September 1963 **PROGRESSIVE ARCHITECTURE**

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feel it . . . it's textured!

that's good?

more than good. . . it's vinyl asbestos tile with fine chips of marble encased in textured translucent vinyl!

hmm . . . I guess texture helps conceal dents and scratch marks.

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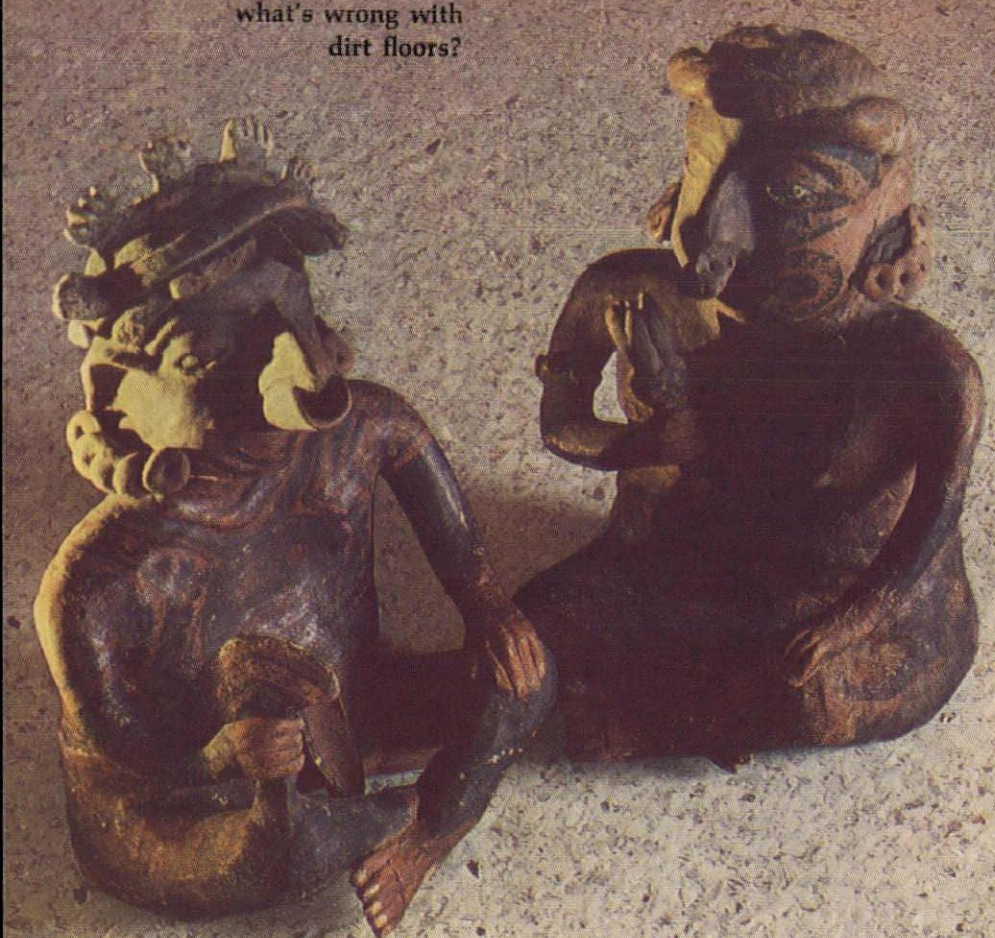
Vina-Lux Pebbled Onyx. The man said you can put it down on any kind of floor . . . except dirt.

what's wrong with dirt floors?



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Donn's Grenadier System makes it possible to progressively install one side of the partition which automatically establishes the stud module. The exposed cavity allows for wiring, plumbing, fixtures, etc. prior to installing the second side. It has a one-hour fire rating with 5/8" labeled gypsum wallboard.

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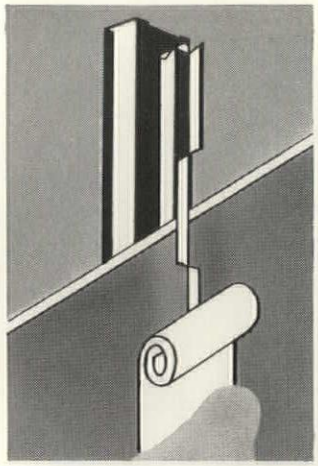

Illustration shows unique integral locking feature and partial joint treatment of the Donn GRENADIER System.

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For more information, turn to Reader Service card, circle No. 386

United Parcel Service Building, N.Y.C.
Architects: David and Earl J. Levy, N.Y.C.
Engineers-Architects: Abbott, Merkt & Co., N.Y.C.
Interior Architect: Edwin Harris, Jr., AIA, N.Y.C.

Bold good looks— one of 6 reasons the architects used Armstrong Tessera Vinyl Corlon flooring in these new offices

This photo shows Armstrong Tessera Vinyl Corlon flooring installed in the national executive office and reception area of the new United Parcel Service Building, New York City. Tessera is a striking floor that's especially well suited to distinctive custom installations. Although costing about 90¢ sq. ft. installed, its beauty and functional advantages make it an excellent long-term value for new and remodeled commercial interiors. Here's a brief summary of the reasons why Tessera is often selected for these interiors.

1. Dramatic Color and Design Tessera Vinyl Corlon is a boldly handsome floor. Its colors are rich and decorative, ranging from subtle off-whites and softly recessive hues to vibrant blues, deep apricot orange, and leather brown. Tessera comes in both monochromatic and multicolored stylings that will harmonize with any decorative scheme. And Tessera's random chip design adds interest to any interior without intruding on its other features.

2. Distinctive Texture The vinyl cubes in Tessera are raised slightly from their translucent vinyl setting, giving Tessera a gently textured surface. This texture complements the other textured interior surfaces so widely used today. It also helps hide stiletto heel marks and conceal minor subfloor irregularities.

3. Easy Maintenance Tessera Vinyl Corlon comes in rolls 6′ wide and up to 90′ long, so it can be installed with a minimum of dirt-catching seams. Cleaning the dense monolithic surface is fast and economical. Because Tessera is resistant to staining and damage from grease, most alkalis and chemicals, food, and beverages, the architects installed it in the United Parcel Service cafeteria.

4. Durability .090″ gauge Tessera Vinyl Corlon has proved itself extremely durable in countless commercial installations. Its design goes all the way through to the backing—won't blur or disappear in areas of concentrated traffic. The floors at United Parcel Service will serve for years and still keep their good looks.

5. Can Be Installed Almost Anywhere Tessera's exclusive moisture- and alkali-resistant Armstrong Hydrocord Back enables you to specify it on or below grade, as well as above grade (except where excessive alkali or hydrostatic pressure is present).

6. Excellent Material for Custom Designs In these offices, the floor was designed to function as a spatial divider. Large rectangles of a contrasting Tessera color are used to define conversation areas and furniture groupings. Strips in a third coloring echo the linear architectural features. Made in long, wide rolls, Tessera also lends itself readily to large-scale, curving custom designs.

For Specifications, Complete Data, Samples of Tessera and the other Armstrong Vinyl Corlon flooring styles, call your Armstrong Architect-Builder Consultant. A flooring expert, he can help you solve almost any flooring problem you encounter. He can also get you further assistance from Armstrong research, installation, and technical advisors. And since Armstrong makes a complete variety of flooring materials, he can make unbiased recommendations as to the right type of resilient flooring, properly balanced in quantity and quality, for any interior. Call him at your nearest Armstrong District Office, or write direct to Armstrong, 309 Watson St., Lancaster, Pennsylvania.

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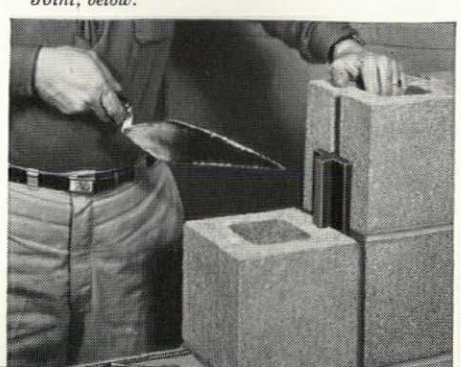

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THIS MONTH IN P/A

Cover THE JOHN HANCOCK BUILDING IN NEW ORLEANS (page 126) Photo: Ezra Stoller Associates

Frontispiece SCHOOLHOUSE AT AESCH (page 158) Photo: F. Maurer

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VOLUME XLIV, No. 9

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VIEWS

Hits Pan Am "Malcontents"

Dear Editor: Against all these so-called Architects, let us propose *one* problem. What would you have done under *said conditions*. Let us hear from these malcontents.

Why not run a design contest of *what you would have done?* Also give a prize. The Owners set a detail of what is wanted. If you louse it up, you are through.

So I say, the Architects planned as they thought they should. Whether you or I like it is immaterial. That is what was wanted. And accepted.

It is built, so shut up.

CLARENCE M. BAKER, A.R.A.
San Francisco, Calif.

Additional Comment on Pan Am

Dear Editor: Haven't you passed too harsh a judgment on the Pan Am Building (APRIL 1963 P/A)? No one will argue about the size, siting, and parking, but shouldn't the City Planning Commission share some of your potent criticism?

As a former New York resident, I really find it hard to get indignant about this latest—but not last—mammoth. Anyway, the shell has some guts, which is more than can be said about most of the other aluminum-and-glass envelopes.

MORTON RADER
San Francisco, Calif.

Advanced Thinking

Dear Editor: The nostalgic idea of Peter Collins ("Genius Loci," JULY 1963 P/A) of going back to medieval times seems a bit ridiculous.

Today we live in an age of advanced thoughts. Modern architecture should be fully integrated with the social, political, and cultural developments of the time. It would be absurd to erect architecture that is the accumulation of centuries of feudal remains based on false ideals.

ROBERT MARTINEZ
University of Southern California
Los Angeles, Calif.

New York Waterfront Plan

Dear Editor: The comment about the 40-Year Plan for the New York Waterfront (p. 63, JUNE 1963 P/A) seems to us, as architects for the project, to miss the point.

(1) Since New York City is a port city, the location of the cargo piers was the first consideration.

Continued on page 10

Otis

New York World's Fair Premiere

in the pavilions illustrated: ELEVATORS that herald space age living. ESCAL-AIRE* and TRAV-L-AIRE* transportation that opens up a new universe of materials and colors. Again, leadership by OTIS!
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(A) USS AmBridge Curtainwall systems are available with exterior faces in a choice of 47 colors recommended by the Porcelain Enamel Institute; in 28 baked enamel colors, or in stainless steel. Interior surfaces are fully finished with vinyl (at no extra cost to you) or baked enamel to match or harmonize with the partitions. The steel panels are normally designed to a 4-ft. module and run continuously outside the columns. Standard panels are available in 1- 2- and 3-story heights. Panel frame members are cold formed galvanized steel. Face sheets are mechanically attached to the structural frame. Heat transfer is controlled with thermal breaks which prevent a thru-metal condition. Because the glass fiber insulation is held away from the exterior face by stainless steel clips, the panel is free to breathe, thereby minimizing condensation. AmBridge walls are so thin compared to masonry construction that you gain about 5% usable floor space. Yet the walls provide a tested thermal "U" factor of .168 that assures comfortable temperatures at reasonable cost.

(B) Sash are high quality 2" monumental projected or fixed-type, of stainless steel or aluminum. Vertical or horizontal sliding sash are optional.

(C) Exterior Battens are extruded metal sections with provisions for mechanical attachment without drilling. Battens are fitted with shop-applied neoprene gaskets that permit expansion or contraction while keeping joints weathertight. Custom-designed covers permit aesthetic variation in stainless steel, porcelain enamel finish or special extruded shapes.

(D) USS AmBridge Open Web Steel Joists support floors and roof. Joist and framing details have been designed to adapt to any specific load requirements. Like all AmBridge Coordinated Structural Components, joists meet specifications of the SJI, ASW, AISC and AISI latest adoptions.

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(H) USS AmBridge Steel Doors with a corrosion-resistant polyurethane foam core are supplied as an integral part of exterior and interior panels. All doors are complete with pressed steel frames and hardware, baked enamel finish, and can be furnished with lights and/or louvers. Neoprene weather-stripping is furnished on all exterior doors to assure a storm-tight seal. Hardware of the finest quality approved by the architect—such as lock sets, closers, panic bars, and kick plates in various finishes—can be installed under supervision of experienced American Bridge personnel.

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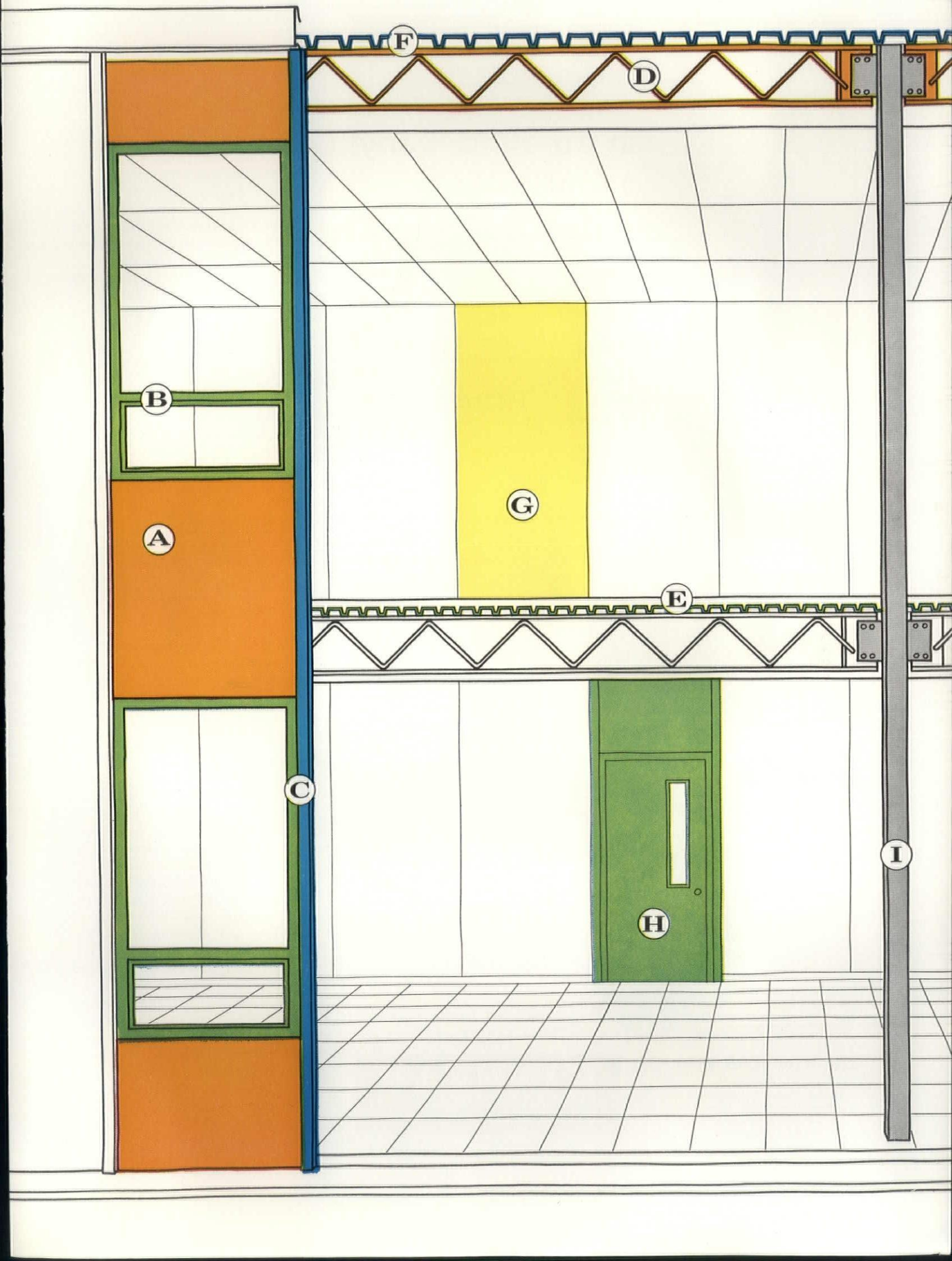
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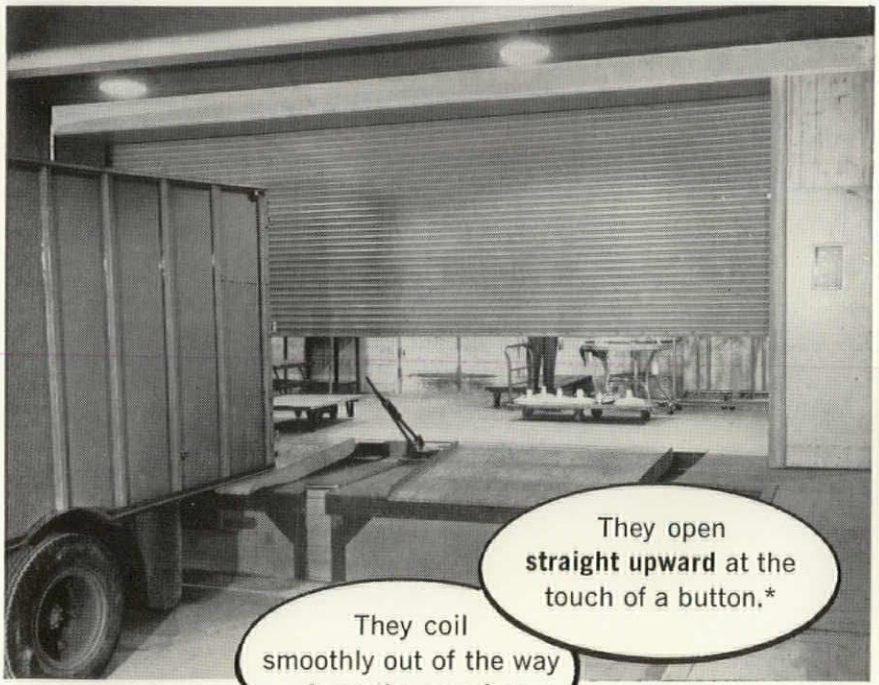

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Continued from page 6

(2) Main passenger line piers must stay where they are. The piers are in good condition and are worth saving—and their locations (midtown) are excellent.

(3) Areas left over were considered as to the best use possible.

Consequently, the comment that "Unfortunately the plan seems to fall into separate units, both from a design and a planning standpoint, with little interaction between several areas" seems rather like a fast bird's-eye view.

In the Battery (Area I) section, the remark that "the appearance of the housing bears a sad resemblance to most of New York's current development projects" again misses.

It was determined to have various types of buildings to have contrasting forms and heights oriented toward the river. They were arranged so that the air, the light, and the vistas would be as uninterrupted as possible. The appearance of the individual buildings was only suggested. The developers would, it is assumed, arrive at the appearance of the buildings through their own architects.

ALLEN R. CONGDON
Eggers and Higgins
New York, N. Y.

The Zoning Laws

Dear Editor: I thought the Editorial (JULY 1963 P/A) very good indeed. We have a long way to go to be effective in obtaining acceptance of the non-zoning concept.

WILLIAM L. SLAYTON
Commissioner
Urban Renewal Administration
Washington, D. C.

Dear Editor: Your Editorial on zoning hits exactly the right spot.

We have made copies of it and are circulating it to our clients so that they may to some degree understand the grueling problems we struggle with.

Not only do we have the merciless zoning problem but also the Building Code, Housing and Redevelopment Board, City and State Mitchell-Lama, Park Department, Board of Education, Fire Department, and so on, *ad nauseatum infinitas*.

To top it all off, we cannot do houses for the aged without providing parking on or adjacent to the site, making it virtually impossible to provide such housing within city limits.

It would seem to me that the missing catalyst is a powerful commissioner with no political strings who would have a

Continued on page 12

Headquarters for American Cyanamid Co., Wayne Township, N. J. Architect: Vincent G. Kling, FAIA. **Structural Engineers:** Severud-Elstad-Krueger Associates. **Contractor:** Frank Briscoe Co., Inc. **Precast Concrete Manufacturer:** "Schokbeton" by Eastern Schokcrete Corp., N.Y.

VINCENT G. KLING, FAIA, chose precast white concrete

for this award-winning project at Wayne, New Jersey. The long faces of the low, curving building are horizontally scored with deep, concave bands of precast concrete spandrels made with ATLAS WHITE portland cement and exposed aggregate. The spandrel units were precast in 9-foot lengths to equal the width of 2 windows. They are supported on outriggers projecting 18 inches from the outer face of the columns. ■ The effect is a continuous band of dark glass set between the bold projections of concrete spandrels. White, gray and brown aggregates were used in the matrix of tan sand and white cement to produce a creamy-white finish. ■ Today, more architects are selecting precast concrete for the exciting departures it invites in form and color, along with important construction economy. Any idea of size, shape, texture and pattern is attainable. For specific information about panels, facings and cast stone units, see your local precast concrete manufacturer. For a brochure on precast concrete, write Universal Atlas, 100 Park Ave., N. Y. 17, N. Y.

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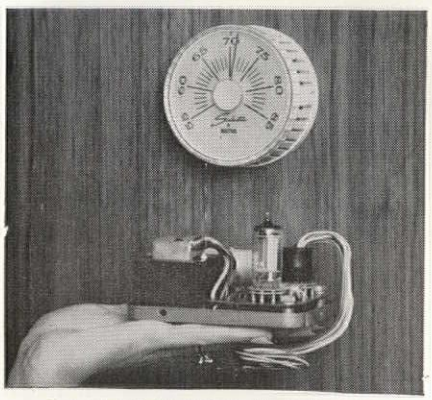

For more information, circle No. 353

Continued from page 10

social and design sense.

Anyway, you have written a great article and all of us in the office enjoyed it.

EDGAR TAFEL
New York, N. Y.

Dear Editor: As a participant in Commissioner William Slayton's campaign to make urban renewal a leading force for good design, I cannot help but feel gratified by your July Editorial.

But paralleling your sound major theme lies a conventional error that does no one any good. Contrary to your assertion, zoning was invented and introduced by lawyers, not architects. It derives from common law nuisance doctrine and American property law, not architectural theories about open settlements.

Architects who masochistically mistake simultaneous occurrence for casual connection may make themselves bigger in their own eyes. But such fuzzy evasions mask the hard difficulties blocking any major revisions in American planning practice.

The indestructibility of zoning depends on vested property interests, not architectural errors. That architects seem overwhelmingly happy with the status quo is another question.

ROGER MONTGOMERY
Chevy Chase, Md.

Spanish Architecture

Dear Editor: It is a real pleasure to find in your magazine a positive appraisal of today's Spanish architecture, especially in the field of urban design. As an architect educated in Spain, I had the great satisfaction of taking an active part in the study and execution of structural and architectural design, together with my good friends Oiza, Romany, and Sierra, of the project Batan, which you pictured on page 132 of the JULY 1963 P/A. Batan, a new suburb of Madrid, with its shops and educational facilities, takes into consideration the best orientation toward the sun, and, despite its relative rigidity in plan, achieves variety in height through irregularity of contour and the setback of row houses, and in addition introduces on the most elevated terrain the towers that enjoy a view of City Park (Casa del Campo).

I would like to stress that the collaboration between the client, Cooperative Housing, and the Madrid city officials, played an important role in the realization of this project.

ADAM M. KASS
New Haven, Conn.

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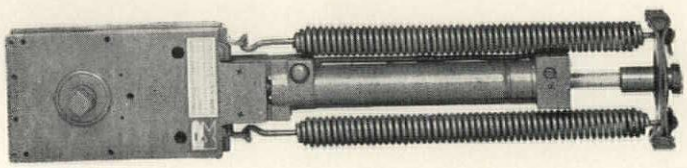

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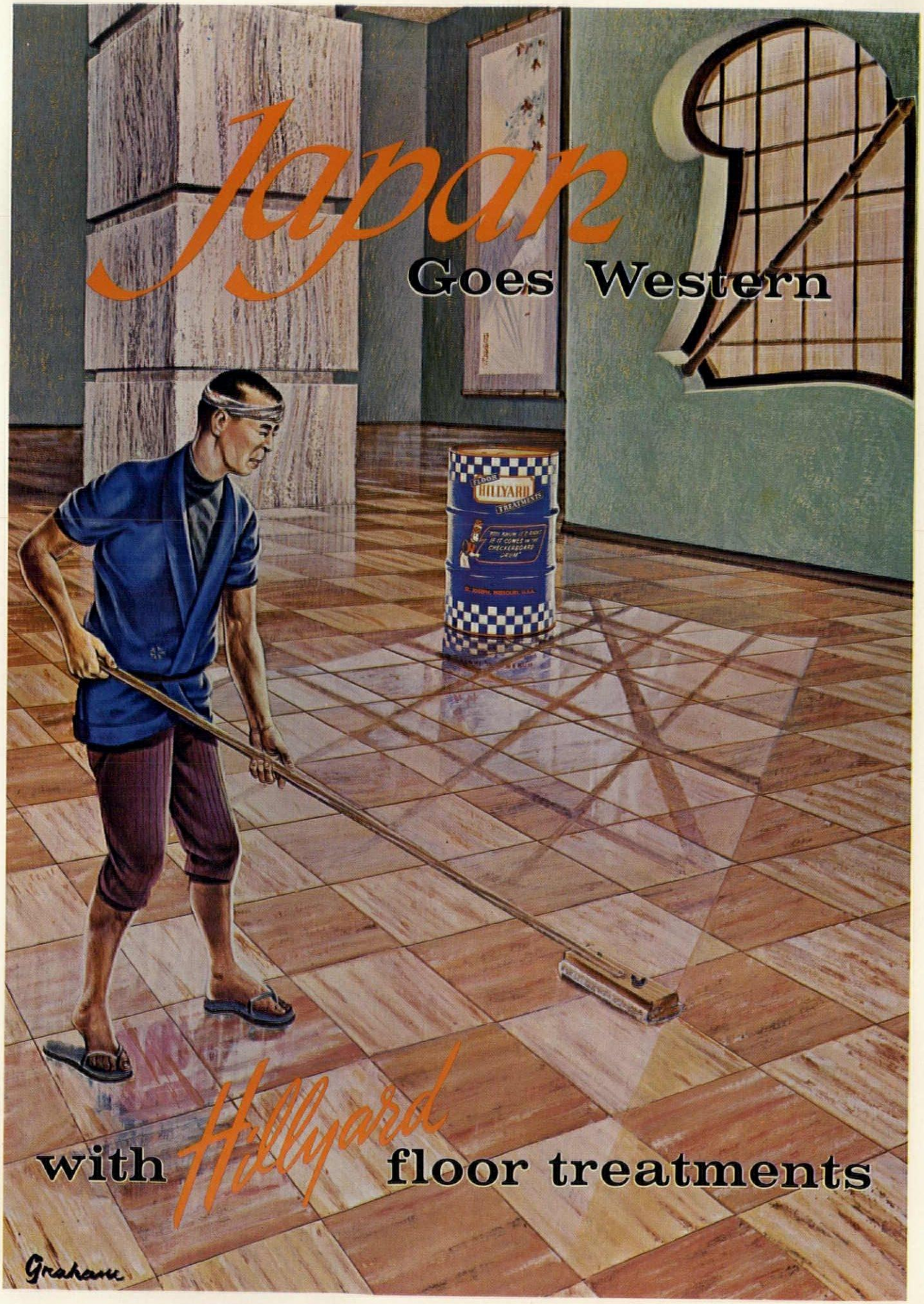
Japan
Goes Western
with Hillyard floor treatments
Graham

In Japan

. . . Hillyard floor treatment products are gaining wider acceptance every day. A great compliment . . . for the Japanese are a meticulous people. They possess an inborn desire for cleanliness, and beauty is a mark of social standing, while poorly kept surroundings mean a serious loss of social standing . . . of "face".

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And so it is that in this land of fantastic contrasts, where ancient shrines and temples exist side by side with the most modern of today's skyscrapers, you will find ancient teakwood floors being preserved by Hillyard's most modern floor care products and techniques . . . just as are resilient floors of today, along with the ever-popular terrazzo, ceramic tile and marble, gracing Japan's modern buildings.

And now Hillyard's internationally approved floor care materials and methods are firmly entrenched in the Japanese market . . . helping keep the commercial, industrial and institutional floors of Japan traditionally clean, safe, and handsomely protected. All of which simply proves that wherever you are, wisdom of choice lies in quality.

And Hillyard makes the distinguishing difference in beautiful floors all over the world. A Hillyard "Maintaineer" is a highly skilled, highly schooled engineer of maintenance . . . a real expert. And you can put a Hillyard "Maintaineer" on your staff without added expense. You'll find his knowledge and advice a sure way to savings. Call the "Maintaineer" near you soon.

Wax in Japan is Rō, In Brazil It's CĒRA

But When It's Super Hil-Brite Carnauba Makes the Difference!

Carnauba . . . the only wax of its kind in the world! Carnauba Wax is the hardest, finest, most resistant wax nature produces for wax emulsions . . . and there has never been a synthetic substitute to match it. It is formed on the new leaves of palm trees found only in a relatively limited and very primitive area of Brazil. As the world's largest importer of finest grade No. 1 Prime Carnauba for floor waxes, Hillyard blends and emulsifies this superior natural wax in exacting formulation.

Reason? Simple! No. 1 Prime Carnauba wax makes the best floor wax known to man. It is unexcelled for deep, rich lustre, soil resistance, washability, resistance to water spotting, and excellent buffability. And with its great lasting qualities come important economies. Saves labor, too. When you switch to Super Hil-Brite, you will save 3 out of 4 waxings with ordinary wax.

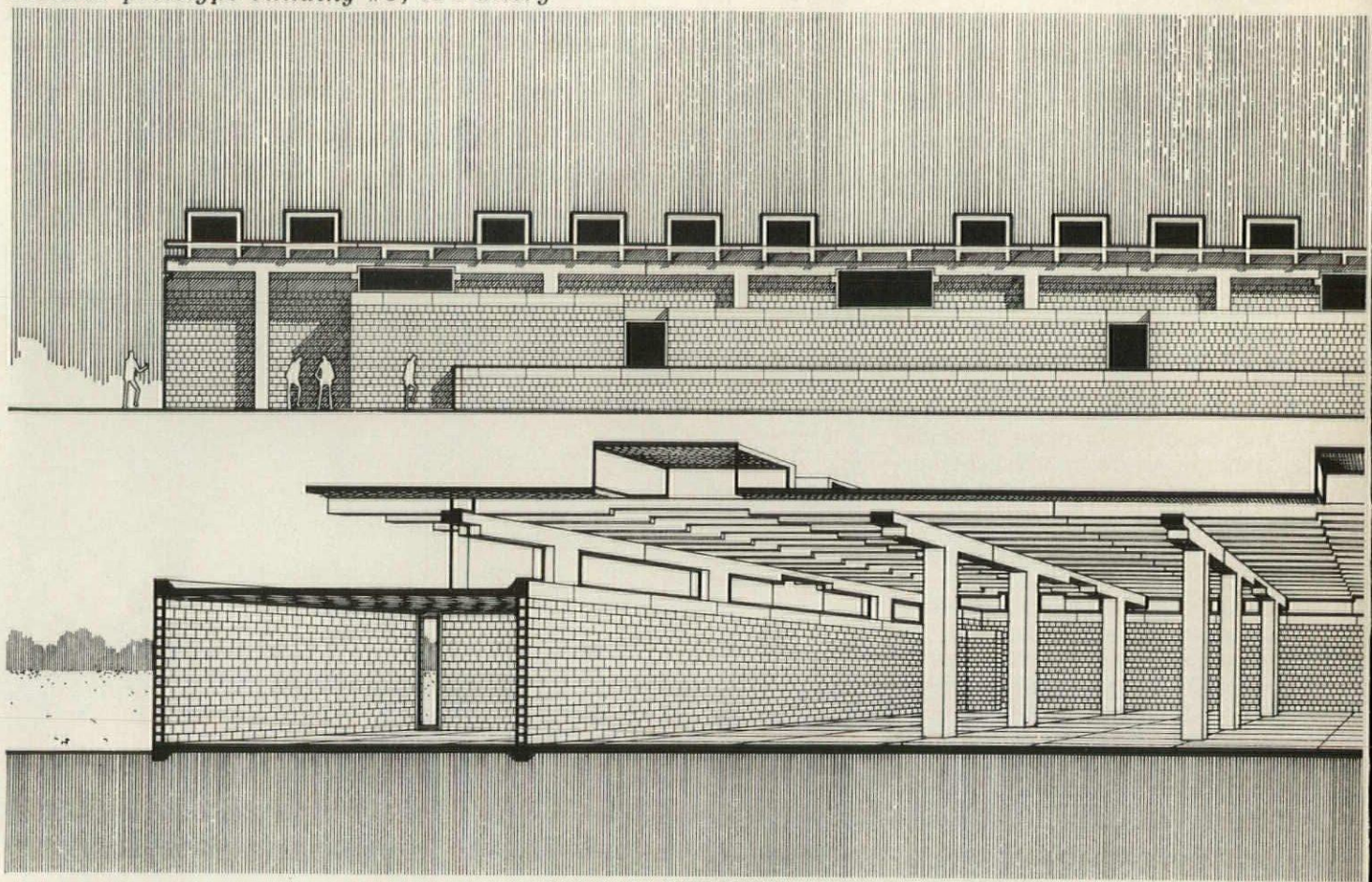
In Japan or Jacksonville, there's a Hillyard "Maintaineer" ready to serve you . . . ready to recommend proper Hillyard money and labor savers for the floors you are specifying. See Sweet's Catalog 13M/Hi or A.I.A. Building Products Register 13.06.

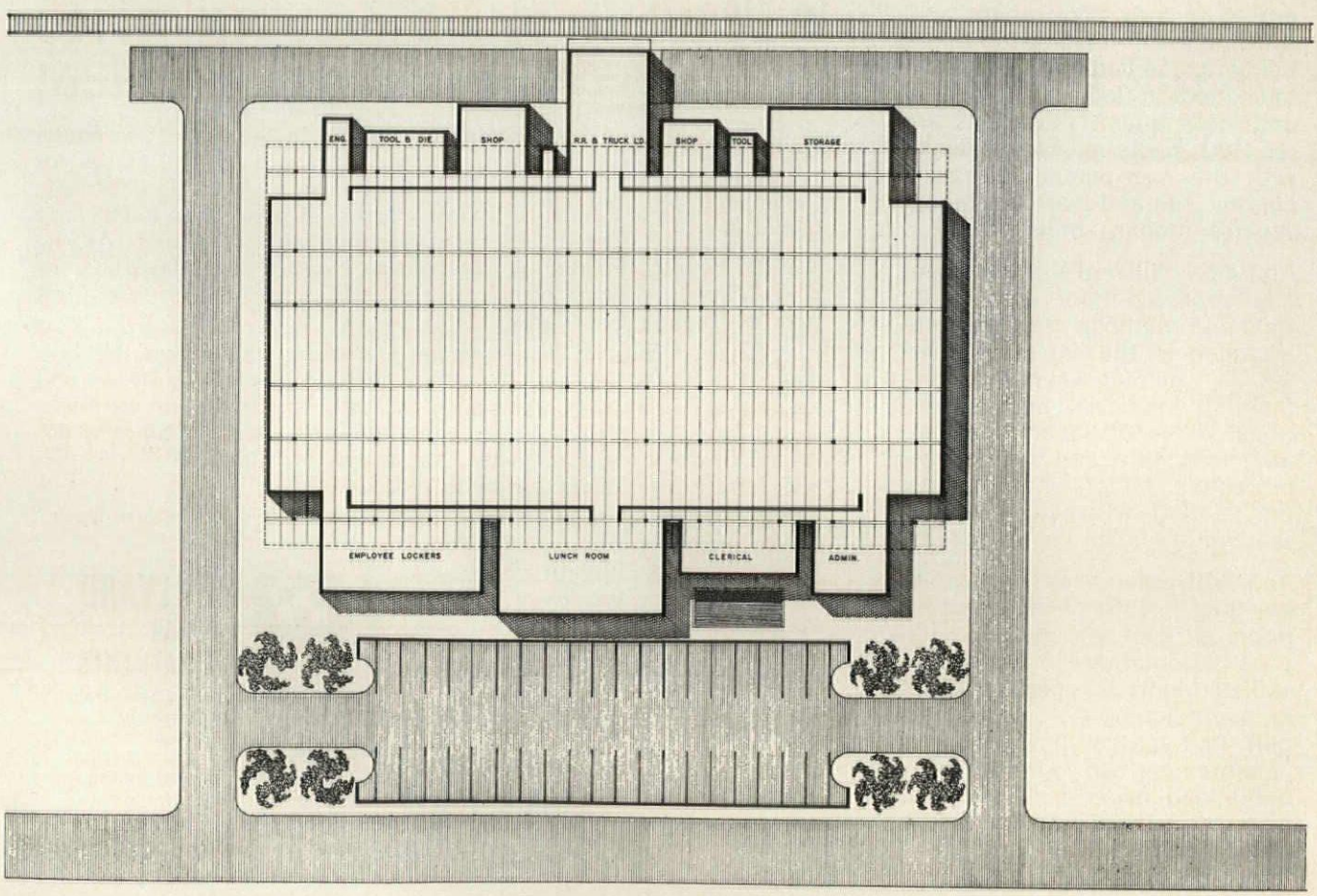
HILLYARD
FLOOR TREATMENTS
St. Joseph, Missouri, U.S.A.
Passaic, New Jersey
San Jose, California

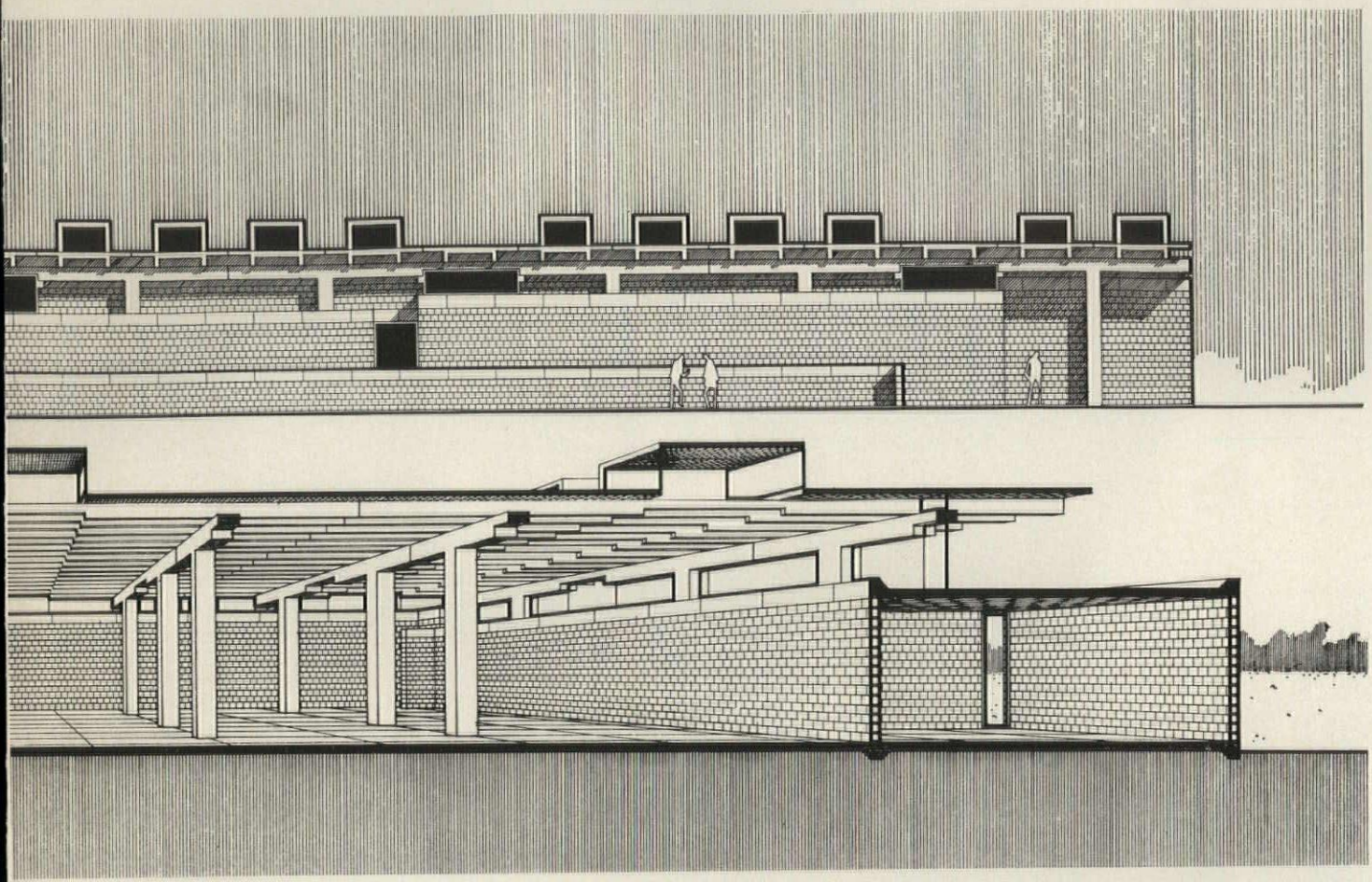
"On your staff, not your payroll"
PROPRIETARY CHEMISTS SINCE 1907

For more information, turn to Reader Service card, circle No. 334

Zonolite prototype building #3; A Factory







This factory in concrete block features both 20′ and 30′ bays; Zonolite Masonry Fill Insulation minimizes its operating costs

Stanley Tigerman of the architectural firm of Tigerman & Koglin, Chicago, designed this factory building. Consulting Engineer Norman Migdal, Chicago, engineered it. Zonolite commissioned it.

It is interesting to note that in spite of the vast, open interior space in relation to the small wall area, Zonolite Masonry Fill Insulation makes an effective contribution toward lowering the heating costs; approximately 10% annually.

As a matter of fact, on an annual basis for the mortgage term, it costs less per sq. ft. of wall to put the material in than leave it out. The annual return on the client's investment in insulation per sq. ft. of wall for the mortgage term is 188% annually! The formula below shows how Mr. Migdal arrived at that figure.

$$100 \times \frac{AHC - AHC - P \times CRF}{P \times CRF} = \%\ \text{return on annual mortgage payment for insulation}$$

$$100 \times \frac{3840.00 - 3200.00 - 2540.00 \times .0872}{2540.00 \times .0872} = 188\%$$

WHERE

AHC = Annual heating cost without Masonry Fill $/YR.
AHC = Annual heating cost with Masonry Fill $/YR.
P = Present cost of insulation $
CRF = Capital recovery factor $= i\ \frac{(1+i)^n}{(1+i)^n - 1} = 0.0872$
i = Interest rate 6%
n = Number of payment periods 20

Block is particularly well suited to the economics of factory construction for another reason; the interior walls can be of exposed block, the same that is exposed on the exterior.

And with Zonolite Masonry Fill Insulation in the block cells, the interior surfaces stay warm and dry (the material is water repellent). Which means that you can paint right over the block without the paint cracking, peeling and blistering.

The installed costs of Zonolite Masonry Fill Insulation are low. They are:

approx. installed costs per sq. ft. of wall	6″ block	8″ block	12″ block
	10¢	13¢	21¢

The installed costs are low for two reasons. First the low initial cost of the material. Second, to install it, you just pour it out of the bag into the block cells until the wall is full.

For more information about this remarkable insulation, write Department PA-93 for Bulletin MF-83, to Zonolite, 135 South LaSalle Street, Chicago 3, Ill.

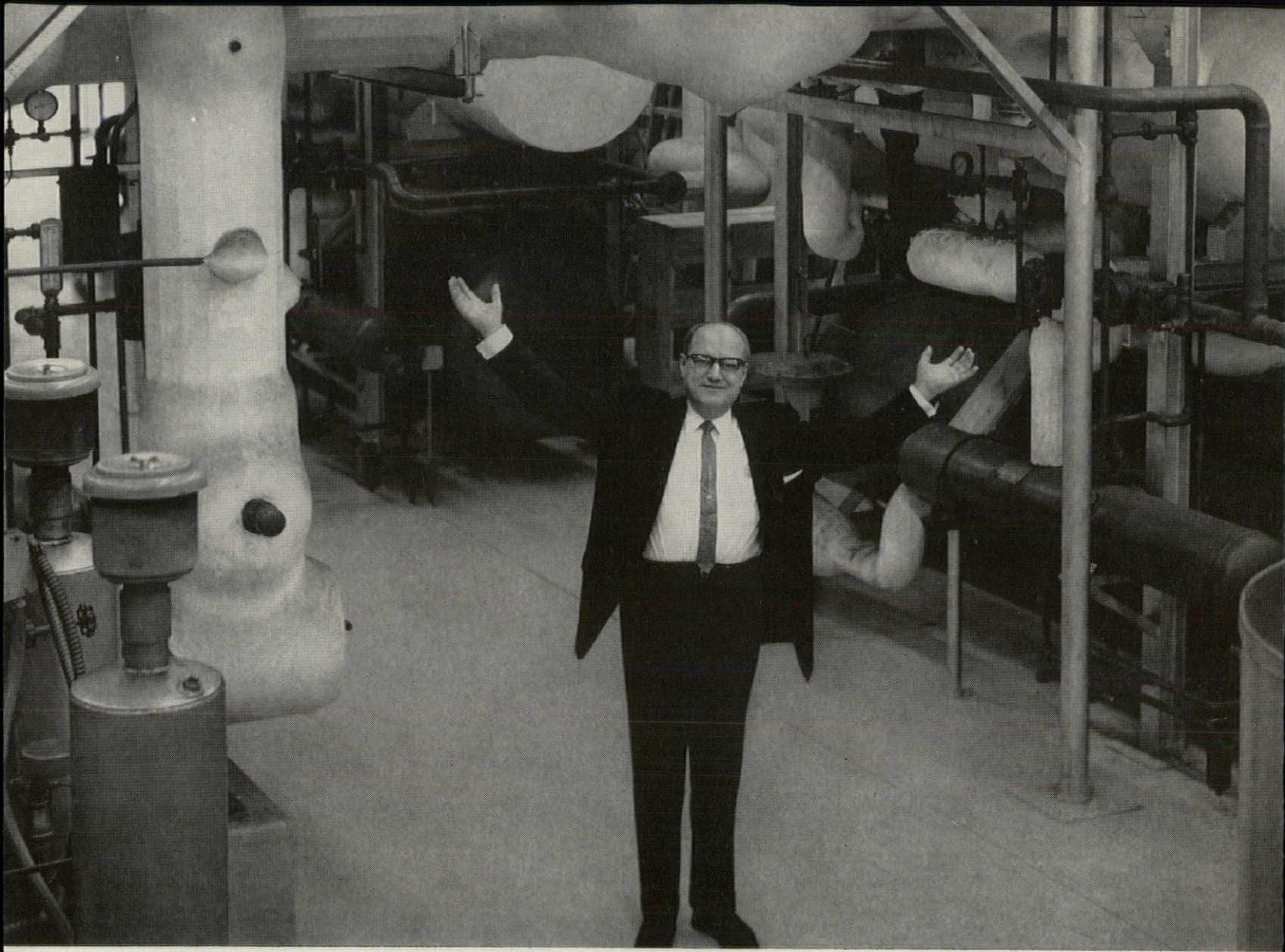
ZONOLITE

GRACE ZONOLITE DIVISION W. R. GRACE & CO.

DESIGN CONDITIONS			WINTER HEAT LOSS IN BTU/HR ASSUMING 70°F INDOOR −10°F OUTDOOR	
	WITHOUT MASONRY FILL	WITH MASONRY FILL	WITHOUT MASONRY FILL	WITH MASONRY FILL
TRANSMISSION LOSSES	2″ EDGE INSULATION DOUBLE GLASS 6″ CONC. ROOF 3″ INSULATION		501,000	**501,000**
VENTILATION & INFILTRATION	15,540 CFM		1,354,000	**1,354,000**
WALL	8″ LT. WT. CONC. BLOCK	8″ LT. WT. CONC. BLOCK WITH FILL	520,000	**266,000**
TOTALS	—	—	2,375,000	**2,121,000**
SAVINGS WITH MASONRY FILL	—	—	**% SAVINGS** $\frac{2,375,000 - 2,121,000}{2,375,000} =$ **10.7%**	

1. Operating costs are reduced by approximately $640.00 per year. First cost of insulation ($2,540.00) can be paid off in less than 4 years.*
**Based on six 113 degree days. Gas at 10 cents per therm. 50 hrs./week ventilation system operation.*

For more information, turn to Reader Service card, circle No. 385



"OUR 640-TON ELECTRIC HEAT PUMP will keep our entire 220,000-square-foot plant and offices at 70° year-round, regardless of outside temperatures," says Frank Flick.

"TOTAL ELECTRIC SPACE CONDITIONING FOR OUR PLANT WAS THE BEST RECOMMENDATION OUR ARCHITECT MADE"

Frank Flick, President of Flick-Reedy Corp., Bensenville, Illinois, reports on the advantages of using flameless electricity as a single source of energy for all plant heating, cooling and lighting

"Without any doubt, one of the most important new design elements in our new Flick-Reedy plant is total electric space conditioning," reports President Frank Flick. "By following our architect's recommendation and using electricity as our only source of power, we have obtained a markedly more efficient operation.

"Greater plant cleanliness, for example, has enabled us to improve the quality of the hydraulic cylinders and sealing fittings manufactured by our two divisions. And automatic year-round air conditioning—with heating and cooling both provided by our electric heat pump—has resulted in a sharp drop in absenteeism and a consequent increase in production.

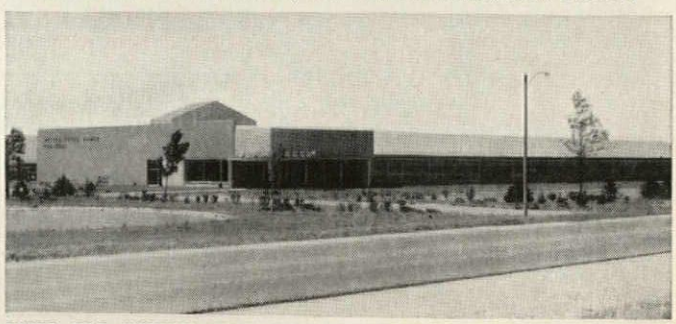
"On the basis of our own experience here at Flick-Reedy, I would strongly recommend that anyone involved in industrial design look into the advantages of total electric space conditioning as soon as possible."

For architects and consulting engineers, total electric space conditioning offers the modern method for combining heating, cooling and lighting into one efficient operation using a single source of energy. In many cases, recommended lighting levels can provide a substantial part of the heat as well, thereby reducing the size, space requirements, and cost of heating equipment.

If you are interested in finding out ways in which total electric space conditioning can help you in the design of industrial and commercial buildings, contact your local electric utility company. They will welcome the opportunity to work with you.

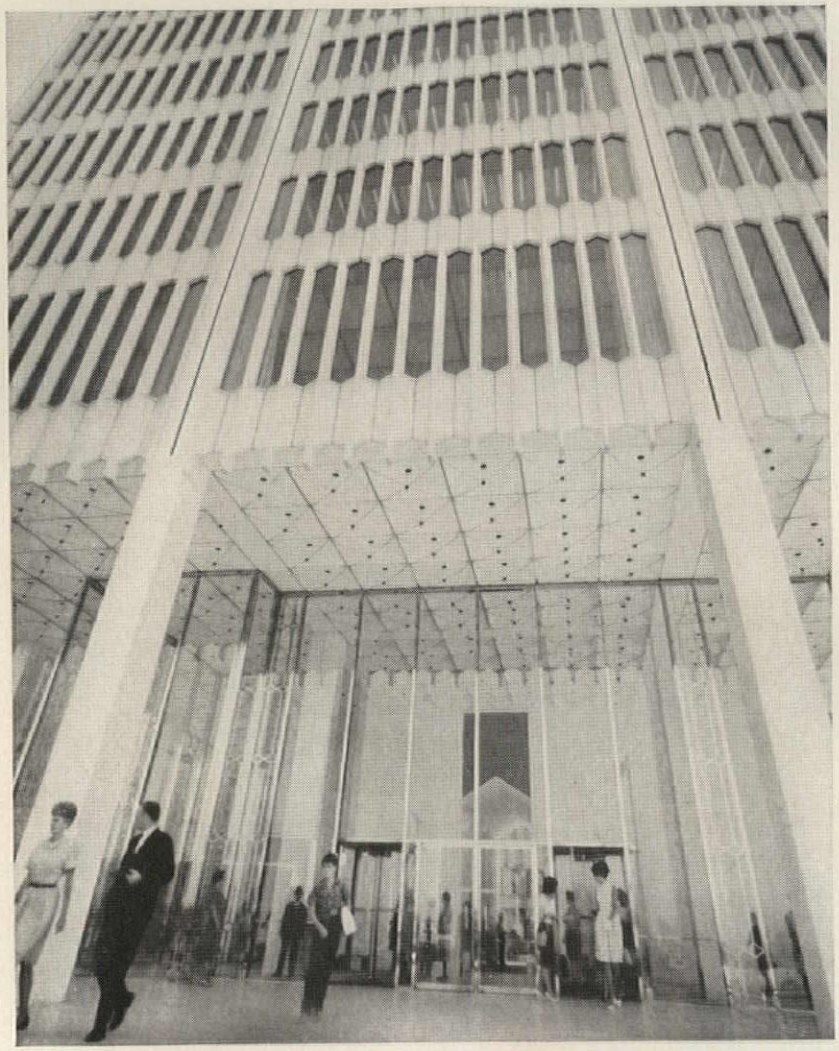
BUILD BETTER ELECTRICALLY

Edison Electric Institute, 750 Third Avenue, New York 17

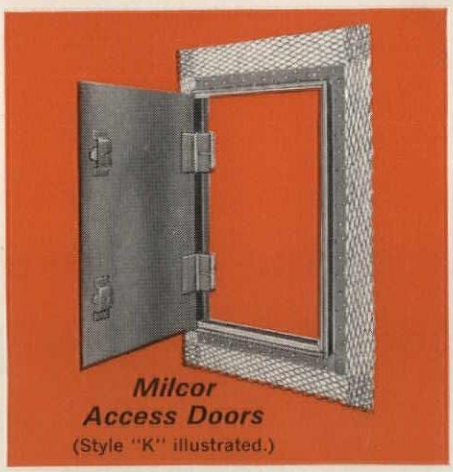


CITED FOR "IMAGINATIVE BOLDNESS," the award-winning Flick-Reedy plant features total electric design. Architect-engineering firm was Zay Smith & Associates, La Grange, Illinois.

For more information, turn to Reader Service card, circle No. 326



In Detroit's 28-story Michigan Consolidated Gas Company shown here — and in buildings stretching across the Nation's skyline—Milcor Steel Access Doors provide service openings without encroaching upon design.



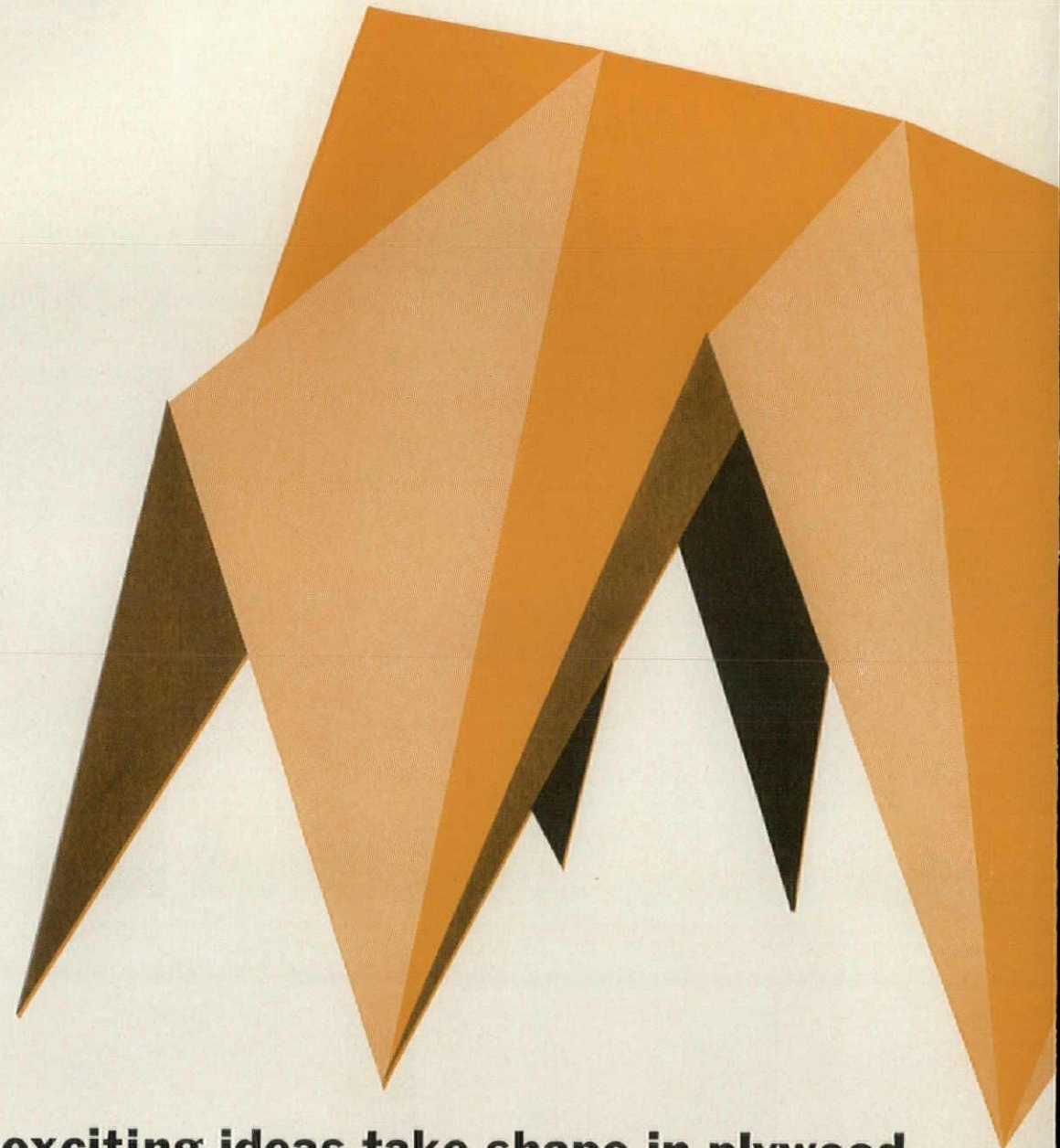
Milcor
Access Doors
(Style "K" illustrated.)

Known for the company — and beauty — they keep. In this, his first skyscraper, Minoru Yamasaki has availed himself of the beauty of plaster walls and ceilings. Milcor Steel Access Doors finished flush with the surrounding plane keep service openings inconspicuous. ■ Only Milcor Access Doors have casing beads on their frames. These provide protective plaster terminals and serve as grounds for better plastering. You are assured of a clean, straight-line connection with the plaster. ■ There are five styles of Milcor Steel Access Doors — 17 sizes — each suited to a particular surface. All are constructed rigidly; they install economically, require minimum maintenance. See Sweet's section 16 k/In, or write for Catalog 210.

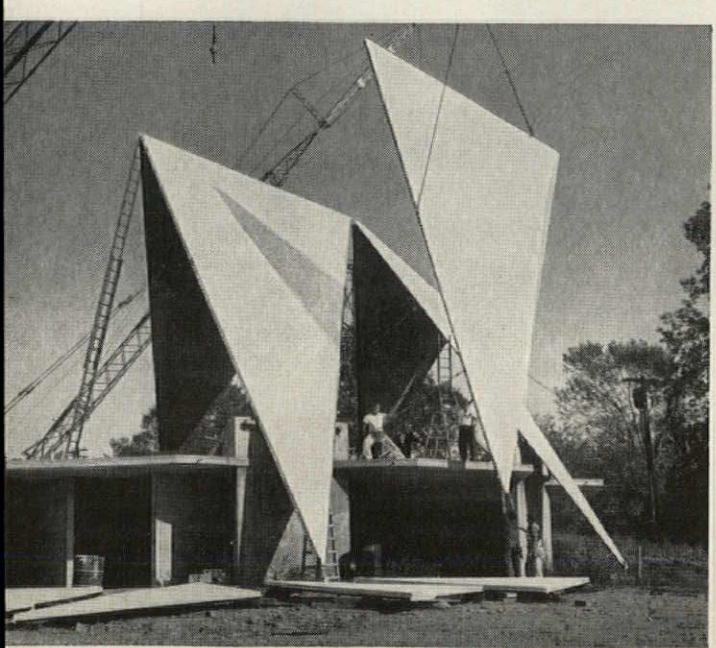
MILCOR®

Inland Steel Products Company DEPT. I, 4069 WEST BURNHAM STREET, MILWAUKEE 1, WIS.
BALTIMORE 5, BUFFALO 11, CHICAGO 9, CINCINNATI 25, CLEVELAND 14, DETROIT 2, KANSAS CITY 41, MO., LOS ANGELES 58, NEW YORK 17, ST. LOUIS 10, SAN FRANCISCO 3
BS-2

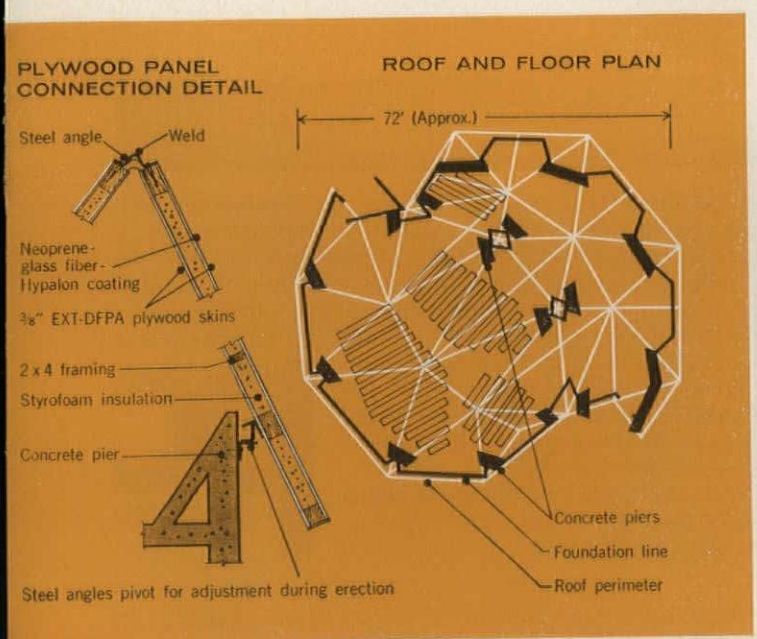
For more information, turn to Reader Service card, circle No. 337



the most exciting ideas take shape in plywood



UNITED CHURCH OF WEST NORWALK, CONN. / VICTOR CHRIST-JANER & ASSOCIATES, ARCHITECT / ROBERT DAMORA, ASSOC. ARCH. / WERNER-JENSEN & KORST, ENGINEERS



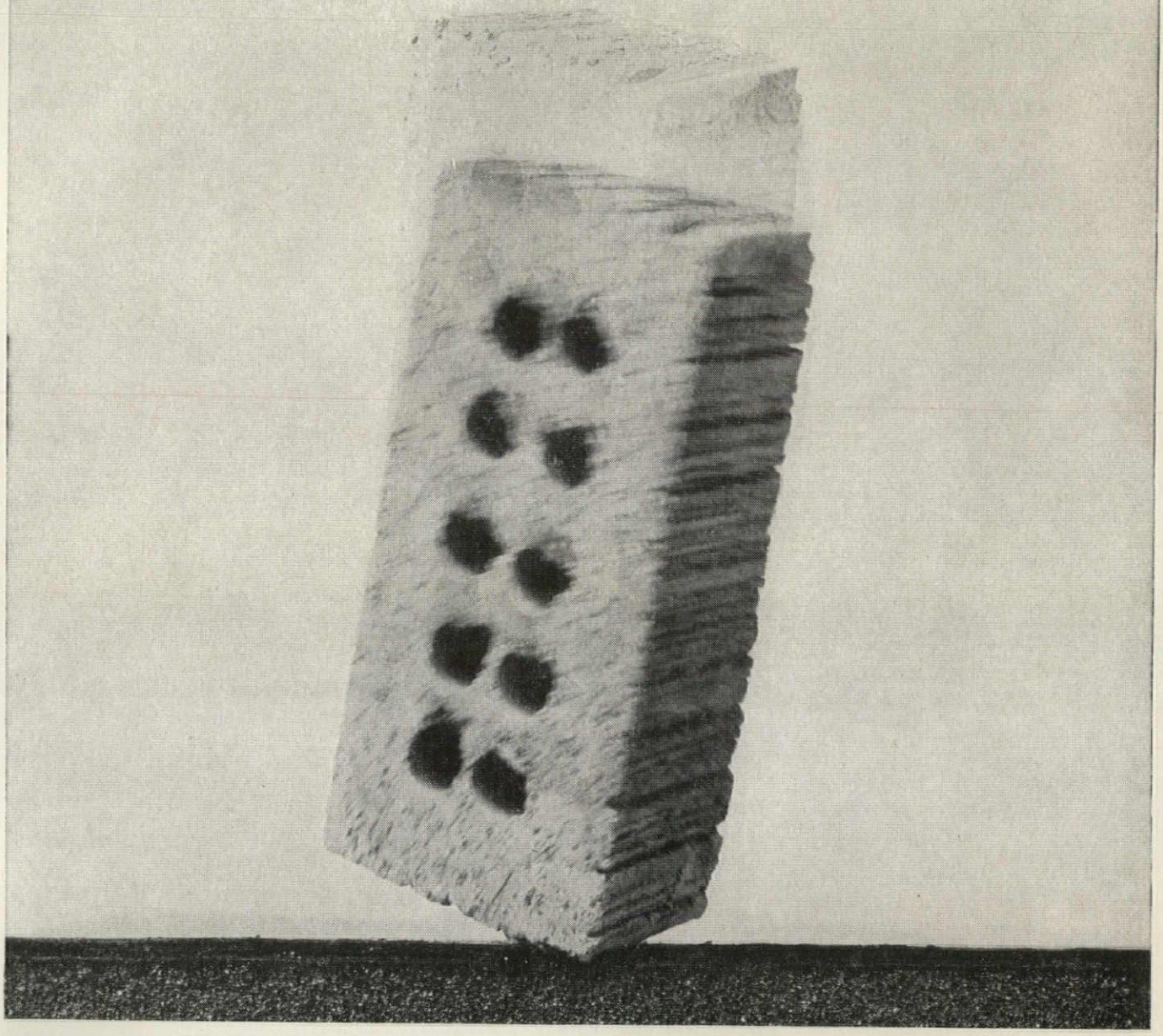
The soaring canopy of this church demonstrates again how modern plywood technology can turn a sophisticated design into practical reality. ■ Perhaps the most complex plywood space plane yet built, it is actually a variation of the folded plate. The roof becomes self-supporting by the interaction of inclined diaphragms—in this case 42 triangular stressed skin plywood panels. It shelters 5,000 sq. ft. and rises to 35 ft. at two points. ■ Plywood's size, strength and adaptability to precise fabrication made it possible to execute the design within a tight budget, and to erect the entire roof in seven working days. For more information on plywood folded plate systems, write (USA only) Douglas Fir Plywood Association, Tacoma 2, Wash.

DFPA® TESTED QUALITY PLYWOOD

ALWAYS SPECIFY BY DFPA TRADEMARKS

For more information, turn to Reader Service card, circle No. 322

CATCH IT! BEFORE IT RUINS YOUR CLIENT'S ROOF



Picture it. The roof's down on your client's building. A workman carrying bricks for further construction above it drops one from a ladder or scaffold. Wham! It punctures the roofing. What happens to the insulation the next time it rains?

It depends. If it's FOAMGLAS,® there's nothing to worry about. The insulation value won't change.

And we guarantee this kind of security for 20 years, in writing, without charge to your client.

You see, FOAMGLAS stays dry indefinitely. Its sealed glass cells can't absorb moisture. That's pretty comforting when you consider the 101 human errors that can damage a roof. Things like ladders, wheels, heels, knives, tools, and pipe can all cause punctures that go undetected until it's too late. Next thing you know the insulation's wet. You may have to replace the whole roofing system.

Considering the added value of *constant* thermal efficiency in reducing the investment in air conditioning equipment and in cutting operating costs, you'll do your client a service that lasts the life of the building if you specify FOAMGLAS Roof Insulation.

Write today for your sample of the FOAMGLAS guarantee. Remember, it will be like money in the bank when we're asked to sign it.

Write to Pittsburgh Corning Corporation, Box AB-93, One Gateway Center, Pittsburgh 22, Pa.

PITTSBURGH® CORNING

For more information, turn to Reader Service card, circle No. 363

PROVED AND PREFERRED

*PATHFINDER miller

The original long-life exit sign

Lighted exit signs used to be considered necessary evils, required by code, but bulky and ugly. Then in June 1962 PathFinder was introduced by Miller . . . the first lighted sign with both decor possibilities and long life. Acceptance has been rapid. "PathFinder" has been showing up in specification after specification . . . building after building. Here's why:

DIE-CAST ALUMINUM is used for all housings and door frame assemblies for a near-perfect blend of attractiveness and function.

A BRUSHED SATIN FINISH with a clear lacquer coating is applied by hand for a soft, unobtrusive beauty.

AMPLE BRIGHTNESS far exceeds code requirements. Colors used for sign faces are permanent and not garish.

COMPACT HOUSING tapers from 1⅞" to about 1". Twin face units utilize same slender housing as single face units and require but one wiring assembly and one set of lamps.

LAMP LIFE IS GUARANTEED for 50,000 hours of continuous burning (normal usage). Annual operating costs are less than 1/5 that of conventional units. Initial cost is surprisingly low. Replacement lamps are readily available.

HINGED DOORS provide easy access for installation and maintenance. There are no screws to remove, no back plates to take off, no panels to pry out.

COMPLETE LINE

The PathFinder line includes stencil and luminous field units for six mountings: recessed, back, top, end, pendant, triangular; a choice of red or green letters or background; directional arrows; down lights. Wiring to meet any emergency circuiting requirement can be provided. PathFinder units for 277 volt operation are also available. Write Dept. PF963 for complete information. *TM

miller LIGHTING SINCE 1844

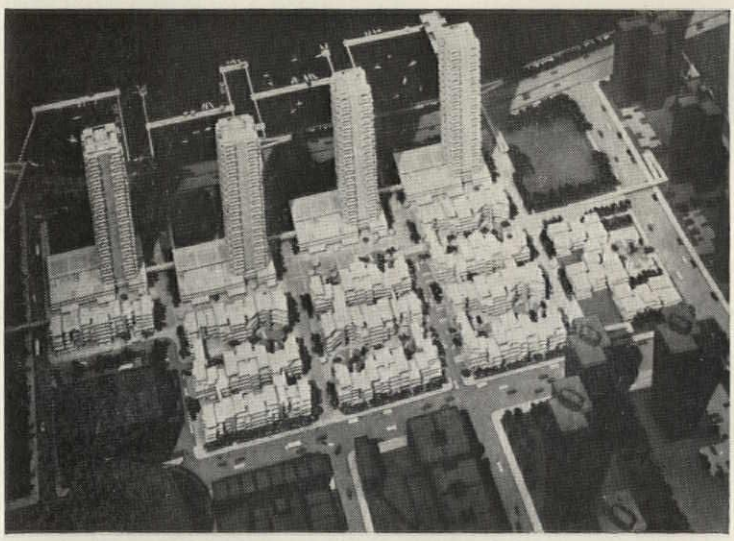
THE miller COMPANY
MERIDEN, CONNECTICUT • UTICA, OHIO

For more information, circle No. 404

The RUBEROID Co. announces the

$25,000

New York City's East River Urban Renewal Project



Prospective of First Prize Concept—"a lively treatment of the facades on the low height streets culminating toward the river in four towers"...

In Ruberoid's Fifth Competition, conducted with the co-operation of the City of New York's Housing and Redevelopment Board, the attention of the architectural profession was directed to one of the nation's major problems—Urban Middle Income Housing. For this problem the City provided an actual site in Manhattan's East Harlem area and cooperated with Ruberoid in developing the Competition program. The City Housing Board also agreed to exert every effort on behalf of the winning concept for use in building the project.

Professional interest and participation reached a new high in the history of Ruberoid's architectural competitions. The opinion of the Competition Jury was that important new ground was broken by the winning awards in a challenging area of American life. It felt also that many of the ideas presented will be brought into existence and make a contribution to housing of the future.

The winning designs will be reproduced in a brochure later this year. For a copy write to The Ruberoid Co. on your letterhead.

THE DISTINGUISHED JURY that selected the winners (Left to Right)

- Herbert J. Gans, Research Assoc. Prof. of City Planning Inst. for Urban Studies and Dept. of City Planning. University of Pennsylvania, Phila., Pa.
- David A. Crane, A.I.A., Dir. of Land Planning and Design, Boston Redevelopment Authority, Boston, Mass.
- Lewis E. Kitchen, Lewis Kitchen Realty Co., Specialist in urban redevelopment; Kansas City, Mo.
- Albert Mayer, F.A.I.A., Chairman of Jurors, eminent architect and consultant, specialist in town, city and rural planning and development, New York, N. Y.
- Sir Leslie Martin, F.R.I.B.A., Prof. of Architecture, Univ. of Cambridge, England, Past Vice-Pres. Royal Inst. of Architects, leader in urban planning and redevelopment.
- Milton Mollen, Chairman of Housing and Redevelopment Board of City of New York, eminent lawyer.
- Harry Weese, F.A.I.A. widely experienced engineer, architect, and community planner, Chicago, Ill.
- B. Sumner Gruzen, F.A.I.A. (not shown) professional advisor to Competition, leading architect and engineer, Principal of Kelly & Gruzen, New York, N. Y.

Fifth Annual Design Competition

AWARDS

GRAND NATIONAL AWARDS

FIRST PRIZE $10,000	Thomas H. Hodne, A.I.A., James McBurney, Kermit Crouch, Robert Einsweiler, A.I.P., James Solverson, Vern Svedberg and Tokiaki Toyama	Hodne Associates Minneapolis 14, Minn.
SECOND PRIZE $5,000	Felix J. Martorano	Shreve, Lamb & Harmon, New York, N. Y.
	Ricardo Scofidio Edvin K. Stromston	Richard G. Stein, New York, N. Y.
THIRD PRIZE $2,500	Amiel Vassilovski Hanford Yang	Pedersen & Tilney, Boston, Mass.

(6) MERIT AWARDS $500 EACH

1.	Ena M. Dubnoff, Richard K. Fleming, Eugene P. Flores, Ellis D. Gelman, Lewis A. Greenberg	Dubnoff, Fleming, Flores, Gelman & Greenberg Los Angeles 4, Calif.
2.	R. E. Alexander, FAIA, C. R. Wojciechowski	Robert E. Alexander & Assoc., Los Angeles, Calif.
	Paul R. Drag	William L. Pereira & Assoc., Los Angeles, Calif.
3.	John Dollard	Huntington, Darbee & Dollard, Hartford, Conn.
	Tai Soo Kim	Philip Johnson Assoc., New York, N. Y.
4.	Robert W. Brantingham, Thomas J. Eyerman, Thomas O. Schnell, Robert N. Wandel	Ohio State University, Columbus 1, Ohio
5.	Joseph J. Schiffer	Joseph J. Schiffer, Concord, Mass.
6.	Thomas E. Selck George C. Winterowd, Assoc. Prof. of Arch.	Miami University, Oxford, Ohio

SPECIAL STUDENT AWARDS

FIRST PRIZE $2,000	Robert P. Holmes Robert L. Wright	University of Illinois Urbana, Illinois
SECOND PRIZE $1,000	Michael Wurmfeld	Princeton University Princeton, New Jersey
THIRD PRIZE $500	Woodrow W. Jones, Jr. Gerrard E. Raymond Philip A. Shive	North Carolina State College Raleigh, North Carolina

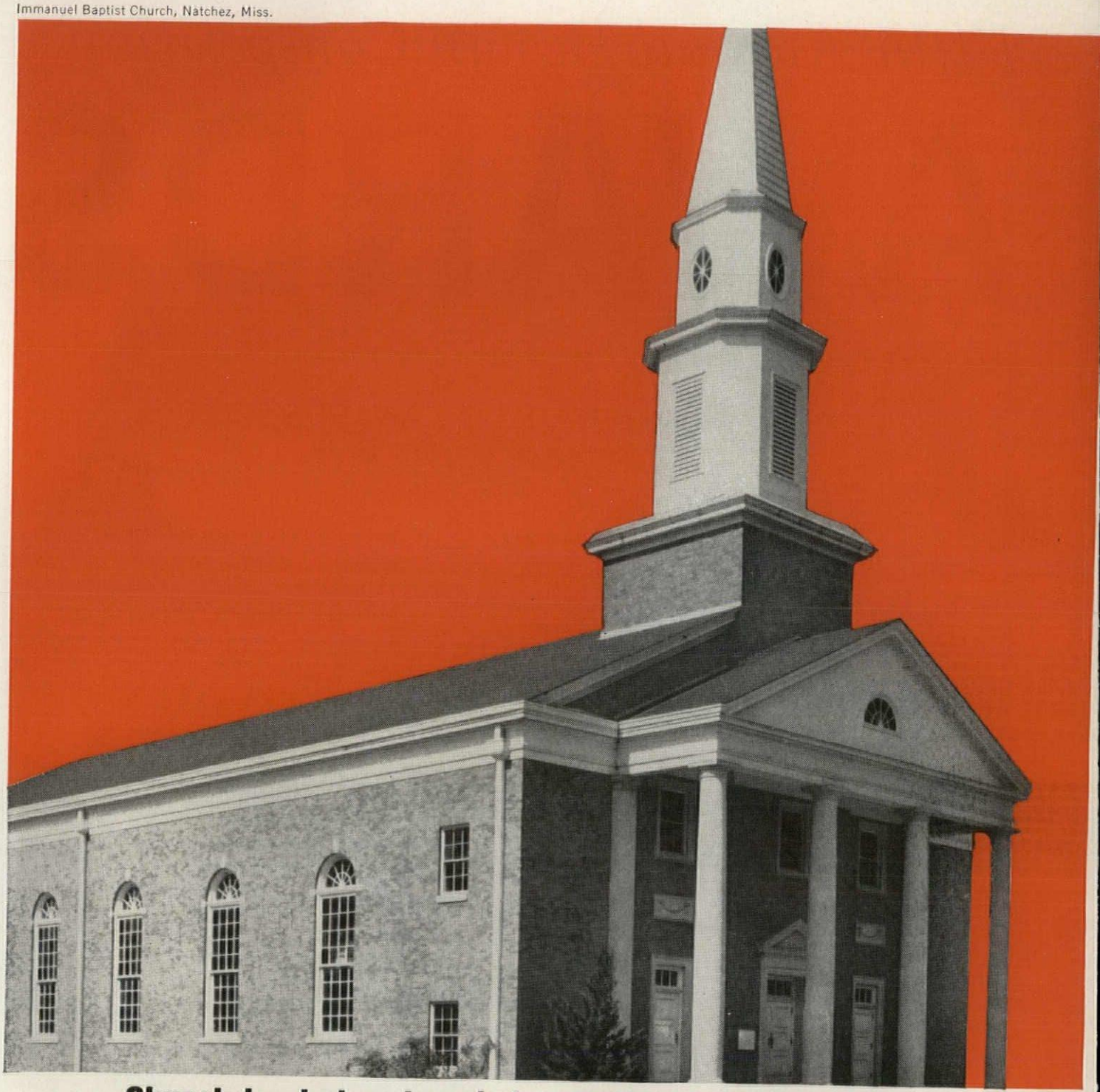
(4) MERIT AWARDS $250 EACH

1.	Peter R. Bromer	Rensselaer Polytechnic Institute, Troy, New York
2.	John D. Duell, David S. Traub, Jr.	University of Illinois, Urbana, Illinois
3.	Iwao Onuma	University of Southern Calif., Los Angeles, Calif.
4.	J. Stroud Watson, Jr.	University of Illinois, Urbana, Illinois

RUBEROID®

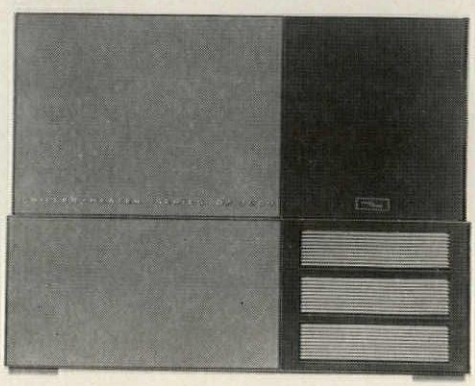
The RUBEROID Co., 733 Third Ave., New York 17, N. Y.
Manufacturers of RUBEROID Floor Tile and RUBEROID Building Products

Immanuel Baptist Church, Natchez, Miss.



Church heated and cooled...

(by Gas)



First Presbyterian Church, Natchez, Miss.

Church cooled and heated!

(by Gas)

Arkla's DF-3000 unit—the first large tonnage air conditioner that both heats and cools—was chosen by two churches in Natchez, on the hot, humid banks of the Mississippi River, for one outstanding advantage: rockbottom operating costs. Why? It has no moving parts to repair or replace. Heats and cools automatically—no boiler, no compressor. Sealed for life, requires no lubrication. Uses the quiet, efficient and economical fuel—Gas. For more facts on how the Arkla DF-3000 cuts operating costs, call your local Gas Company. Or write: Arkla Air Conditioning Co., General Sales Office, 812 Main Street, Little Rock, Ark.

AMERICAN GAS ASSOCIATION, INC.

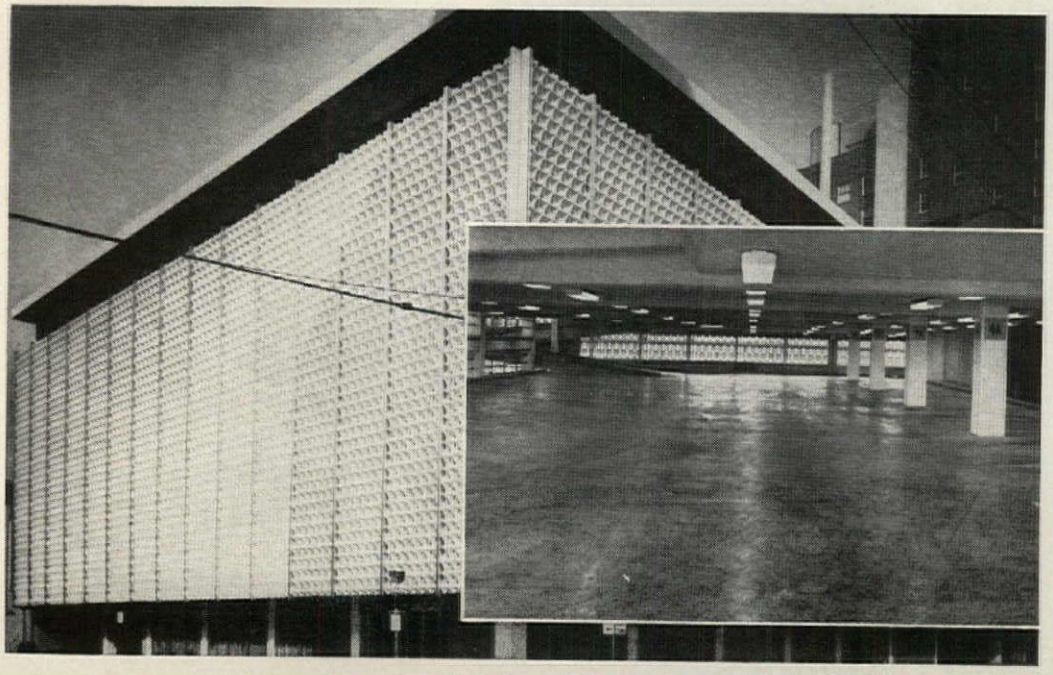
For heating & cooling Gas is good business

For more information, turn to Reader Service card, circle No. 406

A. C. HORN

FLOOR MATERIALS

Horn A. E. Dispersed Black adds tone to ramps and floors of Beaumont bank



DAREX HORN
A. C. Horn Products

SINCE AS FAR BACK as 1897, A. C. Horn has been another way of saying quality and dependability in construction and maintenance products.

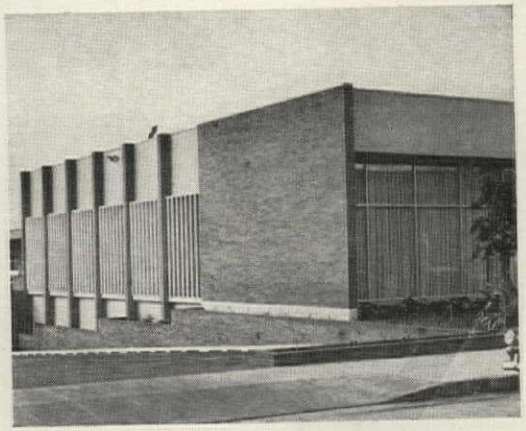
Horn product lines you hear most about include CAULKS and SEALANTS, FLOOR MATERIALS, ADMIXTURES, WATERPROOFING and ROOFING MATERIALS, ADHESIVES and BONDING AGENTS, TECHNICAL COATINGS and SPECIALTY PRODUCTS.

There are more than 200 time-tested and performance-proved products available from Horn. Chances are you will find one specifically designed to meet your particular construction or maintenance requirements. The man from Horn is ready to work with you – contact him through the nearest regional office listed below.

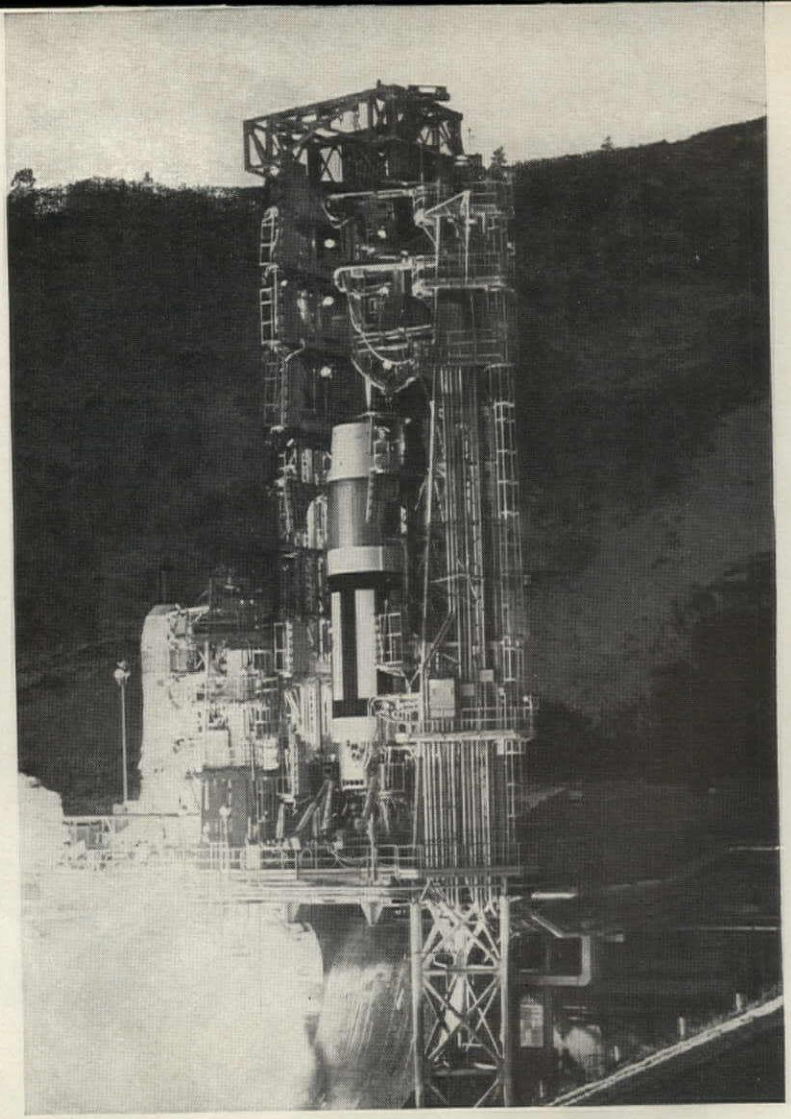
Pre-cast solar screens keynote the structural elegance of the new $3,500,000 First Security National Bank building in Beaumont, Texas. Floors and ramps of interior parking areas reflect it further, with the help of HORN A.E. DISPERSED BLACK. Some 16,000 pounds of this liquid Horn tinting agent were used to make the concrete flooring an attractive tone of grey, permitting color contrast for space markings and effectively camouflaging stains and tire tracks. Easy-to-use A. E. DISPERSED BLACK permits any degree of intensified tonal value from light grey to solid black. It will not alter compressive and flexural strength nor affect air entrainment in concrete. HORN THIOPOXY 62 CONCRETE ADHESIVE and several types of Horn sealants were also used in the Beaumont structure. Architects: Pitts, Mebane & Phelps. Contractor: Thad Dederick Construction Co.

