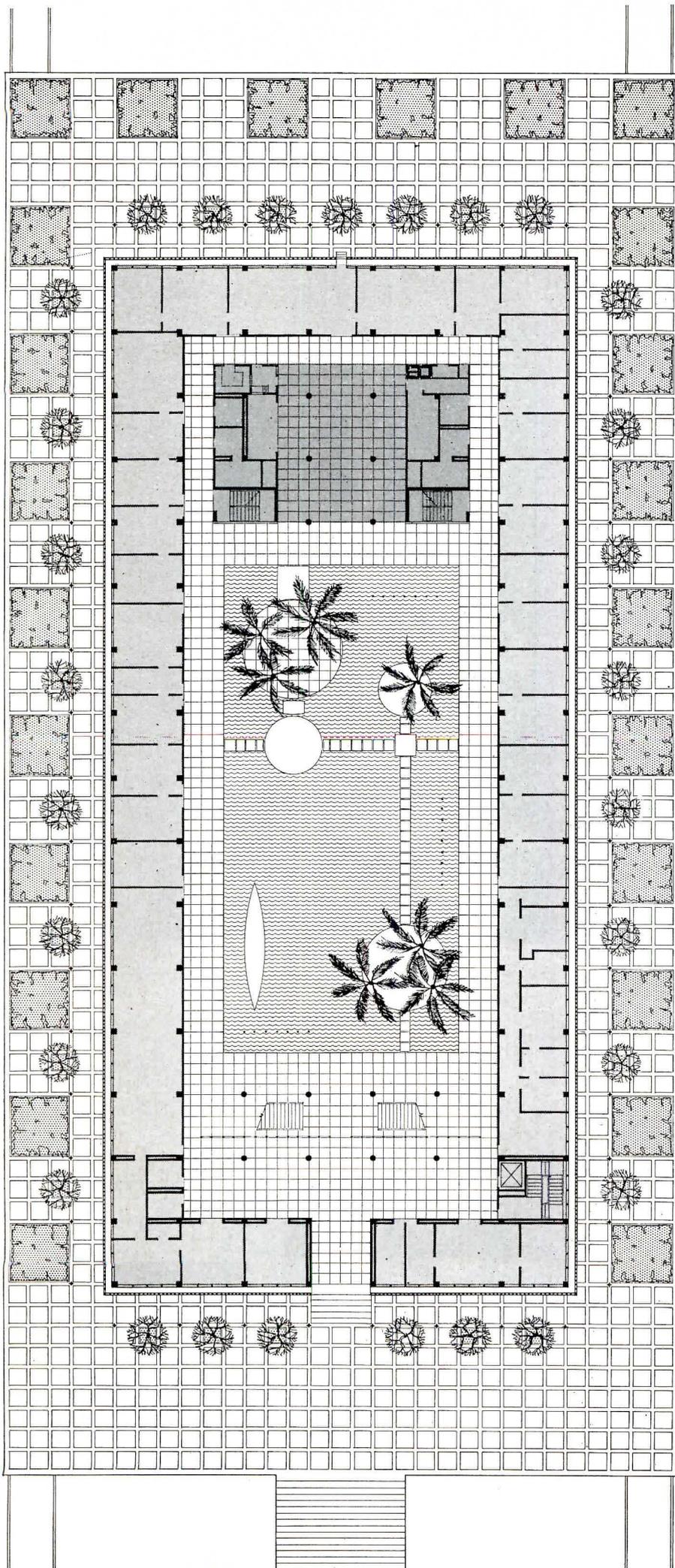
### A PROPOSED GALLERY BUILDING FOR NEW YORK CITY

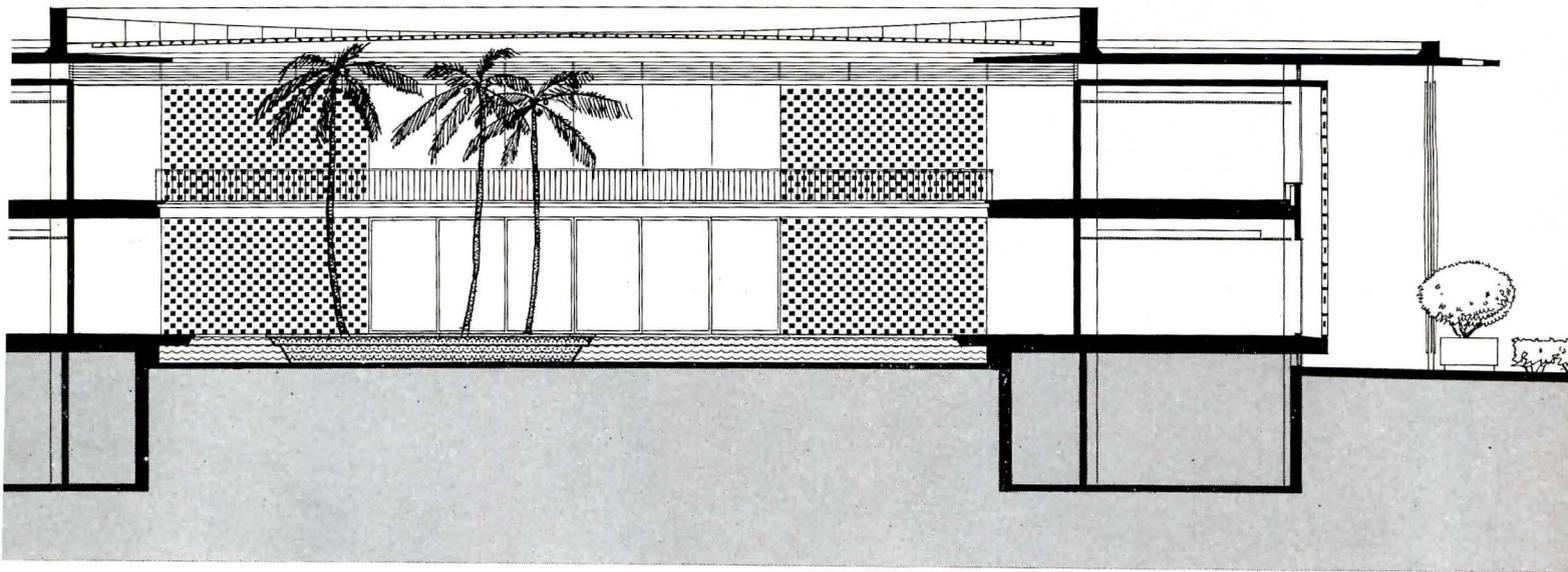
This tower-museum, encased in a perforated terrazzo screen, is planned for the exhibition of contemporary art. To allow the utmost freedom in setting up temporary exhibits, the structure is visualized as tiers of open galleries around a central mechanical core. At the top a restaurant overlooks Columbus Circle and Central Park. A paved plaza at the ground level provides an area for the exhibition of sculpture in a landscaped background. To add to the flexibility in exhibit arrangement, the exterior walls are formed in three layers. Inside is a tier of opaque sliding screens, next a layer of sliding glass panels, then the terrazzo screen to cut direct rays of the sun from the glass. The design of the screen is tentative — two possible types are shown above and in the model at right.

Wall, U. of Arkansas, 1948

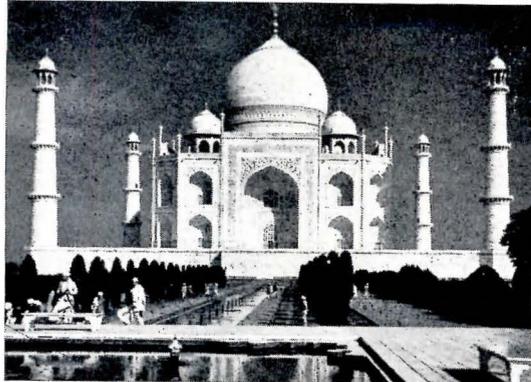




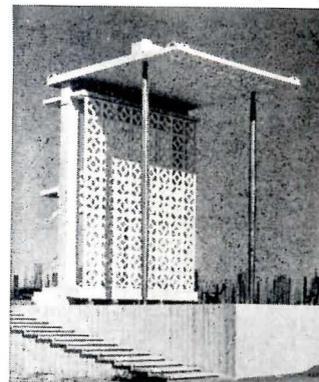




Taj Mahal (Deane Dickason from Ewing Galloway)



Embassy Mock-up



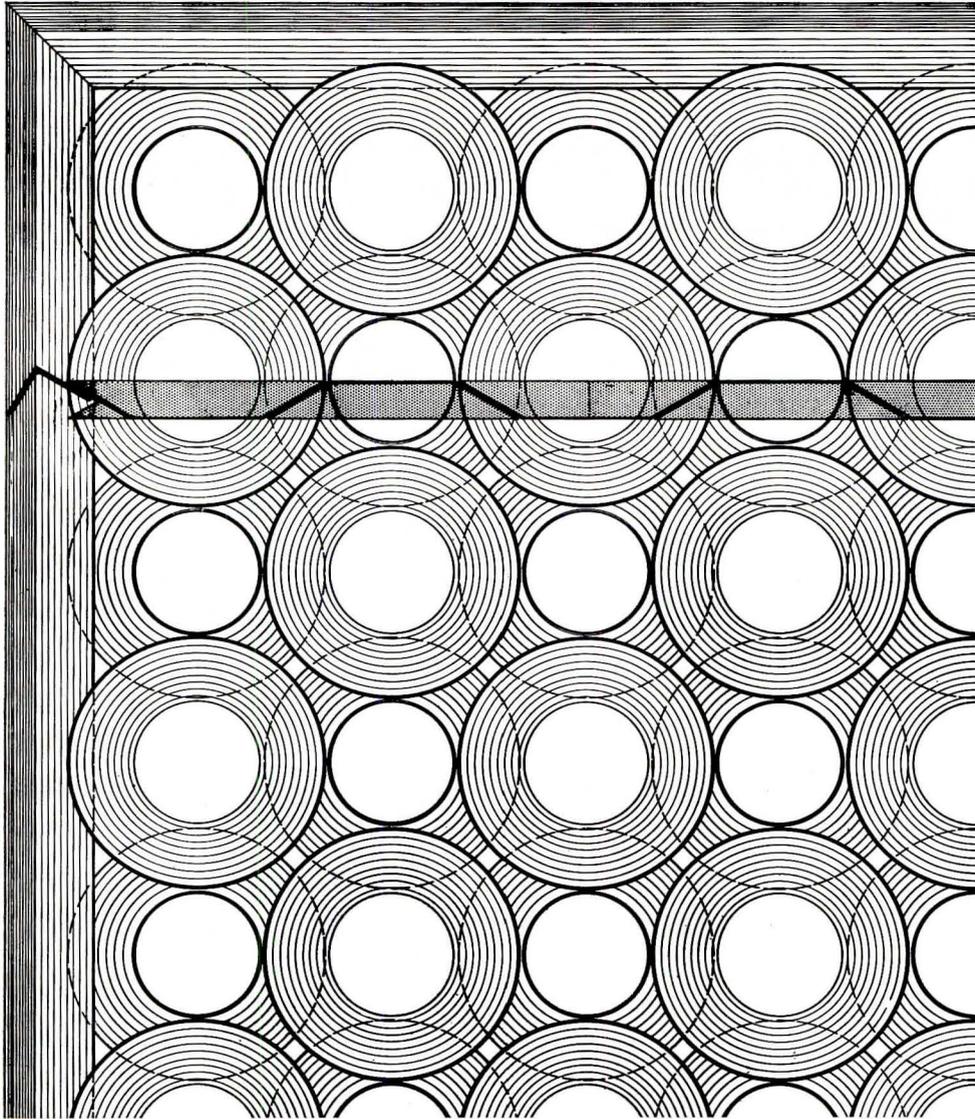
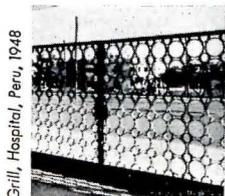


Photo opposite: Louis Checkman

### UNITED STATES EMBASSY FOR NEW DELHI, INDIA

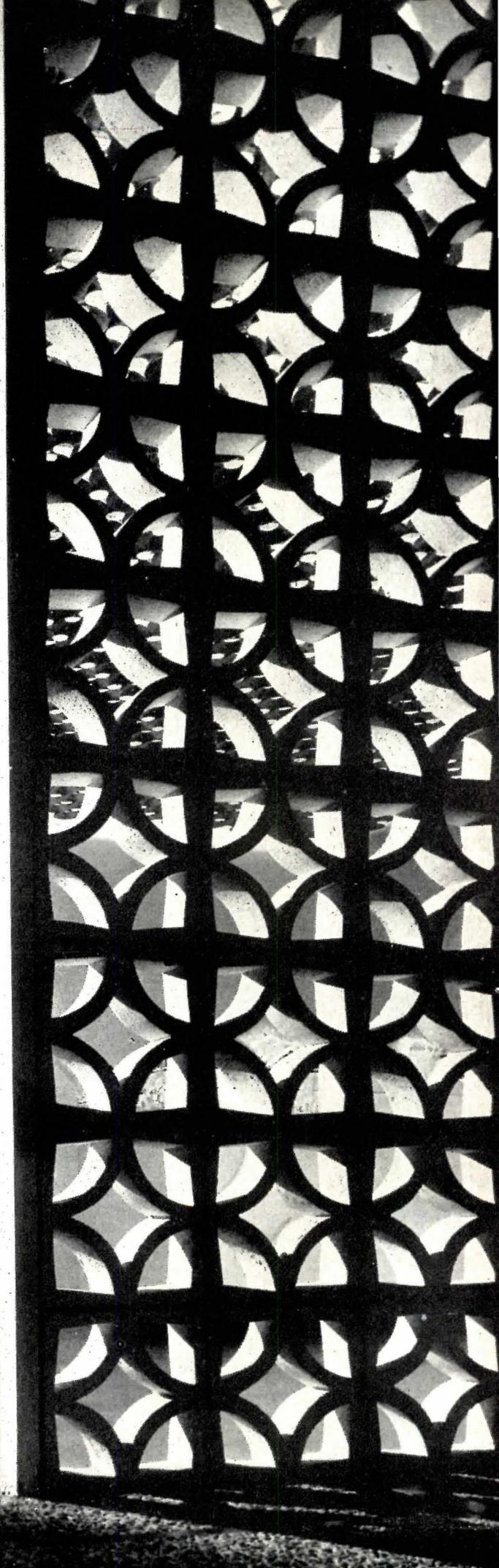
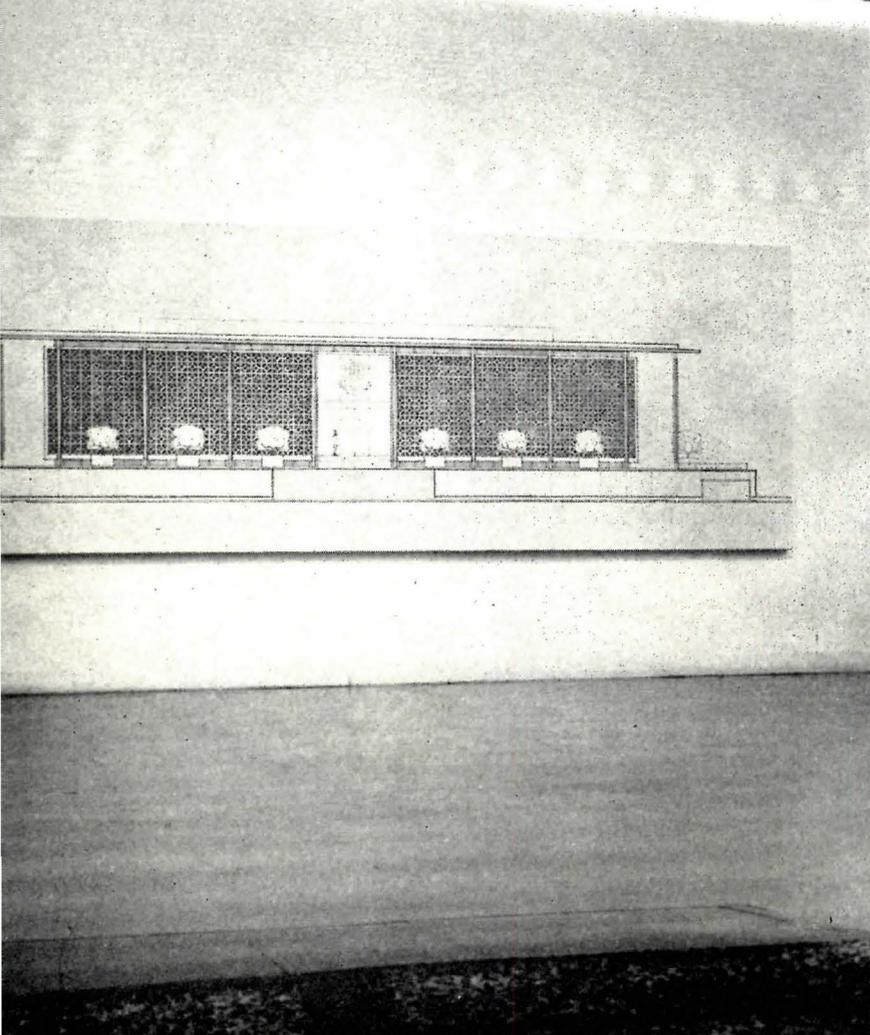
A number of devices was used to dissipate the heat in the chancellery building. An umbrella roof, separated from the actual ceilings, shields the entire structure. This is supported on the delicate colonnade. Over the water garden, with its planting and jets of water, is an arabesque mesh of aluminum to filter the sunlight. Details of this ceiling mesh are shown above and in the photograph (right) of a recent exhibit of the building at the Museum of Modern Art.

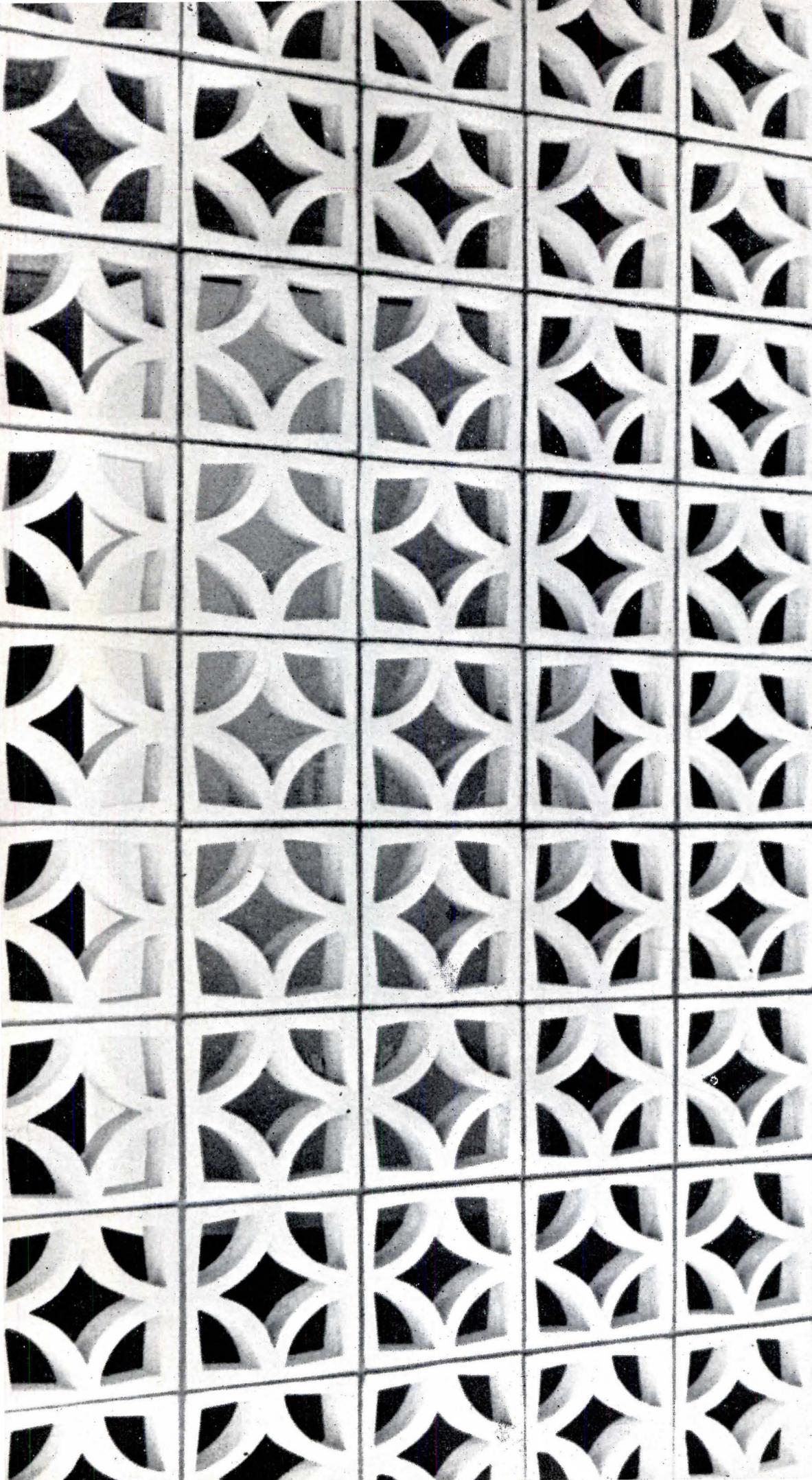


Grill, Hospital, Peru, 1948

The highly effective grill (right) which surrounds the building, is of pre-cast terrazzo and will be installed completely free of the windows to permit easy cleaning.

The building is air-conditioned for the six months of extreme heat, opened for cross ventilation during the temperate season.



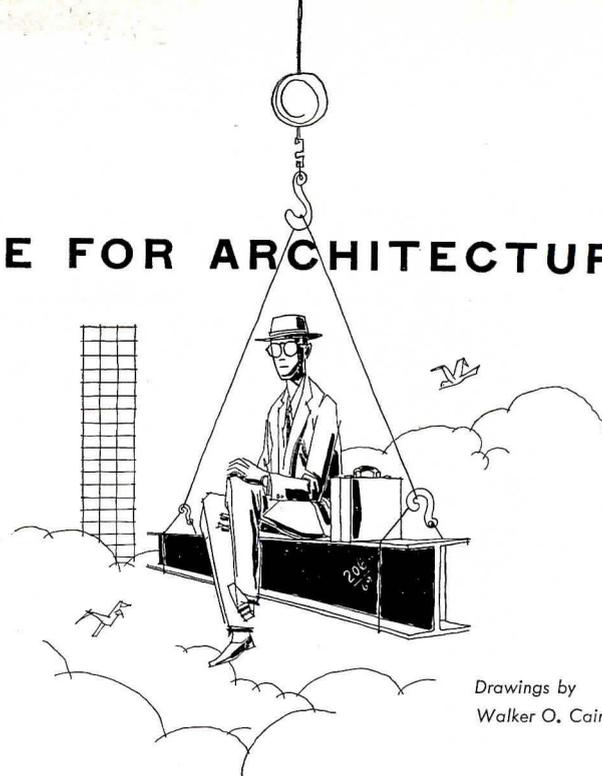


Rolfie McKenna, courtesy Museum of Modern Art

EDWARD D. STONE: NEW DELHI EMBASSY

# A NEW ELOQUENCE FOR ARCHITECTURE

*"... this prime mover  
— this architect-laureate of our time  
— is the steel I-beam."*



Drawings by  
Walker O. Cain

By JOSEPH HUDNUT

HISTORY HAS BEEN DEFINED as the art of remolding the past into a harmony with our desires. Because we read history, not to make us wise but to fortify our pre-conceptions, we ask our historians to re-appraise past events and their causal relationships in order that we may see our own opinion and passion reflected in their pages.

Historians of architecture afford no exception to this practice. In response to our own urgencies we have witnessed in the realm of architecture many re-shufflings of time, space and prejudice by those who announce themselves as historians. I am not so young that I cannot remember the vogue of Richardson Romanesque, the rehabilitation of Imperial Rome by the Pennsylvania Railroad, the return of colonial architecture to a respectable popularity. I can remember also the disgrace and sad end of all of these styles before the importunities of a race of men who had grown indifferent to all style. And each of these revolutions had its apologist and its historian.

We expect our historians not only to approve each in his turn our changing tastes but also to illumine and defend their congenial narratives — and our tastes — with philosophies of taste. We encumber them willy-nilly with the responsibility of reconciling our preferences with rational truth. To Victorian England, already persuaded of a morality in art, John Ruskin explained Gothic architecture as the architecture of virtuous men. To a more sophisticated — and presumably less virtuous — audience Geoffrey Scott defined Renaissance architecture as an art of superior sensibilities. And to the democratic passion of the American Revolution Thomas Jefferson unblushingly presented the Roman Revival as the architecture of popular sovereignty.

We should not think it strange then if our present historians, finding themselves at home in a bright and delightfully revolving machine, should describe the stream of past architectures as a stately procession

towards that ideal of perfect mechanization which, we are told, possesses the mind of our day or should season their admiration for the architecture of a mechanized world with a philosophy of mechanized form.

"Throughout history," writes a popular historian, "the appearances of buildings and their styles have been determined by the practical techniques of construction — that is to say, by the materials available and the tools with which materials were worked. Greek architecture, for example, was elementary in form because the Greek builder knew only the lintel and the column upon which the lintel rested. Roman architecture was grandiose because the Roman engineer had developed the grandiose resources of concrete vaulting. Gothic architecture, ethereal and daring, rose, as inevitably as the night follows the day, from the pointed arch and the flying buttress." And the author, although careful to assure his readers that beauty in buildings is not wholly a consequence of structural efficiencies — aesthetic experiences, taste and fashion being also elements of beauty — nevertheless leaves them with the impression that aesthetic sensation, taste and fashion are after all redundancies: pleasing appliqués which do not modify essentially the character of architectures. The column, the vault and the flying buttresses are thus made the prime movers in the evolution of architectural species and the fundamental sources of expression throughout the ages. And in our time this prime mover — this architect-laureate of our time — is the steel I-beam.

What is needed, it seems to me, is another history. We should ask our historians to examine more curiously this concept which, ever since Choisy wrote his *L'Art de Batir*, has haunted their minds: this concept of structure as secret architect of temple, thermae, cathedral and skyscraper. Their minds quickened by the perils which now confront architecture they might then re-invigorate our art with a newer and less devastating doctrine.

*“The Greeks . . . celebrated quietude and sweetness . . . used only the simplest of structural forms . . .*

*The Romans . . . achieved power and magnificence by the use of great concrete arches invented for that purpose . . .*

*The peoples of the Middle Ages . . . had need of a symbol, ethereal and soaring, and for that purpose developed the pointed arch and the flying buttress.”*



I shall offer such a history — not my own but one which is in need of a novel pronouncement. It shall be brief and it shall occupy only one paragraph.

The Greeks, who lived in the sunlight, celebrated in their temples the quietude and sweetness of the natural world in which their religion was born. To that end they employed in their temples only the simplest of structural forms: the rectangular lintel and its supporting column. The Romans, to whom power was a virtue and magnificence a delight, achieved power and magnificence in their buildings by the use of the great concrete vaults invented for that purpose. The peoples of the Middle Ages, having built a spiritual universe around their life on earth, had need of a symbol, ethereal and soaring, and for that purpose developed the pointed arch and the flying buttress. In no one of these instances was the idea to be expressed inherent in the structural device through which it was made explicit and visible. In no instance did the idea derive its origin from such a device. In no instance was the eloquence of the architecture a consequence of a perfection in technological resources.

This precedence of idea over technique is most clearly illustrated in the history of the Gothic cathedrals. No one, of course, will deny that the precision and elegance of Gothic vaulting witnesses a builder's delight in his craft and it would be strange indeed if that delight had not been shared by those who employed him; and I think it probable that the intellectual control which is evident in Gothic plan and structure — the fusion of so many diverse energies into an organic pattern — afforded to the medieval mind satisfactions not less trenchant than those which they afford the receptive mind of our day. Nevertheless these satisfactions could not have been conceived as the central intention of Gothic architecture. Clearly they are parallel or contributory enjoyments and are by no means essential to the idea and feeling of the cathedral. Idea and feeling had their genesis, not in the experiments of engineers,

but in the meditations of the cloister. The influence that dissolved in light the dark vaults of the Romanesque abbeys was the monastic vision of the Celestial City. The history of the cathedral is the history of a progressive translation of that vision into glass and stone.

No one, happily, told the Gothic architect that he must imprison the Celestial City within the reasonable laws of masonry construction. To raise the Romanesque vaults into the sky, to give resiliency and grace to the supporting arcades, and to surround the sanctuary with vista and light the architect contrived a nice order and balance of pointed forms. These transfigured the Romanesque pattern without, at first, any violence to the traditions of masonry; but that rationalism sufficed for only a moment. Order and balance had to give way almost immediately before the urgencies of the spiritual idea. Already in the choir of Saint-Denis, the birthplace of Gothic architecture, the pointed ribs are designed, not with reference to the true nature of stone, but actually in defiance of that nature: the stones, inflexible and crystalline, bend and become fluid, the inert masses are changed into lines of action and energy, and it is as line and action that they embrace the Celestial City.

From that time forth the architect of the cathedral progressively ignores the lithic basis of his pattern. He diminishes the weight of his arcades, attenuates as he lengthens the shafts which support his vaults, ever more fragile, and around the perimeter of his building march the rhythms, ever more ethereal, of that most questionable of engineering expedients, the flying buttress. Neither the architect's experience nor his common sense, neither his science nor the intuitions of his practical mind, prevail against the imperatives of the Christian aspiration; his vaults must be ever higher, their supports more slender, until all lithic character and lithic energy are erased. There remains only a linear frame. Light, pouring in splendor from all sides, obliterates even that frame. We stand no longer in a building of stone. The arch is no longer present, being represented



by a line; the pressures of the vaults and buttresses are abstractions and must be known, if at all, by analysis. Nor will the spirit of the cathedral rest until the unsubstantial fabric has been drawn out to a still greater tenuity; until piers and arches, trceries and the ribs of vaults, reach the point of collapse; until, at Beauvais, they do collapse.

I do not pretend that there is in our day a passion so deep and pervasive as thus to direct and illumine the art of architecture. I am of course illustrating a principle. Expression in architecture springs from idea and feeling. Structural expedients come into being as the means by which idea and feelings attain a visual language. And to these premises we may now add an inescapable deduction: structural virtuosity and structural candour are secondary virtues in architecture.

I must admit that such a judgment is subjective in nature; but I shall maintain that it is not less subjective than the theory of those who discover in the column, the vault and the I-beam the source of meanings in architecture. These are indeed objects set solidly in space but that which they signify must be constructed of materials less frangible. I do not find it fantastic to believe that the significances of buildings precede a material realization.

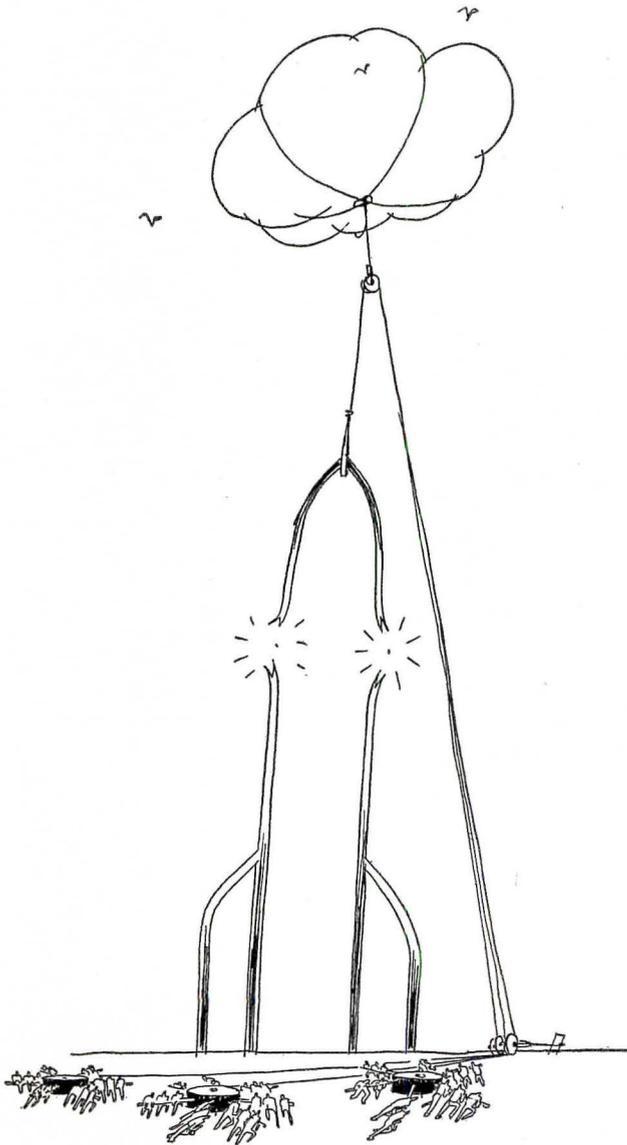
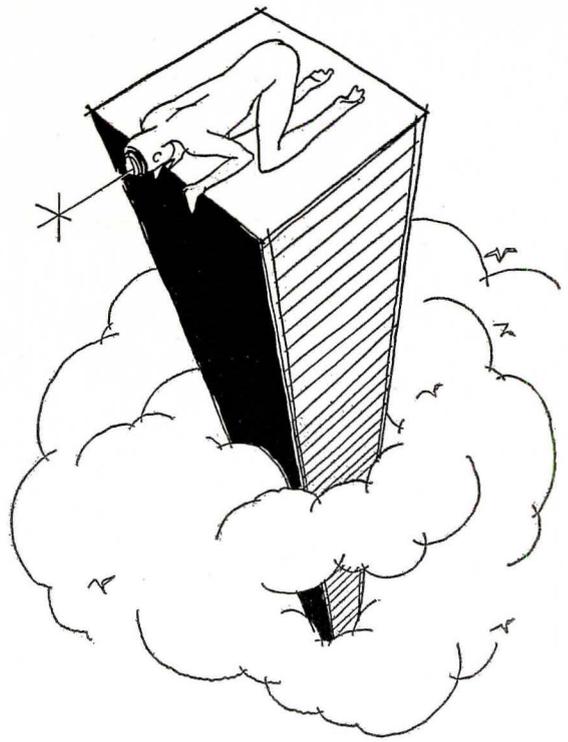
I think that all mechanical ingenuities are (like paintings and poems) the children of popular desire and contrivance. The first printing press, for example, was not invented by Gutenberg but by the hunger of a people for the hidden truths of the Scriptures. The first airplane was lifted from the sands of Kitty Hawk, not by Orville and Wilbur Wright, but by a nation's longing to command the thoroughfares of the sky. And those who think that the force which condemned Edison to his life-time of labor and experiment was his need for money and fame little know the ways in which a nation's will can possess, torture and exalt the noblest of her sons.

Scholars have spent no end of research to discover

the inventor of the skyscraper without perceiving that the skyscraper was created by a people's need for an avenue of expression. It was not merely because we wanted to escape the crabbed streets of Chicago that we evolved this most typical of all modern building types; it was also because we wanted to exhibit in visible form the confidence and pride of our new republic. We had need of a symbol. The skyscrapers which at the turn of the century rose suddenly from the soil of our great cities, like sunflowers at the advent of Spring, were driven upward not by the dull science of engineers but by a romantic necessity.

It is true that this necessity became confused in the neighborhood of Wall Street with a necessity, scarcely less urgent, for splinters of Paris and Rome — a necessity that led to some scenic excesses. We may assume, remembering these excesses, that the romantic impulse may make itself felt in skyscrapers in more than one way. The life that is the theme of architecture is not a specially selected phase of life but the whole of it, mean or exalted, ugly or beautiful; and a skyscraper, however prosaic in purpose, is nevertheless an object through which many kinds of thoughts and imaginings may function. No doubt these thoughts and feelings are sometimes less profound in a skyscraper than are those which, quite apart from its architecture, must inform a cathedral; nevertheless they may exist and make themselves felt. And whatever may be said of "slavish imitation" in the skyscrapers of lower Manhattan — and surely they belong to a page of architectural history somewhat less than sublime — the fact remains that they were charged with meanings by those who built them. Meanings, at any rate, for those for whom they were built. The Woolworth Building, when I first saw it, was peopled not with brokers and commission men but with promises and enchantments. I knew that it was an advertisement — like the newest skyscrapers on Park Avenue — but it was not chained to the ground by a theory of constructivism; and beneath its quaint

*“What is the chief characteristic of the tall office building: And we answer at once: it is lofty”*



*“Nor will the spirit of the cathedral rest until the unsubstantial fabric has been drawn out to a still greater tenuity . . .”*

medievalism the Woolworth Building satisfied for the moment my need for that reassurance for which height had suddenly become a national symbol.

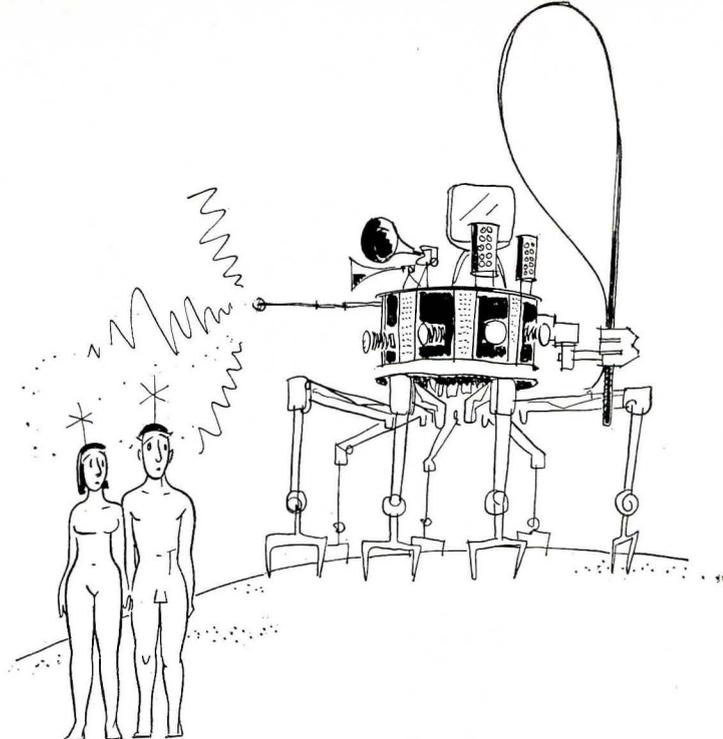
The command over our imaginations which height had assumed is eloquently expressed in a passage written by Louis Sullivan and separated by less than a paragraph from his famous pleas for logical analysis in the design of skyscrapers:

“ . . . We must now heed the imperative voice of emotion. It demands of us: What is the chief characteristic of the tall office building: And we answer at once: it is lofty. This loftiness is to the artist-nature its thrilling aspect. It is the very organ-tone of its appeal. It must in turn be the dominant chord in expression. The skyscraper must be tall, every inch of it. It must be every inch a proud and soaring thing. . . .”

The true excitant of the imagination then was not the steel structure and the necessity of confessing its presence but the loftiness: the loftiness which to the artist-nature was the thrilling aspect of the skyscraper, the organ-tone of its appeal. The architect puts aside his theory and turns to the messages of his heart, finding a source of expression not in that which he has been taught but in that which he has felt. He turns from understood relations, accessible to the intelligence, to those relations which are accessible only to the imagination. It was at that moment that the skyscraper ceased to be a work of engineering and became a work of architecture.

I am sure that Louis Sullivan did not in his glowing paragraph conceive height, an objective characteristic of the skyscraper, as a subjective characteristic. Height was the thrilling aspect of the skyscraper because he had discovered in it a force and power, a glory and pride; and that force and power, that glory and pride, were essences drawn from the civilization that lay around it. This proud and soaring thing was a similitude of this land.

“ . . . with a solemnity of speech that might have become the Pythia above the afflatus of Delphi — mechanization has taken command.”



