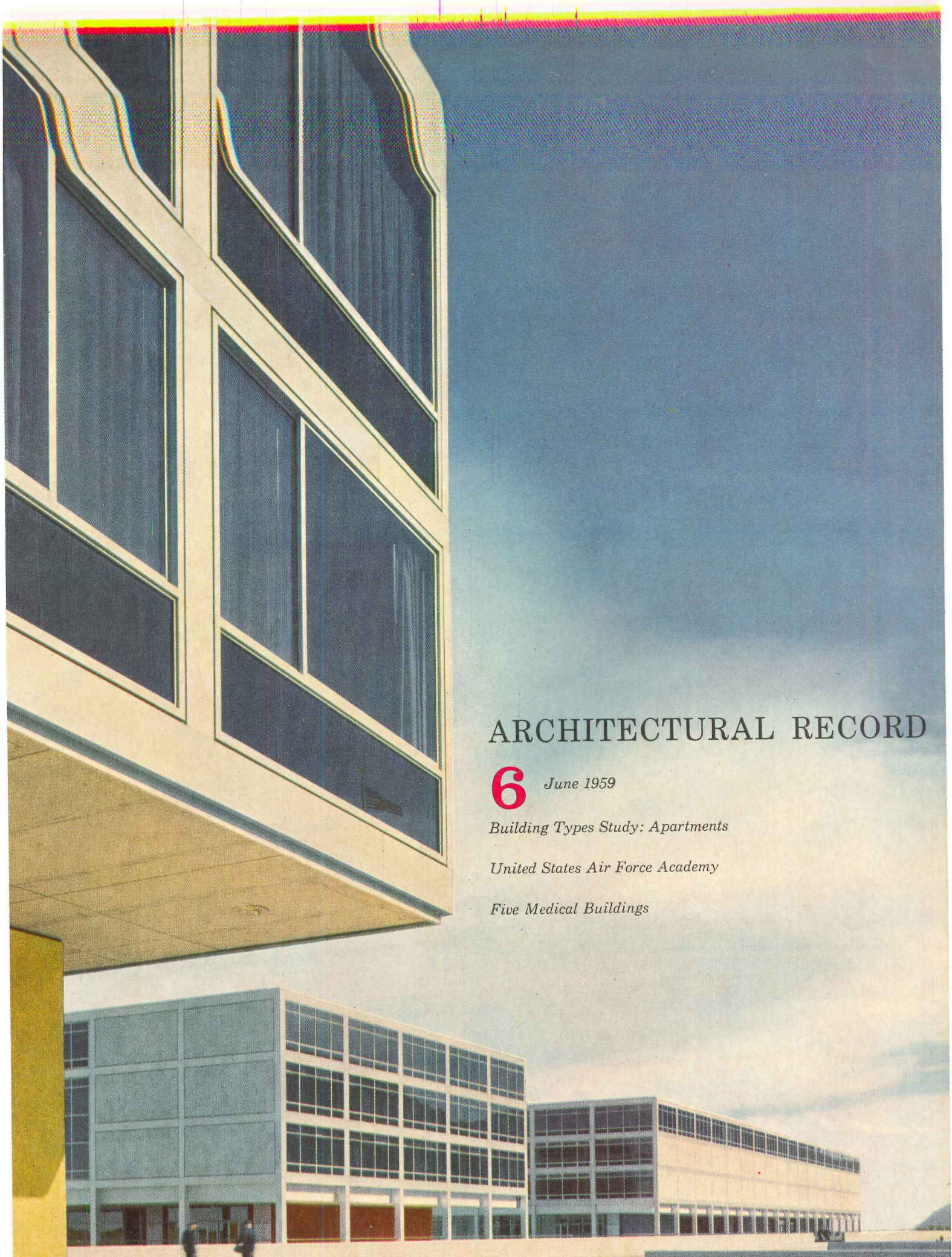


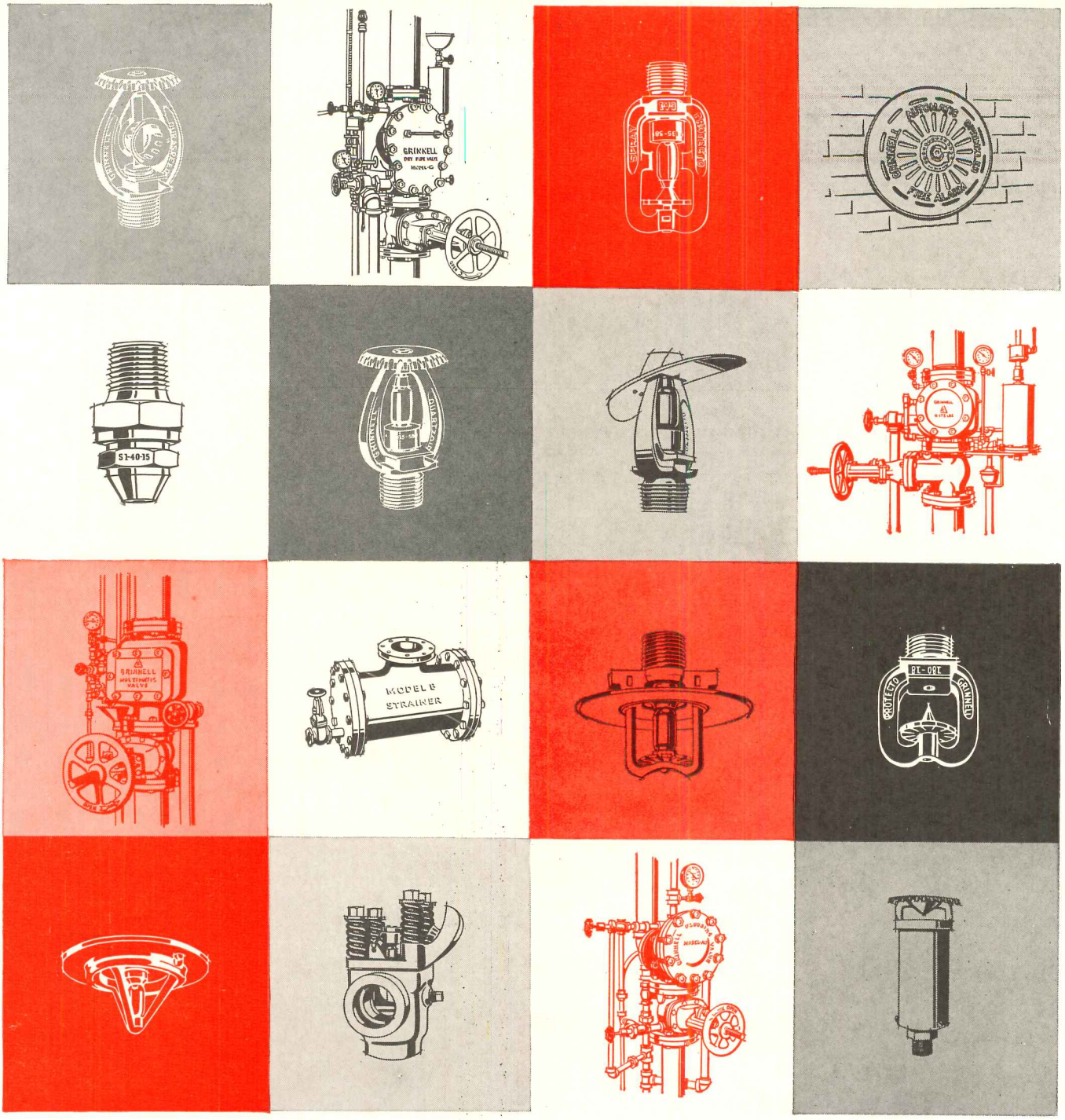
ARCHITECTURAL RECORD

6 *June 1959*

Building Types Study: Apartments

United States Air Force Academy

Five Medical Buildings



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June 1959

Cover:
U. S. Air Force Academy, Colorado Springs, Colo. Skidmore, Owings & Merrill, Architects and Engineers. Hedrich-Blessing, photo.

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Coming in the Record

ARCHITECTURE BY BELLUSCHI

A Building Types Study on Religious Buildings consisting entirely of new works by Pietro Belluschi: four buildings designed since he left the Northwest, a synagogue and three churches: a presentation generous with drawings that speak eloquently of how architecture is made.

MODERN WITH TRADITIONAL

Paul Rudolph's most important completed building to date, the Mary Cooper Jewett Arts Center for Wellesley College, has an important site in the heart of an old campus that loves its (pseudo-) traditional architecture. There will be some esthetic arguments about this one, but it will have to rank as one of the significant efforts on a front on which so many architects these days are engaged.

DESIGNED FOR "RECREATION"

A look at some of today's facilities for recreation, with an introductory article in which Dr. Karl Menninger asks some thoughtful and provocative questions about the human premises on which the programming of such facilities is based. So—what are "recreation" facilities?—in fact, what is "recreation"?

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REYNOLDS AWARD JURY REPORT—The winner of that richest of annual architectural competitions, the $25,000 R. S. Reynolds Memorial Award, was announced last month (page 10). The announcement was accompanied by a unanimous jury report which was at once highly enthusiastic, comprehensive and thoughtful. The most significant portions of that report are published below

In the dramatic structure selected, aluminum is not used as ornament, but as an intrinsic element of shelter and acoustic reinforcement. The web structure creates a form designed to bring the sound and sight of a musical performance not only to 2100 people seated under the aluminum roof, but to 20,000 others seated on the lawn under the sky. The design accomplishes this relationship gracefully, with maximum efficiency and unity.

The Sidney Myer Music Bowl is a direct and simple solution of a project needed by every community or city of any size in the world; a building used by the people, semi-enclosing space for a cultural purpose; and space in or adjacent to a city is our most precious commodity today. . . . In this project, the design of structure and site are inseparable, and are handled with equal skill and grace. Earth movement is used as an architectural tool to simplify the visual scene by suppressing the "business end" of the stage, to provide good visibility for a tremendous audience, and to extend the natural hilltop as two arms embracing the listeners and shielding them from distracting sights and sounds of the city. Many attempts have been made to achieve continuity and unity of a sheltered, formal area and a great outdoor expansion area, but none appears to have been as successful as this one. It is interesting and refreshing to a jury drawn largely from the U. S. A. to find not one single automobile parking space on the site plan.

The winners, in their design, have sought to solve many significant problems. This they have done with utmost simplicity and ingenuity. First, they have tackled the problem of outside noise interference. By an ingenious site plan and the use of molded ground coupled with judicious overhead shielding, they have attempted to isolate the performance from nearby city noises. Second, they have dealt with the problem of shelter. By the skillful configuration of a tent-like hanging roof, they have achieved a form suitable to its purpose—a band shell drawn out to cover a section of the audience. Compression is consolidated in two vertical steel columns. All other structural members are cables.

The hanging roof always has two inherent problems: (a) The first is to achieve a contour of a saddle shaped nature so that the cables in one direction will hold up the roof, and in the other direction, hold the roof down. This problem is excellently solved. (b) The other problem is the covering material, which usually creates great difficulty. The large thin sandwich of 7- by 25-ft aluminum-covered plywood is a superb answer to the problem.

A recurring problem with this type of roof is the warped parallelogram formed by the basic web of cables. Choosing a material which can be job-cut is a "fitting" solution. Choosing a metal which has the flexibility needed to bend according to the curvature of the roof is also excellent. The sandwich is prestressed and therefore controlled. The aluminum skins, applied in hot presses, shrink after manufacture, keeping the plywood in compression.

The detailing and the development of the joints, castings and connections is accomplished with real authority and utmost simplicity; but the most important contribution is the selection of a superior skin for a two-way cable roof.

The design has application far beyond this specific problem. We are coming into an era where larger and larger light-weight, space-spanning structures will be needed. Many drawings or diagrams of what such shapes might be have been published, but few proposals have solved the most difficult problem—the skin itself.

The successful designers have created a complete skin vocabulary; that is, its connection, and its fabrication method. This is a real contribution. Of all projects submitted, this project offers the most significant building material application—an aluminum sandwich applied to a cable frame.

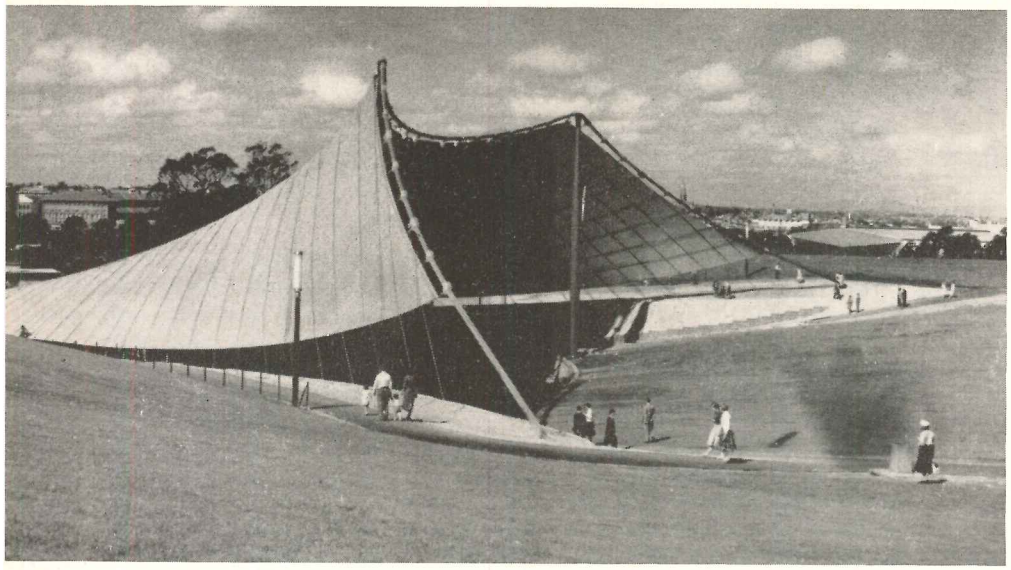
We live in a world separated by man-made walls. The language of one specialist has become almost incomprehensible to another. Architecture, a profession straddling the gap between an art and a science, fills an unique role. The winners of this competition have done a remarkable job in joining several sciences and arts all into one cohesive design concept. This comprehensive structure demonstrates their combination into one unity; architecture, structural and electrical engineering, acoustics and landscape design become one. But this is architecture!

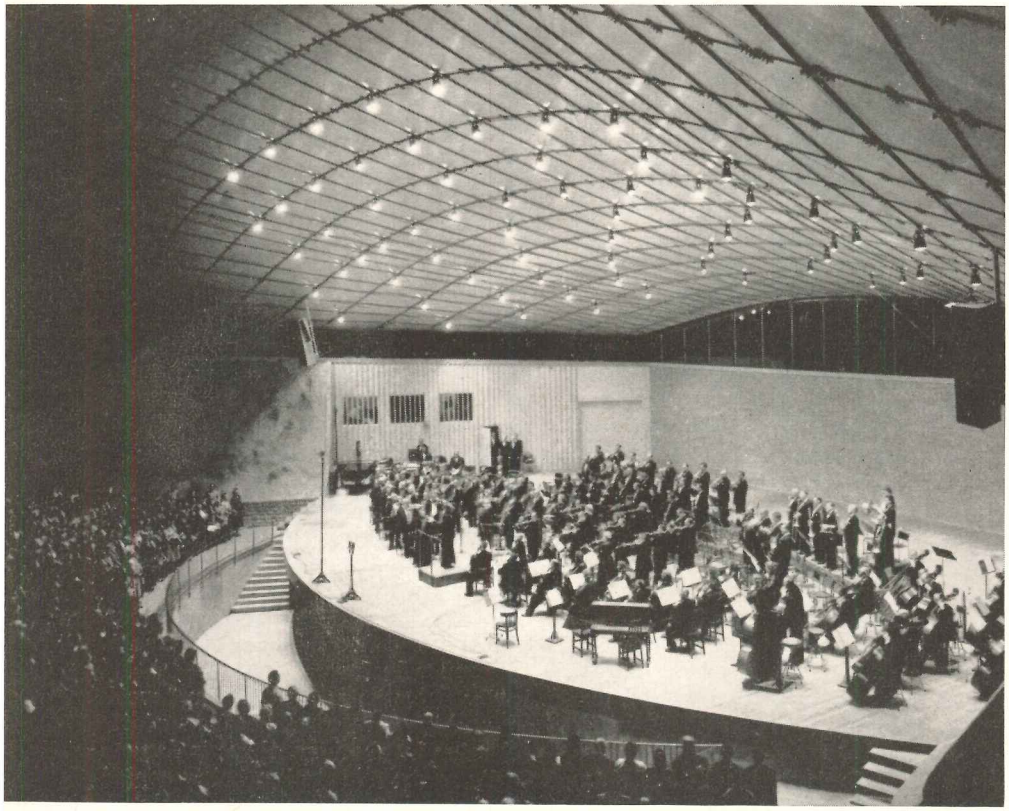
This performance is carried out in such a way that contributing disciplines are completely intertwined; the surface configuration serving as a reflecting surface for the music is also the structural shape of a hanging shelter; the molding of the landscape around it deflects unwelcome sounds from the surrounding city, and incidentally also disposes of the earth left over from the excavation of the bowl. In architecture today there seems more than ever before to come a real satisfaction out of the complete intertwining of purpose, structure, economy and form. Our time almost seems to be saying, "Vitruvious was right—commodity, firmness and delight; but do it all together. *Do it all with the same thing.*" . . . In summary, what is the big concept? In essence it is an acre-sized umbrella—artistically, technologically conceived as semi-outdoor space in which the forces of science, art, and economy have been brought into pleasing equilibrium to produce a protected amphitheater for a vast audience. Here we have an architecture that is a strong statement of the problem-solving approach, which results in a fresh, original solution.

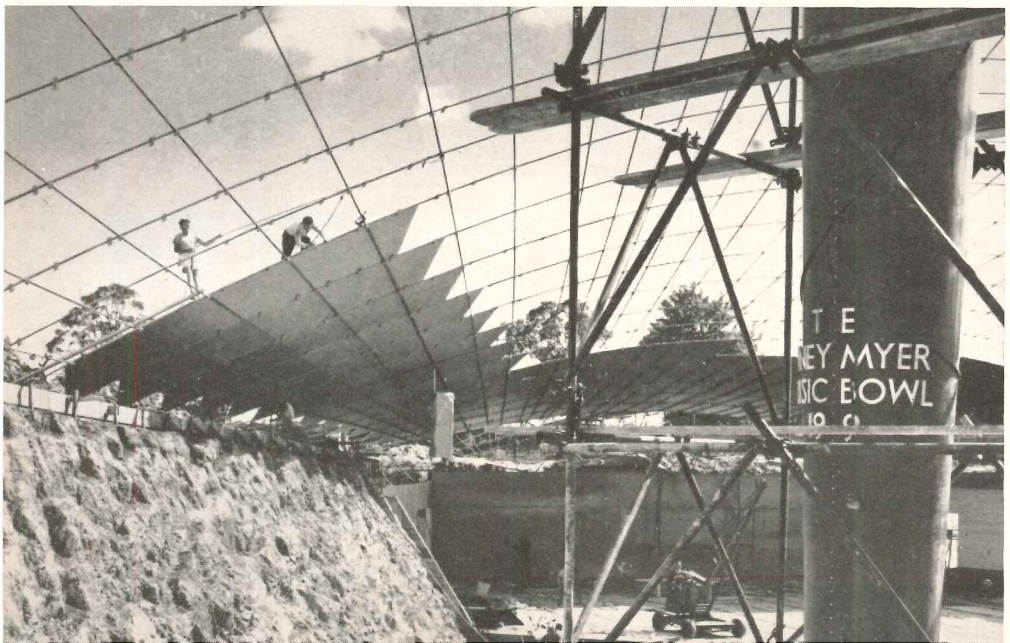
The solution is a significant work of architecture, and because of its selection by the jury, there is danger in its shape and design being copied blindly, without regard to scale or suitability. Many results of this misinterpretation would be grotesque distortions. On the other hand, if the approach and principles of the winners are followed, architecture may soar to new levels of freedom, utility and grace.

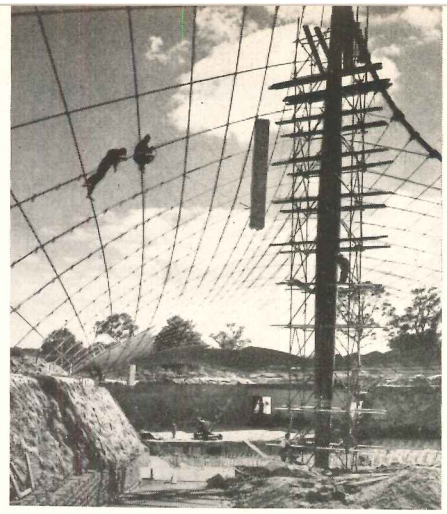
Reynolds jury: (left to right) William Caudill, John N. Richards, Robert A. Alexander, Eero Saarinen, Carlos Contreras

Buildings in the News









Australians Win Reynolds Award For Aluminum-Roofed Bowl

Winner of the third annual R. S. Reynolds Memorial Award for the best use of aluminum in architecture is the Melbourne architectural firm of Yuncken, Freeman Brothers, Griffiths & Simpson for designing the Sidney Myer Music Bowl in the Australian city. Barry B. Patten was named as the firm member most responsible for the design.

The American Institute of Architects, which administers the award each year, announced that the $25,000 honorarium and aluminum emblems are to be presented during the A.I.A.'s convention this month.

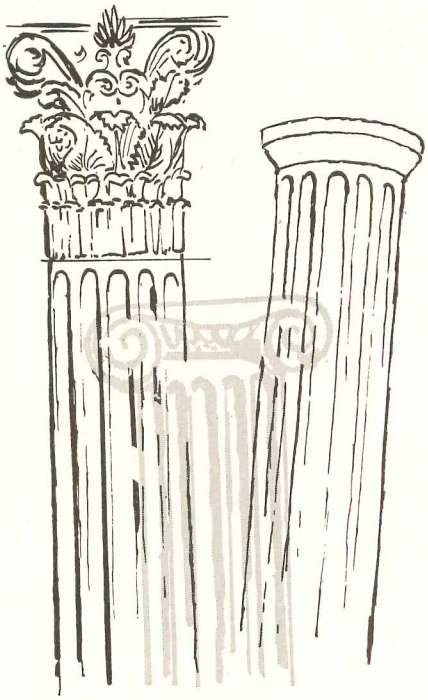
Members of the jury were: Robert E. Alexander, F.A.I.A. (chairman); John Noble Richards, F.A.I.A.; Eero Saarinen, F.A.I.A.; William W. Caudill, A.I.A.; and Carlos Contreras, Hon. F.A.I.A. The jury considered 52 entries from the United States and 11 other countries.

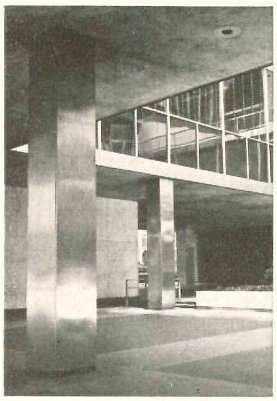
Placed on a 10-acre site in a park near the center of Melbourne, the £A200,000 Music Bowl was completed last December after less than a year of construction. The 40,000-sq-ft roof shelters 2100 people; some 20,000 more seated on the lawn can both see and hear. The 6000-sq-ft stage has dressing rooms, etc., under it.

Extensive research led to the use of a roof covering consisting of marine-grade plywood sheathed on both faces with 26-gauge aluminum. The two construction photos show stages in the installatcn of the "sandwich" sheets over a two-way cable system. The main cable is supported by two 72-ft steel masts. All cables are anchored in the ground by concrete blocks or strips.

The winners cf the two previous Reynolds Awards were: seven Belgian architects—T. and F. Hoet-Segers, H. Montois, R. Courtois, J. Goossens Bara, R. Moens de Hase, Abraham Lipski—for the Transportation Building, Brussels World's Fair (1958); and the Spanish firm of Cesar Ortiz-Echague, Manuel Barbero Rebolledo y Rafael de la Joya for the Lounge Center, S.E.A.T. factory, Barcelona (1957).

Armco Steels / for Architecture





Lever House, New York
Architects: Skidmore, Owings & Merrill

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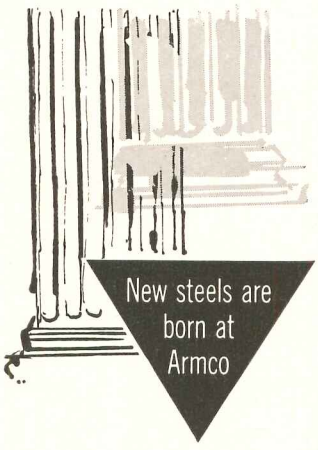
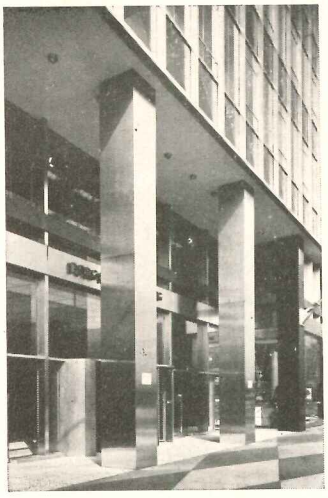
First National Building, Tulsa
Architects: Carson & Lundin





Prudential Building, Chicago
Architects: Naess and Murphy

Borg-Warner Building, Chicago
Architects: A.Epstein and Sons, Inc.
Consultant: William Lescaze, FAIA

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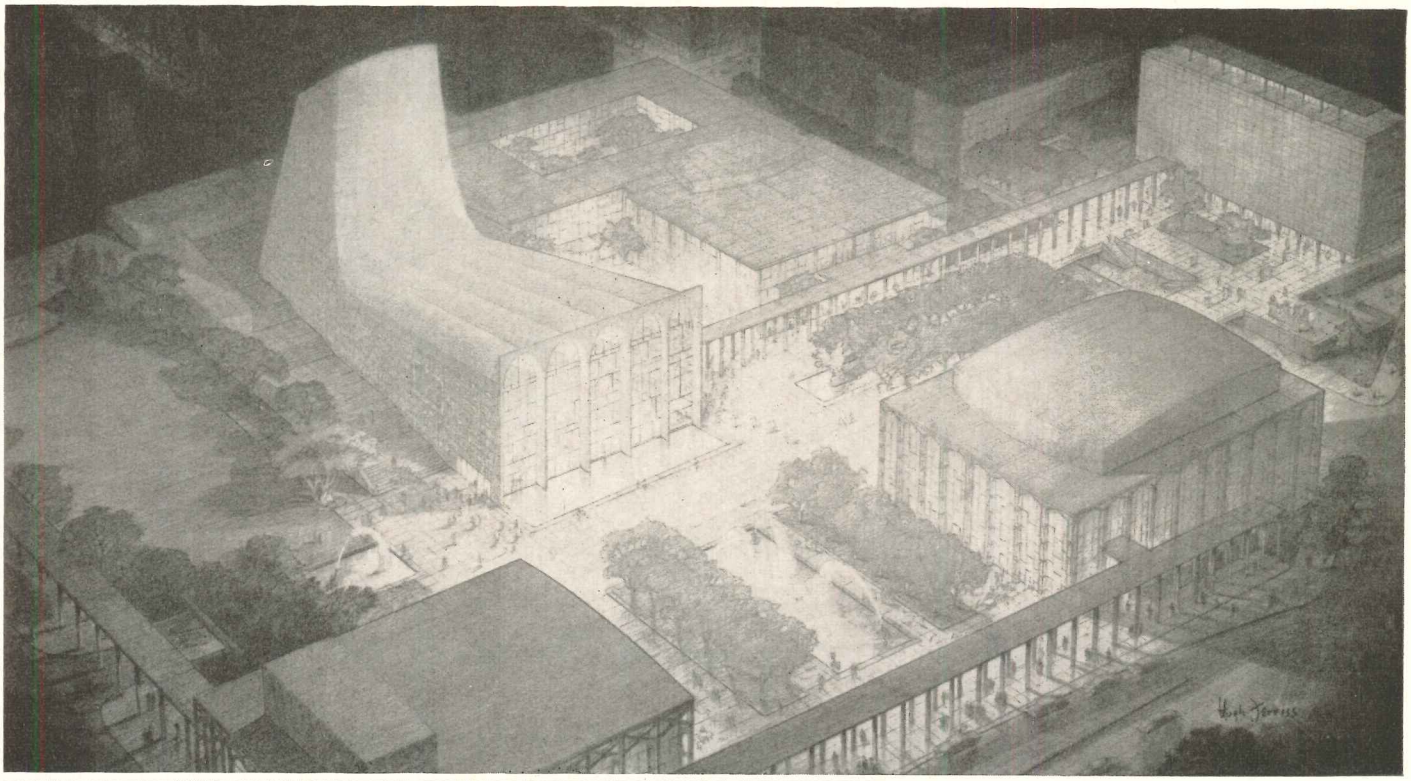
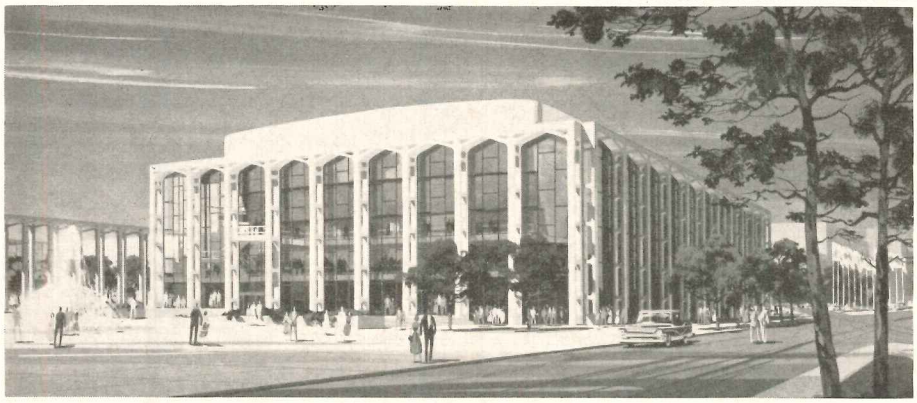


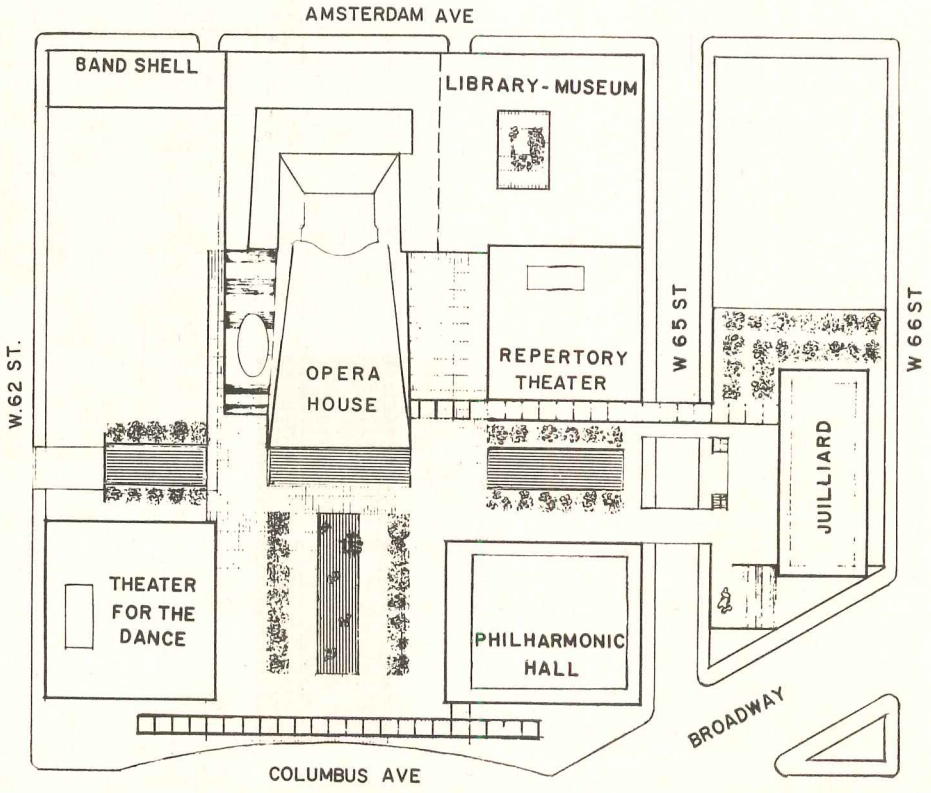


The latest rendering of Lincoln Center shows, clockwise from lower left, the Theater for the Dance, the Metropolitan Opera House, the Library-Museum of the Performing Arts and Repertory Theater adjoining it, and, across 65th St. at upper right, the Juilliard School and its residence facilities. The $9.8-million Philharmonic Hall, now under construction, is at lower right and, *left*, in the separate rendering. Reflecting pools and colonnades are featured in the site plan; a city park is also included. It should be noted that except for the Philharmonic Hall all buildings are shown in purely schematic representations; designs are all in development stage

Philharmonic Hall Under Way: Lincoln Center is Started

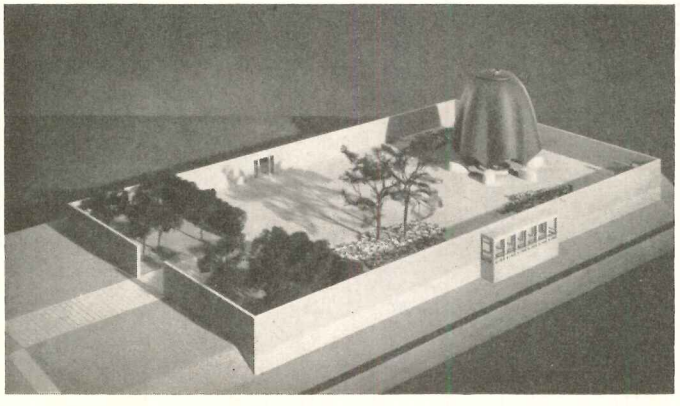
President Eisenhower broke ground on May 14 for the $75-million Lincoln Center for the Performing Arts in New York, and construction of the Philharmonic Hall began.

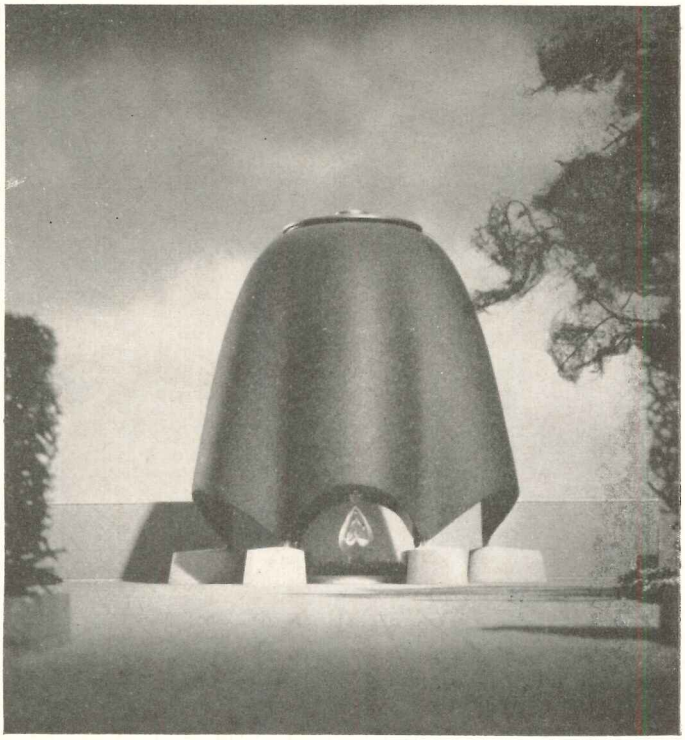
Wallace K. Harrison of Harrison & Abramovitz is chief architect. Other commissions so far are: Philharmonic Hall—Max Abramovitz of Harrison & Abramovitz; Metropolitan Opera House—Wallace K. Harrison; Dance and Operetta Theater—Philip Johnson Associates; Juilliard School—Pietro Belluschi; Repertory Theater—Eero Saarinen (Jo Mielziner, collaborating designer); Library-Museum—Skidmore, Owings & Merrill (preliminary design consultants). General contractors are a group of four firms associated as a joint venture—Turner Construction Company, George A. Fuller Company, Walsh Construction Company and Slattery Contracting Company.



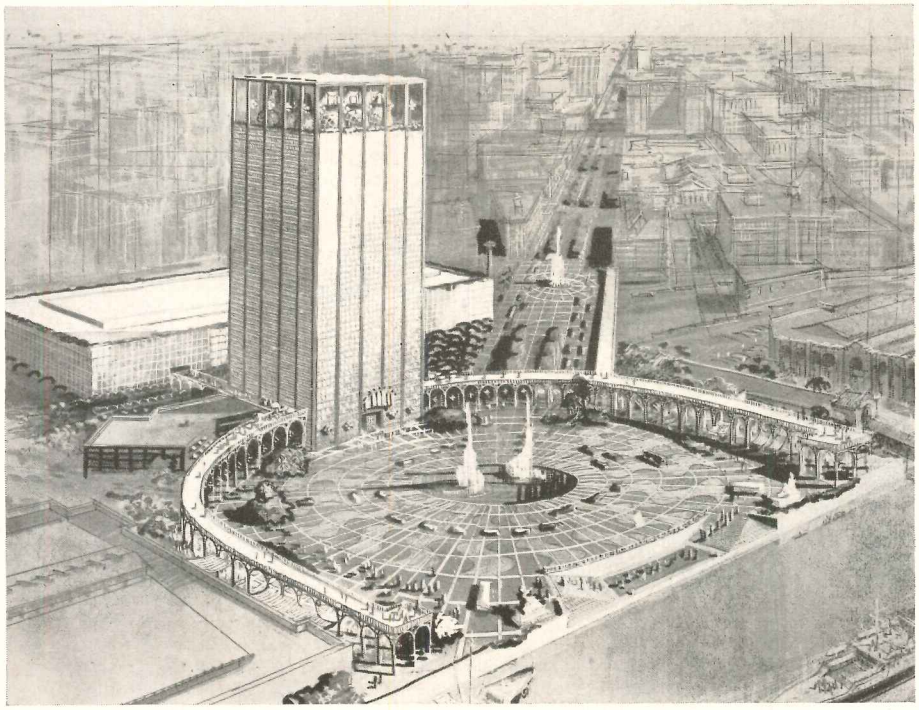
The William B. Greeley Memorial Laboratory at Yale University was dedicated last month. Paul Rudolph, chairman of Yale's department of architecture, was the architect. The $600,000 building, named for a graduate of the School of Forestry at Yale who was a former chief of the U. S. Forest Service, is to be used by the school for graduate instruction and research in forest biology and wood technology. The one-story structure, 100 by 164 ft, "is conceived as a pavilion with a single hovering roof supported on precast concrete columns," according to Mr. Rudolph. "These Y-shaped columns . . . are placed in front of a glass and marble-chip spandrel wall to gain the maximum amount of play of light and shadow and to give a measured rhythm to the façade." The individual laboratories are grouped around a central service spine. Five kinds of wood veneer (Honduras and Philippine mahogany, oak, black walnut, cherry) are used for interior wall paneling; flooring is wood block. Charles Brewer, associate architect; Henry A. Pfisterer, structural engineer; Hubbard, Lawless & Blakeley, mechanical engineers; Dwight Building Co., general contractor

Construction started last month on a shrine in New Harmony, Ind., designed by Philip Johnson in collaboration with the sculptor Jacques Lipchitz. The non-denominational structure, being erected by the Robert Blaffer Trust, has dual related purposes: it is intended in part as a memorial to the Rappites—religious group that founded the town—and Owenites—successor communal group that set up pioneering educational and cultural programs there; it is also intended as the nucleus of a cultural and religious renaissance planned for New Harmony. The shrine, two blocks from the business section, consists of a brick wall, 12 ft high, enclosing a 250-by-150-ft area; two bronze doors (not shown in model) designed by Mr. Lipchitz form the main entrance. The bell-shaped structure is primarily a shelter for Mr. Lipchitz' large bronze statue, "The Virgin" (shown in photo at right). Mr. Johnson has put the shelter on six blocks of stone, each 9 by 6 ft and 6 ft high, arranged in a 50-ft-diam circle. From each rises a laminated fir support; the supports curve to join with a 6-ft-diam brass ring, forming a hole 50 ft from the ground. Ribs of laminated fir join the supports. The skin is plywood covered with cedar shakes. Sunlight through the top hole emphasizes the statue. Traylor Bros. Construction Co., general contractor

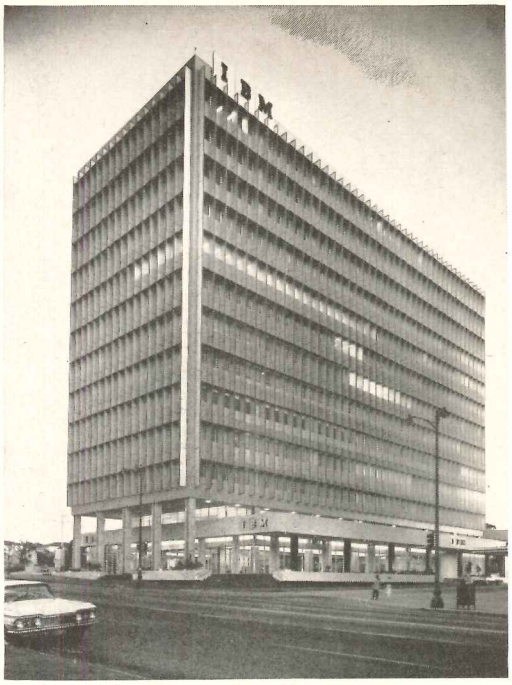




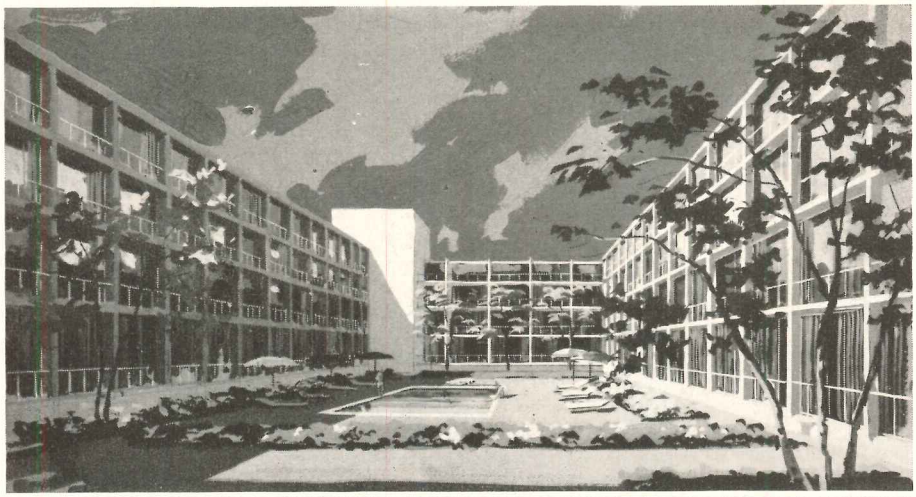
Buildings in the News

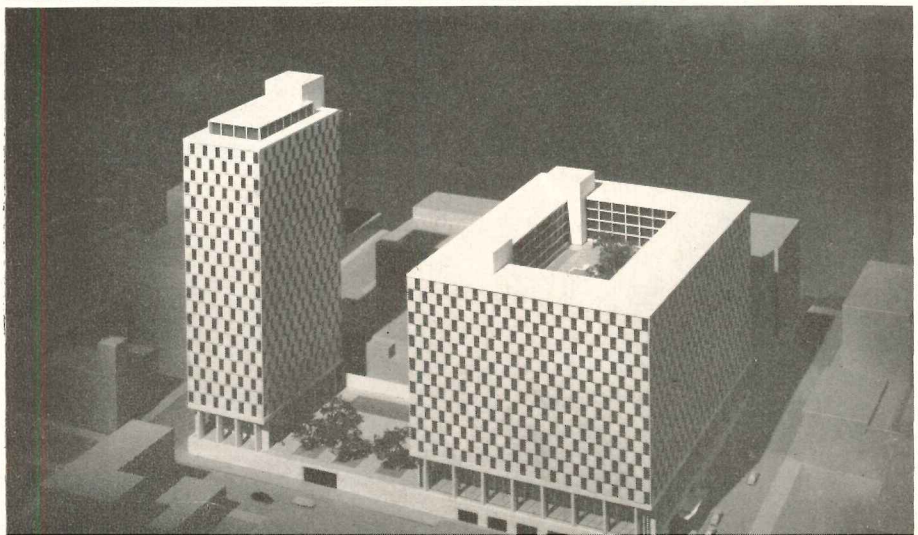


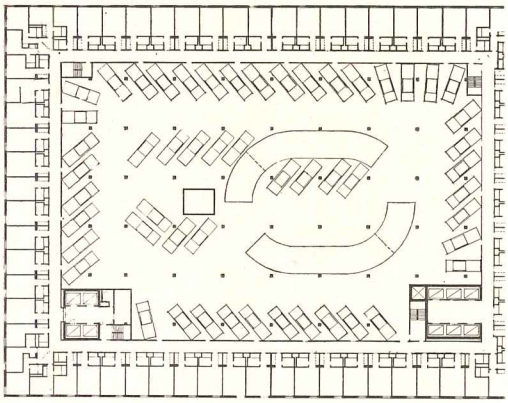
The design by Edward D. Stone for a proposed new International Trade Mart for New Orleans would include, in a $10-million group of buildings: a 19- to 21-story office and exhibition tower; a building combining parking facilities and an auditorium, to be connected with the tower by elevated ramps; two colonnades curving from the tower to the edge of the Mississippi River, enclosing a paved plaza; a paved mall. It is hoped that construction can begin next January. The 190-ft tower is about 150 ft on each side and provides some 300,000 sq ft of office and exhibit space; its vertical ribs are covered in gold-anodized aluminum; its two top stories, glass enclosed, contain tourist, bar, and restaurant facilities. The four-story building behind, 450 by 200 ft, holds 600 cars on three floors and provides 75,000 sq ft for its top-floor auditorium. Visitors would be able to stroll along the tops of the colonnades rimming the 500-ft-wide plaza



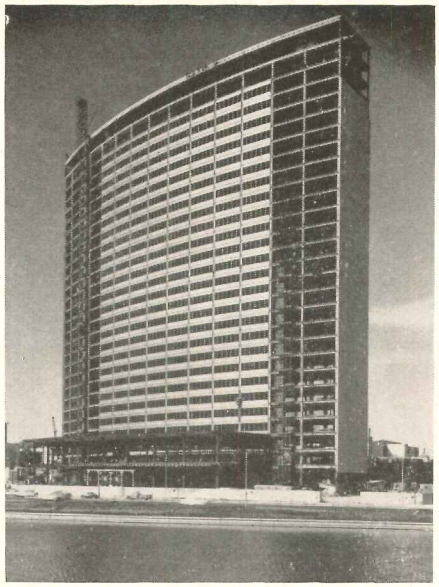
The new Western Headquarters of the International Business Machines Corporation in Los Angeles was opened recently. The 13-story steel and concrete building features horizontal and vertical aluminum fins and louvers for day-long sun control. A glass-enclosed reception lobby contains a 25-ft-high brass and bronze sculpture by Bernard Rosenthal. The building is the center of I.B.M.'s operations in the 11 western states, Texas, Alaska, and Hawaii. Pereira & Luckman, architects; McNeil Construction Co., general contractor





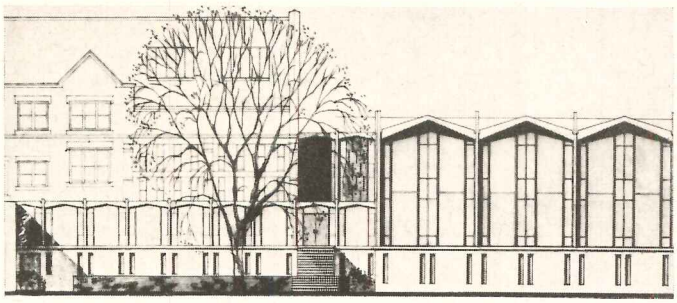


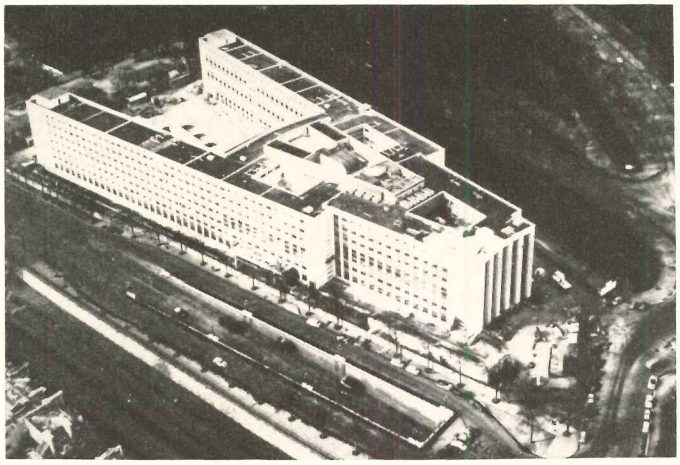
Expected to go out for bids next month is the San Francisco Hilton, to cost $25 million. The 18-story hotel includes parking facilities (see floor plan) on the fourth through 10th floors for some 400 cars; a guest will be able to drive up ramps in the center core and park near his room. About 300 more cars can fit in the three-level basement garage. A penthouse courtyard (see rendering) occupies the top four floors. The building includes 1200 guestrooms on 15 floors. The 20,000-sq-ft ballroom is one of the largest hotel ballrooms in the world; there are also nine private dining rooms, a main dining room, cocktail lounge, coffee house, and two specialty restaurants. Reinforced concrete is used for construction, with a concrete exterior. (A 22-story office building, also shown in the model, is being considered as part of the project.) William B. Tabler, architect

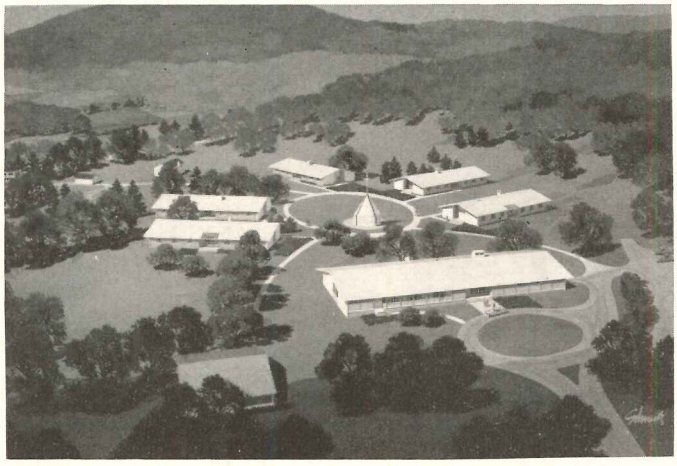


Far left: Southland Center in Dallas, recently dedicated, is a $35-million project with a gross floor area of 1,519,902 sq ft. The 42-story Southland Life Tower is connected with the 29-story, 600-room Sheraton-Dallas hotel. Both are clad mainly in prefabricated light-weight aggregate panels, anodized aluminum, and glass. Welton Becket & Associates, architects; Mark Lemmon, consulting architect; Murray Erick Associates, structural engineers; J. W. Bateson Co., Inc., general contractor. *Left:* Aluminum alloy curtain walls and solid dolomite-embedded concrete end walls mark the 976,000-sq-ft, 28-story Kaiser Center Building, Oakland, Calif., under construction. Welton Becket & Associates, architects; Robert E. McKee, general contractor

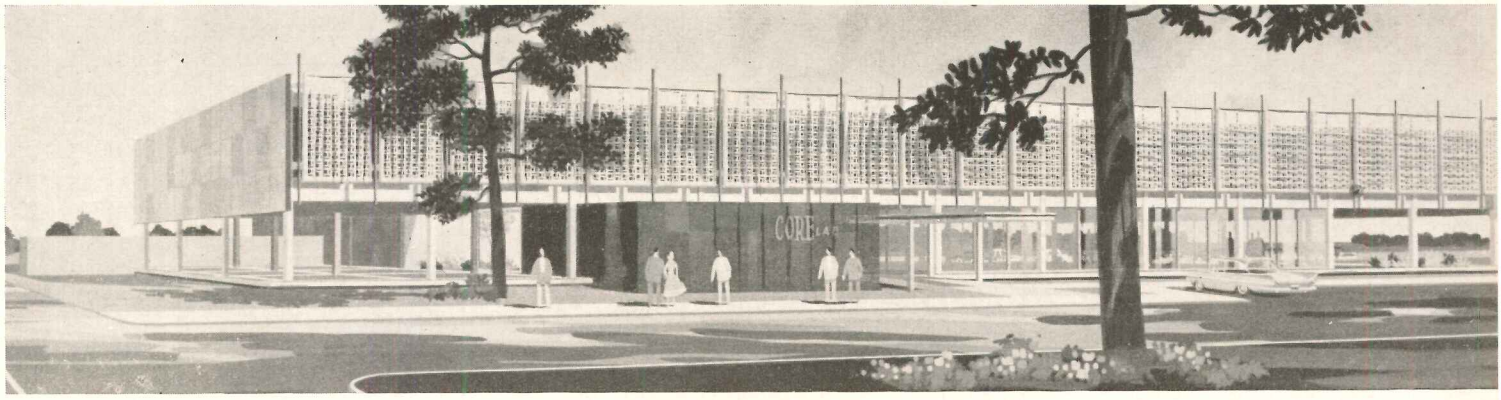
Right: A new library wing for the Harvard Divinity School is expected to cost more than $600,000. The building, which has a limestone and glass façade, adjoins the present library. It provides reading, study, and office space, as well as three below-ground stack floors. Shepley, Bulfinch, Richardson & Abbott, architects. *Below:* The permanent headquarters of the North Atlantic Treaty Organization is nearing completion. The building stands on land donated by France at the Porte Dauphine on the edge of the Bois de Boulogne in Paris. There are some 900 offices, a main council hall seating 1500, a sixth-floor restaurant and bar overlooking both the park and the Arc de Triomphe, a library, and other facilities. Contractors from all NATO nations helped erect the structure. Jacques Carlu, architect



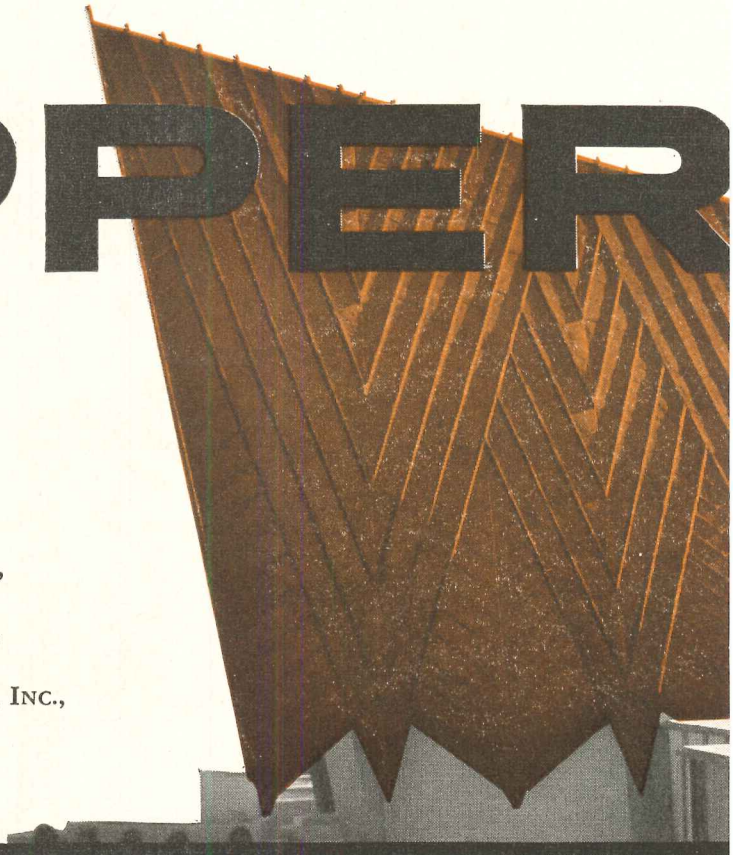




. The rendering shows the Ecumenical Training Center built in Stony Point, N. Y., by the Board of Foreign Missions of the Presbyterian Church of the U. S. A. A training school for candidates for foreign mission duty, it provides housing that is intentionally somewhat austere, with communal bathroom facilities. Four buildings (total cost: about $500,000, excluding site work) have been completed: the Center Building in foreground, with seminar lecture rooms, dining area, kitchen, offices; and three of the housing units. General construction is concrete slabs on grade, concrete block bearing walls, wood trusses. Sherwood, Mills & Smith, architects; Werner-Jensen & Korst, consulting engineers; Kreisler-Borg Construction Co., general contractor. *Below:* The estimated cost of a building for Core Laboratories, Inc., in Dallas is $600,000. The 40,000-sq-ft, two-story concrete frame structure is to be started next month; occupancy is scheduled in June 1960. Harwood K. Smith & Partners, architects



COPPER

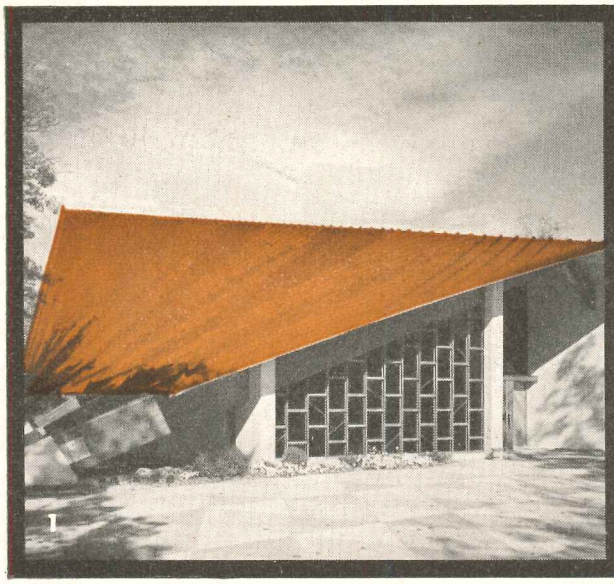


Architect: A. G. ODELL, JR., & ASSOCIATES, Charlotte, N. C.

Sheet Metal Contractor: INGOLD COMPANY, INC., Hickory, N. C.

Revere Distributor: LYON-CONKLIN & CO., INC., Baltimore, Md.

General Contractor: HERMAN-SIPE & COMPANY., INC., Conover, N. C.



THE ROOF of the Concordia Lutheran Church takes the form of two hyperbolic paraboloids, with battens arranged to form the surface pattern.

1 **SHEETS IN** 30" x 48" size were used as they were more readily adaptable to the roof contours.

2 **ROOF UNDER CONSTRUCTION** showing how battens were designed and formed.

3 **31,500 lbs.** of Revere 16 and 20 oz. soft sheet copper were used for the roof.

4 **SUCH A ROOF** as this would have been economically impractical without the extreme design flexibility of copper.

A. G. ODELL, JR., dared to be different in designing the Concordia Lutheran Church, Conover, N. C., with astonishing results

While the church you see pictured on these pages is the only one of its kind in the world, it is not a freak. The dominant architectural feature of the unique church is the sanctuary roof, of laminated wood beams and tongued and grooved decking. Each pair of beams extends from the ground to an apex which forms the ridge line of the roof. The beams are the same length and at the ground level are further apart at the entrance to the church than at the altar, making the altar a focal point.

The roof cover could probably have been treated in any one of a dozen

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C.S.I. Convention Gives Push To New National Program

The story of the Construction Specifications Institute during the past year has been one of continued growth: from 3000 members in 1958 to 3600 members at present; an estimated expenditure of $60,000 in 1958-59, compared to a 1959-60 budget of $80,000; a 1959 convention on their own in Chicago, May 4-6, which drew close to 400 members and associate members, and 89 exhibitors; a year in which they chose (last December) an executive secretary, to help coordinate affairs nationally.

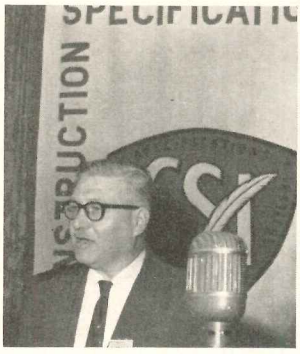
After a shaky start 11 years ago, C.S.I. has added 2600 members in the last three years, and has scarcely had a chance to catch its breath so as to put its collective effort behind a national program. The time has come, said President J. Stewart Stein in his keynote address, to decide whether C.S.I. is going to operate at the national level or continue as a group of individual chapters (there are 34 chartered, seven organizing). He praised chapters for their fine technical programs and training schools, and cited the dependence on local chapters for leaders at the national level. But he made clear the sense of urgency in achieving unity on a national technical program to make C.S.I. an "ever-constant workshop on a large scale with a single aim—to write better specifications."

This same need for getting policy matters under control and maintaining the professional character of the organization was evidenced at the meeting on resolutions. Several of the resolutions presented dealt with the fairly controversial topics of fixing some ratio of active members (professional specification writers) to associate members (individuals from manufacturing or contracting firms), and for allowing associate members to hold certain offices at both local and national level. Action was to refer these to the board or study committees.

The three-day program comprised five general sessions and two half days of committee workshops.

All of the general sessions were business meetings except one. This took up that perennial topic, "Or Equal," which always draws a crowd and seems to elicit as many views as there are people participating. Some of the six panel members, composed of architects, specification-writing specialists and engineers, were for "or equal" if used intelligently and with discrimination. Others were dead set against it. And one discussant suggested a modified form of "or equal" in which criteria are given to judge what constitutes an "equal."

Panel on "Or Equal" clause (left to right): Kenneth Schaefer, Morton Ackerly, Frank Crimp, Donald Scripture, Kenneth Wilson, Terrell Harper



Above (left to right): J. Stewart Stein, president; Harry C. Plummer, secretary-treasurer; George F. Lamb, executive secretary. *Below:* Philip Will of Perkins & Will, first vice president of A.I.A., speaking on "The Survival of the Design Profession"; Warren Richardson, program chairman and last year's Chicago chapter president

Philip Will, first vice president of A.I.A., spoke at the first-day luncheon on the topic, "The Survival of the Design Profession." He expressed concern over the economic status of the design professions in an age of automation. He suggested that society will have to realize how important the physical environment is to the general welfare, and that there will have to be a totally new type of professional design team which includes sociologist, anthropologist, and psychologist, as well as architect and engineer.

J. Stewart Stein, Chicago, was re-elected national president.

Others re-elected included: Willard H. Barrows, vice president, New York, and Harry C. Plummer, secretary-treasurer, Washington. George F. Lamb, Washington, is executive secretary.

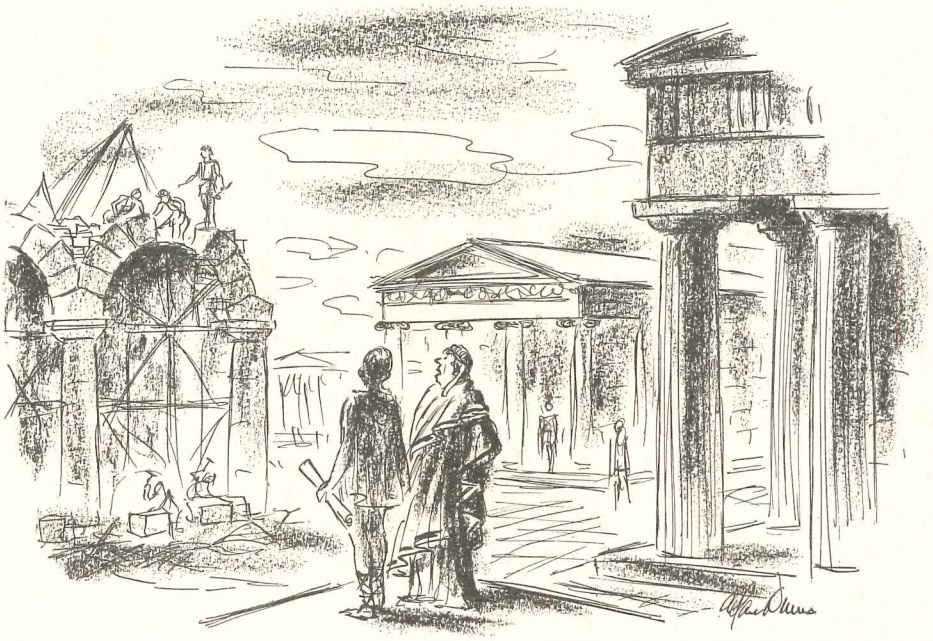
National directors elected include: Glen H. Abplanalp, New York; Frank Couch, Detroit; Frank W. Crimp, Boston; H. Griffith Edwards, Atlanta; H. T. J. Martin, Dallas; Rolf T. Retz, Sacramento; Raymond A. Fisher, Pittsburgh; Alfred C. Kluge, Milwaukee; and Wallace W. MacDonald, Seattle.

Directors-at-large are: James C. Bort, Evanston, Ill.; Edwin T. Pairo, Washington; and Terrell H. Harper, Dallas.

Five members were elected to fellowships. Posthumous awards were made to Ben John Small and J. Norman Hunter. Living members receiving the awards were : Leon Chatelain Jr., Carl J. Ebert, and Col. Alfred W. Sikes.

Next year's convention will be held in San Francisco the last week in May. New York is scheduled for 1961.

—Robert E. Fischer

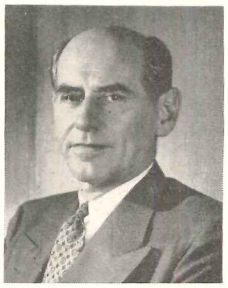


—Drawn for the RECORD by Alan Dunn

"The arch may be a good idea, Epocles, but it won't last, because it's a cliché—"

Dodge Announces Promotions

Irving W. Hadsell has been named president of F. W. Dodge Corporation, construction news and marketing specialists among whose publications and services to the construction industry are ARCHITECTURAL RECORD, Dodge Reports, and Sweet's Catalog Services. Mr. Hadsell, formerly executive vice president in charge of the corporation's Construction News and Statistics Division, succeeds Howard Barringer, who is retiring.



Irving W. Hadsell

Retirement of James McV. Breed, chairman of the corporation's Board of Directors since 1931, also was announced. Paul Abbott, vice chairman from the same year, becomes chairman; and Chauncey L. Williams, who has been executive vice president in charge of the Catalog Division, is the new vice chairman. Both Mr. Breed and Mr. Barringer will continue as voting trustees and as members of the Board of Directors.

In other top management changes announced last month, all of them promotions of Dodge personnel, new executive vice presidents were named to head all four divisions of the corporation and to constitute its Management Committee: Howard M. Thompson (executive vice president and treasurer), Financial Division; Oliver O. Paulsell, Construction News and Statistics Division; J. T. Little, Catalog Division; Robert F. Marshall, Magazine and Book Division. A fifth new executive vice president, T. Oliver Morgan, was named to assist Mr. Hadsell. Mr. Marshall continues as executive vice president of The Modern Hospital Publishing Company Inc., a Dodge subsidiary, and Hospital Purchasing File.

Three new vice presidents and directors, also promotions of Dodge personnel, were appointed: Richard H. Ray (Construction News and Statistics Division), William H. Hatch Jr. (Catalog Division), and Robert M. Cunningham Jr. (Magazine and Book Division). Mr. Cunningham continues as vice president of The Modern Hospital Publishing Company Inc. and editor of *The Modern Hospital*.

Sanford D. Stockton, the corporation's secretary and a director since 1922, has retired and is replaced, as secretary and as a member of the Board, by John S. Brittain.

Members of the Board of Directors other than the officers of the corporation mentioned above are H. Judd Payne, vice president (Magazine and Book Division); George Cline Smith, vice president and economist (Construction News and Statistics Division); and William C. Breed Jr. and George W. Morgan, assistant secretaries of the corporation.

Convention Month for A.I.A.

The American Institute of Architects, in its 102nd year, will hold its 91st annual convention June 22-26 in New Orleans. Walter Gropius will receive the Gold Medal, highest honor of the A.I.A.; and other awards, announced last month, will be made as follows: Fine Arts Medal—Kenneth Hedrich, of Hedrich-Blessing, architectural photographers, Chicago; Allied Professions Medal—Robert Moses of New York; Edward C. Kemper Award for service to the Institute—Bradley P. Kidder, A.I.A., of Santa Fe; Citation of Honor—Kansas City Chapter of the A.I.A., for its "KC-80" program evolved to focus public interest in and action on future city development; Citation to an Organization—Public Buildings Service of the U. S. General Services Administration, for its enlightened approach toward the employment of private architects. Also announced was an honorary membership to Gen. John S. Bragdon, U. S. public works coordinator.

As preconvention nominations for Institute officers to be elected at the convention closed last month, the incumbents were unopposed for president (John Noble Richards of Toledo), first vice president (Philip Will Jr. of Chicago), and second vice president (Henry Wright of Los Angeles). For secretary there were two candidates, Edward Wilson of Fort Worth and Roy Carroll of Philadelphia; for treasurer, four—Gerson T. Hirsch, Pleasantville, N. Y.; Raymond S. Kastendieck (the incumbent), Gary, Ind.; Robert Little, Miami; and Clyde Pearson, Montgomery, Ala. Additional nominations for all offices can be made at the convention.

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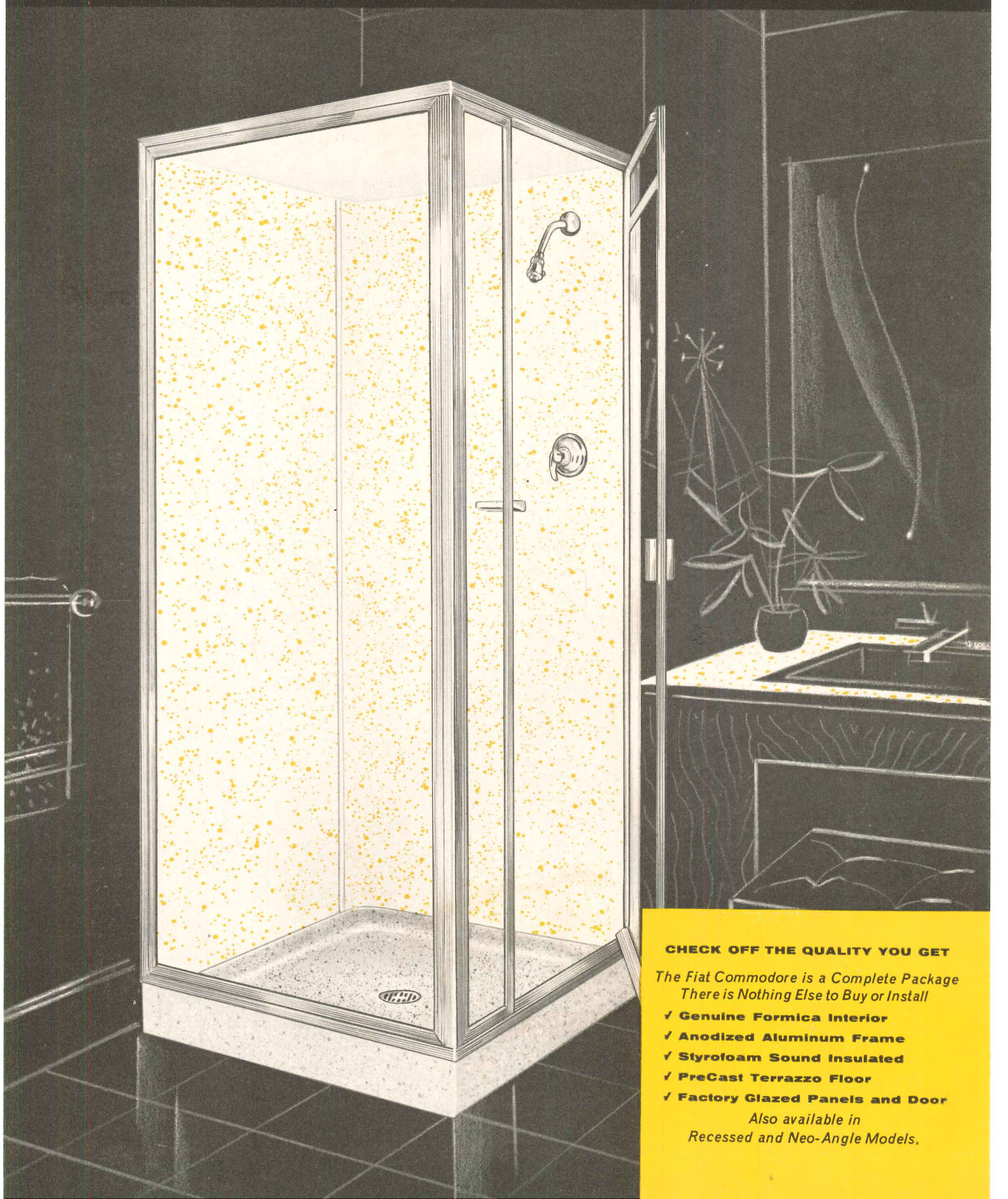

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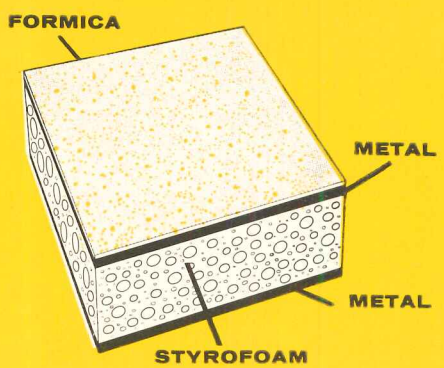

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AR 69

Recent Honors

FRANCIS KEALLY, A.I.A., has been elected to membership in the National Academy of Design. Mr. Keally, a past president of the A.I.A.'s New York Chapter, is one of two new members.

CHARLES W. STEINBAUGH, A.I.A., recently was honored by the Nebraska Architects Association on his retirement as chairman of the state examining board; he had served since 1937.

U. S. Architecture in Moscow

One of the features of the American National Exhibition in Moscow, due to open July 25 and run six weeks (AR, April '59, pp. 10 and 44), is to be an exhibit of American architecture. The display, mostly large photographs but including a few models, was designed and assembled by Peter Blake, A.I.A., and Julian Neski, A.I.A. (see cuts below).

Also, a separate group of photographic portraits of American architects considered to be among those who have done the most creative work during the past 20 or so years will be shown. They include: Pietro Belluschi, Marcel Breuer, William A. Caudill, Walter Gropius, John MacL. Johansen, Philip Johnson, Louis I. Kahn, Carl Koch, Victor Lundy, Ludwig Mies van der Rohe, Richard Neutra, I. M. Pei, Paul Rudolph, Eero Saarinen, the firm of Skidmore, Owings & Merrill, Edward D. Stone, Hugh Stubbins, John Carl Warnecke, Frank Lloyd Wright, and Minoru Yamasaki.

The exhibit of American architecture will include the following buildings:

Anshen & Allen—Holy Cross Chapel, Sedona, Ariz.; Warren Ashley—High School, Greenburgh, N. Y.; Donald Barthelme—West Columbia Elementary School, Brazoria County, Texas; Pietro Belluschi—Zion Lutheran Church, Portland, Ore.; Marcel Breuer—Housing, Institute for Advanced Study, Princeton, N. J.; Carson & Lundin—Esso Building and Tishman Building, both New York; Caudill, Rowlett & Scott—Central High School, San Angelo, Texas; Mario J. Ciampi—Elementary School, Sonoma, Calif.

Curtis & Davis—Thomy Lafon Elementary School, New Orleans; De Mars & Hardison, Easter Hill Housing, Richmond, Calif.; Durham, Anderson & Freed—St. Elizabeth's Episcopal Church, Burien, Wash.; Craig Ellwood—South Bay Bank, Manhattan Beach, Calif.; A. Epstein & Sons—247 E. Chestnut Apartments, Chicago; Victor Gruen Associates—Northland Shopping Center, Detroit, and Tishman Building, Los Angeles; Olav Hammarstrom—Chapel of St. James the Fisherman, Wellfleet, Mass.

Harrison & Abramovitz—First Presbyterian Church, Stamford, Conn.; Wallace K. Harrison, director of planning—United Nations Headquarters, New York; Hellmuth, Yamasaki & Leinweber—Airport Terminal, St. Louis; Burnham Hoyt—Amphitheater, Morrison, Colo.; Philip Johnson and Landis Gores—Sculpture Garden, Museum of Modern Art, New York; Johnson, Wilson, Merrill & Alexander—Baldwin Hills Village, Los Angeles.

Kennedy, Koch, De Mars, Rapson & Brown—Memorial Drive Apartments, Cambridge, Mass.; Levitt & Sons—Levittown, Pa.; Ludwig Mies van der Rohe—Housing, Illinois Institute of Technology, and 860 Lake Shore Drive Apartments, both Chicago; Ludwig Mies van der Rohe and Philip Johnson—Seagram Building, New York; Sidney Morris & Associates—1000 Lake Shore Drive Apartments, Chicago; Richard Neutra & Robert Alexander—Holiday House, Malibu Beach, Calif.; Louis Kahn, architect, in association with Douglas Orr—Yale University Art Gallery, New Haven.

Pedersen & Tilney—North Lake Garden Apartments, New Haven, Conn.; I. M. Pei & Associates—May-D & F Department Store and Mile High Center, both Denver, and Roosevelt Field Shopping Center, Long Island, N. Y.; Pereira & Luckman—Valley Presbyterian Hospital, Los Angeles; Perkins & Will—Heathcote Elementary School, Scarsdale, N. Y., and International Minerals & Chemical Co., Skokie, Ill.; Philadelphia City Planning Commission (George Howe and Vincent G. Kling, consulting architects)—Penn Center, Philadelphia.

Eero Saarinen & Associates—Chapel, Massachusetts Institute of Technology, Cambridge, General Motors Technical Center, Detroit, and War Memorial Building, Milwaukee; Satterlee & Smith—Southwest Redevelopment, Washington; Schmidt, Garden & Erikson—American Hospital Association Building, Chicago; Schwartz & Graham & Associates—Parktowne Houses, Philadelphia; Skidmore, Owings & Merrill—Connecticut General Life Insurance Co., Bloomfield, Conn., Inland Steel Building and Lake Meadows Development, both Chicago, and Lever House, New York.

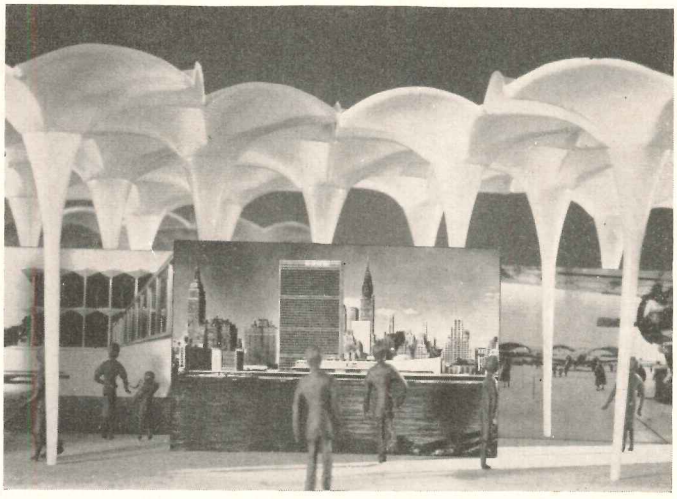
Williams & Williams and Clark, Frey & Chambers—Elementary School, Palm Springs, Calif.; Frank Lloyd Wright—Florida Southern College, Lakeland, Johnson Wax Research Laboratories, Racine, Wis., Taliesin, Spring Green, Wis., and Taliesin West, Phoenix, Ariz.; Lloyd Wright—Wayfarer's Chapel, Palos Verdes, Calif.; Wurster, Bernardi & Emmons—Study Center, Palo Alto, Calif.; Yamasaki, Leinweber & Associates—Wayne State University, Detroit; Minoru Yamasaki & Associates—Public School, Grosse Pointe, Mich.; Young, Richardson, Carlton & Detlie—Gaffney's Resort, Maple Valley, Wash.

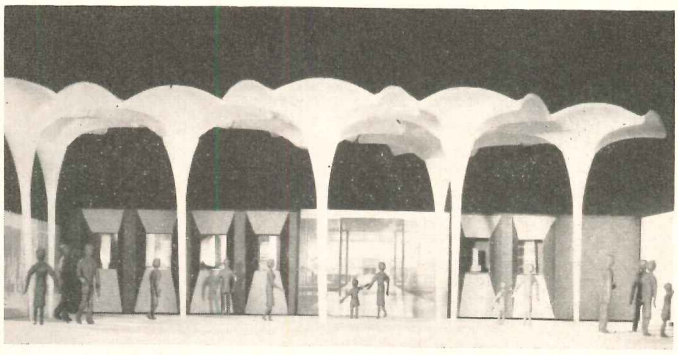
Edward D. Stone, F.A.I.A. (left), receiving honorary membership in the American Institute of Decorators from J. A. Leroy Chambers, newly elected A.I.D. national president. The presentation to Mr. Stone, for his "outstanding achievements in world understanding through architecture," took place during the A.I.D.'s 28th annual national conference recently. Mr. Stone also was one of the program speakers

Ralph M. Hairston Dies

Ralph M. Hairston, Southern regional vice president of F. W. Dodge Corporation's Construction News and Statistics Division, died in Atlanta on April 21 at the age of 51.

Mr. Hairston had been with Dodge since 1927. From 1943 to 1946 he was executive assistant to Irving W. Hadsell, then a vice president, now president, of the corporation. In 1946 Mr. Hairston was appointed Southern regional vice president and Atlanta district manager.





Two views of a model of the architectural exhibit to be shown at the American National Exhibition in Moscow (see story, this page). *Left:* The main entrance. *Above:* Another section of the exhibit, showing the use of one-point perspective photographs; the large ones are 12 ft high. Plastic hexagons form the roof

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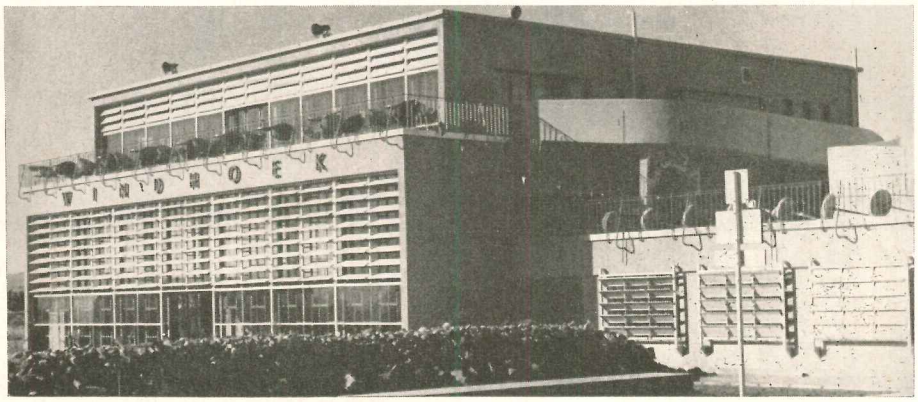
Difficult Site Problems Solved In African Airport Scheme

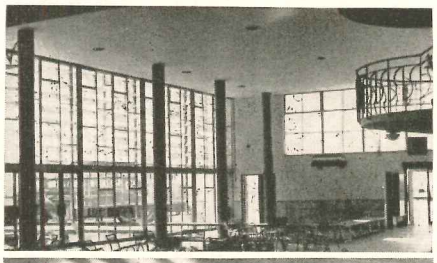
Some difficult siting problems were faced by the designers of the Terminal and Control Buildings of the Windhoek Municipal Airport in South West Africa. The architects were W. W. Wood & Partners.

An existing concrete apron to the east of the airfield and a railway line on the west restricted the site in such a way that the architects had to place the buildings facing west. To control sunlight, manually and automatically operated louvers are used; also, the heat-transmitting tendency of the glare-resisting glass that is employed is counteracted by placing it in frames forward of the ordinary glass, thus letting air flow around it. In addition, because runways must be expanded later when space is cleared, both buildings had to be sited and designed for future horizontal and vertical extension.

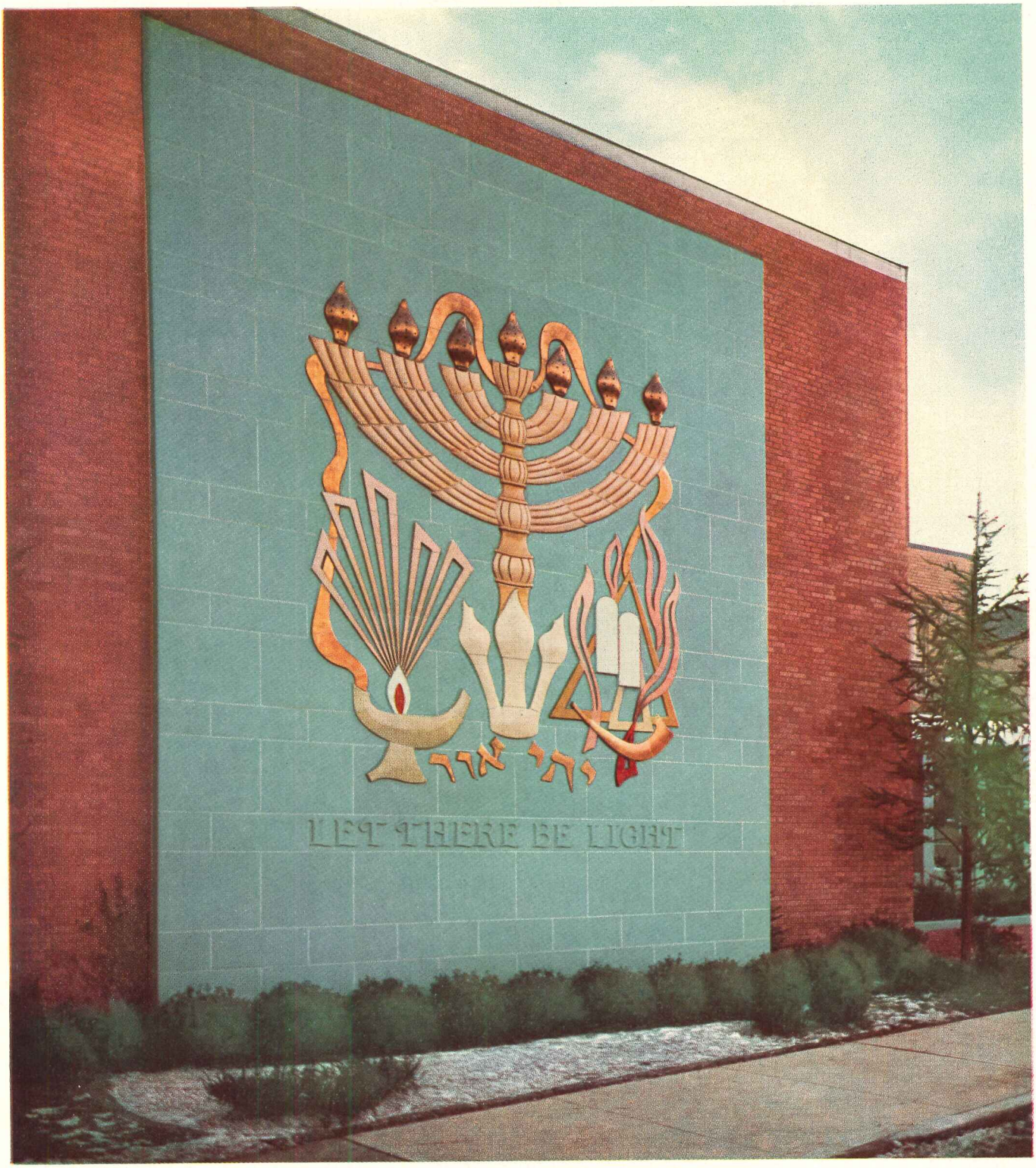


The Terminal Building, above, has a double-volume concourse, below, that gives access to the wing for international passengers and, by means of a spiral staircase, to the restaurant above. The lower cuts show the staircase; its two supporting columns also support an elliptical roof that forms a clerestory.

