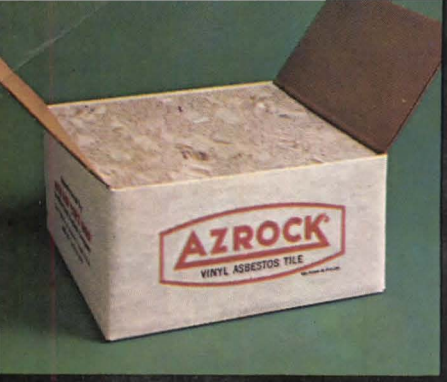
PROGRESSIVE ARCHITECTURE
SEPTEMBER 1969

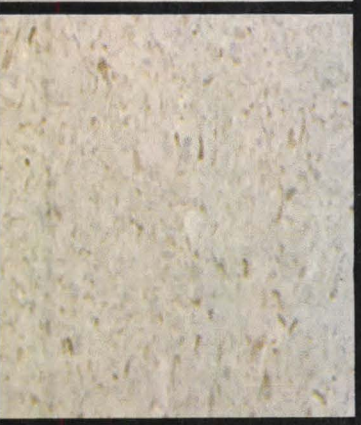
AIRPORT INTO JETPORT:
The Logistics of Travel

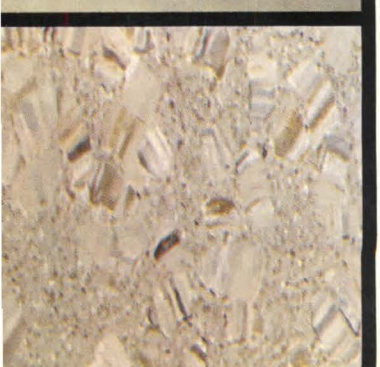
einhold Publication



Carton Full of Miracles

Azrock Vinyl Asbestos Tile. It's what's happening in hospital flooring.





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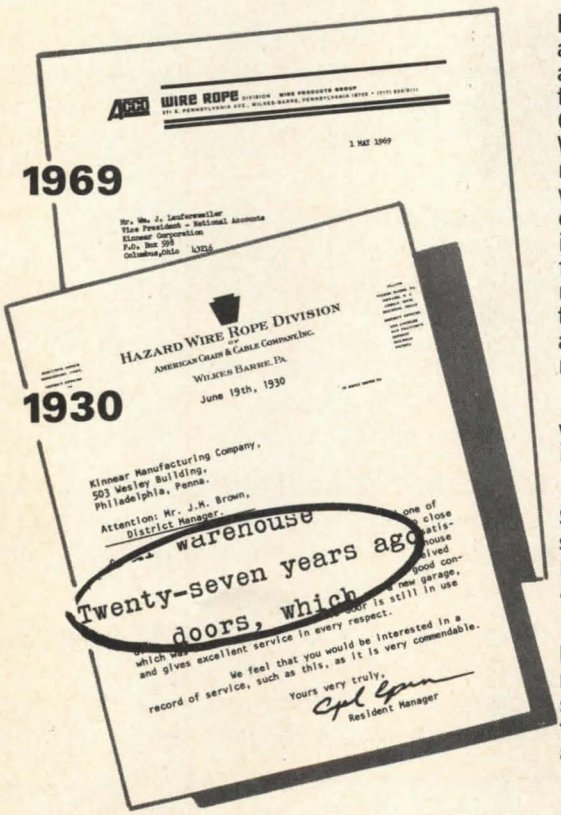
GOING STRONG after 66 YEARS

--reports American Chain & Cable Company, Inc.

Photo taken April 29, 1969, of a Kinnear Rolling Door purchased by the Hazard Company in 1903. The Door was moved once but has always operated faithfully.



1903 - ORIGINAL ORDER

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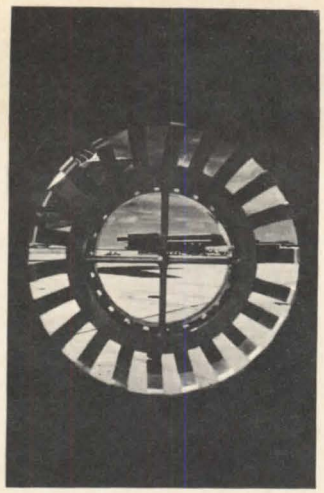
A view of Goleman & Rolfe and Pierce & Pierce's Houston Intercontinental Airport through a jet engine. Photo: Bert Brandt and Associates.



P/A THIS MONTH

Progressive Architecture® September 1969

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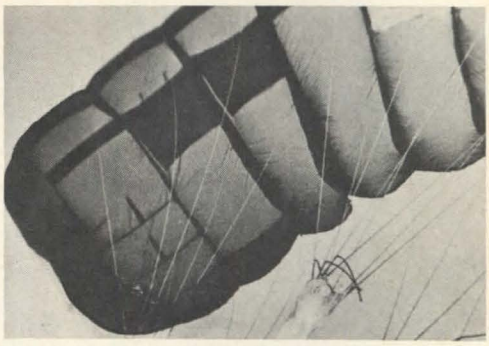
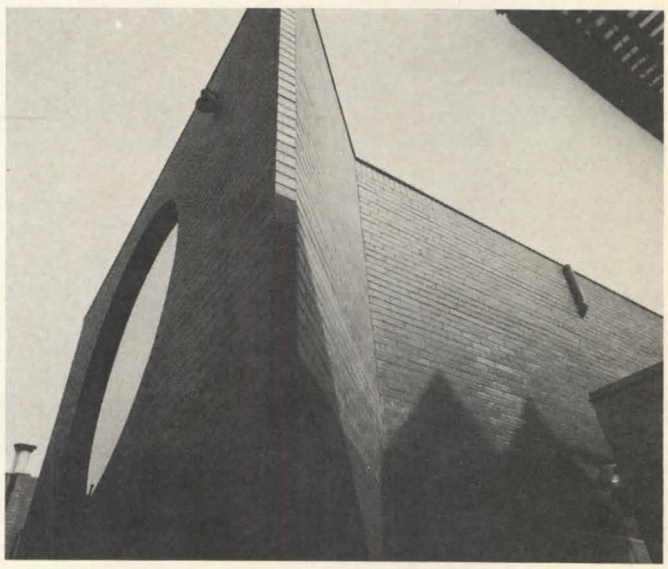
Simple materials were called for



Pneumatic structures solved intuitively



Renewal project sets example

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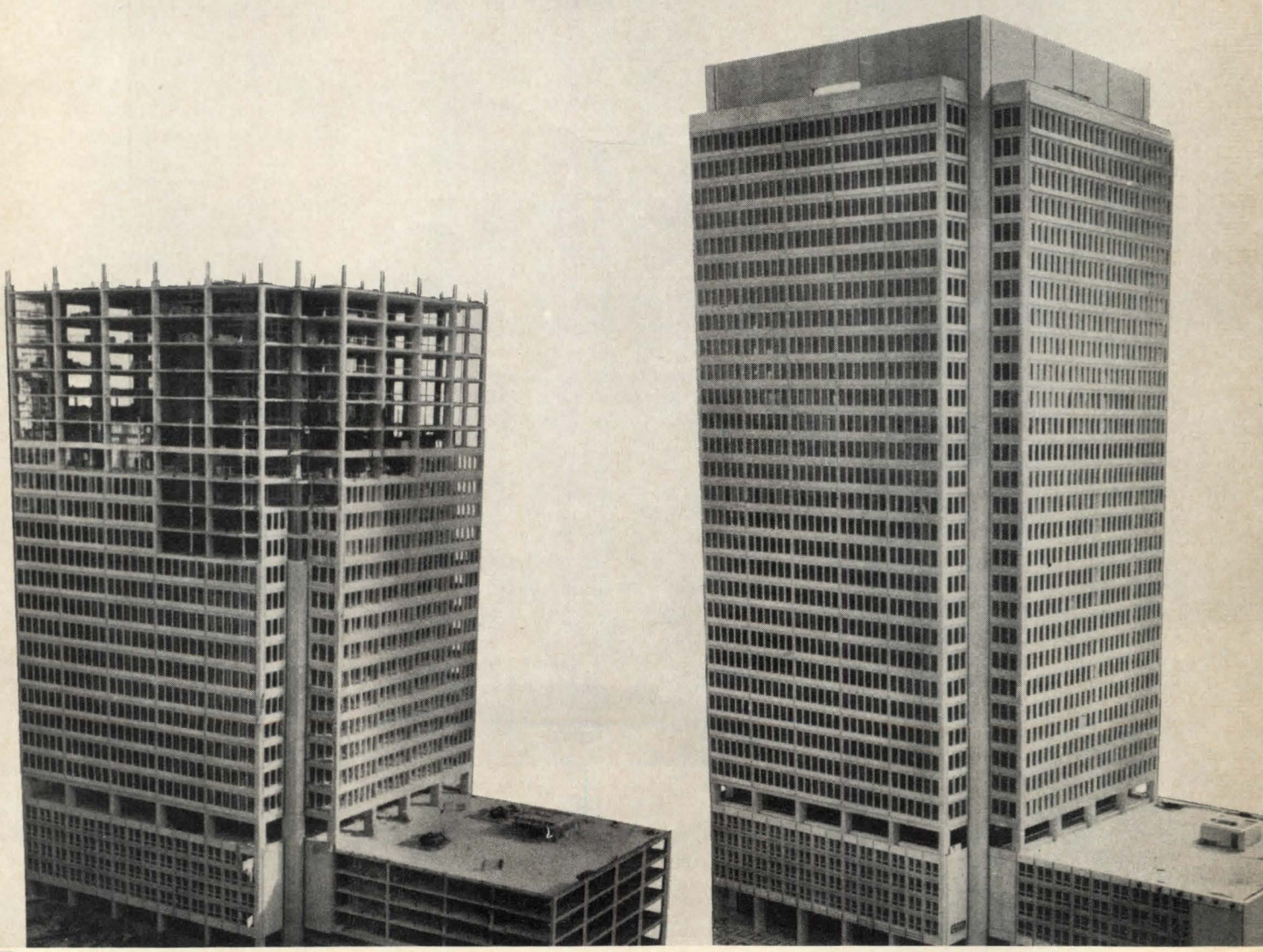

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2-69

YOUR POINT OF VIEW

Overstatement of Cost

Dear Editor: Your article on El Camino Real in Mexico City (June 1969 P/A) was both interesting and informative.

Was there possibly an error in your statement that the building contains only 90,000 sq. ft.? On page 91 you say that cost of construction was $14,000,000. My quick calculation indicates unit costs to be approximately $155 sq. ft.

This seems very high indeed, considering Mexico's labor costs!

LOREN MASTIN, AIA
Las Cruces, New Mexico

You are correct; there is a mistake in the figures, and the building has 90,000 square meters of construction equal to 900,000 square feet. The figures regarding construction cost are as follows:
Construction cost US $14,000,000 (US $15.50 sq. ft.)
Construction, land, fees, furnitures, pre-opening expenses, etc. US $24,000,000

Art Appreciation

Dear Editor: In Michael Leonard's HUMANIZING SPACE (April 1969 P/A), one statement expresses what seems to be a prevalent opinion regarding the appreciation of architecture, and art in general:

"Rambling groups of buildings lack identity, because they lack a formal arrangement that can be taken in and held mentally. Orientation within them is impossible. The plan needs to have something in common with a good trademark if it is to be quickly and clearly registered."

Although narrow in its view, the statement is true if to be "quickly . . . registered" is indeed the key to appreciation. Time as well as involvement is acutely essential in the appreciation of architecture as well as the other arts. If time were ignored the dot would be the perfect "form." Following the dot in relation to length of time for apprehension are the line, the circle, and the intersection. If sufficient time and interest are taken, even large complex cities such as London or Paris can be "clearly registered."

Formal arrangement is not necessary for order or identity. An area's disorder or rambling quality may very well be its identity. Orientation is always possible when objects are distinguishable from one another and references are established.

Although appreciation of art is a subjective experience it should be given sufficient time for thorough apprehension.

KELLY RIORDAN
FPO. San Francisco

Process Orientation

Dear Editor: Your May 1969 issue tells it like it is. Until we, as architects, realize that the new client expects accountability — in terms of cost, time, quality, and performance — we are going to be fighting a losing battle if all we can offer is design.

Design today is increasingly no more than a stage — an important one, it is true, but still only a stage — in a very long and costly building process. Our profession must become more process-oriented if it is to survive in this highly competitive society.

STEPHEN A. KLIMENT, AIA
Caudill Rowlett Scott
New York

Implications Corrected

Dear Editor: Your January 1969 "News Report" entitled *From Battleground to Testing Ground: Washington's Urban Experiment* contains several major implications I feel sure you would want brought to your attention.

The Phase I project area is not, in fact, "a prototype for planning the remaining acreage" as you state. The selection of the three architects and the site was completed and committed prior to any selection of architects and planners for Fort Lincoln New Town itself.

Edward J. Logue was not commissioned to do the planning, but in fact was Principal Development Consultant to the three public agencies and directed the planning and design work done by my firm in association with Keyes, Lethbridge & Condon, Architects of Washington, D.C., who are not mentioned in your article. In addition, we received the very valuable contributions of a number of other consultants including: Alan M. Voorhees & Associates, Transportation; Robert Gladstone & Associates, Economic Feasibility and Marketing; and David Volkert & Associates, Engineering.

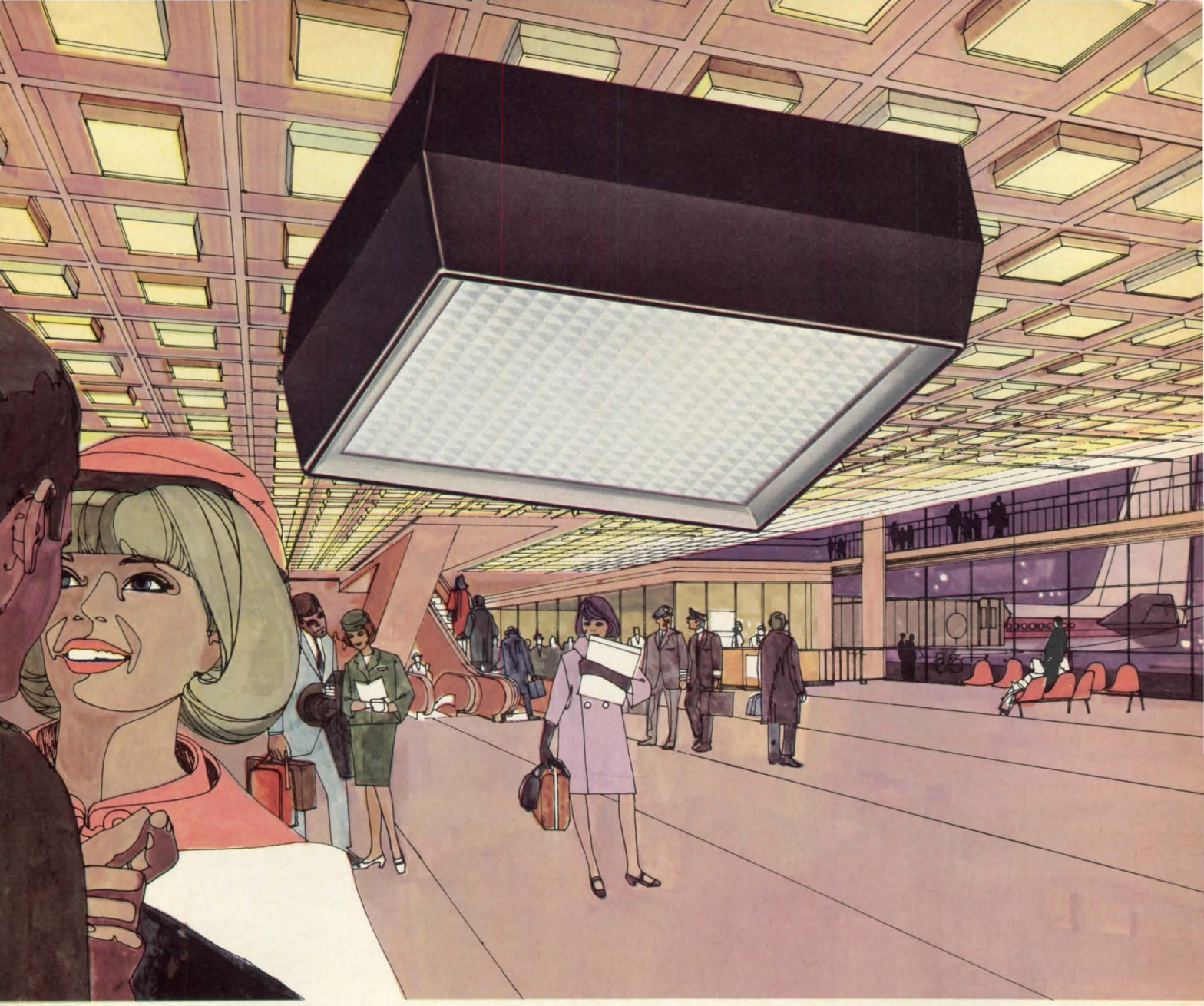
The master plan for Fort Lincoln New Town contains considerably more than "a school." It provides a complete educational system for a total of 10,000 students from the age of six to eighteen, and 1,000 pre-school students. It also includes the site for the Federal City College with an anticipated enrollment of 5,000. The one school to which you must be referring was included in the Unit I program, but within the larger planning area, at a very late date due to the pressures of the surrounding community and due to the lack of community facilities of any nature in the original program.

Further, the associated offices of David A. Crane and Keyes, Lethbridge & Condon have recently conducted a study in the application of innovative technology in the planning and design of a new community. This study was done in close parallel with the planning for Fort Lincoln New Town and is a broad-ranging examination and investigation of technology in this country and Europe. It takes a very different and broader approach to systems building than in the 20-acre "testing ground" of Unit I.

There has been a great deal of publicity about the early-construction Unit I site — more publicity by far than that for the more comprehensive and totally innovative approach in the 335-acre Fort Lincoln project. We do not feel the problems of the Unit I "crash effort" should be related to or reflect on the planning and design for Fort Lincoln New Town by the team under Mr. Logue.

DAVID A. CRANE,
Architect
Philadelphia, Penn.

(Continued on page 16)



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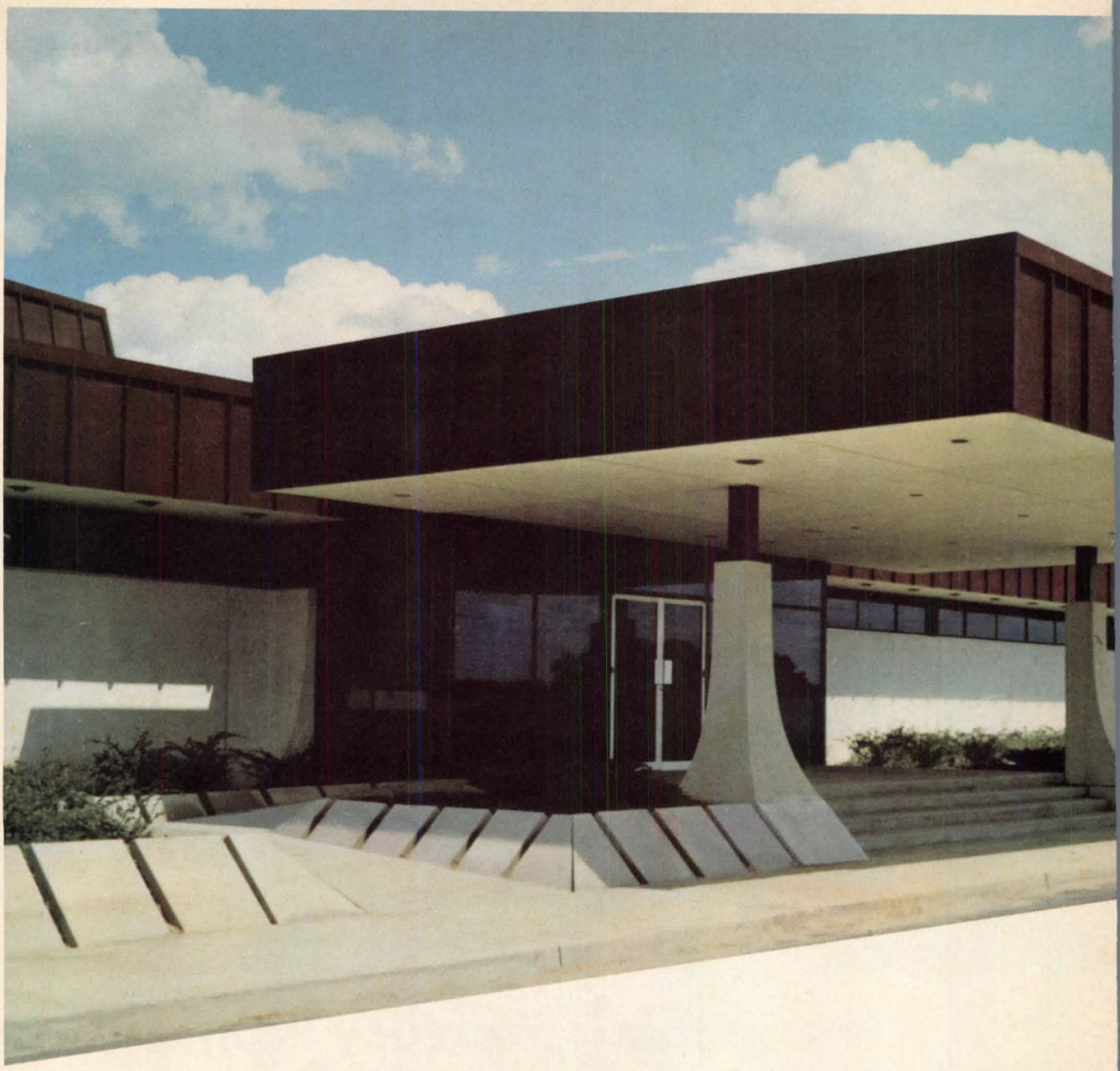

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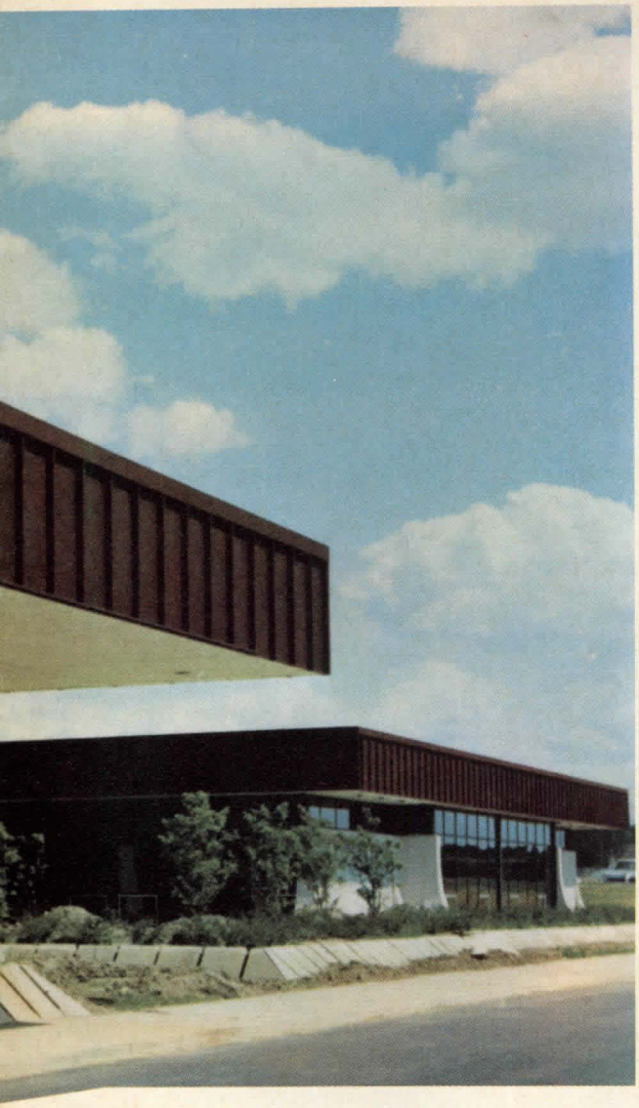