(Horn also features well-known Colorundum dust-on colorant and hardener for floors, walks and driveways, as well as integrally-mixed Staybrite colors for blocks, panels, poured concrete).

Horn Duraflor helps streamline Swingline floor care. At the well-kept Long Island City plant of Swingline Staplers, major importance is attached to efficient maintenance of floors. Critical floor areas—subject to oil or acid spillage and heavy abrasive traffic—are treated with chemical and acid-resisting HORN DURAFLOR epoxy coating. Less critical areas are decorated and protected with Horn floor enamels. Meanwhile, HORN THIOPOXY 60 TOPPING and PATCHING COMPOUND is used to keep all concrete flooring in good repair.



Horn Colorundum stars in floor show at Los Angeles Chamber of Commerce. Colorful concrete floors reflecting a colorful community image were specified for the Los Angeles Chamber of Commerce building in the form of decorative HORN COLORUNDUM. Easily dusted-on COLORUNDUM provides a bright, permanent coloration. At the same time it helps produce a hard, abrasion-resistant surface, thus enhancing both the function and appearance of the structure. Architects: Heitschmidt and Thompson. Contractor: T-S Construction Company.



Horn Tread-Sure skid-proofs loading ramps at Martin missile site. Safety underfoot is a vital factor on the loading ramps of Martin-Denver's missile test stands in the hills of Colorado. That's why HORN TREAD-SURE got the skid-preventing job. This plastic, abrasive-filled brush coating is as easy to apply as paint. It provides a heavy, slip-resistant finish that makes both floors and safety records *stand up* in the face of oil, grease or acid. Also used at the Martin-Denver missile complex was HORN SUPER-BONDSIT in concrete toppings for leveling administration building floors. And HORN DURAFLOR was chosen as an acid and abrasion-resistant finish for the plating room. Inside and out some half-dozen other well-known Horn products were specified to keep the missile site moisture-free and weather-tight.

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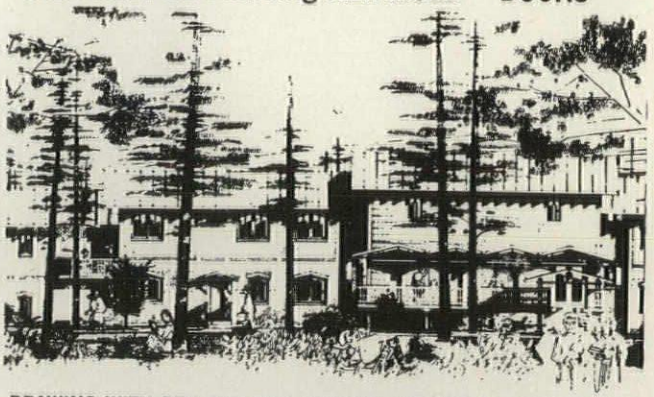

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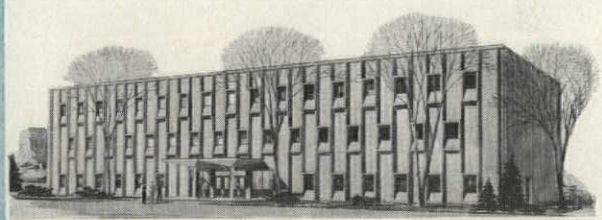

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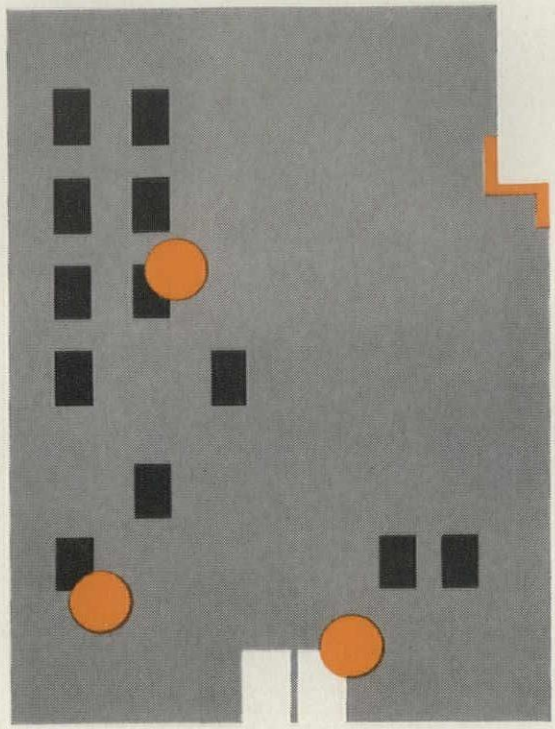

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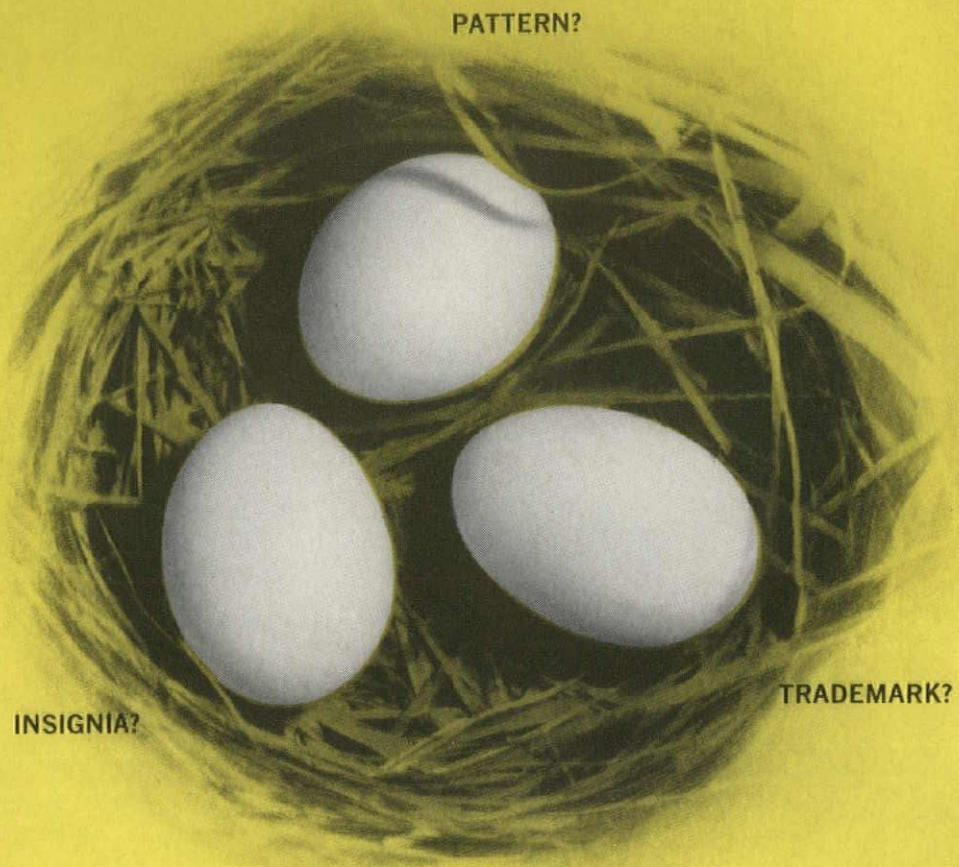

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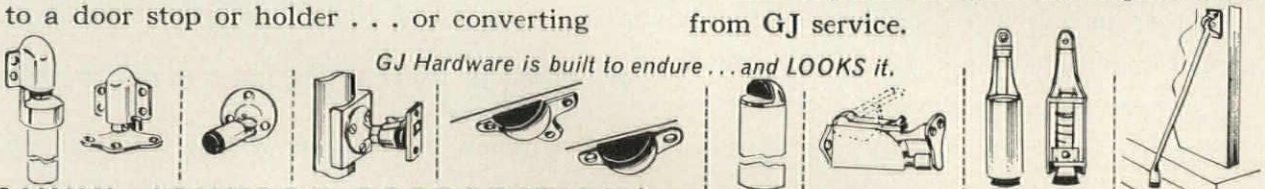

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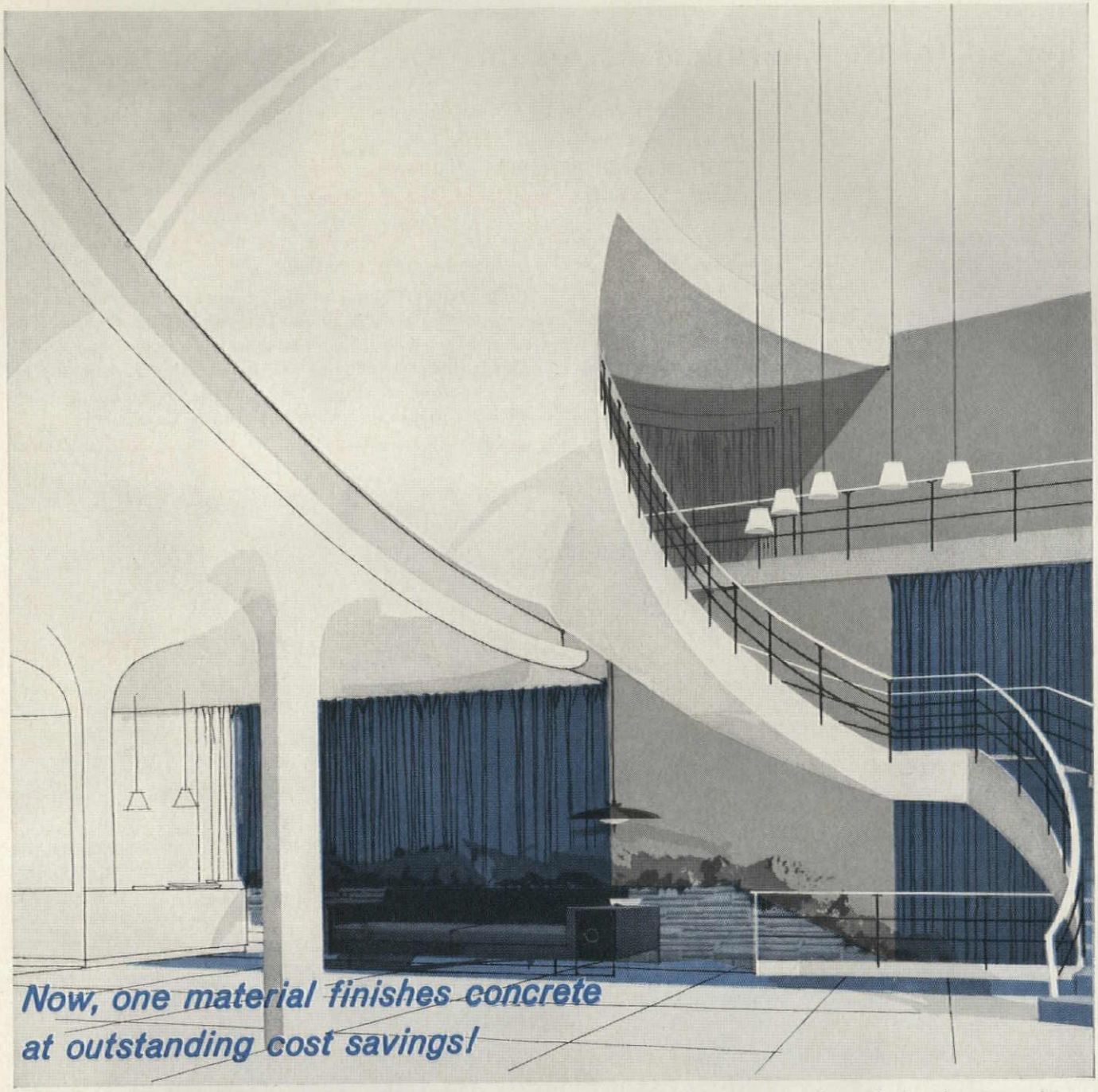

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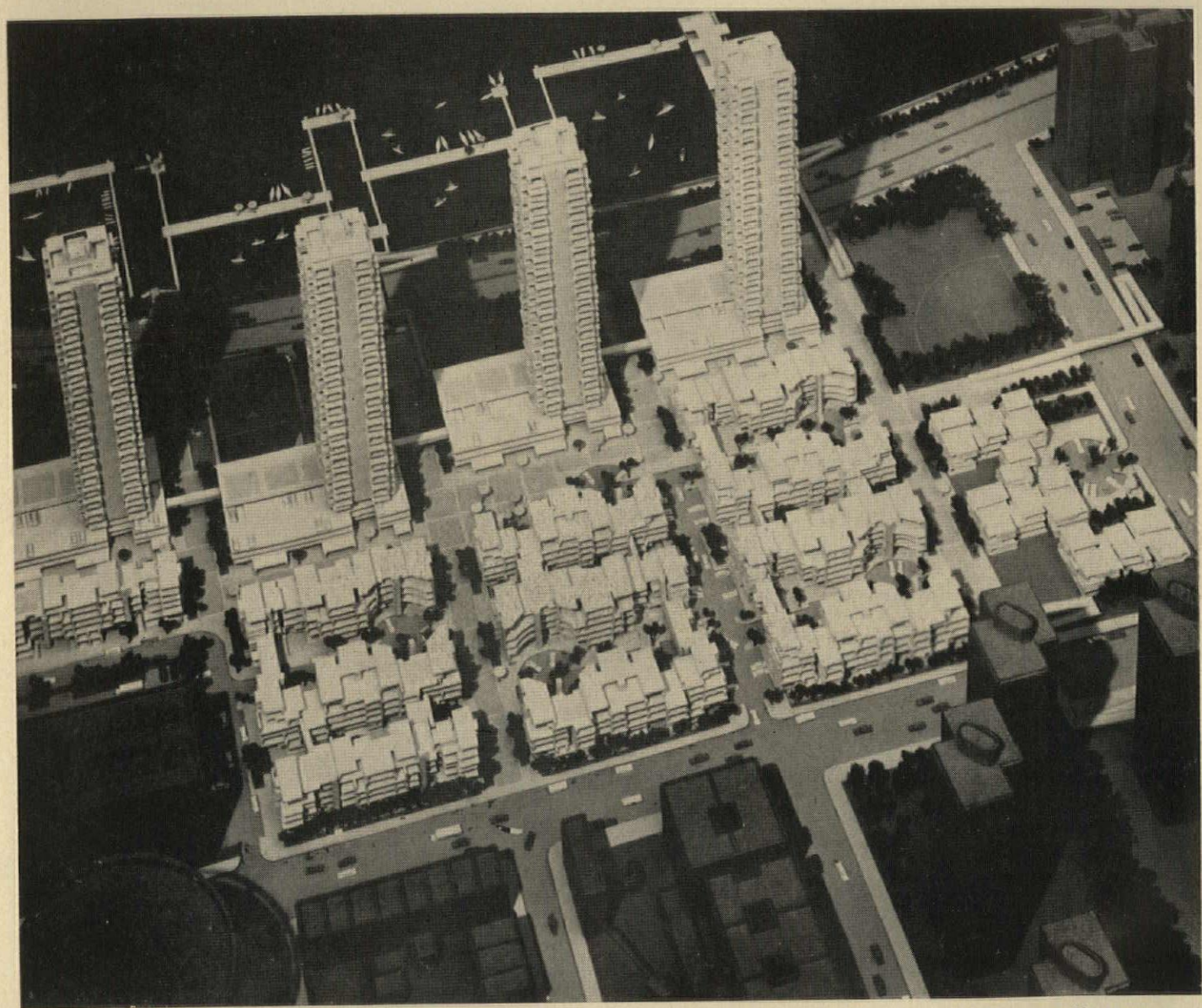
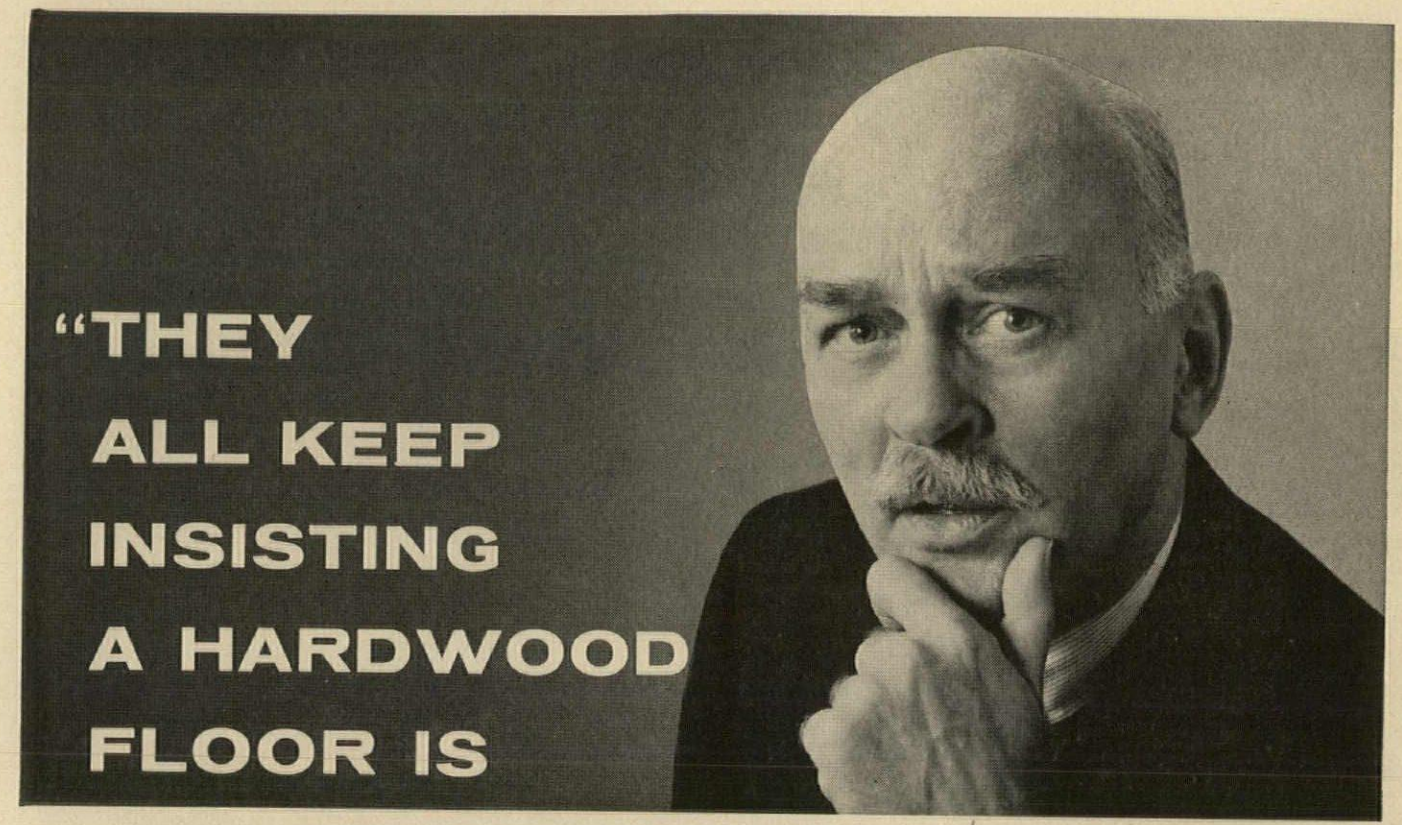


Housing design for New York's East Harlem riverfront wins Ruberoid Competition first prize for Minneapolis team.



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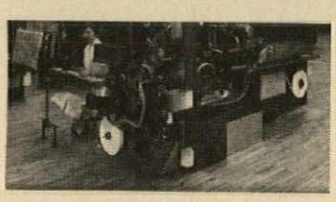

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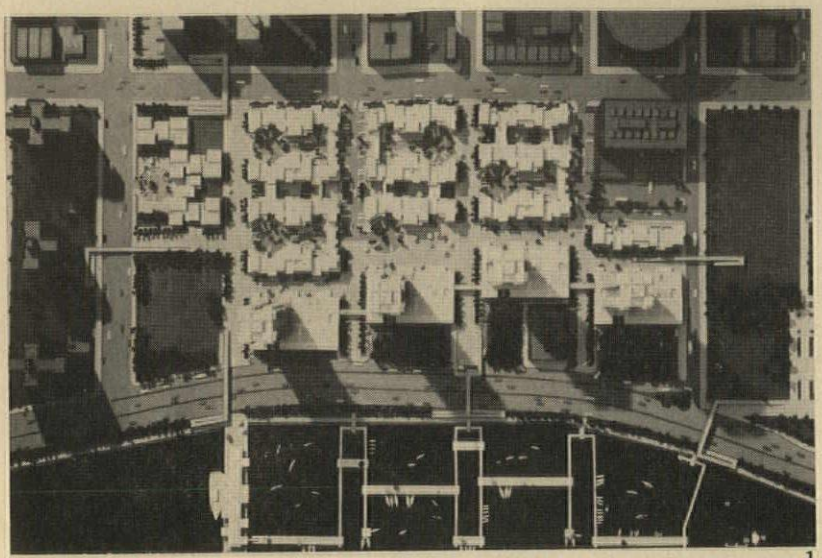

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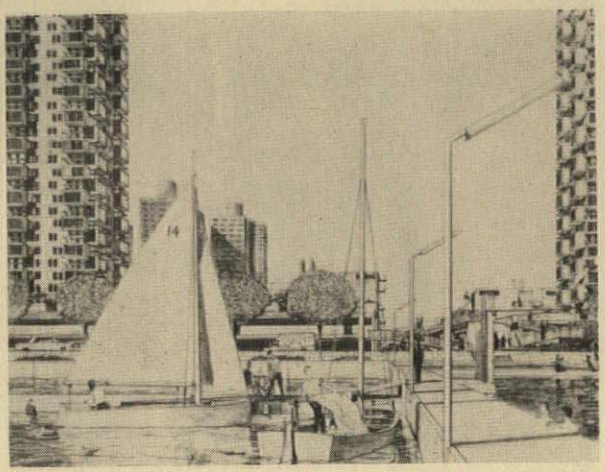

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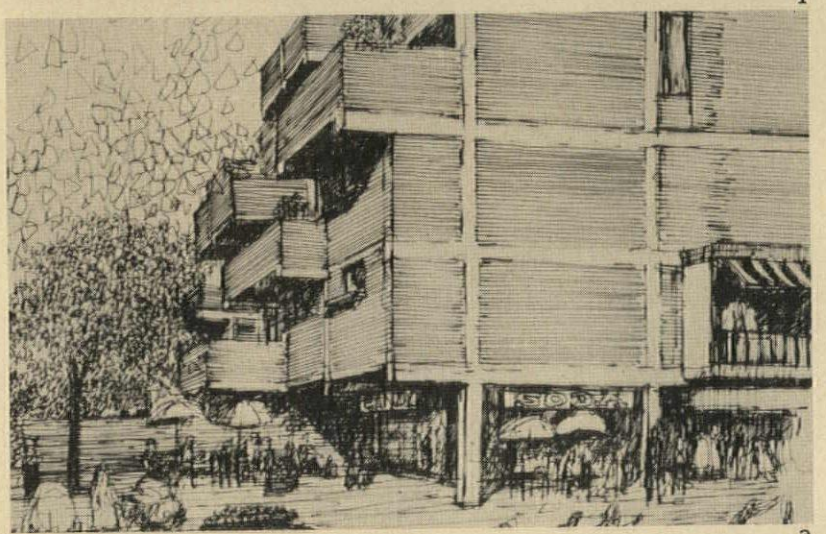

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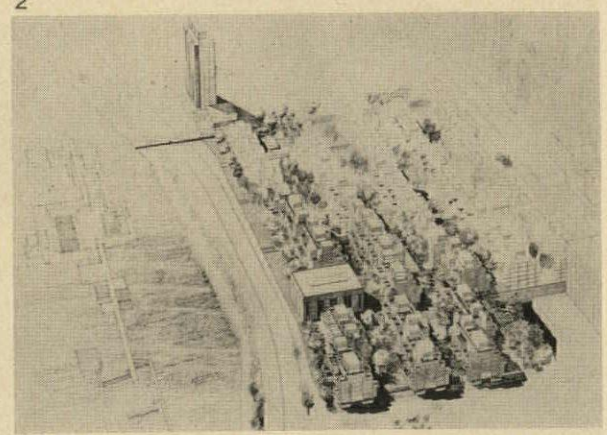

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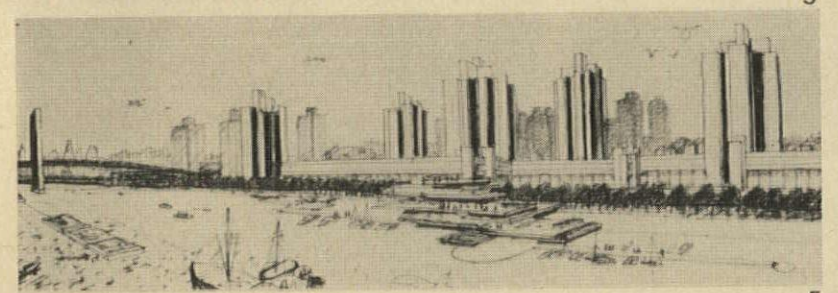

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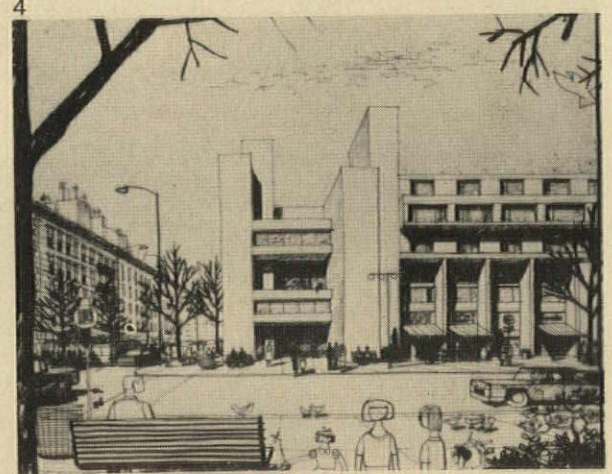

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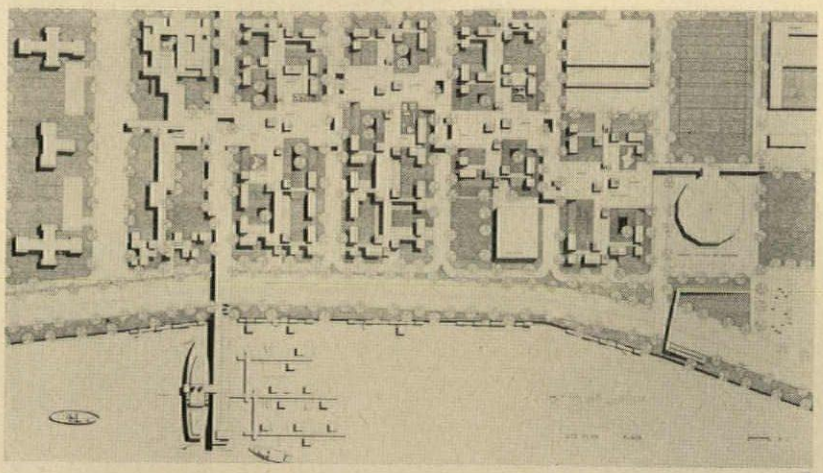
Minneapolitans Win Ruberoid Competition

NEW YORK, N.Y. A team of architects from Minneapolis has been announced as winner of top honors in the 5th Annual $25,000 Architectural Competion of the Ruberoid Company. This was the most closely followed of all the company's competitions, since the problem dealt with a real redevelopment problem on New York's Upper East Side, and the city government has given assurances that the winning proposal will be given close consideration when the time arrives for construction of the actual project. Jury for the competition was composed of architects Sir Leslie Martin, Albert Mayer, and Harry Weese; Herbert J. Gans, city planning associate professor at University of Pennsylvania; David A. Crane, director of land planning and design of the Boston Redevelopment Authority; Lewis E. Kitchen, president of his own Kansas City realty company; and Milton Mollen, chairman of the New York City Housing and Redevelopment Board. Architect B. Sumner Gruzen, professional advisor to the competition, proposed the program and the jury.

The winning scheme (1,2) by Thomas H. Hodne, Kermit Crouch, Tokiaki Toyama, Vern Svedberg, James Solverson, James McBurney, and Robert Einsweiler (affiliation: Hodne Associates) devotes the bulk of the site to buildings of five and six stories—the same height as most older structures in the section. Four high-rise towers occur at the river side of the area, and there is provision for a marina (as in most of the programs submitted). Every third floor of the towers is a common social and recreational area.

Second prize money went to the proposal (3,4) by Edvin Karl Stromston and Richard Scofidio (affiliation: Richard G. Stein) and Felix John



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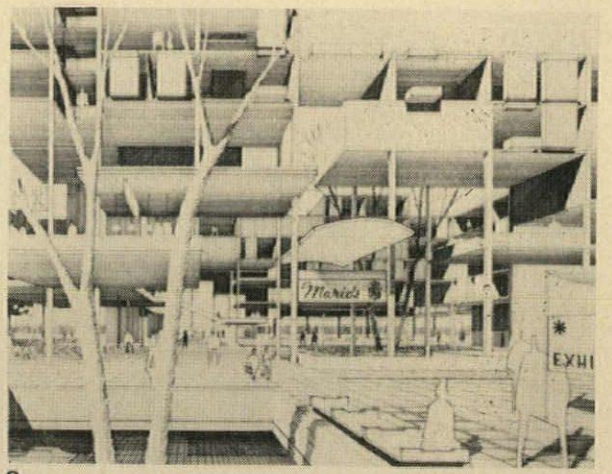

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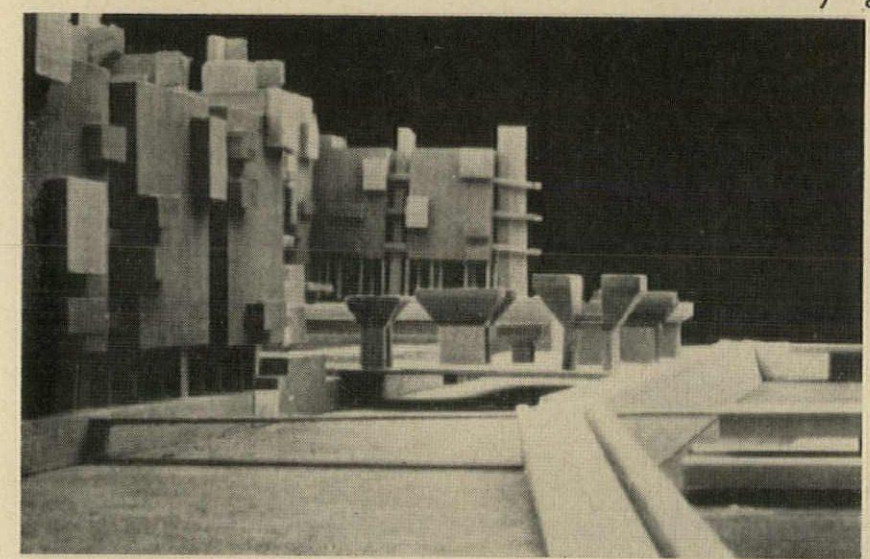

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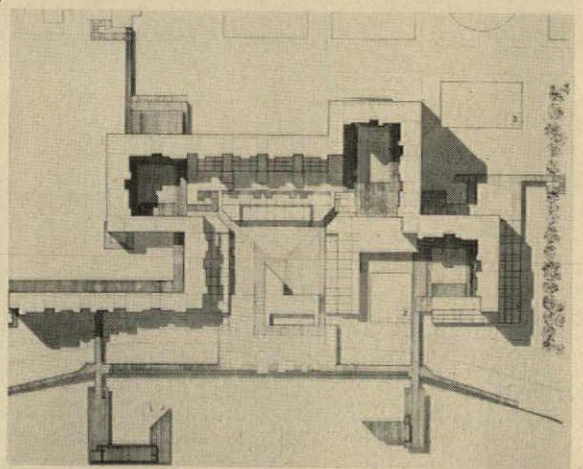

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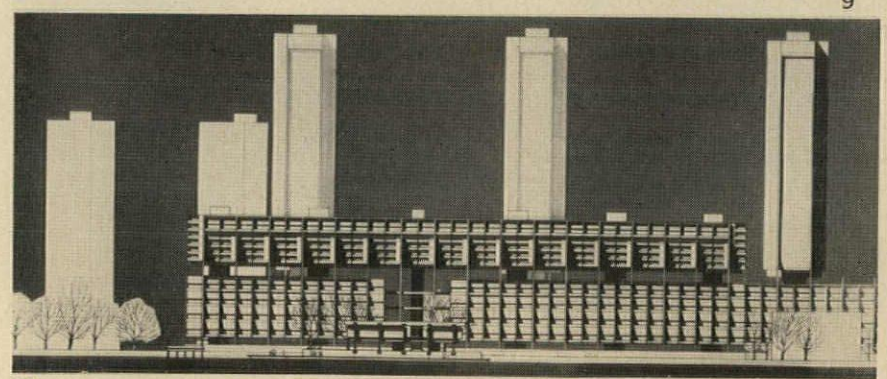

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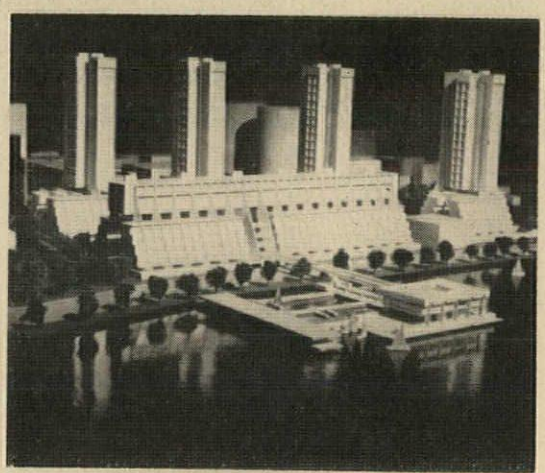

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Martorano (affiliation: Shreve, Lamb & Harmon). It creates a pedestrian community, parking being integrated within the structure—covered, but not buried underground. The jury thought this proposal the "least like public housing" and a "fresh and most radical approach."

Third architectural prize winner (5,6), by Hanford Yang and Amiel Vassilovski (affiliation: Pederson & Tilney), proposes a system of long "ramparts" of low-rise housing joining high-rise towers. Shops and stores occur beneath the housing, a New York characteristic. The low-rise elements tie in with East Harlem.

First prize winning scheme in the Student Awards section of the Ruberoid program (7,8) received praise for its proposed prefabricated frame system to furnish superior low-cost public housing. Designed by Robert P. Holmes and Robert L. Wright of the University of Illinois, the scheme depends on standardization of a certain variety of dwellings to make the prefabrication system viable.

The second student winner (9,10), by Michael Wurmfeld of Princeton, makes more than usual use of the river development, creating an extensive crossing of Franklin D. Roosevelt Drive and tying in marina and recreational areas on the river with the whole development. The design concentrates on the perimeter of the area, causing the buildings to "frame" a walled-off section.

One of the most architectonic concepts of the whole list of winners is the third student prize winner (11,12) by Philip Augustus Shive, Woodrow Wilson Jones, Jr., and Garrard Edmond Raymond of North Carolina State College. Towers are oriented for maximum river view, and low-rise housing creates interesting pyramidal forms through use of step-back terraces designed to catch the sun and form a more man-scaled façade.

ANOTHER MAJOR U. S. AIR TERMINAL

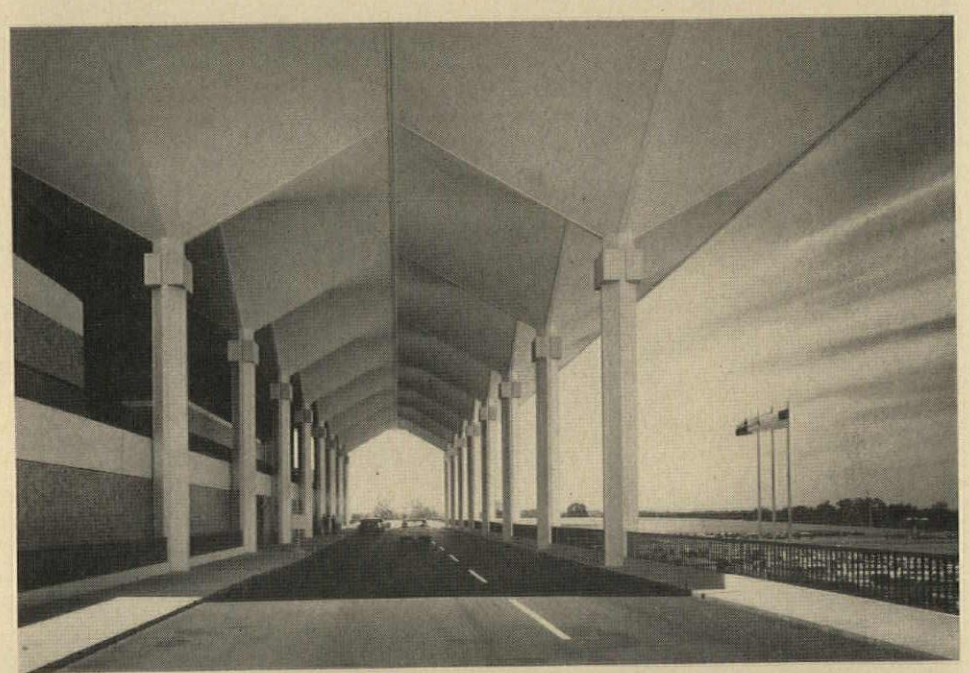
Photos: API Photographers

MEMPHIS, TENN. "I have seen none handsomer, and I have seen most of the metropolitan airports in the world," said Adlai E. Stevenson, United States Ambassador to the United Nations. "An architectural masterpiece," he exclaimed.

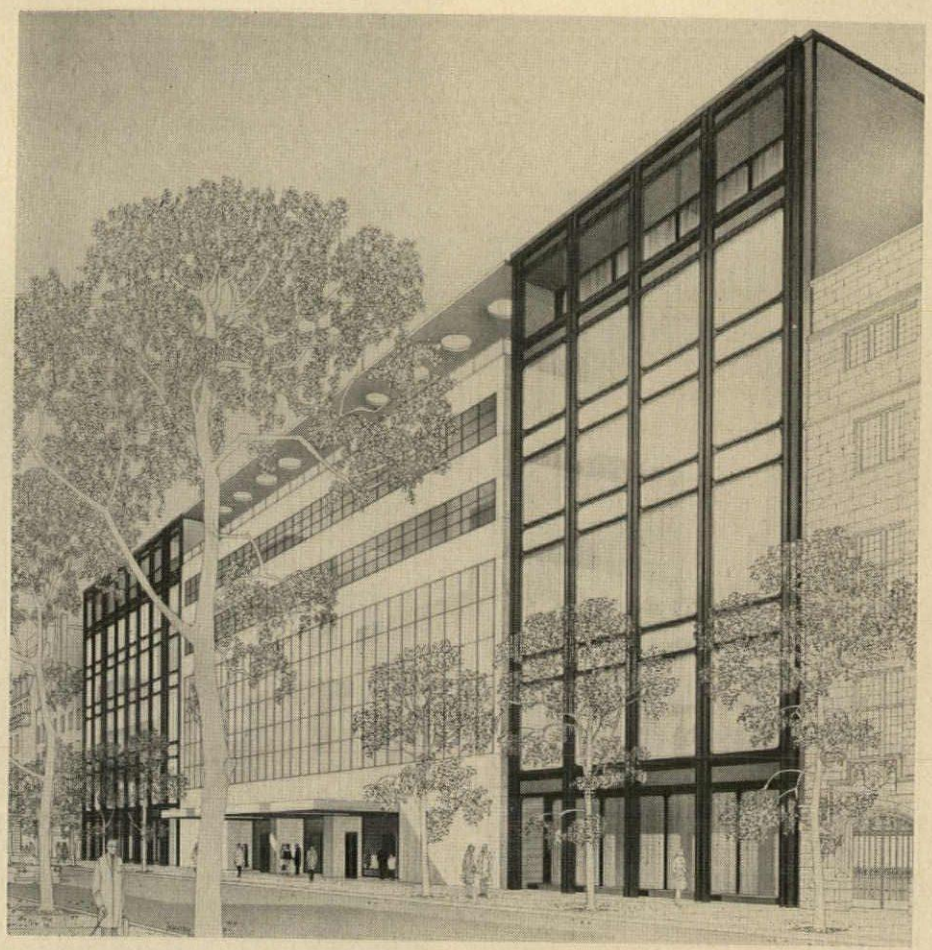
This high official praise came at the opening of the new Memphis Metropolitan Airport recently. Ambassador Stevenson's praise is justly earned by the Mann & Harrover design, according to those who have been through the new building. Winner of a PROGRESSIVE ARCHITECTURE Award Citation in 1961 (JANUARY 1961 P/A, pp. 112–115; detailed analysis in NOVEMBER 1961 P/A, pp. 132–135), the terminal is that *rara avis*, the building that, in completed form, looks almost exactly as it did in the project design stage.

The terminal, distinguished by the high, vaulted roof of its central section, has a smoothly operating, two-level traffic plan (*top*). Enplaning passengers are discharged from automobiles and buses at the top level under the great vaulted canopy (*center*), and deplaning passengers leave from the ground level, where there are baggage claims, telephone and telegraph facilities, rental car desks, and, of course, taxi, bus, and private car lanes. There is an underground passageway to the parking lot. Extending from the main building on the field side is the Y-shaped concourse structure, with its individual waiting lounges at each gate position. A notable "plus" by the Mann & Harrover office is its control of all signs and other graphics in the terminal, which has produced an atmosphere unmarred by the Coney-Islandish claims for attention of many older airports.

In an editorial on the terminal, the *Memphis Press-Scimitar* said, "The new airport terminal gives a lift to the spirit as it was designed to do. It is high and massive and gives the feeling of awe that the gate to a great city should have. But it gives comfort, too, and the comfort that hospitality wants to give."



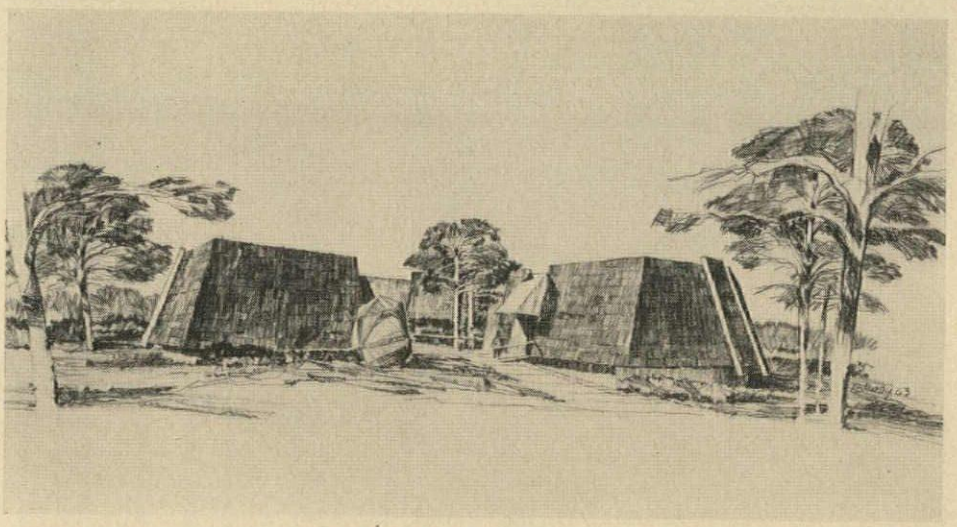
MUSEUM OF MODERN ART ADDITIONS PROCEED



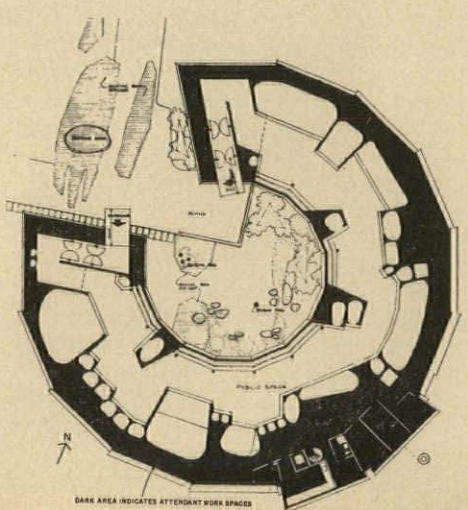
NEW YORK, N.Y. The Philip Johnson-designed additions to the Museum of Modern Art are now under construction following the demolition of the old townhouse next door on West 53 Street. Included in this first stage is the east building (*right in rendering*), which will contain three gallery floors, two office floors, and one floor for conference and reception rooms. Behind this will be the enlarged Sculpture Garden and wing (p. 61, NOVEMBER 1962 P/A). These new facilities will eventually be joined by the new west wing (*background in rendering*), which will be operated in conjunction with the recently purchased Whitney Museum of American Art building. The Whitney will move into a new building designed by Marcel Breuer.

Of additional interest are the changes to be made to the façade of the old Museum of Modern Art building, originally designed by Philip L. Goodwin and Edward D. Stone. The entrance will be moved to the center of the ground floor, and public spaces enlarged and modernized.

Robert Zion and Harold Breen are the landscape architects.



DARK WORLD FOR NOCTURNAL CREATURES



NEW YORK, N.Y. Bats, rodents, owls, and other denizens of the night will be the inhabitants of a unique new building at New York's Bronx Zoo. Designed by Morris Ketchum, Jr. & Associates, the building will be an arc-shaped structure surrounding a central entrance and exit court. Its in-slanting walls will be appropriately sheathed in dark gray slate.

"The World of Darkness," as the exhibition will be known, will use infrared lighting techniques to show the night creatures moving actively, in displays designed to simulate accurately their natural surroundings. The building will have a special "conditioning" room where the creatures' life cycles will be gradually and painlessly reversed before they go on display. The plan (*right*) will lead visitors through a light-baffled entrance to a circular aisle between the exhibit cases and displays. There will be displays showing nocturnal life in tropical forests, Southern swamps, the desert, and caves, in addition to exhibits of burrowing animals, large carnivores, reptiles, and birds and insects.

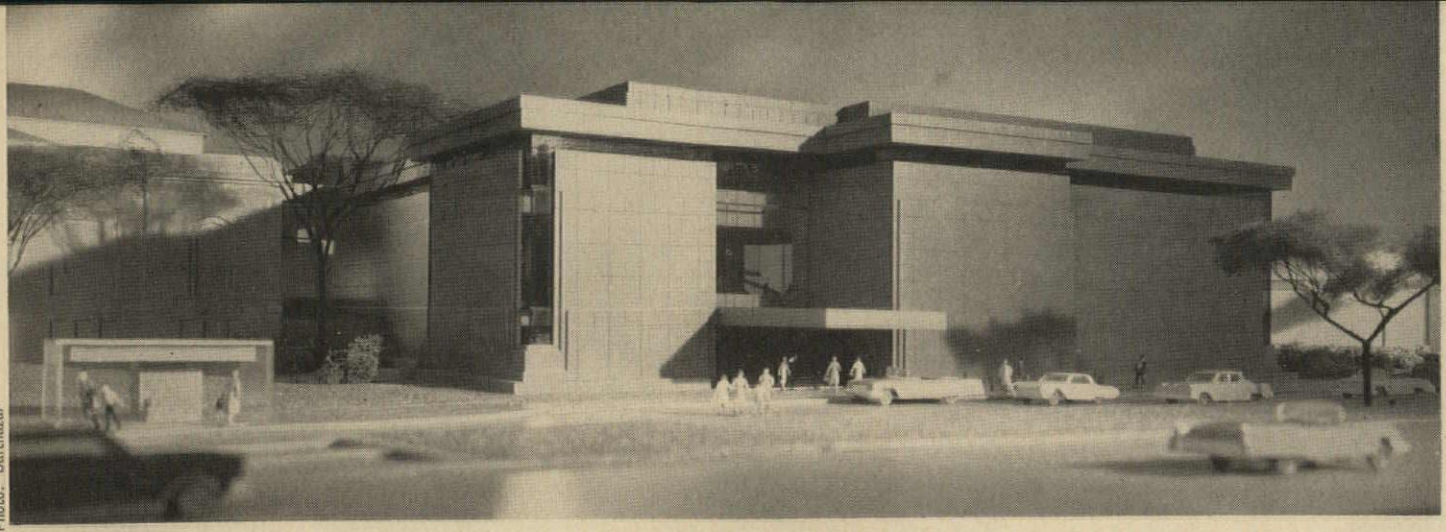


Photo: Balthazar

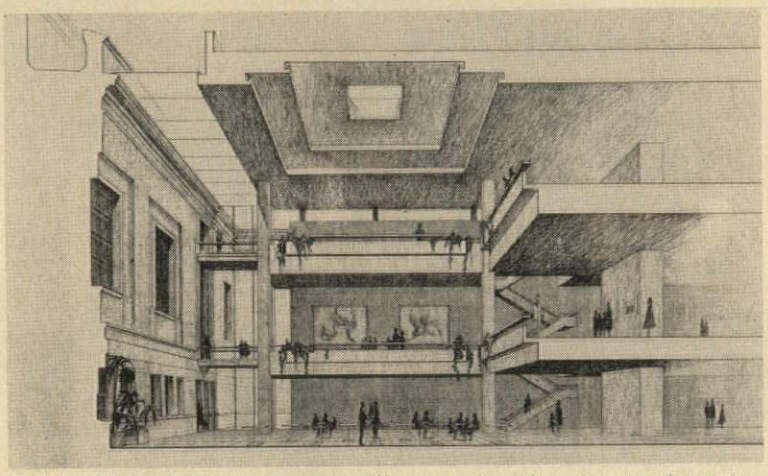
Well-Related Addition for Detroit Art Institute

DETROIT, MICH. A proposed addition to an art museum in which the new structure is perhaps better related to the parent building than the one on page 68, is the one designed for the south wing of the Detroit Institute of Art (Harley, Ellington, Cowin & Stirton, Architects & Engineers; Gunnar Birkerts, Design Consultant.)

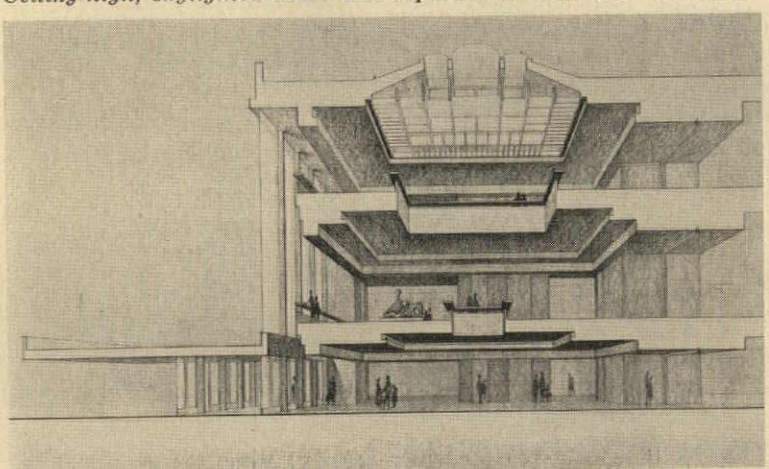
According to Birkerts, "The original building by Paul Cret, built in 1925 in Italian Renaissance style, is strong in its form and symmetry and the scale is tremendous."

The major design problem, of course, was to provide greatly increased gallery space in a building that will "go with" the Cret building while still preserving its own architectural integrity and contrast. Birkerts has done this very well in several ways. He follows the cornice line of the old structure faithfully, although in greatly simplified form. And, most interestingly, he makes of the new building what could almost be described as a "photographic reverse" of some of the old building's elements. The soffit line becomes glassed, reflecting the shadowed soffits of the earlier structure, and the new wing's corners are "cut out" in glass, recalling the inset but opaque corners of the eclectic museum. A particularly sophisticated element of the design is the three-layer, striated treatment of the granite walls (*right, bottom*). The walls are stepped in twice to become wider, taller panels, and the vertical emphases or striations alternate to deepen the texture. Thus, this building echoes the rich ornamentation of its marble progenitor in quite contemporary terms. Birkerts, incidentally, considers this one of the central design ideas of the project.

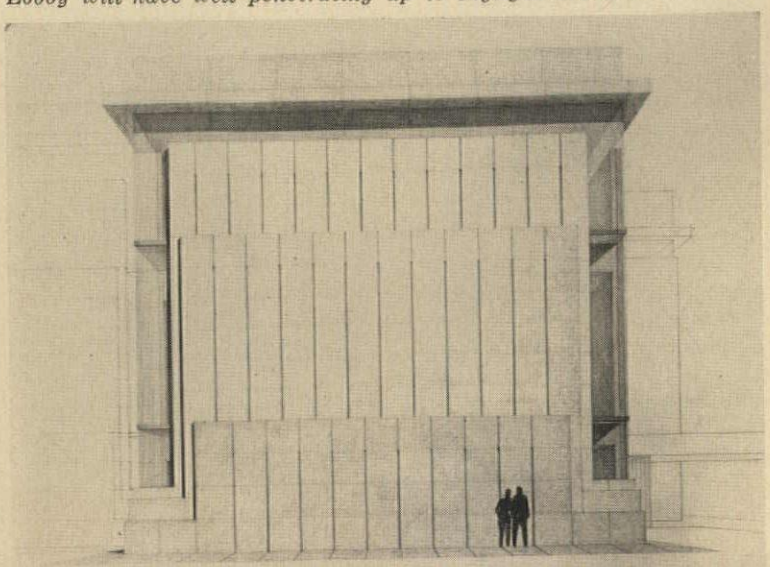
The new wing will provide lobby, sales space, and display areas on the ground floor, plus a dining court in the area joining the two structures. Temporary and permanent exhibition areas will occur on the two upper floors. Basement will house mechanical equipment.

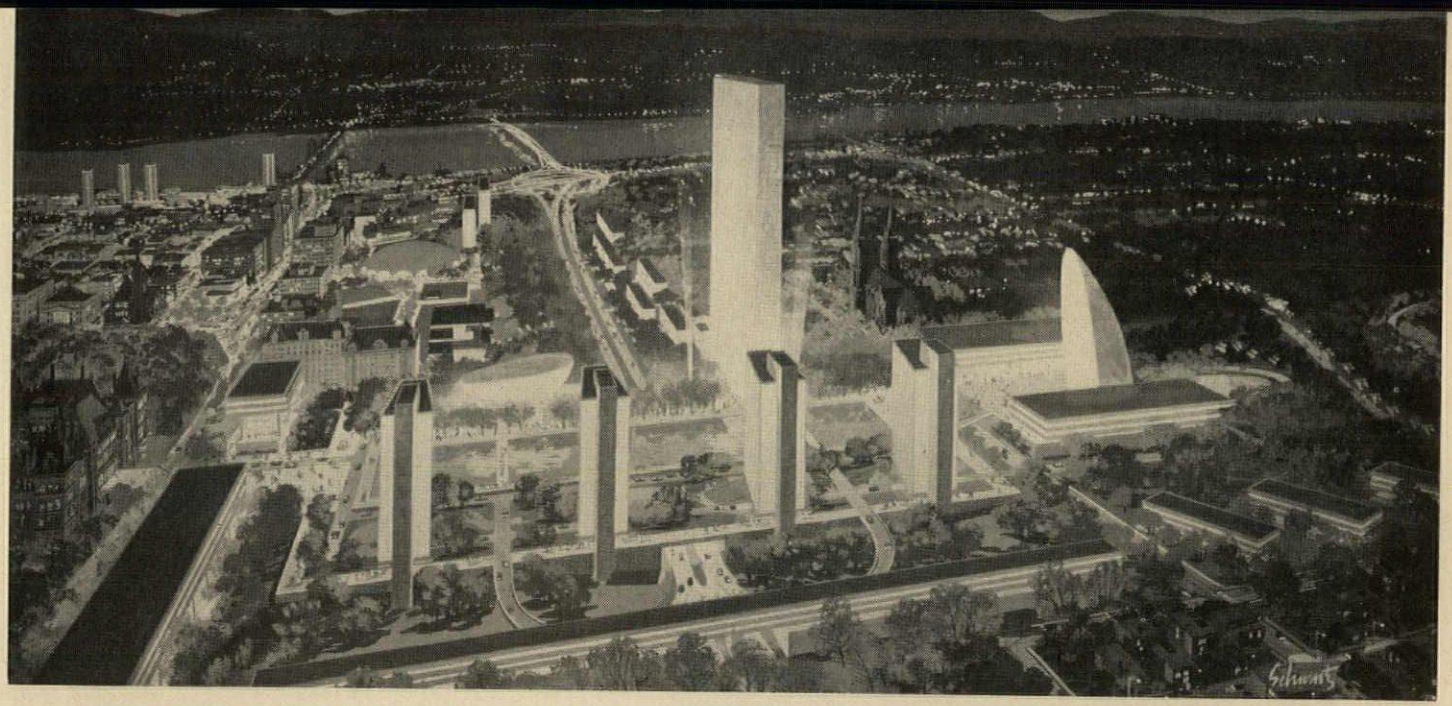


Ceiling-high, skylighted court will separate old and new elements.



Lobby will have well penetrating up to skylight above third level.





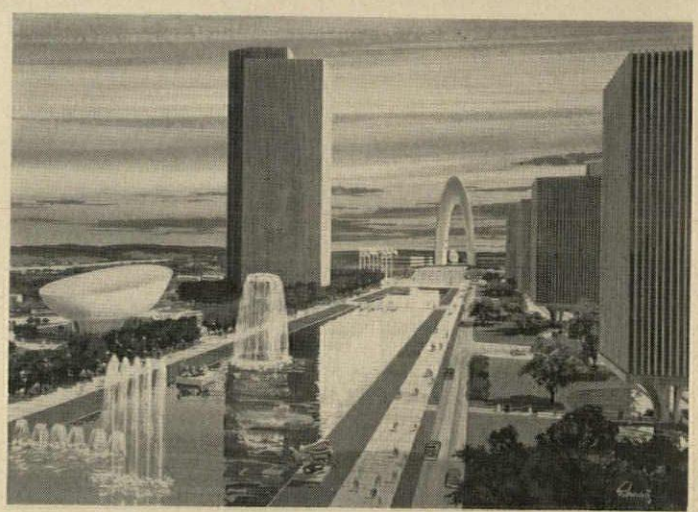
Cacophony of Forms in New York Capital

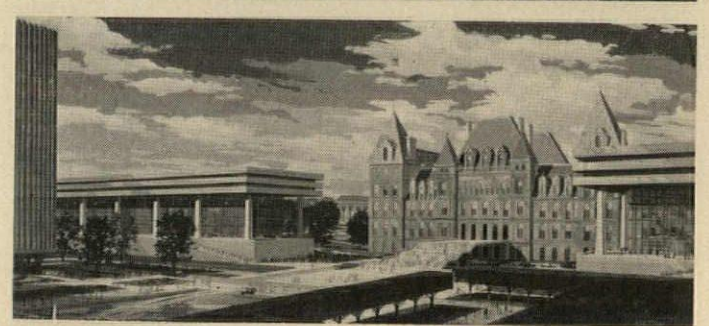
ALBANY, N.Y. Half a cantaloupe sliced on the bias, a croquet wicket with avoirdupois, an upside-down orange half from a Kraft salad, and four little towers and a big tower resembling forms of cubistic coition are the major elements in the South Mall Plan proposed — seriously, we presume — for the capital of New York State.

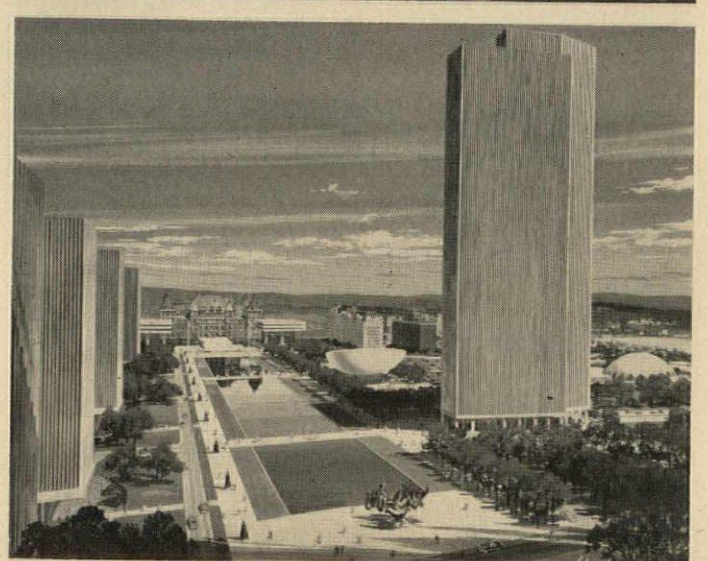
Culpable parties include Architects Wallace K. Harrison, George A. Dudley and Blatner & Williams, plus that would-be architect, Governor Nelson A. Rockefeller. A noted selector and collector of modern art, the Governor evidently has a lot to learn about the mother of the arts.

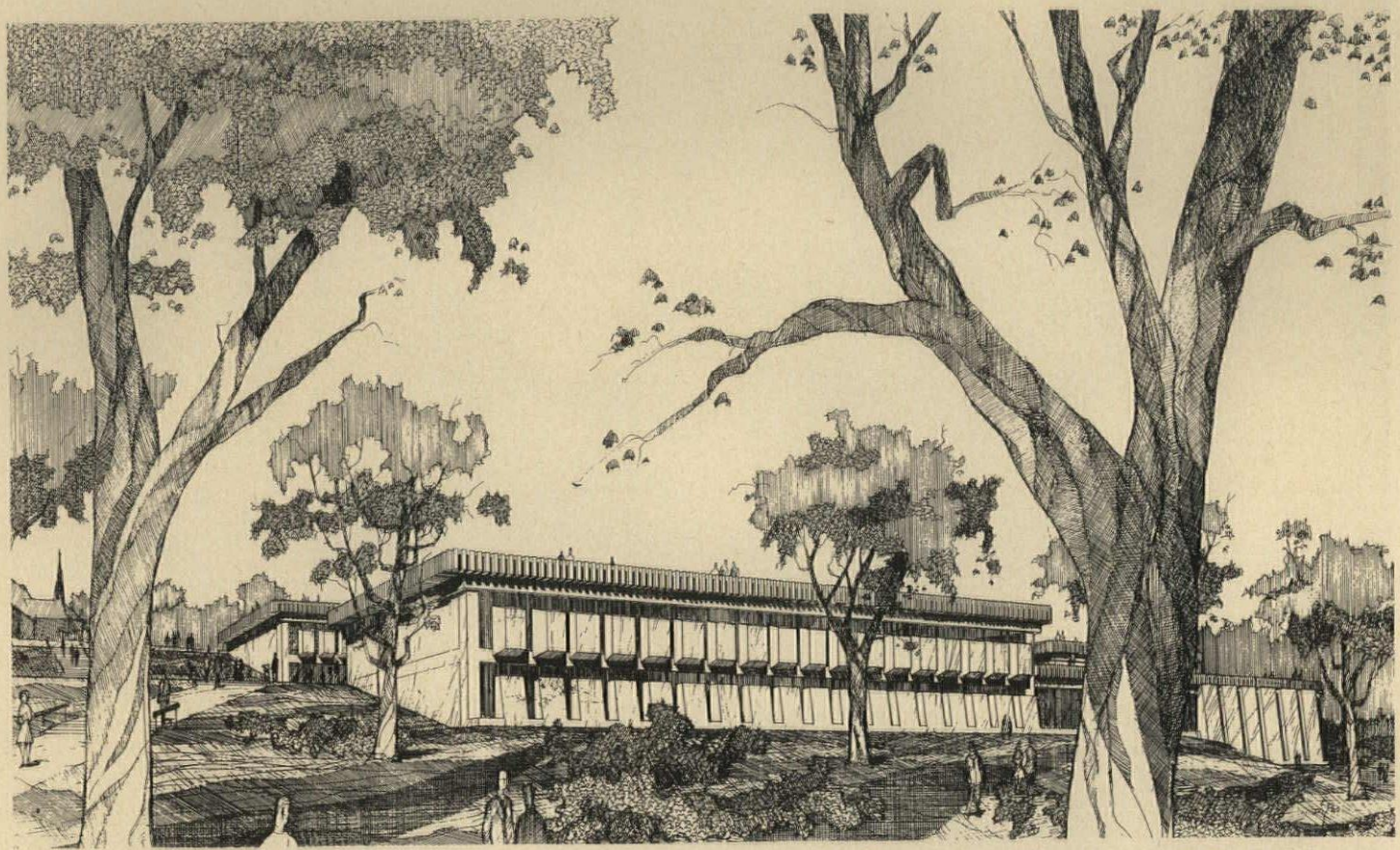
The badly related, diverse forms are proposed to extend from the capitol itself down a vast mall to the "Arch of Freedom" (the croquet wicket). Along the way will be the office buildings (for government agencies), the 750-seat auditorium and 300-seat conference room Meeting Center (the cantaloupe), a Legislative Office Building, a Department of Law and Department of State Building, State Library, and State Archives Building. Peripheral to the mall development will be a long, street-spanning Motor Vehicle Building and the Convention Center (the half-scalloped orange). Not content with diminishing the pleasantly Graustarkian old Capitol Building with all this M-G-M monumentality, the mall actually would climb up to its second story with a series of vast steps (*center, right*).

Admittedly, the state is in severe need of well-planned downtown space to integrate the many departments that now occupy ragtag and bobtail quarters throughout the city, but certainly the center of a rather proud metropolis need not become an exercise in architectural pop art.





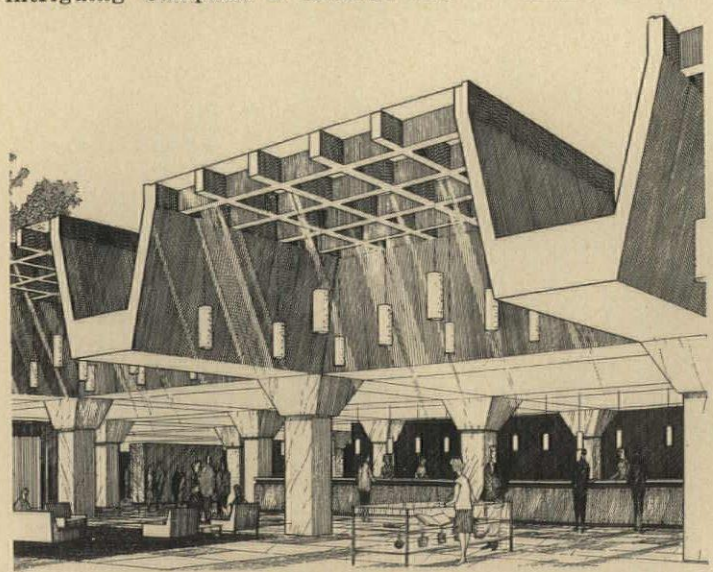


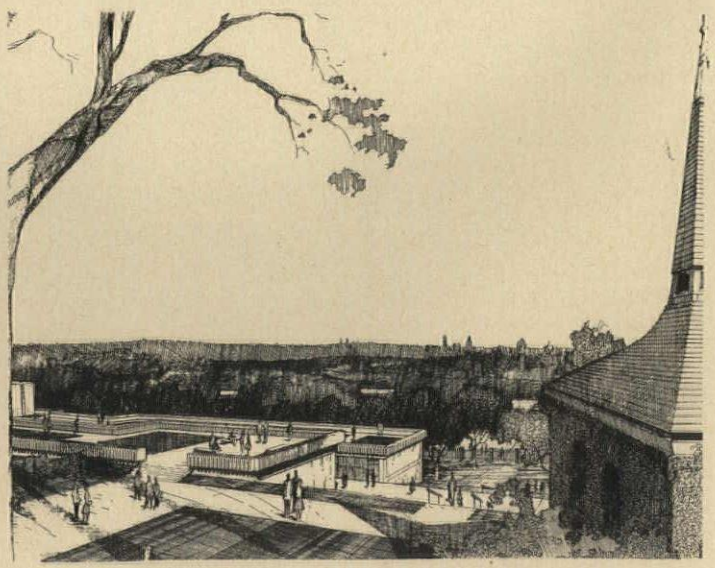


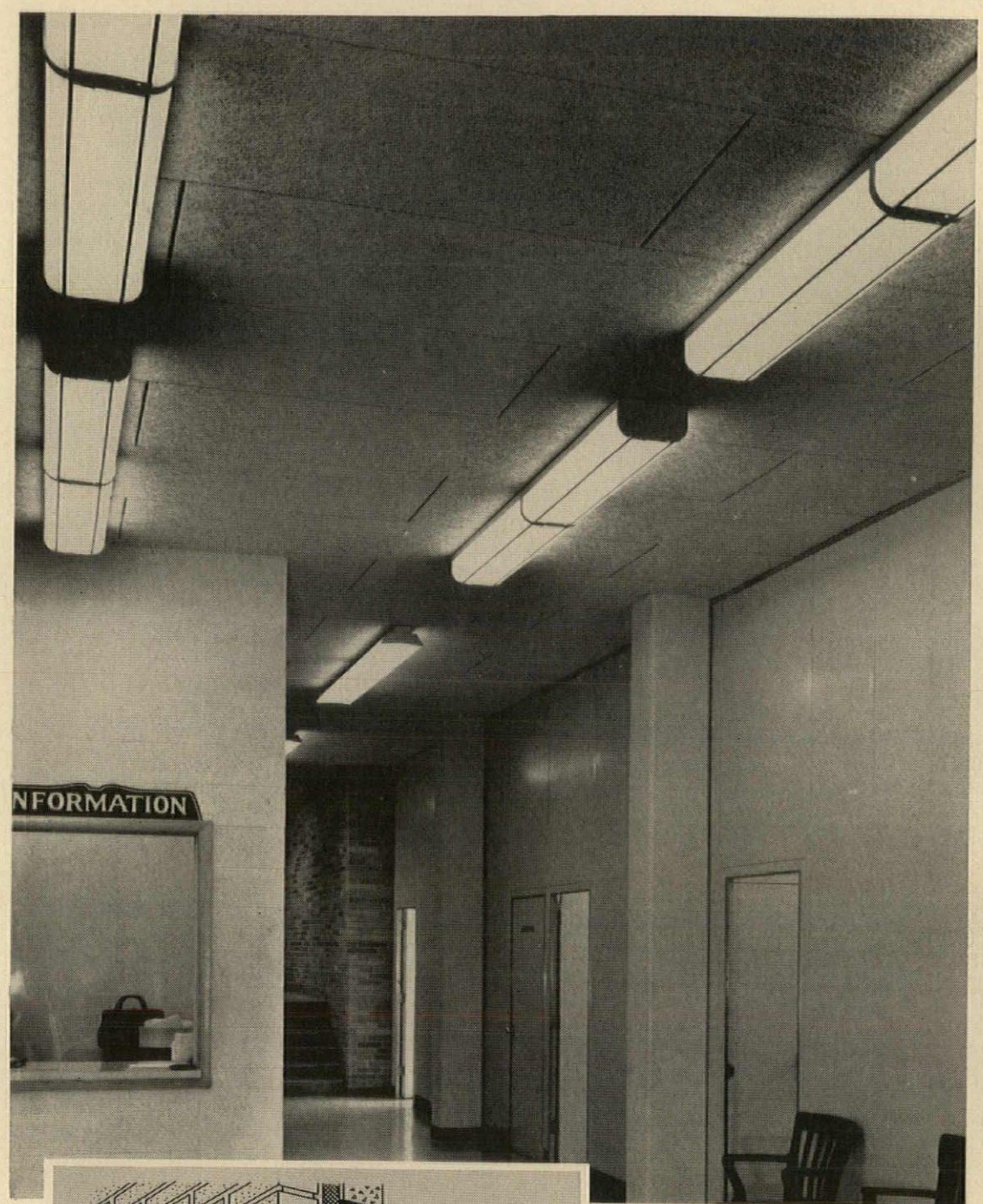
Imposing Design Wins Tufts Library Competition

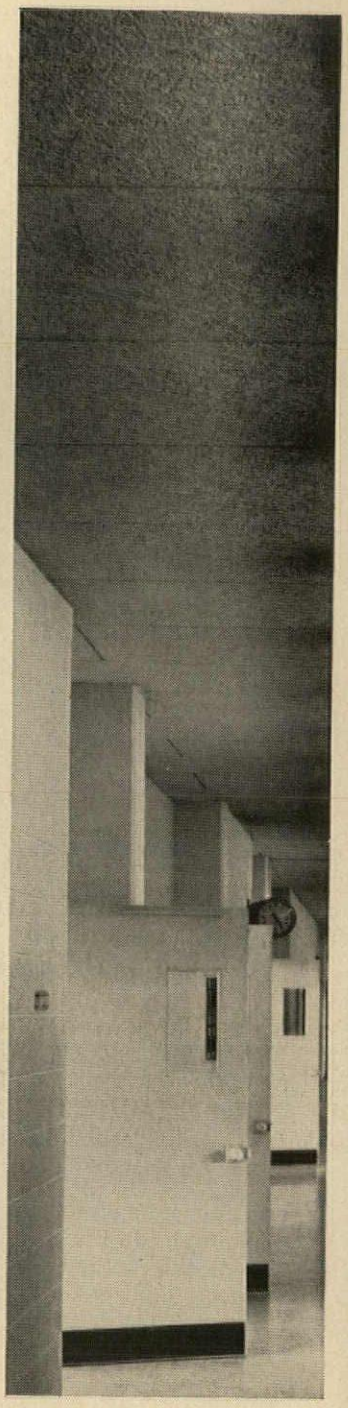
MEDFORD, MASS. Like a rock thrown into a quiet pool, the Boston City Hall design seems to be spreading its influence in ever-widening ripples over this New England state. Latest notable project to testify to the design resurgence of the Boston area is the one by Campbell & Aldrich, which recently won an invited competition for the design of the Tufts University Library. Competing against The Architects Collaborative; Shepley, Bulfinch, Richardson & Abbott; and Perry, Shaw, Hepburn & Dean, the intriguing Campbell & Aldrich concept walked off with honors from a jury which was, surprisingly enough, mainly nonarchitectural. Architect Lawrence Anderson and Landscape Architect Hideo Sasaki *were* jurors, as were Tufts President Nils Yngve Wessell; Tufts Vice-President Comegys Russell de Burlo, Jr.; and William Francis Keesler, Senior Vice-President of the Boston First National Bank and a Tufts Life Trustee. Pressional Advisor Walter F. Bogner of Harvard Graduate School of Design prepared program.

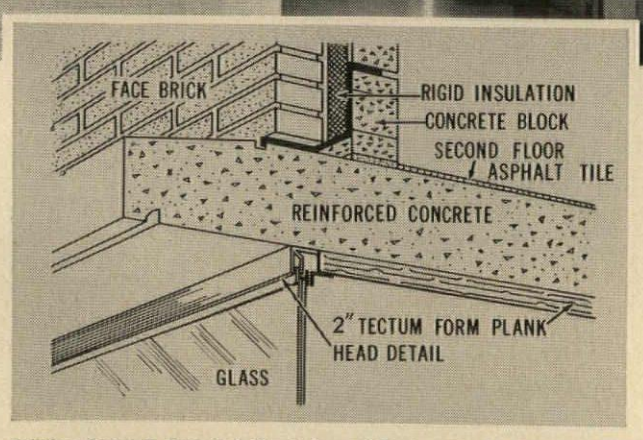
Unlike at least two of the other entries, the winning proposal makes wise use of the hillside site by stepping the building down the hill and creating a rooftop terrace (*below right*). This ties in splendidly with Goddard Chapel on the crest of the hill, a landmark of the university. The strong form of the building as seen from Professors Row at the bottom of the site (*above*) evokes a "fortress of learning" feeling that is impressive without being forbidding. Equally strong structural concept is seen in section through the circulation desk area (*below left*).











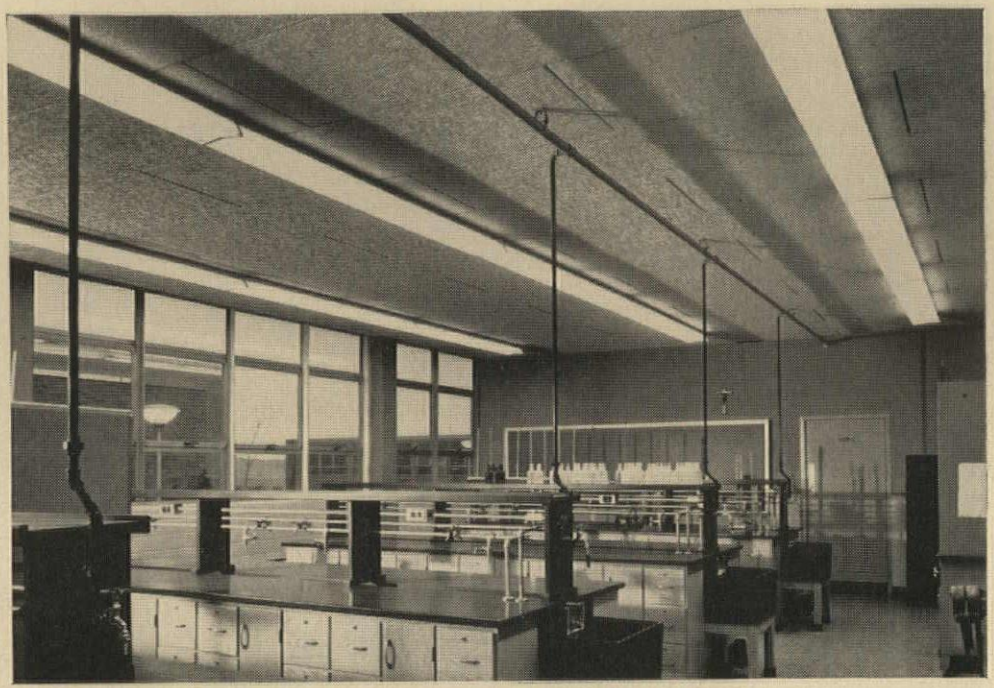
Color and texture are beautifully balanced in the reception area and throughout the building.

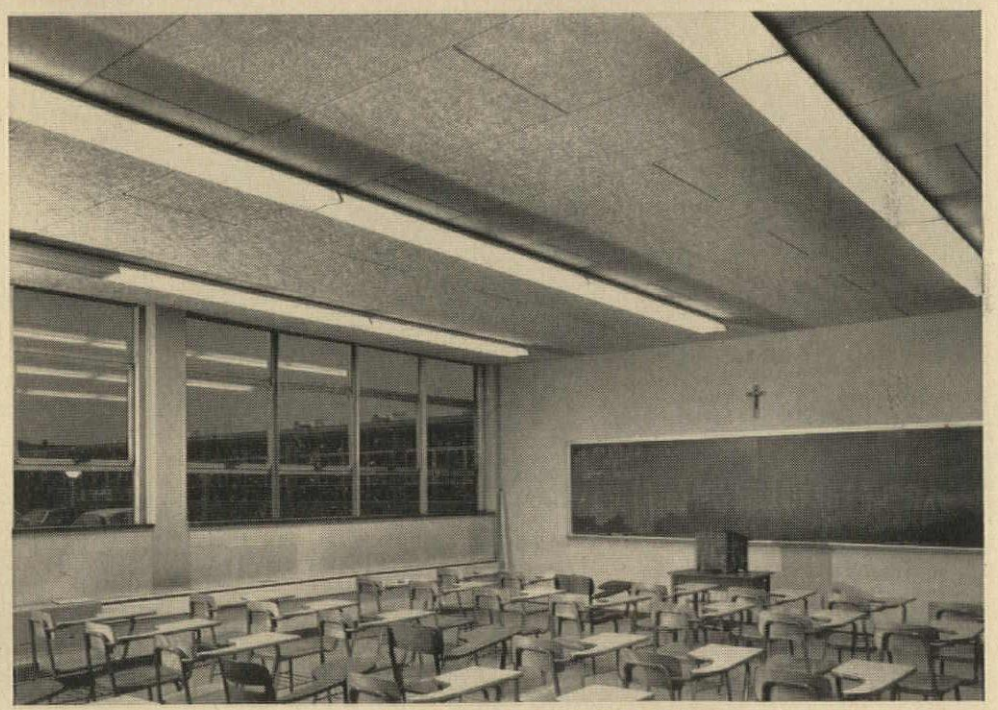
Building: Daniel W. Egan Hall, The College of Steubenville, Steubenville, Ohio
The Reverend Columba J. Devlin, T.O.R., President
Architect: Joseph F. Bontempo & Associates, R.A., Rochester, Pa.
Consulting Engineer: Michael Baker, Jr., Rochester, Pa.
General Contractor: Gilbane Building Company, Providence, R. I.

The Gold Bond difference is Tectum

"Best construction on campus"

Intermittent noise and confusion in busy corridors is controlled by sound-absorbing Tectum.





The classrooms above illustrate how the esthetic and the functional values of Tectum ceilings contribute to better study conditions.

Egan Hall on the beautiful campus of The College of Steubenville in Ohio is one of several buildings here employing the Gold Bond Tectum Form Plank method of construction. It houses classrooms, lecture halls, faculty offices, library, student lounge and book store.

According to school authorities, "Tectum was used in this electrically heated building for economies of erection as well as functional benefits inherent in the basic material. We are especially pleased with its insulating and acoustical values and the attractiveness of the richly textured ceilings. Tectum as a form plank for 8" reinforced concrete slabs—then functioning as a finished ceiling after shoring is removed—makes for fast, economical construction. We've used it for a number of our buildings with equal success."

National Gypsum Company, Dept. PA963, Buffalo 25, New York

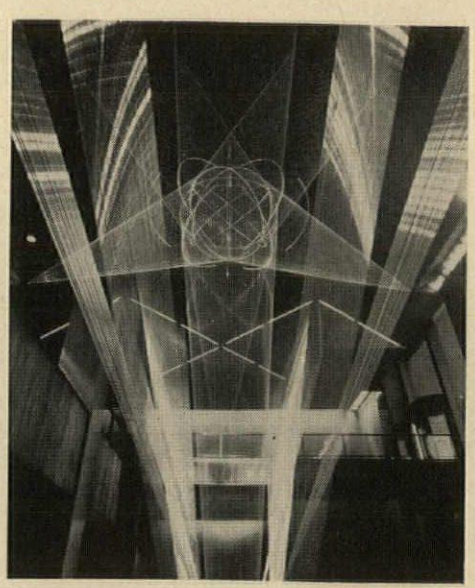
Gold Bond® TECTUM

Dry Lumber Standard

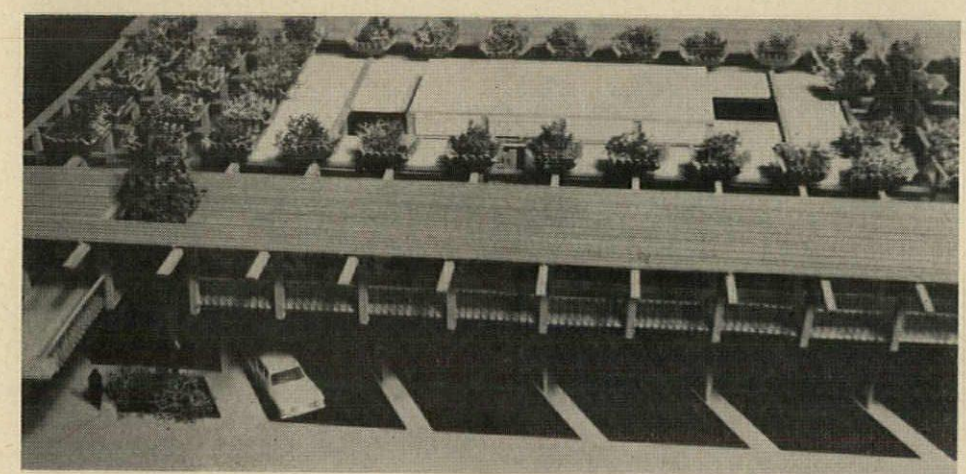
Through the efforts of the American Lumber Standards committee, a new standard for dry lumber has been circulated by the Department of Commerce to architects on its acceptor list for approval. The new standard, revised SPR 16–53, proposes the following: (1) establishment of a measurable lumber standard with sizes related to moisture content (average moisture content of 15 per cent with a maximum moisture content of 19 per cent); (2) provision of positive identification of dry lumber; (3) establishment of minimum surfaced thickness for dry lumber framing at 1½" (tests by U.S. Forest Products Laboratory say that this is more than adequate to meet existing span tables); (4) requirement that green lumber be surfaced at the mill to sizes that will allow for shrinkage to match equivalent size and strength of dry lumber. Among advantages, according to proponents of the standard, are: lower-in-place cost; higher strength-to-weight ratio; first step towards establishment of simplified span tables. Architects who are desirous of expressing their opinions should write to The Department of Commerce, Washington 25, D.C.

Lippold Piece Viewed

Richard Lippold's heroic arrangement of stainless steel and gold wires for the Pan Am Building is now complete and is by far the best art work in the building, and perhaps the most maltreated. The viewer, taken unawares when entering the side lobby of the building in which the piece is placed, tends to flinch back from the room-filling display of glitter. Cautiously edging his way in and around the work, he can appreciate Lippold's technical mastery of his form. The quasi-representational spheres at the center of the composition, unfortunately, recall Robert Moses's googy "Unisphere" at the New York World's Fair.

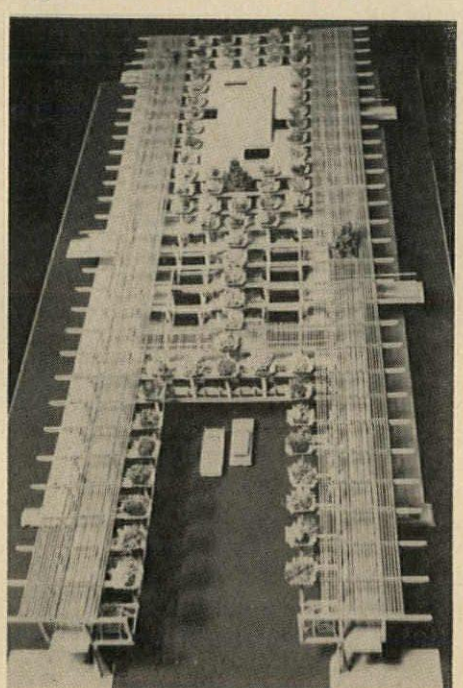


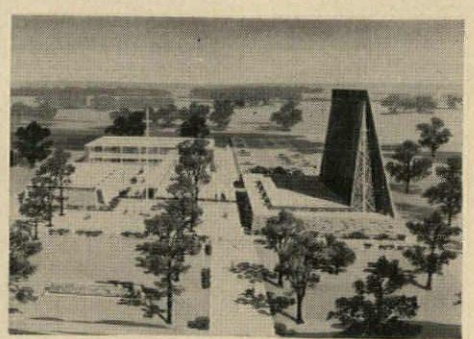
Elsewhere in the Pan Am Building, there were, at last count, about 12 signs and symbols — including one intruding all the way into the concourse of Grand Central Station — proclaiming that this *is* the Pan Am Building (who ever questioned that?). This display has earned the opprobrium of many architects for its vulgarity. Why not go the whole way and hang a Pan Am sign in the Lippold?



Overhead Mall Unified by Trellis Treatment

An overhead pedestrian mall proposed by Architect Herb Greene would provide additional downtown parking and reduce in-city congestion by separating cars and people. The proposal, which could span existing thoroughfares, is made a visually continuous form by treatment as a huge trellis covering the street. All diverse functions within the mall — shops, stores, offices, cafes, gardens, rest areas, etc. — are thereby unified into one aspect. A modular design of precast concrete units would permit some degree of flexibility. As stores change, locations of entrances to the mall could be moved, for instance. Overhead panels shading the pedestrian walk would double in brass as a platform for fire equipment. Local character would be attained through color and pattern of the precast panels and plant boxes. Proposal permits normal renewal of existing buildings, but with added dimensions for the city.



