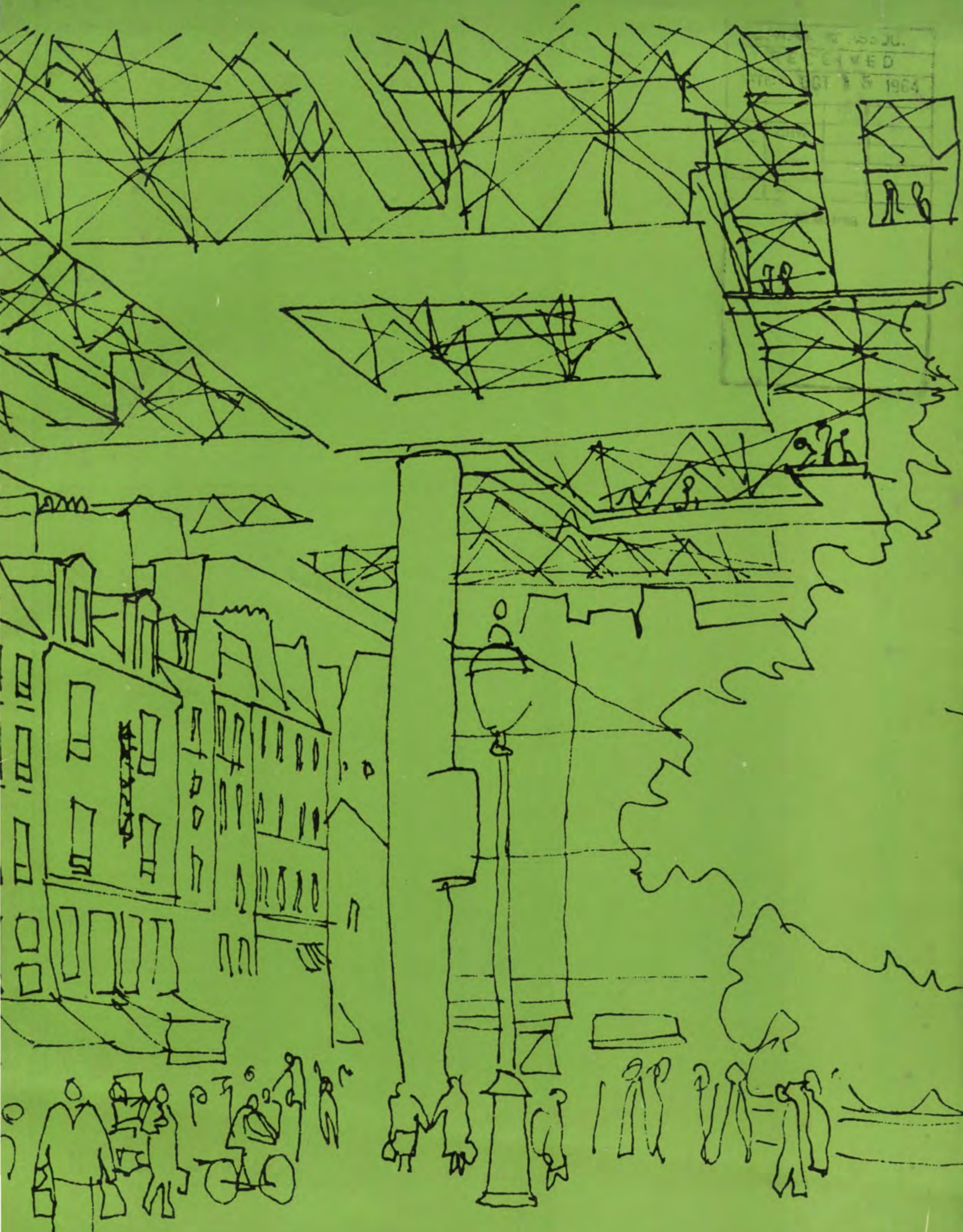
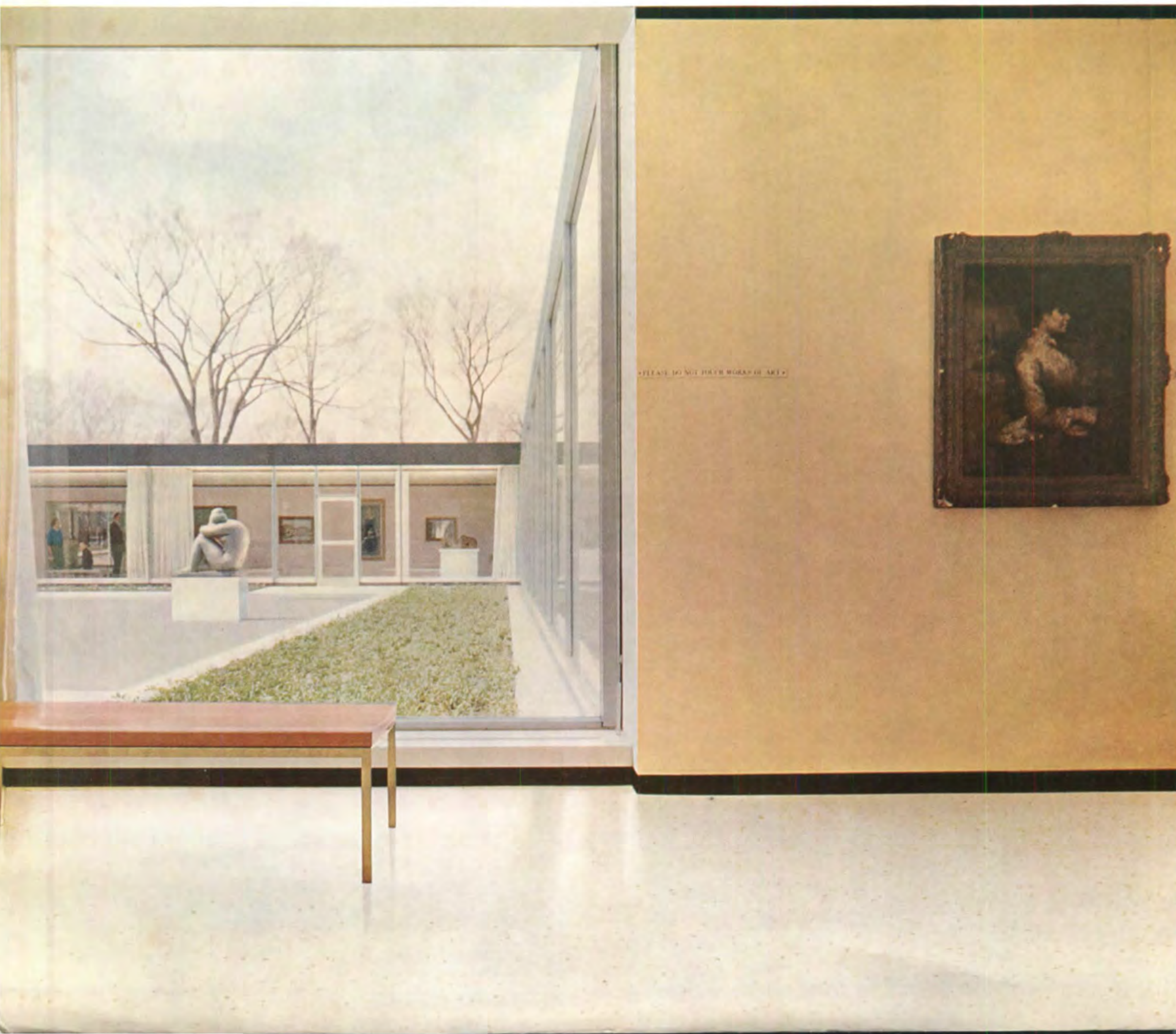
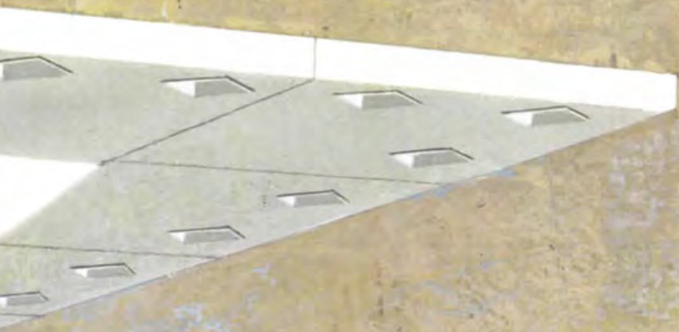


October 1964 **PROGRESSIVE ARCHITECTURE**




HEATH



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For fast, simple ceiling installation, nothing tops

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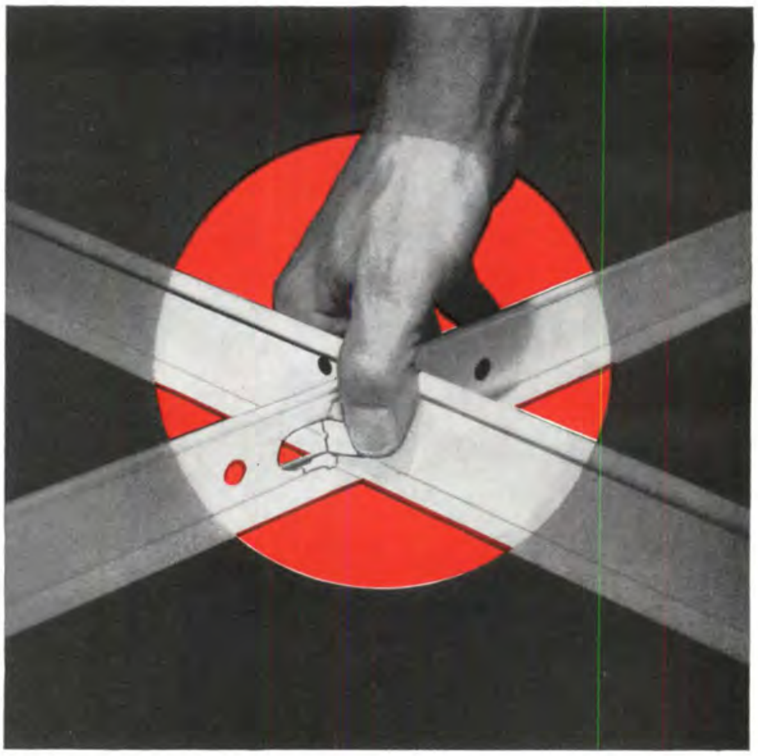
with universal TAB-LOCK*



With Eastern's new universal TAB-LOCK, cross tees are locked in tension by simply bending back the end tab. Bridging and splicing of beams, also, require no tools or clips. Die-formed to precision tolerances, members align perfectly . . . resist torsional movement. Complete interchangeability of components in three beam and tee weights, plus fire-rated design, lets you tailor specifications for optimum balance of economy and structural support under all load and spanning conditions. For today's most advanced features, specify Eastern Acoustical Suspension Systems. See Sweets 11c/Ea, or write for complete specs.

* Patent pending

Eastern Products Corporation

Acoustical Suspension Systems

Architectural Metal Products Division
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For more information, turn to Reader Service card, circle No. 437

◀ For more information, circle No. 316

THIS MONTH IN P/A

Cover Yona Friedman's Spatial City (p. 170) Sketch by the architect

Frontispiece Model of Kurokawa's Helix City (p 190) Photo by the architect

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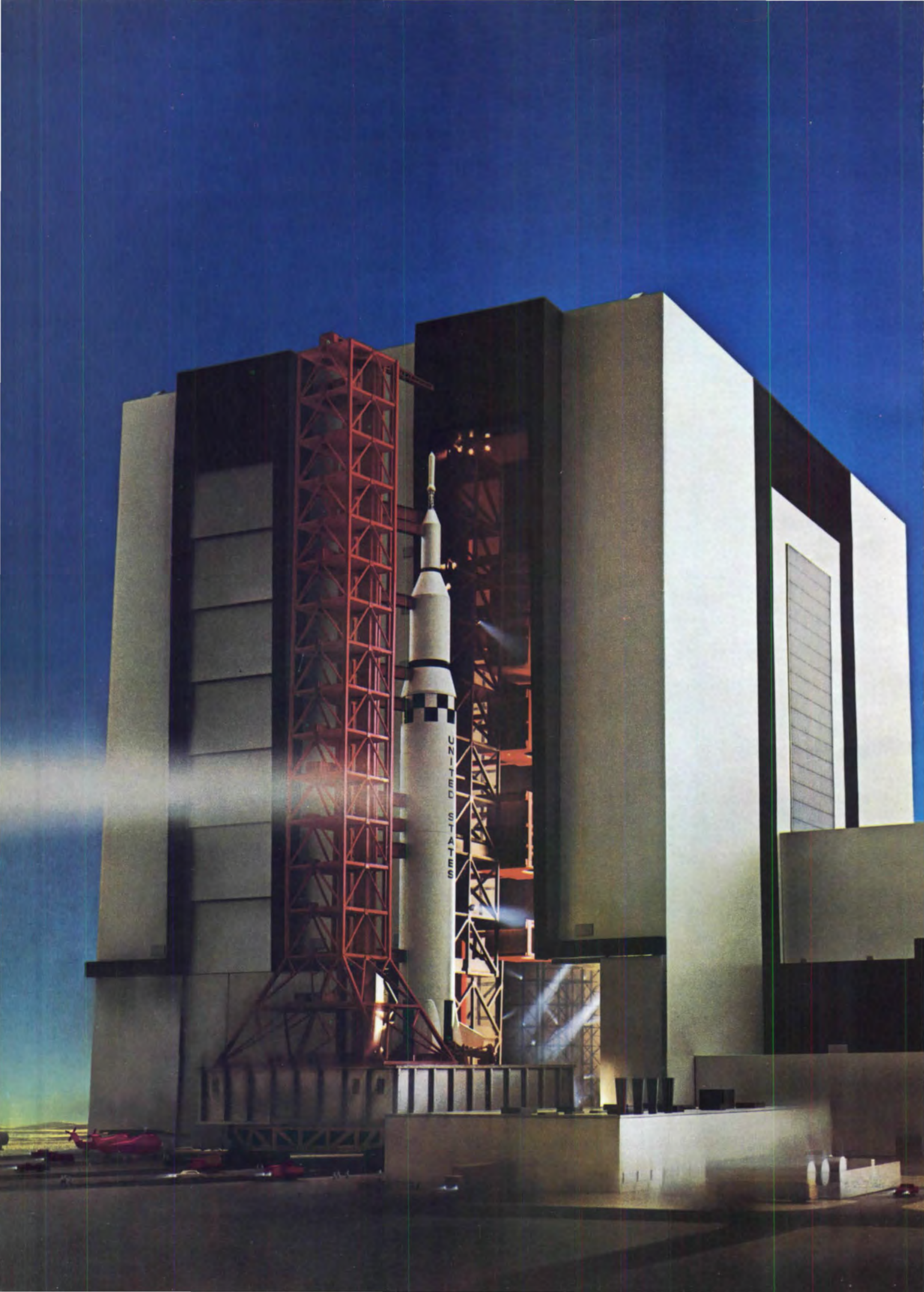
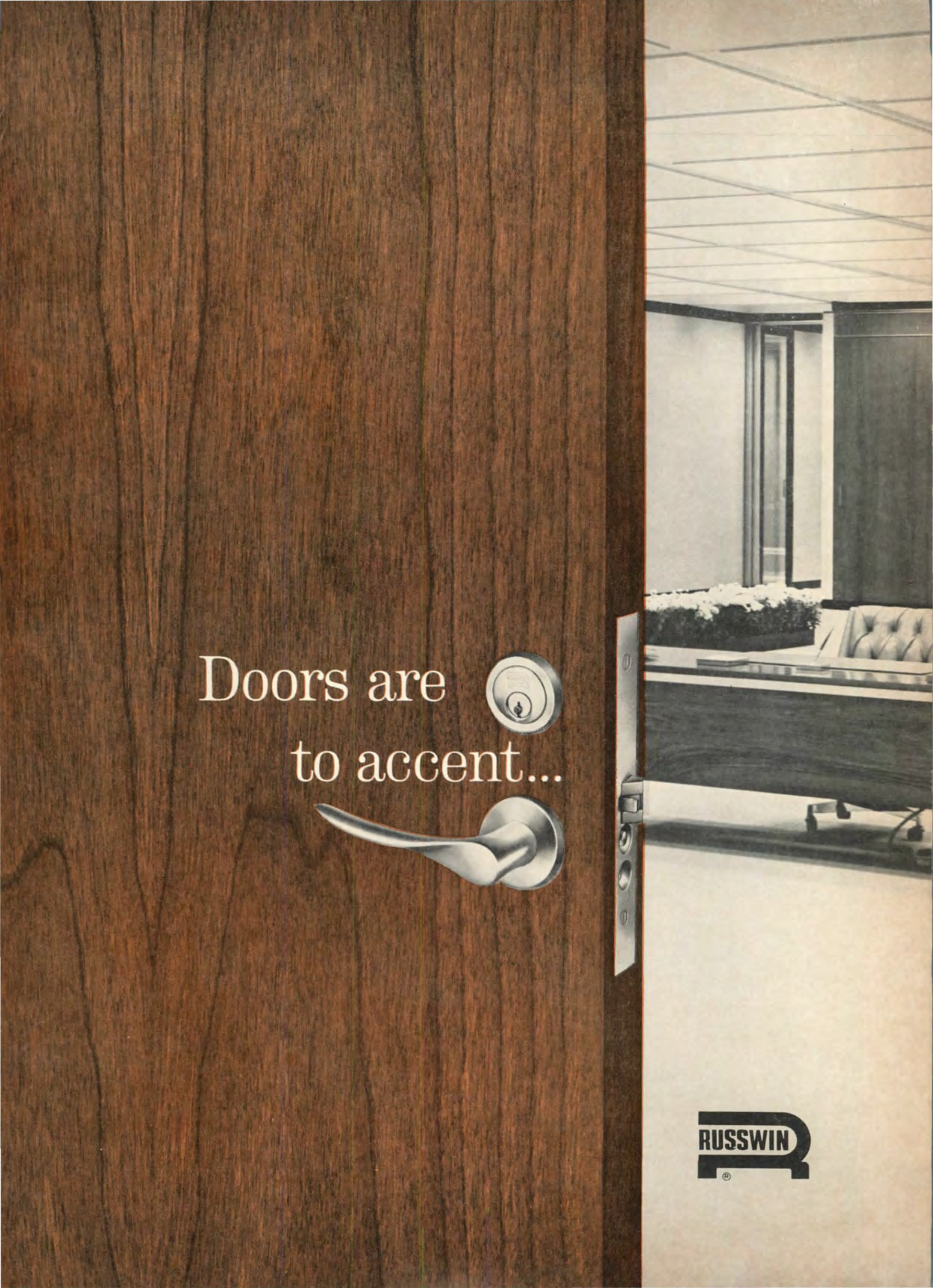
VOLUME XLV, No. 10


UNITED STATES


Doors are
to accent...
RUSSWIN

VIEWS

The Small Office and the AIA

Dear Editor: I enjoyed reading your recent Editorial on "Small Office Survival" [August 1964 P/A]. Your observations and concluding suggestions are most interesting.

We have a small office and have, over the past 15 years, developed a very satisfactory practice in the architect-builder category. However, the AIA has an ethical neurosis when it thinks of an architect contaminating himself with responsibility in construction. I wonder, therefore, how you would reconcile your viewpoint with the AIA's (if that mattered).

In our office, we have a basic policy that all work—architectural and construction—is a tool, and the product is service to the "client's best interest." The service is performed for a fee, which, we think, answers any possible ethical objection by the AIA. However, the AIA doesn't agree and I have recently resigned in protest against this attitude.

I believe there are many members of the AIA who feel as you do, and scores of clients who think the architect should be *responsible* for the *entire* building operation. These clients are forced to look up a package-builder-dealer because architects are prohibited by the AIA (and some state laws, e.g., Massachusetts and Connecticut) from serving them.

O. KLINE FULMER
Princeton, N. J.

Dear Editor: I greatly enjoyed your Editorial in the August issue of P/A, being a practitioner in what I would assume would be classified a small office —three to six people—and being small by what I hope is choice. You have put your finger on some of the reasons that make me prefer the "small" condition.

What I am really writing about however, is contained in your sixth and seventh paragraphs. As I understand the rules of the Institute, we are not allowed the privilege of acting in a dual capacity, and after some 25 years of practice, I still judge this is a sound decision *where* a lump sum contract is involved.

We surely are tired of the "construction broker" who calls himself a general contractor and would certainly like to supplant them on some of our work and deal directly with the subs, many of whom are still craftsmen interested in quality and good workmanship.

It seems that anything you could do to further the architect's opportunity to directly control all phases of the building would be of real service to the profession.

LOWELL LAMMERS
Baytown, Texas

[*The present position of AIA is that it is "ethical" for an architect to let out many separate subcontracts on behalf of the owner and thus act as a sort of quasi-contractor. It is unethical, however, to bid or have any other financial involvement in the work.*—ED.]

Asks for More Design, Less Salesmanship

Dear Editor: The article-editorial by J.T.B., Jr., on page 61 of the August 1964 P/A, sorely misses a point of importance. The article tends to criticize the Museum of Modern Art for overlooking the architect for the engineer in the business of creative building. It seems to me that the examples of engineer-creativity shown are damned good. It would seem to me that the article could have more reasonably gone into an admission of this followed by an explanation of why they are so good, and why, conversely, the architects do not measure up, and what they can do about it. Since the article didn't, I will proceed to do it.

A quick examination of the examples shows an obviously clear-cut problem to be solved in each instance. Given a clear-cut problem, the answer to it nearly always tends to be good.

Most buildings have no such clear-cut problems, making a farce of the old "form follows function" bit. The elaborate excuses given for most buildings by their architects simply do not hold water. The only clear-cut problem in architecture is that of doing something the client will accept, hardly a problem conducive to a satisfactory solution.

Since the myriad of so-called practical problems in architecture are neither binding enough, clear-cut enough, nor important enough to suggest an answer, the answers (nearly all buildings) are neither binding, clear-cut, nor important.

Given a lack of clear-cut practical problems (even after a diligent search for same), a building falls under the category of sculpture. Sculpture that has to be buildable, of course. Buildable, big, useable, yes, but sculpture, not a so-called practical structure. Practical structures demand practical problems that must evolve and be stated *before* the design of the structure is begun. The sculptor, of course, states his own problems.

Building types do vary. Low rise, high rise, compartmented, and relatively open, small, and large. A sculptor, working continuously with these limitations mentioned, has constantly on the shelf of his mind items to fit the practical needs of his customers.

This is reflected in the work of the great architects. The Guggenheim was anticipated years ago in the work of Wright. Ronchamps, by Corbu's admission, was a crab shell picked up on a beach years ago. Neither *evolved* from the practical requirements of an art gallery or a church. They evolved from a problem of sculpture and were waiting for a chance to be used.

Recognition of the above by the architects would produce better buildings. As a matter of fact, it is the *only* possibility of better buildings. Acceptance by the client is the only obstacle, and that problem remains, as always, one of salesmanship, not design.

J. ALLAN RUDOLPH
St. Petersburg, Fla.

Products Issue Praised

Dear Editor: Unashamedly, this is a letter of praise. I have just finished reading (from cover to cover) the June 1964 P/A, which was devoted to "The Design of Building Products."

Needless to say, as a manufacturer of quality lighting equipment for the architectural market, the whole subject of design of building products is an absorbing and crucial one to me. I have never seen a magazine state the problem and lay down the guideposts as well as your June issue.

JERRY LITNER
President, Curtis-Electro Lighting, Inc.
Chicago, Ill.

A Cable From Mrs. FLlW

Dear Editor: Secretary Stuart Udall was extremely active in trying to save the Imperial Hotel [p. 89, September 1964 P/A], but the other forces did not move to interfere with the destruction of a great historical building.

MRS. FRANK LLOYD WRIGHT
Spring Green, Wis.

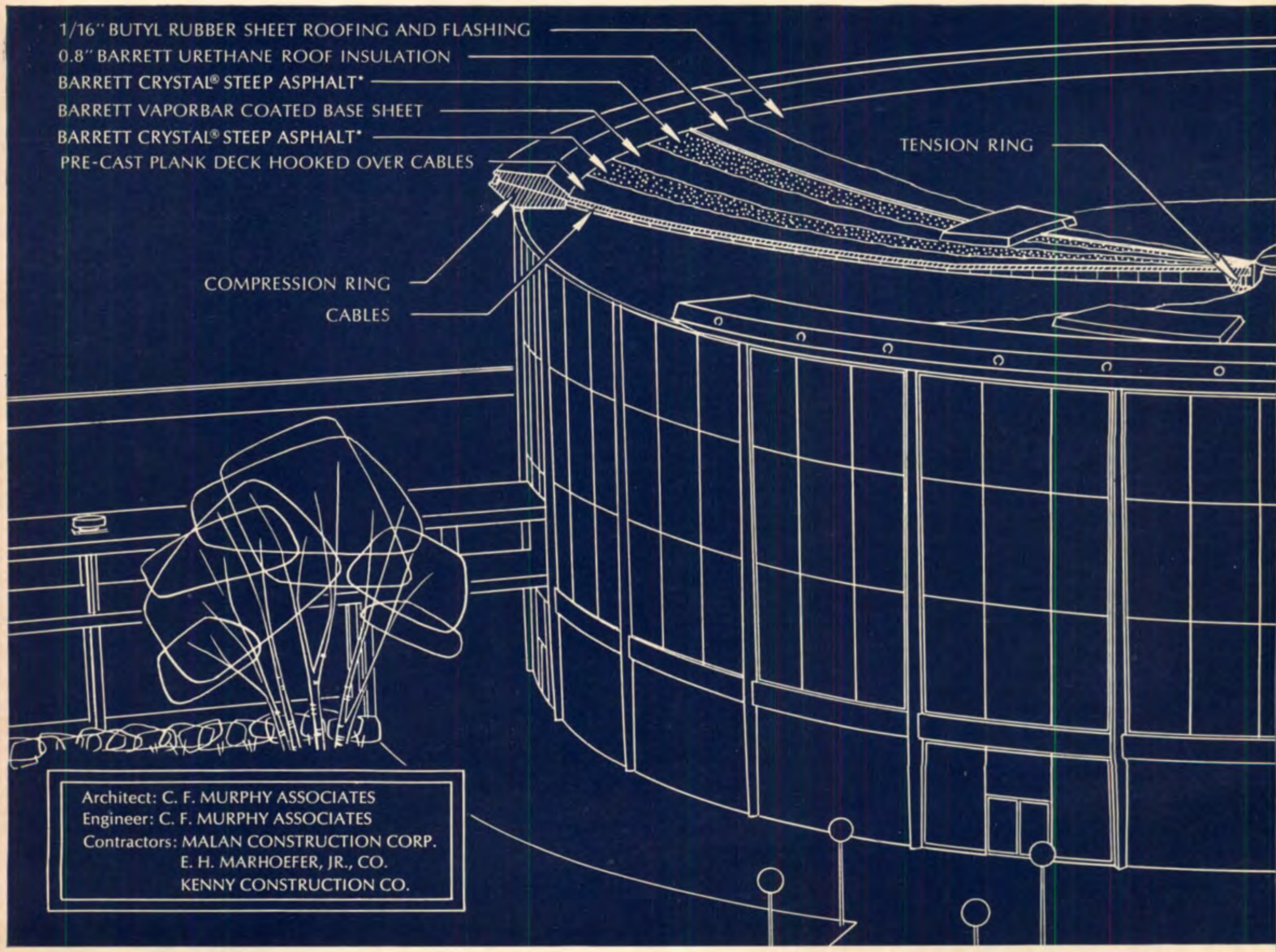
Row Housing

Dear Editor: The August 1964 P/A is an important contribution to the literature on row housing, a building type which may be destined to replace the single-family house as the predominant residential unit outside of urban centers.

I would like to point out one pitfall

Continued on page 14

Barrett...exciting new building materials from chemistry



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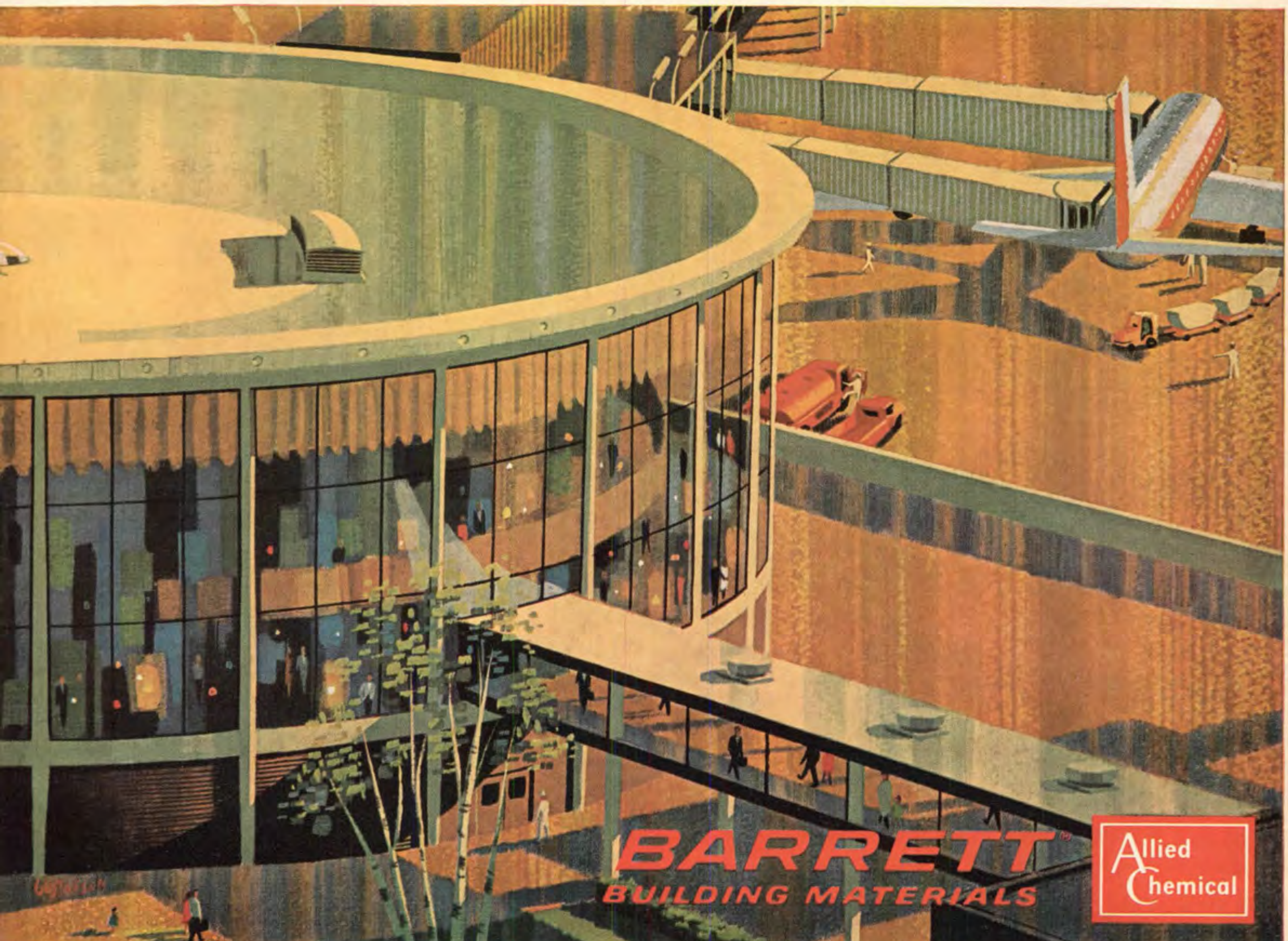

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For more information, turn to Reader Service card, circle No. 330

Continued from page 10

that will work against the acceptance of row housing. In many instances, the advantages of "cluster design" have been used to sell down zoning for a windfall profit. The results achieved by good design may for a short time emphasize the advantages of the row house, but it will no longer have the visual foil of open space derived from existing open space around older single-family homes. Projects like Ulrich Franzen's proposal for Tenafly, N. J. (p. 141), could save the row house from the stereotype of poor man's housing. Here there is acceptance of the number of dwellings allowed under the existing 40,000 sq ft zoning but averaging the density permits a large open area reserved in its natural state. The resulting saving in site development costs can provide better dwelling units. Other advantages are less road maintenance and lower costs for community services.

I am afraid that even well-chosen camera angles could not hide the wall-to-wall parking-lot character of a number of the completed row house projects shown in the August issue.

Your Editorial points out a number of advantages of the small office. I feel the featured projects give evidence of the advantages of the smaller job. The Brecksville West Apartments by Don M. Hisaka and the Chicago Theological Seminary project by Edward D. Dart demonstrate the sensitivity and attention to scale that is lacking on many of the larger projects. This may reflect the advantages of the small office. I personally feel it is partly the result of doing site plans at large enough scale to study detailed relationships.

BERNARD J. ALBIN
New York, N. Y.

Losing Another Eighth of an Inch

Dear Editor: Detailers Arise! We are about to lose another eighth of an inch in dimensions of framing lumber. We are told that we should now accept dimensions of $1\frac{1}{2}$ in.—a 20 per cent reduction over the already dangerously narrowed section—and that load tables are predicated on this new dimension. This indicates a *discrepancy* between the load tables employed on Madison Avenue and those compiled by Mr. Parker. The 20 per cent lumber reduction is further stated to be the natural shrinkage dimension. It all depends on how you slice it.

A few years ago, hardwood panelling was normally a full $\frac{7}{8}$ in. In the space

For more information, turn to Reader Service card, circle No. 470

of a few years, it has reduced to 11/16 in. and seems to be shrinking rapidly. Structural lumber formerly came to the job in its full 2 in. dimension. As the woodworking industry becomes more verbal, sections become thinner—soon we will be able to see right through them like a politician's promises.

Why did we ever regress from undressed lumber in the first place? Like a bathing beauty, its structural advantages are obvious. It is the full dimension and can be calculated in round figures. Structural lumber is buried beneath the finished construction, and rounding its edges and smoothing it like a piece of plastic only serves to gratify the aesthetic enjoyment of termites.

I strongly suspect this campaign is being perpetrated by those motivated by the old Chicago Stock Yard psychology of using everything from the pig but the squeal. The sawdust that is not used for chip core panelling is probably used on the floors of the local coffee houses. There is more in this than can be read between the fine script of Madison Avenue. We are faced with a conspiracy as blatant as water of gold. Soon the manufacturers may give us structural lumber of 1/28 in., the requirement for face veneer.

And what happens to the moisture content? We are obviously paying for the stuff. Let's have it delivered bottled with the lumber. It can be utilized in exercise pools for goldfish or lubricant for dry conversation. If we do not make a stand here, it is my suspicion that this moisture will be secretly hoarded for the manufacture of a new product soon to inundate the market, *structural water*. I can see it now on the pages of your magazine: structural water; long leaf and yellow leaf water; short leaf water and craftsman grade.

Arise, dealers, or soon you will be calculating water or worse yet; if the vanishing process continues, you will be figuring 2 x 4's in negative numbers. Mr. Manufacturer, give us back our rough-surfaced undressed lumber, for we much prefer splinter pricks to the favors of Madison Avenue.

FORREST WILSON
Brooklyn, N. Y.

Protesting the Seagram Decision

Dear Editor: P/A could perform its most noble service by rallying architects, planners, building materials manufacturers, contractors, subcontractors and interested citizens to rise up in protest

Continued on page 22

For more information, turn to Reader Service card, circle No. 327

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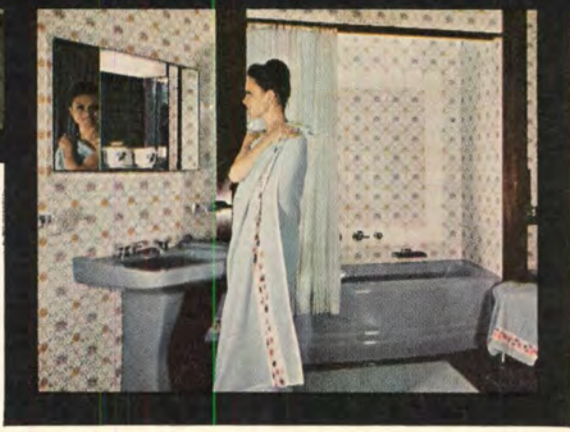

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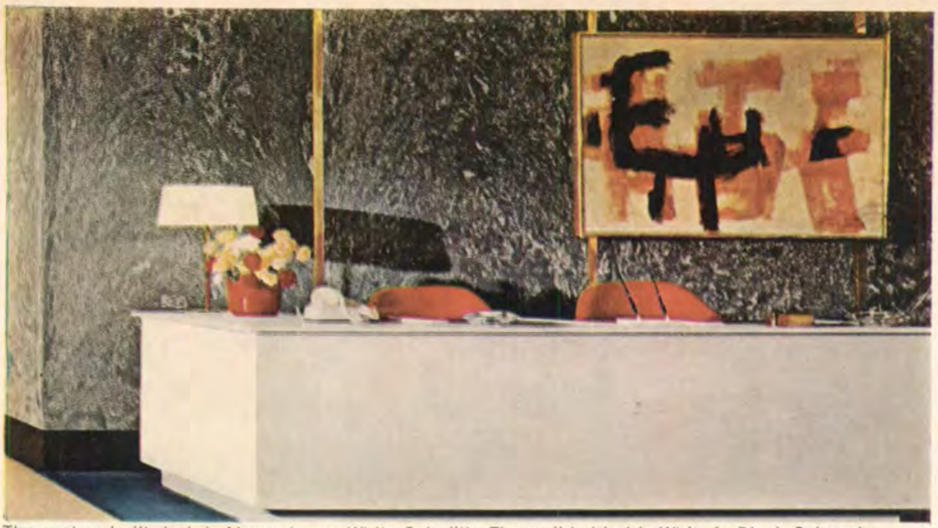

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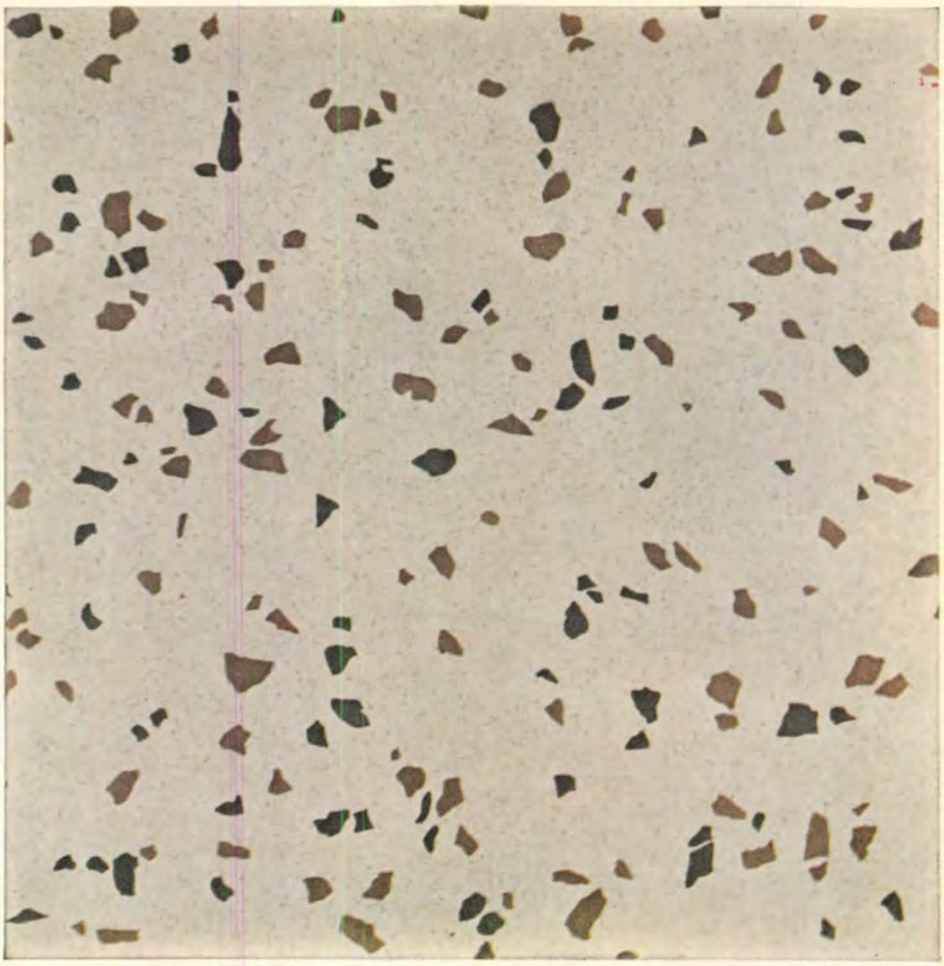

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Continued from page 16
against the Seagram case decision in such numbers and volumes, that a climate would be created for the decision to be reversed. Furthermore, it seems to me that while Seagram is financially capable of conducting its own last appeal, the Court should be confronted with an appeal from a much broader cross-section of community thinking than the profit motives of one specific company. The issue is no longer one of the amount of tax that Seagram has to pay, but rather whether or not unenlightened clods in city government will have the power to tax good architecture into oblivion. This is a community problem, and the case should be appealed by the community, not by Seagram alone.

J. H. BLITZER, JR.
Los Angeles, Calif.

CORRECTION: The master plan of Elmwood Park, shown in the News and Feature sections of the AUGUST 1964 P/A, was the work of the following design team: Crane & Gorwic, Inc.; Meathe, Kessler & Associates; Johnson, Johnson & Roy; and Irving Grossman.

NOTICES

New Addresses

MURRAY JONES MURRAY, Architects, 424 S. Cheyenne, Tulsa, Okla.

STYLON HOUSE, showroom, 136 Newbury St., Boston 16, Mass.

WIRE REINFORCEMENT INSTITUTE, 5034 Wisconsin Ave., N.W., Washington, D.C.

New Firms

FISCHER, KOSCHER & BOWDEN, Architects and Designers, 103 N. Glenview Dr., Carbondale, Ill.

DAVID E. MILLER, Architect, 30141 Silverado Canyon Rd., Silverado, Calif.

DAN SAXON PALMER & ASSOCIATES, Architects, Engineers, Planners, Westwood, Calif.

STEPHEN SKIRPAN, Theatre Consultant, 138–70 Elder Ave., Flushing, N.Y.

STANLEY TIGERMAN, Architect, 664 N. Michigan Ave., Chicago, Ill.

DONALD WOLBRINK & ASSOCIATES, Architects, Engineers, Planners, 1441 Kapiolani Blvd., Honolulu, H.I.

New Partners, Associates

CAUDILL, ROWLETT & SCOTT, Architects, Planners, and Engineers, Houston, Tex., have named eight new associates: RALPH C. CARROLL, WILLIAM G. FORD, HARRY

Continued on page 320

ARCHITECT:
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YAMASAKI
AND ASSOCIATES
Birmingham, Mich.

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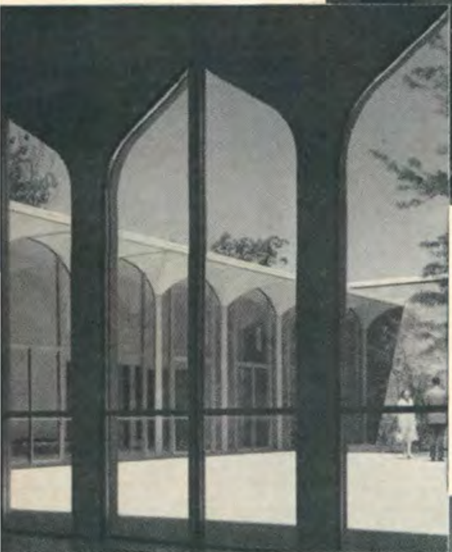
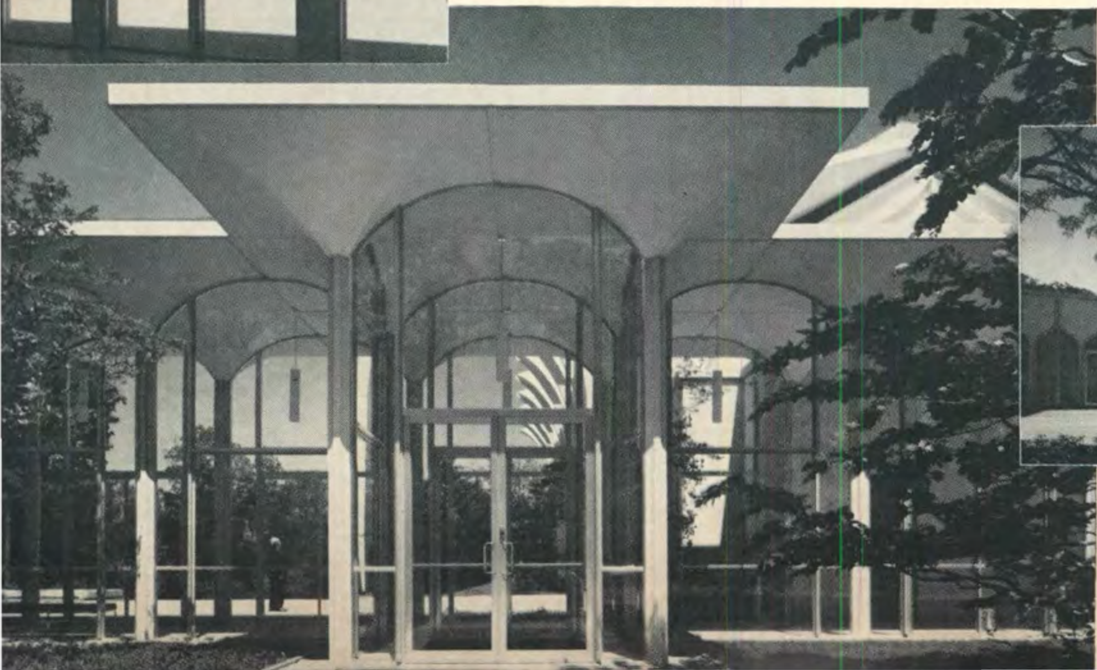
Fenestration
by
MARMET CORPORATION



An inspiration in structure
to lift the spirit of the worshiper



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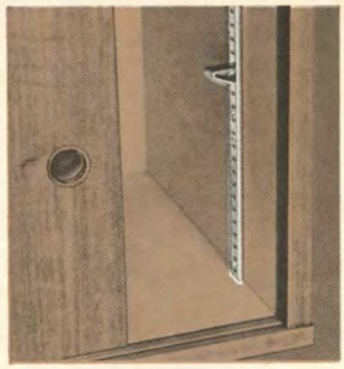

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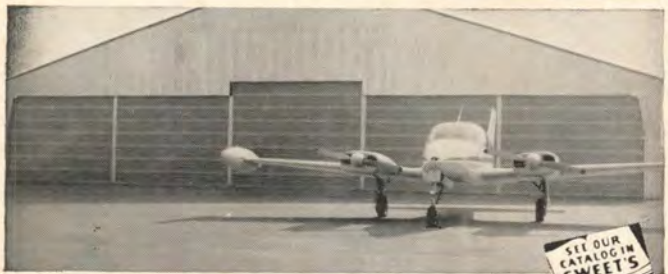

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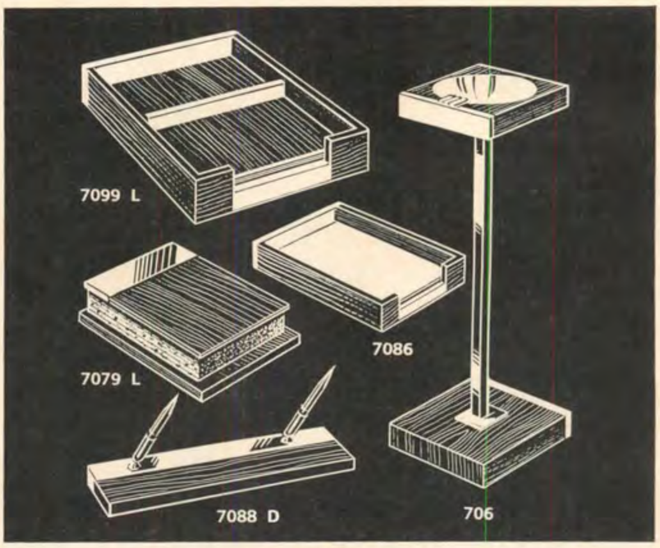

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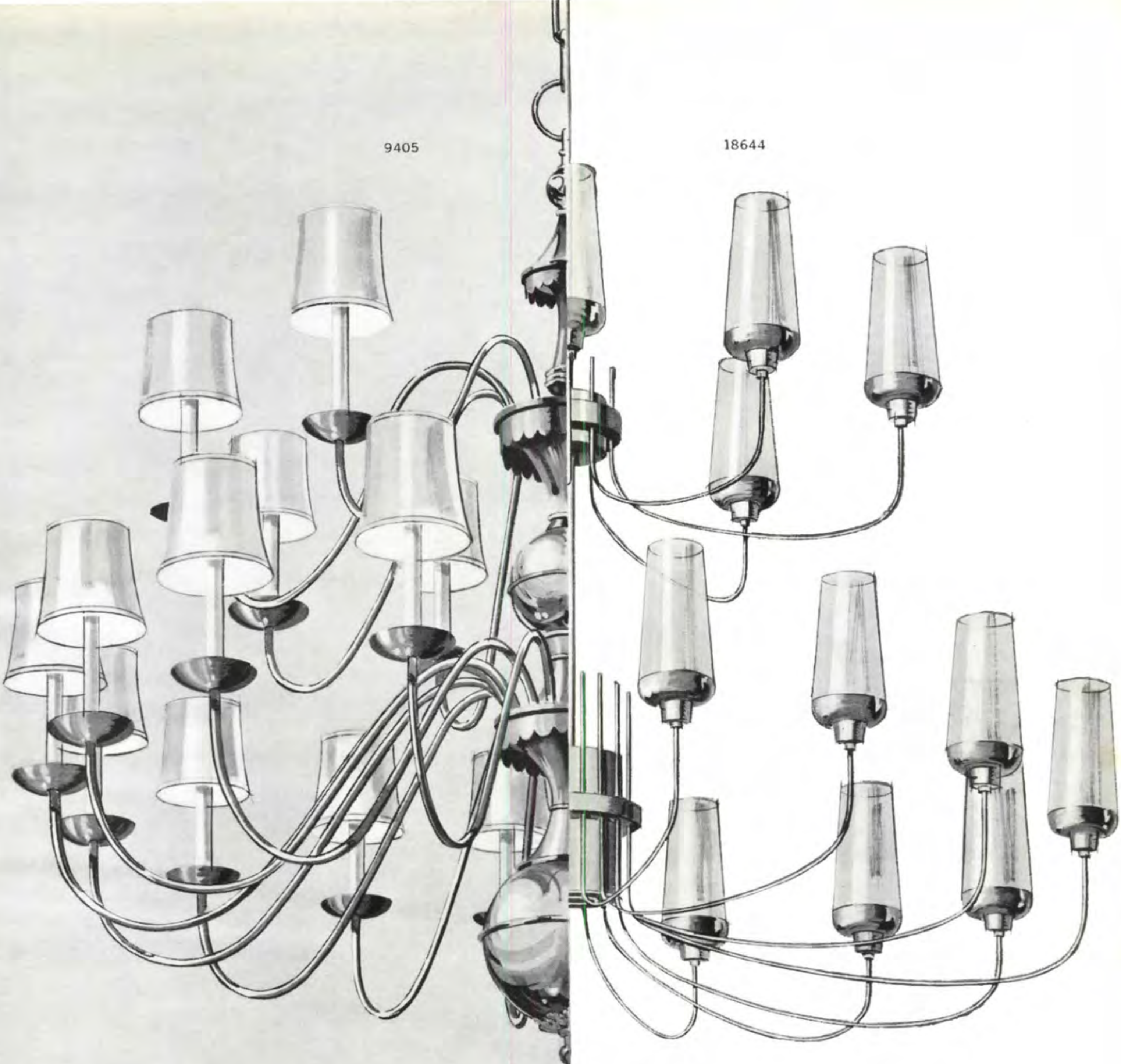

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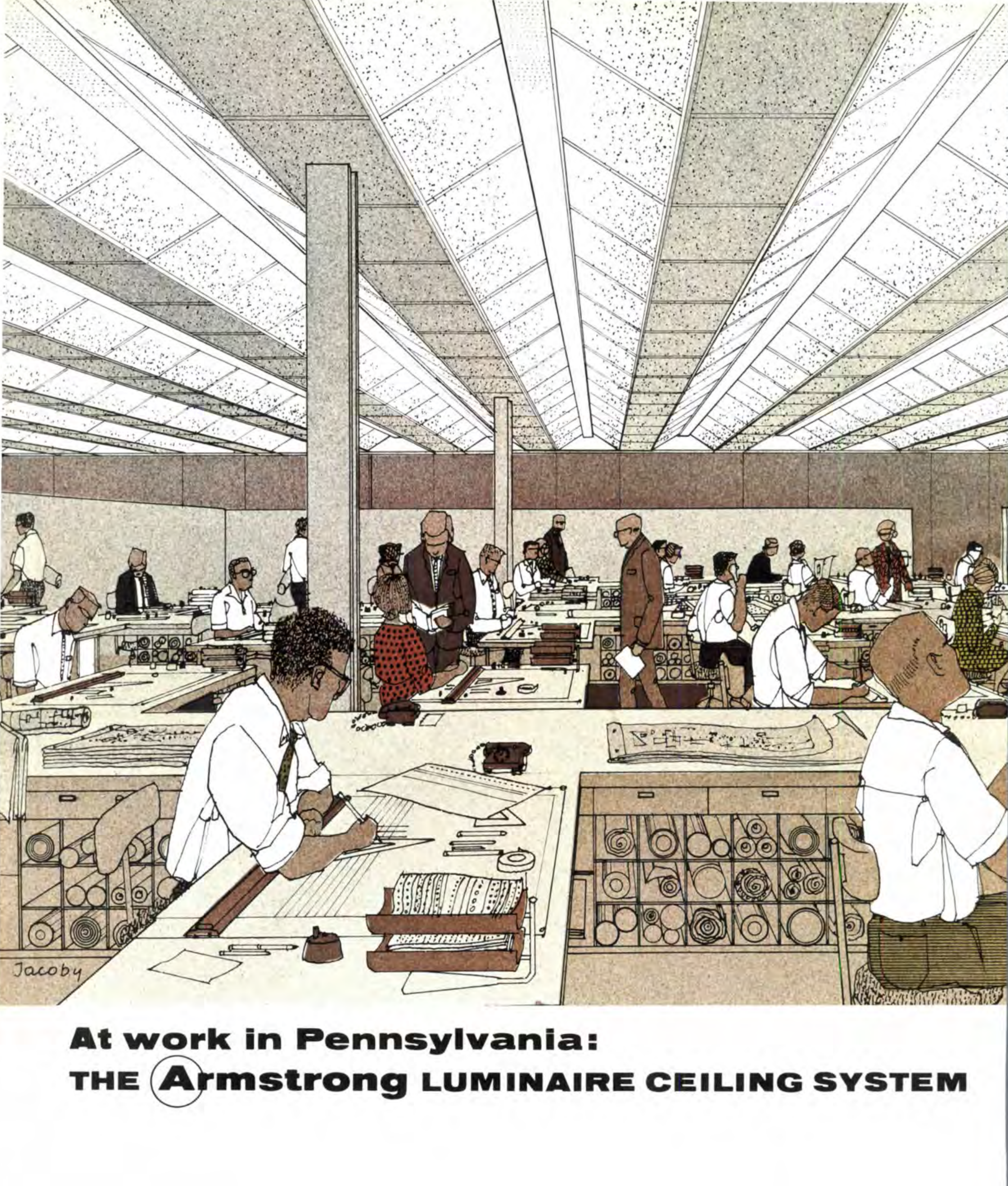

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The B-48 System's basic unit is a 48" module. Each is a separate air- and light-distribution source. There are 444 eight-foot, two-lamp fixtures installed throughout this building. The drafting room above is illuminated to 200 footcandles.

The system is flexible. Here, horizontal ceiling panels separate the glowing bands of light. The system also is designed to accommodate ceiling-high partitions.

The B-48 System here is a companion to the A-50 Luminaire System with triangular end panels. Both are essentially the same. For complete information, write to Armstrong, 4210 Watson Street, Lancaster, Pa.

Elliott Engineering Building, Jeannette, Pa.
Owners: Elliott Company, Division of Carrier Corp., Jeannette, Pa.
Architect: Thomas Donald, Greensburg, Pa.
Consulting Engineer: Gerald A. Mattern & Assoc., Greensburg, Pa.
General Contractor: Dill Construction Co., Latrobe, Pa.
Mechanical Contractor: Koenig, Incorporated, Pittsburgh, Pa.
Ceiling Systems Contractor: Pittsburgh Acoustical Corp., Pittsburgh, Pa.

Ceiling Systems by Armstrong

For more information, turn to Reader Service Card, circle No. 300

Door by WELDWOOD

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Architectural hardware may be a functional detail. But attention to detail adds up to better design. So it is with architectural hardware; it works day after day creating important first impressions. With CORBIN hardware you'll find classic simplicity that quietly complements contemporary architecture. CORBIN designs are graceful, modern, clean: qualities which help give your building a look of enduring good taste. To prove it to yourself, simply turn the page . . .

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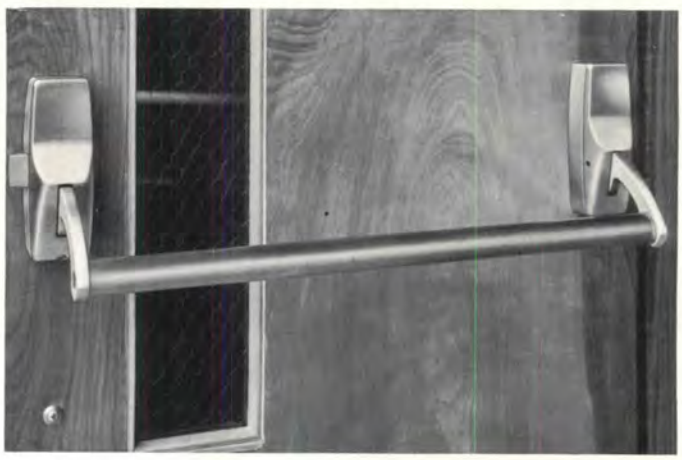

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Prospect House, Arlington, Va.

In the Washington, D.C. area, the swing is to steel framing for apartment buildings

Facts show an amazing rise in popularity for steel-framed apartment buildings in this area in the past two years. Here are just 14 of those buildings . . . and the reasons why you should ask us what steel has to offer before you cast your vote for a framing material.

Easley House, Silver Spring, Md.

Grosvenor Park Apartments, Rockville, Md.

Why is steel framing becoming

around our nation's capital?

Congressional Plaza Apartments, Rockville, Md.

Blair Towers, Silver Spring, Md.

4600 Duke, Alexandria, Va.


The Madison Apartments, Arlington, Va.


Von Bottger Apartments, Arlington, Va.


Fort Meyer Apartments, Arlington, Va.


The Crystal House, Arlington, Va.


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River Tower Apartments, Alexandria, Va.

Chadwick Towers, Alexandria, Va.

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We can show you new structural steel concepts that make steel framing more economical than ever before.

Without paying a premium, you can have the assurance of safe steel construction.

You can design award-winning, steel-framed apartments that will attract and hold tenants.

Good housekeeping, easy with steel, speeds job. Steel decking provides clean working platform. No drippage. No form work. Minimum clean-up.

Things have changed. Today steel offers advantages that you, the architect, engineer, or owner, must be fully aware of in order to achieve outstanding designs and top values.

Before you start designing, ask us what STEEL has to offer!

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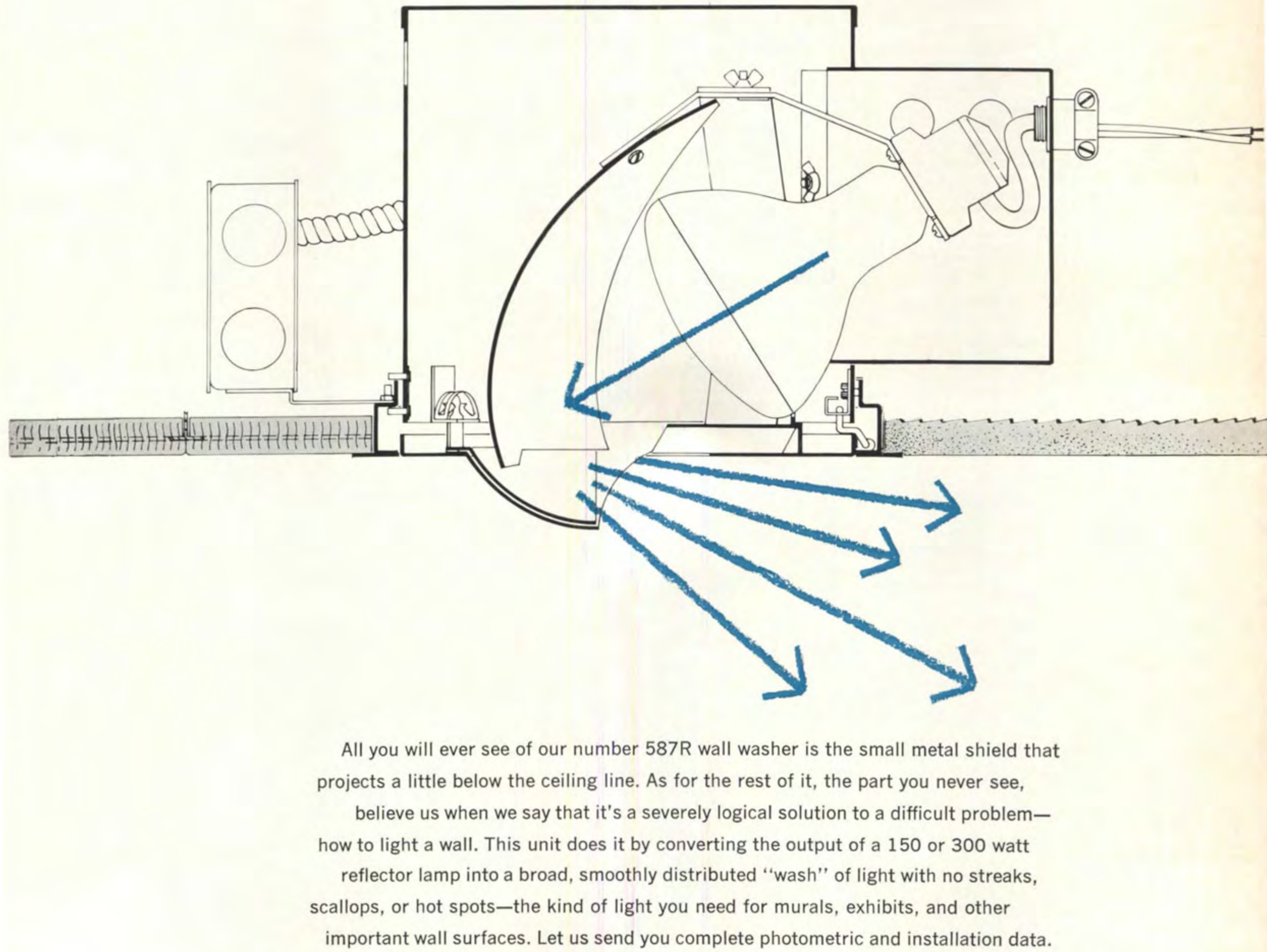
(Names of the architectural and engineering firms responsible for the projects shown in this advertisement will gladly be furnished on request.)

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. *Export Sales:* Bethlehem Steel Export Corporation

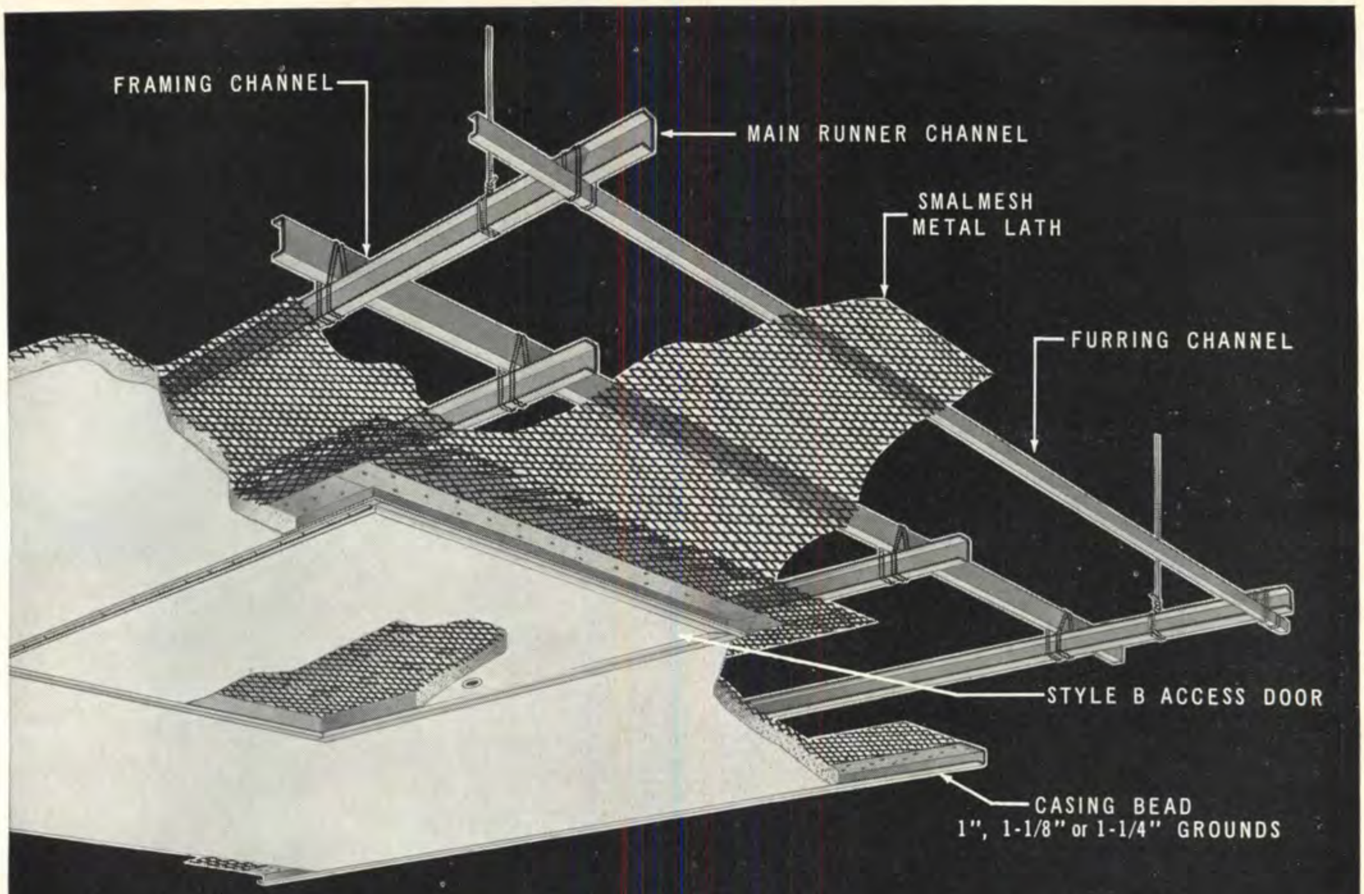








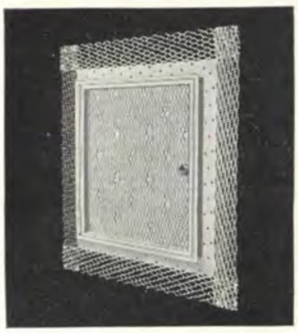
For more information, turn to Reader Service card, circle No. 472



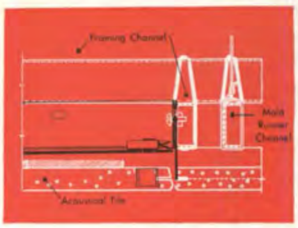
Inside Story:

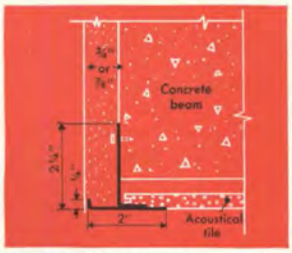
Behind acoustical ceilings that install faster, look better, maintain maximum acoustical capacity

Access to utility systems behind an acoustical plaster ceiling is through virtually concealed Milcor Style B Access Door. It is keyed to surrounding plaster by Milcor No. 66 Expansion Casing Bead, an integral part of the door's outer frame. Casing bead also protects edges of plaster bonded to recessed door panel by Milcor Furlath.



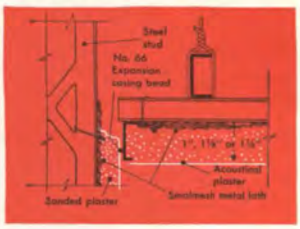
With acoustical tile, a Milcor Style A Steel Access Door is used. The tile attaches to the recessed door panel at a depth flush with the surrounding tile surface.





Milcor plaster and acoustical tile terminal forms a neat, clean terminal where a plastered fascia meets an acoustical tile ceiling. Provides automatic grounds and return for the plaster and a shelf to support the tile.

Milcor No. 66 Expansion Casing Bead — with 1", 1⅛", or 1¼" grounds — provides the extra depth you need for proper thickness of acoustical plaster. Avoids structural cracking at unrestrained juncture of wall and ceiling. Provides straight, narrow reveal.



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ML-72

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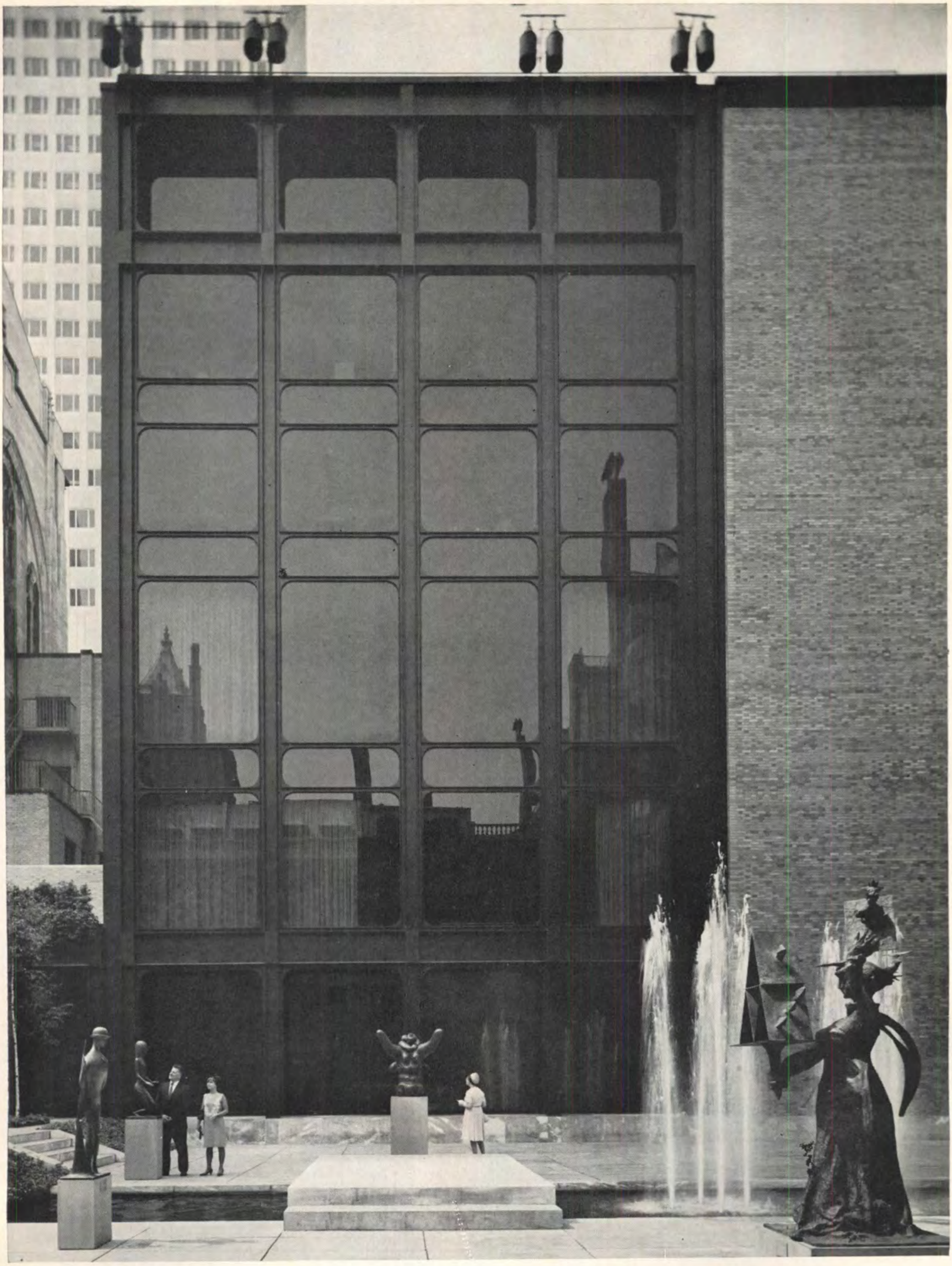

Enjoy greater DESIGN FREEDOM with L·O·F Heavy-Duty Plate

L·O·F's strength-test data on Heavy-Duty Plate Glass lets you use bigger sizes with confidence and safety

The Museum of Modern Art's New East Wing is sculptured in steel and in subtly tinted, glare-reducing Heavy-Duty *Parallel-O-Bronze®* plate glass ⅜″ thick and in sizes up to 111″ x 152″. It's another example of the great versatility of glass . . . extra thickness for extra strength . . . a warm bronze tone to enhance the beauty of the architects' design. You, too, can design freely with large expanses of glass.

L·O·F has conducted exhaustive strength tests on Heavy-Duty plate so you can specify with full confidence that you will meet code requirements or whatever good safety standards you establish. 1,530 lights of plate glass were tested to destruction to establish pressure limits for each size and thickness to provide trustworthy p.s.f. data. **Review the test data shown here**—for ¼″ plate (for comparison) and for Heavy-Duty plate in thicknesses from 5/16″ through ¾″.

Parallel-O-Plate® is available in ¼″, 5/16″, ⅜″, ½″, ⅝″, ¾″, ⅞″ and 1″; *Parallel-O-Grey®* and *Parallel-O-Bronze* in 13/64″, ¼″, ⅜″ and ½″; and blue-green Heat Absorbing in ¼″ and ⅜″.

There is also an impressive reduction of sound transmission when you use Heavy-Duty plate. So go ahead and think BIG!

FREE KIT! Explains how tests were made, results achieved; gives sound-reduction data. Write to 23104 Libbey·Owens·Ford Building, Toledo, Ohio 43624.

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TOLEDO, OHIO

DESIGN LOAD — P.S.F.

Glass Thickness	10	20	30	40
	Maximum Allowable Area — Sq. Ft.			
1/4″	107	54	36	27[a]
5/16″	153	77	53	39
3/8″	221[a]	112	75	56
1/2″	244[b]	162	109	82
5/8″	225[b]	223[c]	148[c]	111[c]
3/4″	208[b]	208[b]	207[a]	155

[a] value extrapolated from test data [b] largest size presently available
[c] value interpolated from test data

NOTE: This table is based on (1) a design factor of 2.5; (2) glass supported on all four edges; (3) L·O·F's published minimum glass thicknesses; and (4) aspect ratios from 2:10 to 10:10.

◀ In the new gallery wing of New York's Museum of Modern Art, ⅜″-thick Heavy-Duty *Parallel-O-Bronze* plate glass floods the interior with daylight, yet reduces glare and sun heat. Architects: Philip C. Johnson Associates, New York. Glazing contractor: David Shuldiner, Inc., New York.

For more information, turn to Reader Service card, circle No. 381

Texture delicate as cloisonne, or rough as a driftwood log:

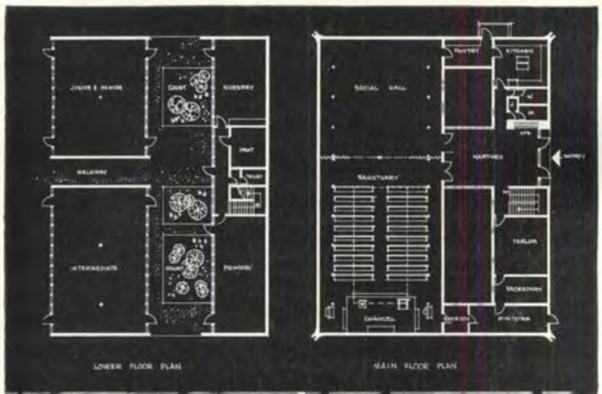
Red Cedar Shingles and Handsplit Shakes

The new Japanese Presbyterian Church in Seattle, and a home on California's windswept Mendocino coast demonstrate the design flexibility of Red Cedar shingles and shakes. The church sidewalls, even in shadow light, retain the delicate scale and refined wood texture sought by the architects, while the shake roof on the home seems almost to have been hewn from the driftwood that guards the door. It is this textural versatility of Red Cedar, coupled with its rich appearance and ability to age gracefully, that makes it a valuable means of expression. The product offers other advantages, too, such as wind- and weather-resistance, lightness, insulating capacity and ease of application. For more information, write the RED CEDAR SHINGLE & HANDSPLIT SHAKE BUREAU, 5510 White Building, Seattle, Washington 98101 or 550 Burrard Street, Vancouver, B. C.

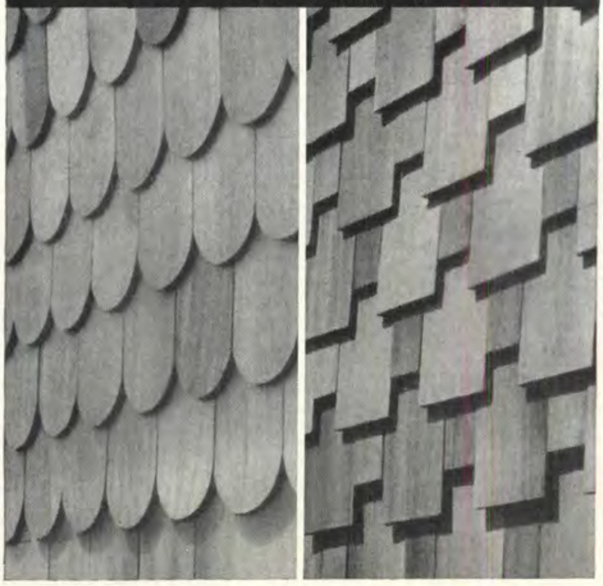
Above left: Japanese Presbyterian Church, Seattle, Wash. Architects: Kirk, Wallace, McKinley & Associates. The "fish scale" fancy butt shingles were specially sawed, while the dimension width shingles were applied in a staggered (wide and narrow shingle) exposure. All are Red Cedar Certigrade #1.

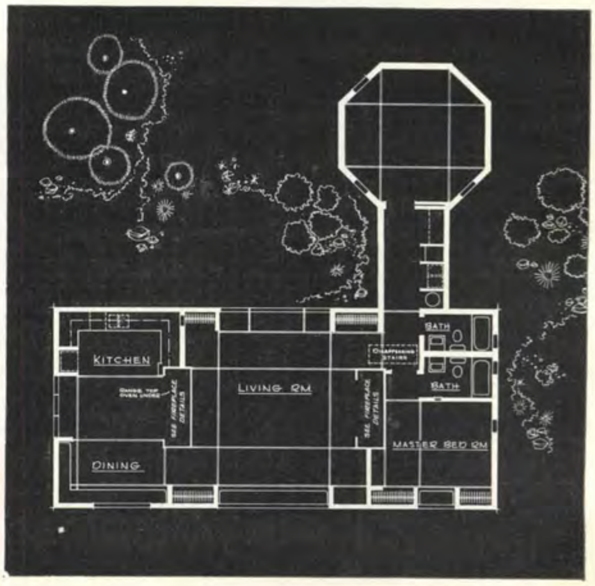
Below left: This home, perched on a fog-swept Pacific bluff, was designed by Architect Charles Warren Callister. The roof rises in a steep, 4-sided pitch. These are Red Cedar Certi-Split straight-split shakes.

Red Cedar shakes are featured on the House of Good Taste at the New York World's Fair.



THE CROWNING TOUCH OF QUALITY • RED CEDAR SHINGLES & HANDSPLIT SHAKES •





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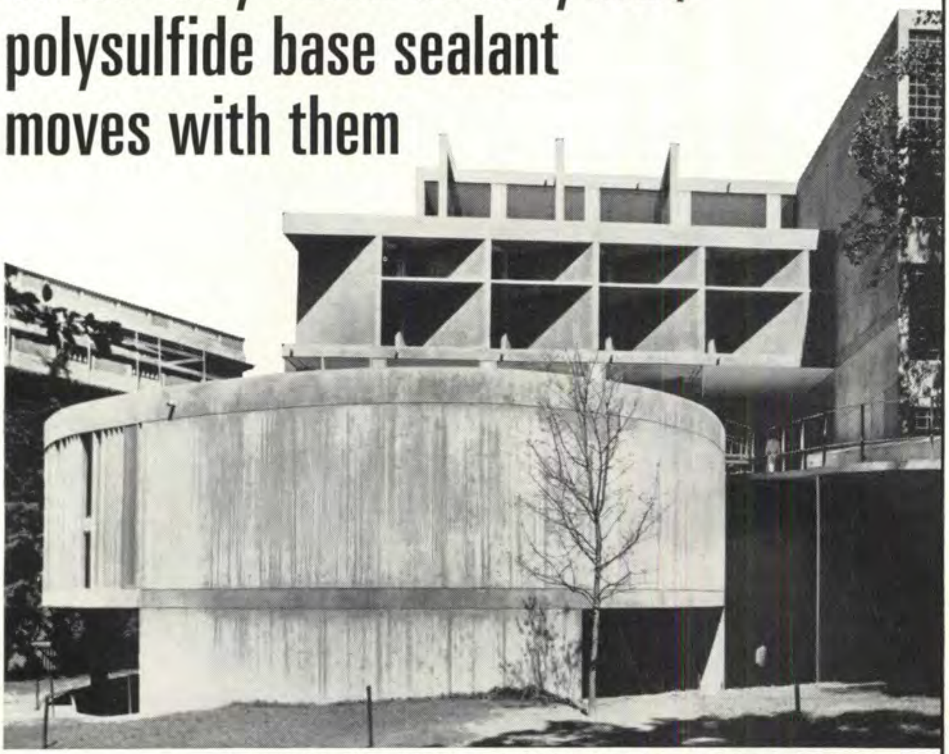
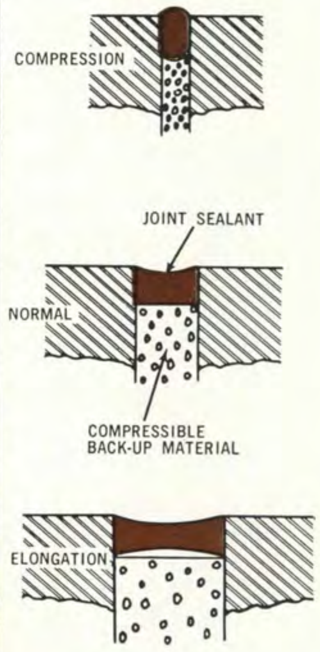
JOINTS

When they move as they will, polysulfide base sealant moves with them



Carpenter Center for the Visual Arts, Harvard Univ., Cambridge, Mass. Designer of the Architecture: LeCORBUSIER OF FRANCE. Architects: SERT, JACKSON and GOURLEY, Cambridge, Mass.

EFFECTS ON JOINT MOVEMENT



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780 North Clinton Avenue,
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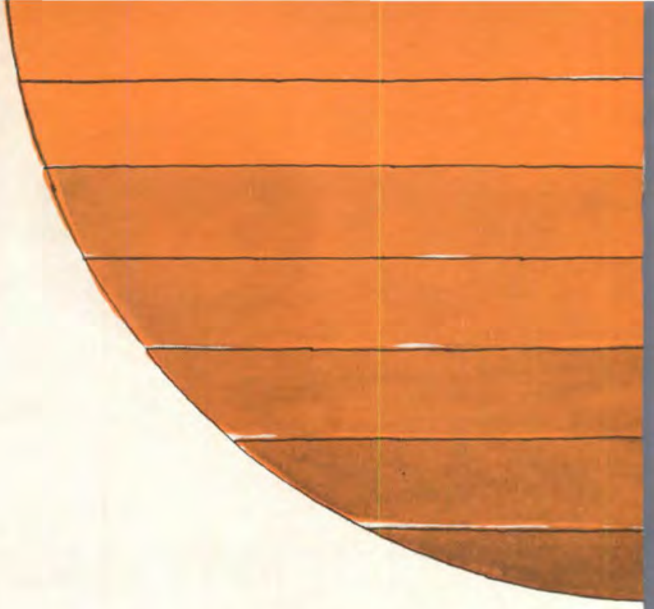

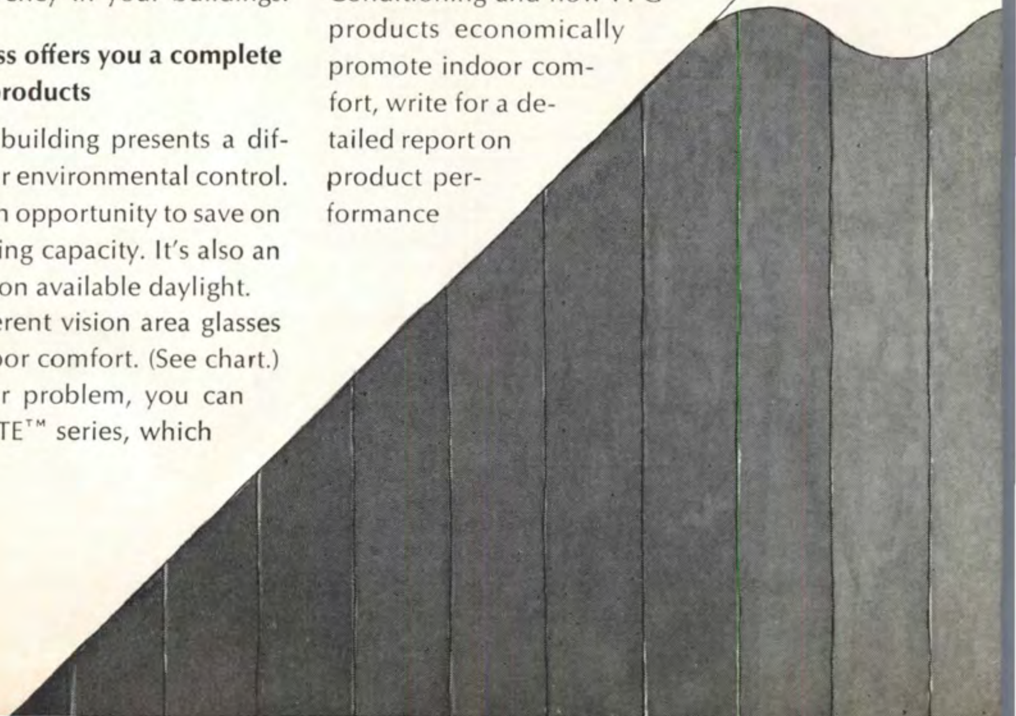

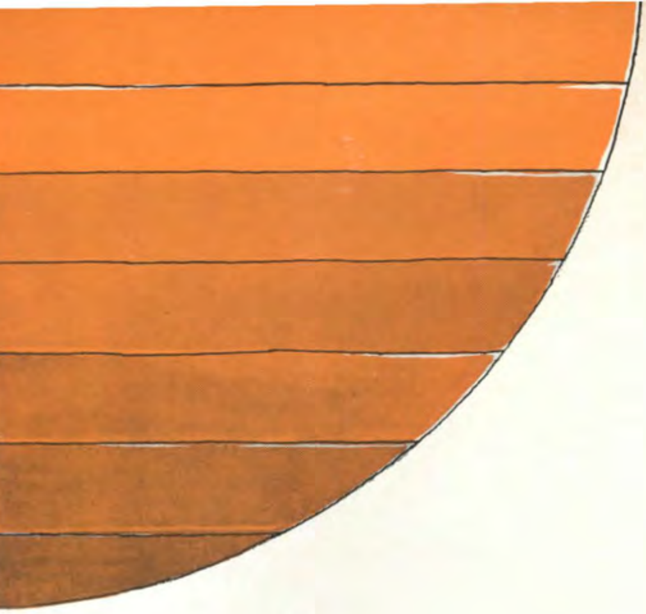

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	3/8"	130	38	.58
	1/2"	115	29	.50
Solex®	1/4"	150	75	.67
	3/8"	130	64	.58
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Clear Sheet Glass	7/32"		89	.96
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Graylite 61	3/16"		61	.91
Graylite 56	7/32"		56	.88
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Solarbronze Twindow		115	45	.54
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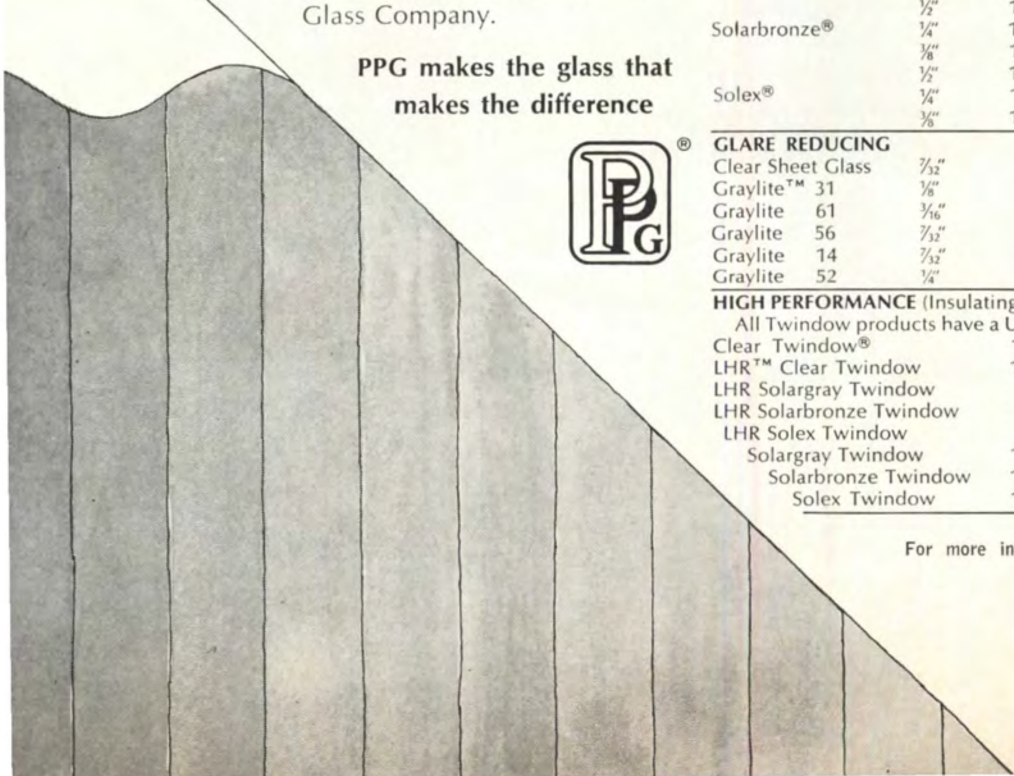
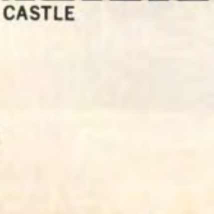


ARROWLINE

News: Wheeling introduces 9 decorative expanded metal



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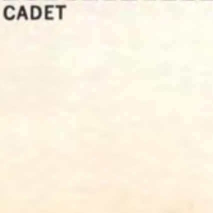

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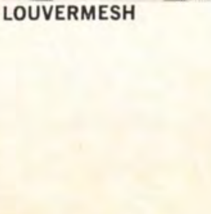

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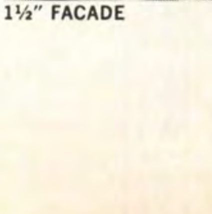
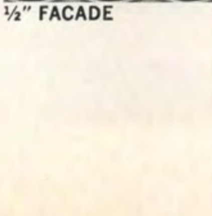


1½" FACADE



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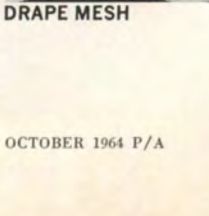

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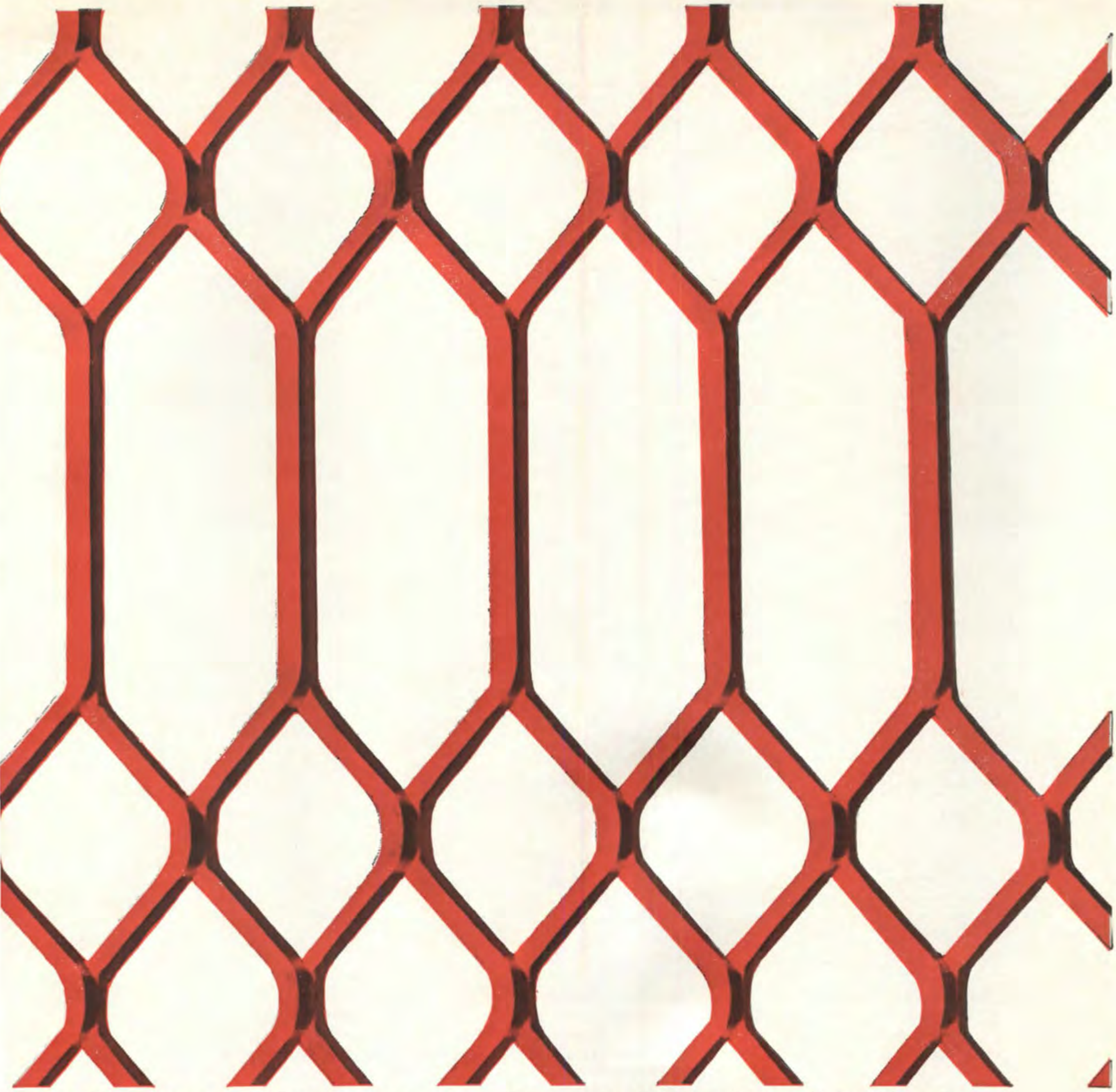

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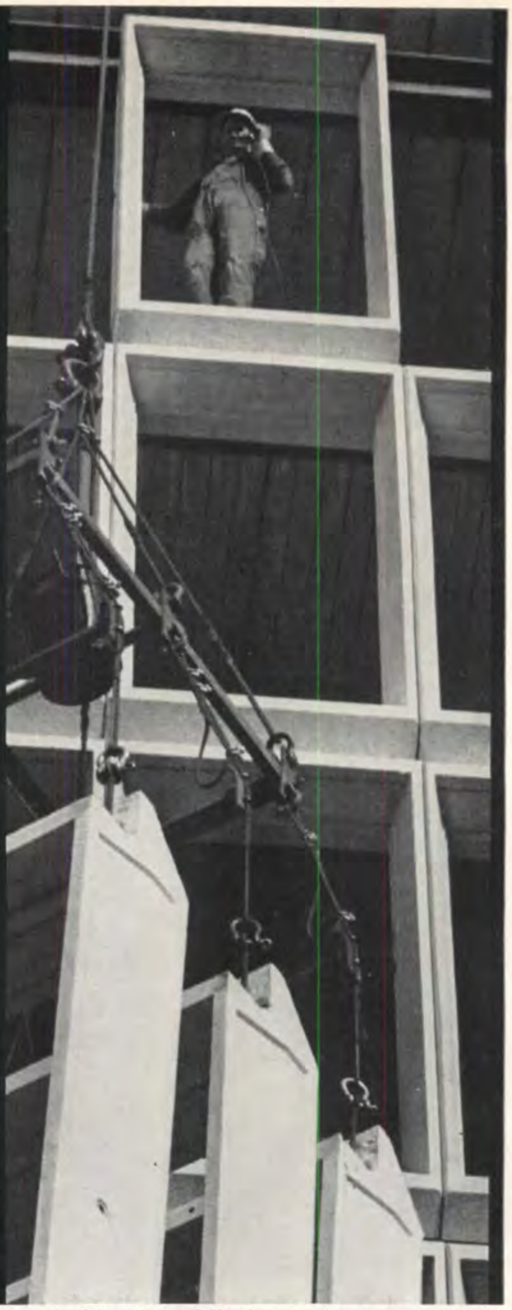

Detroit Bank & Trust Building, Detroit, Mich. **Builder-Owners:** Sam Minskoff & Sons. **Architects and Engineers:** Harley, Ellington, Cowin & Stirton, Inc., Detroit. **Consulting Architects:** Emery Roth & Sons, New York. **Contractor:** Minskoff-Detroit Construction Corp., New York. **Concrete Panel Manufacturer and Erector:** Pre-Cast Concrete Products Company, Marysville, Michigan.

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■ For specific information, consult your local precast concrete manufacturer. For general information and a 32-page, fully illustrated brochure titled "White Concrete in Architecture," write to Universal Atlas, 100 Park Avenue, New York, N.Y. 10017.

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7/32" HYLITE in entrance and office partitions, Pomona, Calif. *Glazing:* City Mirror & Beveling Works, Inc., San Gabriel, Calif.

Patio courts in the Wilson Park Apartments, Castellamare, Calif., are divided with light for privacy and wind protection with partitions of 7/32" textured BURLAP and ¼" BURLAP MISCO (wire).
Architects: Pollock and Drazan, Pacific Palisades, Calif.
General Contractor: Geo. A. Fuller Company
Glazing by: Ful-Trim

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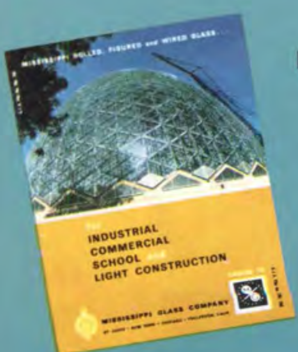
Lustrous, obscure 7/32" BURLAP glass in office building, Bellflower, Calif.
Owners, Builders and Architects: Lane and Brodie
Glass: Downey Glass Company
Glazing: Hal's Glass Company



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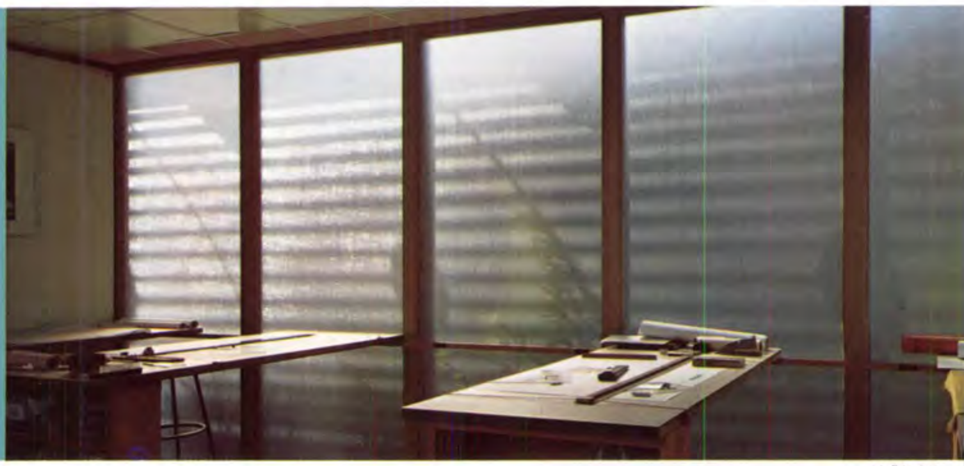

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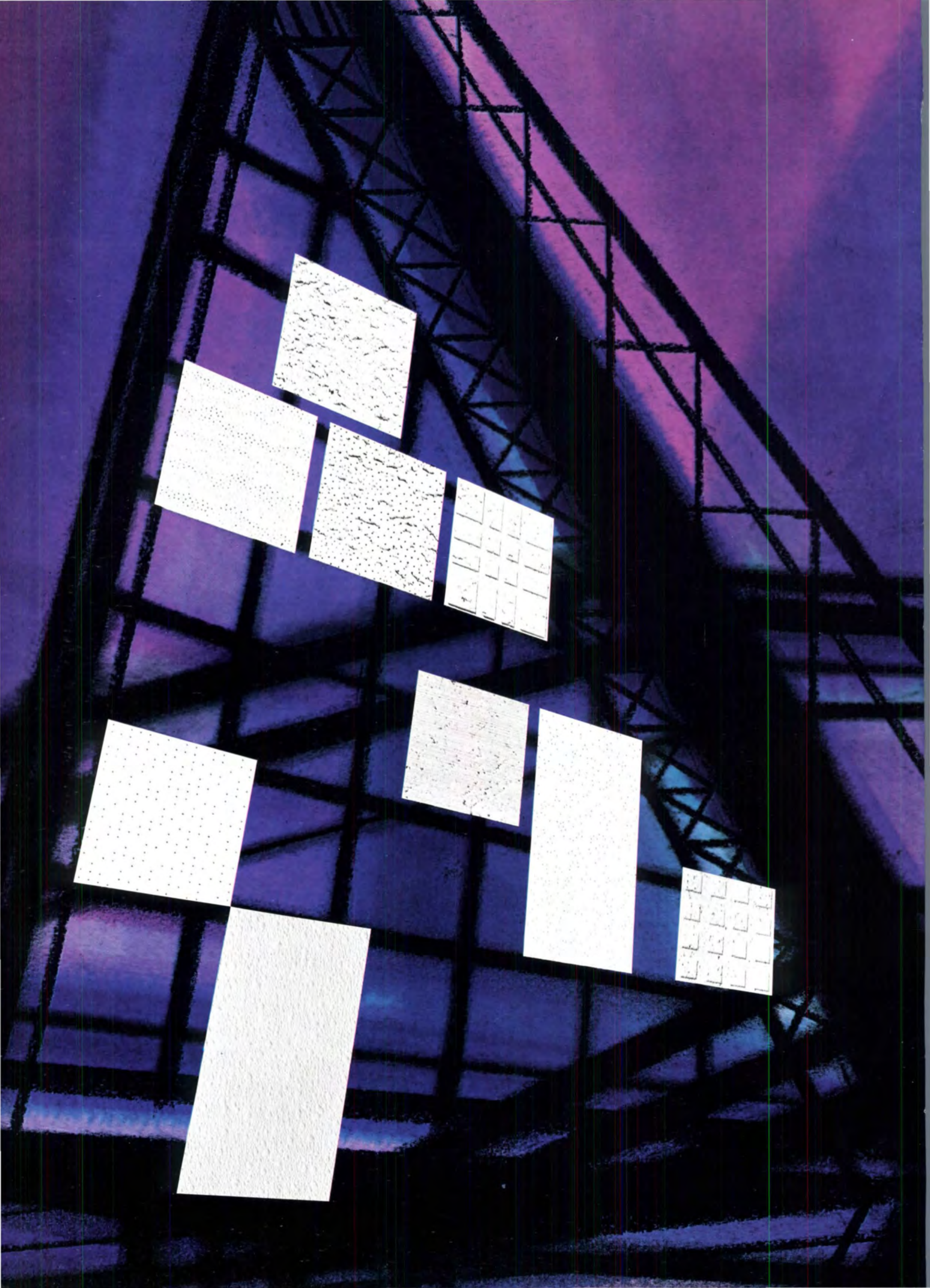

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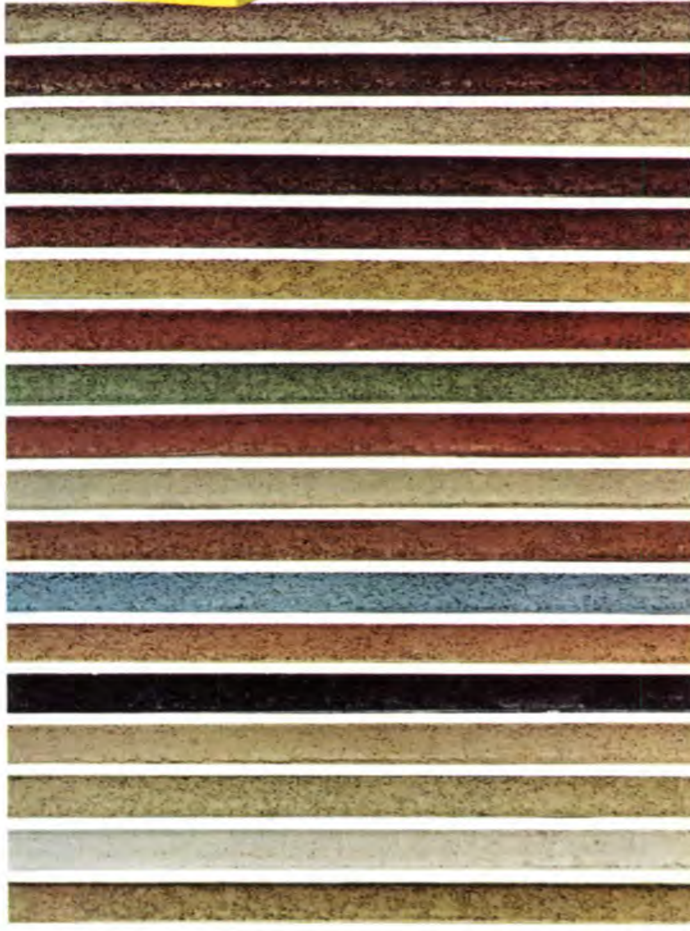

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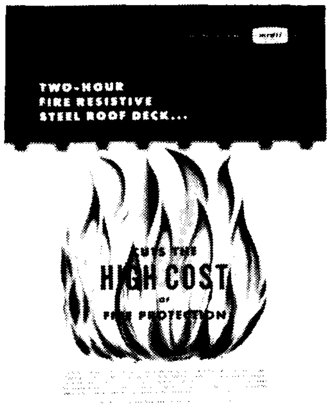

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DESIGN IDEAS 1964

On the following five pages you'll see specific examples of how Koppers building products have helped architects and engineers obtain greater latitude of design and save money for clients. These Koppers products are either permanent in themselves or they give permanence to other materials.

A. Dining hall, chapel, library, lounges, arts and crafts shop. Patio in center.
B. & C. Living quarters; each room has access to outdoors. D. Living quarters, plus medical facilities.
Architect: Carl A. Strauss & Associates, Cincinnati, Ohio
Associate Architect: Lipson and Wallace, Cincinnati, Ohio

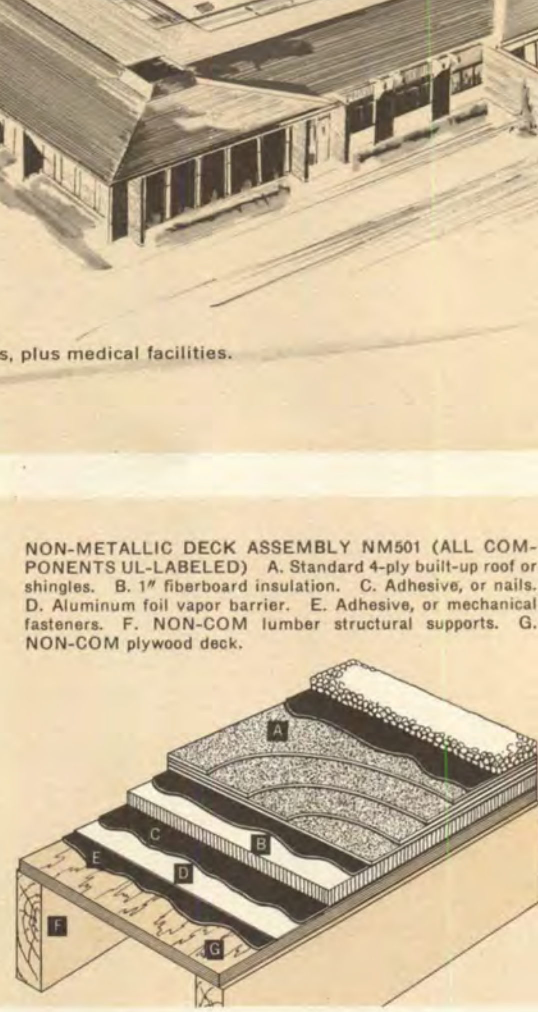
This wood roof has a fire rating equal to steel construction

Because the building site for the Glen Manor Home for the Aged in Cincinnati was lower than the street level, the architect designed a *pitched roof* for more visual interest, and to give the building a more "home-like" appearance. The architect used a new wood roof system, which has received a fire rating from Underwriters' Laboratories, Inc. that's equal to steel.

The roof was built with NON-COM® fire-protected lumber—120,000 board feet for the trusses and joists, and 46,720 square feet of ¾″ NON-COM plywood for the deck. NON-COM wood was selected for ease of construction and for the insurance savings. The roof (UL Listing NM501 for a non-metallic deck assembly) also met the fire code requirements of the Ohio Inspection Bureau, the City of Cincinnati, and the State of Ohio.

NON-COM lumber is pressure-impregnated with chemicals that provide automatic protection against fire. At temperatures below the ignition point of wood, the chemicals produce carbon and water vapor that choke off any flame and prevent fire spread. The same chemicals also provide permanent protection from decay and termites. Check the coupon for more information about NON-COM.

NON-METALLIC DECK ASSEMBLY NM501 (ALL COMPONENTS UL-LABELED) A. Standard 4-ply built-up roof or shingles. B. 1″ fiberboard insulation. C. Adhesive, or nails. D. Aluminum foil vapor barrier. E. Adhesive, or mechanical fasteners. F. NON-COM lumber structural supports. G. NON-COM plywood deck.



New low insurance rates for non-metallic deck assembly NM501

Many state insurance rating bureaus, based on UL's fire rating, have recognized this NON-COM treated plywood roof deck system, and have assigned it new low rates. Submit preliminary plans to your state rating bureaus for rate evaluation. This new comprehensive recognition by Underwriters' Laboratories of NON-COM roofs makes possible for the first time:

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Check the coupon for a Koppers brochure describing this NM501 deck assembly.

KOPPERS®

New residential colleges at Yale University protected with permanent, coal tar pitch built-up roofs

A. Co-operative Store. B. Master's House. C. Ezra Stiles College. D. Morse College. E. Master's House.

Architect: Eero Saarinen & Associates; Hamden, Connecticut
General Contractor: E & F Construction Company; Bridgeport, Connecticut

The late Eero Saarinen designed the Morse and Ezra Stiles residential colleges at Yale to be at home with the existing neo-Gothic buildings. "The familiar systems, elements and material of modern architecture — regularity, uniformity, standardization — were at odds with the diversity and individuality we wanted," he said. Rectangles and cubes, the flatness and lightness of glass and metal, seemed out of character.

"We conceived these colleges as citadels of earthy, monolithic masonry —whose interiors of stone, dark oak and plaster would further their spirit of strength and simplicity," Saarinen said.

Each of the colleges, named for Samuel F. B. Morse, and Ezra Stiles (Yale's seventh president), houses 250 undergraduates, and contains dining halls, libraries, offices, and quarters for faculty fellows and a separate master's house looking out to a walled garden. The buildings were opened in 1962.

The two dormitory buildings, two masters' houses and nearby co-operative store are all protected by Koppers coal tar pitch built-up roofs, constructed of alternate layers of coal tar pitch and tarred felt, and topped with gravel imbedded in a heavy pouring of pitch.

Unlike other roofing materials, coal tar pitch has a molecular structure that permanently resists oxidation and the penetration of water and water vapor, and provides long life. Many Koppers built-up roofs like this one are more than 30 years old and still in excellent condition.

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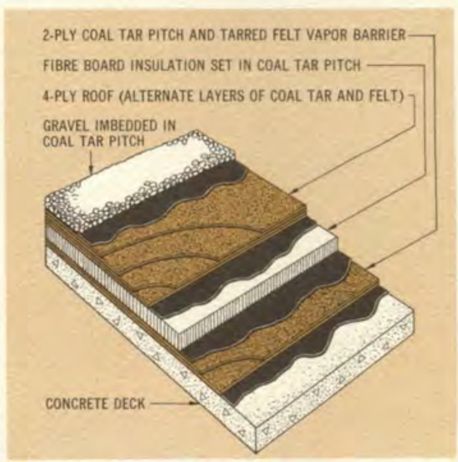

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Insulated structural panels saved $16,000 in this freezer warehouse

The new Charley Brothers Co. freezer warehouse addition in Greensburg, Pa., was built with factory-made DYLITE® Refrigeration Panels. The designers and builders, S&E Associates, Pittsburgh, estimate a savings of $16,000 because the client was able to get into business two months sooner; DYLITE panels go up faster than conventional cold storage construction materials. The 85,000-cubic-foot building is 64 feet long, 64 feet wide, and 20 feet, 8 inches high.