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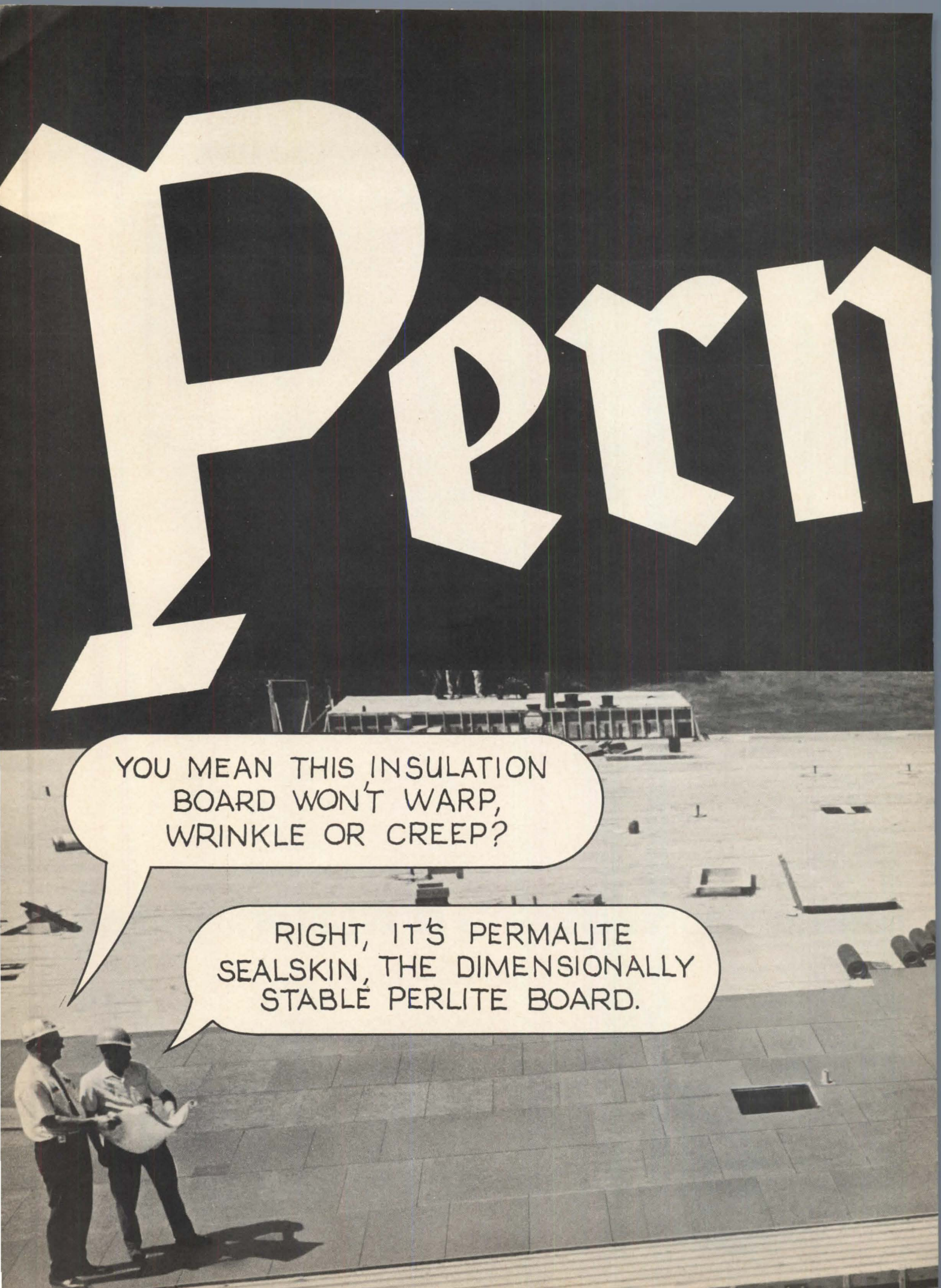
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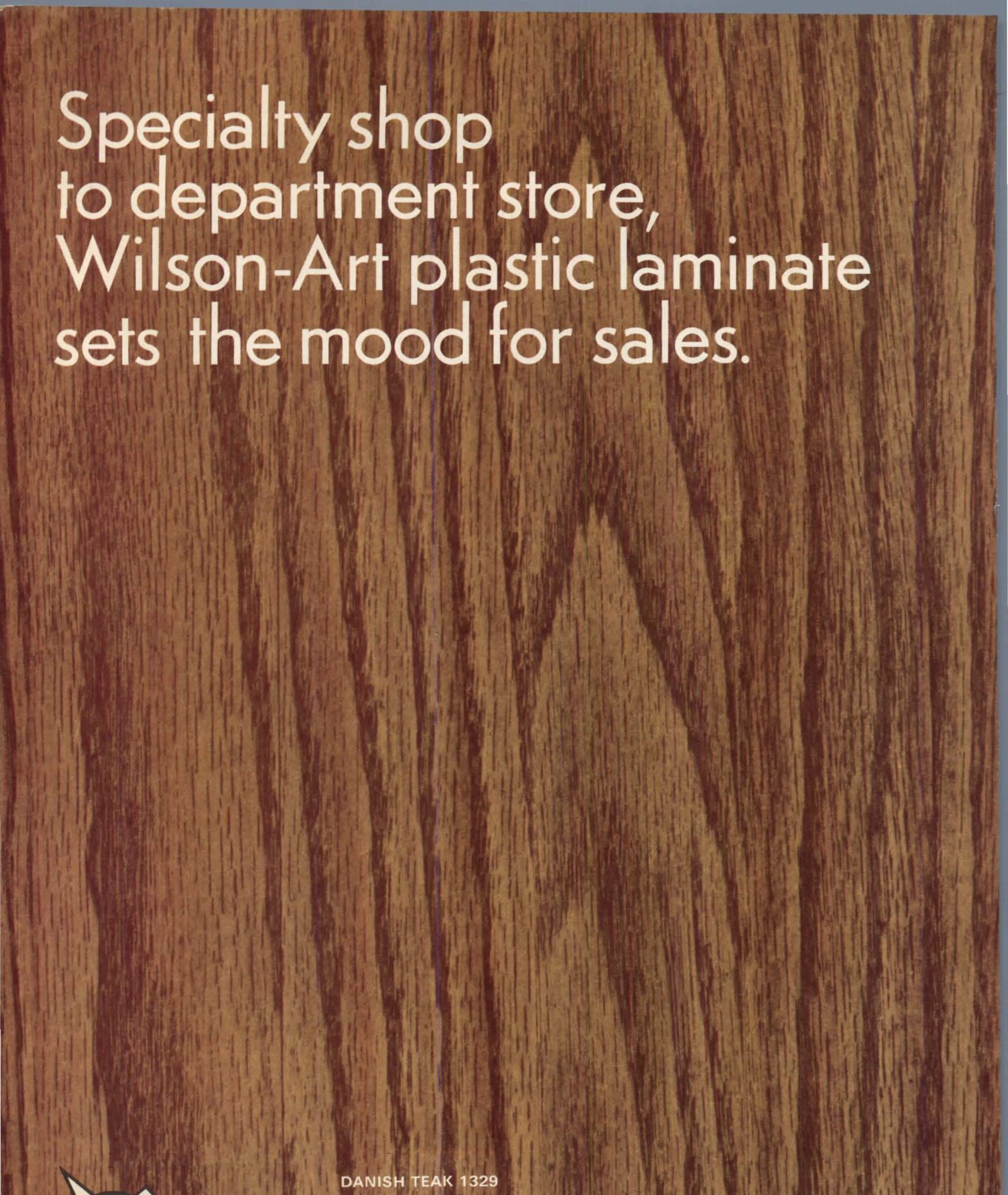

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See Wilson-Art, Dart Industries Architectural Products Division Booth 111, Contract '69 Show.

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(Continued from page 6)

Architects Domain

Dear Editor: After seeing such new master-builder proposals as the scheme for the Brooklyn Navy Yard, the Seattle Mount Baker Ridge Study, Parry Island, Turner City, and so on, it would appear that the architect's domain is relatively uncrowded.

KENNETH SHIMER WOOD
Urban Design Consultant
New York City

More Reactions to May Issue

Dear Editor: We would like to take issue with the position taken by Tishman Realty in the May issue in the article "Construction Managers Set Design Patterns." Your readers would be interested in the positive aspects of the owner-builder to architect relationship. Our experience, on numerous occasions has been that: 1) architects are cooperative, not reluctant, in making beneficial substitutions; 2 architects are familiar, not unfamiliar, with ever-changing negotiating strategy; 3) in the majority of cases, detailed drawings are necessary, not unnecessary, to construct a building to suit the client.

It is also patronizing to suggest, as Tishman has, that architects "can enhance their capabilities by optimizing their potential through introducing them to the practical and economic aspects of the building." The architect is not an impractical dreamer, although dreams are the stuff that goes in to make tomorrow's architecture progressively better.

Raymont Epstein, A. Epstein & Sons, Inc.,
Engineers and Architects, Chicago, Ill.

Dear Editor: The New Environmental Professionals (MAY 1969 P/A) was just great. Too many architects don't know what's happening or what the scope of competitive competence is (and what is to develop) — because they have been too preoccupied with a profit motive and outmoded "Drafting Room Architecture."

I have experienced (employed by) all sides of client/government: aerospace construction and design divisions: turnkey corporation: the largest A-E firms; and my own private practice. There are more "nonprofessional" managers in architectural offices than industry: The Litton Industries prove the point with P/A.

My congratulations to John Eberhard, he will contribute more than most draftsman-hungry firms. Wake up you super ego designers: RPC is coming.

It looks as though P/A will show the way for the AIA. Keep it up. Maybe we can do a better job of solving "people problems" and manufacturing problems if we all put our talents together.

R. ANDREW JOHNSON
22920 Dale Allen
Mt. Clemens, Mich.

Dear Editor: I wish to congratulate you on the MAY 1969 P/A. I hope that in future we will see more of this type of coverage, especially about the unheard, unseen, and unspoken world of architecture.

WALTER M. KRONER
Cambridge, Mass.

On Readers' Service Card, Circle No. 415

On Readers' Service Card, Circle No. 326

Textured Plywood:

Notice how you see it
on more and more of today's really
stunning commercial buildings?
For examples, look inside.

Another very good thing about textured plywood: You can use it as combination siding-sheathing and cut costs by 40% or more.

1. Architects Callister and Payne used Texture One-Eleven® plywood stained in basic earth tones of buff, brown, red, for siding on this sophisticated condominium community: Hiller Highlands, Oakland, Calif. Plywood is strong enough to use without an additional layer of sheathing—a great time-saver.

2. Rough sawn plywood, with battens at joints every four feet, is a good choice for any situation where style, simplicity and economy are essential.

3. Paul Wilson Bosholm, A.I.A., designed his own small office building in Palo Alto with an ingenious use of rough sawn plywood siding and closely spaced battens.

4. Rough sawn plywood paneling with narrow battens every four inches gives a look of richness to this library's rare-book room.

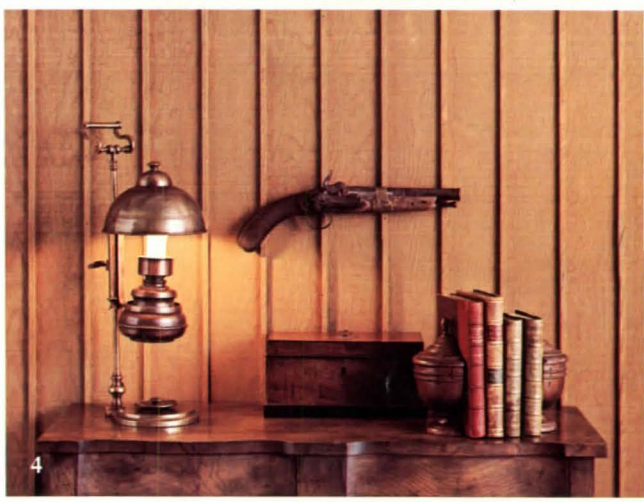
5. When you use textured plywood for interiors, it's important to specify your supplier's top-of-the-line grade if you want clear paneling with a minimum of knotholes and natural wood characteristics. These new plywoods come in different appearance grades, and you'll want to be sure of the right material for the job in hand.

6. Fellowship Hall at a Methodist church in Cedar Rapids combines rough sawn T 1-11 with other strong, natural materials. *Architects: Brown*, Healey and Bock.

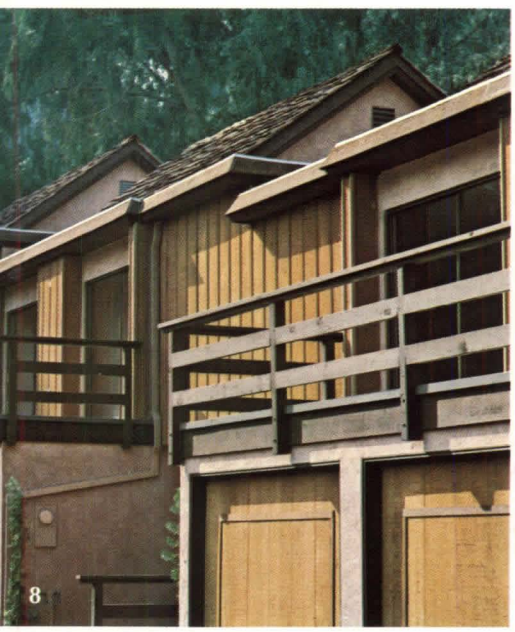
7. Plywood siding, applied directly to studs without sheathing, makes sense for any commercial or industrial building, even huge warehouses. It can save days in construction time. It's neat and easy to maintain. This is T 1-11 on a passenger terminal of a small airport. Architects and Engineers: Seifert, Forbes and Berry.

(More ideas on next page.)

One of a series presented by members of The American Wood Council.



A few more design ideas with textured plywood —from townhouse to office building.



8. Rough sawn plywood, reverse board-and-batten style, on a group of townhouses.

9. This office uses 2′ x 8′ panels offset from black frames.

10. Maintenance-free aggregate-surfaced plywood on a Salt Lake City building designed by Roger Van Frank, built by Alan Brockbank.

11. T 1-11 may be used horizontally, too, with vertical battens on 4′ centers.

For more on styles, systems and availability and a new report on qualified coatings for plywood, send the coupon.

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Tacoma, Washington 98401

Please send free portfolio on textured plywood, with design ideas, sidings guide, qualified coatings directory.

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On the left: the 56-story Toronto Dominion Bank Tower. General Electric Silicone Construction Sealant was used to caulk its aluminium windows to steel mullions.

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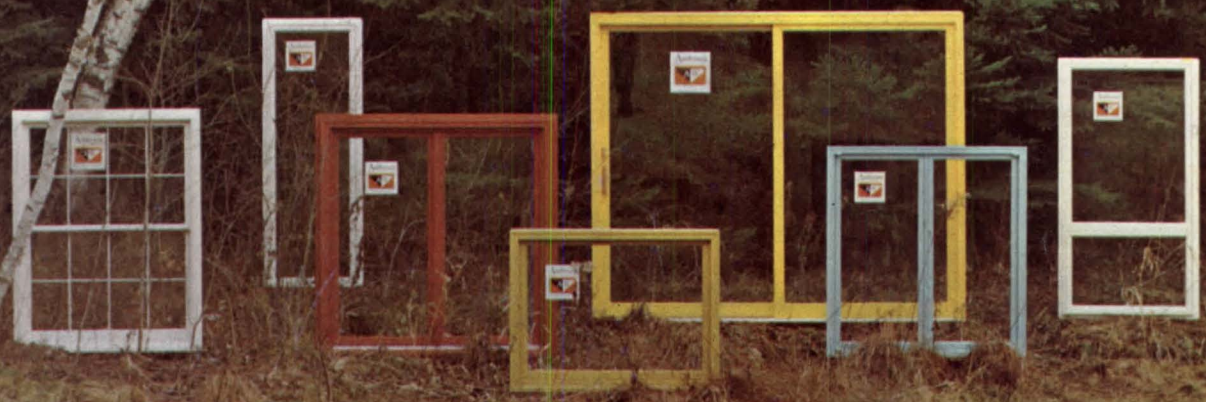

For over 60 years, Andersen, along with leading architects and builders, has campaigned for more beautiful buildings. A quiet, but solid campaign for more window variety, warmth and weathertightness.

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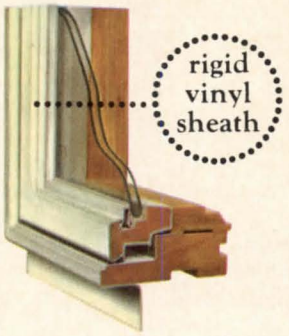
Do your part to help keep America beautiful. Specify ... use Andersen Windows and Gliding Doors. They're beautifully at home almost anywhere.

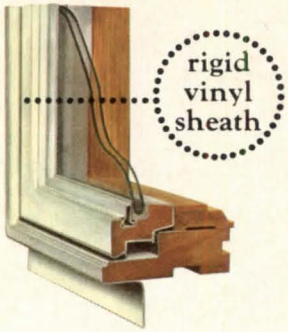
Andersen Perma-Shield eliminated window maintenance.



There's a beautiful ocean view from the balconies of this seaside inn. There's plenty of corrosive salt air, too. That's why the architect specified 8-foot Perma-Shield Gliding Doors, with welded insulating glass. Inside both sash and frame, there's a heart of warm, stable wood. Outside, there's a sheath of rigid, weatherproof vinyl that doesn't need painting, resists denting and warping, can't rust or corrode.

Washington Club Inn, Virginia Beach, Virginia. Architect: Evan J. McCorkle, Virginia Beach.

Windows have practically
That's the real beauty of them.



Because of a difficult elevation, window maintenance might have been a nightmare at this St. Paul, Minnesota girls residence. Perma-Shield Windows avoided the problem beautifully. There's no need for storm windows with welded insulating glass, and the rigid vinyl sheath doesn't need painting. You can choose Perma-Shield double-hung, casements, awning style, fixed types, single or multiples right from stock. There are six sizes of gliding doors, dozens of window sizes and combinations.

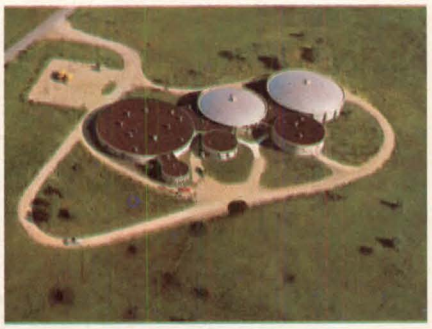
Emma Norton Methodist Girls' Residence, St. Paul, Minn. Architects: Progressive Design Associates, St. Paul.

Andersen Windowalls

More new schools with to match the settings.

You might expect custom windows in a design as different as Aspen High School, but there was no need for them. The students look at the mountains through *stock* Andersen Casements, just one of 6 types and hundreds of sizes available. Close Andersen tolerances may mean up to 15% fuel savings. It didn't take a crew of window specialists to install them, either.

Aspen High School, Aspen, Colorado. Architects: Caudill Associates, Aspen.



beautiful, weathertight windows

The natural look and warmth of Andersen wood windows match the warmth and charm of this beautiful school setting. There are plenty of Andersen sizes and styles to permit design freedom. And the architect knew in advance that every window for Simon's Rock School would be available fast from local warehouse stock . . . a comforting thought on any job.

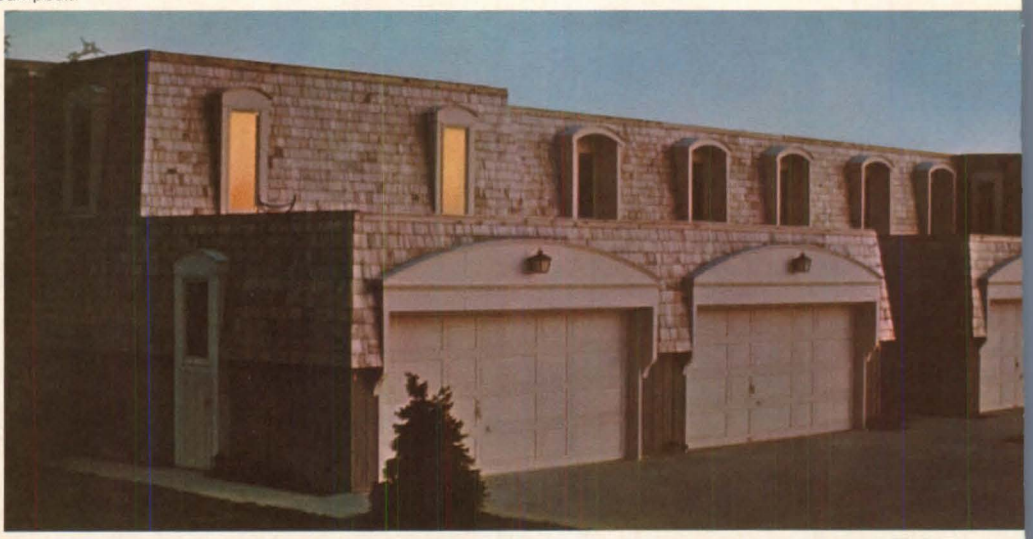
Simon's Rock School, Great Barrington, Massachusetts. Architects: Morehouse, Chesley and Thomas, Lexington, Mass.

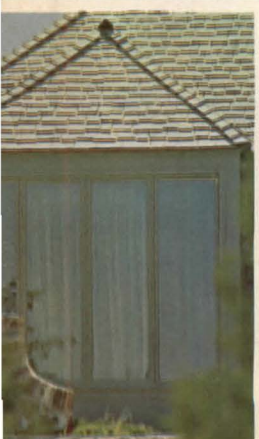
Andersen Windowalls™

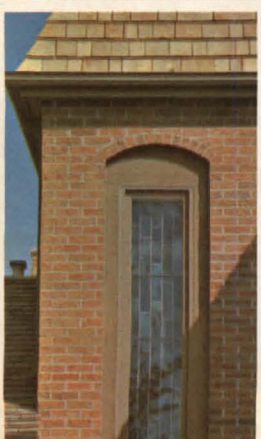
Proof that stock beautifully custom.

Here again, window design details make the difference. These might have been look-alike townhouses. They're all part of the same development. Yet each unit has its own charm and sales appeal. Each townhouse has its own style with stock Andersen windows. Maintenance is the builder's obligation here, so he appreciates the solid service backup he gets from his nearby Andersen Distributor.

Wellington Greens, Lincoln, Nebraska. Architect: Sidney Campbell.







Andersen Windows can be

This condominium has *character*, thanks partly to the creative use of windows. It has another kind of appeal, too: the sales appeal of low maintenance. That's the sales key for many condominium prospects. They're quality conscious, and they know what they *don't* want. They're out to avoid all the usual upkeep of home ownership, and trouble-free Andersen Windows fit into the picture beautifully.

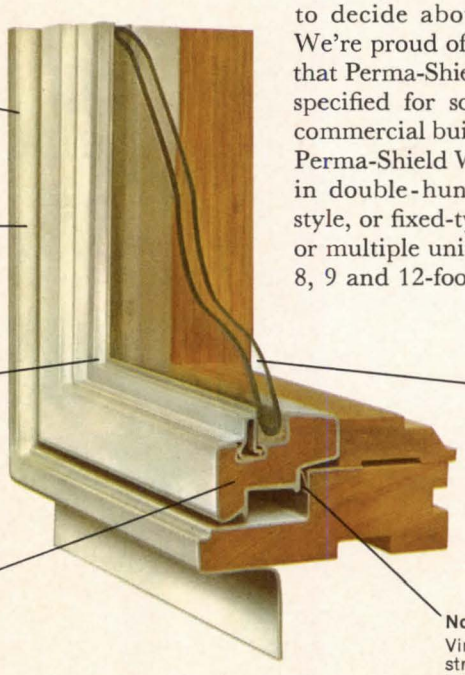
Bonnymede at Montecito, California. Architects: Hawkins and Lindsey and Associates, Los Angeles.