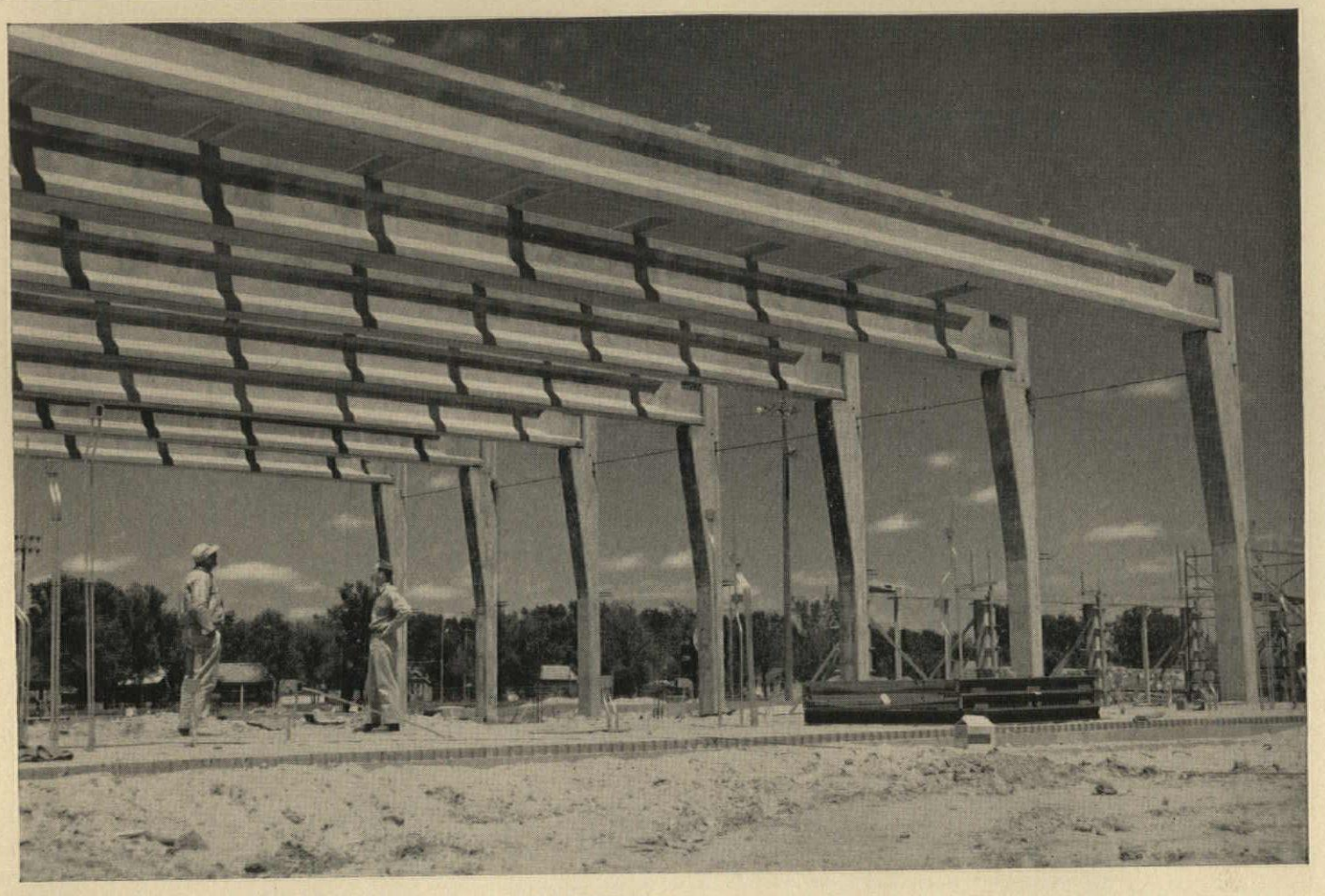


French Glass in N. J.

Sanctuary of First Baptist Church of Vineland, N. J.,will feature end walls of faceted mosaic glass from France. Thick glass, which will be set in concrete tracery, is made in pots and broken into pieces to be chipped when cool. Architect: John Robert Gilchrist.

Penn Center Compass

Vincent Kling's design for IBM's 21-story office tower at Penn Center



Prestressed concrete structural system includes columns, girders and purlins.

ARCHITECT: Hinde & Laurinat, AIA, North Platte, Nebraska
CONTRACTOR: Homan Brothers, Inc., North Platte, Nebraska
PRESTRESSED CONCRETE PRODUCER: Nebraska Prestressed Concrete Co., Lincoln, Nebraska
OWNER: City of Gothenburg, Nebraska

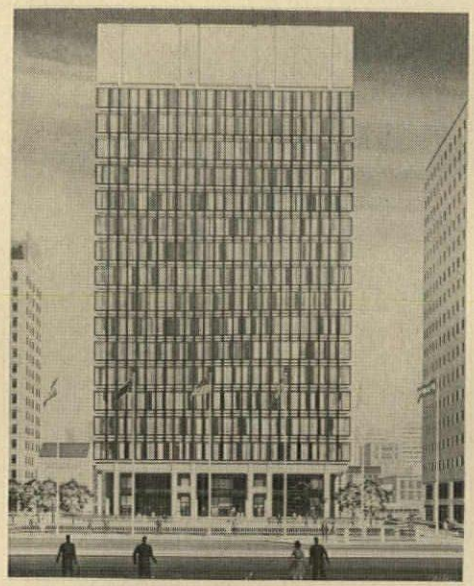
PRESTRESSED RIGID FRAME PROVIDES COLUMN-FREE COMMUNITY BUILDING

Structural system shown in the picture is part of the Gothenburg, Nebraska, Community Building. The structure consists of a precast, prestressed rigid frame, with a girder-column connection welded after erection. Clear span is 100 feet, with a total of 8,500 square feet of floor area. The girder is a Type III, 45-inch AASHO bridge girder section. Structural members spanning between girders are 8-inch deep prestressed concrete purlins.

This project is another example of the versatility of prestressed concrete construction. Prestressed concrete producer for the job was Nebraska Prestressed Concrete Company, Lincoln, Nebraska. Prestressing tendons were Union TUFWIRE Strand. Write for helpful folders on Union Wire Rope TUFWIRE or ask to have a Union Wire Rope specialist contact you.

TUFWIRE Strand and Union Wire Rope are products of Sheffield Division, **Armco Steel Corporation, Department S-853, 7100 Roberts Street, Kansas City 25, Missouri.**

ARMCO Sheffield Division



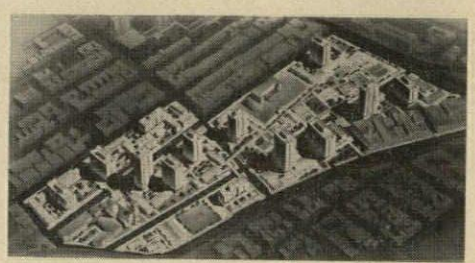
Plaza, Philadelphia, is based on a backbone/rib-cage structure. Its reinforced concrete "backbone" is the service core which, forming the south façade, will function as primary load bearer and as a shield against heat and glare. This core, faced in buff-colored limestone, will anchor the steel "ribs" of the tower. The character of each remaining façade, as that on the south, is derived from exterior environment as well as interior usage. On the shadowed north face, glass panels will be set forward from limestone spandrels to create a surface highly reflective of the Center's esplanade. East and west walls, mainly glass, will be faced in limestone at the southernmost parts. Limestone will be repeated on a two-story mechanical penthouse. A vertical tier of windows set into the core wall will tie in with glass expanses and provide views of the city from elevator lobbies.

One-Man, One-Woman Architectural Exhibit

The husband and wife architectural team of E. H. and M. K. Hunter recently presented a one-couple show of its works at Hopkins Center, Dartmouth College. The show by the New Hampshire architects will be traveling to other museums in 1963–64. Of particular emphasis in the exhibition is the attention paid by the firm to preservation of natural beauty, including a development on Stratton Mountain and a residential development in Hanover in New Hampshire.

3rd Generation Architect

Father Frederick G. Frost, Jr. (left) and grandfather Frederick G. Frost, Sr. (*center*), benignly look over the model of a school designed by son and grandson A. Corwin Frost (*right*),



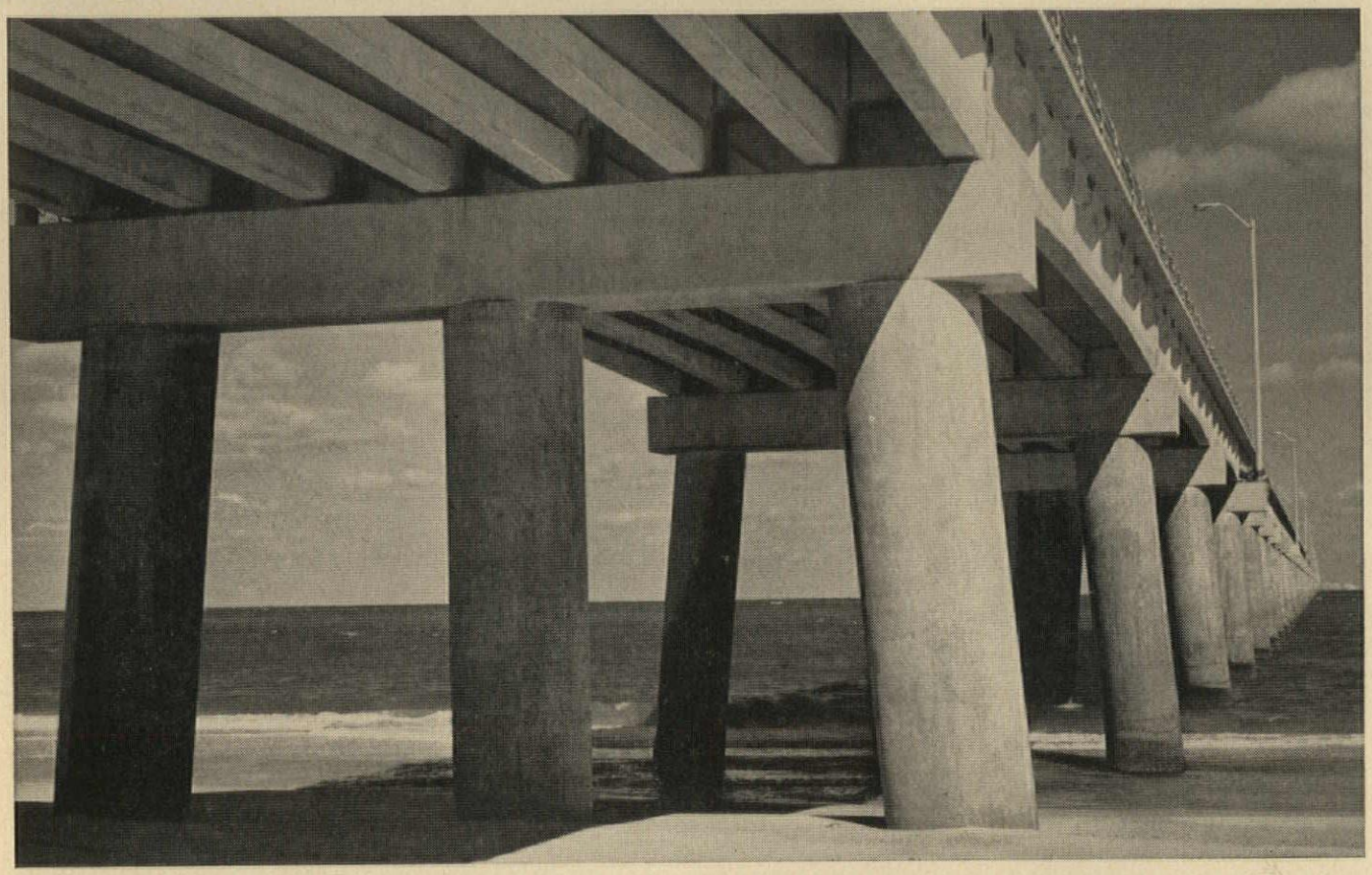
who was recently made an associate of the family firm, Frederick G. Frost, Jr., & Associates of New York (successor to the firm Frost Sr. started in 1917). Firm is currently working with a citizens' group in the south Bronx, attempting to provide a better-than-usual plan for redeveloping 27 acres for middle-income co-operative and low-income housing with generous recreational and commercial space (*shown*).

Mission's Apartments and HQ in Central Harlem

Occupants of the proposed Minisink Town House on Lenox Avenue in Central Harlem may be awakened in the wee hours by the ghostly strains of Ethel Waters, the Mills Brothers, and Cab Calloway's "Minnie the Moocher," for the apartment building is to be erected on the site of the famed old Cotton Club of the 20s and 30s. It will be part of a complex designed for the New York City Mission Society by Architect Edgar Tafel; the other section will be a service center for the society, which will include a headquarters for the resources and training program carried on by the group's Harlem branch. Also to be included are a combination gymnasium-auditorium, kitchen, craft shops, and classrooms. Tafel says the project has been "a hard, long pull and the agencies have been 'cooperative'."

Interior Design Show: October 11–20

The nation's most extensive interior design exhibition will be open from October 11–20 in the New York Coliseum. Called "National Decoration & Design 1964," this year's show is said to be carefully controlled so as to emphasize good design rather than mere



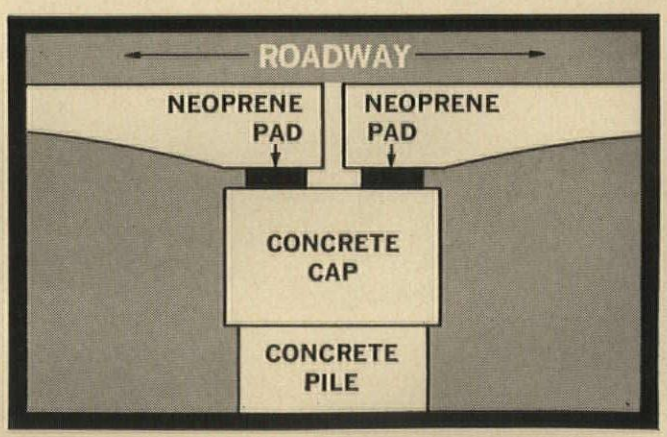
OCEAN BRIDGE RIDES ON NEOPRENE

More than 17 miles of open sea are being spanned in one of the greatest construction projects of all time—the Chesapeake Bay Bridge-Tunnel, joining the Delmarva Peninsula and the Norfolk, Virginia, area.

Supporting more than 12 miles of roadway are 14,700 bearing pads made with Du Pont Neoprene synthetic rubber. Eleven separately engineered types of pads provide for leveling, side thrust, expansion and contraction.

In hundreds of bridges and other structures throughout the world, bearing pads of Du Pont Neoprene have proved to be less expensive and more dependable than mechanical assemblies—both at construction time and over the long haul. Neoprene pads have no moving parts, never need to be cleaned or lubricated. Neoprene has been the elastomer which engineers have specified for years because it is highly resistant to set, ozone, temperature changes, salt spray, oil and the deteriorating influences of weather extremes.

For more information about Neoprene in structural bearing design, write E. I. du Pont de Nemours & Co. (Inc.), Elastomer Chemicals Dept. PA-9-NM, Wilmington 98, Delaware. In Canada, Du Pont of Canada Ltd., 85 Eglinton Avenue, E., Toronto 12, Ontario.



16 Neoprene pads on each cap support the ends of the roadway sections. The pads are about 8½″ by 10½″ and vary in thickness and hardness to meet the assorted engineering requirements of this job. The pads require no maintenance.

NEOPRENE—A RELIABLE DU PONT ELASTOMER

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novelty. Over 100 model rooms (some of them multilevel displays), broad avenues, and gardens are among the features; new elements in the show will be an Antiques Pavilion (in which *à propos* period decorating is to be displayed using art and antiques from several distinguished dealers and galleries), a group display of "Colonial Williamsburg" reproductions, and a prefabricated house. A program-catalogue is planned as a reference to furnishings and their sources. Architects should be interested in how U.S. interior design is being presented to the public.

Educational Program for Stainless Steel

The International Nickel Company, Inc., has initiated a comprehensive three-part program to augment the use of stainless steel in the building and construction field. First, a kit will be distributed to accredited architectural schools, which will include samples of gages, finishes, tubing, bar stock, extrusions, roll and brake form sections, and a stainless-steel data sheet. Second, to keep architects abreast of the developments in the industry, a four-volume Architect's Stainless Steel Library will be distributed to about 1000 architectural firms. First volume will contain finish and gage samples; second, architectural data sheets; third, suggested guide specs for stainless-steel products; and fourth, a design manual. Third phase is a program to be instituted for developing new stainless-steel architectural products. Entire program is being presented in symposia held in various cities.

Synagogue Show

The Jewish Museum in New York is devoting three months (September 29 through December) to an exhibition of contemporary Synagogue Architecture. The exhibition concentrates primarily on synagogue design in the United States during the last 15 years. It consists of photographs, models, and drawings of experimental and projected work as well as completed structures.

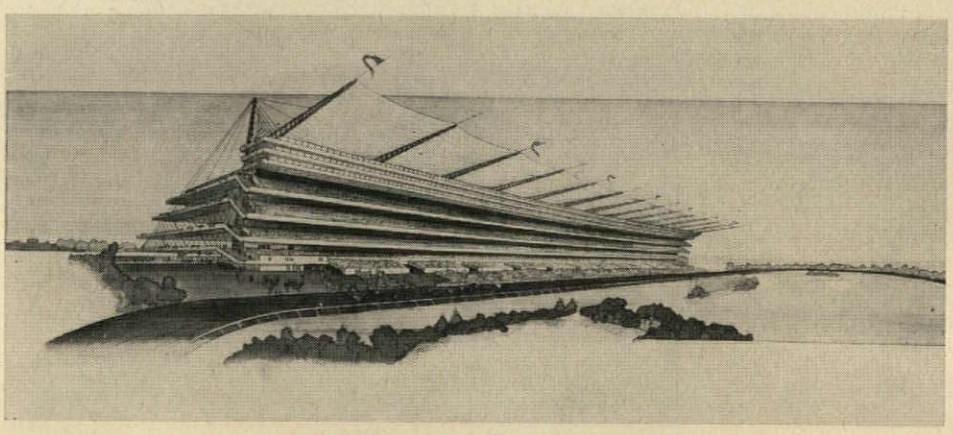
Approximately 15 architects are represented, including Mendelsohn, Wright, Kahn, Breuer, and Percival Goodman. The show was organized and designed by New York architect Richard Meier.

Two Corbu Projects

Le Corbusier has been commissioned to design two new projects: one in Paris, the other his second U.S. commission (not counting the U.N.).

André Malraux, France's Minister of Cultural Affairs, and Jean Chatelain, director of France's national museums, announced that Corbu will design a national museum of modern art to replace the present wholly inadequate museum. The building will be part of a cultural center at Rond Point de la Défense in suburban Neuilly.

On the U.S. West Coast, developer T. Jack Foster announced that he has commissioned *le maître* to design an apartment building in Foster City on the San Francisco Peninsula.



Balconied Betting At Belmont

Fans at Belmont Race Course, Long Island, may enjoy new visual perspectives under a pavilion proposed by William Wesley Peters of Taliesin Associated Architects to replace the present grandstand. This design features cantilevered balconies projected one-over-the-other from a central pylon. Thus the highest seats (most remote in traditionally banked grandstands) will be brought within 134′ of the rail. Each seating level will contain betting areas, dining rooms and bars. At the highest level a Clubhouse Promenade will have glass-enclosed lounges for the New York Racing Association. A translucent plastic canopy will be cable-supported from the pylon and extend over the standee ramp to shield all areas of activity. The canopy—pale green—is planned to blend with landscaped grounds. Glazed screens around wagering areas and a warm air curtain around balconies will provide additional protection. The 100′-bay module unit permits additions as needed.

PERSONALITIES

Peru's new constitutional President, FERNANDO BELAUNDE TERRY, has a second profession—architecture. In 1935, while in exile, Belaúnde received his B.S. Arch. from the U. of Texas and had an active practice until, returning to Peru, he was elected a Federal Deputy. Ousted in 1948, he became Dean of the National School of Architecture. His son, Fernando, is now studying architecture at the U. of Texas . . . CHARLES H. BURCHARD will become Dean of Architecture at Virginia Polytechnic Institute in January . . . BENJAMIN THOMPSON of The Architects Collaborative will become chairman of the Department of Architecture, Harvard School of Design . . . MIES VAN DER ROHE is a recipient of the new Presidential Medal of Freedom—the highest peacetime civilian honor which a U.S. President can bestow . . . Program chairman at 1964 International Design Conference in Aspen next June will be ELIOT NOYES; Noyes will direct the conference in "exploring discrepancies between our standards and our performance" . . . The engineering works of EMIL H. PRAEGER, Praeger-Kavanagh-Waterbury, won him the 1963 award of the Consulting Engineers Council; cited especially was his use of precast concrete in Dodger Stadium, Los Angeles . . . AIA announces the appointment of three department heads: C. HENRI RUSH, Washington, D.C., Dept. of Institute Relations; JOHN F. DAWSON, Ann Arbor, Mich., Dept. of State, Chapter and Student Affairs; and BEN H. EVANS, College Station, Tex., Dept. of Research . . . JOHN W. LINCOLN, The Architects Collaborative, is head of the recently combined departments of graphic and industrial design at Rhode Island School of Design . . ERIC PAWLEY joins the University of Southern California staff as Professor of Architecture; Pawley is Research Secretary of AIA's Headquarters Staff in Washington.

For more information, circle No. 341 ➤

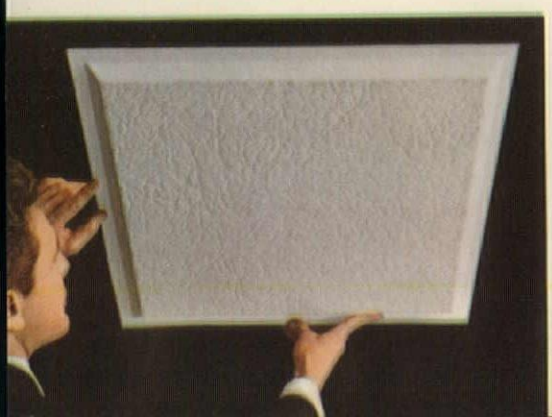
NEW FROM JOHNS-MANVILLE:
INVERTED COFFER

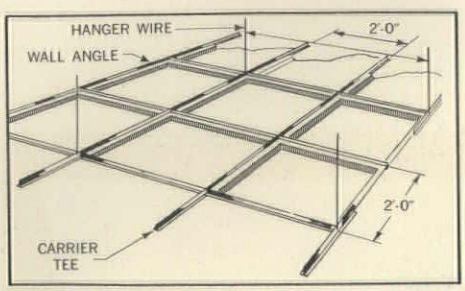
ACOUSTI-SHELL
3-D CEILING PANELS

FLOOR IS J-M TERRAFLEX VINYL-ASBESTOS TILE; WALLS AND COUNTERS ARE FACED WITH J-M GLASAL ASBESTOS-CEMENT PANELS

New dimensional square...New textured surface...New low price!

This new Johns-Manville all-fiber-glass ceiling panel offers a combination of practicality and style . . . at moderate cost. Square lay-in panels are moulded in inverted coffer shape, projecting 1" downward into the room. As shown above, the visible surface has an attractive, low-relief, rippled texture. Panels are factory-painted white, but can, of course, be repainted to suit any decorative scheme. Measuring 24" x 24" x 1" deep and acoustically effective (NRC of .75) . . . Inverted Coffer Panels suggest interesting applications in supermarkets and other broad-expanse areas.





Lay-in Inverted Coffer Panels are quickly installed in an exposed grid-type suspension system.

JOHNS-MANVILLE

JOHNS-MANVILLE JM PRODUCTS

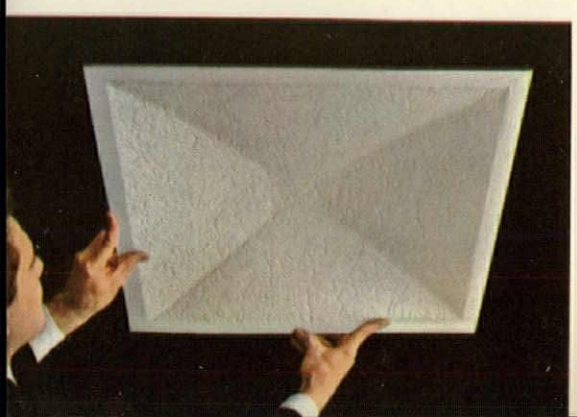
SEE NEXT PAGE

NEW FROM JOHNS-MANVILLE:
TEXTURED VAULT

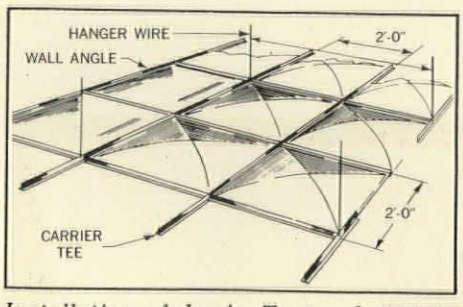
FLOOR AND PEDESTAL ARE J-M COLORCHIP; WALLS ARE J-M GLASAL; BOTH ARE JOHNS-MANVILLE ASBESTOS-CEMENT MATERIALS

New textured surface...with vaulted contour...at modest prices!

A singularly effective way to add dramatic value to virtually any ceiling . . . and at the same time achieve high acoustical efficiency! Textured Vault Panels are moulded entirely of fiber glass with an NRC of .75. They are 24″ x 24″, rising gently to create a 2″ vault. As you see above, the surface is made more visually interesting by a low-relief, rippled texture. White-painted at the factory for easy repainting if desired, Textured Vault Panels offer an opportunity to create a sense of height and elegance, as in the gallery above, and in larger institutional or commercial building areas.



Send for more information on the complete line of Johns-Manville acoustical products. Ask for our new booklet, "Sound Control Ceilings". Address Johns-Manville, Dept. AB, Box 158, New York 16, N. Y. In Canada: Port Credit, Ont. Cable: Johnmanvil.



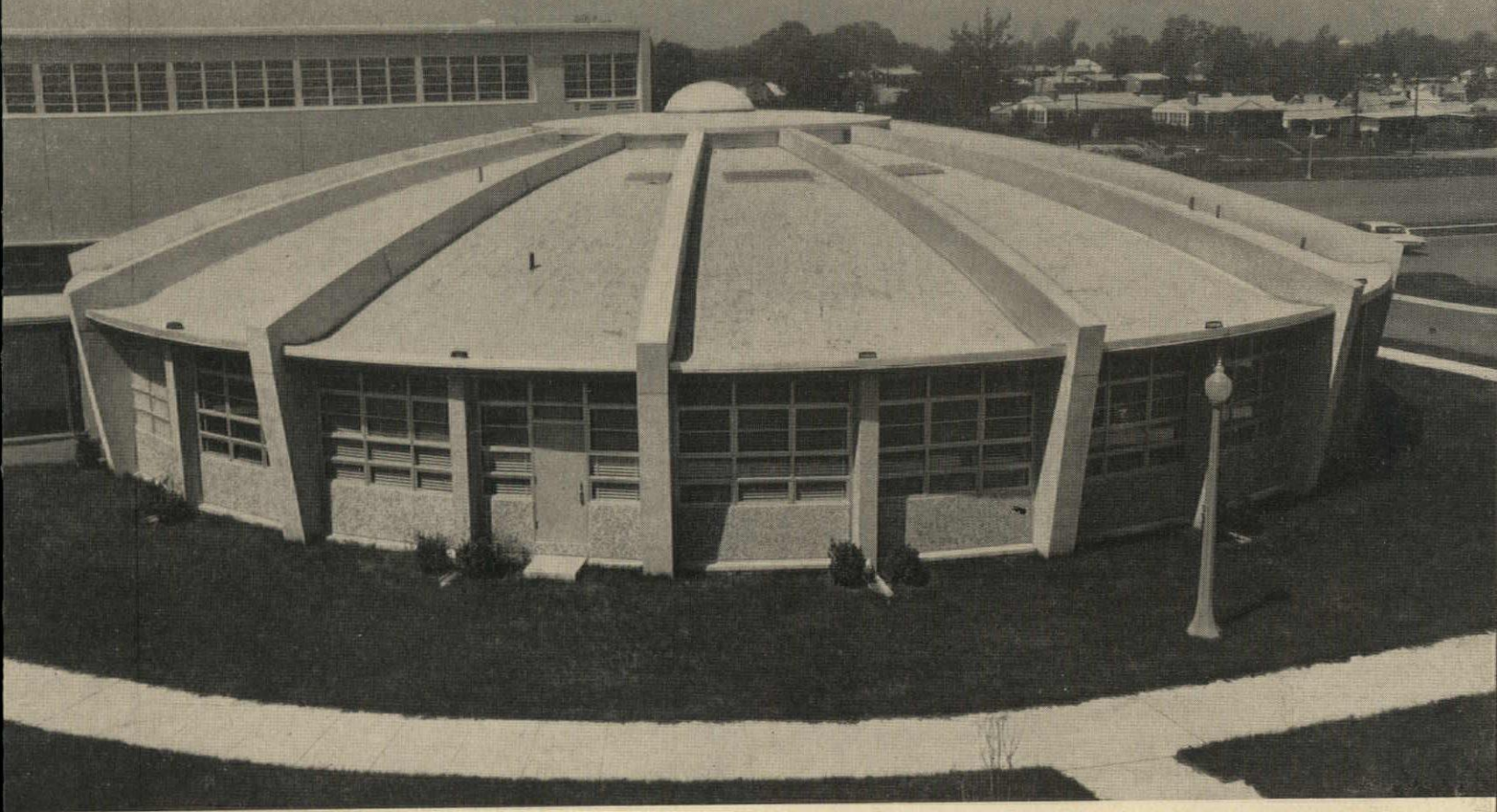
Installation of lay-in Textured Vault Panels is fast and simple in an exposed grid-type suspension system.

JOHNS-MANVILLE PRODUCTS

JOHNS-MANVILLE

AC-72A 3-63 LITHO IN U.S.A.

new shape in science education



SCIENCE BUILDING, LaREINE HIGH SCHOOL, SUITLAND, MARYLAND. Architect: E. PHILIP SCHREIER. General Contractor: VICTOR R. BEAUCHAMP, INC. (both of Washington, D.C.) Precast Concrete Supplier: FORMIGLI CORPORATION, Philadelphia, Pa.

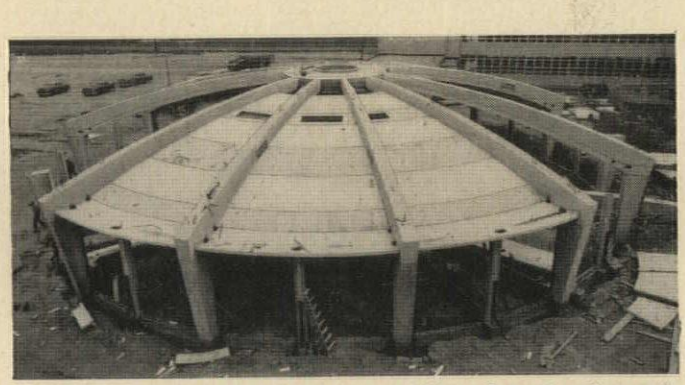
There's educational significance in the circular shape of the Science Building at LaReine High School. Combined laboratory and lecture rooms, with amphitheatre-type seating in the lecture area, are ideal for science instruction. Triangular rooms, then, are most appropriate. This, in turn, suggests a circular building.

Strength and symmetry were achieved with exposed precast concrete columns and arched roof beams. 112 precast concrete slabs are supported by the beams to form the domed roof, 105 feet in diameter and covering 7,450 square feet of column-free interior.

For maximum efficiency in producing the hundreds of units needed, the precaster made a time-saving choice. He used "Incor", America's *first* high early strength portland cement.

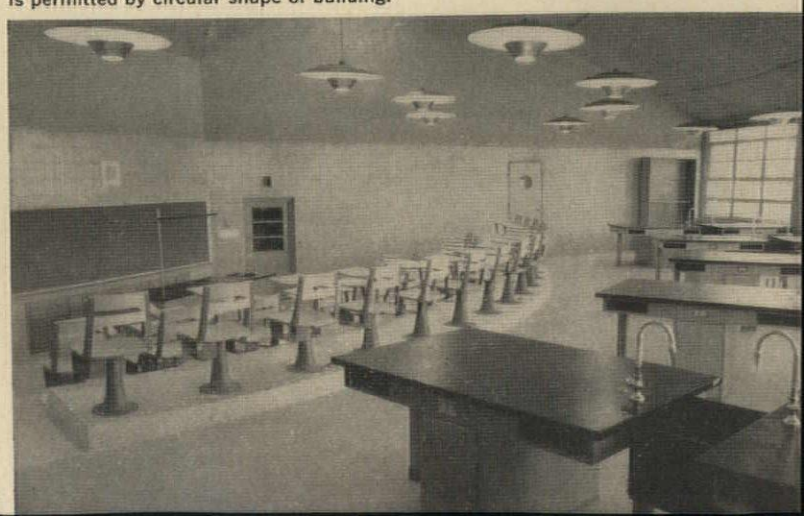
LONE STAR CEMENT CORPORATION N.Y. 17, N.Y.

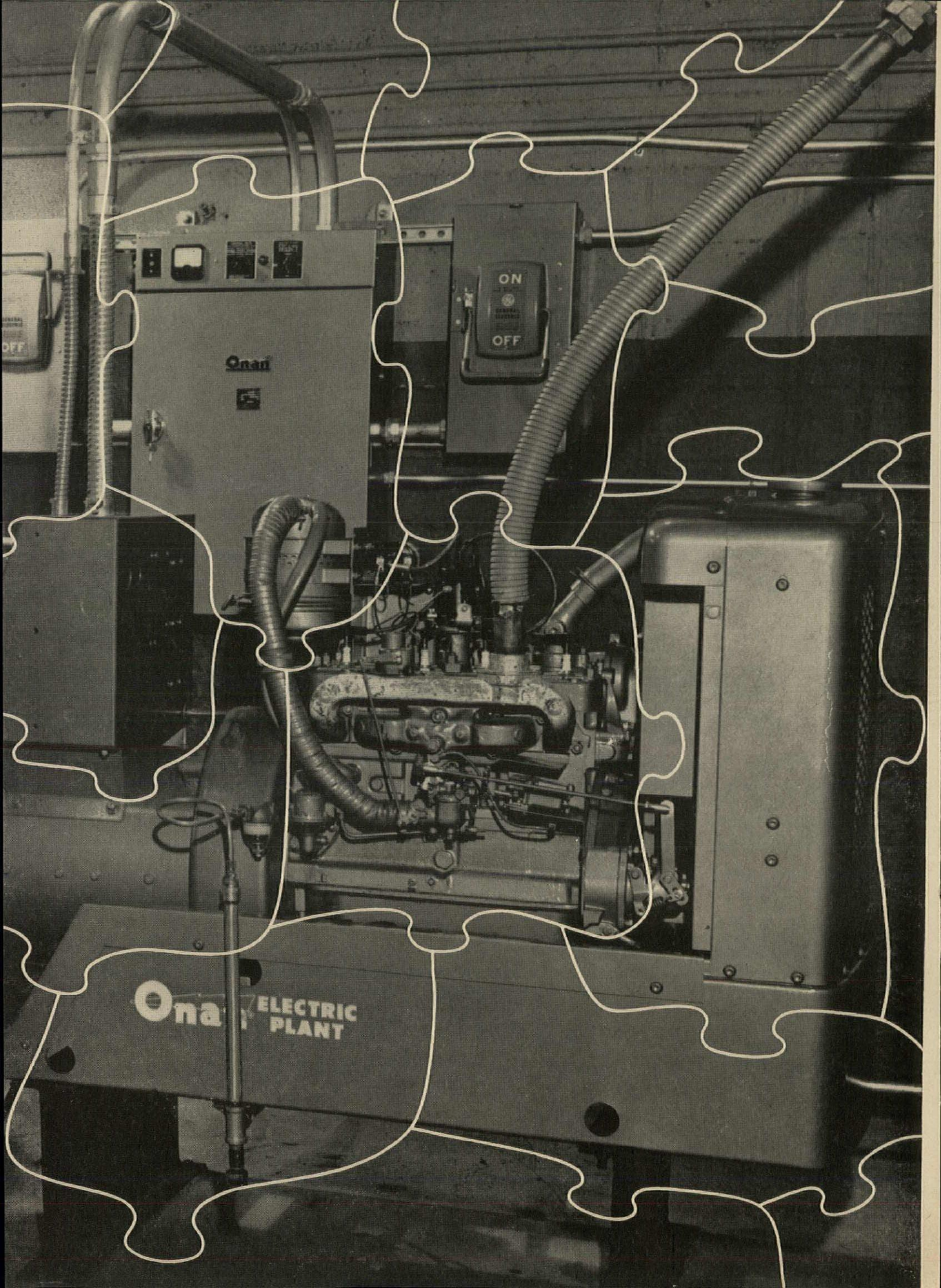
INCOR® 24-HOUR CEMENT



44-foot, 12-ton beams, precast with "Incor" 24-hour Cement, rest on cast-in-place center core and on 13-foot precast columns on the outside.

Advantageous arrangement of laboratory and lecture-demonstration areas is permitted by circular shape of building.

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You'll find your local Onan distributor listed in the Yellow Pages. Thomas' Register, Sweet's. Ask him to send you a copy of Bulletin F-170 "Unit Responsibility." Or, write the factory, 2515 University Ave. S.E., Minneapolis 14.

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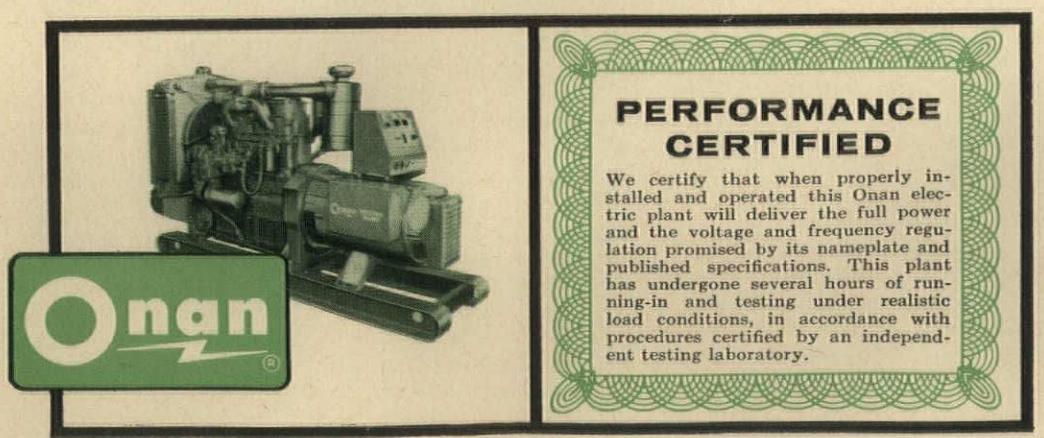
Studebaker
CORPORATION



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For more information, turn to Reader Service card, circle No. 360

CIVIL RIGHTS AND CONSTRUCTION

by E. E. Halmos, Jr.

Anyone involved in the construction industry is right in the middle of the highway down which the civil rights controversy is rolling.

This is bound to affect architects, even if only indirectly, as a result of difficulties anticipated by contractors in connection with orders issued by various Government agencies. It will affect costs, might cause strikes and other delays, and might even be an official opening wedge to bring about the long-held desire of the mechanical specialty contractors for contracts separate from those of the general contractors.

As you may know, Government agencies have already issued a series of orders threatening contractors with loss of Government contracts and even blacklisting them if they fail to comply with antidiscrimination orders.

The President's Committee on Equal Employment Opportunities now has moved to reinforce those orders through a series of meetings with contractor groups in Washington aimed at establishing nondiscrimination standards for the industry and methods for enforcing them.

Most disturbing to contractors was the very obvious intent of Government agencies to use building contractors as a means of ending discrimination in the building trades—a means they regard as "getting to" the trade unions through the employers. The contractors have protested that they often are unable to control discriminatory practices, since they are compelled by various Government agencies to accept hiring halls and exclusive referral agreements and thus must accept whatever men a union group sends them; but this argument seemed to have no effect on the Government people.

The general attitude of Federal officials seemed to be that the contractors could afford a few strikes, if this will force integration on the construction unions, and that the contractors should be forced to quit any contractor group that won't or can't extract nondiscriminatory pledges from the unions with which it does business. Contractors feel that officials have put no equivalent pressure on the unions.

These protests did succeed in postponing issuance of any final orders at least until late August, and the action may be further delayed by a Congressional committee that is also looking into the matter.

Separate Bids

As to the question of separation of mechanical trades bids, the implication is contained in the proposed industry compliance standards:

Prime contractors are required to certify—before being awarded a contract—that their subs subscribe to antidiscrimination rules. That implies that the subs will have to be named before bids are submitted. General contractors see this as an opening wedge toward full, separate contracts.

Local Scene

Washington's own problems with architecture and planning boiled along in usual shape through the hot summer days.

Capitol Architect J. George Stewart, for example, said he was miffed at failure of transit planners to consult him about plans for a subway station under the Capitol itself—thus (for once) getting on the side of an apparent majority who were dubious about the whole idea of subways in the city.

Edward Durell Stone came up (unofficially) with a plan to use 24 pillars, removed when the Capitol's east front was refurbished, as part of an open-air pavillion at the National Arboretum.

And the newly constituted Fine Arts Commission (charged with protecting the beauty of the capital) held the first meeting with all five Kennedy appointees present, and elected William Walton, a painter, as chairman.

D.C. Transit

On planning, Washington's horde of architectural and planning critics seemed to have abandoned any comments on architecture per se, and have concentrated their fire either for or against programs to build rapid-transit lines in this almost transit-less city.

Highway interests lined up on one side, railroad and rapid-transit advocates on the other, in a fight that has been sparked by a proposal that highway work be held up to some extent in favor of transit lines.

The implications are broad, of course: If Congress goes along with any such holdup, similar rules could be applied to highway projects in other urban areas. For the moment, however, the arguments over whether highways damage or beautify a city were dormant.

FINANCIAL

Three related items — all from the Census Bureau — serve to put some perspective into the future of one of the biggest segments of the construction industry, one of its biggest users of supplies and materials: the housing field.

Item: Construction of new, private non-farm residential buildings in June was up 8 per cent over May of this year, up about 3 per cent over June a year ago.

Item: Residential housing vacancy rates were virtually unchanged from the first to the second quarter of 1963, and up very slightly (0.1 per cent) over rates in the same period of 1962.

Item: Expenditures on residential additions, alterations, maintenance and repair in 1962 (full year's figures available) were $11.4 billion—$6 billion by owner-occupants, the rest by owners of rental properties of various sizes. (It is interesting that, of the maintenance and repair work listed by Census, $6.1 billion was for "alterations, additions, and replacements" to residential structures.)

Implication, when you put the items together, is inescapable: Between new construction and alterations, the housing market is somewhere near a balance between supply and demand. In Washington, observers are beginning to believe that housing construction is thus at or very near a plateau that will be maintained for some years to come — particularly as the wartime "baby boom" population comes to maturity and settles down, almost all at once.

Other economic indicators continue to show a steady health for the industry — as predicted, no boom, but a solid and apparently healthy increase.

Highway work, for example, got a boost when the Bureau of Public Roads announced the release of $3.7 billion of Federal-aid money for commitment in the year 1965.

And, in May, voters showed their continuing support of local public works construction by approving a total of $553.3 million worth of bond issues presented to them, turned down $141.4 million worth.

Some facts and fallacies about LABORATORY SINKS

☒ **Selecting a laboratory sink involves many highly technical factors.**

FALSE: Buying a laboratory sink is actually a very simple matter. There are, after all, only four meaningful considerations: corrosion-resistance, service life, cost (including freight) and appearance.

☑ **A "U.S." Chemical Porcelain Laboratory Sink provides universal corrosion resistance.**

TRUE: "U.S." Chemical Porcelain Laboratory Sinks will safely handle all acids, alkalies, caustics and solvents — weak or strong, hot or cold. Thus, there's no need for corrosion charts . . . for special sinks for special corrosives.

And . . . *the body of the sink is every bit as corrosion-resistant as the glaze.* Thus, even if someone were to hit the sink with a hammer and chip the glaze, there would be no need for concern: the sink would retain its full utility.

Because the "U.S." Chemical Porcelain sink has relatively thick walls, there is ample "face" for caulking and sealing the sink to the laboratory furniture. On the other hand, a lasting, leakproof installation of a thin-walled plastic sink is extremely difficult to accomplish and impossible to guarantee. Considerable damage can result if a corrosive liquid splashes into such an imperfect joint or if someone fills the sink to overflowing.

☑ **"U.S." Chemical Porcelain Laboratory Sinks carry industry's longest and strongest guarantee.**

TRUE: Because of their corrosion-resistance and rugged construction—(they'll withstand all the heat-shock and physical abuse they'll ever receive in normal usage)—U. S. Stoneware confidently backs its Chemical Porcelain Laboratory Sinks with a guarantee which we believe is unparalleled in American industry. Too comprehensive and lengthy to reproduce here, it appears in its entirety in Bulletin L-10. (Write for your free copy.)

Many "U.S." Laboratory Sinks in service today were installed more than half a century ago! Actually, today's "U.S." Chemical Porcelain Laboratory Sinks will *outlast the building they're installed in!*

☒ **The cost of laboratory sinks varies widely.**

FALSE: Most laboratory sinks are bought through laboratory furniture manufacturers. A check will show that there's little if any difference in the price of equipment whether furnished with a "U.S." Chemical Porcelain Laboratory Sink, a cast epoxy plastic sink or a soapstone sink.

Motor or rail freight rates between any two points, incidentally, are the same size for size for "U.S." Chemical Porcelain and epoxy plastic sinks, with both being slightly lower than soapstone units.

☒ **All laboratory sinks are dull and drab in appearance.**

FALSE: While epoxy plastic sinks can be furnished only in black and soapstone only in dull gray, "U.S." sinks are available in three attractive colors to match any decor: cool "surf green", soft "mist gray" and sparkling white.

They'll stay attractive, too, for they're non-staining and scratch-resistant — wipe clean as easy as a china dish.

Your laboratory furniture manufacturer can give you complete information. Or, write direct for a free copy of Bulletin L-10. No obligation, of course.

Chemical Ceramics Division

U. S. STONEWARE

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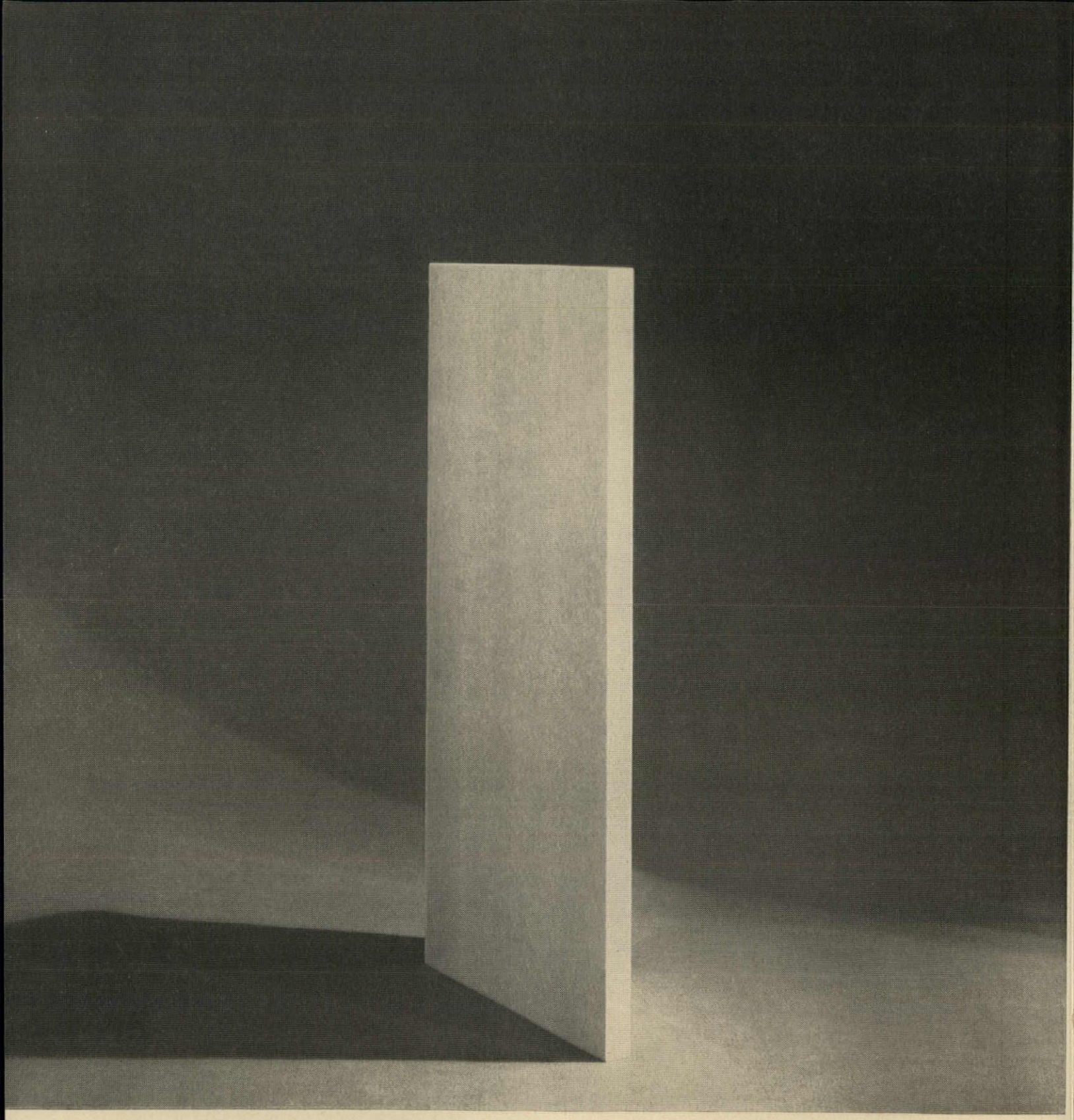
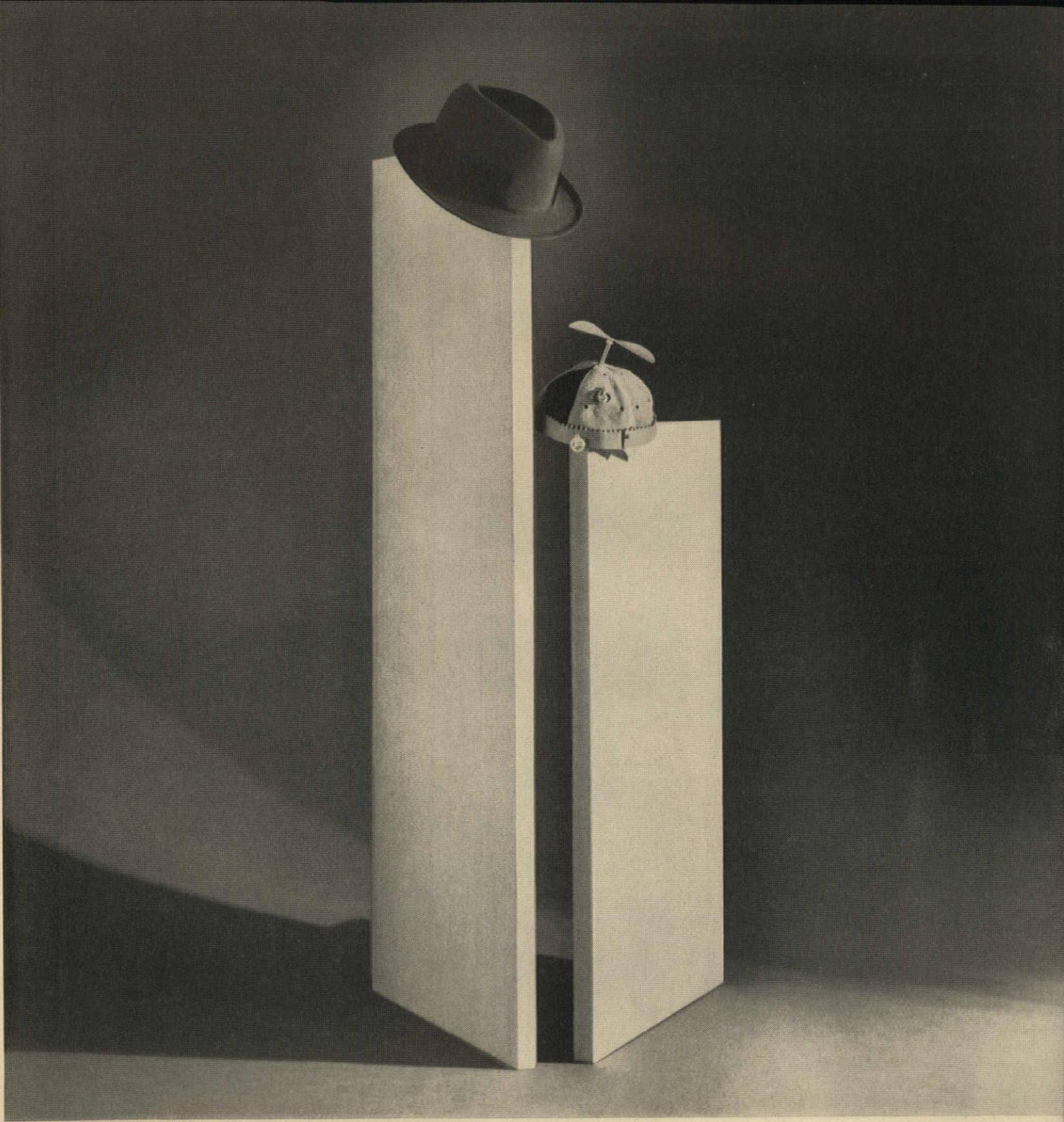


Roofmate FR is the most dependable insulation since Styrofoam®.



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Competitive in price as a material, Roofmate FR saves on installation: as much as one dollar a square! It's lightweight (less than 25 lbs. to the bundle) but tough. We give it a high-density skin top and bottom to take the beating a roof insulation gets. Roofmate FR is pleasant to handle; easy for roofers to fabricate, fit and install. Roofmate FR comes in thicknesses to meet standard "C" factor requirements. Want more data and specifications? Just see our insert in Sweet's Architectural File, or write us: The Dow Chemical Company, Plastics Sales Dept. 1001EB9, Midland, Michigan.

DOW

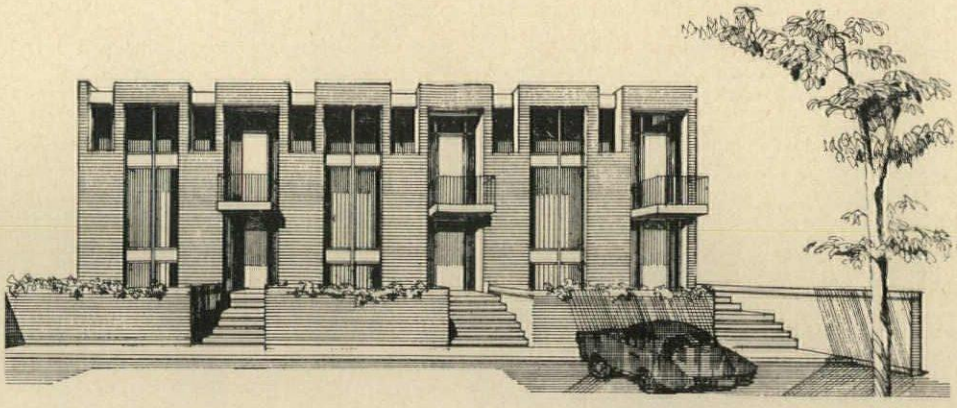
For more information, turn to Reader Service card, circle No. 323

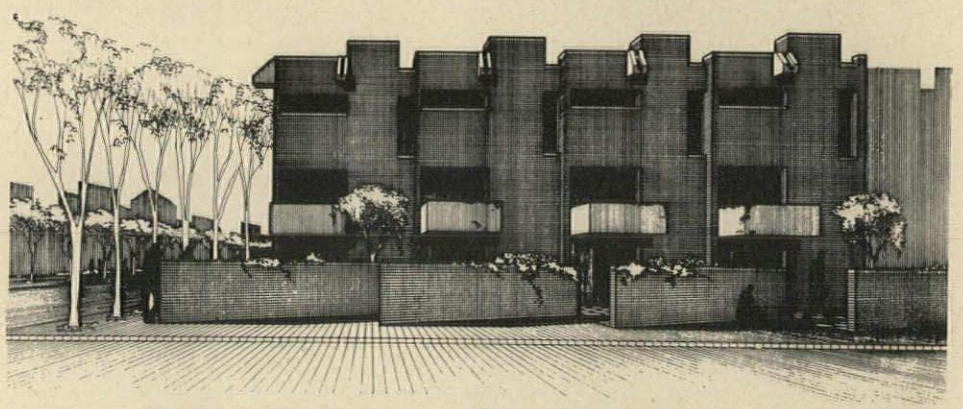
TWO NEW TOWNHOUSE PROJECTS

The current proliferation of new townhouses and townhouse projects marks one of the most interesting trends in today's urban housing picture.

A group of three townhouses (*top*) designed by Clovis B. Heimsath for Westmoreland, an older residential section of downtown Houston, is planned for entertainment-prone families without children. Structure will have heavy timber or concrete floors and load-bearing brick walls. This is the first project under the newly formed Westmoreland Urban Action Group, of which the architect and his client are members.

"Pickwick Village" by Tigerman & Koglin (*bottom*) will be situated in the periphery of Chicago's Old Town section. Eight three-story townhouses will be grouped around a common, interior, cloistered entranceway. Ground floors will open from private courtyards (*see rendering*) and contain dining room, kitchen, and family room. First floor will contain living room and library separated by a free-standing core, and top floor will be devoted to sleeping area. Structure will have masonry bearing walls conventionally spanned in timber.





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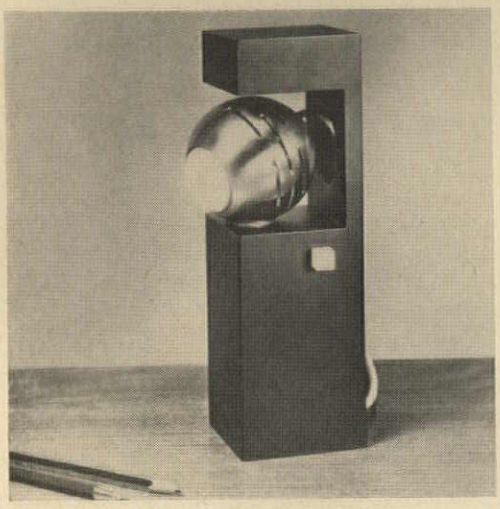
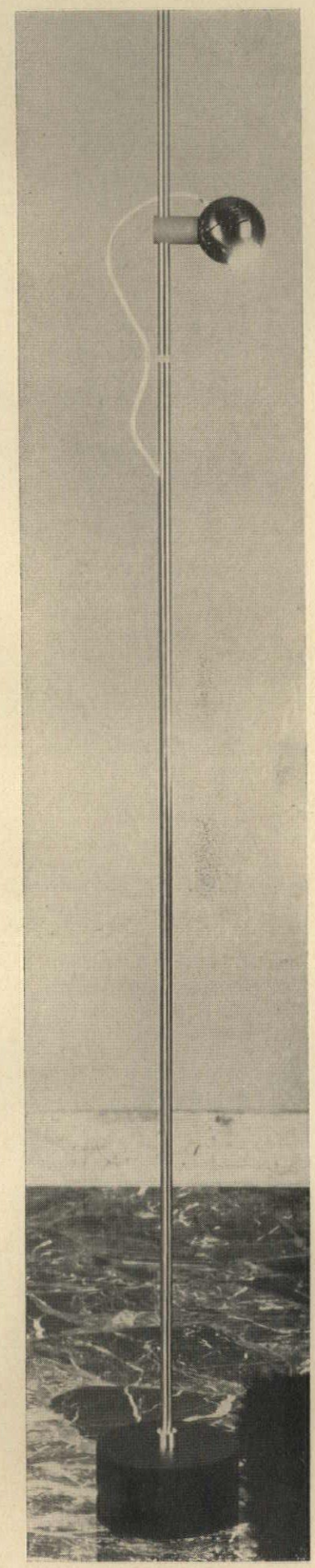
NEW PRODUCTS



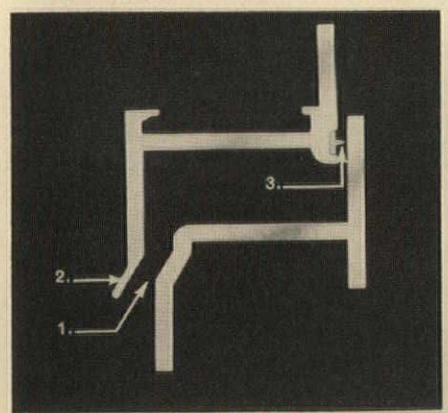
A unique collection of lighting from Arredoluce of Italy is now available in the U. S.—14 sculptural designs, all meticulously articulated. Many of the lamps have an "eyeball" sphere (3″ diameter) which may be manually rotated in a magnetic socket for reading, spotlighting, or general illumination. The 18-w bulb especially designed by General Electric, sheds light equal to 100-w. A 9″-high table lamp *(left)*, cubistic in feeling, has a rectangular black metal body, contrasting nickel matte "eyeball" and red button. Standing lamp *(right)* has "eyeball," white wire, long stem, and black base. Stiffel, 225 Fifth Avenue, N. Y.

On Free Data Card, Circle **100**



Revolutionary refrigerator design features sliding doors of triple pane glass to keep doors free of frost and fog. "Avanti," 72″ x 48″ x 26″, also features exterior side paneling in walnut, oak, birch, or paint. Refrigerator is located in upper half of unit, freezer below. Total interior space is 23 cu ft, refrigerator area 13 cu ft, and freezer space 10 cu ft. Cold-air machinery is concealed in rear portion of drawer area in freezer. Refrigerator can be free-standing, built-up, or utilized as a room-divider unit. Tentative price is $800. Studebaker Corp., Franklin Appliance Div., 65–22nd Ave. N.E., Minneapolis, Minn.

On Free Data Card, Circle **101**



"Sealair" window resists water and air leakage by means of a triple weather guard consisting of (1) "Pressure Equalization Slot"; (2) integral drip member; and (3) complete neoprene weather sealing *(detail illustrated)*. System represents two years of development and testing. During turbulent weather, outside pressure is substantially higher than air pressure inside a building, producing water leakage. To alleviate this condition, a continuous air Pressure Equalization Slot runs the width of the window and allows air pressure within the extruded frame member to achieve balance quickly with outside pressure. Kawneer Co., 1105 N. Front St., Niles, Mich.

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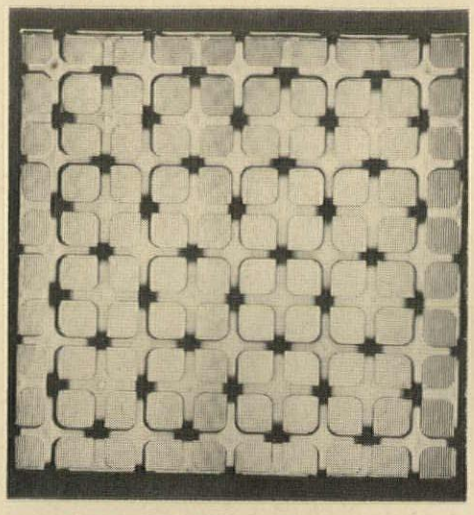


Sculptural Ceiling

New in suspended-ceiling lighting diffusers is this three-dimensional sculptural acrylic grille designed by Erwin Hauer. It is composed of modular plexiglas units (24″ x 24″) which are pigmented to shed glareless light. Grille is easily installed by steel hanger hidden suspension; any "T" bar spline system may be used for perimeter treatment. Acrylic will not discolor or warp and is dirt-repellant. Available in semitransparent, gray-green matte finish or any standard plexiglas color. Arts for Architecture, Inc., 16 E. 53 St., New York, N. Y.

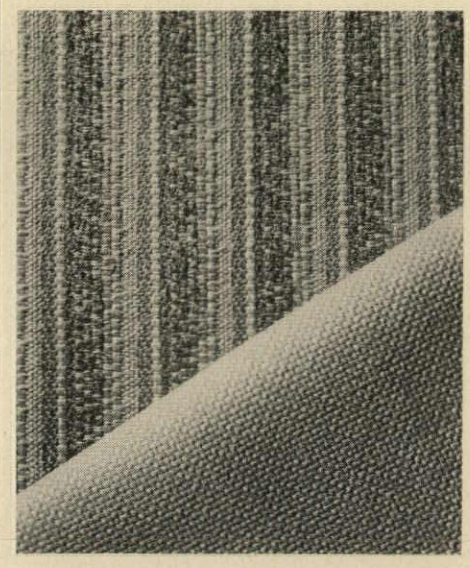
On Free Data Card, Circle **103**

Welding Studs to Porcelain Panels

Special fasteners and equipment were developed to mount on-site, porcelain

panels to aluminum studs at the Terminal Building at the Dulles International Airport. Terminal contains 40,000 sq ft of porcelain enamel used as soffits, fascia, and other formed panels that frame portalounge entry and exit gates. These poreclain-enameled aluminum panels are welded to aluminum studs that are ¼″ in diameter and 1″ in length. Fasteners prevent any risk of warping or damage to enamel finish and eliminate need for spiral channels or angle supports. Nelson Stud Welding Division, Gregory Industries, Inc., Lorain, Ohio.

On Free Data Card, Circle **104**



Dorothy Liebes Fabrics

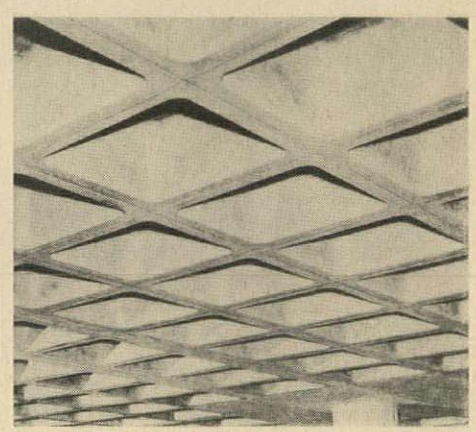
Dorothy Liebes, well known custom textile weaver and color arbiter, has designed her first collection for a fabrics house. The line consists of 90 upholstery fabrics and 18 casement cloths. In a myriad of color, there are textured stripes, bulky weaves, twills, and basket-weaves—most of them with colors correlated to go with other fabrics in the collection. Many are constructed with Dupont's durable "Antron" nylon, yet they retain the hand-crafted look for which this designer is renowned. Stroheim & Romann, 155 E. 56 St., New York, N.Y.

On Free Data Card, Circle **105**

Ventilated Cooking

High oven range, 40″ tall, features advanced ventilation system and removable oven panels coated with Dupont's "Teflon," so that cleaning is quick and easy. Range also has side-by-side, eye-level ovens with double-paned glass doors that lift-up and out-of-the-way for easy oven access and cleaning. From horizontal tube beneath ovens, air jets spiral out over front surface of units, wafting grease, odors, and smoke to rear intake. Inside range, pleated glass-fiber filter and a bed of activated charcoal clean air, which is then returned to the room. Vent system, connected to two ovens to permit closed-door broiling, eliminates heat and fumes that would otherwise fill kitchen. Hotpoint, Division of General Electric Co., 5600 West Taylor St., Chicago 44, Ill.

On Free Data Card, Circle **106**



Deeper Dome Forms

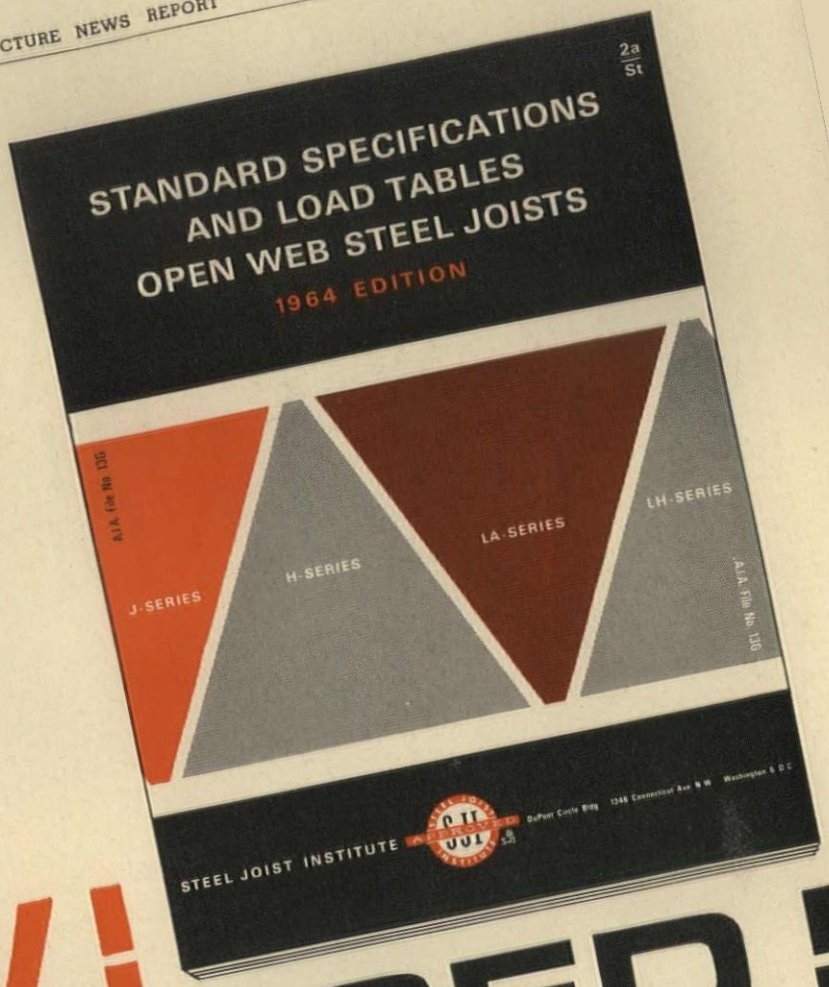
Deeper, one-piece steel dome forms for larger span reinforced concrete waffle slabs have been introduced. Steel dome, 30″ x 30″, formerly limited to 14″ in depth, is now available in 16″ and 20″ depths. Utilizing dome forms for waffle flat-slab roof and floor framing system, greater stiffness is produced enabling spans over wider areas and support of heavier loads. Deeper depths will now permit column-to-column spans in 50′ range as compared to previous span of 40′. Ceco Steel Products Corp., 5601 W. 26 St., Chicago 50, Ill.

On Free Data Card, Circle **107**

Storing Paintings

Carnegie Institute in Pittsburgh has installed "Space Frame" overhead arbor and suspended movable aluminum display panels for storing valuable paintings. Space-saving rack consists of vertical storage panels, 8′x10′, suspended on rollers, that can hold many sizes of paintings. The rack spans a clear distance of 25′. Thirty-six open-slotted channels are strung horizontally near the ceiling of the storage vault. Each panel, rated to hold 500 lbs, is placed so that paintings can be hung on both

Continued on page 99



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See AIA File No. 39-B in Sweet's Catalog. For samples, literature, or technical data—find your local Lo-Tone Acoustical Contractor in the Yellow Pages, or write us: Wood Conversion Co., St. Paul 1, Minnesota.

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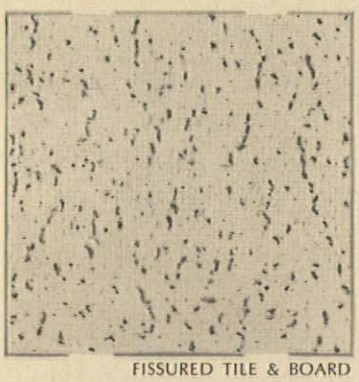

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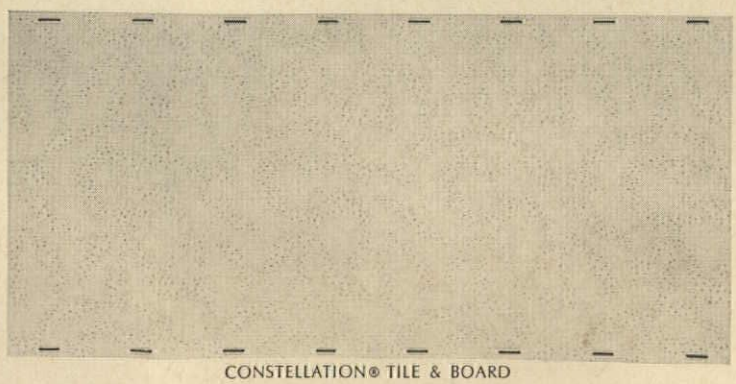

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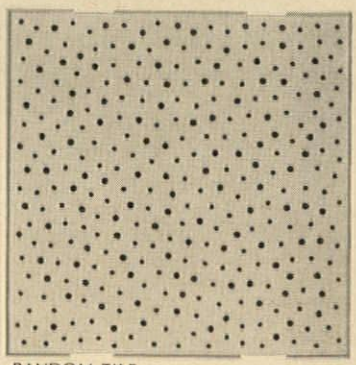

RANDOM TILE

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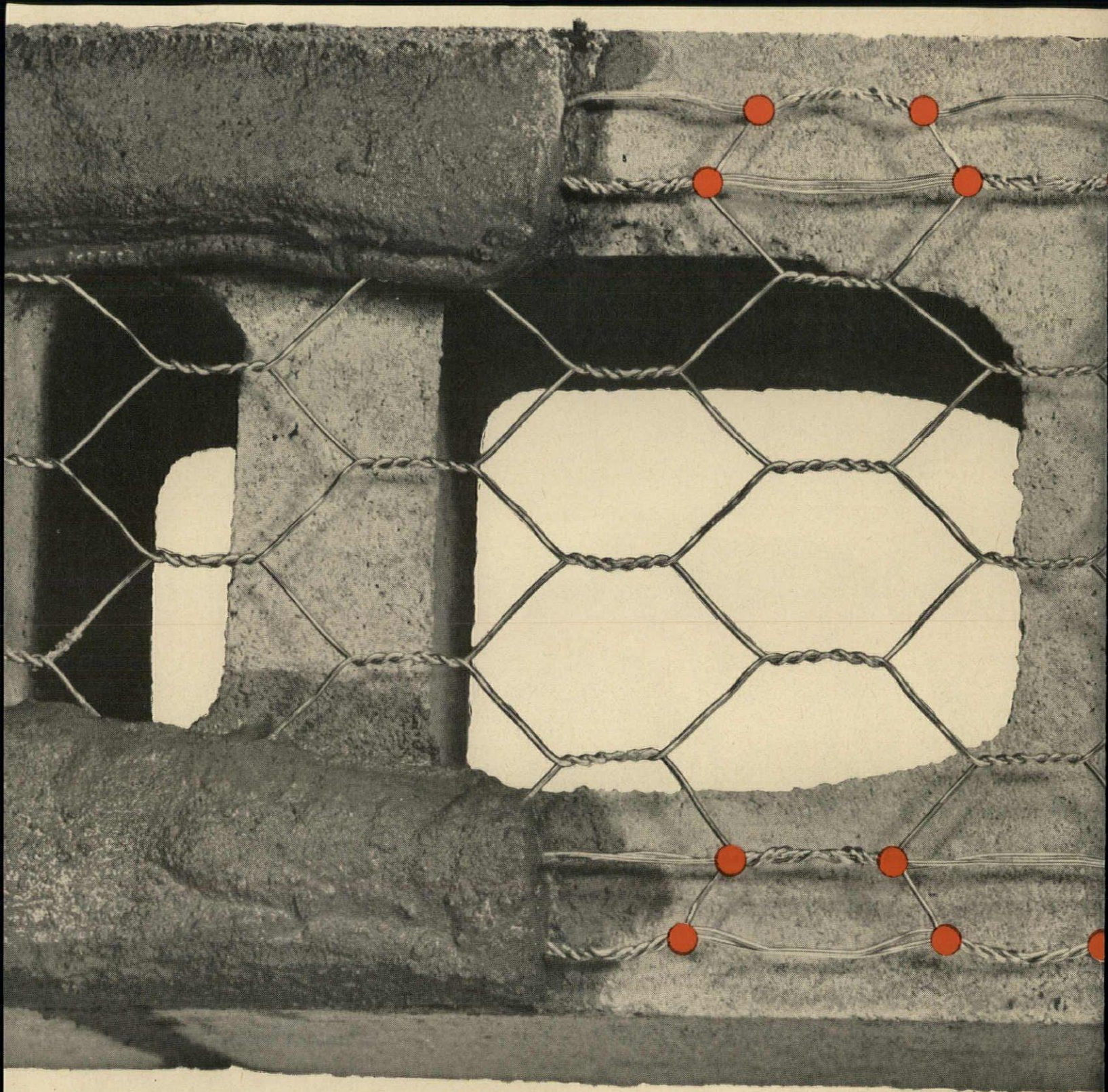
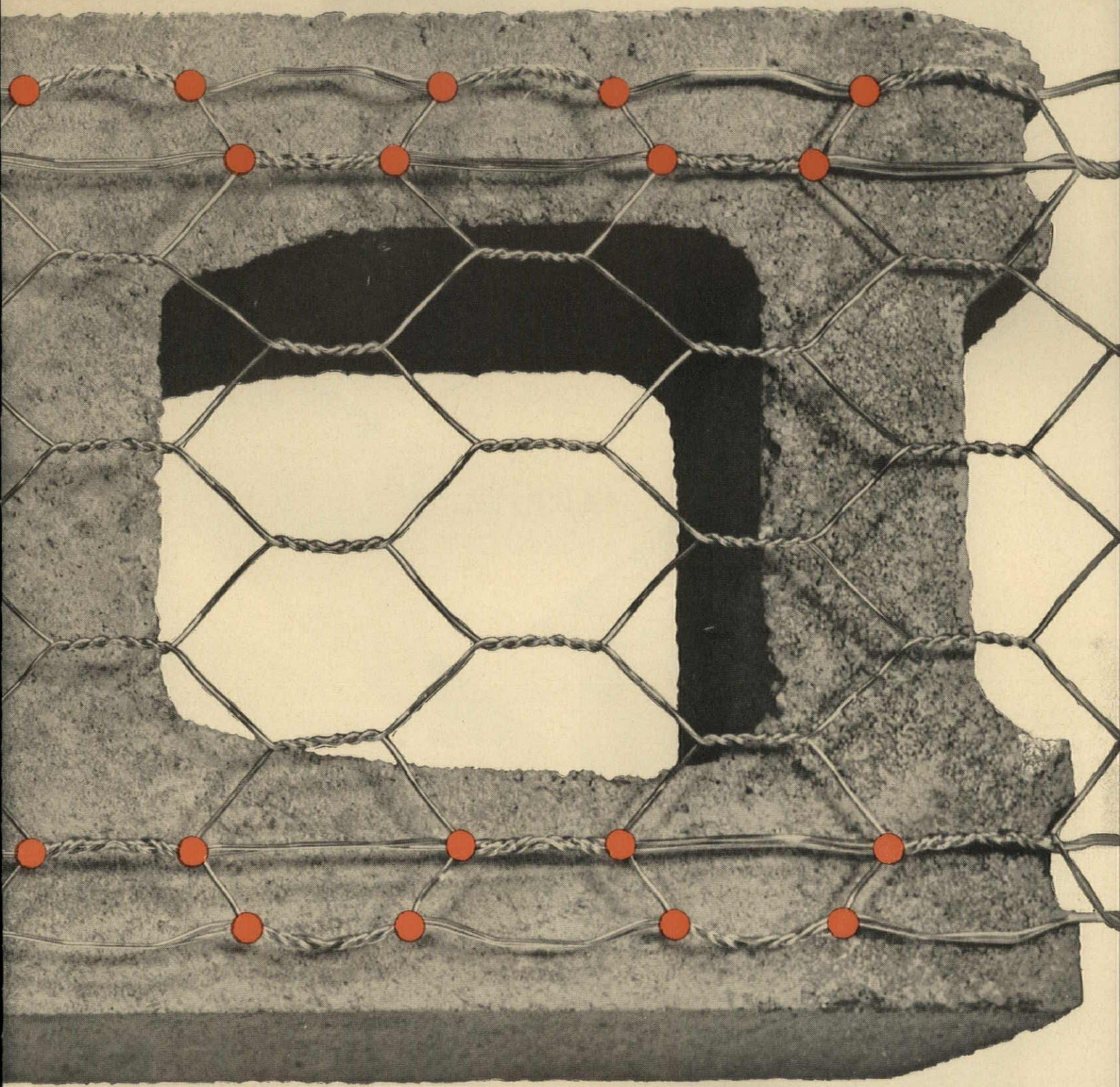
ACOUSTICAL VENTILATING BOARD

Centurion at the Foot of the Cross, a Byzantine mosaic dating from the 11th century.



KEYSTONE STEEL & WIRE COMPANY Peoria, Illinois



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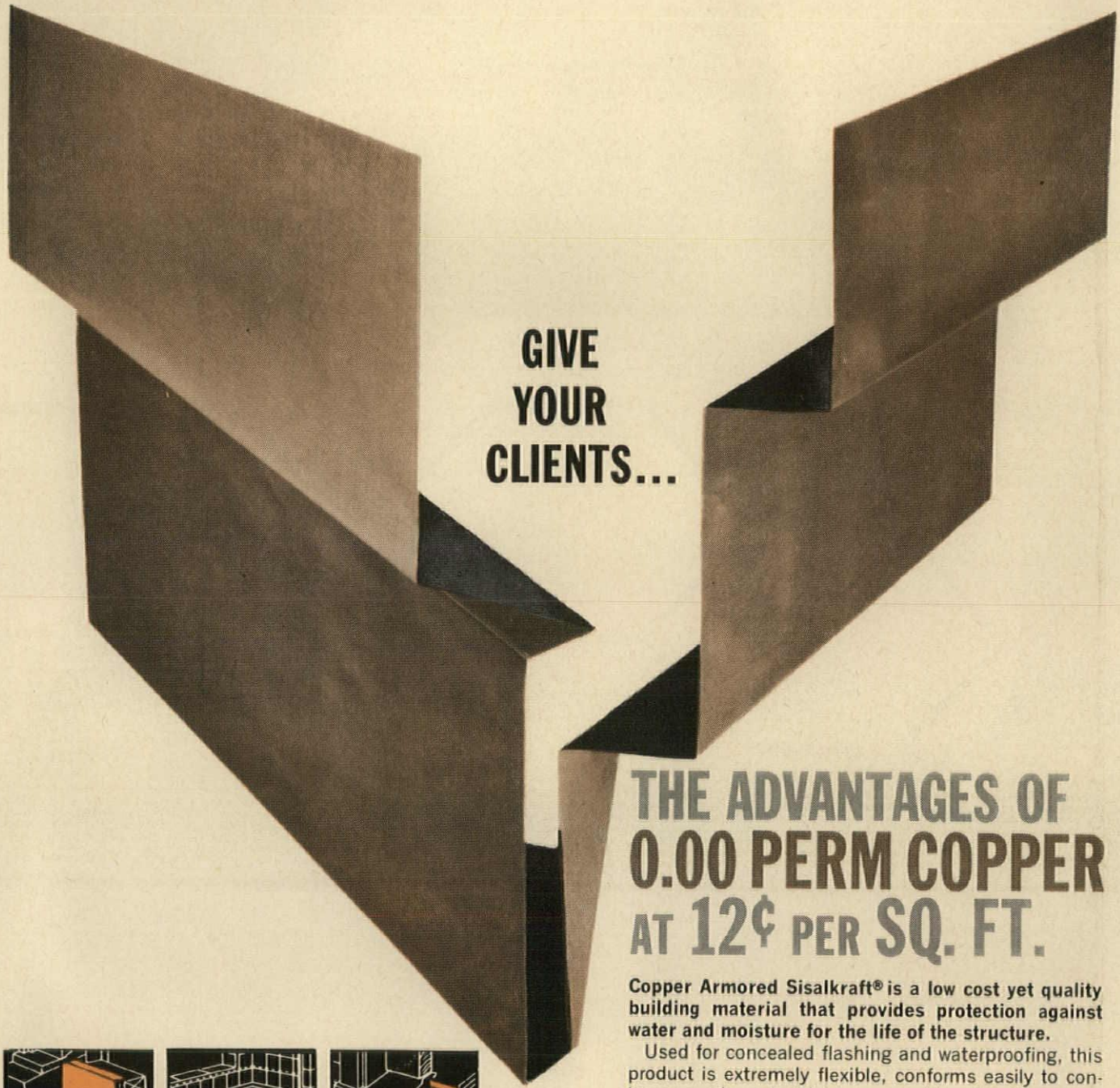

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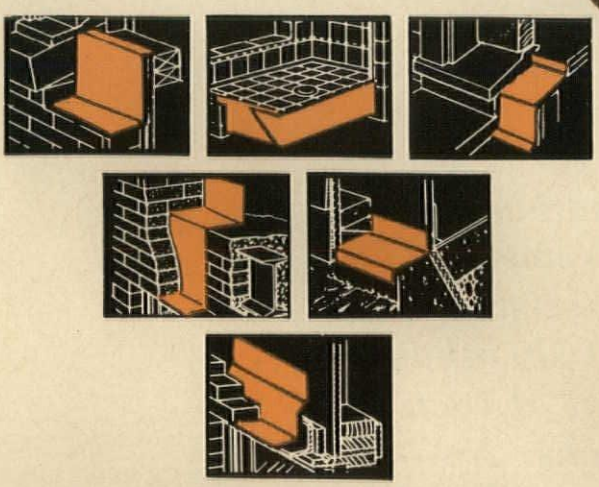
Suggested specifications will be found in Sweet's File 8h/Am. For additional information and actual samples, write American Sisalkraft, 56 Starkey Ave., Attleboro, Massachusetts.



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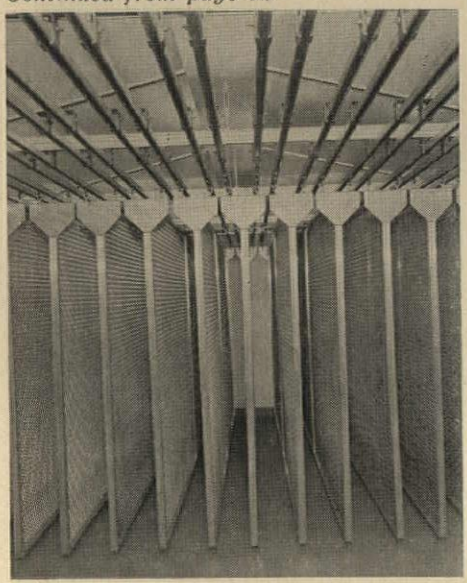
Continued from page 92



sides. Steam, water lines, and uneven wall conditions are not a problem. Brackets can be added for placement of additional paintings or picture frames. Unistrut Products Co., 933 Washington Blvd., Chicago 7, Ill.

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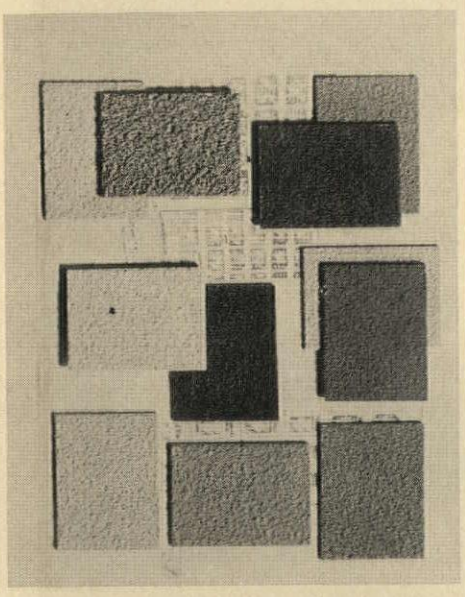

Weather-Resistant Exterior Coating

Exterior coating, called "Textane," is made of polyurethane resins and specially selected graded aggregates. Coating permits normal transmission of water vapor which eliminates costly film failures that often occur when non-breathing materials are employed for exterior applications. Textane resists deterioration resulting from efflorescence and condensation. It is chemical- and weather-resistant, as well as tough and durable. Textane can be used for coating concrete blocks, bricks, poured concrete, cement plaster, asbestos-cement board, and other forms of masonry backing. It is available in a variety of colors. Desco International Assn., Box 74, Buffalo, N.Y.

