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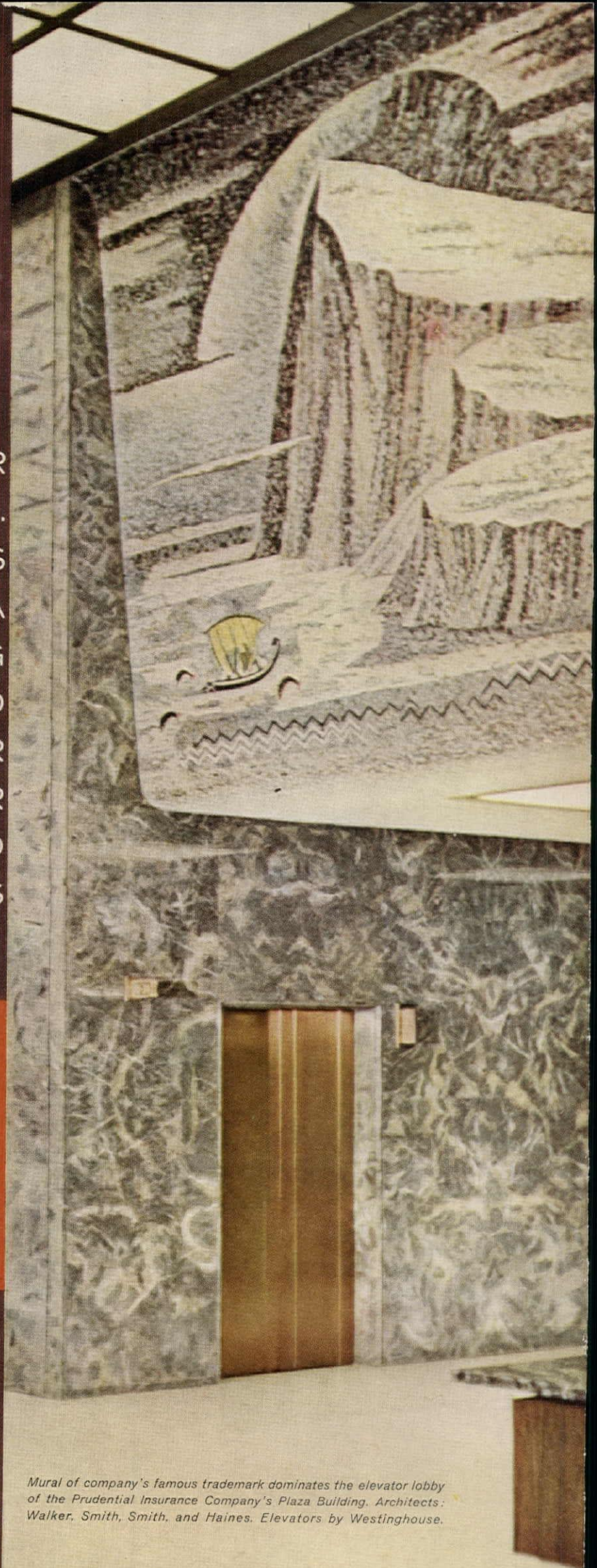
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*Mural of company's famous trademark dominates the elevator lobby of the Prudential Insurance Company's Plaza Building. Architects: Walker, Smith, Smith, and Haines. Elevators by Westinghouse.*



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Cover: Le Corbusier's Ronchamp Chapel.  
Photo by ©Ezra Stoller & Associates.  
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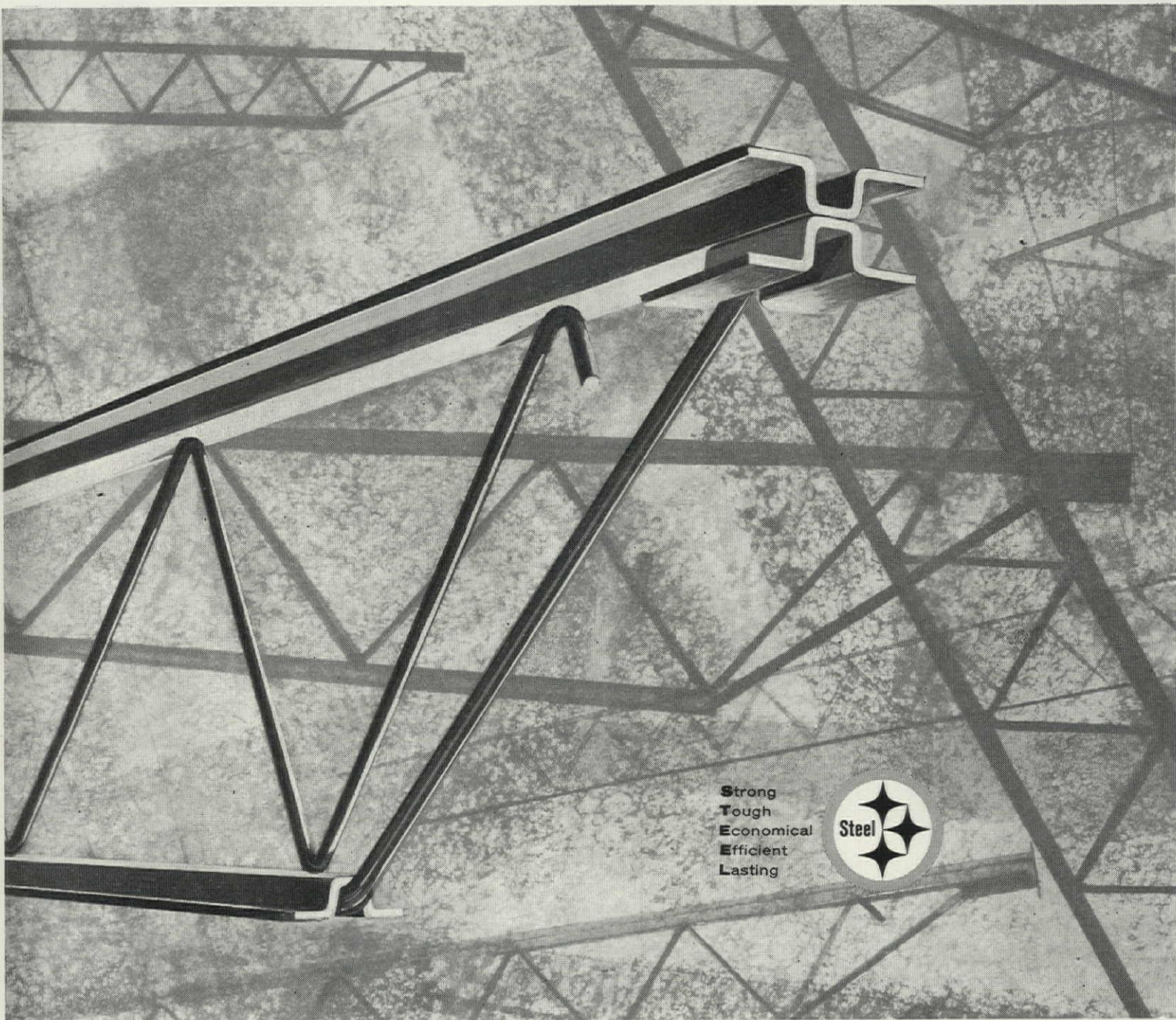
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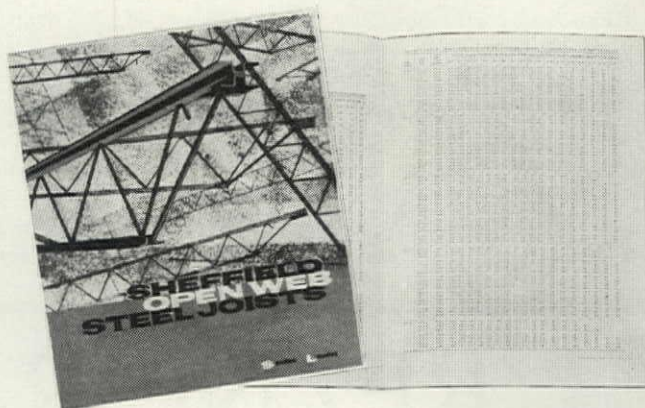


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Tough  
Economical  
Efficient  
Lasting



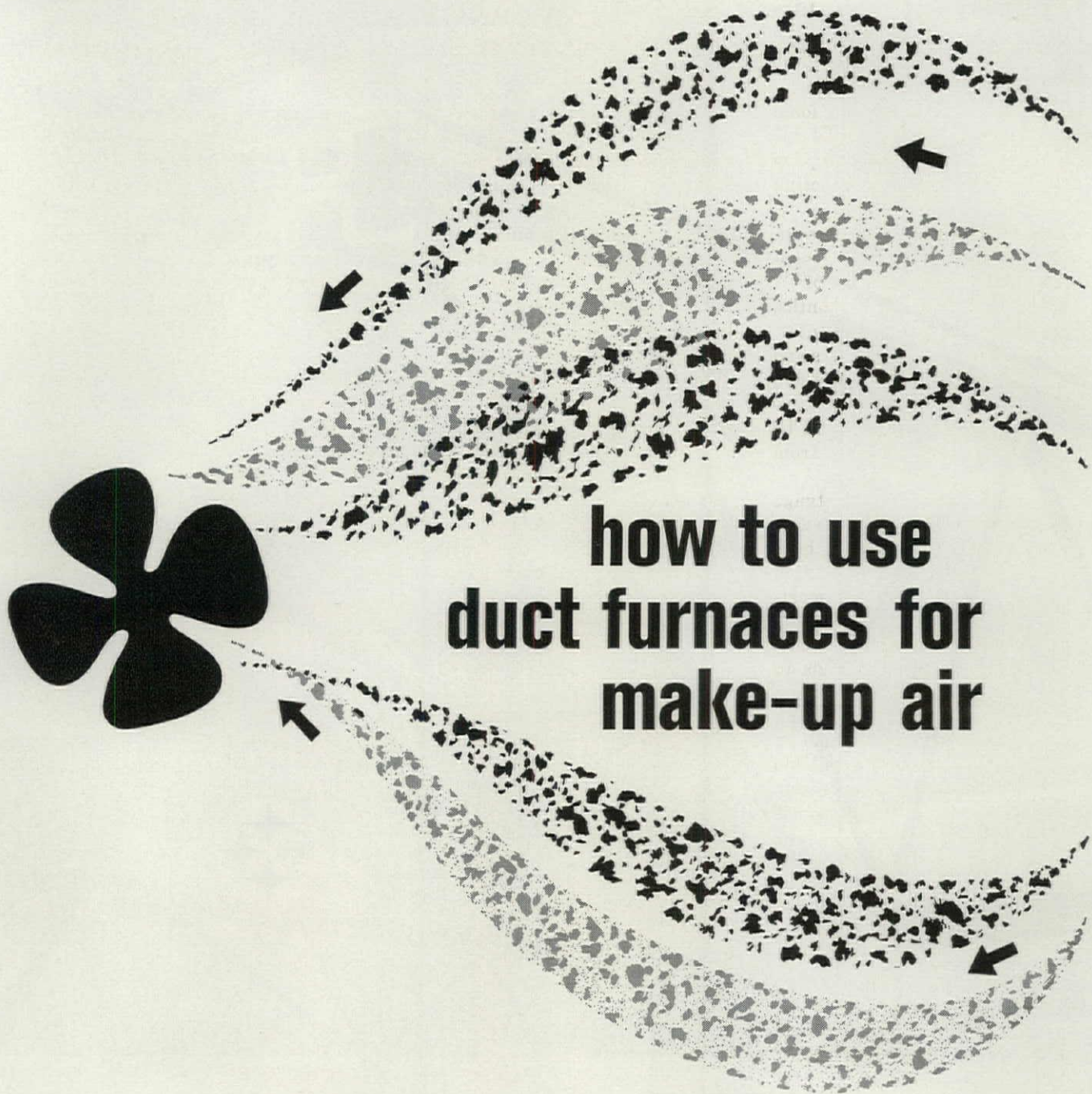
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**Sheffield Division**





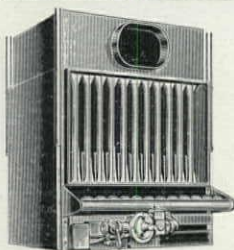
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## President pushes construction programs to offset recession, proposes expanded urban renewal

To help stimulate the laggard national economy, President Kennedy used his executive powers last month to push three government programs affecting construction:

► The Post Office Department was instructed to step up its \$270 million construction program, getting all of it under way within the next ten months, instead of the scheduled 18 months. About \$100 million of federal funds and about \$169 million of private funds will be spent for new construction or rebuilding. The private buildings will be erected under lease commitments from the post office.

► The Federal National Mortgage Assn. (Fanny May) was instructed to advance the prices at which it both buys Federal Housing Administration and Veterans Administration mortgages and resells the loans it already owns, thus encouraging financial institutions to use more of their funds to make new mortgages. At the same time the Federal Home Loan Bank Board announced a program to make an additional \$1 billion of credit available to savings and loan associations to spur home building. As one Midwestern savings and loan officer commented, however: "We don't need any of this extra credit. What we need is loan applications."

► Housing and Home Finance Agency and Urban Renewal Administration officials were instructed to hold a series of regional meetings with state and local officials in an effort to speed up local renewal and redevelopment projects.

In rapid succession President Kennedy also sent to Congress a series of special messages proposing expanded federal programs for housing and urban renewal, assistance for school and college construction, and stepped-up highway building, all of which could make construction hum in the years ahead.

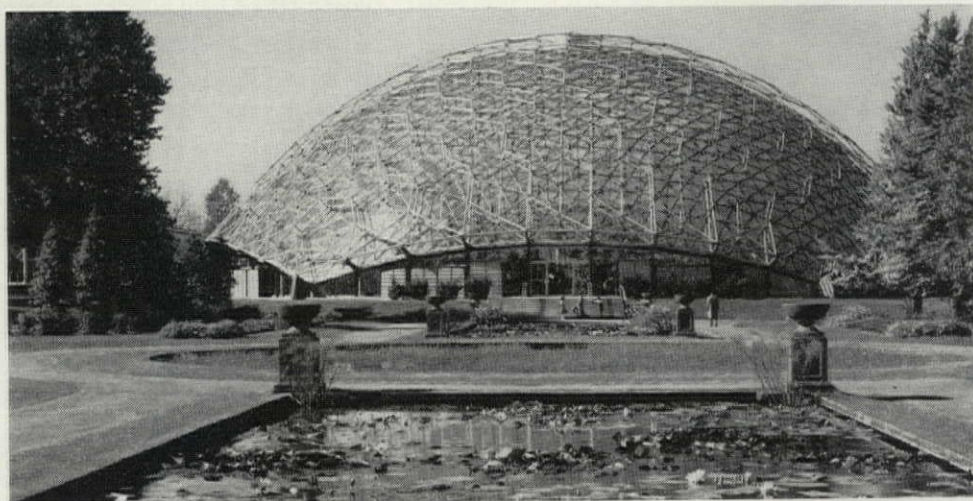
*Housing and urban renewal.* In this message the President said he favored creation of a Cabinet-rank Department of Housing and Urban Affairs. (Previously he had called this proposed new agency a Department of Urban Affairs.) Home-building lobbyists have insisted that such a department should give priority to "housing." Its revised title might win greater home-building industry support for the President, but was hardly likely to eliminate opposition of the National Association of

Real Estate Boards. Vigorously opposed to federal spending, the Realtors' organization estimated that this Kennedy program would cost almost \$5.5 billion dollars, including \$2.5 billion for urban renewal grants, \$1.9 billion for 100,000 new public housing units, \$240 million for extra subsidies for elderly occupants in public housing, and \$100 million for loans and grants for "open space" acquisitions.

The American Institute of Architects, on the other hand, endorsed the Kennedy proposals as a "vital and long-awaited program to restore the vigor of America's cities and protect the 75 per cent of our national income which they produce." A.I.A. President Philip Will Jr. said: "For the first time we see a clear recognition of our most important domestic problem at the highest level of government—and one whose elements are stated in the correct

order." A special committee of 12 board members of ACTION, chaired by former HHFA Administrator Albert M. Cole, also endorsed the administration program. It recommended last month that President Kennedy "give highest priority to housing and urban development," that Congress authorize the President to reorganize existing federal agencies in these fields, and that "there be established a Cabinet post for housing and redevelopment." Four members dissented from the third recommendation, however. They were: Robert H. Levi, president of the Hecht Co., Washington, D. C.; Elmer L. Lindseth, president of the Cleveland Electric Illuminating Co.; Charles K. Rieger, vice president of General Electric Co.; and James W. Cook, vice president of American Telephone & Telegraph Co.

*School and college aid.* The President  
*continued on page 7*



HEDRICH-BLESSING

### CLIMATRON WINS REYNOLDS AWARD

For the first time since it was instituted five years ago the \$25,000 R. S. Reynolds Memorial Award for a significant structure "in the creation of which aluminum was an important factor" was won this year by a U. S. team: Joseph D. Murphy and Eugene J. Mackey, of St. Louis. Their 70-foot-high, 175-foot-diameter, aluminum and plastic Climatron in the Missouri Botanical Garden, said the jury, "was sensitively executed and strikingly appropriate for its purpose"—displaying tropical plants under controlled climatic conditions.

This year a Reynolds prize for architectural students was inaugurated too. First winner of the top \$5,000 prize, divided equally between the student and his school, was John L. Dewey, of the University of Cincinnati, who submitted a design for a roof of interlocking truss panels suitable for covering bus stations, display centers, and other limited-area activities that might require shelter in otherwise open shopping malls.







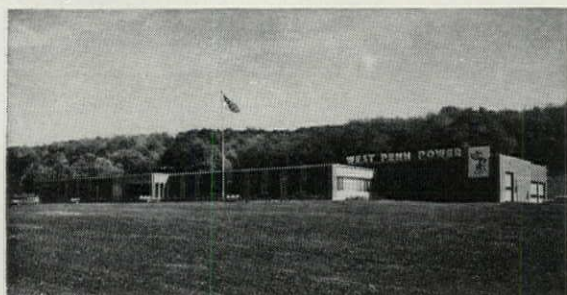
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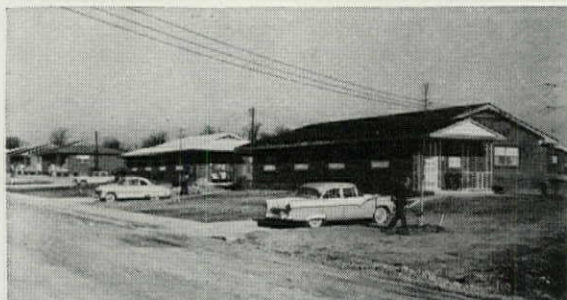
## VAPOR SEAL



• The Methodist Country House, Wilmington, Delaware. Architects: Dollar, Bonner, Blake and Manning, Wilmington, Delaware.



• West Penn Power Company, Connellsville, Pa. Architects: Hoffman and Crumpton, Pittsburgh, Pa.



• Federal Low Rent Public Housing Project, Elberton, Ga. Architect: James M. Hunt, A.I.A., Elberton, Ga.

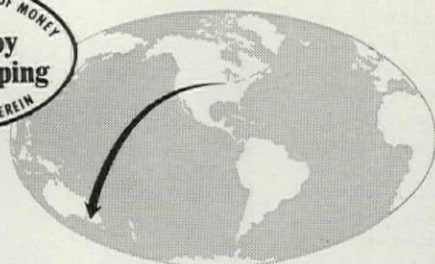


• Harris Trust and Savings Bank, Chicago, Ill. Architects: Skidmore, Owings and Merrill, Chicago, Ill.



• Northwestern Bell Telephone Company, Des Moines, Iowa. Architects: Tinsley, Higgins, Lighter and Lyon, Des Moines, Iowa.

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dent's various recommendations for federal aid for education carried a total price tag of \$5.6 billion. He proposed \$2.3 billion in grants to states for elementary and secondary schools that could be used for either construction or teachers' salaries; a \$577 million college scholarship program; \$1.5 billion for loans to build college academic buildings, and expansion to \$1.2 billion of the existing college housing construction loan program. These proposals stirred up the greatest controversy the Kennedy administration has faced to date, because the aid they would provide would not be available to parochial schools. Although Cardinal Spellman and the nation's Roman Catholic bishops insisted parochial institutions should qualify for this assistance on the same basis as public schools, President Kennedy took the position that this would be unconstitutional. No early resolution of this conflict is in sight and, unless it is resolved, the administration may not be able to obtain the enactment of any education aid measure.

**Federal highway program.** The President said the nation's \$37 billion interstate superhighway program would fall five years behind its 1972 completion date unless it obtains an additional \$900 million a year. To obtain this he proposed an increase in taxes on heavy trucks, Diesel oil, tires, and tubes, and cancelation of a scheduled one-cent-a-gallon reduction in the federal tax on gasoline. Of special interest to planners and city officials, he also stressed the importance of integrating highway and urban redevelopment programs and proposed that families displaced by federal highway construction receive federal relocation payments from highway program funds comparable to those paid to families displaced from urban renewal areas.

In his special messages to Congress the President gave only broad outlines of the various programs he proposed. Only when specific bills are introduced, worked over in committee, and finally enacted, will it become clear just how much federal assistance will be given to cities and highways.

## Chain of 30 domes planned to show building products

Plans for a 30-city network of building-product display and marketing service centers, each in a large aluminum geodesic-dome "Showcase," were announced last month by Mrs. Mildred E. Puddington, of Birmingham, Mich., originator and president of the venture



BUILDING PRODUCTS DISPLAY DOME

and the retired head of a multimillion-dollar plastics company. The R. C. Mahon Co., of Detroit and Torrance, Calif., will fabricate and erect all 30 structures under license from Kaiser Aluminum & Chemical Co., licensee of R. Buckminster Fuller. Total costs, including equipment and typical 10-acre sites, will exceed \$22.5 million, or an average of \$750,000 each.

The first Showcase, which also will house the headquarters of Showcase, Inc., the development and management organization, and Showdome, Inc., a separate corporation to handle the construction, licensing, and leasing arrangements, will be started in Detroit this summer. It is scheduled to be opened next January, and if everything goes on schedule there will be another opened every three weeks until the entire chain is completed late in 1963.

Building industry professionals and the consumer public will both be served through the Showcase system. According to Mrs. Puddington, who has been working on the project for almost four years, "Showcase will collate and centralize the primary marketing efforts for products and services in industrial, commercial, and residential building. It will offer permanent product-exhibit space, a brand new film service on building products, informational services, market research and related promotional services on a year-round and nationwide integrated basis." Showcase personnel will neither sell nor attempt to influence sales, but will answer product questions, provide literature, demonstrate equipment, forward "leads," and answer the questions of both professionals and the public on where specific products can be purchased. Co-operating manufacturers will be able to advertise nationally that their products may be seen at any "Showcase."

One of the most important Showcase features will be a new building-product film-information service using color microfilm, high-speed, easy-selection viewers and equipment for immediate black-and-white reproduction of any detail drawings, specifications or other information in each installation's indexed building-products film library.

Each stressed-skin Showcase dome

will be 64 feet high, have a diameter of 210 feet, and contain about 35,000 square feet of floor area. In addition to about 460 product display areas of 20 square feet each and about 120 12-square-foot sliding-panel displays, it will have several general-purpose rooms and areas suitable for conferences, sales meetings, and public gatherings (available free for nonprofit events).

Don Muntz of Mason, Muntz & Associates, Los Angeles architects and engineers for the structures, says the geodesic dome was adopted because it is easily built, it is suitable for exhibit needs, and, as "an architectural form it lends itself for use as a national promotional symbol."

## One out of 18 New Yorkers a public housing tenant

One person out of every 18 in New York City now lives in public housing, and, when all of its currently approved projects are completed, the city will be the landlord for almost one out of every 14 citizens.

This revealing estimate of the proportion of New Yorkers who now live in City Housing Authority buildings—not counting occupants of other publicly subsidized housing that receives the benefit of tax abatement or low-interest public loans—is derived from a report of the City Planning Commission recording the 25th anniversary of the start of the city's public housing program. This program now provides "almost 110,000 apartments for about 430,000 persons, a population greater than Newark's," says the Planning Commission report. The units under construction or approved total 38,520, or more than one-third of the existing units. Relating these figures to the city's 1960 population of 7.8 million, and allowing for a population of no more than 8 million by the time all approved projects have been completed (between 1950 and 1960 the city actually lost 110,000 population), 5.5 per cent of all New Yorkers now live in city-owned apartments, and projects now under construction or approved will boost this to 7.1 per cent.

The growing scale of public housing in New York City is also revealed in the 1960 annual report of the New York City Housing Authority. It shows that assets exceed \$1.5 billion, including an increase of more than \$105 million during 1960, an average advance of more than \$2 million a week. Excluding working cash and other inci-

*continued on page 9*



# Architects find "quality of manufacture" is real key to lowest maintenance

Most people agree that aluminum is the ideal material for windows — it cannot rust, will not warp, swell or stick, and never needs costly painting. Experience, however, shows if lowest maintenance costs are to be realized, the design of the window itself and the care exercised in its manufacture are equally important.

To protect architects, contractors and building owners against unsatisfactory windows, the Aluminum Window Manufacturers Assn. has established quality specifications that carefully spell out the requirements for good quality windows in terms of the metal alloy used, wall thicknesses, strength of sections, size limitations, hardware, protective coatings, as well as performance

tests for air infiltration, deflection and other physical load tests.

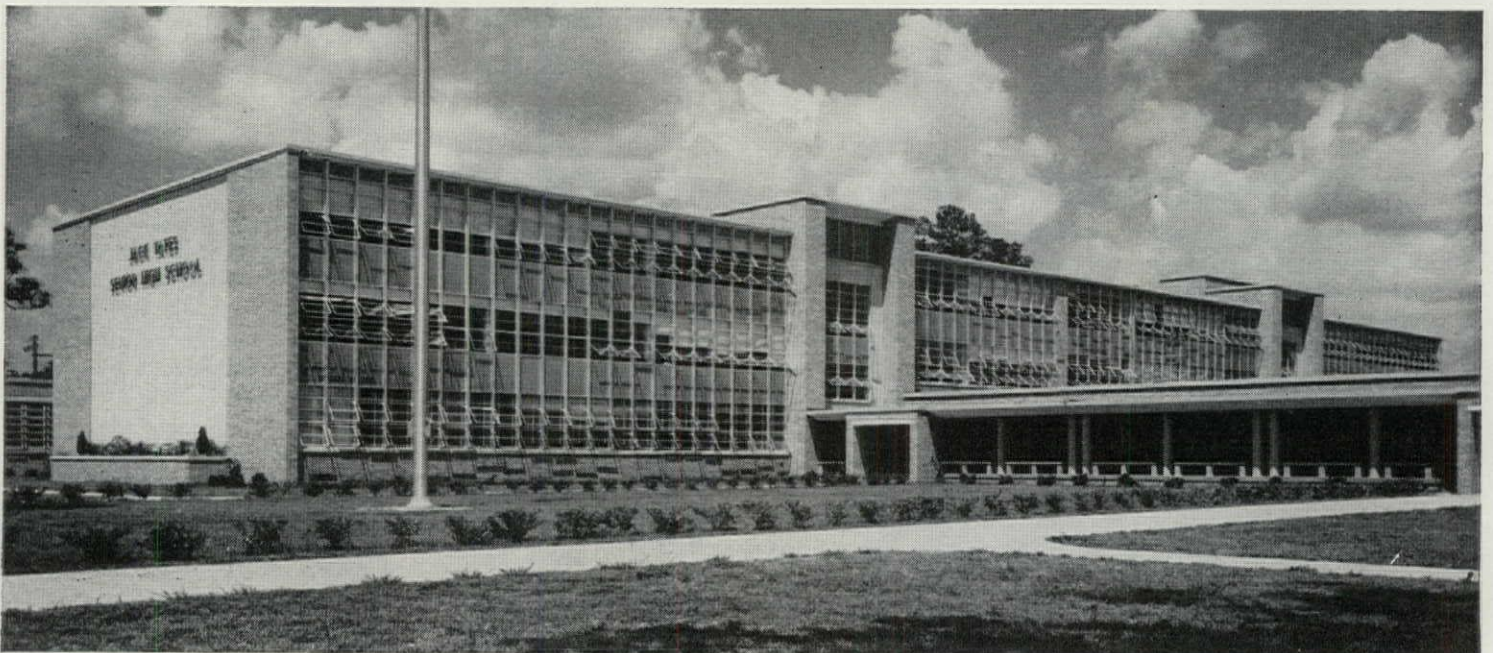
These standards are the result of many years of hard and diligent work. They reflect the thinking of thousands of architects and contractors, as well as quality-concerned manufacturers. They are not theoretical, maximum standards, but practical and workable minimum standards.

If you want to make sure your clients

enjoy all the benefits that good quality aluminum windows have to offer, specify windows that carry the AWMA Quality-Approved seal. It's positive proof of full compliance with these quality standards. For a copy of latest AWMA window specifications, together with the names of AWMA manufacturers and the types of windows they produce, write to Dept. F-614, Aluminum Window Manufacturers Association, 630 Third Avenue, New York 17, N. Y.



Jack Yates Senior High School, Houston, Texas • Architects: Herbert Voelcker & Associates



**MEMBERS:** Adams Engineering Co., Inc., Ojus, Fla.; Albritton Engineering Corp., Bryan, Texas; American Duralite Corp., Loudon, Tenn.; American Metal Window Co., Inc., Shreveport, La.; Amco Aluminum Corp., Philadelphia, Pa.; Arnold Altex Aluminum Co., Miami, Fla.; The William Bayley Co., Springfield, Ohio; Capitol Products Corp., Mechanicsburg, Pa.; Ceco Steel Products Corp., Chicago, Ill.; Crossly Window Corp., Miami, Fla.; Dunaway Manufacturing Co., Longview, Texas; Fenestra Inc., Philadelphia, Pa.; Michael Flynn Mfg., Co., Philadelphia, Pa.; Kesko Products Co., Bristol, Ind.; Likit Windows, Inc., Hayward, Calif.; Mayfair Industries, Inc., Lafayette, La.; Miami Window Corp., Miami, Fla.; S. H. Pomeroy Co., Stamford, Conn.; Porterfield Industries, Inc., Miami, Fla.; Porter-Lite Products Corp., Houston, Texas; Reynolds Metals Co., Richmond, Va.; Rogers Industries, Inc., Detroit, Mich.; The F. C. Russell Co., Columbiana, Ohio; Southwest Aluminum Products, Inc., Dallas, Texas; Stanley Building Specialties, North Miami, Fla.; Truscon Division, Republic Steel Corp., Youngstown, Ohio; Valley Metal Products Co., Plainwell, Mich.; Weather-Tite Mfg. Corp., Baltimore, Md.; Windalume Corp., Kenil, N. J.; Wisco Inc., Detroit, Mich.



dentials, its land and buildings on December 31 were valued at almost \$1.4 billion, which represented development costs of \$1.5 billion, less amortization. In round figures the authority's income was \$85 million a year, expenses and debt service were \$119 million, leaving a deficit of \$34 million a year—not counting real estate taxes the city sacrificed. Including land and commercial facilities at some projects, but excluding projects in construction, the agency's \$1.5 billion of assets averaged roughly \$13,600 for each of its 110,000 existing units.

## Eleven developers bid for California beach project

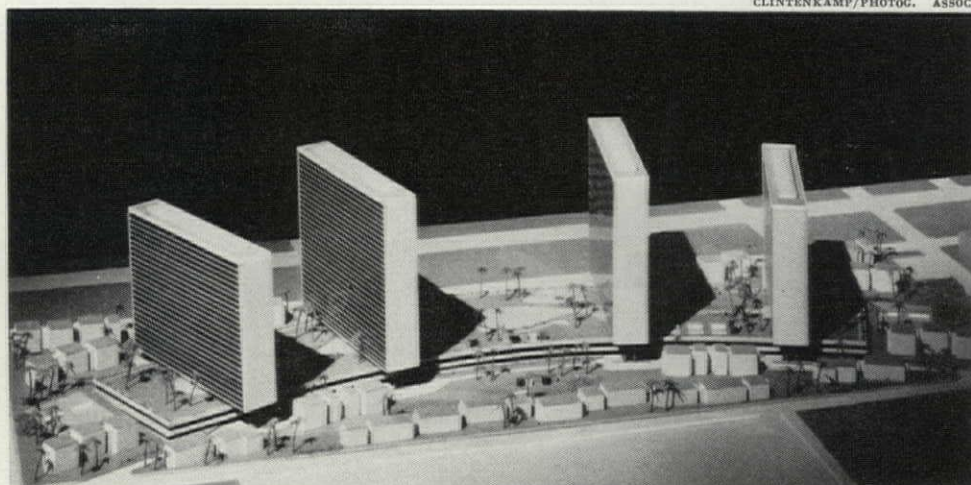
Santa Monica got a wealth of proposals last month from developers eager to purchase its 36-acre beach-front Ocean Park redevelopment property a half-hour drive from downtown Los Angeles. Eleven different offers ranged all the way from the aggregate upset price of \$5.8 million to a high of \$9.9 million on a 50-year rental plan covering one portion of the tract that would then revert to the city.

This part-purchase and part-lease bid, from Kern County Land Co. and Del E. Webb Corp., and the two highest conventional offers, \$8.3 million by Deane Associates, of Van Nuys, Calif., and \$7.5 million by Dworman Associates, of New York, were also unusual for another reason. All three would exceed the City's land acquisition and improvement costs and would eliminate the need for any federal Title I grant for the project.

Architects for several developers displayed imagination in conquering a large public parking area between the project's apartment buildings and most of its one-third of a mile beach-front. The most unusual in this respect was a design by William L. Pereira for the Western Urban Renewal Corp., representing New York Developer James H. Scheuer. Pereira's scheme (see photo) would create three "man-made highlands," under which would be three seven-level garages that would be covered with irregular clusters of apartments designed to resemble Italian Riviera cliff houses. However, the bid submitted by this group was far down the list: \$5.5 million.

The local Redevelopment Agency's plans for evaluating the various proposals are flexible, and Executive Director Russell F. Priebe believes it will be able to select the winning developer on

*continued on page 11*

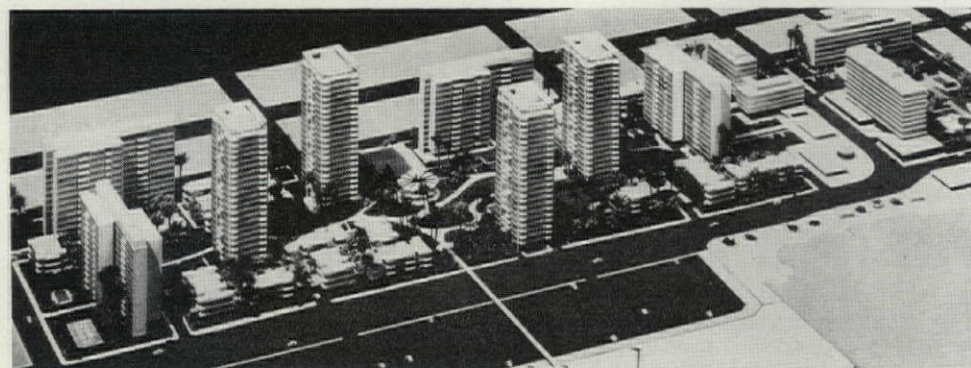


DWORMAN'S SLABS ON A CURVE BY KELLY & GRUZEN AND ROBERT ALEXANDER

HERBERT BRUCE CROSS



DEANE ASSOCIATES PROPOSAL BY DANIEL, MANN, JOHNSON & MENDENHALL

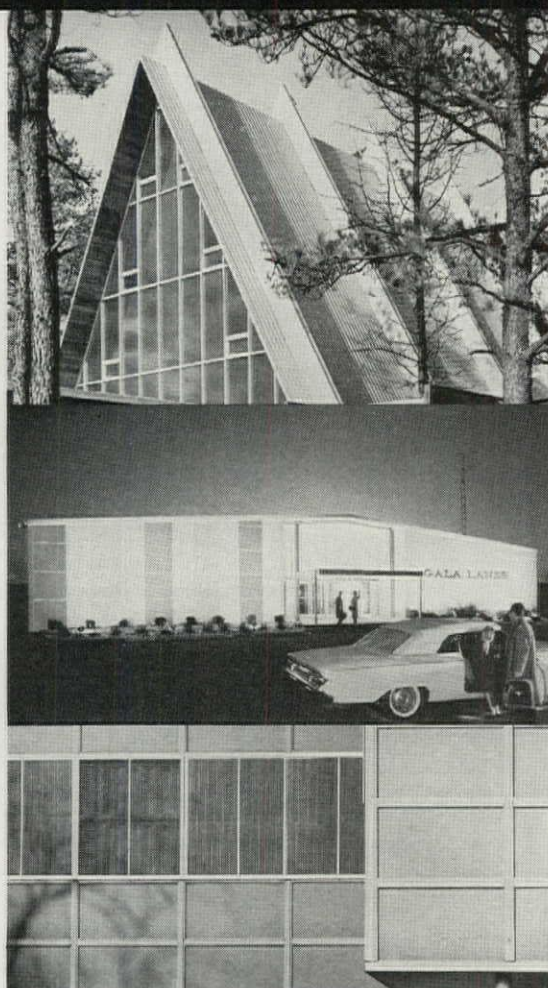


KERN-WEBB ORGANIZATION PROPOSAL BY WELTON BECKET & ASSOCIATES



WESTERN URBAN RENEWAL'S SCHEME BY WILLIAM L. PEREIRA & ASSOCIATES





*Whatever your approach to architectural beauty . . .*

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economically without flaking or peeling. And steel's low expansion/contraction rate gives Weirkote a vital edge over lighter metals—namely, an edge that stays put at the seams. (Weirkote is also available from National Steel's Midwest Steel division—Portage, Indiana.)

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a combined basis of design merit and land price without repeating the architectural "competition"—land-price mix-up that bedeviled the Golden Gateway project in San Francisco last year (FORUM, Aug. '60 *et seq.*). To avoid such trouble, Priebe has deliberately refrained from making architectural merit a formal or predominantly controlling factor in the selection of a developer. The agency will not have an architectural review board rate the plans. Instead the developers' proposals will be studied by a 100-member Citizens Progress Committee, of which seven members happen to be architects. Each committee member will "review all proposals as to their social and physical qualities," but will not give them any precise numerical rating. Priebe will receive their reports by May 15, and in the interim will receive an analysis by the Federal Housing Administration of the economic feasibility of

each proposal, its estimated construction cost, rents, and profits, etc., and a report from the Housing and Home Finance Agency on land disposition factors. Coordinating all these reports, Priebe will make his narrative but nonrated recommendations to the Redevelopment Agency commissioners on May 17, and, if the present schedule holds, they will name the winning developer on June 7.

In addition to those already mentioned, the following developers and architects are participating in the competition: Braemar Associates with Architects Ladd & Kelsey; Diller-Kalsman, Osias Construction Corp. with Milton Schwartz & Associates; Samuel Firks with Vernon Duckett; Heftler Construction Co., Wallace Properties, Inc., and Centex Construction Co. with Maynard Lyndon and Jones & Emmons; Perini-Santa Monica Associates with DeMars & Reay, Charles Eames and Pietro Belluschi; Reynolds Aluminum Service Corp. with Victor Gruen & Associates; Santa Monica Developers with Adrian Wilson & Associates.

## Seven buildings win A.I.A. First Honor Awards

From a total of 270 submissions an all-architect jury selected seven buildings to receive the 1961 First Honor Awards of the American Institute of Architects, including two by Philip Johnson. The jury said this year's prize buildings "went far beyond mere competence and achieved true significance."

Morris Ketchum, of New York, was chairman of the 1961 jury. Serving with him were Fred Bassetti, of Seattle; Richard D. Butterfield, West Hartford, Conn.; Arthur Q. Davis, New Orleans; and William L. Pereira, Los Angeles. Their selections:

### FIRST HONOR AWARDS

U. S. Embassy, New Delhi, India, by Edward Durell Stone (FORUM, Jan. '59).  
Fernando Rivera Elementary School, Daly City, Calif., by Mario J. Ciampi and Paul Reiter, associate architect (page 114).  
Shrine, New Harmony, Ind., by Philip Johnson (FORUM, Sept. '60).  
Reynolds Metals Regional Sales Office Building, Detroit, Mich., by Minoru Yamasaki (FORUM, Nov. '59).  
Nuclear Reactor, Rehovot, Israel, by Philip Johnson (page 120).  
Pepsi-Cola World Headquarters, New York, by Skidmore, Owings & Merrill (FORUM, March '60).  
Summer House for Mr. and Mrs. Alan Schwartz, Northville, Mich., by Birkerts & Straub.

### AWARDS OF MERIT

Ivory Tower Restaurant, Santa Monica, Calif., by Richard Dorman & Associates.  
Denver Hilton Hotel, by I. M. Pei & Associates (FORUM, Aug. '60).  
Marin Bay Display Pavilion, San Rafael, Calif., by Bay Group Associates: Daniel H.

Bushnell, Lun Chan, Ichiro Sasaki and Camiel Van De Weghe.

Office and Warehouse for The Coppertone Corp., Miami, Fla., by Weed-Johnson-Associates (page 118).

Dr. Henry G. Simon Residence, New Orleans, by Charles R. Colbert.

Chapel, Moline Public Hospital, Moline, Ill., by Henry Hill.

Office Building for Cambridge Investments, Inc., Long Beach, Calif., by Killingsworth Brady Smith & Associates (FORUM, Jan. '61).  
Unitarian Church, Concord, N. H., by Hugh Stubbins & Associates.

Crown Zellerbach Building, San Francisco, by Hertzka & Knowles, and Skidmore, Owings & Merrill, associated architects (FORUM, April '60).

Lincoln Commons Building, Lake Erie College, Painesville, Ohio, by Victor Christ-Janer & Associates (FORUM, Dec. '60).

Willow Creek Apartments, Palo Alto, Calif., by John Carl Warnecke & Associates.

## Briefs

**Late schedule change** will result in the convocation to honor Le Corbusier, in the Four Great Makers series of Columbia University School of Architecture, being held on April 26, instead of April 24, as listed in thousands of programs already distributed. The program originally scheduled for the 26th will be held on the 24th.

**Under an overpass** of the Seattle Freeway the nation will soon have its first atomic fallout shelter incorporated into a highway project. Anderson-Bjornstad-Kane, Seattle consulting engineers, have been retained to design a prototype shelter for 200 persons that will cost about \$60,000. Construction funds will be provided by the federal Office of Civil and Defense Mobilization.

## People

Talented members of the Philadelphia chapter of the American Institute of Architects have been entertaining architects all across the nation to lure them to the national A.I.A. convention there April 23-28. More than 30 chapters have been viewing a novel convention-promoting movie written, acted, photographed, produced, and distributed by the Quaker City architect-theatians. In the ultimate of compliments, several chapters have asked the Philadelphians for advice on how to produce similar silver-screen dramas to promote local architectural subjects to civic groups.

LAWRENCE S. WILLIAMS, INC.



PERFORMERS PRICE (L.) AND BOULWARE

The script for the Philadelphia film, prepared by a committee headed by **Vincent G. Kling**, tells the improbable story of how an out-of-town architect, played by **Lyle Boulware** (see photo), will be welcomed at the Philadelphia convention, and then follows him on a tour of noteworthy buildings and historic places. Along the way he meets many of the city's best-known architects, including **Louis Kahn**, **Oskar Stonorov**, **Charles Peterson**, **J. Roy Carroll**, **Alfred Bendiner**, **John Harbeson**, **Morton Keast**, **Edmund N. Bacon** (and Conductor **Eugene Ormandy**, promoting the convention's special concert by the Philadelphia Orchestra). For some suspenseful Hitchcock-type comedy relief, **Beryl Price**, chairman for the host chapter's hospitality efforts, appears in a succession of roles as airplane mechanic, taxi driver, hotel doorman (see photo), short-order chef, watchman, musician, Japanese houseboy, and finally as a corpse. Architect-cameraman: **Louis de Moll**. Architect-narrator: **George Qualls**.

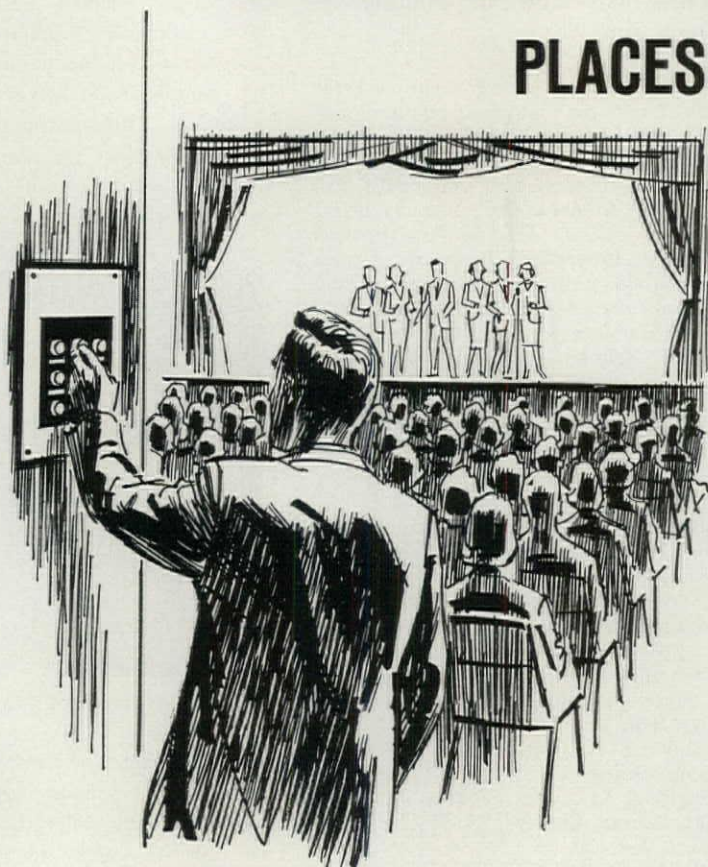
### TOP PUBLIC HOUSING POST FILLED

A vigorous, articulate woman of 56 with waving gray hair—and an expert on housing for the elderly—was appointed last month by President Kennedy as the new Commissioner for the federal Public Housing Administration, the highest post

*continued on page 16*



# New *Executone* sound systems give you great design freedom in planning **PLACES OF ASSEMBLY**



## 1. Broaden capabilities of large rooms—with sound.

Today's institutional activities—and the economies of space use—demand a broad range of service from public assembly rooms and buildings.

A civic auditorium, for example, must accommodate meetings, broadcasts, musical and theatrical events, ceremonies, expositions, etc. A gymnasium may be called upon to serve as a social hall . . . theater-in-the-round . . . community forum . . . exhibition area.

A sound system capable of handling such diverse functions can be provided with surprising economy—if it offers enough flexibility of input, coverage and control.

Executone's unique zero-level design, with transistorized controls, accepts any combination of close or widely separated inputs—mikes, record players, tape decks, movie projectors, radio or TV tuners and telephone line sources. An

Executone control panel, capable of mixing 9 or more inputs, is available in a light, fully portable console. It requires no plug-in power source or ventilating; can be located at any distance from the inputs and power amplifier—without noise or loss of quality. Zero-level transmission permits use of single conduits for both input and output wiring—for substantial installation savings.

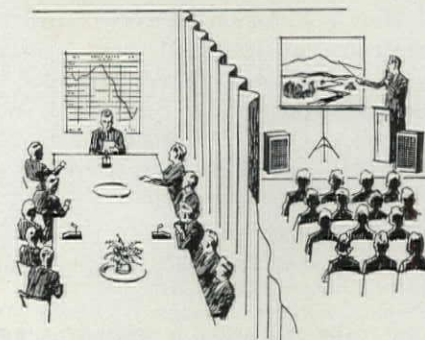
## 2. Control sound from best audience vantage.

Control of sound levels and balance depends on some person's subjective judgment. This person should be situated where his hearing corresponds truly to that of the audience, to insure full coverage without excessive volume. In an auditorium, for example, controls traditionally located backstage or in projection booths may now be brought unobtrusively into the audience. A rear column or wall can accommodate a compact, flush-mounted Executone mix-

er. Or a portable mixer may be plugged into a special receptacle under a conveniently located seat. These units—with edge-lighted lucite panels—can be operated even in a completely darkened auditorium.

Another solution is the placement of Executone mixers in conventional locations—with small, matched line amplifiers at critical spots in the audience. In a church, an usher's station would serve. In a night club, a rear table might be chosen. Such auxiliary controls greatly increase the system's flexibility.

## 3. Permit split or combined room functions.



Frequently, spaces are physically joined—or subdivided—to accommodate varying events or audiences of varying size . . . e.g., banquet rooms, multi-purpose school rooms, etc. In these cases, Executone system flexibility is important—especially in the location of sound sources and controls. It becomes even more vital when isolated areas are to be joined by sound alone. In planning a church system, for example, you may wish to offer your clients the use of an area for overflow congregations . . . sound distribution to selected classrooms and Brides'



or Mothers' rooms . . . to and from chapels and sanctuaries.

Executone implements these functions, at low cost, by simple input switching through the main power booster — for bridging and separating individual sound channels. Small, conveniently placed, transistorized line amplifiers serve as secondary controls. Executone's zero-level transmission eliminates distortion and noise problems.

#### 4. Maintain quality reproduction from moving sources.



Church and synagogue services illustrate a problem that arises frequently in large-room design. That is: the need for multiple sound pickups capable of evenly reinforcing speech or music from moving participants. System planning based on the complete Executone line finds ready solutions. For example, the wide variety of specialized microphone pickup patterns helps the church designer provide sensitive coverage of altar, pulpit, organ, choir, Stations of the Cross, and all other points from which services are conducted. Placement of controls in the

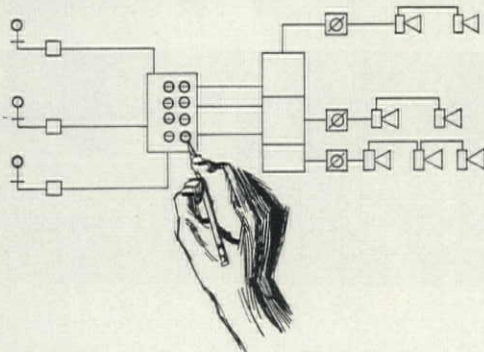
congregation—as explained in (2), above —assures maintenance of proper volume and balance.

#### 5. Link separated functions with intercom.



Executone communications are invaluable in rooms where a number of separate functions have to be coordinated. In theaters or auditoriums, for example, stage management, lighting and other functions mesh smoothly when instant contact is available—via Executone.

#### 6. Apply system planning to acoustics, aesthetics and performance.



The importance of a coordinated sound system goes far beyond the savings

available through single-source specification. Matched electronic characteristics are essential for clear, life-like reproduction. System planning minimizes the architect's aesthetic problems, too. The compactness and smart detailing of Executone components . . . the wide choice of units and unobtrusive mountings . . . flexibility of placement . . . all contribute to good appearance.

The broad line of reproducers meets the special acoustic demands of any interior. Low-level coverage is available through a wide selection of multiple ceiling reproducers . . . high-level coverage through carefully designed theater type systems.

With an integrated Executone system, you also have the assurance of full installation responsibility, and *on-the-spot* maintenance for any contingency — by factory-trained technicians. There are no field assemblies. Each system is manufactured and tested—in its entirety—at the Executone factory. All units are engineered to stringent transportation terminal standards—for operation 24 hours a day, 365 days a year. Every component is guaranteed by the factory for a full year.

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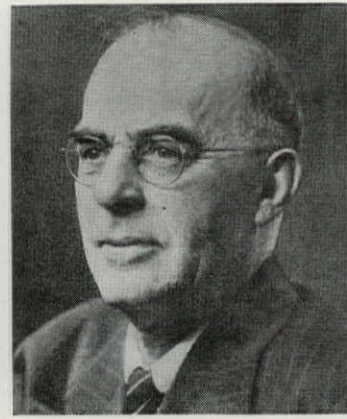
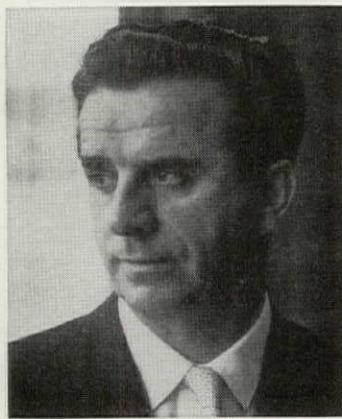




The earth shifted just after this shopping center was completed. Serious cracking



an adjustment to the exterior of the structure. A well-adjusted building is what



**Owner:** (left) Stanley J. Harte, President, Harte Haven, Inc. **General Contractor & Developer:** (center) Edward J. DeBartolo, President, Youngstown Industrial Development Corp. **Steel Fabricator:** (right) Stanley Macomber, Macomber, Inc.



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of the façade was threatened. Fortunately, its strong backbone of steel permitted



Stan Harte might call his \$4,000,000 Harte Haven Shopping Center in Massena, N.Y.

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in the federal housing agencies ever occupied by a woman.

Washington-born Mrs. **Marie McGuire**, once a journalism major in the Capital's George Washington University, has lived in the Southwest for the past 32 years, the last 19 of them actively engaged in operating local public housing programs. In 1942 she joined the Houston Housing Authority as a project manager, and was soon appointed assistant executive director; since 1949 she has been executive director of the San Antonio Housing Authority, which now shelters some 21,000 persons in 5,154 apartments in 1,042 buildings. Recently Mrs. McGuire has won national fame for her role in developing San Antonio's Victoria Plaza project, more popularly known as the "Golden Age Housing Center," a high-rise apartment and related facilities designed especially for the aged. Architect **Thomas B. Thompson** devoted three years to studying the housing needs of the aged before starting actual designs for this project. Largely as a result of this project's success, Mrs. McGuire was selected to make the keynote speech for the housing sessions at the recent White House Conference on Aging.

**ARCHITECTS AND THE ARTS**

Among the nine new members to be inducted into the National Institute of Arts and Letters next month, raising its membership to 246 out of a maximum of 250, will be **Mies van der Rohe**, Painter and Muralist **George Biddle**, and Sculptor **Jacques Lipchitz**, the last two the creators of works in many public buildings. The Institute's 1961 Brunner Award, \$1,000 given to "an American architect who has made a contribution to architecture as an art," will be presented to **I. M. Pei**. END

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• R-W Folding Partitions of a special sound retarding design in a Chicago TV Studio.

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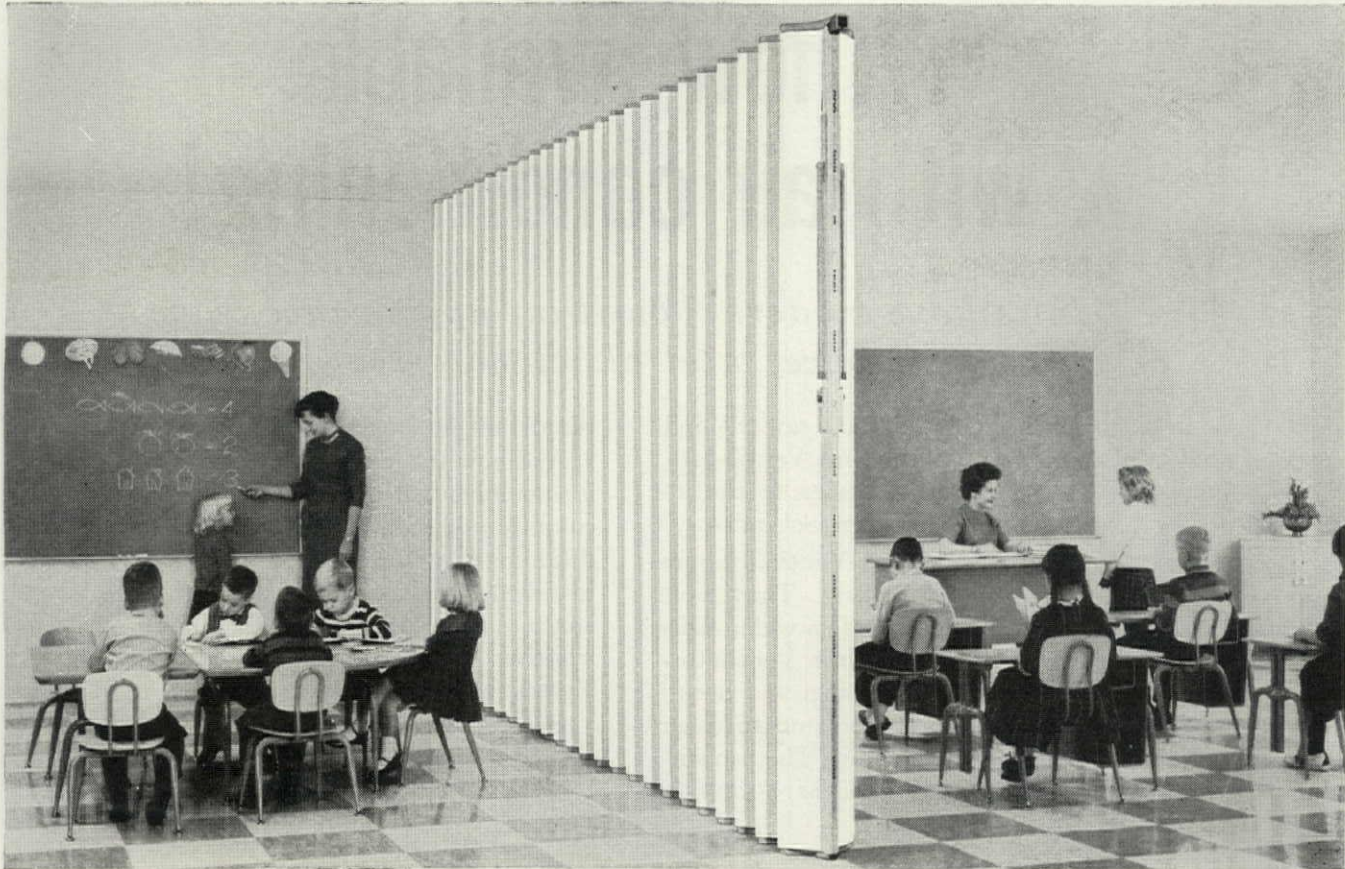
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Partition	"240"	"A"	"B"	"C"
*Sound Reduction 125/4000 cps av.	37.4	32.4	31.8	27.9
354/4000 cps av. (Industry Standard)	41.8	35.8	36.4	33.0
Acoustic Panels	steel 5½" wide, wt. 1 lb./sq. ft.	uses cardboard	steel, 2¾" wide, wt. ½ lb./sq. ft.	uses cardboard
Sealer Strips	8	8	4	4
Foam-Lined Jamb-Seal	yes	yes	no	no
Air Release	yes	no	no	no
Pull-In Latch	yes	yes	no	no
Best Fabric Weight— Outside Covering Only	45 oz. per lin. yd.	45 oz. per lin. yd.	18 oz. per lin. yd.	27 oz. per lin. yd.
Top Row Horizontal Hinge Plate Depth	8½"	3"	(vertical)	1½"

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# Trane Unit Ventilators with space-saving design ... now available with air conditioning!