Look at all the styles, features and options you can get. Beautiful, huh?

Meet Andersen Perma-Shield . . . the most attractive window option to come along since insulating glass.

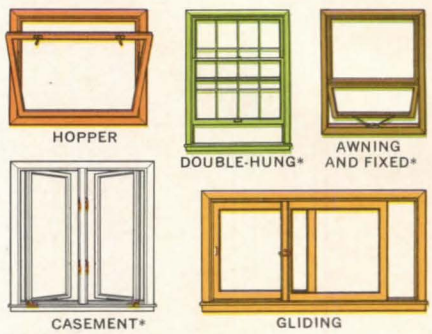
Perma-Shield Windows don't need painting or storm windows. They resist denting and warping. They can't rust or corrode. They've now been performance proved on thousands of jobs—exposed to every climate over the past 10 years. Inside, they have natural wood trim, so they can be finished to match any decor.

The perfect window? You'll have to decide about that for yourself. We're proud of it, and we're pleased that Perma-Shield Windows are being specified for some of the best new commercial buildings and residences. Perma-Shield Windows are available in double-hung, casement, awning style, or fixed-type windows in single or multiple units. Gliding doors in 6, 8, 9 and 12-foot widths.



Hundreds of sizes, thousands of combinations.

There are 6 Andersen wood window styles, so we never handicap design.



*Available in Perma-Shield

Options to match.

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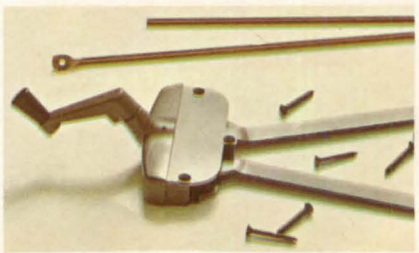

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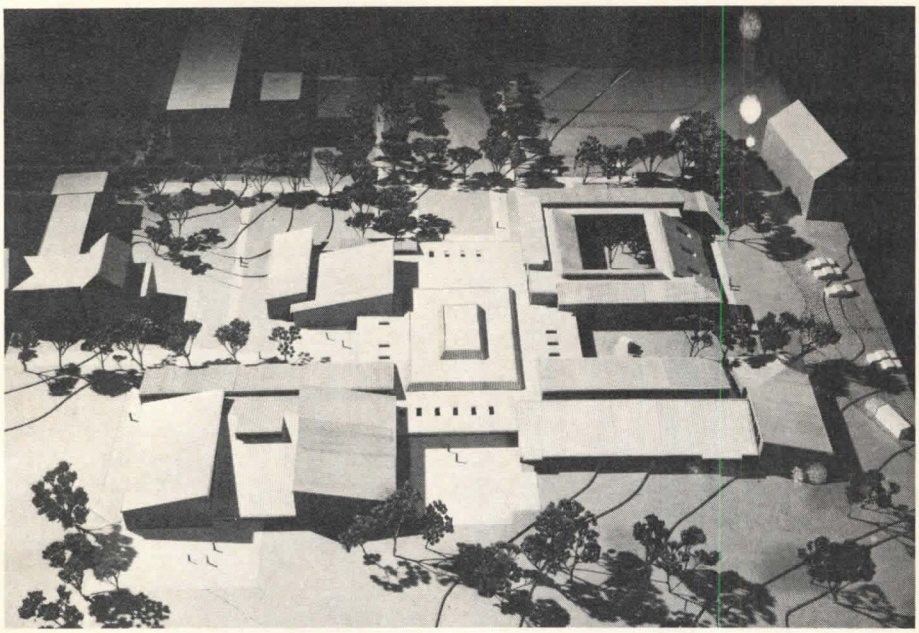
P/A
NEWS REPORT

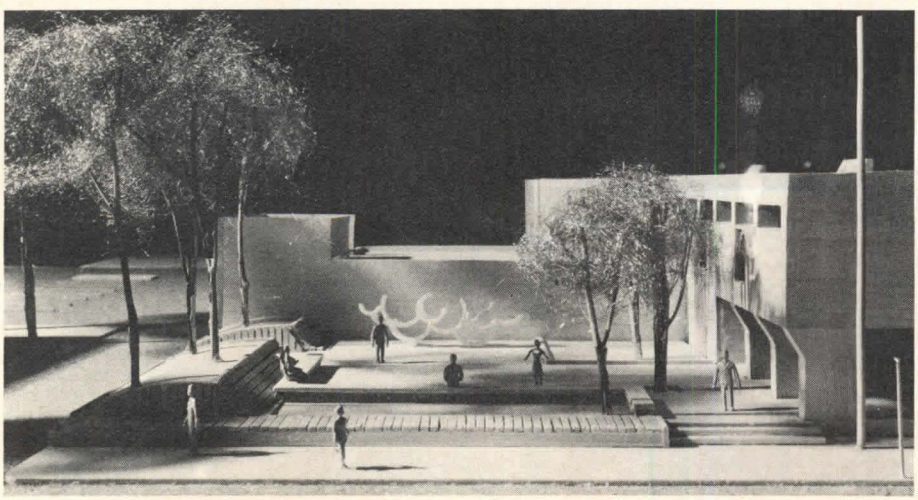


Rehabilitation Center at the State Hospital of Buffalo, Buffalo, New York; **Architect:** Milstein, Wittek, Davis & Hamilton; Completion date: 1970; Materials: Red brick facing, steel, fire-rated wood beams, metal roof.

On the Way Up

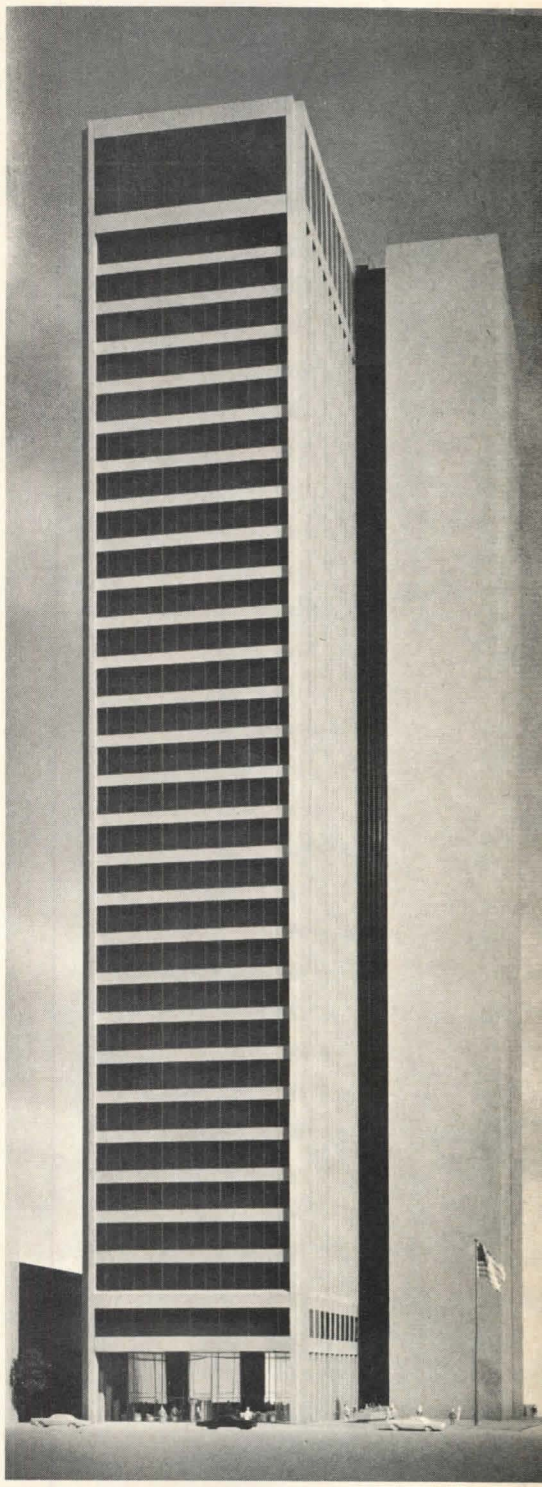
P/A presents here and on page 33 a factual rundown of some of the many interesting building designs now on the board.

Photo: Stephen F. Rosenthal



District #11 Police Station, Boston, Massachusetts; **Architect:** Cambridge Seven Associates; Completion date: 1970; Cost: $780,000; Materials: brick exterior with precast concrete lintels; steel frame.

Photo: Louis Checkman



Pittsburgh National Corporation, Pittsburgh, Pennsylvania; **Architect:** Welton Becket and Associates; Completion date: 1971; Cost: $26 million; Materials: tower of granite-sheathed steel utilizing 70-foot-long high tensile beams to clear span each floor without need for intermediate columns.

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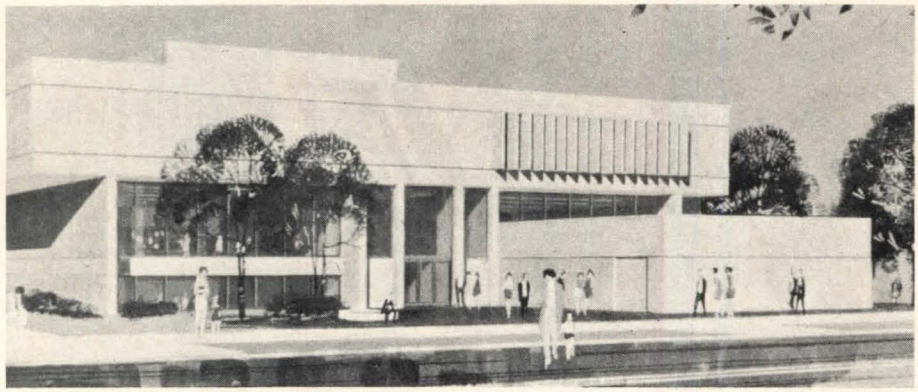
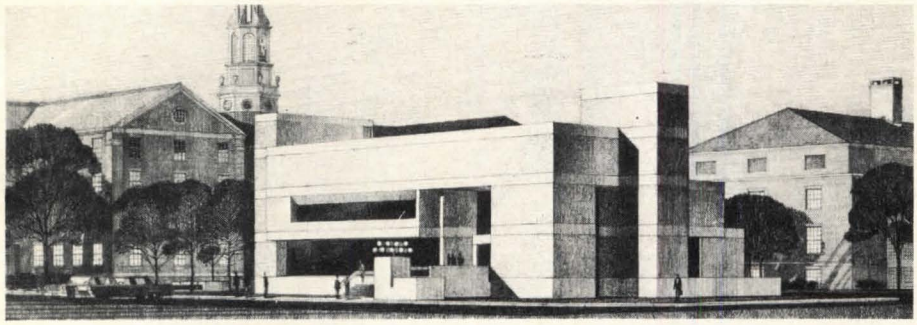
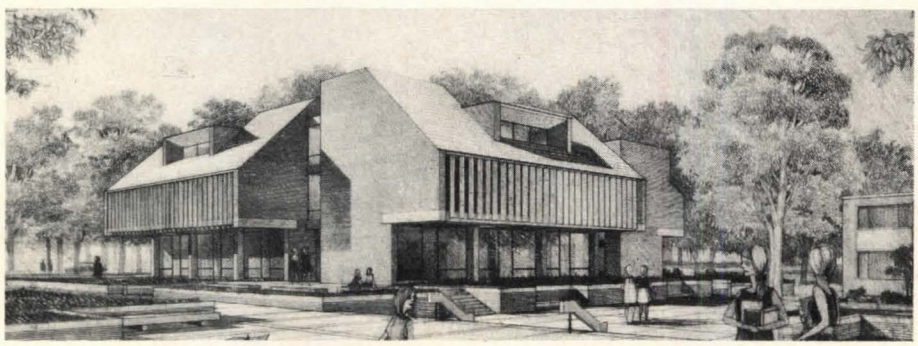
On the Way Up



Monroe County Library, Bloomington, Indiana; **Architect:** R. L. Hartung and the Perkins and Will Partnership; Completion date: 1979; Cost: $1.4 million; Material: concrete.



Harvard Business Review Building, Cambridge, Massachusetts; **Architect:** Kubitz and Pepi; Completion date: November 1969; Cost: $1 million; Materials: poured in place light buff concrete with solar bronze glass window recesses.



Our Lady of the Elms College Library, Chicopee, Massachusetts; **Architect:** Carroll and Greenfield and Dober, Paddock, Upton; Completion date: 1969; Cost $1.8 million; Materials: brick and poured in place concrete.

Simmons College *Science Building,* Boston, Massachusetts; **Architect:** Campbell, Aldrich and Nulty; Completion date: 1971; Cost: $4.5 million; Materials: concrete frame with coffered concrete ceiling; long span post-tension concrete floors.

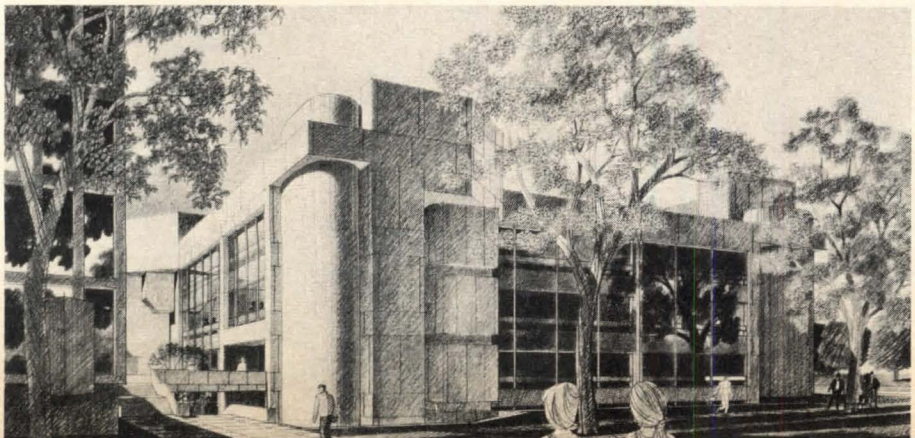
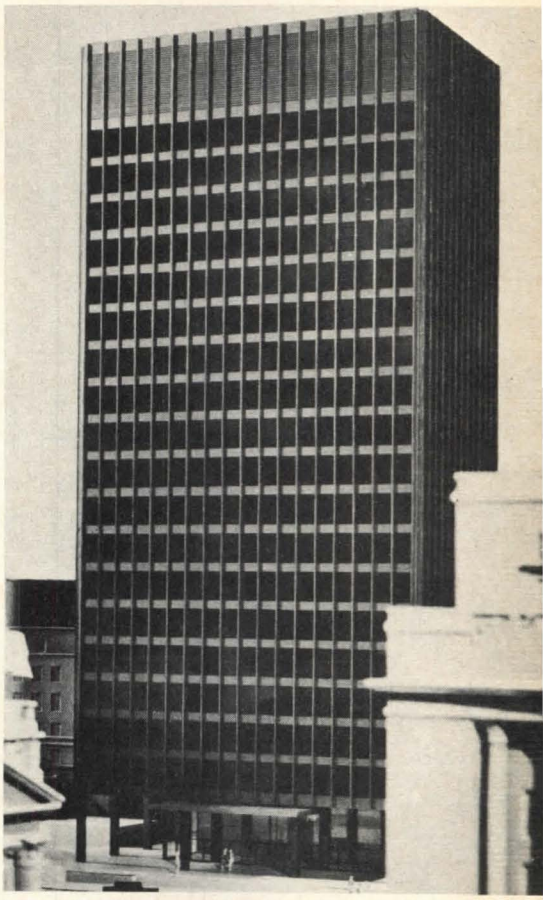


Photo: John Donat



New City Square and Office Tower, London, England; **Architect:** Mies van der Rohe and William Holford and Partners; Completion date: 1974; Materials: steel and glass.

Boston Gas Company, Boston, Massachusetts; **Architect:** John Carl Warnecke and Associates and Emery Roth & Sons; Completion date: 1971; Cost: $25 million; Materials: granite stone with solar glass windows.

Time & Life Building, Chicago, Illinois
600,000 sq ft of Ceco Steeldome services
Harry Weese & Associates, architects-engineers
James Rudeman, structural engineer
Turner Construction Company, contractor

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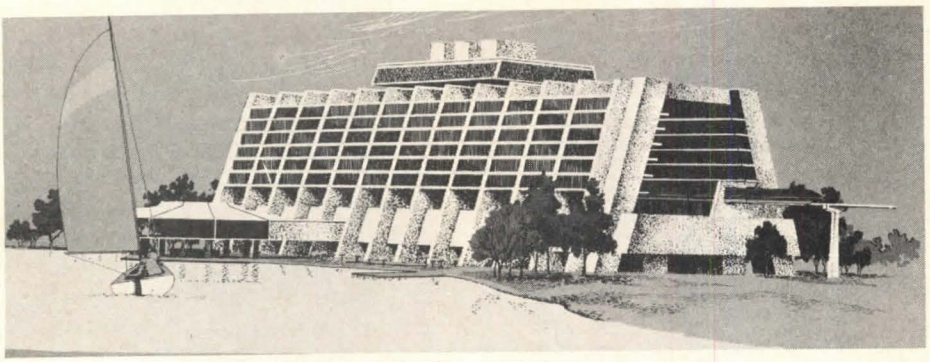


Photo: Walt Disney Productions

750-room convention hotel in the Walt Disney World.

Disney in Florida

Amid the flat orange-grove lands of central Florida, site preparations on 2500 acres of swamp land are nearing completion outside Orlando. The parcel, a fraction of Walt Disney World's total 27,000 acres, will accommodate Phase One of a bigger and grander Disneyland of the east — the "Vacation Kingdom of the World" that expects to see 8 million visitors in its first year of operation, beginning October 1971.

The water-oriented complex will be built around a dying lake that is being reshaped, dredged, lined with clean sand and filled with fresh water. Five "theme" hotels are expected to attract large numbers of vacationers to the so-called "destination resort." Phase One calls for completion of two hotels and an entertainment-recreation "Magic Kingdom." Thunder Mesa ("a spectacular panorama of the old west"), Space Mountain ("the world of the future"), the Mickey Mouse Musical Revue performing to such Disney favorites as "Zip-A-Dee-Doo-Dah," and many, many more attractions have been conceived and planned for the delectation of the international tourist by the "imagineering" staff at WED Enterprises, the design and showmanship subsidiary of Walt Disney Productions.

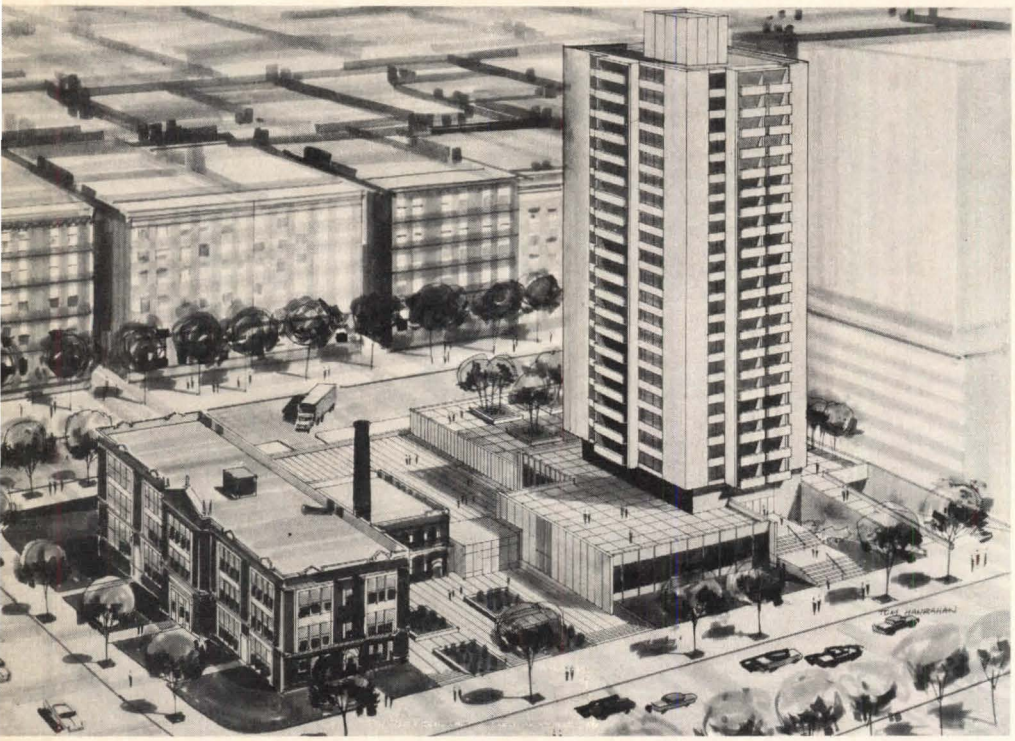
In answer to questions concerning Experimental Prototype Community of Tomorrow (EPCOT), (p. 158 MAY 1969 P/A) the industrial-residential community that was the brainchild of Walt Disney himself, company spokesman were vague. Although it is scheduled for an indefinite Phase Two, there are "no definite plans at the moment." Some observers feel, however, that the entertainment park is planned as a money-maker that will eventually help finance EPCOT.

Welton Becket & Associates are designing the hotels, which will offer a total of 4000 rooms. In planning with the client, the architects decided on a steel-frame prefab system. Steel-frame boxes, or rooms, will be plugged into a steel structural frame and suspended in stacks of three. Thus, one box will be capable of supporting two boxes above it. Rooms will be hoisted into place completely furnished and equipped with a pre-assembled bathroom, ready for use except for connecting utilities. Sound insulation will be supplemented by an air space between units.

Weight estimates are 6 tons per box, which, according to U.S. Steel, contrasts with 30 tons for modular hotel rooms that have been built using "other construction materials." Generous room dimensions of 29′ x 14′-4″ are aimed at the family trade and will sleep a family of five. Prenegotiated labor agreements, conducted on both national and local levels, were undoubtedly hastened along by the fact that units will be prefabbed on-site, using the building trades rather than assembly-line labor. The Realty Development Division of U.S. Steel will build and lease the hotels to Walt Disney Hotel Co., which will operate them; the first of which is shown in the photo.

Awards

R. S. Reynolds Metals Company has announced the winners of the **Reynolds Aluminum Prize for Architectural Students.** First prize, $5000 to be shared by student and his school, went to Gerald D. Runkle of Ohio State University; two Honorable Mention gifts were received by Hal M. Moseley, Jr., Cranbrook Academy of Art and Mark W. Vande of M.I.T. . . . A $20,000 Fellowship sponsored by **American Metal Climax, Inc.,** N.Y.C., and its subsidiary, the Kawneer Co., Inc., Niles, Michigan, for research and graduate studies in architecture was given to Dale Ashley Bryant, a University of Michigan doctoral candidate. . . . The American Academy of Achievements has presented the **Golden Plate Award** to Charles Luckman, architect, for his outstanding service to architectural education. . . . The New York Chapter, AIA, has awarded the annual Arnold W. Brunner $6000 scholarship to Walter H. Kilham, Jr., FAIA. . . . Louis and Henry, Architects & Associates, Louisville, Kentucky, received a merit award in the **1969 Gold Medal Housing Award competition** sponsored by the Southeastern Regional Council of the National Association of Housing and Redevelopment. . . . Winners of the 1969 **Alcoa Student Design Merit Awards** are: Gary L. Rockwell, Auburn University, for underwater propulsion unit for skin and skuba divers; Jeffrey R. Samson, Cranbrook Academy of Art, for mass transportation system; David Bridges, James F. Mathews, and George O. Snook, Illinois Institute of Technology, for movable modular office system. . . . **The Woman's Architectural Auxiliary,** New York Chapter, AIA, has presented equal scholarship amounts to City College of New York, Columbia University, Cooper Union, and Pratt Institute, architectural schools. . . . Winners of the **Annual Royalmetal Student Design Competition** have been announced: Richard A. Richards, $500; Ringo Yung, $300.