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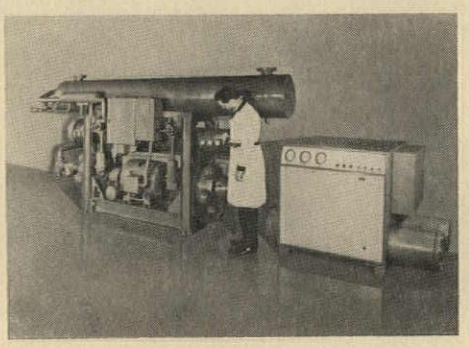
Vibration-Free Chiller

Chrysler Corporation has announced new line of air-conditioning equipment in 20-to-100-hp range that solves problems of equipment isolation and



space requirements. Particularly emphasized is reciprocating chiller that is quiet and vibration-free. Chiller is the only available 100-hp unit that occupies only 19 sq ft of floor space and weighs less than 2 tons. Compressor muffler is acoustically tuned to frequency of refrigerant gas. Cooler and condenser tanks are used as "structural backbones" of chiller to eliminate unnecessary supporting material. Through more efficient use of cooling surfaces and redesign of tube sheets, tube bundles have been reduced in size and spacing with no loss in overall heat transfer, thereby reducing size of both cooler and condenser. Photo compares sizes of old and new chillers. Chrysler Corp., 1600 Webster St., Dayton 4, Ohio.

On Free Data Card, Circle **110**

Glass Fiber Garage Doors

Glass fiber reinforced paneling for garage doors is lightweight, shatterproof, and impact-resistant. It will not fade, rust, or warp. Panels are available in wide variety of colors and require no painting. Resins are evenly dispersed for better weathering and longer wear. Structoglas, Inc., 11701 Shaker Blvd., Cleveland 20, Ohio.

On Free Data Card, Circle **111**

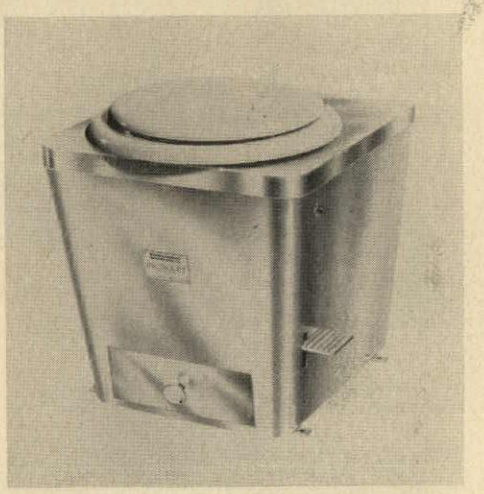
Heat-Absorbing Glass

Bronze plate glasses provide glare- and brightness-reduction, as well as heat-absorbing advantages. Two types, "Parallel-O-Bronze" and "Rough Bronze Plate Glass," are offered. Parallel-O-Bronze is a twin-ground, tank plate glass providing a "high degree" of visual clarity. It is available in thicknesses of 13/64", ¼", ⅜", and ½". Rough Bronze Plate Glass is a translucent glass providing relatively high light transmission and good obscurity. It is available in thicknesses of 9/32", which is rough on both sides, and 17/64", which is rough on one side and polished on the other. Libbey-Owens-Ford Glass Co., 811 Madison Ave., Toledo 2, Ohio.

On Free Data Card, Circle **112**

The Effluent Society

Waterless, electric incinerating toilet features catalytic odor reduction. Method catalyzes odors given off during incineration of human waste, both



liquids and solids, into sterile, odorless ash. It reduces effluent odors during incineration below threshold of smell. Unit is self-sustaining in supply within 80 lb disposal plant and does not need replacement. Research Products Manufacturing Co., P.O. Box 35164, Dallas 35, Tex.

On Free Data Card, Circle **113**

Glass Fiber Roof Ventilator

An up-blast roof ventilator has been introduced that is notable for corrosion- and moisture-resistance. Components that are exposed to air are all glass fiber, except for the motor shaft, nuts, and bolts, which are made of stainless steel. Ventilator offers capacities from 1700 through 34,000 cfm and is available in standard sizes of 14", 18", 24", 30", 36", and 42". Aerovent Fan Co., Inc., Piqua, Ohio.

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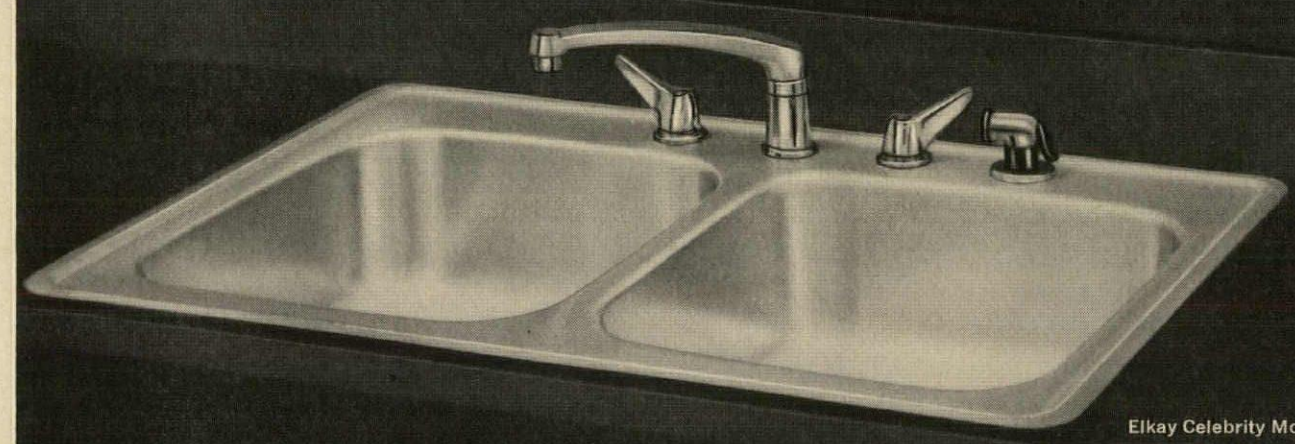
Good News for Builders

Women Prefer Stainless Steel Sinks



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REVISED AISC STEEL MANUAL

By Ira M. Hooper, Associate, Seelye, Stevenson, Value & Knecht, Consulting Engineers.

America's most popular book on construction has been completely revised for the first time in 17 years. It will enable designers to take full advantage of new materials and new design methods.

Since the previous edition, technological research has developed high-strength steels, high-strength bolts, improved welding techniques and electrodes, stud shear connectors for composite construction, to name just a few innovations. At the same time, improvements in the theory of structures resulted in the development of plastic design, and a better understanding of plate girders and of columns.

It was no small task to accommodate all of this new material in a manual. An eight-man committee worked for more than a year, with assistance from an editorial staff of 14. Suggestions and recommendations were received from more than 1200 engineers, architects, educators, and fabricators. The committee chairman was William H. Jameson; the editor was Mace H. Bell of AISC. Other members included Theodore R. Higgins, who is Director of Research and Development, AISC, and five representatives of steel fabricating firms.

The basic steel is now ASTM A-36, instead of A-7, which represents an increase in yield strength to 36 ksi from 33 ksi with practically no increase in cost per ton. A-36 steel has good welding characteristics and is now generally accepted in place of A-373 steel, which costs about $3 more per ton. With this basic revision, the manual has been conveniently regrouped into seven logical, thumb-indexed parts. A list of the parts and new features follows:

Part 1. *Dimensions and Properties.*

a. Data for new lightweight wide-flange sections.

b. Data for new square and rectangular tubes.

c. Rearranged section on standard mill practice.

d. New data for crane rails, welded and bolted splicing.

Part 2. *Beam and Girder Design.*

a. Plastic section modulus table added.

b. New tables of allowable loads for laterally supported beams of A-36 steel; conversion factors are included for high-strength steels.

c. New charts of allowable moments for A-36 beams without lateral support.

d. Expanded section on plate girders, with detailed examples and tables of section properties.

e. New section on composite beams, with explanation, examples, and tables of section properties.

Part 3. *Column Design.*

a. New tables of allowable concentric load for A-36, and for A-242, A-440, A-441 steels; detailed examples showing use of tables for concentric loading and for combined loading.

b. New tables of allowable concentric loads for steel pipe and structural tubing, A-36 steel.

c. New column base plate tables for A-36 and for high-strength steels.

Part 4. *Connections.*

a. New tables for framed connections and for seated connections; includes use of rivets, plain bolts, high-strength bolts, welding with two types of electrodes; values shown for basic steel and for high-strength steels.

b. New design examples for special connections, one-sided connections, moment connections.

c. Enlarged section for eccentric loads on fastener groups and weld groups, with examples.

d. Added section on suggested details.

e. Enlarged section on welding symbols and permissible welds.

Part 5. *Specifications and Codes.*

a. New AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings, adopted April 17, 1963; a commentary is included.

b. New summary of ASTM Specifications for rolled structural steels.

c. Revised Minimum Design Loads; excerpts from American Standards Building Code.

d. Added Recommended Live Loads for Storage Warehouses, U.S. Department of Commerce.

e. New Specifications for Structural Joints Using ASTM A-325 Bolts (high strength).

f. New Specification for Architecturally Exposed Structural Steel.

g. New Specifications and Load Tables for Open Webb Steel Joists—longspan, shortspan, standard steel, high-strength steel.

Part 6. *Miscellaneous Data and Mathematical Tables.*

a. Added information on corrugated steel construction.

b. Expanded discussion of the effect of heat on structural steel, including the use of heat for straightening and cambering.

c. New geometric tables for bracing and for the parabola and ellipse.

Part 7. *Index.*

The manual is preceded by a complete list of nomenclature, which explains all of the symbols used. Partial lists of nomenclature are to be found in the body of the manual where they apply. These lists are a great help in understanding the text and the tables. The manual represents a remarkable effort by an entire industry to modernize its basic source of information. Inevitably, there will be some typographical errors, as well as criticism by practitioners with preference for personally developed methods. It is to be hoped that these will be brought forward in a constructive manner. The following remarks are offered as helpful comments and are not intended as adverse criticism.

In Part 2, the charts for allowable moments in beams without lateral support are not easy to use. The complexity of the jagged intersecting curves and the lack of accentuated grid intervals are some of the difficulties to be encountered. Part of the difficulty can be quickly corrected by ruling grid intervals with a red ball-point pen.

Also in Part 2, the tables for composite design of steel beams with concrete slabs are admittedly limited in scope: only one concrete strength of 3000 psi; slab thickness, t, of 4″ to 5″, effective flange width of 16-t or 8-t; steel beam depth from 8″ to 21″. The tables, the explanation, and the examples offer a good introduction to the subject. Further information and more extensive tables are available in a recent publication of Bethlehem Steel Company. The subject really calls for a separate manual.

Plastic design is mentioned only in the design specifications, Part 5; and in the plastic section modulus table, Part 2. The explanations and examples were too voluminous for inclusion; the AISC has published a separate volume entitled "Manual on Plastic Design in Steel."

The absence of information about a steel unit that has increased the economy of steel office buildings is noteworthy. Cellular steel deck is widely used, but details vary greatly between manufacturers, so that standard sections have not yet been adopted. For the present, there is no alternative to using the manufacturer's literature.

In spite of the few comments above, designers will find that, with a little practice, the manual will be a great saver of time. Let us hope that the AISC will not rest for too long after

a job well done; the accelerating pace of research and development will require constant surveillance. Manual is available for $7.00 from the American Institute of Steel Construction, Inc., 101 Park Ave., New York 17, N.Y.

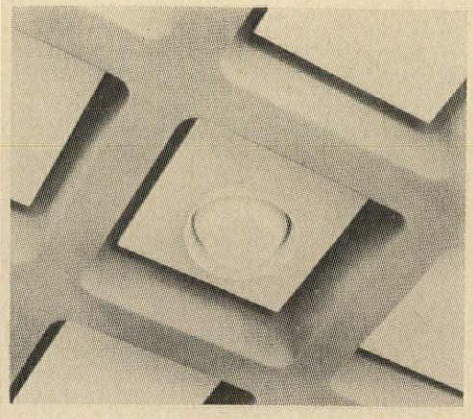
CONSTRUCTION
Tests on Cement

Flier, 6-pages, offers test reports, specifications, and other data on an all-purpose cement. Details and specifications include materials, mixture, properties, application, finishing, and curing. Perma-Cement Corp., 2501 N.W. 75 St., Miami, Fla.

On Free Data Card, Circle **200**

Joist Construction

Benefits of reinforced concrete joist construction are defined in 60-page publication. Topics discussed besides concrete joist construction are steelforms, steeldomes, flangedomes, adjustable steelforms, longforms, anchorage devices, underfloor electrification and ceiling construction. Also



described are reinforcing bars, spirals, fabrics, and accessories. Illustrations, details, and specifications are given. Ceco Steel Products Corp., 5601 West 26 St., Chicago 50, Ill.

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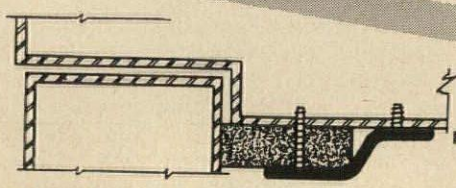

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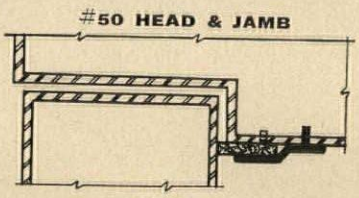

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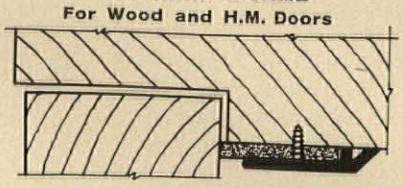

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Structural Bolt Units

Advantages of high-strength structural bolting is explained in 22-page booklet. Bolt assembly has shorter thread length, requires no washers if turn-of-the-nut method of installation is used, and has ⅛" increased bolt head width. Nut and head widths are identical and same wrench can be used on both. Less construction time is required and higher shear values reduce number of bolts required. Booklet contains specifications, dimensions, and strength properties charts as well as sections on shear, tension, installation, bearing tests, etc. Republic Steel Corp., 1441 Republic Building, Cleveland 1, Ohio.

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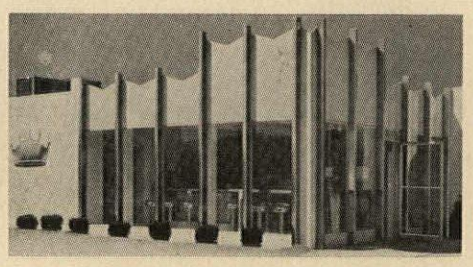

Porcelain-Enameled Curtain Walls

Booklet, 8-pages, describes porcelain-enameled steel curtain-wall system. It is protected from water by use of extruded butyl sealants, clamped under pressure, in all vertical joints. Poly-

Pools are sure getting around ...but water isn't!

Here's still another decorative pool adding distinctive flair to an outstanding modern building — 1120 Avenue of the Americas, New York. You see pools practically everywhere today — in lobbies (like this one), in and out-of-doors, upstairs and down. And it's thanks to lightweight, leakproof lead that you can put attractive pools nearly anyplace your fancy dictates.

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Let it soar a bit now. Couldn't you do something dramatic with lead-lined planters or pools on some project you're thinking about? Detailed technical data on lead in these applications are yours for the asking. Lead Industries Association, Inc., Dept. N-9, 292 Madison Avenue, New York 17, New York.

LEAD INDUSTRIES ASSOCIATION, INC.
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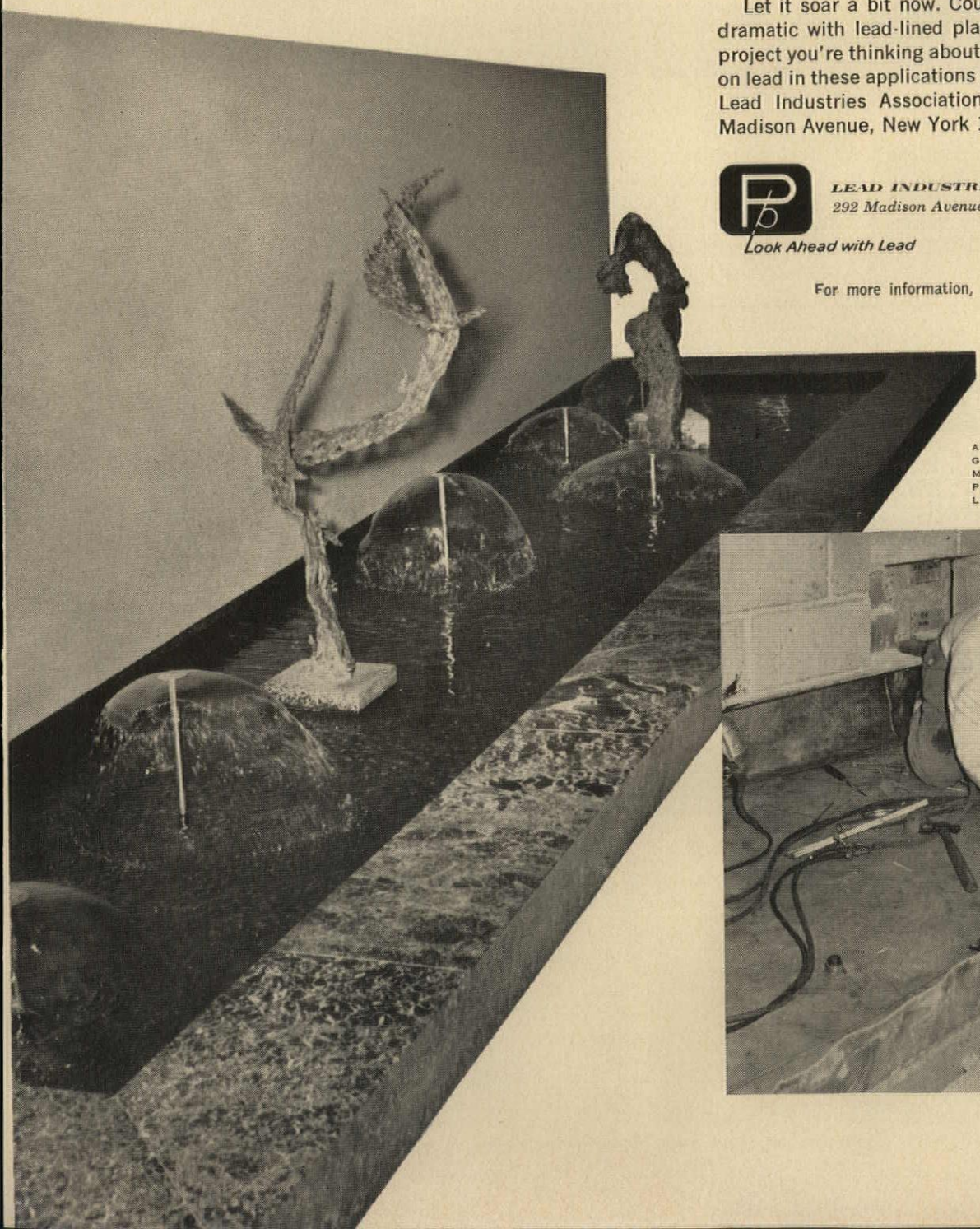
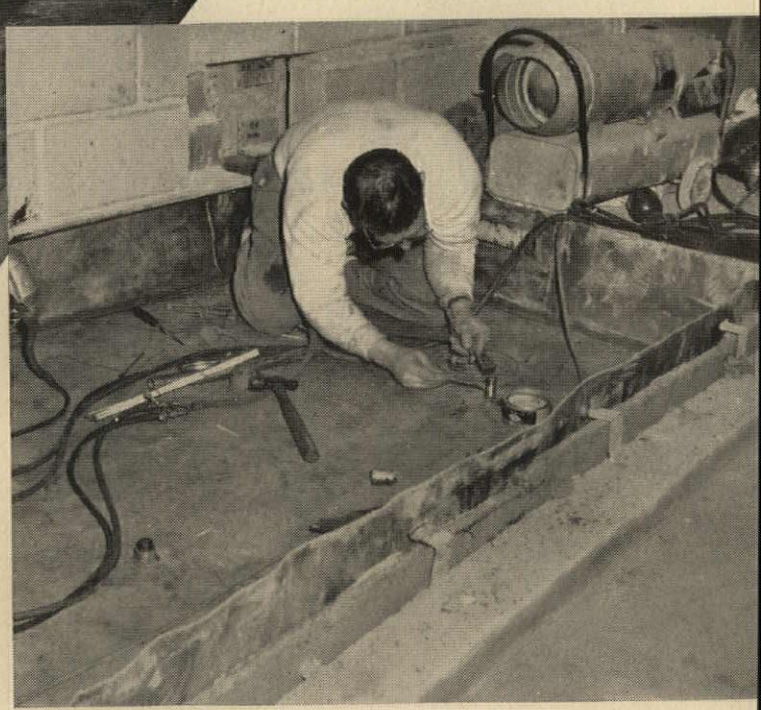
Look Ahead with Lead

For more information, circle No. 347



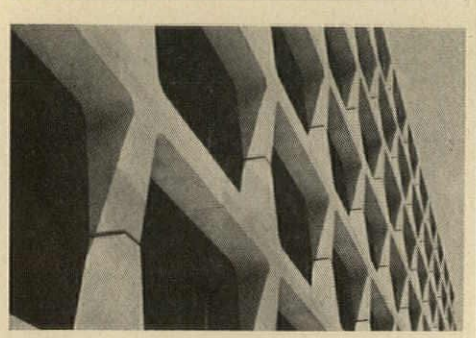
ARCHITECTS: KAHN & JACOBS
GENERAL CONTRACTOR: HRH CONSTRUCTION CORP.
MECHANICAL ENGINEER: SYSKA & HENNESSY, INC.
PLUMBING CONTRACTOR: J. L. MURPHY INC.
LEAD WORK: JOHN F. ABERNETHY & CO., INC.



4570

sulfide sealants are used in horizontal joints. System utilizes panels as structural members, thereby eliminating all horizontal mullions and reducing joints by about 30 per cent. Also given are typical details, technical data, specifications, and photographs of completed installations. Erveen Corp., 4000 West Ridge Rd., Erie, Pa.

On Free Data Card, Circle **203**



Curtain-Wall Gaskets

Booklet, 24-pages, offers specifications on curtain-wall "zipper type" gaskets. Booklet includes physical properties; test data; sectional drawings of gasket installations; installation instruction; channels, spacers, and setting blocks. F. H. Maloney Co., P.O. Box 1777, Houston 1, Texas.

On Free Data Card, Circle **204**

Low-Cost Ceramic Tile

Brochure, 4-pages, describes ceramic glazed structural tile. "Utilitile" has been developed to compete in price with lowest cost utility wall materials. Tile offers fire-safety standards, imperviousness, resistance to stains, and structural strength. It is available in stretchers, corners, jambs, sills, and miters. Arketex Ceramic Corp., Brazil, Ind.

On Free Data Card, Circle **205**

DOORS/WINDOWS

Hardwood Doors

Brochure, 4-pages, illustrates special hardwood made for door skins. "Masonite Dorlux" hardwood skins are available in factory-primed or custom-grained walnut or cherry finishes. Temperature and humidity changes have no important effect on doors. It is free of internal stresses and has unusual dimensional stability that helps to prevent sagging or swelling of the door. It will not split, splinter, crack, rot, or corrode. Masonite Corp., 29 N. Wacker Drive, Chicago 6, Ill.

On Free Data Card, Circle **206**

ELECTRICAL EQUIPMENT

Outdoor Lighting

Booklet, 8-pages, describes outdoor fluorescent lighting units. They are used for lighting shopping centers, monuments, and commercial buildings. Booklet includes specifications covering lamp types, ballasts, wiring, enclosures, luminaires, reflectors, venting, color choices, and strength. Sterner Lighting, Inc., Winsted 1, Minn.

On Free Data Card, Circle **207**

Supplementary Lighting

GE has published 16-page booklet entitled "Supplementary Lighting." Booklet contains information on lighting systems designed to fulfill specific re-

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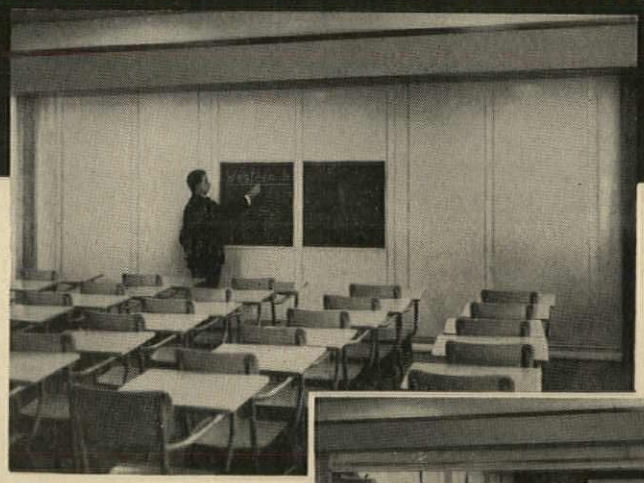
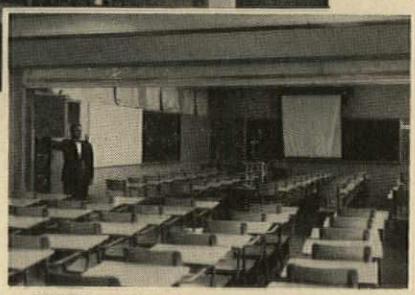


ACTUAL FIELD TEST RESULTS ON SOUND TRANSMISSION LOSS

Western Jr. High School, Washington, D. C.
Sound Transmission Class of 32 db

Hamilton Avenue School, Greenwich, Conn.
Sound Transmission Class of 31 db

COMPLETE FIELD TEST REPORTS ON REQUEST



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2. Electrically operated; rolls up into an 18" square ceiling enclosure in seconds at touch of key switch.
3. No Floor track.
4. Sideguides take only 10" x 3" of floor space on each end regardless of size.
5. Gasketed sides and top, and weighted loop at bottom of curtain assure perimeter sealing.
6. Tests by Riverbank Acoustical Laboratory to ASTM E-90-61T show 3 lb. (⅛" thickness) LeadX gives a 9 frequency transmission loss of 32 db and a sound transmission class of 34.

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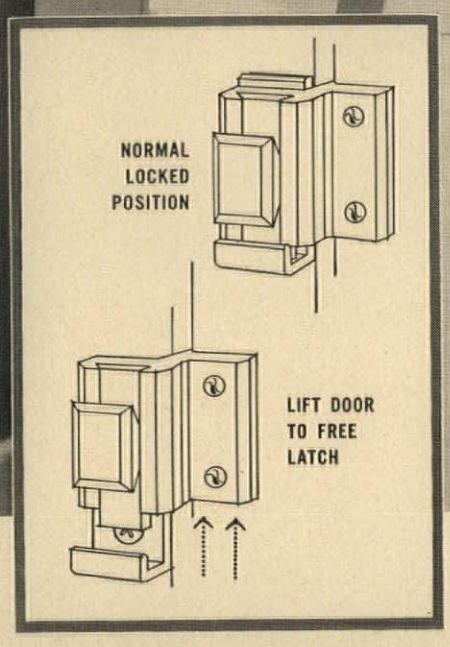
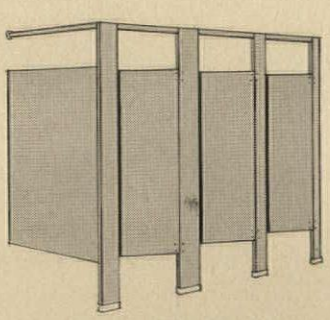
EMERGENCY ACCESS



(Pat. Pending)

Weis Lift-Free Latch unlocks by merely lifting door upward



Lift the door... the latch is free... the door unlocked. No delay in reaching an emergency situation—*fast!* This exclusive Weis feature is especially important in hospital, nursing home, school and other institutional locations. It's a handsome, simple, cleanly designed latch, described in the new Weis Toilet Compartment catalog—write for copy.

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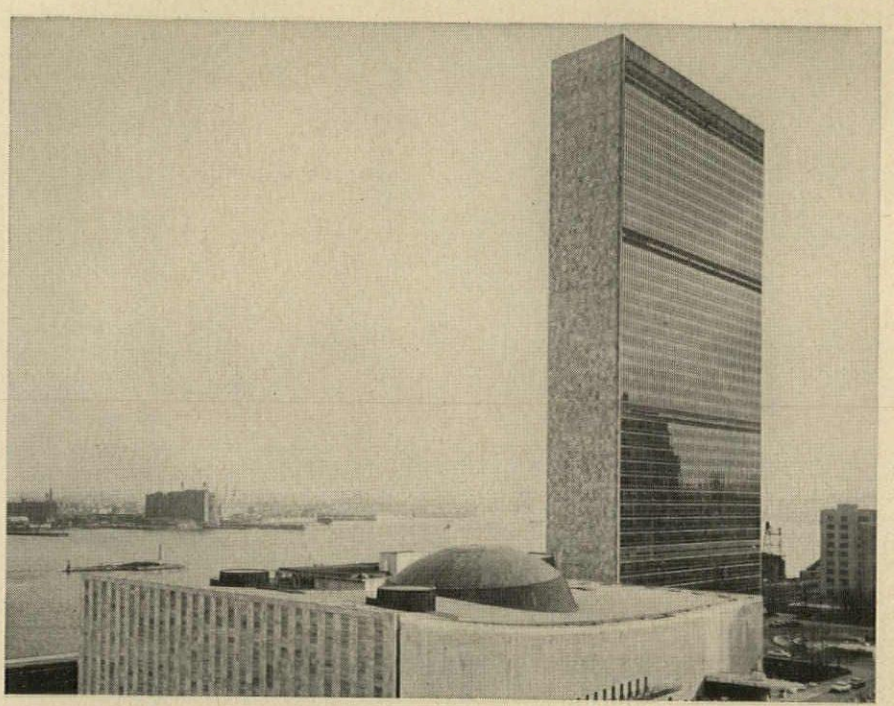
Q. WHAT OTHER LIGHTWEIGHT ROOF DECK MATERIAL COMBINES COMPLETE INSULATION WITH SUCH HIGH STRENGTH FOR MASS AREAS?



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quirements of visibility that cannot meet requirements of general lighting. Techniques for alleviating problems involving objects of small size, low contrast, rapid motion, low brightness, color matching, and grading are discussed. General Electric, Large Lamp Department, Nela Park, Cleveland 12, Ohio.

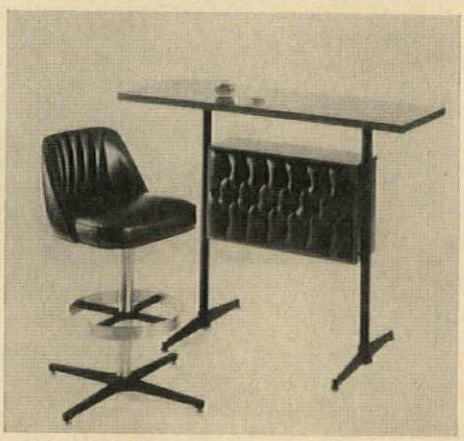
On Free Data Card, Circle **208**

Dome Lighting

Booklet introduces line of fluorescent round dome lighting units. Domes are available in 6′, 4′, 3′, and 2′ diameters, and in larger diameters on special order. All fixtures have flat, concave, or convex Plexiglas diffusers. Detailed drawings show construction of fixtures, including variations in lamp spacing and placement, mounting details, and arrangements of hinged opening devices. Morris Kurtzon, Inc., 1420-30 St. Talman, Chicago 8, Ill.

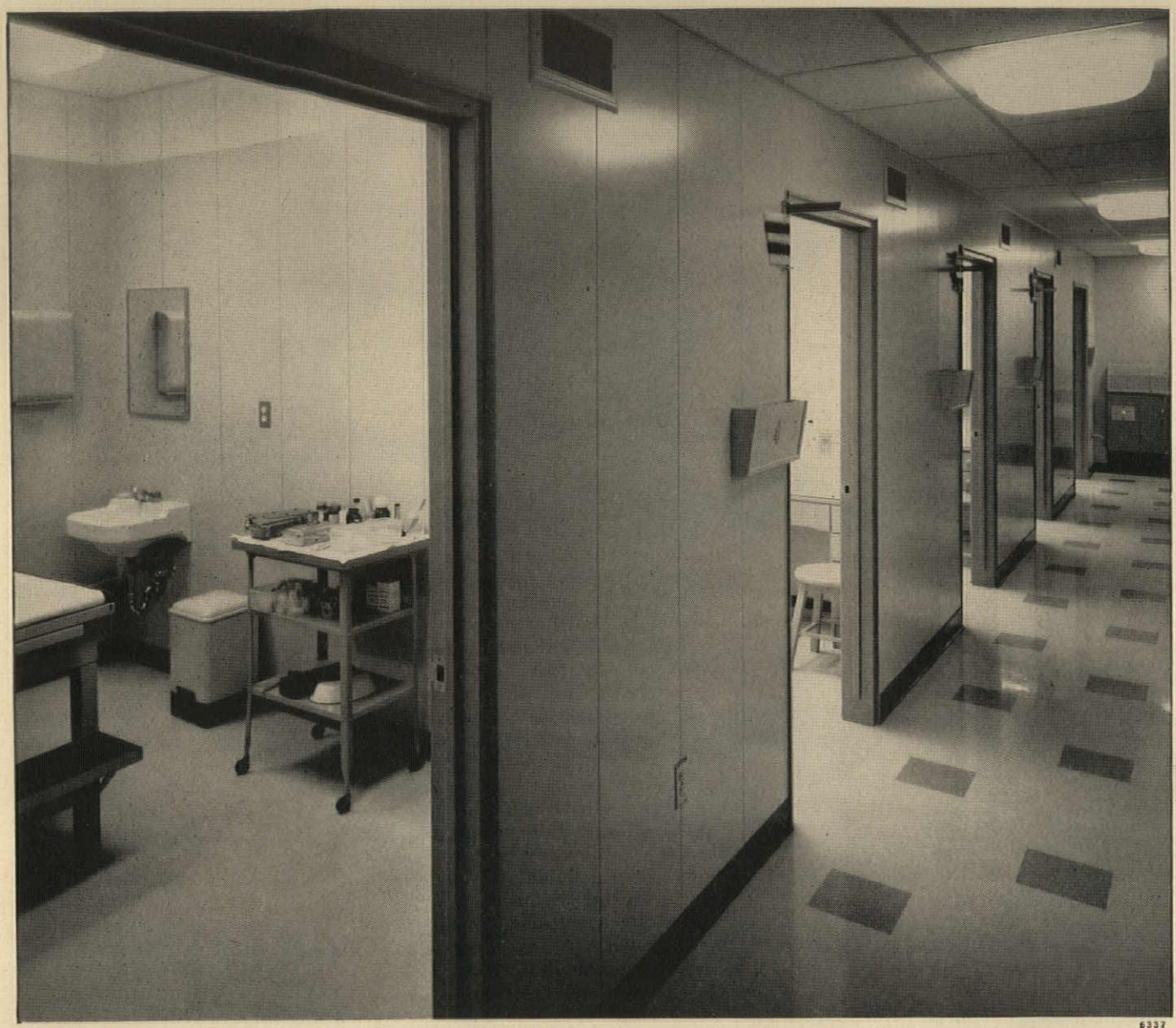
On Free Data Card, Circle **209**

FURNITURE



Changeable Tables

Folder illustrates 17 tables and bases. Special attention is placed on CHF adjustable tables that are changeable in height from 18" high coffee tables



6337

Marlite paneling is used throughout the new Akron Orthopedic Clinic designed by Wagner and Luxmore. The corridor features beige Plank; treatment rooms are paneled in various colors of Marlite Plank.

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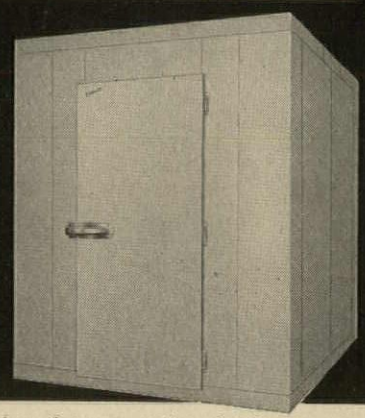

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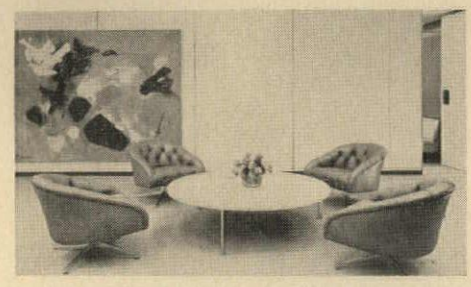
to 29″ high dining table. Metal finishes include solid bronze, bronze plate, satin or bright chrome, and anodized cast aluminum. Wood finishes include walnut and mahogany, as well as plastic and porcelain enamel tops. The Chicago Hardware Foundry Co., 2500 N. Commonwealth Ave., North Chicago, Ill.

On Free Data Card, Circle **210**



Furniture Catalog

Catalog contains descriptive information on benches and upholstered stools, cabinets, desks, sofas, and tables showing installation views. Separately included is a price list and specifications of all the aforementioned furniture. Lehigh Furniture Corp., 16 East 53 St., New York 22, N. Y.

On Free Data Card, Circle **211**

SPECIAL EQUIPMENT

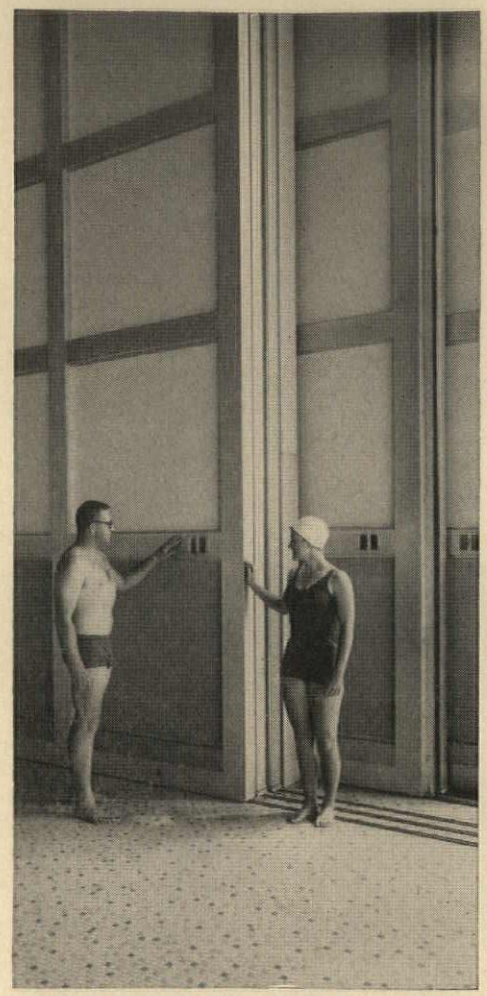
Wrought Aluminum Manual

Fifth edition of Standards for Wrought Aluminum Mill Products has been introduced. Manual contains information on properties and dimensional tolerances of aluminum and aluminum alloy mill products. It is revised annually to include data on new standard alloys and products, and advances in production methods. This year's edition includes tables of mechanical properties, which now list strength in kips instead of psi. Data on standards for painted aluminum sheet and bend radii for sheet and plate are also included. Write on letterhead to The Aluminum Association, 420 Lexington Ave., New York 17, N.Y.

Cleaning Acoustical Ceilings

Pamphlet, 4-pages, outlines complete procedures for care and maintenance of acoustical ceilings. Pamphlet describes how to clean all types of acoustical material, including wood-fiber,

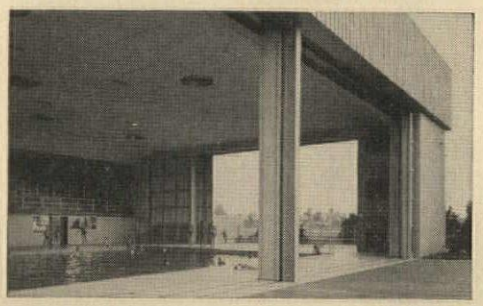
Continued on page 112

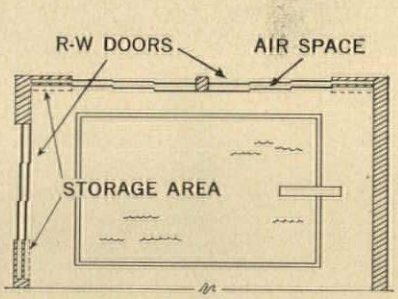


R-W DOORS

provide indoor-outdoor atmosphere at the Niles Township West High School swimming pool

Floor Plan, below, shows how the 18 R-W Doors were utilized to provide indoor-outdoor flexibility. Architects: Orput and Orput, Rockford; Contractor: Mercury Builders, Forest Park.





This installation of R-W No. 847 Doors graphically illustrates how "custom-engineered" industrial type doors can be utilized to close a special opening. Eighteen doors, 22 feet high by 13½ feet wide were used in double rows separated by an air space. During the winter, warm air is circulated through the air space to provide effective insulation qualities. The manually operated doors are ruggedly constructed of tubular anodized aluminum frames with panel inserts finished in various shades of blue to complement the surrounding architecture.

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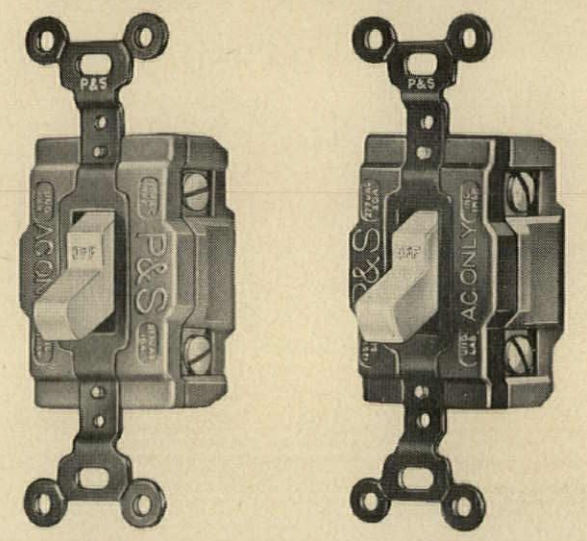

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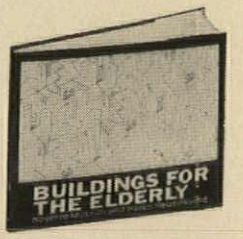
216 pages, 8¼ x 10½
300 illustrations, 1963, $15.00



Designed to stimulate the thinking of architects and laymen concerned with the problem of providing adequate care for the elderly, this book carefully isolates those factors which are purely or primarily architectural in nature and examines them in light of the work presently being done in all parts of this country. About half the book is devoted to photographs, plans and drawings of some 65 existing or projected homes, with complete data on each, including capacity, costs, facilities provided, charges and services, materials of construction, site development, and the like. Another section treats architectural details, including plan types and relationships, typical room requirements, and special furniture and equipment. In their introductory chapters the authors explore the statistical, financial, sociological, and philosophic problems that confront any would-be builder of housing for senior citizens that will truly meet today's needs. They answer the questions of who should build, what to build, where to build, and what the project will cost to build (and run). They summarize prevailing viewpoints on questions of group size, programs, integration with community, amount of care and nursing facilities, and psychiatric problems. Their study is not limited to any particular economic segment of the community but examines the problems of retirement in luxury as well as on social security alone. A variety of architectural solutions are posed for each group.

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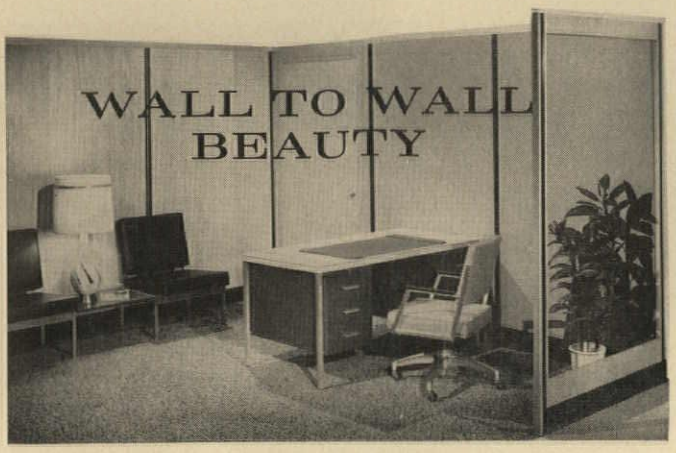

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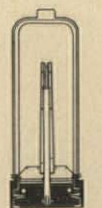

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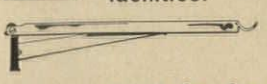

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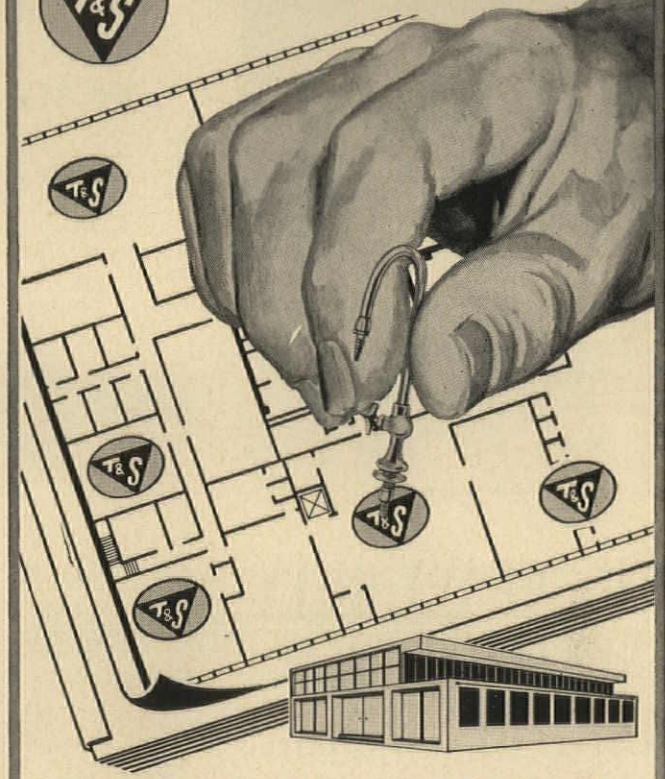

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Slater Electric, Inc. • Glen Cove, New York

For more information, circle No. 392

Continued from page 109

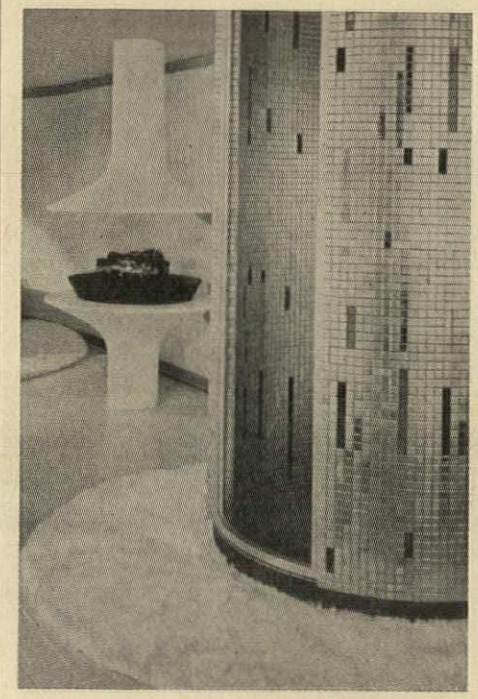
mineral, metal-pan, and membrane-faced ceilings. Included is information on types of paint, type of brush, and methods of application to be used. Armstrong Cork Co., Dept. P.I., Liberty and Mary Sts., Lancaster, Pa.

On Free Data Card, Circle 212

SURFACING MATERIALS

News in Tile

Highlights of Tile Technical Progress, 16 pages, sets forth in a series of short articles the most important recent innovations in ceramic-tile



products and procedures. Material covered includes new epoxy mortars and grouts developed by Tile Council research, as well as dry-set mortars and grouts, organic adhesives, conductive floor installations, cleaning procedures, and other aspects of tile installation. Write (enclosing 10¢) to: Tile Council of America, Inc., 800 Second Ave., New York 17, N.Y.

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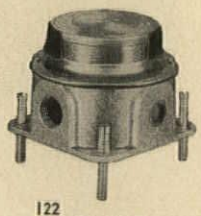

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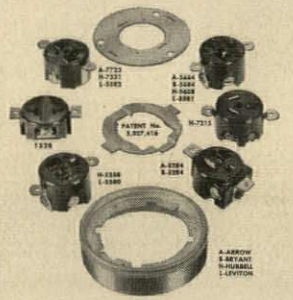

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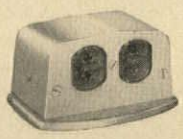

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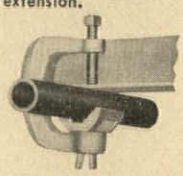

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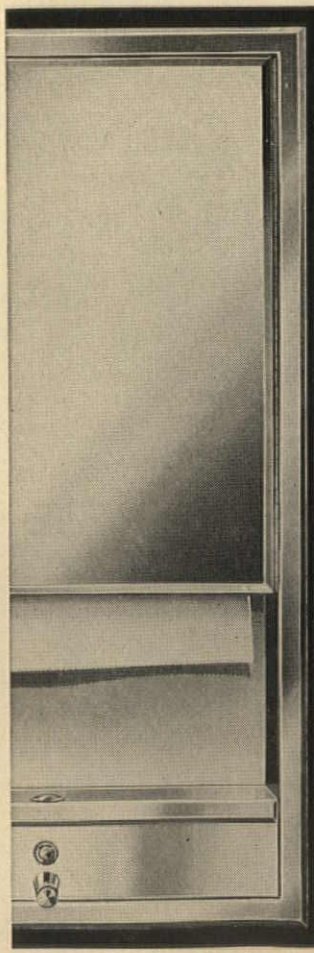

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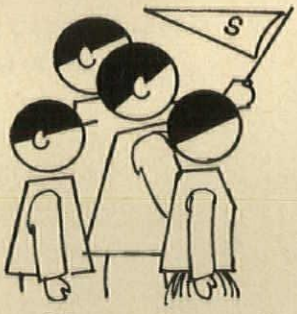
where people congest



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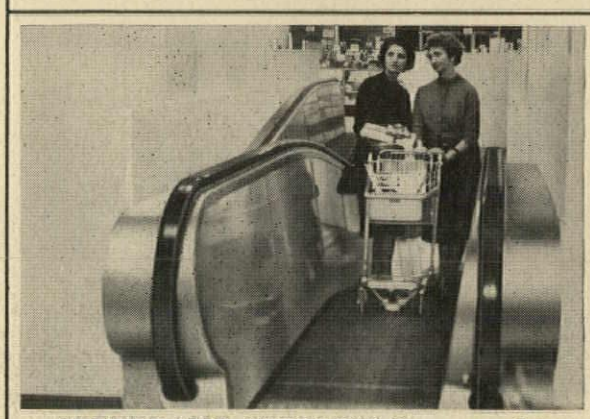

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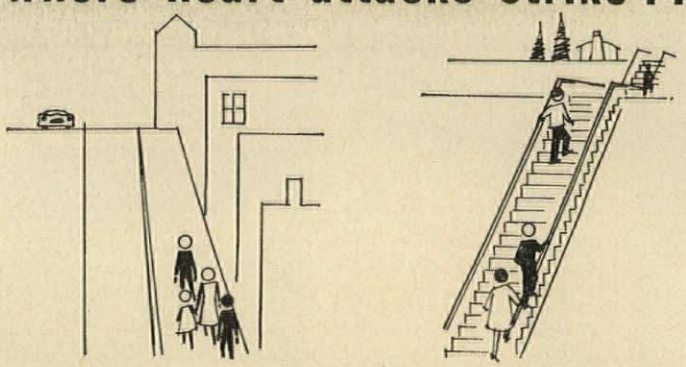

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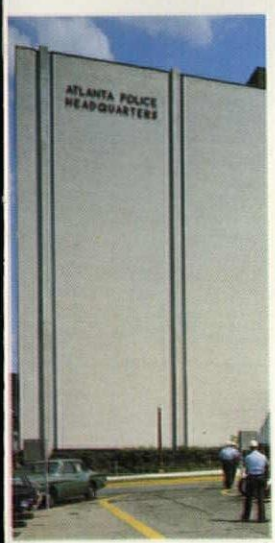

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8

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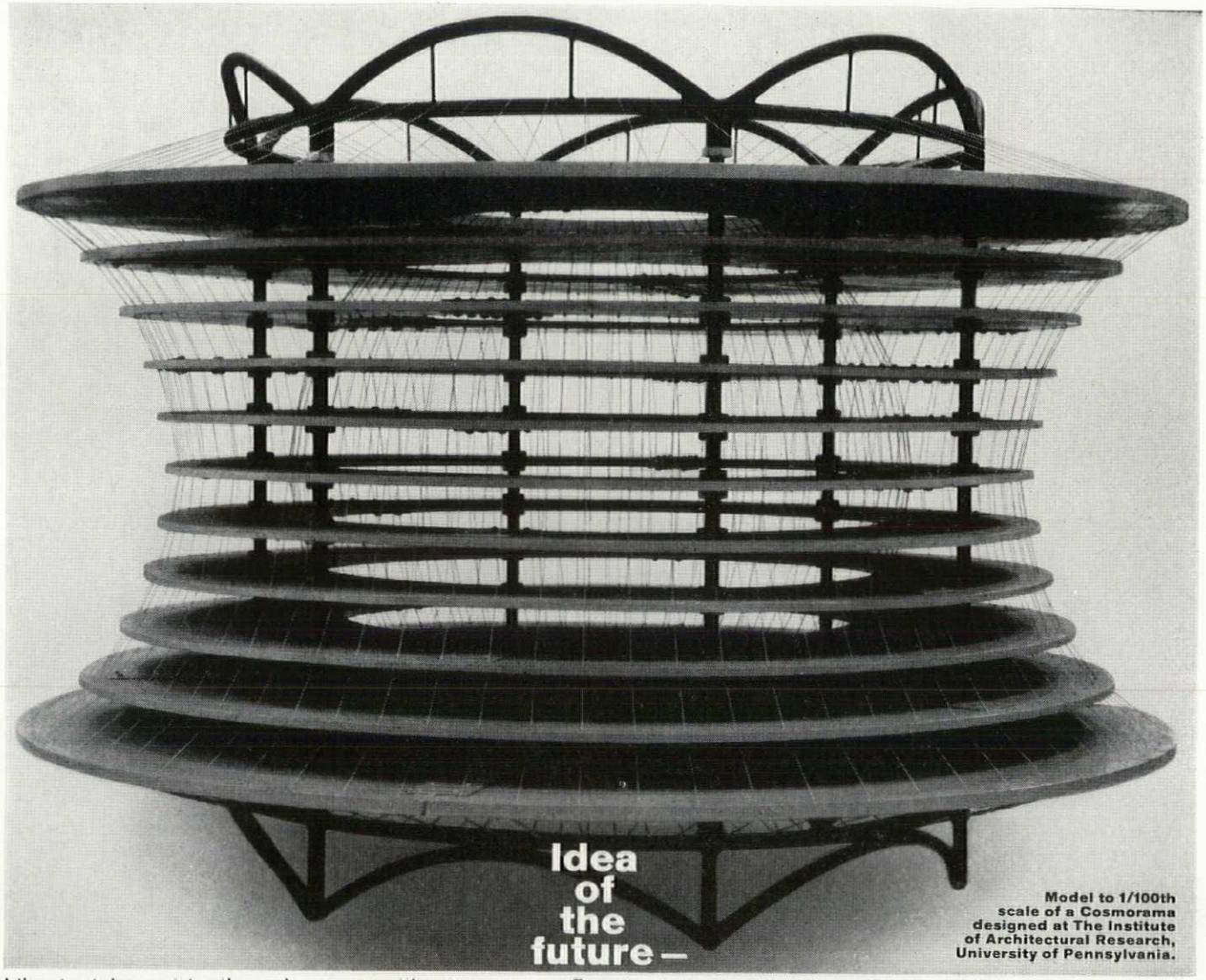

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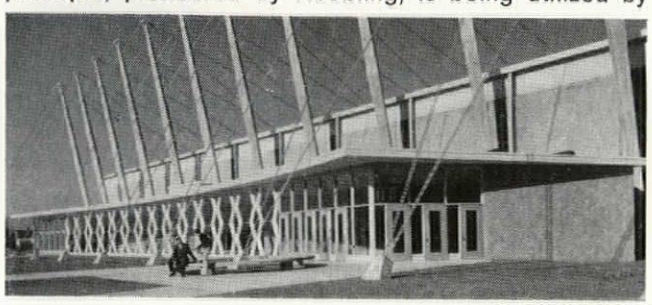

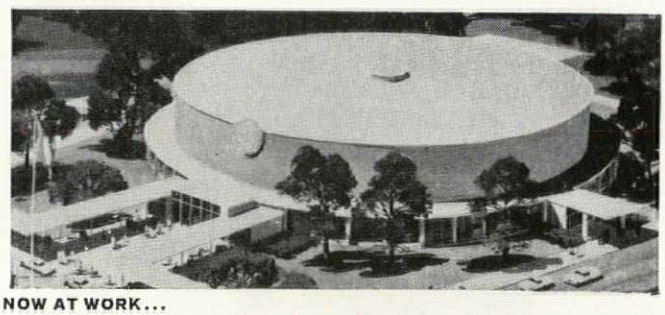

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Health and Physical Education Building, Central Washington College of Education, Ellensburg, Wash. Architect: Ralph Burkhard, A.I.A., Seattle. Structural Engineers: Anderson, Birkeland, Anderson, Tacoma. General Contractor: Earley Construction Company, Tacoma. Prestressed Concrete Fabricator: Concrete Technology Corp., Tacoma. Cables by Roebling.

Utica Memorial Auditorium, N. Y. Architects: Gehron & Seltzer, N. Y. City. Associate Architect: Frank C. Delle Cese, Utica. Consulting Engineer: Dr. Lev Zetlin, N. Y. City. Contractor: Sovereign Construction Company, Ltd., Fort Lee, N. J. Roof Supporting Structure, Including Cables, Furnished and Erected by Roebling.

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SPECIAL BULLETIN ON NEW YORK WORLD'S FAIR, 1964-65: The Furniture Design Competition sponsored jointly by the Fine Hardwoods Association and the Pavilion of American Interiors during the school year 1962-1963 was so successful that it is being repeated in 1963-1964. Winning designs of both competitions will be shown at the Fair in the Fine Hardwoods Association Exhibit in the Pavilion of American Interiors. Inquiries from senior and graduate school student designers are invited. Entries must be in by August 1, 1964.

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September 1963 **PROGRESSIVE ARCHITECTURE**®

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Man's physical environment has become a fashionable subject. We already have Schools of Environmental Studies and soon, it is my guess, architects will start calling themselves "environmentalists." The AIA's latest study on the future structure of the profession tends in this direction. It suggests that the next generation's "architects" will be planners, building designers, landscape designers, real estate experts, structural engineers, mechanical engineers, and various other specialists connected with the design, financing, and construction of buildings and related facilities. Since all professionals are, I am sure, as jealous of their own nomenclatures and prerogatives as architects are of theirs, it is quite certain that they will resent the designation of "architect." Should the AIA proposal ever be implemented, a typical future office will probably be called XYZ & Associates, Environmentalists.

One subject that deals with physical environment and which was discussed recently on P/A's pages—the historic continuity of cities—brought mixed reactions from the readers. Many agreed with our thesis, but others opposed it as being unrealistic romanticism offering no solution to today's problems.

A controversy on this subject is inevitable, for there are two diametrically opposed approaches that can be taken.

One might be called the rationalist point of view. Proponents of this approach argue that the only valid design solution is one utilizing only the most contemporary knowledge, materials, and methods. The extreme example of such thinking would be a Huxleyan-type world of tetrahedral bubbles, where people wash their bodies with an atomized drop of water (or is it ultrasonic waves?), feed themselves by swallowing little pills, and happily contemplate weight-performance ratios of their habitat. On the opposite pole are diehard traditionalists who refuse to accept any new concepts and try to ignore advances in technology and the changing social patterns.

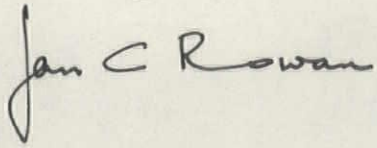
Extremists are seldom numerous, and neither of the above groups has many devoted adherents. Today, it is as unnatural to live in a totally sterilized world of electronic efficiency as it is to ride in a horse-drawn buggy along the orthodox path.

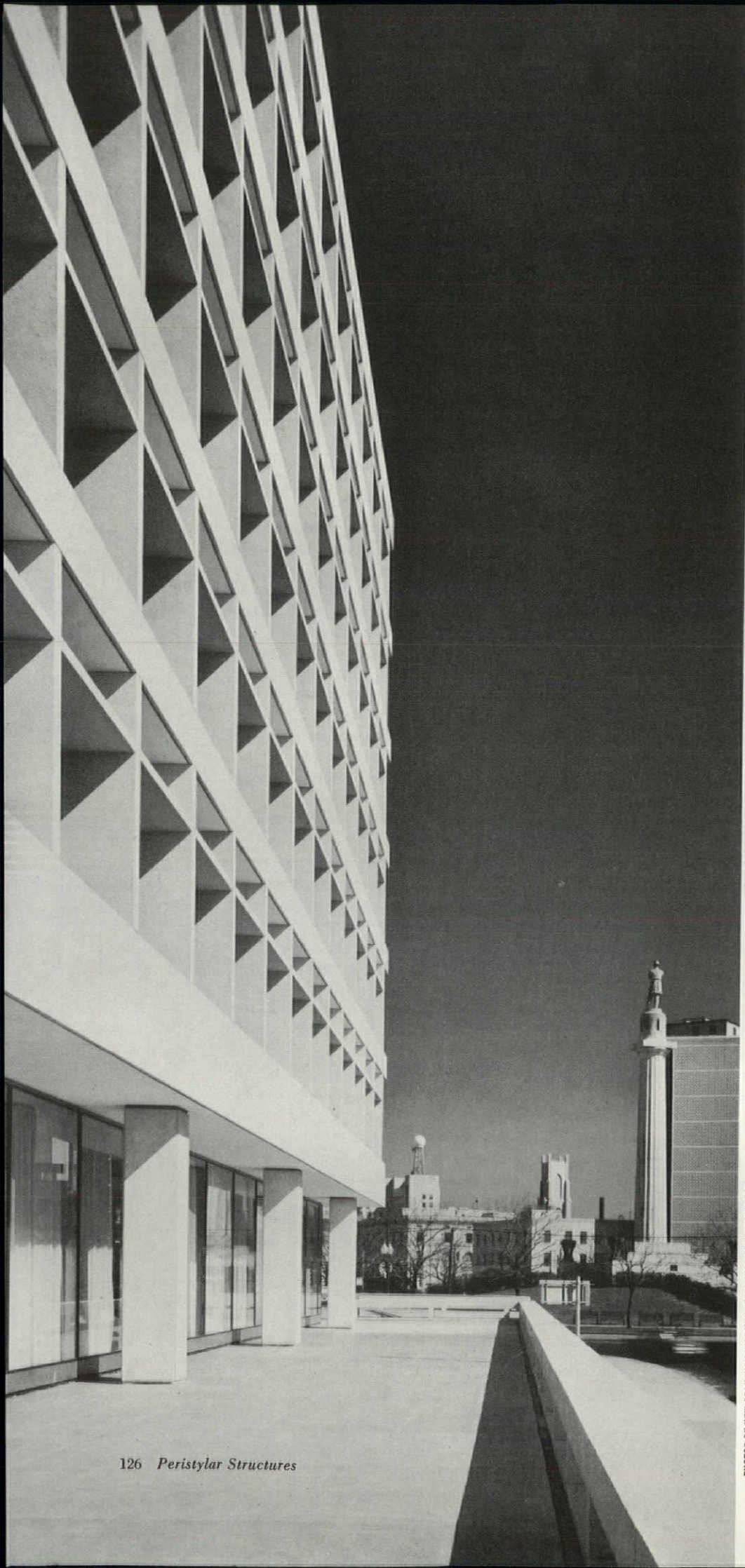
Human nature changes slowly, if at all. Our instincts were developed over a period of thousands, or even millions of years, and it will certainly take many generations before environmental responses change to any appreciable degree.

That is why today, after about thirty years of its existence in this country, modern architecture is usually accepted only as a nonresidential environment. Americans seem to be willing to work in modern office buildings and to do their buying in equally modern shopping centers, but most of them still prefer to live in "traditional" houses; and if they live in a modern apartment building, they camouflage its architecture with interior decorations belonging to a totally different period and having a totally different spirit.

And that is also why even the most ardent proponent of a tetrahedral, air-conditioned bubble usually ends up by having a wood-burning fireplace whose protruding stack proclaims his true desires. A real flame from a real log puts the avant-gardist at peace by satisfying some primordial instinct in him.

When architects become registered environmentalists, and therefore legally responsible for what *Webster* calls "The aggregate of all external conditions and influences affecting the life and development of an organism," they obviously will have to be conscious of *all* these conditions and influences. If they were conscious of them while still merely architects, perhaps there would be less dissent as to the sort of cities and buildings we should have. For the truth is that we should neither ignore the world in which we live nor the past that made us what we are. ■





PHOTOS OF NEW ORLEANS BUILDING: EZRA STOLLER ASSOCIATES

Peristylar Precast

Of all current explorations in the uses of concrete, one of the more promising developments is the precast, free-standing frame. In its broadest aspects, this system takes advantage both of the sculptural potential of concrete and of the technology of mass-production.

The idea of the free-standing frame is not entirely unknown, as the word peristylar clearly indicates, but the use of a peristyle of precast concrete units with separate glass walls enclosing interior spaces is a 20th-Century development of major significance.

Architects Skidmore, Owings & Merrill pioneered this type of construction in their design for the Banque Lambert, now nearing completion in Brussels. Among the first finished works to use this new system are two buildings for John Hancock Mutual Life Insurance Company, also by SOM—one in New Orleans (*left*); the other in Kansas City, Missouri, (*facing page*).

Besides having similar structural systems, the two John Hancock buildings are similar in other ways. Both are for the same client, albeit in different cities. Both add to their urban environments something more than good architecture, as is usual with SOM projects. In New Orleans (*left*) a fountain sculpture designed by Isamu Noguchi was placed on the plaza (see p. 132, JUNE 1962 P/A); in Kansas City (*facing page*), a planting strip was added to the street in front of the building.

Both also had basically the same program. John Hancock wanted prestige buildings to house their own offices in both cities. They also wanted economical buildings that would provide commercially feasible rental areas; in both buildings, there are six stories of tenant space above the client's ground-floor offices.

The two design solutions are not identical, however. For instance, they differ because of site conditions. But the most interesting distinctions are in the handling of the structure. And here SOM has suggested the breadth of variation this system will permit.

In the Kansas City structure, flat slabs are supported on a load-bearing core, 20 poured interior columns, and the precast peristylar frame. The frame is composed primarily of massive cruciform units with 18-ft horizontal members and tapered 12-ft vertical members, which fit together to form spandrel beams and load-bearing

Structures by SOM

columns. The tapered column members of the units extend from midway below floor level to midway above; spandrel beam members cantilever from the intersection with the columns of the mid-points of the bays. (See SELECTED DETAIL, page 135.) Besides the cruciform units, the frame also comprises roof units, corner roof units, corner floor units, and bases.

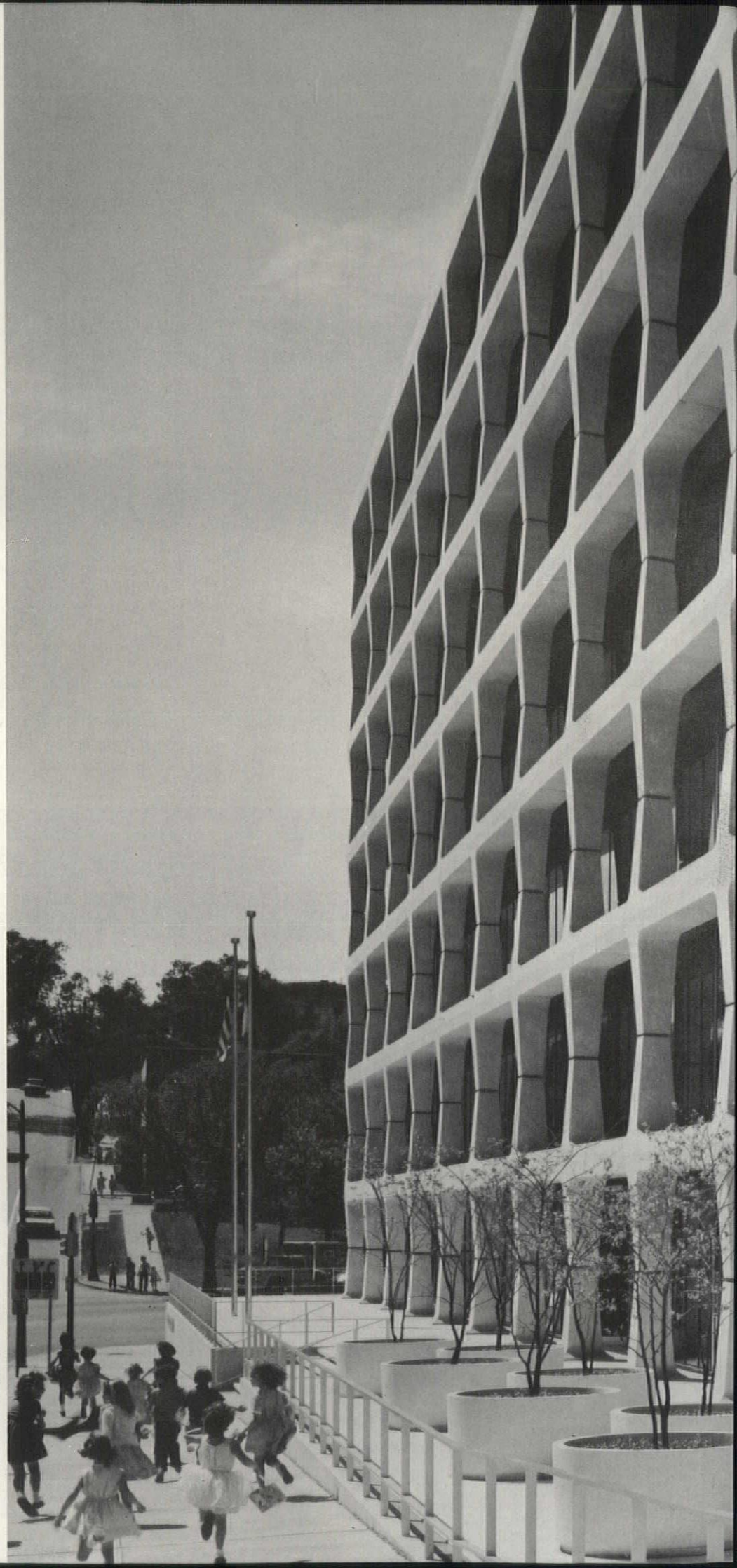
There are no bolted or welded connections in the system. The column members rest on the unit below with a steel dowel between them. Spandrel members are butted. All the units are locked together when the floor slabs are poured into keyways in the spandrels.

The taper of the columns, developed by structural engineer Paul Weidlinger in collaboration with SOM, is designed to correspond to the variation in bending moment from zero at the pin connection to maximum at the intersection of the cruciform unit. The dowel leaves a 2-in. reveal at the midfloor-level joint between column members; this reveal is grouted and expressed with a black aluminum cover. Joints between spandrel beams are grouted and left flush, so that the slabs read as continuous lines.

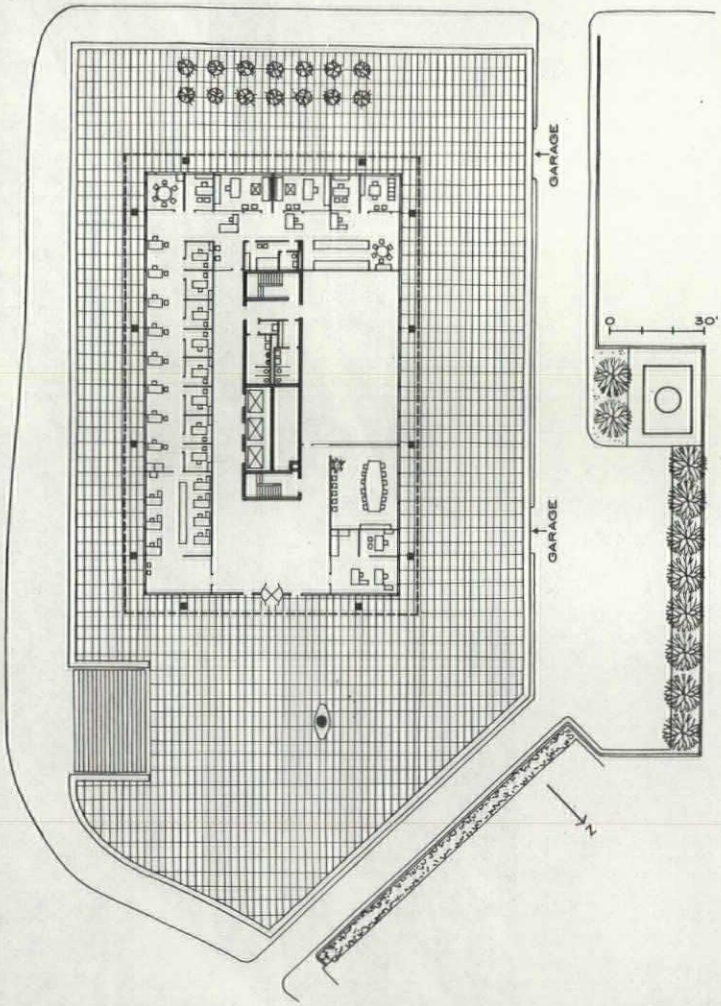
The white quartz aggregate concrete is etched to a smooth, subtle texture. It is noteworthy that SOM has elected a delicate, carefully controlled finish—long an SOM trademark—for such a massive, almost brutal building.

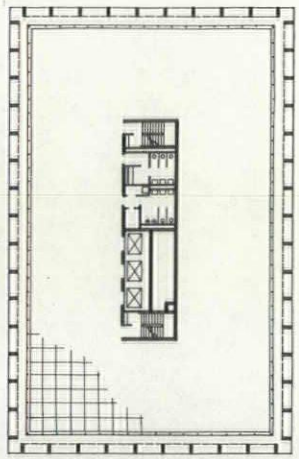
In the elegant New Orleans building, waffle slabs span between the precast frame and a central load-bearing core. The frame comprises precast column members 8 in. wide by 3 ft deep, which are set 9′-4″ o.c., and precast "eyebrow" sunshades 5 in. high by 3 ft deep, which are bolted between the columns 7 ft above floor level. The deep eyebrows provide both lateral bracing and, in conjunction with the columns, effective sunshading. The column members are cast with reinforcing rods, capped by a steel plate, extending 2 ft beyond the tops of the units. A steel plate is also cast into the bottom of the column. (See SELECTED DETAIL, page 134.)

In assembly, columns were set in position and the bottom plates welded to top plates of the columns below; next, the sunshades were bolted between the columns (the notches being filled in later), and the formwork for the floor above was erected. Then that floor was poured, filling



PHOTOS OF KANSAS CITY BUILDING: MARIS, EZRA STOLLER ASSOCIATES





Entrance to the New Orleans John Hancock building (below) *is on the narrow end facing Lee Circle. A rough granite sculpture fountain by Isamu Noguchi is placed on axis with the steps to the plaza. Offices of the client occupy the ground floor* (left); *typical plan of tenant spaces is above.*

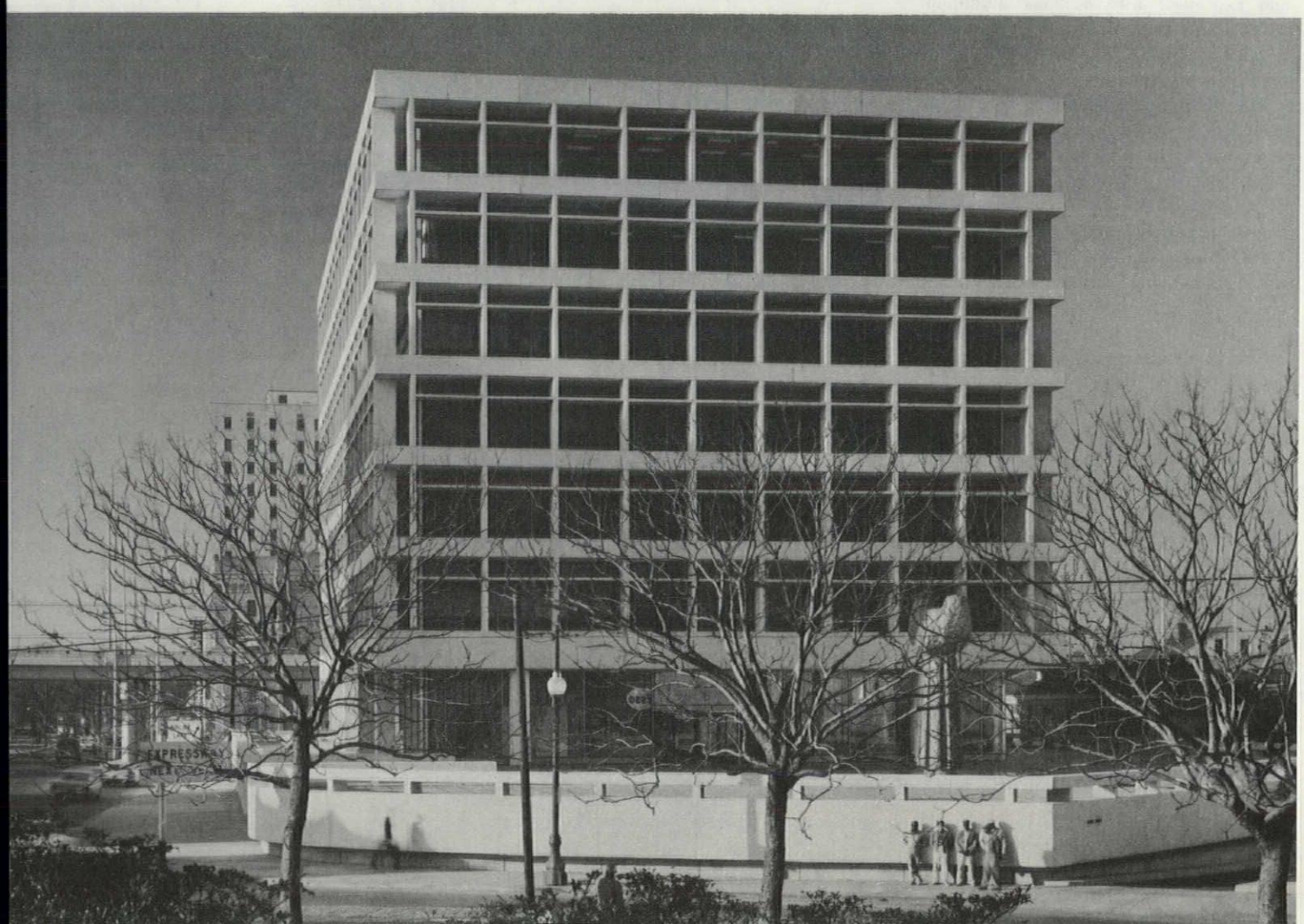
in the space between the top of the precast column and its plate projecting on rods. The reinforcement of the precast columns thereby becomes integral with the floor slabs, which lock all members together. Then the procedure was repeated, the next floor of columns being placed on the top plates of the columns below. Spandrel beams were later veneered with panels precast with the quartz aggregate used in the columns and sunshades.

There are no other precast units in the system. Joints are not expressed strongly, since SOM feels that there is sufficient visual activity in the sunshades and in the closely spaced columns.

The precast frame in New Orleans is elevated above the ground-floor level. The upper six stories rest on deep steel girders at the second floor, which act as transfer beams to 12 poured columns standing free outside the glazed first floor.

A comparison of several details of the design solutions of both buildings is illuminating.

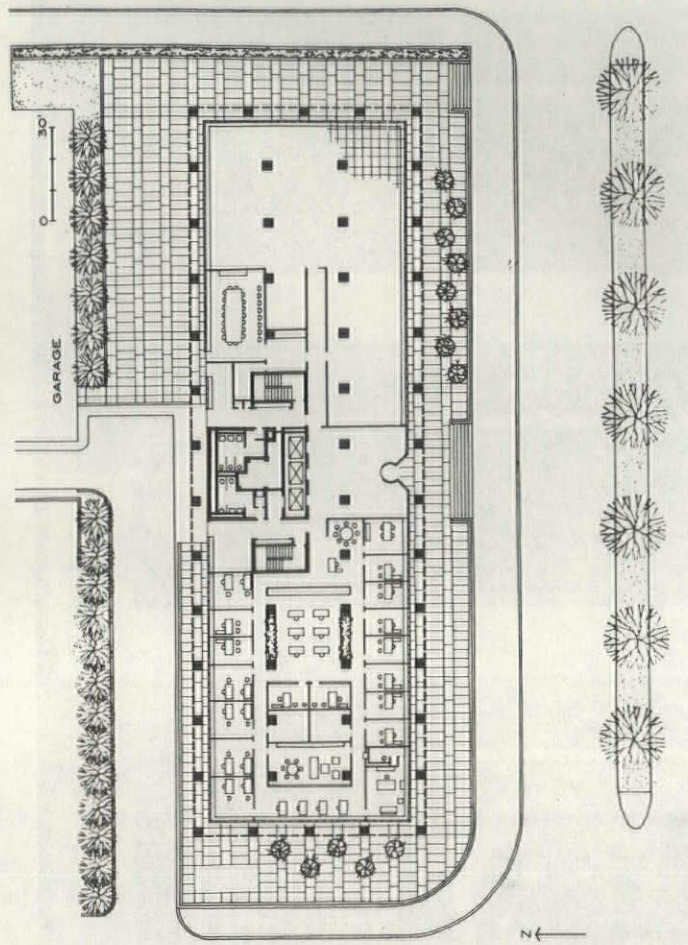
In New Orleans, only two precast members were used, but the assembly is more detailed owing to the veneer panels and to other finishing; in Kansas City, five precast elements were necessary, but construction procedure was relatively con-



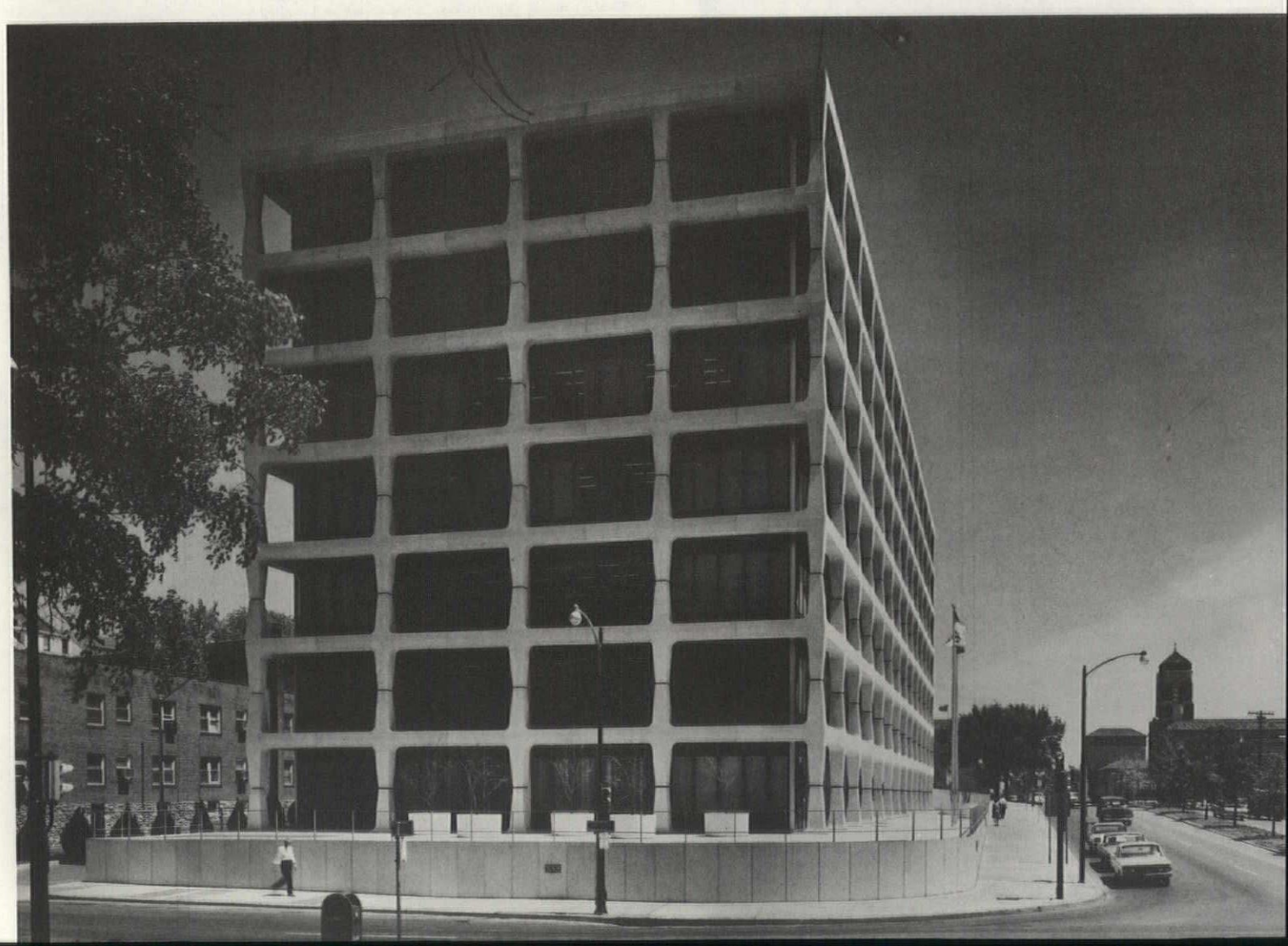
stant, since there were no special conditions for the entrance, base, corners, or roof. The consistency of the grid from ground level to roof-line at Kansas City is economically successful, but it also produces the apotheosis of the pigeon-hole building, a result of SOM's desire to have all the floors "typical." At New Orleans, on the other hand, the expression of the base and entrance as a glazed loggia is perhaps less economical, but, in terms of aesthetics, it shows clarity of vertical organization.

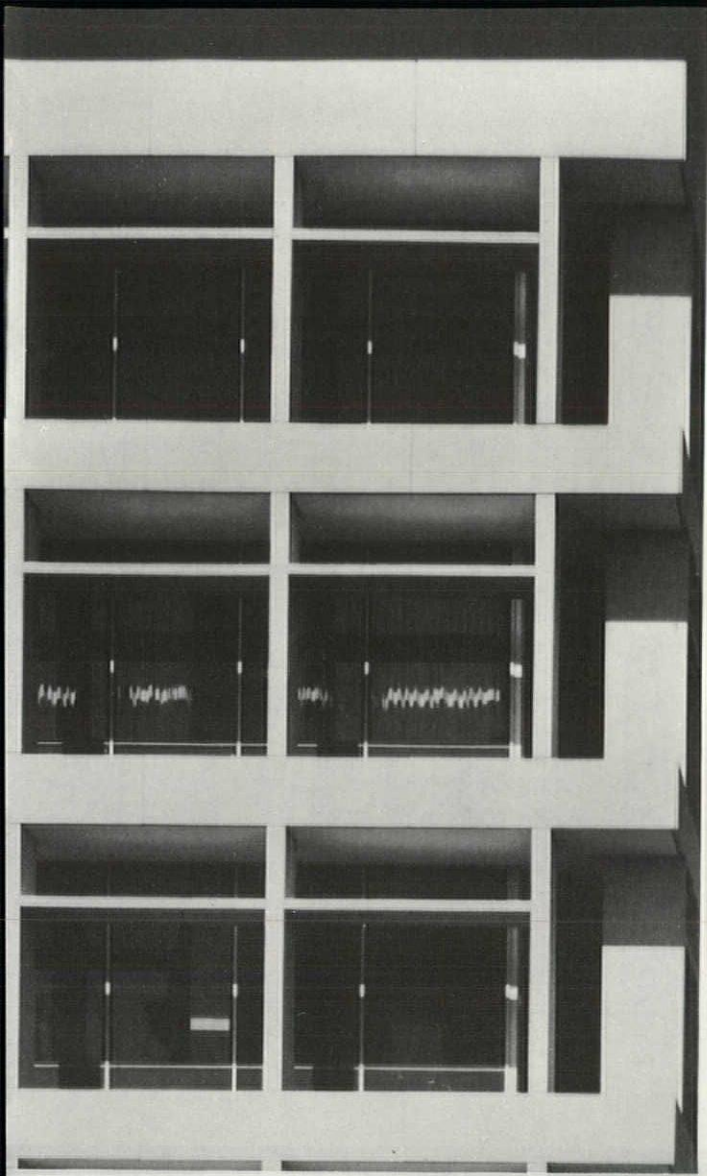
The corners of the two buildings also provide an interesting comparison. At New Orleans, the column members are set back from the corners and the sunshade is terminated at the column, leaving the cantilevered corner open; at Kansas City, corner floor units were considered necessary, since the scale of the cruciform units would have produced a precarious looking cantilever if left unclosed. It is paradoxical, however, that at New Orleans the deep columns that are seen in profile give the open, cantilevered corners an appearance of greater strength than the structural units produce for the building at Kansas City.