Because these panels are load bearing, they form the complete structural wall and roof deck of the building. No perimeter steel framing was necessary.

All 65 wall panels (8 inches thick, 4 feet wide, 20 feet, 8 inches long) and 68 roof panels (8 inches thick, 4 feet wide, 16 feet long) were erected in only 10 working days. The building sits on a reinforced concrete slab, supported by continuous concrete block columns which permit free circulation of air beneath the freezer floor.

The panels are sandwich type. The interior facing is plywood; the exterior is plywood with an embossed .015″ aluminum sheet that provides a vapor barrier with a zero perm rating. The panel core of DYLITE expanded polystyrene is molded in place in the factory. This rigid foam plastic has a very low water absorption rate because of its closed cell structure. It has a "K" factor of 0.24 at 70°F which gives the 8″ thick panel a "U" factor of 0.030. An easily-operated, mechanical locking device joins the panels vertically and also locks the roof panels to the tops of the wall panels.

Koppers produces both load bearing and non-load bearing DYLITE panels—and provides erection services —for refrigeration and many other environmental control applications. Check the coupon for information.

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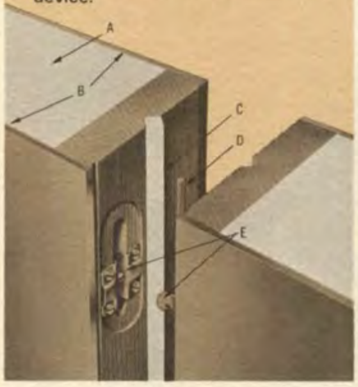

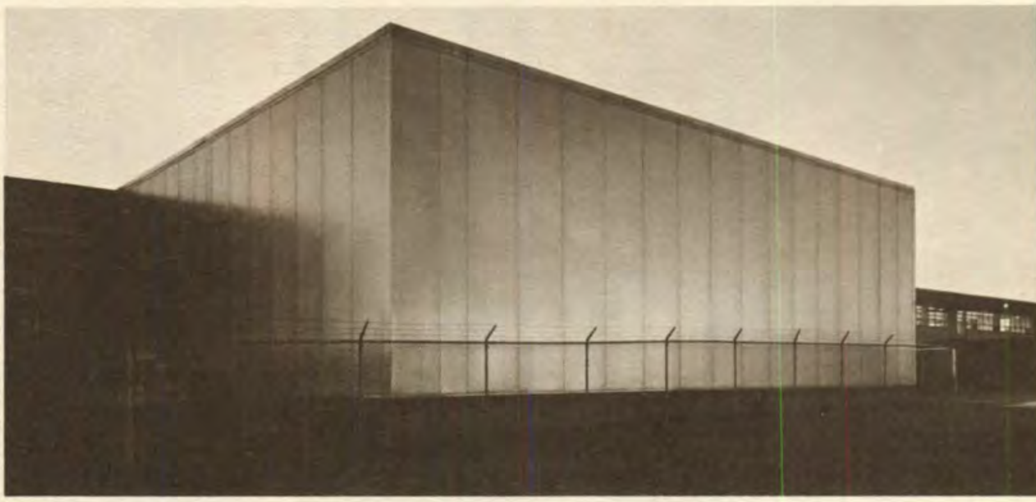

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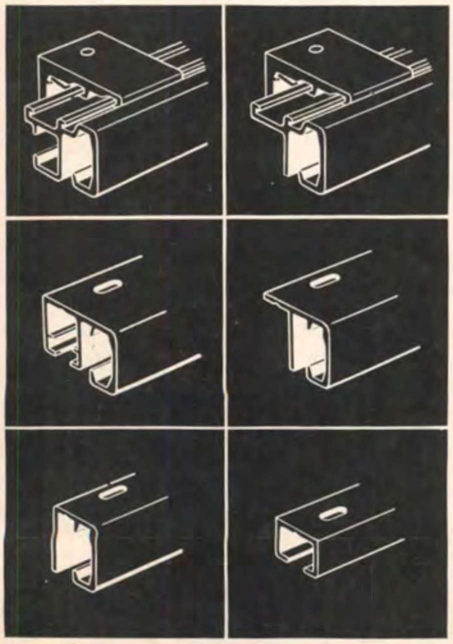

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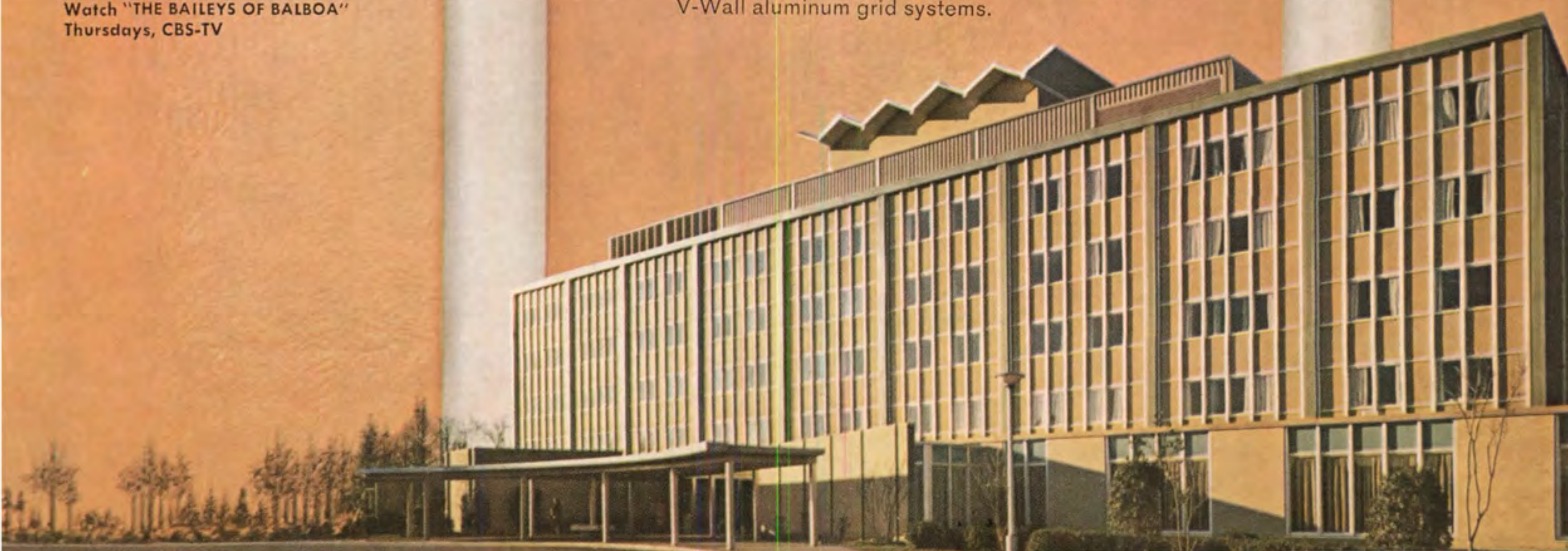

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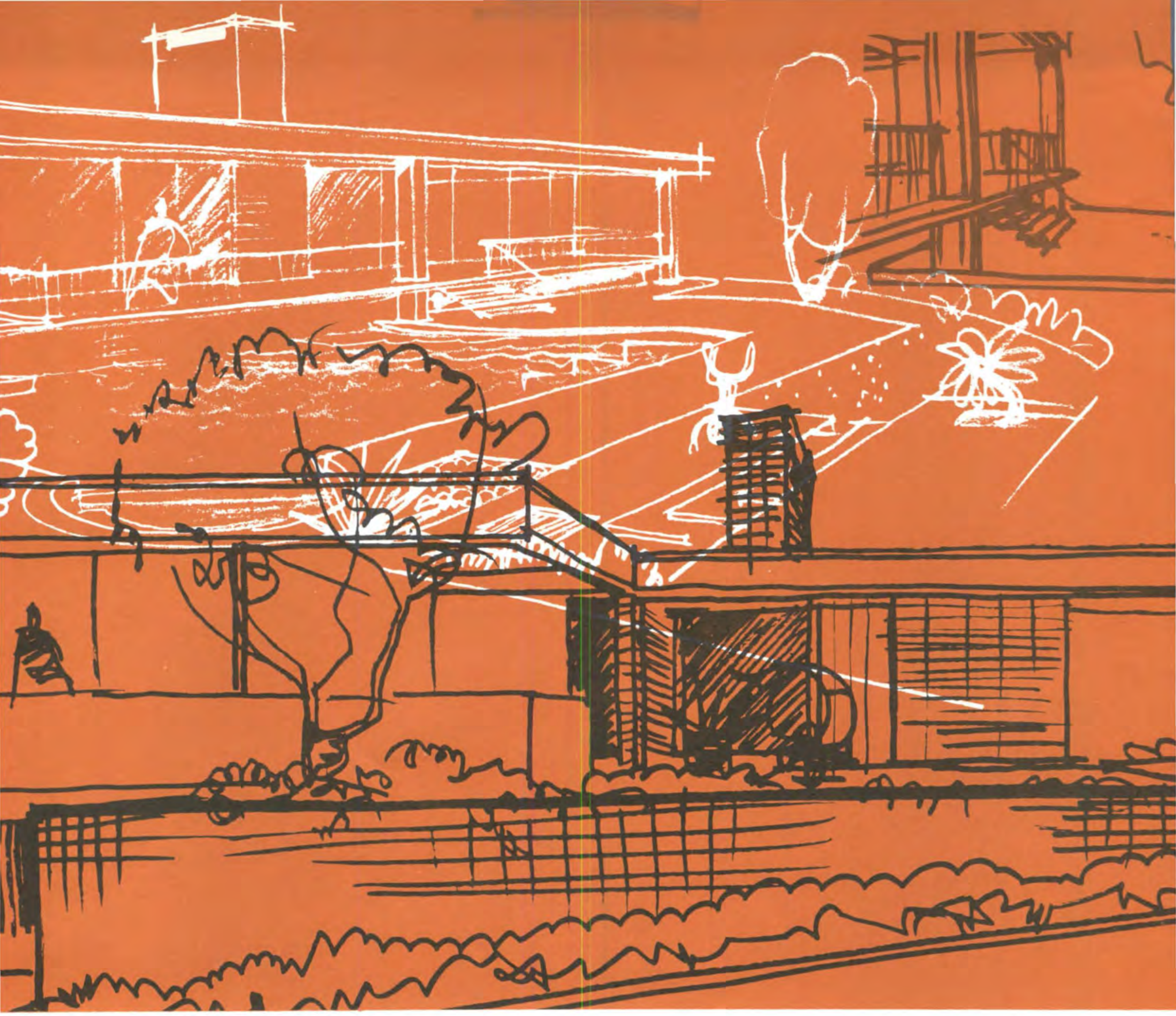
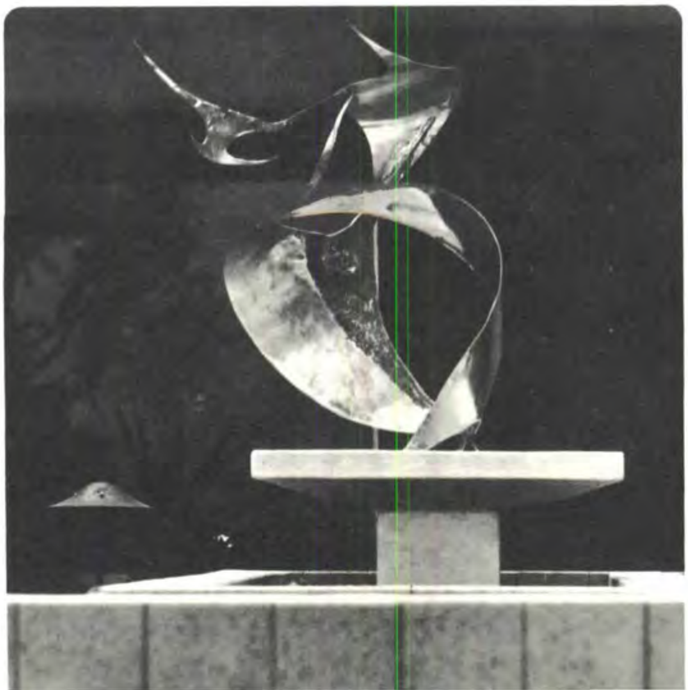
OLYMPIA PACIFICA: THE HOUSE OF EXCELLENCE

OLYMPIA PACIFICA—A PRINCIPLE

On a hill overlooking a bay of the Pacific there is a new house created to explore a number of somewhat unconventional views of the designer, John F. Galbraith, A.I.A. The design philosophy of the house, and how it worked in application, can best be stated by Mr. Galbraith: "This project has been an opportunity—for a moment— to ignore the mainstream of current residential design thought. Fundamental to this concept are these beliefs: that residential design calls for greater discipline than it has received; and that inherent in structure and materials now available, are far greater advantages than have been utilized in housing. Olympia Pacifica was built to prove that the application of logic and sensitivity to residential design, construction and choice of materials can bring about substantial improvements for home occupants."

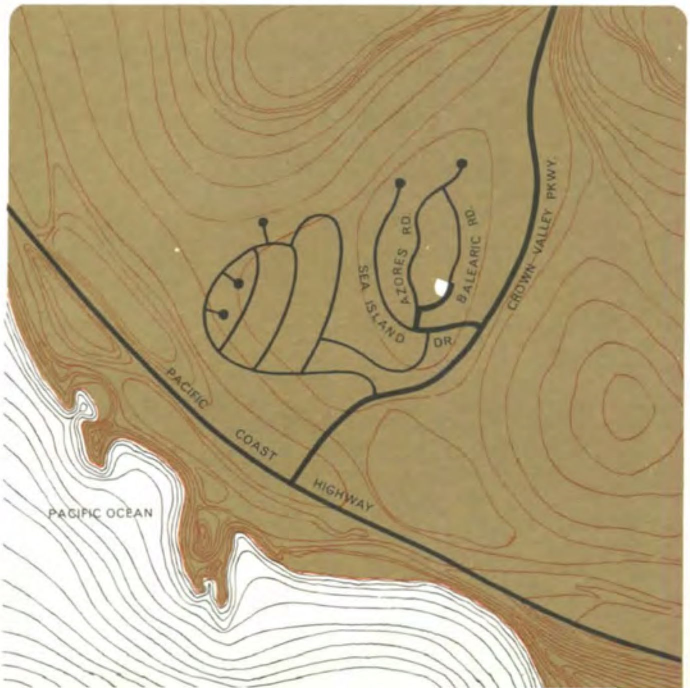
The principles thus proved can be equally successful for any price level and in any locality. As much as has been said of architectural freedom, it must be admitted that society itself tends to develop its own set of basic restrictions. The stereotype interpretation of economics is the biggest problem. But building economi*cally* does not mean cheaply. Here, at Olympia Pacifica, the most common of society's restrictions have been set aside. Site, materials, concepts have been assembled as a whole by the architect. Fifty years from now, one hundred years from now, Olympia Pacifica will still sit above the ocean as a tribute to an age of advanced technology, structural freedom and beauty.

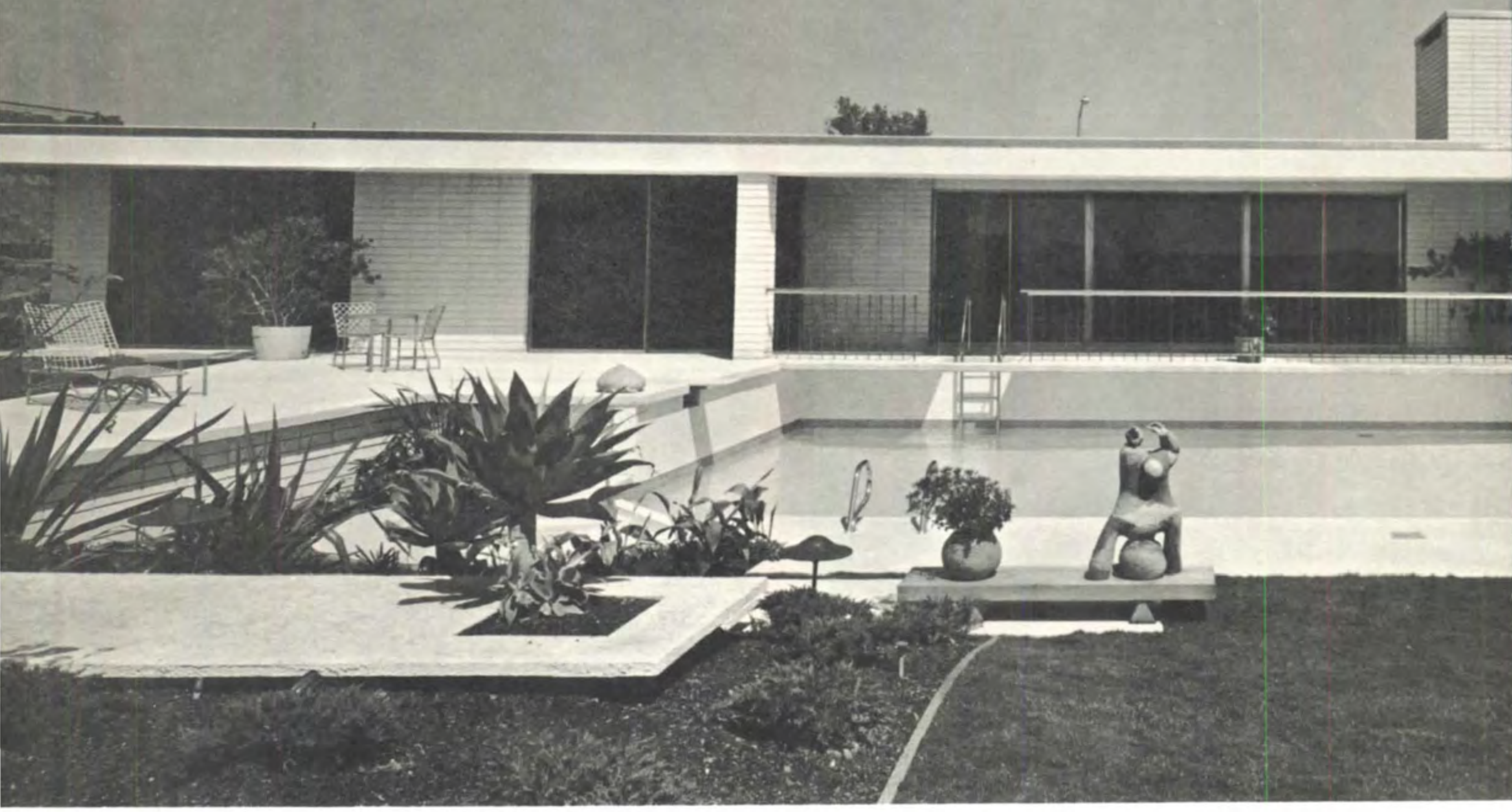




THE HOUSE AT LAGUNA NIGUEL

John F. Galbraith & Associates undertook the design and construction of this house for its own account, in order to give full expression to its deeply felt convictions about residential design and construction. Housing is perhaps the most important industry next to food. It is disquieting that the design and construction of houses has become an intricate, hide-bound and expensive undertaking; so much so that every year fewer people can afford a house custom designed to their needs or desires. Although new methods are constantly emerging in commercial construction to improve results and lower costs, residential design and construction has experienced comparatively little fundamental improvement for many years. This 3,500 square foot house is a research project into the philosophy of excellence in design and the specification of materials. It rejects obsolescence in the selection of components, demonstrates significant achievements in planning and in construction. The site, about 55 miles south of Los Angeles, is a hillside overlooking Monarch Bay and a 225 degree view, including the Pacific Ocean, the offshore islands of Santa Catalina and San Clemente, and the mountainous terrain north and south of Laguna Niguel. The surrounding area, Laguna Niguel, is a 7,000 acre planned community stretching inland about seven miles from the Pacific Ocean. The community will include shopping centers, high and low rise apartment buildings, golf and beach clubs, churches, schools, commercial buildings and its own freeway access. A principal design factor in the creation of the house was a fascination with the site at Laguna Niguel. The site selection was made first because of the views it afforded and second in consideration of its relationship to other lots. The design gives the house a sense of sitting on the hill by itself. To achieve this goal all the views were with a transit and transferred the bearings of all views onto the plot plan as a guide to planning.

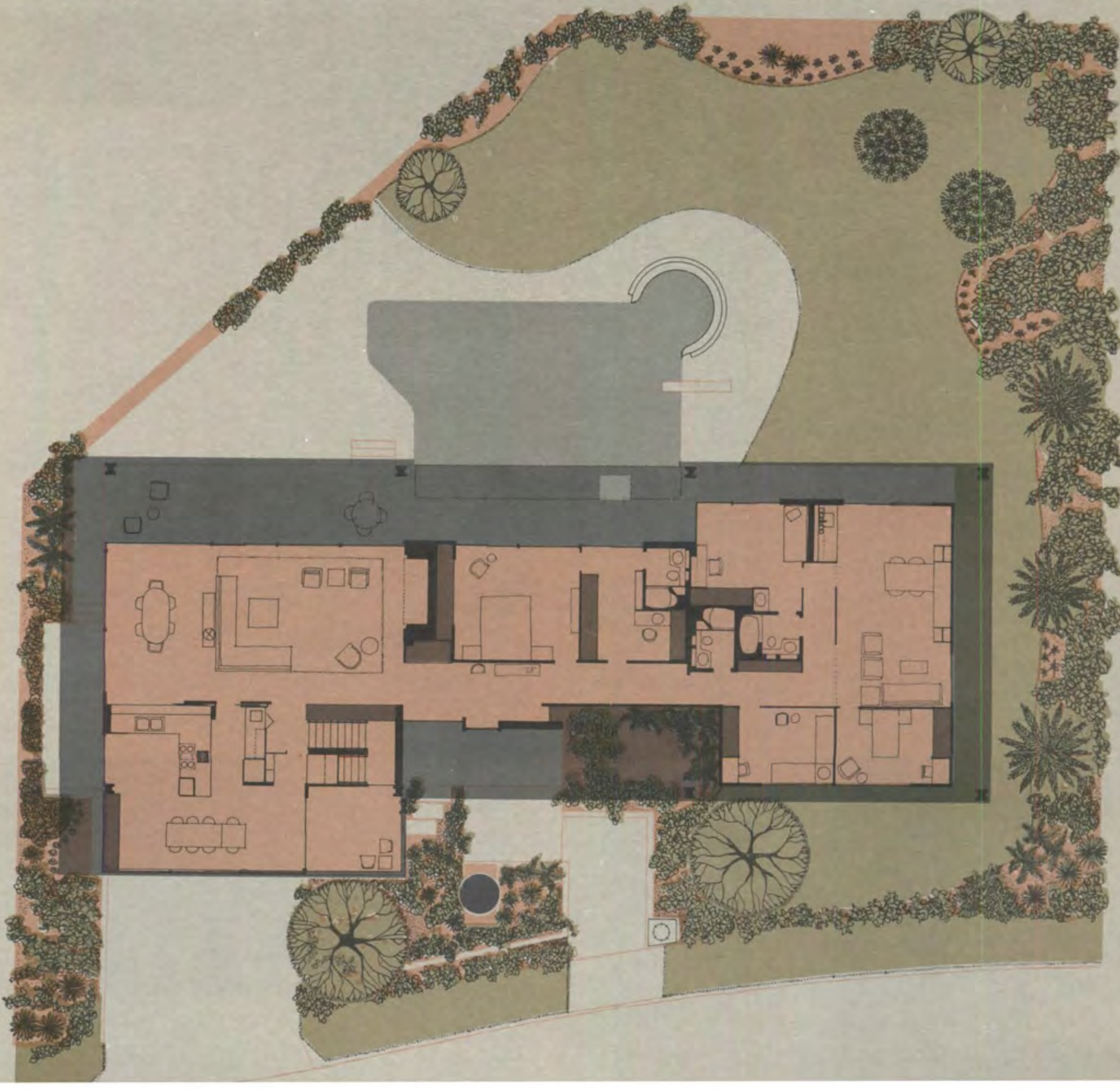




THE HOUSE OF EXCELLENCE

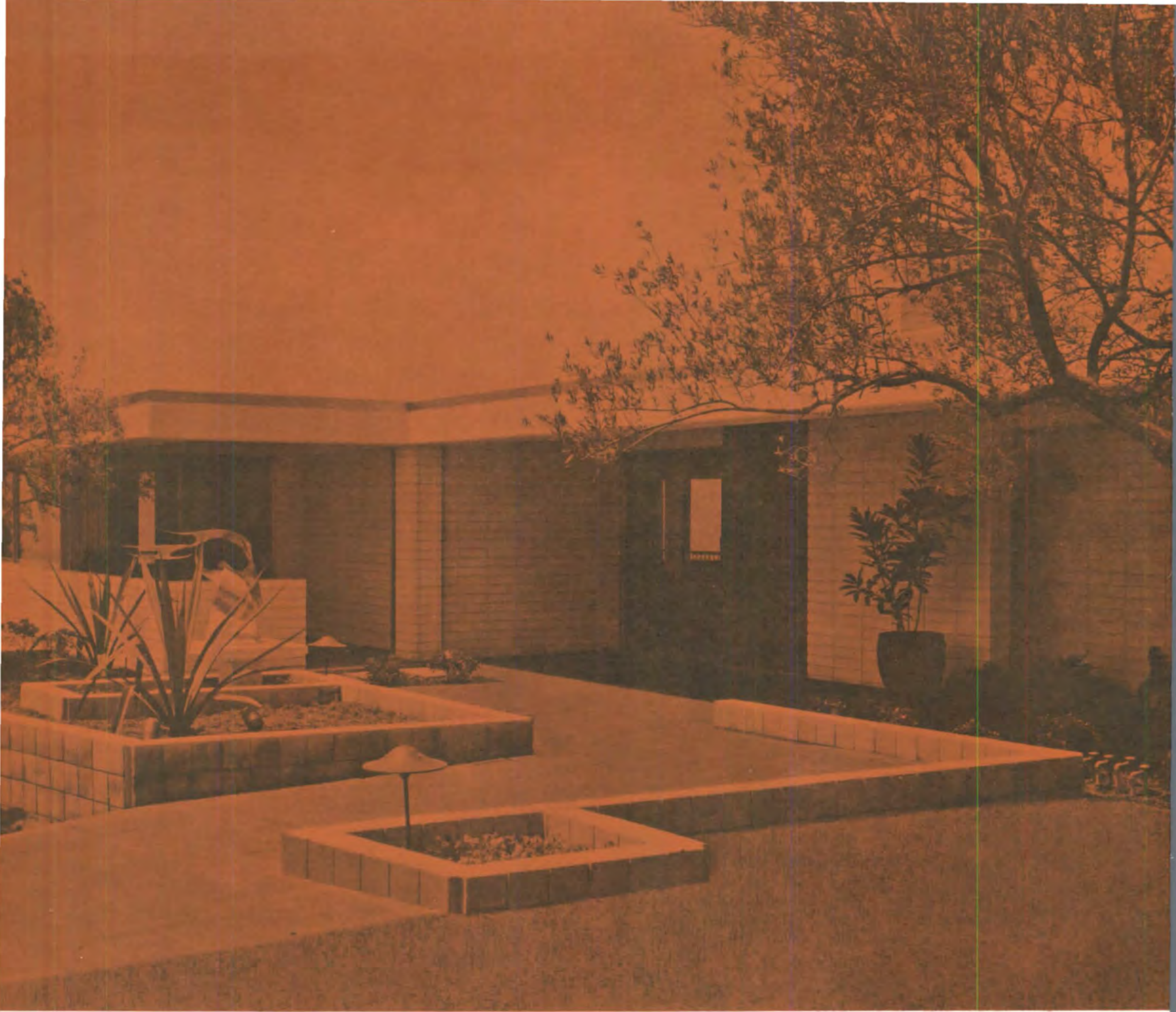
The commanding view of the site selected for the House of Excellence suggested a linear plan for the design. This plan, expressed in the great "floating plane" of the roof, provides each important living area with either an intimate relationship to the garden and decking or the views. The design concept is best described by naming some of the features that are not included: There are no bizarre roof shapes, no unusual shapes in the interior, no myriad uses of unrelated materials, no ostentatious bath facilities . . . in short, none of the many design cliches much too frequently encountered in contemporary houses. Flexibility is rare in houses today. And permanence was traded for first-cost economy many years ago. Olympia Pacifica has returned these two terms to their proper niche. Families change, tastes and interests also change. To meet this problem Olympia Pacifica can have non-load bearing walls anywhere without regard to roof support. A bedroom can be added today and removed 15 years from now. The house will retain its classic acceptability fifteen or fifty years from now. White concrete and stainless steel provide a fusion between structural strength and architectural form. The construction is ageless, and the design is ageless.

Inside the house, the same feeling of freedom prevails. Interrelation of space in the living, entry, kitchen, breakfast and deck areas contributes to the feeling of spaciousness and yet creates a sense of shelter and repose. Walls—normally structural elements in residential design—are treated as screens for privacy and shelter or else as elements in the total visual response that the house conveys. The theory of rejection of obsolescence in the philosophy of materials selection disagrees with much of today's civilization and architecture. Many materials commonly used create a veneered architecture. The finish and color of both stainless steel and concrete are part of the mass of the material itself. You could live in Olympia Pacifica for years and still find the unexpected. A shadow falls across a fireplace. Natural light plays over a stainless steel sculpture. Since living is the key, the living room is the core of the house, oriented to the broad vista of mountains, hills, coastline and sea. Stainless steel sliding glass doors and white concrete columns add perspective to nature. The master bedroom has primary access to the long, shaded veranda and pool. Family activity—work, play, television watching or just plain relaxing and reading—is set away from the more formal area of the house. The pool is integrated with the informal areas of the house, yet contributes to the view from the formal ones. The large fireplace and chimney are a reflection of a personal conviction that everyone enjoys the sight, warmth, and smell of the open fireplace. The living room is generous in scale—closely related to the outside through deck areas and occupying the principal view position. A sculptural panel executed in deep relief accents the fireplace. A deck extends the length of the house, is ten feet in depth and is radiant heated becoming a valid esthetic and real addition to the living-dining and master bedroom area.



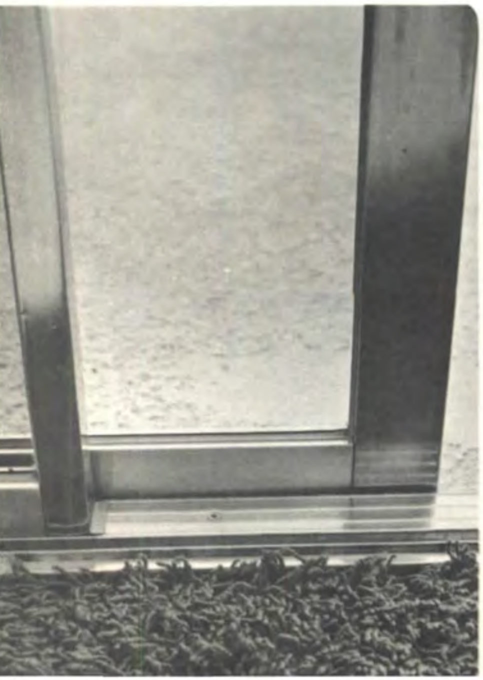
Under the long, horizontal roof plane, one can see within the confines of the house, more than 100 feet of architectural excitement. Each room has its own view, its own privacy. Even from the kitchen, one has almost the same broad vista as from the living room. From the inside-outside informal dining area and the two smaller bedrooms one can see miles down the coastline. The family activity room looks out on the garden area and distinctive site design elements, with the Pacific Ocean beyond. The openness in design is abetted by the long spans obtained in reinforced concrete. The walls become elements of separation and design and not of support. Although the building pad itself is flat, the slope of the terrain toward the sea is utilized as an integral part of the design with the placement of undercover parking and basic utilities under the house. This grade also allows for a unique swimming pool treatment in which the pool continues a full four feet under the cantilevered veranda and can be entered from a "porthole" in the veranda floor. The entry way, as the basic center of the design, is placed so that it is possible to go anywhere in the house with the least possible number of steps. It is placed in a deep shelter to give the visitor the sense of being protected by the shelter of the home even as he arrives. There are a number of places to do things—eating—not just one location, but five . . . a dining space in the living area enjoys the view, but does not intrude on the use of the living room for its primary purpose. Eating space on the veranda by the pool—and on a cantilevered deck by the kitchen —another space down at the level of the pool and a secluded area near the entry way. The floor plan contrives to place the parents' bedroom as far as possible from the children. To provide children—as well as adults—the dignity of privacy, the closely related children's bedrooms have their own living area and a door closing off this children's suite. The children's suite is designed to be converted to other uses when the children leave home.

Much of the leisure time of America has been spent on the front porch, rocking and nodding at the neighbors. A veranda is shade and comfort and a knowledge that you are somehow outside of your house without having lost its protection and warmth. You can lie on the deck in the warm sun or swim in the pool. The veranda is one of the three outside sitting and dining areas for different times of the day and changing weather conditions. On the west side of the house, one has an unimpeded view of the sea. And at the front of the house, one looks south down the coastline. While the design brings the outside inside, the outside does not dominate. From at least two portions of the house, one is able to look out the window and actually see the house. The house is related both to its surroundings and to the people within it. The structural system of the House of Excellence uses reinforced masonry steel columns and a reinforced concrete roof deck and beams to carry the structural load. This structural system provides that no exterior or interior walls are required for load bearing. It thus becomes possible to use sweeping expanses of bronze tinted plate glass framed by stainless steel, instead of exterior bearing walls. Fill from the garage excavation was used to elevate the main floor. This, in turn, dropped the pool so that it does not dominate visually. The house shows "itself" to the occupant in as many areas as could be contrived; being able to see the house from within affords the opportunity to enjoy the perspective lines of the house, a little used factor in the enjoyment of architecture to date.



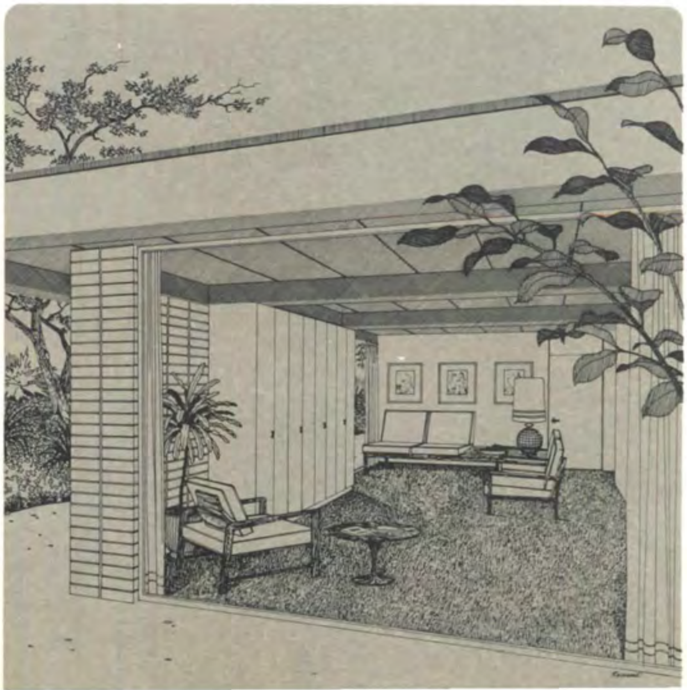
CONSTRUCTION INNOVATIONS

In the creation of a classic house, white concrete and stainless steel represent the highest achievement of masonry and metallurgy. Each was selected for the economy of functional simplicity, to visually complement the other in subtle contrast and for its imperviousness to nature. This was particularly desirable because of the seacoast location: in such a region all materials, both inside and outside, are subject to the ravages of the salt-laden, airborne moisture. One hundred and fifty tons of monolithic white portland cement with lightweight coarse aggregate and special silica sand rest on eight masonry columns. The concrete roof system with conventional mild steel reinforcing formed over a patented modular system lined with fiberglass results in a smooth, dense surface ceiling. Concrete, with the aid of an admixture, was placed in the form through a unique peristaltic action pump allowing for even, uninterrupted distribution. In bare essence, that is Olympia Pacifica. It is a house in which non-structural walls act as screens between different areas of activity. Pure white concrete masonry units were used for all exterior and many interior walls. The final block was sandblasted to expose the white cement, sand and fine aggregates. The foundation and retaining walls are composed of mortarless blocks which permit rapid placement of masonry, steel and grout and provide for an exciting lightness of design. The use of stainless steel not only in detailing but as an actual building material provides a sound architectural answer to the problems of durability and maintenance. Sliding glass doors of stainless steel will be sliding as easily twenty years from now as they do today and will look just as beautiful. From roof fascia to window frames, from deck and pool railings to counter tops, sinks and lavatories, to locks and hardware, Olympia Pacifica uses stainless steel. Radiant heating through copper tubing in the living room and outside decks and fan coil units in all other rooms provide comfortable living. The boiler provides heat to these two systems, for domestic needs, and pool heating. Other details include: special bronze tinted glass for both fixed and sliding units; all irrigation is electronically controlled; low voltage outside light provides complete safety regardless of the weather conditions; glass and acrylic skylights; integrally colored precast concrete tiles for some interior and exterior flooring; and a new colorfast, non-skid material for all wet-area concrete decks.



CONCEPTS AND FEATURES

What does an ageless house cost? For the past decade, at the least, houses have been considered from the point of view of their initial cost. Hopefully, the land will appreciate sufficiently in time to cover the initial cost of house and lot together. Olympia Pacifica is a house which will be worth as much twenty or thirty years from now as it is today. Plus, the maintenance costs of white concrete and stainless steel are so low as to save a minimum of $18 thousand dollars over a thirty year period. Another unusual concept is bathroom design. Even though the trend seems to be toward huge, lavish baths (doesn't anybody remember what happened to the Roman Empire?), Olympia Pacifica relies on a compact room for personal hygiene. The baths are "one-piece" fiberglass and polyester construction, factory built and delivered to the job complete. The kitchen as a place of drudgery is a thing of the past. To work in Olympia Pacifica is enjoyment, whether it's a tete-a-tete supper or a sit-down dinner. Easily maintained steel casework is planned around the person who enjoys her (or his) kitchen. At night there's the glare-free light of a luminous ceiling. And all the while, the view.



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CONCRETE SPECIALTIES COMPANY
Azusa, California/*Sculptural Concrete Facing*

CONCRETE TIE
Compton, California/*Patented Forms*

COROLITE BY CORNADO
Long Beach, California/*Exterior Lighting*

CRESTLITE DIVISION–Susquehanna-Western Inc.
San Clemente, California/*Lightweight Aggregates*

CRYSTAL SILICA COMPANY
Oceanside, California/*Sand*

CUSTOM KITCHENS BY ST. CHARLES
Los Angeles, California/*St. Charles Kitchen*

EMCO/CAL GATE MFG. CO.
Wilmington, California/*Precast Concrete Tile*

FILON CORP.
Hawthorne, California/*Form Lining*

FIESTA POOLS
South Gate, California/*Swimming Pool*

FRANTZ MANUFACTURING CO.
Huntington Park, California/*Garage Door*

GENERAL LOCK INC.
Pontiac, Michigan/*Hardware*

GREAT WESTERN RESEARCH CORP.
Subsidiary of American Cement Corporation
Los Angeles, California/*Portland Cement-Epoxy Coatings*

HAZARD PRODUCTS INC.
San Diego, California/*White & Mortarless Concrete Block*

JACKSON SUPPLY COMPANY
South El Monte, California/*Distributor–RainBird Mfg. Corp.*

JOHNS-MANVILLE
Flooring Division, Long Beach, California/*Floor Covering*

JONES & LAUGHLIN STEEL CORP.
Stainless and Strip Division, Detroit, Michigan/*Stainless Steel*

KRALOY/CHEMTROL COMPANY
Santa Ana, California/*Plastic Pipe & Fittings*

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Gardena, California/*Fan Coils*

LIVINGSTONE GRAHAM BROS. INC.
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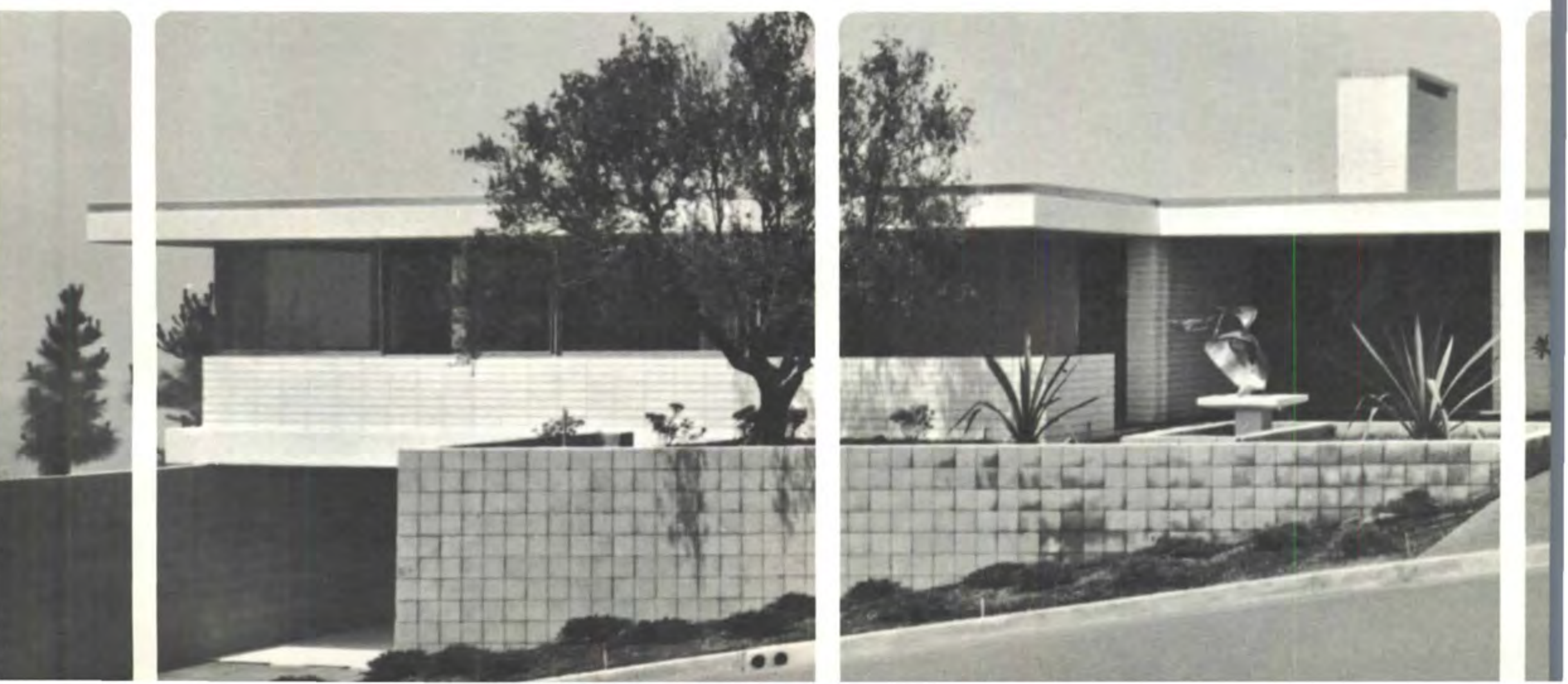
MOEN FAUCET
Division Standard Screw Co., Cleveland, Ohio/*Valves*

MORTEX AND COMPANY
Tucson, Arizona/*Concrete Deck Surfacing*



NOLBY DRY WALL, INC.
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ONEIDA LTD. SILVERSMITHS
Oneida, New York / *Flatware*

OSBORNE LABORATORIES, INC.
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RAYPAK COMPANY, INC.
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REVERE DESIGNERS GROUP
Revere Copper and Brass, Inc., Rome Mfg. Co. Division, Rome, New York / *Utensils*

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Buffalo, New York / *Rigidized Stainless Steel*

RIVERSIDE CEMENT COMPANY
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J. H. BIGGAR
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W. BENNETT COVERT
Pasadena, California / *Landscape Architect*

DAVID CRESSEY
Los Angeles, California / *Architectural Potter*

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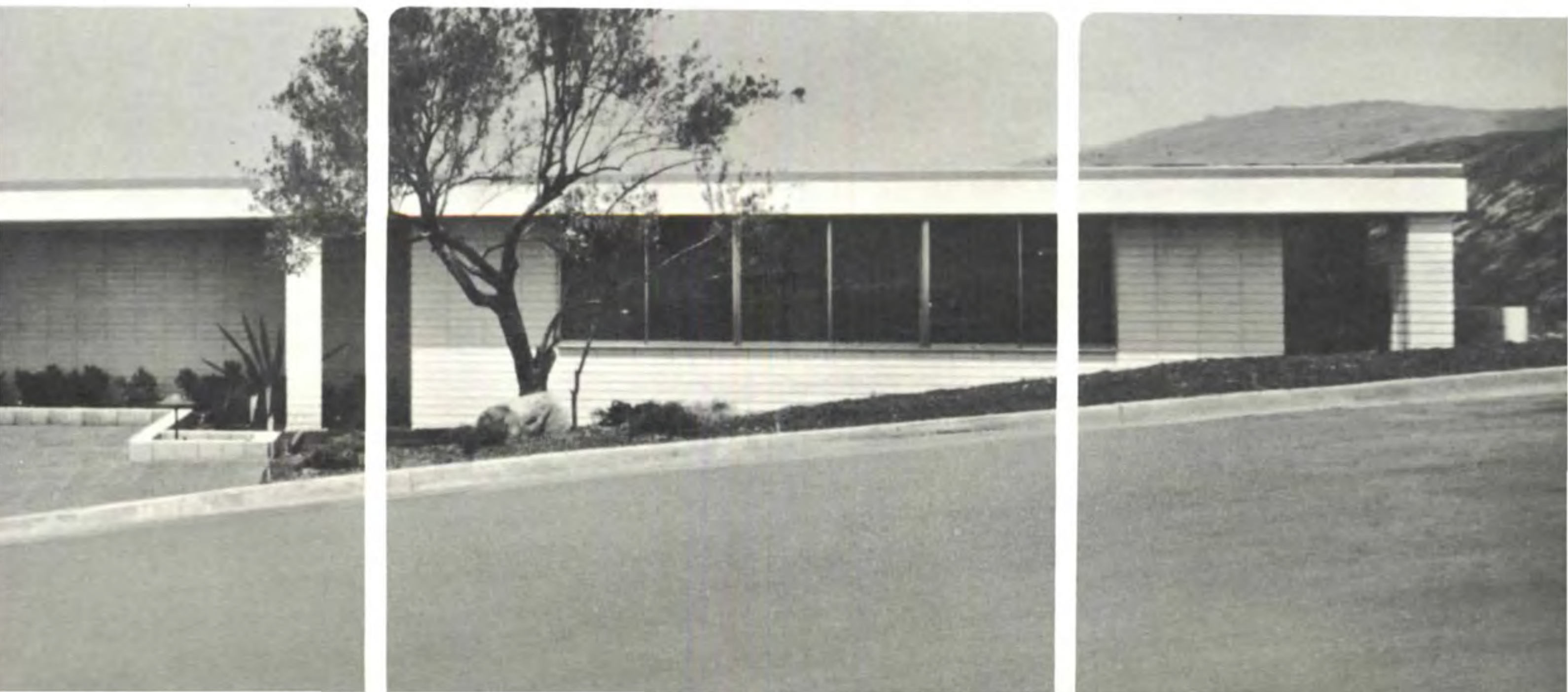
JONATHAN SCOTT
Pasadena, California / *Paintings*

DONALD SNYDER
Birmingham, Michigan / *Stainless Steel Sculpture*

HOWARD WHALEN
Sierra Madre, California / *Terracotta Sculpture*



The Olympia Pacifica house at Laguna Niguel reconfirms the role of the architect in building innovation. John Galbraith has created on the Pacific shore an uncommon house. It combines the building materials of an industrial age in a design of architectural merit. Jones & Laughlin Steel Corporation, as the supplier of stainless steel for this project, provides this description of the house as an outstanding example of the beauty and utility of stainless steel and the other materials utilized in the house.

JONES & LAUGHLIN STEEL CORPORATION—PITTSBURGH, PENNSYLVANIA 15230
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Litho in U.

NEWS REPORT

PROGRESSIVE ARCHITECTURE OCTOBER 1964

Architecture's Monthly News Digest of Buildings and Projects, Personalities, New Products

Pei Buildings for N.Y.U.

Work has begun on the first of three 30-story, concrete-and-glass apartment buildings being built by New York University just south of Washington Square in Manhattan. Designed by I.M. Pei & Associates, the cooperative buildings will have tax and mortgage benefits under New York City's Limited Profit Housing program. There will be six apartments to a floor, with denser than usual soundproof walls. Windows will be deeply recessed, causing the concrete structure itself to act as a sunshade. Less than one-third of the 5-acre site will be occupied by the buildings; the remaining area will be landscaped. In a construction step unusual for New York City, a free-floating mat of concrete, poured last month, serves as a foundation for the buildings, since conventional footings under the slim 30-story towers would overlap. Oddly enough, these handsome towers were contracted for before Philip Johnson was named architectural coordinator for NYU (p. 65, AUGUST 1964 P/A).

Stall on Pennsylvania Avenue

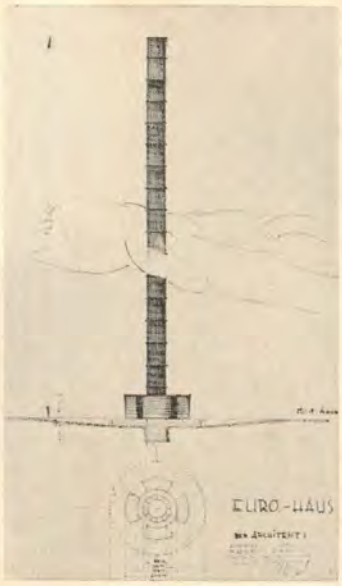
After much ballyhoo about the proposed improvements along Washington's historic Pennsylvania Avenue (*see* p. 68, JULY 1964 P/A), it looks as if the project will roll to a standstill for lack of supporting funds. "This is a cutback year in Washington," says one New York Congressman in answer to P/A's questions. "Republicans are becoming more cost-conscious; as a result, so are Democrats, and Pennsylvania Avenue isn't likely to get appropriations until things loosen up again." When will this be? Not for some time.

Rudolph to Leave Yale

Paul Rudolph, head of the Department of Architecture at Yale University, will leave that post next June to set up practice in either New York or Boston. Rudolph says that increasing volume of work dictated his decision to resign. Asked about a successor by P/A, Rudolph said that there are many good men who might fill the job, but that he intends to disassociate himself from the selection procedure.

7/10-Mile-High Building

As if any more evidence were needed of West Germany's famed resurgence from a defeated nation to her present status as one of the richest countries in Europe, news has now been released of plans for a 3750-ft apartment house designed by Robert Gabriel, a West Berlin architect. Three times as tall as Manhattan's Empire State Building, or more than 1000 ft taller than Yamasaki's two New York World Trade center towers placed one atop the other, the structure, currently under study by West German authorities, would provide 8000 apartments for 25,000 tenants on 365 floors. Gabriel picked a tentative site in a wooded area of the Eifel mountains west of Bonn. The rocky ground there, he says, would support the tower's 500,000 tons of steel, and would be far enough from the urban center to avoid interference to—or by—aircraft. More than an hour's drive from any large city, the apartment structure would be a self-contained "city" and would be an answer to housing people conveniently "without traffic problems outside the big cities." As Gabriel sees it, the cylindrical steel structure would rest on an eight-story steel base, anchored to foundations sunk 180 ft into the ground. Restaurants, supermarkets, and cine-

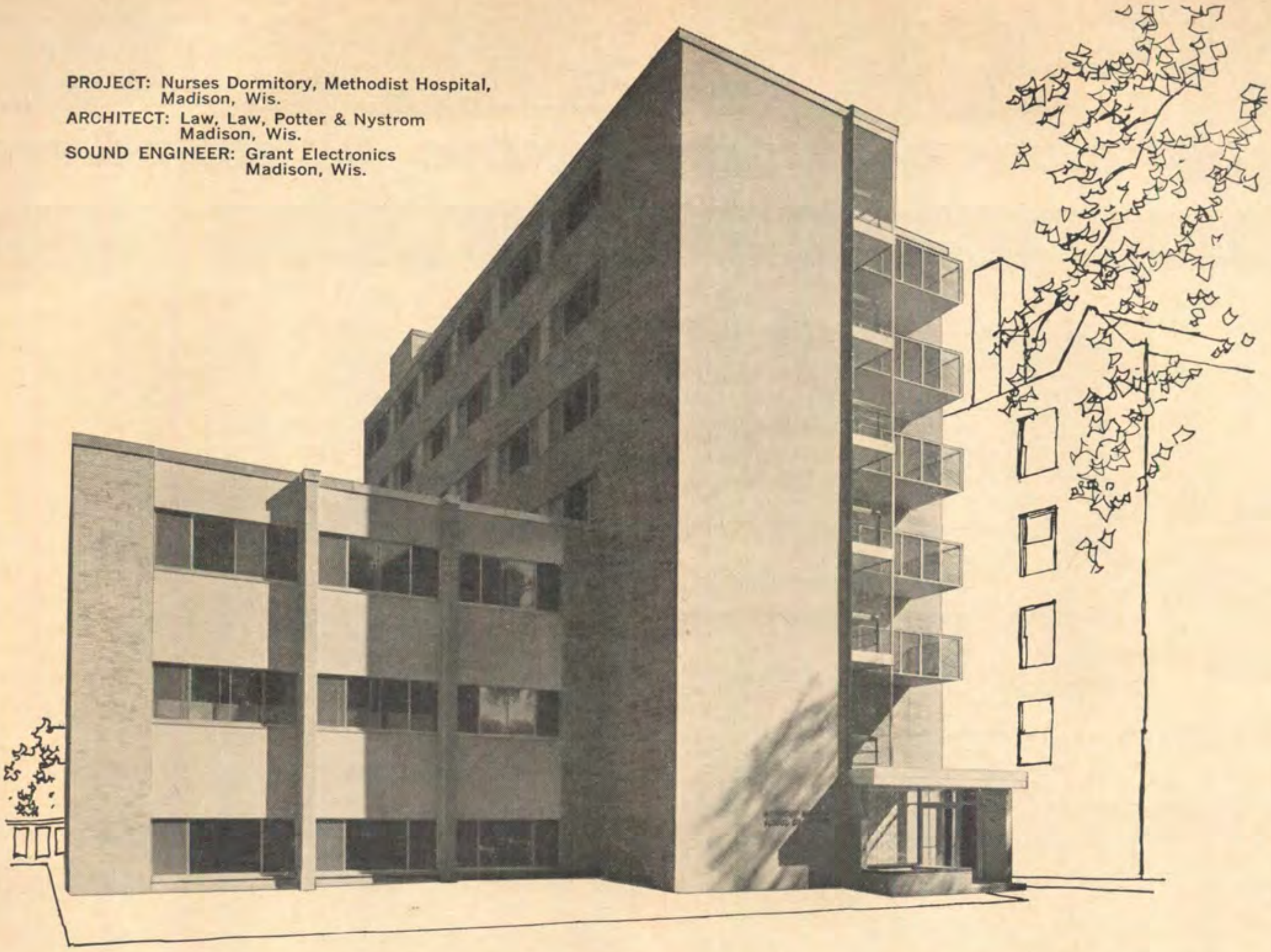


mas would be located on every twentieth floor. A flock of 1500 elevators, each capable of carrying 40 persons, would whisk passengers quickly between floors, and to the top non-stop in an estimated three minutes. Also included in the tower would be schools, recreation facilities, police stations, a "town hall" for the superintendent (who would be more "mayor" than superintendent) and underground parking for 4000 cars. The architect believes that tenants above the 180th floor would have almost constant sunshine. A "soundproof coating" on the upper stories would deaden the sound of the 125 mph winds that would buffet the building but cause little motion because of the structure's Leviathan weight. If the structure is approved by the authorities, the architect believes the estimated $500 million needed to finance the project could be raised from interested parties in the U.S. (of course) and Germany, and that construction could be completed in from 7 to 10 years.

Another Pan Am?

Hotel business in New York City, held artificially high by the World's Fair, will settle into the doldrums with the end of the Fair's run late next year. And with it four of the city's statlier hotels—the Savoy Plaza, the New Weston, the Park Lane, and the Madison—will settle into the dust, to be replaced by office buildings. Most important of the four, architecturally and historically, is the Savoy Plaza (designed by McKim, Mead & White in 1927), which faces the Plaza Hotel across Pulitzer Fountain near the southeast corner of Central Park (the corner threatened by a Huntington Hartford café). The Savoy Fifth Avenue Corporation, a subsidiary of British Commercial Property Investments (Canada), Ltd., the hotel's owners, also owns the Madison Hotel, located in the same block on Madison Avenue and 58th Street, which will also be razed.

PROJECT: Nurses Dormitory, Methodist Hospital, Madison, Wis.
ARCHITECT: Law, Law, Potter & Nystrom Madison, Wis.
SOUND ENGINEER: Grant Electronics Madison, Wis.



Nurses get the message in this new dorm with a **Webster Communication System**

WEBSTER CONSOLETTE provides instant, two-way voice contact with 52 nurses' rooms. Background music and call-in services can also be provided.

New nurses' dormitory at the Methodist Hospital, Madison, Wisconsin, presents a dramatic facade, although the design character of the building is restrained. It will be connected to an older existing hospital in the future. Interesting, too, it can be converted to normal hospital operations with virtually no remodeling.

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In place of the two hotels will rise a 40-story office building whose principal tenant will be General Motors. What will happen to one of New York's most attractive Old-World areas is a question that makes many New Yorkers uneasy. A second-rate building could destroy the beauty of the area, and even a really first-rate one will undoubtedly detract from the present relaxed atmosphere. *The New York Times* commented editorially on the situation: "The tragedy, of course, is that New York, unlike Paris or Washington, has no review rights on its main avenues or plazas. It is now up to the conscience, capabilities and sense of public responsibility of a group of private investors with no direct ties to New York to make or mar the city's face. New York needs no more cut-rate monuments like Pan Am. If the results of this gigantic undertaking are of less than landmark quality it will be an urban disaster." Architectural plans, to be announced shortly, will appear in next month's News Report.

New P/Aer

With this issue, Edward K. Carpenter joins P/A as Associate News Editor. Formerly an Associate Editor of *Industrial Design* magazine, he holds a B.A. from Haverford College and an M.A. from the University of Pennsylvania. Of particular value in his new post, no doubt, will be four years spent as a special agent in the Counter-Intelligence Corps of the U. S. Army—part of it in the Far East and part working on Defense Department security clearances in the U. S.

The Destruction of New York (Cont'd.)

The devastation of New York City's gracious older structures to make way for speculative make-a-buck buildings continues to read like a serial episode of "Perils of Pauline," with the difference that in each perilous incident in Manhattan the threat is actually carried through: Pauline really falls off the cliff, is rent asunder by the buzz saw, or perishes in the flooded cellar.

Latest chapter in this serialization of destruction has one of the city's most elegant Fifth Avenue corners—the northeast corner of Fifth Avenue and 79th Street—transfixed by the hypnotic eye of the high-rise apartment builder and weakly defended by the impotent New York City Landmarks Preservation Commission. Central unit in the three buildings to be sold by the present owner, the Institute of Electrical and Electronic Engineers, is the imposing mansion designed and built in 1887-90 for Isaac Vail Brokaw by Rose & Stone. A building in the French chateau style, it has long furnished visual relief from the offensively characterless apartment buildings gradually creeping up the avenue. That this mansion and its doomed neighbors (984 Fifth and 7 East 79th, left and right in photo) create, with the nearby Metropolitan Museum of Art and other *fin de siècle* mansions across the street (the one on the southeast corner of Fifth and 79th is rumored to be threatened, too), an atmosphere that does not exist elsewhere in the U.S.—one which recalls a past "Age of Elegance"—does not seem to faze city officials, the building's owners, the speculators, or, sad to state, most otherwise responsible citizens. Those who are disturbed by the tear-it-down-and-slap-it-up attitude of this boom town — including most of the city's talented contemporary architects—are usually characterized by the builders and lenders as effete souls longing for a vanished past. A few of those exist, of course, but there is a hard core of responsible opinion that is concerned about the decaying fabric of New York. Unfortunately, it usually gets short shrift at City Hall—there are no votes in "art."

It is interesting to note, in passing, that the Brokaw mansion belonged at one time to Clare Booth Luce (who had been married to George Brokaw before her marriage to Henry Luce, and who inherited a half interest in it on the death of her daughter). Mrs. Luce did not like the house, and sold her share to Mr. Luce.

H. Van Buren Magonigle designed 7 East 79th in 1911 for Isaac Brokaw's daughter, and Charles Frederic Rose of Rose & Stone designed twin townhouses at 984 and 985 Fifth for Brokaw's sons in 1905 (985 does not figure in the present deal).

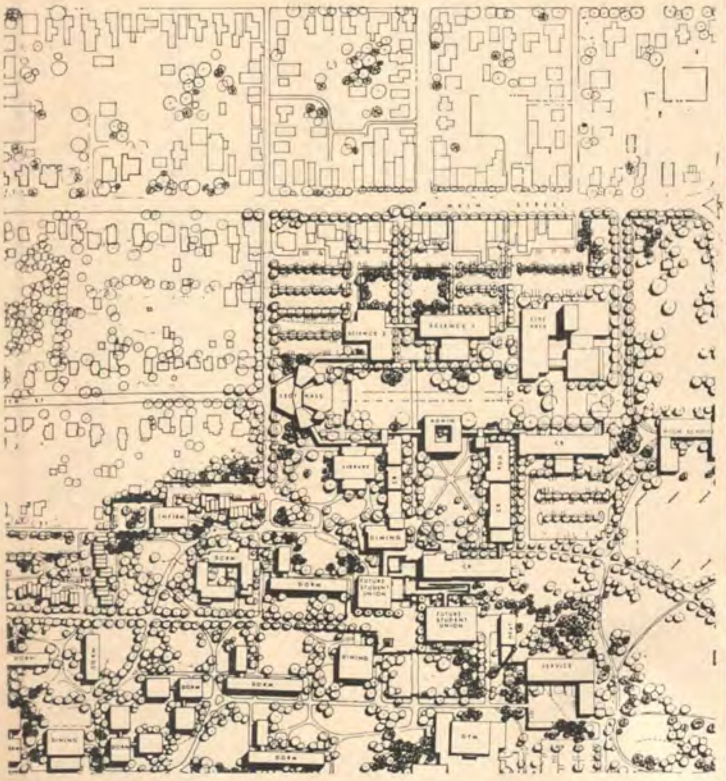
Ironically, on the very day the forthcoming destruction was announced, Mayor Robert F. Wagner announced that the week of September 28 to October 4 was to be Landmarks Preservation Week in New York. The announcement was made with the straight face that represents one of the Mayor's two expressions.

College Program Sparks Community Development

The New York State University Construction Fund, which is producing some admirable campus plans for the state's higher education system, has had more than scholarly impact with its plan for the State University College at Geneseo, a small town in the northwest part of the state. Almost from the beginning, architect-client planning meetings included local business and civic leaders, in addition to MST Architects & Planners Associated (an association for this job of Architects Rolf Myller, Richard Snibbe, and Edgar Tafel) and representatives of the college and the state construction fund. Since the college will "back" directly onto Geneseo's major shopping and business area on Main Street, the college master plan tended to "spill over" into the town in the form of access walks leading from Main Street into the campus, and in the placement

of the Fine Arts Building (by Tafel) close to Main Street so that it might be used by the community as well as the school.

In a series of meetings since December 1962, the architects, and later their Planning Consultants, Hollister Kent and Allan Winslow, have been cooperating with townspeople on establishing a pattern of growth for Geneseo that will reflect that of the college. Although the village and town fathers have since hired Candeub & Fleissig as Geneseo's planning firm, cooperation is still close, and the future looks bright for a well-planned community which, before the advent of the college plan, was content to emulate Topsy in its slow growth. In fact, other nearby villages have been brought into the discussions on such matters as regional elementary and high schools. While there is still progress to be made in these talks, they are an advance, for they were not even being held before.



Renderings by Morgan

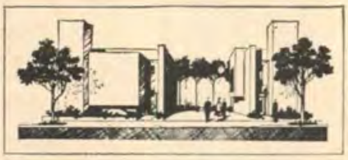
Social hub of the MST plan for the college will be an open plaza surrounded by the student union facilities and dining hall. The site drops steeply at this point, and ramps and stairs from the upper, older quadrangle have been introduced. A

lecture hall (by Snibbe) in the southeast portion of the campus will introduce the latest audio-visual educational aids in a plan that situates lecture halls around a service core containing rear-screen projection equipment and other a-v facilities.

Tafel's Fine Arts Building will consist of a music instructional wing, an art wing (the architect says that art works are added yearly from a student fund set aside for the purpose), and a drama wing containing a 400-seat theater. All new buildings by Myller, Snibbe, and Tafel will have brick exteriors with lead-coated copper roofs in order to relate well to each other and to existing buildings.

AWARDS JURY MEETS

Jury for the 12th Annual P/A Design Awards Program met in New York on September 21–22 to select the 1965 winners from more than 640 entries. Jurors were Serge Chermayeff, Edgar Kaufmann, Jr., Paul Hayden Kirk, Gyo Obata, and Lev Zetlin. The jurors devoted two hard, intensive days to choosing the winning projects, which will be published in the JANUARY 1965 P/A. The annual jury luncheon, traditionally held on the first day of judging, was celebrated in the Chateau Room of the doomed Savoy Plaza (see building obituary "Another Pan Am?" in this News Report). Appropriate libations were poured to appease the demon of urban destruction.



Studio-Office Building

Conceived as a composition of simple architectural forms and placed in the nonarchitectural environment of a busy, cluttered street in Los Angeles, the building *(above)* was designed for graphic artist Louis Danziger by Frank O. Gehry. Danziger hopes to rent part of the building and use part as a studio. Air conditioning and all plumbing are stacked in the towers, flanking the front of the building.

Students Redesign Part of New York

It once seemed politically expedient to promise two cars in every garage. But now that *that* once airy promise is frighteningly close to reality, it becomes clear that two cars in every garage means 2000 cars at every intersection. At ground-breaking ceremonies for the Bay Area Rapid Transit System in Concord, California, June 19, President Lyndon B. Johnson pointed out: "There are more than 80 million motor vehicles on our roads today. By 1980 there will be 120 million —almost one vehicle for every two people . . . . We must develop adequate means of tranportation or the coming crisis of congestion may do more to frustrate the growth and development of America than all the burning deserts and barren mountains which stood in the path of our ancestors a century ago."

Probably nowhere in the U.S. is auto congestion more maddening than in New York City; and it was with hope of proposing a better way to handle masses of vehicles and people that three fifth-year architectural students at New York's Cooper Union, under the faculty supervision of Norval White and Richard Dattner, set out to redesign part of Manhattan Island. Their project, which was proposed in an atmosphere aloof from the stagnating reality of committees, politics and budgets, will, of course, never be allowed to cure New York's woes. Too bad—because it just might.

Photo: David Hirsch

Taking "Yorkville," an area bounded by 60th and 96th Streets, the East River and Fifth Avenue, the students proposed moving all vehicular traffic underground. One level would be reserved for uptown and downtown traffic, another level for cross-town traffic, a third level for a subway, and a fourth level for parking. At ground level between buildings, pedestrians would walk on landscaped malls. And the buildings, which would rise on a structural grid system supporting the underground levels, would afford more space, more light, and less noise. Like many utopian schemes of others, the Yorkville study was carefully worked out, by Roland Dick, John Koster, and Barry Elvasani. One hopes that, banking on the experience of this design problem, they soon can turn their talents to *doing* something about urban congestion.

Uplift by Brashears

Plans were recently announced for a six building office hotel complex, a sort of one-stop business center, to be constructed next year in Fullerton, California. The idea behind the project is to provide the busy business executive with facilities for all his working-day needs on a single 10-acre site. For example, an executive could arrive for work by helicopter, landing on the roof of the 13-story building, where he has an office. During the day, he could bank at an adjacent one-story bank, buy razor blades in the two-story "retail service facility," receive a visitor who is staying at the complex's 12-story, 200-room hotel, and talk with a county judge who has offices and courtroom in the building designed to serve as a branch county administrative center. In addition to the 13-story office building, the complex, to be known as Brashears Center after its developer, William Brashears, will include another building six stories high. Located at a major Y-shaped intersection in Fullerton, the center will have underground parking and service space for 990 cars. Architects are Welton Becket & Associates.

Petite Philadelphia Library

Construction was begun during the summer on a small branch library in Philadelphia. Designed by Nolan, Swinburne and Associates, the reinforced-concrete and brick structure has room for 25,000 books in its 10,000 sq ft. Meeting space is also provided. And 1 per cent of the building cost has been set aside for the purchase of art work.

Georgia Insurance Center

Construction was begun last month in Atlanta on a $16-million Life of Georgia Center for the Life Insurance Company of Georgia. In the planning stage for more than four years, the building was designed by Atlanta Architect Willard Lamberson of Bodin & Lamberson, with Eggers & Higgins of New York as Associate Architects. Current construction is of the Life of Georgia Tower and its ancillary elements—a landscaped plaza and a three-level underground parking and building service system. Eventually, the Center will encompass an entire city block of 3.1 acres. The tower will rise 371 ft above the plaza and will include 24 stories, 20 of which will be office floors. Set back about 50 ft from adjacent streets, the tower will be of steel frame construction, with a façade of white marble and aluminum-framed windows recessed in "shadow boxes." The 300-car parking levels will be connected to plaza and lobby levels by escalators. Two additional 10-story buildings and more underground parking space will complete the project.

Credit

"Nelson Towers," the high-rise housing project shown in "FHA Reaches 30" (p. 65, AUGUST 1964 P/A), was designed by King & Lewis of Detroit.

Photo: L. Marinoff

OUTDOOR AMENITY

An amphitheater covering 60,000 sq ft in the center of Carver Houses, a New York City Housing Authority development, was completed this summer. It will give residents of the East Harlem community a center for theatrical performances, concerts, dances, folk festivals, and art exhibits. The circular stage area, which is backed by three U-shaped brick walls, faces a stepped seating area that will accommodate about 1500 persons. Between stage and steps is a 1,000-sq-ft pool, which serves as a wading pool by day, a fountain by night, and, in the winter, as an ice skating rink. Behind the steps, a curved arbor of brick tiers and timber beams provides shaded sitting areas. And behind that are play areas with sand boxes and other juvenile paraphernalia. Ed Sullivan, Beatle purveyor, presided over opening ceremonies. Architects: Pomerance & Breines. Landscape Architect: M. Paul Friedberg & Associates.

Photo: Central Press

Britian's Tallest Building

Work was completed this summer on what is now England's tallest structure, a 619-ft high post office-TV tower in London. Rising like a gigantic glass-windowed silo above the traditional chimneys and façades of London, it looks unreal. Unfortunately it is not.

Boston Arts Festival Design Awards

Winners of the design awards in the Boston Arts Festival were recently announced by the jury: Professor Lawrence B. Anderson, Philip H. Lewis, Professor Mario J. Romanach, and P/A Editor Jan C. Rowan. The winning projects and their architects are: Wyman Street Office Building in Waltham, Mass., Anderson, Beckwith, and Haible, Boston, Mass. **(1)**;


1


2 Photo: Phokion Karas

Residence in Cambridge, Mass., F. Frederick Bruck, Cambridge, Mass. **(2)**; Landscaping of Residence in Greenwich, Conn., Arthur Edwin Bye, Jr., Greenwich, Conn. **(3)**; Residence in West Stockbridge, Mass., John B. Rogers, Cambridge, Mass. **(4)**; Law and Educational Building and Papas Law Library at Boston University, Sert, Jackson and Gourley, Cambridge, Mass., and Edwin T. Steffian and Associates, Boston, Mass. **(5)**; The David and Arnold Hoffman


3


4

Laboratory of Experimental Geology at Harvard University, Cambridge, Mass., The Architects Collaborative, Inc., Cambridge, Mass. **(6)**; the Art and


5


6 Photo: Louis Reens

7 Photo: Ezra Stoller

Communications Center at Phillips Academy, Andover, Mass. The Architects Collaborative, Inc., Cambridge, Mass. **(7)**; The Gordon School in East Providence, Rhode Island, William D. Warner, Providence, R. I. **(8)**.


8 Photo: Charles R. Hauser

National Council on the Arts

In an historic moment early last month, President Johnson signed into law a bill creating a National Council on the Arts. Never before has the U. S. legislated to encourage the arts; and although it is still unclear how the bill will stimulate the arts (and indeed the term *arts* remains undefined), official Governmental recognition and the action implied is encouraging. We assume that architecture is included, and it is probably also true that where legislation is imprecise, Government action will be more rather than less. The bill calls for the establishment of a council composed of a chairman and 25 other members, one of whom will always be the Secretary of the Smithsonian Institution, ex officio. These members are to be selected so as to include: private U. S. citizens widely known for their knowledge of or experience and profound interest in the arts; persons professionally engaged in the arts, or civic cultural leaders, or museum professionals; and a representation from all the major art fields. Only the chairman, who is yet to be appointed, but who will probably be Roger Stevens, the President's current Special Assistant for the Arts, will be a full-time council member. The others will attend council meetings (to be held no less than twice a year), and will serve when called upon. The bill calls for the council to carry out these responsibilities:

- To recommend ways to maintain and increase the cultural resources of the United States.
- To propose methods to encourage private initiative in the arts.
- To advise and consult with local, state, and Federal agencies on ways to coordinate existing resources and facilities, and to foster artistic and cultural endeavors and use of the arts, nationally and internationally, in the best interests of the country.
- To conduct studies and make recommendations on how the arts can be better encouraged, developed, and enjoyed.

Representative John Lindsay of Manhattan, one of the bill's sponsors, believes that the council will give the arts a much-needed "pressure group" in Congress. By making recommendations and having them sanctioned by the White House, Lindsay believes, the arts will have more cohesive backing and hence stronger selling potential than they have had with the often indecisive and fragmental lobbying of artistic groups. Among the incentives he envisions for the arts, Lindsay told P/A, is tax relief in one form or another. It is also hoped that some design coordination may be given to Government design projects so that blights such as the new House Office Building could be avoided.

What's Going on Here?

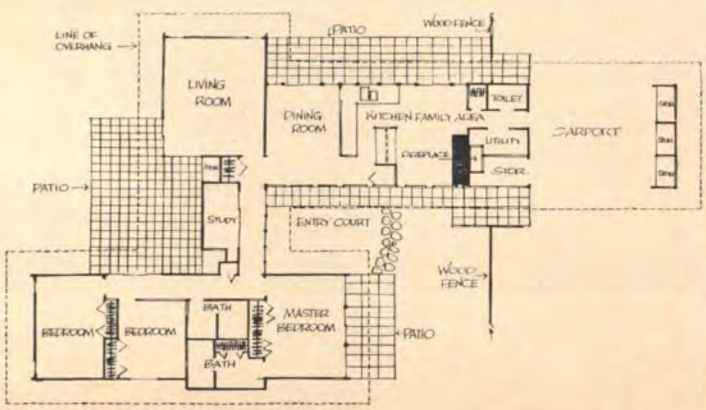
In May, GE's national Kitchen Design Competition was won by Robert Kitchen of Santa Fe, and now Edward D. Stone has been named Architect of the Year by the Building Stone Institute. If this sort of thing keeps up, we expect to see architects begin receiving awards deserving of their cognomens: Robert Marquis will be recognized by the French nobility; Sidney Katz will be tapped by the Feline Institute of America; Louis Sauer will receive a 1939 World's Fair Heinz pickle; O'Neil Ford will be awarded a vintage Edsel; the list is probably endless.

Advancing House Design

In what may be a significant step toward improving the quality of homebuilding throughout the country, a Texas manufacturer of wood products sponsored a program in which five architectural firms designed prototype homes in five Texas cities to meet the requirements of householders. After interviews with owners of homes costing from $15,000 to $40,000, realtors, builders, and finance companies in Houston, Dallas, Fort Worth, San Antonio, and Austin, the manufacturer, Temple Industries, selected five architectural firms, one in each city, and asked each firm to design two homes based on the survey's findings: one in the 800-to-1200-sq-ft category, and another, larger home of up to 3500 sq ft. The architects include: O'Neil Ford & Associates, San Antonio; Wilson, Morris, Crain & Anderson, Houston; Enslie Oglesby, Dallas; Albert S. Komatsu & Associates, Fort Worth *(see rendering above)*; and Barton D. Riley & Associates, Austin. Each firm received its regular fee for the work, and the only restrictions on design or materials were those required by building codes. Temple Industries, which will furnish the house plans complete with working drawings, specifications, material take-offs, and cost estimates free to builders along with a folio of Temple products, hopes to convince builders that they can make more money by selling good design, good materials, and good workmanship, and to convince lenders that they will benefit if they base loans on quality rather than floor space.

What Texas housewives want, it turns out, is an increase in the area of the house containing the kitchen, utility room, family room, and the dining nook. Easy access from this area to the outside is important so that children can be supervised from it whether they are indoors or outdoors. And most mothers suggest that a bathroom be located next to the utility room to keep children from tracking dirt through the house. Dining room and living room are less important, but most families still want these rooms — for entertaining as children get older. Temple Industries calls the program "Viewpoint 1965."

Last month, Temple Industries and Texas Christian University announced plans to build one of the "Viewpoint 1965" homes as part of the TCU Construction management evening school program. The home, designed by Albert Komatsu & Associates in Fort Worth, will total 2245 sq ft and will be built in Fort Worth under the joint sponsorship of the TCU School of Business and the Home Builders Association of Fort Worth and Tarrant County.



They're Off at Belmont

The sport of kings is getting architectural attention in New York State, where Arthur Froehlich & Associates is designing new facilities for two tradition-bound race courses, Saratoga and Belmont. Work at Saratoga started August 29, with the completion of the 1964 racing season, and calls for a 500-ft extension of the present grandstand. The $3.5-million program will increase the seating capacity to just under 35,000.

At Belmont, construction of grandstand and clubhouse to replace the old facilities but "recall" their style will begin next spring. Arthur Froehlich & Associates were selected from three groups who submitted conceptual designs. (For one other concept, see p. 78, SEPTEMBER 1963 P/A). Plans call for a structure 1260 ft long and 300 ft deep, with a roof 82 ft above the standing ramp. Under the roof will be 24,000 seats, including approximately 1800 Turf Terrace dining seats in an air-conditioned, glass - enclosed dining area on the upper floor of the clubhouse. In the stands, the stadium-type seats will be arranged in 3 tiers, with no more than 15 rows of seats between floor levels. The first row of the lowest tier will be only 85 ft from the track's outside rail, an attempt to bring the fans closer to the action and a distance said to be the least in any track of this size. A grandstand area and a sidewalk café facing the track are included on the ground floor. On the three upper floors will be a normal division of grandstand and clubhouse facilities, including two dining areas overlooking the paddock. Twenty-eight escalators, ten elevators and 831 mutuel windows will service the stands. Closed since the end of racing on October 27, 1962, Belmont is expected to reopen with the completion of building in the fall of 1966.

AIA Reiterates

When the AIA toughened its Standards of Professional Practice last June, it seemed to some that two provisions of the Standards meant that architects were forbidden to work as employees of a consulting engineer. Not so, says the AIA. The two sections in question—3:10 and 3:12—state: "An architect shall not serve as an employee of unregistered persons who offer architectural services to the public, nor as an employee of an organization whose architectural practice is not under the identified control of a registered architect." And, "an architect shall not be or continue to be a member or employee of any firm which practices in a manner inconsistent with these standards of Professional Practice."

After some objections to this stand from engineering circles because of its implications that architects should no longer work for engineering firms, AIA clarified thus: "The general intent of these sections of the Standards is to prevent architects from aiding unregistered individuals or firms which offer architectural services to the public in competition with architectural or architectural-engineering firms in a manner which is unethical, illegal, or both.

"It is not the intent of these sections of the Standards to make it unethical for an architect to serve as an employee of a government agency or as an employee of a building industry

Continued on page 102

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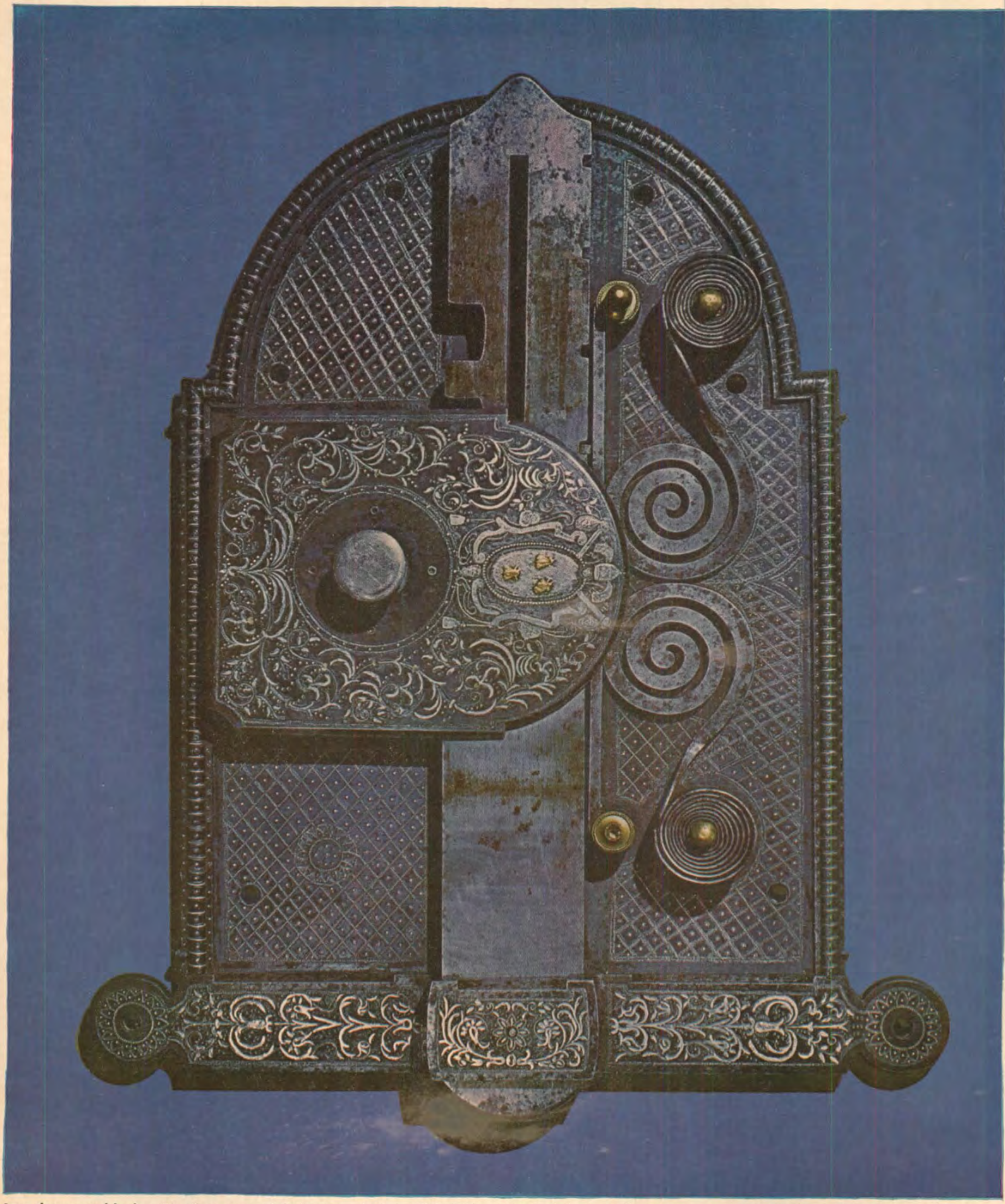

Iron damascend lock, with silver arms of Barberina — Italian, 1623-1644 — New York Metropolitan Museum of Art. Purchase 1957, Dick Fund.

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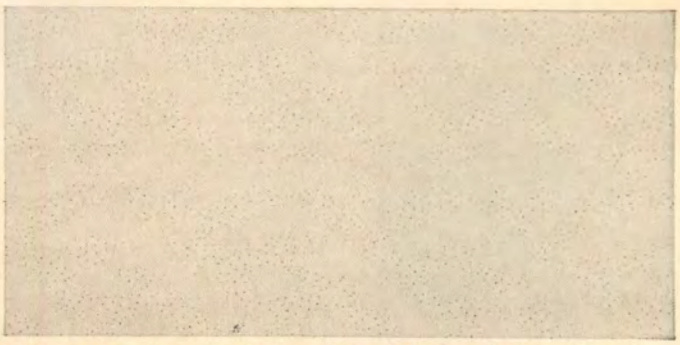

New FISSURA pattern (left) and CONSTELLATION (right) available in Fire-Rated, high attenuation factor and standard mineral tile and board.

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Continued from page 99
organization or firm which does not offer architectural services to the public or engage in building or contracting. Such organizations are not presumed to be in competition with architects."

Mississippi Memorial

Fund-raising has begun for the Chaney-Goodman-Schwerner Memorial, a proposed community center to be built in Meridian, Mississippi, to continue the work of the three civil-rights workers murdered this summer. The center will contain, among other things, a library at which Negroes are welcome; it will offer tutoring in subjects not now offered the Negro; and it will give some basic vocational training. Mostly, it will provide a place where Negroes of the community can develop an awareness of their personal dignity and a political consciousness. Architects are Paul Willen and Paul Moore, both of New York. The project is in the preliminary design stage, with further details to be released shortly.

Many professional people from across the country have gone to Mississippi recently. There have been clergymen, lawyers, teachers, social workers, in addition to the students of the summer project. Few architects have been personally involved, although many have been watching developments in Mississippi closely, as has the rest of the world. Those who wish to contribute to the building fund should send their donations, which are tax-exempt, to Chaney-Goodman-Schwerner Memorial Fund, Room 902, 1 Union Square, New York, N. Y.

Photo: The Times, London

Oxonian Contemporary

Photo: The Times, London

Oxford University's new college, St. Catherine's, opens officially this month to 300 undergraduates and fellows in residence. The complex of buildings, which cost close to $5,000,000, brings the University its first contemporarily styled college. It was designed by Danish architect Arne Jacobsen. White rectilinear concrete design blends with the oölite and limestone of the other Oxford buildings, some of which date from the 11th Century. Two three-story residential blocks, each 440 ft long, enclose the traditional Oxford quadrangle. On the north of the site, which is meadowland located within a network of branches of the river Cherwell, a tributary of the Thames, are the dining room *(see above)* and common rooms; to the south are the library and a lecture hall. None of the buildings rise above the line of the surrounding trees.

Neat Civic Center Neighbor for Seattle

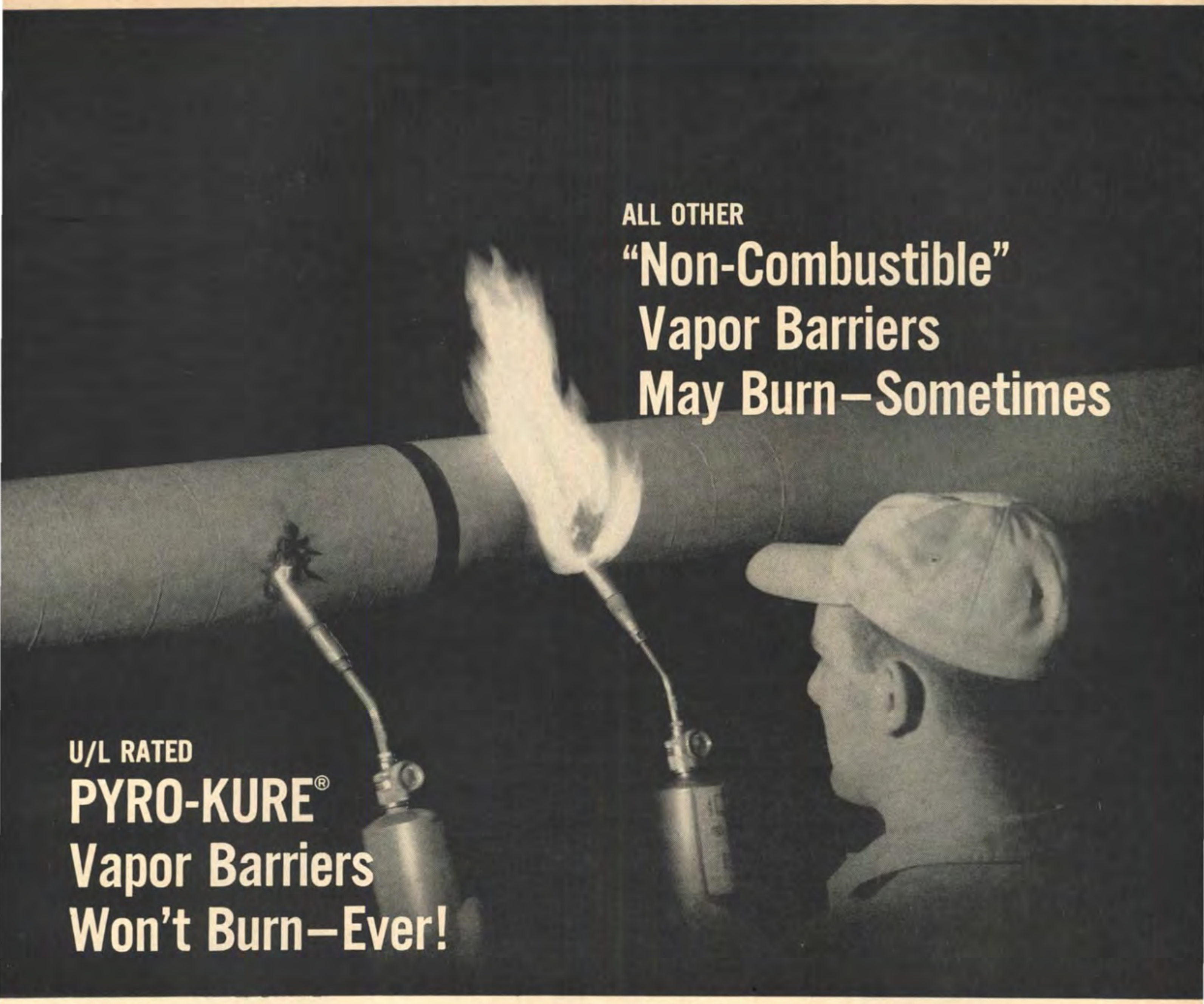
Small, inexpensive, urban office buildings are often overlooked in the tumble of architectural hoopla surrounding their more spectacular cousins. This is usually just, but sometimes, as in the case of a 4-story building currently rising on a 120′ x 119′ site in Seattle, it is not. This particular small building, designed by Seattle architects Bystrom & Greco, is situated about five minutes from the heart of downtown Seattle to the west of the Seattle Civic Center (the ex-Century 21 complex), in an area that has a 60-ft building height limitation. It will have a commanding view of Puget Sound and the Olympic mountains. The owners, Century Investment Company, were specific in their requirements. They wanted a small, modern, loft-type, air-conditioned office building with off-street parking. They wanted the lowest possible cost per square foot, because the area could not command high downtown rents. And they wanted some form of built-in sun-screening so that tenants would not have to keep blinds pulled down half the day, cutting off the view. Looking a little like a well-known new building on a certain Ivy League campus, the structure has a poured-in-place, exposed concrete frame with insulated brick cavity filler walls. Floors and parking deck are clear-span poured-in-place, post-tensioned concrete pan-joist systems. An elevator-stair tower separates the two-level, 50-car parking area *(at right in rendering)* from the main section of the building. To shield occupants from the sun, sun shades of precast concrete are projected from the filler walls at spandrel level by vertical masonry fins.

Apology

P/A apologizes to those readers who received their 1964 Business Survey questionnaires and/or the announcement of the 12th Design Awards Program just before, on, or even after the answering deadline of August 31. We got it in the mails at our usual time, but the vagaries of the postal service (particular in a city such as New York) sometimes cause a boo-boo, and that is what happened to us. Sorry, and thanks to the many hundreds who replied to both the Survey and the Awards Program.

Calendar

The Urban Redevelopment Division of ACTION will meet in Washington on October 26–27 . . . A fall meeting-banquet, celebrating the 40th anniversary of the Concrete Reinforcing Steel Institute will take place at the Drake Oakbrook Hotel, Oakbrook, Ill., on Nov. 4–6 . . . Tenth Annual Seminar of the Ceramic Tile Institute will be held at the Biltmore Hotel, Los Angeles, on Feb. 11-13, 1965; theme of the seminar will be "Carnival of Tile" . . . A "Specialty Conference on Wood" has been scheduled by the Structural Division of ASCE for June 9–11, 1965, at the Pick Congress Hotel, Chicago.



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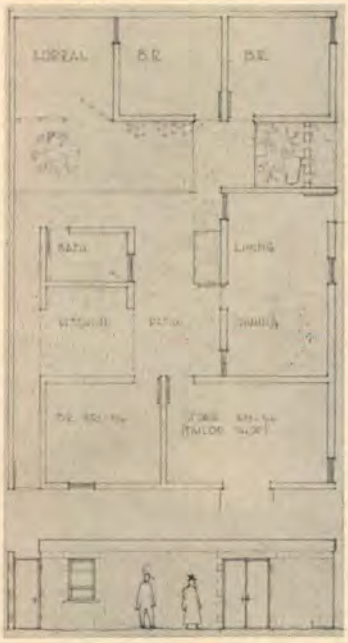
Peace Corps Architect in Peru

What happens to architects and architectural students who join the Peace Corps? It depends a lot on individual personality, attitudes, and interest, says John O'Brien, 25, who spent two years designing and helping construct buildings in two coastal towns in Peru. On completion of his sophomore year at New York's Pratt Institute, O'Brien, an architectural student (he is now completing his schooling there), felt compelled to put aside studies and "do something with my hands." The Peace Corps, on accepting his application, said his Pratt background qualified him as a draftsman, and sent him, after four months of training in American history and Spanish, to Chimbote, a fishing and fish-canning town 240 miles north of Lima. O'Brien soon chafed at the routine drafting work he did for a Peace Corps architect there, asked to work on construction, and subsequently spent a month or so laying bricks for a house the Corps was building. Although challenging (Peruvian bricks are wedge-shaped, require a layer of mortar thicker at one edge of the brick than at the other), the project was arranged so that it inspired no help from the local residents, and O'Brien and most of his U.S. co-workers felt that it failed to fill the ostensible purpose of the Peace Corps—to help people to help themselves. When O'Brien returned from a three-week vacation on a tuna boat, he found a large group of Peace Corps volunteers leaving the city and discovered that the architect for whom he had worked was in a Lima hospital with pneumonia. O'Brien, who had become friendly with Chimbote town officials, agreed to stay on and design a building the town of 120,000 needed badly: another school. Although he had never designed a building for construction before, he worked out plans for a school, with the advice of a local architect, which could be built by local volunteers from inexpensive, readily available materials—wood and cement. The city government arranged an AID loan from the U.S. to pay for the materials. In July of this year, just before he left Peru to return to the U.S., O'Brien attended the opening of his school, five rooms of which—out of a proposed ten—were completed. Like most of the better buildings in Chimbote, the building *(see above)* is of cement block, rests on cement footings, and, because windows are expensive, has few of them.

While the school was being built, O'Brien was in Chancay, a much smaller fishing village than Chimbote, located on the coast about 40 miles north of Lima. There he became the architect for a cooperative project whose aim was to provide housing for a group of residents too poor to get a loan from either AID or the Peruvian government. Most of them were employed in the local fish-stripping plant, earning $6 a week. Each member of the cooperative contributed $2 every week for materials and gave two days of his labor. O'Brien's design consisted of brick row-type units, each consisting of at least three rooms, a kitchen, a living dining room, one bedroom, and an O'Brien-designed latrine-septic system. Some have space for small shops adjoining the living area *(see plan, right)*. Brick walls were to be mounted on cement footings and topped by roofs of wooden trusses covered by matting and 6 in. of earth. "It never rains in Chancay," says O'Brien, and 6 in. of earth will keep out the weather."

Although O'Brien designated one window for each room, most of the cooperative's members bricked up these areas with loose fitting mortar during construction—hoping to put in their own windows when they had saved enough to buy the needed wood and glass. By making their own bricks, which were long on sand and straw, the Chancayans saved about 80 per cent of the cost of ready-made ones. O'Brien reports that one of his toughest jobs on the project was convincing the workers to water the bricks during curing. Water, which had to be trucked into the area, cost 60 cents for 50 gallons, and they couldn't understand the need for using it on something as lowly as a brick.



How to Succeed As a Draftsman

Two dollars for a pari-mutuel ticket at Long Island's Roosevelt Raceway paid off in $172,726.80 last month for Robert Froner, 22, a New York architectural draftsman.
Actually, the investment was $84 for the purchase of 42 tickets in the winning combination for the sixth and seventh races. Not a bad return, all the same.

Froner, who was married on April 25 and attends night school at the Institute of Design and Construction in his home borough of Brooklyn, said he intends to put the money in the bank. Uncle Sam, of course, will get a healthy chunk of it.

We hope that this does not mean that the racing form will now become more popular around drafting rooms than P/A and *Playboy*.

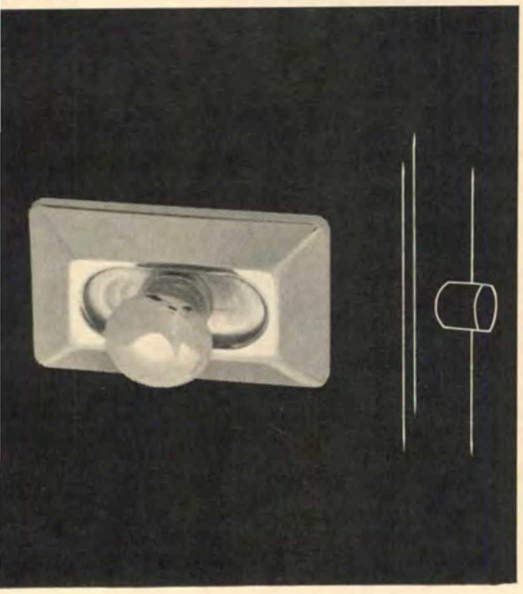
COLGATE GUARDS ALL

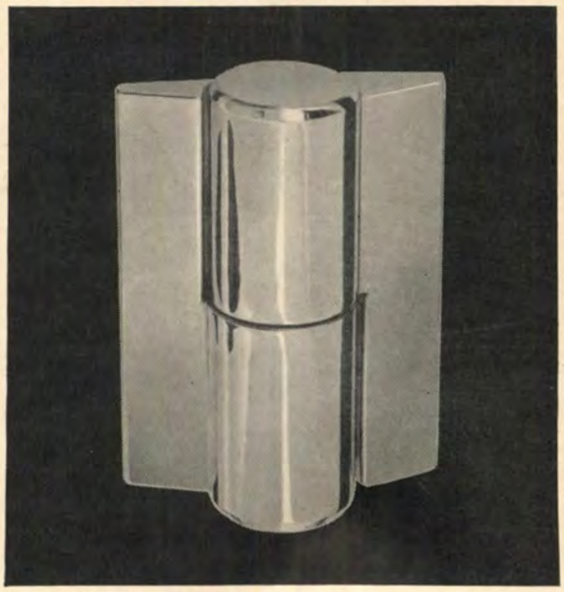
Ground was broken recently for the Paul Rudolph-designed Creative Arts Center at Colgate University. What makes the event more notable than other similar rites is that the building, although controversial, has had the full support both of its major donor, philanthropist Charles A. Dana, and the University. Dana, who did not see the building plans until they were unveiled to the press, (see p. 57, MAY 1964 P/A) seemed somewhat startled by them at first, but has since come around. At the ground-breaking, Colgate president Vincent M. Barnett, Jr., said, "The design of the building, which is contemporary and strikingly original, has aroused a great deal of interest — most, though not all of it, highly favorable. I am convinced the building will be an architecturally distinctive and functionally outstanding solution to our needs, and will prove to be a great asset to the University."

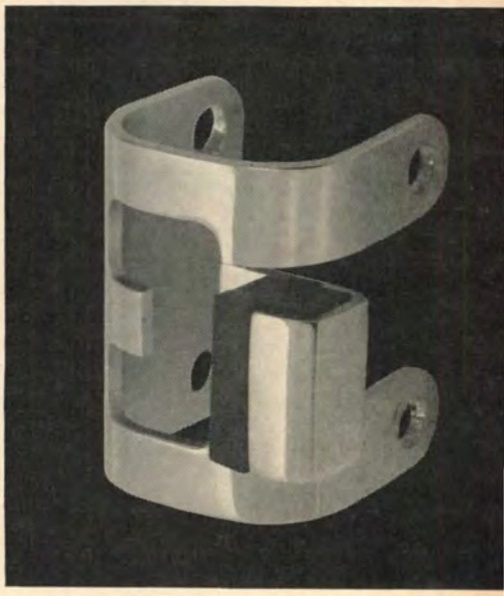
Grille-Topped Museum

Edward D. Stone, working with local architect Carlos R. Sanz, has designed an art museum for the city of Ponce, Puerto Rico. The 2-story museum *(shown with the top off)* will consist of a 320′ x 80′ rectangle topped by seven hexagonal galleries. Roof—a large rectangular grille—will allow natural light to filter into the galleries. Three galleries will have openings in the floor, revealing circular pools at ground level. The balcony, created by placing the irregularly shaped galleries on a rectangular roof, will be an interesting outdoor space for sculpture.

First floor will contain a library of art, conference







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WEIS

room, offices, and exhibit space. Museum grounds will also include an open-air theatre; future plans include an art and cultural school. Edward J. Gerrits, Inc., Miami, is the contractor.

Xerox Headquarters

Handsome addition to Rochester, N.Y., will be the headquarters building for Xerox Corp. A 30-story concrete tower and an auditorium exhibit structure will be placed on a 5-ft-high podium. Deep, tapered columns will provide a sculptured façade for the tower as well as serve as solar protection. The dark exposed aggregate columns and solar bronze glass of this structure were chosen to contrast with the light-colored plaza. Massive sculptured columns at the base of the tower will carry load to the second floor, where it will be transferred to exterior columns.

Two-story trapezoidal-roofed structure will have an auditorium cantilevered over a glass-enclosed lobby. Four supporting pillars will contain stairwells and elevators. Foundations for a third building (shown in photograph) will be included in construction. An ice rink, to be sunken in the plaza between auditorium and office tower, will be overlooked by a concourse-level dining room. Welton Becket & Associates are the architects.

Plan of the Month

A 12-story apartment house proposed for a hilltop site in San Francisco will have oval living rooms, sunken bathtubs, basement sauna rooms, a façade of precast concrete panels, and the most far-out plan since Blenheim Palace. Designed by N.D. Ferzacca & Associates, the building will have two apartments on each floor, plus a penthouse. The structure will be post-tensioned concrete flat slabs, poured in place, with concrete columns. In addition to precast concrete panels, the façade will have precast concrete elements two stories high. These, projecting from the face of the building, will act as balcony guards. The

sauna and garage will be on three underground levels.

Two New Detroit "Centers"

Each of two projects currently underway in Detroit consolidates related activities into one complex. Professional Plaza, adjacent to hospitals in Detroit Medical Center, is aimed solely at the medical profession. Designed by Crane & Gorwic, it will eventually contain 3 high-rise and 11 low-rise elements. The towers—14 stories set on a pedestal—will have offices for physicians, surgeons, and dentists. Two-story concourse buildings will be open to medical laboratories, services, and related commercial facilities, with shops on the ground floor. A landscaped mall that will traverse the plaza is planned. All structures will have bronze-anodized aluminum and tinted glass curtain walls with quartz-aggregate sheathed columns.

The Detroit Trade Center, on the western perimeter of the downtown area, will have two high-rise towers: one planned for the automotive industry, the other for the general wholesale field. Ample display space will be located on the ground floors of both buildings and adjoining all offices. A slender tower connected to the office buildings will contain a 100-car garage, elevator, and service facilities, permitting flexibility of space arrangement in the larger buildings. Architects: Smith, Hinchman & Grylls.

West Coast "Delight"

These two clients are not looking at a model of Yamasaki's Northwestern Life Insurance headquarters in Minneapolis, but at the proposed national headquarters for the Rossmoor Corporation in Laguna Hills, California. The structure is intended as a three-story "jewel box" to rise in the shopping center area of the "Rossmoor Leisure World" development at Laguna Hills. Architects: Burke, Kober & Nicolais, Los Angeles.

Convention Facility Designed by Three Firms

The convention and exhibition building in the "International Trade Center Area" containing Edward D. Stone's International Trade Mart, inadvertent-

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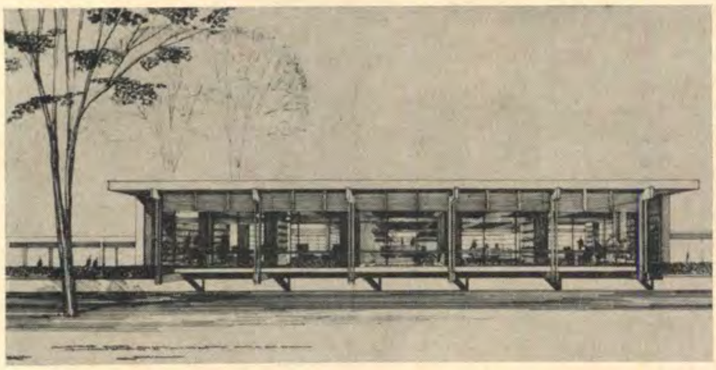
ly attributed to Stone in the APRIL 1964 P/A (p. 72), was actually designed by the New Orleans firms of Curtis & Davis, Edward B. Silverstein & Associates, and Mathes, Bergman & Associates.

The structure will have a swooping, reinforced concrete roof of thin shell barrel-arch design. The great exhibition hall will be covered by a clear span of 255 ft, while the meeting rooms and vehicular drive at the front of the building will be roofed by lesser spans. The roof will be supported on freestanding, diamond-shaped columns tapering up from large bases to a slender intersection with the roof. The four-level, \$9.5-million structure will have parking for 800 cars on its two lower levels; exhibition hall and related facilities, a concourse, and meeting rooms on the main floor; and television galleries, more meeting rooms, a cafeteria, and a cocktail lounge on the second floor.

Front of the hall will face the plaza, trade mart tower, and the Mississippi River. Beneath it will run, eventually, the proposed Riverside Expressway.

Structural Engineers: A.W. Thompson & Associates and Worthington, Skilling, Helle & Jackson; Mechanical Engineers: Leo S. Weil & Walter B. Moses, Inc.; Plumbing and Electrical Engineers: Cary B. Gamble & Associates.



Louisiana Library

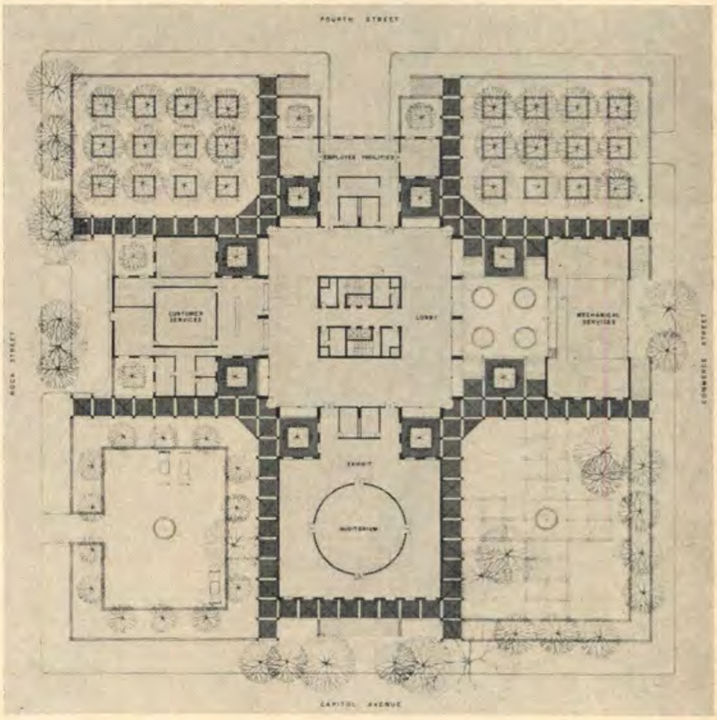
Dual-purpose design for Diboll Memorial Library places a 5000-book library and a 50-seat community meeting hall under one roof. A covered walk bisects the structure, separating the two wings. The walk leads from an entrance drive to central entrance lobby and courts, and continues beyond the building to an outdoor shelter. Library wing *(exterior shown)* is open along east wall. Inside, children and adult sections are placed at either end with a central reference and service area. Local wood products are used extensively on interiors and exterior. Architect is Desmond-Miremont & Associates of Hammond, La.

Gas-Powered Office Building

A new \$2 million office building in Little Rock will have its complete power supplied by engines running on natural gas. Furthermore, the mechanical system will be on view to the public both from the street and the lobby. Oddly enough, the client for the building is the Arkansas-Louisiana Gas Company; it will be the company's headquarters. Designed by Wittenberg, Delony & Davidson, Inc., of Little Rock, the headquarters will respect the tree-lined residential nature of its neighborhood by having all four corners of its city-block site landscaped. Lower elements of the cross-shaped plan will face the streets: an auditorium, the mechanical service display, the customer-service wing, and the employee facilities. At the center of the block, connected to the other elements by arcaded walkways, will rise the four-story office structure.

Structure of the one-story wings will be brick and white precast concrete; of the high-rise building, reinforced concrete with white precast concrete window units. The latter structure is designed to allow for the addition of another floor in the future.

Photo: Earl Saunders



Decentralized Teen Center

Master plan for a Teen Center on a 20-acre site in Van Nuys, Calif., makes use of an existing 6555-sq-ft recreational building and expands to the west along a central mall. Scheme is decentralized, incorporating patios, malls, and arcades, so that separate buildings or groups of buildings can be constructed as funds become available. Center will include clubrooms, outdoor stage, snack-bar lounge, activity rooms, shops, gymnasium, and a 46,-250-sq-ft, multipurpose building *(far right in photo)*, which will be available for general community use.

Emphasis is on maximum flexibility. Patios have been designed as extensions of rooms; each of six clubrooms may be divided in half; and movable partitions in office areas will permit shifting of rooms. Buildings and entire areas can be closed off when not in use. Architect is John B. Ferguson & Associates of Van Nuys; Art Reichenbach, Associate in Charge.

Sloping Roofs for Sanctuary

A traditional cruciform floor plan combined with original treatment of the roof mark the projected sanctuary for Ascension Lutheran Church in Memphis, Tenn. Central portion of the roof will be a concrete-waffle-slab; light entering through waffle-slab apertures will fall on the altar. Four sharply defined wings, containing pews, have sloped roofs. These wings will receive light from windows projecting above the central roof section. Stained-glass windows will be placed at the four junctures of the wings. Walls of masonry brick will be stuccoed on the exterior and left exposed on the interior.

Architects — Wadlington-Marshall of Memphis—have connected the sanctuary to an existing building with a covered walkway. Future additions will extend beyond the walkway, as a continuation of the existing structure.

AIA HQ FINALISTS

Seven firms have been named as finalists in the competition for the design of a new AIA headquarters in Washington. They are: Donald Barthelme, Houston, Tex.; Jean Labatut and Carr Bolton Abernethy, Princeton, N.J.; C. Julian Oberwarth of C. Julian Oberwarth & Associates (Milton Thompson, associate in charge), Frankfort, Ky.; Mitchell/Giurgola Associates, Philadelphia, Pa.; I. M. Pei & Associates (participating designers: I. M. Pei, Henry N. Cobb, Araldo A. Cossutta, James I. Freed, and Theodore J. Musho) New York, N.Y.; and the Perkins & Will Partnership (participating designers: Saul Klibinow, Mozhan Khadem, Phillip A. Kupritz, John Holton,) and Charles R. Colbert.

Jury for the first and second phases of the competition consists of Hugh Stubbins, Chairman; Edward Larrabee Barnes; J. Roy Carroll; O'Neil Ford; and John Carl Warnecke. A. Stanley McGaughan was professional advisor. Each finalist will receive $5000, and the firm chosen as the winner of the final round (to be announced in December) will be employed as the project architect. For such an important competition, open to all AIA members, there were only 221 submissions, which does not indicate a very high degree of interest among American architects on how their professional headquarters is going to look.

New Group

Copper Development Association, Inc., is a new group enveloping all segments of the copper industry, including copper mining companies, smelting and refining companies, fabricating companies such as brass and wire mills, and foundries. CDA assumes all the activities and responsibilities formerly performed by the Copper & Brass Research Association, which was disbanded last December. Primary purpose of the new group will be the expansion of uses and applications of copper and copper products, and greater markets for such products.

Student Takeover in N.Y.

A Pratt student project—redesign of Lower Manhattan—produced a few new ideas for improving the financial district. Shown here, a design by students Burke, McGarty, Meltzer, Terjesen, Vogt, and Wenthe for the new Stock Exchange, fares well in comparison with the controversial O'Connor & Kilham preliminary design (see p. 71, MAY 1963 P/A). Other provocative suggestions included converting Wall and Fulton Streets into pedestrian malls running from river to river, a city college on filled-in land on the East River, and apartments that have both river frontage and views of the lower Manhattan skyscraper-scape.

Architects Design for Engineers

Solution for an office building for two engineering firms in the residential district of Columbia, S.C., called for a long, low building and a bit of camouflage. Bottom level, following the natural contours of the sloped site, will be of native fieldstone. Taller than the upper two stories, this ground level will read as a base, reducing the building's apparent total height. Second level is set-back, with glass doors and windows opening onto the roof of the base. Bronze-colored metal is used on the exterior at this level; precast stone panels on façade of third level provide sun control.