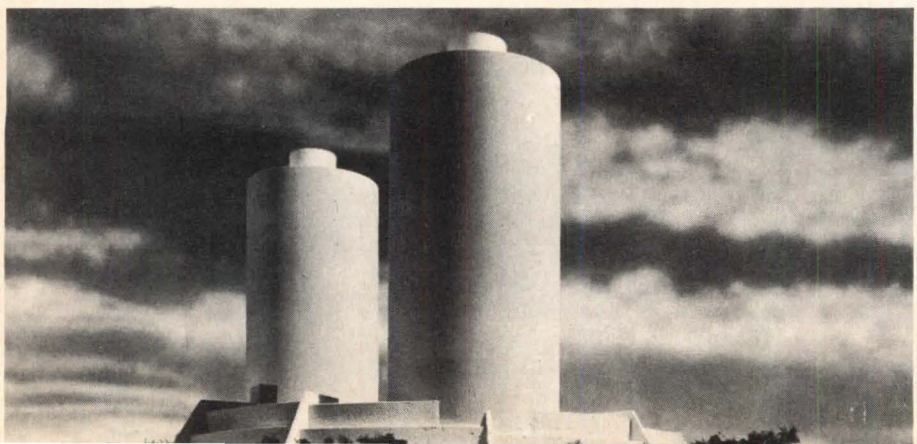
P.S. 99 in Queens had a gymnasium, community center added along with 160 apartments.

Schools for Free

Since its origin in 1966, the New York City Education Construction Fund, a self-supporting, state-created, public benefit organization is responsible for twenty-three multi-use building projects. P.S. 126 and Highbridge house, the first project in the fund's program (already in construction), combines an elementary school for 1,200 children with 400 apartments for middle-income families in the Bronx. Plans for another six projects are already in progress, ten await site selection, and six more await development team selection.

The Fund functions on a revolutionary yet simple principle. The basic idea is to build multi-purpose structures consisting of schools combined with revenue-producing housing and office buildings by the following process: The schools are financed with tax-exempt bonds whose debt service is paid out of income received from the private developers for the leased air rights over the schools, and in lieu of real estate taxes. The city benefits in several ways: first, it obtains a new school without dipping into its strained capital funds; second, it makes maximum use of a site through the dual-use principle; third, tax payments go directly to the city when the school construction bonds are paid off. As a result this scheme provides for schools at an annual $1 paid by the city, and at little or no cost to the taxpayer. If conducted properly, this scheme could, in fact, produce a profit for the city.

A model of a public school with 550 apartments above, by Horowitz and Chun.



The Fund's administrators are bright young men experienced in education, housing, labor, commerce, and finances who, according to Daniel Z. Nelson, Executive Director, want to see things accomplished in their life times. Governing the Fund are nine unsalaried Trustees headed by the President of the Board of Education, John Doar, who is designated by law as Chairman. Four additional members of the Board of Education, appointed by the president, serve the Fund during their terms of office on the Board. The Mayor appoints four Trustees who serve terms set initially at two, three, four or five years. Their successors will serve for five years. These administrators view the Trustee's role as that of a catalyst. They review all new sites selected by the Board of Education to assess their dual-use potential and also search for appropriate sites themselves.

Possible problems such as noise and the necessity for students and apartment house tenants to share recreation areas have been solved brilliantly.

The school recreational facilities, such as tennis courts, playgrounds, and auditoriums, can be used by tenants during non-school hours. Thus the school is actually an asset to them. Architects and builders say that noise will not be a problem as separate entrances and buffer areas between the school and the attached structures will keep each unit's noise confined within its walls. The buildings are, in effect, mutual beneficiaries.

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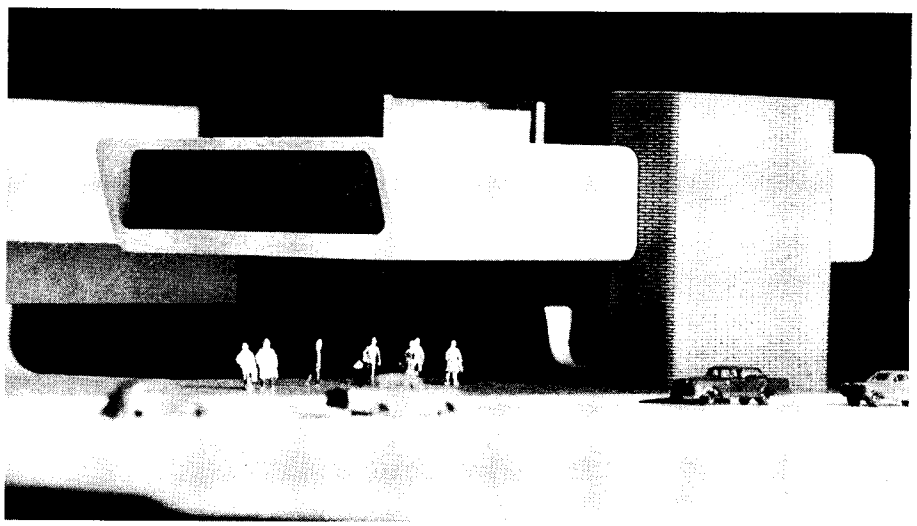


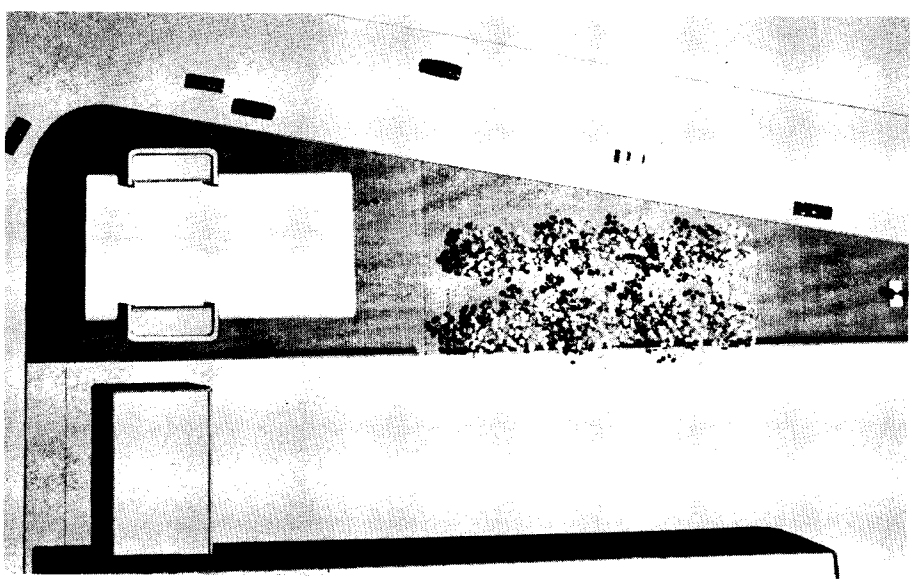
Odd Site for a Library

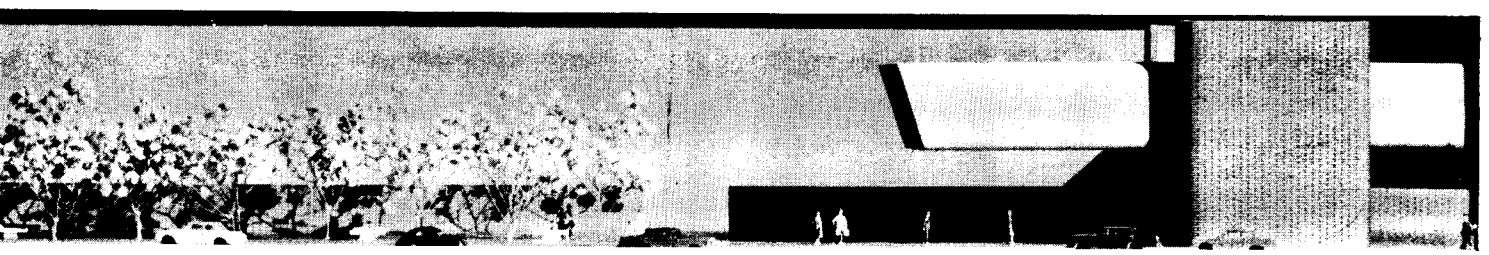
At the corner of 37 Avenue and 21 Street in New York's Borough of Queens is a narrow wedge of land of approximately 32,000 sq. ft., an area of 125′ tapering off to 0′ at 38 Avenue. Remote utilities, heavy truck traffic, automobile junk yards, and weathered and dilapidated factories made this triangular land an unlikely site for development. Architects Raymond & Rado and Partners, when commissioned to design the East River Branch of the Queens Borough Library found their work laid out for them.

The design concept, although appearing radical, is actually a very straightforward solution to the problems presented by this location. The Department of Public Works demanded a building that would allow access to the utilities already in the site area as the cost of relocating utilities in this site is prohibitive. A clear lane over the utilities to a height of 20′ had to be maintained in order to fulfill this requirement.

The site size was also a problem in that it left no opportunity to have the library at ground level as is the usual branch library design. The library, therefore, had to be elevated. Truck traffic on 21 Street is very heavy and the view across the street is junkyards. Consequently, the elevated reading area of the library has its glass area and visibility facing the remainder of the site, (where a small park will be constructed), and will have solid walls facing the noisy street traffic on the other side, insulating the reading rooms from this noise. The walls will be poured reinforced concrete instead of masonry units to provide enough strength to function as cantilevers supporting the main reading units. The supports for this cantilever are made by using, at various levels, stairs, elevators, and lobby and mechanical enclosures as structural elements. These form two towers as is evident in the photos.

The 25,000 volume library is located near a corner of the site so that a feeling of openness is established as people move under the library as they circulate around the park. A small park on the totally brick paved site is expected to encourage people to walk freely all over the site. In the evening, the entire plaza will be brightly illuminated to discourage crime and make the library visible from police patrol cars.





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Highway Planning, Licensing in the Design Profession, and Labor discussed in Congress

BY E. E. HALMOS, JR.

Professional concerns that ranged from highway planning, to licensing procedures, to how to get and keep professional employees were of more interest to architects in the Washington scene in midsummer than was governmental activity.

Congress bickered over taxes and military matters, lauded space activities — and finally took several weeks vacation (to Sept. 3) — without much action significant to the construction industry (except to reach virtual agreement on safety regulation); the President traveled and worried about taxes and social matters.

Architects, for example, ignored the agonized objections of civil engineers and plunged ahead with plans to take a greater hand in the planning of new highways: AIA said it had received a $10,000 grant (from the New York-based Stern Family Fund) to study highway design — and that AIA money would be spent "to advise Congress, government agencies and the public" on highway matters. What AIA wants, of course, is broad federal recognition of the "design team" concept of highway planning (particularly in urban areas) already being tried in Baltimore and Chicago. The thought is not viewed very happily by other design professions, who have resented criticisms implying that they lack aesthetic and social understanding.

In a series of related moves concerning personnel and education, AIA said it would (1) double the number of advanced educational workshops (for "architects and others in the construction industry") to upgrade practice to meet the current building boom (eight sessions will be held instead of four); (2) establish a program to bring disadvantaged young people into the field as qualified, technically-trained personnel through 44-week on-job training programs; (3) along with ASCE, NSPE, CEC, and chemical, mapping and other groups, sponsor a third annual conference (in Chicago, on Dec. 5) of the Joint Committee on Employment Practices, on the subject: "Employer/Employee — A Relationship in Transition." Purpose is to exchange ideas on attracting and retraining men and women in the design professions.

That was not nearly all the professional activity:

The Consulting Engineers Council, for one, appointed a committee to look into the possibility of a merger between CEC, the American Institute of Consulting Engineers, and NSPE's Professional Engineers in Private Practice.

The National Architect-Engineer Liaison Commission (NAELC) voted to ask AIA to hold up further action on a statement on registration and licensing approved by AIA's Board in April. (AIA said that the initial statement — which contained some broad comments on the possibility of licensing the design professions without regard to narrow technical areas — was purely a working paper, not anything near a final position for the organization.)

The Committee on Federal Procurement of Architect-Engineer Services (COFPAES), representing AIA, AICE, NSPE, ASCE and CEC, told both Congress and the Federal Power Commission that government procurement rules must be modified to prevent them from being interpreted to require price competition — bidding — in solicitation of proposals. Among other things, COFPAES would like to see a proposed "Commission on Government Procurement" (which would be created under a bill now before Congress — HR 474) instructed to create a government policy favoring the use of private enterprise in the form of independent consultants, and develop rules for professional negotiation procedures, statutory fee limitations, per diem fees, and the like.

On a more local Washington scale, architects were interested in such things as:

The General Services Administration's decision to "save" the site of Glen Echo amusement park (on the Potomac northwest of the city) from housing developments by "swapping" the now defunct park's 18 acres for the old 10-story former emergency hospital building just up New York Avenue from AIA's famed Octagon headquarters.

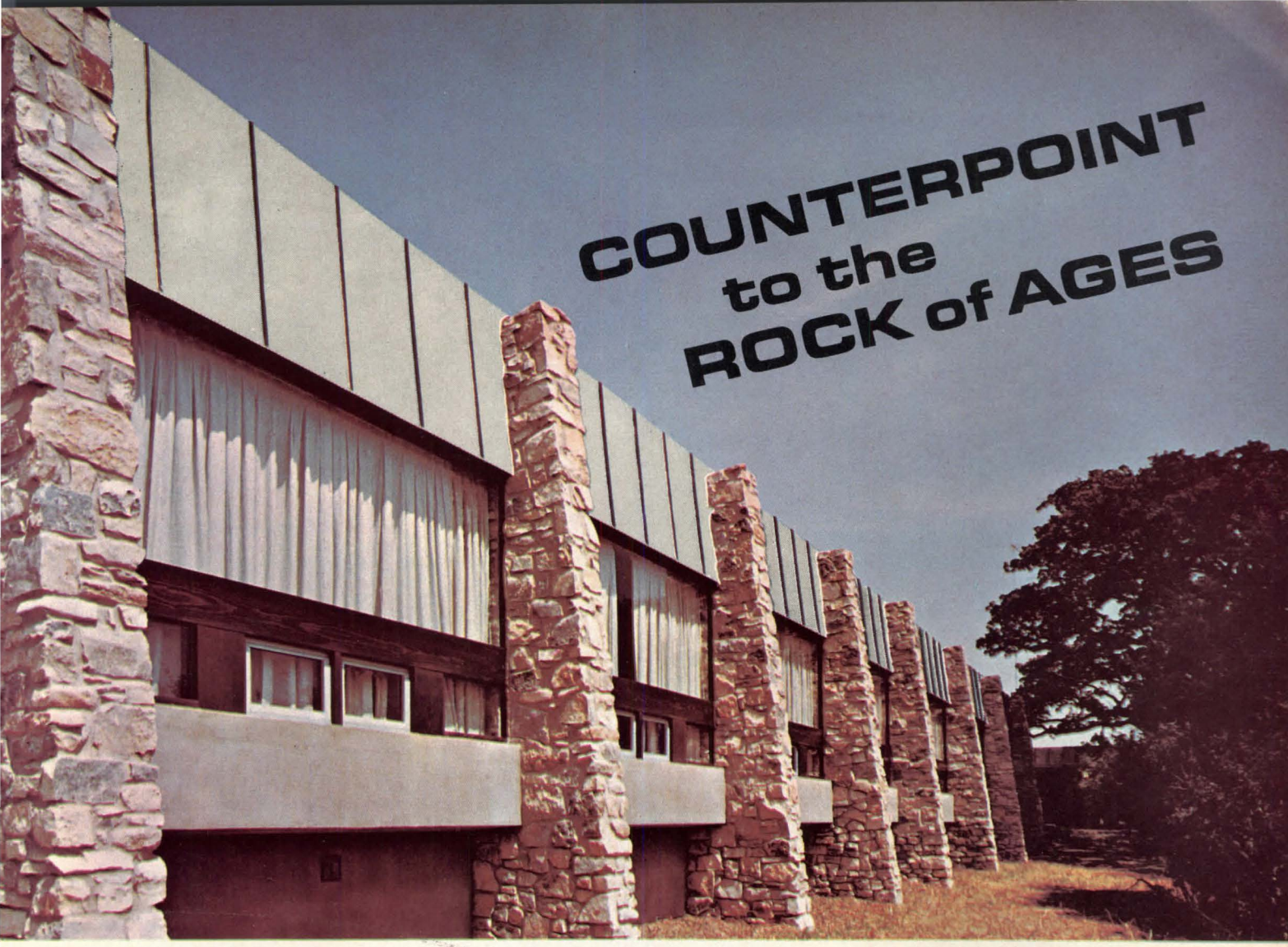
Refusal of the House to approve any money for the President's four-year-old temporary commission on Pennsylvania Avenue — which has been working to create a major redesign of the ceremonial street. Reason: The commission, created by Presidential order, has never been formally authorized by Congress.

A proposal for a steel raft-supported "floating city" for 1,000 to 5,000 residents, to be built in Baltimore harbor. Planned by the Triton Foundation of Cambridge, Mass., the idea was presented to city officials by Architect Shoji Sadoa, who said the 20-story building on the "raft" (to contain housing, schools, recreational facilities) could be built in a shipyard, towed to a permanent mooring.

In other areas of interest, probably most important were two developments affecting labor:

1. The Senate passed its own version of a construction safety act — similar to one already approved by the House (HR 10946), sent it to conference committee to iron out minor differences. Basically, the bill would permit the Secretary of Labor to set up general standards for construction safety, to be applied to all federal

(Continued on page 42)



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TITANALOY THE ARCHITECT'S METAL

P/A
NEWS REPORT

(Continued from page 40)

and federally-aided construction. Contractors, who fear arbitrary actions, succeeded in getting before the Labor Department provisions requiring an advisory board to formulate regulations and review judicial Labor rulings.

2. More than a month of furious negotiations over the Labor Department's "Philadelphia Plan" which seems to require hiring of quotas of "minority group" workers (Negroes, American Indians, Orientals, those with Spanish surnames) in seven mechanical trades in the Philadelphia area, got some results as labor leaders and contractors brought pressure to bear. For one thing, Labor agreed to require that such minority-group workers be qualified for the jobs they were hired to; for another, it backtracked on the original effective date (July 18), with the plea that no new contracts were ready by that time in which the new provisions could be inserted. Contractors feared the result would be added costs, Labor officials grumbled about violations of the U.S. constitution — but all decided to "watch and wait" for enforcement procedures.

3. Congress tried to get at the problem of minority employment in construction another way: A series of three bills (S.2609, 2610, 2611) were aimed at giving special preference to minority-group contractors by permitting them to use "certificates of competency" in lieu of bonds on federal work; giving preference to locally-based contractors in urban renewal areas; raising the size of the job for which bonds are required from $2,000 to $20,000.

FINANCIAL

Construction volume in general continued to slow very slightly, following a three-month trend that indicates the industry has hit at least some sort of a plateau, according to the Census Bureau. In May, for example, total new construction was listed at a seasonally adjusted rate of $91.6 billion — virtually unchanged over the past several months.

At the same time, housing continued to show a slight but steady decline. In June, said Census, housing starts were at an adjusted rate of 1.446 million — down 4 per cent from May when the rate was 1.505 million, and well down from April's 1.563 million pace.

Congress may do something to help the housing market: A bill (S. 2577) would extend for another year the authority of federal agencies to set flexible ceiling on interest paid by financial institutions on time and savings deposits — current law expires at the end of September — and would force interest rates down.

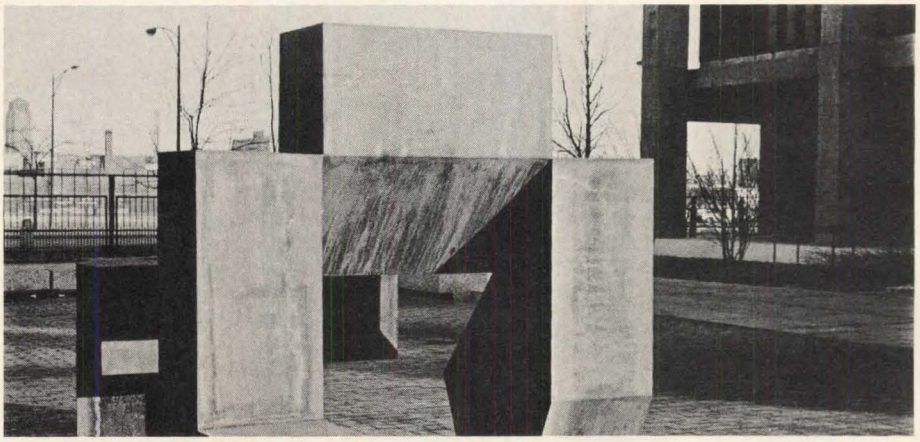
Legislators think that such a drop in interest would send money into the stock market or elsewhere, further curtailing funds available for mortgage lending.

Investment Bankers Association members continued to note the hesitancy with which state and local governments were bringing new public works bond issues to their voters. In the first quarter of the current year, said IBA, a total of just over $1 billion worth of these bonds were presented to taxpayers who approved just a little over half of them. In the same period a year ago, almost $1.6 billion worth of bonds were presented, more than 60 per cent were okayed.

Mies Dies

Ludwig Mies van der Rohe, who with Wright, Le Corbusier, and Gropius, steered the helm of the modern movement, died in Chicago on August 17. His death. following so closely upon that of his great colleague, Walter Gropius, seemed to mark the end of an era.

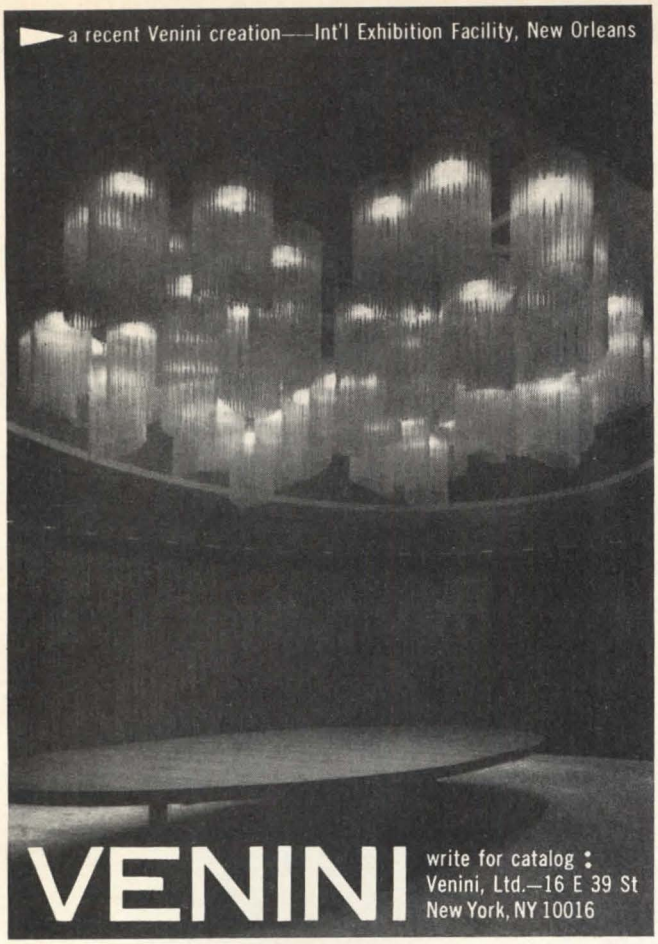
P/A is planning an article on Mies' life and achievements, to be run in a later issue.



'Blue Cinnamon' Used in Sculpture

New vistas are being opened in sculpture by the dramatic appearance of a new material known as Cor-Ten steel, one of the few man-made materials that grows more handsome with age. Cor-Ten's champion is a young sculpture, Jerald Jackard, Assistant Professor of Art, Chicago Circle at the University of Illinois. Jackard states that Cor-Ten "is probably the most versatile in case of formability and casting, and has the workability and strength of steel, and the permanence of bronze — and, I am attracted to its color. This is the first time in history that man has had this natural color in sculpture." After exposure to weather Cor-Ten is a dark bluish, reddish brown.