A collaboration of head and heart is a distinctive characteristic of the art of Louis Sullivan and, in my opinion, a distinctive characteristic of American culture. We are travestied by those naked buildings which proclaim a grim realism in the land they pretend to represent. Are they not, after all, an importation? They represent, not America, but America as seen from across the sea. Louis Sullivan was less hesitant to show ourselves as we are.

I have heard it said — and with a solemnity of speech that might have become the Pythia above the afflatus of Delphi — that we are living in a mechanized world. Mechanization has taken command. Overwhelmed by our inventions we have become conditioned here in America to life in a precise and ever-moving machine. Our ambition is to enrich the world with machines ever more efficient. Mechanization therefore will inevitably take command of our architecture.

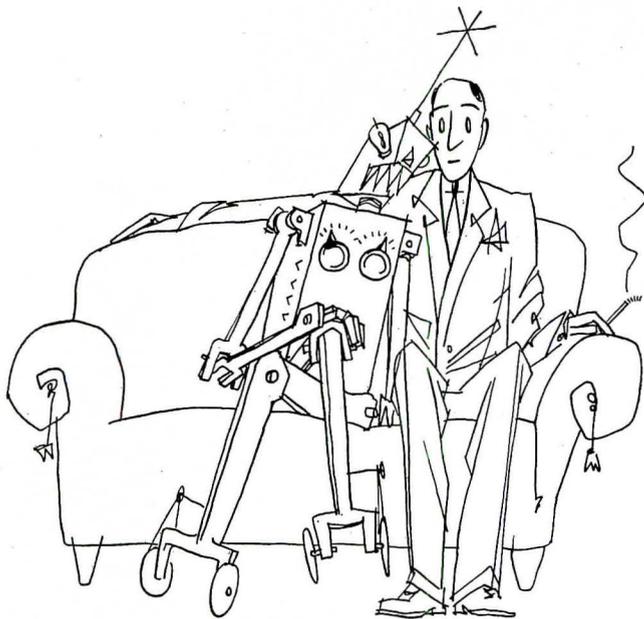
We ought to reject such appraisal with a greater warmth of resentment. If we have accepted with gratitude the gifts of the machine we did so in order to use these in the making of a better way of life — not for ourselves merely but for the world — and that which we gave the world was well worth having. Our engines are in truth the implements of an impulse which lies deep in the culture of this land. In spite of their intimacy to our daily lives our machines remain surface aspects of life which have never impaired the idealism which they overlie. We should not be ashamed of that idealism — not even in our architecture.

It is not the function of art to set forth the material circumstances of a civilization. The ways in which buildings are adapted to new uses and to new techniques are of course of the greatest practical importance but they have little to do with the substance of architecture. To be factual and logical is to be as superficial in architecture as it is in life. The arts have only one important function: to define and make eloquent the experiences of the heart. Except as a means to that end ingenuity and

contrivance are no concern of the arts. The art of poetry is not exalted by the invention of new words — no, not even by the invention of the typewriter. The art of painting gains no new dignity from new colors spread upon the palette of the painter — no, nor by the substitution of the palette-knife for the brush. These are new media, useful to widen the range of techniques, but they have in themselves no new meanings. Nor is the art of music made more magical in the intricacies of the Philharmonic than in the slender orchestra of Mozart; and Beethoven, after all the thunder of his nine symphonies, wrote his most sublime music for a quartet of strings. The notion that the arts progress with the evolution of techniques is the most dangerous fallacy in the architectural thought of our day. How could the arts progress when at all times they are voicing, not event and circumstance, but the experiences of man's inward life, unchanged over a thousand centuries?

The art in architecture consists, as it does in all avenues of expression, of ideas and imaginings — and in that indefinable quality which Freud calls the *feeling-tones* of ideas and imaginings. The art in architecture is poetry, a poetry that functions, not in words, but in constructed fabrics. Such a fabric becomes architecture when it is filled with a poetic content.

Our architecture, like our poetry, is strangely silent with respect to the most salient characteristics of American culture. Among these — if I may pretend to such knowledge — is our faith in a philosophy that sanctions freedom and personality, enterprise and tolerance. We should not, I think, bewail the fact that we pay for these with some surface vulgarities. We have also a religion of love, not superficial but active, which ought to compensate us for a spirituality somewhat less fervent than that which raised the great cathedrals; and there is also, even in small towns and villages, a desire to be hospitable to ideas, to seek beauty, and through idea and beauty to give our daily lives dignity and purpose. These are transcendent qualities which will sur-



*"In spite of their intimacy to our daily lives  
our machines remain surface aspects . . ."*

vive the corruptions of the great wars and the unwanted responsibilities which these wars have placed upon us. Surely they will some day find their way into our architecture. It would not surprise me to learn that steel construction was invented for that purpose.

One thing is certain: we shall not build these qualities into our buildings by the exercise of that outmoded instrument, the intelligence. Heaven forbid that I should ask architects to be unintelligent; and yet I shall venture to remind them that there is a frontier in their practice where the intelligence becomes an impertinence. If we start — and of course we must — from rational, or at least practical, premises it must be with the object of arriving at some unsophisticated conclusions. The time comes in the development of every work of art when we must be less concerned with what we know and more concerned with what we have felt. At that point we must be less solicitous of our technologies, less conscious of them. Surely we are now sufficiently practiced in steel construction to use it intuitively, to accept automatically its authority in that kingdom where it is rightfully sovereign and, having acknowledged that sovereignty, let us be free to command steel to our poetic purpose. I do not mean that we should be merely free to give aesthetic trimmings to works of engineering. I mean that we should be free to give structural shapes our own direction and disposition: to emphasize or suppress them, to aggravate or attenuate them, to veil or distort them, and, wherever that is necessary to our purpose, deny their existence.

I know quite well that the noblest qualities of American culture cannot be exhibited in a skyscraper — perhaps not in any building. I have talked about skyscrapers because they seem to me to have sprung uniquely from American thought and feeling and because that was what Louis Sullivan thought about them. Sullivan found in skyscrapers a quality of aspiration, of a rising out of the dull business of getting and spending, and that aspiration he thought — in the teeth of

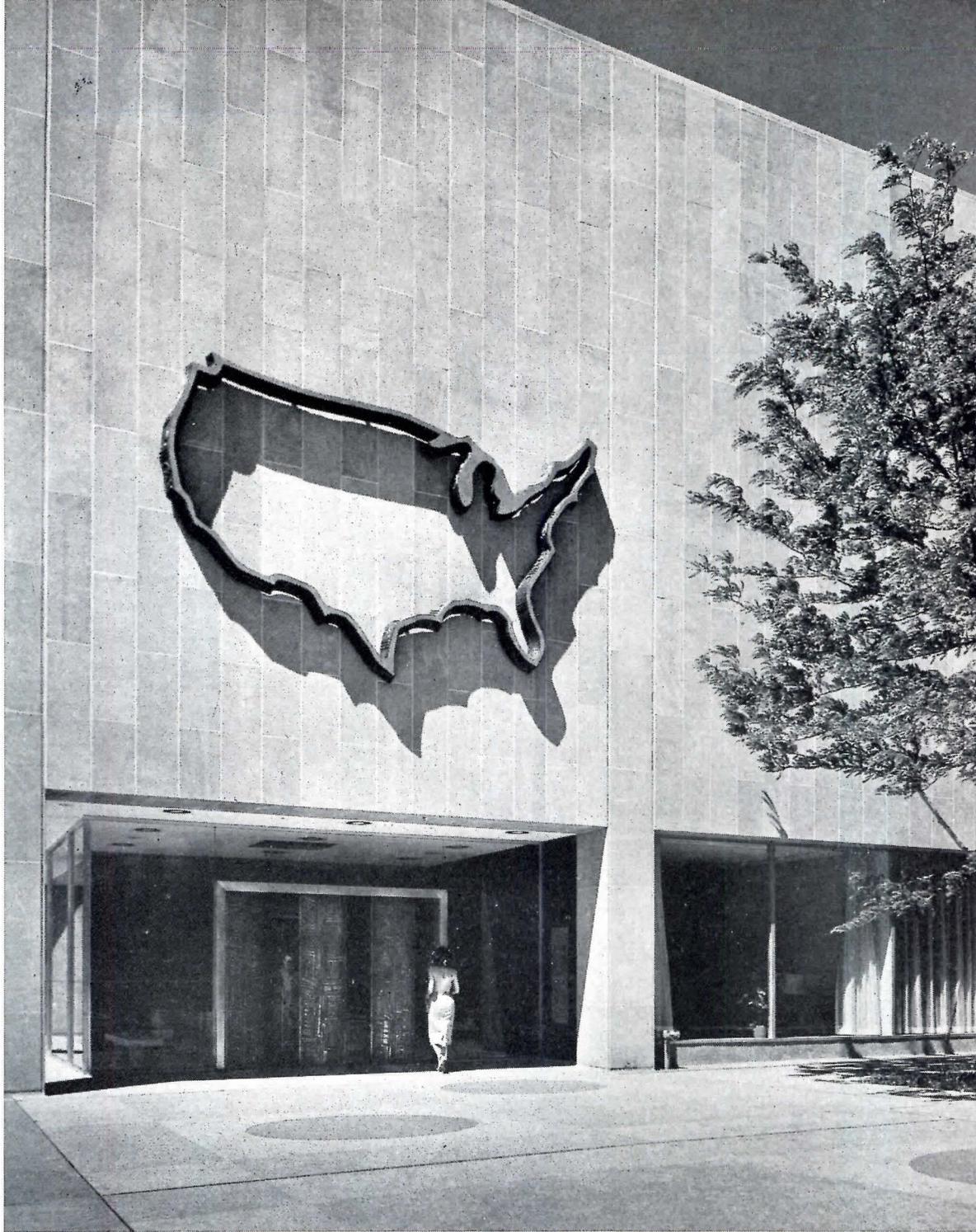
all philosophers of the time — was an American quality. I am not so confident of skyscrapers and yet I agree that there is in them a quality not unworthy of celebration in architecture.

There is also in skyscrapers a romance of a different kind: I mean that visual romance with which they endow our cities. I seldom approach one of our cities from the air without feeling a delight in the upward surge of the tall buildings at its center. These create a new kind of beauty. LeCorbusier has shown us how these brambles at the hearts of cities might submit to the control of an artist and by so doing attain a new grandeur, speaking to us less of a competitive rage and more of that just proportion and peace which is the less published trait of our national spirit. In the beautiful *Ville Radieuse* the skyscrapers consent to live together and to be citizens. They consent to a harmony of proportion and to a consistency of technique; to a majestic rhythm of silhouette; to a poetic artifice; and they consent to live in a garden.

Was the splendor and beauty of LeCorbusier's design created by steel? Did this assurance of faith in man's dignity and worthiness arise from the inward sources of the I-beam? Of course not. Nor did this great romanticist arrive at his design in deference to some abstract theory of design — not even in deference to his own theory.

But we must not expect Utopias; and it may well be doubted that there could be happiness in a world where all conflict is stilled, all accidents anticipated. Whether we like it or not discord and confusion will remain for a long time to come the normal conditions of human life.

Nevertheless it is important — important to our civilization — that we should hold before us such idealisms as that of the *Ville Radieuse*. That is one of the noblest functions of architecture: to exhibit in dramatic form the spirit of our epoch, to renew our faith that great things can still be accomplished.



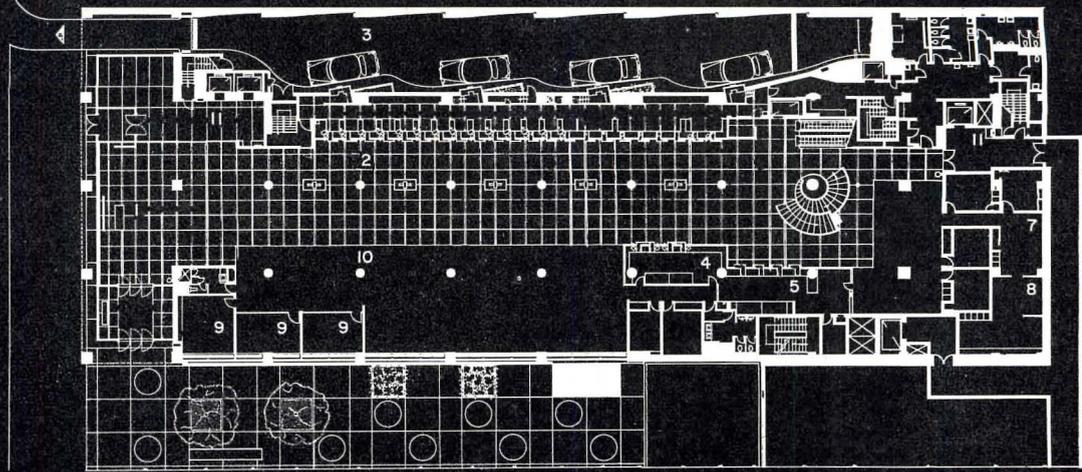
## DEFT REMODELING OF DENVER BANK

*James S. Sudler, Architect; Maria Bergson Associates, Associated Interior Designers; Ketchum & Konkel, Structural Engineers; Swanson-Rink & Associates, Electrical Engineers; Herman & Von Rosenberg, Mechanical Engineers; Edgar Britton, Sculptor, Bronze Doors and Outline Map; Peter Ostuni, Enamelist, Enameled Copper Screens; Robert Probst, Artist, Three-Dimensional Directory; N. G. Petry Construction Co., Interior Contractor; George A. Fuller Co., General Contractor*



Hedrich-Blessing





GROUND FLOOR

**THE UNITED STATES NATIONAL BANK** *In The Mile High Center, Denver, Colorado*

*Particularly in the West, a bank should provide an air of cheerful friendliness while —paradoxically—maintaining an aura of institutional dignity and solidity long associated with banking. In this example, the architect and his associate interior designers, as well as several additional artists, have worked together to transform an unpromising existing structure into a bank of fitting character that holds more than ordinary esthetic interest.*

THE EXISTING BUILDING was a flat-slab concrete structure with a one-story difference in its two street entrance levels. Possible finish ceiling heights were relatively low, and the mushroom column caps presented a problem. Introduction of an open volute stair helped tie the levels together and gave the spaces a high degree of unity; special lighting fixtures hid the caps gracefully, as the photograph on the page at left shows.

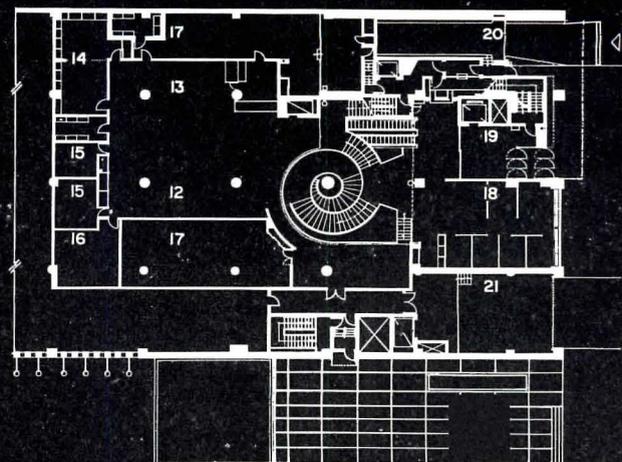
In the main banking area, the floor is light gray-beige terrazzo; the column casings oxidized bronze mesh; the counter walnut and Belgian black marble; the smooth plaster ceiling contains special lighting fixtures made of pieces of aluminum tubing painted white. The back wall is travertine with bronze joint strips; the lobby wall is black marble.

**GROUND FLOOR**

- 1 Reception
- 2 Tellers
- 3 Drive-in
- 4 Savings
- 5 Loan Payments
- 6 Cashier
- 7 Personnel
- 8 Auditing
- 9 Executives
- 10 Officers
- 11 Building Lobby

**SECOND FLOOR**

- 12 Trust Officers
- 13 Investment Officers
- 14 Library
- 15 Conference
- 16 Vice President
- 17 Work Space
- 18 Loan Officers
- 19 Lobby
- 20 Ramp down
- 21 Truck dock



SECOND FLOOR

Photo by Hedrich-Blessing

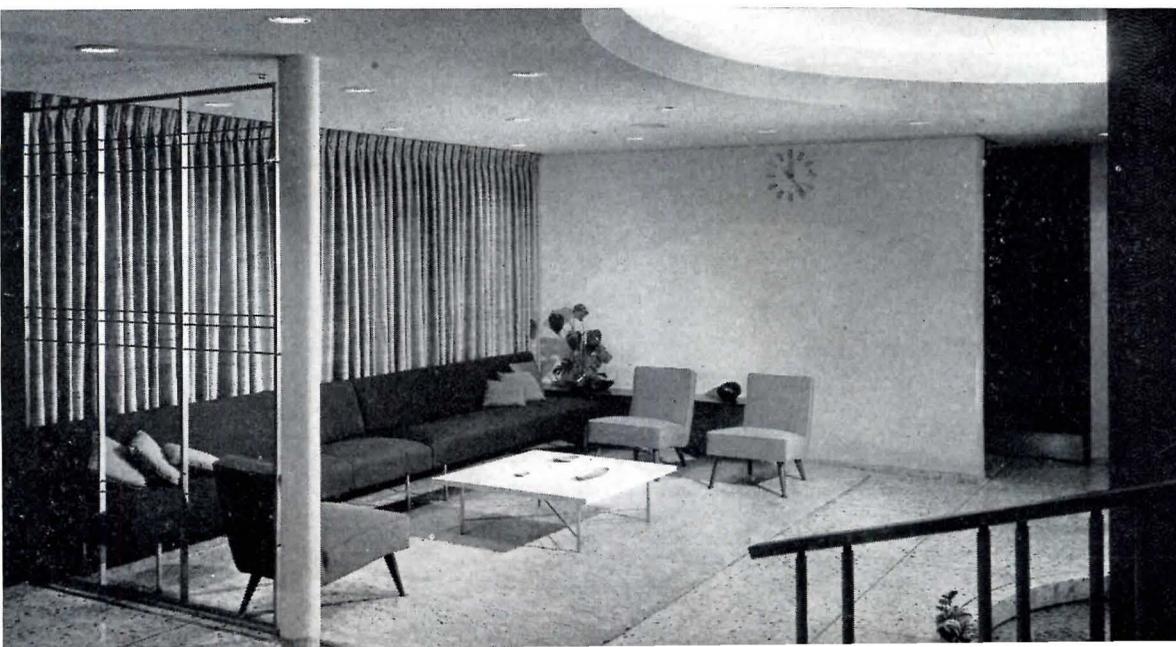




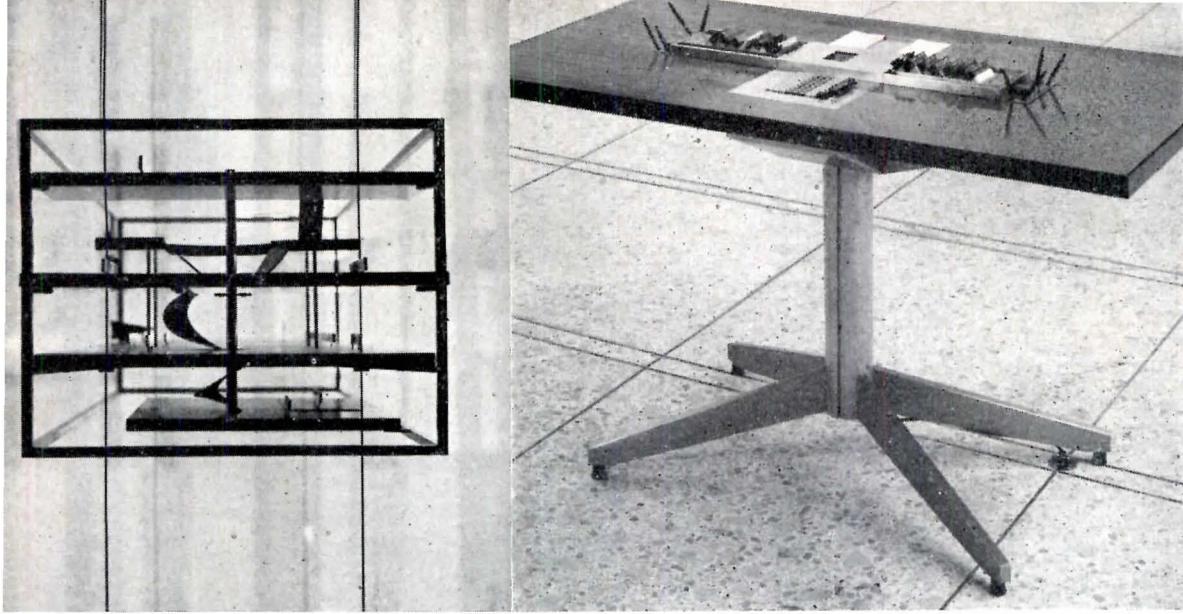
*Top*—Reception area: walnut panels; off-white carpet; beige-gray, blue and black upholstery.  
*Below*—Trust department: gray carpet; walnut panels; white plaster ceiling; dark orange-red



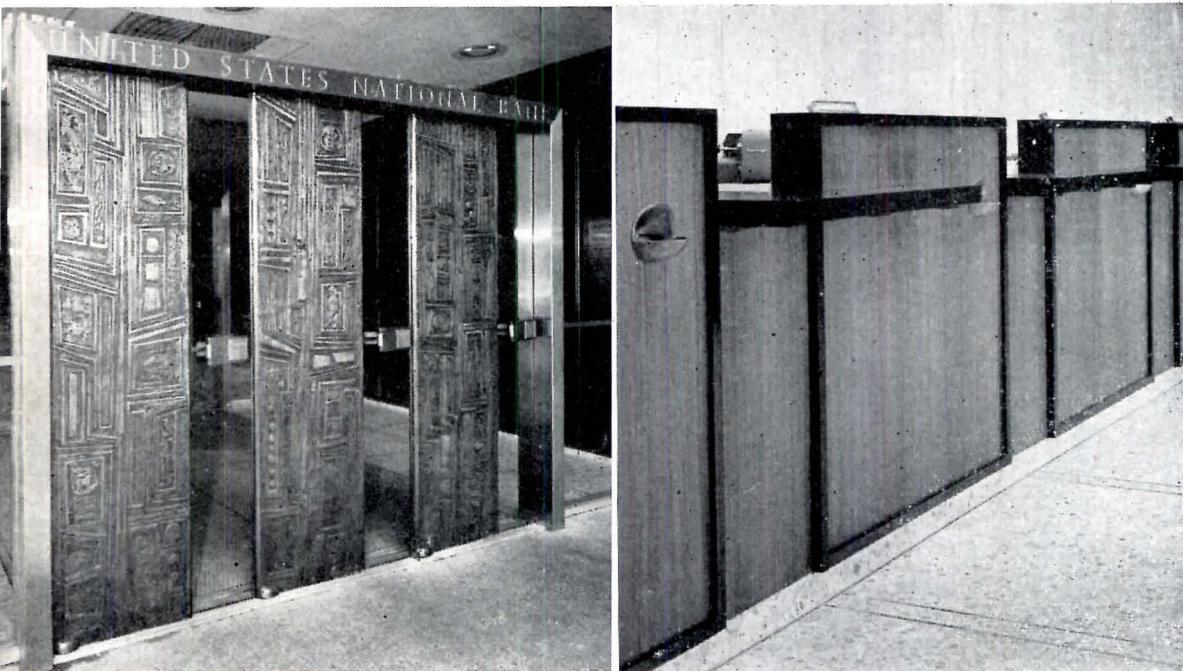
and black upholstery. *Below*—Vault reception area: white enamel and bronze screen; off-white walls; raw silk hanging; upholstery in rich brown, orange-red and sage green.



All photos this page  
 Hedrich-Blessing  
 Photo opposite page  
 L. A. Lucas



*Above, left*—Three dimensional suspended directory in enamel and bronze, with black, white and red accents. *Above, right*—Check desks featuring a flush, built-in adding machine. *Above,*

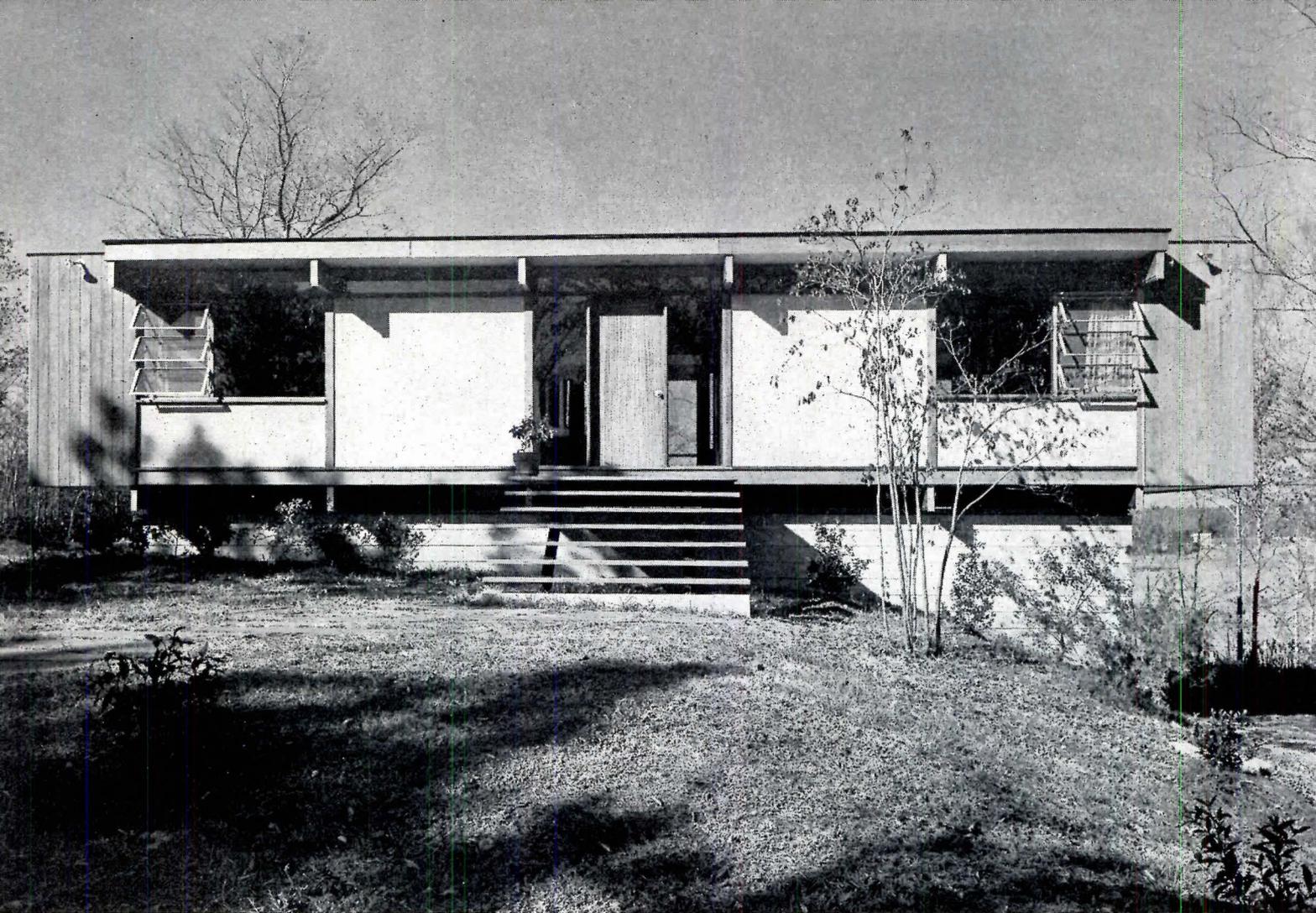


*left*—Bronze entrance doors by Edgar Britton. *Above, right*—Counter with hand-contoured change cups. *Below*—Drinking fountain of special design; cast bronze.





LESSONS IN RESIDENTIAL ORDER



Joseph W. Molitor photos (including page 189)

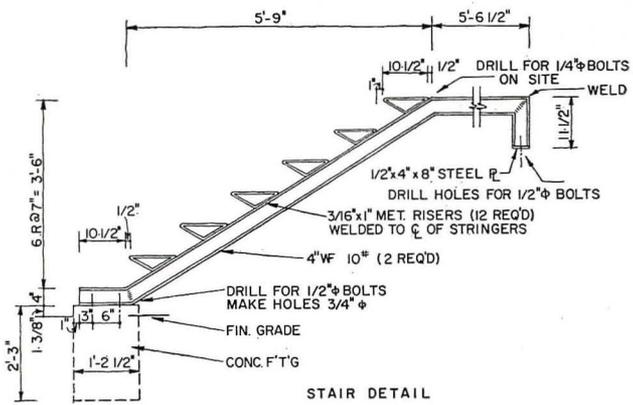
## LESSONS IN RESIDENTIAL ORDER

**Residence for Dr. George W. Poland, Raleigh, North Carolina. Architect: George Matsumoto (School of Design, N. C. State College). Associate: Wayne F. Koontz**

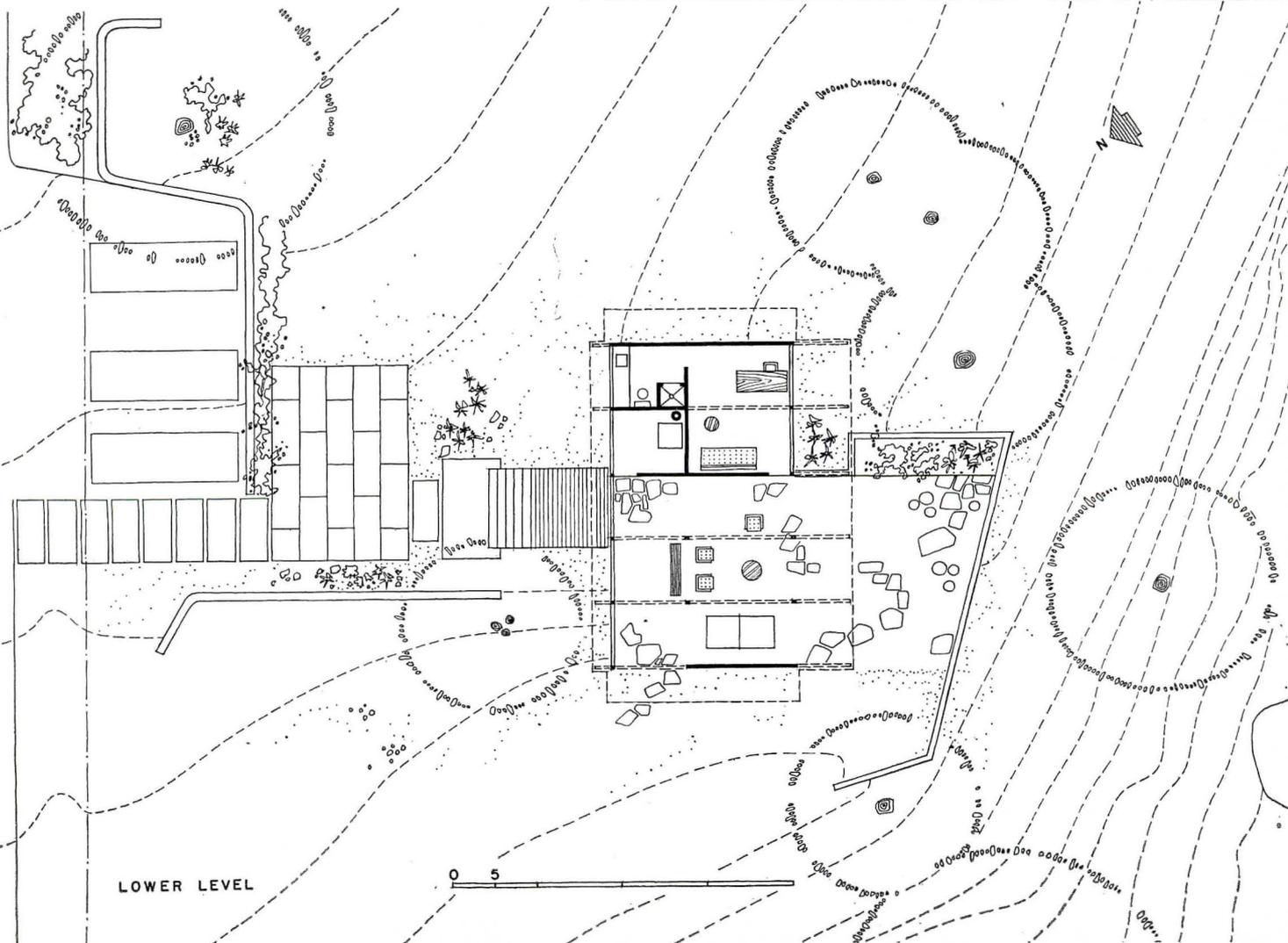
*Adroit use of space, symmetry without monotony, a pleasant contrast of textures and the alternation of openness with enclosure characterize the best of today's residential design. This house, despite its small size and low cost, is prototypical in these respects; it offers many lessons in residential order.*

**T**HE SITE drops off sharply to the rear, and the view is toward the south — scarcely ideal for North Carolina. Orientation difficulties were overcome inexpensively by placing the house at the rear of the lot where the house itself could be used to shelter a lower-level terrace facing the view; a cantilevered balcony on this side gives further shade to the terrace and increases the openness of the main floor.

Front and rear façades are, as the photos show, strikingly different: the one is more than half enclosed, the other wholly open. At the front, the centered door is flanked by floor-to-ceiling glass panels which permit a view through the house to



STAIR DETAIL



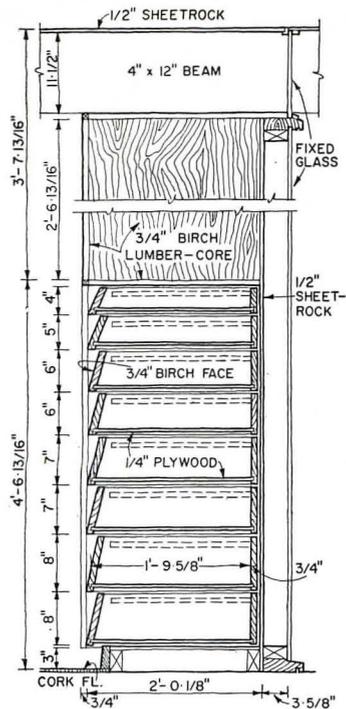


#### LESSONS IN RESIDENTIAL ORDER

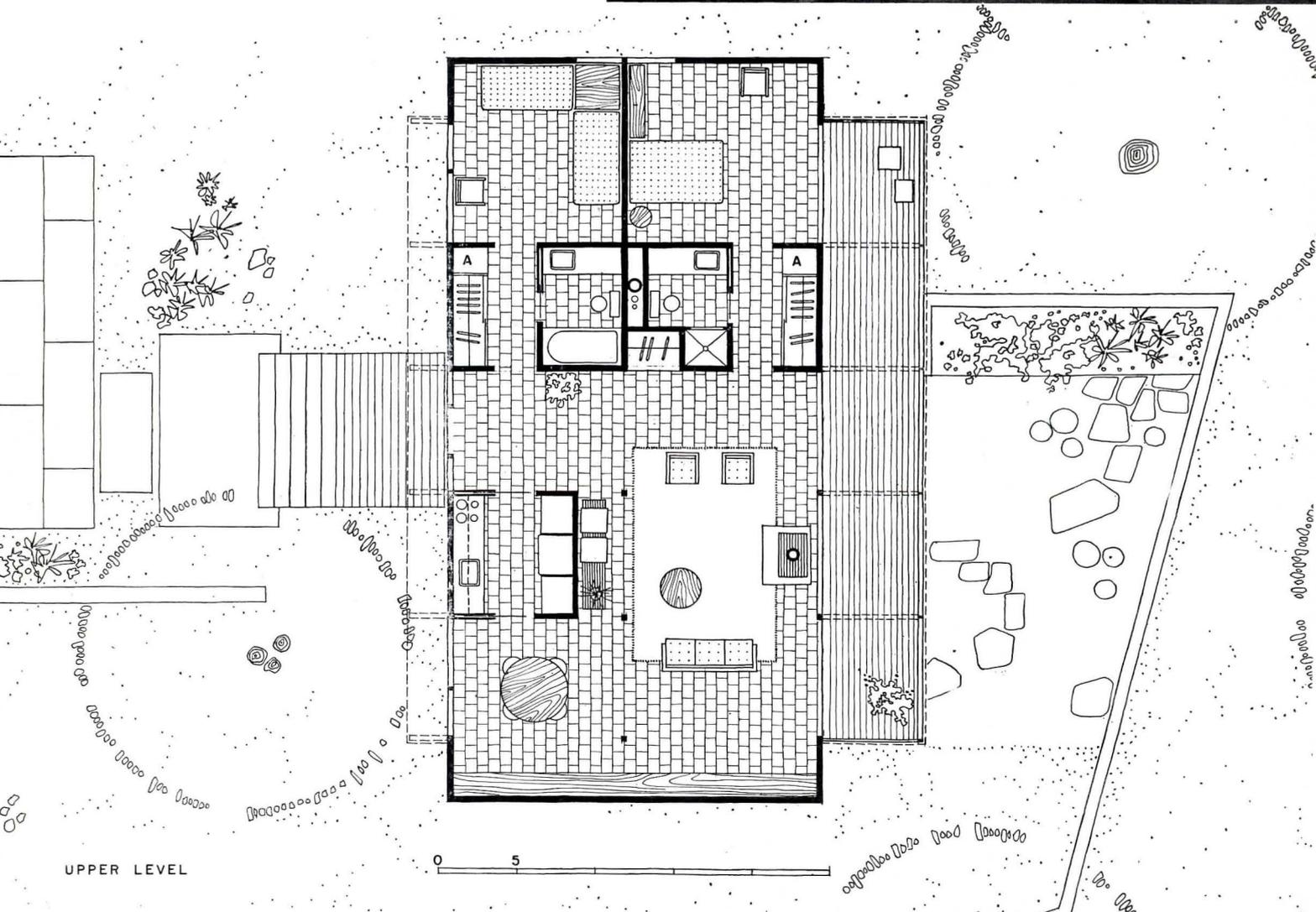
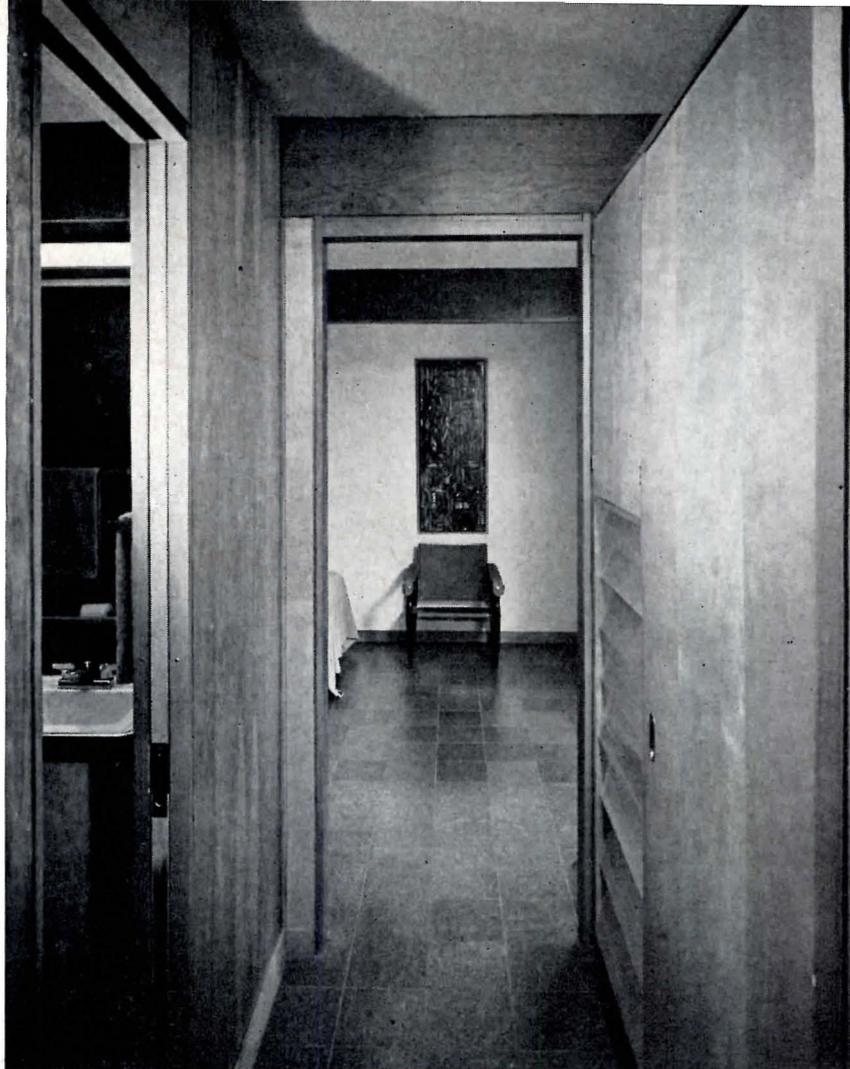
the porch and ravine beyond; cantilevered end wings and open-riser steps emphasize lightness and airiness. The screened porch to the rear adds many square feet of living space to the necessarily limited interior and contributes a columned symmetry of its own.