Behind the exterior frame of each building is a second wall—a glass "exterior



Entrance to the Kansas City John Hancock building (right and below) *is on the long side facing a planting strip. All floors of the 7-story building are identical, owing to the consistent use of the grid over the entire façade. A 3-ft module is used throughout the interior with the aim of providing maximum flexibility for a variety of tenants in the use of partitions, lighting, and other systems. The glass wall that encloses the interior spaces reflects the interior module in the 3-ft spacing of its mullions; it is recessed 4 ft from the building face, leaving a catwalk behind the 2-ft-thick structural units.*



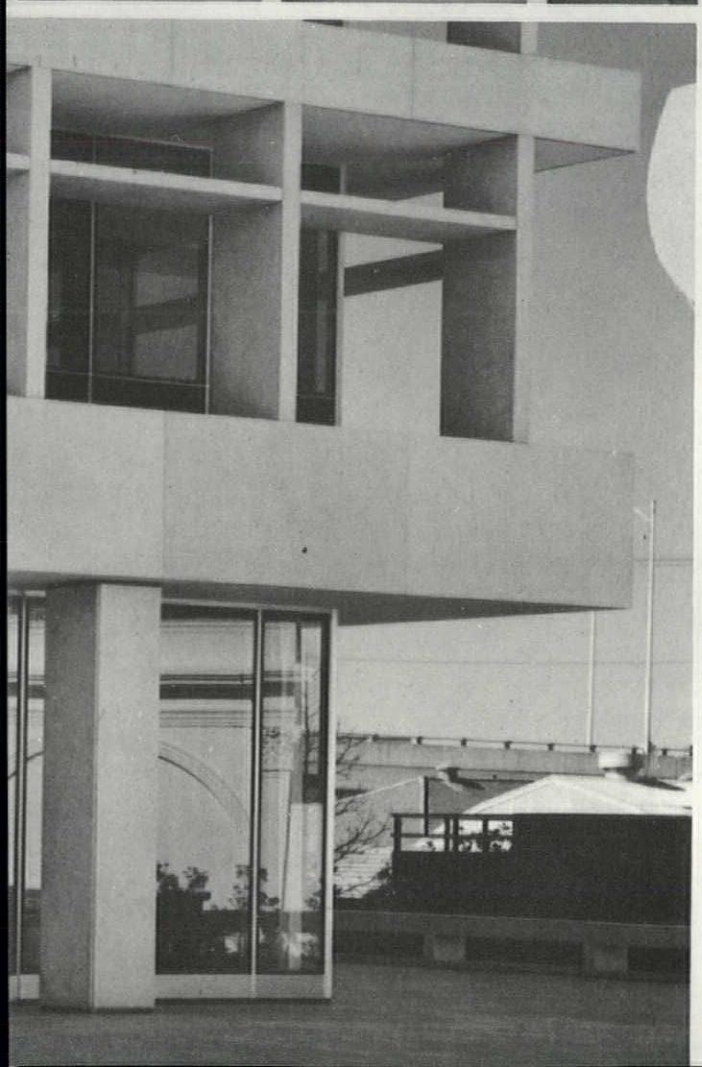


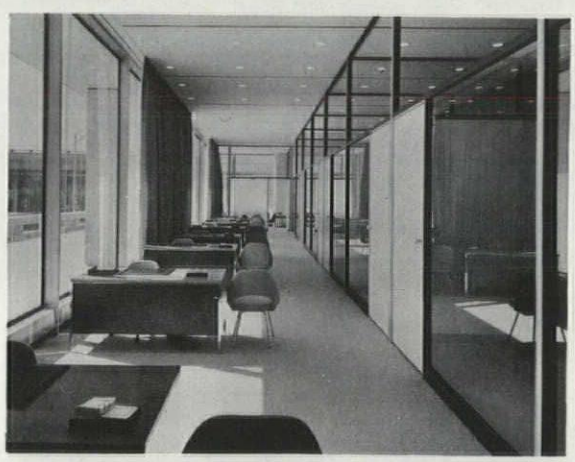
partition" that encloses the interior spaces. There are several advantages to this double-wall system: the space between the peripheral structure and the recessed glass wall provides a permanent catwalk for window washing and for repairs; glass is shielded by the structural frame, which, depending on its design, can provide efficient sun protection and therefore a saving in air-conditioning costs. Further, because there are no atypical joints in the glass wall—that is, no joints with the frame—and also because the wall is protected from the weather by the exterior grid, there is a saving in construction costs.

SOM, which sees the separation of the walls as having a significant aesthetic advantage as well—the articulation of the building is more apparent and more complete—has experimented during the last few years with the double wall using other structural systems, such as a poured concrete frame. (See No. 12, page 152.)

INTERIOR DESIGN DATA: NEW ORLEANS

AGENCY AREA: Ceiling: plaster/white/U.S. Gypsum. **Carpet:** beige/V'Soske. **Partitions:** posts/aluminum/brushed/black notch/SOM design/custom, Virginia Metal Products; panels/glass/rough rolled/Pittsburgh Plate Glass. **Doors:** hollow metal/off white/Virginia Metal Products, American Metal Works. **Lighting:** downlights/recessed / SOM design / custom, Omega Lighting Inc. **Desks:** teak, black metal/Corry Jamestown. **Desk chairs:** in beige and white upholstery/both Knoll. **Side chairs:** in deep orange nylon/both Knoll. **Draperies:** blue silk/Scalamandre.
MEETING ROOM: Partitions: panels/teak/Virginia Metal Products. **Table:** boat shaped/dark walnut/Knoll. **Chairs:** Knoll. **Upholstery:** nylon/beige and white/Stowe & Davis. **Cabinet:** dark walnut/cremo marble top/Stowe & Davis.



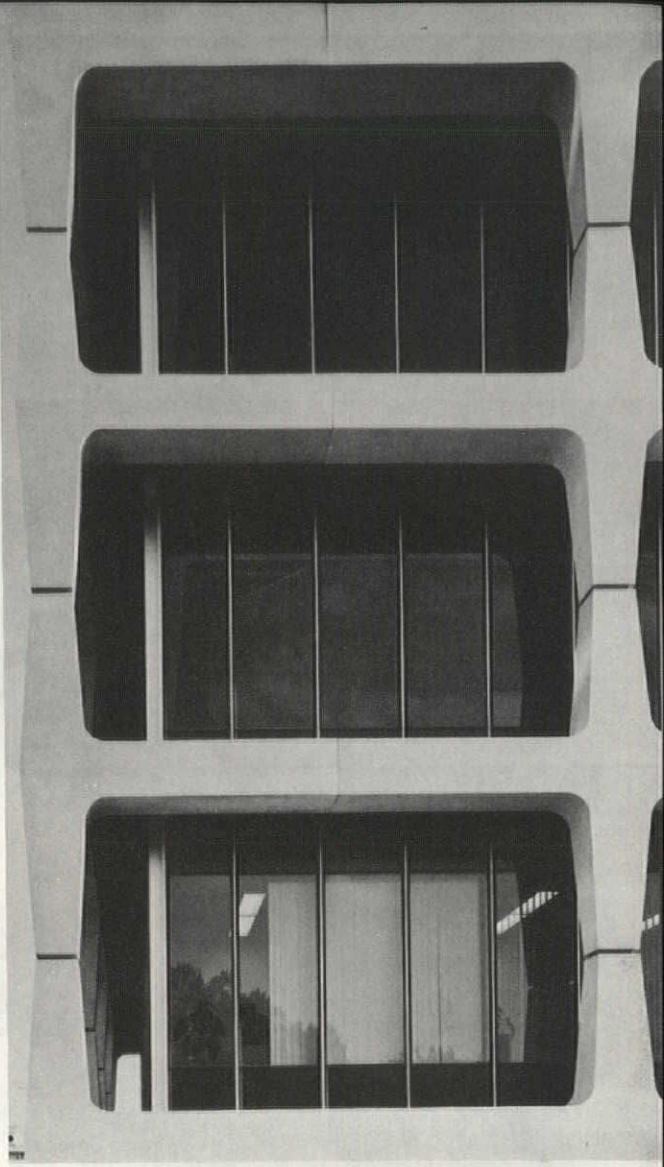


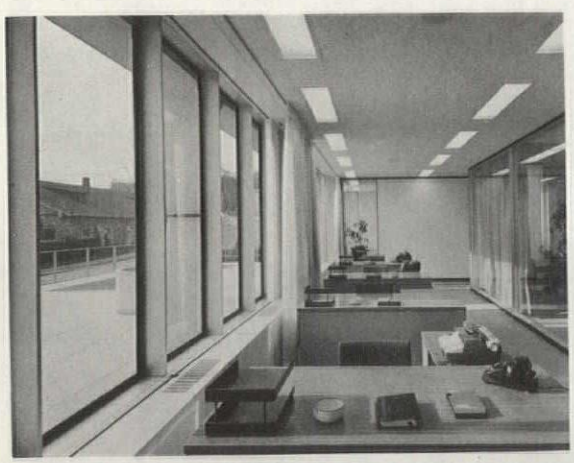
The return of the peristyle in this new form may prove to be one of the significant developments of the decade.

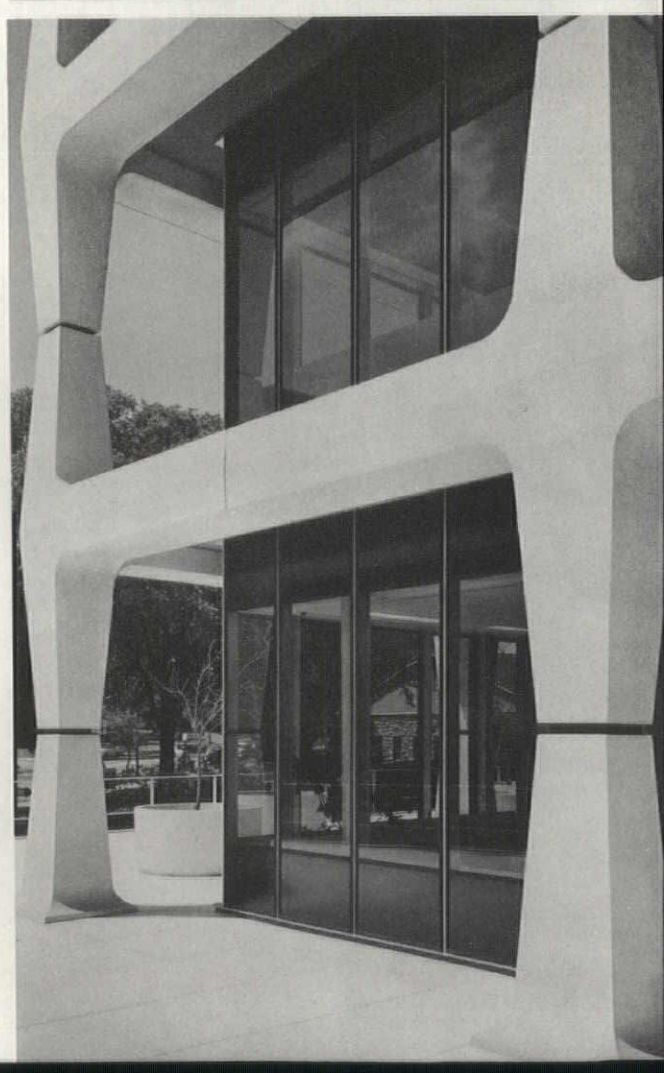
Architects for both John Hancock buildings were Skidmore, Owings & Merrill, New York, with the following staff: William S. Brown, Partner-in-Charge; Gordon Bunshaft, Partner-in-Charge-of-Design; Harold J. Olson, Project Manager; Roger N. Radford, Project Designer; Walter A. Rutes, Job Captain. Associate Architects were Nolan, Norman & Nolan (for New Orleans); Tanner, Linscott & Associates (for Kansas City). Structural Engineer was Paul Weidlinger (New Orleans) Paul Weidlinger, with Weiskopf & Pickworth (Kansas City). Mechanical Engineer for both buildings was Syska & Hennessy, Inc. General Contractors were R. P. Farnsworth & Co., Inc. (New Orleans); and W. E. Brown Associates, Inc. (Kansas City).

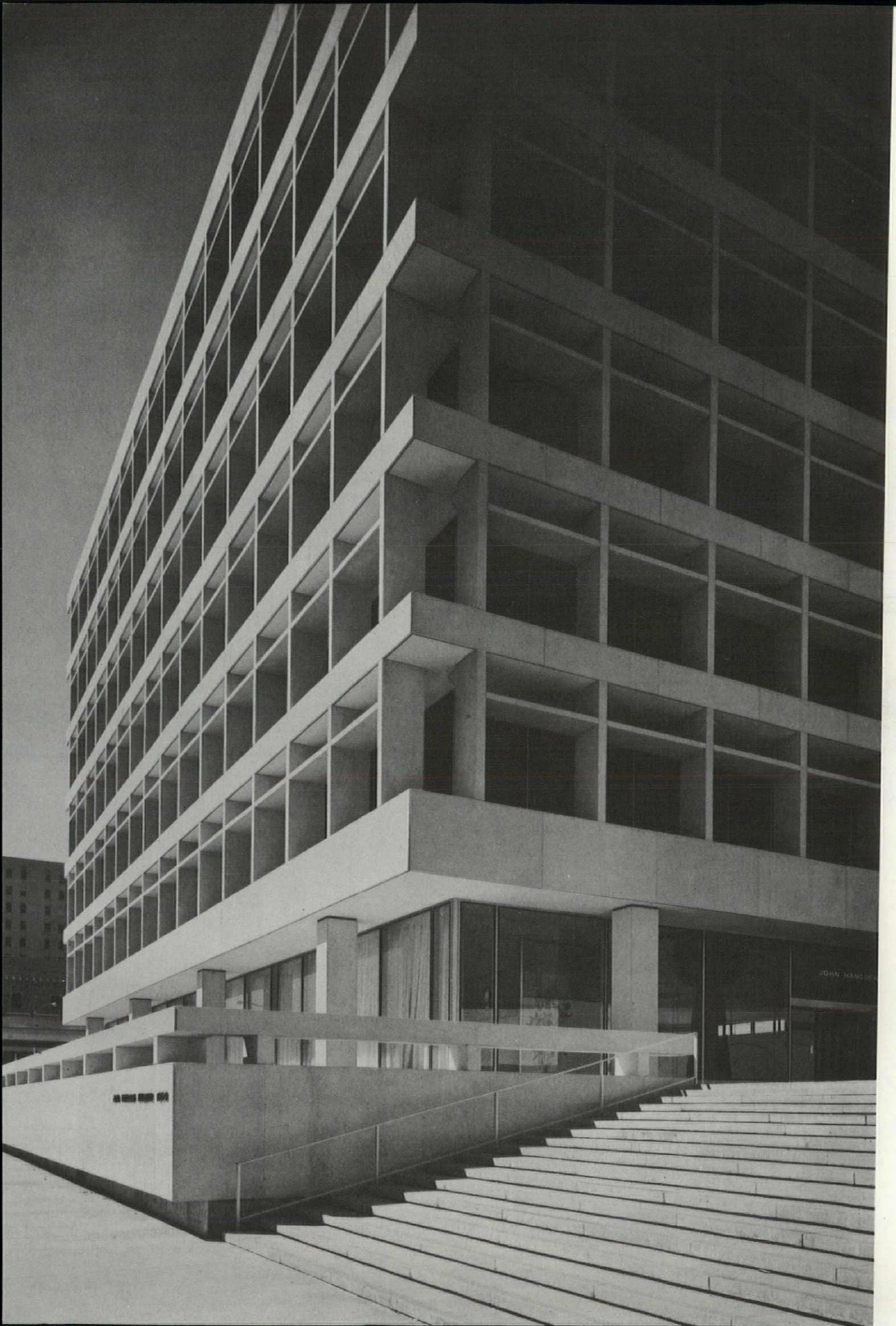
INTERIOR DESIGN DATA: KANSAS CITY

SECRETARIAL AREA: Ceiling: acoustical tile/suspended/white/National Gypsum Co. **Lighting:** 1′ x 4′ recessed troffers/Benjamin El. **Floor:** carpet/beige/V'Soske. **Wall coverings:** vinyl/white/Vicretex/L. E. Carpenter. **Window coverings:** vertical blinds/white/Vertical Blind Corp.; casement/white Draylon/Designtex; draperies/yellow silk/Scalamandre. **Partitions:** posts/aluminum/SOM design/custom, Midstates Ornamental Iron; panels/glass/clear/Pittsburgh Plate Glass. **Desks:** beige metal/chrome frame/English Oak tops/General Fireproofing. **Chairs:** aluminum/General Fireproofing. **Upholstery:** leather/black, brown, beige/American Leather Co.; fabrics/navy blue, brown/Rancocas.
OFFICE: Desk: rosewood/Stowe & Davis. **Desk chair:** in black leather/both Stowe & Davis. **Armchairs:** chrome steel/Albano Contract Division; navy blue silk/Scalamandre. **Sofa:** Knoll; beige silk/Scalamandre. **Side table:** chrome/cremo marble/SOM design/custom. **Planter:** aluminum/Duk-it/McDonald Products Corp.

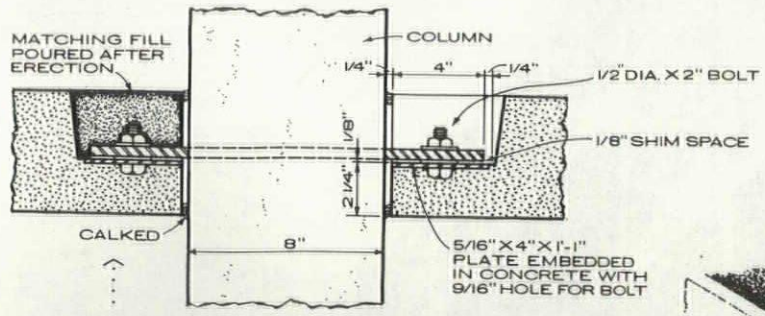




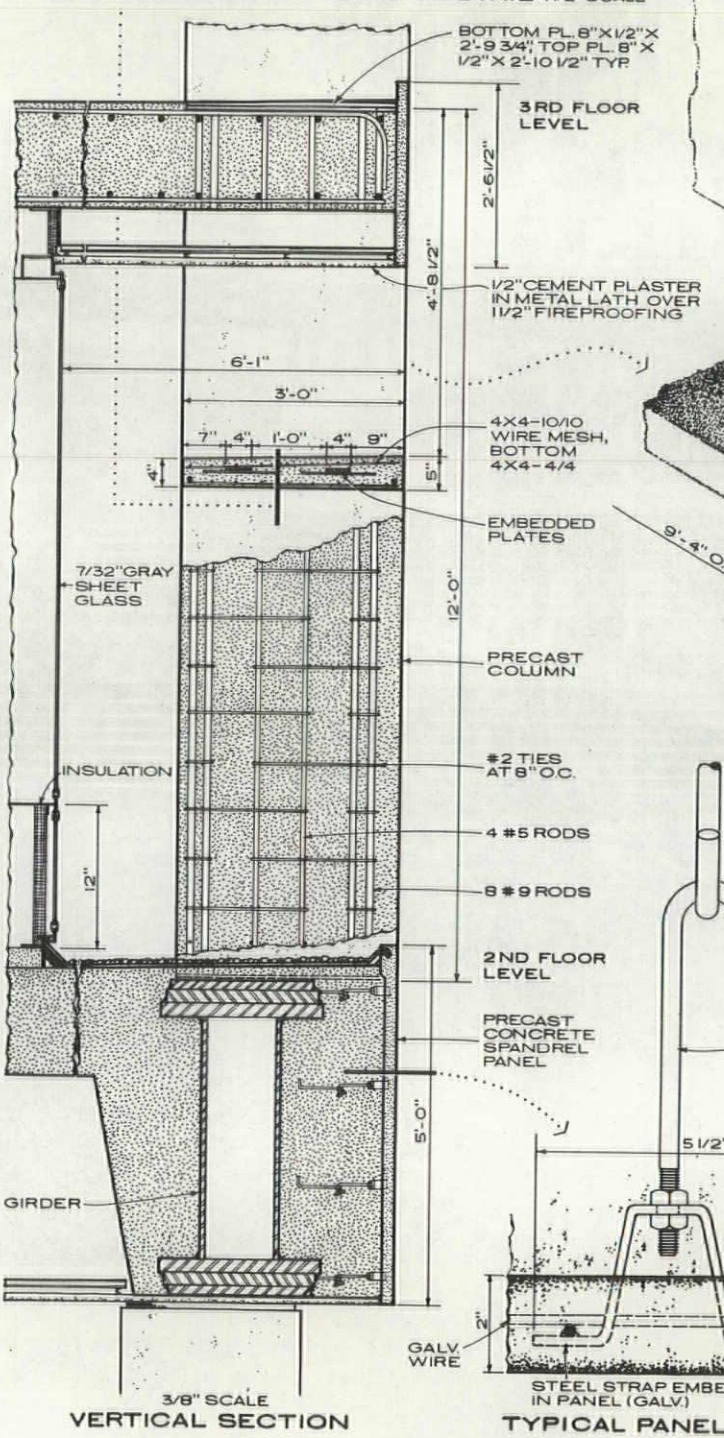




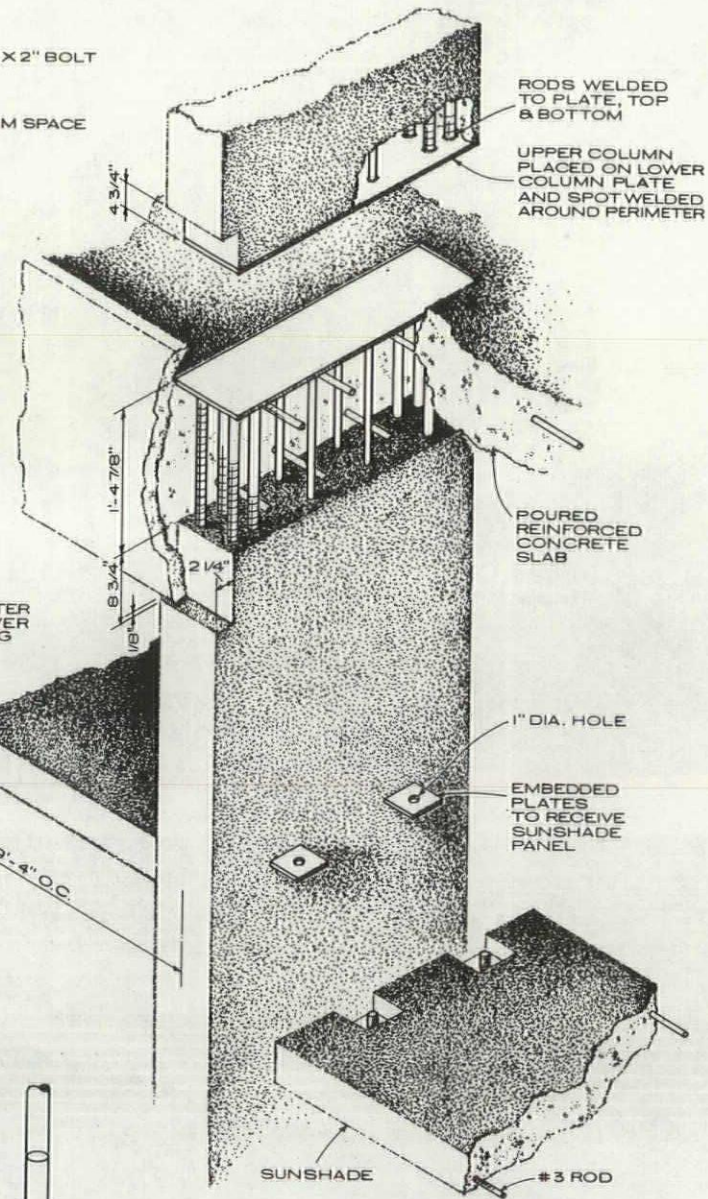
In New Orleans, since the water table is 3-ft below grade, the roof of the "underground" garage became an elevated plaza as a consequence, giving the building (facing page) *a dominant position among its neighbors on Lee Circle. In Kansas City,* (above) *a larger, unevenly sloping site permitted parking in a separate, 5-level structure located on the uphill corner behind the main building. The latter rests on a podium on the downhill part of the site. A prestressed concrete bridge connects the garage to the fourth floor of the offices.*



SUNSHADE CONNECTION DETAIL 1 1/2" SCALE

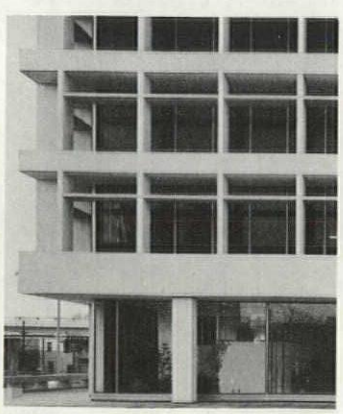


TYPICAL PANEL ANCHOR 3" SCALE

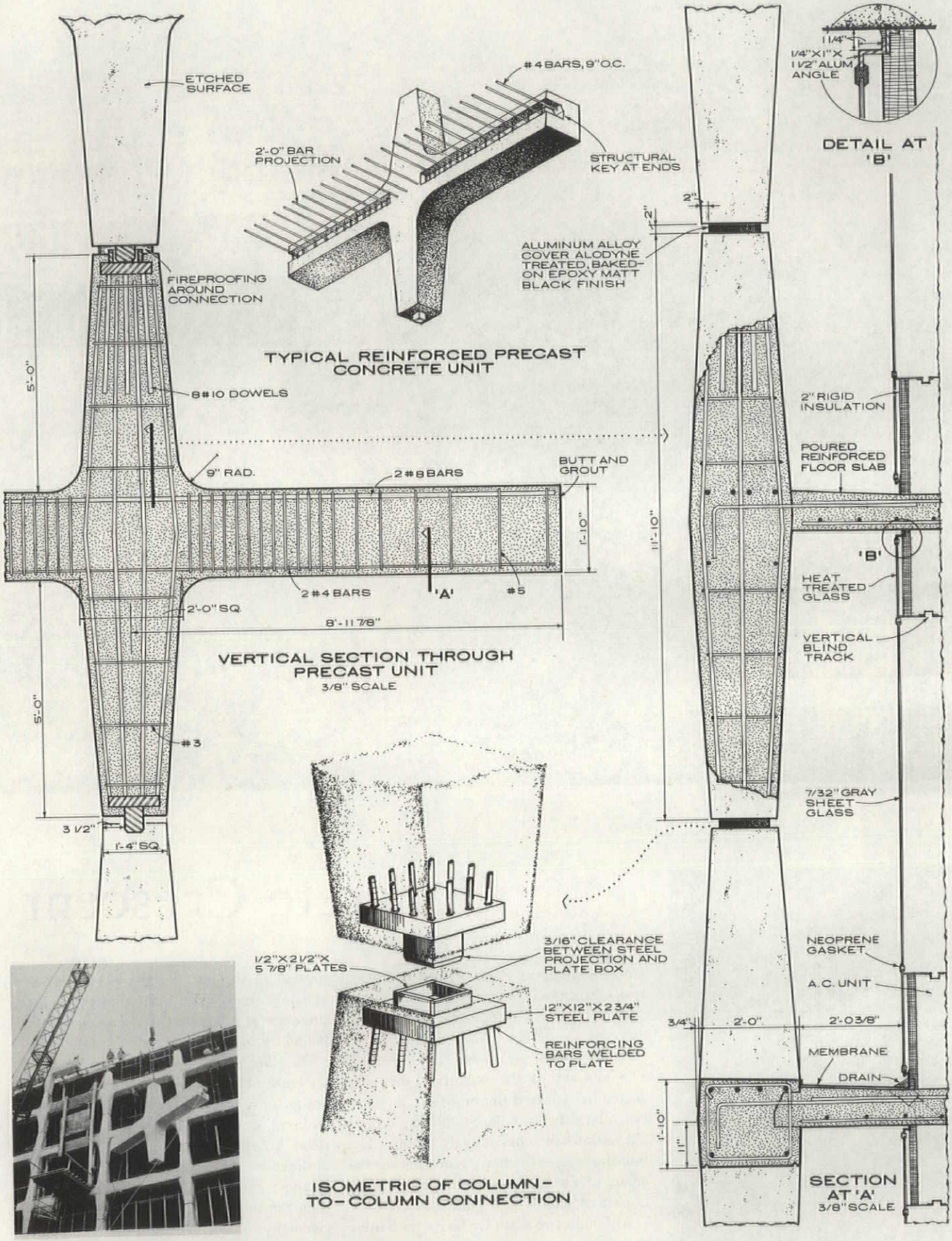


1/2" SCALE

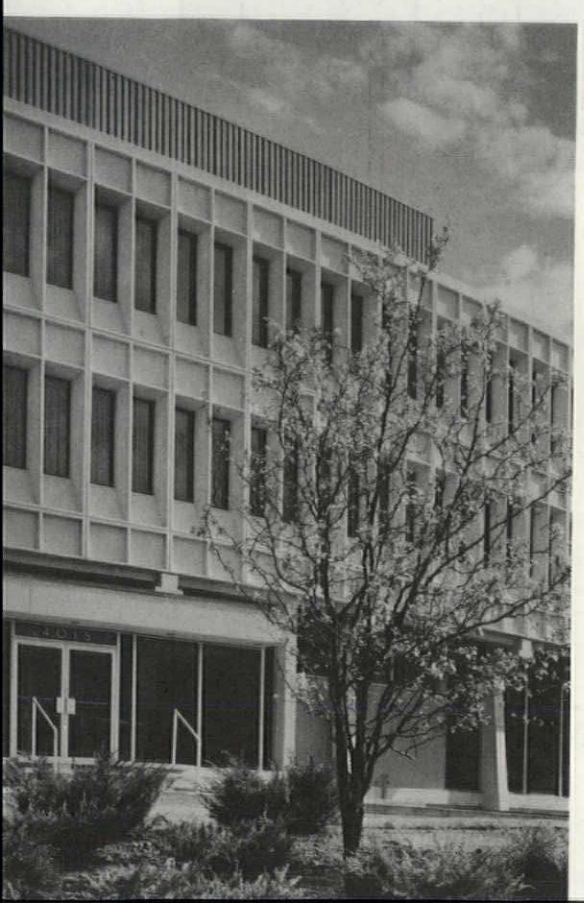
ISOMETRIC-CUTAWAY OF TYPICAL COLUMN ASSEMBLY



JOHN HANCOCK BUILDING: New Orleans, La. SKIDMORE, OWINGS & MERRILL, Architects	SELECTED DETAIL WALL SECTION



JOHN HANCOCK BUILDING: Kansas City, Mo. SKIDMORE, OWINGS & MERRILL, Architects	SELECTED DETAIL WALL SECTION



Concrete Crescent

MODERN MEDICINE PUBLICATIONS BUILDING, EDINA, MINNESOTA • THORSEN & THORSHOV, INC., ARCHITECTS • HERBERT A. KETCHAM, PROJECT ARCHITECT

The success of the suburban shopping center has spurred the growth of another, but relatively unexplored building type—the suburban commercial center. The building presented here, which houses the offices of a publisher of a medical journal, is part of such a new business center.

Although two main traffic routes border the property and a busy shopping center is located nearby, the architects have in this instance succeeded in preserving much of the country-like quality of the area. The building's crescent shape was to a large degree inspired by the configuration of the site, by the placement of existing trees, and particularly by the presence of a lagoon that forms the south boundary of the property.

On close study, the architects felt that the crescent shape offered other significant design advantages: (1) the curve of the building would provide wider ranges of views for the occupants; (2) the play of sunlight would add visual interest to the façades; and (3) the curve would also enliven the interiors and would prevent the monotony of a straight-line corridor scheme.

The interior space is planned to accommodate all phases of publication, save the actual printing of the magazine. In addition, some rental space is provided for related, smaller publishing firms.

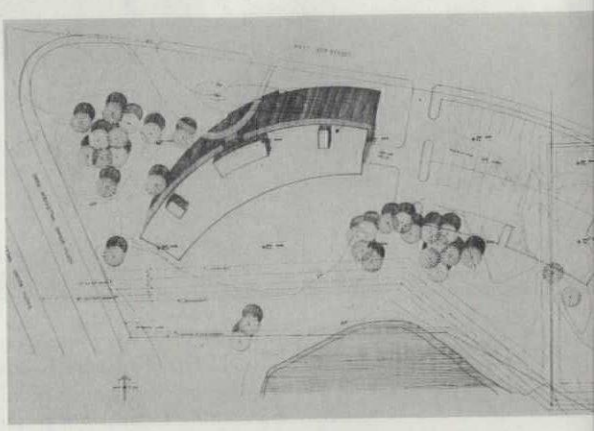
in the Suburbs

A three-story central corridor scheme was found to be the most logical solution, placing the large-scale "front-office" functions, such as reception area and conference rooms, on the main floor; the main work area for the client on the second floor; and rental offices on the third. The restaurant, originally intended for the main floor, was moved to the basement during the course of planning, and offices were substituted in the prime, high-ceilinged space. These changes have somewhat obscured the clarity of the design. Nevertheless, the original design concept —to counterbalance the main spaces and the lesser spaces—was carried to its conclusion and clearly expressed in architectural terms. Therefore, at ground level, where reception areas and auditorium required large spaces, the ceiling is high, the cast-in-place columns are spaced far apart, and the walls are fully glazed. In contrast, the two upper floors are enclosed with small-scale spandrel and window units of precast concrete, which serve to express the less dominant office spaces.

Structurally, the precast concrete walls are designed as bearing walls, which transfer their loads to a girder that rests on the main floor piers. Floors and roof are pan and joist construction.

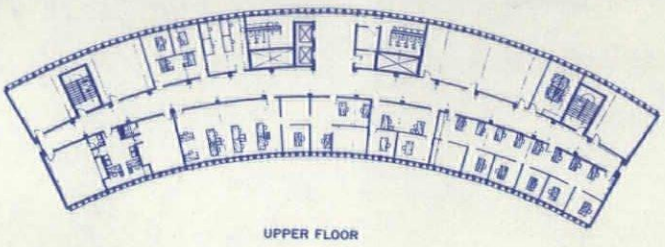
An air system, supplemented by a recessed perimeter radiation system, provides heat for the building. Cooling is accomplished by air supplied through recessed fluorescent troffers. The main air supply and return ducts are located in the space above the central corridor ceiling.

The Consulting Mechanical and Electrical Engineer was Lewis D. Freedland; Consulting Structural Engineers were Meyer & Borgman.

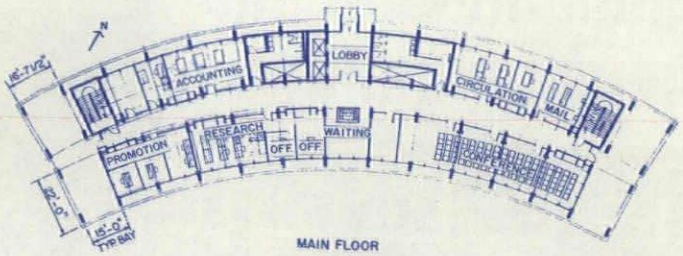


The typical office space (left, top), *expressed on the exterior with precast members, has modest room proportions and comparatively little glass area. The reception room* (left), *on the other hand, has a high ceiling and is fully glazed.*

In the early design versions, the plan was a simple segment of an arc. The final plan is crescent-shaped, giving the building a more logical termination at its end walls, and lending extra width to the central corridor (above) *at the midpoint, where it is most needed.*



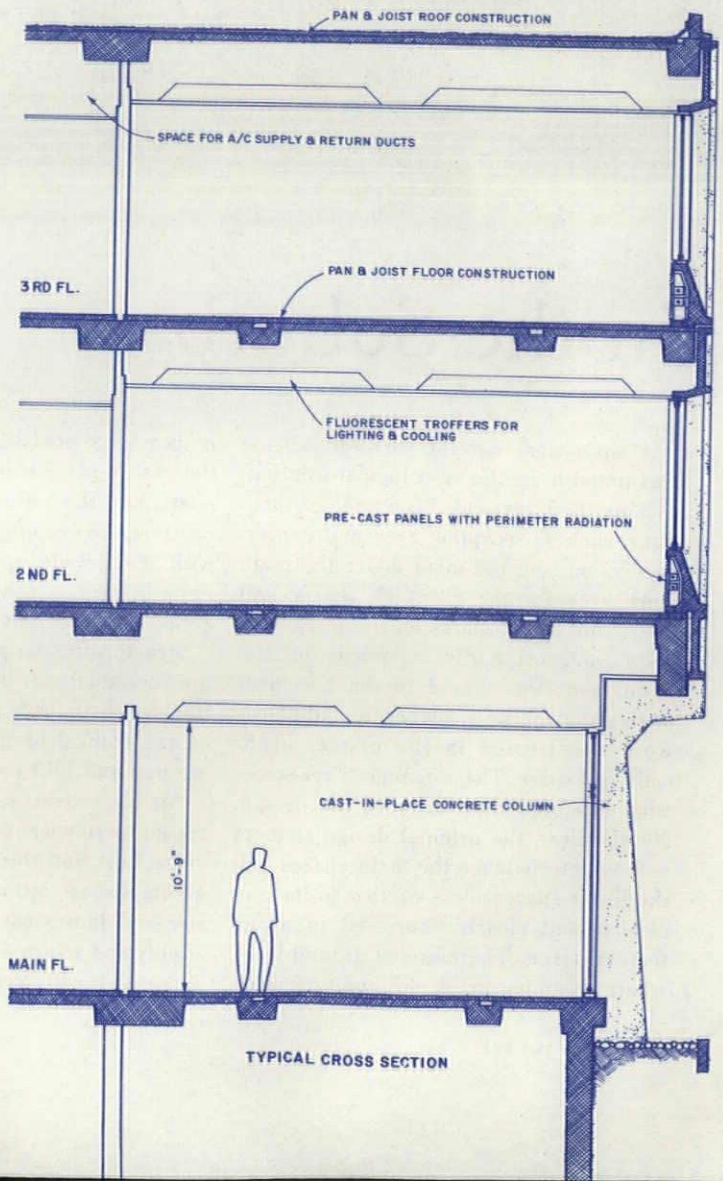
UPPER FLOOR



MAIN FLOOR

INTERIOR DESIGN DATA

FLOORS: terrazzo/earth grays/coarse texture/ Grazzini Brothers. **CEILINGS:** acoustical plaster/off-white/Western Mineral Products. **WINDOWS:** ¼" solar gray/Pittsburgh Plate Glass; fixed aluminum frames/custom, Crown Iron Works; neoprene gaskets. **LIGHTING:** Air troffers/ Anemostat Sunbeam. **TYPICAL OFFICE: Walls:** plaster/putty gray, off-white/U.S. Gypsum. **Desks, cabinets, chairs:** black metal, plastic walnut tops, blue Naugahyde upholstery/Doric/Corry Jamestown. **Draperies:** casement/off-white/Draylon/Overland Fabrics. **RECEPTION: Wall covering:** grasscloth/natural/Murals Inc. **Rug:** three shades of green/made in Japan/Tempo Asia. **Draperies:** casement / white / handwoven / Maria Kipp. **Desk, desk chair:** black/Robert John. **Armchairs:** Marden; wool/brilliant green/Unika-Vaev.



TYPICAL CROSS SECTION

PHOTOS: HUGH ROBERTSON, PANDA STUDIOS

Downtown Bank Tower

CANADIAN IMPERIAL BANK OF COMMERCE BUILDING • MONTREAL, CANADA • PETER DICKINSON, ARCHITECT • CLIFFORD & LAWRIE, ARCHITECTS AND DESIGN CONSULTANTS • ROSS, FISH, DUSCHENES & BARRETT, SUPERVISING ARCHITECTS

One of the major landmarks in the exciting new skyline of Montreal is the 43-story tower known as the Commerce Building. Before the recent boom in high-rise offices, the tallest building in Montreal was the Sun-Life (center of photo, *below;* Pei's cruciform tower in Place Ville Marie is down the street).

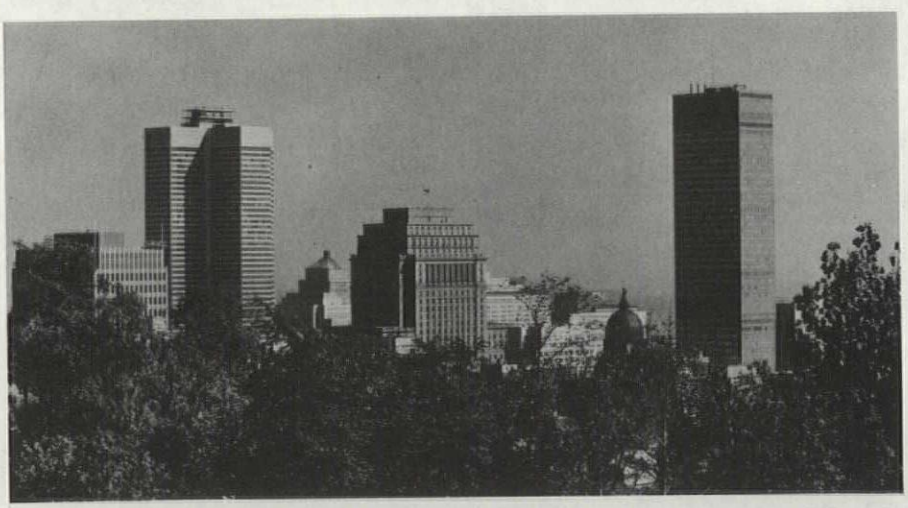
The site, bordering on Dominion Square, was recognized five years ago as one of the most promising locations in this developing downtown part of the city. At that time, a group of businessmen proposed tearing down an obsolete portion of the old Windsor Hotel and putting up rental offices on the 45,000-sq-ft site. The building that evolved is a prestige office tower 590 ft high, with three garage levels, two banking floors (ground and first basement), two mechanical (sixteenth and forty-second), and 40 tower floors (the second, third, and fourth occupied by the bank). Total floor area was limited to twelve times the site area.

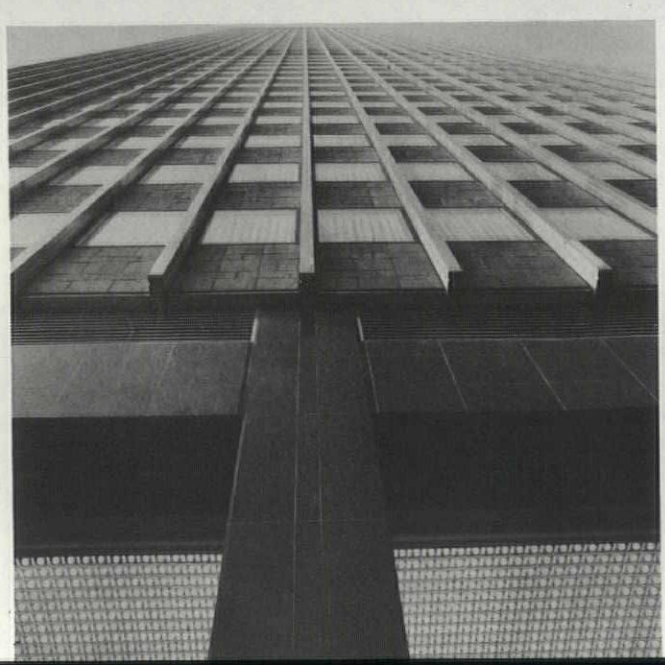
Barely visible through the trees of Dominion Square is the dramatic one-story banking hall that links the office block with remaining portions of the Windsor Hotel. The link is visual only; and from across the square even this visual connection is not readily apparent. The slenderness of the tower has prompted one architectural critic, Peter Collins, to liken it to the campanile in the Piazza San Marco. Proportions are remarkably similar—10:8½:41 for the campanile, and 10:7½:42 for the tower. Collins maintains that even the tower's relation to the square is reminiscent of Venice.

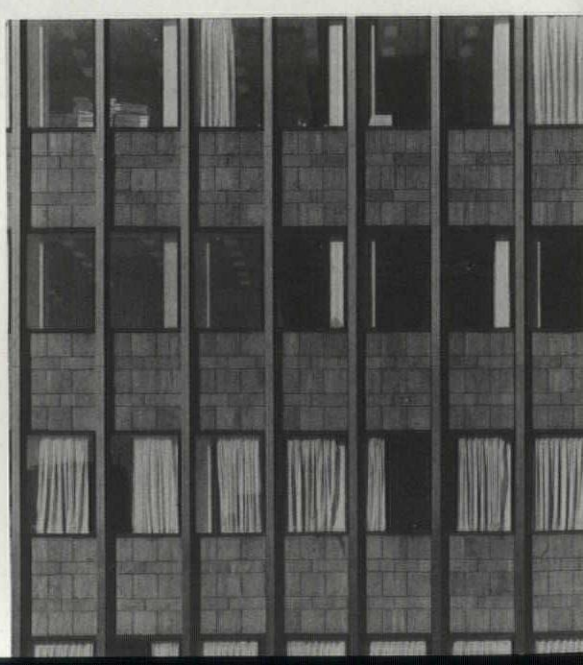
An unusual combination of materials is revealed in a close-up view (*photos, bottom*). Mullions are precast concrete faced with stainless steel; spandrels are precast-concrete faced with slate. This wall was intended to suggest the character of stone, while at the same time providing the advantages of prefabrication.

The structural frame is steel, with concrete or sprayed-asbestos fireproofing. Plaza and basement levels are of concrete construction. One of Dickinson's early design decisions was to locate the boiler, together with the refrigeration plant, at roof level. This unconventional treatment prevents the stack from interfering with planning at the main floor and in the tower core, and also avoids the loss of some 2500 sq ft of rentable area. The plan of the tower is based on a 5-ft module, with all lighting, diffusers, and underfloor ducts conforming to it—everything, in fact, except for some interior columns.

In September 1961, when Peter Dickinson died, the tower structure was well underway, but major areas at ground level and the entire bank areas had not yet been developed. At this point, Clifford & Lawrie became design consultants to the owner, Dorchester Commerce Realty Limited. (Their further responsibility on this project was as architects and design consult-



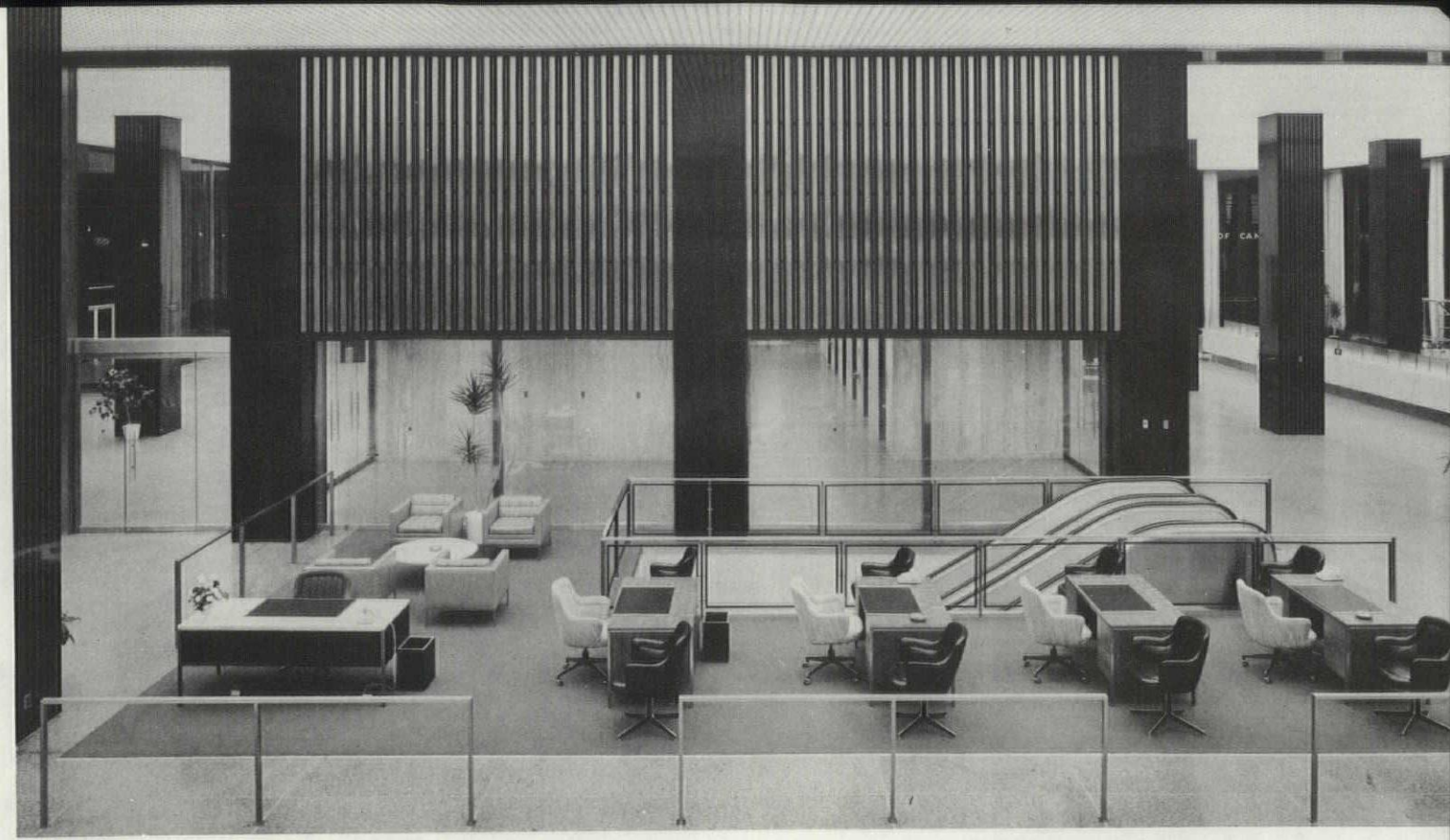


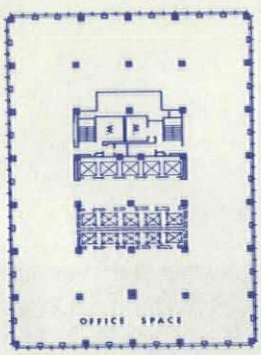


ants to the CIBC.) They describe their design premise as a simple one: "To express the 'banking hall' function related to but not crushed by the tower or shaft, and integrated with the ground-level experience of the plaza, and the gardens in the square." The hall is set back from the tower, making the plaza wider at this point. To articulate the hall further, while ensuring its cohesion with the tower, the four columns of the hall are differentiated at the ceiling from those supporting the tower. Stainless-steel grilles were introduced above the elevators to relate the elevators to the vertical mass of the tower.

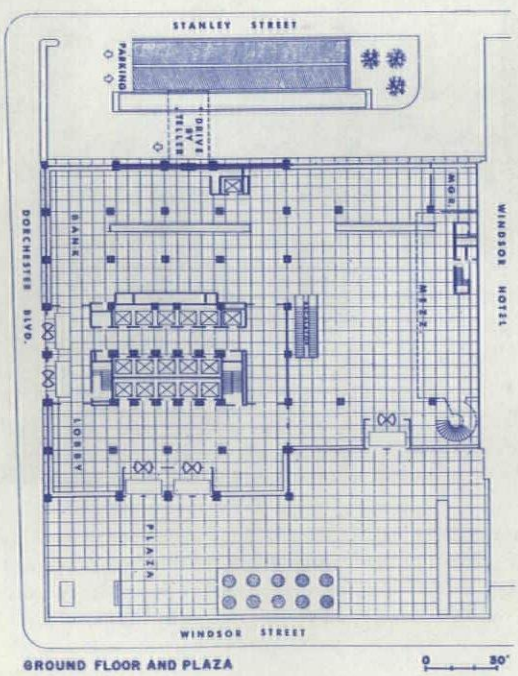
Two other elements of the interior are noteworthy. The ceiling is a specially designed acrylic diffuser, an interlocking grille that grew out of the desire for "a re-emphasis of the traditional importance of a major surface." (Other considerations affecting the design of the ceiling: the need for efficiency and low brightness.) Much care—both technical and aesthetic—also went into the spiral stair, a form traditional in Montreal but achieved here in an utterly contemporary translation. It is constructed on a laminated-beam principle, with $\frac{3}{8}$-in.-wide rectangular bars of stainless steel doweled into place.

Total costs were approximately $25 million. Consultants on the project were M. S. Yolles Associates, Ltd., Structural Engineers; G. Granek & Associates, Mechanical Engineers; and Jack Chisvin & Associates, Electrical Engineers.





TOWER FLOOR

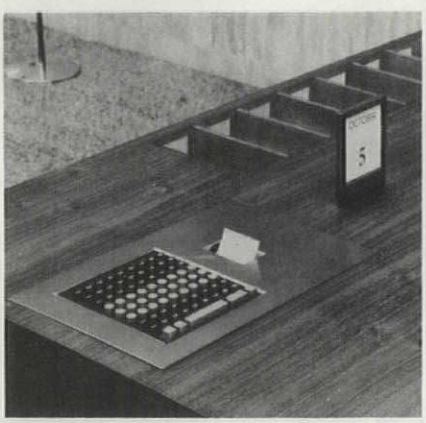


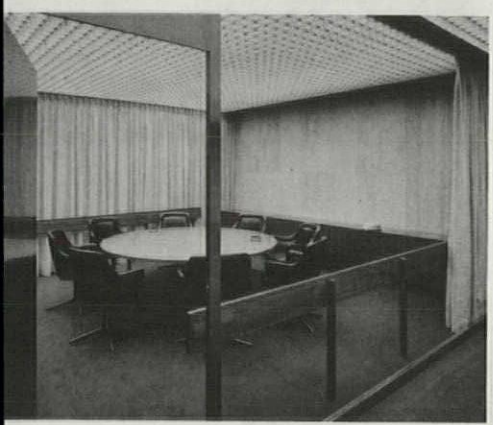
GROUND FLOOR AND PLAZA

0 30'

INTERIOR DESIGN DATA: BANKING HALL

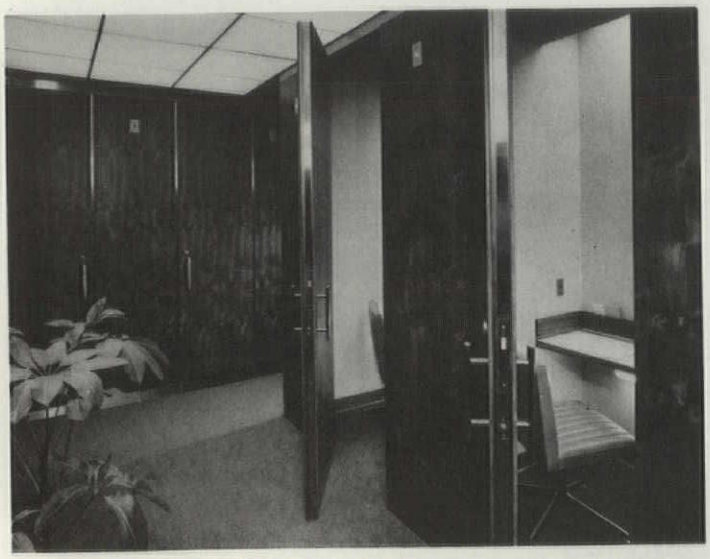
Walls: travertine/unfilled. **Column sheathing:** polished granite/black/Sweden. **Floor:** Diamond Pink granite. **Ceiling:** pierced grille diffuser/gray acrylic/designed by Erwin Hauer of Arts for Architecture, Inc., with the architects. **Carpet:** wool/red/Toronto Carpet Co. **Drapery:** linen/natural/Jeff Brown Fabrics, Toronto. **Desks:** stainless steel, teak/architect design/Knoll Associates. **Check desks:** stainless steel, teak/architect design/J. F. Gillanders & Sons, Toronto; adding machine/Victor. **Desk chairs:** Artwood-Lehigh; in black leather, white wool, blue nylon/Knoll. **Lounge chairs:** in black leather/J & J Brook, Toronto.





The interest of the Canadian Imperial Bank of Commerce in this project was motivated by the need for larger quarters for its main and regional offices. Shown here are the manager's office (left, above), *located in the main banking hall, and a conference room* (left), *located on the mezzanine level that is reached by helicoidal stair.*

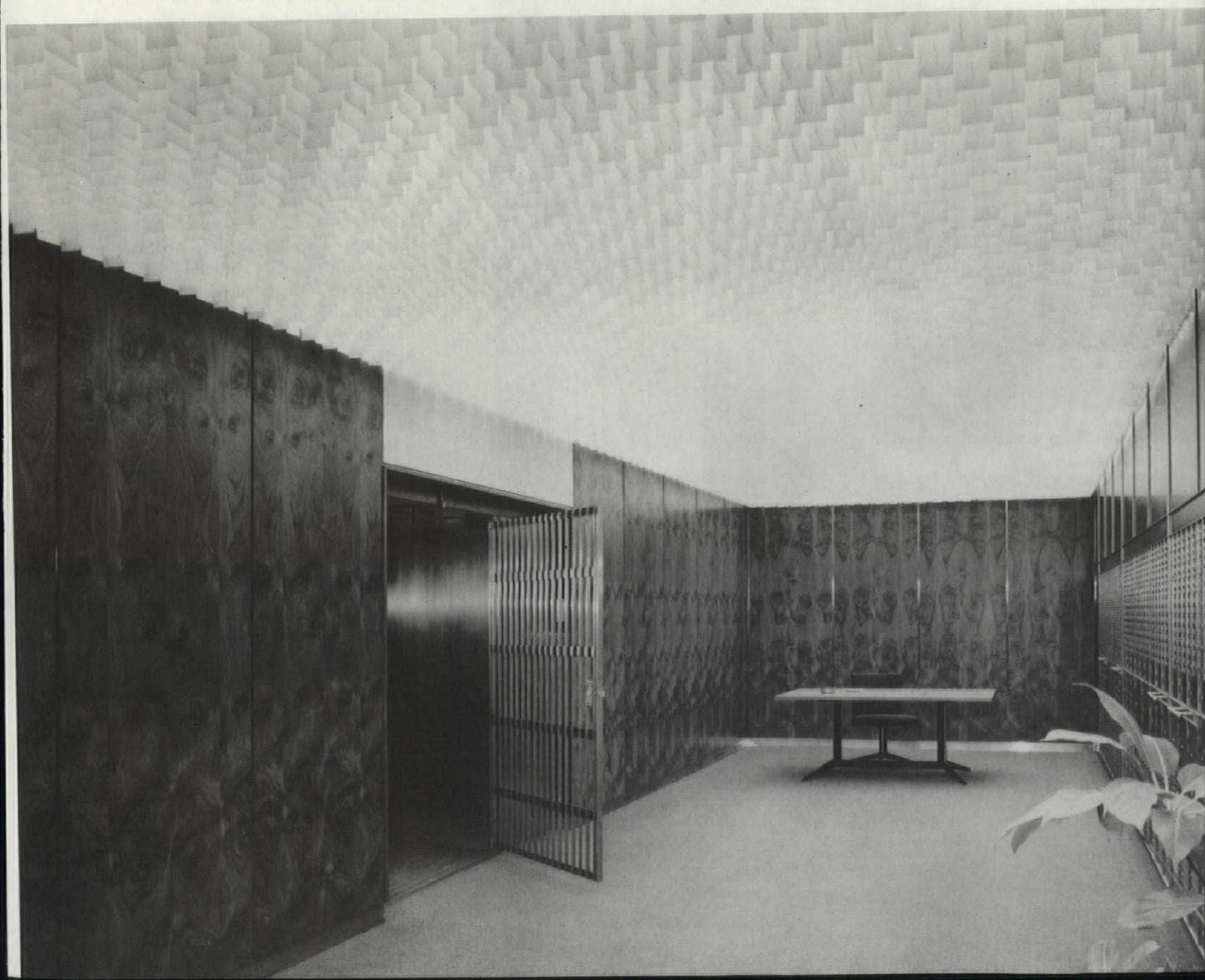
Below the main banking hall is a lower floor occupied by banking facilities. The securities and international department (above) *opens into the vault's reception area* (top) *through gray glass doors. At the vault's entrance is a mosaic mural by Sidney Watson.*



In the safety-deposit cubicles (left) *and in the vault itself* (below), *the mood established is one of richness, yet not without a certain restraint. Clifford & Lawrie, in their capacity as architects and design consultants to the Canadian Imperial Bank of Commerce, were also responsible for the design or selection of all furniture and furnishings.*

DATA: description and sources of the major materials and furnishings shown.

MANAGER'S OFFICE: Carpet: red wool/Toronto Carpet Co. **Desk:** burly teak/Artwood-Lehigh. **Desk chair:** in brown fabric/both Knoll Canada Ltd. **Armchairs:** in pigskin/Artwood-Lehigh. **Sofa, lounge chair:** J & J Brook, Ltd.; sand-colored fabric/Knoll.
INTERNATIONAL DEPARTMENT: Counter: Eureka-Danby marble. **Round table:** white marble/Sunshine Office Equipment, Canada. **Chairs:** in pigskin/Artwood-Lehigh.
VAULT RECEPTION: Ceiling: luminous grid/Integrated Lighting Ltd. **Mural:** multicolored Italian glass mosaic/Sidney Watson design.
VAULT: Ceiling: "Leaflite"/off-white/Integrated Lighting Ltd. **Walls:** burly Burma teak/J. F. Gillanders. **Furniture:** Artwood-Lehigh.



EVOLUTION OF THE HIGH-RISE OFFICE BUILDING

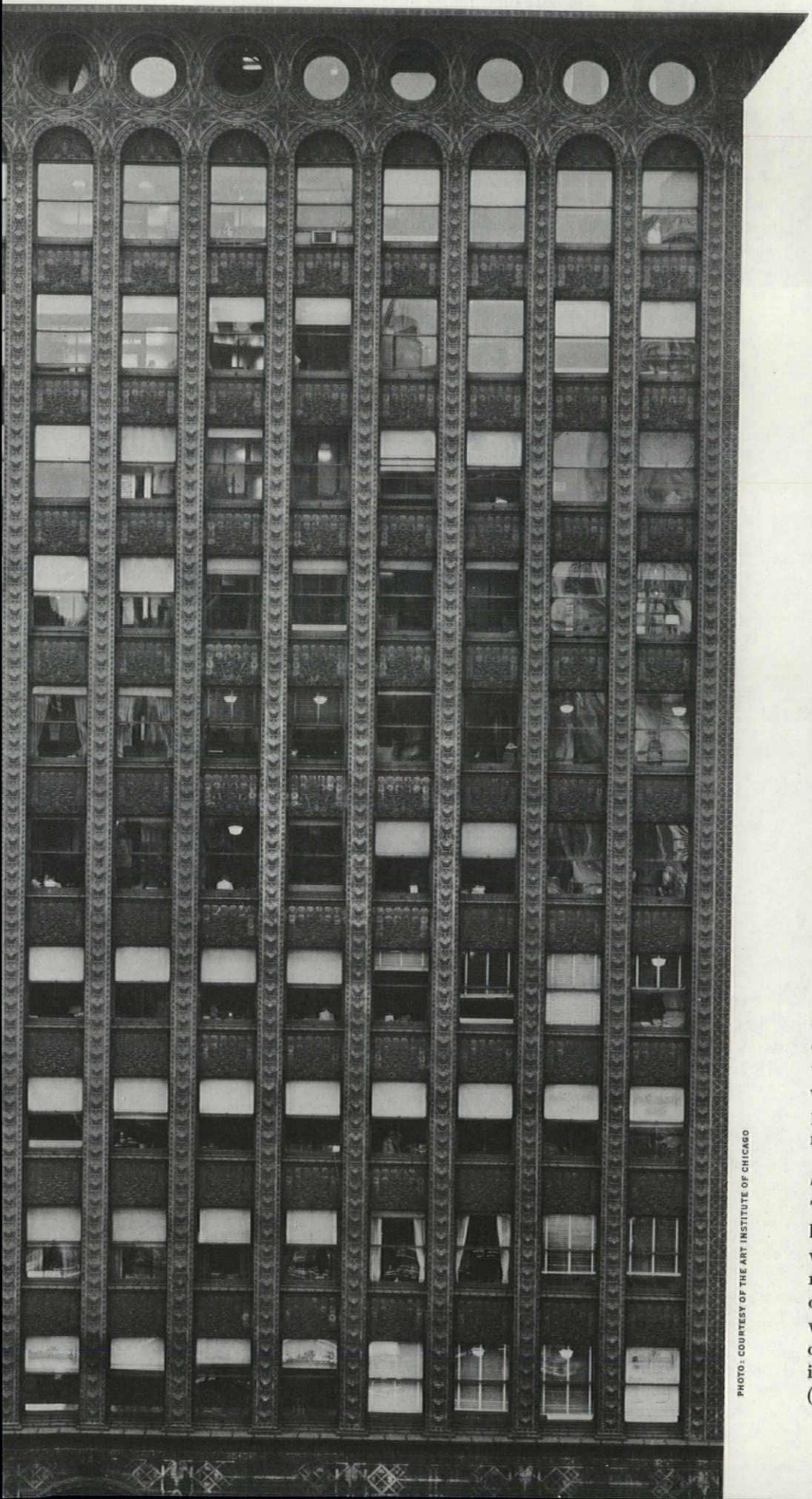


PHOTO: COURTESY OF THE ART INSTITUTE OF CHICAGO

This article is based on a study prepared by Robert P. Sitzenstock, while a graduate student at M.I.T. Individual office buildings presented on the following pages (referred to by number in the text below) illustrate some of the major points.

The high-rise office building emerged as an architectural form about 75 years ago in the United States, and its subsequent development has, for the most part, taken place here. The first great American architect to give serious thought to the form of the office building was Louis Sullivan; utilizing the recently introduced steel frame structural system, he developed a style characterized by office floors of uniform plan and elevation, supported on a base of larger scale and capped by a distinctive attic story (illustrated in the Guaranty Building, Buffalo, 1895, *left;* 1).

The history of office building design for almost a half century thereafter was a process of searching for an appropriate architectural expression of the steel frame and adding mechanical and electrical amenities to the interior. In the early years of this century, the pioneering architectural principles of Sullivan and other members of the Chicago School were largely ignored; office towers generally terminated in Corinthian temples or Gothic spires. The pyramidal or "wedding-cake" form became customary for larger buildings, partly because of the set-back requirements of zoning laws, and partly because the need for light and air limited the distance between the exterior wall and the elevator core, which decreased in size on the upper floors.

In the late 1940's, when adequate air conditioning and artificial lighting became available, the progressive decrease in core areas no longer dictated a corresponding decrease in over-all floor size. The result was the "slab" building, which took advantage of structural standardization and provided larger working areas on the more desirable upper floors.

Interior Planning

The interior layout of the typical early high-rise office building consisted of individual offices of approximately 320 sq ft ranged along double-loaded corridors, all of them on exterior walls with operable windows. Flexible office floors, which could be laid out to suit the tenant, were introduced in 1930 in the RCA Building (New York; Reinhard & Hofmeister; Cor-

bett, Harrison & MacMurray; Hood & Fouilhoux, Associated Architects; 5). Frank Lloyd Wright experimented with the three-dimensional design of office spaces, using high and low ceilings for various functions. (Larkin Building, Buffalo, 1904, and Johnson's Wax Administration Building, Racine, 1936), but his work had little influence on office building design in general.

In the Lever House (New York, 1952; 8), Skidmore, Owings & Merrill began their development of the movable metal-and-glass partition, which was perfected in their buildings for Union Carbide (1960) and Chase Manhattan (1961; 10) in New York.

The co-ordination of movable partitions, lighting, and air conditioning has been achieved through the use of modular planning. The size of the office building module depends on many factors: high or low rents, structural system, size of individual offices, and special use requirements. The module may range from 3'-5", as in the Equitable Building (New York, 1961, SOM) to 6'-0", as in the United Air Lines Executive Offices (Chicago, 1962, SOM). The typical module for buildings built in the past few years or now under construction ranges from 4'-7" to 5'-0".

Structural Systems

The introduction of the steel frame in the 1880's had given the architect an opportunity to break through the height limitations and weight problems of masonry construction. The 16-story Monadnock Building (Chicago, 1891, Burnham & Root), the tallest masonry office building ever constructed, had exterior walls 5'-5" thick at the street level. The earliest example of true skeleton construction (Home Insurance Company Building, Chicago, 1885; William LeBaron Jenney) was built with cast iron columns supporting wrought iron beams. In his Guaranty Building (1), Sullivan used built-up steel members with cast iron plates. Soon after that, rolled steel sections were perfected and quickly became standardized for the building industry.

The size of structural bays in the early steel-frame buildings was generally about 15' x 20', the size of a standard office. When flexible interior planning was introduced, the need for larger bays became apparent; bays approximately 25 ft sq (or equivalent in area) were typical throughout the 1940's and 1950's. A comparative study of bay sizes for steel structures by SOM has indicated, however, that there is a difference of only 40 lbs per ton between 25-ft-sq bays and 37-ft-sq bays; with the larger spans, moreover, there are significant savings in foundations.

Concrete was not employed in high-rise construction until the late 1940's. Belluschi's Equitable Building (Portland, Oregon, 1948; 6) employed a poured-in-place concrete frame with ribbed floor slabs. In the Hartford Building (Chicago, 1962; 12), SOM used a flat slab. The Norton Building (Seattle, 1960; Binden & Wright and SOM; 16) combined 70-ft precast, prestressed concrete beams with steel girders and columns. SOM designed a system of a cross-shaped precast structural wall components for the Banque Lambert in Brussels, still under construction, and later adapted it for the John Hancock Building in Kansas City, now completed (*see page 127*).

The use of post-tensioned concrete for long structural spans is now becoming economically advantageous. Structural Engineer T. Y. Lin has recommended use of post-tensioning for spans of 42 ft to 72 ft; he has also said that, using today's structural techniques, bay sizes of 100' x 100' are attainable with floor slabs 3'-0" deep. Myron Goldsmith's speculative proposal for an 86-story building (1948; 20) shows some of the design possibilities of long-span concrete structures.

Exterior Walls

The facades of early steel-frame buildings were faced with brick, terra cotta, or stone, which placed a considerable load on the frame, increasing its weight and cost. The rediscovery and refinement of the metal curtain wall in the late 1940's cut down on both design loads and construction time. The position of the curtain wall depends on several factors: aesthetics, cost, and heating and cooling loads. The window wall flush with the exterior face of the column takes advantage of the maximum floor area; setting the window wall back within the structural frame, however, as in SOM's Hartford Building (Chicago, 1961; 12) makes it possible to have a weather-tight wall at lower cost and eliminates the need for sun control devices or tinted glass.

The reintroduction of the structural exterior wall has been a significant recent development in office building design. The John Hancock Building (San Francisco, 1959, SOM; 22) has a 1'-0" thick exterior wall, in 5'-0" segments, alternating with 5'-0" windows. Saarinen's CBS Building in New York (under construction; 25) is similar, with support and window in alternating 5'-0" modules, but here the bearing member takes the form of a triangular column, with the window at its rear face.

Structural concrete mullions, which have been used in several of I. M. Pei's apartment buildings of the past few years, have been utilized in SOM's Brunswick Building (Chicago, under construction; 24). In one project now nearing completion (Curtis & Davis' IBM Building in Pittsburgh; 23), a diagonal grid of steel mullions clad with stainless steel serves as an exterior bearing wall.

Mechanical Systems

In early high-rise buildings, mechanical equipment was not a major item of cost, since most of them relied on natural ventilation. Sullivan used vacuum ventilation systems in most of his buildings. Buildings up to the late 1920's used one- or two-pipe low-pressure heating systems with cast-iron radiators. Heat control and zoning were unknown until the late 1920's.

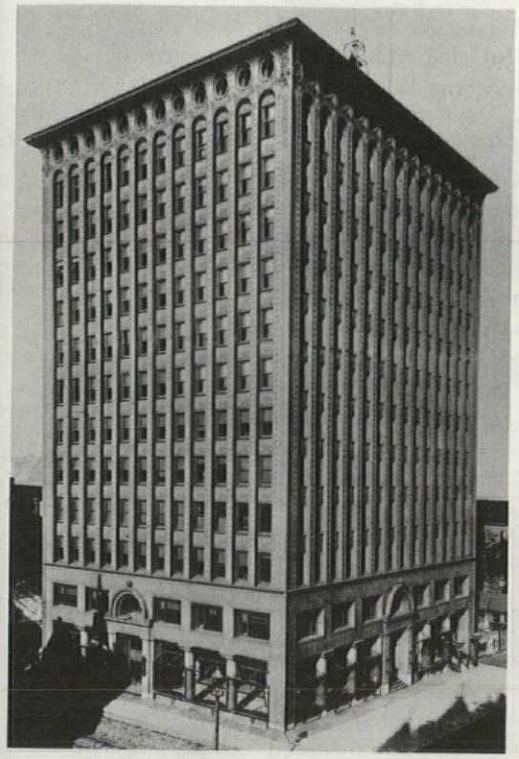
Belluschi's Equitable Building (6) was the first sealed building with a controlled environment and was the prototype for most of the buildings that followed it. In Equitable, air is distributed through ducts in the suspended ceiling, fed by central fan rooms located above the toilets and elevator lobbies on each floor. Heat pumps cool and heat the system, using well water as a source.

As buildings increased in size and equipment became more complex, the location of mechanical rooms and the systems of distribution from them became architecturally significant problems. Mechanical rooms have been located on the top floors, the basement, or both—or, as in the Chase Manhattan Building (10), on several intermediate floors. Vertical distribution generally passes through the core areas; perimeter spaces may be supplied from there or by a separate system of ducts in the exterior wall, as in Rudolph's Blue Cross Building (Boston, 1958; 21). Isolating vertical chases in a separate tower, as at Inland Steel (Chicago, 1958; SOM; 11), introduces new problems and costs.

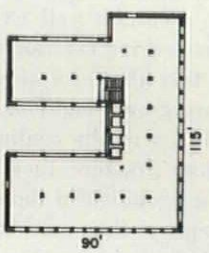
Recent Trends

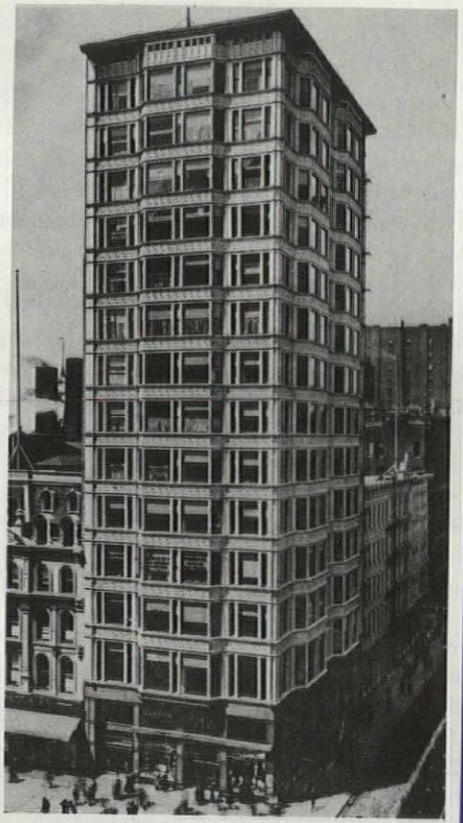
In the past few years, the column-and-beam structural system, which prevailed for decades, has been challenged. The desire for compact, column-free office spaces has led to a concentration of support at the service core and exterior wall, an approach that dictates a more or less square floor plan. Disillusionment with the metal-and-glass curtain wall has led to a revival of the bearing exterior wall; these walls may take the form of structural grids or overgrown mullions, but since they provide a virtually continuous bearing for the floor structure, they function as walls. The evolution of the high-rise office building has thus reached the stage where we may now dispense with the structural frame that originally made the high-rise building possible.

Historical Examples

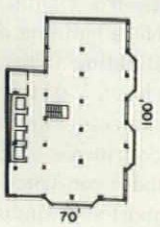


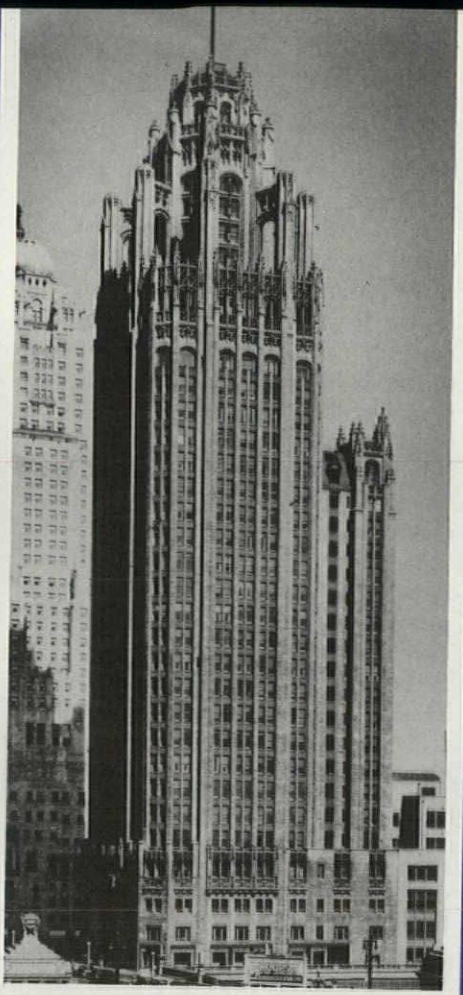
1/Guaranty Building, Buffalo, New York/Completed 1895/Adler & Sullivan, Architects
Generally considered the most refined expression of Sullivan's theories on the form of the high-rise building, this building is clearly divided into three parts—base, shaft, and attic—distinguished largely by the size of openings.
Statistics: Height: 13 stories. Gross area per floor: 8,600 sq ft. Structural bay: 15′-0″ x 20′-0″. Module: none.
Plan: The U-shaped plan provides light for all office spaces. Perimeter spaces are divided into offices by fixed partitions at 15-ft intervals.
Structural System: Steel frame, with cast-iron plates used in built-up sections.
Mechanical System: Vacuum exhaust system, with equipment located in attic story.
Exterior Walls: Nonbearing columns were introduced at the center of each structural bay on the office floors. Shop windows on the first story are designed to leave column capitals exposed, expressing the concept of a transparent colonnade. The lacy relief pattern of the light brown terra cotta is especially well related to the shapes of openings and emphasizes the light, nonbearing character of the material. White terra cotta was used in the light courts for higher reflectance.



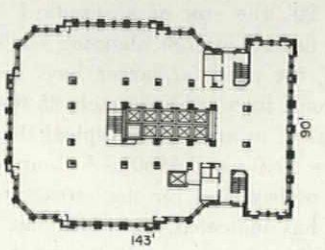


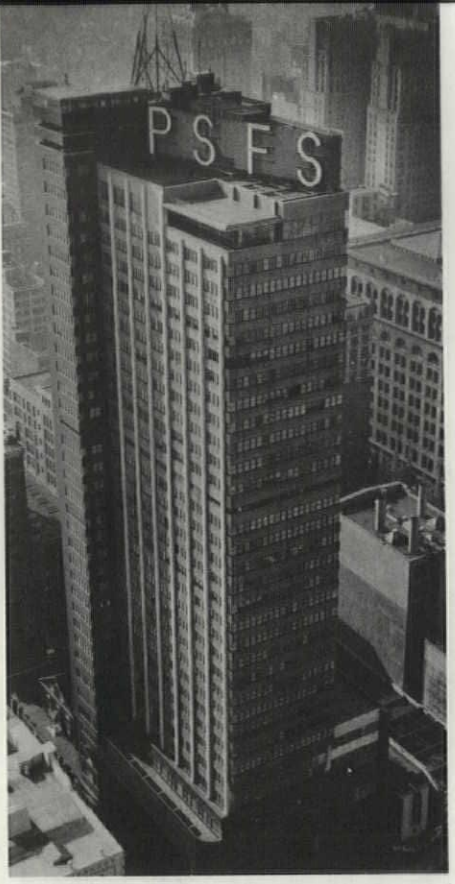
2/Reliance Building, Chicago, Illinois/Completed 1895/Burnham & Root, Architects
As the ultimate expression of the steel frame in the 19th Century, this building has been called "the triumph and swan song of the Chicago School."
Statistics: Height 16 stories. Gross area per floor: 5,600 sq ft. Structural bays: irregular. Module: none.
Plan: The small rectangular office floors required only a narrow court cut out of the interior corner for supplementary light and air. Floors are divided into fixed offices.
Structural System: Steel frame, with irregular column spacing. Two-story columns were introduced to give additional wind resistance to the relatively slender tower.
Exterior Walls: The walls have been treated as a thin, weightless skin, with no emphasis on either horizontal or vertical elements. The edges of the floor slabs are clearly expressed and clad in white terra cotta. The space between is almost completely filled with glass, which is set nearly flush with the thin mullions. The projecting window bays, which appeared as visually isolated elements in many earlier Chicago School structures, are in this case an integral part of the building.





3/Tribune Tower, Chicago, Illinois/Completed 1925/Raymond Hood and John Mead Howells, Architects
The widely heralded international design competition of 1922 resulted in a clear victory for New York eclecticism in the birthplace of skyscraper architecture. The tower is typical of the soaring corporate symbols of its day.
Statistics: Height: 33 stories. Gross area per floor: 11,900 sq ft. Structural bays: irregular. Module: none.
Plan: A corridor encircling the elevator core leads to all of the office suites.
Structural System: The steel frame is conventional in concept but rendered quite complex by set-backs at the fifth and twenty-fifth floors and the angular breaks in plan, all of which are unrelated to the framing pattern. Wind loads on the eight-story penthouse and the 70-ft-high nonstructural "buttresses" required special bracing of the main tower.
Mechanical System: Air conditioning for the entire building was installed in 1934.
Exterior Walls: Windows and spandrels are set deeply inside the line of the gray limestone "piers" to emphasize the verticality of the design. The lower floors are notable for the extravagance of their sculptural ornament in the French Gothic style.





4/Philadelphia Saving Fund Society Building/ Philadelphia, Pennsylvania/Completed 1932/Howe & Lescaze, Architects

This was the first major office building to follow the design principles of the International School of the 1920's. The office floors cantilever slightly beyond the 6-story base, which is articulated to express its diverse commercial functions.

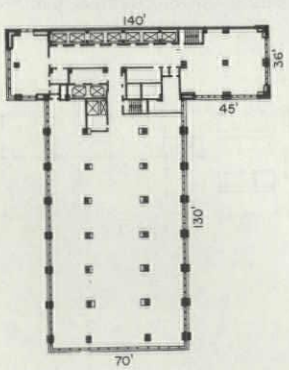
Statistics: Height: 32 stories. Gross area per floor: 11,400 sq ft. Structural bays: 17'-0" x variable. Module: none.

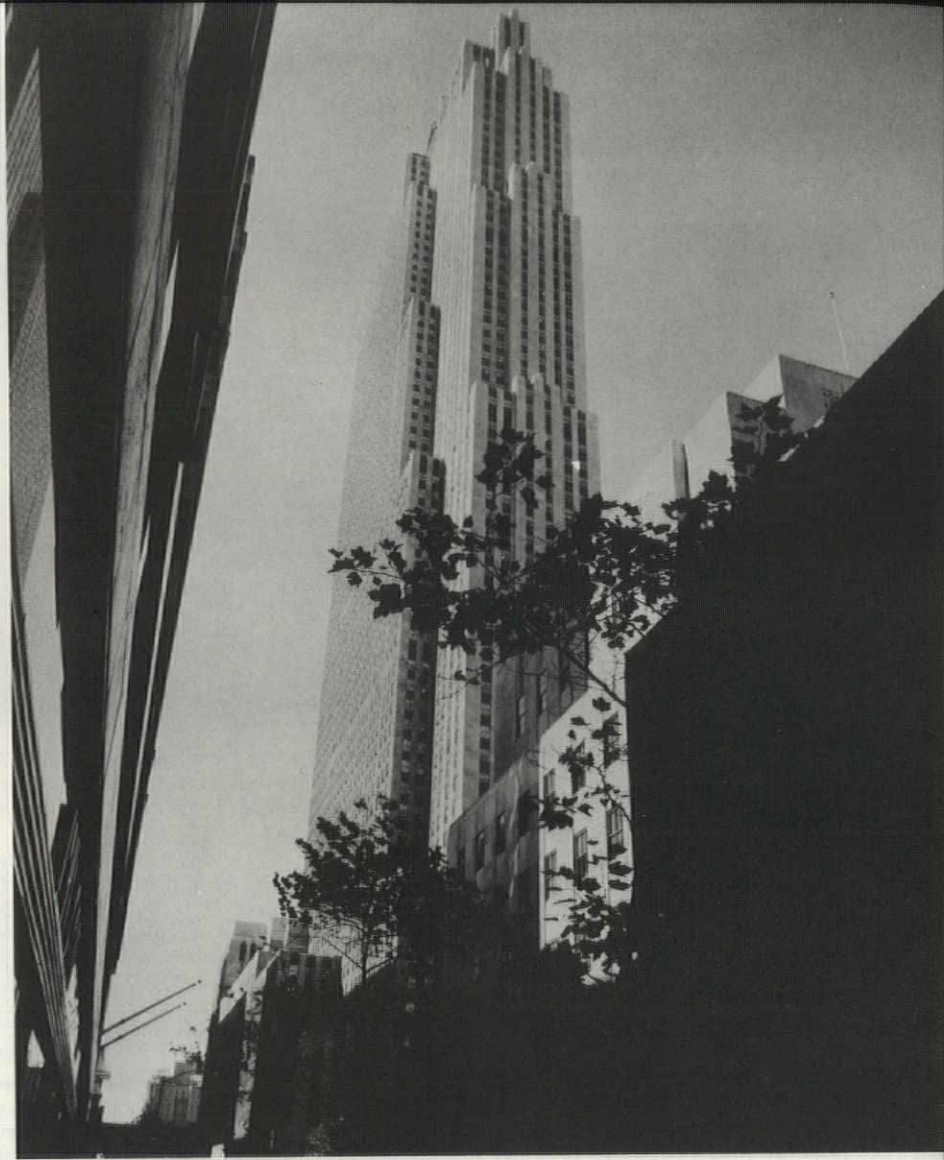
Plan: A shaft at the rear of the building contains elevators and utility chases. The slab containing the principal office space has been placed off-center on the site in order to get adequate light on both sides.

Structural System: Steel frame.

Mechanical System: "PSFS" was the second fully air-conditioned office building in the U.S. (The first was the Milam Building, San Antonio, 1928). Mechanical rooms for the bank are on the third floor, and those for the offices on the twentieth floor, which can be identified on the exterior by its smaller windows.

Exterior Walls: Horizontal strips of aluminum double-hung windows are separated by spandrels of gray brick. Other materials include sand-colored limestone on the projecting columns and the lower floors (where polished gray granite is also used) and blue brick on the vertical shaft at the rear.





5/R.C.A. Building, Rockefeller Center, New York/ Completed 1932/Reinhard & Hofmeister; Corbett, Harrison and MacMurray; Hood & Fouilhoux, Associated Architects

This building was the first to be designed for flexible office-floor layouts. The exterior form is a rational expression of the addition of office space of uniform depth to an elevator core, which diminishes as it rises.