The airport amenities include a bar, a promenade deck over the customs wing, and acoustic treatment throughout. Construction is reinforced concrete and cement bricks, plastered inside and out. J. W. Stein & Partners were consulting structural engineers.



more news on page 36



INDIVIDUAL CHARACTER IN CERAMIC VENEER

The dignity and sanctity of a House of God is expressed in this exterior sculpture executed in polychrome relief Ceramic Veneer. Louis Ross was the artist for Temple Emanu-El of Lynbrook, New York. Levy and Scheingarten were the architects; Calsa Contracting Company, Inc., the builders. Federal Seaboard's colorful literature illustrating the versatility of Ceramic Veneer is available upon request. Also without charge, Federal Seaboard will gladly furnish construction detail, data, color samples, and any other information involving Ceramic Veneer, the modern architectural terra cotta.

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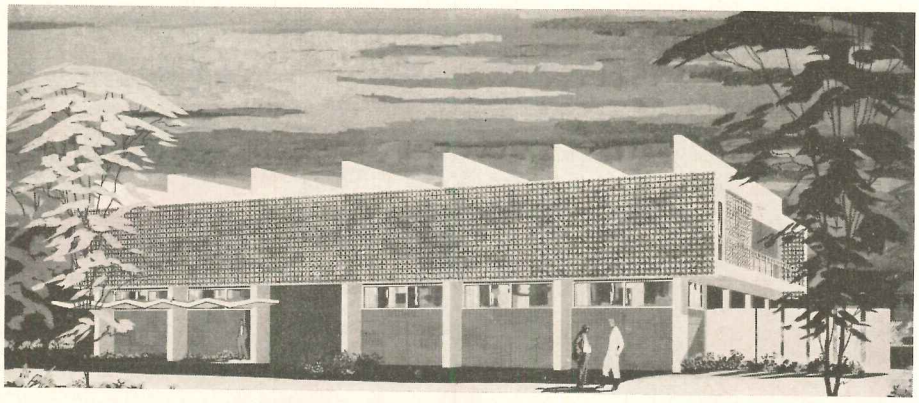
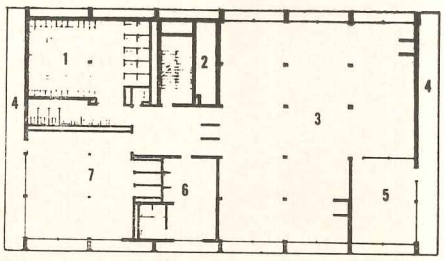
Fire House Designed to Fulfill Exacting Client Requirements

The fire house in Granite City, Ill., scheduled for completion next fall, was designed by Gabriel & Dulgeroff, Granite City architects; the Tom Studebaker Construction Co. was general contractor.

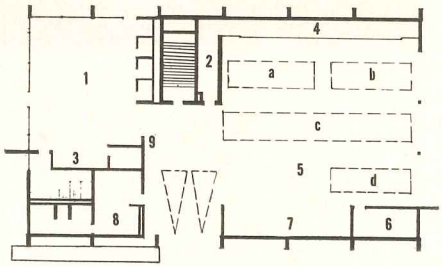
Among the requirements given the architects were: two stories, quarters for a chief, three officers, and 30 firemen; lockers; an instruction room; a library; storage closets; kitchen, dining, and recreation areas; hose tower; areas to wash and repair hose; apparatus room for four pieces of fire-fighting equipment, the chief's car, and a first aid truck; control center; heating plant. The floor plans below show the location of these facilities; the heating plant and hose-repair area are in the basement.



An apparatus room with no columns was requested. The architects accomplished this by raising concrete bents over the roof and hanging the second floor from them. The structure is reinforced concrete throughout, light-weight concrete being used for the roof slab and second floor to reduce load on the bents. Masonry solar screens are used around the dormitory, library, and part of the instruction room to control sun and provide privacy. Ceramic tile panels, painted concrete, and glass are also used on the exterior. Total area: 17,675 sq ft. Cost: $315,417.



Second floor: 1. Shower and locker room; 2. Hose tower; 3. Dormitory; 4. Balconies; 5. Library; 6. Officers' quarters; 7. Instruction room



First floor: 1. Dining and recreation; 2. Hose tower; 3. Kitchen; 4. Hose pit; 5. Apparatus (a. future pumper; b. pumper; c. hook and ladder; d. pumper); 6. Storage; 7. Lockers; 8. Chief's quarters; 9. Joker's station (control center)

more news on page 40

Aluminum offers an economics lesson at M.I.T.

When clients are architects and engineers themselves, building plans get an extraordinarily exacting appraisal with one eye on materials and the other on costs. It happened that way at Massachusetts Institute of Technology on the new Karl Taylor Compton Laboratories building.

Aluminum was used for many good reasons. In all, 50,000 sq ft of Alcoa® Aluminum grid curtain wall, combining tubular aluminum mullions, sheet spandrels and Permatite Projected Windows, were used. Since lightweight aluminum goes up faster with fewer man-hours, labor construction costs were reduced. Still other savings will be realized as long as the building stands, because maintenance costs are eliminated.

If you would like to learn how architectural products of Alcoa Aluminum can bring about equally impressive savings in the building you're planning, call your nearest Alcoa sales office. Or write: Aluminum Company of America, 1823-F Alcoa Building, Pittsburgh 19, Pennsylvania.

Building: Karl Taylor Compton Laboratories, Massachusetts Institute of Technology, Cambridge, Mass.
Architect: Skidmore, Owings & Merrill, New York, N.Y.
General Contractor: George A. Fuller Co., Boston, Mass.
Aluminum Fabricator: General Bronze Corp., New York, N.Y.

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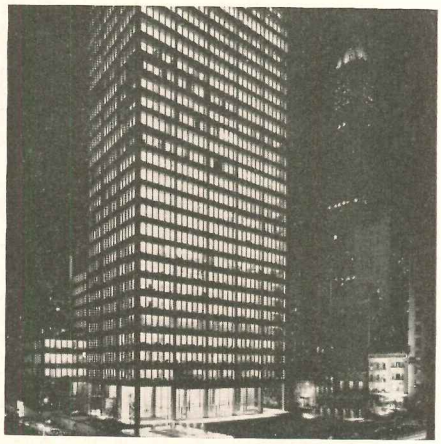
The Record Reports

Seagram's and Omaha Building Win Top Office Awards

Buildings that won the two top citations in *Office Management's* Ninth Annual "Office of the Year" Awards are shown here. The buildings were selected by the magazine's editorial staff for office efficiency *and* architectural merit.

The basis for the magazine's selection of winners is a survey among members of the American Institute of Architects and Association of Consulting Management Engineers.



The award for offices designed for more than 300 employees went to the Seagram Building in New York (AR, July '58), upper cut. Mies van der Rohe and Philip Johnson, architects; Kahn & Jacobs, associate architects; George A. Fuller Co., general contractor. The architect J. Gordon Carr was responsible for interior space planning and for the underfloor duct system for Seagram's own areas (later adopted for the entire building).

Winner of the award for offices designed for up to 300 employees was the Guarantee Mutual Life Company near Omaha, lower cut. Leo A. Daly Co., architects and engineers (also responsible for space planning); Peter Kiewit Sons Co., general contractor.

more news on page 44

U. S. Air Force Academy, Colorado Springs. *Skidmore, Owings and Merrill, Architects*

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A Washington Report *by Ernest Mickel*

NATIONAL CONFERENCE PLANNED TO CONSIDER SCHOOL BUILDINGS AND FIRE SAFETY

A national conference on fire safety in schools will be held this fall with the collaboration of 15 national groups including the American Institute of Architects, the Building Research Advisory Board, the National Fire Protection Association and the American Association of School Administrators. Announcement of the conference, to be aided by a substantial grant from the Ford Foundation, followed a special meeting of interested groups called by the American Institute of Architects at its headquarters in Washington, D. C., in April.

The fall conference may be preceded by a series of four smaller conferences to be sponsored by BRAB during the summer to concentrate thinking on separate well-defined areas of the fire safety problem. Finally, BRAB hopes to produce a "definitive advisory document" for the guidance of all concerned with building fire safety into schools.

According to plans under way last month, this treatise will be prepared by BRAB and will bring to boards of education, fire marshals, local and state officials and any others concerned the latest technical diagnosis of this subject.

The Facts About Fire Safety

A tentative proposal for this study and the big fall conference from which it will emanate has been defined as follows by the BRAB:

"To create a publication that will inform superintendents of schools, school principals, school business managers, school board members, fire marshals and public officials and building authorities as to the facts now known, and the weight of informed opinion where research has not yet determined the facts, that bear on the question of fire safety and its relation to the educational needs of the community.

"Such a publication in the hands of individuals of public responsibility should be of assistance in making the value judgments that are necessary, school by school, as to appropriate precautions against fire, giving consideration to the requirements and effects of existing or proposed codes, regulations, laws or administrative procedures, relative costs and educational implications of physical alterations to existing structures or impositions on the design criteria for proposed structures minimizing fire hazards through maintenance, and to personnel training and organization.

"Further, the publication should cite research needs and directions to the end that these responsible officials may be informed of the state of current knowledge and its implications for the future.

"It would also be hoped that this publication would be of value to independent and church-related schools, colleges, and universities."

Focus for the Meetings

The series of small conferences during the summer, as described by Robert Dillon, BRAB's director, might focus on the following subjects:

1. Personnel organization—the inability of people to react in fire emergencies—and education in the necessity of keeping buildings in fire-safe condition.

2. Old construction—what decisions must be made to make older structures more fire-safe, and how these buildings can be brought to "standards" through applicable administrative services.

3. New buildings—there have been changes in educational trends which call for greater flexibility in the interior arrangement of schools. This trend points toward larger assembly rooms, movable partitions, different corridor arrangements; in short, a more nearly adult environment for children. Architects are moving in this direction steadily with no desire to place learning children in sterile cubes.

4. The business of research itself —the people concerned with school remodeling and construction need to know the latest technical developments and applications. There is concern that without them, the subject of school safety will be in the same retarded spot ten years from now that it is today with administrators and others continuing to work from assumptions and without facts.

Following the A.I.A.'s two-day meeting at the Octagon April 20 and 21, it was announced that the representatives from 15 national groups attending had decided that a national meeting should be convened in the fall—possibly September—to aid in focusing national attention on the subject.

This entire effort, under general consideration for years, was spurred to special action by the tragic fire in Our Lady of the Angels school in Chicago last December 1 in which

continued on page 288

Southwest Research Studies Fire and Building Plastics

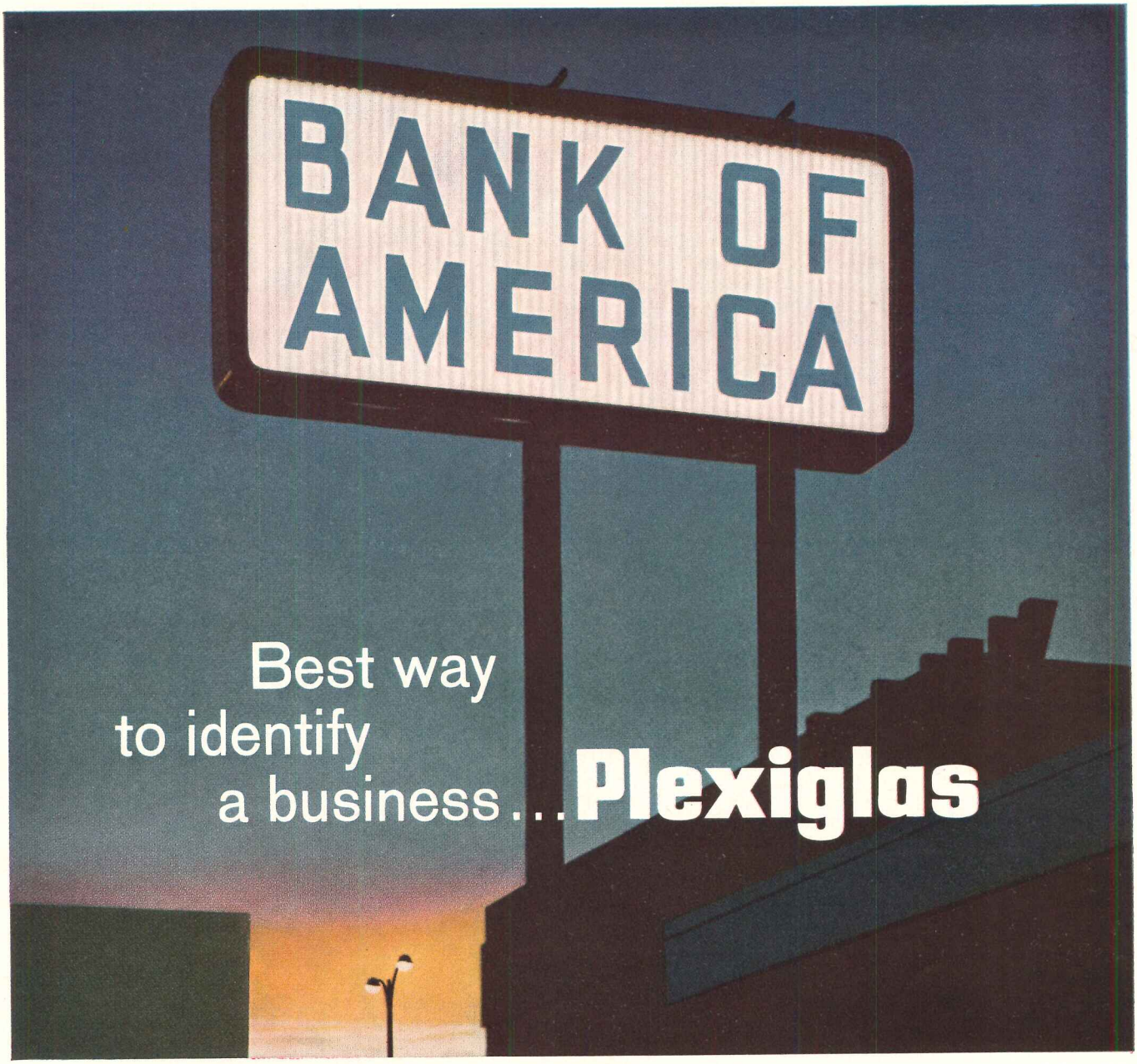
The Southwest Research Institute at San Antonio has started work on a one-year survey of existing standard tests governing use of plastics in buildings with emphasis on the possible fire hazards of the material. The study is sponsored by the Plastics Group of the Manufacturing Chemists Association. The more than 40 manufacturers of raw plastics who comprise this segment of M.C.A. hope to see a new evaluation of the tests evolve from this effort. Possible fire hazards of plastics in buildings will be delineated within the frame of reference of building regulations.

No specific laboratory or testing work will be done by Southwest Research. The study will entail a thorough searching of all the current literature, identification of hazard points for plastics where they might exist, and review of established code regulations.

Assuming that research of the entire field of fire hazards in buildings is presently out of the question, the M.C.A. Group is taking this investigative approach in an effort to define the adequacy of present testing standards in relation to this new category of building materials.

The study is expected to produce both conclusions and recommendations; conclusions as to where these possible hazards may lie, and recommendations for further research.

Many experts. including the manufacturers themselves, long have felt that there was inadequate information on the subject of what fire hazards might exist in the many applications of plastics in the building process. More information, they agree, will assist the producers of raw plastics in guiding their customers, the fabricators, and, in turn, the architects and engineers.



Bank of America uses various types of PLEXIGLAS *signs to identify branch offices. Shown above is an internally-lighted, completely luminous, rooftop sign. Marquee letters with backlighted* PLEXIGLAS *faces are shown below.*

Signs made of PLEXIGLAS® acrylic plastic can be designed to combine powerful identification with pleasing, dignified appearance. That is why PLEXIGLAS signs are being used so widely for the identification of buildings—from business offices to industrial plants.

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Crystal Glass & Plastics, Ltd., Toronto

Professionals Protest Proposed Design Fee Limitation

The American Institute of Architects and the National Society of Professional Engineers joined in protesting a new provision in the House-passed Interior Department appropriations bill for fiscal 1960 which would limit design costs to five per cent of construction cost on all Interior construction except Bureau of Reclamation projects.

This means that design fees paid on such projects as Indian Affairs hospitals, National Park Service construction and access roads would be held to five per cent of total construction cost.

Both organizations, fearing the new legislative provision would foreshadow a trend, protested on grounds that compensation for professional services such as architectural and engineering work must vary with the complexities of any given project. Costs, special conditions, repetitive features and geographical location were listed as a few of the factors which could influence design costs.

The protests were made to the Senate Appropriations Committee in the hope that this group would eliminate the House-approved language in sending the bill to the Senate. It then could be killed in conference.

"There is no question but that in some cases a professional fee of five per cent of the construction cost would be sufficient," Edmund R. Purves, executive director of the A.I.A., wrote the committee. "However, there will be cases where it will be entirely inadequate to allow an architect or engineer to pay the salaries of his office force, pay his consultants, meet his office overhead and still make a reasonable profit.

"In such cases one of two things will occur; either the architect or engineer will turn the job down because of its impracticality, or the architect or engineer who takes it will have to cut down the services he provides in order to avoid losing money."

In either case, Mr. Purves noted, the government and the public stand to lose.

Direct Spending for Building Favored by Administration

The Administration is on record before the House Public Buildings subcommittee in support of direct Federal expenditures for the construction of Federal buildings.

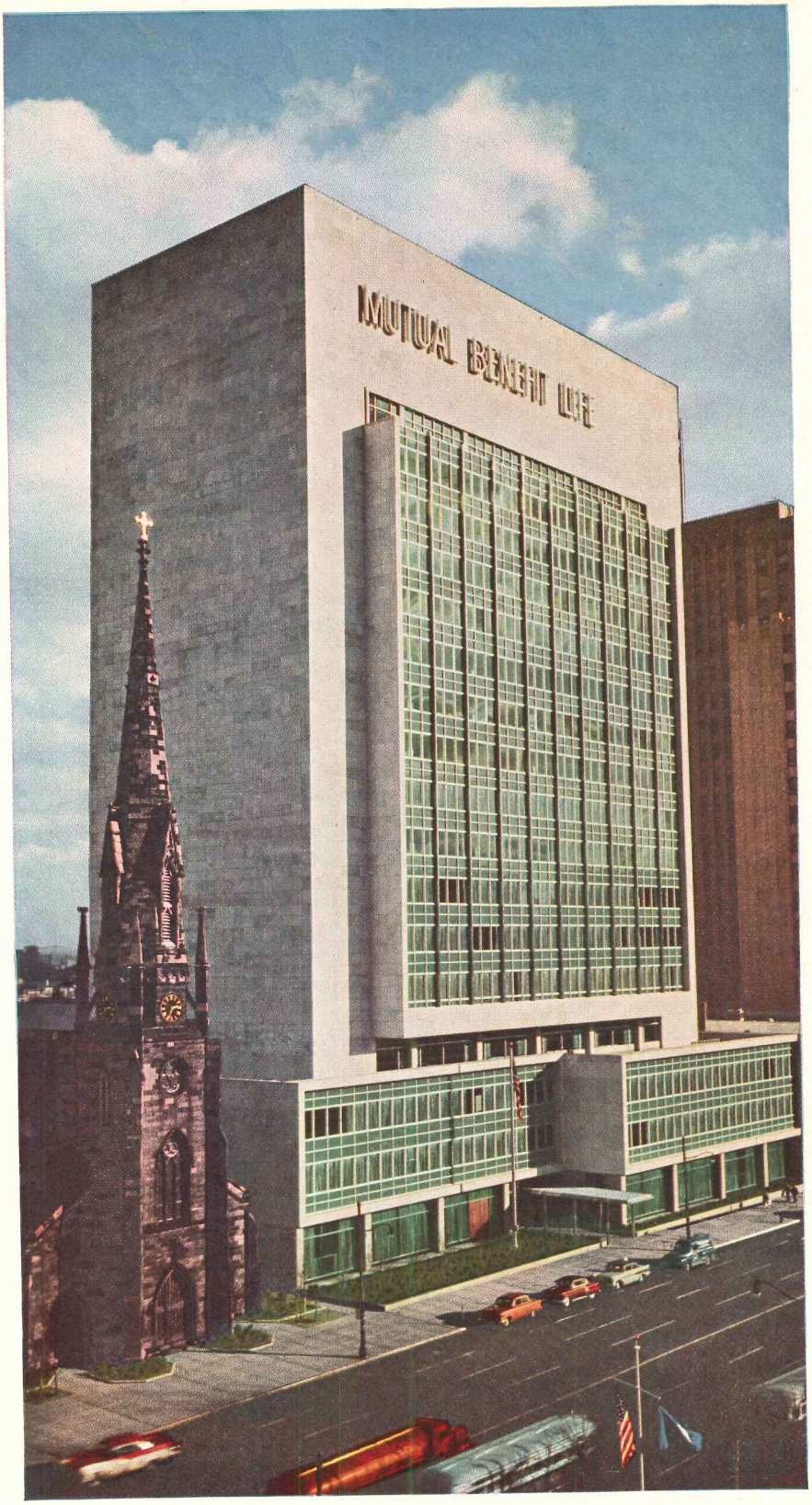
This seemed to bury the lease-purchase concept in the financing of the government's many structures except for the playing out of contracts made under that program.

The minimum direct Federal spending program ordered by Congress last year came over the heavy protests of the Public Buildings Service of General Services Administration. But last month GSA's chief, Franklin G. Floete, testified in favor of a direct spending measure—H. R. 5404, authored by Rep. Robert Jones (D-Ala.)—and suggested several amendments he thought would straighten it.

The public buildings construction program of the Federal government would be revised completely by the Jones measure. Basically, it would authorize direct appropriations for the buildings of urgently needed government structures throughout the country.

Unlike former direct spending bills, it would include alterations as well as new construction. Another feature of the Jones legislation would be a prohibition against any spending for the purpose without prior approval from the public works committees of House and Senate.

continued on page 328



A face of glass in color

Recipient of the William E. Lehman Award for outstanding architectural design, the new home office building of the Mutual Benefit Life Insurance Company, Newark, New Jersey, effectively utilizes SPANDRELITE®—*Pittsburgh's* beautiful *glass in color*—in the spandrel areas.

Specifically designed for curtain-wall spandrels, SPANDRELITE is a heat-strengthened glass with ceramic color fused to the back. It is available in 18 standard colors, plus a wide range of custom colors, and in *polished* or *twill* finishes. The colors retain their freshness, impression of depth, original brightness and true shades indefinitely.

SPANDRELITE is strong, durable and economical. It will withstand impact and a wide range of temperature variations. It resists weathering and corrosion. It is non-porous and non-absorbent. Installed like regular glass, it is easily cleaned and maintained.

Our Architectural Representative near you will be pleased to assist you with your curtain-wall problems, without obligation on your part. For additional information, fill in and return the coupon for our free, full-color booklet.

Other Pittsburgh Glass Products used in this building: Polished Plate Glass; HERCULITE® *Tempered Plate Glass Doors equipped with* PITTCOMATIC® *Automatic Door Openers;* SOLEX® *Heat-Absorbing Plate Glass;* PENNVERNON® *Window Glass; Heavy Plate Glass; Polished Plate Glass Mirrors.*

Architects: Eggers & Higgins, New York City, N. Y.
Contractor: George A. Fuller Co., New York City, N. Y.

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Construction Cost Indexes

Presented by Clyde Shute, Director of Statistical Policy, Construction News Div., F. W. Dodge Corp., from data compiled by E. H. Boeckh & Assoc. Inc.

Labor and Materials: U.S. average 1926-1929=100

NEW YORK

PERIOD	RESIDENTIAL Brick	RESIDENTIAL Frame	APTS., HOTELS, OFFICE BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Steel
1930	127.0	126.7	124.1	128.0	123.6
1935	93.8	91.3	104.7	108.5	105.5
1939	123.5	122.4	130.7	133.4	130.1
1947	219.3	222.0	207.6	207.5	203.8
1948	250.1	251.6	239.4	242.2	235.6
1949	243.7	240.8	242.8	246.6	240.0
1950	256.2	254.5	249.5	251.5	248.0
1951	273.2	271.3	263.7	274.9	271.8
1952	278.2	274.8	271.9	265.2	262.2
1953	281.3	277.2	281.0	286.0	282.0
1954	285.0	278.2	293.0	300.6	295.4
1955	293.1	286.0	300.0	308.3	302.4
1956	310.8	302.2	320.1	328.6	324.5
1957	318.5	308.3	333.1	345.2	339.8
1958	328.0	315.1	348.6	365.4	357.3
January 1959	337.8	322.5	362.3	383.1	368.8
February 1959	338.2	323.0	362.4	383.1	368.9
March 1959	339.4	324.9	363.1	383.2	369.6
	% increase over 1939				
March 1959	174.8	165.4	177.8	187.2	184.1

ATLANTA

PERIOD	RESIDENTIAL Brick	RESIDENTIAL Frame	APTS., HOTELS, OFFICE BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Steel
1930	82.1	80.9	84.5	86.1	83.6
1935	72.3	67.9	84.0	87.1	85.1
1939	86.3	83.1	95.1	97.4	94.7
1947	180.4	184.0	158.1	157.1	158.0
1948	199.2	202.5	178.8	178.8	178.8
1949	189.3	189.9	180.6	180.8	177.5
1950	194.3	196.2	185.4	183.7	185.0
1951	212.8	214.6	204.2	202.8	205.0
1952	218.8	221.0	212.8	210.1	214.3
1953	223.0	224.6	221.3	221.8	223.0
1954	219.6	219.1	233.5	225.2	225.4
1955	225.3	225.1	229.0	231.5	231.8
1956	237.2	235.7	241.7	244.4	246.4
1957	241.2	239.0	248.7	252.1	254.7
1958	243.9	239.8	255.7	261.9	262.0
January 1959	247.7	243.2	261.8	268.4	268.3
February 1959	248.9	244.8	261.8	268.4	268.5
March 1959	249.1	245.0	262.0	268.5	268.7
	% increase over 1939				
March 1959	188.6	194.8	175.5	175.7	183.7

ST. LOUIS

PERIOD	RESIDENTIAL Brick	RESIDENTIAL Frame	APTS., HOTELS, OFFICE BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Steel
1930	108.9	108.3	112.4	115.3	111.3
1935	95.1	90.1	104.1	108.3	105.4
1939	110.2	107.0	118.7	119.8	119.0
1947	202.4	203.8	183.9	184.2	184.0
1948	227.9	231.2	207.7	210.0	208.1
1949	221.4	220.7	212.8	215.7	213.6
1950	232.8	230.7	221.9	225.3	222.8
1951	252.0	248.3	238.5	240.9	239.0
1952	259.1	253.2	249.7	255.0	249.6
1953	263.4	256.4	259.0	267.0	259.2
1954	266.6	260.2	263.7	273.3	266.2
1955	273.3	266.5	272.2	281.3	276.5
1956	288.7	280.3	287.9	299.2	293.3
1957	292.0	283.4	295.2	307.1	302.9
1958	297.0	287.9	304.9	318.4	313.8
January 1959	301.1	292.6	310.5	324.5	318.4
February 1959	302.2	294.0	310.7	324.6	318.7
March 1959	302.2	294.0	310.7	324.6	318.7
	% increase over 1939				
March 1959	174.2	174.8	161.7	170.9	167.8

SAN FRANCISCO

PERIOD	RESIDENTIAL Brick	RESIDENTIAL Frame	APTS., HOTELS, OFFICE BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Steel
1930	90.8	86.8	100.6	104.9	100.4
1935	89.5	84.5	96.4	103.7	99.7
1939	105.6	99.3	117.4	121.9	116.5
1947	193.1	191.6	183.7	186.8	186.9
1948	218.9	216.6	208.3	214.7	211.1
1949	213.0	207.1	214.0	219.8	216.1
1950	227.0	223.1	222.4	224.5	222.6
1951	245.2	240.4	239.6	243.1	243.1
1952	250.2	245.0	245.6	248.7	249.6
1953	255.2	257.2	256.6	261.0	259.7
1954	257.4	249.2	264.1	272.5	267.2
1955	268.0	259.0	275.0	284.4	279.6
1956	279.0	270.0	288.9	298.6	295.8
1957	286.3	274.4	302.9	315.2	310.7
1958	289.8	274.9	311.5	326.7	320.8
January 1959	293.6	278.5	317.4	332.2	325.9
February 1959	295.0	280.3	317.7	332.4	326.3
March 1959	295.0	280.3	317.7	332.4	326.3
	% increase over 1939				
March 1959	179.3	182.3	170.6	172.7	180.1

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

index for city A = 110
index for city B = 95

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

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

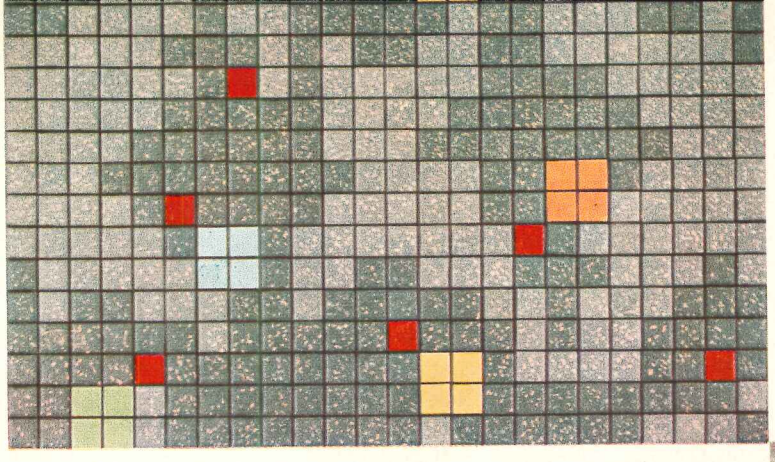
$$\frac{110-95}{95} = 0.158$$

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

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

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

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



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Romany • Spartan

FAIENCETTE

Light Blue	1060
Suntan	1041
Lemon	1012
Ming Green	1050

DECORATOR

Tangerine Red	5035

ORSAN

Light Green
Dark Green

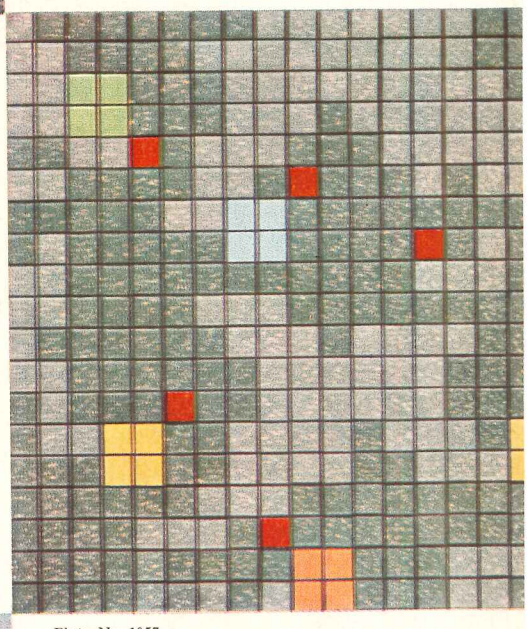
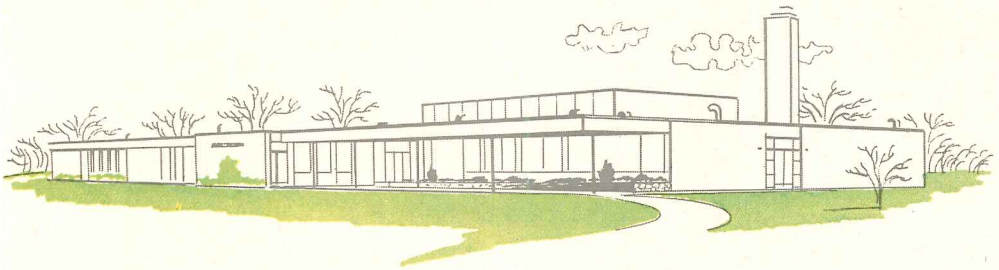


Plate No. 1057

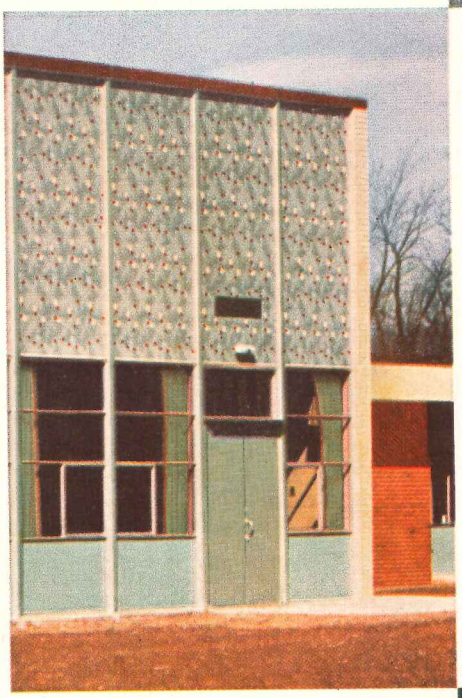
School buildings can be made more practical, more attractive with Romany• Spartan ceramic tile indoors and out



While Romany•Spartan tile is well known as a superior floor and wall finish for use throughout school buildings, its versatility does not stop there.

For example: Bates Elementary School, Brownstown Township, Michigan, primarily a single-story structure, contains a two-story all-purpose room. On two of the walls extending above the main roof line, panels of Romany•Spartan "certified frostproof" tile, expertly designed and skillfully blended with surrounding materials, provide an interesting change of pace in exterior finish.

Here's just one of many ways Romany•Spartan's complete line of ceramic tile can be used in creating handsome, low-cost schools. For design help or information, contact your nearby Romany•Spartan sales representative. If you'd like a copy of "The Talents of Tile", a color brochure of Romany•Spartan school and college installations, write United States Ceramic Tile Company, Dept. R-36, Canton 2, Ohio.



BATES ELEMENTARY SCHOOL
Brownstown Township, Michigan

Architect:
WALTER J. ROZYCKI
Detroit, Michigan

Tile Contractor:
MICHIGAN TILE & MARBLE CO.
Detroit, Michigan

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Genuine Clay Tile

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THE SPARTA CERAMIC COMPANY
MEMBERS: TILE COUNCIL OF AMERICA AND THE PRODUCERS' COUNCIL, INC.

Required Reading

The New Applied Arts Shown

DANSK FORM. *Arkitektens Forlag, Bredgade 66, Copenhagen. 76 pp., illus. $2.65.*

BRUGSKUNST: MOBLER, TEXTILER, LAMPER. *By Birgit and Christian Enevoldsen. Arkitektens Forlag, Bredgade 66, Copenhagen. 107 pp., illus. D.Kr. 28.*

NEW FURNITURE, VOLUME 4: 1956-58. *Edited by Gerd Hatje. George Wittenborn, Inc., 1018 Madison Ave., New York 21. 162 pp., illus. $9.*

BY MARJORIE BLAKE NOYES

The pendulum of artistic expression swings back and forth with the times, from the purest classical form to the most rococo distortion, century after century. It is as if the artist—painter, sculptor, architect, designer—wiped the slate absolutely clean to start embellishing anew. In the applied arts as well as in the fine arts we have just witnessed such a slate-washing. Indeed, many of us have just become accustomed to the stark simplicity of the geometric forms brought about primarily by the technical aspects of the Bauhaus movement. Now these buildings and most simple, rigid forms—are taking on curves. One can almost detect an air of cautious frivolity in the works of some of the heretofore stern masters of geometric discipline.

The movement to enliven the technological rigidity employed by the Bauhaus school and combine it with natural form has already taken hold. In furniture both necessity of comfort and beauty of design must be considered. In an effort to find a happy medium some of the initial results are bound to be forced in either extreme. For the time being the most successful work is found in the applied arts from Scandinavia.

The trend, in its primary stages, is clearly indicated in each of these three books. *Dansk Form* ("Danish Design"), composed of reprints from the Danish magazine, *Arkitektur*, shows the kinds of things at present topical in design in that country. It includes not only attractive Danish furnishings, silverware, pottery, and exquisite textiles, but also some houses built by architects for their own use. Several of these are particularly handsome and well furnished. This volume was not intended as a furniture reference book but nevertheless would serve the architect well.

Brugskunst: Mobler, Textiler, Lamper ("Applied Art: Furniture, Textiles, Lamps") is a handsomely designed little volume—only eight in. square—with excellent photographs of the furniture. This book, more so than either of the others, definitely shows the trend away from the technological approach toward the natural approach to furniture design and in so doing may be a little more up to date. In addition, the textile section is of particular note.

The most useful furniture reference book for the architect practising in this country is the Wittenborn book. It is a large volume, handsomely laid out. Of equal importance is the fact that it is well categorized and indexed with designers' names and addresses. The editors are to be particularly praised for the excellent choice of photographs (there are 347 illustrations). It is not easy to give an accurate picture of a three-dimensional object on a two-dimensional plane. In *New Furniture* in many instances several views are given of a piece of furniture that might otherwise be misrepresented by one. Close-ups of framing, progress shots of convertibles, and several detail drawings further enhance the value of this book to the architect for his reference library.

The Architect as Practitioner

ARCHITECTURAL PRACTICE. *By Clinton H. Cowgill, F.A.I.A., and Ben John Small, A.I.A. Reinhold Publishing Corp., 430 Park Ave., New York 22. 272 pp., illus. (3rd rev. ed.). $12.*

BY DUDLEY HUNT, JR., A.I.A.

This book should be of interest to all who are concerned with the business aspects of architectural practice. And how can any architect, involved as he inevitably must be with the ever-expanding role of architecture today and its increasing opportunities and responsibilities, avoid being concerned?

In earlier editions of this book, the primary emphasis was on the education of architectural students, applicants for registration, and beginning practitioners, in the fundamentals of office practice. Even so, the book gained wide acceptance among more experienced architects. Because of this acceptance and the rapid changes in the profession, the new edition has undergone drastic revision and reorganization. The result is a more realistic and useful reference for the architect.

Through somewhat ruthless and yet judicious editing of the last edition, a much greater amount of use-

continued on page 64

The Functional Tradition

THE FUNCTIONAL TRADITION IN EARLY INDUSTRIAL BUILDINGS. *By J. M. Richards. Photographs by Eric de Maré. The Architectural Press, London. 195 pp., illus. 36s.*

The principal aim of this handsome and charming volume is to bring to our attention a group of buildings in which "a new world of architecture is made available to us for comparison, assessment, and appreciation, just as the temporarily forgotten beauties of Gothic were suddenly revealed to the 18th-century antiquarians." This new world is composed of the structures that housed the early operations of the industrial revolution in England: warehouses, naval dockyards, watermills, windmills, breweries, sheds, and bridges. As seen through the medium of Eric de Maré's extraordinary photographs they are indeed a revelation.

Mr. Richards is on much shakier ground, however, when he seeks to define the historical significance of this group of buildings. He seems to wish to establish the existence of a separate current within the mainstream of English architectural history—of an architecture dominated by functional considerations which would provide a form of spiritual ancestry for the designs and principles of today. It is an appealing notion: one would like to see a concrete demonstration of the concept that functionalism is indeed the alchemist's agent that changes buildings into architecture.

Unfortunately, Mr. Richards fails to dispose completely of the alterna-

continued on page 368

Color as a Sales Weapon

COLOR PLANNING FOR BUSINESS AND INDUSTRY. *By Howard Ketcham. Harper & Bros., 49 E. 33rd St., New York 16. 274 pp., illus. $5.95.*

Chapter I, "How Color Sells," sets the theme for the major portion of the book. With the exception of two interesting deviations, "The Historical Uses of Color" and "Camouflage," the text is devoted to color as a potent weapon for competitive advantage.

Starting with a "Color Quotient" quiz for the reader and a discussion of the methods and values of color surveys, Mr. Ketcham deals with the advantageous use of color and lighting for traffic control and product enchantment in supermarkets; color and lighting in the display window;

continued on page 64

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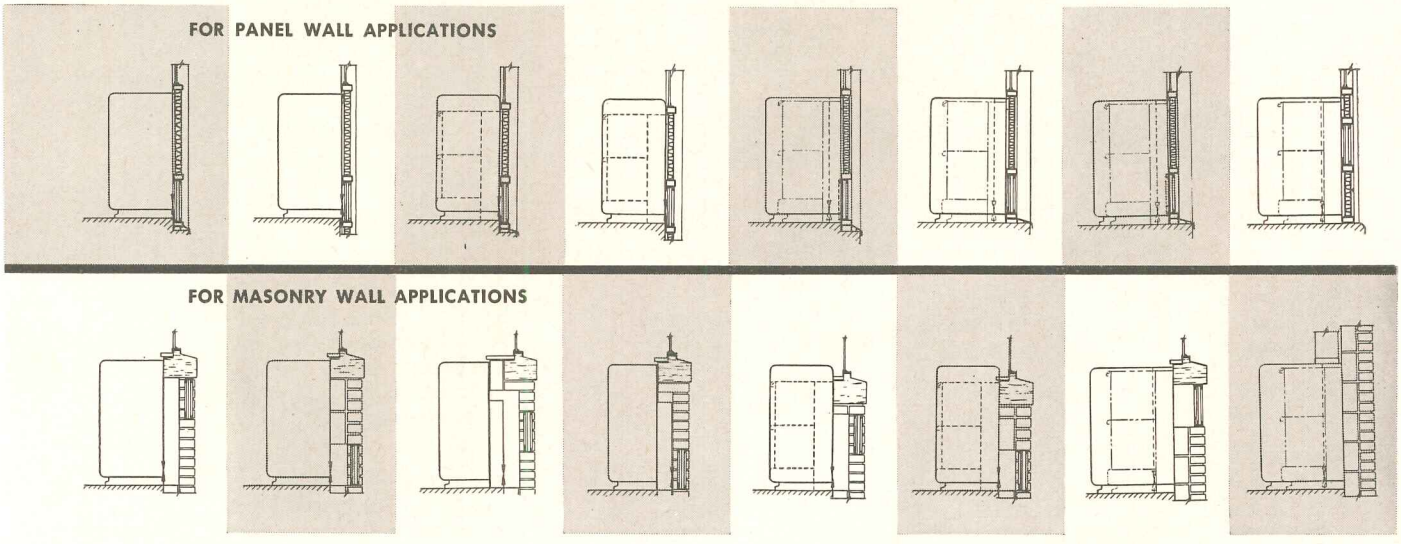

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Required Reading

Practice . . . *cont. from page 60*

ful information has been packed into about one third fewer pages than before. Gone are the many pages devoted to such topics as the recitation of registration laws of all the states (useless when out of date, readily available from the state boards to those interested). Now included are hypothetical case histories of the procedures for setting up a co-op practice composed of a large number of professionals and similar studies of office procedures. These should help the reader—as well as could be reasonably expected in a book of this type—to gain some degree of understanding of actual practice problems without digging through pages of theory.

There is some overlapping of content in this book with the A.I.A. *Handbook of Architectural Practice* (reviewed in AR, April '59, p. 60). This could hardly have been avoided. In the main, however, the two books complement and supplement each other to a great degree. Undoubtedly, many readers will discover that the two can most profitably be used together.

Color . . . *cont. from page 60*

color in packaging; the desirability of making factory employes and school children happier with color and lighting; color in transportation, safety, product design, the office, advertising, clothing, home decor, and ladies' make-up. Except in the chapter on ladies' make-up, there are numerous examples of how color may salvage or has salvaged obsolete or downright peculiar designs.

Color Planning suffers, as do so many books on color, from an anomalous scarcity of color illustrations; there are only ten, and they are poorly printed. Also, Mr. Ketcham gives the impression that he knows a great deal more than he is telling in that he introduces many color problems for which he offers no further solution than consultation with a "color engineer."

For these reasons and because of the lack of quantitative data, those who acquire *Color Planning* as a design reference book may be disappointed. However, those who would like to learn more of a rarefied branch of the design professions will be entertained and edified.

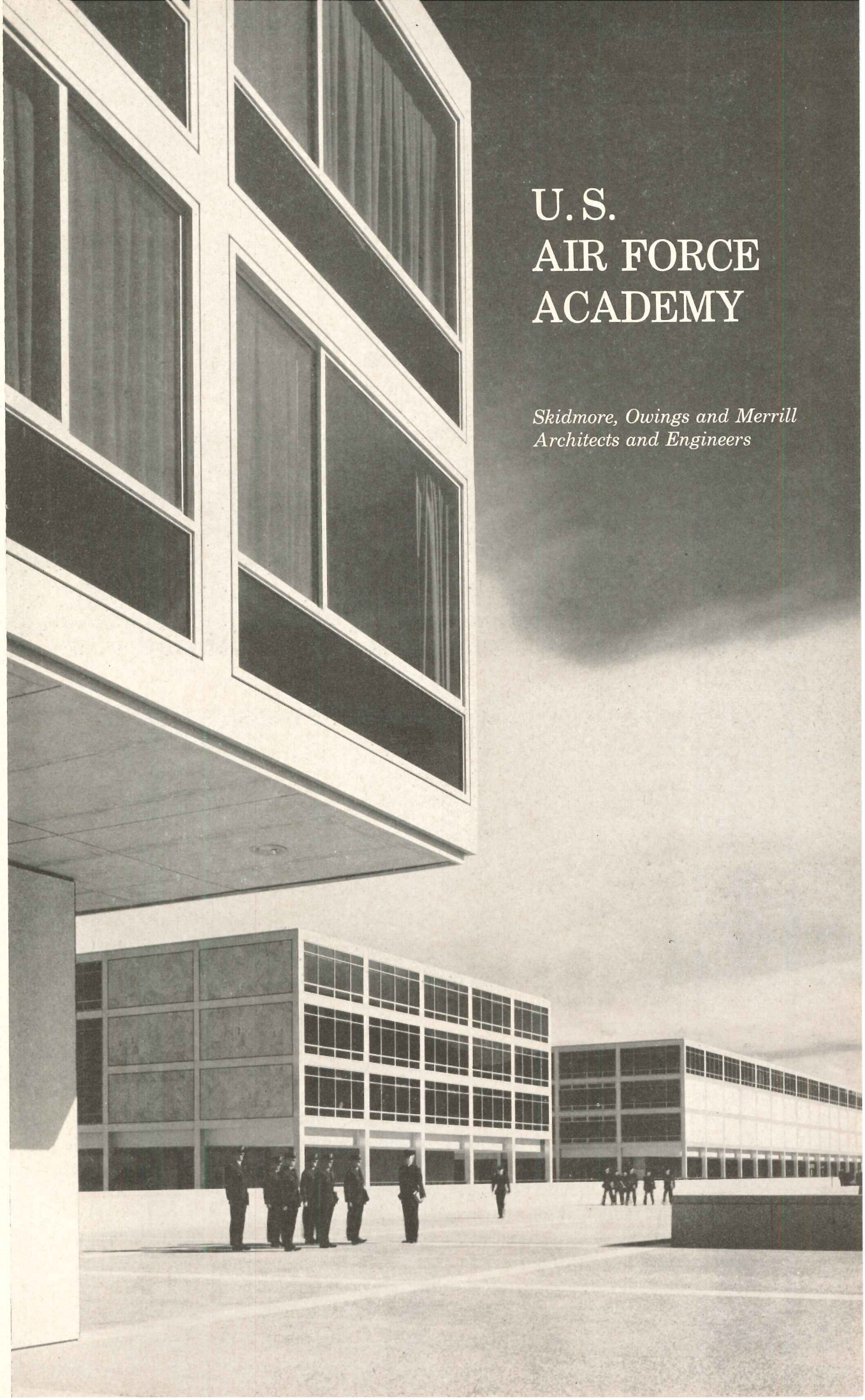
—SETON COTTIER

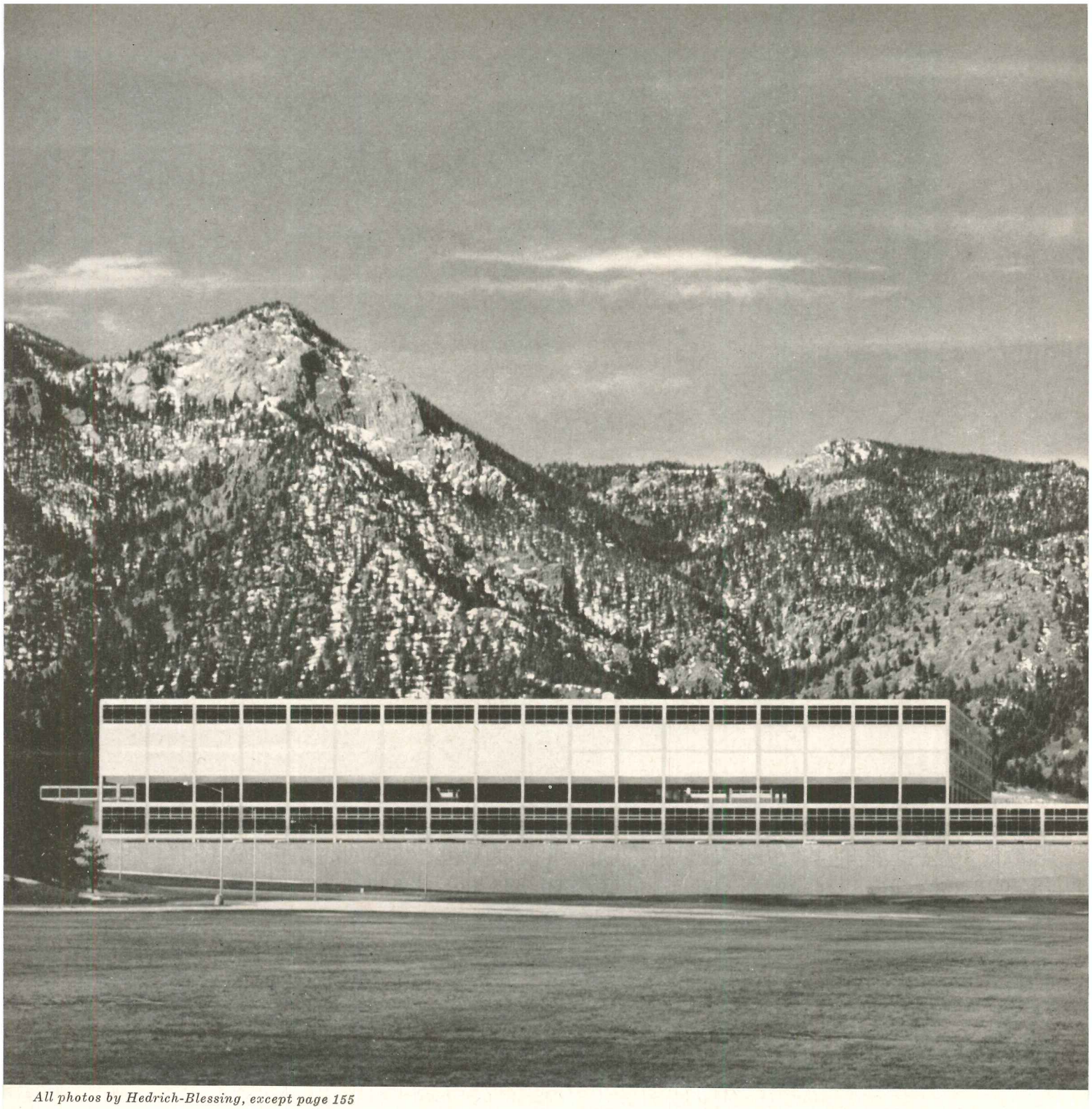
more books on page 368

ARCHITECTURAL RECORD JUNE 1959

U.S. AIR FORCE ACADEMY

Skidmore, Owings and Merrill
Architects and Engineers



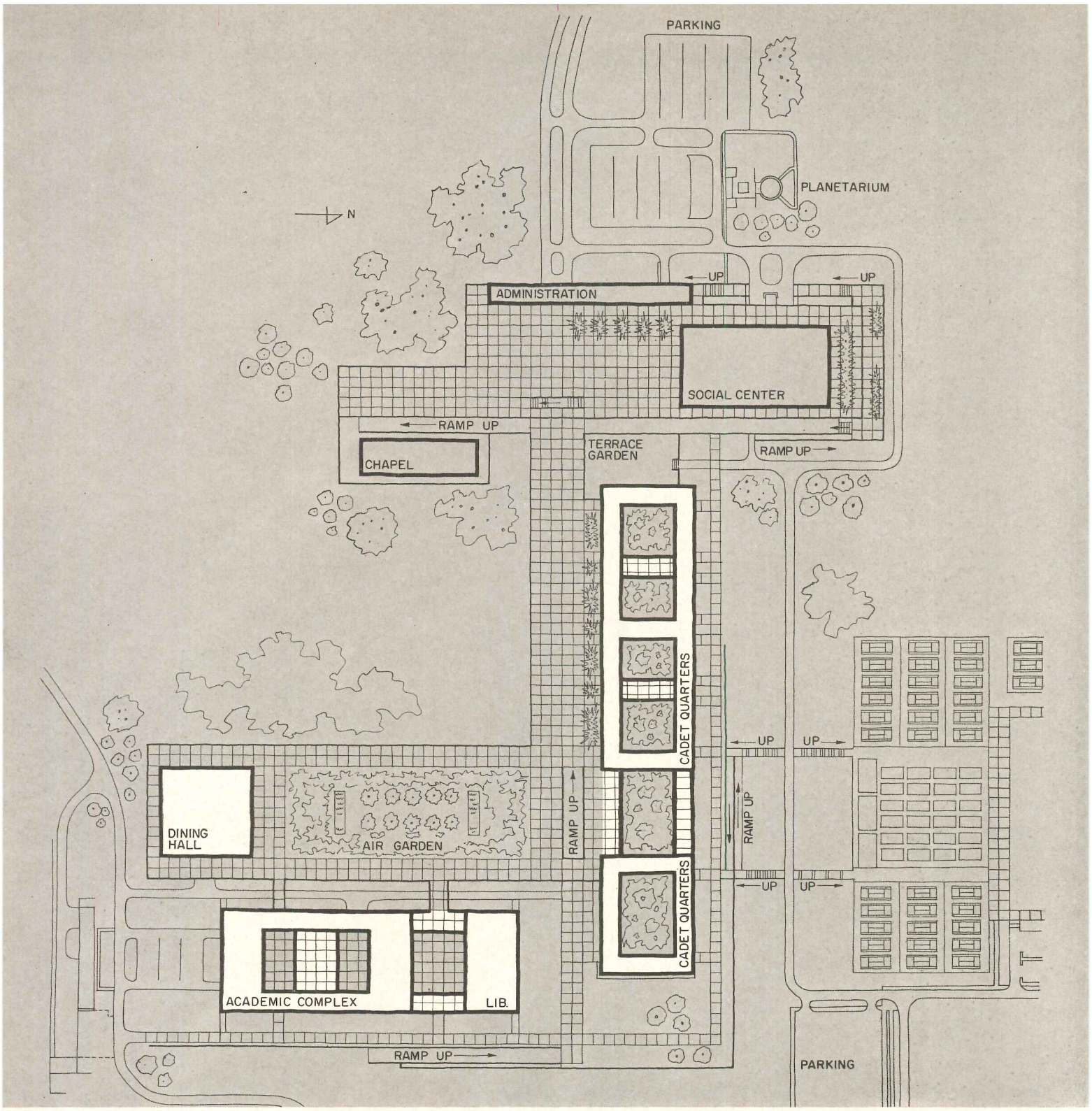


All photos by Hedrich-Blessing, except page 155

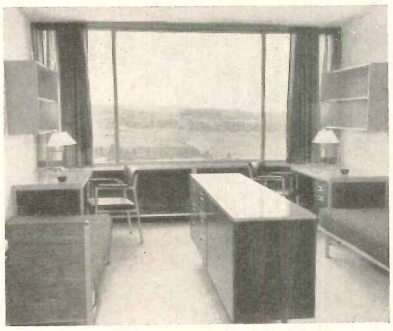
The questions suggested by the great photograph above go to the heart of today's architectural controversies on stylistic matters. As the Air Force Academy is dedicated this month, architects will be asking some of these questions and answering them in ways as sharply divergent as the ways of current architecture. Are the buildings appropriate to their site? The view here shows the Cadet Academic Area as seen from the parade ground below it, with the Rampart Range in the background indicating something of the vastness and rugged grandeur of the Academy's 17,500-acre site high (6200-7200 ft) in the foothills of the Rockies seven miles north of Colorado Springs. The architects have said that respect for an incomparably beautiful and highly assertive setting was their first principle in developing the architectural concept; but followers of Mies and of Wright, and some critics less easily classifiable, are likely to have differing views about the

U. S. Air Force Academy

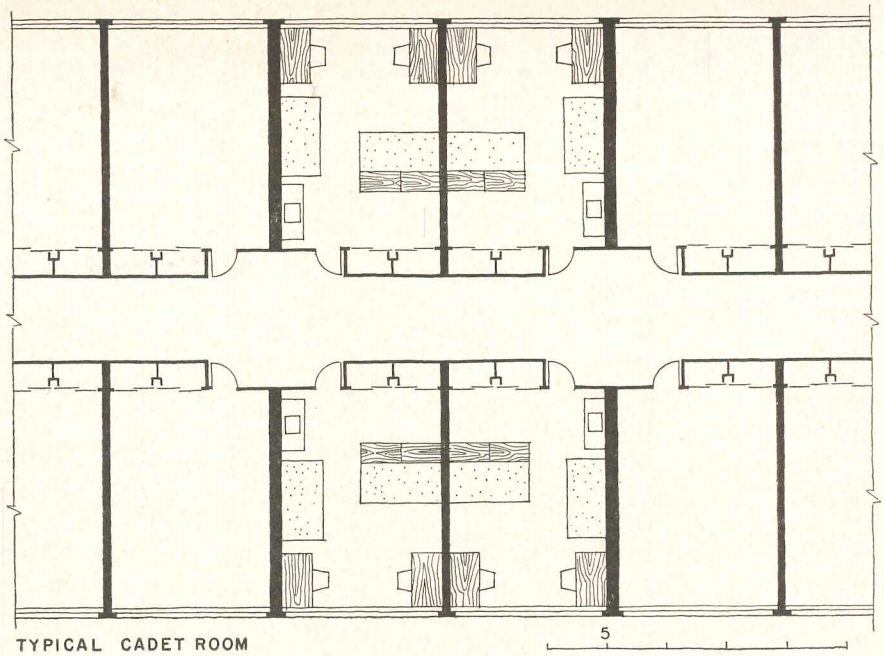
result. Are the buildings an appropriate expression of their purpose? Do they have the character suitable to the great national monument they will in fact be? Or—this questioning will run—do they signify merely the latest expression of what some observers have chosen to call an SOM style; perhaps crisper and handsomer than usual, but nonetheless expression of a corporate esthetic rather than of intrinsic purpose? But until the buildings can be thoroughly evaluated, let the critics beware lest—short of a visit to the site—they fail to grasp the scale at which they must read: the best of photographs only hint at the immensity and splendor of the site; the incredible transitions in scale as the winding approach provides the viewer with various and ever closer glimpses until finally he is within the campus, and sees the buildings and the spaces between them as they relate to each other—and the cadet.



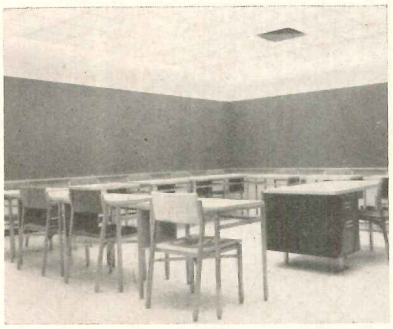
CADET ACADEMIC AREA is the center of cadet life, where the cadets live, eat, study and relax; it is also the administrative center and the public image of the Academy. The plan was carefully developed not only to meet the rigid requirements of the cadet regime—including the perpetual forming and marching—but to accommodate the prospect of public interest without interference with cadet routine. The Administration Building and the Cadet Social Center, above the campus level to the west, form a sort of public area from which visitors can observe at some remove. Landscaping from designs by Dan Kiley was in its earliest stages when photographs in this issue were taken.



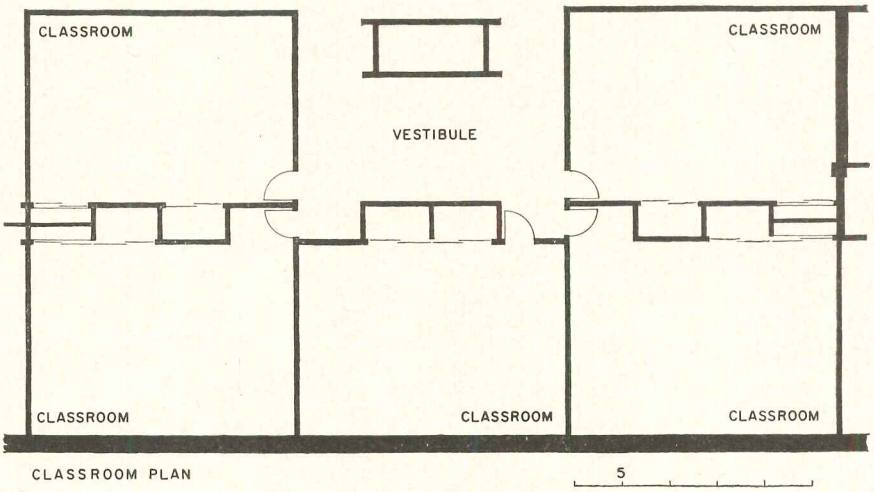
Typical two-man living unit, 18 ft 6 in. by 13 ft 4 in., has sliding aluminum windows, walnut wardrobe and storage units, double lavatory, sand-finish plaster walls



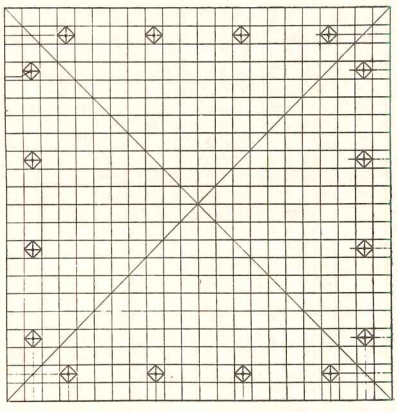
TYPICAL CADET ROOM



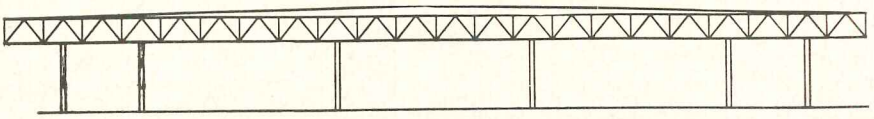
Windowless classrooms, arranged in clusters for flexibility, were deliberately designed to focus attention, blackboard-lined for daily cadet routine

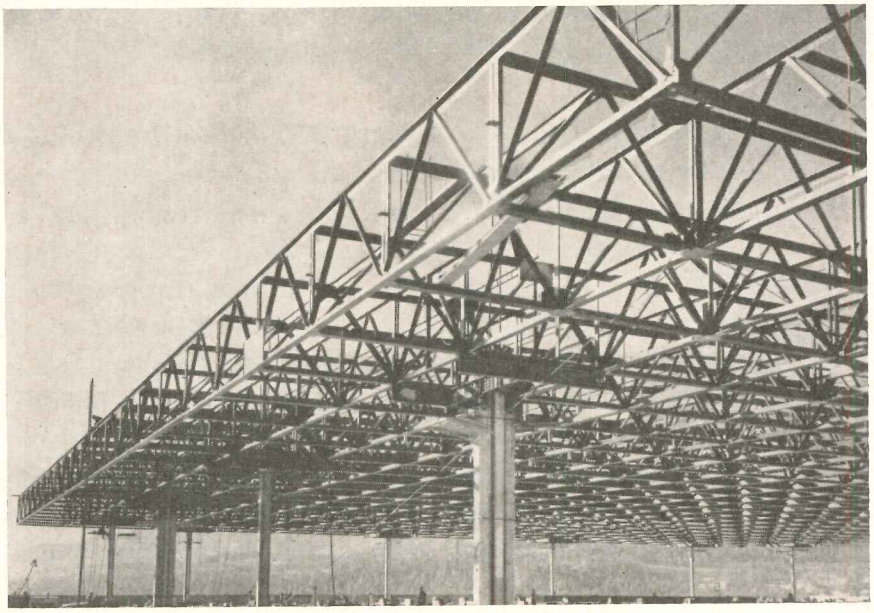


CLASSROOM PLAN

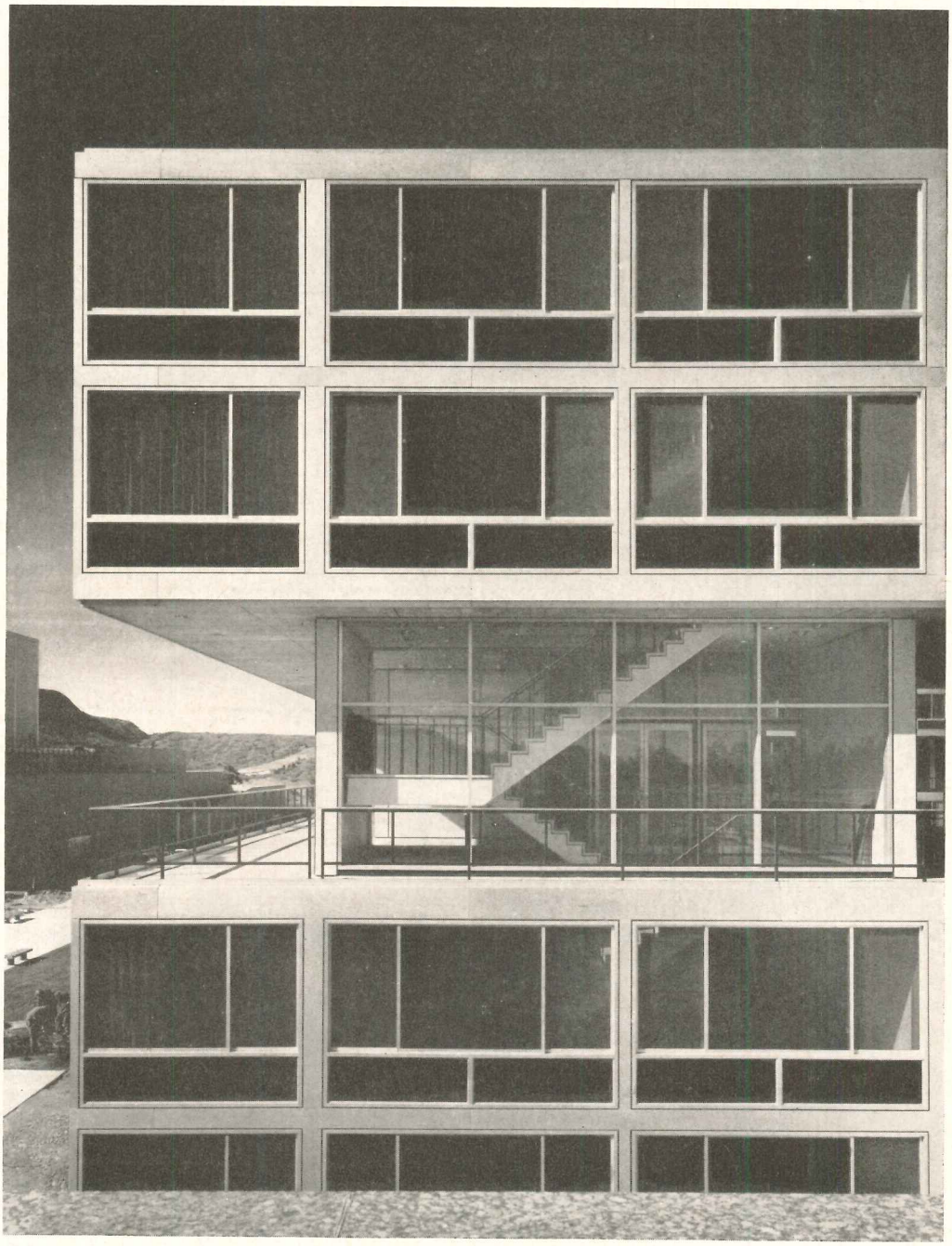


Roof structure of Cadet Dining Hall consists of 23 Warren trusses intersecting at right angles to each other. The trusses are spaced 14 ft on center. The edge trusses have paralleled chords 8 ft 6 in. out to out; all other trusses have partially sloping upper chords to produce a ¼ in. per ft pitch. The out-to-out dimension at the center of the 308-sq-ft roof is 11 ft 8½ in.

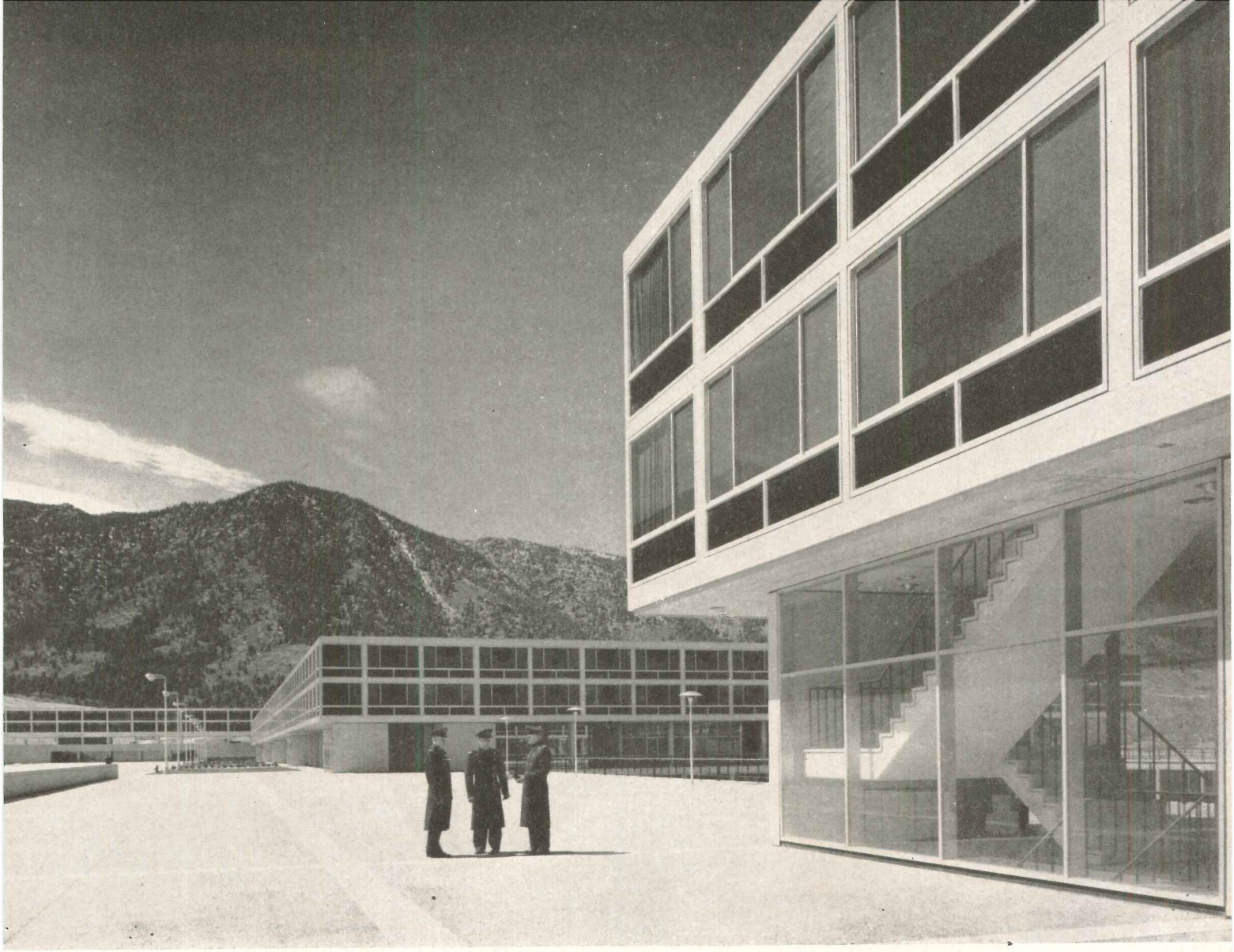


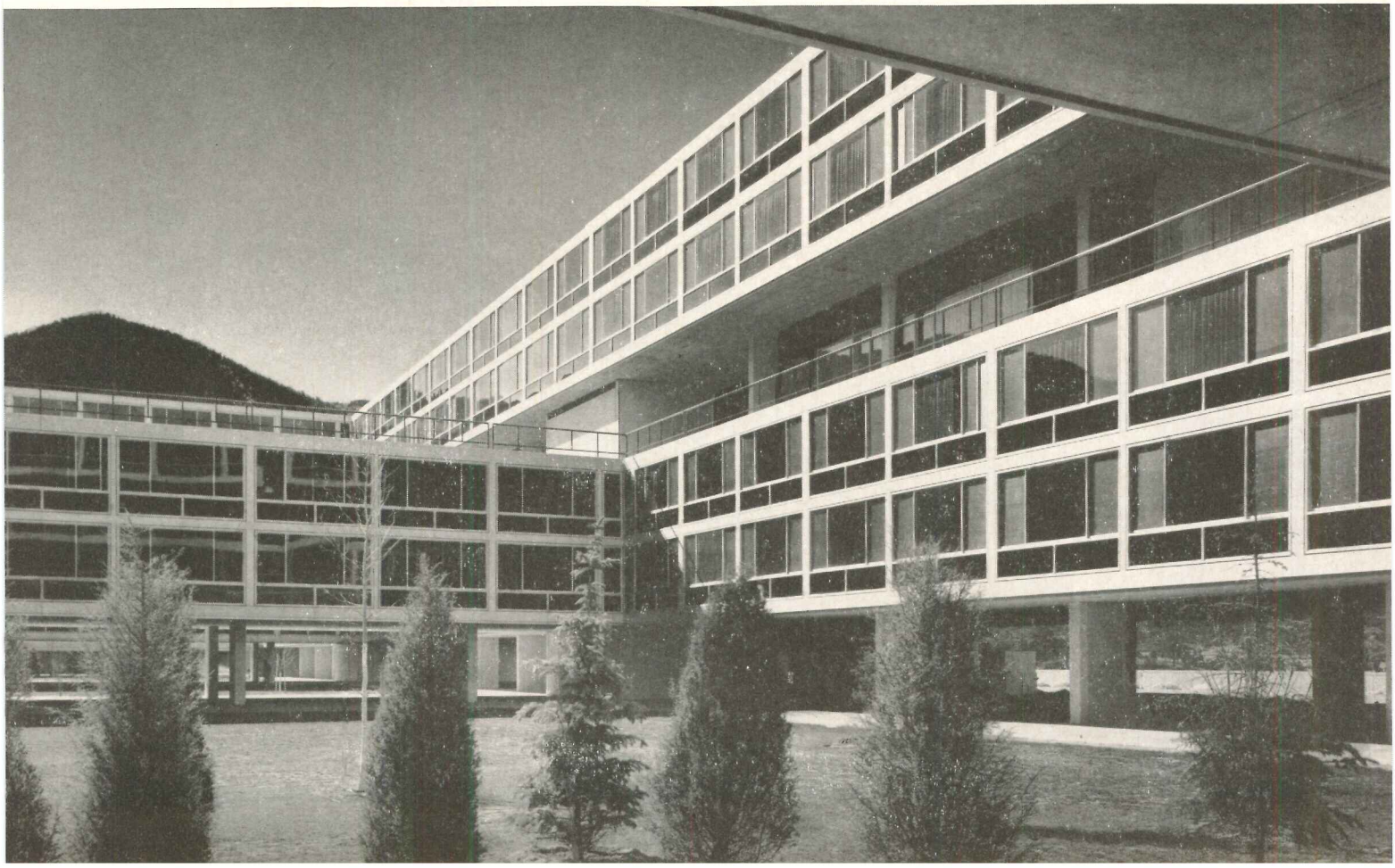


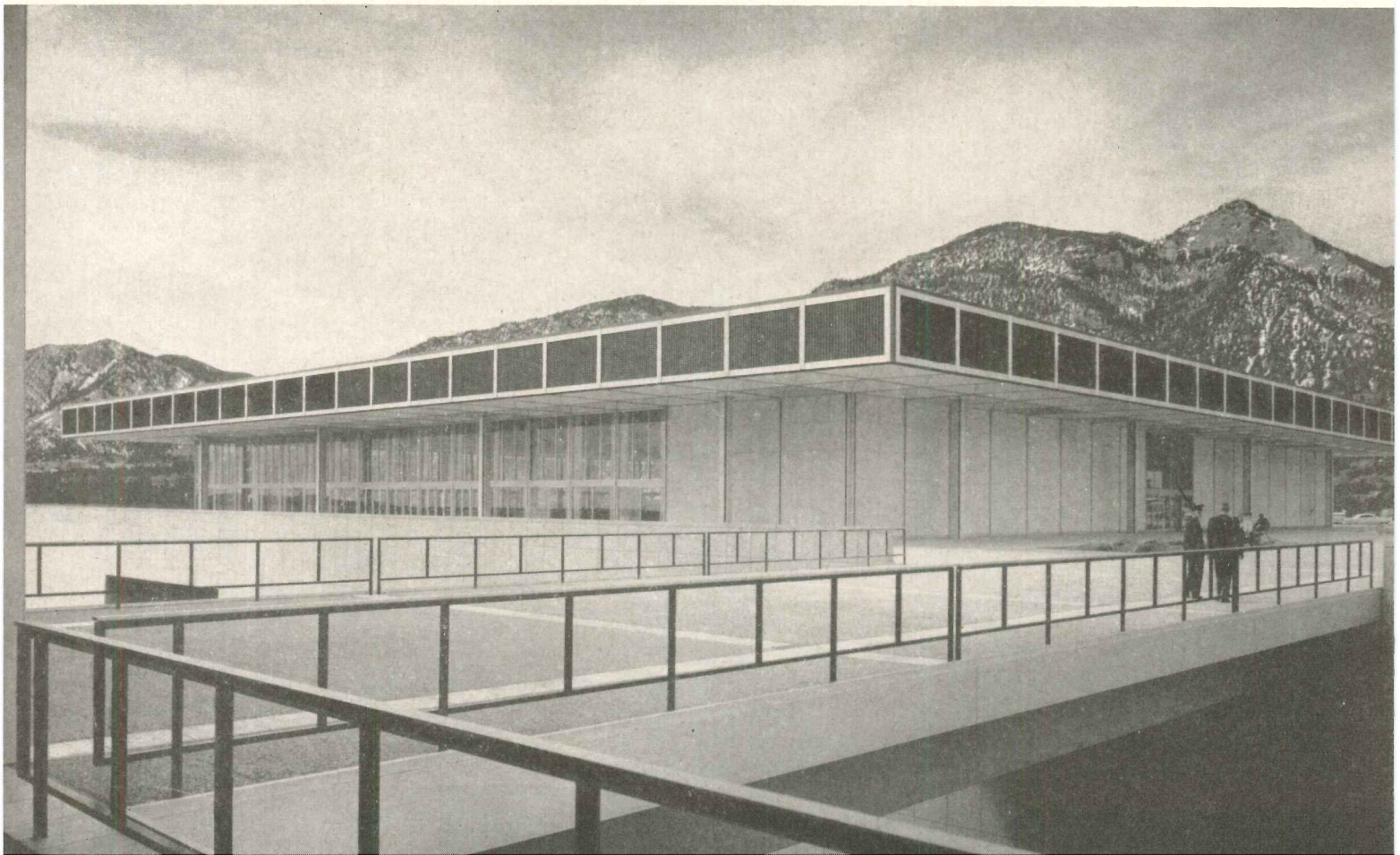
Photos on this page by H. LaPlant

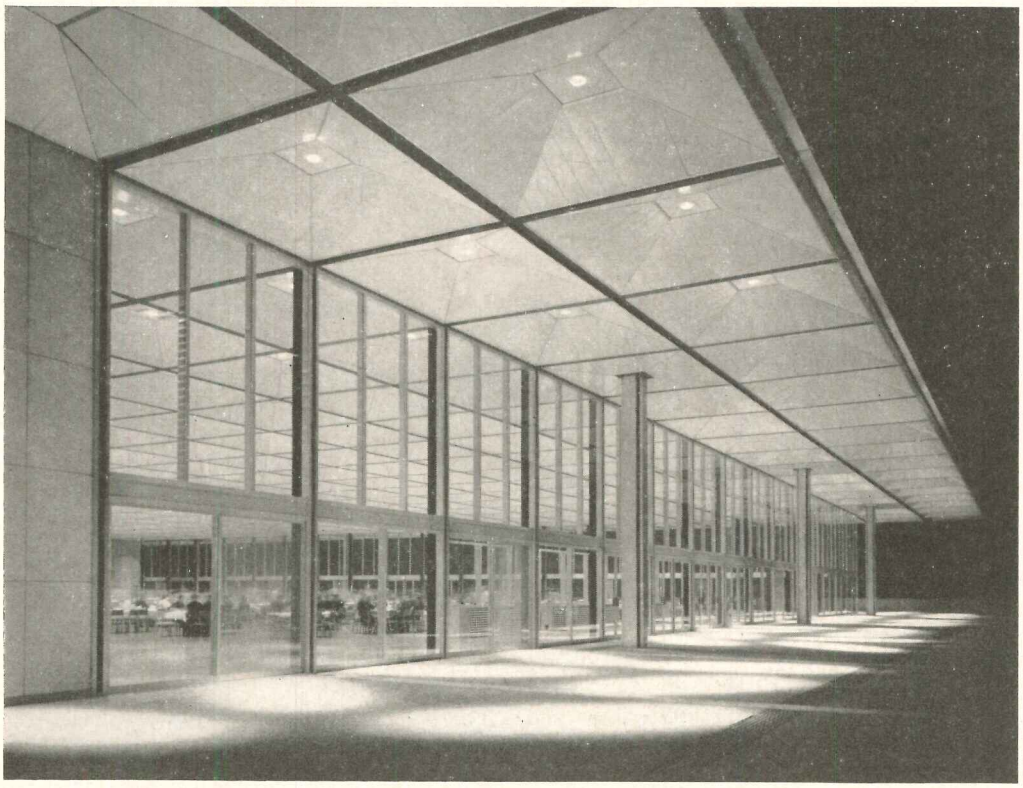


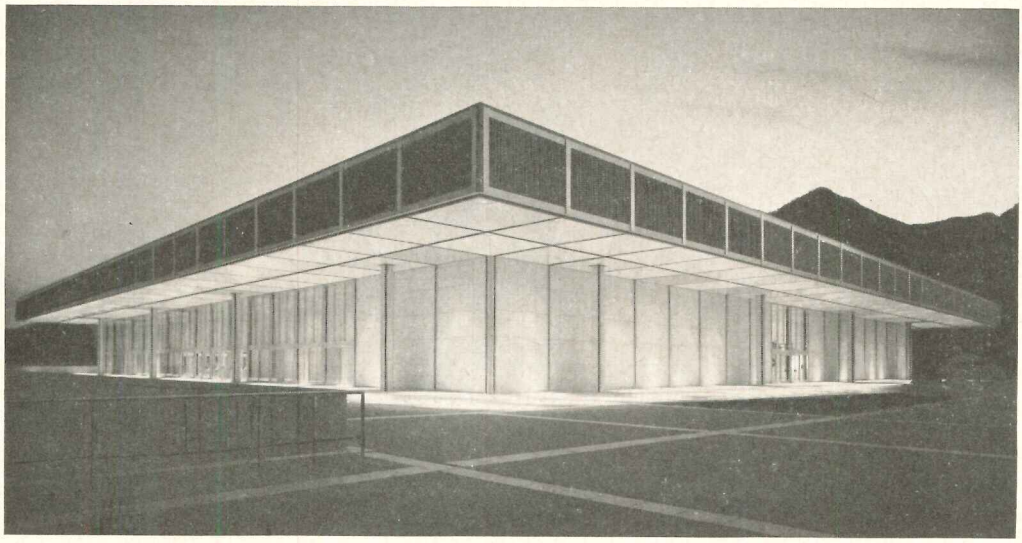
CADET QUARTERS COMPLEX utilizes what the architects call a "two up and two down" scheme on its site at one edge of the campus plateau to provide four floors of cadet rooms with a maximum ascent or descent of two floors from an open floor at campus level. Organization of the plan as three hollow rectangles surrounding open courts then provides the required unit living areas for six cadet squadrons: a total of 2640 cadets in 1320 rooms. Both the vertical and horizontal separations also contribute to a more human scale in a building whose overall length is 1337 ft 9 in. (Height at campus level is 32 ft 10 in.) An open floor on the lower level provides access to the garden courts (and the adjacent athletic facilities—not shown). Structure is reinforced concrete flat slabs on structural steel columns 28 ft on centers; exterior curtain walls are glare-reducing glass in two shades of gray and aluminum.