The most interesting feature of the house probably is its plan. The owner, a faculty member at North Carolina State College, originally wanted an exact duplicate of his architect's own residence (AR, Mid-May '57), but was persuaded that since he is a bachelor and intended to rent a room to a fellow faculty member, he needed two instead of three bedrooms and two baths instead of one. The result is a plan which would work well for almost any small family: note the relationship of main entrance to living area, kitchen, dining room, both bedrooms and porch; note also the uniform spacing of structural bays.

Since this is a small house, no space could be wasted. Bathrooms are minimum in size, and use space-saving sliding doors. Each bedroom gains privacy by an entrance corridor between its bathroom and louvered storage cabinets.



DRESSER SECTION



UPPER LEVEL

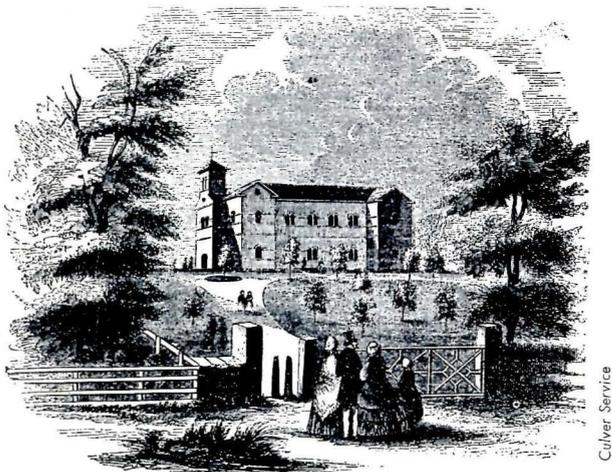


## LESSONS IN RESIDENTIAL ORDER

*Specially-designed built-in cabinets save floor space and supply diversified storage facilities. Treatment of kitchen as aisle between living and dining areas is unusual but highly practical in warm climate. House is wood frame on concrete block foundation; exterior walls combine stained pine with natural cement asbestos board. Interior partitions and ceilings are sheet-rock, floors are cork. Flush panel wood doors are used throughout.*

## ARE THE NEEDS OF PUBLIC AND PRIVATE SCHOOLS FUNDAMENTALLY DIFFERENT?

WE ARE IN THE MIDST of a great tumult about our school buildings — how many? how much, and where's the money coming from, Uncle Sam? However those questions are decided, the act of asking them has some virtues and raises still further questions, many of which we have dodged. Undoubtedly the to-do has reacquainted many segments of our American world, notably the commercial and political, with the great impor-



Culver Service

*Founded in 1791, chartered in 1793, its edifice as pictured built in 1853 from plans by Richard Upjohn, one of the founders of the A.I.A., Berwick Academy in South Berwick could claim to be the oldest academy in the state of Maine.*

tance of education. Some among us, facing construction problems and financing difficulties of staggering size, lash out instinctively to say they just can't exist; and all the time the populace keeps growing while more and more school buildings fall into disrepair. There have been many impassioned statements, also, concerning modern teaching methods; the familiar cry about

Johnny's inability to read — which, based on grains of truth though it may be, has the ring of blind hatred of anything new; all the interpretations and misinterpretations of John Dewey's philosophy, which it is the fashion now not to mention openly by name although its effects are unmistakable; the bland assumption by a good many educators that, given proper facilities, proper techniques can create leaders for our people — when the plain fact is that leaders cannot be created, that what can be done is to seek out in individual children the qualities of leadership to enhance, to cultivate and encourage to bloom.

Indeed, our most serious educational fault appears to be our assumption that the mass techniques we have successfully applied to production of things can be equally successful in producing educated, civilized people. Teachers and architects and laymen alike, we have all been guilty of this: of stereotyped classrooms in characterless rows in monotonous buildings on barren sites. True, many devices are being tried to mitigate the effects of the massive increase in school population and our own unimaginativeness — schools-within-schools, quadrangles and courtyards, special programs for the gifted or the slow-to-learn, and so on; these, as examples of what can be done, are the schools we try to publish in these pages. But there are an infinitely greater number of uninspired new American school plants, too many that are downright depressing. As if we had only to provide enough endless belts, press enough starter buttons and let educational machines do the rest!

Perhaps a look at history may reinvigorate our imaginations. The concept of public education now accepted in this country is relatively new. Our public secondary schools, for instance, have existed in something like their present form only a mere century. (In Charlotte, N. C., where public schools are now of a very high order, the

## NEEDS OF PUBLIC AND PRIVATE SCHOOLS

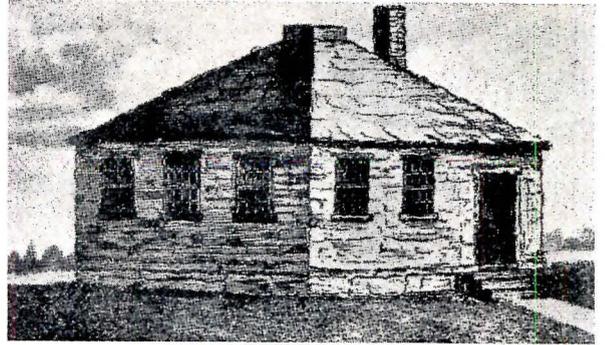
whole concept of the graded school system is even younger!) Our high schools are directly descended from the once-typical New England academy, which was usually founded and supported by a man or a group who had ventured to settle away from the more cultured metropolitan center; it was seldom a proprietary institution; it might be a free academy or a tuition school; a few public-spirited individuals footed the bills. Consider the description of Berwick Academy founded in South Berwick, Maine, in 1791 — the first Maine academy — as reported in *Ballou's Pictorial Drawing Room Companion* before the turn of the century:

"Its (Berwick's) charter bears the handsome and bold signature of John Hancock. The land on which it stands came to the institution only one remove from the red man . . . a number of gentlemen, distinguished for learning, talents, enterprise and liberality, were engaged in the initiative (sic) step of its creation. . . . In 1792 it was assisted by a grant of land from the legislature . . . The number of pupils was originally limited to 40 . . . boys exclusively; but in 1795 females were admitted." The reverend gentleman who sparkplugged the "initiative step" rode a horse from South Berwick to Boston to secure legislative approval of the new academy's charter, just for 40 country boys.

Fryeburg Academy, founded a year later, has an almost identical history. These and others like them, of which fortunately a few are still operating, were conceived as public or semi-public institutions by private individuals who supported them with their own minds, hands and pocketbooks, who at the same time sought for them all the public support that could be obtained. There was no thought of a conflict of interest; the objective was education of as high a quality as the times allowed, and all joined in furthering it. Up to a point, the parallel afforded by St. Edmund's School, with which this study closes, is obvious. The arguments now going on in some states over transportation of pupils to private schools in public school buses may, in the light of such historic precedent, benefit from a different perspective. Are we less concerned than our forbears with providing the educational wherewithal? Should the White House Conference on Education held a year and a half ago have been permitted to virtually write off private schools?

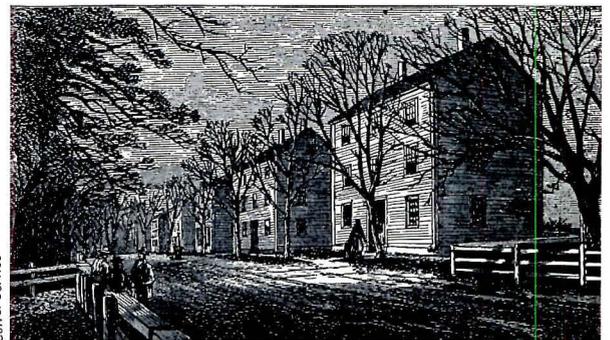
Of the many different kinds of private schools we have been able to include only a few in this short study; actually they are at least as various as public schools and their philosophies differ even more widely. Nearly all of them face financial difficulties at least as serious as the public schools; and all require physical facilities appropriate to their own aims. Many have to make virtues of the shortcomings of their plants, utilizing instead of the latest gold-plated tools of education the human qualities of dedication, love and individual attention to their charges, turning to advantage close spiritual ties or the economy and earthy richness of a rural location. Most have grown in size, though slowly and with parallel development of purpose.

Are there lessons in this for our public schools, for

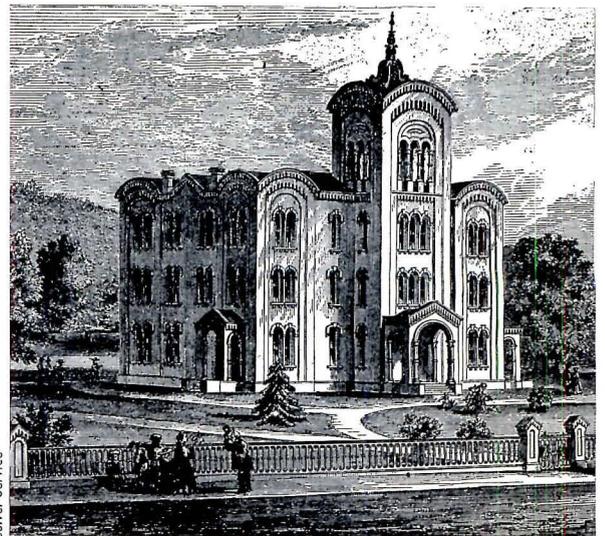


Above, Fryeburg Academy — compare with photograph opposite! — as it was in 1801 when Daniel Webster became its principal

our great undertaking of educating the masses? Are our techniques likely to submerge our aims, and while they're about that, to cost so much that those who decry obvious needs could find in them pretty solid arguments? We do not presume to know the answers to such questions, nor do we believe others have them pat. We do believe, as the founders of Berwick and Fryeburg Academies did, that education is a matter for deep concern both public and private, that school buildings, entire plants and all their equipment, ought to be the best and most appropriate we can produce; and that mass production techniques, though they may become invaluable aids, cannot successfully replace completely the human qualities of individuals however faulty.



Above, English Commons, Phillips Academy; below, Norwich, Conn., Free Academy





## FRYEBURG ACADEMY IN MAINE

Just out of Dartmouth in 1801, Daniel Webster became principal of Fryeburg Academy; salary, \$350 annually. In May, 1802, he took his quarter's pay to his brother in Hanover; he wrote: "I had the pleasure of putting (my first earnings) into my brother's hands for his college expenses."

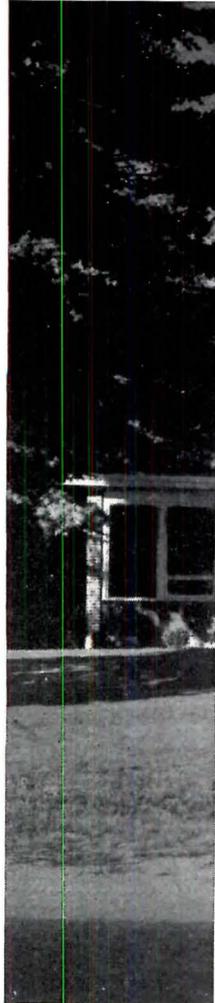


## FRYEBURG ACADEMY: GIBSON RECREATIONAL CENTER

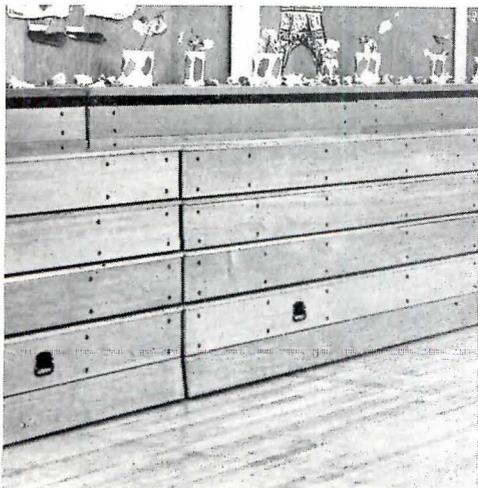
*Architects and engineers for Gibson Recreational Center: Alonzo J. Harriman, Inc.* This is the newest building at Fryeburg Academy. Founded in 1792, the Academy is both a boarding school for students from all over the world and the high school for the children who come from the surrounding rural locality by daily bus. It is co-educational. It has contributed much to the reputation of Fryeburg, "the aristocrat of Maine villages." Some of the Academy's alumni have returned to the village to live; many of this year's graduates are third or fourth generation Ivy League college candidates; outside the village and the state its name is well known. Its concern with students who do not go on to college is equally deep. This is in the tradition of the northern-New-England academy.

So too are Fryeburg Academy's genuinely conservative educational methods. The brick and granite "academic" building, built in 1850 and enlarged in 1930, has desks still screwed to the floor, their tops still bearing the initials of long-departed alumni, in rooms that do not take kindly to modern isms. Teaching is primarily of the 3 R's type, with little apparent progressiveness; yet in actuality its philosophy, slowly modified over the years, is more humane than that of many a school proud of its courses in the humanities, more honestly liberal than many a progressive school.

The school plant for this small, diverse student body covers many acres and includes many types of facilities: the busy home economics department, the well equipped industrial arts shop, the commercial and business department, the Academy Farm with its cattle and acres of fertile Intervale land; conventional classrooms; dormitories and dining facilities — the lounges of the new girls' dormitory and of the Recreational Center provide settings for the occasional departures from routine that help make learning fun. Facilities for indoor and outdoor games are recognized essentials for improving the physical well-being of all the students. The thirty acres of playing fields are constantly being developed; the earlier Gibson Gymnasium, formerly for boys and girls, was extensively changed for the girls' use when the Recreational Center was completed.



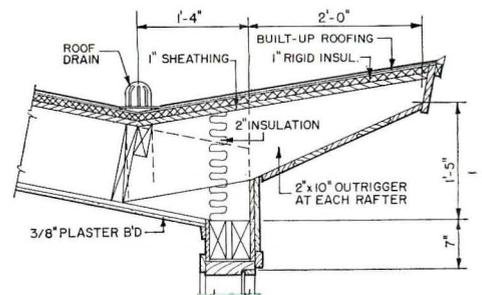
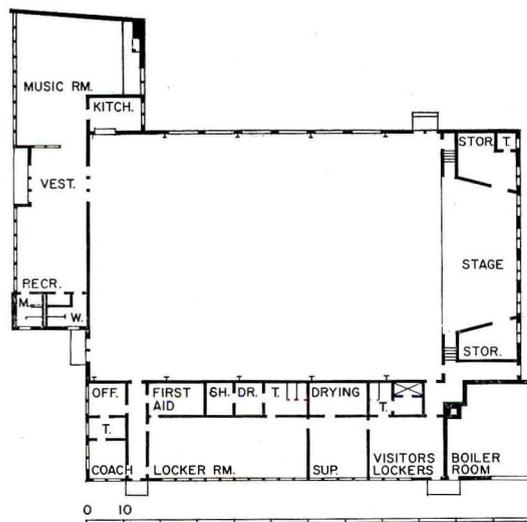
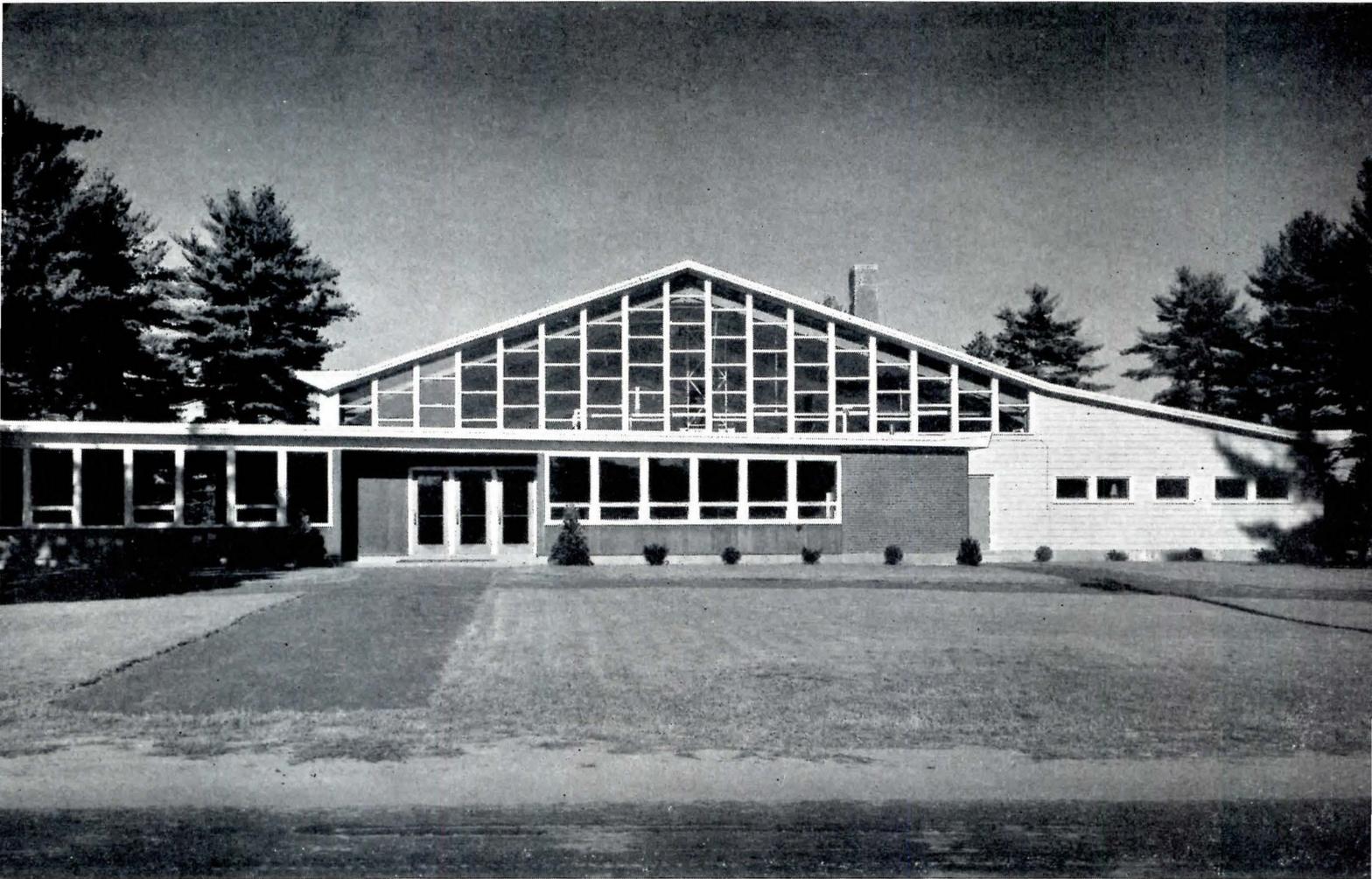
Anderson Studio

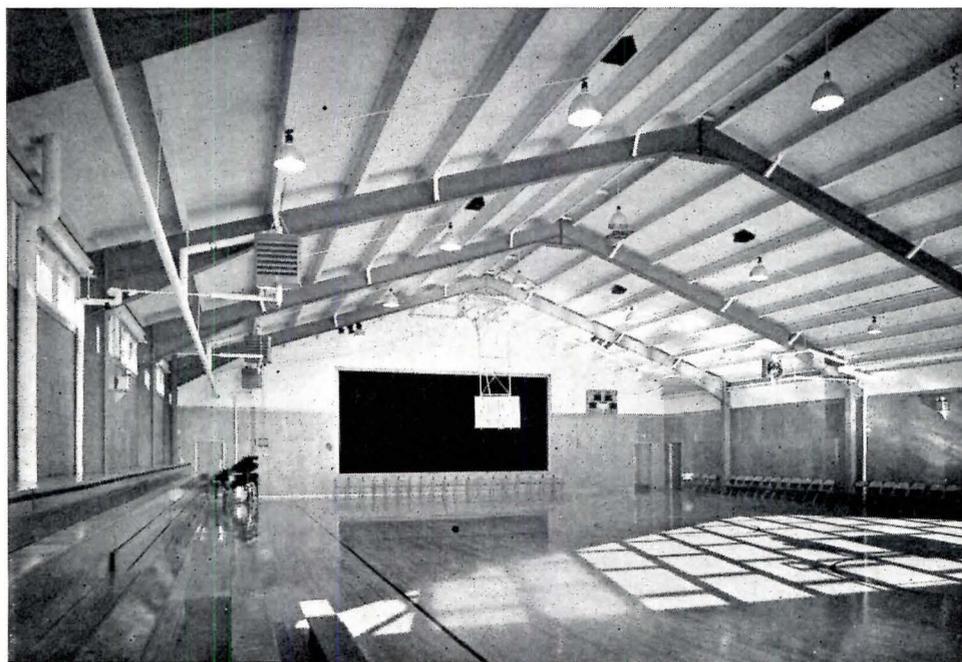




One of the older buildings at Fryeburg, before and after remodeling

Joseph W. Molitor





*Joseph W. Molitor*

## **FRYEBURG ACADEMY**

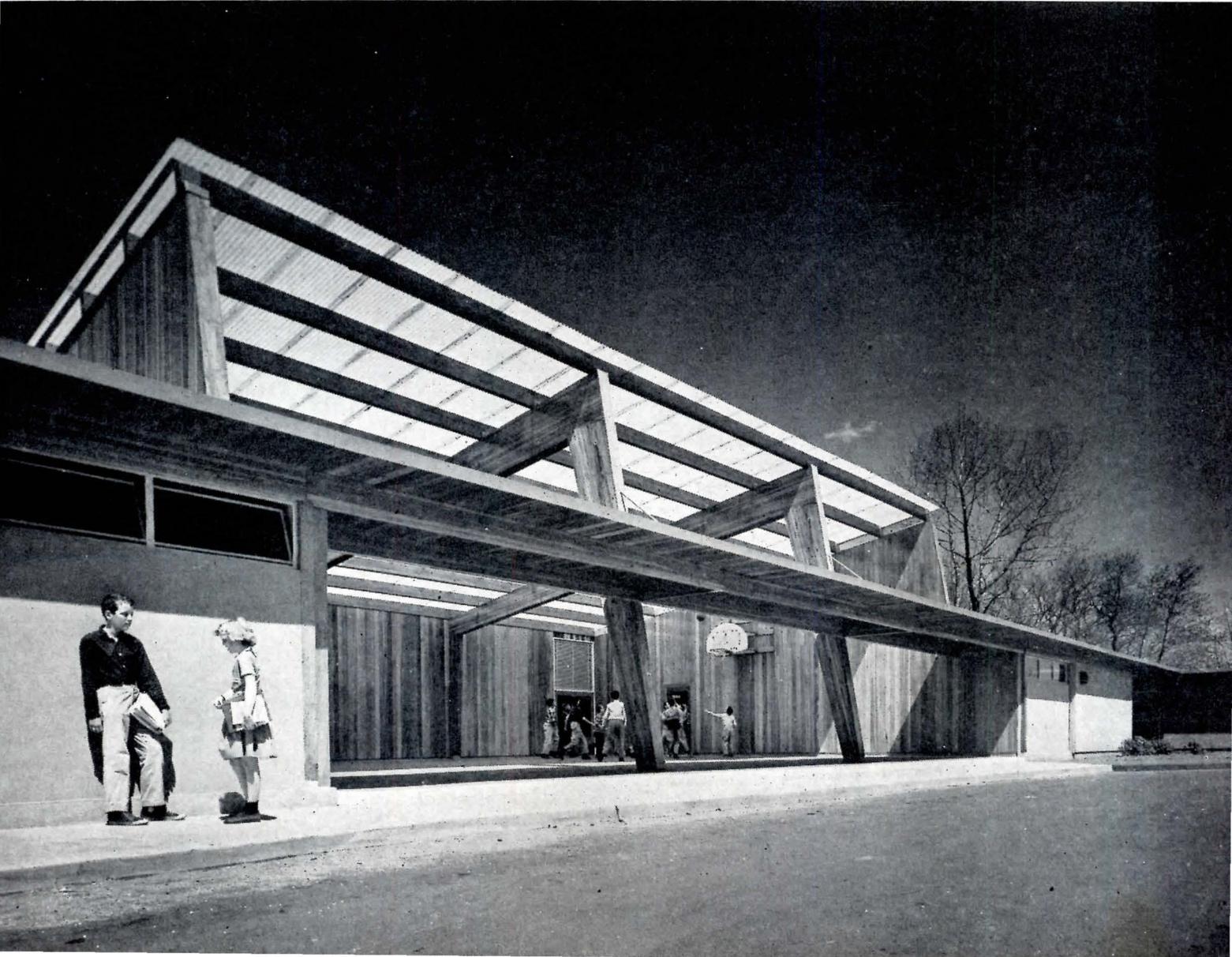
Fryeburg's Gibson Recreational Center is more than a physical education building. The lounge, used also as a music room, has an important set of educational functions: here the chorus and band rehearse, the debating sessions and prize speaking contests take place; here the Friday night dorm record hops are held; here are conducted the many things, all requiring meeting places, that are parts of the life of a small academy.



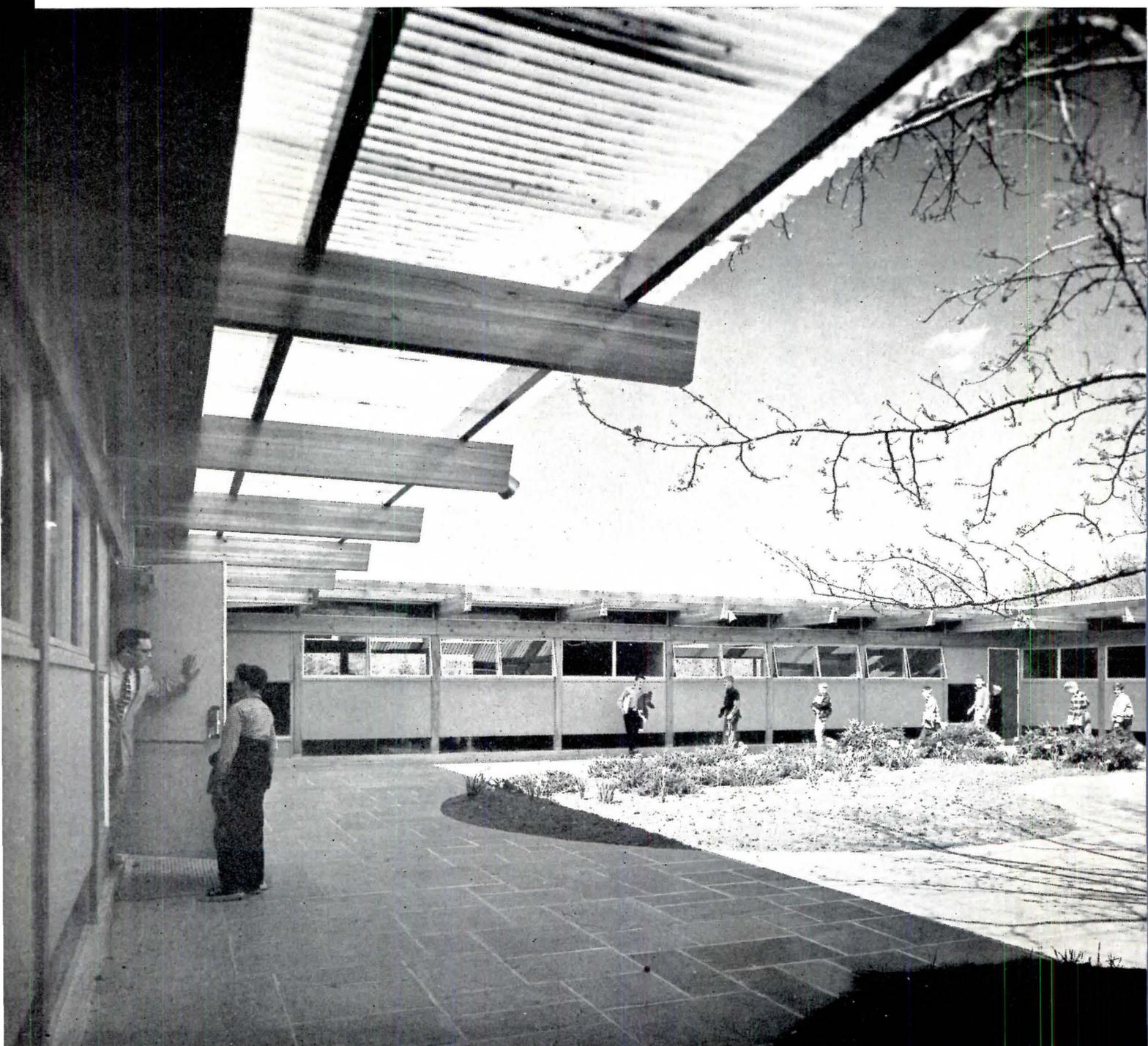
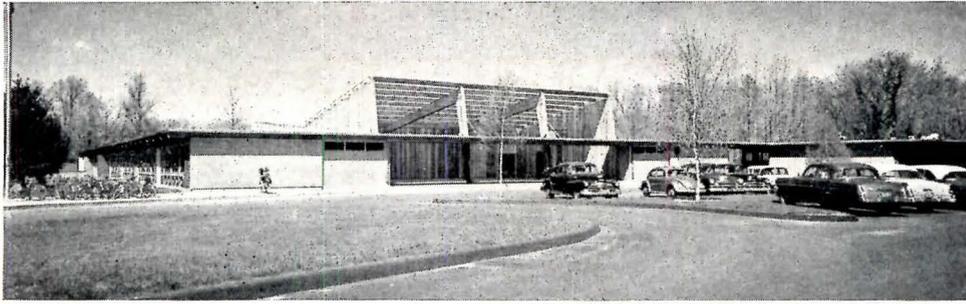
# CONNECTICUT PUBLIC SCHOOL

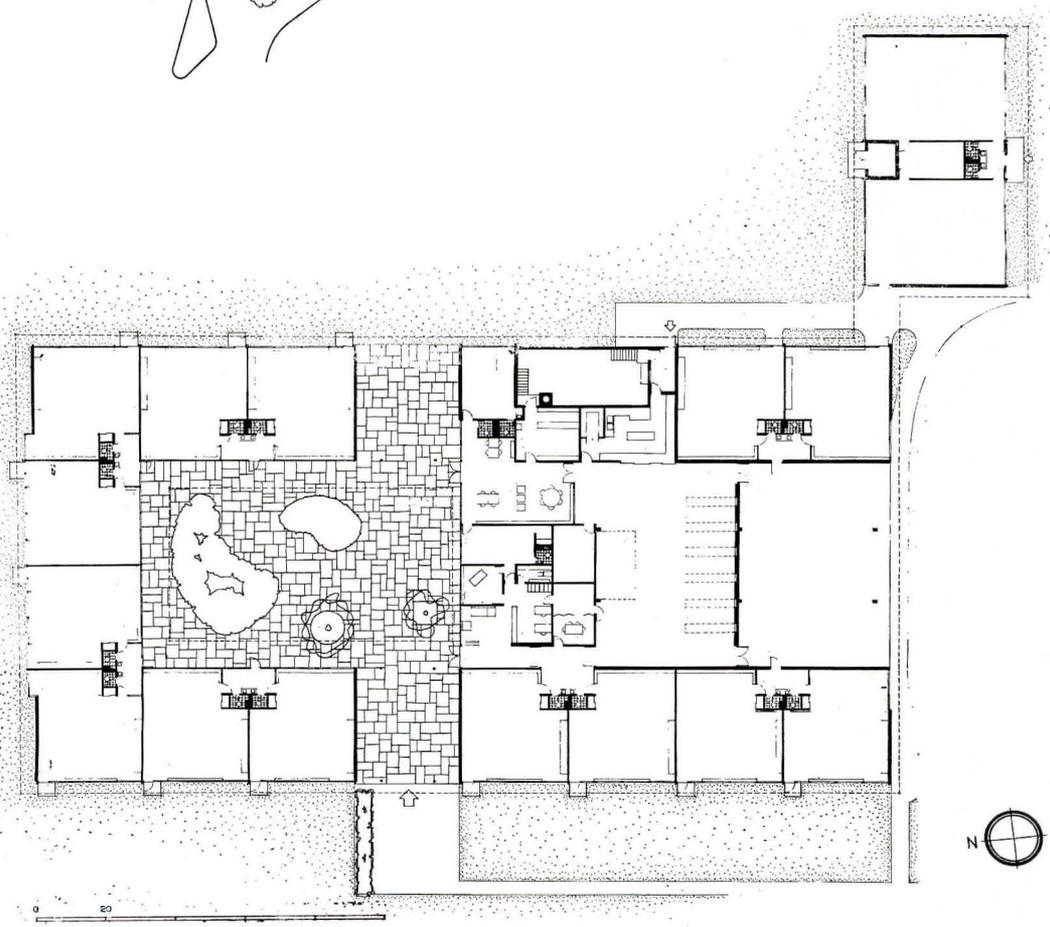
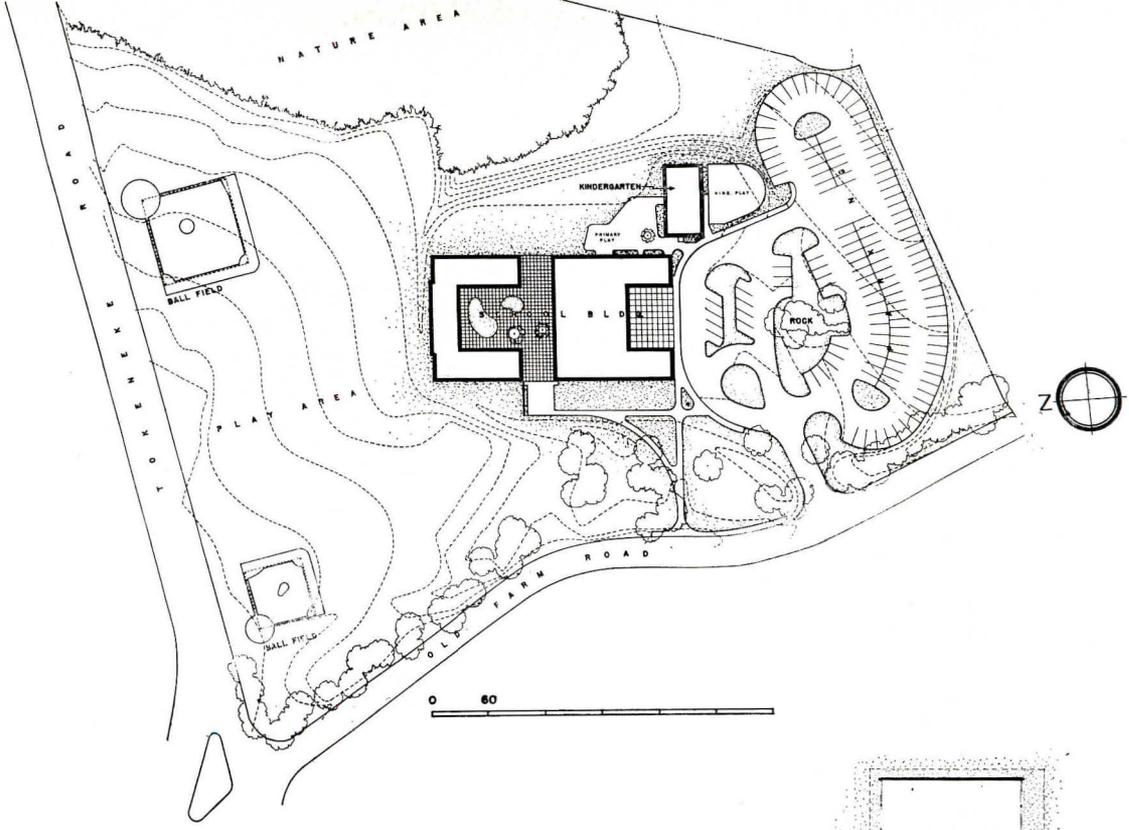
*Tokeneke Elementary School, Darien, Conn., O'Connor & Kilham, Architects.* Tokeneke affords a decided contrast to the Academy, that strong exponent of healthy tradition shown in the pages immediately preceding. Tokeneke is a public school, for elementary grades; it was completed in time for the opening of school last September. It has been adjudged an excellent example of contemporary architecture — it won an Award of Merit from the American Institute of Architects this year, and it has been selected for exhibition at the Art Festival in Boston. Tokeneke is compact, on a relatively small site; one story, with extensive areas of glass in its walls. Teaching methods are quite advanced; the furniture and equipment incorporate the latest appropriate features. Yet there are parallels: one feels upon entering the building that this is a friendly place where each small child receives personal attention. In part this feeling undoubtedly derives from its architectural qualities — the warm, pleasant materials and colors — and in part it obviously reflects the community's attitude as translated by the faculty and administration.