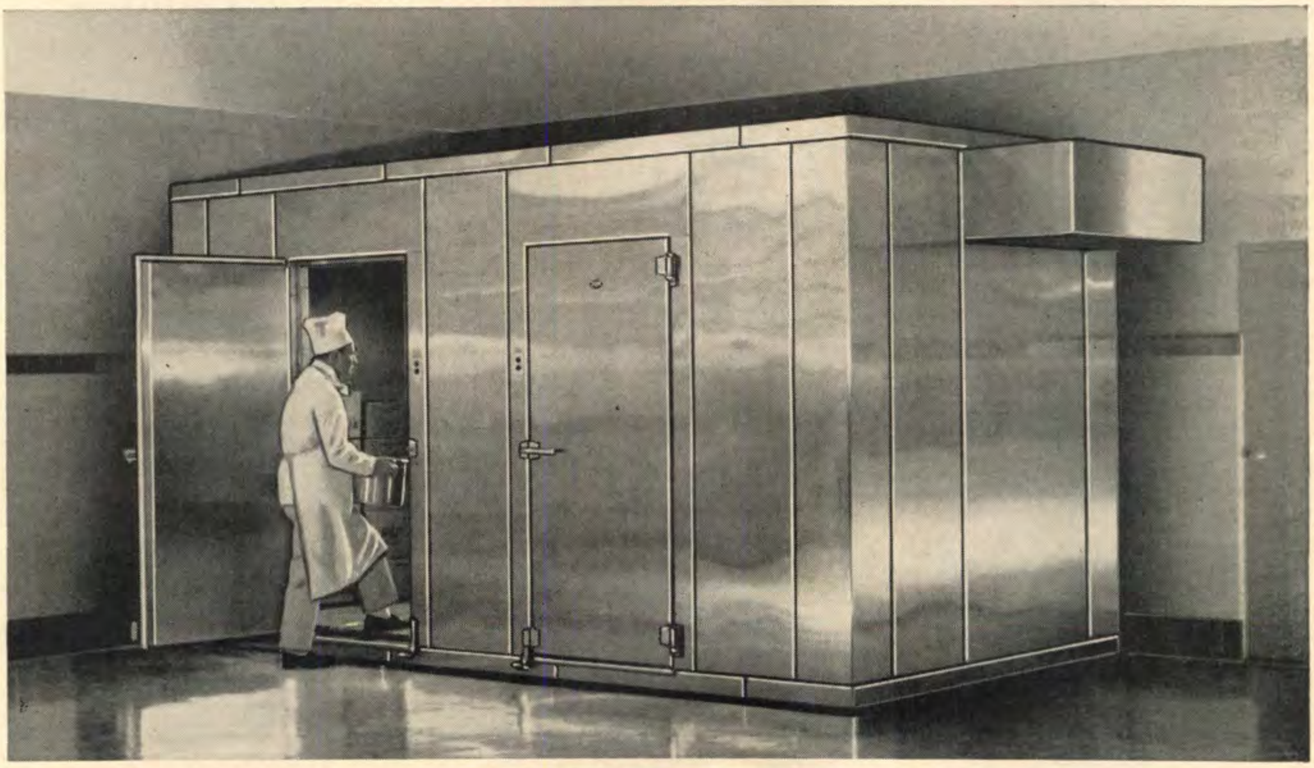
Entrance will be made at ground level to a lobby containing a 3-story light well with a fountain and pool and balconies at upper levels. Complete facilities for the firms of Wilbur Smith & Associates and Smith-Pollitte & Associates will be provided. Architect is Lyles, Bissett, Carlisle & Wolff of Columbia.

Control Tower Controls Detroit Design

DETROIT, MICH. Visions of airports to come can be conjured up by the proposed design for the Detroit City Airport Air Terminal, for the architect (Albert Kahn Associated Architects & Engineers, Inc.) has used as the basis of the design the Federal Aviation Agency's prototype control tower by I. M. Pei *(at right in rendering)*. The upper level of the terminal building will repeat the form of the tower's outslanted "hat." As restrained and competent as this

Continued on page 114

Bally Walk-In Refrigerators, assembled from prefabricated sections, provide highest efficiency, maximum sanitation and are easy to enlarge or relocate.



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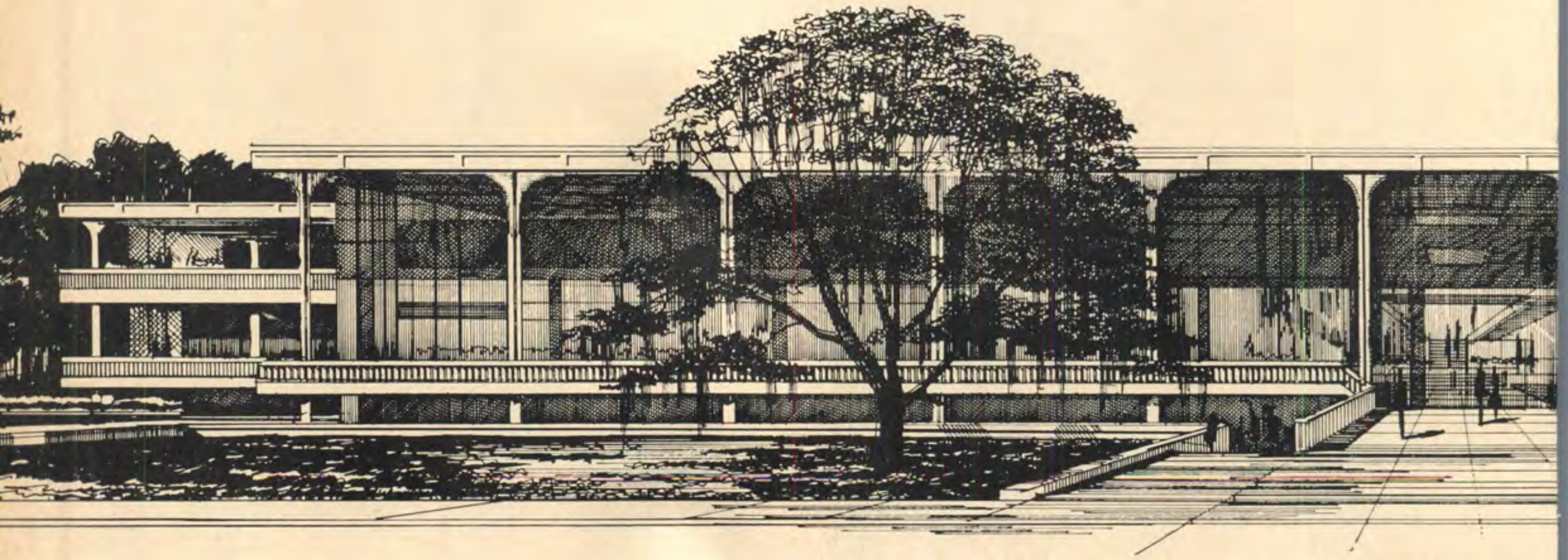
Lone Star goes to LOUISIANA STATE UNIVERSITY

Brilliant use of concrete featured in new Student Union Building



STUDENT UNION BUILDING
Louisiana State University, Baton Rouge, La.
Architects:
MATHES, BERGMAN & ASSOCIATES, New Orleans
WILSON & SANDIFER, Shreveport
JOHN J. DESMOND, Hammond
Engineer:
ALFRED G. RAYNER, Baton Rouge
General Contractor:
R. P. FARNSWORTH & CO., INC., New Orleans
Precast Concrete:
ARCHITECTURAL STONE CO., New Orleans
Exposed-Aggregate Panels:
GRANT-LEHR CORPORATION, Baton Rouge
Ready Mixed Concrete:
ALTEX READY MIXED CONCRETE CORP., Baton Rouge

Central lobby

A student union building traditionally serves as a campus "family room"—a place for relaxation and recreation. Its design should be informal, even light-hearted in spirit, esthetically interesting. On the other hand, it should be in keeping with the existing campus atmosphere—in this case, dominated by a repeated use of arches.

To meet all these requirements, the planners of Louisiana State University's new $4,300,000 Student Union Building chose to design in concrete, the basic construction material offering plasticity and freedom of form. The photographs here show the success of their efforts.

Of special interest is the orderly, exposed structural system, with tall columns flared in four directions to support the overhead beams on a 12-foot grid. This design results in continuity of stress flow from beams to columns.

Preparation of reusable wooden forms for the columns required skillful planning and supervision by the contractor, but no special forming personnel were required.

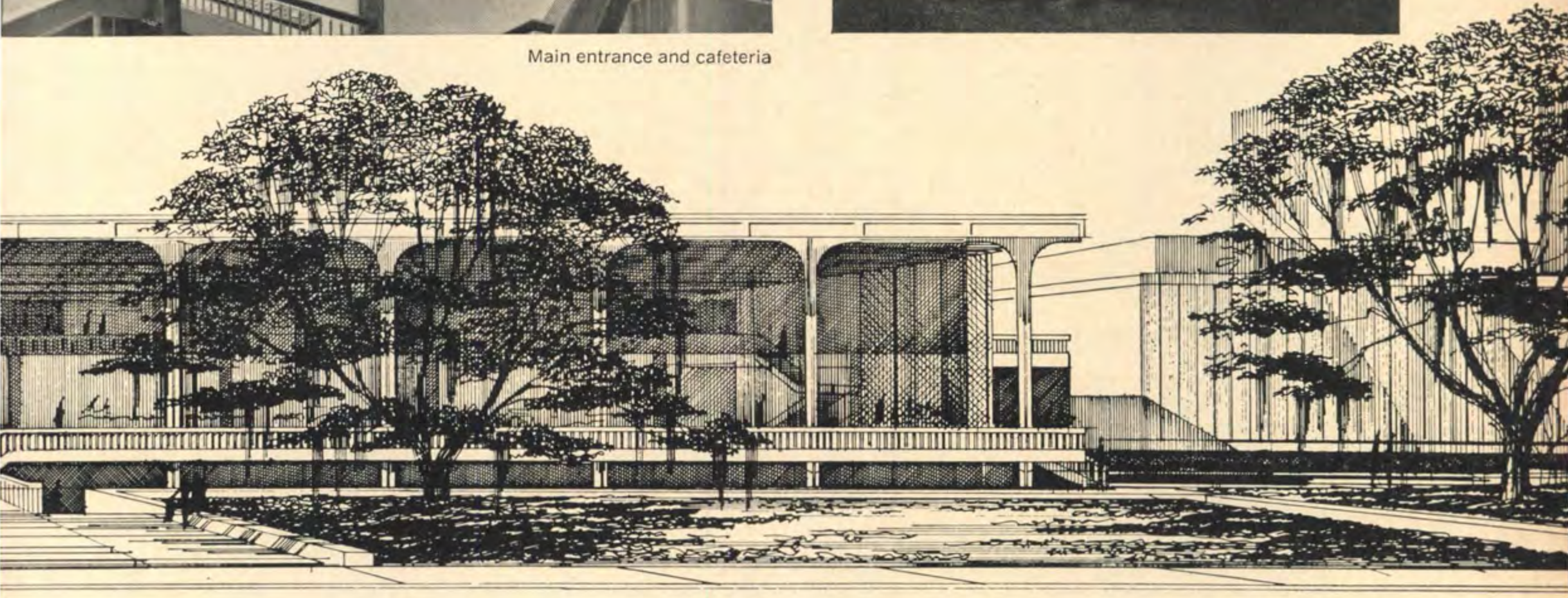
Precast, exposed-aggregate concrete units included rails and balusters for the exterior balustrades, all stair treads and risers, and copings and roof facias. A matching effect was obtained on the exterior concrete walls through the application of prefabricated exposed-aggregate panels. These were asbestos-cement panels, to which aggregate had been applied in an epoxy binder.

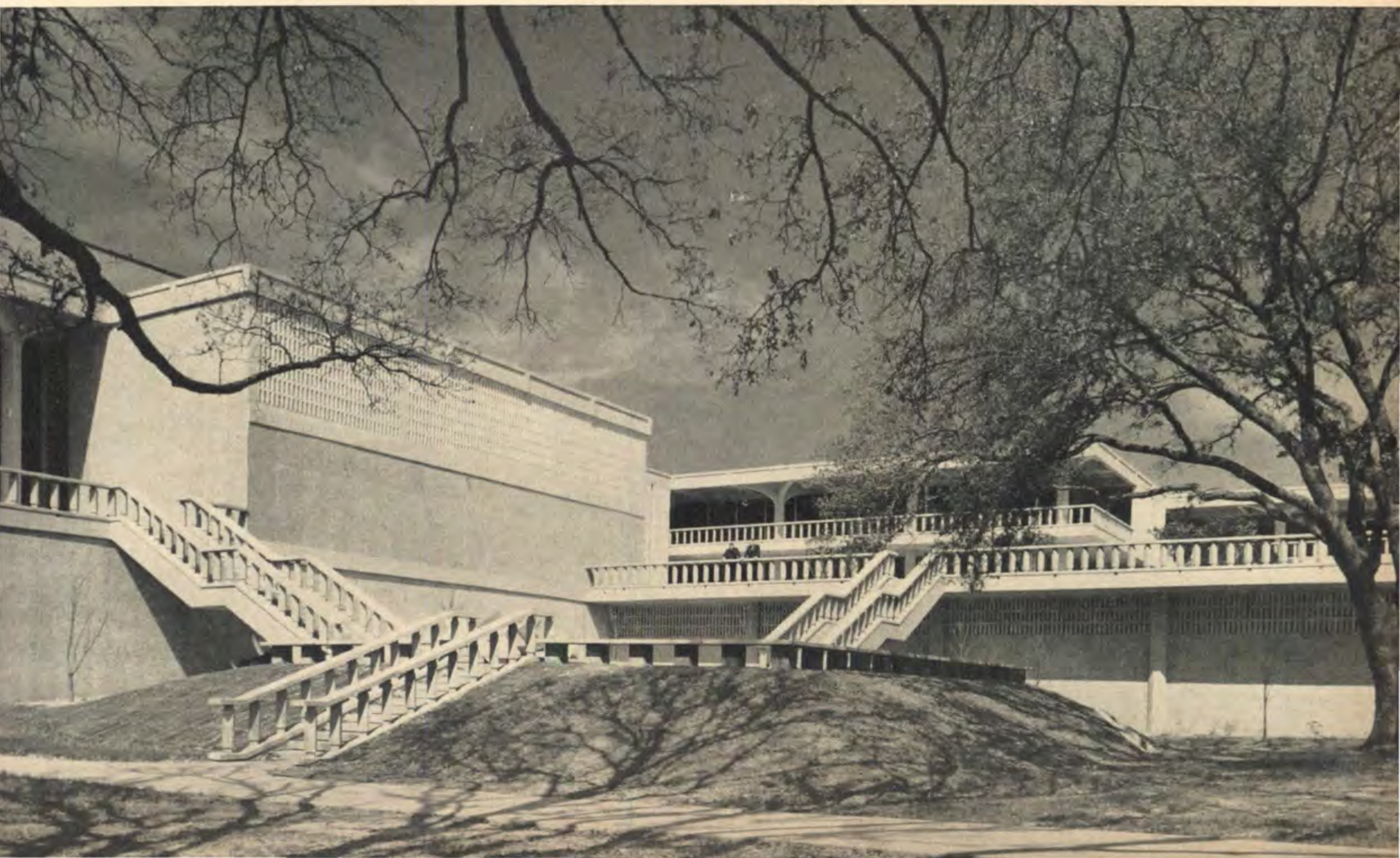
It is a matter of great pride that Lone Star Portland Cement was selected for use throughout this significant and beautiful structure.

LONE STAR CEMENT CORPORATION

New York 17, New York

Main entrance and cafeteria





Continued from page 110
particular terminal design seems to be, we hope it does not augur a future filled with termini that will all be variations on a theme by Pei.

Regional Plan for New York

Governor Nelson A. Rockefeller of New York announced a 60-year program for the regional planning of New York State that will make the state the partner and helper of local communities in their development projects. The program was embodied in a 154-page report submitted by the State Office for Regional Development. It divides the state into 10 regions for development; the first to receive attention will be Nassau and Suffolk counties, which make up most of Long Island. The Governor said that New York had become too complacent about its resources and importance, and that the regional development plan would try to make up for lost time. State cooperation with regions, he said, will maximize the ability of communities to plan for growth. The state would like to be a catalyst in planning for the future, and act as liaison between local and Federal governments.

Schools

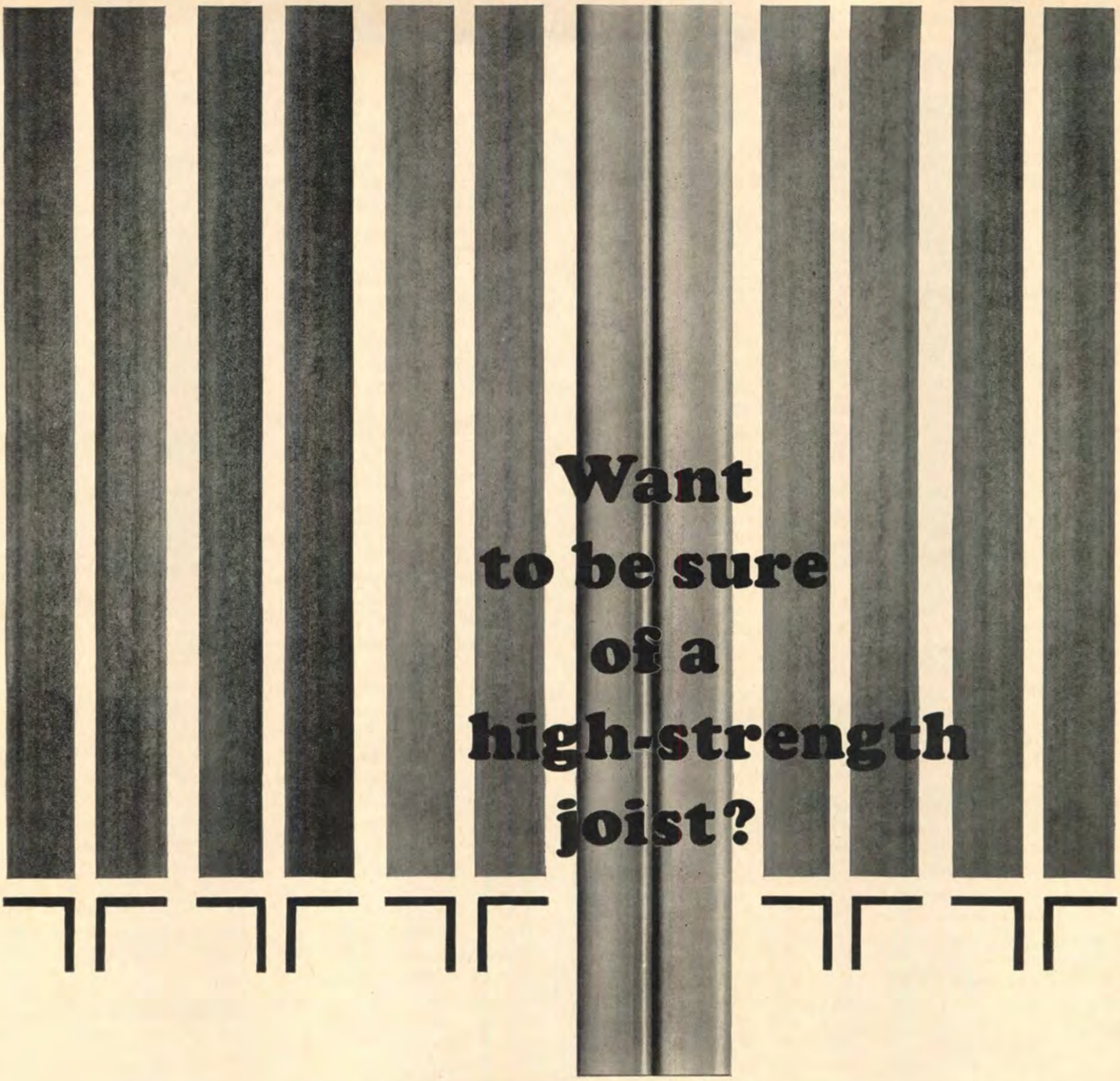
The New School for Social Research, Manhattan, will offer a fall course entitled "Interior Design: Group Consultation." Instructor and designer Kim Hoffman will cover such topics of interest to the homeowner and professionals as: the quality of furnishings, differences between natural and man-made fibers, use of wood, stone, and glass in design . . . Kent State University's five-year architectural program has received full accreditation by the National Architectural Accrediting Board; it has been operating under a provisional accreditation for the past two years . . . Fellowships in city planning and urban renewal have been established at ten U.S. universities through the Richard King Mellon Charitable Trusts. Mellon Fellowships will be available for the next five years for study at University of California at Berkeley, Georgia Institute of Technology, Harvard University, University of Illinois, Massachusetts Institute of Technology, University of North Carolina, University of Pennsylvania, University of Pittsburgh, Syracuse University, and University of Wisconsin . . . A Washington Program in Urban Studies, established by Virginia Polytechnic Institute and commencing with the current school term, will enable students to live and study in Washington D.C. Graduate seminars, lectures, and studio problems, conducted by the Institute and the George Washington University School of Government, Business, and International Affairs, will focus on problems of urban design, housing, planning theory, and planning law.

Concrete and Brick Library

Included in a redevelopment project for Huntsville, Ala., is a 220,000-book public library by Reed-Mullin Associates. At the first level, exterior walls will be brick with concrete star columns. A single column will support a canopy at the entrance. Second floor wall will be of concrete panels and heat-absorbing glass. Facilities will include: circulation, reference and general reading area on the first level; children's area, audio-visual facilities, stage, lounge and dining facilities, display and conference rooms, and technical services on the second. Stacks will be in the basement.

PERSONALITIES

New York—AIA has made three grants through its Arnold W. Brunner Scholarship program. Awards go to: Henry Bowditch Vanloon, former executive director of the Pennsylvania State Planning Board, for a book to cover his 20 years in community, regional, and state planning; Donald Craig Freeman for production of a film on architecture and urban design in the U.S.; and Henry D. Whitney, chairman of the Chapter's Housing Committee, for continuation of his study of urban residential neighborhoods . . . William J. McGuinness, Contributing Editor of P/A's Mechanical Engineering Critique, has fathered a fourth edition of *Mechanical & Electrical Equipment for Buildings;* the book, written in collaboration with Stein, Gay, and Fawcett, has been a standby in architectural schools since its first publication in 1937 . . . The University of Southern California announces the appointment of Konrad Wachsmann as Professor of Architecture to organize its newly established Division of Building Research; Wachsmann, a pioneer of industrialized building, has recently authored a history of prefabricated building entitled *The Turning Point of Building* . . . Ernest J. Kump Associates has been selected to design a student union building at San Jose State College . . . 1964-65 President of the Illuminating Engineering Society is Charles L. Amick, Director of Research and Development for Day-Brite Lighting division of Emerson Electric Co., St. Louis . . . O'Neil Ford has been named to the Board of Directors of the Citizens National Bank of San Antonio, Texas . . . Scholarships of the American Institute of Architects-American Institute of Architects Foundation, Inc., have been announced: scholarships sponsored by the consulting engineering firm of Syska & Hennessy, Inc., of New York go to students James I. Lammers, Department of Architecture and Architectural Engineering at Iowa State U., and David S. Haviland, School of Architecture, Rennsselaer Polytechnic Institute; scholarships sponsored by Desco International Association (wall and floor coating dealers) go to students A. Charles Hill, University of Pennsylvania Graduate School of Architecture; Thomas Braden Daly, University of Texas School of Architecture; Anthony D. Mielke, University of Detroit Department of Architecture; and Richard L. Wilson, University of Washington College of Architecture . . . Charles L. Kent, of Jones & Laughlin Steel Corp., Pittsburgh, Pa., is president of the American Society for Testing and Materials . . . Annual awards of the American Society for Engineering Education went to educators Frederick E. Terman, Acting President of Stanford University; John Bardeen, professor of electrical engineering and the University of Illinois; Cedomir M. Sliepcevich, Research Professor of Engineering at the University of Oklahoma; and Joseph E. Rowe, Professor and Director of Electron Physics Laboratory at the University of Michigan. Recently elected President of ASEE is Elmer C. Easton, Dean, College of Engineering, Rutgers University. . . Harold D. Hauf has joined the University of Southern California staff as Professor of Architecture . . . Robert R. Cueman has been elected President of the New Jersey Society of Architects and the New Jersey Chapter of the American Institute of Architects . . . The National Institute for Architectural Education has announced student awards: (1) The Committee of Stainless Steel Producers Award for design of "A Prefab Vacation Cabin" went to T. Hoffman (First Prize), University of Florida; R. Gruber (Second Prize), University of Illinois; J.D. Jackson, (Third Prize), Oklahoma State University; (2) Kenneth M. Murchison Prize for "A Housing Project with Facilities for the Aged" was divided between H.G. Hawthorn, Yale University, and D. Rosenblatt, Pratt Institute; (3) Hirons Alumni Prize for "A Peace Corps Training Center" went to M.L. Henthorn (First Prize), Oklahoma State University, and R. Arioli (Second Prize) of Kansas State University; (4) Emerson Memorial Prize for design of "A Tree House for Viewing Wild Game" went to E.C. Young (First Prize) and L. Herring, both of Oklahoma State University; (5) 1964 Thesis Award for travel and study went to Mary Jane Long, (First Prize), Yale University; J.R. Mygatt (Second Prize), Princeton University; and C.D. Hosford (Third Prize); (6) The Architectural Record Prize for the best book submitted in conjunction with a thesis went to R. Dick, J. Koster, and B. Elbasani of The Cooper Union for their "Yorkville Study" . . . A new FHA position — Associate



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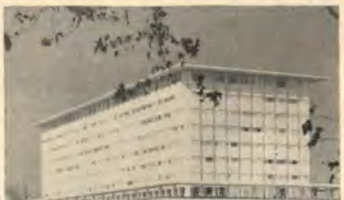
Director for Design in the Architectural Standards Division—has been filled by William J. O'Connor of McLean, Va. . . . Illinois architect Siebron J. Eppinga has been appointed director of campus planning for DePaul University . . . Frederick J. Adams, professor and past head of the Department of City and Regional Planning at MIT has retired from teaching and will continue practice in the firm of Adams, Howard & Opperman . . . Shirleigh Silverman has been appointed as Associate Director for Resources Planning for the National Bureau of Standards . . . Martha Knowles was installed as president of the National Association of Women in Construction at their September convention.

A Committee on Landmarks has been established by the National Capital Planning Commission and the Commission of Fine Arts to prepare an inventory of significant landmarks in the capital. Architects, to serve on the committee with artists, historians and preservationists, are Francis D. Lethbridge, Walter G. Peter, Jr., Alexander C. Robinson, III, and Nicholas Satterlee . . . James H. Scheuer, president of Renewal & Development Corp., client of two P/A First Design Award winners (Capitol Towers, Sacramento, California, by Edward L. Barnes, Wurster, Bernardi & Emmons, and DeMars & Reay, January 1959; and the redevelopment of Marin City, California, by DeMars & Reay, January 1960), won Democratic nomination for Congressman of the 21st Bronx Congressional District; his victory was an upset by reform and insurgent forces over incumbent Rep. James C. Healey (see personality sketch on Scheuer, p.79, May 1960 P/A) . . . A newly created position of executive director of Philadelphia Chapter, AIA, will be filled by William B. Chapman . . . William Daniel Wilson is new president of New York Chapter of the American Institute of Architects; Wilson is a partner in Holden, Egan, Wilson & Corser . . . Alfred Hamilton Barr, Jr., has received the Award of Merit of New York-AIA Chapter, which recognizes nonarchitects for meritorious work in their respective fields. Barr, director of the Museum of Modern Art, was cited as "a pioneer force in creating and developing one of the world's foremost institutions of contemporary art." The chapter also awarded its Harry B. Rutkins Memorial Award to Samuel M. Kurtz in recognition of outstanding service to the chapter and the profession . . . Massachusetts Institute of Technology has announced the retirement of Dean John E. Burchard of the School of Humanities and Social Science; Dean of the School since its establishment in 1950, Burchard has brought humanities and social science to "robust maturity." He will continue to study architectural history under a grant from The Carnegie Foundation. Robert L. Bishop, presently head of the Department of Economics and Social Science, will serve as Acting Dean . . . Linus Burr Smith, chairman of the department of architecture at the U. of Nebraska for 30 years, will retire this summer.



Grilles to Graffiti

Waffled skin of Edward Durrell Stone's Federal Center Building in Prince George's County, Md., is created through a series of precast panels. Each panel consists of two bays, projecting 3′ from the building face; sides of the bays are angled inward approximately 75°. The 6-ton panels of white, very dense concrete were fabricated by Martin Marietta at Baltimore and set on 12″x12″x24″ concrete haunches that had been cast into the floor slabs. Metal clips further secure the panels. Besides effecting a striking shadow pattern on the exterior, these panels form interesting interior bays for offices on the perimeter of each floor.

The Federal Center, largely occupied by the U.S. Department of Agriculture (hence its name: it is a privately owned building) is the key to a $78 million housing-office-store complex. Associate Architects are Brown, Chapman, Miller & Wright. Structural Engineer is Carl C. Hanson.

Significant Data on Community Design

Two publications of a significant nature for the design and planning of residential communities have been made available, one by the Federal Housing Administration, and the other by the Urban Land Institute.

The FHA-issued publication, "Planned-Unit Development with a Homes Association," is a guide to the development of housing subdivisions incorporating privately owned, open common areas and providing a means for the maintenance of the common property. Outline of subdivision of the land is predominately for use with owner-occupied homes developed under FHA home financing programs. This is another instance of the recent forward-looking steps taken by FHA to encourage better planning and design in our residential developments. The 64-page, illustrated booklet is available for 50 cents from the Superintendent of Documents, Government Printing Office, Washington, D.C. Refer to Land Planning Booklet No. 6.

Urban Land Institute Technical Bulletin No. 47, "Innovations vs. Traditions in Community Development," subtitled "A Comparative Study in Residential Land Use," discusses innovations in the planning of residential communities based on density control zoning and the use of varied housing designs and arrangements that have been successful in actual application. The study reveals that traditional planning methods and outmoded zoning and subdivision codes based on minimum plot sizes cannot cope economically or aesthetically with rising land and building costs, but that the innovations noted have solved such problems by accommodating more families on the same area of land at lower costs per family for land, improvements, and utilities. Actual developments studied in the booklet include Eastwick in Philadelphia, Harlow Neighborhood Plan in England, a row-house project in Washington, D.C., and Chevy Chase community in Salt Lake City. Study costs $6 from ULI, 1200 18th St., N.W., Washington, D.C. 20036.

Housing Cats

A—er—feline house has been designed for Denver's Zoological Gardens by McFadzean, Everly & Associates of Winnetka, Ill., and Alan Petersen of Denver. The former firm, specialists in zoo design, did the master plan for the Denver zoo park.

The design proposes twin wings with 14 cages separated by a breezeway, which may eventually be enclosed to house smaller members of the cat family.

Serving the Community

Sensible solution to design of Lincoln (Nebraska) Center for Community Services uses top story for a column-free, 200-seat auditorium. Meeting rooms for 10-75 people will be at the ground level, leaving the remaining three stories free for offices of 20 charitable organizations. Exterior façade of white exposed aggregate precast concrete and gray glass will be recessed at the first and fifth stories. Architects-Engineers: Clark & Enersen, Olsson, Burroughs & Thomsen.

Competitions

Enhancement of Civic Center Plaza in San Francisco will be the goal of a competition open to sculptors, landscape architects, architects, and artists from all over the world. Jury members will represent a variety of design professions: Architect Luis Barragán, Landscape Architect Thomas D. Church, Sculptors Jacques Lipchitz and Costantino Nivola (alternate jurors), Art Historian Lorenz Eitner, and Moses Lasky of the Board of Directors, San Francisco Museum of Art. Program requirements for this municipally-sponsored competition can be obtained from Professional Advisor, Henry Schubart, Jr., 52 Vallejo St., San Francisco 11, Calif. Deadline for registration is Dec. 31, 1964.

Obituaries

Lois Lilly Howe, first woman to receive an architectural degree from the Massachusetts Institute of Technology, died in Cambridge, Mass., on September 13, just 12 days before she was to celebrate her 100th birthday.

John Cecil Haggott, theater-film-television producer and architect, died August 20. Haggott received a degree in architecture from Harvard College in 1935, but worked mainly in the theater until 1962, when he joined the firm of I. M. Pei Associates.

Brazilian architect Afonso Eduardo Reidy died August 10; Reidy, one of the forerunners of modern Brazilian architecture, designed the Ministry of Education Building in Rio de Janeiro.

WASHINGTON/FINANCIAL NEWS

BY E. E. HALMOS, JR.

Architects and engineers doing work for U.S. military services may find themselves being "second-guessed" by contractors from now on. Under terms of new "value engineering" clauses being inserted in most military construction contracts starting this month, it will pay the contractors to do so.

The military services don't intend to have contractors suggest changes that would affect safety or utility of a structure. However, by applying a technique in use for some years in military "hardware" procurement contracts, they want to encourage the builder to think up ways to save more money for the government. The carrot in front of the contractor's nose is more money—up to 50 per cent of any actual savings coming from his suggestion (in addition to normal fee and profit).

It would work this way: If a contractor finds that repositioning a plumbing fixture, for example, might save money in forming work, he may submit a detailed statement of the suggested change and the estimated saving. The military contracting officer must consider the suggestion as soon as possible, and if he finds it good (and safe, etc.), he may accept it; then the contractor can have his carrot.

Military procurement officers are enthusiastic about the idea, and claim it has worked well in getting better prices on munitions, armaments, and other equipment; they can't see why it shouldn't work on construction. Engineering organizations in the services aren't that enthusiastic, but orders are still orders. So the new "value" clauses will go into the contracts, as scheduled.

Bureau Business

With Congress rather grumpily back in session in September, but keeping an anxious eye on the approaching elections, most Washington action was concentrated in agencies and departments, not on Capitol Hill.

For instance, the Labor Department issued new regulations covering inclusion of "fringe" benefits in construction labor scales, as directed by Congress last June. Now to be included as basic wages are such items as pension programs, accident-sickness insurance programs, paid holidays, workmen's compensation costs, cost of apprenticeship programs, and the like.

Navy's Bureau of Yards and Docks announced adoption of the Construction Specifications Institute's 16-division "format" for building specifications. The format sets up a specific order for the appearance of all items normally required in a call for bids or specifications list, and is expected to save time and money.

A new engineering group also appeared on the Washington scene—The National Association of Government Engineers, which is dedicated to promoting better staffing of engineering operations, harmony within the engineering profession, and the like.

Society Ad Tax

Of interest to architects and all other professionals was a Congressional move to block the Internal Revenue Service's announced effort to tax the advertising revenues of publications of professional (as well as charitable, civic, labor) societies and organizations.

IRS has said—unofficially—that much of the revenue of such publications (which would include the *AIA's Journal* is "unrelated" income, and thus taxable, under never-used provisions of the Internal Revenue Code. The proposal brought immediate expressions of concern from most major professional societies.

In early September, it resulted in the introduction of a bill (HR 12505), authored by Missouri's Rep. Tom Curtis, that would specifically exempt these publications from taxation, as long as revenues were siphoned off for proper professional and technical purposes. The bill seemed to have little chance of enactment this year, but it could act as a brake on IRS' operations.

Federal Building

There's a total of 87 public buildings, 74 prospectuses for new buildings, and 41 for considerable repair and extension work included in projects approved by public works committees of both Houses of Congress before the session closed. (Such approval is all that's needed to give General Services Administration the green light to ask for money).

Biggest of the proposed ne buildings is the long-planne $48 million headquarters f the Patent Office, to be bu in or near Baltimore. Al okayed by the committees a a $47.6 million building, Washington, for the Lab Department; a $33 milli Federal office building in D troit; and a $15.5 million offi structure in Portland, Ore.

Approval of the GSA's pr spectuses doesn't automatical assure construction, since Co gress must appropriate actu funds. The proposal to mo the Patent Office to Baltimor for example, has been hot contested.

Bread and Butter

Meanwhile, there was mon for the construction industry- and architects—in many of t bills Congress approved as t session drew to a close.

Notably, there was the $1 billion housing bill, which i cluded a $725 million autho zation for urban renewal (d spite strong attacks on t whole program); $75 milli for direct, low-interest loa for rental housing for t elderly; $150 million for t farm home loan program; ar $25 million for developme of parks and other "op spaces."

And the Bureau of Publ Roads, in apportioning fun both for Interstate and s called "ABC" (primary, rura urban) road-building pr grams, pumped a total another $3.8 billion into th construction economy.

Knowledge Gap

The Library of Congress h moved to fill at least a pa of the growing gap betwee the accumulating scientif knowledge and its dissemin tion to national legislators. recently named Dr. Edwar Wenk, Jr. (a civil enginee who has specialized in applie *mechanics*) as chief of a new created "Science Policy R search Division" of the L brary's Legislative Reference Service. In addition, Wenk will serve as special adviser to the Librarian of Congress in science and engineering.

Idea is to provide a central point within the Library to which Congressmen can go

Continued on page 122

For more information, circle No. 340 ➤

Continued from page 118

when they want information about the roughly 15 per cent of the total U.S. budget that is now going into some form of research and development work. It may also forestall repeated attempts to create a brand-new Federal department concerned with research and engineering.

Bookshelf Item

National Bureau of Standards has published a monograph (available for 20¢ from the U.S. Government Printing Office) entitled "An Engineering Method for Calculating Protection Offered by Structures Against Fall-out Radiation."

Financial

While Congressional action continued to pour money into the construction market, and the general economy continued to show strength, experts were getting increasingly concerned over the housing segment of the industry.

It isn't that housing is in a real slide—the "annual adjusted rate" in July indicates a total of 1.517 units for the year. That wouldn't be a disaster by a long shot, but the fact is that since housing hit a peak (of 1.8 million units indicated) last October, it has been going downhill very slowly but quite steadily. The change in rate of new unit starts, for example, showed a 5 per cent drop between June and July. Many economists think that the rate will stabilize at about 1.5 million for several years to come. Again, that's not at all bad. But the effect of a stabilized housing market may be to push down general construction volumes.

Other indicators in the construction area are still favorable, however. Money continued to be available for new work; voters continued (through July) to support strongly general public works spending. Construction costs seemed to be fluctuating a little —the Bureau of Public Roads' cost index, for instance, dropped more than two points for the first quarter of the year; and the Public Health Service's index of sewage-treatment plant costs kept climbing—by fractions of percentage points, however.

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C. Partner, Arch.-Engr. Firm

D. Job Captain (Project Chief)

E. Staff Architect

F. Architectural Designer

G. Specifications Writer

H. Chief Draftsman

I. Draftsman

J. Staff Engineer (M.E.)

K. Staff Engineer (C.E.)

L. Staff Engineer (E.E.)

M. Structural Designer

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103	116	129	203	216	229	303	316	329	342	355	368	381	394	407	420	433	446	459	472	485	498
104	117	130	204	217	230	304	317	330	343	356	369	382	395	408	421	434	447	460	473	486	499
105	118	131	205	218	231	305	318	331	344	357	370	383	396	409	422	435	448	461	474	487	500
106	119	132	206	219	232	306	319	332	345	358	371	384	397	410	423	436	449	462	475	488	501
107	120	133	207	220	233	307	320	333	346	359	372	385	398	411	424	437	450	463	476	489	502
108	121	134	208	221	234	308	321	334	347	360	373	386	399	412	425	438	451	464	477	490	503
109	122	135	209	222	235	309	322	335	348	361	374	387	400	413	426	439	452	465	478	491	504
110	123	136	210	223	236	310	323	336	349	362	375	388	401	414	427	440	453	466	479	492	505
111	124	137	211	224	237	311	324	337	350	363	376	389	402	415	428	441	454	467	480	493	506
112	125	138	212	225	238	312	325	338	351	364	377	390	403	416	429	442	455	468	481	494	507

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Products

Construction

Cement/Wood Fiber Waffle Ceiling

Combination of portland cement and chemically-treated wood fiber provides sound dampening, good insulation, fire resistance in recently developed precast waffle ceiling units called "Pyrite." They fit into 25 sq in. and $8\frac{1}{2}$ deep ceiling recesses. Concrete is poured over waffle units and reinforcing members to form two-way reinforced-concrete floor or roof deck for story above waffle ceiling. Concrete bonds firmly to textured surface of waffle units. In addition to the bond, the units have mechanical locks formed by concrete. Two sizes of waffle provide for 8″ or 10″ concrete joists. Surface of units can be painted or left natural. Advantages of high thermal insulation include appreciable reduction in fuel and air conditioning costs when waffles are used for ceiling supporting roof decks. Alpha Portland Cement Co., 15 South Third St., Easton, Pa.
On Free Data Card, Circle 100

Air Structures

Air-supported structures consist of single membrane pneumatic envelopes held erect and stable by slight pressure from continuously operating blower. Standard shape is either half sphere or half cylinder capped by quarter sphere at each end. Other shapes include cones and combinations of other shapes. Standard sizes are available in widths from 20′ to 200′ in increments of 5′. Lengths are virtually unlimited. Standard fabric is vinyl-coated nylon with total weight per sq yd of 22 oz. Structures are guaranteed against failure of material or workmanship for four years. CIDAIR Structures Co., 130 and Indiana Ave., Chicago, Ill.
On Free Data Card, Circle 101

Stainless-Steel Panel for Prefab Buildings

Stainless-steel wall and roof panel has been introduced for use on pre-engineered industrial buildings in corrosive atmospheres and for other special applications. Panel is made of 26 gage steel, engineered to $\frac{1}{32}''$ tolerance, and is available in 3′ widths and up to 32′ lengths. Insulation, consisting of field-installed glass-fiber blanket, is optional. Butler Mfg. Co., 7400 E. 13 St., Kansas City, Mo.
On Free Data Card, Circle 102

Pre-engineered Structures

Pre-engineered structures are built from over 1200 standard sizes and designs. Buildings can be combined with masonry, tilt-up concrete, wood, or glass. Blanket-type insulation with vapor barrier is applied to wall and roof panels and can be either covered with standard finishing materials or left exposed. Clear span widths range from 20′ to 140′ (unlimited additional widths are made by combination of multiple spans); eave heights from 10′ to 20′; unlimited lengths in 20′ and 24′ bay increments; roof slopes in low profile and gable type; canopies cantilever in widths of 5′, 6′, 8′, 10′, and 12′. Special buildings are available in nonstandard widths, heights, bays, lengths, and roof slopes that meet all structural requirements. Exterior metal wall and roof panels are formed in lengths up to 30′ and have ribs spaced 8″ o.c. They are available in seven colors. Metal panels are resistant to all types of weather and will not crack, blister, flake, or chip. Pasco Steel Corp., 1301 E. Lexington Ave., Pomona, Cal.
On Free Data Card, Circle 103

Forming Brick Walls

"Pax-Forms," a brick-like forming system, is made of lightweight cast aluminum. It is adaptable to both residential and commercial construction. Forms give low-cost, on-site casting in which no special set-up techniques are required. They can be poured to heights of 8′, with less than $\frac{1}{16}''$ deflection from tie to tie. Setting forms, pouring, and stripping can be done in 32 man-hrs to produce equivalent of hand-laying 10,000 bricks. Standard sizes of 24″, 12″, 4″, and 2″ corners allow contractors to build in any increment of 2″. Pax-Form wall construction costs no more than ordinary concrete. Pax-Products Inc., P.O. Box 683, 205 Southwest 11 St., Des Moines, Iowa.
On Free Data Card, Circle 104

Two-Story Metal Wall

Recently developed two-story wall panel employs 4′ x 18′ aluminum-faced panel with batten sidewall system. Manufacturer states that system reduces construction costs so that metal wall is competitive with stucco. Panel materials consist of conventional 2′ x 4′ stud system and resemble balloon-type framing. Panels are fastened together with nails driven horizontally through uprights so that, combined with trusses, they form post-and-beam structural system. After panels are in place, aluminum battens are snapped on the clips. Battens also cover all nail heads and joints so that finished wall is uniform with fasteners concealed. Aluminum skin wall is prefinished in variety of colors. With simple jig and all material precut, two men can nail together the framework, apply plywood and felt, insert window frames where required, and install aluminum skin and clips. With two jigs and four men, complete panel can be fabricated in about 15 min. Net result is about one man-hr per panel. Reynolds Metals Co., 19 East 47 St., New York, N.Y.
On Free Data Card, Circle 105

Prefab 4-Room Unit

Prefab four-room unit for Holiday Inns of America, Inc., measuring 10′ x 156′ and weighing 15½ tons, consists of reinforced glass fiber, polyurethane foam, and birch plywood paneling. Each of four front panels are 8′ x 14′. End panels, 10′ x 14′, have no openings. Room units can be planned to fit any desired number of basic designs. The 8′ x 14′ panel is 1/16″ thick and weighs 45 lbs. By inserting window casement, air-conditioner frame, electric wiring conduit, and structural wood members, panel assembly is increased in thickness to 3½″. It is then securely locked into structural steel frame, ready for bonding interior skin to rest of assembly. "Hetrofoam #92," pressurized polyester foam is poured in between birch plywood paneling and exterior section. Each interior plywood panel is coated five times with fire-retarding varnish. Steel plates bolted within the double walls between rooms join panel section together. All joints are calked. Self-supporting room sections, 6′ x 14′ and slightly curved, are made of 3″ deep molded, reinforced glass fiber structural ribs that are bonded to underside of roof section. Acoustical tile, flush lighting fixtures, and batt insulation compose interior corridor ceilings. Owens-Corning Fiberglas Corp., Toledo 1, Ohio.

On Free Data Card, Circle 106

Spiral Structures

Automated prefab system, called "Spiral Generation," not only reduces construction time but also building costs. By employing specially designed machine, pieces of "Styrofoam" extruded polystyrene foam are bent, placed, and fastened together into a rising single or doubly-curved hemispherical structure. Following preparation of level site, base ring (made of angle iron preformed to the diameter of the sphere) is assembled, located on the foundation, and anchored. Spiral generation begins with timed feeding of Styrofoam strips to an electrically driven forming head. Foam board strips are thermally sealed, layer upon layer, by the machine head, which is mounted on a boom that swings from a centrally located support. Second boom, handled by an operator, feeds foam boards to the machine head. They may be fed to the operator by a conveyor. Generation process is continued as successive strips of expanded polystyrene are thermally welded together by travelling head to form the hemispherical dome. After the structure has been completed, windows, doors, and ducts are cut out, by using a template when necessary. Surfaces of the interior and exterior are then treated with latex paints, epoxy resins, or cementitious coatings. Sections of spheres have been built from only a few feet to more than 50′ in diameter and from fraction of an inch to 4″ in foam thickness. Dow Chemical Co., Midland, Mich.

On Free Data Card, Circle 107

Electrical Equipment

Sculptural Lighting

Ilse Hoffman-Schenk's recent collaboration with Abraham Schenk has produced four unique lamps for floor or low-table use. Geometric forms of cast stone—looking like free-standing sculptures—shield and diffuse light of a hidden bulb. "Asteroid" (*illustrated*) is a unit of three concentric semi-spheres: two inner shells rotate freely on vertical axis allowing change in direction and amount of light, as well as variation of design. Asteroid is 14″ high and 16½″ wide; base can be oiled walnut, teak, or polished aluminum. Sculptural Lighting Inc., 2527 Palisade Ave., Riverdale, N.Y.

On Free Data Card, Circle 108

Inverter-Ballast For Fluorescent Lamps

Inverter-ballast operates standard fluorescent lamps from battery power or other DC sources. It is capable of delivering up to five times amount of light produced by filament lamps. Ballast is easily applied to present fixtures with conventional wiring. Unit operating T-5 fluorescent lamps ranging from 4 to 13 w is only 1⅜″ x 1⅜″ x 4″ in size. Inverters will soon be available for larger lamp sizes including 40 w preheat and instant-start models. It can also be made available on request for other DC supplies, including 6, 24, 28, 32, 37½, 48, 60, and 90 v. Invlux Corp., Box #89, Madison Sq. Station, New York, N.Y.

On Free Data Card, Circle 109

Finishes/Protectors

One Part Sealant

Four types of single-component urethane sealants for various applications have been developed. Characteristics include factory mixing, negligible staining of white substrates, good consistency in flow rate (viscosity), no toxicity, no offensive odors, and quick curing. "#101" is used for sealing of joints of limited movement, sealing of houses where flexible sealant is desired, and general use in building operations. "#102" is recommended for joints of major movement, particularly where weathering is a problem. "#103" is recommended for all joints in movement. "#104" handles any job where a sealant is forced to hold against maximum movement. Standard Products Co., Chemical Products Dept., Port Clinton, Ohio.

On Free Data Card, Circle 110

Air-Entraining Agent

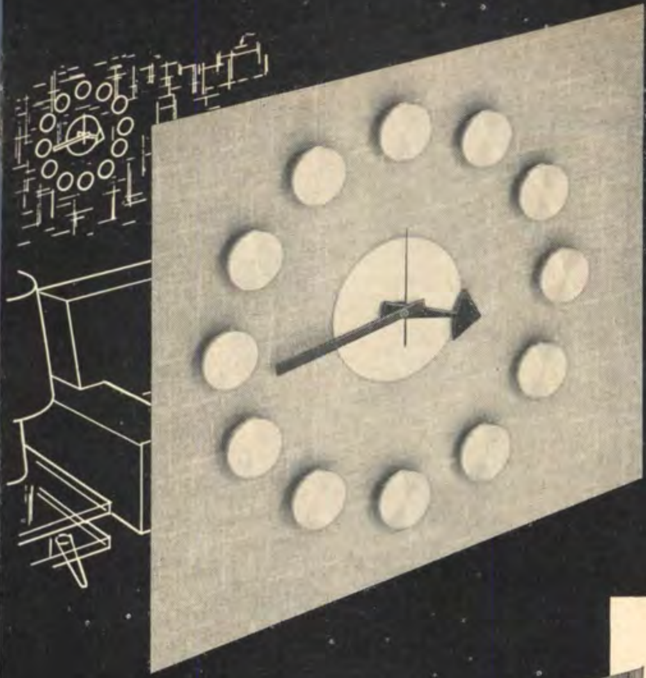
Air-entraining agent, called "Airecon," improves workability and increases durability. It consists of 12 per cent solution of "Vinsol" resin, which in dry form is used for intergrinding as an air-entraining addition to portland cement in conformance with ASTM C-262. In neutralized, soluble form, Vinsol is employed as air-entraining agent for addition to concrete mixes in conformance with ASTM C-260. Airecon dosed at ½ to 1 fluid oz per sack of cement provides 3 to 6 per cent air-entrainment for normal concrete mix. Dosage depends on mix conditions and materials. When used with non-air-entraining, water-reducing admixture, it increases in strength. Johns-Manville, Concrete Specialties Dept., 22 East 40 St., New York, N.Y.

On Free Data Card, Circle 111

Butyl Sealant

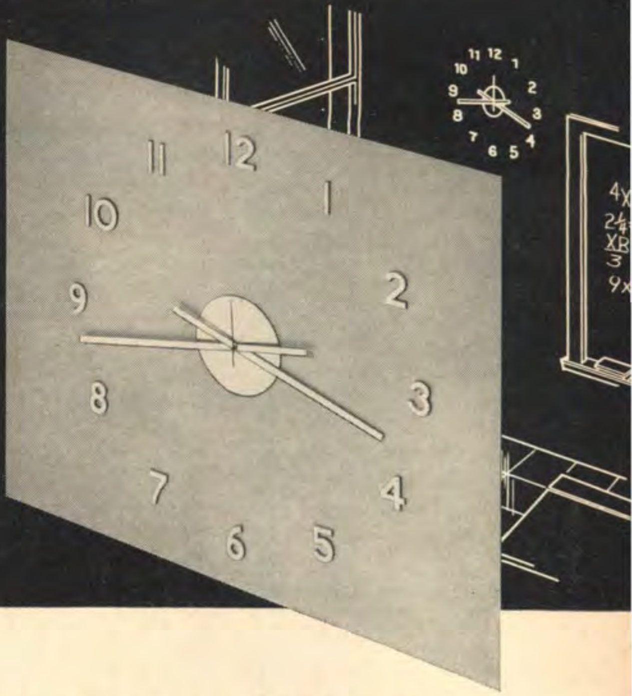
Butyl elastomeric sealant has adhesion properties far exceeding oil or alkyd based calking compounds. "Butakauk" is one component self-curing (within 24 hrs) material compounded with inert fillers, pigments and mild solvent. It adheres tightly to glass, metals, masonry, concrete, and most building materials. Resists attack from sunlight, ozone, water, mild chemicals, and general weathering. Resists temperatures in —30 F to +160 F range. It is available in gray, white, and special colors upon request. Has three times life expectancy of oil-base calking compounds and is compatible with many types of paints, enamels, and lacquers. Sonneborn Bldg. Products, 1700 South Mt. Prospect Rd., Des Plaines, Ill.

On Free Data Card, Circle 112



Model 6773—Hour indicators in aluminum, brass or black; centers in white or aluminum. 13″ or 20″ diameter.

Model 6732—Satin aluminum or brass hour markers, with aluminum or brass centers. 15″ to 24″ diameters.



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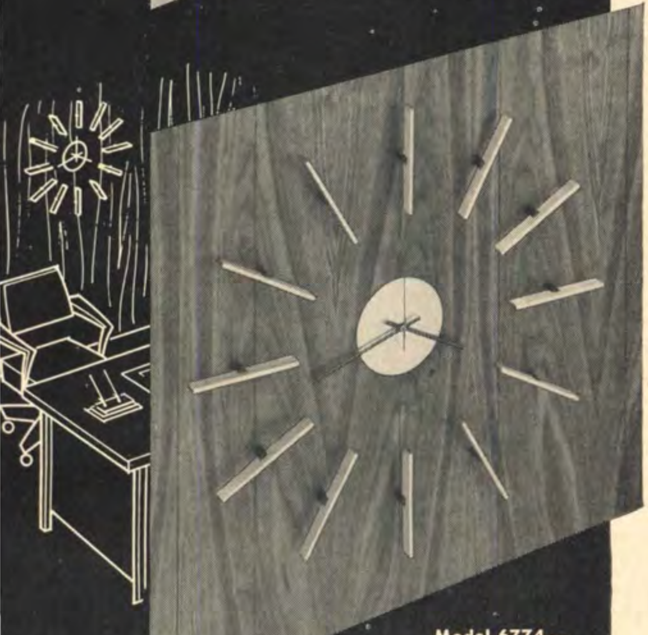
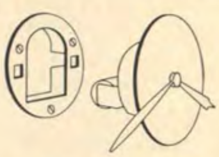


Model 6774—Hour markers in polished chrome or brushed brass, with black posts and hands; brushed chrome or brushed brass centers, 18″ or 26″ diameters.



Model 6720 Battery operated in satin brass, copper, chrome or black finish. 9″ to 12″ diameter.

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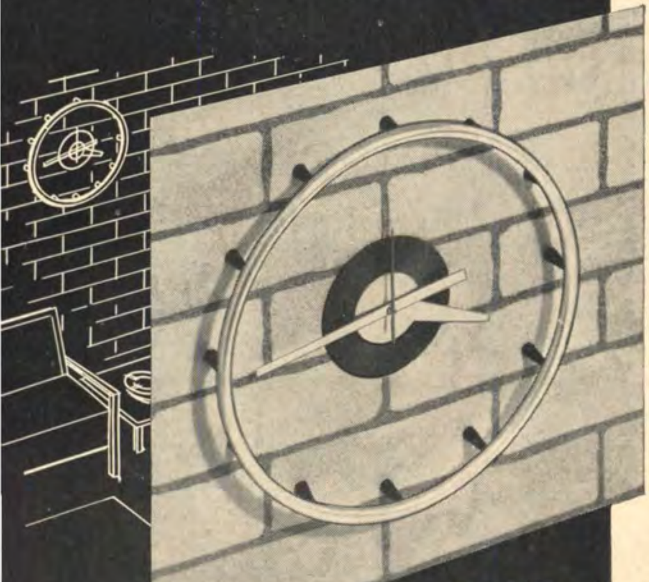


Model 6770 Ring in polished chrome or brass with black post and center disc; chrome or brass hands. 14″ diameter.

For complete information, contact us in Zeeland, Michigan.

HOWARD MILLER CLOCK COMPANY
BUILT-IN DIVISION / ZEELAND, MICHIGAN

Furnishings

Deceptive Bar-Wagon

Sides of bar-wagon pull apart to reveal glass tray above a Formica-lined shelf for bottles. Unit is 20″ deep, 29″ high, and adjusts in length from 35″ to 53″. It is crafted in Denmark from teak, walnut, or rosewood. Selig Mfg. Co., Inc., Leonminster, Mass.

On Free Data Card, Circle 113

High-Back Bucket Chair

High-back bucket chair designed by Nicos Zographos for executive use does not tilt, but has adjustable height mechanism and swivel. Available in fabric or leather. Dimensions: 23¾″ wide, 23½″ deep, and 41″ high. Albano Contract Div., 309 E. 49 St., New York 17, N.Y.

On Free Data Card, Circle 114

Pine Bench

Bench #108 is built from nominal 2′ x 2′ and 2′ x 4′ select #1 Pine. Connections are made with ¼″ diameter bolts exposed and recessed from finish face of each member. Finish is walnut oil stain and linseed oil. It is also available in natural Pine, Oak, and Fawn Oak oiled finishes. Bench measures 22″ wide, 72″ long, and 26½″ high. Design Workshop, 5993 Center Ave., Pittsburgh, Pa.

On Free Data Card, Circle 115

Office Equipment

Electric Drafting Board

By means of electric knob control, "Sinamat" drawing board moves to any height or to any angle desired. Vertical shaft moves freely on ball bearings through 360° and may be locked into any position. Two 115 v 400 w motors supply power. Board is adjustable from 16″ to 31½″ in height. Slope adjustment is 90° from horizontal to vertical. It requires less than five seconds to change to any position. Reed Products Co., Dept. 35, 4438 North 20 St., St. Louis, Mo.

On Free Data Card, Circle 116

Sanitation/Plumbing

Prefab Pumping Station

Prefab pumping stations feature walk-in door, flood-proof hatch, running time meters, local or remote alarm, and water seal system. Although basic capacities range from 50 to 250 gpm, 250 to 750 gpm, and 750 to 1200 gpm, prefab stations have been furnished in capacities as large as 6000 gpm (3000 gpm per pump). Pumps are automatically controlled by air bubbler system. No floats or moving parts are in contact with sewage to corrode or fail. Air compressor keeps system purged against clogging. System provides refrigeration-type dehumidification to keep interior and all electrical gear moisture-free. Oversized ventilator draws fresh air into top of station and discharges stale air from floor. Station is thoroughly ventilated and dry at all times. Zimmer and Francescon, P.O. Box 359, Moline, Ill.

On Free Data Card, Circle 117

Prefab Janitor Station

Prefab "Sani-Prep" janitor station requires only 13.1 sq ft of floor space. It is constructed of stainless steel with exterior door finished in either polished stainless steel or baked-on enamel. Components include floor-level sink for emptying buckets and built-in mop wringer; flexible hose for filling buckets; storage shelves; automatic lighting; personal locked compartment; small tool storage facilities; special holders for mops and brooms. Market Forge Co., Everett, Mass.

On Free Data Card, Circle 118

Special Equipment

Prefab Fireplace

Prefab fireplace, an all-metal unit in corner-opening and conventional front-opening models, is completely packaged installation from hearth to chimney top. No mortar, masonry, or footings are required. Fireplace units are so constructed that they may be placed directly on subflooring and against wood joists and beams with complete safety. Fireplace is installed with triple wall, round flue, and simulated brick chimney top housing that includes protective rain cap and flashing. All parts are fabricated of corrosion-resistant metals. All types of wood paneling and masonry veneer may be used to house firebox and chimney. The Majestic Co., 733 Erie, Huntington, Ind.

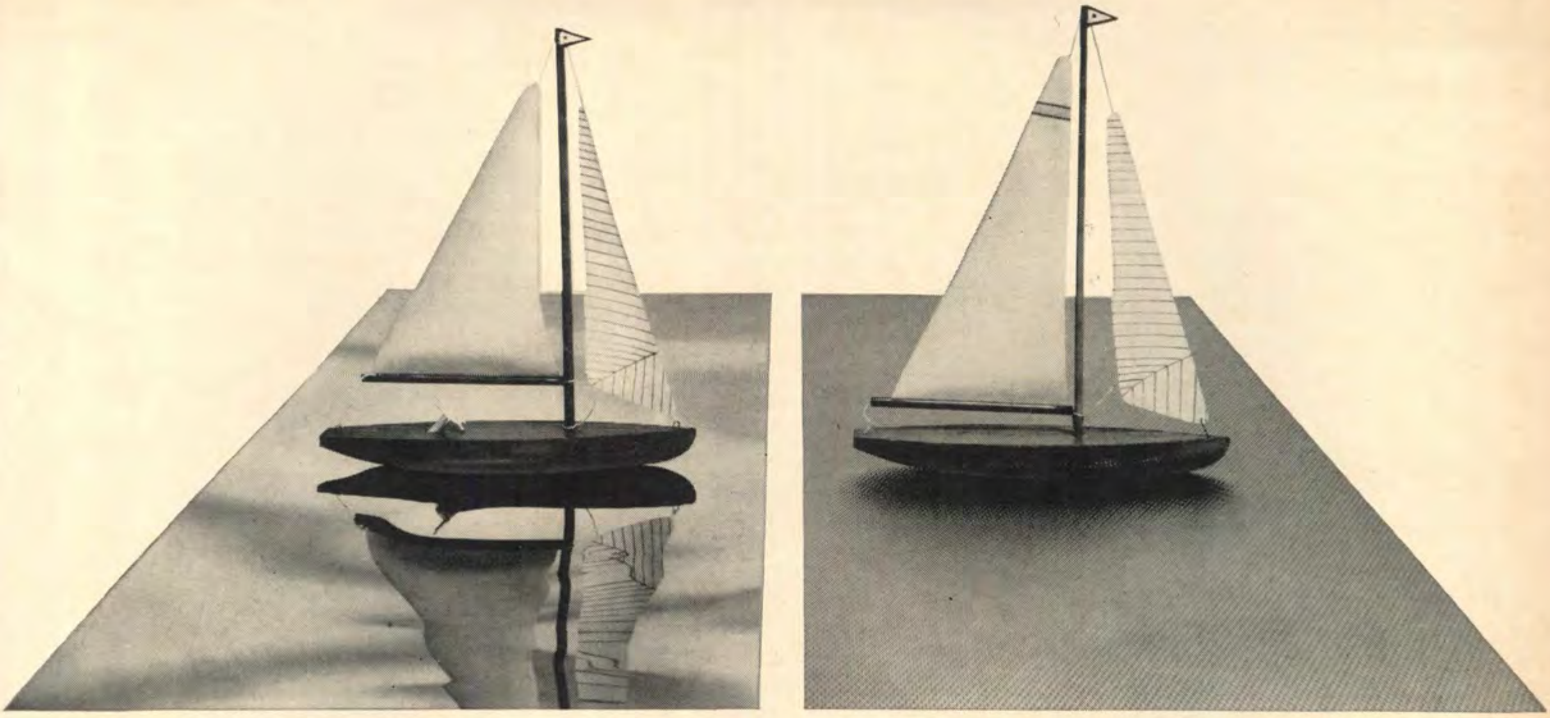
On Free Data Card, Circle 119

Plastic Site Models

Recently introduced concept of machined site reproduction uses low density polyurethane to produce handsome, easy-to-work-with topographical models. Made from single block of polyurethane, wide range of elevations can be made at any scale. Architect submits topo map for price appraisal. Topofoam, 939 Madison Ave., New York, N.Y.

On Free Data Card, Circle 120

Surfacing



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Stainless Rigid-tex Metal Pattern #2-WL provides visual flatness plus cost savings over other metals in the 13-story IBM Building, Gateway Center, Pittsburgh. **Architects:** Curtis & Davis. **Stainless Fabricators:** Limbach Company.

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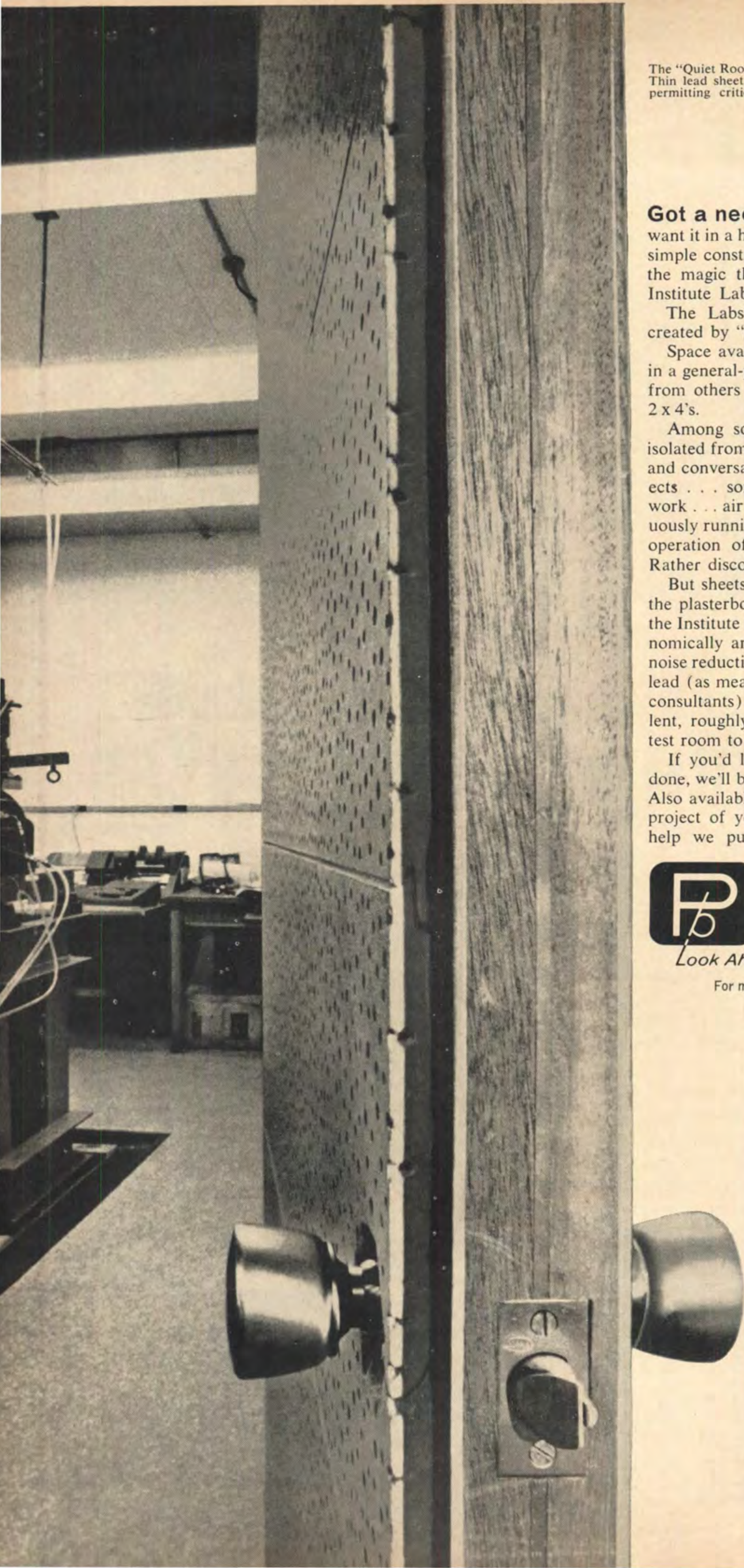
For more information, turn to Reader Service card, circle No. 449



Copper Wall Covering

"Chemetal" sheet copper wall covering consists of copper foil developed by Revere Copper and Brass Inc. Sheet copper is laminated to treated, kraft paper backing. Laminate is then subjected to chemical reagents that create various flow patterns. Any skilled paperhanger can readily apply Chemetal to wood, plaster, paint, metal, and other surfaces by using heavier viscous adhesives employed in applying vinyl type wall coverings. Its surface is protected with several clear, tough coatings. Chemetal resists wear and is cleaned by wiping with damp cloth. It comes in 30″ wide rolls of any specified length up to 30′. Four color patterns are available. Advanced Resin Products, Inc., 132 Water St., S. Norwalk, Conn.

On Free Data Card, Circle 121

Spanish Tiles

Clay tiles in classic Spanish patterns are offered in 6″x6″ and 8″x8″ sizes. They can be used for stair risers, planters, wainscote areas, fountains, kitchens, baths, and other applications. Latco Products, 3371 Glendale Blvd., Los Angeles, Cal.

On Free Data Card, Circle 122

Remember Styrofoam.

For more information, turn to Reader Service card, circle No. 348

Manufacturers' Data

Acoustics

Acoustical Materials

Manual, 86 pages, is entitled "Performance Data of Architectural Acoustical Materials—Bulletin No. XXIV, 1964." Performance data including sound attenuation factors, flame spread classifications, and fire resistance time ratings is given in chart for various products of 13 acoustical material manufacturers. These include Armstrong Cork Co., Baldwin-Ehret-Hill Inc., Celotex Corp., Gustin-Bacon Mfg. Co., Elof Hansson Inc., E. F. Hauserman, Johns-Manville Sales Corp., Kaiser Gypsum Co., Inc., National Gypsum Co., Owens-Corning Fiberglas Corp., Simpson Timber Co., U.S. Gypsum Co., and Wood Conversion Co. Manual received 1964 Certificate of Merit from AIA-PC competition. It is available at 50¢ per copy. Acoustical Materials Assn., 335 East 45th St., New York, N.Y.

Air/Temperature

Heating/Cooling Units

Basic information for complete line of heating and cooling units is given in 8-page catalog. Heating equipment includes warm-air units, gas and oil boilers, electric heat, electronic air filters, and electric and power humidifiers. Cooling equipment includes heat pumps, coil units, condensing units, single package units, and gas and electric units. Worthington Air Conditioning Co., Climatrol Div., P.O. Box 401, Milwaukee, Wis.

On Free Data Card, Circle 200

Roof Ventilators

"Bulletin 610" gives engineering data on roof ventilators. Physical dimensions and rated performances are given for each of five styles. Direct drive, belted, and belt drive models are covered. Aerovent Fan Co., Inc., Piqua, Ohio.

On Free Data Card, Circle 201

Make-Up Air Units

Direct gas-fired make-up air units are presented in 4-page brochure. Unit replaces factory air lost by process exhausts and general ventilation, supplies tempered-filtered fresh air, provides positive pressure in building for efficient exhaust and stack draft, and utilizes cool night air for summer cooling. C. A. Litzler Co., 239 Brook Park Rd., Cleveland, Ohio.

On Free Data Card, Circle 202

Construction

Rating Lumber

Electromechanical stress rating of lumber is nondestructive method of testing to establish allowable unit working stresses of each individual piece. Each piece is graded according to its individual fiber stress and modulus of elasticity without damaging, marring, or impairing strength of board in any way. Ratings are shown for floor joists, roof joists, ceiling joists, and rafters. Method of testing has FHA approval. Operation procedures of testing machine are illustrated and described. Simson Timber Co., 2000 Washington Bldg., Seattle, Wash.

On Free Data Card, Circle 203

Creep/Shrinkage Tests

National Bureau of Standards "Monograph 74" describes series of tests and their results from investigation of mechanical properties of structural-grade lightweight and normal-weight concrete. Comparative values were obtained for compressive creep, drying shrinkage, strengths, and moduli of elasticity for concretes made with 24 lightweight and 5 natural, normal-weight aggregates

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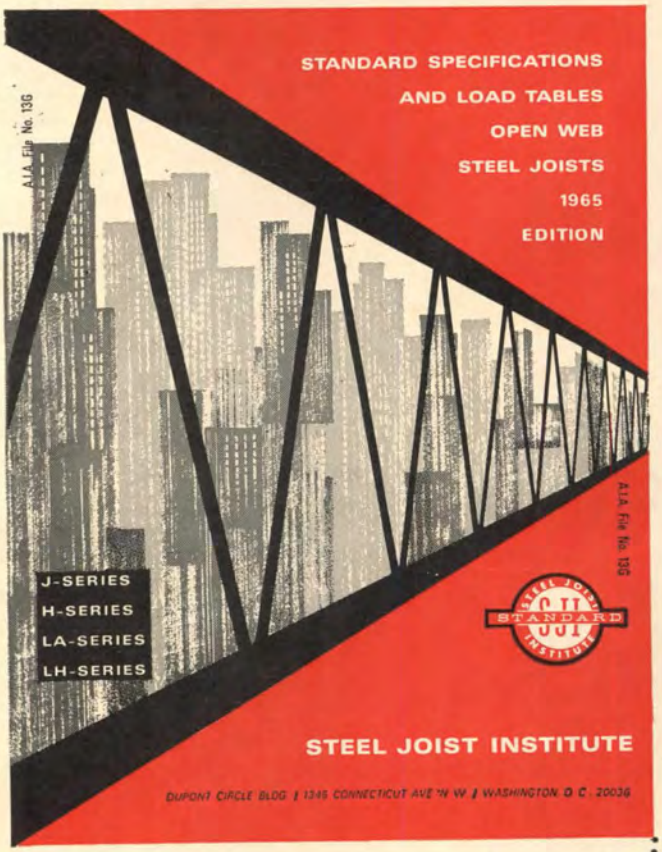

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For more information, turn to Reader Service card, circle No. 455

and having same nominal strength at time specimens were placed under load. Total of 76 different concretes were tested. According to tests, two major factors affecting creep of concrete appear to be ratio of applied stress to the strength at time of loading and aggregate used. Other test results are given. Monograph is available at 30¢ per copy. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.

Masonry Bearing Walls

Series of three booklets discuss structural design, construction techniques, and architectural studies of masonry bearing walls, respectively. Contents of first booklet are Economics of Frame Versus Frameless Buildings, Engineering Load-Bearing Structures, Diaphragm Action, Foundation Analysis, and References. Second booklet contains information on construction techniques, materials, and management. Third booklet illustrates various contemporary buildings that utilize masonry bearing wall construction. Structural Clay Products Institute, 1520 18 St., N.W., Washington, D.C.

On Free Data Card, Circle 204

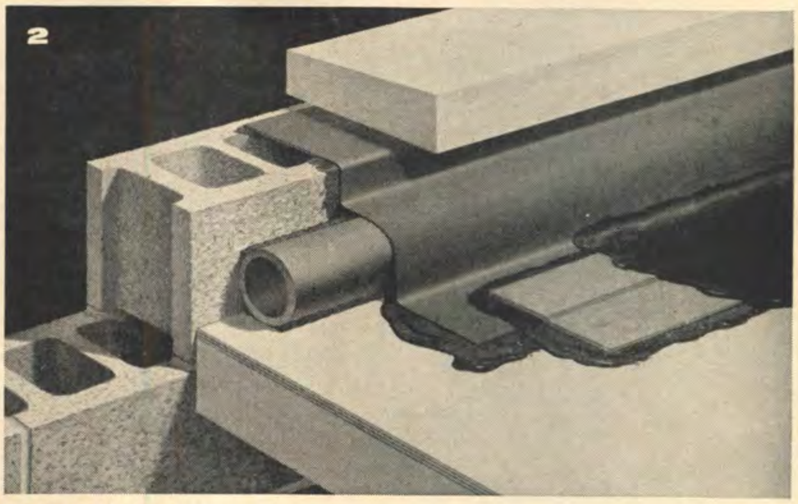
Composite Beam/Slab Floor Systems

Composite beam and slab floor systems are described in 20-page brochure. Laboratory test, conducted this year at Lehigh University, is same as AISC test on identical slab except that permanent "Holorib" forms are utilized instead of standard removable wood

Continued on page 140

BFG FLEXIBLE VINYL FLASHING keeps water where it belongs ...outside

PROBLEM: Failure of composition flashing only three years old, due to movement between deck and parapet. Frequent attempts to patch were unsuccessful. In this photo, coping has already been removed.



SOLUTION:
BFG field service engineers recommended the following procedure:

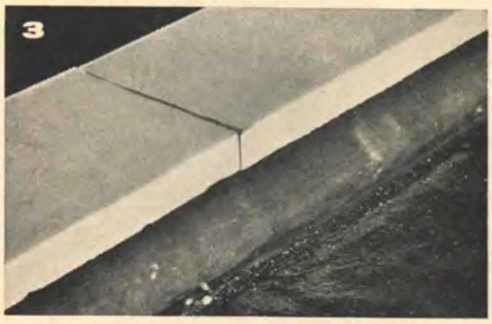
a. Remove existing coping, flashing and cant strip.

b. Place 4" O.D. flexible foam tubing in mastic at wall-roof juncture.

c. Mastic-adhere BFG flashing to parapet, lay dry over foam tubing, adhere to built-up roofing, and strip with felt.

d. Replace coping.

RESULT:
An installation that will remain trouble-free and water-tight because the unadhered loop of flexible flashing is sufficient to accommodate the indicated movement.



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BFG Flashing is a specially compounded, extruded PVC sheet. It is tough, flexible over a wide temperature range and offers excellent weathering properties. By its very nature, it conforms easily to irregular shapes and surfaces—remains watertight where building movement is encountered. It's available in WHITE, too, for use on light colored roofs and other areas where aesthetically desirable.

The same qualities that make BFG Flashing ideal for ordinary, everyday applications become doubly important where the "tough" jobs are concerned. Shown alongside: 1. A specific example of common flashing failure due to movement between deck and parapet. 2. BFG field service engineers' recommendations for solving the problem. 3. The finished installation.

Such technical service and assistance is available to help solve your flashing problems. Just write BFG Building Products Dept. PA-15, The B.F.Goodrich Company, Akron, Ohio 44318.

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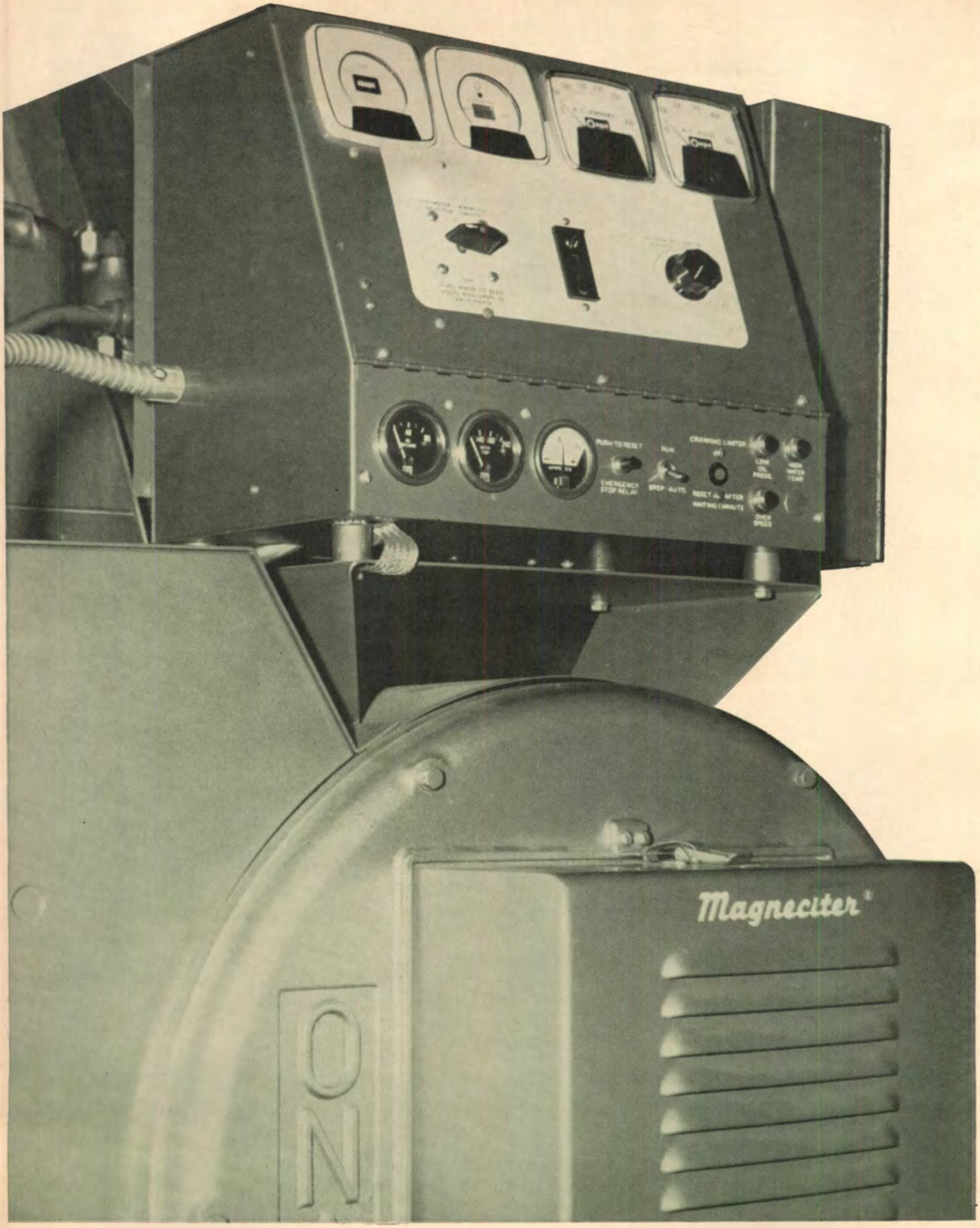
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Continued from page 136

forms. Test proved that standard AISC composite design procedure can be employed for beam design, while taking advantage of greater loadcarrying capacity of Holorib slab. Test data, design examples, specs, and simplified selection tables are included. Composite beam with Holorib forms and field welded shear connectors is shown. Fenestra Inc., P.O., Box 1085, Buffalo, N.Y.

On Free Data Card, Circle 205

Air-Electric Floor

Complete 48-page manual describes floor system with built-in air distribution and electrification called "A-E Floor." Technical design information is divided by sections for structural, mechanical, and electrical engineers. Physical properties, design data, load tables, problem solving details, and suggested specs are included. Manual was recipient of 1964 AIA-PC Certificate of Merit. Granco Steel Products Co., 6506 N. Broadway, St. Louis, Mo.

On Free Data Card, Circle 206

Glass-Fiber Panels

Brochure, 4 pages, presents specs and details on entire translucent glass-fiber panel line. This includes high-light transmission and low-light transmission panels, "Superglazed" flat panels, "Gardlite" panels, decorative panels, continuous roll materials, and accessories. Reichhold Chemicals, Inc., Alsynite Div., 4654 DeSota St., San Diego, Cal.

On Free Data Card, Circle 207

Limestone

File includes several folders on building limestone. Featured is use of limestone in panel form

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without joints. Another folder illustrates limestone altars and fonts for churches. Descriptive data of various types of limestone used, spec sheets, and photos are included. Victor Oolitic Stone Co., P.O. Box 668, Bloomington, Ind.
On Free Data Card, Circle 208

Preassembled House

Manuals No. 1 and 2, which describe UNICOM method of house construction, are condensed into 24-page booklet. It explains and illustrates coordinated modular dimensioning concept of UNICOM system in which each element of building — floors, partitions, walls, and openings—are separated into components for labor and materials savings and faster erection. Component fabrication of UNICOM system is possible on the site or in the shop. National Lumber Assn., Technical Services Div., 1619 Massachusetts Ave., N.W., Washington, D.C.
On Free Data Card, Circle 209

Prefab Panels

Five types of prefab wall panels are described in 8-page folder: (1) Interlocking steel panels having no exposed fasteners. Wall is available in 10 vinyl colors or can be painted any color. Wood grained, vinyl laminated panels are also available. (2) Insulated wall with wood paneling of oak, birch, mahogany, or any other paneling. (3) Insulated wall with wall-board interior that can be painted any color. (4) Insulated wall using variety of materials in wide range of thicknesses as well as variety of surface materials for insulation blanket. (5) Exterior panel without insulation or interior finish is also available in 10 vinyl colors. Girts may be eliminated in sidewalls up to 14′ eave lengths. Exterior panel can be quickly replaced by removing one panel and replacing it with another. Details and specs are given. Stran-Steel Corp., 1202 Fannin Bank Bldg., Houston, Tex.
On Free Data Card, Circle 210

Doors/Windows

Aluminum Windows, Doors, and Curtain Walls

Series of three booklets presents specs for aluminum sliding doors, aluminum windows, and aluminum curtain walls, respectively. First booklet covers short form and master specs, general requirements, windload specs, residential and nonresidential aluminum sliding glass doors. Specs have FHA approval. Second booklet covers specs for residential requirements for double- and single-hung windows for residential type buildings. Other chapters include specs for awning windows, horizontal sliding windows, etc. Also covered are windload specs, design check

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list, and drawings and installation details. Curtain wall booklet contains information on design criteria as loads, deflection, mullions, stresses, expansion and contraction, anchors and attachments, protection against corrosion, etc. Architectural Aluminum Mfg. Assn., 35 Wacker Drive, Chicago, Ill.
On Free Data Card, Circle 211

Door Holder

"MagnaMatic" is electromagnetic door holder that can be installed independently or as part of any fire detector system. Upon interruption of electrical current or power failure, device releases door to close automatically and simultaneously, thereby controlling spread of smoke, fumes, and fire. Spec sheet covers product description, electrical data, and installation procedures. Sargent & Co., 100 Sargent Drive, New Haven, Conn.
On Free Data Card, Circle 212

Gliding Wood Door

Gliding wood door is described in 4-page folder. Wood parts are treated for permanent protection against termites and decay. Anodized aluminum sill track is impervious to stains, rust, and pitting. Thermal barrier in aluminum sill reduces loss of heat to outside and checks condensation on inside of sill. Modular size door panels line up with standard doors in height. Typical details are given. Andersen Corp., Bayport, Minn.
On Free Data Card, Circle 213

Electrical Equipment

Condensed Lighting

Condensed lighting equipment is shown in 52-page booklet. Complete line of outdoor and indoor lighting fixtures includes ratings, sizes, weights, prices, performance features, and illustrations. Equipment covered is incandescent, quartz-iodine, mercury-vapor, and fluorescent units. Accessories such as poles, brackets, adapters, and fittings are also catalogued. Pyle-National Co., Steber Div., 2700

Roosevelt Rd., Broadview, Ill.
On Free Data Card, Circle 214

Chandeliers

Lighting fixtures are presented in 12-page booklet. Featured is circular chandelier with 18 satin glass lights. Outside dimension is 55″ with short arms 42″ in diameter. Color and black and white photos illustrate different styles of fixtures. Price list is included separately. Metropolitan Lighting Fixture Co. Inc., 16 E. 39 St., New York, N.Y.
On Free Data Card, Circle 215

Finishes/Protectors

Foundation Membrane

"Sure-Seal" butyl rubber membrane and lining for foundations is resistant to outdoor exposure, extreme temperature changes, and most chemicals. As water barrier, it is up to 30 times as impenetrable by water as built-up asphalt membranes. Sure-Seal is flexible and nonbrittle to as low as −40 F and up to +350 F. Membrane is available in widths up to 20′ and in standard thicknesses of 1/32″, 1/16″, 3/32″ and 1/8″. Specs, details, and descriptions are given. Carlisle Corp., Carlisle Tire & Rubber Div., Carlisle, Pa.
On Free Data Card, Circle 216

Colors for Concrete

Brochure, 4 pages, describes colors for ready-mixed concrete, "Non-Slip" abrasive grains for concrete, and "True Tone" cement colors for concrete, mortar, stucco, and plaster. Plastic kit, 2″ x 17″ and available upon request, contains colored concrete chips representing 10 shades of color for ready-mixed concrete. Display kit of three grades of

Lighting News ★ ★ ★ ★ ★ ★ ★

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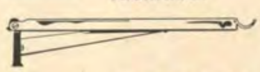

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422 East New York Street
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"Non-Slip" is also available upon request. Brochure illustrates available hues for all three color mixes as well as their uses and applications. Frank D. Davis Co., 3285 E. 26 St., Los Angeles, Cal.
On Free Data Card, Circle 217

Furnishings

Office Furniture

Booklet, 16 pages, reviews "8000" series of office furniture. Arrangements of 8000 series tables and chairs are shown. Model numbers, descriptions, dimensions, and line drawings for every item as well as photos are given. Listing of baked-on enamel finishes, upholstery materials, and top colors are included. Columbia/SPS, Standard Pressed Steel Co., Box 588, Jenkintown, Pa.
On Free Data Card, Circle 218

Table System

Table system that enables designer to achieve horizontal surfaces at any height is described. Leg units can be used in any quantity on any piece of equipment from stool or bench to a desk, work surface, or large conference table. Shown is 16 sq ft of heavy 1½" table top with ¼" solid walnut edge banding. Table is supported on 1¼" sq in. legs. Price list is included. Dick Stambaugh Inc., 513 N. Main St., Ada, Ohio.
On Free Data Card, Circle 219

Insulation

Formulating U Factors

"Technical Sheet No. 7" determines amount of insulation needed to reach specific U factor when other structural and finish wall materials are known. By adding together resistance factors ("R" value) of materials selected and dividing this total into reciprocal of 1, U factor can be determined. Materials include building board, building paper, flooring materials, insulating materials, masonry materials, roofing materials, siding materials, structural woods, metals, various concretes, air, and stucco and gunite. Holland Plastics Co., Gilman, Iowa.

On Free Data Card, Circle 220

Office Equipment

Templates

Size, scale, description, uses, and price for each of 40 different drafting templates and sets are given in 16-page "Catalog No. 64." In addition to circle, ellipses, and alphabets, templates include symbols for building plans, four types of windows, electronics, isometrics, and mechanical fasteners. Timely Products Co., Box 146, Baltimore, Ohio.

On Free Data Card, Circle 221

Special Equipment

Theater Equipment

Brochure describes theater equipment designed by Edgar Lustig. Among types of equipment are low voltage switching manual dimmer boards, magnetic amplifier control boards, 5 and 10 scene preset consoles with selector submastering, presetting silicon dimmer system, movable automatic and foolproof motorized grid system, packaged stage lift system, remote control stage platform system. Design and engineering services are offered to architects on consulting basis. Orientation of brochure is toward conventional proscenium theater. Theater Technology Inc., 5826 S. Broadway, St. Louis, Mo.

On Free Data Card, Circle 222

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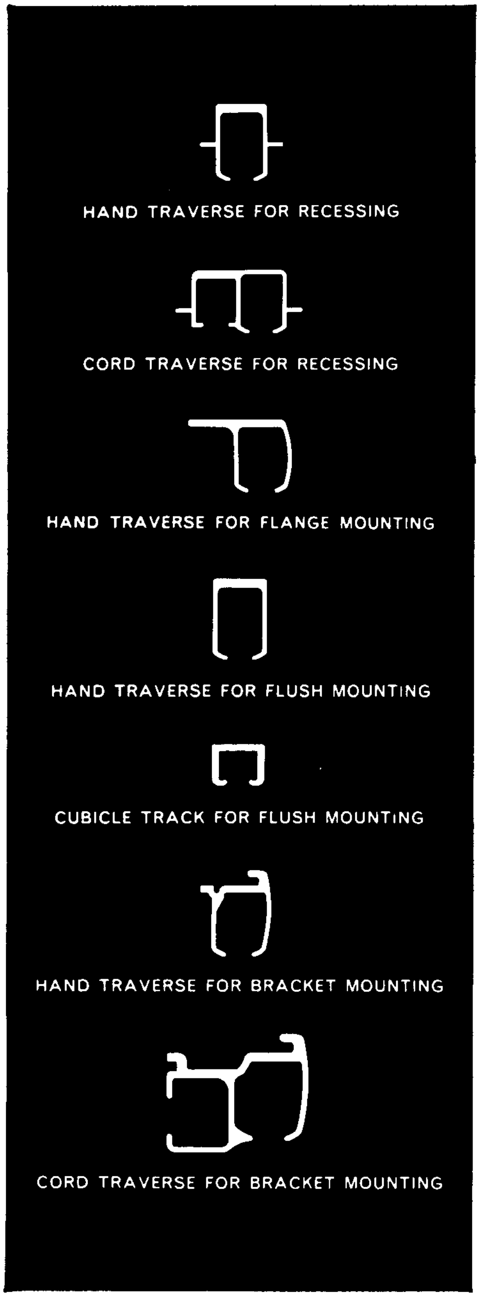


United Airlines Building, O'Hare International Airport

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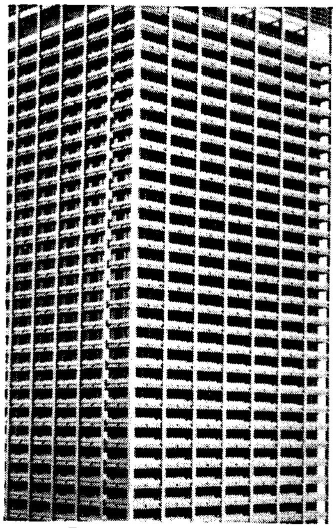
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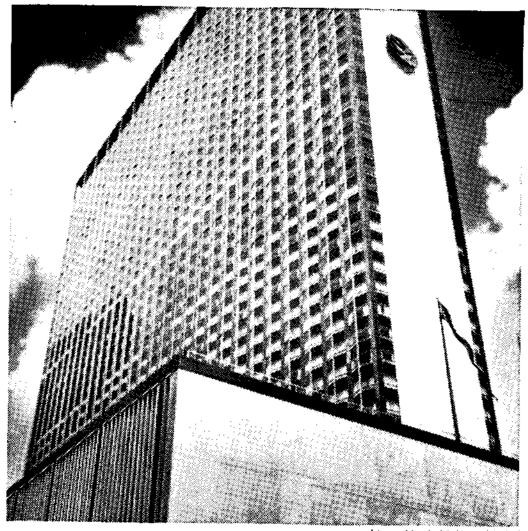
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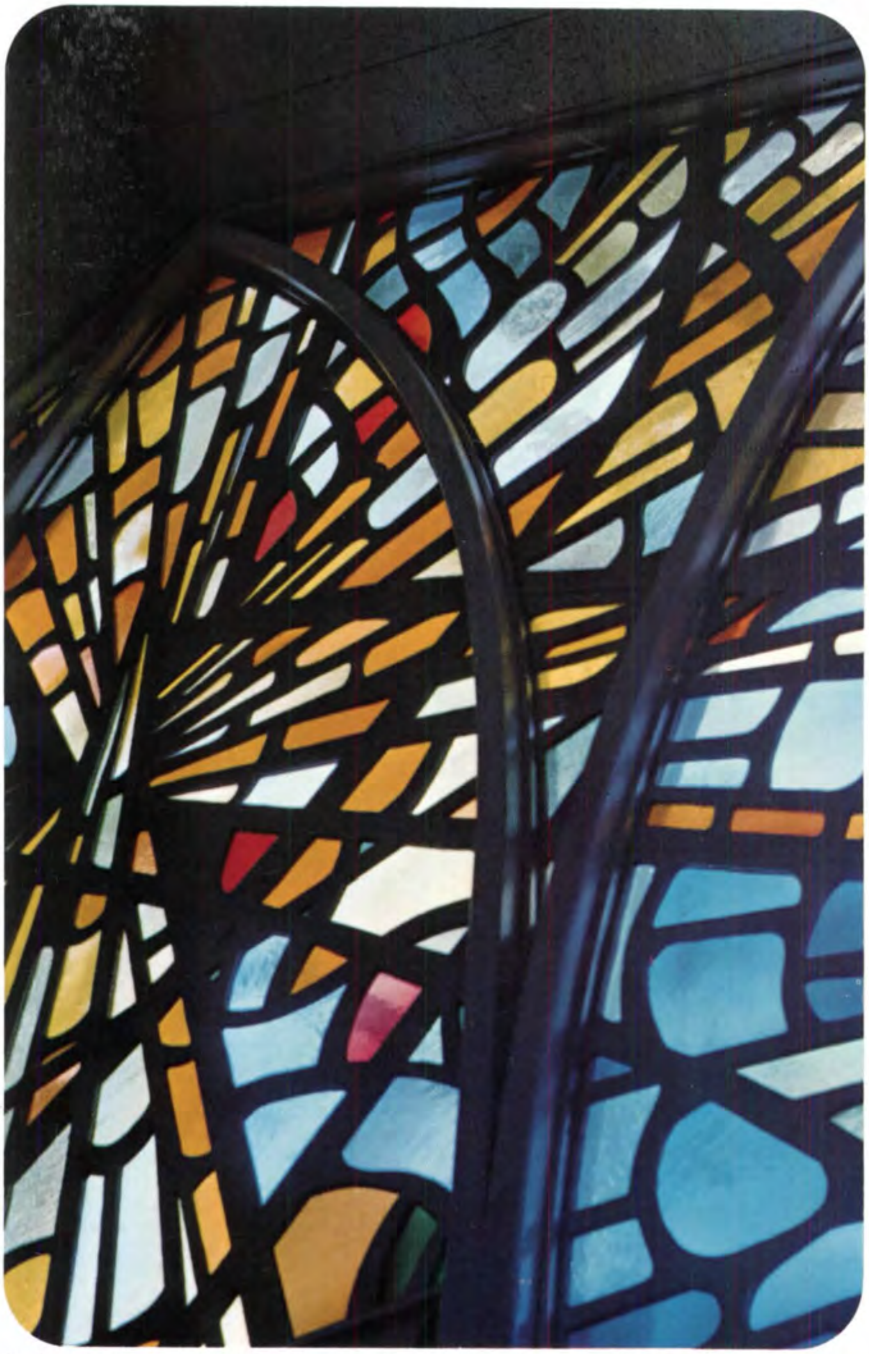

St. Benedict's Roman Catholic Church, Geistown, Pa. / Pastor: Reverend Gilbert C. Fremont / Architect: Nicholas J. Fiore AIA / Stained Glass Windows: Sister Mary Benedicta R.S.M. (Mount Aloysius Jr. College, Cresson, Pa.)/Steel Fabricator: Sender Ornamental Iron Works, Johnstown, Pa.

What modern architects know about Gothic architecture that Sir Christopher Wren never dreamed of.

In Christopher Wren's day, strength required bulk. Nowadays, a variety of steel shapes has changed all of that. One of the most versatile is hollow structural tubing, so attractive it is often left exposed, so strong it resists bending stresses in several directions. Used as posts, beams, columns, rafters, and mullions, hollow structurals can also double as conduit and drain housing.

Nicholas J. Fiore (AIA), of Altoona, Pa., has used hollow structurals for years. Probably his most striking application is in St. Benedict's Church in Geistown, Pa. This is the largest church in the Altoona-Johnstown Diocese, a column-free edifice highlighted by a neo-Gothic narthex, a bell tower, and a stained glass front—all framed in hollow structurals.

Fiore used hollow structurals at the front narthex because it was the best way to support the roof with lace-like traceries. In the bell tower, the tubing not only gives trellis-like form, but functions as wire conduits for the bell and P. A. systems. Exposed hollow structurals for mullions framing the stained glass windows help support the vestibule roof, also carry wiring. Besides obvious aesthetic advantages, Fiore designed with hollow structurals for economy. On the tower alone he halved the cost of an alternate brick design. This helped him bring in the over-all bid $50,000 lower.

USS Hollow Structural Tubing offers advantages not found in other structural tubing. Corners are sharper. It is manufactured to the closest underweight tolerance in the industry, minus 3½%. Its size range is the widest available, going up to 10" x 10" squares and now to 12" x 6" rectangles. Wall thicknesses range up to ⅝" in some sizes.

For more information see our catalog in Sweet's Architectural File. (Also, a new 22-minute movie, "The Shape of Things to Come," is now available upon request.) Write United States Steel, Room 7650, 525 William Penn Place, Pittsburgh, Pa. 15230.

United States Steel USS

TRADEMARK

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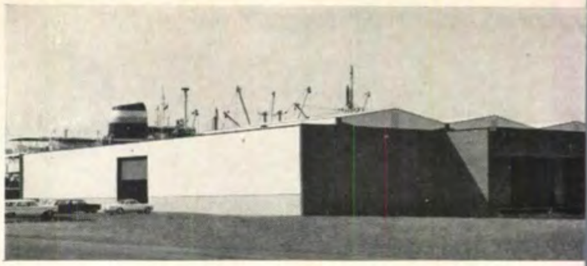
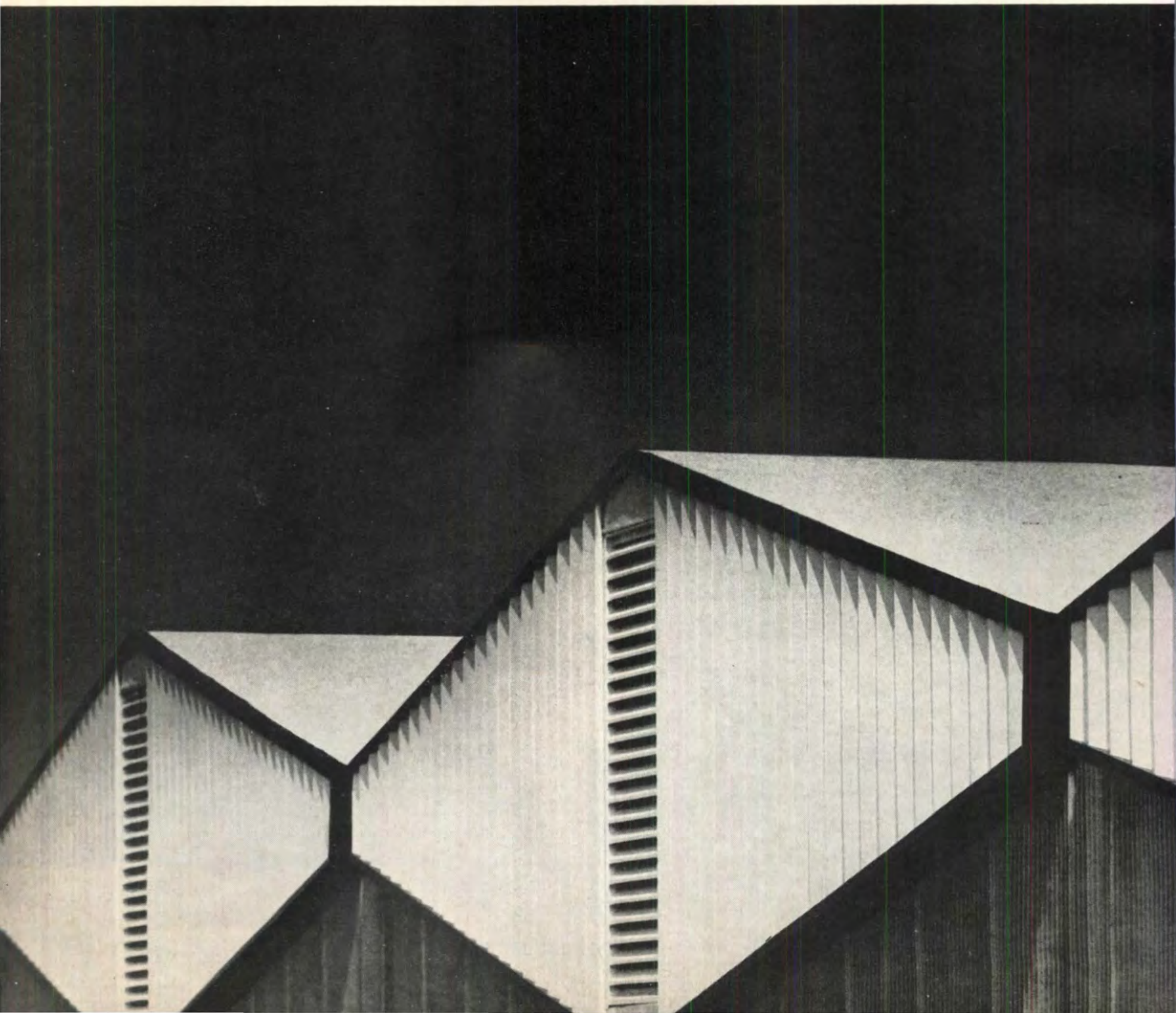
Siding on this lake-front building has a remarkable new finish that outperforms baked enamel 3 to 4 times: Du Pont TEDLAR®





Despite its location on the shore of Lake Erie, exposed to extremes of weather, the siding on this new Transit Building will stay fresh and new-looking for many years. It's surfaced with a new and amazingly tough finish: **TEDLAR*** **PVF** film.

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TEDLAR proved itself during construction of this building when strong winds spilled a bucket of tar over panels surfaced with **TEDLAR** as well as some painted parts stacked on the site. Workmen were unable to remove the tar from the painted surfaces, yet the **TEDLAR** was easily cleaned and restored to original appearance.

The metal building panels, surfaced with **TEDLAR**, are made and erected by Elwin G. Smith Co. More and more architects are specifying **TEDLAR** as the finish on roofing and siding. Du Pont Film Dept., Box 104C, Wilmington, Delaware 19898.

Transit Building, Department of Port Authority, Cleveland, Ohio
Architect: Alexander A. Papesh, Cleveland, Ohio
Engineer: Osborn Engineering Co., Cleveland, Ohio
Contractor: Geo. A. Rutherford, Inc., Cleveland, Ohio

*Du Pont registered trademark for its polyvinyl fluoride film.

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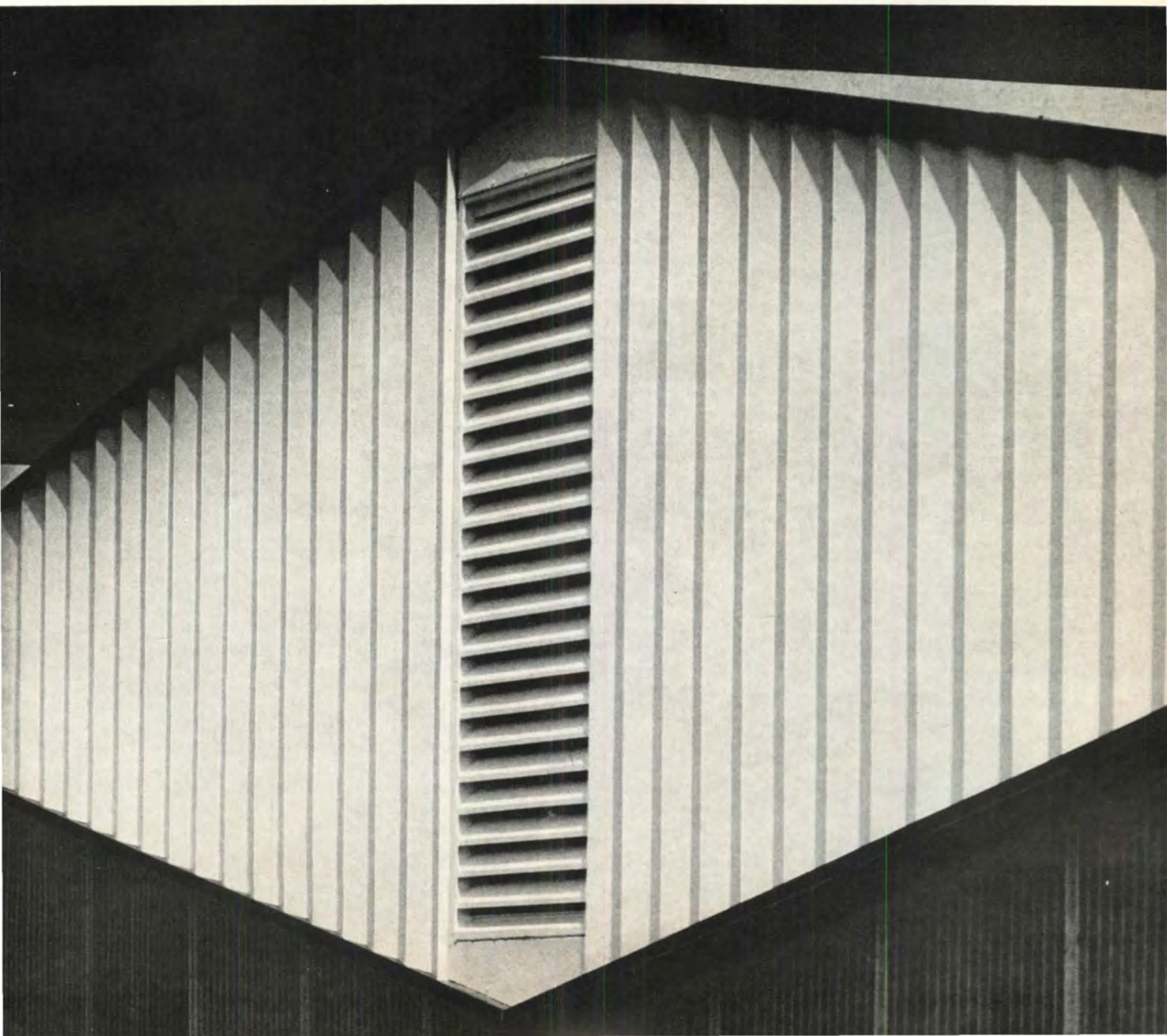

CREDITS:—Architect: Fred C. Sternberg, St. Louis, Missouri; General Contractor: Geo. L. Cousins Contracting Company, St. Louis, Missouri; Terrazzo by: J. Pellarin & Company, St. Louis, Missouri

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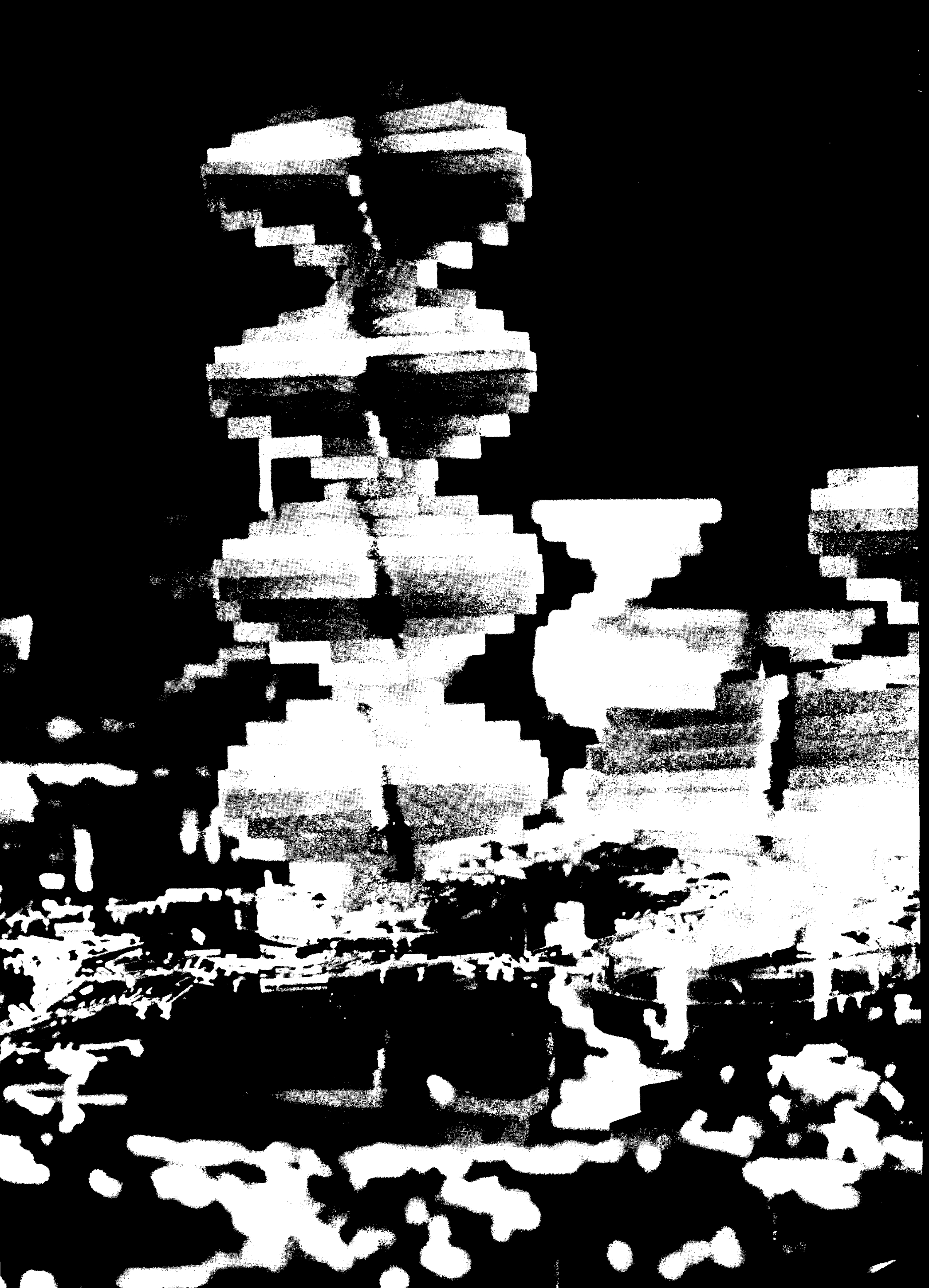


EDITORIAL

Ideas always flow in cycles and we are back, it seems, at a period of re-awakened interest in the possibilities offered by prefabrication. Our theme in this issue is that industrialization in the building industry—the preassembly of large components, even whole structures—is inevitable.

The early modernists were, of course, fascinated with prefabrication. Some even staked their money on it, as the whole Bauhaus group did when it financed a prefabricated house system and promptly lost its investment. But in those days, in the 20's and 30's, prefabrication and the concomitant mechanization of the design process was hailed as an illustrious and sacred goal. It was an age when technology was looked upon as a god of salvation who would relieve the suffering of mankind.

Today we are wiser and we know that machines, by solving some problems, only create others. But we also know that the world cannot stand still. Our job, we feel, is to try and shape what inevitably has to come to our liking—to make the new worlds, as they keep coming along, more bearable than they would be otherwise. We are no longer starry-eyed about the future, for it is not likely that it will be better than the best of the past, but we realize that the present methods of building design and construction are inadequate for existing and future conditions; we know that a change must be made.

For creative architects to be mere assemblers of various erector sets is not a pleasant prospect. A true work of art must be designed down to the last detail in order to be complete. Why, then, do we look favorably on the concept of fabricated buildings?

First of all, we doubt that there are enough truly creative architects who can design systems that are superior to what prefabrication could produce. Secondly, there will not be enough architects of any description who could properly design all the details of the fantastic volume of buildings that will be needed in the future. And thirdly, prefabrication might be the solution to the problems created by stylistic incoherence in our environment, because the basic bones of our cities, all the "anonymous" elements, could at last have a unity that is not achievable when individual architects constantly strive to outdo each other, although the few "foreground" buildings each community needs could still be "custom-made" by the truly gifted masters.