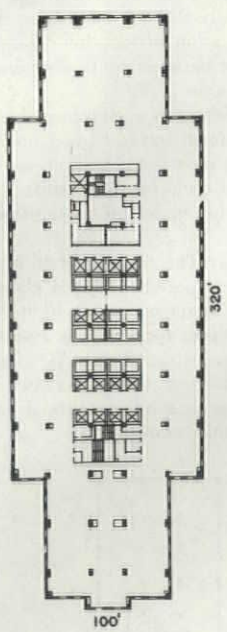
Statistics: Height: 70 stories. Gross area per floor: 28,700 sq ft. Structural bay: 27'-6" x variable. Module: all dimensions based on multiples of 1'-0½".

Plan: Outline of floor based on maximum distance of 27 ft from exterior wall to core, which was considered the maximum permissible for natural lighting. The floor area decreases as elevator banks drop off.

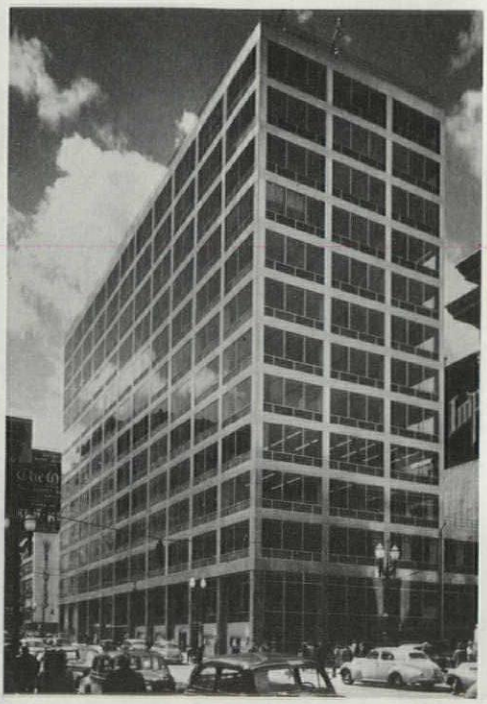
Structural System: Structural bays are regular, although not uniform, and well integrated with the plan. Column spacing is wider than was customary at that time to allow for flexible floor layout.

Mechanical System: The building originally included air conditioning for radio studios and retail shops only. A program for air conditioning all office floors, begun in the late 1940's, is now over 90 per cent completed.

Exterior Walls: The organization of windows and spandrels into vertical panels alternating with gray limestone piers is reminiscent of preceding Gothic buildings, but since there is no exaggeration of depth, the divisions become a mere pattern of stripes.



Curtain Walls



6/Equitable Savings & Loan Association Building, Portland, Oregon/Completed 1948/Pietro Belluschi, Architect

The first office building after World War II to incorporate major design advances, Equitable was a pioneer in many respects: in its frank expression of the structural frame; in its reinforced-concrete construction; in its flush exterior wall, composed entirely of reflective metal and glass; in the sealing of its air-conditioned interiors.

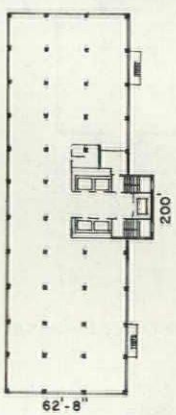
Statistics: Height: 12 stories. Gross area per floor: 12,900 sq ft. Structural bays: 18′ x 20′. Module: none.

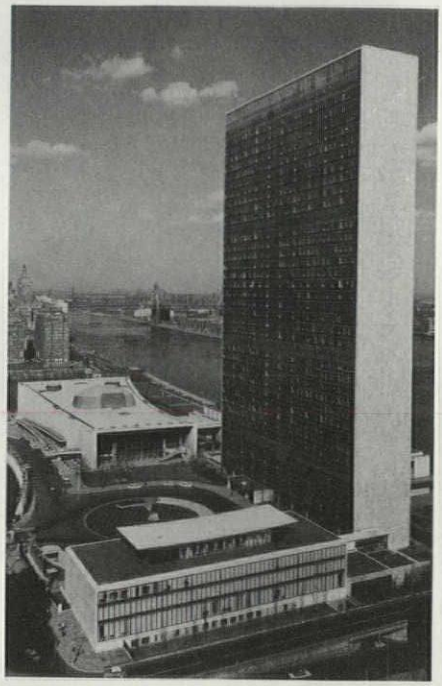
Plan: Floors are laid out with offices of 18-ft (and occasionally 9-ft) width along the periphery. The location of interior columns and the 9-ft spacing between mullions permits no deviation from this plan.

Structural System: Reinforced-concrete frame with uniform bays; ribbed floor slabs.

Mechanical System: As the first sealed, air-conditioned building in the country, Equitable has been the model for most subsequent office buildings.

Exterior Walls: The smooth cladding of the office floors is composed of tinted glass, dark cast aluminum spandrels, and lighter sheet aluminum sheathing for columns and beams. Its maximum projection is only 7/8″. Polished marble sheathing on the lower two floors complements the austere, machined look of the office-floor walls above.





7/United Nations Secretariat Building, New York, New York/Completed 1950/U.N. Headquarters Planning Commission; Wallace K. Harrison, Director of Planning

This prominent noncommercial structure—designed by a team that included LeCorbusier, Niemeyer, Markelius, and Nowicki—set a precedent for the use of the pure slab form and the concealment of the structure behind the curtain wall.

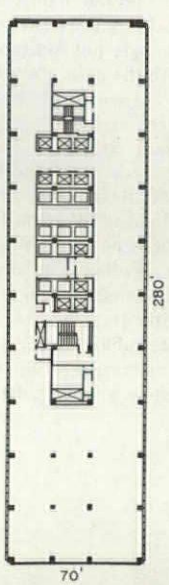
Statistics: Height: 39 stories. Gross area per floor: 19,600 sq ft. Structural bays: 28′-0″ x variable. Module: 4′-0″.

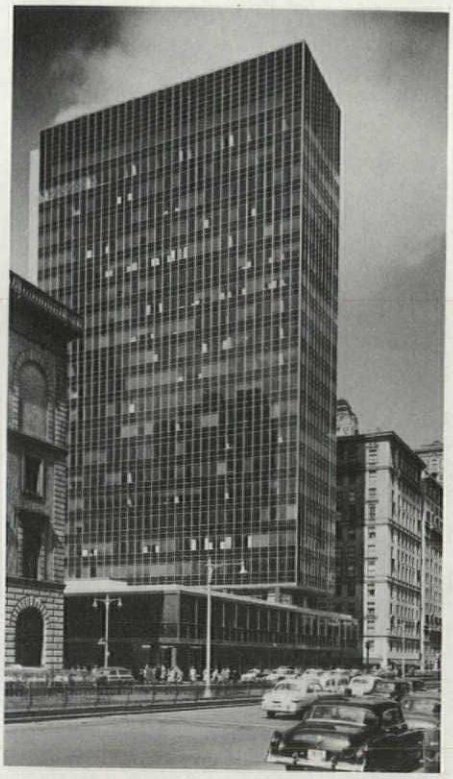
Plan: The rectangle of the plan was oriented with the long sides to the east and west to minimize shading of the site, but the orientation introduced problems of insolation. The elevator core was placed off-center partly because of plan requirements for the entrance level.

Structural System: Steel frame.

Mechanical System: A highly adjustable air-conditioning system was included to accommodate the varying needs of an international working staff. Mechanical equipment floors (6, 16, 28, and 39) can be identified on the exterior by bands of grillework.

Exterior Walls: The east and west walls, which are cantilevered 2′-9″ beyond the exterior row of columns, are composed of grids of aluminum filled in with aluminum sash and windows and spandrels of blue-green glass. The end walls are clad in marble.





8/Lever House, New York, New York/Completed 1952/Skidmore, Owings & Merrill, Architects

All exposed sides of this office slab are covered with a glass and metal curtain wall that gives no indication of the structure behind it, the columns being revealed only on the lower stories. The restriction of the office slab to a small area of the site—the rest given over to a public plaza—set a new precedent in the design of "prestige" buildings.

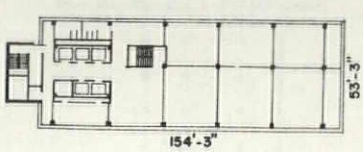
Statistics: Height: 24 stories. Gross area per floor: 8,700 sq ft. Structural bay 28′ x variable. Module: 4′-8″.

Plan: The plan is based on the use of entire floors as unpartitioned spaces (or with only a few private offices on the periphery). Vertical access is at one end of the floor. The single row of interior columns has been placed off-center to allow for a central aisle or corridor.

Structural System: The steel structural frame has floors of concrete poured over cellular steel decking.

Mechanical System: The air-conditioning system includes individual window units on the periphery and ceiling diffusers in the interior zones.

Exterior Walls: The structural frame is concealed behind a curtain composed of a nondirectional grid of stainless steel filled in with windows and spandrels of blue-green glass. The same materials form the high parapet concealing the mechanical penthouse.



9/Seagram Building, New York, New York/Completed 1958/Ludwig Mies van der Rohe and Philip Johnson, Architects; Kahn & Jacobs, Associated Architects

In this structure, the office tower was given a new purity of form. The tower occupies only 25 per cent of the site area, its walls rising without a break on three sides from the large open plaza to the roof.

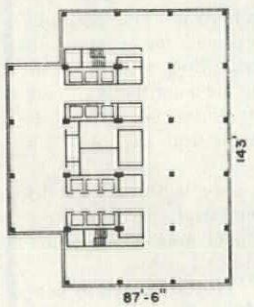
Statistics: Height: 38 stories. Gross area per floor: 14,900 sq ft. Structural bays: 27′-9″ x 27′-9″. Module: 4′-7½″.

Plan: The long rectangular plan of the preceding slabs is replaced here by a T-shaped plan with little difference in the two over-all dimensions.

Structural System: The steel structural frame has poured concrete floors.

Mechanical System: The high-pressure air-conditioning system has unusually sensitive controls, which can be adjusted to different conditions on upper and lower portions of the same wall. The unusually compact window units allow the sill to be only 11 in. above the floor.

Exterior Walls: The curtain walls, the first to be framed in bronze, are composed of amber glass, bronze and (where there are no windows) green marble, set between vertical bronze I-sections 4′-7″ apart on center, which are hung on the edges of the floor slabs. The low sills permit an unusually high percentage of window area in the exterior wall.



10/Chase Manhattan Bank, New York, New York/Completed 1961/Skidmore, Owings & Merrill, Architects

In this recent and highly refined version of the office slab, all columns have been eliminated from the office spaces.

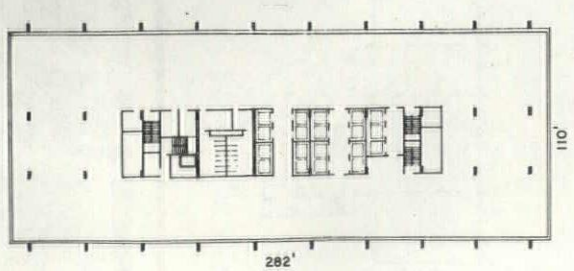
Statistics: Height: 60 stories; Gross area per floor: 31,000 sq ft. Structural bay: 29′-0″ x variable. Module: 4′-10″.

Plan: The off-center core allows spaces of different scale along the two long sides.

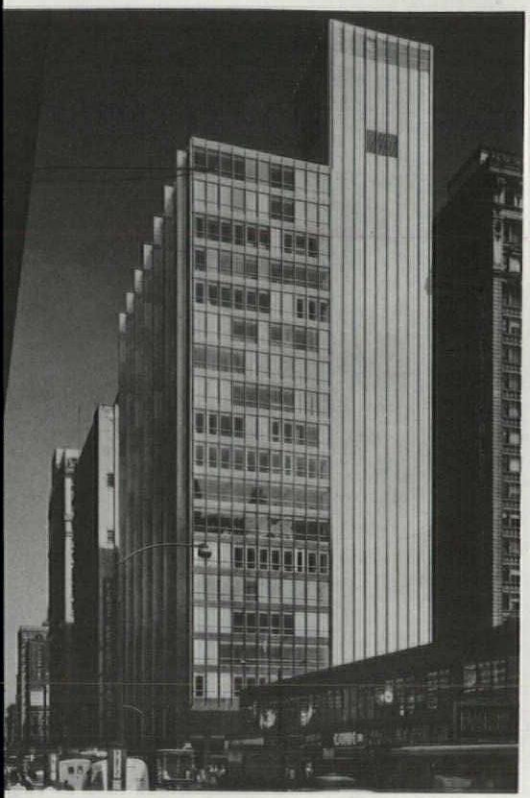
Structural System: All columns of the steel structure are located in the core or on the outer face of the exterior walls. Girders are 3′-0″ deep, with openings for passage of ducts and conduits. The floor is constructed of cellular steel with concrete fill on top. The total floor depth is 3′-9″.

Mechanical System: Mechanical equipment is located on four floors (third sub-basement, and eleventh, thirty-first, and fifty-first floors). Interior medium-velocity and peripheral high-velocity systems are supplied through utility shafts in the core.

Exterior Walls: The curtain walls between the aluminum-clad columns are composed of glass, aluminum mullions, and spandrels of both black anodized and natural aluminum.



Diverse Concepts



11/Inland Steel Building, Chicago, Illinois/Completed 1958/Skidmore, Owings & Merrill, Architects

The vertical services are housed in a separate shaft, allowing completely unobstructed office floors; a similar plan has been used in many subsequent buildings.

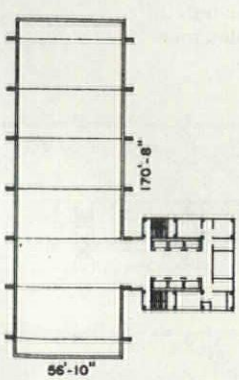
Statistics: Height: 19 stories. Gross area per floor: 12,300 sq ft. Structural bays: 25′-10″ x 56′-10″ clear span. Module: 5′-2″.

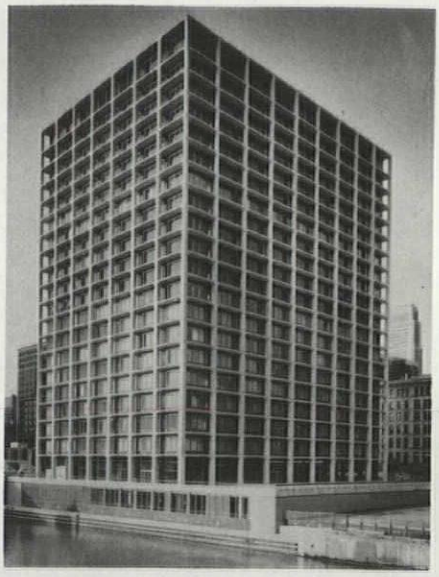
Plan: The separation of vertical services from office space and the location of all columns outside the walls permit a completely uninterrupted rectangle of office space, but the remote location of the elevators extends internal circulation routes.

Structural System: A series of rigid steel bents, spanning the entire width of the office block, supports floor slabs that cantilever one-half bay at each end. Cellular steel subfloors provide passage for all wiring and air-conditioning ducts. Total floor depth is 4′-0″.

Mechanical System: The peripheral air-conditioning units project only 3 in. above the floor, allowing, in effect, floor-to-ceiling glass. In the interior areas, both outlets and returns are in a perforated metal pan ceiling.

Exterior Walls: Columns, spandrels, and the windowless ancillary shaft are clad in stainless steel. The floor-to-ceiling windows are divided by a railing at sill height.





12/Hartford Building, Chicago, Illinois/Completed 1961/Skidmore, Owings & Merrill, Architects

The peristyle of structural columns standing outside the curtain wall, which SOM has developed further in later buildings (*pages 126 to 135*), first appeared here as a practical solution in a building designed for economy. It provides sun-shading, simplifies window cleaning, and reduces the air-conditioning load.

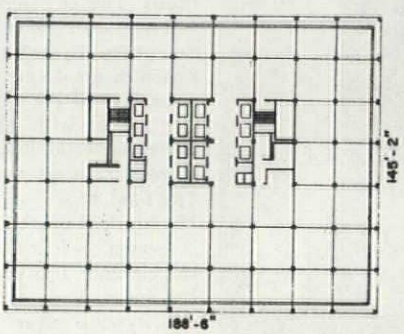
Statistics: Height: 20 stories. Gross area per floor: 27,400 sq ft. Structural bay: 21′-8″ x 21′-8″. Module: 4′-4″.

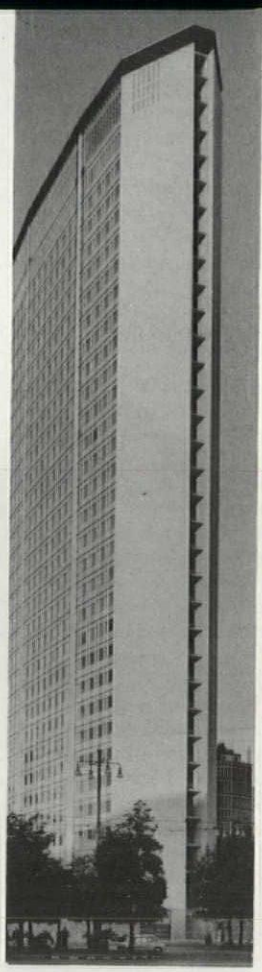
Plan: The off-center core is surrounded by private offices and secretarial space on three sides, with a clerical pool area in the wider space on the fourth side.

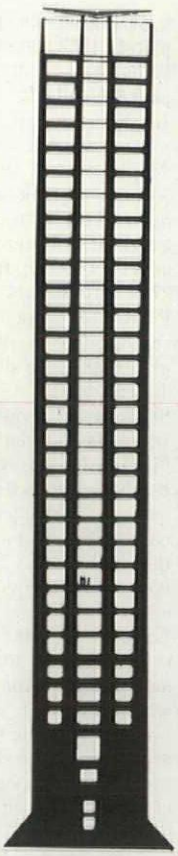
Structural System: Flat-slab concrete construction was selected for its economy. The haunches, however, have been used as a distinctive feature of the exterior. The columns taper nearly 8 in. from the base to the roof. The total floor depth is 2′-6″.

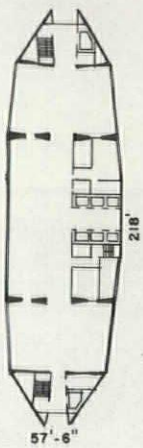
Mechanical System: Conventional air-conditioning system is used, with induction units at the windows.

Exterior Walls: The exposed structural frame is clad in light gray granite; the curtain wall is of gray glass and aluminum.









13/Pirelli Building, Milan, Italy/Completed 1960/Gio Ponti and Alberto Rosselli, Architects

Instead of being made up of repetitive units of space and structure, this building is a "finite" form, complete and not capable of being extended.

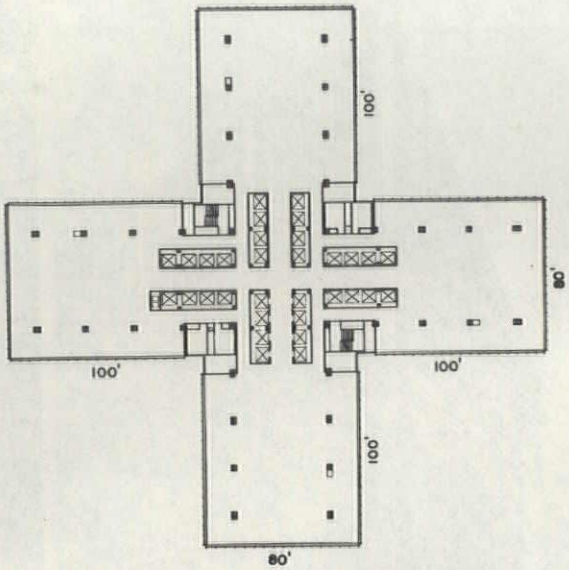
Statistics: Height: 33 stories. Gross area per floor: 10,280 sq ft. Structural bays: none. Module: approximately 3′-1″.

Plan: The structural piers divide each floor into six separate areas, each one with its own modular grid system at an angle to the others. The elevator and service core occupies one of these areas, taking up almost one-third of the available exterior wall space.

Structural System: In the unique reinforced-concrete system, designed by Pier Luigi Nervi, all loads are concentrated on the hollow piers at the ends and on the two pairs of internal piers, which split into tapered columns on the upper floors. The ribbed concrete floor spans 81 ft across the central bay. The asymmetrical placement of the elevator core produces loading conditions that do not conform to the structural design.

Mechanical System: The most notable feature of the system is the glass-walled basement tunnel from which visitors can observe the air-conditioning and other equipment in operation.

Exterior Walls: The metal-and-glass curtain walls—less transparent than originally intended—obscure the structural form. Elimination of opaque spandrel panels on either side of the piers somewhat offsets this effect.



14/Royal Bank of Canada Building, Place Ville Marie, Montreal, Canada/Completed 1962/I. M. Pei & Associates, Architects

The cruciform tower was devised as a way to obtain a desirable ratio of exterior exposure to floor area for very large office floors. A secondary benefit of this form is that it keeps the scale of the exterior from being oppressive. Another major addition to downtown Montreal, the CIBC Building, is presented in this issue (*page 140*).

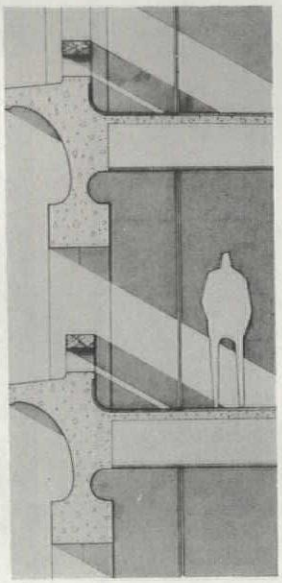
Statistics: Height: 42 stories. Gross area per floor: 38,400 sq ft. Structural bays: 25′-0″ x 50′-0″. Module: 5′-0″.

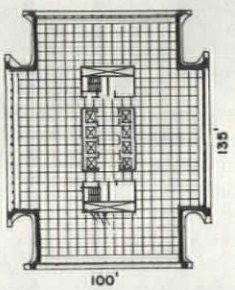
Plan: Each of the four rectangular blocks of office space is uninterrupted except for six interior columns located 15 ft from the exterior walls, the depth of a private office.

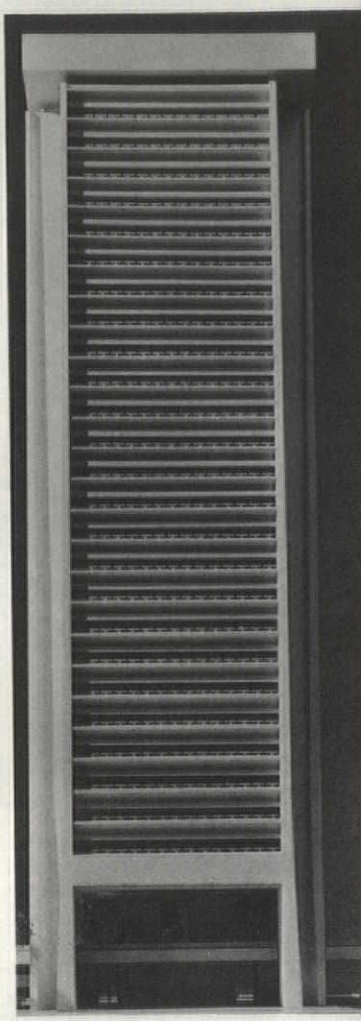
Structural System: The steel frame is made up of bents spanning 50 ft, with 15-ft cantilevers at either end. The unusual reaction of the apparently stable cross form to wind loads necessitated elaborate bracing.

Mechanical System: Offices are air-conditioned through ceiling diffusers and low, deep, continuous units below the windows.

Exterior Walls: Curtain walls are composed of aluminum and gray glass.







15/Metropolitan Tower, Honolulu, Hawaii/Unrealized project, designed 1960/I. M. Pei & Associates, Architects

This design, winner of a P/A First Design Award in 1961, is based on the concentration of all structural loads on a few massive concrete piers, with concrete spandrels acting as bridges between them. Unlike the Pirelli Building **(13)**, this building is compact in plan, with its central core integrated into the structural scheme.

Statistics: Height: 28 stories. Gross area per floor: 11,200 sq ft. Structural bays: none. Module: 5′-0″.

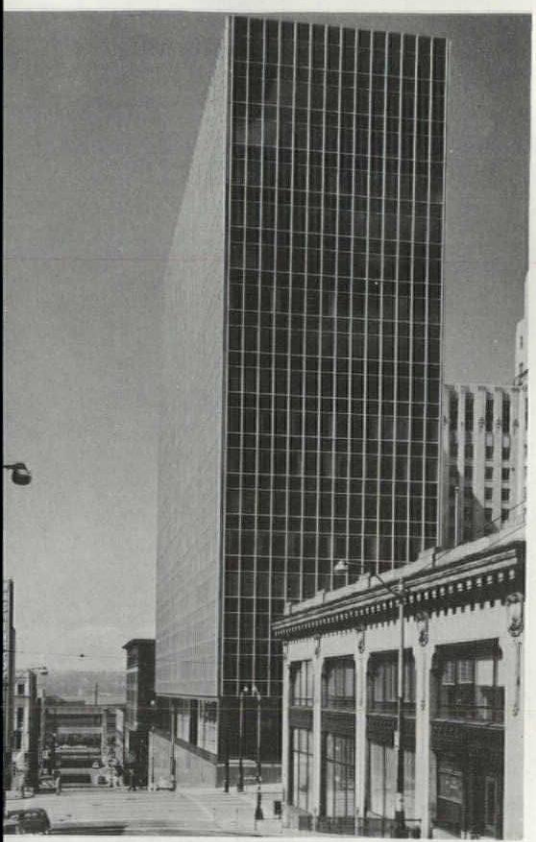
Plan: The floors may be used as general offices or divided into private offices that could be rented separately.

Structural System: The reinforced concrete spandrels carry the floor load between the massive piers. The piers are so designed that, as they increase in area to carry greater loads, they neither encroach on the interior space nor increase the over-all dimensions of the building.

Mechanical System: Windowless floors located just above the lobby and at the roof house mechanical equipment.

Exterior Walls: Glass curtain walls are set back a few feet behind the structural spandrels, which serve as effective sunshades. The railings of the shallow balconies have been made discontinuous to distinguish them from the structural concrete spandrel girders.

Longer Spans



16/Norton Building, Seattle, Washington/Completed 1960/Bindon & Wright, Architects; Skidmore, Owings & Merrill, Consulting Architects
In this building, long-span construction and strategic placement of the vertical core yield over 13,000 sq ft of usable office space with no internal columns.

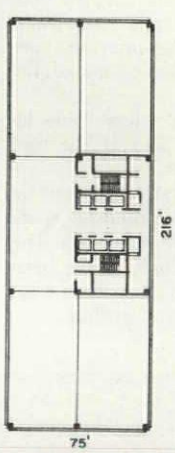
Statistics: Height: 21 stories. Gross area per floor: 16,200 sq ft. Structural bays: 35′-0″ x 70′-0″. Module: 5′-0″.

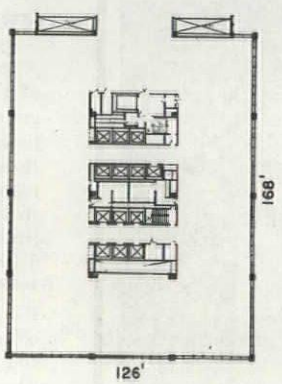
Plan: The plan is similar to that of Belluschi's Equitable Building **(6)**, except for the greatly expanded structural bays and the larger vertical core required.

Structural System: The structural frame consists of four transverse steel bents, supporting 70-ft precast prestressed concrete beams, which carry the poured-in-place concrete floor slabs. Total floor depth is 4′-2″. Lateral forces are taken up by the walls of the core.

Mechanical System: Mechanical equipment is located in sub-basements, which are exposed because of the slope of the site.

Exterior Walls: The aluminum-framed curtain wall, with gray glass windows and spandrels, was entirely shop-assembled.





17/Continental Center, Chicago, Illinois/Completed 1963/C. F. Murphy Associates, Architects
The uncompromisingly functional character of this structure, visible in its black-painted steel exterior, is maintained in its open, column-free office floors. The design closely follows the principles of the 19th-Century Chicago School.

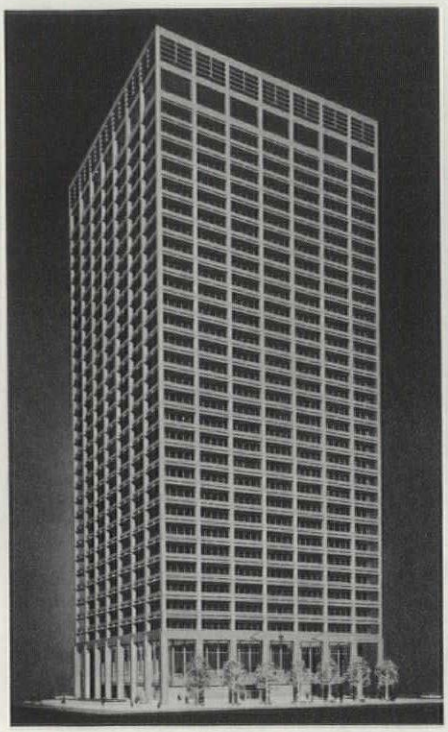
Statistics: Height: 23 stories. Gross area per floor: 22,000 sq ft. Structural bays: 42′-0″ x 42′-0″. Module: none.

Plan: The column-free floor space, 42 ft deep from central core to exterior wall, is ideal for the large clerical pool area required by the clients.

Structural System: The long spans had to be obtained without excessive floor depth, since the structure is linked to an existing building at every floor. Cellular steel floors are carried on 2′-3″ deep steel beams, through which ducts pass. The total floor depth is 3′-1½″. High-strength (A440) steel is used for the lower columns.

Mechanical System: A high-velocity dual-duct system is used, with outlets integrated into the lighting fixtures.

Exterior Walls: The ⅜-in. welded steel spandrels and cover-plates served as formwork for the fireproofing concrete. Windows are of gray glass in stainless-steel frames.



18/Tennessee Gas Building, Houston, Texas/ Completed 1963/Skidmore, Owings & Merrill, Architects

This building has the widest clear-span between central core and exterior columns of any yet constructed. The columns are set 5 ft beyond the curtain wall, forming part of a sun-shading grid.

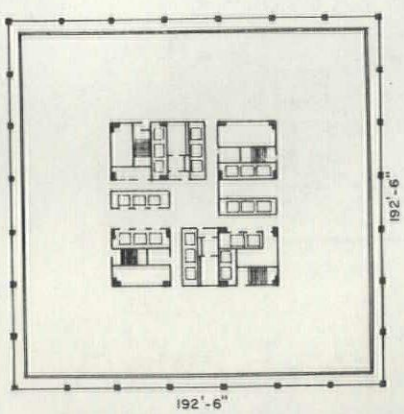
Statistics: Height: 32 stories. Gross area per floor: 32,400 sq ft. Structural bays: 55′-0″ x 55′-0″. Module: 5′-6″.

Plan: A 50-ft-wide column-free space is provided on all sides of the central core.

Structural System: The concrete frame supports waffle slabs with 3-in. concrete fill. Intermediate columns have been introduced at the center of the 55-ft bays wherever possible without obstructing potential office space.

Mechanical System: The conventional air-conditioning system has induction units along the exterior walls.

Exterior Walls: Curtain walls of dark gray glass in aluminum frames are 5 ft behind the face of the structure, which is composed of cover-plates, spandrel panels, and sunshades of amber-colored anodized aluminum.



19/Chicago Civic Center, Chicago, Illinois/Under construction/C. F. Murphy Associates, Architects; Skidmore, Owings & Merrill and Loebl, Schlossman & Bennett, Associate Architects

The largest structural bays in any office building yet designed for actual construction are found in this 630-ft tower, which will house an entire "civic center."

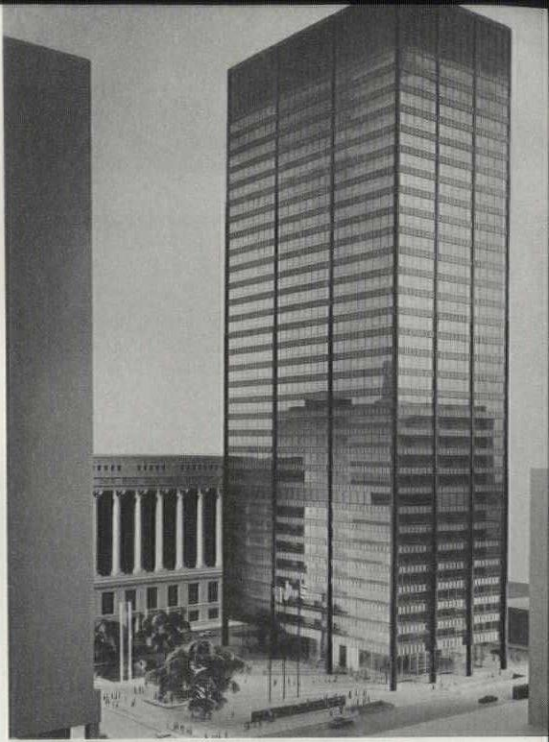
Statistics: Height: 31 stories. Gross area per floor: 37,600 sq ft. Structural bays: 48′ x 87′. Module: 4′-10″.

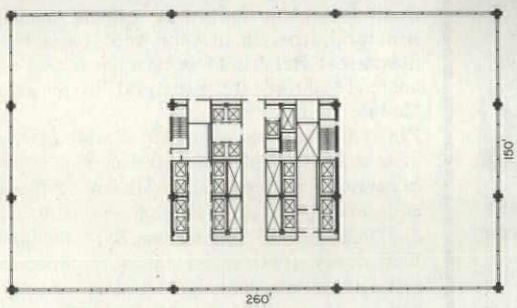
Plan: The vast unobstructed floors are designed to house not only offices, but also courtrooms and hearing rooms, of which there will be 108 initially (out of an ultimate capacity of 162).

Structural System: A steel frame yielding a total floor depth of 6′-0″ will span the large bays. Part of this floor depth will be recovered, however, to add necessary height to the larger courtrooms. The entire structure will be supported on 16 tapered cruciform columns.

Mechanical System: Mechanical rooms are located in the basement and on the ninth and thirty-first floors.

Exterior Walls: All exterior metal will be a special steel alloy that develops a permanent russet-colored oxide coating.





20/Concrete Office Building/Master's Thesis, I.I.T., 1948/Myron Goldsmith, Architect

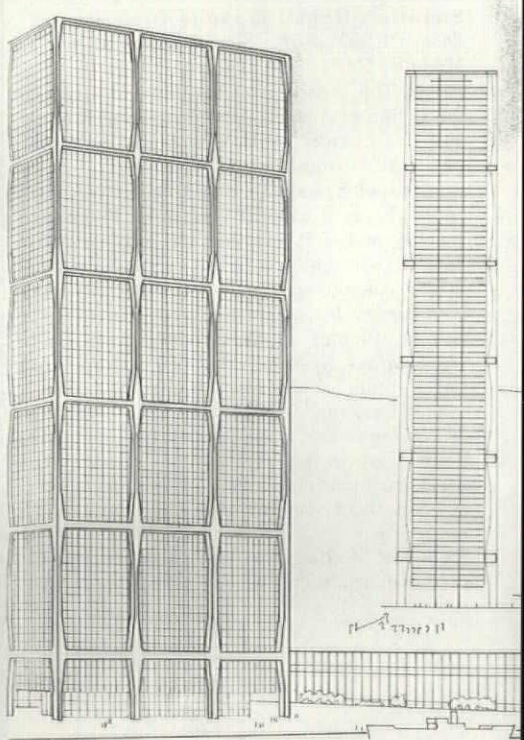
This 15-year-old study proposes a concrete structure considerably higher than any yet constructed.

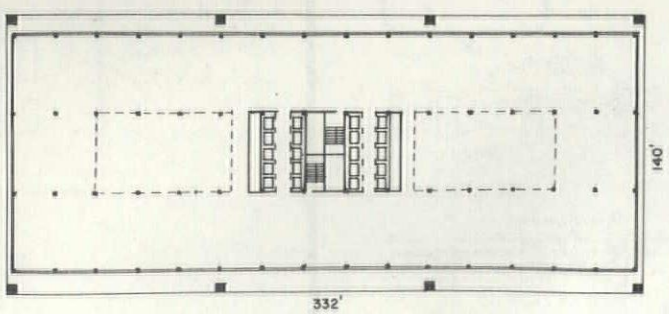
Statistics: Height: 86 stories. Gross area per floor: 42,000 sq ft. Major structural bays: 108′ x 140′. Minor structural bays: 22′ x 42′.

Plan: Each floor is three 42-ft bays wide, part of the middle bay being devoted to a vertical transportation core.

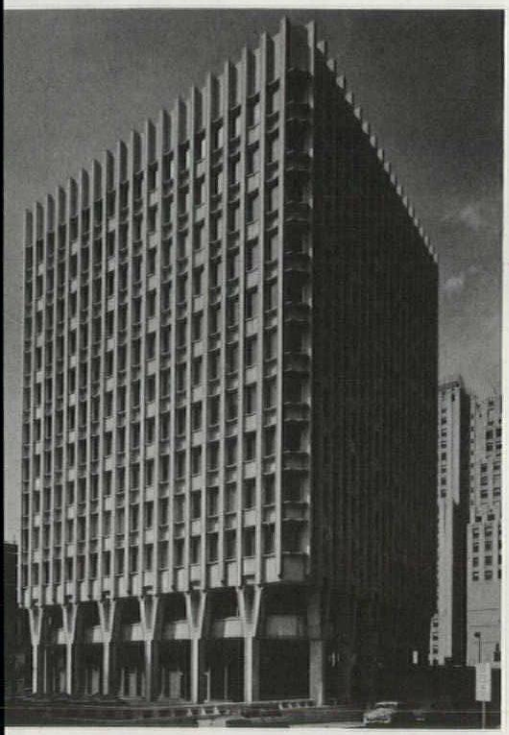
Structural System: The major structural frame is composed of eight concrete columns, 16-ft wide at the base, which are connected by six stiffening platforms at 15-story intervals. The dimensions of the columns, the platforms, and the haunches at their joints decrease proportionally as the height of the building increases. Each of the six platforms supports seven stories above it and seven stories below it on 22-in. round columns. The middle story in each series of 15 is columnless, since its floor is supported from below and its ceiling from above. The framing of the office floors is thus no heavier than would be required for a seven-story building.

Exterior Walls: The curtain walls are supported on the edge of the floor slabs, clearly separated from the exterior concrete skeleton.





Bearing Walls



21/Blue Cross Building, Boston, Massachusetts/Completed 1960/Paul Rudolph and Anderson, Beckwith & Haible, Architects

The exterior walls of this building are intricate assemblages of structural and mechanical elements, all of them sculpturally expressed.

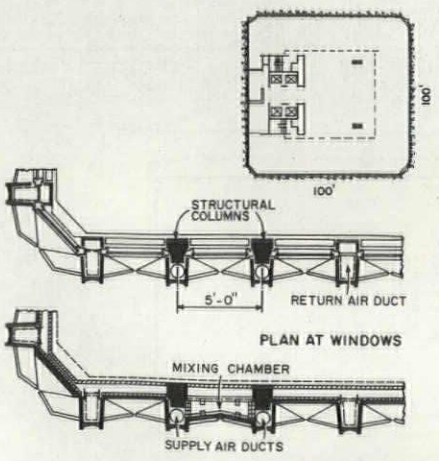
Statistics: Height: 13 stories. Gross area per floor: 10,000 sq ft. Structural bays: none. Module: 5′-0″.

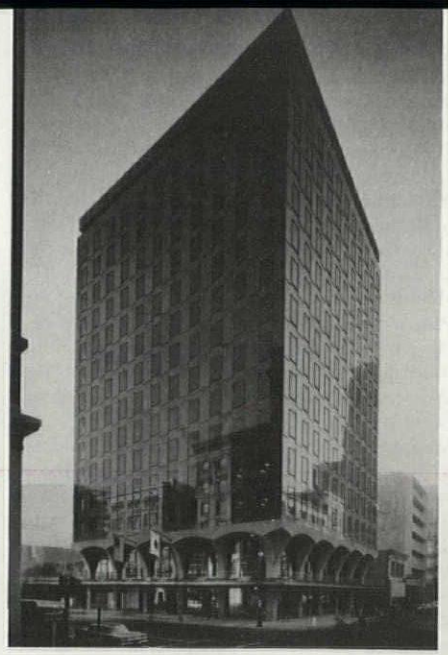
Plan: The vertical core has been located on the periphery, leaving large floor spaces, suitable for clerical pools, interrupted by only two interior columns.

Structural System: Pairs of columns 5′-0″ apart alternate with 10′-0″ spaces. The close spacing makes it possible for a 17-in.-deep floor to span the 34 ft to the central columns. Wider column spacing on the lower floors is achieved by collecting loads from each pair of columns at the Y-shaped "capitals."

Mechanical System: Perimeter risers are served from a top-floor mechanical room. Supply lines run along the structural columns, decreasing in size where the columns increase. Returns are in the intermediate mullions between each pair of columns. Mixing chambers in every third spandrel panel add variety to the façade.

Exterior Walls: The wall is made up of precast quartz-aggregate concrete components.





22/John Hancock Building, San Francisco, California/Completed 1960/Skidmore, Owings & Merrill, Architects

In this building, the wall reappeared in its traditional plane form, but with the modern structural strength of reinforced concrete.

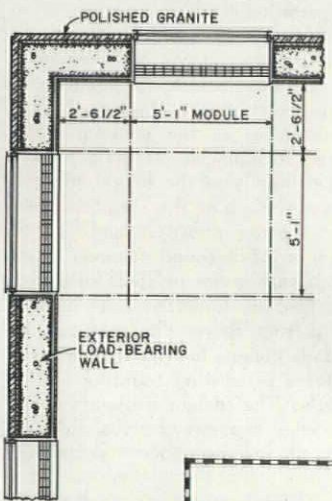
Statistics: Height: 14 stories. Gross area per floor: 13,200 sq ft. Structural bays: none. Module: 5′-1″.

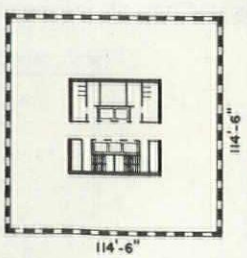
Plan: Column-free space 30′-6″ wide extends around all sides of the central core.

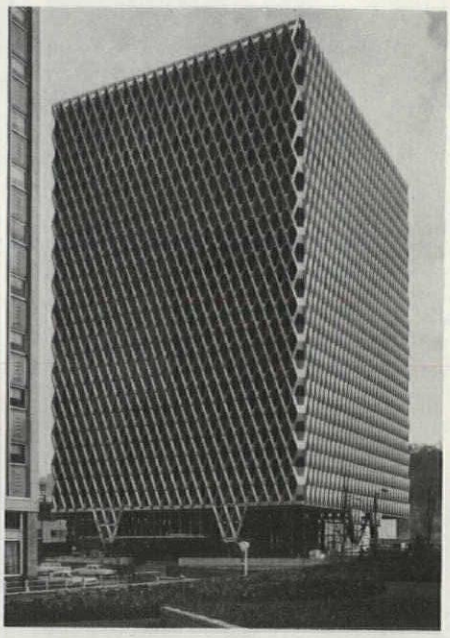
Structural System: The walls are composed of lightweight reinforced concrete, with windows cut out of alternating 5′-1″ modules. Wall loads are transferred to the recessed columns at street level by deep concrete arches. The stiff horizontal diaphragm connecting these arches transfers seismic loads to the shear walls around the core. The floors are supported on T-beams.

Mechanical System: The conventional air-conditioning system is supplied from a mechanical room on the top floor. Ducts are suspended beneath the floor structure.

Exterior Walls: The walls are sheathed in dark gray polished granite; windows are of gray glass in bronze frames. The arches and columns at the base and the parapet at the roof are of exposed concrete.







23/IBM Building, Pittsburgh, Pennsylvania/To be completed 1963/Curtis & Davis, Architects

This structure is supported on a central core and four 13-story-high steel trusses, which form its exterior walls (see p. 162, SEPTEMBER 1962 P/A).

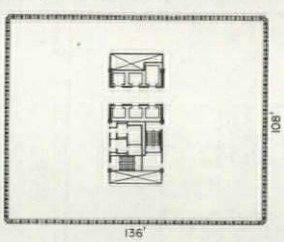
Statistics: Height: 13 stories. Gross area per floor: 14,800 sq ft. Structural bays: none. Module: 4′-6″.

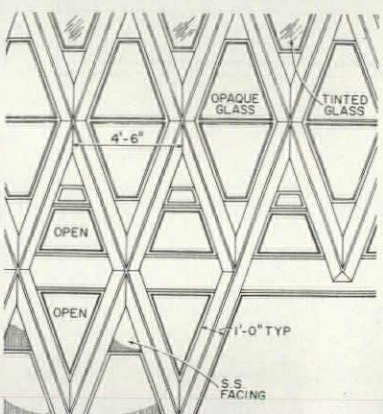
Plan: Most of the available office space is in two column-free areas 53′-7″ wide on either side of the vertical core.

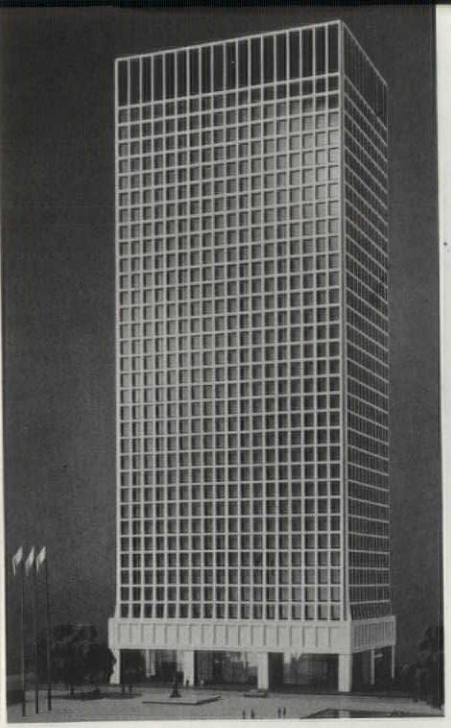
Structural System: The use of steel with four different grades of strength makes it possible for all truss members to be of similar dimensions despite great variations in loading. The 53-ft floor spans are framed with 30-in. wide-flange members on 9-ft centers. Conventional framing has been used for the core, which is relieved of horizontal loads by the exterior trusses.

Mechanical System: The use of a double-duct air-conditioning system was one of the basic conditions that controlled the design of the building.

Exterior Walls: A maximum window area for efficient air-conditioning was set at 30 per cent of the exterior wall. The steel trusses, with fireproofing and stainless-steel sheathing applied to them, leave openings that almost exactly meet this criterion.







24/Brunswick Building, Chicago, Illinois/To be completed 1964/Skidmore, Owings & Merrill, Architects

An exterior load-bearing concrete grid and a concrete shear wall around the vertical core will support the office floors of this building. Exterior wall loads will be transferred to 10 massive columns at the base of the building by a story-high girder.

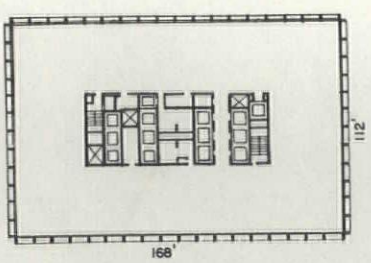
Statistics: Height: 37 stories. Gross area per floor: 18,800 sq ft. Structural bays: none. Module: 4′-8″.

Plan: There will be an unobstructed area 37′-4″ wide on all sides of the central core.

Structural System: The mullions of the exterior concrete grid will be 9′-4″ apart on center. They will taper from 1′-10″ x 3′-8″ at the base to 1′-4″ x 2′-0″ at the top. Ribbed slabs will span between the core and the exterior wall, overlapping to form waffle slabs at the corners. The columns at ground level will be 7-ft square and spaced 56 ft apart. The entire structure will be poured in place.

Mechanical System: Perimeter risers, located on the backs of the mullions will be served by mechanical rooms on the third and top floors.

Exterior Walls: All concrete members will be sheathed in white granite.



25/CBS Building, New York, New York/To be completed 1964/Eero Saarinen & Associates, Architects

The closely spaced triangular columns, which act as an exterior bearing wall in this building, are not interrupted on the lower floors, but are continuous from the foundations to the roof. This continuous-compression system makes unusually efficient use of reinforced concrete.

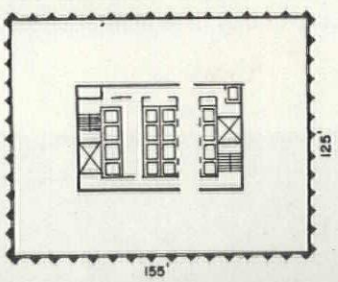
Statistics: Height: 38 stories. Gross area per floor: 20,000 sq ft. Structural bays: none. Module: 5′-0″.

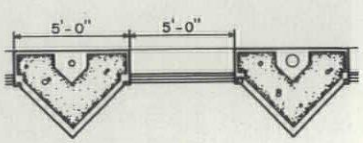
Plan: The building has 35-ft clear spans on all sides of the central vertical core. Provisions for circulation through the core reduce requirements for corridors in the surrounding space and make possible division of the floor among as many as four tenants.

Structural System: The triangular columns are poured-in-place. Floor slabs will have ribs 17″ deep spanning from core to exterior wall; similar ribs will span both ways to form waffle systems in the four corner areas.

Mechanical System: Vertical risers will run through chases in the triangular columns. Since the main mechanical room will be on the top floor, ducts will decrease in area toward the base where the area of the structural column is largest; other risers will be in the central core. Horizontal ducts will be located within the suspended ceilings.

Exterior Walls: Columns and spandrels will be clad in dark gray granite and windows will be of gray glass.

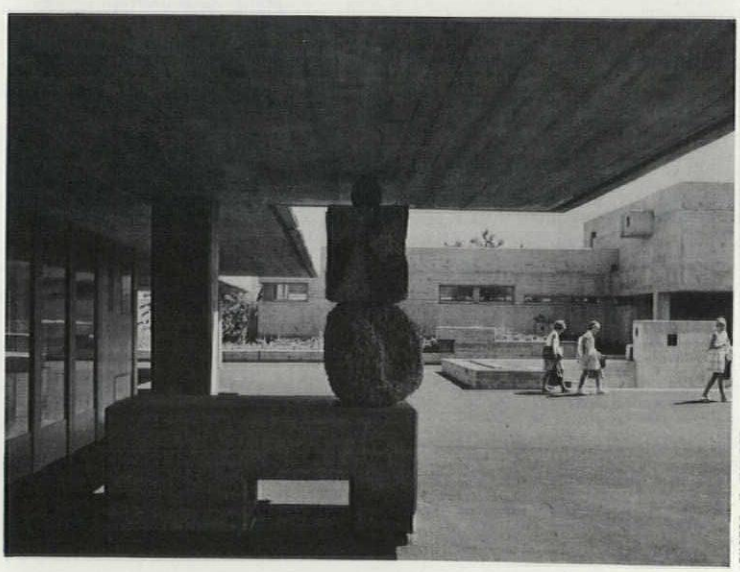




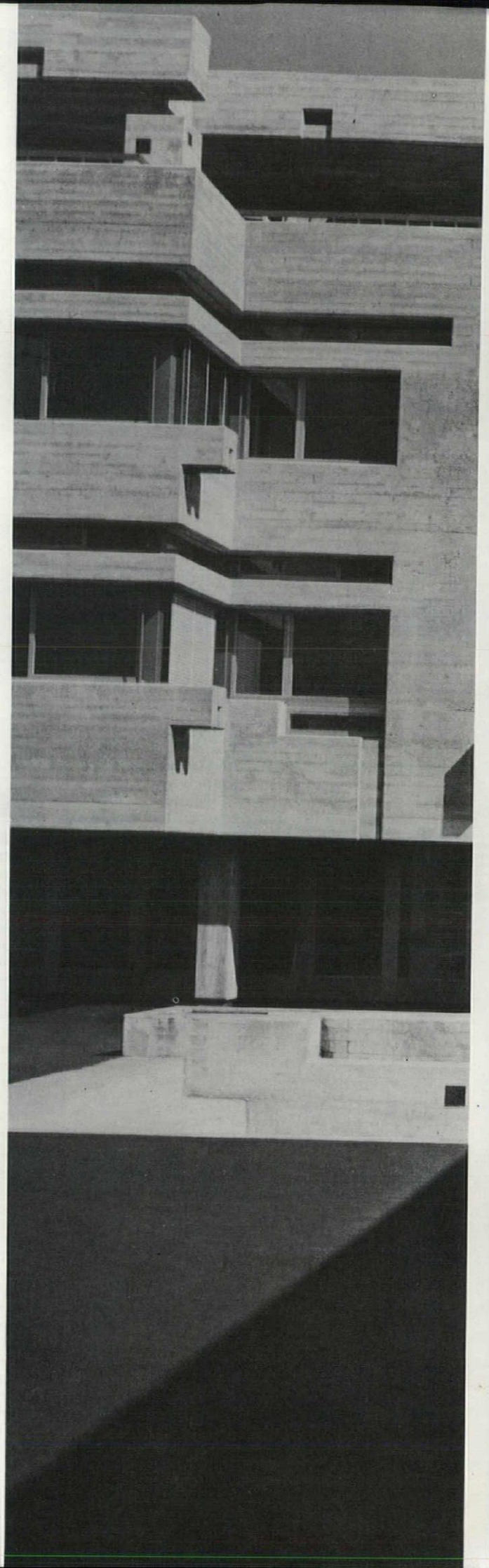
For photo credits, see page 221.

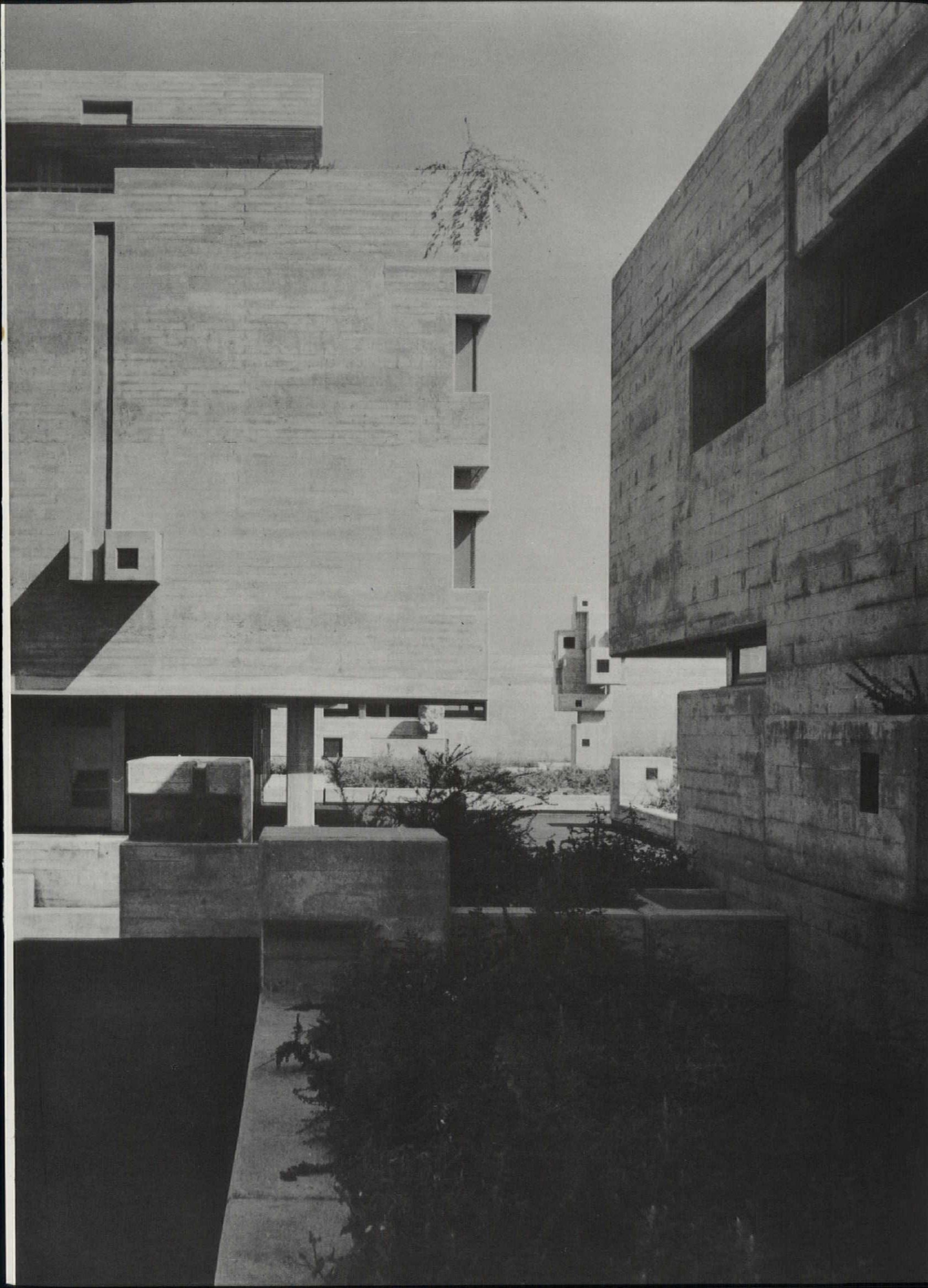
THE NEW SCHOOLHOUSE IN AESCH

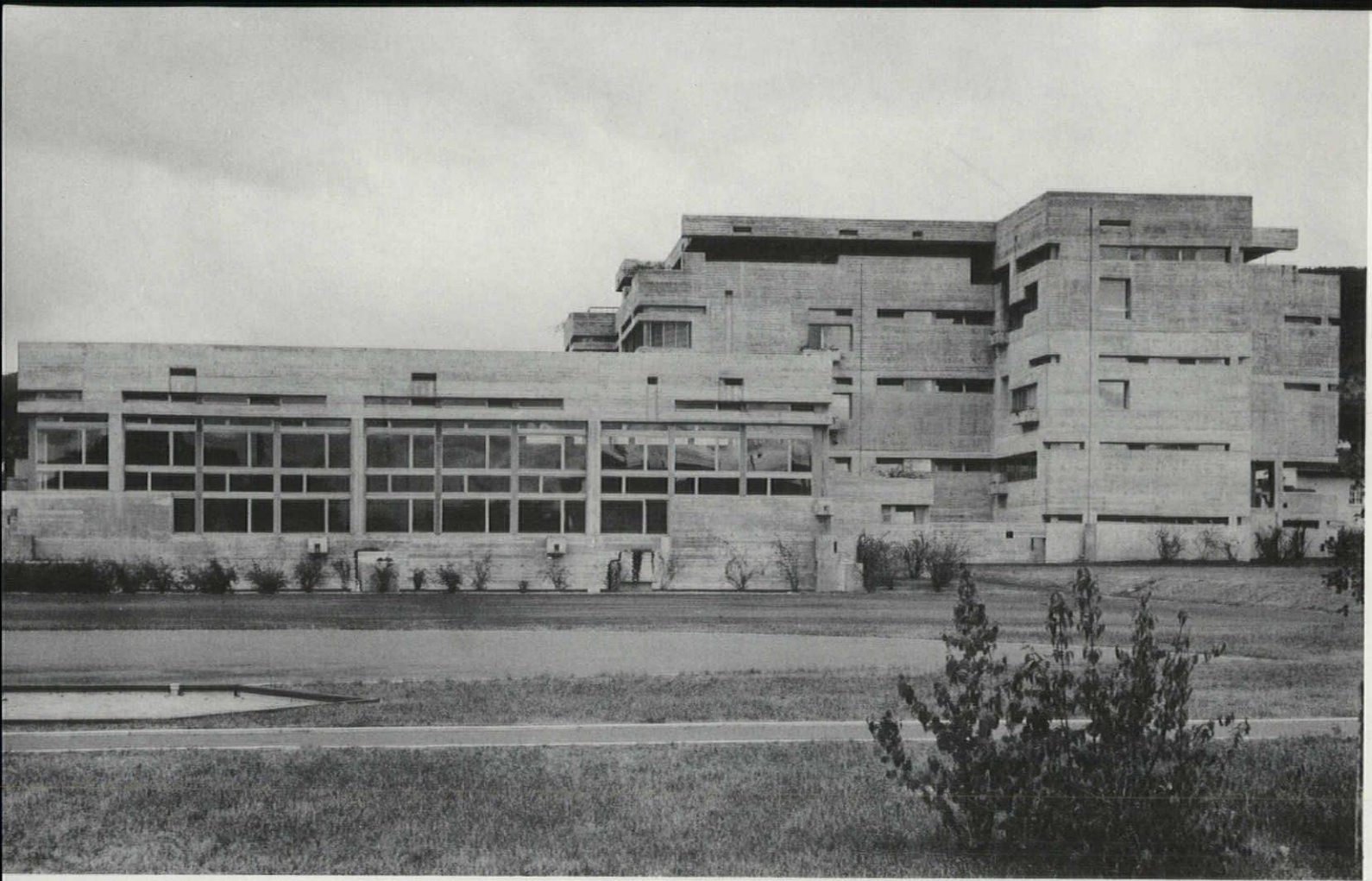
Aesch, like most other communities around Basel, is a pleasant but generally undistinguished Swiss town. Its recently added residential quarters have contributed little of architectural significance. The "Realschule," roughly the equivalent of a U.S. junior high school, was built in the midst of one of these rather uninspired new residential districts. However, this building — the result of a competition — has now placed Aesch on the architectural map, and has brought the work of three young architects — Walter M. Foerderer, Rolf G. Otto, and Hans Zwimpfer — to international attention. With its audacious forms, the new school is in direct contrast to its environment. As one critic, concerned with this discrepancy, asked, "Can it be helped that the new residential district looks like a hundred others? Can one blame the architects for not having paid respect to this mediocrity? And should they be chided for having refused to adjust to it in the interest of a more homogeneous townscape?" The architects, indeed, felt it to be their mission to awaken the complacent population. They hoped especially to open the eyes of the impressionable 10–16-year-old students, and, through architecture, to involve them more thoroughly with their environment. With the completion of this undeniably forceful structure, the architects' aspirations have been realized: they have built a schoolhouse where questions will be asked.



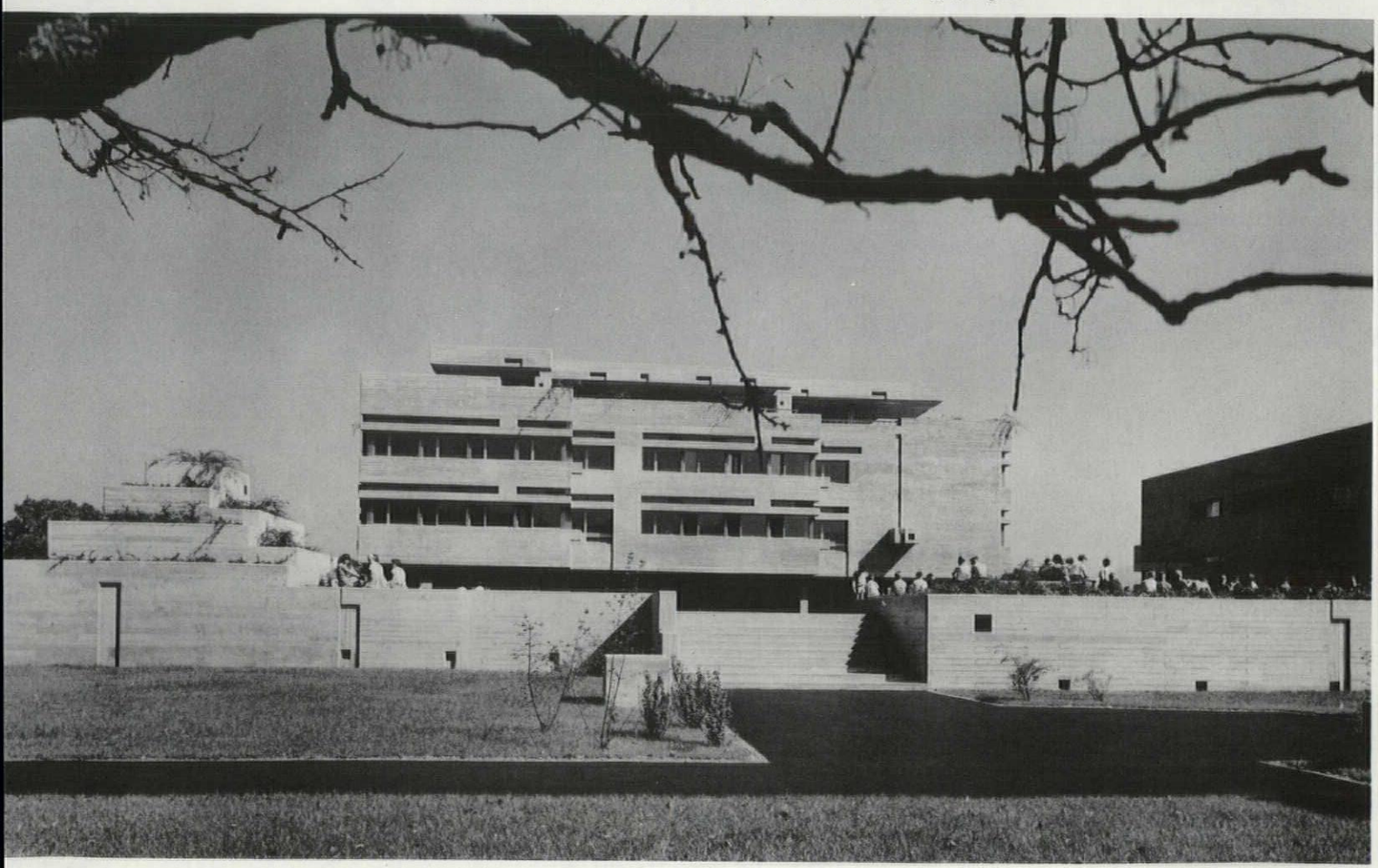
PHOTOS: F. MAURER



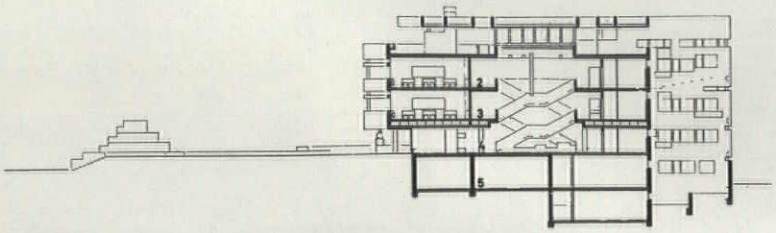




View from north, with gymnasium to left, classroom building to right.

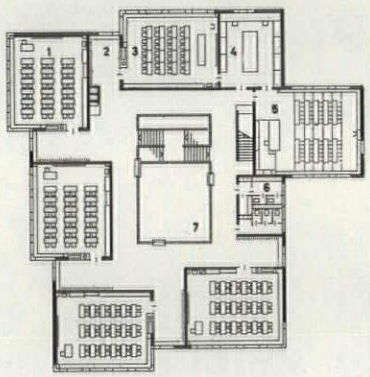


View from south, with classroom building in center, auditorium to right.

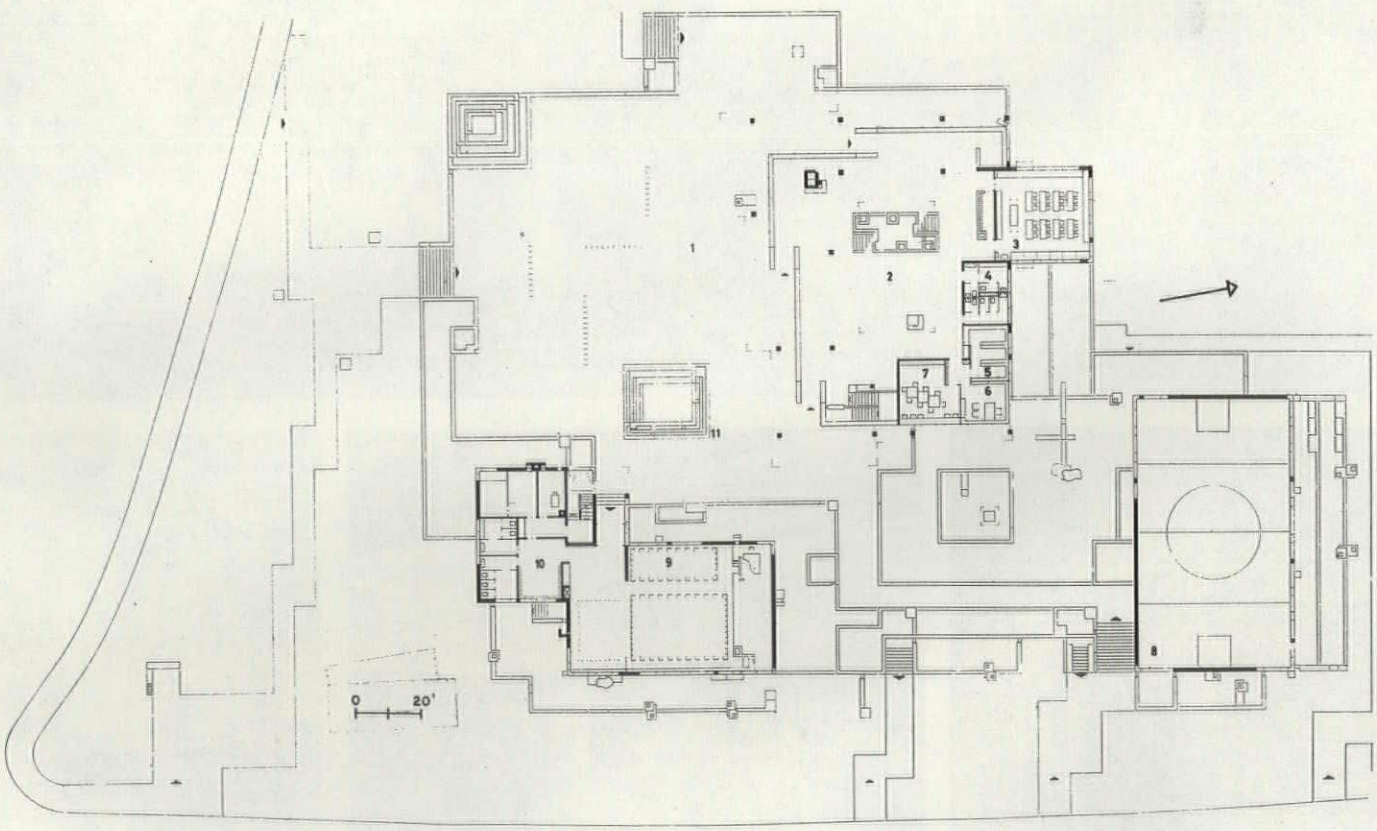


CROSS SECTION THROUGH CLASSROOM BUILDING
1 roof terrace
2 classrooms, second level
3 classrooms, first level
4 entry level
5 basement

TYPICAL CLASSROOM FLOOR
1 classroom
2 coatroom
3 geography and nature study
4 storage for collection
5 physics and chemistry
6 toilets
7 central hall



PLAN AT GROUND LEVEL
1 school yard
2 entrance hall
3 crafts room
4 toilets
5 library
6 principal
7 teachers
8 gymnasium
9 auditorium
10 coatroom
11 fountain



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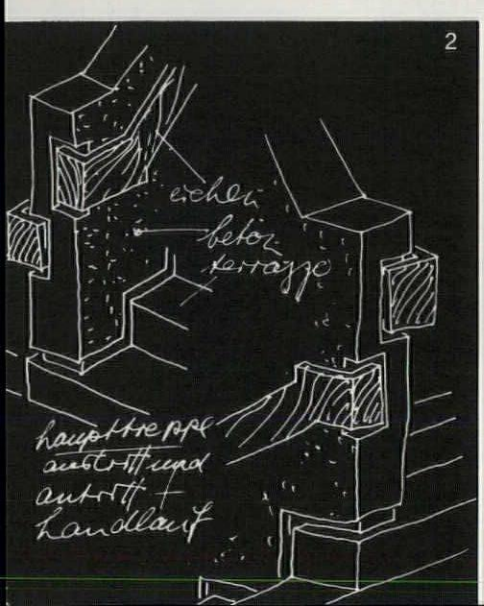
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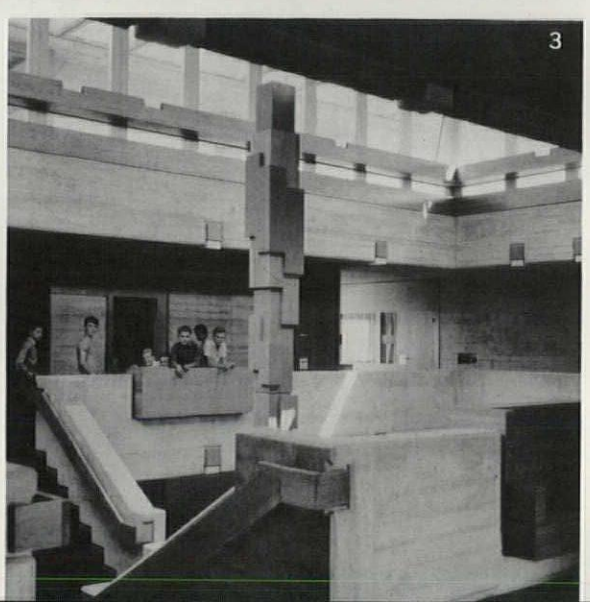
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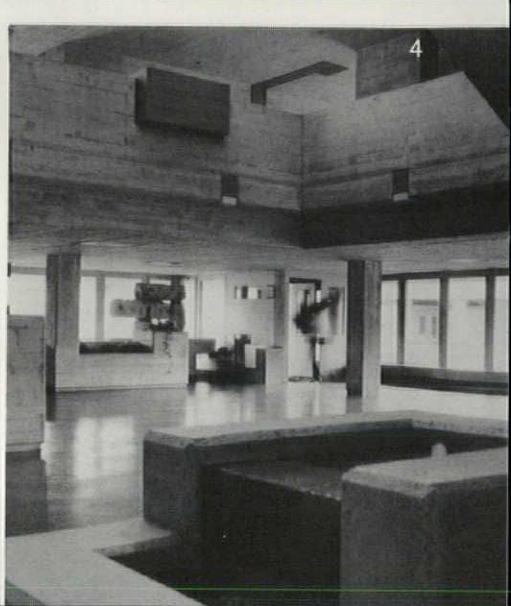
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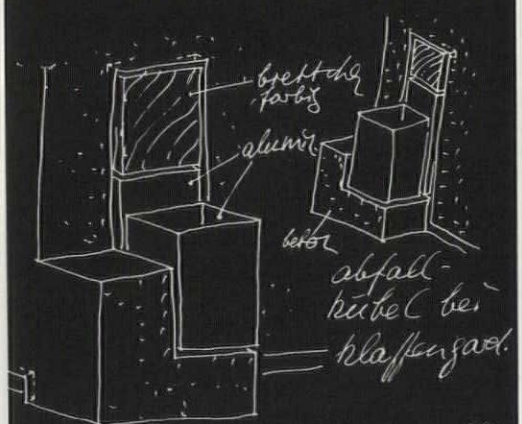
9

From the large-scale drama of the classroom building's central hall **(1, 3, 4)** *to the smallest details of handrails* **(2)** *and waste baskets* **(10)**, *the design has been controlled with determined consistency. Concrete, as the structural material, responded well to the architects' idea of plasticity, and, used consistently throughout, also contributed toward the remarkable continuity that exists between the three individual structures, between exterior and interior, and between art form and functional form. The only other material of importance is oak, which, in texture and color, complements the unfinished concrete. Oak has been used to sheath most of the walls and ceilings of the classrooms and for all of the cabinet work.*

There are nine classrooms **(5, 6)**, *each with its own entry/coat room. The unusual ceiling treatment in the art room* **(7)** *reflects the stepped floor arrangement of the physics and chemistry lab* **(9)** *on the floor above. An auditorium for 255 students* **(8)** *is housed in a separate structure, as is the gymnasium.*



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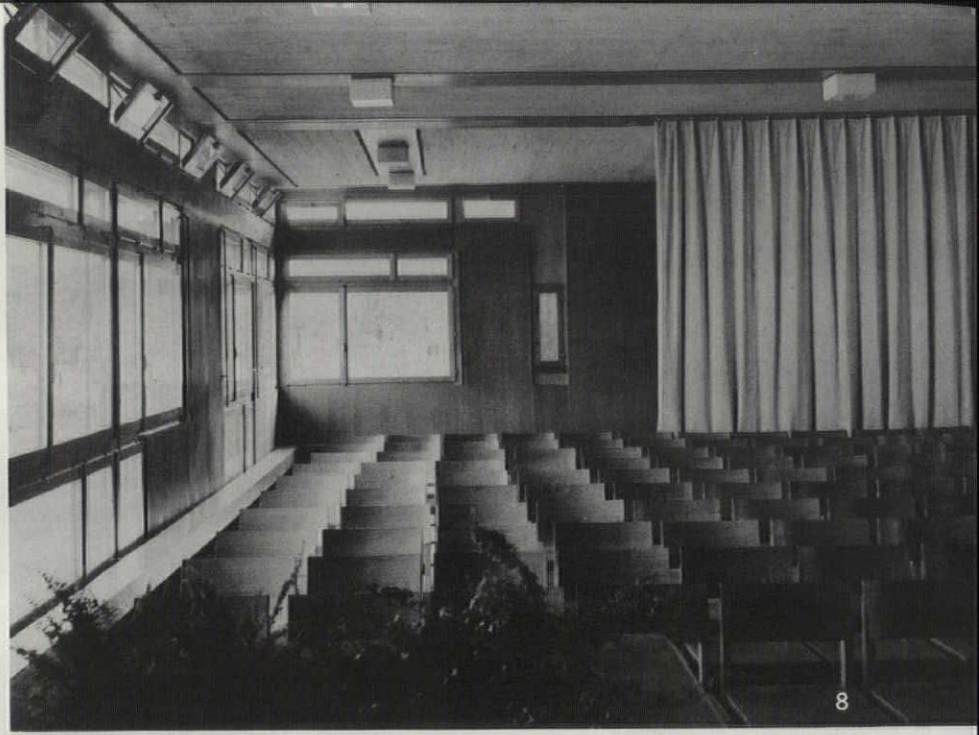

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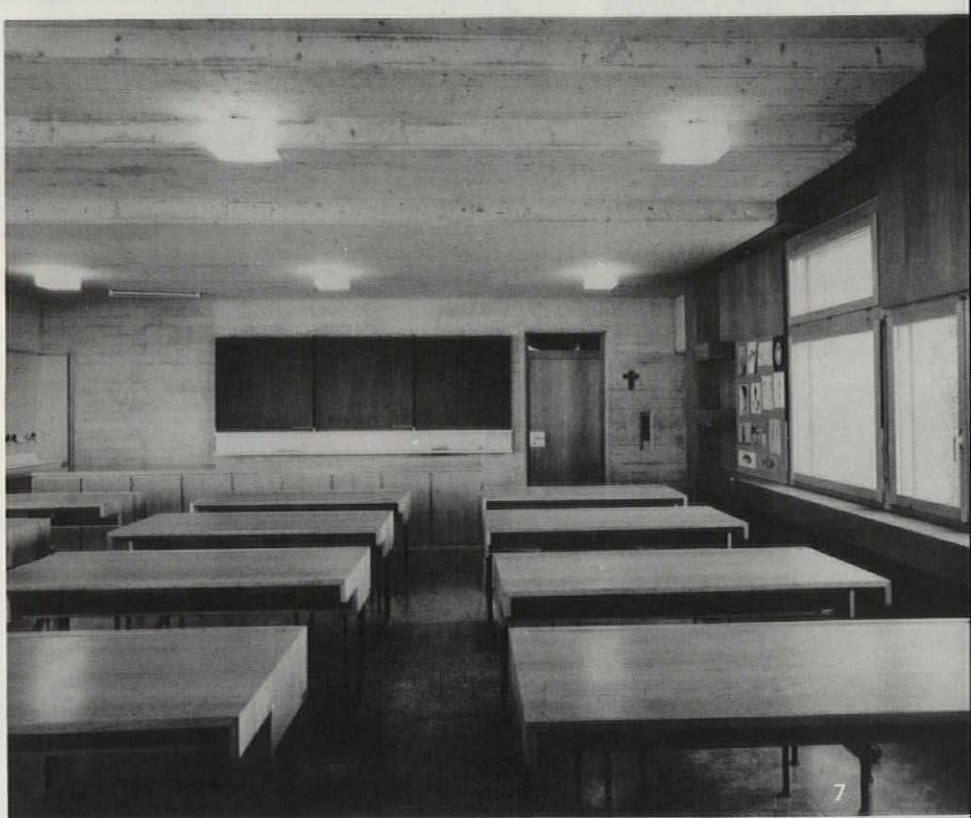

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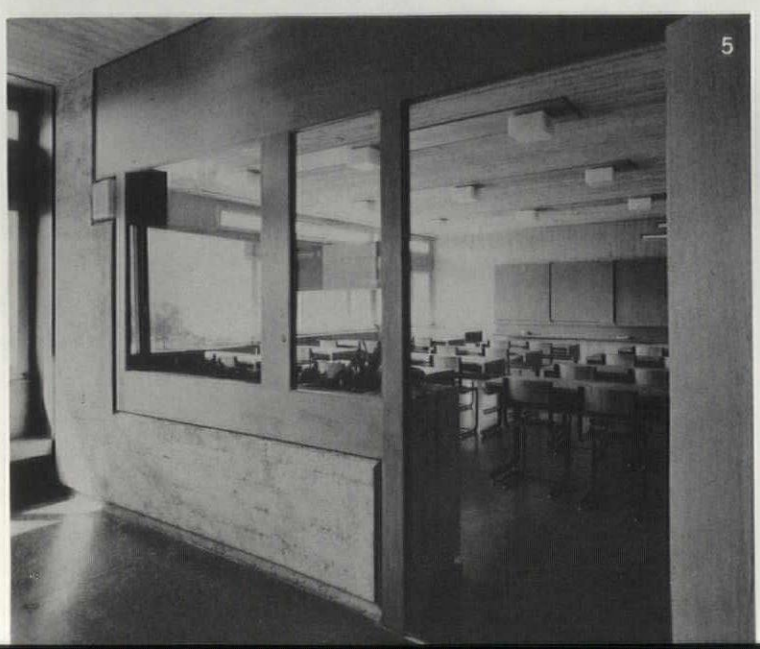

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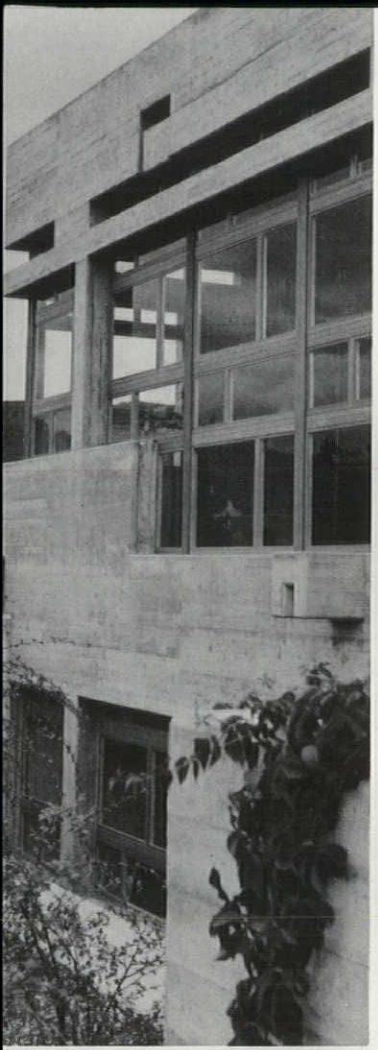
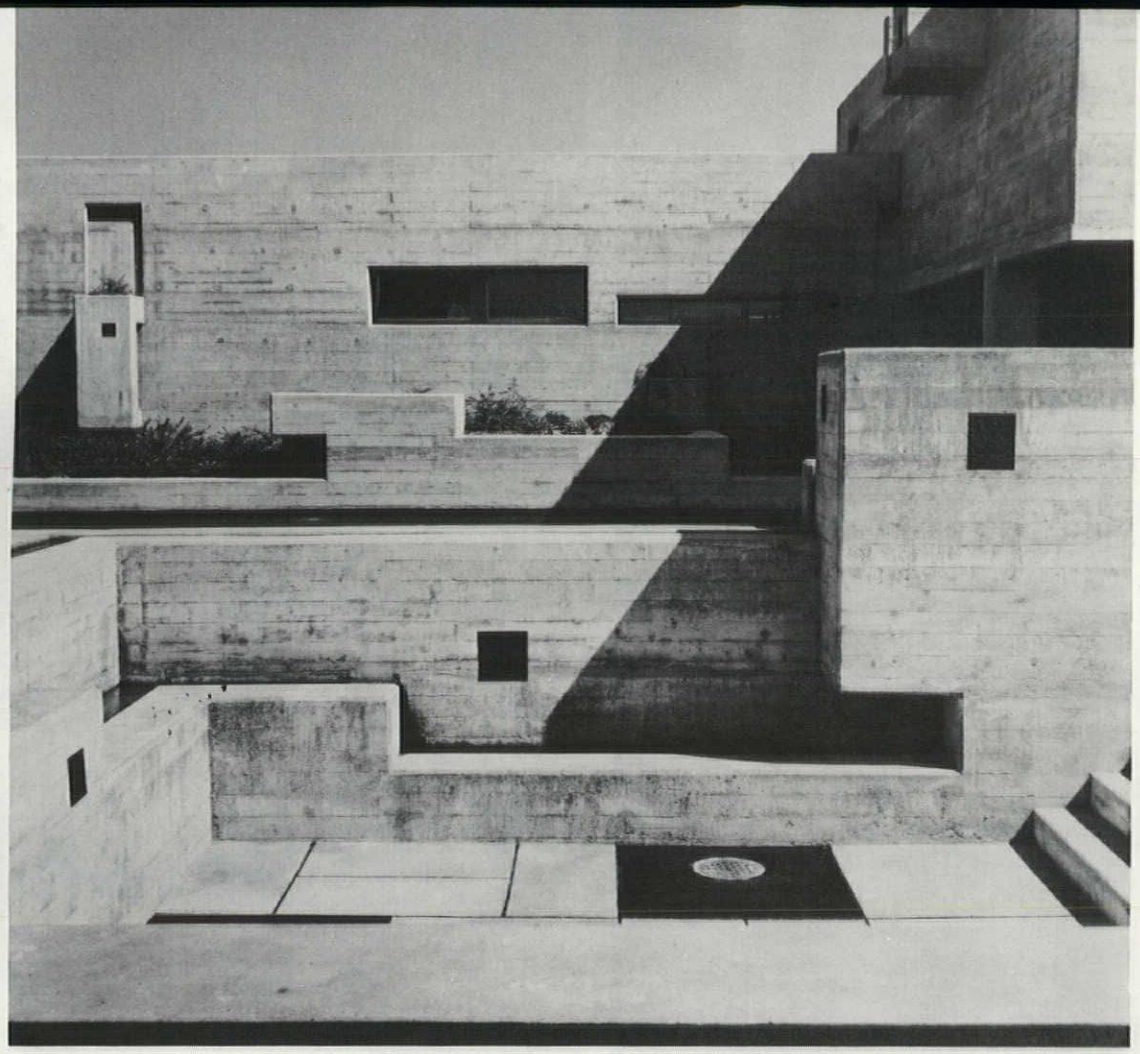
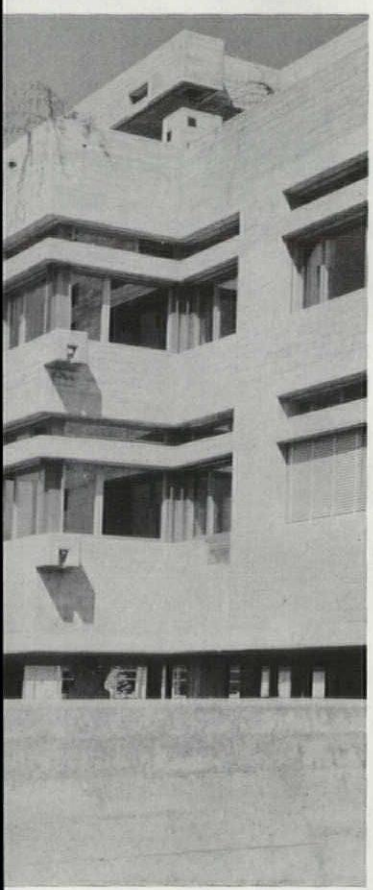
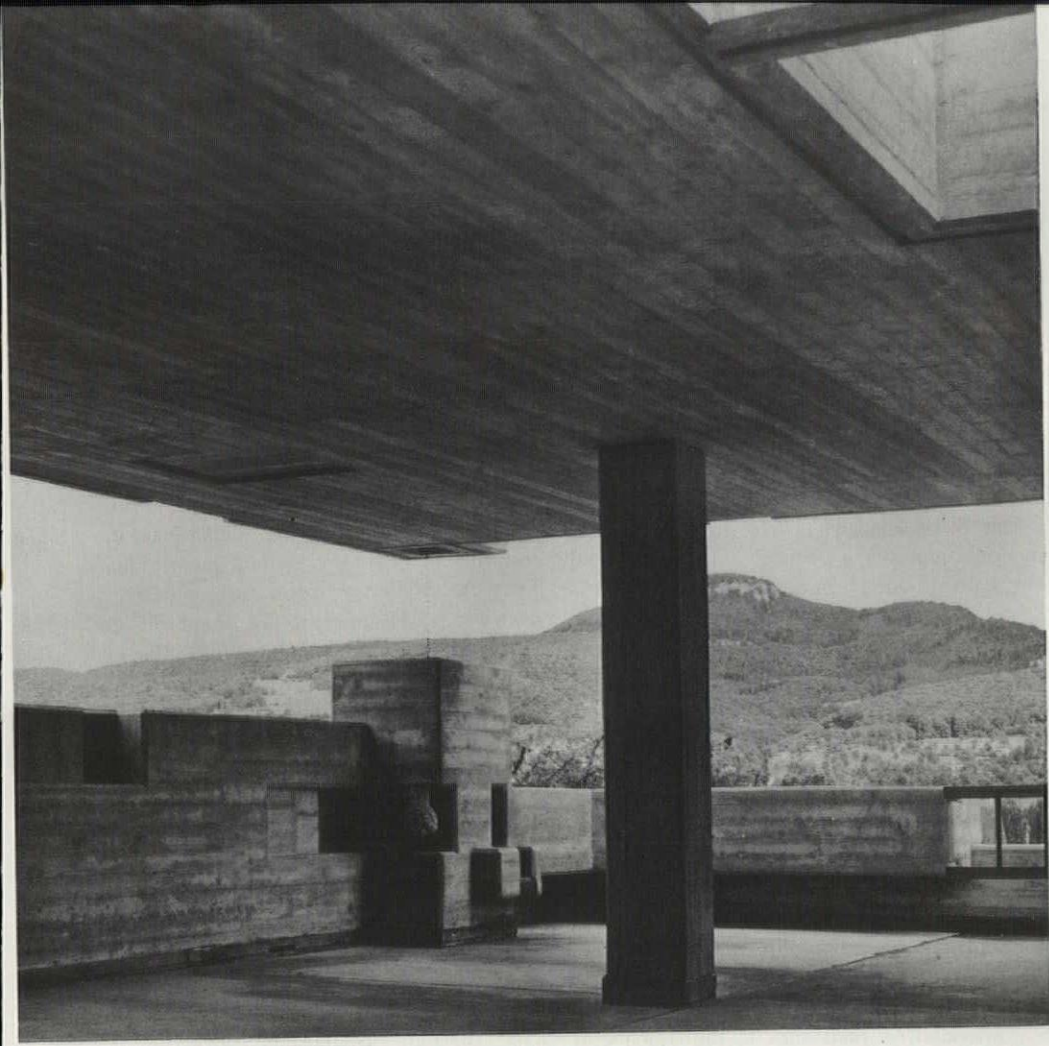
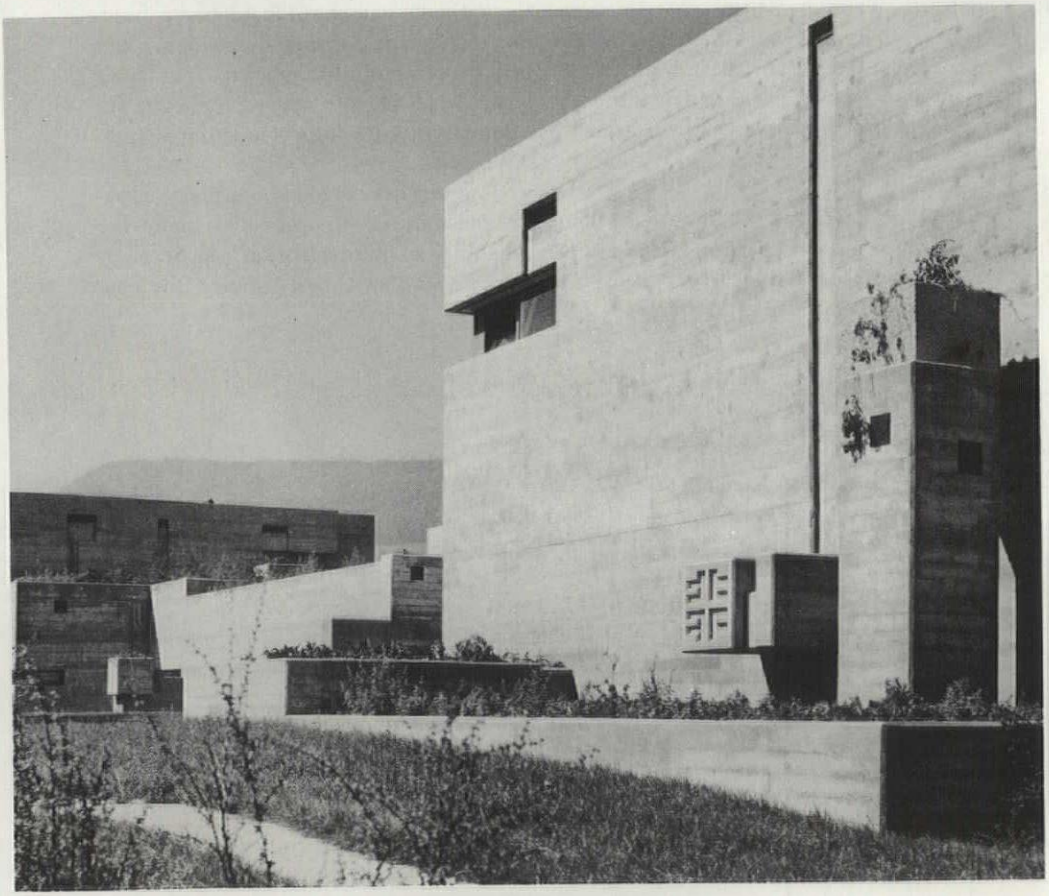










LEHRER FRAGEN SO,
SCHÜLER FRAGEN ANDERS.