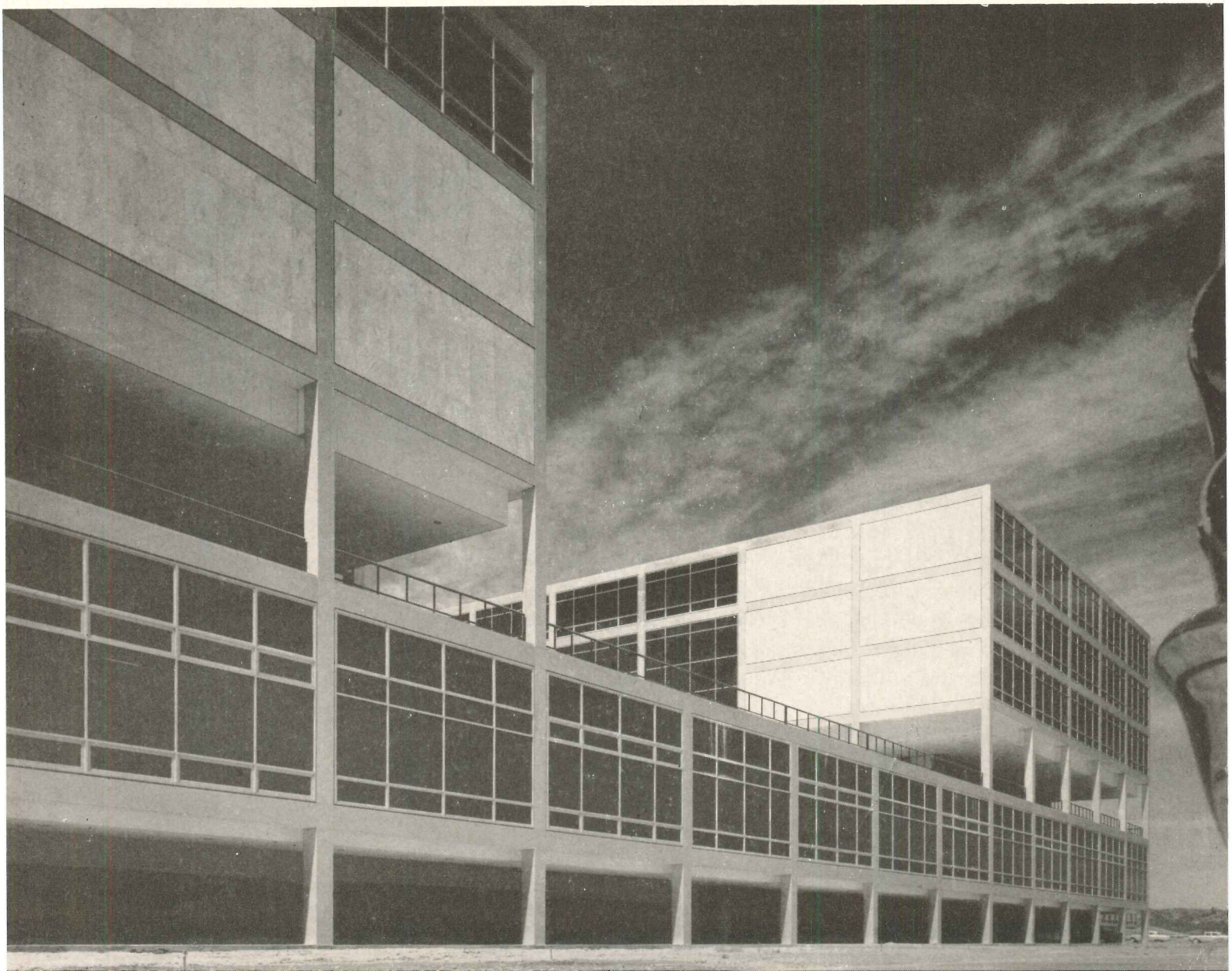


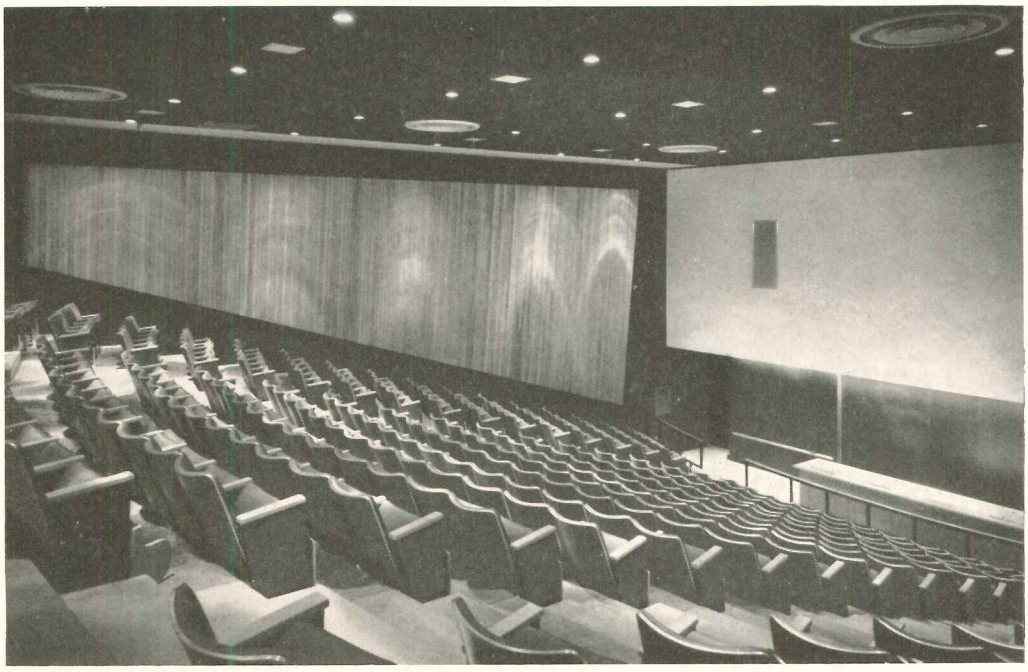




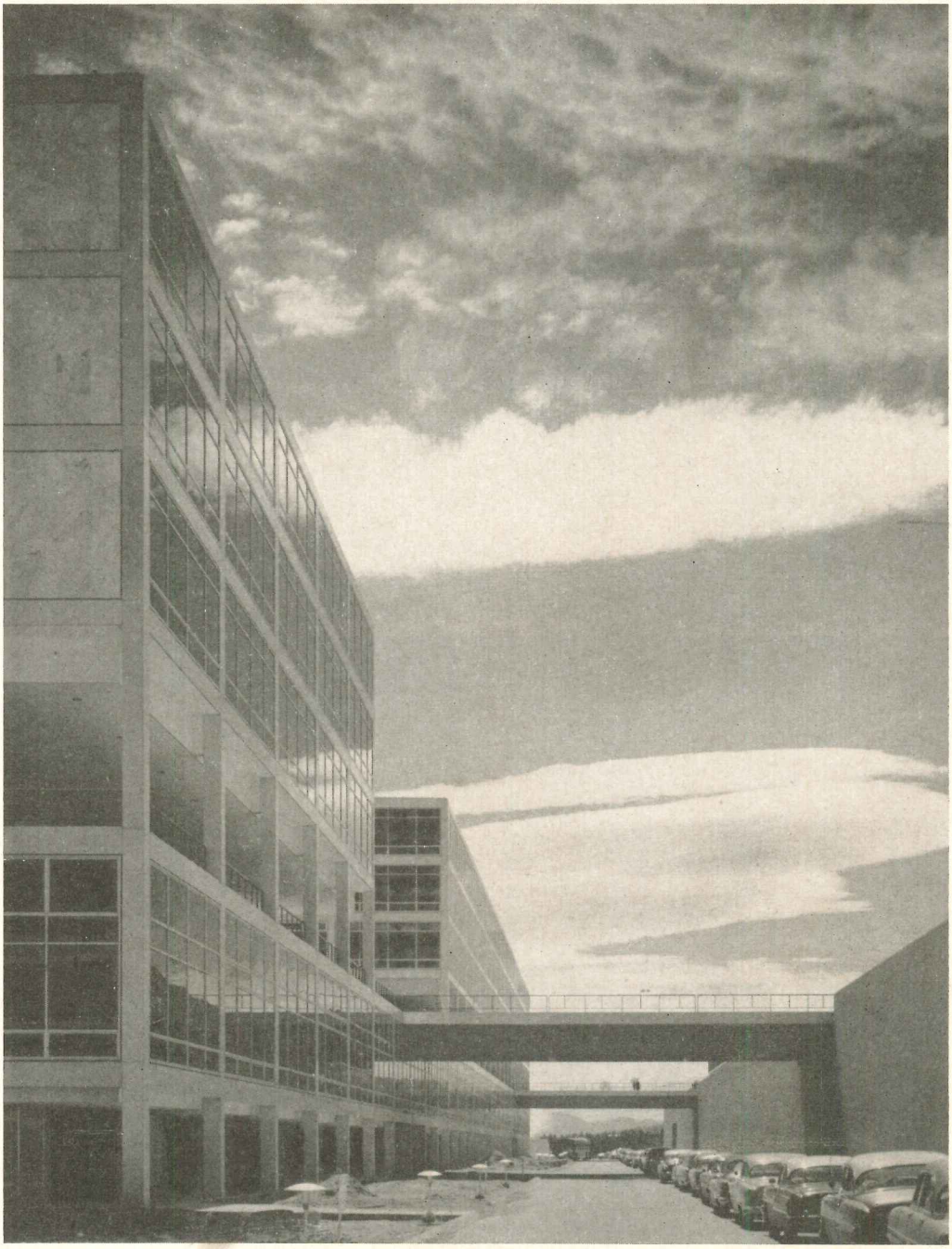


CADET DINING HALL, which was required to accommodate entire cadet corps at one sitting, provides a great column-free dining space 252 ft sq and 24 ft high; a mezzanine deck above the cadet dining area seats senior personnel and guests. Space under mezzanine contains serving, kitchen, scullery and dish-washing facilities; a complete lower floor loading deck and the numerous food receiving and storage facilities. Below campus level structure is reinforced concrete. Campus level structure consists of a structural steel roof (see page 155) 308 ft sq supported by 16 steel columns, four to a side, with the roof cantilevering 21 ft for a clear span of 266 ft. Exterior walls are of plate glass with aluminum mullions. Dining area is lighted by high-bay incandescent units centered in metal coffered ceiling panels between the 14-ft truss grid.





ACADEMIC COMPLEX, like the Cadet Quarters an "up and down" building on the edge of the campus plateau, contains most of the educational facilities for the cadets—in the larger unit science and humanities classrooms, laboratories and lecture halls; in the smaller wing the library and office space for the Commandant of Cadets and his staff. The first floor, connected to the campus level by two bridges, contains in the larger wing the lecture halls, with three floors of classrooms above and on two lower levels laboratories, the cadet dispensary and dental clinic and service facilities. Classrooms are inside and windowless (see page 155), designed to assist the intensive concentration required during recitation periods; glazed exterior corridors afford a major change in environment between classes. Overall dimensions of the build-



ing are 785 ft 9 in. by 281 ft 9 in. for the lower floor base, with the two sections of the upper floors 141 ft 7 in. by 281 ft 9 in. and 505 ft 9 in. by 281 ft 9 in.; height is 60 ft 4 in. at campus level and 90 ft 10 in. at the service level. Structure is a steel frame with a floor system of steel pan lightweight concrete joists spanning 28 ft. Upper expansion joints consisting of rockers similar to those used for bridges, and supported on brackets attached to the columns, obviate the need for double columns which would otherwise have been expected in a building of such great length. The curtain walls are of glare reducing glass, aluminum and marble. Lighting is fluorescent throughout; classrooms have luminous aluminum grid ceilings providing over 50 ft-c of illumination, corridors continuous fluorescent troffer. The building is completely air conditioned.

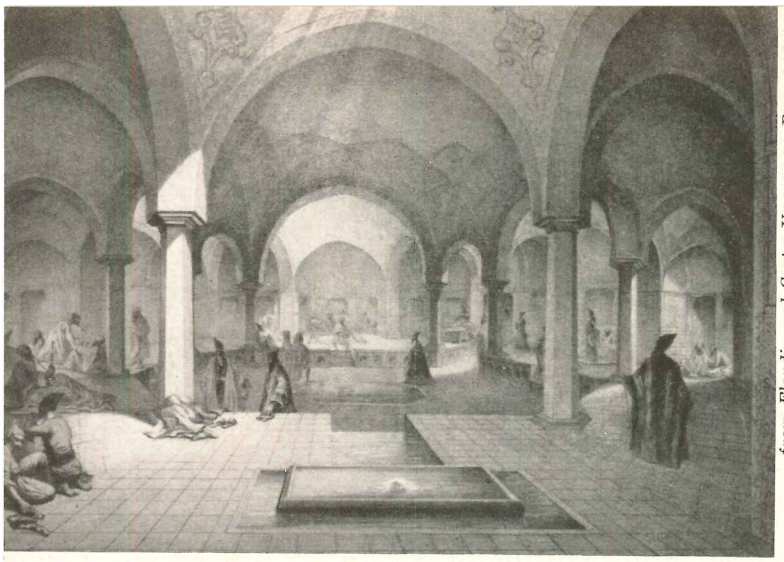
Water plays self-complementary roles in the North Fort Grotto of Sir Edwin Lutyens' Viceroy's Palace at New Delhi, c. 1913

Country Life

Water Inside and Out

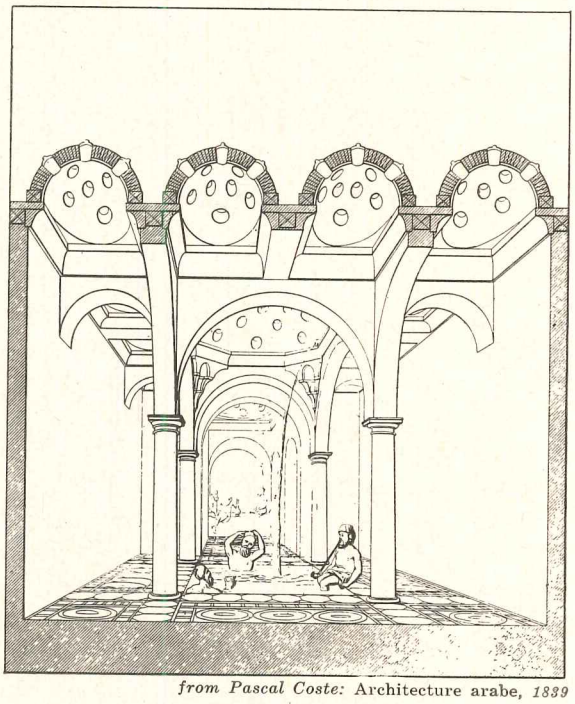
by Elizabeth B. Kassler

As architects who have struggled conscientiously over the years to keep water *out of* buildings and buildings *out of* water now warily begin to welcome the traditional enemy within their camp, they find new opportunities, new problems and—if they care to look into history—a multitude of venerable precedents, some of which are presented in this concluding essay of a series on Water and Architecture.

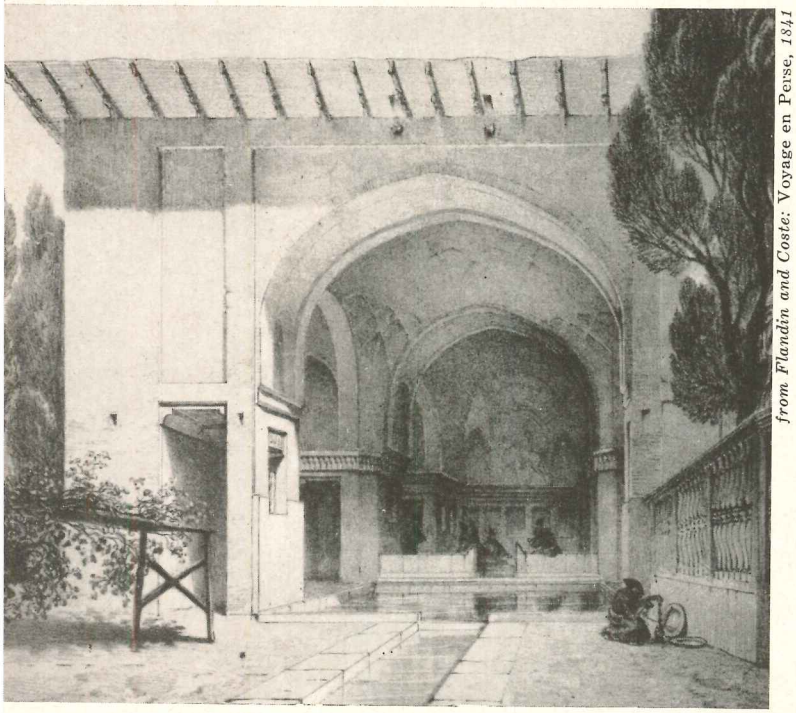


from Flandin and Coste: Voyage en Perse, *1841*

The traditional Middle-Eastern bath makes the standard sanitary American solutions look pitiful. Like the ancient Roman baths, which they seem to predate, they are usually communal affairs, offering air and water at artfully graduated temperatures in a series of variegated spaces. As shown in the Persian example at left and the Cairo version below, Islamic bathers like a dim, subaqueous light, procured by domes dotted with green glass eyes

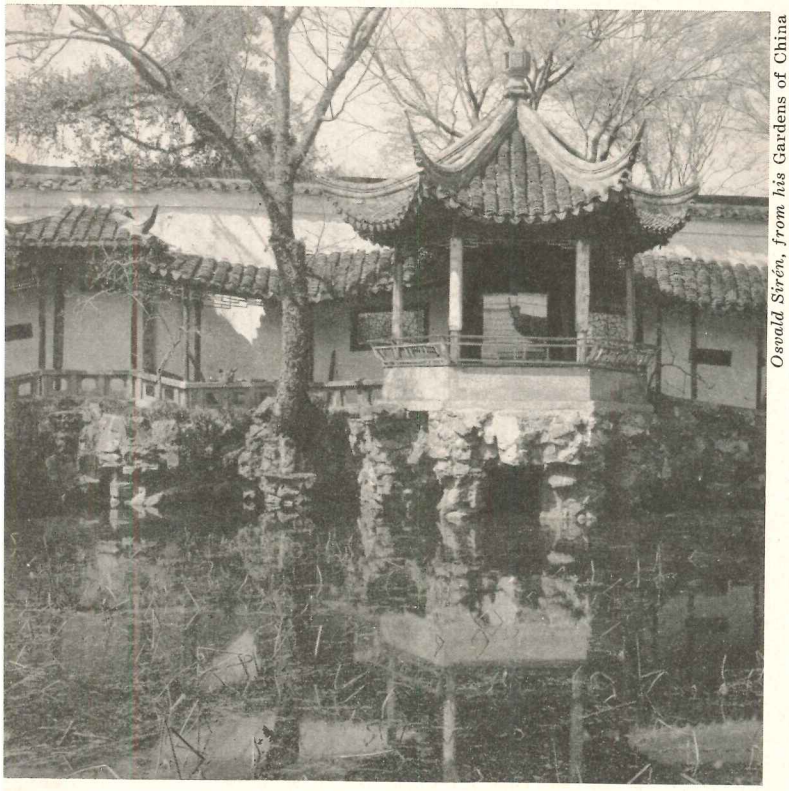


from Pascal Coste: Architecture arabe, *1839*



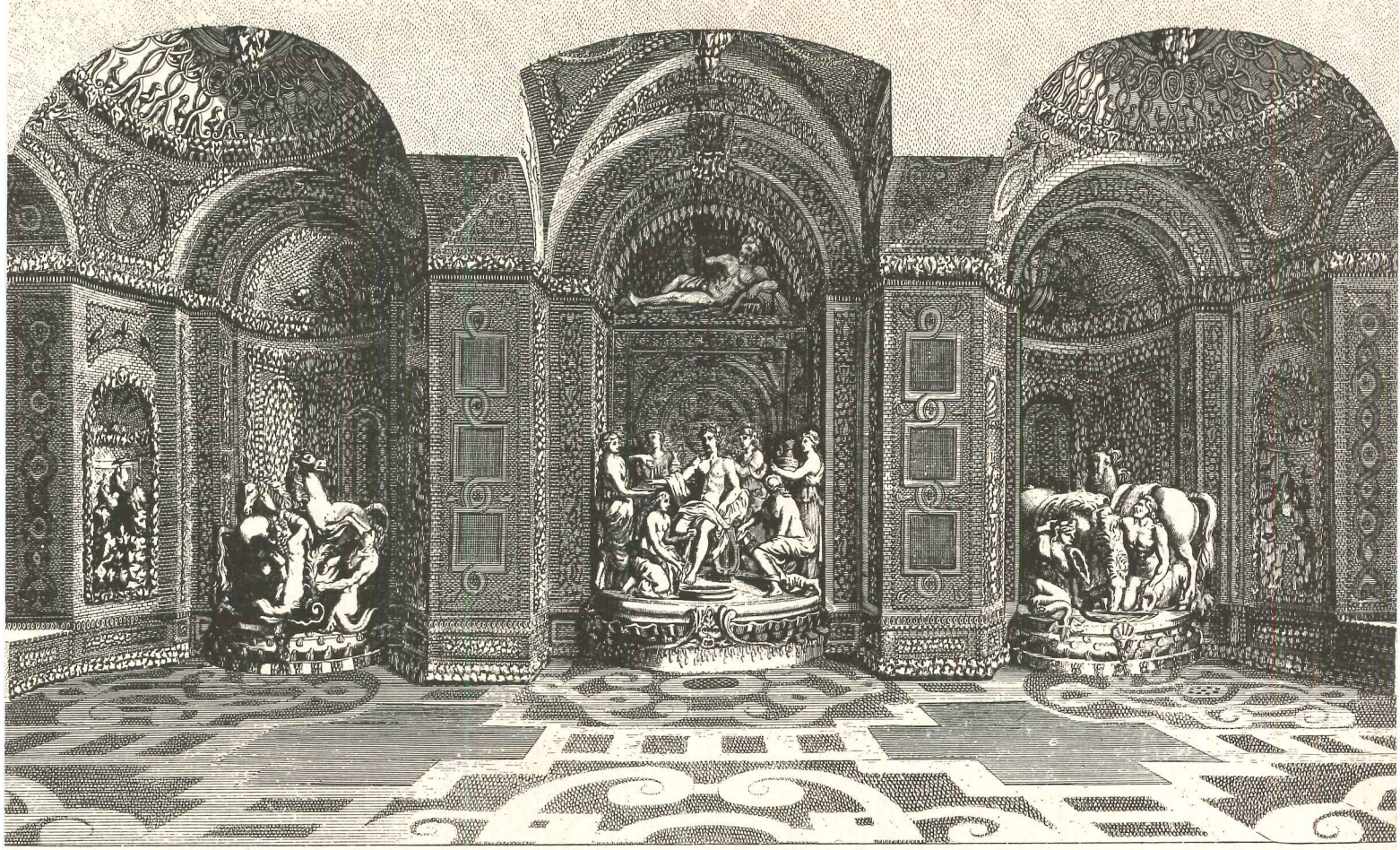
from Flandin and Coste: Voyage en Perse, *1841*

Persian summer pavilion with sheltered pool and channel



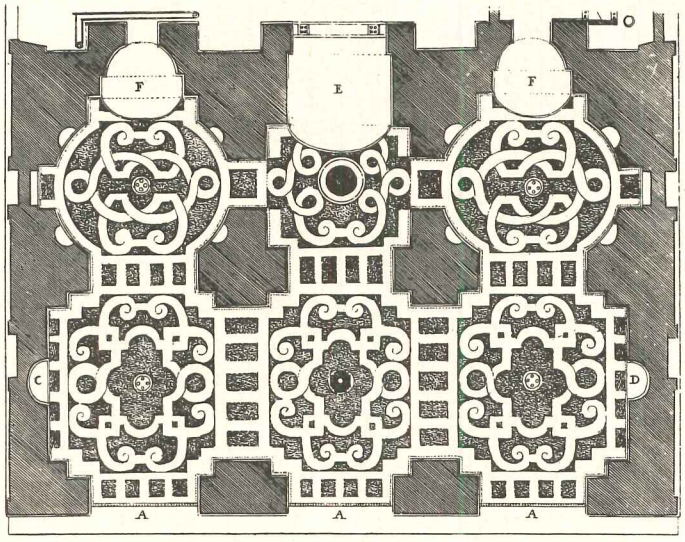
Osvald Sirén, from his Gardens of China

The roofing-over of water would be considered an anomaly by the Chinese. They leave it open to sun and sky, then build around it and into it in a wonderfully effortless and intimate way. Here the water level would originally have been higher



from Johann Ulrich Kraus, Description de la grotte de Versailles, *16??*

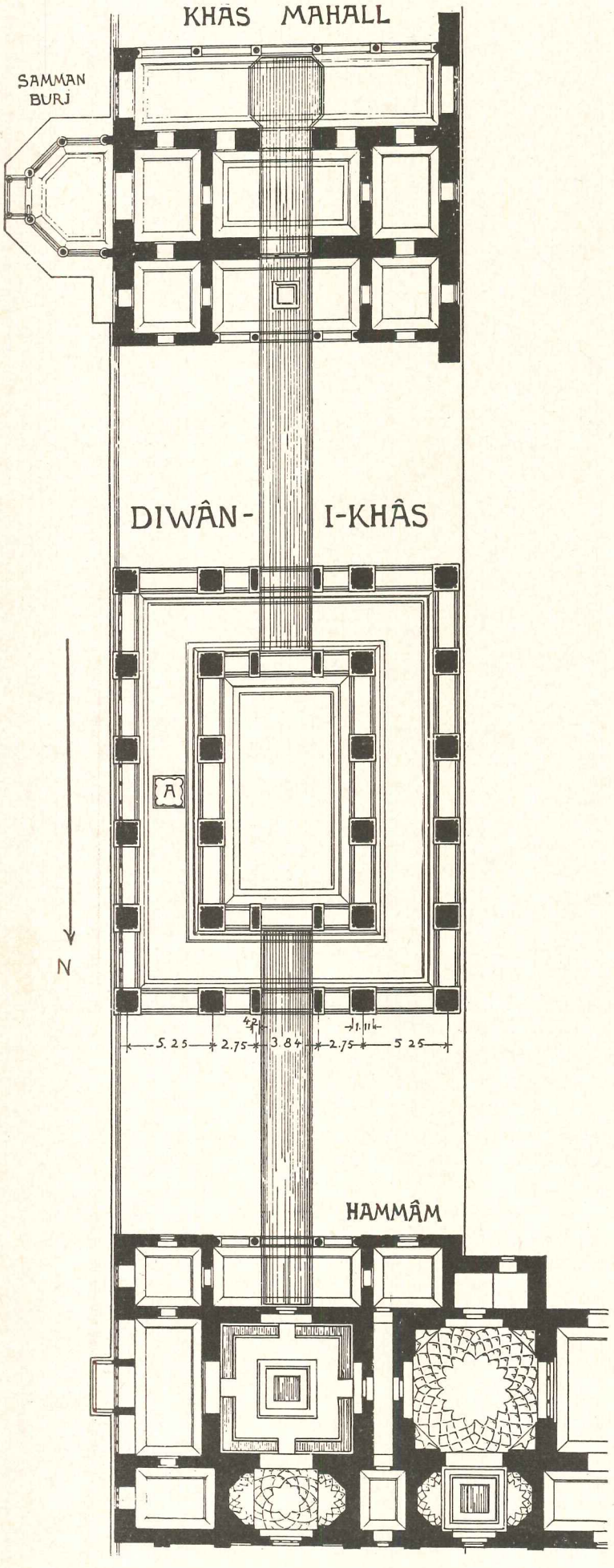
Grotto of Thetis, Versailles. Existing in 1668; destroyed soon after. . . . . This most renowned of all grottoes was under a palace terrace and received daylight only through its three entrance arches. Here the Sun King, Louis XIV, was honored by well-watered sculpture (F, E, F in plan below) representing Apollo, the sun god, and his horses resting in the home of Thetis, goddess of the sea, after running his daily course across the sky. The underwater theme was emphasized by intricate colored shellwork which covered every visible surface—even, in naturalistic tints, the statuary. Behind the main niche was a water-organ and all around was the song of water-automatic birds. . . . . Formal fountains in niches and at axis crossings were supplemented by surprise jets and falls: "Keep them for the townspeople and the Germans," cried LaFontaine as he fled dripping from the scene after a special trip to Versailles to see this marvel

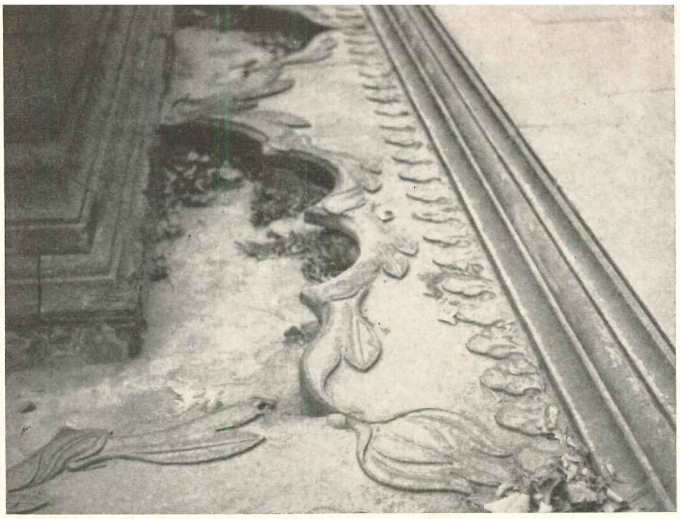


Since Westerners have never had much interest in a show of water inside their buildings, there is little in our tradition to stimulate today's architect. There were the Italic atrium house, prototype of Florida's inner-courtyard swimming pools, the great public baths of Imperial Rome, and Hadrian's fabulous villa at Tivoli, where ruins suggest elaborate inner waterplay. There was the artificial cave or grotto, a summer retreat frequently overpopulated by sculptured deities, and there has been the legendary association of fire with water, probably first domesticated by Frank Lloyd Wright—always one to recognize a natural affinity—in fire-and-waterplaces at Taliesin West.

More challenging to us than our own past is the Islamic way with water. Although the great monuments are at least two centuries old, it is still a live show, and no one has ever understood better than a Moslem how to make an intimate pleasure, indoors and out, of fountains, pools and narrow burbling channels. Human in scale, effortless in style, their waterworks are easy to live with.

An indoor display of water is unthinkable in China or Japan, where water is regarded as inseparable from earth and sky. Our own sense of propriety is less acute, yet common sense does suggest that water be brought cautiously into a limited living or working area, for quiet pools soon acquire a dreary murk and the sound of live water, if inescapable, may prove no less torturous than a leaky faucet.





Catherine Bauer Wurster

Drought has overtaken the Red Fort's channels and pools, falls and jets, yet Arthur Drexler feels that water is still its essential all-pervasive reality, and claims it as a veritable encyclopedia of the possible uses of water . . . Here is one exquisite detail: a cusped slab of leaf-carved marble suspended over a channel to obscure its confines

When using water to join indoors with outdoors, it is the Moslem custom to give it direction. They like a canal of clear water, running to the outside with a will that makes our own half-in, half-out pools seem ambiguous.

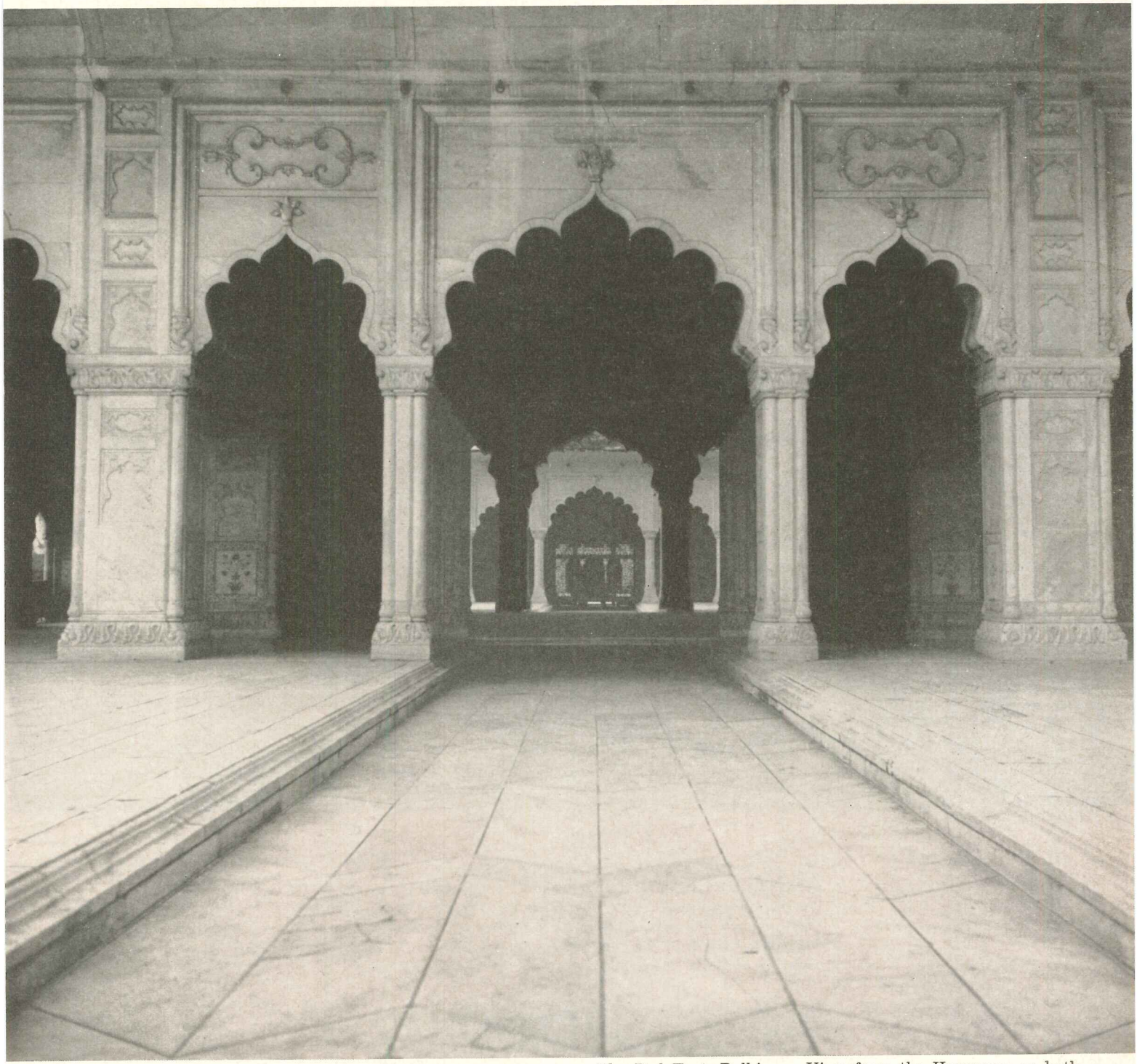
Two of the great monuments of Moslem architecture are based on this theme . . . Some travellers say that the Alhambra's Court of Lions is the supreme achievement, while others find their favorite at the Red Fort in Delhi, India.

The Red Fort is a vast palace built by Shah Jehan in the first half of the 17th century. Here on a great red sandstone wall overlooking the river are three pavilions of lacy white marble, strung together by a canal "like pearls on a chain." The water itself has long since disappeared, yet its presence is implicit.

High in the southern wall of the Khas Mahall (plan at left) is the source, a horizontal slot from which a sheet of water emerged to rush as frothing rapids down a carved chute. Quieted to a ribbon ten feet in breadth, it passed under a pierced screen of translucent marble to embrace a square island, then came out into the sunlight as it flowed toward the second pavilion, the open-sided Diwan-i-Khas or audience hall. There, before the shah's throne (A), the water temporarily disappeared under a central floor-slab and for the first time the visitor could enjoy the axial view without stepping into the stream. Reappearing in its same wave-carved channel, the water swept out once more into the open before entering the Hammam, or bath, where it became a series of square stepped pools set in flowering marble, carved and jewelled.

Incised over the portals of the Diwan-i-Khas are lines from the Sufi poet, Sa'adi: "If there is a Paradise on earth, it is here, it is here." And there, no doubt, it was.

Catherine Bauer Wurster



The Red Fort, Delhi . . . View from the Hammam, or bath, south along the canal to the Diwan-i-Khas, the central audience hall. Visible at the rear is the pierced marble screen of the Khas Mahall

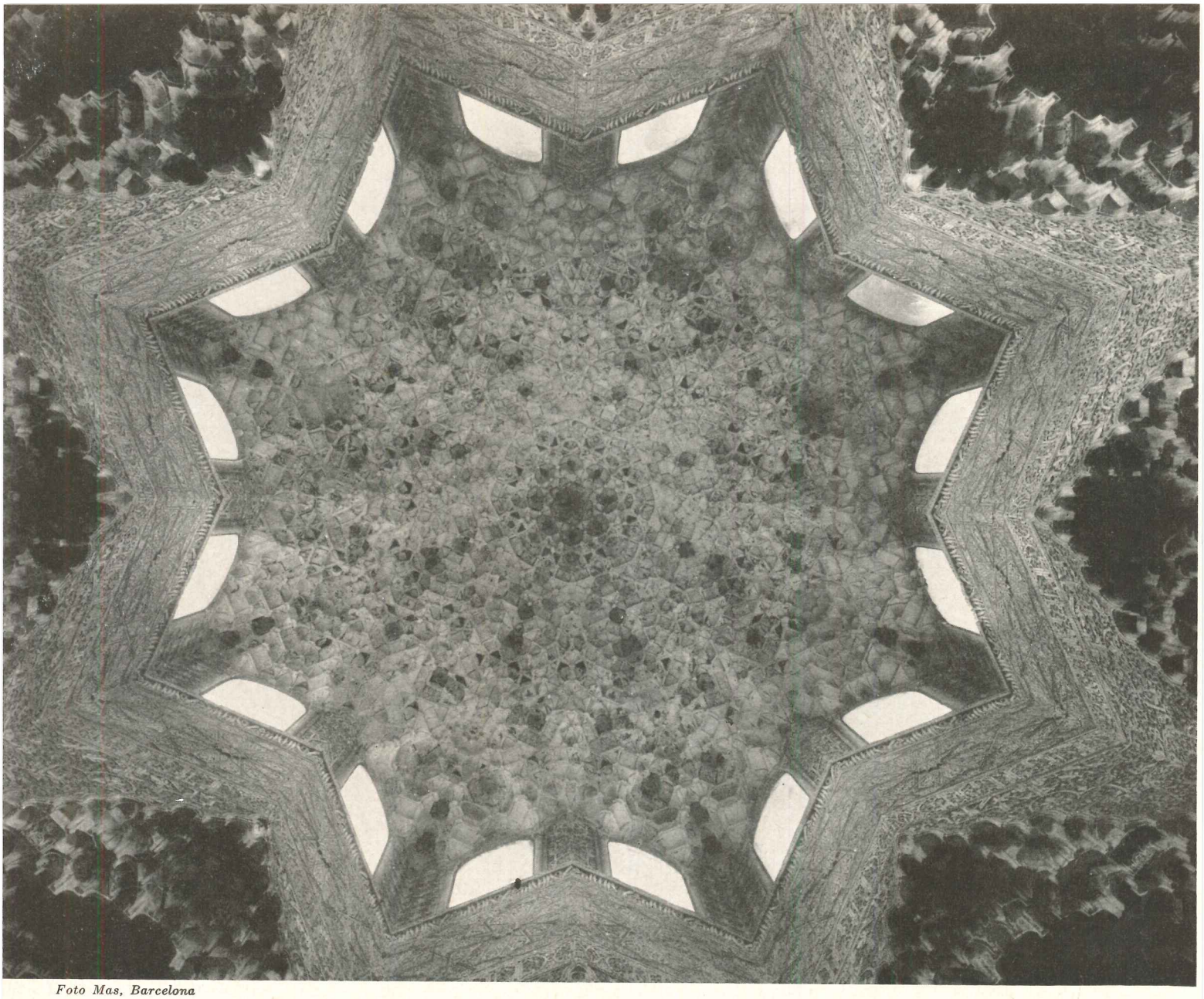


Foto Mas, Barcelona

In the Hall of the Abencerrages, on the south side of the Alhambra's Court of Lions, the central jet seems to create its own complementary space as it leaps toward the cupola which hovers above to embrace it. The water spatters back into the polygonal pool, then flows in a marble channel down steps and out to the courtyard

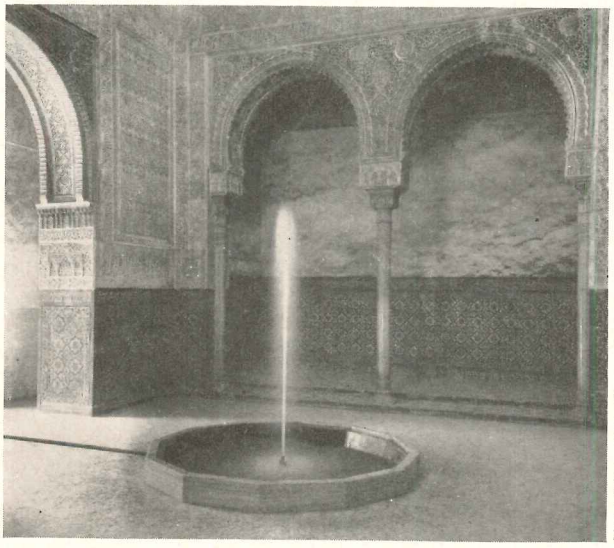
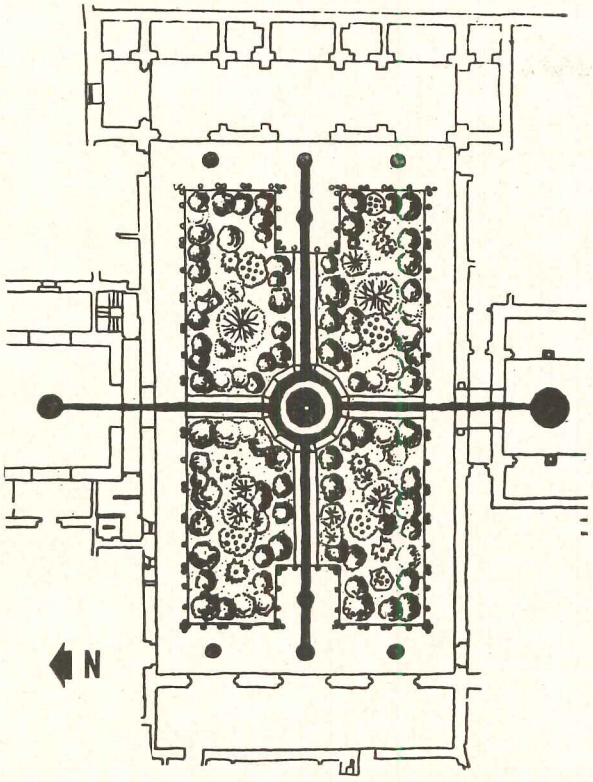


Foto Mas, Barcelona

Francisco Prieto-Moreno, from his Los Jardines de Granada



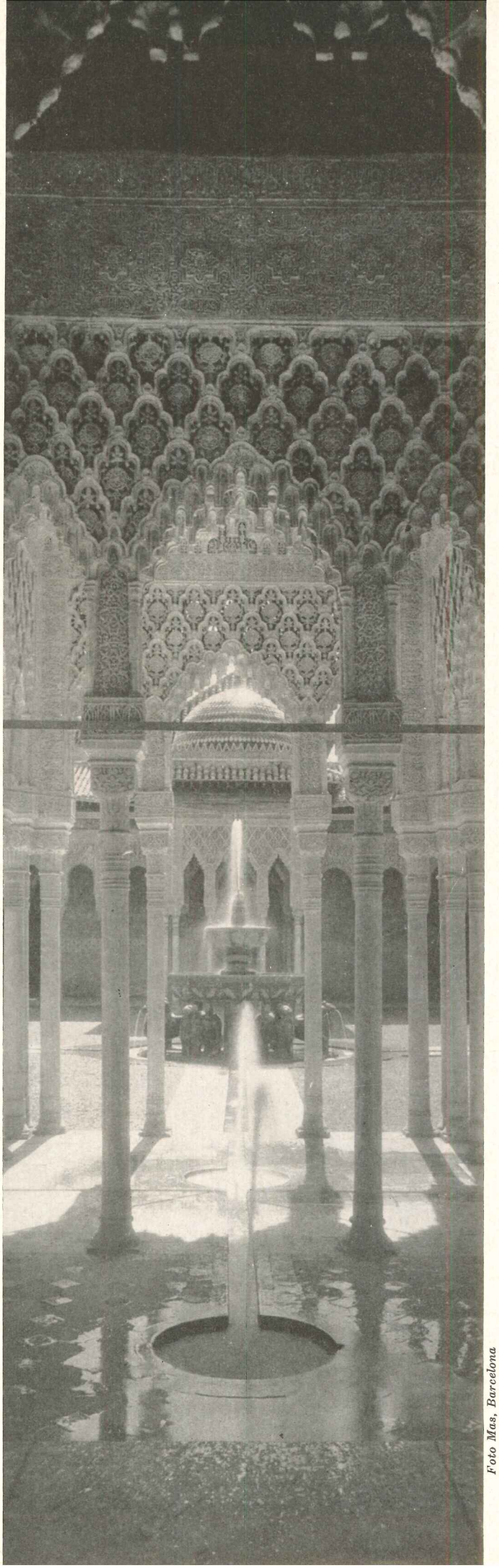
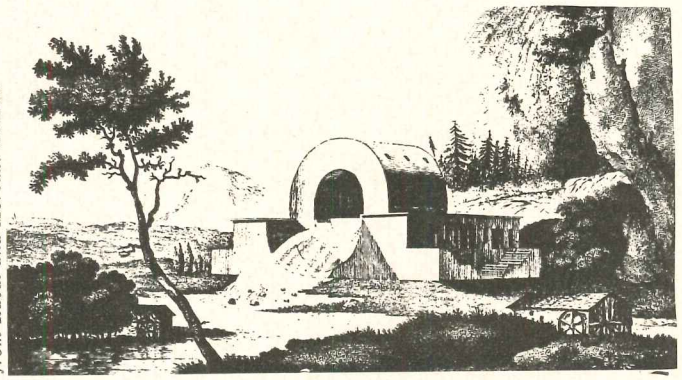


Foto Mas, Barcelona

At the other end of the Moslem world, in Granada, Spain, is the earlier masterpiece—the Court of Lions in the Palace of the Alhambra, begun in 1377. On the north and south sides the water starts as an interior fountain, leaping toward a fretted, light-pierced dome and falling into a basin set low into the marble floor, then becomes a tiny stream which drops down three steps under dim Moorish arches to emerge from a portico into the sunny courtyard. From east and west come other marble runnels, fed by fountains under extended porticos. At the Lion Fountain the four streams converge to form a cross, familiar symbol of the four rivers of Paradise. As Washington Irving observed in 1832, "the alabaster basins still shed their diamond drops," and that is happy, yet for full savor of the design one must imagine the court with its original planting of orange trees as shown in plan above.

The Persians, too, used running water to join inner and outer space, and even today an Iranian mansion may have, under the main quarters, a ground-level summer room with a fountain, whence a channel runs beneath latticed doors to bisect the garden.



from Raval and Moreux: Ledoux

Claude-Nicholas Ledoux (1736-1806) had small use for Baroque fountains: "There one sees Thetis wringing water from her hair. Here it's Neptune who strikes his trident on the rock to bring forth a few inches of water . . . It's all a fraud." Waterwise, he himself sometimes decorated his buildings with congealed waterfalls of stone, or—romantic showman that he was—set them astride real canals or waterfalls. Around 1775 he designed this "house for the Surveyors of the River Loue," with the entire river coursing through its grand geometric shapes—through a cylindrical tunnel to cascade out over a larger semi-cylinder. A Ledoux biographer, Emil Kaufmann, sees this project as a "symbol of human rule over nature" and a lesson that "architecture can and should be more than the plumber's domain"

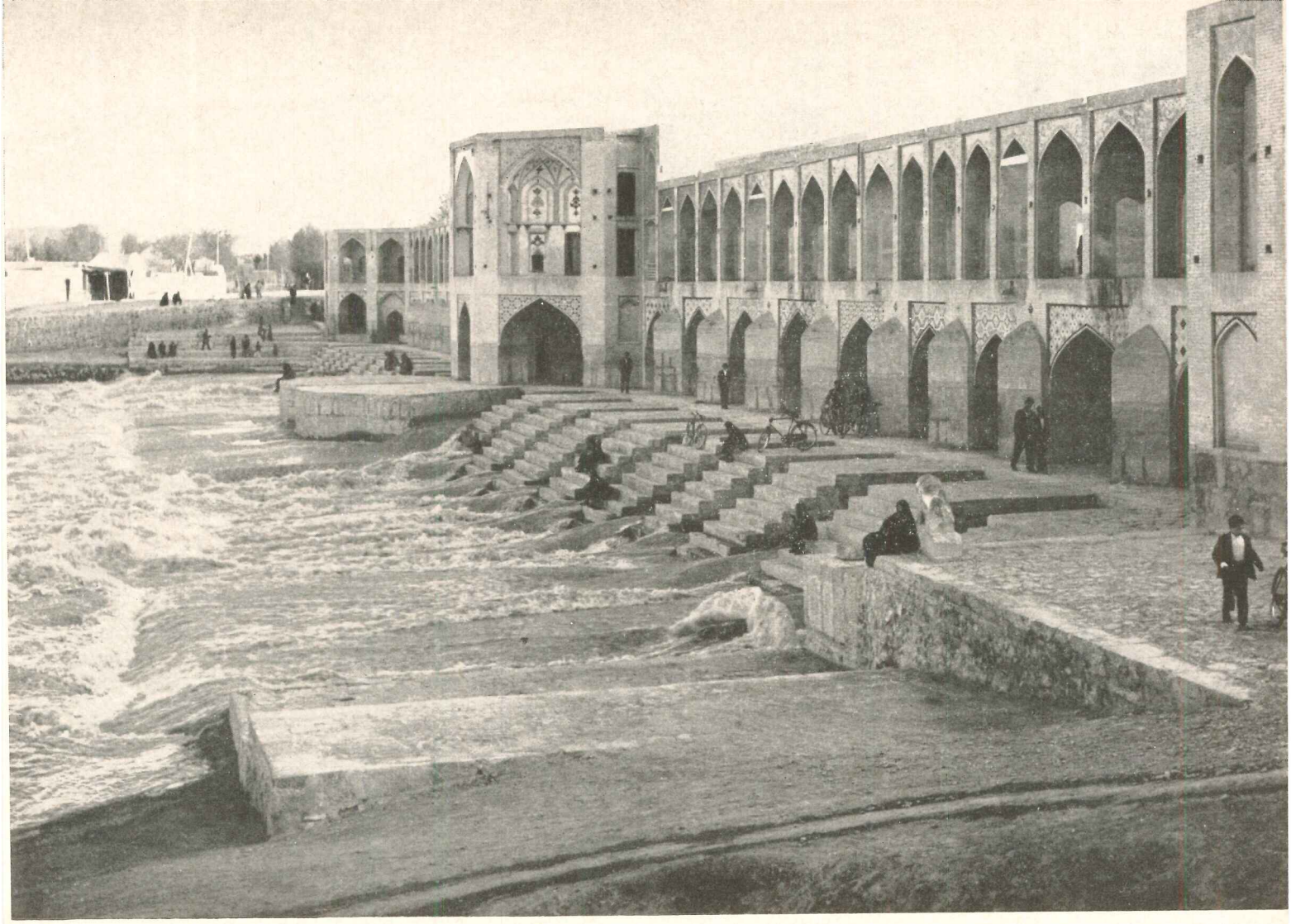
The Palladian Bridge at Prior Park near Bath serves no practical purpose. It is a pleasant waterside loggia, a worthy objective for a gentle promenade from the great house on the hill, and a gracious feature of the fine romantic landscape, complete with sheep. The designer of bridge and park may well have been Capability Brown, around 1765

For whole-hearted response to the challenge of water there is nothing else in architecture quite like a bridge. Active and passive, it penetrates even while it is penetrated.

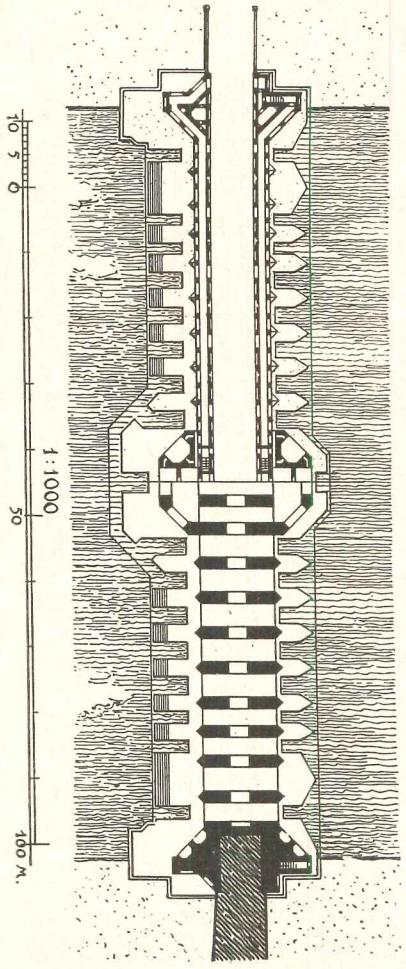
Bridges are architecture, but exceptional in their single-mindedness. Architecture otherwise is complex, devoted usually to problems of human shelter, always to the creation of space by definition; but a bridge is primarily just a cut through a void.

Bridges are a subject in themselves. Occasionally, however, a bridge has been less a bridge than something other: a house, like Ledoux's familiar, nonetheless extraordinary project; or a continuation of an ordinary city street, intact with shops and residences, over an obstructing waterway, like Old London Bridge or the Ponte Vecchio; or it may be primarily a picturesque feature in a carefully contrived landscape, like some Palladian examples in 18th century English parks. In a class by itself is the Khaju Bridge at Isfahan. More than a bridge, and more than an irrigation dam, this is the city's great public pleasure pavilion and retreat.

Photochrome Co., Ltd.



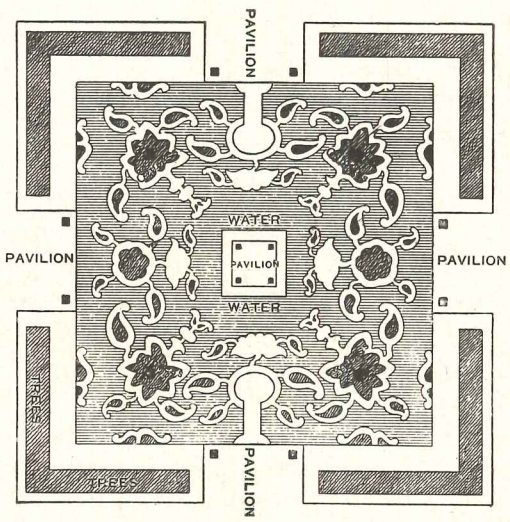
Catherine Bauer Wurster



La Roche

The Khaju Bridge at Isfahan, Persia, was built in the mid-17th century by the great shah, Abbas II, to serve not only as a bridge and a dam, but as an end in itself. Its high sill forms a six-foot dike to make possible irrigation channels at either side of the river. Traffic crosses at both levels, for pedestrians have walkways between the piers and on their downstream side, or can cross with the caravans on the road above. Opening to the road on both sides are long arcades of niches, each a little outdoor "room with a view," large enough for half a dozen people, with privacy secured by hanging a rug over the entrance. Larger chambers are provided in octagonal pavilions at the center and at either end. . . . . Julian Huxley gives the legendary history of the bridge in *From an Antique Land:* "Shah Abbas told his architect that the bridge must fulfil many functions beyond that of carrying traffic. It was to provide repose: so in each pier there had to be a stair leading down to a restroom with couches. There was to be a space for wedding parties (the bridge is still used for such festive celebrations); and a retreat for a holy man; and rooms where singers and dancers and jugglers could entertain travellers. Furthermore, the Shah insisted that even in summer, men's ears should be charmed by the sound of running water; so the architect made a special channel to collect every trickle of dry-season water into a sufficient stream. And when the bridge was finished the Shah visited it disguised in every capacity to satisfy himself that his instructions had been carried out. Only then was the architect paid"

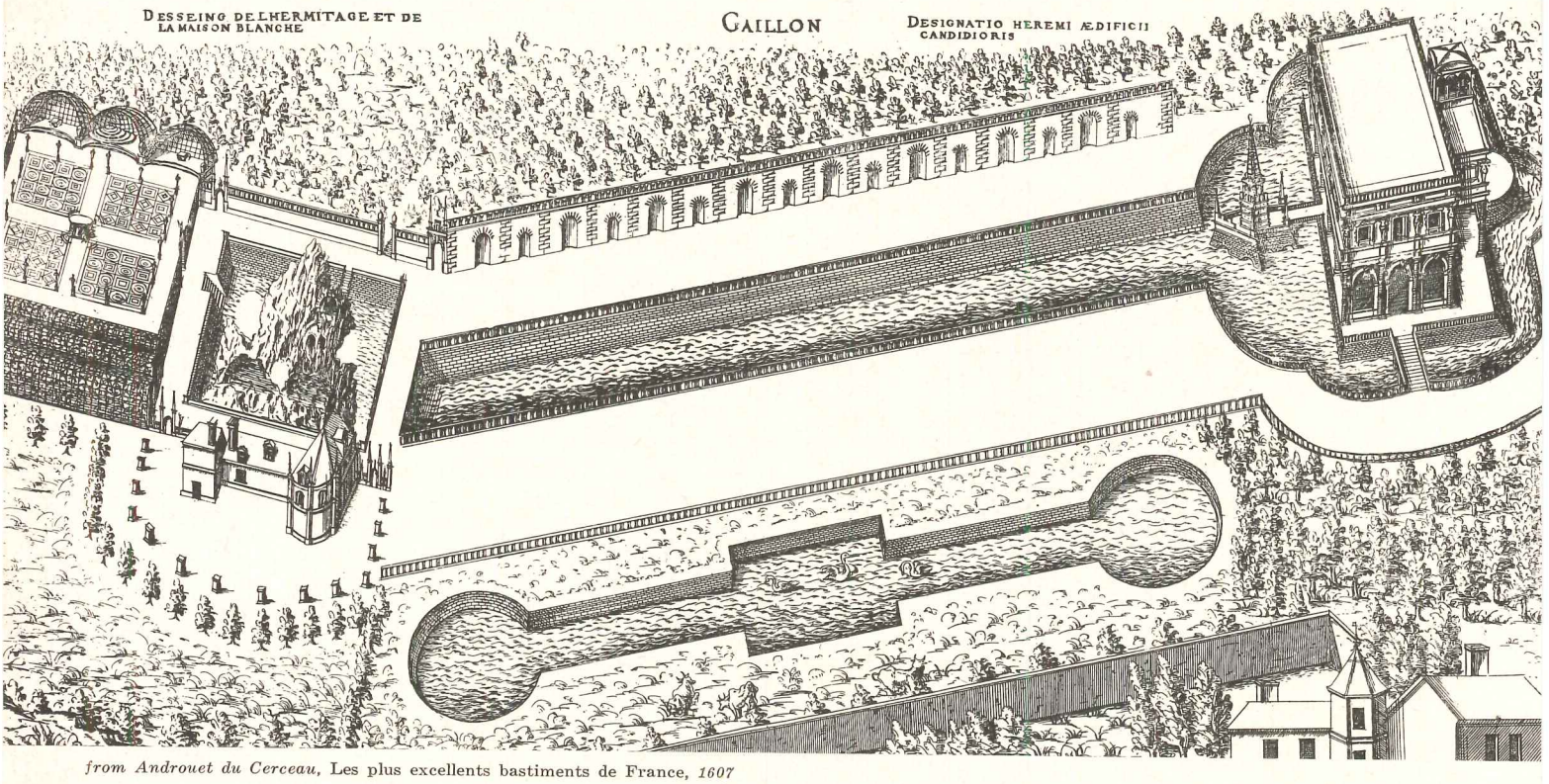
Left: forming a small round island in a round pond in a round high-walled courtyard of the Emperor Hadrian's villa at Tivoli is a ruined pavilion of uncertain purpose. Maritime theater? Natatorium? Temple of Love?



from Villiers Stuart, Gardens of the Great Mughals

Left: a marble music pavilion forms a central island in a water garden on the island of Jag Nawas at Udaipur, India. Intricately curved flower beds of bright white masonry are raised above the lakewater background in a Persian rug pattern, and a marble platform for looking and listening encloses the whole

Below: one island for pleasure, a second for religious retreat. . . . The French seem to have understood about islands, but they were slow to understand the principles of design that made the Renaissance gardens of Italy into unified wholes. In the 1560's, when the Italians were producing masterpieces like the Villa d'Este at Tivoli and the Villa Lante at Bagnaia, Bernard Palissy was building the castle and gardens of Gaillon for Cardinal Bourbon. Symmetrically disposed in its long pool is the White House, an arcaded marble pleasure pavilion. Incoherently juxtaposed are other features, including a square tank with a rocky island hermitage. . . . The low level of the water, making the pools into pits and severing objects from their reflections, was a carry-over from the time when a French castle needed the security of an encircling moat with high unscalable walls. Compare with the brimful pools of Persia filled to the brim



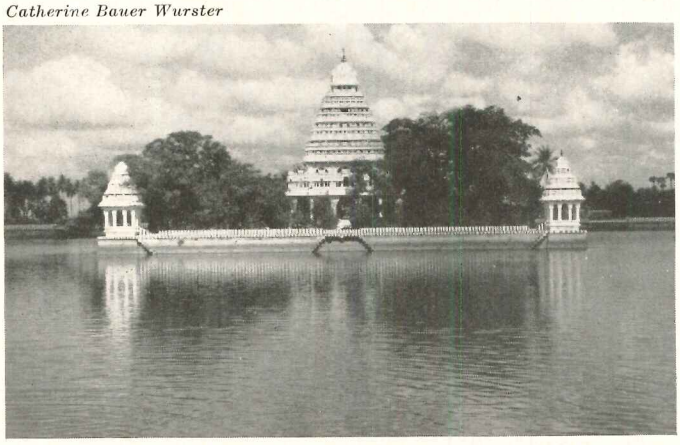
from Androuet du Cerceau, Les plus excellents bastiments de France, *1607*

On the opposite page are photographs showing how the Hindus have used holy water to their architectural advantage: above, sacred tank, rectangular and walled, with the 17th century island tomb of King Tirumalai, at Teppakulam, Madura; below, island shrines in tank of the Dravidian Vishnu temple at Conjeeveram (Kanchipuram)

Ewing Galloway

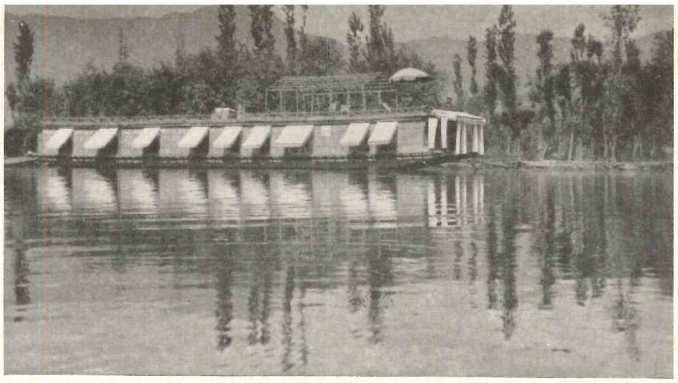
Abbey Church of Mont Saint Michel—a 13th century fortified monastery set high above the swirling tides of the Channel

Catherine Bauer Wurster



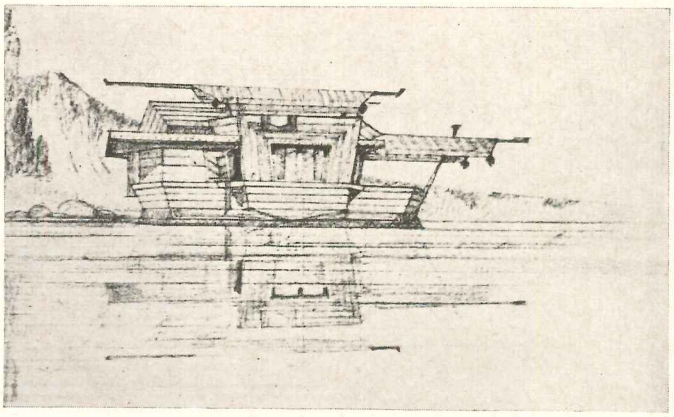
Although castles were often surrounded by water for simple reasons of defense, to build as an island has generally meant to make a very special kind of building, dedicated to something apart from the concerns of the everyday world. Such a structure is traditionally either a pleasure pavilion or a holy place, for water—it has long been known—will wash away both care and sin. Niemeyer's gay dancing pavilion at Belo Horizonte is as well justified an island as the great Mont Saint Michel itself, and it is no accident that the pleasure pavilions of Persia were often separated from their gardens by narrow moats. . . . The islands inevitable in the garden ponds of China and Japan have also had a mystical significance, often symbolizing the legendary turtle of the Eastern Sea which carries on its back the Isle of the Immortals, land of eternal youth.

To give an office building, for example, a watery surround is to debase the symbol of withdrawal, unless it is argued that the Cathedral of Business is the modern equivalent of the Temple of Love or the Temple of Worship.



Government of India Tourist Office

If Bali Ha'i is traditionally conceived as an island, might it not equally well be afloat? Above is a houseboat, happy invention of the English for summering on the high lakes of Kashmir. Below it is one of the barges designed by Frank Lloyd Wright in 1922 for Lake Tahoe, California . . . Or consider Mr. Wright's proposal that the 1933 Chicago World's Fair be a "pontoon fair": floating pavilions with vertical-tube walls of light pulp or colored glass and light web roofs, connected by floating bridges and embellished with floating gardens and lofty lake-jets

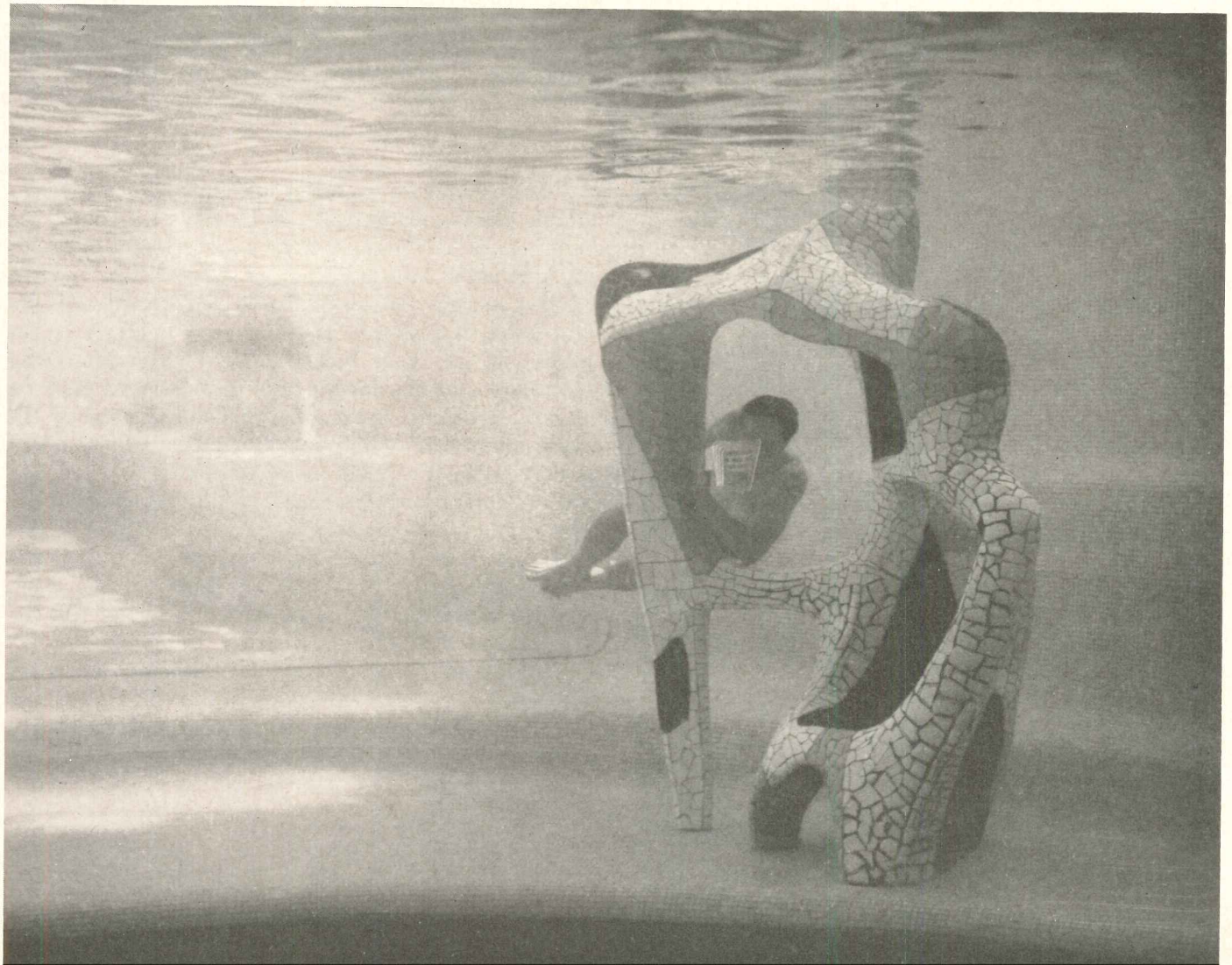


from Frank Lloyd Wright: A Testament, *1957*

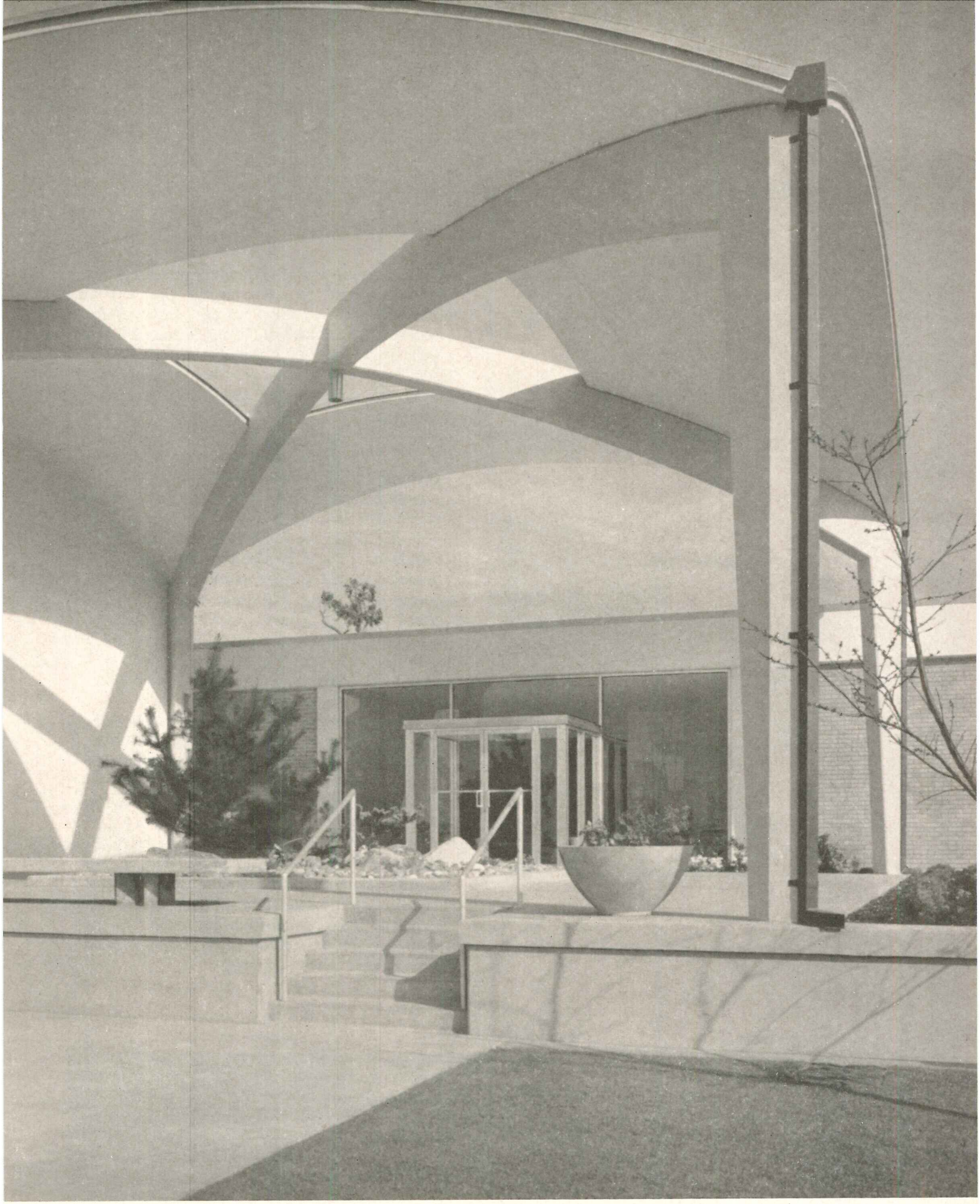
This series of articles has concentrated on water-architecture of the past, but water is a medium perhaps better suited to our own brief day than to any other. Elusive, incalculable, other-dimensional, it can complement the classic certainties, or it can epitomize and expand creative explorations into the nature of the unknown and the infinite.

Modern composers have long been alert to water as a special source of inspiration, to judge from an off-hand but impressive list of Bruce Goff's which started with Wagner and his Rhine, featured Debussy, and included a "Poisoned Fountain for Two Pianos." . . . . . Modern painters too have loved water. . . . . Architects?

Will the architect go under water to meet the skin diver?



G. E. Kidder Smith, from his Italy Builds



Office and Warehouse for Parke-Davis

Menlo Park, California

Visual Delight for a Warehouse-Office

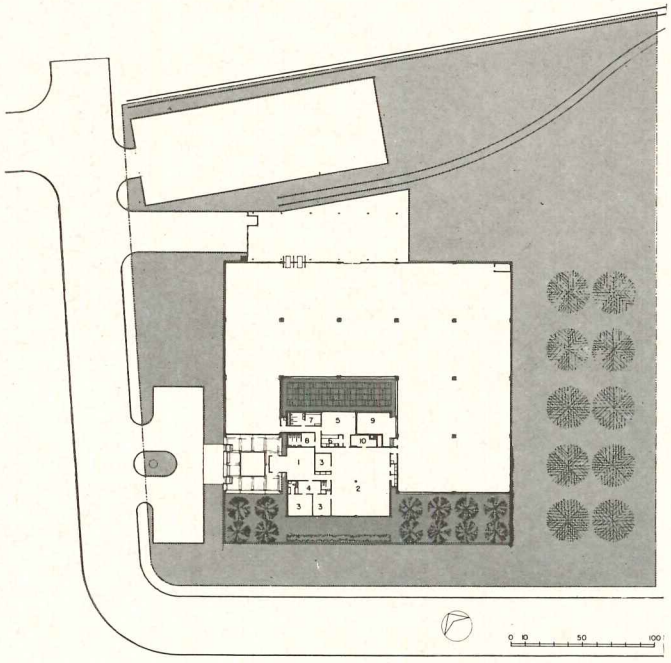
Minoru Yamasaki & Associates, Architects

Knorr-Elliott Associates, Resident Architects

Ammann & Whitney, Structural Engineers

Lawrence Halprin, Landscape Architect

Williams & Burrows, Inc., General Contractors



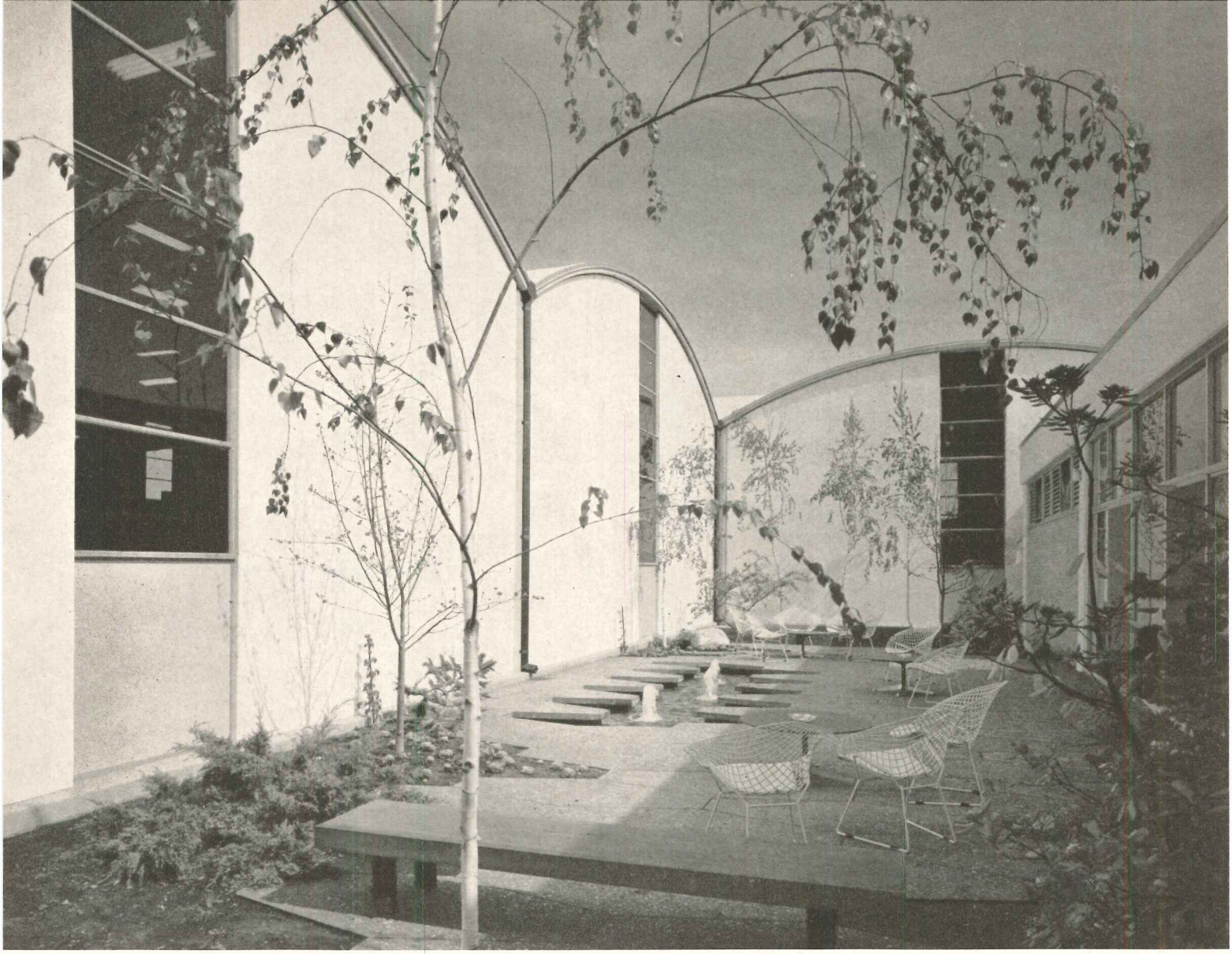
Warehouses are all too seldom associated with visual delight, but here is one that can be characterized by that phrase. Parke-Davis requested a striking building for advertising value, plus a pleasant, attractive environment for their employes. This building meets both of those requirements with a great deal of distinction.

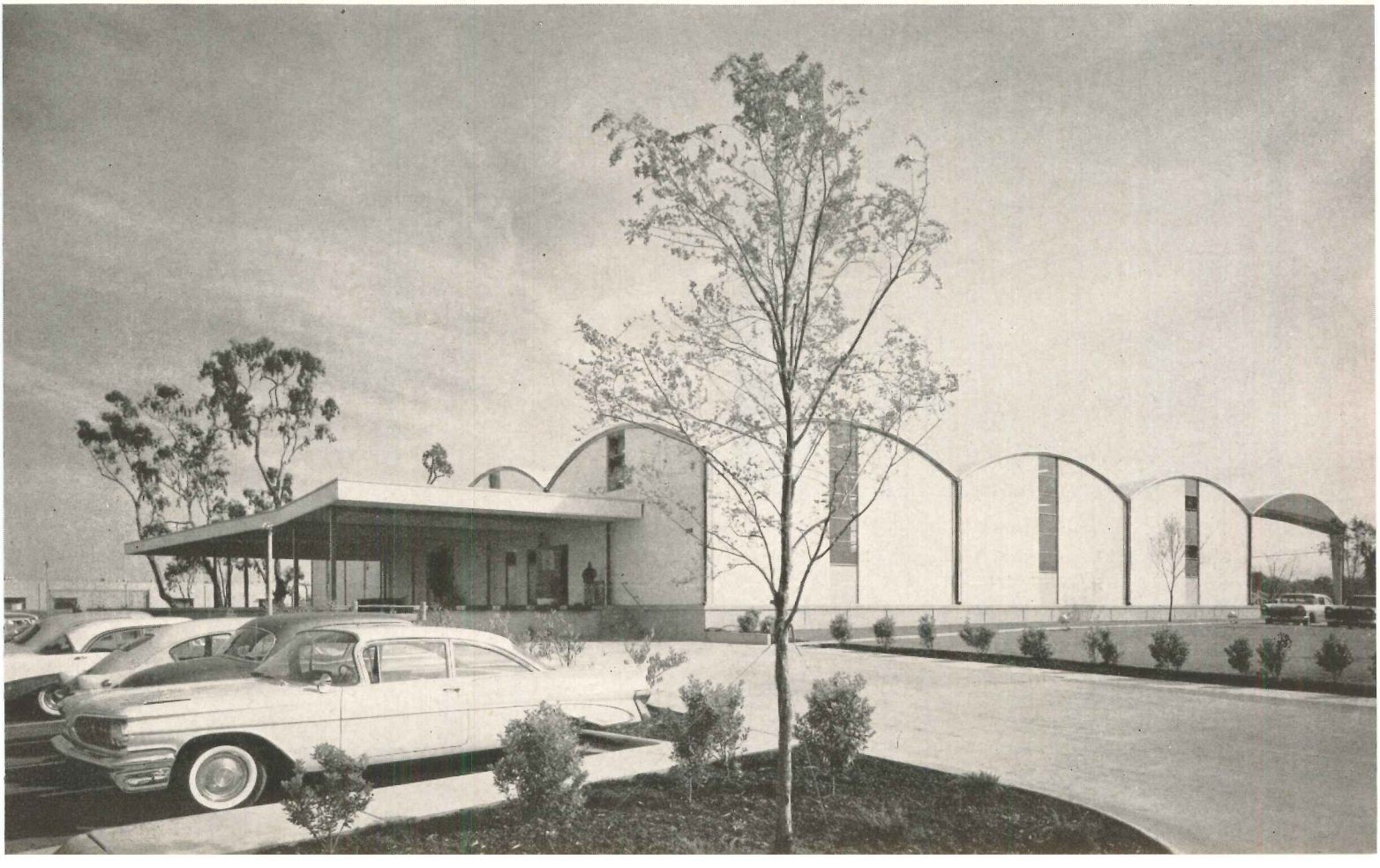
The structure is located in a planned industrial community facing the main highway between San Francisco and Los Angeles. Architect Yamasaki explains, "by wrapping the warehouse around the office building we were able to bring the arching silhouette of the warehouse closer to the highway, and thus achieve a total concept and a 'look' quite different from other buildings along the road. Since the branch is an area center for supply and distribution, we also tried to achieve —both inside and out—a clean, almost antiseptic appearance appropriate to the pharmaceutical products handled."

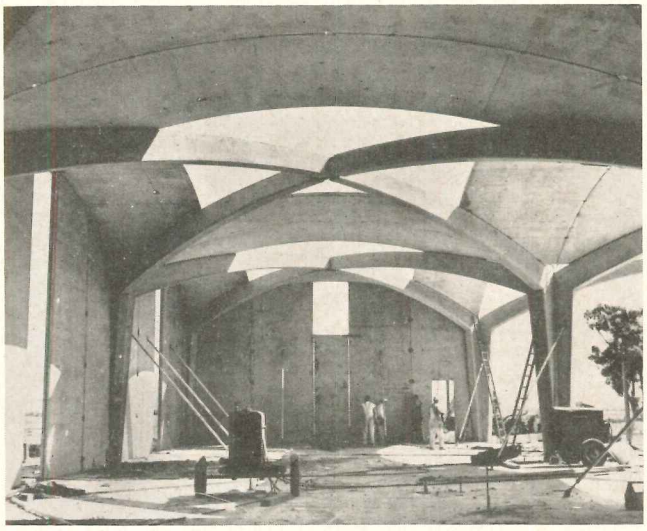
The attractively landscaped courtyard (right) becomes a focal point in the scheme; and the entrance porch (below and page 175) with its arching, perforated shelter and intriguing play of light and shade, is another feature of particular interest.

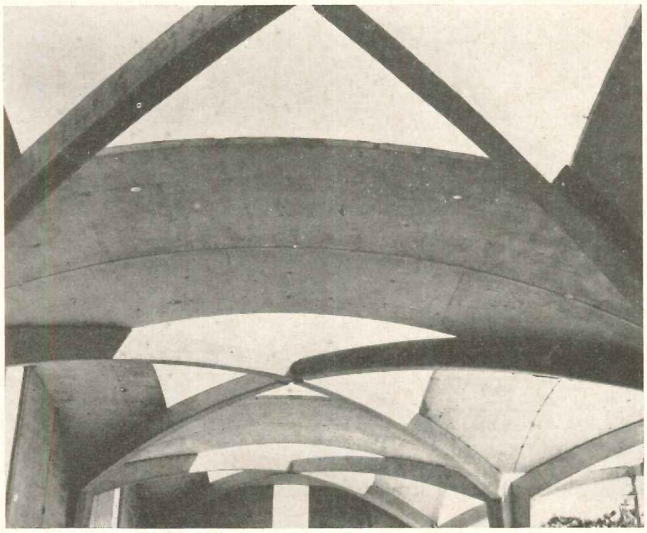
Yamasaki is not entirely pleased with the vertical window design, which replaces the original scheme for continuous strips following the roof curve—the change made hurriedly in order to reduce a bid price. The architect might have liked more glass; perhaps located next to the columns.