On the following pages, the discussion on future forms of urban environments was written by Associate Editor Ellen Perry. It was a difficult task. I think that her presentation offers much food for thought and is well worth reading. An equally difficult task faced Technical Editor Burton Holmes who, besides co-ordinating the whole issue, also had the assignment of collecting latest developments in preassembly within the U.S. The problem he had was that many industries were feverishly working on prefabrication systems, but were not willing to talk about them, and even less willing to release the information. This seems to be somewhat reminiscent of the auto-makers who are holding under wraps many new systems of transportation they have developed because they do not want to kill the goose so long as she lays golden eggs.

But, after many years, the stainless steel blade finally *is* on the market. And someday, somebody will break wide open the prefabricated buildings market. When that day comes, architects must be ready for it. ■

Jan C Rowan

AESTHETICS AND TECHNOLOGY

THE FUTURE OF URBAN

Twenty years ago, all available or conceivable technology was being directed, from every side, toward the war. Today, much of our applied science is being focused on outer space—getting to the moon (and beyond), staying there, and presumably getting back. But what are we building here on earth? And what will we have here in another 20 years, in 1984? George Orwell had his own vision of 1984, as a time of man's ultimate dehumanization, a time when the qualities and values of human life had been so utterly distorted or destroyed that without resistance, even without consciousness, man was soon in full cooperation with the forces that were destroying him.

There are many people today who would agree with Orwell that we are fast heading in this direction, who would say that our world in general and our physical world in particular is being destroyed more catastrophically than as if by war, and who would put the blame for it all on the increasing importance of technology.

Undoubtedly, one of the major forces in the world today is technology. It is both initial cause and further effect of a fast-growing industrialization, a fast-growing population, and a fast-growing urbanization. And one of the by-products of this world is that architecture is coming to be considered just another product, able to be produced almost full-blown by the same processes that now make other things for human use. At the least, buildings will require only final assembly at the site; at the most, there will be machines capable of "laying buildings like eggs," as one visionary, William Katavolos, puts it. Aldo van Eyck, member of the questing Team 10 that developed from CIAM, would seem to be voicing these ideas when he says, "After all, people buy clothes and shoes the right size and know when the fit feels good! It's time we invent the built thing that fits them—us."

But where does this leave the practice of architecture as we know it? Surely not where it has been, and almost everyone involved in building knows this except the architect. Being for the most part idealists and optimists, architects often choose to avoid being realists. Reaction to the growing industrialization of building is illustrative. Some architects are letting out a howl of protest, warning that mechanization in any form is inimical or even disastrous to human values, and that we are already at the dawn of doomsday, what with design consisting of little more than the judicious combination of items selected from catalogues. To make a more "positive" protest, these architects concentrate all the more devotedly on each building as a single work of art, trying to give it all the excellence that consummate craftsmanship can achieve.

This protest has a certain validity, in a certain context, but it does not rise to the problems and potentials of the latter-day 20th Century. By not taking a good solid look at realities, the profession is in effect putting its collective head in the sand, ostrich-fashion. Other animals can survive by hiding, or by feigning death, or by screeching frightfully at the attacker, but man cannot afford to fight his crucial battles this way. In particular, the architect cannot afford to pass up a creative role in the new physical world that is willy-nilly rising around him.

To catch up to the 20th Century, the architect must accept the realities of the world today; he must understand the new building techniques and seek to adapt his talents to the new tools; he must redefine his professional role so that the job being undertaken is actually the vast job that is needed (not

OF PREASSEMBLY

ENVIRONMENT

just the gem of a job that he might like to do). This involves a willingness to see that industrialization, its processes and products, is neither panacea nor poison, and that the architect can cooperate with it without selling his soul—in fact, must cooperate in order to prevent the world from becoming a soulless wasteland.

One of the first necessities, then, is to accept certain conditions and go on from there. Appearing in the IUA catalogue for 1961 is this statement by Peter Smithson: "What, for example, is the good of neat prefabricated metal bungalows sitting on little plots of ground in a layout pattern we all know to be obsolete and which collectively looks dreadful? Is there no feed-in from urban theory, or feed-back from fabrication technology (which is in many cases highly advanced and elegant as in the United States and France) which might suggest new modes of urban organization, new sorts of buildings? Thus for the architect the question of the industrialization of building is still a question of what to fabricate, not how to fabricate it."

But if our concern is directed toward the "what" and not the "how" of prefabrication, we must then question the viability of the forms and spaces that grew from an earlier technology. Does the uniqueness and unity of an Umbrian hill town or a Greek island village have any validity for our own time?

The future great towns obviously cannot have the handcrafted idiosyncrasies of a group of mud-huts (facing page). (For that matter, most of the present-day building trades even in the highly industrialized nations are out of date.) But can we accept the new processes, and yet avoid the deadened, leavened, endlessly repetitive environment that is being predicted by the conservatives? This environment is also being seriously proposed by forward-looking thinkers; Reginald Malcolmson based his Metro-Linear in 1956 on the linear quality of contemporary transportation carried to its logical extreme (above). But to many, his vision of rigidly disposed elements is one in which individual man has become mass man; it is the very antithesis of a humanistic architecture.

Give a man a number and he ceases to exist as a man. There must be a way to give a man his place in the new environment that at the most will enhance and enrich him as a man; at the least, not diminish him. And there must be a way for the architect to take part (and an important part) in creating this new environment. If he doesn't take the responsibility, there are many others who will (product designers, manufacturers, packagers, and merchandisers of all sorts). Architects already have precious little responsibility over what makes up the total environment; and as building becomes more industrialized, there will be increasingly more people expecting to have a finger in the pie.

Fortunately, there are some architects aware of 20th-Century actualities and potentialities. Their thinking is frequently far in advance of what the world can now accept, but the world moves fast, and today's vision may well be tomorrow's reality. On the next pages, we present some of these visions of the future urban environment, visions based either specifically on the industrialized process or more generally on the new speeds and scale of life. Later in this issue, we present a report on the accelerating movement toward fully industrialized building in Western Europe, and a review of developments in the U.S. indicative of the trends toward industrialization of building. The year 1984 holds both a warning and a challenge for us.

Urban design, for KENZO TANGE, must seek to reconcile the discrepancy between the "mass-human" scale of technology and the scale of man.

"Architects and designers are the only people who stand in the middle ground between technology and humanity," Kenzo Tange has said, "and it is therefore essential that with the advance of science they manifest more and more creativeness." In this speech at the World Design Conference in Tokyo in 1960, he also outlined what he considers one of the growing problems of our age—scale. Our cities are filled with "structures scaled to the size of man," dating from the 19th and early 20th Centuries, but there is also the "superhuman scale created by technology," the "mass-human scale" of giant transportation routes. Much of Tange's thinking about cities is based on the desire to reconcile these two scales in both a functional and a visual sense.

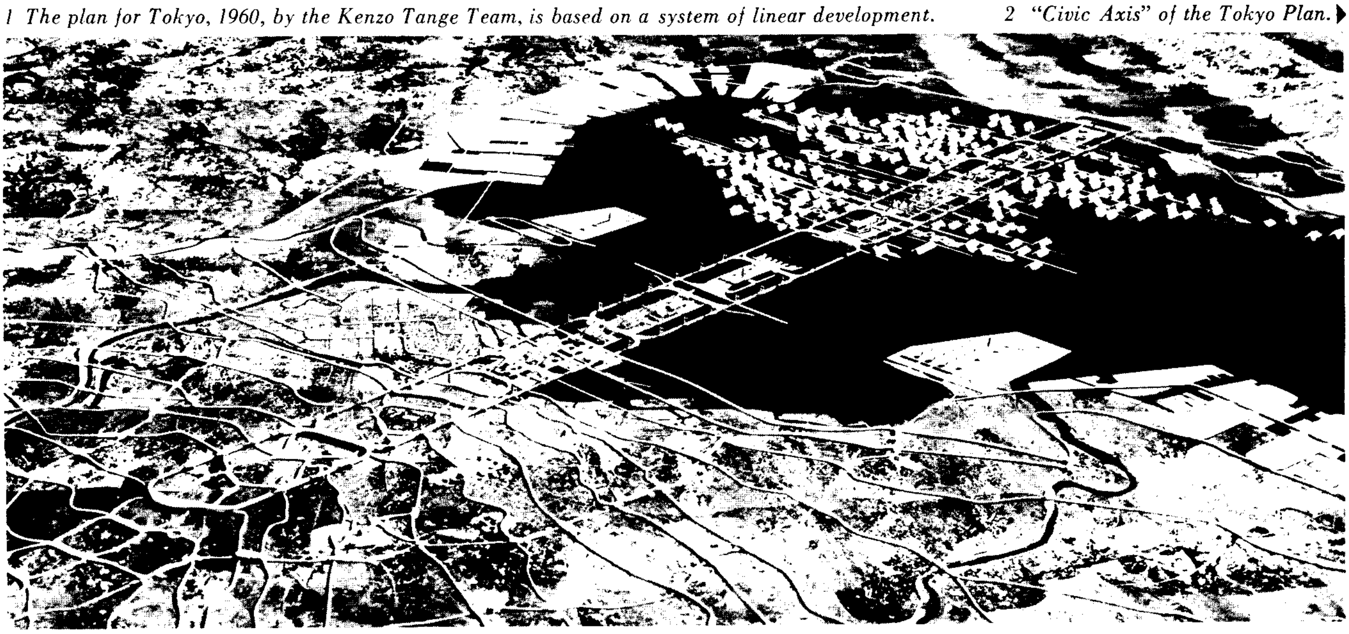
He sees another pair of "incompatibles" operating in the mechanism of change. There are "short-lived items" lasting fewer and fewer years before they need replacement; and there are increasingly larger items, tending "to decide the over-all system of the age," and lasting increasingly longer periods. Dwellings are among the short-lived items; vast engineering constructions are among the long-lasting. Tange believes that these two trends—toward shorter cycles and toward longer ones—are each necessary, just as "any organism is composed of elements that change and elements that do not change; the cells of the body renew themselves but the body itself remains stable."

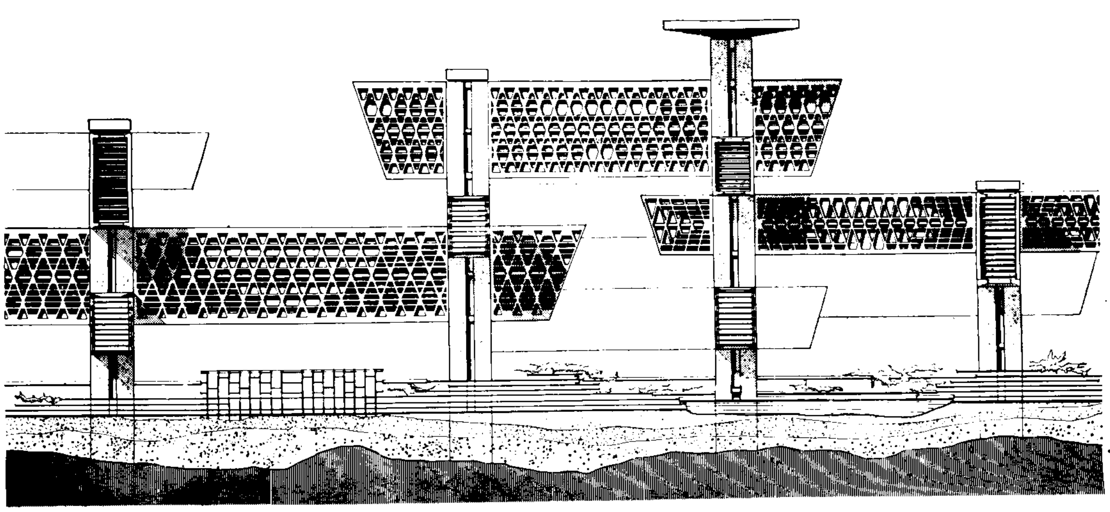
A Plan for Tokyo, proposed by the Kenzo Tange Team in 1960, exemplifies these ideas. To save the great pivotal cities—Tokyo in particular—from being choked by the congestion of their centralized structure, Tange proposes a new urban structure, one that organically unifies urban transportation and urban architecture. For the open organization and open society of the great metropolis, only an open urban structure is appropriate. Instead of a civic center, therefore, Tange starts with a civic axis—a linear system not a radial one—which has further streets branching off perpendicular to it **(1)**. Office buildings are suspended as needed from vertical service cores **(2, 3)**. Triangular structures (built over water or on reclaimed land) contain various neighborhood facilities and housing that is constructed to an individual's taste **(2, 4)**.

The *Community for 25,000* was a fifth-year design problem at MIT, in 1959, with Tange as visiting critic. Here, too (*next page*), architecture becomes a "long-cycle" structure—within the huge triangular structure, an individual builds his "short-cycle" home **(5)**. The individual can thus find an identification at the smallest level of the project and yet there is a comprehensible unity of the whole. Furthermore, the superhuman scale of the highway is not denied, but is fully integrated with the architectural form. Tange's one reservation about this example of "man-made nature" is that it did not develop to the point of providing for urban growth and development (the major structure does not have the "same possibility for growth as a tree trunk"). Students involved in this proposal for Boston Bay were George Pillorge, Edward Haladay, Ted Niederman, and Gustave Solomons, Jr.

1 The plan for Tokyo, 1960, by the Kenzo Tange Team, is based on a system of linear development.

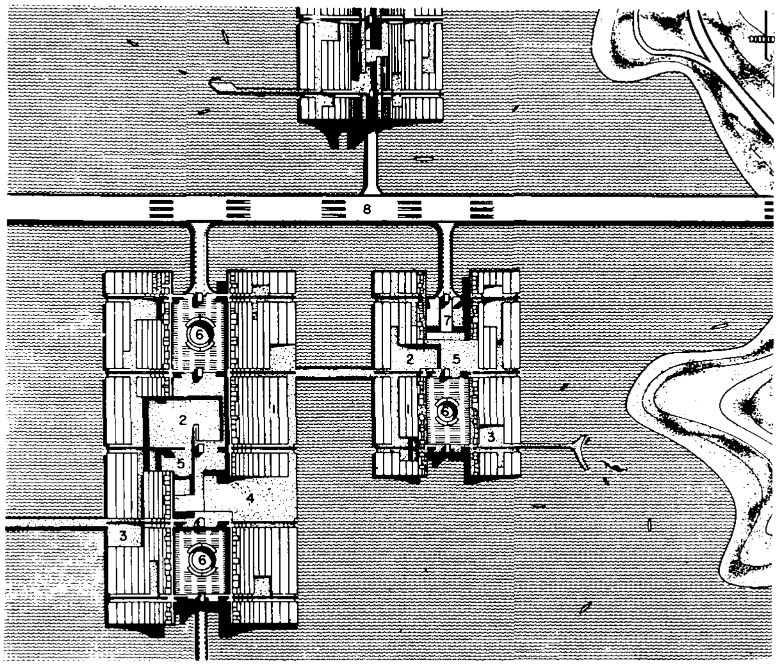
2 "Civic Axis" of the Tokyo Plan. ▶

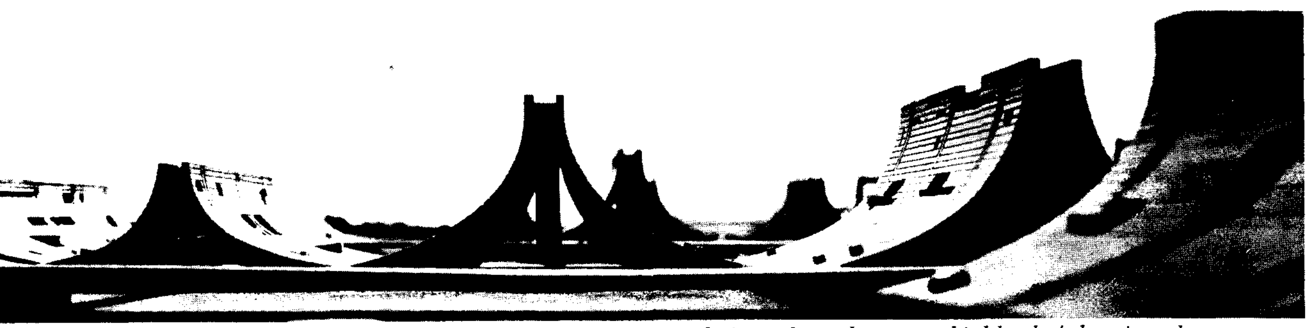




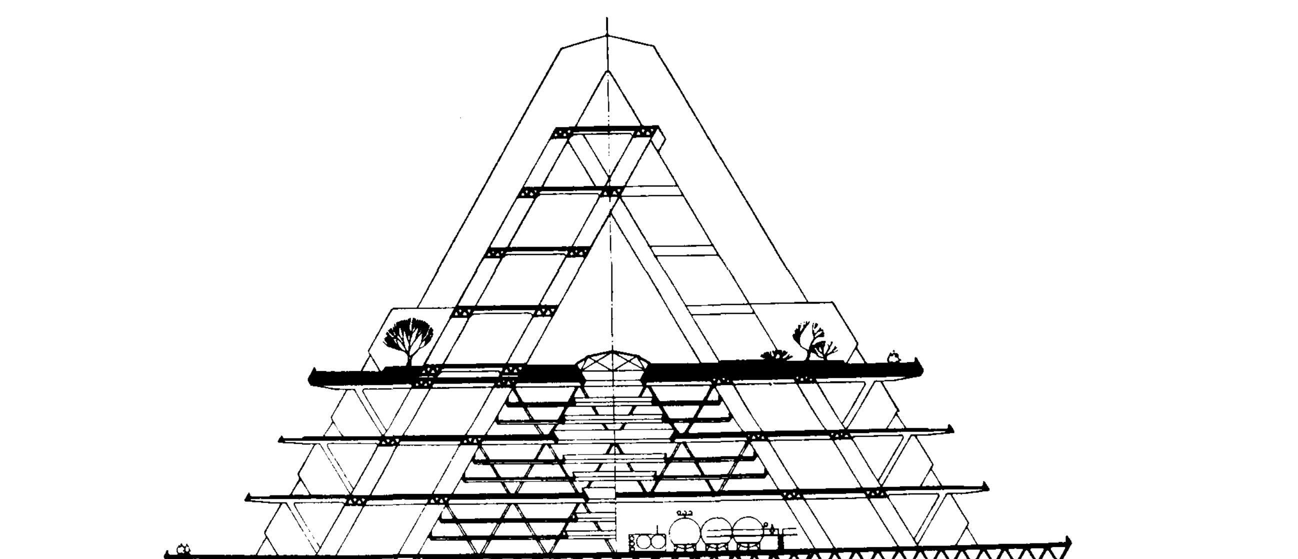
3 Tokyo offices combine core idea with pilotis.

I-RESIDENTIAL SPACE, 2-PUBLIC SQUARE, 3-KINDERGARTEN, 4-SCHOOL
5-SHOPPING CENTER, 6-PARKING, 7-MONORAIL STATION, 8-HIGHWAY

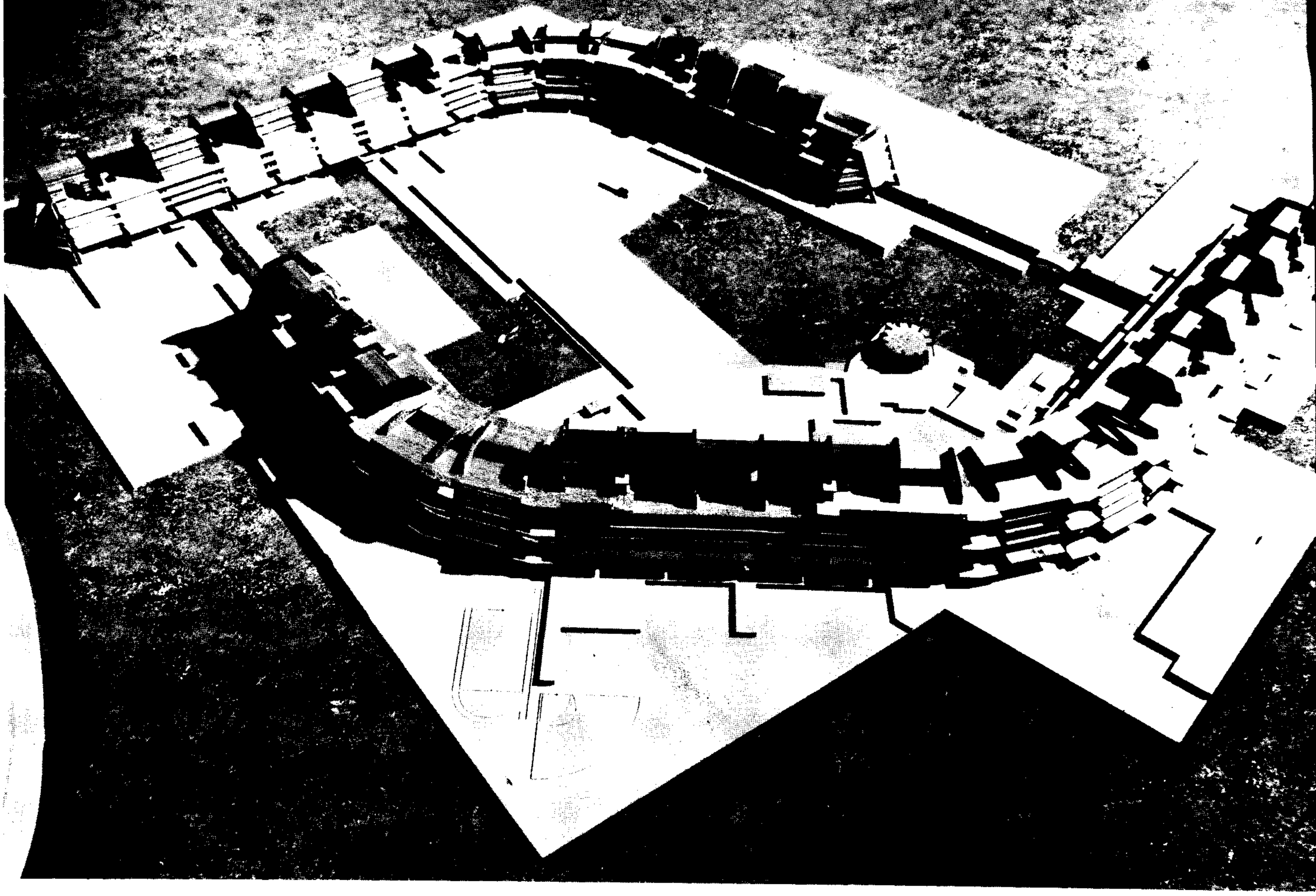




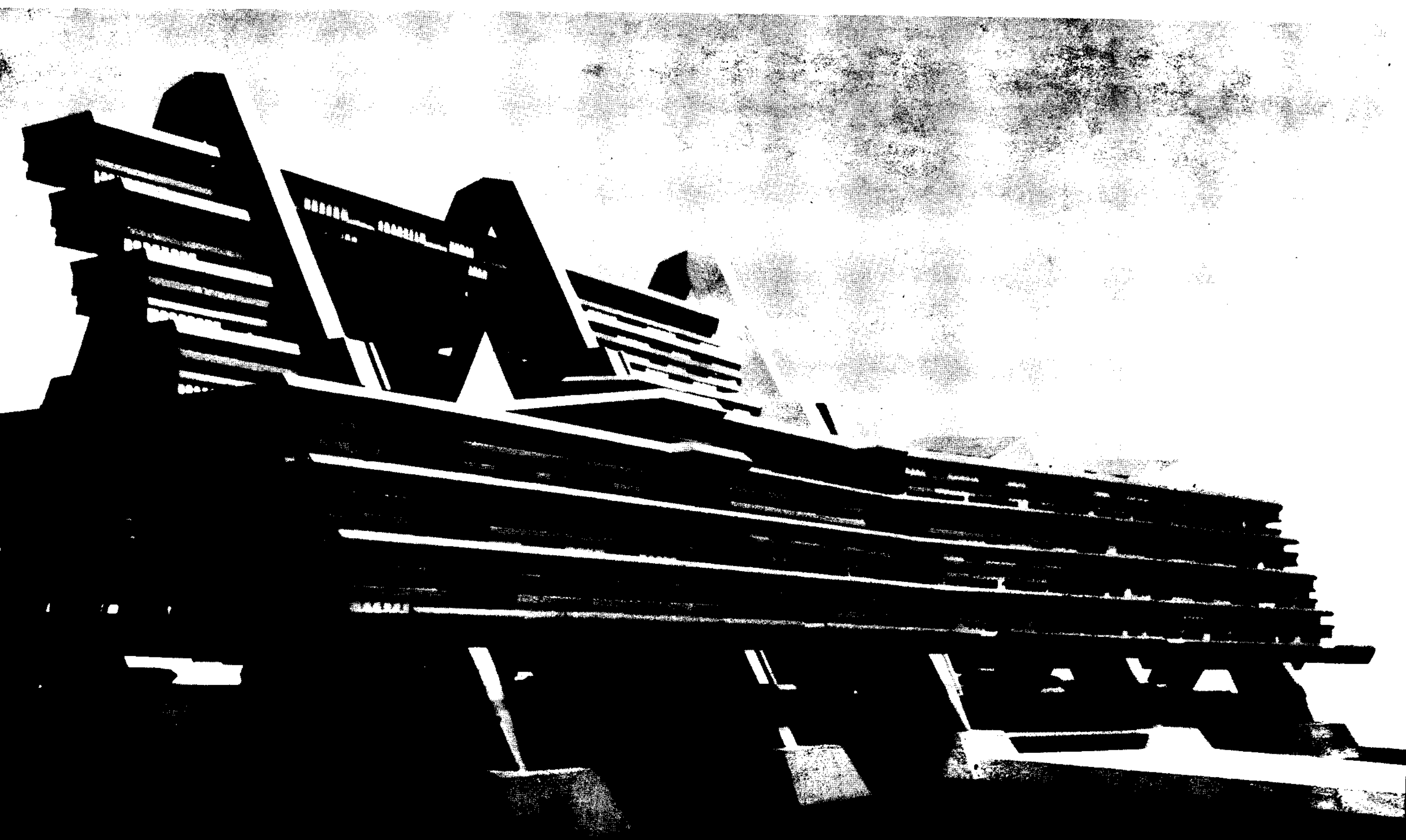
4 Housing for Tokyo is individually built on platforms located at every third level of the triangular structures.



6 Section of MIT Community for 25,000.



5 *An MIT project, a Community for 25,000, also has a huge triangular structure into which individual units are placed.*



The METABOLISM group of Japan offers a series of proposals for an environment that will correspond to the vital processes of life itself.

It is no coincidence that a number of interesting proposals come from Japan. A densely populated group of islands, Japan faces a growing urban crisis; Tokyo is already one of the world's super-*cities*.

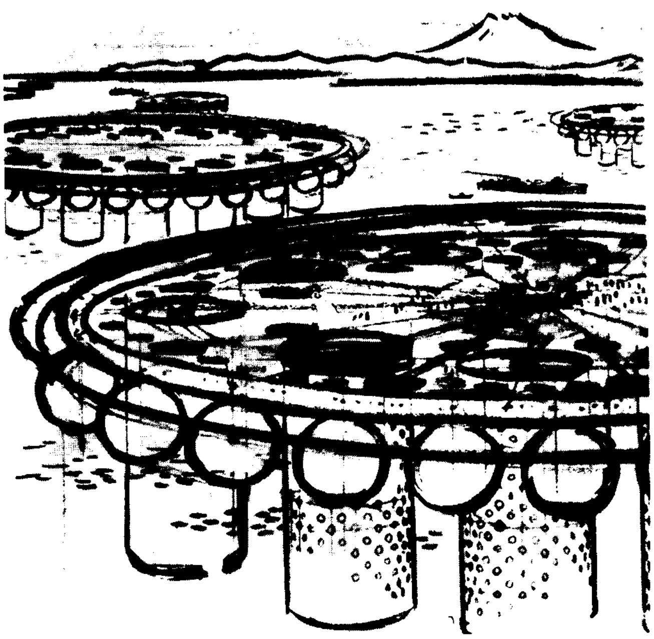
The Metabolism group, recently formed in Japan, is concerned with creating a human environment that will correspond to the vital process of human life, to the growth and decay cycle of the metabolic process. Their vision goes far beyond the single building; their membership, in fact, is not limited to architects. (One architect of the group, however—Kurokawa—was part of the Tange Team's plan to utilize Tokyo Bay.)

Among Metabolism's "proposals for a new urbanism," first published in 1960 in their small book by that name, is *Marine City*, by the architect Kiyonori Kikutake **(1)**. The Industrial Revolution, he says, abolished man's connection with the land and his dependence on it. Marine City is a fully industrialized entity that is likewise free of the land. Its concrete cylinder contains a manufacturing plant within it, making prefabricated units to be inserted into the exterior of the shaft. Kikutake explains that the city does not need to be anchored; it can cruise to any location where it is needed. And if it should become an "unsatisfactory unit for community," it can be moved out to sea and sunk "without the least hesitation."

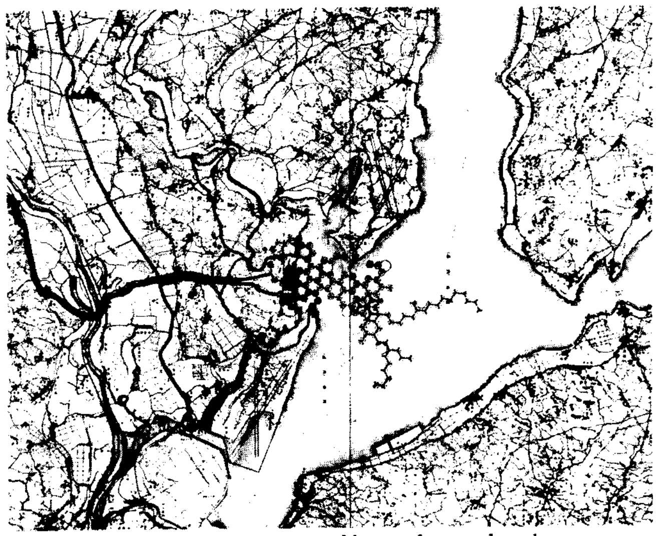
Noboru Kawazoe, talking about "material and man" in this same publication, writes: "There is no fixed form in the ever-developing world. We hope to create something which even in destruction will cause a subsequent new creation. The 'something' must be found in the form of the cities we are going to make—cities constantly undergoing the process of metabolism."

Noriaki Kurokawa's view of the future is also one of change in every aspect. In his words, "A living unit is now based on only one generation and will eventually change into a per-person unit. With the change in working conditions, working hours will be shortened. People will have three or four days for recreation. To have one's roots in the city will in itself be meaningless." In his *Wall City* **(2, 3)**, Kurokawa suggests that "separation of living space into fixed living space and movable living space will be the decisive element of urban life." The units for living, fixed and movable, are attached to an equipment wall; on the other side of the wall are office units. The wall, in effect, becomes "artificial ground." Like the MIT students' community (*previous page*), this project seeks to reconcile the human scale of living with the mass-human scale of transportation.

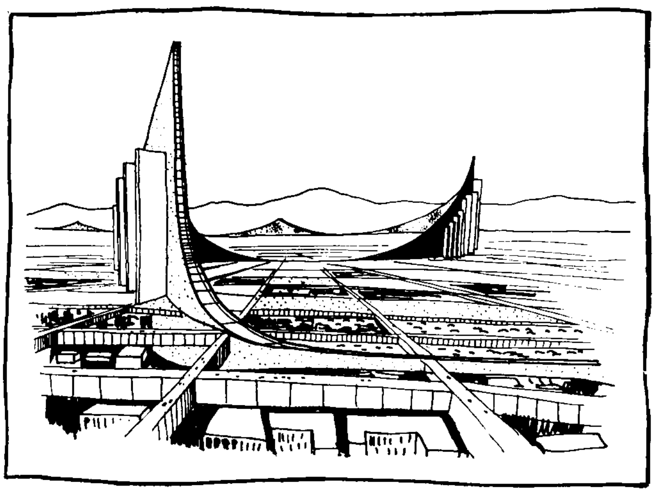
Another of Kurokawa's projects, *Helix City* **(4, 5)**, has living units grouped into an immense fan-shaped structure that he calls a "basic cell" of urbanism. Instead of a master *plan*, which is authoritarian, he is looking for a master *system*, which is evolutionary. The transportation system here, which includes monorail, is integrated with the helicoidal towers. The project was conceived for a busy part of Tokyo; since ground area of the towers is small, demolition of existing buildings would be minimal. A helix form is also used in a scheme Kurokawa proposes to be built over water.



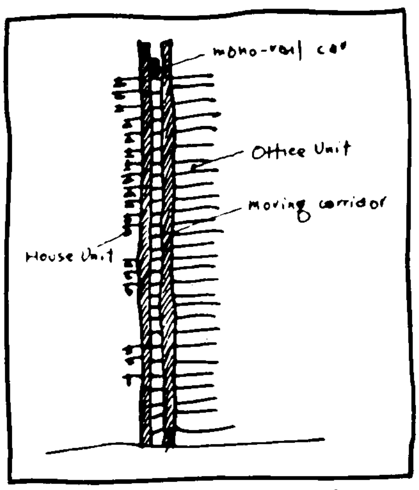
1 Marine City by Kikutake manufactures its own prefab units.



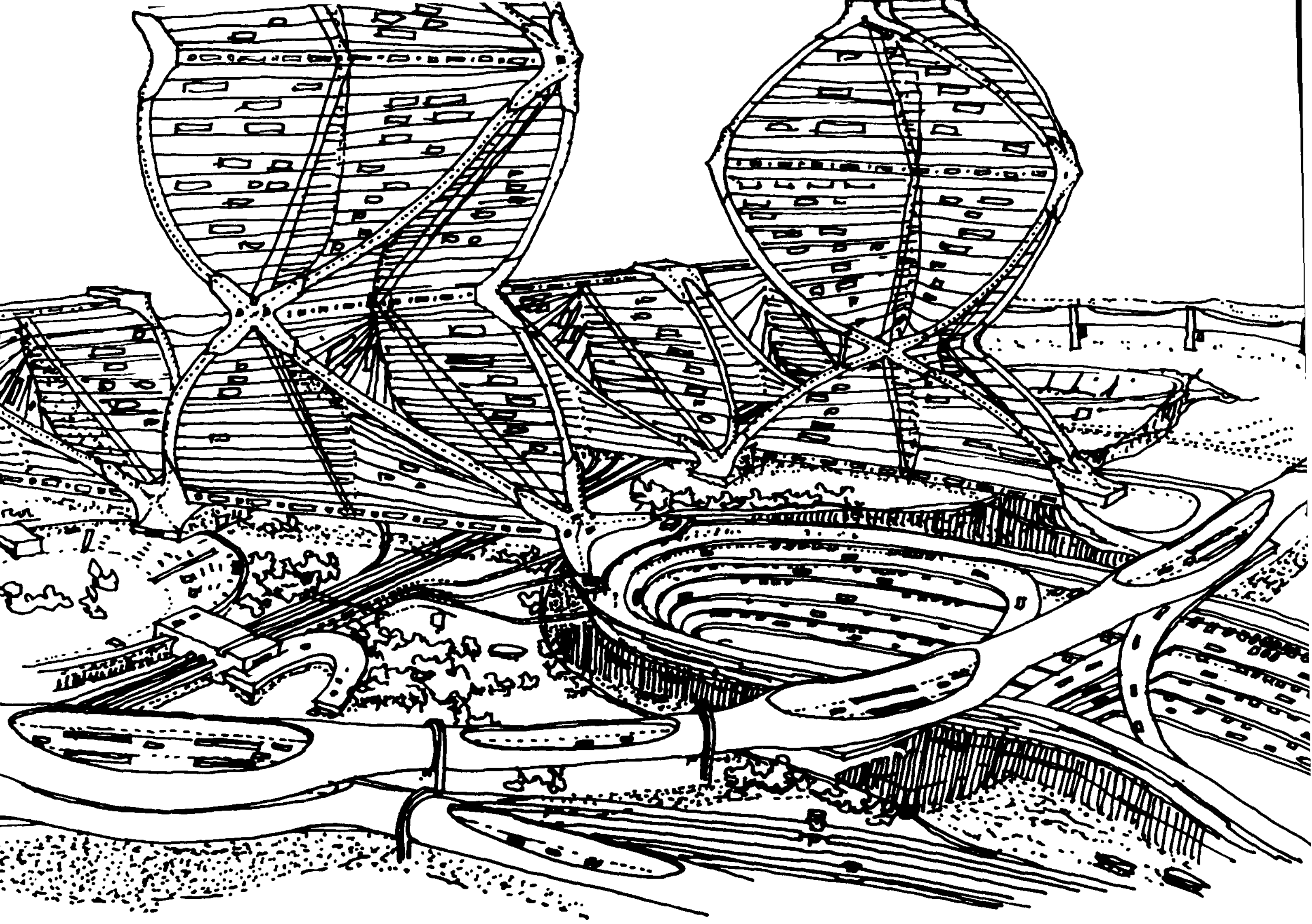
4 Helix City is an urban system able to adapt and evolve.
5 Helix City's "basic cell" is a huge fan-shaped unit. ▶

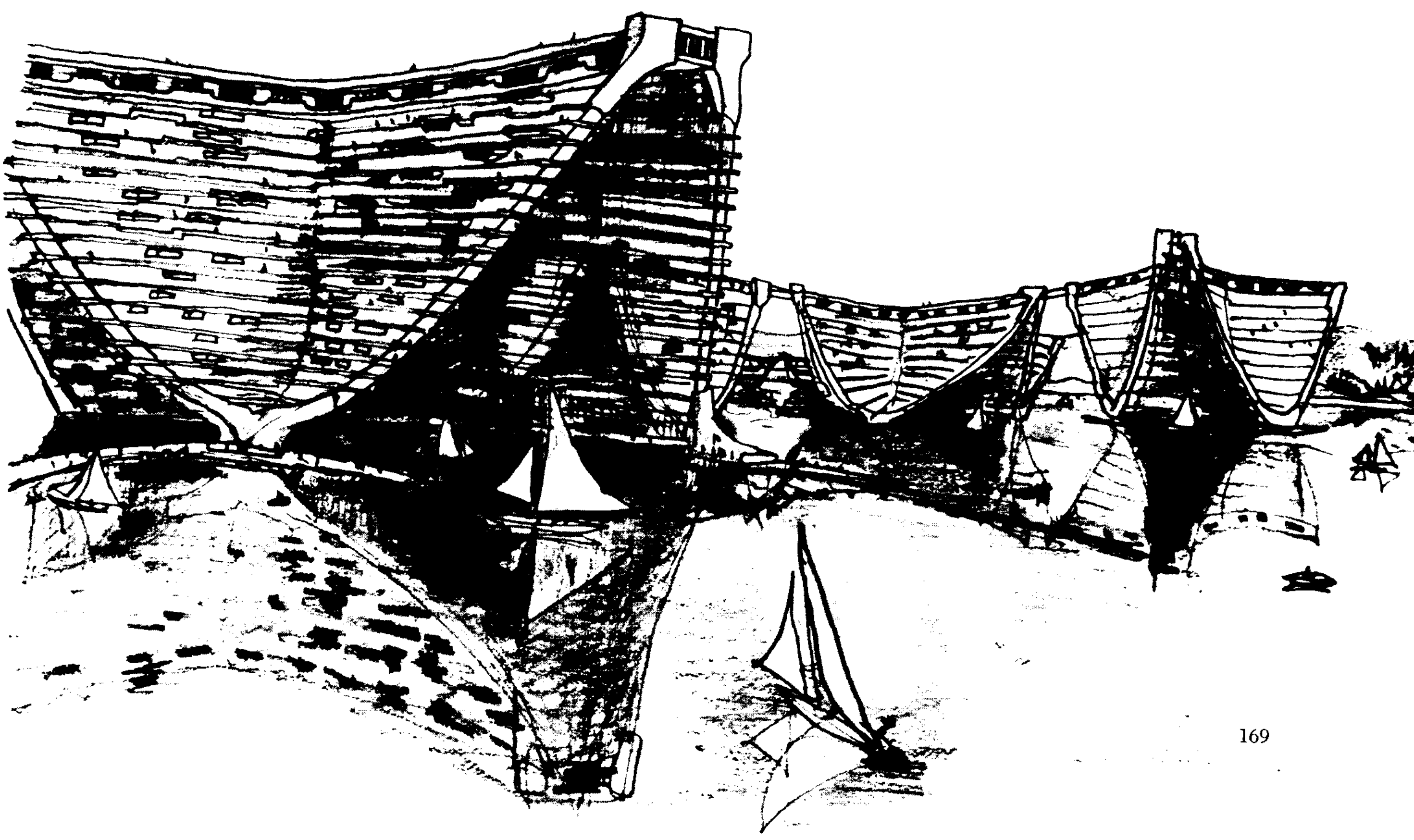


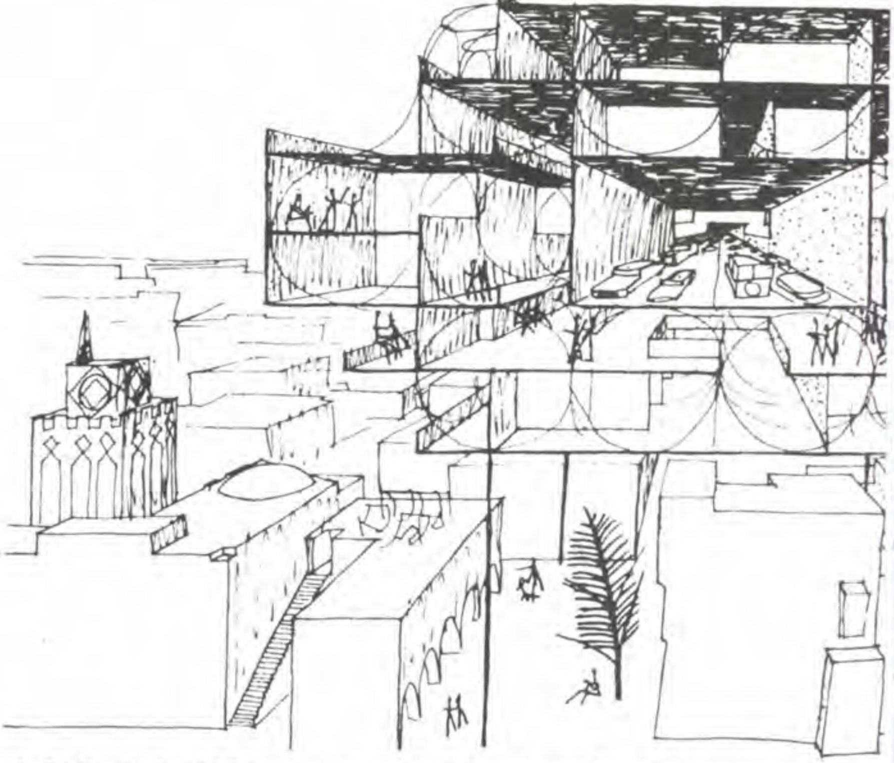
2 Wall City by Kurokawa has fixed and movable living space.



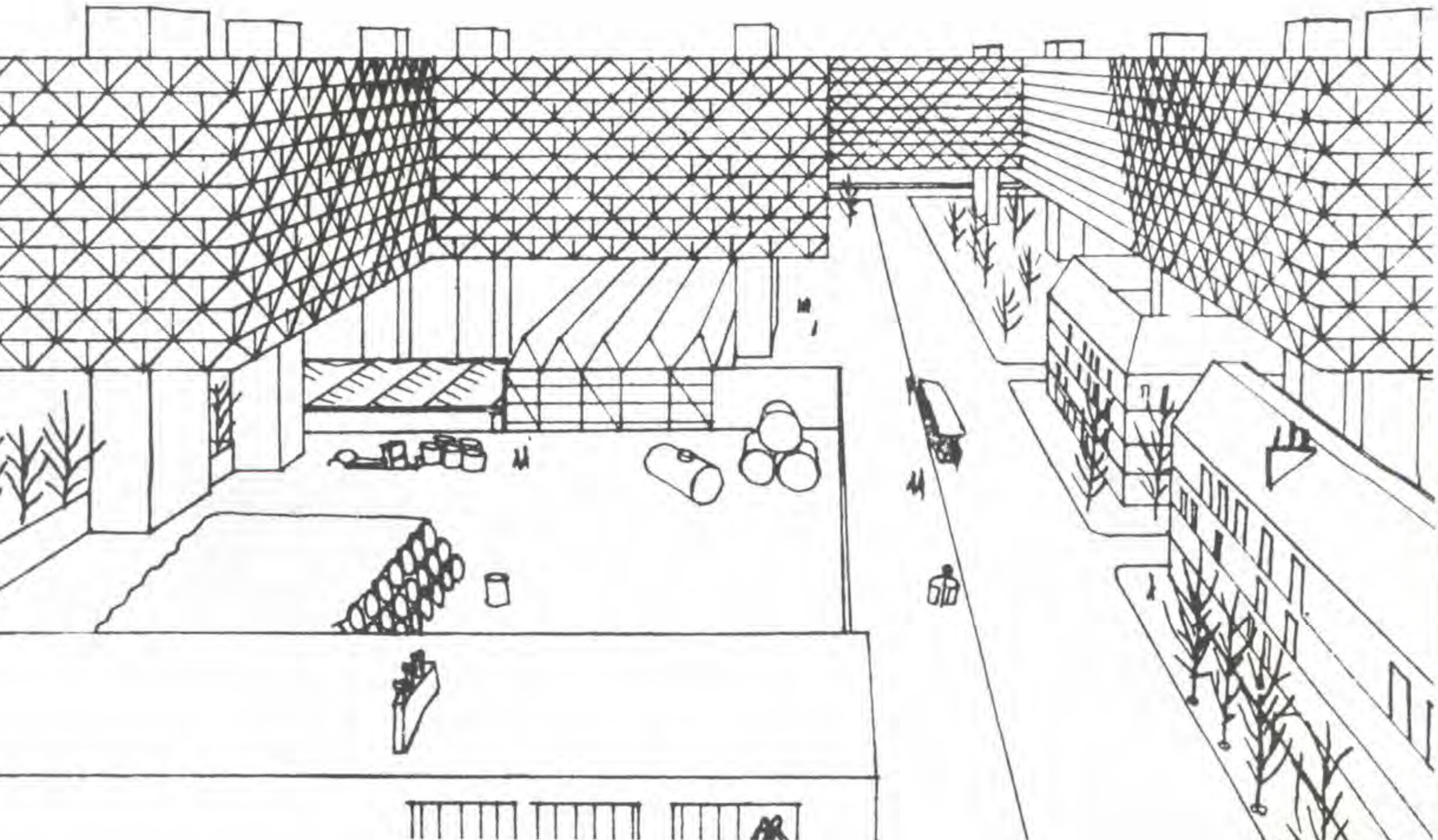
3 The wall of Wall City is for utilities.

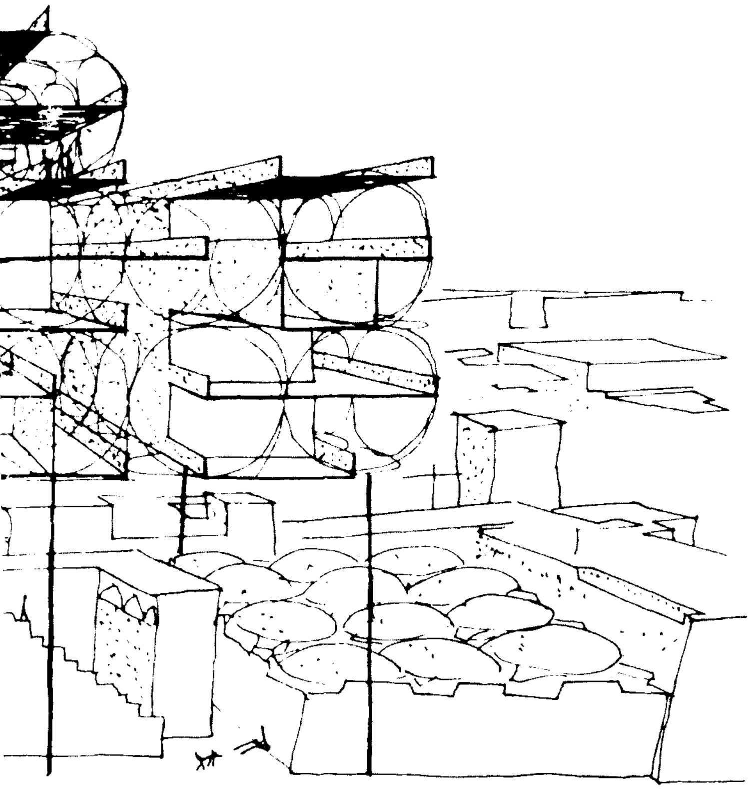




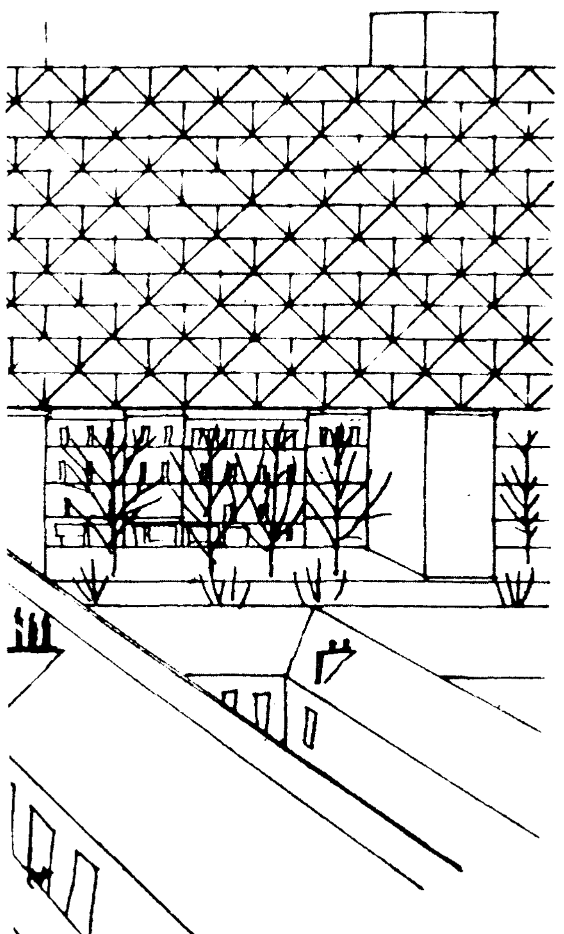


1 Friedman's Spatial Town is a continuous skeleton elevated on pilotis.





2 Spatial Town can be placed over any existing townscape.



YONA FRIEDMAN'S Spatial Town grew from his concept of mobile architecture—adaptability to "changing needs of an ever-changing society."

In an age of fast-moving transportation and communication, the far sides of the world are tending to become more and more alike. Thus the architect-planner Yona Friedman—Hungarian-born, Israeli-trained, and now living in Paris—thinks in somewhat the same terms as the architects of the Metabolism group.

The study group founded by Friedman in 1957 was called *le Groupe d'Etude d'Architecture Mobile.* He clarifies the concept in this way: "The term 'mobile architecture' does not mean mobility of the whole construction, but rather adaptability to the changing needs of an ever-changing society. In this way, mobile architecture is the expression of a constantly changing structure of society."

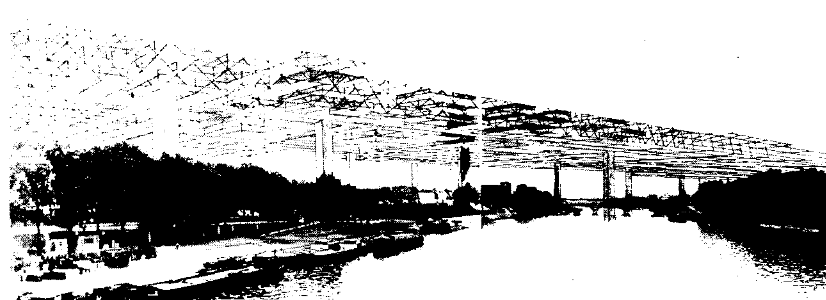
The application of this principle is his *Spatial Town,* wherein a uniform and continuous skeleton is elevated on pilotis **(1, 2)**. The skeleton is a many-layered space-frame supported every 200–250 ft. This "infrastructure, or technical basis of the town" provides rectangular voids (about 300–400 sq ft) into which apartments (dwellings, offices, etc.) can be placed. Apartments can have any interior configuration, can be grouped and regrouped into any urban pattern. The city can be placed over any existing landscape or cityscape, and the land underneath ultimately utilized for any purpose. Most important is the three-dimensional implication: "As the different levels remain technically and functionally independent of one another, the planning of the town can be different on any level." Friedman envisions the possibility of having "a civic center over an industrial zone, habitations over a shopping center, etc."

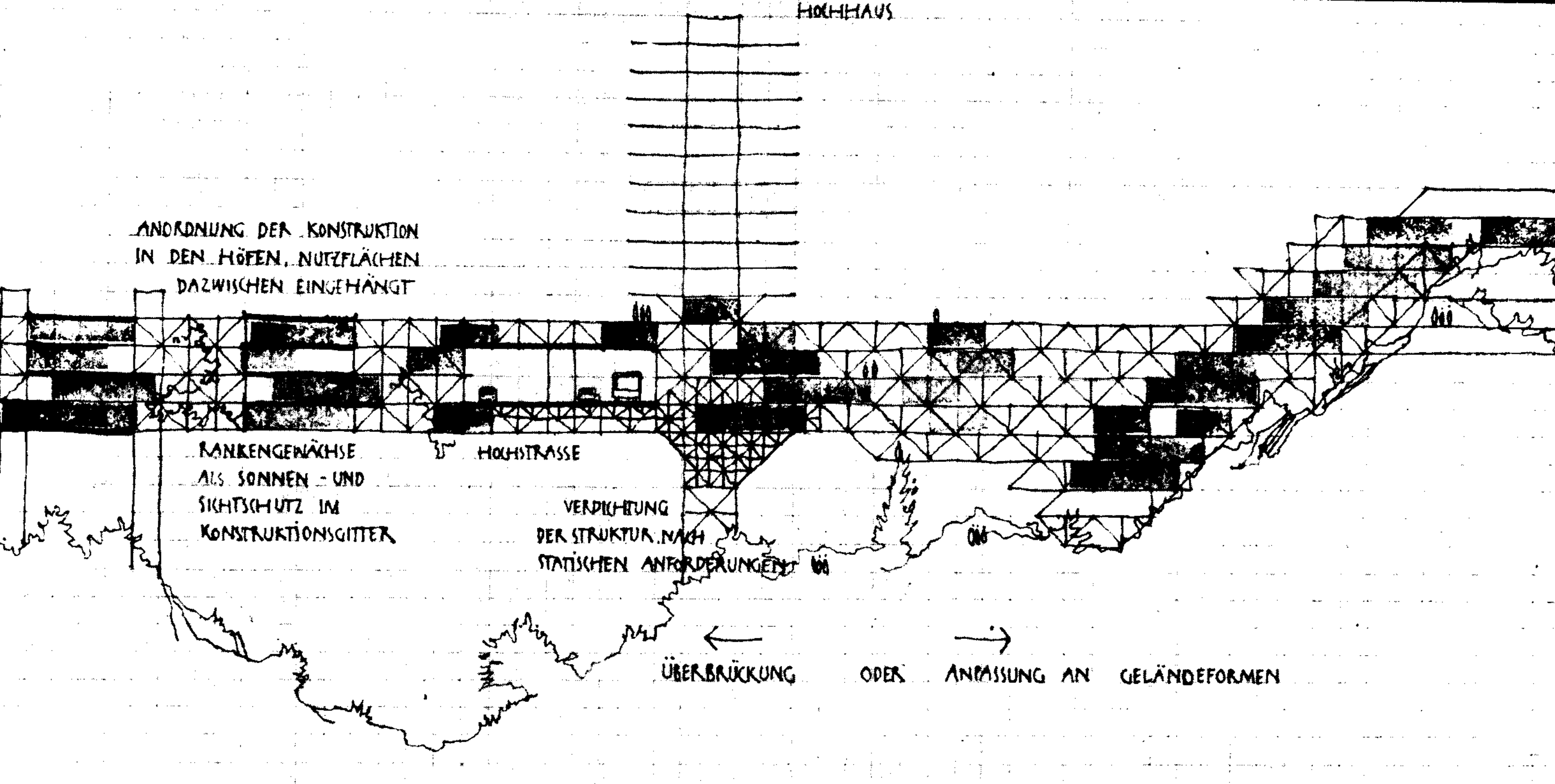
There is the same sense of long-term and short-term elements as in Tange's thinking. In a lecture given at Harvard early this year, Friedman said: "Obviously enough, these objective elements (the infrastructure) don't decide the character of the town. The character of a town should be decided in an intuitive way, by the habitants themselves (as in the historical past) or by their trustees. Now this intuitive decision is as unstable and temporary as any political decision—for instance, the election of the President. But, as the constitution of the state does not change at every election, so the infrastructure can stay fixed even in the case of changing intuitive or artistic physical planning."

Space is everywhere in *Spatial Town.* There is free space under the grid, which stands some 50 ft off the ground; there is free space in the grid itself, since many modules (approximately 10 ft vertically x 20 ft horizontally) remain open; there is free space on the upper surface of the grid, for shops, promenades, and public facilities.

Applying the theory to Paris, Friedman proposes to triple its density by building *Paris Spatial* over the existing capital **(3)**. A great part of the existing town could be preserved, since this construction does not entail prior demolition of buildings now on the land. Where rebuilding is anticipated, the *Spatial Town* provides four simple steps toward this end: (1) build the space-frame over slums destined for demolition; (2) install slum tenants in the new overhead town; (3) demolish the now-empty slums; (4) reconstruct new buildings on the ground.

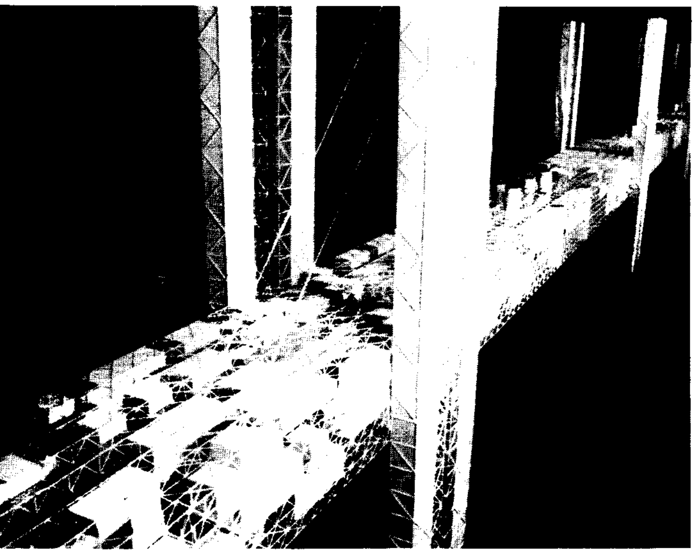
3 Paris Spatial applies these principles to the city of Paris.



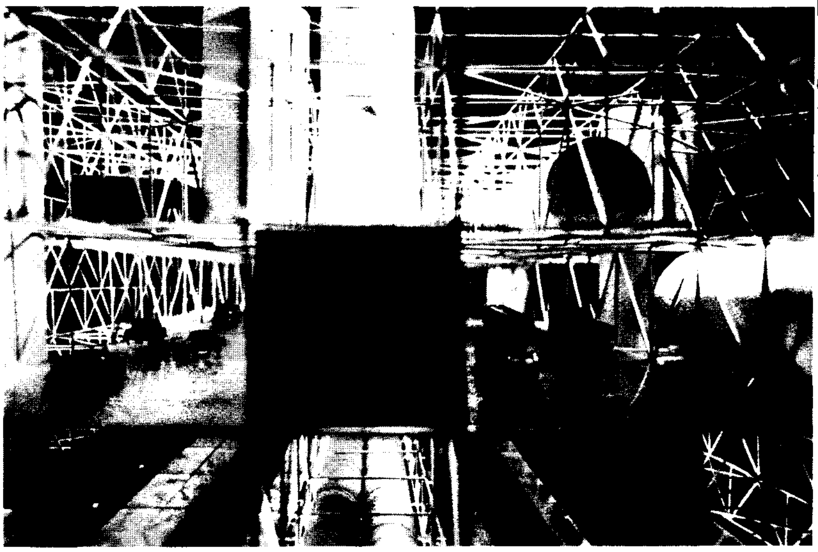


1 Spatial City is a labyrinth of structural space that is "systemized, prefabricated, demountable, multifunctional."

2 Bridge over the English Channel is a vast Spatial City.



3 Industrial facilities would also be part of the Channel bridge.



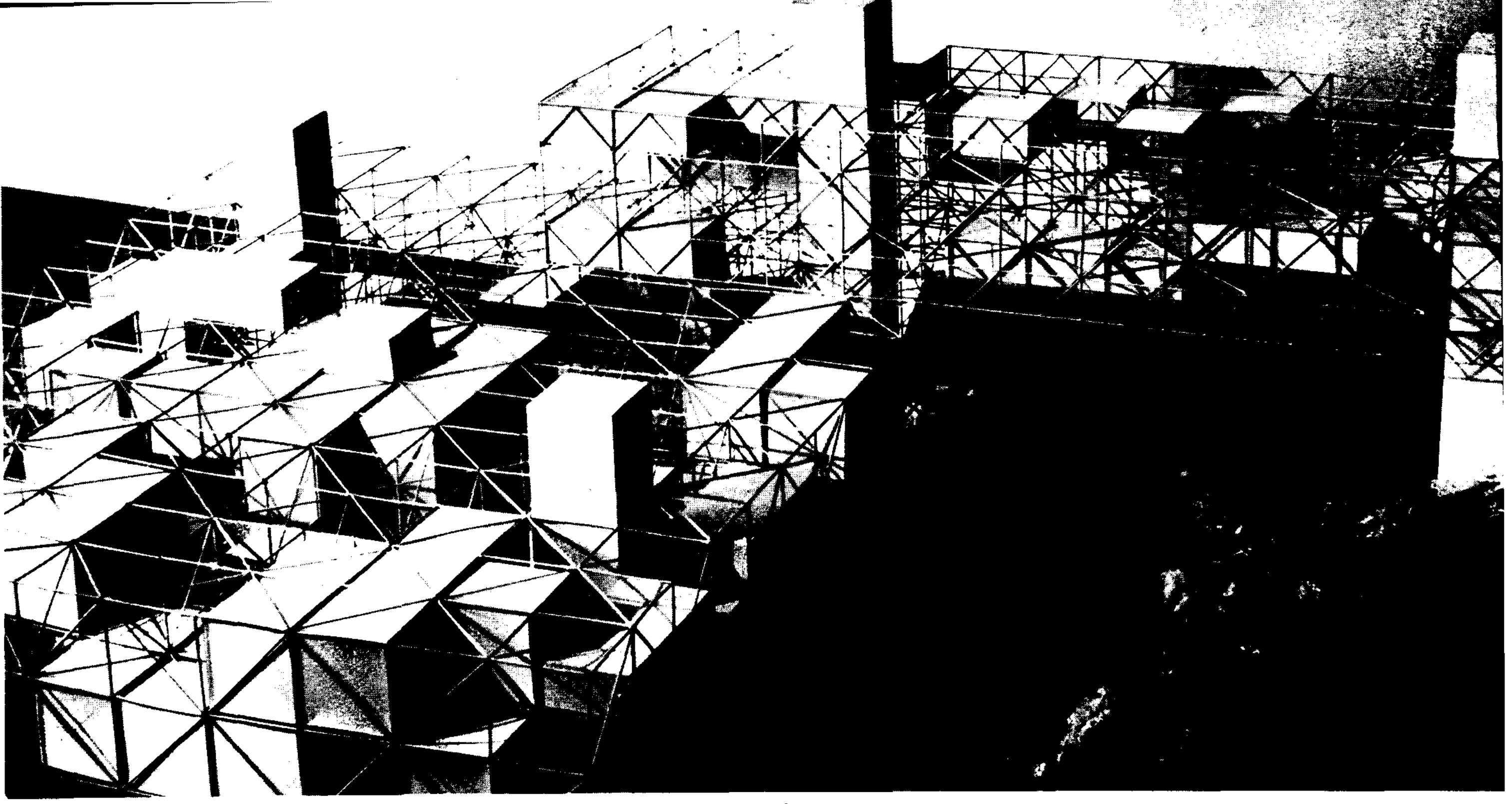
ECKHARD SCHULZE-FIELITZ calls his Spatial City "a science fiction of town planning" that is, however, technically feasible today.

In both his statements and his projects, Eckhard Schulze-Fielitz makes the same assumptions about planning that Yona Friedman does. Even the terms are similar. Schulze-Fielitz defines his *Spatial City* as "a labyrinth of structural space, systematized, prefabricated, demountable, developing or contracting, adaptable, multi-functional." The young German architect has been a member of Friedman's Mobile Architecture group since 1961, and in fact has collaborated with Friedman on one of the works shown on these pages.

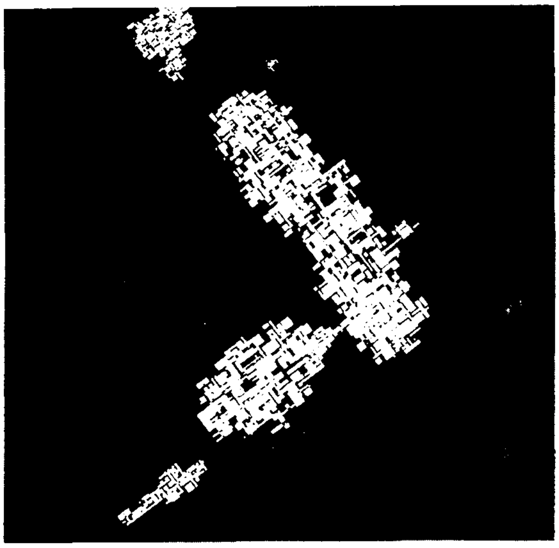
Schulze-Fielitz states the rational foundation of *Spatial City* in these words: "In a free society, a perfect plan is neither possible nor desirable; it would signify an anticipation of unforeseen developments. The *Spatial City,* on the contrary, is a conglomeration of diverse spatial structures which adapt themselves gradually to the needs of the city."

The "man-made nature" concept of Tange's is present here too. In Schulze-Fielitz's words, "The *Spatial City* accompanies the profile of the countryside like a crystal vein; it is itself a countryside comparable to that born of geological formations, with mountains and valleys, gorges and high plateaus, comparable also to the leafy zone of a forest where the branches, making light and shade, create their most beautiful outline." His drawings show the variety in nature, and the potentialities for adapting *Spatial City* to a varied terrain **(1)**.

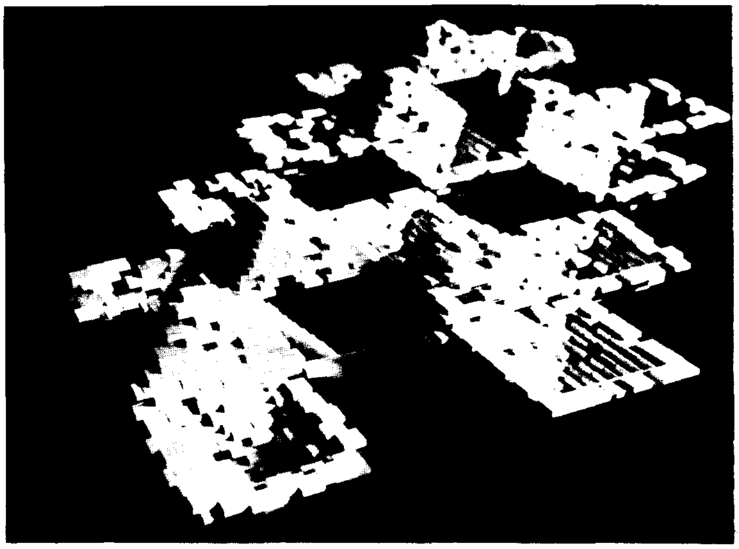
Thus far, he has adapted these principles to a number of different projects. The scheme for bridging the English



4 *Project for the university at Bochum has space that can be expanded in every direction.*



5 *Irregular outline in the Bochum university project.*



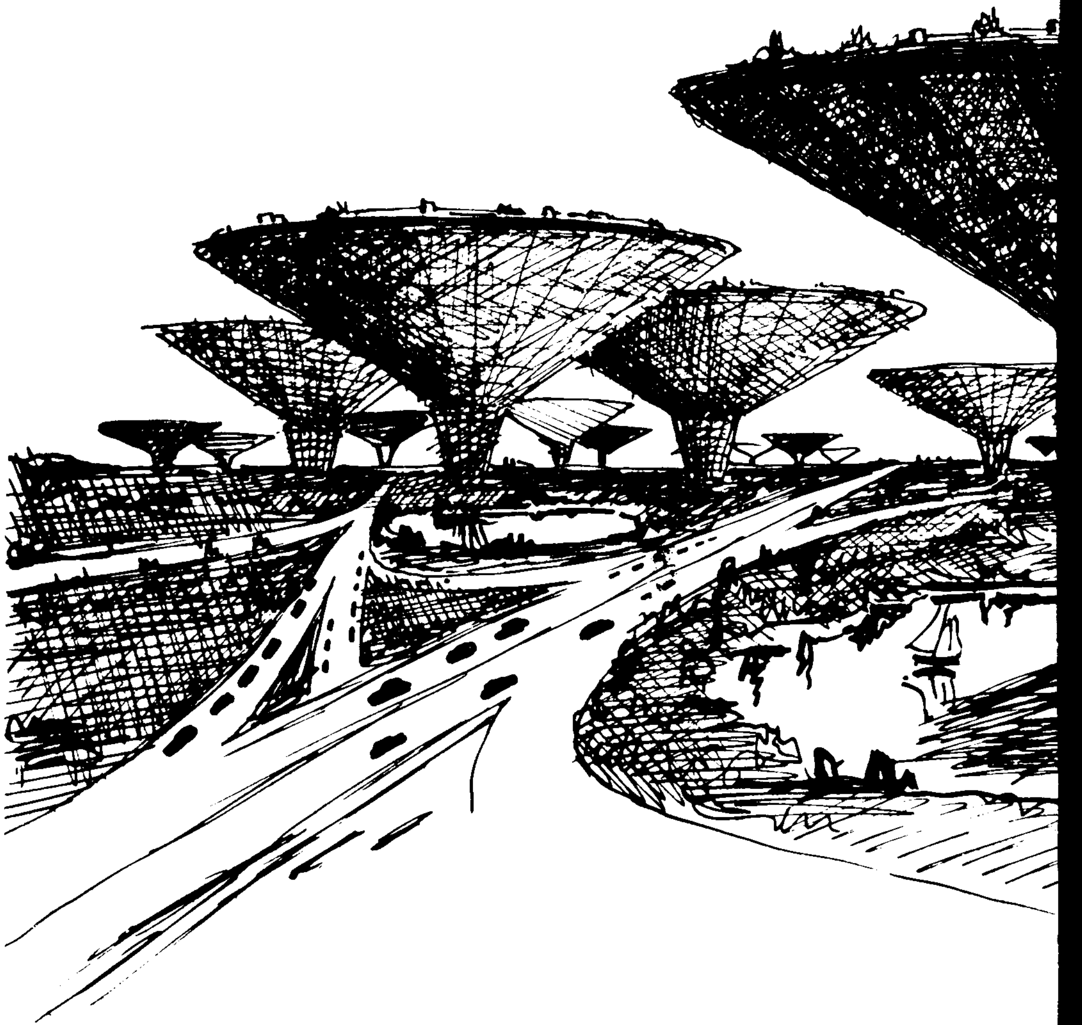
6 *A hypothetical city that is organized on a coordinated network.*

Channel (**2, 3**), done in collaboration with Yona Friedman, is perhaps the most ambitious. Here is a linear *Spatial City*, which even incorporates harbor installations into it. The height required by the great spans makes a vast cubage available for such facilities; the width of the structure offers stability against winds. Financial strength would be achieved through industry, harbor income, and tourism.

A more modest proposal is the competition entry for the university at Bochum (**4, 5**). The prefabricated space frames make a continuous structure which would be filled according to need; expansion is possible in every direction. Internal streets, steps, plazas, galleries, are part of the spatial possibilities. Underneath are greenery, water, traffic, sports.

Also interesting are his experiments with the hypothetical form of a city—using the adaptable space frame to develop a coordinated network for any desired occupancy (**6**).

In the mind of Schulze-Fielitz, the *Spatial City*—"science fiction of town planning"—could be realized today. We have technical and material means far superior to previous epochs; all that remains are changes in social, juridical, and governmental areas. For instance, since land is fast becoming a scarce and high-priced commodity, it is suggested that the spatial units themselves be owned (or rented), instead of the land. As for the details of mobile architecture, they are a curious mixture of the far-out and the near-at-hand. The system gives the possibility of complete climatization and of complete utilization of prefabrication methods (with "building blocks" for each apartment available from department stores). But for an *America Spatial City*, proposed by Schulze-Fielitz, the individual apartment would be a "do-it-yourself" project.



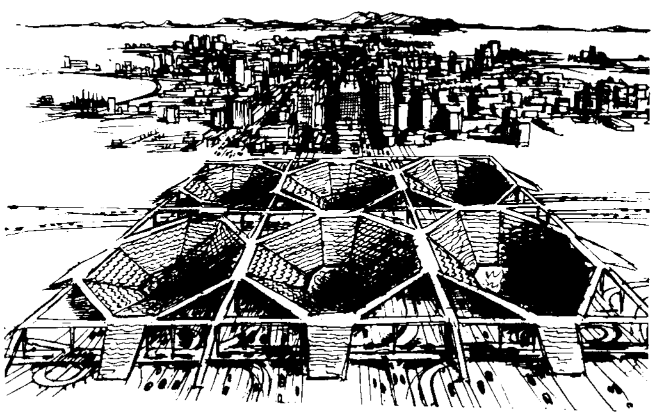
The Inter-Settlement by WALTER JONAS isolates each individual home from the outside world and provides a well-defined community within.

While the pyramids and cones in one of Schulze-Fielitz's studies (**6**, previous page) may look similar to the conical elements in Walter Jonas'·vision, their rational basis is quite different. Each proposal develops from a different view of urban society and urban structure. The Swiss artist-painter, Jonas, places less emphasis on providing for an unpredictable future than on correcting present ills; and although he designs in futuristic terms, he would seem to be trying to recapture the closed structure of an earlier day when these ills did not exist.

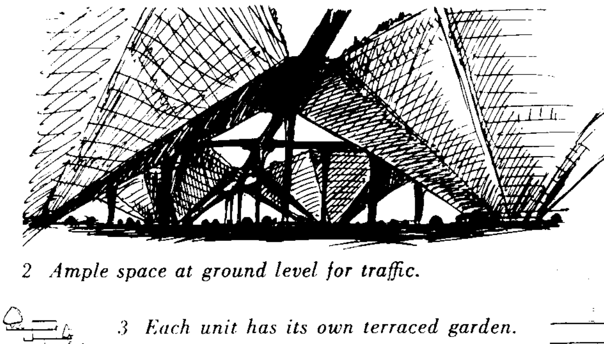
Jonas sees the growth of population (and urban population, in particular) as creating certain imperatives for planning: (1) to control traffic; (2) to use the land economically; and (3) to meet hygienic needs for light, air, and green space. Primarily, however, he is concerned with restoring the "neighborly group life"—the "positive community spirit"—which, in his opinion, has been destroyed by the automobile and ribbon development. He suggests a well-defined limit to the size of the group—"about 300 families, where everybody knows everybody."

The individual's home, he believes, should offer "a complete change and isolation from the outside world, from bustle and movement. It is just in the hectic restlessness of technological civilization with its dangers for body and soul that a man needs to have 'a place of his own.' For this reason, every centrifugal conception of a building with windows facing outwards was eliminated right from the start."

This led Jonas to "a funnel-shaped arrangement for a modern

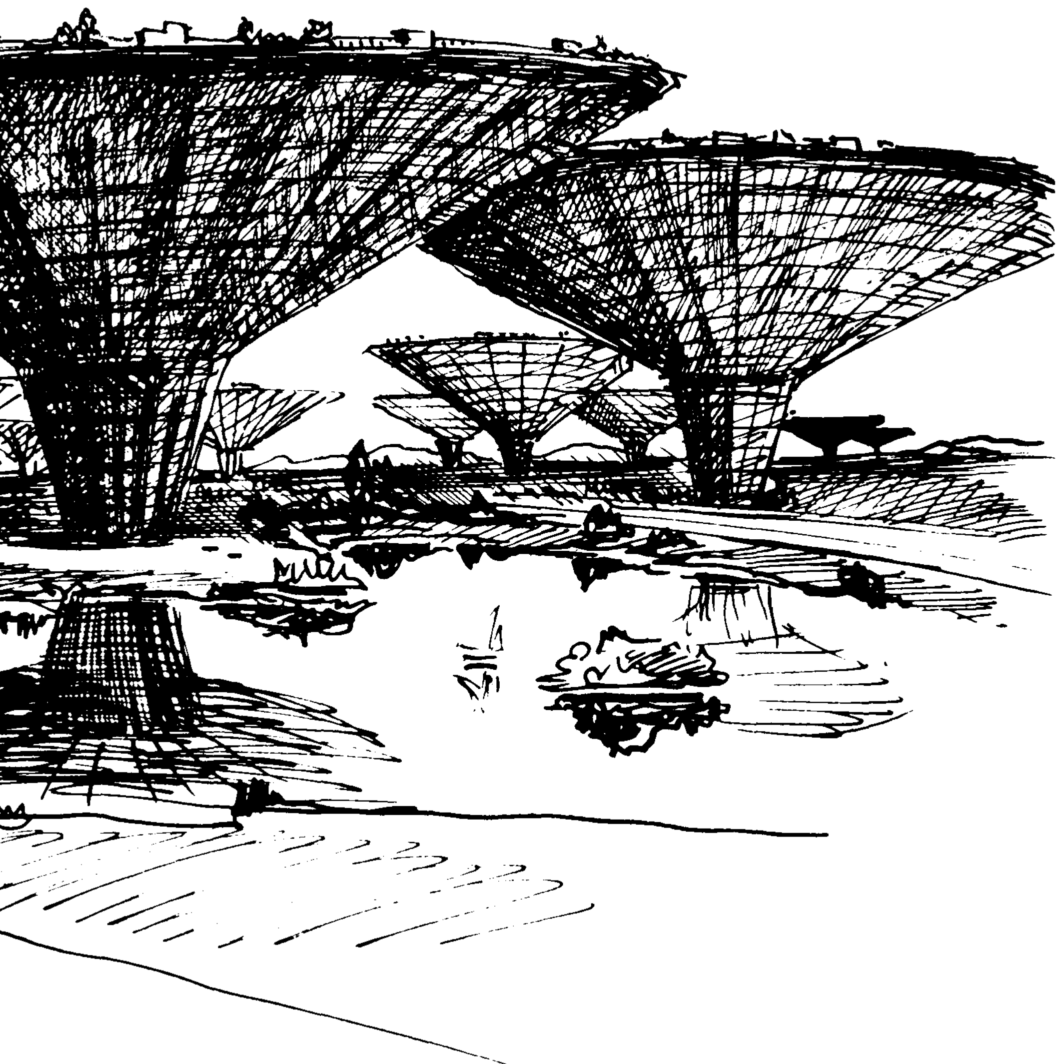


1 Three settlements, with full community facilities, make a sub-city.



2 Ample space at ground level for traffic.

3 Each unit has its own terraced garden.



tall building with the individual dwellings arranged around a central patio." His *Inter-Settlement* is thus "an inverted hollow cone, or possibly a four-sided pyramid." The upper two-thirds becomes an amphitheater, with houses terraced out like theater boxes **(1)**. The floor of the arena is a huge garden some 200 ft in diameter, below which are the shops, cinemas, and other facilities not needing natural light. Since each house also has its own garden, the result is "a sort of garden city inside the structure" **(3)**. The distance across the top of the cone is 600 ft, based on building machinery currently available. Population of each cone is approximately 2000.

Internal transportation consists of "sloping lifts, escalators, and circular travelaters." Wide bridges along the top link several *Inter-Settlements* together (three settlements, containing full community facilities, make up an entity that is complete in terms of "design, sociology, transport, and economy"). Since *Inter-Settlement* takes little space where it touches the ground, and requires support only at vast distances, there is ample space at ground level for the main highways **(2, 4)**. In fact, says Jonas, there is "so much space available for mechanical transport such as cars, trams, and buses that such complicated and expensive installations as underground railways and car-parks, etc., would not be necessary."

Construction advantages, he suggests, are the low center of gravity, great rigidity, and resistance to earthquakes and wind. Because the terrace-rings carry the full load, individual homes can be built of interchangeable prefabricated elements. "The idea is not to place prefabricated houses as finished units around the terraces," but to give people freedom of choice in composing a modifiable unit from standardized elements.

4 Jonas envisions the funnel-shaped Inter-Settlement in a variety of landscape settings.

Combining many similar elements into lively groups of buildings, JAN LUBICZ-NYCZ believes that future cities will become "groupings of large containers."

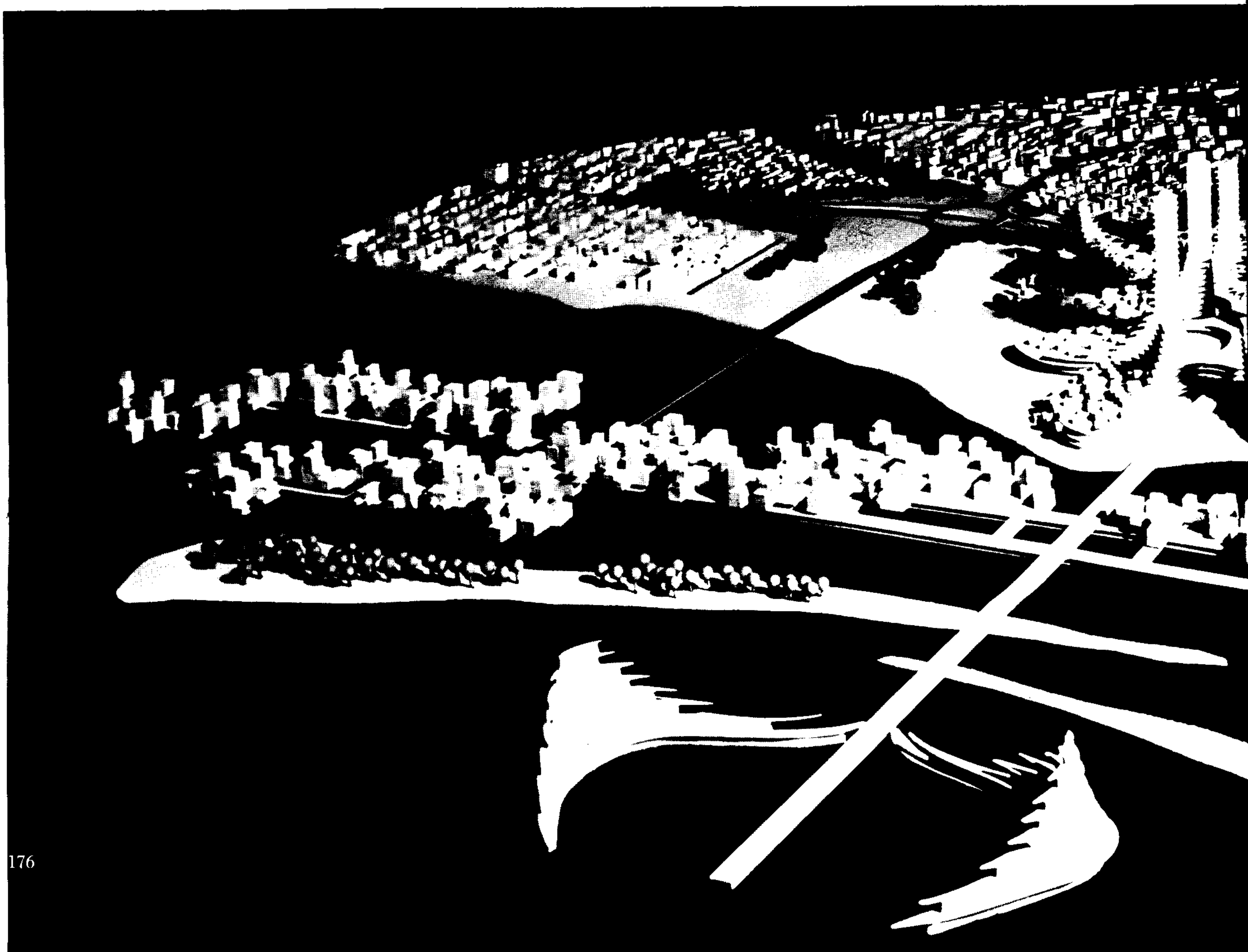
The inverted cone by Jonas (previous page) is a closed form, finite and complete. So too, despite first impressions, is the poetic creation by Jan Lubicz-Nycz, a free-form ziggurat that swoops up into a tapering tower. To be sure, there is a futuristic quality here, it is almost a lunar landscape; and the profile of his later designs looks very much like the graph of a hyperbolic equation, with the lines approaching but never reaching infinity. However, each of his projects is based on a particular competition program and there would seem to be little room for flexibility within or beyond the specific proposal. Also, he takes little advantage of new technology. The pertinence of the Lubicz-Nycz designs, rather, is their implicit suggestion for making a variety of similar elements into a cityscape that is lively, rich, even magnificent.

Lubicz-Nycz deplores the desecration of the environment that, in his mind, began with the Industrial Revolution. The "dignity and magnificence . . . the richness and eloquence [of the past] . . . have not been equalled in aesthetic, spiritual, and human values by edifices that belong to the contemporary scene."

Seaching for "a more meaningful organization of urban environment" and "appropriate forms of human habitat," he suggests the direction in which architecture must move. There must no longer be "isolated buildings with separate frontages, but an organic structure that is like a shell—the shell of humanity, of our way of life. This shell encompasses and gives shelter to a multiplicity of occupancies brought together, is capable of coping with changes or variations within its form and is based in its conception on the more permanent and fundamental sides of life that are universal, ageless, and unchanging in their biological, social, and spiritual aspects—not succumbing to the passing and superficial."

This leads him to a design process that "transcends the scope of architecture or urban design." He calls it "Urbatecture" and defines it as "an art or skill that would (generally speaking) develop structures to house the city in a somewhat similar way as a building is developed to house a specific occupancy." (This is not to be confused with "Total Architecture," says Lubicz-Nycz, which, according to him, is "the most unfortunate and inappropriate juxtaposition of terms, with its political connotations of force, suggesting complete control of environment, leaving no place for individuality, mistake, nonconformity, oddity or just-plain uselessness, caprice or frivolity, which also are part of life.")

There has been no lack of recognition for this young Polish architect, who emigrated to the U.S. in 1958; and a steady progression of his ideas can be read in his award-winning projects. In 1960, his proposal for the Golden Gateway development (1) was hailed, by, among others, Louis Kahn, one of the architects on the advisory panels to the city of San Francisco. Lubicz-Nycz himself said that architecture must be "a willful and positive element, not faceless and indifferent." Although unorthodox in design—2135 apartments in one cruciform plan—the project is simply a group of 11 towers of varying height joined together. Associated with Lubicz-Nycz on

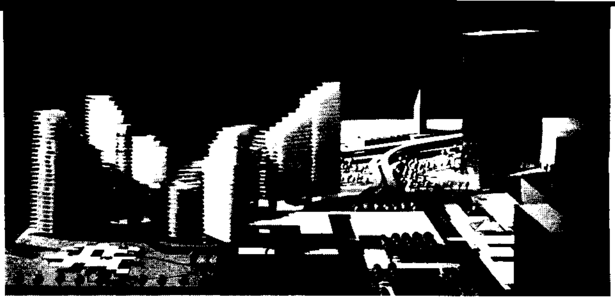


this project were John Collier and Philip Langley.

In 1961, his Diamond Heights project **(2)**, also for San Francisco, had 990 apartments located in 8 structures, with cellular units formed by vertical cross-walls and horizontal flat-slabs. In this aesthetic solution, there is relevance to the problems of combining repetitive elements manufactured by any method. Associates here were John Karfo, Mario J. Ciampi, and Marquis & Stoller.

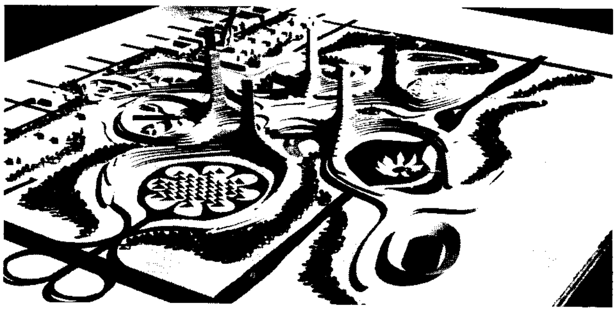
The project that received a National Merit Award in the 1962 Ruberoid competition **(3)** has towers containing 1000 units. "It is becoming apparent," said the architect, "that the concept of architecture as we know it now, dealing with a particular building . . . will change in the future . . . to concern itself with housing parts of or a whole city."

In the 1963 competition for renewing part of Tel Aviv-Jaffa, with Louis Kahn on the jury, Lubicz-Nycz (and Donald P. Reay as consultant) won second prize **(4)**. He reiterated: "It is this designer's belief that cities . . . will become groupings of large containers, rather than the aggregation of small buildings. Containers will grow along the line of broadly established patterns until they reach maturity." The towers have multi-use occupancy—commercial, cultural, residential—and in formal terms represent a continuing refinement of his earlier work. A new and significant element in this project is the waterfront area of about 3000 dwelling units (and ancillary services). These are "envisaged as a series of types of buildings, to some extent repetitive, but their relation to one another varying, thus forming a continuous variety of spaces." As Lubicz-Nycz says, "A city or a building without spirit is not worth living in."



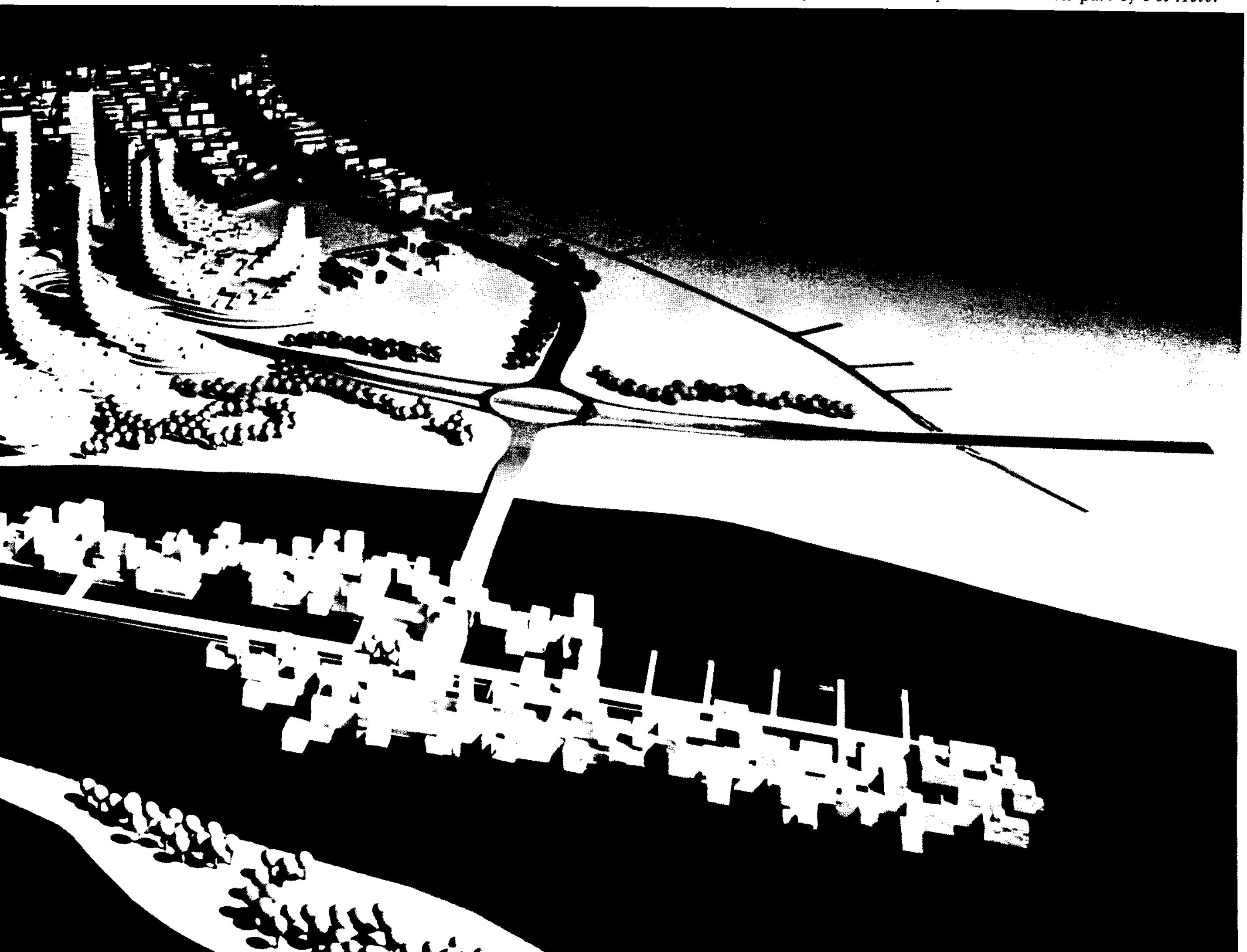
1 Golden Gateway development project, for San Francisco.

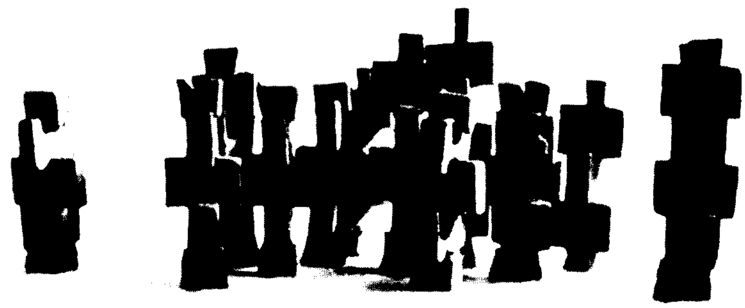
2 Diamond Heights redevelopment, also for San Francisco.



3 National Merit Award in the 1962 Ruberoid competition.

4 Second prize in the competition to renew part of Tel Aviv.





FUMIHIKO MAKI's Group Form is an attempt to create a total image and at the same time maintain the identity of individual elements.

An architect very much concerned with the form of the city—and with the problem of reconciling technology and human values—is Fumihiko Maki. A member of the Metabolism group, which published a brief section on his *Group-Form* in 1960, Maki has been developing this theory more recently at Washington University in St. Louis. Two "working papers" were prepared while he was there in 1961 and 1962; and now, as Associate Professor of Architecture at Harvard, he and Harvard's urban-design students are exploring the theory further.

Maki stresses the visual aspect of cities, but behind it he is well aware of the nonvisual forces: "Cities today tend to be visually and physically confused. They are monotonous patterns of static elements. They lack visual and physical character consonant with the functions and technology which compose them. They also lack elasticity and flexibility. Our cities must change as social and economic use dictate, and yet they must not be 'temporary' in the worst visual sense."

In analyzing the problem of urban design, Maki distinguishes three approaches. The first is what he calls the compositional approach, with design proceeding from a two-dimensional layout of buildings to an exercise in composing them on the site. Chandigarh and Brasilia are examples, as also are many urban-renewal schemes. It is often a valid approach, he believes, but it "may tend to widen a discrepancy between evolving social organism and its physical statement," particularly if the approach is combined with the master-plan concept, which is difficult to justify.

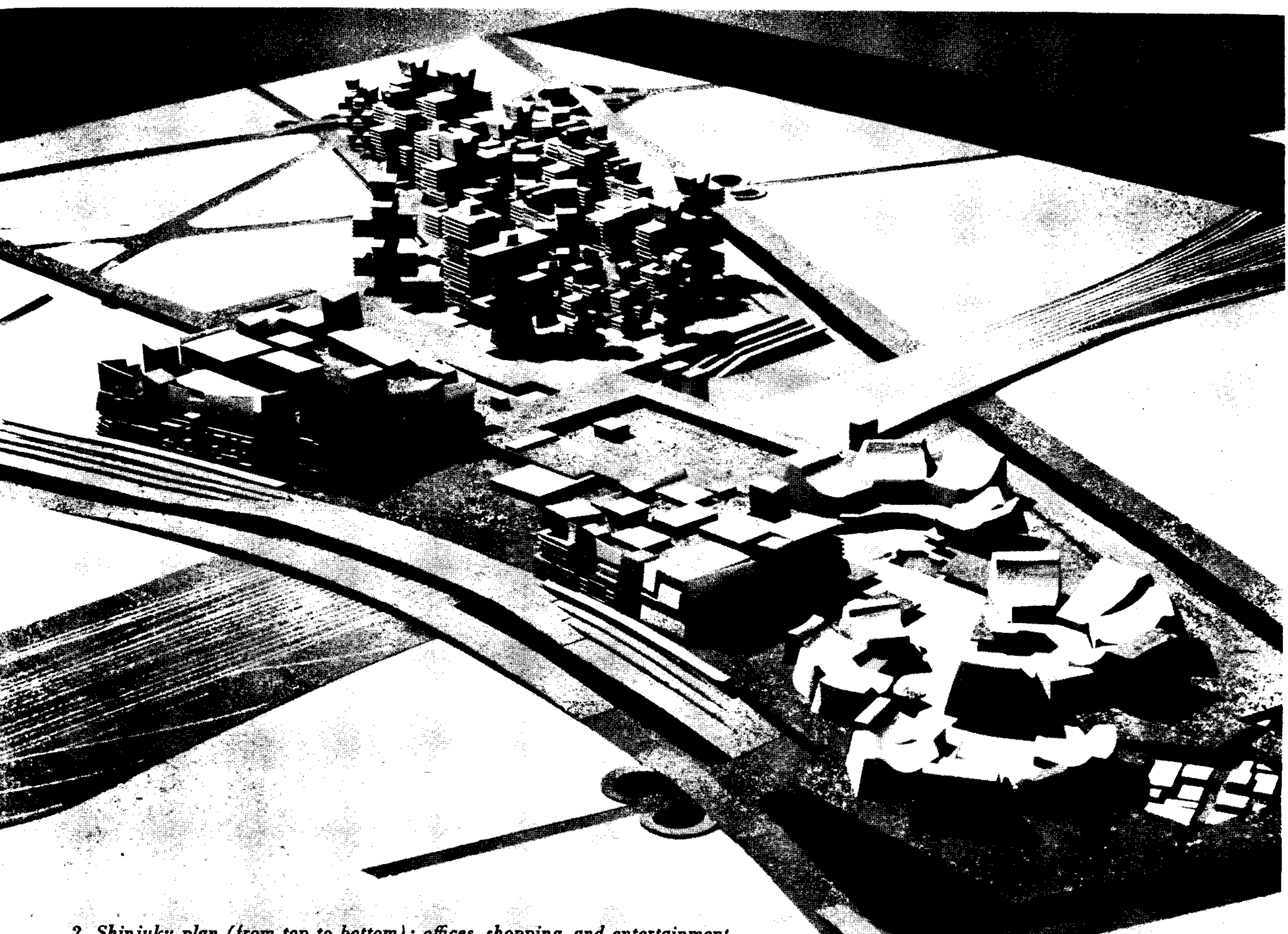
Megastructure, Maki's second categorization, is defined by him as "a large frame in which all the functions of a city or part of a city are housed." One of the earliest megastructures was Le Corbusier's plan for Rio, in 1929, and one of the most interesting developments of megaform, according to Maki, is the MIT student project of 1959 (*page 166*). Discussing the drawbacks of the megaform approach, Maki suggests that "sometimes, the impact and momentum of technology become so great that a change occurs in the basic skeleton of social and physical structure." The megaform could then become "rapidly obsolete" and "a great weight about the neck of urban society." Another objection: "Inherent in the megastructure concept, along with a certain static nature, is the suggestion that many and diverse functions may beneficially be concentrated in one place. A large frame implies some utility in combination and concentration of function. That utility is sometimes only apparent. We frequently confuse the potential that technology offers with a kind of compulsion to 'use it fully.' "

"Perhaps the real freedom of choice that technology offers can best be understood in a system which allows even more flexibility and choice over the short-term cycle than does megastructure," writes Maki. "The ideal," he suggests, "is a kind of master form, which can move into ever-new states of equilibrium and yet maintain visual consistency and a sense of continuing order in the long run. . . . *Group-Form* is an effort to create a new total image to express the vitality of our society, at the same time embracing individuality and retaining the identity of individual elements. . . . Forms in *Group-Form* have their own link, whether expressed or latent, so that they may grow in a system. . . . The vital image of *Group-Form* derives from a dynamic equilibrium of generative elements, not a composition of stylized and finished objects" **(1)**.

To investigate these principles further, Maki (and Masato Ohtaka, who was co-author of the first *Group-Form* paper) proposed a pilot project for the redevelopment of Shinjuku **(2)**, a large commercial and amusement district in Tokyo. In their description: "Shopping, amusement, and office blocks are expandable. The over-all form is somewhat loose. We call this 'master form.' The master form is not a static composition, but is a state of equilibrium sustained by given elements." Master form is always more elastic, and more enduring in the face of societal change, than master plan.

Elements and systems are developed according to themes reflecting the activity and energy of life. In the amusement squares, for instance, the theme is "gathering"—the plaza forms a center about which the various theaters cluster like flower petals. The image remains a total one, even though individual parts may be designed by different architects. In the shopping centers, the theme is "milling"—vertical service shafts are the only permanent elements, around which "floors will be extended freely vertically and horizontally" depending upon the needs at the time. In the "office town," the main consideration is "vista"—the towers have various sizes, heights, and cantilevered elements for making "dynamic vistas."

1 Water can be a controlling element of group form.



2 Shinjuku plan (from top to bottom): offices, shopping, and entertainment.

To SHADRACH WOODS, of Candilis, Josic & Woods, "the structure of a city lies not in its geometry but in the human activities within it."

Like Maki, the firm of Candilis, Josic & Woods also seeks a city that will provide for the richest interaction of free individuals, and at the same time permit the growth and change that is essential to life. (Two members of this Paris firm—Georges Candilis and Shadrach Woods—are with Team 10, the group that is also investigating these same problems). Explaining one of their projects, they wrote: "Men create cities in order to conjugate their efforts and coordinate their activities in such a way that the whole of their life together may become greater than the sum of their lives apart. If the city is to fulfill its promises it must be able to adapt itself constantly to the changing forms and intensities of human intercourse."

Woods elaborated on this approach in a recent lecture in St. Louis, to architecture students at Washington University. "The function of art," he said (including architecture), "is illumination." And this illumination of society, when "fed back into the society, produces change. I would not argue whether this is good or bad, because as is everything in this world, it is both good and bad. But I would argue that the function of art is to produce change. What is positive is that which encourages change, while that which discourages change is negative. This may appear to equate change with good; such is not my intention. I equate change with life: the principle of life is change."

Woods says, "The scale of human relationships today is such, it is so vast and they are so thin, that the visual disciplines alone are no longer adequate to express these relationships. . . . I insist on this visual aspect of architecture, but the fact is that we experience and use buildings in many ways, we don't only look at them. . . . Other systems, beyond the visual, are required to illuminate those relationships and forces which are the structure of our cities."

By discovering the "hidden relationships" operating in human association, it should be possible, says Woods, to bring a greater clarity and identity than possible with "plastic or spatial arrangements alone." And since change is the basic and organic principle of life, change should become "one of the basic conditions of design." Thus one cannot begin with the discovery, or invention, of form. The structure of a city "lies not in its geometry but in the human activities within it." (The plastic manifestation is certainly not incidental, though. "It is, of course, the most important part, since it is all that remains as evidence of our intentions.")

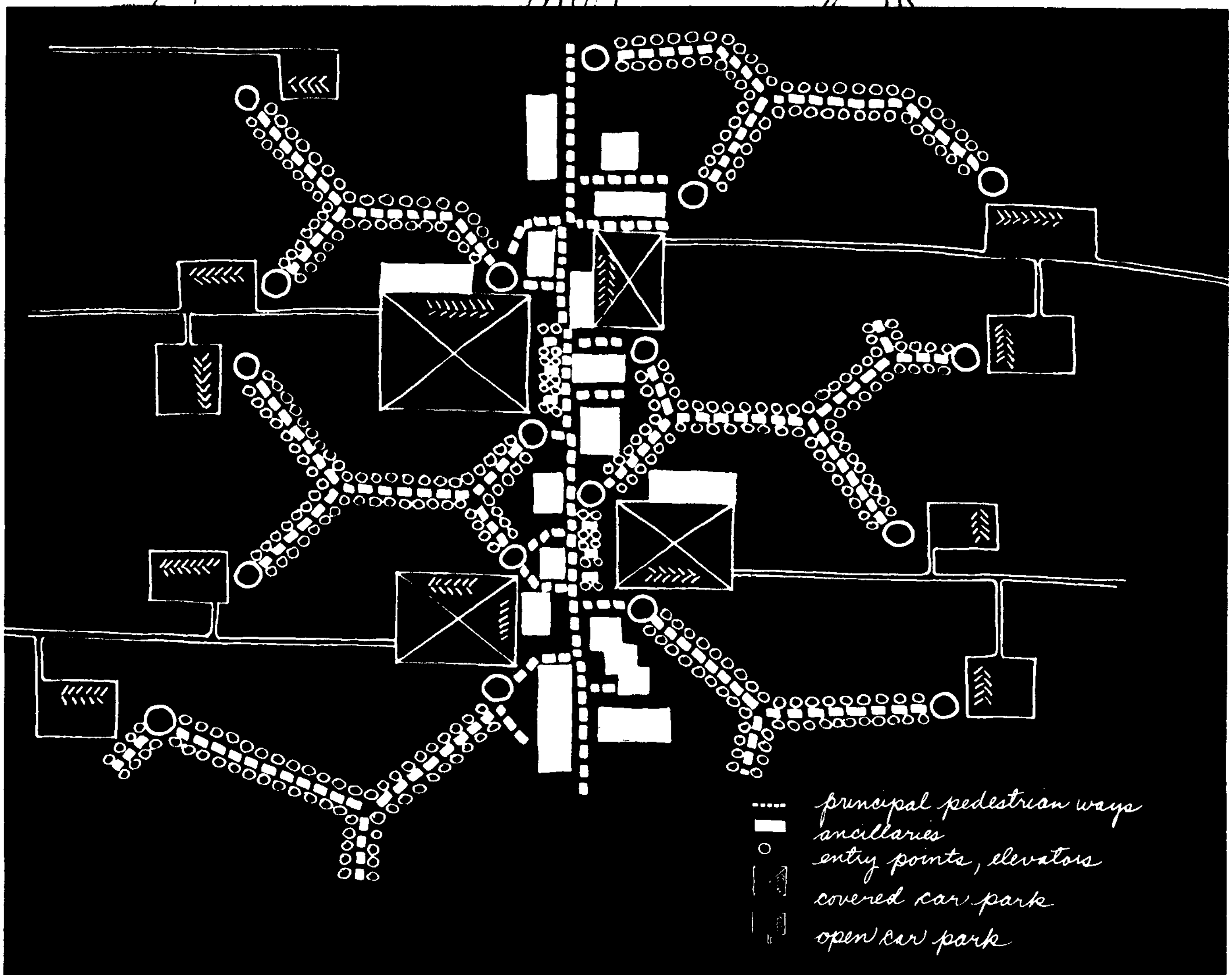
Out of the search for a structuring device of real viability, came a linear organization and the idea of *stem*. "A line is open-ended, it has no dimension, it can change direction at will." Dwellings become cells which attach themselves to the stem; the stem, in fact, generates cells. The stem, then, is no "simple linking mechanism between additive cells, but a generator of habitat, providing an environment in which the cells can function." The two scales of speed—pedestrian and automobile—are reconciled by conceiving of them as meeting only at points, never in lines. The man on foot will go directly to his destination, while the auto can go around the longer way. There are points along the stem where private transport has access, and these become logical places of entry into the dwelling complex. But the stem remains a pedestrian way—"a street, not a road." Three miles from Toulouse, in the new satellite city of Le Mirail, the Candilis, Josic & Woods plan organized on the stem principle is already under construction.

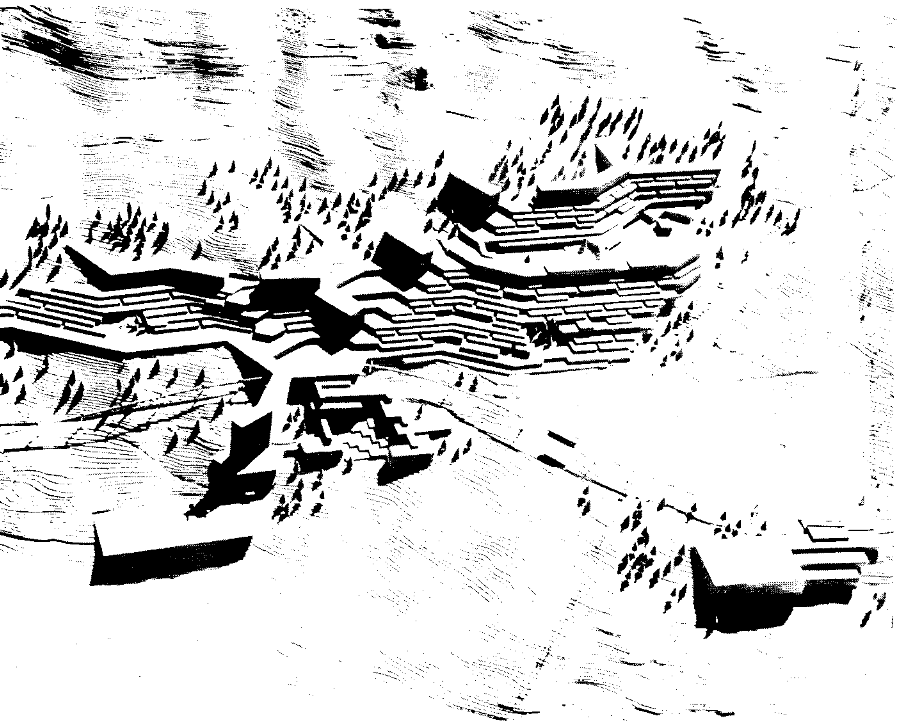
The stem principle also finds expression in the 1962 plan for a new sector of Bilbao, a city in northern Spain **(1)**. The stems follow the crests of the hills, with automobiles confined to the valleys. Density of the project is controlled as needed, by controlling the intensity of activities along the stem. It is "less a plan than a way of planning," and even the forms are not necessarily those that different architects would create over a period of years.

Belleville, in the French Alps (*next page*), is to be a 25,000-bed ski-resort—part of the government's program for mass-leisure facilities. In the Candilis, Josic & Woods entry, all buildings are prefabricated. They are of two types—6–8 story structures for dorms and hotel rooms, and a continuous one-story structure, following the shape of the slope, for apartments and additional hotel rooms **(2)**. There are four dwelling areas and an administrative center. A monorail would serve the entire valley, and thus do away with the dangers of avalanche and problems of snow removal along the road to the nearest city 15 miles away; the monorail would also serve to leave the snowy hillside intact for skiers. From the monorail stations, a system of escalators, travelators, and elevators would serve the buildings. Associates on this project were Charlotte Perriand, Henri Piot, Jean Prouvé, and Ren Suzuki.

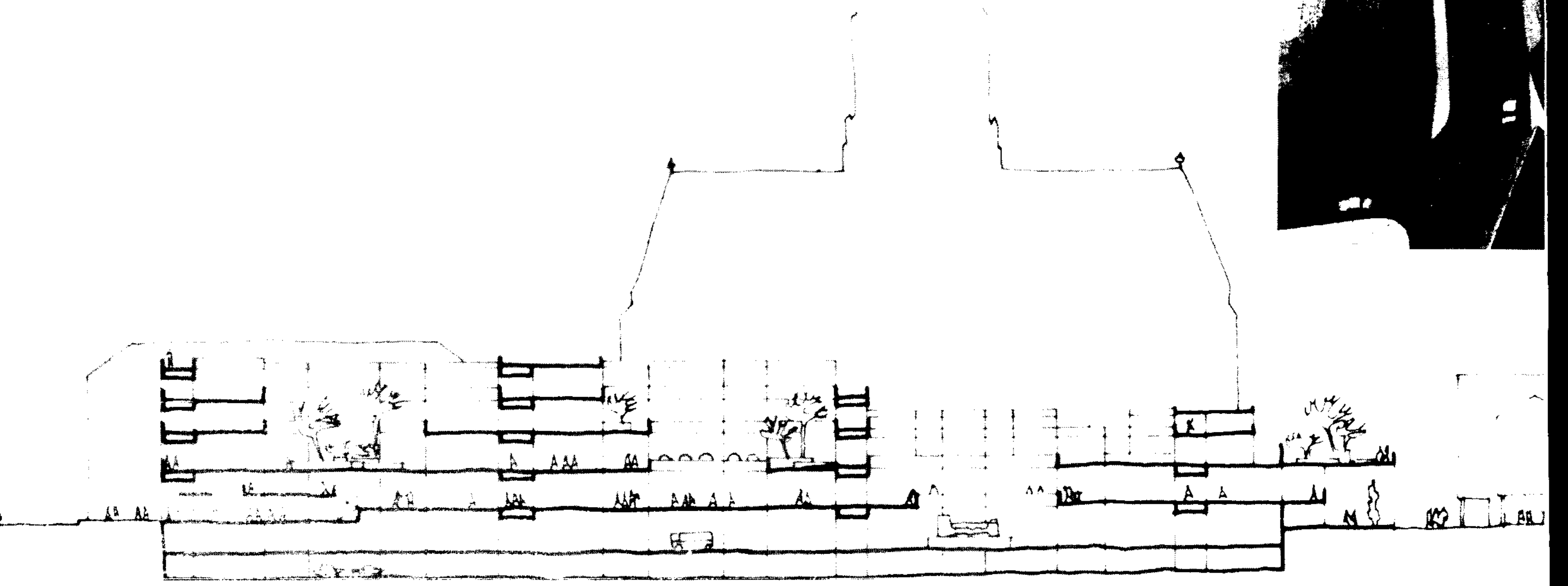
The 1963 proposal for the reconstruction of the center of Frankfurt is a further expression of the city as a living, changing organism **(3, 4, 5, 6)**. It is an attempt to "re-establish the scale" of the older city that is adjacent to it in space, while it provides for the unforeseen needs of the future city, adjacent to it in time. The system here is a multilevel gridwork. The main grid contains mechanical services; while a secondary structural grid, inserted into it, is only built when and where it is needed. "No more can we think of planning in the static terms of 3-D space, when we realize that we live in a 4-D world," Woods told the students at Washington University.