Economy is another point in Cor-Ten's favor; it only takes $200 to get a seven-foot piece of the steel. In addition, the finishing time for sculptors is markedly reduced because Cor-Ten needs no protection.



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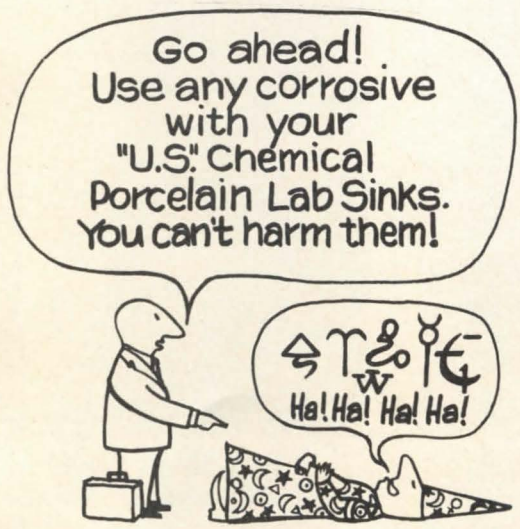

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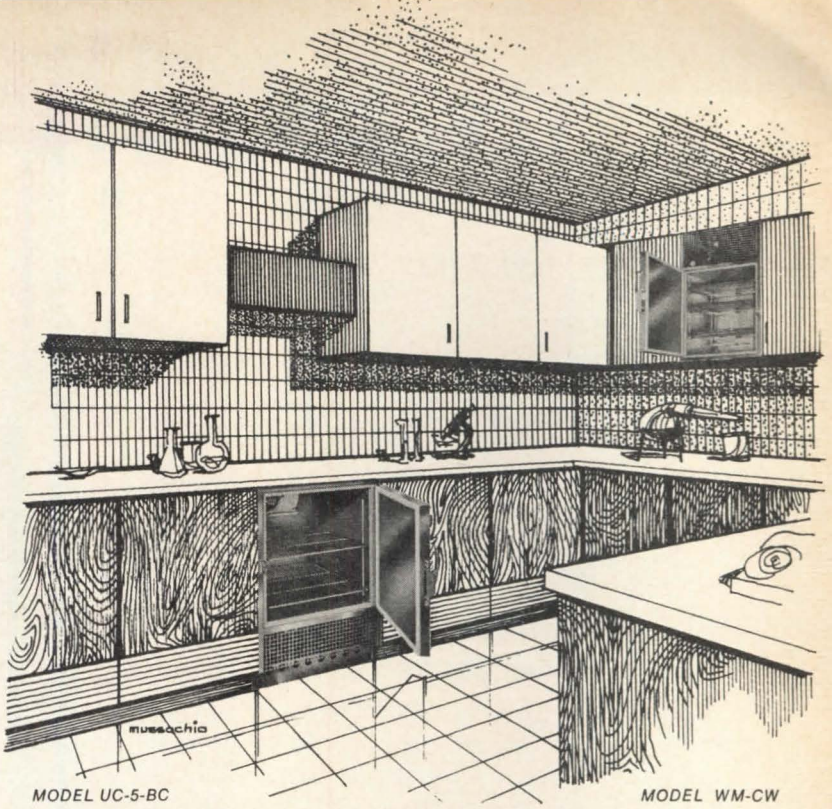

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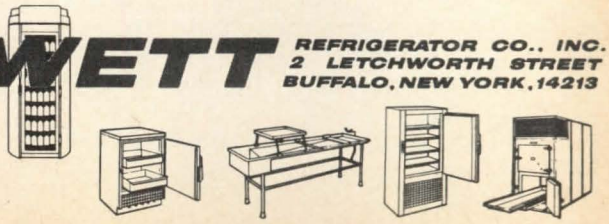

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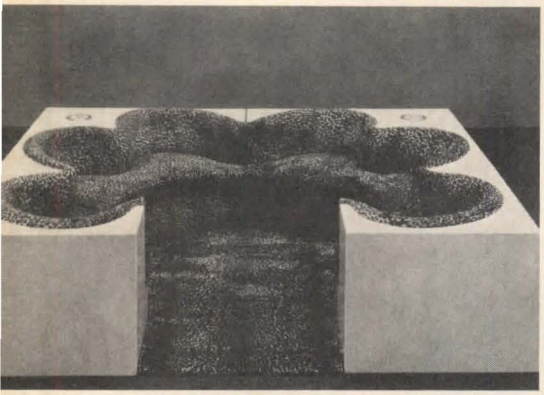

Fiberglas Sections and Three-legged Tables

A seating group called SAFARI is composed of one-and two-seater units which form a square on the outside and leave in the center a "keyhole" design which is covered by a rug of the same fabric as the upholstered sections. Frame is of white fiberglas covered with either "wet" vinyl, wool military cloth, synthetic leopard, or natural, black or orange/red Italian leather. The CARLA table is comprised of three pie-shaped wedges fastened together to form a round table that stands on three legs. CARLA three-legged dining armchairs further the theme. Rosewood, or red, white, beige, or black lacquer finish. Stendig Inc., 410 E. 62nd St., New York, N. Y. 10021.

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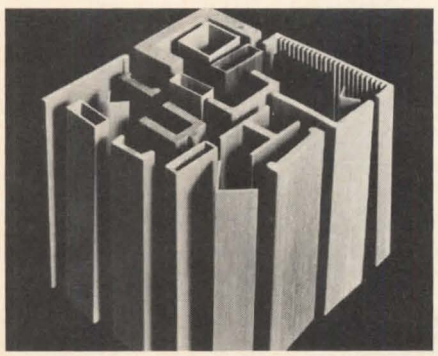

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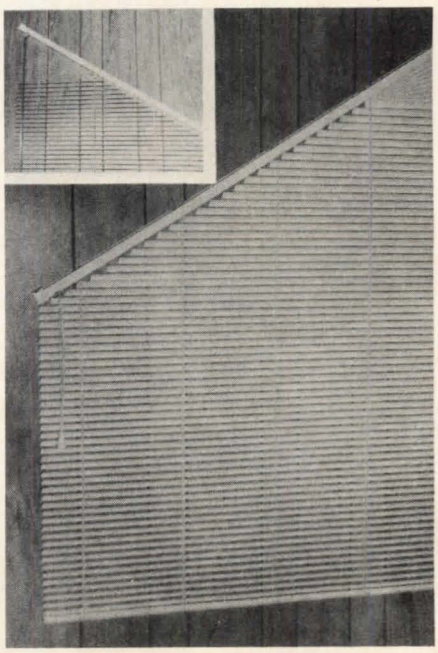

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(More products on page 49)

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Pile Ht.—⅛″ or .125
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Primary backing—4 oz. 100% non-woven polypropylene
Passes ASTM E-84 flame spread test on jute back

Secondary Backings
(wt. per sq. yard)

1. 40 oz. high density rubber
2. 9 oz. jute
3. 60 oz. vinyl for indoor-outdoor

For samples and information on Universal Vanguard, write:
Universal Carpets, Inc.
Department A, Ellijay, Georgia 30540

NAME_____

COMPANY_____

ADDRESS_____

CITY_____

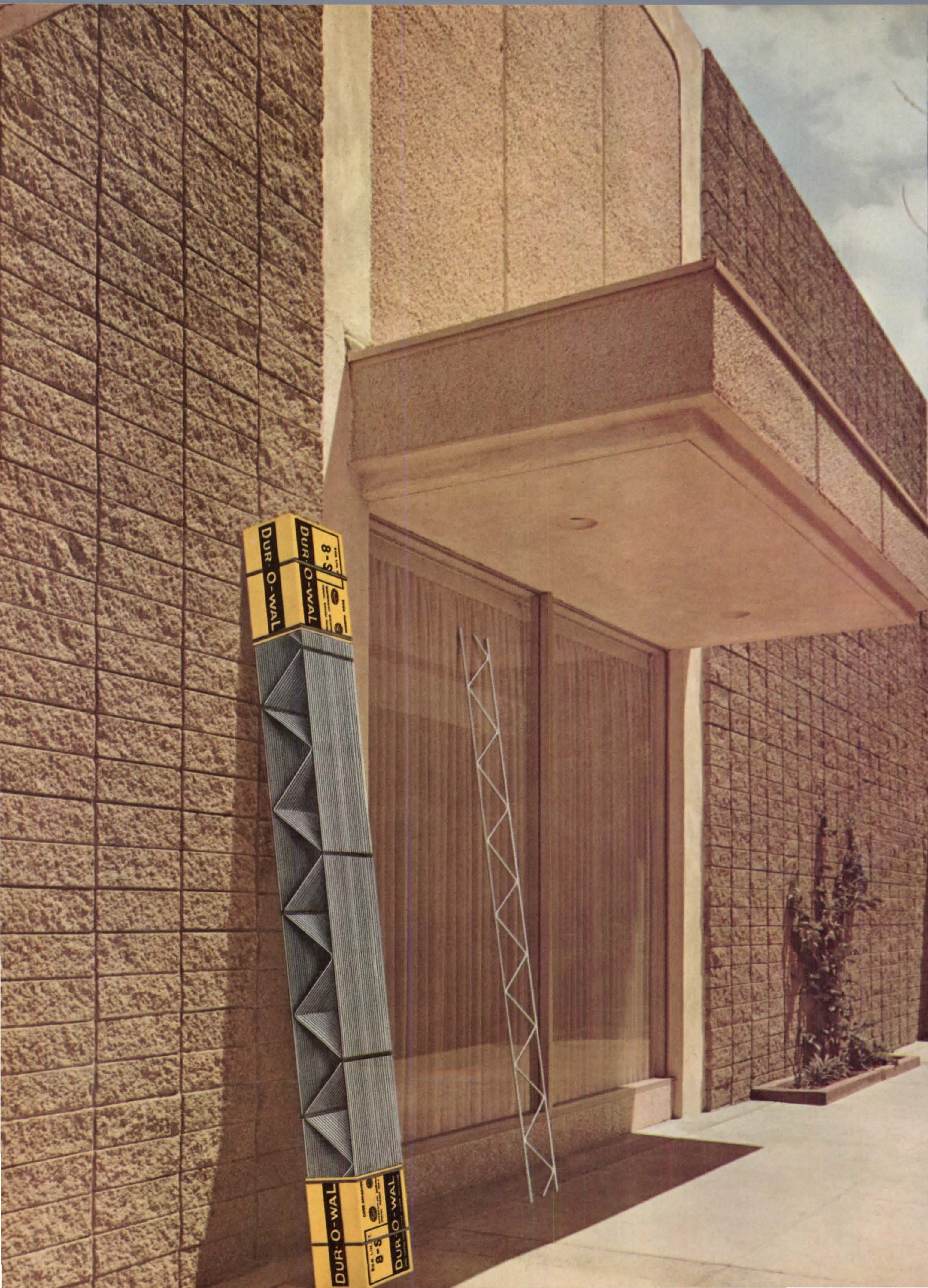
STATE_____ ZIP_____

ENJAY

Vectra® olefin fiber is manufactured by Enjay Fibers and Laminates Company, Odenton, Maryland, a division of Enjay Chemical Company. Odenton: (301) WO 9-9000. New York: 350 Fifth Avenue (212) LO 3-0720. Atlanta: 225 Peachtree Street, N.E. (404) 688-4250. Enjay makes fiber, not carpets.

Vectra . . . the fiber that believes resistance is still a virtue.

On Readers' Service Card, Circle No. 354


DUR-O-WAL
8-S
DUR-O-WAL

Take out a life insurance policy for beautiful masonry walls

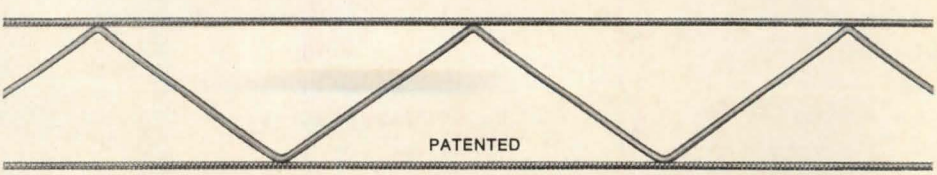
Specify Dur-O-waL® Truss masonry wall reinforcement

Masonry walls are more beautiful, more versatile than ever. And more numerous. Close to 700 million dollars' worth this year. That's a lot of masonry walls. And you can protect nearly every one of them with a Dur-O-waL "life insurance" policy.

All kinds of walls, too—single wythe, cavity or composite. Dur-O-waL Truss not only controls cracking, but also ties wythes in cavity and composite walls. All this from one product.

Dur-O-waL stands back of the policy with material approvals from many national and local code organizations.

Specify the original. Specify the best. Take out a Dur-O-waL life insurance policy on masonry walls. Need evidence? Write Dur-O-waL, P.O. Box 368, Cedar Rapids, Iowa 52406.

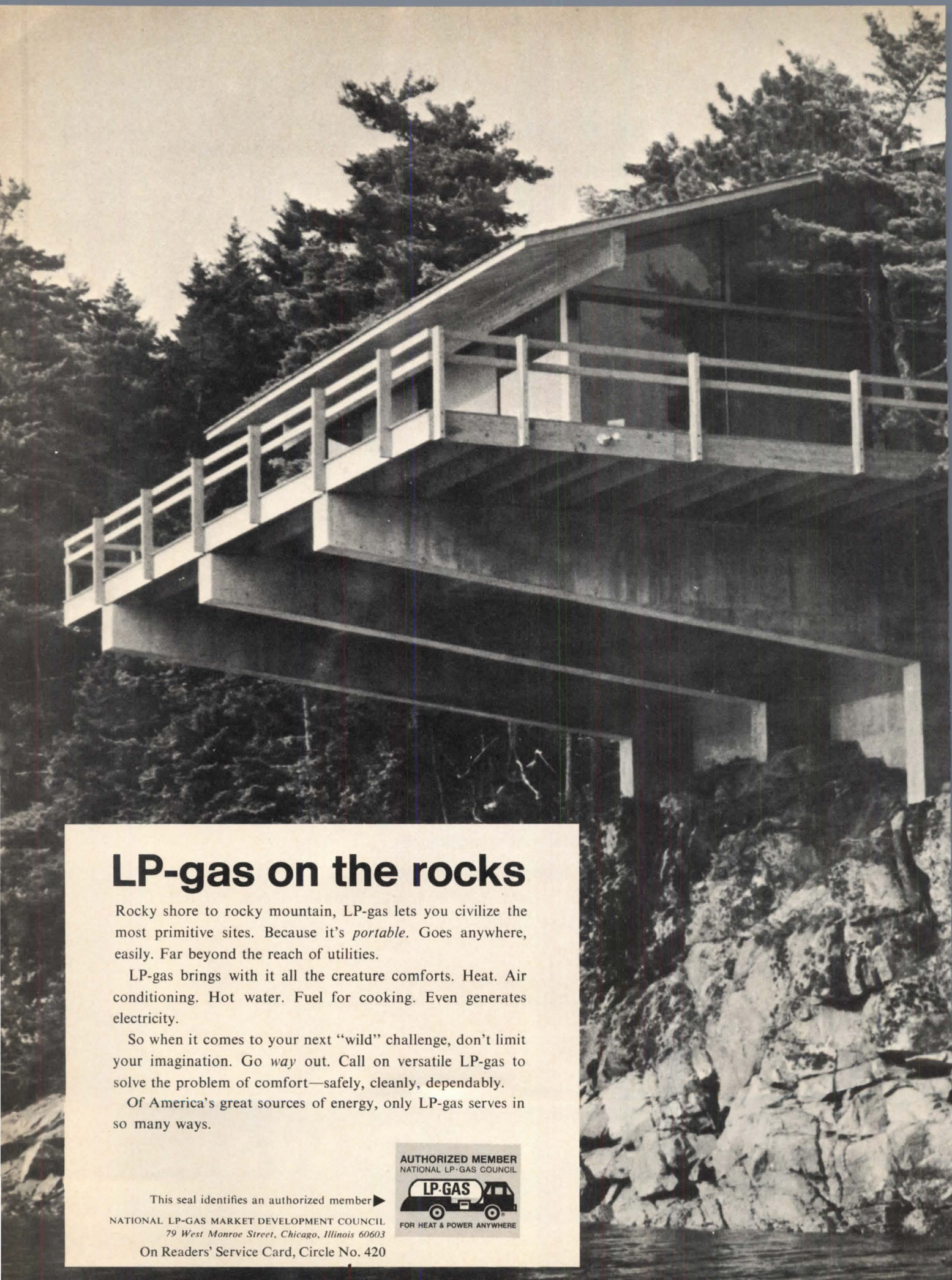


DUR-O-WAL®

THE ORIGINAL MASONRY WALL REINFORCEMENT WITH THE TRUSS DESIGN

DUR-O-WAL MANUFACTURING PLANTS • Cedar Rapids, Iowa, P.O. Box 368 • Syracuse, N. Y., P.O. Box 628 • Baltimore, Md., 4500 E. Lombard St. • Birmingham, Ala., P.O. Box 5446 • Aurora, Ill., 625 Crane St. • Pueblo, Colo., 29th and Court St. • Toledo, Ohio, 1678 Norwood Ave. • Mesa, Ariz., 213 So. Alma School Rd. • Seattle, Wash., 3310 Wallingford Ave. • Minneapolis, Minn., 2653 37th Ave. So. • Also manufactured in Canada.

On Readers' Service Card, Circle No. 347



LP-gas on the rocks

Rocky shore to rocky mountain, LP-gas lets you civilize the most primitive sites. Because it's *portable*. Goes anywhere, easily. Far beyond the reach of utilities.

LP-gas brings with it all the creature comforts. Heat. Air conditioning. Hot water. Fuel for cooking. Even generates electricity.

So when it comes to your next "wild" challenge, don't limit your imagination. Go *way* out. Call on versatile LP-gas to solve the problem of comfort—safely, cleanly, dependably.

Of America's great sources of energy, only LP-gas serves in so many ways.

AUTHORIZED MEMBER
NATIONAL LP-GAS COUNCIL
LP-GAS
FOR HEAT & POWER ANYWHERE

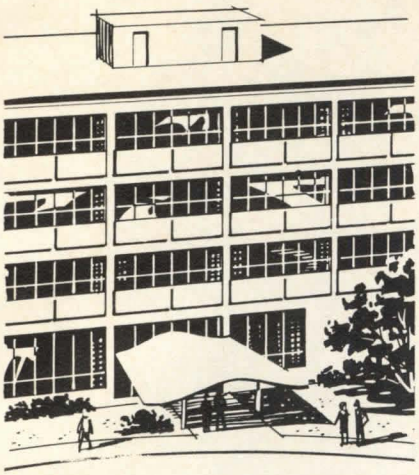
This seal identifies an authorized member ▶

NATIONAL LP-GAS MARKET DEVELOPMENT COUNCIL
79 West Monroe Street, Chicago, Illinois 60603

On Readers' Service Card, Circle No. 420

ARCHITECT: JOSEPH B. THOMAS

Stauffer vinyl wallcoverings are in...



Saddle Brook General Hospital

New Saddle Brook General Hospital specified Stauffer vinyl wallcoverings throughout...for cheerful beauty and long wear. Easy care, too...just wipe clean with a sudsy sponge. And great resistance to stains and fading.

PERMON®—in Wexford, Corteza and Samar designs—went into patient rooms and corridors. Offices and other areas were decorated with FABRON® in Jaspé, Strié, Moresque and Yuma patterns.

See Stauffer vinyl wallcoverings at our showroom, Decoration and Design Building, 979 Third Avenue, New York. Or at the Chicago Merchandise Mart. Or write to Stauffer Chemical Company, Decorative Interior Products at the D & D Building. PERMON and FABRON are quality products of Stauffer Chemical Company, 299 Park Avenue, New York, N.Y. 10017.

Stauffer CHEMICALS

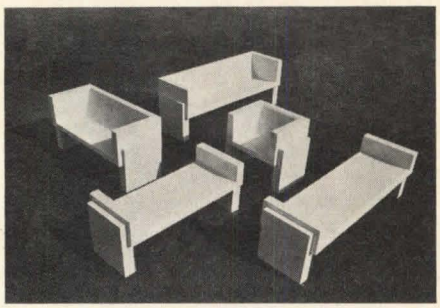
Saddle Brook General Hospital
Saddle Brook, N.J.
Interior Designer: Mrs. Lucy McSpirit
Architect: Martin, Gebhardt & Di Paola

STAUFFER'S MARK FOR QUALITY VINYLS

On Readers' Service Card, Circle No. 402

PRODUCTS

(Continued from page 44)



Concrete Furniture

Concrete furniture, called Benchmark, features interlocking and interchangeable components to provide maximum flexibility. Includes planters, and single, double, and triple seats with or without backs. Concrete can be controlled to match or contrast with the building treatment. Letterhead request. Director of New Development, Random Industries, Inc., Farmington, Conn. 06032.
Circle 105, Readers' Service Card

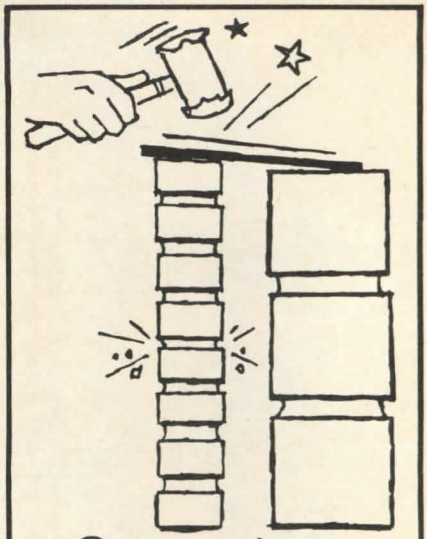
Swivel Mini-Lights

Miniature R Swivel lights are particularly useful for high intensity lighting of limited spaces, such as under shelves, in windows, etc. Individual swivel sockets are mounted along a linear channel at 4″ intervals. Channels are available in 1′, 2′, 3′, and 4′ lengths, with three lampholders per running foot of channel. A fully enclosed switch and fused step-down transformer is provided with 3-wire grounding linecord and plug. Lamps are 12-volt R-14 reflector spots with 2000 hr. life, available in 15 and 25 watts. Lighting Services, Inc., 77 Park Ave., New York, N.Y. 10016.
Circle 106, Readers' Service Card

Vinyl Cove Base

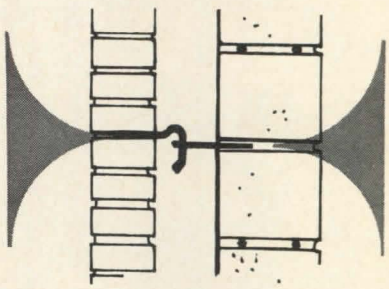
Manufacturer introduces a line of vinyl cove bases available in a variety of solid and woodgrain colors in 4″ and 2½″ heights, 48″ lengths, and .080″ gage. Outside corners are available (inside corners may be formed from the flexible bases) as well as the manufacturer's cove base adhesive. Asrock Floor Products, P. O. Box 531, San Antonio, Tex. 78206.
Circle 107, Readers' Service Card

(More products on page 51)



Save time and money with

DUR-O-WAL® ADJUSTABLE WALL TIES*

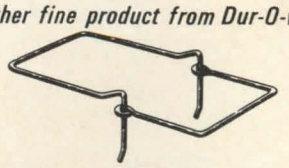


Advantages?