*Units have modern, "built-in" appearance, save classroom space, meet all climate requirements*

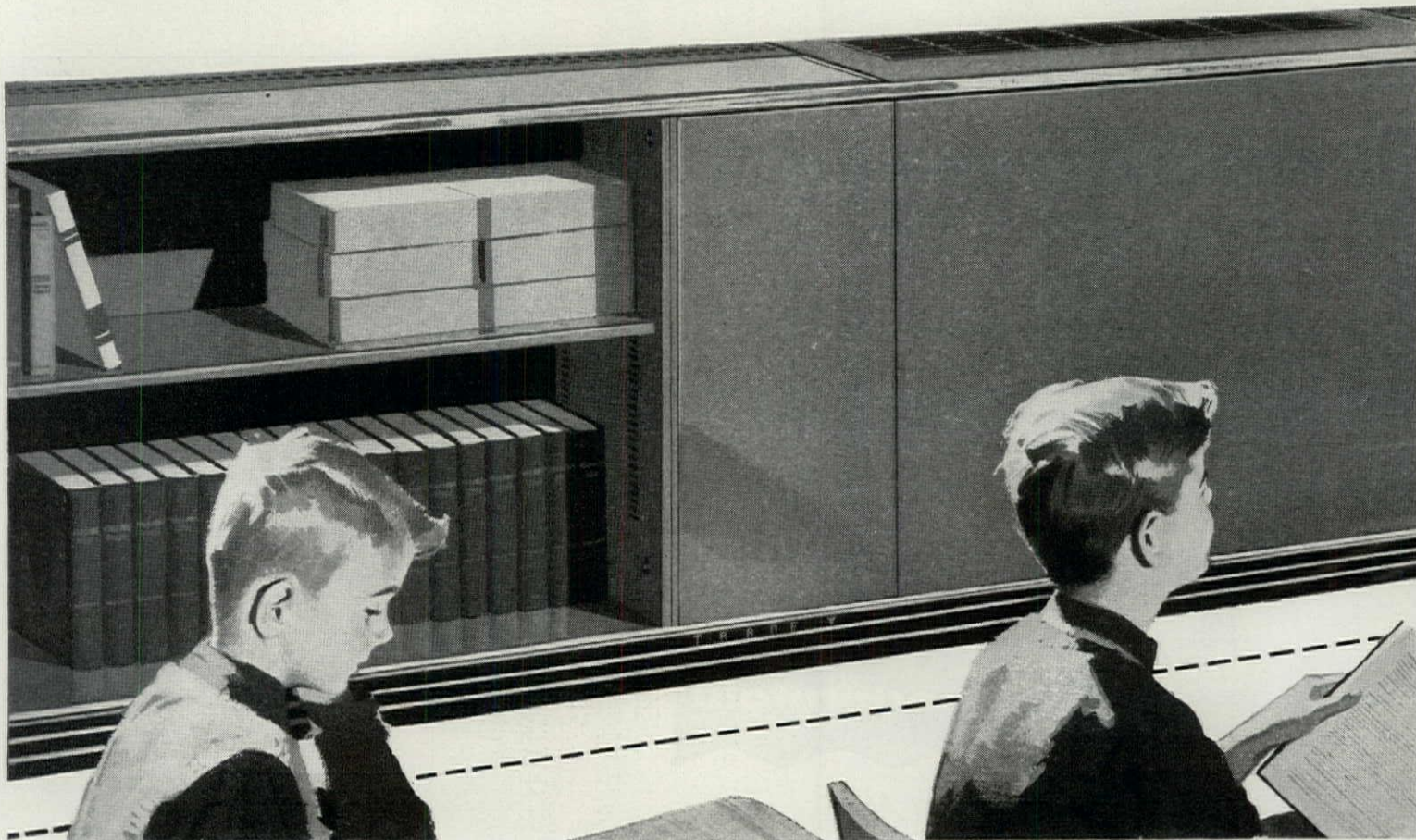
When a group of school architects saw the first models of these new TRANE Unit Ventilators, they said, "Most advanced design in the industry... best-looking, most compact units..."

These modern TRANE Unit Ventilators are more compact than any others. They save space along the wall, can provide a wider aisle. Attractively styled, TRANE Unit Ventilators complement modern school design and decor. Matching trim blends the components together to form a single, continuous unit. The top surface is covered with a patterned hard-top ma-

terial that enhances appearance, resists wear.

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For complete facts on the new TRANE Unit Ventilators, call your nearby TRANE Sales Office; or write TRANE, La Crosse, Wisconsin.





**TRANE Unit Ventilators**  
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- **Space-saving design.** Most compact units in the industry provide more usable classroom space. All 28" and 32" high conventional units are 11 $\frac{5}{8}$ " deep. 28" high *Kinetic Barrier* air conditioning units are 14 $\frac{7}{8}$ " deep.
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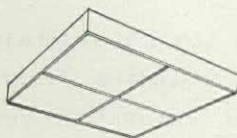
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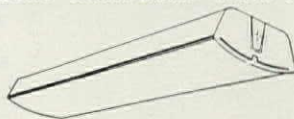
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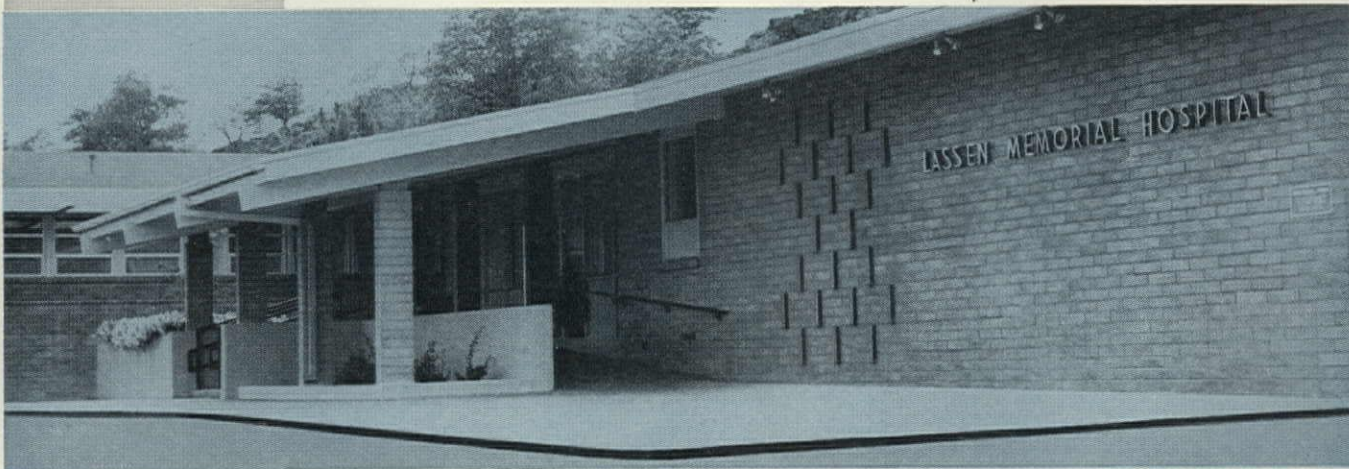
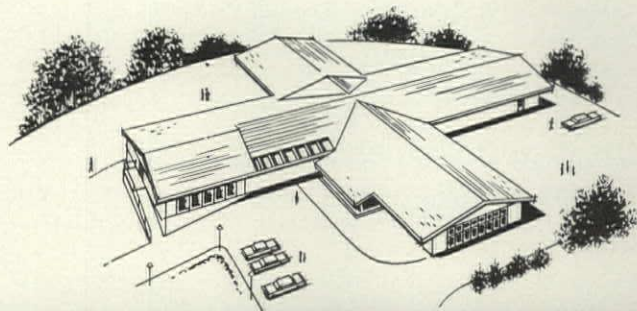


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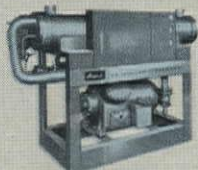
R. H. Charles, Charles and Braun, Consulting Engineers, San Francisco ... "We specified Acme on this project because we consider it quality equipment. In addition, small size was essential to fit all the equipment into the allotted space."

A. H. Brown, Brown Sheet Metal, mechanical contractors, Oakdale ... "We have found Acme equipment to be the most compact available ... provides trouble-free performance, too."

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These men ... each one a well-qualified expert in his field on the subject of air conditioning ... are *sold* on Acme. Their reasons why, important to them from a professional standpoint, are equally important to building owners as well.

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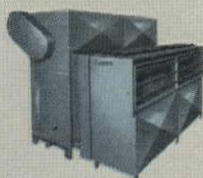
Cooling Towers 3-120 tons



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Evap. Condensers 10-110 tons



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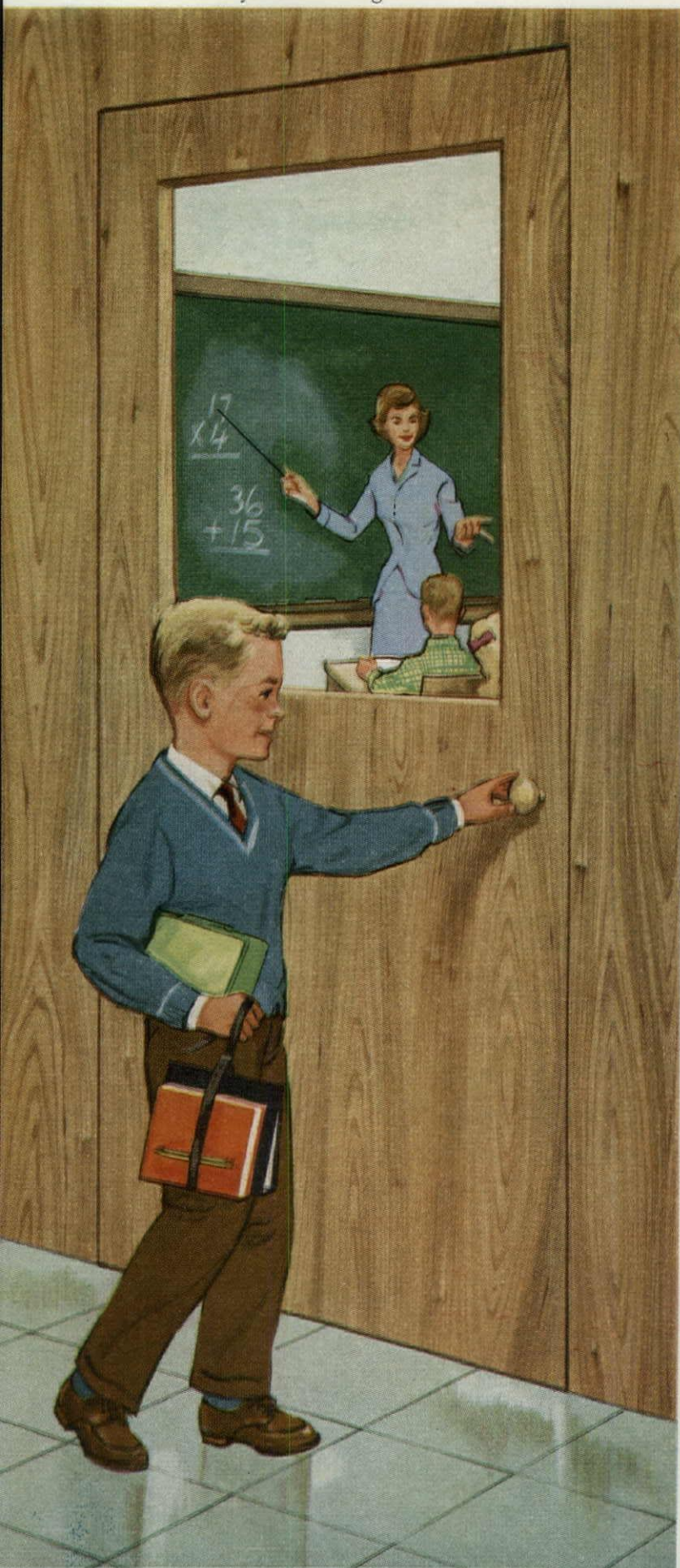
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**RESISTS SCUFFING AND STAINING.** In commercial interiors . . . such as restaurants, theaters, stores, and hotels . . . cooking fumes, tobacco smoke, food stains—even shoe polish—won't discolor Permagard Paneling and Doors. The satin-smooth Permagard surface provides a protective, nonporous barrier between the wood and dirt, spills, and smudges. A gentle wiping with a damp sponge is usually all that is needed to wipe them away. Stubborn dirt can be removed with standard chemical or abrasive cleaners without harming the surface.





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**GIVES FREEDOM FROM REDECORATING.** From the busiest corridors, lobbies, and lounges to private offices and conference rooms, office building interiors that have Permagard Paneling and Doors by Weldwood *stay* beautiful under all normal conditions, in all climates. Hot, cold, humid, dry, and even rapidly changing weather do not affect the native beauty and color of this luxurious real wood. In the event of severe abuse, the Permagard surface can be repaired in the field.



## WELDWOOD PERMAGARD PANELING AND DOORS add unprecedented beauty and wear resistance to the surface of fine wood

What does "Permagard" mean? It is the trademark for a totally new type of Weldwood factory-surfaced hardwood paneling and doors that have been sheathed at the factory with a thin, tough, invisible armor of new plastic resin film. This film is virtually fused to the wood's fibers to preserve its native beauty and protect it from scratches, stains, moisture, and extreme climatic changes.

In addition to providing superb wearing qualities, Weldwood Permagard Paneling and Doors yield important savings in installation and maintenance. The Permagard protective film is applied with a unique roll laminating technique that reduces to a simple operation the steps that normally require prolonged staging in standard four-coat, conversion-type, on-the-job finishes. The result is that United States Plywood can supply Weldwood Permagard Paneling and Doors at prices competitive with ordinary finishes.

The future design opportunities that Weldwood Permagard-surfaced wood promises to architects and decorators are virtually limitless. For a free sample and literature on Permagard Paneling and Doors by Weldwood, mail the coupon.

**PERMAGARD™**  
paneling and doors made only by  
**WELDWOOD®**

SEND FOR FREE SAMPLES

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AF 4-61

Please send me free samples of Permagard Paneling, along with descriptive technical data and suggested specifications for Permagard Paneling and Doors by Weldwood.

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35 YEARS LATER, AND AGAIN  
NEW YORK LIFE INSURANCE CO.  
SELECTS **GENERAL BRONZE**

...for its new  
home office building



1926  
New York Life Insurance Co.  
Home Office, New York, N. Y.  
Architect: Cass Gilbert



1961  
New Office Building, New York, N. Y.  
Architects: Carson & Lundin  
Contractor: Turner Construction Co.

There's no better endorsement of a product or service than to have it repeatedly specified by satisfied architects and owners.

In 1926, the renowned architect, Cass Gilbert, designed a new Home Office Building for the New York Life Insurance Co. and specified Permatite windows "by General Bronze." Now, 35 years later, the New York Life plans a new, modern curtain wall building to house its ever expanding operations and, once again, "General Bronze" has been specified. This time by the architects, Carson & Lundin.

Reflecting the modern trend in architectural design, the new building will feature a glass and aluminum grid curtain wall system set in 21 ft. bays between full height stone piers. Horizontal mullions of dark gray anodized finish give emphasis to the staggered vertical mullions which are finished in natural color anodized aluminum. All details were designed to permit setting the glass in pre-moulded channels with pressure glazing stops. Aluminum track guides for window cleaning equipment are designed into the jambs.

As the country's foremost producer of curtain walls, windows and architectural metalwork in either aluminum, bronze or stainless steel, General Bronze is anxious and ready to serve you, too. Call us in on your next job. Our Catalogs are filed in Sweet's.

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Left: Gray and white serpentine terrazzo plaza at Time & Life Building, New York. **Architects:** Harrison & Abramovitz & Harris, New York. **Terrazzo Contractor:** Port Morris Tile & Terrazzo, Inc., New York. Right: 47,328 square feet of terrazzo surrounds Libbey-Owens-Ford Glass Company Building, Toledo. **Architects:** Skidmore, Owings & Merrill, New York. **Terrazzo Contractors:** American Mosaic & Tile Co., Louisville; Port Morris Tile & Terrazzo, Inc., New York.

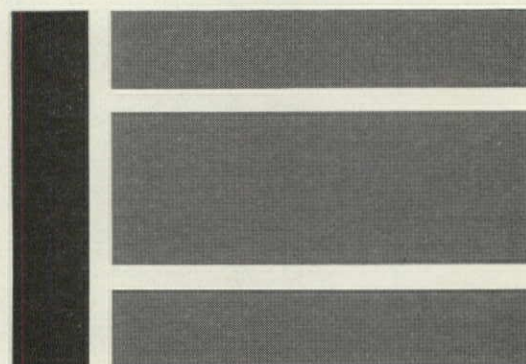
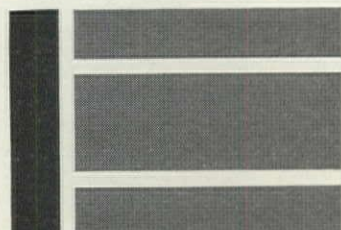
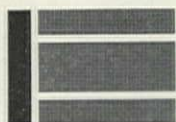
## TERRAZZO

**goes out of doors** to create plazas that surround a building with light, space and color. Any design, any color combination can be specified. A terrazzo plaza enhances a building, adds prestige, provides a safe walkway surface. Upkeep is negligible. When planning terrazzo plazas, consider ATLAS WHITE portland cement. Only a white cement matrix brings out the true color value of aggregates and pigments. For a brochure of terrazzo color samples with white cement, write  
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New York 17, New York.

**Universal Atlas Cement**  
Division of  
**United States Steel**



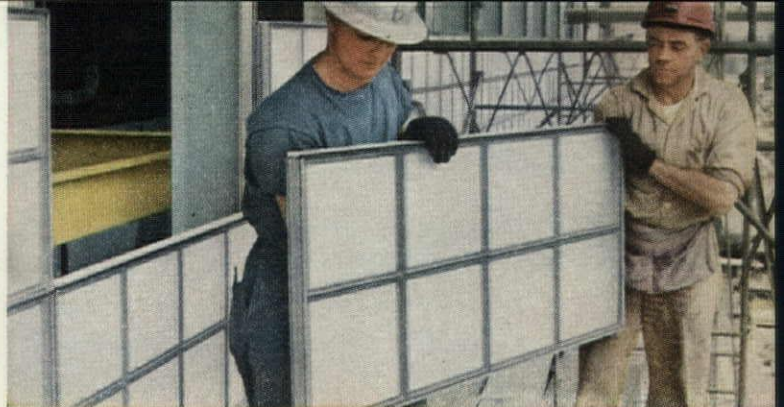
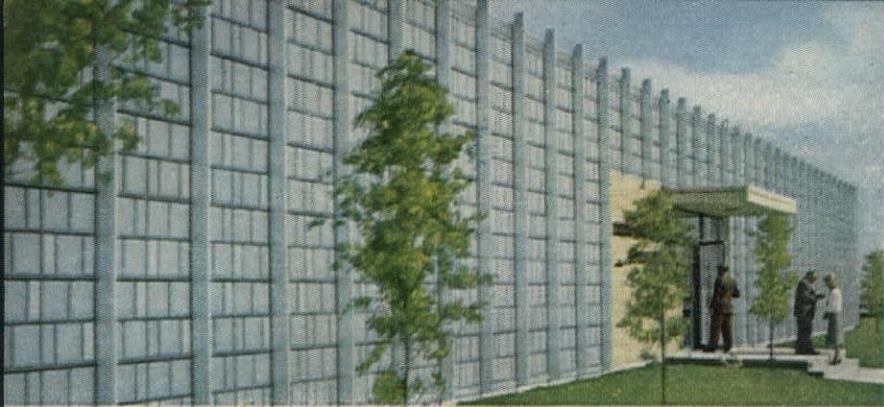




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***ELJER***

**NOW—EVEN THE ELJER TRADEMARK IS NEW—**to match the NEWEST line of bathroom fixtures in the industry. The staff of famous designer Dave Chapman went all out —put fresh, imaginative ideas in every fixture, every fitting. Sparked-up styling. Beautiful pastel colors. Bathroom planning with real sales appeal. You can't miss when you specify Eljer. So look for this new symbol of excellence in distinctively modern fixtures and fittings of unmatched quality and unique value. Eljer Co., Three Gateway Center, Pittsburgh 22, Pa.





Prefabricated in modular units . . .

installed quickly and easily



Light and bright inside, yet no glare . . . thanks to Thinlite

## Only Thinlite curtain wall gives design freedom plus daylight control...with weather-tight permanence


**T**HINLITE OFFERS the architect an almost infinite variety of design possibilities for any building being planned. In modular units, Thinlite panels are readily available in solid colors or with individual color tiles positioned in each panel according to your specifications.

In addition to the design freedom which Thinlite offers, you are assured of maximum daylight control, for "solar-selecting" Thinlite tiles cut glare and radiant heat, while directing diffused daylight to interior areas.

And, important in curtain wall construc-

tion, Thinlite is weather-tight due to its Neoprene gasketing system. Thinlite requires little maintenance, provides a permanent, beautiful exterior surface.

For your free brochure about Thinlite, just write to Kimble Glass, subsidiary of Owens-Illinois, Toledo 1, Ohio.

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*unique floor beauty that won't "walk off"...*

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The Vina-Lux 800 Series can be specified for installation over concrete — even below grade, or over wood subfloors. In 12 fashion-coordinated colors; 9"x9" size;  $\frac{1}{8}$ ",  $\frac{3}{32}$ " and  $\frac{1}{16}$ " gauges. See Sweet's Catalog or write for samples, color charts and complete architectural specifications — no obligation, of course.



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## A roundup of recent and significant proposals

### SKI LODGE IN NEW MEXICO

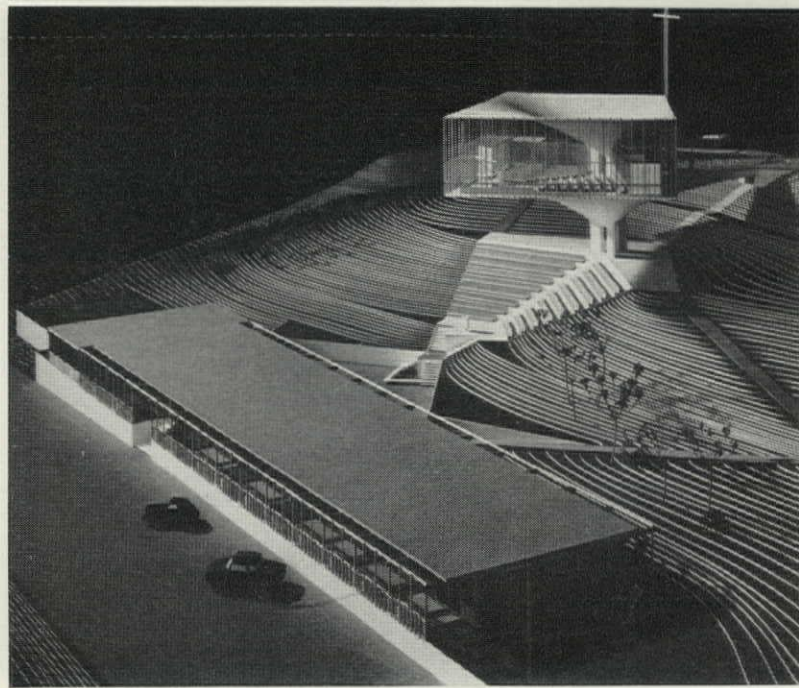
The six jolly peaks at right will top off the restaurant and sun deck of a new ski center in Lincoln National Forest, near Ruidoso, N. M. The peak shapes are derived, in part, from Victor Lundy's study of the site and its pine forests and, too, from ski patterns in the snow, and they will be carried out in laminated wood beams crisscrossed for wind bracing and shingled on the outside. Jutting out beneath these cones, diamond-shaped sun decks will cantilever over a brook on one side and a skating rink on the other. This is the main building of the base site, but in addition to the bar lounge (upper left), the project will include several lodges, a manager's house, and a summit restaurant.



### BOAT-SHAPED OFFICES IN CONNECTICUT

Riding at its moorings in Constitution Plaza, Hartford's downtown redevelopment project, the boat-shaped Phoenix Mutual Life Insurance Co. building will contrast sharply with the straight-sided structures around it. Harrison & Abramovitz give two reasons for this shape: the company's desire for a distinctive build-

ing, easily recognizable as a company symbol, and the construction economies of reducing the tower's surface area, quite literally cutting corners. The two-story square around the tower base will insulate it from traffic, give the company bulk office space for business machines, and enclose a private garden.



### DOUBLE-SHELLED CHAPEL IN WASHINGTON

A single concrete column will support this chapel, part of the Church of the Good Shepherd in Bellevue, Wash. (above), the chapel floor, a concrete hyperbolic paraboloid shell, and the roof, a twin shape of wood. Between these shells will run thin wooden rails and glass, providing sweeping views from the chapel

in all directions. In a separate building at the bottom of the hill, the church school, social hall, and administrative facilities will be quartered. Both the chapel and the auxiliary building are the designs of Kirk, Wallace, McKinley & Associates of Seattle, who estimate the total cost to be \$120,000.

*continued on page 51*



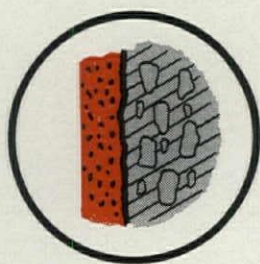
# RE-NEW-COAT® PROTECTS MASONRY AGAINST SURFACE EROSION ...IN ONE EASY APPLICATION!

Down go construction costs! One staging, one application . . . and the job is done!

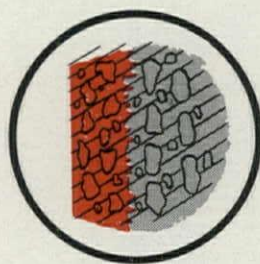
You can design longer life into masonry structures by specifying one application of Truscon Re-New-Coat.

Re-New-Coat is actually a masonry surface in itself, and it has even greater strength and durability than concrete. Not to be confused with a film-forming paint, Re-New-Coat anchors itself into masonry walls and becomes part of the structure. It *looks* like masonry, it *feels* like masonry, it *is* masonry.

Truscon engineers borrowed from concrete technology, combined it with the wonder world of epoxy, and produced a new masonry surface in a wide range of colors. Instead of using only finely dispersed pigments in a soft drying vehicle like ordinary paints, Re-New-Coat also contains large-size graded minerals suspended in a tough, hard-setting vehicle. As a result of this graded aggregate principle, the masonry surface gets super-protection from hard interlocking minerals bonded tightly together by tough Devran epoxy resin.



Conventional paint pigments give no protection against film shrinkage.



Re-New-Coat's interlocking aggregate principle eliminates internal shrinkage stresses.

## RE-SURFACES OLD MASONRY, TOO

Re-New-Coat renews the eroded surfaces of older masonry buildings, and, as in new structures, only one application is required.

Re-New-Coat has a heavy body and resembles soft, creamy mortar, except that it has more cohesive qualities. It is high in solid content and thus it produces a substantial build-up on the surface being treated. It dries to a hard flat finish with a slight textured effect.

## RESISTANT TO CORROSIVE FACTORS

Re-New-Coat is resistant to the alkali that is present in all masonry, and is also resistant to acid fumes, gases, and other harmful elements present in industrial atmospheres. It presents a hard, dense surface to driving rains, alternate freezing and thawing, hot sun and wind . . . shielding the structure from damage while providing an attractive masonry finish.

## PROVEN FOR OVER SIX YEARS

More than six years of successful use all over America is your insurance that Re-New-Coat lives up to every statement made here. Not new and untried, but an experienced, successful protector of new and old masonry surfaces in all types of environment.

Truscon will welcome the opportunity to furnish you with photographs of typical applications, complete specifications and technical data, and actual samples of Re-New-Coat in color. Send coupon now for fast action.



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- ☐ Send Re-New-Coat bulletin 6160 and color card.  
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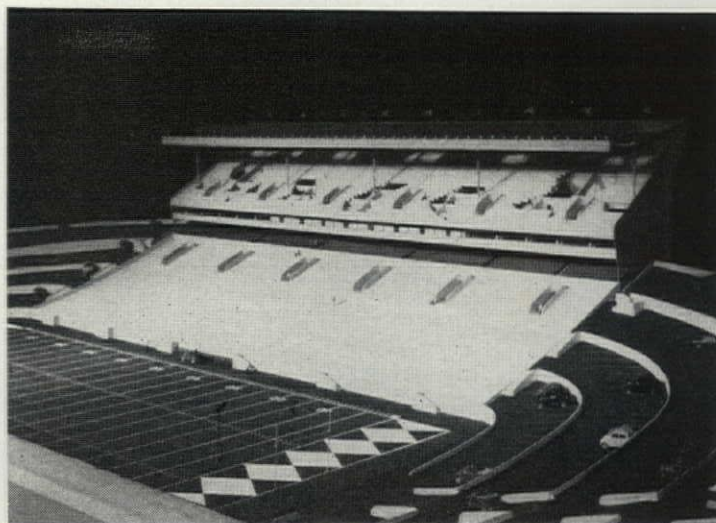
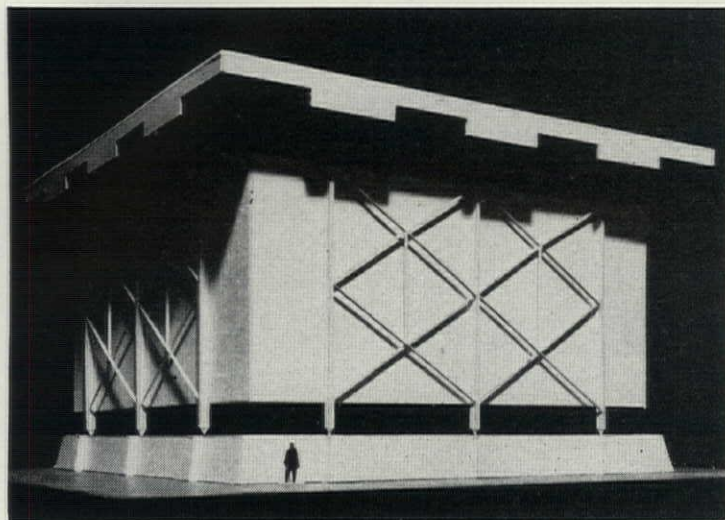
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ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_



## SIMULATED SPACE IN PENNSYLVANIA LABORATORY

One part of the huge space technology center that General Electric is building at Valley Forge, Pa. will be this "envelope" for an egg-shaped simulator which will test actual space vehicles. On the outside,

12 large steel columns will rise from truncated concrete bases; these will support the roof, which will cantilever into a canopy. Architects-engineers: Jackson & Moreland, Inc.; architect: Vincent G. Kling.



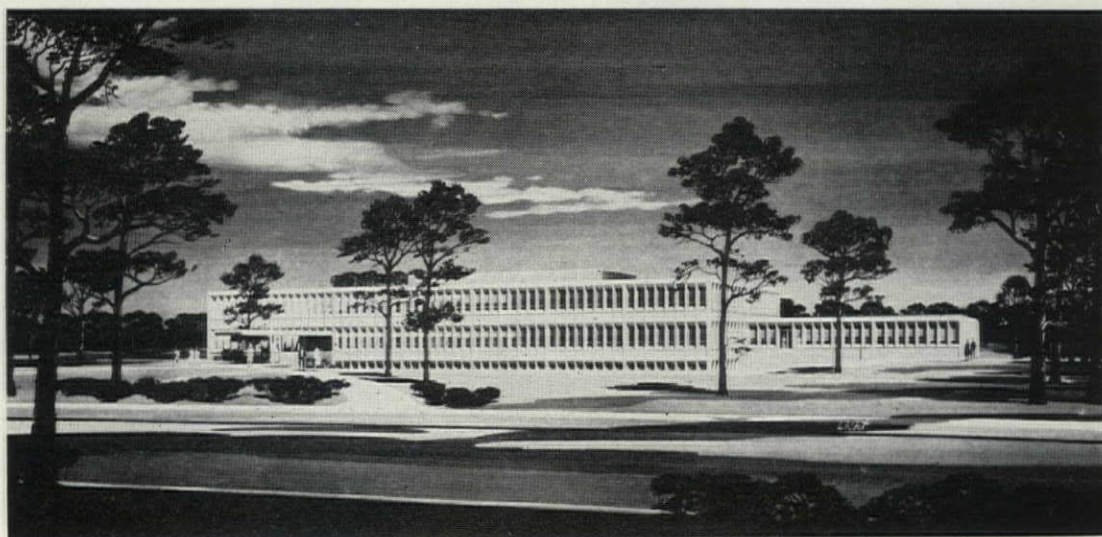
## DRIVE-IN STADIUM FOR UNIVERSITY OF OREGON

Avoiding the problem of selling end-zone seats, the University of Oregon Alumni Assn. proposes a stadium in Eugene banked with 400 tiered parking spaces in the end zones for drive-in game watching.

Engineer Marshall Bessonette's scheme will also give the university 40,000 pedestrian seats, 9,000 of them in a covered, reinforced concrete shelter at the top of the stadium, the rest in 50-row blocks.

## NEW JERSEY CLASSROOMS

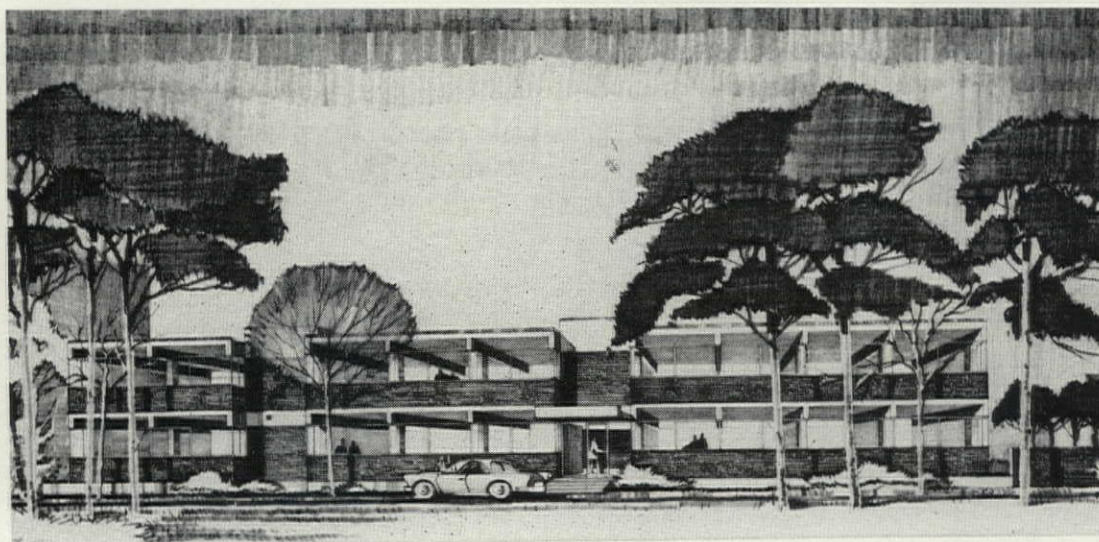
Earth tones, in keeping with the predominant brick flavor of the campus, will be used on the exterior of this new classroom-laboratory at Douglass College in New Brunswick, N. J. The exposed aggregate cast into the large wall panels and window frames will be warm brown, and the base, brick in a harmonizing color. Architects Kassler & Weisbecker of Princeton point out that these large precast concrete sections will not only be economical in construction, but their deep reveals will cut air-conditioning operating costs.



## PHILADELPHIA LABORATORY

Reinforced concrete in a sequence of 11 bays, two of them recessed, will run the full depth of the Philadelphia Presbyterian Hospital's new medical science research laboratory (right), and each laboratory or office will occupy a single or a double bay on one side of the building. Inside the two setback bays will be the service areas—stairs, elevators, and lobbies. Besides the exposed white concrete of the frame, the exterior finish will be red brick and glass. Architect: Vincent G. Kling.

*continued on page 53*







*for construction headaches, use the dependable*

# **24-HOUR CURE**

Incor 24-Hour Cement speeds construction... cuts costs to the bone by earlier release of men, forms and equipment...lets concreting move ahead smoothly the year-'round... even in cold weather months. Makes clients

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**FINNED LIBRARY IN FLORIDA**

A September bond vote will determine whether or not this city library goes ahead; if it does, it will replace the old Jacksonville city hall on a downtown corner. This proposal, by Architects Hardwick

& Lee, is a five-level structure, two levels underground. The building will be faced with precast concrete panels on the upper stories, which will be solid on the sunny sides and glass filled on the others.



**INSURANCE COMPANY BUILDINGS IN LOS ANGELES**

Embarking on a \$25 million building program in downtown Los Angeles, the Occidental Life Insurance Co. has announced that it will rebuild its present headquarters and erect three entirely new buildings:

the 25-story tower and nine-story service building above and a 700-car garage nearby. The architects in charge of designing Occidental Center: William L. Pereira & Associates of Los Angeles.

**MILLION-DOLLAR SCHOOL IN FLORIDA**

Although best known for his flamboyant Miami hotels, Architect Morris Lapidus demonstrates work of a plainer style below, the Hebrew Academy buildings in Miami Beach. Under roofs of prestressed

concrete folded plates, the school will have 23 classrooms, a 700-seat assembly hall, a cafeteria, a library, and a chapel. Architects: Morris Lapidus, Harle & Liebman; Connell, Pierce, Garland & Friedman.



**GYM FOR INDIANA STATE TEACHERS COLLEGE**

In Terre Haute, on the campus of Indiana State Teachers College, work is under way on the new physical education building above, the left-hand portion topped by a prestressed concrete roof spanning more

than 160 feet. The three gyms under these eight folded plates will convert into one large gym for intercollegiate basketball games and other college events. Architects: Miller, Vrydagh & Miller of Terre Haute.

**PLEATED ROOF ON MILWAUKEE CHURCH**

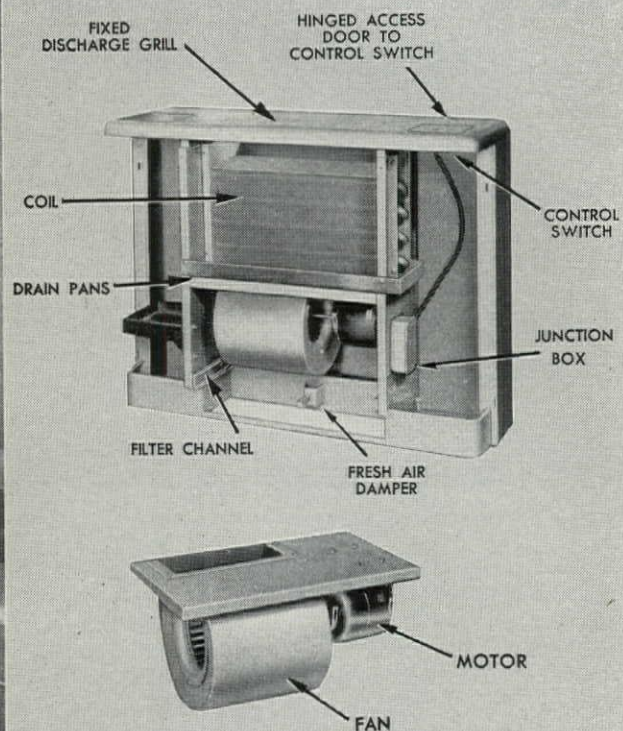
Fifty-foot circular steel columns, tapering from top and bottom to the center, will carry the pleated steel-webbed roof over St. Agnes Church in Milwaukee, under construction now and due for completion

this summer. Designed by Milwaukee Architects Herbst, Jacoby & Herbst, who describe it as "contemporary Gothic," the church's exterior will be of brick and cast stone, the latter forming pierced screens. **END**





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Individual room control permits each occupant to select the conditions he desires—without affecting other rooms or zones. One unit handles cooling, heating and circulation of fresh, filtered air . . . quietly!

Perfectly suited for either new construction or existing buildings, the Dunham-Bush unit system requires no costly, difficult-to-install central duct system. A single piping system is utilized year 'round.

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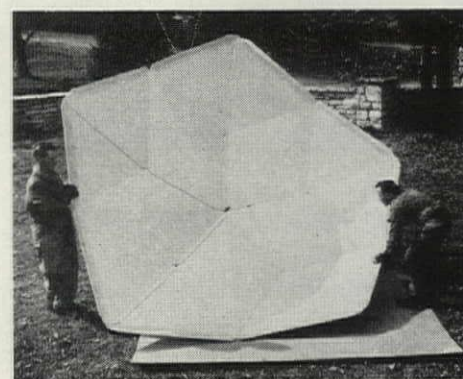


## Plastic domes . . . wall and roof panels . . . steel partitions



### PREFAB DOMES

Monsanto Chemical Co. is going into the dome business, designing, manufacturing, and marketing plastic geodesic domes under license from R. Buckminster Fuller. These *Geospace* domes, produced by a wholly owned Monsanto subsidiary, will be sold initially as ready-to-assemble package units, easily glued together on the site to make domes of two sizes, 22 and 9 feet in diameter. At 85 cents per square foot, the domes are cheap, waterproof shelters for a variety of uses, such as temporary warehouses on construction sites, disaster



housing or, in the case of the smaller dome, swimming-pool cabanas for motels or clubs.

Included in the package are panels of Fomecor, lightweight foamed styrene laminated to kraft paper and coated with a weather-resistant alkyd inside and out, a treated pine base ring, eye bolts, iron staking rods, neoprene adhesive, and instructions. The dome is assembled from the top down, pasted together joint by joint, and finished off with the wooden base and eye bolts. Stakes driven through the eye bolts secure the dome to the ground. Erection time varies with the skill of the workmen, but three unskilled men need less than a day to complete a dome. The 22-footer costs \$300 f.o.b. Baxley, Ga., but no price has been set for the smaller dome, to go into production April 1.

Manufacturer: Filtered Rosin Products Co., Baxley, Ga.

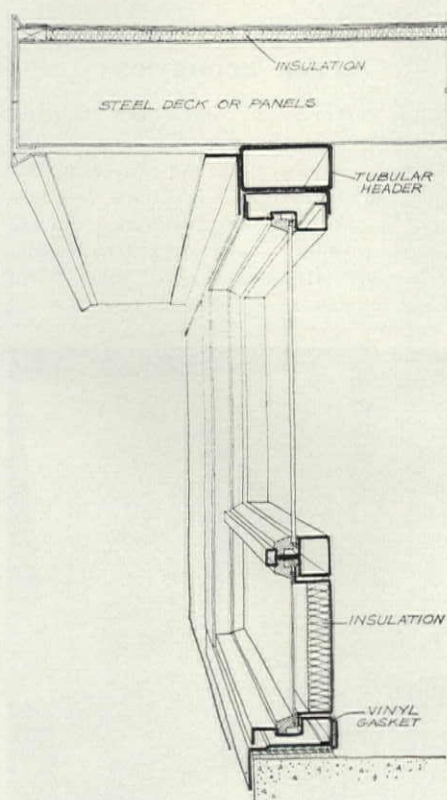
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### WORKING PANELS

With the addition of two shear end walls to carry the lateral load, Fenestra's new load-bearing wall and roof panels form a complete shell for a one-story building. This integrated system, called *Fenmark III*, spans up to 32 feet with continuous runs up to 150 feet without an extra shear wall. In most cases the use of structural steel is unnecessary. Erected by Fenestra crews, the panels go up quickly: after the wall panels are in place, the roof panels are welded to them. Insulation, finish roofing, and glazing are installed after roof and wall panels are up.

Standard Fenmark III panels are 9, 10, 11, and 12 feet high and 4, 6, and 8 feet wide, but special sizes may be ordered. Wall panels are porcelain enamel on steel, with or without glass-fiber insulation, and mullion caps are aluminum in two finishes. Fenestra offers two kinds of roof panels: one unfinished on the interior, the other finished with either a plain or acoustically corrected ceiling. Costs depend on materials and engineering services required.

Manufacturer: Fenestra, Inc., 2250 E. Grand Blvd., Detroit 11.





# Engineered BEAUTY and PERMANENCE in Ellison Balanced Doors

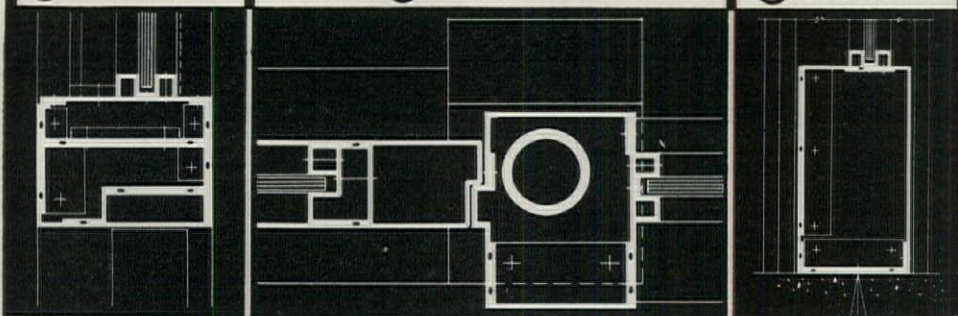


**SUN LIFE**  
INSURANCE COMPANY  
Baltimore, Md.  
Architect:  
Buckler, Fenhagen,  
Meyer & Ayers  
7 ELLISON BALANCED  
DOORS in the entrances  
to this building

① Transom Bar

② Mullion Section

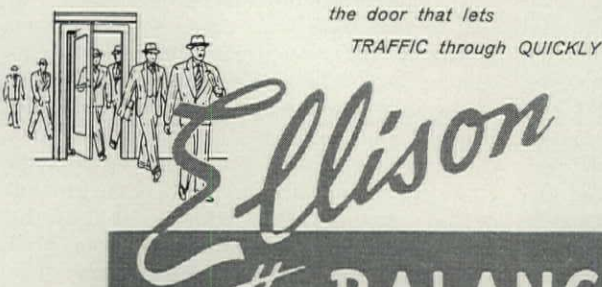
③ Base Section



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Whether you are planning one door or a battery of doors Ellison has had 45 years experience that can help you solve any entrance problem.

Ellison engineers can make recommendations on structural support, traffic flow, wind and suction conditions that will be helpful in early planning — for either new or modernized buildings. Along with all these advantages — the customer receives a trouble-free door.



the door that lets  
TRAFFIC through QUICKLY

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### ARTIFICIAL REVERBERATION

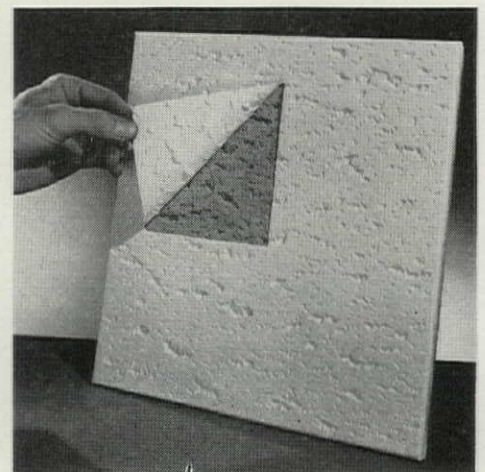
This electronic acoustical system for new and rebuilt auditoriums and churches relays sound so that rooms designed primarily for voice reverberation can work equally well for musical programs. Manufactured by a division of Litton Industries, the *Westrex 1400 Distributed Reverberation System* makes up for the short reverberation time of voices by spreading the sound, creating a complex train of repetitions in diminishing volume. Sounds are recorded on magnetic tape, which then passes over a succession of reproducing heads. Tape speed and head spacing determine the frequency of repetition, and both factors may be adjusted to the needs of a particular room. To further the illusion of sound passing from front to back with successive reflections and diminishing volume, each head connects to an individual pair of loudspeakers installed on opposite sides of the room, and the reproduced output feeds back onto the tape at decreasing volumes. Once installed, the system is flexible enough so that it may be adjusted to several kinds of musical programs, some of which, particularly religious music, require longer reverberation times than others.

The equipment needed falls into three groups: the tape transport, including erase, record, and reproducing heads; the distributed reverberation assembly, including recording and reproducing circuits; and amplifiers for each speaker. The basic price for this equipment is \$10,000, excluding microphones and speakers.

Manufacturer: Westrex Recording Equipment Dept., 6601 Romaine St., Hollywood, Calif.

### CLEAN ACOUSTICS

A thin, waterproof vinyl sheet stretched over acoustical tile gives it scrubability without reducing its sound-absorbing efficiency. Manufactured especially for hospitals, laboratories, restaurants, and food-processing plants, where acoustical tiles are washed often, the vinyl sheet withstands repeated scrubblings, protects the





tile face from water damage, yet does not affect the penetration of sound into the tile's porous core. It will not shrink, crack, or separate from the tile, and is said to be the first washable film which actually repeats the fissures of the tile beneath rather than carrying a printed design.

This tile is incombustible and may be installed by mechanical suspension or by cementing. Sold only in white and in 12-inch squares, *Vinyl Face Travertone* costs about 85 cents to \$1 per square foot installed.

*Manufacturer:* Armstrong Cork Co., Lancaster, Pa.

### EPOXY MORTAR

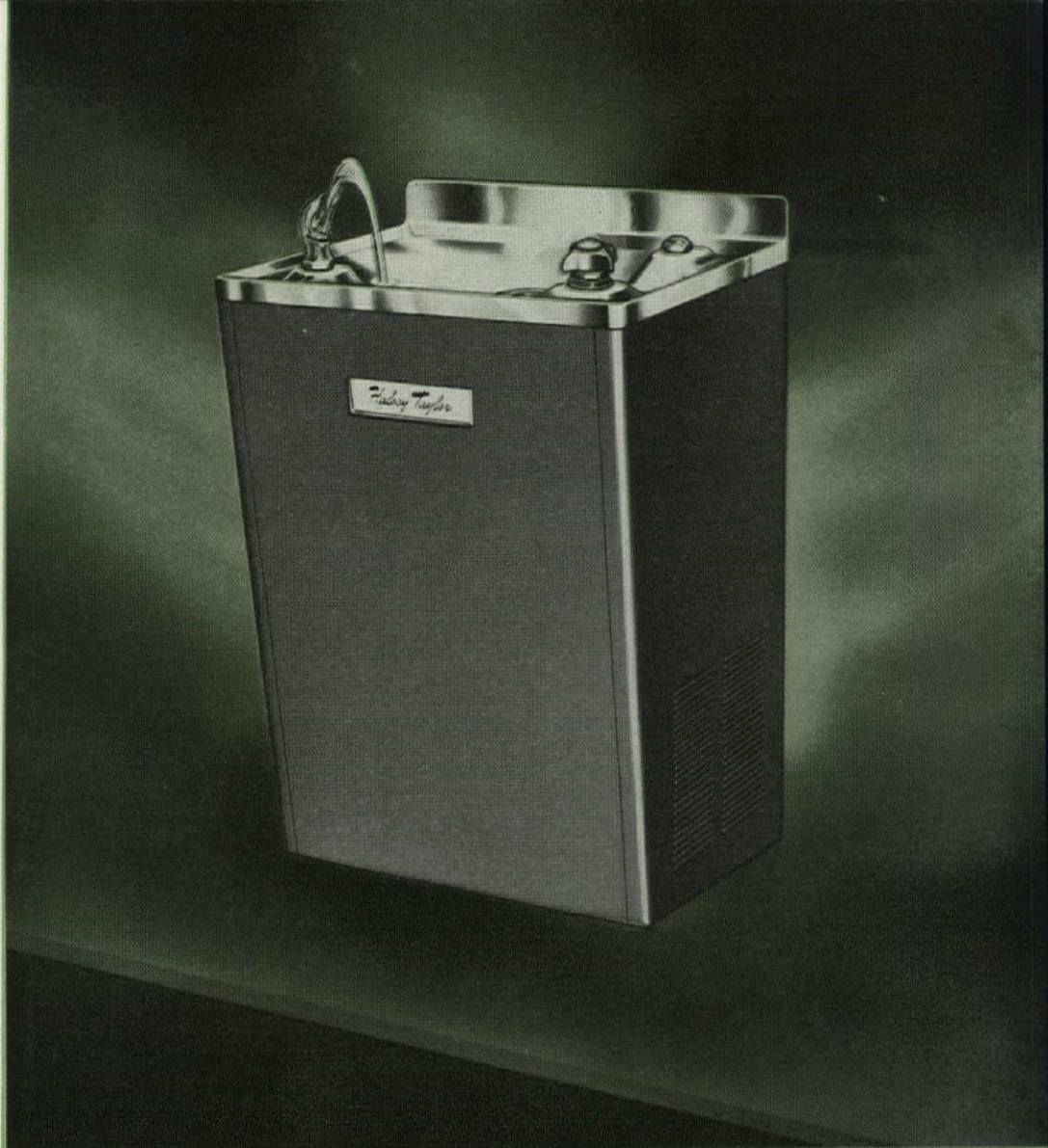
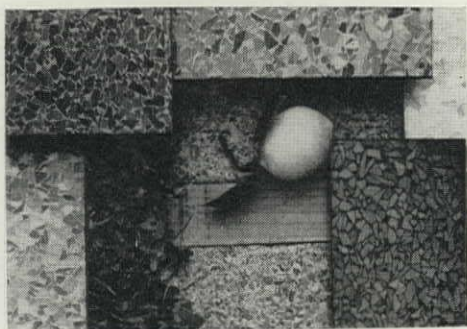
*Threadline*, an epoxy-based mortar, forms a strong bond between brick, concrete block, and other masonry units, but the thin joint, which is less than 1/16 inch, limits this material's use to precision-ground units. Threadline is mixed on the site and squirted from a caulking gun in a thin bead around the block. It cures in 24 hours and reaches full strength in 72. According to the manufacturer, even though Threadline costs twice as much as cement mortar and requires more expensive masonry units, the labor and time saved cut as much as one third from the cost of a masonry wall. Threadline is sold in packages containing mortar for 100 blocks, measured and sealed into plastic bags ready for mixing. A single kit costs about \$10.

*Manufacturer:* Raybestos-Manhattan, Inc., Bridgeport 2, Conn.

### PATTERNED PANEL

The new *Soulépanel* for curtain walls is a six-layer sandwich faced on the outside with a layer of Mosaica, a glass-chip material. The other layers in the sandwich consist of an inorganic matrix, cement asbestos board, glass-fiber insulation, aluminum foil, and an interior finish of cement asbestos. Aluminum sections frame the whole panel, and in panels larger than 9 square feet galvanized steel channels add stiffness. Mosaica, which has been on the market for some time, looks deeply grained and rough (see photo below) but is actually smooth enough to write on, and it comes in 17 standard colors and

*continued on page 58*

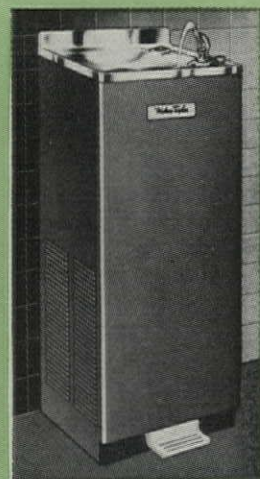


## This is the cooler that pioneered a trend

Just a little over a year ago no one ever saw a cooler like this. We call it the Wall-Mount, truly a Halsey Taylor first.

It mounts on the wall . . . no exposed fittings, no space behind cabinet to catch dirt or grime! Off the floor . . . room underneath for easy cleaning! The answer to maintenance-free installation and, like all Halsey Taylor fixtures, gives years of trouble-proof service.

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The Wall-Tite, big brother to the Wall-Mount. Fits tight to the wall.



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## Products contd.

faceted (half glossy) or matte finishes.

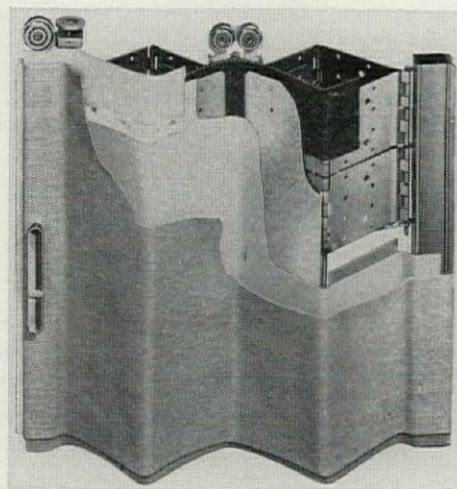
Panels are made to specifications in four thicknesses—1, 1½, 1¾, and 2 inches. Typical prices for 1,000 square feet are \$1.90 per square foot for the 1½ inch panel and \$1.95 for the 1¾ inch panel. Both prices are f.o.b. San Francisco.