1 The new sector of Bilbao, in northern Spain, uses the stem principle, which is diagrammed below.

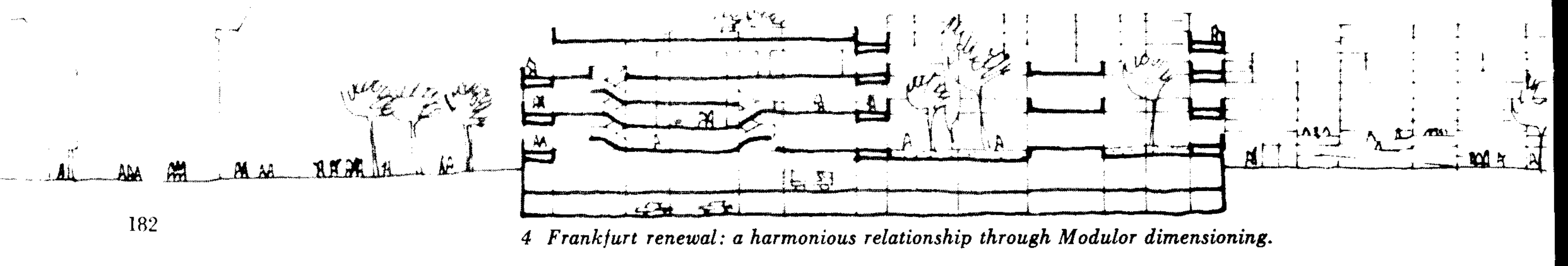




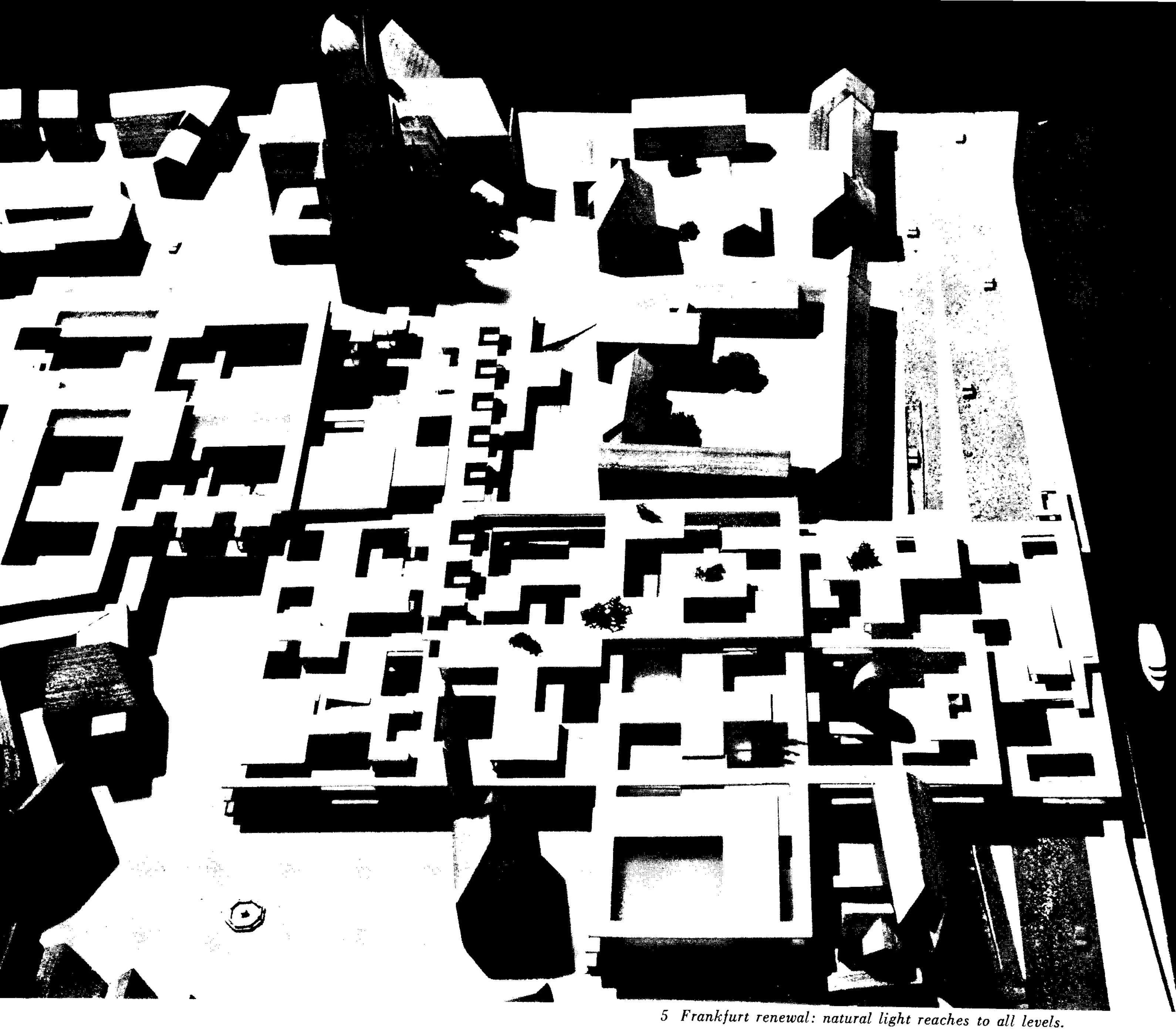
2 *One of four dwelling areas proposed for Belleville ski resort.*



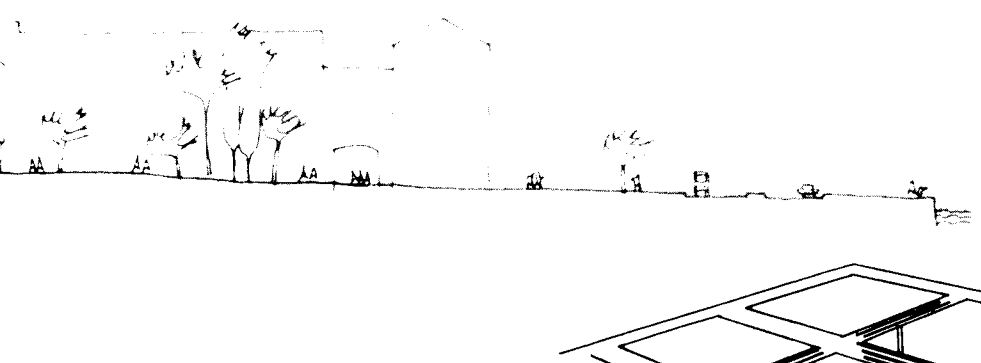
3 *Frankfurt renewal: a simplicity of forms against the historic monuments.*

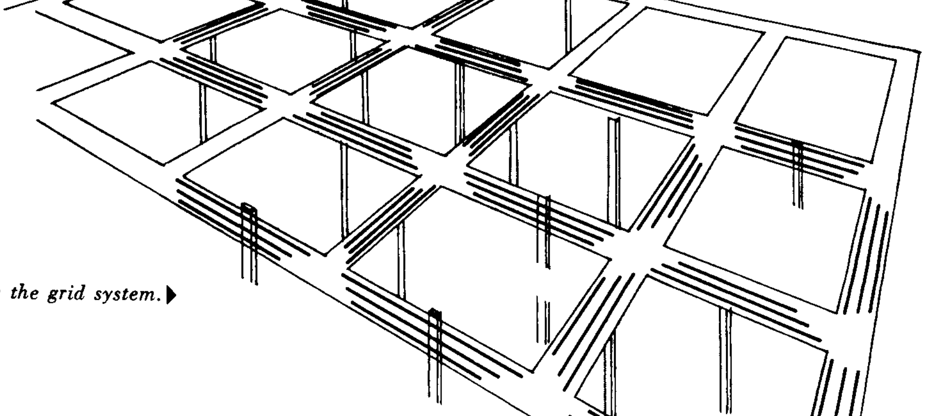


4 *Frankfurt renewal: a harmonious relationship through Modulor dimensioning.*

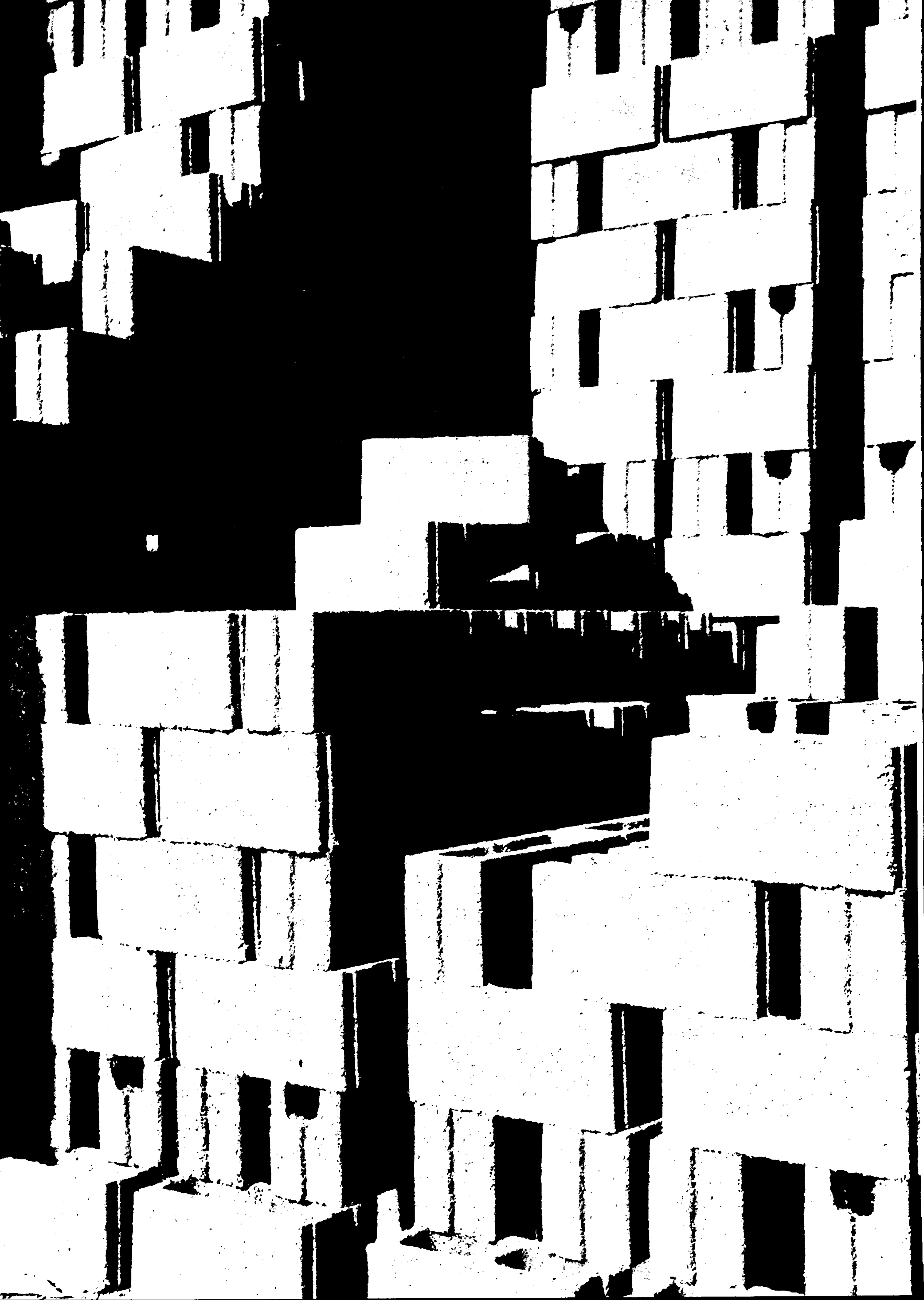


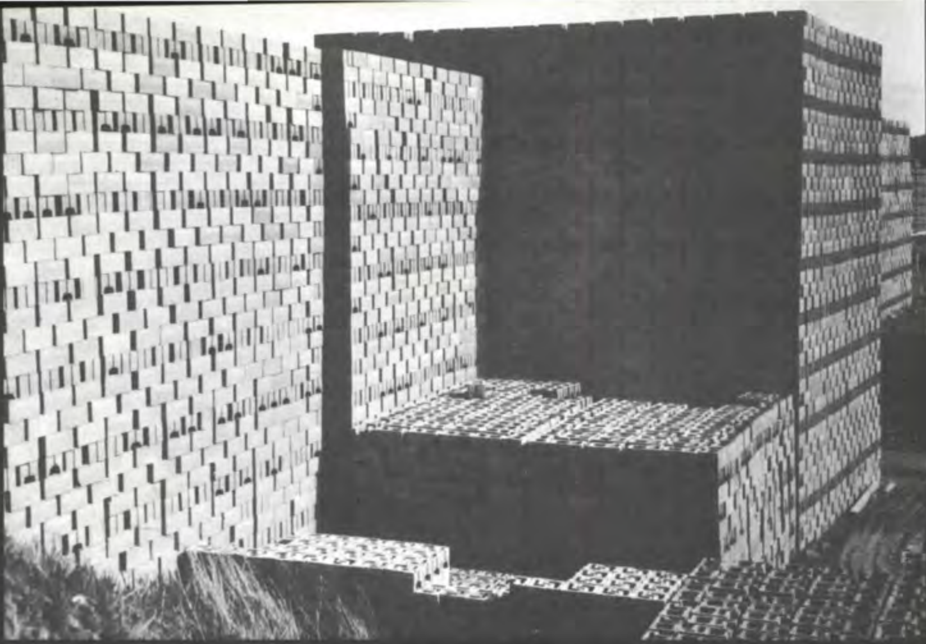
5 *Frankfurt renewal: natural light reaches to all levels.*





6 *Frankfurt renewal: the grid system.* ▶





PREFABRICATED HOUSING:

Three Proposals

The preceding pages of this section offer a quick glimpse into the future urban environment, as visualized by various architects around the world. Their theories seem to fall into two groups. In the first group are the huge structures into which individual cells (even transportation) are placed, the shell being either anonymous and mechanistic, or personal and poetic. In the second camp are the free groupings of separate (or linked) buildings, the total plan permitting growth and change without having its completeness impaired. Each of these broad approaches recognizes the new scales and speeds of this age. Some are based specifically on the industrialized process; others are only tangential to these conditions.

But the grand idea of any architect must ultimately stand or fall on its most intricate workings. Aside from the technical problems in industrialized building, there remains one major aesthetic problem—how to design and combine the parts so that they will have an independent identity as individual units, yet contribute to the over-all unity of the larger organization. This problem exists, in some form, in most areas of human association. And in the new architecture, it will exist whether the parts are to be in-filling for a grid, or additions by accretion.

Answers to this problem will be found in many ways. In these brickyard photographs, for instance, are some intriguing suggestions for the combination of similar elements. The analogy is not farfetched, if the new prefabricated elements (whether a panel, a room, or a whole dwelling unit) are thought of as new building blocks—of a new scale, produced in new ways, and offering new challenges in their assembly.

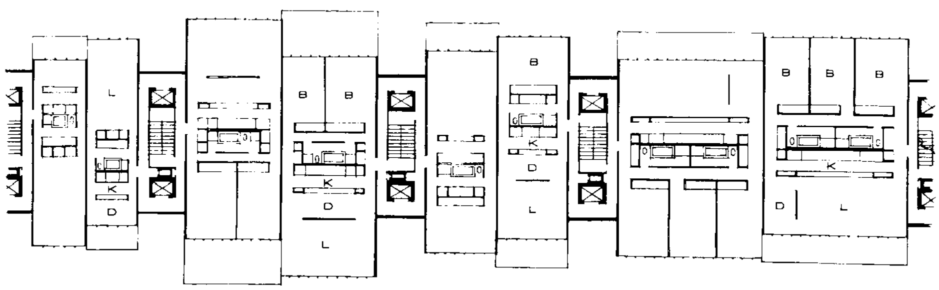
On the following pages, we conclude—for the present—this look into the future, with three of the most interesting prefabricated-housing proposals that have come to our attention. Although each of these proposals makes detailed suggestions for utilizing the new techniques and new materials, it is in the methods in which they combine elements that they offer real hope for a 1984 environment amenable to human habitation.

In the high-rise system by JORDAN GARY MERTZ, articulated and independent units maintain their individuality within the total structure.

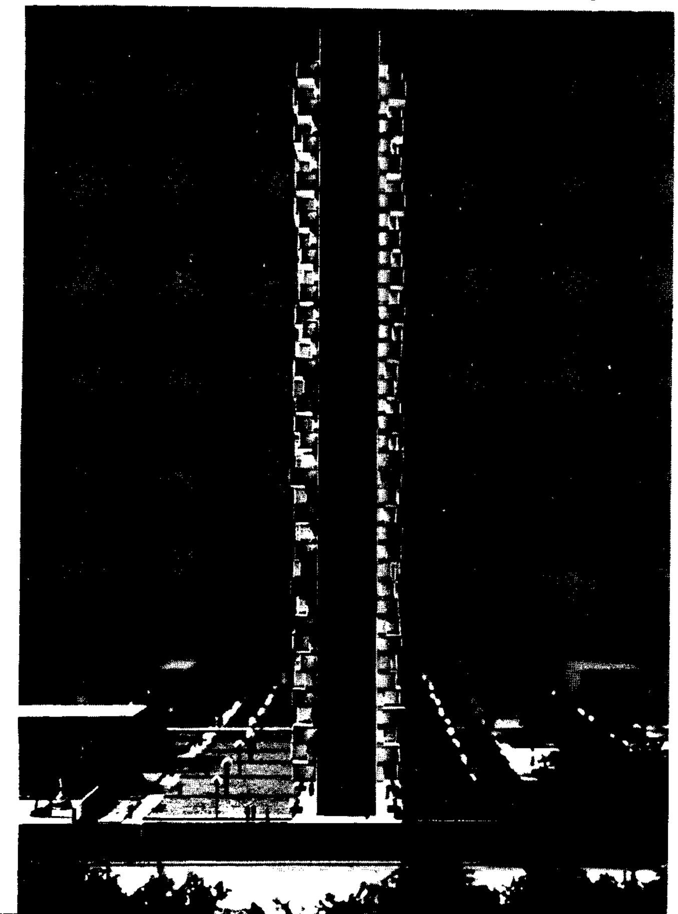
Jordan Gary Mertz, a young New York architect who worked with Eero Saarinen on the TWA and Dulles terminals, has developed what he terms "a completely new approach for repetitive housing." It aims to overcome the usual (visual) failings of multiple dwellings—dullness and dreariness—while at the same time using prefabrication techniques to advantage.

Mertz proposes a building made up of articulated and independent units that maintain their individuality and variety within the total structure. The system has complete flexibility, suggesting any length or height, any combinations or variations. (See p. 149, AUGUST 1964 P/A, for a down-to-earth version of the proposal.)

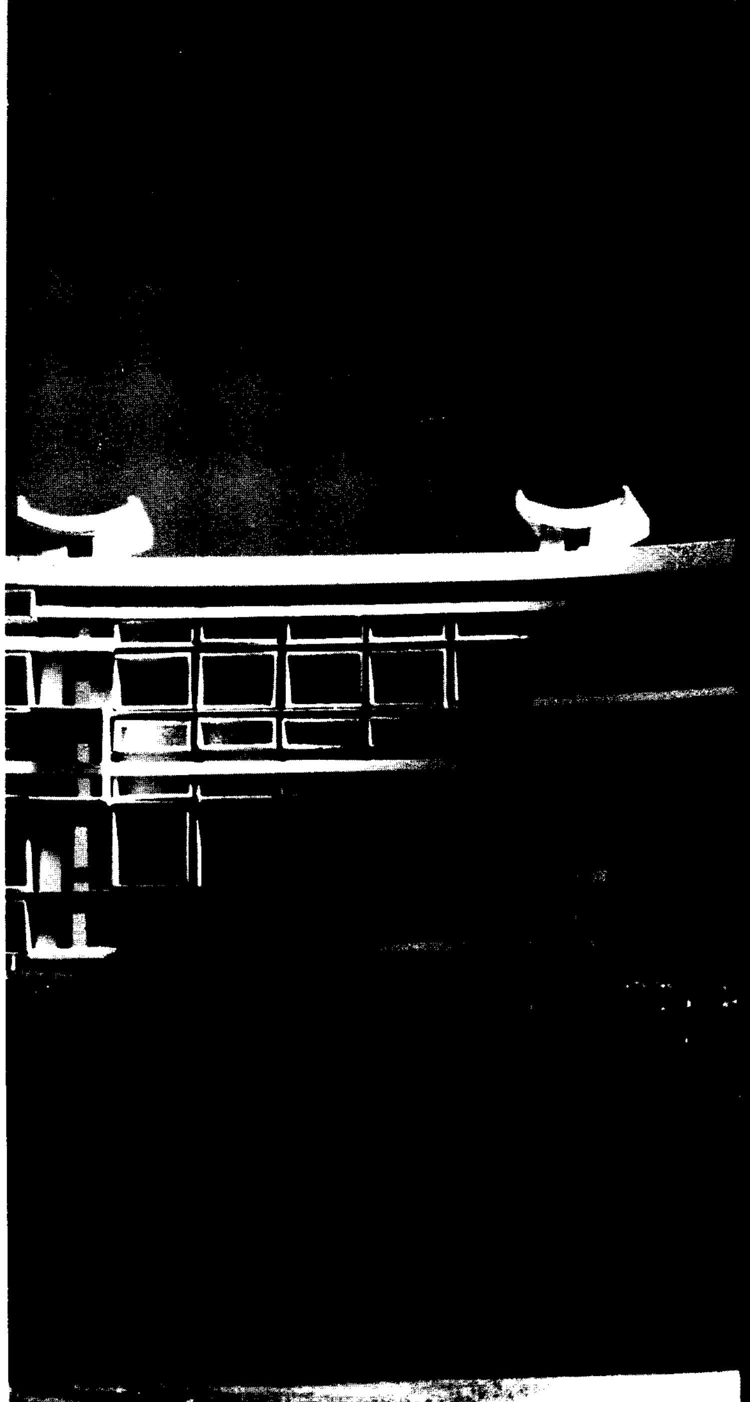
Column supports are hollow cast-in-place concrete, housing all elevators, stairs, ductwork, incinerators, and mail chutes. Between these cores are the apartment units, precast at the site and lifted into place whole. Each unit is glass-walled, floor to ceiling, at two opposite exposures. The apartments are like floor-through brownstones: living and dining areas at one end, bedrooms at the other, and—as a buffer in the center—kitchens, bathrooms, and closets, all prefabricated as whole units.



Units can compose a building of any length, any height.



The Christie-Lew-Loverud OMNIHABITATION, a student project done at Harvard, establishes a permanent matrix to be filled with housing as needed.

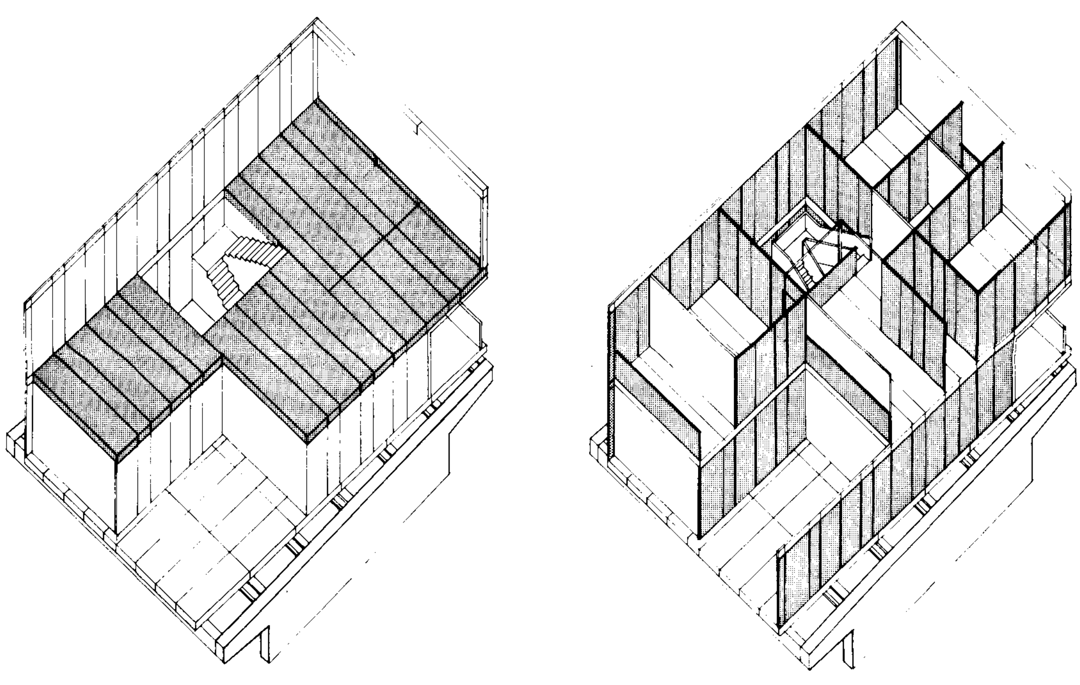


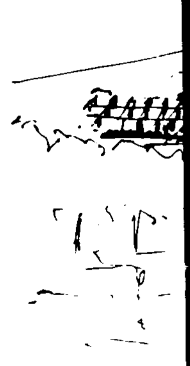
In 1961, three students at Harvard Graduate School of Design proposed what they call "Omnihabitation: a universal housing solution." They do not claim that it is a panacea for all housing ills, but rather that it can be "a tool which has a universal application when used as it is intended." One such application is for high-density satellite communities in the unspoiled exurbs, giving amenities long sought in the new "irreparably debauched" suburbs.

The Omnihabitation maintains the separate identity of dwelling unit and superstructure "like bottles in a bottle rack." The matrix (bottle rack) is considered a permanent structure, made of slip-formed and precast elements, to be filled with housing units as needed. The units are of many types—simplex, duplex, or triplex—to be chosen from a catalog according to an elaborate system that pinpoints the needs of many family types. Also, each dwelling can be changed with changing family needs.

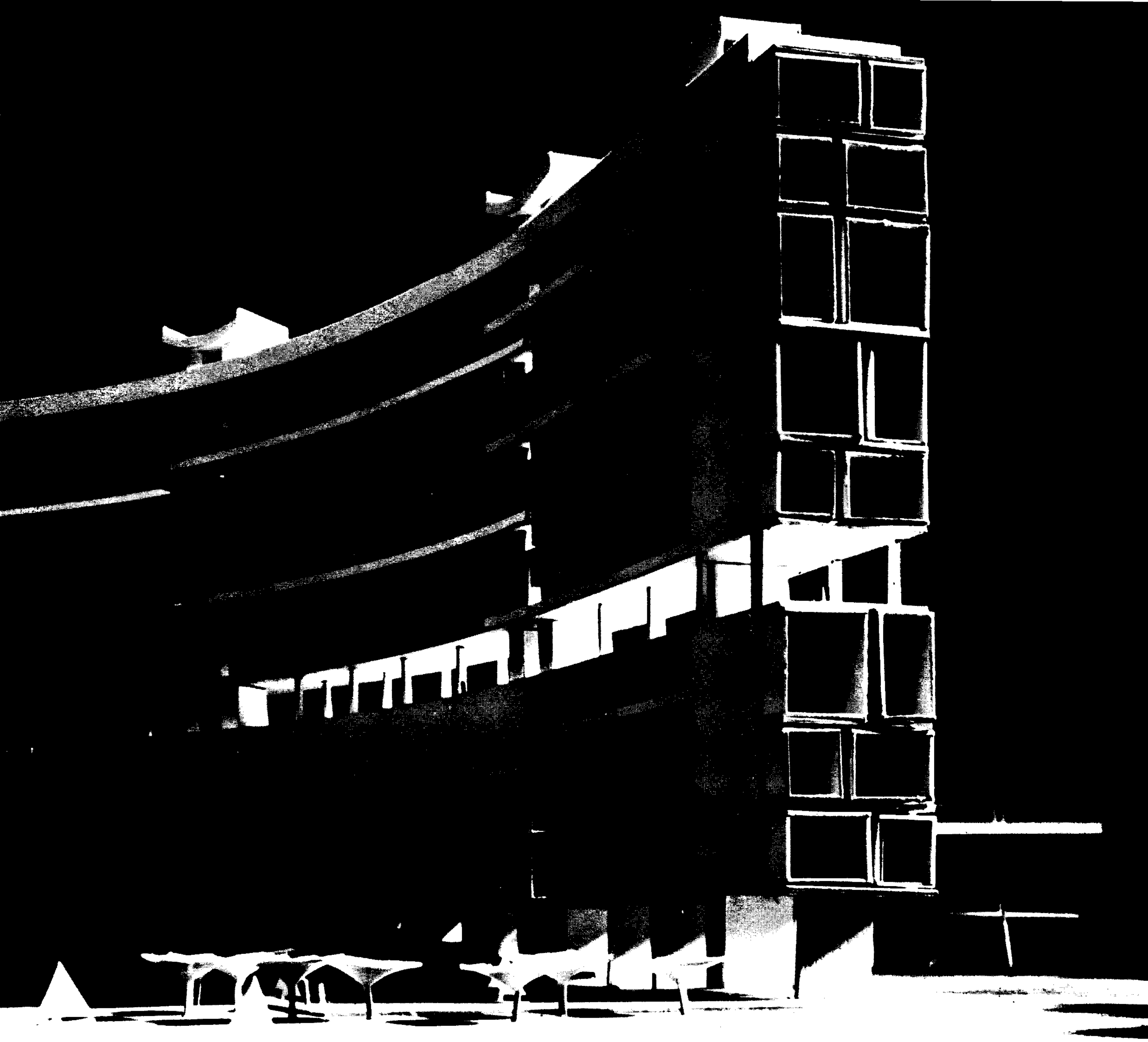
The Omnipanel system of standardized prefabricated components consists of structural plastic sandwich panels, with different cores making them suitable for floor and ceiling slabs, exterior bearing walls, and interior partitions. The panels are capable of being combined in numerous ways; dimensions are based on the *Modulor* system of proportions **(1)**. In both its panels and its joining techniques, the Omnipanel system uses plastics, which can be specially formulated for specific functions—and which lend themselves to a machine technology in ways that natural materials can not.

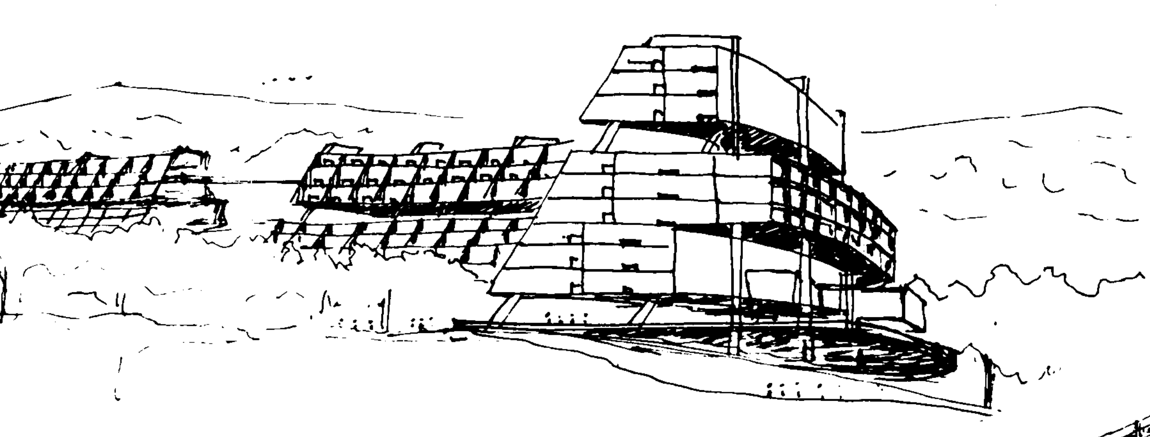
In the concluding pages of their report, these students suggest a PVC Capsule, completely fabricated in the factory, for the transient housing demands of a mobile society. Their sketches suggest how a matrix of varied design can receive either Omnipanel or PVC dwellings **(2)**. The students were Alden Christie, Eugene Lew, and Robert Loverud. Consulting engineers were Professor Albert G. H. Dietz of MIT, and William J. LeMessurier.

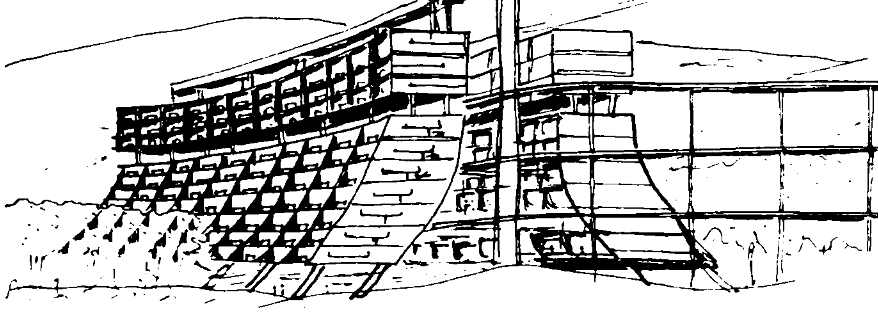




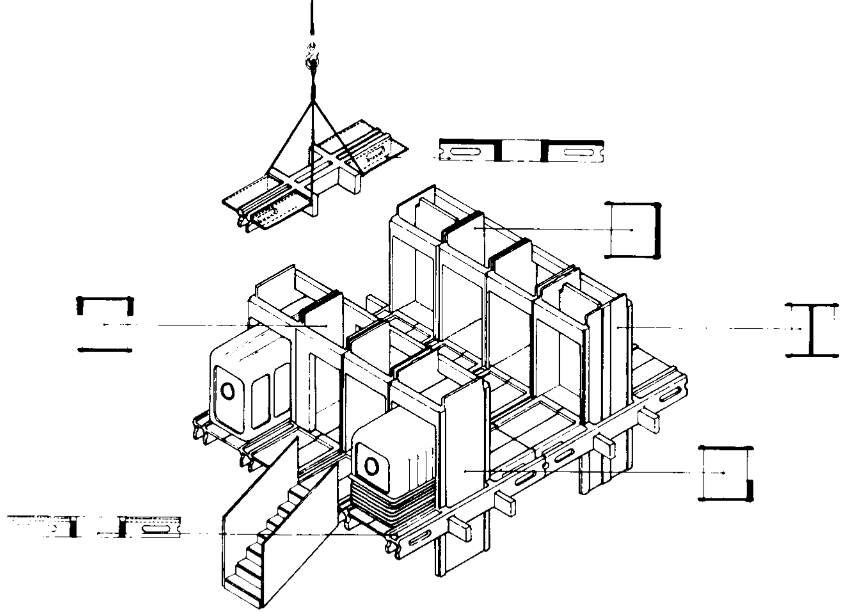
1 Units are constructed by combining, as needed, any number of the 35 standard sandwich panels.



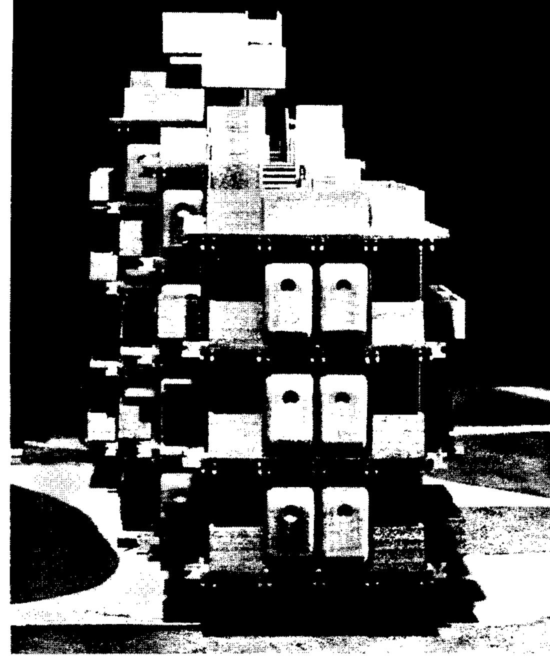




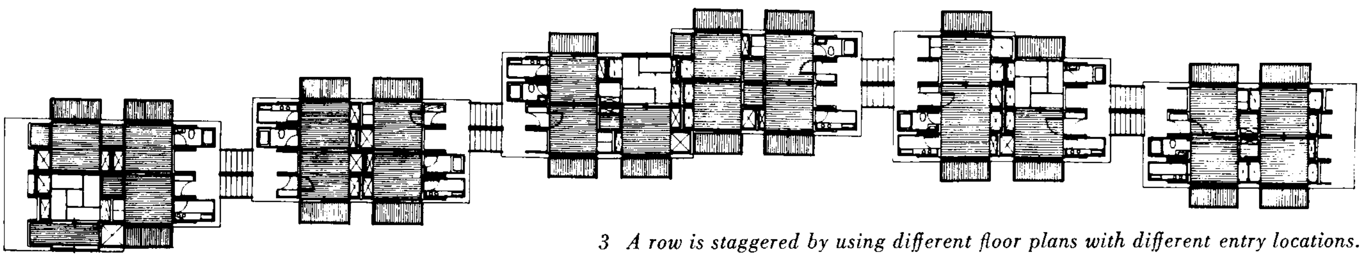
2 *A variety of forms is possible: here, two ziggurats.*



1 *Parts are precast concrete in this all-dry system.*

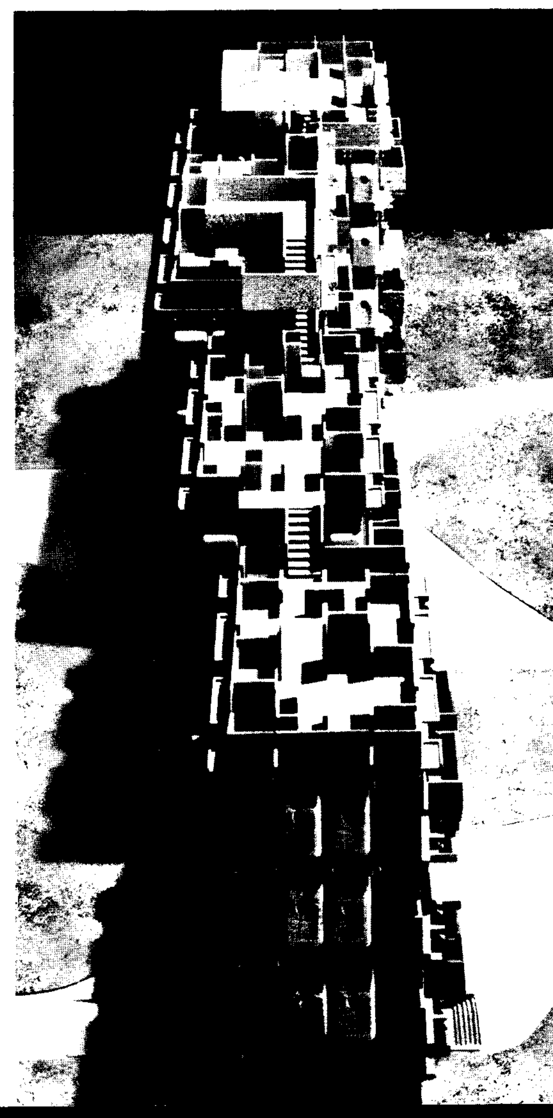


2 *A row of staggered units.*



3 *A row is staggered by using different floor plans with different entry locations.*

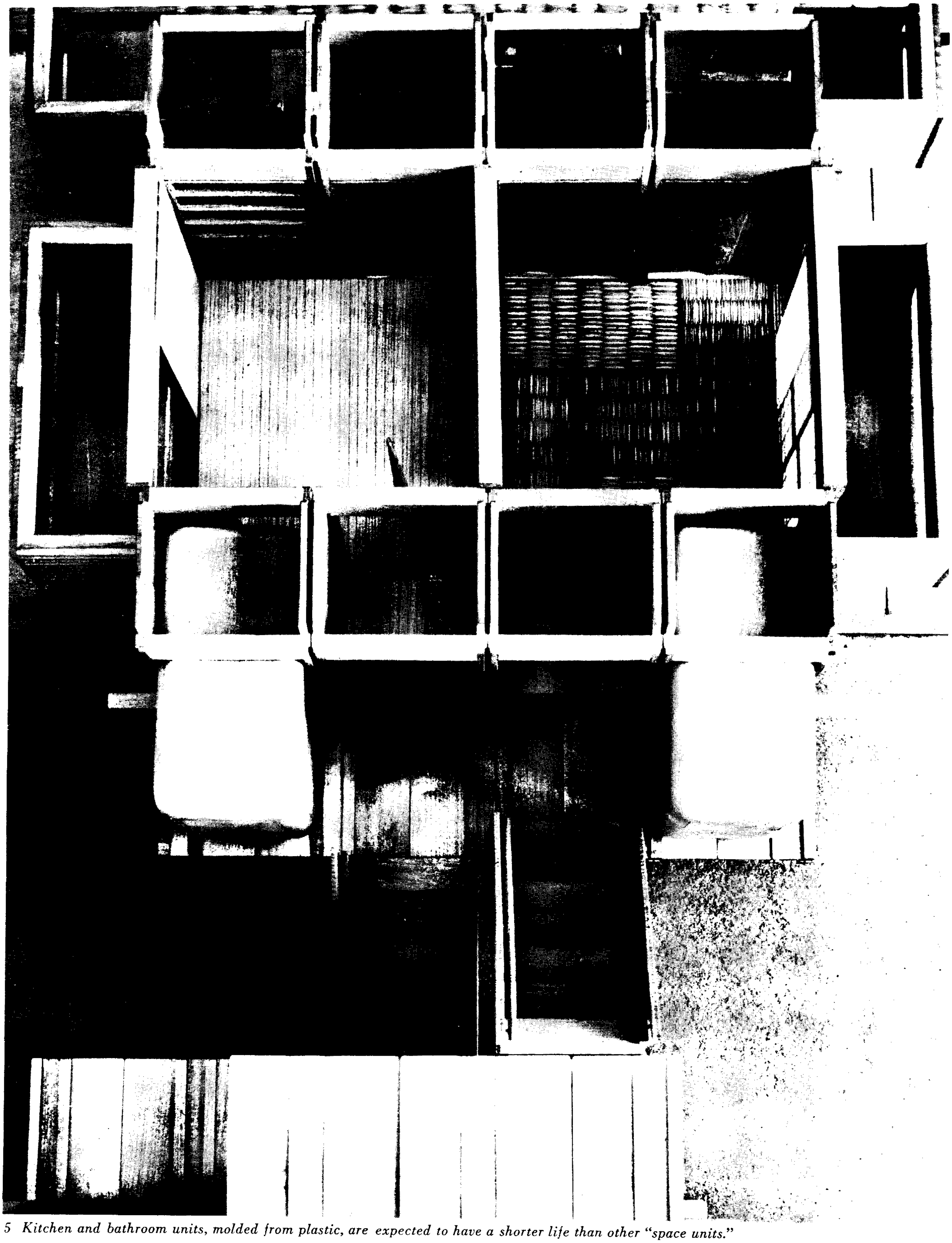
4 *The resulting richness of form.*



The apartment project by NORIAKI KUROKAWA has great richness of form, despite the fact that all units are standardized and mass-produced.

Noriaki Kurokawa feels that both quality and quantity are vital concerns of architecture today. He does not think, however, that the necessary mass production of housing can be patterned after the mass production of automobiles, because of the difference in their length of life. With cars, the replacement of parts is more important; with houses, it is the wide selectivity among a variety of products (**1**). Nevertheless, he combines aspects of each—the kitchen and bathroom units, molded from plastic, are expected to have a shorter life than other "space units" (living rooms, bedrooms, etc.). In his words, he is in pursuit of "metabolic space" (see page 168).

Kurokawa believes that the technique of joining is not just one of combining, but also one of separating. The staircases of this project are precisely this kind of combining-and-separating device; a row of apartments is articulated by them and can be staggered by using different floor plans with different entry locations (**2, 3, 4**). Plans are based on traditional mat sizes (**5**). It is an all-dry system, utilizing precast-concrete elements; even the balconies are precast clip-on units.



5 *Kitchen and bathroom units, molded from plastic, are expected to have a shorter life than other "space units."*

INDUSTRIALIZED BUILDING: Western Europe

BY EDWARD T. SHIFFER

A movement toward fully industrialized building has been underway in Western Europe since World War II. Although only a small part of an enormous potential has so far been realized, this movement is accelerating. A general report of this activity is reviewed here and five of the "building systems" are described in detail. The author, who gathered material for this report during a recent trip through Europe, has an architectural practice of his own in New York and is a member of the Research Department in the School of Architecture at Pratt Institute.

To the architect, as designer, architecture is like an iceberg, right side up. A tiny part is visible to his professional attention through the exercise of his selective taste and appearance in the pages of his magazine. This tiny part is all right, it is good, at times "beautiful," at rare times inspiringly so.

When the architect, as designer, becomes simply a citizen, the iceberg is irrevocably inverted and the huge submerged portion is exposed, dripping its ugliness and meanness. This is our present urban and suburban environment, steadily growing uglier and meaner. No power that the architect can exert, through education, example of "good design," or direct pressure, seems to be able to bring the iceberg right side up again.

We like to speak of this environment as "background architecture," as if mankind conspires to create a great gray setting for our shining jewels. On this matter two positions can be taken. The first is that we assign to the people who live in and use this background architecture the status of gray, faceless "background people." In this case, the architect is not concerned with the general building environment. He is a singular artist creating for his appreciators and select users good and beautiful buildings that exist only for themselves. The fact that the rest of building is not significantly influenced is unfortunate, but nothing can be done. All is well, then, and we can go on working cheerfully in our exclusive way. The second position is that the architect is deeply involved with all building and that something is wrong. If the overwhelming majority of our new buildings do not satisfy human needs in the opinion of specialists in the design of buildings, the architects, then a radical change of some kind is called for, and society is making incredibly limited use of the skills developed by the architects.

As Doxiadis points out in his new book *Architecture in Transition*, the monumental or foreground buildings of preindustrial societies were designed by artful practitioners of the building skills common to all buildings. These designers had emerged from the general body of builders due to their superior abilities. Today, the architect is a specialist whose inspiration and training arise from thought and examples developed essentially in isolation from the mundane and common building practice.

It will be argued in response to this that today's architect must be a leader. His successful adventures in form, it is implied, will serve to raise the general level of design. This does not seem to be the case, however. The voluptuous romanticism of the new Yale School of Art and Architecture, appealing as it is, repeated again and again would create streets, blocks, and neighborhoods of unbearable agitation of feeling. Lever House, the Seagram Building, and the Pepsi Cola Building thrive in their cold but satisfying classicism in a masonry environment. Mindlessly imitated for block after block on lower Park Avenue, their style creates a street of glassy-eyed horror. Only a slight amelioration in horror would result if the imitations were more skillfully done.

The need for new building throughout the world is under pressure due to the immense population increase, betterment in living standard, and many other factors. If we subscribe to the second position—that architects are concerned with all buildings—then the contemporary architect has been a failure. The visual and human poverty of our new townscapes and suburbs is coupled with the sad fact that frustration of their basic social aims is planned into these new projects.

The blame for all this has been placed on low levels of public taste and education, the overriding influence of the profit motive, the restraining hand of tradition, and the stifling effect of Governmental regulation. This blame is well placed. But the building profession is also responsible. It is frequently said that the public gets the Government, the education, and the buildings that it deserves. If the public wanted better, it would get better, is the corollary. To want better is primarily to know better. And this is the particular point of leverage of the architect. Proposals must be made by the architect for new solutions to the building problem that are needed, desirable, and feasible on a massive scale. These proposals must be in tune with economic reality; they must reflect awareness of desirable patterns of living in a crowded urban context. They must satisfy the needs and aspirations of the people who use the buildings and they must create streets and neighborhoods of livability and beauty. A genuine understanding of economics, sociology, planning, and architecture must permeate these proposals. Finally, to be fully useful as example, these proposals must be in the form of actually realized pilot projects.

New Building Methods Needed

The enormous size of the task casts into serious doubt the ability of present building methods to produce the volume and quality needed. New building methods—industrialized methods—are the means for achieving this volume and quality. It is part of the present task of the architect to invent humane and fruitful ways of using these methods.

In Western Europe, at this moment, some architects and builders are beginning this work. A movement toward fully industrialized building has been underway since World War II. Although only a small part of an enormous potential has been realized so far, this movement is accelerating. Five to ten per cent of the current housing production in France, Scandinavia, and Holland is now accounted for by the new methods, and will be described fully in this article. The extensive Russian experience in mass-produced housing [JUNE 1961 P/A] and the prefabricated schools of England [DECEMBER 1950 P/A; JULY 1957 P/A] are both significant and interesting, but lie outside the scope of this article.

Generally, four main advantages are hoped to accrue from the industrialization of building. First, a better building will be produced, both in design and quality of performance. Second, a less expensive building will result. Third, the elapsed time between the ordering of the building and its occupancy is decreased. Fourth, the building industry can produce more buildings with the same human resources.

So far, the first three advantages have

been marginal, at best, in Western Europe. The prefabricated buildings as a group are architecturally no more distinguished or exciting then contemporaneous traditional buildings. They certainly display no significantly greater refinement of finish or mechanical performance. In some cases, the appearance and performance are inferior.

The bulk of the work in industrialization of complete buildings has been in the fields of housing and schools. The people directly concerned with these projects are in agreement that costs are generally of an equal magnitude, sometimes more, and never greater than 10 per cent less than conventional buildings. Although the actual construction time on the building site of most of the building systems is dramatically less than the normal construction time, the over-all time from order to completion is, in most cases, of the same magnitude of duration as conventional techniques.

Labor Shortage

However, the use of industrialized construction is spreading widely and it is the fourth advantage that is at the root of this. The universal theme that runs through all analyses of the necessity for industrialized building is "labor shortage." After World War II, Europe was left with extensive destruction of buildings, loss of five years or more of building effort, and a tragically induced loss of young men. Government authorities, professional people, and contractors, all working in their own spheres to produce the needed buildings, faced constantly the limitations imposed by the slowness of hand labor. As the late 1940's became the early 1950's and as capital became available for more building projects, the situation became more severe. Men were not flocking to the building industry, but were seeking factory jobs and white collar jobs with their advantages of steady employment, better working conditions, and greater prestige.

The painful need for new housing and schools existed, the financial and material resources to fill some of this need existed, but the productive capacity of the building industry did not. In Denmark, the situation is still critical enough so that the government has to issue licenses for buildings to insure that the scarce labor resources are used on what are felt to be the most socially necessary.

Therefore, government officials, professionals, and contractors turned to ways of increasing output per scarce labor hour invested. In Britain, various local governmental authorities and the national government commissioned the development of industrialized building systems. In Denmark, the government encouraged these systems by granting better financing and, in certain cases, by refusing to give licenses to projects that used conventional techniques. In other European countries, similar patterns of government action prevailed.

Contractors, such as Larsen & Nielsen of Denmark, and Camus of France, developed their own industrialized systems and found that they could enter the market competitively against traditional building and win contracts. Proprietary systems now exist by the dozen in almost all countries. Since much of the housing work has government-insured financing, and since all of the schools are built by government agencies, the private financial institutions have felt generally secure about lending money for buildings constructed with these new techniques. Their traditional conservatism has not been much of an obstacle for this reason. More of an obstacle has been the unwillingness of the labor unions to revise their practices to accommodate these new techniques, although in Sweden, and in Denmark, certain unions have formed building societies and actually constructed industrialized buildings, at the same time as the union membership was engaged in traditional buildings.

In design, structural engineers have been in the vanguard. The appeal of efficiency, mechanization, and economy is quite attractive to the engineering mind. With some exceptions, architects have been disinterested or disapproving, expressing frequently the sentiment that the industrialization of building is going to deprive them of their occupation.

Some of the "building systems" that are the products of this development have been evolved by individual professionals and co-operative building societies, but most systems are the property of large contracting firms. Five such systems, typical ones, will be described in detail later, but first some general description of trends and common problems is in order.

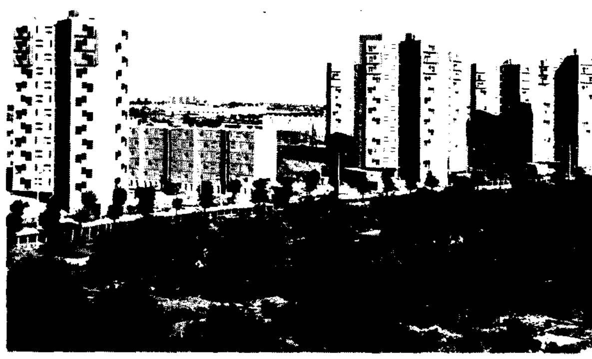
Today's Trends

The principal building type is the long slab block. It is a walk up under six stories **(1)**. Twenty-two story towers and tower slabs **(2)**, Y-shaped **(3)** and curved buildings **(4)** have also been built. The access to the units has been made by balcony, by long corridors, and by closely spaced stairs and entry halls. Balconies are frequently used, both projecting and recessed. Site planning has been undistinguished, with little or no

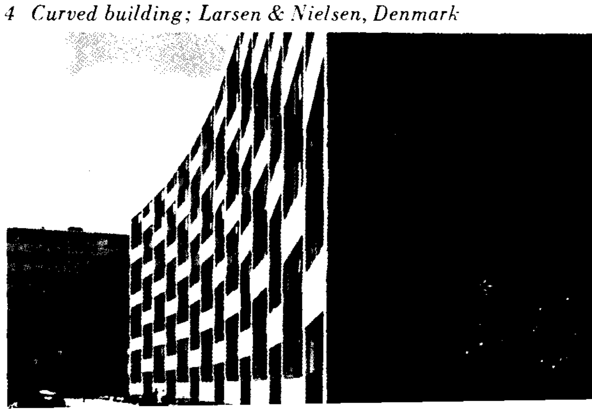
1 Long slab block; Coignet system, France

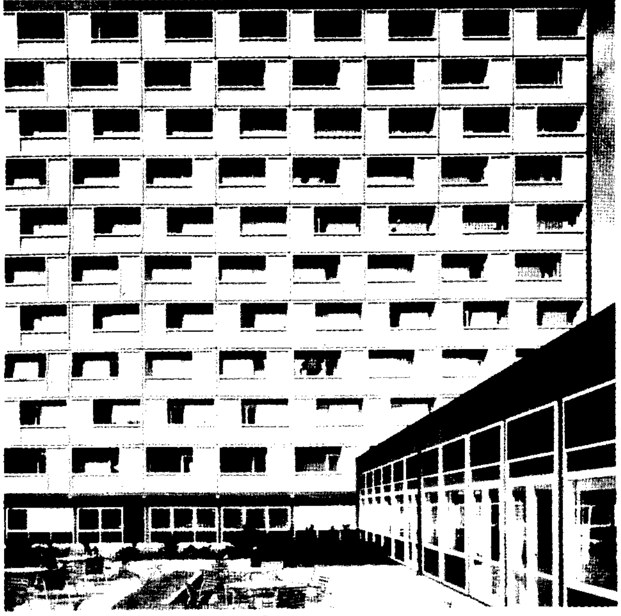
2 22-story tower; Camus system, France

3 Y-shaped buildings; Camus

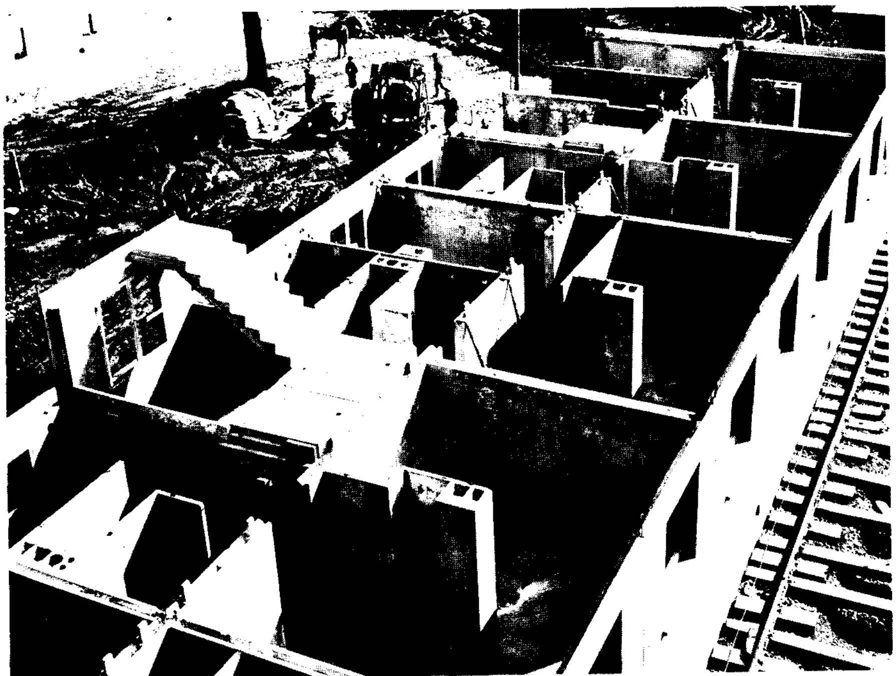


4 Curved building; Larsen & Nielsen, Denmark



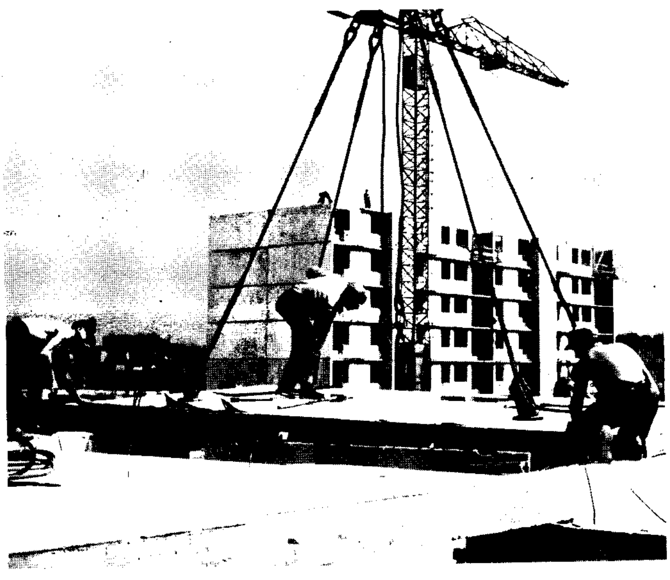


5 *Imaginative precast façade*



6 *Box frame; Coignet*

7 *Wall elements; Larsen & Nielsen*



8 *Floor element being placed; Camus*

attempt to form useful and beautiful outdoor spaces with the buildings except for a few fine Danish projects. The living units themselves have small rooms, distinctly separated from one another in the European tradition. All apartments have completely equipped kitchens and bathrooms.

The block form resting squatly on the ground is not an exciting shape, and in all but a few cases the design is pedestrian. In these few cases, notably in Denmark, the designers are becoming aware that the large units give a new scale and a new texture to the fabric of the building, and are willing to express this **(5)**.

Structurally, the commonest type is the box frame **(6)**, which has bearing crosswalls every 10 or 12 ft, with floor slabs spanning between. Façades are generally nonstructural. The wall elements are normally precast-concrete slabs one story in height, 4 to 7 in. thick, 4 to 21 ft long, and weigh from 1 to 10 tons **(7)**. Floor elements are 6 to 7 in. thick, 10 to 15 ft long (parallel to their span), 4 to 21 ft wide (perpendicular to their span), and weigh from 2 to 10 tons **(8)**. They are sometimes solid and sometimes made with cylindrical voids.

Most European codes prescribe, with great humanity, maximums for sound transmission between apartment units. So far, the least expensive way to achieve this has been through dense concrete construction. Since these heavy walls can also be used for bearing, precast-column and beam-frame systems **(9)** are much in the minority, although a few have been successfully used in Sweden and Denmark.

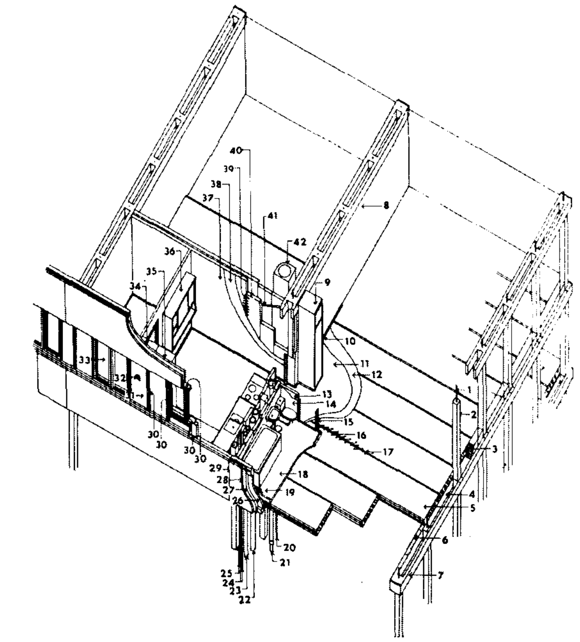
The Swedes are now working on a system using entire precast rooms, complete with floor, ceiling, and walls stacked like shoeboxes, which is the ultimate development of this type of structure **(10)**. When delivered, these rooms are complete with exterior walls, glazing, doors, floor finish, and wallpaper.

Exterior wall panels, generally nonload-bearing, but not always, have been made in timber-framed panels **(11)**. Concrete sandwich panels, however, with a layer of rigid insulation between two outer layers of concrete, are the most common type. They arrive complete with an integral exterior finish—or a factory-applied material such as ceramic tile, window frames, and glazing.

One of the principal problems, naturally enough, occurs at the façade joint. The interior joints have to accept the rather large tolerances that result in producing single units that may be as much as 21 ft long; the façade, however, has to accommodate these large tolerances in addition to being water- and wind-tight. The most successful joint is the open, dry, drained joint (12) developed by the Danes and characteristic of the Larsen & Nielsen system discussed below.

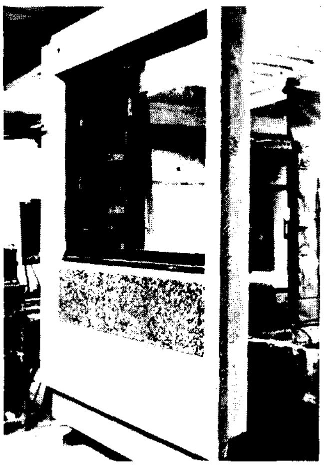
Almost universally, the interior finishes are dry. When cast, the wall panels and the bottom of the floor panels are made smooth and flat. When the tiny surface imperfections are filled, they are ready for conventional painting or papering; a variety of thick, paint-like surface coatings has also been developed for the purpose. In Scandinavia, a wood floating floor is applied to the floor slabs, while in France resilient tiles are commonly used.

Although convectors and radiators under the windows are frequently used for heating, the most common method employs radiant coils placed in the floor panels at the factory. Some projects have been built with preassembled plumbing trees and a few in France and in Sweden have installed complete bathrooms, preassembled in a concrete box which forms the floor and walls of the room. A Swedish company, Skanska Cementgjuteriet, has in mass production a complete bathroom-kitchen-heater room unit for single-family houses. The unit, called the "heart," weighs 10 tons (13); in spite of this, they have been sold and shipped for use in locations quite remote from the factory. Some experimentation has been conducted to adapt the "heart" to multifamily buildings, but it is not yet in commercial production for this use. Methods of producing the floor, wall, and façade panels vary widely. At one extreme is the movable on-site factory used by the Swedish Sundh System, or the French Barets, to be described in detail later, in which all panels are made near their point of final use and transported and placed by the same crane. The advantages of low capital investment and flexibility result, but with inevitable consequences of slower productivity, less precision, and more hand labor than the factory-made systems. Larsen & Nielsen, also to be discussed more fully below, makes the panels in a central factory; however, a great deal of hand labor is used in mold assembly, reinforcing, transporting and placing concrete, and stripping forms. They claim to be able to adapt their panels to a variety of designs. There are more highly mechanized central factories like Coignet or Jespersen, both reviewed below, which have great speed and precision, but the varieties of units they can produce are somewhat limited. Naturally, the capital investment is great and a large volume of production

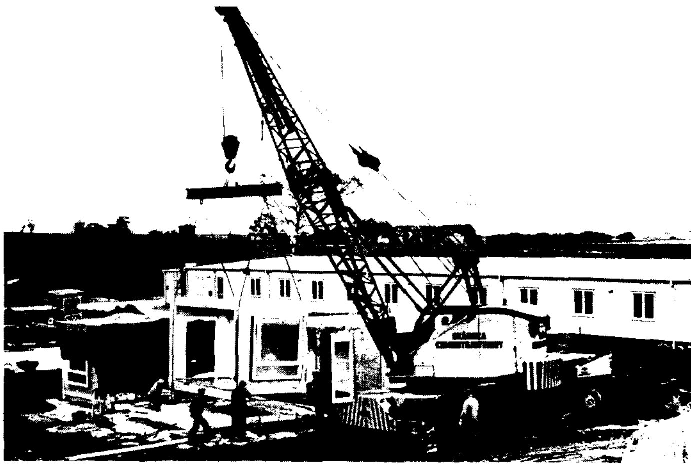


Key to isometric (above). 1 dowel; 2 concrete column; 3 rock wool; 4 asphalt; 5 floor slab; 6 cork pad; 7 floor beam; 8 dividing cavity wall; 9 joinery; 10 skirting; 11 linoleum; 12 cork underlay; 13 sprayed-on skim coat; 14 wall linoleum; 15 door lining; 16 joint coating; 17 cement mortar; 18 mosaic finish; 19–25 service ducts; 26 load-bearing concrete; 27 insulation; 28 external concrete; 29 weatherproofing; 30 synthetic rubber strip; 31 facing unit; 32 larder vent; 33 triple-pane window; 34 larder; 35 refrigerator; 36 wall cupboard; 37 wall finish; 38 two coats sprayed skim; 39, 40 foam concrete; 41 cross ties; 42 prefab rubbish chute.

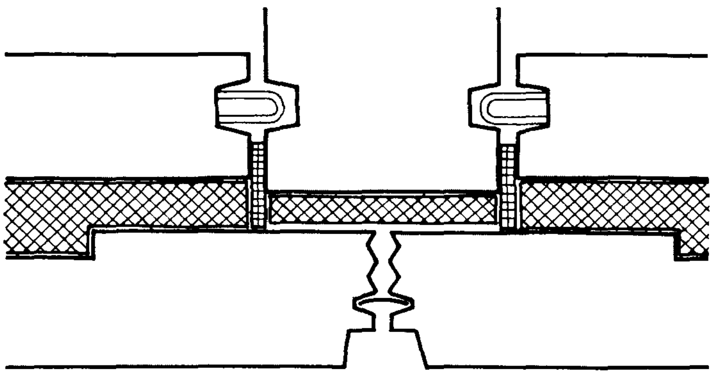
9 Precast column and beam framing



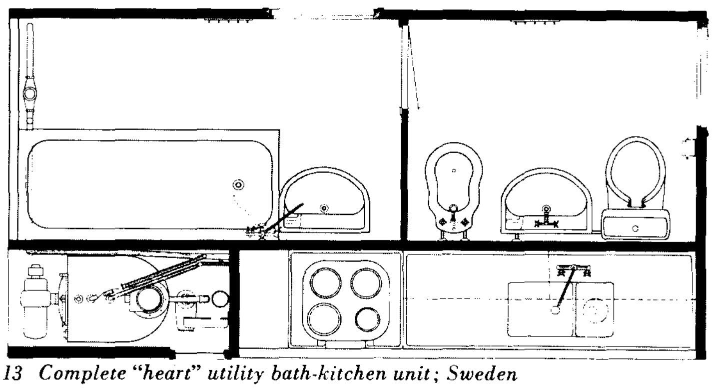
11 Exterior wall panels; Larsen & Nielsen



10 Precast rooms; Corpus system, Sweden

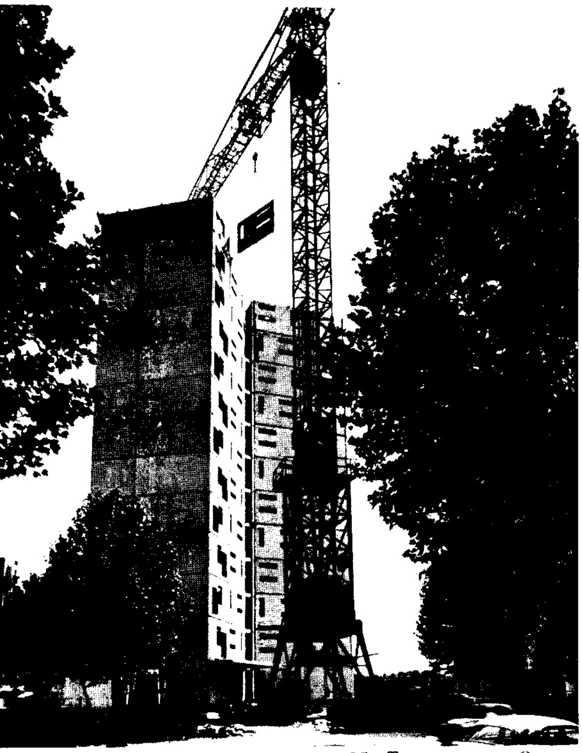


12 Open, dry, drained joint; Denmark



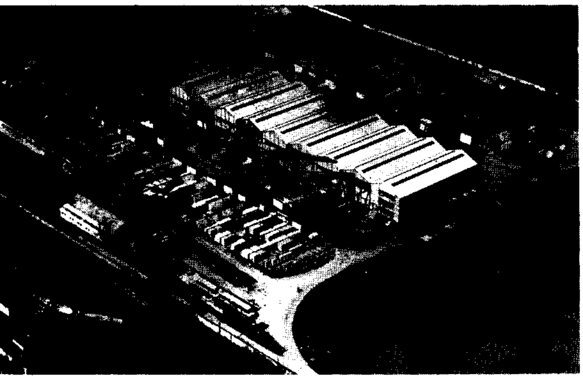
13 Complete "heart" utility bath-kitchen unit; Sweden

14 Transport on A-frame trucks: Camus



15 Tower crane; Camus

16 Camus factory; Montesson, France



17 Mechanically operated panel mold; Camus

is essential to economical operation.

Fabrication/Erection Techniques

In most methods, preassembled reinforcement cages are placed in the forms; the concrete, frequently heated, is then poured into the forms that are normally heated; vibration is almost universally used; stripping takes place from a minimum of two hours in the Jespersen system to a working day in the Larsen & Nielsen system. Generally, the floor panels are poured horizontally and kept in that position, except during transport when they are carried leaning upright on A-frame trucks **(14)**. The cross-wall panels, with light or no reinforcing, are poured, stored, and transported vertically.

After curing for a week or two, the off-site factory-made panels are placed on the A-frame trucks and transported to the factory. The French systems consider a 40 to 60 mile range as the economic maximum shipment range, although Larsen & Nielsen, in Copenhagen, has made and shipped by truck and water a housing project to Hamburg, Germany, a distance of 195 miles.

A tower crane picks the panels off the trucks and places them on the building **(15)**. Exact scheduling is essential to avoid either double handling of panels or tie-up of the truck trailers. Special diagonal braces hold the wall panels erect while grout is placed at the bottom. Floor panels are then placed, leveled, and fixed on top of the walls. Myriad devices for leveling, holding, and fastening are available. Foundations are generally site-cast in a conventional manner, but precast terrazzo stairs and bathroom floors are widely used. The site work for the typical radiant heating consists generally of hooking up pipes in adjoining panels. Plumbing is usually done in the conventional manner.

The most important factory-produced systems in France are the Camus and Coignet systems. At once the earliest and the largest entrant in the field of French postwar prefabricated housing, the Raymond Camus organization **(16)**, has completed over 40,000 flats since their first experimental work in 1949. Their factories or licensees' factories in France, Algeria, Russia, Germany, and the Ile de la Réunion are capable of producing 60 flats per day. New factories are in various states of development in Argentina, Brazil, and Great Britain. The decisive moment for the success of the system came in 1952 when the French government, anxious to develop new methods of cost- and labor-saving construction, selected the Camus Company to build 4000 flats at Nanterre just northeast of Paris. A permanent factory was built to produce these flats. In the two-year span of this project, the factory was almost completely amortized. From that point on to the present, the work of the company has been constantly expanding.

Camus

The emphasis of the Camus System is on simplicity, flexibility, and productivity. They will study new molds for a project as small as 200 units. Although their factory is highly mechanized **(17)**, it does not contain the complex machine-operated molds of the Coignet System. Panel sizes may be varied, but panel precision and quality are not as high as in Coignet. Measurement and shimming are necessary during the erection process to place the panels in their final position.

Typically, the housing units are box frame, with all elements precast and moved by crane into position. Façades are concrete-polystyrene-concrete sandwiches, at times load-bearing and at times not. Interior walls and floors are solid, reinforced concrete approximately 14 cm thick. Partitions are concrete, 7 cm thick. Maximum panel size is 7 m long by one story in height, weighing 7 to 7½ tons. Floors are cast in room-size units to avoid ceiling joints and have heating pipes and electrical conduit cast in. Door frames, windows, and ceramic tile finishes are also put in at the factory. Site work includes hooking up the pipes and conduits; reinforcing and grouting the panel joints; and filling and painting the concrete panels for the interior finish. Plumbing assemblies, staircases, and railings are prefabbed in large units and site assembled.

The Camus Factory SERPEC in the Paris region receives its aggregates and cement from barges on the River Seine, which abuts the site. Concrete is mixed automatically and transported to the forms by towed cart or pipeline. Forms for the interior wall panels are in vertical batteries that are heated for a 3-4 hr cycle of use. Exterior sandwich panels are cast horizontally in flat steel plate forms with movable edges. These forms are tipped up for demolding to avoid the use of special reinforcement for demolding stresses and are used in a 12-hr cycle. After curing in the stockyard, the panels are trucked to the site. One tower crane will erect two apartments per day, using approximately 50 panels. The day after the panels are hoisted and temporarily braced with diagonal rods, the crane moves to another section of the project and the panels are aligned and grouted. The next two days are allowed for the curing of the grout. At this point, the panels are ready to receive the next story.

Coignet

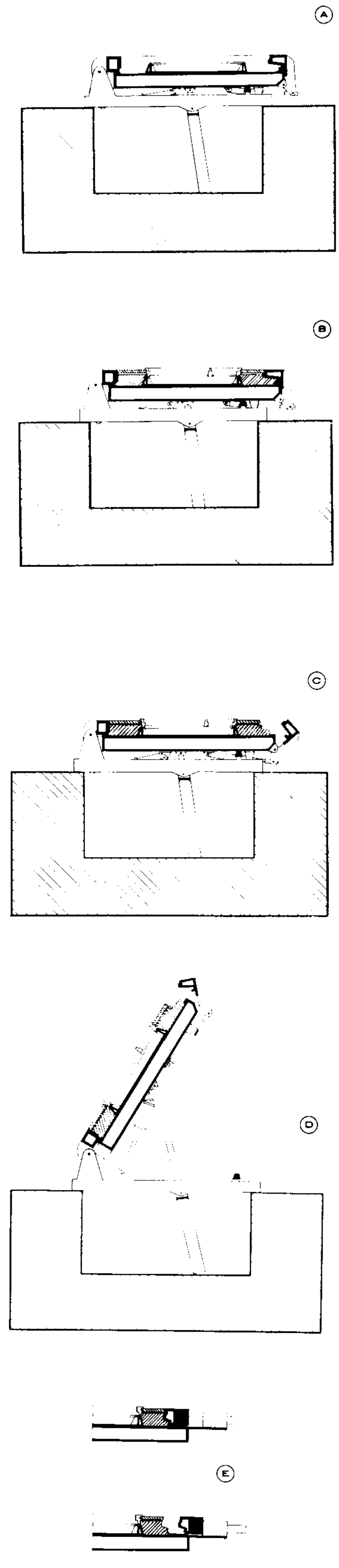
Quite different from the Camus system is the Coignet system. Since 1951, the Coignet Company has produced about 16,000 dwelling units, most of which are multistory precast-concrete box frame buildings up to 16 stories high. These buildings are produced by the most highly mechanized and complex process in France. The emphasis of the Coignet Company is on quality and precision through the maximum use of semiautomatic machines **(18)**. This quality and precision is impressive indeed, although their achievement involves a heavy investment in production facilities.

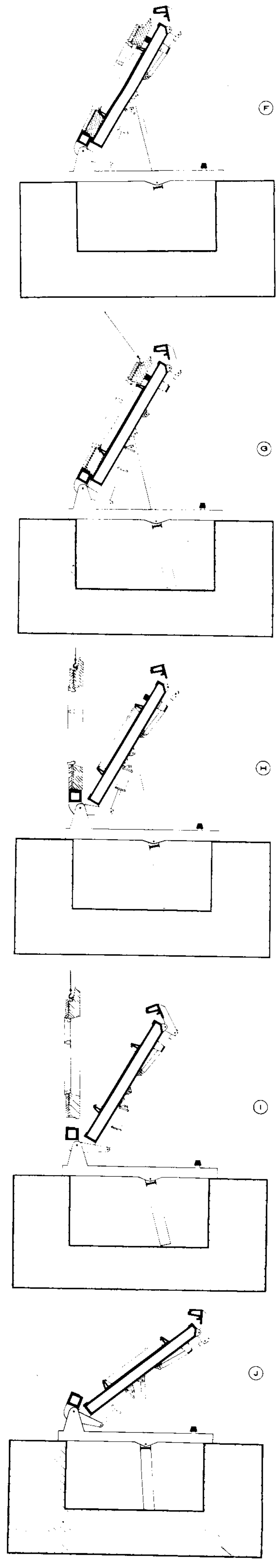
The company has factories at Rouen, Lille, Aulnay-sous-Bois, Rosny, as well as Rotterdam and Frankfurt. All factories produce units for four flats a day except for Lille, which produces eight per day. In these plants, the concrete is mixed at a central batching station, moved mechanically to the molds, which have placed within them all required reinforcing, heating pipes, wiring channels, windows, door frames, exterior facing materials, and insulation. Both the forms and concrete are heated. After placing in a horizontal position, the concrete is finished with power finishers and cured for about 3½ hrs. After this period, the mold goes through a complex series of motions to release the edges of the panel and bring it to a near vertical position **(19)**. A crane then lifts the panel and transports it to the curing yard. The mold itself is a production machine, principally of steel, of great accuracy. With two 9-hr shifts, each mold is used four times a day.

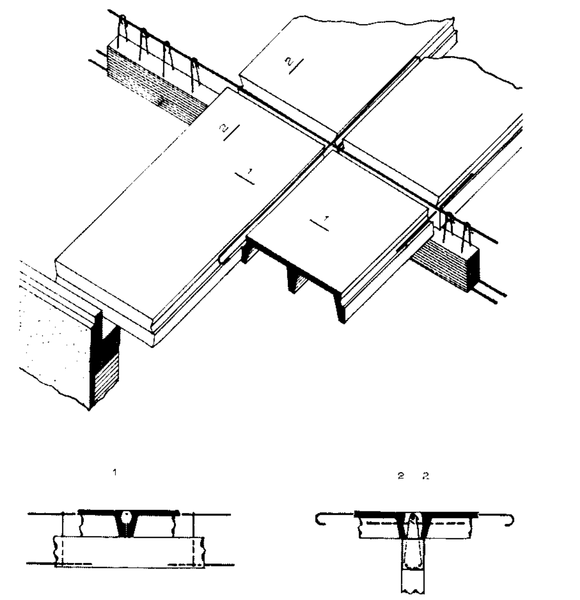
The panels, the largest of which is 7½ m by 2½ m and weighs 10 tons, are trucked to the building site on special trucks. They are placed with tower cranes, each of which is capable of erecting two flats per day. Little or no site measurement is used to place the panels, except for the plumbing of the wall panels. They are precise enough to be self-positioning horizontally and vertically. The interior wall panels have projecting lugs on top, upon which rest the next wall panels, so the vertical dimension is automatically obtained. A space is left at the bottom of the wall panels for grouting the joint. Continuity between panels is created by this grouting and steel lugs projecting

18 Semiautomatic mold; Coignet

19 Casting and demolding cycle; Coignet







20 *Barets·system; France*

21 *Prefab units (Barets) cast at site*

22 *Crane demolds and places units*

from the edges of the vertical panel.

Floors are solid concrete, 14 cm thick. Exterior walls are load-bearing sandwich units, 25 cm over-all, with concrete inside and out and insulation between. Interior bearing walls are solid, reinforced concrete 14 cm thick; nonbearing partitions are also solid but are 6 cm thick. Cement or ceramic tiles are used for exterior finish. The typical interior walls have their surface voids filled; paint is applied directly to the concrete.

Heating is generally by hot water, with pipes pre-embedded in the floor. Electrical installation on the site consists of hooking up the ducts pre-cast in the panels and installing the wiring. Even roller blinds are installed in the windows at the factories. Every effort is made to insure that site operations are minimal in quantity and extremely simple to carry out.

Coignet does the entire project, including site work. They report cost savings of somewhere around 10 per cent over traditional construction. As an extreme example of time saving, they cite the example of a 40-family, 5-story dwelling that was erected in 24 days.

Barets

Also in France, the Barets system makes a significant use of on-site casting of building units. The Barets System represents an operation that involves a consulting engineer and a licensing organization. The consulting engineer, Jean Barets, whose office, or Bureau d'Etudes, is called CO.F.E.BA., invented and developed the system. The licensing organization in France is called SIREC, which holds the patents and promotes the system. When a housing project comes into Barets' office, and is considered suitable for his system, he prepares the drawings. The contractor, who is the licensee of SIREC, will then take these drawings and produce the building. The Barets unit is a different structural type than the typical box frame **(20)**. The bearing elements of the buildings, which are generally slab blocks in form, consist of precast façades and two precast portal frames that are on either side of the central corridor. The floor slabs span between the bearing façades and the portal frames. The cross walls are nonbearing.

The prefabricated units are cast on the site in horizontal concrete tables with metal or wood edges, made anew for each job. These tables are located between the buildings **(21)**. The same crane handles the materials, demolds, and places the unit **(22)**. Since the units are cast on site and in the open air, a fairly small number of dwelling units can be made to amortize the relatively low investment in plant.

The exterior walls are made of hollow clay units with concrete cast around them. Plaster forms the interior finish. A variety of exterior finishes may be used, since the entire exterior surface is formed by the poured concrete. Voids in the clay units provide thermal insulation. Floor slabs are of two types: plain panels of 14-cm-thick concrete, or thin slabs with three ribs projecting downward. The portal frame consists of four columns, with a continuous beam joining them, all precast monolithically. Joints between the panels are filled with in-situ concrete. Reinforcing bars are placed in the floor joints. Portal frames have steel bars, protruding from the top, which provide a shear connection. Crosswalls are precast concrete. All units, except for the channel-shaped floor slabs, are room-sized to avoid joints. The maximum weight of a floor slab is 7 tons, while the maximum weight of a façade panel is 2½ tons.

Windows, heating pipes, door frames, and electrical channels are all placed in the forms and cast with the various panels.

So far, about 29,000 flats have been constructed or are in the planning stage. They have been built in France, Belgium, Germany, and Switzerland. The Barets people claim that their system uses 20 per cent less labor than traditional construction, consumes 8–10 per cent less time, and costs 5–8 per cent less. On one particular project, the Cité Modèle, in Brussels, which was designed for conventional in-situ concrete, the contractor proposed the Barets system and actually cut the cost by 4 per cent.

The leading systems in Denmark are Larsen & Nielsen and Jespersen, both of whose products were designed by P. E. Malmstrom, probably the most important engineer in the field of industrialization.

Larsen & Nielsen

The Larsen & Nielsen Company produces multifamily dwellings from heavy, five-ton, room-sized concrete units made in central factories and trucked to the building site in special vehicles. The units are lifted from the truck by mobile crane, placed and fixed by a crew of approximately eight men. Their Copenhagen plant is currently producing 20 apartment units per week **(23, 24)**.

Production of the panels is semimechanized. The factory has several rows of tilt-up forms. Reinforcement, door frames, window frames, electrical conduit and boxes, and plumbing sleeves are hand-placed in the forms. The concrete is brought in by fork lift or crane, placed and vibrated. All panels are cast horizontally. Wall units with both faces exposed are finished on one side by hand. A one-day cycle of form use is maintained, with the units being moved out to the curing yard by travelling crane. Curing takes two weeks.

The façade unit is a sandwich of concrete-insulation-concrete, with a maximum size of 280 cm by 480 cm. The floor units are 18 cm thick with cylindrical voids having a maximum size of 240 cm by 480 cm. Both types are reinforced. Interior wall units are plain concrete 15 or 18 cm thick, 260 cm by 480 cm maximum size.

The resulting building is a slab block generally one apartment in depth and ranging from four to eight stories, although the system is capable of going higher. The structural type is box frame, with floors spanning from cross wall to cross wall enclosed by a nonstructural façade. Balconies may or may not be included. Staircases are of precast terrazzo as a special unit; terrazzo to form bathroom floors is added to a normal slab at the Larsen & Nielsen factory. The flat underside of the floor slab is left exposed and painted as a ceiling finish. Concrete walls are given a light filling of plaster and can then be papered with a decorative wallpaper or papered with a plain paper and painted. There is little wet work on the site except for placing mortar in the structural joints. Floors are wood on wood sleepers, as is traditional in Denmark.

Due to the large size of the concrete units, there are not many options open to the designer of a small contract as far as flat layout is concerned. However, since Larsen & Nielsen do not stockpile standard units, but make every piece to order for a particular project, the design of the façade can have considerable variation. It is difficult to imagine that the box frame structural system will permit much variation in building forms, although one example has been produced in a gentle curve (Bellmansgade) by making the stair hall slightly wedge shaped. This was done, of course, at some sacrifice to standardization. If a large enough contract—say 500 flats—is signed, almost any flat layout can theoretically be produced.

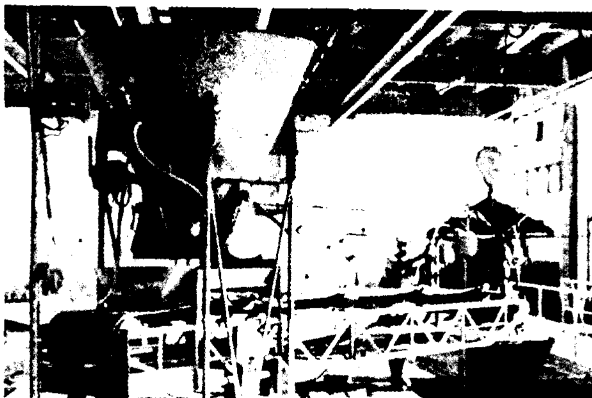
Larsen & Nielsen were one of the earlier entrants in the field and have had sufficient experience to develop a really mature system with such troublesome problems as the façade, weatherproofing joints, and floor-panel to wall-panel joints well worked out. Their experience is, in fact, a marketable commodity, for they have licensed their system in various parts of Europe — Taylor Woodrow-Anglican, for example, in Britain—and they are in direct competition with the large French manufacturers in several other countries.

Jespersen

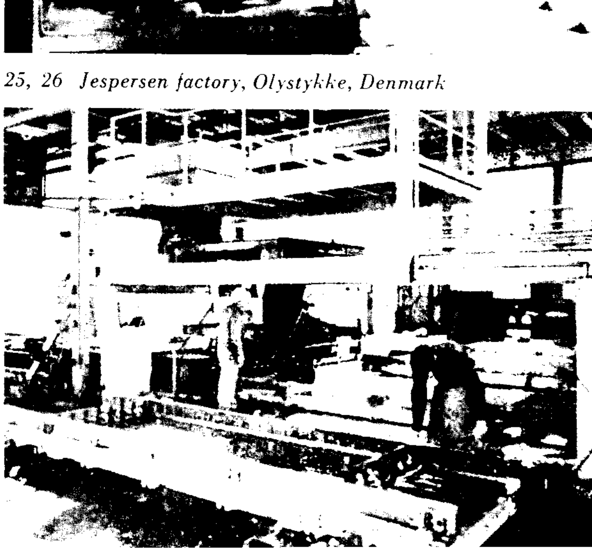
In a more experimental way than the Larsen & Nielsen Company, the Jespersen Company has just entered a new and exciting phase of the industrialization of building that has considerable promise for the creative designer. They are just beginning the production of building units that do not contain within them a complete building scheme, but rather are in the category of large sized bricks that can be used in many ways. These bricks weigh a maximum of 2½ tons. The wall units are 260 cm high, 15 or 18 cm thick, 120, 180, 240 cm wide plain concrete. Floor slabs are 18 cm thick, 120 cm wide, and from 240 to 480 long in 30 cm jumps. The floor slabs have cylindrical voids. No façades are produced by Jespersen.

Their factory at Olstykke is mechanized and automated to an extremely high degree, and has a large production capacity for a small plant **(25, 26)**. The present plan is to produce 4000 flats in five years, although the capacity is 2000 flats a year. The factory, which costs just under $1,000,000, consists of four sections. A mixing plant in the center feeds concrete to a floor-slab producing unit on one side, and to a wall-slab producing unit on the other. The mixing of the concrete is controlled by one man in a control booth, from which he regulates the weights of the mechanical aggregates and the automatically fed-in water and cement. The

23, 24 Larsen & Nielsen factory, Copenhagen



25, 26 Jespersen factory, Olystykke, Denmark



mixed concrete is moved by mechanical bucket to the two slab-producing units.

Wall slabs are cast vertically in multiple molds. The concrete is heated to 80 C and hot air is circulated within the steel molds. Since both exposed surfaces of the wall slab are against the form, no finishing is required. Two hours after pouring, the forms are lifted off the casting bed and the wall units—still in a vertical position—are mechanically trucked through a steam curing chamber to the curing yard. Conduit, sleeves, and door frames can be installed in the molds as needed.

Floors are cast in a horizontal position in a series of steel forms which are moved through the workshop in an oval path. At the center of one long side of the oval is a complex machine that inserts a series of steel tubes into the molds to form the hollow cores in the floors, places the concrete, vibrates it, and withdraws the cores in a minute or two. The mold moves to the next position, where the unit is hand-finished on its top surface; it is then moved to the steam curing chamber, which forms the other long side of the oval. Upon emerging from the steam curing chamber, the floor slab is lifted from the mold and moved to the yard. The mold is then cleaned, oiled, and the reinforcement cage is inserted, at which point it moves again to the concrete placing machine.

Emphasis of this plant is upon a high level of production of standard units which may be used in a variety of ways. Apartment blocks of 3 to 16 stories are to be produced. The structure is the box frame, with floor units spanning from the cross walls. Due to the small size of the units, a much greater variety of flat planning and building shape is possible than with the room-sized unit system. Two projects to be commenced are the Ballerupplanen and the Gladsaxeplanen. Development of this facility was based on the fact that these two projects, comprising almost 4000 units, would use the products of this factory. The design drawings of the Gladsaxeplanen in particular indicate an architectural character of a high order.

General Observations

In the past 10 years, in Europe, only a small step has actually been taken in the direction of industrialization. This small step has been taken with the aid of the many materials and techniques of conventional building. The realized industrialized buildings are, for the most part, replicas of what could be done in the old way.

At this time, in England, great interest has been aroused in building multistory apartments on the Continental pattern. The London County Council, for instance, is in the process of importing the Larsen & Nielsen system for use on some of its housing projects. Several private companies are in the process of importing some of the French systems. Naturally, advantage has been taken of the previous experience of these Continental systems so that the investment and experimentation of development do not have to be repeated. In England, the climate, living patterns, and building conditions are similar enough to allow almost a direct importation.

As time goes on and labor costs rise, industrialized housing is undoubtedly going to increase in proportion to conventional building. The technical and planning problems have been solved adequately, as have the cost problems. A considerable body of skill and experience are already in existence. The potential for lower costs with increasing volume is tremendous in industrialized building. In ordinary building, the costs are going the other way—up. As the economic reasons become more persuasive, the remaining opposition on the part of unions, architects, governments, and financial institutions will lessen. Further, greater technical refinement and improvement are to be expected as more firms enter the field and compete. Naturally, the more advanced people will be pushing back the frontiers of new and lighter materials and more effective mechanical systems. At the moment, concrete—inexpensive, universally available, fire-resistant, relatively soundproof—is the unquestioned choice for housing. Many schools have been built with so-called light prefabrication in steel, precast concrete frames with light infilling, and even timber, but the sound transmission problem has almost always prevented their use in housing. However, the English are experimenting in lightweight housing.

Lightweight systems offer the advantages of transportability, simple erection, lighter foundation, and less total material. There will undoubtedly be a strong movement to use them in housing if the problems of sound transmission between separate units can be solved. With light prefabrication, one can use the relatively effective mass production technique of extrusion, stamping, and rolling developed for the automobile industry.

Although Western Europe is highly industrialized, the principal problem that has been alleviated by industrialized building also exists in underdeveloped countries—that is, a shortage of skilled building mechanics. In most of the developing countries, machinery, capital, and transportation are all in short supply. This, however, is almost as inhibiting for conventional building as it is for industrialized building. Adding to this the necessity of training building mechanics over a long period of time, it seems likely that industrialized methods will prove even at the moment less burdensome for the developing countries than developing a conventional building industry. As a growing volume of building becomes necessary and the labor rates start to rise dramatically, industrialized building will become even more attractive.

Since housing programs in developing countries will generally be sponsored or administered by governmental agencies, a possibility exists of a large program of similar units: this is particularly suitable to industrialization. When the work of skilled building mechanics is replaced by machinery, a relatively permanent addition to the nation's capital plant is made —usable over and over again as more money becomes available for building houses. Therefore, it seems that the use of industrialized methods in underdeveloped countries is a beneficial and promising thing.

The direct importation of building systems from Europe to the Asiatic, African, and South American countries is in most cases impossible due to differing conditions of climate, geography, social organization, and ability to pay. One possibility is to prefabricate part of a building (the mechanical core and the structural frame, or the foundations) and then turn it over to the user of the dwelling for finishing. It is the industrial product that is the most difficult one for the user to produce himself.

U.S. PROGRESS IN PREASSEMBLY

In the United States, there is at one and the same time a highly developed conventional building industry and an elaborate industrialization of building materials production. Technologically, it is not much of a step from producing curtain walls in a factory to producing an entire light, prefabricated building. The resistance of all elements in the building industry to this has been demonstrated time and again, as has also been demonstrated the effectiveness of this resistance. Popular acceptance of the word "prefabrication" is not good, since it seems to imply to most minds a standardized and lifeless building. Building codes would in most of the larger cities take extensive modification to allow thinner members, factory-installed units, and other aspects of prefabricated building. In spite of these difficulties, and in spite of the abundance of trained building mechanics in all branches, prefabrication will ultimately find universal acceptance in the United States. The efficiency and economy of the machine versus hand labor will prevail. The principal evil attributed to industrialization, that of sameness, has infected conventionally built single-family houses and apartment houses, because builders long ago discovered the economy of repetition, even with hand work. Right now, whole buildings are a standardized production. If large-size building components were produced in the factory, a great deal more variety would be possible, at the same time achieving lower cost and better performance. The machine, providing enormous sensitivity of control, repetition of identical parts, and wide range of materials and finishes, is the new workman. With it, the architect can create new style, no less enchanting to the eye of mankind than the styles of the past. Demonstrated on the following pages are the directions preassembly is taking in this country. There is a long road ahead. The way it points, however, is incontestable.

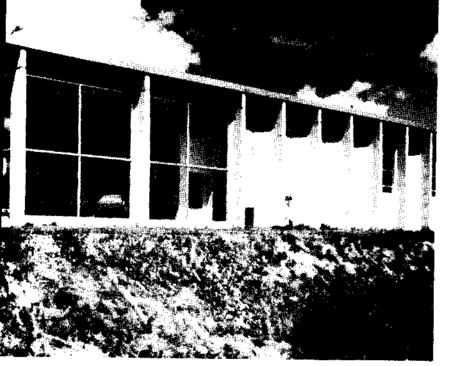
A system of precast-prestressed concrete building shells is now being produced in an industrialized manner to exploit the attributes of the manufacturing process: quality control, cost control, dependability, standardization, and volume production.

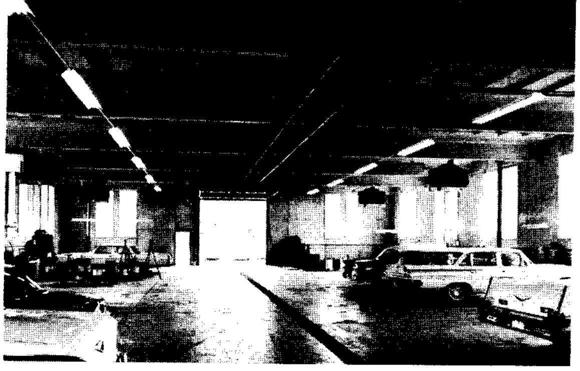
During the last three years, Lord & Den Hartog, Boston Architects-Engineers, have been designing and developing systems of precast-prestressed concrete standardized building shells. They have had the help and encouragement of the Boston office of the Portland Cement Association as well as the co-operation of the several precast-prestressers in the New England area. Their client, Precreate, Inc., is a newly formed company organized to promote and market these building shells.

The concept, as developed, is to produce a simple, attractive, cost competitive, durable, and flexible building shell-structural system to meet the requirements of a large variety of commercial and industrial uses. The architects in this case have chosen precast-prestressed concrete as the basic material with which to work, since it has now been developed to the point where concrete components of this kind can be produced in an industrial manner, exploiting many of the attributes of the manufacturing process—quality control, cost control, dependability, standardization, and volume production. Combined with the development of dependable sealants, and the increased efficiency and capability of materials handling and equipment since World War II, it is now entirely economic and practicable to consider volume production and erection of standardized precast-prestressed building shells.

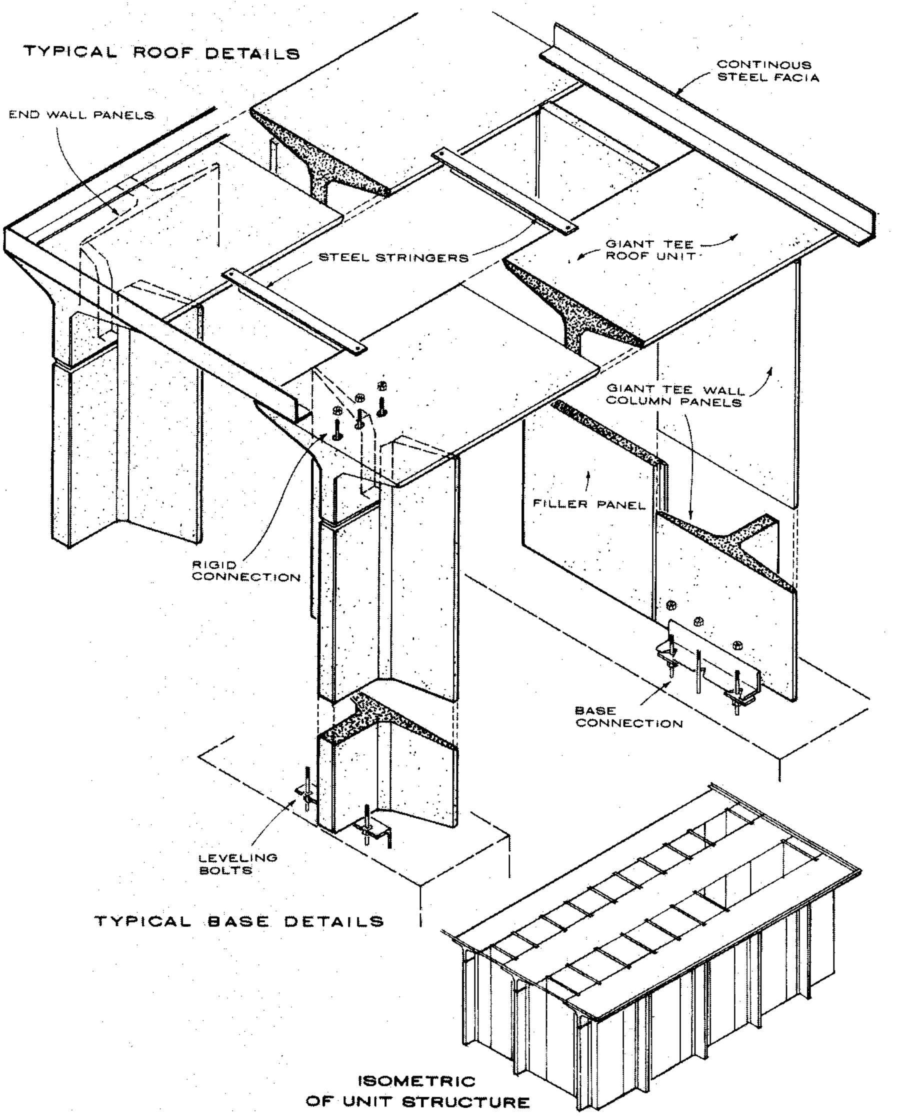
The most efficient manner of working with concrete in this country is from a central aggregate and batching facility. Thus, it is logical and has generally followed, particularly with the additional operation of prestressing, that this work has tended to originate from companies in the ready-mix concrete business, as "on site" or "in plant" operations. In this country, through various interested agencies such as PCI, PCA, Leap Inc., and T. Y. Lin, Inc., certain useful shapes have become standardized, such as double and giant tees, columns, and various beam configurations. These are cast in long, smooth, joint-free steel forms which generally are mounted in beds designed for rapid steam curing. Thus, a 350 ft double-tee "bed," with jacking heads for prestressing, can produce ten 30-ft long double-tee units at one casting—say, in about an eight-hr period—ready for removal and shipping. The ability to maintain close, continuous control of concrete, technical supervision of prestressing, testing, supervision, and efficient management over such a centralized plant operation must also be obvious. Hence, there is potentially a manufacturing operation, working with a material basic to building construction. Only lacking was the design of, or application of, standard components into a simple, complete system, the construction of an entire building shell—structure, walls, floors, and roof. Lord & Den Hartog & Associates proceeded from this premise to try to work out such useful standard designs.

There are certain elementary considerations to be established for the design





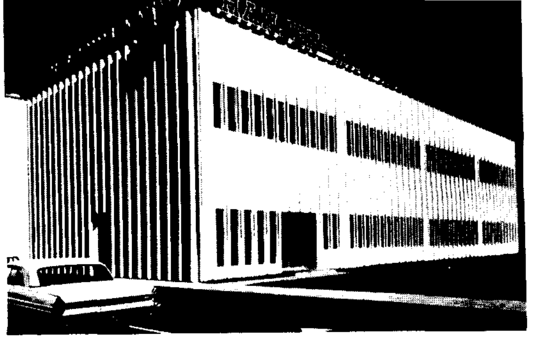
Auto sales and service; 15,000 sq. ft; $8.50 per sq. ft.



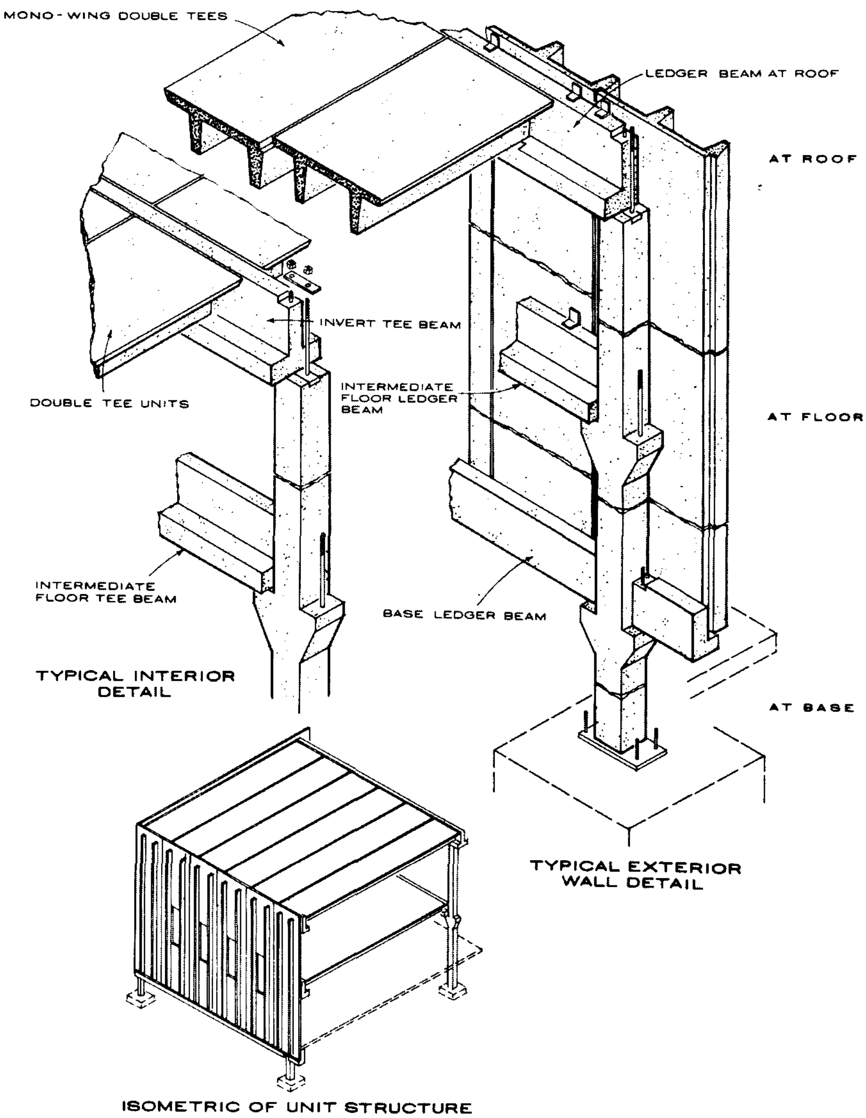
of standardized structures or building systems. The Hartogs decided as a first step to limit the building types to relatively simple rectangular modules suitable for industrial and commercial uses. This assumption begins to presuppose buildings whose size will generally not exceed 75,000 sq ft, since larger buildings tend to become more specific in requirements and shape, and no longer are as appropriate to standardization. Standardization being the key word, predictable fixed costs, dependable production, delivery and erection, familiarity in the entire construction process, and simplification followed. The architects-engineers designed building systems utilizing to maximum advantage the least number of different components, or conversely, maximum repetitive use of few standard units. Similarly, connections, a serious problem with the extensive use of precast concrete units, were reduced insofar as possible to repetitive use of a few simplified bolted (mechanical) joints, rather than the more common practice of welding with plates and clips. The designers tried to assign as much of the fabrication that is appropriate and efficient to plant production as possible, leaving the erector in the field with as simple a task and set of instructions for lifting and joining as possible. The objective is an "erector set" building shell operation, insofar as possible, with present techniques and building industry practices. The methods as outlined when put into practice result in buildings which conform with all code requirements (actually far in excess in most cases) and create no problem with existing labor and union rules and practices.

The pilot projects erected of both double-tee and giant-tee types in the New England area have proven the feasibility and practical usefulness of designing standardized shell structures of precast-prestressed concrete units. There were problems, to be sure. From experience in New England, it is clear that any consideration of standardized building construction presupposes completed buildings: the building as an entirely finished product—heated, watered, lighted, and finished to suit function. In this regard, the building-shell item, complete and erected ready for roofing, windows and doors, and finishing, comprises slightly under 30 per cent of the total project effort and cost. The remaining work is foundation, mechanical-electrical, and finish — normal general contract work performed in the normal manner. Thus, so-called "pre-engineered" or "prefabricated building shells," whether made of steel or aluminum or precast concrete, are but one step in the industrialization of the building construction, though it is a fundamental first step.

One of the problems has been that the precast-prestressed producers themselves are still relatively new in business in this country and the demands upon their facilities are so many and greatly varied that they have not been able to concentrate and stabilize on a standardized basis —nor has there been anything like a demand from such a market area to warrant their concentrated attention in this direction. The general demand for precast-prestressed concrete products has been of a more specialized custom nature or a requirement for units and components employed on an ingredient basis. Thus it remains for the producers to become much more familiar and oriented toward "standardized production" and to develop more fully the potential manufacturing capability implicit in their operations. With



Warehouse and regional office; 60,000 sq ft; $11.50 per sq ft.



respect to standardization of buildings as a general concept, it represents so basic a change in thinking patterns, not just in the construction industry but to all sectors of the economy affected, that it will be a slow, long-term process in this country. Den Hartog states that: "We believe the increased industrialization of the building construction product and processes is inevitable. Such efforts as ours with the prestressed concrete industry, and the continuing and successful efforts of the steel industry with respect to 'packaging' more standardized buildings are properly useful applications of the required logic, that must and will become increasingly accepted and efficient."

The cost experience on the pilot projects mentioned has been interestingly consistent. The giant-tee design (*facing page*) for buildings 10,000 to 20,000 sq ft, with average 80-ft clear span, have ranged $3.00 and $3.25 per sq ft shell erected. The double-tee post-and-beam scheme (*right*) for two structures of 60,000 and 25,000 sq ft floor area respectively, and numerous bids for similar projects, fell in the range of $2.75 and $3.00 per sq ft for such building shells erected. The precast-prestressed concrete shell is purchased as an erected "package" complete from the prestress concrete producer in all cases, generally as a subcontractor to a general contractor, with complete responsibility for the entire item.

A minor problem encountered was that in some areas the technique and concepts of precast-prestressed concrete are new to various people and agencies whose business it is to administer and interpret codes and ordinances, and public safety and welfare with regard to building construction. A certain amount of educational back-up is thus required by designers. Underwriters and insurance companies have made their peace with the use of precast-prestressed. From the point of view of professional (civil engineering) design, the situation generally leaves something to be desired. Much of the groundwork has been done by such groups as Leap, Inc., and to a great extent by professional engineers in the service of precast-prestressed producers. "The professional relationship is in these cases a somewhat cloudy proposition," continues Hartog. "Of course, the precise relationship of the professional designer, with regard to standardized construction on a long-term basis is a complex problem which the professions do realize, about which much discussion is taking place, but no definitive solution has been reached. It will probably take the form of a slow adjustment to the facts of life, as the pace of standardization increases. The area of precast-prestressed concrete is still relatively so novel that a large, well-found body of professional engineering talent completely familiar and ready to work imaginatively with the technique and material is not readily available at this juncture."

On the basis of individual projects designed with an eye for standardization (shell buildings of entirely precast prestressed concrete), Lord & Den Hartog & Associates feel that, in all respects, there were no really fundamental problems and that the results indicate fully the potential for results of high quality building at competitive costs. The full future development of such construction into volume, "mass production" situation can come easily with time and the increasing demands for efficient and larger quantity of construction that are coming in the future.

One significant research program involves a low-income housing demonstration project having the aim of reducing costs of high-rise housing through new building techniques—free of restrictive building codes.

One of *the most* significant research programs related to industrialized building in this country, combining an evaluation of some recent European developments as they may be applied here and many U.S. developments not now used in housing, is currently being undertaken by the Research Department of the School of Architecture at Pratt Institute. Last January saw the beginning of a three-year low-income housing demonstration project, having the aim of sharply reducing costs of high-rise housing through the use of new building techniques—free of restrictive building code requirements. This work is made possible by a grant of $237,000 from the Low-Income Housing Demonstration Program of the Office of the Administrator of the Housing and Home Finance Agency, which administers grants under Section 207 of the Housing Act of 1961.

The basic objective of the project is to use existing construction techniques that either have not been used for high-rise housing or have not been used in this country. The investigators feel that many construction techniques exist that have the basic advantage of cutting costs, but which need some demonstration to bring them to a point where clients, government, professionals, and the building industry will recognize their values and use them.

For a long time, the co-ordinator of this project, Robert L. Davison, a veteran of past research programs of inestimable value, had pursued the basic approach for such a project with various foundations and agencies, including those of the government. Joining with Pratt Institute, Davison continued this work and found a sponsor in HHFA. The principal personalities involved in the project are: in over-all charge, Olindo Grossi, Dean of the School of Architecture; projector director, John H. Callender; project co-ordinator, Robert L. Davison; and project architect, Edward T. Shiffer. All are members of the faculty at Pratt. Consultants engaged for the project are: structural, Paul Weidlinger; mechanical, Fred S. Dubin Associates; construction and cost, Tishman Research Corporation (an association made possible by an additional $25,000 grant from the Ford Foundation).

A preliminary list of all systems, components, and materials promising cost saving was drawn up as subjects for investigation. Working with the above consultants, this preliminary list was narrowed. The subjects were evaluated in the light of two primary criteria: materials and techniques considered should be available for use in an actual building in the summer or fall of 1965; the amount of development work required to make the method or material usable should be within the available funds or available support from industry.

The investigators realized, of course, that housing costs can always be decreased by lowering the standards of accommodations, by making spaces smaller, by using less expensive materials, or by employing shoddy construction methods. However, such methods are of no value and the objective of lowering cost while maintaining comparable or superior standards was early seen to be built into the project. A document of standards has been issued. Acoustical controls follow the new FHA Minimum Property Standards. The question of fire protection has been reconsidered, since it was felt that the currently required amount of fire protection far exceeds the existing hazard. This determination was based on the extensive Bureau of Standards investigations of combustible contents of apartment dwellings and close investigation of records of apartment house fires, and certain downward revisions to existing fireproofing requirements were made. Living standards were arrived at by making a survey of the available Federal, state, and city standards, especially those that apply to New York City. The most desirable *minimum* standards, in the judgment of the investigators, were selected. Structural standards, as well as mechanical, were based upon those recommended by the related consultants. A qualitative and vitally important standard for social and architectural value was established.

A basic assumption of the project is that existing building codes contain unnecessary and costly restrictions, and one of the definite keys to the success of this project is its freedom from local building codes. This was possible for the Navy Demonstration Project since the demonstration building, to be built by the fall of 1965, will be constructed on the U.S. Navy base at Newport. Its construction cost will be paid for by the Department of Defense. All other research, mock-up, testing, and evaluation costs will be met by the HHFA grant. It is expected that the construction techniques first employed in the Navy housing may be tested also in an urban community in which the local government has sufficient authority for waiving of building code restrictions as may be necessary.