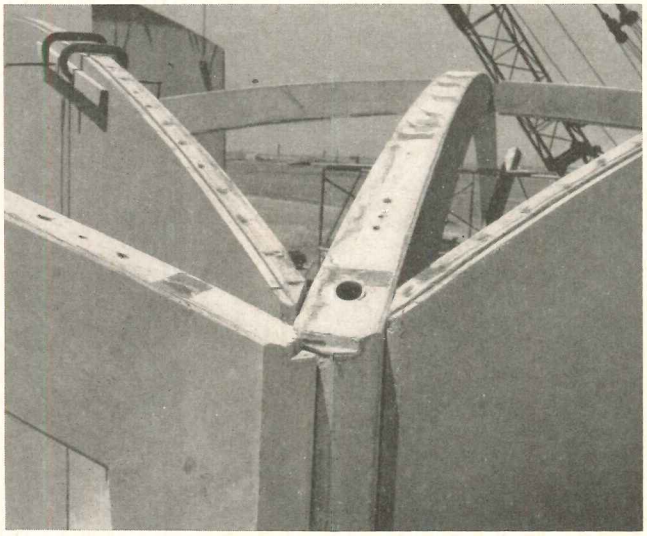
All photographs by Roger Sturtevant

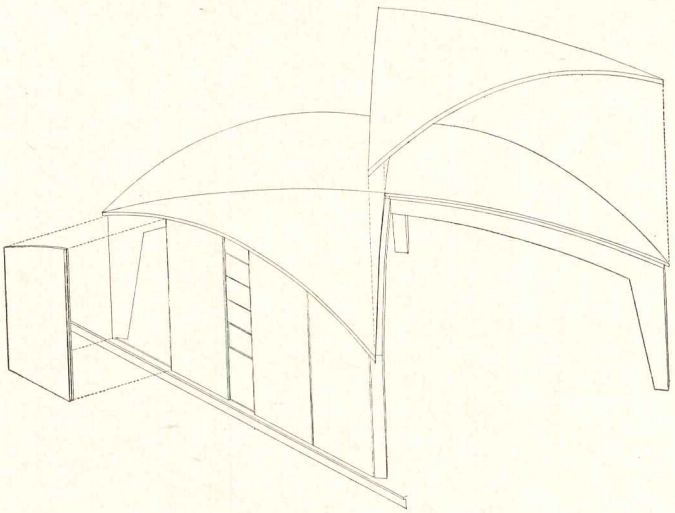


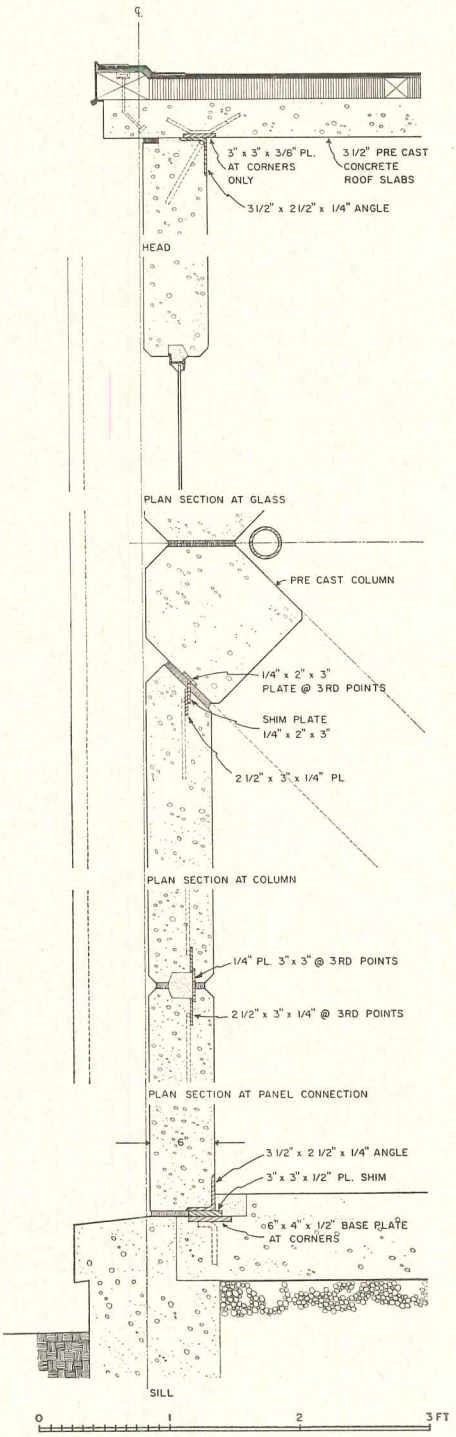






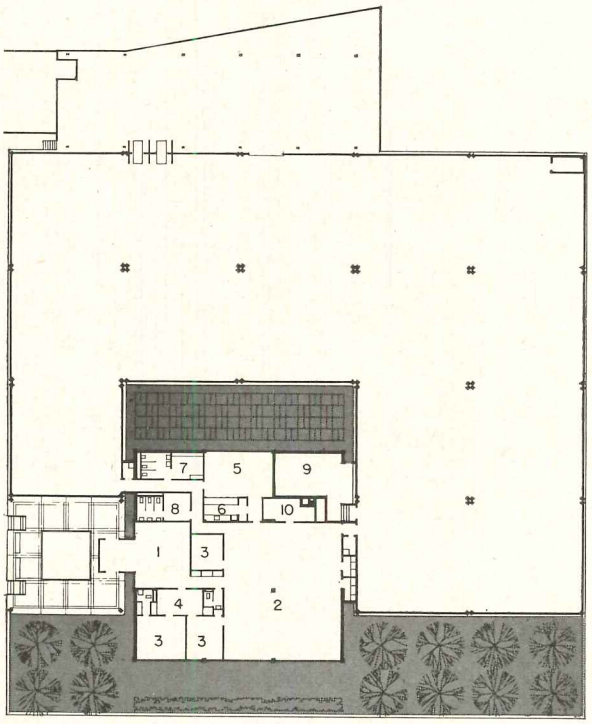






The entire building—both structure and enclosure—was constructed by assembling precast concrete units (see ARCHITECTURAL RECORD, June 1958, pages 171-4). Four basic components were used: the L-shaped bents; the spherical triangular roof shells; and wall panels of two sizes—see diagram and details at right. Foundations and floor slab were poured in place while the other elements were being precast. The 3½-in.-thick roof triangles—40 by 20 in size—were cut in two lengthwise to facilitate handling


P&H
P&H

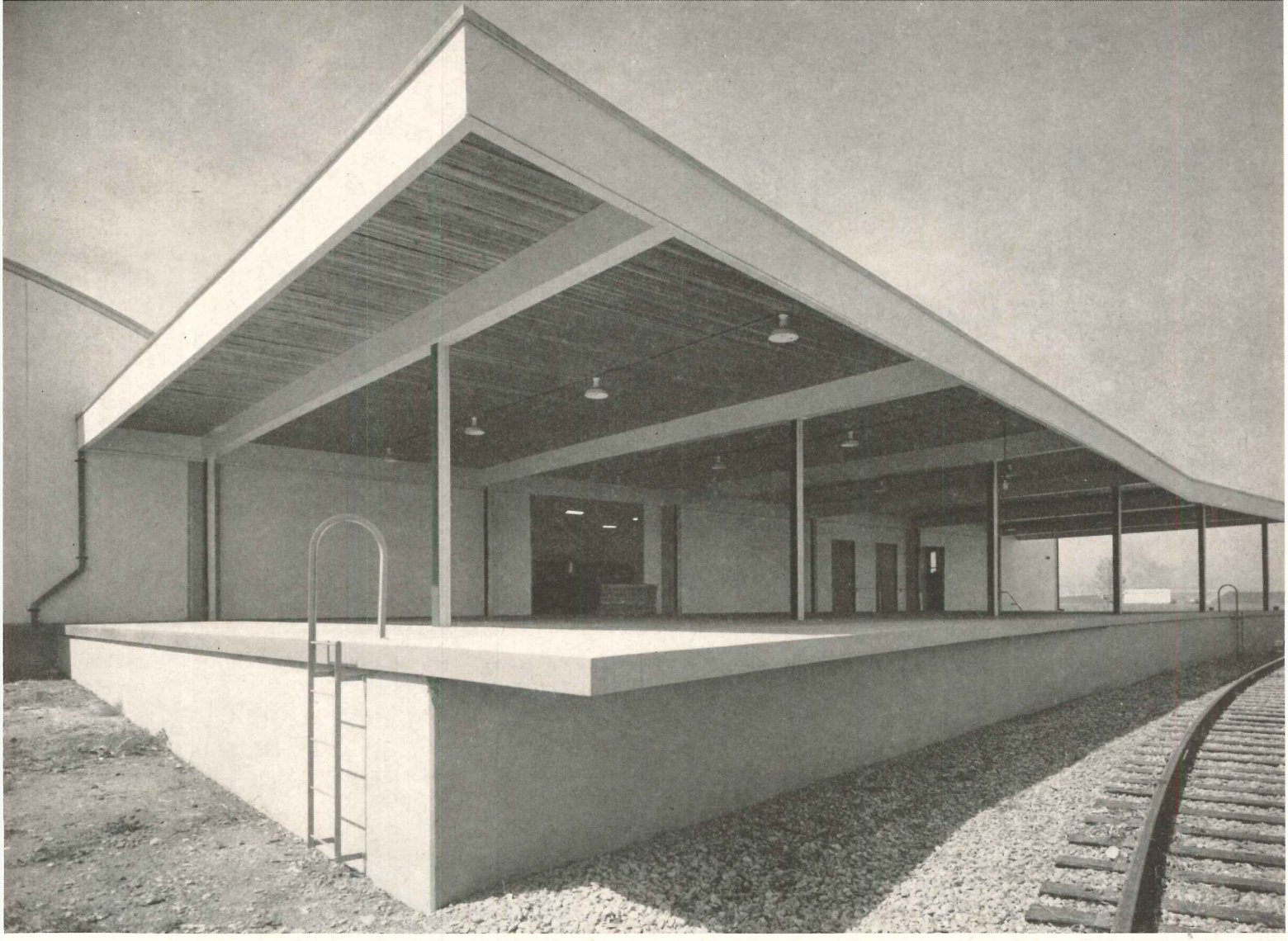


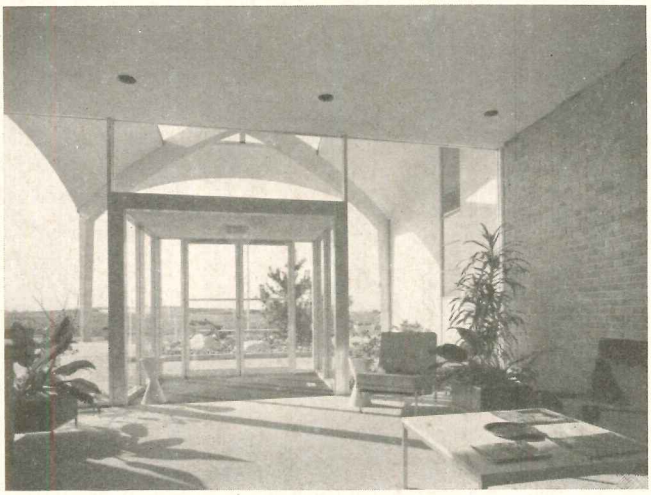
1. Reception
2. General Offices
3. Office
4. Secretaries
5. Conference and Dining
6. Kitchen
7. Men
8. Women
9. Heating
10. Storage

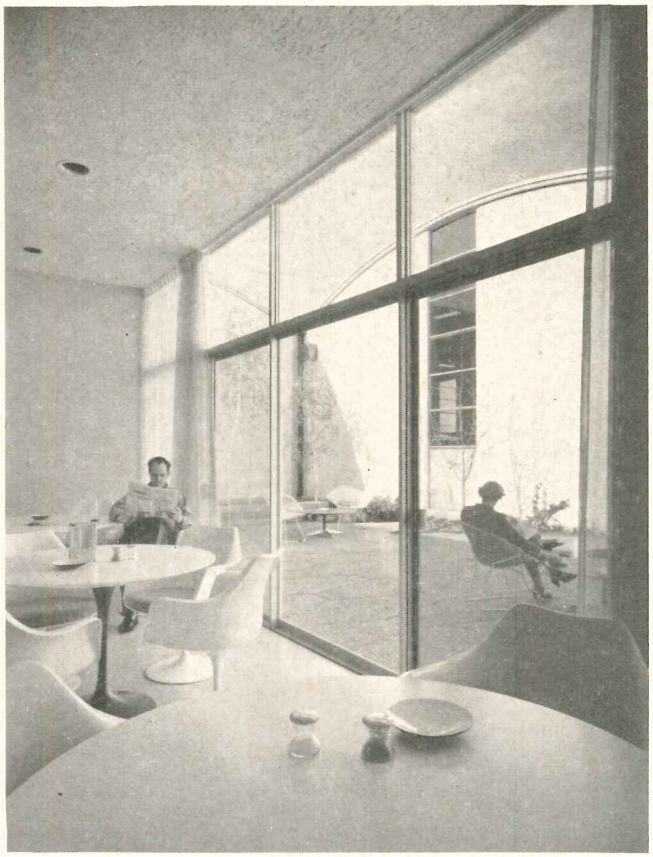
The plan above shows the relationship of warehousing, office areas, trucking, and railroad platform. The warehouse was wrapped around the office element for design reasons (page 176) and also to bring it into closer proximity to both executives and the general office force.

The owner required 40-ft square bays, and the 4-element columns are therefore spaced on that module. Although the ribs could have been eliminated if it were deemed desirable, the rigid frame rib system was chosen for ease and economy of erection, and also because such a construction greatly simplifies provisions for expansion as opposed to a more continuous type of concrete building. The general effect in the warehouse area seems to have the clean, airy look that was desired.

The architect requested that credit be given to Stefan J. Medwadowski as supervising structural engineer; and to the owner's engineering department, Dow-Foraker, for their cooperation during the project's design and construction

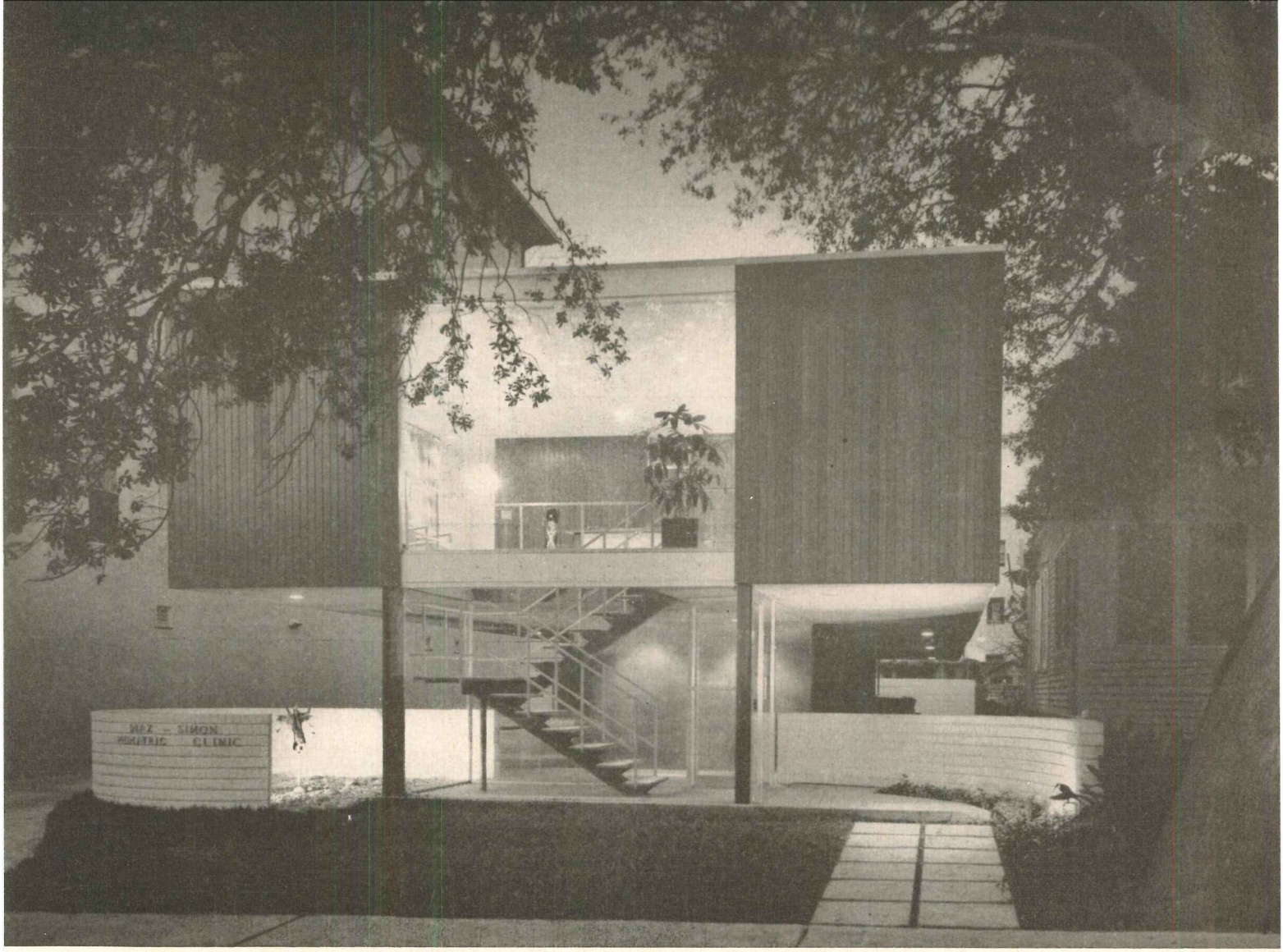






The interior design and furnishings were carried forward by the resident architects, Knorr-Elliott Associates. The entrance porch (top left) leads to the reception room (left center). The conference-dining-lounge area (bottom left) opens attractively by sliding glass doors to the central courtyard. An executive office is shown below

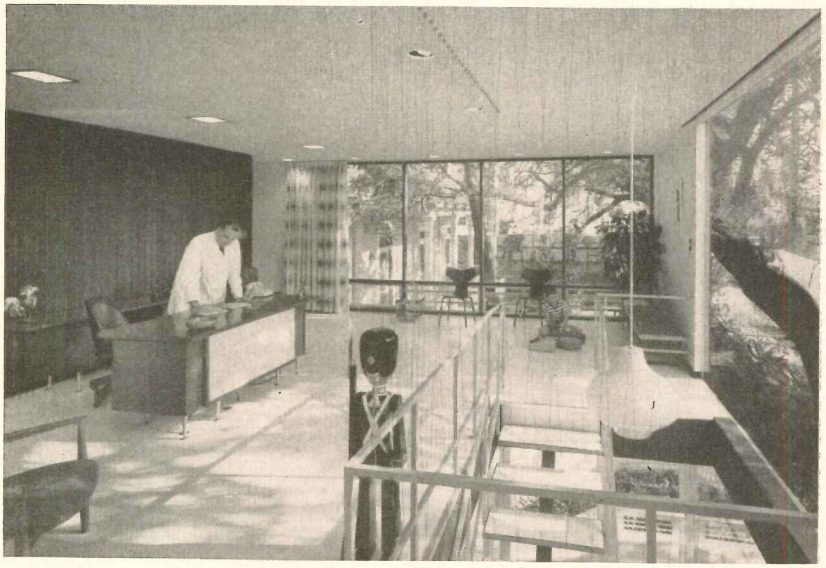
Materials and finishes: interior walls are painted plaster on block except for certain walnut paneling; office ceilings are acoustical tile; floors are either carpeted or vinyl asbestos tile, except that the warehouse floor is concrete; the sash are aluminum of the projected type; the entrance doors and frames, as well as the glazed sliding doors, are of aluminum. The building is air conditioned

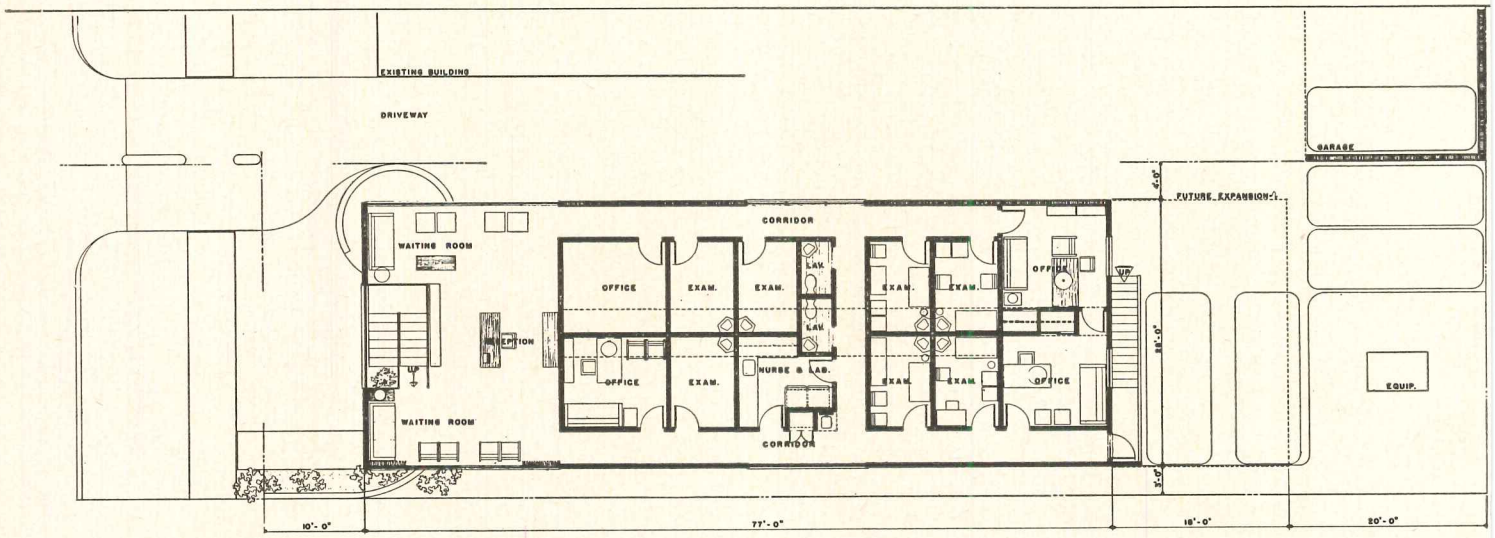


All photos: Frank Lotz Mun

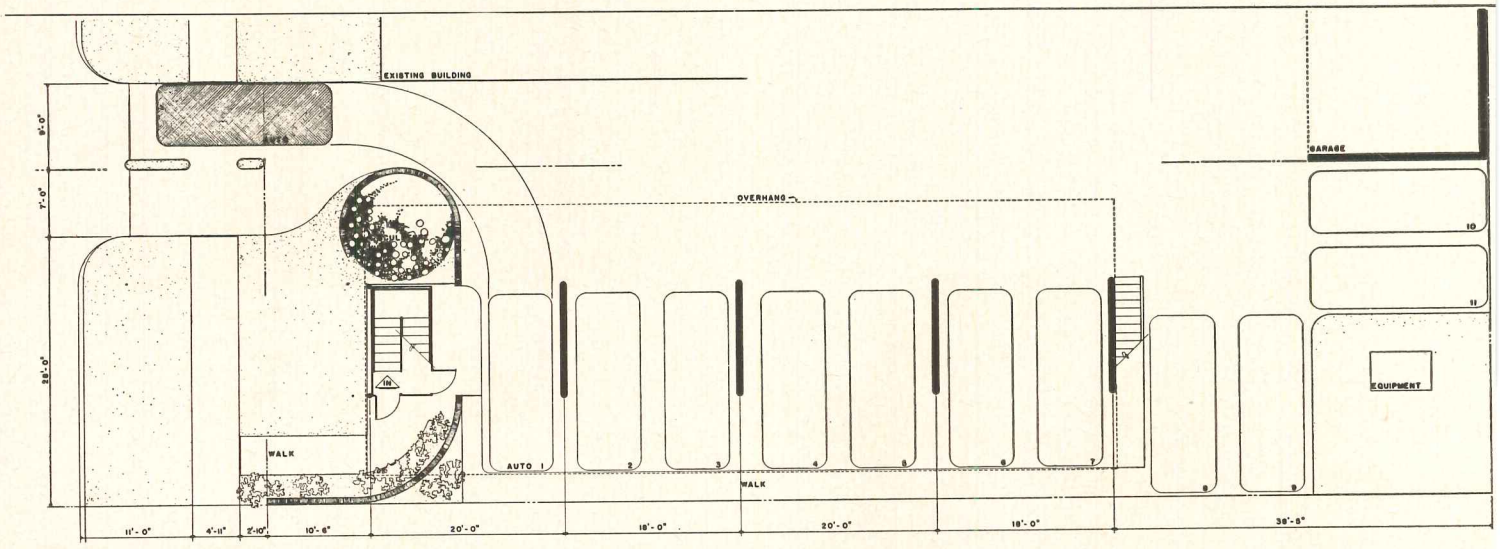
PEDIATRIC CLINIC FOR FOUR DOCTORS

Diaz-Simon Pediatric Clinic, New Orleans, La.; Colbert and Lowrey and Associates, Architects; Ogle-Rosenbohm & Associates, Structural Engineers; John W. Waters, Contractor

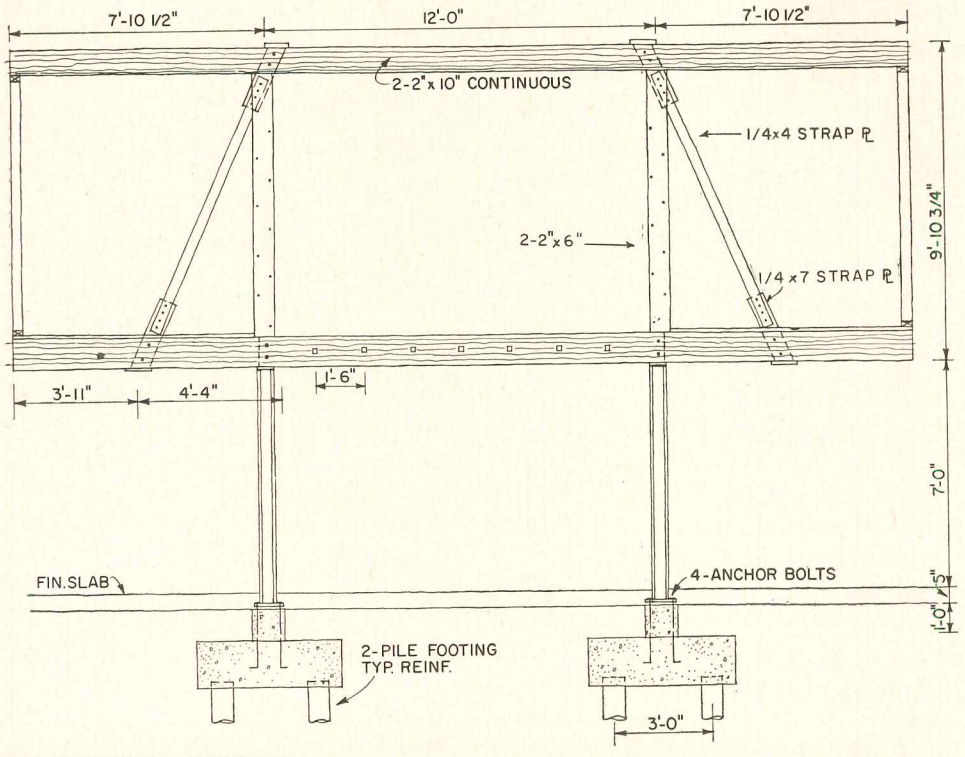




SECOND FLOOR

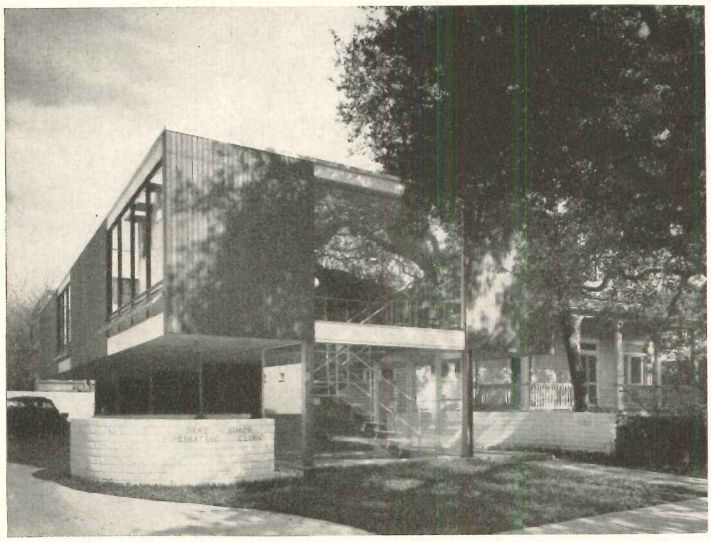


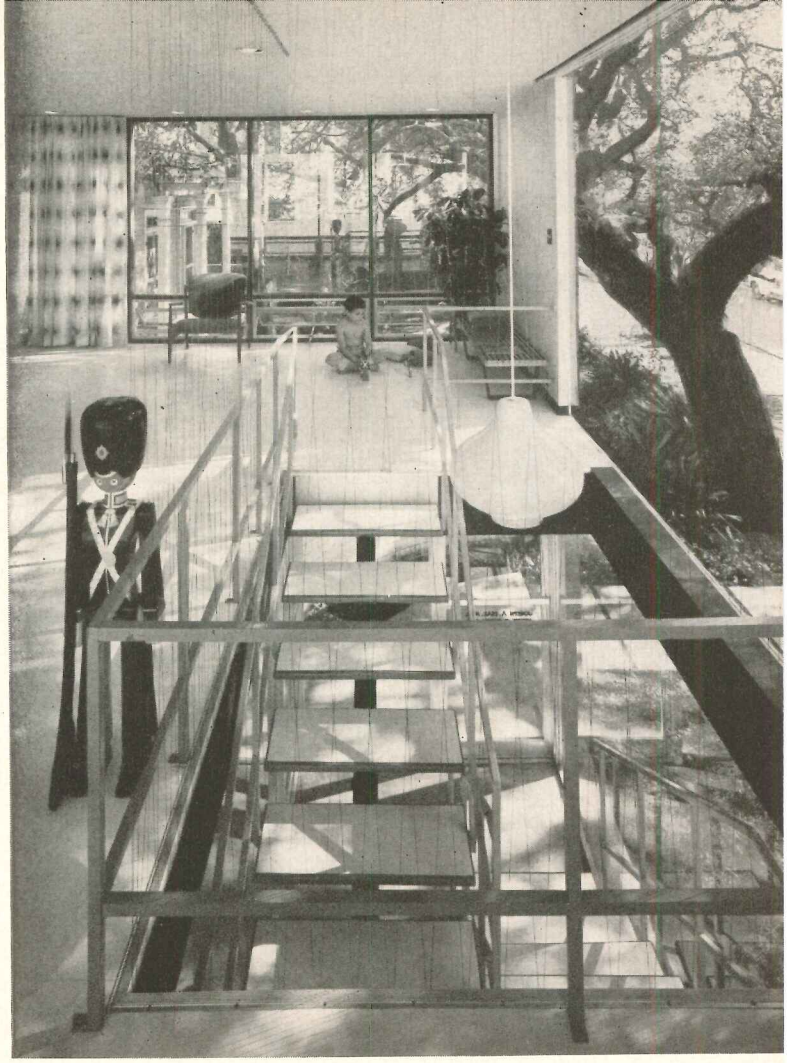
GROUND FLOOR



FRONT TRUSS ASSEMBLY

Because of the limited size of the site and zoning restrictions, the ground floor is used only for parking, stairwells, entrance foyer, and equipment spaces. The second floor contains all medical spaces including a small laboratory for routine work. As shown in the section, the structure at the front of the building consists of steel columns supporting wood frames. The remainder of the upper floor is supported on concrete piers located under the upstairs walls, which are designed to act as conventional (story high) wood truss members. These are cantilevered both sides by means of metal straps anchored near the heads of columns and at the top chord of the trusses as shown





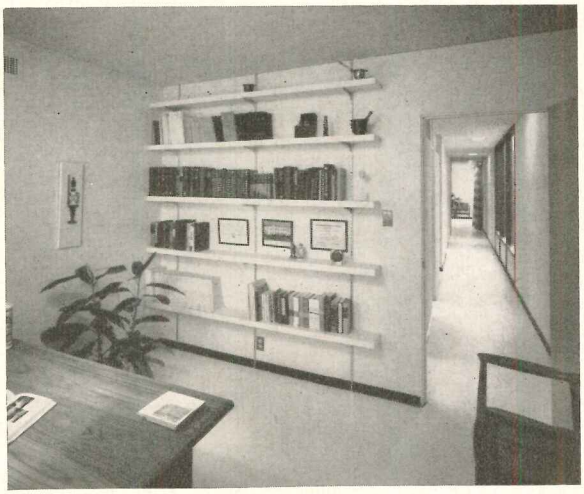
From the waiting room on the second level, the views are toward a large live oak tree and the surrounding residential neighborhood. The open stair leads down to a glass-enclosed entrance foyer on the ground floor

Pediatric Clinic

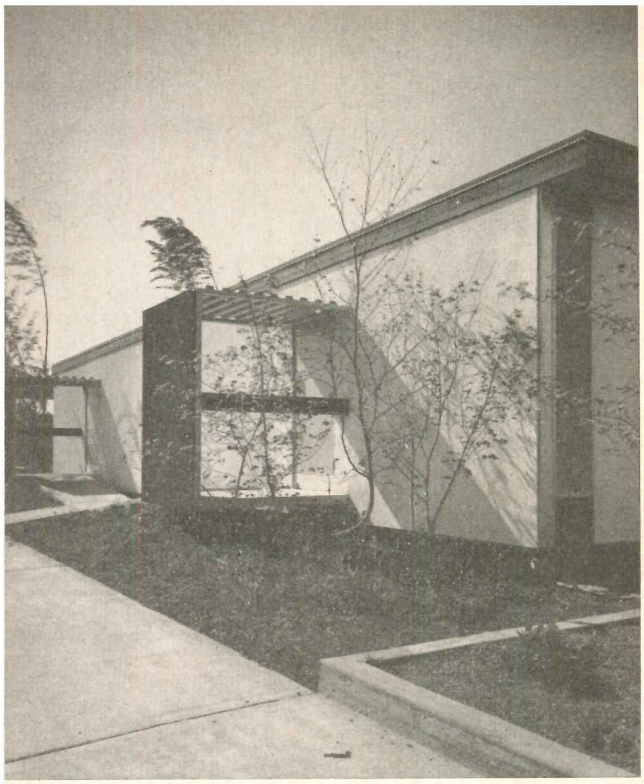
The architects for this small, four-doctor pediatric clinic have achieved an economical and efficient solution to a difficult problem. For their accomplishments, they have received a 1959 A.I.A. National Honor Award.

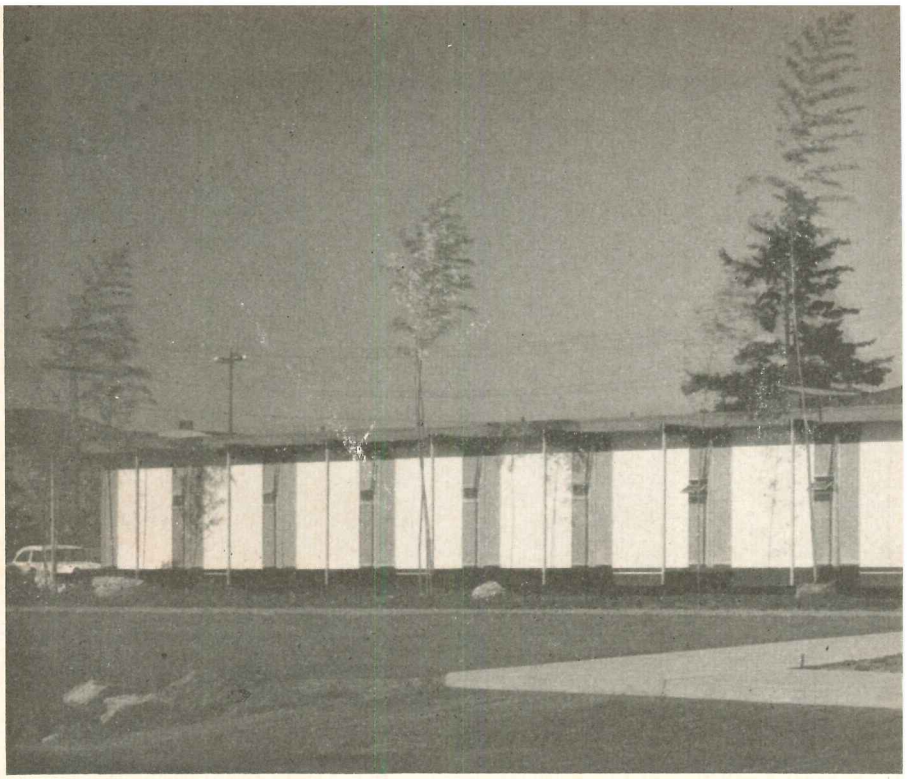
Located on a limited-size urban site, severely restricted as to allowable lot coverage by zoning regulations and requirements for off-street parking, the clinic has been raised off the ground. In this way, maximum space was provided for required medical functions while the ground floor was essentially preserved for parking. Circulation was planned for reducing steps between consultation and examining rooms for the staff, to reduce congestion to a minimum, and to provide for easy patient access, traffic, and egress. The last was accomplished by providing for an entrance at the front with traffic flow around the central rooms and an exit at the rear. Incidentally, this scheme allows injections to be given at the last possible moment, after which children may depart without disturbing incoming patients.

A concentrated effort was made to keep the entire building as comfortable and simple as possible, yet retain a childlike and playful atmosphere. This has been accomplished through the use of natural materials such as the stained redwood exterior panels in conjunction with clean interior surfaces. Accents are provided by the contemporary Scandinavian furniture (which one doctor collects), playful wood sculpture, and other carefully planned details.



The doctor's consultation room-office shown indicates the simplified treatment used in the interior. Gypsum board walls, painted or covered with vinyl are used with vinyl floors and acoustical plaster ceilings

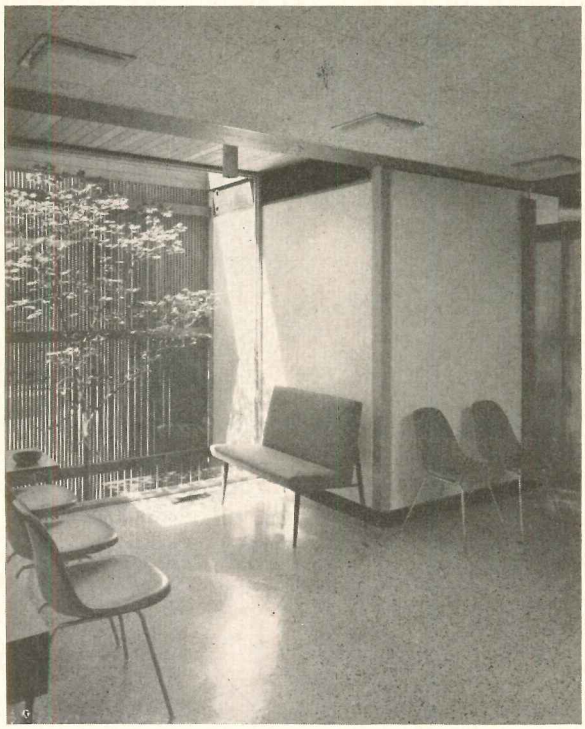




All photos: Dearborn-Massar

PLEASANT ATMOSPHERE FOR GROUP MEDICINE

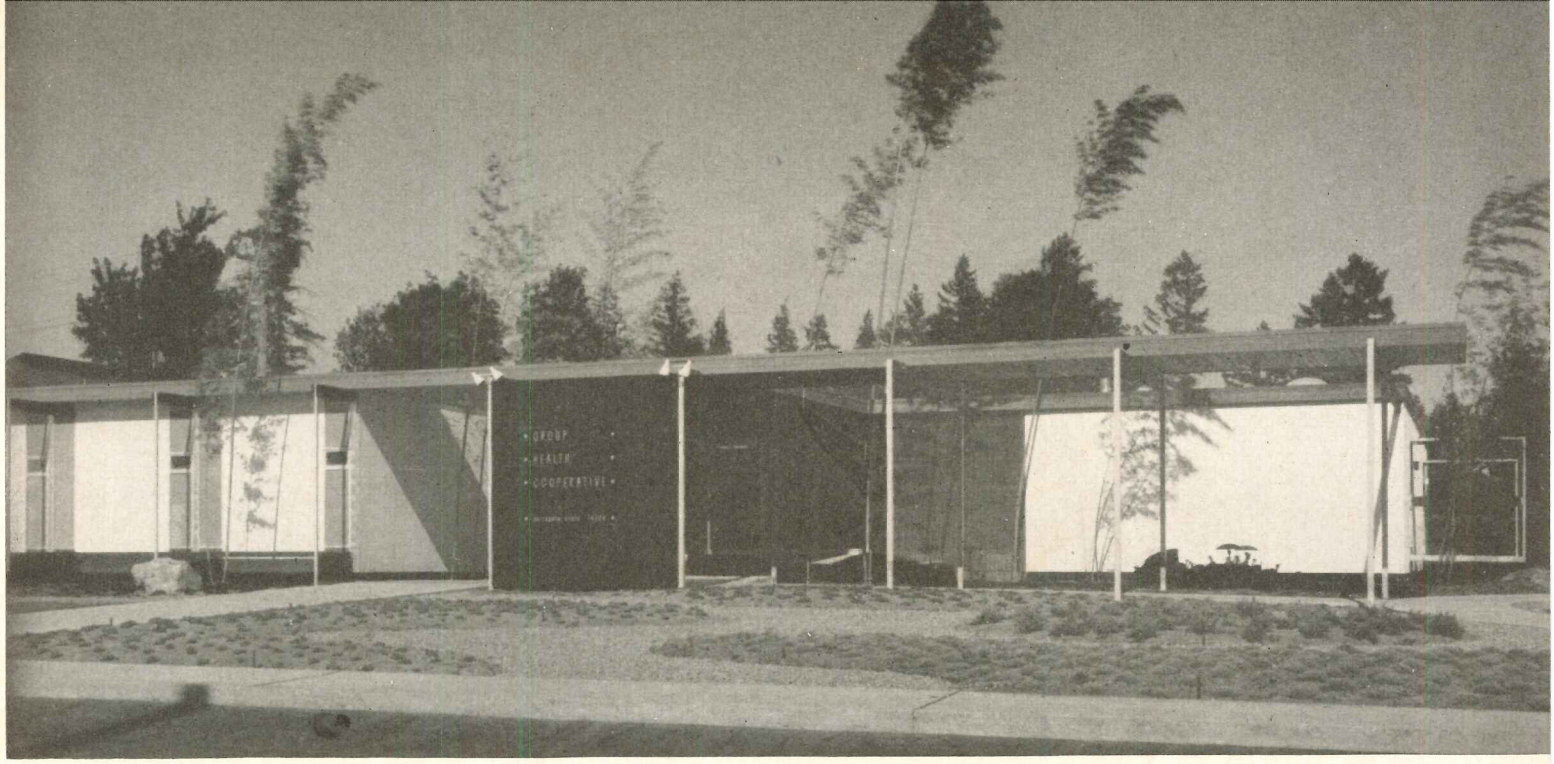
Group Health Cooperative Northgate Clinic, Seattle, Washington; Paul Hayden Kirk & Associates (Don S. Wallace & David A. McKinley, Jr.) Donald G. Radcliffe, Structural Engineer; Stern and Towne, Mechanical Engineers; William G. Teufel, Landscape Architect



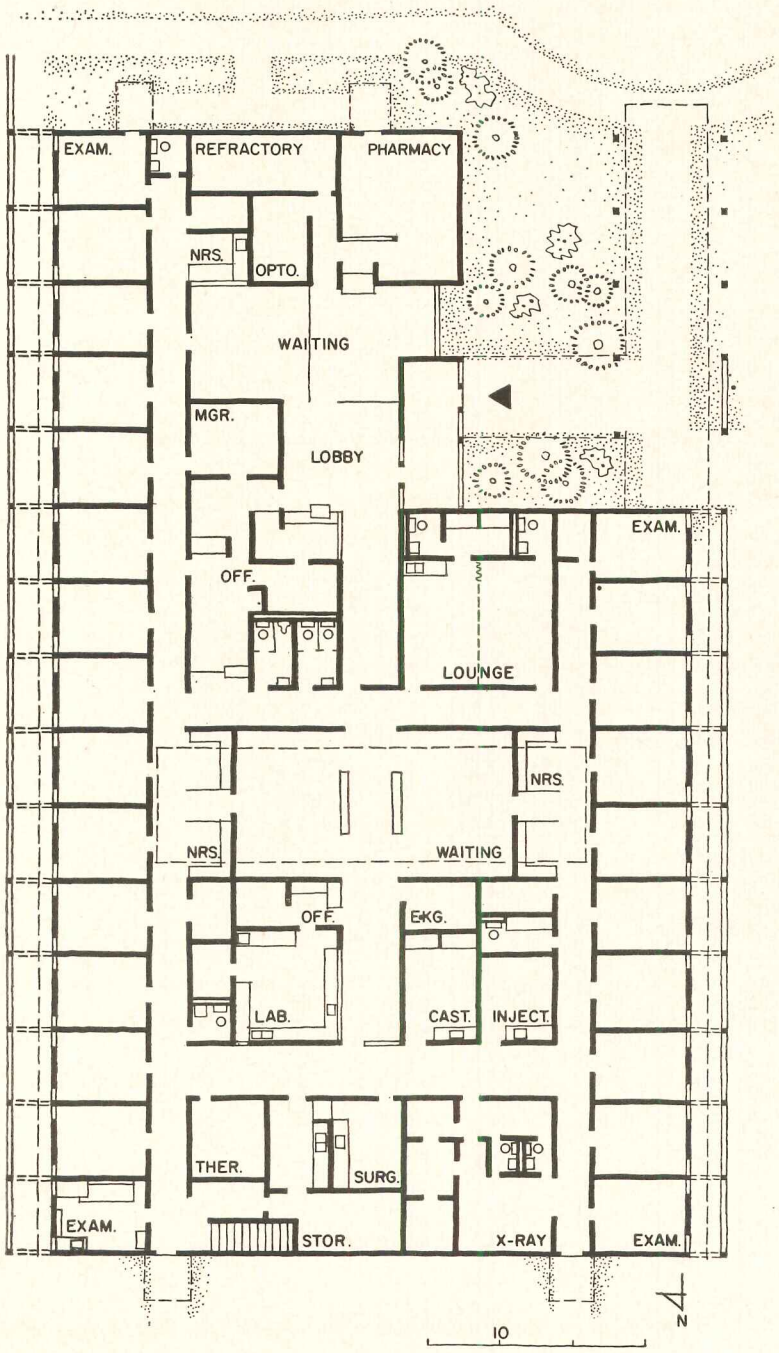
In this rather large clinic (10 doctors), the architect has created an efficient and functional layout, a pleasant and skillfully detailed building. Not the least of its virtues is the feeling of relaxation and well-being engendered in patients through its design and detailing.

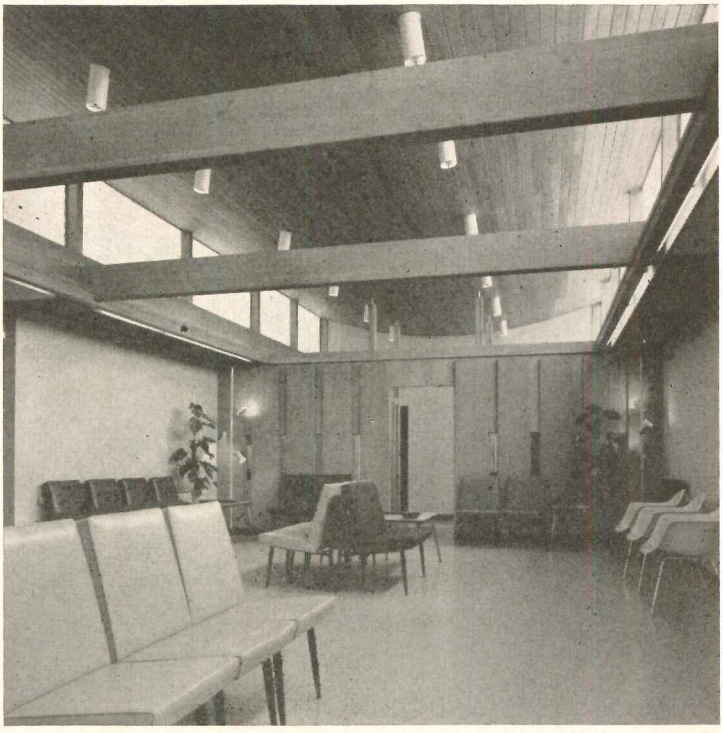
The clinic was established as a branch of the downtown Seattle Group Health Cooperative Hospital in order to relieve over-crowding and to provide more easily accessible medical facilities for the residents of Northgate community. Circulation of staff and patients is initially separated through the use of two parking lots, one for each group. Entry for the staff is at the end of the building, while patients enter from the front. From the control receptionist's station, patients are directed to the various waiting rooms, from which they are controlled and routed from the nurses' stations nearby. Throughout the entire building, an effort has been made to open up interior spaces to the outdoors and to obtain an appearance as opposite to the institutional character of many such buildings as possible. The use of simple surfaces and natural wood contributes to this purpose. Colored plastic panels and other spots of color combined with extremely well thought out planting do much toward achieving this end.

The structure of the building is wood frame with laminated beams. The exterior is finished with stucco. Windows are aluminum, glazed with translucent plastic panels and clear glass. Interior walls are finished with hardwood plywood and painted gypsum wallboard. Ceilings are fiberboard acoustical tile and floors are covered with vinyl-asbestos tile.



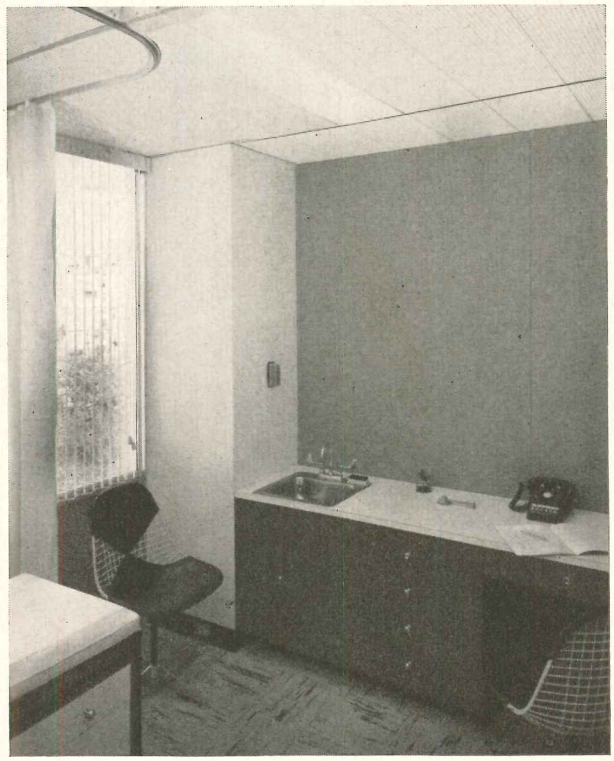
Patients enter the building from a covered walkway, passing through the landscaped entrance court. The unclinical appearance of the building entrance contrasts with the ordered look of the examining rooms





The central waiting room is located for efficient handling of patients bound for various departments. A pleasant feeling is achieved by the use of clerestory windows, exposed beams, and the reverse-curve roof

MEDICAL BUILDING WITH RENTAL OFFICES

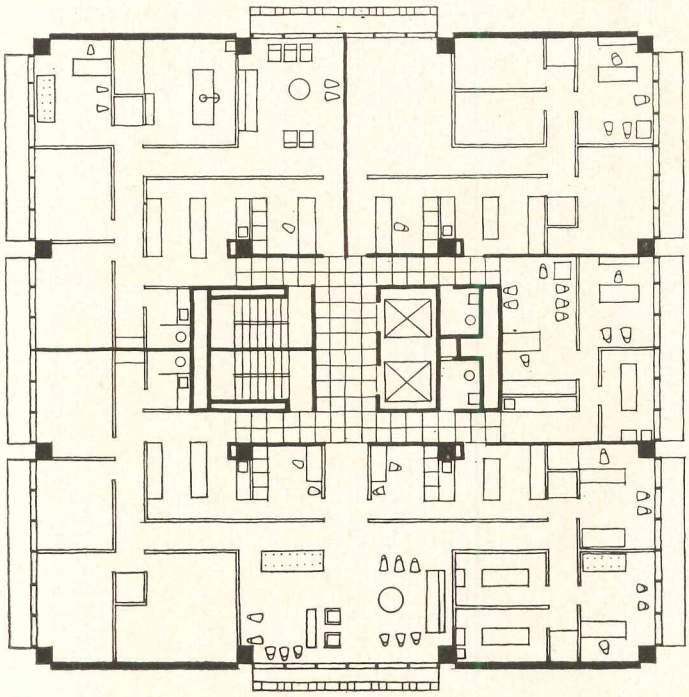


This building was designed by the architect to satisfy the complex and somewhat indeterminate requirements involved in providing flexible space for a number of individual medical practices.

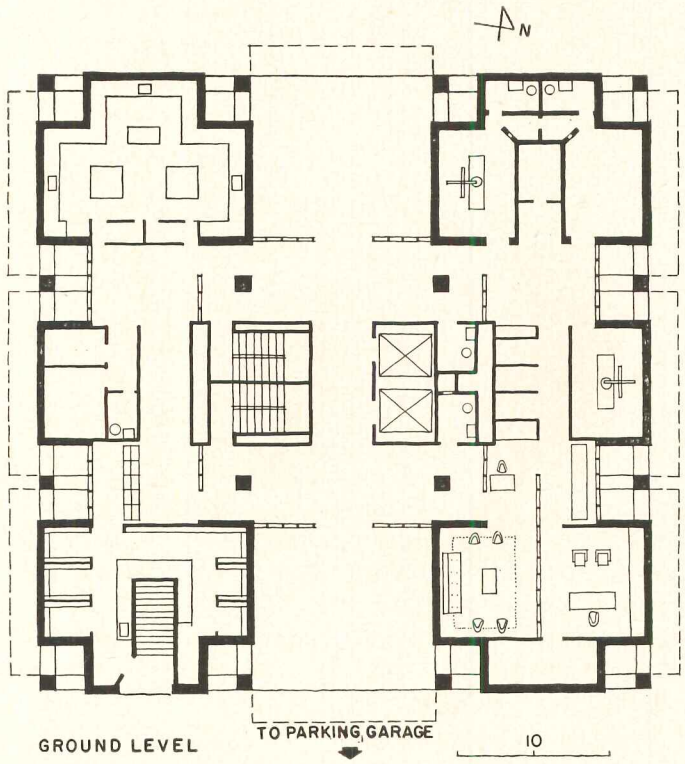
Owned by a corporation formed by a group of doctors, the building is located on an island near the heart of the Tampa business district. It commands a view of the bay and the bridge to the mainland. Nearby is the newly enlarged and remodeled Municipal Hospital. Parking is handled by an existing garage adjacent to the building. This was altered to provide a sheltered entry connecting the two. The ground floor contains a pharmacy, laboratory, and X-ray department available for use by all building occupants. The six upper floors were constructed with their entire areas completely open except for the fixed central service cores which contain elevators, stairs, and toilets. Movable partitions are used for subdividing these spaces as required.

The building frame is of reinforced concrete with lightweight concrete floors. Exteriors are aluminum curtain walls with porcelain enamel panels and lightweight, gravel-surfaced precast concrete panels.

Number One Davis Medical Office Building; Davis Island, Tampa, Florida; Mark Hampton, Architect; Russello & Barker, Structural Engineers; Charles T. Healy, Mechanical Engineer; DeWitt, Furnell & Spicer, Inc., Contractors



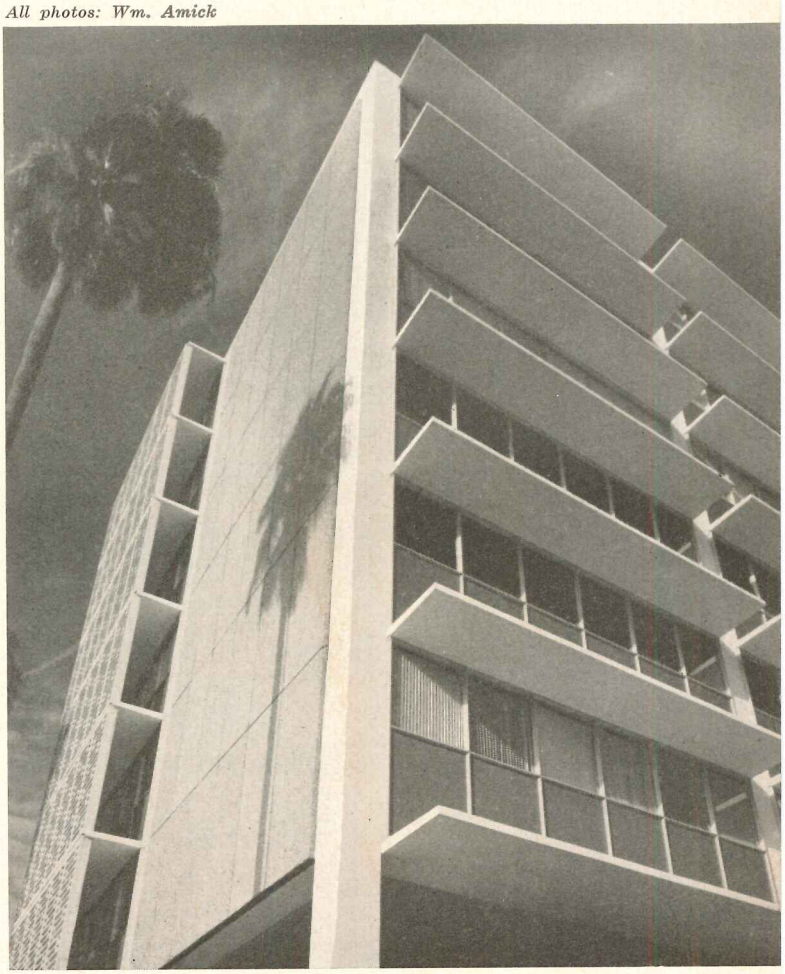
UPPER LEVEL

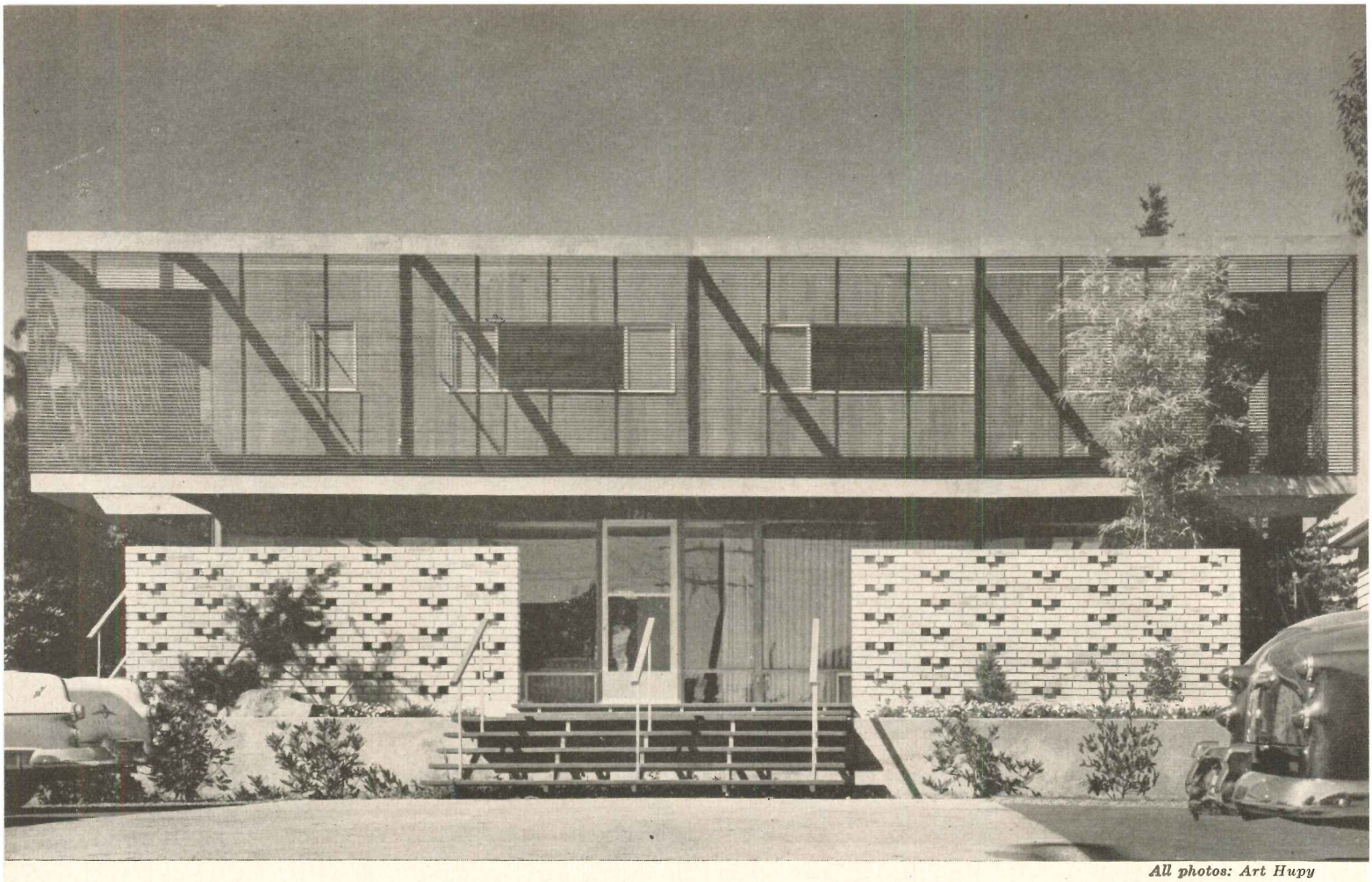


GROUND LEVEL

Cantilevers on north and south sides (right, above) act as sun controls and as platforms for window washing. Precast concrete grilles on east and west (right, below) were omitted on other sides for budgetary considerations

All photos: Wm. Amick





All photos: Art Hupy

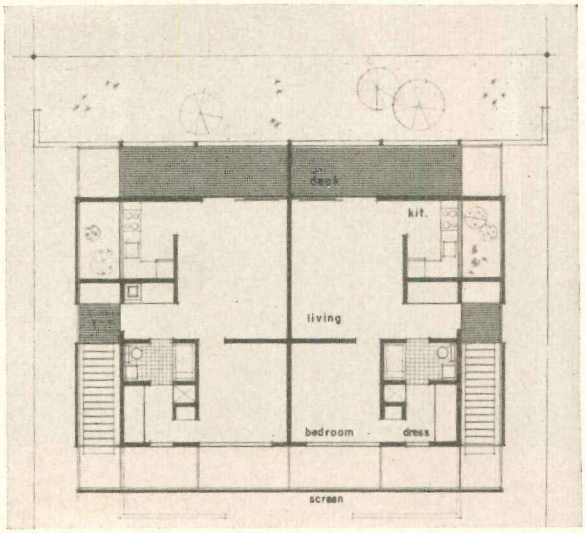
DENTAL CLINIC COMBINED WITH APARTMENTS

Clinic and Duplex Building for Dr. K. M. Robertson; Seattle, Washington; Bystrom and Greco, Architects; Stern and Towne, Mechanical Engineers; Tom Paulsen, Contractor

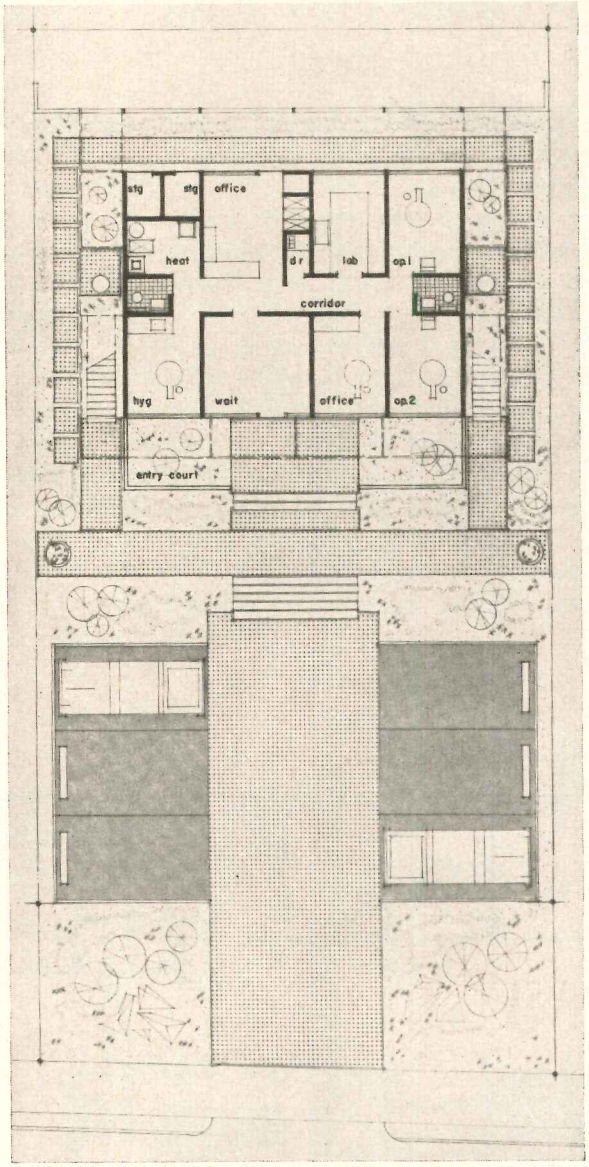
Second-floor rental apartments have been combined with a ground floor dental clinic by the architects of this building, resulting in a friendly, residential atmosphere for two widely-varied functions.

Located on the fringes of a neighborhood business district, the site is quite small. This consideration primarily dictated the two-story scheme. The building was placed near the rear lot line in order to provide on-site parking at the front and to create an attractive foreground. Since the lot slopes up about seven feet from front to rear, terracing was used to minimize grading and to provide some separation between the parking area and the building. Louvered wood screens are used at the second level on three sides for sun control and preservation of privacy in the apartments. These also serve to considerably lighten the appearance of the upper story. Both floors have a shallow, planted area on the north side. The apartments have balconies on this side, accessible through sliding glass doors.

The structure is wood frame on a concrete foundation and slab. Exterior walls are finished with natural finish T & G cedar siding. Interior walls are painted gypsum board. Floors are vinyl-asbestos in the clinic, asphalt tile in the apartments. Ceilings of the clinic are fiberboard acoustical tile, while those in the apartments are gypsum board.



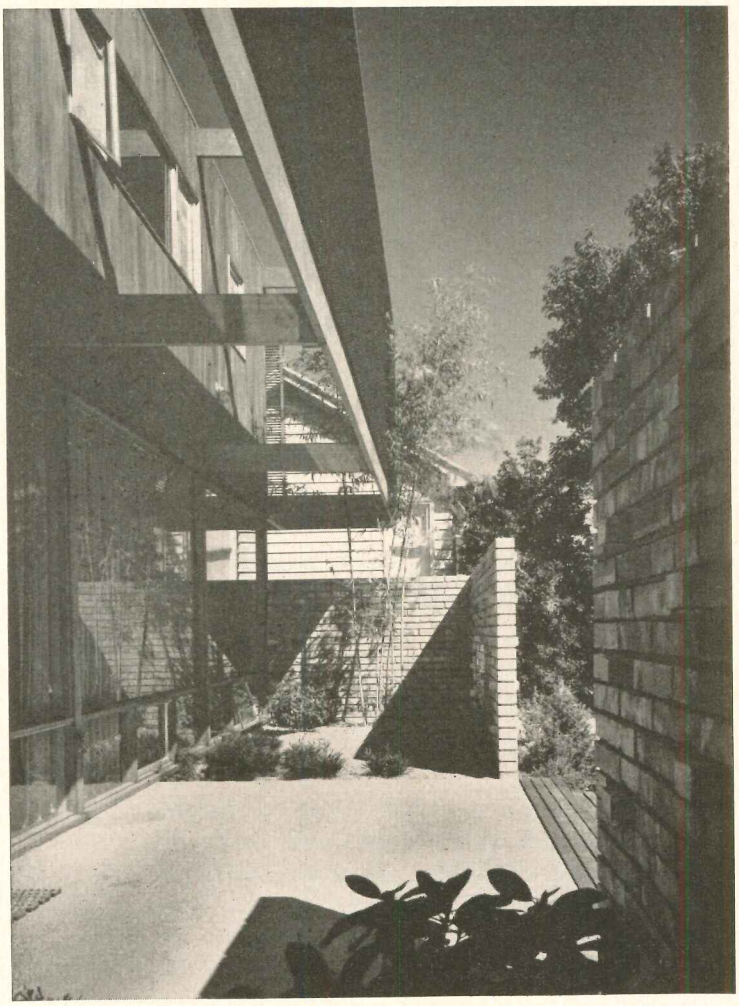
Duplex Level

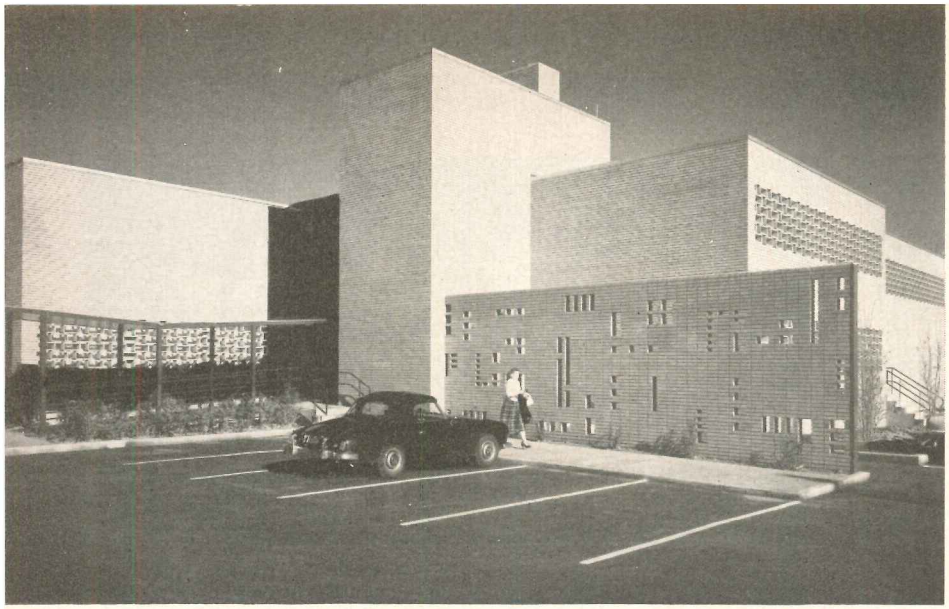


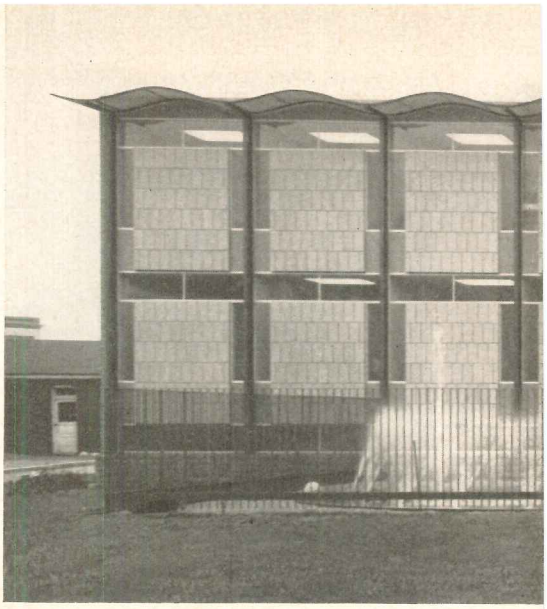
Clinic Level

10

As shown in the plans, the entrances to the second-floor apartments are separated from the clinic entrance by high brick walls. These enclose a landscaped entry court. Rooms along the front are opened up with glass toward the privacy and view of the court





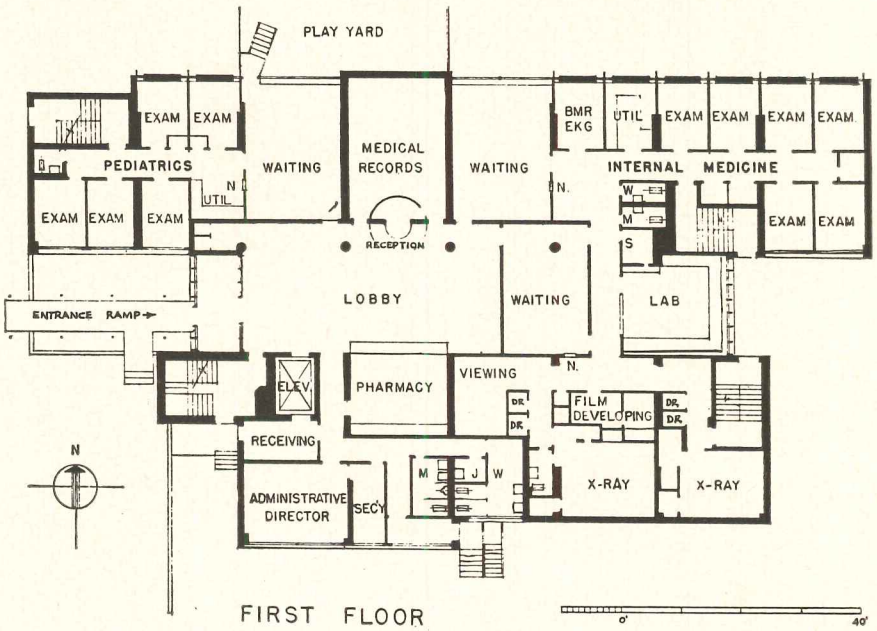


EXAMINATION AND TREATMENT CENTER FOR UNION

Medical Institute of Local 88, Meat and Related Industries Health and Welfare Fund; St. Louis, Mo.; Harris Armstrong, Architect; Leslie J. Bergmeier, Structural Engineer; Belt & Given, Mechanical Engineers; G. Carl Cooper, Jr., Electrical Engineer; C. Rallo Contracting Company, Contractors

This building houses a highly complex and complete medical service for the members of a labor union and their families. It is the first new building to be designed and constructed for such a purpose.

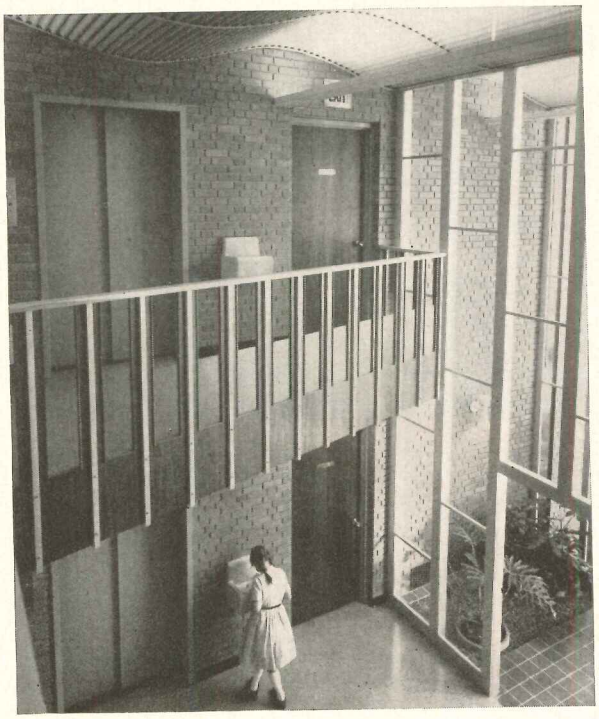
Located on a city lot, the building has been conceived by the architect as a three-level structure, oriented to take advantage of sunlight when desired and to control it when necessary. Major problems were the location and planning of the building and related parking on the available ground and the extremely complicated circulation necessary for the many functions to be housed. By placing parking and main entrance on one side of the building with the service entrance facilities nearby (the two are screened from each other by a wall), the architect devised simple, workable traffic patterns.

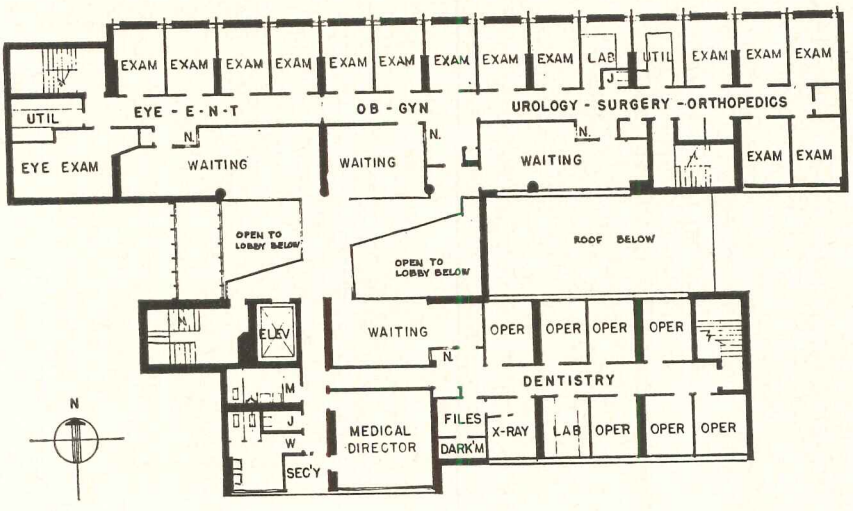


All photos: Art Fillmore

The control center of the building is the two-story-high lobby. Patients are received at a reception desk near the records storage area. From this point, patients are routed to various departments of the building according to their specific needs.

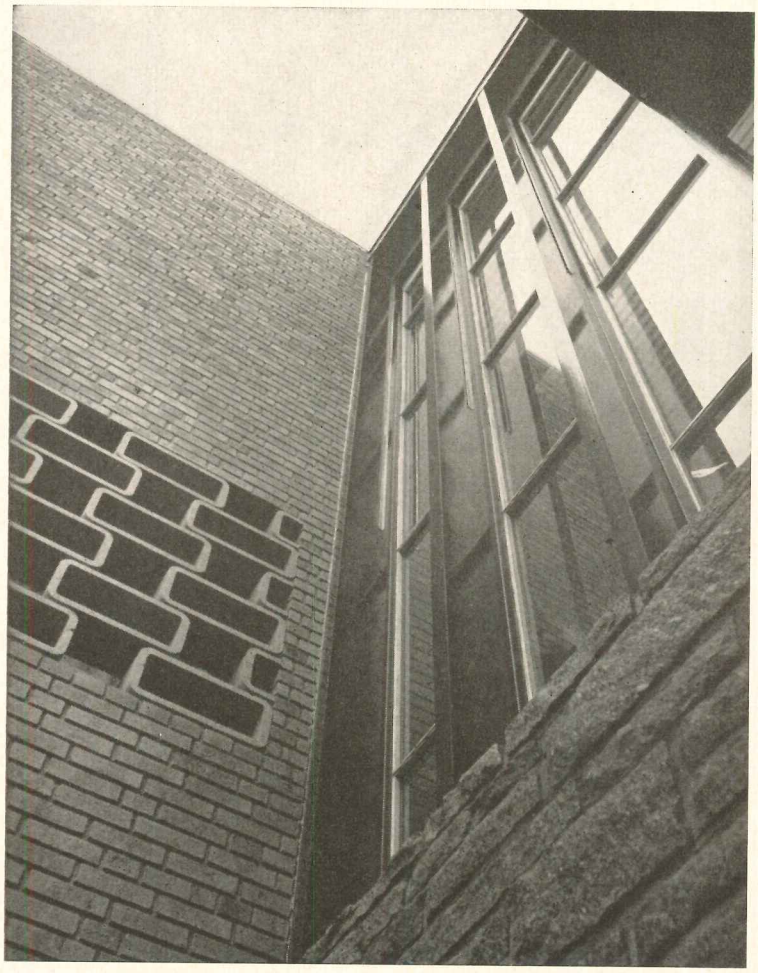
Each department has its own waiting room and all departmental facilities are closely related to this area. Relationships between departments were closely studied. As a result, circulation patterns between them are free of confusion and highly efficient. Room sizes most suitable for the various specialties were meticulously studied. Desirable optimums were established and used. One result of this care is the provision of internal medicine and obstetrics examining rooms sizable enough for placement of tables lengthwise or crosswise in the rooms.

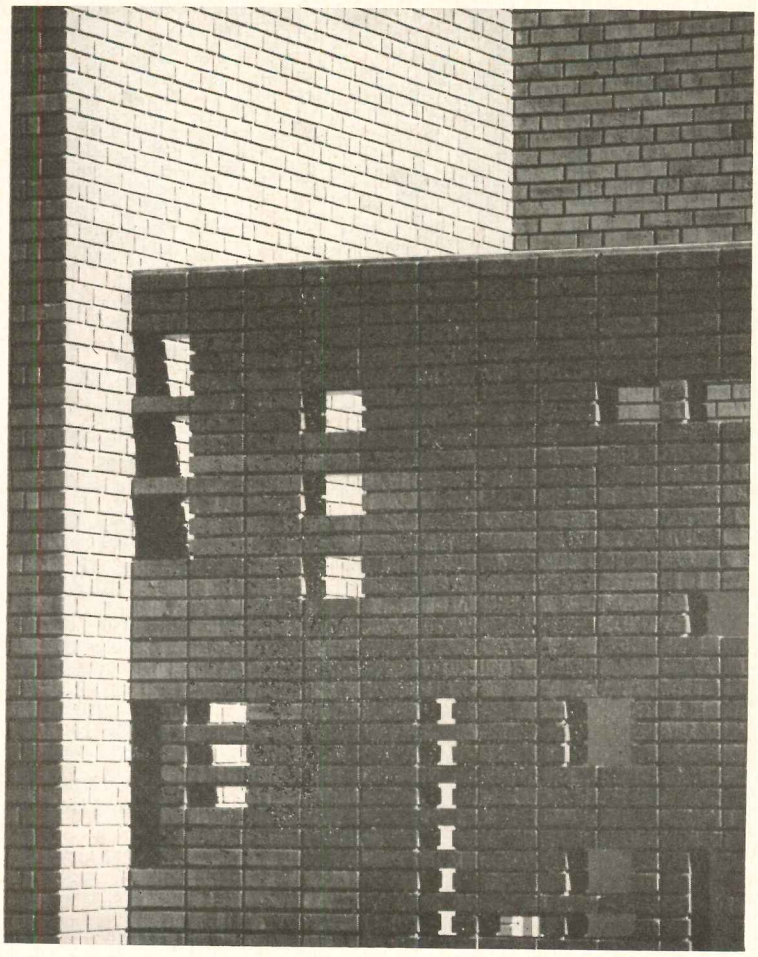


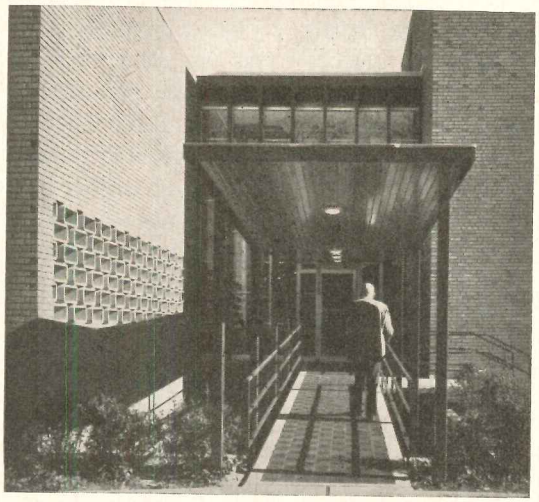


SECOND FLOOR

The main lobby (above) has balconies at the second level, contributing to an open and spacious feeling. As may be seen in the major floor plans shown, the facilities are extraordinarily complete. These include necessary spaces for physical examinations, preventive medicine, and treatment for approximately 7500 people (union members and their families attached to this local). Only hospital inpatient care and major surgery require performance elsewhere. The facilities provided are strictly departmentalized. An additional floor, located partially below grade, contains service equipment, offices, and an auditorium for staff meetings and similar purposes







Examination and Treatment Center

The careful study made by the architect of the masses of the building and their relationships to each other is indicated in the illustrations (left). The care used in the selection of the great variety of coordinated materials (including brick, pierced brick, tile grilles, granite, and glass curtain walls on the exterior) may also be seen. These are used in conjunction with a reinforced concrete frame structure. Some of the exterior feeling is translated to the inside spaces by the continuation of brick walls into the interior. The main entrance (above) is reached via a ramp designed for easy access by patients in wheel chairs or otherwise handicapped. The ramp passes over a landscaped entrance courtyard adjacent to the building

BUILDING TYPES STUDY 271
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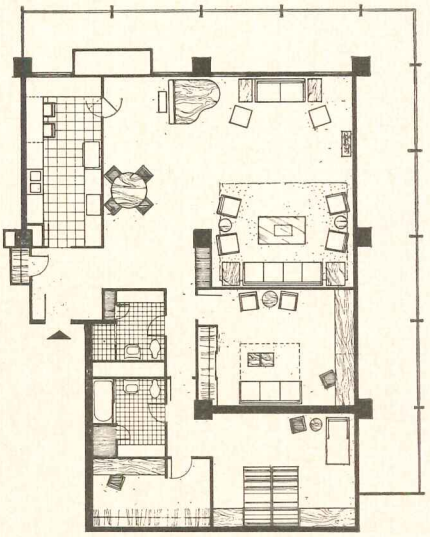
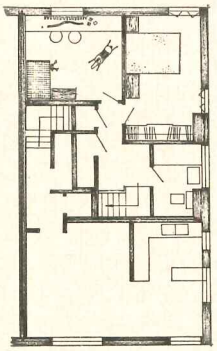
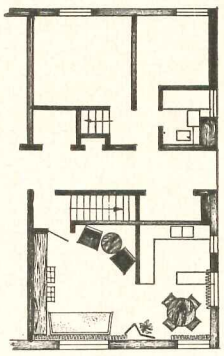
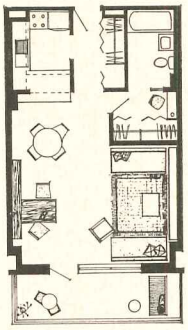


APARTMENTS







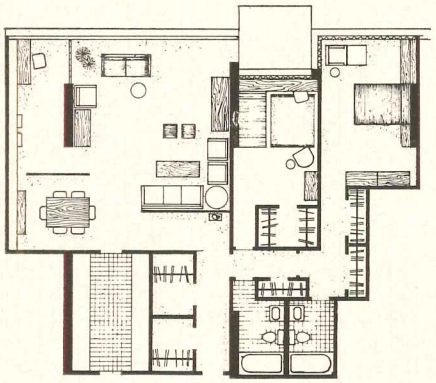
A Reminder:

The important basic fact about apartments—the consideration that overshadows all others in real significance—is the fact that *people live here.* And it is the undeniable responsibility of the architect to see to it that the lives of such apartment dwellers are as pleasant as possible, and are lived in the most attractive surroundings the environment and circumstances will permit.

In far too many cases, rentable sq ft, amortization tables, FHA regulations, zoning laws, building costs, and the myriad other (and admittedly necessary) economic and legal factors of apartment construction seem to receive major attention—over human considerations—in the rush of preparing preliminary sketches. Yet, it is elementary that apartment building design for pleasant living must be based upon the individual living units themselves; and that these can be successful only when their spaces, traffic patterns, furnishings, and all the other considerations of daily living affecting interior design have been thoroughly studied and solved. Only then can a group of such units be assembled into a building, properly related to the setting, and begin to assume their role as a background for life.

In considering the ten apartments that follow, we have concentrated our attention upon their interior designs and arrangements, together with a quick look at the buildings. Miss Eleanor Pepper, interior designer and teacher, has collaborated with us in preparing this study. The detailed plans and perspective sketches were made in her office; she has prepared an introduction (next page); and has written comments on the various apartments through the article. Her comments are enclosed in quotation marks and begin each text.

—JAMES S. HORNBECK



Apartments for Pleasant Living

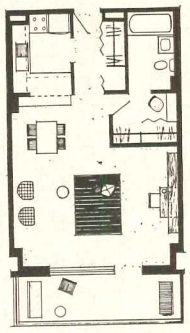
*by Eleanor Pepper**

Millions choose to live in apartment dwellings—in the city or country, in town or suburbia. Some prefer the anonymity of large buildings; others choose the more intimately scaled maisonette or row house. But whatever the apartment type, no one is willing to give up the dignity and individuality commonly associated with life in one's own house. Avoiding the burden of private home maintenance and repair should not mean that rental dwellers will not have the quality and quantity of space that is necessary for graceful living and adequate privacy.

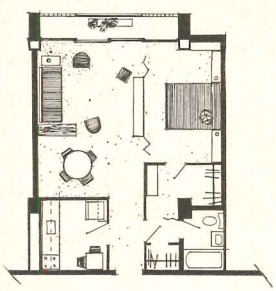
Providing a background for living is the architect's responsibility. No one can say with scientific certainty the effect a building may have on its occupants; sociologists have long speculated on this relationship without measurable result. But we can be certain that the architect—through his work—can help an unsure citizenry to a more adequate and richer way of life. The great buildings are never crowded—there is plenty of space—and the well designed apartment will provide space for doing all the things that require doing, plus a measure of extra space to set off and make more beautiful the areas designed for specific functions.

What kind of space is needed for civilized living; for an easy, pleasant, full life? To give quality to living, there must be much more than a mere stringing together of a group of minimum-sized areas. Far too many buildings erected in recent years neglect the spiritual needs of the occupants in favor of commercial considerations; or perhaps are too involved with mannerisms or design clichés, lack of plan organization, poorly proportioned rooms, too low ceilings broken by beams, awkward corners with jutting piers, etc. Such structures are not only soon dated, but age with ill grace.

Just as architects are again discovering the joys of curved and irregular shapes—as opposed to the glass box—so the most thoughtful of the designers are aware of the necessity for a variety of shapes and spaces in apartments; the need for spatial sequences which arouse curiosity and which can constantly be a source of delightful surprise in their unexpected variation of pattern. In every period in the history of art, the classical period has given way to the baroque, and now we are searching for all the baroque qualities of variation, tasteful enrichment, chiasoscuro, overhang, and undercutting. The dull and meaningless—as well as the gaudy and pretentious—have been all too evident. Now we are searching for—and sometimes finding—a cleaner and simpler, yet more interesting kind of expression.



The articulation of architectural space and its effect on apartment dwellers can best be studied by trying to arrange the necessary accoutrements for living. Of course the imaginative handling of materials, color, detail, and scale will help in adding zest and graciousness, but our first step in designing interiors is to deal with the arrangement of furniture so its pattern becomes both functional and pleasing. In other words, let us consider the positive factor of pieces in place and at the same time the negative factor of the empty spaces about them. The best plans avoid the dull form of the long, narrow living room with windows at one end and entrance opposite. There is no shape more difficult to arrange in a pleasing manner. Conversation groups are difficult to compose when about all one can do is line furniture up along the walls. A good plan will permit more than a single arrangement, so that the pattern of living for different tenants of differing tastes can be approached in different ways. The same tenant might also want to move his furniture about from time to time in order to create a new atmosphere—perhaps even for just a party.



The better plans also show good space distribution, with enough change

*Miss Pepper is Professor and Chairman of the Department of Interior Design, Pratt Institute; and also conducts her own design practice, in which she has had wide experience working with architects. She has served as consultant on color and finish material selection for various projects, such as schools, hospitals, commercial and industrial buildings. She holds a BS in Architecture from M.I.T., degrees from Barnard College and The Institute of Art, University of Paris; is an associate member of the A.I.A., New York Chapter; and a member of A.I.D. and N.S.I.D.

in shape and volume to create variety and interesting sequences. Even when a plan is open, with one space flowing into another, privacy can be achieved if a clear separation of function is carefully studied.

In a good plan the entrance will be placed so it is hidden from the rest of the apartment by means of a vestibule or hall. It is disconcerting to have those who ring the bell clearly visible and audible to those in other parts of the apartment.

It is fundamental that rooms should not be used for circulation. One should be able to reach the bedrooms, bathroom, and kitchen from the front hall without walking through the living or dining rooms or other principal areas. A room scarcely exists that can provide paths for traffic and pleasant spaces for living and entertaining at the same time. All feeling of order and calm is destroyed when people must pass through a space, and comfortable furniture groupings are virtually impossible.