Manufacturer: Soulé Steel Co., 1750 Army St., San Francisco.

### ACCORDION WALL

Twelve layers of material, two of them 24-gauge steel, seal out sound in the *Modernfold Soundmaster 240*, a heavy-duty folding partition. Pulled into place, it has an average sound attenuation of 41.8 decibels, equivalent in effectiveness, the manufacturer claims, to a solid apartment wall in making normal speech inaudible from one side of the partition to the other. Credit for this goes not only to the 12 layers but also to polyurethane cushions along the jams and double felt and rubber seals at the horizontal edges. The outside covering is heavy vinyl.

The largest single partition is 25 feet high and 60 feet wide, but wider expanses present no problem—several partitions may be fitted together to fill the space. In closed position, a partition 20 feet wide





folds to 32 $\frac{3}{4}$  inches. Cost: about \$5 per square foot.

*Manufacturer:* New Castle Products, Inc., Box 353, New Castle, Ind.

### COLORED PLYWOOD

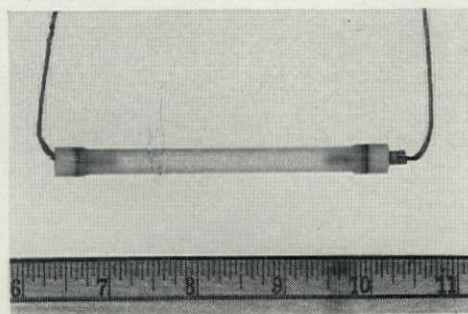
Georgia-Pacific's new colored fir plywood has two baked-on finishes, one on top of the other: a high-density resin-fiber undercoating and an acrylic overlay available in four colors (red, blue, green, or white). The acrylic overlay is a permanent all-weather finish applied to one or both sides, and panel edges are weather-sealed at the factory. This factory finish makes plywood weather-resistant and tough enough for use in highway signs and exterior building walls, either as a curtain-wall panel or a structural component.

Georgia-Pacific is offering this treated plywood in standard thicknesses of 5/16,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ , and  $\frac{3}{4}$  inches, widths of 30, 36, 48, and 60 inches, and lengths of 72, 84, 96, 108, and 120 inches. To give an idea of cost, the company quotes 65 to 87 cents per square foot for the 5/16-inch thickness, one side overlaid with acrylic, the exact price depending on specifications and quantity.

*Manufacturer:* Georgia-Pacific Corp., Equitable Building, Portland 4, Ore.

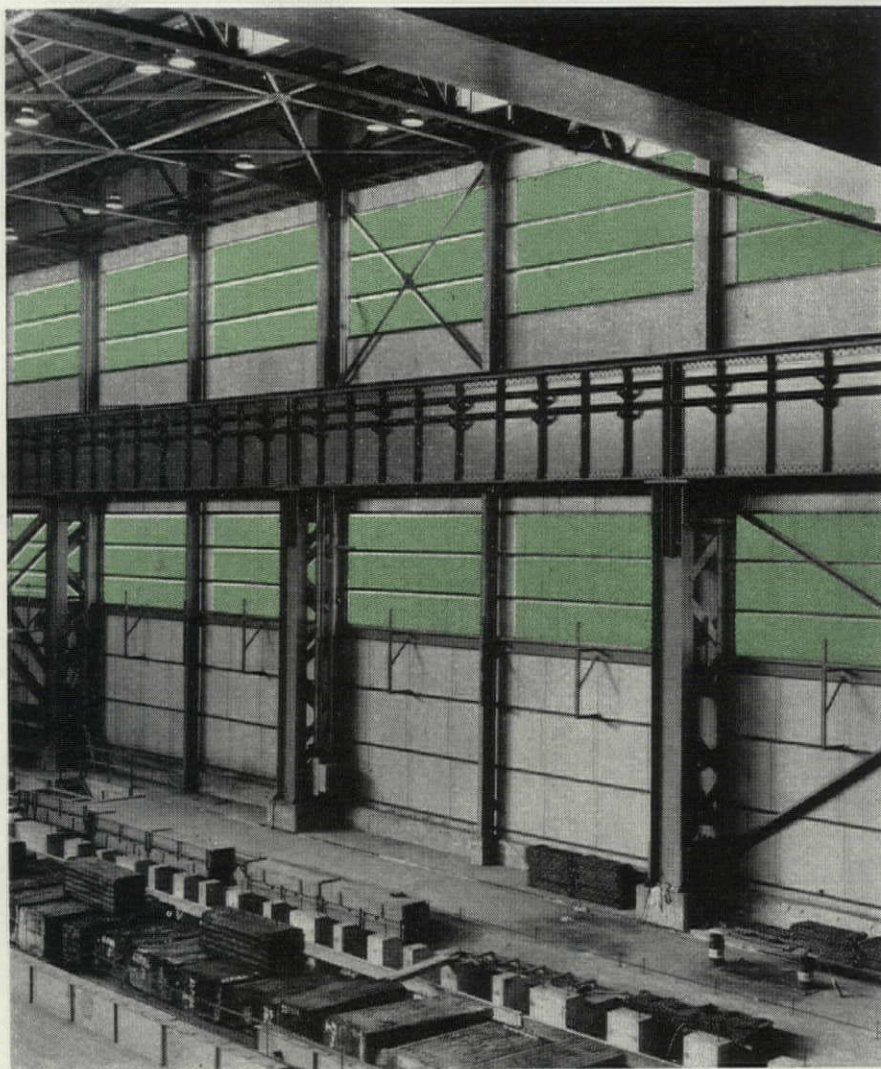
### PREVIEWS

► General Electric laboratories are experimenting with a vapor lamp (below) which combines high light output and favorable color quality. Thin envelopes of GE's Lucalox, a polycrystalline alumina ceramic, tolerate higher pressures and temperatures than quartz or other conventional bulb materials without melting. If the experiments are successful, the new metallic vapor lamps will be marketed primarily for industrial, commercial, and defense lighting purposes.



► Brunswick Corp. and Mohasco Industries, Inc. are working together on the production of a flexible room divider consisting of a lead-filled fabric for sound-deadening. Although designed specifically for schools, the *Acousti-Flex* material is expected to find use in commercial and industrial buildings as well.

END



## Shatterproof Structoglas cuts building and maintenance costs for United States Steel

United States Steel saved on construction expense and assured years of maintenance-free daylighting by using Structoglas fiberglass windows in this new vertical furnace building. The strong corrugated plastic panels were fastened directly to the steel walls without sash. No painting was required since the light-filtering green tint is "built in." Structoglas is shatterproof and highly weather resistant, so that maintenance is virtually eliminated. Glaze your plant *once and for all* with Structoglas—best plastic panel under the sun. Get the PROOF.®



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Write Structoglas Inc., Dept. 409, Cleveland 20, Ohio, for Glazing Folder SL-1, with proofs of Structoglas superiority and glazing details.

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against dents, peeling, surface chipping and mildew under conditions specified.

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12" x 12" fissured mineral wool acoustical tile. Acoustiroc can even be installed before plaster and terrazzo work are dry, saving a week or more of building time. Acoustiroc is an excellent choice, any way you look at it. National Gypsum Company, Buffalo 13, N.Y.







"G-E Remote-Control Wiring has saved money since the day it went into this building in 1953," says Mr. Donnelly, standing in front of 3-story, block-long office building, Menands, N. Y.

## "G-E Remote-Control Wiring saved us \$20,561 in this N. Y. Telephone building - on installation alone!"

**... Mr. H. J. Donnelly, Supervising Electrical Engineer New York Telephone Company, Albany, N. Y.**

"We compared General Electric Remote Control with an ordinary switching system that would give us the kind of lighting control we wanted," says Mr. Donnelly. "We were surprised to find that, in addition to its other advantages, the G-E low-voltage system cost \$20,561 less to install!"

"On top of the initial savings, we reduced our operating costs, because G-E master switching makes it easy for maintenance crews to turn ON only those lights needed, rather than lighting up whole floors. Switches at convenient locations save our men extra steps, too."

"These savings were all in addition to the original reason we con-

sidered Remote-Control. That was extra safety in controlling the 480Y/277-volt power system we chose for its saving in branch circuit copper. Remote-Control relays in the ceiling control the 277-volt lighting circuits, so there's only a low, 24 volts at the switches. Of course, the lightweight, 24-volt switch wiring makes it easier to relocate office partitions, too. And the elimination of switch-loop voltage drops that can cut the life and efficiency of lamps, is still another feature."

General Electric would appreciate the opportunity of working with you on the design of a Remote-Control Wiring System tailored to fit your particular needs. Write Commercial Engineer, General Electric Company, Wiring Device Department, Providence 7, Rhode Island.



"Douse the lights you don't need!" is standard procedure for maintenance crew, in building from 5:00 to 11:00 p.m. G-E Remote Control makes it easy.



G-E master selector switches at ends and center of each floor control lighting separately for each 1/2 floor. Building contains 2000 fluorescent lamps.

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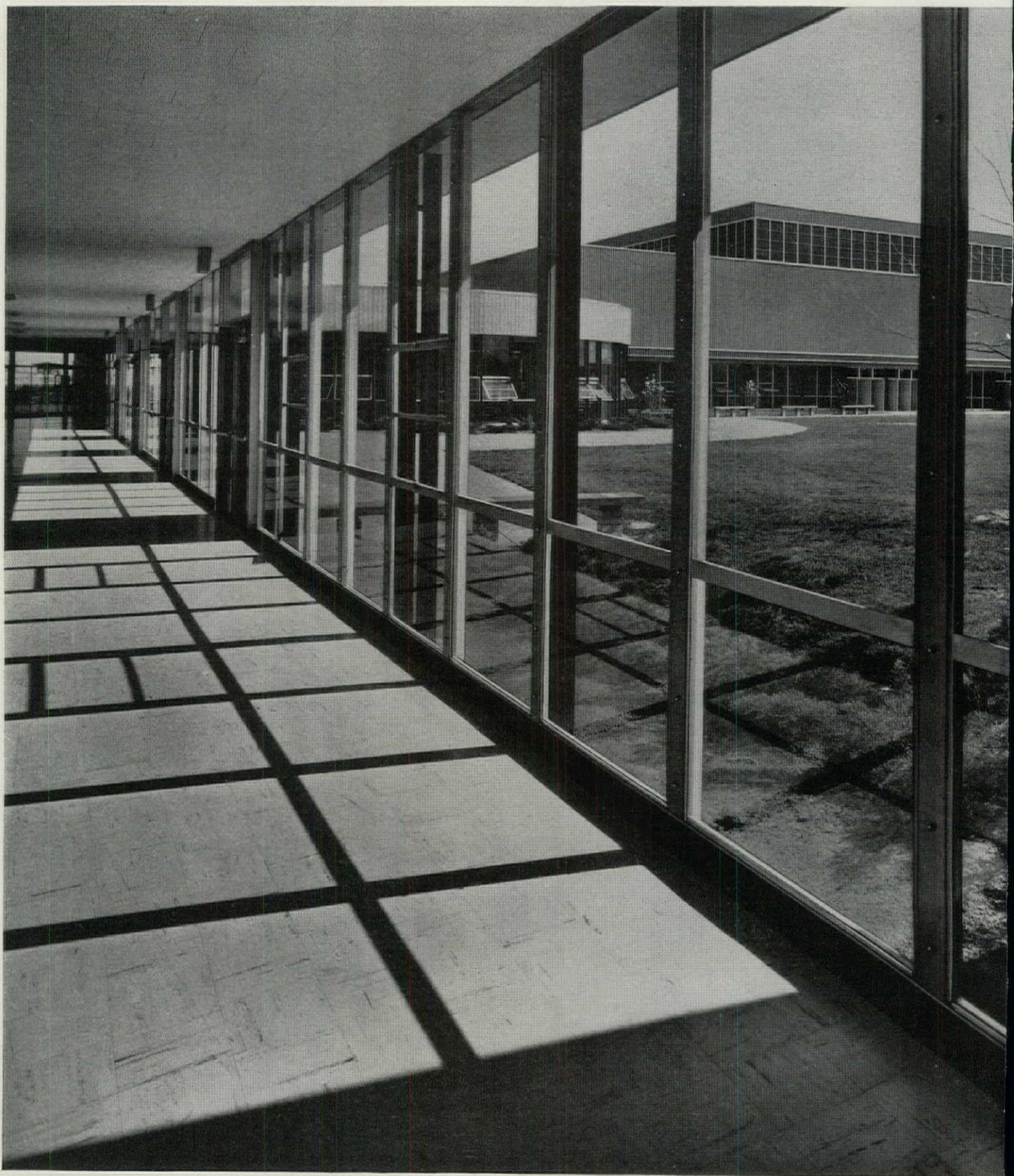
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# SOLEX<sup>®</sup> glass protects their eyes...



In the corridors, PPG polished plate glass was used in the upper sections and HERCULITE shock-resisting tempered plate glass was below where damage could occur.



# HERCULITE® protects the school

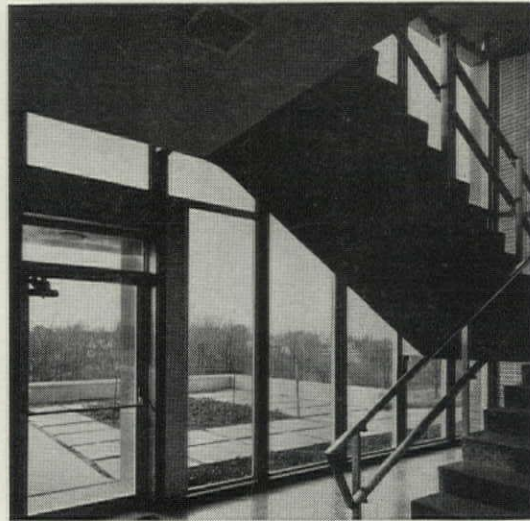
Large expanses of glass create a feeling of unlimited spaciousness in the new Quincy, Illinois, Senior High School. Glass performs many practical functions, too. PPG SOLEX green tint, glare-reducing, heat-absorbing glass not only protects young eyes from solar glare but keeps classrooms cooler in summer. HERCULITE tempered plate glass, because it is four to five times stronger than regular plate glass of the same thickness, provides plenty of impact resistance in corridor areas likely to receive the most abuse.

Polished plate glass, SOLEX and HERCULITE are deftly woven into the design pattern to produce a brilliant, modern look which opens the building to the whole outdoors.

For more information on any of these products, write Pittsburgh Plate Glass Company, Room 1100, 632 Fort Duquesne Boulevard, Pittsburgh 22, Pennsylvania.



The driver training classroom gets plenty of light but glare and solar heat are greatly reduced by SOLEX green tint plate glass.



TUBELITE doors, surrounded by large panels of PPG polished plate glass, accentuate the open-vision theme.

*Architects and Engineers: Charles F. Behrensmeyer & Frank W. Horn, Quincy, Illinois*  
*Contractor: Simmons Construction Company, Decatur, Illinois.*

## PPG glass products for schools:

SOLEX® Plate Glass—green tint, heat-absorbing, glare-reducing glass  
SOLARGRAY® Plate Glass—a neutral gray, heat-absorbing, glare-reducing glass  
PENNVERNON® GRAYLITE™—a neutral gray, heat-absorbing, glare-reducing, heavy sheet glass  
HERCULITE®—shock-resisting tempered plate glass  
TWINDOW®—the world's finest insulating window  
Polished Plate Glass—for clear, true vision  
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## Pittsburgh Plate Glass Company

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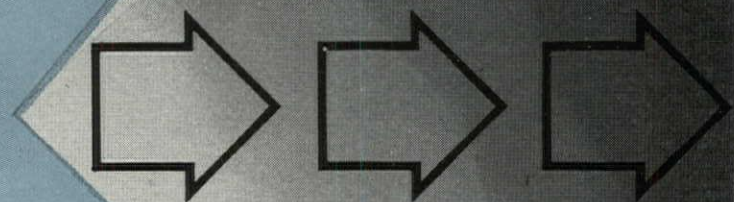
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Because of its high production potential and adaptability, the uses of Van Huffer square and rectangular tubing are practically unlimited. Here are a few:

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### GREATER SAVINGS

High strength-to-weight ratio permits use of lighter gauges or smaller sizes than solid metals.

### UNIFORMITY

Uniform wall thickness, square sides, accurate radii and straightness.

### FUNCTIONAL BEAUTY

Smooth finish, free of scale and protruding flash, ready to paint.

### STANDARD SIZES AND GAUGES

#### Squares:

5" x 5" — .165" to .259 wall

6" x 6" — .165" to .259 wall

#### Rectangles:

4" x 6" — .165" to .259 wall

4" x 8" — .165" to .259 wall

in any lengths and all common grades of steel.

**ACTUAL SIZE: 4" x 8" .259 WALL**

Structural Columns  
Sign Supports  
Canopy Supports  
Beams  
Steel Buildings  
Farm Equipment  
Earth Moving  
Equipment  
Bridge Work  
Automobile  
Transports  
Storage Racks  
Guard Rails

### ACTUAL SIZE

**6" x 6" .259 WALL**

Van Huffer also produces this wide range of standard welded sizes and gauges:

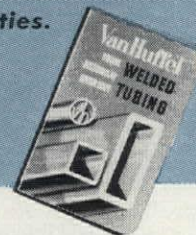
**ROUND:** 3/8" thru 6" in gauges from .020 (25 ga.) thru .259 (3 ga.) and all intermediate sizes.

**SQUARE:** 3/8" thru 6" in gauges from .020 (25 ga.) thru .259 (3 ga.) and all intermediate sizes.

**RECTANGULAR:** 3/8" x 3/8" thru 4" x 8" in gauges from .020 (25 ga.) thru .259 (3 ga.) and all intermediate sizes.

All Van Huffer Welded Tubing stocks are available through Steel service centers in principal cities.

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Metropolitan apparel store, Dayton, Ohio. **Architect:** Coates Weiler and Wagenknecht. **Contractor:** Chas. H. Shook, Inc.

## Two separate Chrysler Packaged Air Conditioners cool each floor in Dayton's largest apparel store

One large air conditioner could have done the job. But Metropolitan, Dayton's largest family apparel store, decided on *two* 30-HP Chrysler Packaged Air Conditioners for each floor of the building. The reasons are interesting:

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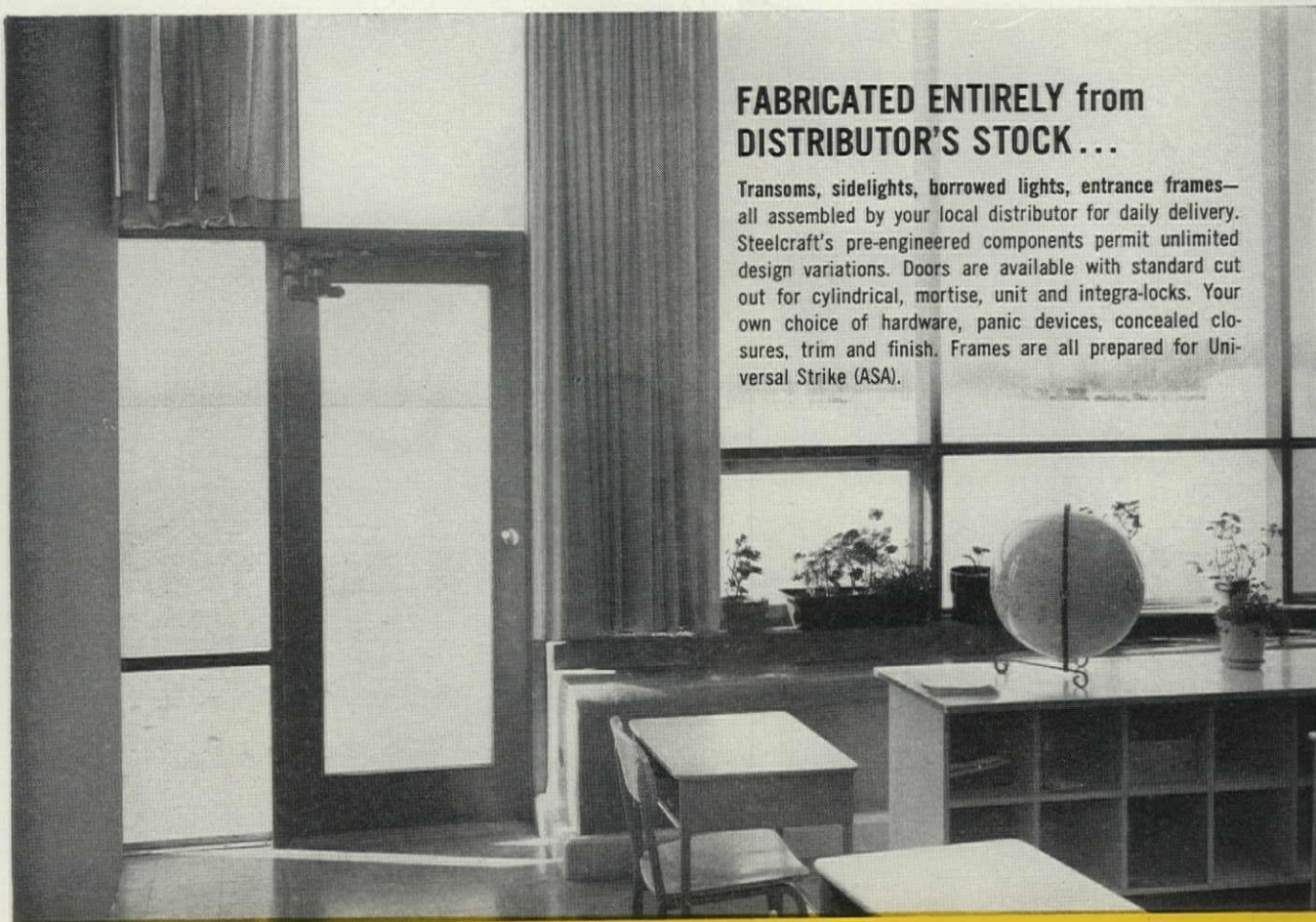
to work whenever outdoor temperatures rise to their peak.

Why was Chrysler equipment specified? Because installed cost is low . . . and operation is more economical. And because Chrysler, the pioneer manufacturer of packaged air conditioning equipment, offers the top quality unit for any building need. Before you decide on your next air-conditioning job, check with your local Chrysler Engineer. Or write today for technical data.



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Fredericktown, Ohio  
Architects: Joseph Baker and Associates,  
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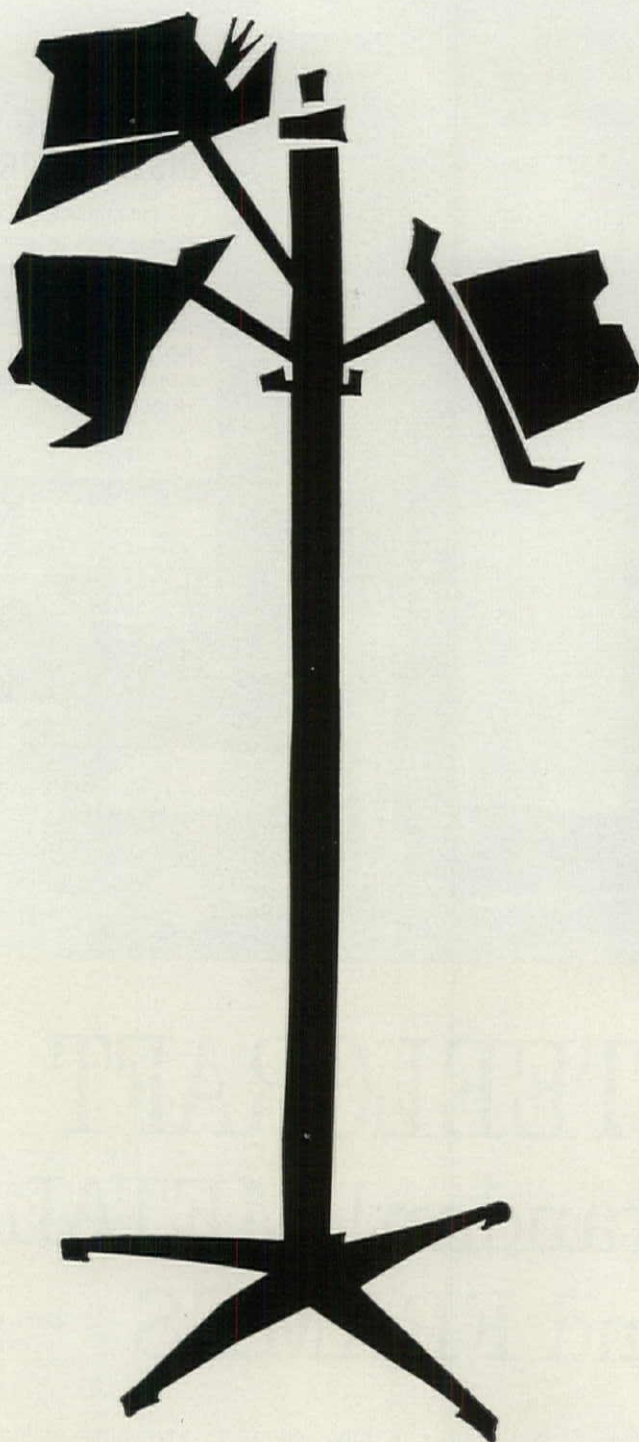
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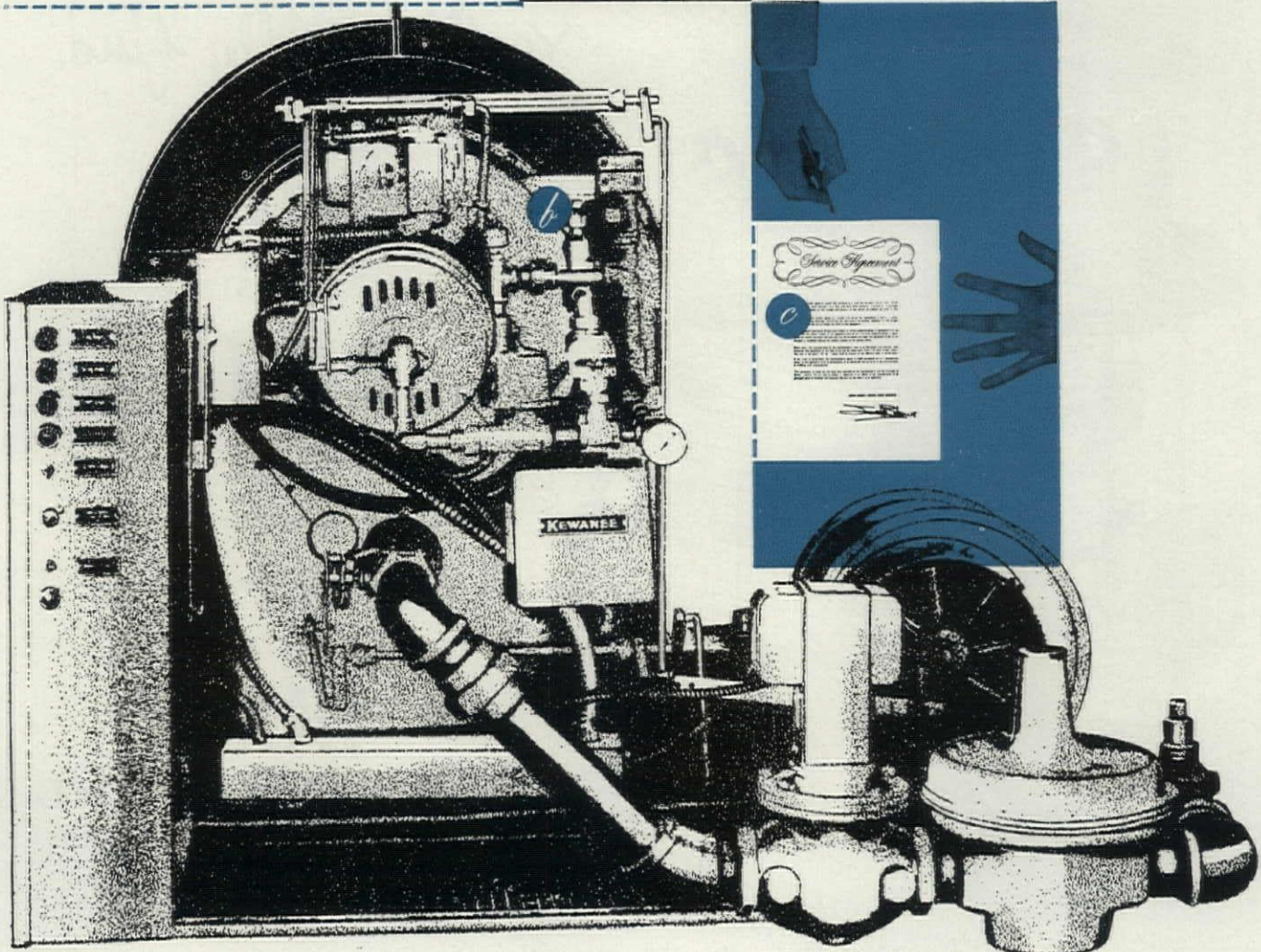
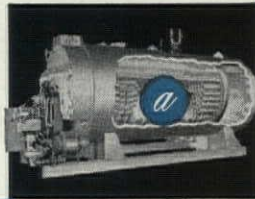
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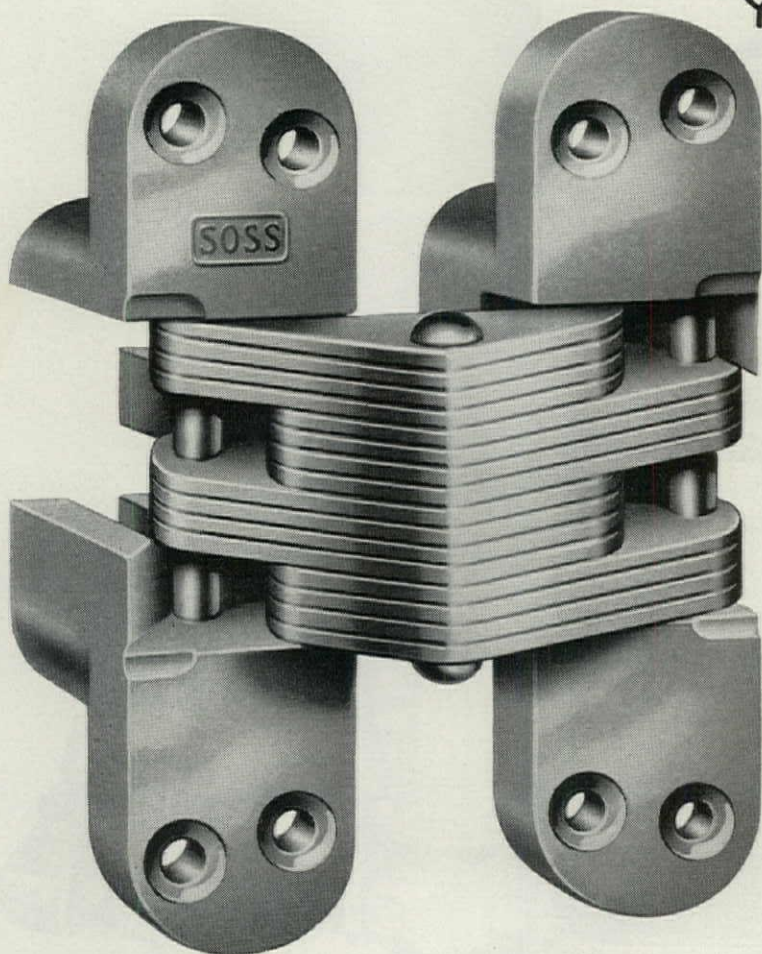
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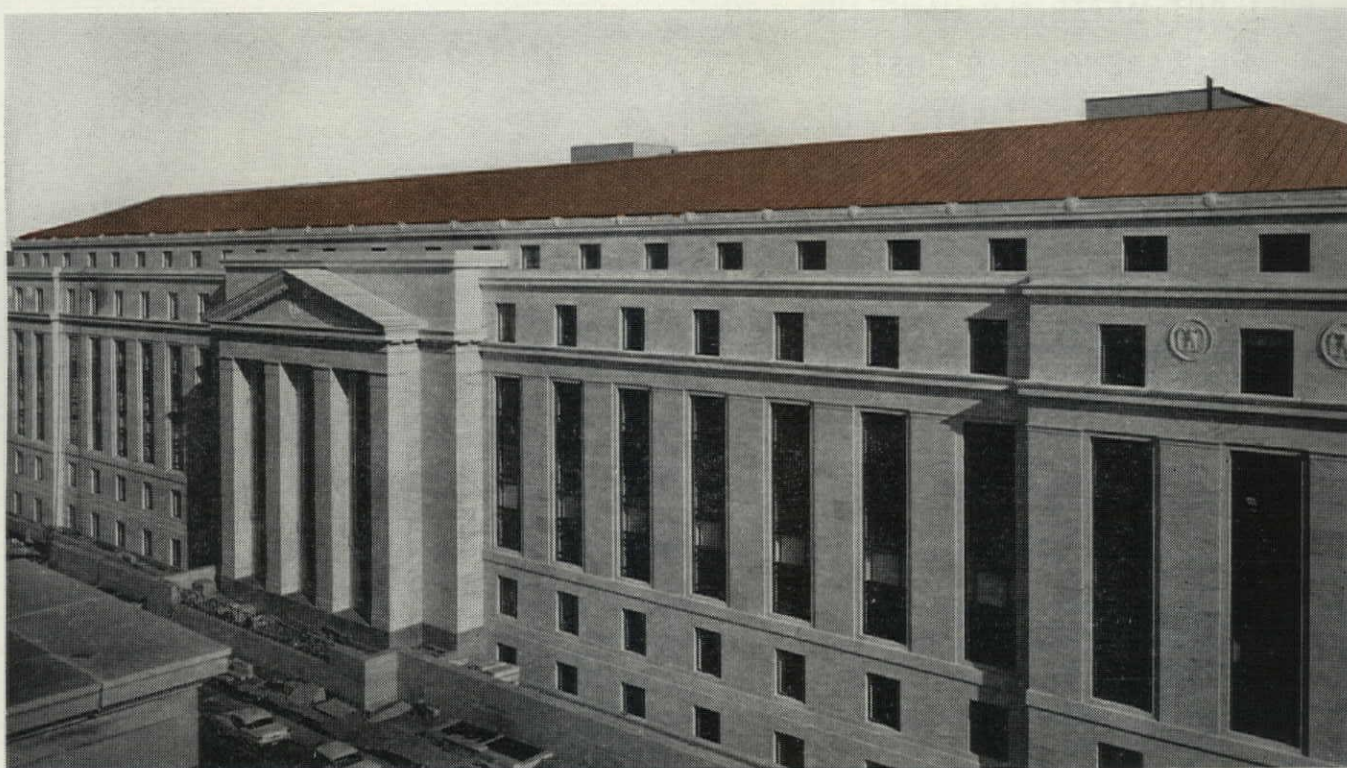
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Copper batten seam roofing on the new Senate Office Building, Washington, D. C.

## New Senate Office Building has copper roofing for enduring protection

Approximately 75,000 pounds of Anaconda copper were used for the batten seam portion of the roof and the deep, boxed concealed gutter on the new Senate Office Building. In the nation's capital and in cities throughout the country, copper roofs are establishing records of long service and low maintenance costs.



The roof was fabricated and erected by the Overly Manufacturing Company, Greensburg, Pa. A modified "Overly" batten was formed from copper strip. Roofing sheets were formed from 20-ounce cold-rolled copper. Architect of the Capitol, J. G. Stewart. Architects: Eggers and Higgins, New York City. General Contractor: George Hyman Construction Co., Washington, D.C.

A realistic comparison of roofing costs requires the inclusion of two important factors—estimated maintenance costs over the years, and estimated serviceable life of the roofing material. Copper has proved its economy. Performance records covering many years of service show that expected long life and minimum up-keep are based on fact, not guesswork. Here is an example:

When the 47-year-old Grand Central Terminal Building was razed recently to make way for the huge new Pan-American Building, more than 150 tons of sheet copper were removed from the roof. The copper was still sound and beautifully colored by nature's patina. It is also worthy of note that the scrap value of the removed metal was considerably higher than the price for ingot copper prevailing when the roof was installed in 1913.

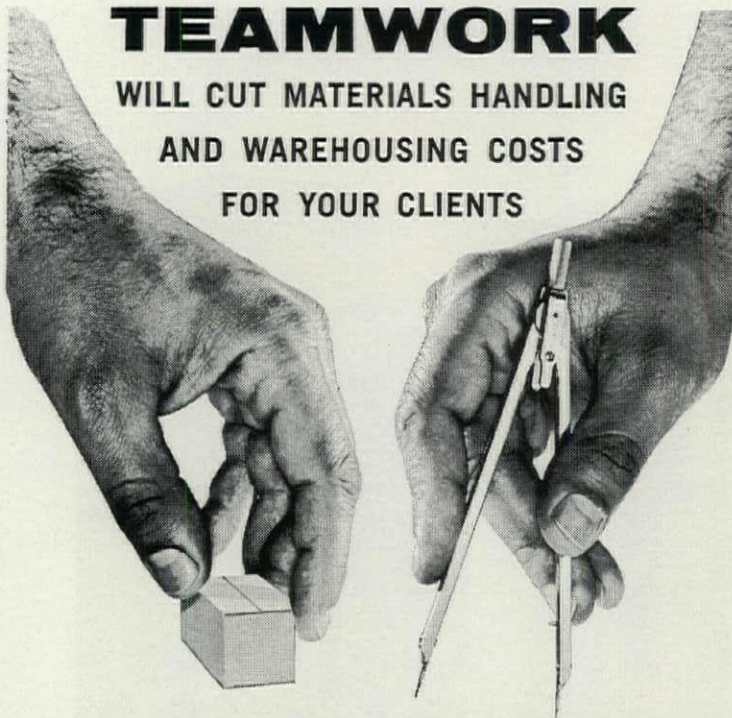
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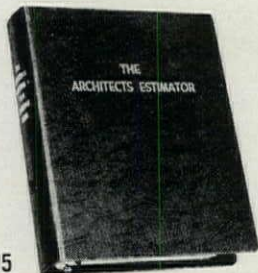
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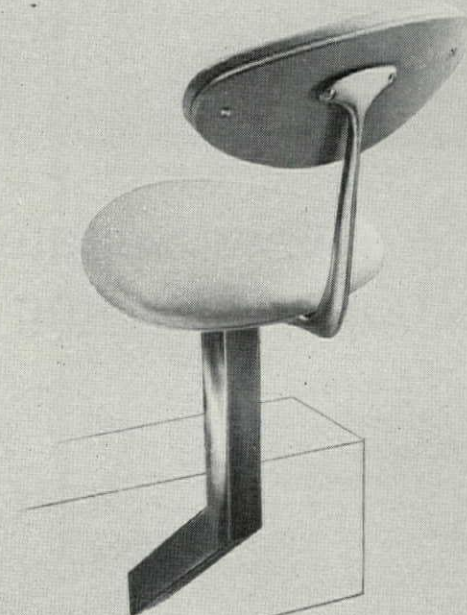
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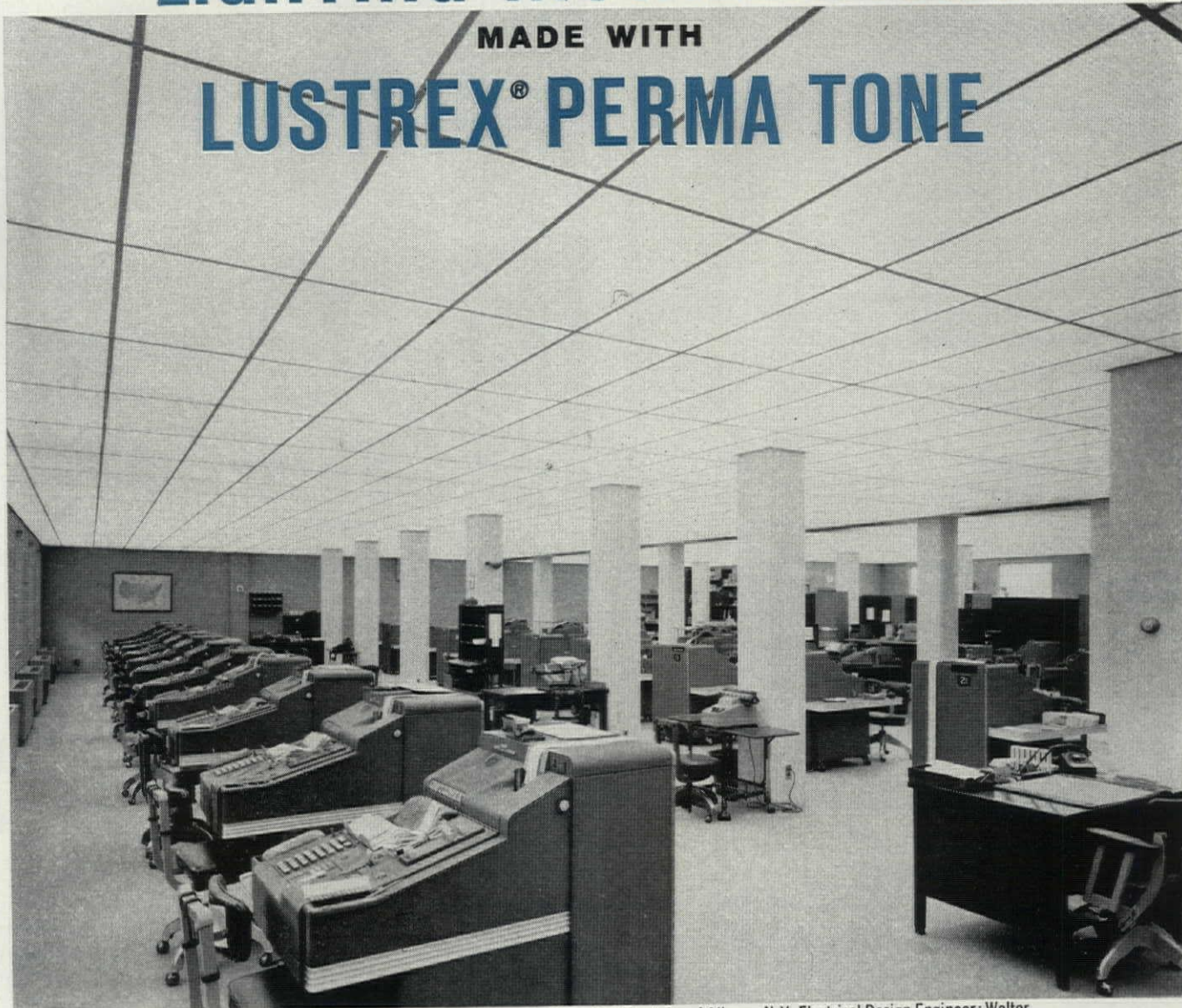


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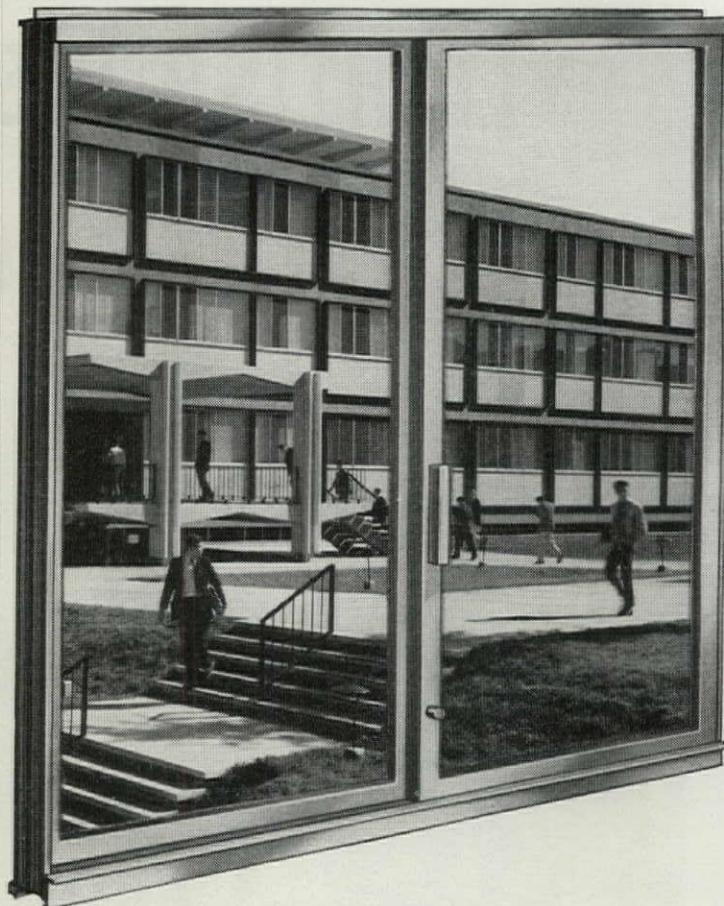
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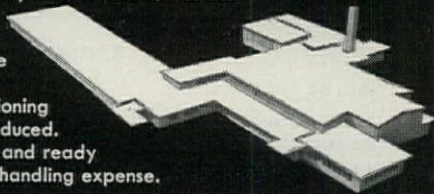
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## Editorial

# Philadelphia and vision

On April 24 to 28 the American Institute of Architects, the chief professional body related to the art of building, will convene in Philadelphia to discuss "redesigning urban America." Today this seems natural. In 1956, when this magazine proposed a convention on this subject, perhaps it was premature. Ten years ago it would have seemed visionary. Anyway, President Will and the A.I.A. are right, and are to be congratulated.

As for Philadelphia, way back in 1947 it treated itself to a wonderful show on the future of the city (FORUM, Dec. '47). Gimbel's department store gave the space for the exhibit to the indefatigable architects of the local A.I.A. chapter. There were, of course, people then who thought that the businessmen backing this move were premature, that the architects making the giant models were dreamers, and that this magazine in devoting so much space to it was unbalanced. Not so. Cities were beginning to have to move, though only the leaders yet knew this. Two years later Congress passed Title I of the Housing Act of 1949, and thereby enacted the first, epoch-making, urban renewal legislation. At last Philadelphia and other cities had a major usable tool for steady redevelopment operations. The "redesign of urban America" was on the way.

Doubting Thomases yield hard. Despite the manifest devotion of all the Philadelphia architects who put on the 1947 show—Stonorov, Bacon, Kahn, Kling, and many others—FORUM kept hearing that "architects could not possibly be interested in that kind of blue-sky stuff," anyway not rank-and-file architects. Nevertheless, FORUM settled down to regular treatment of the urgent city subject. Mayor Dilworth of Philadelphia, successive planning commissioners, and Planning Director Edmund Bacon must have heard equally assured statements that businessmen could not possibly care for urban renewal either. Wrong again. Now businessmen are with it all the way across the nation.

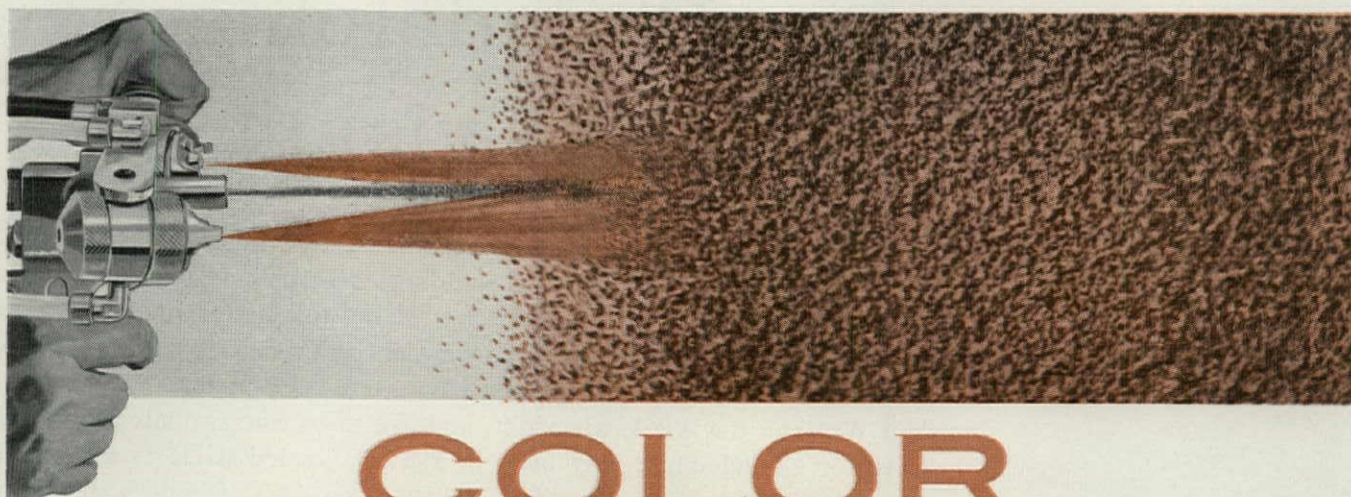
Philadelphia's businessmen have gone so far as to create an exemplary redevelopment corporation; Philadelphia's central business district stands visibly transformed; other big transformations are under way elsewhere all through the city.

Break-throughs seldom come singly: one leads to another. Urban renewal has been followed by the discovery (heavily shared by this magazine, see the February issue) of the importance of *rebuilding*; and also of the importance of having cities and *suburbs* solve their problems together (FORUM, Jan. '61).

All these "visionary" moves result ultimately in construction activity involving billions upon billions of dollars. Urban renewal adds several billion construction dollars a year, and rebuilding—which must soon become an organized effort—involves more billions annually than all new houses do. There still remain Doubting Thomases who regard these latest break-throughs of imagination as "visionary." But most architects, builders, and manufacturers in the building industry are bold by nature, not picayune; all they need is good leaders, like the Philadelphia folks. The Doubting Thomases will be on board in the end, no doubt declaring that they did it all.



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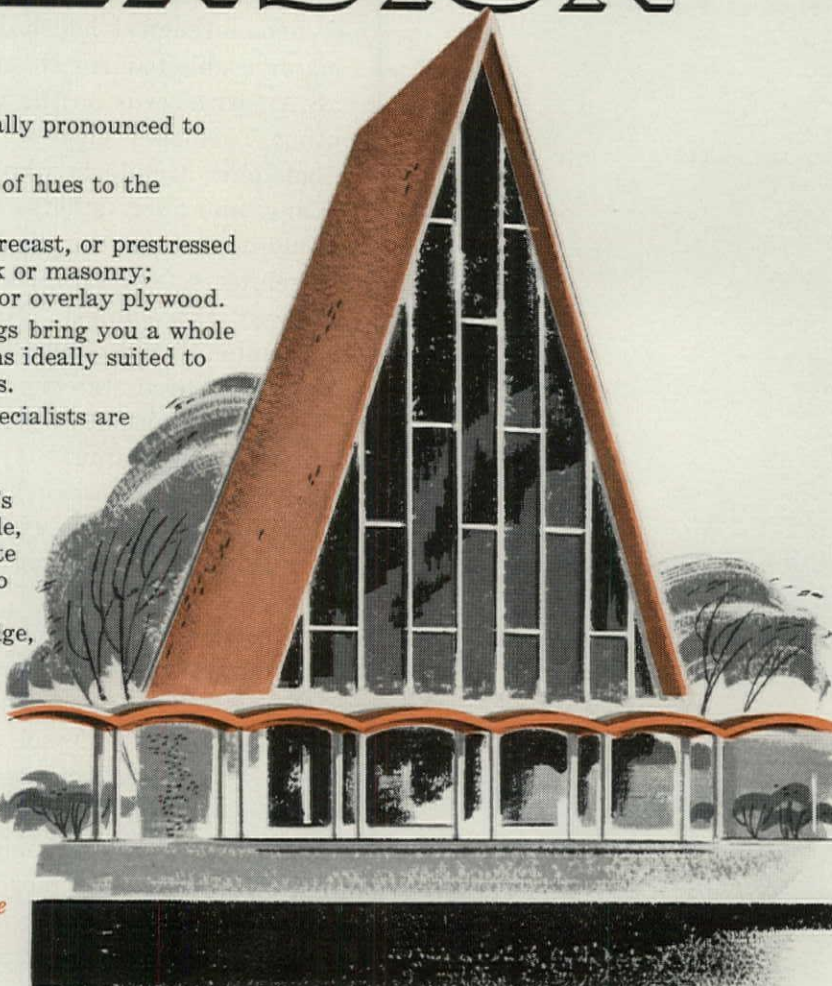
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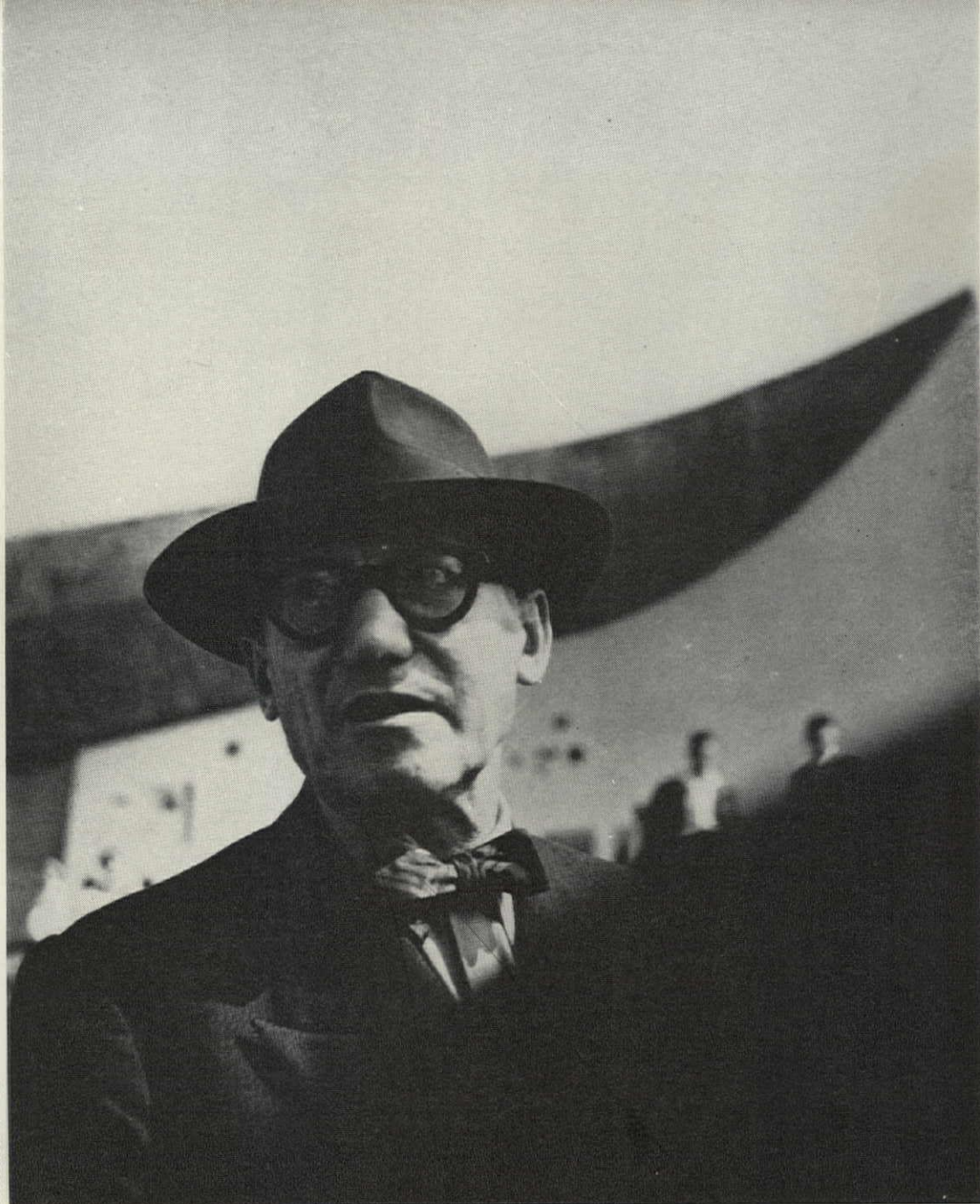
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Le Corbusier

The familiar face under the jaunty hat (in front of an equally jaunty and famous roof) is, of course, that of Charles-Edouard Jeanneret, better known as Le Corbusier and generally, nowadays, referred to as "Corbu." Incredibly, Le Corbusier is now 73 years old. He is also, in the opinion of most of his peers, the world's greatest living architect.

This opinion is being given tangible expression this month in Philadelphia, where Corbu will receive the Gold Medal of the American Institute of Architects. But Corbu's importance to the architecture of our time is given even more tangible recognition every single day in every part of the world: for there are very few modern buildings completed nowadays—whether in New York, Bangkok, Berlin, or Rio—that do not owe a significant debt to the vastly resourceful work, over the past 50 years, of this remarkable innovator.

In recognition of this fact, the editors of FORUM are proud to devote a major portion of the present issue to his work.







# The contribution of Le Corbusier

Corbu is not only an architect and city planner; he is also a leading modern painter and sculptor, a passionate pamphleteer, an incisive writer, and a surprisingly lyrical poet. But the most significant body of his work is in architecture and city planning; and in these areas he has shown a consistency and single-mindedness almost unknown among artists since the Renaissance.

Three specific objectives have dominated his work: first, the creation of forms and spaces characteristic of our time; second, the development of a vertical city-in-a-park and the solution of problems posed by such a city; and, third, the establishment of a flexible system of proportions in architecture and planning. Corbu has pursued these three objectives for half a century. In the course of this search his idiom of expression has changed frequently, his fundamental objectives never. The next 20 pages are devoted to Corbu's three basic preoccupations.