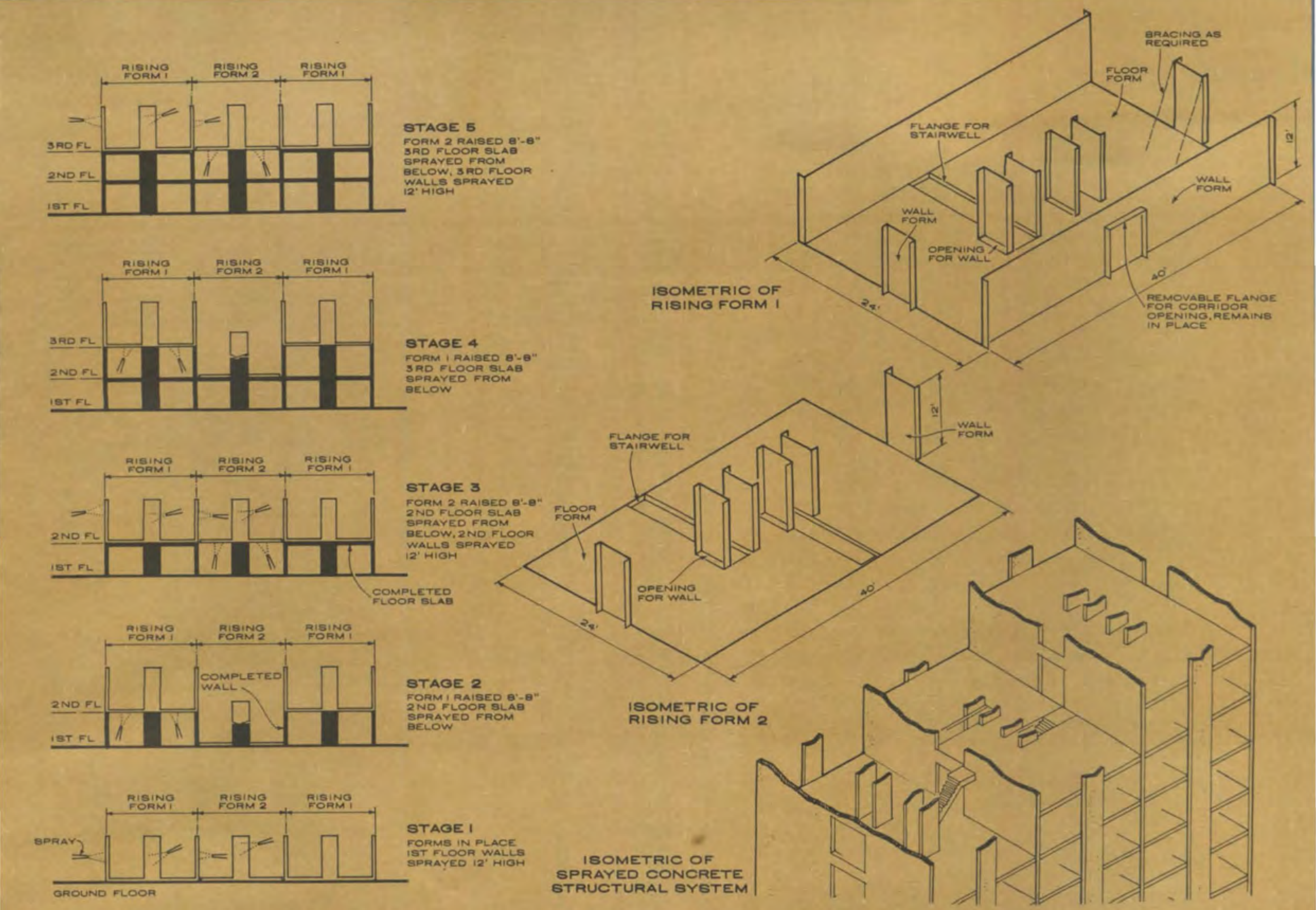
Eventually contemplated for the Navy project are 200 residential units. The majority of these will be in high-rise buildings. Generally, they will consist of two-, three-, and four-bedroom units. The final project may include some low-rise buildings.

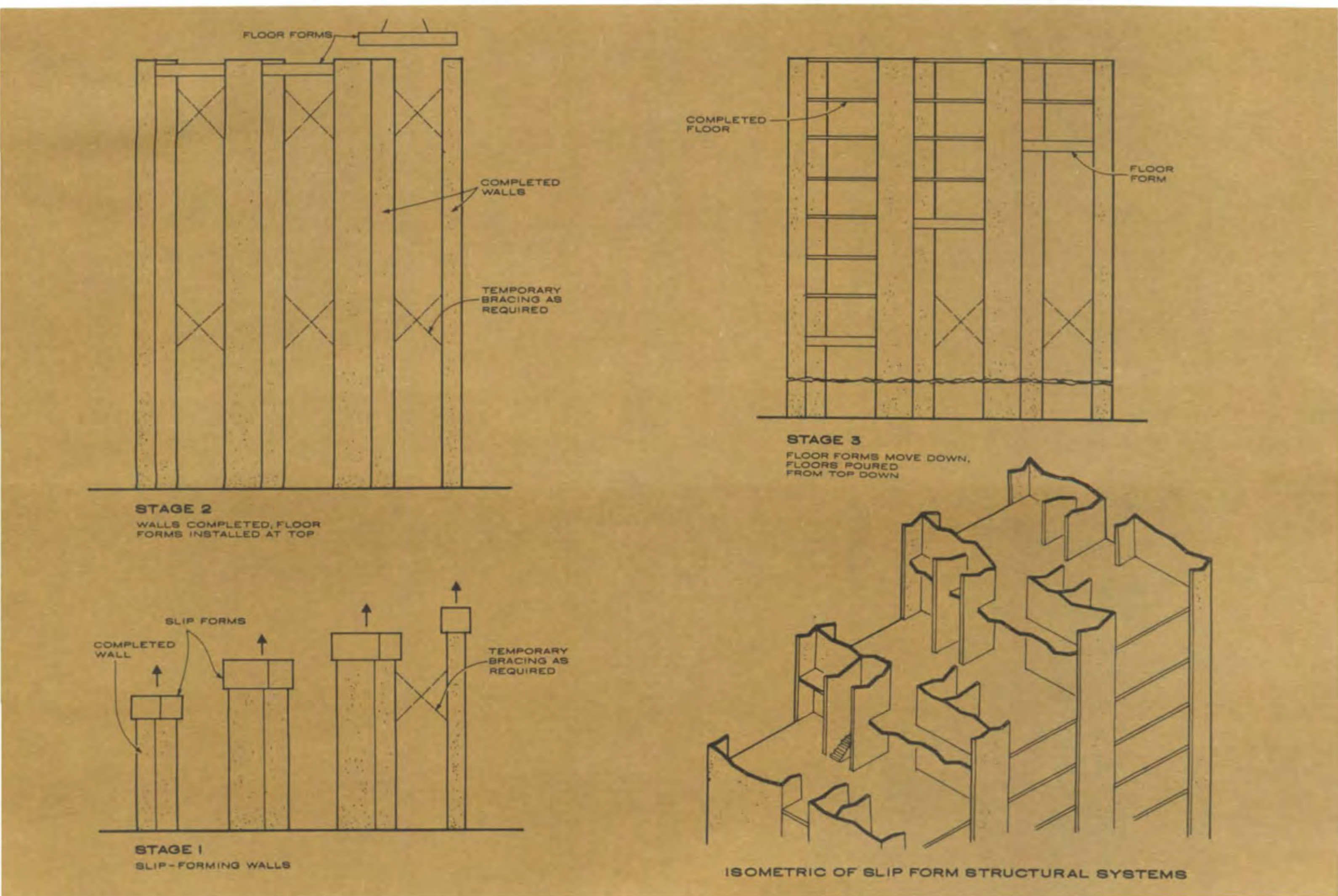
Investigations are being made of the following components:

A. *Foundations.* (1) Precast-concrete foundations. These are not used in this country, though they are employed extensively in Russia. (2) Cast slab, or mat foundations.

B. *Structural Systems.* It was felt that there are inherent economies in using the dividing walls of apartments as structural elements, since apartment buildings necessarily consist of a series of relatively small cellular spaces. This leads to a "box frame" structural system. In complying with the new FHA acoustical requirements, the dividing walls must be so sound resistant that if mass is used as the sound-resisting method, they become suitable for structural purposes. Furthermore, flexibility of space in middle- and low-income apartment housing is not a major requirement. If a person buys a $200,000 co-operative, he feels that he should be able to knock out a few walls. However, this project was not concerned with that kind of building project, and therefore that sort of flexibility is not necessary. The investigators feel confident that they are on firm ground in going into a structural system that also divides the space.

C. *Construction Methods Under Consideration.* (1) Precast panels. The great advantages of these precast concrete components are speed, the elimination of wet plaster from the building by casting the panels in steel forms so that they are ready for painting, and the considerable reduction of on-site labor. Among the approaches to precasting are: (a) Factory-made panels. These are difficult to ship unless one dimension is less than 10 ft. However, there are many precasting plants in the eastern United States and the controlled conditions, regular production, and precision possible with factory precasting are attractive. (b) On-site precasting. Panels can be made larger or entire rooms can be cast in box form and stacked one atop the other. Ultimate size limitation is the weight of the element in relation to the capacity of the crane and the height of the building. The crane selected for use and the organization of the site as a precasting factory become critical elements in this method. (2) Spraying or slip forming concrete to erect box frames (*facing page*). Sprayed or slip formed walls to be used in combination with other systems for the floor, such as light steel, cast-in-place concrete, or pre-


RISING FORM 1
RISING FORM 2
RISING FORM 1
3RD FL
2ND FL
1ST FL
STAGE 5
FORM 2 RAISED 8'-8"
3RD FLOOR SLAB SPRAYED FROM BELOW, 3RD FLOOR WALLS SPRAYED 12' HIGH
STAGE 4
FORM 1 RAISED 8'-8"
3RD FLOOR SLAB SPRAYED FROM BELOW
STAGE 3
FORM 2 RAISED 8'-8"
2ND FLOOR SLAB SPRAYED FROM BELOW, 2ND FLOOR WALLS SPRAYED 12' HIGH
COMPLETED FLOOR SLAB
COMPLETED WALL
STAGE 2
FORM 1 RAISED 8'-8"
2ND FLOOR SLAB SPRAYED FROM BELOW
SPRAY
GROUND FLOOR
STAGE 1
FORMS IN PLACE
1ST FLOOR WALLS SPRAYED 12' HIGH
BRACING AS REQUIRED
FLOOR FORM
FLANGE FOR STAIRWELL
WALL FORM
OPENING FOR WALL
12'
24'
40'
REMOVABLE FLANGE FOR CORRIDOR OPENING, REMAINS IN PLACE
ISOMETRIC OF RISING FORM 1
ISOMETRIC OF RISING FORM 2
ISOMETRIC OF SPRAYED CONCRETE STRUCTURAL SYSTEM


FLOOR FORMS
COMPLETED WALLS
TEMPORARY BRACING AS REQUIRED
STAGE 2
WALLS COMPLETED, FLOOR FORMS INSTALLED AT TOP
COMPLETED FLOOR
FLOOR FORM
STAGE 3
FLOOR FORMS MOVE DOWN, FLOORS POURED FROM TOP DOWN
SLIP FORMS
COMPLETED WALL
TEMPORARY BRACING AS REQUIRED
STAGE 1
SLIP-FORMING WALLS
ISOMETRIC OF SLIP FORM STRUCTURAL SYSTEMS

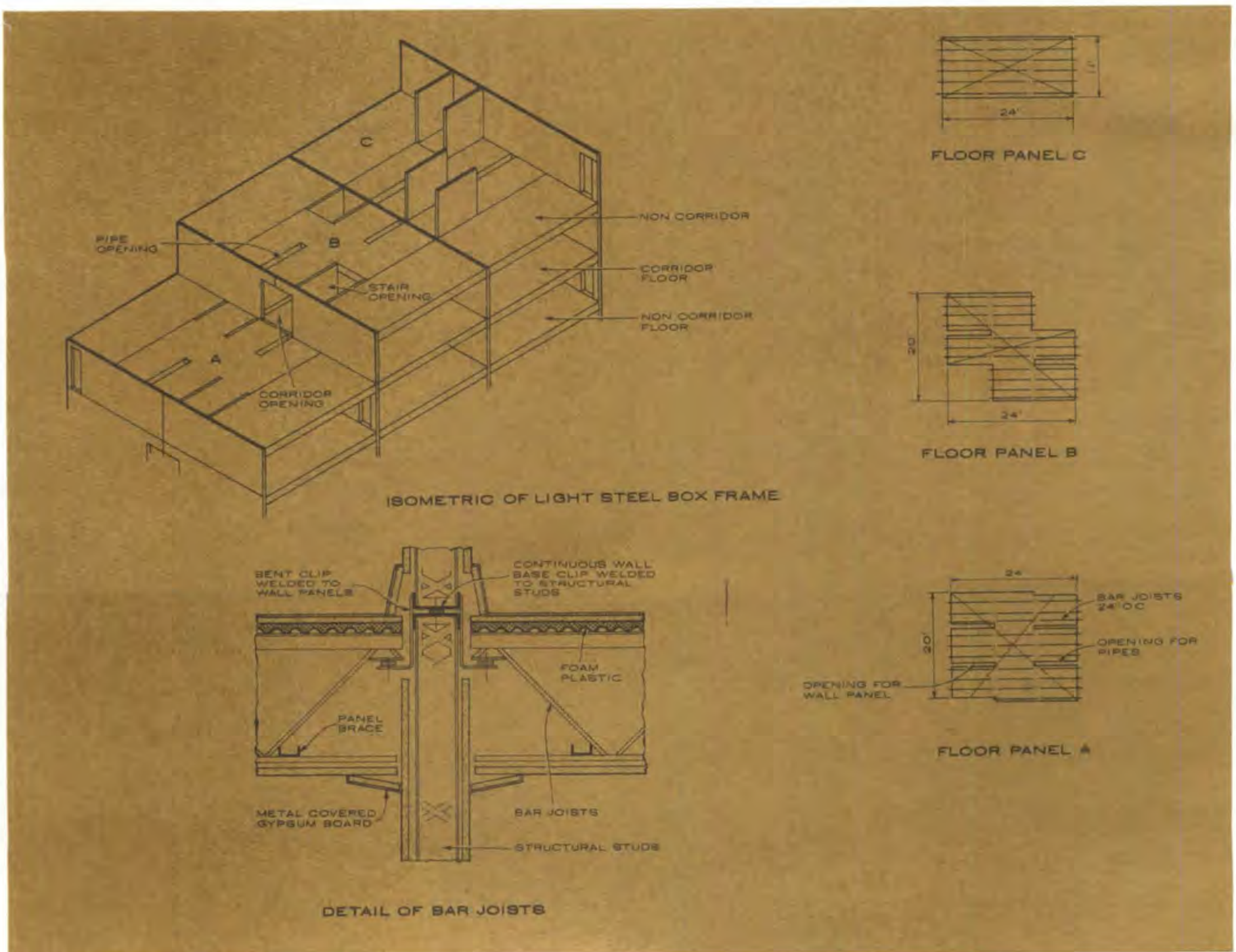
cast panels. (3) Slip forming vertical walls. (4) Slip forming elevator and stair cores to be used with other methods for walls and floors. (5) Investigations are concurrently being made of light steel box frames (*this page*). (6) Exterior walls. Consideration is being given to various lightweight sandwich and honeycomb panels now on the market. Individual companies have indicated a willingness to develop panels that would fit the special requirements of this project. There are some steel-frame panels that look promising. Also being considered are precast-concrete sandwich panels. Final choice of the exterior wall will depend on economy and suitability to the particular structural system selected. (7) Interior nonbearing walls. Attention is being given to several types of dry-wall panels including: laminated gypsum panels and panels glued to steel studs. Also being considered are precast concrete and sprayed concrete in association with a precast sprayed or structural system.

D. *Mechanical Equipment*. (1) Heating system. (a) Studies are being made of individual apartment boilers and individual room gas heaters to eliminate the complexities and costs of installing a central system. Not only would the capital costs of the building be less, but operating costs would also be decreased. Tenants would be more inclined to be careful about use of heat. (b) Electric heating is under consideration. (c) The effect of insulation, double glazing, low heat capacity walls, and reflective wall finishes will be evaluated. (2) Plumbing: Various pipe materials other than the traditional cast iron are being evaluated. In addition, a European piping system that vastly simplifies the vent piping and effects great economies has been tested and used in high buildings. This system is under active investigation.

Drawings and specifications for each system under consideration were completed August 15, 1964. Bids were received one month later. By the first of October, a decision was made on the most likely cost-saving system. Drawings will then be prepared for a full-size mock-up. Between December 1 and April 1, 1965, the mock-up will be constructed and evaluated by tests. This accumulated knowledge will be incorporated into final working drawings and specifications for the structure to be erected at Newport.

In order to select the most promising building system from the various alternatives remaining after the first screening, comparative cost estimates will be made for the various components. The best and most realistic way of accomplishing this was determined to be by preparing drawings and outline specifications of typical buildings and submitting these through the cost consultant to contractors for pricing. Since the first target of the study is to be the Navy housing at Newport, the building design was aimed at the Navy program and site. Two designs emerged—a tower and a duplex slab scheme. The purpose of these designs is not to make a definite statement about the form of the final building, which is the province of the Navy's architect, but to serve as a vehicle for selecting the least expensive products and systems.

Duplex. The duplex scheme (*facing page*) uses a longer span than the tower. Bearing walls define an entire two-story unit, while nonbearing partitions form bedrooms, kitchens, bathrooms, and closets. From the elevators, a common play space on the living room lower floors is entered. From this play space, exterior corridors lead to the duplex units. On the other side of the unit is a private balcony. On the bedroom or upper floors the play space, corridor, and private balcony is omitted. Only the kitchens look directly onto the public corridor, so that privacy is respected. An attempt is made to express the identity of each individual unit, both inside and on the façades. This plan is suited to large panel precast-concrete prefabrication for both walls and floors. Also suitable are prestressed, narrow (16-in.) units spanning between precast crosswalls of the framing system.



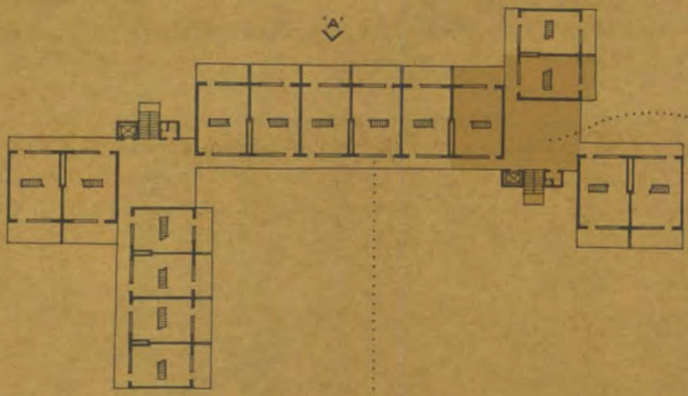
FLOOR PANEL C

ISOMETRIC OF LIGHT STEEL BOX FRAME

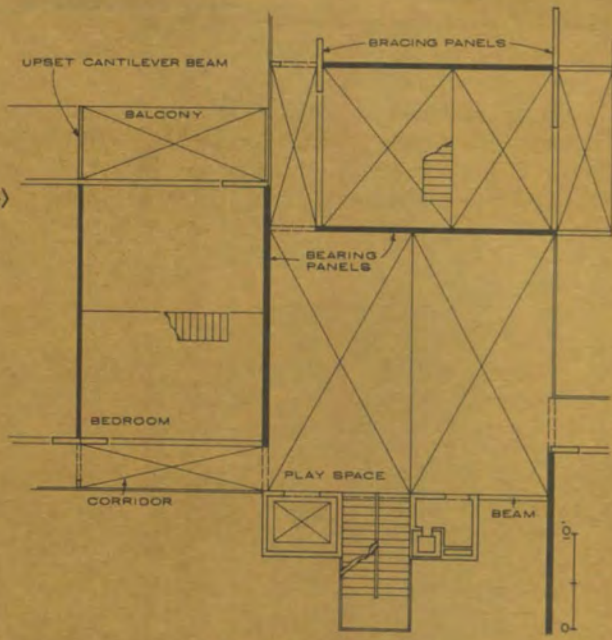
FLOOR PANEL B

FLOOR PANEL A

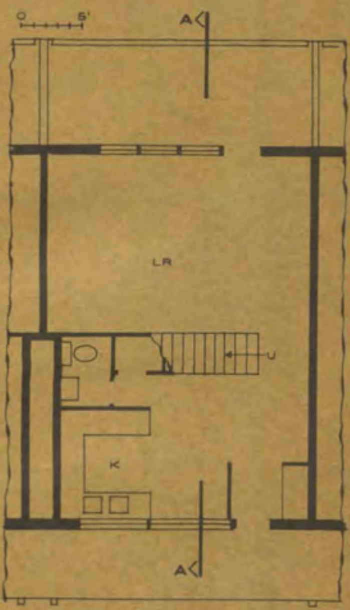
DETAIL OF BAR JOISTS



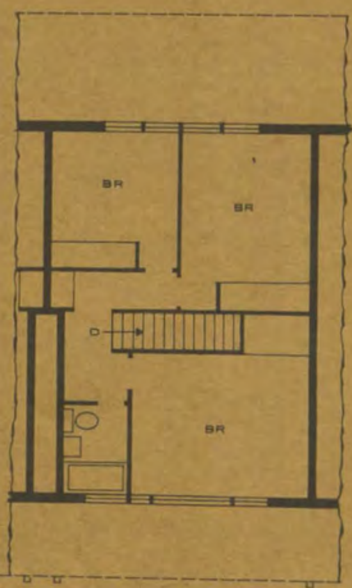
TYPICAL FLOOR PLAN AT LOWER LEVEL



PARTIAL FRAMING PLAN

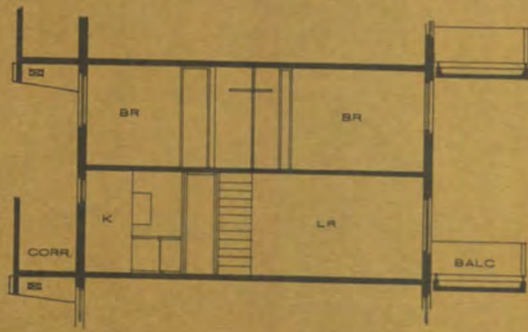


1 ST. LEVEL

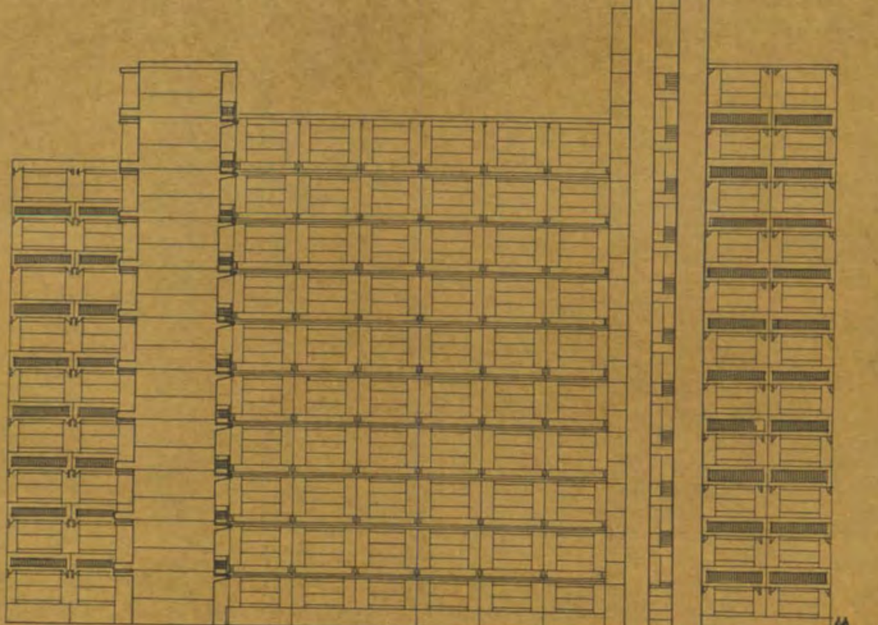


2 ND. LEVEL

THREE-BEDROOM UNIT



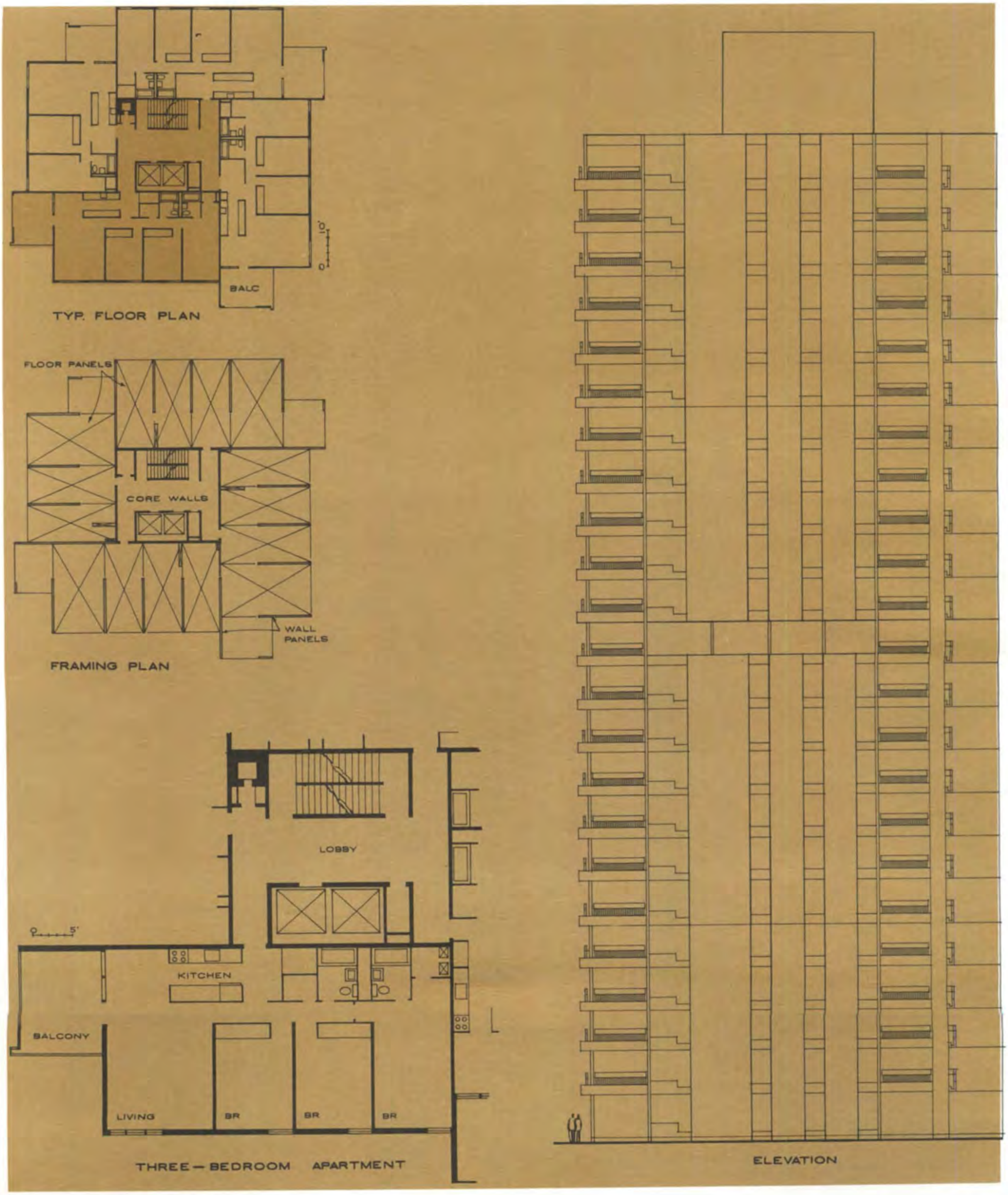
SECTION A-A



ELEVATION AT 'A'

Tower. The tower scheme (*below*) is a short-span scheme in which each living room and bedroom is a separate structural cell, defined by bearing walls. Toward the interior of the plan, the bearing walls perpendicular to the façade stop short, allowing a freedom of planning for the kitchen, bathrooms, and storage. The living-dining rooms are placed at the corners of the building so that each has exposure on two sides. There are four units on each floor and two towers are required to satisfy the program. One floor halfway up the building is given to community and play space. This plan is particularly suited to a room-sized concrete panel type of construction or a precast box type with upended boxes serving as stair and elevator shafts.

Both plan types are to produce buildings in the 20-story range and can be faced with a variety of exterior wall materials in various sizes and shapes of panel to meet aesthetic demands.



One of the most completely thought-out approaches to the prefabrication of buildings is to be found in an "adult erector set" system.

A construction system that reflects a flexible method of building based upon a minimum number of standard components that are capable of being variously arranged has been evolved by Roger Halle, Architect, of Pound Ridge, New York. Contributing to this unique approach to mass-produced building were Wm. F. Pedersen & Associates, Consulting Architects, and Severud Associates, Consulting Engineers.

Philosophy Behind System

"The art and science of building seek to satisfy one of the basic areas of human requirements," states Halle. "Yet, despite all the attempts to industrialize the process of building, it persists as a largely unfulfilled industrial challenge. The coveted goal of orderly and essentially complete prefabrication is still ahead of us.

"What are the ingredients of success? In my view, the basic requirement is for a flexible method consisting of components that can be variously arranged and organized to form complete buildings. In essence, what is needed is an 'adult erector set' for complete buildings.

"Such a system must be based upon separation of structure and enclosure. The structure is the skeleton; the enclosure is the skin.

"Dimensions must be standardized and parts minimized. The components must be few enough in number and of such a nature that they can be readily presented in a catalog, with choices capable of being made by knowledgeable laymen.

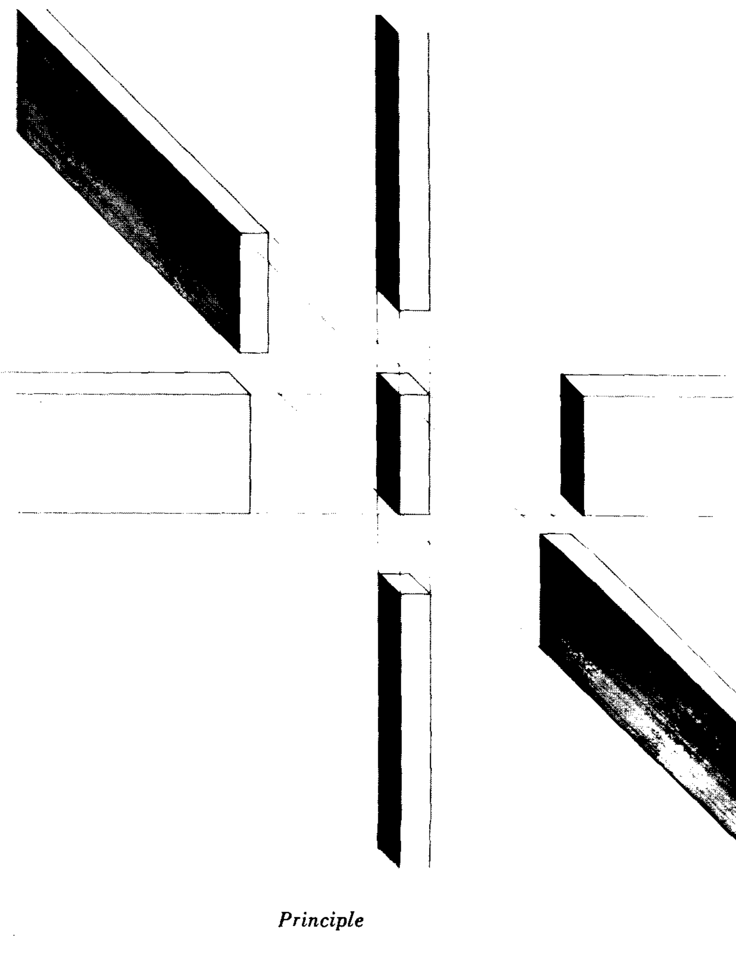
"Such a system must place as much of the work in the factory and as little in the field as possible. Field work must consist essentially of simple assembly.

"And there must be the possibility of adjustment to compensate for human error. This most elusive trap of all must be avoided, for tolerances can be almost as demanding as stresses.

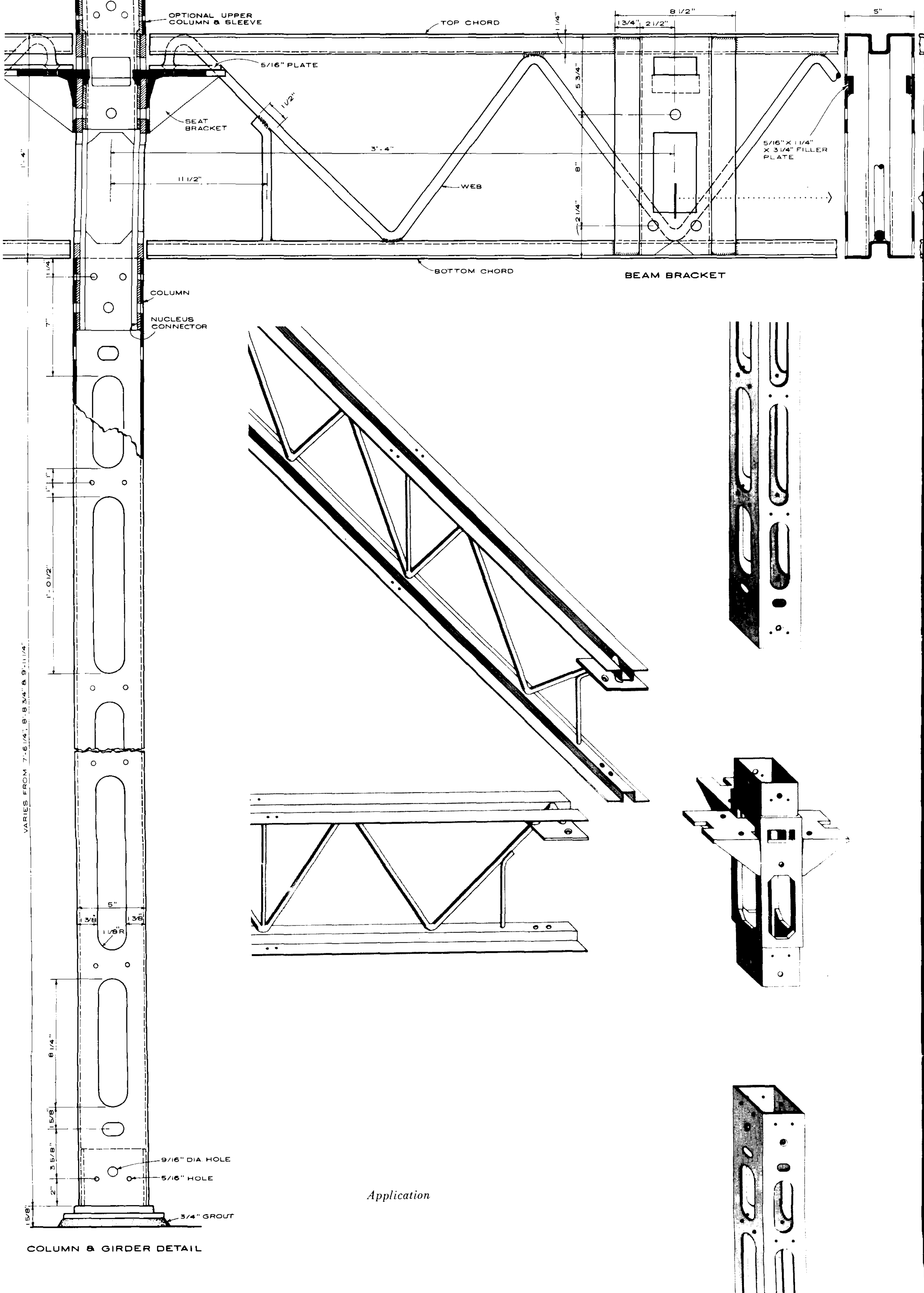
"To succeed, a system must be, in essence, a complete, flexible three-dimensional integrated version of curtain walling, which provides, in addition to the exterior skin, the structure, the means for dividing interior space and a basis for accommodating mechanical lines. In other words, it must provide a 'kit of parts' for complete buildings."

Key to System

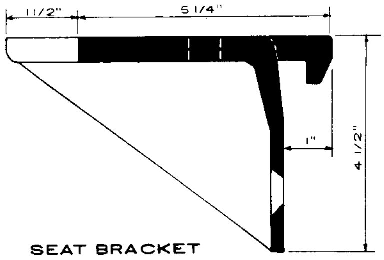
A number of years ago, Halle recognized that a barrier to further progress in creating a truly workable prefabrication system was lack of a solution (*right*) for



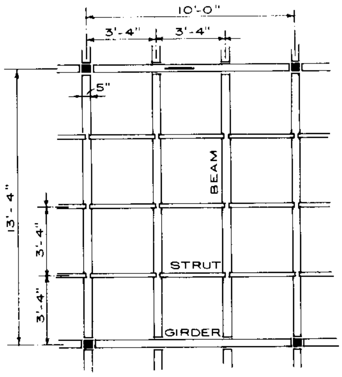
Principle



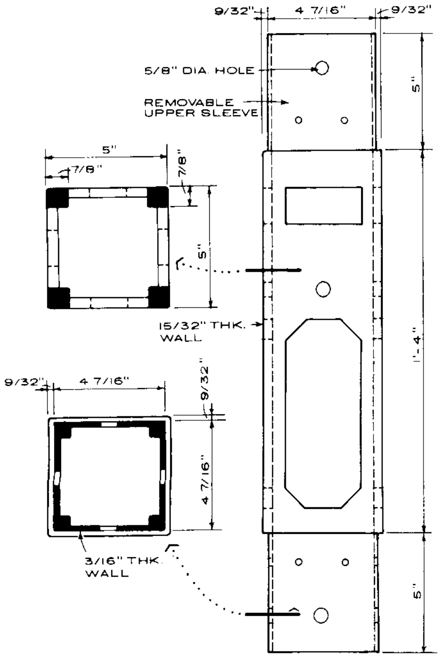
Application



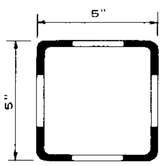
SEAT BRACKET



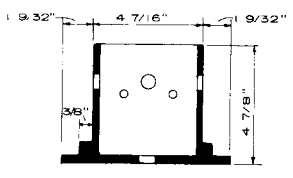
TYP. FRAMING PLAN



NUCLEUS CONNECTOR DETAILS



COLUMN PLAN SECTION

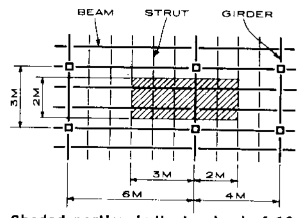


BASE PLATE SECTION

BEAMS					
Span in Mod.	Total Load in Psf				
	30	50	70	90	110
1	B1	B1	B1	B1	B1
2	B1	B1	B1	B1	B1
3	B1	B1	B1	B1	B2
4	B1	B1	B1	B2	B4
5	B1	B1	B2	B4	B7
6	B1	B2	B7	B7	B13
7	B2	B7	B10	B13	B14
8	B4	B7	B13	B14	B15
9	B4	B10	B14	B15	B16
10	B7	B13	B15	B16	
11	B10	B15	B16		
12	B10	B15			
13	B13				
14	B15				
15	B15				

3M GIRDERS					
Sq. Mod.	Total Load in Psf				
Load	30	50	70	90	110
1					
2	G1	G1	G1	G1	G1
3	G1	G1	G1	G3	G3
4	G1	G1	G1	G3	G5
5	G1	G1	G3	G6	G6
6	G1	G1	G3	G6	G8
7	G1	G3	G6	G6	G8
8	G1	G3	G6	G8	G9
9	G1	G3	G6	G8	G9
10	G1	G6	G8	G9	HSG
11	G1	G6	G8	G9	HSG
12	G1	G6	G8	HSG	HSG
13	G3	G8	G9	HSG	HSG
14	G3	G8	G9	HSG	HSG
15	G3	G8	G9	HSG	HSG
16	G5	G9	HSG	HSG	HSG
17	G6	G9	HSG	HSG	HSG
18	G6	G9	HSG	HSG	HSG
19	G6	G9	HSG	HSG	
20	G6	G9	HSG	HSG	
21	G6	G9	HSG		
22	G8	HSG	HSG		
23	G8	HSG			
24	G8	HSG			
25	G8				
26	G8	(27–30: for 30 psf G9)			

GIRDER SELECTION EXAMPLE



Shaded portion indicates load of 10 square modules carried by girder. Referring to the 3M girder table, the girder required with a total load of 70 lbs per sq ft is G8.

the problem of the central joint. In essence, this problem was: How could columns and beams be joined together at their confluence in a completely standardized way? When, in his research, a separate structural element for this confluence was developed, the basic answer was found. Once this unit was isolated, previously difficult problems of detail and attachment fell into place one by one. His patented solution is called a "nucleus connector." It acts as a universal joint for construction, representing a fundamental principle necessary, in Halle's view, for meaningful further simplification and standardization of the building process.

Structural Components

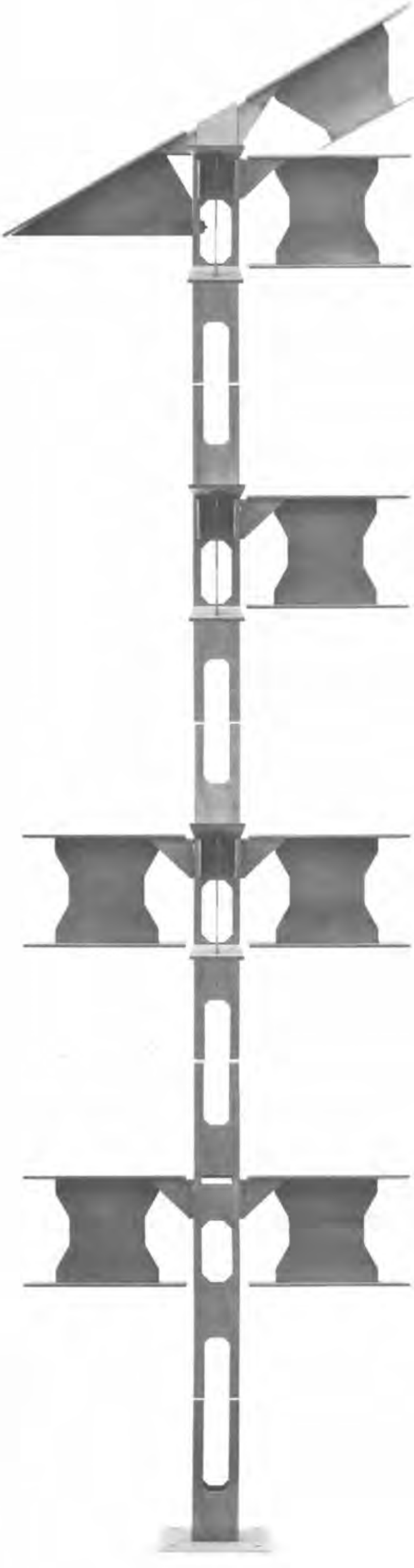
The structural system consists of three basic elements: beams, columns, and "nucleus connectors." Beams, a standard 5 in. wide and 16 in. deep, are essentially open-web steel joists; columns are 5-in. square tubes perforated at spaced intervals for lightness and to receive panel attachments; the "nucleus connector" joins the beams and columns (*left and overleaf*).

All these parts, for both structure and enclosure, can be efficiently manufactured in the factory and easily distributed. For military or other large programs, they can be stocked and called forward as desired. For general use, they can be marketed through established sales organizations. And, for whatever use, they can be chosen from simple design tables (*left*) and catalogs, transported to sites and erected easily, quickly, and at low cost. Errors of fit cannot be made, for the parts will not fit together incorrectly.

With the standard structural series of only 58 parts, buildings up to three stories high, with spans of nine modules (30 ft), and carrying live loads up to 60 psf can be built. With a total of 95 parts, the complete structure for buildings up to five stories in height, with spans of 12 or more modules and supporting live loads up to 100 psf, can be readily stockpiled and variously arranged, so that the system is informally described as an "adult erector set" for complete buildings.

Design Criteria

The specific criteria upon which the system is based include use of the 3'-4" vertical module, center-line dimensioning, and standard depth and width of beams and columns. An aspect continually borne in mind during development was that an economy should be considered not by itself, but rather in relation to the entire building process. If possible, one economy should lead to another.



The 3'-4" dimension, which is always prominent in the consideration of grids, offers planning flexibility without being too small to be meaningful. In other words, if a dimension is too large, say 10 ft, flexibility cannot be achieved. Yet, if the dimension is too small, the building process remains too close to handicraft technology. The 3'-4" dimension does what neither 3'-0" nor 4'-0" can do. After deduction for structure, the 3'-0" dimension is too small to accommodate doorways, whereas the 4'-0" dimension is wasteful. The 3'-4" planning grid is remarkable in that it achieves so much with so few limitations. To make it even more flexible, Halle has been considering using it with a 1'-8" submodule.

As for the 7¼ in. vertical module, it does not seem sensible to Halle that either a horizontal grid or an arbitrary dimension, such as 4 in., be used vertically. 7¼ in. is a standard stair riser height, so that if a high ceiling is desired, it is necessary only to add module lengths to columns and risers to stairs. This simplifies design and opens the path to inclusion of standard prefab stairs within a system. Also in favor of the 7¼ in. dimension is that four modules plus sill thickness comes to 2'-6", a standard sill height. Thus, in a vertical context, the 7¼ in. module works as neatly as the 3'-4" dimension does horizontally. As with the 3'-4" planning grid, the 7¼ in. vertical module is based upon human dimensions. Halle cites this as a basis for its merit, as against dimensions such as 4 in. or 1'-0".

Erection

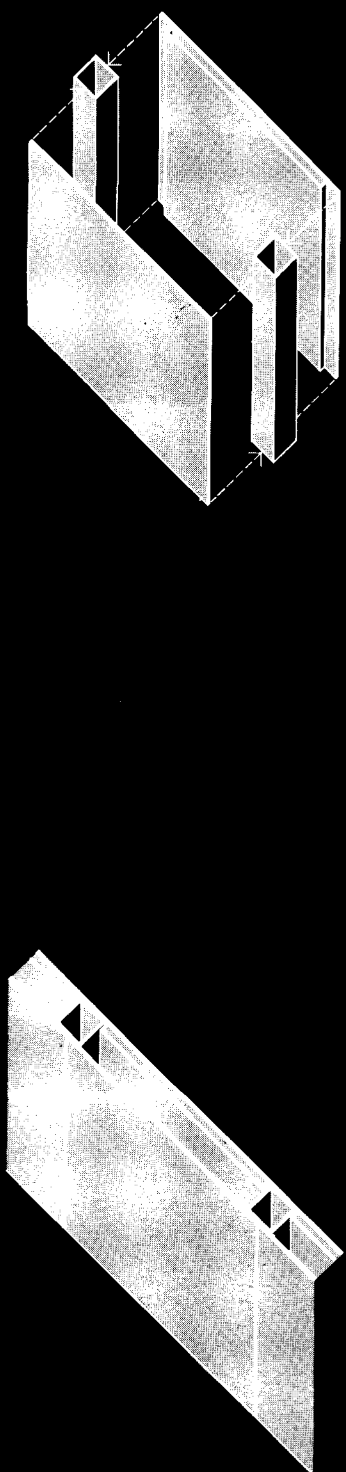
Base plates attach to foundations in conventional manner, columns fit in sleeved relationship over base plates, and, similarly, "nucleus connectors" fit into tops of columns. An upper column can be added by inserting a sleeve connection in the upper part of the "nucleus connector" and sliding the upper column over it.

A beam or girder can be attached (or omitted) at any side of a "nucleus connector." To achieve this, a hanger fits into an opening in a side of the "nucleus connector," and the beam or girder rests, in turn, on the hanger. The standard structural series includes beams up to nine modules (30 ft) in length and accommodates live loads of 40 and 60 psf. The supplementary series expands the list to include beams up to 12 modules (40 ft) in length and live loads from 20 to 100 psf.

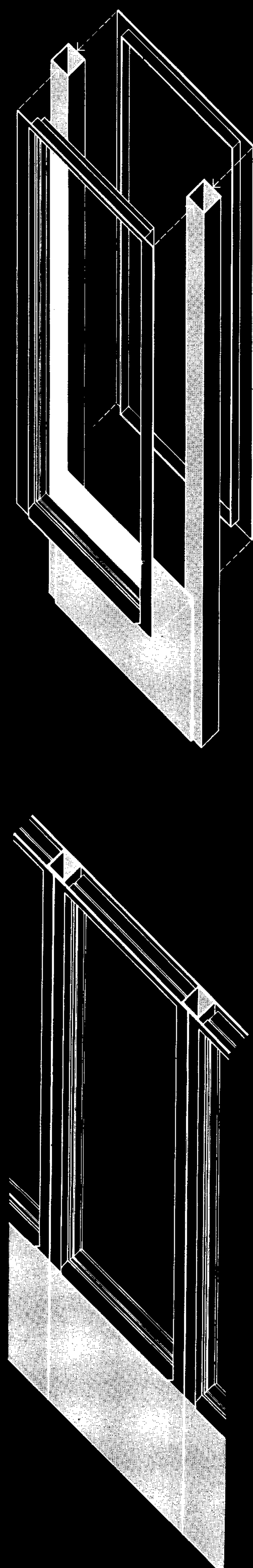
All these parts rest in bearing. This is important in order to achieve necessary tolerance adjustments. No load is transferred through bolts. There is only one type or size of bolt in the entire structural system and it is used merely for securing, rather than transferring, load.

PHOTOS BY DAMORA

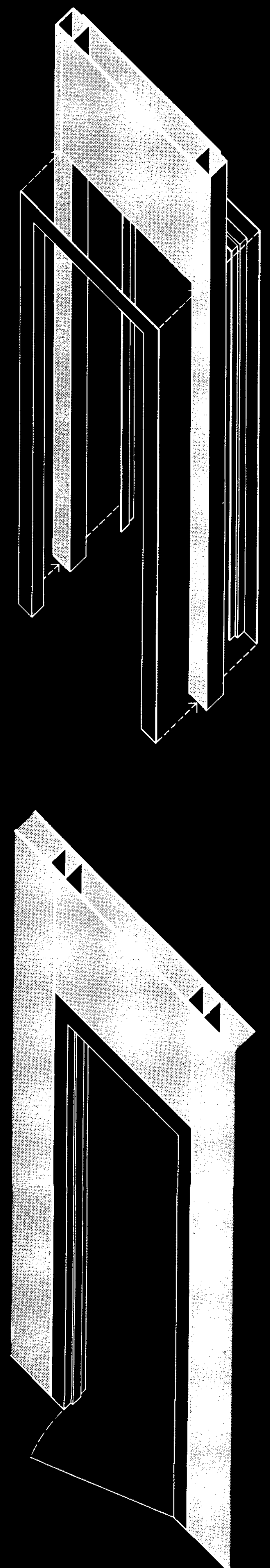
Walls



Windows



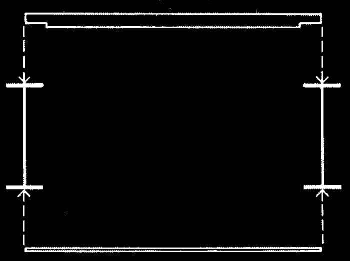
Doors

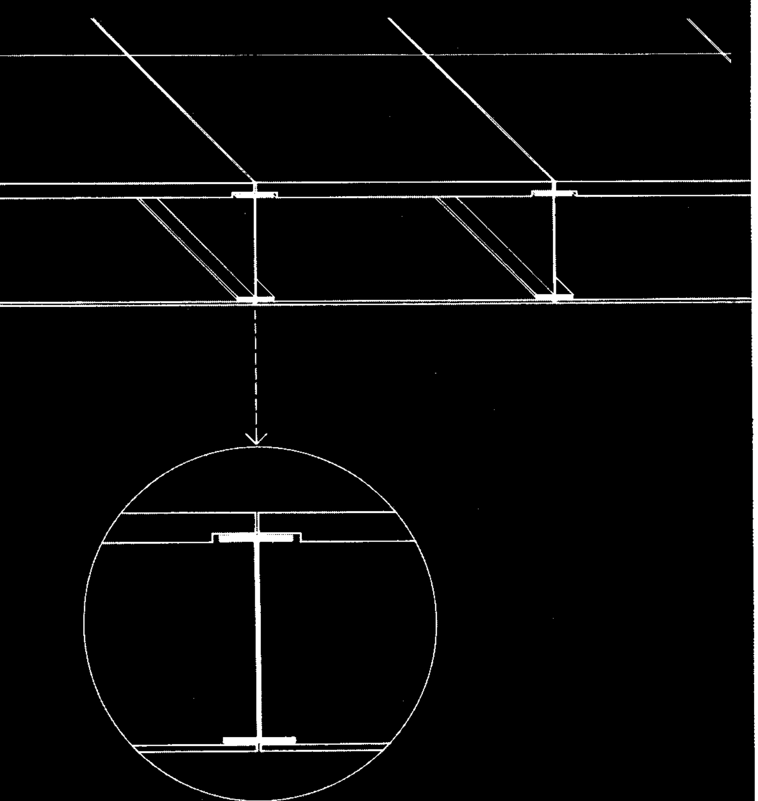


As an additional feature, the columns, beams, and "nucleus connectors" have been designed to be continuously hollow, to allow for passage of smaller utility lines. For example, electric wiring can be passed continuously through the hollow columns and open-web beams, and from one to the other through the "nucleus connector."

Beyond the basic elements, there are special purpose components. Where a column is not required for structural support, but is needed for panel attachment, a strut can be used instead. Also, a special series can achieve longer beams and columns, pitched roofs, and cantilevers.

Floors and ceilings





Enclosure Elements

Panels for walls, partitions, and window and door frames apply from opposite sides of columns by simple pressure and are held by blind, bayonet-type attachments. Wall and partition panels can be of various types and materials.

Window units consist of subframes, which, in being applied to columns or struts, overlap each other to form the desired shapes. They are aluminum extrusions and accept various types of sash, such as casement, sliding, double-hung, pivoted, or projected. Door frames are also aluminum extrusions and similarly formed.

Floors and roofs are achieved with standard panels. The floor panel is one module square, with corner cutouts to accommodate columns. Where there are no such columns, a 5-in.-square tile filler is placed in the opening. In this way, one universal panel covers virtually all conditions. Roof panels are similar to floor panels.

Comparative Systems

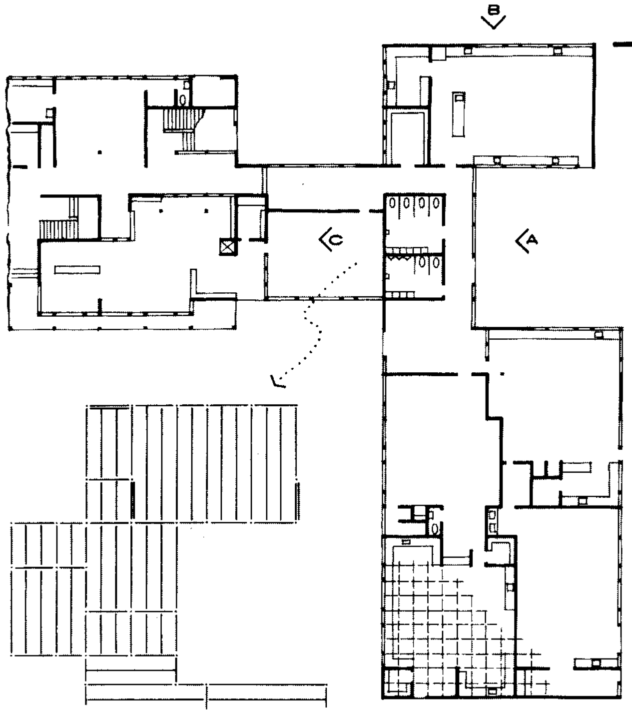
The closest realization to such a system has been in England, rather than in America, which is so often thought of as the nation of mass production. Shortly after World War II, with the sponsorship of the Ministry of Education, a group of bright young architects, working for the Hertfordshire County Council, sought a basis for a rational approach to flexible design of schools.

The Hertfordshire County Council worked out the basis and designed the schools built by Hills (West Bromwich) Ltd. These were milestones in the development along this path. After initially using an 8′-3″ dimension, they came to the 3′-4″ planning grid. The CLASP group, a joint effort of several school authorities in Britain, built even more economical schools. Although these schools improved upon the Hertfordshire work, their main distinction was in achieving economy through mass purchasing.

For comparative purposes, Halle, with the co-operation of the Ministry of Education, has redrawn the plans of a British school designed by the Nottinghamshire County Architect *(facing page)*. No difficulties whatever were encountered in adaption or detailing. The basic 3′-4″ planning grid of the school simplified comparison, and he reports that, once having established the framing plan and design loads, he was able to select the specific beam, girder, and column sizes for this 26,500-sq-ft school within one hour.

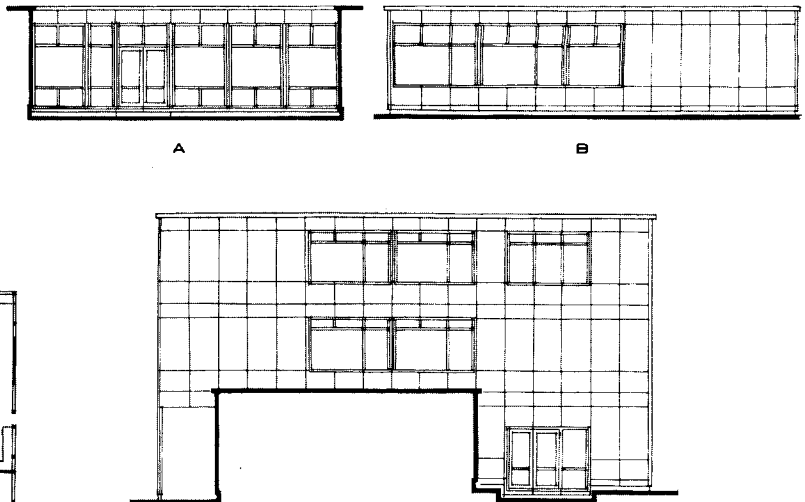
A prototype of the Halle System is being planned. As the system then moves toward manufacturing or licensing, its thorough engineering, simplicity, and completeness would seem to offer promise of great success.

Halle concludes: "The best and most imaginative architecture will always be largely the result of thoughtful individual design and special manufacture. But just as hand-tailoring cannot clothe the world well, such processes cannot adequately supply mass building needs. A more fully industrialized basis is obviously required. I believe that with a flexible system, it can produce buildings which can function well and be visual assets to our communities that will be built in the future."



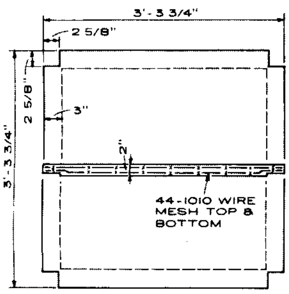
PARTIAL FRAMING PLAN

PARTIAL PLAN

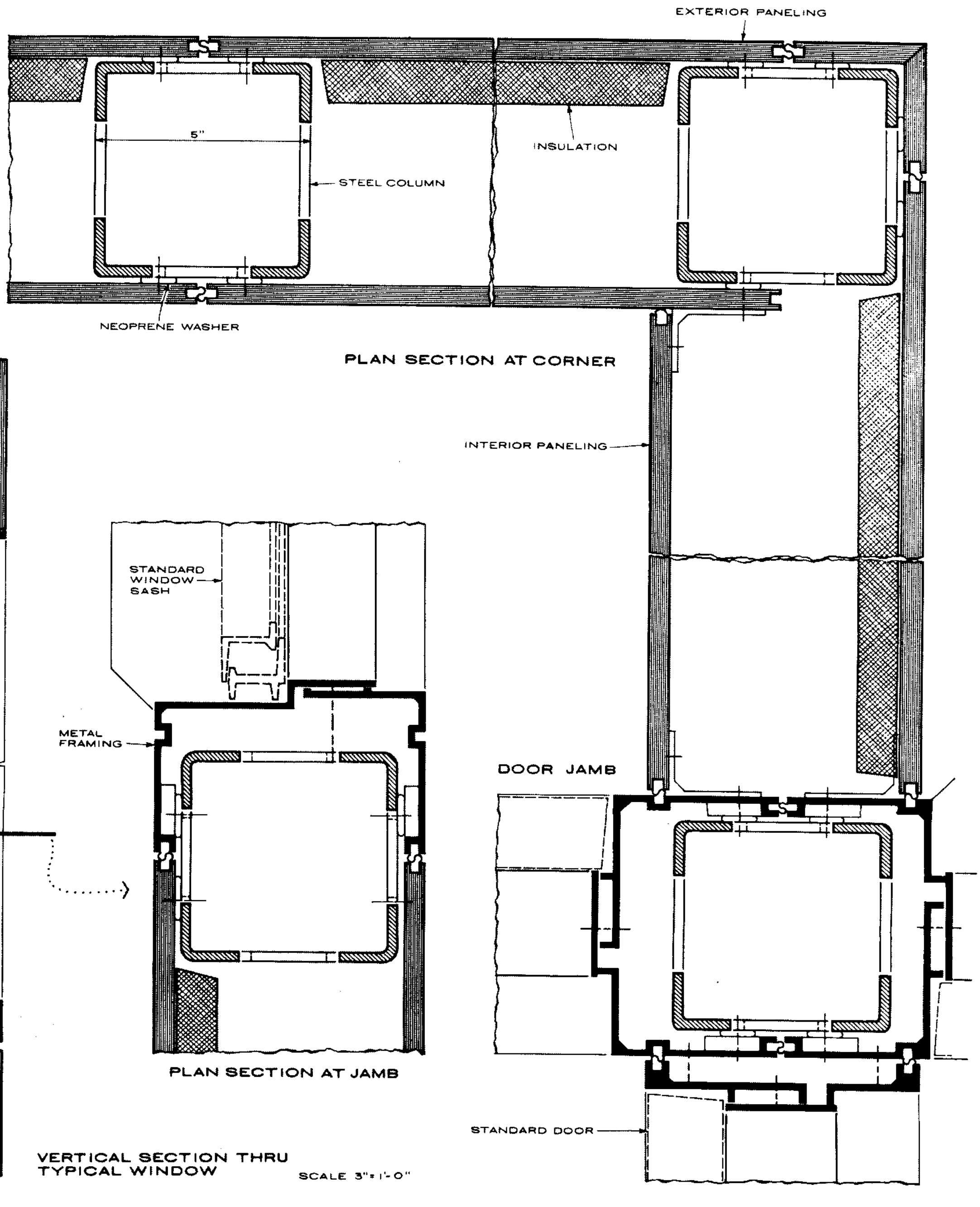


C

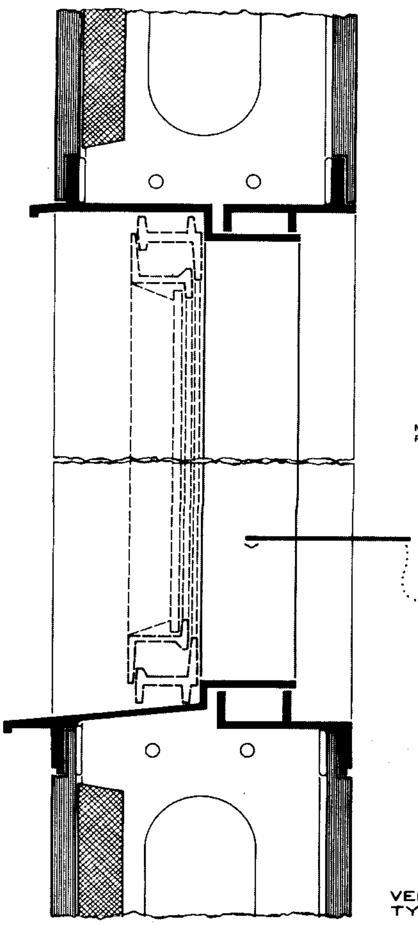
ELEVATIONS



FLOOR PANEL



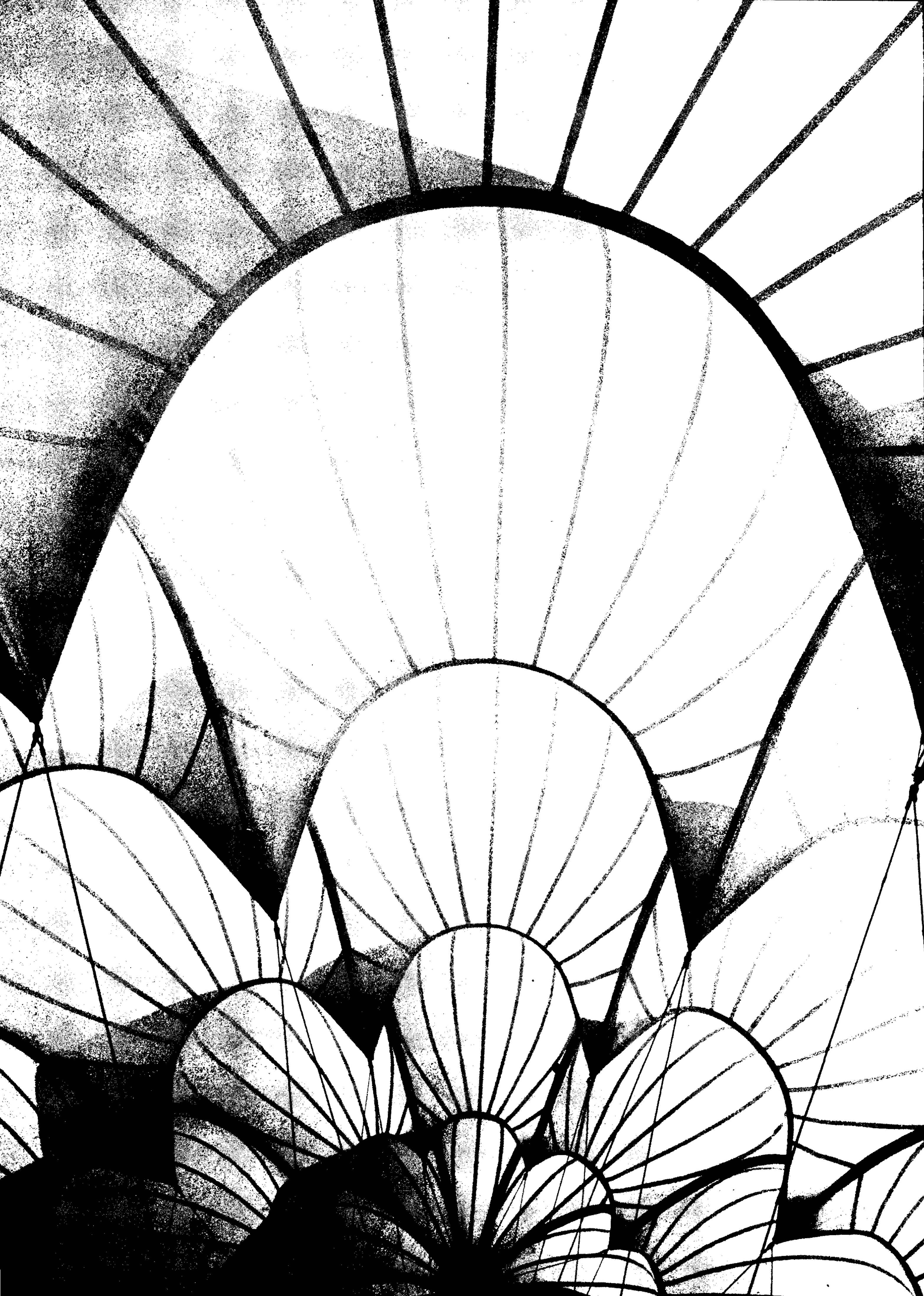
PLAN SECTION AT CORNER



VERTICAL SECTION THRU TYPICAL WINDOW

PLAN SECTION AT JAMB

SCALE 3" = 1'-0"

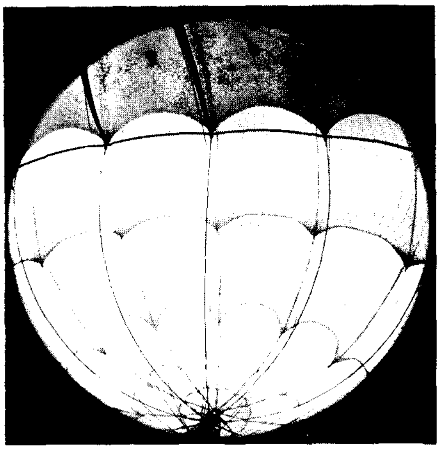


Perhaps the most easily erected of all prefabricated buildings are the air-supported structures that create high volumes of architectural form and space through relatively simple and inexpensive means.

An extremely promising method of prefabrication lies in the extension of the application of air-supported structures. Already familiar as enclosures for such occupancies as motel swimming pools, tennis courts, storage spaces, and so on, their wider acceptance for diverse enclosures as well as anticipated configurations of great aesthetic potential is to be expected.

Although admittedly a "Fair" structure conceived for a carnival atmosphere, Victor Lundy's "abstract air flowers" for the Brass Rail Refreshment Centers at the New York World's Fair demonstrate the appeal to the imagination that these structures make (*interior photos left and right; exterior below*).

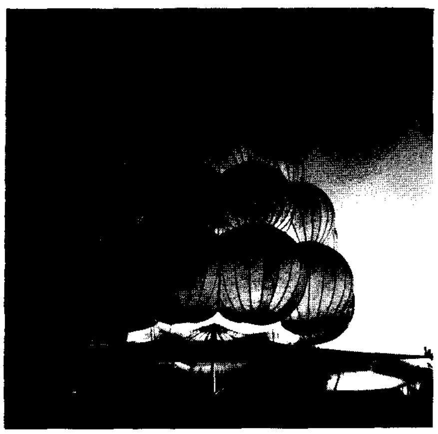
As constructed at the Fair, these air structures, made by Birdair Structures Inc., are of a glass-fiber material that is inflated and maintained constantly at a low internal air pressure. These units rise 75 ft in height and are about 60 ft in diameter. This high volume, anchored to a central mast, is actually a big three-dimensional roof hovering over the refreshment stand. At night, strong lights mounted on the mast illuminate the air structure from within so that it has a dull glow of light which reveals the vertical

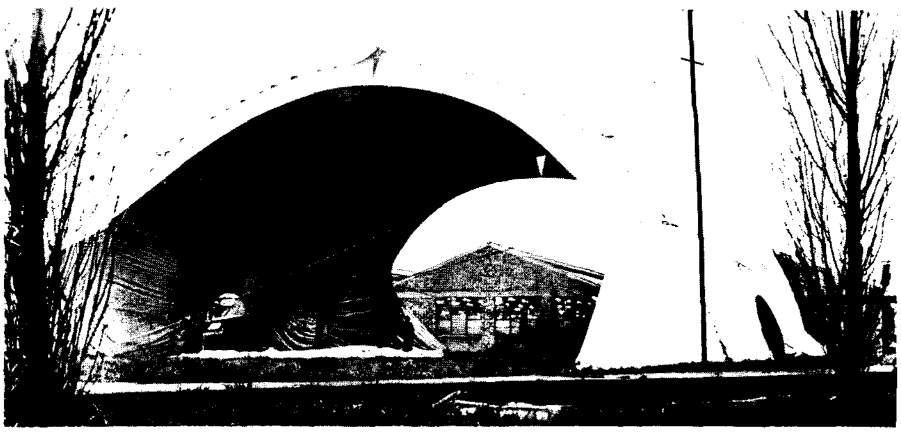


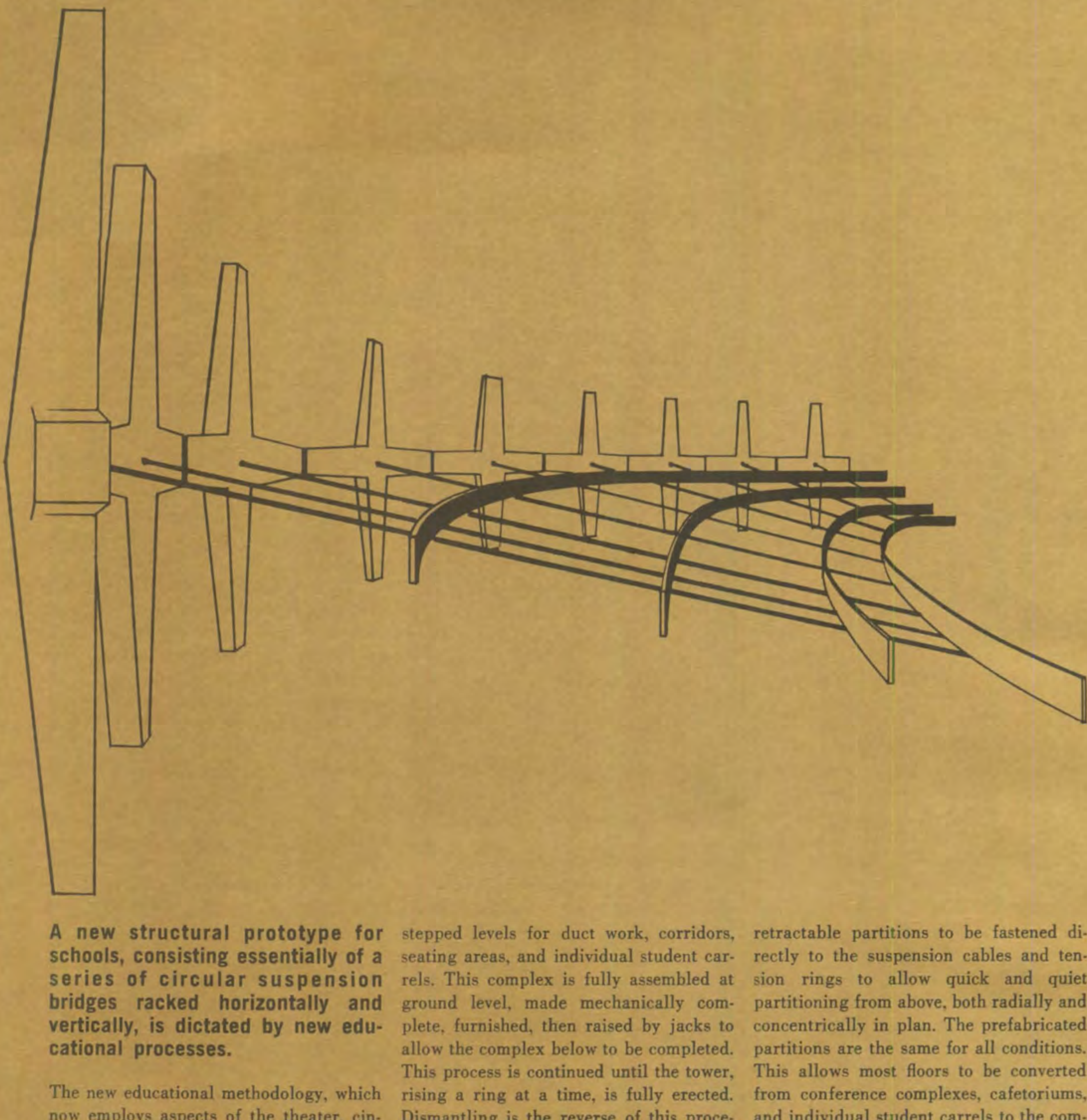
patterning lines in the structure.

The extension of this principle to many other applications is easily imaginable. "Whatever it may suggest to different people," states Lundy, "there is no denying that it is a brave roof over a rather simple function. Below are the central refreshment counter and two other sales counters, and a cusped terrace that one can mount continuously over the cusped stairs to tables and chairs on the roof. I think this demonstrates how it is possible, through 20th-century technology, to create high volumes of architectural form and space through the device of relatively simple and inexpensive means."

A variation in the approach to inflatable structures is the use of nylon all-purpose marquees, portable classrooms, aircraft hangars, garages, and temporary structures of many types that are being researched by Walter Kidde & Company. Its portable shelters, which roll up for easy storage, are now in production. In one case, the shelter's basic structure is a series of flexible ribs arranged like hoops and inflated to 100 psi to support a translucent skin of nylon fabric coated with weatherproof synthetic rubber (*below*). Since the entire load is supported by the inflated ribs, high pressure is not maintained in the building itself. Doors can be left open or end walls can be removed to ease traffic circulation. Three span widths are in production with the following specifications: span 15 ft, height 8 ft, length 55 ft, weight 300 lbs; span 30 ft, height 16 ft, length 70 ft, weight 850 lbs; span 60 ft, height 35 ft, length 120 ft, weight 2800 lbs. The latter span can accommodate an aircraft up to the size of a fighter bomber, yet can be folded into a package small enough to be carried by a ¾-ton truck. It can also be erected in three to four hours by a team of eight construction workers.







A new structural prototype for schools, consisting essentially of a series of circular suspension bridges racked horizontally and vertically, is dictated by new educational processes.

The new educational methodology, which now employs aspects of the theater, cinema, and concert hall, as well as a vast assortment of audio-visual aids and demonstration devices, dictates a new structural prototype.

Demonstrated here is a school complex that consists essentially of a series of circular suspension bridges, racked horizontally or stacked vertically. The system, as conceived by Designer William Katavolos and his Consultant Designer Paul Schulze, is prefabricated from a minimum of building components serving both situations. The precast-concrete sections that comprise the outer compression ring are assembled and post-tensioned. Fastened from them are the radiating suspension cables that converge to the central tension ring. These cables carry the circular stiffening rings concentrically to create the stepped levels for duct work, corridors, seating areas, and individual student carrels. This complex is fully assembled at ground level, made mechanically complete, furnished, then raised by jacks to allow the complex below to be completed. This process is continued until the tower, rising a ring at a time, is fully erected. Dismantling is the reverse of this procedure and opens up the prospect of large-scale portable structures.

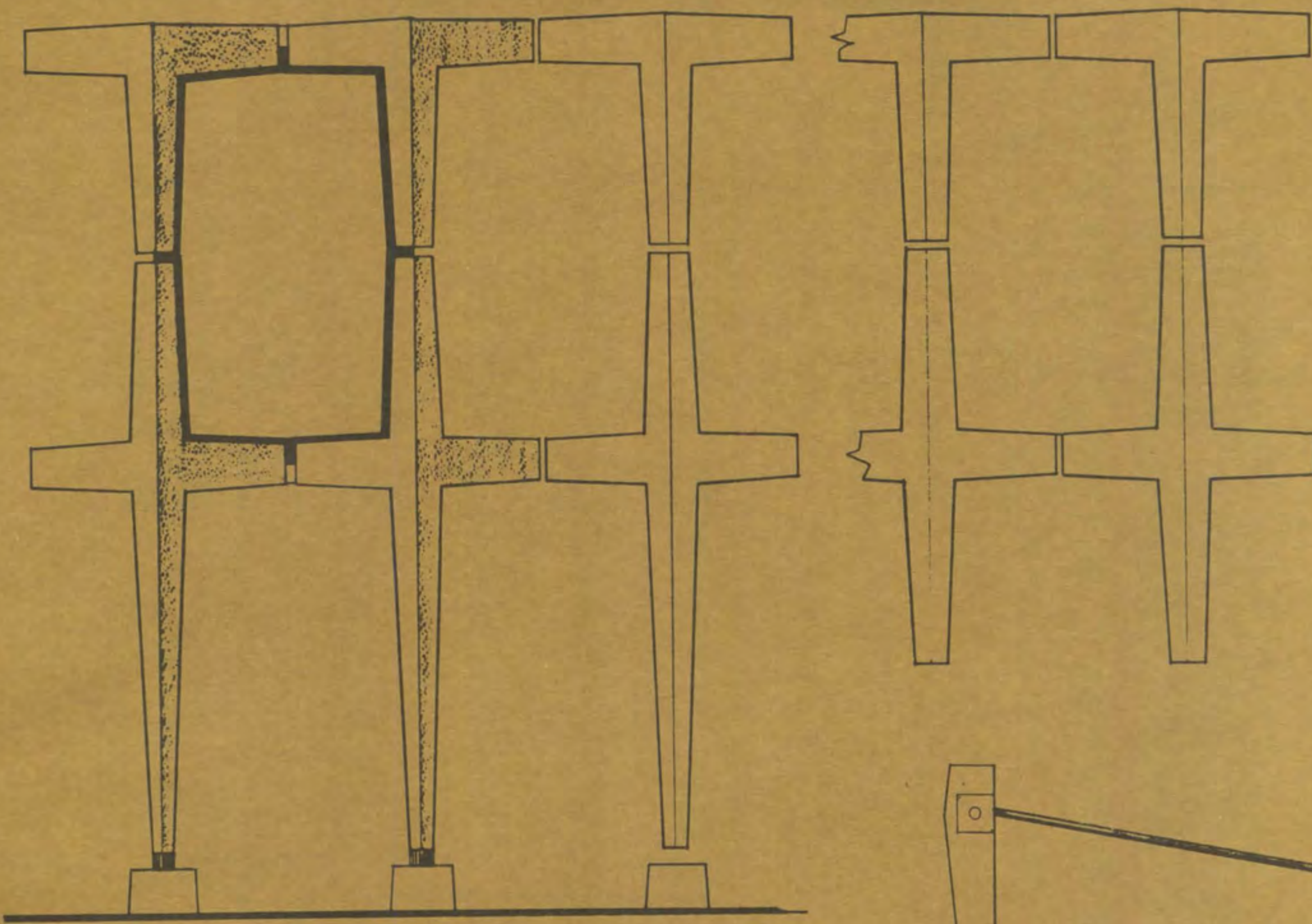
Such a structural system clearly separates into tension and compression situations that are clearly suitable for schools. The compression cylinder of stacked rings creates maximum areas for classes, and the columnless flexibility of the suspension system provides structural configurations that follow closely the functional requirements of the new class shapes.

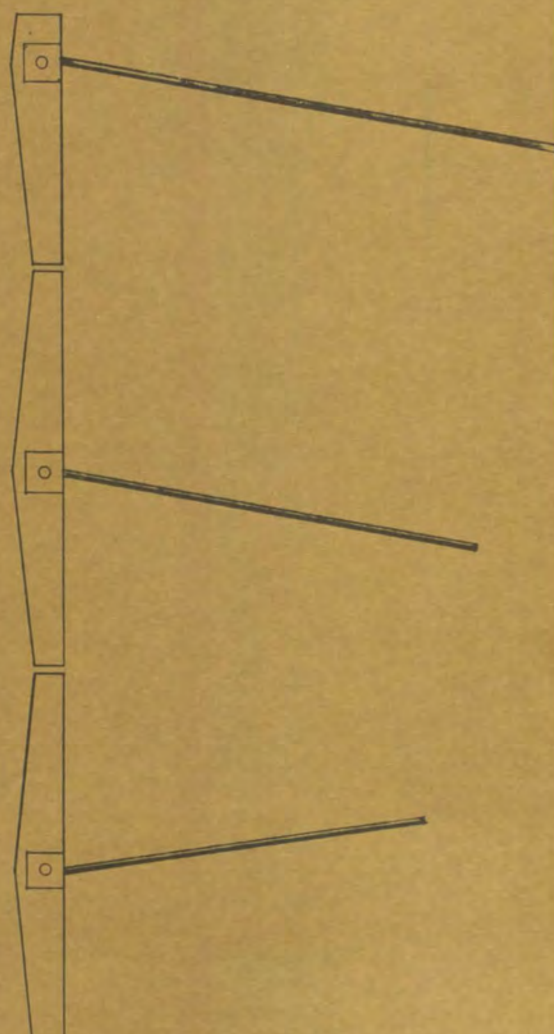
Demonstrated in the drawing are divergent and convergent class-types for wide-screen viewing, multiple-projection presentations, as well as the vertical screen for teaching machine techniques, the central 360° projection cores, and the various audio-visual viewing arrangements.

The tension system also provides for retractable partitions to be fastened directly to the suspension cables and tension rings to allow quick and quiet partitioning from above, both radially and concentrically in plan. The prefabricated partitions are the same for all conditions. This allows most floors to be converted from conference complexes, cafetoriums, and individual student carrels to the complete openness of the theater in the round. The student elevators, which are located in the outer corridors, also include educational equipment that can be vertically controlled from the interior teaching cores, to provide projection and other audio-visual effects.

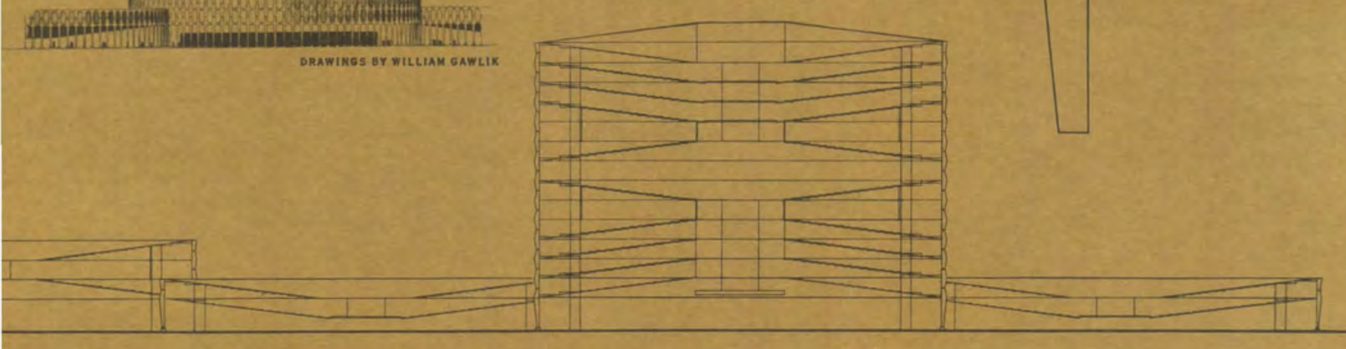
This structural system includes the added economy of corridor-carrels at the perimeter of the building, providing television and teaching machine facilities. This produces a partial student-teacher separation that curtails the need for horizontal traffic.

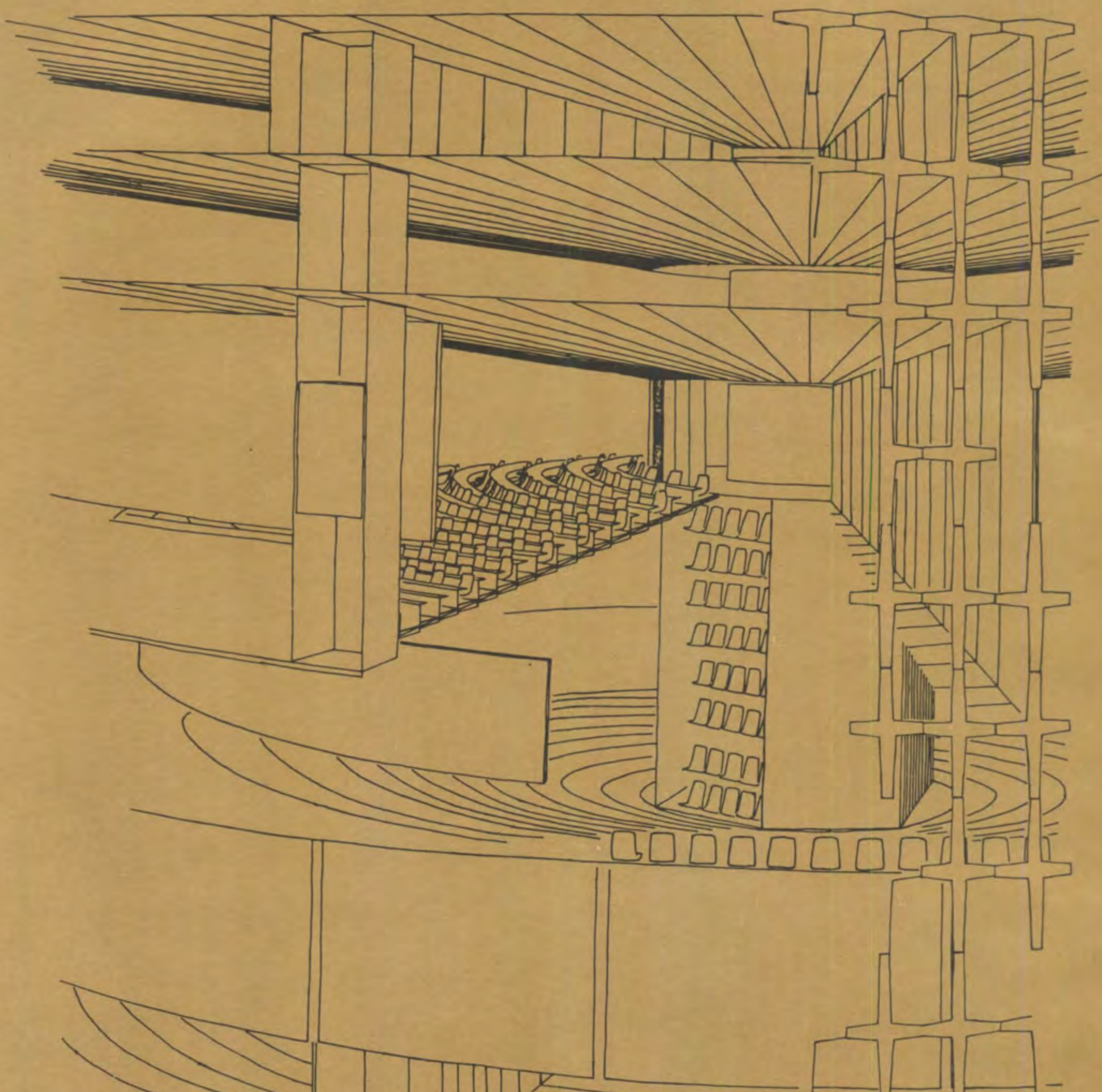
Team teaching cores at the center of the building provide vertical travel of teaching aids, stages, and demonstration devices, making them and the teachers available at any floor. This inhibits stu-





DRAWINGS BY WILLIAM GAWLIK





dent circulation vertically and stabilizes classroom loads. The teaching towers serviced by teaching teams employing electronic extension of themselves, ushers in a new phase that reminds one more of the operational procedures on the landing deck of a nuclear carrier or preparation for a rocket launch. The problems of prolonged seating become more critical and dictate new solutions, for now the student receiving information from his head rest, or hearing aids, and projecting a training film on the area above him, can so isolate himself from the conversations of nearby students or the lecture in process, that he plugs into the teaching complex at any place he chooses.

Need for this freedom has been determined from the growing realization that the education process does not proceed inductively from the parts to the whole, or deductively from the whole to the parts, but is rather a transduction from part to part, presupposing pertinence to the larger patterns of the whole.

This implies that the student may begin in different places, proceed in different ways: tutorially with instructors or machines, through team critiques, conference calls, or lecture groups. Throughout this process he *must innovate* and invent, using the school as a vast idea fund that verifies his assumptions or patiently and privately invalidates them, at the same time providing alternates that may encourage the continuance of creative search. Ideally, this implies an operational intuition on the part of students and teachers, serviced by the most scientific means.

Observations and Conclusions

Many people known to have both interest and experience in the field of industrialized structures were surveyed by the Editors to inquire how they evaluate the present development of this kind of building in the United States. Three of the questions posed to them, and significant excerpts from their responses, are presented on the quotations that follow:

Are we really progressing in the direction of industrialized building? And if so, are we on the right track?

WALTER GROPIUS, Architect. Prefabrication, which penetrates more and more into building, cannot be considered as a revolution because it is a slow, evolutionary process. It has penetrated even more into high-rise building than into the residential market. Eighty to ninety per cent of all parts of a skyscraper are industrially made and being assembled on the site. For residential buildings, a wrong turn is taken when the manufacturer tries to repeat the same type of house indefinitely. I foresee that we will end up with a great many component parts of houses obeying basic dimensions, which will be used by all manufacturers who compete with each other. This will make it feasible to assemble different-looking houses according to the different requirements of families, but made from the same standardized component parts.

EZRA D. EHRENKRANTZ, Project Architect, School Construction Systems Development, Stanford University. I think that there are a number of directions for experimentation which should be tried and are not being tested in a valid way. SCSD, in the way in which we are trying to attack the problem, presents only one direction heretofore not explored in this country. I think there are others as well which should be tried, and that, if we had an opportunity to review efforts made in a variety of different directions, we would have a much better chance of then deciding which of these are appropriate or are on the right track. At the moment, all we can do is see how our present general trend is related to more conventional construction and say it's a little better, or a little worse, or about even. As yet, we do not have sufficient information on the possible alternatives to determine if we are on the right track or not.

Office of CARL KOCH & ASSOCIATES. From our experience, we would have to say that progress in the development of industrialized building often seems painfully slow, but there are increasing signs that the pace may pick up soon. The SCSD project of EFL suggests that if industry is not yet really awake, it is twitching in its sleep. This project recognizes that larger assemblies of components represent only part of the answer: that integrated systems of components are required if significant benefits are to accrue.

GEORGE J. SANTRY, President, Schokbeton Products Corp. In the near future, the demand for social housing, schools, and related buildings will bring about the industrialization of this type of construction. A study of the requirements in the field of social housing brings one to the rapid conclusion that it will take tremendous efforts on the part of Government and industry to meet these needs even partially, let alone keep up with the ever-increasing demand caused by population growth. It is our conviction that only through properly planned and executed industrialized building can we hope to meet this challenge.

HAROLD D. HAUF, Professor of Architecture, University of Southern California. Whether consciously or not, there is a growing acceptance of the idea that the construction operation at the site should be an assembly operation, and not a hand-wrought process. Large—especially multistory—building operations have long exhibited many of the characteristics of industrial "line" production, especially in the erection of their structural systems. This aspect of industrialization of the building process is becoming more evident with the development of new construction equipment such as the long-reach "climbing" cranes, and the growth of the slip-form method of concrete construction and its adaptation to complex building types such as apartments and institutional buildings. Industrialization of the building process, I believe, will advance in the two directions of assembling larger components (especially of walls and mechanical systems), and the development of ever-more efficient construction machinery and methods to stream-line "production" at the site.

C. HERBERT WHELLER, JR., Associate Professor of Architectural Engineering, The Pennsylvania State University. Progress is being made faster than we realize. Home manufacturing, being the most industrialized of building types and being of sufficient volume to mass-design, mass-produce, mass-purchase, and mass-market, is making strong inroads. One home builder predicts that 90 per cent of the homes built in 1970 will be manufactured. The entire light construction industry shows signs of being industrialized. Roadside restaurants, car washes, automobile showrooms, stores, and gas trailers have grown in the postwar period to over 10 per cent of the housing starts. Certainly, the growth of towns like "Levittown" may be categorized as industrialization with mass production assembly on the site.

JAMES G. GROSS, Director, Engineering and Technology, Structural Clay Products Institute. The structural clay products industry is conscious of the high cost of labor that goes into the use of its products in building construction. It has investigated a number of approaches to reduce the cost of clay masonry through industrialization. A number of approaches have been made to panelization —from those of precasting clay masonry panels to building clay masonry panels by masons in a plant under ideal conditions. Some new investigations are under way within the industry, some involving new products not yet marketed, but prefabricated into large elements. To date, savings over conventional hand-laid masonry have not been achieved. This is due to a number of factors, among which are the high cost of handling, transporting, and placing large elements in building construction. As far as we can determine, from the initial and ultimate cost viewpoint, the most economical permenent wall that is architecturally acceptable today is still a hand-laid masonry wall.

BARRIE GREENBIE, Designer. Is industrialization taking place in a manner to meet contemporary construction needs most effectively? The cancer of urban blight that is eating the guts of our cities and the scrofulousness of suburban sprawl that is throttling the countryside around them suggests pretty grimly that it is not. Much thought, of course, has been going into the problem of planning to meet the situation; but it also represents a backfiring, a dangerous misapplication and misdirection of the industrial process itself in the whole business of building that was once the practice of architecture.

Are our reasons for it valid?

RICHARD SHARPE, Architect. Research and development of industrialized building in this country is so often performed by large corporations, whose general concern is with short-term and immediate results translated into some form of instant profit. There is an enormous need for the industrialized product, and future development will ultimately rest in the hands of the people involved in industries; I see the whole future in terms of architects, industrial designers, and engineers working jointly toward a common goal.

ROBERT M. DILLON, Executive Director, Building Research Advisory Board. We definitely need the advantage of industrialized processes to reduce cost over the long range and to achieve quality control, but I personally would not like to see standardization of buildings *per se.* It may be argued that a number of factors have and will continue to be major deterrents to industrialization: the myriad of local and national regulatory bodies promulgating codes and standards that differ widely in terms of both quality and proficiency; the greater distances over which any centrally produced components or structure must be transported; and the low profit margins resulting from keen competition. Nevertheless, a continuing major effort in the area of building technology and in the areas of codes and standards seems clearly needed.

GEORGE A. DUDLEY, Dean, School of Architecture, Rensselaer Polytechnic Institute. Even sizable reductions in the initial cost of a given component do not sufficiently affect the ultimate total price of the structure to motivate real action toward industrialization. Only if the entire operation is conceived of as a whole, with integrated reductions all along the line, will such motivation be developed.

KOCH. We believe that the development of prefabrication techniques has come close to its limit in wood frame construction and that the more fruitful developments will come in other materials: concrete, metals, and possibly plastics, or composites of these groups.

SANTRY. Economic forces consisting of sheer demand and rising labor costs combined with the relative inefficient productivity of site labor are the basic factors that will inevitably bring this about.

GREENBIE. Prefabrication seems to have failed to make any significant inroads into construction practice in this country. . . . This is due to the policies of building material manufacturers and contractors who remain committed to a merchandiser's product psychology. Effective industrialization of building requires concentration not on products, but on methods.

Does this portend a change in the role of the architect in building? And how should the architect consider his part amid this approaching phenomenon?

GROPIUS. From the point of view of the architect, I do not think it makes a great difference whether he uses the standardized brick as formerly, or standardized industrially-made component parts from which he can make different-looking houses according to his design intentions. . . . Prefabrication will not stop the desirable variety of the final appearance of the buildings. However, I believe that the architect should venture to develop with industries the details of component parts for building in order to give much closer connection between the designer and the manufacturing industry.

EHRENKRANTZ. I look toward a design keyboard of compatible components to give the individual architect considerable flexibility in his design approach. This flexibility will not necessarily come about of its own accord, but only if it is required and demanded strongly by the profession.

SANTRY. To us, the role of the architect in the field of industrialized building is vital. It is only through his active participation in depth that we can hope to avoid the dangers inherent in mass construction.

HAUF. One of the principal impacts will be the need to consider much more carefully than heretofore the proposed construction method as an element influencing the design process.

WHEELER. Next big step forward in the building field will be the synthesis of the building design professions.

GREENBIE. The designer, the architect, must play a larger part at the industrial level, to create components that are so simple, so effective, and so flexible in application that they permit, even require, unique organization into specific and individual forms.

DILLON. The architect's role need not change, provided he becomes a more effective co-ordinator of the "whole"—i.e., of the many disciplines required to produce today's structures.

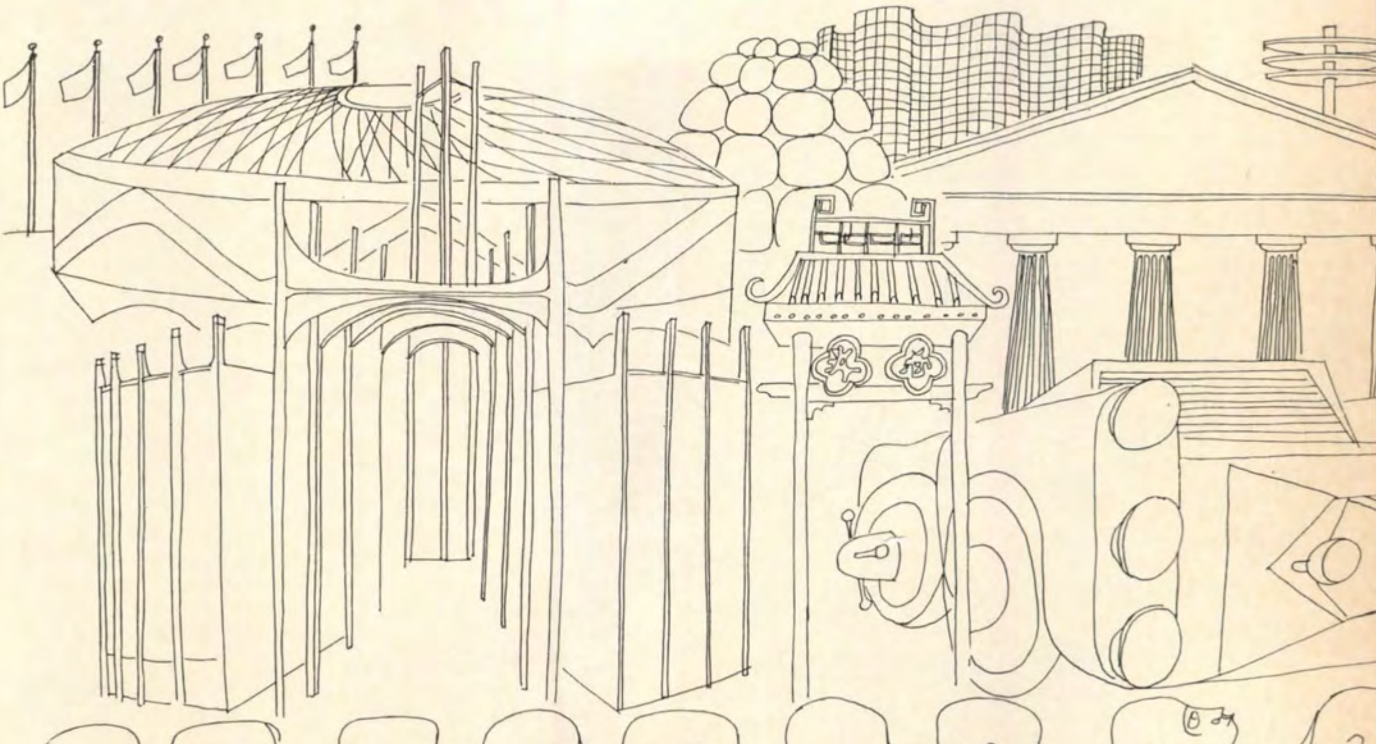
DUDLEY. The architect should be far more involved in the many interrelated phases of the total building process, reaching all the way back to direct involvement in the industry's production of elements of the building.

SERGE CHERMAYEFF, Professor of Architecture, Yale School of Art and Architecture. Except for the highly specialized few, or the very few stars that accept god-like commissions, the profession as a whole is turning slowly from the classic designer with which we associate the architect, and is, in fact, becoming an arranger and assembler.

CLIVE ENTWHISTLE, Design Consultant. Important breakthroughs in building economics will not be made by mass-producing *components*, but by the development of *systems* that permit a rational assembly of elements into integrated wholes and sub-wholes. The development of such systems depends on close engineer-contractor-labor co-operation, programmed by architects who understand the problems in all three fields, and who are also inventive designers. It is essential that the architect, and not the builder or manufacturer, take and keep the initiative in this increasingly effective development.

In gathering material for this review, a number of potential sources were queried. Among those who responded, practically all were able to suggest new preassembly systems of one sort or another that were known to them. Upon subsequent investigation, it was indeed found that all sorts of organizations, architects, industrial designers, consulting engineers, manufacturers of building components, basic producers of raw materials, investors seeking opportunities for their clients, and so on, were devoting considerable attention to this future direction in construction. Surprising to us, however, was that so few are as yet in such an advanced state of development that their backers are willing to describe them freely. In some instances, specific projects to employ preassembly techniques have been delayed due to financing difficulties. Numerous universities and Governmental research projects of this kind are similarly under development but cannot yet be relieved of their wraps. Accordingly, no attempt has been made to present an over-all report on this potentially vast influence on future construction. Instead, we have tried to present sufficient material to impress the reader with the scope and complexity of activity in the field of preassembly so as to leave no doubt that it is a force to be reckoned with. More importantly, such a relatively brief review emphatically points up the architect's responsibility in helping shape the future development of the industrialized building process, and his need to accept this challenge for leadership, or else to cease being the directing force in building that we now recognize him to be.

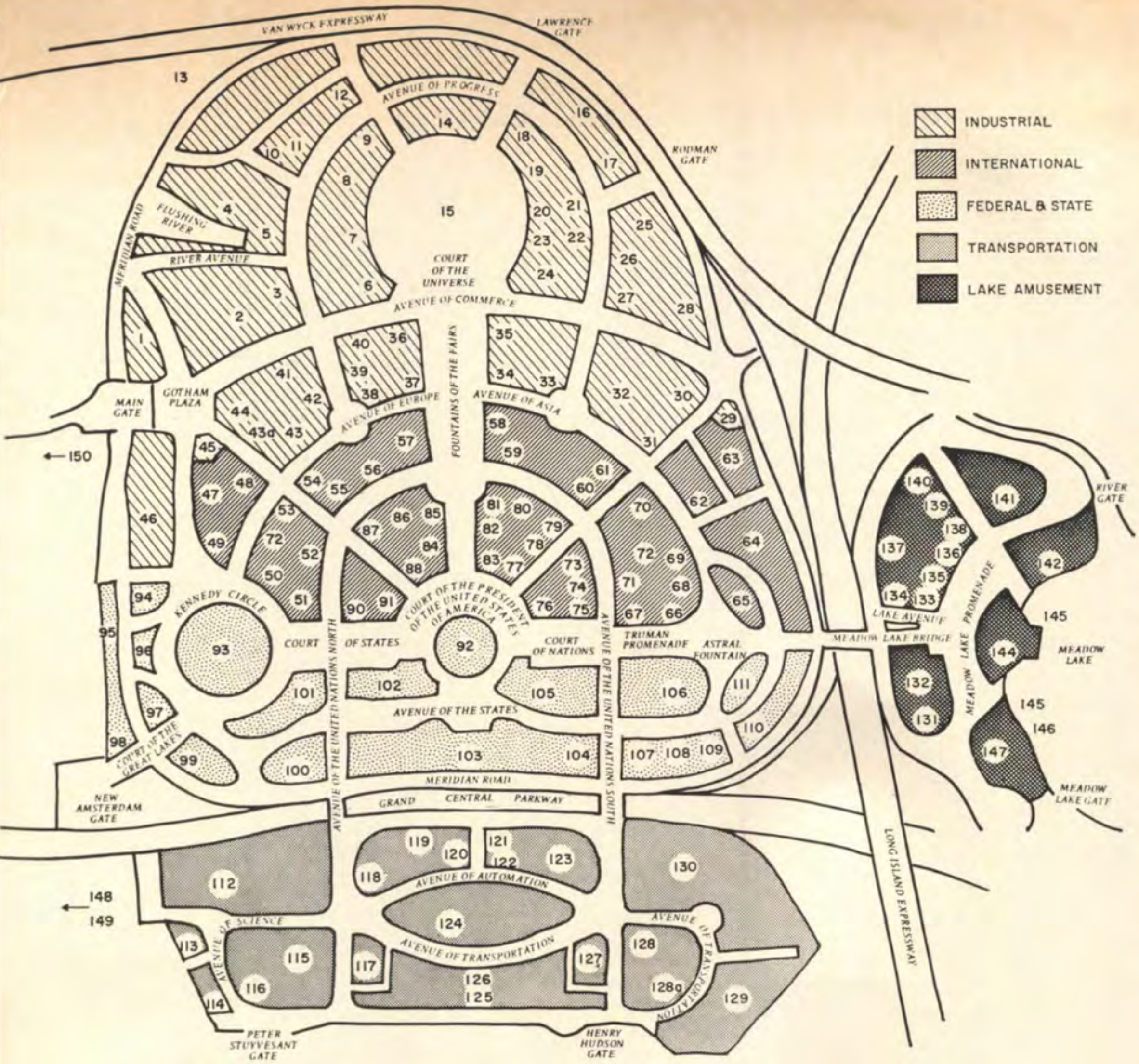
THE BUSY ARCHITECT'S GUIDE TO THE WORLD'S FAIR

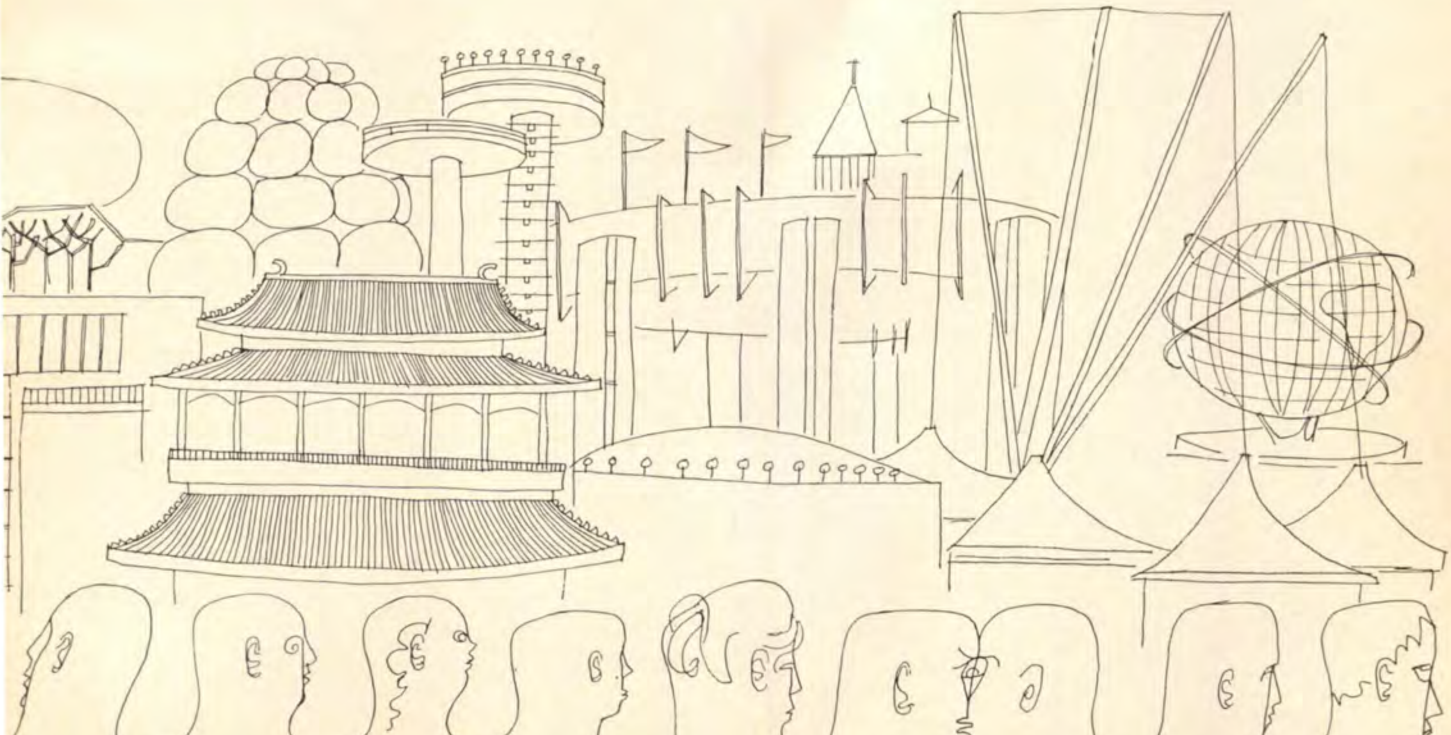


Tear out for use at Fair in 1965

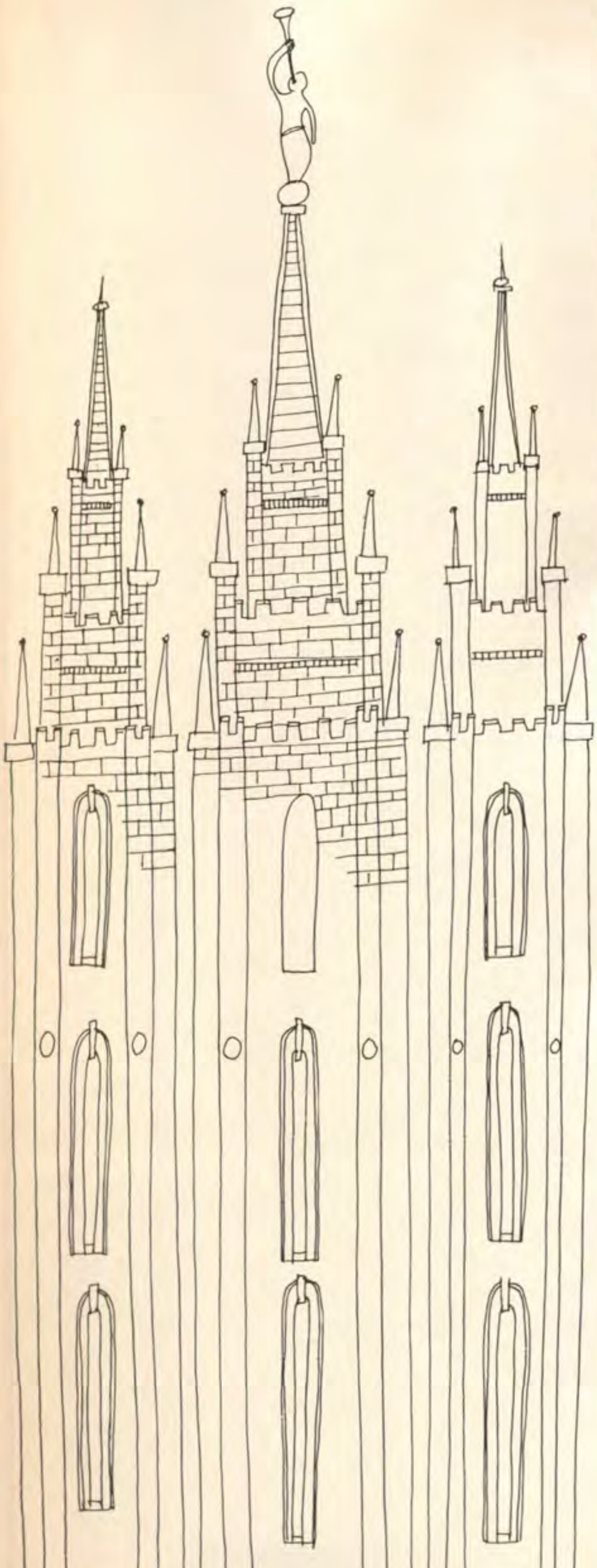
As we promised you last May, we have waited until the dust settled on the first year of the 1964-1965 New York World's Fair before attempting to separate the wheat from the chaff out at Flushing Meadows. Since the chaff is distinctly in the majority, we have affixed an asterisk (*) to a number of outstanding pavilions in the list of brief descriptions that follows. Seeing only these pavilions will give the architect a good one-day tour of the Fair (including evening festivities), and allow him to see all that is worth seeing architecturally. (A Fair spokesman once estimated that the masochist intent on seeing absolutely everything would need 10 days.) Some otherwise undistinguished pavilions are starred for particular reasons—the Vatican, for instance, because of the *Pieta*. In addition, the reader will note that P/A has sometimes been moved to present special "awards" to a number of pavilions. Pavilions are listed according to numbers on site map.