IM NEUEN SCHULHAUS
SOLL ALLES SEIN, DAS
ZUM LEHREN UND
ZUM LERNEN DIENT.
IM NEUEN SCHULHAUS
SOLL ABER AUCH VIEL
FRAG-WÜRDIGES SEIN,
DAS NICHT ZU ERKLÄREN,
KAUM ZU DEUTEN IST.

WENN ES DAROB WAHR
WIRD, WAS WIR ERHOFFEN,
DASS DEN LEHRERN UND
DEN SCHÜLERN
DIE WOLKEN AM HIMMEL
UND DER SONNENSCHEIN,
DER REGEN UND DER
SCHNEE, DIE TIERE
UND DIE PFLANZEN
UND DAS VIELERLEI AN
MENSCHENWERK RINGS-
UM, TROTZ ALLEM WISSEN,
STETS NEUES ERLEB-
NIS BLEIBEN KÖNNEN,
DANN MAG DIE NEUE
SCHULE STIMMIG SEIN:

WIR HABEN EIN
FRAGENHAUS GEBAUT.

In forceful and poetic words—qualities also inherent in the school's vocabulary of forms—architect Foerderer expresses above the thoughts that were guiding principles throughout the project: "Teachers ask questions one way, pupils ask differently. In the new schoolhouse, everything must serve the process of teaching and learning. But in the new schoolhouse there will be much that demands questioning, much that is not easily explained, much that is hardly answerable. If it happens that for both teachers and pupils the clouds in the sky, the sunlight, the rain and the snow, the animals and plants, and the multiplicity of man-made works remain ever new experiences, our hopes shall have been realized: we will have built a schoolhouse where questions will be asked."

FOAMED ROOF INSULATIONS

BY JAMES P. SHEAHAN

Since their introduction in the mid-1940's, rigid cellular plastic roof insulations have taken lengthy technological strides in meeting high standards for efficiency, weatherability, safety, and economy. Today, these foamed plastics are firmly entrenched in the building industry. Their progress has been such that the total consumption of cellular plastic roof insulation may exceed 100 million board feet by 1965, which is approximately 20 per cent of the estimated total market for roof insulation at that time. This projection is all the more remarkable since it denotes the rapid incorporation of a relatively advanced system in roofing practices, which, for the most part, have remained unchanged in concept for centuries. The following generic discussion presents the case for plastic-foam roof insulations. Background, properties, and installation methods are reviewed, as well as the future for cellular foam products. Its author is Customer Service Engineer, Plastics Development and Service, The Dow Chemical Company.

Waterproofing of structures is an ancient art dating back to man's first attempt to find shelter. The classic materials were clay tile, slate, lead, and bitumen such as coal-tar pitch and asphalt. Bitumen has long been the most common waterproofing material used. Even today, most roof structures are waterproofed with some type of bitumen. They are held together with intermittent layers of organic felt, such as rag felts, or inorganic felt, such as asbestos felt, to impart strength to the entire assembly. These assemblies, approximately $\frac{3}{8}$" thick, provide excellent waterproofing; however, they offer little resistance to thermal conductance and cannot, in themselves, contribute measureably to maintaining the high comfort levels desired in buildings erected today.

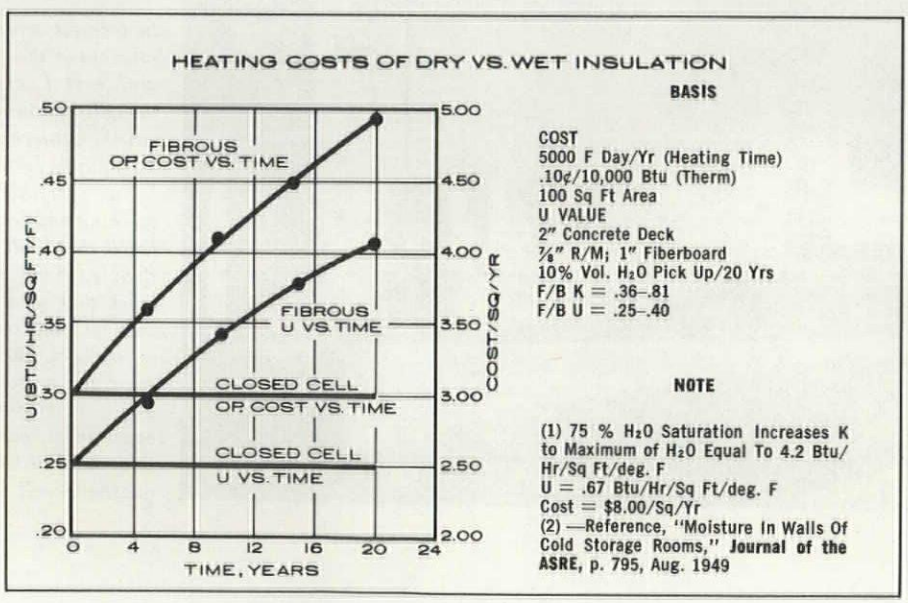
Insulating the structure to stabilize the inside surface temperature will control the degree of comfort within. To achieve this condition, designers originally turned to insulating materials such as fibrous board and cork board, in approximate thicknesses of 1", to increase the roof's thermal efficiency. But while helping to solve the comfort problem, these products introduced a new problem in that they provided no resistance to the transfer of moisture. Thus, moisture vapor in warm interiors migrated into these insulations and condensed within them, with consequent damage to their inner structure and, in fact, to the roofing membrane itself.

Vapor Barrier Needed

One remedy for this condition has taken the form of a vapor barrier, which is applied directly to the structural deck before the insulation and its waterproofing cover are installed. Failure of the vapor barrier or the built-up roof, however, is a specific danger. If leakage into the fibrous insulation occurs, captive moisture will vaporize as outside temperatures increase, causing blistering, delamination, and rupturing of the roofing membrane. Thus, the efficiency of the roof insulation, as well as the integrity of the built-up roof itself, becomes inextricably linked with the reliability of its vapor barrier. This problem was a spur to the creation of plastic-foam insulations.

Further impetus toward the development of foolproof insulating systems has come from the universal concern over heating and cooling costs. Previously, just enough insulation was added to bring about a desirable degree of comfort. The heating or cooling equipment installed in a structure was designed with this minimum amount of insulation in mind. But basic thermal calculations prove that if the optimum amount of insulation is used, the cost of the heating or cooling plant may be substantially reduced. This factor not only offsets the cost of the extra insulation, but also lowers long-range operating costs.

However, safe reduction of plant capacity can only be programmed where the reliability of the insulation can be guaranteed. Without this assurance, the con-



cept of "trading in" equipment for more insulation eliminates the safety factor inherent in the extra standby capacity of the heating or cooling plant. Thus, the roof insulation must maintain its initial low thermal conductance value by remaining dry, thereby offering permanent and total resistance to the passage of moisture.

Closed-Cell Reliability

A comparison of the reliability of closed-cell insulation with that of a fibrous type is shown *(see chart)*. The lower horizontal axis represents time in years from 0 to 24. The vertical left-hand axis represents the U-value of an insulated roof deck. In this example, a 2-in. concrete deck was insulated with both a fibrous insulation and a closed-cell plastic foam insulation, with identical C-factors of .36, providing overall U-factor values of .25.

Should both insulations remain dry indefinitely, their insulating values would remain constant. If, however, the fibrous insulation picks up water to a total of 10 per cent by volume in a 20-year period, its U-value will increase to .40, as indicated by the curve. (An estimate of 10 per cent water absorption was used because Government specifications for fibrous types of insulation board allow this proportion of water volume on the day of purchase.) The significance of an increase in U-value is seen on the right vertical axis which indicates the consequent rise in annual heating costs—given in dollars per 100 sq ft of roof area. The cost is based on a national average of 5000 degree F days per year, at a fuel expense of 10¢ per therm.

On this basis, from the day of construction, the cost per year of the closed-cell type of insulation stands at $3.00 for an indefinite period. However, if fibrous insulation picks up 10 per cent water in 20 years, operating costs will advance to almost $5.00 per 100 sq ft per year. If absorption continues until the insulation is saturated, the annual cost climbs to $8.00 per 100 sq ft.

With the advent of polystyrene and (subsequently) urethane closed-cell foamed plastics—the only two of the many foamed plastics whose processing costs and structural strength were within the competitive reach of conventional insulations—a practical solution to the vapor penetration problem was reached. With the passage of moisture blocked, owing to their closed-cell structure, these two plastics meet the criteria of "permanent insulation" *(evaluated in chart)*.

Polystyrene is a thermal plastic that is somewhat sensitive to the direct application of excessive heat, while urethane is a thermoset plastic that will remain undamaged at elevated temperatures. Aside from this difference, both offer fundamentally similar properties. Their density is from 1 to 2 lb per cu ft and their low rate of expansion gives dimensional stability to both. Insulation values differ, with polystyrene at 0.26 and urethane at 0.17, measured as the stabilized K-factor at 75 F.

It is this difference in insulating capacity, plus the higher production costs for urethane, which compels the manufacture of urethane in thinner sections. While the compressive strength is essentially the same for both (as high as 50 psi), the thinner boards of urethane, as compared with polystyrene, are less able to absorb impact and particularly heavy traffic, or to span flutes in a steel deck. Although present economics recommend polystyrene in terms of cost per equivalent insulating value, urethane is favored for its high heat distortion (250 F compared to 170 F for polystyrene) and solvent resistance.

Contribute Little Fire Hazard

Because cellular plastics have only one-tenth of the fuel content of standard roofing membranes, they contribute little to the fire hazard of a building. Of significant benefit is the fact that plastic foams can be rendered flame retardant, especially during storage and erection. This means that if accidental ignition occurs, the fire hazard will be localized to the point of ignition and can be speedily controlled by removing the source of flame.

Any hazard to the completed construction can be further reduced or even eliminated by the design of the structure. If the cellular plastics are to be installed on the underside of the structural deck, some fire-resistant finish, such as plaster, is indicated. The nature of the over-deck, particularly if it is designated with a Class A rating, as is concrete, wood, or gypsum, does not create any fire hazard. This is reflected in its preferential insurance rating. When the insulation is installed over a metal deck that does not have sprinklers installed on the underside, the structure falls into two categories—Class I or Class II. The Class II type of construction is considered to be a risk and its insurance rating reflects this. Class I construction demands the use of fire-resistant adhesives to adhere the insulation to metal deck, thereby reducing the fire hazard.

Orientation to Foamed Plastics

A basic factor of particular importance to the roofer is the compatibility of any insulation system with standard roof application techniques. In this respect, fibrous insulation board has had the advantage of familiarity of handling and long-time use, and the roofer knows how to adapt it to a roofing routine. In a number of cases, the roofer's knowledge of closed-cell insulation is not yet on a par with older materials. However, with the wide dissemination of information about the new approach, which is proceeding from an intensive campaign to familiarize all segments of the building industry with the properties and characteristics of foamed plastics, the gap is closing rapidly.

The orientation to foamed plastics is taking place on two levels, economic and practical. When the product cost of fibrous insulation is superficially weighed against that of closed-cell types, economics might seem to favor the former. When, however, mechanical engineering aspects and ultimate operating factors enter into the equation, the reverse is true.

Formerly, this did little to sway the roofer, who, unlike the architect with his concern for the life of the structure, has been concerned primarily with product and installation costs. If the fibrous type of insulation was less expensive (consid-

ering only initial material costs) than the closed-cell foam, the roofer who bid the fibrous insulation would get the job, unless specifications were very tight.

With familiarization, and some re-education, the roofer is losing this reticence. Furthermore, he has been learning methods to effect savings during installation so that "in place" costs for the new materials are not only well within the range of competing nonplastic types, but tend to be even lower. The manufacturer, too, has done much to "re-engineer" foamed polystyrene to answer the remaining objections of the trade.

Both polystyrene and urethane plastics offer considerable ease in handling. Customarily available in 2′ x 4′ sections, they weigh from 1 to 2 lbs per unit, depending on thickness. Whether installed in a single layer over structural-steel deck, or in a multiple layer in staggered-edge fashion over the other types of roof, their total weight adds no appreciable weight to the load of the building. When overlayed by a coated base sheet, they represent the most effective and reliable vapor barrier inherently provided by rigid roofing insulation board.

Future Trends

The future undoubtedly will signal a further expansion of this still narrow field of rigid, insulated, hot-applied roofs. The solvent resistance of urethane, along with different methods of fabrication, will further widen the market for closed-cell plastics.

A major new trend is noticeable in roofing construction today. Structural roofs are undergoing transition from the traditional flat deck to curvatures that allow the roof to be visible from ground level. New forms, such as domes, scalloped domes, barrel vaults, and hyperbolic paraboloids are inducing manufacturers to make plastics perform remarkable new feats. The most promising among these is their ability to add aesthetically to the appearance of the structure, while intimately following steep and curvilinear surfaces. Recent waterproofing systems that accommodate these shapes are solvent-applied plastic membranes that are light in color and can be blended in various tones.

Expanded polystyrene has already found extensive use as a form liner for contoured structures. Employed as form board, it eliminates costly plywood forms and much of the false work that is commonly used for difficult configurations. Arched boards of foamed plastic are affixed between steel angles, covered with wire grid and sprayed with concrete. Thus, they simultaneously combine the attributes of a foam liner, insulation, and a vapor barrier.

Polystyrene can only be contoured to comparatively simple curves. Urethane fares better in this regard, since it provides adequate insulation value in thinner sections and now offers a modulus of rigidity; thus, it adapts successfully to more extreme curvatures. The application of a solvent roof system may also make it advisable to select a plastic such as urethane in lieu of polystyrene, unless the latter receives a protective coating such as a cement layer.

Panel construction, in which the insulation becomes part of the structural deck itself, opens still another door for plastic insulation. Such panels can be prefabricated with core materials of rigid board stock, or they may merely be supportive "platforms" of various materials which receive a foamed-in-place application of urethane foam.

It is this quality of urethane—its adaptability to spray application—that may eventually reform the existing principles of roofing method. Here is one of the great potentials of cellular plastics. Although present spraying techniques do not always provide consistent and uniform results, research and development are proceeding at rapid pace to improve equipment and end results.

The role of cellular plastics in roof construction is enlarging dramatically, with steadily increasing demand for quality insulation for flat overdeck construction as well as for the complex, imaginative shapes that are beginning to evolve. Toward this end, the plastics industry is intensifying programs of development that will serve architectural needs for foamed plastics that are more economical, as well as being fireproof, waterproof, foolproof, and versatile. At their arrival, we may see the age-old methodologies finally disappear as revolutionary techniques of roofing come to fruition.

DECORATIVE FOUNTAINS

BY NELSON HAMMOND

The decorative water fountain has recently enjoyed a rebirth. Under the benevolent influence of cheap power and of technical improvements in nozzle design, water offers the architect a new dimension in design. The author is Manager of Process Equipment Sales, Schutte and Koerting Company.

Decorative fountains have been a part of architectural art since the beginning of recorded history. As early as 3000 B.C., Babylonian architects designed fountains for their more important structures, for both aesthetic and functional reasons. The fountains of Rome occupied the talents of that civilization's greatest artists.

Serious as these efforts were, the first 5000 years of fountain design were only a beginning. Until modern times, the architect was greatly restricted in the effects that he could achieve with water simply because he did not have the power to move water in sufficient quantities. Falling water represented just about his total capability. Therefore, in most ancient fountain designs, water was almost incidental to the stone and mortar.

By contrast, the modern architect can achieve with water whatever effect his imagination can create. He has at his disposal an almost unlimited supply of nozzles at reasonable cost and power is abundant, regardless of location. It is not surprising that water has become the main, and sometimes the only, architectural element of modern fountains *(montage below)*.

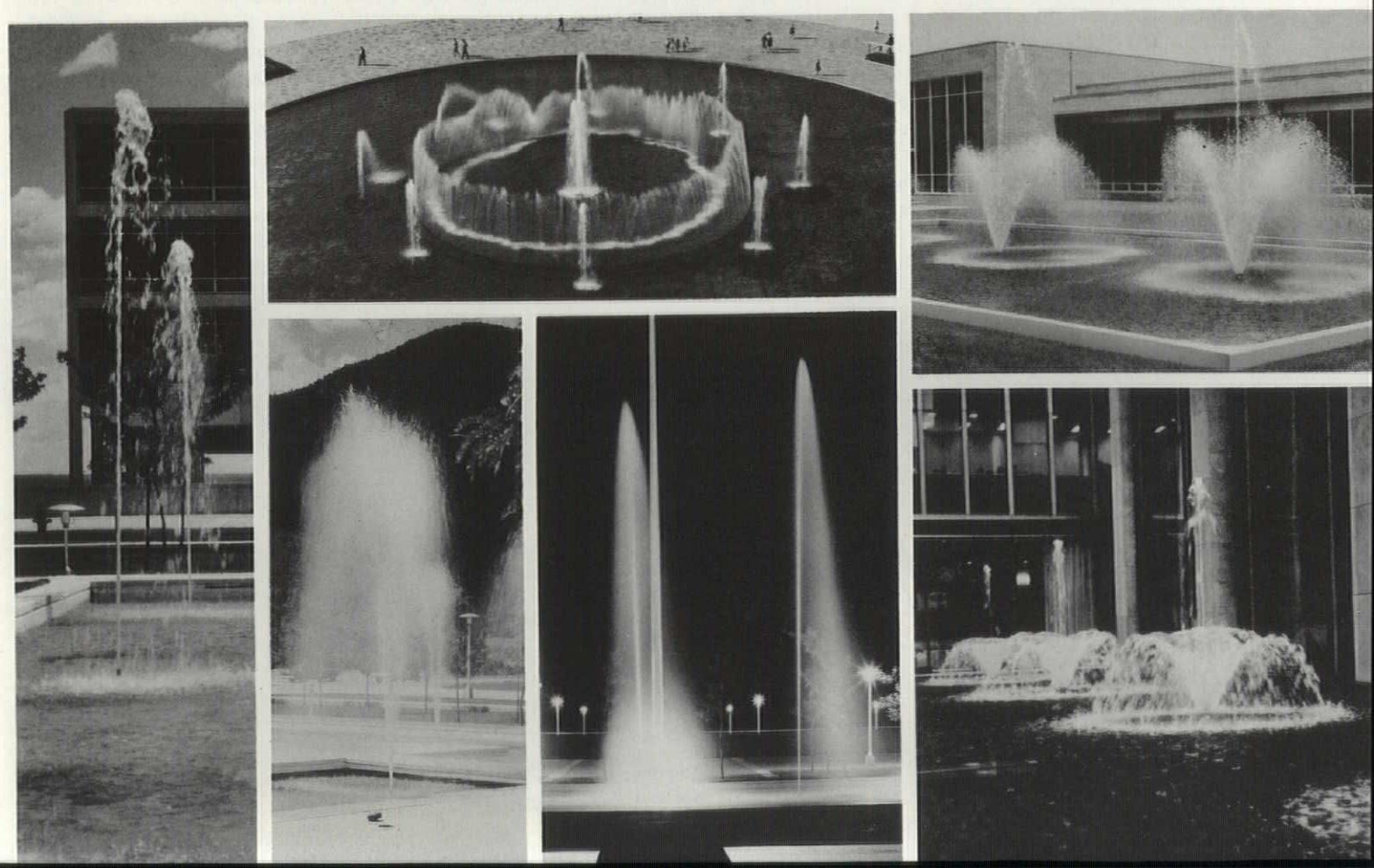
But before he can take full advantage of this new dimension in architectural design, the architect must learn two important sets of facts. He must learn about nozzles and the effects that each type can produce. And he must realize that the modern fountain is a *complex system* of engineered parts, subject to many physical influences that the designer cannot ignore.

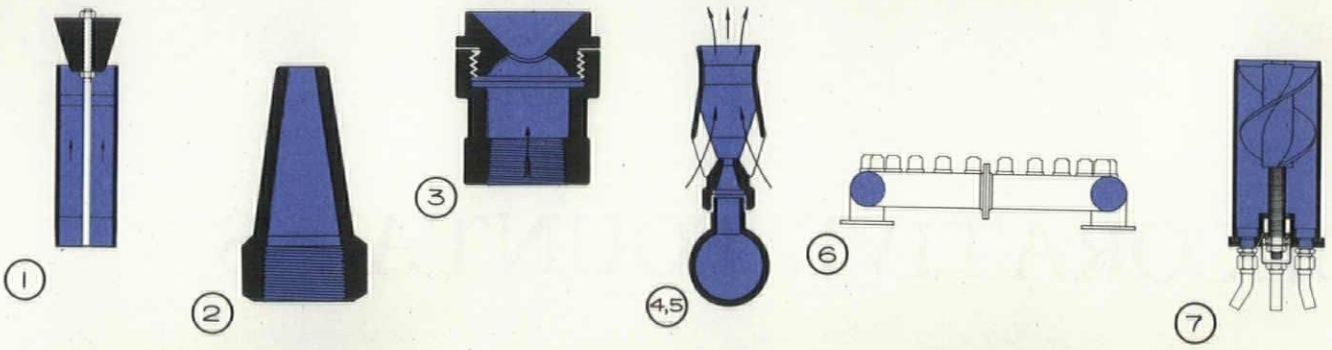
Nozzles and Their Effects

Between the nozzle's prosaic status as an engineered restriction in a piece of pipe and its potential effect as a sculptured stream of water, there must be a thorough understanding by the architect of nozzles and how he can weave the effect of the different types into the fabric of his intended creation.

There are 10 standard types of nozzles, each of which produces its own characteristic effect:

Mushroom **(1)**. This nozzle produces





a hollow cone film of water that breaks into a spray either under or over the crest, depending on: (1) the position of an adjustable plug at the orifice; and (2) the pressure at the nozzle. The smaller the adjustment between plug and orifice, the faster the film breaks into a spray. If the water pressure at the nozzle is below 2½ psig, the film of water extends to and over the crest. At high pressures, the film breaks into a spray under the crest. The angle of the cone is fixed for each plug, but interchangeable plugs are usually available from the nozzle manufacturer for angles of 20° to 45°.

The Jet **(2)**. The most simple of nozzles, the jet discharges a long, uniform stream of water that falls straight back on itself or in an arc back to the pool, depending on how it is aimed. The height or distance of the stream of water varies with the water pressure, nozzle design, and position of the nozzle. The jet nozzle is also manufactured in an adjustable version, where the discharge tube of the nozzle can be routed about 15° in any direction. This convenient feature permits the architect to compensate for irregularities in the installation.

Flat **(3)**. Almost rectangular or elliptical in cross-section, the spray produced by this nozzle is solid at the nozzle and gradually diverges into droplets. The nozzle is normally installed in such a position that the stream discharges horizontally or up to 45° from horizontal. The width of the spray as it hits the pool is at a minimum when the nozzle is horizontal and about three times wider at 45° above horizontal.

Aerating **(4)**. Very similar in construction and operation to the cascade nozzle **(5)**, this type nevertheless achieves a very different effect. It confines the stream of water in a more narrow column that ends in a ball of foaming water at its peak. Cascade nozzles can be used effectively to recirculate pool water, when they are mounted appreciably below the pool surface. Although functional in intent (i.e., to prevent growth of algae and insects), its use can be made to serve a worthwhile aesthetic effect by an alert fountain designer.

Cascade **(5)**. Installed below the surface of the pool, cascade nozzles entrain air and about two gallons of pool water for every gallon of water supplied to the nozzle. They discharge large volumes of foaming, glistening water that cascades softly back to the pool in the symmetrical cone-shape of a pine tree.

Spray Ring **(6)**. Any curved shape of pipe on which a series of nozzles at regular intervals are mounted can properly be called a spray ring. The effect produced is almost unlimited because of the countless variations possible not only in the shape of the ring, but also in the types, number, and position of nozzles. For instance, the drawings demonstrate the entirely different effect produced by two rings that are identical except for the inclination of the nozzles.

Rotating **(7)**. Rotated on its own vertical axis by the force of the water supplied to it, this nozzle produces a moving stream of water that spirals upward in a helical pattern and falls back to the pool in a rainlike effect.

Dual Spray **(8)**. This nozzle produces two hollow cone films of water, each of which breaks into a spray before falling back into the pool. When operated at pressures of 2½ psig or less, both cones are a solid film of water up to the crest. At higher pressures, the two cones tend to merge into a single spray.

Hollow Cone **(9)**. An internal spiral in this nozzle causes the stream of water to rotate, and thus to discharge in a hollow cone spray of a fixed angle. Nozzles can be manufactured with angles of 20° to 70°, depending on the type of spiral used. The spray proper varies from fine to coarse droplets, depending on water pressure.

Solid Cone **(10)**. Besides an internal spiral, these nozzles also have a center hole that fills in the spray, and thus results in a solid cone spray of a fixed angle, normally around 70°. Again, the spray characteristic varies from fine to coarse as the pressure drops.

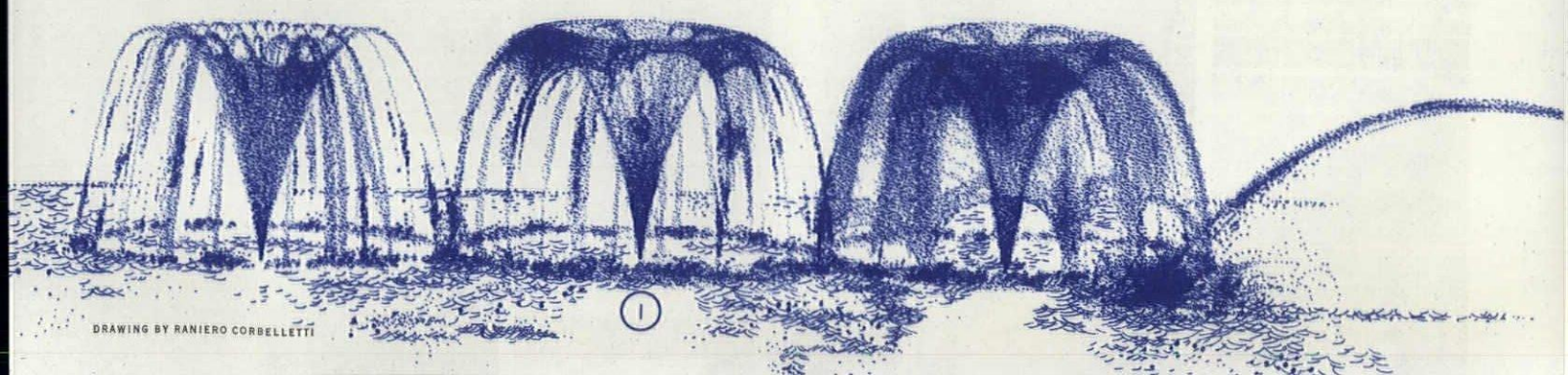
Dynamic Patterns

Modern fountain designers like to create dynamic rather than the changeless patterns of orthodox design. To do this, they have three effective tools, each of which should be used only with sound technical advice:

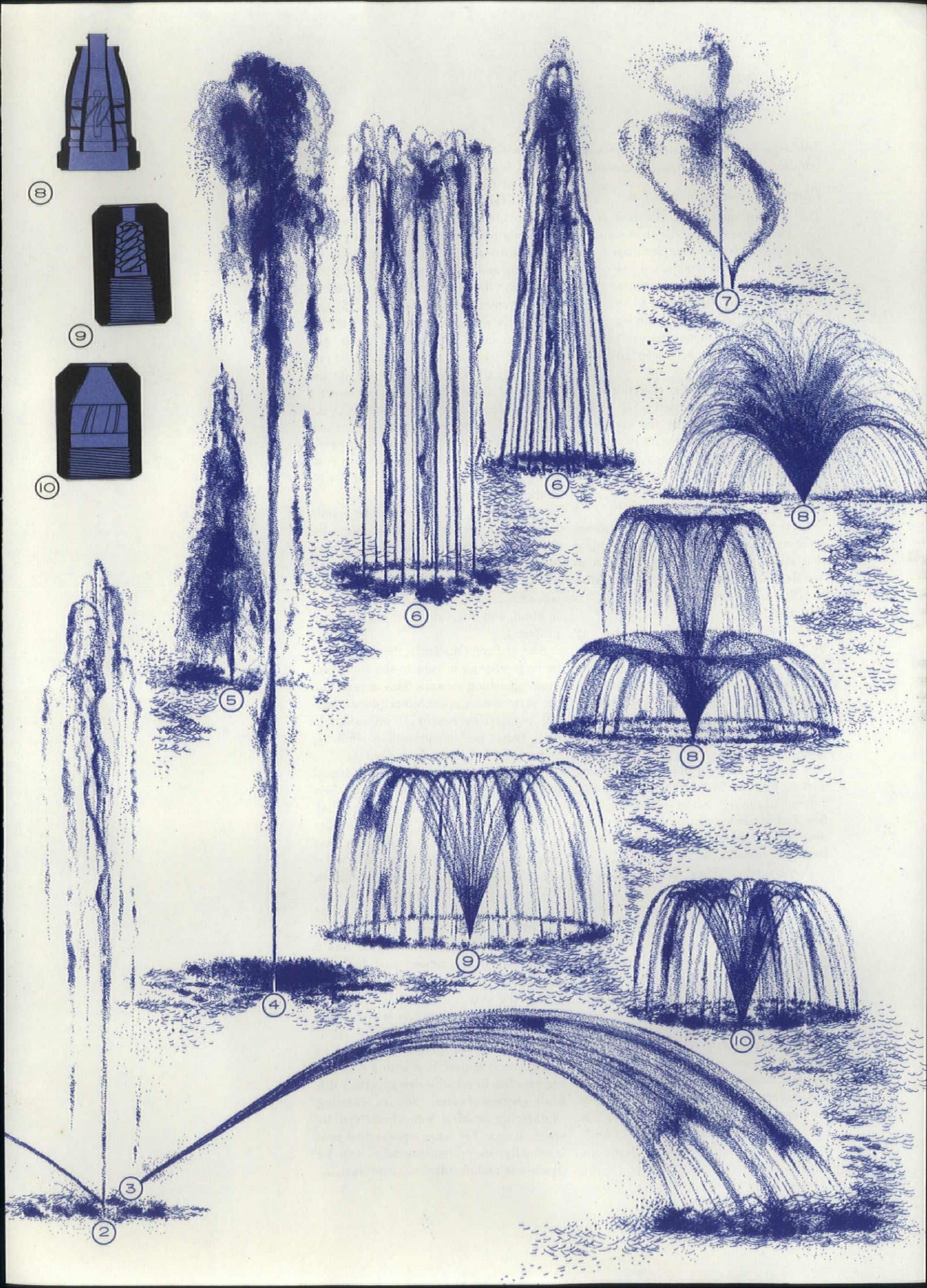
(1) *Sequencing.* Programmers of different types can be used to operate valves in the supply line to individual nozzles, and thus control flow or pressure. The purpose is to create a moving pattern of water where individual streams go on and off, at controlled heights or even patterns, according to a predetermined design.

(2) *Motion.* A less sophisticated alternative is to mount nozzles in swivel joints and link them mechanically, pneumatically, or hydraulically to a motion-producing device. Individual streams are thus made to move in a regular, repetitive pattern.

(3) *Light.* At night, it is possible to create motion through controlled lighting.



DRAWING BY RANIERO CORBELLETTI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This is a particularly tricky project that requires the advice of lighting specialists.

The Fountain as a System

The modern decorative fountain is not just a collection of nozzles in a pool, but rather a surprisingly complex system consisting of dozens of engineered parts, each of which has a bearing on the aesthetic as well as practical success of the fountain. There is a way to handle the countless technical problems that can crop up —get competent, experienced advice on all technical matters.

But this does not solve everything, nor does it insure that these technical matters will not, in the end, mar the architect's design. Complete success requires that the designer himself learn a few simple concepts and keep them in mind during all stages of design. Here are the most important:

Preservation. Nothing is more disappointing or costly than a finished fountain that misses the designer's intent so completely that it becomes an architectural liability and must be modified after installation.

The most effective single step that can be taken to preserve the original design is to specify the installation of balancing cocks at each nozzle. This will permit control of the water pressure at each nozzle, and thus give the designer effective control of the effect produced by each nozzle *after* installation.

It is also useful to obtain experienced advice about the flow system (pipe, pumps, valves, strainers), because the required flow and pressure must be supplied to the nozzles if the intended effect is to be realized after installation.

Perpetuation. After the fountain is turned over to the building owner, its care and operation are usually entrusted to the building maintenance group. Because these people have no special knowledge of fountain design or operation, it is a wise architect who sees to it that the building owner understands the fountain design and that instruction manuals are prepared for his maintenance group.

Another important consideration for an architect interested in perpetuating his fountain design is its economy of operation, especially the cost of electricity for the pumps and lights. In most cases, it is relatively easy to determine the maximum operating cost that the owner will accept. Confine designs to that figure.

Cleanliness. Many a beautifully designed fountain is spoiled by an accumulation of dirt and debris in the pool. To prevent this from happening, one should: (1) provide a filtering device in the water recirculation system, but only on competent engineering advice, to avoid excessive pumping and maintenance costs; (2) make provisions for vacuum-cleaner outlets at regular intervals near the pool; (3) specify for large pools an automatic addition of algaecide to the make-up water, and consider using an agitating nozzle to prevent stagnation, and thus slow down the growth of algae and breeding of insects; (4) provide an overflow connection to the pool to take away excess rain water, which would otherwise create a messy and sometimes dangerous situation; (5) use rustproof piping everywhere to avoid discoloration of the pool water.

Appearance. The considerable plumbing inevitably connected with decorative fountains can detract from its appearance, especially if the pool is shallow. In all cases, exposed plumbing can be ugly when the pool is drained. Keep this always in mind, and conceal all piping whenever practical.

Size of Pool. Obviously, the pool should be large enough to contain the spray and avoid splashing viewers. This depends on the surrounding architecture (does it permit pedestrians nearby?); on local climate (what are the prevailing winds?); and on the height of the spray.

Lighting. There are several technical problems in fountain lighting that are best solved by an experienced lighting specialist: (1) still water is a clear reflector, but spray absorbs incident light; (2) most light attracts insects; (3) underwater lights can be a problem in maintenance.

Heating. There is hardly a location in the country where a fountain can operate year round without some form of heating. Again, the fountain designer runs into a purely technical problem that he must nevertheless keep in mind during a large part of the year.

Clearly, the modern decorative fountain has evolved way beyond the traditional concept of falling water in an architectural milieu. It is both a demanding exercise in creative design with a difficult element (water), and an exacting engineering problem with almost endless ramifications. Yet when approached professionally, decorative fountains can be significant architectural achievements.

SUPER-ROOFS

BY WILLIAM ZUK

Although the technical, economic, and legal problems associated with the erection of super-roofs are prodigious, this construction form could some day become a reality. Such is the opinion of the author, a Professor of Civil Engineering at the University of Virginia.

A super-roof may be defined as a roof that is many magnitudes greater in size than any roof that has ever been built. The largest roofs constructed to date are only several hundred feet in free span. A super-roof is envisioned as being several miles in span.

A typical reaction to this statement might be, "Well, just what good would such an immense roof be?" If a professor may be pardoned for his prerogative of temporarily ignoring the hard facts of economics, many exciting uses can be listed for such super-roofs. Large industrial complexes could be completely enclosed, permitting a controlled environment for more efficient production; roofs over airfields could protect aircraft from hail, snow, ice, and fog, thereby allowing continuous, all-weather operation; high-yield farms could be encapsuled to provide ideal growing conditions for any climatic area or condition (even permitting bananas to be grown in Maine); and large shopping centers could be totally covered for the greater comfort, safety, and convenience of consumers.

Perhaps the most exciting of all these possibilities, however, is that of roofing an entire city. Pressures of population increase and needs of survival in a nuclear age may eventually require the habitation of many climatically extreme areas such as the very cold, the very hot, the very wet, and the very dry regions of the earth. Habitation in these rigorous regions could be made possible through a controlled environment, as in a city "under glass."

Since such a city, protected by a single mother roof, would require radically new concepts of city planning, only "newborn" cities designed specially to function in this special environment would be generally feasible. A roof simply covering an existing city would be difficult to justify, even from a purely technical point of view, notwithstanding economics. There are several city planning considerations that must be re-evaluated for roofed cities, such as the optimum use of three-dimensional space for living, working, commerce, and transportation. Also to be reconsidered are atmosphere, sunlight, thermal, acoustic, vegetation, and fire control. The architecture of structures under such a roof would likewise require substantial rethinking, because the traditional building materials used for wind and weather protection would be totally unnecessary. Financial savings in construction beneath this super-roof could partly offset the cost of erecting the mother roof.

As for the economic problems involved, the cost of a super-roof would undoubtedly be tremendous. However, the initial investments involved in television, the satellite program, and mile-long suspension bridges also were tremendous; and, despite their detractors, such facilities quickly proved their worth. It generally follows, therefore, that great technical advances promote their own use and rewards, often exceeding the wildest dreams of their originators.

There still remains, however, the important question, "Are such roofs technically possible?" This writer believes that the advanced state of our technology is capable of coping with this challenge, but only in conceptual form. The general concepts of optimization and stress analysis, necessary for the design and construction of such monumental structures, can be brought to bear on this problem to evolve the general ideal configurations demanded. Such ideal configurations would demand materials with special properties not now in existence (although some are beginning to emerge from research laboratories). Until these materials are produced, detailed design or construction would, of course, be impossible. However, the pressures of the space race have tremendously motivated our developments in materials science, giving us a better than even chance that the needed new materials could be produced in the foreseeable future. Public interest in super-roofs may possibly generate a little research of its own.

What are some of the specific ideas on which construction of a super-roof would be based? One of the basic hypotheses upon which to base the proposed configuration is that the structure must be "fail-safe." Thus, the roof must be capable of standing with absolutely no reliance on any sort of mechanical or electrical device for generating pressures, mechanical fluid, or gas motion, or electromagnetic force fields, since only the highest reliability factors are admissible. This restriction admittedly eliminates many fascinating antigravity schemes, such as pressure envelopes of plastic or electromagnetic suspension. Furthermore, "fail-safe" principles require that the structure remain essentially intact, even if any one component of the roof is accidentally severed or punctured. This latter condition necessitates the use of multiple redundants in the structure.

When thinking in terms of mile spans, gravity is the greatest adversary. Thus, whatever the structure is, it must be conceived for minimum weight. The structural component that is most efficient, with the highest strength-weight ratio, is the pure tension member. The structural configurations that most nearly meet this condition for a roof are the suspension cable and the membrane. However, under gravity forces, no self-contained system can be totally in tension, for there must exist at least one compression member in order to maintain static stability. Since compression members have a lower strength-weight ratio than tension members, it is best to locate the necessary ones in positions other than on the free spans, where weight is critical.

However, gravity is not the only adversary. Some additional foes are those of aerodynamic forces of winds and atmospheric pressures (capable of acting downward, sideward, or upward), thermal forces generated by differential temperatures or restraints, as well as corrosion, erosion, and fire damage.

As in any complex design, the embodiment of these factors involves a judicious balance of optimums, because all factors can never be fully optimized simultaneously. Nevertheless, the concept depicted (*see illustration*) could conceivably be one solution.

As a commentary on this scheme, note that the roof structure contains both normal and inverted suspension cables. The normal ones resist the downward gravity forces of dead weight, snow, ice, and rain; and the inverted ones resist upward wind forces of vibration and flutter. The cross cables are "basket woven" around the radial cables. The roof surface in itself is almost totally in the ideal state of tension, with the laminate between cables acting as a semirigid membrane.

The central compression core structure (which must be of metal because of

its height) would not only be the main pillar of support but would also symbolize this brave new city itself (as the Eiffel Tower symbolizes Paris). If desired, further practical use could be made of such a tower by subdividing it into shops, offices, or apartments. In this way, the central tower would not only halve the total free span (thereby greatly reducing the cost), but also become a financial asset. If the tower is erected on a hill, its height and cost could be reduced proportionately.

The circular outer ring would resist the pull of the roof cables. By attaching the primary suspension cables horizontally, the induced vertical forces would be minimized, thereby reducing the anchorage mass and permitting the ring to function at its best as a self-balancing compression ring. The ring in cross section has a closed form, which more easily resists torsional forces. Since some mass is desirable in the ring, reinforced concrete would be an appropriate material. Paralleling the double duty of the tower, the outer compression ring could also be designed to accommodate warehouses, power-generating plants, or even fall-out shelters.

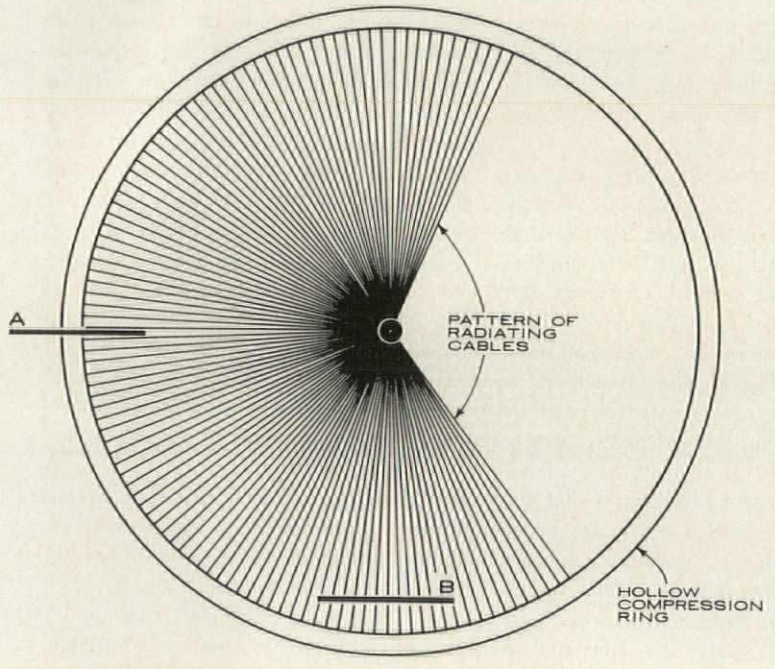
Neither the central tower nor the outer core present any insurmountable technical obstacles. Structures such as the Empire State Building, the Golden Gate Bridge, and the Boulder Dam prove that we can handle both metal and concrete in enormous quantities and dimensions. However, the optimum design of the actual roof structure depends on special materials not yet available. Use of conventional materials would make the structure so grotesquely ponderous and massive that it would risk collapse under its own weight, as an elephant on the legs of a gazelle.

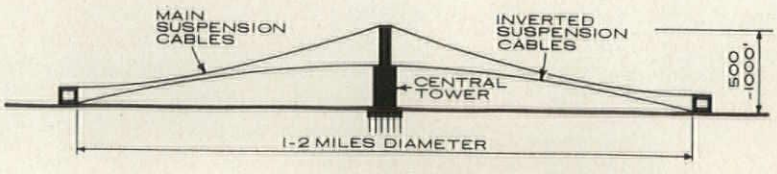
The cables should be lightweight and of ultra-high-strength metal (500,000 psi or better). The material should have a low coefficient of expansion and a high elastic modulus. Furthermore, its properties should not be affected by extreme temperatures, as from fire (it could, perhaps, be protected with a thin ablative coating). Some of these qualities are already met by the new and exotic metal called titanium, so that actual realization of such a metal may not be too far off. The requirements of the transparent laminate stretching between the cables, however, are much more demanding. A partial list of qualifications would include transparency, strength, ductility, heat stability, incombustibility, lightness, and ease of field splicing by adhesives for erection and repair. An added bonus could be that one of the layers of this laminate would be so chemically active that it would change its sun-filtering properties with the sun's intensity.

Researchers at the Mellon Institute in Pittsburgh are already well advanced along this path. They have found that small amounts of rare earths, such as cerium III or europium II, when added to clear glass, cause the glass to turn an amethyst color when exposed to light. The color fades again when the light is removed.

These are, admittedly, extremely difficult conditions to meet, but perhaps "far out" goals are what we need to point the way to success. Technical, economic, and legal problems, over and beyond those mentioned, would fill an encyclopedia and would probably be more than any one man could anticipate. Nonetheless, super-roofs could some day become a reality.

Even now, such visionaries as Buckminster Fuller, with his geodesic dome to cover Manhattan, and Edward D. Stone, with his proposed New York World's Fair suspension pavilion to span one mile (engineering by Severud, Elstad, & Krueger), are impatient to probe this new frontier.





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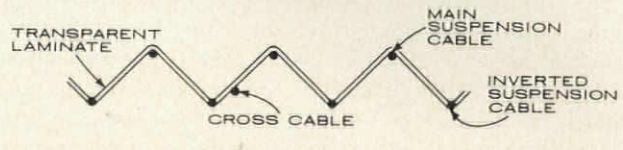

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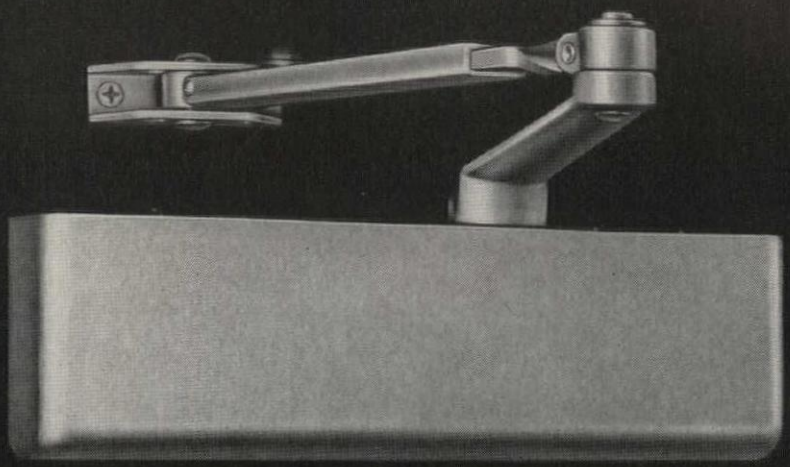

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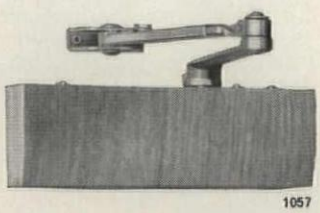

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FHA Cooling Standards

By WILIAM J. McGUINNESS

New FHA standards for unit heat gains in air-conditioned buildings, as well as a rapid method of calculating ceiling heat gain, are discussed by a practicing mechanical engineer.

If one designs a 1000-sq-ft house in a 95 F dry-bulb "design area" and expects to get an FHA-guaranteed mortgage, based upon its value, including the cost of the air-conditioning system, the heat gain may not exceed 22,900 Btu/hr. Further, the ceiling of this house may not have a summer (heat-gain, downflow) transmission coefficient greater than .08.

New Minimum Property Standards of FHA, issued in December 1962 and effective as of March 1963, establish unit heat gains that may not be exceeded. They are expressed as Btu/hr per sq ft of floor area. Under the conditions stated above, 22.9 is the value that may not be exceeded. It varies by floor area and by dry-bulb design temperature from 18 to 28 Btu/hr per ft. The higher values are allowed for smaller houses (down to 800 sq ft), because they have, characteristically, a proportionately greater heat-gain rate per sq ft of floor area due to the greater ratio of exposed wall areas with respect to floor area. There is also a permissible regional variation in the allowed unit heat-gain value, as the dry-bulb design temperature varies through the four selected values of 90, 95, 100, and 105 F. Thus, an 800-sq-ft house in a 105 F locality may have a 28 Btu/hr per sq ft gain, while a 1500-sq-ft house in a 90 F region is limited to 18 Btu/hr per sq ft.

It is necessary, of course, to submit calculations to substantiate the expected hourly heat gain. The architect or builder now has the respected design standards of the Heat Gain Joint Study Group upon which to base his computations (MECHANICAL ENGINEERING CRITIQUE, NOVEMBER 1961 P/A).

To facilitate the use of these standards and to allow a careful study of the insulation to be selected, a new tool is available in the "Residential Air Conditioning Calculator" of the National Mineral Wool Insulation Association. It is based strictly upon the findings of the Joint Study Group, but is ideally arranged for the analysis and adjustment of the several components contributing to the heat gain total rate.

The Joint Study Group method has standardized a number of these components. For instance, people are assumed to contribute at a fixed rate of 300 Btu/hr per person, and a kitchen is considered to supply 1200 Btu/hr. Infiltration is established as being about one-half air change per hour.

After the above and other values have been tabulated, glass is evaluated in regard to its number of layers (single or double), its orientation, and its shading. The total of all these gains, including that through glass, may then be subtracted from the total allowed by FHA. This will give a value by which the insulative treatment of walls, roofs, and the floors above open spaces may be determined.

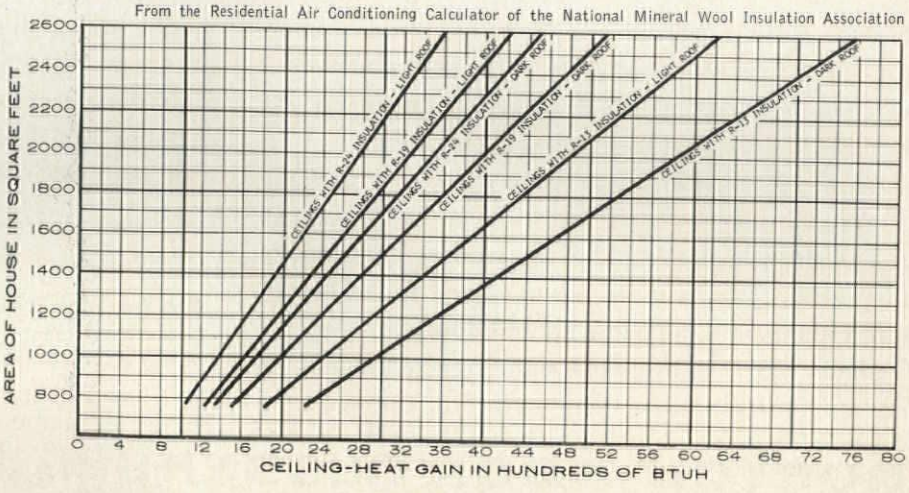
It is possible, of course, and often desirable, to do better than merely meet FHA minimum standards. It is quite usual to find that the cost of extra insulation is more than offset by the saving in the initial cost of the plant.

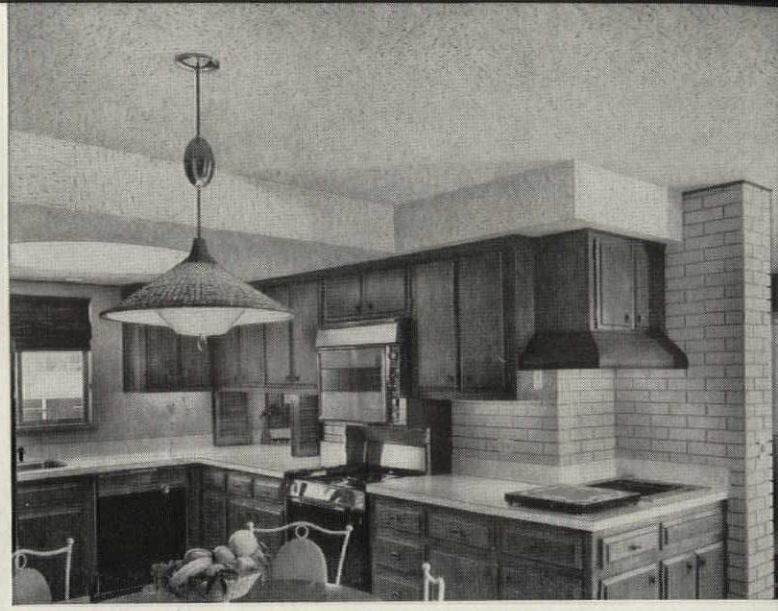
Insulation standards are now most often expressed in R values. These resistance values are the reciprocals of the corresponding C or conductance values of the batt or unit. For instance, the FHA maximum U transmission value of .08 is usually achieved by an R-13 insulating unit. It is seen that 1/13 is .077, which meets the .08 value required by FHA. The resistance values of the standard products of mineral wool insulation are 7, 8, 9, 11, 13, 19, 24. Those between 7 and 11 are appropriate for walls and fit well there. In roofs, which control the ceiling heat gain (*see graph below*), R values of 13 to 24 are usual.

Now it is possible to judge by how much the FHA goal may be exceeded in the selection of ceiling insulation. In a 1000-sq-ft house, if R-24 (with a lighter-colored roof) is used instead of the minimum of R-13 (*see graph*), there is a reduction of more than 50 per cent in the heat gain transmitted through the ceiling. Similar reductions can be made in the case of walls.

The National Mineral Wool Insulation Association will make available, for a modest fee, eight different calculators, each relating to its appropriate geographic region. The calculation method has the approval of FHA, in whose field offices it will be used, and of others, including the National Association of Home Builders.

From the Residential Air Conditioning Calculator of the National Mineral Wool Insulation Association





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Format for Building Specs

By HAROLD J. ROSEN

A review of the format for building specifications recommended by CSI is presented by the Chief Specifications Writer of Kelly & Gruzen, Architects-Engineers.

In the JULY 1957 P/A, this column cited the advantages to be gained from affixing permanent trade-section numbers to the divisions of the specifications. A total of 31 sections were listed, and is was suggested that the Construction Specifications Institute would be the proper organization to find a workable solution.

In May 1961, a tentative recommendation was prepared and presented by the Specifications Methods Committee of CSI at its fifth annual convention in New York. The method suggested was a numerical-alphabetical, division-section arrangement wherein the major division headings and numbering were fixed. Under these divisions there could be assigned, as each project required, similar trade sections that were related to these divisions by materials, trade functions of work, or place relationships. These trade sections would be listed by the division number and by an alphabetical suffix that would permit flexibility.

At the April 1963 annual convention of CSI in Detroit, the CSI Format for Building Specifications, approved by its board of directors, was presented to the membership as a recommended practice. In addition, the AIA board of directors has accepted the format.

The following is the format recommended for building specifications:

BIDDING REQUIREMENTS
CONTRACT FORMS
GENERAL CONDITIONS (and Supplementary General Conditions)
SPECIFICATIONS
- Division 1—General Requirements
- Division 2—Site Work
- Division 3—Concrete
- Division 4—Masonry
- Division 5—Metals; Structural and Miscellaneous
- Division 6—Carpentry
- Division 7—Moisture Protection
- Division 8—Doors, Windows, and Glass
- Division 9—Finishes
- Division 10—Specialties
- Division 11—Equipment
- Division 12—Furnishings
- Division 13—Special Construction
- Division 14—Conveying Systems
- Division 15—Mechanical
- Division 16—Electrical

How does it work? For each specific project, the specifications writer prepares his trade sections as he did previously, except that he now places them under the fixed divisions as local trade practice or conditions dictate. The division headings are based upon the considerations of materials, trades, functions of work, and place relationship. For example, Division 4 — Masonry — is an instance of materials relationship. Section 4A could be Brickwork; 4B, Granite; 4C, Limestone; 4D, Cast Stone; etc. Division 5 is an example of trades relationship. Section 5A could be Structural Steel; 5B, Steel Joists; 5C, Metal Roof Decks; 5D, Miscellaneous Iron; 5E, Ornamental Metal; etc. Division 7—Moisture Protection, is illustrative of the function of work and could include 7A, Built-up Roofing; 7B, Sheet Metal Work; 7C, Dampproofing; 7D, Waterproofing; 7E, Skylights; 7F, Roof Insulation; etc. Division 2—Site Work—is an example of place relationship. Section 2A could be Demolition; 2B, Piling; 2C, Excavation; 2D, Paving; 2E, Landscaping; 2F, Fencing; etc.

The assignment of the trade section number and alphabetical suffix is flexible. These are determined solely by the individual specifications writer for the specific project. If, for example, he has only a handful of wood doors on his project, he may elect to put them under Division 6—Carpentry. If he has only a yard or two of concrete, he could put this under Division 4—Masonry.

It is interesting that in 1860 a "Handbook of Specifications" was written by a T. L. Donaldson of London, England, in which he recommended a similar specifications arrangement. However, because of the more primitive state of the art, his format consisted of two major divisions of work with trade sections as follows:

CARCASE	FINISHING
Excavator	Joiner
Bricklayer	Plasterer
Mason	Plumber
Slater	Painter
Founder and Smith	Glazier
Carpenter	Paperhanger
	Ironmonger
	Smith and Bellhanger
	Gasfitter

What are the advantages of this new method? In preparing his trade specifications, the specification writer need no longer be concerned whether the architect or engineer adds or deletes certain materials or trades as he develops his drawings. Previously, this meant omissions in his numbering system or the inclusion at the last moment of an item placed entirely out of sequence. Under the new system, such revisions will no longer worry him. He can write or prepare sections long before the drawings are completed, and assign numbers to them immediately. In addition, the specifications writer can now file material, shop drawings, correspondence, technical data, literature, samples, estimates, and a host of office memoranda under a similar numbering system. The contractor, manufacturer, and estimator can find more readily those items in the specifications with which he is concerned.

In time, with widespread use, the AIA will conform its Product Register to this system, along with its Standard Filing System and Alphabetical Index, and the AIA Specifications Work Sheets. The AGC can number its Estimating Work Sheet on the same basis; Sweet's Catalog Service can renumber its Architectural File; and manufacturers of building products can number their literature accordingly.

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Aesthetics and the Law: Part 1

BY JUDGE BERNARD TOMSON AND NORMAN COPLAN

In the first of three articles on the increasing recognition by the judiciary of aesthetic factors in architecture, P/A's legal team discusses a recent case in which a city ordinance was upheld on the basis of aesthetic considerations.

Judicial and legislative recognition of aesthetic values as a significant element in public policy has been an eagerly sought goal of the architectural profession and of all those who believe that beauty constitutes a valid social objective. The importance of aesthetics is often reflected in zoning ordinances and other statutes regulating the use of property, but in most jurisdictions the courts have been reluctant to validate such statutes on aesthetic grounds alone. The courts often justify zoning laws in terms of the "safety" or "health" of the community (which factors traditionally support the exercise of the police power of the state), when in reality the statute in question may be primarily aimed at aesthetic objectives. In recent months, two important judicial determinations in New York have been made involving aesthetics and the power of state, one of which (*People of the State of New York* v. *Stover*) is a large step forward in the promotion of aesthetic values, and the other (*Joseph E. Seagram & Sons* v. *Tax Commission*) may accomplish the opposite result.

In the Stover case, New York's highest court departed from precedent and unequivocably ruled that an ordinance may be upheld as a valid exercise of the police power by the municipality even though its objectives are purely aesthetic. In this case, the defendants were a married couple who resided in a 2½-story, one-family dwelling in a residential district in the City of Rye, New York. In 1956, the defendants installed a clothesline filled with old clothes and rags in their front yard as a protest against the high taxes imposed by the city. During each of the next five years, the defendants added additional clotheslines to indicate their continued displeasure concerning taxes, and hung torn clothing, underwear, rags, and scarecrows on these lines.

In 1961, the city enacted an ordinance prohibiting the erection and maintenance of a clothesline in a front or side yard abutting a street. The ordinance also provided for the issuance of a permit for the use of such a clothesline if there was a "practical difficulty or unnecessary hardship in drying clothes elsewhere on the premises." The defendant's application for a permit was denied, but they nevertheless continued to maintain the clothesline. The defendants were tried and convicted of violating the ordinance, and upon appeal challenged its constitutionality, both as an interference with free speech and as a deprivation of property without due process.

In defending the ordinance, the city, keeping in mind the traditional rule that aesthetic considerations alone would not justify the ordinance, maintained that the objective of the regulation was to provide clear visibility at street corners and thus reduce accidents, and to provide greater accessibility in the event of fires. The Court, however, casting aside past timidity, upheld the ordinance on aesthetic grounds, stating:

"Although there may be considerable doubt whether there is a sufficiently reasonable relationship between clotheslines and traffic or fire safety to support an exercise of the police power, it is our opinion that the ordinance may be sustained as an attempt to preserve the residential appearance of the city and its property values by banning, insofar as practicable, unsightly clotheslines from yards abutting a public street. In other words, the statute, though based on what may be termed aesthetic considerations, proscribes conduct which offends sensibilities and tends to debase the community and reduce real estate values.

"There are a number of early decisions, both in this State . . . and elsewhere . . . which hold that aesthetic considerations are not alone sufficient to justify exercise of the police power. But since 1930 the court has taken pains repeatedly to declare that the issue is an open and 'unsettled' one in New York. . . .

"Once it be conceded that aesthetic is a valid subject of legislative concern, the conclusion seems inescapable that reasonable legislation designed to promote that end is a valid and permissible exercise of the police power. If zoning restrictions 'which implement a policy of neighborhood amenity' are to be stricken as invalid, it should be, one commentator has said, not because they seek to promote aesthetic objectives' but solely because the restrictions constitute 'unreasonable devices of implementing community policy.'"

In rejecting the contention of the defendants that the ordinance in question restricted their right of free speech, the Court pointed out that the prohibition against clotheslines was designed to proscribe conduct that offends the sensibilities and tends to depress property values and bore no necessary relationship to the dissemination of ideas or opinion. It was obvious, said the Court, that the value of the defendants' protest "lay not in its message but in its offensiveness."

In a dissenting opinion, one member of the Court contended that zoning, unrelated to health or safety, compels conformity and could become "a legalized device to prevent property owners from doing whatever their neighbors dislike." The dissenting justice stated:

"To direct by ordinance that all buildings erected in a certain area should be one-story ranch houses would scarcely go beyond the present ruling as a question of power, or to lay down the law that they should be all of the same color, or of different colors, or that each should be of one or two or more color tones as might suit the aesthetic predilections of the city councillors or zoning boards of appeals. . . ."

In next month's column we will discuss the Seagram case, which has aroused concern in architectural circles.

For more information, circle No. 331 ➤

IN ATLANTA
A BUILDING TO REMEMBER

Georgia's new State Archives and Records Building—the latest addition to the state government complex in Atlanta—is a model of grace and beauty in architectural design. Even more important, it is a structure designed to endure for ages—to preserve the state's priceless historical records for countless generations to come.

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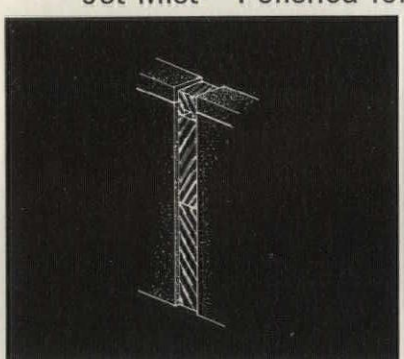

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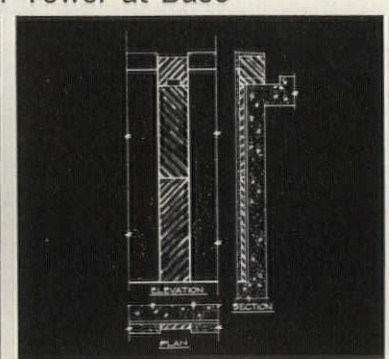

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Transparency in primeval and contemporary art: Chapel of the Mammoths, Pech-Merle, southern France; and an engraving by Georges Braque.

Photo: Herdeg

Giedion Opens New Vistas

By PAUL ZUCKER

THE ETERNAL PRESENT. VOLUME I: THE BEGINNINGS OF ART *by Sigfried Giedion. (The A. W. Mellon Lectures in the Fine Arts, 1957.) Published by Bollingen Foundation, New York. Distributed by Pantheon Books, 22 E. 51 St., New York, N.Y. (1962, 588 pp., illus. $12.50). Reviewer is Professor of Art at Cooper Union.*

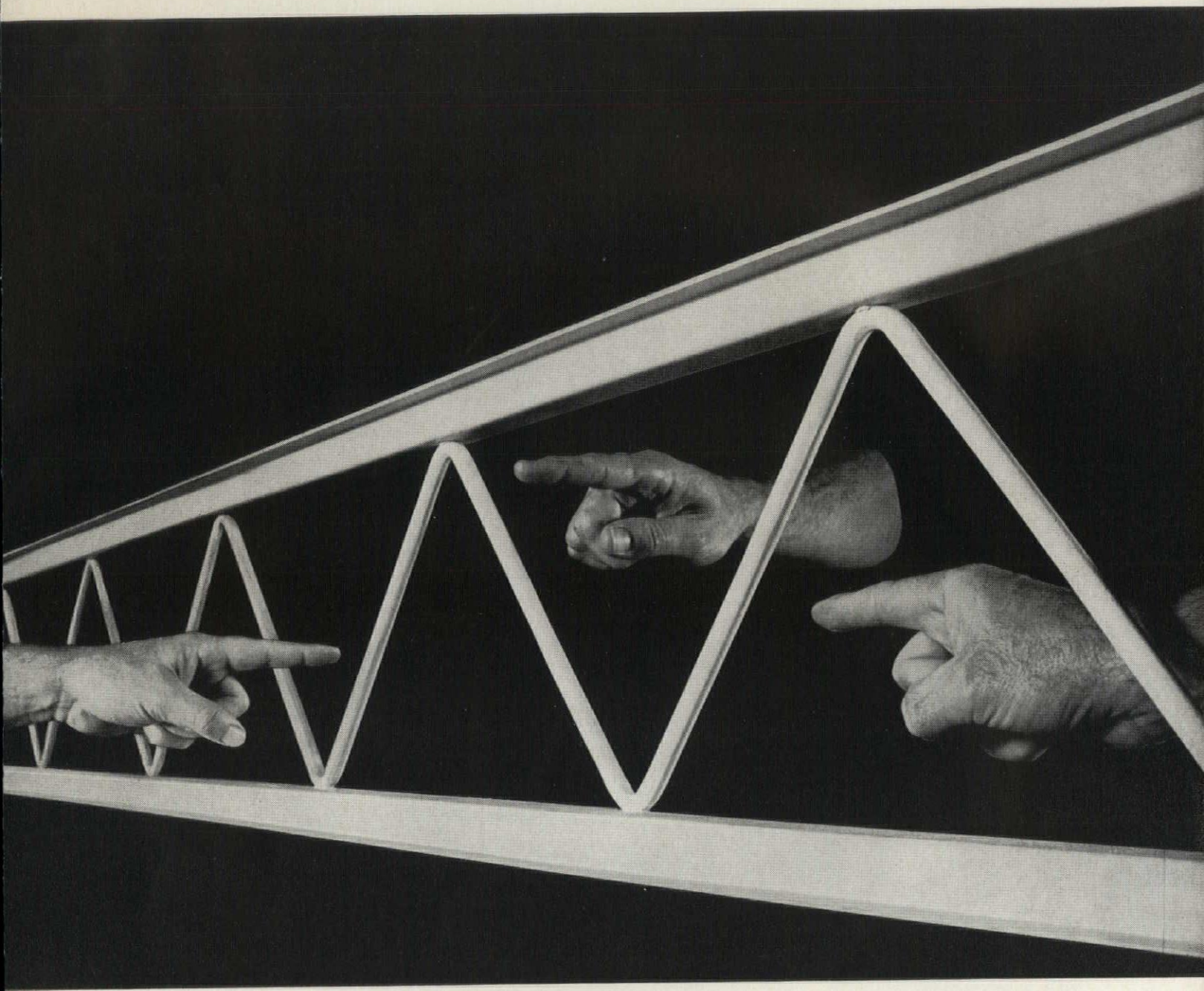
A geologist, a paleontologist, an archeologist, an ethnographer, a sociologist, a psychologist, and an art historian have banded together to write this book, and the name of them all is Sigfried Giedion. The wealth of information he draws on from each of these spheres is breathtaking—some of it new, some of it based on the discoveries of numerous scholars over a period of almost a century. It follows that no one, with the exception of specialists in these respective fields, could dare review such a compendium critically; this is even more true of the reviewer writing for an audience of architects, who will mostly be interested in Giedion's conclusions regarding the general development of art.

However, Giedion's findings are so basic to an approach to the development of art and architecture, his comparisons between modern and primitive art so striking, that it will certainly open new vistas even to those who, like most architects, are unaccustomed to historical thinking. Giedion, after all, began his career as an architectural historian, and it was his *Space, Time and Architecture* that made his name known in this country. Already at that time, in 1941, he emphasized that "history is not a compilation of facts, but an insight into a moving process of life." And as far apart as these two books are in content, they are based on the same philosophy.

To introduce the reader to his way of thinking, Giedion begins *The Eternal Present* by establishing two phenomena that seem basic to him: first, that the human organism confined by nature can be regarded as constant; and second, that "the relations between man and his environment are subject to continual and restless change." There exists no static equilibrium between these. He agrees with Herbert Read and Wilhelm Worringer (the latter so influential during the first half of the 20th Century) that man's anxiety and fear form the deepest roots for the development of art. He also accepts Salomon Reinach's theory about magic as the decisive spark for the beginnings of art. To Giedion, the symbol and the animal, so closely related, represent the most relevant factors. It was not till the end of the Paleolithic era that the animal was dethroned by man, who until then had considered himself inferior to and less beautiful than the animal. Finally and most decisively, Giedion believes that "the all-embracing quality of any art is how man experiences space; space conception." This is the hypothesis, of course, that connects *Space, Time and Architecture* with *The Eternal Present,* and is the reason for bringing the new book to the special attention of architects.

Although this reviewer has found it necessary to quote Giedion almost verbatim in order to explain his basic ideas, such an approach would be impossible for a 500-page volume. We therefore propose to emphasize those statements that seem to us of greatest importance for the development of art in later historical periods. Giedion emphasizes that primeval art is never naturalistic, and that naturalistic art had never existed in prehistory. This thesis has been generally acknowledged for some time, but it is nevertheless reassuring to have it documented by more than 350 illustrations in this volume. Giedion is thus able to show us similarities and differences between the abstract art of prehistoric and modern times. Transparency and superimposition of bodies, found in almost all cave drawings, were motivated by the concept of "simultaneity in time," which seems to have been the characteristic outlook of primitive man. For us,

Continued on page 183



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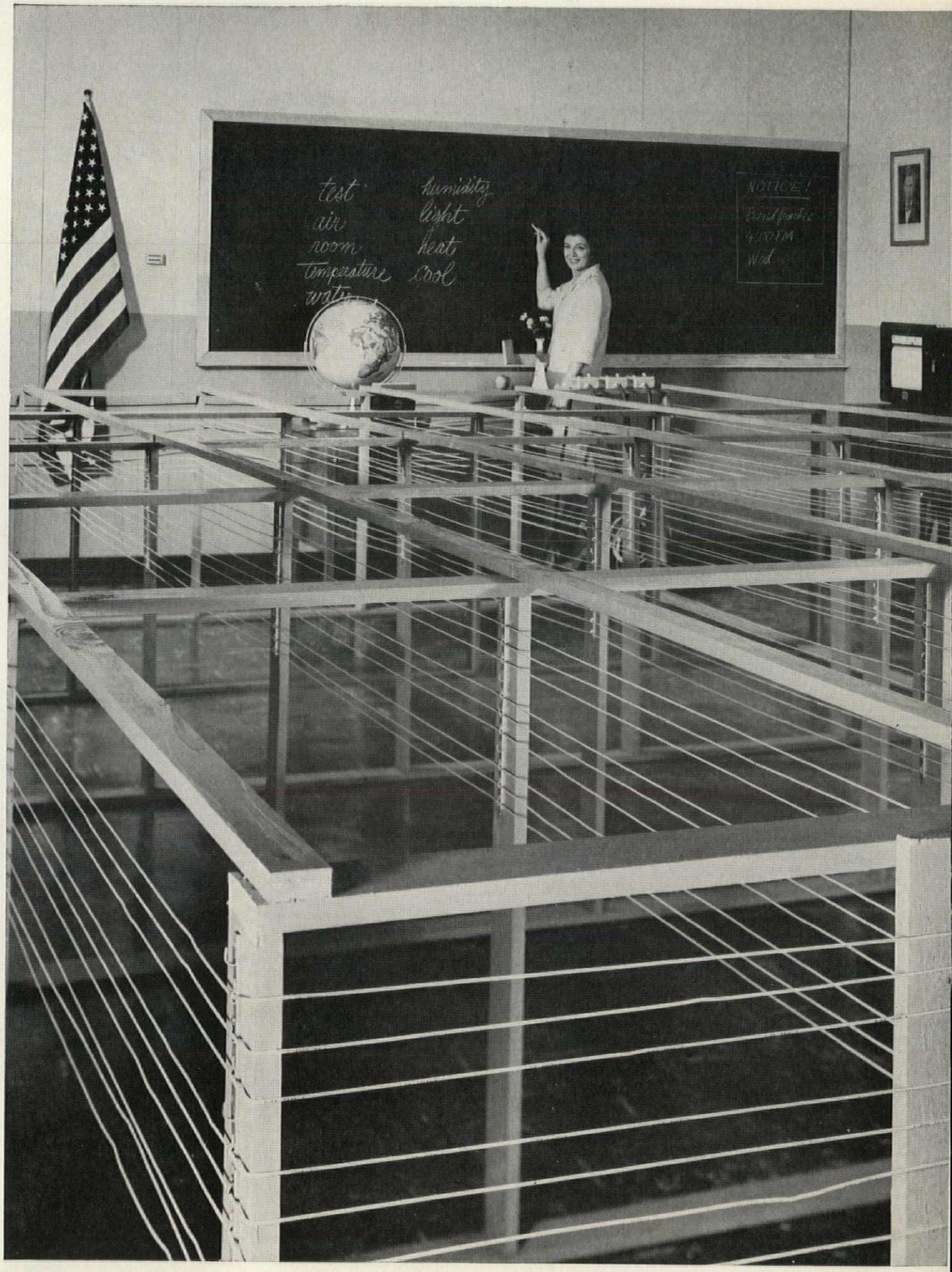
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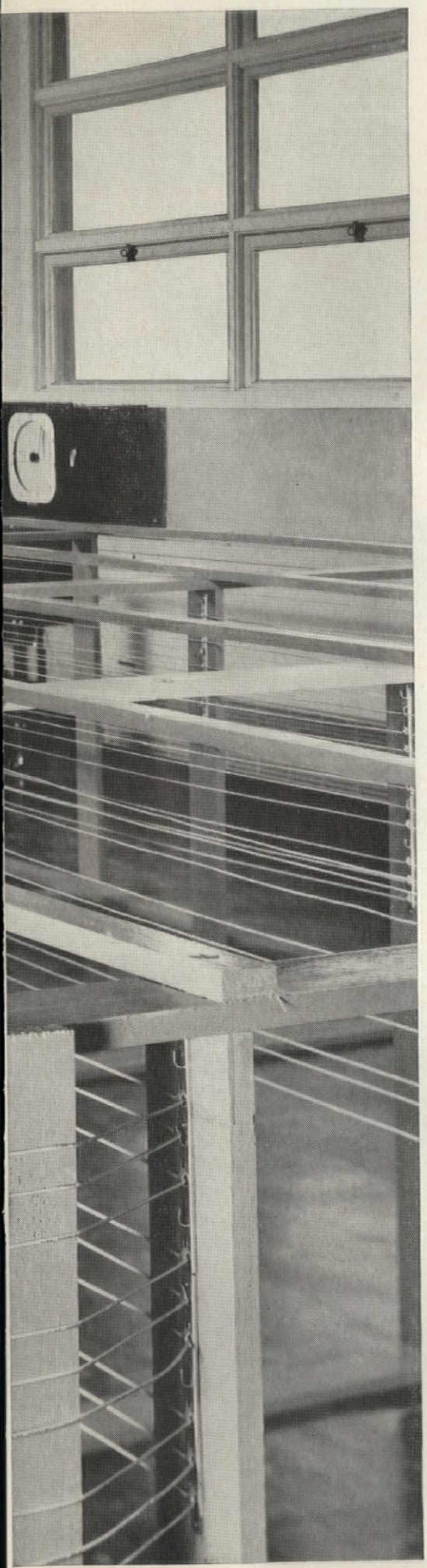

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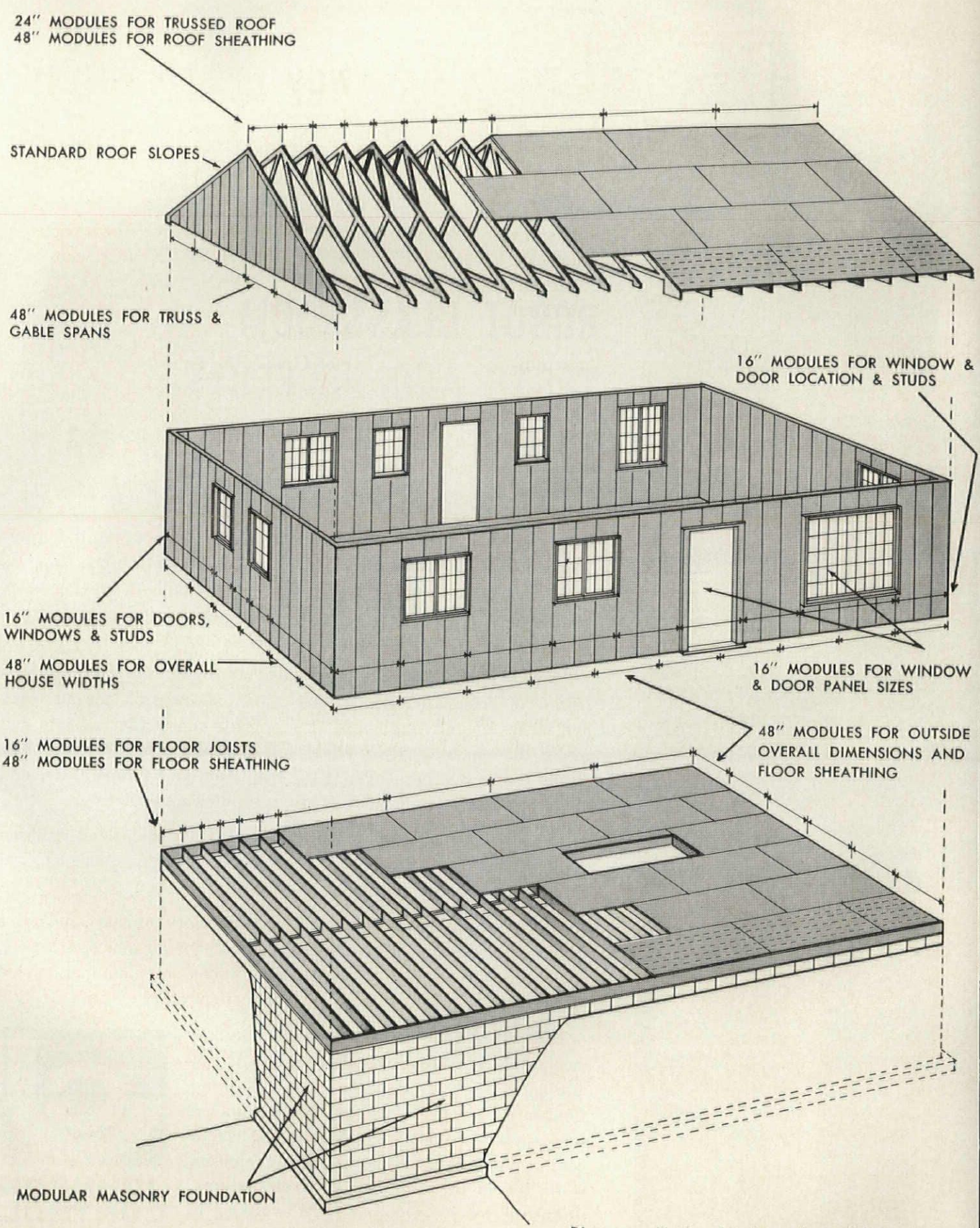

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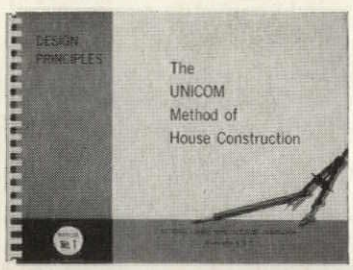

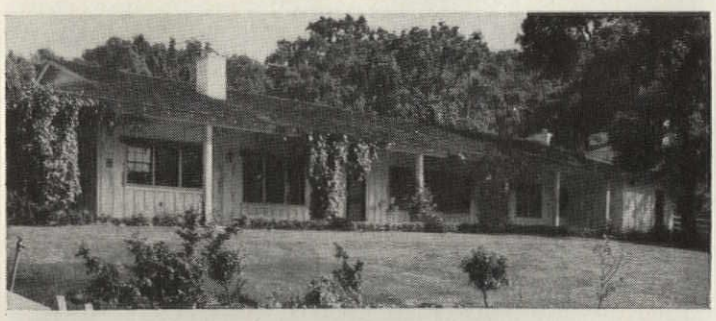

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Continued from page 182

still chained to 19th- and early 20th-Century rationalism, this may be difficult to understand. Yet today, one at least dares to protest against the monopoly of the Darwin-Spencerian tenet of automatic progress. The beginnings of truly modern art coincided with the annihilation of rational materialism in aesthetics.

The investigation of symbols was already started in the mid-19th Century by J. J. Bachofen, but his findings were accepted only after 1900:

> "Earthly events are knotted to the cosmic. They are its telluric expression. It was the universal, fundamental belief of the ancient world that earthly and heavenly phenomena obeyed the same laws and that a great harmony permeated perishable and imperishable alike."

This outlook is for Giedion the very *leitmotif* of his research.

A review as short as this one does not allow us, unfortunately, to follow Giedion's analysis of the symbol in primeval art; of hands as a magic symbol; of the meaning of specific round forms (cupules); and especially of fertility symbols, Venus forms, masks, and hybrid figures.

For architects, of course, Giedion's discussion of space conception in prehistory is the most challenging part of the book. The sense of space—the awareness of visual space as empty, and thus the awareness of undisciplined freedom—developed quite obviously prior to the sense of time. Some scholars claim to have found specific proportions in the depiction of animals, findings that this reviewer, however, considers rather artificially constructed. It should not be forgotten that prehistoric man did not live in caves but was sheltered by overhanging rocks or trees. Caves always meant something special, sacred, their walls multiform as they had grown, and thus they stimulated the first man-shaped forms of primeval art, imbedded in nature. The change was brought about by the early high civilizations of Sumer and Egypt; the unlimited number of directions was replaced by relation to a single one: the vertical.