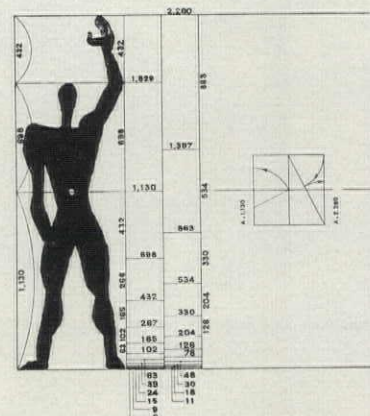
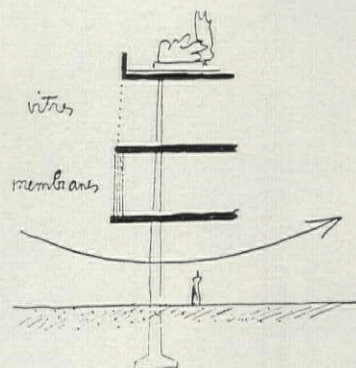
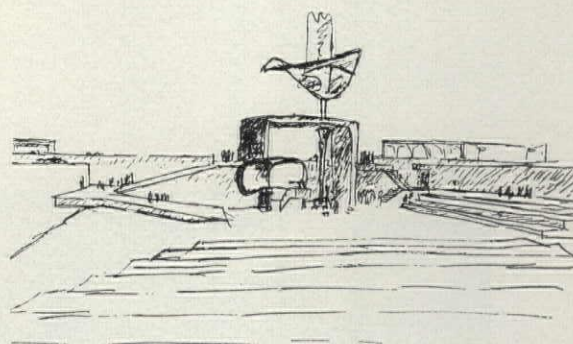
**New forms and spaces.** Cézanne once said that everything in nature is formed according to the sphere, the cone, and the cylinder. To this trilogy, Corbu added the cube, and then substituted the word "architecture" for "nature."

Le Corbusier's early architecture was pure "machine art"—compositions of cubes, spheres, cones, and cylinders, all very smooth and polished. But sometime in the thirties, "organic" forms began to interest him—the forms of plants, snails, pebbles, and rocks. Today, his work has a richness of form and of texture far removed from the sleekness he and others practiced in the twenties. But the basic preoccupation remains: the search for bold and simple forms, clearly man-made, raised up to be silhouetted against the sky; the search for tall, dramatic spaces of many levels that reflect the discovery of something new—the things that happen to a space as one moves through it; and the search for more plastic forms and spaces stimulated by new techniques in engineering.

**A new kind of city.** Corbu has designed some 30 or 40 vertical cities to date, and he is in the process of building the center of one of them—Chandigarh, capital of the Punjab. While most of his vertical-city projects remained on paper, he was able to build a number of tall, individual buildings that demonstrate three aspects of the vertical city which Corbu considers important: first, the stilts (or pilotis) which raise most of his buildings off the ground to permit unobstructed circulation at pedestrian level; second, the roof garden which recaptures, several hundred feet up in the sky, some of the park space lost to construction at ground level; and, third, the free and varied façade which introduces a rich texture into the great "walls" that shape the outdoor "rooms" of Corbu's new townscape.

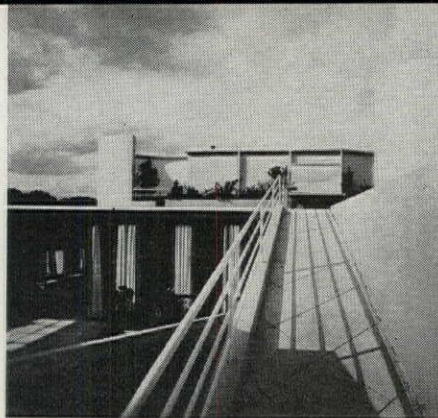
**And a new system of proportions.** From the start, Corbu has been interested in dimensional coordination to permit the mass production of building parts. But he was never satisfied that such coordination must mean monotonous repetition of identical units. Instead, he tried to develop a proportional scale of related dimensions, which would make standardization possible—but would still permit much freedom of choice and of effect. His Modulor scale, formalized in the years after World War II, is the culmination of this effort.

Le Corbusier's work has been prolific to a degree that staggers the imagination. He has designed every kind of building, every kind of city, automobiles, boats, monuments, even mountains. The grilles, space frames, arches, vaults, storage walls, prefab kitchens, suspended stairs, form-fitting furniture, et cetera, that are hailed as "radically new" today were designed and often built by Corbu in the twenties and thirties. The work on the following pages is a mere sampling of one of the most creative minds of our times.





## New forms and spaces



1929

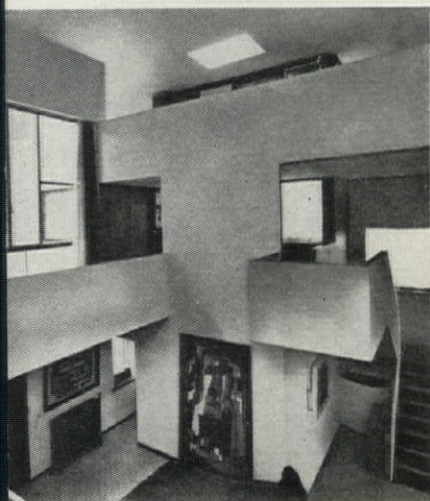
**New drama.** When one speaks of “time” as a “new dimension,” it is to say that three-dimensional spaces in architecture acquire a special quality when one moves through them. Corbu has long been aware of this quality of space in motion, and his tall rooms, with projecting galleries at many levels, are a significant part of his personal vocabulary. The great, open ramps that connect different levels within the High Court at Chandigarh (below) turn the prosaic climb from one floor to the next into a drama of changing views and changing light.

1956



PHOTOS: (LEFT) HERVE; (ABOVE) COURTESY MUSEUM OF MODERN ART, N. Y.





1923

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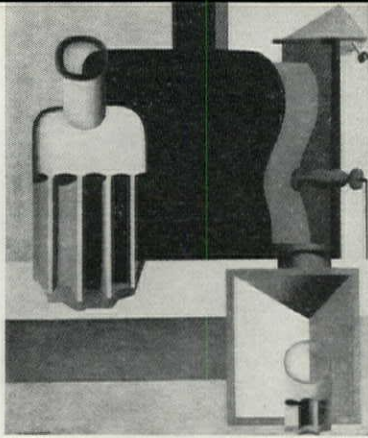
BEAN BEAKE—MAGNUM



1954

**New spaces.** Quite often, Corbu gets his spatial effects by carving a void out of a seemingly monolithic structure, and then making that void a lively and somewhat theatrical space by filling it with sculptural accents like stairs and balconies, all played upon by streaks of sunlight. In the Millowners' Association building at Ahmedabad, India (above), a ramp leads up into a kind of outdoor lobby that seems to have been carved out of the mass of the building. This lobby then becomes an airy stair tower, interrupted by bold cantilevers of concrete.





1920

1956

**New forms.** Sharp-edged, geometric forms, like pyramids and conical sections, have been a characteristic part of Corbu's vocabulary from his earliest paintings to his latest details in rough concrete and stucco. The oval splash basin at the southwest end of the High Court building at Chandigarh (below) catches rain water from a concrete scupper above, and conducts this water through a shallow canal into large reflecting pools in front of the building. Yet this menial function has been turned into a sculptural performance, vaguely reminiscent of the early astronomical instruments of stone found in many parts of India.





1953

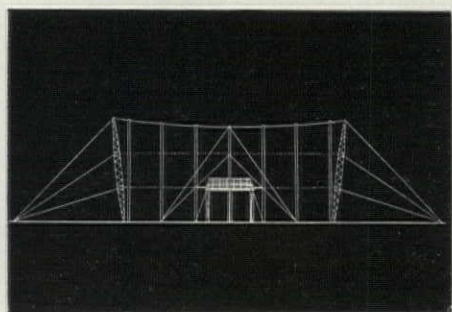
1933



COURTESY MUSEUM OF MODERN ART, N.Y.  
MOOSBRUGGER—LIFE

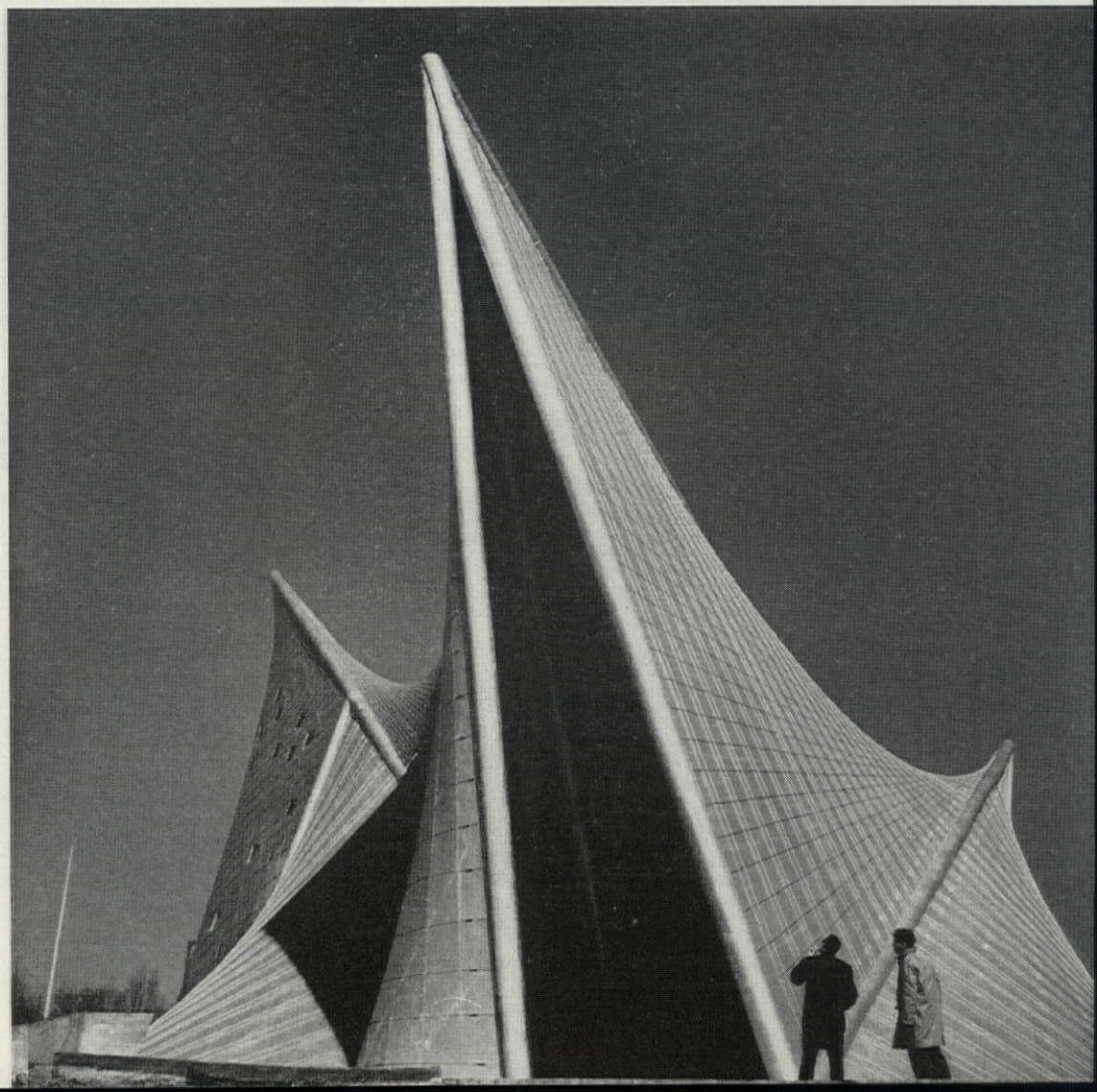


**New structures.** In the early thirties, Le Corbusier expanded his vocabulary of forms beyond the pure geometric to include more curvilinear, or organic, shapes as well. His motivation was not only a renewed interest in natural forms, but also a readiness to use the new possibilities of advanced engineering. The roof of the chapel at Ronchamp (above) is built like an airplane wing: two membranes of concrete, with vertical stiffeners between them. The Philips Pavilion at the Brussels Fair (below) is a series of hyperbolic paraboloids. Corbu designed his first suspension structures and space frames just before World War II.

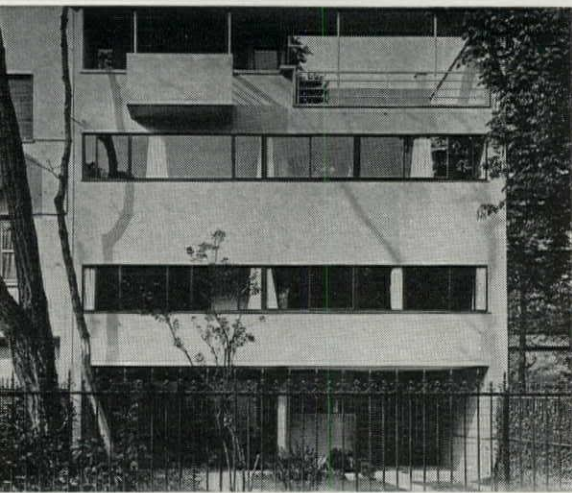


1937

1958



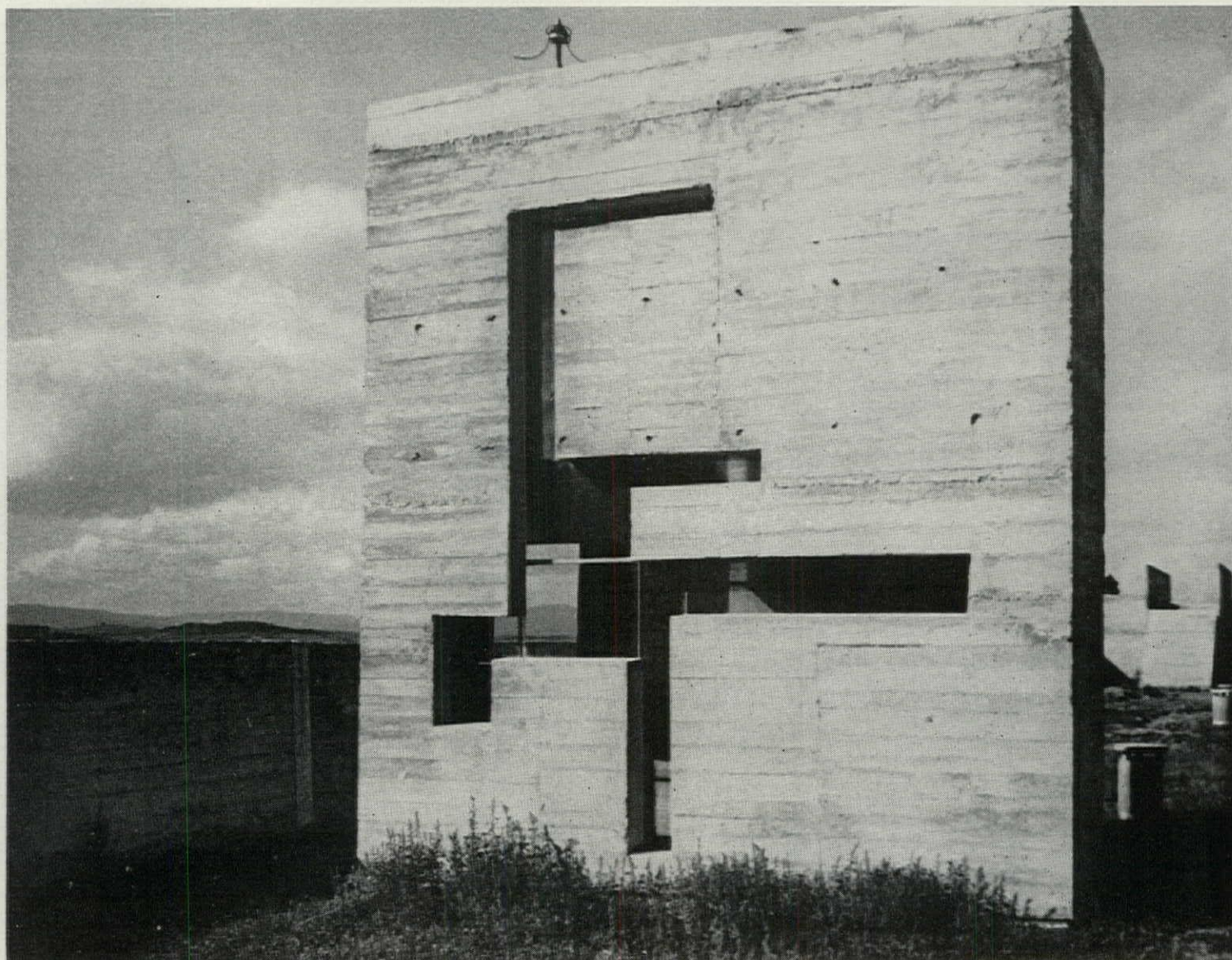




1926

**New walls.** Le Corbusier understood from the start that a concrete- or steel-frame structure could liberate not only the plan, but also the skin of a building. Unlike others who liked to drape monotonous graph-paper patterns over their building frames, Corbu tried to make his nonbearing walls a free and lively composition of solids and voids. Below is a typical concrete and fixed-glass detail at the Couvent de La Tourette, near Lyon; and opposite is the famous wall at Ronchamp. Over the years, Corbu added another dimension to his free façades—texture. For these new walls are of *béton brut*, or “reconstructed stone,” as he likes to call his kind of rough concrete; and the proportions of the openings are governed by the Modulor scale.

1960



PHOTOS: (LEFT) HÉRVÉ; (ABOVE) COURTESY MUSEUM OF MODERN ART, N.Y.; (OPP. PAGE) MOOSBRUGGER—LIFE









1959

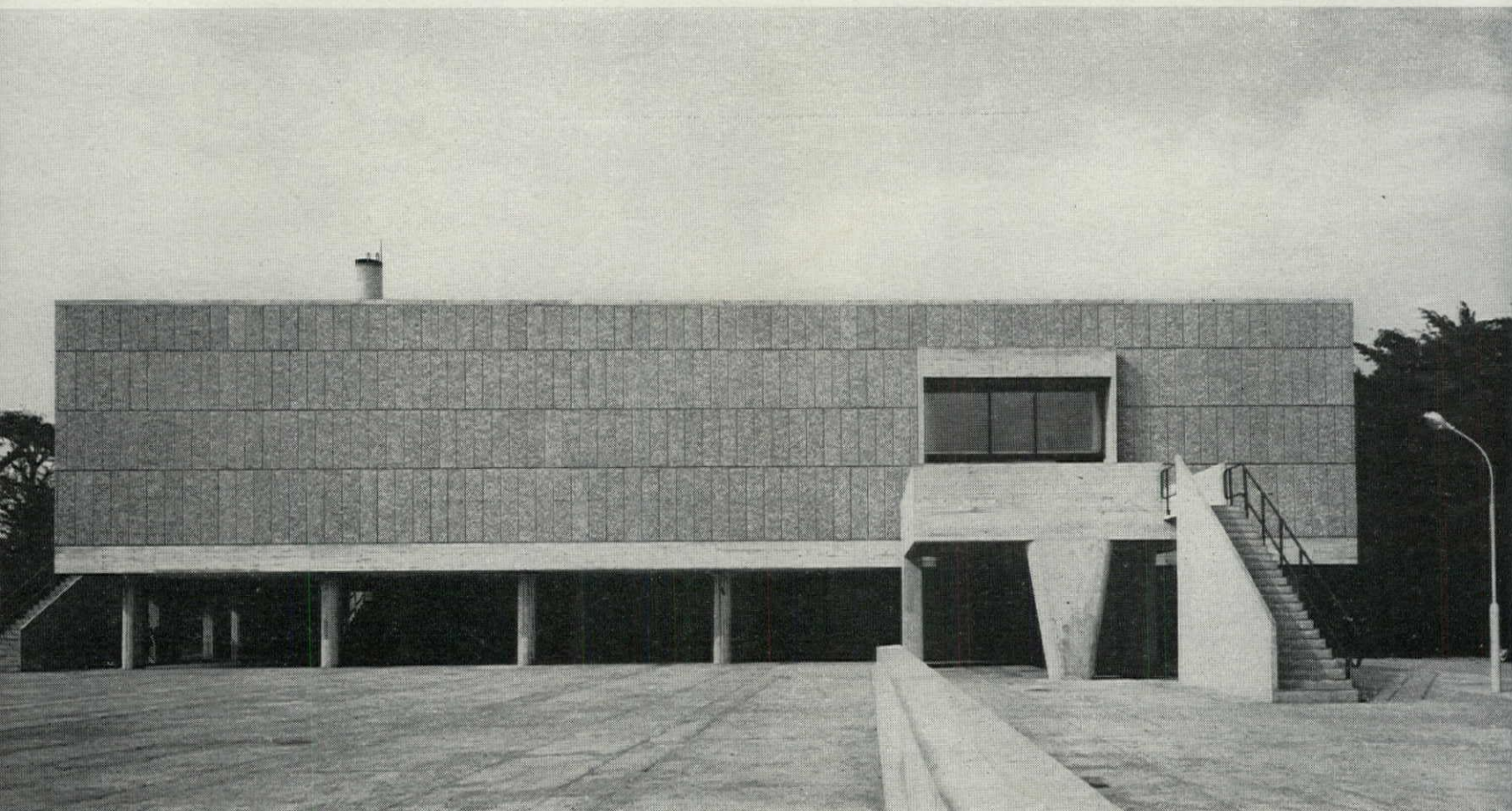
1957 

1960

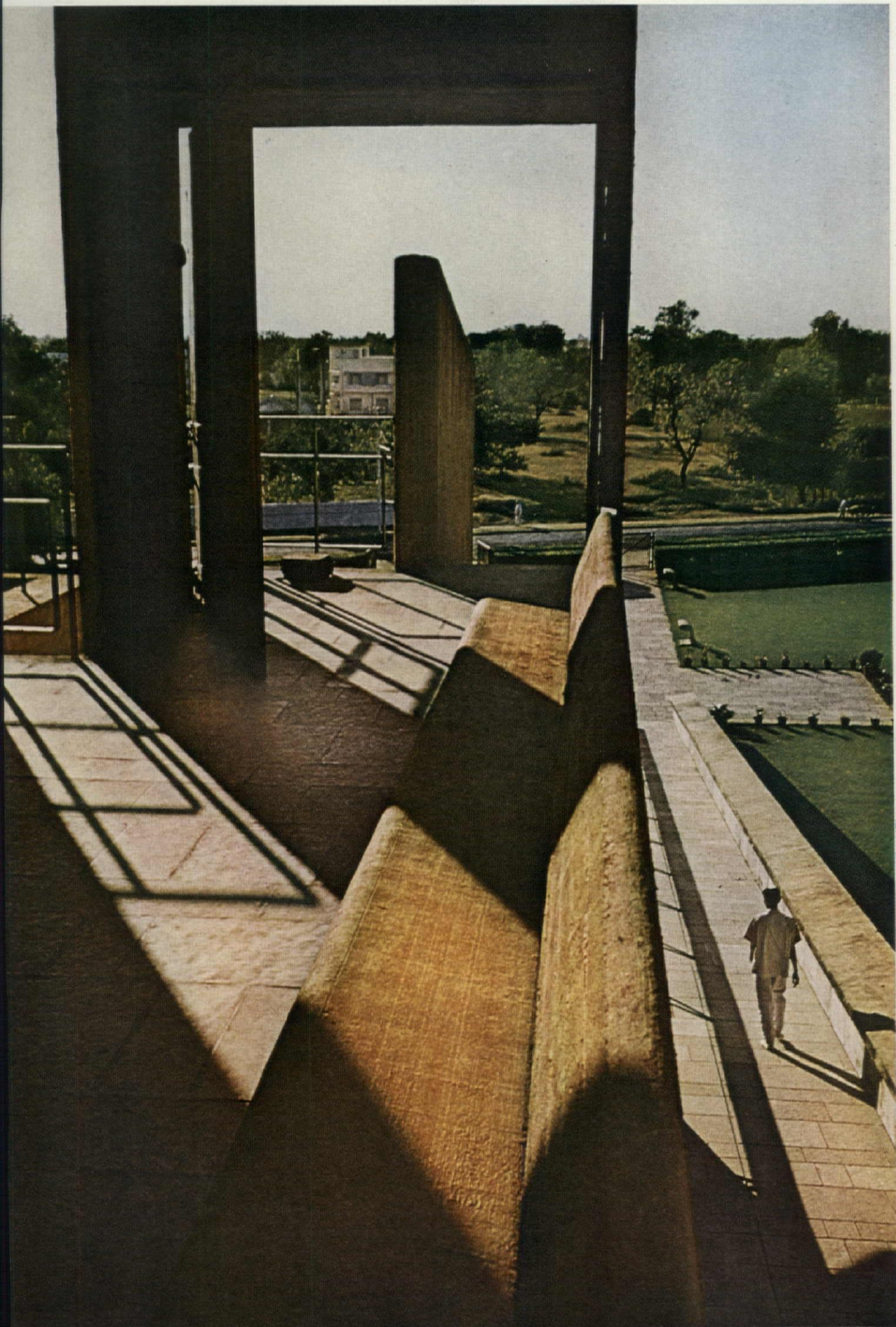


MOOSBRUGGER—LIFE

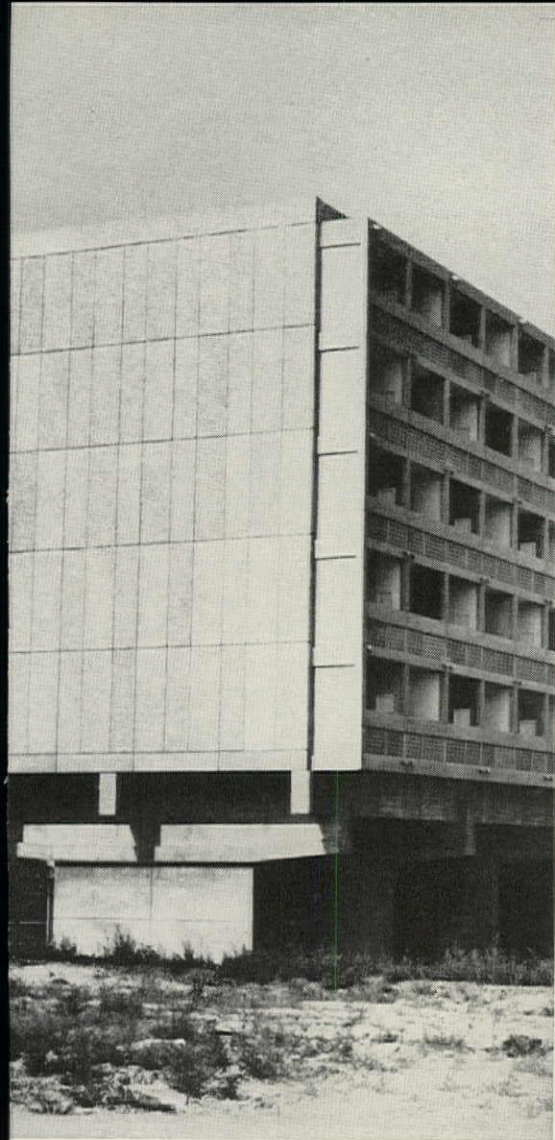
CHUJI HIRAYAMA



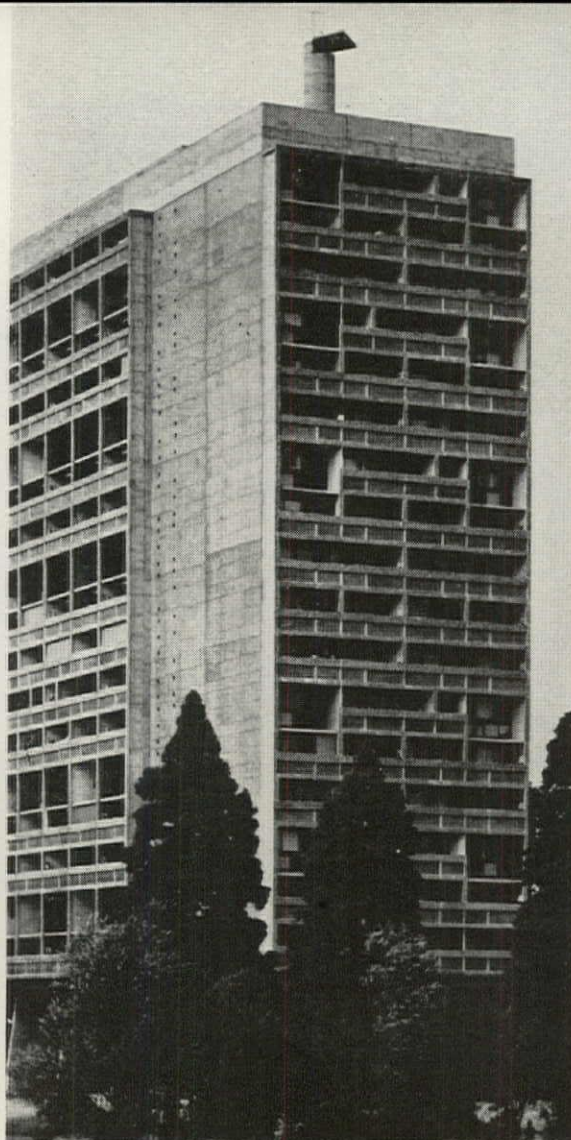




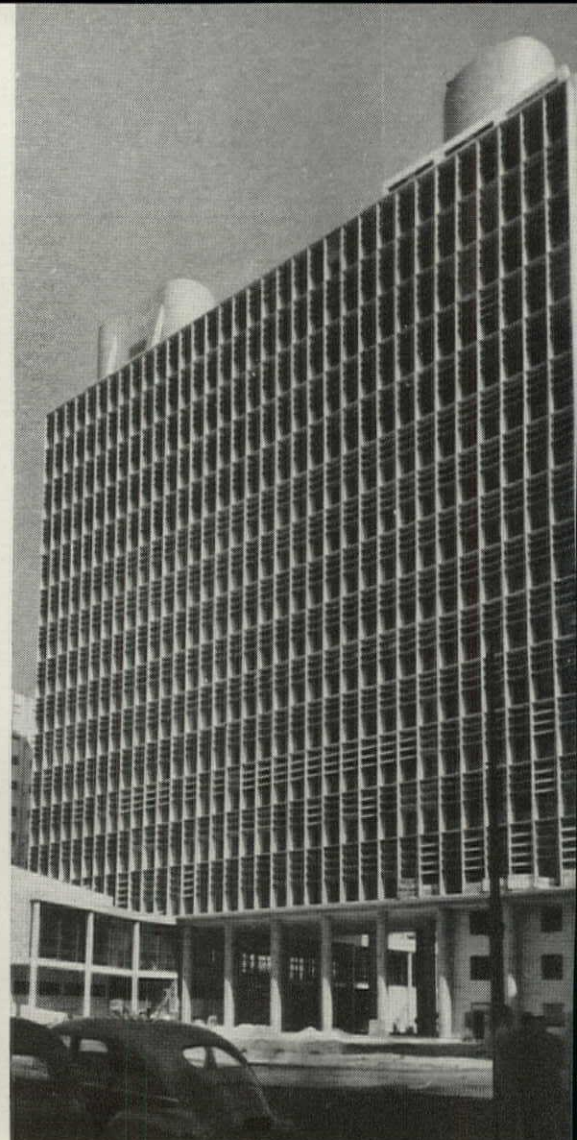




PARIS



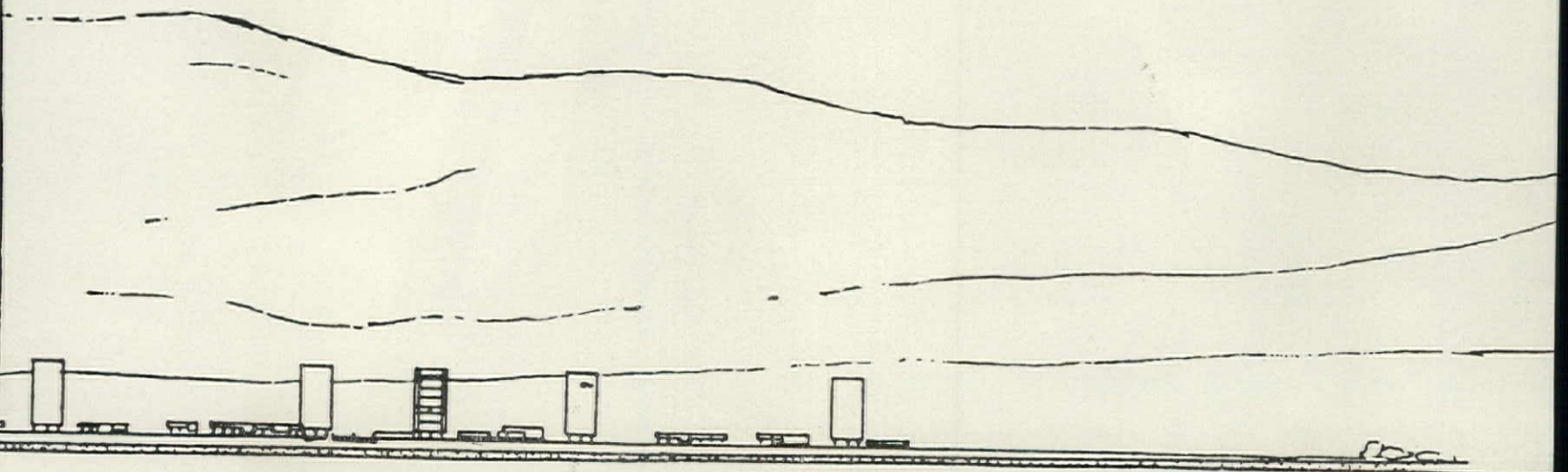
NANTES



RIO DE JANEIRO

duced a theoretical plan for Paris which has been one of the most recurrently influential of his shrewd visions. He is also one of the few people who has brought urban design into individual buildings, in the ways shown on the next six pages and in his impressive roster of large urban buildings, above. To achieve this, he has been not only anti-horizontal in his thinking, but positively pro-vertical, making each of his tall towers a self-contained city in itself, with shops, recreation facilities, gardens—and views. Three of the methods he has used toward these ends are analyzed on succeeding pages: his roofs, pilotis, and spacing.

Left to right: Chandigarh Secretariat; Marseilles apartments; Berlin apartments; Brazilian Pavilion at University City, Paris (designed with Lúcio Costa); Nantes apartments; Brazilian Ministry of Education and Health (designed with Oscar Niemeyer, Lúcio Costa, et al.). Below: sketch for the reconstruction of Saint-Dié. Photos by Vernon Gibberd, G. E. Kidder-Smith, Peter Blake.







CHANDIGARH



MARSEILLES

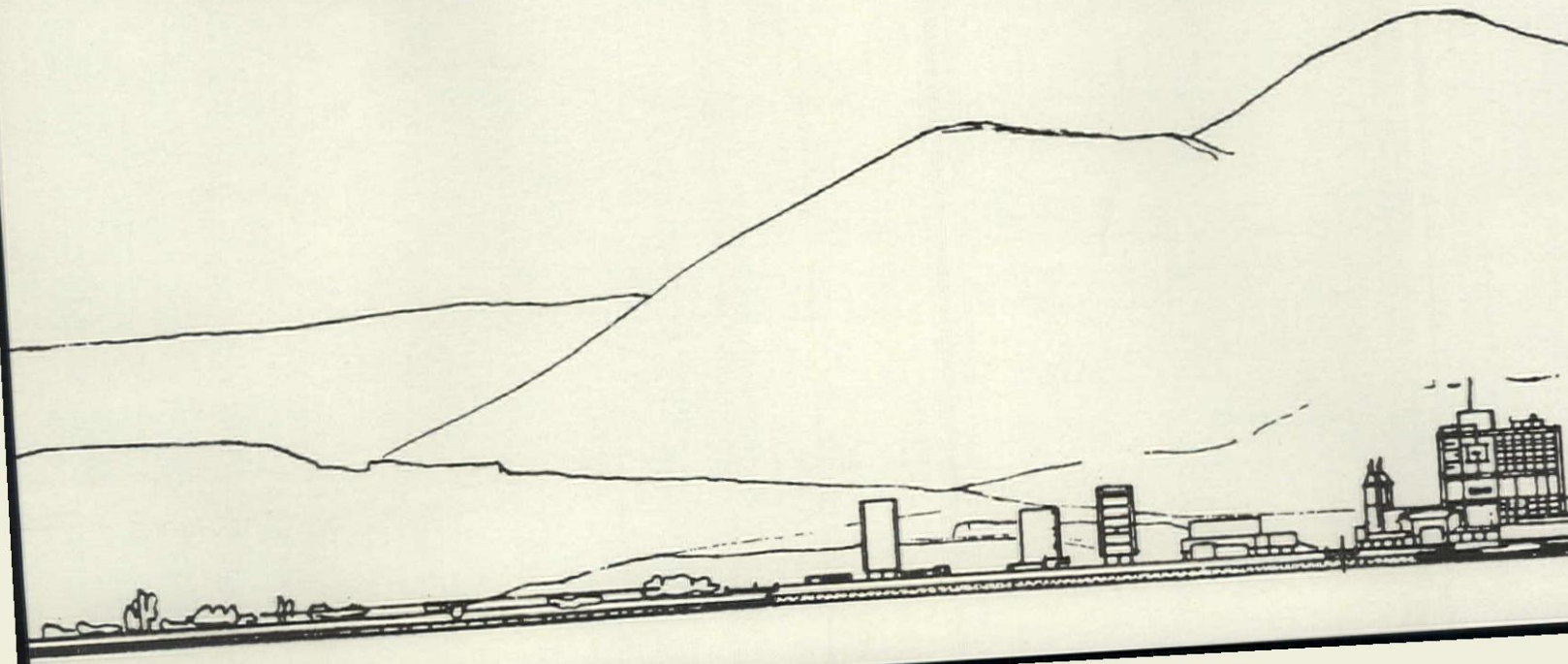


BERLIN

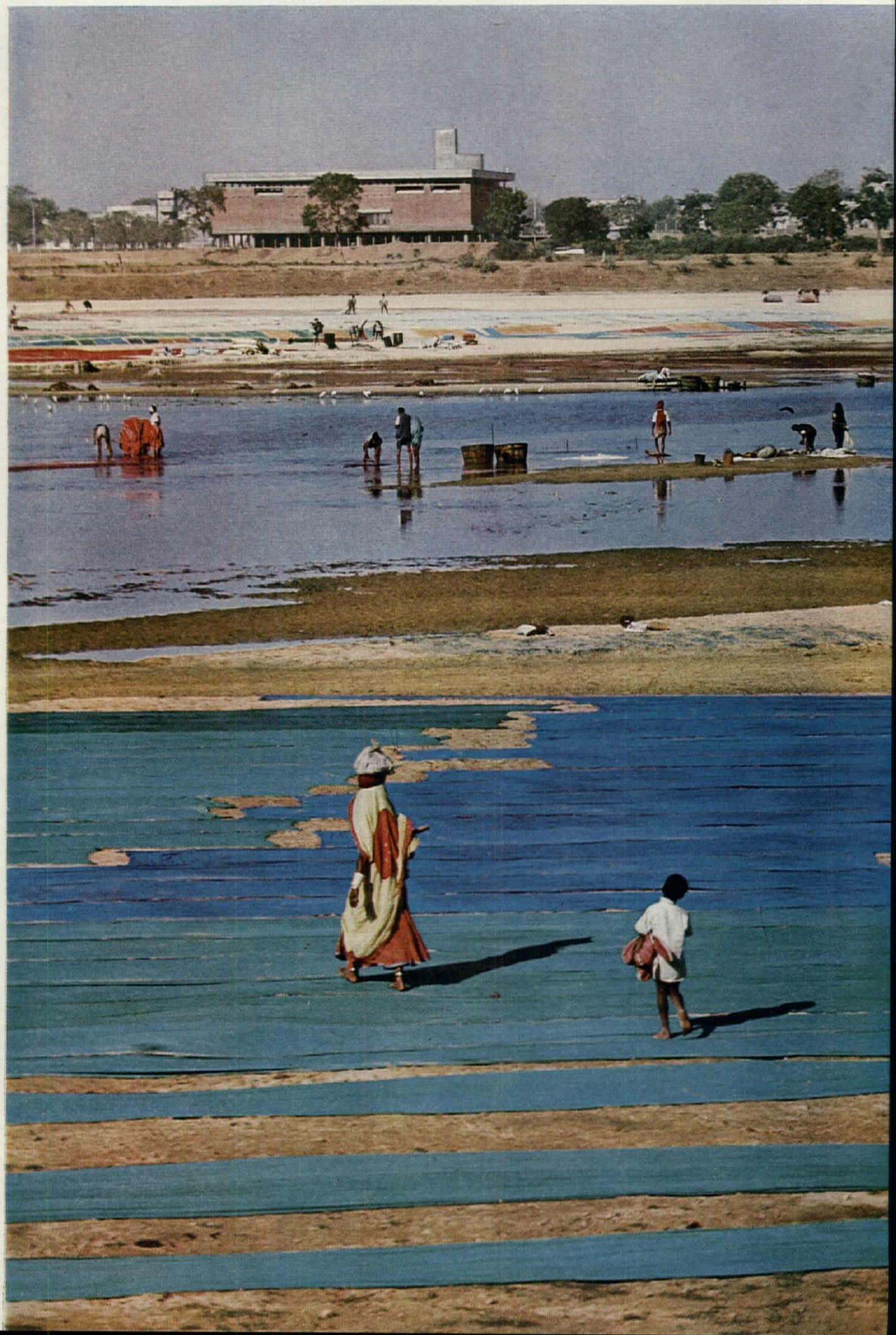
## A new kind of city

Le Corbusier likes cities; he basically is an urban type. (Even his famous Modulor figure has been dubbed a subway strap-hanger.) When Corbu first visited New York, in 1936, he returned home with numerous startled impressions, among them: "... the skyscrapers ... a thousand feet high! That is an event in the history of architecture—an event of psychophysiological importance. ... I cannot forget New York, a vertical city, now that I have had the happiness of seeing it."

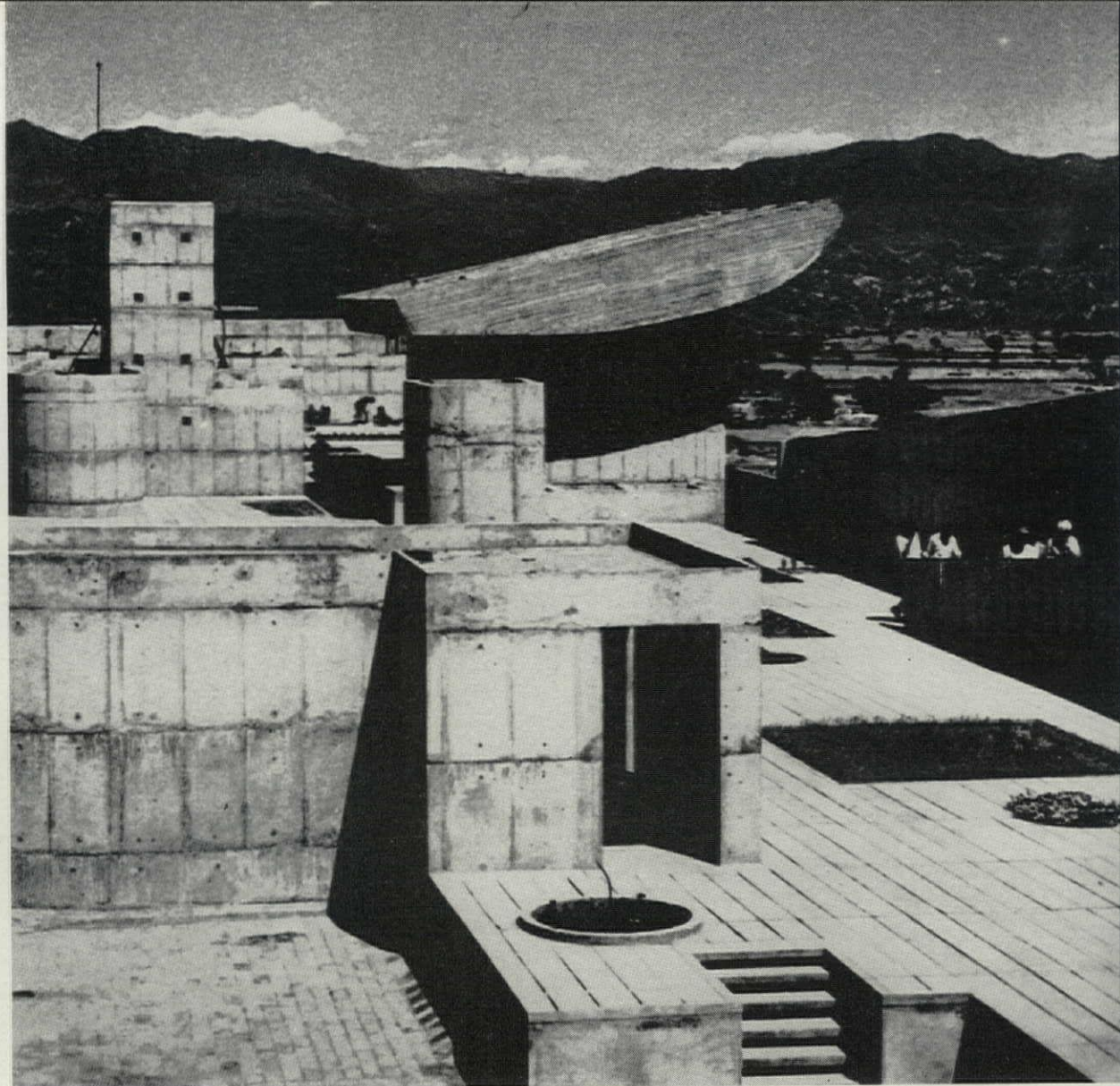
Yet any great architect must be a realist, and Corbu was one of the first to see the dreadful trouble modern cities were building themselves into. ("Manhattan is so antagonistic to the fundamental needs of the human heart that the one idea of everybody is to escape. ... In New York the skyscraper is only negative. It has destroyed the street and brought traffic to a standstill. ...") Back in 1922 he pro-





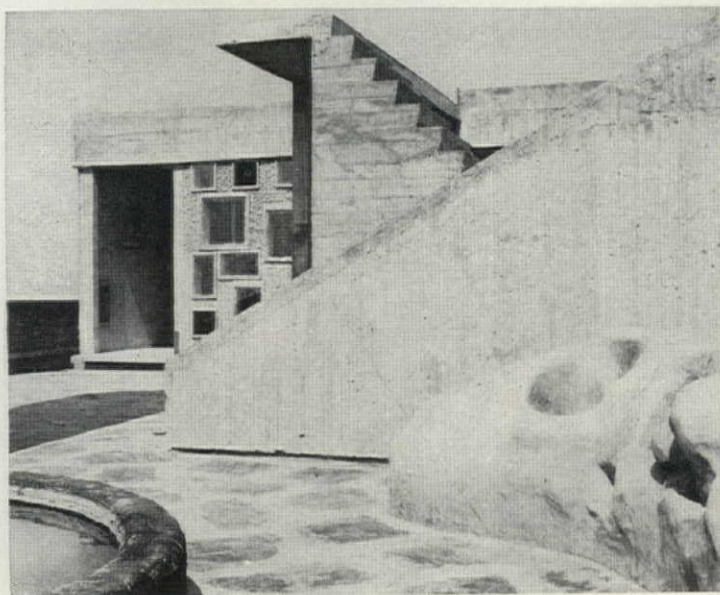






CHANDIGARH

**Plazas in the sky.** To Corbu, the city is a three-dimensional organism: the space lost to the construction of tall buildings at ground level must be recaptured at the level of the roof. Here he creates private parks, playgrounds, plazas, and the like, quiet and far removed from vehicular traffic. These plazas in the sky are often places of singular enchantment: not only will there be benches and screens, but also terraces on many levels, concrete “hills” for children to climb, and pools for them to splash about in. By surrounding these plazas with high parapets, Corbu takes care to block out all views except those of distant landscapes.

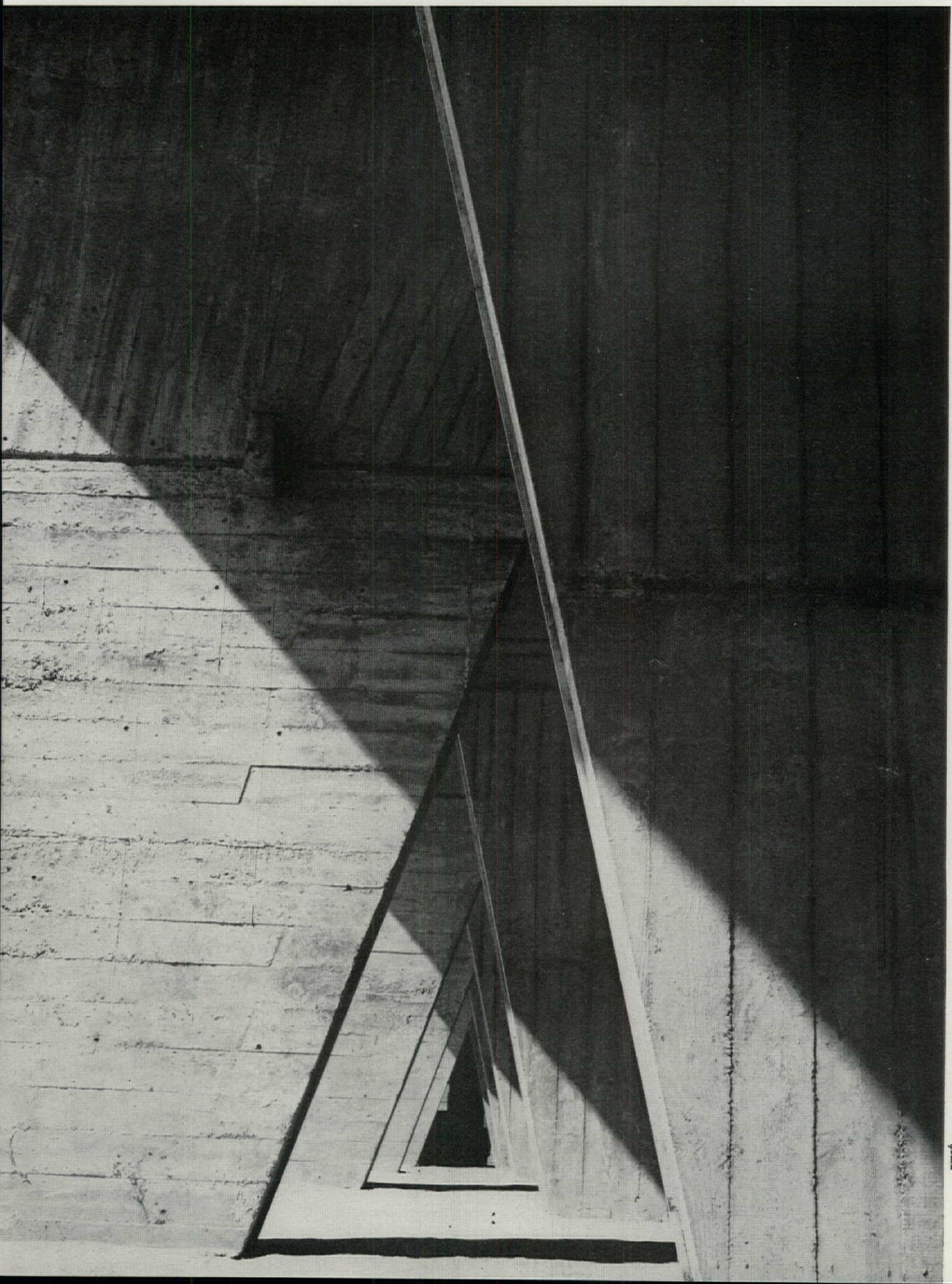


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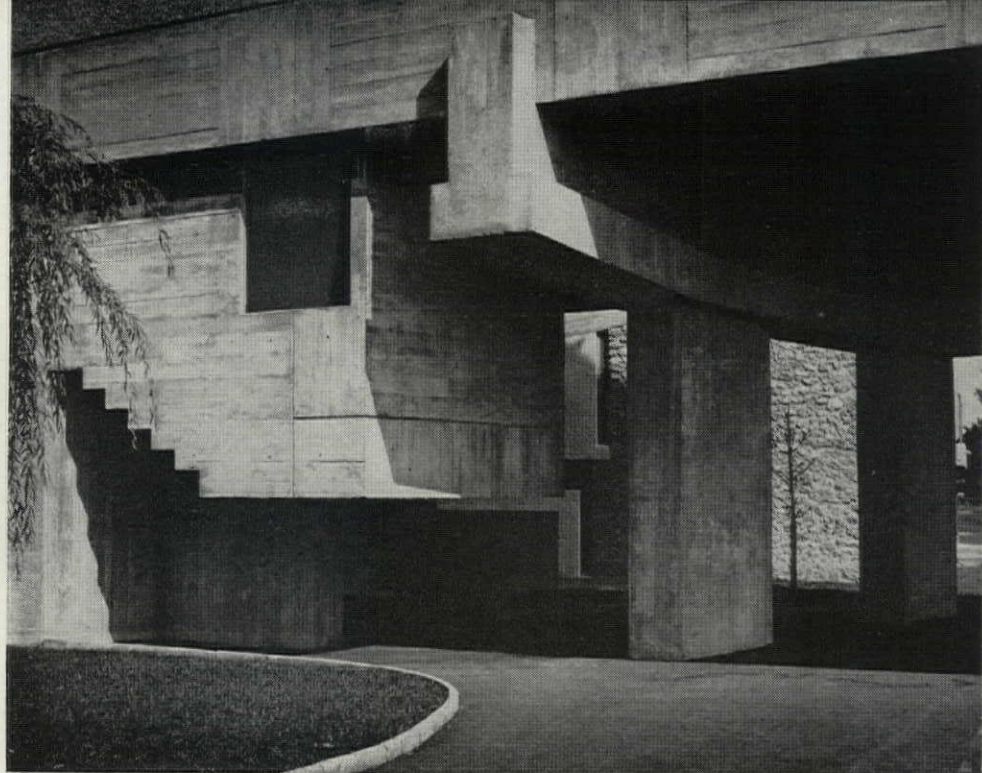


MARSEILLES









PARIS

**Pilotis.** The legs on which Corbu sets his tall boxes of offices or apartments have always been more than mere exercises in structure. They characterize their buildings—and also Corbu's periods; from slim stems in the earlier days (when the buildings were close to being cubist expressions of industrialism) they have evolved, gaining weight, into the burly concrete shapes of the more recent Corbu architecture. They are an emphatic way of giving a large plain structure muscle (left, facing page), and the muscle is exposed where it is most in use.