- Solves coursing problems
- Anchors rigid insulation
- Makes parging and waterproofing easier
- Permits construction of one wythe ahead of other

* Patented

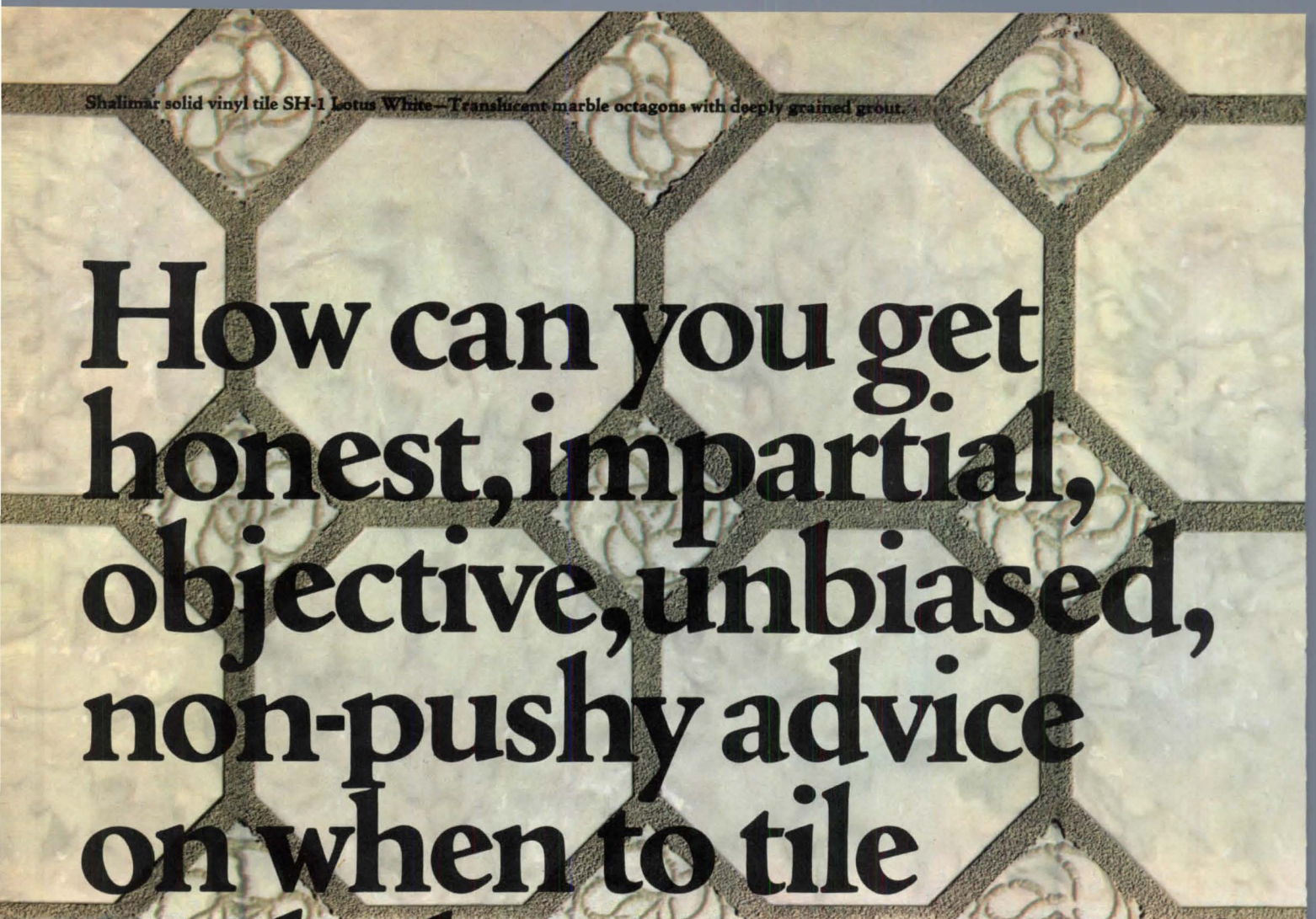
Another fine product from Dur-O-wal



More information? Gladly. Write
Dur-O-wal National, Inc.
P.O. Box 368, Cedar Rapids, Iowa 52406

DUR-O-WAL®
THE ORIGINAL MASONRY WALL REINFORCEMENT WITH THE TRUSS DESIGN

On Readers' Service Card, Circle No. 348



Shalimar solid vinyl tile SH-1 Lotus White—Translucent marble octagons with deeply grained grout.

How can you get honest, impartial, objective, unbiased, non-pushy advice on when to tile and when to carpet?

Ask the company that makes both.

Makes sense, right? If you ask a carpet company, or a vinyl tile company, you'll get only one side of the answer. We're both. So we'll give you both sides. And tell you which side makes *better* sense for your requirements—and why. For color folio and name of Amtico representative, call or write us at Amtico Flooring Division, American Biltrite Rubber Co., Inc., Trenton, N.J. 08607.

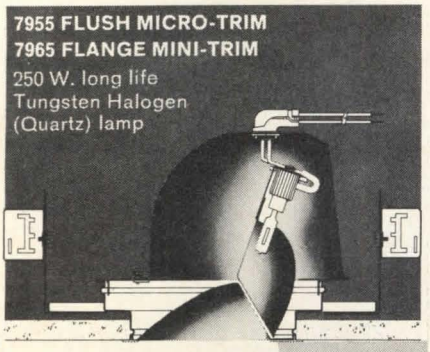
AMTICO®

Fashion Leader in Vinyl and Carpet

Rutherglen 2010 Jewel Green—Fine tufted commercial grade carpet in Dow Badische Zefkrome® acrylic.

DOW BADISCHE

through this
ceiling aperture
THOUSANDS OF LUMENS
light the wall below
evenly . . .
from top to bottom



optica
Pat. Pending

New from Century—**OPTICA,** the wallwasher that yields efficiency levels and smoothness of field unprecedented in the lighting industry ▪ A masterly play of scientifically shaped reflectors redirects the output of a tiny powerful Tungsten Halogen lamp through a dark specular aperture—Brightness values are unmeasurable even at acute viewing angles—and OPTICA wallwashers do not forget a single inch, from ceiling line to floor ▪ It could only come from Century—where the newness of a product stands on advanced thinking, on total approach to design and on Century's expertise in sophisticated dramatic *lighting* applied to architecture ▪ **OPTICA** wallwashers show why, when it comes to lighting...

CENTURY is always a step ahead.

CENTURY LIGHTING

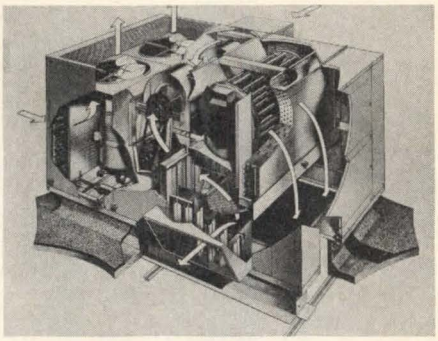
LCA
LIGHTING CORPORATION OF AMERICA

3 ENTIN ROAD, CLIFTON, N.J. 07014
5432 W. 102 ST., LOS ANGELES, CAL.
P. O. BOX 185, REXDALE, ONTARIO

On Readers' Service Card, Circle No. 340

PRODUCTS

(Continued from page 49)



Oil Heating/Electric Cooling

Oil heating and electric cooling rooftop unit in a single factory-assembled package is for single zone, light and heavy commercial applications. Air-cooled direct expansion cooling ranges from 7½ to 22 nominal ton sizes (either bottom or end handling of conditioning air). Oil-fired heating inputs range from 244,000 Btuh to 490,000 Btuh. Separate adapter slides into place when using a combination ceiling supply and return. Corporation Public Relations Dept., Lennox Industries Inc., 200 S. 12th Ave., Marshalltown, Iowa 50158.

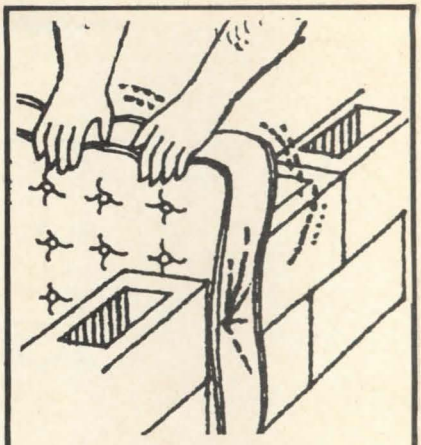
Circle 108, Readers' Service Card

Fastening System for Concrete

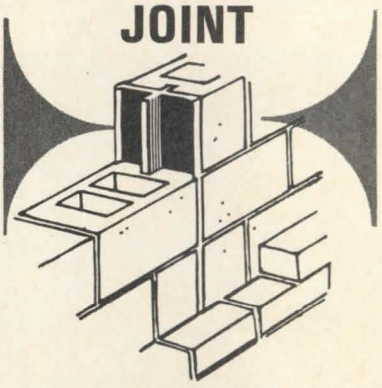
System 505 makes fastening to concrete as easy as fastening to metal or wood. It consists of a fastening plate and self-drilling fasteners. The fastening plate, made of hot dipped galvanized metal, is a pre-pour insert. In continuous form the plate provides a fastening surface in lengths up to 40 ft. The self-drilling fasteners incorporate a metal drilling point with a threaded screw that drills, taps, and fastens in one quick operation. Fasteners can be driven anywhere along the fastening plate, thus eliminating job-site alignment problems. Plate provides reinforcing strength because it has both vertical and lateral dimensions and more steel per inch than a number 3 rebar. Many other advantages. BUILDEX Division of Illinois Tool Works Inc., 801 N. Hilltop Dr., Itasca, Ill. 60143.

Circle 109, Readers' Service Card

(More products on page 53)



Do it the
Easy way with
DUR-O-WAL®
RAPID® CONTROL
JOINT



Advantages?

- Stress relief for masonry walls.
- Easy installation.
- Shear strength provides lateral stability.
- Types:

No. 8. Wide Flange* (with neoprene compound edge) for 8″ or wider walls.

No. 6 Wide Flange* (with neoprene compound edge) for 6″ walls only.

Regular for all wall sizes.

Another fine product from Dur-O-wal

WIDE FLANGE * (Patented) REGULAR

More information? Gladly. Write
Dur-O-wal National, Inc.,
P. O. Box 368, Cedar Rapids, Iowa 52406

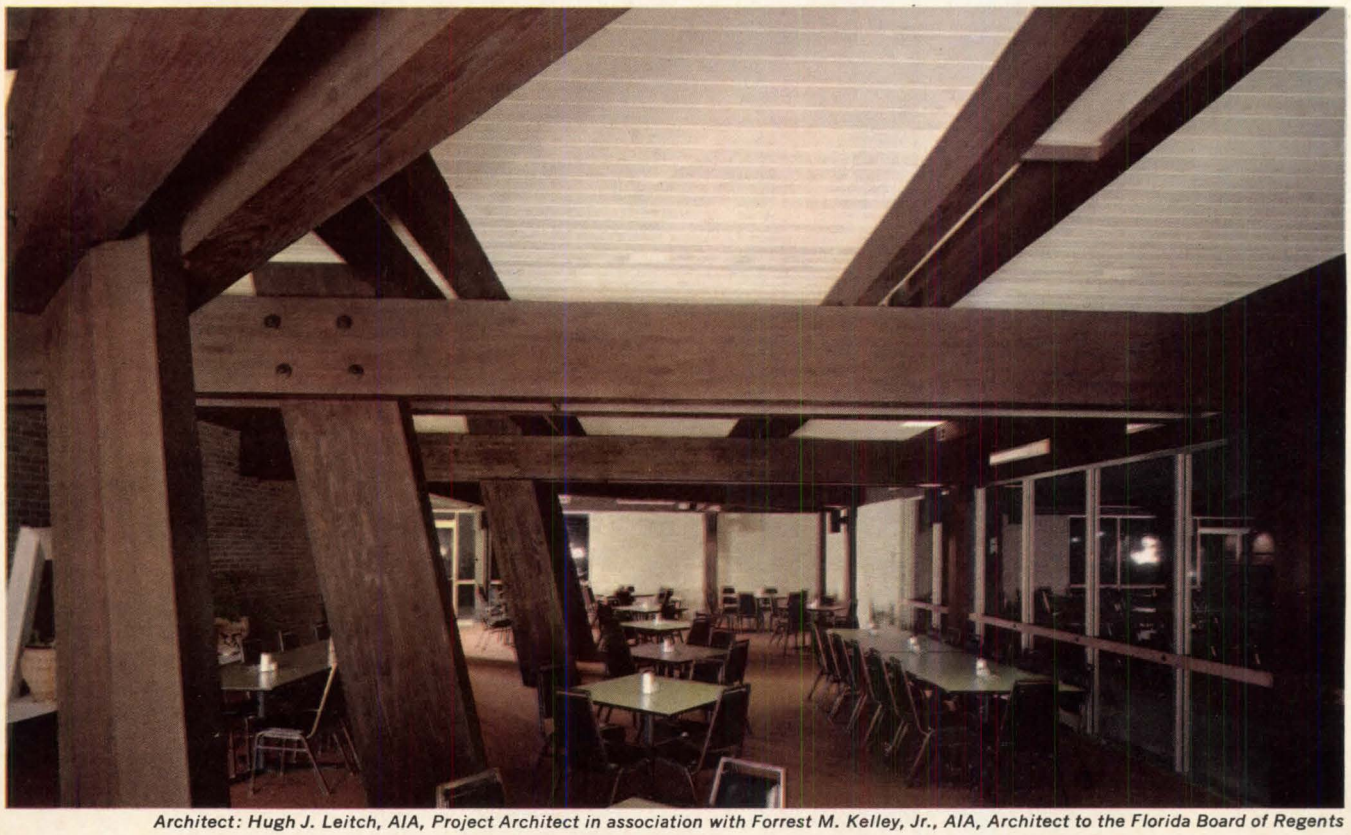
DUR-O-WAL®
THE ORIGINAL MASONRY WALL REINFORCEMENT WITH THE TRUSS DESIGN

On Readers' Service Card, Circle No. 349

On Readers' Service Card, Circle No. 323

Strength and beauty of the forest

...engineered Southern Pine



Architect: Hugh J. Leitch, AIA, Project Architect in association with Forrest M. Kelley, Jr., AIA, Architect to the Florida Board of Regents

The students at West Florida University study in unique surroundings which reflect the versatility, economy and strength of Southern Pine for engineered timber structures. □ In this ultra-modern food, health and study complex, laminated arches of Southern Pine and wood roof decking impart a massive air of permanence combined with a congenial environment. □ For an illustrated case history on this building, write: Southern Pine Association, P. O. Box 52468, New Orleans, La. 70150.

Specify Southern Pine

AS PRODUCED BY THE MEMBER MILLS OF THE SOUTHERN PINE ASSOCIATION

ONE OF A SERIES PRESENTED BY THE AMERICAN WOOD COUNCIL

NOALA®... The sound control system that rises to every noisy occasion.

When passenger areas are quiet, NOALA whispers. But when crowds roar or jets take off, NOALA shouts loud enough to be understood.

Automatically. Electronically.

NOALA stands for Noise Operated Automatic Level Adjustment. An Altec-patented variable volume control system that compensates instantly for varying ambient noise levels.

We think it's the greatest improvement in airport paging systems since airports started using paging systems.

We also make multipurpose systems to handle paging, announcing, music, emergency warning, pocket type "radio" paging system, and special purpose communications.

Altec airport systems are the knowledgeable choice for new projects. They're also compatible with existing installations scheduled for improvement or expansion.

Send for our comprehensive Airport Sound Systems brochure. Or for more detailed technical data and specifications, contact the man who knows: your nearest authorized Altec Sound Contractor. He's in the Yellow Pages under "Sound Systems."

ALTEC LANSING

A Quality Company of LTV Ling Altec, Inc.
1515 S. Manchester Ave., Anaheim, Calif. 92803

ALTEC LANSING, DEPT. PA-9
1515 S. Manchester Ave.
Anaheim, Calif. 92803
Please send me your brochure on Airport Sound Systems.

Name_____
Street_____
City_____
State_____ Zip_____

On Readers' Service Card, Circle No. 436

PRODUCTS

(Continued from page 51)

Aluminum fascia system

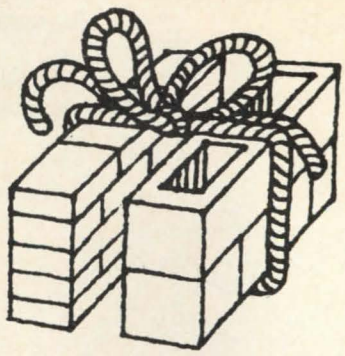
An aluminum fascia panel system named "Modu-Line" is intended for mansard and vertical installations. Modular spacings may be from 4" to 24", in Kalcolor baked enamel or Fluropon finishes. Fasteners are concealed under lock-on battens that are available in V, square, rectangular and half-round shapes. Extruded sills, formed head closures, fasteners and corner members complete the system. W. P. Hickman Co., 2520 Industrial Row, Troy, Mich. 48084
Circle 110, Readers' Service Card

Spark Ignition Pilot Lighter

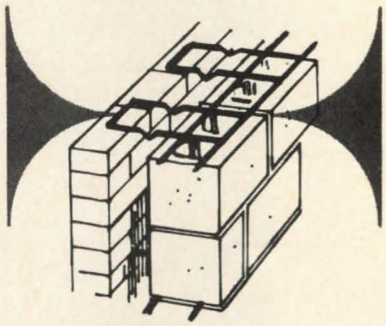
Spark ignition system provides ignition and reignition for gas pilot burners. When the pilot flame is established, the spark ceases — if the flame goes out, the spark starts again and continues til the flame is re-established. Requires no change to existing pilot safety circuits. Available in 120 or 240 VAC units. Energy Engineering, 4667 E. Belmont, Fresno, Calif. 93702.
Circle 111, Readers' Service Card

Panic Button for Educators

Campus rioting ranging from college through high school level and the need for instructor and student safety has prompted the "Random Access" System. The system is a complete operating school intercom, sound program retrieval system, and signaling system. It features an emergency button that sets off a pulsating tone signal to alert the administrative offices and identify the classroom. Administrative personnel can communicate with classrooms, and conference calls among several rooms can take place simultaneously. All stations are protected against eavesdropping with a light signal and a repeating tone signal. Advertising Dept., Altec Lansing, a division of LTV Ling Altec., Inc., 1515 S. Manchester Ave., Anaheim, Calif. 92803.
Circle 112, Readers' Service Card



Tie masonry walls the easy way with DUR-O-WAL® CONTINUOUS RECTANGULAR TIE (Tab-Tie)

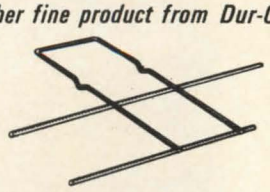


Advantages?

For bonding multi-wythe walls while reinforcing one of the wythes.

- For composite and cavity walls.
- Available in several sizes of wire and wire finishes.
- Variety of prefabricated corner and tee sections.
- Faster and more economical to install than masonry headers.
- Easy installation.

Another fine product from Dur-O-wal



More information? Gladly. Write
Dur-O-wal National, Inc.
P. O. Box 368, Cedar Rapids, Iowa 52406

DUR-O-WAL®
THE ORIGINAL MASONRY WALL REINFORCEMENT WITH THE TRUSS DESIGN

On Readers' Service Card, Circle No. 350

We interrupt this monsoon with the Pittco Seventy-Five Rainscreen.

Pittco's new Seventy-Five Curtain Wall system is designed for water-shy tenants. It's the curtain wall that won't leak. The rainscreen system combats leaks and drips with a proved pressure equalization principle. It specializes in monsoons, but also disarms blizzards and squalls.

The Seventy-Five Curtain Wall isn't just talented, it's beautiful too. Each of the five anodized aluminum colors is coordinated with Pittco® entrance systems and storefront metals. The Seventy-Five Curtain Wall accommodates any standard thickness of glass or spandrel. And lets you design an elegant building at an artless price.

You save expensive days of glazing and erection with interior-glazed Seventy-Five Curtain Wall. A controlled-pressure glazing system cushions and seals glass tightly between neoprene strips to minimize breakage. No more expensive fooling around.

The Seventy-Five Curtain Wall system has all the credentials, too. Passed all the requirements of NAAMM Tests A, B, C-1 and C-2, for instance.

The new Seventy-Five Curtain Wall has fully eclipsed the competition. For details on the talented beautiful inexpensive rainscreen, write: Pittco Architectural Metals, Box 930, Kokomo, Indiana 46901.

PPG
INDUSTRIES

On Readers' Service Card, Circle No. 391

MFRS' DATA

Anti-Slip Safety Surfaces for Stair Treads

Manufacturer's new line of safety stair treads, nosings, thresholds, and floor plates are introduced in brochure. The product, designated POXI-GRIP is said to be a tough but not brittle compound of epoxy resin and aluminum oxide grit that is factory applied to steel, aluminum, or bronze. 4 pages. Wooster Products Inc., Spruce St., Wooster, Ohio 44691

Circle 200, Readers' Service Card

Laboratory fixtures

Extended line of laboratory faucets, fixtures, apparatus, electrical and drainage units are introduced in a 24-page brochure. Price list and specs included. Wolverine Brass Works, Div. of Wolverine Industries, Inc., 648 Monroe Ave., N.W., Grand Rapids, Mich. 49502

Circle 201, Readers' Service Card

Chalkboards, Bulletin Boards, Directory Boards

Chalkboards, bulletin boards, and directory boards are illustrated and described in a 20-page catalog. Includes technical data on finish, use, and performance of standard and steel chalkboards in 15 colors, self-sealing cork and vinyl-covered bulletin boards in two patterns and 23 colors, changeable letter directory boards, sliding and hinged door bulletin and directory boards, vertical and horizontal sliding panel boards, picture projection boards, crayon boards, portable floor standing chalkboards and bulletin boards, and magnetic visual control boards for schools and offices. Ralph Ward, A-1 School Equipment Co., 2511 East Imperial Highway, Los Angeles, Calif. 90059

Circle 202, Readers' Service Card

The Character of Carpet

A 20-page booklet includes factual background on carpets in general. Includes data on tufting and man-made fibers, a review of various major carpet fibers, trends in carpet color, color in relation to soilage, and an evaluation of specs as they apply to commercial applications. Berven Of California, Dept. B., 2600 Ventura Ave., Fresno, Calif. 93717

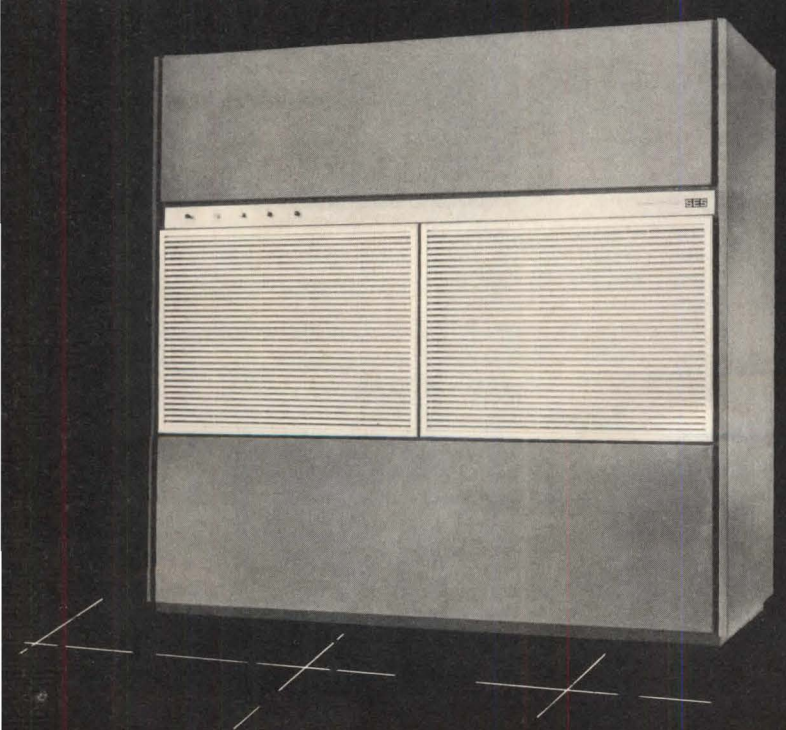
Circle 203, Readers' Service Card

Prismatic Lighting Components

"Plaskolite" prismatic fluorescent luminaires that include flat panels, frameless, and wraparound lenses are detailed in a 6-page folder. Includes manufacturer's new line of extrusion-embossed plastic lenses that now can be specified directly. Dimensions, photometrics, details and specs included. Plaskolite, Inc., 1770 Joyce Ave., Columbus, Ohio 43219

Circle 204, Readers' Service Card

VERY DEPENDABLE & PRECISE ENVIRONMENTAL CONTROL FOR EXPENSIVE & SENSITIVE COMPUTERS



Computers require precise, constant control of temperature and humidity for efficient operation with minimum down time. Units for this application must handle heat loads up to 95% sensible and 5% latent heat generated by computers and maintain 40%-60% RH levels to keep tapes from becoming brittle. *Site Environment Systems perform these tasks precisely and reliably.*

Reliable—Engineered and built to operate continuously. Light and alarm bell indicate need for service. Dual circuits and dual condensers give fail-safe protection.