*Joseph W. Molitor*



CONNECTICUT PUBLIC SCHOOL





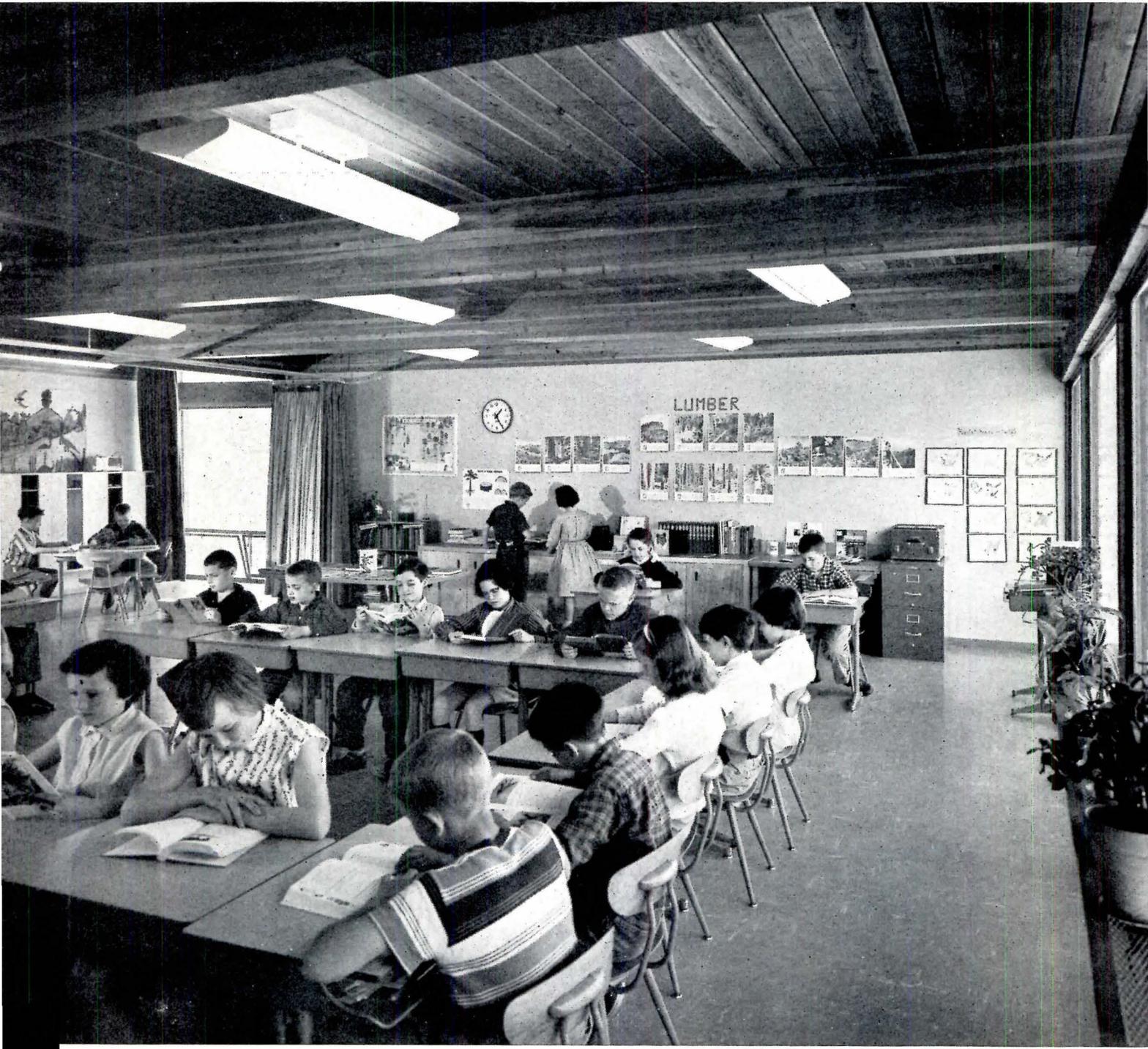
*Left, murals at students' entrance; right, multi-purpose room*

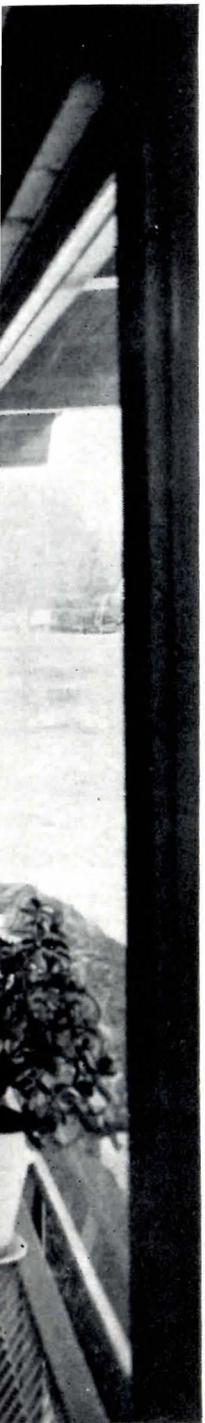
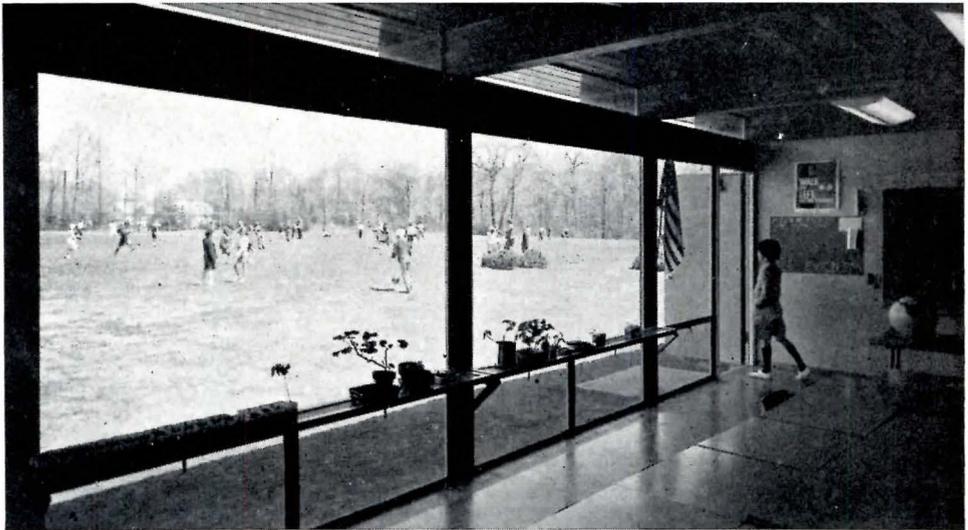
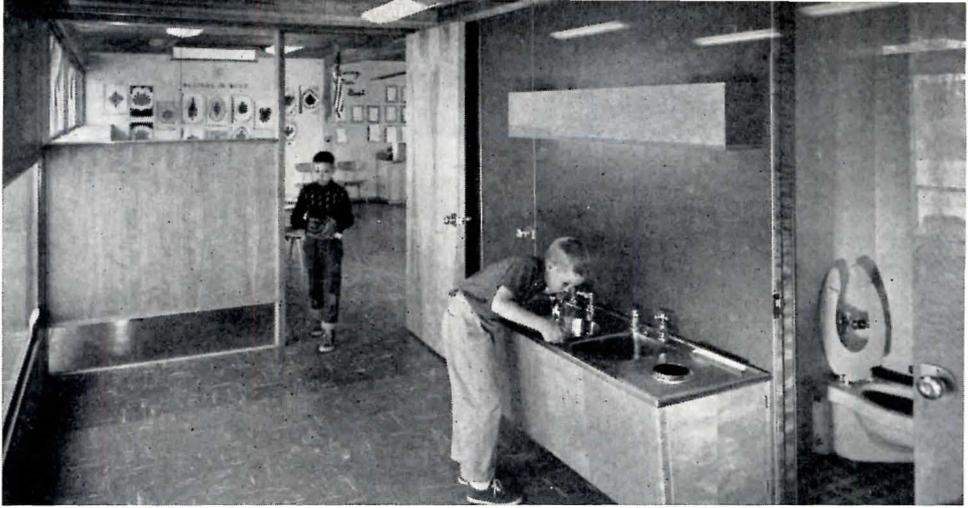


## CONNECTICUT PUBLIC SCHOOL

Like pupils at the Academy shown in preceding pages, Tokeneke's students must go outdoors to get from classroom to multi-purpose room, library or office; this, in spite of the cold New England winter, has proved quite satisfactory. At Tokeneke the corridorless grouping of classrooms around the court was adopted partly for economy's sake. The building cost \$14.40 per square foot, neither cheap nor extravagant for the quality desired and the date of construction; but there is less building to house the given capacity, so cost per child was low. The library is something of a monument to Yankee independence: though the state education office objected, the school library occupies a wide, well traveled corridor, thus economizing on construction and making the library a daily fact of each pupil's life.

Joseph W. Molitor



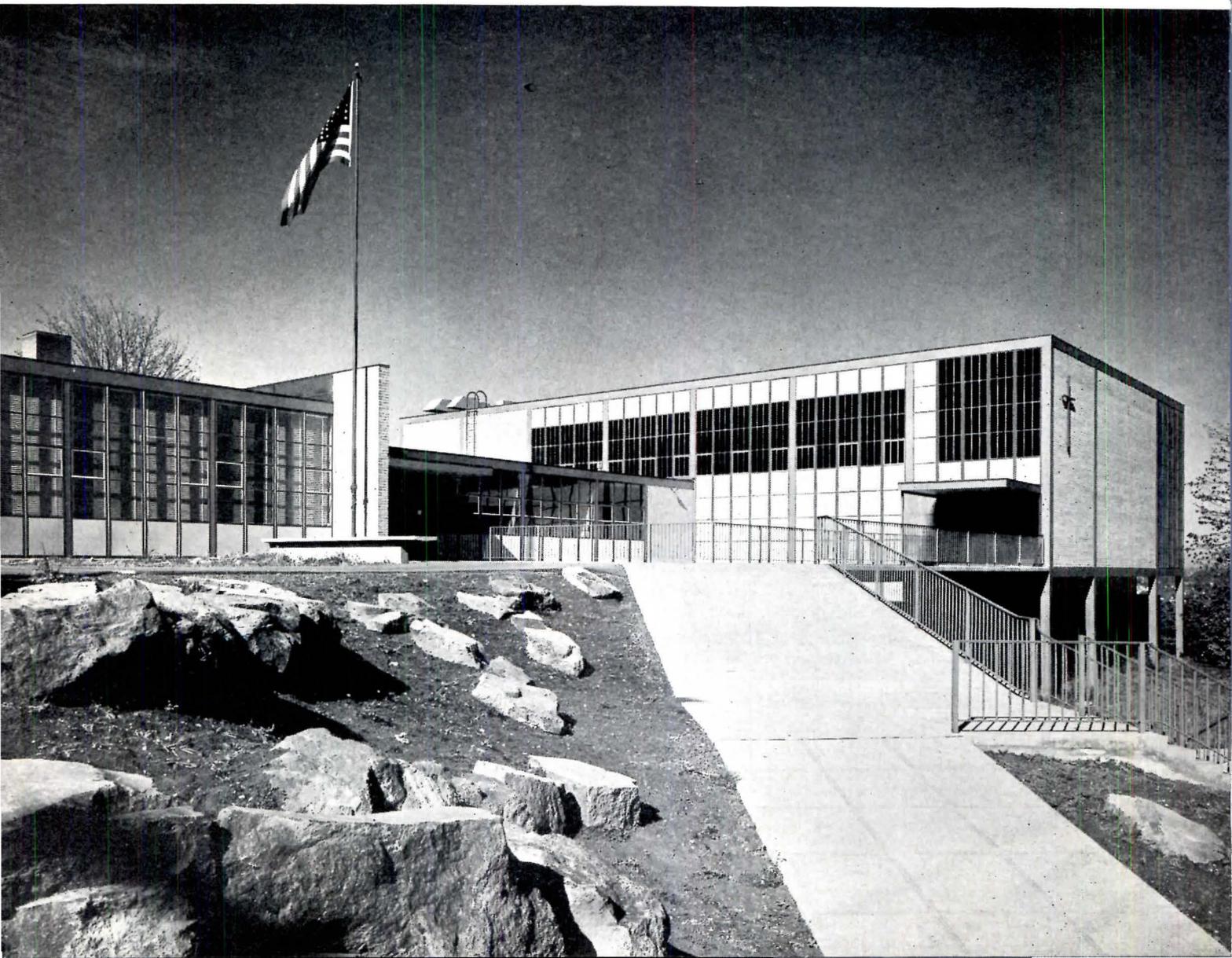


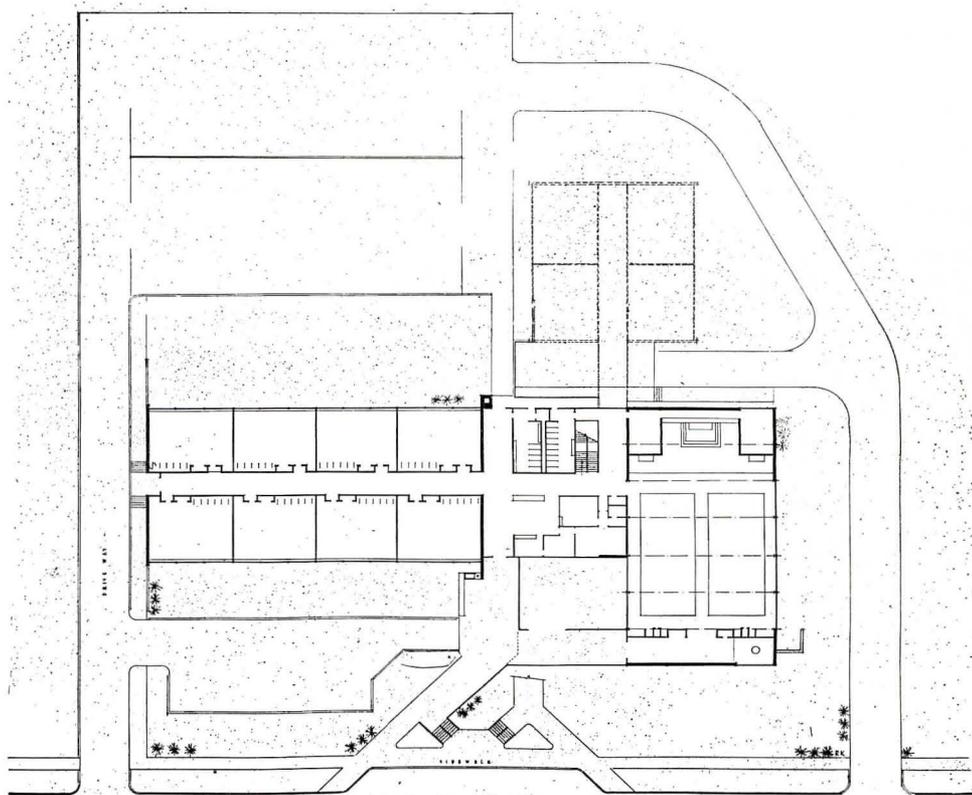
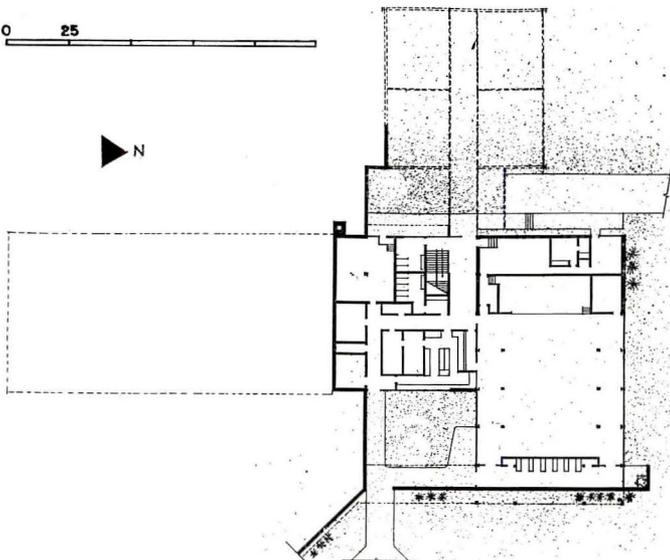
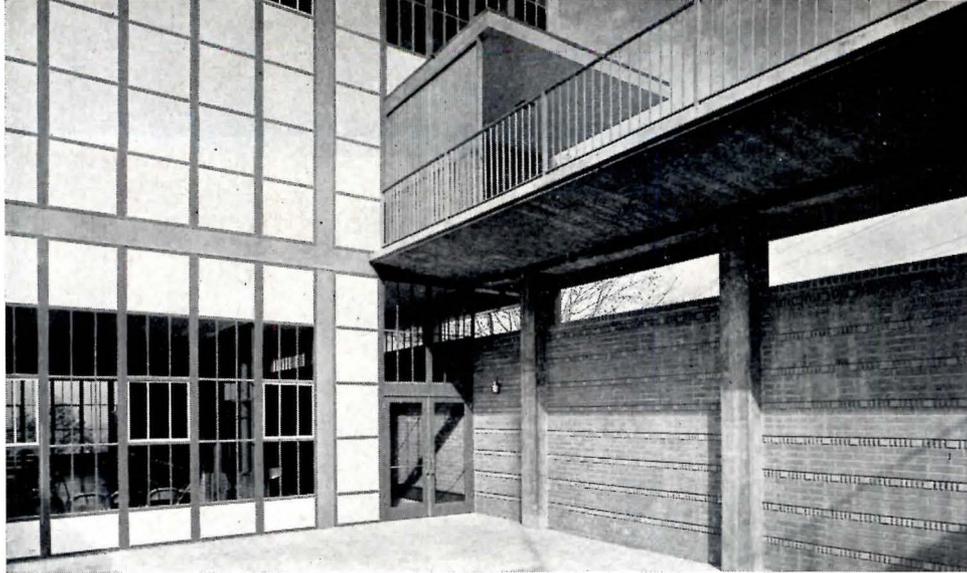
## PAROCHIAL SCHOOL IN SEATTLE

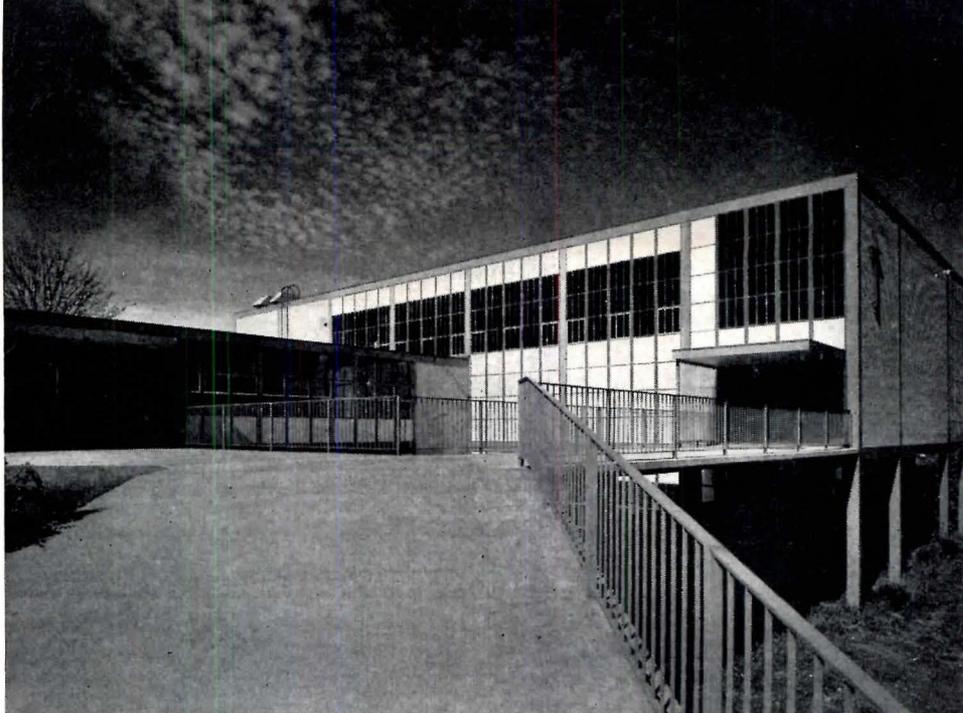
*Elementary School, St. Paul's Parish, Catholic Archdiocese of Seattle, Wash.; Roger Gotteland, Architect.* Serving as an assembly place and a temporary church as well as an elementary school, this parish institution was built in 1955 at a cost of \$11.80 per square foot. The sanctuary occupies what will later become the gymnasium when the permanent church is built. Construction is entirely masonry, with SCR brick used both in normal fashion and, sawed through one row of cores, with rough surfaces exposed to form patterns visible in the photograph across page.

Although the auditorium-gymnasium-church wing is two stories, each level is directly accessible from grade: the church by means of a bridge, the auditorium via an open court sheltered by a high retaining wall. In such fashion was the steeply sloping lot turned to economical advantage. The ease with which the plan can be converted completely to school use, and the simplicity of future expansion, are clear in the accompanying drawings.

Charles E. Pearson







## SEATTLE PAROCHIAL SCHOOL

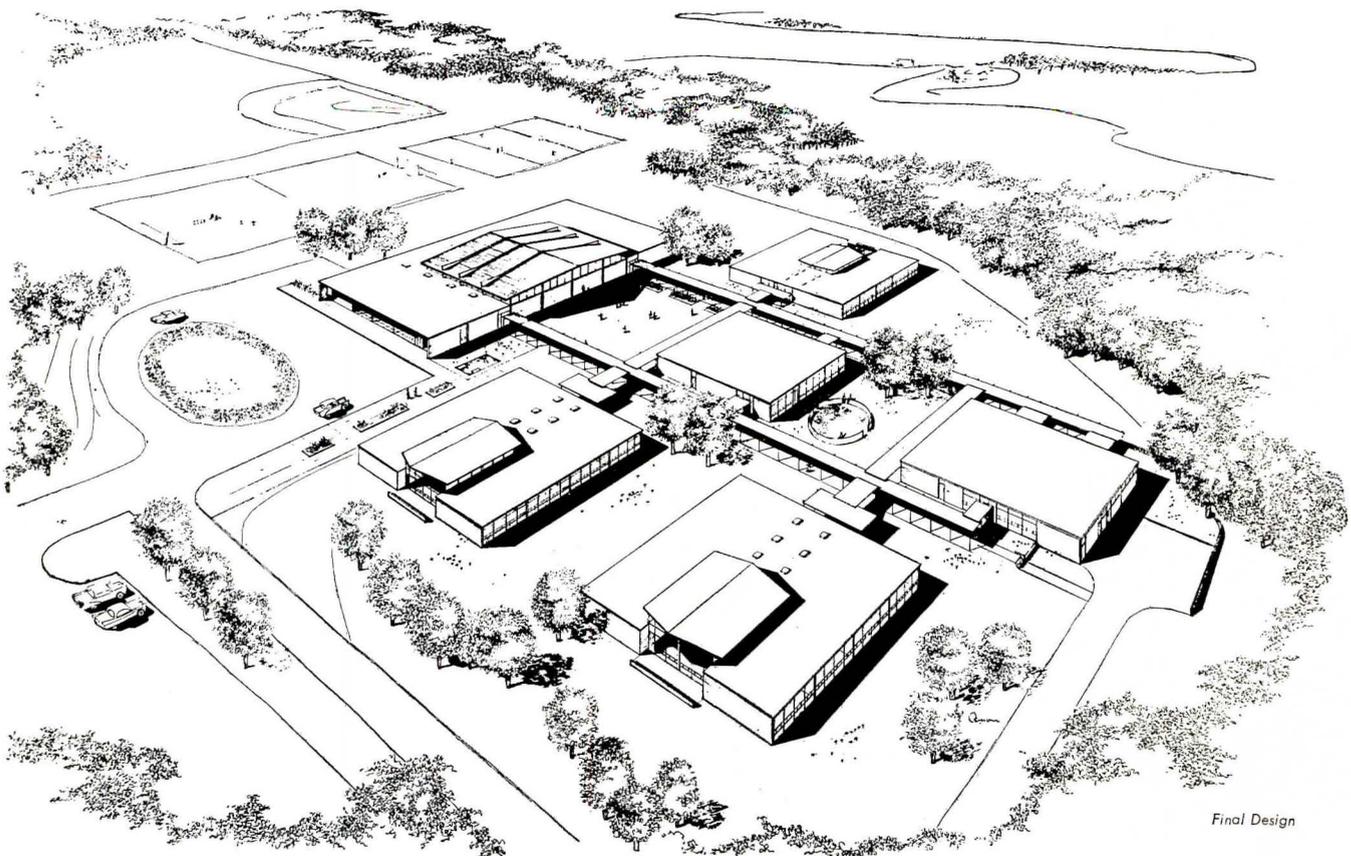
Conservative in method — witness the carefully aligned classroom desks — this school yet contains many of the practical devices and types of equipment developed for schools in recent years. The double-loaded classroom corridor is skylighted; clerestories provide bilateral light for the eight classrooms; tack space, cabinets and efficient wardrobe units are provided. A rear exit from the classroom wing gives access to large parking and play areas.

*Charles R. Pearson*

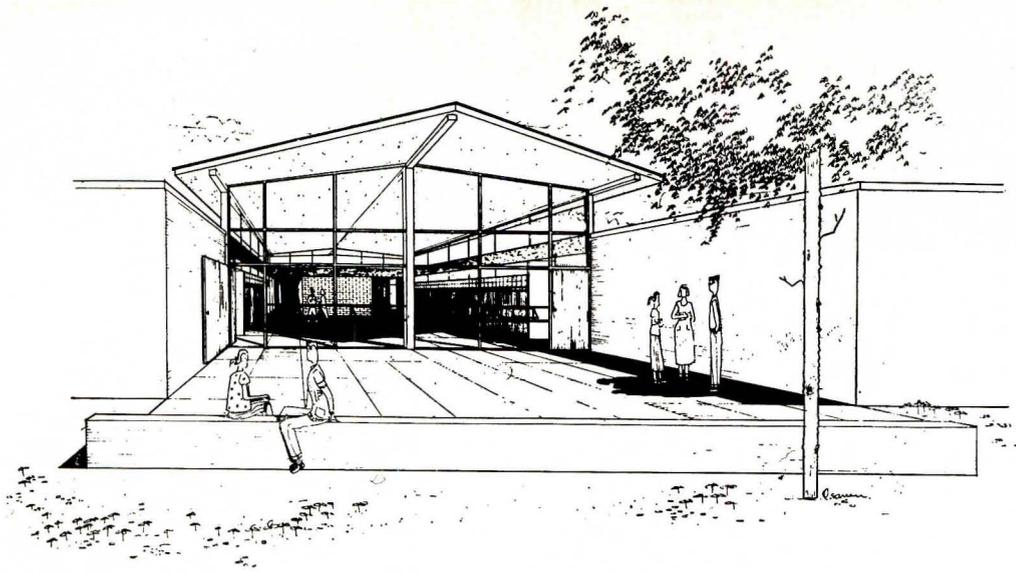


## FLEXIBLE DESIGN FOR NEW DISTRICT

*Parkway Junior High School, Creve Coeur, Mo. Hellmuth, Obata & Kassabaum, Architects; Engelhardt, Engelhardt, Leggett & Cornell, Educational Consultants.* This school, now under construction for the newly consolidated Parkway District, is the result of the concerted work of many people. The locale is the St. Louis suburbs, which have recently grown explosively. In 1953, three districts formed a Citizens' Study Group which, assisted by professional educational consultants, painstakingly studied the area's needs. One result was consolidation for, in part, the purpose of providing a sound basis for starting a secondary school system. Another was so thorough a public comprehension of their problems that an exceptionally close rapport still exists between lay citizens, educators and architects. Still another was a set of objectives so clear that a definite program could be developed and an archi-

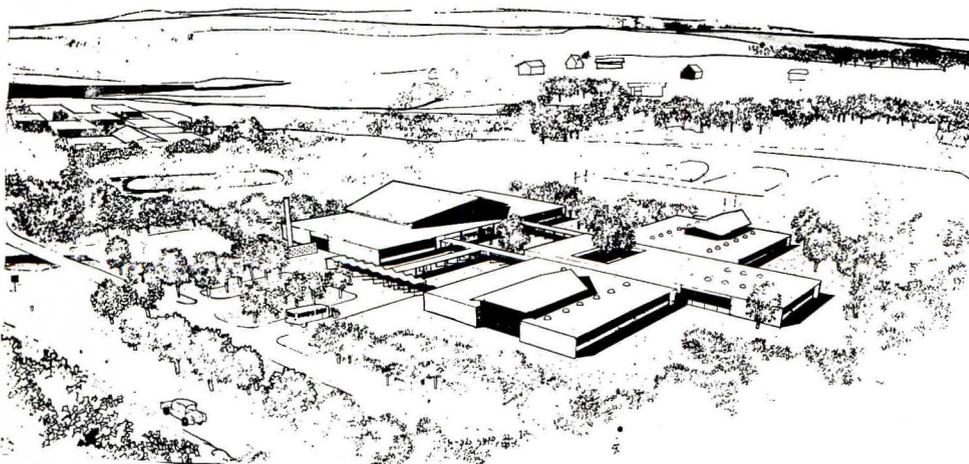


tectural competition held, open to all architects in metropolitan St. Louis. Buford L. Pickens, A.I.A., was professional adviser; William W. Caudill, F.A.I.A., Charles R. Colbert, A.I.A., and George D. Engelhardt of the Missouri Department of Education composed the jury. In accordance with the study group's findings, the site selected contained 102 acres, and the competition required its full development to include a senior and a junior high; first prize was the contract for the junior high which would for the present house grades 10-11-12 as well. Among the general considerations which characterized the program were a desire for great flexibility; determination to provide a school designed specifically for the transitional age of the junior high pupil; a wish to avoid rigid departmentalization; provision for non-academic subjects; appropriate emphasis on the social aspects of school life and on full community use.

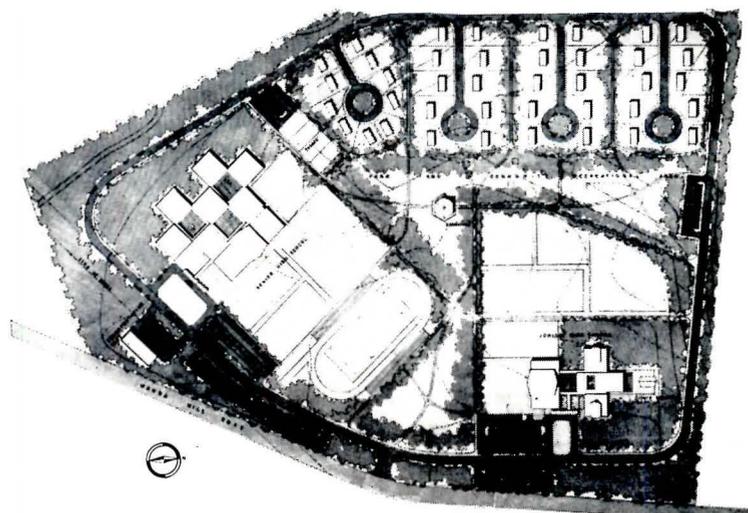
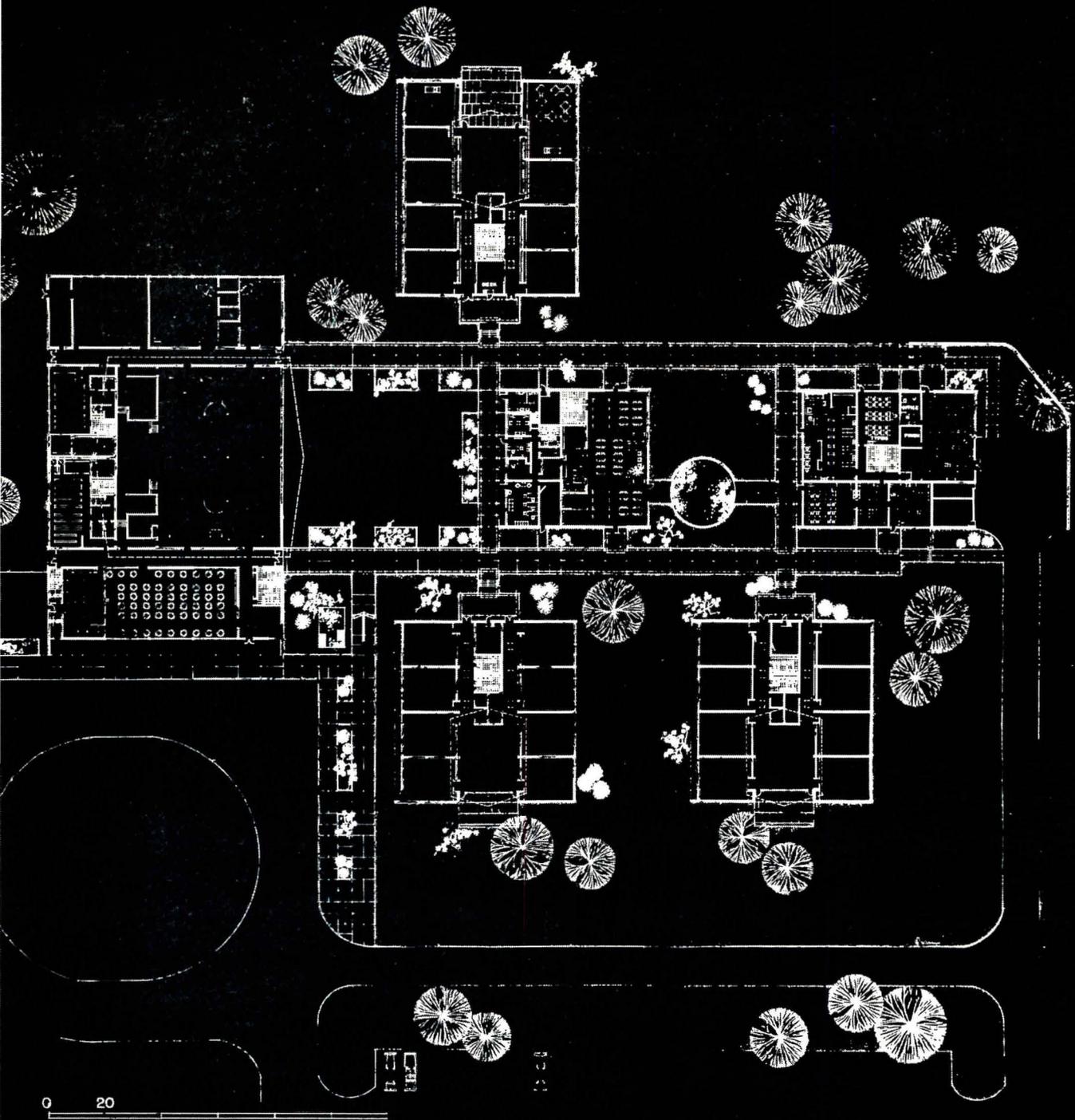


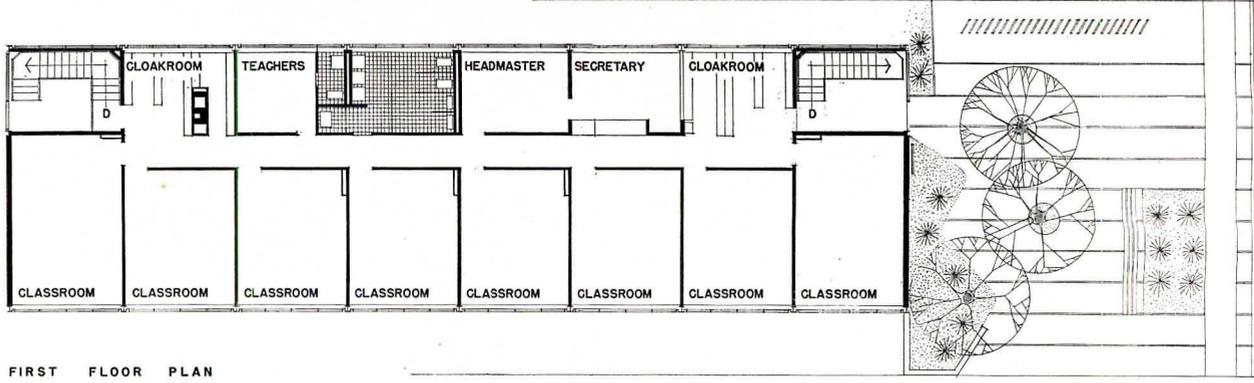
## MISSOURI JUNIOR HIGH SCHOOL

To Robert D. Snyder, Parkway Superintendent, is due much credit for this undertaking. He has stated that Parkway has all the customary financial problems of expanding school districts; that economy was a necessity but that the true economy of making certain the school would serve well for many years was elected rather than the cheapest possible enclosure of space. Simple construction and materials, ease of maintenance and durability, and flexible design were insisted upon. The design, modified as indicated below, includes three "schools within a school," each containing a large central space or general education laboratory. Two of these are for the present junior high, one for a senior high (which will eventually have its own plant); the three other units will house non-academic subjects; administration and library; and gymnasium, cafeteria and music rooms. With inclusion of senior high facilities, the cost has been increased from the \$600,000 envisioned at the time of the competition to \$986,000. The school will accommodate 600 pupils, 200 in each of the three "little schools." Construction is to be wall-bearing concrete block with steel framing for the raised roof and long-span areas. Exteriors will be brick, glass and sprayed concrete. Interiors will be painted block, with a plastic finish in kitchen, toilets and locker rooms. Each unit will have its own oil burner supplying forced warm air through under-floor ducts with peripheral ventilation and individual room controls. Lighting will be fluorescent.

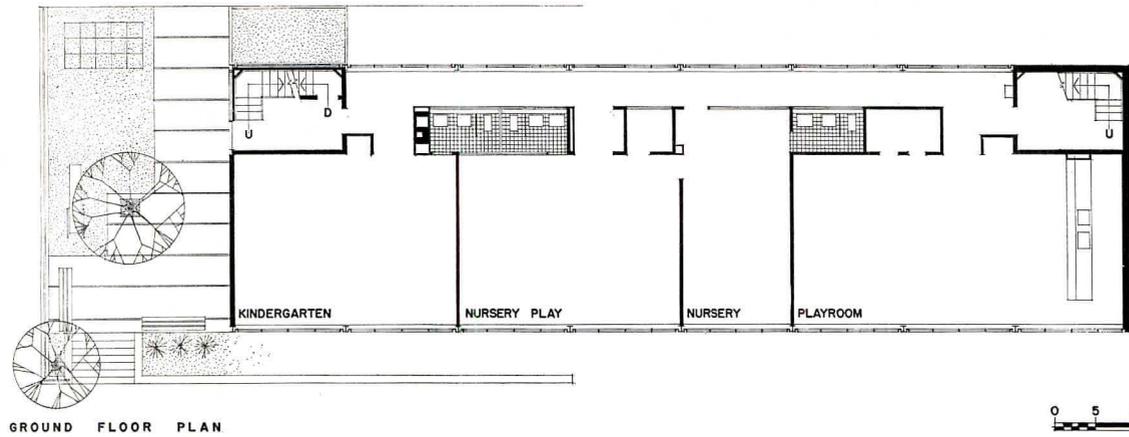


Competition design

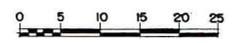




FIRST FLOOR PLAN

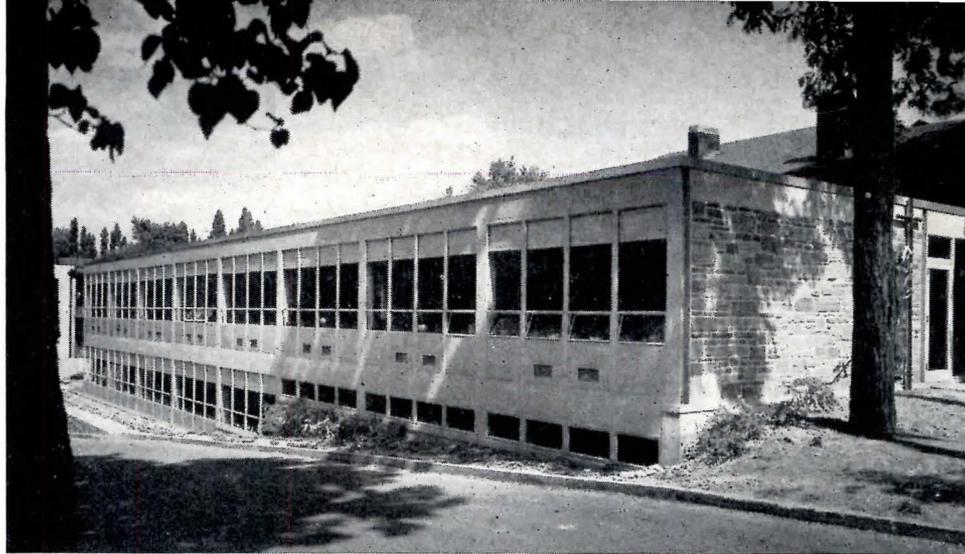


GROUND FLOOR PLAN



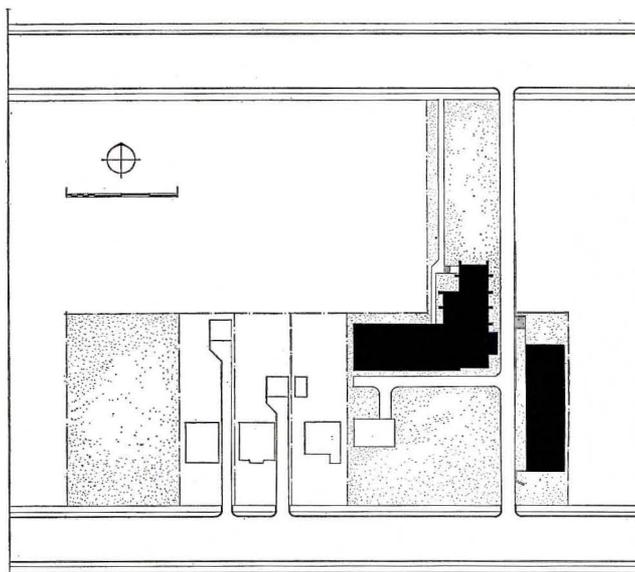
Joseph W. Molitor

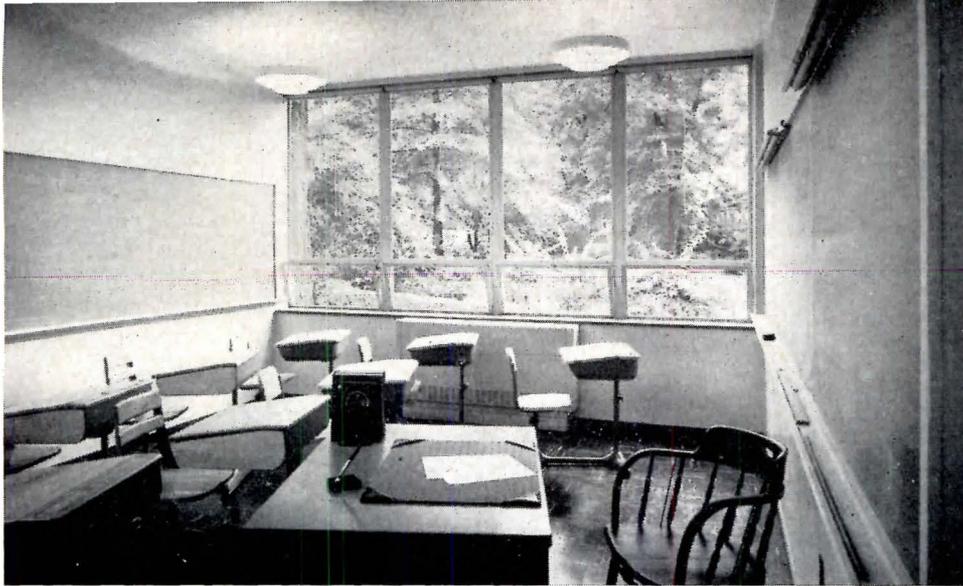




## NONSECTARIAN SCHOOL FOR BOYS

*St. Edmunds' School, Episcopal Diocese of Pittsburgh, Pa. John Pekruhn, Architect.* Formerly known as Ascension Academy, this young school was founded in 1947 by Bishop Campbell, then rector of the Church of the Ascension. So vigorous was the school that it soon outgrew its original location and spread into temporary quarters in the Redeemer parish house, with the nursery and kindergarten housed in the present Calvary Church rectory. This was in 1951. Then and in the next two years much happened. A new headmaster was named; a donor, Mrs. Edmund W. Mudge, gave the school land adjoining the Church of the Redeemer; the architect was commissioned and a building fund campaign was launched; the school was approved as an organization of the Diocese; and, following naturally from the fact that the board of trustees of this nonsectarian school is interdenominational, it was decided to adopt a name independent of any Pittsburgh church. St. Edmunds' was the name selected because it recalled the man in whose memory the land was given and because the young king of East Anglia, martyred because he would not compromise (portrayed in the contemporary sculpture by Eliza Miller), was considered an appropriate patron saint of boys.