The size, shape, and scale of openings is important in creating a serene interior. Too many or too few openings may produce a room that is restless in its changing patterns of light and dark. Windows at the ceiling not only provide a superior quality and quantity of light, but are also much easier to treat decoratively with curtains and hangings than those placed a foot or more below the ceiling. The area over the head of a window is a peculiarly awkward one to handle attractively.

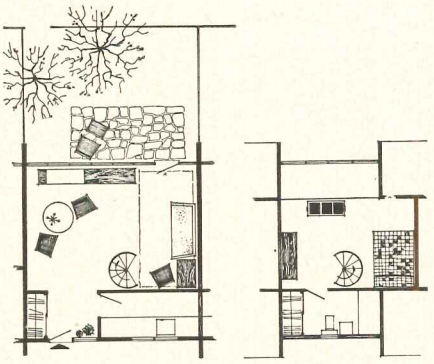
The group of apartments shown on the following pages are of various types, designed to fit different needs and pocketbooks. First, the high-rise building, usually located in the city, and offering the privacy that only city living can give. Here, one's neighbor is not necessarily a friend—or even an acquaintance—and can come and go as anonymously as you. But such apartments must offer certain other qualities to provide pleasant living.

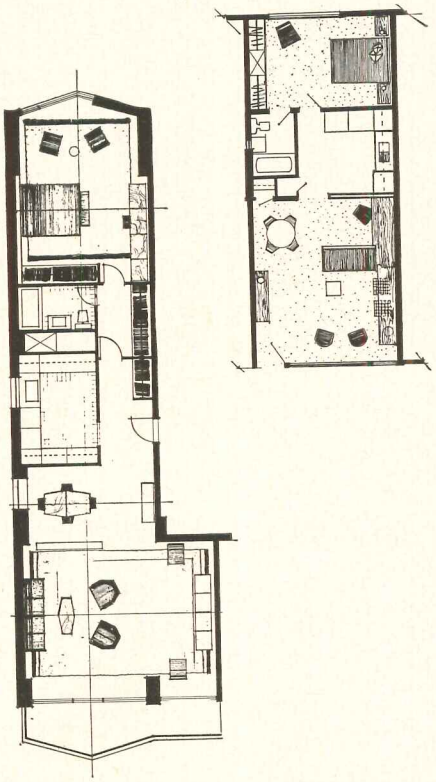
First, the relationship to outdoors must be carefully studied. While the entire building should be, as M. Labatut so charmingly puts it, "dressed in a landscape," each resident should also be able to feel some community with the outdoors. Perhaps this can be achieved by a balcony, a terrace, or even a view from a window that overlooks a garden or lawn. Vistas should be a part of the interior scheme so that one's eyes and imagination are not confined by the apartment walls. Upper floor views take on a different scale, and outdoors tends to become a map spread out below. In this situation we seem to feel our own littleness in the face of the big city. However, tall buildings—when well designed—offer a kind of living that appeals to cultivated persons seeking a maximum of convenience and privacy; an easier life free of the responsibilities of snow removal, grass cutting, and all the other chores and expenses that go along with home ownership and maintenance.

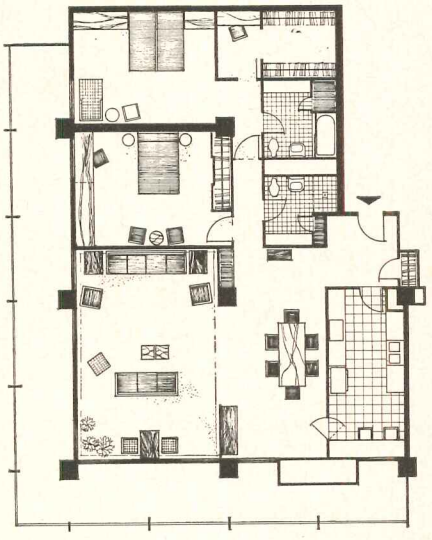
The row house—whether single story or of the maisonette type—provides a different kind of apartment living. With a relatively small land coverage, row houses usually allow generous outdoor areas for community use, and housing should—many feel—be thought of in community terms and not just as space for a given number of tenants. Row houses can provide a feeling of community as well as adequate privacy for the occupants.

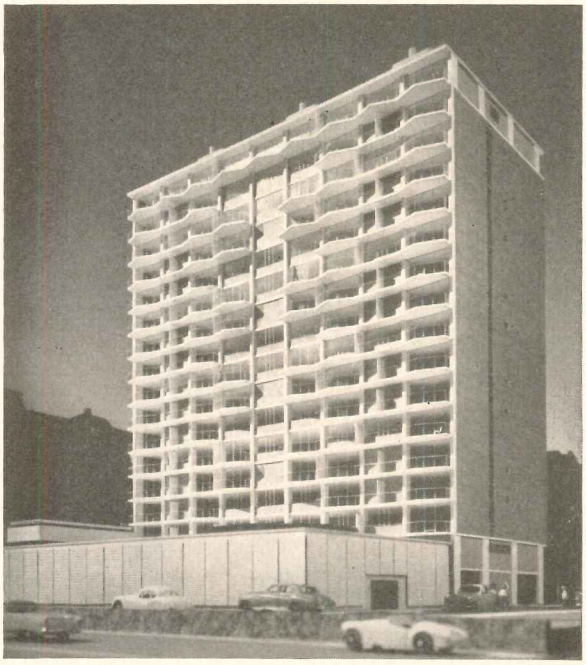
This type, with its individual entrance for each unit, avoids the hotel-like corridor typical of so many large, high-rise buildings. Several schemes have been tried in order to eliminate such corridors. The exterior gallery is one; the use of multiple elevators with only two or three entrances opening off each landing is another. The row house, which finds especial favor with younger couples as well as older persons, offers more in the way of useful and desirable space—for money spent—than the single detached dwelling.

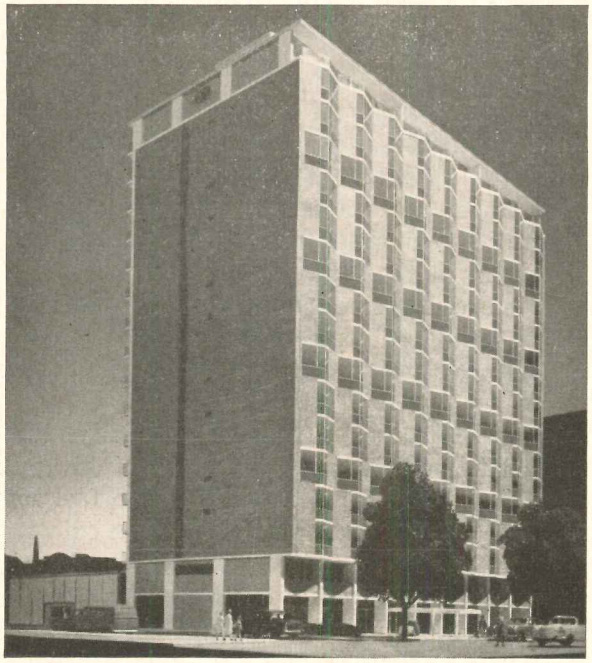
The apartments that follow solve—with varying degrees of success—the problem we all have of a place to live that can be furnished and decorated in a manner that will provide attractive surroundings and a pleasant background for living.











Robert D. Harvey Studio

Back Bay Center Hall

330 Beacon Street
Boston, Mass.

Hugh A. Stubbins & Associates
Architects

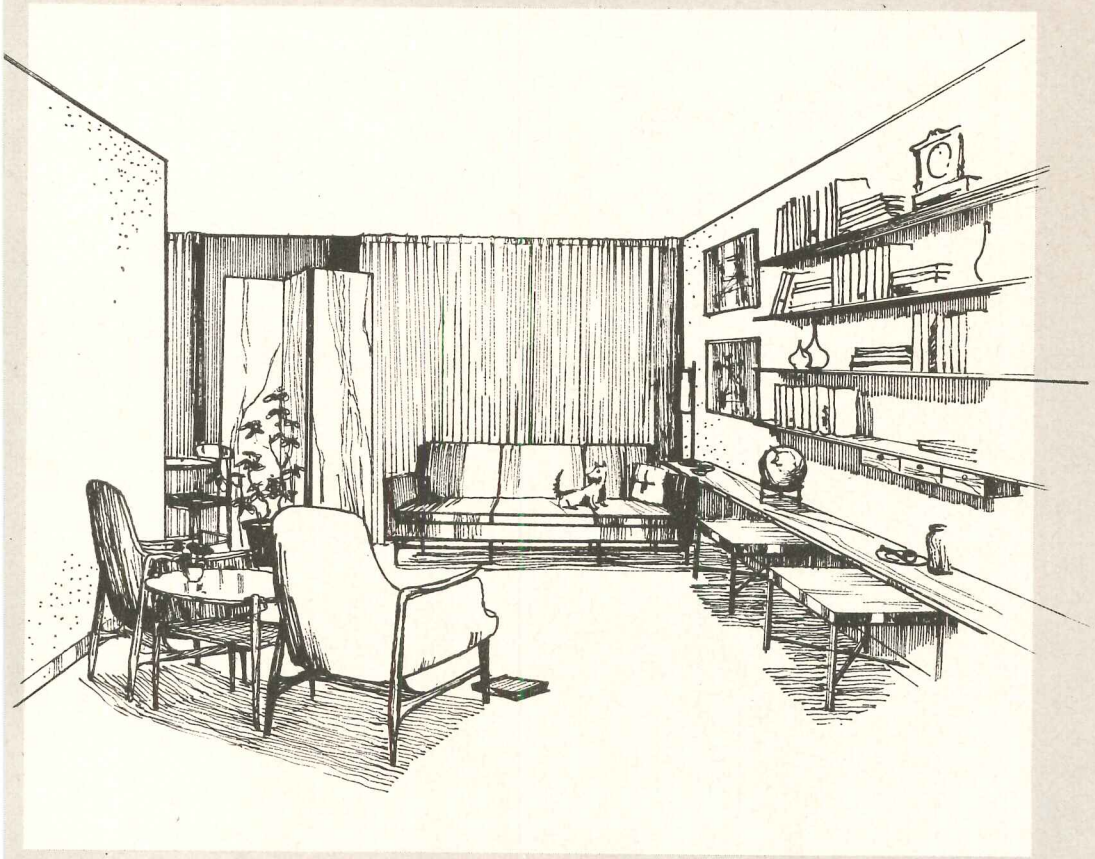
Turner Construction Co.
General Contractors

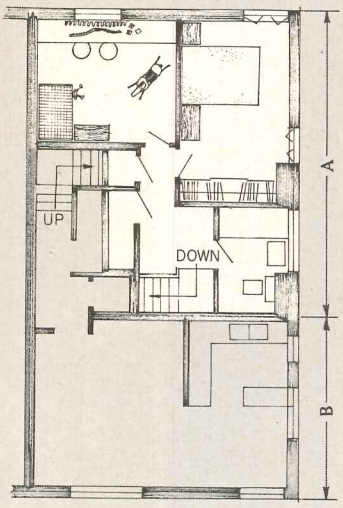
"The plan shows excellent distribution of space, with an interesting variety of shapes and volumes. The central-hall arrangement provides notably good circulation, compact and with no room suffering from through traffic. The plan rather reminds me of a one-story version of the old Back Bay house, with windows at the front and back providing a through view and cross ventilation. How delightful!

"The living room—entered from the center of a wall—is more or less square, permitting a pleasant furniture arrangement and plenty of wall space. The balcony is large enough to be used by several people in a conversation group, as opposed to the usual apartment one-chair-deep one.

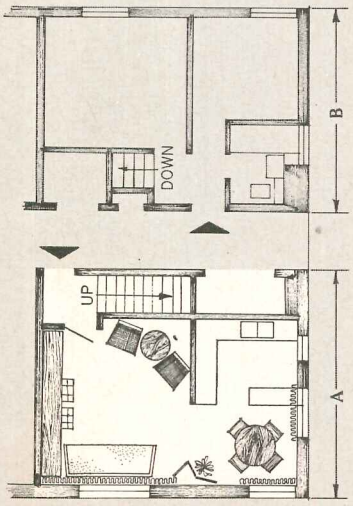
"The bedroom is spacious enough for a sitting area, and its modified bay-window fenestration permits an outside view, yet provides privacy."

Construction is under way on this 17-story structure, the first large apartment building to be put up in Boston in 25 years. Completion of its 78 apartments is scheduled for summer, 1960. The 155-ft building will feature attended parking for every unit, plus central air conditioning.





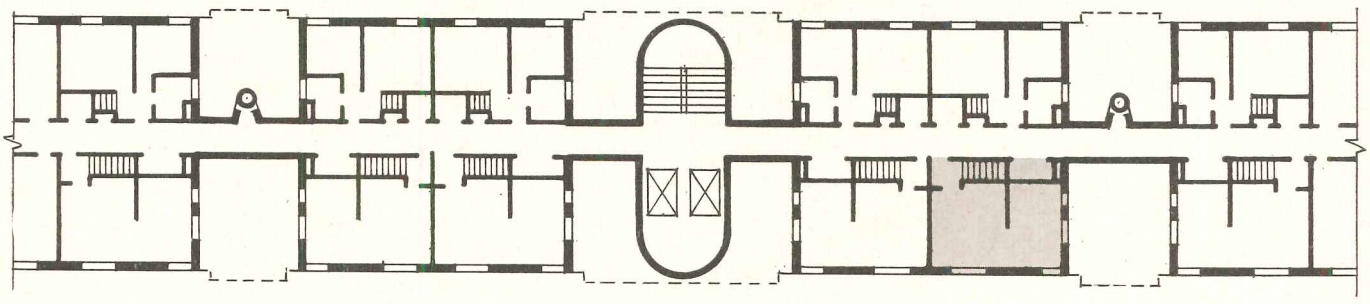
NON-CORRIDOR FLOOR

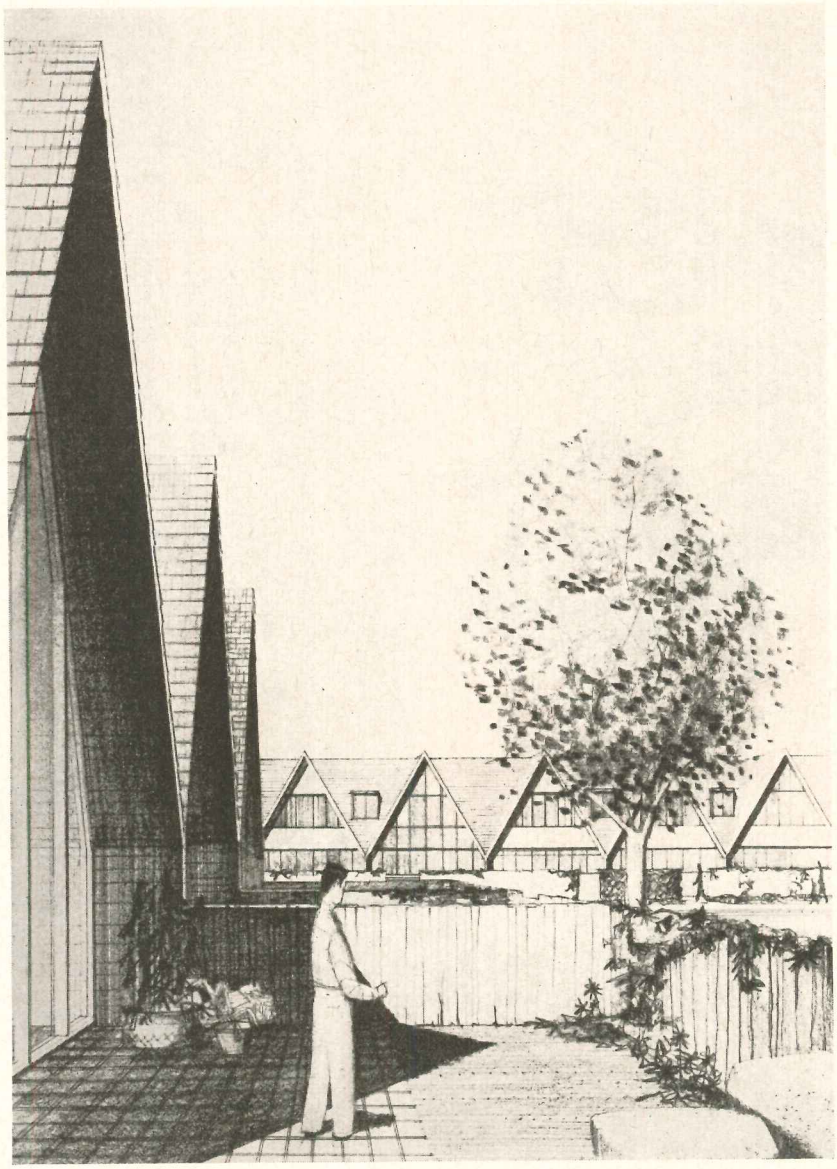


CORRIDOR FLOOR

The ingenious cross-over maisonette plan makes it possible for all living rooms to face southwest and all bedrooms northeast. Access is from three towers, each housing stairs and two elevators, serving alternate, or corridor floors. The corridors continue as open bridges slung under the skip-level garden slabs to connect the several blocks, and provide also an additional means of escape in case of fire. The provision of a "garden", 10 by 20 ft, for every tenant is a new and commendable kind of amenity in British high-rise developments.

Sketch by Leslie Christenson





Dallas Row Studios

Studio Apartment Group
Dallas, Texas

Howard R. Meyer
Architect

James Reece Pratt and
John Harold Box
Associated Architects

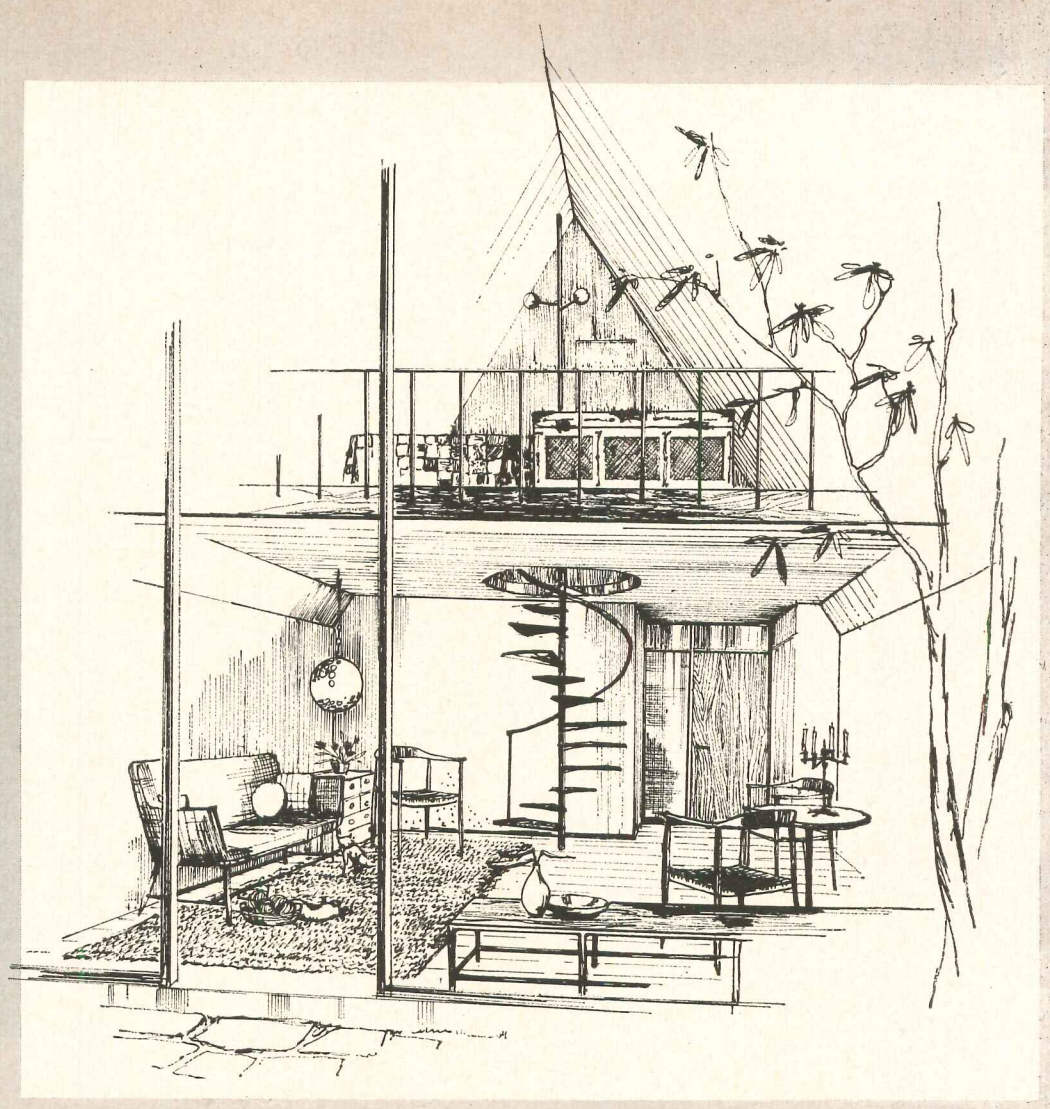
Dicker-Frank & Associates
Owners and Builders

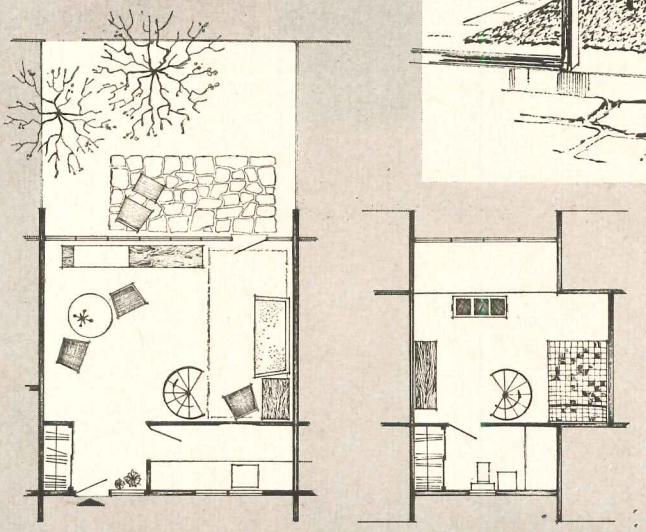
"These studios—each with a garden—seem to me to express a simplicity of the most sophisticated kind, and to have a character that demands informal furnishings and casual living.

"The diversity of shapes and spaces is most interesting and altogether charming. We chose the balcony bedroom type for our sketches, and in keeping with a spirit of gaiety that seems at home, decided that a semi-buffet kind of dining (with an assist from the round table) would be fitting. There is plenty of room for a regular table, but why that when many meals will doubtless be consumed out on the terrace anyway?"

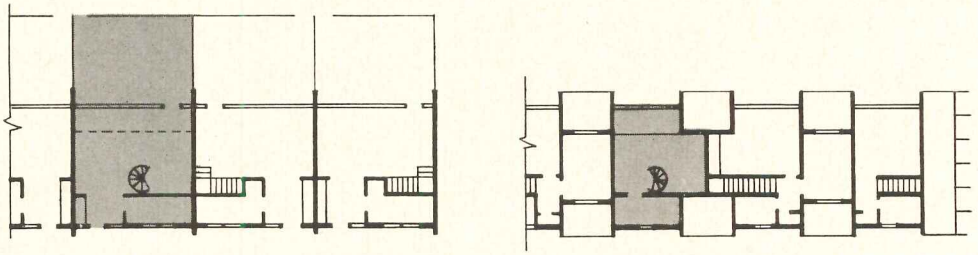
This 26-unit project was designed to meet an indicated need for small duplex apartments in Dallas. The one-acre site is convenient to downtown.

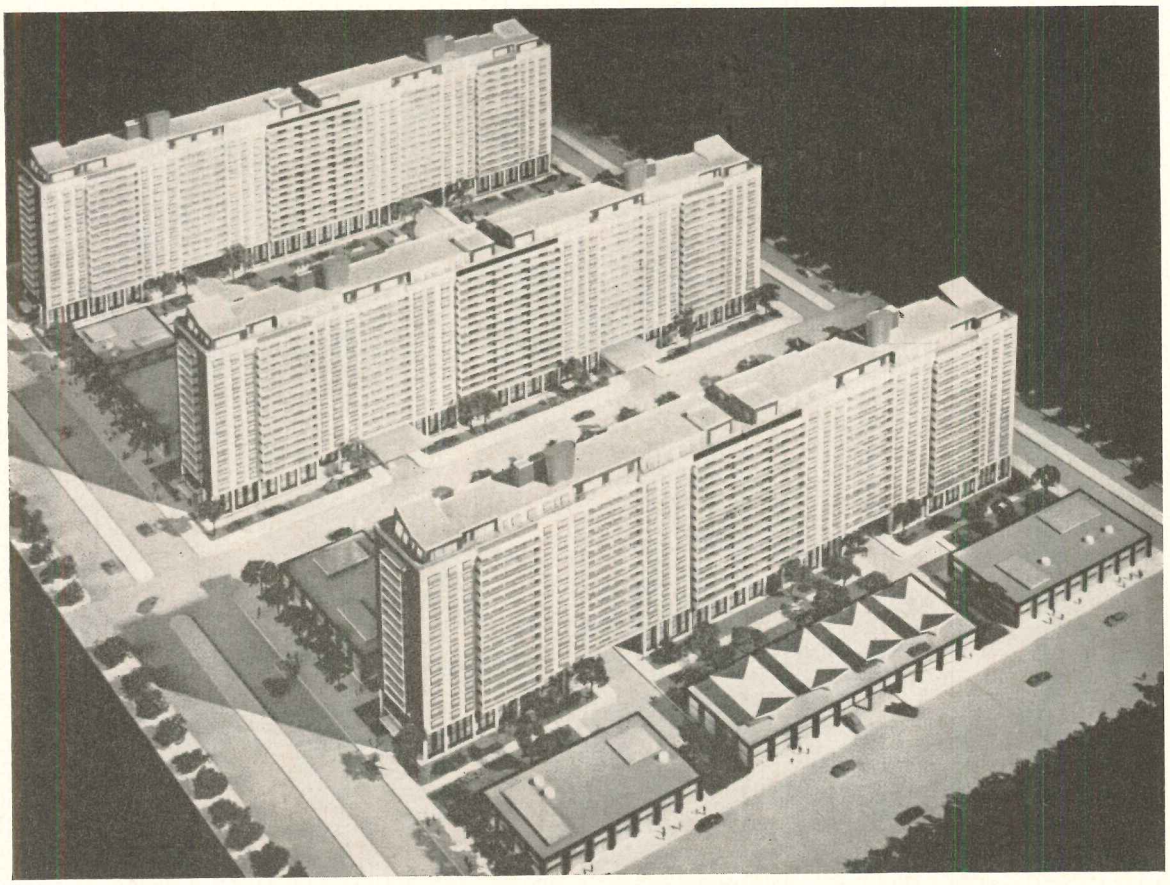
The pitched roofs will not only give the occupants a fine sense of shelter—and the project good residential scale—but will also make framing cheaper and cut cost by reducing the exterior wall area. The longitudinal gable will house the air conditioning apparatus. The roofs will be shingled; the gable ends will have glass or asbestos board infilling.





Sketch by Leslie Christenson





Big City Two-and-a-half

Washington Square Village
New York City

S. J. Kessler & Sons
Architects and Engineers

Paul Lester Wiener
Site Planning and
Design Consultant

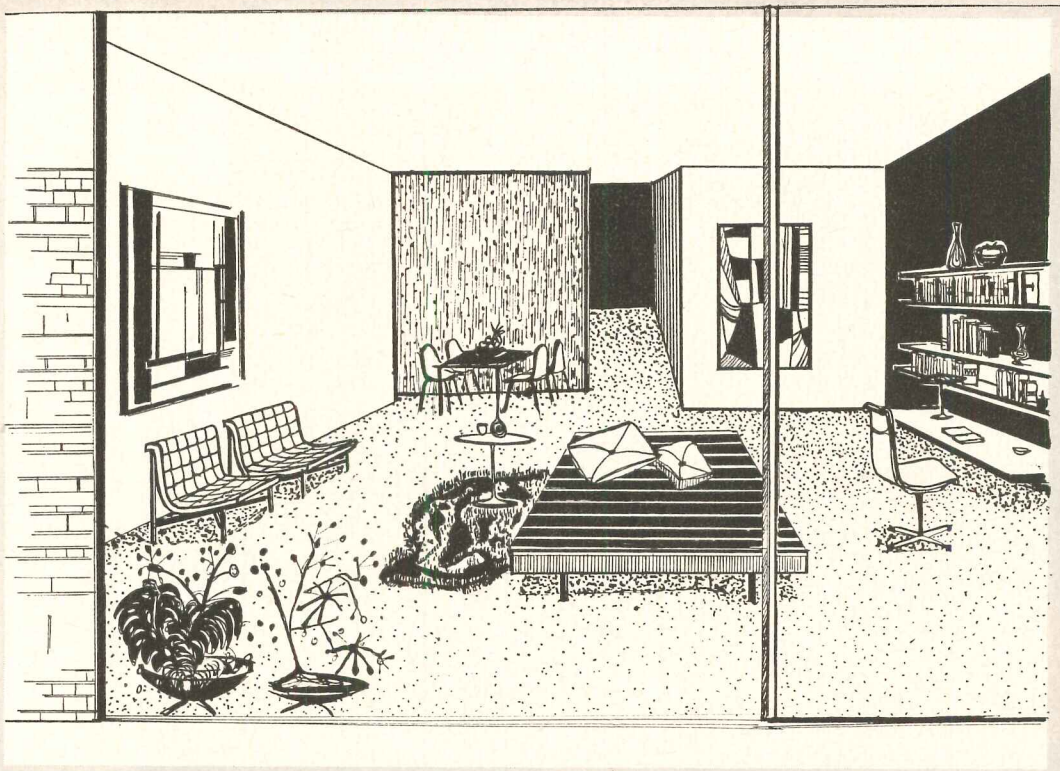
Sasaki, Walter & Associates
Landscape Architects

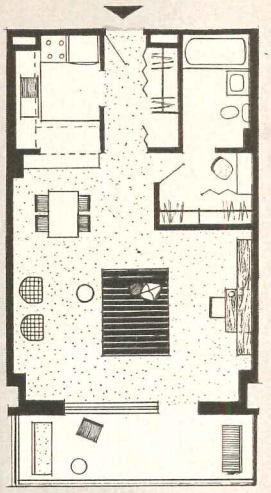
Paul Tishman Company
Builders

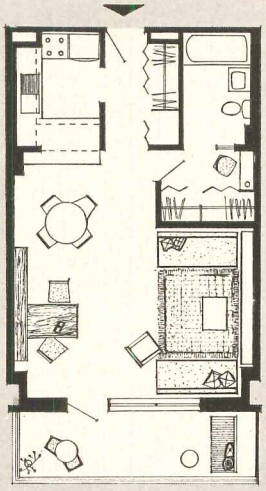
"Here the balcony is large enough to be of real use, and as a result we have a small apartment with an outdoor living space that seems to make the whole interior area expand. Utility, storage, and service areas are grouped and out of the way when one enters or uses the large room.

"The living-sleeping space is well shaped, has an excellent ratio of wall space to window area, and lends itself readily to a variety of orderly, uncluttered arrangements. We tried two: one (left) with studio beds for a couple; and the other (right) a more unconventional scheme in which the large bed doubles as a sofa. The latter seems to say bachelor."

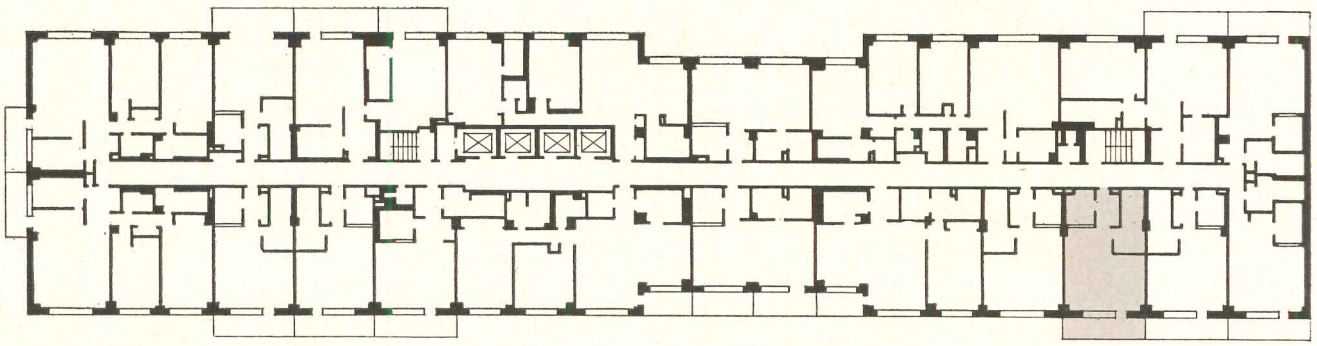
With one building now occupied and a second under way, this 2000-apartment project—covering 6 blocks—will soon take its place as one of New York's largest commercial residential developments. The buildings will look out over four acres of gardens, play areas, and plazas, and will be served by parking facilities for 900 cars as well as a strip of commercial establishments along the southern border of the property. The design will feature vertical strips of glazed brick in bold colors.

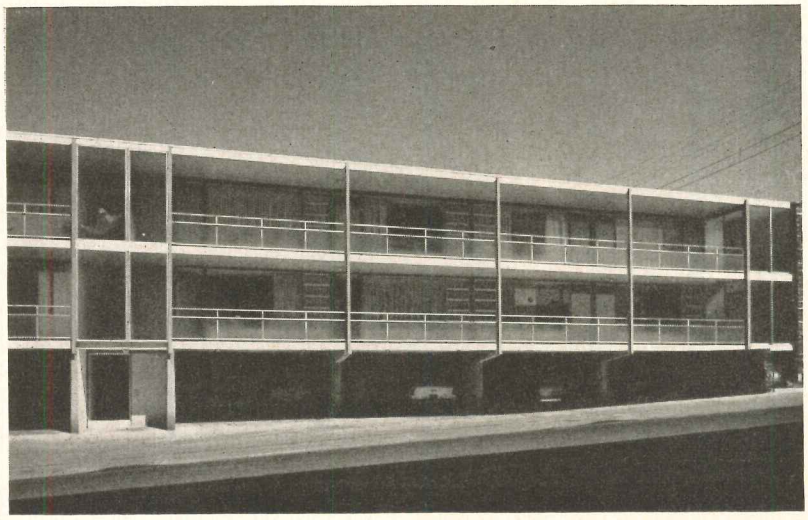




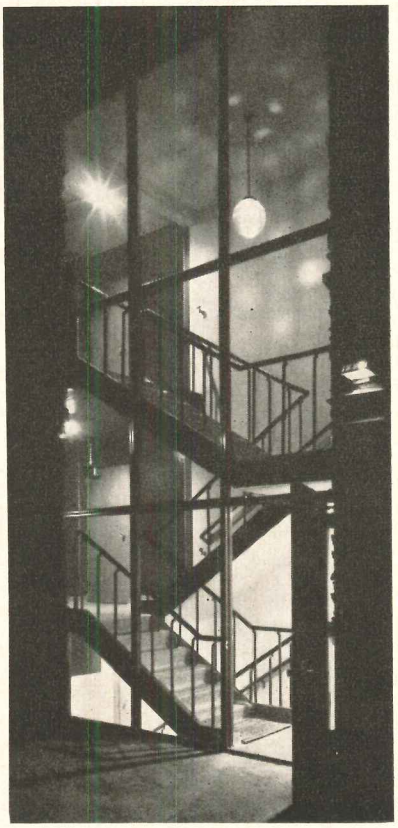


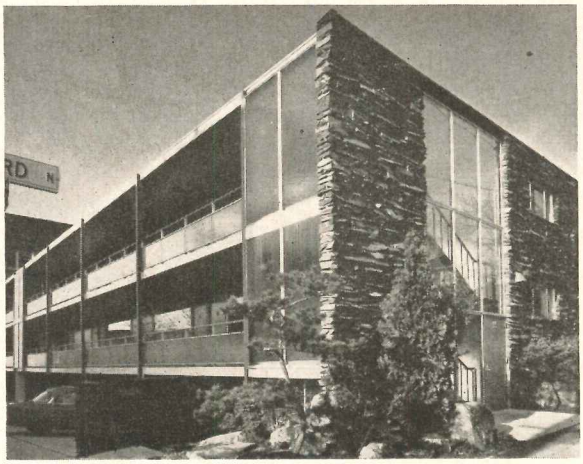
Sketch by Phyllis Sira





Photos by Vern Green





Seattle Balcony-Corridor

401 Harvard North
Seattle, Wash.

Gotteland & Koczarski
Architects

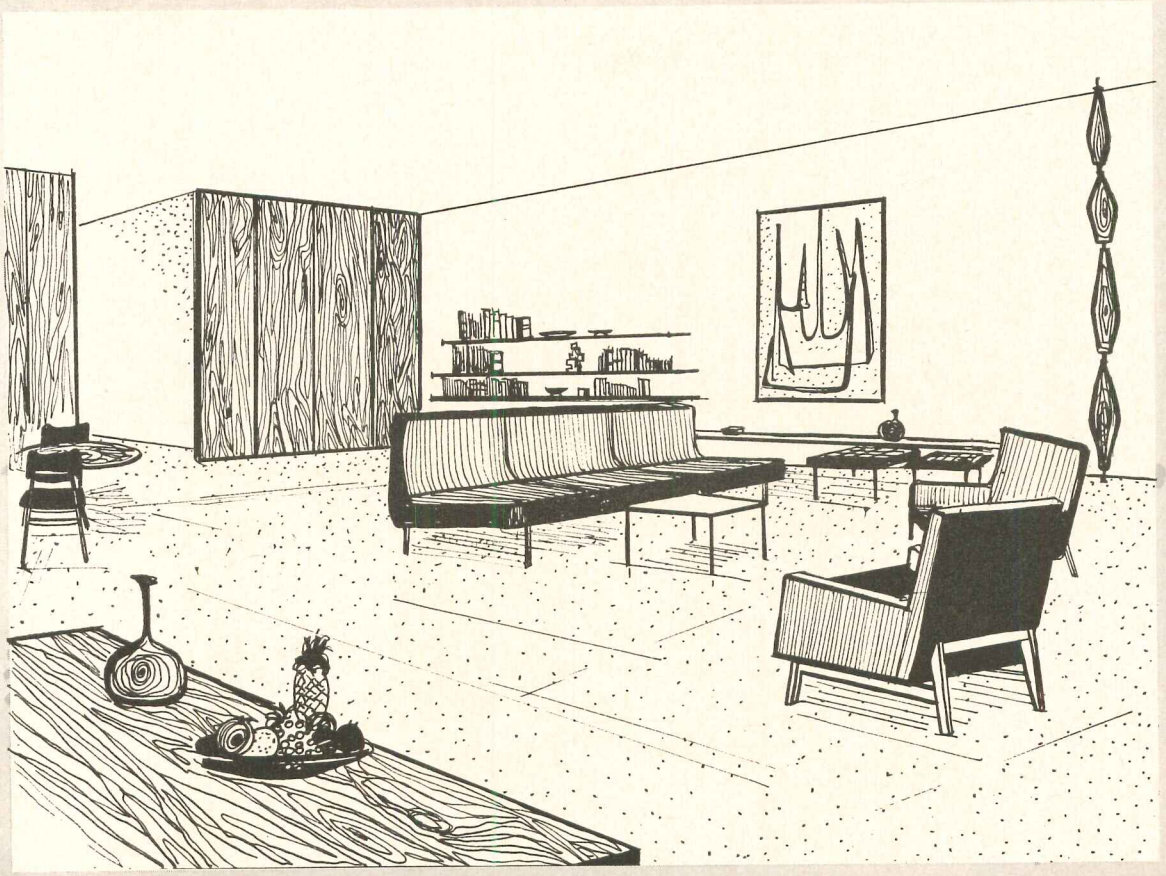
Judson Nelson
Developer

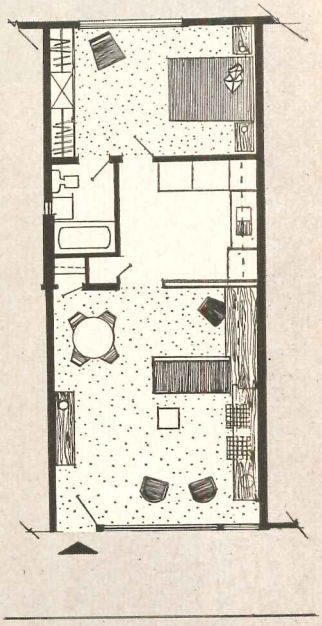
"The exterior balcony-corridor as access to the apartments does eliminate the unpleasantness of a motel-like atmosphere, but it does seem to me that placing the living rooms so they face this corridor causes them to lose a certain amount of privacy as a result.

"However, the rooms are large and pleasant in character. The living area is ample for the development of special areas for conversation, study, and dining. The bedroom has ample storage and space for seating.

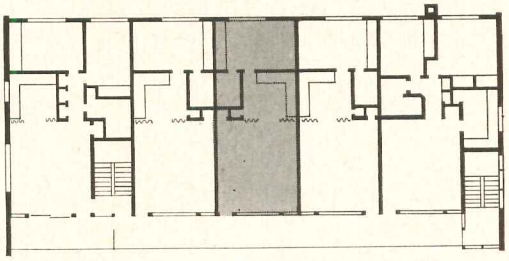
"The kitchen is large enough for informal meals, but we objected to its being completely exposed to the living room and added a divider in our plan. Others may disagree, but the fact that the entrance door opens directly into the living room tended to strengthen this feeling."

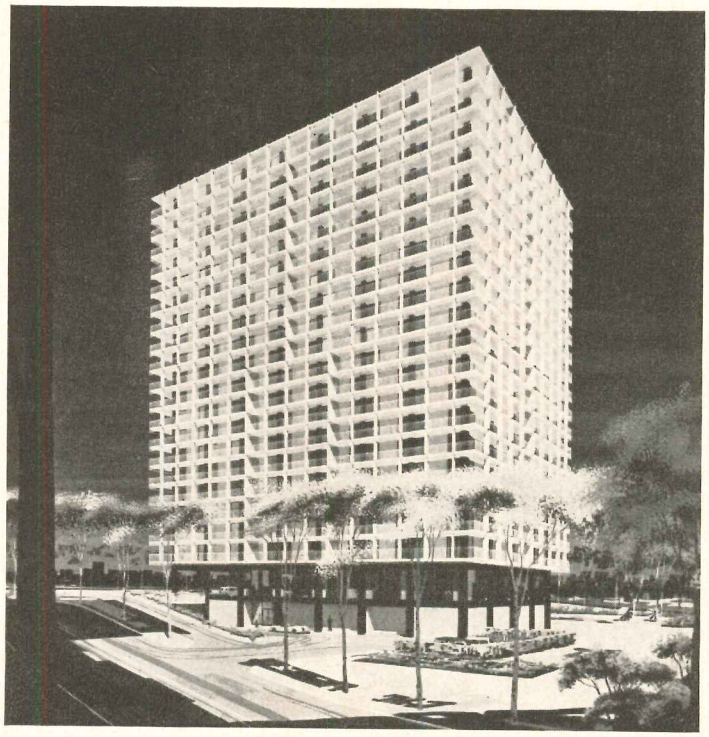
The building contains ten apartments—five to a floor—with the sloping ground floor providing sheltered parking. The construction is of reinforced concrete below the first floor slab and wood frame above, except that the upper balcony is a concrete slab on metal deck. Plastic domes provide natural light for second floor kitchens and bathrooms.

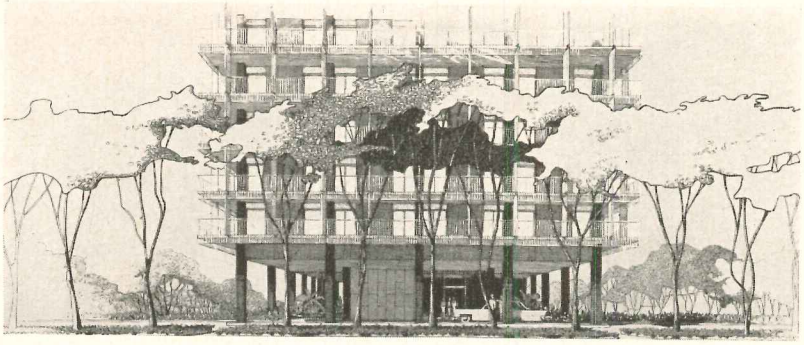




Sketch by Phyllis Sira







Oklahoma Luxury

2300 Riverside
Tulsa, Oklahoma

George F. Harrell and
E. G. Hamilton
Architects

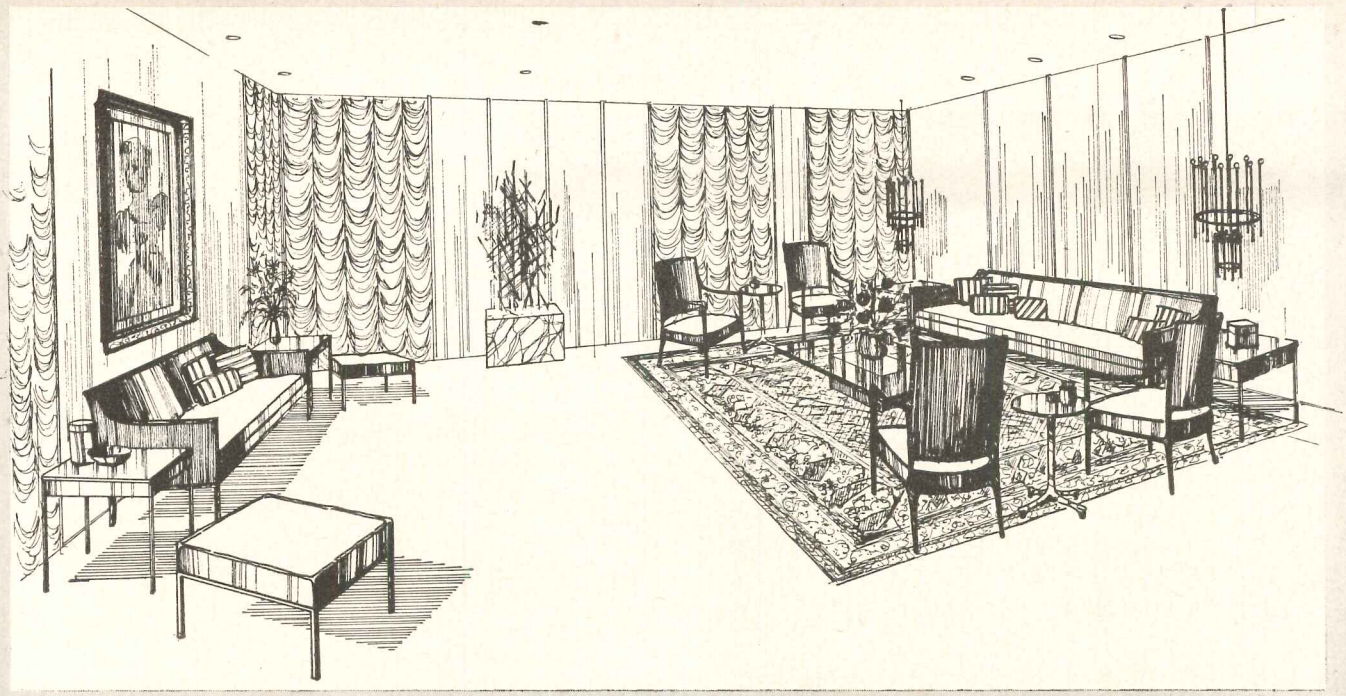
Raymond D. Nasher
Developer

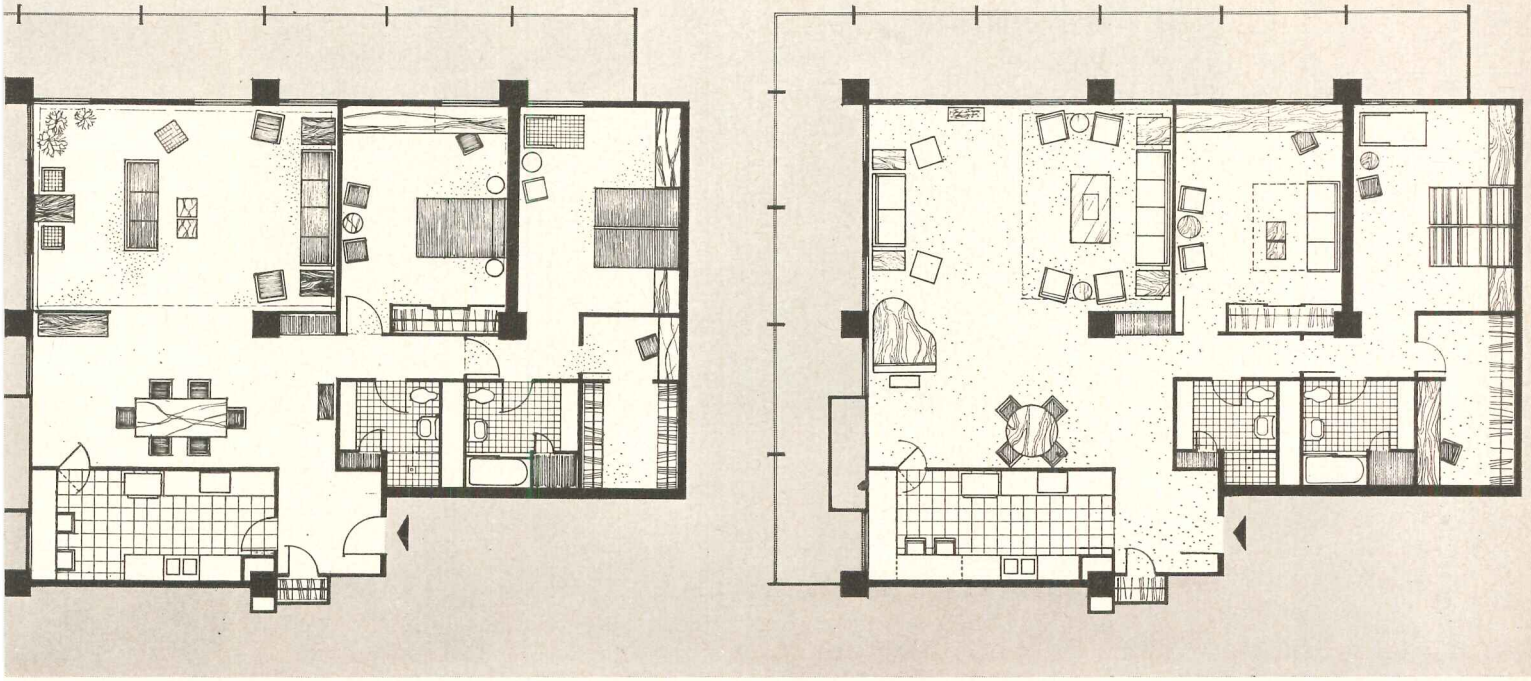
"Elegant is the word for these apartments; the rooms are spacious, and their relationship to each other and to the circulation is excellent, with a minimum of corridor space and a maximum of comfort and privacy. The lavish spaces for service and storage add further amenity to the scheme.

"Window and wall areas are well handled, both functionally and esthetically; outside corners float free, creating an open feeling and a community with the outdoors when the curtains are pulled open.

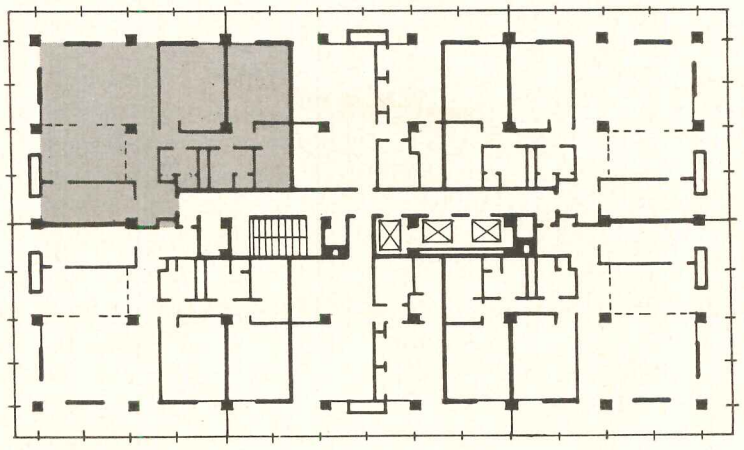
"We have made alternate plans to give some idea of the flexibility possible. In the first (left) the living and dining functions are more precisely defined than in the other (right). Note also that the bedroom nearest the living area is designed as a combination den-guest room."

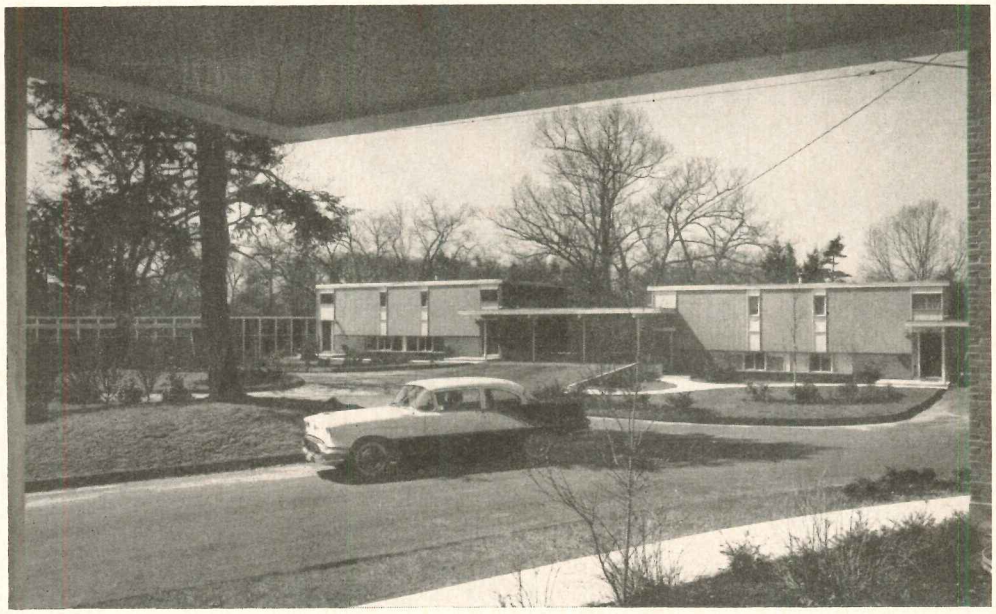
This 21-story, air conditioned building will contain 102 luxurious apartments (including three penthouses) and its facilities will include a clubroom, heated swimming pool, greenhouse, putting green, attended parking and domestic help on call. It will be set in a rolling, wooded 6-acre site in a residential area that overlooks the Arkansas River.

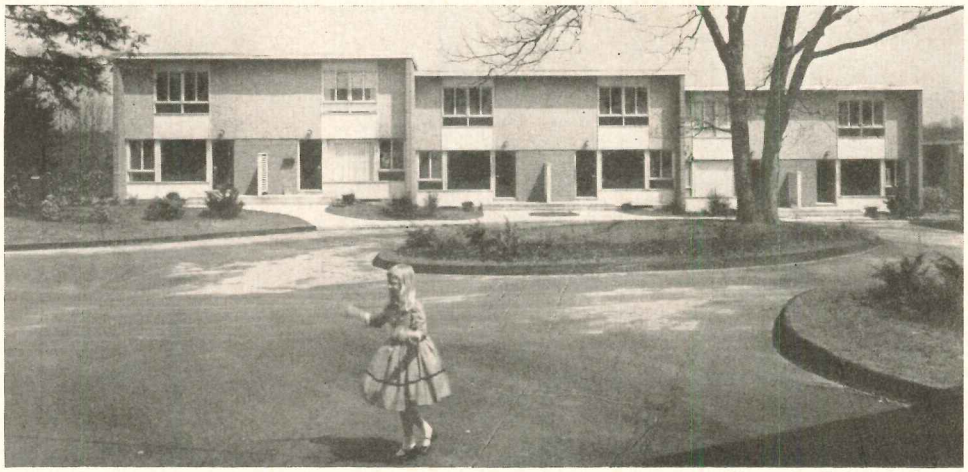




Sketch by Gair Nourigat







Photos by Robert Stahman

New England Row House

North Lake Apartments
Hamden, Conn.

Pedersen & Tilney
Architects

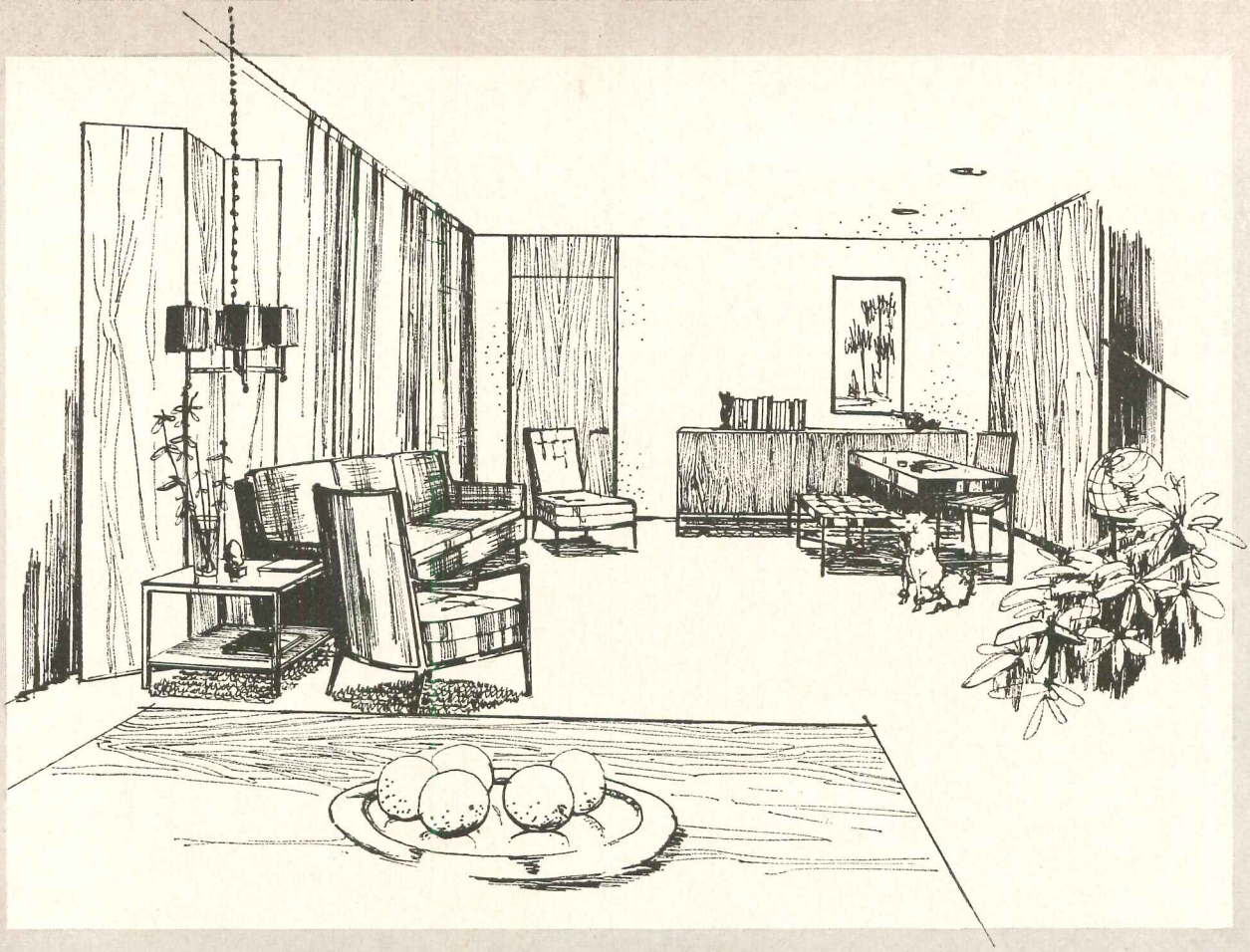
Carl Stelling
Landscape Architect

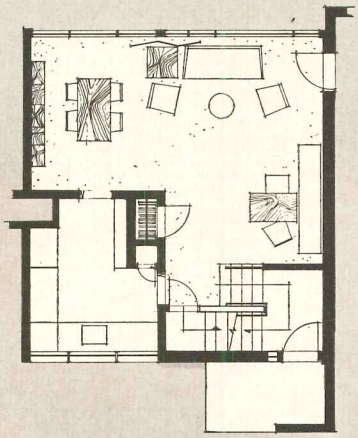
Veggo Larsen Company
Builders

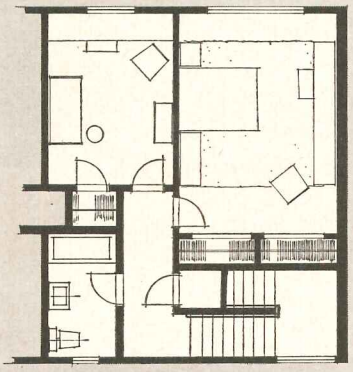
"Creating a series of small, two-story houses set in the woods is of course an excellent idea; one that gives the entire project both a pleasant character and good residential scale.

"The interior circulation is well thought out, with no traffic through rooms and hence good privacy; the various areas are well related to each other and to the outdoors, so they function well and can be furnished for comfortable living in a variety of arrangements. However, the sequence of spaces might have been made more stimulating if their shapes and volumes were more diverse, to give one a greater feeling of change."

The site for this development is an unusual and attractive one; practically unspoiled Connecticut woods, formerly belonging to the New Haven Water Co. One can look through the woods over the water of a reservoir or pond in several directions. The wood-frame dwelling units all two stories in height divided equally between flats and row houses. The latter are of two types; one a conventional duplex, and the other a more unusual scheme (right) designed for the sloping site.

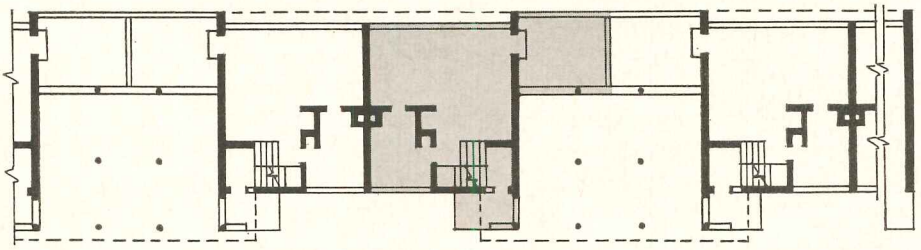


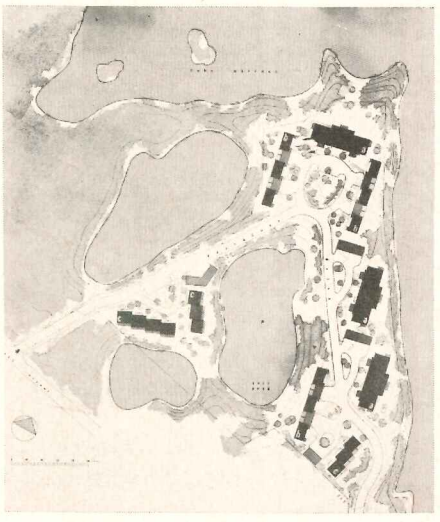




UPPER FLOOR

Sketch by Leslie Christenson





Washington "Efficiency"

Capitol Park Apartments
Southwest Redevelopment Project B
Washington, D. C.

Satterlee & Smith
Architects

Mayer, Whittlesey & Glass
Consulting Architects

Ralph Eberlin
Site Engineer

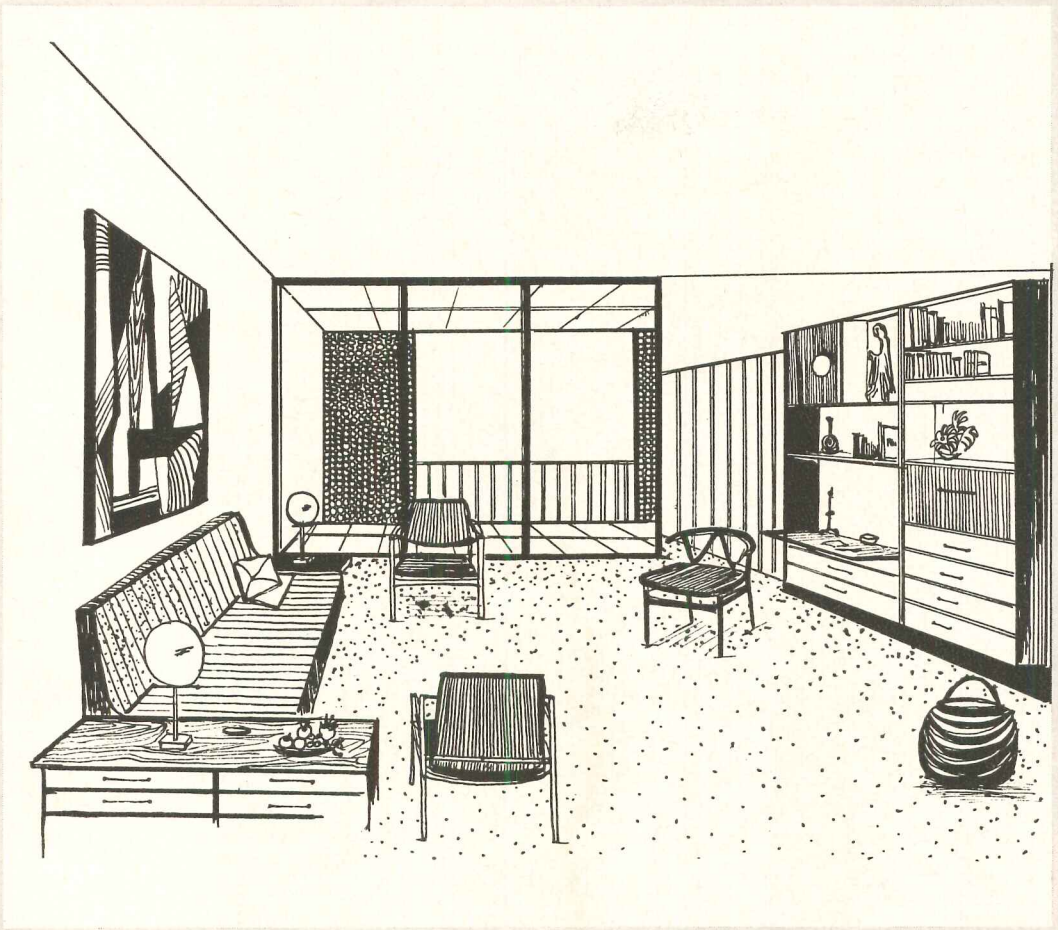
Dan Kiley
Landscape Architect

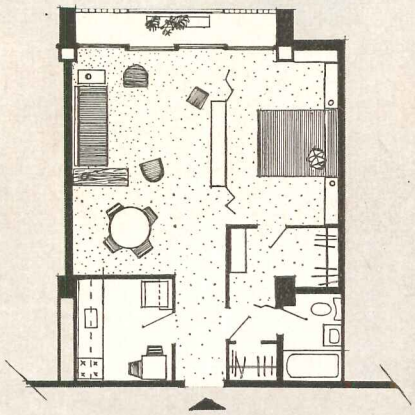
Severud-Elstad-Krueger
Structural Engineers

"The balcony with its tile sunscreen will add a rich, lacelike pattern and third dimension to the simple lines of this living area, which is approached pleasantly through a compact grouping of service areas.

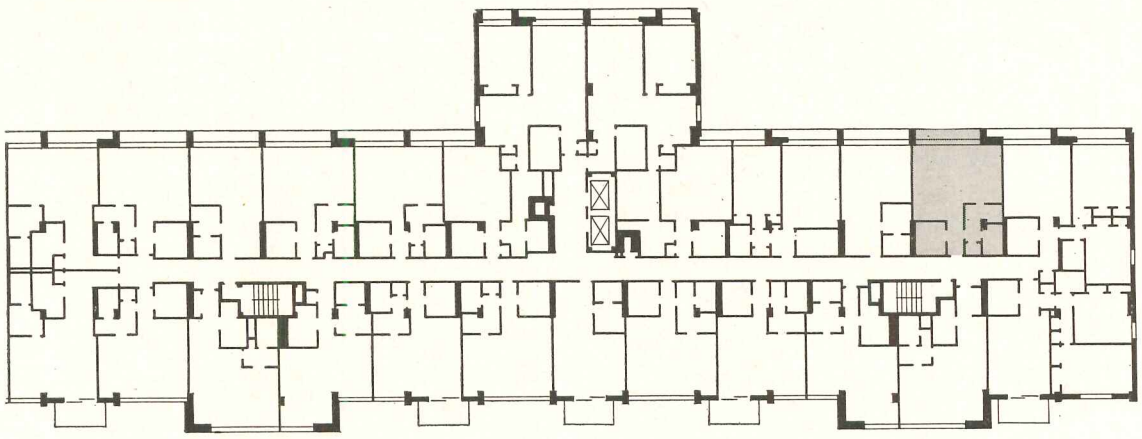
"However, the disposition of wall areas and window-wall allows little diversity in either the use of the principal space or in furniture arrangement. We have replaced the foldback partition shown in the architect's plan with a low, fixed divider flanked by folding screens. There is space above this divider, and a glimpse around it on either side adds a sense of space continuing. Our feeling is that if the sleeping area is to be furnished as a bedroom, it is desirable to conceal the bed from direct living room view, and yet not to box it off by itself."

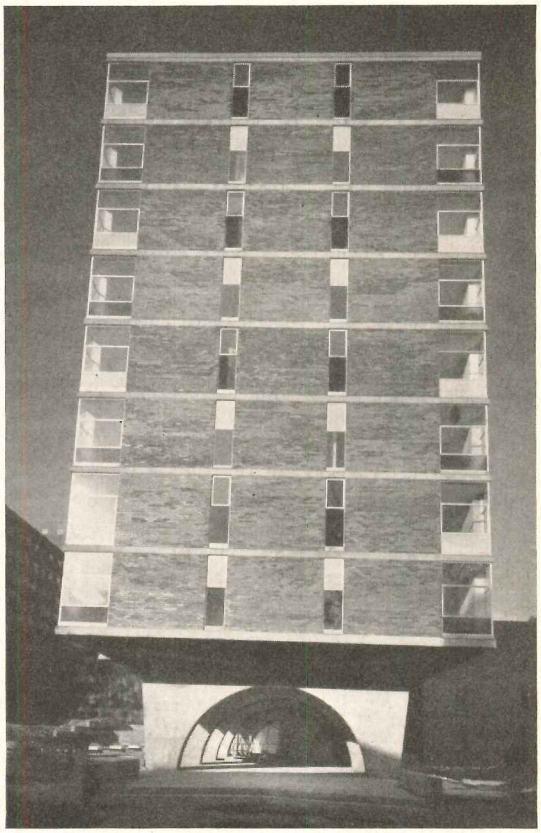
This large development—sponsored by Roger L. Stevens and James H. Scheuer—will comprise 1020 rental units in two 8-story buildings of 400 units each, and 82 town houses. Sixty per cent of the apartments will be "basic flexible efficiencies." All of the buildings will be air conditioned; screens of hollow tile will provide exterior pattern and shade.

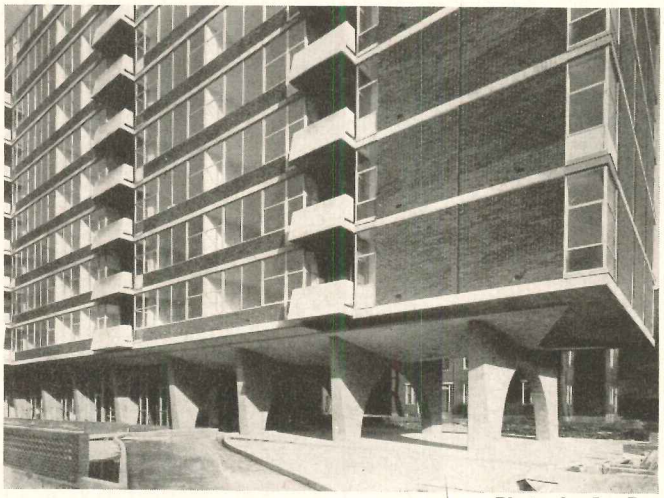




Sketch by Phyllis Sira







Photos by Jay-Bee

Unusual Pittsburgh Scheme

Neville House
Pittsburgh, Pa.

Tasso Katselas
Architect

Gensert, Williams & Associates
Structural Engineers

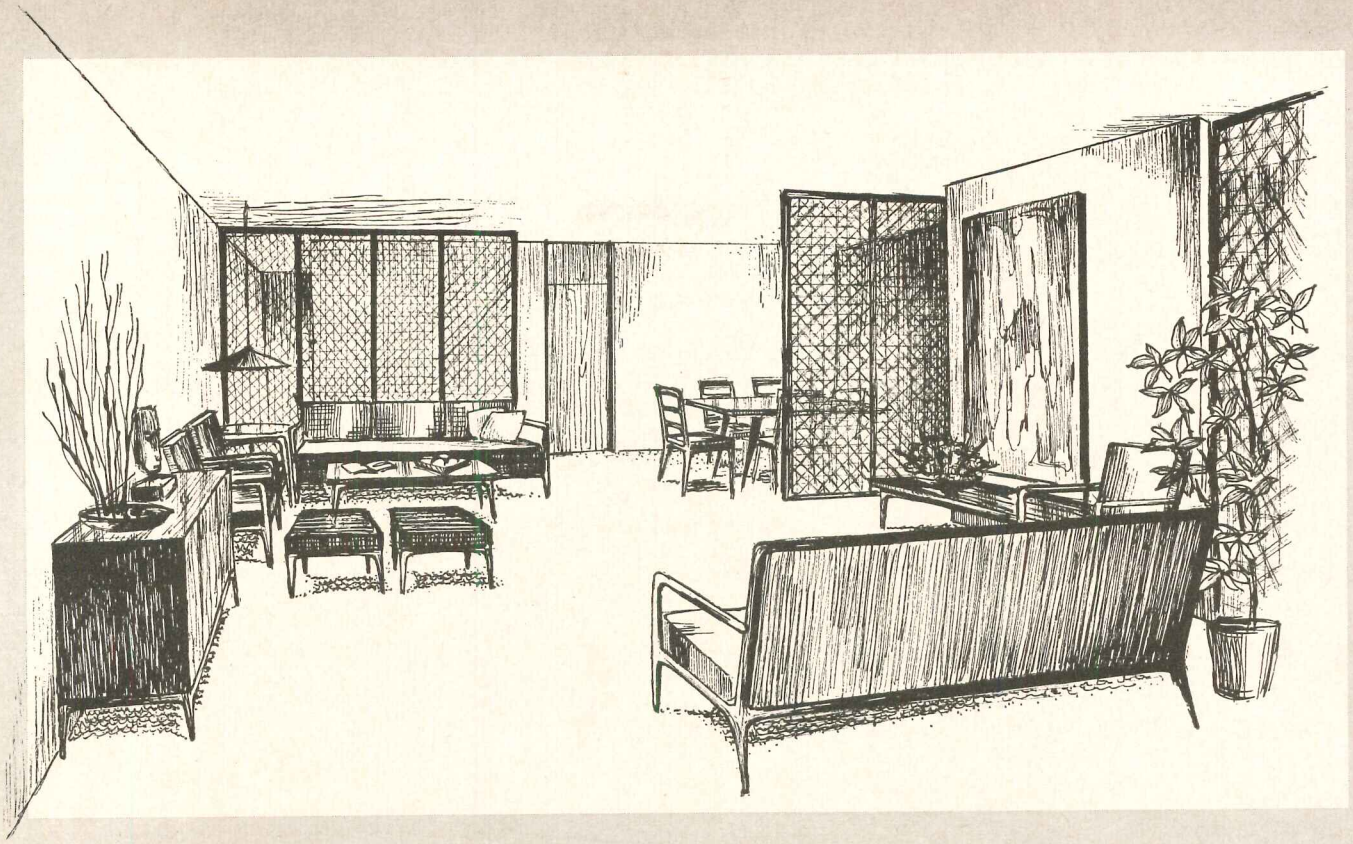
H. H. Reich
Mechanical

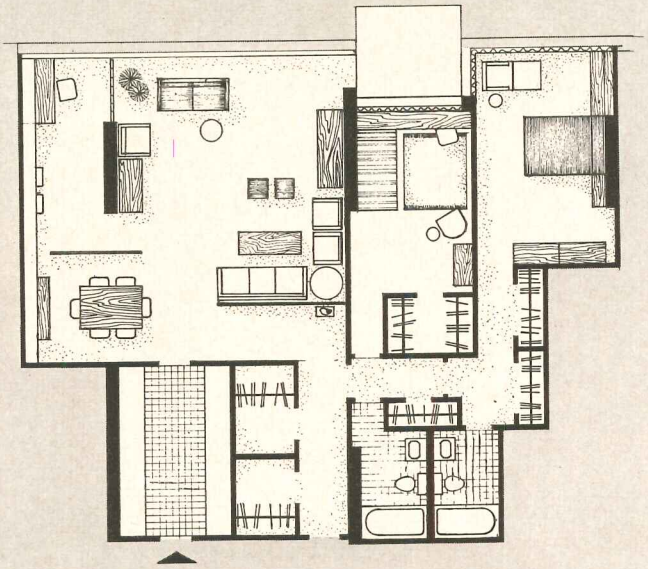
Graziano Construction Co.
Builders

"The idea of the architect that the unusual structure of this building should 'sing through the plan and control it' and that the shear walls 'become screens or room dividers' is a bold and exciting one, but in only a few instances can we find 'spaces reading around and behind' the shear walls. However, the clean sweep of the perimeter walls—free of the columns that usually make windows and corners difficult to handle—means that the cantilevered structural system is indeed very much worthwhile.

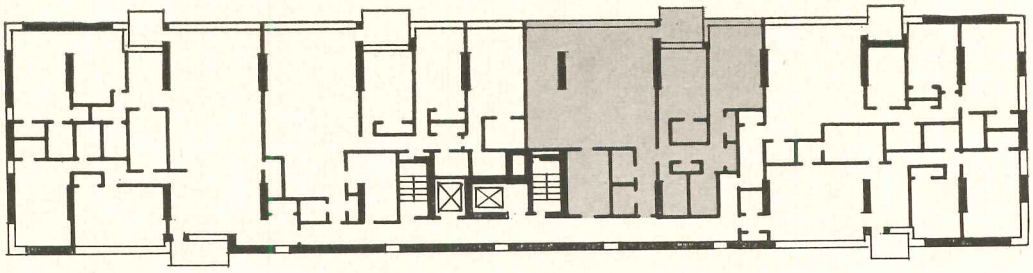
"The interplay of volumes and the diversity of space sensations is admirable in the over-all concept, and the living-dining area of this particular apartment (right) is of a size and shape that allows a variety of interior arrangements. The hall seems long, but there is an abundance of useful storage space provided in the areas that define it."

This 10-story, 50-family apartment is located in a congested area. Its unusual structure consists of 9-in. floor slabs supported by and cantilevering beyond two rows of 1- by 7-ft columns upon a series of arches which span 32 ft and provide a colonnade for the open ground floor area.





Sketch by William Noffke



Continental Interior

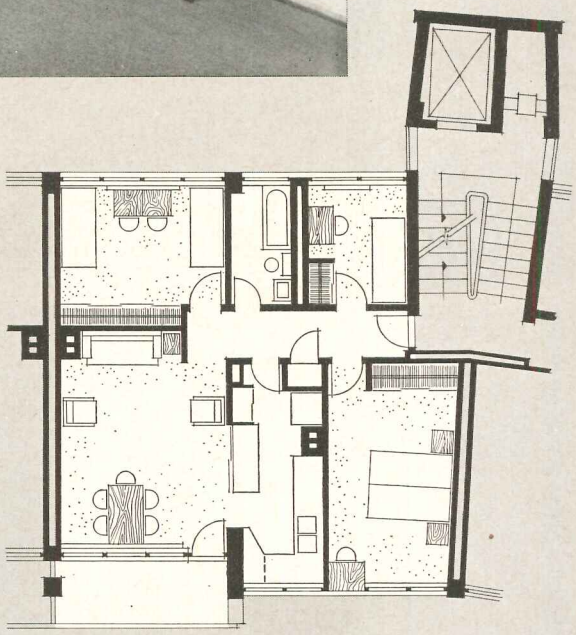
Hansa, A. G.
Berlin, Germany

The Architects Collaborative
Architects
Walter Gropius, in charge
Norman Fletcher, associate

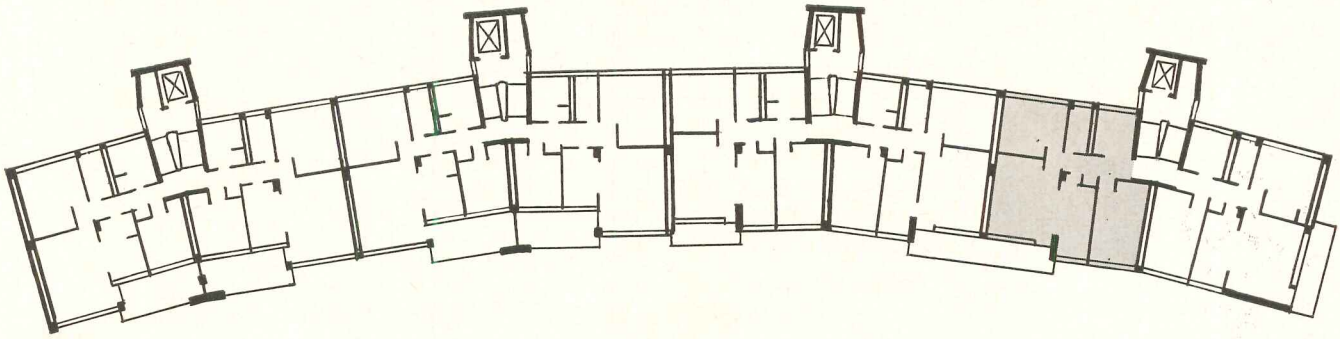
Wils Ebert
Architectural Consultant

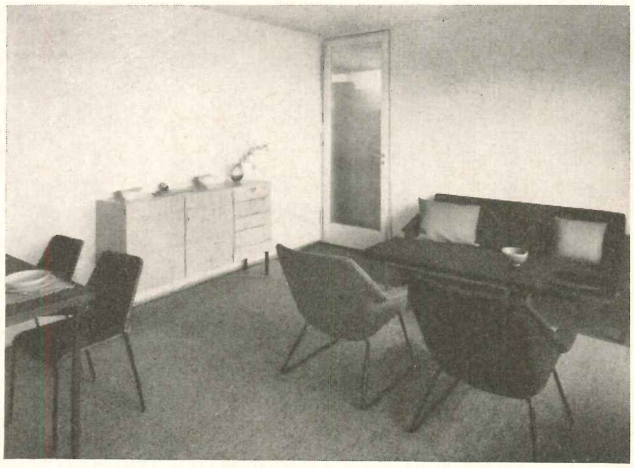
"It is interesting to compare this continental interior with the American ones. Today, many American designers are seeking a new kind of richness, warmth, and refinement in detail by means of patterns, less severe forms, developed edges and shapes, etc. In the Hansa apartment there is a more restrained approach which is almost austere by contrast; evidence of the continuing strength of the Bauhaus influence. In Scandinavia one finds interiors with a warm feeling—sometimes nearly rustic—and craftsmanship of high quality. Here, although the interiors are clean-lined, functional, and straightforward, there appears to have been a minimum of sentiment involved in their concept."

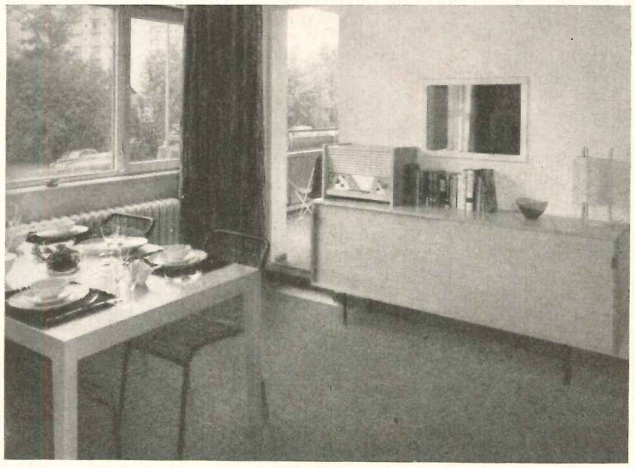
This nine-story structure—one of the buildings of the West Berlin Interbau—contains 64 three-bedroom apartments plus two larger penthouse units. The structural frame is of reinforced concrete, and the wall infilling is bomb rubble block stuccoed in contrasting rough and smooth textures. The excellent apartment plan (right), which is designed for middle income families, provides good circulation and maximum individual privacy.

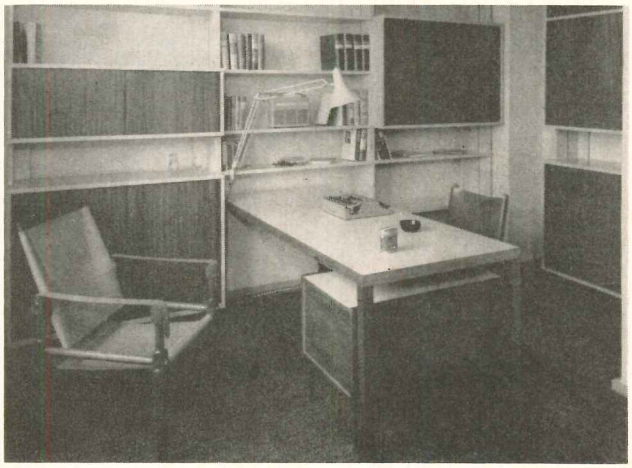


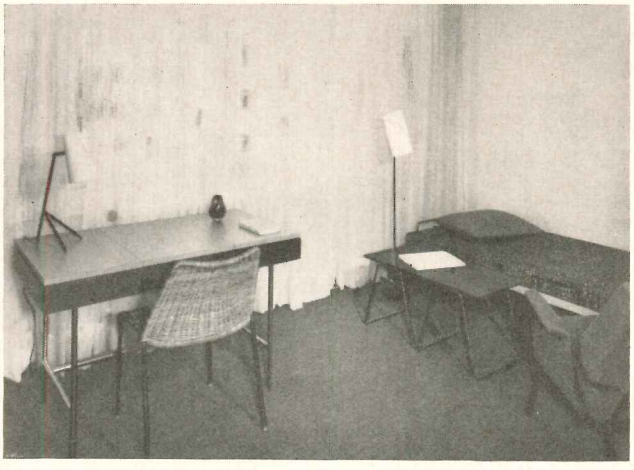
Photos by ***Kessler***











Hansa A. G.

Berlin, Germany

The Architects Collaborative
Architects
Walter Gropius, in charge
Norman Fletcher, associate

Wils Ebert
Architectural Consultant

Gugelot & Hirche
Interior Designers

Photos by Kessler

Architectural Engineering

How Bright The Sun's Future?

Solar energy experts do not foresee large-scale utilization of the sun's energy to heat, cool or supply power to buildings for some time to come. This is what they say regardless of such technological breakthroughs as direct conversion of the sun's rays to electricity. Problem still is to get constant energy output from variable energy input—and economically. Evidence is in statements made by members of the Advisory Council of the Association for Applied Solar Energy in this organization's newsletter celebrating its fifth anniversary. Most promising areas for solar energy now are the unindustrialized, hot arid countries. Suggested developments include: distillation of sea water, solar pumps for irrigation, small solar power systems of a few kilowatts, and even solar air conditioning. Nevertheless, one member predicted commercial solar air conditioning of U.S. houses in the next five to ten years. Another adviser, the late Frank Lloyd Wright, felt that solar heating could not compete with ". . . the simple floor heating apparatus I used [since my early days of planning homes.]"