Precise—Automatic Controls filter, warm or cool, humidify and dehumidify room air to maintain environment within narrow tolerances.

Adaptable—Completely self-contained units in a complete range of sizes, 3, 5, 7½, 10 and 15 tons for use singly or in combination.

Flexible—Available in water or glycol cooled, air-cooled, or chilled water models. Easily altered to duct air up or down through ductwork or floating floors.

Economical—Quality engineering reduces need for maintenance. Easy access from front cuts service time.

Write for complete specification information:

FLOATING FLOORS INC

Loading Dock Design Problems Examined

A manual titled "Modern Dock Design" explains the problems and offers solutions to the design and equipping of all dock loading facilities, including those on rail sidings. Also described and listed are minimum standards and dimensions for access roads, gates, road surfaces, turning radiuses, aprons, traffic patterns, sloping approaches, shelters, as well as loading platform and building design. Kelley Co., Inc. 6720 North Teutonia Ave., Milwaukee, Wis. 53209

Circle 205, Readers' Service Card

Gravel Stops and Copings

Utilization of aluminum in common place but critical building details is described in a 12-page booklet. Includes diagrams, construction details and installation procedures. Aluminum Company of America, 645 Alcoa Bldg., Pittsburg, Pa. 15219

Circle 206, Readers' Service Card

Channel-Shaped Glass Offers New Concept in Daylighting

An extensive selection of patterns available in rolled, figured and wired glass are illustrated in manufacturer's catalog. Featured is channel-shaped "Profilite" glass — a practically self-framing glass that offers new design possibilities. Detailed are light diffusion, decoration, protection and heat absorption. Charts to determine light distribution are included. 16 pages. Mississippi Glass Co., 88 Angelica St., St. Louis, Mo. 63147

Circle 207, Readers' Service Card

The Steam Machine

A 24-page brochure describes the Clayton Steam Machine and its uses in the manufacturing and processing industries, and institutional and maritime applications. Specs, installation weight requirements, and water softener and water treatment information included. Clayton Mfg. Co., P.O. Box 550, El Monte, Calif. 91734

Circle 208, Readers' Service Card

Insulation Adhesives

A 4-page catalog describes insulation adhesives for bonding fibrous glass insulation to galvanized sheet, steel and aluminum in the fabrication of duct work, heating and air conditioning, and refrigeration units. Details include application methods, solids content, consistency, bonding range, heat resistance, and aging characteristics. Adhesives, Coatings and Sealers Div., 3M Center, St. Paul, Minn. 55101

Circle 209, Readers' Service Card

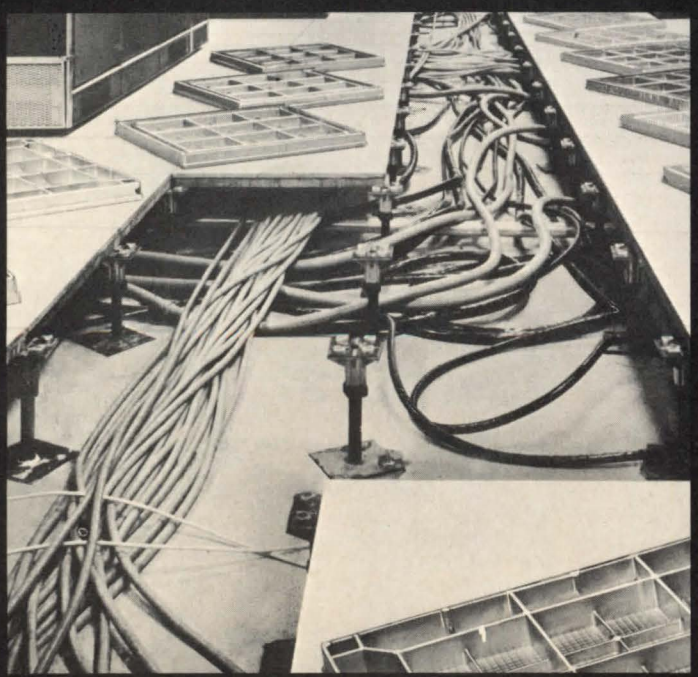
Single Unit Integrates Plant and Fire Protection Functions

Catalog provides details of the "CMS-200" plant protection monitoring system. Described are capabilities for fire detection and alarm, sprinkler supervision, palnt security monitoring, plant guard reporting, recording functions, and so on. Notifier Co., 3600 56th St., Lincoln, Neb. 68504

Circle 210, Readers' Service Card

(Continued on page 64)

THE ULTIMATE IN ACCESS/AIR PLENUM FLOOR SYSTEMS FOR EXPENSIVE & SENSITIVE COMPUTERS



Elevated Floors provide full access to cables and ducts and a pressurized plenum for efficient, flexible, draft-free air distribution. Choose the best. A lightweight, aluminum panel, precision engineered, maintenance-free floor with all the reserve strength you'll ever need, from Floating Floors, Inc.

Precision-made—Floating Floors panels fit perfectly, with complete interchangeability.

Strong—Unique combination of die cast panels and pedestals provide all the reserve strength you'll ever need, without stringers.

Maintenance-free—Corrosion-resistant aluminum panels never need painting . . . are grounded for continuous, worry-free operation.

Cleaner environment—With aluminum panels, no iron oxide particles or paint flakes can get into the computer room environment.

Total Access—Lightweight aluminum panels simply lift out to allow complete access.

Flexible Air Distribution—The cavity beneath Floating Floors serves as plenum to deliver air. Rearrangement is by moving louvered panels.

Write for complete specification information:

FLOATING FLOORS INC

A Subsidiary of National Lead Company 5400 North Detroit Avenue Toledo, Ohio 43612

On Readers' Service Card, Circle No. 356

This is epoxy terrazzo. It was just given 4000 wear cycles with a Taber Abraser.

This is PermaGrain.™ Ditto.

PermaGrain is not ordinary wood.

It's genuine red oak impregnated with a liquid plastic, which is then hardened throughout the entire wood-pore structure by atomic irradiation.

The test shown here, performed on a section of a PermaGrain tile, indicates just how tough it is. In a standard ASTM test (D-1044), depth of track was 50 mils in the terrazzo, 8.5 mils in the PermaGrain. In a series of tests, PermaGrain was proven to be 6 times more durable than epoxy terrazzo.

Obviously, this is important news for architects. It means that you can now specify real wood floors for high-traffic areas like lobbies and corridors in commercial buildings, stores, churches and schools.

When you install flooring, you install a surface. The surface in PermaGrain goes right through the entire 5/16-inch thickness of the 12 x 12 tile. PermaGrain is completely sanded and buffed at the factory. It requires no filling, sealing, staining, varnish, shellac or waxing. The result: very low maintenance cost.

PermaGrain is available in five colors: Natural, Provincial, Americana, Barcelona and Gothic. It is now being installed in a wide variety of applications. Its installed price is comparable with other high-quality materials like terrazzo, vinyl and urethane.

If you want more information, or an actual sample of PermaGrain, please write:

ARCO Chemical Company
Division of AtlanticRichfieldCompany
260 South Broad St.
Philadelphia, Pa. 19101

an ARCO-NUMEC product

On Readers' Service Card, Circle No. 421

BSA 5525

THAT'S YOUR ASSURANCE THAT ALBINA WINDOW WASHING SYSTEMS ARE REALLY SAFE!

Hi-Climber Window Washing Systems made by Albina Engine and Machine Works meet the country's most stringent safety regulation. The Albina Hi-Climber carries New York state's BSA Approval Number 5525. Climbers and Super Hi-Climbers also carry a BSA approval. So you know they're safe!

What's more, these light weight systems won't scratch or mar exterior surfaces. Washing platforms are designed to suit window and mullion spacings. And only non-marking poly-urethane rollers touch walls and roof. Other features include: safety chain tie down. Exclusive level wind mechanisms and grooved drum. All aluminum platform. When not in use, the entire system can be rolled out of sight or stored.

Albina will provide a complete general description and engineering data for whatever project you're designing.

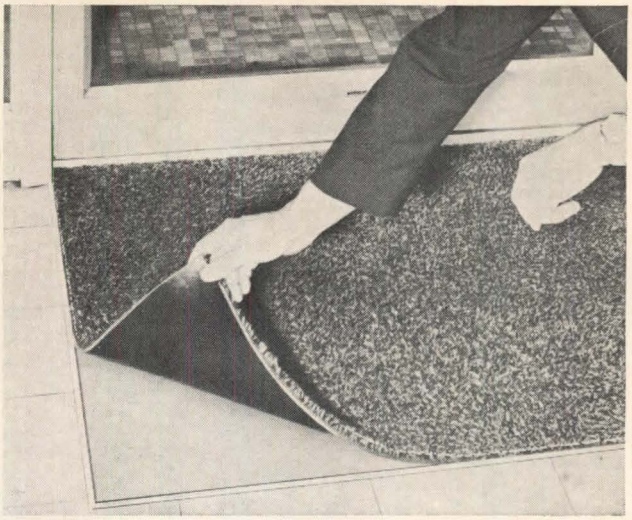
Cost? Fully competitive with other systems. So it costs no more to play it safe! Write for complete details.

ALBINA ENGINE AND MACHINE WORKS
2100 N. ALBINA AVE., PORTLAND, ORE. 97227
503/284-1131 · CABLE ADDRESS: ALBINASHIP

A DIVISION OF
DILLINGHAM CORPORATION
MARITIME SERVICES

On Readers' Service Card, Circle No. 433

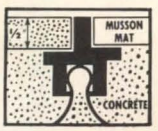
MUSSON NYLON-ON-VINYL*RECESSED



DELUXE NYLON-ON-VINYL CARPET MAT RECESSED FOR SAFETY AND BEAUTY

Commercial 100% cut pile Nylon, permanently bonded to ¼" thick pliable vinyl. Four colors. Custom cut to any size or shape, for recess or wall-to-wall.

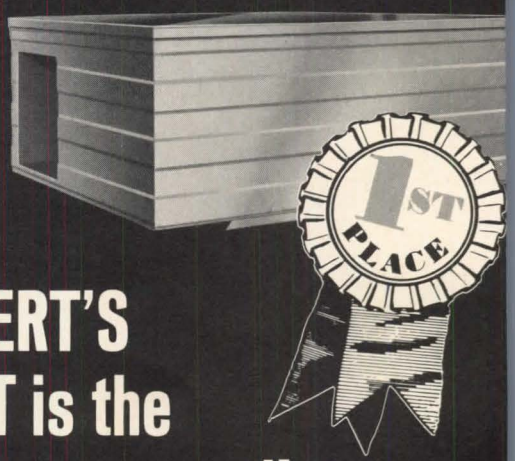
ALUMINUM MAT RECESS FRAMES
Insure perfect fit of mats into recesses. Specify MUSSON Recess Frame—pre-cut, extruded, heavy aluminum. Easily installed.



Write For Catalog, Prices, Samples

THE R. C. MUSSON RUBBER CO.
1320 Archwood Ave. Akron, Ohio 44306

On Readers' Service Card, Circle No. 417



here's why BREIDERT'S LO-SET is the BEST power ventilator made!

Leading architects helped design Lo-S

The result — trim lines and an exceptiona low silhouette that will enhance any building (a unit typica providing over 37,000 CFM is only 36½" high). The p formance leader, Lo-Set **quietly** moves the **highest** volur of air, at any given pressure, with the **lowest** horsepowe Find out about Lo-Set's numerous advantages. *Write toda*

Performance certified with AMCA Seal. UL listed.

BREIDERT

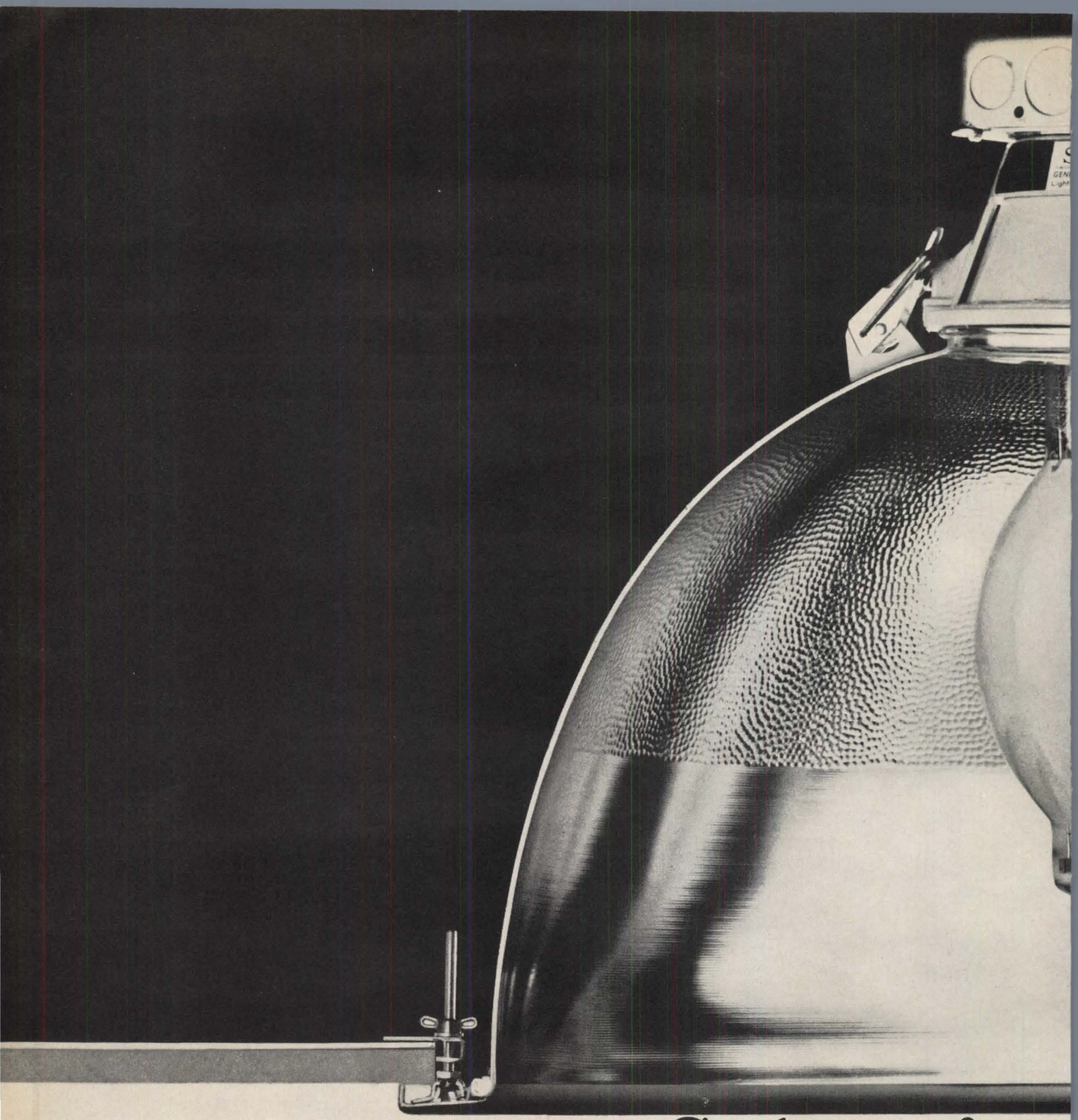
New all-weather closer, with adjustable hydraulic back check, that requires only standard overhead concealed preparation.

For exterior or interior doors . . . hollow metal, aluminum or wooden door and/or frames . . . handed, single-acting . . . with easy-access adjustments . . . new hydraulic fluid for extremely low temperatures . . . optional mounting hardware. Proven extremely reliable.

CENTURY 2000 *Details?*

RIXSON CLOSERS
A DIVISION OF RIXSON INC.
FRANKLIN PARK, ILLINOIS
In Canada: Rixson of Canada. Ltd.

On Readers' Service Card, Circle No. 393



Sylvania

Our Recessed Vanguard fixture is buried in the ceiling.

Our Metalarc/C lamp is buried in the fixture.

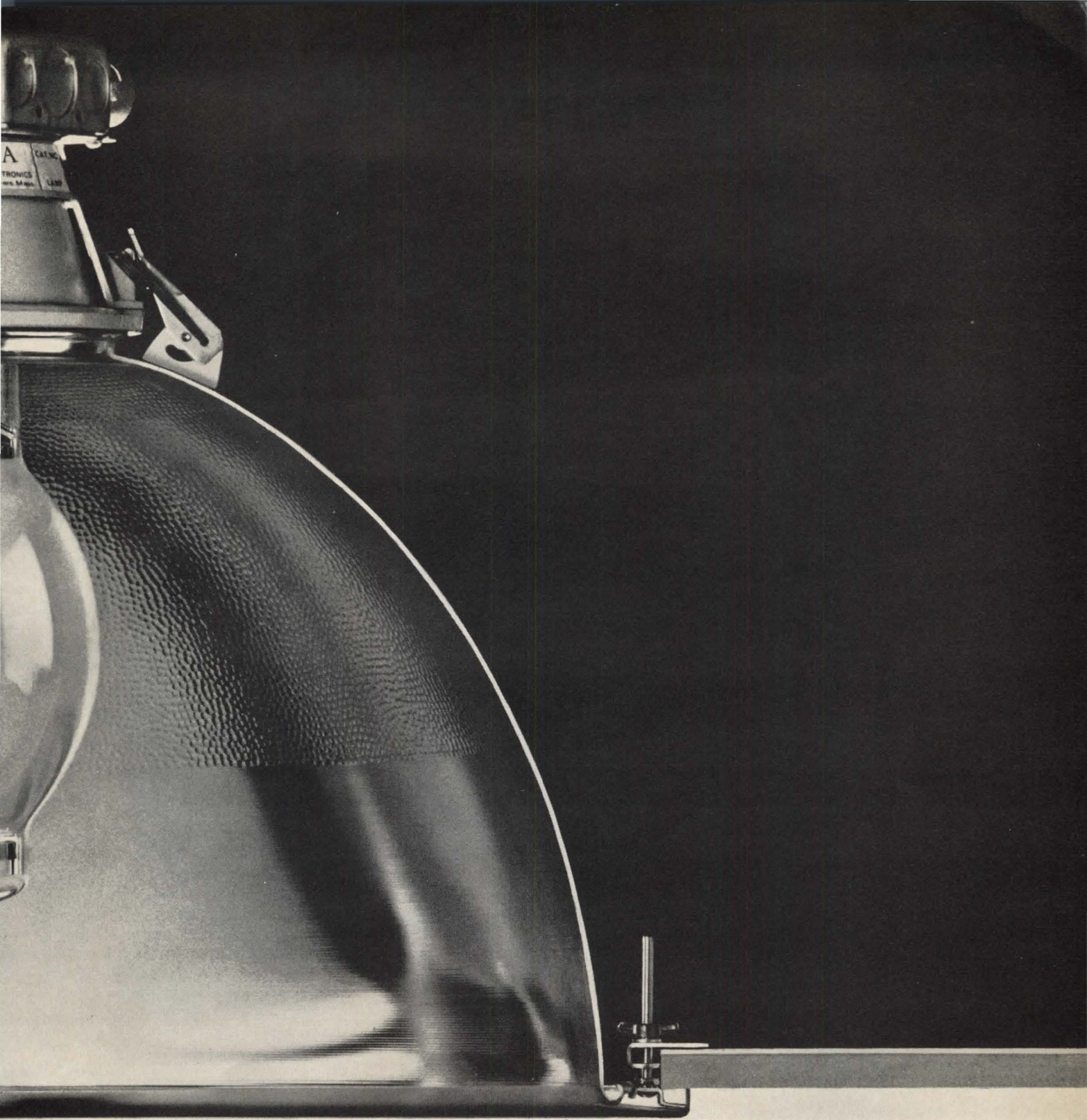
So the glare which would otherwise be giving your eyes a pain in the neck is buried, too.

(Compare this with fluorescent strip that fights for attention with everything in sight and never stops glaring at you.)

With a Recessed Vanguard installation, if you notice the ceiling at all, it's to notice how uncluttered it looks. You get bright, comfortable light over the whole interior of your store, lobby or building. Colors look warm in it: you never get that feeling of the blues.

A Recessed Vanguard installation has just one disadvantage: it costs more at first.

But you don't need as many fixtures



buries the glare.

compared with fluorescent strip lighting, because the light is so powerful.

Which means you don't need anywhere near as many lamps (only one per fixture, not two to four).

And each lamp has a long life (10,500 hours).

So your costs for lamp maintenance go down. Your electric bills also drop, because mercury lamps go easy on power.

After a few years, a Recessed Vanguard installation actually turns out to be cheaper.

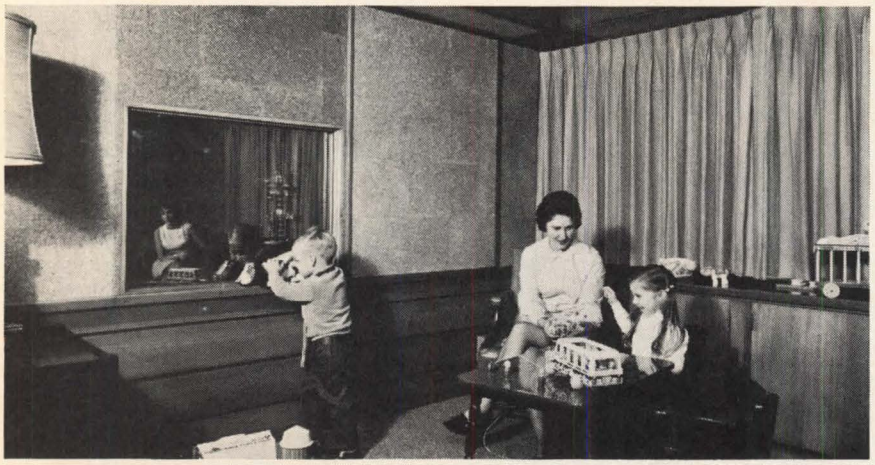
Which for a lighting fixture is quite a silver lining.

For more details—write to: Lighting Equipment Division, Sylvania Lighting Center, Danvers, Massachusetts 01923.

SYLVANIA
GENERAL TELEPHONE & ELECTRONICS

On Readers' Service Card, Circle No. 418

Would you believe this is a toy manufacturer's testing laboratory?



It is. For Fisher-Price Toys Inc., the nation's largest manufacturer of preschool playthings. Children's acceptance of new toys is measured by company engineers without the youngsters' awareness. The secret is in the mirror. From the tots' viewpoint, that's just what it is. But for *the engineers* behind it, it's a window. And the "see-thru" mirror is Mirropane®, a product of many uses.

Mirropane is used to train future teachers. To observe reactions of patients in clinics. To protect stores against shoplifters. For more information on Mirropane, call your L-O-F Distributor or Dealer (listed under "Glass" in the Yellow Pages). Or write Liberty Mirror Division, Brackenridge, Pa. 15014.