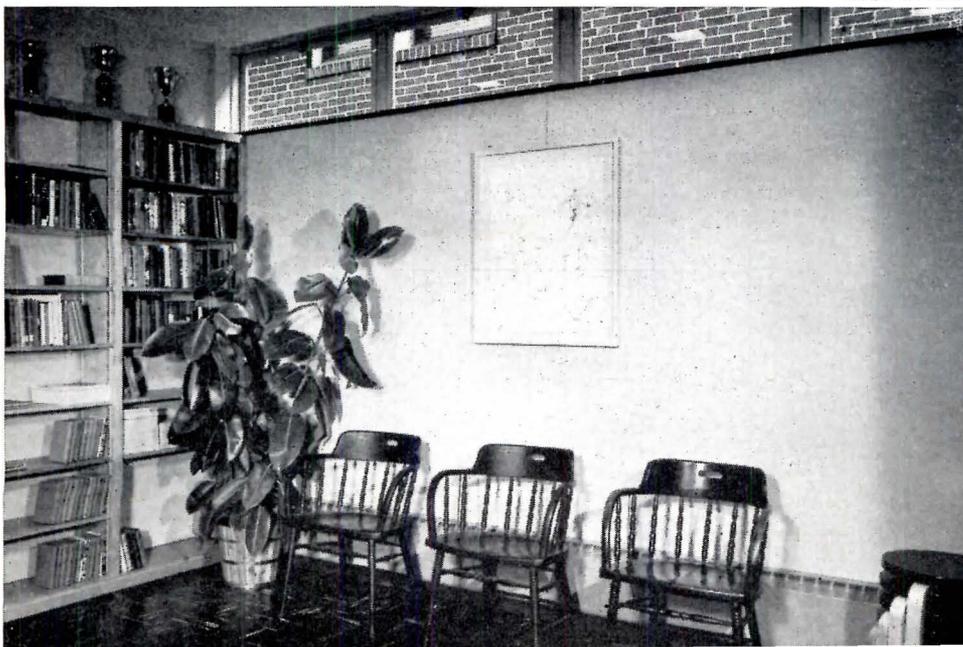


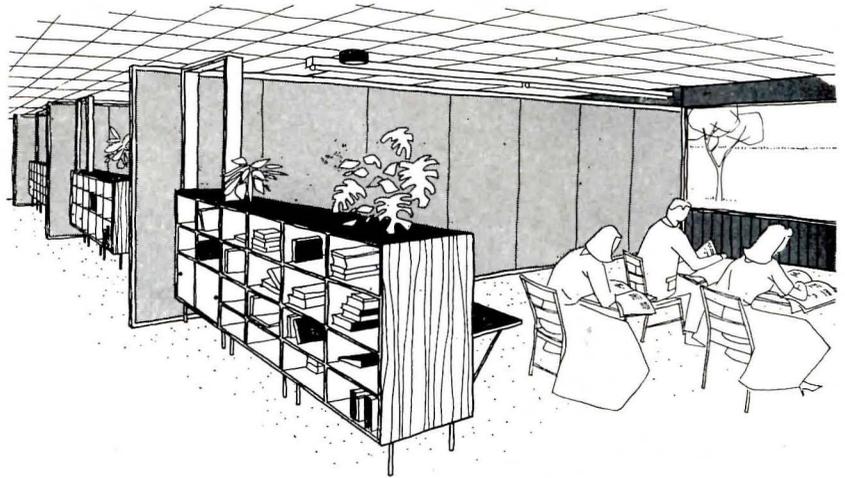
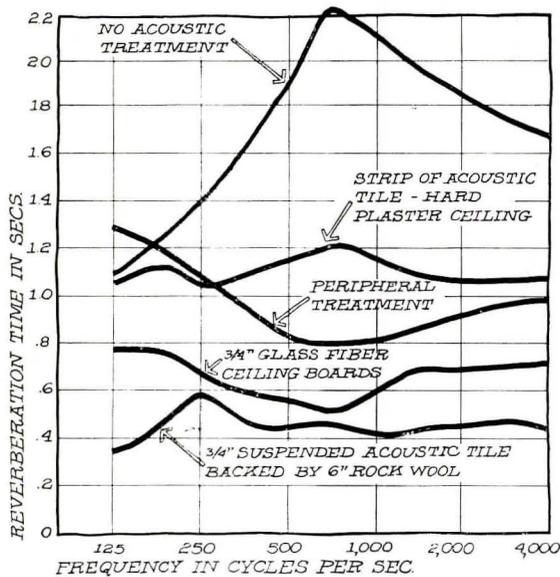


## **NONSECTARIAN BOYS' SCHOOL**

One of the virtues of schools of this type is, usually, the small size of classes and the consequent close relationship between teacher and students. Above, classroom and kindergarten room; below, library.

*Joseph W. Molitor*





## New School Designs Bring Along Noise Problems

By R. N. LANE, Boner & Lane, Consultants in Acoustics, Austin, Texas

This article in expanded form is appearing concurrently in *Noise Control*

*Noise problems in schools have been accentuated because of changing school design concepts. School construction is lighter (sound can penetrate walls more easily); there is considerable emphasis on "open planning" (eliminates barriers for stopping sound); natural ventilation has become more prevalent (makes way for cross transmission of sound and admission of outdoor noises); and the wide range of school activities brings up more special problems (audio-visual rooms, music practice rooms, etc.) Fortunately there are acoustical techniques available which can mitigate these problems while still preserving the intent of these new design features.*

THERE ARE CERTAIN STEPS to be taken with any school to minimize noise. The first of these is to select a site as remote as possible from noise sources. If this can't be done, at least classrooms and administrative areas can be buffered by other buildings such as shops which can be closer to the noise. The next step is to have interior spaces sufficiently quiet and to prevent excessive sound transmission between rooms. This is the primary concern of the following article.

### Open Classrooms

Consider the noise problems within

the classroom first. The noise to be controlled is generated in the classroom itself by the teachers and the students. The noise level inside the room is, of course, a function of the amount of acoustical absorption in the room and the amount and type of activity. The Acoustical Materials Association has sponsored a study by our firm of the various acoustical conditions prevailing in classrooms in several schools over the country and part of these data are shown in the chart above. Noise level within a room will vary directly with the reverberation time. Notice that there is a spread in reverberation time from about 0.4 second to about 1.2 seconds for all the acoustically treated rooms, and our tentative findings were that the teachers in these classrooms were satisfied with the interior acoustics of the rooms or at least had not complained that the rooms were too noisy or too live. These data are for standard size classrooms approximately 24 ft wide, 30 to 35 ft long, with a 9 ft ceiling.

Our preliminary recommendation is that the amount of absorption is not critical so long as the reverberation time for the empty room is below one second and preferably around 0.8 second throughout the frequency band.

From these acoustical studies in the schools, it was found that a much more serious consideration from a noise standpoint was the *lack of noise control between classrooms*. Many times the lack of noise control is caused by poor wall construction; however, as often it results from efforts to achieve the best natural ventilation possible (especially in the warmer climates) without sufficient money being budgeted for attendant sound control.

We found that classroom walls of most new construction does not come very close to the commonly recommended value of 35 to 40 db. To substantiate these observations, we decided to measure the noise reduction achieved in twenty schools and question the faculties as to the suitability of their classroom environments (study also sponsored by the Acoustical Materials Association).

One school in which conceivably there could be a noise problem due to the interior arrangement is shown in the sketch above. Notice that there are no side walls whatsoever; therefore, the only acoustic isolation between rooms is the heavily treated ceiling and the partial barrier partition between each classroom. The space divider which serves in

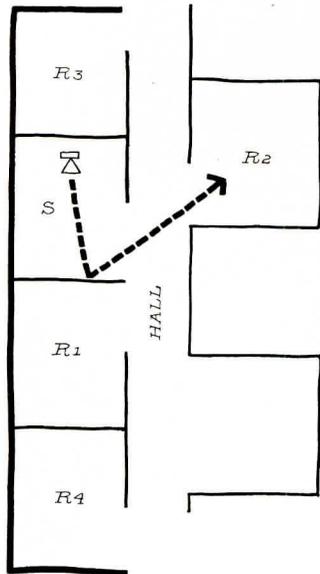


Figure 1

Open planning brings with it inherent noise problems, but some ways are better than others to minimize distraction. Figure 1: Sound from room "S" hits a partition and bounces across the hall into "R<sub>2</sub>"; average N.R. (noise reduction) is only 11.5 db between the two. The arrangement in Figure 2 gives 15 db between room "S" and "R<sub>1</sub>" which, while far from ideal, did not seem to cause annoyance

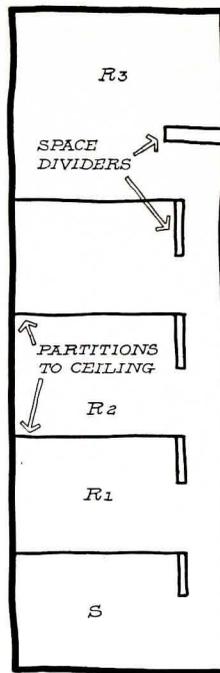


Figure 2

all its surfaces are glass, concrete or hard plaster.

Various architects have asked what might be done acoustically to preserve the feeling of openness and space and yet provide a measure of noise control. Figure 3 shows one possibility. In this scheme an attempt is made to obtain about 12 to 15 db reduction from classroom to corridor through the ventilating duct built into the divider. Also, the corridor ceiling is acoustically treated and will act as a sound-absorbing chamber rather than a sound propagation duct and thereby reduce the sound transmission down the hall to the adjacent classroom. The ceilings of the rooms are also fully treated with acoustic tile to reduce the noise level in each room, and the combination of these three treatments should, we believe, provide about 25 to 38 db noise reduction between classrooms. These measures do add to the expense of the building; therefore, it is doubtful that they will be installed until the teachers demand more acoustic privacy than is presently afforded them.

### Cross-Ventilation

Figure 4 illustrates the type of noise problem one encounters in the more customary double-loaded corridor schools where the ventilation is through the classroom wing from the window side, through the hall, into the opposite classrooms. For normal conditions, with the windows and transoms in the corridor wall open, only 14 decibels noise reduction is obtained between the source room and opposite room "R-2" which is across the hall. This noise reduction could have been greatly improved upon in this particular case if a very absorbent ceiling had been used in both classrooms and corridor instead of hard plaster. As a result of the hard plaster ceilings, the sound propagated very well along the ceiling, through the transoms and into the opposite room. When the windows and transoms are closed, which could be only a few days a year for this Texas school, a respectable average noise reduction of 31 to 32 db is achieved between the various classrooms.

Figure 5 shows another double-loaded corridor classroom wing in which the ceiling of both rooms and corridor was heavily treated with acoustic tile. The noise reduction in rooms across the hall from each other and with the corridor transoms open is up to a reasonably good 26 db average. Rooms adjacent to each other have gone up to 19 db aver-

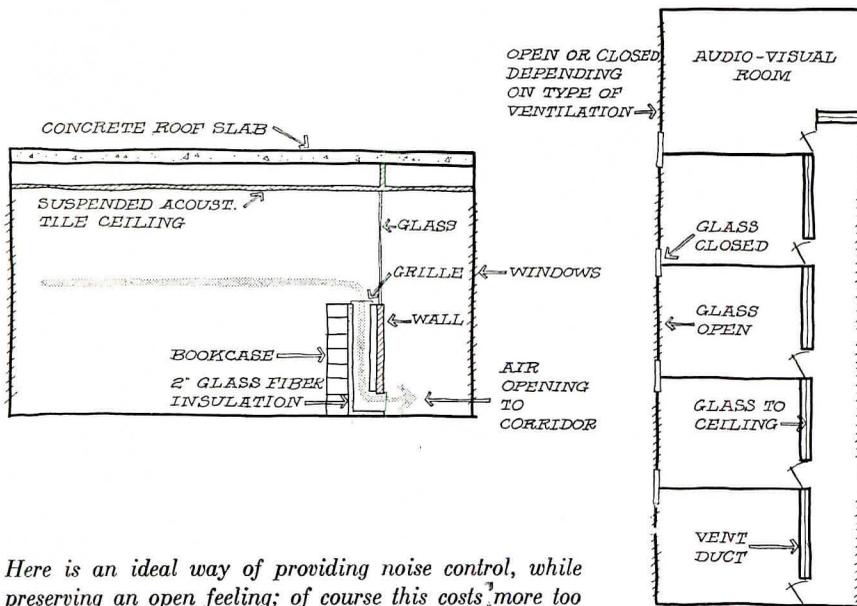


Figure 3

Here is an ideal way of providing noise control, while preserving an open feeling; of course this costs more too

place of the corridor wall extends only halfway to the ceiling and only a few feet from the dividing wall. Only 15 db noise reduction is obtained between adjacent rooms.

Actually, this school seems to be designed as well as could be expected from an acoustical standpoint if an open plan is wanted. (See Figure 2.) We made measurements in one other open plan school in which the noise reduction between classrooms was much less. The reason for the lesser noise reduction

between rooms in the second school (Figure 1) is twofold; first, the latter school is not heavily treated with acoustical material and sound propagates down the hall more readily; and second, the sound is actually reflected directly into classrooms across the hall from each other. For example, sound emanating in the source rooms are reflected from the partition between the source room and the room labeled "R-1" and propagate directly into "R-2" which is across the hall. Also, the hall is wide and

age and would have been even better had it not been for the fact that the common wall between the two adjacent classrooms did not go to the floor slab or roof—they simply went up to a suspended acoustic tile ceiling and therefore there was considerable sound transmission over the wall to the adjacent room.

The solution to the noise transmission problem between adjacent rooms is well known and it is to continue the 30 to 35 db common walls all the way to the ceiling. The problem of noise transmission from the classroom to the hall has not generally been recognized, or if it has, it has been ignored. One suggestion for a partial solution to the problem is shown in Figure 6. The main objection to the sound absorbing baffles placed over each opening above and below the hall lockers is their cost, and this suggestion may meet with some resistance on this count.

In our field studies noise reduction measurements were also taken where efforts were made to provide ventilation with some measure of noise control. Figure 7 shows classrooms which had a ventilating duct separating them. In this case jalousie windows are open to the prevailing wind on one side, the air passes through the ventilating duct into the classroom, and then outside through another set of jalousie windows. The measurements showed that 23 db isolation was obtained between the rooms back to back separated by the duct, but only 19 db was obtained for rooms adjacent on the same side of the duct with their windows open. With the big jalousie windows closed, this attenuation was increased to 25 db. This entire arrangement could have been improved considerably if separators had been put in the ventilating ducts so that the adjacent rooms, S and R<sub>2</sub>, were not interconnected to each other and if the duct between S and R<sub>1</sub> had been lined with a sufficient thickness of material. In this particular case the duct lining consisted of 3/4-inch thick glass fiber duct liner with the tarred side exposed instead of the soft side, and so was not very effective. However, it should be noted again that with the 23 db noise reduction between the rooms, there have been no teacher complaints whatsoever even though the teachers' desks were located back to back.

In Figures 10 and 11, two other types of ducts are shown; the duct in Figure 10 is a ventilating duct above a corridor on a double-loaded corridor wing and again the lining of this duct was com-

pletely inadequate and consisted of 1/2-in. perforated acoustic tile. The average attenuation between these two rooms shown in Figure 9 was 23 db. However, for teachers standing directly under the duct and facing each other the attenuation was down possibly to 18 db at the mouth of the duct and considerable complaint has been registered. When a new wing of the school building was to be built, the architect asked for improvements in the original system. The duct in Figure 11 was designed and installed between classrooms which were back to back without a corridor in between.

In the new classroom wing the average attenuation between classrooms was 26 db, and this improvement was such that the faculty considered the noise reduction completely satisfactory. Why should 3 db difference in the average attenuation cause such a different teacher reaction? In this case it is thought that the difference is the result of the greater attenuation of sound at the higher frequencies (from 600 cps up

which if too prominent make speech much less intelligible.

Throughout our measurements it was found that there were very few faculty complaints if the noise reduction between classrooms amounted to 26 db or more.

Summing up, we would recommend that no classrooms have less than 25 to 30 db noise reduction between them if at all possible. If there is to be a common ventilating duct, then there is no necessity for building a wall which has a transmission loss of more than 20 to 25 db. Of course, in corridorless schools the noise reduction is even less, and simple, single-thickness plywood partitions or glass will suffice.

### Problems With Other Rooms

Another room which has come into general use in modern schools is the "cafetorium." Experience has shown that the design of these particular rooms is usually based more upon cafeteria requirements than upon auditorium requirements. The rooms, therefore, should

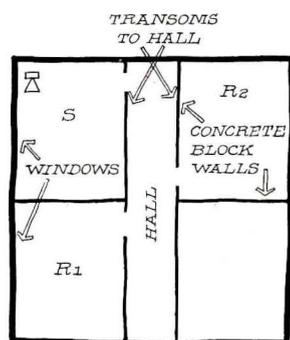


Figure 4

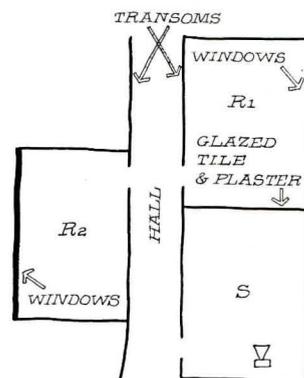


Figure 5

Openings for natural ventilation, without provision for acoustical control can cause poor noise reduction. In Figure 4, where all room surfaces are hard, the N.R. between rooms "S" and "R<sub>2</sub>" is 14 db with windows and transoms open. Figure 5 is much better with an average of 19 db between "S" and "R<sub>1</sub>"; it also has a glass fiber ceiling. Figure 6 shows recommendation for cross ventilation

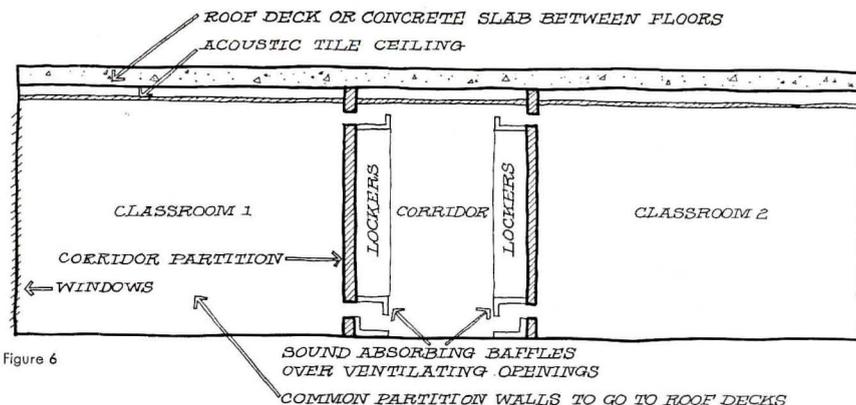


Figure 6

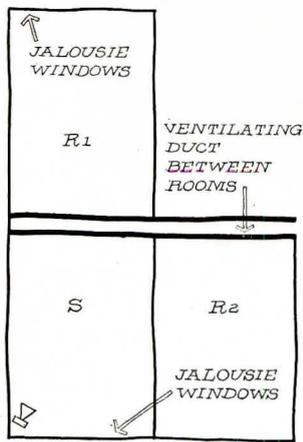


Figure 7

When classrooms are back to back, common ventilation ducts are often used. The situation in Figures 7 and 8 will suffice if the duct is lined sufficiently with insulation. The situation in Figure 10 was inadequate when lined only with acoustical tile (jagged line is grille). Improvement is shown in Figure 11

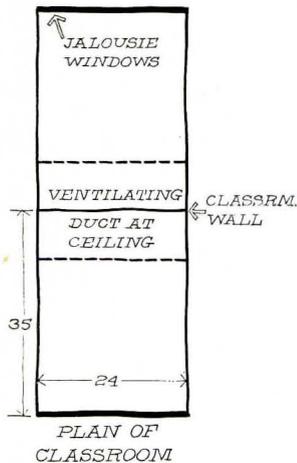


Figure 9

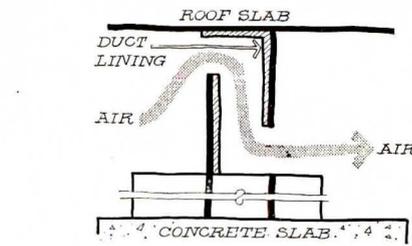


Figure 8

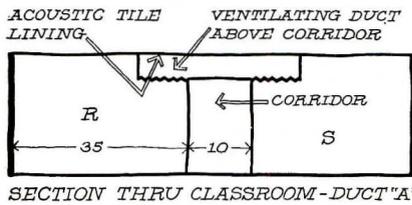


Figure 10

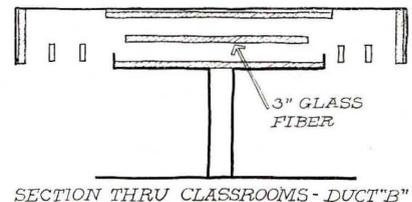


Figure 11

be treated primarily as a problem in noise control. It is recommended that as much absorptive material be used in a cafetorium as possible so that the clatter of the dishes will be somewhat reduced and the conversation will not get acoustically overpowering. Since cafeteriums invariably have low ceilings and improper layout for a good auditorium, it is impossible to treat the room for a good hearing. A sound amplifier is recommended for speech distribution.

The next room in which noise can be quite a problem is the gymnasium. It can be effectively treated at minimum cost first of all by using an exposed, acoustically absorbent roof decking, thereby providing an entire ceiling with a noise coefficient of 0.8 or more. This type of roof combined with concrete block walls having the rough face exposed will give an acoustically satisfactory and economical gymnasium.

The music department also comes in for its share of problems. If the band room cannot be in a separate structure, then special attention to sound reduction of walls is required. If the choral room and the rest of the music department are located in the same wing, it will be necessary to provide good isolation between these two rooms; as a matter of fact, a minimum of 55 db noise reduction should be provided for any room adjacent to the band room, with possibly the exception of a machine shop or manual arts room. Several satisfactory wall constructions for 55 db are shown in Figure 12 and may be used interchangeably, depending on cost. If the choral room is located next to the band room, as in many music departments, it would be even better to provide 60 to 65 db attenuation and this may be accomplished rather economically by putting a row of practice rooms or storage rooms between the band room and the choral room. The interior acoustics of the choral room are quite critical and the wall finishes should be selected to provide a uniform response with frequency in this room and have a reverberation time of about 0.7 to 0.9 second. We can state this with reasonable assurance as most schools allocate about the same size rooms for choral rooms. The interior acoustics of the band room, however, are not critical except that, in our opinion, the room should be as dead as possible. The control of low frequencies are particularly important. We have found that if a considerable amount of exposed porous concrete block masonry can be used, it will effectively absorb the low frequencies.

## WALL STRUCTURES FOR MUSIC TEACHING STUDIOS

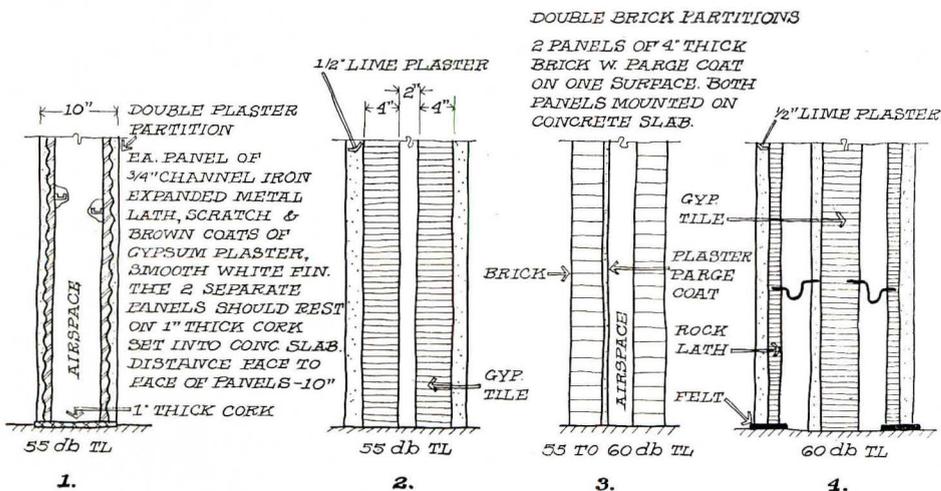


Figure 12



## PRECAST SHELLS STACKED TO CUT COSTS

ALTHOUGH THEY MAY AT FIRST GLANCE look like oversized slabs of strudel, the striated mounds pictured above are the product of a Latin-American recipe for low cost thin shell construction. Working with barrel roof shells supported on precast walls and columns, Colombian architect Alvaro Ortega, currently teaching at Harvard's Graduate School of Design, has developed a method of casting curved concrete sections on the ground in stacks of as many as forty — one atop the other — so that all the shells required for a structure can in most cases be cast from a single form. Columns and walls are also cast on the ground, with the wall sections stacked in the same way as the shells.

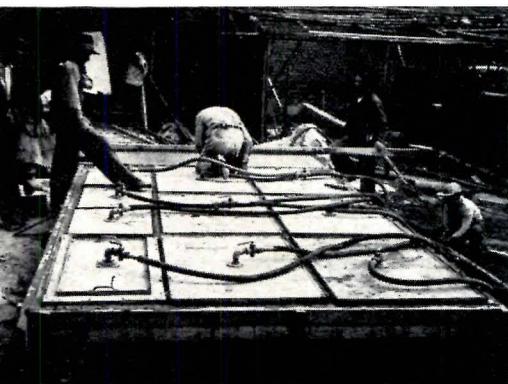
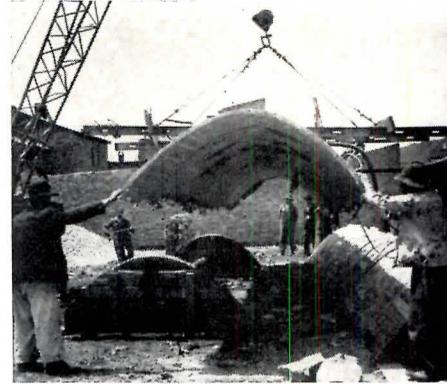
Ortega, who has tested his system on projects ranging from a 600 unit housing development to a chicle processing factory, believes that this reduction in formwork may cut total construction costs by as much as 35 or 40 per cent. Additional savings result from the speed with which such a building may be erected. As Ortega points out, work proceeds on the roof and foundations simultaneously — and once the supports are in position, the shells can be placed very rapidly.

Perhaps as essential to this type of construction as

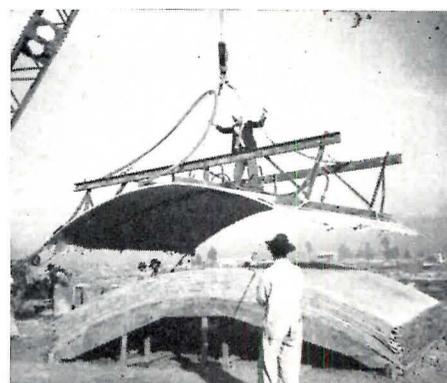
the concrete mixer is the vacuum equipment that is used not only in lifting the precast elements, but in forming them as well. As each shell or wall section is poured, it is covered with pads connected by hoses to a vacuum pump which draws out the uncombined water in the concrete. Within half an hour, the newly-poured surface, though still moist, is strong enough to support the wet concrete of the next shell. To prevent bonding between the stacked layers and to give a smooth undersurface, each shell or wall is coated with paper or lime paint before the next element is poured. Using this vacuum drying system, it is possible to cast eight layers per day in each stack. And, because each layer is sealed top and bottom, the stack becomes a ready-made curing room in which moisture and temperature are kept uniform until the concrete reaches full strength.

The shells are usually poured over a curved wooden form in thicknesses of  $1\frac{1}{2}$  to 2 in., and reinforced by a mesh of  $\frac{1}{4}$  in. bars on 8 in. centers, with additional diagonal reinforcing following the lines of principal stress. The thickness of wall sections varies from 3 in. for houses to  $3\frac{1}{2}$  in. for factories or warehouses. Both

Roof shells and wall sections are cast in layers on the ground, each acting as a form for the one above. Because formwork is kept to a minimum, construction costs may be reduced by as much as 40 per cent.



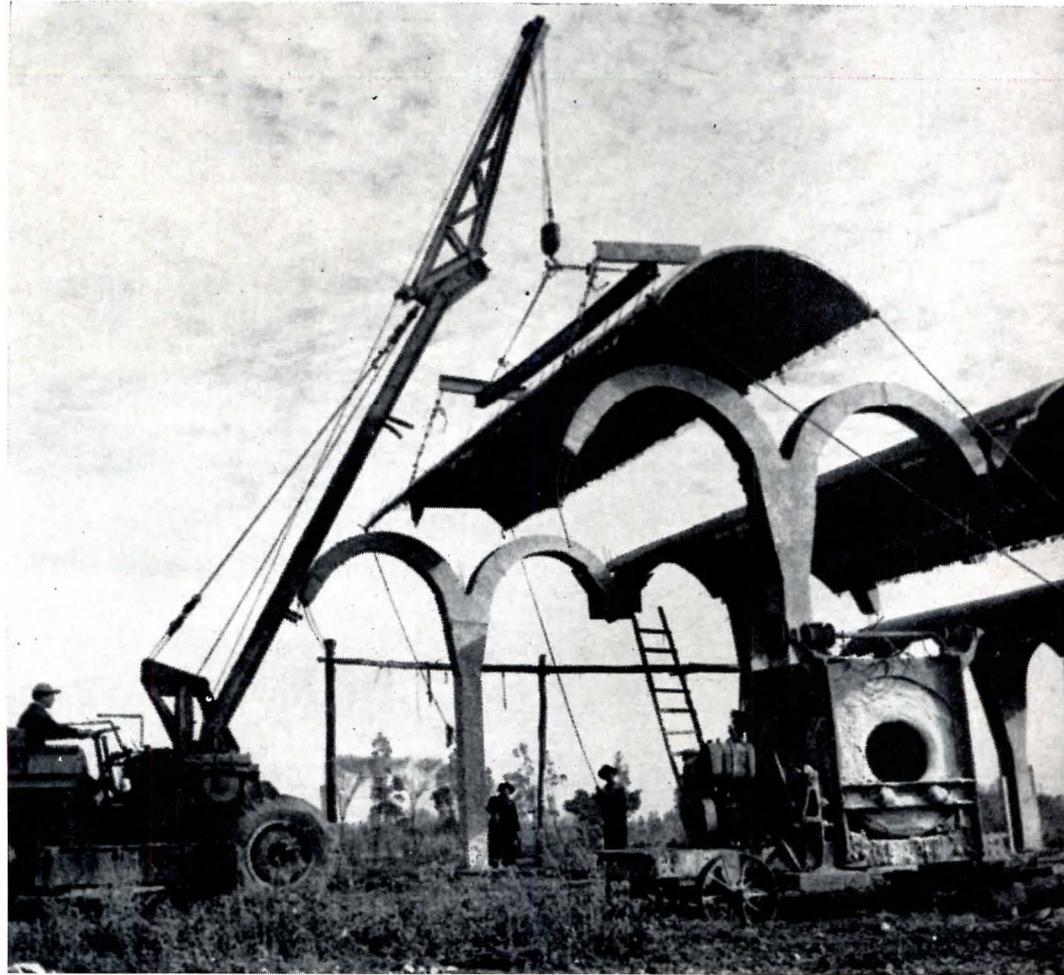
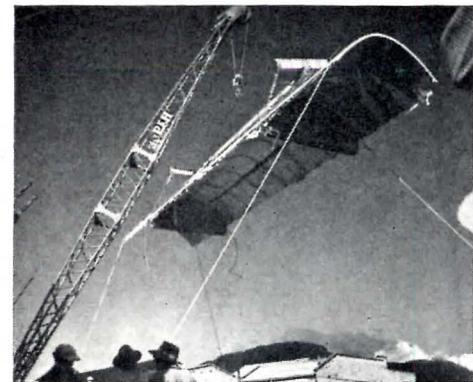
Vacuum equipment "pre-dries" each layer of concrete before the next is poured (photo far left). Later the same equipment is attached to a crane and used to hoist the pre-cast elements into place.



are reinforced with  $\frac{1}{4}$  in. bars spaced 14 in. on center. The wall sections are formed around the necessary openings for doors and windows; and, on at least one of the factory projects, Ortega provided built-in skylights by casting small sections of glass directly into the barrel vaulted shell roof.

When the precast elements are ready to be lifted into

position, the vacuum equipment goes into action again. A vacuum lifter with suction pads similar to those used in "pre-curing" the concrete is placed over the section to be lifted, and connected by a system of ropes and pulleys to the crane which finally strips the shell or wall from its stack and hoists it into position. Although the lifter is capable of handling sections of almost any



*The thin concrete shells for this 600 unit housing project in Bogota, Colombia, were cast at the rate of eight per stack per day. Using the vacuum lifting process, 20 or 25 shells were placed daily.*

size, the maximum dimensions practical for the shells and walls are determined to some extent by the capacity of the crane. For the projects shown here, an 8-ton crane was used, limiting the shells for the factory roofs to a length of about 40 ft and widths of 9 to 12 ft. Wall sections for the houses are 22 ft long by 9 ft high; those for the factories are 20 ft high and 11 ft wide.

The upper sections of both walls and columns are cast to conform with the curvature of the shells they support. Because the shells can then act as simply supported beams rather than as arches, tie rods are unnecessary, and placing is easier and faster. Two types of supporting capitals are used with the columns, depending on the desired spacing between bays. When



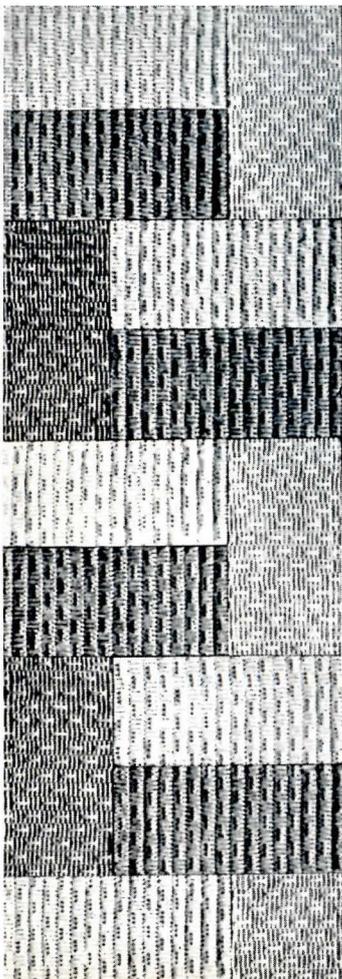
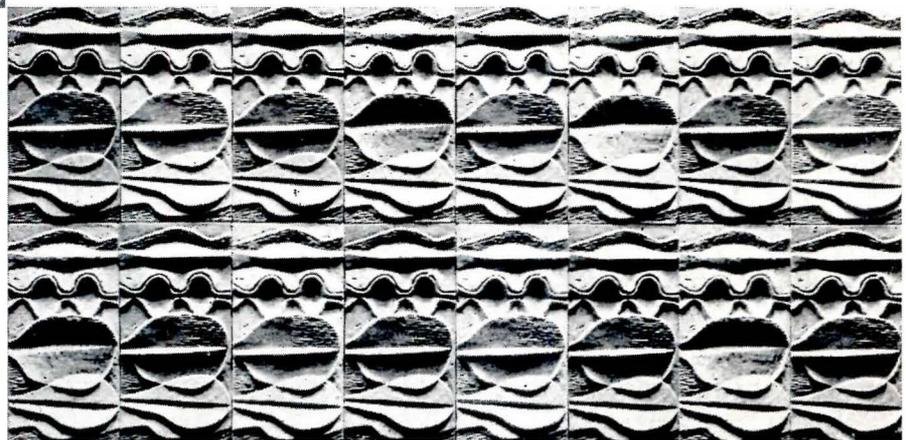
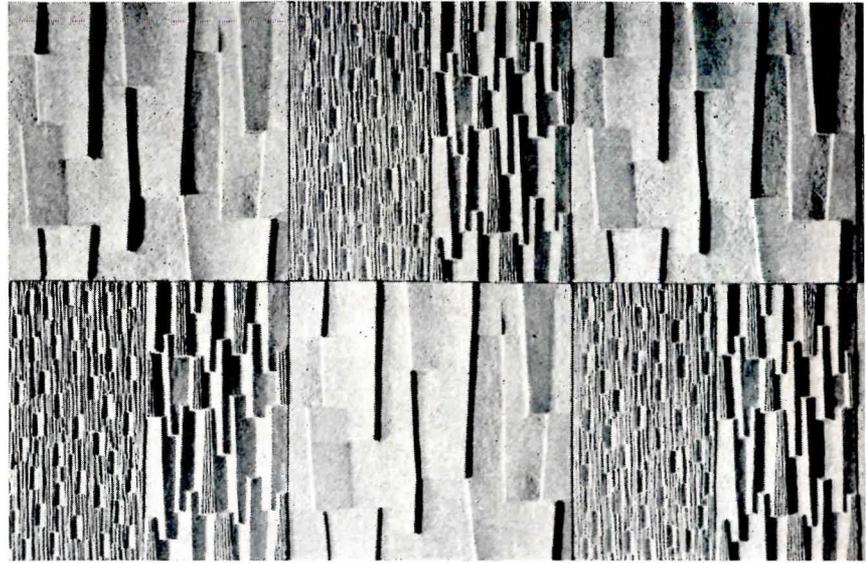
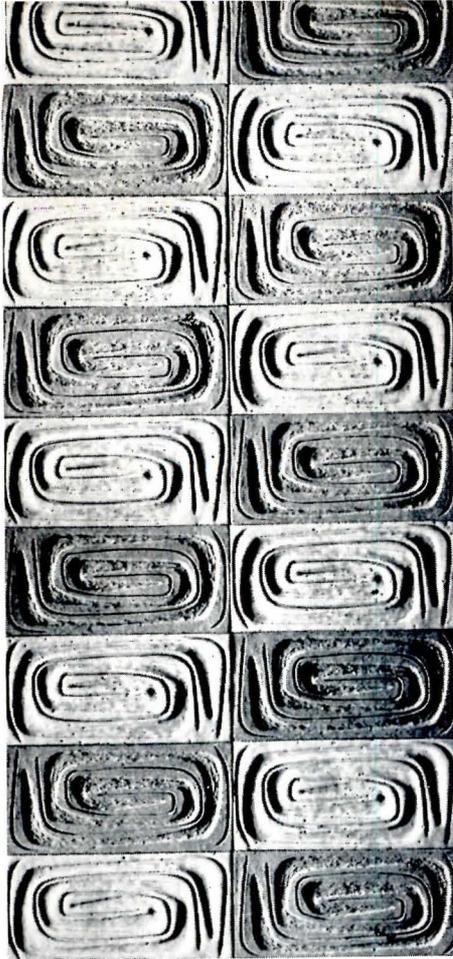
*Openings for doors and windows — and even glazed skylights as in the shell at right — are formed into the elements as they are cast. To eliminate tie rods and speed erection, column capitals and upper wall sections follow the curvature of the shells they support.*



bay spacing need not exceed the combined width of two barrel shells, the columns are formed with radiating arches which support a shell on each side of the column; if more than two shells are needed to roof a bay, adjacent columns are spanned by a beam which is “scalloped” with arch sections that support as many shells as are required.