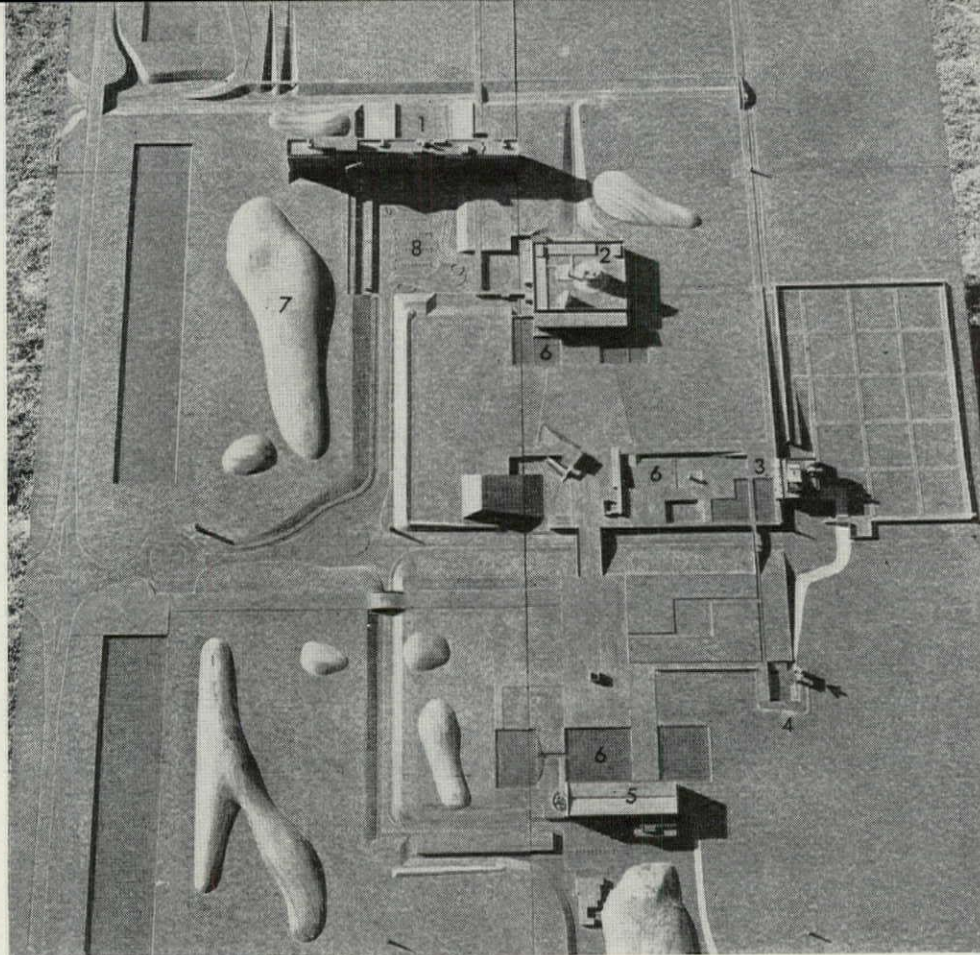
BERLIN



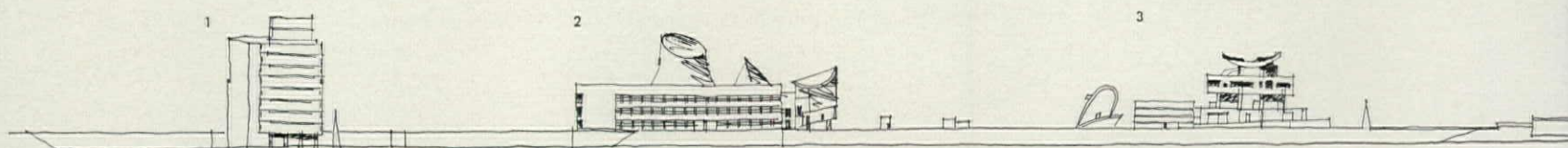
C. E. KIDDER-SMITH



*Relief model, right, and partial elevation, below, shows 1. Secretariat, 2. Assembly, 3. Governor's Palace, 4. Sculpture—The Hand, 5. High Court, 6. Pool, 7. Constructed mound, 8. Parking.*



PHOTOS: (LEFT) HÉRVÉ; (RIGHT) VERNON GIBBERD



## SECRETARIAT





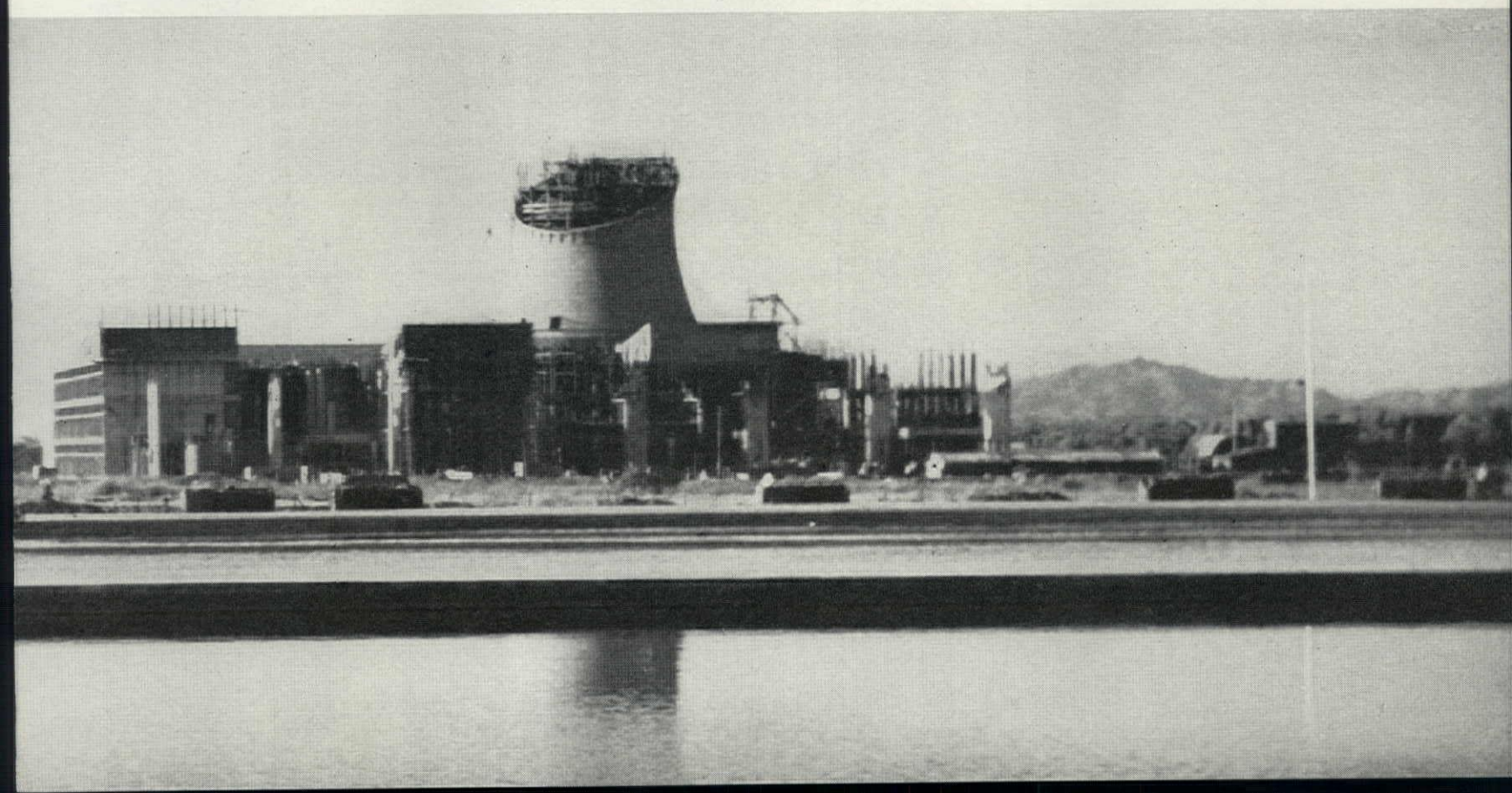
**New heart, new circulation.** At Chandigarh Le Corbusier is sinking the principal roads into the plain, thus making open-roofed tunnels of them, to preserve the ground level of the city for the pedestrians. At the core of his new creation, he deliberately is spreading this pedestrian space lavishly in majestic areas among the mighty pieces of architecture. Special features of these spaces are large pools (below) in the Indian tradition, and great sculpted mounds (model air view, facing page). Architect Paul Rudolph, who visited Chandigarh last summer, reports:

"One approaches the capital group across a great plain, with the mountains rising out of that plain. The first sight of the buildings is the Secretariat on the left hand, sitting at right angles to the mountain range. In every way it opposes the mountains: the angled stairway, the ramp on the roof, the projecting viewing stand—all of these angles are obviously and carefully conceived to oppose the receding angles of the land masses.

"Slowly one becomes aware of what appear to be foothills among the buildings themselves, but these subsequently prove to be man-made hills rising out of the plain. Their scale is immense; this is sculpture. These man-made hills are as important to the siting as the buildings, and are indeed an integral part of the whole complex. One is not aware that the buildings are still on the plain. The artificial hills obscure the view at first of the High Court building, and they also define the limits of the entire site as well as shutting off the major part of the city of Chandigarh when one is in the governmental complex. Indeed the relation of the buildings to the site—also, the manipulation of the site in terms of the various levels of both the geometric depressions and the irregular hills—is unsurpassed anywhere at any time. You think you are on the face of the moon. In a sense it becomes one great horizontal plaque. Most of the sunken automobile accesses are not yet there, but the intent is clear.

"As time goes on I am sure that every man will understand the importance of Chandigarh; people will go there as they now go to the Piazza San Marco. They will go not because of any individual building but because of the relationship of buildings to site, the environment created, the aspirations of man realized. It is the only grouping of the twentieth century of which I know that makes any sense whatsoever, undoubtedly the century's greatest."

ASSEMBLY (nearing completion)

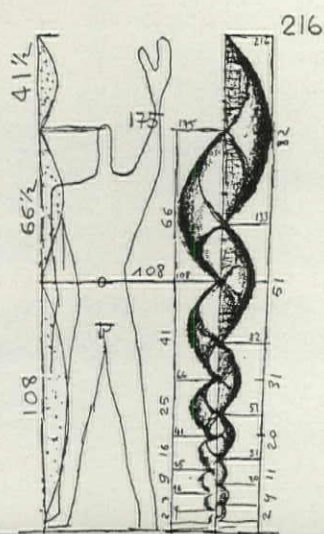




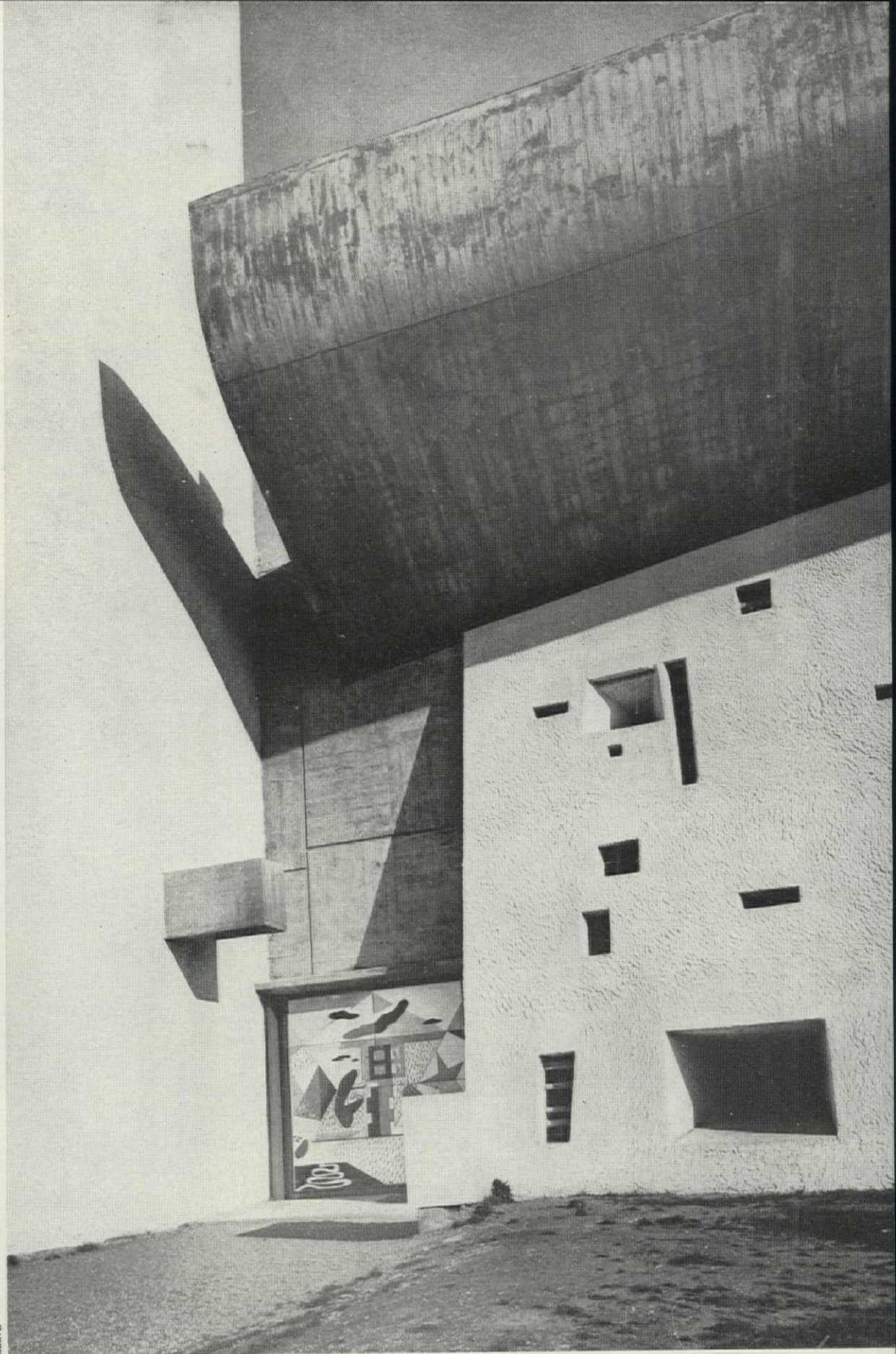


## A new system of proportions

Corbu's first houses, in the twenties, were proportioned according to the ancient "Golden Section." In the years since World War II, he perfected his own Modulor scale—a system of related proportions, all based upon the dimensions of an average human figure, with upraised arm (below, left). "I am, in principle, against modules when they curtail the imagination," he said. "But I believe in the absolute nature of a [poetic] relationship. And relationships are, by definition, variable, diverse, and innumerable." The significance of the Modulor scale is that it is not a "modular" system of identical units, monotonously repeated, but a family of numbers that can be used with great flexibility to solve almost any problem from the dimensioning of a civic center to the dimensioning of a bathroom window. In a mass civilization, Corbu feels, it is necessary to lay down rules that will "make the bad difficult and the good easy," as the late Albert Einstein put it to him. The walls of the Secretariat at Chandigarh (above) and of the Couvent de La Tourette (below) were given variety and unity through the Modulor rule.

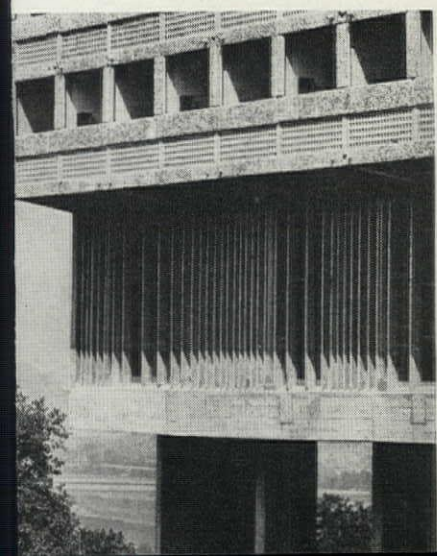






HENRY

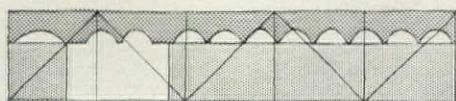
**New fenestration.** Each man in Corbu's drafting room has a list of two columns of ten numbers, each, pinned up on the wall next to his table. According to Corbu, these ten pairs of numbers are all that is required for the use of the Modulor scale in practice. The two systems of fenestration shown here demonstrate the great flexibility of the scale: the slot windows at Ronchamp (above) make a tense, abstract pattern of light and shade, oddly in balance despite the great variety of openings; the vertical window divisions at the Couvent de La Tourette (left) set up a "vibration" (as Corbu puts it) that makes the whole façade shimmer like ripples in a pool.



HENRY RUIB—MAGNUM

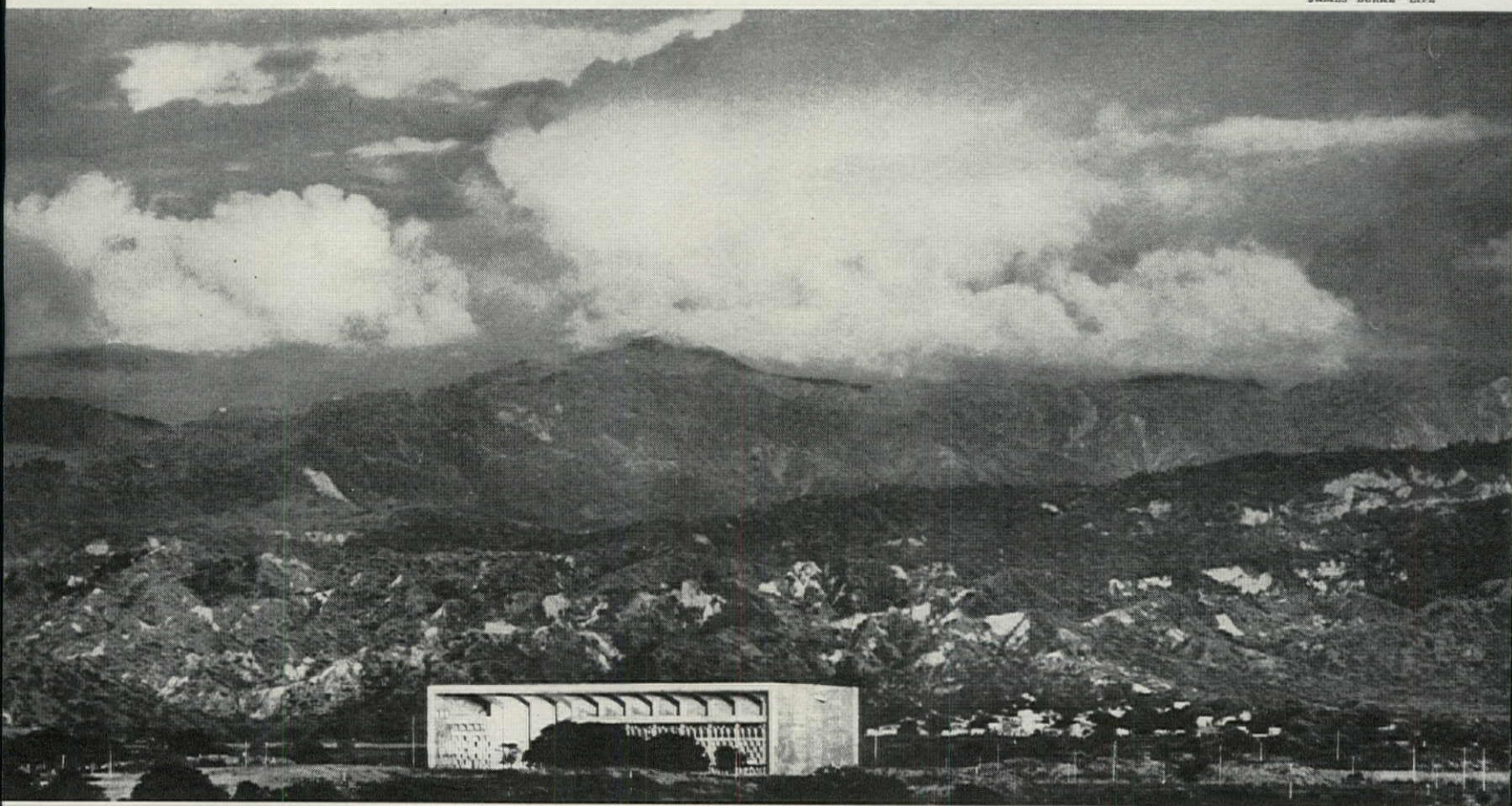


**New monumentality.** The High Court at Chandigarh is Corbu's Parthenon; and like the proportions of the original Parthenon, those of the High Court building are extremely subtle: although the main façade is divisible into five identical squares (left), the actual division is quite irregular and free, to emphasize some parts of the structure and play down others. However, the five squares do establish the basic monumentality of the building, for each square measures 70 by 70 feet. This monumentality—especially noticeable in the full-height entrance portico—is suitably in keeping with the majestic backdrop provided by the Himalayas (below). At the same time, the powerful building is quite intimately scaled to the human figure when seen at close quarters (opposite): this is so because the monumental façades have been broken down into small-scale patterns of irregular, concrete sunshades that protect the glass walls behind them. These sunshades, as well as other dimensions experienced at close quarters, were scaled according to the Modulor, and thus according to the human figure.



Nearly 40 years ago, Le Corbusier wrote: "For 2,000 years, those who have seen the Parthenon have felt that here was a decisive moment in architecture." And he added: "We are now at a decisive moment." The quality of Le Corbusier is in the decisions he made when that moment arrived for him.

JAMES BURKE—LIFE



## A special message from Prime Minister Jawaharlal Nehru:

*"To the editors of ARCHITECTURAL FORUM:*

*"India has many famous ancient cities and buildings. Among these reminders of the past, there now stands a new and utterly different, growing city—Chandigarh, which is, in the main, the creation of the famous architect, Le Corbusier.*

*"Some people, who are too much attached to old forms, have not appreciated these new and rather revolutionary designs.*

*"I think, however, that Chandigarh is a great creation, which has already powerfully affected Indian architecture and brought new and fascinating ideas to our architects and town planners.*

*"I send my greetings to M. Le Corbusier."*







# Building resumes its upward trend

Revised FORUM forecast for 1961 indicates that general increase in building construction will more than offset sluggishness in house construction.

BY MILES L. COLEMAN

Six months ago FORUM's 1961 forecast indicated that construction activity would reverse the downward trend of 1960 and surpass the record set in 1959. This forecast still stands despite the faltering pace of house construction and the general business recession which has characterized the months since the original prediction was made. This year's total construction expenditures will be somewhat smaller than first anticipated, of course, but still impressive. They will aggregate \$57.5 billion, up 4.2 per cent from last year, and 2.3 per cent above the 1959 level.

The breakdown of this figure is presented at the right in a new format which shows the outlook for each of the three broad classifications of construction (building, house, and "other") and for each kind of building in the first classification. This building construction classification, the biggest of the three, will also fare the best in 1961; it is expected to total \$21.1 billion by year-end, up 6.4 per cent from the 1960 level. On the other hand, house construction (one- and two-family dwellings) will advance only 2.4 per cent, and other construction (principally highways, power and pipe lines, sewer and water systems, farm structures, and military facilities) will increase only 3.6 per cent.

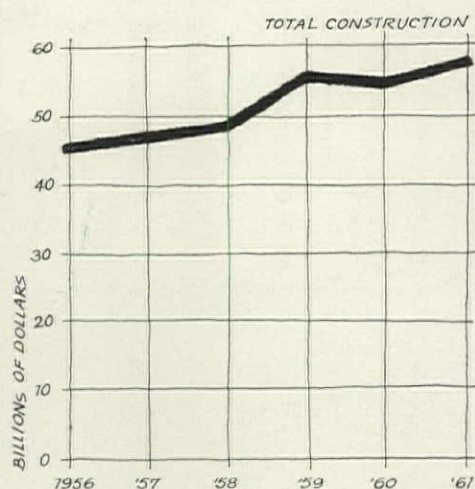
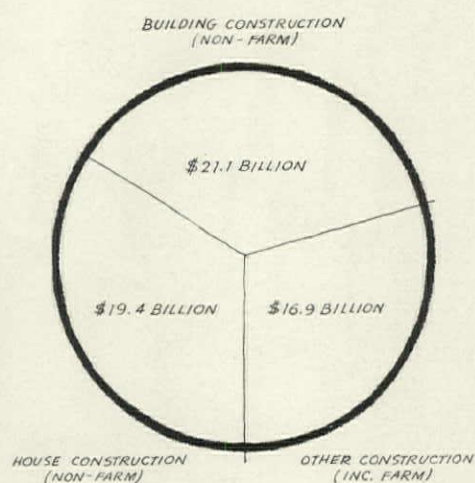
that federal measures adopted this year, whatever these may be, will do more than hold multifamily public housing at its present annual rate of about \$300 million. Combined public and private financing will produce about 225,000 apartment dwelling units this year, 25,000 more than last year.

All other types of buildings will participate to some extent in the general increase forecast for building construction. Religious buildings will be up 1.7 per cent; hospital and institutional buildings, up 7.3 per cent; social and recreational buildings, up 4.7 per cent; hotels, motels, and dormitories, up 7.8 per cent; public administrative and service buildings, up 18.4 per cent; and industrial building, up 0.6 per cent.

The relatively small increase predicted for industrial building is not surprising, for it has already reached a high level of activity. This kind of building last year made the biggest peacetime advance in history—36 per cent—reaching a level of \$3.3 billion which will not be easily exceeded during the next few years.

Private financing will account for \$14.6 billion, or more than two-thirds of the building construction total. The \$6.5 billion balance will be financed by local, state, and federal governments.

*House construction.* Although the construction of one- and two-family houses is expected to be a little better this year than last, the sales market seems to have entered into a phase which is likely to result in a sluggish volume for several years to come. The basic causes of this are: 1) the low rate of growth in the number of families in the 25-to-44-year age bracket which has customarily provided the bulk of the home buyers, and 2) the high ratio of home ownership (about 58 per cent) already attained by families in this age bracket. (The large increases in both the younger and older households will help the apartment market more than the house market.) Beginning from the low base of 1.2 million private nonfarm houses started in 1960, the volume in



*Building construction.* Within the building classification, the biggest dollar increase is expected in the educational field. Here substantial gains in both private- and public-school and college construction will raise the total for this kind of building to \$3.7 billion, up \$325 million, almost 10 per cent above the 1960 level. Other substantial dollar increases are expected in both the office and mercantile categories of commercial building (up \$378 million, about 10 per cent) and in the construction of apartments (up \$146 million).

The 5.4 per cent increase in apartment construction, to \$2.9 billion, will be entirely financed by private funds. Despite the talk of a much increased public housing program, it is doubtful



# FORUM CONSTRUCTION REVIEW AND FORECAST (expenditures in millions of dollars)

	Private	1960 Public	Total	Private	1961 Public	Total	INCREASE 1960-61
<b>BUILDING CONSTRUCTION<sup>1</sup></b>							
Industrial	\$2,861	\$ 419	\$3,280	\$2,900	\$ 400	\$3,300	0.6%
Offices and warehouses	2,072	...	2,072	2,250	...	2,250	8.6
Stores, restaurants, and garages	2,000	...	2,000	2,200	...	2,200	10.0
Religious	1,032	...	1,032	1,050	...	1,050	1.7
Educational	580	2,820	3,400	625	3,100	3,725	9.6
Hospitals and institutional	579	400	979	625	425	1,050	7.3
Social and recreational	671	131	802	700	140	840	4.7
Public administrative and service <sup>2</sup>	...	591	591	...	700	700	18.4
Apartments <sup>3</sup>	2,403	301	2,704	2,550	300	2,850	5.4
Hotels, motels, and dormitories	921	150	1,071	1,000	155	1,155	7.8
All other <sup>4</sup>	685	1,251	1,936	715	1,310	2,025	4.6
<b>TOTAL BUILDING CONSTRUCTION</b>	<b>\$13,804</b>	<b>\$ 6,063</b>	<b>\$19,867</b>	<b>\$14,615</b>	<b>\$ 6,530</b>	<b>\$21,145</b>	<b>6.4%</b>
<b>TOTAL HOUSE CONSTRUCTION<sup>1, 5</sup></b>	<b>18,700</b>	<b>266</b>	<b>18,966</b>	<b>19,150</b>	<b>270</b>	<b>19,420</b>	<b>2.4</b>
<b>TOTAL OTHER CONSTRUCTION<sup>6</sup></b>	<b>6,425</b>	<b>9,915</b>	<b>16,340</b>	<b>6,585</b>	<b>10,350</b>	<b>16,935</b>	<b>3.6</b>
<b>TOTAL CONSTRUCTION<sup>7</sup></b>	<b>\$38,929</b>	<b>\$16,244</b>	<b>\$55,173</b>	<b>\$40,350</b>	<b>\$17,150</b>	<b>\$57,500</b>	<b>4.2%</b>

1. Excludes all farm construction.

2. Mainly public office buildings but also post offices, courthouses, prisons, etc.

3. Buildings containing three or more dwelling units.

4. Includes fire stations, zoos, veterinary hospitals, animal havens, boathouses, greenhouses, transportation terminals, crematoriums, heating plants, grain elevators, etc., plus FORUM's

estimate of the amount of building construction (such as power plants, terminals, barracks, maintenance shops, pumping stations, etc.) usually reported in the Census Bureau's predominantly nonbuilding categories—see footnote 6.

5. One- and two-family nonfarm dwellings.

6. Includes farm construction of all kinds amounting to \$1.250 million in 1961; and pub-

lic utility, military, highway, sewer and water and public service construction, exclusive of the amount of this kind of construction estimated to be for buildings of various kinds—see footnote 4.

7. All categories include major alterations and additions.

Source: Estimates by Miles L. Colean based on figures collected by the Census Bureau.

1961 can hardly be expected to exceed 1.3 million units.

**Other construction.** Embracing a wide range of structures other than buildings and houses and including all kinds of farm structures, this classification of construction will account for \$16.9 billion of expenditures in 1961, about 3.6 per cent more than last year. Highway work will comprise the biggest part of the total (\$6.2 billion) and will increase the most (6.1 per cent). Almost as big in dollar volume, privately financed public utility projects will increase about 3.5 per cent. Only farm construction (which will amount to about \$1.3 billion) is expected to fall off from last year, and only 2.2 per cent at that.

As in the past, about three-fifths of

the activity in the "other" construction field will be publicly financed. Farm and private public utility work accounts for most of the balance.

The outlook for construction this year is in marked contrast to last year's behavior. Whereas 1960 was a year of strong cross-currents in construction activity (house construction was down about 10 per cent while industrial building was up 36 per cent) and the first year since World War II to suffer a decline in total construction expenditures (1.8 per cent), 1961 promises to be a year of modest general improvement. Barring an unforeseen international crisis, a sharp rise in costs, and failure of the recession to "bottom" by early summer, three basic assumptions which underlie FORUM's forecast, it seems likely that construction expendi-

tures in 1961 will exceed those of all previous years and that the industry will work its way back to the long-term upward trend line established during the fifties.

This revised forecast takes into account the fact that the industry's record during the first two months of 1961 was not impressive. Preliminary figures for January and February indicate that house construction was down almost 12 per cent from the corresponding months of 1960, that all kinds of building construction were up by margins ranging from 7 per cent for commercial to 15 per cent for industrial, and that the total was almost unchanged. However, as weather and economic conditions improve, future months are expected to make up for this slow start.



# Portland's great hall of glass

The dual new Coliseum may have its faults, but they cannot ruin its gift of soaring, luminous space. BY ALLAN TEMKO

At nightfall, when the rich green Oregon countryside goes dark, Portland's recently dedicated Memorial Coliseum—a great cube of light on the east bank of the Willamette—glows like a civic beacon in the heart of the regional metropolis (1). As an expression of vitality in a city which, since pioneer days, has curiously lacked gusto, the Coliseum is a rousing success. Virtually every evening, after the lights go on within the tremendous walls of glass—revealing the powerful form of the oval arena curving freely through the luminous interior space—the crowds converge from every part of the city to fill the 9,000 seats during basketball and hockey games and make the immense structure resound with partisan cheers. When no sporting event is scheduled, they still come by the hundreds to skate or dance. A few times each month a stage is erected at the end of the oval, extra seats and bleachers are installed, and a capacity audience of 13,500 applauds a musical show.

Never before has bland Portland possessed such an enlivening social resource. It belongs not only to the new age of mass leisure, but also to a new architectural era of vast, unobstructed spaces, exhilaratingly free in them-

1

ART HUPY





selves, multipurpose in function, and in a profound esthetic sense, liberal in concept. The transparent Coliseum is candidly open to the world at large.

Never before has Portland enjoyed a structure of such spectacular strength. Not even Pietro Belluschi's suave but very direct Equitable Building of 1948, the first of the postwar "skin-and-bones" towers and still the city's finest large building, approaches the Coliseum's prodigious masculine vigor. Only four massive concrete columns support the 360-foot-square roof (2); and when the building is illuminated, the immense ceiling floats in light above the oval bowl, which rises like an enormous sculpture out of the spacious concourse. Seen like this—at its festive nocturnal best, when the vivacious crowd provides indispensable human scale—the Coliseum must be considered one of the stirring glass-enclosed arenas of the world.

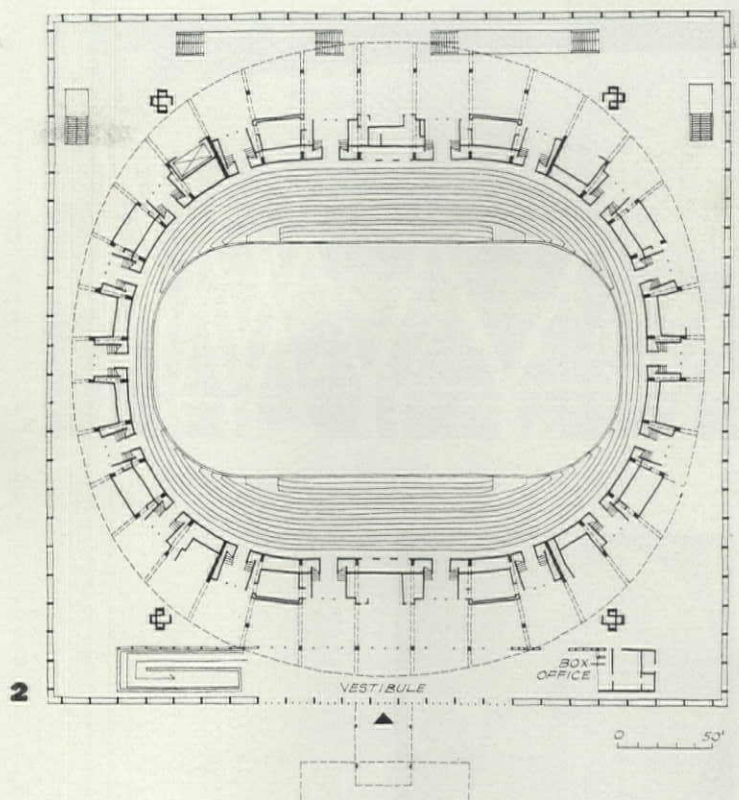
Yet in the harsh light of day, although the Coliseum remains a strong and even formidable building, it perceptibly loses force and grandeur (3). What had seemed an extremely large and dynamic structure at night appears considerably diminished and subdued at noon. Viewed from a distance, in the context of a rather forlorn urban riverscape, the building is a sharply defined, but severely contained, horizontal box of elegant gray glass, capped with an unexpectedly heavy and smooth white lid (which went quite unnoticed in the dark). If the interior volume still may be reckoned to be tremendous, the building's crystalline transparency nevertheless has vanished. For the glass curtain wall—all 80,000 square feet of it—turns almost opaque, as do most glass surfaces unless seen directly against the light; and within the shadowy depths of the interior, except at close view, the splendid form of the oval is difficult to discern.

This daytime reduction in scale and mood, moreover, is accompanied by a disconcerting change in proportions. The 22-foot-deep and featureless roof fascia, which gives no indication of the steel trusswork it conceals, seems to crush the elevations. This unfortunate effect might have been rectified by a strong base, but the main façade, high on the sloping site, has no base at all; and on the other sides of the building, where the fall of the land exposes a recessed basement, the indentation looks strangely like a toe space at the bottom of the 80-foot-high walls (4).

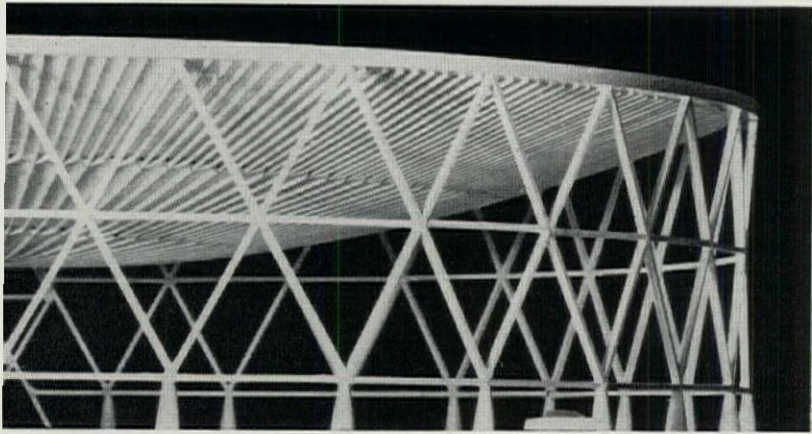
Outsized as the fascia may be, its neutral off-white surface of acrylic overlaid plywood seems insubstantial in so large a monument. This is the first sign that the Coliseum, distinguished as it is in many respects, has been badly compromised by false economy, lack of vision on the part of the lumber industry, and other disheartening factors which affected the design.

Indeed, when the ill-starred history of this imperfect monument is pondered, it seems remarkable that Portland got so good a building at all. As the architects, Skidmore, Owings & Merrill, have laconically observed: "The problems encountered . . . were many and complex."

In fact, they were almost maddeningly vexatious. Although SOM recommended an inexpensive, spacious, and otherwise admirable site in the urban renewal area on the opposite (and more appropriate) side of the Willamette, the voters were induced to choose instead a cramped location which provided inadequate parking, so that the Coliseum stands hemmed in by a skimpily landscaped expanse of blacktop. The small site severely compressed the architectural program also, with the result that a large exhibition hall, originally foreseen as a

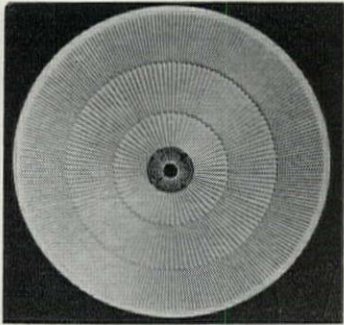




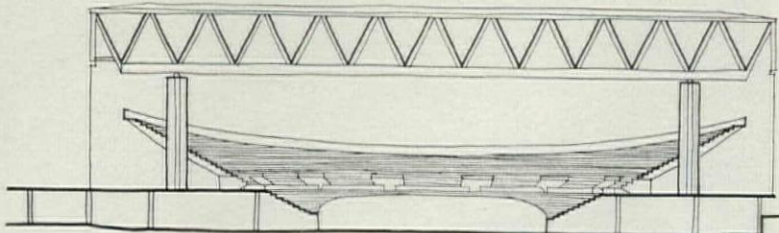


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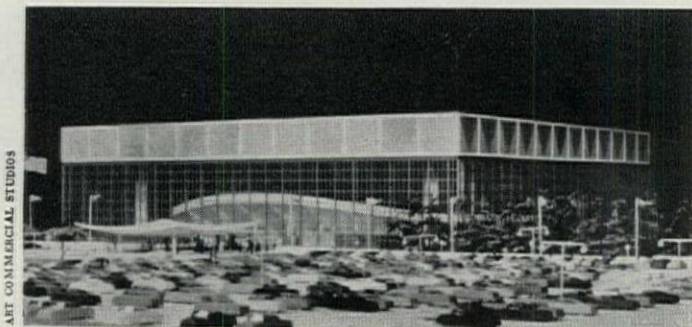
PHOTOS (5 & 6) : WILLIAMS & MEYER CO.



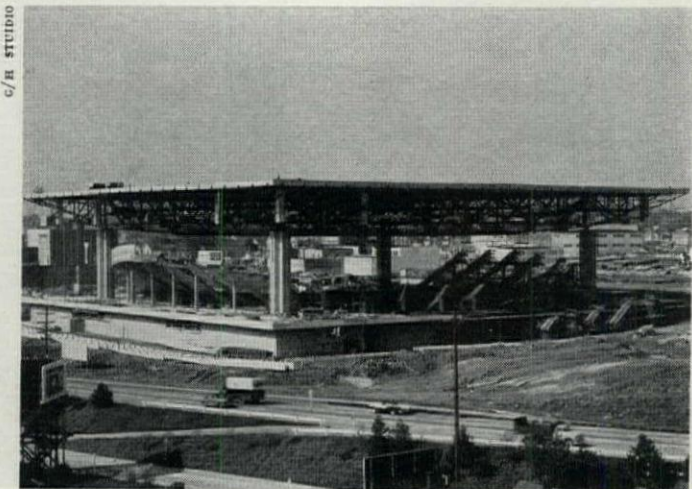
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separate building, has been consigned to perpetual darkness beneath the parking lot. Other public rooms have been relegated to the almost equally forbidding basement of the arena. Lack of money, as well as want of space, caused these programmatic changes, for this bad site had the additional disadvantage of costing \$1.9 million, or nearly one-fourth of the bond allocation of \$8 million. This led to the cheapening of the entire project.

#### Designs one, two, and three

After these setbacks the architects turned to the design of the arena, but again they encountered frustrating difficulties. The firm's gifted structural designer, Myron Goldsmith, was assigned to the job, and SOM thereupon gave Portland the opportunity to erect one of the purest and most powerful arenas of the twentieth century. This great building would have been a circular structure of prestressed concrete, 360 feet in diameter (5). Its catenary roof, given the pattern of a gigantic abstract chrysanthemum (6) by petal-like, precast elements, was to be hung from a compression ring supported by 80-foot-high X-frames. A circular bowl and surrounding concourse were to be sheltered by this magnificent roof.

The design was rejected. No one had anticipated the objections of the lumber industry, which exerts an understandable influence in forested Oregon, and which demanded a wooden structure as a showcase for its wares.

Although Goldsmith took no further part in the project, other SOM designers produced a brilliant new concept in wood (7). Fundamentally this was the concept for a glass-walled, square structure containing an oval bowl that was carried out in the completed Coliseum, except for one all-important feature: an extraordinary "delta" roof of 12 huge, triangular wooden plate trusses which was to have crossed the width of the building and terminated in richly expressive fascias (8). A pair of cross-beams was to have passed beneath the trusses at right angles, and these in turn were to have been held up by four massive concrete columns—one at each corner of the vast room—which remained in the final design. This ingenious roof design, which displayed exceedingly staunch resistance in design tests, would have been an incomparable advertisement for the technological potentialities of wood. Yet when the bids came in several hundred thousand dollars too high (partly because sprinklers were needed), neither the city nor the lumber interests made an accommodation.

One last time the structure was redesigned. The delta roof was replaced by an ungainly, two-way system of steel trusses which taper at their cantilevered extremities (9). They cost comparatively little, but did not prove cheaper than the wonderful prestressed covering of the first design would have been. Not surprisingly, SOM hid this workaday steelwork with a hung ceiling; the roof fascia went blank. Innumerable thrifty minor changes were made with lamentable effect on the detailing. Portland got a ruggedly useful, but incompletely realized, building: in no sense a masterpiece, but in some respects a very significant work of architecture.

The major significance of the Coliseum resides in the unique spatial organization of the interior (10). Although the great space possesses almost radiant clarity when the sunlight pours through the curtain wall, filling the hollow of the bowl as well as the concourse, and playing over the white plane of the ceiling, this unprecedented room is far from simple. If the scheme can be seen as a classical circle within a square, the circle is very far from being a blithe, predictable ring. It rises



and falls with surging plastic vitality, exuberantly traveling through space. To control this effect of liberation, to provide it with the inner order which distinguishes true freedom from mere liberty, required a high degree of civilized art.

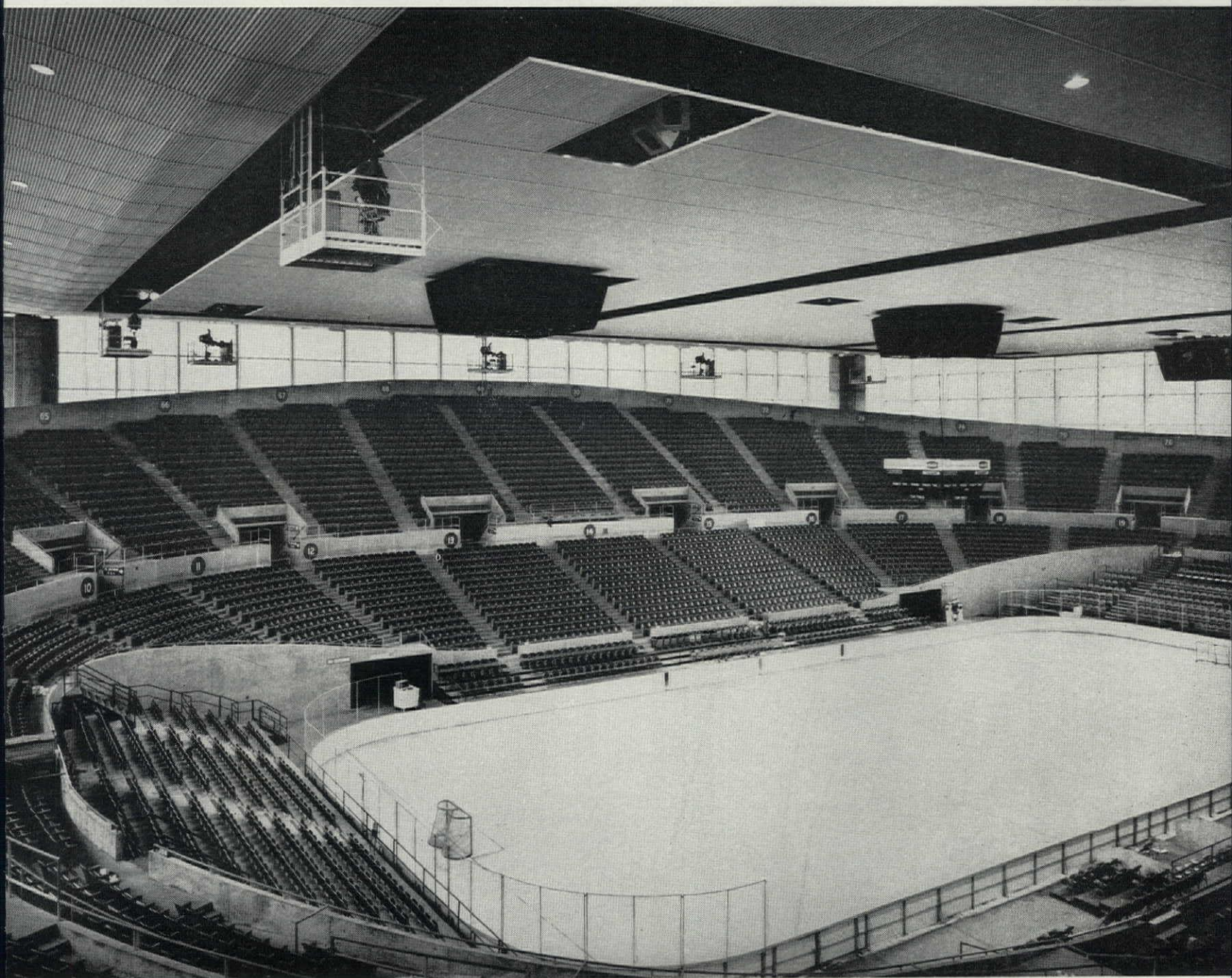
It also demanded multidimensional vision by the designers. The concept of placing a dynamic sculptural form within a prismatic glass cube is unparalleled, perhaps, in structures of this size. There are not many oblong, flat-roofed rooms of these dimensions in the world; and excepting possibly some hangars and industrial buildings, probably no rectangular structure can match both the transparency and the 270- and 240-foot clear spans of the Coliseum. Almost certainly none is borne aloft by only four supports.

To master this problem the architects of the Coliseum drew on several resources that were partly controllable: the calm geometry of the enclosure; the upright strength of the cruciform columns; the optimum seating pattern which governed the upward sweep of the bowl on the long sides of the playing surface; and, within the limited scope of the terrain, adroit use of the site, so that on its high platform the Coliseum commands an exhilarating

panorama of the river and the towers of the business district on the opposite bank, and beyond, the view of hills lifting steeply to the west.

None of these design factors could be controlled absolutely, of course; and in view of the impediments placed in the way of pure design, the architects did well. Some harm, to be sure, was irreparable. The great columns, much less clearly expressed than in the original design, were moved inward for economic reasons, in order to shorten the spans, thus badly crowding the oval where it needs room most, swinging through the wonderful corner spaces (12).

On the other hand, some handicaps were turned to happy advantage, as in the case of the 85-foot-high laminated wooden mullions of the curtain wall. These, of course, were a concession to local emphasis on wood, but if the delta roof had been built, their esthetic logic could not be questioned. Beneath a steel roof in a structure of this magnitude, however, wood is less convincing, since steel or another industrial material presumably would have been competitive in price and inevitably finer in profile. The mullions naturally are not bearing members, but they do take the considerable wind load, and are

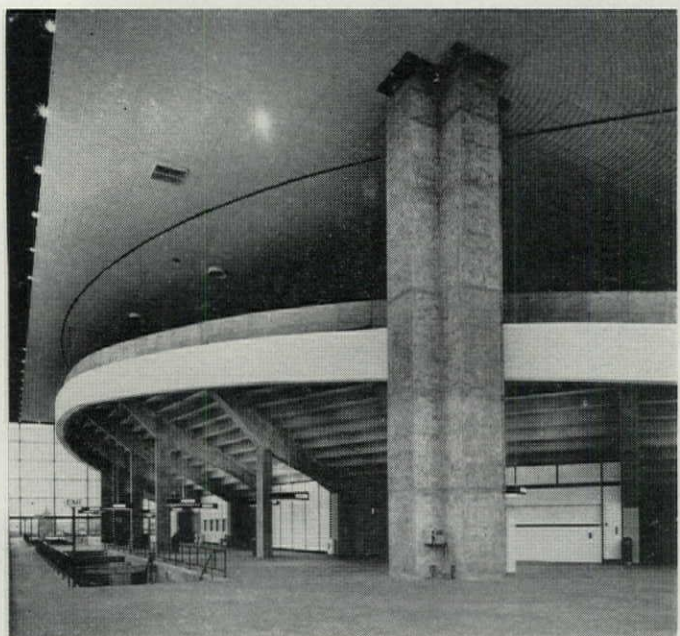






11

ARCHITECTS AND ENGINEERS: *Skidmore, Owings & Merrill*  
CONSULTING STRUCTURAL ENGINEERS: *Moffat, Nichol & Taylor*  
GENERAL CONTRACTOR: *Hoffman Construction Co.*



12

PHOTOS: (11 & 12) JULIUS SHULMAN; (OTHERS) ART RUDY



13

therefore very husky (9 by 40 inches) in section (15).

Yet this very bulk saves them from banality, and greatly enriches the play of space. The accordion effect of the curtain walls—their varying gestures of openness, depending on the angle of view, as the mullions contract or expand—in this sheathing attains monumental power. The mullions have the quality of a colonnade: during intermissions, when crowds throng the concourse, they provide inviting spaces, much like alcoves, for small groups.

The vigor of the curtain wall is especially evident as the main entrance is approached (across the crass parking lot) on the east (11). It is possible to see not only the eastern façade in action, but to have two, three, or at times all four enormous planes of glass in view simultaneously. One's glance carries through surface after surface, and on to sun and clouds.

On the disgracefully tiny entrance plaza—all that could be rescued, evidently, from the traffic engineers—there is an upswept canopy mounted on four tapered columns (14). This little pagoda was not very carefully studied in relation to the oval looming behind it, but in the absence of any other sculptural adornment it serves as a cheerful foil for the rectangular walls. On inspection, its shell roof turns out to be not concrete, but wood; and the brief play of space beneath is an intimation of the spatial drama which commences immediately inside.

#### Inside, a composition in motion

Overhead, at the crest of its wide, lifting turn, the top of the concrete oval swoops broadly away and gradually downward to either side, narrowly missing the great columns, but setting the whole composition in motion on the swell of this tremendous movement. How well the present generation of architects has profited from the lessons of Nervi and other masters can be seen in the design of the stands, which are mounted on inclined beams that rest on their columns like slanting seats, so that the underside of the precast seating tiers makes a saw-tooth pattern with the long diagonal (12). Running along the top of the grandstand is an obviously nonstructural plaster housing for the black curtain which is drawn to the ceiling when the arena is darkened for certain events: a neat and almost ridiculously inexpensive answer to a problem which has caused most arenas to be solidly enclosed (12 and 13).

This arena, as one enters from the concourse at mid-level in the stands, shows what has been missing in other buildings of this kind. From almost every seat there is a view over the high surrounding rim to the sky. On afternoons when the rink is filled with skating children and the sun shines brightly on the ice, the arena takes on a warm elation that is rare in stadium architecture. Everywhere the design of the stands is admirably handled. Access is easy and quick. The graphics are plain but clear. The spare use of color (which indicates seating dispositions) is sensitive. The seats are comfortable and rather more spaciouly arranged than in most indoor arenas. Visibility is excellent even from the topmost rows, and the lowest seats are high enough for a fine view of the playing floor. This bowl could have been more luxurious; it could not have been much more thoughtfully designed.

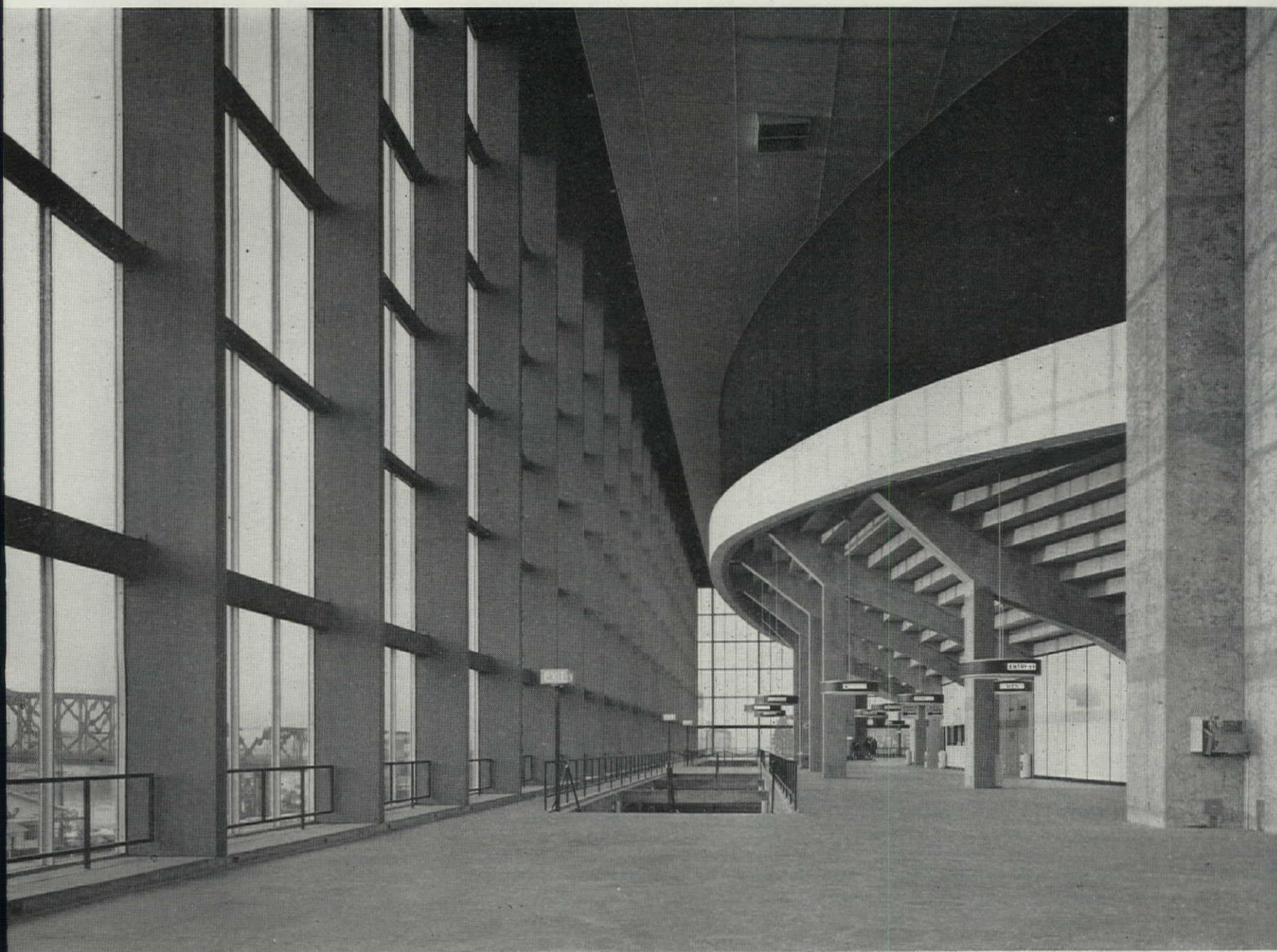
But it is above all in the ever present, ever exhilarating expanse of space that the civilized strength of the building is most deeply felt. The modern architect, Eero Saarinen, has protested, has talked more and done less about space than did architects of previous times. One wonders. Here in a provincial city is a building—suitably

*continued on page 181*





14



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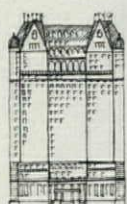




TACOMA BUILDING  
CHICAGO



FLATIRON BUILDING  
NEW YORK



PLAZA HOTEL  
NEW YORK



PENNSYLVANIA STATION  
NEW YORK



NATIONAL CATHEDRAL  
WASHINGTON, D.C.



LINCOLN MEMORIAL  
WASHINGTON, D.C.



U.S. SUPREME COURT  
WASHINGTON, D.C.

# Building's No. 1 contractor

Behind the steady growth of George A. Fuller Co. is a smooth kind of selling, an uncanny sense of costs, and a close liaison with clients, architects, and subcontractors.

BY DAVID B. CARLSON

In a year which is expected to establish new records for building construction, the building contractor that has consistently headed FORUM's directory of the 100 biggest is happily anticipating commensurate gains. Last year, the George A. Fuller Co. put in place an estimated \$193 million dollars of buildings, represented by a wide variety of projects in 29 states. An Otis Elevator factory in California, a laboratory in Pittsburgh, a missile base in Kansas, and a Chicago Federal Reserve Bank building are just a few examples of projects going up under Fuller's energetic direction. Although it works on much heavy construction too, Fuller is mainly occupied with buildings, and has become best known for its widespread activities in the development and construction of the skyscraper. In fact, the popular image of Fuller is that of a skyscraper builder, particularly as the leader in the furious activity of the recent skyscraper boom in Manhattan.

It is an image well earned, but somewhat incomplete. The Fuller company has probably placed more well-known landmarks on the American scene, aside from skyscrapers, than any other building company. The frieze at the top of these pages shows only a few of its best-known buildings. But, missing from this panoply is a structure which many thousands of Americans got to know better than any of these—the Quonset hut, developed by Fuller while it was building the huge naval air station at Quonset Point, R.I. at the start of World War II.

In its 79 years, the Fuller company has earned a reputation as a pioneer in building methods. This has involved not only new construction techniques, but also a business rationale that has made Fuller a profitable enterprise, in an industry where profits are frequently hard to come by. In the last five years Fuller's construction operations have grossed from \$4.2 million to \$6.2 million and netted \$800,000 to \$1.3 million per year. (The postwar peak was reached in 1959.) With a working capital now built up to over \$7 million, Fuller has shown that it is possible to flourish in an industry that last year claimed 1,020 business failures, representing \$111 million in liabilities.