Ten Years From Now

Present mood of the building industry concerning materials and techniques is terribly bullish, reflecting the spirit of space-age technology and economics. And if the industry's conservative moments have sometimes caused concern, they didn't worry the research executives of six large Pittsburgh manufacturers turned seers. The research men delineated for conferees of the annual Building Research Institute meeting, April 8 in Pittsburgh, what might be expected in products for 1970's buildings: *Glass*—Windows which will automatically become darker as the sun shines brighter; partitions which can be made transparent or opaque at the twist of a knob. Porous glass partitions with controllable micro-openings for passage of air. *Metals*—High-strength, corrosion-resistant steel allowing columns to be 25 per cent lighter. Super-alloy steels for structural members. Greater use of light-gage steel. Metal-clad buildings of aluminum or steel, with primary loads being carried by the skin. *Plastics*—Movable wall panels hung from roofs of houses to permit rearrangement of rooms, opening up exteriors to let in breezes. *Electrical Devices*—Single wall and ceiling panels which heat, cool and light by means of thermoelectricity and electroluminescence.

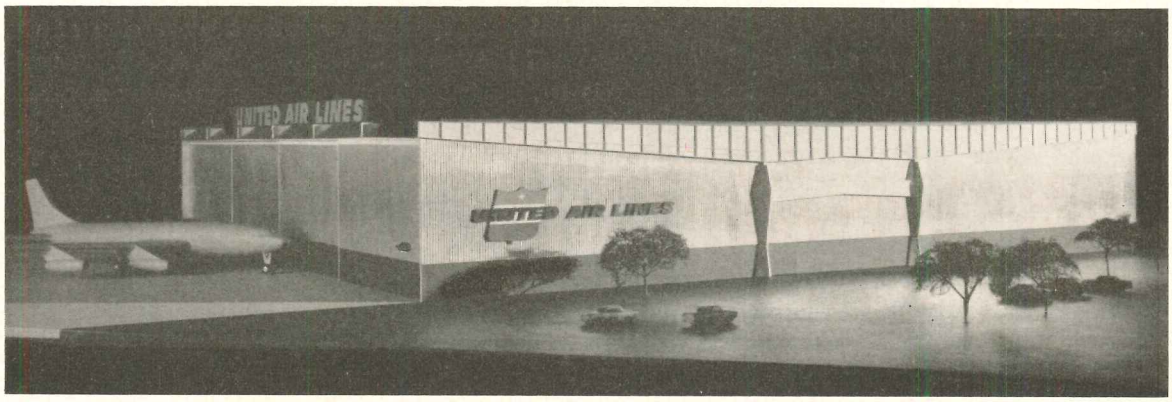
Surprising Facts On Air Pollution

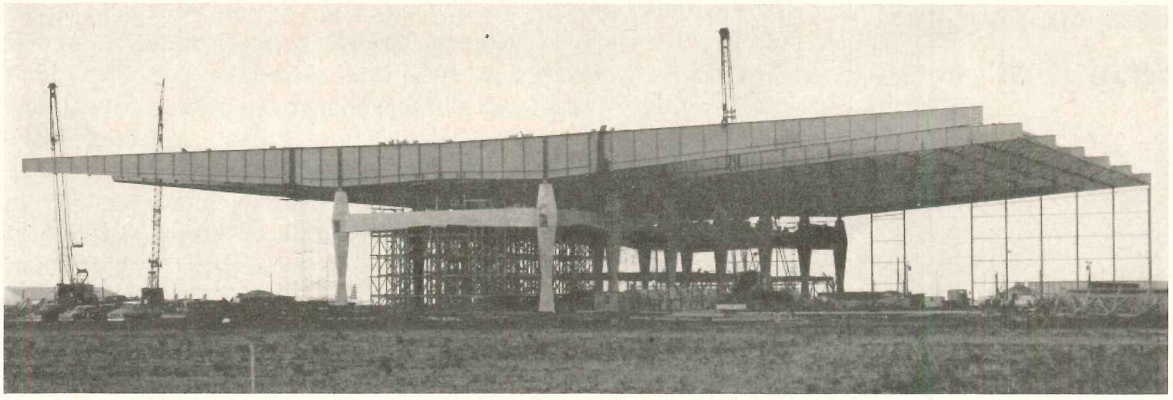
Industry now spends $500 million a year on equipment to control air pollution, according to Harry M. Pier, Executive Secretary of the Air Pollution Control Association. Speaking at a seminar sponsored by Research-Cottrell, Pier estimated total cost of air pollution at $2 billion—and this includes no measure of the public nuisance factor. Fifty per cent of pollution comes from domestic sources—furnaces, incinerators, cars—the other 50 per cent from industry. Contrary to popular opinion ("In a few years there'll be no more air left to breathe"), the rate of air pollution has decreased in most areas over the last few years. Except for an increase in the incidence of radioactive waste in the atmosphere. Trend now is to state-wide legislation. None, providentially, resembles the early English law which caused anyone producing black smoke to be beheaded!

Performance of Houses

FHA wants to know what kind of problems owners of FHA-insured houses are having. First step is a pilot mail survey begun in April by the Building Research Advisory Board. Questionnaires have been sent to 2500 owners of houses built from 1952 through 1957. If the pilot study proves successful, a much larger sample will be taken. Questions cover the building lot; the structure; interior finishes; sanitary, electrical and heating systems; damage due to termites, rot or fire.

This Month's AE Section





United Air Lines Hangar, San Francisco. Prismatic concrete columns get their shape by following the stress pattern. Tapered steel girders achieve economy by varying plate thickness and using stiffeners

Hangar Shows Its Structural Economy

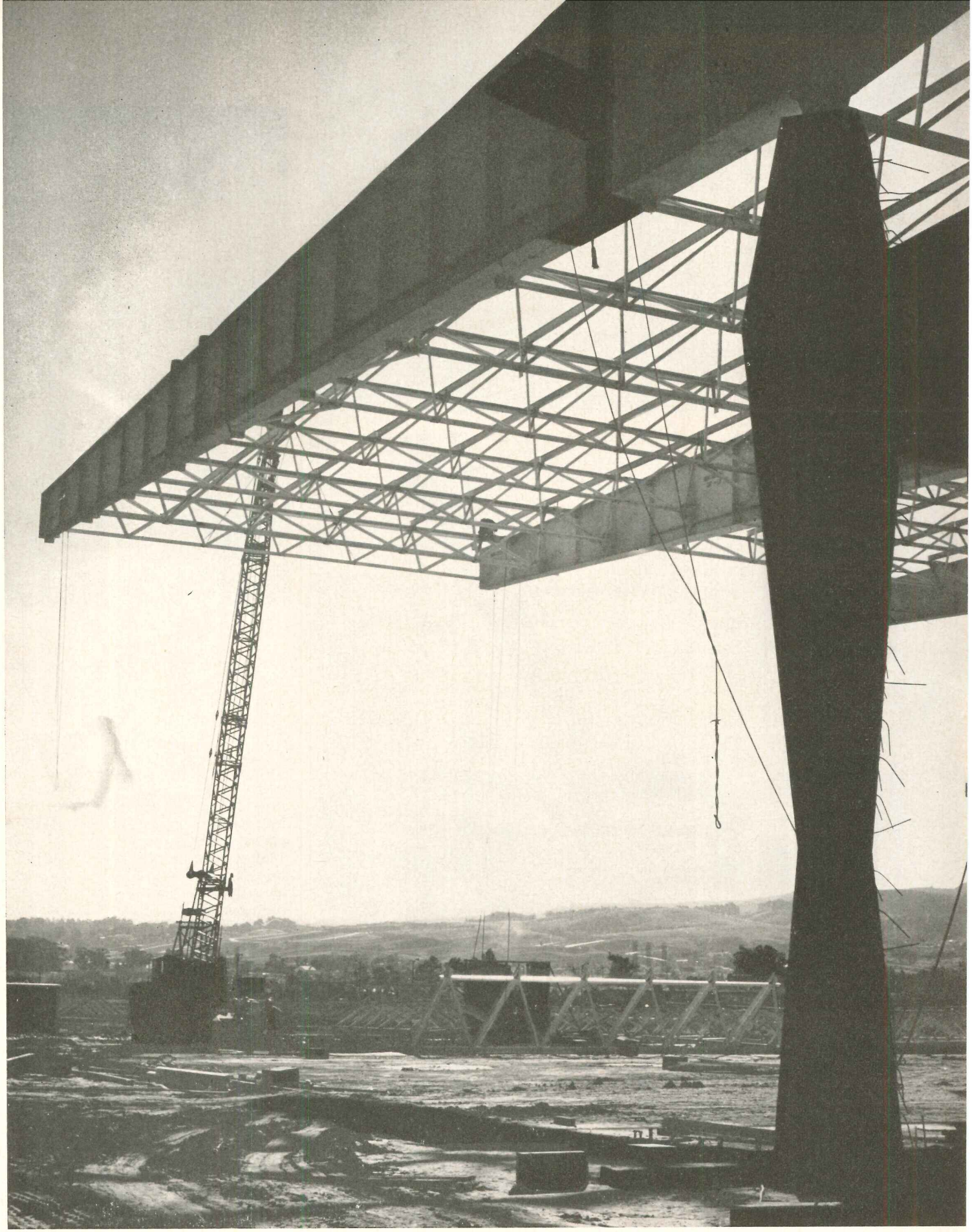
Skidmore, Owings & Merrill, Architects, San Francisco; Elliott Brown, Partner-in-charge; Myron Goldsmith, Chief Engineer; Anthony A. Braccia, Chief of Construction.

Choice of structural form for an airplane hangar is based primarily on that shape which allows most efficient use of interior space. At the same time it must be structurally efficient and economical. The once popular barrel vault has given way, at least for the time being, to the cantilever, single and double, self-supporting and cable hung. One reason seems to be that with the jet age, wings are becoming shorter (in scale) and tails taller. (As the height of a barrel increases, so does the span.) Also in the transition period between piston craft and jets, sometimes both —thus different sizes—have to be serviced side by side. This calls for complete flexibility of interior space. A cantilever hangar has unlimited expansibility longitudinally, and the roof can be placed at the proper level to give sufficient clearance for the tail of the largest airplane.

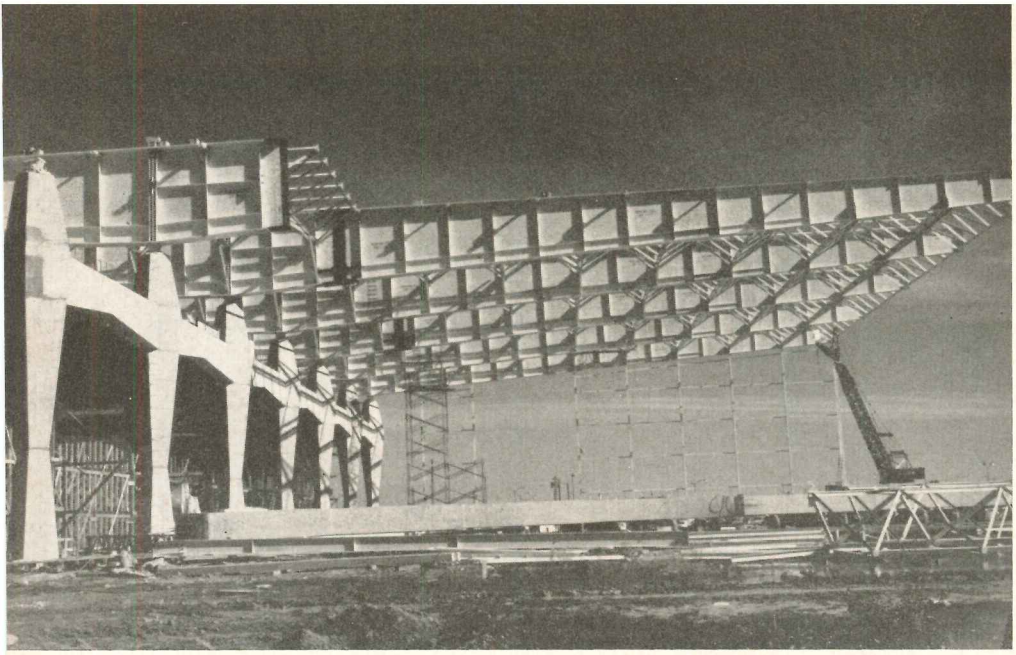
This double-cantilever jet service and maintenance hangar for United Air Lines in San Francisco will accommodate four DC-8 jets, each weighing 300,000 lb and having a wing spread of 150 ft, a length of 150 ft and a tail height of 43 ft. The hangar reflects in its appearance (as a result of its engineering) efficiency not unlike that of the craft it houses.

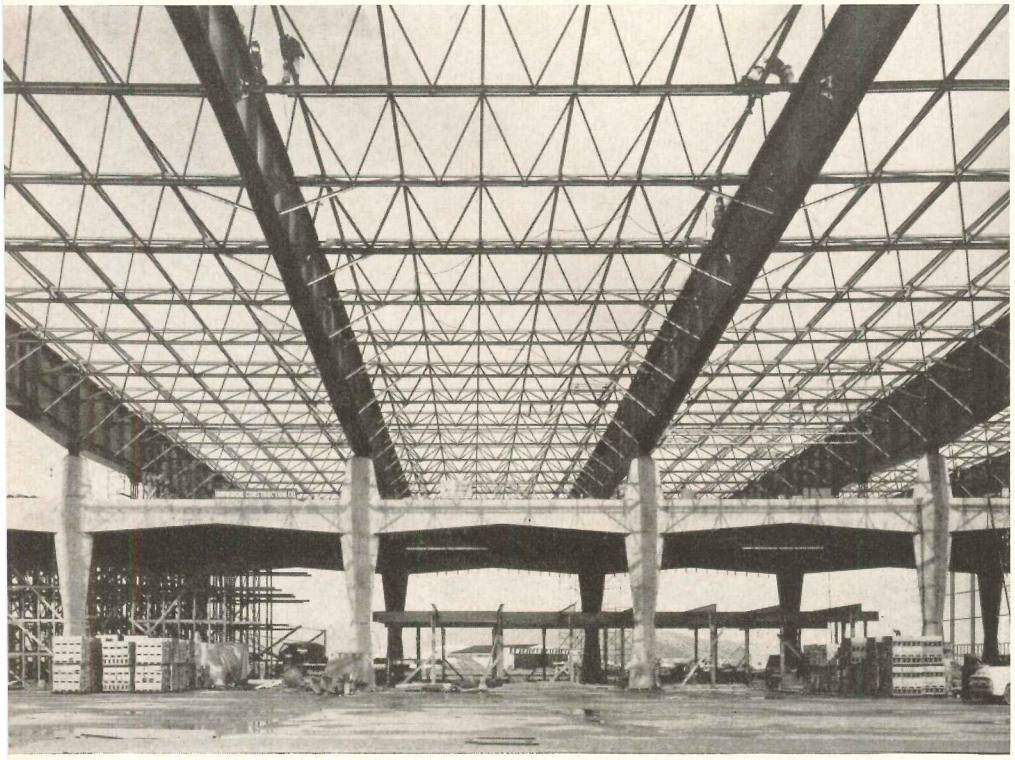
First, the concrete columns are shaped to follow the stresses corresponding to the moment diagram—of vertical load plus lateral resistance to earthquake forces. Columns are fixed at the base, partially fixed at the second floor and have a point of inflection about 12 ft from the ground; the steel girders are pin-connected to the columns.

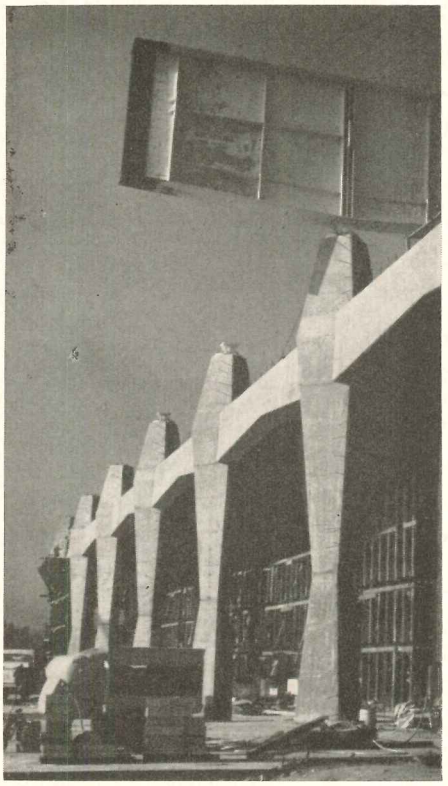
Second the tapered, welded steel girders are tailored from end to end in depth, thickness of flange and web, and stiffening—horizontal and vertical—to meet the "real" load requirements. The second floor is hung from



Silhouette gives outlines of the three framing elements of the hangar: (1) concrete columns shaped to follow combination of vertical and earthquake loads, (2) tapered, welded girders, pin-connected to the columns, and (3) the triangulated space frame which carries the roof and provides lateral bracing







Here again, but in more detail, are the three framing elements. Girders cantilever 142 ft; total length of girders is 362 ft. In erection, center sections of two end girders were welded and erected in one piece; center sections of other five girders were spliced and bolted. Cantilever portions (120 ft long) were joined to center sections with high-tensile bolts. Plans and sections across page show nose pockets and relative sizes of DC-7 and DC-8. Note two sets of 3½-in. diameter hangar rods for supporting permanent second floor. Clear height of the hangar door is 50 ft

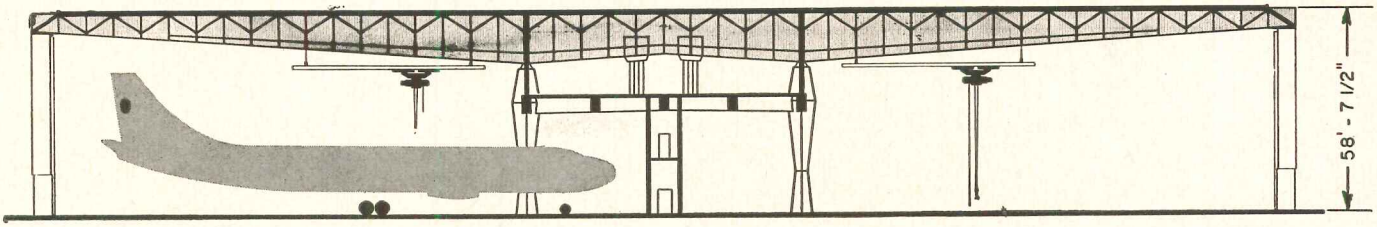
the girder by means of hangar rods, partially counteracting the tendency of the cantilevers to deflect. The center span is 80 ft and each cantilever is 142 ft, making a total girder length of 362 ft. Maximum depth is 14 ft at the pinned supports, and minimum is 5 ft at the outer edge. Maximum flange size is 2 by 36 in., and minimum is ⅝ by 15 in. Thickest web is ¾ in. and thinnest, ½ in.

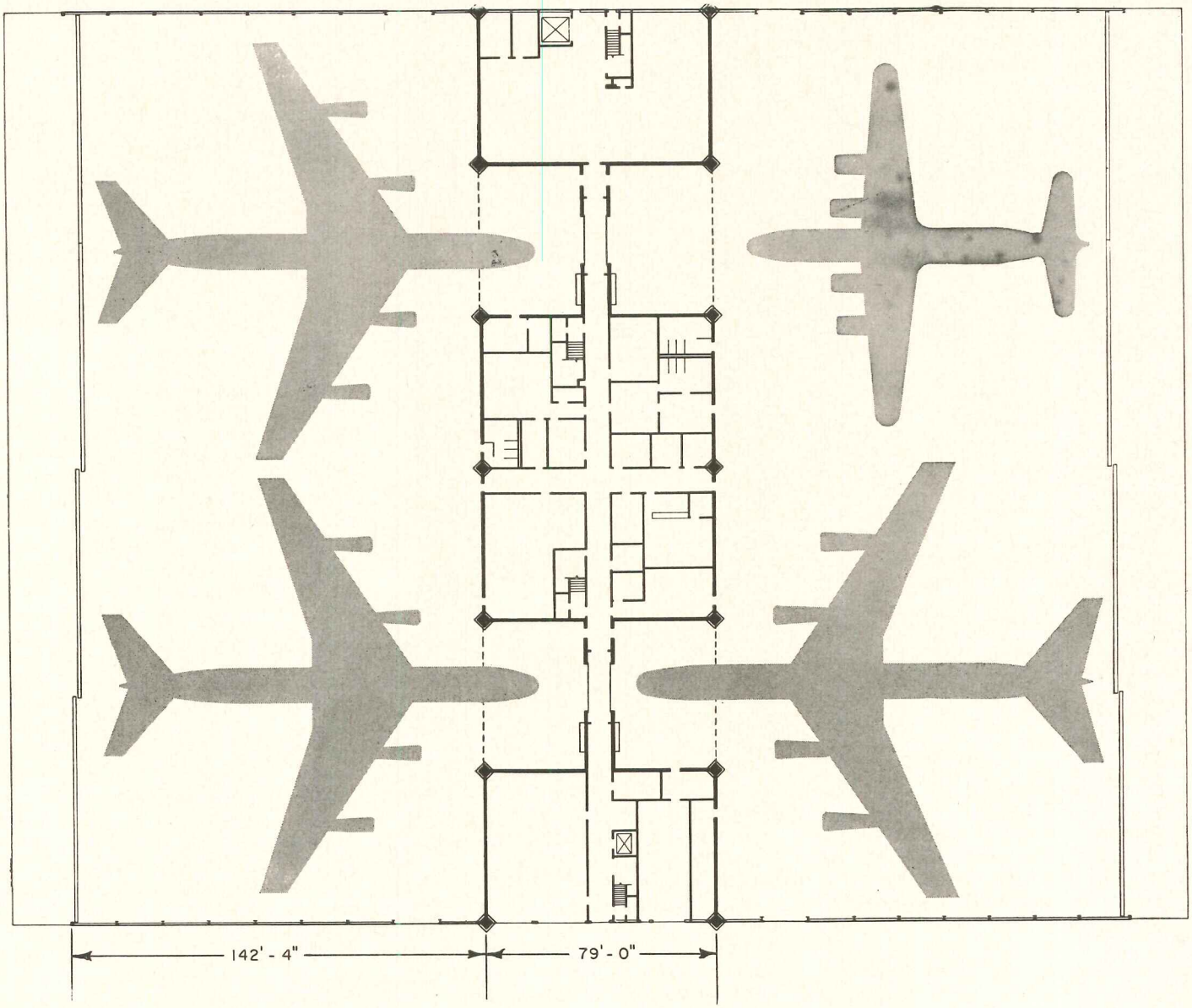
Third feature of the structure is a 5-ft-deep triangulated space frame, spanning 51 ft 6 in. between plate girders to support the roof, provide bracing in the horizontal plane and prevent buckling of the compression flange of the girder.

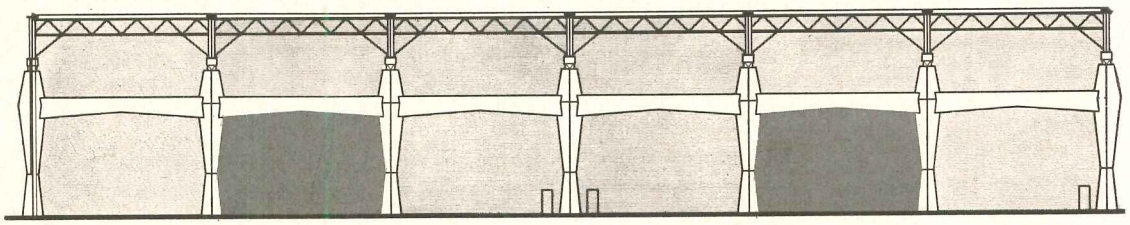
How did it happen that the columns are concrete and the girders steel? In any case the columns had to be fire-protected, and at the time the hangar was being designed, there was a long delivery time for steel. It was decided that the whole core could be completed in concrete by the date the steel arrived. Prestressed concrete, plate girders and steel trusses were included in preliminary design studies, and the costs were found competitive. Plate girders had less depth than trusses, and they formed a partial draft curtain. This and other considerations, including appearance, gave the nod to the steel plate girder design.

To insure a smooth column surface, the forms of 2-in. planking were lined with hardboard. To eliminate bugs in construction and give workmen a picture of what was to be built, a full-scale mock-up of the column and girder intersection was constructed.

SOM's Myron Goldsmith was responsible for the structural design. Objective was to create a structure which would "follow the forces"; which would not be a tour de force, but an economical and esthetically pleasing design. Special consultants on the structure were H. J. Brunnier and Professor Boris Bressler of the University of California.


58' - 7 1/2"


142' - 4"
79' - 0"



THIN SHELLS:

Some basic references for architects and engineers

by Matthys P. Lévy

Here is a list of preferred literature sources that an engineer on the staff of Paul Weidlinger, New York structural consultant, has encountered during his reading which gives a basic background for the professional interested in shells. He begins with the historical development and concludes with observations on the current scene.

A true understanding of modern shell structures must include an awareness of their historical development, an appreciation of the functional and esthetic problems in building design and, of course, a knowledge of the technical considerations of analysis.

During the past five years, architects in the United States have come to recognize the thin shell as a form-giving, as well as an economical means of covering space. How did this popular use of the thin shell come about?

The appearance of shells evolved from two independent sources: a development in mathematical analysis, and the perfection of a structural material. In the early nineteenth century, Lamé and Clapeyron formulated the mathematical expressions necessary for the stress analysis of shells. Their work led to further researches by Love (1892) into the way in which shells support loads. By this time methods of analysis were sufficiently advanced to permit engineering application in the design of shell casing, pressure vessels and hulls. However, applications in the field of construction required a suitable material. The French gardener J. Monier in 1867 decided to put wire mesh in concrete to build a bigger flower pot. In this way, tensile resistance was added to a basically compressive material and reinforced concrete was realized.

The marvelous potential of this inherently plastic material which could take any desired shape remained unrecognized. The use of reinforced concrete was thus limited to imitations of existing materials, stone, wood, iron and steel, and to existing methods of construction, such as post and beam.

One of the first men to utilize concrete in a more imaginative fashion was the Catalan architect Antoni Gaudi. Although his work often presents a bizarre appearance, he achieved freedom and an admirable fluidity of form in translating imaginative fantasy into actual structures. In 1909 he designed a scalloped shell to cover a parochial school in Barcelona which may be the first shell roof ever built. Gaudi probably never analyzed his shell mathematically; chances are he used only a model and his structural intuition as guides. On the other hand, the Zeiss dome built in 1924 was definitely the result of a formal analysis based on the mathematical expressions developed by Love. In the material-scarce countries of the world, shell structures then became increasingly popular and progress in design and construction methods proceeded at an accelerating rate to the present time. In this country the shell was long considered a novelty and economically impractical since its construction consumed too many man-hours of expensive labor. This situation changed as new methods of construction were devised: multiple use of forms by precasting, movable scaffolding, earth forms, etc. Thus, today, a concrete shell is often competitive with other forms of fire-resistive construction.

The engineering approach to design, as covered in the technical literature, involves mathematical analysis, structural intuition and model testing. In fact, the intuitive approach is too often neglected, especially where form is used as a resisting element. The classic geometric shapes have been picked most frequently by designers—cylindrical barrels, domes, conoids, hyperbolic paraboloids, etc.—but these need not necessarily be the limiting shapes. The experienced designer can rely partly on his imagination for a shape that satisfies the space requirements and fully exploits the capabilities of the material used. Similarly, in the matter of materials, the designer has many to pick from—wood, steel, aluminum and plastics, as well as concrete.

The architect might assume that simple shapes lend themselves to simple structural analysis. But the literature shows this statement is, unfortunately, not often true.

For example, the membrane analysis of a cylindrical shell is more involved than the membrane analysis of a hyperbolic paraboloid (even though today much of the calculation time in cylindrical shell design has been eliminated through the use of tables). What of complex forms? Certainly no general rule may be established but in many cases it is possible to simplify the mathematical model (representation) without significantly affecting the basic integrity of the prototype shell. Various references show that many shells can be analyzed on the basis of equivalent beam and arch action. If such an approach is not reliable, or if lengthy calculations would be necessary for an exact solution, the designer may want to consider a model test to verify his results. Many of Nervi's advanced designs were tested in the laboratory, and Candela used a large scale model to test his computation and to try out construction methods.

When the literature is being considered in relation to a particular structure these points should be kept in mind: (1) appropriateness of the form for functional requirements, esthetics and structural efficiency, (2) suitability of the material, (3) degree of difficulty of the analysis, and (4) feasibility of construction. Many otherwise well designed shells lose their economic advantage when construction methods are considered.

No complete history of shell structures is available, but most of the references listed under *Form and Materials* contain fragments of the historical development. The bibliography which follows is not intended to be exhaustive, but should give the reader a starting point from which to examine the various phases of shell design.

FORM AND MATERIALS

1. "Introduction to Thin Shells," Atilio Gallo; *Student Publications,* North Carolina State College, Vol. 4, No. 2, 1954
2. *Proceedings of a Conference on Thin Concrete Shells,* Massachusetts Institute of Technology, 1954
3. "Shell Concrete Today," Anon.; *Architectural Forum,* August, 1954
4. "Thin Shells," Mario Salvadori; *Architectural Record,* July, September and October 1954 also published in *Architectural Engineering,* F. W. Dodge Corp., 1955
   An introduction to the concept of shell structures. Gives a series of simple design considerations and discusses the geometry and load carrying action of shells.
5. "Work of Felix Candela," *Progressive Architecture,* July 1955
6. "Useful Curves and Curved Surfaces: 1-38," Seymour Howard; series of Time-Saver Standards in *Architectural Record,* 1955-1959
7. *Structures,* Pier Luigi Nervi; F. W. Dodge Corp., 1956
8. *Reinforced Concrete in Architecture,* Aly Raafat; Reinhold Publishing Corp., 1958
9. "The Rise of Shells," L. Lessing; *Architectural Forum,* July 1958
10. *The Structures of Eduardo Torroja,* Eduardo Torroja; F. W. Dodge Corp., 1958
11. "Understanding the Hyperbolic Paraboloid," Felix Candela; *Architectural Record,* July and August 1958
12. "The Recent Work of Felix Candela," *Progressive Architecture,* February 1959

ANALYSIS

General

1. "Bibliography on Shells and Shell-Like Structures," W. A. Nash; *U.S. Navy, D. W. Taylor Model Basin Report No. 863,* Nov. 1954 & Supplement, June 1957
   Covers publications of a theoretical nature, not necessarily related to buildings.
2. *Statistics and Dynamics of Shells (Statik und Dynamik der Schalen),* W. Flugge; Springer-Verlag, Berlin 1957
   A complete reference work for the shell designer. Flugge treats most of the simple geometric forms encountered in practice and provides a clear understanding of the design considerations.

From the innumerable books and articles written in the past decade, the following are the most useful from the point of view of applied design:

3. *General Theory of Shells and Application in Technology,* W. S. Vlassow; Moscow State Publications of Technical & Theoretical Literature 1949 [Ed. Note: Not generally available]
4. *Theory of Plates and Shells,* S. Timoshenko; McGraw Hill Publishing Company, 1940
5. *Science of Construction, (Scienza delle Costruzioni),* O. Beluzzi; *Zanichelli,* Vol. III, Bologna, 1954
   A plates and shells book, many examples
6. "On Some Aspects of the Theory of Thin Elastic Shells," E. Reissner; *Journal of the Boston Society of Civil Engineers,* Vol. 42, No. 2, April 1955
   Gives insight into the bending stress in the neighborhood of the boundary of a thin shell
7. *Elementary Statics of Shells (Elementare Schalenstatik,* A. Pfluger; Springer-Verlag, Berlin 1957
   Deals exclusively with the state of membrane stresses of shells. Contains complete catalogue in the appendix of membrane stresses of different shells under a variety of loading conditions.

Rotational Shells

8. "Earthquake Stresses in Spherical Domes and in Cones," E. I. Popov; *Journal of the Structural Division,* American Society of Civil Engineers, Vol. 82, May 1956
9. "Bending Stresses in Edge Stiffened Domes," Mario Salvadori; *Journal of the Structural Division,* American Society of Civil Engineers, Vol. 82, July 1956

Cylindrical Shells

10. *Cylindrical Shells,* H. Lundgren; Danish Technical Press, 1951
    Deals particularly with long cylindrical shells and shells with north lights
11. *The Design of Cylindrical Shell Roofs,* J. E. Gibson & D. W. Cooper; Van Nostrand, 1954
    Has many specific problems worked out
12. "Ultimate Load Theory and Tests on Cylindrical Long Shell Roofs," G. L. Ernst, R. R. Marlette & G. V. Berg; *Journal of the American Concrete Institute,* Vol. 26, No. 3, November 1954
    Gives a new method of analysis using ultimate load theory
13. "Design of Cylindrical Concrete Shell Roofs," A. Parme, H. Bleich, M. G. Salvadori; *Manual 31,* American Society of Civil Engineers, 1956
    Gives tables and procedures simplifying analysis

Doubly Curved Shells

14. "Simple Concrete Shell," Felix Candela; *Proceedings,* American Concrete Institute, December 1951
    Discusses one particular hyperbolic paraboloid built by Candela
15. "Structural Applications of Hyperbolic Paraboloidal Shells," Felix Candela; *Journal of the American Concrete Institute,* Vol. 26, January 1955
    Shows a number of types of hyperbolic paraboloids with various proportions, singly and in combination
16. "Hyperbolic Paraboloids and Other Shells of Double Curvature," A. Parme; *Journal of the Structural Division,* American Society of Civil Engineers, Vol. 82, September 1956
    Covers the hyperbolic paraboloid and elliptical paraboloid and presents tables for the elliptical paraboloid.
17. "Shells of Double Curvature," A. Parme; *Transactions,* American Society of Civil Engineers, Vol. 123, 1958
    Amplification and continuation of the previous reference
18. "The Philips Pavilion at the 1958 Brussels World's Fair," Reprint from *Philips Technical Review,* Vol. 20, No. 1, pp. 1-36, 1958-59

Translational Shells

19. "Bending Theory of Translational Shells and Its Implications in Industrial Type Buildings," (Biegetheorie der Translationsflachen und ihre Anwendung im Hallenbau), K. Kruban; *Acta Technica,* Budapest, 1943
20. "Results on Shells of Translation," P. Osonoka, *Acta Technica,* Vol. X, Budapest, 1955
    Simplified analysis of a translational shell by the selection of a particular type of generating curve
21. "Analysis and Testing of Translational Shells," Mario Salvadori; *Journal,* American Concrete Institute, Vol. 27, June 1956.
    A practical method of analyzing translational shells based on finite differences; results compared with an actual test
22. "The Buckling of a Spheroidal Shell Curved in Two Directions," P. Osonka; *Acta Technica,* Vol. XIV, Budapest, 1956
    Buckling of a translational shell is re-evaluated, and a new buckling coefficient is introduced
23. "State of Membrane Stresses in Elliptical Paraboloids", ("Membranspannungszustand im Elliptischen Paraboloid"), E. Tungl; *Oesterreicher Ingenieur-Archiv.,* Vienna, Vol. 10, 1956
    Novel "trick" is used to simplify calculations by choosing the proper generating curve
24. "Elliptical Paraboloids Over Rectangular Bases," ("Elliptisches Paraboloid Uber Rechteckigem Gundriss"), E. Tungl; *Oesterreichische Bauzeitschrift,* Vienna, Vol. II, 1956
25. "Transverse Bending of Thin Shallow Shells of Translation," Gunhard-Aestius Oravas; *Oesterreicher, Ingenieur-Archiv,* Vienna, Vol. II, 1957

What sort of isolation from noise do people want in different situations—drafting room, private office, reception room, college dormitory? It may not depend so much on *who you are* as it does on the type of *work you do.*

A major limitation of most partition systems, based on field experience, is air leaks around, above and below partitions. First, however, the partition itself has to be effective. Acoustical experts have found that weight alone is not sufficient. When even a moderately heavy partition is stiff, it resonates at certain frequencies and virtually is short-circuited. One answer is an acoustically "limp" partition which has sufficient weight and still is structurally acceptable.

Depending on heavy partitions alone for acoustical privacy may be expensive, so what else can help? Acoustical people are now suggesting that the "whoosh" of an air conditioning system, is not actually objectionable, but can be turned to profitable use as a "masking" sound.

What is industry doing to develop new materials which improve privacy? Here are three items (1) specially designed acoustical materials for ceilings which not only absorb sound but also cut down transmission, (2) prefabricated mufflers for walls and ceilings which allow air movement, but reduce sound transmission, (3) new concepts in partitioning materials which (a) are acoustically "limp" but statically stiff and (b) others which are designed to negate the resonant effect of stiff partitioning. These ideas were just announced at the May meeting of the Acoustical Society of America.

ACOUSTICAL PRIVACY:

What it is and how it can be achieved economically

by William Ranger Farrell

Bolt Beranek and Newman, Inc., Consultants in Acoustics, Cambridge, Massachusetts

Stop reading this article for about two minutes and listen to what you hear around you.

If you are in a large drafting room area, you will undoubtedly hear voices of other people, typewriters clicking, footfall noises, paper rustling, and so on. On the other hand, if you are sitting in a large, comfortably furnished private executive office, you may hear nothing but the whoosh of air coming through the air supply grille in your ceiling, or perhaps you may hear the gentle purr of traffic in the streets. In the drafting room, you surely have no privacy. However, in the executive office, you undoubtedly have more privacy than most people feel is minimum. When planning for the construction of offices, hotel rooms, hospital rooms, etc., a generally accepted design goal is to separate adjacent rooms with the least costly construction commensurate with each occupant's definition of "acceptable privacy."

You might think that if you were the person in the drafting room mentioned above, you would have an entirely different concept of the meaning of "acoustical privacy" than if you were the person who normally occupies the executive office.

Several months ago, we conducted a series of tests to find out whether people did vary in their privacy requirements. Surprisingly enough, these tests have shown that though people do vary in their concept of privacy, the variation does not relate to their present position, but rather to the type of tasks they do.

We found that if some fixed degree of isolation is provided between two adjacent offices, some fixed percentage of people using offices of that type will probably be satisfied. For example, in a typical air conditioned Manhattan office, a standard metal, prefabricated movable partition to the height of the suspended ceiling, will, if well installed, satisfy about 90 per cent of the office workers.

What, then, are the ingredients that contribute to the solution of a problem of acoustical privacy? What are the factors which enter into a privacy problem, and over which factors does the architect have control?

What is Privacy?

First, in answering that question, let's assume that we are talking about the privacy you get when people cannot overhear what you are saying, or conversely, when your neighbor's speech is not sufficiently loud to disrupt your train of thought.

Limiting ourselves to "speech privacy" would not seem to be unreasonable since, whether the people complaining about existing situations say "I have no privacy," or perhaps, "I have a terribly noisy office," what they mean most often is that they can understand what their neighbor is saying in his office.

Indeed, one suspects that what they really mean is that because they can hear what their neighbor says, they assume that he can overhear them. Throughout this discussion, therefore, let us limit ourselves to the

privacy problem in which you can hear more or less clearly what your neighbor is saying.

The *first factor* which enters into the degree of privacy achieved in your office is how much of a "loud mouth" your neighbor is. Even if he speaks continuously, in a loud voice, the voice levels will be reduced by any partitions or other barriers separating your office from his.

These barriers and their detailing and construction are, in fact, the *second factor* in obtaining privacy since they will establish the loudness of speech sounds arriving in your office and at your ear.

The *third factor* is one seldom considered in problems of this type and certainly is a very important one—the level of steady, continuous noise in your office which "covers up" the transmitted voice of your neighbor.

We have all observed the privacy obtained in an airplane in flight. Even with no partitions between seats, we can talk to our seatmate in complete confidence because the engine noise is loud enough to cover up the voice by the time it has passed to the seat across the aisle. This is, of course, an extreme example of the effect of masking noise, but at the other extreme, if your office is as quiet as some special quiet rooms in acoustical testing laboratories and your neighbor's transmitted speech levels are only slightly above the ability of your ears to detect sound, you will have no difficulty understanding what he says with ease.

The *fourth and final factor* is a bit difficult to pin down—how fussy are you?

Your Noisy Neighbors

Many detailed studies have been made on the loudness of normal speaking voices. These studies show that a raised voice is approximately twice as loud as the normal conversational voice and that a shout is approximately twice again as loud as a raised voice. It would probably be unreasonable to plan office partition construction which would be adequate to isolate shouting. We can specify those spaces in which isolation of raised voice levels seems economically justifiable in terms of the probability of a raised voice being used.

For example, if you are planning psychiatric testing rooms, you may expect disturbed patients to use raised voices frequently; or in a room having a conference table 30 ft long you may anticipate the use of raised voices to span the 30 ft distance. If one knows who actually will occupy a given office, one may also know something of his voice levels. In the more general case, it is safe to assume that in a typical business or engineering office almost all speaking will be done at conversational levels.

Heavy Walls

The goal in selecting a partition should be to reduce the transmitted levels of speech from the neighboring office to the lowest possible level. In other words, one should attempt, within economic limits, to provide the maximum degree of isolation between offices. How, though, are we going to know which construction provides the most isolation? Our advice is to evaluate material qualitatively through the use of the following "rules of thumb":

1. For any given material, the heavier it is, the more isolation it will provide.
2. For two materials having the same average weight (say 10 lb per sq ft of wall surface area), the one having high thickness and low average density will probably provide far less acoustical isolation than high density "limper" materials. Many walls get as much as one-third (10-20 db) less transmission loss than other walls with the same weight.

The first rule of thumb is fairly easy to understand and fairly straightforward. Unfortunately, the second requires a bit of explanation. Generally, partitioning materials which have a low average density and a high stiffness (the poor sound isolators) can be easily recognized because most of their weight is concentrated near the faces of the partition.

To illustrate the problem of low density and high stiffness, let us consider two layers of thin plywood bonded to a lightweight, honeycomb core. Such a construction, used in a partition, will provide a certain measurable degree of sound isolation. If, however, we were to remove the core and support the plywood sheets only by a frame at the four edges, we would find that, in spite of the fact that some of the weight had been removed from the construction, the partition would provide considerably more sound isolation.

This apparently anomalous change in acoustical behavior is caused simply by the reduction in the stiffness of the overall partition construction. Very simply, the reason for this improvement is that some of the favorite resonances of the stiff construction have been eliminated.

Leaky Walls

In studying office areas in which privacy complaints have arisen, we have found that almost invariably the problem can be completely solved, or very nearly so, without making any alterations to the existing partitioning. We have found, in fact, the greatest cause for complaint is noise transmission around, above and below the partitions through air leaks.

Very few of the significant acoustical "leaks" can be observed by eye. The best way to detect acoustical leaks in a partition construction is to listen! In preliminary testing, this can be done by having a person stand on one side of the partition and talk through the partition to someone on the other side. For more prolonged testing, (since the speaker is likely to become tired), we suggest that a steady noise source such as a vacuum cleaner be placed in one of the offices while listening tests are performed in the other.

The air leaks can be sealed simply by packing, caulking, plastering, etc. while the vacuum cleaner is running. When the sound appears to come from the entire partition, rather than specific points, the leaks are sealed.

For the architect, we advise that he start by detailing as carefully as possible to prevent air leaks. Since this cannot assure elimination of all leaks, we feel that he should then insist that his contractor use a vacuum cleaner or other similar noise source during the actual erection of all partitioning in the building.*

Figure 1 shows some of the most common points of acoustical leakage. Of these, the most costly to remedy is the case where the construction of the suspended ceiling is such that the sound isolation provided over the top of the partition is not sufficient for good privacy.

This problem arises when lightweight porous acoustical ceilings are used on mechanical suspension systems or where luminous plastic ceilings are used. In the former case, the addition of an impervious material such as plasterboard, sheet metal, or foil-backed building insulation laid on top of the suspended ceiling will often solve the problem.

The only feasible correction for transmission through luminous ceilings is to provide an extension of the partition from ceiling height up to the structural floor slab above. In all probability, the partition extension will have to be installed around three or four sides of the office since noise can be transmitted through the ceiling and around through the corridor

* Notice we say all partitioning—we do not mean random testing of *typical* movable partitions. Since many of the leaks will occur due to random irregularities will vary from partition to partition, the noise test must be used continuously.

ceiling space and back down into the neighbor's office.

In the planning stages of a building, the ceiling transmission problem can often be resolved by the selection of one of the several currently available acoustical materials which have been specially designed, not only to absorb sound within the spaces, but also to prevent sound transmission from space to space.

Another very frequent offender is noise transmission through the tunnel formed by continuous under-window air conditioning unit covers. A typical solution to this problem is to block the opening wherever a partition will occur, using masonry block and mortar.

In one large Manhattan office building recently completed, the space was packed with plastic covered bats of mineral wool. Another technique which is currently being employed is to force a wire mesh into position under the convector cover and to spray it with "gunite" concrete, making sure that the sprayed material reaches in under pipes and up into all corners of the enclosure.

Noise transmission through ventilating ducts can only be solved by the use of duct linings, mufflers, or more extended duct runs between offices.

If interconnecting doors are the problem, these may be gasketed. If they are louvered or undercut, it may be necessary to substitute prefabricated mufflers (currently available for installation in walls or ceiling) to facilitate movement of air from room to room. Of course, if office holders insist upon having doors left open, there is practically no solution and they must indeed learn to live without privacy.

A large number of relatively small leaks will usually be found between the partition and the ceiling, the partition and the floor, above the partition baseboard, and between the partition panels. Altogether, these can give a serious noise transmission problem. Though some of the leaks can be packed or caulked, the smaller ones must often be paint-sealed. Any method which is employed to seal such small leaks should be rechecked every few years as they tend to open up and recreate privacy problems.

In general, sound leakage will occur in any type construction. Fixed dry constructions are more likely to have significant leaks than masonry or plaster construction. However, movable constructions are the most serious offenders of all, and in planning a building for flexibility, extreme care must be taken to assure that an airtight job is provided.

Acoustic "Perfume"

The third factor we listed for the provision of privacy is the often-ignored background noise level. Since even in a qualitative discussion it is useful to have some numbers to talk about, we use a special shorthand which is becoming generally accepted in the acoustical engineering profession, to designate how noisy an office is.

For example, we say that an average business office will have noise levels of around "NC-35". The meaning of this term "NC" (the initials actually stand for Noise Criterion) is given in detail in the Heating, Ventilating, Air Conditioning Guide for 1959, Chapter 25 and describes not only the magnitude of the sound but its frequency spectrum—how loud, how much rumble, how much screech, etc.

NC-35 approximates the noise level found in unoccupied business offices. A very quiet business office would be more likely to have a noise level as low as NC-20, and by the time levels get as high as NC-45 or NC-50, it becomes difficult to talk at a distance of more than 10 ft and telephone use becomes increasingly difficult. A typical busy restaurant during the lunch hour will have levels of approximately NC-50 to 60.

We stated ealier that there is good privacy between seats in an airplane, and from this one might assume that the acoustical engineer is now telling you that by providing noise levels as high as those in the airplane, you could completely eliminate partitioning from modern office buildings. Though this method is, of course, impractical, it is not unfair to say that by planning for slightly higher than normal noise levels in an office space, we can in turn plan for more economical than usual partition construction.

We feel that a well designed building should have low, steady noise levels and partitions which provide good acoustical isolation, but if in the interest of economy or flexibility less effective partitions are to be used, we feel that privacy is more important than quiet. Thus, it is better to raise the steady noises than to permit intelligibility of your neighbor's voice.

The study previously referred to was directed toward finding "how audible" transmitted speech sounds from an adjacent office could be before an average listener felt he did not have acoustical privacy. We found that we could relate the average judgment very closely to the number of words which the listener could understand.

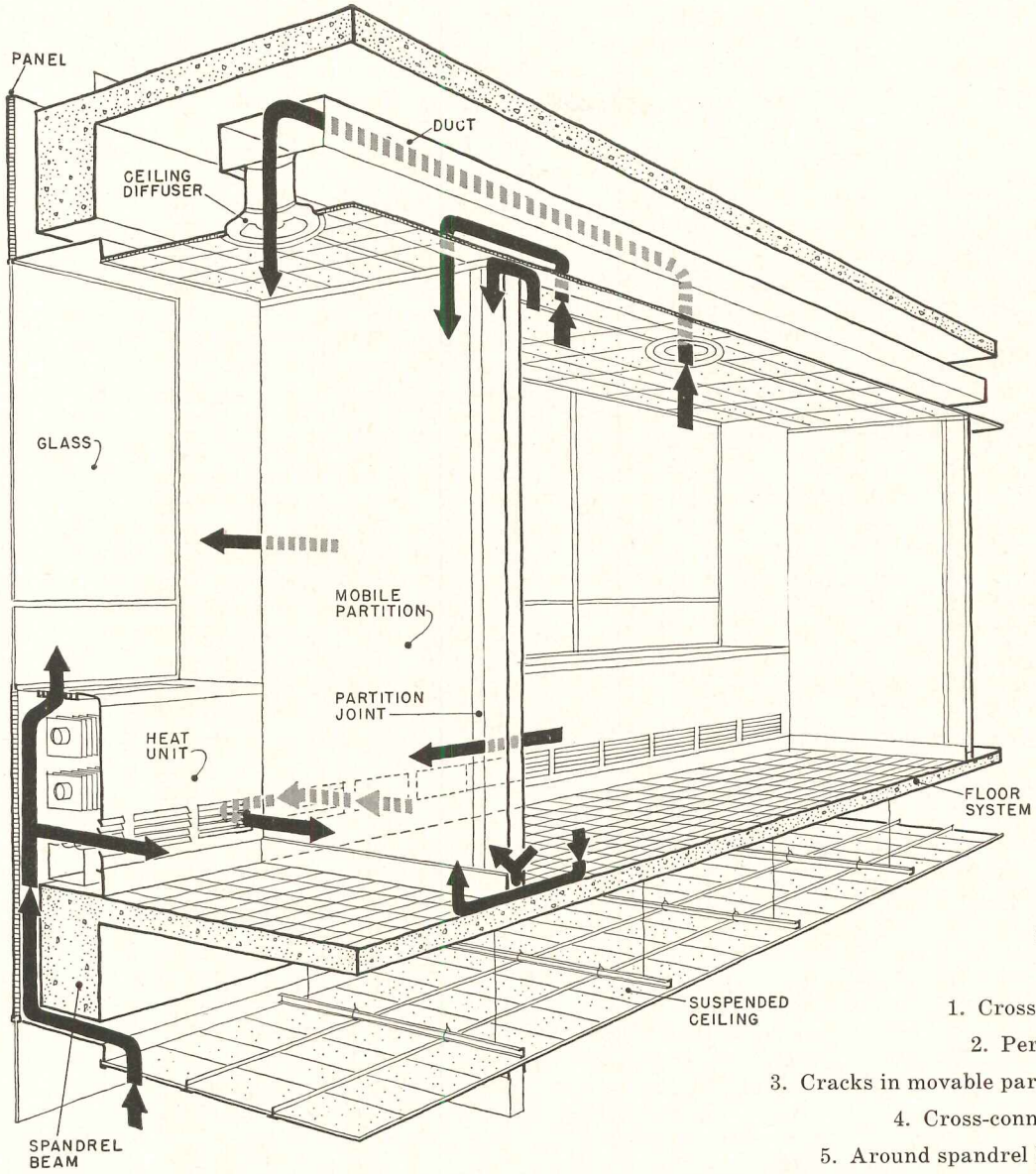
At first guess, one might expect that when the transmitted speech was inaudible, the space would be private, or, perhaps being more lenient, audibility of the speech would determine the acceptability. In actual fact, it turns out that most listeners feel they have marginal privacy even if they can understand as many as seven words out of every hundred spoken.

Such a condition is achieved if the level of speech as heard by the listener is just slightly louder than the level of the steady masking noise. If, for example, speech is heard at exactly the same loudness as the steady background noise, the probability is that out of ten listeners, nobody will complain. If either the loudness of the speech is doubled or if the loudness of the noise is cut in half, still only about one person in ten is likely to complain. If the relative speech and noise levels are changed, roughly the same amount again, we would anticipate that five people will complain, and with still one more shift in the relative loudness of speech and noise, we expect three quarters of the people to complain.

Notice that we did not say *how loud* the speech levels or the noise levels must be—merely their ratios. It will not matter whether the offices are very quiet and have excellent partitions from the sound isolation point of view, or if the offices are very noisy and have rather poor partitions. The same probability of complaints will exist in both cases based on the levels of speech and background noise relative to each other.

Now there must be some standard or criterion by which we can judge the maximum permissible loudness of the steady masking levels. At first consideration this criterion might be based on whether or not levels of noise are high enough to interfere with understanding of the speech sounds that you want to hear. A comparison of measured levels with speech intelligibility within the talking-distances encountered in most normal sized business offices would indicate that quite a high level of noise was acceptable. Most people, however, would balk at having an office as noisy as that which would be indicated by an intelligibility criterion alone. Therefore, we must establish acceptable noise levels simply on the basis of what most people consider to be tolerable or comfortable conditions.

Experience would indicate that levels approximating an NC-40 spectrum are about the highest in which most private office holders are willing to work. NC-35 is, as mentioned previously, typical of most business of-



SOURCES OF NOISE LEAKS FROM OFFICE TO OFFICE

1. Cross-connected air conditioning duct
2. Perforated ceiling without barriers
3. Cracks in movable partition: ceiling, wall, floor, joints
4. Cross-connected air conditioning enclosure
5. Around spandrel beam and through a.c. enclosure

fices, and only a very small number of people would be expected to complain at levels of NC-30.

Now then, how does this all relate to the architect's problem in designing a building or the building owner's problem of solving an existing problem? Let us begin by following an actual case history in a university in Baltimore.

In a dormitory building there which had recently been completed, students were complaining quite vociferously that they could hear anything going on in the next room. The partitions were practically solid, dense masonry and there were no significant acoustical leaks. Measurements in the bedroom indicated that background noise levels were extremely low—approximately NC-15. Although the relatively high isolation provided by the masonry partitions reduced the level of transmitted speech from an adjacent room to extremely low levels, the even lower background level permitted almost complete intelligibility of the speech sounds.

Could the architect have predicted this? We believe that two factors were known prior to the design of the building which (had the architect had the results of the privacy tests) would have permitted him to predict that complaints would occur. But even had he predicted complaints, how was he to solve the problem? Certainly he was using very heavy masonry construction to separate the rooms, and looking at the available acoustical performance data supplied in the literature of the various testing laboratories and provided by the manufacturers, this construction has one of the highest rated sound isolating capabilities; therefore, what else could he do?

Well, the answer lies in the two factors which should have originally permitted him to predict the probability of the problem arising. First, the building was not to be air conditioned, and second, the building was to be located right in the middle of a traffic-free campus several hundred yards from the nearest street (a street having very low traffic count at that). It is enough to say here that had he either selected a location for the building near a busy road or had he air conditioned the building, the background levels of the room would have been raised to approximately NC-30 or NC-35 and literally no privacy problem would have arisen.

In this particular case, our recommendation to the owner was to install a ventilation system. Though this was not the first time we have recommended such a solution nor will

it be the last, we were immediately faced with the reaction which we expect to get for some time to come. The owners looked at us a bit aghast and said, "What? Make these quiet rooms noisy?"

Of course, the intention of our recommendation was to make these rooms "quieter" by making them *noisier* but not actually noisy, since the levels which we anticipated after the installation of the ventilation system would only have raised the noise to levels to which people are normally accustomed in spaces of this type. Indeed it would seem that after years of evangelical work in attempting to get quieter buildings and quieter mechanical equipment, the acoustical engineering profession is reversing its ground and proposing that we make spaces noisier and noisier.

It is perhaps more accurate to look at this new point of view as a more precise specification of what levels of noise are acceptable in a given space. Much of the earlier work has been devoted to specifying what levels should not be exceeded. We are now simply saying that there is a second criterion which indicates levels below which noises should not fall. In other words, we are now proposing both a top and a bottom limit for acceptable noise for buildings where many people live or work near each other.

If we accept the thesis that raising noise levels will often be useful, either in the planning stages to permit economical partition selection, or in the remedial steps simply to solve an existing problem, then we must know how such noises can be achieved. Experience to date indicates that the only source of noise which proves acceptable to most listeners and which at the same time is under complete control of the building designers, is the noise produced at the air diffuser or grille in the supply section of the air conditioning system.

Unfortunately the noise of the fans themselves is of little use as a masking noise since it is likely to be disturbingly noisy near the fan room and inaudible at a distance away. Relatively little work has been done on establishing methods for predicting precise noise levels which these air delivery devices generate under a given set of operating conditions. We do know that for a given air supply diffuser, a fairly wide range of noise levels can be achieved without varying the number of cubic feet per minute of air delivery. This is done by opening or closing the terminal device valve and adjusting the static pressure in the ducts by changing either the fan belts or a main control valve to give a fixed cfm.

For example, in a recent problem, a privacy complaint was registered in the top executive offices of a Manhattan office building and a study of the problem indicated that modification of the partitions would be so costly that some other approach must be observed. It was proposed, therefore, that 11 of the valves in the terminal devices in the air supply system be very nearly closed and that a higher horsepower motor be provided on the fans. In this manner, the cfm would be retained, the static pressure in the system would be increased, and the noise levels in the space would be slightly greater. This slight increase in noise levels, though we felt it would not be noticeable to listeners, would eliminate, or at least reduce the complaints of lack of privacy.

We feel that electronic masking (synthetic) noise sources should be avoided wherever possible. There is always the possibility of electronic failure and our experience indicates that unless the higher noise levels are providing some secondary benefit to the occupants of the offices, the occupants are far more likely to complain.

We are frequently asked about the advisability of using music as the masking noise. In the first place, in the typical business office as opposed to an open secretarial, clerical or drafting area, the music would probably prove as distracting or more distracting than speech transmitted from adjacent offices. Furthermore, since a considerable percentage of the time during a musical recording there is no sound coming from the loudspeaker system, enough speech would be transmitted through a poor construction in an intelligible way that listeners' complaints would remain about as they were before the music was injected into the space.

In one specialized type of problem, we have, on occasion, recommended a very special solution. The problem is the fairly common one of voices from doctors' offices drifting into the waiting room. A small, electrically-operated table fountain in the waiting room will do much to prevent waiting patients from overhearing those in the office.

Individual room air conditioners are of some value, but only while they are operating. Therefore, we believe that their effect should not be considered in planning. They do, however, bring up an interesting point in that noise levels measured in a typical small office having a window air conditioning unit will have noise levels between NC-40 and NC-45. Thus, you can see that, if a person is both benefiting from the operation of the machine and also be able to control it, he will accept noise levels that are considerably louder than the levels we would expect to find in a typical office. Numerous experiences of this type have led us to the conclusion that traffic is seldom a reliable or useful masking noise. An exception might be made to that statement in the case where windows are left at least partly opened throughout all use periods of the room all the year 'round. Since this is probably not certain, and there is the increasing probability that there will be no operating sash in the office at all (thanks to air conditioning), we feel that the main contribution of traffic noise is to provide a low frequency rumbling sound which, combined with the "whoosh" of the air conditioning system, gives the masking noise a balanced and natural character. Such balancing would have virtually nothing to do with the intelligibility of transmitted speech sounds but only with what we are accustomed to hearing.

An interesting aspect of the relationship between the loudness of transmitted speech levels and the steady background noise is the effect which it has on the value of installing sound absorbing materials in an office. First, it is our belief that a comfortable acoustical environment can be provided in an office only by installing a certain amount of sound absorbing material. In the broadest terms, this amount is the amount provided by acoustical material installed over the entire ceiling or through the installation of carpeting and upholstered furniture.

But now what effect does the installation of acoustic tile have on the privacy problem? Let's assume first that this is an existing building without acoustic tile ceilings in which a privacy problem has been observed. Since it is an acoustical problem, the natural reaction of most building owners is to install an acoustical material and this, to most people means a sound absorbing material or an acoustic tile. Most people know that installing sound absorbing materials in a room will reduce the level of people's voices in that room, but let's go over into the next room and try to listen to the voices. True, the acoustical tile has reduced the level of the transmitted speech as well as the level of speech in the original room. But we must not forget that the installation of

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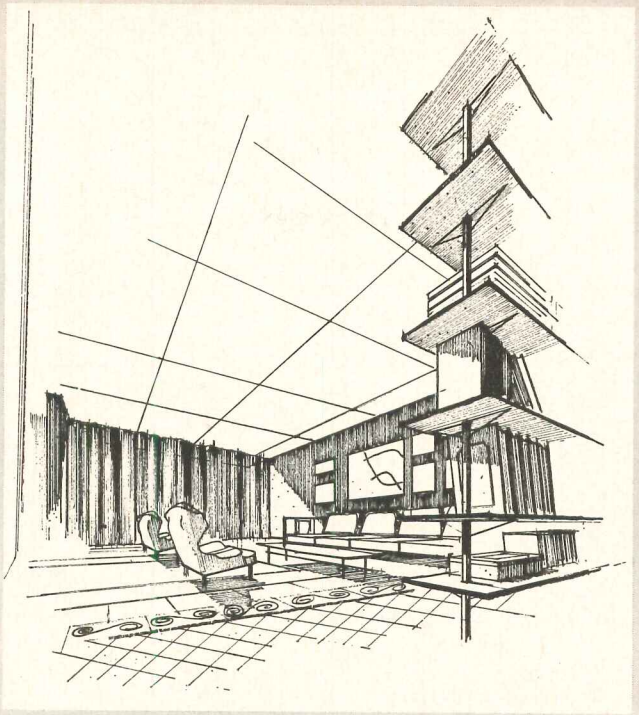
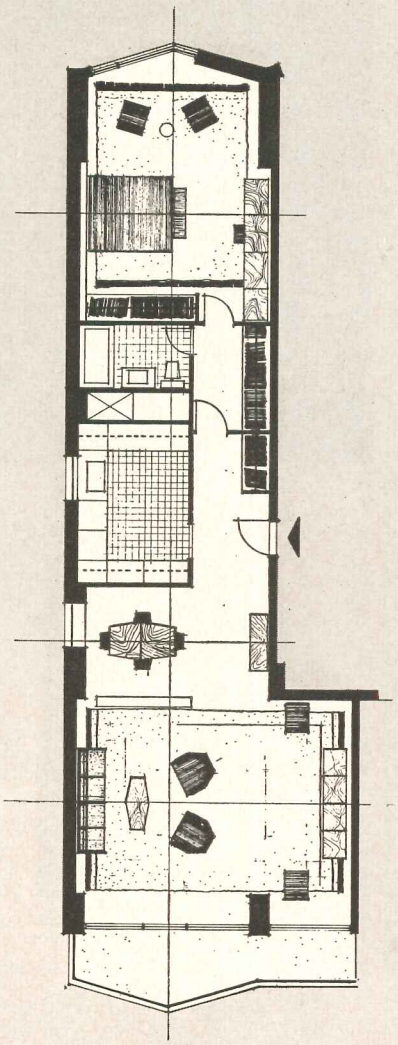
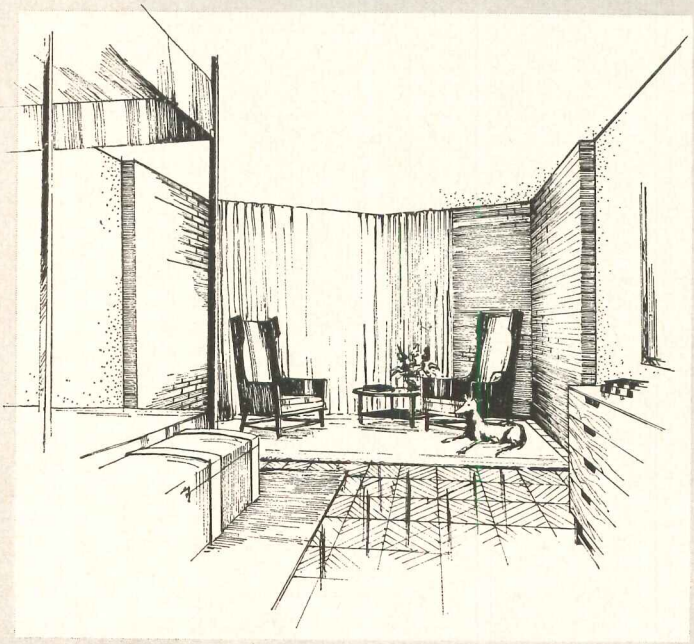
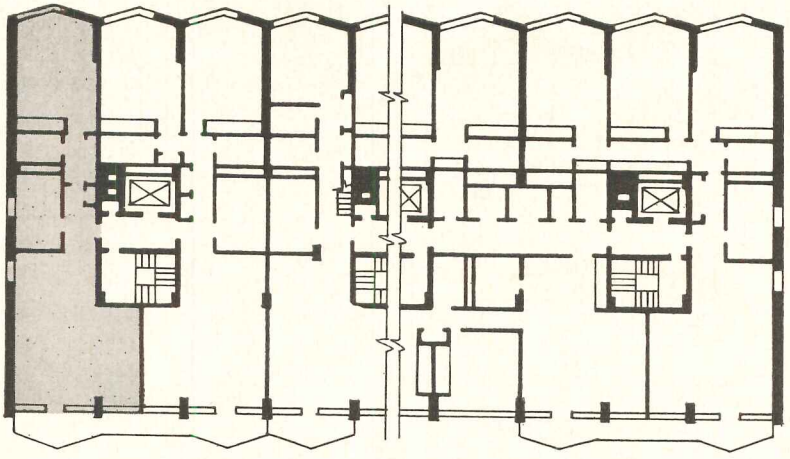
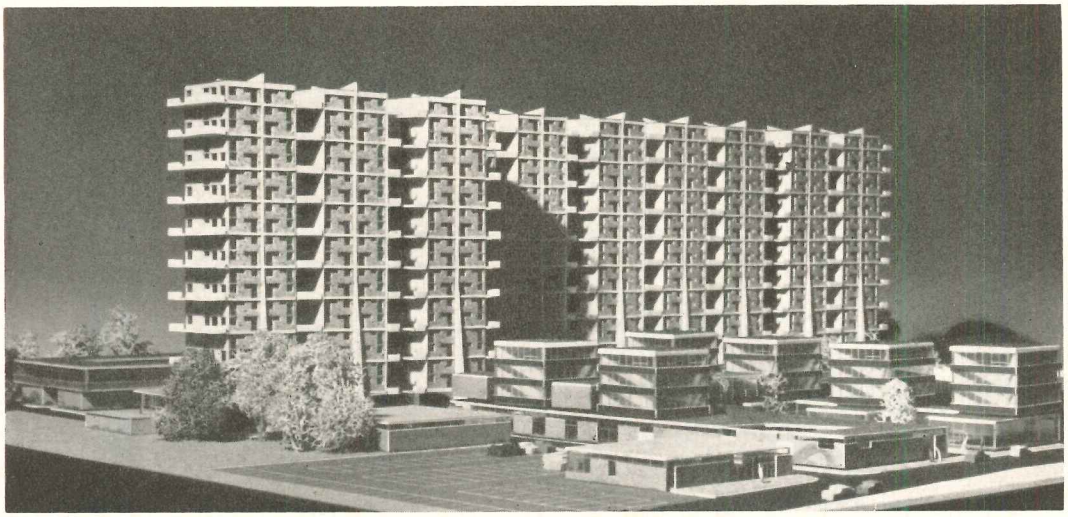


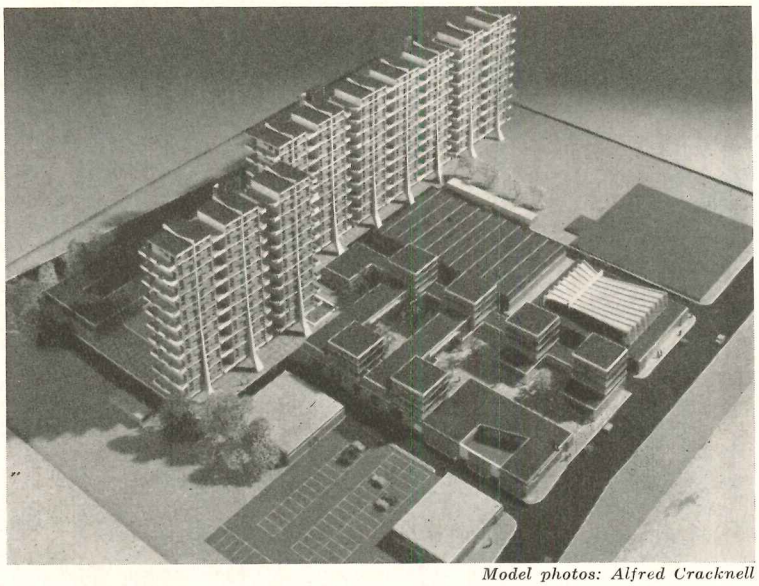




Sketches (upper) by Tony Easton, (lower) by Leslie Christenson







Model photos: Alfred Cracknell

British Maisonette

Redevelopment in Gorbals
Glasgow, Scotland

Developers:
The Glasgow Corporation
A. G. Jury, City Architect

Sir Basil Spence
Architect

Ove Arup
Consulting Engineer

"By means of two-story maisonettes, each with a garden, the architect's idea was to create the atmosphere of a private dwelling for each family; and the concept has been carried out with considerable skill. The gardens do much to humanize low cost, high-rise living, and although the rooms are of minimum size, the progression of spatial volumes in each unit is pleasant enough. There is adequate wall space, and the rooms are of such shapes that a variety of furniture arrangements could readily be planned for different types of families. As for privacy and bedroom quiet, there is great merit in separating living and sleeping functions by floor level."

The giant, 62-acre redevelopment of the Gorbals and Hutchensontown wards of Glasgow will wipe out some of the most miserable slums in Europe. The 20-year project will provide housing, commercial buildings, light industry, recreation buildings, schools, nurseries, etc. A few buildings—such as churches—will remain standing as parts of the finished complex.

This portion—a 15-acre centrally located site—comprises the third development of the "first five years phase" of the master plan.

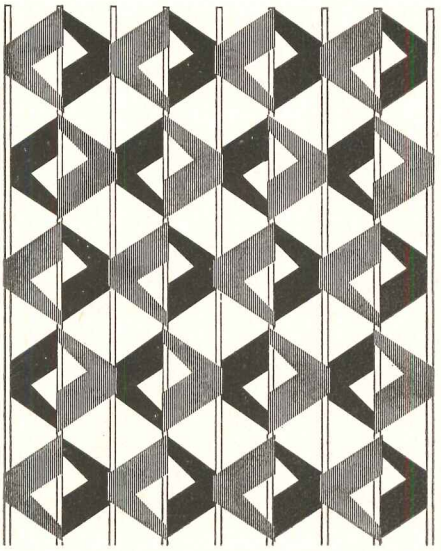
"CUSTOM" ALUMINUM GRID WALL SYSTEM

A new aluminum grid wall system made up of miniature I-beams and solid "panelettes" is expected to find wide use as sun shading, decorative and vision screens, overlays for cooling towers and elevator penthouses, and barriers for outdoor living areas.

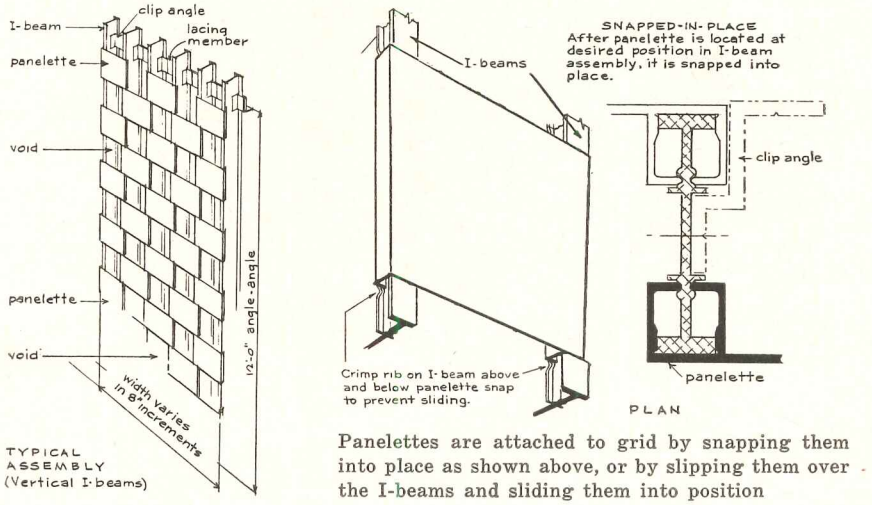
The main structural members of the *Sol-Dec* system, the I-beams, are normally spaced 8 in. on center, held in place by small aluminum clip angles which join them to lacing members. (If the I-beams are arranged vertically, the lacing bars may be as much as 12 ft apart; if they are arranged horizontally or diagonally, the span must be reduced accordingly.) The aluminum panelettes are attached to this grid by snapping them onto the I-beams and locking them in place with a pair of pliers as shown below, or by simply slipping them over the legs of the I-beams and sliding them into the desired position.

Precut, prefinished panelettes are available for eleven standard patterns, two of which are shown at right, but special profiles and shapes will be fabricated to order. Widths up to 12 inches are practical in one-piece profiles; wider panelettes can be formed by combining sheets and extrusions. Patterns can also be varied by attaching the panelettes to the front or the back of the grid, or both.

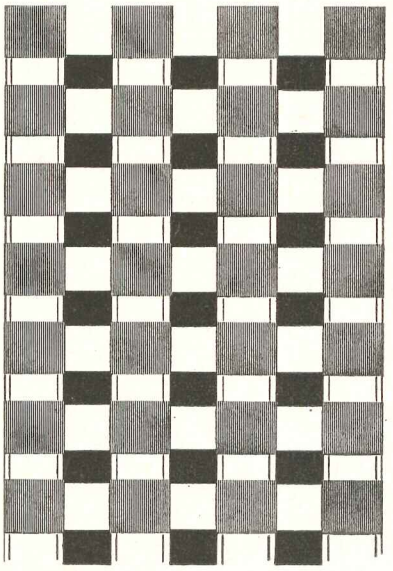
The panelettes will be furnished in *Alumalure* (baked enamel) colors, with other finishes—including anodized colors and some textures—available on special order. The I-beams and clip angles are mill finished unless otherwise specified. *Aluminum Company of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.*



Designs shown are typical of eleven standard grid patterns. (Shaded areas indicate front panelettes; black areas indicate back panelettes.) Panelettes can also be ordered in custom shapes and profiles



Panelettes are attached to grid by snapping them into place as shown above, or by slipping them over the I-beams and sliding them into position



ONE PART NEOPRENE SEALING COMPOUND

Neoprene Sealing Compound No. 90, a one part elastomeric formulation, was developed for use in sealing joints requiring high expansion and contraction characteristics of the compound.

Ready to use from the container, it has good adhesion to all building materials, requires no primer even on concrete and marble, and can be easily applied with caulking gun or knife. Because the compound includes a built-in water dispersant, its adhesive properties are unaffected by surface moisture and joint sealing can proceed even in wet weather. Further time and labor savings result from the ease of cleanup: joints need not be masked since stray sealant can be readily wiped off surrounding surfaces with a common "white gas" solvent. Other advantages cited by the manufacturer include uniform consistency, a non-tacky surface, and minimum "sag."

Sealing Compound No. 90 is particularly recommended for use in curtain wall construction where a very soft setting compound at final cure is required to seal expansion joints. It should also be used where only a very low shrinkage factor of the sealant can be tolerated, as in surround seals for glass and metal panels. Available colors are aluminum and white; cure time ranges from six to twelve months depending on temperature conditions. *Stay-Tite Products Co., Inc., Cleveland 4, Ohio.*

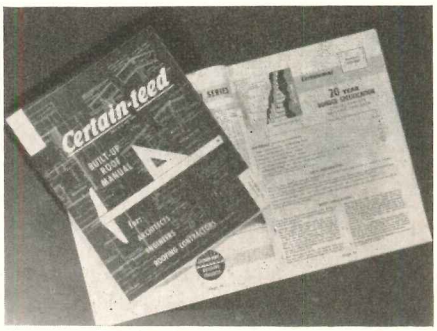
Tensile Test Results

(Adhesion to aluminum, ¼-in. seam, 45 day accelerated cure at 120 deg.)

Adhesion	37.5 psi
Elongation	200%
Durometer A (hardness)	9
Nature of failure	cohesive
Life expectancy	20 years

more products on page 254

Office Literature



CERTAIN-TEED BUILT-UP MANUAL (A.I.A. 12-B) presents built-up roof specifications in four series: asphalt felt, *Certaglas*, tarred felt, and mineral surface. Each is designed to meet varying roof slopes, deck types, climates, building codes, life expectancies, prices and color requirements; and each is prefaced by an index page showing the specification number, years bonded, deck type, roof surface, number of plies and Underwriters' Classification. Special sections contain information on the correct type of specifications for use with all known deck constructions, and on the varying conditions affecting specifications for gravel surfaced, mineral surfaced and smooth surfaced roofs. Flashing specifications, construction details and roof drainage data are also included. 56 pp. *Certain-Teed Products Corp., 120 E. Lancaster Ave., Ardmore, Pa.*

Metal Stair Manual
Contains design data covering all component stair parts for circular, monumental and conventional metal stairs. Typical details and load tables are included. 72 pp. *National Association of Architectural Metal Manufacturers, 228 N. LaSalle St., Chicago 1, Ill.*

Weyerhaeuser Hardboards
"How to Use" booklet gives detailed drawings and descriptions showing use of hardboard for new building and remodeling. 8 pp. *Silvatek, Box S, Weyerhaeuser Timber Co., Tacoma 1, Wash.*

Building Insulations
(A.I.A. 37-C) contains pertinent data on properties, performance and application of *Fiberglas* building insulation. 8 pp. Dept. 690, *Owens-Corning Fiberglas Corp., Toledo 1, Ohio**

Interior Fire Control Products
Gives detailed information—specifications, operation descriptions, installation diagrams, component cutaways and dimensional drawings—on interior fire extinguishing systems, portable extinguishers, cabinets and other "inside" fire control products and accessories. Form No. S-62, 28 pp. *The Fyr-Fyter Co., Customer Service Dept., 221 Crane St., Dayton 1, Ohio**

Forest Products Bulletins
The U. S. Forest Products Laboratory has recently issued eleven new or revised publications on research results. Of particular interest are: Revised Technical Note No. 236 on nail-withdrawal resistance of American woods; Report No. 1740 on the application and use in houses of thermal insulation made of wood-base materials; Report No. 2131 on water-vapor permeability of matched barrier materials; Report No. 1259 on the two-coat system of house painting; Report No. 2137 on light frame wall construction for houses; Report No. 1583-B on compressive buckling of sandwich panels having dissimilar facings of unequal thickness; and Report No. 2136, which reviews existing information and outlines needed research on theories of the combustion of wood and its control. *Director, U. S. Forest Products Laboratory, Madison, Wis.*

Architecture
. . . and Allegheny Stainless fifty-page discussion of architectural uses of stainless steel includes sections on curtain walls, store fronts and entrances, windows, specialties and hardware. Photos and details of specific applications—among them many major buildings—are included. *Advertising Dept., Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22, Pa.**

Metal Gas Vent
(A.I.A. 30-D-4) Covers construction features, typical installations, specifications and ordering information on entire line of vent pipe and fittings. 16 pp. *Van-Packer Co., 1232 McKinley Ave., Chicago Heights, Ill.**

Aircraft Hangar Heating
Bulletin HA-100 describes and illustrates aviation hangar heating installations using overhead revolving discharge heaters. 20 pp. *L. J. Wing Mfg. Co., Linden, N. J.*

Rolling Steel Doors
(A.I.A. 16-D) Gives engineering specifications, installation information, drawings and tables of dimensions for rolling steel doors, grilles and shutters. Catalog No. G-59, 16 pp. *Rolling Steel Door Div., R. C. Mahon Co., E. 8-Mile Rd., Detroit 34, Mich.**

Laminated Architectural Glass
(A.I.A. 26-A-5) Describes how laminated architectural glass is manufactured; how special decorative effects are achieved; and how light control, glare reduction, ultraviolet exclusion and solar energy control are obtained. Physical properties and installation techniques are also discussed. 8 pp. *Dept. SG, Monsanto Chemical Co., Springfield, Mass.**

Control of Draft
Twelve-page brochure offers complete specification data on draft control equipment for commercial or industrial heating plants. *Field Control Div., H. D. Conkey & Co., Mendota, Ill.*

Soap Dispenser Catalog
(A.I.A. 29-I) Describes and illustrates complete line of *Watrous* liquid and lather type soap dispensers, with a special section on typical gravity feed soap systems. Catalog No. 472, 20 pp. *Imperial Brass Mfg. Co., 6300 W. Howard St., Chicago 48, Ill.**

DEL Synthetic Rubber Compound
Describes characteristics, uses, and application of *Thiokol*-based sealing compound. Typical window and joint details are included. 8 pp. *David E. Long Corp., 220 East 42nd St., New York 17, N. Y.*

**Additional product information in Sweet's Architectural File, 1958*

more literature on page 276

CRAWL SPACES: 1—Moisture and Insulation Problems

Used by permission of the University of Illinois Small Homes Council from its copyrighted publication Crawl-Space Houses.

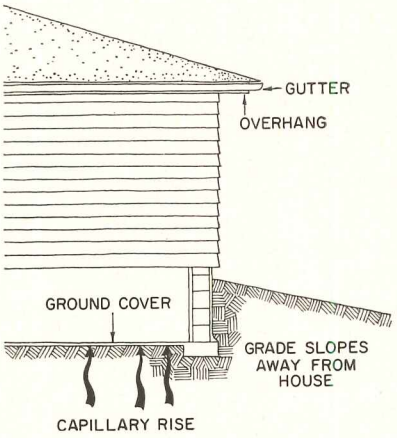
by Rudard A. Jones, A.I.A.; Architectural Consultants: F. M. Lescher and W. H. Kapple

Crawl-space houses should, and can, be constructed so that: (1) they are free from problems of moisture, (2) they resist termite attack, and (3) the floor and rooms above crawl space can be kept at comfortable temperatures.

MOISTURE

Excessive moisture within a house can result from dampness in a crawl space due to improper grading of the lot for drainage or due to the omission of moisture control devices, such as ground cover, vapor barrier and ventilation openings. An uncorrected moisture problem can cause decay of wood and eventually structural failure of the house.

The only satisfactory way of avoiding moisture problems is to prevent moisture (vapor and liquid) from entering the crawl space.



Moisture in the crawl space can be due to:

1. High ground-water level in the area.
2. Surface water.
3. Capillary rise of ground moisture.
4. Moisture from the house.

SOURCE OF MOISTURE

1. GROUND WATER

Sometimes the level of the water in the ground (water table) is raised above the bottom surface of the crawl space due to:

a. Heavy or prolonged rains.

b. A spring which appears only in wet seasons and is not discovered when the house is built.

RECOMMENDATIONS: Crawl-space construction is not recommended if ground-water level in an area is so high that it can flood the crawl space periodically.

Where a spring is discovered during or after construction, or where unexpected flooding occurs:

a. Install drainage collector lines within the crawl space. Grade the bottom of the crawl space so that any water will drain to the tile. Cover the crawl-space area with coarse, washed gravel (fine gravel or sand tends to block the tile).

b. Costs and installation problems make impractical the use of other methods of control, such as a membrane waterproofing system.

2. SURFACE WATER

Rain water on ground or from roof passes through, or under, the foundation walls.

In some areas, heavy soils may retain surface drainage and cause water pressure against the walls of the crawl space. (See recommendations No. 3 and No. 4.)

RECOMMENDATIONS: Surface drainage problems usually occur because the floor of the crawl space is 2 to 3 ft below finished grade.[1] To avoid such problems:

a. Grade the lot so that drainage is away from the house and no water is allowed to stand on the site. Minimum grading specifications, listed below, will suffice for most surface drainage conditions:

(1) Slope of the grade should be at least 6 in. in 25 ft.

(2) The ground should fall at least 6 in. on all sides of the house.

(3) Slope should extend at least 10 ft except where side yards are narrower.

b. Use wide overhangs and/or gutters and downspouts. (Do not connect downspouts to footing drains.)

c. Install a footing drain of field tile with open joints.

d. Waterproof the outside of the walls with a bituminous coating. Masonry walls should have a half inch coat of mortar applied first.

3. CAPILLARY RISE OF GROUND MOISTURE

Moisture travels upward from lower layers of certain soils by capillary action (as much as 18 gal. per day have been noted under a 1000 sq ft house) and evaporates within the crawl space.

Capillary rise occurs in nearly all crawl spaces built in areas where the soil is clay or silt. Such moisture is present even though the ground in the crawl space may seem dry and dusty.

RECOMMENDATIONS: Moisture from capillary rise can be kept out of the crawl space:

a. By using a vapor-barrier type of ground cover which is not susceptible to damage by fungi.

b. Grade and smooth the ground before installing the ground cover.

c. Turn up ground cover 4 to 6 in. on the walls of the crawl space.

4. MOISTURE FROM THE HOUSE

Theoretically in a cold open crawl space, excessive moisture from the house may travel downward through the floor into the crawl space. The moisture may condense on walls or floor of the crawl space if they are cold.

RECOMMENDATIONS: To prevent downward flow of moisture into an open crawl space:

1. Install a vapor barrier above the floor insulation—either directly above it, or between the subfloor and the finish flooring.

VENTILATION

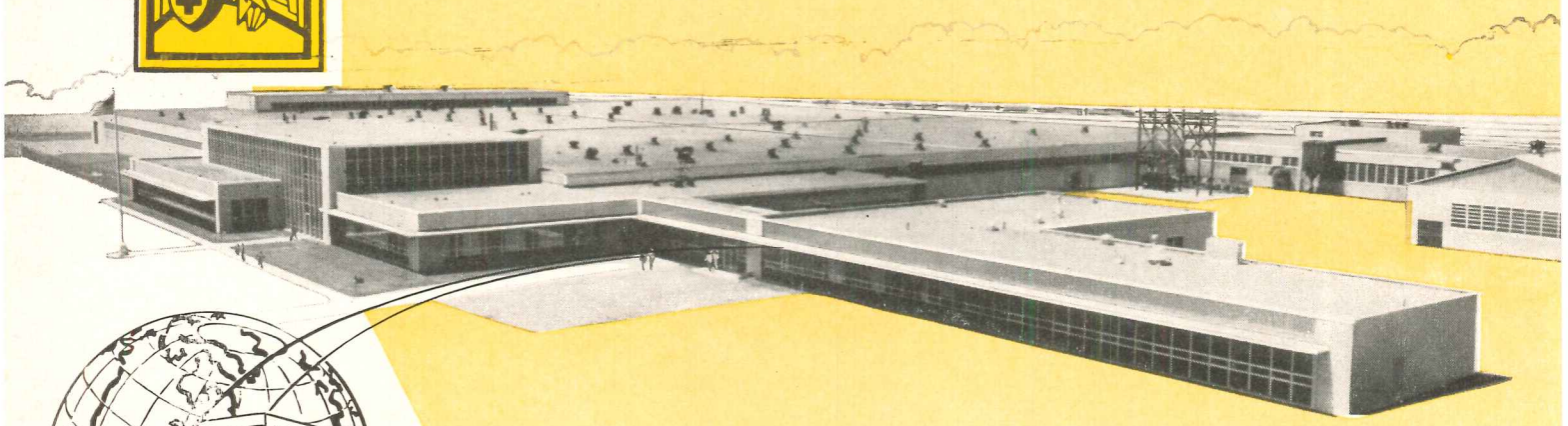
Before the effectiveness of ground cover was proven, large ventilation openings were required in the foundation wall to allow moisture to escape from the crawl space. With the use of ground cover which prevents moisture rise from the ground into the crawl space, a minimum amount of ventilation[2] is needed. Provide at least four corrosion-resistant foundation vents which can be closed during the heating season. Four 8-in. by 16-in. units will satisfactorily vent a house up to 1400 sq ft—install an additional vent for each additional 350 sq ft. (Screen the vents with 8-in. by 8-in. corrosion-resistant mesh—64 openings per sq in.—to keep out insects.)