In forming the elements, allowance is made for a one or two inch cast-in-place joint and the reinforcing is placed so as to extend several inches beyond the edge of the concrete. When all the sections are in place, they are connected by simply overlapping the reinforcing (or welding it) and filling the joint with concrete.

*(More Roundup on page 234)*



### CERAMIC FACINGS ADD COLOR, TEXTURE TO WALLS

DESIGN-TECHNICS ARE CERAMIC TILES — but with a difference. They are also raw materials from which the architect can fashion an almost limitless variety of sculptured ceramic wall surfaces. Colors range from the subtle earth tones of unglazed natural clays in buff, tan, taupe gray, black or terra cotta to the brilliance of more than thirty matte or glossy glazes, while the patterns run a gamut from bold relief sculpture to quiet texture. The flexibility of the material stems not only from this wide range of “standard” designs and colors, but also from the myriad possibilities for combining them into integrated three-dimensional wall treatments. And to aid

the architect in visualizing a completed wall surface, Design-Technics presents for his approval a “blueprint” pasted up from photostats of the component patterns, scaled at 1½ inches to the foot and tinted with a water color wash.

Waterproof and weather resistant, the wall surfacing requires no maintenance, and the tiles can easily be set in place with a contact adhesive on exterior or interior walls of stone, wood or masonry. Tile sizes are 4¼ by 8½, 6 by 12, 12 by 12 and 18 by 18 inches, with wholesale prices ranging from \$3.60 to \$6.25 per square foot for most patterns. *Design-Technics, 4 East 52nd Street, New York, N. Y.* (More Products on page 260)

HOUSE ANCHORAGES: 1-Introduction

By ALBERT G. H. DIETZ\*

SCOPE OF STUDY

Whether or not anchorage is necessary for small buildings, particularly houses, has long been open to question. Faced with this problem, the Federal Housing Administration asked the Building Research Advisory Board to study the problem and make recommendations. The Building Research Advisory Board consequently asked a group of individuals from various parts of the building industry to consider this problem and to report its findings and recommendations.

It was evident that there is no hard and fast answer applicable to all parts of the country. The forces to be resisted vary, the types of construction vary and, consequently, the likelihood of forces large enough to cause overturning or displacement of the house from its foundation varies in different parts of the country. In some instances, anchorage is needed; in others, it is unnecessary. An an-

\* Professor of Building Engineering and Construction, Massachusetts Institute of Technology, Cambridge, Mass., and Chairman, BRAB Special Advisory Committee, for the study, "The Anchorage of Exterior Frame Walls to Various Types of Foundations," conducted by the National Academy of Sciences-National Research Council at the request of the Federal Housing Administration, 1955-56.

alysis must be made to determine whether anchorage is or is not required.

It was decided that it is possible to design anchorages for (1) wind, (2) earth pressure and (3) earthquakes. On the other hand, tornadoes are disasters and structures in their direct paths are subjected to forces too great to be resisted by economical residential construction. The best that can be done is to design houses for normally expected high winds including hurricanes, but not for tornadoes. Similarly, floods are excluded from the study. Blast has been excluded also because too little is known about the areas where blast might be probable and important. If earthquake forces are severe enough a house will be destroyed, but if the forces are not great enough to destroy the house, it is possible to anchor it against displacement.

The committee recommended that research be carried on in a number of different fields. These recommendations for research include, in addition to the uncertainties surrounding floods and blast, a careful analysis of insurance and F.H.A. records to determine to what extent damage has actually occurred because of displacement of houses from their foundations. Certain insurance company records

showed no widespread damage but also revealed uncertainties in the records with respect to the degree to which damaged houses may or may not have been anchored, the degree to which anchored houses may have been saved from damage because they were anchored, and similar uncertainties. Furthermore, with the trend toward lighter construction, the probabilities of displacement due to wind and other forces are increasing. In addition, further research is recommended to determine the ability of different types of anchorage to withstand the forces imposed.

ANALYTICAL APPROACH

Wind

Wind is easily the most important of the natural forces to be resisted by a house and its anchorage.

The problem has been approached from two standpoints: (1) an analytical approach which would make possible fairly exact computations of wind forces and the resistance of a building to displacement, and (2) a quick approximate check by means of graphs to determine whether the more exact but more laborious analytical approach is  
*(Continued on page 227)*

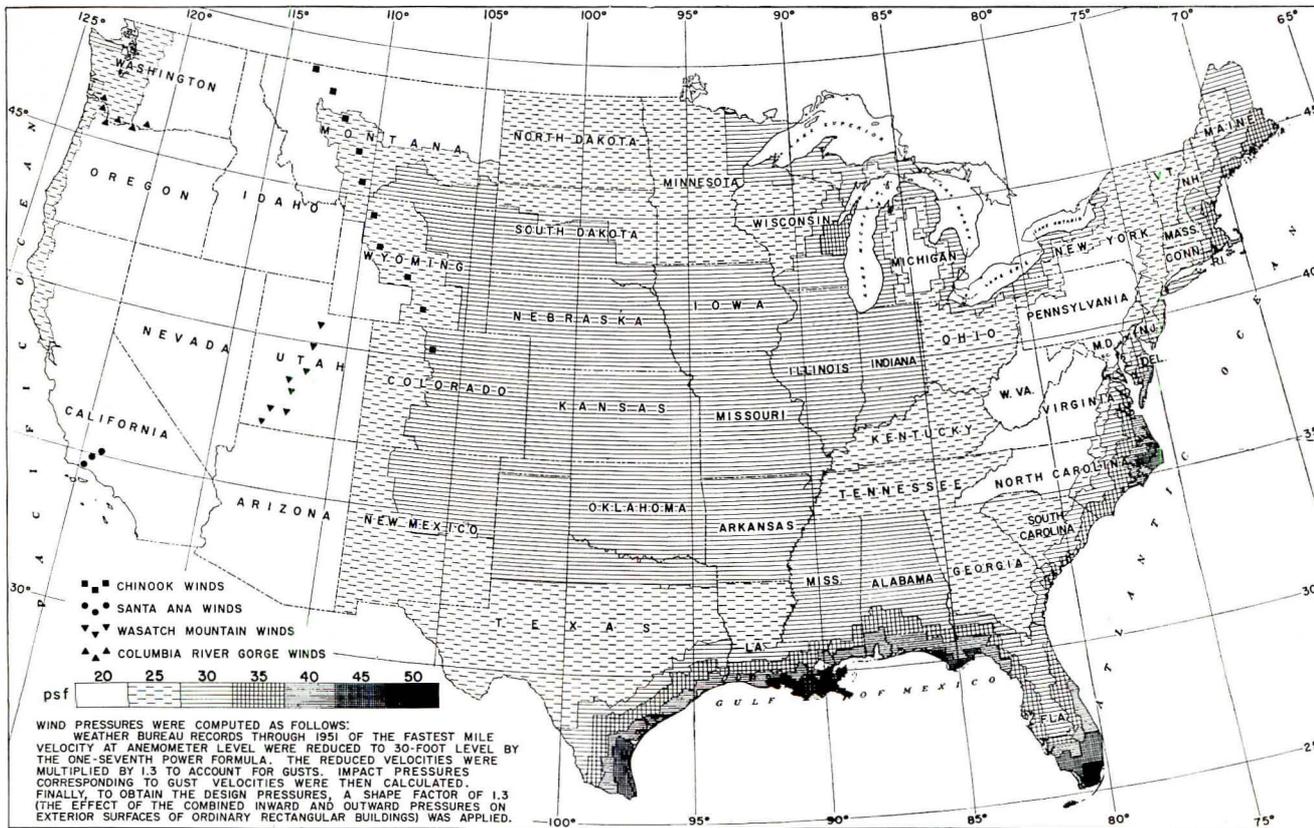


Fig. 1. To convert wind values shown on map to figures suitable for residential purposes, use the following ratios (map value first): 20 = 15; 25 = 20; 30 = 25; 35 = 25; 40 = 30; 45 = 35; 50 = 40. Reason is that map values are for 30 ft above ground

## HOUSE ANCHORAGES: 2-Methods of Calculation

By ALBERT G. H. DIETZ

necessary. The analytical approach is set forth first, and the more rapid graphical approach is then described.

The analytical approach to wind pressures is based upon the wind map (Figure 1) prepared for A.S.A. publication A-58.1-1955. It shows the expected wind pressures in various parts of the country in pounds per square foot against a surface oriented at right angles to the direction of the wind.

The design pressures shown on the map are for a basis 30-ft level and need to be modified for residential purposes where building heights are less than 30 ft. As a matter of interest, it may be noted that 30 lb per sq ft corresponds roughly to a 100-mile wind.

When a wind blows directly against the vertical wall of a house, the full wind pressure is applied. On the leeward side of a house, a negative pressure exists because of the partial vacuum developed which tends to force the leeward wall out in the same direction as the direction of the wind. Furthermore, a flat roof experiences an upward pressure and the same holds true of roofs of shallow pitch. Not until the pitch exceeds approximately 27 to 30 degrees does a positive pressure develop on a sloping roof. The leeward roof experiences a negative pressure or uplift at all times. Where overhanging eaves are encountered, strong uplift pressures can be expected. These are approximately double the design pressure on the windward side, that is to say, eaves on the windward side of a house experience strong upward pressure. Eaves on the leeward side experience negative pressure.

Design pressure coefficients for the various portions of a building are given in Table 1. It should be noted that the pressures on the leeward side are not only for negative pressure because of the flow of the wind around the house, but include an allowance for internal pressure on the leeward wall occasioned by doors and windows either being open or having been broken open by flying debris in a high wind. A sketch showing the types of forces and their directions is given in Figure 2.

Wind blowing against a house has three effects for which an anchorage analysis should be made. First, the house tends to rotate about the point where the bottom of the leeward wall meets the foundation. Secondly, the house tends to lift because of negative pressures or uplift forces developed on the roof. Third, the house tends to slide off the foundation because of horizontal forces. All of these forces are resisted by the weight of the house. As the house tends to rotate about the intersection of wall and foundation, an opposite rotating tendency is developed by the weight of the house, assumed to act

at its center of gravity. The uplift forces are resisted directly by the weight of the house. Horizontal motion of the house is resisted by friction developed by contact between the superstructure of the house and the foundation. The amount of friction is directly related to the weight of the house. If the house is heavy enough to resist all of these forces anchorage is unnecessary; otherwise, it should be used.

### Analytical Method

The analysis can best be illustrated by taking an example as shown in Figure 2. The house is 30 feet wide, 40 feet long, one story high with sidewalls 8 feet high, and has a roof with a pitch of 4 in 12 or 18½ degrees.

All wind forces are assumed to be directed at right angles to the surfaces on which they are acting. Consequently,  $W_v$  and  $W_{lw}$  are horizontal and can be assumed concentrated 4 feet up on the windward and leeward

walls, respectively. These cause a rotating tendency or moment equal to  $4 \times W_v$  and  $4 \times W_{lw}$ , respectively, about the point of rotation. Similarly, the forces acting on the various portions of the roof can be considered to be concentrated at the centers of the corresponding roof areas. Using the values for the various design pressure coefficients taken from Table 2, it is possible then to set up the computations in Table 3 for the various rotational effects or moments corresponding to the various wind forces.

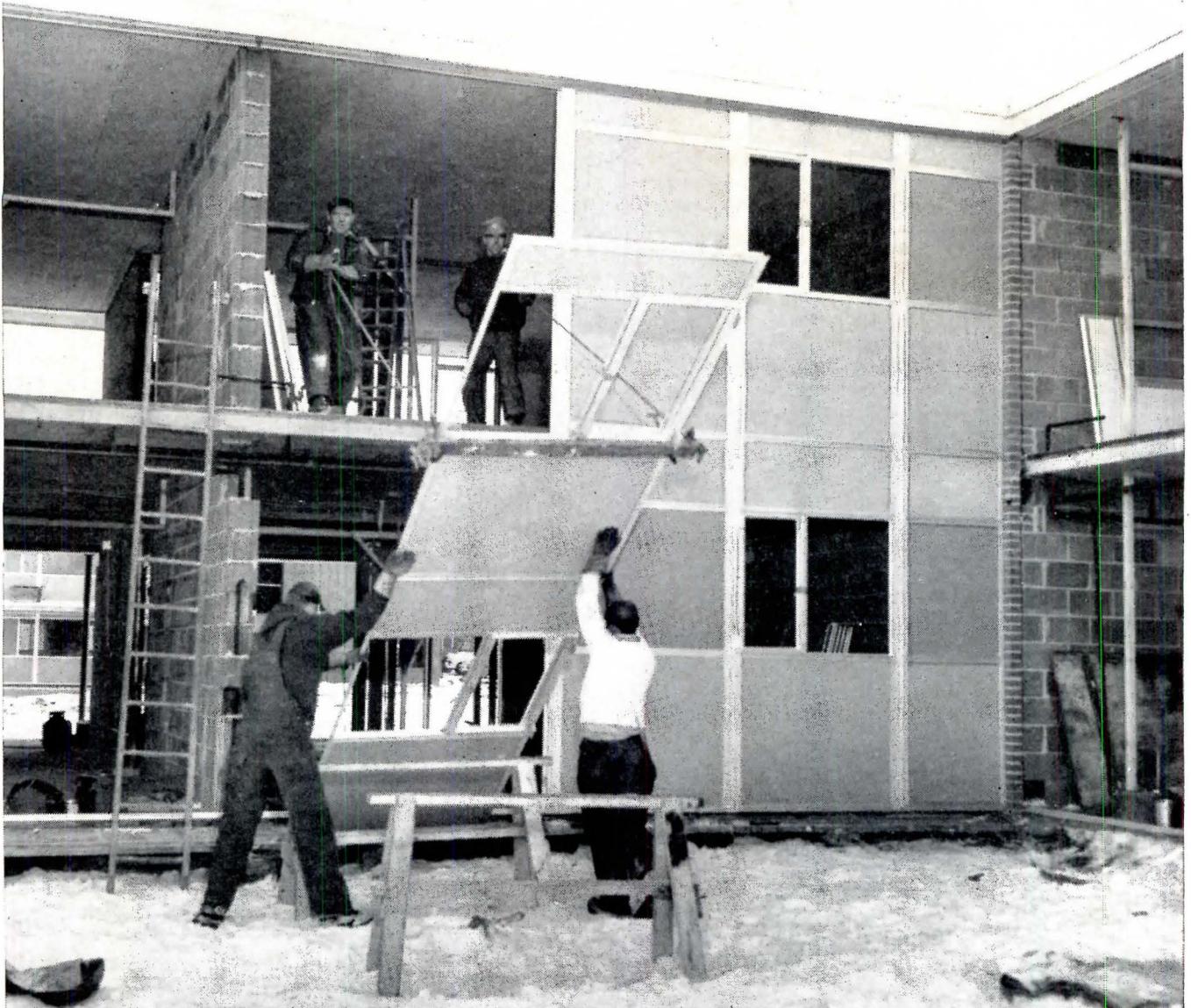
### Overturning

If the design wind pressure is known, it is possible to calculate the overturning effects or moments about the point of rotation. If, for example, the design wind pressure is 15 pounds per square foot, the various overturning effects are as given in Table 2 under the heading Moment for 15 psf. It is seen that the

TABLE 1—EXTERNAL AND INTERNAL DESIGN PRESSURE COEFFICIENTS

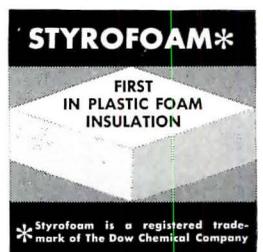
Roof Slope (degrees) Pitch	External & Internal	Design Pressure Coefficient				
		$W_v$	$W_e$	$W_w$	$W_{le} & W_{li}$	$W_{lw}$
0°	E	1.0 $P_w$		-0.60 $P_w$	-0.60 $P_w$	
	I	-0.2 $P_w$		-0.45 $P_w$	-0.45 $P_w$	-0.45 $P_w$
	Total	0.8 $P_w$	-2.0 $P_w$	-1.05 $P_w$	-1.05 $P_w$	-0.45 $P_w$
9½° or 2/12 and 18½° or 4/12	E	1.0 $P_w$		-0.60 $P_w$	-0.45 $P_w$	
	I	-0.2 $P$		-0.45 $P_w$	-0.45 $P_w$	-0.45 $P_w$
	Total	0.8 $P_w$	-2.0 $P_w$	-1.05 $P_w$	-0.90 $P_w$	-0.45 $P_w$
22½° or 5/12	E	1.0 $P_w$		.06 × 22.5 - 1.8 = -0.45 $P_w$	-0.45 $P_w$	
	I	-0.2 $P_w$		-0.45 $P_w$	-0.45 $P_w$	-0.45 $P_w$
	Total	0.8 $P_w$	-2.0 $P_w$	-0.9 $P_w$	-0.90 $P_w$	-0.45 $P_w$
27° or 6/12	E	1.0 $P_w$		.06 × 27.0 - 1.8 = -0.18 $P_w$	-0.45 $P_w$	
	I	-0.2 $P_w$		-0.45 $P_w$	-0.45 $P_w$	-0.45 $P_w$
	Total	0.8 $P_w$	-2.0 $P_w$	-0.63 $P_w$	-0.90 $P_w$	-0.45 $P_w$
40° or 10/12	E	1.0 $P_w$		.015 × 40.0 - 0.45 = -0.15 $P_w$	-0.45 $P_w$	
	I	-0.2 $P_w$		-0.45 $P_w$	-0.45 $P_w$	-0.45 $P_w$
	Total	0.8 $P_w$	-2.0 $P_w$	-0.30 $P_w$	-0.90 $P_w$	-0.45 $P_w$

Note:  $W_v$ ,  $W_e$ ,  $W_w$ ,  $W_l$ , and  $W_{lw}$  denote windward wall, windward eave, windward roof surface, leeward roof surface, and interior leeward wall, respectively. E denotes external pressure, and I denotes internal pressure. Positive values denote inward load; negative values, outward load except for  $W_v(I)$  which represents the 20 percent loss due to openness.  $P_w$  denotes wind load per sq. ft.

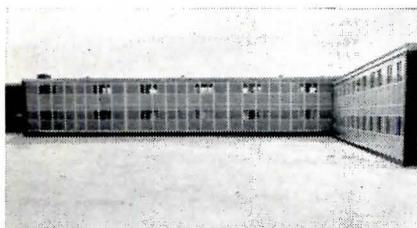


Workmen installing window walls made with Hasko-Struct<sup>†</sup> plastic laminated sandwich panels. Architect is Manson & Carver Associates, General Contractor is Christman Company.

## Styrofoam\* insulation chosen for housing project at Michigan State University



Class of '58 or '88—students will be assured of warm, dry rooms in this large, married students' housing project in East Lansing, Michigan. It's insu-



The new Michigan State University Married Students' Housing Project. There are 46 complete units housing 508 families.

lated with Styrofoam, a Dow plastic foam.

Styrofoam was specified for the Hasko-Struct building panels and as the perimeter insulation by the architectural firm of Manson and Carver Associates. It has a low K factor that *stays low* because Styrofoam won't absorb water. It doesn't rot, mold, deteriorate or warp. In addition, Styrofoam is a rigid insulation with high compressive

strength. It makes panels stronger and won't pack down. Yet it's very light in weight.

If you need an outstanding insulation for curtain wall construction, perimeter or plaster base installations, cavity walls or low-temperature work—investigate Styrofoam. Contact your nearest Dow sales office today. THE DOW CHEMICAL COMPANY, Midland, Mich.

<sup>†</sup>Registered Trademark of Haskelite Manufacturing Corp. of Grand Rapids, Mich.

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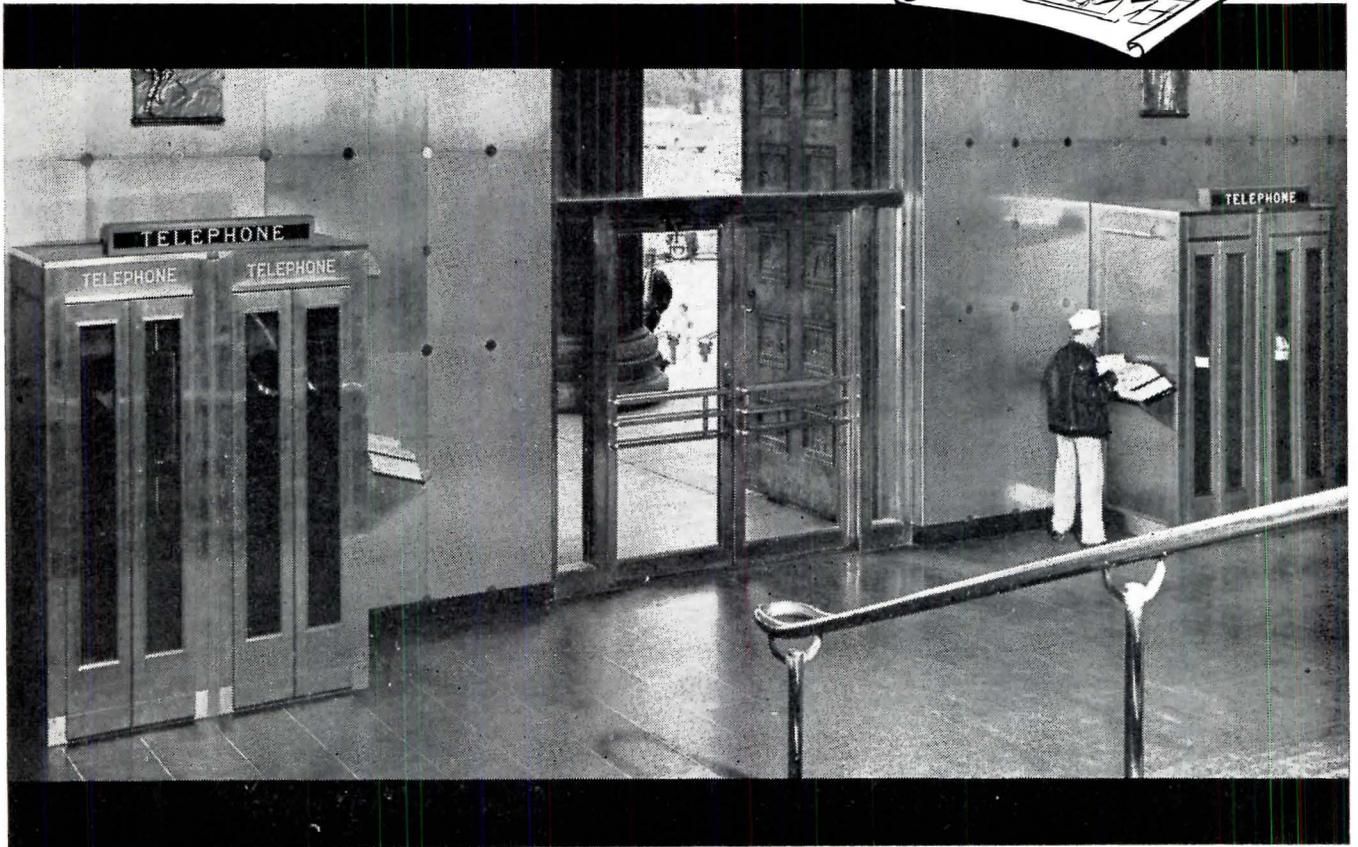




the best laid plans include

# Sherron

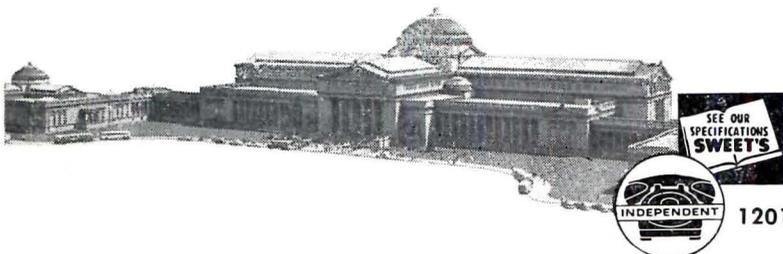
steel telephone booths



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(To be continued in a later issue)

## HOUSE ANCHORAGES: 4-Methods of Calculation

By ALBERT G. H. DIETZ

is a net resistance to overturn of 305,000 foot-pounds which is still more than adequate to resist the overturning moment. The net downward force, however, becomes 30,500-22,400 or 8100 pounds. This still provides a net downward component resisting uplift. When it is multiplied by  $\frac{2}{3}$  to find the resistance to horizontal loading, the horizontal resistance becomes 5400 pounds, which is slightly higher than the horizontal wind force of 4880 pounds. The house still qualifies as not needing anchorage.

Returning to the house with basement and framed first floor, if the wind load is increased to 40 pounds per square foot the overturning moment is  $40/15 \times 26,200$  or 70,000 foot-pounds instead of 26,200 foot pounds. The net resisting moment of 400,000 foot-pounds is still more than adequate to offset, so anchorage against overturn is unnecessary. The upward force now, however, is  $40/15 \times 22,400$  or 60,000 pounds, so that there is a net upward force of 20,000 pounds which requires anchorage against both uplifting and sliding. Similarly, if the house is considered to be of slab-on-ground construction, the net resisting moment of 305,000 foot-pounds is more than adequate to take care of the 70,000 foot-pound overturning moment, but there is now a net upward force of 29,500 pounds which requires anchorage against uplift. The horizontal force is  $40/15 \times 4880$  or 13,000 pounds. It must be resisted by anchorage because friction cannot be counted

on when a net uplift exists.

Where anchorage is needed bolts, or their equivalent in terms of powder-driven fasteners; hammer-driven masonry nails; straps, clips and angles should be used. Anchor bolts  $\frac{1}{2}$ -in. in dia. should be set at least 7 in. in solid concrete or 15 in. into concrete block, with the bolts not more than 8 feet on centers. This anchorage will be analyzed to determine if it resists forces in the example above. An important aspect is the size of the washer because the washer, in turn, bears against the wood sill and must be large enough to develop the necessary load against the side grain of the wood. If, for example, a 2-in. round washer with a  $\frac{9}{16}$  in. round hole is chosen, the net area of the washer bearing against the side grain of the wood is 3.1 square inches. If the allowable side-grain stress is 360 psi (e.g., hemlock) and if this is multiplied by 1.33 to allow for the increased stress that can be taken during short-time loads such as winds, the allowable pressure against the washer is 480 psi. This times 3.10 gives an allowable uplift of 1500 pounds per bolt. Dividing the uplift force of 29,500 pounds by 1500 pounds indicates that 20 bolts are needed against uplift. If a bolt is placed one foot from each corner along each wall, as is customary, the rest of the bolts are spaced approximately 8 ft apart along the periphery of the house. In other words, the standard  $\frac{1}{2}$  in. bolt 8 ft on centers will take care of the uplift condition on this house

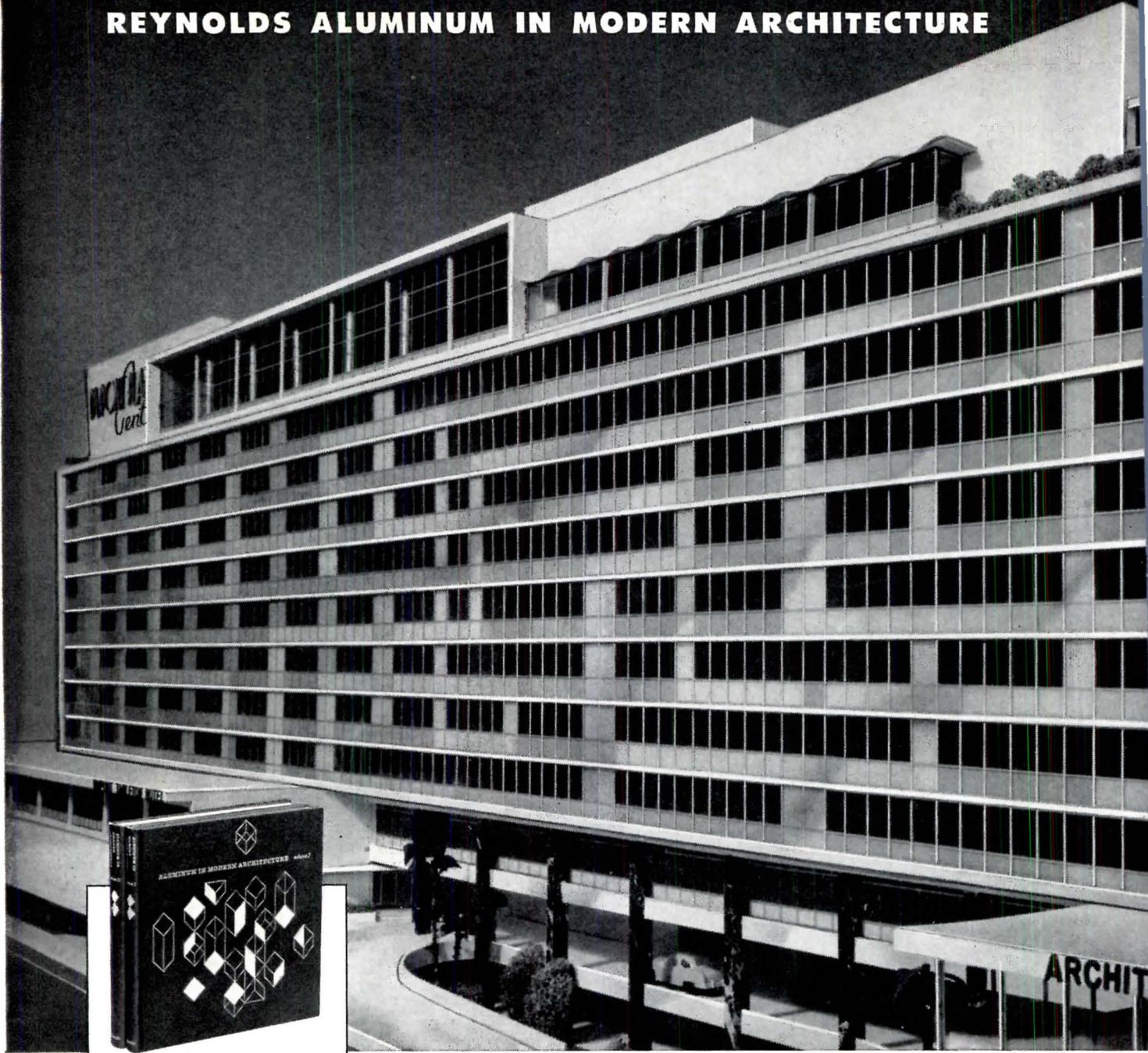
provided 2-inch round washers are used. Furthermore, the weight of the footing and the slab tied into the footing must be sufficient'y great to withstand the 29,500 pound uplift. A footing 10 in. deep and 12 in. wide, for example, weighs approximately 115 pounds per foot or 16,000 pounds, consequently, approximately 3 to 4 ft of a 3-in. thick slab would have to be tied in to the footing so that the weight of slab and footing together would be adequate to withstand the uplift force of 29,500 pounds.

The full horizontal force of 13,000 pounds must be resisted by the anchor bolts. For hemlock and similar species the allowable long-time load perpendicular to the grain against a half-inch bolt in material  $1\frac{1}{8}$  in. thick is 320 pounds (National Design Specifications, National Lumber Manufacturers Association). This can be increased one-third for wind load and therefore becomes 425 pounds per bolt. Dividing this into 13,000 indicates that 31 bolts are needed, instead of the 20 bolts adequate for uplift. If fewer bolts are to be used, the sill must be made thicker. For example, the allowable wind loading if material  $2\frac{1}{8}$  in. thick is used is  $530 \times 1.33$  or 710 pounds per bolt. This calls for 19 bolts. Standard anchorage now is adequate. End and edge distances of wood around the bolts must be adequately designed according to standard wood engineering procedure as set forth, for example, in the National Design Specifications.

TABLE 3 — VERTICAL AND HORIZONTAL COMPONENTS OF WIND LOADS

	Vertical	Load per Foot of Length	Length, feet	Load for 15 psf lb.	Horizontal	Load Per Foot of Length	Length, feet	Load for 15 psf lb.
$W_v$				0	$8 \times 0.8 P_w$	$= 6.4 P_{wh}$	40	3,840 ←
$W_e$	$2 \times 2 P_w \times 0.95$	$= 3.8 P_{wv}$	44	2,500 ↑	$2 \times 2 P_w \times 0.32$	$= 1.3 P_{wh}$	44	860 →
$W_w$	$15.8 \times 1.05 P_w \times 0.95$	$= 15.8 P_{wv}$	44	10,400 ↑	$15.8 \times 1.05 P_w \times 0.32$	$= 5.3 P_{wh}$	44	3,500 →
$W_{le}$	$17.8 \times 0.45 P_w \times 0.95$	$= 7.6 P_{wv}$	44	5,000 ↑	$17.8 \times 0.45 P_w \times 0.32$	$= 2.6 P_{wh}$	44	1,720 ←
$W_{li}$	$15.8 \times 0.45 P_w \times 0.95$	$= 6.7 P_{wv}$	44	4,500 ↑	$15.8 \times 0.45 P_w \times 0.32$	$= 2.3 P_{wh}$	44	1,520 ←
$W_{lw}$				0	$8 \times 0.45 P_w$	$= 3.6 P_{wh}$	40	2,160 ←
		$33.9 P_{wv}$		22,400 ↑		$8.3 P_{wh}$		4,880 ←

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*Petersen & Shufkin, Miami*

### *General Contractor:*

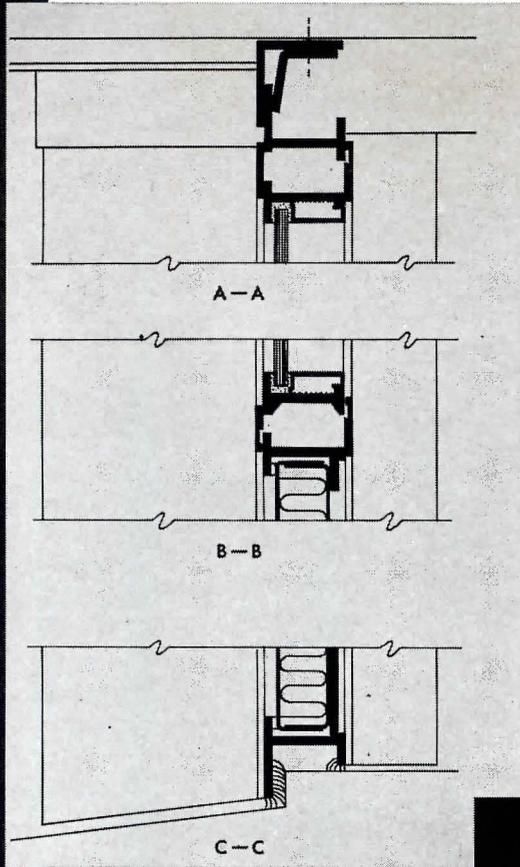
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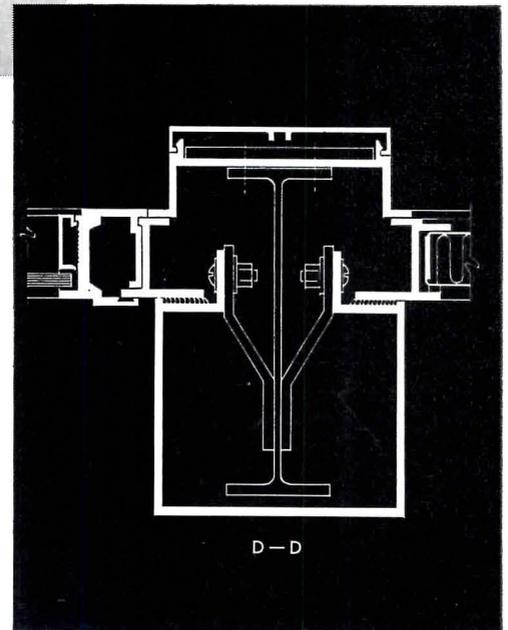
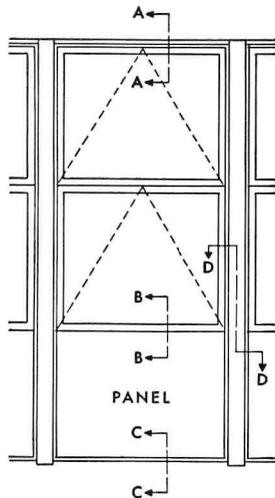
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# ALUMINUM

(Continued from page 222)

**CATENARY UMBRELLA SHELTERS  
HYPOTHETICAL SCHOOL CAMPUS**

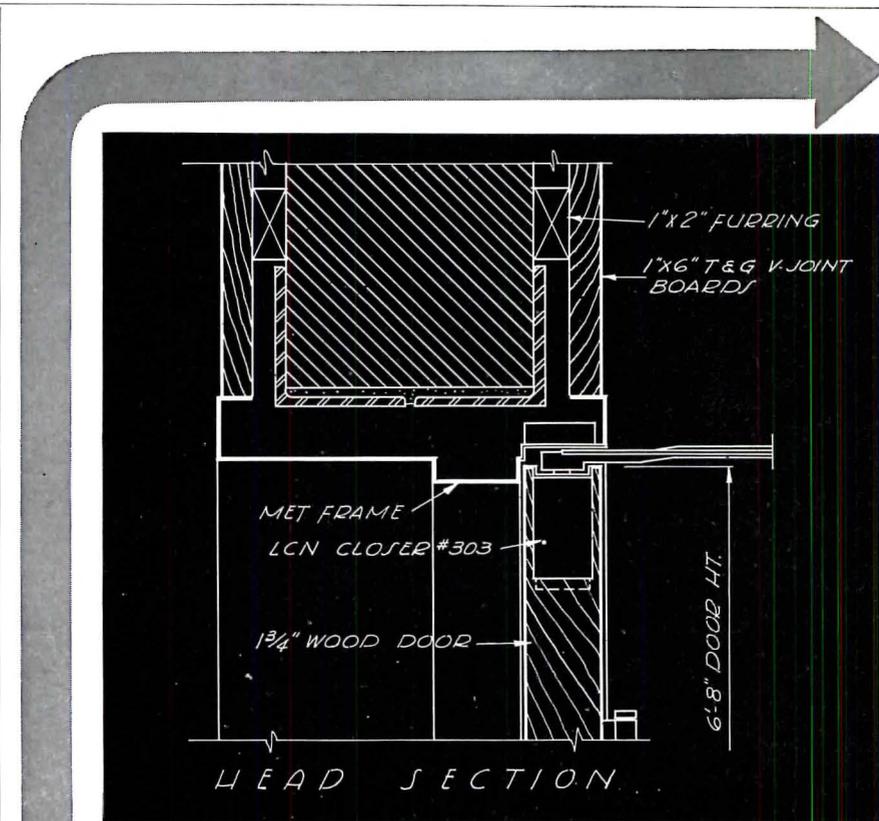
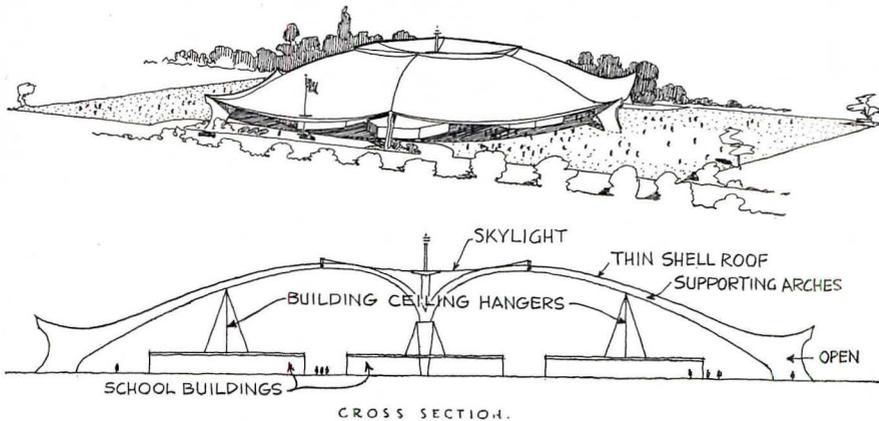
California architect Frank Wynkoop, A.I.A., first conceived of sheltering an entire school campus under a single roof while pondering a plastic dome protecting the delicate model of a group of school buildings. Pursuit of the idea that a similar protective shell might present many advantages for an actual school led to his design for the hypothetical campus scheme shown above right.