The talented hand of Forrest Wilson has captured for us the wild shapes and hectic visual atmosphere of the New York World's Fair, and rendered much heavy-handed dross into humorous gold.


INDUSTRIAL
INTERNATIONAL
FEDERAL & STATE
TRANSPORTATION
LAKE AMUSEMENT
VAN WYCK EXPRESSWAY
LAWRENCE GATE
AVENUE OF PROGRESS
RODMAN GATE
FLUSHING RIVER
RIVER AVENUE
MERIDIAN ROAD
COURT OF THE UNIVERSE
AVENUE OF COMMERCE
MAIN GATE
GOTHAM PLAZA
AVENUE OF EUROPE
FOUNTAINS OF THE FAIRS
AVENUE OF ASIA
KENNEDY CIRCLE
COURT OF STATES
COURT OF THE PRESIDENT OF THE UNITED STATES OF AMERICA
COURT OF NATIONS
TRUMAN PROMENADE
ASTRAL FOUNTAIN
AVENUE OF THE STATES
AVENUE OF THE UNITED NATIONS NORTH
AVENUE OF THE UNITED NATIONS SOUTH
COURT OF THE GREAT LAKES
MERIDIAN ROAD
GRAND CENTRAL PARKWAY
NEW AMSTERDAM GATE
AVENUE OF AUTOMATION
AVENUE OF SCIENCE
AVENUE OF TRANSPORTATION
PETER STUYVESANT GATE
HENRY HUDSON GATE
LONG ISLAND EXPRESSWAY
MEADOW LAKE BRIDGE
LAKE AVENUE
MEADOW LAKE PROMENADE
RIVER GATE
MEADOW LAKE
MEADOW LAKE GATE



INDUSTRIAL AREA



HOUSE OF GOOD TASTE (1): Taste, taste, and more taste, ranging from good to bad, most of it just middling enough to leave a bad taste in the mouth. The house is actually three houses (Traditional, Contemporary, and Modern), done by these architects (match them if you can: *Edward Durell Stone, Jack Pickens Coble, and Royal Barry Wills*). If that isn't confusing enough, go in and see the clutter of "ideas" inside. Keep the clients away, of course.

MORMON CHURCH (2): Surely the world's largest (perhaps its only) free-standing façade, a replica of the east towers of Salt Lake City's Mormon Temple. The stonework is of a material strangely resembling divinity fudge.
Architects: Fordyce & Hamby Associates

FESTIVAL OF GAS (3): Pretty jazzy display of turbines, generators, stoves, etc., on the grounds. Get your gastric juices flowing at the "Festival '64, American Restaurant" run by Restaurant Associates (the Four Seasons crowd). Get a Heinz pickle pin (remember *those?*) dispensed free outside. Pavilion is a double umbrella of gypsum over steel, supported by two columns and sheltering 30,000 sq. ft.
Designer: Walter Dorwin Teague Associates

***IBM (6)** One of the few that didn't lay an egg. See it, THINK, and marvel at the mind of man and his machines.
Architect: Eero Saarinen & Associates; Designer: Charles Eames

EQUITABLE LIFE ASSURANCE SOCIETY (7): The Demograph records the net growth of U.S. population, adding one person every 11 seconds. Over and above any architecture at the Fair, this will probably have the single most important effect on the future American environment. Latest count, several weeks ago (before lunch): 192,566,995. Winner of P/A's Population Explosion Award.
Architect: Skidmore, Owings & Merrill; Designer: Douglas Leigh, Inc.

HALL OF EDUCATION (8): A potpourri of commercial exhibits—everything from religious proselytizing, to handwriting analysis, to pocket billiard tables (very educational), to fine arts books, to all that audio-visual equipment that is raising the costs (and hopefully the quality) of education. If you're passing by, step inside the front door to see the School of Tomorrow, a large-scale model with such traumatizers as "the physical health and fitness center" and "the learning resources and community center" (this last featuring a science tower, a cultural media tower, and a human resources tower!).
Architect: Frederick P. Wiedersum Associates

TRAVELERS INSURANCE (9): Illustrating the old principle: "Build a Better Umbrella and the World Will Beat a Path to Your Door." Inside, out of the rain, a show entitled "The Triumph of Man." Structure is something of a triumph too, engineered by Lev Zetlin. Boomerang ribs curve upward and outward to a tension hub at the top; cables and ribs together obviate need of the usual compression ring, and the total amount of steel is down to 9 psf.
Architect: Kahn & Jacobs; Designer: Donald Deskey Associates, Inc.

SIMMONS (10): Animated displays on the ground floor (George Washington's sleeping problems, etc.). Upstairs, a new record for the transient trade—beds in private alcoves rented at $1 the half hour.
Architect: A. Epstein & Sons, Inc.

PAVILION OF AMERICAN INTERIORS (11): Four floors of room settings, product displays, furniture designs. At least the circular layout keeps walking distance to a minimum.
Architect: Thomas H. Yardley; Designer: John Vassos

FORMICA (12): Formica, obviously, in all the usual places in this home; also used experimentally as exterior siding, with vertical strips battened at narrow intervals.
Architect: Emil A. Schmidlin

BELL SYSTEM (14): Coming in on a wing and four pylons. A grand cantilever of 108 ft at each wing; the steel trusses are covered with large panels of glass-fiber-reinforced plastic. Paul Weidlinger was the structural engineer. Inside: "From Drumbeat to Telstar" in moving chairs.
Architect: Harrison & Abramovitz; Designer: Henry Dreyfuss

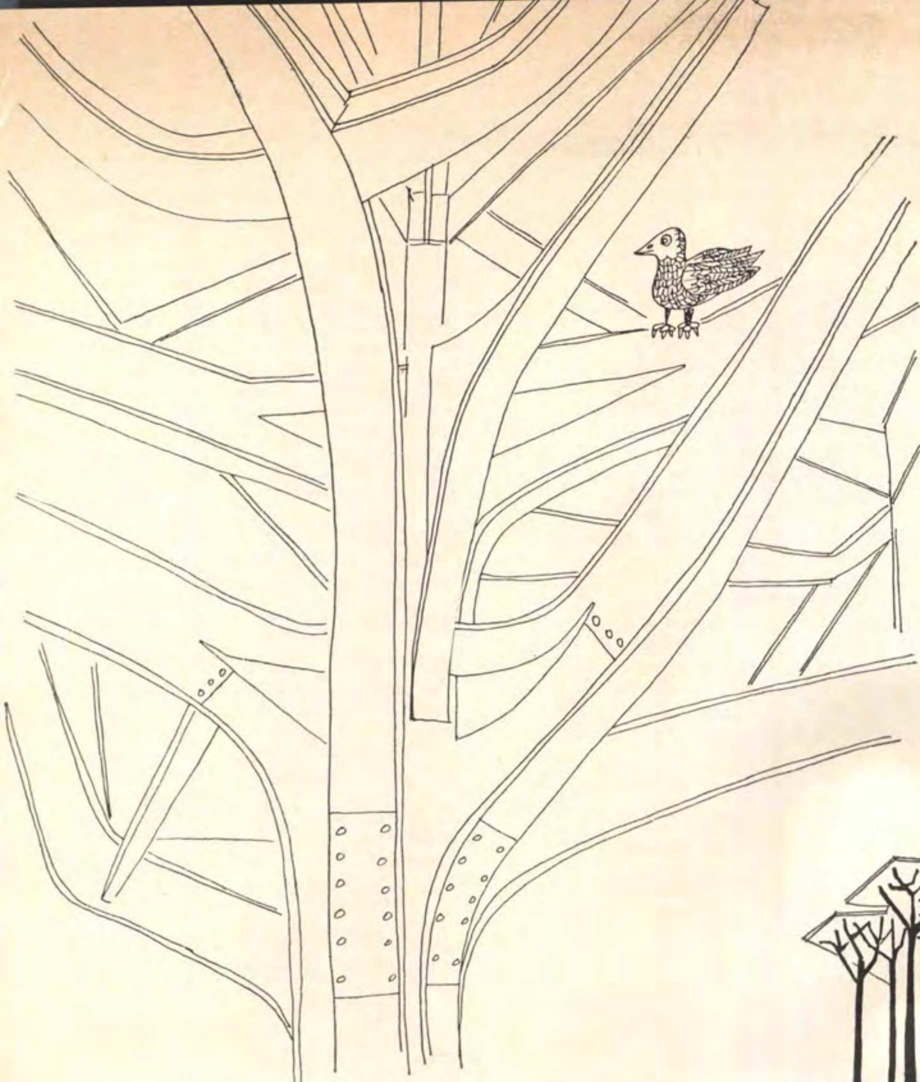
RHEINGOLD (18): Little Old (Turn-of-the-Century) New York — a little old gas-lighted street, with tavern: a little old park, with green slatted benches and outdoor café; a little old Town House serving little old Oysters Rockefeller.
Architect: Kahn & Jacobs

SCOTT PAPER (19): A pleasant enough series of woodsy pavilions. The first contains an exhibit entitled "The Enchanted Forest," extolling (among other things) the virtues of printed toilet tissue. From here, the route leads directly and appropriately into a lounge, with rest rooms and a special diaper-changing department. There is a pleasant outdoor area too.
Architect: Anthony R. Moody; Designer: Donald Desky Associates, Inc.

PARKER PEN (20): Fill in the proper forms (with a Parker pen, natch) and let their computer find you a pen pal. We don't know whether they've got anyone for a 46-year-old architect whose hobby is girl-watching, but it seems worth a try.
Architect: John J. Flad & Associates

CLAIROL (23): A carousel wherein the ladies enter private booths to try on various hair colors (all done with mirrors). Colors of the pavilion are pretty wild, too—pink, purple and chartreuse—bringing back the earlier days of the 1920's and '30's.
Architect: Robinson-Capsis-Stern Associates, Inc.

GENERAL ELECTRIC (24): Dull Disney—a sit-down ride past four scenes that represent homes and occupants from the Gay '90's, the '20's, the '40's, and onward and upward into the future. Pretty tedious, unless you're the type who goes around singing about



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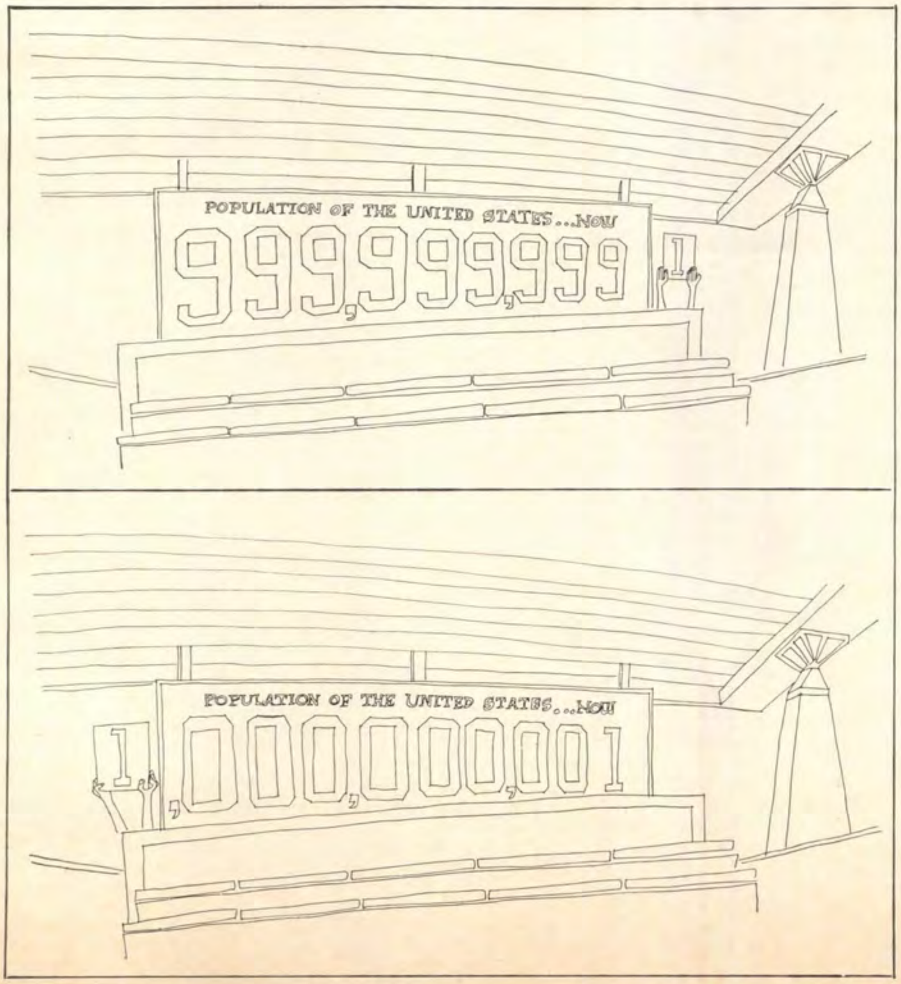
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How Great It Is To Live in Electrified America, tra la. From this silliness, one enters the huge dome, for some dizzying sound and light effects depicting nature's sources of energy, electrical and other. At the end is a demonstration of controlled thermonuclear fusion —a loud noise and a dramatic flash. Viewed from the outside, which is all we recommend, the pavilion is a dome suspended from spiraling pipes. Long lines of people spiral around, waiting to get in and be enlightened. (Very few will find themselves electrified!).
Architect: Welton Becket & Associates; Designer: WED Enterprises, Inc.

BETTER LIVING CENTER (25): Third largest pavilion at the Fair; 250 exhibitors showing what the American Way of Life means in terms of food, fashion, fun, and furnishings.
Architect: John Lo Pinto & Associates

JULIMAR FARM (26): A tiny pavilion by Ed Stone, in a landscape designed by his son, Edward Jr. The company sells custom-designed gardens of exotic types, and a line of exotic foods to match.
Architect: Edward Stone

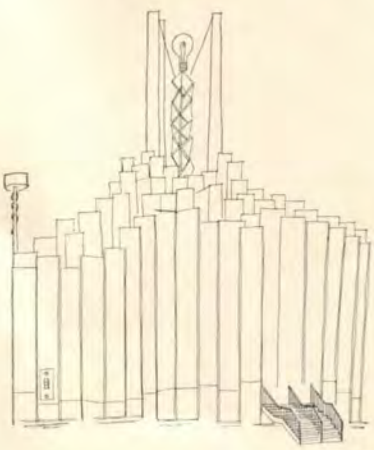
SCHAEFER (27): The restaurant and historical exhibits are roofed with pillow-like plastic discs filled with air. Largest of the pillows is 90 ft in diameter. Engineering by Seelye, Stevenson, Value & Knecht.
Architect: Eggers & Higgins; Designer: Walter Dorwin Teague Associates

***PEPSI-COLA (28):** Outside, and visible from a good distance, is the 120-ft Tower of the Four Winds, a marvelously active mobile, a fair in itself. Inside is the widely hailed boat ride, "It's a Small World—A Salute to UNICEF," an animated delight by Disney, with Eiffel Tower, Taj Mahal, and other reasonable facsimiles of architecture around the world.
Designer: WED Enterprises, Inc.

***EASTMAN KODAK (30):** The undulating concrete roof is surfaced, topside, with an interesting experimental decking of synthetic rubber. Good fun on this Magic Moondeck, and easy on the footpads. Good place for photos, says the host—take them against the seductive background, or shoot out across the Fairgrounds. Above you are the world's largest outdoor photographic prints, each 30' x 36'.
Architect: Kahn & Jacobs; Initial design concept: Will Burtin, Inc.

GENERAL CIGAR (33): If you're not dragged, as we were, into the magic show to hear it explained by a 12-year-old of our acquaintance, you'll hear of the place anyway—every 20 seconds a huge smoke ring is sent 150 ft into the air, with a great blast of noise accompanying it.
Architect: Finch, Alexander, Barnes, Rothschild & Paschal

***JOHNSON'S WAX (34):** The theater is a Big (gold) Ball of Wax suspended above ground, supported by six surrounding columns that curve to meet tenuously above the gold disc. Severud-Elstad-Krueger did the engineering of the (surprise!) steel-ribbed dome. Inside is the truly superb movie "To Be Alive," a poignant and joyful poem on the similarity of the human condition the world over. The three screens sometimes work together as one, sometimes show separate pictures; the viewer is sometimes careening down a roadway, sometimes inspecting the greeness of a leaf in the forest. A rare theatrical experience.
Architect: Lippincott & Margulies, Inc.



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***TOWER OF LIGHT (35):** Sponsored by investor-owned electric utility companies, and they don't let you forget it. Not necessary to go inside for the commercials; stay outside and enjoy the 600 gleaming aluminum prisms that make up the impressive exterior. It is a veritable cathedral, to the greater glory of Light and Power; at the crossing of the nave is the vast vertical searchlight beam, equal to 340,000 automobile headlights.
Architect: Synergetics, Inc.; Design Concept: Robinson-Capsis-Stern Associates; Sculpture: Kenneth Snelson

DUPONT (36): A clever musical show about chemistry, in which actors on film and in the flesh step back and forth between the two worlds. Afterward, a demonstration of chemical magic, producing light from chemicals, etc., etc.
Architect: Voorhees, Walker, Smith, Smith & Haines

SEVEN-UP (37): Sandwich garden, broken into pleasant open pavilions, each a small concrete igloo.
Architect: Becker & Becker & Associates, Inc.

DYNAMIC MATURITY (38): The newest euphemism for "senior citizenship." Galleries and gardens for those who are retired or who are interested in retiring.
Architect: Ira Kessler & Associates

ALL-STATE PROPERTIES AND MACY'S (39): Two vacation houses, $13,500 and $17,000.
Architect: Stanley H. Klein; Designer: Raymond Loewy-William Snaith, Inc.

COCA-COLA (40): The Taj Mahal again, as one of five settings of distant places where Coke is sold; others are a Cambodian forest (with temple of Angkor Wat), a street of Hong Kong, an Alpine ski resort, and a cruise ship anchored at Rio. Nicely authentic, even down to the salt spray in this last. It was in this spot, in fact, in the lifeboat, that a local boy found accommodations when he ran away from home for a week this summer.
Architect: Welton Becket & Associates

WORLD'S FAIR PAVILION (47): Geodesic dome for various spectaculars and productions, located—appropriately enough—at the Court of the Moon on the Avenue of Commerce.
Architect: Eggers & Higgins

NATIONAL CASH REGISTER (42): Intricate space-frame, supported by three-eighths of the proposed FDR memorial.
Architect: Deeter & Ritchey

PROTESTANT AND ORTHODOX CENTER (43): A hectic succession of booths rented by many denominations. At the end of the line is the controversial pantomine film, "Parable." Outside: a child-care center, imaginatively furnished; outside in the other direction: the charred cross on loan from Coventry Cathedral.
Architects: Henry W. Stone; Kempa & Schwartz Associates

RCA (44): Color telecasts—of yourself, lost children, and other live shows.
Architect: Malcolm B. Wells

AMERICAN EXPRESS (45): Large-scale model of the Fair inside.
Architect: Kelly & Gruzen

SINGER BOWL (46): Stadium for 18,000. Nothing to cheer about.
Architect: Architectural Enterprises, Inc.

INTERNATIONAL AREA

BILLY GRAHAM (47): A restrained octagonal building featuring a movie giving the famed evangelist's message. Marred by a really tacky 100-ft tower hard by.
Architect: Edward D. Stone

***BERLIN (49):** A good-looking round structure topped by tensioned plastic tenting à la Frei Otto.
Architects: Ludwig Thurmer and Ira Kessler & Associates

***INDIA (50):** A pleasant exhibit pavilion showing some exquisite Indian arts as well as technological advances is awkwardly connected to a recommended circular restaurant serving Indian dishes.
Architect: Mansinh Rana; Designers: Stonorov & Haws

***IRELAND (51):** Here you can hear famous voices read from famous Irish writers, see Gaelic products in a central structure reminiscent of an old Irish coastal watchtower, and—looking at a screen on the floor—view parts of Ireland as if from a balloon. The latter boast can be made only by this pavilion.
Architect: Andrew Devane; Designer: George Nelson & Co., Inc.

KOREA (52): More past and present presentations in a "reminiscent" structure. The antiquities, as usual, are the most interesting.
Architects: Chung Up Kim; Walter Dorwin Teague Associates

***DENMARK (54):** Two indoor-outdoor restaurants (one moderate, the other rather expensive), a very neatly detailed bar, a "Tivoli Garden" where you can park the kids while you observe the bar's neat details, and a somewhat cluttered exhibit area make this a very pleasant stop.
Architect: Erik Moller; Designer: Werner, Jensen & Korst

VENEZUELA (55): The redwood exterior of this pavilion is more interesting than its interior spaces.
Architects: Oscar Gonzales; Edmundo Diquez; and Stephen Leigh & Associates

HONG KONG (56): Just as commercial as the place itself. We observed pretzels being sold from a sampan. Why not? You can buy about anything else in this "old Moulmein pagoda."
Architect: Eldredge Snyder

***SPAIN (57):** Unquestionably the best architecture at the Fair, further enhanced by impeccably presented exhibits, fine (if somewhat expensive) cuisine, and excellent Spanish entertainment. Worth your whole trip. Will be presented in detail in the DECEMBER 1964 P/A.
Architects: Francisco Javier Carvajal Ferrer and Kelly & Gruzen

AUSTRIA (58): Huge A-frames support the pavilion and overwhelm it at the same time. Underneath is an exhibit of Austria's SOS Children's Villages, a subject deserving of more understanding treatment.
Architects: Gustave Peichl and Pisani & Carlos

***JAPAN (59):** A good-looking main pavilion by Kunio Mayekawa with handsome sculptured stone walls by Nagare is let down by overindustrialized exhibits ("atmosphere" is provided by a separate traditional-style building where flower arranging and the tea ceremony are exhibited).
Architects: Kunio Mayekawa; Kiyoshi Seike; Kyoritsu Sekkei Jimusho; Oppenheimer, Brady & Lehrecke Associates; and Chapman, Evans & Delehanty

GUINEA (60): After observing the native crafts in ivory, leather, etc., you can quaff banana juice and beer (not at the same time, please).
Architect: Noel & Miller

CHRISTIAN SCIENCE (62): Another Ed Stone religious pavilion (actually two buildings); this one is better than the Billy Graham Pavilion.
Architect: Edward D. Stone

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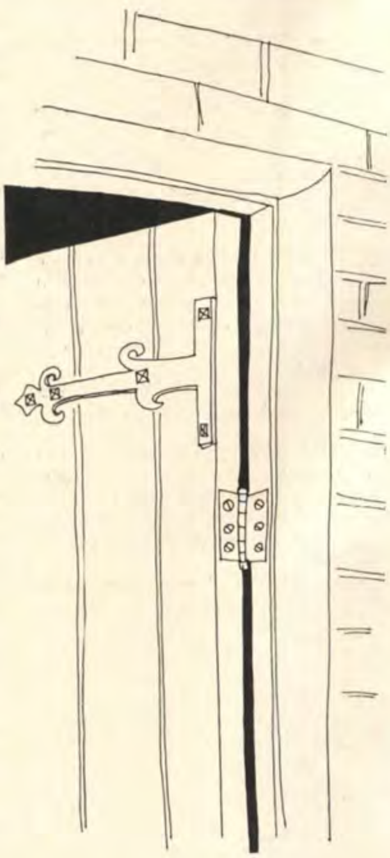

***BELGIAN VILLAGE (64):** An unexpected and delightful success (although still uncompleted at this writing). Although the lath-and-plaster, "load-bearing" papièr-maché "stage-set" atmosphere show through at times, this is a fine place to escape from the overwhelming technological-transportation atmosphere of much of the Fair. It is also a lesson that pleasant urban spaces solely for pedestrians are still possible and desirable.
Architects: Alfons De Rijdt and Hooks & Wax

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***VATICAN (65):** Attraction here, of course, is Michaelangelo's *Pietà*. It is viewed head-on from moving sidewalks and is displayed in a "showbiz" setting complete with blinking electric votive candles and a blue blue blue backdrop (*mise en scene* by Jo Mielziner). The building itself is no threat to St. Peter's architecturally.
Architects: York & Sawyer, Hurley & Hughes, Luders & Associates

SWEDEN (67): A deep blue structure studded with many puzzling gold-colored metal arrows. Smorgasbord, of course.
Architects: Backstrom & Reinius and John L. O'Brien, Jr.; Designer: Count Sigvard Bernadotte

INTERNATIONAL PLAZA (68): Mostly small shops and snack spots for various foreign enterprises (including a fake stone tower where you can view original fakes of England's crown jewels).
Architect: Ira Kessler & Associates

HALL OF FREE ENTERPRISE (69): A temple to the Good Old Do It Yourself System. Winner of the special P/A edition of the complete works of Lord Keynes.
Architect: Ira Kessler & Associates

AMERICAN-ISRAEL (70): The Fair's only kosher food can be bought here in a rather handsome curvilinear wooden structure. This is a private venture, the Israeli government having decided not to build the pavilion that won a P/A Design Awards Citation last January.
Architect: Ira Kessler & Associates

SWITZERLAND (71): Cuckoo clocks, chocolates, and cheese in chalets. What did you expect?
Architects: Guex, Kirchoff & De Freudenreich and John L. O'Brien, Jr.

***SIERRA LEONE (73):** Interestingly shaped pavilion of three cones recalling the mountains of the nation and standing for three pyramids on its coat of arms. To be dismantled, shipped home, and used as a permanent structure after the Fair. Hopefully, it will be on a larger site there.
Architects: J. R. Jarrett-Yaskey and Costas Machlouzarides

MALAYSIA (74): Dioramas and models in a large-scale local-color strucure show the way things are in the new federation. Specialty of the restaurant is *satay*, a well-known native barbecue. A small theater shows continuous films extolling the 14 Federal States.
Architect: Tippetts-Abbett-McCarthy-Stratton; Designer: Paul Leung, Kuala Lumpur

PAKISTAN (75): A nicely restrained pavilion of concrete block with a notable restaurant (if calories are of no concern to you). You can eat inside, but the terrace is best for enjoying yourself while watching those poor slobs with tired feet parade past.
Architect: Oppenheimer, Brady & Lehrecke

AFRICA (76): Plastic "huts" showing exhibits from about 24 free African nations. A "white hunter" shills the public into the interior court where "colorful natives" perform for the nice people. The whole thing is embarrassingly patronizing.
Architect: Kahn & Jacobs; Designers: Tom John

GREECE (77): For those who have been there, a terrace *taverna* with *ouzo* and, sometimes, Greek music and dancing. Same thing is recommended for those who have not been there, come to think of it. You can forget the rest.
Architects: Anthony Kitsikis; Athanase Makris; and John James Carlos

MOROCCO (78): A pavilion and native tents offer *cous cous* and all sorts of lamb in a restaurant and a supper club. Lots of rugs and leather goods on sale, of course, some of them made on the premises.
Architect: Charles James Koulbanis; Designer: Franz Schwenk

SUDAN (79): A modern at the bottom and traditional at the top design. Some of the artifacts shown here were saved from the Aswan Dam flood waters.
Architect: Noel & Miller

JORDAN (80): A colored-glass-studded pavilion resembling an expiring pizza harbors the propaganda mural that the American-Israel Pavilion is so mad about.
Architects: Victor Bisharat and James A. Evans

U.A.R. (81): Among the requisite propaganda of up-to-dateness, you can find over 100 antiquities from the area's incredibly rich past, a past the pavilion's slick midway exterior does its best to belie.
Architects: Ismail Nazif and Thomas V. DiCarlo

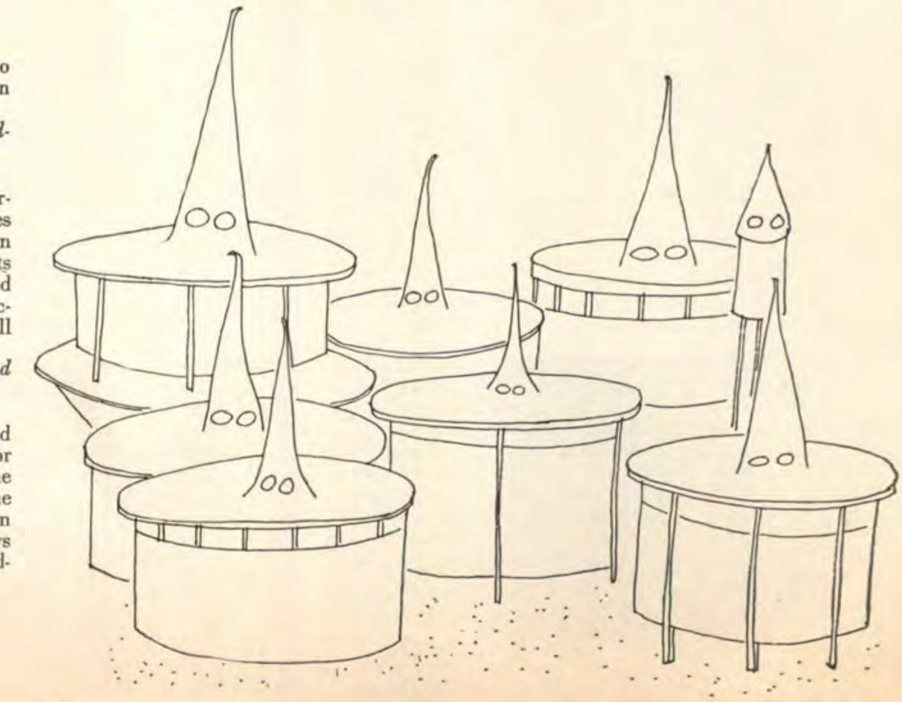
LEBANON (82): A rather handsome pavilion of native Lebanese stone surrounds a patio restaurant and contains just enough exhibition material not to tire you.
Architects: Assem Salaam & Pierre El Khoury and Justin Henshell & Edward A. Weed, Associates

PHILIPPINES (83): The Filipino farmer's *salakot*, or straw hat, inspired the shape of this pavilion. Emphasis is placed on U.S.-Philippines ties, particularly during World War II.
Architect: Otilio A. Arellano and Jeffrey Ellis Aronin

REPUBLIC OF CHINA (84): Reproduction of a "traditional imperial palace," whether Formosan or from the mainland it does not say.
Architect: C.C. Yang and Paul K.Y. Chen & Associates

POLYNESIA (85): Pearl diving, fire dancing, and such gallimaufry take place in and around a "lagoon." The restaurant serves Americanized "native" cuisine.
Architect: Abel Sorensen and Peter Blake

INDONESIA (86): A round pavilion that is mostly restaurant (Lucille Ball ate here!) is topped by an excited



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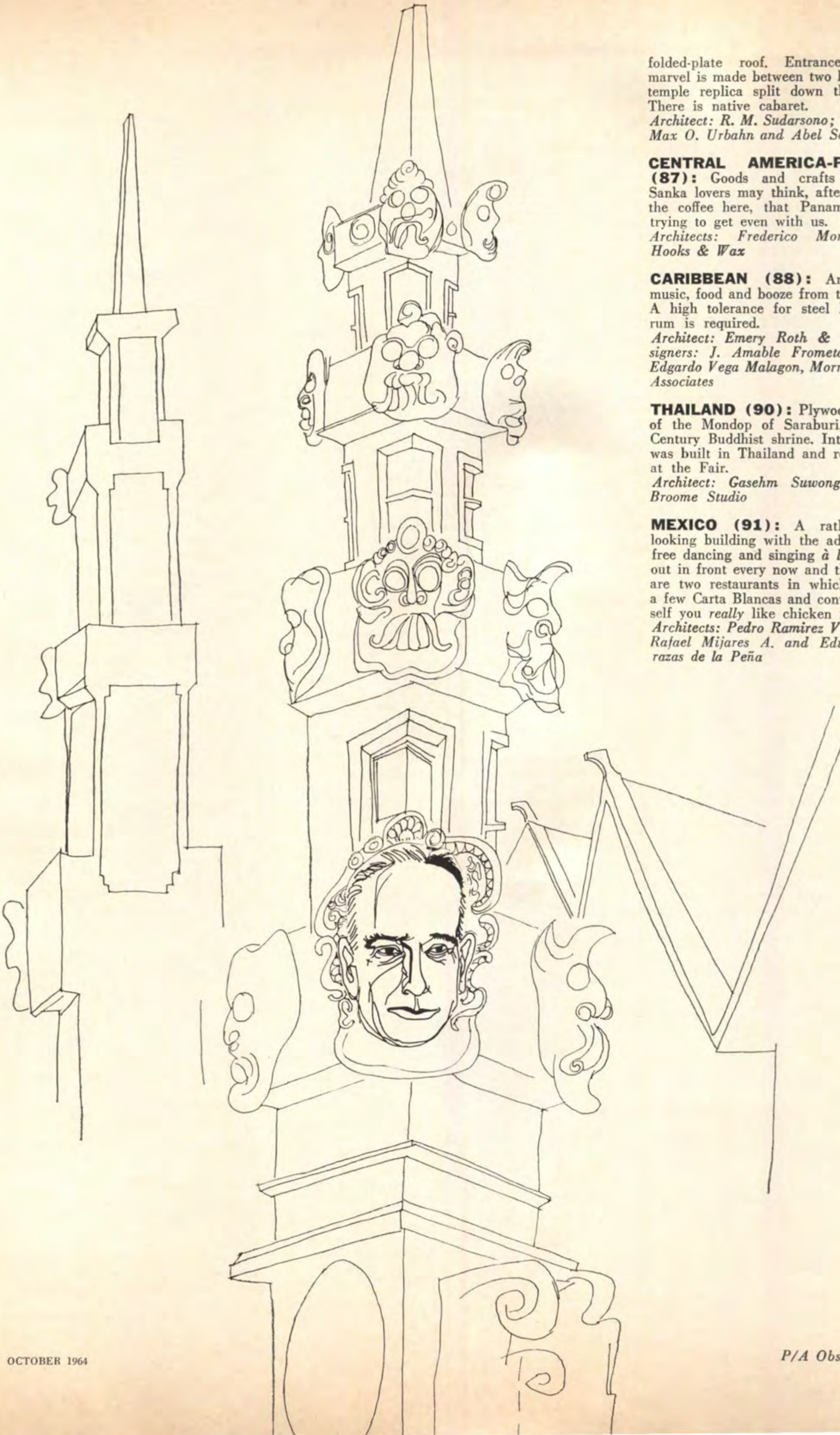
folded-plate roof. Entrance to this marvel is made between two halves of a temple replica split down the middle. There is native cabaret.
Architect: R. M. Sudarsono; Designers: Max O. Urbahn and Abel Sorensen

CENTRAL AMERICA-PANAMA (87): Goods and crafts for sale. Sanka lovers may think, after drinking the coffee here, that Panama is still trying to get even with us.
Architects: Frederico Morales and Hooks & Wax

CARIBBEAN (88): Arts, crafts, music, food and booze from the islands. A high tolerance for steel bands and rum is required.
Architect: Emery Roth & Sons; Designers: J. Amable Frometa Pereyra, Edgardo Vega Malagon, Morris Lapidus Associates

THAILAND (90): Plywoody replica of the Mondop of Saraburi, an 18th-Century Buddhist shrine. Intricate roof was built in Thailand and reassembled at the Fair.
Architect: Gasehm Suwongsa of the Broome Studio

MEXICO (91): A rather flimsy looking building with the advantage of free dancing and singing *à la Mexique* out in front every now and then. There are two restaurants in which to drain a few Carta Blancas and convince yourself you *really* like chicken molé.
Architects: Pedro Ramirez Vasquez and Rafael Mijares A. and Eduardo Terrazas de la Peña



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FEDERAL AND STATE AREA

***UNISPHERE (92):** You can't miss it! But did you know that this is the largest structure fabricated entirely of stainless steel (900,000 pounds' worth)? And that it is "the largest globular structure ever built by man"? And that the computation of stresses, according to U.S. Steel, the donor, required the solution of 670 simultaneous equations, and without computers the job would have taken 10 years? This sort of thing calls for at least a moment of silence.
Designer: Gilmore D. Clarke

***UNITED STATES (93):** You can't miss this one either. It's rather better than we feared, but still a bit heavy on pomposity—particularly where the four stupendous flights of stairs end up, at the top, only 4-ft wide. The building itself is a gigantic ice-cream sandwich above this ceremonial entrance mound, blue and green plastic where the vanilla would be. Four pairs of parallel trusses—two inner and two outer—hold the whole thing together. Structural engineering by Severud-Elstad-Krueger. Steel by Bethlehem.
Architect: Charles Luckman Associates

MARYLAND (94): The World's Fair is the place to learn such things as: "Oyster shells are the only animal naturally colored red, white, and blue." There are oyster shells all over the bottom of the waterway meandering through this pavilion; as far as we could see, they are the only unifying elements in an otherwise chaotic assembly of exhibits and architectural details.
Architects: Tatar & Kelly, and Van Rosen Schwab Associates; Designer: Paul Carreiro Industrial Designers

MONTANA (95): Simulated frontier town.
Architect: Oswald, Berg & Associates

WEST VIRGINIA (96): Simulated mountain lodge.
Architects: Irving Bowman & Associates, and Frederick P. Wiedersum Associates

ILLINOIS (97): A handsome brick building, with a simple brick wall curving in at the entrance. Inside, a vast collection of Lincolniana, including Disney's life-sized figure of Lincoln, which is capable of 250,000 combinations of gestures and expressions..
Architect: Skidmore, Owings & Merrill

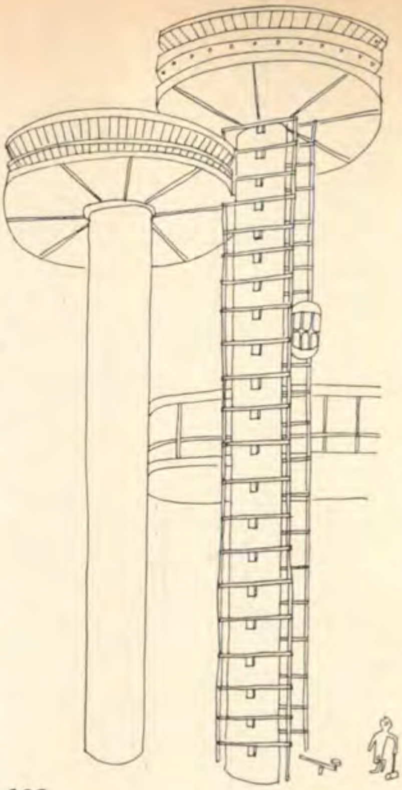
LONG ISLAND RAIL ROAD (98): A small park, with a miniature train ride that looks about as uncomfortable and quaint as the actual LIRR.
Architect: Daniel Chait

NEW MEXICO (99): Simulated adobe pueblo.
Architect: William Leftwich

HOLLYWOOD (100): Simulation of Grauman's simulated Chinese Theater. Replicas of movie sets inside—throne room from *Cleopatra*, etc.
Architects: Randall Duell, Inc., Donald Schwenn, and Oppenheimer, Brady & Lehrecke Associates

OKLAHOMA (101): An outdoor animated (but not very) map of the state, 96′ x 46′.
Architect: Howard-Samis-Davies

***NEW ENGLAND (102):** A line of small hexagonal pavilions strung out loosely along a village green. Very successful translation of the clapboarded tradition into contemporary terms. Extremely sensitive approach to space, inside and out—particularly outer space, which unfolds interestingly as one strolls into the site.
Architect: Campbell & Aldrich



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***NEW YORK CITY PAVILION (103):** The City's 300th birthday has somewhat fizzled, with the midsummer melting of Dick Button's ice show. However, don't miss the "Panorama Around New York"—a ride as if by helicopter over and around an extraordinary model of the city. The model measures 180′ x 100′, with Manhattan only a sliver in the middle of the whole motley mess. The scale is 1″-100′, enough to show every one of New York's 835,000 buildings. This New York City Pavilion is one of the two structures (Amphitheater is the other) left over from 1939; its façade is now all dolled up in a brassy new grille.
Architect: Daniel Chait; Designer: Lester Associates, Inc.

WISCONSIN (104): Simulated tepee. (Yes, Virginia, there *is* a regional architecture in these United States.)
Architects: John W. Steinmann

***NEW JERSEY (105):** Also celebrating its 300th birthday, this old girl looks very sprightly indeed. Representing the 21 counties of the Garden State are 21 neat square pavilions that mushroom out of the water. Each is roofed by a steel space frame and a vinyl covering, the whole held up by a network of steel booms and cables. This exhibit is the winner of an architectural competition held by the state of New Jersey—both the effort and the result highly commendable.
Architect: Philip Sheridan Collins; Designer: Yang Gardiner Associates

***NEW YORK STATE (106):** A grand, gaudy circus-tent, under the largest cable-hung roof in the world. Around the circumference are 16-slip-formed columns; the elliptical roof was assembled on the ground, then jacked into place. Three observation towers off to one side are another feat in concrete (by Lev Zetlin, Structural Engineer). And completing the three-ring

TRANSPORTATION AREA

circus is a small round theatre, off to the other side, with 360° dizziness on film. Pop art all around. World's largest terrazzo map on floor. Great good fun.
Architect: Philip Johnson Associates

MISSOURI (107): Air-Conditioned ante bellum.
Architects: Kivett & Myers and Daniel Schwartzman

ALASKA (108): A sort of igloo. Another sort of igloo, in front of it, sells Eskimo pies. Inside the bigger of the igloos, amongst other information on life in the 49th state, is a view of a dam that will someday be the largest in all America.
Architects: Olson & Sands; Mandeville & Berge; and Walter Stengel

WESTINGHOUSE (109): The new 5000-year Time Capsule, suspended delicately from stainless-steel wires. Surrounding it are three trim circular pavilions, displaying times present, times past (back to 1939, year of the first Time Capsule), and times far distant (back 5000 years).
Architects: Eliot Noyes & Associates

LOUISIANA (110): Pseudo-simulated Bourbon Street fakery.
Architects: Albert C. Ledner; Saputo & Rowe, and Furman & Furman

MINNESOTA (111): Many-facted polygon. Go inside to see the double-barreled impact of the strong planes of the roof and the 100-dish smorgasbord.
Architect: Edgar Tafel & Associates; Designer: James R. Dresser & Associates, Inc.

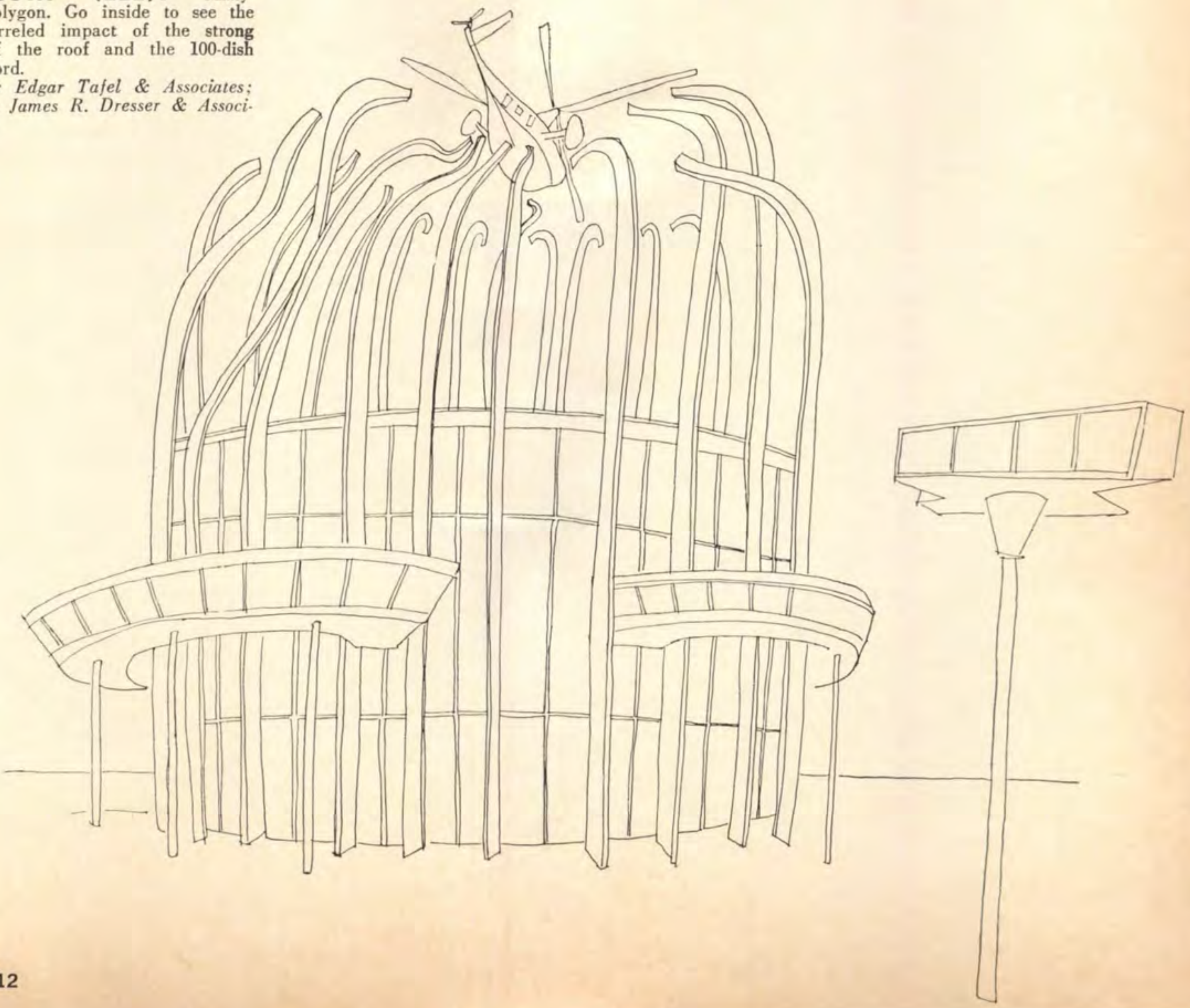
FORD (112): Viewers ride in real convertibles through Walt Disney's version of human history from the Mesozoic Era to, of course, the "future." Winner of P/A's Venus Flytrap Award.
Architects: Welton Becket Associates; Designer: WED Enterprises, Inc.

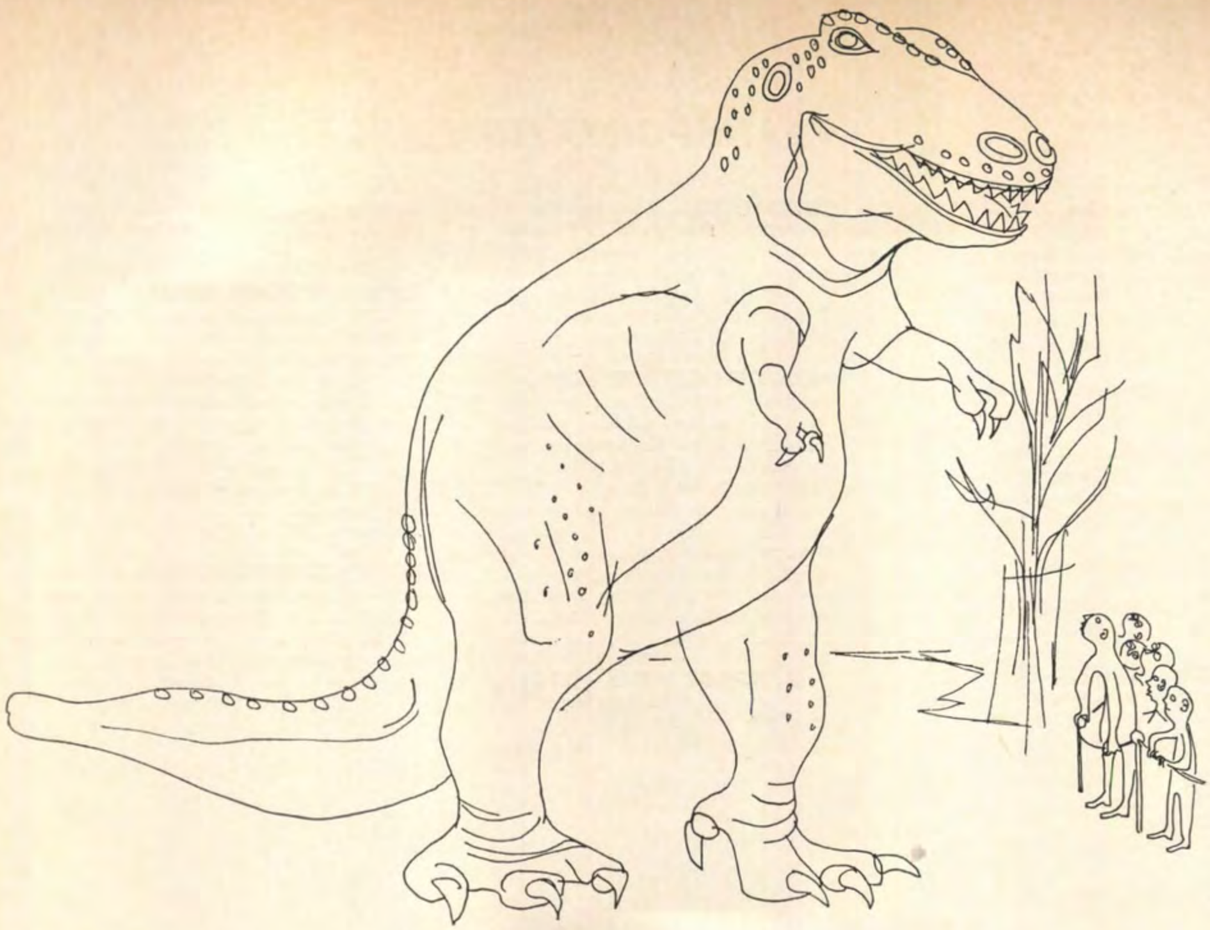
HALL OF SCIENCE (115): What Yamasaki did for science with his gleaming white Gothic pavilion in Seattle, Wallace Harrison has done in his curvilinear Hall of Science in New York. Also to be a permanent structure, this unique building has a concrete structure bee-hived with panels of blue glass. An interesting, personal building which, unlike Yama's science pavilion, does not rely on themes from the past to house exhibits of the future.
Architect: Harrison & Abramovitz

U. S. SPACE PARK (116): Full-scale models of various craft used in our space tests and explorations, including the tail section of the Saturn-V rocket.

UNDERGROUND WORLD HOME (117): Just what it says: a buried three-bedroom house offering protection from radiation fall-out, pollen, and other air-borne threats of our civilization. If you are still willing to take your chances above ground, perhaps you could use this for growing mushrooms or raising a colony of cunning little gophers. Winner of P/A's Dr. Strangelove Award.
Designer: Billy J. Cox

LOWENBRAU GARDENS (119): A pleasant stop for a stein or two in an old Bavarian *biergarten*-type atmosphere. The brew is good and the waitresses are fine to look upon.
Architect: Jesse Berkman; Designer: Becker & Becker Associates, Inc.





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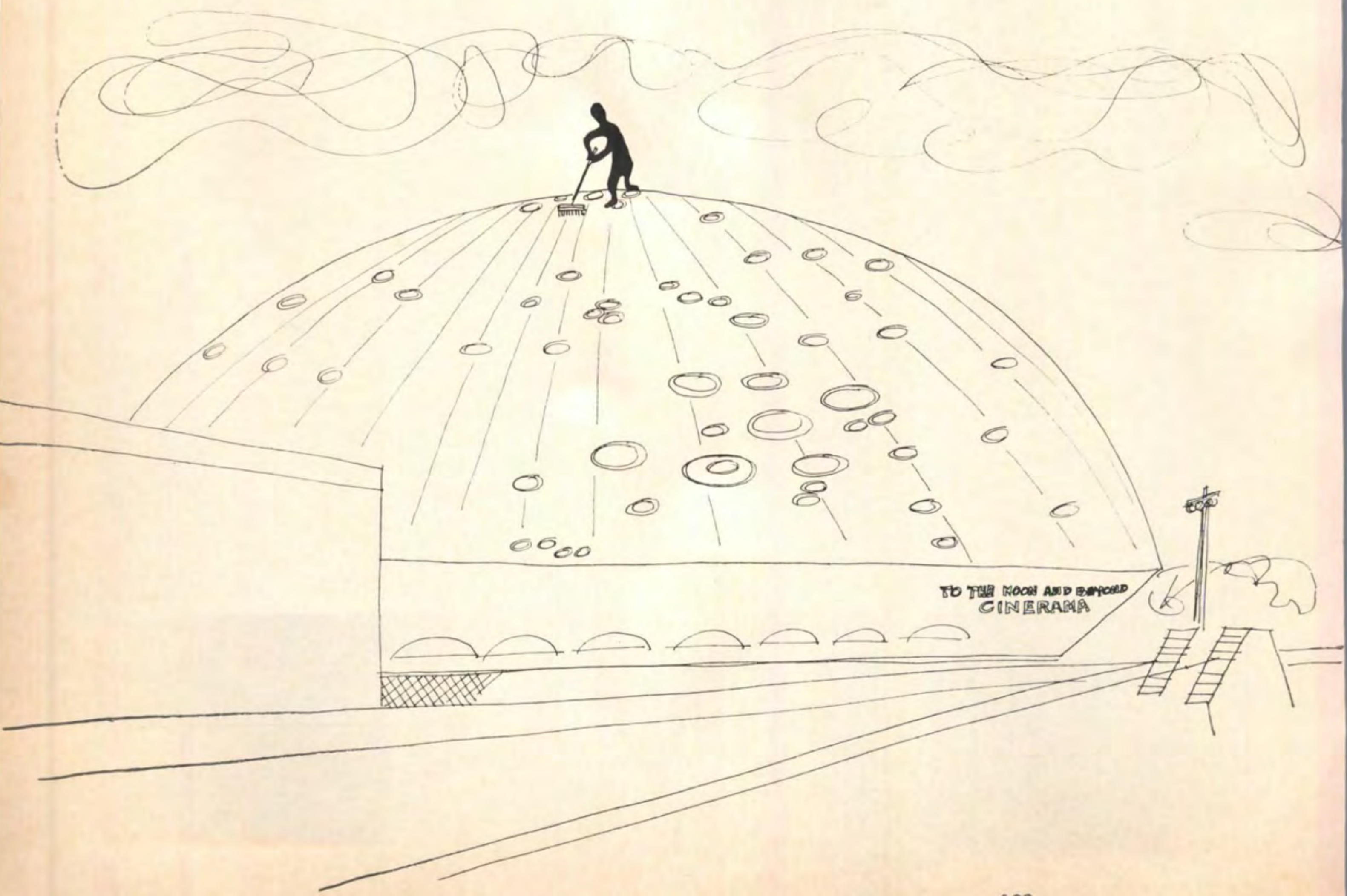


123

SINCLAIR DINOLAND (120): A landscape featuring nine life-size, partially animated prehistoric behemoths. One's head swings back and forth, back and forth, back and forth.
Architect: J. Gordon Carr

U. S. RUBBER (121): An 80-ft Ferris wheel-tire, winner of the P/A Pop Art Award.
Architect: Shreve, Lamb & Harmon Associates

SKF (122): A tiny pavilion with a film devoted to the contributions of ball-bearings to our culture.
Architect: Pisani & Carlos

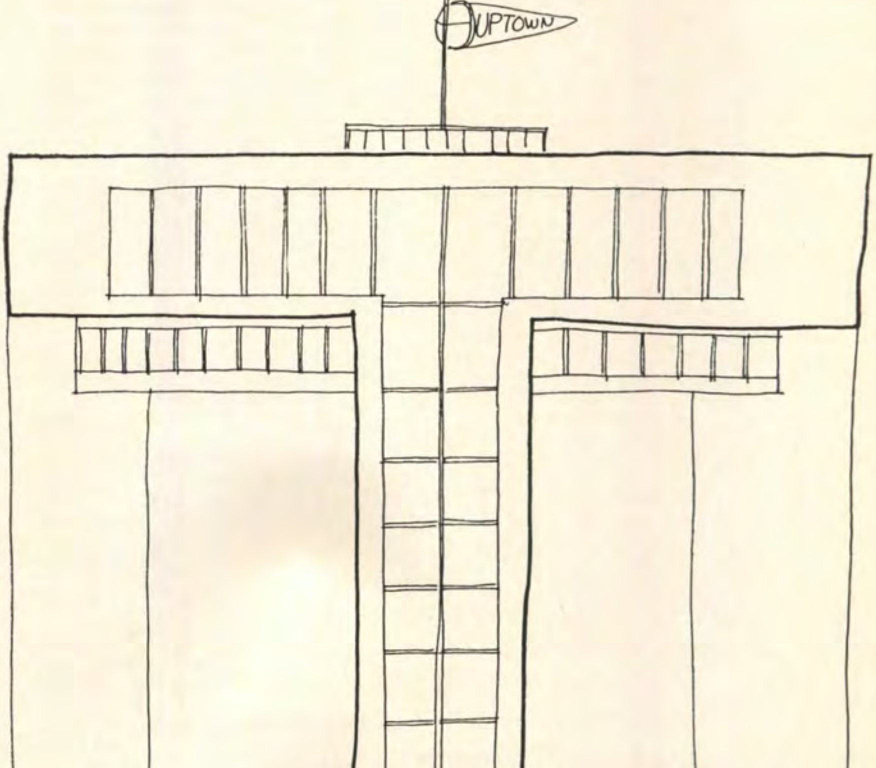
TRANSPORTATION & TRAVEL (123): A multiresident pavilion featuring—more or less appropriately—exhibits of various means of moving people and material. A "Cinerama" trip through space occurs beneath a dome designed to look like the surface of the moon. *This* moon surface is cleansed of New York dust occasionally.
Architect: Clive Entwhistle Associates

***CHRYSLER (124):** A delightful park featuring an automobile "engine" large enough to walk through, and "assembly line" around which one can ride in a car frame, a half-hour musical show with puppets, movies, and live action, and, for the more sedentary, bucket seats around the site for just looking on.
Architect: George Nelson & Co., Inc.

PORT AUTHORITY HELIPORT AND RESTAURANT (125): Another building that will remain after the Fair, sad to say. We award it P/A's Dead T Scroll.
Designer: Port of New York Authority

SOCONY MOBIL (127): Fairgoers may test their driving skills in artificially contrived situations. Attend before the cocktail hour.
Architect: Peter Schladermundt Associates

GENERAL MOTORS (130): In profile, this pavilion deserves the title Miss Tailfin of 1964–65. The "Futurama" inside is not likely to have the impact of the 1939 version by the same company, being an overbearing and somewhat frightening view of traffic eventually determining the shape of man's life (present-day harbingers can be seen right outside in the coils of expressways which snake around the Fairgrounds). The GM "styling" staff's ideas of future architecture are banal in the extreme.
Architect: Sol King and Albert Kahn; Designer: GM Styling Staff



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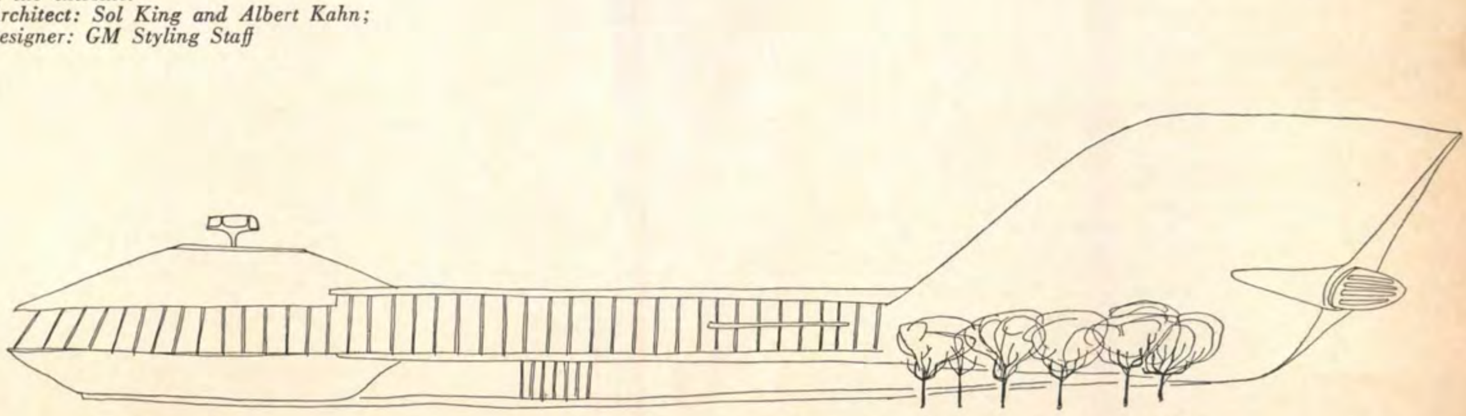


130

MISCELLANY

A number of attractions at the Fair are either widespread or diffused enough to call for this catchall category.

***BRASS RAIL:** Ten of these snack pavilions (*below*) sport marvelous air structures (see also p. 216 of this issue). Obviously, these won the P/A Elizabeth Taylor Award. If the Brass Rail people had been brave enough to use the balloons on *all* their eateries, they would really have taken over the Fair. *Architect: Victor Lundy.*

TELEPHONE BOOTHS: There are two varieties: the single customer type, (*facing page, bottom*), which, while having an interesting free form, inev-

LAKE AMUSEMENT AREA

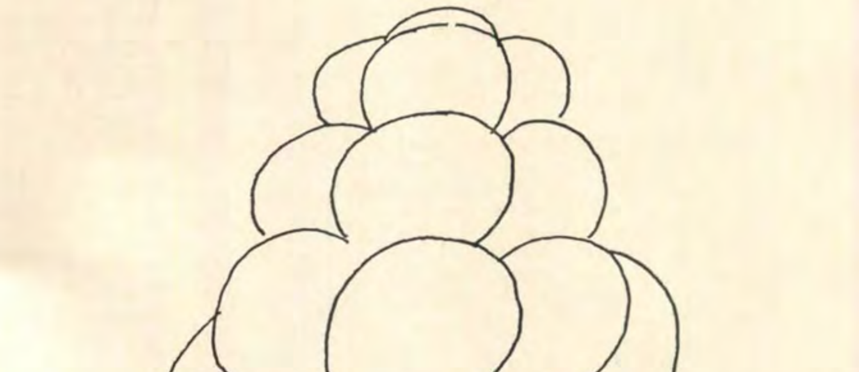
This area has been the financial fiasco of the Fair, thereby earning P/A's Federal Anti-Poverty Grant. Three states chose to have their pavilions here:

TEXAS (141): An over-2400-seat auditorium housed a lavish (and good) musical, "To Broadway with Love," until lack of attendance forced posting of the closing notice.
Architect: Randall Duell

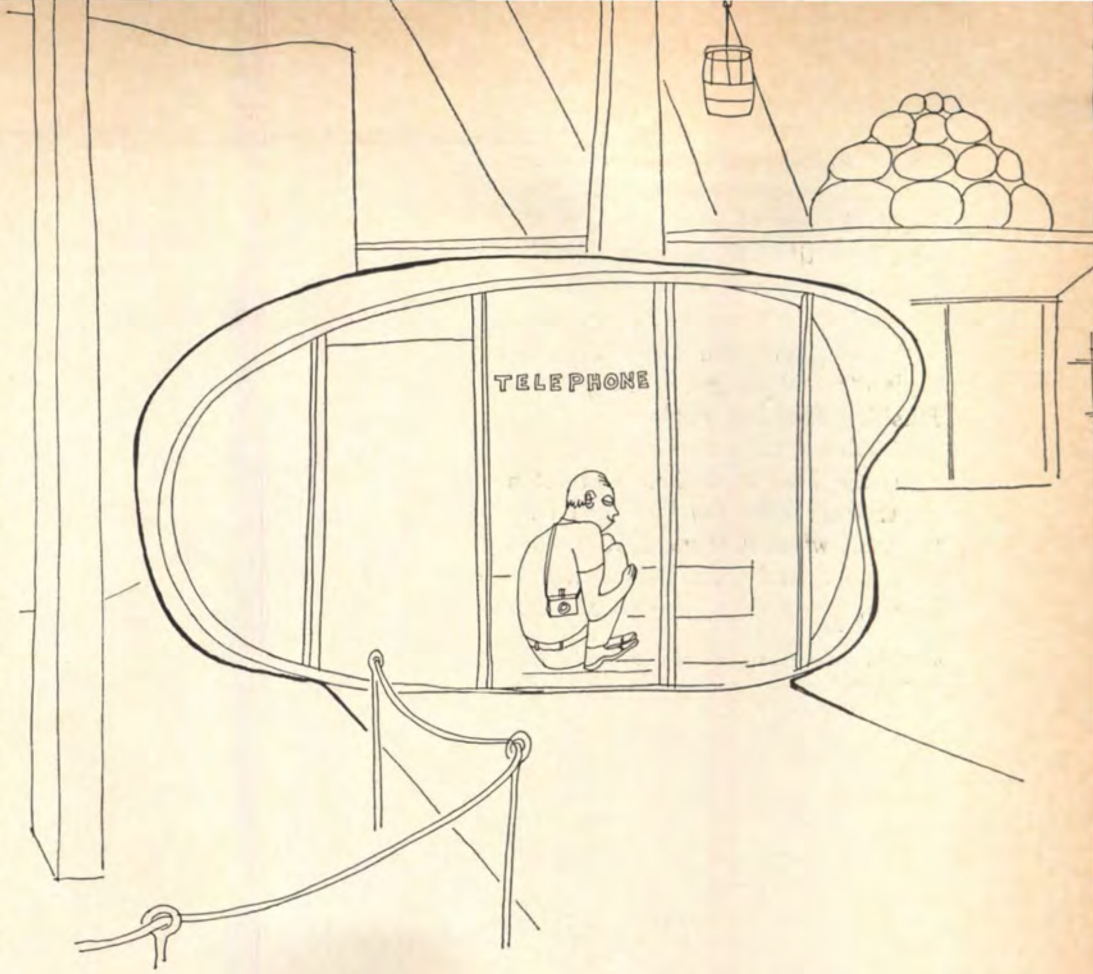
HAWAII (142): Juxtaposition of jazzy exposition architecture with huts sporting thatched roofs of a suspiciously plastic-looking material make this a rather disturbing visual spectacle.
Architect: Reino Aarnio

FLORIDA (147): A porpoise act, an immense plastic orange atop a 110-ft tower, and promotional buildings standing in Meadow Lake set the tone here.
Architects: Pancoast, Ferendino, Grafton, Skeels & Burnham

The rest of the Amusement Area is largely devoted to rides and concessions. Earlier, there was the best show for the money at the Fair in the reconditioned Amphitheater, where Eleanor Holm disported herself in the 1939 exposition. It was called "Wonder World," and was a splendid all-singing, all-dancing, corny spectacular. Also closed because of lack of business.



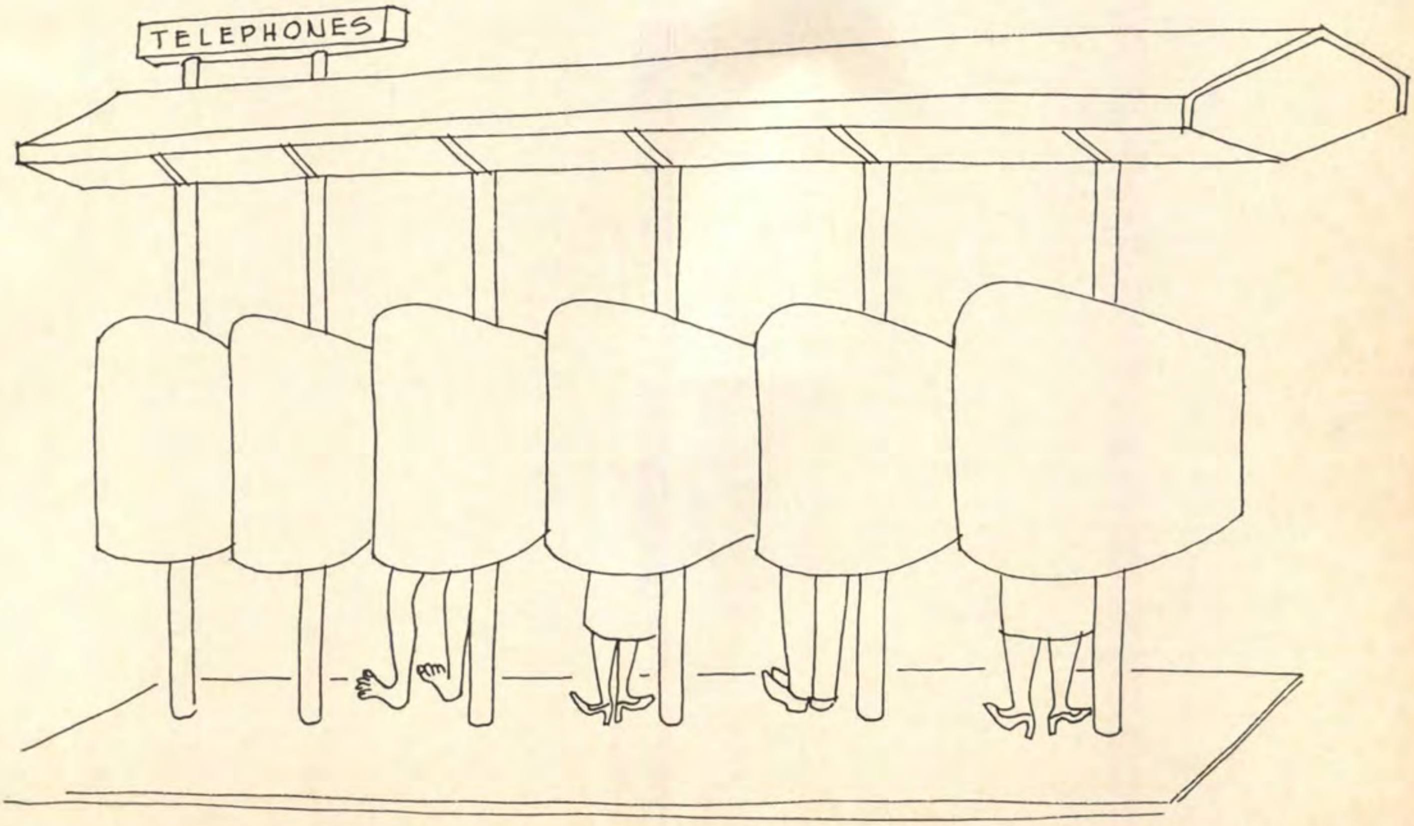
itably recalls certain public facilities in the streets of Paris. The second type, an innovation, is the family telephone booth (*right*), which has been called a nice "wombomatic" device for calling home to Mama.



GENERAL FOODS ARCHES: Pygmy versions of the St. Louis arch with lighted signs giving Fair news plus such vital messages as "Eat Grape-Nuts Flakes."

FOUNTAINS AND SCULPTURE: These *objets d'art,* placed in the same spots on the same site plan as the 1939 Fair, are universally mediocre, except for one which is positively objectionable (the "Astral Fountain"). Aside, of course, from the "Unisphere," there is the usual Mussoliniesque big-hands-and-feet male nude of the *ad astra per aspera* variety, a "Pool of Industry" (15) which seems to go on and off at will (off, it's just a maze of perforated metal), and the "Fountains of the Fairs," separating the traffic flow on the Fair's main axis.

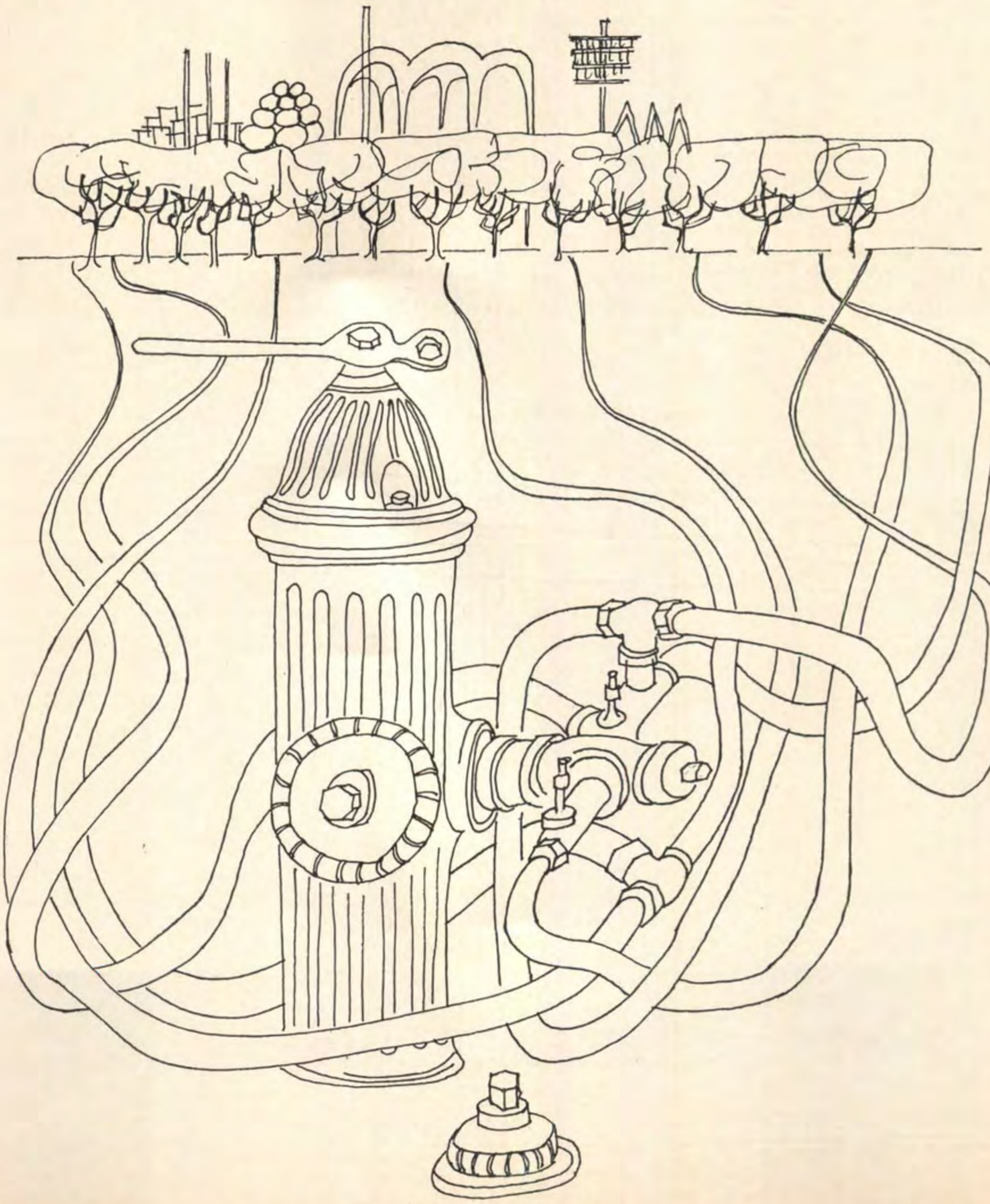
One of the Fair's attractions that engenders more exhilaration than the soupy piped music emanating from p.a. systems all over the place is the traveling—in an open-trailer arrangement by Greyhound—Cities Service Band of America directed by Paul Lavalle. Every now and then, when feet and spirits are flagging, this caravanserie passes by with stirring strains and puts Fair-goers once more into a hup-two-three-four briskly-marching pace.



Well, there you have it. There are no Crystal Palaces or Eiffel Towers here, not even something like Maybeck's Palace of Fine Arts. Of the structures that will remain, Harrison & Abramovitz's Hall of Science is probably the most distinguished. The Unisphere will also stay, like a giant's stickpin left in the grass of Flushing Meadow Park.

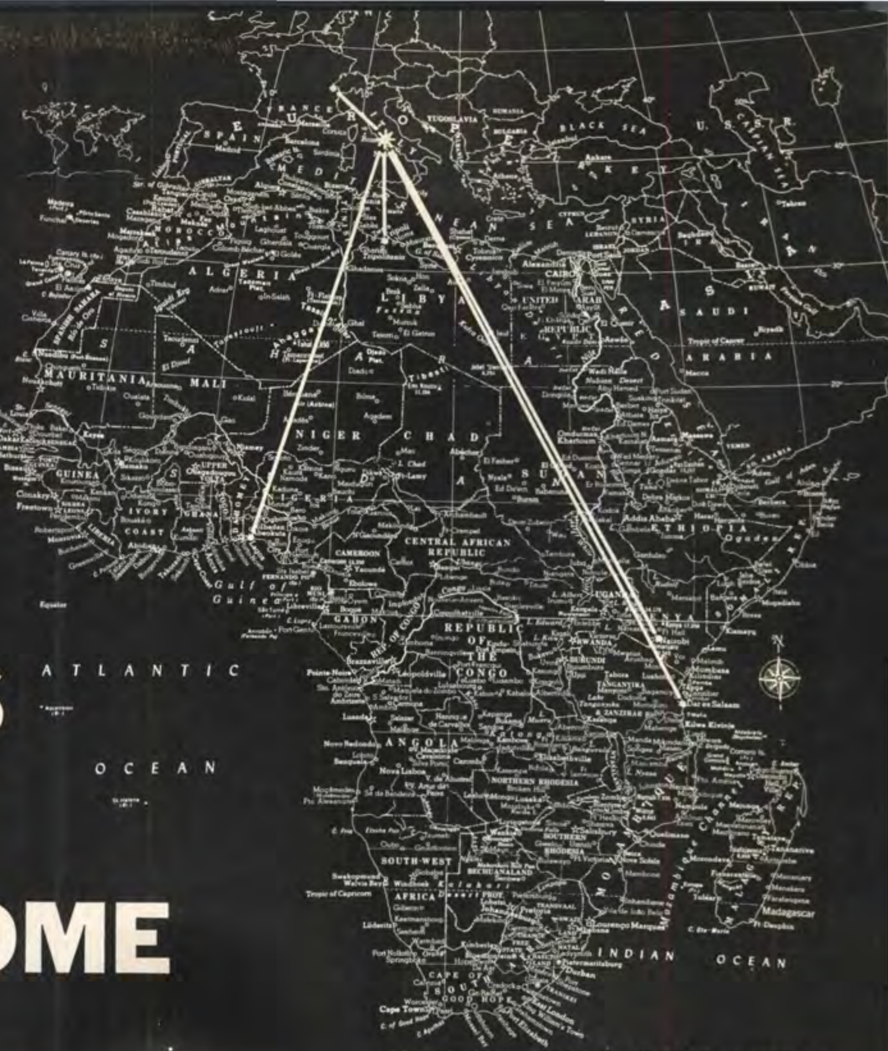
To those interested in good design, the Fair is curious and often frustrating. Like the little girl with the curl, when it is good, it is very, very good, and when it is bad, it is horrid. —EP/JTB, JR

Note: All design credits are from the official guide to the Fair.



Drawings by Forrest Wilson

U.S. FIRM RADIATES FROM ROME



REPRODUCED WITH PERMISSION FROM C. S. HAMMOND & CO., MAPLEWOOD, N. J.

When The Architects Collaborative was commissioned to design the University of Baghdad, an office was set up in Rome to handle that major project. Most of the architects were brought from the United States for the job, and a number of them noticed an ideal opportunity for a permanent practice in Rome to satisfy the ever-growing demand for superior architectural services emanating from the newly independent countries of Africa. Robert S. McMillan, who had been a senior partner in The Architects Collaborative for 16 years, teamed up with John H. Griffis a year-and-a-half ago to create such a firm, and they took with them as associates TAC staffers Riccardo Bonicatti, Barrie Dewhurst, Joseph H. Onuma, Herbert D. Rader, and Richard E. Swibold. All principals in this young, busy firm are in their thirties except for McMillan, who is in his forties. Countries of origin of the group include the United States, England, Italy, and Japan, and languages spoken in the office include English, Italian, French, German, Japanese, and Greek. Educational background of all principals includes architectural training or graduate work in the U.S.

In the short time since its founding in 1963, Robert S. McMillan Associates has garnered impressive commissions in Nigeria, Libya, Tanganyika, Kenya, Iran, Italy, and Switzerland. These range from a national parliament (still under wraps) to a beach hotel, from a major university to an industrial plant. This early success ratifies the belief of McMillan and his associates that there is a need, especially in the new countries, for young, imaginative architects who will strive to bring design creativity and social and economic responsibility to people who are all too frequently given a pedestrian job by one or another of the large foreign architect-engineer firms that operate in the area, and who are often inclined to award commissions to an American firm rather than one from a country with a history of colonialism in Africa or the Near East. Rader reports that McMillan considers his office the only foreign-based U.S. firm with work in Africa that emphasizes design as a *primary* consideration.

Owing to the unique problems involved in dealing with clients from young nations, a firm such as McMillan's must be able to furnish a broad spectrum of services generally not offered by firms in the United States. Basic professional services include: "Complete programming, master planning and preliminary design—architectural engineering and landscaping. Preparation of all architectural, engineering and landscaping final designs, working drawings and contract documents, including bills of quantity. Assistance in preparation of tenders and evaluation of bids. Supervision of construction." In addition, the firm is frequently called upon—either on its own or with the McMillan-guided services of a third party—to provide economic analyses, feasibility studies, site analyses, operational programming, promotional services, assistance in financing, negotiations of various sorts, interior design, food service planning, acoustics, lighting, and product and equipment design and *specification*. The comptroller of the firm, a graduate of the Harvard Business School, provides the economic feasibility and financial studies for both governmental and private clients. McMillan makes extensive use of the Quantity Survey System, and consequently has an arrangement with the British surveyors, G. H. Hanscomb Partnership, to have a Hanscomb partner in the McMillan Rome headquarters "to facilitate day-to-day coordination."

Each client is served by McMillan, plus one of the associates as project manager. McMillan is the main designer of the firm, as well as being administrative and technical head of office procedure. This is an interesting departure from the "team" concept fostered by the alma mater of all principals of the firm, The Architects Collaborative. Its Rome location gives the firm the opportunity to have a principal at a project site within 24 hours should any problems arise requiring major decisions or should a client request on-the-spot consultation. In addition to the Rome office, whence all designs originate, there is a titular head office in Lucerne, Switzerland, a branch office in Lagos, Nigeria (run by Swibold), and affiliated offices in Nairobi, Kenya, and Washington, D.C. The average number of McMillan employees is 25. The principals, representing four nationalities or cultures (American, English, Italian, Japanese), have—between them—worked in every continent or major area of the world. With this background, they can understand local or national problems in discussions with officials (often the very top men in the new countries), keep their eyes and ears open to the ever-changing social and political climates of the developing nations, and make appropriate decisions quickly and with assurance. Most new governments have civil service systems patterned on those of colonial days, with some still being advised by hangover colonials of the gin-and-tonic-every-afternoon-at-three variety. Although some new governments are aware of all ramifications of a project and retain a degree of control over it, the architect is usually regarded as the final authority.

The great responsibility this entails is joined by a greatly widened scope within which the architect can work. McMillan feels that such work gives the architect the opportunity to produce the best work he can and stand behind it all the way. Rader notes that the final results are usually closer to preliminary designs than is the case in the United States.

The range of building needs in these countries is so vast that McMillan considers the opportunities for the architect and planner virtually unlimited. With no manufacturers' catalogs or samples to act as crutches, the architect is forced to be more ingenious, inventive, and responsible. Simplicity of design details handled basically in a concrete context is a hallmark of the McMillan African projects so far. According to Rader, precasting and prestressing are in use and the techniques are improving. McMillan's partner, Griffis, says that the University of Lagos is one of the first large-scale prestressing operations in Nigeria. The only difficult problem the firm has encountered so far lies in complex systems that must be imported. Labor, of course, is plentiful and inexpensive, but must be closely supervised by the foremen, since construction labor is likely to be a man's first experience at such work.

McMillan Associates is currently working on projects in which English, Italian, and French are used, and where both feet/inches and metric systems are employed. Most contracts are percentage arrangements, with higher percentages than in the United States, but at lower costs, of course. It is fascinating to see a newly founded firm build up, within a year and a half, an international practice that puts many long-established stateside offices to shame. This type of practice may represent a new horizon for struggling young firms in the U.S. Brush up at Berlitz first, however.—JTB, JR

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Model photos by Gherardi-Fiorelli

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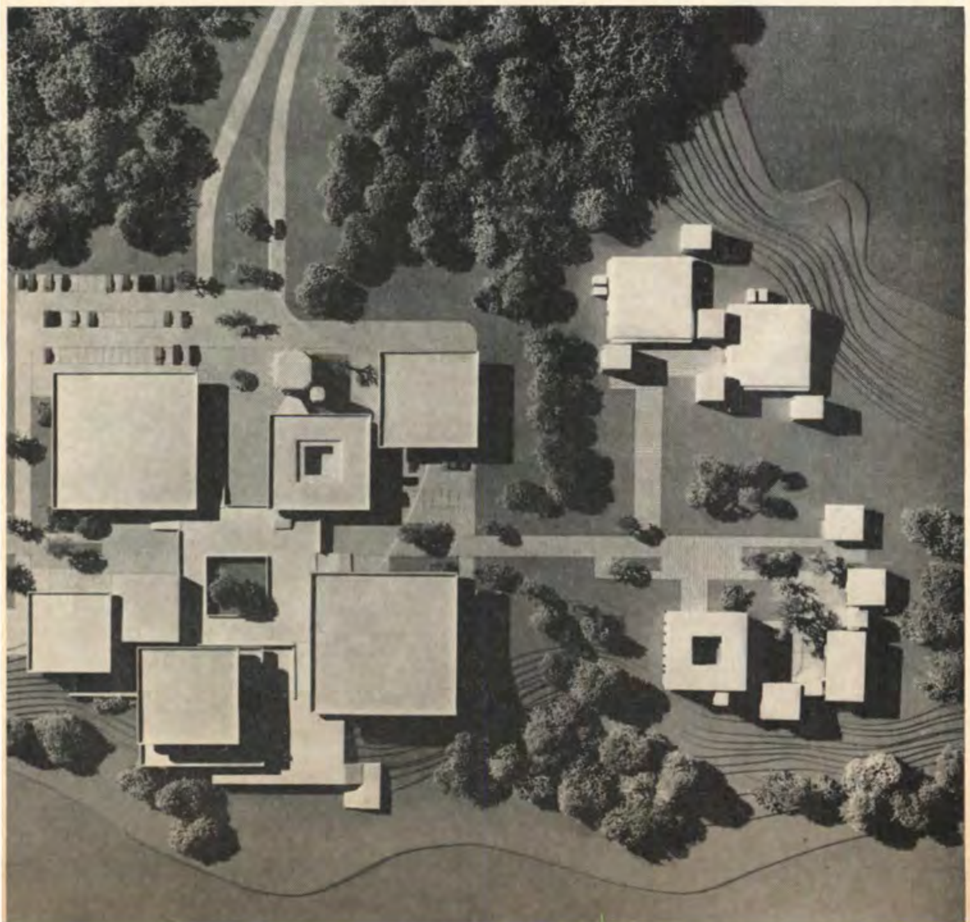

UNIVERSITY OF LAGOS

Lagos, Nigeria

(Project executed in English language and feet/inches.)

The University of Lagos is the largest project by the McMillan office currently under construction. The University plan is phased in three stages: from the beginning of the academic year in October 1962, when instruction in Business, Law, and Medicine was begun elsewhere (the Medical Faculty is an autonomous unit with the University); through Phase II, which is seeing the construction of facilities for Business, Law, Engineering, Arts, and Science at the new campus; to Phase III, which concerns the period after 1964, when the student body is expected to grow from its present size of 515 to 1362 in 1968. Post-1968 developments will include expansion of the Faculty of Engineering into the Faculty of Technology, encompassing the disciplines of Architecture; Land Surveying; Communications; Chemical, Municipal, Public Health, and possibly Marine Engineering. Civil, Electrical, and Mechanical Engineering are the subjects presently covered. The adjoining Federal Advanced Teachers College will be merged with the University as the College of Education. The Faculty of Science will add courses in Marine Biology and Oceanography, and the Faculty of Arts will emphasize more strongly Modern Languages, Nigerian Languages, add Sociology and Psychology, and contribute toward the development of an Institute of African Studies.

The University is being built on the shore of Lagos Lagoon, approximately midway between the growing complex of government buildings and where the lagoon empties into the ocean. Preconstruction state of the site was completely undeveloped **(1)**; Rader reports that site clearing was always just a step ahead of rapid jungle regrowth. The central facilities **(2)** include (clockwise from left to right in center group): administration complex, library, dining halls, and auditorium. The Academic Group South (left in model) contains the Faculty of Science; Academic Group North (right) includes faculties of Business, Law, and Arts at bottom and Faculty of Engineering at top. Perspective of Academic Group South **(3)** shows architectural treatment of buildings. Upper floors contain lecture rooms and laboratories for better air circulation; office and service areas are on lower floors. Separate stair towers provide access. Progress on this group was well advanced at midsummer.

A view from the lagoon **(4)** shows the dining hall (left) and library (right) in the central group. Deep terraces protect the dining rooms from the sun and encourage natural ventilation; overhangs plus vertical concrete louvers are used for the same purposes on the library.

The dormitory area is to the south of the main access road leading to the main academic complex **(5)**. In the initial phases, provision for 270 resident students is being made. More single occupancy rooms (all rooms are double occupancy in first segment) and additional social spaces will be provided in the future, as well as dining facilities within the living areas. Faculty and staff housing is located between the University entrance and the dormitory area. The main housing types are row houses and detached single-family dwellings. Sixty units will be completed this year, and 150 units will be ready in 1968. This area also includes a nursery school, small shopping center, and play areas for faculty children.

Simple structural systems utilizing materials and methods generally used and available in Nigeria are emphasized here. Structural building components, foundations, floors, and roofs are of reinforced concrete, with concrete block walls and precast wall cladding components and grilles. Free-standing walls are of **abeokuta** (a local stone) and concrete, and precast concrete is used for paving. Windows are metal-framed and floors are either local terrazzo or asphalt tile.

Robert S. McMillan Associates, Architects and Planners
Engineering Consultants International, Ltd., Engineers
G. H. Hanscomb Partnership, Quantity Surveyors

The Hon. Aja Nwachuku, M.P., Federal Minister of Education
Chief Dr. E. N. O. Sodiende, Chairman, Provisional Council
Professor E. Njoku, Vice-Chancellor
Chief A. Y. Eke, Registrar
Mr. Z. A. Odunsi, Resident Engineer

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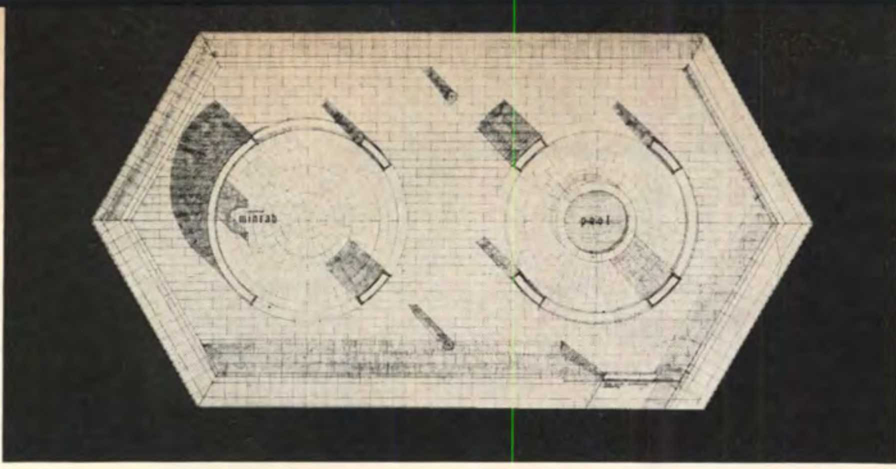
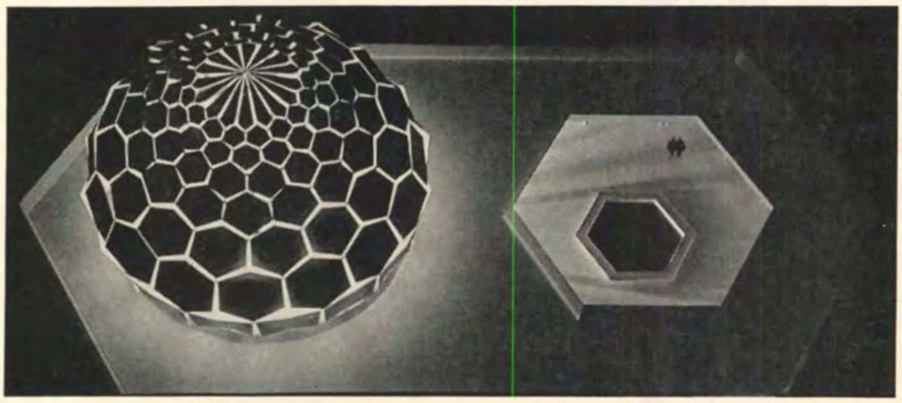
Current plan includes (from top to bottom): faculty housing; student living quarters (left of access road); service area (right of road); and the central and academic areas at bottom.





MOSQUE

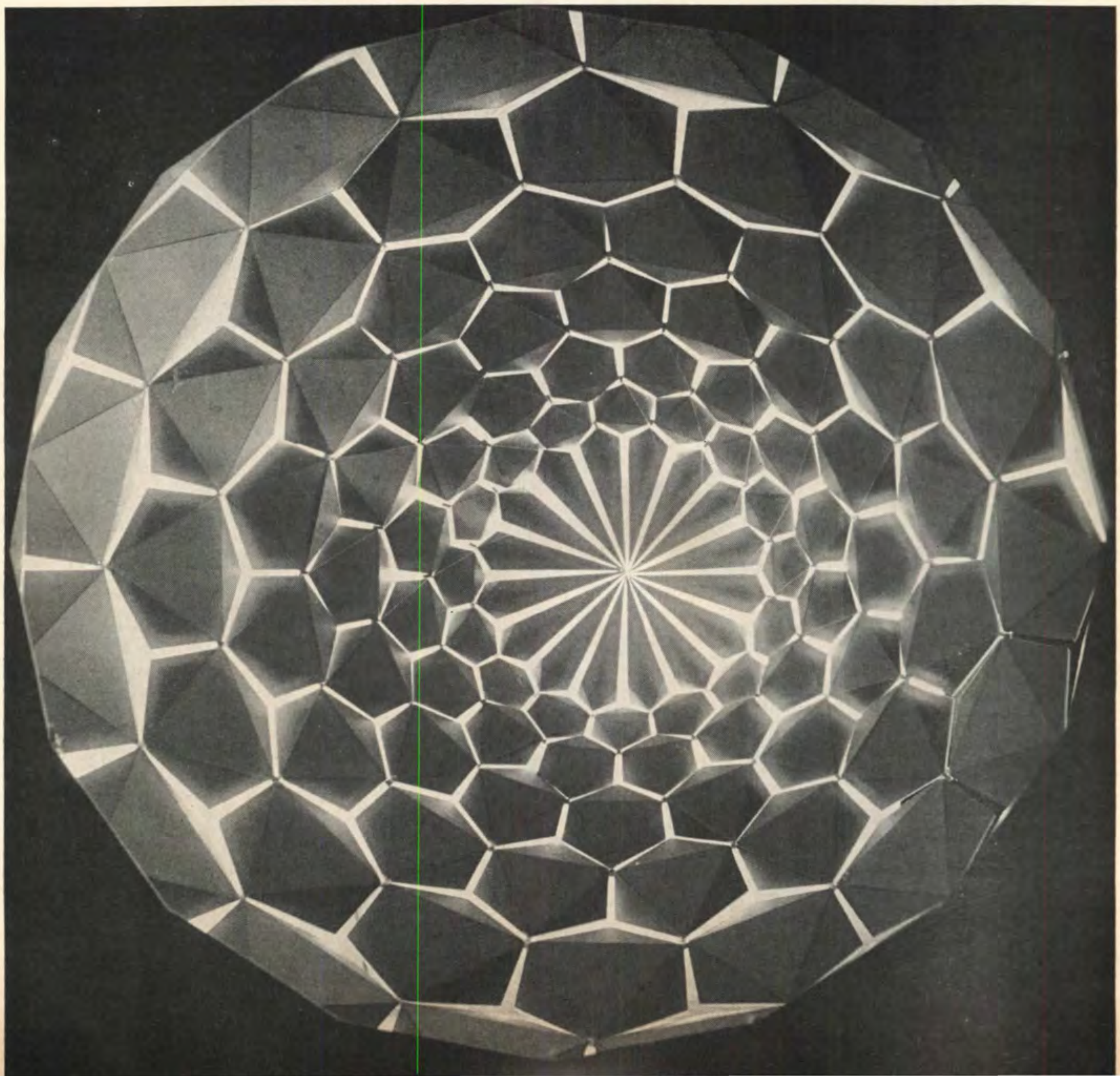
University of East Africa
Dar es Salaam, Tanganyika

(Project executed in English language and feet/inches.)

Use of the traditional dome and a capacity of 200 persons were the only requirements given the architect for this mosque, a gift to the University College from the Aga Khan and his community.

The dome rests on a base, which is in the form of an elongated hexagon. An open-air court with a central pool forms the approach to the sanctuary.

The architect states that the design approach "rephrases" the traditional onion shape of the dome by use of contemporary precasting technology. The 70-ft-diameter dome consists of 8 tiers of 16 mosaic-faced precast panels each. The units are joined together at three points with steel dowels and epoxy cement; at each tier, steel cables laced through the junctions are post-tensioned to relieve the dome's thrust. The interstices between the panels are filled with stained glass fastened directly to the panels with zipper gaskets.



OFFICE BUILDING

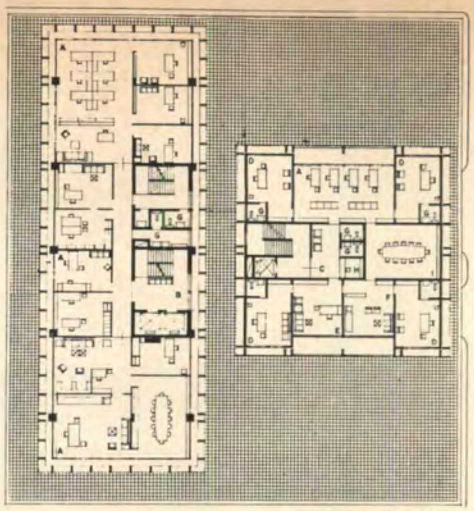
Nairobi, Kenya

(Project executed in English language and feet/inches.)

This design for a speculative office building aesthetically surpasses the majority of similar projects in the U.S. Major element will be a 13-story reinforced-concrete structure offering rental office space based on a flexible, 6-ft module. This tower rises from a one-story base containing shops, a bank, lobbies, and, at the insistence of the client, an "American" drug store. Also rising from this base is a three-story structure containing a restaurant and two "executive suites." A skylighted shopping arcade separates the tower and the four-story element. Total estimated cost for the project is $781,000, based on $5.40 per sq ft. It should be noted here that neither heating nor air conditioning are required in Nairobi. McMillan Associates' professional services were contracted on a percentage basis and include all engineering, quantity survey, and supervision.

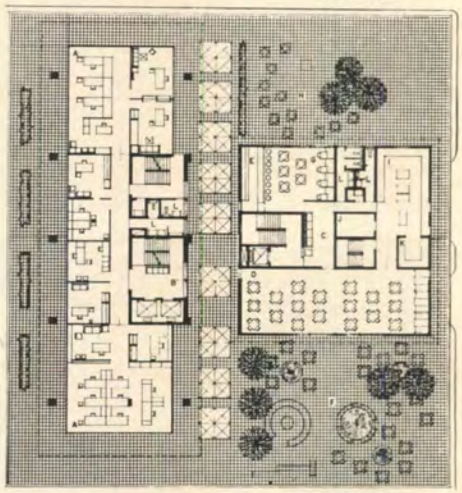
The restaurant will accommodate 70 diners indoors, and will in addition offer a large dining terrace overlooking Government Road. The two executive floors above will be leased to professional firms, such as law practices. Basement parking for 75 cars has been provided to ease a critical traffic problem in Nairobi.

Space has been left in the building for the incorporation of African art, and the restaurant will have "African décor." The city has promised to donate a sculpture for the triangular plaza in front of the building.



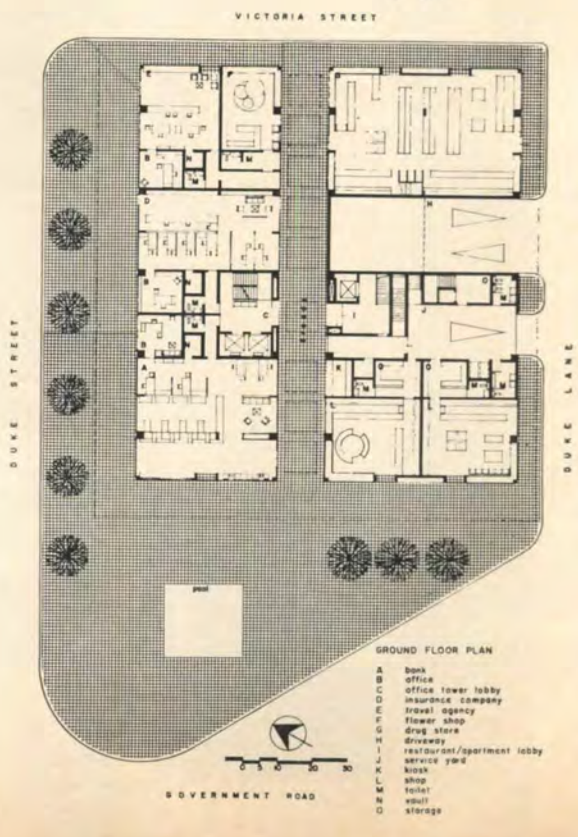
TYPICAL FLOOR PLAN

A office space
B office tower lobby
C executive suite lobby
D executive office
E reception
F executive lounge
G toilet
H control
I conference



FIRST FLOOR PLAN

A office space
B office tower lobby
C restaurant lobby
D dining room
E bar
F outdoor dining terrace
G cocktail lounge
H outdoor cocktail terrace
I kitchen
J kitchen storage
K dishwashing
L toilet



GROUND FLOOR PLAN

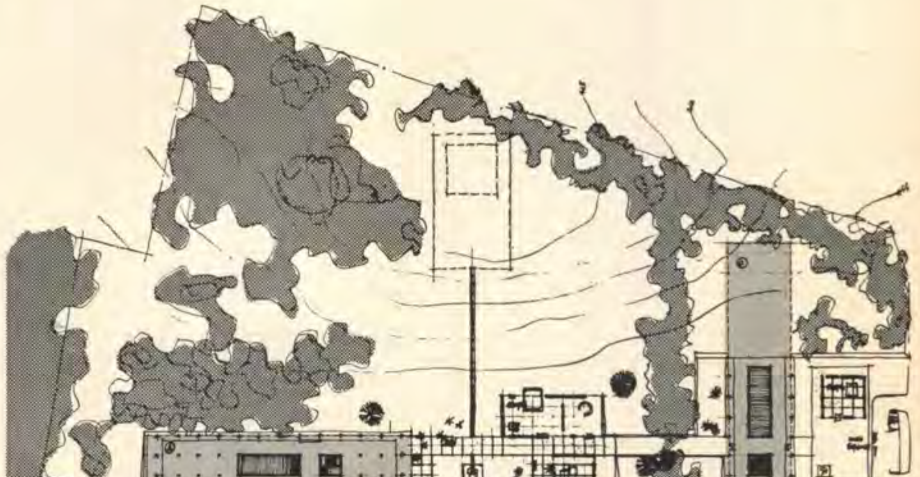
A bank
B office
C office tower lobby
D insurance company
E travel agency
F flower shop
G drug store
H driveway
I restaurant/apartment lobby
J service yard
K kiosk
L shop
M toilet
N vault
O storage

COMMERCIAL CENTER

Geneva, Switzerland

(Project executed in French language and metric system.)

Project consists of three large slab-type commercial buildings housing "the needs of international business." **Centre Executif de Genève** occupies a wooded site a short ride from downtown Geneva and affords fine views of Lac Léman and Mont Blanc. Zoning restrictions held the buildings to rather low heights for such structures. **In-situ** reinforced concrete is the main structural element; the buildings will be enclosed with precast concrete panels and frames. Retaining walls and terraces will be of local stone. On the terraced portion of the site, an auditorium and several shops are separate from the main buildings. Remainder of site is landscaped as a park. Rentable space totals 50,000 sq m, with additional space for conference rooms, banks, shops, and restaurants. There will be 16,000 sq m for parking. Total estimated cost is $20 million, excluding land and fees.



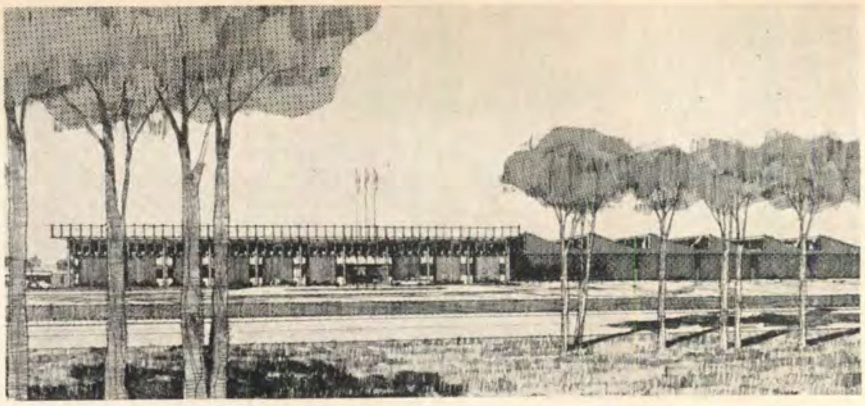
Site plan.

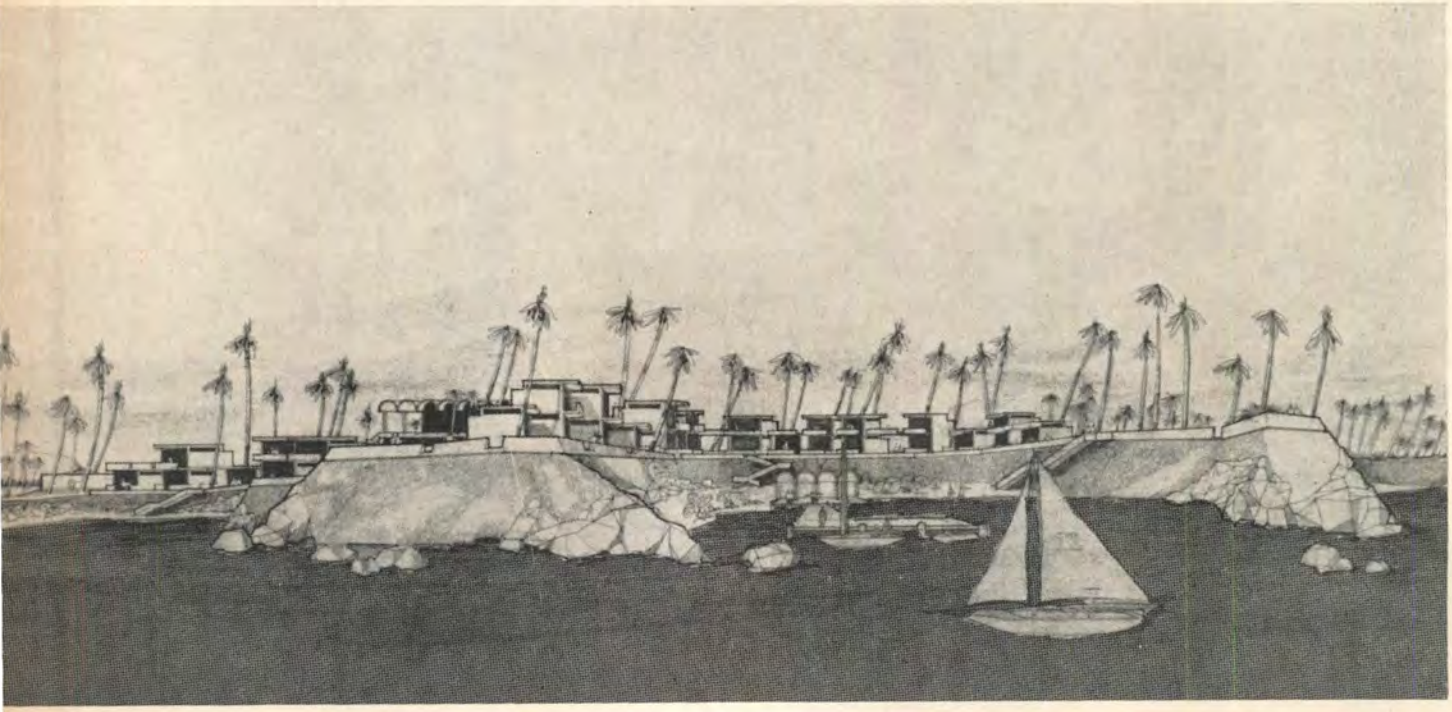
INDUSTRIAL PLANT

Aprila, Italy

(Project executed in Italian language and metric system.)

This hardware manufacturing plant for Yale, s.p.a. (subsidiary of Yale & Towne, White Plains, N. Y.) is to be built 20 miles south of Rome. Scheme consists of a one-story, 85,000-sq-ft plant connected to a two-story, 22,000-sq-ft office building. The plant will be constructed of steel; the office building, of reinforced concrete. Low general contract bid was $1,100,000. Engineering Consultants International, Ltd., are the engineers.





BEACH HOTEL

Dar es Salaam, Tanganyika

(Project executed in English language and feet/inches.)

A dramatic site featuring 20-ft rock cliffs descending to sand beaches provided the opportunity for a "village" plan of 40 double and 40 single units staggered around the undulating contours of the property. General facilities include dining areas, lounges, night club, bars, tennis courts, and a swimming pool (in *addition* to ocean bathing, of course). The main lower beach also has a marina and bar. Access to the beaches is by ramps and stairways. Structure is load-bearing masonry walls with reinforced concrete floors and roofs. Estimated cost, excluding land cost and fees (but including air conditioning of the guest units), is $457,000, or $5.40 per sq ft. This project received the complete package of McMillan major and ancillary services noted on page 239.

specify MAHOGANY*...natural background for fashion*

For centuries mahogany has been to the world of wood what leather has been to men's clothing. Both materials have built lasting reputations for beauty, performance, and long life. Little wonder that both leather and mahogany are imitated. Mahogany by so-called Philippine Mahogany, which is not a Genuine Mahogany but may be one of 14 different species of wood.

Just as a top tailor wouldn't think of using an inferior cloth for a fine suit, today's architects should insist on Genuine Mahogany rather than substitutes. One way to be sure is always buy from Weis-Fricker, world's largest producers of Genuine Mahogany. Weis-Fricker imports and manufactures only *Swietenia Macrophylla* from Central and South America. It's yours quickly in any quantity at prices that will please you—and at lengths up to 20 feet, widths to 24 inches, and thicknesses to 4 inches!

From Weis-Fricker you'll get the same magnificent material that tests by the U. S. Forest Products Laboratory and Cornell University show superior over all other popular hardwoods in nearly all properties for mortising, boring, planing, warping, shaping, and turning. And you'll join some of America's top architects who chose Genuine Mahogany recently for the interior of the luxurious Hotel Sheraton in San Juan, the Professional Golf Association's (PGA) clubhouse in Palm Beach, and the Library at the University of Chicago.

For name of nearest dealer to you, write today. Free mahogany kit on request. Contains samples with finishes in red, yellow, green, blue, brown, and violet, plus mahogany fact book with mechanical stresses and other information.

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Plumbing Code Revision

BY WILLIAM J. McGUINNESS

Recommendations for the revision of the New York City Building Code in respect to plumbing requirements based on design decisions are discussed by a practicing mechanical engineer.

Two years ago, New York City initiated a study for the revision of its Building Code and allocated $700,000 for completion of the project. Under the direction of the Polytechnic Institute of Brooklyn, proposals for changes are now being formulated by specialists. Frederick G. Frost & Associates is acting for the architectural section, Praeger-Kavanagh-Waterbury for the structural division, and Meyer, Strong & Jones for the several sections on mechanical equipment, which include plumbing.

Francis W. Hay, Partner, and George R. Jerus, Senior Associate, have made their proposals for changes in plumbing requirements, which are now receiving favorable consideration by the City authorities. Guided by the 60 years of experience of their firm, Hay and Jerus have adopted many of the principles tested and approved by established authorities. These include the National Bureau of Standards, the National Plumbing Code sponsored by the American Public Health Association, and the American Society of Mechanical Engineers, the New York State Building Code, the New York City Department of Hospitals, Health, and Buildings, and many time-tested sections of the City Code itself. A significant characteristic of their study is the fact that *reasons* for design decisions are being brought into the spotlight and reviewed in a trade which has had somewhat less study than others, and in which there had been a tendency to continue, without challange, some long-established customs.

Despite periodic revision and up-dating of the New York City Code subsequent to its last major editing in 1937, it is a difficult book to read. This becomes noticeable in comparing it with the clarity of the American Standard National Plumbing Code, ASA-A40.8-1955 (now also about to appear in revised form). The need for a readable book with a good index is being met in addition to establishing changes that will facilitate the use of better or more economic materials, the installation of more workable systems, and the inclusion of well-proven recent developments. A few of the newly proposed items, perhaps the most important, have been selected for mention.

Water Distribution. It is recommended that constant pressure booster pump systems be allowed. This makes the installation of roof storage tanks unnecessary, hence reducing the structural cost, the danger of water contamination, and the possible collapse of roof tank supports. Aesthetic, economic, and space advantages permit greater freedom of design. Tanks are still permitted, but it has been found that there is little need for them, whether they be gravity tanks, pressure tanks, or surge tanks. Pumping directly out of city mains appears to be satisfactory. The standpipe protection must be adjusted to make it compatible with the use of booster pump systems.