---

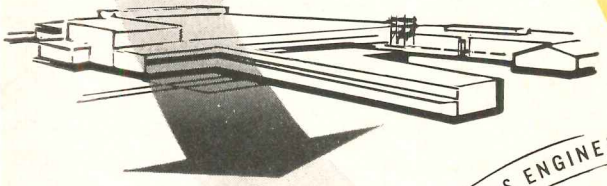
[1] No surface drainage problem will occur if the ground level of the crawl space is higher than the ground outside; however, because this design raises the house a number of feet above grade with a resulting awkward appearance, it is not commonly used.

[2] FHA regulation: A minimum of two vents, giving a total free area of ventilation equivalent to 1/1500 of the crawl-space area, is required when ground cover is used. Without ground cover, ten times as much ventilation area is required.

Solution for Hospital Technical Departments



AMSCO RESEARCH LABORATORIES



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CRAWL SPACES: 2—Moisture and Insulation Problems

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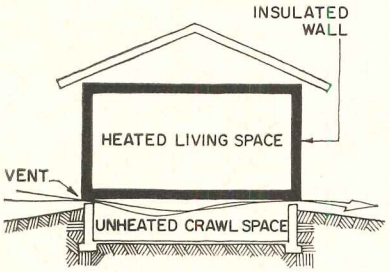
by Rudard A. Jones, A.I.A.; Architectural Consultants: F. M. Lescher and W. H. Kapple

OPEN CRAWL SPACES

To achieve warm floors in a crawl-space house, either (1) insulate the floor above an open crawl space, or (2) insulate the exterior walls of a closed crawl space.

Open crawl spaces are those which are ventilated to such an extent that the temperature within the crawl space approaches



OPEN CRAWL SPACE

that of the outside air. In cold areas, it is necessary to insulate water pipes in such crawl spaces to protect against freezing, heating pipes or ducts to prevent excessive heat loss, and floors to make them comfortable.

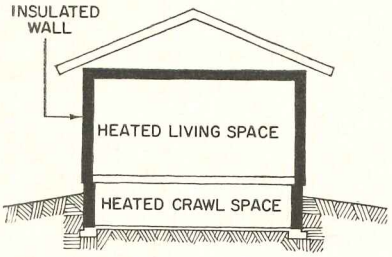
RECOMMENDATIONS FOR RESISTANCE[3] OF FLOOR INSULATION

Table 1 shows the minimum amount of insulation required to maintain the surface temperature of a hardwood floor over a plywood subfloor[4] at 65 F. (the minimum temperature recommended for comfort) or higher. These insulation requirements will also limit heat loss through the floor to 5.5 Btu/hr per sq ft.

(SEE TABLE 1)

CLOSED CRAWL SPACES

The moisture control provided by ground cover is so effective that crawl-space ventilators can usually be kept closed during the heating season. This "closed" crawl-space construction is recommended except under severe moisture conditions since it provides maximum floor comfort with a minimum expenditure for insulation. Insulation around water pipes and heat ducts and pipes is not needed; furthermore, a closed crawl space can also serve as the plenum for a warm-air heating system.



CLOSED CRAWL SPACE

If the temperature of the crawl space can be maintained at 70 F., the surface temperatures of the floors in the rooms above will also be a comfortable 70 F. Heat from uninsulated warm-air ducts or hot-water heating pipes can often keep a well-insulated, closed crawl space near the 70 F. level. Sometimes, however, additional heat may have to be introduced into the space.

The walls enclosing the crawl space must be insulated to reduce heat loss and to help maintain the temperature of the crawl space at 70 F. (Heat loss to the ground through the earth floor of a crawl space is small.) To accomplish this:

a. The box-sill headers and the end joists of the floor must be insulated, preferably with a flexible-type insulation (batt or blanket) which has a vapor barrier on one side. The vapor barrier should face the interior of the crawl space.

b. For the exterior walls, insulation in sheet or block form is most easily applied. Tempered nails or an adhesive mastic are suggested. Insulation should be of a type not affected by termites or dampness. If it is not vaporproof, a vapor barrier should be installed on the inside face of the insulation since moisture condensation is otherwise likely to occur between the insulation and the wall, or within the wall cavity.

HEATING SYSTEMS

Heating systems which supply heat near the floor along the exterior walls of the house are very effective for a crawl-space house since they eliminate or reduce uncomfortable drafts along the floor. For this reason, perimeter heating or baseboard heating is recommended.

In a warm-air perimeter system, the heat can be distributed (1) through ducts in the crawl space, or (2) by using the crawl space, if it is closed, as a plenum.

When a closed crawl space is used as a plenum the temperature in the space will approach 100 F. See the table below for recommendations for wall insulation. Insulation and ground cover selected for a plenum-type crawl space should be fire-resistant. To reduce dust, a floor in the crawl space is necessary.

TABLE 1

RESISTANCE OF FLOOR INSULATION

Outside Design Temperature[5]	Resistance of Insulation
—30°	13.26
—20°	11.42
—10°	9.58
0°	7.74
10°	5.90
20°	4.06
30°	2.22

[5] Approximates the average annual minimum temperature.

FOUNDATION-WALL INSULATION FOR HEATED CRAWL SPACES

The recommended minimum insulation shown in the table will limit the heat loss to 50 Btu/hr per lineal foot of wall around the crawl space. These insulation standards are based on economy since, with a warm crawl space, floor comfort is no problem. The more thoroughly a wall is insulated, the lower is the heat loss and the greater is the fuel saving.

Recommendations are for a crawl space which is 3 ft deep, and which is enclosed with a concrete block wall that is 8 in. thick. The box-sill construction is insulated with a 2-in. corner pack, and the foundation wall with sheet or block insulation 3 ft high. If more than 12 in. of the foundation wall is

[3] Resistance equals 1/C where "C" is equivalent to the thermal conductivity of the insulating material (expressed in Btu/hr per sq ft per Fahrenheit degree temperature difference.)

[4] Denser flooring materials, such as asphalt, vinyl and ceramic tile, require slightly more insulation.

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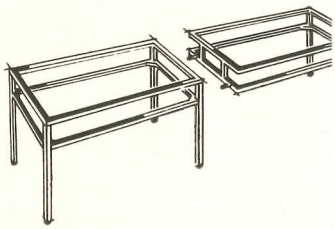

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CRAWL SPACES: 3—Moisture and Insulation Problems

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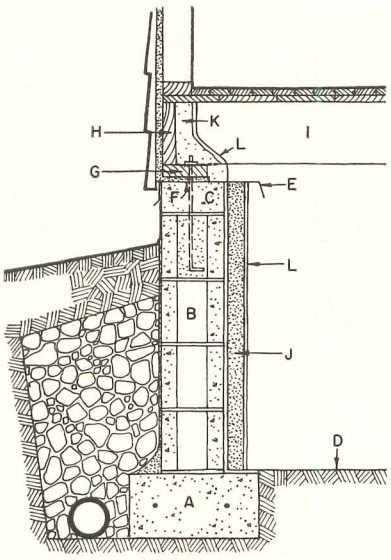
exposed above grade, additional insulation is recommended.

(SEE TABLE 2)

CONSTRUCTION DETAILS

The minimum depth of the crawl space should be 2 ft under the floor joists or 18 in. under the girder.

Two types of crawl-space construction for houses are presented on this page: (1) foundation-wall construction for a closed crawl space (illustrated), and (2) pier construction.



FOUNDATION-WALL CONSTRUCTION
(Key to illustration)

A. *POURED CONCRETE CONTINUOUS WALL FOOTING* either 12 by 16 in. or 16 by 8 in., preferably with two round, ½-inch steel reinforcing rods.

Size of footing depends on bearing value of soil. Footings specified above are suitable for most conditions.

B. *WALLS FOR FRAME HOUSES,* 8-in. masonry or 6-in. poured concrete. (Check local building code.)

Where the exterior walls to be supported by the foundation are thicker (as in an 8-in. solid brick house), the foundation wall must be correspondingly thicker.

Foundation wall should extend at least 8 in. above grade and remain exposed at least 6 in.

C. *HOLLOW-MASONRY FOUNDATION WALL* must be capped with (1) a course of solid masonry, or (2) a 4-in. poured concrete cap reinforced by No. 14 wire mesh 2 by 2 in.

D. *GROUND COVER.*

E. *METAL TERMITE SHIELD.* Use corrosion-resistant metal which is stiff enough to retain the form shown. Where anchor bolts penetrate the shield, the area should be well sealed with coal-tar pitch or tight lead washers.

F. *SEALER FOR THE SILL PLATE.* Use material similar to expansion joint.

G. *SILL PLATE* 2 by 6 in., anchored with ½-in. bolts, 8 ft on center—minimum of two bolts to each piece of sill.

Lumber that is pressure treated with preservative is recommended for sill plate (a) to prevent decay in lumber likely to be caused by condensation, and (b) to discourage termites.

H. *HEADER OF BOX SILL.*

I. *JOISTS.*

J. *FOUNDATION-WALL INSULATION.*

K. *CORNER-PACK INSULATION.*

L. *VAPOR BARRIER.*

PIER CONSTRUCTION

Where the outside walls and the outer edge of the floor of a house rest upon a beam supported by piers, the crawl space is usually enclosed by non-loadbearing (curtain) walls placed between the piers. (In some instances, the curtain wall may support the masonry veneer walls above it.)

The footing for the curtain wall should be poured integrally with the footings of the piers, unless the bottom section of the curtain wall is reinforced to span between piers.

Common size limitations for pier construction are given in Table 3.

TABLE 2: RESISTANCE[6] OF HEATED CRAWL SPACE INSULATION

Outside Design Temperature[7]	For Closed Crawl Space	For Crawl Space As Plenum
—30	5.03	7.61
—20	4.25	6.74
—10	3.45	5.85
0	2.71	5.03
10	1.98	4.25
20	1.27	3.45
30	.59	2.71

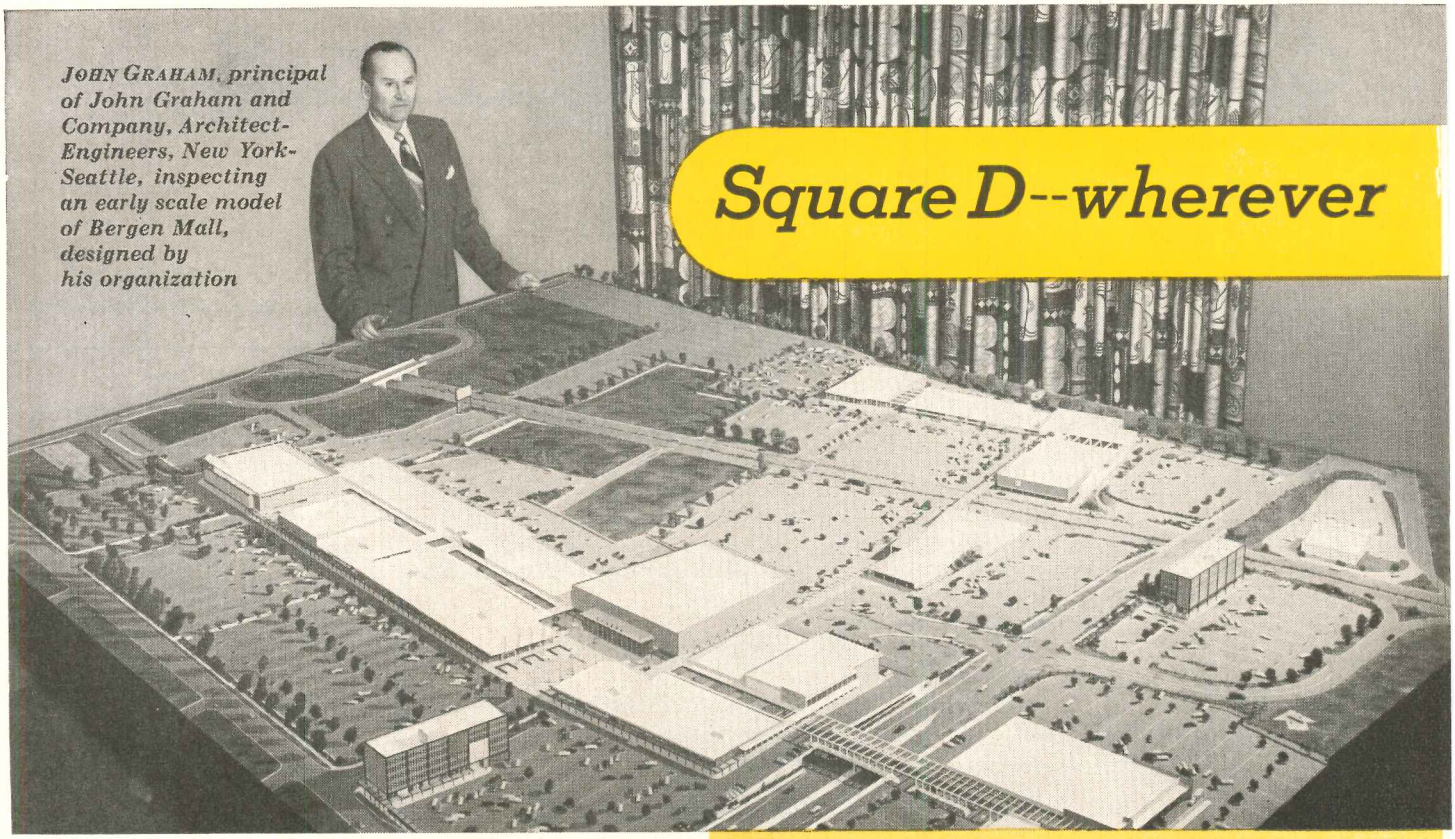
[6] Resistance equals 1/C where "C" is equivalent to the thermal conductivity of the insulating material (expressed in Btu/hr per sq ft per Fahrenheit degree temperature difference).

[7] Approximates the average annual minimum temperature.

TABLE 3: COMMON LIMITATIONS FOR SIZE OF PIERS AND CURTAIN WALLS

	Minimum Dimensions (Inches)	Limit on Height
PIERS		
Concrete	8 dia	10 times the least dimension
Solid Masonry	8 x 12	10 times the least dimension
Hollow Masonry	8 x 16	10 times the least dimension
CURTAIN WALLS		
Concrete	4	14 times thickness[8]
Solid Masonry	4	14 times thickness[8]
Hollow Masonry	4	10 times thickness[8]

[8] Unbalanced fill against a 4-in. curtain wall should not be higher than 2 ft.



JOHN GRAHAM, principal of John Graham and Company, Architect-Engineers, New York-Seattle, inspecting an early scale model of Bergen Mall, designed by his organization

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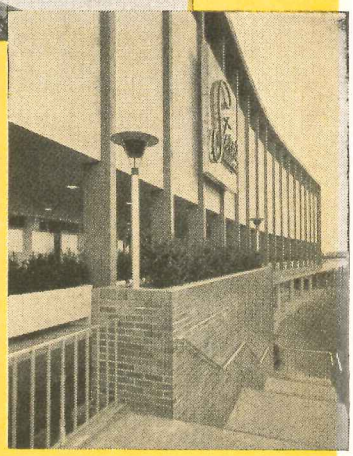

(*Above*) Only one main street ...a proven way to generate heavy shopping traffic. The central Mall, 920 feet long, is designed to create a park-like atmosphere.

(*At right*) The new Stern's department store is a thing of functional beauty. 320,000 square feet on four levels—a total of more than seven acres of space. Exterior combines use of marble, red brick, rough-cut stone and large glass areas.

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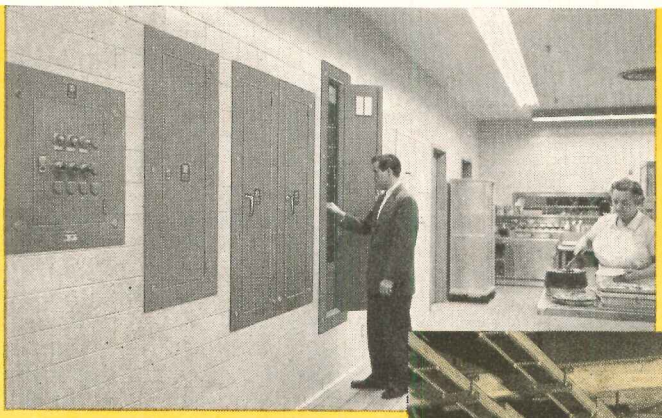
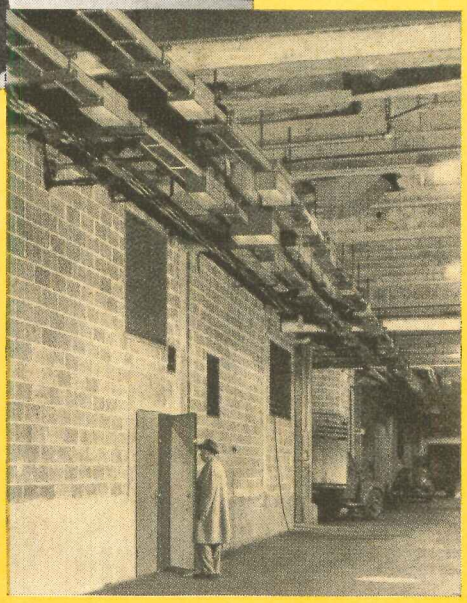
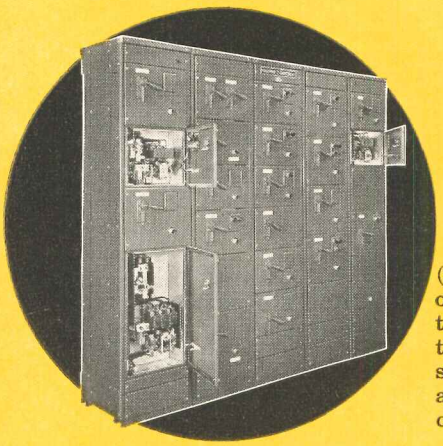


There are hundreds of **Square D Lighting and Power Panelboards** throughout Bergen Mall. These are in kitchen area, and control lighting for the Stern dining room and power for kitchen equipment.



(*At right*) **Square D Feed-In Duct** runs the full length of this half-mile truck concourse, distributing power to the stores on both sides.



(*At left*) A **Square D Control Center** of this type provides complete control for the air-conditioning system in the Stern store. In addition, there are seven **Square D Switchboard** installations with a total combined ampere capacity of 22,500 amperes.

A *Complete* LINE OF ELECTRICAL DISTRIBUTION AND CONTROL EQUIPMENT

ADJUSTABLE SPEED DRIVES
BUSWAYS & WIREWAYS
CIRCUIT BREAKERS
CONTROL CENTERS
CRANE & HOIST CONTROL
DISTRIBUTION SWITCHBOARDS
ELECTRIC TRUCK CONTROL
HIGH VOLTAGE CONTROL
LAUNDRY CONTROL
LIFTING MAGNETS
LIGHTING AND POWER PANELBOARDS
LIGHTING CONTROL—LOW VOLTAGE
LIMIT AND FOOT SWITCHES
MACHINE TOOL CONTROL
MAGNETIC BRAKES
METER MOUNTINGS
MOTOR STARTERS
PRESS CONTROL
PRESSURE, FLOAT, & VACUUM SWITCHES
PUSHBUTTONS
RELAYS AND CONTACTORS
RESISTORS
SAFETY SWITCHES
SERVICE ENTRANCE EQUIPMENT
STAGE DIMMERBOARDS
STEEL MILL CONTROL
SWITCHGEAR & UNIT SUBSTATIONS
SYNCHRONOUS MOTOR CONTROL
TERMINAL BLOCKS
TEXTILE MACHINE CONTROL
TIMERS
VOLTAGE TESTERS
WELDER CONTROL

ACOUSTICAL PRIVACY

continued from page 230

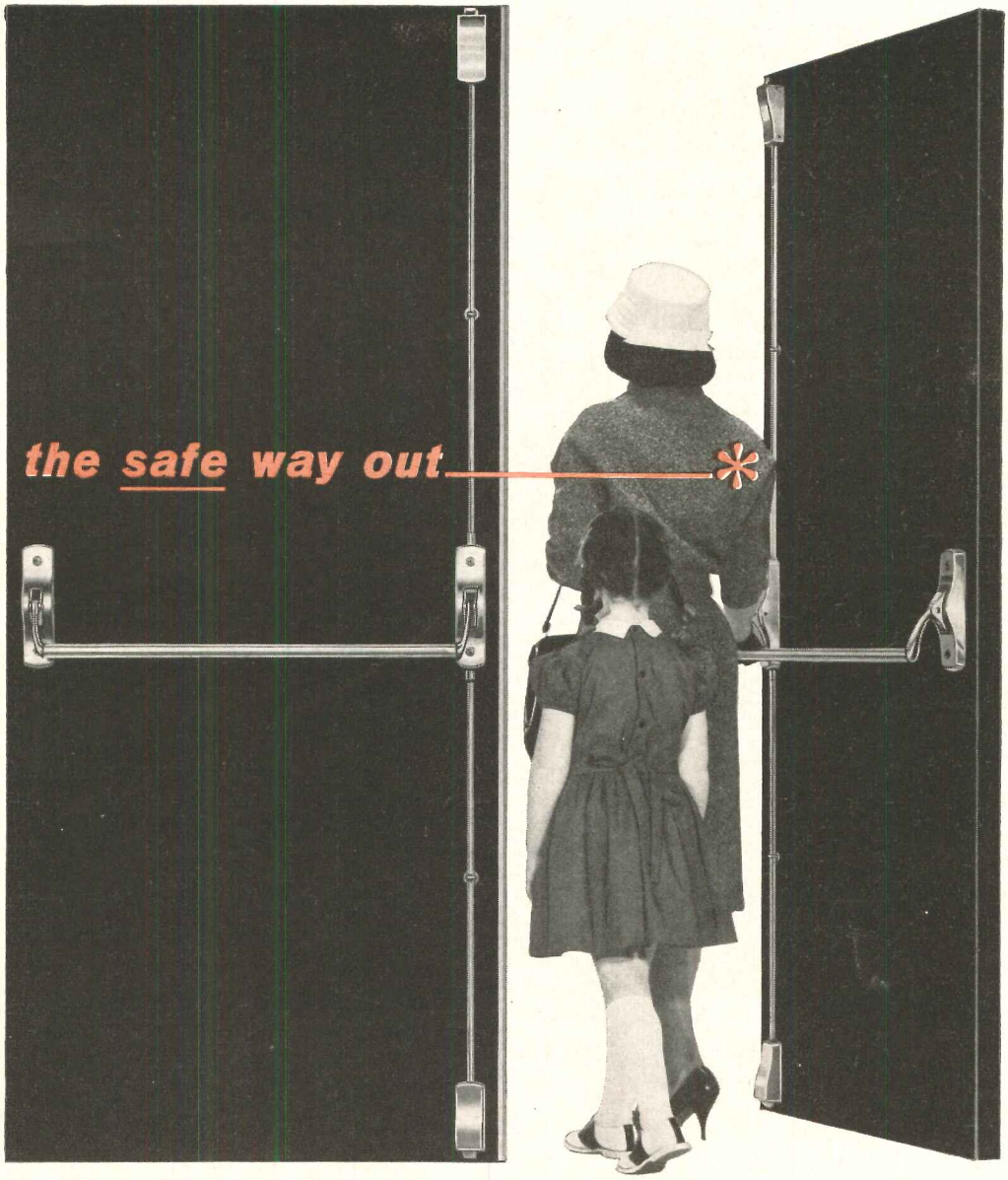
acoustic tile has also reduced the level of the masking noise in the listening room, and therefore the relationship of the loudness of the transmitted speech to the noise remains just as it was before the tile was installed, and the privacy problem is not solved.

On the other hand, if we are considering a building in the planning stage and make the assumption that we have control over the level of background noise and can adjust it after the building is complete, the picture is different. The talker, our neighbor in the adjacent office, will not raise his voice to compensate for the effect of the tile on his ceiling, and therefore, the voice level in his office will indeed be somewhat lower than if the acoustic tile had not been applied. Going again to the listening room, the levels of transmitted speech will be reduced but now our mechanical engineers are going to come in and adjust the level of background noise to some predetermined value, say NC-35. Thus, we succeed in rendering a significant improvement in the privacy conditions in the building because the voice levels transmitted from our neighbor's office have been reduced by sound absorption, but the masking noise has remained constant.

Fussy Listeners

The final link in the privacy chain is the sensibility of the listener to the transmitted speech sounds as they are heard over and above the steady noises in the room. Unfortunately, we cannot predict this fussiness or sensitivity in the same way that we are able to predict the probability that he will speak in a raised voice. We must, therefore, rely on the evidence provided by the privacy test. In a purely qualitative discussion, we must limit ourselves to a statement that the most critical decisions will be based on whether we want to satisfy, say 85 per cent of the people likely to occupy an office, or 95 per cent. The top 5 per cent are likely to require very elaborate and special constructions and even then may not be satisfied, and there are about 25 to 50 per cent of the people who will not complain regardless of how bad privacy conditions are. It is our experience that a building designed to satisfy 90 per cent of the people represents a practical, economical limit on the degree of speech isolation provided between adjacent spaces.

continued on page 246



Von Duprin® EXIT DEVICES

illustrated above: the sleek, smart Type 66 device . . . in stainless steel. Catalog number 6621 on active door; 6627 on inactive door. Write for Bulletin 581 for full details.

● Von Duprin builds devices to *last* . . . give decades of dependable service with minimum maintenance! From Von Duprin's *complete* line, you can select a design, material, locking function and outside trim style to harmonize with every type exit. To perfect the performance of the entire door opening, you can choose from a wide range of quality auxiliary items. With Von Duprin, you *know* you have provided "the safe way out!"

VONNEGUT HARDWARE CO. • VON DUPRIN DIVISION • INDIANAPOLIS, INDIANA

ACOUSTICAL PRIVACY

continued from page 242

The privacy tests were set up in such a way that they did indicate one standard of judgment of the degree of "fussiness" of individual listeners. People engaged in normal business activities or engineering activities will demand a certain degree of privacy. However, people doing work of a confidential nature, for example, personnel work, discussions of cost and fees, etc., will require a considerably higher degree of isolation. Therefore, in planning a building, the architect should indicate that though the executive vice president may be satisfied with an office similar to offices throughout the building, the chief accountant or the personnel man may require even better construction.

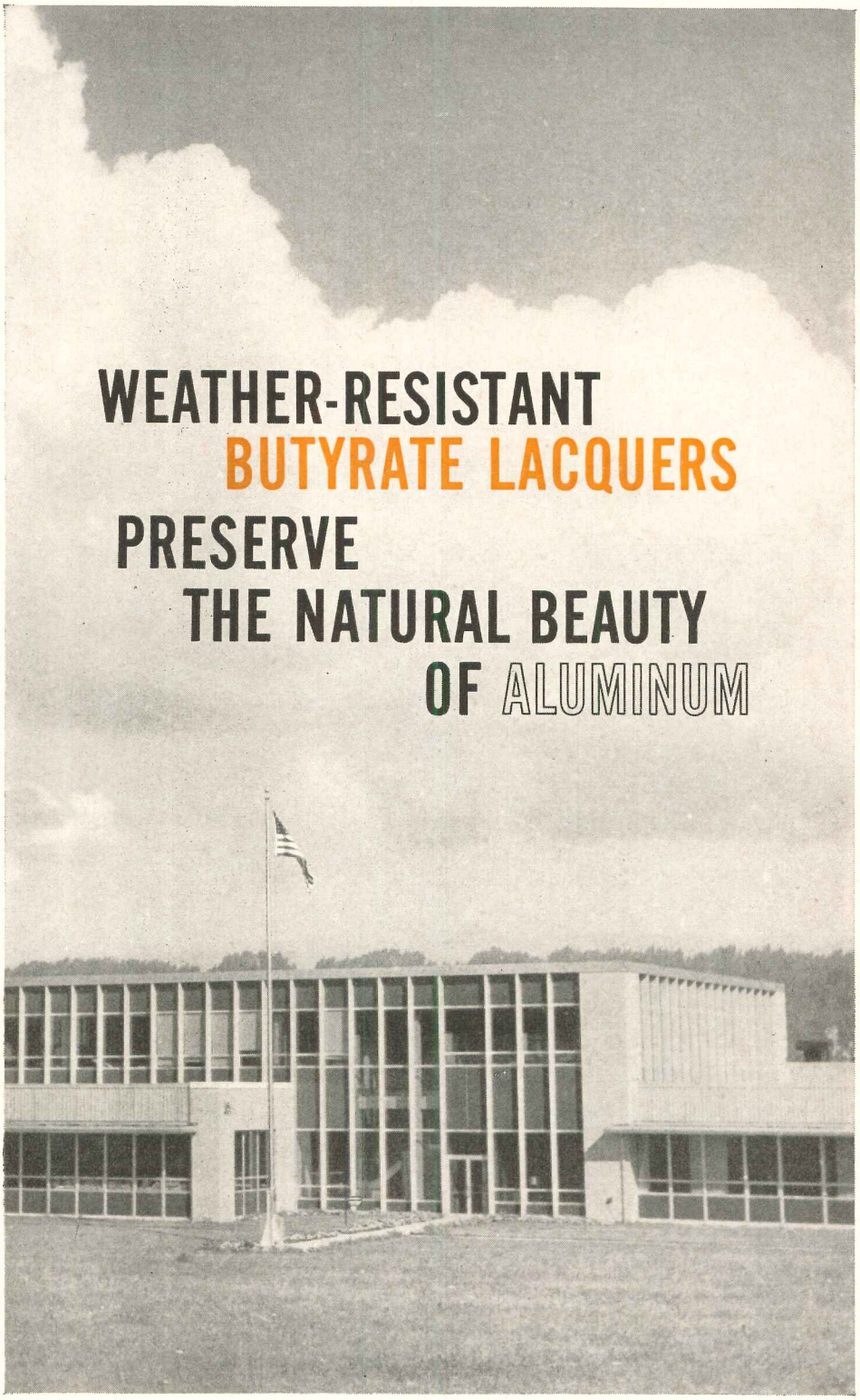
Where Do We Go From Here?

Of the various factors involved in a privacy problem analysis, really only two of them are directly under the control of the building designers. The first of these is the partition construction (or the ways in which sound can travel around the partition) and the other is the level of steady background noise in the building.

We would therefore propose that the following general rules of thumb be observed when planning a building in which speech privacy is an important consideration, and indeed, in what building is it not important?

1. Select partition panel materials which have high weight, high density and low stiffness.
2. Avoid partition panel materials which are designed to be both stiff and light.
3. Detail partition drawings, ceiling drawings and convector drawings to minimize the possibility of air leaks through and around the partitions.
4. Always use a noise source on one side of the partition while checking for leaks on the other.
5. Design mechanical equipment so that no spaces have levels exceeding some pre-established criteria, but also so that no spaces have levels below some pre-established bottom limit. This is usually done by using undersized air diffusers and grilles on the ducts.

Our only further piece of advice goes to the building owners themselves, and to them we say, "make sure that you only hire people with very soft voices and who are extremely insensitive, if you can find them."



Butyrate lacquers provide clear, weather-resistant coatings that won't yellow, even under prolonged exposure to sunlight. They have high strength and flexibility ...withstand oxidation and discoloring... and are little affected by salt spray or rapid temperature changes.

When outdoor aluminum surfaces are protected with Butyrate lacquers, cleaning and maintenance costs are at a minimum. Usually, the action of rain itself is enough to keep aluminum surfaces clean.

This combination of features makes Butyrate lacquers particularly advantageous for use on aluminum curtain walls, siding, spandrels, louvers, solar canopies and architectural trim and hardware.

Your client's interests are well served when you specify a protective coating of Butyrate lacquer on all exterior aluminum surfaces. Butyrate lacquers can be easily applied in the aluminum fabricator's plant and are available from lacquer manufacturers in all parts of the country.

An informative 15-minute 16mm. sound color film has been produced especially for viewing by those who design in or specify aluminum in an outdoor application. Would you like to see it? See below.

The aluminum exterior of the American Sterilizer Company plant at Erie, Pennsylvania, is protected against weather and oxidation with a clear, colorless Butyrate lacquer.

The finest lacquers for aluminum are made with

Eastman BUTYRATE

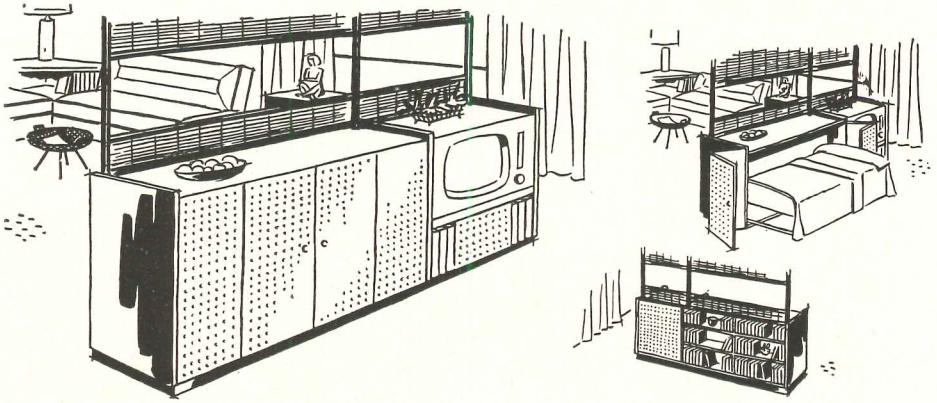
SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; Atlanta; Chicago; Cincinnati; Cleveland; Framingham, Massachusetts; Greensboro, N. C.; Houston; New York; St. Louis.
West Coast: Wilson Meyer Co., San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

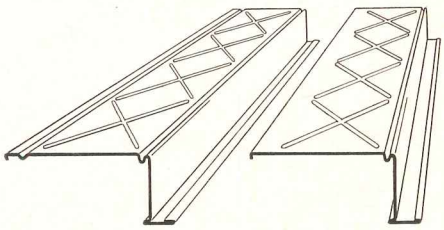
ARCHITECTS! ENGINEERS!

HERE'S HOW TO GET the complete story on this new method of preserving exterior aluminum.
1) Send for Eastman's catalog on Butyrate lacquer. It tells you where this new protective coating has proved particularly successful and why these lacquers are so effective in preserving aluminum surfaces.
2) Check Sweet's Industrial Construction File, Sweet's Architectural File, or see 15-M of the A.I.A. Alphabetical Filing System for specification details.
3) Send for sound color film. Indicate the date you plan to show the film and an alternate date.

Side-Folding Murphy Bed

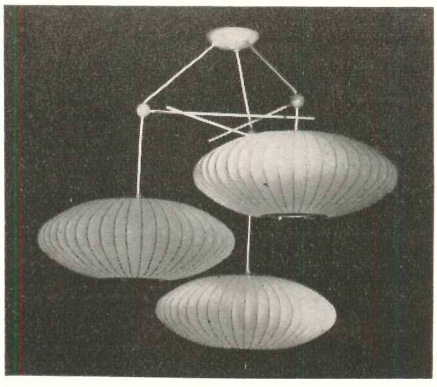
That pioneer space-saver, the Murphy bed, now comes in a side-folding model that suggests a whole new bag of tricks for combining living and sleeping spaces in small hotel and dormitory rooms, apartments, and residences. The sidebeds come in single or double sizes and take standard mattresses, but fold up neatly into the 12-in. depth of freestanding or wall cabinets like the one shown above. The more familiar upright models, which also come in standard twin or full sizes, lend themselves to similar treatment. *Murphy Door Bed Co., Inc., 3 East 44th St., New York 17, N. Y.*





Long Span Roof Deck

A new low cost, long span roof deck available in 4½-, 6- and 7-in. depths and 18, 16 and 14 gages, is capable of spanning 32 ft or more. The basic unit of the *Fentura* system is Fenestra's LS (long span) deck, which comes in three types, each with a continuous top sheet. The longer lengths are provided for overhangs, double span conditions and similar needs. *Fenestra, Inc., 2250 E. Grand Blvd., Detroit 11, Mich.*



Bubble Lamp Clusters

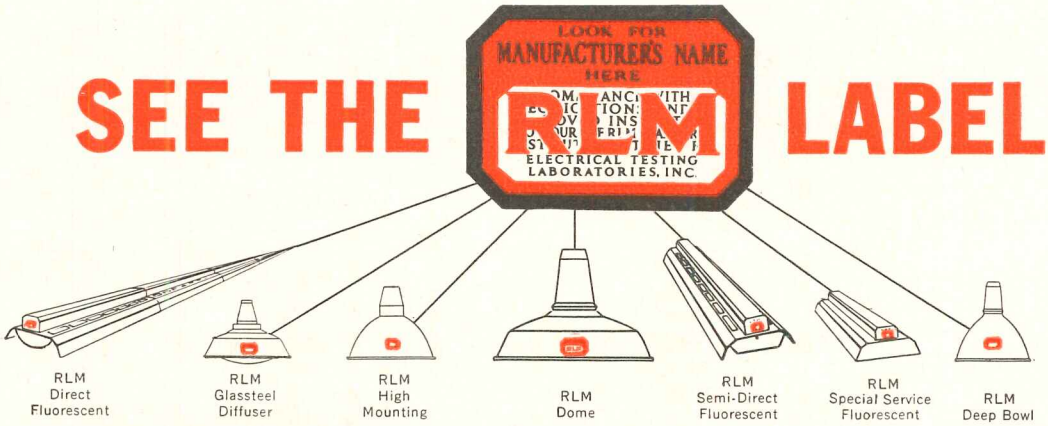
George Nelson's famed "bubble lamps" are now available in clusters of from two to six round or elliptical bubbles suspended at the same or varying levels from a single fixture. The bubbles are made of light-weight steel and translucent white plastic; the canopy supports come in white, chrome or brass, decorated with spheres of walnut or birch. *Howard Miller Clock Co., Zeeland, Mich.*

more products on page 258

Either it is RLM APPROVED or it is NOT!

The ONLY WAY to be SURE is to

SEE THE RLM LABEL!



There is NO SUCH THING as an RLM "TYPE" Fixture

According to the new, higher I.E.S. Recommended Industrial Lighting Levels, 80% of present industrial lighting is now obsolete. This makes RLM quality concepts of lighting equipment design, performance and maintenance features more important than ever.

You can't have quality lighting without quality lighting equipment!

There are those who claim a lighting unit to be "just as good" as an RLM-labeled unit. It may even LOOK like an RLM unit. But the only proof positive is the RLM Label itself — the only evidence that the unit is RLM approved.

Why there is NO SUCH THING as an RLM "Type"?

The RLM Label on fluorescent and incandescent lighting units, first of all, assures the buyer of design and construction that meet the RLM Institute's high standards of quality. However, he also receives a Warranty of Uniform Quality because of the Inspection System back of every RLM-labeled unit. This Inspection System assures the buyer that each and every fixture labeled will uniformly meet the quality RLM standards.

How RLM Checks Uniformity of Quality

RLM testing and inspection procedures require that representatives of the Electrical Testing Laboratories periodically visit plants of all RLM Member-manufacturers. They take lighting fixtures right off the assembly lines and out of stock for testing and inspection at their laboratories. They may also obtain test samples directly from the distributors' shelves or out of contractors' stocks on the job in order to check Uniform Quality at every level of distribution.

This activity of the RLM Standards Institute, which makes possible the Warranty of Uniform Quality, is not duplicated by any other agency in the lighting industry. That is why there is no such thing as an RLM "Type" Lighting Unit.

Uniform Quality as assured by the RLM Label does not mean that all RLM fixtures made by the various manufacturers are alike in quality. Quite the contrary, each manufacturer engineers into his RLM-labeled fixtures such other advancements in design and quality which he deems important to quality performance. Uniform Quality refers to the labeled fixtures delivered to the buyer by the manufacturer.

Uniform Quality Essential to Finest Performance

This quality uniformity in delivered fixtures is essential to uniformly satisfactory lighting equipment performance. It assures that each unit in the system performs with equal efficiency to the other . . . that ballasts function with uniform efficiency . . . that the reflection factor be uniform from unit to unit . . . that the units be of uniformly durable construction with the identical-gauge steel and the same thickness Porcelain Enamel. Such uniformity reduces to a minimum the plague of spotty performance by individual units in a lighting system.

FREE SPECIFICATIONS BOOKLET! FREE I.E.S. Industrial Lighting Recommendations!

These two publications are a must to anyone planning lighting or re-lighting projects of industrial plants and utilitarian locations. Contains all RLM Specifications. For a complimentary copy write: RLM Standards Institute, Inc., 326 W. Madison St., Suite 8276, Chicago 6, Ill.

R-526

Every RLM Unit Must Conform with High-Quality Standards such as these:

Porcelain Enamel Reflectors — all porcelain enamel RLM Units must have a specified thickness of Genuine Porcelain Enamel fused to steel. This unsurpassed high-reflection, high-diffusion reflecting surface is the only commercially available finish that cannot deteriorate or corrode. Simple soap-and-water cleaning quickly restores it to original efficiency.

High-Quality Ballasts — RLM Fluorescent Units must be equipped with Certified Ballasts which prevent high-temperature ballast operations, supply proper starting current, maintain proper operating watts to the lamp. Because of their high power factor, present wiring capacity can be utilized most efficiently.

Reflector Design — every RLM Unit must conform with the approved principles of Illuminating Engineering. Such design protects the workers' eyes while delivering, not only the most light per dollar, but also the required quality of light for the individual seeing task.

Sound Construction — RLM Units must comply with high fabrication and materials to insure standards of maximum resistance to sag, distortion and breakage.

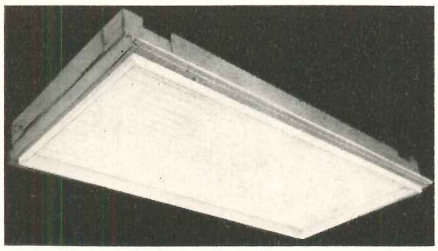
RLM STANDARDS INSTITUTE

Colored Silicone Water Repellent

Through a new tinting process, *Dri-Film 103* silicone water repellents combine color with masonry protection in only one application. As a result, the long-standing problem of restoring the original appearance of masonry after sandblasting or cleaning can be solved while applying a water repellent treatment. In many cases, tinted *Dri-Film 103* can not only restore but actually improve the original surface, giving common brick the appearance of the more expensive tapestry variety. *Silicone Products Div., General Electric Co., Waterford, N. Y.*

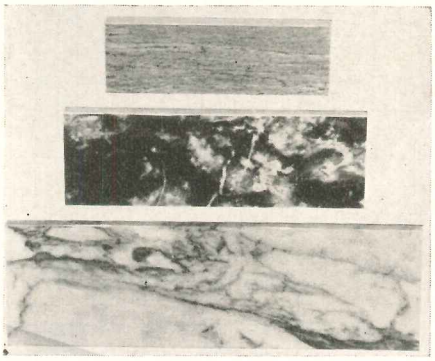
High Temperature Water Boiler

The *Flo-Kontrold* boiler, a packaged unit designed for high temperature hot water heating and process work, circulates water at temperatures between 250 and 450 degrees Fahrenheit with system loads from 4 to 10 million Btuh. To eliminate the possibility of vapor locking, there are no reverse vertical down flow tube circuits. The circuits are also designed to maintain the required velocity and flow of water, while a nitrogen pressurized or steam balanced drum maintains the necessary system pressure. Since pressure drop through the boiler is only 10 to 15 psi under normal conditions, boiler circulating pumps are optional. The need for auxiliary equipment is further reduced by the low volume of makeup water that must be handled (less than one per cent). The *Flo-Kontrold* boiler requires no special foundation and can be fired with oil, gas, oil/gas, or coal. *Boiler Engineering & Supply Co., Inc., Phoenixville, Pa.*



Recessed Lighting Units

The new *Holoflux* Series 6400 features recessed lighting units in two major styles: one has a lens with a shallow dropped edge that projects light on the ceiling; the other has a flat lens for unbroken ceiling surfaces. The luminaires are designed for all types of ceilings, including suspended acoustical ceilings, and can be installed in continuous runs with no visible metal parts. Each consists of two 2- by 2-ft injection molded clear acrylic plastic *Controlens* that give total luminosity over the entire width. *Holophane Company, Inc., 342 Madison Ave., New York 17, N. Y.*



Rectangular Marble Tile

Imported Italian marble for floors and walls is now available in three patterns: herringbone, brick and basket; and in three tile sizes: 2 by 6 in., 2¾ by 8¼ in., and 4 by 12 in. The *Salirma* tiles are all ⅜ in. thick, and come in twenty-four shades of green, rose, brown, gray, black and white. They are said to be competitive in price with other floor and wall covering materials. *Furstenberg & Co., 52 Broadway, New York 4, N. Y.*

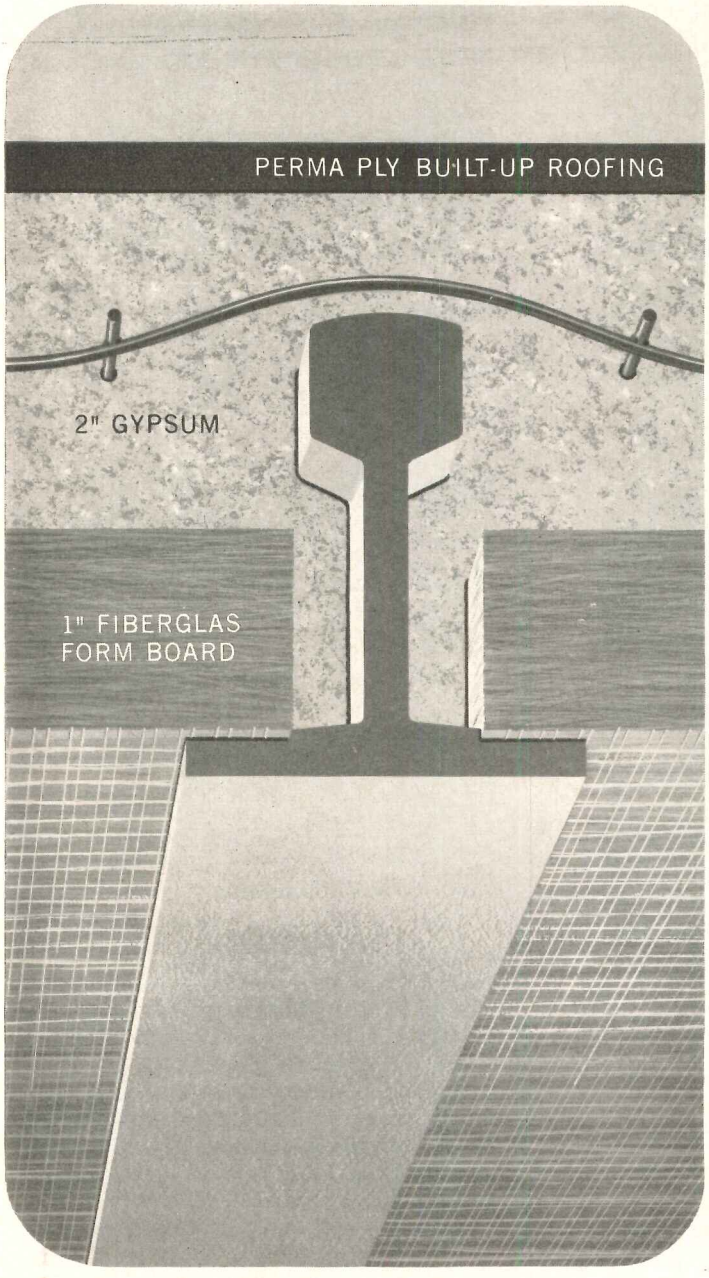
more products on page 262

"U"=.16 THERMAL EFFICIENCY for LOW-COST HEATING AND COOLING

The combination of Fiberglas Form Board and poured-in-place roof deck, shown below, results in exceptional thermal efficiency. Thickness of 1" form board and 2" of poured gypsum provides a "U" value of .16† which will net savings in the cost of heating-cooling equipment and will lower operating costs.

Your Fiberglas representative can give you full details on the savings made possible with Form Board or other Fiberglas Roofing Products. Ask for a Roof Construction Cost Evaluation on any roof deck.

†BTU/hr./sq.ft./°F. at 75° F. mean temperature.

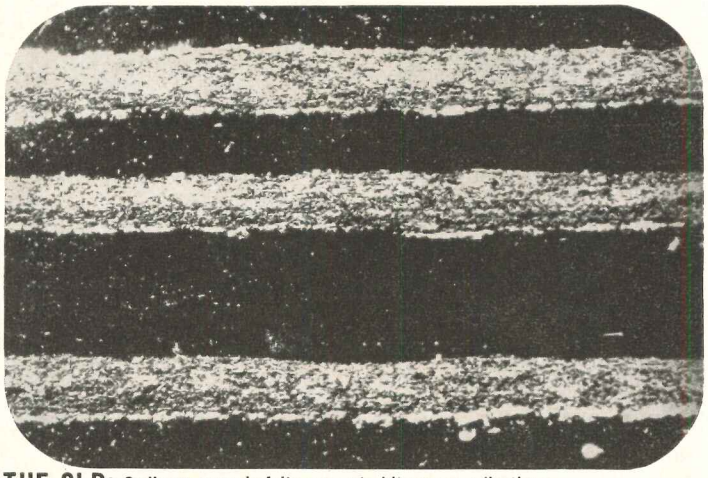


ABOVE THE DECK, PERMA PLY MAKES THE ROOF MONOLITHIC

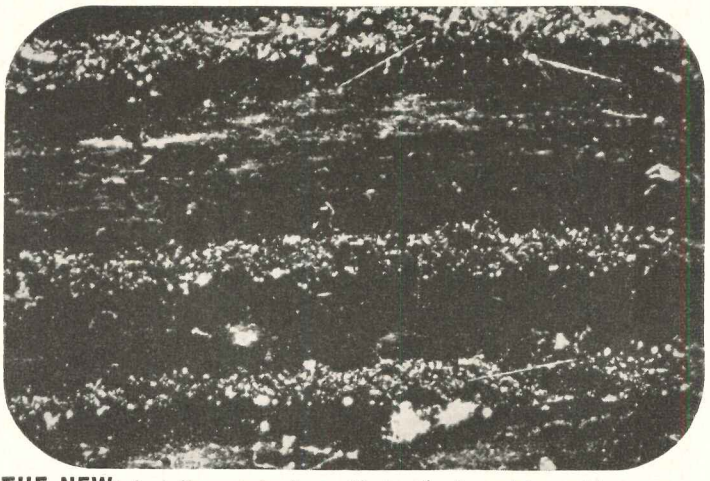
In the photomicrographs below, you see why Perma Ply*—the Fiberglas Built-Up Roofing—assures a longer lasting roof. Notice that a Fiberglas Built-Up Roof is of monolithic (single-unit) construction while a conventional roof is made of distinctly separate layers.

A Fiberglas Built-Up Roof has no layers; it's a solid weatherproof slab of asphalt reinforced with Perma Ply. This is why a Fiberglas Perma Ply roof is the *Big Change in Roofing*. A change to Fiberglas means a big change for the better in roofing performance.

Write for A.I.A. folders on Fiberglas Form Board, Fiberglas Roof Insulation or Perma Ply, or ask for a Roof Construction Cost Evaluation. Owens-Corning Fiberglas Corp., Dept. 68-F, Toledo 1, Ohio.



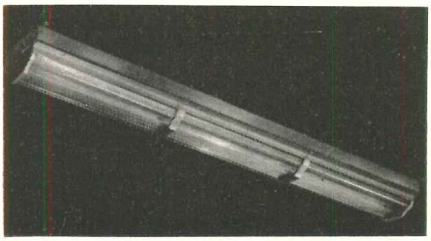
THE OLD: Ordinary organic felts separate bitumen applications.



THE NEW: Asphalt penetrates Perma Ply, bonding layers into a solid monolithic reinforced roof.

*T.M. (Reg. U.S. Pat. Off.) O-C. F. Corp.

OWENS-CORNING
FIBERGLAS
T.M. REG. U.S. PAT. OFF.



Vaportight Fluorescent Fixture

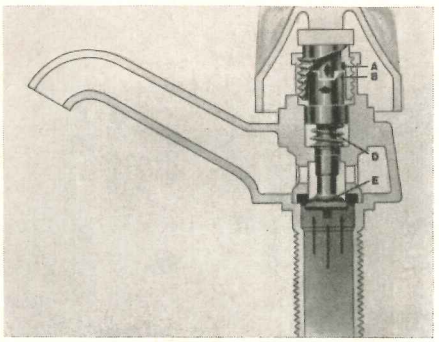
A new vaportight fixture, designed for wet locations requiring high intensity lighting, features a non-corrosive extruded aluminum body and prismatic lens, sealed with extruded sponge rubber gaskets. The fixture is available for use with one or two slimline or high output 800 M.A. rapid start lamps in 4-, 6- and 8-ft lengths. Low temperature ballasts are supplied for reliable operation down to minus 20 deg. F. *McPhilben Lighting, Inc., 1329 Willoughby Ave., Brooklyn 37, N. Y.*

Marble-Based Masonry Paint

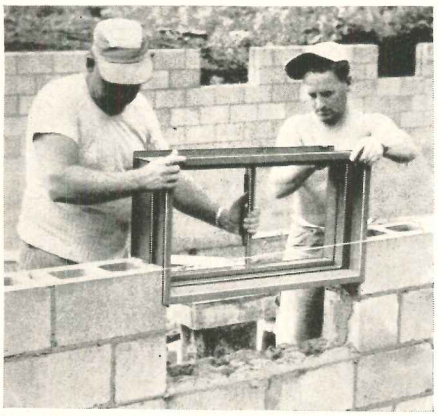
Marble-Coat, a new masonry paint with a base of tiny white marble crystals, is guaranteed to be waterproof if applied as directed. It is suitable for interior and exterior block, stucco, brick, non-glazed tile and similar masonry surfaces, above or below ground levels, and can be applied by brush or spray. Several colors are available. *Lee-Rick Co., Box 108, Vineland, N. J.*

Self-Seating Faucet

The *Kel-Win* self-seating faucet features a new cam and straight-lift piston action that prevents manual, mechanical squeezing of the valve seat. According to the manufacturer, tests indicate that this "self-seating" mechanism will retrieve up to 36 per cent of the water usually wasted in institutional use, and will virtually eliminate the need for maintenance. *Kel-Win Mfg. Co., Richmond 30, Va.*



Closing action, started manually, becomes automatic when cam A reaches the valley in cam B. Spring D and water pressure against bottom of valve E then close the faucet at the automatic seating point, insuring a positive leakproof seal.



Block "Buck" Windows

A new line of windows for concrete block construction features frames made to full wall thickness so that no mortar sill is necessary and jambs need not be caulked. Two types are available: a modular window (two blocks wide by two or three blocks high) for general use, and a utility model (two blocks wide by five blocks high) for light commercial or industrial work. *Kewanee Mfg. Co., Kewanee, Ill.*

more products on page 266

Guth
LIGHTING
PRESENTS

SLIMFIN

...SWEPT-WING BEAUTY
WITH MORE THAN
A TOUCH OF GLAMOR!

The high-style, eye-comfort luminaire . . . designed in the fashion of a Paris Original . . . to bring new glamor to lighting.

Polystyrene side fins emit soft beams of light to emphasize the graceful fixture lines. Color-fashioned in three beautiful finishes . . . sun drenched bronze, satin silvan or gloss white. Chrome end fins add a decorator's flair. 4′ and 8′ lengths. Two and four light widths. Choice of GrateLite, Prismoid or metal cross-baffle bottoms. Apparent depth only 1½″. The finest for slim contemporary, close-ceiling installations.

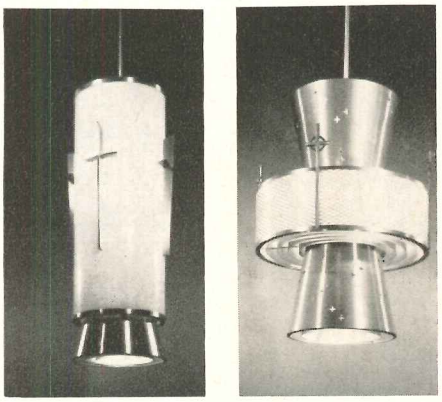
WRITE FOR FREE BROCHURE

Low Cost Btu Meter

A new mechanical Btu meter provides building owners with an economical means of proportioning heating and cooling costs among tenants served by a central air conditioning system using hot or chilled water. The Model 200 multiplies the temperature change of the water by the flow, and registers heat transferred, water flow and differential temperature. The meter may be located up to ten feet away from the flow measuring element, in a position convenient for reading and checking. Any water volume above 0.25 gpm can be metered. *Mechanical Component Dept., American Meter Co., P. O. Box 306, Garland, Tex.*

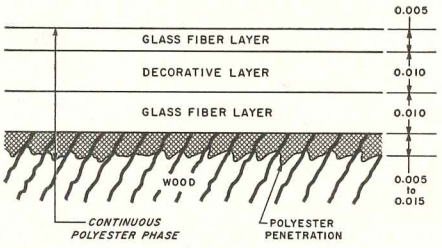
Wall-Mounted Dimmer

A new wall-mounted dimmer offers fingertip control of both fluorescent and incandescent lights. Its features include a single dial control with built-in on-off switch, an automatic re-set circuit breaker which eliminates fuses, and a single terminal panel for easy installation. The dimmer controls up to eight rapid-start 40-watt fluorescent lamps or eight trigger-start 20-watt lamps, and any number of incandescent lamps up to a total load of 360 watts. *Moe Light Div., Thomas Industries Inc., 410 S. Third St., Louisville 2, Ky.*



Church Lighting Fixtures

A new line of lighting fixtures for churches features white *Plexiglas* cylinders which are light in weight, break-resistant, and have uniform wall thickness for optimum appearance and performance. As shown above, the cylinders are combined with gold anodized aluminum grilles and trim in a variety of styles. *R. A. Manning Co., Inc., 1810 North Ave., Sheboygan, Wis.*



Decorative-Protective Wood Surface

A new surface treatment for wood and other porous materials consists of a molded, glass fiber-reinforced *Plaskon* polyester resin covering which is applied under vacuum followed by heat and pressure. The material permeates a decorative layer (available in marble or wood grain patterns) and an additional layer of glass fiber, and continues into the wood itself. This forms a strong, weather-, stain-, and abrasion-resistant surface that hides superficial defects and "welds" cracks, checks and loose knots, thus enabling cheaper woods to be used. Because the covering is more flexible than the wood itself, bending and similar abuses will not de-laminate it unless the wood subsurface is ruptured. *The Hartglas Co., 1302 Expressway Dr., Toledo 8, Ohio*

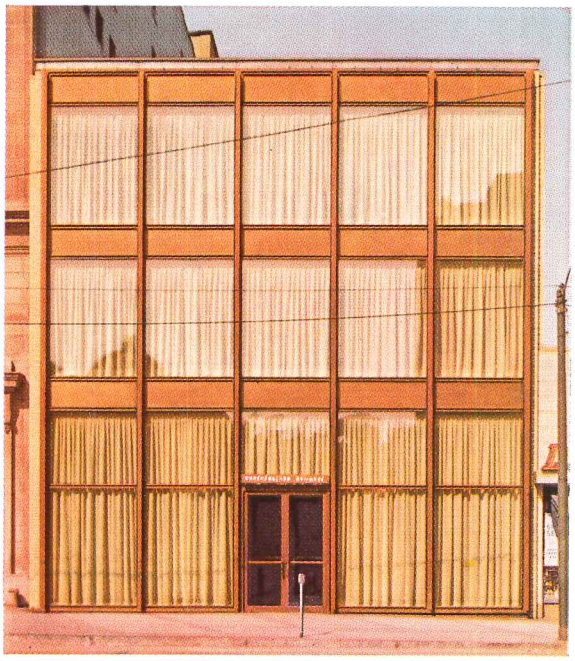
more products on page 270

CREATIVE DESIGN IN WALLS OF GLASS AND ARCHITECTURAL BRONZE

Here are excellent examples of the broad range of curtain-wall design made possible with Architectural Bronze. At the right the metal components consist of bronze extrusions, including a large I-beam shape for the mullion, and Muntz Metal sheets for the spandrels. Below, the design for the glass framing incorporated standard sizes of Architectural Bronze angles, bars and Red Brass rectangular tubes.

The distinctive elegance of Bronze is unsurpassed, whether it is seen in the bright color of the metal—in the warm statuary bronze finish obtained by treatment, as in these two buildings—or by natural weathering.

Details of these and other curtain-wall designs are given in our new publication, "Architectural Metals" by Anaconda. Its 64 pages also give practical and detailed information on the available metals, their compositions, colors, forms, physical properties, architectural applications, instructions for obtaining various finishes, detailed specifications and many pages of fabricators' shop drawings. Send today for your copy. Address: The American Brass Company, Waterbury 20, Conn. In Canada, Anaconda American Brass Ltd., New Toronto, Ont.



Northeastern Pennsylvania National Bank and Trust Company, Scranton, Penn., George M. D. Lewis, Scranton, architect. Standard Iron Works, Scranton, fabricator.

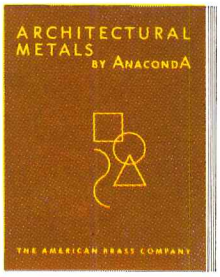
BRONZE—the architectural metal of distinction

ANACONDA®

ARCHITECTURAL METALS

Made by The American Brass Company

Longwood Gardens, Kennett Square, Penn., Victorine & Samuel Homsey, Wilmington, Del., architects. Modern Metal Crafts Company, Philadelphia, Penn., fabricator.



Write today on your firm's letterhead requesting your copy of Architectural Metals by Anaconda, Publication B-15.

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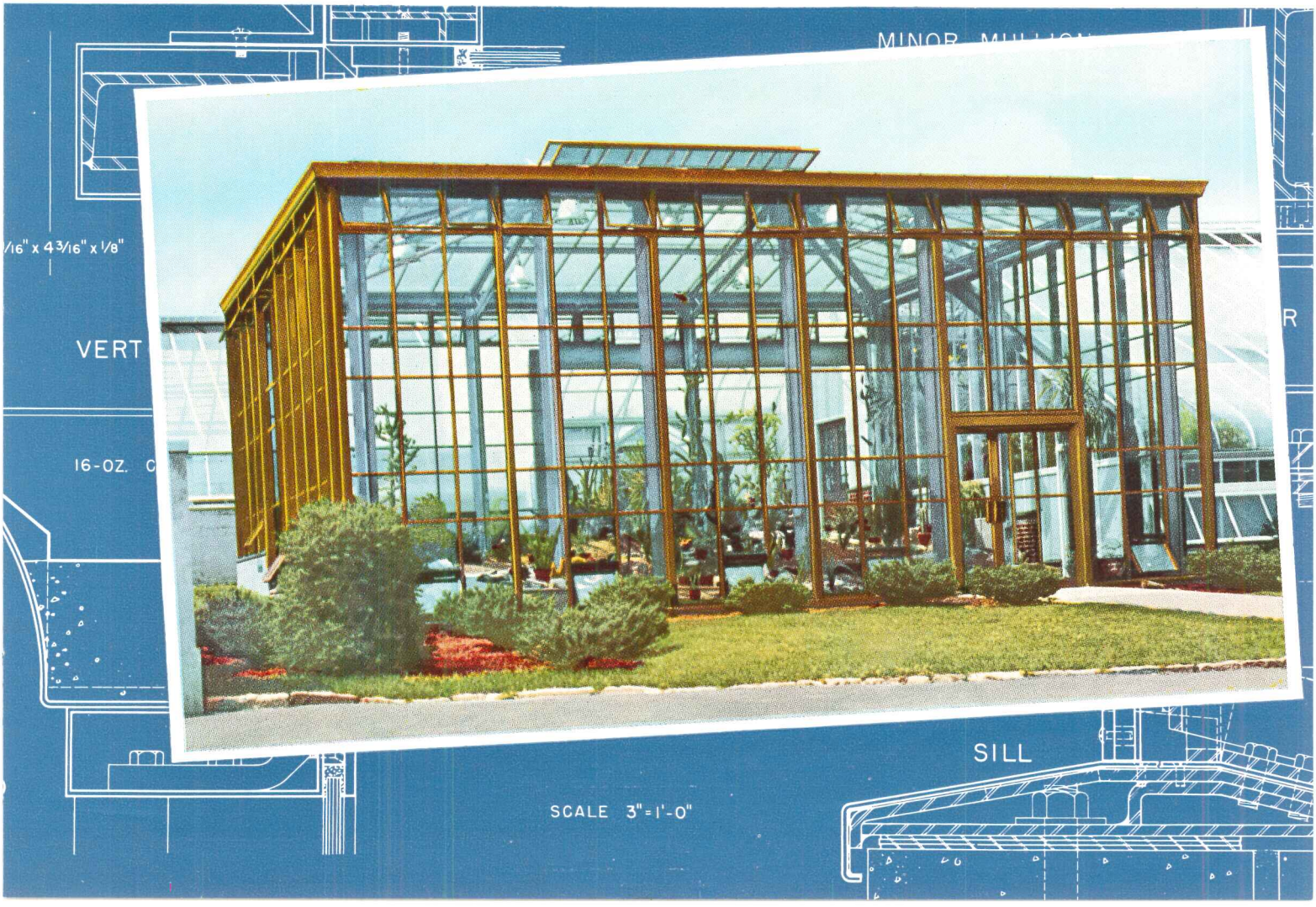
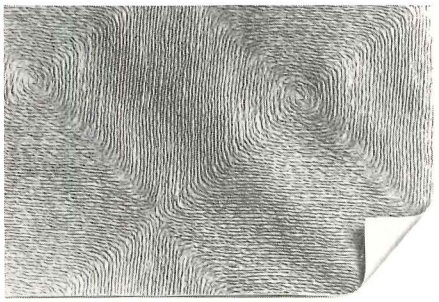


Product Reports

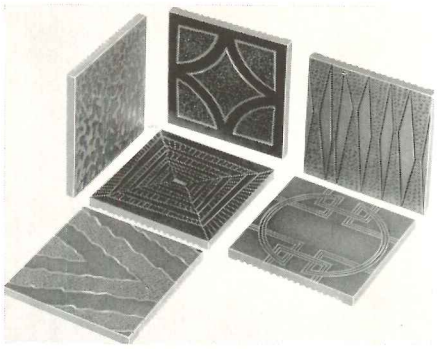
"Lumistatic" Light Control

The *Luxtrol* Automatic Light Controller is said to save power costs and provide better lighting by measuring daylight in a room and balancing it with artificial light to keep room-lighting constant at a pre-set level. The system includes a *Lumistat* which may be set for the desired foot-candle level, and a photo-electric scanner which is mounted where it can best monitor the lighted area. If the measured amount of combined natural and artificial light differs from the *Lumistat* setting, signals are sent to the motor-driven *Luxtrol* light controls which then dim or brighten the artificial lights accordingly. *Superior Electric Co., Bristol, Conn.*



Vinyl Wallcovering

The latest addition to the *Vicrtex VEF* line of vinyl wallcovering fabric is "Lanai," a pattern which offers "authentic tropical flavor" and is at the same time durable, practical and permanent. Fadeproof, frayproof, and resistant to acids and stains, it wipes clean with a damp cloth. *L. E. Carpenter & Co., Inc., Empire State Bldg., New York 1, N. Y.*

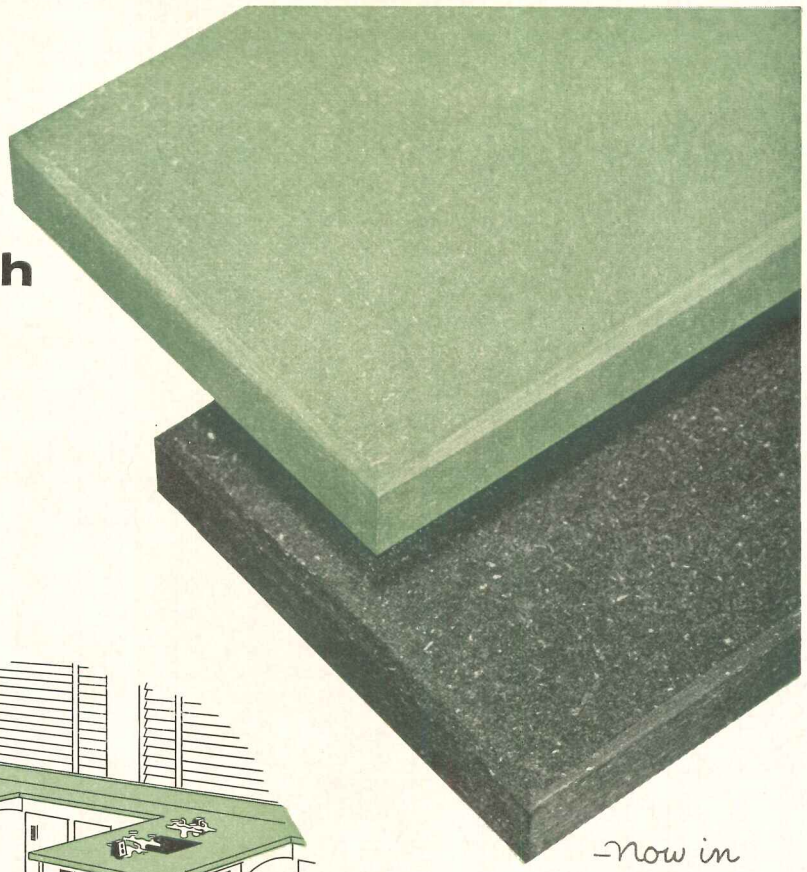


Textured Quarry Tile

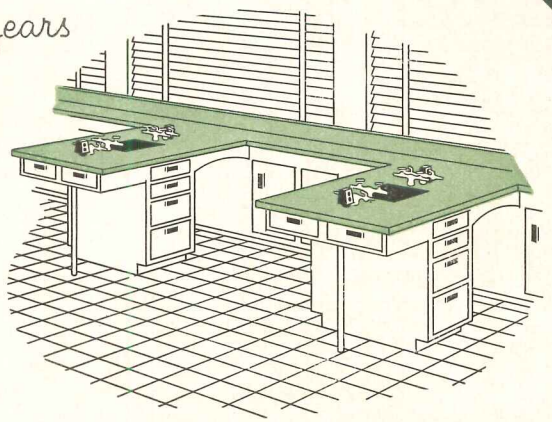
A new ceramic tile product uses the wear-resistant surface of quarry tile as a backdrop for intaglio designs which are filled with a ceramic glaze in contrasting colors. The 6- by 6- by ½-in. tiles and matching trim units are offered in ten standard designs and sixteen color combinations. *Summitville Tiles, Inc., Summitville, Ohio*

For hard-working laboratory surfaces

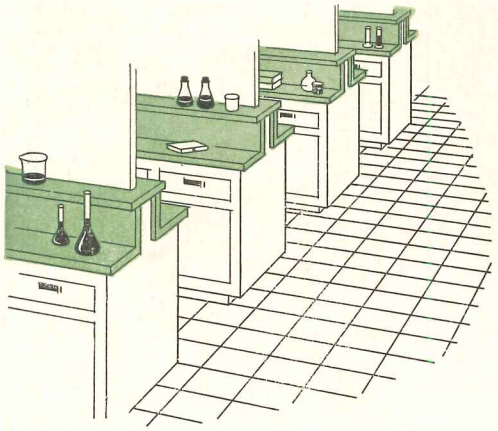
a bright new touch of personality...



In school and college laboratories, Colorlith table tops stay attractive after years of abuse.



—Now in 3 modern decorator colors: Surf Green, Cameo Brown, Charcoal Gray.



In leading industrial labs, Colorlith combines finest working conditions, unusual durability, low cost.

J-M COLORLITH®... handsome, tough, colorful

Now, no matter what the work load, laboratories can be bright, colorful, pleasant places to be in. This completely inorganic material, properly coated with a clear lacquer or equivalent to meet specific service requirements, gives table tops greater toughness and durability than natural stone—at lower cost.

Fabricated from asbestos fiber, Portland cement, and chemically resistant colorings which run all the way through the sheet, Colorlith withstands heat, flame, moisture . . . acids and solvents in working concentrations. It comes in large 4′ x 8′ sheets which can be cut in any shape. Thicknesses range from 1¼″ all the way down to ¼″; ¼″ can be used safely because of great uniform strength.

Write for Colorlith specification sheet EL-94A and brochure EL-62A. Johns-Manville, Box 14, New York 16, New York. In Canada, Port Credit, Ontario.

JOHNS-MANVILLE JM PRODUCTS

JOHNS-MANVILLE

Office Literature

Continued from page 232

High Velocity Air Distribution
General information on high velocity systems—what they are, what they can do, where they should be used, how much they cost—is supplemented by an extensive design and application section as well as by specific information on *Uni-Flo* high velocity products. 52 pp. *Barber-Colman Co., Dept. 766, Rock St., Rockford, Ill.**

Key to the Perfect Swimming Pool
Catalogs complete line of pool supplies, chemicals and equipment. *Paragon Swimming Pool Co., Inc., 12 Paulding St., Pleasantville, N. Y.*

Dunbar Office Furniture
Fully illustrated, 80-page catalog of office furniture designed by Edward Wormley includes desks, storage units, seating units, tables and accessories. *Dunbar Furniture Corp. of Indiana, Berne, Ind.*

Foamglas Building Insulation
Contains descriptive information, technical data, and drawings and specifications for typical applications of cellular glass insulation. Booklet FB-105, 20 pp. *Pittsburgh Corning Corp., One Gateway Center, Pittsburgh 22, Pa.**

Dust Collector Bulletin
Provides complete information on the application, design, construction, operation and installation of the Type D *Roto-Clone* dust collector. Bulletin 272-B, 20 pp. *American Air Filter Co., Inc., 215 Central Ave., Louisville 8, Ky.*

Audio-Visual Nurse Call System
Details a newly-developed audio-visual nurse call system for use in hospitals, describes its functions, and gives technical data on each component. 75 pp. *Dahlberg, Inc., 7731 Sixth Ave. North, Minneapolis 27, Minn.*

Open-Web Steel Joists
(A.I.A. 13-G) Booklet 3001-0 contains complete descriptions and diagrams of open-web steel joists, steel roof deck and *Cecor* centering. Tables of available dimensions, allowable loading, specifications and recommended handling and erection procedures are supplemented by accompanying Load Tables Bulletin 3009-A. *Ceco Steel Products Corp., 5601 W. 26th St., Chicago 50, Ill.**

**Additional product information in Sweet's Architectural File, 1959*

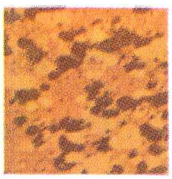
more literature on page 280

Shown above . . . B. F. Goodrich Koroseal floor tile in Black White, Citron, and White Black.

Its beauty is everlasting, it needs less care!

HEAVY TRAFFIC enhances its good looks. Footsteps actually *buff* its lustrous anti-slip surface. That's the beauty of B. F. Goodrich Koroseal, best-known name in vinyl. So everlastingly tough . . . Koroseal virtually takes care of itself. Can't peel or crack. Defies dirt, grease, stains, chemicals. A damp mop leaves it glistening clean.

IDEAL FOR even the most original of flooring designs. Choose from smart new terrazzo, cork shades, carpet shades or marbleized patterns. 39 decorator colors. 9" x 9" tiles for below, on or above grade; ⅛" for heavy commercial traffic areas; 80 gage for medium and light traffic areas; 1/16" for residential use, thriftier and faster to install. For more information, see Sweet's or write The B. F. Goodrich Company, Flooring Products, Watertown 72, Mass., Dept. AR-6.



Koroseal®

VINYL ASBESTOS
FLOOR TILE

B.F.Goodrich *Flooring Products*

Office Literature

Spang Conduit
Bulletin No. 485 features brief descriptions of installations of *Spang* conduit and fittings. A technical section includes specifications and other planning and estimating data, applicable electrical data compiled by the NFPA, and standard symbols and abbreviations for use on drawings. The latest ASA specifications for conduit and electrical metal tubing are also reproduced. 60 pp. *The National Supply Co., Two Gateway Center, Pittsburgh 22, Pa.*

Powder-Driven Fastener Handbook
. . . for Architects and Engineers (A.I.A. 17-F) provides complete information on the various applications of powder-driven fasteners in the construction field. Detailed line drawings of most applications are included, as are tables covering working loads, shear values, tensile values, design limitations and physical properties. 48 pp., $2. *Ramset Fasteners, Inc., 12117 Berea Rd., Cleveland 11, Ohio**

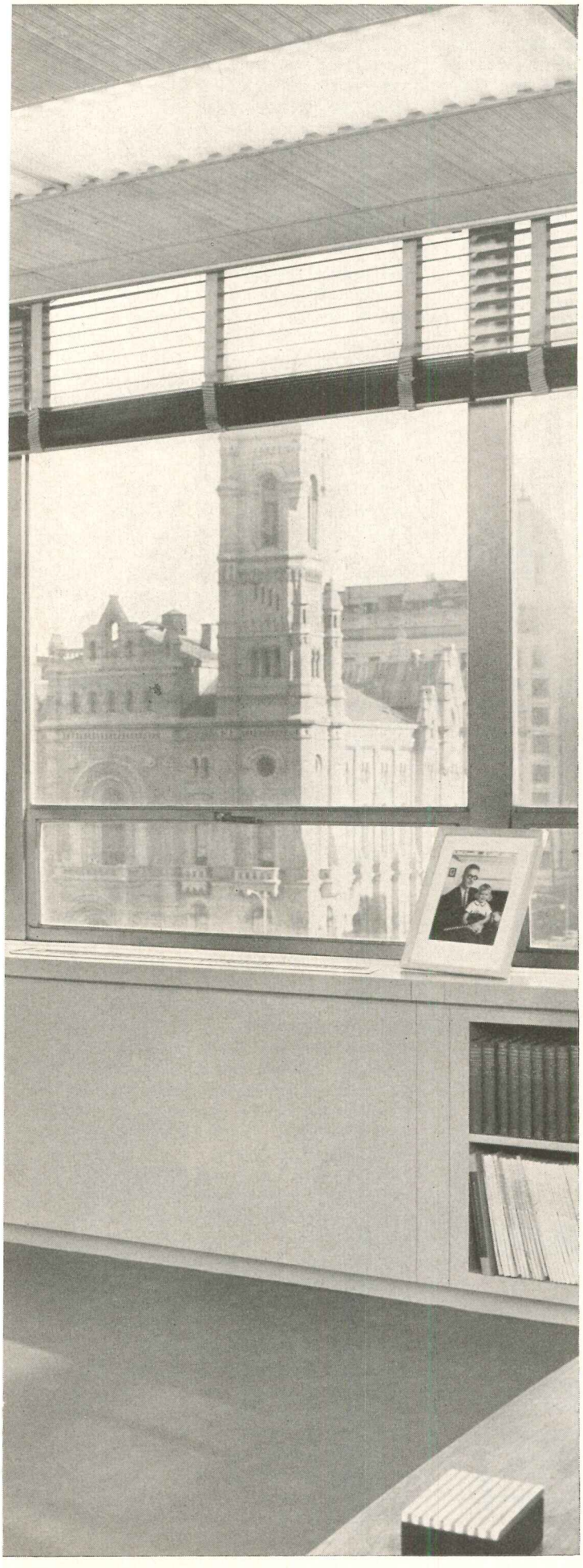
Plan Hold Filing Equipment
(A.I.A. 35-H-32) Catalog No. 4-59 describes and illustrates complete line of *Plan Hold* vertical and roll filing equipment. 12 pp. *Plan Hold Corp., South Gate, Calif.*

Loudspeaker Select-A-Guide
Fold-out brochure offers information on response, sensitivity, power-handling capacity, and other characteristics of twenty-four RCA loudspeakers, horns and drivers. Data on recommended baffles or horns and applications is also included. Form 3R 3509. *Radio Corporation of America, Sound Products, Building 15-1, Camden, N. J.*

Art for Architecture
New brochures cover sculptural pierced walls by Erwin Hauer; Ceramica Venezia; Yucatan Stone and other products in the "Art for Architecture" line. A general brochure on the entire line is also available. *Murals, Inc., 16 East 53rd St., New York 22, N. Y.**

Curtain Wall File Folder
Contains details and specifications on Reynolds *Economy Wall System 101*, a standard curtain wall system for one and two story buildings. Details are printed on tracing paper for more convenient use. *Dept. PRD-4, Reynolds Metals Co., Richmond 18, Va.**

**Additional product information in Sweet's Architectural File, 1959*



IT COOLS, IT HEATS IT VENTILATES

New LUPTON Comfort-Conditioning* Curtain-Wall System

* Patent Pending

This new LUPTON development integrates in a single system: exterior walls, heating-cooling-ventilation units and undersill storage cabinets. And, every one of the Comfort-Conditioning units is designed with a control panel, from which the occupant of each room, office, or motel unit can *individually* regulate temperature, fan, and exhaust for odor- or smoke-removal. This personalized Comfort-Conditioning prevents wasteful over-air-conditioning and over-heating.

Two interchangeable units

LUPTON offers two interchangeable Comfort-Conditioning units: heavy-duty for areas with a particularly heavy cooling load, and lighter-duty for average loads. Operating as heat pumps, these units are satisfactory for all heating purposes during change of season, and wherever winter design temperatures are not extreme. Also, they can be furnished with supplementary heat to take care of all heating requirements, regardless of winter design temperature. LUPTON Comfort-Conditioning units have a wide separation between outside air intake and discharge. The result is faster, more efficient operation for heating or cooling.

Low-cost flexible system

Unlike central systems, LUPTON Comfort-Conditioning requires no unsightly, expensive cooling towers, duct-work, plumbing connections, or condenser units . . . only electrical connections. Installation costs drop 50 to 60%. Nothing protrudes on the outside. What's more, with all panels sized uniformly, the LUPTON system can be readily re-arranged at small cost. If capacity requirements expand or decrease, you can interchange the Comfort-Conditioning units in themselves, or with storage cabinets, shelving, or bookcases. Also, the LUPTON system gives you great opportunity for variation in spandrel proportions and surface treatment.

Investigate fully LUPTON's newest advance in aluminum curtain-wall design and function. Write for more information today.

We are prepared to give, during sketch stages of building design, "not to exceed" appraisals of installation and operating costs of LUPTON Comfort-Conditioning used in connection with LUPTON curtain-wall systems.

*Trade Mark

LUPTON®

ALUMINUM CURTAIN WALLS AND WINDOWS

MICHAEL FLYNN MANUFACTURING COMPANY

Main Office and Plant: 700 E. Godfrey Ave., Philadelphia 24, Pa.
New York, N. Y.; Chicago, Ill.; Cincinnati, Ohio; Cleveland, Ohio; Los Angeles, Calif.; Stockton, Calif.; Dallas, Texas. Representatives in other principal cities.

A Washington Report

continued from page 44

90 pupils and three adults lost their lives. A full report on this fire was made to the April meeting by Robert S. Moulton, technical secretary, fire marshal's section, National Fire Protection Association. This developed no new facts over those contained in previous reports.

School Projects Affected

Of great concern to the architectural profession is the subsequent development of what it calls unreasonable demands on school projects currently on the boards. It is reported that in many instances local officials imposed unnecessarily severe structural requirements on projects in design soon after the Chicago fire. This increases the cost of buildings outside the architects' control.

Henry Wright, F.A.I.A., Los Angeles, who was chairman of the Octagon meeting, said following the sessions that it was hoped the full-fledged fall conference could guide, and protect against, such needless demands and forestall the unnecessary tightening of regulations.

Approval of a substantial grant in Ford Foundation funds led to the decision to proceed with the BRAB summer meetings and later publication. Mr. Dillon said he hoped the document could be readied for distribution within six weeks after the big conference concludes in the fall. At least, it is felt dissemination should occur well before the first of next year.

Steering Committee Named

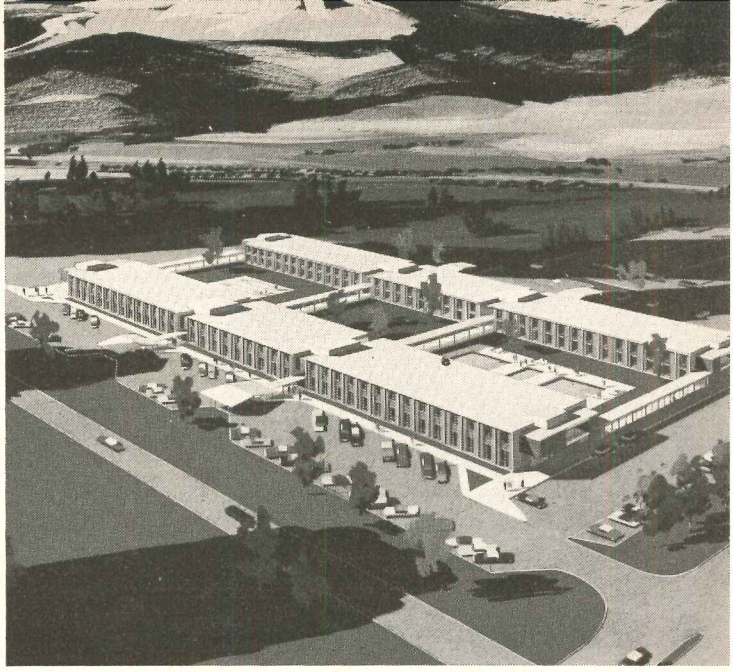
A steering or advisory committee was named at the preliminary April meeting to work on subject matter for the fall conference. This is headed by Dr. Shirley Cooper, associate secretary, American Association of School Administrators, and includes Charles Granger, of Fehr & Granger, Austin, Tex., chairman of A.I.A.'s committee on school buildings and educational facilities; James F. Steiner, manager, construction and civic development department, U. S. Chamber of Commerce; Stanley A. Abercrombie, assistant secretary, commission on safety education, National Education Association, and Mr. Moulton. (Mr. Dillon said he probably would propose the addition of two or three persons to this group before the full program is undertaken.)

Code Problems Stressed

Statements to the press following the closed preliminary meeting in April stressed the conflicts in different building codes throughout the country regarding school construction and emphasized the problems these create for architects doing school work. An individual or firm working under multiple jurisdictions with differing regulations finds performance unnecessarily complicated, it was pointed out. No objections were raised to differences in codes based on regional influences, but it was asserted that better schools and less costly schools could be built with more sensible codes.

Dr. Cooper, as head of the steering group, summarized the movement as a recognition of the need to make a choice now. Functional architecture versus degree of reasonable safety is involved, he said. We could have concrete cells, he said in illustration of the point, but these would lose their educational benefits. What we've been trying to do for the past six or seven years, he went on, is to transfer the philosophy of education into building design with added airiness, brightness and better learning environment. The flexibility concept has come along, new fire standards are being promoted and code conflicts are apparent.

Snug fit of Steeltex around drain pipe at Canevin High School is shown by Joseph V. Cutuly, job superintendent (l.), and Foreman Dean Regan. Mr. Cutuly says, "Steeltex takes more punishment during installation than a sheet material, goes down faster and is much easier to handle."



At luxurious Hilton Inn, San Francisco Airport, 65,000 square feet of Steeltex in floor slabs aid earthquake construction. Architect: William B. Tabler, New York City. Contractor: Cahill Construction Co., San Francisco.

• **New Users Like Steeltex**—Steeltex also is endorsed by new users such as the architectural firm of Charles Bacon Rowley and Associates, Inc., and Ernst Payer, and Contractor Albert M. Higley Company, both of Cleveland. They teamed up on building the $805,000 Western Reserve Historical Society Museum in their city.

Superintendent Albert M. Higley Jr. estimated "perhaps a four percent savings was realized by using 11,500 square feet of Steeltex instead of placing conventional roof structures."