A great part of Fuller's success results from its resiliency and its willingness to change its operations in response to advances in building technology. When George Allon Fuller formed the company in 1882, in Chicago, contractors used their own workmen to do just about every phase of a job and frequently designed most of the projects as well. Fuller himself was an architect, a graduate of M.I.T., and had earned early recognition for himself as construction supervisor of several of Manhattan's earliest high-rise structures, including the First National Bank at Broadway and Wall. But in the boisterous rebuilding of Chicago, Fuller had visualized the contractor's role as distinct from that of the designer, and set out to provide architects and clients with a full range of strictly building construction services. Before a decade had passed, Fuller's young company had gained its most significant commission—construction of Chicago's Tacoma Building, one of the first completely steel-framed skyscrapers in the nation. With the erection of this building, Fuller pioneered the concept for the building team that would build skyscrapers from coast to coast. Trusted by architects, he became a leader in skyscraper construction in Chicago fol-

lowing the great fire, and his knowledge of high-rise construction, involving the use of electric hoists and a new science of steel fastening, secured that position.

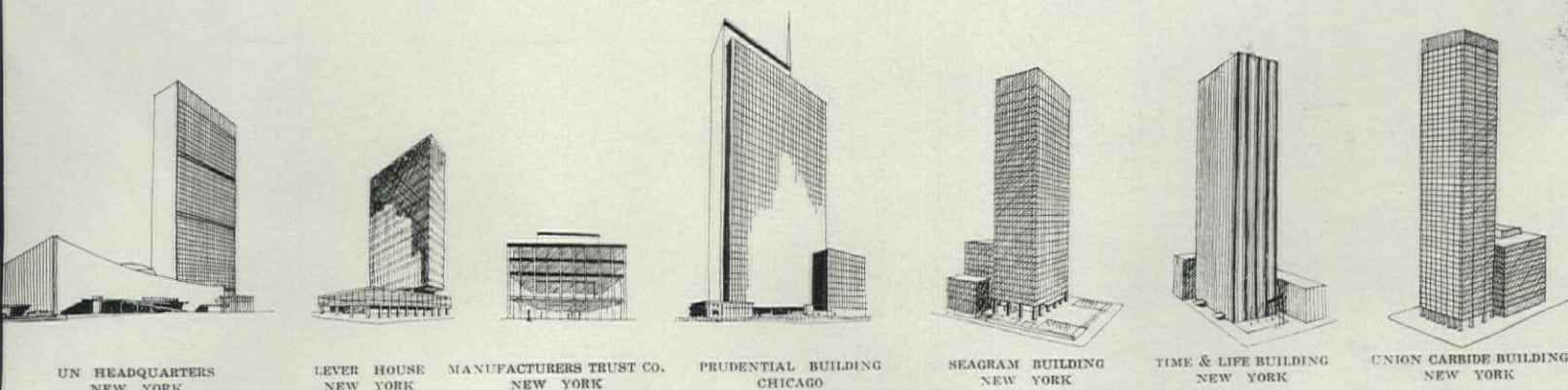
By the time Fuller died, at the age of 49, the company had grown considerably; its initial capitalization of \$25,000 reached \$750,000 in an industry swarming with pygmy companies. (Today, Fuller's capitalization stands at \$9.4 million.) As jobs got bigger—for instance, the Pennsylvania Station and its neighbor, the U.S. Post Office in Manhattan, both built by Fuller—only big companies could cope with the increasingly complex problems of their erection, and Fuller had, by World War I, become one of the biggest.

## The contractor's changing role

The company founder would probably be somewhat dismayed by the operations of his creation today, even though he started it on its present course when he began specializing in skyscraper construction. For today, the large contractor, although he has more employees than ever before, does little of his own work, particularly on high-rise jobs. As Fuller President Raymond C. Daly says: "Contracting today is a service industry," and this concept is nowhere more thoroughly developed than at Fuller whose fixed assets (land, buildings, machinery, and equipment) are valued at only \$649,000.

Daly means that the days when a general contractor owned his gravel pits and brickyards and hired all his own labor are long gone. They died, he says, mainly because of large-scale unionization of labor and the increasing specialization required in most building trades. As a consequence, general contractors today do little of their own work. Fuller subcontracts an average of 75 per cent of every job, the exact ratio depending on the location and availability of specialists in the area. It subcontracts all of the work on most jobs in New York City where





it does only general supervision and a few minor trade jobs, such as having its own carpenters build fences around its building sites. Fuller long ago learned that well-financed, experienced subcontractors could handle their specialties more efficiently than could Fuller itself, and this is nowhere truer than New York, which boasts the broadest range of building specialists in the nation. And Fuller has carefully cultivated its relationships with top subcontractors. Although Chairman Lou R. Crandall says "We have no pets among the subs, because we have to be prepared to do business with any of them," it is true that Fuller has a strong following of subcontractors who are as large and experienced in their respective fields as Fuller is in general contracting. Fuller is noted among the subcontractors for prompt payment and fair treatment.

Architects, who on most big jobs are instrumental in recommending builders, are fully aware of Fuller's strong following among experienced, reliable subcontractors, and this contributes to Fuller's pre-eminent position. As one leading architect says: "Today, a general contractor is no stronger than his subs . . . and Fuller usually lines up the best subs in the business."

What role do these shifts leave to the contractor? Fuller, in its own definition of a service business, provides its clients and architects with a variety of building expertise on everything from structural systems, materials, engineering techniques, and deployment of building trades to the complex logistics of assembling all the elements of a huge project on the site at the right time.

Fuller's changing role has also permitted it to make investments for its own account in several projects. At one time, Fuller was made a subsidiary of what was in effect a real estate development concern, called U.S. Realty & Improvement, which did much speculative

building. Fuller separated from this organization in 1938, and has stuck to contracting ever since. But on occasion it does take a minority equity position, as it did several years ago with William Zeckendorf on Denver's Mile High Center, which Fuller built. The company had a 42½ per cent interest in the Center, which it sold two years ago at a net profit of \$1.1 million. It now holds interests valued at slightly over \$1 million in several New York buildings, real estate in Chicago and California, and in an Oklahoma cement plant which it built in 1960. Crandall says that, as opportunities present themselves, the company will probably invest in other building projects.

#### Selling cost control

Perhaps the most important service Fuller performs is controlling the cost of any project it undertakes. This has its effect all the way through the job, from the initial estimate down to the detailed periodic cost reports delivered

to the client and architect during construction. Fuller clients, particularly those which have built Manhattan office towers, express satisfaction with its cost-control procedures. But more than that, they are impressed with the fact that Fuller is so often able to build clients' buildings within the cost estimates first given to them, even when contracts are in the most tentative stages of negotiation.

Fuller's cost-control methods constitute the nearest thing yet developed to a scientific method for accurate cost estimating. In many respects, estimating the cost of a large project is the most ticklish, and most important, aspect of selling a client. No one realizes this more fully than Lou Crandall, who is regarded throughout the industry as perhaps the most skillful salesman of a contractor's services in the business.

Crandall's salesmanship is a shrewd combination of personal knowledge of all phases of construction, including the pivotal element of costs, and an uncanny knack for convincing clients that Fuller is the one builder that can do the sort of job their buildings deserve. Crandall himself says modestly: "I'm not really a good salesman . . . all I can do is try to convince each client that his building is the most important one in the world . . . and just as important to Fuller as it is to him."

How good Crandall, and Fuller's other top executives, have become at convincing clients of this is plain enough from the number of buildings they are asked to build. But for all Crandall's skill, he is the first to admit that cost is the major element in the selling equation, as it is in the building equation: "It doesn't matter how much charm a fellow might turn on, or how close he might be to a client—if he can't build a job cheaper than the competition, he probably won't have the chance to build it at all."

Fuller uses two distinct estimating techniques, depending on the sort of

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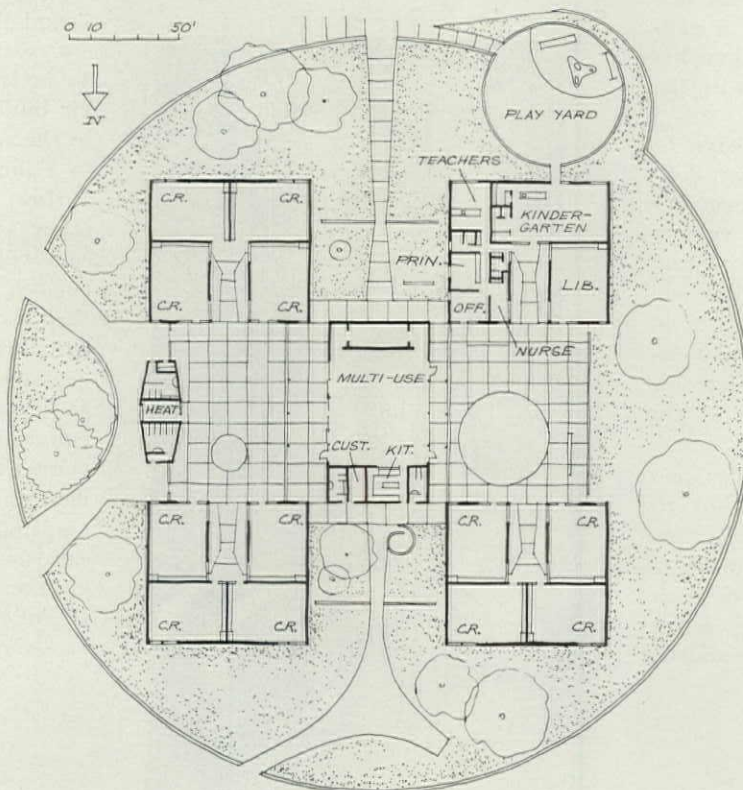
Chairman Lou R. Crandall







*The folded-plate roof provides a low, playful roof line. The view above is from under a sheltered entrance passage.*





# Child-size school

An A.I.A. award winner is scaled down to the children who attend it.

Many schools, even primary schools, somehow lose—or never have—a sense of the size of the people they are built for. To put it another way, some communities still build nothing but high schools, even for kindergartners.

Architect Mario Ciampi's triumph in school design—an elementary school in Daly City, Calif., which recently earned one of the top honor awards of the American Institute of Architects—fits

its clients like the right pair of Keds. It is an amiable-sized elementary school in terms of program (12 classrooms, plus kindergarten, library, administration, and multiuse room), but even beyond this, the designer has adroitly broken up all the components into visual fractions. The two most evident methods are his treatment of the ground and the roof; the floor plan breaks up the areas of the school into clusters of classrooms bounded by various-sized courts; the roof is not just one single sweeping plane, but instead is a pattern of folded plywood plates reminiscent in character of classroom

scissorwork. Somehow Ciampi was able even to pass title of the art and sculpture onto the children. This is true not only in the way the art is set—low, to be appreciated from a 4-foot eye level—but in the compositions themselves.

Yet, for all its midget character, this is a community-use schoolhouse too. It is sited on a stretch of ten green (and slightly soggy) acres among the usual tracts of California housing, and eventually the site will be developed as a recreational park. So far none of the adults using the building after hours has objected to its friendly scale, not even the tallest and broadest of them.

*The tile mural in the courtyard is by Architect Allyn Martin, who has done outstanding wall designs for several Ciampi schools.*





**Financial program:**

School is the ninth constructed by this architect for the Jefferson Elementary School District over a ten-year period. Total cost with architectural fee, \$456,000, including furniture (\$29,000) but not site (\$55,000). Number of square feet, 24,887; number of pupil stations, 451. The building was financed with a combined local and state bond issue, passed on the first attempt, 4 to 1. There was no effect on the local tax rate because previous issues required maximum tax levies of \$.45 per \$100. of assessed property valuations. The district tax rate is \$2.32; adding the bond redemption rate, the total rate is \$2.75 per \$100.

**Cost breakdown:**

General conditions .....	\$ 28,000
Site work .....	85,000
Structure, concrete, millwork, etc. . .	142,000
Masonry .....	10,000
Roofing .....	9,500
Finish .....	33,000
Heating, plumbing, electrical .....	89,000
Kitchen equipment .....	2,500
Sheet metal .....	5,000
Architectural fee .....	26,500

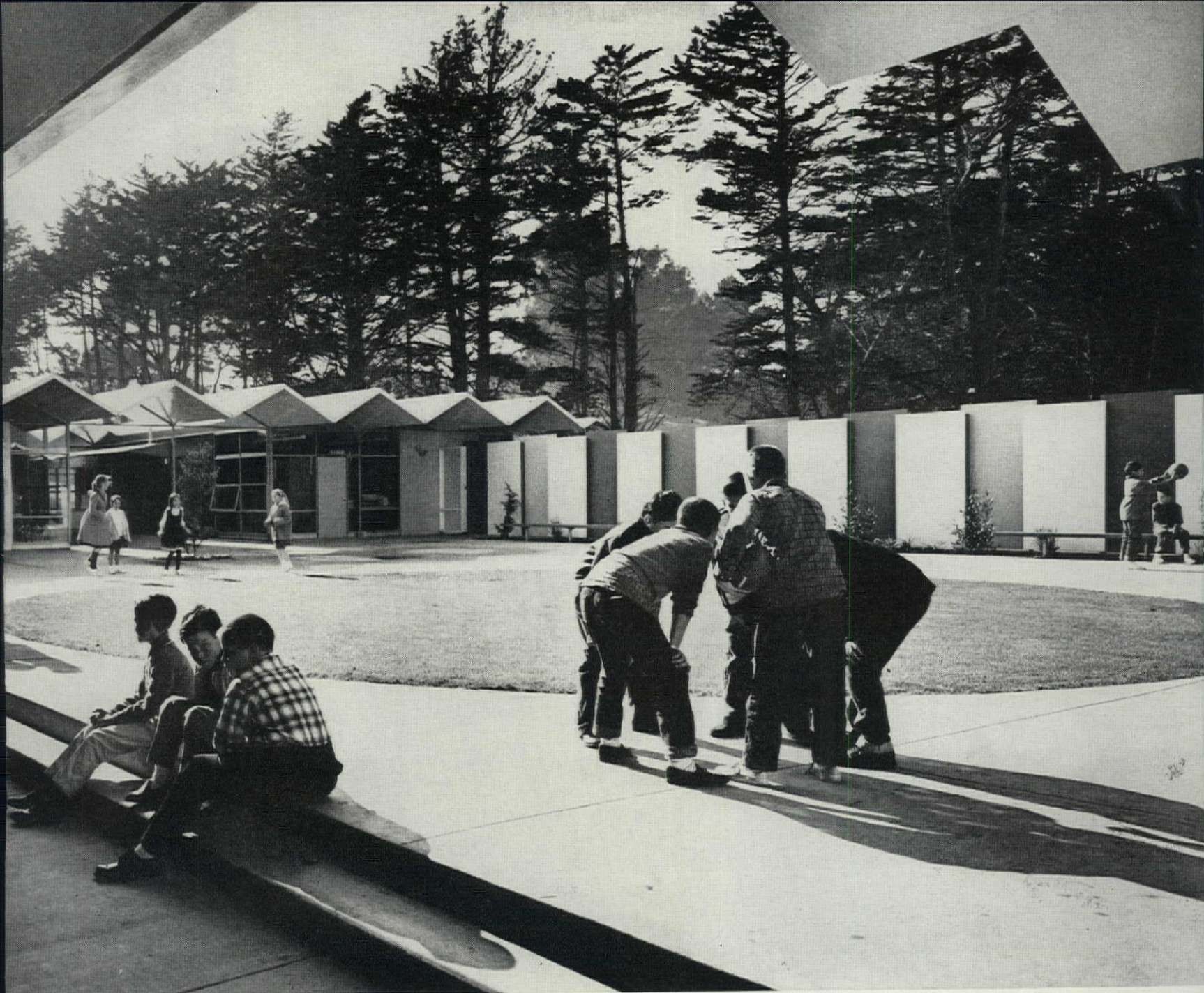
FERNANDO RIVERA ELEMENTARY SCHOOL, DALY CITY, CALIF. ARCHITECT: *Mario J. Ciampi*; *Paul Reiter, associate*. STRUCTURAL ENGINEER: *Isadore Thompson*. MECHANICAL ENGINEERS: *Van Dament & Darmsted*. ELECTRICAL ENGINEER: *Harold A. Wright*. CIVIL ENGINEERS: *Daniel Coleman Engineering Co.* GENERAL CONTRACTOR: *Midstate Construction Co.*



*The school sits on a circle of fill to raise it above the swampy surroundings.*





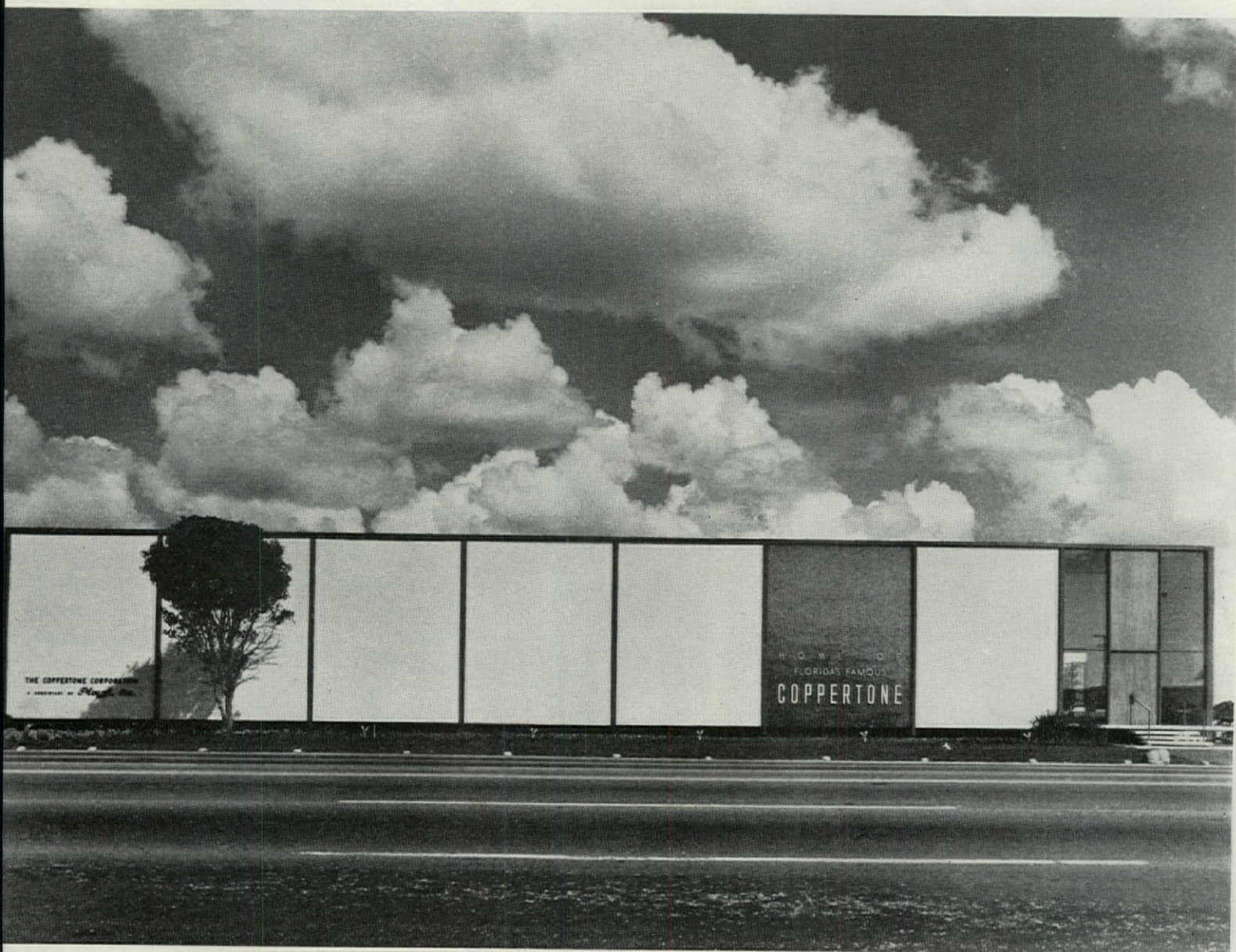


*A fence protects the playground, when in use, from winds, and from vandals after hours.*

*The projecting saw-tooth profile of the roof is a good shield against sky glare.*







DAVID BLACK

## Warehouse with elegance



DAVID BLACK



Before the owners added a gigantic, flashing neon roof sign, the new warehouse and office building for Plough, Inc. in Miami was an unadulterated composition of great simplicity, honored with an award of merit from the American Institute of Architects.

Behind the crisp façade of matte-finished, copper-colored, ceramic tile, a skeleton of steel columns and bar joists frames the utilitarian building which, for all its tailored elegance, cost only \$7.37 per square foot. Because of proximity to the International Airport, all glass areas in the office section were double-glazed for sound reduction.

Architects: Weed-Johnson-Associates. Structural engineer: H. J. Ross & Associates. Mechanical engineer: R. L. Duffer & Associates. Electrical engineer: Weeks Engineering Co. General contractor: Edward J. Gerritts, Inc. The real estate cost of \$150,000 and the construction cost of \$109,321 were met by Plough, Inc. from cash reserves.





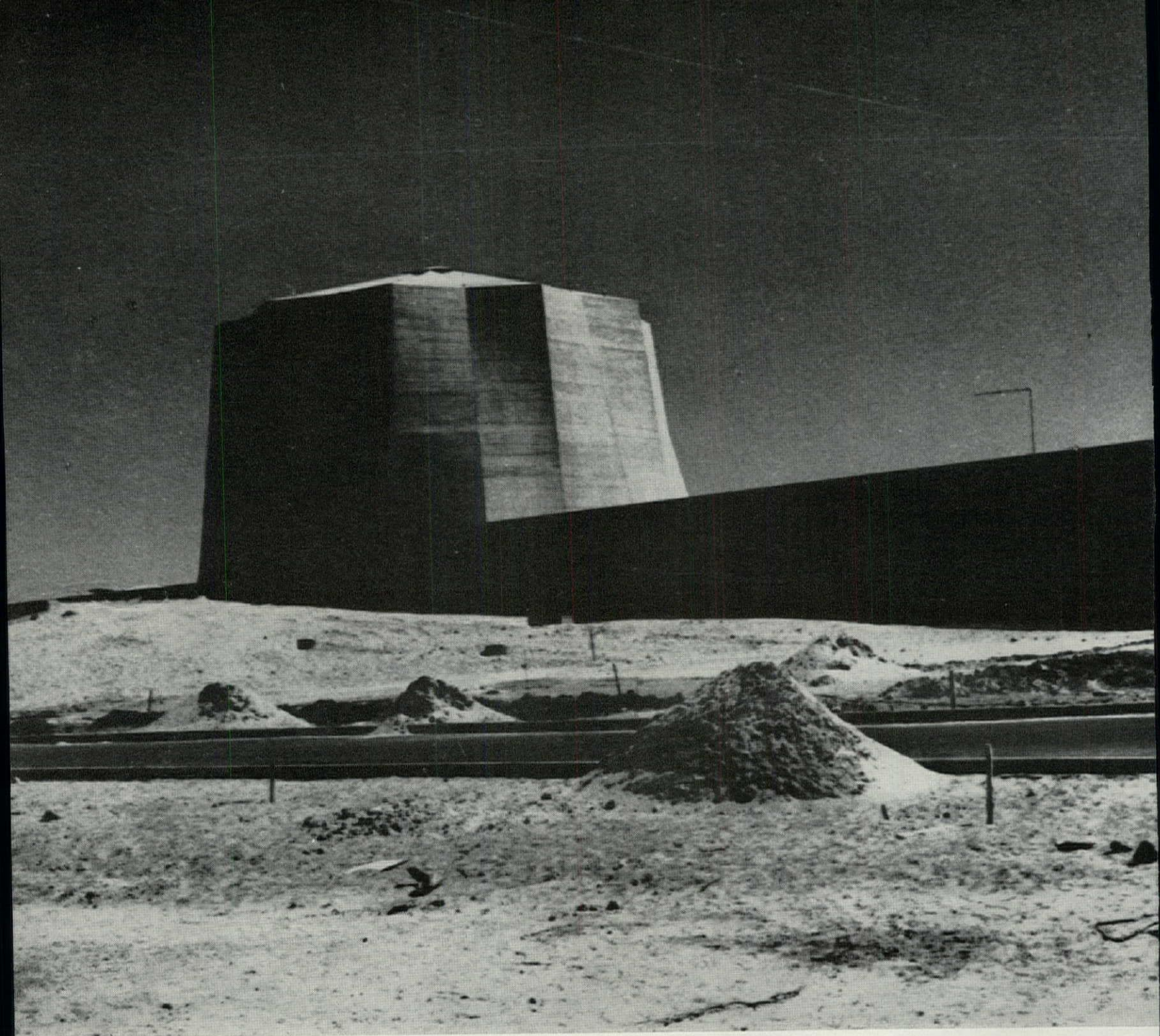
## Oasis amid showrooms

The only real architectural attraction in the huge (980,000-square-foot) Dallas Trade Mart is the sky-lighted mall (over 300 feet long, 100 feet wide, and four stories high), which runs down the center of the building and was developed by Consulting Architect Harwell Hamilton Harris. Not only does the mall give the wearied buyer—escaping from the maze of showrooms and the 3½ miles of corridors—a fountain, a gazebo, pools, trees, and even parakeets with which to relax, but the spidery pedestrian bridges, spanning the mall at quarter points, break up the great space, draw attention away from the indifferent façades, and bring this magnificent “outdoor” room into human scale.

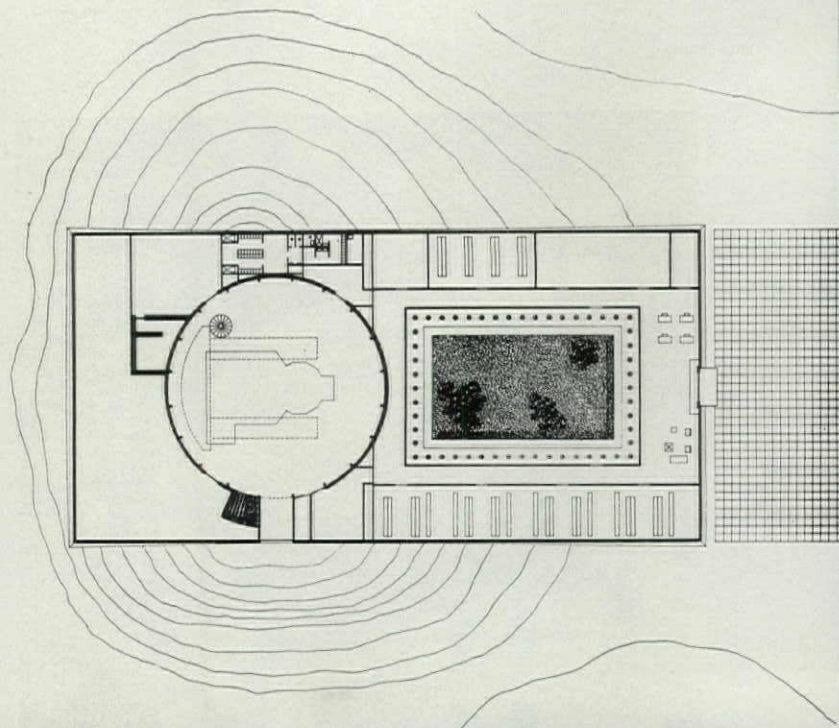
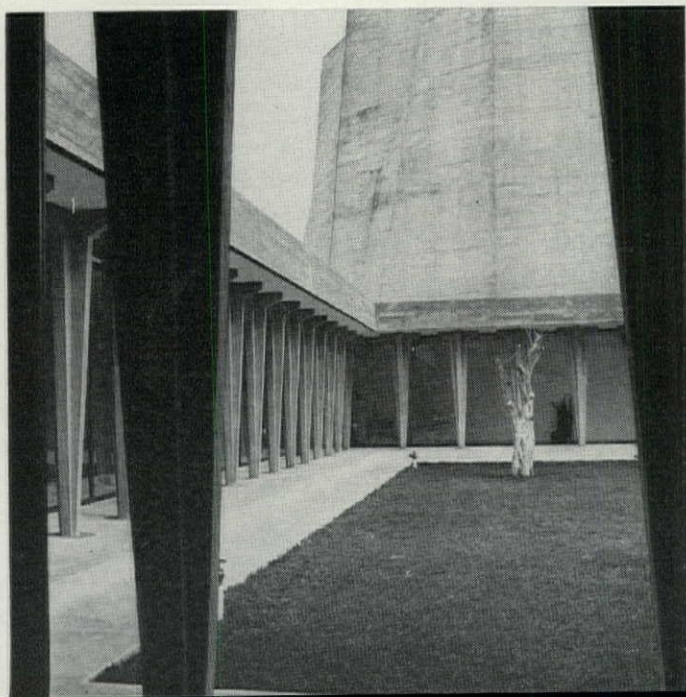
Architects of the building: Harold Berry and Donald Speck. General contractor: Ten Eyck & Shaw. Total cost of the Trade Mart was \$12,640,000. The Equitable Life Assurance Society supplied a \$6.5 million, 20-year mortgage at 6¼ per cent.



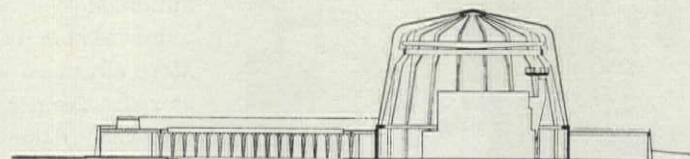




PHOTOS (RIGHT & BOT. OFF. PAGE); GEORGE HOLTON







## Atoms for Israel

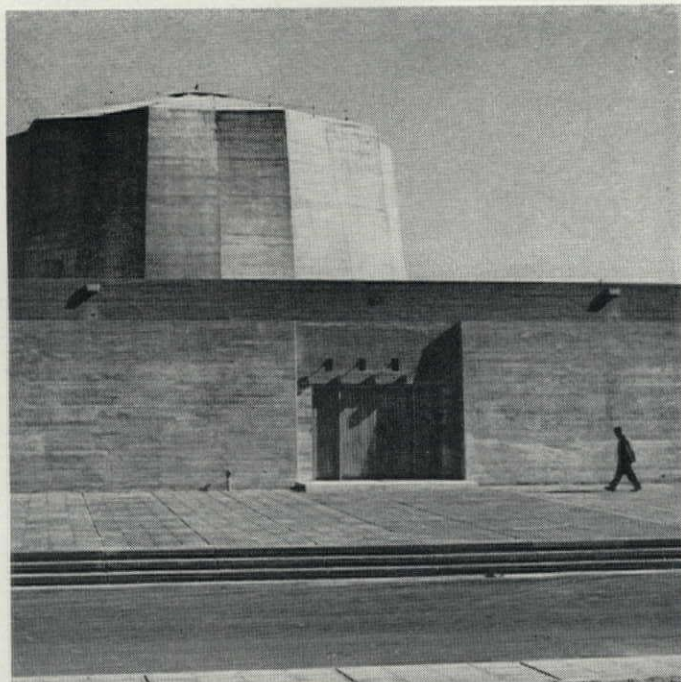
Philip Johnson's nuclear reactor building, designed for the Israeli government and located in Rehovot, recently won a deserved honor award from the American Institute of Architects—deserved for this is a remarkably strong and richly suggestive design.

Its roughly formed, raw concrete walls, unbroken by windows, reflect a conscious effort to turn away from the harsh natural surroundings of the rugged coastal plain. It embraces instead a stylized, serene, artificial nature of its own in the oasislike interior court, which is rimmed with carefully articulated columns and walls of glass.

The secret nature of the work within is suggested by the steeply battered, fortresslike walls which clearly—and powerfully—resist the visitor. This is not a building which invites, but one which repels. Another aspect of the building's function is suggested by the dome, whose restless, faceted exterior hints at the struggle to harness the enormous, restive forces within.

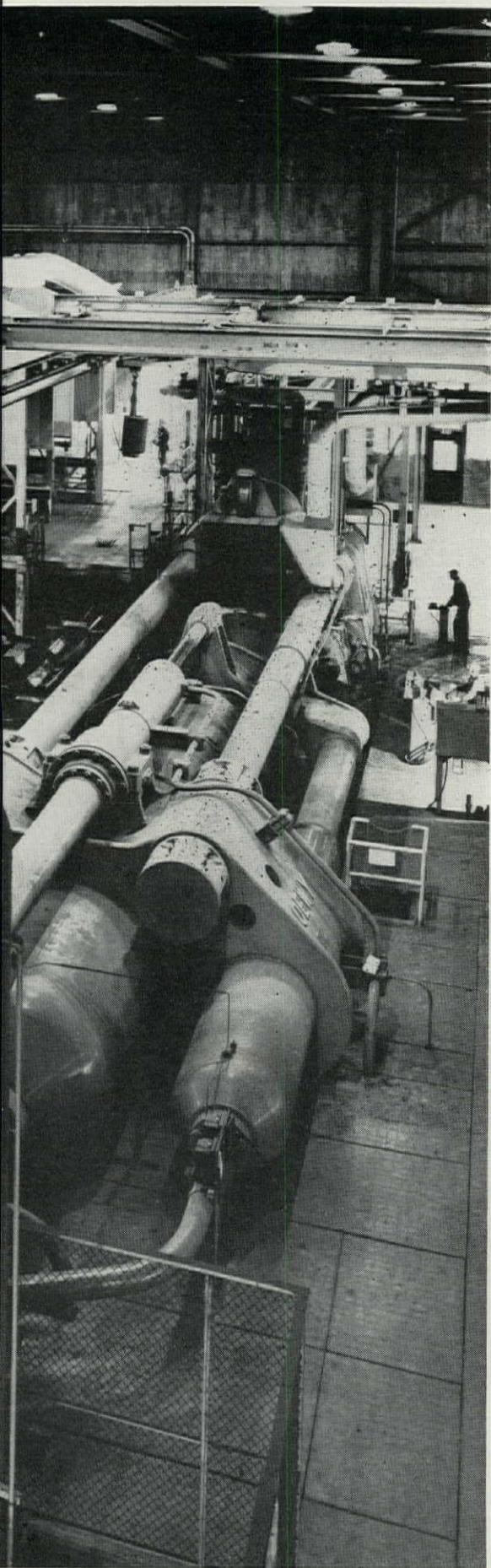
Finally, in the severe, rigidly formal organization, which culminates in the great space of the reactor dome, the building suggests a temple, with a peculiarly regional flavor of ancient Israel and Egypt. And, in a way, it is a temple, dedicated to the new "religion" and served by a new order of high priests.

Supervising architect for the Israeli government: Gideon Ziv. Structural engineer: Dr. Lev Zetlin.





# Aviation eyes the building industry



Much that has been learned in making air frames and rockets could be used in the construction of tomorrow's buildings.

By LAWRENCE LESSING

A major revolution may well be under way in the invasion of building by the aircraft industry. The influence of aeronautical design on architecture is already strong. In the finely jointed, thin-aluminum or stainless-steel-clad buildings typical of today there is the unmistakable light touch of the air age. More advanced types of structure, such as space frames, cable-suspended roofs, geodesic domes, and air-supported buildings, show an even clearer debt to aeronautical design. Even concrete, through development of thin-shell construction, prestressing, mesh reinforcement, and lightweight aggregate, has taken on soaring aerodynamic qualities.

Today, by a violent coincidence of economic and technological events, there are signs of an even more direct entry of aeronautic techniques, materials, and designs into building. The U.S. aircraft industry is in the midst of the greatest transition and crisis of its life. The ascendancy of rocket missiles over manned military aircraft is pushing the industry's historic air-frame business into a decline from which it is expected never to revive. While most of the big aircraft makers are shifting to rocket-satellite work, and some can continue to count on a small backlog of orders in jet aircraft, the whole business is not expected at its optimum to occupy more than about a quarter of the industry's present 105 million square feet of floor space and facilities. Hence the industry is on a search even more frantic than that following World War II for diversification into other industrial products. And some of the giants are having a

long look at the building industry.

Building would seem to be a natural for the aircraft industry. The aircraft industry is perhaps the world's most advanced developer and fabricator of materials and components into self-contained structures. Its deployment of men and machines on a factory floor is one of the wonders of the modern world. Moreover, over two-thirds of that plant and its machines—about \$1.2 billion worth—is free and clear, having been paid for by the U.S. government. Above all, this industry has an unparalleled core of engineers and researchers to draw on in any attack on building problems. And boiling up out of the industry's space research are still newer, more advanced techniques, materials, and constructions that, together with those of the past, might indeed revolutionize building.

## Plastic molding of metals

Essentially, the manufacture of air frames, as it has developed, has become a smooth molding of light metals into curved aerodynamic shapes, whereby metals are more and more treated as plastic materials. For this there has been developed a great range of metal molding and manipulating machines, which, if turned to building products, might well introduce into the generally rigid rectilinear patterns dictated by conventional steel beam-and-column construction some of the curvilinear freedom of such plastic materials as concrete (or an occasional metal form such as the Alcoa Building's soft-cornered windows). Moreover, the range of shapes and sizes thus made available for building could be greatly extended, particularly in the direction of larger, more economical unit components.

Two classes of these metal-forming machines would probably be most readily adaptable to building needs. One is a range of big extrusion presses,

Giant extrusion press at Curtiss Wright Metal Processing Division at Buffalo (left) is typical of the advanced equipment in the aircraft industry available, with the decline in air-frame production, to new concepts in building and construction. About two-thirds of the

aircraft industry's modern plant will have to be turned over to new markets in the next decade or be disposed of at a substantial loss. The huge stretcher press (right) is part of the Aluminum Company of America's plant in Lafayette, Ind.

WILLIAM R. MITCHELL



which squeeze out certain aircraft structural parts like toothpaste from a tube. Aluminum extrusions of a smaller and lighter variety are already common in building use, for such things as window framing, stripping, trim, and tubing, but larger, heavier extrusions, beginning to appear experimentally in bridges, are just over the horizon for actual structural members. The other class of machines, probably of even greater potential for building design, comprises a great variety of metal shaping devices and big stretch presses for bending, molding, and stretching sheet metal into compound curves and complex forms. These shapes, in combination with structural forms or honeycomb cores (see below), produce light, exceedingly strong stressed-skin panels that in their freedom of shape and size could introduce a new order in curtain-wall construction.

Furthering this plastic treatment of metals is a radically new technique, developing out of rocket and satellite production, called explosive or high-energy forming of metals. In this remarkably ingenious process, now in full-tilt production at Aerojet-General Corp., Ryan Aeronautical Co., and other companies, intricate or highly curved metal shapes are formed against dies under water by high-explosive charges. With one explosive shot and a minimum of fixed equipment—little beyond an open water pit and a crane—the most intricate shapes are instantly formed, requiring little or no further treatment, machining, or assembly. Dies are the major cost, but for large shapes not

held to close tolerances a very low-cost, plastic-coated, concrete die has been developed. And the technique works on a gamut of metals from the most common ones to titanium, stainless steel, and the hardest refractory alloys, in sizes and shapes impossible to form by conventional means. Ryan Aeronautical has formed highly embossed bronze curtain-wall panels experimentally, and this technique might well introduce a new breadth of variety, both in size and sculptural detail, into the flat curtain-wall scene.

As an indication of how rapidly the field is moving, last summer researchers of the Battelle Memorial Institute announced the development of an entirely new and still cheaper method of explosive metal forming. The new technique revolves upon the invention of an extremely simple gas generator that produces from plain water, as needed, a mixture of hydrogen and oxygen gases. This mixture is ignited in a closed chamber to produce an explosion that builds up to a maximum tenfold increase in pressure in ten microseconds. The gas is produced at about one-third the cost of solid explosives, and creates an explosion more controllable, beneficial, and adaptable to large metal forming. While the process is open to license by any industry, it is the aircraft industry, already far ahead in explosive forming, that is more likely to pick it up most energetically.

The aircraft industry's main forte is not only its experience in forming metals but also its long, intensive, basic experience in handling all the most ad-

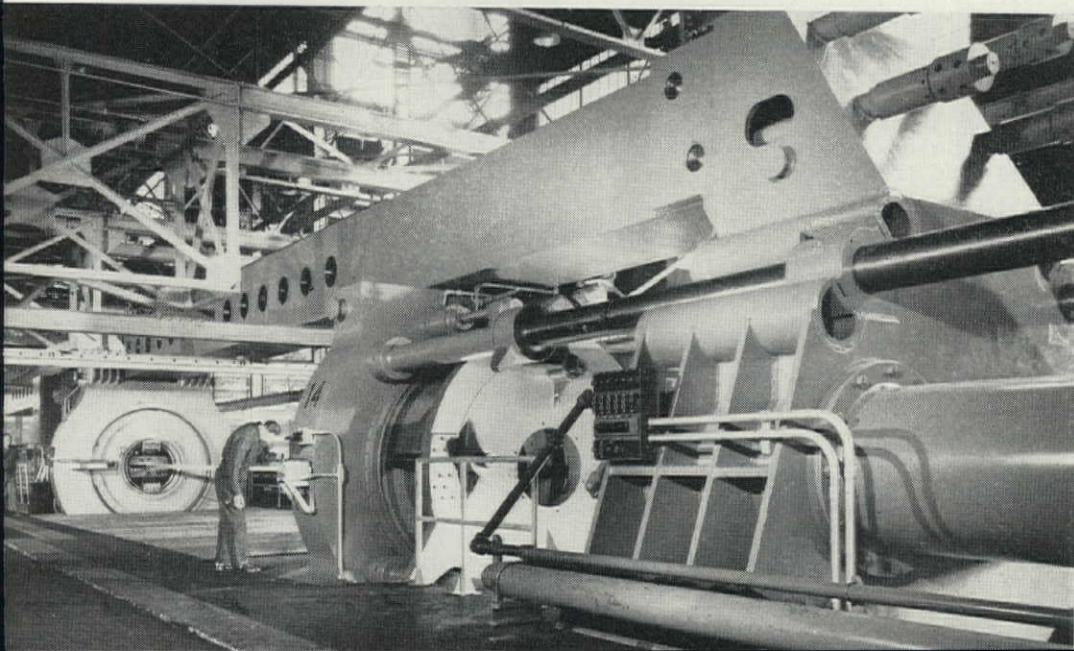
vanced materials of the age under extreme conditions of heat, cold, load, and endurance. In this the industry is one vast test chamber of large significance to building. For, if the problem of building is to be solved by modern industrial techniques, it is primarily a problem of materials, of the economic coordination of new and old materials into advanced designs, able to withstand weather and the force of gravitation. To this task the aircraft industry could contribute much, for it is at the crux of the most prolific development of materials in all history.

### Endless materials

The stream of new materials is so great that it cannot be examined in much detail here. It is a mighty mix of new, higher strength plastics, ceramics, and metals, many with remarkable new properties, many leading to entirely new building techniques.

In plastics, the inclusion of chlorine, fluorine, and other inorganic elements in plastic compounds has brought up a whole new range of high heat-resistant, nonflammable, highly stable plastics, overcoming the major defect of plastics in building up to now. New vinyl chlorides by B. F. Goodrich are one example, and an entirely new group of silicon-nitrogen plastics developed by Eugene G. Rochow, a pioneer in silicone plastics, is another. These in turn are leading to new high-strength reinforced plastics by new techniques. One of the most advanced is filament-wound reinforcement, developing out of rocket construction, in which glass fiber and other fibers are stress-wound on mandrels and fixed with a resin binder to form very light, extremely strong vessels, shells, and piping—a kind of prestressed plastic technique that could lead in building to new structural shapes, conduits, and a light, maintenance-free plumbing system.

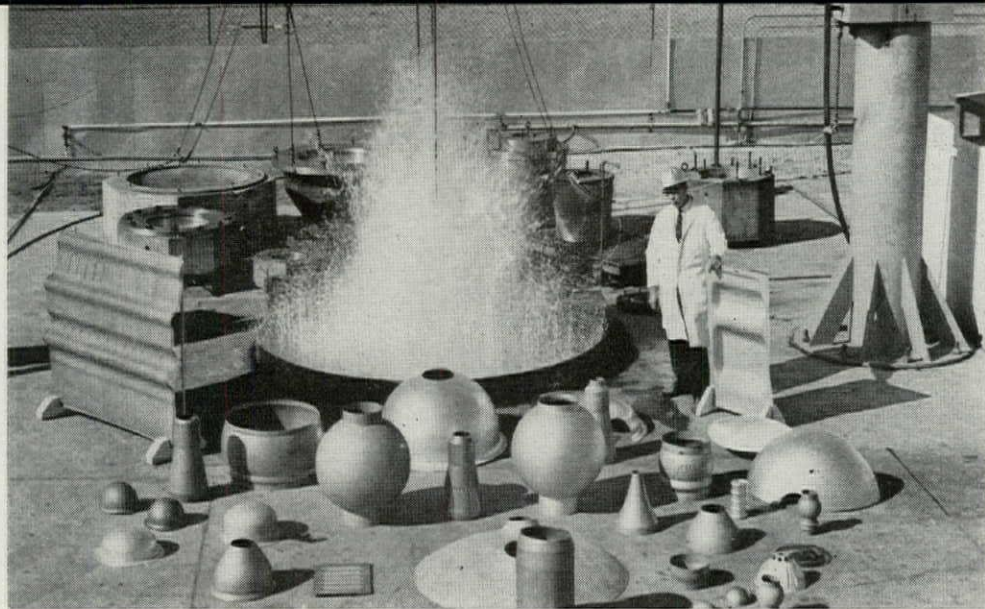
In ceramics, perhaps the most promising of new materials is Corning Glass's Pyroceram, the first truly crystalline glass, developed for rocket nosecones. This is a really remarkable material, gem-hard, fireproof, stronger yet lighter than steel, with amazing resistance to thermal shock. In it, fragil-



ASSOCIATED PHOTOGRAPHERS



**Explosive forming of metals against a die under water is an efficient new technique developed by the aircraft industry for intricate rocket construction, adaptable to many kinds of architectural shapes and materials. Photos show an explosive water pit at Ryan Aeronautical Co. in California. Explosive pellets of only a few grains exert enormous pressures in a shock wave under water.**



ity and glass are no longer synonymous. Pyroceram already has been domesticated in flameproof kitchenware and experimentally in curtain-wall panels, and it may even have distinct structural possibilities. Low in cost and available in all degrees of transparency, opacity, and color from a range of formulas still largely untapped, Pyroceram is one of the new space-age materials of largest architectural potential.

In metals, excluding the well-known light ones, a spate of rare or exotic metals is at hand for entirely new uses by new techniques that may well hold the deepest revolution of all. These include such unusual forms and combinations as foamed metals (for lightweight cores), thin molecular metal films (for electronic circuitry and solar heat reflection), fiber metallurgy (for light reinforcing mats of enormous strength in shell construction), and a magic group of pure and exotic metal combinations.

Perhaps the most significant of new materials, literally and figuratively joining all the rest together, is a revolutionary line of adhesives, mainly epoxy and other new hybrid chemical forms, which totally eliminates or greatly reduces the use of nails, bolts, rivets, and older mechanical fasteners. Adhesion theory has progressed so far, and the tailor-made materials to prove it, that bonds are now produced which are actually stronger than the base materials. And a range of adhesives is available that strongly grips metal to glass to ceramic to plastic to wood, and to other dissimilar materials, with all due allowance for coefficients of expansion. Moreover, the adhesives are available now in such novel forms as tubes, strips, capsules, and microspheres to ease application and allow the final setting to take place with the mere exer-

tion of a slight pressure.

Some small, timid uses of the new adhesives have crept into conventional building, mainly in the fabrication of curtain-wall panels and in strip adhesive sealants for their installation. And National Homes and others have moved into wide use of adhesives in home building. But again the most aggressive user of adhesives is the aircraft industry, which has pioneered them in the production of rivetless bombers and rocket structures, and proved that the chemical bonds withstand enormous stress, fatigue, and load. Indeed, advanced aerodynamic structures would be impossible, it has been found, with rivet and bolt construction. Since the crux and age-old problem of architecture is in the jointing, this development of superadhesives promises the first seamless buildings and a new fluidity of design.

#### **Toward new constructions**

The variety of new materials is nothing, however, without their imaginative conjugation into new components of construction, often based upon new principles made possible by combinations of new properties. It is here that the aircraft industry has moved furthest out in front, by necessity, and has the most to offer in the application of new aeronautical constructions to building design.

The neatest and newest example of this is the application of thin-film reflective surfaces to glass to solve the hothouse effect of modern architecture's vast transparent planes, a solution being pioneered on two new buildings by Eero Saarinen & Associates (FORUM, July '60). The technique of laying down layers of gold or other high-reflective-index metals one or two molecules thick by vacuum deposition

was greatly accelerated by the pressing need to protect space vehicles and their occupants from the fierce, unfiltered rays of the sun in outer space. Architects Saarinen & Associates found that the application of such molecular films, now commercially available, directly to glass or to plastic films sandwiched between glass could reflect off as much as 75 per cent of the sun's heat, at great savings in air-conditioning costs and human discomfort, without limiting vision. The same imaginative architects earlier had taken over from the automobile industry, which in turn had got the idea from aircraft window-sealing techniques, the use of neoprene gaskets to make big window glazing easier, more permanent, and leakproof. Thus may an alert architecture integrate the products of advancing technologies.

The most widely assimilated of all aircraft constructions into building is probably the honeycomb core structure. This structure—a hexagonal grid of metal, paper, or reinforced plastics bonded between stressed skins of metal, composition board, or plywood—was devised for aircraft wing and panel construction to provide structures of great lightness, strength, and rigidity. Indeed, honeycomb-core panel construction, using nearly the whole gamut of modern materials, including the superadhesives, provides the highest strength-to-weight and rigidity-to-weight ratios known. Moreover, batteries of high-precision cutting, slitting, and corrugating machines, plus automatic bonding and welding techniques, make honeycomb one of the most economical of modern structural materials.

Under such mass-production pioneers as Hexcel Products, Inc., basic honeycomb products and materials have been pushed out from the aircraft industry



through a growing number of finished unit fabricators into such building components as flush doors, partitions, ceiling light louvers, translucent room dividers, curtain-wall panels, and hollow floor systems for such rigid and exacting requirements as computer centers. Mainly, these are in the lower-cost impregnated paper or aluminum honeycomb constructions. But building so far has considered or made use of only a fraction of the honeycomb constructions going forward in aircraft and space-vehicle manufacture. A tremendous range of properties can be designed into honeycomb sandwich-panel construction for different purposes, simply by juggling and combining the wide variety of materials. Many more structural exterior and interior wall, floor, and ceiling uses are possible, particularly in prefabricated systems. Little imaginative architectural use has been made thus far of honeycomb's immense diversity and potential.

Fitting into this honeycomb structure in a way that will appear in a moment are all the new, small energy converters made up of exotic metals, called semiconductors, mentioned above. Last year alone nearly \$20 million of government-military research funds were poured into these new devices, because space vehicles, in order to maintain themselves in empty space, must carry their own lightweight, independent sources of power, light, heating, and cooling through the conversion of free energy in the universe around them. Hence, rapidly reaching a forward stage of development are solar-cell panels for converting light directly into electricity, thermoelectric generators for directly converting solar heat (focused by thin-film reflectors) into electricity, thermoelectric grids for alternatively converting an electric current into wall heating or cooling, and electroluminescent films (new semiconductive phosphors embedded in plastic) for converting electric current into almost heatless strip or panel lighting.

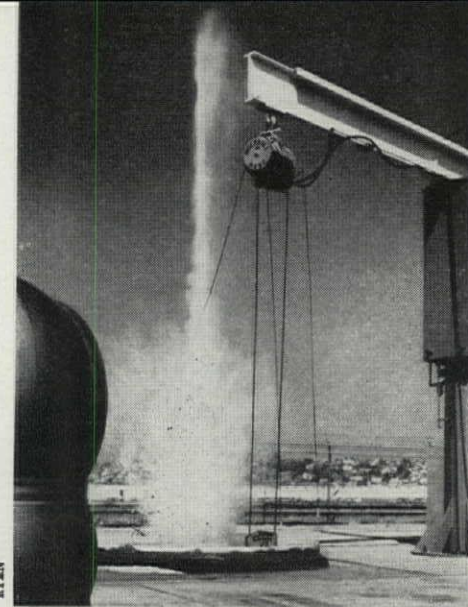
The common feature of all these new devices is that, operating without moving parts, they all fit compactly and durably into the thickness of a wall or

of a skinlike membrane. And authorities now seriously assert that, within another decade of development, they will not only be found in space but also will have changed the entire pattern of electric power generation on earth, unchanged for a century. The new devices make possible wall structures that will act more closely like the human skin in controlling interior environment, walls that will bury all the clumsy mechanical devices for heating, cooling, and lighting that today absorb some 30 to 40 per cent of the cubic space of major buildings. These new structured walls, with their own compact, free-generating power sources, will free building of utility connections and usher in a new era of autonomous building.

#### **Toward a new integration**

No industry is in a better position than the aircraft industry, it would seem, to put all these new elements together for building. Up to now, however, the industry has been singularly inept in entering new markets. The search for diversification following World War II devolved, in the industry's own disgusted terms, into "making toasters or aluminum canoes." Its approach to building products was equally trivial. Only recently, for instance, Curtiss-Wright unloaded an unsuccessful business in foam-plastic wall coverings. Used to dealing with single big customers like the government, on contracts in which cost was little or no object, the aircraft industry found itself bemused, as others before it, by the highly fractionated, competitive, low profit-margin nature of the building industry.

The only saving point in the situation is that the building industry itself is even more inept at putting together anything new or revolutionary. And recently, under the spur of necessity, the aircraft industry has been taking a much longer-range, more considered look at the problem of entering the building field. Northrup Corp., for instance, is actively working on the building of a portable classroom, a project that could well engage its spe-



cial technical resources, and it is investigating more ambitious flexible modular systems for prefabricated school design. Lockheed Aircraft is also working up a portable classroom based on trailer design, a general business it is entering because of its closeness to air-frame construction. (The same company also is working on monorail transportation systems, an item to fit into the urban renewal push ahead and another area for growth.)

The aircraft industry's best bet obviously is to concentrate on developing advanced, highly integrated building and building component *systems*, employing the intricate systems-engineering in which it is now pre-eminent. The risks would still be great, but they would not be so hopeless as entering odds and ends of building products into the competitive maelstrom of the building-materials market. Any unique, composite wall system, for instance, might carry a company above the competition for a time to fatter profits. High-cost materials and devices could be incorporated in such a system, for the materials would be subordinate to what the system as a whole could uniquely do. The major requisite in all this is top, imaginative engineering and architectural direction, a commodity which, unfortunately, is severely limited. Few architects are trained by background, experience, or native patience to understand industrial processes.

Yet, if the aircraft industry were to approach the building of earthbound structures with the same integrated, multitalented energies that it devotes to aerodynamic structures, a revolutionary new industrial force would enter building. It is a force sorely needed to meet the mounting problems of national growth and an expanding world population.



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## Rebuilding

Sensitive remodeling preserved the best of a grandly scrollworked 1912 façade in the Sullivan tradition (left). A stock canopy had already replaced the original marquee (top photo); this was ripped off in favor of a plain cast-stone front, extended all the way around the first-floor level (photo right). New display windows are shaded by a continuous, permanent canopy. The store, topped by a floor of offices in the St. James building, faces Jacksonville's downtown Hemming Park.



PHOTOS: ALEXANDRE GEORGES

# A department store reborn

*"Replanning takes on real urgency when one considers that only 60 per cent of space in older stores, on the average, is used productively because of outmoded layout and fixtures. We find that a thorough modernization can almost double a store's capacity for selling, without adding a square foot to its size."*

So speaks Morris Ketchum, leading New York architect and store designer. His most recent rebuilding job bears him out remarkably.

Although the last coat of paint is barely dry, and specific figures are un-divulged, there is little doubt that the \$2 million remodeling of Jacksonville, Florida's May-Cohen's department store is helping business considerably. The old basement sales floor, whose renovation was completed first about a year ago, has already shown a sound sales increase. On all floors, related departments have been brought together and clearly identified, and the "forward content" of visible merchandise has been increased roughly 50 per cent. Result: not only are more people attracted to the store, but they can find their way more easily, and make more of their own selections without waiting for a

clerk. Sales personnel waste far less time finding items, and running back and forth to stockrooms. Department heads are now able to classify their merchandise and lay out a fuller variety in view. New light levels raised to 60 foot-candles (from about 30) and a modernized air-conditioning plant have also helped put May-Cohen's on a competitive footing with brand-new stores in the area.

When the May Co. took over Cohen's in February 1959, the old St. James building which housed it (and a top floor of small office tenants) still had an enviable location opposite downtown Hemming Park. It also had a distinctly moth-eaten look. Ketchum wisely decided to preserve most of the rich old character built into the 1912 façade by Architect H. J. Klutho, a disciple of Louis Sullivan (see drawings opposite). However, the original wroughtwork marquee (top photo) had been replaced by a less sensitive modern canopy. Ketchum ripped it off in favor of a cleaner, if blander, entrance. The crumbling terra-cotta trim and awnings of the old display windows were replaced by a new band of beige cast-stone panels that gets along nicely with the old beige brick above, and by a contin-

uous, permanent canopy 10 feet wide in charcoal-colored aluminum. Show windows were reduced in size and number to pinpoint intimate displays, reducing operational display costs and gaining some stockroom space against the outside wall. Across the street, needed parking was provided by a new 370-car, privately operated garage.