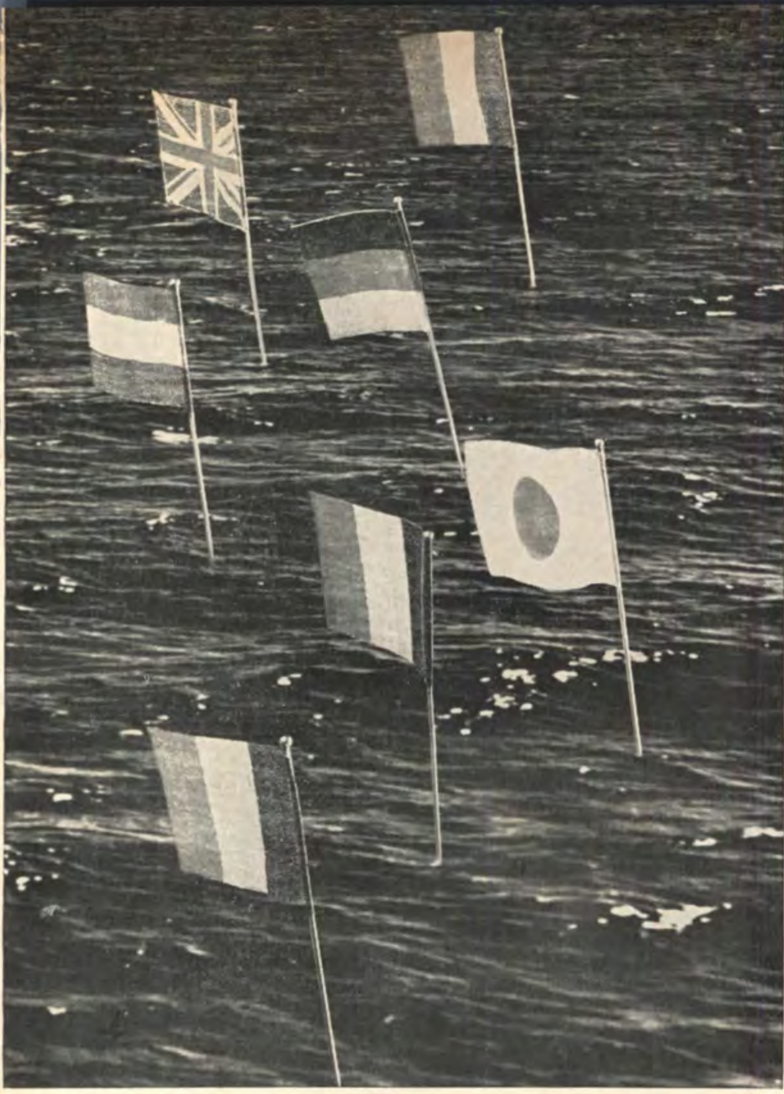
Materials. For water piping, types K and L copper tubing may be used. At present, only type TP copper tubing with brazed fittings is permitted. Standard-weight cast-iron soil pipe may be used for drainage and vent piping within buildings. Extra heavy cast iron is still required for building drains in the ground and to a point 5 ft outside the building line. Beyond that point, for residential one- and two-family dwellings, asbestos cement sewer pipe, concrete, and tile drainage pipe are satisfactory if properly installed. In accessible or exposed locations within buildings, plastics may be used for cold water. Plastics may also be used for drainage and vent systems under specific conditions.

Venting. Loop and relief venting reduce the quantity of vent piping, obviating the need for individual fixture vents, especially at groups of water closets. This simplification, used satisfactorily in Chicago, St. Louis, and other cities, is a feature of the National Plumbing Code. Wet venting permits a single vent for two fixtures such as a lavatory and a bath tub.

Vent sizes are, in general, smaller than those previously required in New York City, though somewhat larger than those suggested in Monograph 31 of the National Bureau of Standards. This increase offsets the effects of fouling (partial clogging) of vents and fittings after long use.

Storm Drainage. Water from heavy storms is retained on roofs for 24 hrs. During this period, it is fed slowly and at a uniform rate by proportional weirs at the roof drain fixtures. Dead-level roofs are recommended. A depth of 3 in. of rainfall is the maximum that can be so retarded; (24 hr rainfall seldom exceeds 2 in.). This depth exerts only 16 psf on roofs usually designed for 40 psf. The results are smaller drain piping and reduction of the current overloading of city sewers. Pollution of rivers is reduced, since the amount of overflow to them from the city's combined storm and sanitary sewers is greatly reduced. This makes it possible for sewage treatment plants to do the job for which they were designed.

Inspections and Tests. General recommendations for inspections and tests are also in the revised proposals. The most important of these, which permits the inspection of procedures to be officially witnessed by a registered architect or a licensed professional engineer, facilitates construction by eliminating the need for inspections by as many as six different departments with jurisdiction. City participation could take place, if desired, but would no longer be obligatory.



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Built-Up Roofing

BY HAROLD J. ROSEN

Differences between various types of built-up roofing, as well as recent techniques for their application, are discussed by the Chief Specifications Writer of Kelly & Gruzen, Architects-Engineers.

Generally, the specifier can expect to encounter problems when he uses new materials. These problems are associated either with the material itself (the manufacturer has not yet eliminated all the bugs), or with its use in conjunction with other materials (incompatability and differences in coefficients of expansion).

When old materials are used—and built-up roofing systems of tar or asphalt are certainly in this category—the specifier would not expect to be confronted with problems. However, when we examine the literature of the major manufacturers of built-up roofing materials, we find today a divergence of opinion with respect to recommendations, good practice, details, and specifications.

One point of concern to the specifier is the decision of one major roofing manufacturer, in an announcement made last year, not to issue roofing bonds on roofs employing coal-tar pitch as bitumen. This action was based on what the company reported as an unusually high incidence of roof repairs on coal-tar pitch roofs applied since 1950. A review of the literature of coal-tar versus asphalt would indicate a more favorable use experience with coal-tar than with asphalt for flat roofs. Primarily, coal-tar can withstand sunlight, water, cold, and heat better than asphalt. It has a property known as "cold flow," which results in the "self-healing" of small cracks.

Another major difference of opinion occurs in the recommendations concerning slope on flat roofs using coal-tar pitch. Some manufacturers will bond these roofs, which are dead-level; others require a minimum slope of $\frac{1}{8}$ in. per ft; and still others require $\frac{1}{4}$ in. In the matter of roofing bonds for coal-tar built-up roofing, some manufacturers state that the bond will not be effective in areas that permit standing water or ponds, while other manufacturers point out the resistance of coal-tar to water and do not place limitations on the roofing bond. These latter manufacturers are apparently aware that with flat roofs there may be low spots, or uneven settlement of the building, that may cause poor drainage which will result in standing water and bird baths. These latter manufacturers will also bond built-up coal tar roofs with slopes up to 1 in. per ft.

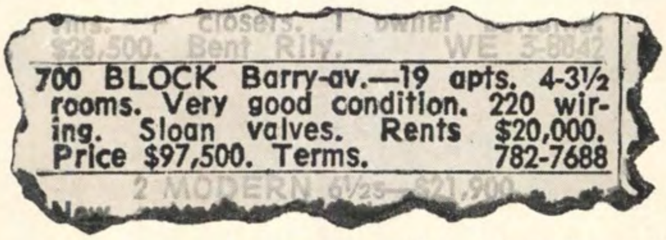
Several years ago, it was popular to specify the use of water cut-offs for insulation. Its primary purpose was to limit the extent of water damage to insulation if a roof leak occurred, and to isolate leaks. Now, most major manufacturers ask for the sealing off of roof insulation at the end of the day's work by means of cut-offs, but insist on its complete removal before the roofing operation is continued. Its discontinuance is based on the assumption that it adds to the problems of vapor pressure. However, some major manufacturers of roof insulation still require water cut-offs.

Another innovation in built-up roofing construction is the use of a coated base sheet in lieu of the first ply of felt over insulation, lightweight concrete, poured gypsum, and shredded wood fiber decks. A description of the coated base sheet is not easily found in any of the manufacturers' literature, but it is apparently a 30 lb asphalt saturated felt that has been coated or surfaced on one side with asphalt. The coated base sheet is generally 43 lb per 108 sq ft. It was developed to overcome the phenomenon known as "ridging," which results from the accumulation of condensation of moisture vapor in these types of decks. However, we do not find complete agreement by built-up roofing manufacturers on the use of these new coated base sheets. Some major manufacturers do not include the uses of the coated base sheet for coal-tar built-up roofs over the decks previously described. The old adage concerning the separation of coal tar products from asphalt products is disregarded with the use of these new coated base sheets, since coal-tar is used by some manufacturers over these asphalt saturated and coated base sheets. Perhaps in another 10 years, we will not only experience roofing failures as a result of this marriage of coal tar and asphalt, but also will receive new recommendations and perhaps a coal-tar-coated base sheet.

One major built-up roofing materials manufacturer recommends against the use of wood cant strips in conjunction with concrete roof decks. Whether this admonition precludes the issuance of a roofing bond is not made clear.

From the foregoing discussion, it appears that built-up roofing materials manufacturers are searching for solutions to problems arising not necessarily from the old materials, but from the changes occurring in our construction of buildings. The use of insulation over structural decks has created new problems for old reliable materials. The National Bureau of Standards has found higher temperatures of built-up roofing over insulated decks than over noninsulated decks. This increased solar heat has resulted in earlier failures of the built-up roofing through blistering, wrinkling, or buckling. Tightly sealed buildings add to the accumulation of water vapor with only one place for it to go—up and out through the roof construction.

In designing roofs and in specifying built-up roofing systems, the architect would be well advised to review the latest literature and recommendations of the built-up roofing manufacturer. Too many changes have taken place in the last two or three years. It is imperative that these latest recommendations be studied, since there is little agreement between manufacturers and since roof design should follow the recommendations of the manufacturer you elect to specify.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Seagram Building Tax Upheld

BY BERNARD TOMSON AND NORMAN COPLAN

P/A's legal experts examine the New York Court of Appeals' decision upholding a controversial lower court ruling on taxing the Seagram building.

Litigation involving the appropriate real estate tax basis to be applied to an office building containing unusual and outstanding aesthetic and architectural features has finally been resolved by the New York Court of Appeals, the highest court of New York. This decision, involving the Seagram building on Park Avenue in New York City, had been awaited with great interest and concern because of its possible effect on the quality of new construction in the City of New York. Critics of the decision of the lower Appellate Court, from which the appeal to the Court of Appeals was taken, had contended that the tax formula applied to the building as approved by that Court would have the inevitable effect of discouraging quality building and condemning the City of New York to perpetual architectural mediocrity [see IT'S THE LAW, OCTOBER and NOVEMBER 1963 P/A]. The Court of Appeals, however, rejected this criticism, affirming the determination of the lower court by a 4 to 3 decision (*In the Matter of Joseph E. Seagram & Sons, Inc. v. Tax Commission of the City of New York,* 25 L.R.N. #41).

The Seagram building was erected at a cost of approximately $36,000,000, but its market value, based upon a capitalization of income, was only $17,800,000. The building was constructed of unusual and striking materials and it was well set back from the streets on which it fronts, the space involved being employed in distinctive decorative effects. The difference between the cost of the Seagram building and its market value is accounted for by its distinct and unusual architectural features and the reservation of areas and space for aesthetic effect rather than utilization for commercial income. The Tax Commission of the City of New York had refused to apply the normal standard in calculating the real property assessment upon this building, which would be based on a capitalization of rental income. The owners of the building contended that the Tax Commission, in refusing to apply this standard, was, in effect, penalizing them for making a contribution toward a more beautiful city because a higher tax base was being applied to a structure of unusual architectural attainment than would be applied to a "run of the mill" building.

Upon their appeal to the New York Court of Appeals, the owners of the building argued that the Tax Commission's actions, which had been affirmed by the lower Appellate Court, while couched in the language of taxation upon building value were, in reality, a tax upon the prestige and advertising value "which accrued to it because the building had become world-renowned for its striking and imposing beauty." Such a tax, contended the building owners, was not valid. The Court of Appeals, however, rejected this contention, holding that since the owner had not built for commercial income purposes alone, capitalization of such income without adjustment would produce a false result. It was the opinion of the majority of the Court that the nature of the building justified, for example, a different and higher valuation for that part of the building which was occupied by the owner than a valuation based upon normal rental income. The Court concluded that the refusal of the Tax Commission to apply the normal assessment standard based upon capitalization of income was not taxing advertising or publicity value as realty value, nor did it mean "that a corporate sponsor of architecture is being penalized for contributing to the metropolis a monumental and magnificent structure."

The dissenting judges, however, came to the opposite conclusion. It was their opinion that the departure from the norm in tax assessment as applied to the Seagram building could only be based upon the "presumed benefit occurring to the Seagram company from its name associated with an architecturally superior and well-known building." The dissenting judges, in their opinion, stated:

> "Value under . . . . the real property law is market value given willing sellers and buyers. . . . In our view, this approach to value necessarily excludes any element that is unique to the present owner of a building. Any increment in Seagram's outside business enterprises deriving from public appreciation of the Seagram building will not pass to a buyer of a building in a sale. Such an element would disappear if the building were sold to another investor, engaged in another business or in no business at all, other than real estate investment. The good will follows Seagram and cannot be regarded as real property value inherent in the building itself.
>
> "Of course, the prestige of the Seagram Building undoubtedly enhances the value of the building in any hands. This is undoubtedly real estate value—value which is transferable in a sale, and for which a buyer will pay. Such value also affects the rental commanded by the building. But if tenants are willing to pay more for space in the Seagram Building than for similar space elsewhere, that is fully reflected in the capitalization of earnings. In turn, it would seem to follow that such capitalization adequately comprehends any increase in value that the building would bring in a sale—without resorting to concepts foreign to real estate value."

If the effect of the decision is to discourage quality building, it can only be avoided by legislative action. Many are urging such action in order to prevent what they claim is a "tax on beauty." However, it is doubtful whether legislative action will be forthcoming unless the architectural profession provides the leadership that will result in both awareness and understanding by the legislature of the problem involved.

Alvar Aalto and his wife, Elissa Makiniemi, also an architect.

The Work of a Master Architect

BY LEONARD K. EATON

ALVAR AALTO *by Alvar Aalto. Published by George Wittenborn, Inc., 1018 Madison Ave., New York 21, N. Y. (1963, 269 pp., illus. $16.75 text in English, French, and German). Reviewer is a Professor of Architecture at the University of Michigan. His most recent contribution to P/A was the article "Finnish Architecture: Traditions and Development," which appeared in the April 1964 issue.*

The publication of the collected work of a great architect is always an important event. This handsome volume, which was produced with the full cooperation of Aalto himself, will therefore be an important addition to every architectural library in the United States. Published by the American firm of Wittenborn in conjunction with the Swiss House of Girsberger, it is obviously intended for an international audience, since the text is in English, French, and German. Beautifully illustrated with over 200 plans, photographs, and drawings, it is in every way worthy of a great architect who is also a great human being.

Several aspects of the publisher's preface are significant. In the first place, the book required 10 years to prepare. "Looking back on the ups and downs in this work," writes Hans Girsberger, "it is less the delay that surprises me, than the fact that the volume has actually appeared. Alvar Aalto is not publicity-minded, and certainly does not like being pushed, while his letters have rarity value. Interruptions of one or two years occurred and turned this undertaking into a game of patience." In the second place, this presentation is extremely subjective in character. "Aalto himself," says the publisher, "selected the material and designed the layout with affectionate care and the sensibility peculiar to him. The texts, elaborated by the Swiss architect Karl Fleig, who spent many years in his office, are based on his own remarks." In addition, Aalto's own interest is indicated in the many line drawings and personal documents which he contributed. The selection of buildings and projects is accordingly in keeping with the architect's wishes. An objective observer might have gone at the job somewhat differently.

Finally, Aalto is "deeply suspicious of every form of pigeon-holing and verbal interpretation . . . The book and his buildings are to speak for themselves." It is, as a matter of fact, rather difficult to say who was the actual author. Probably credit should be equally divided between Aalto, Fleig, and Girsberger. The only interpretive material is a short introduction by Aalto's favorite critic, Göran Schildt.

We are therefore confronted with a book which sets forth the work of a master architect, and that work is shown very definitely on the master's own terms. Hence the volume is more comparable to Le Corbusier's presentations of his own work than it is to Hitchcock's book on Wright or Philip Johnson's treatise on Mies. At 66, Aalto is one of the acknowledged world leaders of the modern movement, and his total achievement may not unreasonably be compared with the efforts of its other form-givers. He has been awarded the gold medals of the RIBA and the AIA, has received numerous honorary degrees, and has taught at leading universities in Europe and the United States. His office is filled with students from many countries, and he is without question the leading "international citizen" of Finland. The real question, therefore, that this volume poses for the reviewer is: "To what extent does it reflect Aalto's total accomplishment?" The problem becomes particularly acute when it is realized that most of his really important structures are inaccessible to the ordinary American tourist in Europe. For every architect who has visited the cellulose factory at Sunila and the town hall at Säynätsalo, there must be eight or ten who have seen Ronchamp and the Unité at Marseilles.

Continued on page 262

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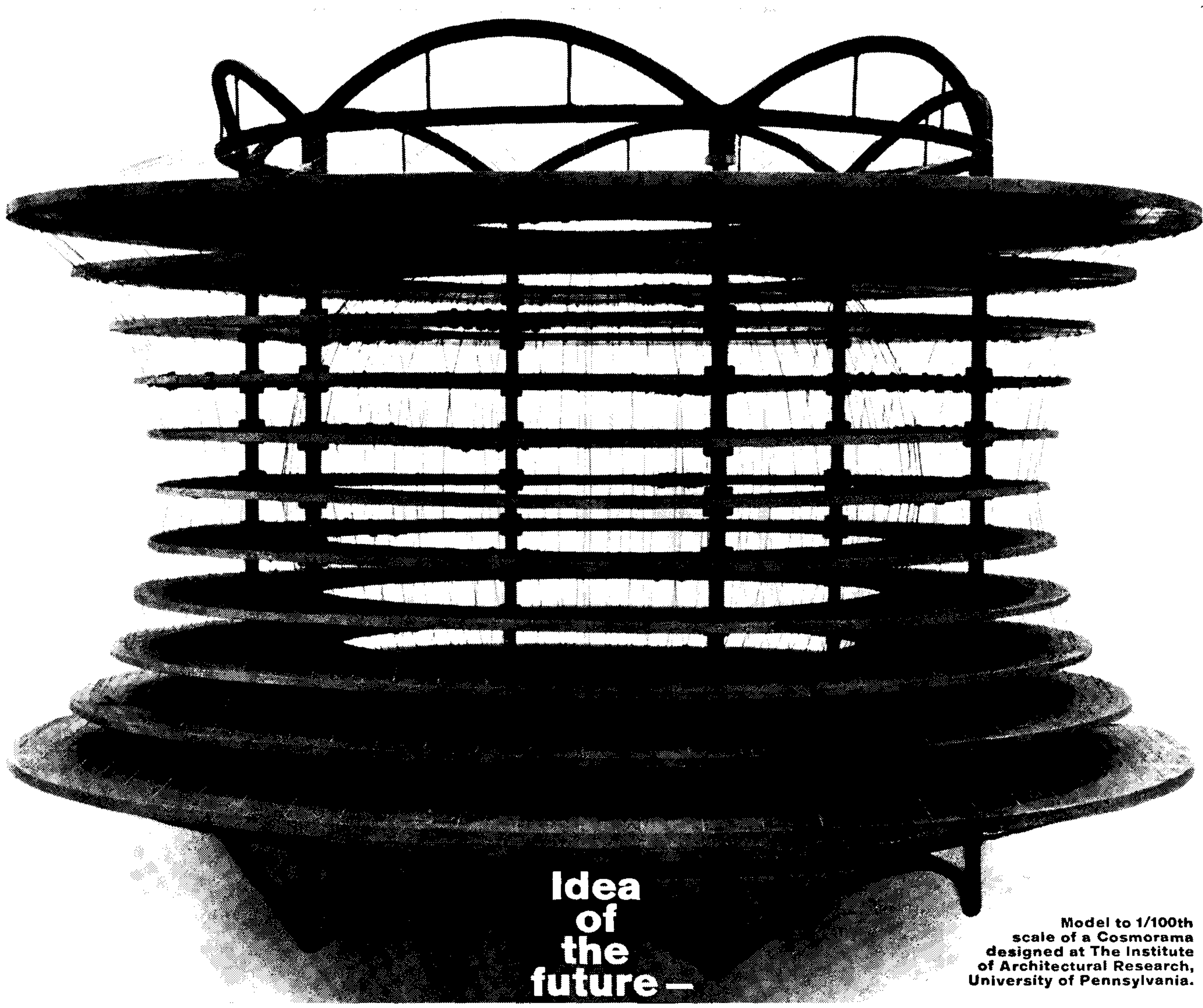

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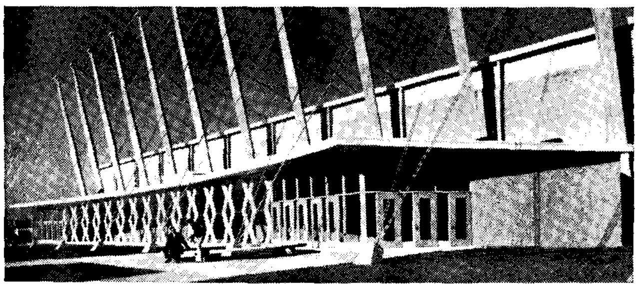

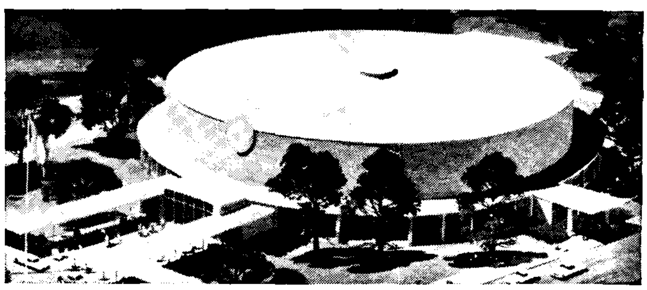

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Architects: Charles Luckman Associates.

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AMERICAN SAINT GOBAIN

Continued from page 254

We may begin with the observation that the scheme of the book is roughly—but not strictly—chronological. Extra space is devoted to those buildings and projects that are of particular significance in Aalto's development. Thus the Paimio sanatorium receives 13 pages and the Viipuri library 15, while the project for an art museum in Reval, Estonia (1934) is covered in only 4. Aalto's development of furniture, lighting fixtures, glassware, and so on, is skillfully woven into the accounts of these buildings. The first light, standardized wood furniture was designed "not just as a protest against the cold properties of tubular steel furniture, but rather with the specific goal of using material better suited to the requirements of the human body." Aalto managed to induce a local lumber firm to set up an experimental workshop, and soon the first investigations into the properties of bent wood structures were begun. These have continued up to the present day, and have resulted in the distinguished series of products marketed by Artek.

The place of furniture and lighting fixtures in Aalto's total output is, on the whole, well treated, but some fascinating questions are left unanswered. An illustration of an early experiment in bent wood is extremely suggestive of the undulating structural forms that later appeared in Aalto's buildings, most notably in the Finnish Pavilion at the New York World's Fair (1939) and the Senior Dormitory at MIT (1947). Were the forms that were first developed at a small scale later transmitted into buildings? Theodore Brown has shown that a direct relationship exists between Gerrit Rietveld's red-blue chair of 1919 and his famous Schröder house of 1924. Perhaps something of the same sort is true here. One is also tempted to speculate on Aalto's amazing success in furniture design, as compared with the relative failure of Frank Lloyd Wright and Le Corbusier. Of all the great modern architects, Aalto is assuredly the most skillful in this difficult area. Undoubtedly he owes something to the adventurous spirit of Finnish manufacturers, but he probably owes an equal amount to his own basic respect for the human body.

Of Aalto's *other prewar* structures, undoubtedly the best known are the cellulose factory and worker's dwellings at Sunila and the Villa Mairea for Maire and Harry Gullichsen at Noormarkku. Both have been published many times, but never before with so many excellent

Continued on page 265

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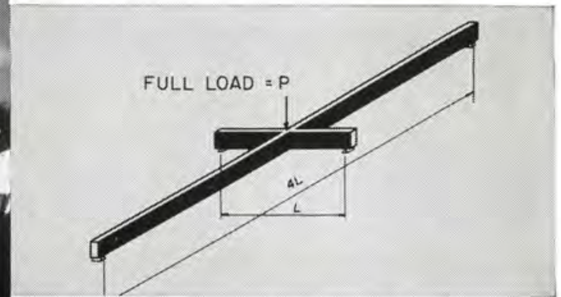

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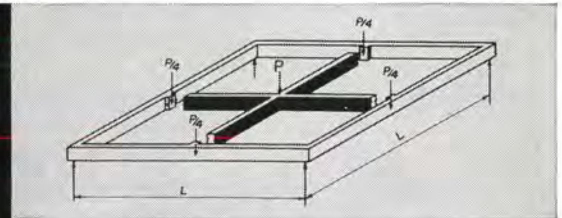

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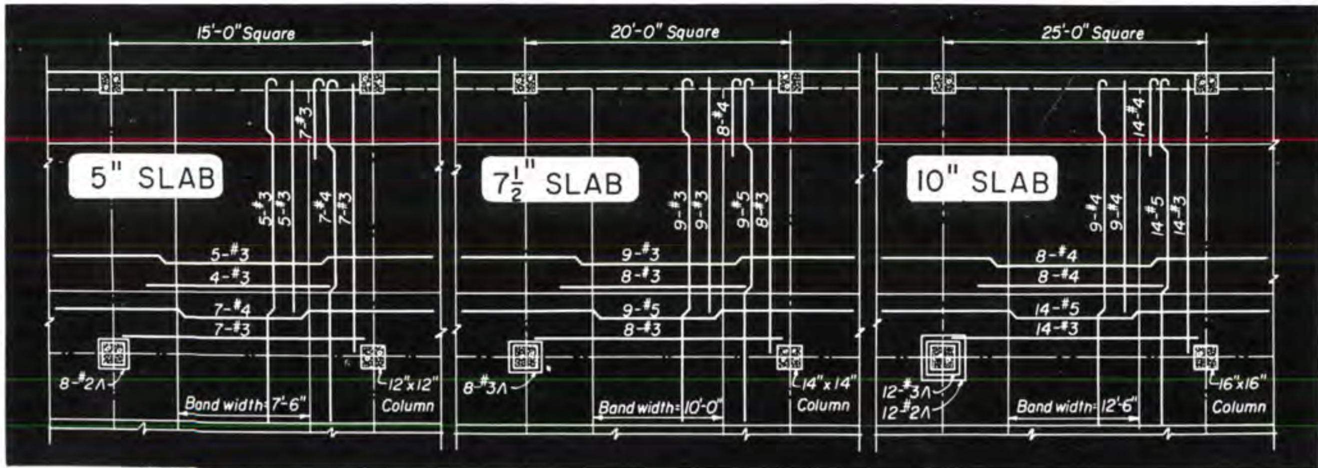

Item	Concrete (cu.ft.)						Reinforcement (lb.)						Formwork (sq.ft.)					
	15x15		20x20		25x25		15x15		20x20		25x25		15x15		20x20		25x25	
	Total units	Units per sq.ft.	Total units	Units per sq.ft.	Total units	Units per sq.ft.	Total units	Units per sq.ft.	Total units	Units per sq.ft.	Total units	Units per sq.ft.	Total units	Units per sq.ft.	Total units	Units per sq.ft.	Total units	Units per sq.ft.
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Continued from page 262

photographs, plans, and structural details. When one compares the complex of buildings at Sunila with similar works in the United States and Western Europe, one cannot help being impressed. These buildings are now almost 30 years old, but nothing so good in the line of an integrated industrial plant and worker's housing has since been done in the United States, and very little approaches it in Europe. The housing is very much in the "International Style" of the 20's and 30's, but has weathered better than most of the work of that period. The photographs make clear its close integration with the landscape. Indeed, one can say that the most important photograph of any Aalto building is usually a landscape photograph. Unquestionably, he has a greater feeling for site than any other modern architect except Wright.

The Gullichsen Villa must, as Frederick Gutheim has written, be ranked as one of the really important houses of the 20th Century, along with Le Corbusier's Villa Savoye and Wright's Fallingwater, and it has never been better displayed than in this superb series of photographs. The plan, a miracle of free-flowing space, provides dozens of intimate connections with the forest setting, as well as a fine background for the owner's art collection. Aalto's mastery of detailing in wood, brick, and metal, is shown to wonderful advantage here. This building will well repay hours of study.

The Carré house of 1956-59 at Bazoches-sur-Guyonne just outside Paris is a later solution of a similar problem and provides an interesting contrast. Built for the prominent art dealer Louis Carré, it was intended to serve both for family living and as a gallery for paintings and sculpture. "The point of departure for the architectural conception," says the writer of the text, "was the site itself: an oak grove on a hill dominating the surrounding landscape." He adds that the architect was not only responsible for the construction of the building, but also, at the express wish of the client, designed all the furnishings, lamps, fabrics, hardware, and other equipment that went into the house. Notwithstanding such a tremendous opportunity, it is, for this reviewer, not as fine an achievement as the Gullichsen Villa. Perhaps the problem lies in the collection of paintings which adorn the walls; the Légers and Picassos are so strong that they clash with Aalto's architectural details. It may be that his interiors are best when furnished with Finnish rugs and wall hangings. Another discordant note is struck by the rolling, fertile, French countryside, so different from the austere Finnish landscape. One is left with the conclusion that Aalto, like many other great artists, is happiest on his native heath.

The entire problem of Aalto's work in the last two decades is a knotty one. In this reviewer's opinion, its most important aspect is the series of great town and regional planning schemes resulting from the destruction caused by World War II. Recognized in 1945 as his country's greatest architect, he was able to exert an unparalleled influence on rebuilding the nation. Thus he was asked to supply plans for the "new cities" of Rovaniemi and Oulu, for the technical university at Otaniemi and the teacher's college at Jyväskylä, and for the entire region of Imatra near the Soviet frontier. Many of his most significant structures, such as the town hall at Säynatsälo and the Vuoksenniska church, must therefore be seen as incidents in townscapes and landscapes of his own design. The Helsinki buildings, on the other hand, often occupy rather cramped and constricted sites in nondescript sections of the city, i.e., the Pensions Institute and the "House of

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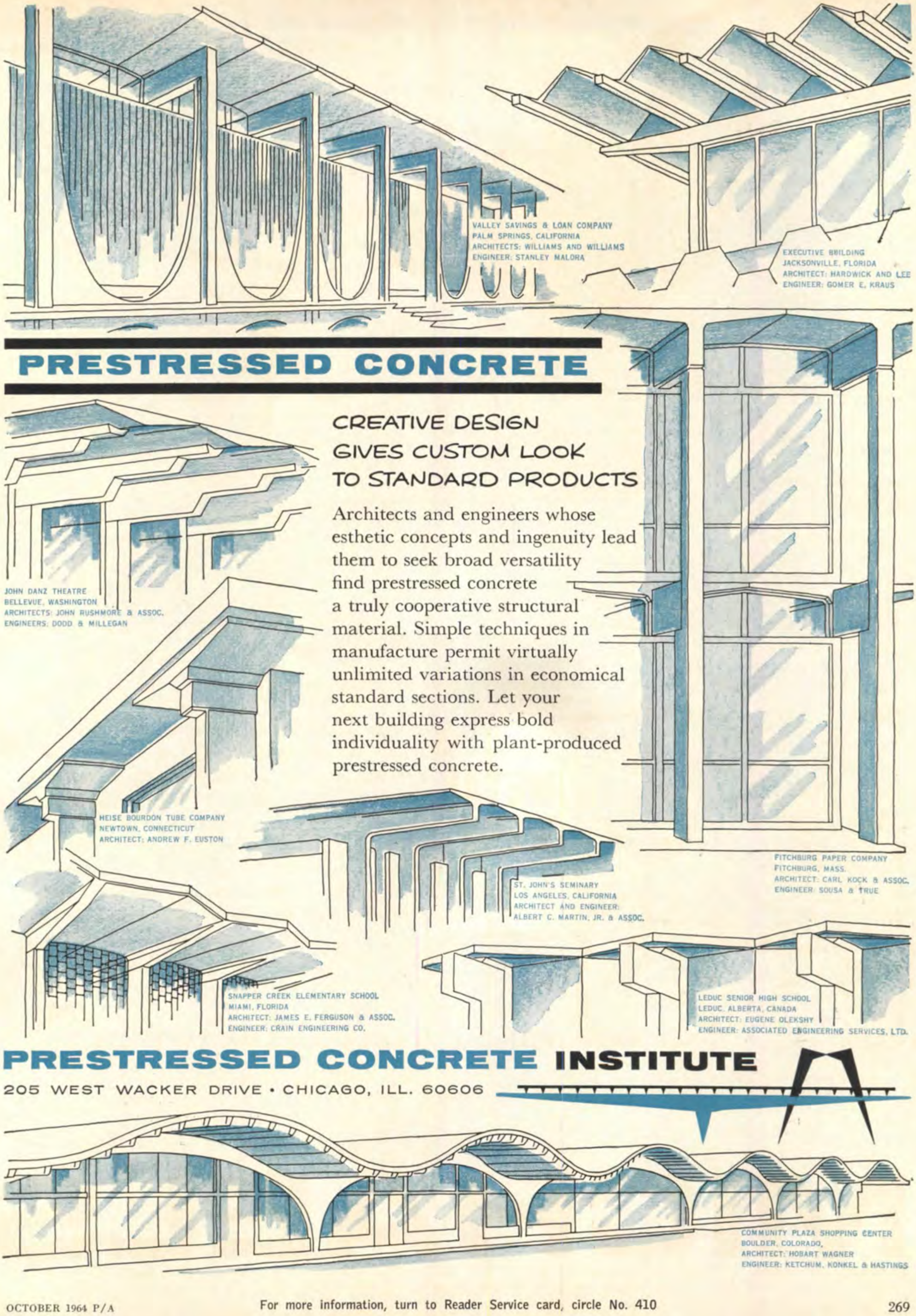

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Continued from page 265

Culture" for the Finnish Communist Party. At least one—the headquarters for Enso Gutzeit (the Finnish Timber Trust)—is a deliberate attempt at architectural harmony with the older, neoclassic portions of the city by Carl Ludwig Engel, a very able contemporary of the German master Karl Friedrich Schinkel.

The Enso Gutzeit building is illustrative of some of the problems that confront the student of Aalto's later work. Granted that it was necessary to use a white facing material in order to preserve the powerful image of Helsinki as "The White City of the North," was it appropriate to employ Carrara marble here? Unhappily, there are no interiors of this building shown in the book. Since they were done with great lavishness, they form an interesting contrast to the more modest interiors of the Säynätsalo Town Hall. This reviewer's personal opinion is that the less expensive are of greater interest. Aalto appears to be one of those architects who respond vigorously to the challenge of a limited budget and are a bit unhappy when they have large amounts of money to spend. Of course, this generalization is not altogether true; nothing could be finer than the Gullichsen Villa. Still, in the late work one frequently senses a tendency to use form and material in a rather arbitrary manner.

In summary, this volume is the most important single item of the substantial literature on Aalto. At the same time, we must recognize that it will by no means supplant such earlier treatments as the excellent essay by Giedion in the most recent edition of *Space, Time and Architecture*, the perceptive book of Edward and Claudia Neuenschwander on *The Finnish Buildings of Alvar Aalto* (Zurich, 1954), and the work of Frederick Gutheim in the Braziller series of monographs on great modern architects. However, if you have space for only one book on Aalto, this is the one to buy.

Sullivan as Jeremiah

BY GRANT CARPENTER MANSON

THE TESTAMENT OF STONE: THEMES OF IDEALISM AND INDIGNATION FROM THE WRITINGS OF LOUIS SULLIVAN *by Maurice English. Published by Northwestern University Press, 1840 Sheridan Rd., Evanston, Ill., (1963, 227 pp., $6.50). Reviewer is Professor of Architecture and Fine Arts, also Associate Dean for Fine Arts, at the University of Southern California. He is the author of* Frank

Continued on page 276

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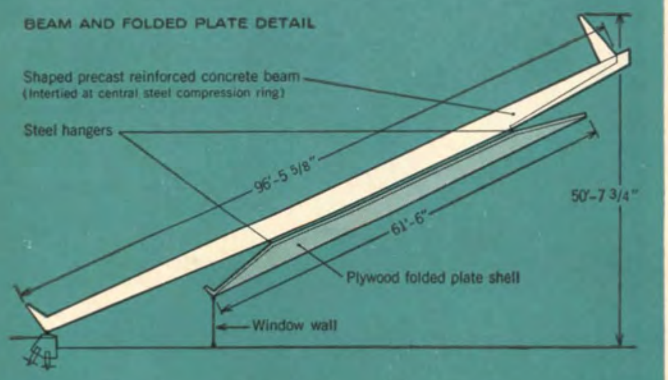

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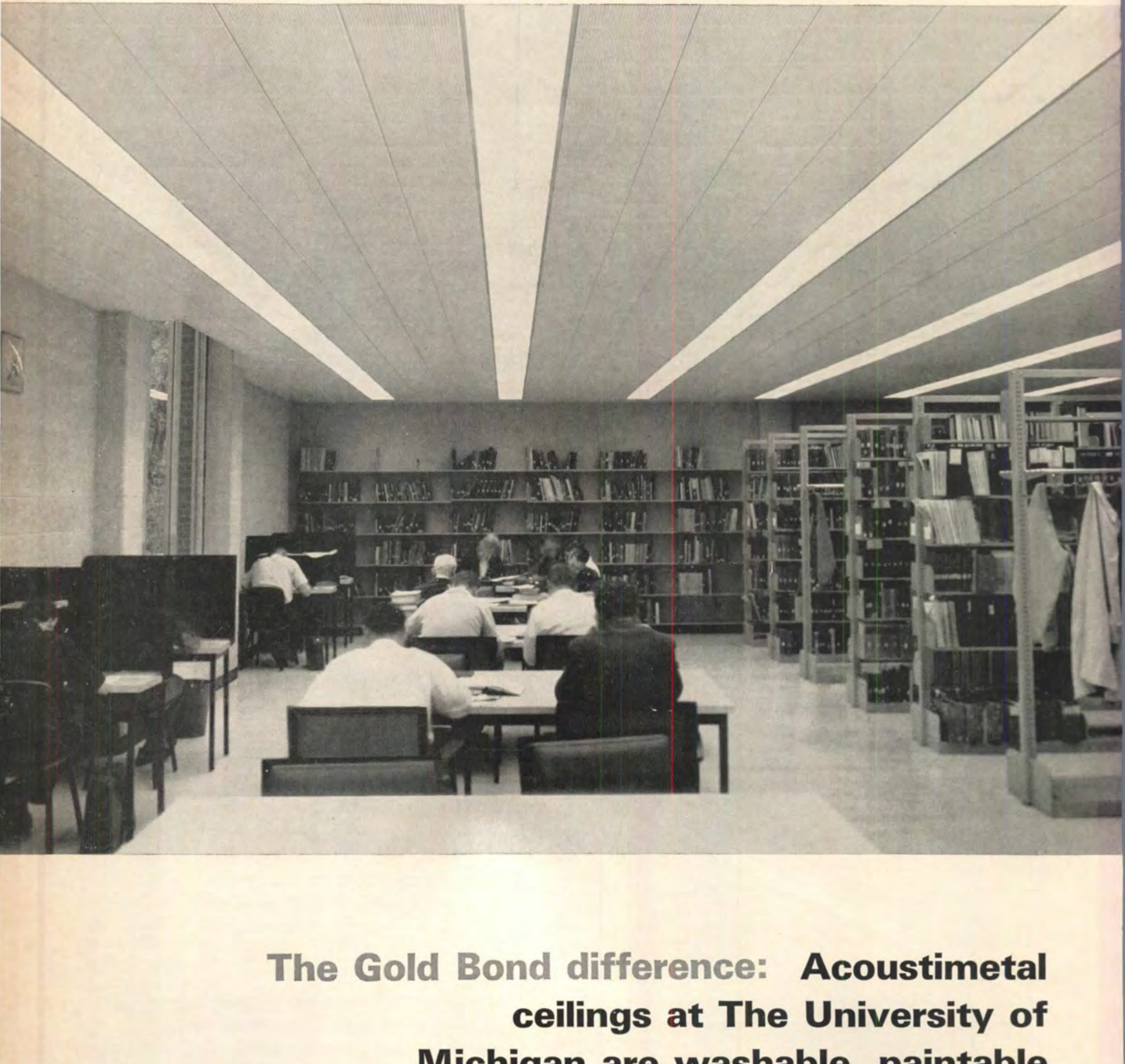

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Continued from page 270
Lloyd Wright to 1910: The First Golden Age, *published by Reinhold and selected for the new White House library of Americana.*

This book is a Sullivan reader with a misleading title. The editor of the compilation disclaims in his Introduction all intention of discussing Sullivan's architecture; why, then, is this a "Testament of Stone"? So far are we from any concern with Sullivan's buildings in Maurice English's reader that we might wonder what stone has to do with it, or even whether, in Sullivan's case, stone is the key word that brings him to mind.

There has been a spate of books on Sullivan in the past five years and much reference by the cultists to his writings. It should be stated at once that this newest book does not seem to be the work of a cultist. The Introduction contains a cool evaluation of the writings, which is refreshing. We are reminded that "torrents of bad prose flowed from Sullivan's pen, interrupted occasionally by even worse poetry," and that our sometimes embarrassed reaction may be due in part to Sullivan's "coupling of Nietzsche and Whitman, androgynous spirits" the union of whom ". . . resulted in strange births." Then the Editor goes on to say that it is "necessary to rescue Sullivan from himself in order to appreciate him as a writer and thinker." Here is where we come up inevitably against the built-in weakness of any anthology: since the selection is quite personal and arbitrary, we, as readers, are asked to commit an act of pure faith.

If the readers of this book are thoroughly acquainted, anyway, with Sullivan as a writer, then all is well. It is a legitimate sort of colloquium in which everybody has something to contribute to the subject in hand. But I suspect that this is not the case, nor did the publisher have any delusions that it might be. It is frankly stated that Sullivan's writings are "neglected works," so that Maurice English's present compendium will largely reach a public that has not really read Sullivan, or even attempted to. There can be only two purposes to such an anthology. The first is to give to one who has no intention of going further a taste of Sullivan, relying totally upon the Editor to recognize and dish up the best passages. The second is to promote a new interest in reading Sullivan himself. If this latter is the purpose, then the reader quite reasonably expects a bibliography. The really curious thing about this book is that, let alone a bibliography, there is not even a checklist of Sullivan's writings. The inference is clear: Mr. English addresses himself either to the rare *cognoscente* or to the person who will trust him for his one experience with Sullivan the writer.

As for the *cognoscente,* we do not need to trouble ourselves; he is a wary bird. As for the novice, how is his taste of Sullivan prepared? The main body of the anthology is divided into three sections, entitled respectively, "Architecture and Democracy," "Pivotal Themes," and "Democracy and the Spirit of Man." Under these, there are subdivisions —all, except the final part, consisting of a heading and little essay by the Editor, followed by one long unbroken quotation from Sullivan. Presumably, the headings and the little essays will set the novice's mind in the right tone for appreciating the quotations. The experience is a little like going through Scripture with Mrs. Eddy as guide. Finally, in the third part, comment by the Editor is dispensed with, as if to imply that, by then, the novice has gained the correct insight and is on his own.

Continued on page 282


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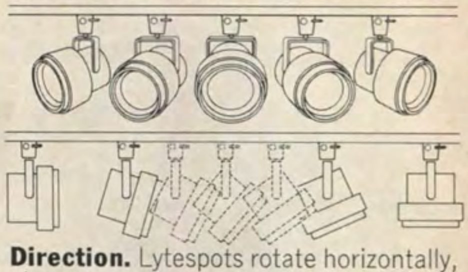

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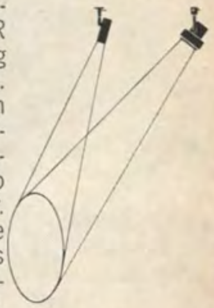

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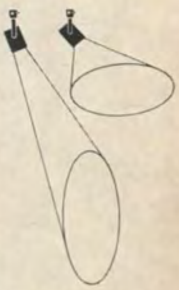

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Continued from page 276

There is, therefore, a discrepancy in the creation of Maurice English's book. The Introduction leads one to believe that Sullivan's writings will be discussed in the subsequent pages—and discussed in the cool light of unbiased criticism. But the balance of the book is just a series of selections from Sullivan with the usual Editorial manipulations. If the book has any unity, it is supplied by the fact that English feels that Sullivan's value as a writer is like the burr under the saddle—it keeps us stirred up. He thus seeks those passages from *Der Liebe Meister* which have indignation as their theme. The comment on the book's dust-jacket stresses this point: we are informed that "*The Testament of Stone* was selected to illustrate, not Sullivan the architect or the precursor of modern architecture, but Sullivan as Jeremiah." The question is: Are we presented with Sullivan seeing himself as Jeremiah, or with Maurice English seeing Sullivan as Jeremiah? Since the book falls into two relatively independent portions — that written by Maurice English and that written by Louis Sullivan—the question remains unanswered.

Honorarium to a Late Professor

BY WILLIAM ZUK

ARCHES, CONTINUOUS FRAMES, COLUMNS, AND CONDUITS: SELECTED PAPERS OF HARDY CROSS. *Introduction by Nathan M. Newmark, University of Illinois Press, Urbana, Ill. (1963, 164 pp., illus. $5). Reviewer is Professor of Civil Engineering at the University of Virginia, and author of* Concepts of Structure.

The stated intention of this book is to bring together Hardy Cross's most important papers so as to make available to structural engineers his contributions at first hand. Actually, the book appears to be more of an honorarium paid by the University of Illinois to their late professor of structural engineering, who died only four years ago. Although Cross later went from Illinois to Yale, his most productive period was the 16 years at Illinois, where he developed his well-known method of moment-distribution for the analysis of rigid structural frames. (It may be parenthetically noted that in their grand manner, the Russians credit the origin of moment-distribution to one of their own engineers, who, they claim, published the method exactly one year before Cross did). Other important papers in this memorial volume include his column analogy method, his network analysis of conduits and conductors, as well as several papers on structural design.

Although there is a brief introduction by Professor Newmark of Illinois on the general significance of Cross' works, the book consists basically of reprints of the original papers, which are left to stand on their own merits, without supplementary commentary or discussion. The essentials of the material contained have long since been incorporated into standard texts on the subject; if not, it can be found in most technical libraries, as the original papers are only about 30 years old. Consequently, this volume, without any new material or insights, will probably have limited direct use for the practicing engineer or architect; academicians, friends, and old students, however, might well like to have a copy on their shelves.

The preceding comments, though, are not meant to detract from Cross's very substantial contribution in his time and place to the promotion of continuous structures and rigid frames that we have come to rely on so much these days.

His concept of moment-distribution helped open the Pandora's box from which emerged the iteration method (or relaxation method as it is sometimes called), which now proves indispensable in the analysis of a vast variety of very complex problems. Modern high-speed computers also make extensive use of the iteration process, although not in Cross' original form, which was intended for hand calculation.

The publishing of such a compilation of his technical works reminds us all of Hardy Cross' notable achievements both as an engineer and as an educator. Readers who would like to know Cross better as a person will be interested in another compilation, by Robert C. Goodpasture, entitled *Engineers and Ivory Towers* (McGraw-Hill, 1952), in which excerpts from many of Cross' talks and nontechnical articles are presented.

A Limping Effort

BY HENRY HOPE REED, JR.

NEWPORT: PLEASURES AND PALACES *by Nancy Sirkis. Published by Viking Press, Inc., 625 Madison Ave., New York 22, N.Y. (1963, 161 pp., illus. $10). Reviewer is an architectural critic who has been particularly critical of modern architecture.*

As a people, we Americans have a curious way of contemplating the best of our visible world. Nature comes first, although we delight in destroying it;

Continued on page 288

Here is the biography of Candela, master-builder and construction poet, famous throughout the world of architecture and engineering as developer of the hyperbolic form. The book tells in chronological sequence the story of Candela, the man—his background and work. Contained within this fascinating story is paradoxically *the most comprehensive information on shell structures ever presented.* The technical text which covers construction procedures parallels the general text which expounds aesthetically Candela's mastery of the abstract in structure.

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From simple explanation and description to technical analysis and detail, there is a complete integration of photographs and drawings with the text. The reader can either admire the beauty of these structures through the photographs, or study carefully the material related to his own course of study.

Candela's architectural philosophy implied in his constructions should appeal to layman and student alike, and all readers will enjoy the personal level on which anecdotes are told. The drama implicit in his sculptural forms will prove equally valuable to architects, engineers, draftsmen, sculptors, artists, and building contractors.

By Colin Faber

Assistant Professor of Design,
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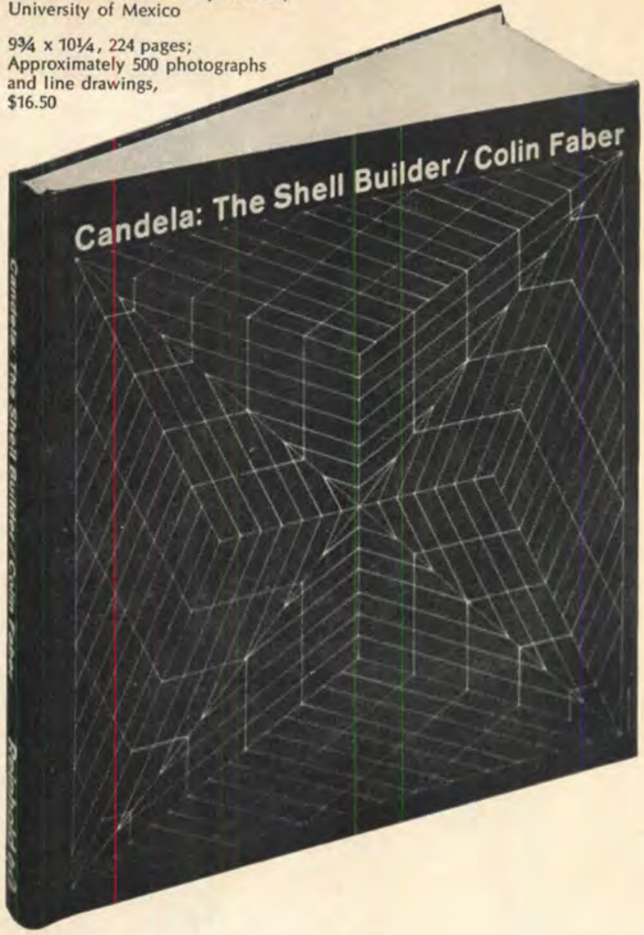

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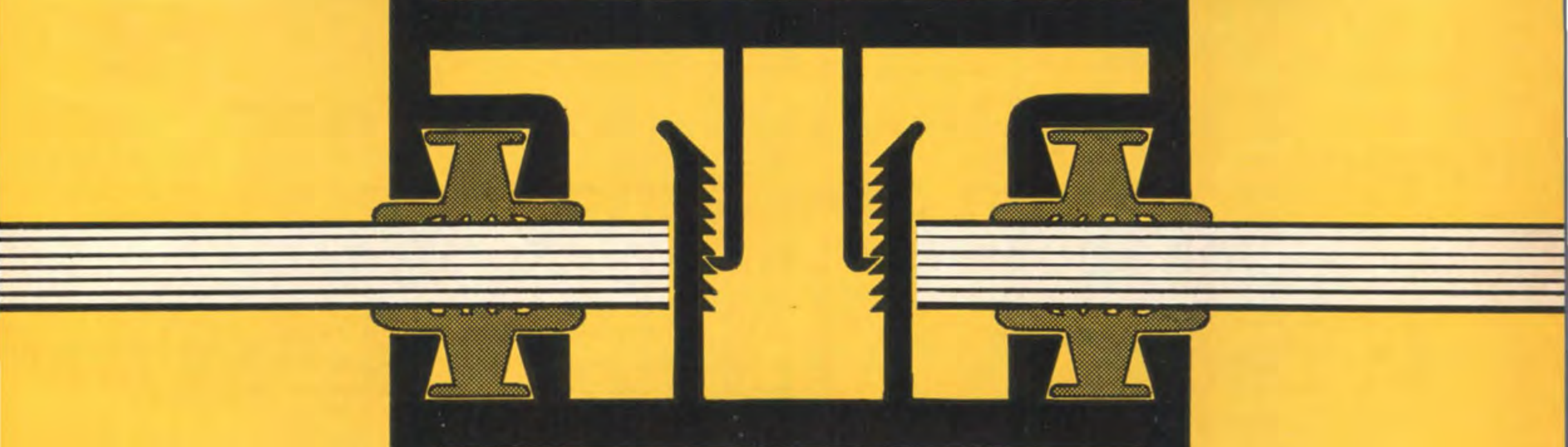

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Continued from page 282

then there is the picturesque; engineering feats are a possible third; while far down the list comes man-made splendor. One good reason for the neglect of the splendid is, of course, the climate of a modernism, which has declared the works of the American Renaissance to be evil. Happily, this climate is growing old-fashioned, as is evidenced by the recent struggle to save Pennsylvania Station. Even the word "classical" has been revived by experts of architectural merchandising, to describe what a decade ago would have been termed "International Style."

Part of the change is the acceptance of Newport. Although the general public never bothered to limit the uses of the past by artist and art historian, many were discouraged from exploring the visible wealth of America's heritage as represented by Newport. They had, after all, been told again and again "Thou Shalt Not Like the Opulent," or, "Man-made Splendor Is Un-American." To declare Newport to be of greater value in terms of America's heritage than, let us say, Williamsburg, would have been unthinkable a few years back. Today the response is, "You may have something there." But, even if Newport's importance is acknowledged, it escapes general notice because it is not offered to the world with the expertise of public relations such as accompanies Rockefeller-endowed activity. Nor has it the museum-hothouse attraction of an Old Sturbridge Village. Newport is truly a City of Art and History, where people live, work, rest, and play, and, for that reason, it does not seem to have a slot in the American categories. Yet here is an American "ville d'art et d'histoire," a "città d'arte," a veritable "Kunststadt," unrivaled in the scope of its monuments of architecture, its garden art and interior decoration, its abundance of Colonial heritage.

It would seem that, introduced by Louis Auchincloss, this picture book could have helped overcome the still-present hesitation before the "Queen of the Resorts." Unfortunately, even his generous hand has not averted a lost opportunity. The author, Nancy Sirkis, has a certain competence with the camera, but that cannot make up for a lack of understanding of the subject and a certain absence of taste. It is not so much the mistakes: "Miss Edith Wharton" when surely "Mrs. Edith Wharton" is meant, or "Mrs. Otto Belmont" for "Mrs. Oliver Hazard Perry Belmont"

Continued on page 292

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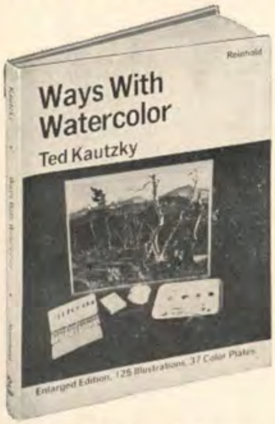

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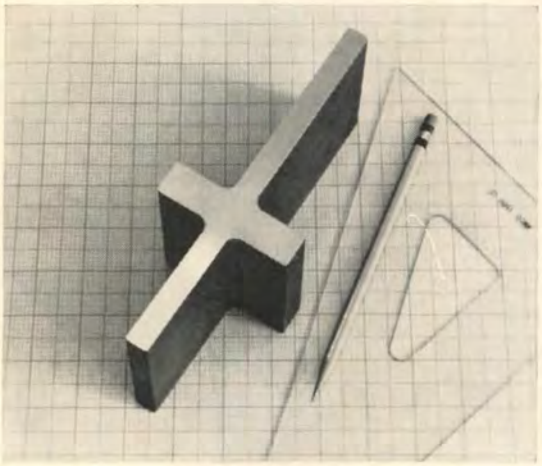

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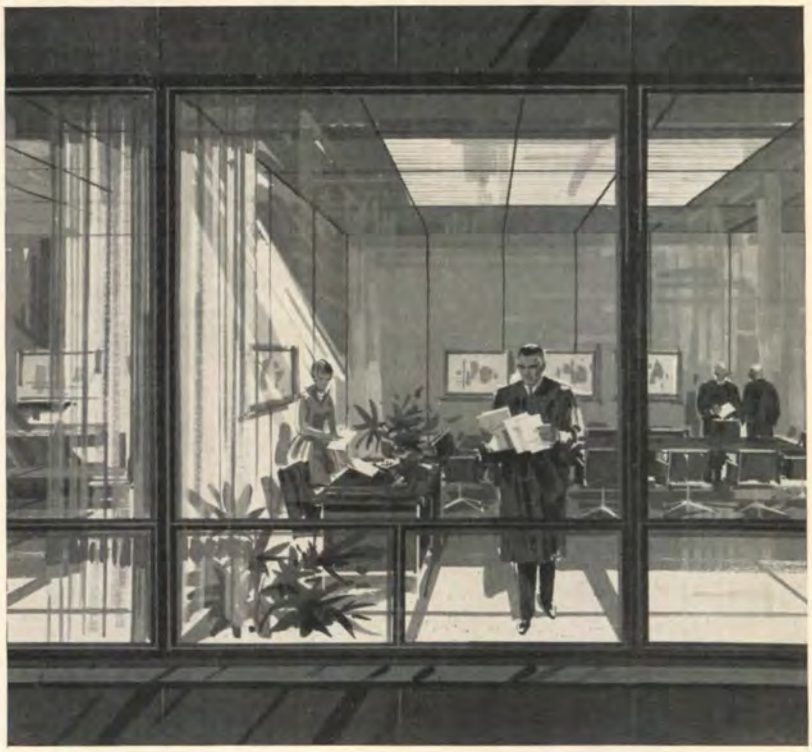

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Continued from page 288

(usually written simply "Mrs. O.H.P. Belmont"); rather, it is the attitude of someone who has not outgrown a youthful inclination to Thorstein Veblen. There are some people who, at the theater, cannot help giggling nervously at heroic episodes; the author reacts similarly in the face of American splendor. She protests her love for Newport and then closes the book with a dozen or so shots of a degrading auction in one of the big villas.

This limping effort only underscores the need for a proper picture book on Newport along the lines of a Hürlimann—a book not afflicted with moralizing. For anyone with a passion for America's heritage, anyone not afraid of opulence, Newport presents endless opportunities.

The Lengthy Process of Reform

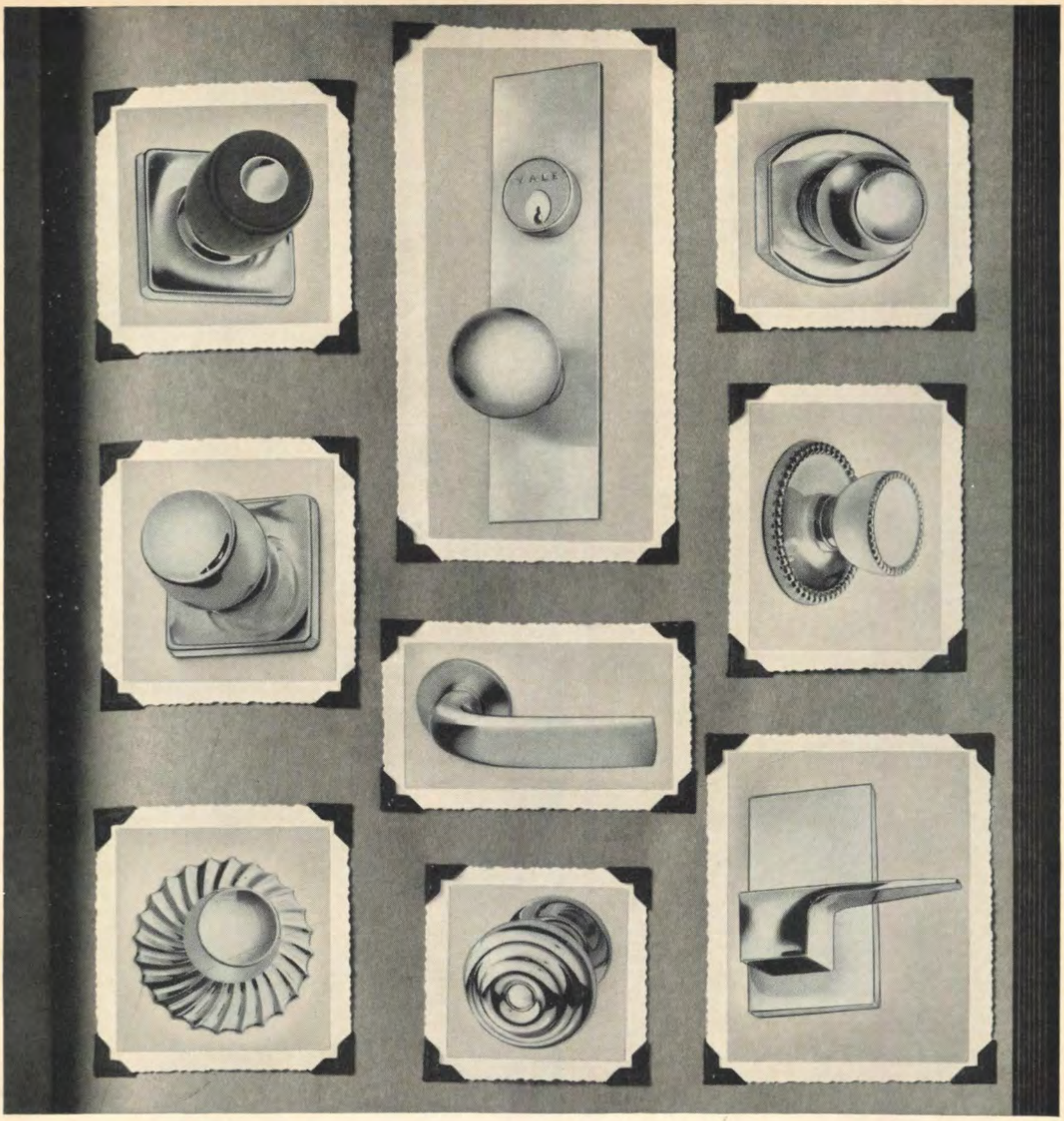
BY CARL FEISS

THE PROGRESSIVES AND THE SLUMS: TENEMENT HOUSE REFORM IN NEW YORK CITY 1890–1917 *by Roy Lubove. Forewords by Samuel P. Hays and Philip S. Broughton. Published by University of Pittsburgh Press, Pittsburgh 13, Pa. (1963, 284 pp., $6). Educated as an architect and planner, and with broad experience in government and education, reviewer is a planning and urban renewal consultant in Washington, D.C.*

This is an important book. It should be read by all Americans interested in courage and self-sacrifice in the face of historic and political indifference. It is an important book in the history of American cities, the history of the development of social, political, and architectural interest in the slum problems of American cities, and the role the American architect and planner played in the early days of an absolutely essential urban reform.

As the mass of literature on American city development accumulates, various universities and intellectual presses are turning out reports and books on the problems of cities and city life. We are gradually accumulating a small hard core of essential documents, the suns around which various galaxies of highly specialized materials revolve. The first of these hard core books, published in 1899 by the Columbia University Press and republished as one of the Cornell University reprints in Urban Studies in 1963, is a book by Adna F. Weber, *The Growth of Cities in the 19th Century.* This extraordinary book is the precursor to today's scientific analysis of urban

Continued on page 300



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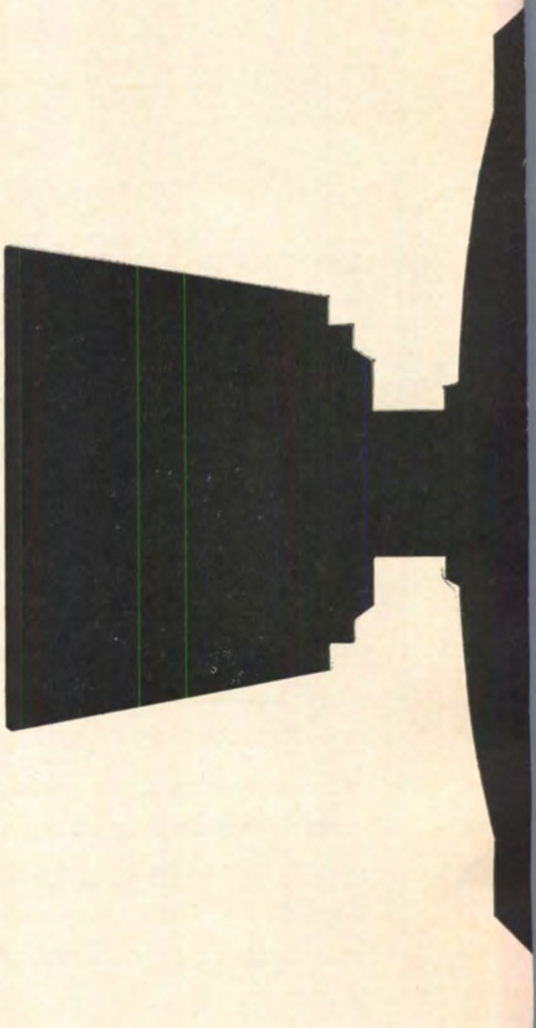

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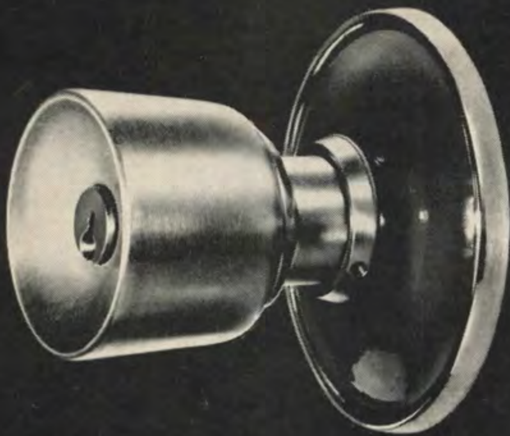
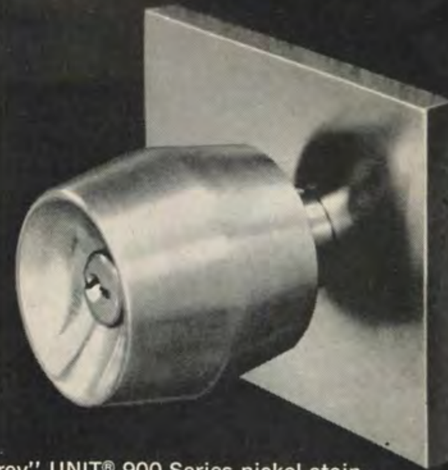
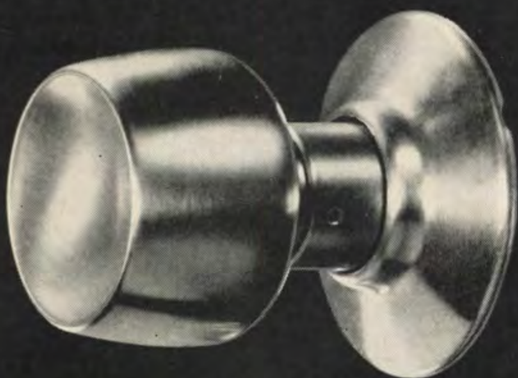


"SentryLock" D2N nickel stainless steel lockset (Sargent & Co., New Haven, Conn.)



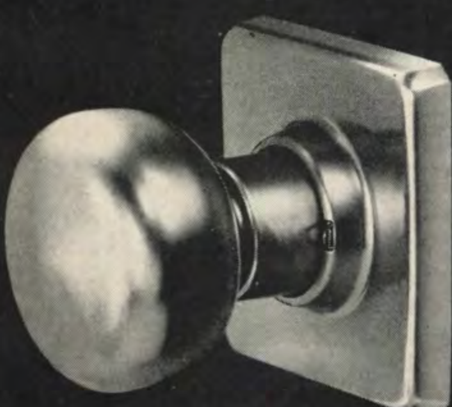
"Monterey" UNIT® 900 Series nickel stainless steel unit lockset with square rose (P.F. Corbin Div., American Hardware Corp., New Britain, Conn.)



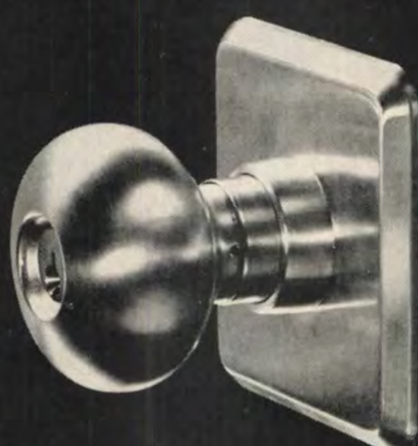
"Brandywine" heavy-duty cylindrical nickel stainless steel lockset (Yale Lock and Hardware Div., Yale & Towne, Inc., White Plains, N. Y.)

Extruded nickel stainless steel door pull —"3301" (Sargent & Co., New Haven, Conn.)

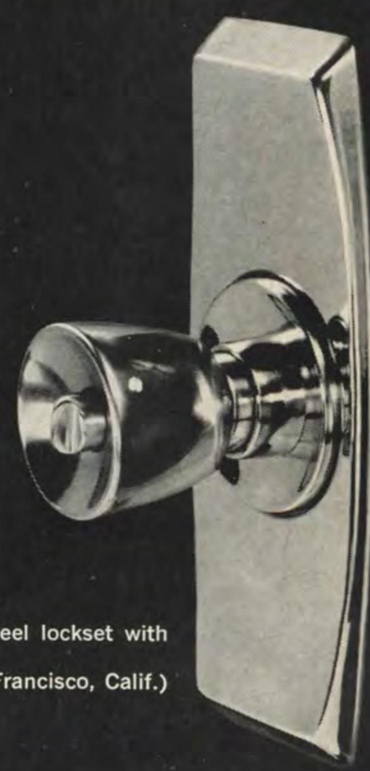
Lever-Handle nickel stainless steel lockset —"M2110B" (General Lock, Inc., Pontiac, Mich.)



"Litchwood" heavy-duty cylindrical nickel stainless steel lockset (Yale Lock and Hardware Div., Yale & Towne, Inc., White Plains, N. Y.)



"Hanover" standard line "A" series nickel stainless steel lockset (Schlage Lock Co., San Francisco, Calif.)



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Continued from page 292

growth and today holds its place as a leader, with little competition, in the science of urban analysis. In some ways parallel to, and certainly as important as Adna Weber's book is Max Weber's book *The Nature of the City*, 1921. (The two Webers are not related.) This latter book is a classic in the study of sociological and philosophical understanding of Western cities; Don Martindale's excellent introduction to the Collier paperback edition of the book should be read in conjunction with Roy Lubove's book being reviewed here. The scholar who wishes to investigate in depth the creation and expansion of the American slum problem would of course go directly to *The Tenement House Problem* by Deforest and Veiller, published in 1900, and James Ford's equally monumental *Slums and Housing*, published in 1936. There are also the numerous works of Edith Elmer Wood, Coleman Woodbury, and the 1938 President's Conference on Home Building and Home Ownership, as well as the limitless records of the National Association of Housing and Redevelopment Officials and many others, and recent works done at various universities in their urban studies centers.

To understand and appreciate the Lubove book the reader does not have to be a social scientist or an historian. But it would be wise for him to study it in conjunction with Mumford's *The City in History*, and, in particular, the earlier *Culture of Cities*. For anyone who wants to investigate the beginning of American cities, to get the background to Adna Weber's material, two books by Carl Bridenbaugh are highly recommended, *Cities in the Wilderness* (1938), and *Cities in Revolt* (1950). Then, following *The Progressives and the Slums*, it would be natural to pick up the extremely interesting study of New Deal community programs by Paul Conkin, *Tomorrow and the New World*, published for the American Historical Association by the Cornell University Press in 1959. What has been developing without plan is a sequence of hard core books on the history of the growth and social problems beginning with the first settlements and proceeding into the New Deal. Here we run into a proliferation of books and documents, but nothing definitive about the many programs that got underway during the New Deal, including the public housing program. We have nothing definitive on housing and urban improvement legislation, on urban renewal and many other important Federally-

Continued on page 306

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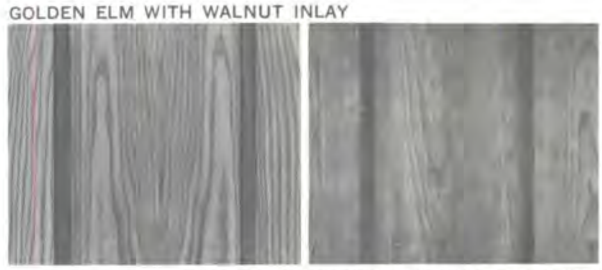

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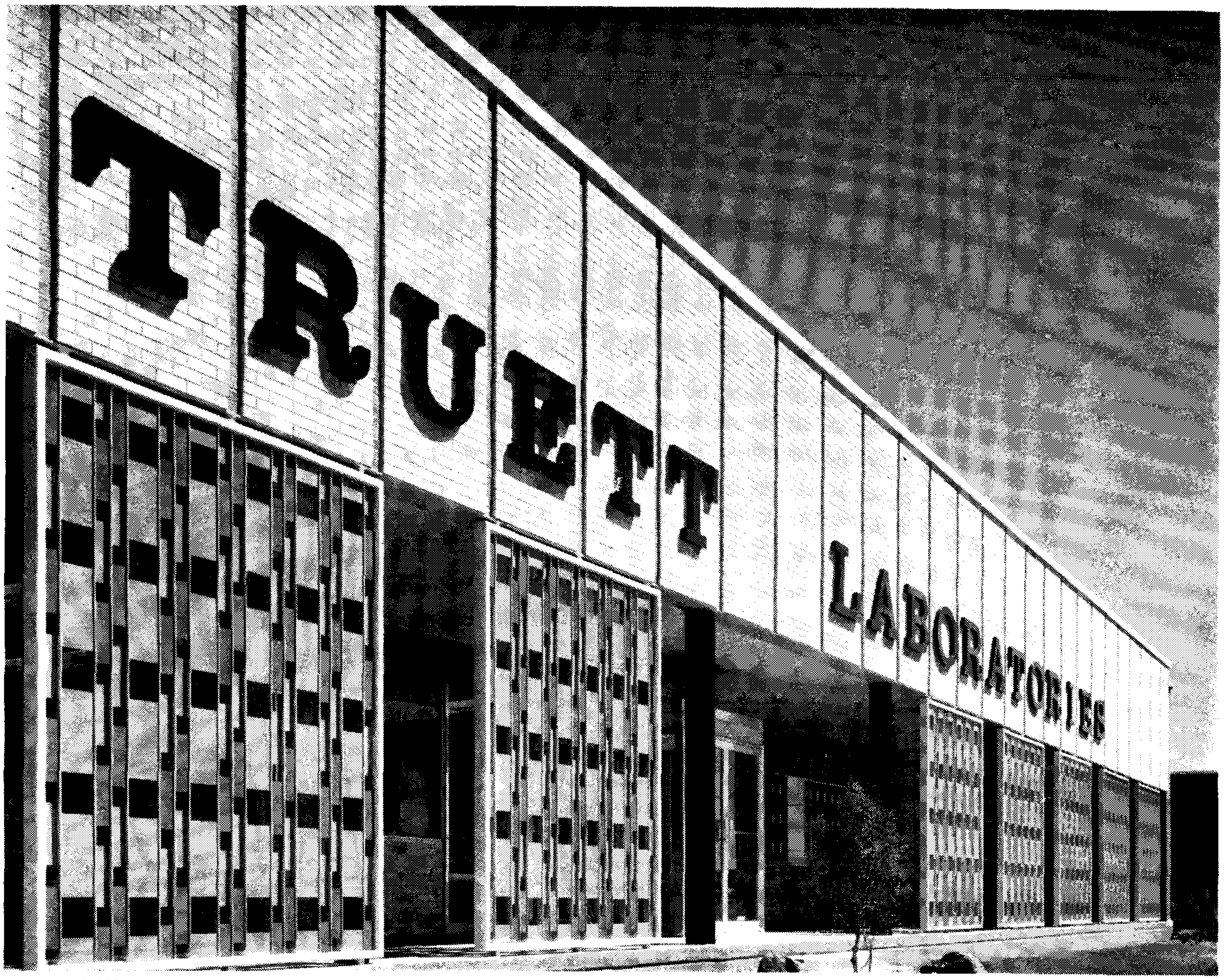

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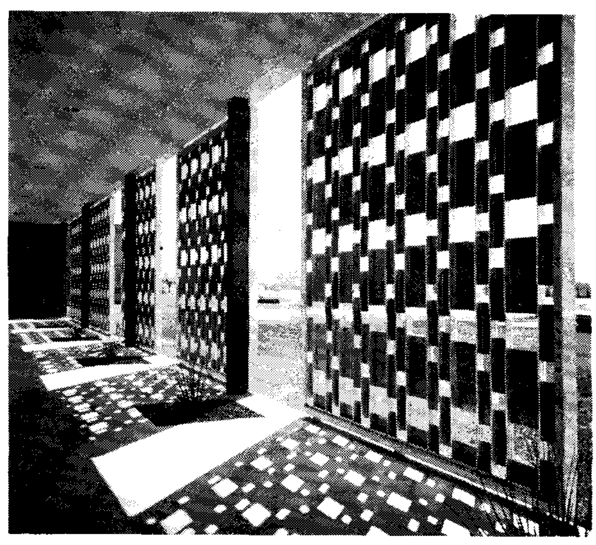

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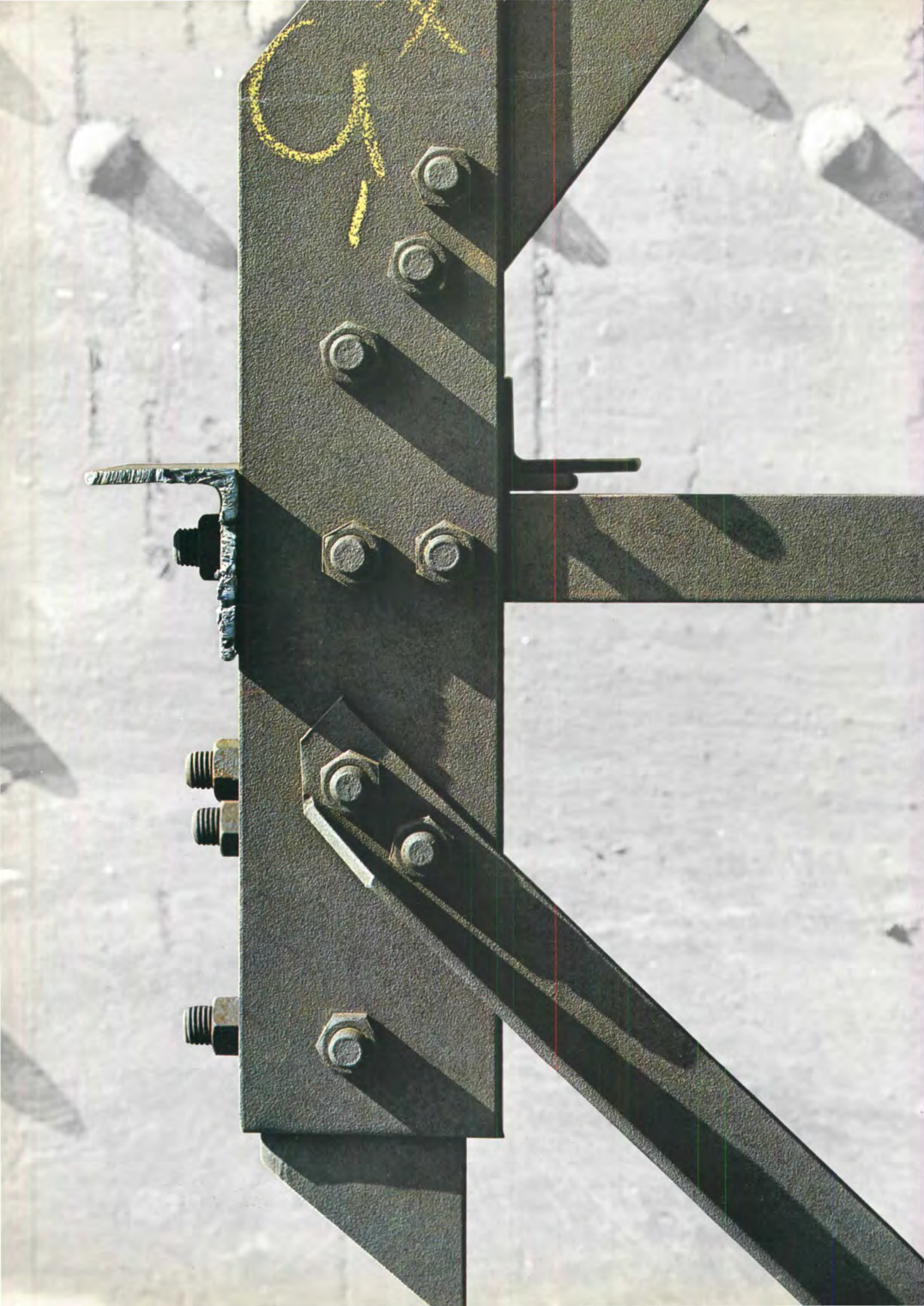

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Steel for architectural achievement

United States Steel USS

Continued from page 300

assisted urban activities growing out of the extraordinary period of reform so ably described in *The Progressives and the Slums.*

Lubove begins with the origins of tenement house reform in 1830 and ends with the passage of New York City zoning in 1916, the first in the country. The book is worth reading, if for no other reason than for the extraordinary verbal portraits of Jacob Riis and Lawrence Veiller. At the same time, it weaves in the counterpoint of the work of the many other "sisters and brothers of the poor," including such wonderful people as Lillian Wald and Mary Simkhovitch. It is a fine analysis of the timing and the extraordinary work of a great number of highly dedicated people. Today, the so-called "do-gooders" are derided. However, one shudders to think where we would be without these "do-gooders" of the first half of this century. The Lubove book specifically relates to New York City, but it is not parochial in approach.

The architect's role in housing reform is spelled out by Lubove in some detail. The American architect can take little pride in the results of the 1878 architectural competition sponsored by "The Plumber and Sanitary Engineer," on whose jury sat James Renwick, among others. The winner, James E. Ware, Architect, invented the dumb-bell apartment, the proliferation of which under the Tenement House Law of 1879 resulted in the creation of slum problems from which we have not yet recovered.

Perhaps the great value of Roy Lubove's book lies beyond the history of people and events. It demonstrates with clarity how tedious and how lengthy the process and progress of reform has been. It gives us pause as to the speed with which we are moving today, when we are forced to recognize that slum reform was begun in 1830, and that 134 years later the greatest democracy in the world, possessing a technology that has no peers in the proficiency of building, has still not solved the problem.

I recommend *The Progressives and the Slums* to be read either in the context of the other books mentioned above or by itself. In either case, it is an impressive addition to our knowledge and a fine book.

Cities and Civilization

BY PERCIVAL GOODMAN

BABYLON IS EVERYWHERE: THE CITY AS MAN'S FATE *by Wolf Schneider. Translated from the German by Ingeborg Sam-*

Continued on page 310

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Continued from page 306

met and John Oldenburg. Published by McGraw-Hill Book Co., Inc., 330 W. 42 St., New York 36, N.Y., 1963. 400 pp., illus. $7.95. Reviewer is an Associate Professor at Columbia University's School of Architecture, and is co-author (with his brother) of Communitas.

Here is a first-rate book written by a lover of cities. The author is obviously not an architect or a city planner, for he has no axe to grind, has a fine historical sense that is not distorted to prove a thesis, writes in a lucid and unembellished style, uses source material that shows wide reading, and employs scholarship not to impress but to inform. In short, here is a book that isn't angry, doesn't look with dismay, doesn't recommend panaceas. He doesn't find ancient Rome, Athens, or Ur lovable or the reverse, nor does he find Brasilia or Chandigarh horrid or the reverse. He presents, he discusses—and his conclusions, though never brilliant, are logical deductions from the facts.

The premises are: (1) that civilization and city are synonymous; (2) that the world population will become almost completely urban in the next few generations.

The range of the book is encyclopedic. Schneider deals with 7000 years of history, yet manages, in spite of this wide scope, to provide felicitous and intimate details as delightful as they are unexpected.

To cover *Babylon is Everywhere* in a brief review is impossible, but the following few samplings will show its flavor.

Ancient Roman streets (Juvenal): "Now, no matter how I hurry, I am hampered by the crowds who almost crush my ribs front and back; this one strikes me with his arm another with a heavy board; my head is brushed by a beam, then I have an encounter with an oil barrel. Mud clings to my legs in heavy clods, large feet on mine; and my toes get painfully acquainted with a soldier's nailed boots."

Noise in 1859 Frankfurt (Schopenhauer): "The most inexcusable and disgraceful noise is the cracking of whips —a truly infernal thing when it is done in the narrow resounding streets of a town. I denounce it as making a peaceful life impossible; it puts an end to all quiet thought."

Public transport in old Paris: Louis XVI ordered the establishment of an omnibus service, the fare to be 5 sous. "Strangely enough there did not seem to

Continued on page 314

Photograph by William Wollin

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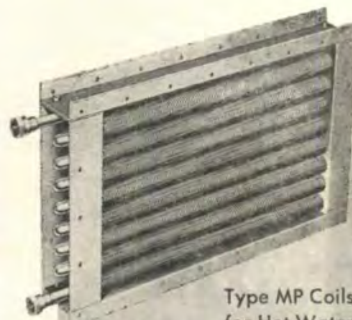

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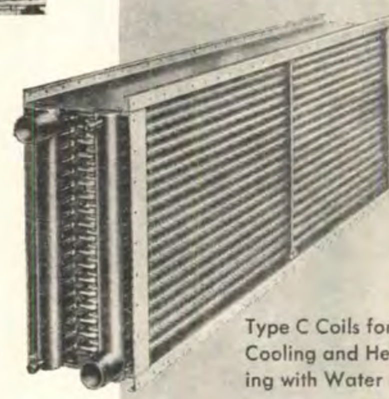

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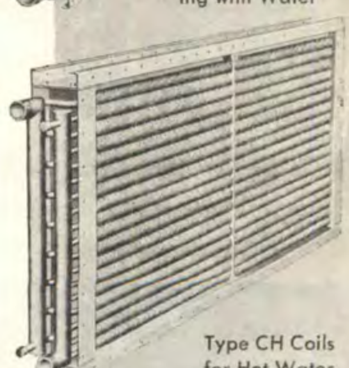

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Continued from page 310

be much need for this kind of transportation in a Paris of half million inhabitants." It was discontinued until 150 years later (1829), when a service of public transport was started.

His discussion of the modern city and city planning is excellent. He finds that, "A planned city can best be beautiful if it is not so ambitious that it wants to include the very last hut in its planning." And he quotes the German sociologist Helmut Schelsky, "All organized community development which deprives the individual of his privilege to choose is rejected by the city dweller. He does not wish to be tied up with any sham neighborhood." The author himself exclaims, "If only someone would save us poor city dwellers from schemes and systems! Neighborhoods fine; no neighborhoods—all right too."

Yet he is not opposed to planning; on the contrary, he finds that planned cities are nearly as old as the city itself, although planning was dispensable as long as the city's growth proceeded slowly and its monuments and walls were respected. This respect guaranteed a healthy entity. But industrialization and rapid urbanization of the population have destroyed the organically growing city, and "for city planning, designs by property development companies are no longer satisfactory." He concludes: "Every city planner should be aware of his limitations. The things we like in many cities can develop better without planning. If nothing worse can be said about the historic city centers than they get in the way of traffic, we may well ask whether the developed city or the rolling car is to be preferred. . . . If cars and beautiful city nuclei get into each other's way, then the car has to yield."

It takes no seer to prophesy that this book will be required reading for every student of city planning.

OTHER BOOKS TO BE NOTED

Interiors Book of Hotels & Motor Hotels. Henry End. Introduction by Lawson A. Odde. Whitney Library of Design, 18 E. 50 St., New York, N.Y., 1963. 256 pp., bibliography, illus. $16.50

A successful specialist in hotel interiors discusses the history of hotels and motels, the distinctions between city, resort, and international hotels, and the broad picture of the design problems, as well as procedures that have become accepted as profitable. Sections on cooperation between architect, interior designer, and client will be helpful primers to anyone new to hotel design. Interspersed in the text is a photographic anthology of recent hotels, along with a broadside critique of them which is self-revealing, straight-from-the-shoulder, at times vitriolic, and almost always interesting.

Chartres. Harcourt, Brace & World, Inc., 757 Third Ave., New York 17, N.Y., 1963. illus. $85 slipcase.

Record of the cathedral at Chartres consists of 33 full-color plans and 123 black-and-white illustrations. Text describes the cathedral's history.

The Coventry Tapestry. Graham Sutherland. Introduction by Eric Newton. New York Graphic Society Publishers, Ltd., Greenwich 31, Conn. 1964. illus. $10

The story of the conception, development, and manufacture of the Coventry Tapestry as told through conversations between the artist Sutherland and Andrew Revai, director of the Passas Gallery in London. Numerous plates—in color and black-and-white—show the finished tapestry in place and a selection of working drawings.

The Finest Rooms. Introduction by Russell Lynes. Edited by Katharine Tweed. The Viking Press, 625 Madison Ave., New York 22, N.Y., 1964. 192 pp., illus. $18.50

Heretofore unpublished rooms from the private homes of prominent Americans exhibit traditional design, antiques, and works of art in a non-museum setting. The decorators — William Baldwin, Rose Cumming,

Continued on page 318

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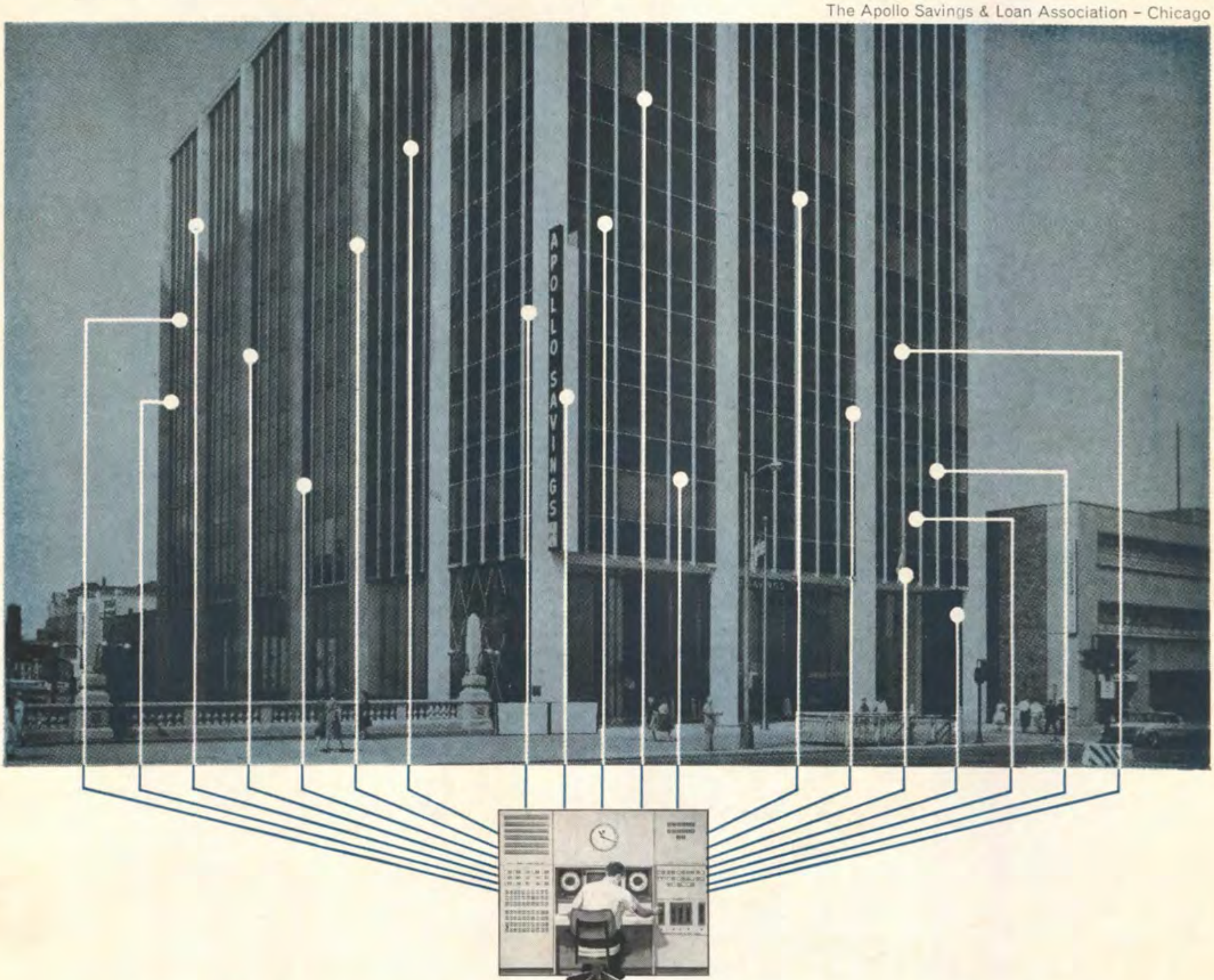

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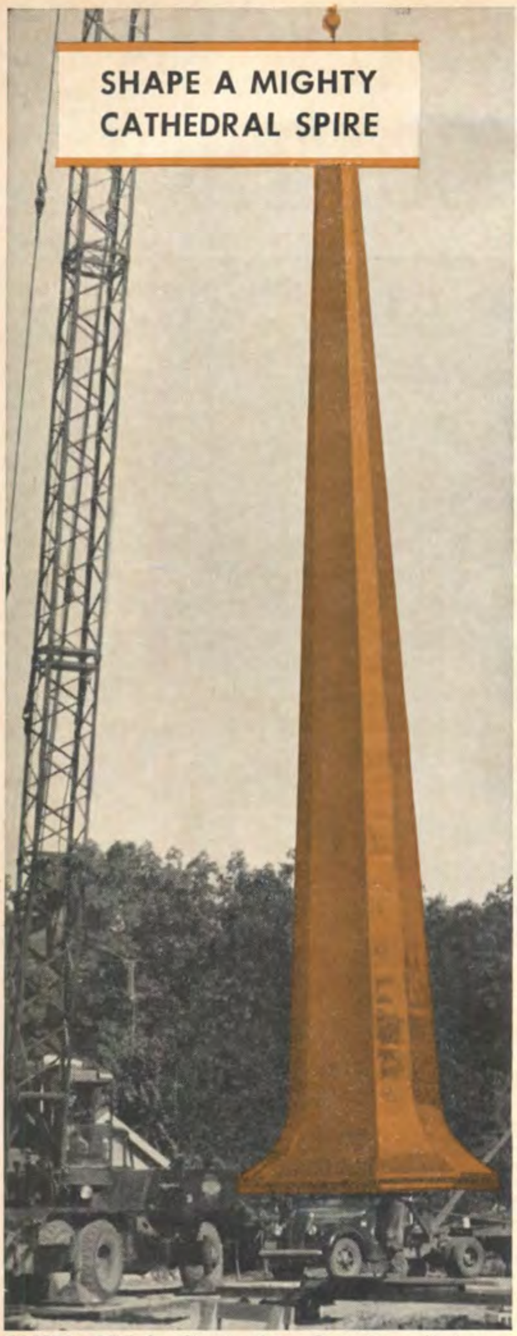

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Continued from page 314

Marian Hall, Eleanor Brown, Mrs. Henry Parish II, George Stacy, Anne Urquart, and Michael Taylor—relate their aims in decorating these rooms. An introduction by Russell Lynes traces the history of decorating in America.

Five Cities. Blanche R. Brown. Doubleday, 575 Madison Ave., New York 22, N.Y., 1964. 632 pp. $6.95

This is an art guide—not to museums, but to cities themselves. Five cities—Athens, Rome, Florence, Paris, and London—which the author feels are works of art, are described in terms of the experiences they offer.

Furniture of Classical Greece. T.H. Robsjohn-Gibbings and Carlton W. Pullin. Alfred A. Knopf, 501 Madison Ave., New York 22, N.Y., 1964. 123 pp., illus. $20

Robsjohn-Gibbings has recreated 22 models of Greek furniture from the Sixth to the Fourth Centuries B.C. These models are based on studies of design motifs of sculptured reliefs, vase paintings, terra-cottas, and bronze statuettes of classical Greece. This book consists mainly of photographs of these models plus captions.

Arne Jacobsen. Tobias Faber. Frederick A. Praeger, 111 Fourth Ave., New York, N.Y., 1964. 176 pp., illus. $17.50

To be reviewed.

The Mexican Mural Renaissance, 1920–1925. Jean Charlot. Yale University Press, 149 York St., New Haven 11, Conn., 1963. 336 pp., illus. $15

Artist Jean Charlot recalls the first five years after the Mexican Revolution and the rebirth of mural painting. The book begins with an account of the centuries-old mural tradition in Mexico and discusses outstanding renaissance artists. Charlot, who, among other muralists discussed, helped define this movement, is presently a Senior Professor of Art at the University of Hawaii.

New Monuments of Etruscan Painting. Introduction by Massimo Pallottino. Text by Mario Moretti. George Braziller, 215 Park Avenue South, New York, N.Y., 1964. 450 pp., illus. $65

Fifty newly discovered Etruscan tombs are illustrated in full color. The tombs, excavated by the Lerici Foundation, have been resealed —the photographs reproduced here are the only available knowledge of the monuments. Appendix describes the new archaeological techniques used in the excavations.

Relocatable School Facilities. Frank Carioti. Educational Facilities Laboratories, 477 Madison Ave., New York 22, N.Y., 1964. 64 pp., illus. No charge

Results of a survey of over 10,000 nonpermanent classrooms in 23 communities in the U.S. The majority of existing structures were found to be inadequate for modern instructional programs and lacking in the expected potential for flexibility. A number of new, promising designs are described, and the report suggests a system of a common core to which portable or demountable space can be added and subtracted according to demands.

Roof Design. Paschen von Flotow and Horst Leiermann. Karl Kramer Verlag, Rotebuhlstrasse 40, Stuttgart W. Germany, 1964. 212 pp., illus. 3gns.

Reference on use of zinc—a traditional roofing material in Western Europe—in modern building. Photographs and drawings illustrate roofing, wall cladding, flashing, and roof drainage. Captions are in English, German, and Italian.

Thermal Design of Buildings. Tyler Stewart Rogers. John Wiley & Sons, Inc., 605 Third Ave., New York 16, N.Y., 1964. 196 pp., illus. $10

Text, tables, and diagrams provide assistance in making thermal design decisions during the schematic design phase of a project. Book is intended for the architect with minimal engineering knowledge, has information on thermal characteristics of building materials and various wall, roof, ceiling, and floor constructions as well as on related costs.

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Continued from page 22

D. Minto, Arlyn A. Orr, Jack W. Smith, James Byron Thomas, Michael H. Trower and Jack R. Yardley.

Daniel, Mann, Johnson & Mendenhall, Architects, Los Angeles, Calif., have made Radoslav L. Sutnar a member of the firm.

Faulkner, Kingsbury and Stenhouse, Architects, Washington, D.C., have admitted Robert Louis Nolte as associate and Avery Coonley Faulkner as junior partner.

Fordyce & Hamby Associates, Architects, New York City, have announced that David R. Dibner has been appointed an associate of that firm.

Frid, Prentice & Ferguson, Architects, Hartford, Conn., have named Frederick J. Mahaffey a partner.

Hugh Gibbs, Architect, has made his son, Donald Gibbs, a partner in the Long Beach, N.Y., firm.

Morris Ketchum, Jr., Associates, Architects, New York, N.Y., have made John D. Evans a member of the staff.

Ernest J. Kump, has made Peter Kump a member of the firm.

McLoney and Tune, Architects, Lexington, Ky., announce the appointment of Robert E. Olden, Architect, as associate.

Neuhaus & Taylor, Architects, Houston, Tex., have admitted William C. Blackstone to the design and development department of the firm.

Whittlesey & Conklin, Architects and City Planners, have made William Hamilton Roehl an associate partner.

Williams and Tazewell & Associates, Architects, Norfolk, Va., announce that John Paul C. Hanbury, Tamas F. Pucher, and William M. Wilshire, Jr., have joined the firm.

Appointments, Elections

Borg-Warner Corp., (Norge Div.), Chicago, Ill., has appointed Robert D. Triplett chief engineer of domestic products and Curtis E. Behrens chief engineer of commercial products.

Fred C. Kramer and Alexander S. Timoshenko have joined the firm of Albert A. Hoover & Associates, Architects, as senior architects.

John M. Leitch has been made project manager for Joseph S. Ward and Associates, Architects.

Libbey-Owens-Ford Glass Company announces the following executive changes: George P. MacNichol Jr., chairman of the board and chief executive officer, has retired from that office but continues as a director and as chairman of the executive committee; Curtis W. Davis succeeds Mr. MacNichol as chief executive

Continued on page 324

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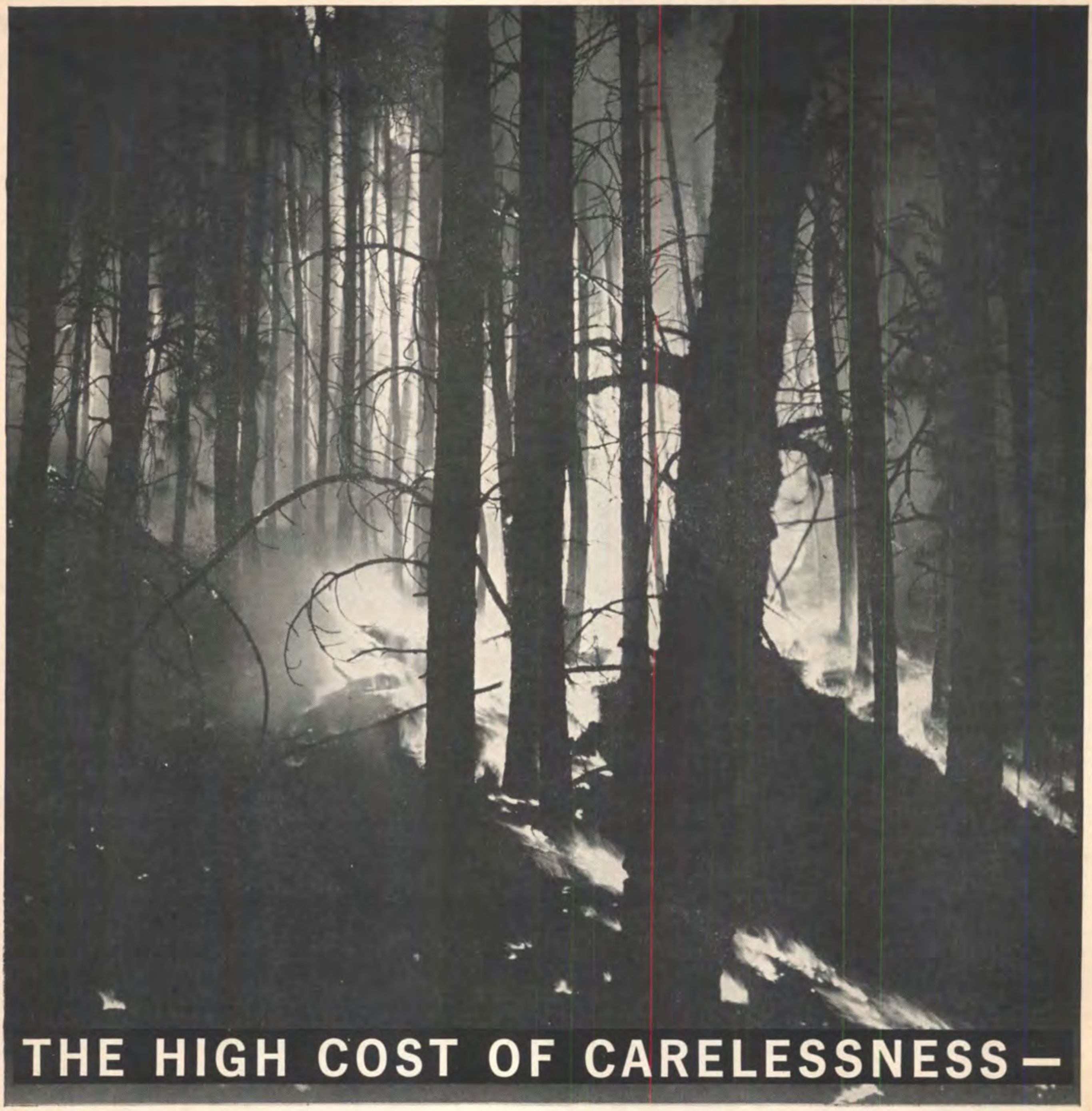

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Continued from page 320

officer, retaining also the office of president; F. EARLE CAZAYOUX was elected executive vice-president; JOHN D. BIGGERS retires as a director and chairman of the finance committee.

LOCKWOOD GREENE ENGINEERS, INC., New York, N.Y., elected DONALD G. RADWAY a director of the firm.

RAYMOND LOEWY/WILLIAM SNAITH, INC., New York, N.Y., announces the election of ANDREW M. GELLER as vice-president.

HERBERT ROSSER SAVAGE has joined the architectural staff of THE DELTONA CORPORATION.

EBERLE M. SMITH ASSOCIATES, INC., Architects, Detroit, Mich., has appointed ROBERT H. LILES chief architectural draftsman.

STANDARD PRESSED STEEL CO., (COLUMBIA-HALLOWELL DIV.), has appointed WILLIAM SKLAROFF DESIGN ASSOCIATES designer of its office furniture and product identity.

UNION CARBIDE CORP., (FABRICS & FIBERS DIV.), has appointed ELEANOR WAY stylist-designer for the department of Household Furnishings.

Name Changes

AMERICAN PLYWOOD ASSOCIATION, formerly DOUGLAS FIR PLYWOOD ASSOCIATION.

BERGER-FIELD ARCHITECTS AND PLANNERS, 329 N. Euclid Ave., St. Louis 8, Mo., formerly CHARLES T. BERGER, INC.

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The Aesthetics and Technology of Preassembly

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left: Courtesy Collection Musée de l'Homme, Paris
right: George Nan. This model was shown at the Museum of Modern Art, in 1960, as part of their exhibition entitled "Visionary Architecture."

PAGES 164–167
Akio Kawasumi

PAGES 176–177
(2, 4) Dwain Faubion

PAGE 178
Courtesy Werk

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bottom: Marianne Goeritz

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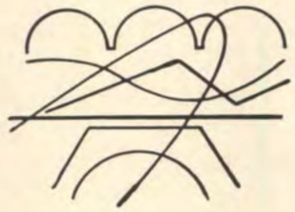

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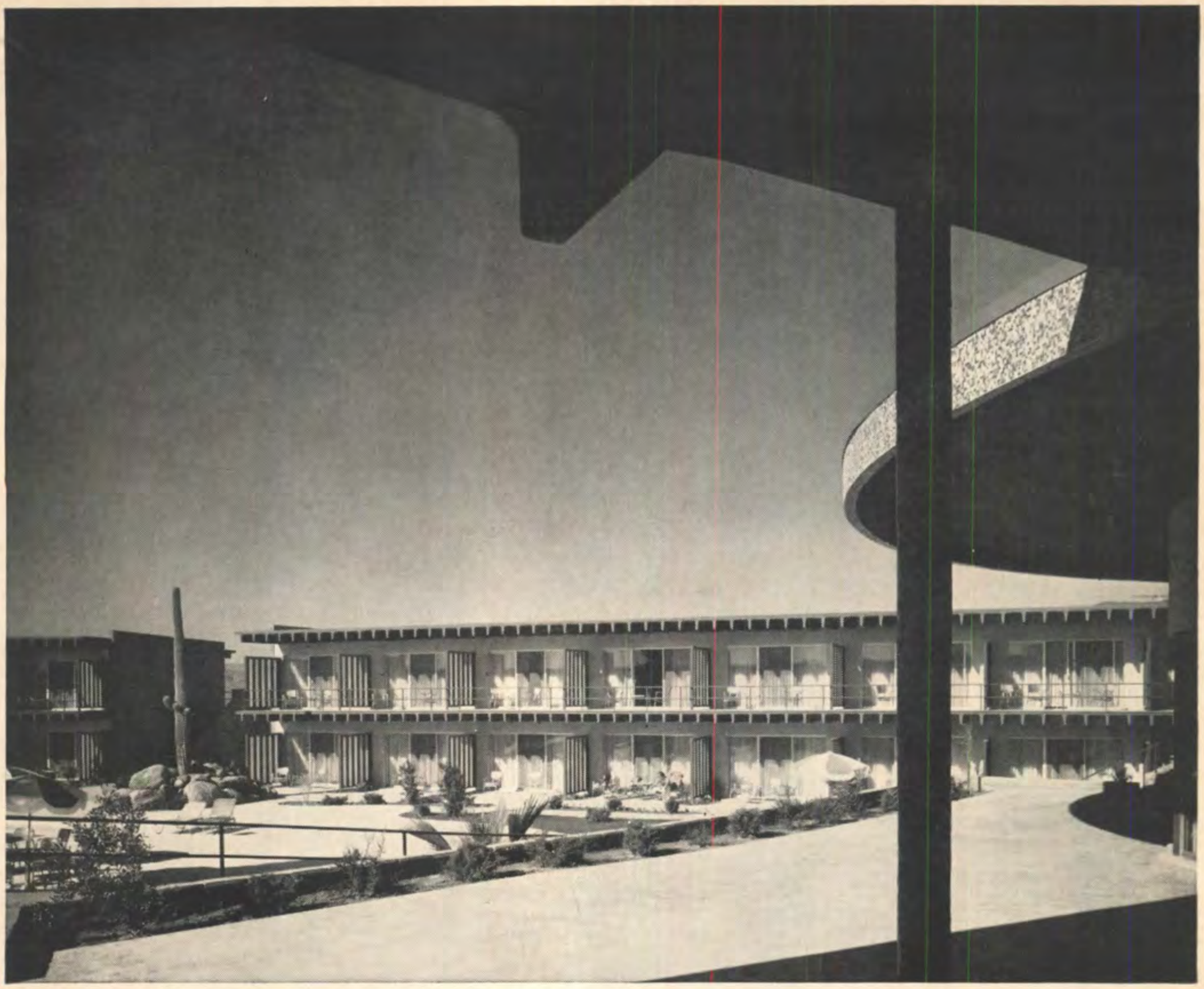

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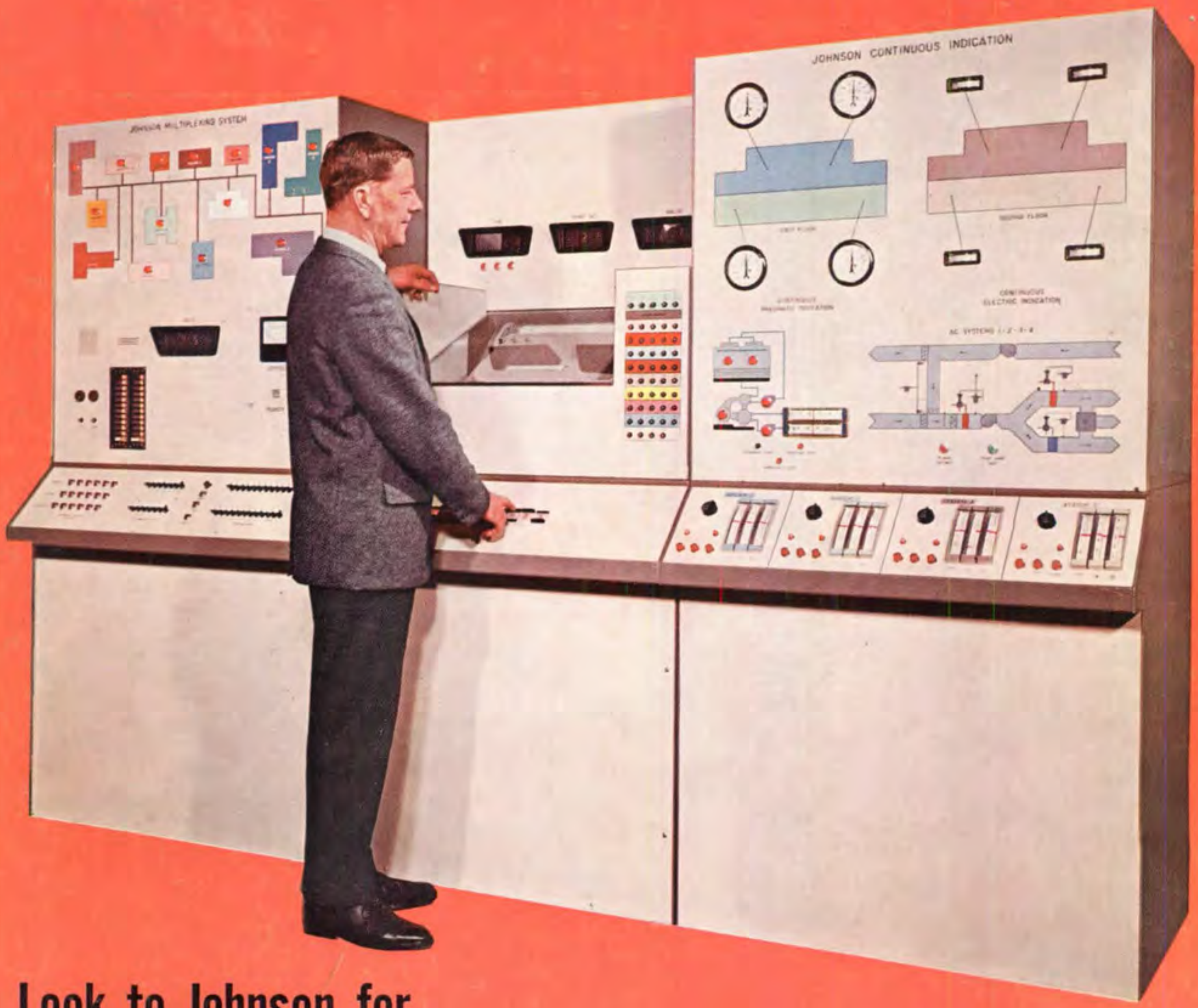

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