The project includes seven hexagonal buildings centered in a compact group on a five acre site and roofed by a fire-proof umbrella covering 138,000 sq. ft of the ground area. Consisting of a series of catenary spans of steel cables and vermiculite concrete, the shell is supported on arched concrete ribs. Its underside is sprayed with acoustical plaster; the exterior surfaced with a vinyl plastic membrane. Light enters through a huge plastic skylight, as well as through the perimeter which is left open for ventilation and view.

Although the shelter provides a controlled climate that permits year-round outdoor play and maximum site utilization, its primary advantage lies in the savings made possible in the construction of the school buildings themselves. With an over-all shelter lessening the problems of environment control, interior structures can be merely thin shells of incombustible panels which provide thermal insulation, sound control, and separation and enclosure of interior space. Waterproofing, drainage and sun control cease to be problems, and heating and maintenance costs are greatly lowered. In addition, the buildings can be designed without provision for circulation via the usual corridors and covered walks. Because their roofs are suspended, foundations and structural framing are kept to a minimum, and interior partitions can be easily moved. Savings also result from a reduction in wall area. The hexagonal buildings have 65 per cent less perimeter wall than would rectangular ones of the same area; and the use of artificial lighting permits lower ceilings and walls than would be required for adequate daylighting.

Mr. Wynkoop estimates that a school of this type could be built for about \$700,000 exclusive of land, furniture and engineering, the low costs of the sheltered buildings making possible the investment in the thin shell.

(More Roundup on page 238)



**CONSTRUCTION DETAILS**

for LCN Closer Concealed-in-Door Shown on Opposite Page

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Ann Arbor, Mich.	University of Mich. Library	Albert Kahn Assoc.	Dunbar-Borton	Russ Collins
Portland, Ore.	Woodrow Wilson High School	Tom E. Taylor	A. G. Rushlight Co.	Dick Finklea
Salem, Ore.	South Salem High School	Tom E. Taylor	Vern Collins Plbg. Co.	Dick Finklea
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New Orleans, La.	St. Martin's School	James M. Todd & Assoc.	Frank A. Dorsa	Bob Barnes
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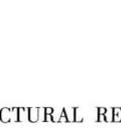
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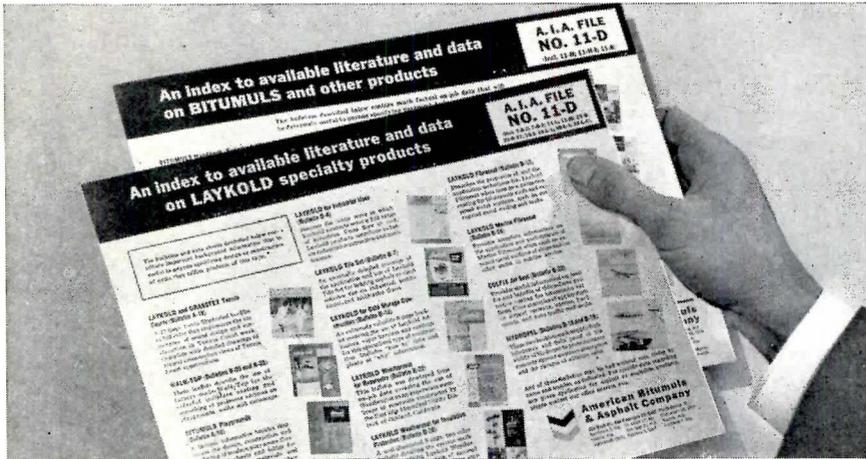
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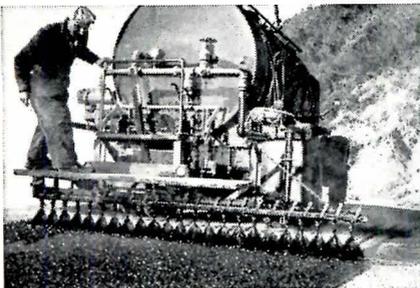
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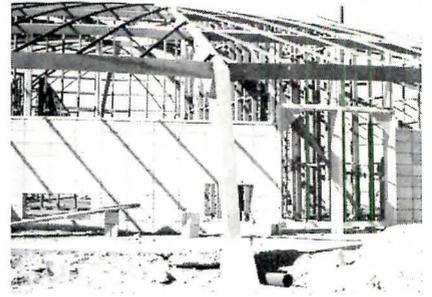
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### TECHNICAL ROUNDUP

#### WELDED STEEL BENTS SPAN DUAL-PURPOSE CAFETORIUM



Meeting head-on the familiar problem of providing more space for less money, Arizona architect John Sing Tang recently presented the Gila Vista School in Yuma, Arizona, with a domed circular structure designed to serve dually as cafeteria and auditorium.

The interior space of the "cafetorium" is divided by a stage set slightly to one side of center, under the high portion of the roof. Behind it are ranged the kitchen, storage rooms, equipment room and toilets; in front is a large semicircular open area for dining — and looking.

Broken bents of all welded steel span the 88 ft across the cafetorium, enclosing an area of 6082 sq ft with no interior supports. To resist the outward thrust of the arches, the bents are tied with reinforced concrete ties beneath the slab. Knee and column sections are fabricated from steel plate; the arches are rolled wide flange shapes; and the purlins are welded boxed channels bent to the dome's radial curves. For the roof, a monolithic slab of 2 in. gypsum was poured over 2 in. acoustical form-board and topped with a reflective built-up roof. Both the steel and the form-boards were left exposed on the interior.



(More Roundup on page 240)

# How ANEMOSTAT

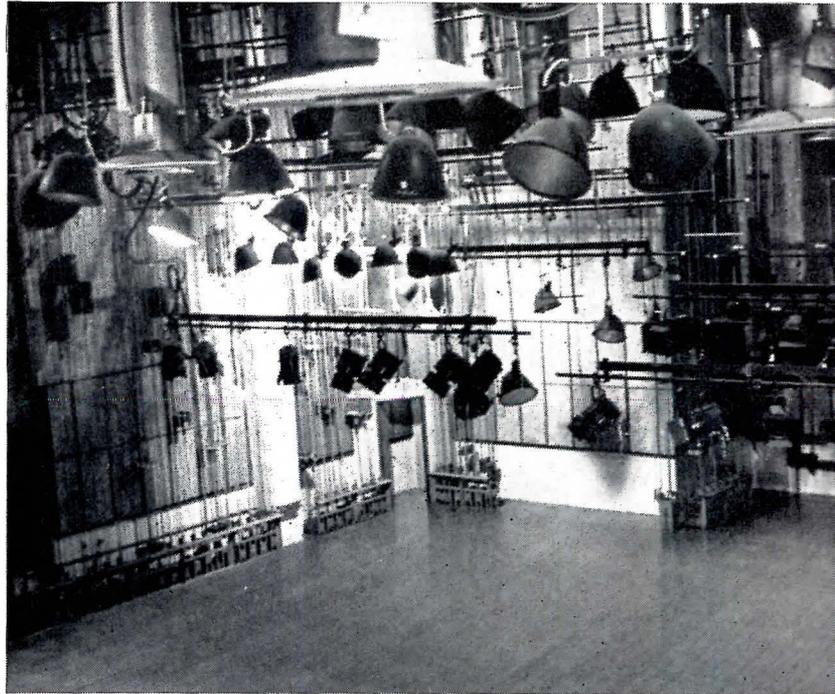
## Air Diffusers help make movies

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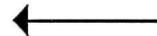
Anemostat Air Diffusers help do this vital job. They draftlessly diffuse 20,000 cubic feet of cooled air per minute pushed by giant fans through the soundproofed ducts. The two main studios have 32 vertical ducts, ranging in diameter from 18 to 24 inches; of these, 24 are telescopic and can be raised or lowered to suit requirements. The conditioned air, efficiently distributed by Anemostat Air Diffusers, offsets the heat from the tremendous wattage of the lights needed for film-making.

Movie-viewing, as well as movie-making, is aided by Anemostat Air Diffusers. They are installed in hundreds of theatres throughout the country. Anemostat Air Diffusers also provide *true* draftless comfort and uniform air distribution in schools, hospitals, banks and practically all types of commercial and industrial buildings.

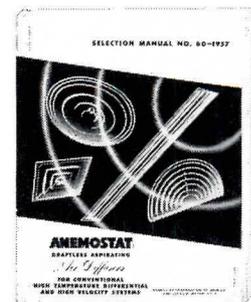
One of three completely air conditioned sound stages at Production Center, Inc. in New York City.



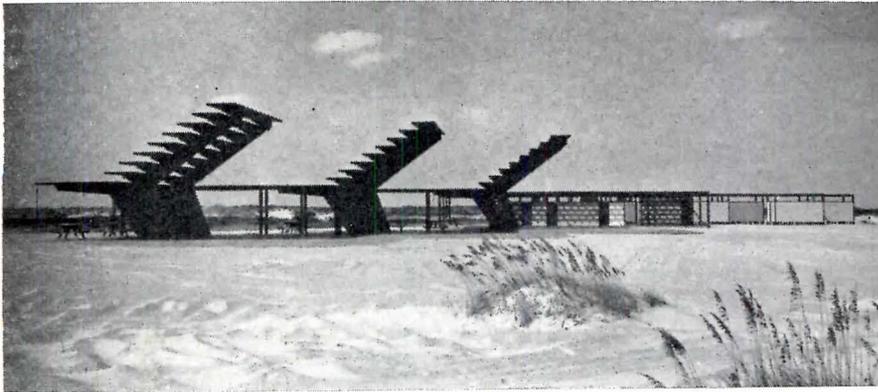
Note the Anemostat Air Diffusers installed on the telescopic ducts.



Joseph B. Klein, Architect  
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Angling upward in sharp contrast to the surrounding dunes, the windblown structures shown at left are slanted and slatted to allow the free passage of ocean breezes while providing welcome shade for visitors to the Coquina Beach Day Use Area in North Carolina.

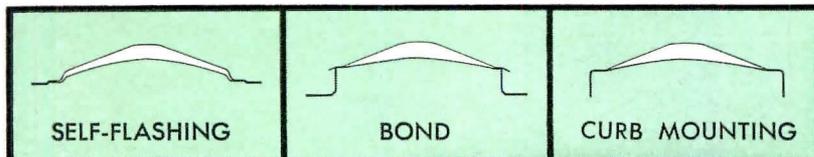
When John B. Cabot, supervising architect for the Department of the Interior's Division of Design and Construction, first undertook the design of a recreational structure on Cape Hatteras, nothing more was involved than a shelter. However, the program ultimately developed to include other public facilities — within the slim budget allotted for the shelter alone. In addition to the three timber shade structures, the project now includes a boardwalk of girder, joist and plank construction supported on piles, and frame buildings to house dressing enclosures, rest rooms, storage space, and facilities for first aid, information and control.

The primary site problem was posed by the sand-carrying prevailing winds which sweep constantly along the dunes. Thus the shape of the shade structures evolved from the attempt to arrive at a form that would produce maximum shade and use materials economically, while presenting minimum surface to sand-blasting by the winds.

As finally executed, the shelters consist of horizontal fins of 4 in. double tongue and grooved cedar decking, factory assembled in 4 ft sections and cantilevered from a laminated wood superstructure. The fins, which are spaced 18 in. apart to allow free passage of winds, overlap enough to provide a completely shaded, though moving, area beneath the shelters from early morning to late afternoon during the summer months. Although the decking was treated with pentachlorophenol, it was given no other protective finish except for painting of the edges. The shade structures have foundations of cross braced steel piles with horizontal timbers buried in the sand as deadmen.



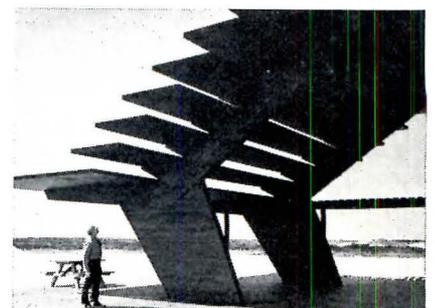
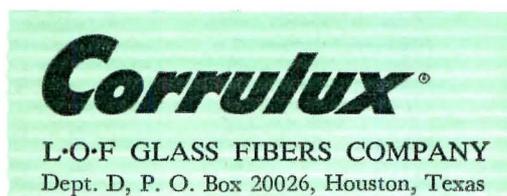
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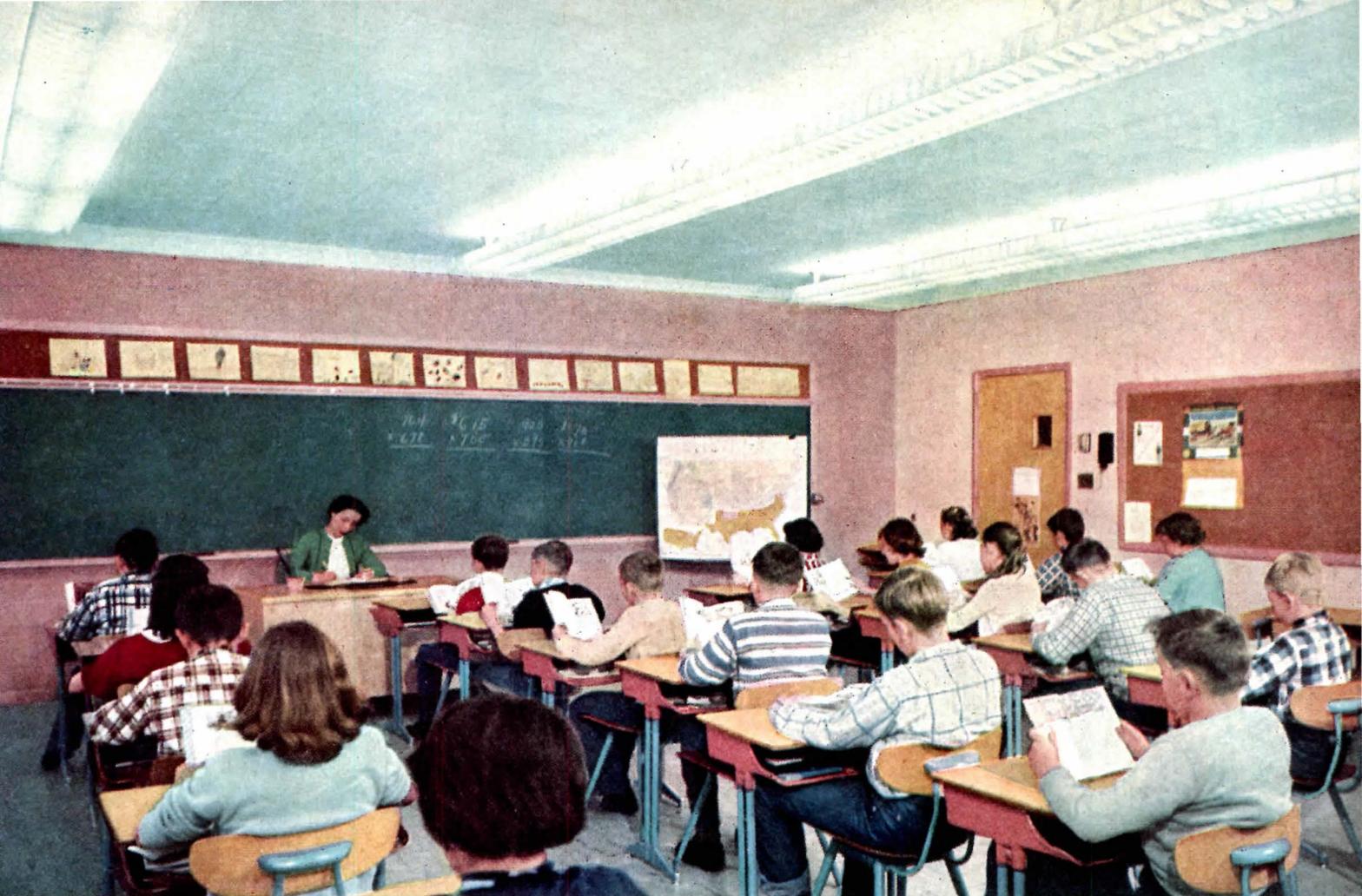
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(More Roundup on page 244)



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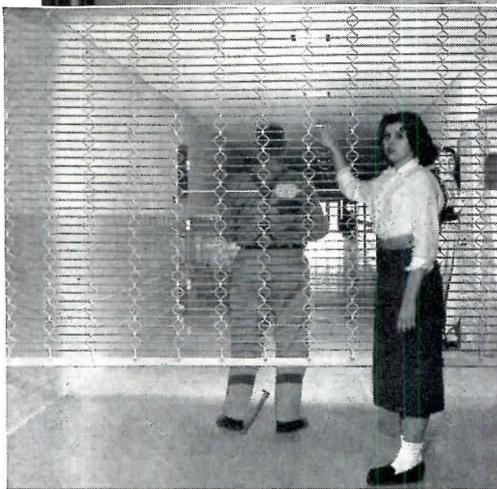
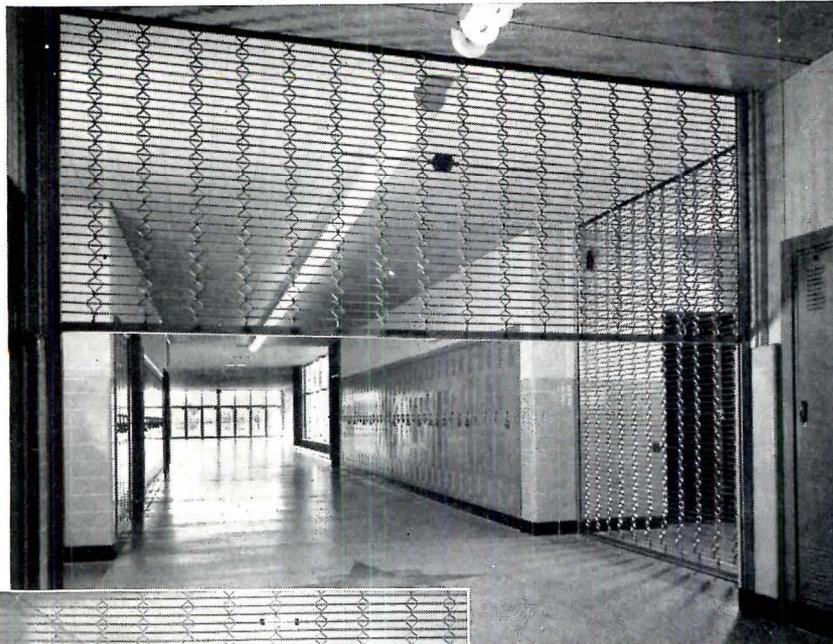
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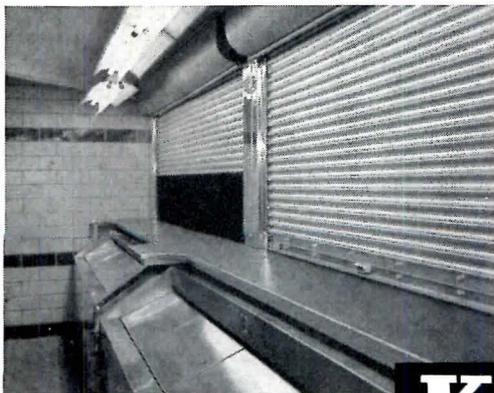
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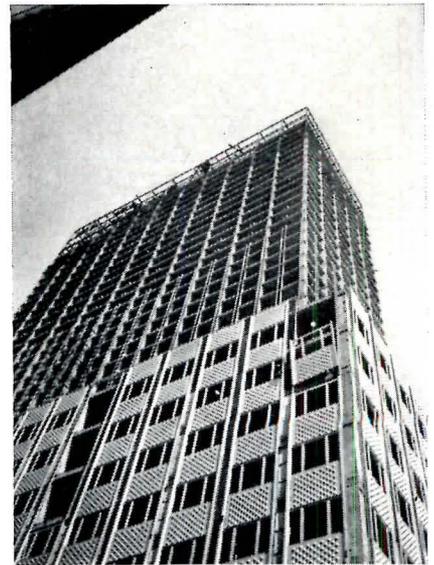
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### TECHNICAL ROUNDUP

#### EIGHT ACRES OF ALUMINUM TO FACE MANHATTAN SKYSCRAPER



The largest aluminum curtain wall to date has been spread over the eight-acre face of a 38-story office building now under construction at 666 Fifth Avenue in New York City.

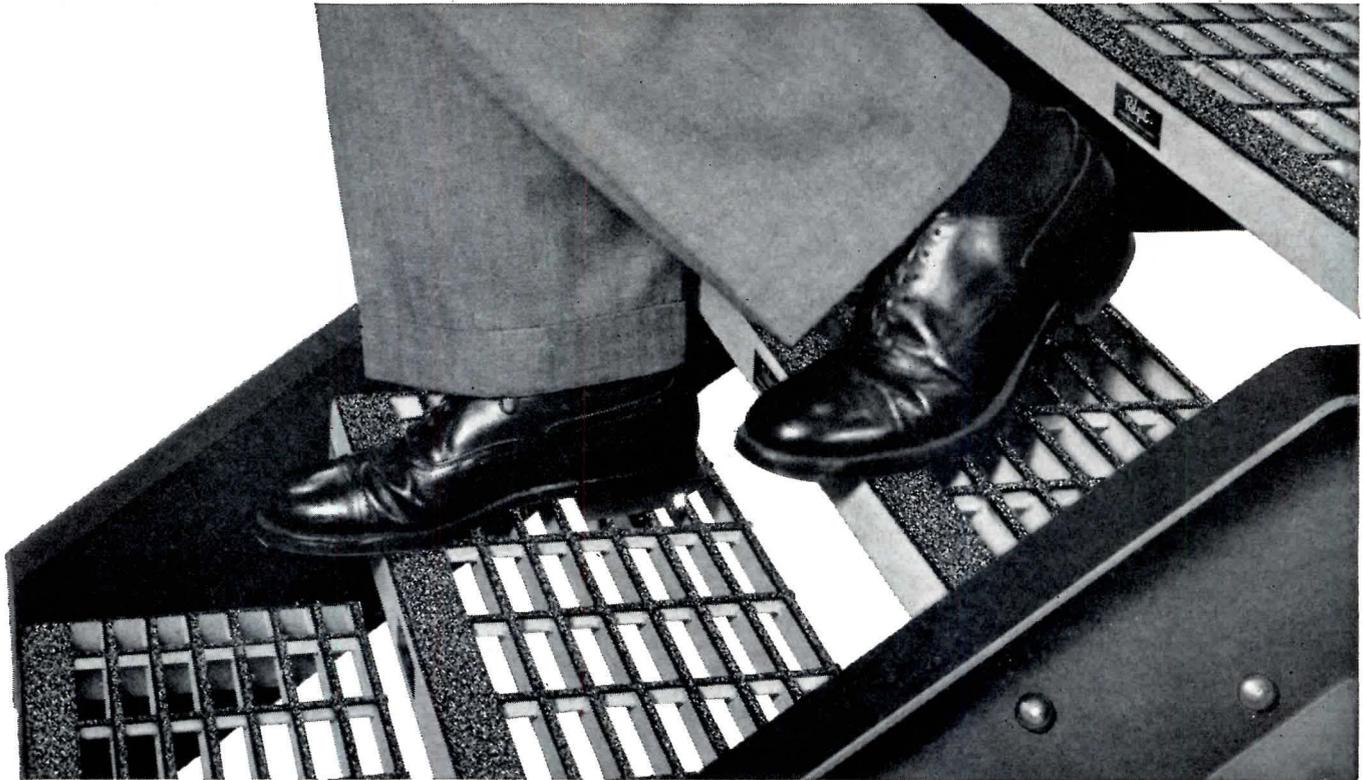
A total of 2950 prefabricated aluminum panels, each 7½ ft wide by 11 ft high, will make up the building's facade. The upper half of each panel contains a window unit composed of a central pivoting sash flanked by fixed sash on either side. The lower half is a spandrel of anodized aluminum, die-pressed with a design of alternate rows of small pyramids to give greater structural rigidity as well as a decorative pattern. For vertical accent — and greater freedom in subdividing the interior space — adjacent panels are separated by narrow "wall" sections which extend the entire height of the building. Fabricated of white porcelain enameled aluminum, these 20 in. vertical strips are framed on each side by a 3 in. polished aluminum border.

The panels are set in place from inside the building and bolted to vertical steel rails previously welded to the building's frame, each unit interlocking at the bottom with the one below it. The steel weldments, which consist of 5 in. channels and 3 in. angles varying in length from 11 to 20 feet, are zinc-sprayed to prevent corrosion.

The building, whose 38 stories enclose more than a million square feet of office space, was designed by architects Carson and Lundin of New York City. Panels were fabricated by Reynolds Metals Company.

*(More Roundup on page 248)*

Eliminate  
slipping  
accidents!



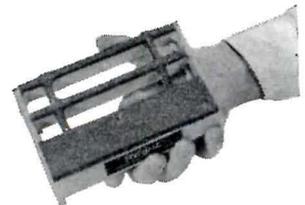
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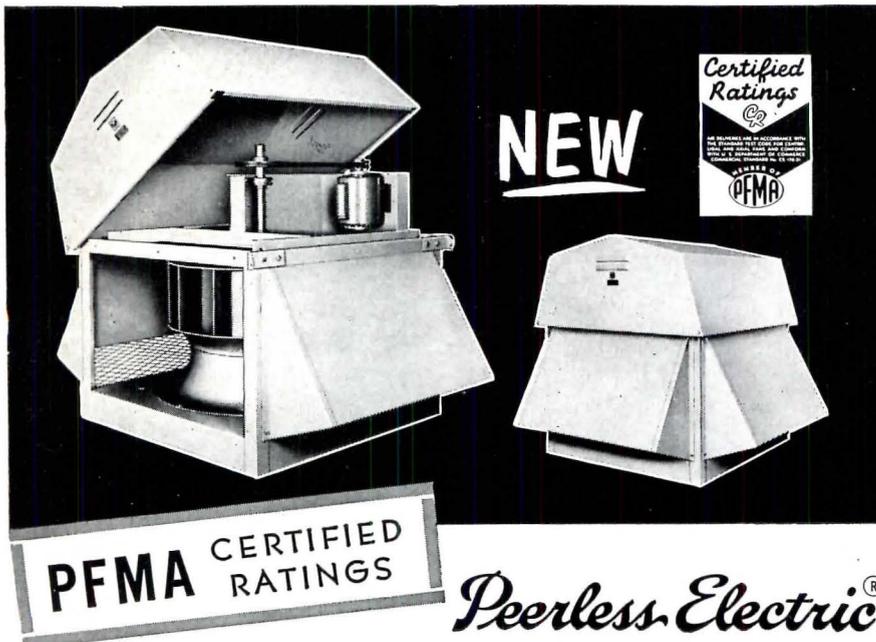
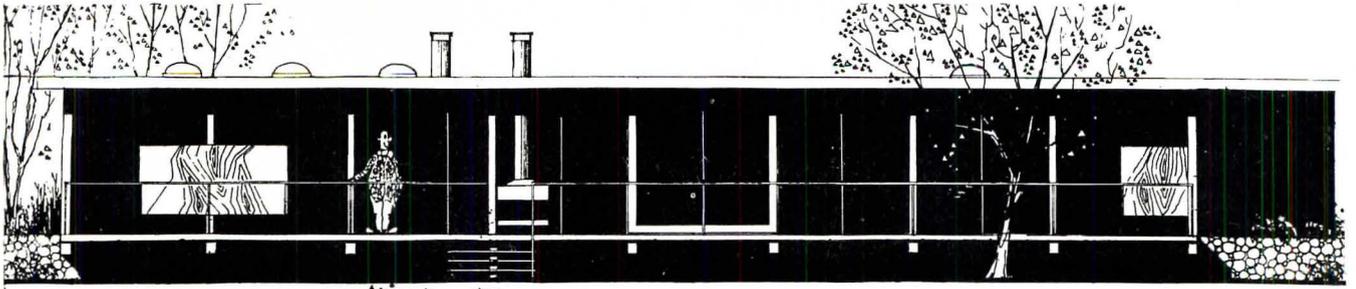
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# THE RECORD REPORTS

(Continued from page 340)



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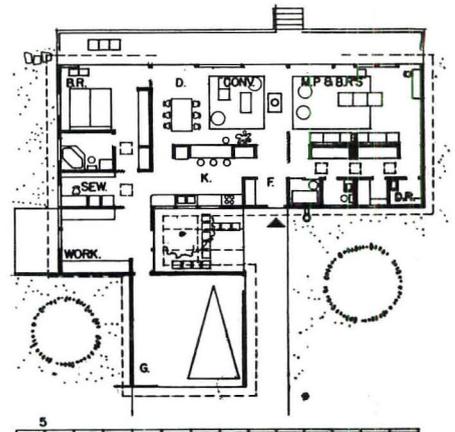
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First prize winner in Indianapolis Home Show design competition was entry of David G. Billmeyer, in association with fellow Notre Dame student Noel J. Blank. Jury commented that "arrangement of space was the outstanding thing about this design."



### NOTRE DAME STUDENTS FIRST IN HOME SHOW COMPETITION

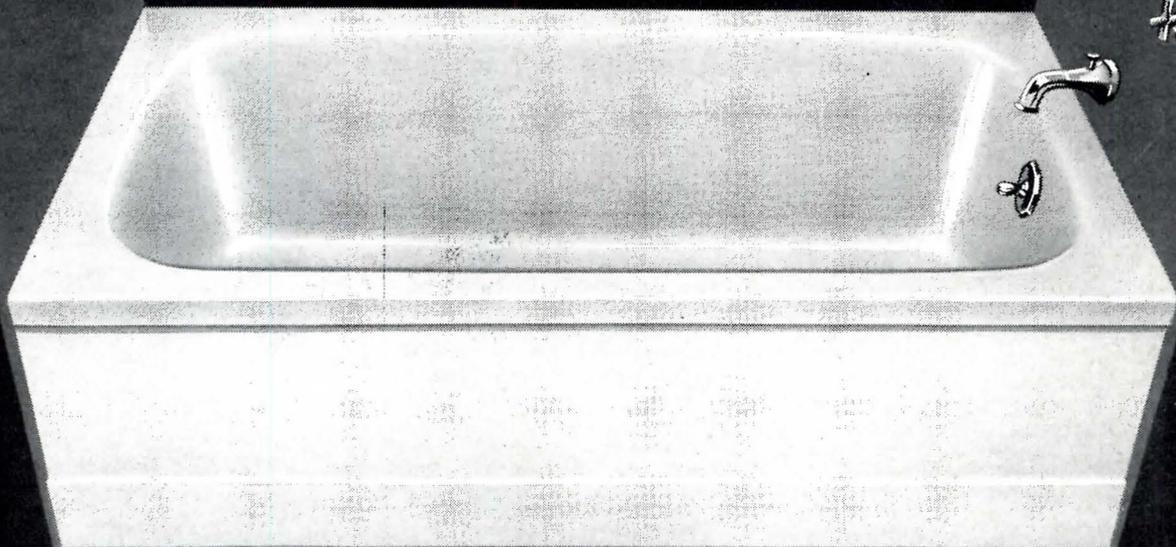
Examining more than 225 entries from architects, designers, draftsmen and students, judges of the annual architecture design competition of the Indianapolis Home Show awarded the \$1000 first prize to Notre Dame architecture student David G. Billmeyer, and his collaborator, also of Notre Dame, Noel J. Blank. The \$500 second prize went to Howard E. McCall, and the \$200 third prize to Thomas S. Torke (their designs, p. 346). Honorable mentions, each of \$50, were awarded to Gerald H. Miller; Home F. Woodward; Frederick F. Sadri; Pvt. Richard C. Donkervoet; Roger W. Kautola; and Robert Vignieres, Jack Saro and David Miller.

The program called for a house for a retired couple, with ample room for hobbies and guests. Speaking for the jury, chairman Leon Chatelain Jr., president of the American Institute of

(Continued on page 348)

# ANNOUNCING!

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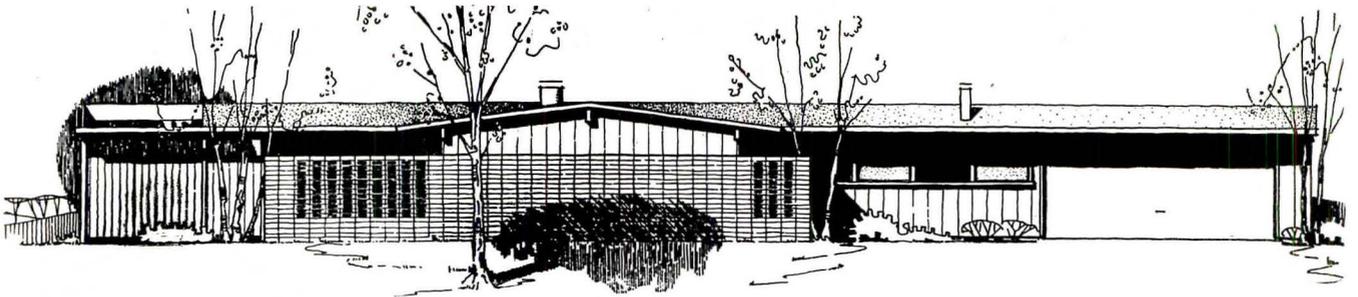
# BRIGGS

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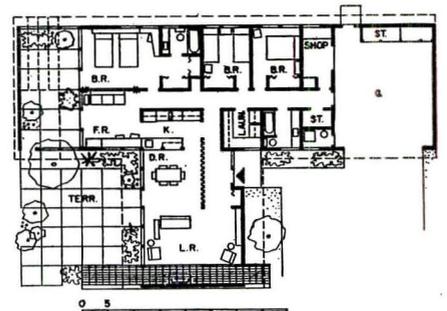
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# THE RECORD REPORTS

(Continued from page 344)



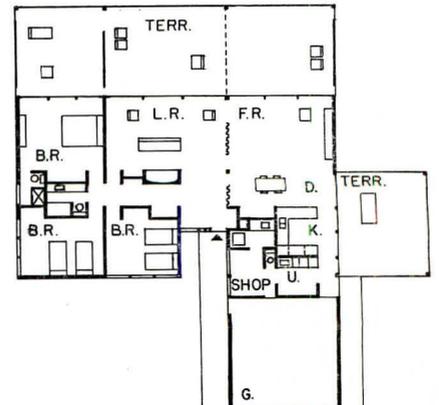
Second prize in the competition was awarded to Howard E. McCall, research associate in architecture at Small Homes Council at the University of Illinois



Architects, remarked, "All the entries were modern in the sense of crisp clean lines and effective use of space. There was no useless ornamentation even in those that showed a touch of the traditional."

Serving with Mr. Chatelain on the jury were Raymond Thompson, president of the Indianapolis Section of the Indiana Society of Architects; Howard L. White, A.I.A.; O. C. Winters, and Ben Olsen Jr., builders. Richard C. Lennox, A.I.A., was architectural advisor.

Third place was taken by Thomas S. Torke, an architectural student at the University of Illinois



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### IN SWEET'S

See 8-page Multi-Clean insert at end of Section 13 of Sweet's Architectural File. Also advertised in Producers Council Technical Bulletin.



(More news on page 348)



THE TOWN AND COUNTRY PLAZA SHOPPING CENTER, Pensacola, Fla., used 1,825 tons of structural steel, including 448 tons of AmBridge Steel Joists—all fabricated and erected by American Bridge.

## AMBRIDGE STEEL JOISTS

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# AMBRIDGE STEEL JOISTS



UNITED STATES STEEL

## THE RECORD REPORTS

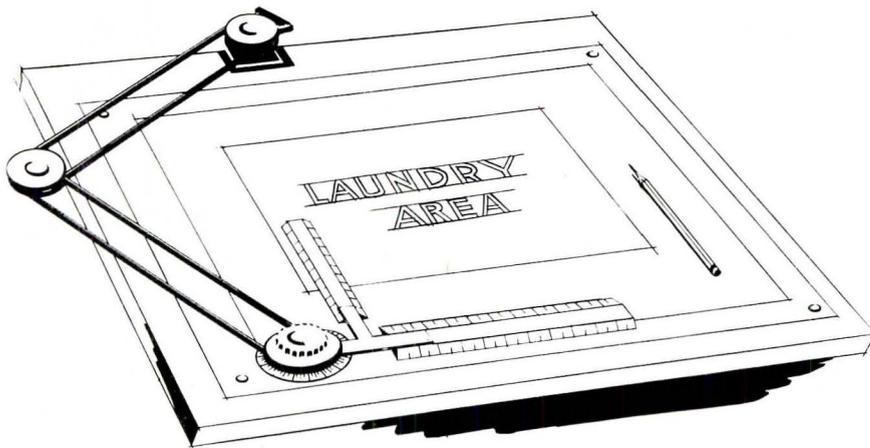
(Continued from page 346)

### BEHIND THE IRON CURTAIN: U. S. DOME AT POLISH FAIR

Assigned the problem of designing a pavilion to display such varied items of American living as automobiles, a house, fashion and building materials, New York architect Reino Aarnio has planned the U. S. exhibit pavilion for the Poznan International Trade Fair around one of Bucky Fuller's geodesic domes. The



American pavilion at the Poznan Trade Fair showed new building materials in use in the aluminum and plastic geodesic dome as well as in exhibits



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dome, which has a diameter of 124 ft., will be fabricated of plastic and aluminum in this country, shipped and erected on the fair grounds; prefabrication was also used for the full-scale model house.