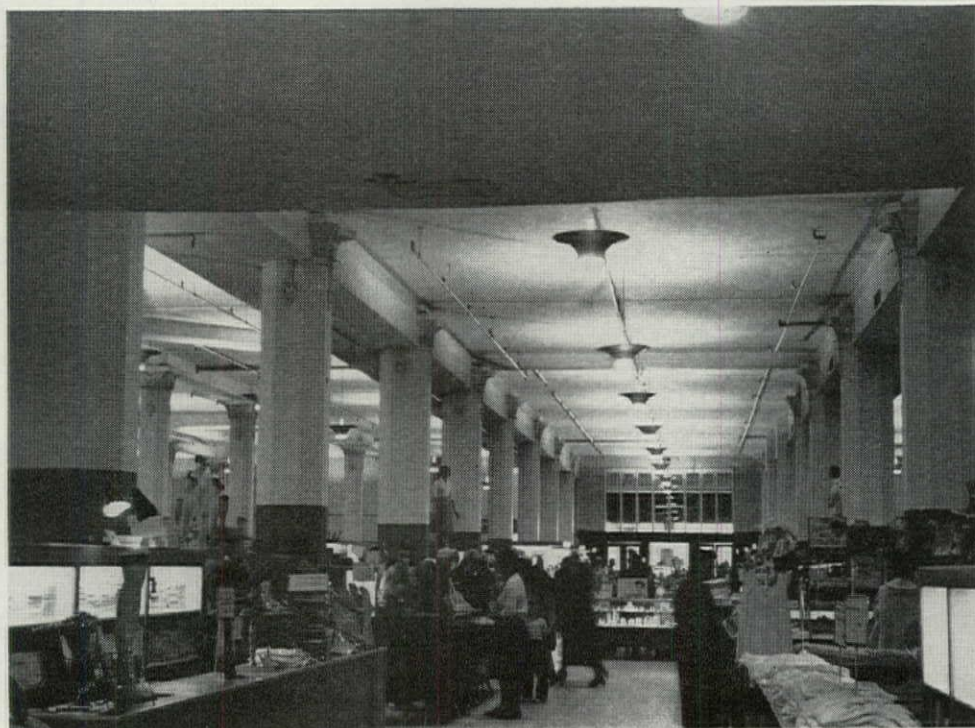
The bulk of the rebuilding, however, took place inside. A lowered acoustical ceiling now hides the unsightly old beams and column capitals—as well as new lighting fixtures, ductwork, and sprinklers—giving the main floor a cleaner, more spacious look. An existing mezzanine was extended, and customer services such as telephones, post office, and service bureaus were moved up here to free ground-floor selling space (interiors overleaf).

Total contract: \$2,101,500 (including \$1,135,500 in interiors); financing by the May Co. Architects: Ketchum & Sharp (Rosario D'Agrosa, associate in charge; Herbert W. Riemer and Stanley Wolf, staff architects); Morris Leedom, staff architect for the May Co. Engineers: Smith, Hardaker & Huddleston (structural); Robert E. Hattis Engineers, Inc. (mechanical, electrical). Contractor: Batson & Cook Co., Inc.



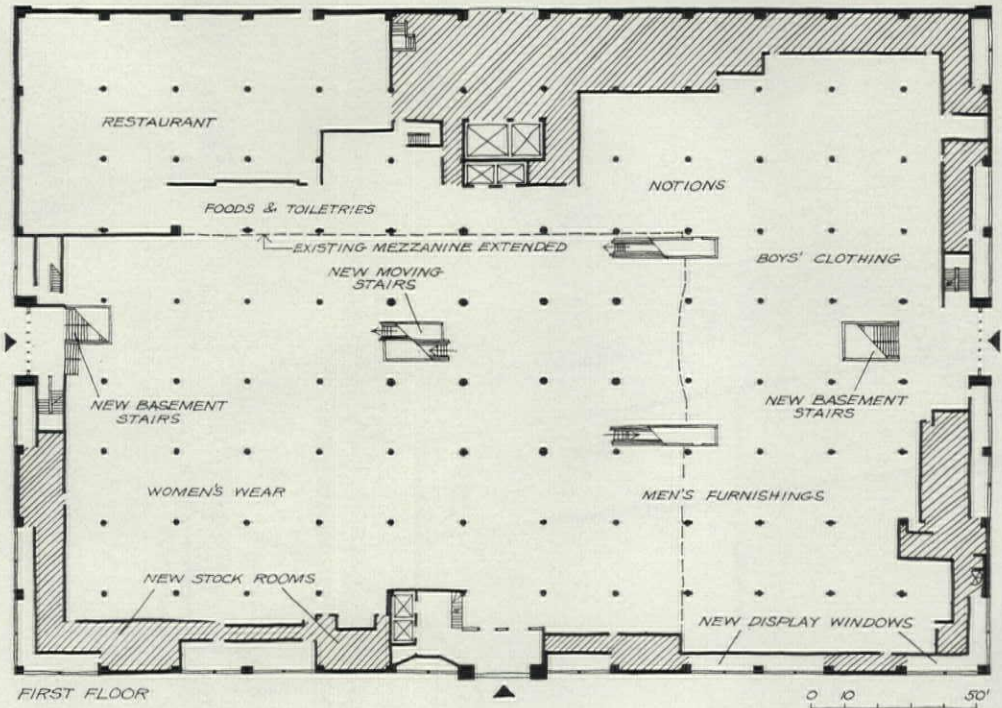
*Before, the main sales floor had a typical high ceiling, hanging lights, and column capitals obscured by added cooling ducts.*

*After, the same area was made quieter, more spacious and dramatic by a dropped acoustical ceiling incorporating air conditioning, sprinklers, and incandescent spots. The newly extended mezzanine, with plant boxes for rails, is also seen in this photo.*





**Sketch plan** of the main floor and mezzanine indicates the major architectural changes to the store. Merchandise areas are now consolidated into related departments, and floor space is used as efficiently as in most brand-new department stores. Women's and children's apparel and home furnishings are upstairs on remodeled second and third floors.



**Main floor:** moving stairs down from the mezzanine and upper floors (left in photo), and up (background) were refinished in a pattern of gold leaf. A new moving stair to the basement was added nearby.



**Typical department:** china, linen, silverware (shown in photo) are displayed in handsome new fixtures designed by the architects for flexibility, capacity, good looks.



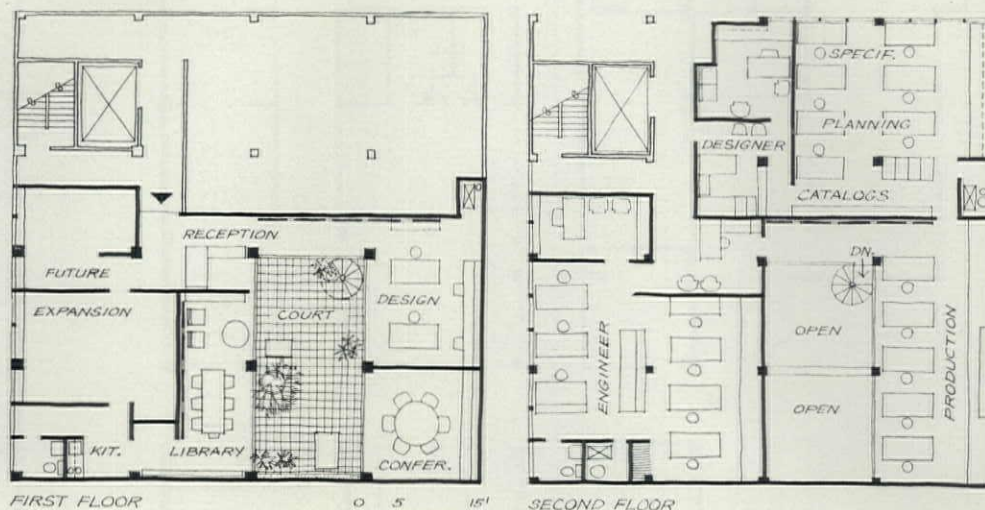
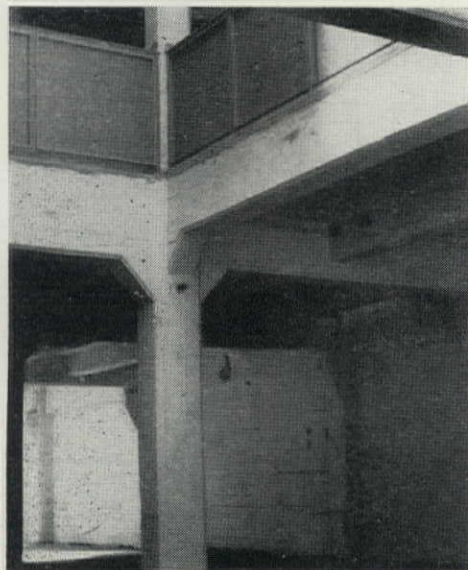
PHOTOS: ALEXANDRE GEORGES







Rebuilt offices dramatize the rough concrete beams of the old loft structure (below).



## Office space at \$3 a foot

By renting space in a San Francisco loft structure, built in 1910 as a syrup factory, and imaginatively remodeling the interiors, the small (12-man) architectural firm of Knorr-Elliott came out with handsome offices in a central location at a total annual cost of less than \$3 per square foot, including rent and improvements. Tenants of newer buildings in the area pay from \$7 to \$11 per square foot.

This saving was not at the expense of quality. The character of the roughly formed beams was exploited with fresh, white paint; floors were finished with vinyl asbestos tile and, in the two-story display court, with precast concrete tile; a delicately detailed circular stair was installed to connect the two levels; and separate heating units were provided for each floor. The resulting space has a strong, individual flavor, appropriate to the work of its tenants.

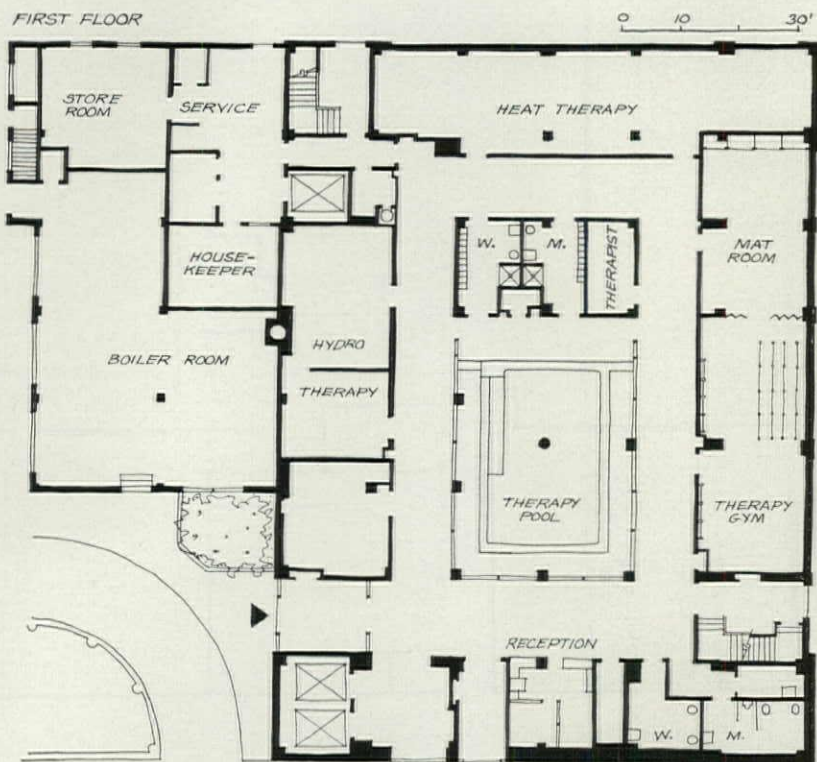
Knorr-Elliott presently use 3,000 square feet of their 6,150-square-foot holding, controlling the remainder for expansion and for sublease to consultants whom they regularly employ.

Total cost of remodeling the initial 3,650 square feet was \$11,500. Break-down: carpentry, \$3,500; electrical, \$2,400; heating, \$500; painting, \$1,050; floor finish, \$2,000; doors, stairs, rails, and miscellaneous, \$2,050. General contractor: Greystone Builders.

PHOTOS: (BELOW & OPP. PAGE) KARL H. RIEK







## New hospital in an old factory

Aluminum screens veil ugly walls, add privacy, and reduce the air-conditioning load.







*Therapy pool, on first floor, is typical of hospital's unusual and expensive equipment.*

From almost any point of view, the Magee Memorial Hospital, a rehabilitation center for the disabled, looks like a brand new hospital. And it works like one, too. In fact, however, it is a remodeled loft structure, built in about 1910 to house light industry.

Languishing on the fringe of a commercial-residential slum, the building had two major assets: a large amount of unencumbered floor area and a strategic location, admittedly near a slum but also near Philadelphia's principal general hospitals.

The floors, the skeleton structure, and most of the exterior walls were left intact, although the virtually blank west wall was rebuilt to provide windows. An aluminum screen veils the building's ugly south and west façades, and at the same time considerably reduces the air-conditioning load. Neither the east or north façade was touched because one abuts a taller commercial structure while the other looked out on a slum. The shortsightedness of this decision has been emphasized by the redevelopment of the area, which now houses numerous hospital staff members.

If the per-bed cost of \$28,500 for 70 beds seems high (compared to a national new construction average of about \$20,000 per bed), there are good reasons. Unusual disabilities require unusual treatments and specialized, ex-

pensive equipment, such as the large therapy pool pictured above. Only 5 per cent of the patients are ambulatory; the rest are stretcher or wheel-chair cases, and thus the corridors had to be much wider — and costlier — than in conventional hospitals. Finally, the per-bed cost figure is in itself misleading; Magee Memorial has an unusually extensive outpatient program and, as a result, only two of the five floors are devoted to beds. And, at \$32 per square foot, the cost of this hospital is actually below the national average of \$35 to \$40 per square foot.

Real estate cost was \$300,000. Total reconstruction cost, including fees, for 62,000 square feet was \$1,996,000, paid for by the Magee estate.

Architects: Hatfield, Martin & White. Mechanical engineers: A. Ernest D'Ambly. Structural engineers: Nicholson, Rothbaum & Davis. Hospital consultant: James R. Mays. General contractor: United Engineers & Constructors.



## Public housing in Buffalo rebuilt for private use

In a pioneering rebuilding experiment, the Buffalo Municipal Housing Authority is transforming a low-rent public housing project into a private middle-income cooperative development.

When the 616-unit Dante Place project was built in 1952, it replaced a slum beside Lake Erie just a short walk from the city's central business district. Since then, however, a wave of urban renewal developments has been upgrading the entire adjacent area, and Buffalo city fathers have realized that public housing was not the highest and best use of this site. In converting the project to middle-income housing (while providing additional public housing in other areas), the city will spur continued rehabilitation and upgrading of its choice water-front area to a higher potential, and will also gain about \$50,000 a year in real estate taxes from this parcel.

Interior rebuilding has been completed in five of the seven buildings in the development, now called Marine Drive Apartments, and work on the other two will be started this month. Mainly this has consisted of the removal of interior partitions to make rooms larger (all four-bedroom units are being turned into three-bedroom apartments without any reduction in total area, and most three-bedroom units are being rebuilt as two-bedroom apartments). Bathrooms are being tiled, and showers added; kitchens are being modernized, and doors added on closets. Building entrances also are being modernized. Rehabilitation, under the direction of Backus, Crane & Love, the original architects for the project, is costing approximately \$650 per unit.

Says Housing Authority Executive Director Robert D. Sipprell: "This whole operation would have been impossible economically if the project had not been well designed and built of high-quality materials and workmanship in the first instance. This is a credit to the original architects, contractors, and the State Division of Housing, and is a point to bear in mind in the construction of any future public housing where ultimate disposition might evolve."

To finance the conversion, a citizens' committee of realtors, bankers, contractors, and architects subscribed a \$40,000 pool of working capital in a state-chartered limited-dividend housing corporation.

*continued on page 134*



This corporation has leased the project from the Housing Authority for \$400,000 a year, which covers all the obligations of the Housing Authority until the bonds for the development have all been retired. Initial payments of cooperative tenants (on long-term proprietary subleases) run from \$200 to \$350, and their monthly carrying charges from \$67 to \$116.

## Cole outlines three ways to spur FHA rebuilding

The rebuilding provisions of the Federal Housing Administration Section 220 urban renewal mortgage insurance program enacted in 1954 have been a dismal failure so far, according to Albert M. Cole, former administrator of the federal Housing and Home Finance Agency and now executive vice president of Reynolds Aluminum Service Corp.

Not a single rebuilding project depending primarily on Section 220 financing has been successful—in six years only one rebuilding mortgage for an investor-owner and only 73 for owner-occupants have been insured under Section 220—Cole told a recent meeting of the National Association of Real Estate Editors. Maximum loan ceilings have been too low, he declared, and loan procedures have been too slow and too complex.

Estimating that there are at least 12 million substandard dwelling units in urban neighborhoods that need rebuilding, Cole recommended three changes in the Section 220 program so it could provide "simple, attractive, but sound financing" that would make rebuilding more feasible:

- Make lenders share the insurance risk on rebuilding loans in the same way they are now co-insurers on Title I home-repair and remodeling loans. Under this system all time-consuming FHA procedures would be eliminated; lenders would assume the primary responsibility for investigating and approving all loan applications.

- Instead of establishing loan ceilings, allow mortgages to be based on the prospective sales price or rental income of the property; i.e., the more income available for debt service, the higher the allowable mortgage.

- Create a separate section of the Federal Housing Administration that would deal exclusively with urban renewal and rebuilding projects and

would develop the faster, more simple procedures that are essential for an effective renewal and rebuilding program.

## Cooling for 13,000 stores, the Alamo, and a harem

Three reports last month gave a revealing picture of the diversity of the market for air conditioning in rebuilding.

- Chain stores are planning 10,790 new stores and 11,375 major remodelings this year, and air conditioning will be installed in 13,050, or 59 per cent of the total, according to the annual air-conditioning survey of *Chain Store Age*. The chains' direct outlays for air conditioning in these projects will total \$138.5 million, compared with \$130.3 million spent for conditioning 12,900 stores last year. In addition, landlords usually spend about another 25 per cent for improving stores rented to these chains. When allowance is made for this, outlays for air conditioning in new and existing stores occupied by chains will probably hit \$173 million this year, compared with an estimated \$163 million in 1960, and \$145.8 million in 1959.

- In Texas, air conditioning is being installed in the Alamo. The Daughters of the Republic of Texas, custodians of this historic San Antonio shrine, were uncertain about what course to take last year when one air-conditioning company offered to install equipment free. In recent years the Alamo has been spotted with unsightly fans in summer and small gas and electric space heaters in winter to help make it a little more comfortable for the hundreds of thousands of reverent visitors who go through it every year. But could it be air conditioned without the introduction of large equipment, ducts, and air outlets and intakes that would disturb the old structure's authentic atmosphere? Finally, the Daughters invited proposals from all firms willing to install equipment free, ultimately approved a General Electric dealer's plan for an undetectable 13-ton-capacity heat

pump for both heating and cooling. A 5-ton unit will be hidden behind stone breakfronts and decorative grillwork, and two 4-ton units will be concealed in unused loft spaces.

- In distant Saudi Arabia, the royal compound of Nasrayah has become probably the world's first completely air conditioned city (see photo below). Near Riyadh, the capital, the big enclosure contains the King's palace and homes of the royal family as well as a royal Mosque, royal harem, schools, offices, a library, a hospital, communications center, storage and supply buildings, and residences for all the people who staff these facilities. From a huge \$3.5 million, 8,000-ton capacity plant just outside the walls, in which the Carrier Corp. has completed installing equipment for the first 6,000 tons, more than 120 buildings inside the city are now being cooled. More than 19 miles of chilled-water pipes have been installed—buried 6 feet deep. Outdoors the temperature in Nasrayah can reach 110 degrees, but inside the royal buildings the temperature is maintained at a comfortable 65 for the King and his many activities.

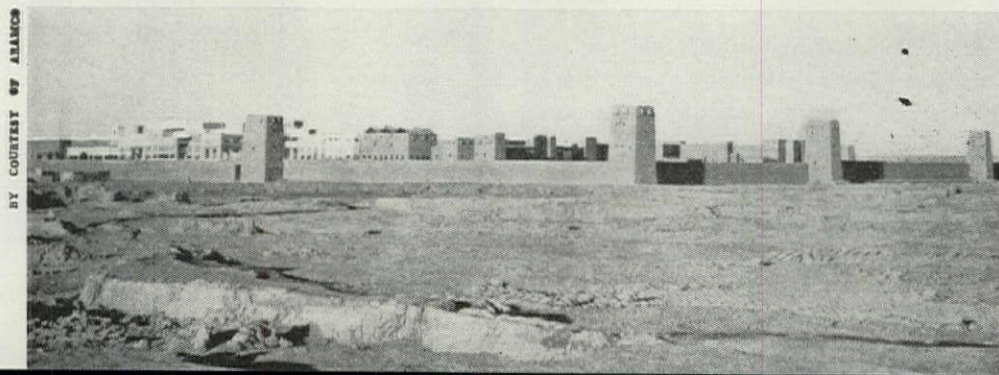
## Briefs

**Victorian grandeur** will be restored to the Goodspeed Opera House in East Haddam, Conn., under the direction of the American Institute of Decorators, working with Schutz & Goodwin, architects, and Frederick C. Palmer, consultant. The dilapidated structure, erected in 1876, was rescued from demolition in 1958 and turned over by the state to a nonprofit foundation. Its rebuilding as a festival theater and cultural center will include modern lighting, plumbing, and air conditioning.

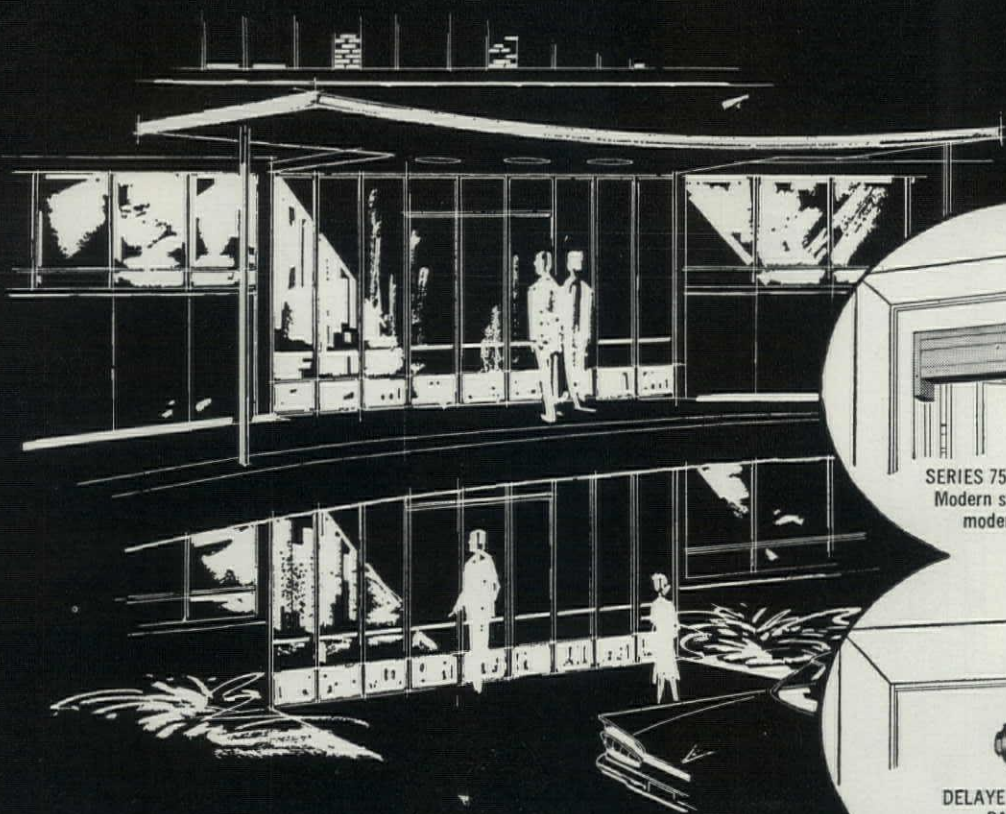
**Hotel rebuilding** stimulated increased occupancy in 80 per cent of a group of 62 major hostels in 46 states surveyed recently by the Walter M. Ballard Corp., institutional designers and decorators. Managers were able to increase rates an average of \$1.87 per room in 83 per cent of the surveyed hotels.

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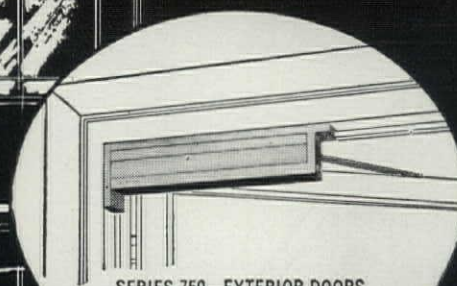
Walled, air-conditioned royal city of Nasrayah in Saudi Arabia



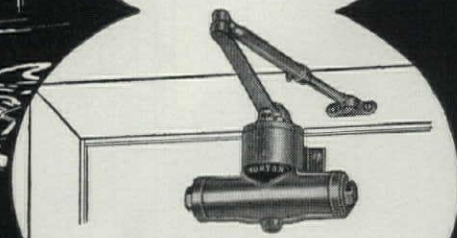




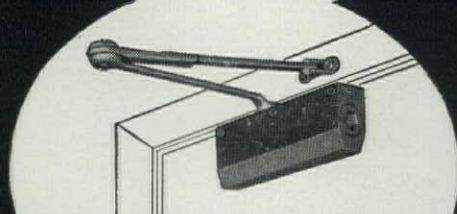
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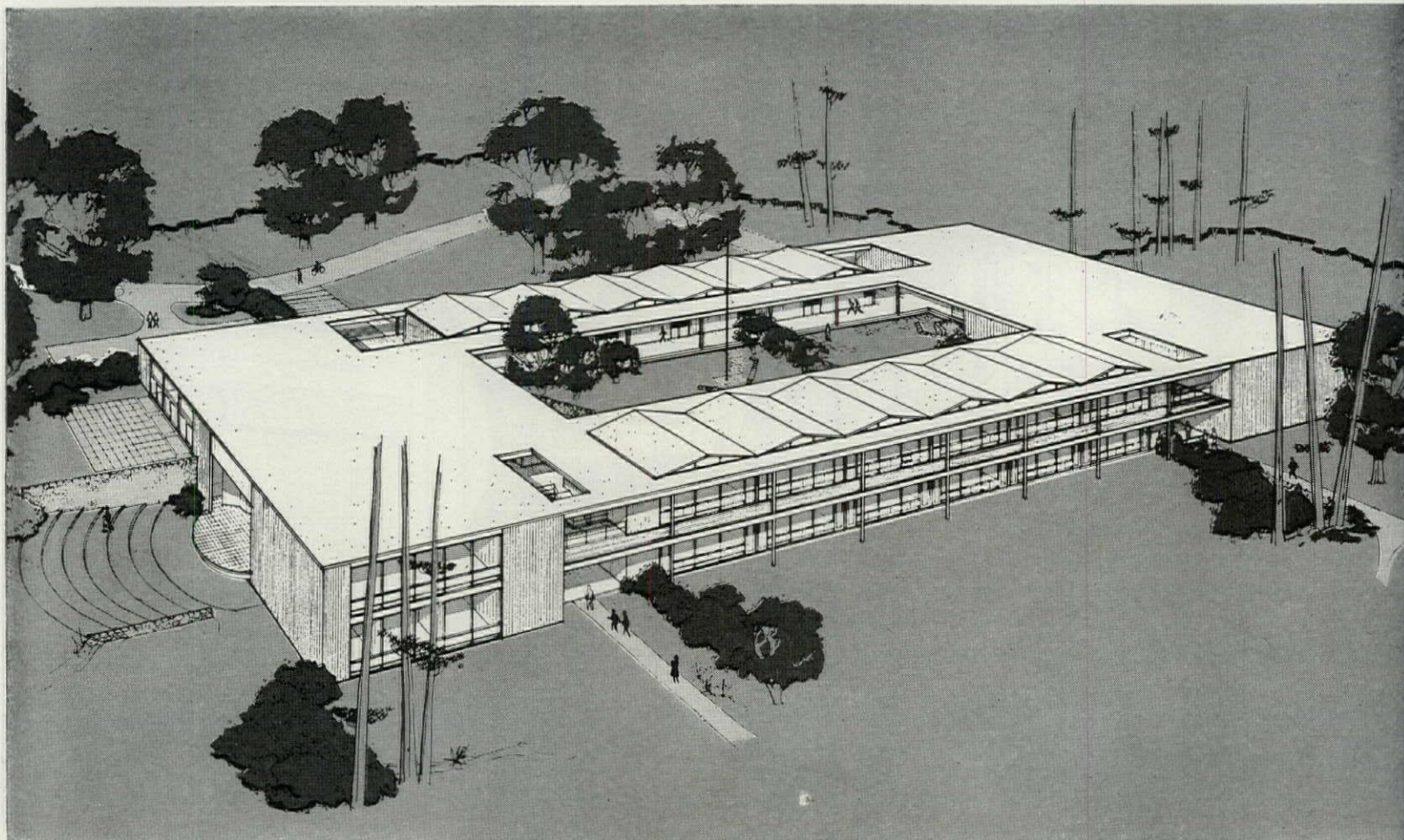
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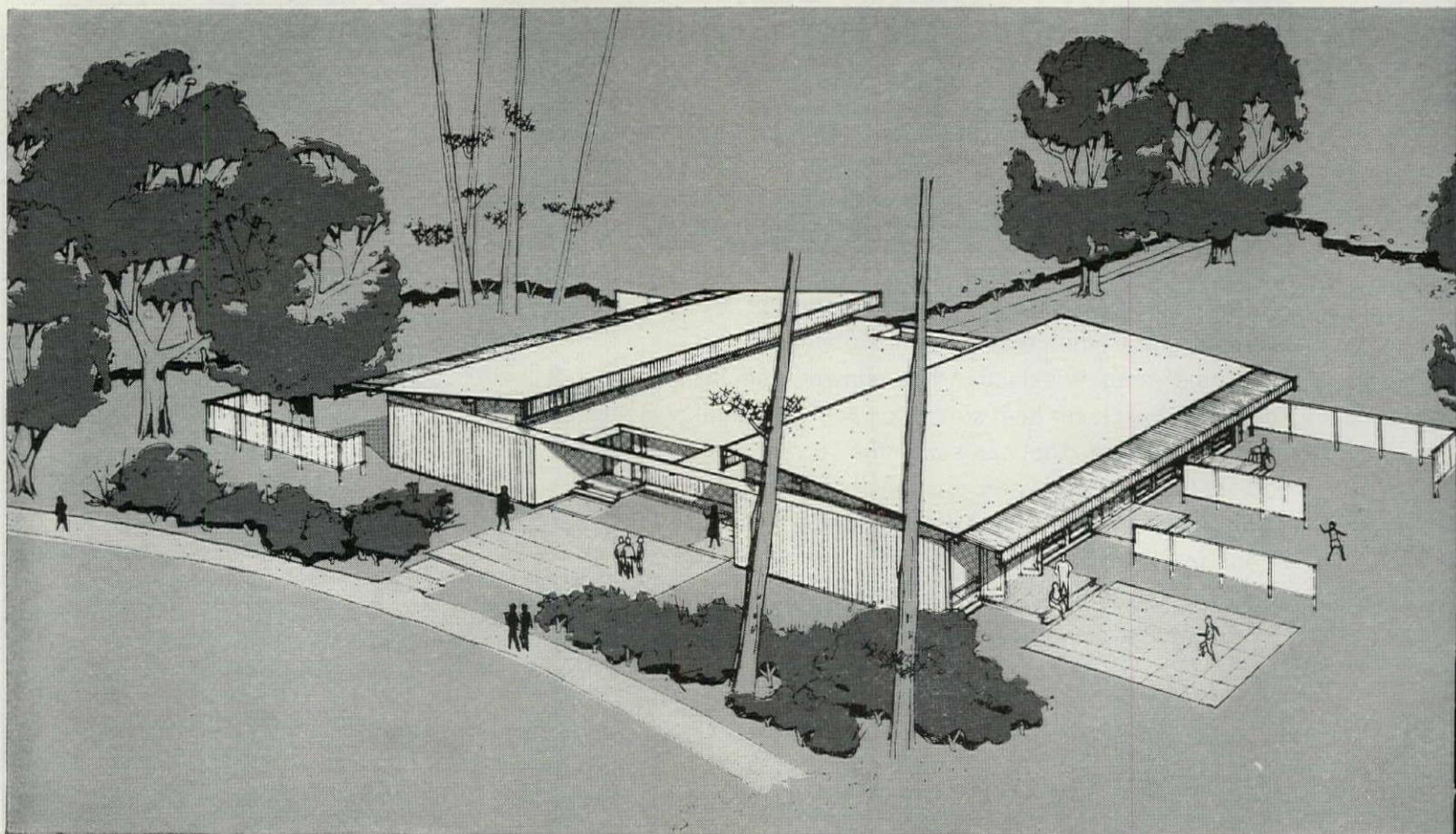
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The Hillside School is one of three concepts developed for NLMA's new book, *"Blueprint for Better Schools."* An inner court allows excellent lighting and easy access to lower classrooms on the downhill side. Modular modified mill construction offers prefabrication of many components.



The Pavilion School stands for economy, is adaptable to practically any site and designed for expansion using additional units. This structure provides six classrooms around a main room, all with standard frame construction and wood paneling. Exterior permits a choice of siding.



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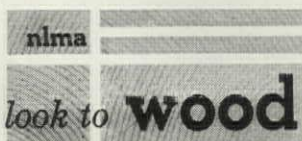
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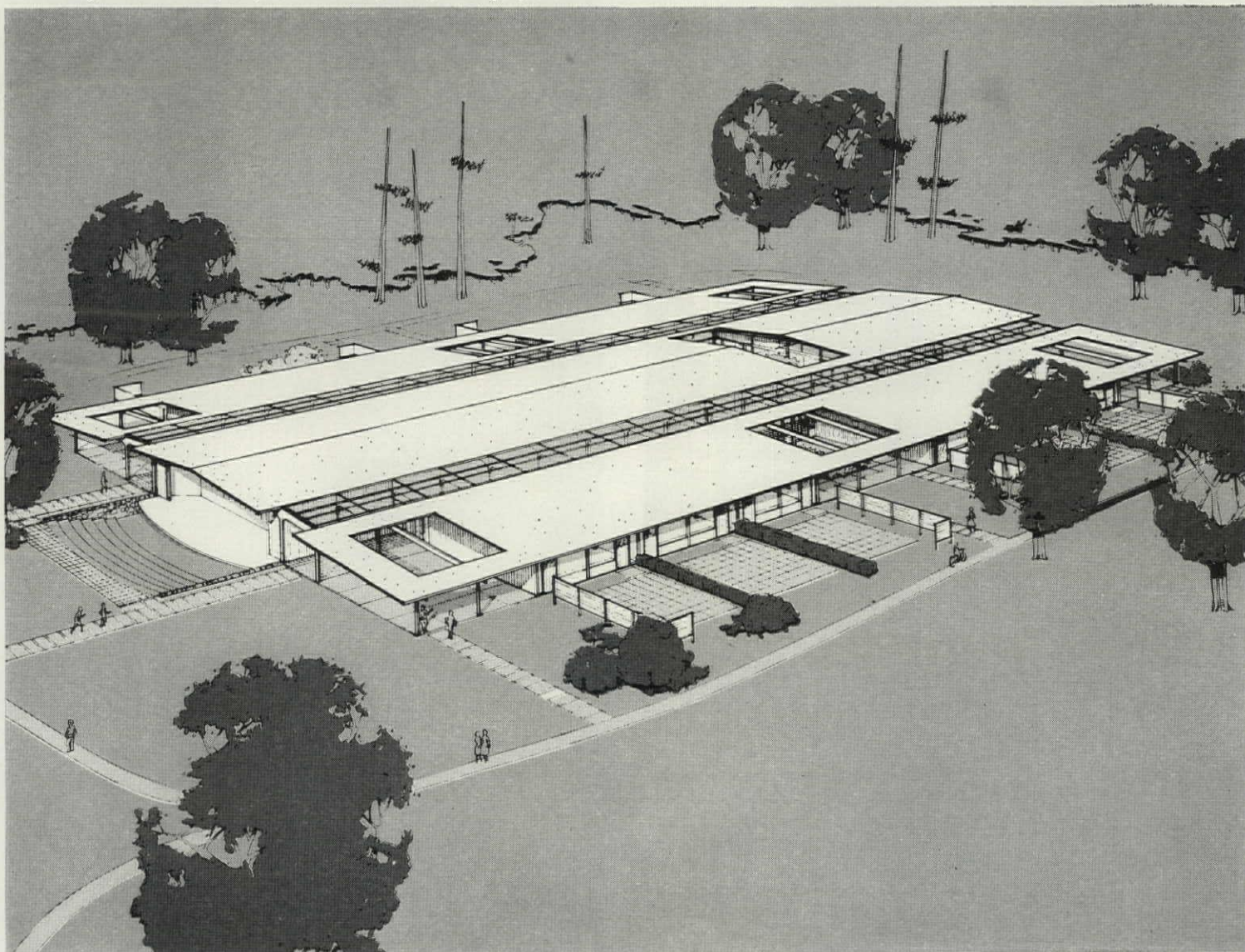
For your free copy of the book, "*Blueprint for Better Schools*," and information about NLMA's new 22-minute color motion picture on school planning with wood, write:

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Schools designed for NLMA by Cooper and Auerbach, A.I.A., Washington, D.C.



The Compact School, with its exciting design and structural simplicity, was planned for a level site. Its vast multi-purpose room has a depressed floor-level to afford a straight laminated wood beam roof for economy, continuous skylights over each corridor for brighter interiors. Classrooms open onto separate patios.



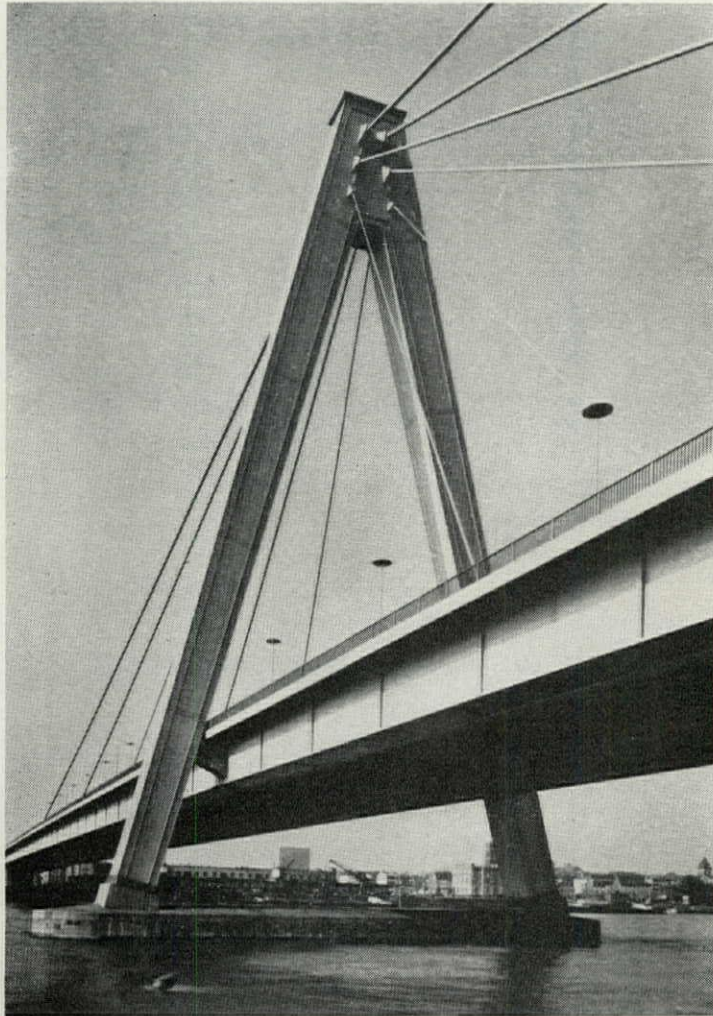


PHOTO: STOECKEL

## SUSPENSION ON THE RHINE

One of the most skillful pieces of architecture yet to grace the *Rheinfront* is this new single-tower bridge crossing the river at Cologne. Like an old gin-pole hoist, its big steel bipod actually seems to lift the great slung weight of the roadway which it straddles—a nice articulation not found in most suspension bridges. The drama is further sharpened by the few fine filaments of steel which spin out from the single

lifting point to hold the span. In designing the bridge, engineers of the Gutehoffnungshütte steel works and Architect Gerd Lohmer placed the tower asymmetrically toward one bank, leaving the opposite bank for docking use. The single-tower design is also a thoughtful civic gesture: it leaves the city's main sky line unbroken and does not compete with the great spires of the Cathedral of Cologne.

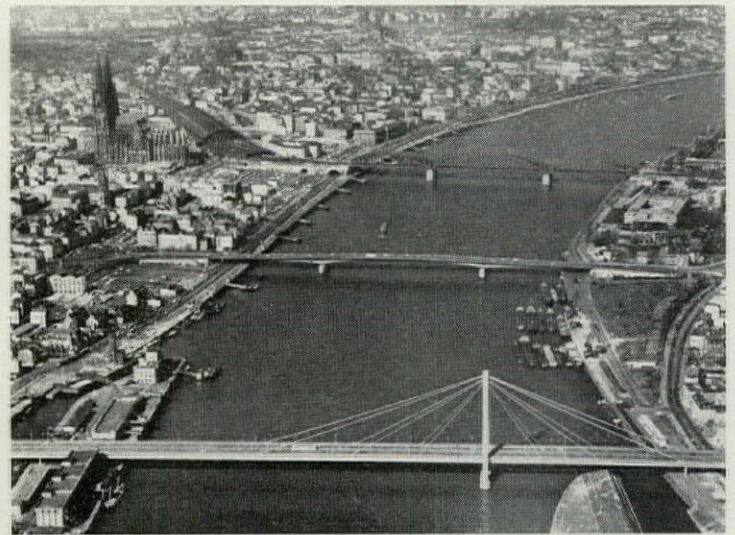
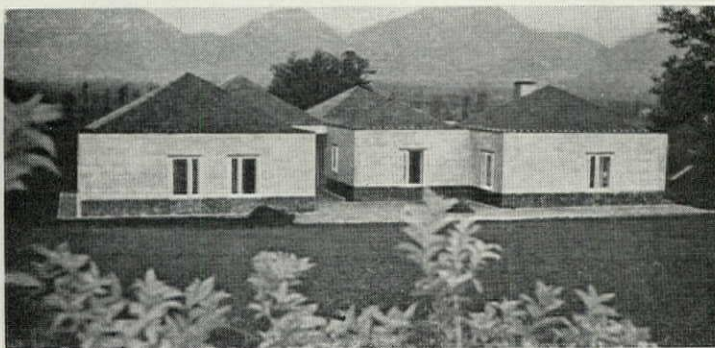
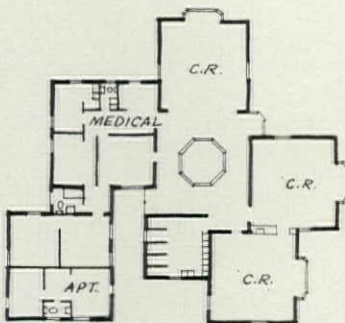


PHOTO: DIETER STORP

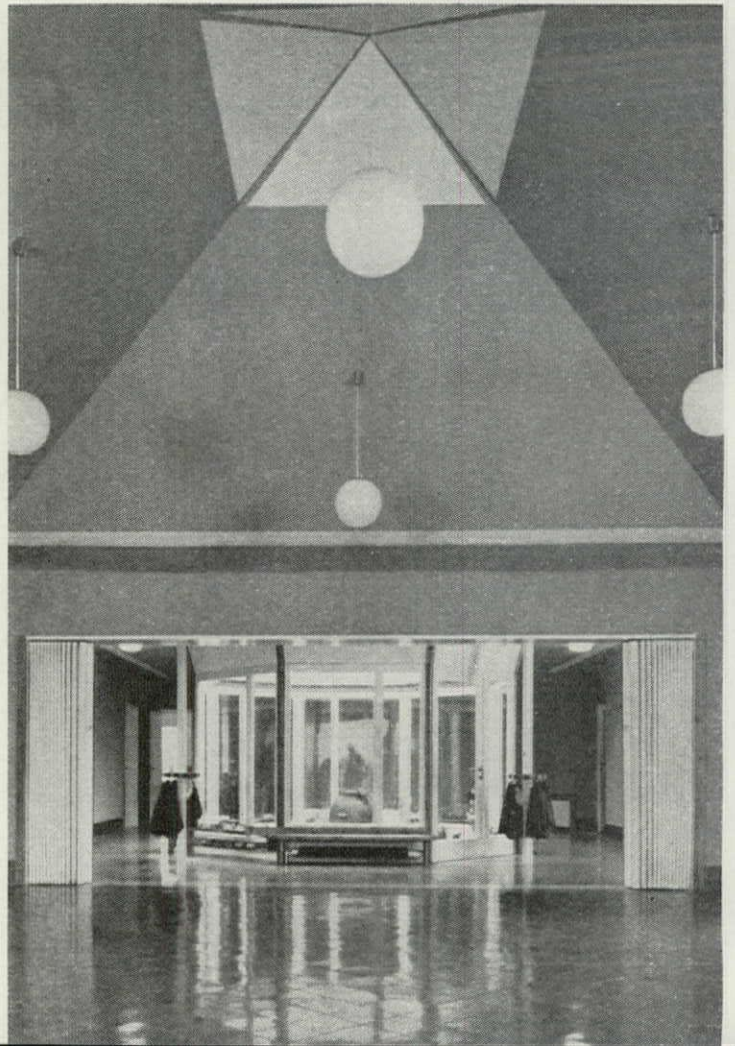


## CHARM IN ITALY

For a working-class community in Gubbio, Architect Marco Zanuso has designed a children's school simply and charmingly scaled to its inhabitants. A "village" of five little houses in red and white stucco, each with its own outside door, is grouped around a glazed octagonal garden open to the sky—the village's little "piazza" (photo, right). Walls are only 7 feet high, and the pyramidal roofs rising to full height inside emphasize a hut-like sense of shelter. The school doubles as a community medical center and social hall.



PHOTOS: COURTESY "DOMUS"



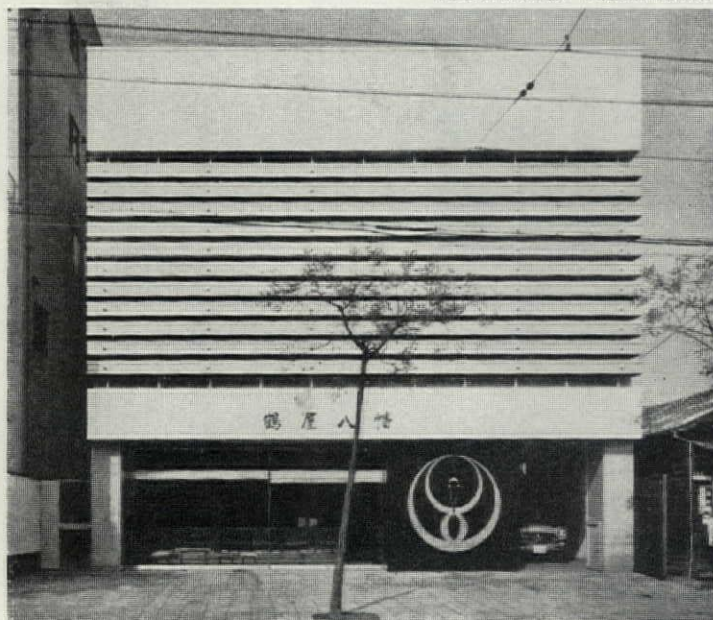




#### SHOWCASE IN SWEDEN

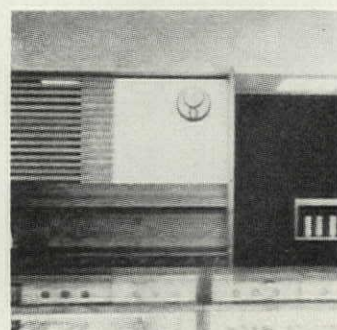
While more and more American emporia are being designed as efficiently windowless, air-conditioned blocks, this new building for Stockholm's PUB department store displays itself and its wares, night and day, in a veritable crystal palace. All walls are of double insulating glass set in a framework of tubular steel, except for larger show win-

dows, which are single panes. Floor edges and other non-transparent parts are covered in enameled steel; the roof is clad in copper plate. Both entrances are shielded by "air curtains" instead of heavy doors. Below their crystal iceberg, Architects Erik and Tore Ahlsen have placed a basement sales level, stockrooms, and garage.



#### SWEETMEAT IN JAPAN

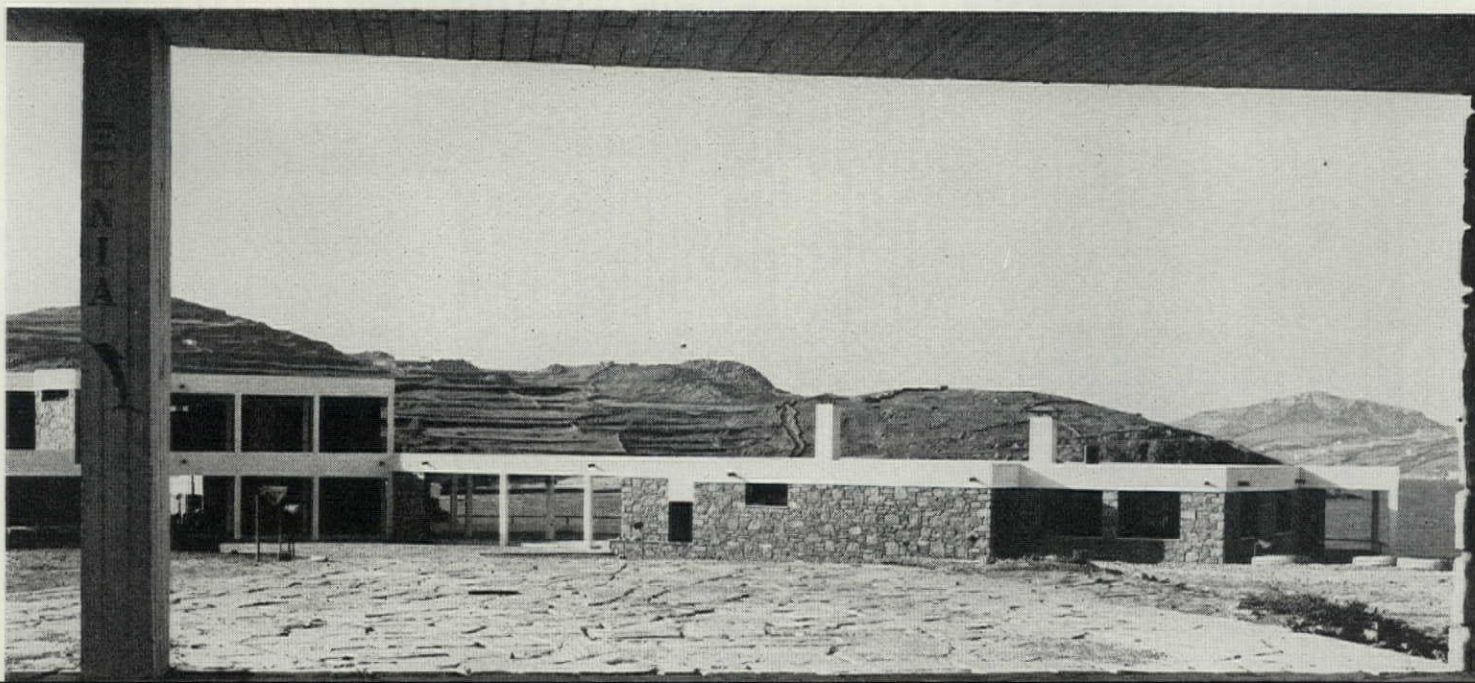
The new Tokyo branch of Turuya-Hatiman confectioners would be a treat on any Main Street. Beneath a neat layer cake of gold-trimmed window slits shielding working quarters, the store is separated from a small garage by a polished stone panel bearing a pelican symbol. Inside, this striking trade mark is repeated. Architects: Matsuda & Hirata.



#### CHARACTER IN GREECE

On the Aegean island of Mykonos, Architect Aris Konstantinidis has shaped his "Xenia" resort hotel in sparse and rugged style to match the island's own special beauty. Unlike Mykonos' softly sculptured whitewashed villages and windmills admired by many a traveling architect (FORUM, Feb. '59), the hotel is starkly linear, almost fortlike, its

small ports shuttered against the Mediterranean sun, its deep guest-room balconies recessed in rough stone walls. Whitewashed concrete frames and roof lines complete the composition; chimneys and jutting drain pipes are the only decoration. Overlooking the little fishing cove is a two-story administration building, and restaurant-bar (below).







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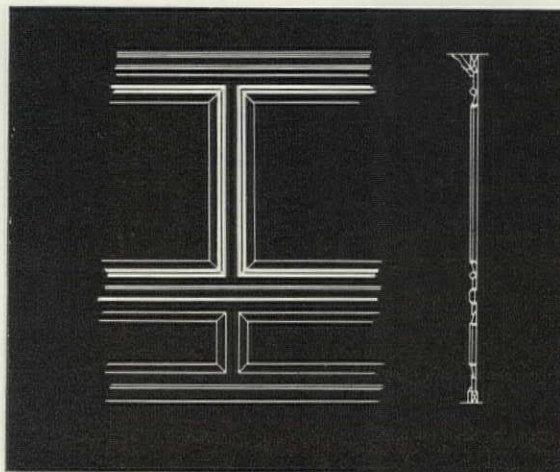
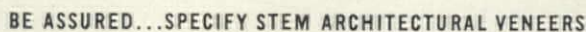
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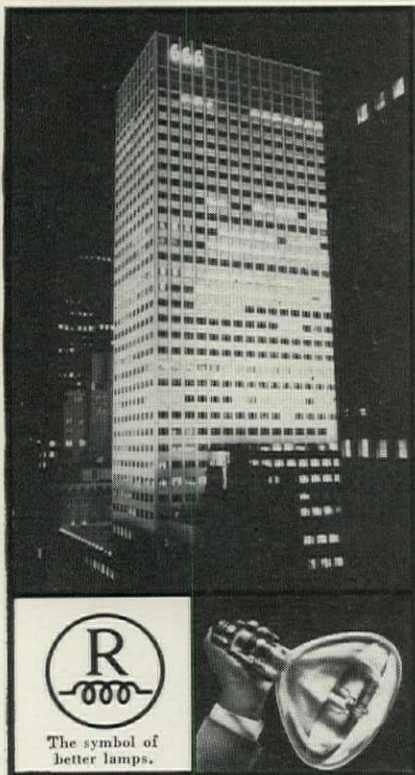
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## Deserted houses . . . opulent art . . . daring vaults

**AN ANTHOLOGY OF HOUSES.** By Monica Pidgeon and Theo Crosby. Published by Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. 174 pp. 7 $\frac{3}{4}$ " x 10". Illus. \$10.95.

This is another handsome addition to a rapidly expanding collection of books on modern houses. It differs from other, similar books in three respects: first, this anthology is international—there are houses from Finland, Japan, Chile, the U.S., and a dozen other countries; second this collection is based, largely, upon work originally published in the British magazine, *Architectural Design*, which has been giving the long-established *Review* an exciting run for its money in recent years; and, third, the editors of this anthology have shown a degree of discrimination rare in this sort of publication.

Any time an anthology of anything is published, every critic will quarrel with the selection made. The selection, however, is the prerogative of the authors; if a critic wants to make a different selection, he is free to publish this at any time; the present selection, in any case, is just fine!

Two comments seem appropriate: it is heartening to see so high a standard of excellence, spread over so large a part of the globe; and it is eerie to see so many slick and competent photographs of the human habitat, with hardly a human being in sight! In more than 300 illustrations, we spotted only 7 $\frac{1}{2}$  people and 1 dog, and he was made of excelsior. Those architectural photographers must be getting awfully lonely out there.

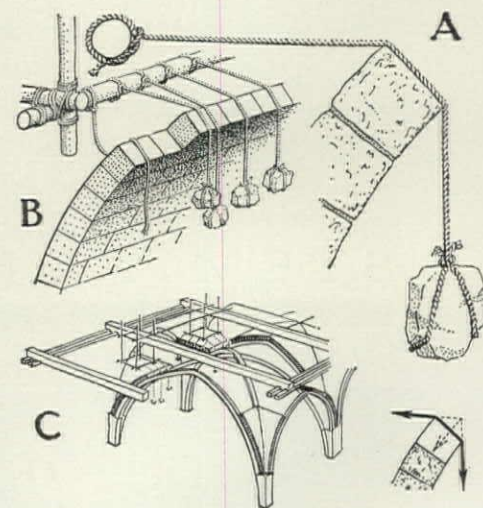
**THE AGE OF GRANDEUR.** By Victor-Lucien Tapié. Translated by A. Ross Williamson. Published by Grove Press, Inc., 64 University Place, New York, N. Y. 305 pp. 7" x 10 $\frac{1}{4}$ ". Illus. \$12.50.

The Baroque period of art and architecture, which flourished in Europe in the sixteenth and seventeenth centuries, has been much maligned for its unrestrained ostentation and its exaggerated concern for sheer, almost overpowering, splendor and opulence. Traditionally, it has been dismissed as a decadent offshoot of the Renaissance.

In this, his latest work, Victor-Lucien Tapié attempts to bury these prejudices by re-examining the movement from a fresh perspective. Using selected examples, he tours the Rome of Bernini and Borromini, the churches of Prague, Vienna, and Moscow, indicating the relationship between the motifs common to Baroque works of art and the general conditions of the society which witnessed their birth and then embraced them. With broad strokes, Tapié presents the Baroque, not

as an isolated phenomenon, but as one vital part of the whole fabric of sixteenth- and seventeenth-century thought. Born in a war-scarred Europe, the Baroque was eagerly received because, in its unfailing ability to evoke emotions and excite sensibilities, and in its undisguised search for magnificence, it perfectly mirrored the social, religious, and political aspirations of its time. Thus, Tapié concludes, the Baroque was not a deviation but "... a derivation from the Renaissance, adapting its lessons to express a new ideal in a society that had radically changed."