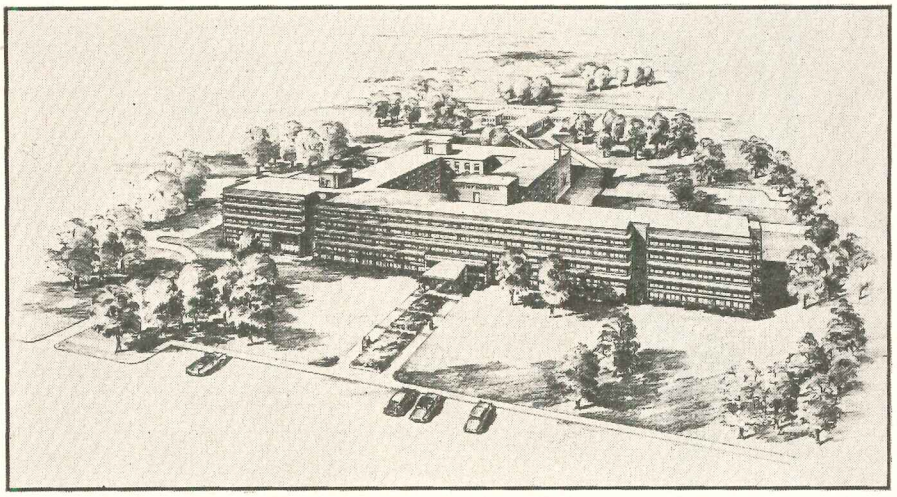
• **Will Use Again**—Another satisfied new user is Irving D. Robinson, architect for the new $325,000 Luria Brothers Building in Cleveland.

Mr. Robinson said: "This is the first time I specified Steeltex and I am sure I will use it many times again. Steeltex permitted work to continue on the floors without planking or scaffolding, although the concrete slab was not poured for many weeks after the 12,000 square feet of Steeltex were installed." Contractor for the job was J. L. Hunting Company, Cleveland.

Whether you are a veteran Steeltex user or a newcomer, you cannot afford to pass up using Steeltex on your next construction job.

Trained sales engineers are available to help solve your construction problems. Put them and Steeltex to work for you soon.

Contact the nearest Pittsburgh Steel Products sales office listed at right. Call today . . . you'll be glad you did.



$24,500 was saved on cost of material and labor by using 70,000 square feet of Steeltex in the Baptist Hospital addition in Pensacola. Architect: Charles H. McCauley, Birmingham. Contractor: Dyson and Company, Pensacola.

On the Calendar

June

1-5 Annual Meeting, National Fire Protection Association—Hotel Dennison-Shelburne, Atlantic City

1-6 11th International Hospital Congress, organized by International Hospital Federation—Assembly Rooms, Edinburgh, Scotland

5-6 Annual Meeting, Virginia Chapter, A.I.A.—Thomas Jefferson Inn, Charlottesville

7-11 Semi-Annual Meeting, American Society of Heating and Air-Conditioning Engineers—Vancouver, B. C.

8-12 Maintenance Coatings Short Course (for painting contractors, architects, maintenance engineers)—School of Mines and Metallurgy, University of Missouri, Rolla

10-13 British Architects' Conference—Cardiff, Wales

11-13 Annual Convention, New Jersey Chapter, A.I.A., and New Jersey Society of Architects; theme, "Planning is Architecture"—Berkeley-Carteret Hotel, Asbury Park, N. J.

15-20 International conference on electronic computers and information-processing techniques, sponsored by UNESCO—Paris

17-20 Silver Anniversary Convention, National Society of Professional Engineers—Hotel Commodore, New York

20-21 38th Annual Convention, National Council of Architectural Registration Boards—Hotel Monteleone, New Orleans

21-26 Annual Meeting, American Society for Testing Materials—Chalfonte-Haddon Hall, Atlantic City

21-27 Ninth International Design Conference in Aspen; theme, "Communication: The Image Speaks"—Aspen, Colo.

21-27 Annual Conference, American Library Association—Washington

22-24 12th Annual Conference on Aging—University of Michigan, Ann Arbor

22-26 Annual Convention, American Institute of Architects—Roosevelt Hotel, New Orleans

22-26 52nd Annual Meeting, Air Pollution Control Association—Hotel Statler-Hilton, Los Angeles

22-29 Annual Meeting, American Society of Refrigerating Engineers—Lake Placid Club, Lake Placid, N. Y.

28ff 60th Annual Meeting, American Society of Landscape Architects; through July 1—Palmer House, Chicago

28ff 13th National Meeting, Forest Products Research Society; through July 3—San Francisco

July

26-30 Annual Meeting, American Institute of Planners—Hotel Olympic, Seattle

August

24-27 Annual Convention, American Hospital Association—Coliseum and Hotel Statler, New York

Office Notes

Offices Opened

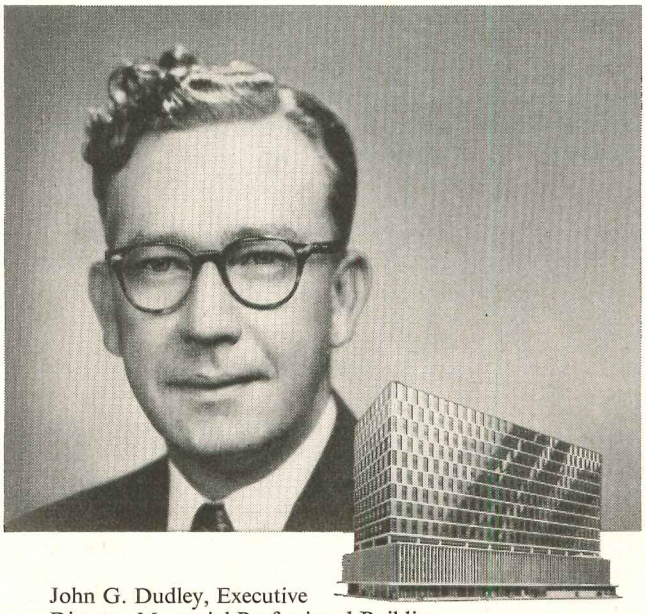
Stanley B. Brundage, A.I.A., has opened an office in the Blair Bldg., Norfolk, Va.

Campbell-Evans, Consulting Engineers, is the name of a firm estab-

continued on page 296

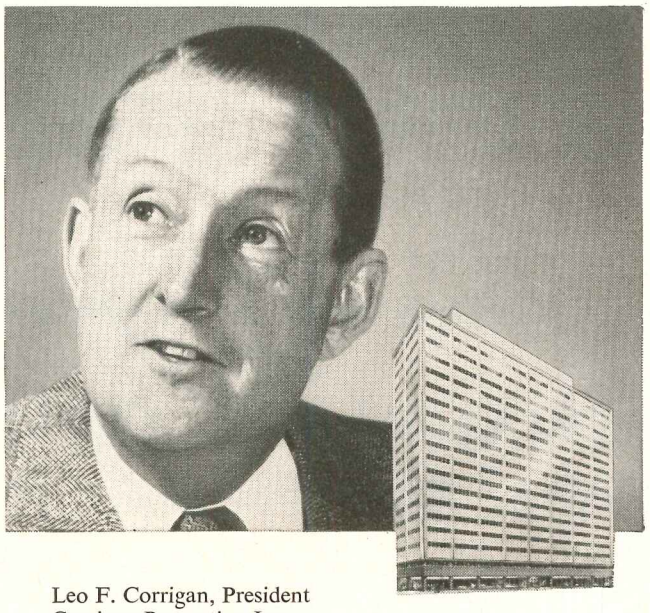
Executives experienced the

PRE-INVESTMENT EYE-OPENER"



John G. Dudley, Executive
Director Memorial Professional Building,
Houston, Texas.

"We, together with our architects and engineers, reviewed available elevator systems before purchasing our vertical transportation system for our new Memorial Professional Building and found that the Westinghouse Automatic Traffic Pattern with Traffic Sentinel would provide us with the finest operatorless elevators. The installation to date has confirmed our 'pre-investment' investigation."



Leo F. Corrigan, President
Corrigan Properties, Inc.
Dallas, Texas

"Our investigation of operatorless elevators led us to select Westinghouse for our new office building in Dallas (211 N. Ervay) and the success of this installation satisfied us to proceed with an additional job at the Biltmore Hotel in Los Angeles. We are happy that we spent the time reviewing the many Westinghouse outstanding features that are giving us the best vertical transportation system."

WESTINGHOUSE ELEVATOR INVITES YOU TO EXPERIENCE THE "30-MINUTE PRE-INVESTMENT EYE-OPENER"

YOU CAN JUDGE FOR YOURSELF THE BENEFITS OF THESE TRULY MODERN ELEVATORS—JUST AS THESE EXECUTIVES DID

See this fascinating demonstration that takes only 30 minutes of your time. It is an opportunity to put your personal stamp of approval on the elevator system that contributes to the reputation of your building now—and in the future. The choice of elevators, a major capital investment, is one of the most important decisions you make for your building. A behind-the-scenes demonstration will add confidence to that decision, which you make only once. Make arrangements now by writing to: R. H. Wagner, General Manager, Westinghouse Elevator Division, 150 Pacific Avenue, Jersey City 4, New Jersey—or call the Westinghouse Elevator Division Sales Office in your city.

WESTINGHOUSE ELEVATORS AND ELECTRIC STAIRWAYS

J98769AA

YOU CAN BE SURE...IF IT'S Westinghouse

lished by Donald C. Campbell, mechanical engineer, and Dale V. Evans, electrical engineer, at 3381 Gorham Ave., Minneapolis 26.

Lawrence H. Mallard, A.I.A., has opened an office at 2820 Lawndale Dr., Greensboro, N. C.

Roger Orkin has opened an office for the practice of architecture at 5346 N. Lincoln Ave., Chicago. He formerly was with Olsen & Urbain and Shaw, Metz & Dolio.

Rouse, Dubin & Ventura, Architects-Engineers, is the name of the firm formed by Marshall J. Rouse, A.I.A., Milton Dubin, and August F. Ventura at 55 West 42nd St., New York 36.

Edward X. Tuttle Jr., A.I.A., has opened an office at 30801 Northgate Dr., Birmingham, Mich.

Robert W. Wening, A.I.A., has opened an office at 106 Lakeview Bldg., North Palm Beach Village, Fla.

Firm Changes

Arendt-Mosher-Grant, Architects, is now the name of the firm formerly known as Howell, Arendt, Mosher, & Grant. Henry W. Howell, A.I.A., has retired. The principals are Wallace W. Arendt, Glen G. Mosher, and Robert S. Grant, all A.I.A. Address: 116 E. Sola St., Santa Barbara, Calif.

Clark, Daily & Dietz, Consulting Engineers, announces that Thomas C. Shedd, professor of structural engineering, emeritus, University of Illinois, is now an associate. Offices: Champaign-Urbana and Carlyle, Ill., and Memphis, Tenn.

A. M. Kinney Associates, architects and engineers, announces that Charles R. Greenidge has joined the firm as a project architect. Addresses: 2912 Vernon Pl., Cincinnati 19, and 60 E. 56th St., New York.

Masten, Hurd & Gwathmey is now the name of the firm formerly known as Masten & Hurd. A new principal, Cabell Gwathmey, A.I.A., has been added. Address: 526 Powell St., San Francisco 2.

Frederick A. Muhlenberg, F.A.I.A., announces that Frederick A. Muhlenberg & Associates is now the name of his firm. Former names were Muhlenberg, Yerkes & Muhlenberg and, more recently, Muhlenberg, Yerkes & Associates. Address: 230 N. Fifth St., Reading, Pa.

New Addresses

Bellante & Clauss, Architects-Engineers, 1617 Pennsylvania Blvd., Philadelphia.

William Bruce Reiner, A.I.A., 225 W. Winton Ave., Hayward, Calif.

Arthur W. White, Architect, 132 S. Court St., Orlando, Fla.

New Urban Program at Yale

Yale University announces a new program in urban planning and traffic engineering. The program, intended to train students who will be qualified to deal with overall aspects of urban and regional transportation problems, extends over two academic years and includes classroom work, laboratory, group projects, field problems, etc.

The curriculum is formed by combining portions of the regular courses offered by the Bureau of Highway Traffic (Frederick W. Hurd, director) and Graduate Program in City Planning (Christopher Tunnard, director). Students who satisfactorily complete the new program are awarded a master of city planning degree and a certificate in highway traffic. An engineering degree is prerequisite.

Further information may be had from the Secretary to the Faculty in City Planning, School of Art and Architecture, Yale University, New Haven, Conn.

more news on page 304

at new IBM® plant...

provided by Barber-Colman automatic controls and air distribution components working together in a "combination system"

It is impossible to provide uniformly comfortable air conditioning without the correct correlation between *air movement* and *room temperature*. When occupants complain that a room is alternately too warm, too cool, or too drafty, you can be sure that the correct relationship between air distribution and temperature control has not been met.

The scientifically correct relationship necessary to provide human comfort is plotted on the Barber-Colman Comfort Chart shown at the right. This requires closely co-ordinated functioning of the system's automatic controls and its air distribution units.

Barber-Colman combination systems are *guaranteed* to meet Comfort Chart requirements because . . .

Barber-Colman Electronic controls provide fast-acting accurate response with design flexibility offered by no other means of temperature regulation.

Barber-Colman Uni-Flo engineered air distribution products provide quiet, draft-free diffusion of conditioned air for uniform comfort throughout the occupancy zone.

Barber-Colman assumes the undivided responsibility for complete system performance.

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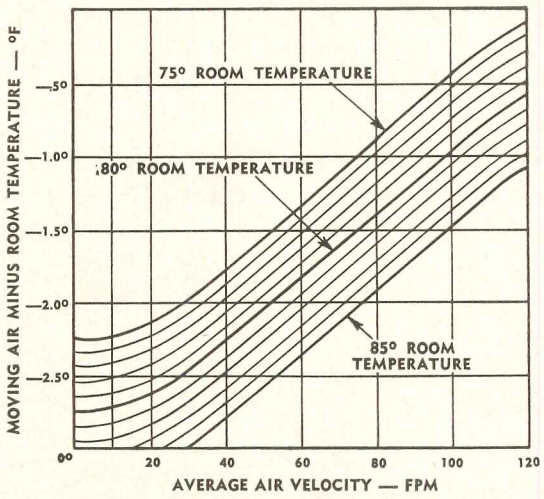
✻ COMFORT CHART



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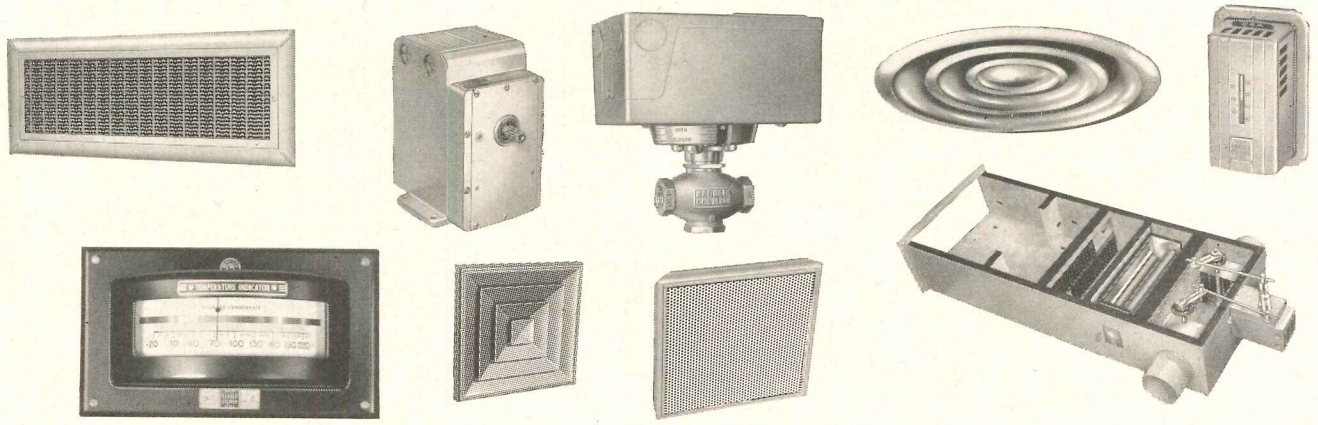

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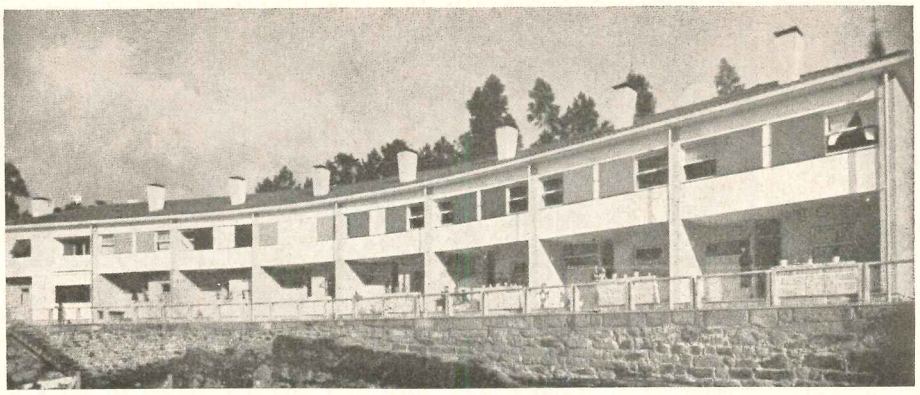
Recent Portuguese Architecture Shown in Traveling Exhibit

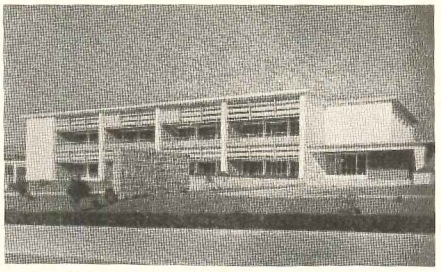
Among the exhibits being circulated by the Traveling Exhibition Service of the Smithsonian Institution is "Contemporary Portuguese Architecture." The 50 structures included were chosen as representative of the architecture of the country from 1951 to 1958.

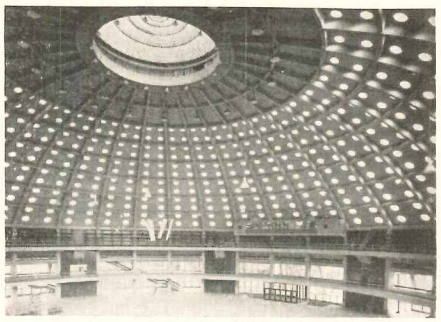
The exhibition is sponsored by the Portuguese Embassy; it was organized by the Portuguese National Secretariat for Information and the National Syndicate of Architects.



A brief introductory section shows Portugal's architectural heritage. The contemporary works are divided into three broad classifications (see captions).

Top: From the "Living" group: Workers' dwellings, Oporto, 1954. Arménio Losa and Cassiano Barbosa, architects. *Above:* From the "Working" group: Office and bank building, Oporto, 1951. Cunha Leão, Fortunato Cabral, Morais Soares, architects





From the "Care of Body and Spirit" group: *Upper:* Primary school, Lisbon, 1953. Rui Atouguia, architect. *Lower:* Sports pavilion, Oporto, 1955. Carlos Loureiro, architect

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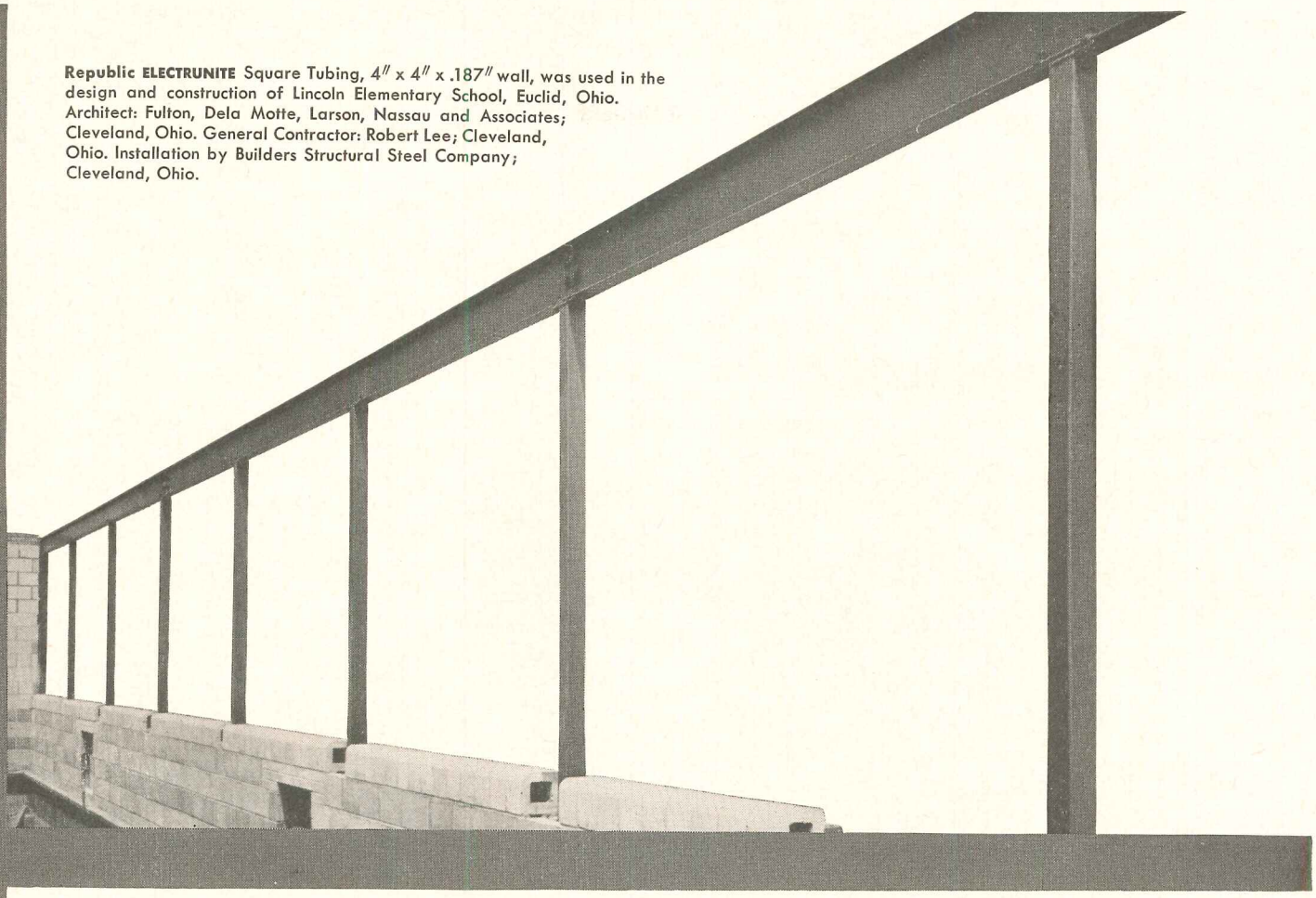

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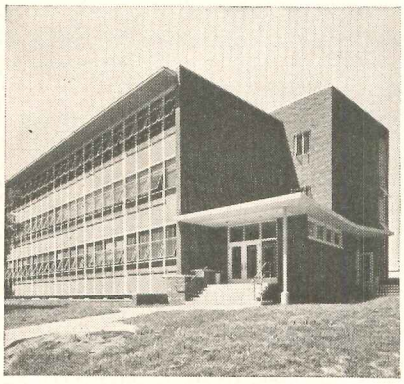

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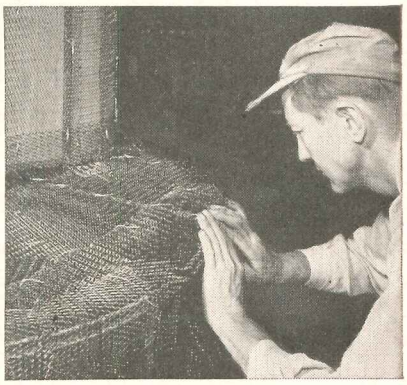

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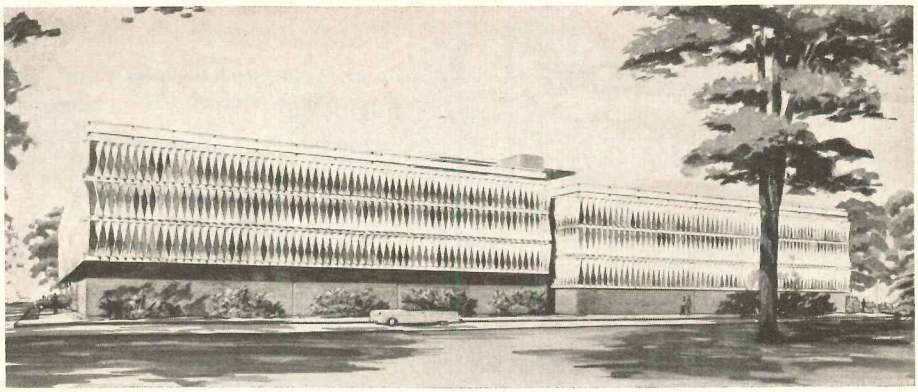
Parking Garage for Hospital Features Concrete Grill

This parking garage for the staff of the Henry Ford Hospital in Detroit is under construction. Albert Kahn Associated Architects and Engineers designed it; Darin & Armstrong, Inc., is general contractor.

The five-story, self-parking structure holds about 870 cars. It has an open-deck, split-level arrangement of floors connected by short ramps, bridged at half levels. There are two passenger elevators and three staircases. On the ground floor are facilities for servicing and car washing.



The grill, intended to shut off parking activities from view and give an attractive appearance, is composed of some 1800 doubly curved white precast concrete panels of hyperbolic paraboloid shape. Natural light is let into the center of the building by separating the two sets of floor slabs and placing a skylight, 8 ft wide and 200 ft long, across the top of the wall.

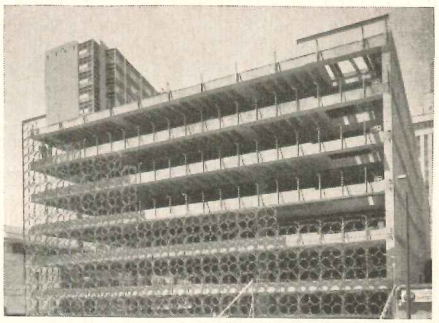
Parking Garage in Texas City Features Aluminum Rings

The Associated Parking Garage in Dallas is clad in intertwined circles of solid cast aluminum, anodized gold. Completed some months ago, it is shown below under construction. A. J. Greenberg and Mark I. Finfer of Chicago were the architects and engineers; the James Stewart Co. was contractor.

The outer rings are 4 ft 6 ins. in diam, the inner ones 2 ft 3 ins. They are bracketed to the concrete by aluminum tubes.

Prestressed, pre-cast concrete in 50-ft spans is used for the interior. Two spans are for parking; the third ramp-span is used for maneuvering and parking. Total capacity is 400 cars.

Below its six parking floors the building houses seven stores at ground level. The structure, which cost about $550,000, was built for the Canal-Randolph Corp.; Parking Facilities of Texas, Inc., operates it.



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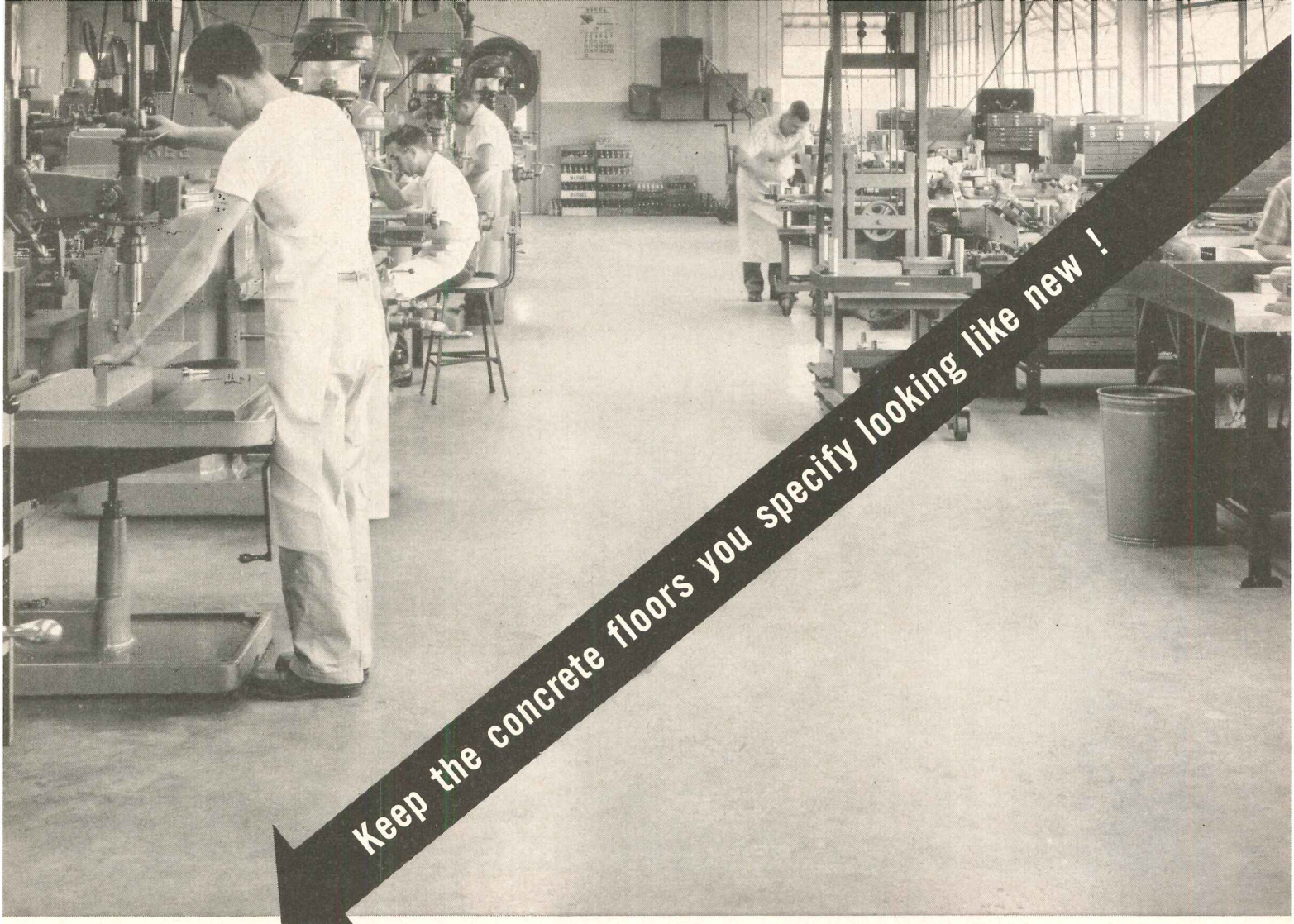

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The Record Reports

Advice on Houses for Clients Would Interest Architects

Students at Pratt Institute's School of Architecture have written a client's guide or vade-mecum, called "An Investigation of the Small House." Dean Olindo Grossi of Pratt says that the book was written for "everybody who is building or plans to build a house; is living in or plans to live in a house. . . ." He adds that architects may read it too.

The book does not teach the client how to design his own house, or discuss styles of architecture. It attempts to show him how to formulate his ideas about what he needs and to communicate them to the architect.

For the purposes of the study, the book is divided into three parts: The Function Makes the Plan, Small House Structure, and Mechanical Equipment.

The first section traces the growth and decline of a typical family, and shows its needs over the years in terms of the five functional zones of the house: food preparation, eating, living-recreation, bathing and washing, and sleeping and dressing.

The report stresses that design must begin with the individual. A typical man is chosen, and the scope of his reach, called the "arc of convenience," is established. With reference to this, storage spaces, room arrangements, and even the relationships of one room to another, are discussed. The reader is reminded that none of the zones can be considered in isolation from the other four. Food preparation and living-recreation come together in entertaining, and so on.

The proper uses of materials are shown in the second section. Wood, steel, and stone are discussed, as well as plastics, paper-core panels, and pre-stressed concrete. Many exotic structural systems are discussed without any mention of their applicability to small houses. For instance, it might have been useful to mention the Small Homes Council's study that showed conventional stud-framing to be the most economical means of constructing a house.

The third section is a survey of mechanical equipment. Basic information is presented about cooling, heating, lighting, insulation and plumbing.

The book tells the architect nothing new, but it does give the prospective client an excellent view over the problems his architect has.

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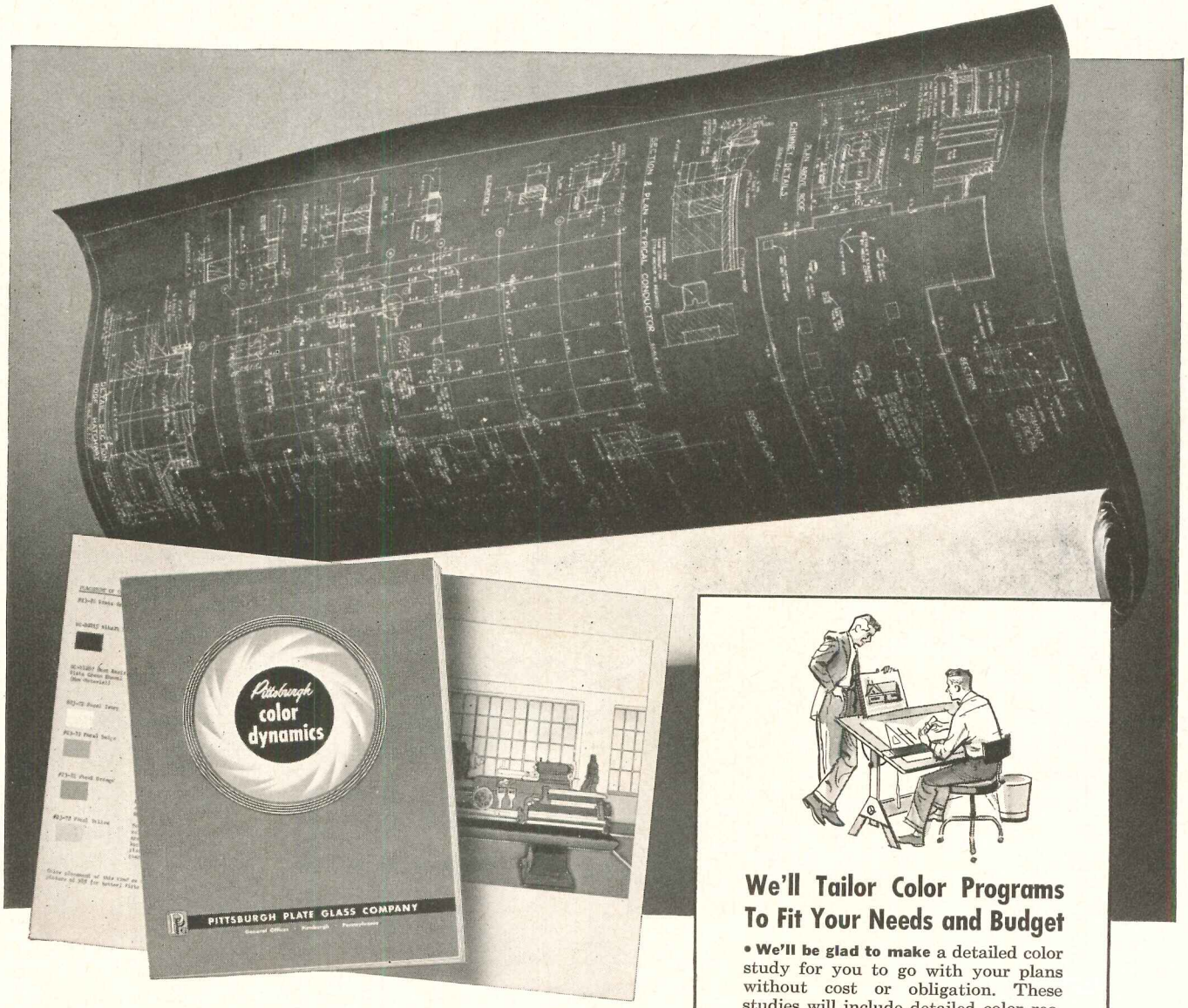

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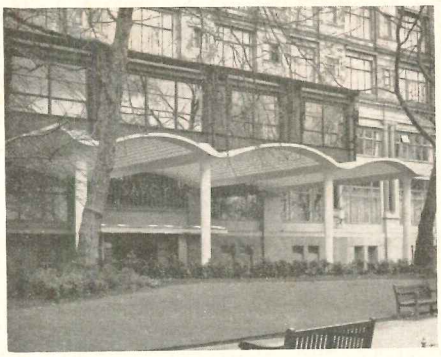
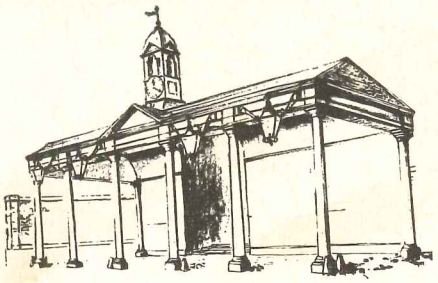


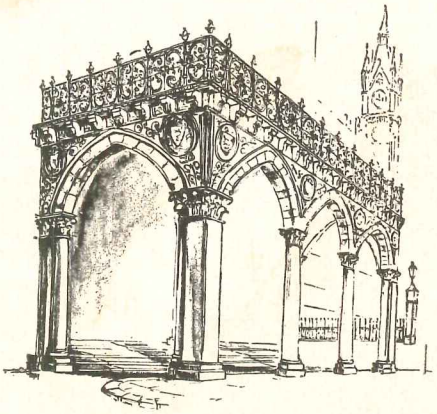
London Motor-Age Porte Cochere Recalls Horse-Age Examples

A new porte cochère, designed by Eric Janes, A.R.I.B.A., was recently built at one of the entrances to the Savoy Hotel in London (photo above). Of light reinforced concrete, with glass lenses, it is intended to take several cars at a time and to contrast with the Embankment façade, designed in 1910 by Collcutt & Hamp.

To commemorate the occasion, the hotel issued a booklet recalling earlier portes cochères. In the days of horse-drawn vehicles, the minimum width was only 7½ ft. One erected in that era still stands on the west side of Kensington Palace (upper drawing), built between 1689 and 1727, and designed first by Sir Christopher Wren and then by William Kent. This porte cochère has been ascribed to Wren.

The other drawing shows the Gothic porte cochère of the Midland, a railway hotel built 1868-1874 and designed by Sir Gilbert Scott.





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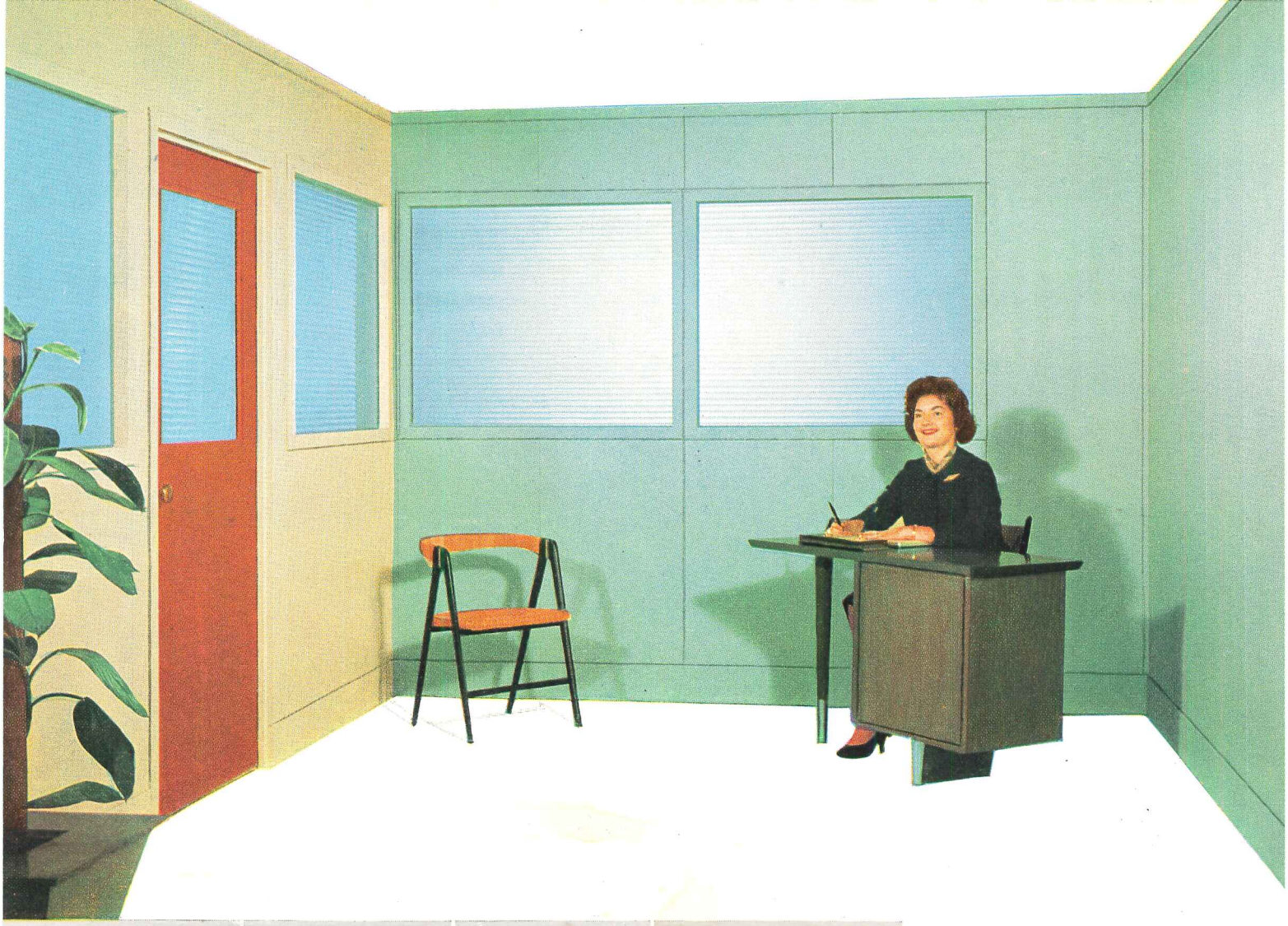

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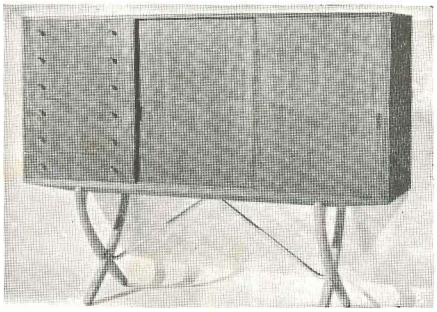
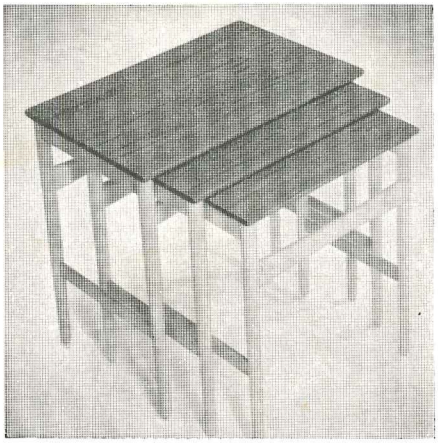
The Record Reports

The Furniture of Hans Wegner: A Look at a Recent Exhibit

An exhibition of work of Hans Wegner, the Danish furniture designer, was held earlier this year at Georg Jensen, Inc., New York. About 70 different pieces (three examples are shown) were on view.

Mr. Wegner, also an architect, was first known in this country for his "Classic Chair," imported by Jensen in 1951. All his work shows his skill as a craftsman. Among his honors are recent citations from the Architectural League of New York and the Philadelphia Museum School.





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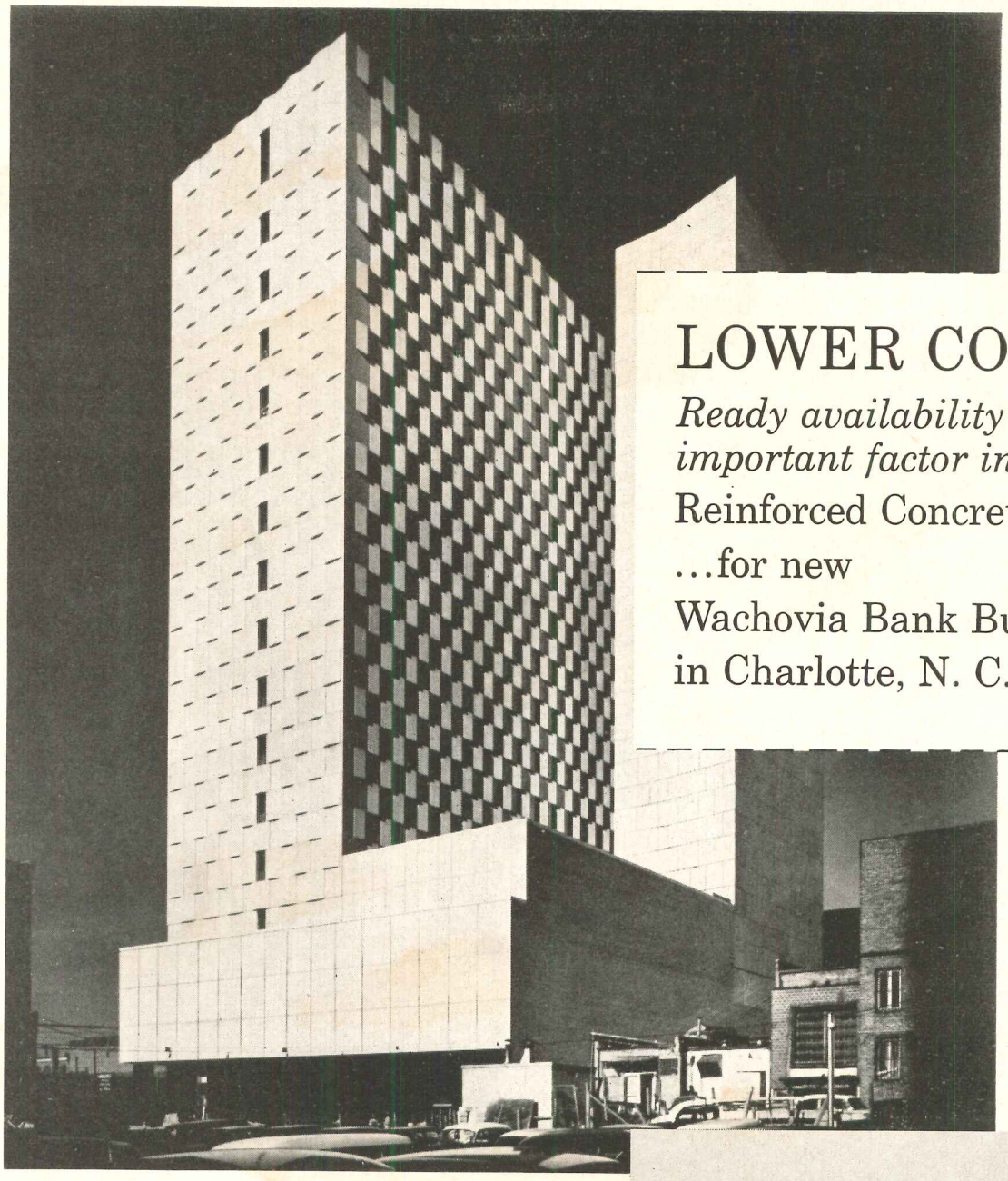

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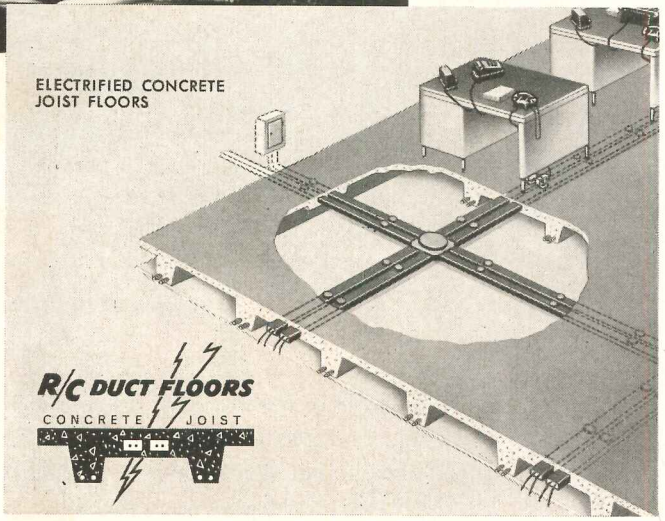

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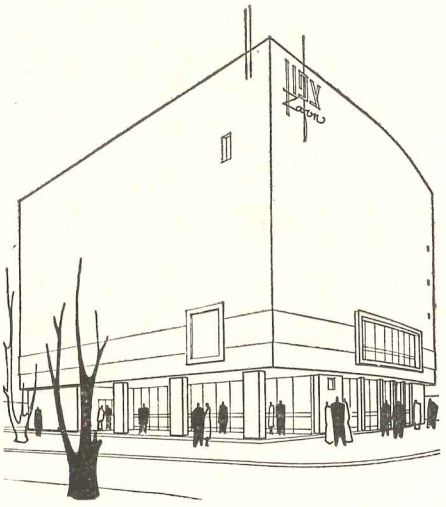
The Record Reports

Israeli Cinema Includes Café, Large Screen, Meeting Hall

The Zafon Cinema in Tel-Aviv, Israel, recently finished, has four levels. Ludwig Schorr of that city was the architect. The building is intended to have a commercial-public character without interfering with the residential areas surrounding it.

The basement contains a small hall for meetings, etc., air-conditioning machinery, and a lobby built to double as an air-raid shelter.

The main lobby, café, and covered entrance on the ground floor are combined visually by the use of glass walls and uniform ceiling and lighting treatment.



The amphitheatrical auditorium (shown below) on the next level has no balcony; it seats 363 in the lower section and 365 in the upper. The cinemascope screen measures 12.1 by 5.5 m. The upper level contains air-conditioning ducts, etc., and a small lobby.

The auditorium side walls are plastered in rough plaster, and the back in acoustical plaster. The building was constructed of inexpensive materials.

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Washington Topics

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The GSA administrator argued against these two provisions. Mr. Floete testified that the agency already had a going alteration program of some magnitude—almost $75 million this fiscal year. As for Congressional committee approval of funds for both new and altering work (where projects cost over $250,000), he said it would involve "a myriad of administrative detail affecting literally thousands of construction, extension and repair projects."

He suggested, instead, that Congress require a report from his agency of proposed major projects as a prerequisite to appropriation of money.

The Jones bill carries no sum for the program. Administrator Floete, however, said there was a reasonable need for new public building construction between 1960 and 1965 of from $1 billion to $2 billion, or around $350 million per year.

Talking about longer range needs, he said an added $4 billion worth of buildings probably would be needed by 1975. He offered the comment that he could immediately submit a list of approximately 100 unauthorized projects in all parts of the country if the Jones bill were put through.

Discussing recent cost trends, the witness said he was satisfied with the situation during the past year. Contractors have bid under government estimates consistently and out of nearly 4500 contracts, the average cost per sq ft ran at $20. He called this "a very reasonable price."

Out of the 105 projects authorized under the lease-purchase program, 28 now are under construction or completed, 17 are under contract by direct appropriations, 33 are not under contract but will be by fiscal 1960, and 21 are not yet funded.

Hill-Burton Progress Noted, Future Plans Discussed

A frank appraisal of hospital construction and bed need was given the centennial meeting of the Kansas State Medical Society recently by Elliot L. Richardson, assistant secretary of the U. S. Department of Health, Education, and Welfare.

In his remarks, Mr. Richardson described the Hill-Burton hospital construction program as "a tremendous success" but added quickly that most of the gain in new beds had been offset by population increases,

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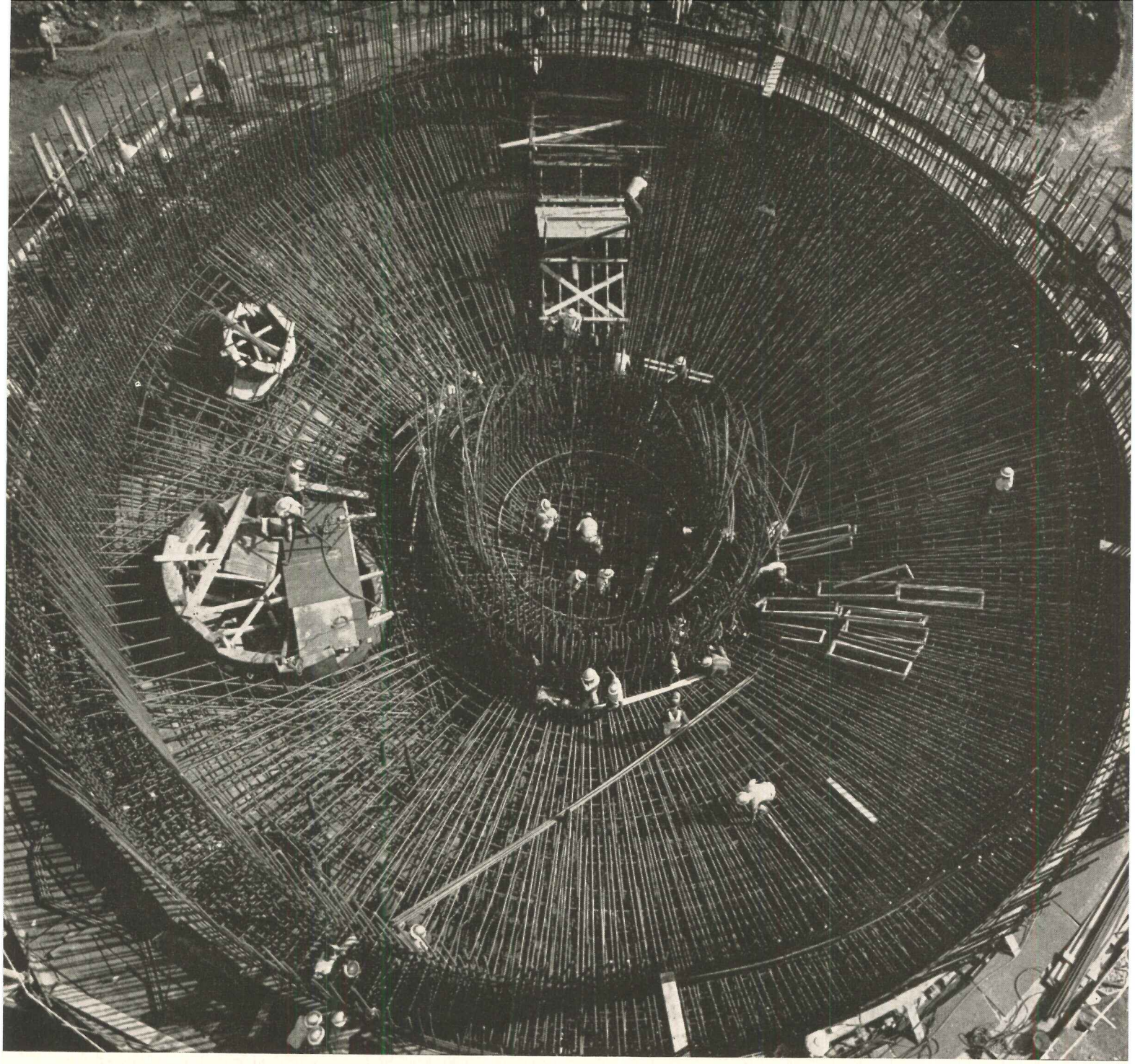

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Washington Topics

by obsolescence, and by abandonment of old facilities.

"Like Alice and the Red Queen, we have had to run like blazes to stay in the same place," he observed.

Eleven years ago this country had approximately 60 per cent of the general hospital beds it needed. Now, with the help of nearly $1 billion in Federal money and more than $2 billion in state, local, and private matching funds, 75 per cent of the estimated need for general hospital beds has been met. And the greatest success of the program has been realized in the general hospital category, Mr. Richardson said.

In addition, he continued, we now have 73 per cent of the tuberculosis beds needed as compared with 46 per cent in 1948. In mental hospitals the bed supply has slipped from 55 per cent of need in 1948 to 53 per cent today.

Altogether, Mr. Richardson reported, state plans show a remaining deficit for 880,000 beds of all types and 323,000 nursing home beds.

HEW's new approach to operation of the Hill-Burton program was described with regard to high cost of hospitalization. The growing concern with this problem has prompted Department officials to place new stress on the construction of diagnostic and treatment centers. As the Act now reads, the government makes grants for building such centers only where they are formally affiliated with a hospital.

"Although we have considered the complete elimination of this requirement, our present view is that it should be removed only for mental health clinics and diagnostic and treatment centers in remote areas," Mr. Richardson said.

More important as an impediment to construction of more out-patient facilities, however, is the lack of readily available insurance against the cost of out-of-hospital care and treatment, the HEW official explained.

The Department also has under study some new methods of providing funds for the repair and modernization of existing hospitals. Among the suggested approaches: earmarked grants, direct low-interest loans, mortgage insurance, or some combination of these.

Looking forward toward research in design to reduce cost of hospitalization, HEW is considering an expansion of the research and demonstration authority of the Hill-Bur-

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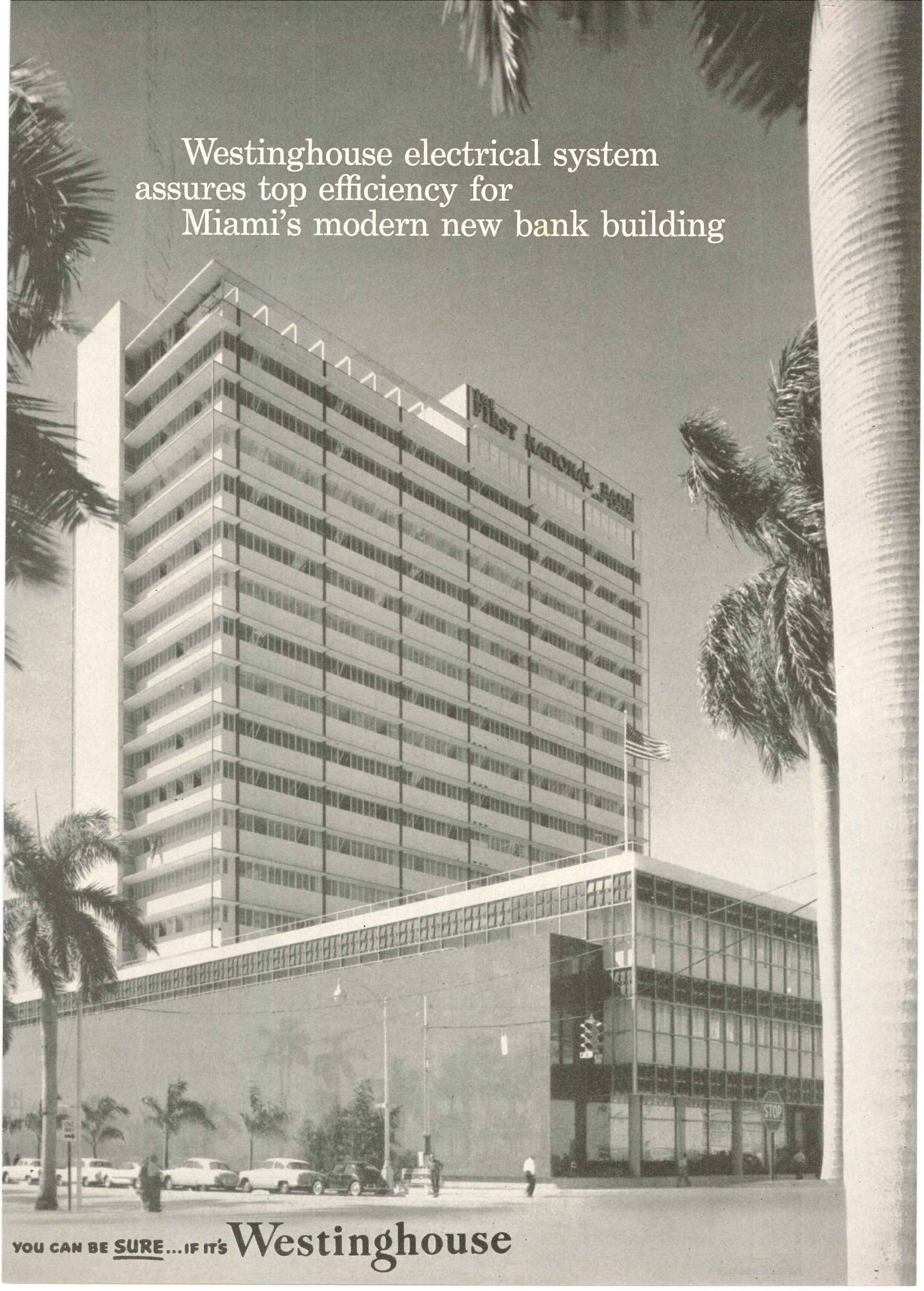
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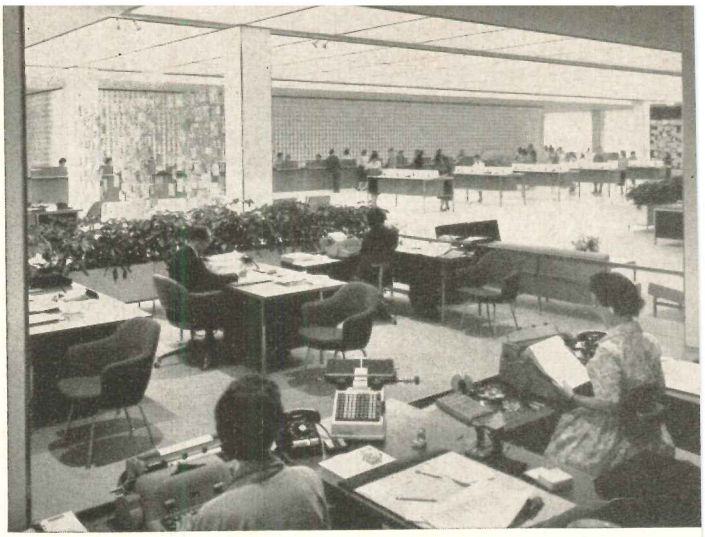
Cover photo: Newest face on the downtown Miami skyline is the 18-story First National Bank Building —Florida's largest and Miami's oldest bank. The office tower, served by five Westinghouse high-rise elevators, offers more than 10,000 square feet of rentable area per floor.



Over-all view of the new bank lobby. Contrasts in lighting levels and in functional colors are used here to delineate areas. Traffic flow is well defined through use of a modern metal sculptured screen.

J-94122-2

Herbert H. Johnson, Weed-Johnson Assoc., Architects and Engineers, points out advantages of a bus duct vertical-rise electrical system, the electrical backbone of this new bank and office building, to Edward Clarke, Project Manager for Rooney-Turner, General Contractors; Charles W. Butsch, Westinghouse Construction Specialist, and Ralph W. Crum, President of The First National Bank of Miami.

Washington Topics

ton program. This would provide for direct grants—grants not included in state allotments—for the construction of experimental structures.

Finally, the future plans also embrace an amendment which would consolidate the chronic-disease hospital and nursing home categories of the program into a new "long-term care facilities" category and increase the authorized appropriations for this type of building.

Mr. Richardson noted that his agency supported the provision in the pending housing bill. This calls for mortgage insurance for proprietary nursing home construction coupled with assurance through state licensing agencies of adequate standards of care.

Military Housing Program Scored Again by Byrd

Military housing was on the pan again with Senator Harry F. Byrd (D-Va.), who issued another of his critical statements which scored both the Federal Housing Administration and the Armed Services for their handling of some aspects of this program.

After noting that there are more than 156,000 units in over 600 military housing projects with mortgages totaling nearly $2 billion, Sen. Byrd said the Comptroller General of the United States had uncovered significant findings applicable to the Capehart program as a whole in his investigation of this type of housing at Fort Belvoir, Va., home of the Army Corps of Engineers research laboratories.

Specifically, Senator Byrd represented the report as "revealing"—

1. Lack of emphasis on economy; 2. excessive costs incurred for title search and insurance; 3. failure of FHA to adjust bid price to comply with terms of bids; and 4. inadequate criteria for size of housing units.

According to Senator Byrd, these represent "examples of gross waste and negligence inherent in backdoor Federal spending outside of effective appropriations control."

Current military housing programs indicate, he continued—

1. Use of loose programs capable of windfalls to builders and money lenders.

2. Long term private mortgages against Federal military agencies.

3. Payment of premiums by one Federal agency (Army, Navy or Air Force) to another Federal agency (FHA) for insurance of mortgages

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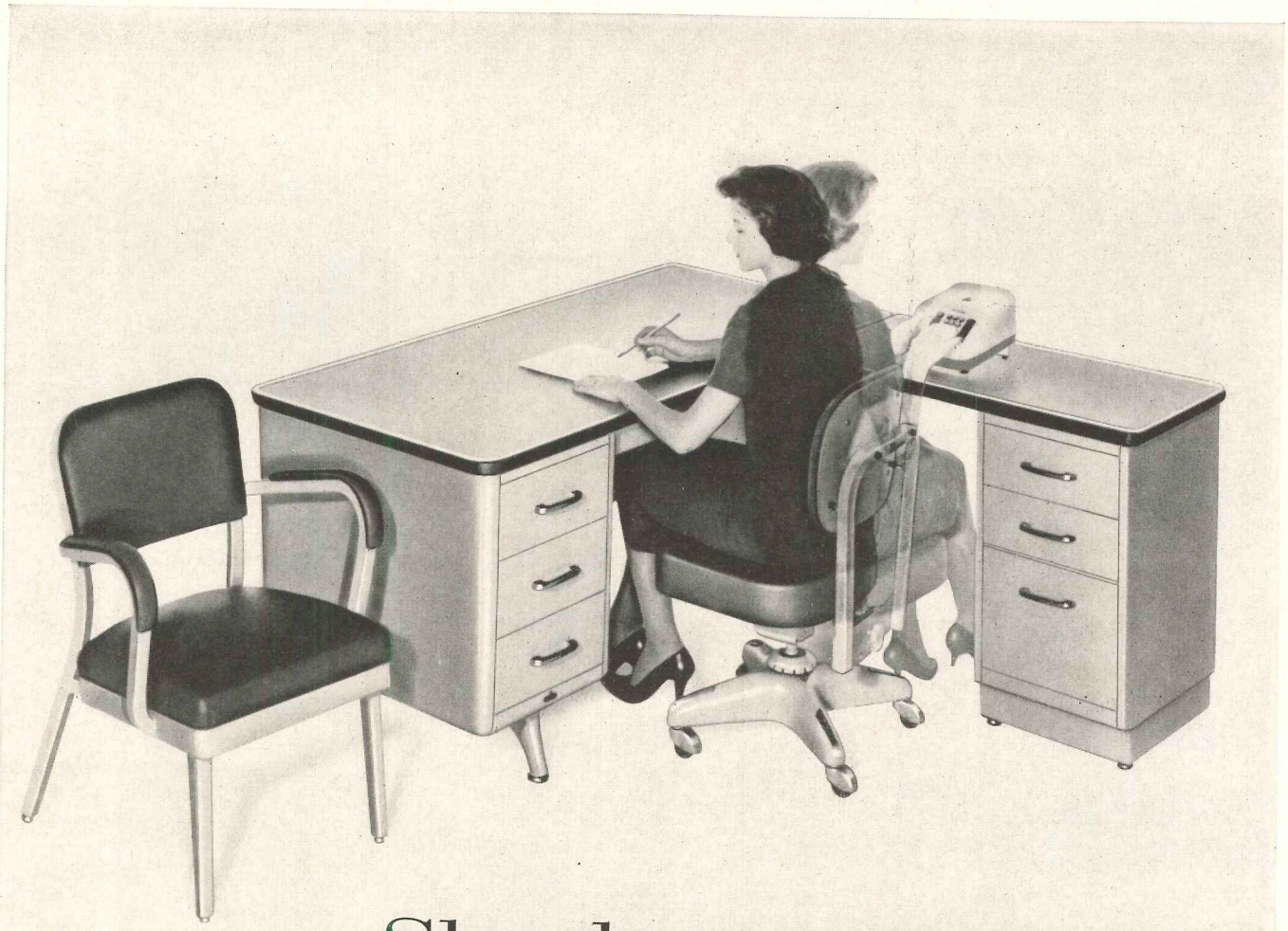

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held by private lenders with payment guaranteed by the military agency.

4. Marketing to the public through a third Federal agency (Federal National Mortgage Association) of privately held mortgages secured by Federal property on military installations.

Senator Byrd's curt comment: "The nonsense is obvious."

The General Accounting Office report said the $10 million Capehart project at Fort Belvoir was built on government land in Federal ownership for over 100 years. Yet, GAO found, $15,000 was spent on the search and insurance. The report suggested that this could have been saved by the simple means of having the Justice Department certify the government land title.

The CG's office also charged that cost of the project was increased deliberately to a point as close as possible to the $16,500 unit ceiling specified by Congress. The low bid was said to have been increased nearly $700,000 for "additives", raising the unit cost to $16,345. The extras included ceramic tile for bathrooms, attic fans, aluminum gutters, asbestos shingles and patios for officers' houses.

GAO also noted that the original four- to eight-unit row house plan was re-drawn to provide two-family units after Congress boosted the unit cost allowance from $13,500 to $16,500.

The report also brought out that the contract was raised by some $242,000 for increased labor costs whereas the FHA estimated that the contractor actually had to pay but $125,000 in higher labor charges. On this point, according to GAO, the Army ignored a contract requirement that the FHA estimate be used.

U. S. Housing Racial Policy Reiterated by Mason

Housing Administrator Norman P. Mason reiterated his views on racial policy in the government's housing programs when he appeared recently before a meeting of the National Urban League in New York.

He revealed at the time that to deal comprehensively with the housing problems confronting minorities, he would create soon a new "leadership nucleus" of inter-group relations advisers composed of various racial backgrounds. The director will report directly to Mr. Mason, he said.

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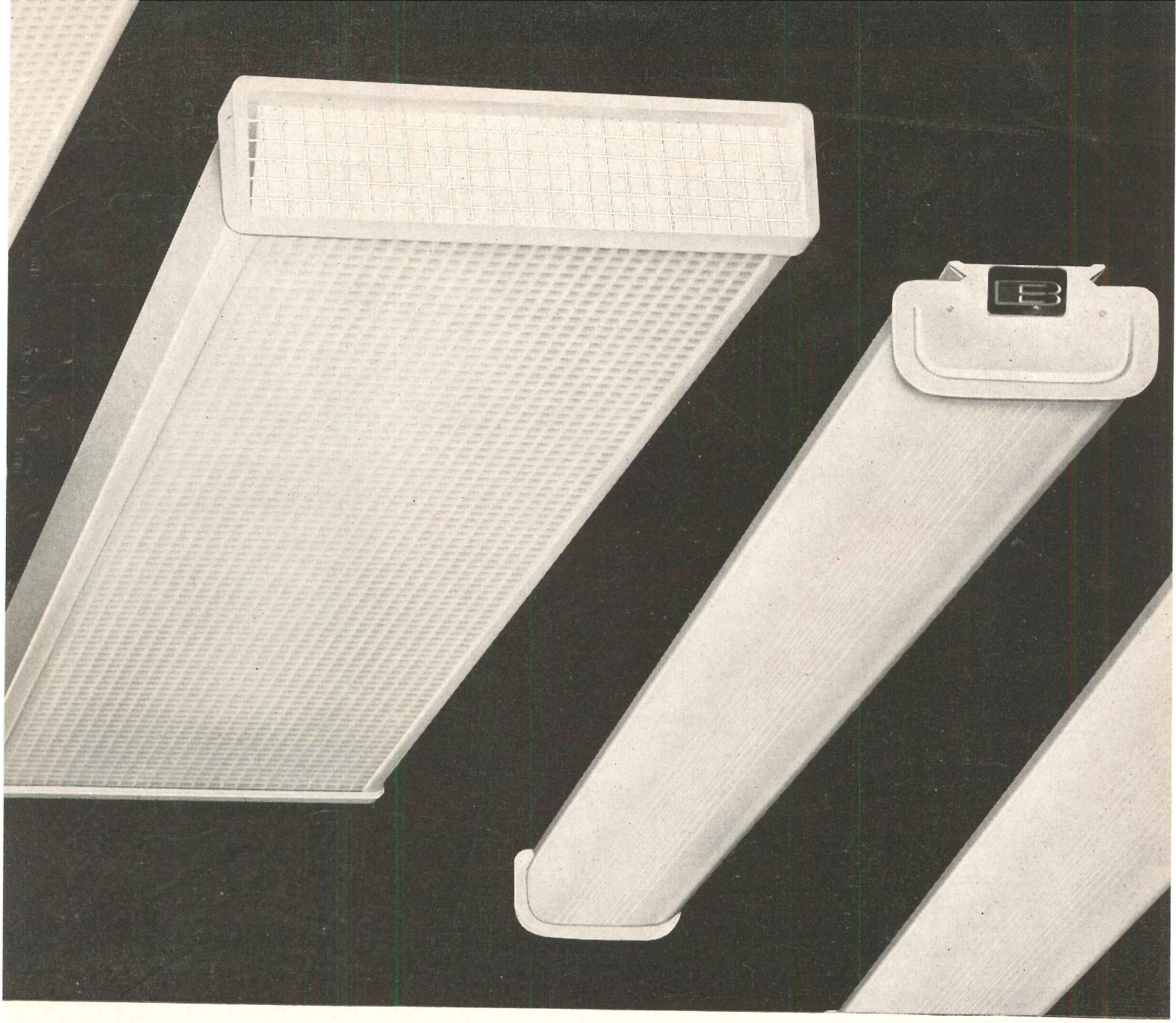

How Benjamin Electric Company uses EVENGLO® polystyrene on commercial lighting fixtures

The Benjamin Electric Manufacturing Company, Des Plaines, Illinois, an established leader in fluorescent lighting equipment, is another well-known manufacturer making wide use of EVENGLO in commercial lighting equipment. Take the case of the smart and stylish Catalina line, which has molded EVENGLO polystyrene louvers and extruded side panels. Easily detached and easily cleaned, these light stabilized EVENGLO plastic louvers and side panels aid in the reduction of glare, give uniform diffusion without shadows and help create an over-all pleasing effect in commercial establishments.

For another example, in the new, economical Benjamin B_2 line, EVENGLO polystyrene is extruded into a wrap-around shield. This dramatizes the clean, even sweep of the entire fixture and makes lamp installation easier. You merely lower either side of the lightweight plastic diffuser and insert the lamps. In sum: you have an attractive fluorescent luminaire that costs only a little more than a bare-lamp unit.

For more information on EVENGLO polystyrene, or for a list of lighting manufacturers currently using EVENGLO polystyrene in fluorescent fixtures, please write to Koppers Company, Inc., Plastics Division, Dept. AR-69, Pittsburgh 19, Pennsylvania.

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Washington Topics

He promised that states and communities that have legislated against discrimination in housing will have unswerving support of HHFA and its constituents.

The advantages of an urban renewal program, he continued, must not be obtained at the price of reducting the living space available to minorities. He noted, too, that he was following with keen interest the current series of hearings by the Federal Commission on Civil Rights. The FCCR is looking into housing, as well as other policies, holding its hearings in scattered locations throughout the country.

House Group Okays Bill to Spur Depressed Area Building

The House Banking Committee has approved a $251 million area redevelopment (or "depressed area") bill despite strong rumblings of protest which went so far as to include a veto threat. The House committee's figure compared to $389 million approved by the Senate and only $53 million requested by the President.

The legislation, as it goes to the full House, calls for a $150 million loan fund to be apportioned equally between rural and industrial areas needing help. This money would encourage construction of new plants and the enticing of new industries. In addition, there would be available $50 million in loans and $35 million in grants to qualified areas for construction of public facilities. The more liberal Senate version proposed a revolving fund of $100 million for the public facility construction loans and $75 million in appropriations for grants. Where the House measure contained provision for $150 million in revolving loan funds for both rural and industrial locations as it came from committee, the Senate's approved bill specified $200 million to be split evenly between the rural and industrial centers.

The President vetoed a similar bill last year and it did not become law.

Another free-spending measure was entertaining criticism from many sides as it was heard before a House Banking subcommittee. This was the amending legislation which would push the present $100 million authorization for assistance in construction of community facilities to $1 billion.

The Administration, through John C. Hazeltine, Commissioner of Community Facilities in the Housing and

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Home Finance Agency, opposed the Democrats' proposal on grounds it would boost Federal spending next year above levels budgeted by the President.

The Commissioner said the suggested interest rate formula in the amending bill would force the use of Federal money where private capital might otherwise be called upon to do the job.

Murray-Metcalf School Bill Gets Labor Support

Shortage of safe classrooms has been listed by organized labor as one of the basic problems in education today. The spokesman was Arnold Zander, vice president of the Industrial Union Department of the A.F.L.-C.I.O. He testified before the Senate subcommittee on education, supporting the Murray-Metcalf bill (S. 2), which he said dealt directly with the problems of school construction and teachers' pay. This measure can hardly be called a crash program in view of the need, he said.

The Murray-Metcalf proposal would allocate to each state $25 per year per estimated school child (five to 17 years of age) until 1961, when the allotment would go up to $50. In the period 1961-1962 it would increase to $75 and in 1962-1963 would go to $100 per child. This would provide an estimated $1,085,000,000 for the states in the first year of operation, rising to $4,745,900,000 in 1962-1963.

What is not needed, said Mr. Zander, is any further generalized study of the problems. To hesitate further in the face of the overwhelming evidence is sheer irresponsibility, he added.

The Administration's school aid program, also under committee consideration last month, would assist construction programs totaling $3 billion over a five-year period at the rate of $600 million a year. This would result in construction of about 75,000 classrooms which would not otherwise be built, in the opinion of the U. S. Office of Education.

The Administration's proposals on education were characterized by Mr. Zander as "making a mockery of the Federal responsibility."

"It is hard to believe," he told the Senate subcommittee, "that it is offered with serious intent; in fact, it was called in the press a 'counter-attack' on other pending bills."

Required Reading

Function . . . *cont. from page 60*

tive possibility that, despite the presence of craft and nautical building traditions, these buildings owe much of their esthetic appeal to the influence, however diluted, of the architectural principles of the Renaissance. His principal argument in favor of a functional tradition as opposed to a Georgian survival seems to be the difference in scale between the buildings he illustrates and that of earlier English buildings. Other early 19th-century buildings exhibit this phenomenon, however; and one might imagine another author framing his explanation in terms of "Piranesi-like space" or the "Megalomaniacal scale of Romantic Classicism."

Even if the reader is not convinced by the concept of a functional tradition, however, he cannot fail to be impressed by the buildings presented. By bringing them to the attention of a larger public, Mr. Richards has performed a highly significant service. —JONATHAN BARNETT

Of General Interest

OUR HOUSE. *By Olgivanna Lloyd Wright. Horizon Press, 220 W. 42nd St., New York 36. 308 pp., illus. $4.50.*

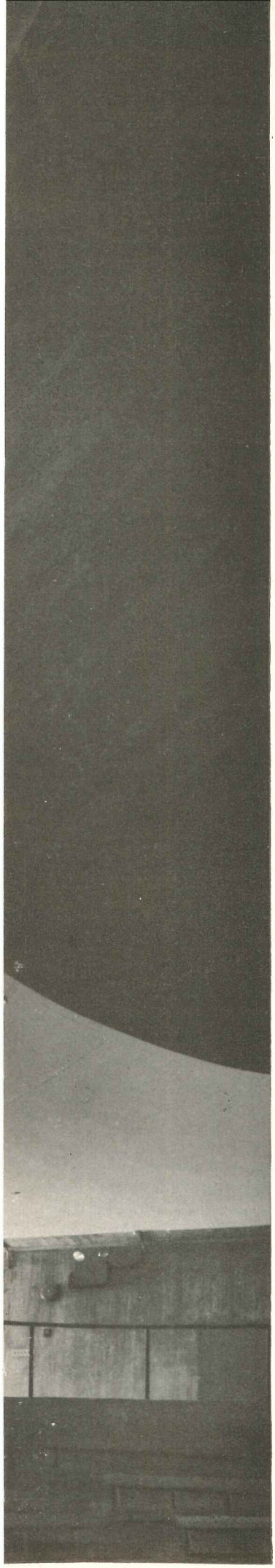
In this book—published, by sad coincidence, within a few days of Frank Lloyd Wright's death—Mrs. Wright chats, for the most part with charm and perception, about life with her husband at the Taliesins and elsewhere from their marriage in 1926.

THE OBSERVER'S BOOK OF ARCHITECTURE. *By John Penoyre, A.R.I.B.A., and Michael Ryan, A.R.I.B.A. Frederick Warne & Co., Inc., 210 Fifth Ave., New York 10. 223 pp., illus. (rev. ed.). $1.25.*

This rather appealing little (less than 4 by 6 ins.) handbook describes and illustrates building in Britain "from Saxon times to the present day." Illustrated "visual indexes" and glossaries of terms are included.

WONDERS OF THE WORLD. *By Leonard Cottrell. Rinehart & Co., Inc., 232 Madison Ave., New York 16. 249 pp., illus. $4.50.*

The 14 architectural and other "wonders" described enthusiastically by Mr. Cottrell include seven ancient and seven modern ones: the Great Pyramid, the Lighthouse at Alexandria, the Hanging Gardens of Babylon, the Colossus of Rhodes, the Tomb of Mausolus, the Statue of Zeus at Olympia, the Temple of Diana at Ephesus, the Golden Gate Bridge, the Empire State Building, Sputnik, Calder Hall, the Grand Coulee Dam, the Snowy Mountain Hydroelectric Scheme (Australia), and the Manchester radio-telescope.



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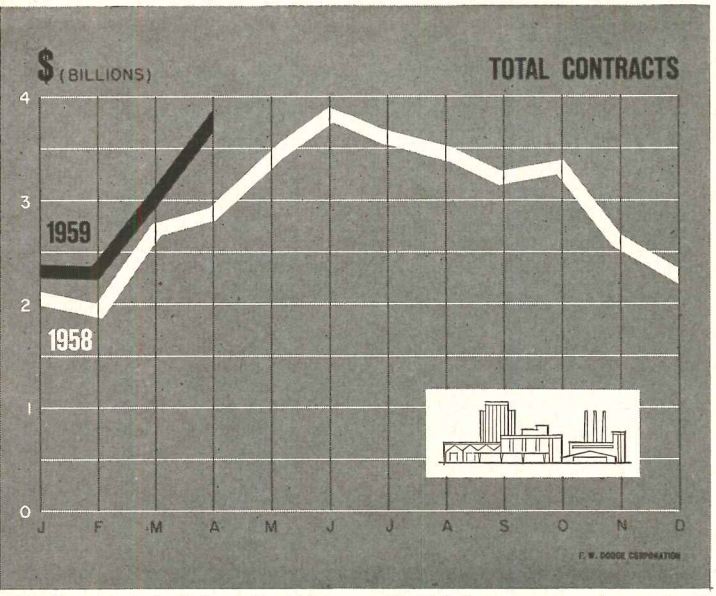
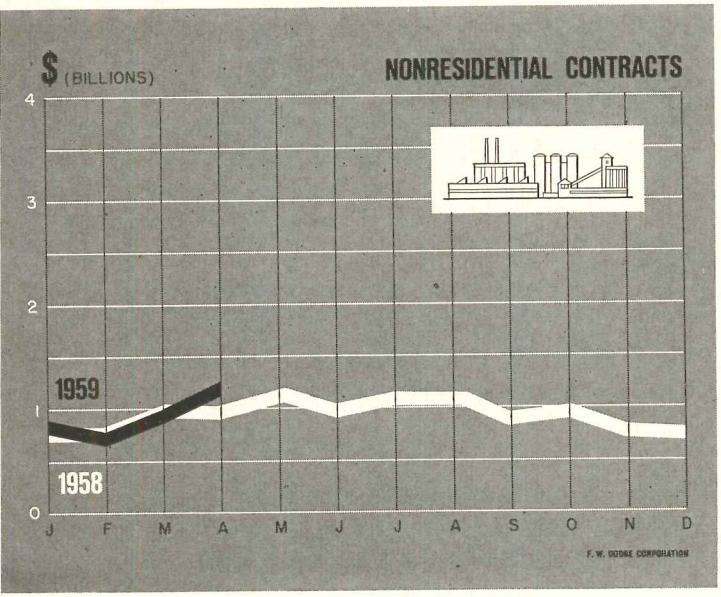
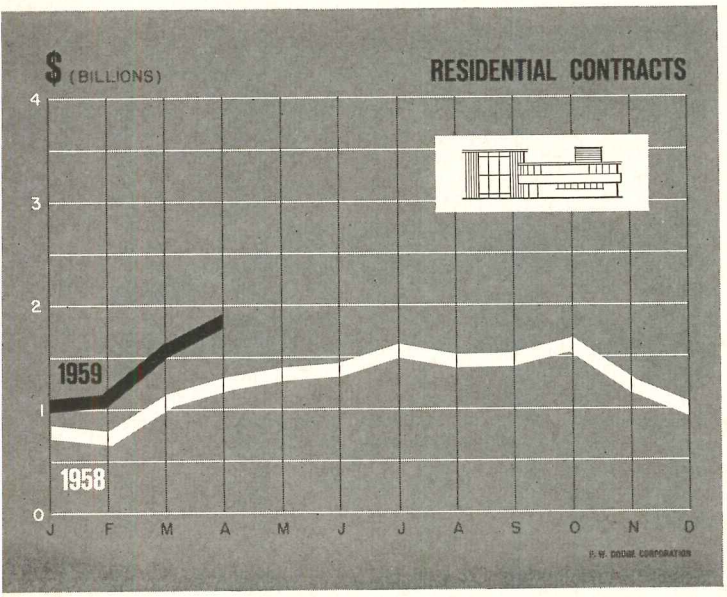
Yale Hockey Rink
Architect: Eero Saarinen
Photographer: Joseph Molitor

Current Trends in Construction



Total contracts include residential, nonresidential, heavy engineering contracts





HOUSING STARTS and dwelling units are terms bandied about with abandon by practically everybody in and around the building business, and you would think they were universally understood by now. But we are continually surprised at the tendency, even on the part of those who know better, to equate housing and single-family homes. The truth is that a substantial (and variable) portion of our new housing units each year is in multiple dwellings, a fact fraught with significance for designers, builders and manufacturers. Socially, the dwelling unit is a satisfactory statistic: one unit houses one household. But architecturally and economically, a dwelling unit in an apartment is vastly different from a single-family house. The distinction is rapidly acquiring greater importance.

BACK IN THE BOOM of the Twenties, apartment building was at its relative peak. In 1927 and 1928, about 32 per cent of all the units built were in structures housing three or more families. In the period after World War II, apartments fell into the doldrums, accounting for considerably less than 10 per cent of all units in several years. Suddenly, however, there has come a shift in emphasis. According to the Dodge contract figures, multi-family structures (3 or more units) provided just 10 per cent of all the new dwelling units in 1956. In 1957, the figure jumped to 14 per cent; in 1958 it reached 17 per cent, and so far in 1959, it has been about 20 per cent.

WHY THE SUDDEN UPSURGE in apartment building? The simplest explanation is that we have neglected this type of housing for some years, and are suddenly waking up to the need, particularly on the part of young and old families without children, for rental housing. But there is much more that could be said. Single-family housing is a great absorber of land and facilities; as it extends further into the suburbs it may be slowed down, at least temporarily, by problems of cost and transportation, and the lack of developable land. It would be unwise to conclude that the single-family home will lose its pre-eminence in the foreseeable future, but it would also be foolish to overlook the resurgence of apartment building as a major factor in new housing.

IN LAST MONTH'S RECORD, an intriguing article by Pena and Caudill emphasized "designing for needs." One of the problems over which the designer has little control is the fact that needs may change during the life of the structure. A conversation we overheard last week in a restaurant bears this out. One man asked another if he had gone to any baseball games this season. The second man said he hadn't, because he didn't like the narrow seats at the ball park. "You know why those seats are so narrow?" the first man said seriously. "That place was built during the depression, and nobody had enough to eat in those days!"

GEORGE CLINE SMITH
Vice President and Economist
F. W. Dodge Corporation

ARCHITECTURAL RECORD

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SEMI-ANNUAL INDEX VOLUME 125 JAN.–JUNE 1959

ABBREVIATIONS: BTS—Building Types Study; AE—Architectural Engineering; TSS—Time-Saver Standards.

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