General exhibits in the dome are displayed on a steel-frame balcony, running around the entire circumference of the dome, as well as on the ground floor; in the center of the dome, at ground level, the architect has planned a garden and fountain. Extra exhibition space has been gained by the addition of a single-story building surrounding the dome, and giving an overall diameter of 164 ft.

At the center of the open plaza in front of the dome, an identifying tower was built of scaffolding. The platform at the bottom of the tower will be used for fashion shows and "periodic entertainment," as will the flying bridge, which is connected by a ramp to the balcony inside the dome, extends over the garden and outside to the platform. Both bridge and platform are covered with canvas.

Visitors to the display will leave the dome twice — once to see the house (a post and beam construction with brick veneer exterior) and once to enter a smaller dome containing exhibits on research.

Automobiles will be displayed on turntables in the entrance plaza.

The Polish fair, was held June 9 to 23, marks the first time that the United States has participated in a trade fair behind the Iron Curtain. The government's trade fair program, initiated by the President in 1954 and approved last year by Congress, is carried on under the direction of the Department of Commerce.

(More news on page 350)



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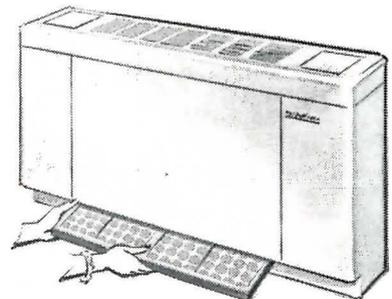
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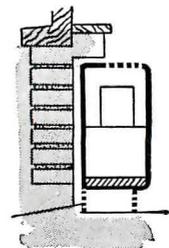
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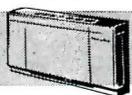


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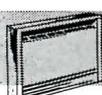


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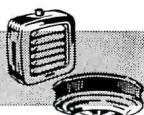
Convectors



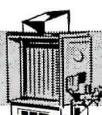
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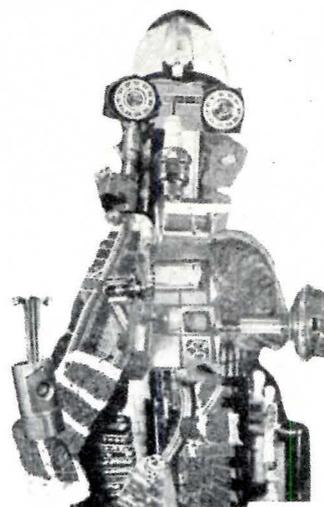


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**ARCHITECTURAL REVIEW**, May 1957 (Great Britain), a special number on "Machine Made America," paints a different picture altogether from that of the well-remembered December 1950 issue of the *Review* on "Man Made America." When the reader has overcome the initial embarrassment of the implication that our machines really do this sort of thing better than we, the report, edited by Ian McCallum, gives a

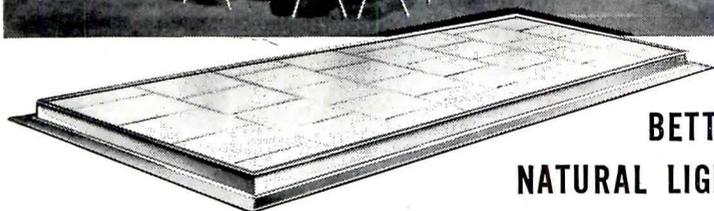
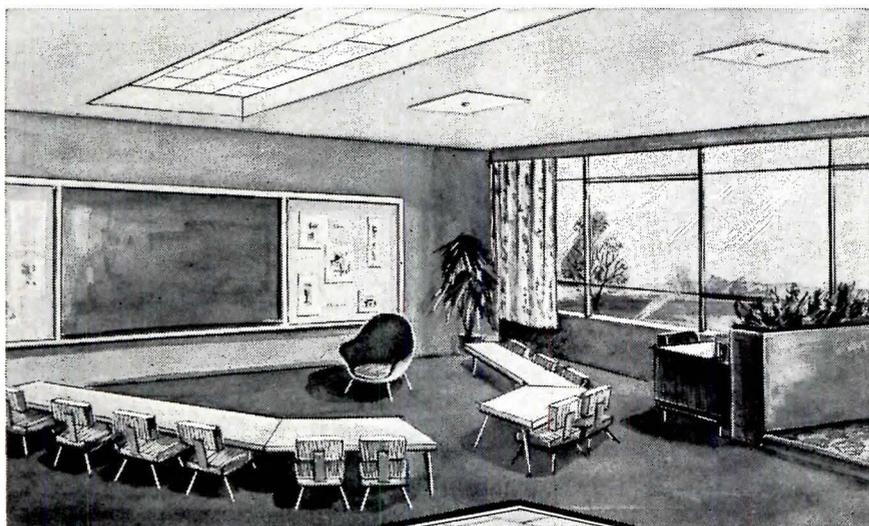
quite favorable, though not head-turning, view of American accomplishments and contributions. The two most considerable contributions, according to the *Review's* lights, are sheer quantity of building and the industrialization of the curtain wall.

"Syntax," the first of three main sections, is devoted to a study of the curtain wall, its past and present, and its implications for the future, leading,



*The Review's "cover personage"; a collage of automotive elements, pre-mixed foods, licker tape and parkways; source of the anatomical parts was "one of America's favorite flattering mirrors, colored magazine illustrations"*

## INSULATED SKYLIGHTING

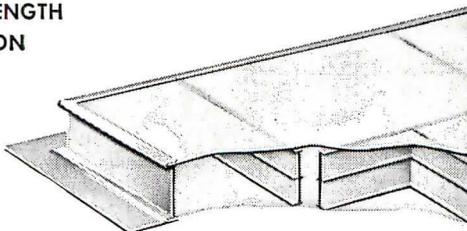


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suggests the *Review*, to a new architectural vernacular. "An age or a nation," it commented, "may or may not produce its geniuses, there is nothing at all you can do about it, but if the average man is left without terms of reference, codes of practice, vocabulary or pattern book, he flounders. And the average man, architect, builder, handyman and client has been left to flounder now for nearly 150 years without any clear architectural terms of reference. . . . The curtain wall is the first sign of such a discipline presenting itself to modern architecture and being generally accepted."

In "Genetrix," the magazine gives brief architectural biographies of 40 architects who have made "personal contributions to American architecture."

"Matrix" is an assessment of "American architecture in world perspective," and takes, for a European observer, a refreshingly lenient view of U. S. fascination with the machine: "America does not suffer from . . . inhibitions; it has kept its very real feelings of guilt well-reined in the matter. . . . Of course America is not free from fear of the possible consequences, (a little fear in this department can be a life-saver), nor is it free of laggardness in adapting itself (cf. architectural education and the landscape), but the willingness is there and the right kind of brashness is there."

*(Continued on page 352)*



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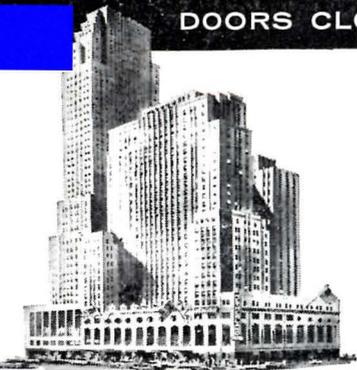
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# THE RECORD REPORTS

## CURRENT PERIODICALS

(Continued from page 350)

**L'ARCHITECTURE D'AUJOURD'HUI**, February 1957 (France), carries a report on developments in French West Africa and French Equatorial Africa, where building has flourished since the end of World War II. Much of this post-war building has been for industry, still another large part of it city planning. In 1946, plans were laid for major de-



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velopment of six cities — Dakar, Douala, Brazzaville, Conakry, Fort-Lamy and Abidjan. Two articles — one by Roland Pré, the other by Michel Weill — agree that technical gains have been made in designing for the climate, but agree also that design is "too European."

Among the buildings shown in the report: (1) Palais du Grand Conseil for French West Africa, Dakar — Daniel Badani and Pierre Roux-Dorlut, architects; (2) City Hall, Abidjan — Henri Chomette, architect; (3) office, Crédit Congolais, Leopoldville — Claude Laurens, architect.

(Continued on page 354)

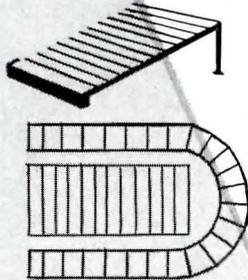
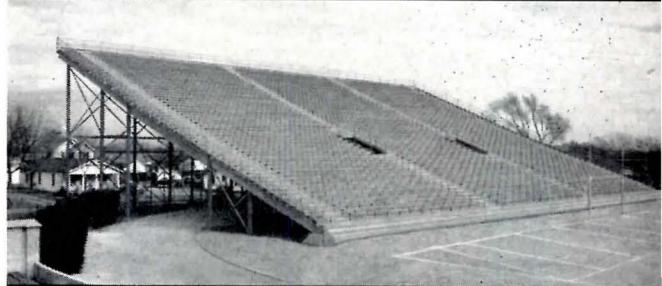
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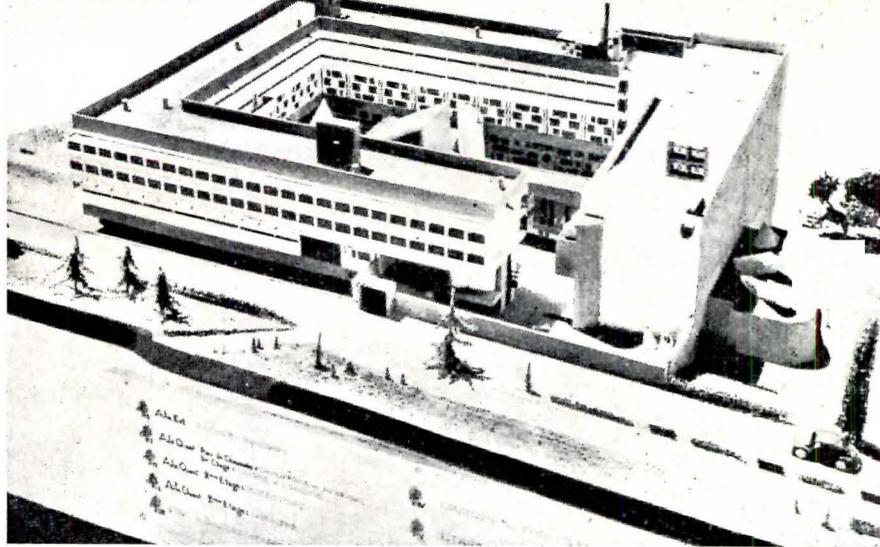
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## THE RECORD REPORTS CURRENT PERIODICALS

(Continued from page 352)

**ARKITEKTUR**, February 1957 (Denmark), is the first issue of the new journal of the Danish Architects' Federation, which decided recently to carry on its organization's business in one journal, and to produce this bi-monthly design magazine for both domestic and foreign consumption. It contains an English summary, with captions in both



**BOUW**, April 13, 1957 (the Netherlands), showed photographs of Le Corbusier's model for a Dominican cloister to be built at d'Eveux

Danish and English. Published at 66 Bregarde, Copenhagen K.

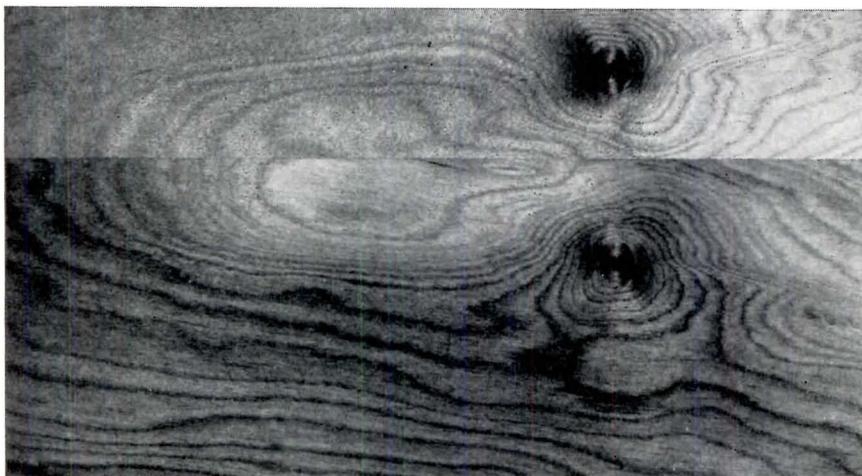
**ARCHITEKTONIKE**, March-April 1957 (Greece) is not a new magazine, though this is the first we have seen of it. It covers contemporary Greek architecture as well as some archeological findings and reports on foreign architecture, and carries translations in French, German and English, though not simultaneously for each article — most of the translations are in French. It is published at 3 Rue Kriesotou, Athens.

**DESIGN**, January 1957 (India), is, according to its subtitle, a "Review of Architecture, Applied and Free Arts." This first issue contains two text pieces on architecture, a report on town planning, and some material on Indian Art and textiles, as well as some lively criticism of the current state of Indian architecture. In English. Published monthly at Ionic, Coloaba, Bombay 5.

**NEUE LÄDEN**, October 1956 (Germany), is the second number of a journal devoted entirely, as its name suggests, to the design of stores. Captions all are in German, French and English, and an English supplement is provided. Published bi-monthly by Konradin-Verlag, Postfach 625, Stuttgart.

**SINKENTIKU**, December 1956 (Japan) is an established magazine now publishing an English edition. The English and the photography are generally excellent; a small glossary of Japanese measurements and architectural terms is provided in each issue. Published monthly at 6, 1-Chome, Takaracho, Chuo-ku, Tokyo.

(More news on page 356)



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The new Y.M.C.A. in Stroudsburg, Pa., was designed by Rinker and Kiefer, architects. General contractor: Paul L. Edinger. Both are Stroudsburg firms.

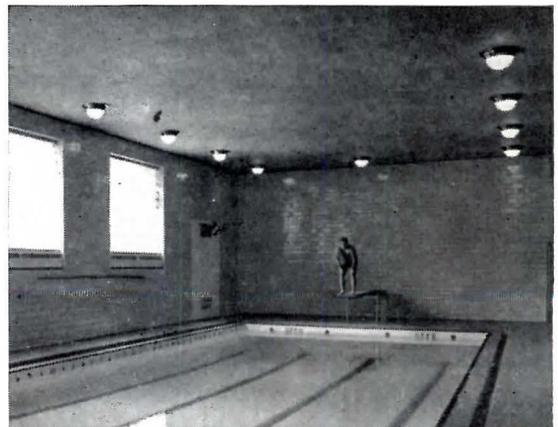
## STEEL JOISTS HELP PROVIDE FIRE-SAFETY FOR Y.M.C.A. BUILDING IN PENNSYLVANIA

The attractive Y.M.C.A. building in Stroudsburg, Pa., is a three-story brick structure containing lobby, club rooms, dormitory rooms, craft shop, kitchen, gymnasium and swimming pool.

Bethlehem Shortspan Steel Joists were used in the floor structures throughout the building. These steel joists were chosen not only because they provide a rigid, non-warping construction which keeps future maintenance at a minimum, but also because they provide a fire-resistant construction. In combination with floor slab and ceiling, steel joists provide up to four hours' fire-safety.

Bethlehem Open-Web Steel Joists offered several other advantages to the builders of the Y.M.C.A. They reached the job-site fully fabricated, tagged and ready for placing. They needed only field-welding to secure them permanently in place.

In the roof structure over the swimming pool, the builders used Bethlehem Longspan Steel Joists, giving to the swimming pool maximum unobstructed space, with no need for vertical supports. Longspans also simplified the installation of the lighting over the pool, because wires and conduits as well as piping could be run right through the open-webs.



Bethlehem Longspan Joists in the roof over the swimming pool give maximum column-free space below.

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On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

**BETHLEHEM OPEN-WEB STEEL JOISTS**

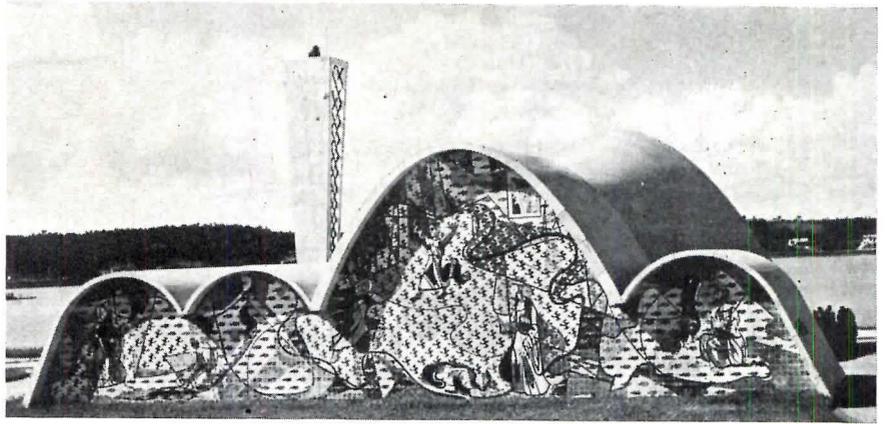


# THE RECORD REPORTS

(Continued from page 16)

in a special section covering this country, while both Europe and South America are represented in the larger section. Among the architects whose work is shown: Baudot, Auguste Perret, Guillaume Gillet, Domenikus Böhm, Erik Bryggman, Oscar Niemeyer, Felix Candela, Le Corbusier, Guiseppe Vaccaro, Rudolf Schwarz, Mr. Wright, Lloyd Wright, Pietro Belluschi, Philip C. John-

(Continued on page 358)



Above: Church of St. Francis, Pampulha, Minas Gerais, Brazil, 1943; Oscar Niemeyer, architect—“a response on Niemeyer’s part to the more emotional aspects of worship in the Latin temperament”

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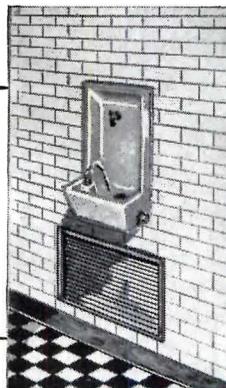


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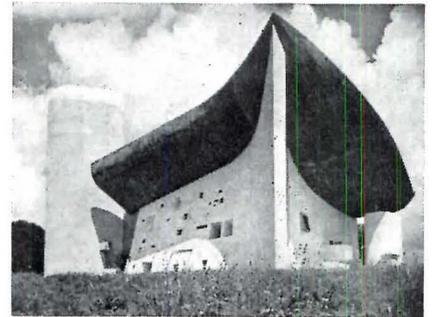
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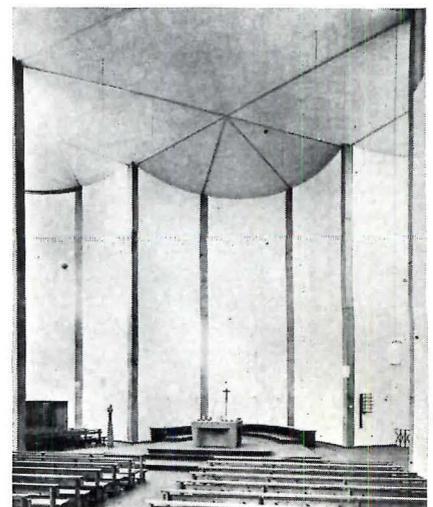
The Halsey W. Taylor Co., Warren, O.

P-73

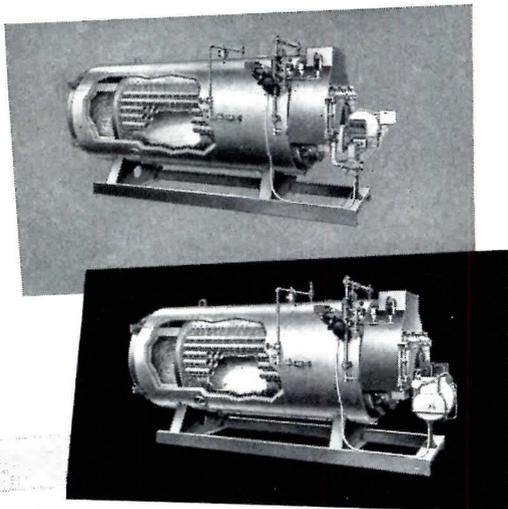
**COOLER FOUNTAINS**



Above: Church of Notre Dame du Haut, Ronchamp, France, 1955; Le Corbusier, architect—“the result of plastic and abstract curves molded and formed with consummate artistic power.” Below: Church of St. Michael, Frankfurt am Main, Germany, 1955; Rudolf Schwarz, architect—“... a fortress from the exterior . . . the interior is airy and uplifting, the scene of great architectural refinement”



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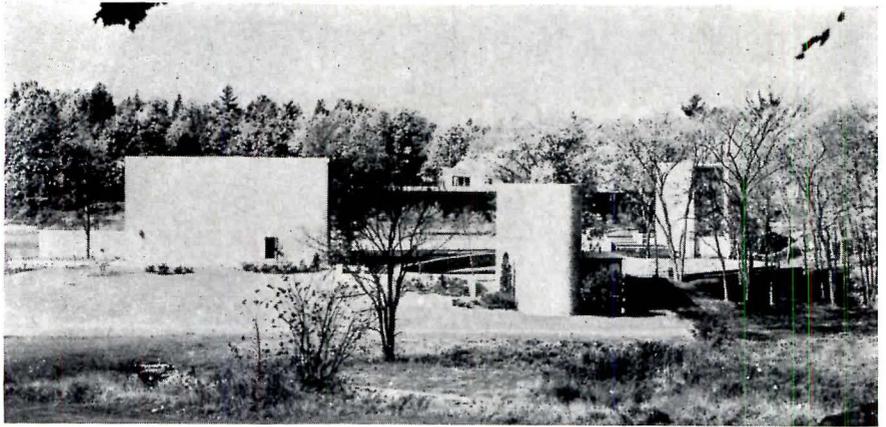
KEWANEE BOILER DIVISION

## THE RECORD REPORTS

(Continued from page 356)

son, Ludwig Mies van der Rohe, Harrison & Abramovitz, and Eero Saarinen.

The exhibit is scheduled to be seen at the Washington Cathedral, Western Michigan College, Williams College, Philips Exeter Academy and in 1958, at Washington University, the University of Michigan, the University of Illinois, Carleton College and the J. B. Speed Art Museum in Louisville.



Above: Interfaith Center, Brandeis University, 1955; Harrison and Abramovitz, architects — “chapels for divergent faiths are essential elements in a harmonious relationship — an achievement of more than passing religious significance”

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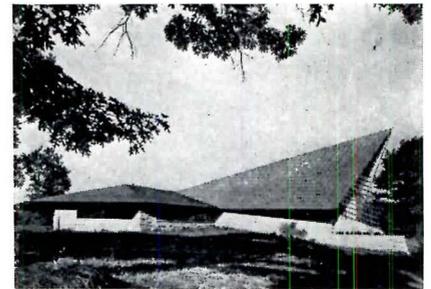
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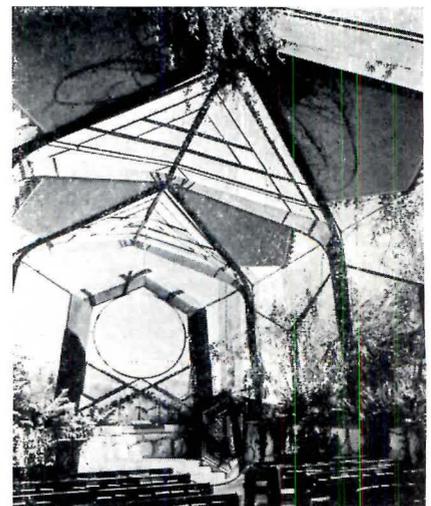
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Above: Meeting House of the First Unitarian Society, Madison, Wis., 1951; Frank Lloyd Wright, architect — “characterized by a richness that only Wright can impart.” Below: Wayfarer's Chapel, Palos Verdes, Cal., 1951; Lloyd Wright, architect — “conceived with a high order of understanding (of Swedenborg theology) and executed with great delicacy”



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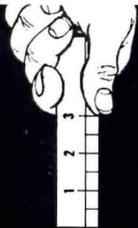
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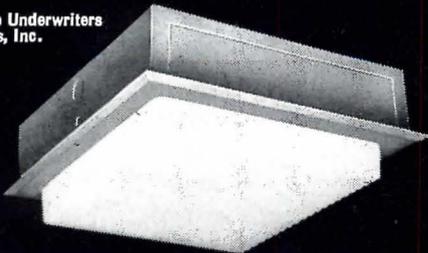


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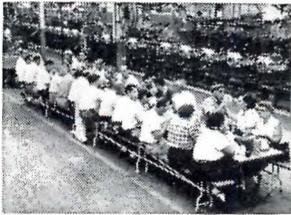
**PAROCHIAL SCHOOL**, J. Gerald Phelan, Architect



**COMMUNITY HOUSE**, Edward A. Schilling, Architect



**FIRE STATION**, Jahr-Anderson Assoc., Inc., Architects



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## REQUIRED READING

(Continued from page 62)

well past the century mark. Both the charm and the relative ruggedness of heavy adobe construction, plus a salubrious climate, seem to explain the survivals.

Mr. Lewis has written what is more a social history centered on architecture than a strictly architectural history. That is, true criticism and technical data are virtually absent, while light anecdotes abound. Nevertheless, as a collection of descriptions and good photographs of residences from adobe ranch houses to art-filled castles, the book is both interesting and valuable. The illustrations alone provide a remarkable exhibit of amazingly varied styles of domestic architecture. P. C. F.

## A SCORE FOR GINGERBREAD

*The Gingerbread Age: A View of Victorian America.* By John Maass. Rinehart & Co., Inc. (N. Y.), 1957. 212 pp, illus. \$7.95.

A book dedicated to clearing the name of Victorian architecture of years of calumny, and even to making it seem attractive and desirable, is an ambitious undertaking. Yet Mr. Maass just about carries off his self-imposed assignment. Actually, Victorian interior decoration, at least, has been enjoying something of a "comeback" in popular appreciation during the past few years. But this book is the first to emphasize the desirable attributes of the buildings put up in what critics have called the "Age of Horror."

The author goes beyond mere negative refutation of criticism. His attitude is one of positive appreciation; for instance, he is not afraid to use the word "beautiful" in describing structures embellished with scroll-work, spindle-work, towers, or cupolas. He retains some perspective, of course — he admits that one building combining Collegiate Gothic and a mansard roof is "now fortunately covered with ivy."

Mr. Maass, an art director with a Philadelphia advertising agency who also teaches at the Philadelphia Museum School of Art, portrays the American architectural scene from about 1840 to 1880 — the period when the versatile man who designed buildings often doubled as surveyors, cabinetmakers, or illustrators. (The first graduate architect in America received his diploma in

(Continued on page 382)

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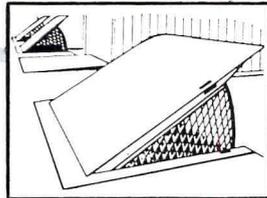
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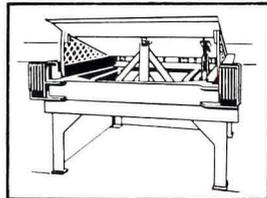
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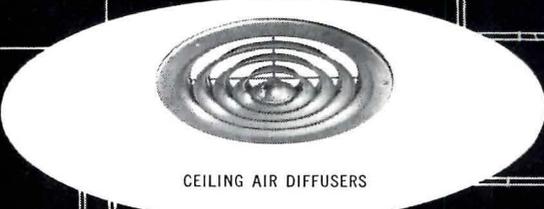
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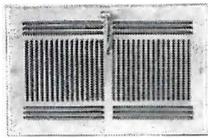


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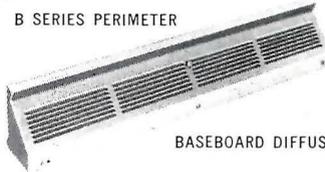
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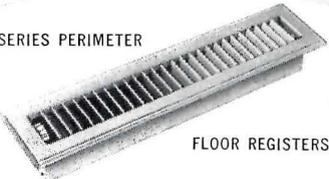
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### REQUIRED READING

(Continued from page 378)

1873.) The many fine photographs and engravings present an almost bewildering variety of styles in both houses and public buildings, from Greek Revival to Carpenter Gothic to American Mansard. The author perhaps overstates his case for Victorian, but he does so with charm and facility, and whether one agrees or not, his book is thought-provoking, and his illustrations are fascinating.

### EARLY GREEK DESIGN

*Mnesicles: A Greek Architect at Work.* By J. A. Bundgaard. Gyldendals Presseafdeling (Copenhagen, Denmark), 1957. 272 pp., illus.

This is a very complete and well-documented study of the work of Mnesicles, architect of the Propylaea of the Acropolis. The author, a Danish scholar, has produced what will obviously remain for a long time the indispensable treatment of the topic. The book includes a number of good photographs, many detailed drawings, and a key map of the site. The author evolves a reconstruction of Mnesicles' building on a somewhat new principle. He also concludes that Greek architects' greatest talents lay in the sphere of organization, rather than of creation.

### STRUCTURAL DETAILS

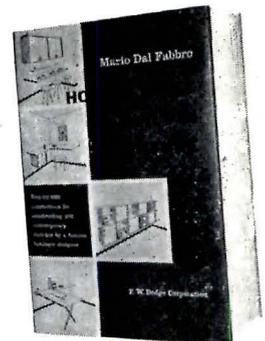
*Handbook of Standard Structural Details for Buildings.* By Milo S. Ketchum. Prentice-Hall, Inc. (N. Y.), 1957. 120 pp., illus. \$4.65.

This handy reference book contains complete sets of scaled, detail drawings of six representative-type building structures, including a complete house, a masonry building, a reinforced concrete office building, a steel frame office building, an industrial building, and a timber building.

The book deals exclusively with the preparation of working drawings, and the principle emphasis is on the routine presentation of the minimum essential information for construction. Although, obviously, structural details will never become completely standardized, the drawings shown in this book have withstood the test of use in many architectural and engineering offices.

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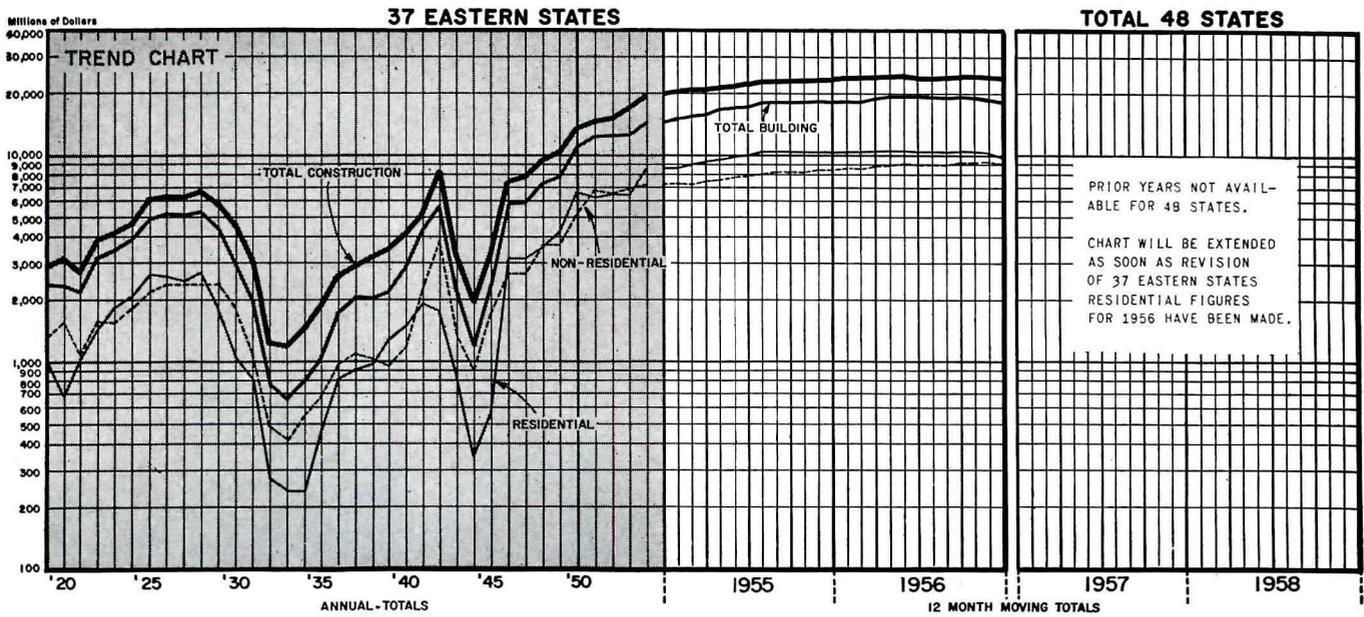
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# THE RECORD REPORTS: CURRENT TRENDS IN CONSTRUCTION

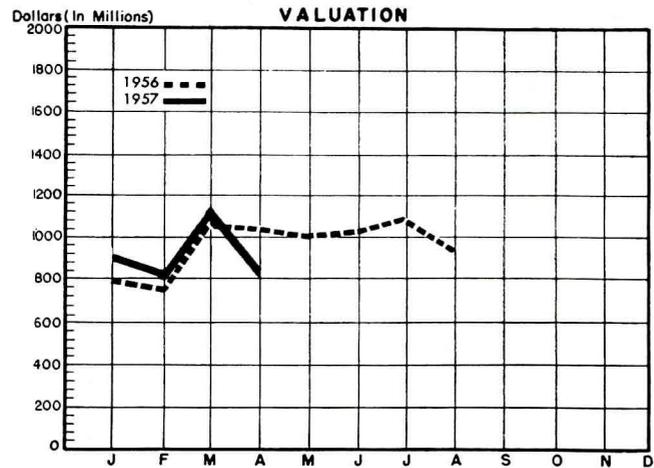


Charts by Dodge Statistical Research Service

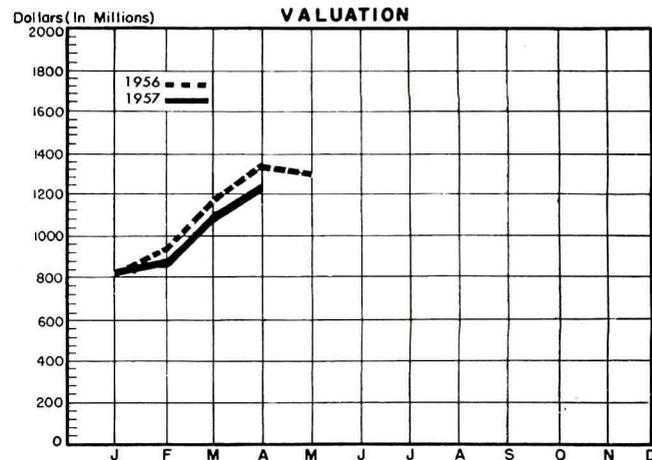
## APRIL TOTALS DROP, BUT FIRST THIRD AT '56 LEVEL

April construction contracts, reports F. W. Dodge Corporation, fell nine per cent below the level established in April 1956. Thanks, however, to a rise in March contracts, the cumulative total for the first four months of the year stayed even with those of the same period last year. The sharpest drop in April occurred in the nonresidential category, down 20 per cent at \$838,065,000. The largest decreases in this category were recorded in manufacturing and public building. (For one exception, see table below on hospital construction.) In the first four months, nonresidential contracts were about on a par with the same period in 1956; the total was \$3,664,712,000. In residential building, April contracts, at \$1,231,667,000, declined eight per cent below the April 1956 dollar figure. Residential contracts in the first third of the year were valued at \$4,031,007,000, a six per cent decline. Heavy engineering contracts were up six per cent in April with a total valuation of \$706,699,000. For the first four months of the year, heavy engineering contracts, totaling \$2,619,272,000, were up 12 per cent.

### NONRESIDENTIAL BUILDING



### RESIDENTIAL BUILDING



Source: F. W. Dodge Corporation

### HOSPITAL BUILDINGS

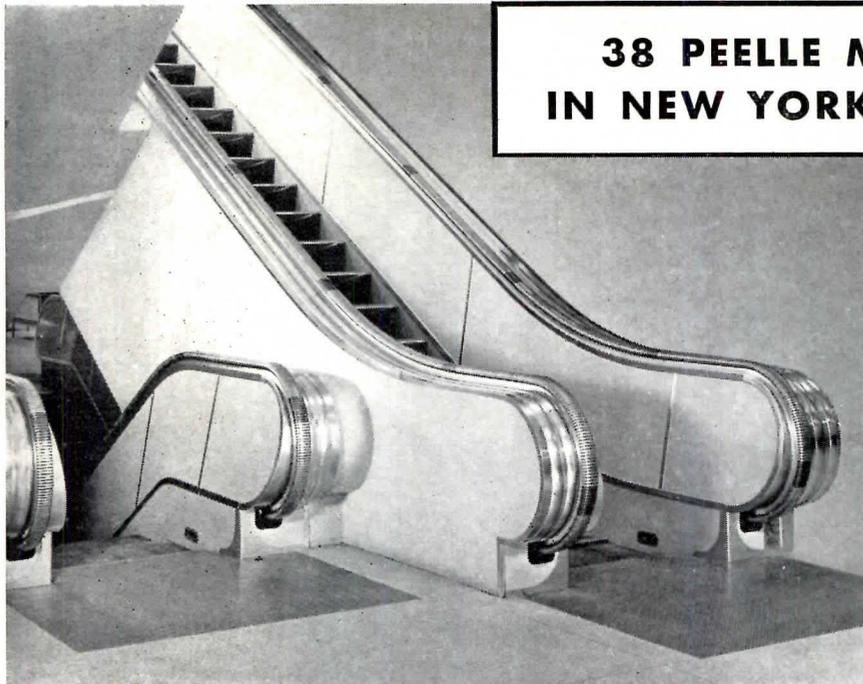
Construction Contracts—Regional Comparison

Valuation (in \$ thousands)

Region	4 mos. 1957	4 mos. 1956	% change
I (Boston District)	6,239	7,249	-14
II (Buffalo, N. Y. C., Phila.)	71,683	42,700	+68
III (Atlanta, Birmingham)	25,680	14,728	+74
IV (Cinti., Cleve., Pittsburgh)	32,352	16,625	+95
V (Chi., Detroit, Mpls.)	41,366	22,436	+84
VI (N. Orleans, St. Louis)	12,294	15,549	-21
VII (Dallas, Kansas City)	28,727	16,068	+79
VIII (11 Western states)	29,898	23,203	+29
43 states total	248,239	158,558	+57

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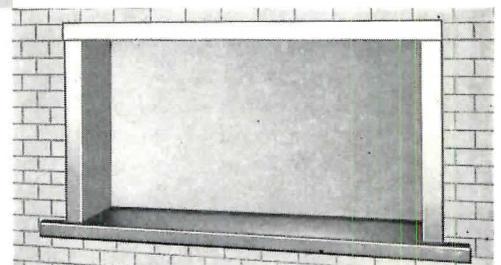
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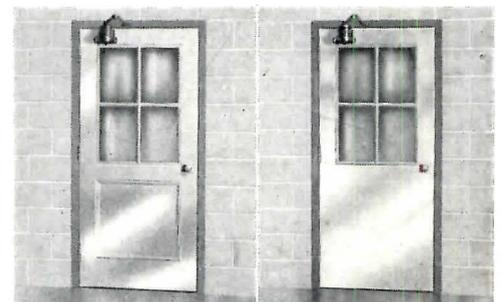
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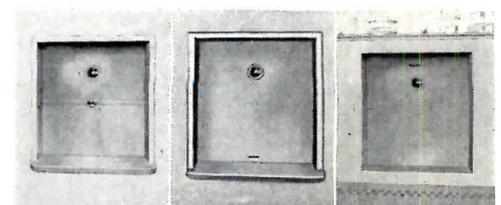
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