The Baroque has long been a source of sharp controversy among scholars, and Tapié's work is certain to provoke dissent. But his argument is articulate, well-documented, and, on the whole, convincing. The book contains over 200 illustrations, eight of them in color, but they are unfortunately scattered in groups bearing such little relationship to the text that the reader must constantly thumb back and forth to find the cited plate.



**THE CONSTRUCTION OF GOTHIC CATHEDRALS.** By John Fitchen. Published by Oxford University Press, 417 Fifth Ave., New York 16, N. Y. 344 pp. 11" x 7 $\frac{1}{2}$ ". Illus. \$10.10.

The author's interest is not in the spiritual qualities of the old cathedrals, but in the on-the-job methods their constructors used in putting them together, and his book is entirely fascinating. The formwork and centering should not surprise any contemporary builder, but at least one of the devices used for building vaults without lagging or other formwork should make contemporary building code officials sit up and take notice (see drawing).

This is a very rewarding book, a rare piece of scholarship in architecture.

*continued on page 147*

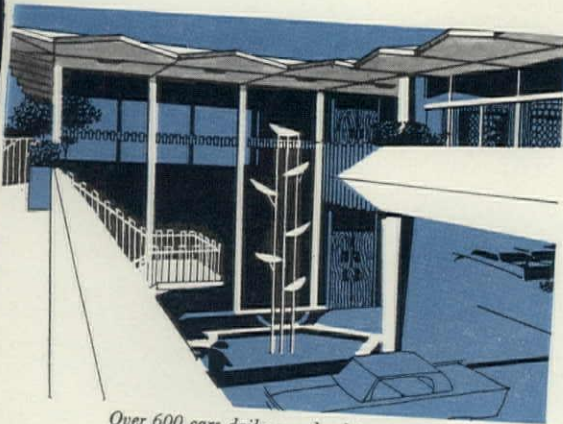


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*First National Autobank, Tulsa, Oklahoma. Architects & Engineers: McCune, McCune & Associates. Contractor: Tulsa Rig, Reel & Manufacturing Company, Tulsa.*

## Folded roof to glamour walls... concrete adds new attraction to drive-in banking



*Over 600 cars daily use the drive-up windows. A half million transactions were handled at the Autobank the first year. Tom-Tom Room, to the right of two-story bank lobby, is provided for meetings of Tulsa civic groups. It's reached directly from upper parking deck.*

Out of a need for drive-up tellers' windows, as well as parking facilities, came this handsome banking center. Tulsa's First National Autobank is a delightful example of the many ways concrete can combine structural practicality with good design.

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**IT'S THE LAW!** By Bernard Thomson. Published by Channel Press, Great Neck, N.Y. 436 pp. 8 1/2" x 5 3/4". \$7.50.

This is a comprehensive handbook on legal problems involved in architecture, engineering, and construction based on the author's monthly articles in *Progressive Architecture*, plus supplementary material not previously published. In a brief preface, Architect Edward Durell Stone pays tribute to Thomson for "his intelligent guidance in a field in which the architect, owing to pressures of his own profession, is neither properly aware nor advised—nor does the traditional architectural education provide the proper background."

#### ECONOMIC PLANNING FOR BETTER SCHOOLS.

By Benjamin Handler. Published by the College of Architecture and Design, University of Michigan, Ann Arbor. 107 pp. 10 1/2" x 8 3/4". \$5.

#### A NEW APPROACH TO SCHOOL BUILDING COST COMPARISON.

By Fred M. Fowler. Published by the Utah Department of Public Instruction, Division of School Finance, Room 223, State Capitol, Salt Lake City. 44 pp. 8 1/2" x 10 3/4". \$90.

Each of these books is, in its own way, a recognition of the fact that an isolated figure representing a school's cost is no true indication of that school's worth nor of the fiscal wisdom of the community that built it. Because this fact needs to be widely understood, the books are valuable additions to school-building literature.

*Economic Planning for Better Schools* divides its seven lucid chapters into two parts: the first is a close-up analysis of the major factors that can inflate or keep down school-building budgets; the second is an analysis of how capital budgeting for the entire community can be conducted in such a way as to keep all costs (schools included) in line with needs and capabilities.

An important (but unpopular) point in this capital budget argument is that school administrators and laymen must surrender some of their well-guarded privacy from other fiscal competitors in the community. They must fight for proper priority ranking for their school-building projects and not assume a guaranteed hunk of the budget. Otherwise the day may come when the reservoir of nonschool public-building needs within the community may burst its dam and overwhelm them all.

*A New Approach to School Building Cost Comparison* is a two-part formula for the delicate process of comparing school costs. As explained in the introduction, the formula "not only deals with cost units, but gives weight to values lying back of the costs." The first part of the formula covers actual costs, excluding site acquisition and development, fees, and equipment. The "values" that the second part of the formula takes into account are: educational adequacy, safety, long-term cost economy, esthetics, auditory comfort, thermal comfort, visual comfort.

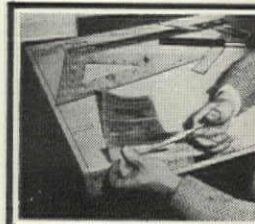
The results of the formula are ungainly, but probably as fair as possible. **END**

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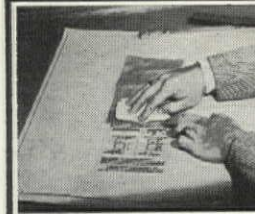
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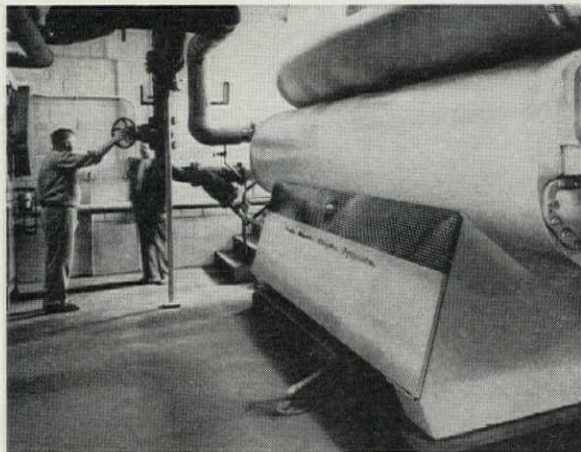
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## Federal perils . . . sacred triumph . . . tired parks

### FEDERAL SPRAWL

*"The Wall Street Journal" recently editorialized on the perils of federal aid to U.S. cities but, unfortunately, had no large-scale alternatives to suggest.*

According to the diagnosis of the Democratic platform, the cities of the U.S. are generally afflicted with "sprawl" and "blight"—ills that demand a federal cure. To minister to "sick" cities, the Democrats promise a new, cabinet-rank secretary of urban affairs.

This urge to cure the ills of the cities with federal handouts obscures the fact that big cities have always suffered from the natural consequences of having too many people in one place. Many a Roman fumed in the five o'clock chariot snarl, and wondered when something would be done about the potholes in the Appian Way. Just as this chariot-commuter looked to Caesar, so the Democrats suggest that city dwellers look to a remote federal benefactor for everything from highways to slum clearance to sewage disposal.

No government can hope to eliminate completely the "blight" and "sprawl" of the cities unless it first repeals the laws of human nature. Certainly one big city hall in Washington won't make local government wiser, more thrifty and efficient, especially if indifferent citizens overlook the obvious remedy of cleaning up their own city hall. Indeed, the shift of responsibility for the cities farther away from the cities themselves provides new opportunities for waste and inefficiency. Urban sprawl is bad enough without still more federal sprawl.

### THE CLERGY ON LA TOURETTE

*In the "Listener," Father Illtud Evans comes to the defense of Le Corbusier's controversial monastery.*

The La Tourette priory is likely to be counted Le Corbusier's masterpiece, if only because here the strands of his prophetic understanding of the architect's work seem to be most closely knit together. Here, one feels, he has labored with a love that has been shared by those who commissioned him. In the contemporary debate on sacred art, the priory is certainly a vital statement. At La Tourette, unequivocally declared, is the radical distinction between tradition and mere traditionalism, which are so often confused in any discussion of religious art.

Tradition is the discipline which any artist must be glad to accept, and within it the sacred must be expressed in every age. It is an acceptance of the subordina-

tion of what is made to the purpose of its making. Thus a church is governed by the altar and the sacred action that is done there, just as the monastery demands a coordination of its separate parts in its communal work. But this does not mean, it cannot mean, a tyranny of styles. We must, says Le Corbusier, banish styles. He goes on to say: "All we can do is to think of style in itself—that is to say the moral probity of every work that is truly and genuinely creative."

How ironical it is that sacred art is so often the least honest of all: the one most dominated by feebleness of purpose and the fear of the future. I think the gratitude, not only of architects, but of all who care for the sacred as deserving to be seen as ever new, should go to Le Corbusier and to those who commissioned him, for at La Tourette something very important has happened—a building has gone up to the glory of God, and it is in the truest and noblest sense a building of our time.

### PARKS FOR A NEW SOCIETY

*In "Landscape Architecture," Grady Clay raises some pointed questions about the purposes of city parks.*

Nobody who has any hope for the future of cities can get much comfort from the hooliganism, vandalism, and crimes of violence which are taking place in so many city parks and playgrounds these days. Nor from the fact that many bond-issue votes for new parks and playgrounds in recent years have failed.

Is it not time to admit that many a Grand Design no longer fits the needs and requirements of a community? That a park planned for a middle-class population of 1880, given to croquet and carriage riding, may offer few of its original amenities to a crowded, mobile, working-class population of the 1960's? That playground redesign may save many a decaying neighborhood?

In a slow and not really mysterious fashion many a park has become what some lawyers, in their inverted argot, might call an attractive nuisance. Whenever trouble breaks out in one portion of the park, the infection spreads to the farthest corners. Thus high visibility, which was an asset in an earlier era, may now become a factor leading to a sense of uneasiness throughout the entire park whenever audible shouts come from the most troublesome corner.

While I would not suggest that any Grand Design be abandoned simply be-

*continued on page 162*





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We at American Sterilizer know little about current concepts of general building design and construction, except that they advance at a headlong pace.

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This knowledge is *yours to use* in developing, for your hospital designs, Technical Departments which assure the ultimate in *patient protection* with *simplified staff work* and *lower operating costs*. This specialized information is gathered, evaluated, applied and supported by a group activity at Amsco which is not elsewhere equaled . . . for size, completeness or professional stature.

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**Research** Working with a knowledge of hospital problems and procedures gained from equipment installations in more than a hundred countries of the world . . . Amsco Research investigates, evaluates and recommends techniques for the highest standards of patient protection.

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**Detailed Technical Planning** This service includes the preparation of room plans, specifications and roughing-in prints to provide the maximum in function and utilization of space *for your specific project.*

**Supervision of Installation** Amsco's supervision of the total department installation assures the Architect that his approved concepts will be fully achieved.

**Technique Training** When the department goes into service, equipment demonstrations and thorough technique training by Amsco's Nurse Consultants provide the staff knowledge that will maintain the efficiencies of the integrated design.

**Preventive Maintenance** The continued high performance of Amsco Technical Department equipment is assured by the soundest of production engineering and by the only national Preventive Maintenance staff in the technical field.

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Literature or consultation is freely available  
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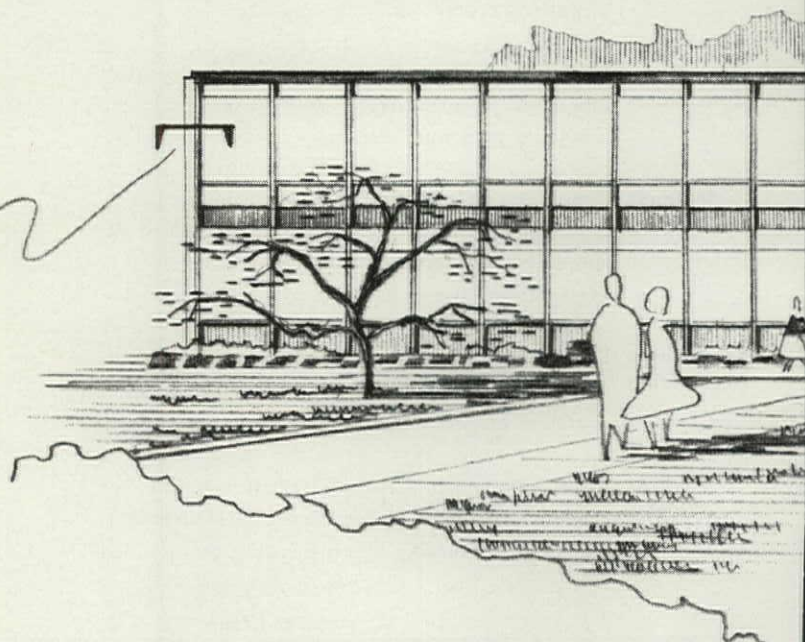
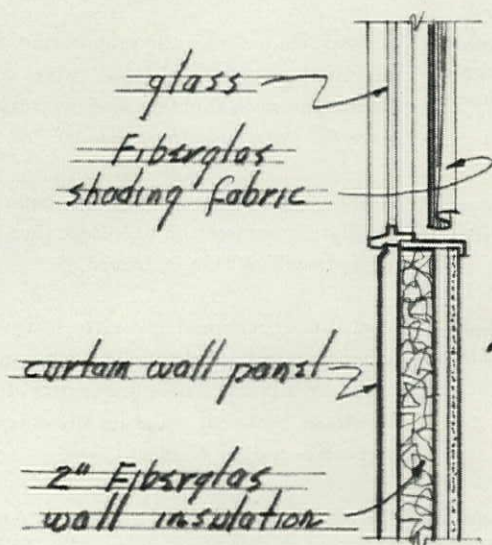
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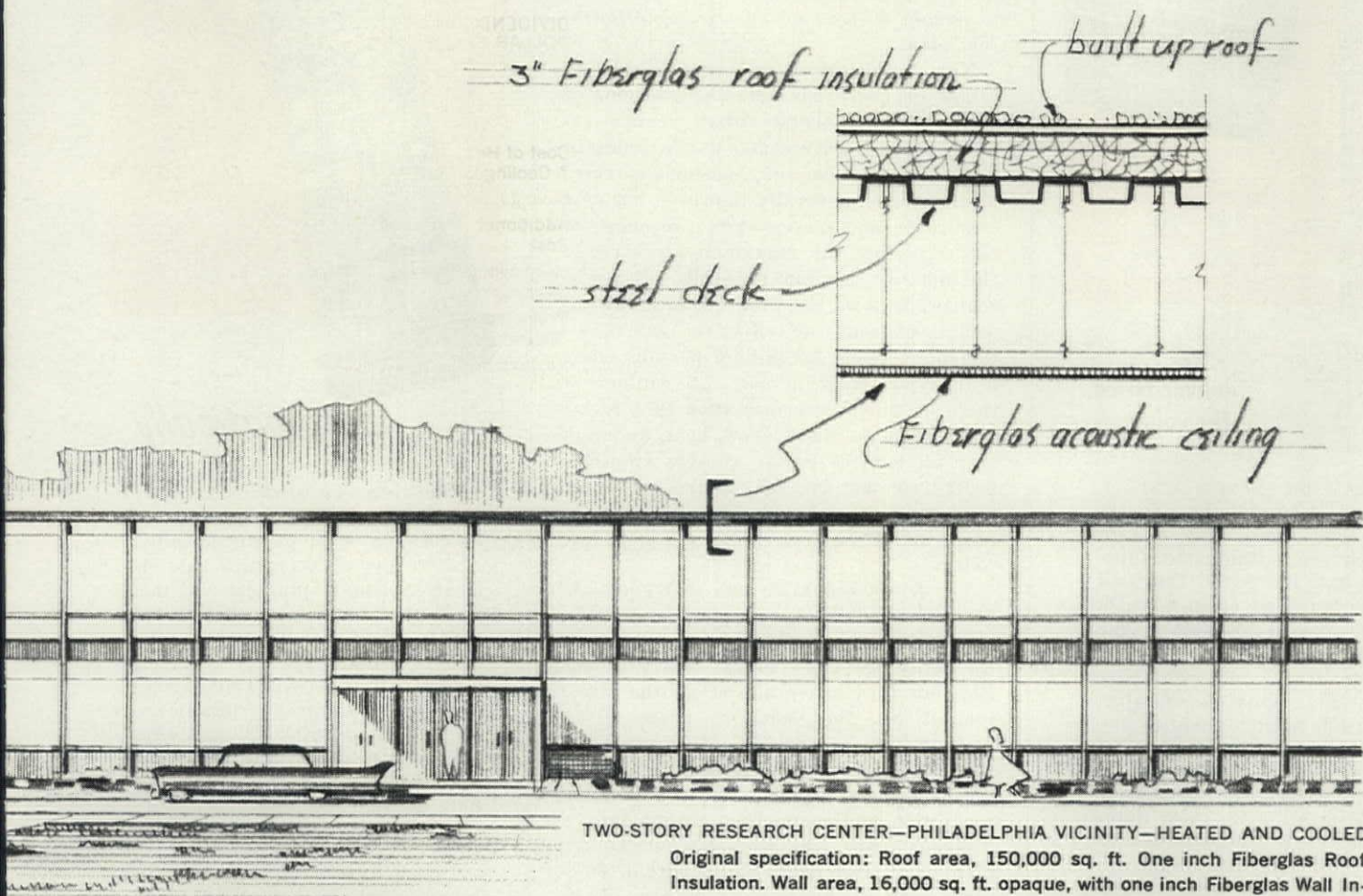
## DIVIDEND ENGINEERING DOLLAR SAVING PROPOSAL

	Original Specifications	Dividend Engineering Specifications (Illustrated)
Cost of Heating & Cooling Equipment.....	\$189,450	\$130,580
Savings.....		\$ 58,870
Additional Construction Cost.....		\$ 42,000
Net Savings on Initial Costs.....		\$ 16,870
Projected Annual Operating Costs.....	\$ 64,222	\$ 59,469
Savings on Operating Costs, per year.....		\$ 4,753





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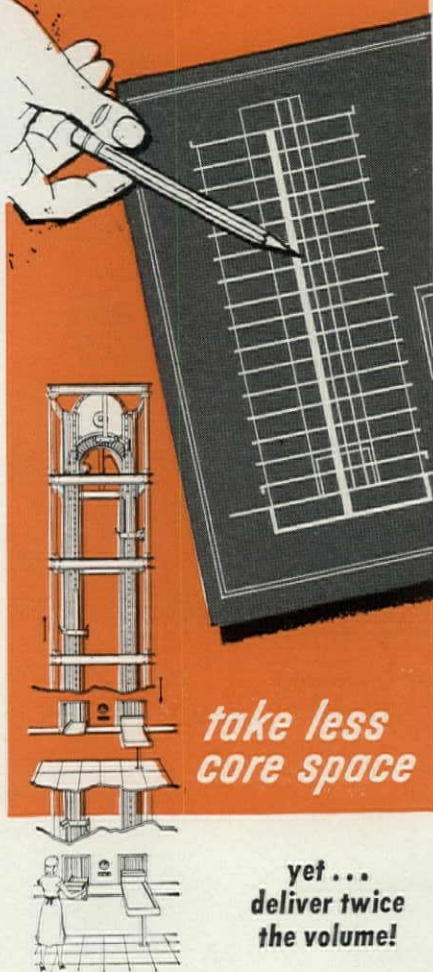
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cause its neighborhood has changed, I would question whether the typical city playground and many larger open spaces, for that matter, meet the city's present needs. Is the block-square park of a former middle-class era, or the flat, formal, village-green-type playground suited to the changing needs of communities around it? Can such areas be redesigned to reduce neighborhood tensions? Are there opportunities for topographical experimentation to "break up" a playground into component areas, each with its own character, its own appeal to different neighborhood needs? Is not total visibility, insisted upon by police, a drawback in many neighborhoods?

Out of such experiments can come the seeds for park and playground redesign.

### TRANSIT FIRST

*At the recent annual convention of the National Association of Home Builders, New York State Housing Commission, James W. Gaynor predicted the biggest urban renewal program of all would come to naught without an effective transportation plan.*

New York's efforts represent a massive attack on the urban renewal problems of the country's largest urban center, expenditures of private and public funds in the billions, renewal of thousands of acres of city slums, generally improved business conditions, and increased tax revenues to the city. Yet, the maximum potential of this massive program probably will not be realized because the program lacks an essential element—an effective transportation plan. Some 3.3 million persons enter Manhattan daily, almost 2.5 million of these by public transportation that is far from adequate. Sleet, snow, heat, and rain stay all but the postal workers from the swift completion of their appointed rounds, and newspapers carry regular boxes under the head "Why you were late today."

The 800,000-plus persons that arrive in Manhattan daily by private cars, taxis, and trucks represent only one-quarter of the daily travelers to the heart of the city, but they cause almost all the street congestion. The solution proposed at present is more parking in the center of the city. Experience elsewhere has shown that additional parking brings additional congestion and commercial stagnation.

Victor Gruen, the country's outstanding planner of large urban and suburban shopping centers, has analyzed New York City's parking program and is convinced that the direct gain in retail sales in the center of Manhattan would be only a fraction of the \$100 million a year that the garage planners anticipate. The intent to provide a place to park is laudable, but the economic objective is unrealistic. The answer is not more parking to attract more cars into the center of the city. The answer lies in more parking at the periphery and, most importantly, improved public transportation into the center core.

END

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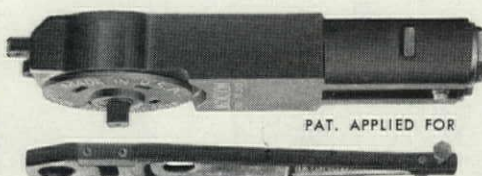
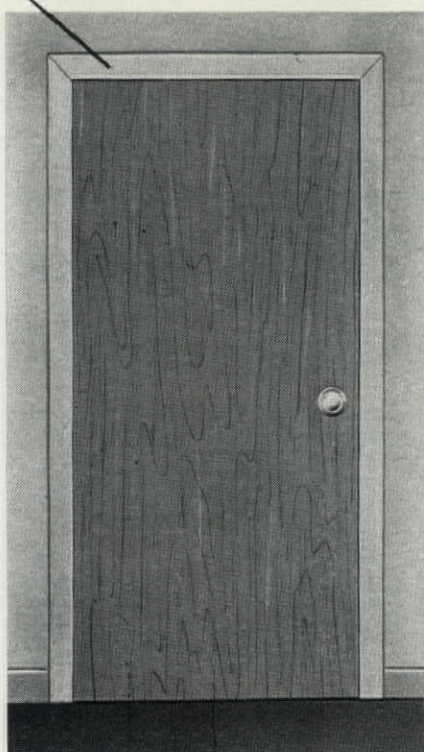
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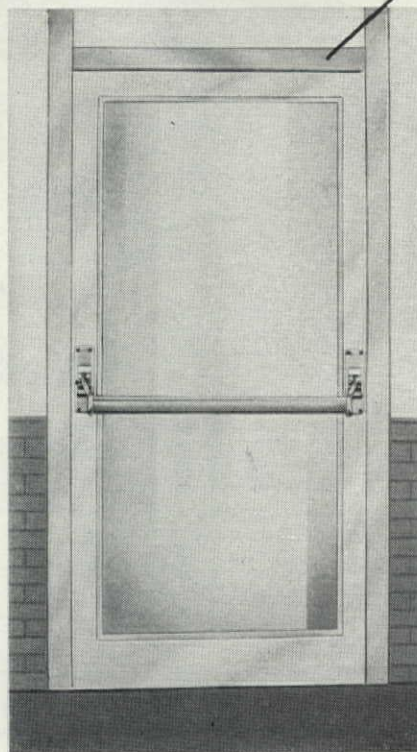
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- single or double acting
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## BUILDING'S NO. 1 CONTRACTOR

*continued from page 172*

—for every phase of the operation. In its seven fully staffed offices across the nation,\* Fuller executives are authorized to take on jobs as their facilities permit and to draw on the talents of the main New York office, or any of the others, for services. The emphasis throughout is on teamwork and coordination, not only within the company but with client and architect. As one architect with long experience working on large Manhattan skyscrapers says: "The one thing that really distinguishes Fuller from so many other contractors is its wholehearted attitude of cooperation with the architect." Another architect adds: "Crandall understands design and respects the architect's position—and he will fight for the architect's ideas."

Architects generally like the idea of working with Fuller, too, because they know its top people are experienced and well-trained in building skills. "In too many contracting companies, construction is in the hands of money men rather than engineers," says one architect, "and Crandall always impresses clients with his all-round savvy. On one job he did with us, he looked at the plans for a couple of days, then came to a session with other prospective contractors and stole the show. He had learned as much in a couple of days of looking at the plans as we had in all the time we took developing them, and he started in building it before the client's very eyes. He is a good salesman because he knows what he is talking about."

Crandall and Daly are looking to the future now, as the great New York office-building boom that has carried them to the top of their business shows signs of leveling off. "We have a lot of other things going on," Daly says, "like the UN library, Lincoln Center (a joint venture with several other contractors), five department stores, and a great variety of small projects. Although we are noted for big jobs, we do many smaller ones, though seldom one under \$1 million. But if the proper client asks me, I'll go put in a single window for him."

The proper client might be any of the many clients who have done repeat business with Fuller, perhaps as good a measure of customer satisfaction as can be found. Some 59 per cent of all Fuller's business is repeat business, and one client has asked Fuller to build a total of 26 buildings of various types and sizes for him over a period of 16 years.

END

\*New York, Boston, Chicago, Dallas, Los Angeles, Pittsburgh, and Washington.



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ROLLING DOORS  
steel or aluminum

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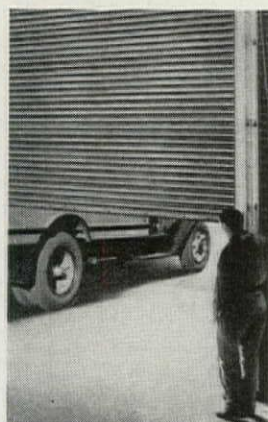
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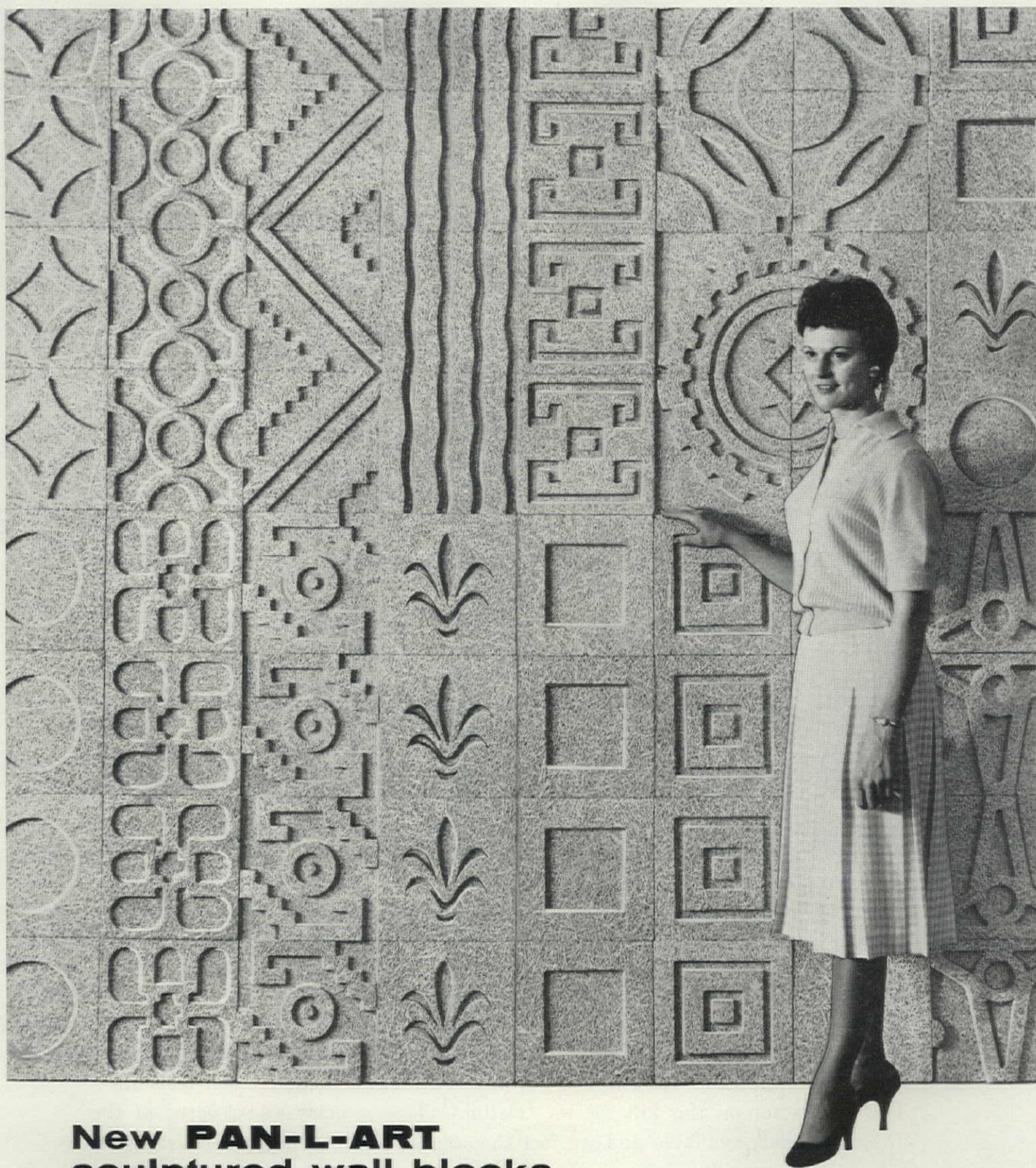
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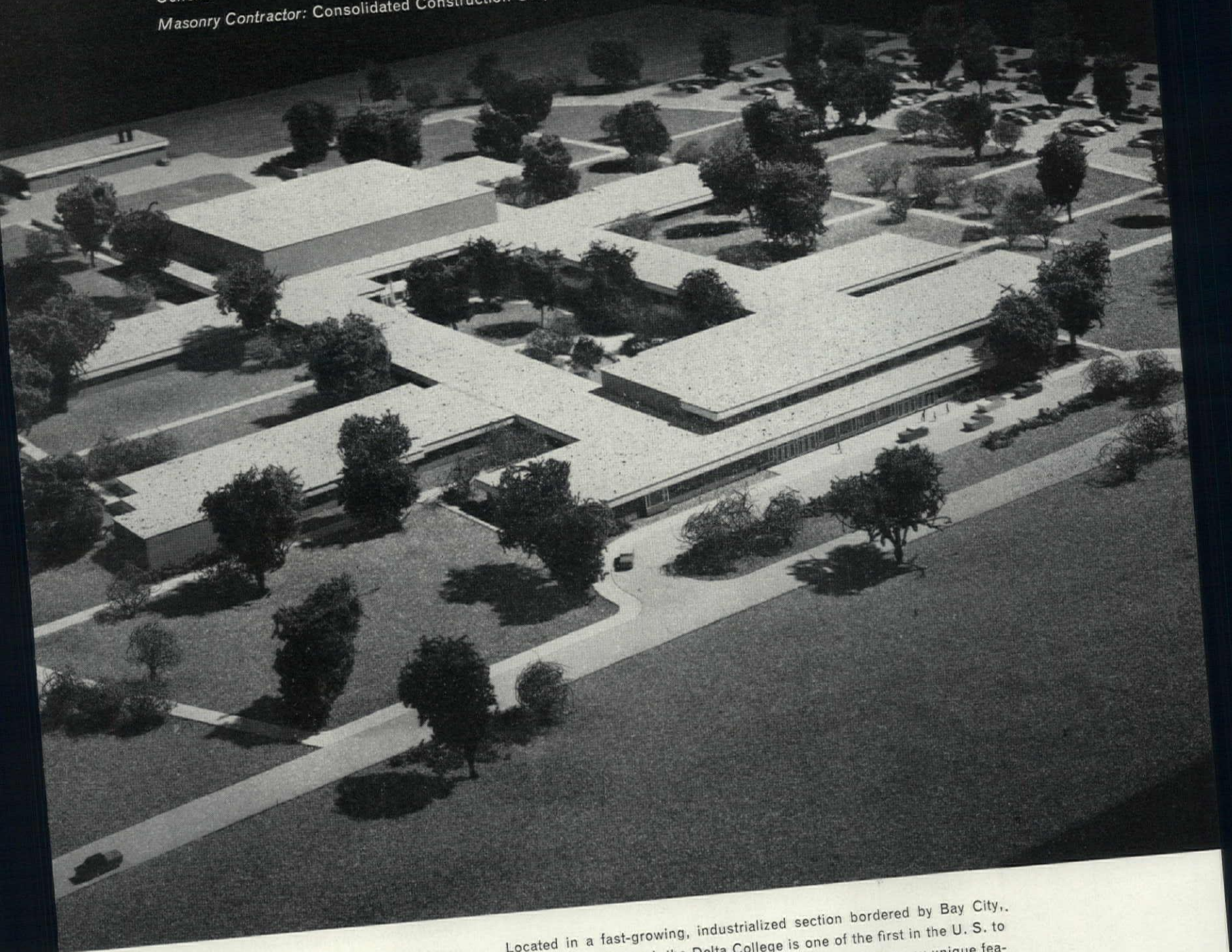
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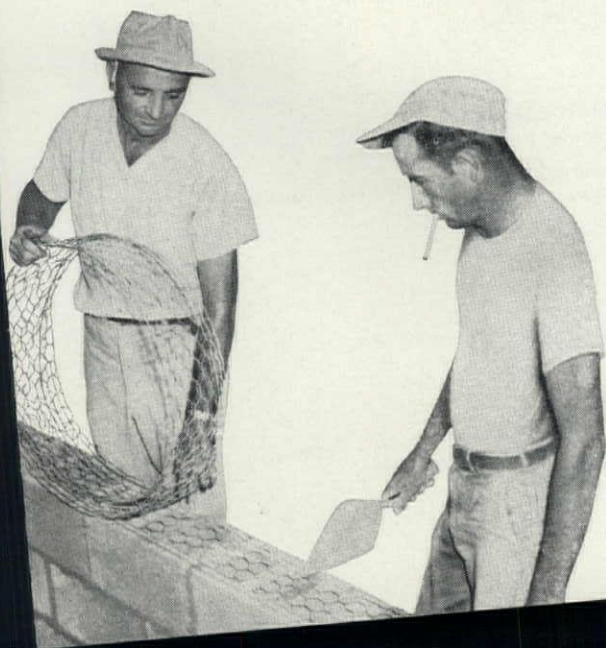




Architect's model  
Architect: Brysselbout-Dow-Wigen, Saginaw, Michigan  
General Contractor: Bryant & Detwiler Co., Detroit, Michigan  
Masonry Contractor: Consolidated Construction Co., Bay City, Michigan



Located in a fast-growing, industrialized section bordered by Bay City, Saginaw, and Midland, the Delta College is one of the first in the U. S. to be financed by a multiple county tax program. One of its many unique features is a closed-circuit TV studio which will originate educational programs throughout the school and neighboring communities.



For buildings that stay young throughout the years, rely on Keywall galvanized masonry reinforcement. Masons find Keywall easy to handle, easy to adapt to a wide range of applications. It can be lapped at corners without adding thickness to joints. Full embedment and complete bond assure effective reinforcement. Comes in 4", 6", 8", 10", and 12" sizes.



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## PORTLAND COLISEUM

*continued from page 111*

enough, a big one—which is a synthesis of spatial doctrines and structural convictions which belong to no century but the twentieth.

What counts is not the grandeur of the synthesis (although this one is far from negligible), but that a synthesis can be achieved, against great odds, in a period supposedly doomed to anarchic, neo-Baroque "sensualism." The premise of the plain-spoken Coliseum is not Saarinen's striving personalization of eloquent forms, still less the deliberate energizing of space which can be witnessed in his Yale rink. On the contrary, the Coliseum displays manly adherence to the "objectivity" of Mies and the "correctness" of Nervi. This is to name only two teachers (the Coliseum's architects have had others) who, in an age of reviving rhetoric, believe that syntax should come first. The effect of this philosophy on the design of the Coliseum is as unmistakable as the sinewy curve of the oval following its organic path—a path which Nervi helped chart—through Miesian "universal space" which the individual is free to make his own.

Either master could have done better with this building, as the architects themselves abundantly could have, too. But a quick tour of the grim basement accommodations, "dedicated to the advancement of the cultural opportunities of the community," gives evidence of how far a representative American community has to go before it appreciates its responsibility in such matters. Here, money ran out. The coarsely finished structure, the cheapened detail, the almost incredibly ugly furniture, are the same in room after room.

Of the entire characterless ensemble in the basement the brutal exhibition hall—once envisioned as a glistening dome—is perhaps the most disheartening. Near it, facing on a sunken court which has the look of a prison yard (16), is a cell which at first is taken for simply another meeting room but then appears—because of an altarlike table in front of the ranks of folding metal chairs—to be the chapel of some impoverished dissenting sect. In truth, this is the single formal memorial, in all the vast structure, to Portland's war dead—to whom the Coliseum is ostensibly dedicated. This, for the time being, is all that has been deemed necessary by the city; and the architects have not been able to do anything more.

But in the great hall above, as the seasons change, and the summer sun fills the space with golden light, the dead have been commemorated with a gift of life, and the vivid air is signed with their honor.

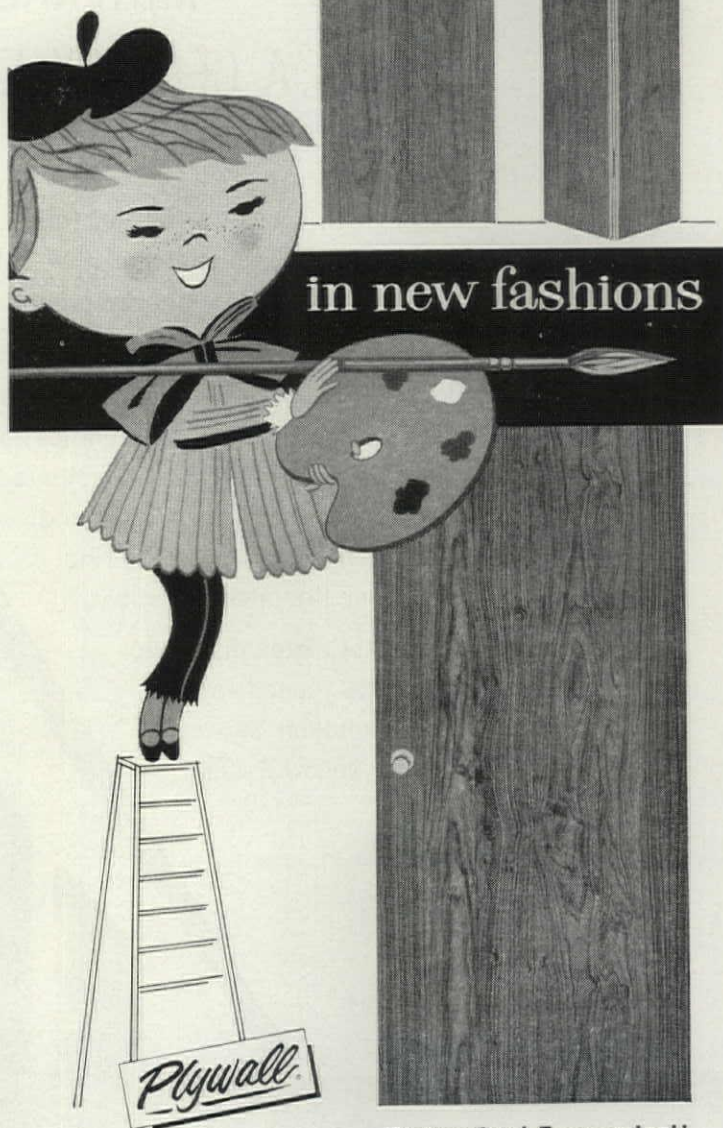
16



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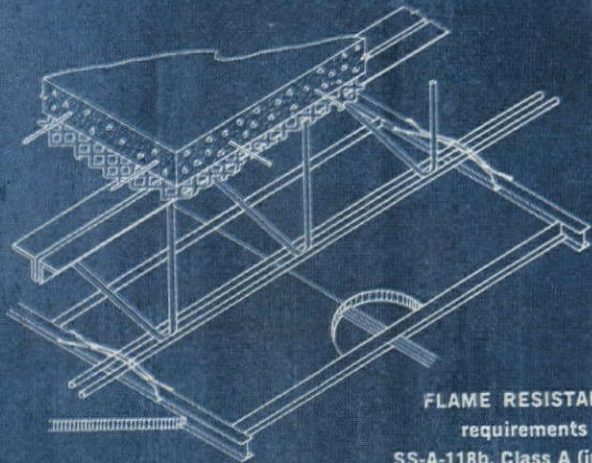
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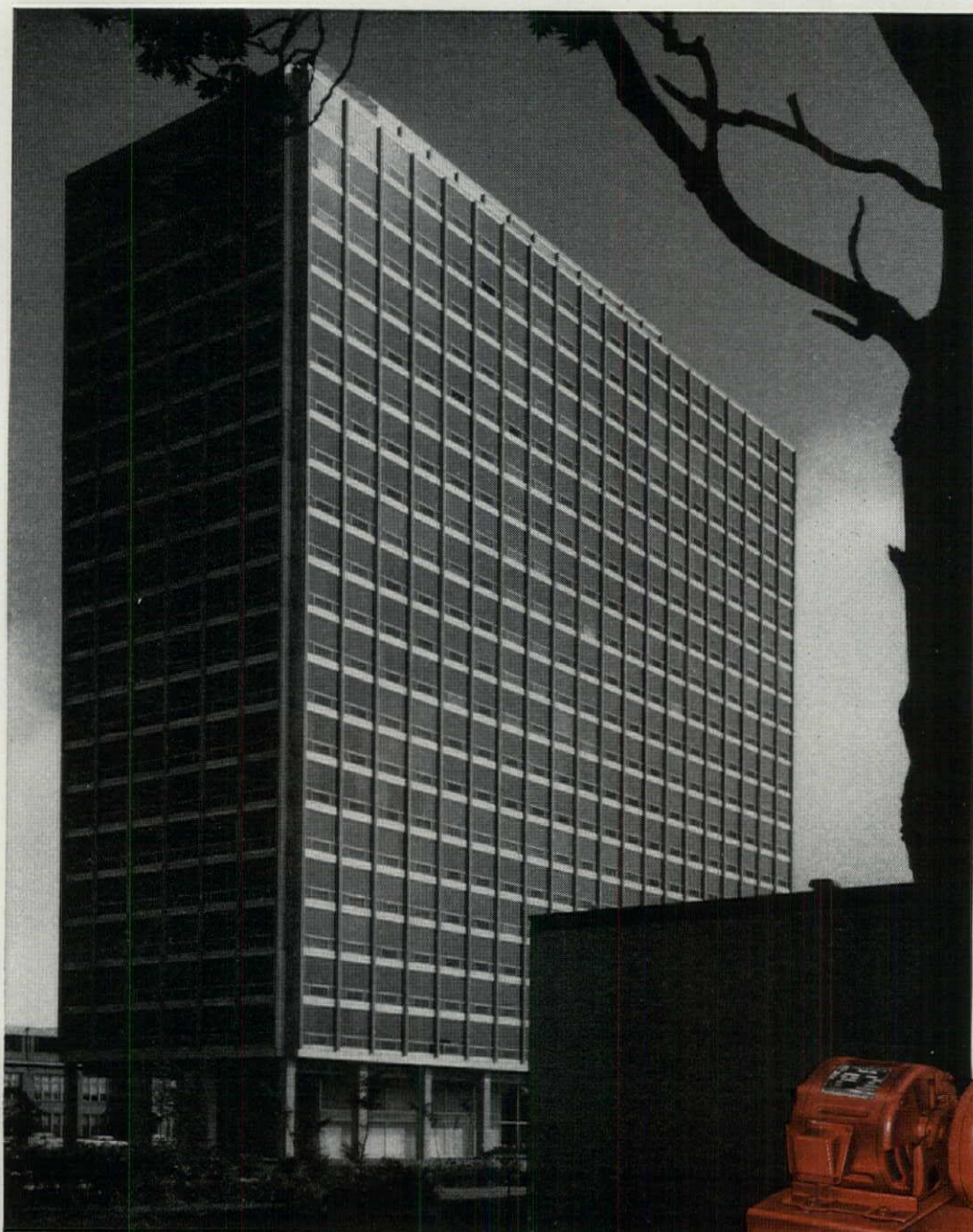
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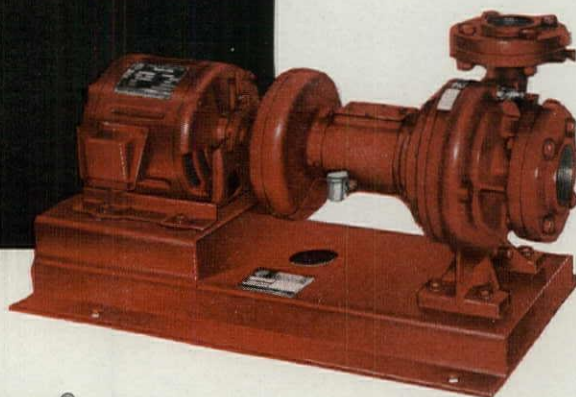
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**Mechanical Engineer:**

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# The F.D.R. Memorial competition—pro and con



© LOUIS CHECKMAN

Whatever else it has done, the recently concluded design competition for a Franklin D. Roosevelt Memorial in Washington, D.C. (FORUM, Feb. '61) has elicited strong, and articulate, feelings, the preponderance among architects and critics being apparently favorable. Among the views stated are those of the competition's jury chairman and its professional advisor; a minority juror, asked for his dissenting opinion, declined on ethical grounds.

## ELOQUENT FORMS

Forum:

The general reaction of the public to the F. D. R. Competition has been rather negative. The Roosevelt-haters seem to have considered this a fine opportunity to vent their repressed feelings. Others have found it easy and smart to use ridicule. I am not surprised.

Maybe this is not the greatest design that could be conceived, but it is as good as can be produced by a society such as ours whose values have not conspicuously been in the realm of imaginative visual expression. I still would guess that the contribution it makes will appear in future times to have been greater than we are now able to assess. First of all, it is the first design produced under competition for a Congressional committee. Here an attempt has been made to find new symbols, to advance from derivative to creative expression.

Ours is certainly not an age of monument builders. Even utilitarian architecture as an art is fumbling in many directions; but somehow and slowly there seems to emerge on many fronts an awareness that a society to be great must take into account other and higher values than the

ones which have prevailed thus far. The theater, music, the visual arts at all levels are beginning to flourish. Other nations of the world are looking to us for leadership in architecture and the arts, not only because we have the means but also the variety of situations and people and the freedom and opportunity to explore, to test, and even to make mistakes. This competition shows how the government can encourage creativity without dictation.

It is unfortunate that, of the many top-ranking designers in the country who have spoken to me with approval, none has so written to the F. D. R. Commission or to the papers. I wish that they had, because their opinion, convincingly expressed, may be all that is needed to sway the opinion of the many who are often hesitant to accept new ideas.

The winning design is as good as can be produced today. Whether that is good enough is for someone else to decide, but I may point out that perfection grows from self-confidence and this in turn needs a climate of freedom to experiment. It is an appropriate solution because it is basically a landscape solution. The steles complement the lovely trees on the fringe of the peninsula; they compose with them; their shapes do not compete with the other three memorials; they are transparent and changing; yet visible and eloquent. As forms they are better than any of the more literal entries where sculpture constitutes the main idea.

PIETRO BELLUSCHI  
Chairman of the Competition Jury  
Cambridge, Mass.

## WENT TOO FAR

Forum:

If the winning design is not to go further, perhaps it should stop sooner. Viewed from the water, it is effective as a cluster of primitive shapes in the landscape. Viewed closely, the shapes are no longer primitive, they are sophisticated rather than simple, dynamic rather than static, pretentious rather than natural. Their engineering is exhibitionist. Gone is the elemental simplicity of a circle of giant slabs surrounding a clearing in the forest. Gone with it is the profound

quiet in which words carved in stone speak loudly. In this instance, stopping sooner means using more primitive structure and possibly achieving more effective architecture.

It is unfortunate our architectural ideas are not powerful enough to dominate our engineering. It is unfortunate we are architecturally too unimaginative to express the character of a man in architectural terms.

HARWELL HAMILTON HARRIS  
Architect  
Dallas, Tex.

## AN OPERA SET

Forum:

Organized chaos! Giant gleaming white slabs against a blue sky—a good design for an opera set.

The F. D. R. granite grave-stone at Hyde Park, designed by the late President himself, reveals his distaste for pretentiousness.

SAL GRILLO  
Island Park, N. Y.

## EXCELLENT SCULPTURE

Forum:

The F. D. R. competition results bring into focus the whole problem of monuments and memorials in this age of unbelief, nonheroics, anti-tragedy.

We cannot, inside ourselves, sense any need for the externalization of a feeling we can no longer feel. All architects therefore are ill at ease before the task. The jury was obviously ill at ease also. They felt that the best architecture was no architecture. They preferred either "useful" memorials or sculpture like the prize winner. I certainly agree with them in spite of my own minority contribution of a low-domed building to fit between, and in scale with, the Lincoln and Jefferson Memorials.

For the prize-winning team, it seemed essential to deny architecture; essential to make sculpture very, very large in order to avoid architecture. The resulting sculpture I like. The balance of slabs is excellent in placing and in change of shape and size. The grouping has some of the space feeling of a Giacometti "Place." It is an appealing type with overtures of Stonehenge, totem-pole

groups, San Gimignano. I congratulate the jury.

I am glad it is not a "useful" memorial; indeed the lettering on the towers of ghost-written speeches, unreadable anyhow at that height, should be left off. I wonder only about the scale: 165 feet of raw concrete between the marble Lincoln and the marble Jefferson.

I hope it will be built. I am worried it will not.

PHILIP JOHNSON  
Architect  
New York City

## A MOURNFUL DIRGE

Forum:

Perhaps the most disheartening aspect of a disappointing competition is the evident failure of the designers to evoke F. D. R.'s complete personality, even though organic completeness is theoretically a premise of modern architecture.

Why not? F. D. R., the public man, was characterized by many-faceted exterior brilliance; and his almost intuitive approach to human affairs, kind and broad though it was, nevertheless possessed a sharply focused strength which was the strength of refinement: an optimistic, yet patrician, elegantly contained power which was in no sense coarse, and which—although it displayed great clarity—was not at all simple. On the contrary, F. D. R.'s jealously guarded, avowedly partly mystical, possibly wounded, but grandly complex, noble, and generous private essence dwelled in what Robert Sherwood, I believe, called a "deeply forested interior."

In view of all this, the public essence of the man might well have been expressed in an open, and therefore democratic and egalitarian, structure, a true building rather than an amalgam of sculptural forms, which at the same time could have captured F. D. R.'s gay, brave, aristocratic fineness.

As for F. D. R.'s complex inner self, that could have been admirably conveyed in water sculpture, but in a richly organized architectural fountain, not a few thin sprays and jets (theatrically lighted by world's-fair specialists). A memorial to F. D. R. should be serious, but not sad,

continued on page 188



for his life was nothing if not a cheerful battle—in many ways a victory—against tragedy. Yet in spite of the rich potentialities of the program, the designers largely produced melodrama or watery sentimentalism. (That symbolic field of wheat, for instance, should have been, frankly, corn.) The mournful winner is not, I hope, the harbinger of a neoneolithic revival. This outsized Stonehenge, whose primitiveness of concept is in direct opposition to F. D. R.'s own high degree of civilization, needs only canned recordings of barbarian dirges to make it a more obvious failure.

ALLAN TEMKO  
Architectural critic  
Berkeley, Calif.

## ORIGINAL AND GOOD

Forum:

Pedersen & Tilney's winning design is not fully convincing, but its approach is original and good. I like the fact that it has a third dimension, a volumetric consistency, without being a "building" enclosing a static portion of space. It has been stated that it is literature, and not architecture; that it is a memorial not to a man, but to his writings and speeches; finally, that it is anonymous. Perhaps. But if you take Lincoln's statue out of his memorial, and you put a statue of somebody else in its place, don't you have a memorial to somebody else? And what is a man other than his ideas, messages, and inspirations? Roosevelt was not a simple man, and you cannot have a memorial for him based on a simple symbol. This is one of the very rare cases in which I happen to agree with a jury. I feel relieved and happy.

BRUNO ZEVI  
Editor, "L'architettura"  
Rome, Italy

## RESTLESS MOVEMENT

Forum:

The most interesting aspect of the winning design is the provision for movement over the stepped and tilted floor planes, together with the changing vistas of distant landscape which this movement brings. Unfortunately, however, the treatment of the immediately surrounding landscape, with its loops in the A. J. Downing manner, while banally fitted to the peninsula, hardly accords with the staccato angularity of

movement within the Stonehenge precinct.

A feeling for the earth underscores the primitive, elemental quality sought by all finalists and near finalists. In most of the projects, the primitivism appears in uneasy alliance with constructivism. The embarrassment of the modern movement in confronting a monumental commission also appears in the failure to approach the problem as a *building*. Architectural landscape and sculpture predominate. Yet this competition is richly suggestive for the monumentality which must come. Despite my serious reservations about it, the jury's choice seems to have been the right one.

WILLIAM H. JORDY  
Art department  
Brown University  
Providence, R. I.

## A STATESMAN'S WORDS

Forum:

The winning design alone created unity combined with multifocal centers of interest, and a space which contained the spectator without alienating the landscape. The conception of Roosevelt's mind as portrayed by his words (not his body as portrayed by a statue) is surely a good concept, especially since the memorial is to a statesman, not a sportsman.

JANE B. DREW  
Architect  
Cambridge, Mass.

## PHOTOS NOT ENOUGH

Forum:

Because the winning design is based on principles other than those of Euclidean geometry and constructed perspectives, the usual means of representation fail to convey its most significant qualities. The photographs so far available give a very inadequate idea of what it is all about. Anyone who has not seen both models is at a severe disadvantage in forming an adequate critical opinion.

I have trouble in understanding what was wanted by those who object to the "wide-open program." It seemed to me that the report by the advisory committee, which was incorporated in the program, set the finest possible tone for the entire undertaking, and that anything more would simply have been the imposing

of an individual prejudice on all the designers.

There is no doubt that it is difficult for the 573 losing competitors to accept wholeheartedly someone else's solution for the same problem. Certainly the losers don't have to like the winning design, but they do have an obligation to subject themselves to the discipline of being as objective as they possibly can.

EDMUND N. BACON  
Professional advisor to the competition  
Philadelphia

## WHAT HAPPENED?

Forum:

What has happened to architecture?

I was trained in the classics and still find beauty in the Egyptian, the Greek, and especially in simplified modern classic buildings.

The Stonehenge design seems to me to have been conceived as a Norwegian Parliament meeting place and it is the best idea in the latest competition. But the handling of it lacks the quality of architecture in both beauty and practicality. Perhaps the fault lies in the jurors.

ROBERT NORDIN  
Architect  
San Francisco

## NOT THE STERILE MOLD

Forum:

I know all too well the time it takes to do a competition and the time and attention it takes to judge it, so I would hesitate to speak out either for or against on my scant observation. I know the jury members' distinction and I liked what I saw. The longer I live the more I want variances and not just the acceptable, rather sterile mold—nor do I

want the wild, unreasoning forms of exhibitionism. Therefore the winning scheme seemed good to me.

WILLIAM W. WURSTER  
Dean, College of Environmental Design  
Berkeley, Calif.

## LITERARY, PICTURESQUE

Forum:

Our architecture lacks an unself-conscious, authoritative language, due largely to our obsession with individualistic expression rather than with epic values. Furthermore, the disquiet of modern man about himself, illustrious personages and causes, inhibits the heroic stance commonly associated with the monumental.

A monument to F. D. R. must be a memorial to life, to construction and to purpose. I find the tablets in the winning design embarrassingly literary. Roosevelt was not a law-giver like Moses or Mohammed, or even Lincoln. I question whether the picturesque grouping and shaping of elements will, when unraveled in time, possess more than scenic qualities which will determine a more durable power.

G. M. KALLMANN  
Assistant professor of architecture  
Columbia University  
New York City

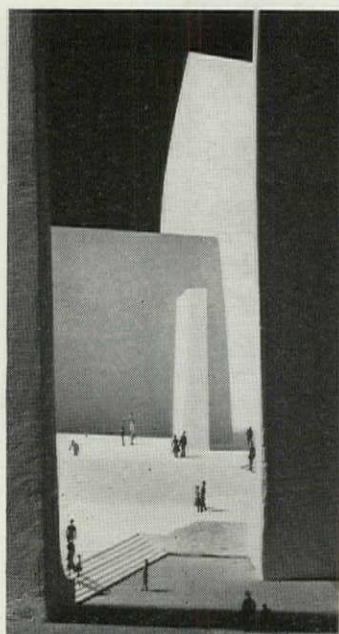
## STRIKING PROOF

Forum:

The competition was based on one of the most unusual and stimulating programs ever issued. The entries were of very high caliber and varied in theme. The winning design combines, in an appropriate and monumental composition, the enclosed yet open space reminiscent of the ancient temple themes of Lincoln and Jefferson, and the height, majesty, and sculptural interest of the Washington memorial. Roosevelt's writings, immortalized on its stone monoliths, seem to define the man more clearly than any statue.

Here is striking proof that today's architecture can produce a monumental memorial of outstanding merit! I sincerely hope that the shallow and superficial criticism of the type that always pours forth when any new and great idea in music, art, or architecture is first produced will not stand in the way of its final realization.

MORRIS KETCHUM JR.  
Architect  
New York City



GEORGE CSERNA