Giedion finally concludes that "abstraction, transparency, and symbolization are constituent elements of prehistoric as well as of contemporary art." The first part of this statement, so well documented throughout the book, can be accepted without reservation, all the more so since only the expert would be able to contradict special findings.

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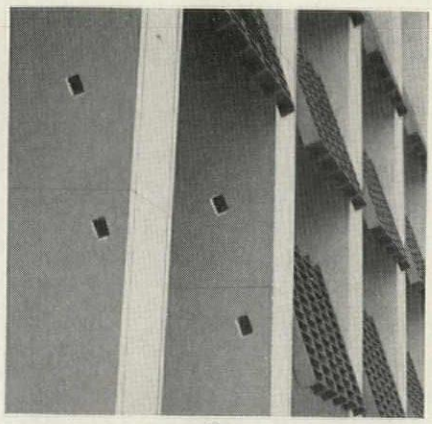

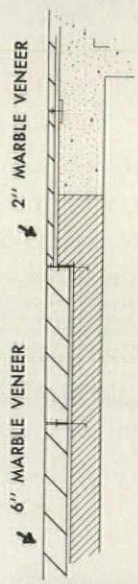

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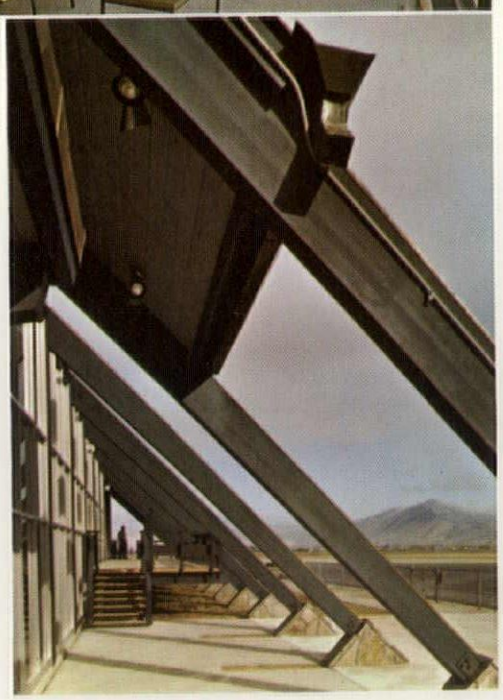

Architect: Norman Hamill & Associates, A.I.A.

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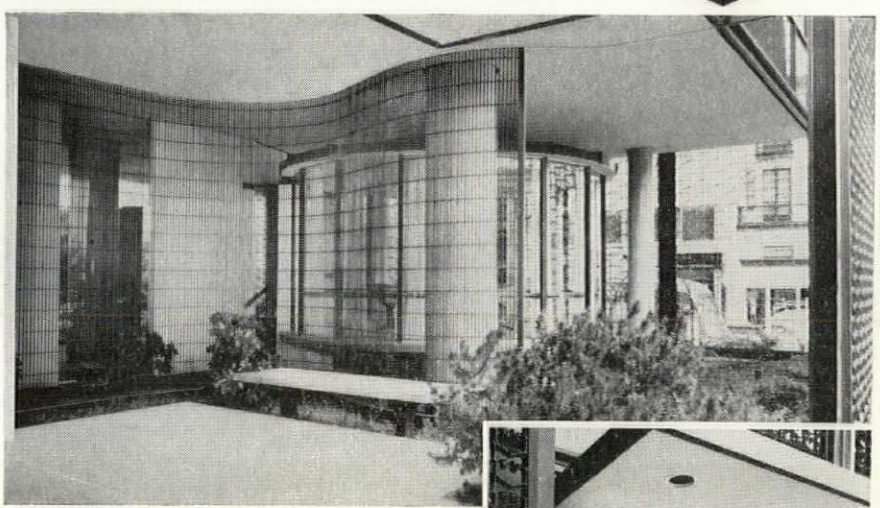

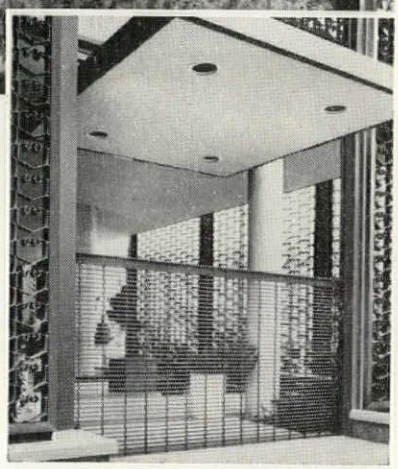

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Continued from page 190

ously, smoke can be as dangerous as flames; it is therefore important to use with care plastics that give off smoke, as well as those that produce hydrochloric acid.

In the section on fire-retardant treatments, architects and interior designers will find much to be kept in mind when preparing specifications. For example, impregnated wood loses its effectiveness in as little time as six months, when installed in environments of high humidity or when exposed to the weather. Yet if the impregnation is followed by a couple of coats of good house paint, an effective life of more than 10 years is not unusual.

Even the statistics in this handbook suggest desirable actions. For example, much of the loss of life in residential structures—even in small, single-family homes—is a direct result of sleeping occupants failing to awaken to their danger before being overcome by fire gases, or before the way of escape is blocked by flames. The precaution to be taken by the architect or engineer is clear and simple: provide a danger signal as a standard installation for all new residential buildings. The cost is nominal, the watch-dog effect perhaps priceless. Signal suppliers, if they are on their toes after reading this handbook, will initiate installations for existing buildings as well as new ones.

If the designers of the Hartford Hospital had had reference to this book a dozen years ago, there is no doubt that the wide-open space above the ceiling that spread flames in the 1961 fire would have been fire-blocked, and many now dead might still be alive.

ROBERT H. EMERICK
Consulting Mechanical Engineer
North Charleston, S. C.

Needed: The Fourth Dimension

SITE PLANNING *by Kevin Lynch. Published by The MIT Press, Cambridge, Mass. (1962, 248 pp., illus. $8)*

Kevin Lynch's first book, *The Image of the City*, published in 1960, has already achieved a high place in the literature of architecture and urban design. It made a fundamental contribution to the theory of urban design. The criterion of "imageability" was applied to the form of the city and its districts, nodes, edges, and paths. The "image" and its qualities has become a common concern, almost a method of working, transcending a narrow definition of city planning, land-

Continued on page 200

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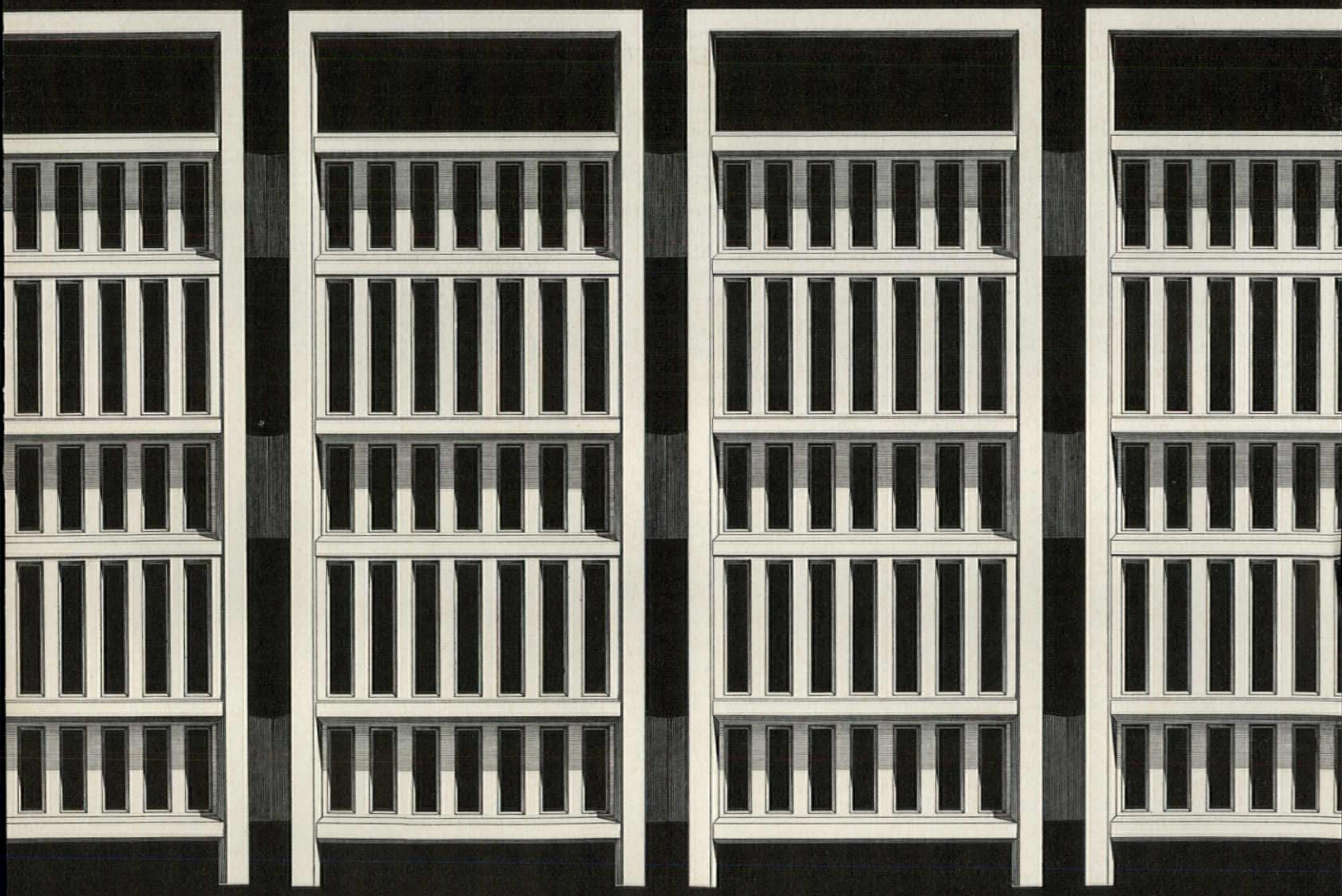

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Continued from page 196

scape architecture, and architecture.

It is small wonder that Kevin Lynch's second book, *Site Planning*, should give rise to high hopes on the part of his large following. Unfortunately, the second book does not contain much original work or insight to match Lynch's other contributions. It is, instead, a summation of experience and techniques in contemporary practice, and is mostly concerned with details. The text grew out of notes for a course in site planning and retains the advantages and limitations of an introductory textbook.

Site planning, according to Lynch, is the art of arranging the external physical environment in complete detail, according to one design, by one agency, in one process, and subject to "unified and complete control." Site planning is thereby distinguished from city planning and urban design, "where control is incomplete and development is never terminated." Examples of this limited definition of site planning are: Bath's Royal Crescent, Baldwin Hills Village, and the Imperial Palace in Peking.

Lynch deals with site planning as a three-dimensional art, but separates it from the four-dimensional art of urban design and its concern with the growth of form through change, adaptability, and development. If Lynch had addressed himself to the relationship between site planning (as the organization of the physical environment up to the largest scale in which it can still be subject to unified and complete control), and the process of growth and form (which gives continuity of site planning, relating individually stable units to each other in space and time), his second book would have been a sequel to his first.

Site Planning is divided into two sections, the first on "Fundamental Technique," and the second on "Detailed Technique." The chapters on detailed technique are short introductions to the design of utility and street systems, planting, and special site planning problems. These sections will serve as introductions to handbooks and other reference materials, but they do not themselves contain technical information in any depth. For example, if one were really interested in site engineering, one would not look long in this book, but would more likely go directly to E. E. Seelye's *Data Book for Engineers* or to other site engineering handbooks. Similarly, if one were concerned about cost estimates, one would find Lynch's few pages inadequate and dated. Similar comments could be made about the designs of streets and ways, utilities and subdivisions. These sections can perhaps be most valuable if used as class notes, revised and redistributed each year.

The section on "Fundamental Technique," however, permits the real interests of Lynch to show through. Especially in the chapter on "Visual Form," there is much wisdom to be found in a few brief pages. These chapters come from Lynch's studies and other theoretical work which should be valuable to all architects. For example, it is very important to know the size of objects in the landscape, just as it is important to know the size of the parts of a building. The most important formal problem is scale. Therefore, it is helpful when Lynch comments:

"A few tentative quantities can be assigned to the size and proportion of external spaces. Although developed empirically in the course of direct observations outdoors, these statements seem to derive from the optical characteristics of the human eye, and from the size of the objects which are generally of greatest interest to it, i.e., other human beings. We can detect a man about 4,000 feet away, recognize him at 80 feet, see his face as

Continued on page 204

Construction Details

for LCN overhead concealed door closer installation shown on opposite page

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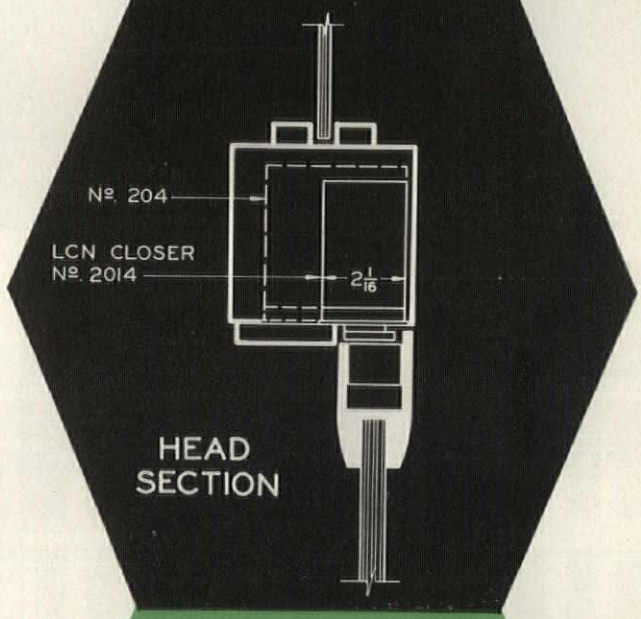

Send for comprehensive folder and see Sweet's 1963, sec. 19e/Lc, p. 6

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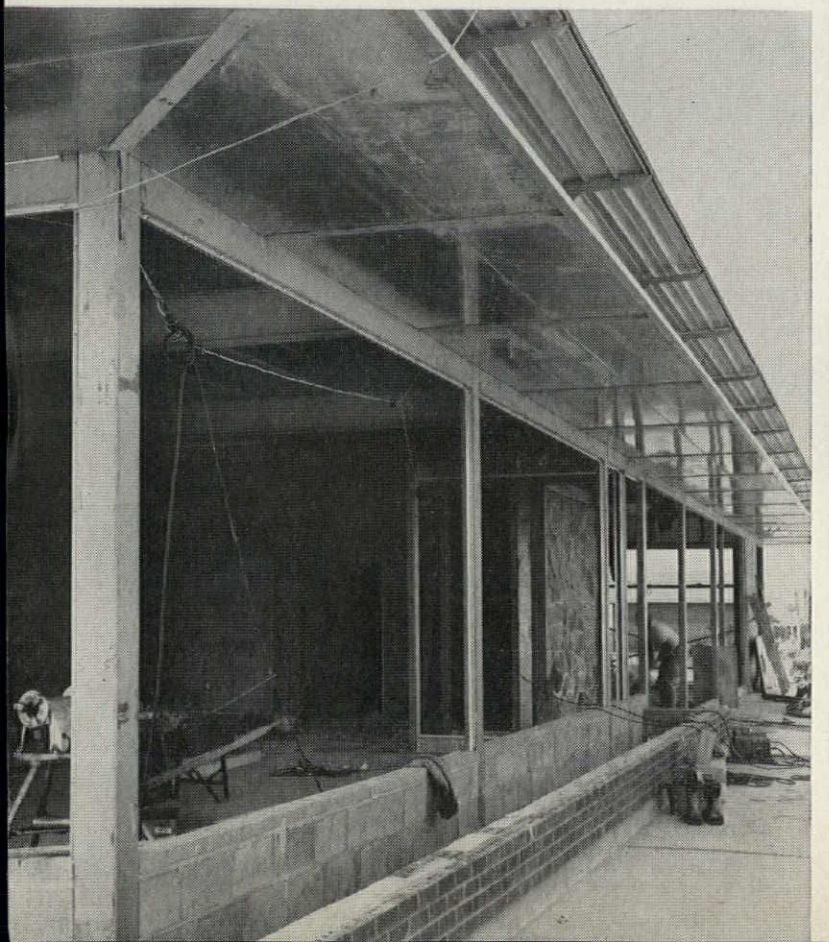

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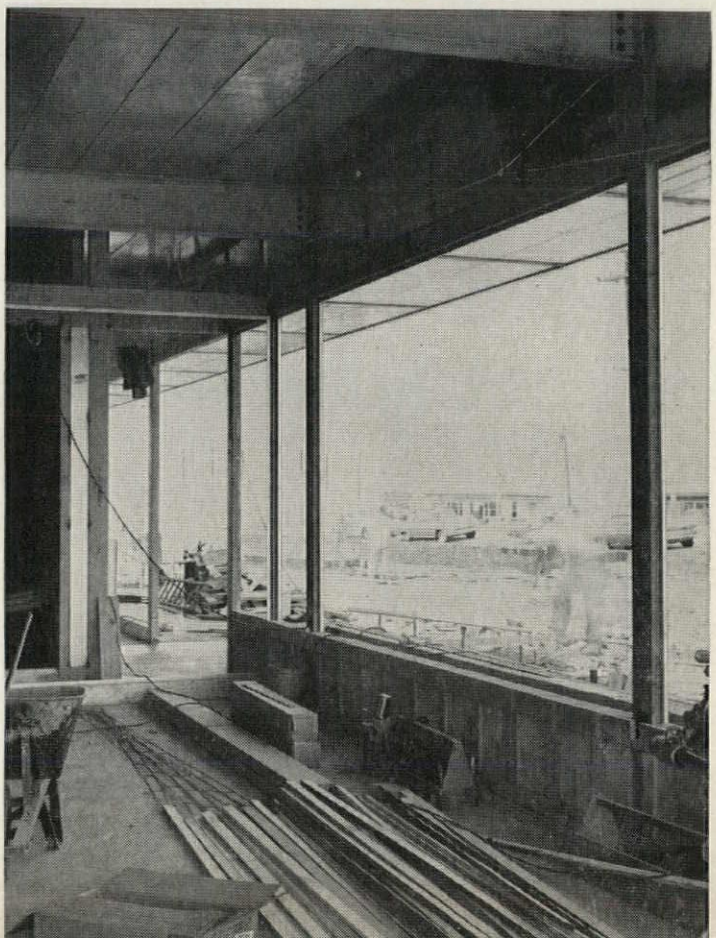

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Continued from page 200

a clear portrait at 45 feet, and feel him to be in direct relation to us, whether pleasant or intrusive, at 3 to 10 feet. Outdoor spaces of the latter dimension seem extremely or intolerably small, while dimensions of 40 feet appear intimate. Those up to 80 feet are felt to be still at an easy human scale. Most of the successful enclosed squares of the past have not exceeded 450 feet, at least in the smaller dimension. There are few good urban vistas much over a mile in length, unless they are distant panoramas seen over a featureless foreground."

Lynch warns that there is a difference between the vision of the human eye and that of the camera.

"There are limits to the angle of clear vision and to rapidity of scanning by the human eye, so that an object whose major dimension equals its distance from the eye is difficult to see as a whole, but tends to be analyzed in detail. When it is twice as far away as its major dimension, then it appears clearly as a whole; when it is thrice as far, it is still dominant in the visual field but is seen in relation to other objects. As the distance increases beyond four times the major dimension, the object simply becomes one part of the general scene. Thus, it is often said that an external enclosure is most comfortable when its walls are one-half or one-third as high as the width of the space enclosed. While, if the ratio falls below one fourth, the space ceases to seem enclosed."

Spatial observations such as these, tentative though they be, are worthwhile recording. As Lynch expresses it, "the sensuous experience of a site is a spatial one." On this subject, the book is fine.

The most disturbing aspect of Kevin Lynch's *Site Planning* is that it does not contribute to a better understanding of long-range site planning. Lynch claims that "form created at this larger scale in advance of a specific program has rarely been successful. We need to know far more about how it can be done." This is precisely the point. To deal with site planning as a static, complete unit is probably an anachronism. More than ever before, man needs to be able to connect things, to relate things in all dimensions, including time.

ROBERT L. GEDDES
Geddes, Brecher, Qualls & Cunningham, Architects
Philadelphia, Pa.

The Best to Date

OFFICE BUILDINGS *by Jürgen Joedicke. Published by Frederick A. Praeger, Inc. 64 University Place, New York 3, N.Y., (1962, 220 pp., illus. $15)*

After long years of frustration, the architect at last has a volume that fills a long-time need on the architecture of office buildings. Jürgen Joedicke in his book *Office Buildings* has dissected this type of structure with the skill of a master surgeon. His explanation of what makes up this type of structure is concise and complete, clear and without arbitrary solutions. He directs but never dictates. In fact, practically the only item he fails to cover is how to find a client for an office building.

Joedicke realizes that since the end of World War II the office building has been the dominating force of a gigantic construction boom. It has served as the experimental building for new types of structural and mechanical efficiency, new conditions of working efficiency.

Because of the international impact of office buildings, a staggering number of books has been written on the subject, most of which have either lacked insight into so complicated a problem or have been so fragmentary in their approach that they were of little real value to either architect or layman. On the whole, they have failed to cover the myriad facets that make up an office building and they have generally become outdated before publication.

Now, with the publication of Joedicke's book, the problem is faced and broken down into its component parts: the plan; the structure; the façade; and finally the heating, lighting, and air conditioning of office buildings.

In the chapter on "Plan," he explains the basic difference between planning for an American office building and a European one: the distinction between the office building designed for a specific tenant and one that is constructed for multiple tenancy. His information on adapting the module to these varying problems is invaluable. This chapter alone is a must for any architect engaged in the layout of office space.

In the chapter on "Structure," he discusses the potential of different types of structural systems that have been used in designing the office building. The integration of the structure and the planning module is lucidly explained, indicating how the optimum may be created.

Joedicke next approaches the cladding of the building and demonstrates the many possible ways of constructing the external walls. His illustrations here show many uses of the exterior materials (metal, glass, stone, and concrete) and, by the same token, many abuses of these same materials. Through the use of well-drawn details and photographs of buildings under construction, he provides new perception in this area.

The last technical chapter in the book deals with that portion of design and

Continued on page 208

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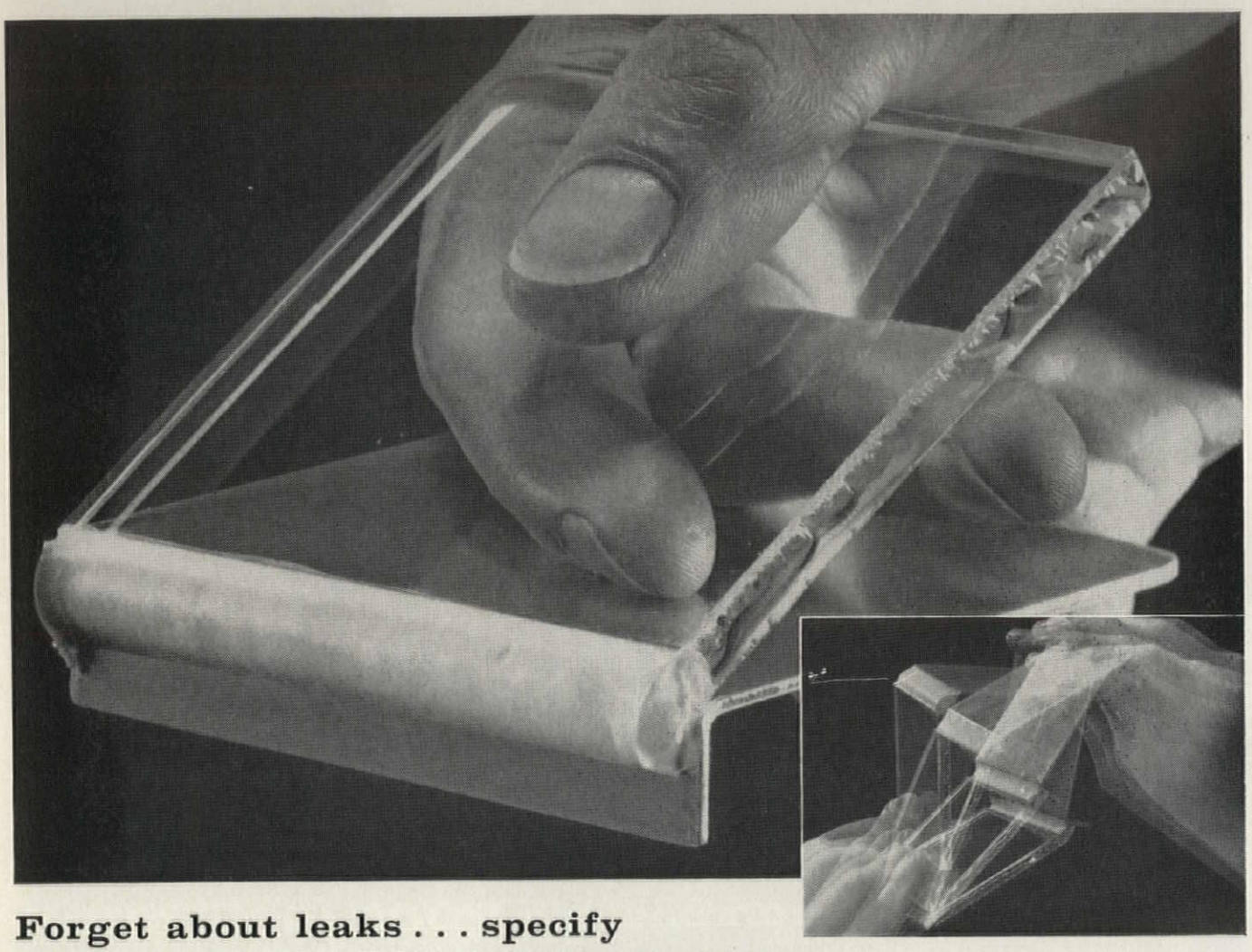

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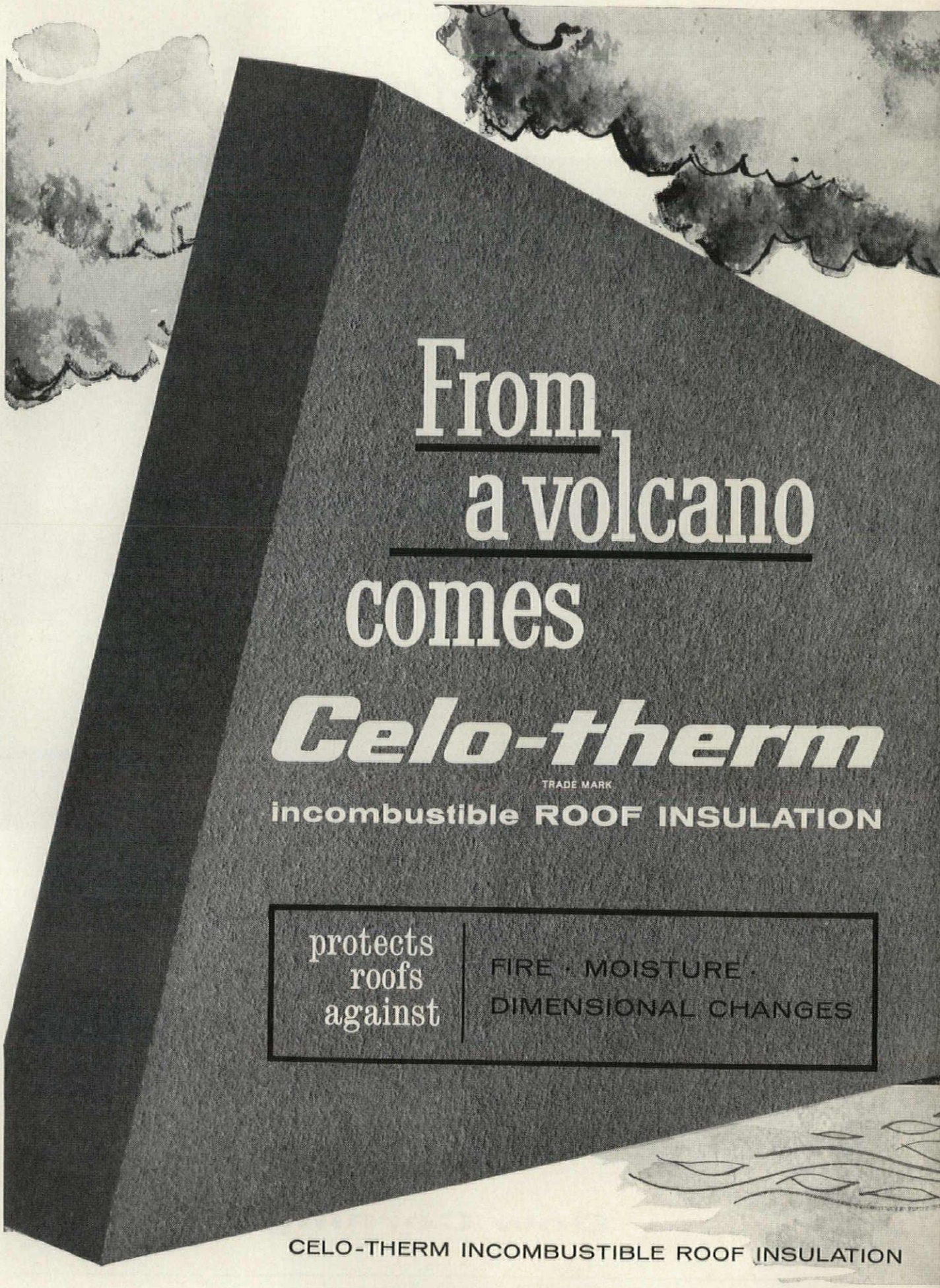
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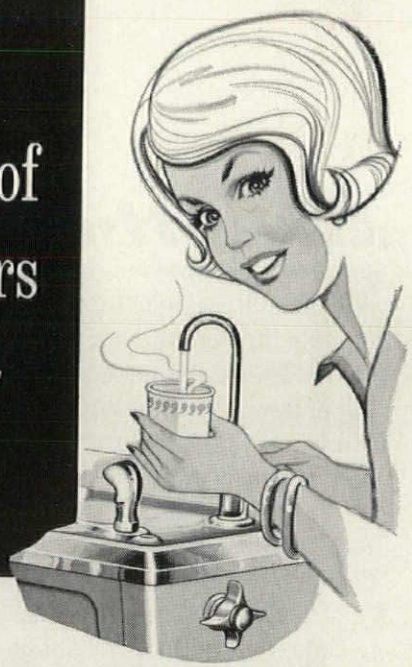

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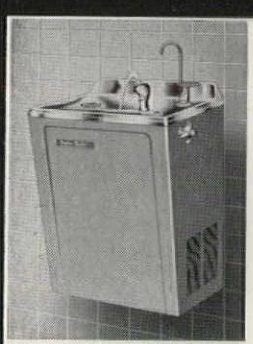

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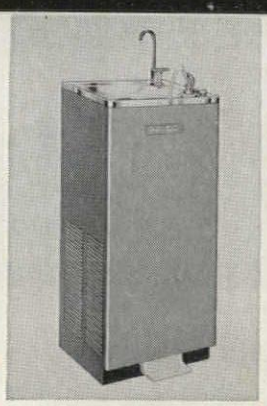

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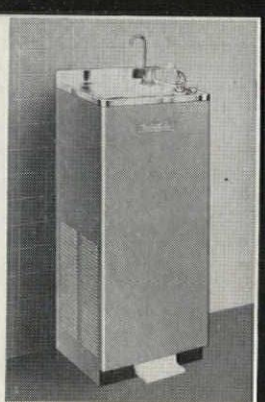

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Continued from page 204

plan that can make a building a success or a failure—how to heat, cool, and light an office building. Here again, Joedicke does not attempt to solve the problem, but his keen penetration of it indicates how a solution may be achieved.

The final section of the book is devoted to illustrations of various office buildings, and its value lies only in indicating what has gone before. Since most of these buildings have been previously published, and for the most par in greater detail, this chapter will prob ably be more useful to the student or layman than to the architect.

The book is informative, readable, and well documented. The drawings and photographs are excellent. It never becomes complicated or overly long; and the author avoids the pitfall of dwelling on any one fact until it is beaten into the ground. To date, it is the best book published on the subject, and should find a place in every architect's library. Bravo to Jürgen Joedicke for taking the time to put it all down on paper.

RICHARD ROTH, JR.
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New York, N. Y.

Agrarianism and Urbanism

CITY AND COUNTRY IN AMERICA, *edited by David R. Weimer. Published by Appleton-Century-Crofts, Inc., 35 W. 32nd St., New York 1, N. Y. (1962, 399 pp., illus., paperbound, $2.75)*

This anthology, which attempts to illustrate the main currents in agrarianist and urbanist thinking in this country since the time of its founding, as well as the various attempts during the last 50 years to develop rational syntheses embracing the best of both, is a useful and absorbing book.

It is useful because here, in one inexpensive paperback, are to be found kernel excerpts from many of the classics of town, rural, and regional planning, as well as other writings not so well known or easily available, which have been carefully chosen and arranged to carry forward the subject dialectic. Excerpts from some 30 Americans (ranging from Thomas Jefferson to Daniel Burnham, Frederick Law Olmsted, Lewis Mumford, Ralph Borsodi, Robert Moses, and Victor Gruen) form the main body of this collection, but the seminal contributions of such non-American figures as John Ruskin, Pierre L'Enfant, Ebenezer Howard, Kropotkin, Patrick Geddes, Camillo Sitte, and Le

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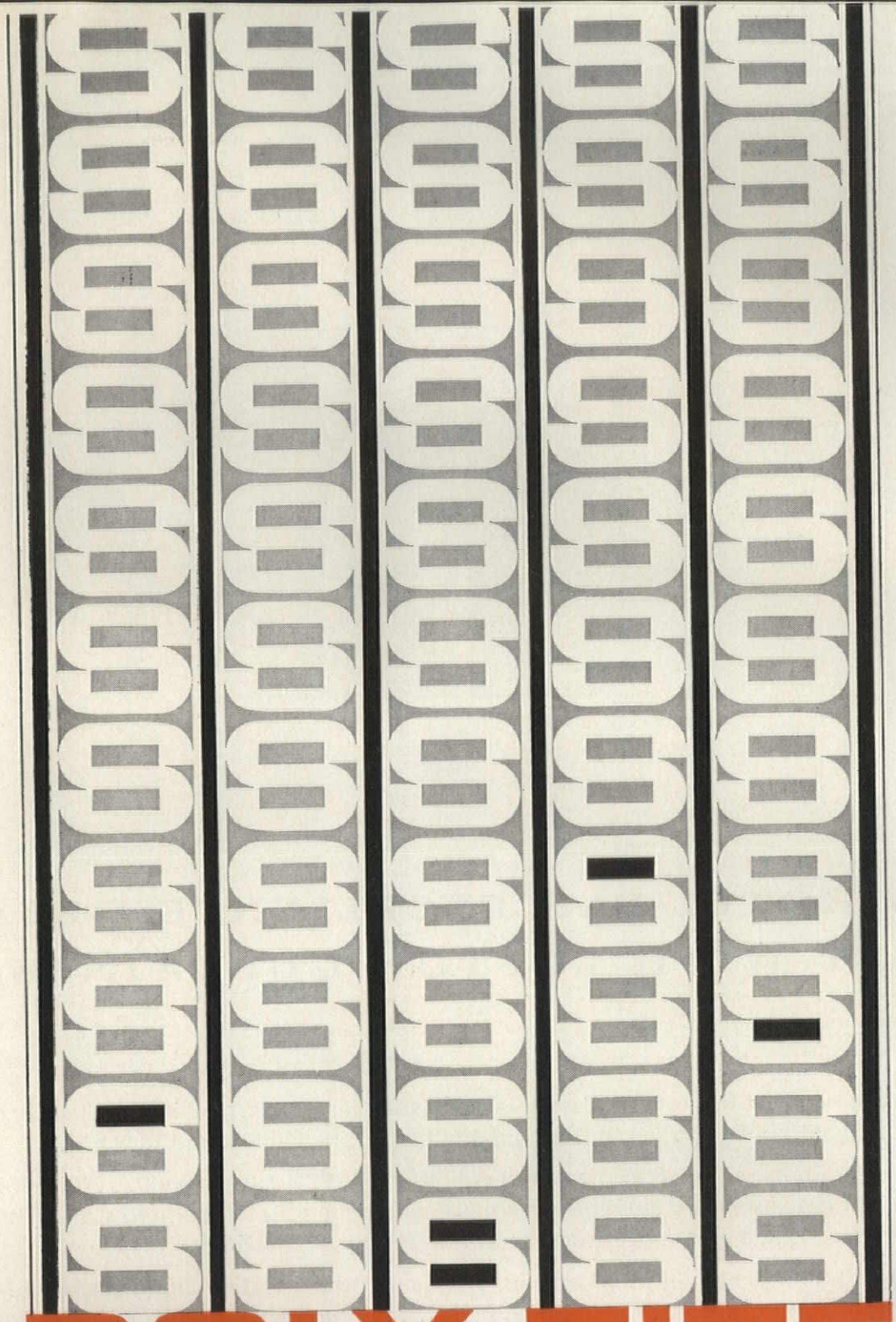

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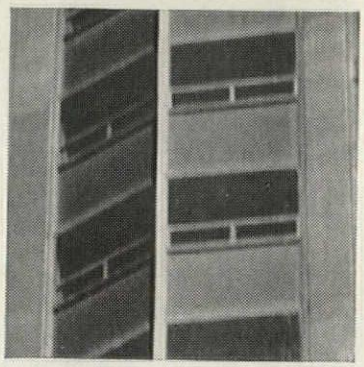
This 46-story hotel opening June 26, 1963 is owned by Rock-Hil-Uris, Inc., a joint investment of Rockefeller Center, Inc., Hilton Hotels Corporation, and the Uris Building Corporation. Architect: William B. Tabler, N.Y. Consulting Architects: Harrison & Abramovitz, N.Y. Details on this LUPTON job are in the 1963 Michael Flynn Manufacturing Co. Curtain Wall catalog.



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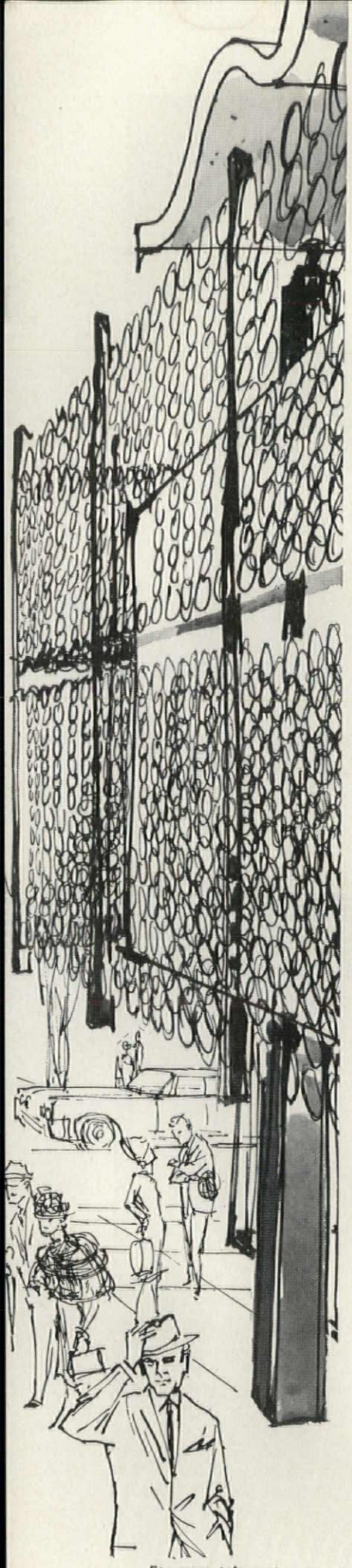

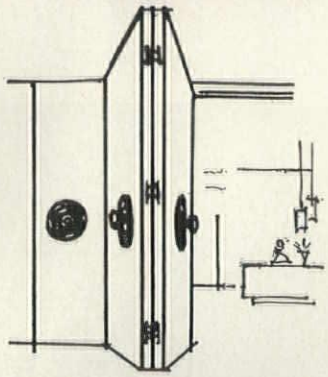

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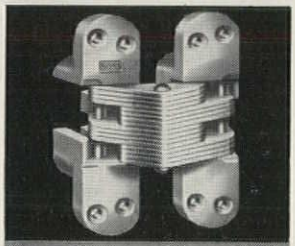

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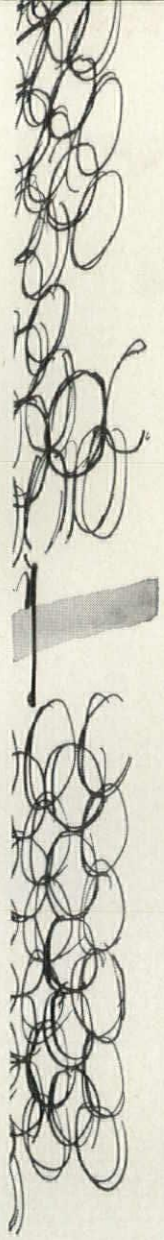

Continued from page 208

Corbusier have also been properly included. One must regret, however, the omission of American anti-urbanists such as Melville, Poe, Hawthorne, Henry James, Henry Adams, Louis Sullivan, and John Dewey, for their inclusion would have rendered more emphatic the basic agrarianism of our literary and philosophic tradition.

The very fact that our culture has become so highly urbanized, in spite of this tradition, accounts in part for the fascination of the material. But the tradition persists. Our spreading suburbs, neither rural nor urban, show this ambivalence. The great American dream, documented in Wright's Broadacre City, is the large front yard—full of grass. Our automobile is at its best in rural transport.

Needless to say, the principal problems of city living, so thoroughly documented in nearly 200 years of American criticism, remain with us today, in large part unsolved; at the same time, we increasingly sustain the loss of accessibility to the rural life valued so highly by the agrarianists. The value of this book is thus twofold. First, it helps present-day urbanists to be more intensly aware of our heritage; understanding may lead us to a new and better vision of what the city should be. Second, the book reminds us that the problems of developing an environment sympathetic to the family, to education, to individuality rather than conformity, to useful and satisfying work, and to life-enhancing communication among men, must now be solved in the urban and regional context, if it is going to be solved at all.

ROBERT G. DYCK
Associate, R. C. Weinberg & Associates
Architects and City Planners
New York, N. Y.

What's Playin' at the Roxy?

THE BEST REMAINING SEATS, *The Story of the Golden Age of the Movie Palace, by Ben. M. Hall. Published by Clarkson N. Potter, Inc., 56 E. 66 St., New York 21, N. Y. (1961, 266 pp., illus. $12.50)*

The closest re-creation of the "good old days" of the American motion picture since Gloria Swanson sashayed forth as Norma Desmond some seasons back can be seen, and possessed, in *The Best Remaining Seats.* Subtitled "The Story of the Golden Age of the Movie Palace," this book is actually a history of exhibition techniques, movie house architecture, and all-around razz-ma-tazz from the earliest nickelodeons up to the dis-

Continued on page 216

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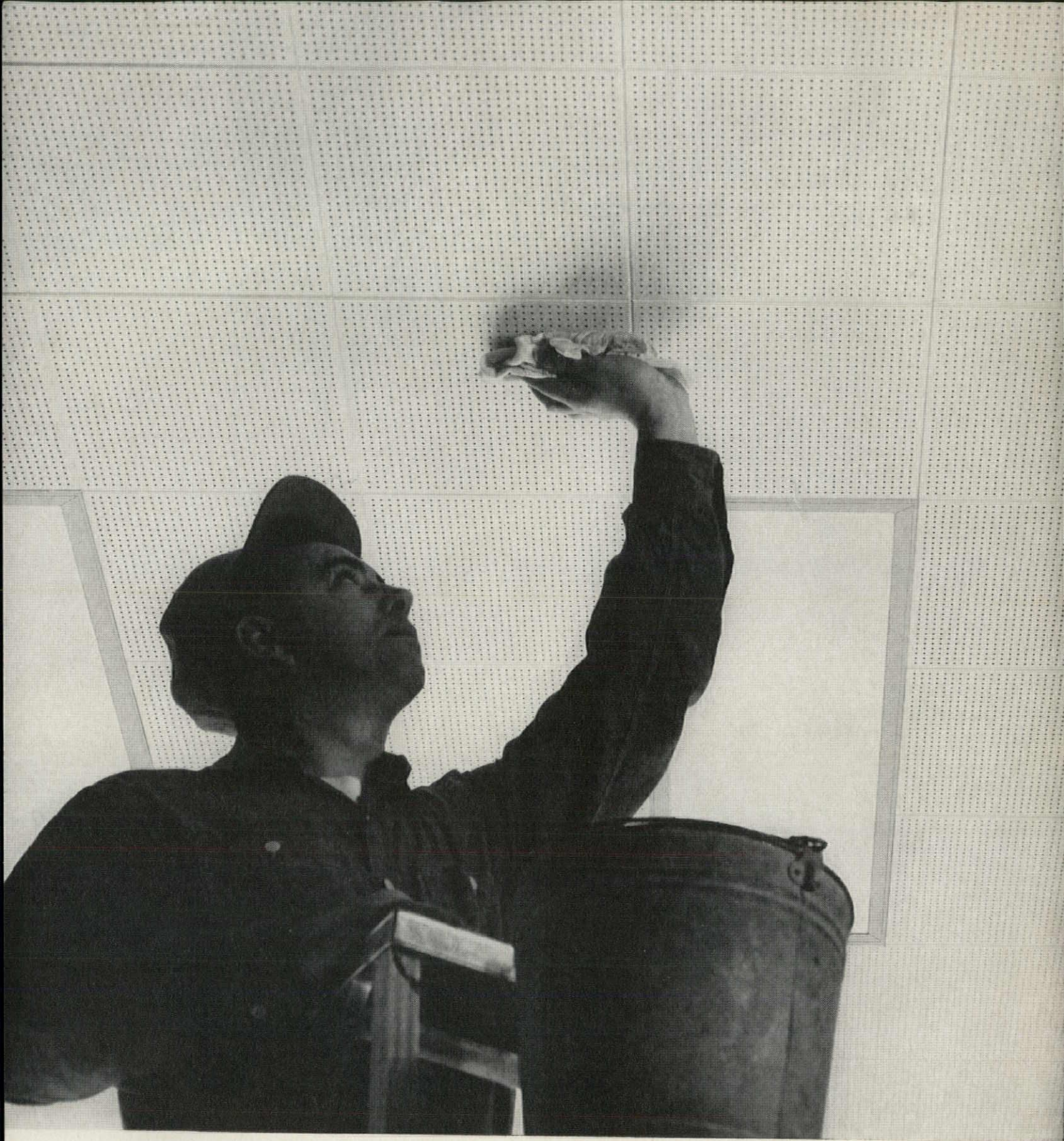

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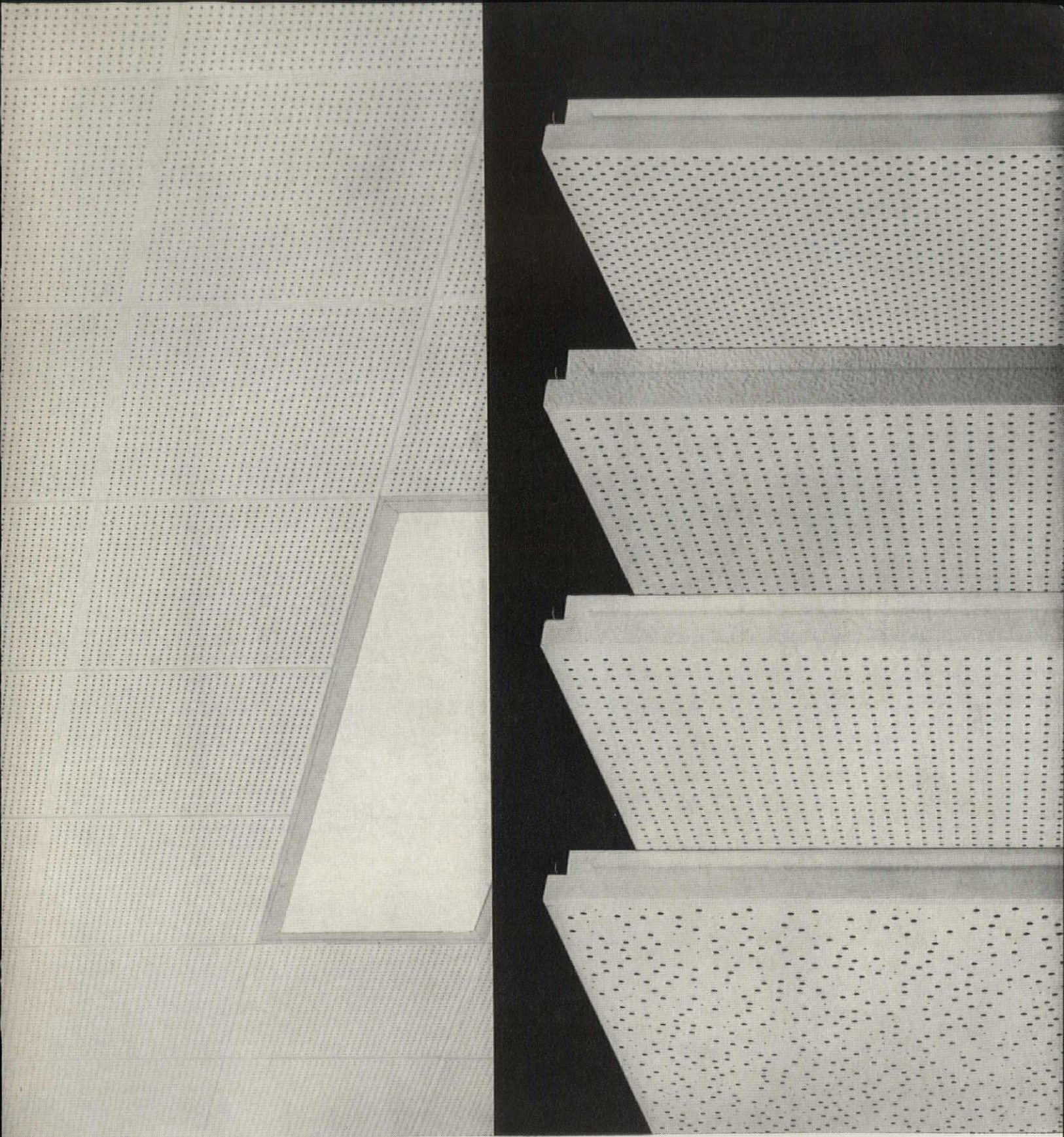

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Continued from page 212

mal day in 1960 when the wrecker's ball hit S. L. "Roxy" Rothafel's famous Roxy Theater in New York (there again, Miss Swanson was in evidence, posing amongst the ruins—her "Loves of Sunya" had opened the house in 1927).

The main emphasis in the book is threefold: on the wild Moorish-Chinese-Egyptian - Adamesque - Spanish - Italian-You-Name-It-And-We-Have-It architecture of the period; on the showmen who bought (and had no small hand in creating) the architecture and put on the shows; and on the performers who appeared on the "great stages" to the strains of the "Mighty Wurlitzers"—Major Bowes, Eugene Ormandy (yes), Jesse Crawford, Max Baer, Aimee Semple McPherson, Ruth Etting, Ken Murray, and the young Ginger Rogers.

The architects who dreamed up the hashish ornaments to house all this gallimaufry—W. W. Ahlschlager, John Eberson, Thomas W. Lamb, C. Howard Crane, Boller Brothers, Rapp & Rapp—get their just due in page after page of photographs of pleasure domes across the country (including a dandy section of Ted Kautzky's color renderings of interiors). The text is disarmingly witty.

That's what's playin' at the Roxy.

J.T.B., Jr.

OTHER BOOKS TO BE NOTED

An Architectural Journey in Japan. J. M. Richards. The Architectural Press, 9 Queen Anne's Gate, Westminster, S.W. 1, England, 1963. 192 pp., illus. 42s

To be reviewed.

Babylon is Everywhere: The City as Man's Fate. Wolf Schneider. Translated from the German by Ingeborg Sammet and John Oldenburg. McGraw-Hill Book Co., Inc., 330 W. 42 St., New York 36, N.Y., 1963. 400 pp., illus. $7.95

To be reviewed.

Brick and Tile Enginering (Second Edition). Harry C. Plummer. Structural Clay Products Institute, 1520 18 St., N.W., Washington 6, D.C., 1962. 450 pp., illus. $5

This edition, about engineering design of clay masonry structures and construction specifications covering them, was awarded Special Commendation in the 1963 Engineers' Literature Competition sponsored by the Consulting Engineers Council and The Producers' Council. The volume has been extensively rewritten to include important new developments of the past 12 years.

Brick as an Element in Design. Gerd Zimmerschied. Translated by Peggie Benton. Interbuch, Berlin, 1961. Distributed by Renouf Publishing Co., Ltd., 2182 St. Catherine St., W., Montreal 25, Canada. 189 pp., illus. $9.50

To be reviewed.

The Copyright Handbook for Fine and Applied Arts. Howard Walls. Watson-Guptill Publications, Inc., 1564 Broadway, New York 36, N.Y., 1963. 144 pp. $5.95

A presentation, stripped of legal jargon, of today's copyright laws, including their application to architecture and industrial design. Information was selected from Government publications by a past employee of the Copyright Office.

The Epic of Steel. Douglas Alan Fisher. Harper & Row, Inc., 49 E. 33 St., New York 16, N.Y., 1963. 344 pp., illus. $6.75

Man's earliest uses of metals and the Age of Iron form the background of this narrative. Steel—Bessemer's process and subsequent innovations—is depicted in detail, and an even greater transformation in the industry is predicted—both in the location of steel centers and in manufacturers' processes.

Experiencing Architecture (Second Edition). Steen Eiler Rasmussen. The MIT Press, Cambridge 39, Mass., 1962. 245 pp., illus. $7.95

Tour, via photos, of less-familiar architectural triumphs within different cultures. This comparison of the effects of solids, cavities, color, scale, rhythm, texture, light and sound is a translation from Danish.

Gardens of Japan. Tetsuro Yoshida. Frederick A. Praeger, 64 University Place, New

Continued on page 220

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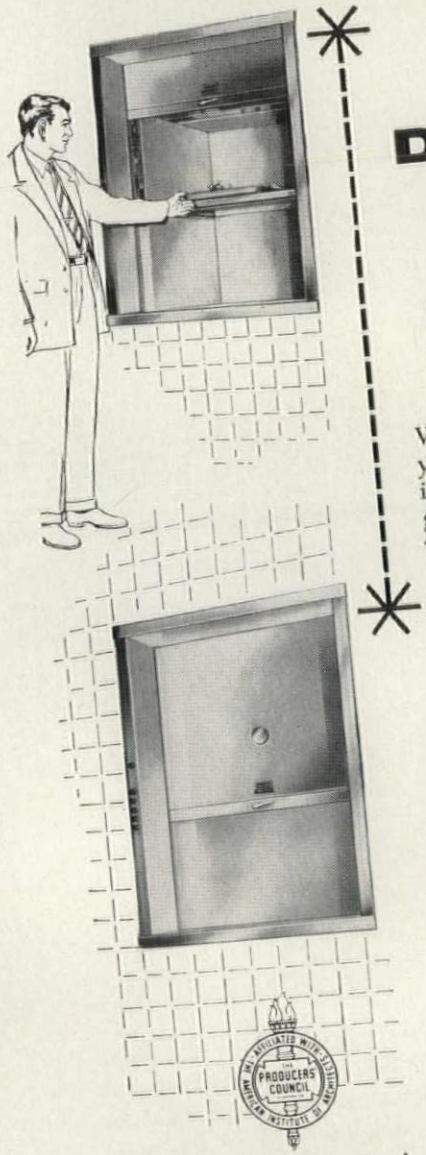

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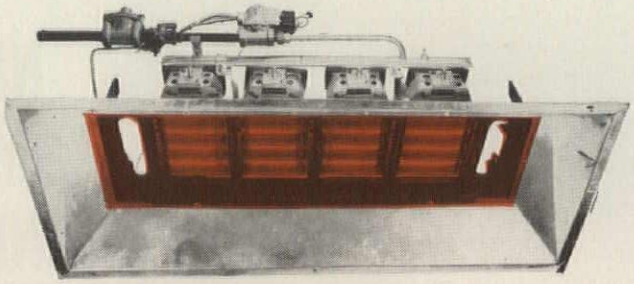

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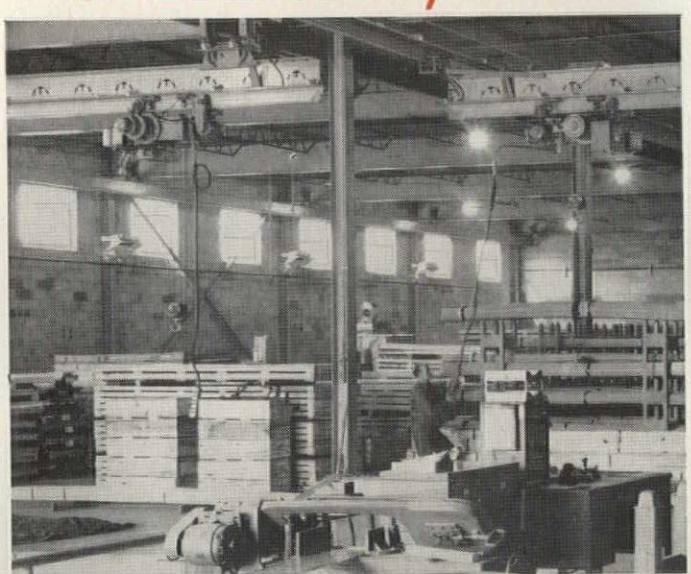

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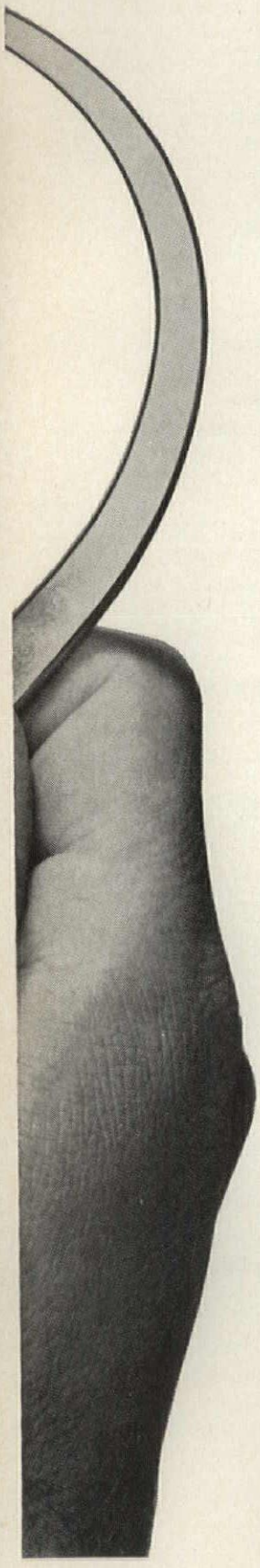

ALS proposals for new lumber standards are a forward step toward making lumber an engineered building material

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The great weakness of the present system is the requirement that dry lumber be manufactured oversize to satisfy span tables based on the lesser strength of green lumber. The new standard establishes a realistic minimum thickness for dry lumber of 1-½" and tightens up moisture content requirements.

The new standards are being circulated now as revised *Simplified Practices Recommendation 16-53*. Although Weyerhaeuser is one of the largest producers of green lumber, we support revised SPR 16-53 in the interest of architects and specifiers everywhere. We strongly urge that you write the Department of Commerce, Washington 25, D. C., now expressing your support.

Weyerhaeuser Company
Wood Products Division
Tacoma 1, Washington

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Continued from page 216

York 3, N.Y., 1963. 188 pp., illus. $12.50

Collection of photographs selected by architect Tetsuro Yoshida to illustrate Japanese garden design is a reissue of the out-of-print 1957 edition. General characteristics and history of Japanese gardening are included but the focus is on significant details.

The Good City. Lawrence Haworth. Preface by August Heckscher. Indiana University Press, Bloomington, Ind., 1963. 160 pp. $4.50

To be reviewed.

Guide to Modern Art in Europe. Junior Council of the Museum of Modern Art with Pan American World Airways. Distributed by the Museum of Modern Art, 11 W. 53 St., New York 19, N.Y., 1963. 120 pp., illus. $1.50 (paperbound)

The museum-goer in Europe can utilize this pocket guide to popular as well as little-known collections of post-1850 art. Complete data—addresses, hours, fees, descriptions, and listings of local publications—is given for 400 museums in the cities and towns of 27 countries.

Handbook of Structural Design. I.E. Morris. Reinhold Publishing Corp., 430 Park Ave., New York 22, N.Y., 1963. 803 pp., tables. $25

Tabulated structural data for architects and engineers plus technical information for general use by the construction industry. A handy reference feature: tables are at the center of the volume, where it can most easily be kept open.

NOTICES

New Branch Offices

BAKER, MOODY & FREDRICKSON, Consulting Engineers, 301 South Highland Ave., Las Vegas, Nev.

ENGINEERING SERVICE CORPORATION, 1402 Las Vegas Blvd. South, Las Vegas, Nev.

FSA INCORPORATED, 520 North Michigan Ave., Chicago, Ill.

JOHN M. JOHANSEN ARCHITECT & ASSOCIATES, 306 E. 50th St., New York 22, N.Y.

New Addresses

FRED W. BUTNER, JR., Architect, 847 W. Fifth St., Winston-Salem, N.C.

SANDERS & THOMAS, INC., Consulting Engineers and Architects, Chamber of Commerce Bldg., 121 S. Broad St., Philadelphia 3, Pa.

NICHOLAS SATTERLEE & ASSOCIATES, Architects, 1820 Massachusetts Ave., N.W., Washington 36, D.C.

TARAPATA, MACMAHON, ASSOCIATES, INC., Architects-Engineers-Planners, 1191 W. Square Lake Rd., Bloomfield Hills, Mich.

TUCHMAN, CANUTE, Architects, Southport Bldg., 88 South Portage Path, Akron, Ohio.

New Firms

ADLEMAN, COLLINS & DUTOT, Landscape Architects and Site and Planning Design Consultants, 121 North 18 St., Philadelphia 3, Pa.

ATELIER NORTHWEST, Room 103, 10306 N. E. 10 St., Bellevue, Wash.

DUNCAN GRAY, Structural Engineer, 805 15 St., N.W., Washington 5, D.C.

HICKS-CARROLL, Designers, 760 North La Cienega, Los Angeles, Calif.

MARSHAK & LEEDS, Architects, 820 South Sixth St., Las Vegas 1, Nev.

PETER MUNSELLE ASSOCIATES, 315 S. Beverly Dr., Beverly Hills, Calif.

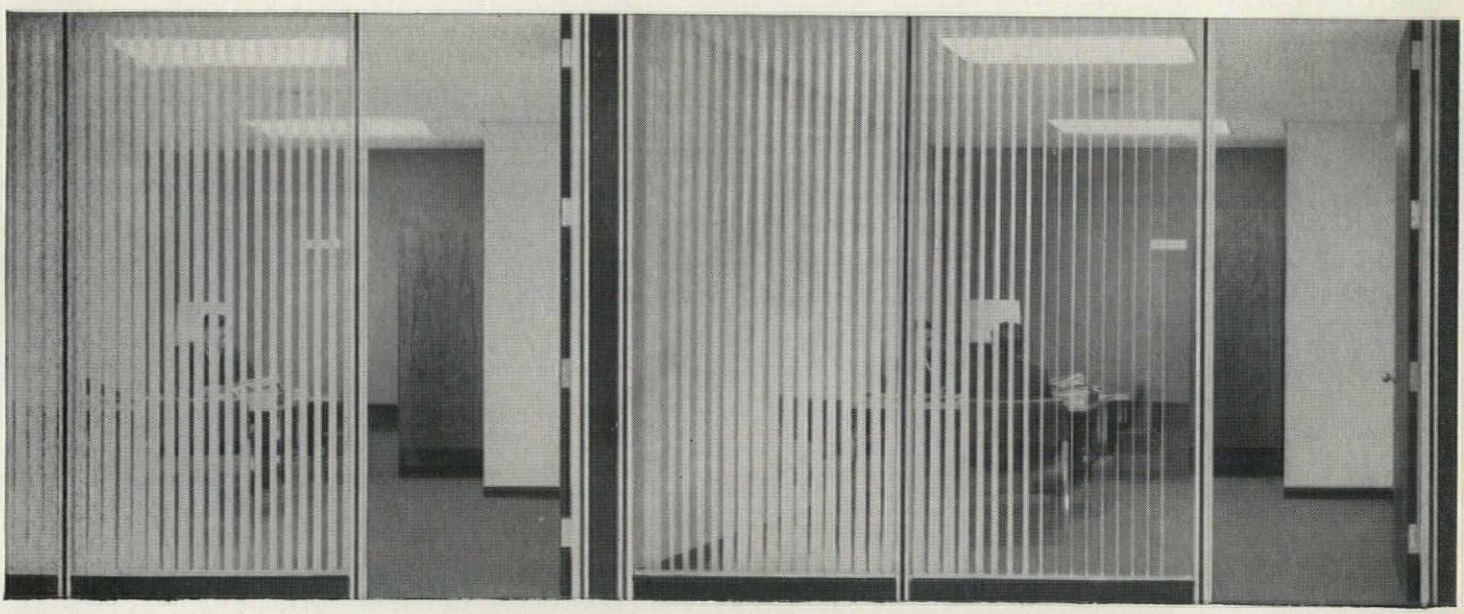
NORTHWESTERN DEVELOPMENT CO., Building Consultants, Models, Designers, Interiors, 5101 North 37 St., Milwaukee, Wis.

New Partners, Associates

MALCOLM G. DUNCAN has joined the staff of J. RUSSELL RAILEY, Orange, N.J.

GUSTAVE R. KEANE and CHARLES GATES BECKWORTH have become partners in the firm of EGGERS AND HIGGINS, New York, N.Y.

PERKINS AND WILL, Architects, announce HEM C. GUPTA, WESLEY V. PIPHER and WESLEY S. WIETING, as new Senior Asso-



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PAUL REISS, Architect, has joined the staff of RICHARD W. SNIBBE, Architect, 200 E. 37 St., New York, N.Y.

SASAKI, WALKER AND ASSOCIATES announce STUART O. DAWSON, KENNETH DE MAY, PAUL GARDESCU and MASAO KINOSHITA as new Principals; and JOHN ADELBERG, KATHERINE DEMAY, RICHARD F. GALEHOUSE, J. E. ROBINSON and RICHARD H. ROGERS, as new Associates.

LLOYD H. SLOMANSON was made Associate in the firm of FORDYCE AND HAMBY, ASSOCIATES, 717 Fifth Ave., New York 22, N.Y.

Name Changes

ALDEN B. DOW ASSOCIATES, INC., 315 Post St., Midland, Mich. Formerly ALDEN B. DOW, INC.

KURT MEYER AND ASSOCIATES, Architects, 132 S. Vermont Ave., Los Angeles 4, Calif. Formerly HAGMAN AND MEYER.

Elections, Appointments

ALLAN S. AUSTIN elected as Chairman of the Board and Chief Executive Officer and HAROLD A. ANDERSON elected President and General Manager of THE AUSTIN COMPANY, Cleveland, Ohio.

GEORGE M. FREI appointed Planning Director in Retail Development Div. of RAYMOND LOEWY/WILLIAM SNAITH, INC., New York.

HARRY GREEN appointed Director of Production in firm of CHARLES LUCKMAN ASSOCIATES, New York and Los Angeles, Calif.

JOSEPH HANDWERGER appointed Planner-Designer in firm of COHEN, HAFT ASSOCIATES, Washington, D.C.

P/A Congratulates

EDWARD L. O'NEILL elected President and Chief Administrative Officer of DAYBRITE LIGHTING COMPANY and Director of EMERSON ELECTRIC MANUFACTURING COMPANY, New York, N.Y.

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Evolution of the High-Rise Office Building

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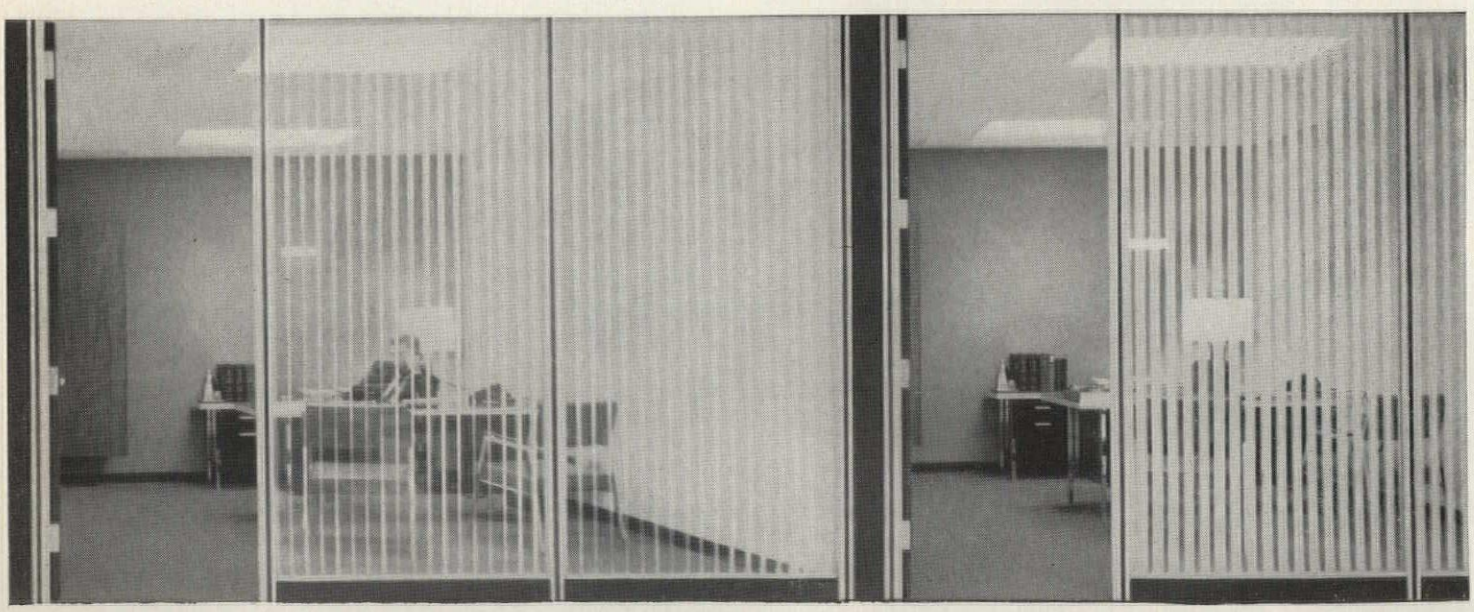
(16) Dearborn-Massar; **(17)** Hube Henry, Hedrich-Blessing; **(18)** Dwain Faubion; **(19)** Hedrich-Blessing.

PAGES 156-157
(21) Joseph W. Molitor; **(22)** Morley Baer; **(23)** Robert E. Dick Studio; **(24)** Hedrich-Blessing; **(25)** Maris, Ezra Stoller Associates.



ll-to-wall-to-wall-to-wall-to-wall carpeting in an office building?

problems and is non-allergenic.

Its initial cost isn't as much as you might think. And the big thing: luxurious carpets made with Acrilan are economical to maintain.

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Turn the page to see another interesting installation of Cabin Crafts carpet made with 80% Acrilan acrylic, 20% modacrylic pile.

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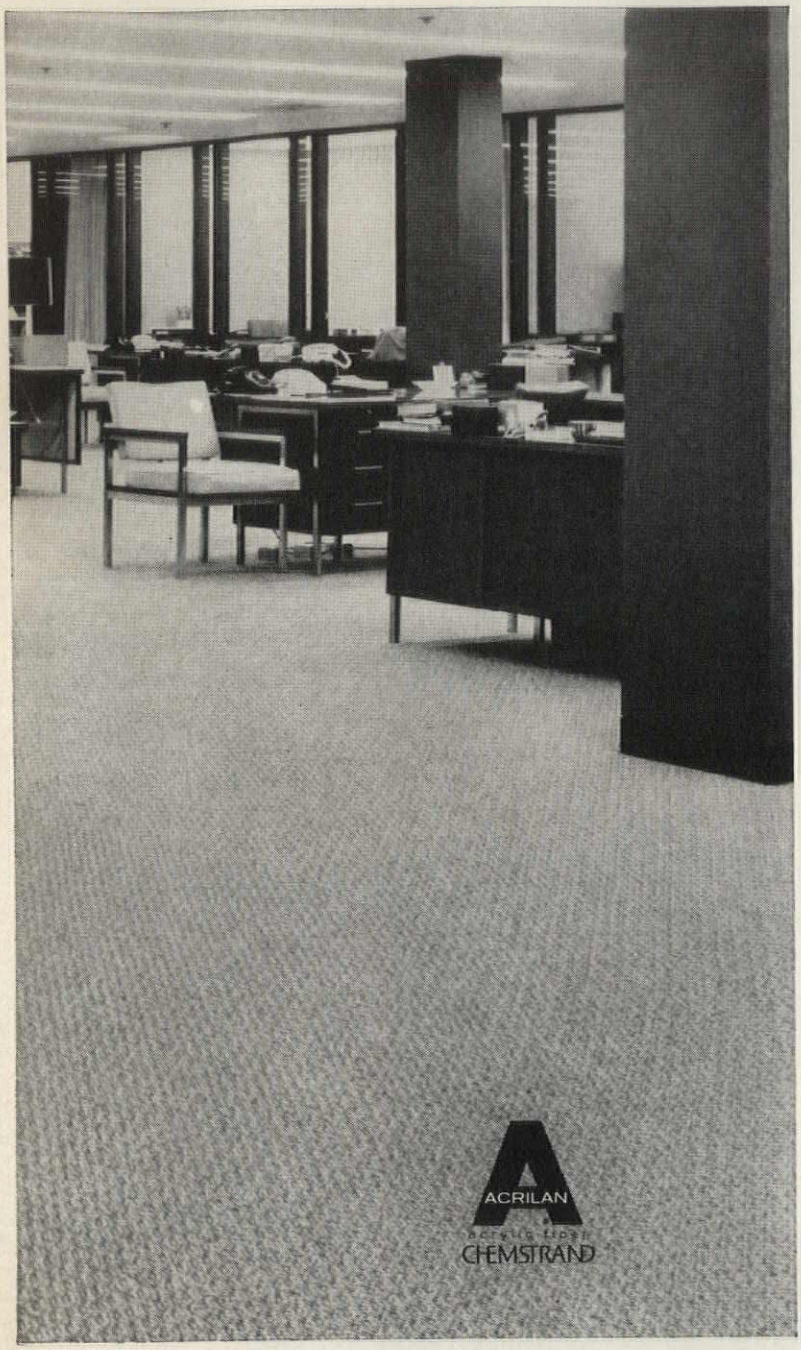
For more information, turn to Reader Service card, circle No. 319

Cabin Crafts carpet with Acrilan looks luxurious in Alderman Studios' new offices, provides the quiet atmosphere essential to good working conditions.

Alderman Studios, specialists in home furnishings photography,

Alderman Studios' new 3-acre plant in High Point, North Carolina.



Heavy traffic on this staircase to offices calls for carpet with Acrilan's resilience, long wear, ease of cleaning. Cabin Crafts carpet fills the bill!

pick carpet by Cabin Crafts—specialists in carpets with Acrilan

Outside of Hollywood, there's nothing to compare with Alderman Studios. Their new 3-acre studio in High Point, North Carolina, is so vast that golf carts are used to cover the distances. Famous for photography in the home furnishings field, they think nothing of building a whole house right in the studio. And they have a full-time staff of twelve interior designers.

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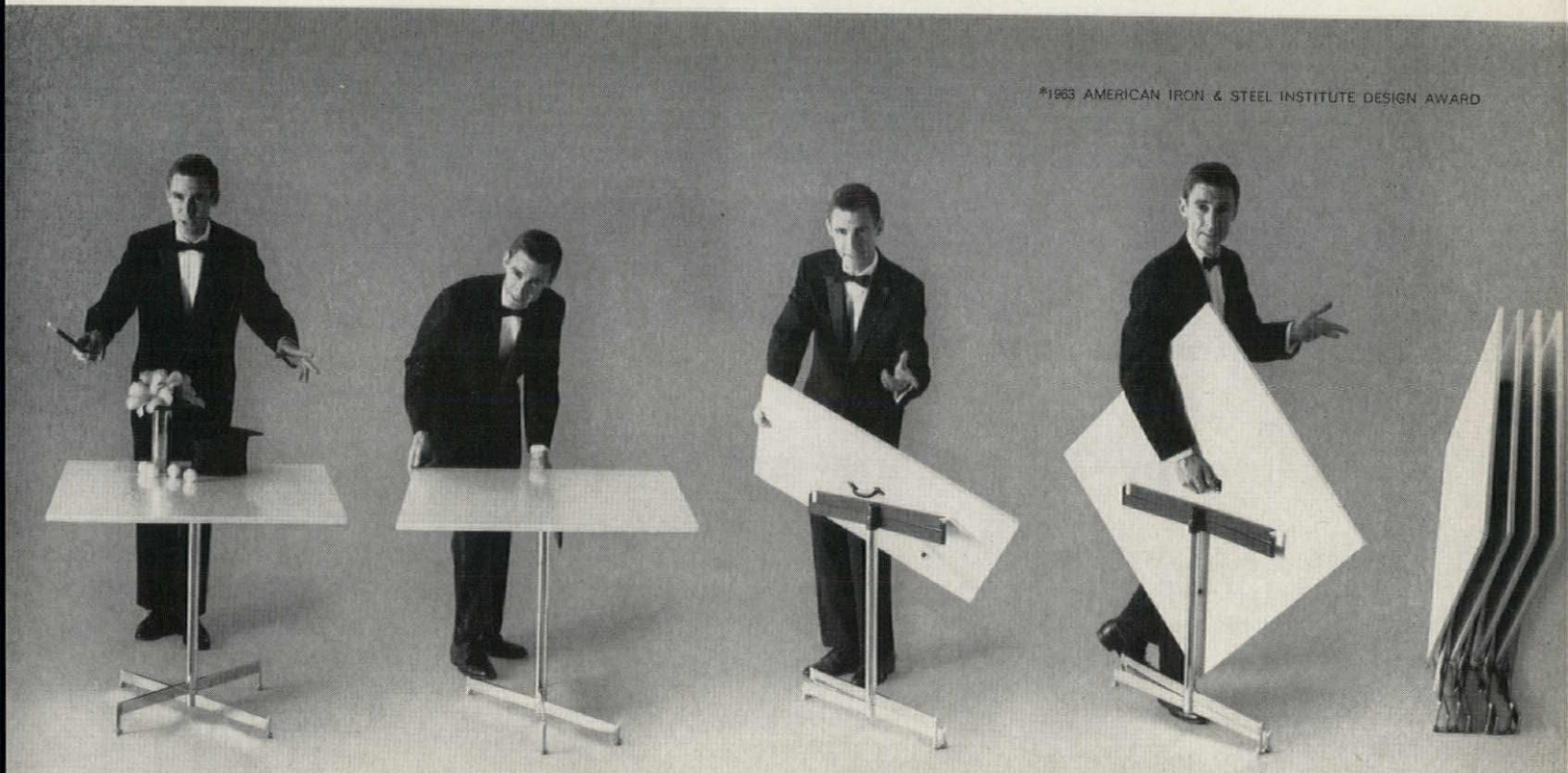

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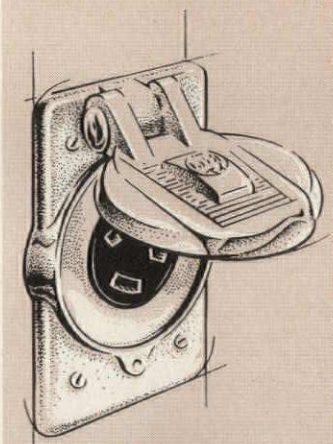

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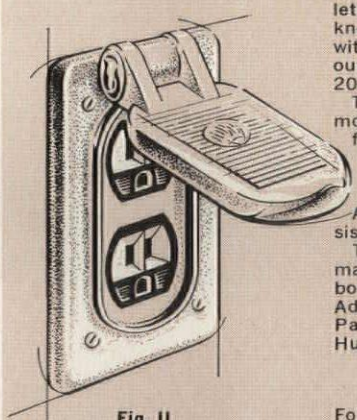

Fig. II
No. 5221, Fiberglas

No. 5221

For use over duplex outlets, gray Fiberglas lift cover plate No. 5221, Fig. II, fits FS boxes.

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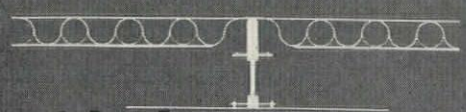

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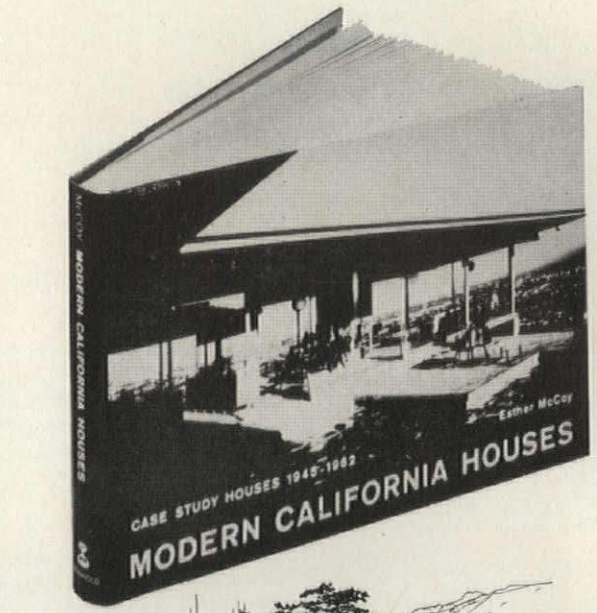

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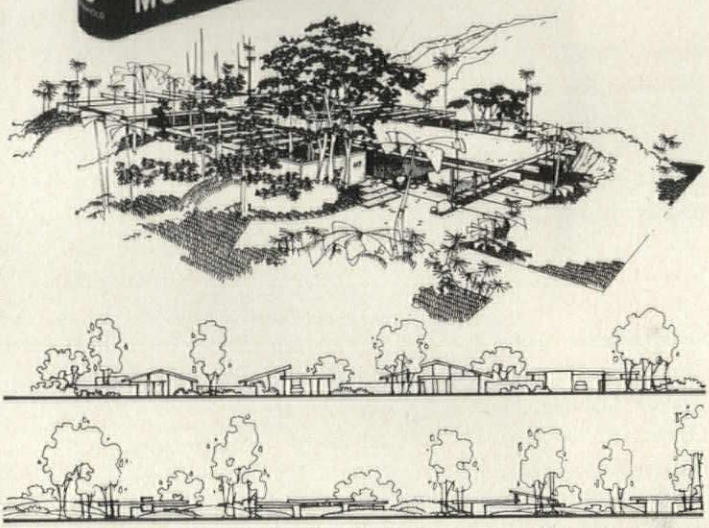

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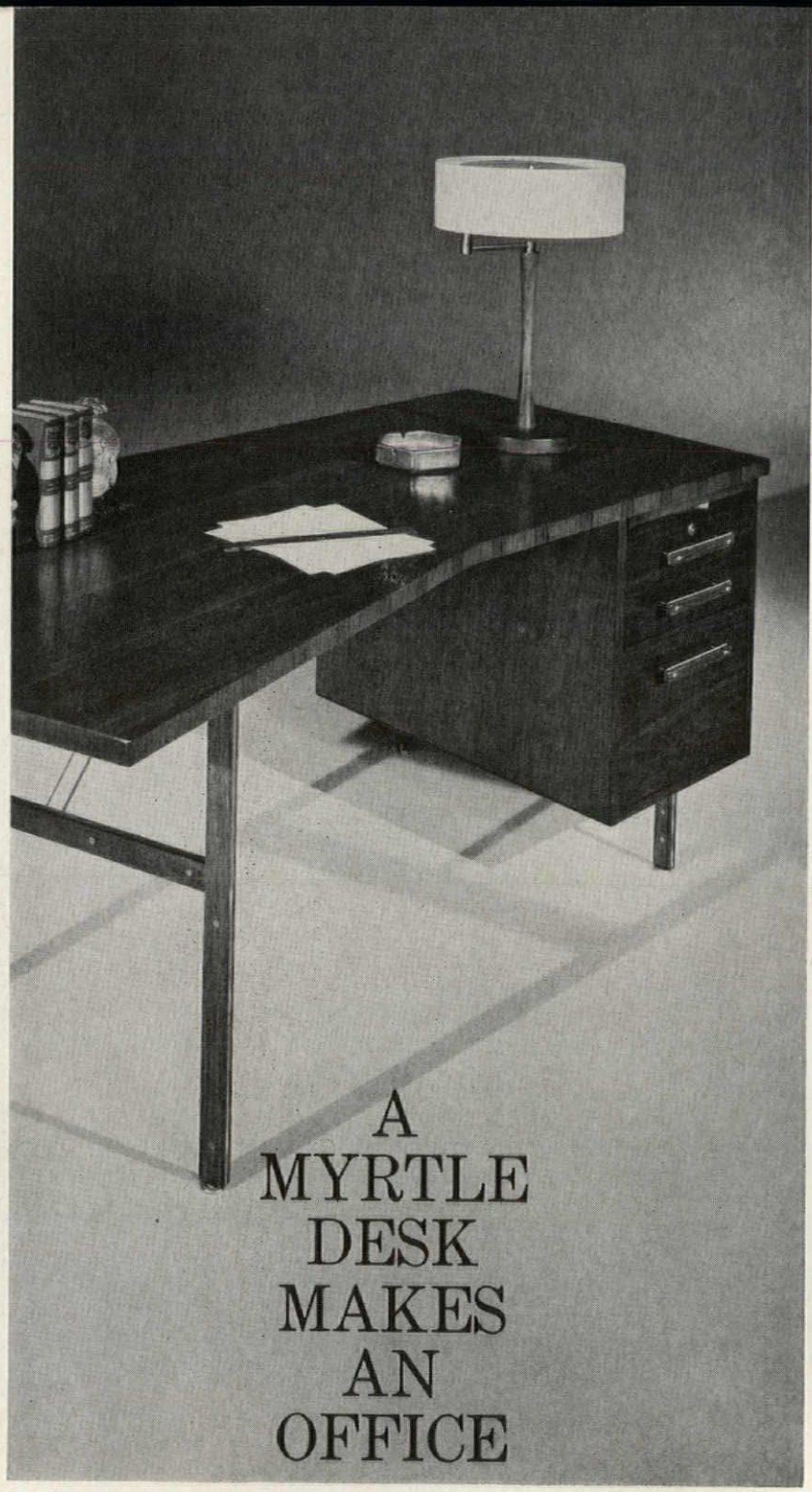

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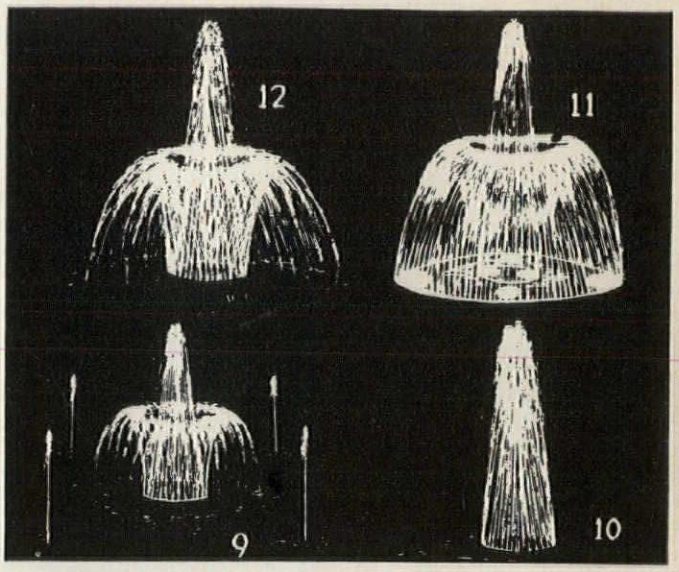

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