LIBERTY MIRROR®

A DIVISION OF LIBBEY-OWENS-FORD COMPANY

On Readers' Service Card, Circle No. 379

MFRS' DATA

(Continued from page 57)

Swimming Pool Lights and Fixtures

Swimming pool lights and accessories are described in a 9-page folder that features dry niche and wet niche fixtures in 12-v and 120-v models. Special attention is drawn to the "Thermo-Flow" fixture with slots in the lens door that, through convection, "permits the positive flow of cool water over the body of the unit carrying off generated heat resulting in improved efficiency and extended lamp life." Fixtures are heavy cast bronze and niches are stainless steel with integral cast bronze mounting ring and positive fixture locking device. Hydrel Corp., 406 S. Varney St., Burbank, Calif. 91503

Circle 211, Readers' Service Card

Sculptured Wood Screen for Interior Use

Color brochure describes "Sculpture-wood" decorative hardwood screens and paneling for residential, office and commercial applications. It includes photos of installations and descriptions of 16 different see-through and solid designs in ¾" and ½" walnut, birch, poplar, oak and ash. Specs included. 7 pages. Penberthy Architectural Products, 5800 South Boyle Ave., Los Angeles, Calif. 90058

Circle 212, Readers' Service Card

Stone Drinking Fountains

A 4-page drinking fountain catalog illustrates 6 polyester and stone drinking fountains. Catalog features two precast stone fountains available in five colors and two finishes. Includes a polyester and stone color chart and illustrations of six standard enameled iron, vitreous china, and stainless-steel drinking fountains. Western Drinking Fountains, Inc., Dept. WDF-1, Glen Riddle, Pa. 19037

Circle 213, Readers' Service Card

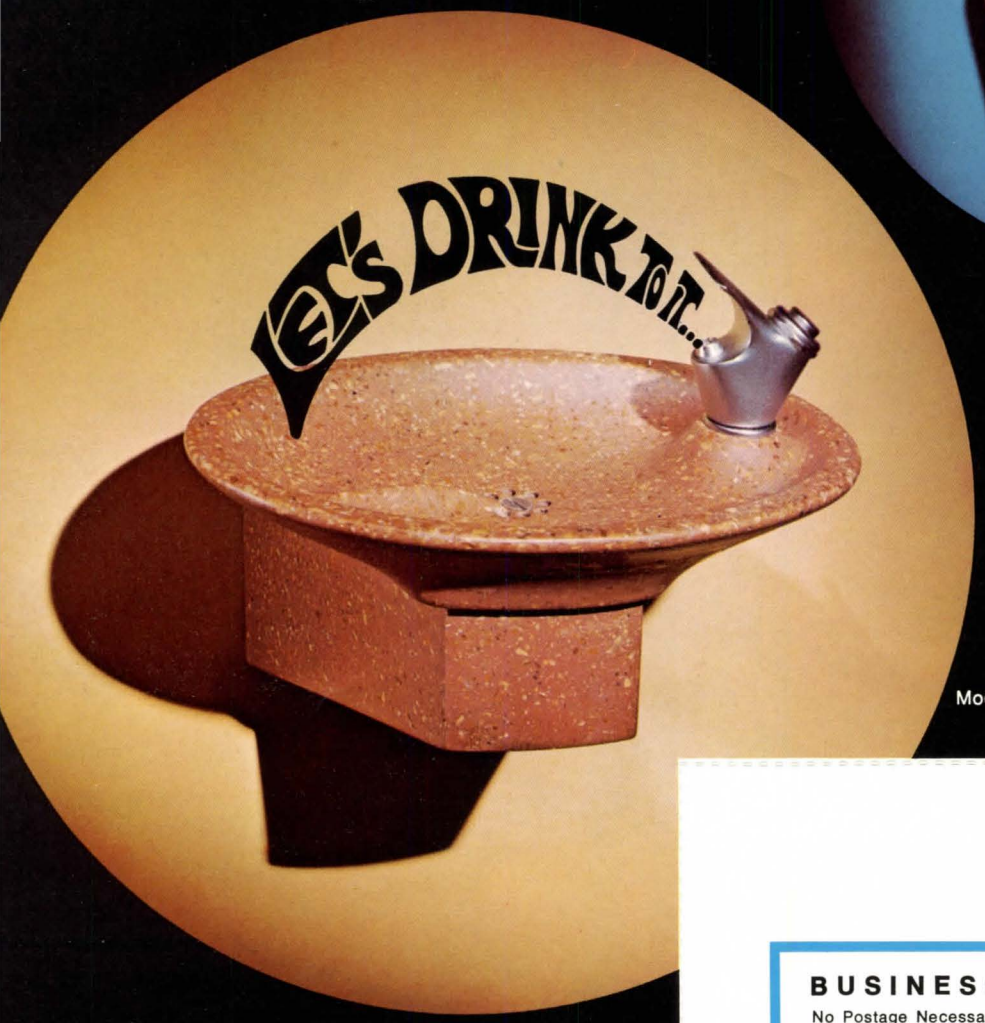
(Continued on page 70)

Model 7PB

Can architects and designers love a drinking fountain?

Yes... if it's

POLYESTER & STONE by WESTERN



Model 9

Model 50P

Polyester and stone is durable for long service, yet lightweight for easier installation. This new material allows exact control of aggregate to match almost any color or texture . . . and is polished to a hard, smooth finish. For unlimited designs, beautiful textures and colors to match any interior, specify polyester and stone. Models 9 and 7PB are face mounted, model 50 is wall mounted.

FIRST CLASS
Permit No. 1
Glen Riddle, Pa.

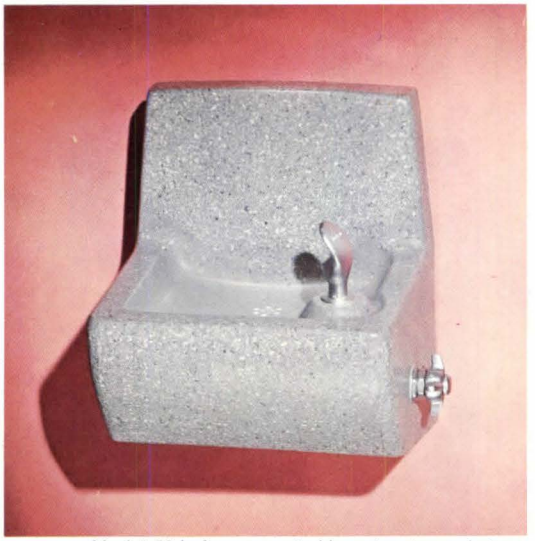
BUSINESS REPLY MAIL
No Postage Necessary If Mailed in the United States

Postage Will Be Paid By Addressee

WESTERN DRINKING FOUNTAINS, INC.
Architectural Service Department
Glen Riddle, Pa. 19037

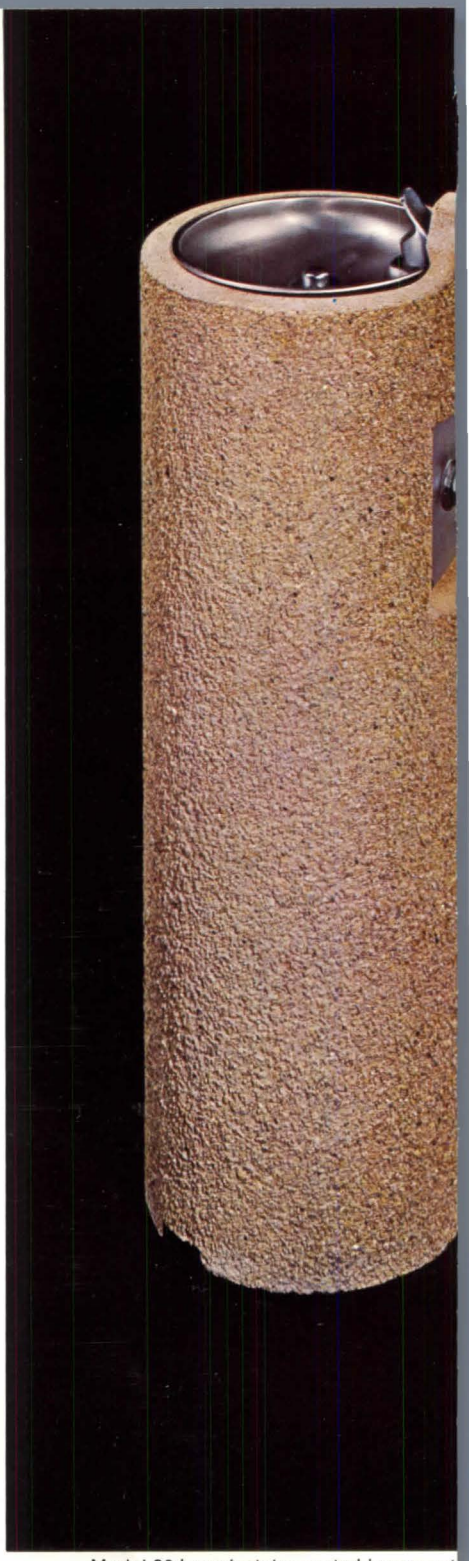
Model 12C is face mounted in polyester and stone

Model 90 is semi-recessed in polyester and stone



Model 52 is face mounted in polyester and stone

Model 50 is wall mounted in precast stone



Model 30 is pedestal mounted in precast

Gentlemen:

Frankly, I'm interested. And . . .

- ☐ Have a rep call
- ☐ Send me name of nearby distributor
- ☐ Send me full line catalog.
  - ☐ Architect ☐ Interior Designer

NAME_____

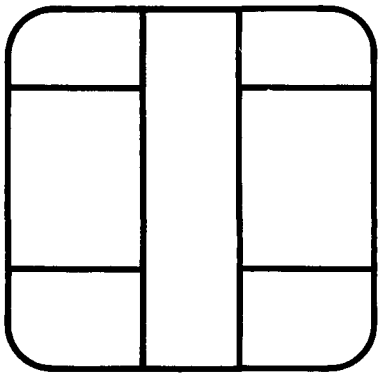
FIRM_____

ADDRESS_____

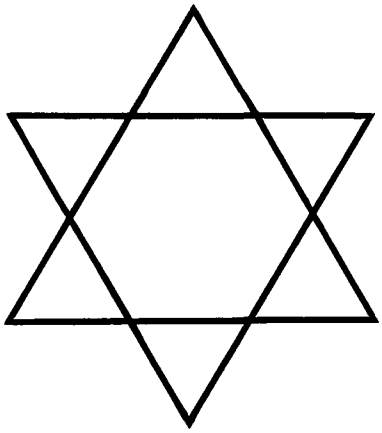
Five standard colors available: Grey, Green, Char
Beige and White to match or blend with any applica
Special colors also available upon submission of
samples.

The precast stone units are ideal for exterior dri
fountain needs in *entrance ways, courtyards and re*
tion areas . . . and withstands weather conditions
the hardest use. Special colors and aggregates ca
provided upon submission of samples—or complete
scription from architect or designer—regarding col
cement and color and size of aggregate desired.

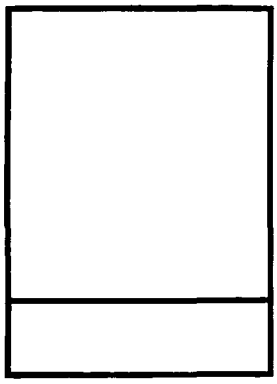
WESTERN DRINKING FOUNTAINS, IN
A Subsidiary of SUNROC CORPORATION
14487 Griffith St., San Leandro, California 9



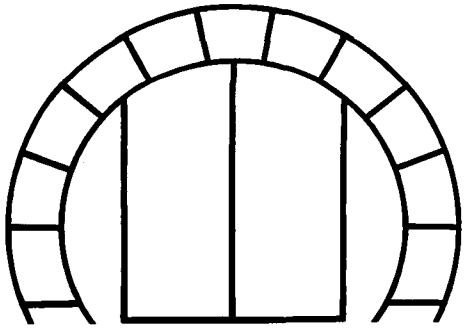
Bayley offers advanced window designs for contemporary buildings.



Decorative Bayley windows available in steel, aluminum or stainless.



Bayley vertically pivoted windows solve washing problems (you wash both sides inside), provide a hopper vent for natural ventilation.



Bayley engineers and builds unusual combinations of windows, structural grilles and entrances.

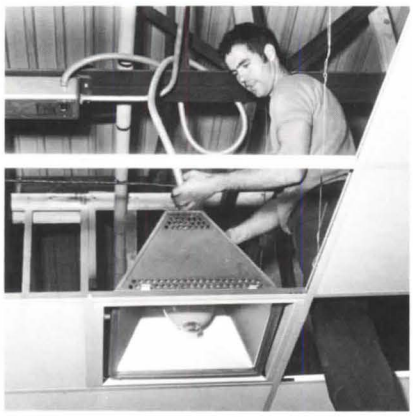
odd-ball windows

Bayley comes up with straightforward solutions to your needs for unusual window designs. We have the engineering know-how and capacity, and the imaginative craftsmanship to handle out-of-the-ordinary projects. And we design and produce unusual windows without compromising performance. Bayley leads with innovative ideas—Bayco baked-on colors, Bayseal draft prevention, and many others.

Ask The William Bayley Co., Springfield, Ohio 45501.

BAYLEY

On Readers' Service Card, Circle No. 416



This man is setting a trend in modern store lighting.

Here's a completely new kind of lighting for stores and commercial buildings — lighting that raises illumination and lowers cost: Wide-Lite* recessed mercury vapor Indoor Luminaires.

There's about *three times more light* in this new Wegmans Supermarket than in a similar Wegmans store with 168 ordinary fluorescent luminaires. Yet all this light comes from only 68 "Wide-Lite" luminaires, recessed neatly into the ceiling. There's absolutely no bothersome glare, and new rare-earth phosphors give mercury lamps a color rendition similar to fluorescent light.

Lighting like this can make the difference when it comes to leasing store and office space. You can offer it right now . . . and economy for years to come. The mercury vapor lamps used in "Wide-Lite" recessed fixtures not only produce more light than fluorescent lamps but also last twice as long! Also, the lamp and reflector are sealed from the atmosphere so that no dust or moisture can reach them and thus block light. You get more light, and high lighting levels are maintained without any cleaning maintenance.

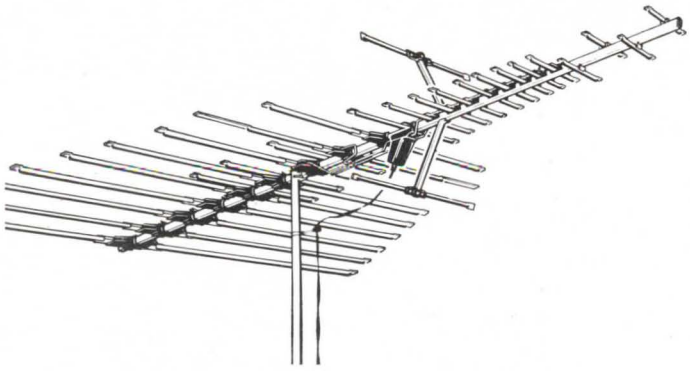
The neat, geometric appearance of the lighting system is another dividend. It's evidence of the kind of quality you want associated with your building.

Get all the facts about "Wide-Lite" recessed mercury vapor lighting— the new trend in modern building interior lighting. Write to Wide-Lite Corporation, P. O. Box 191, Houston, Texas 77001.

WideLite

Manufactured in United States, Australia, Belgium, Canada, Great Britain and Mexico.
*Trademark of Wide-Lite Corporation.
A Division of Esquire, Inc.

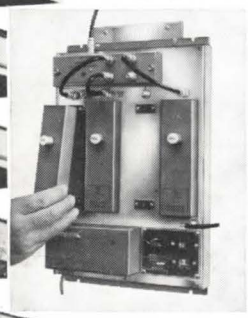
Wegmans Supermarket, John Glenn Shopping Center, Syracuse, N.Y.



For better Color TV reception specify the MATV System by Winegard.

"The System" is Ultra-Plex—an all-new, solid state package that delivers better all-channel color and black & white TV and FM reception at lower cost. Because Ultra-Plex is completely flexible, it never becomes obsolete; a simple plug-in unit adds a new UHF or VHF channel instantly, with a perfectly balanced signal to hundreds of outlets. There's no need to install a separate system for UHF!

Ultra-Plex is ultra compact, easy to install, and inexpensive to operate; its unique circuitry and highly efficient transistors keep maintenance to an absolute minimum.



Winegard offers a full line of completely compatible equipment for master antenna installations, from a wide array of antennas to the individual wall outlets. Because of their flexibility, Winegard systems are being specified more and more for replacement of obsolete units as well as for new installations in apartments, motels, commercial buildings and institutions.

The coupon below will bring you full technical specifications and costs on Ultra-Plex and its many problem-solving applications.

Winegard ANTENNA SYSTEMS

3015-D Kirkwood Street • Burlington, Iowa 52601

☐ Please send additional information on your Ultra-Plex MATV systems.

☐ Please have a representative call for an appointment.

Name_____

Title_____ Phone_____

Company_____

Address_____

City_____

State_____ Zip_____

On Readers' Service Card, Circle No. 411

MFRS' DATA

(Continued from page 64)

Vinyl Flooring Catalog Introduces New Styles

The "1969 Flooring Products" catalog illustrates manufacturer's complete line of asbestos vinyl flooring products for commercial and residential interiors. Two new vinyl polymer styles, "Vintal" and "Vincor," are featured. The catalog includes the expanded line of adhesive-backed "Peel & Stick" tiles and cushioned sheet vinyl reinforced with glass-fiber. Manufacturers line of vinyl cove bases and a complete range of cleaners and adhesives complete this catalog. The Flintkote Co., 201 E. 42nd St., New York, N. Y. 10017

Circle 214, Readers' Service Card

Interlocking Extruded Sections Form Multiuse Panels

An illustrated folder describes the "Panel-loc System" of interlocking specially extruded sections of fiberglass and aluminum. The sections can be assembled with only a screwdriver or wrench, and may be used for walls, flooring, concrete forms, catwalks, roof, etc. Standard section sizes range from 6″ to 12″ wide x 20′ long. The folder includes load-bearing tables. Panel-Loc System, Inc., P.O. Box 644, Dover, N.J.

Circle 215, Readers' Service Card

Spray-in-place Foam for Insulating Roofs

A new brochure describes GACOFOAM, a rigid polyurethane foam that is spray applied to form a seamless, fire-retardant roof insulation. GACOFOAM is also recommended for insulating storage tanks, cold storage warehouses, and chemical processing equipment operating at temperatures up to 250F. The brochure describes physical properties and shows comparative insulating values for different materials, and contains complete specifications. 4 pages. Advertising Dept., Gates Engineerings, P. O. Box 1711, Wilmington, Del. 19899

Circle 216, Readers' Service Card

THIS FILE IS ONE FOR THE BOOKS.

Or more precisely, our new bookcase is one for the files. This unusual and flexible unit is from the TAG Collection. It enables you to put Agatha Christie and Accounts Receivable in their proper place. And get either extra file or storage space (take your pick) right near your now-uncluttered desk.

In addition to convenience, you get extra peace and quiet because the file (like all vertical surfaces in the TAG Collection) is covered with sound-absorbent Artitex. Artitex looks like velvet, wears like iron and turns harsh noises into the kind of silence you can really work in.

The TAG Collection was designed to function best in the toughest place—the open office. That's why it functions best in every kind of office. Like all Art Metal furniture, it looks beautiful and works beautifully. Write for more information and the name of your nearest dealer.

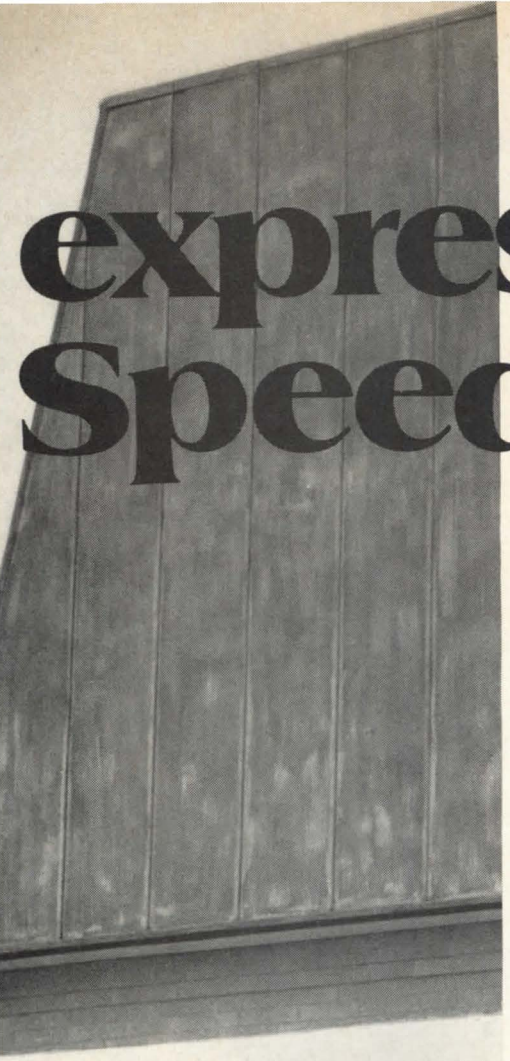
TAG (The Task Administrative Group). A new kind of furniture for the new way of doing business.

ART METAL
JAMESTOWN NY

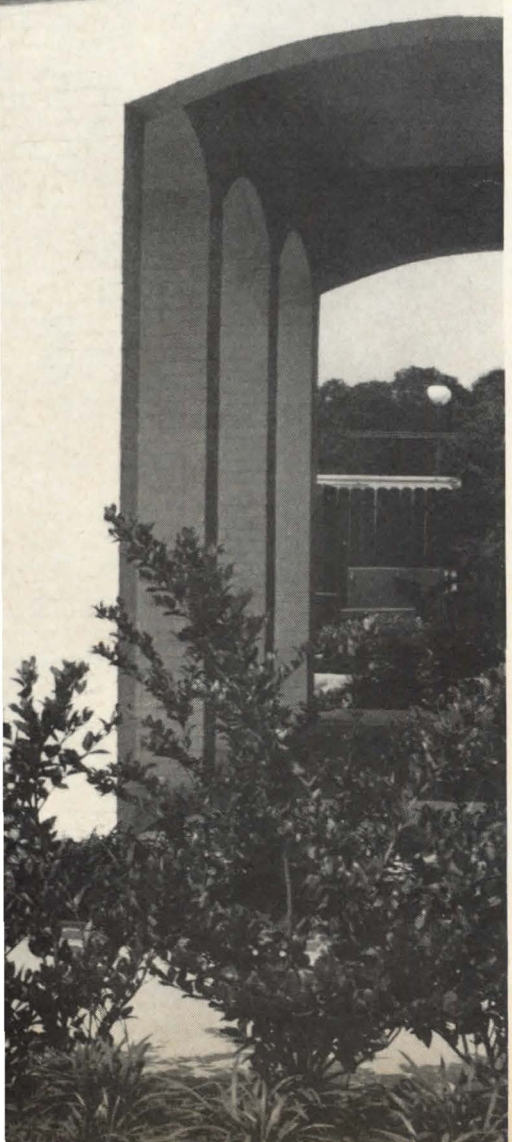
©1969 ART METAL, JAMESTOWN, N.Y.

Keene versatility structural

Architect: Brodnax—Phenix & Associates
General Contractor: J. A. McDermott
Owner: Dan M. Moody



expresses itself in Speed-Steel.™



The seventy-four buildings of this Town and Country Shopping Center range in design from French Provincial to Early Spanish to English Tudor to contemporary. Each has the look of permanence that is real. A look that suggests solidity and a long time a-building.

Yet it took only three men three days to raise the skeleton, shown here, on which the building was formed. The secret: Keene Speed-Steel. Lightweight and easy to handle, this framing system has the highest work to weight ratio of any building material available. So designs can easily incorporate exterior walkways, balconies, cantilevered roofs.

Competitive in cost with wood, this steel system can be erected faster. And there are the added advantages of being vermin and fire-proof. What's more, Keene Speed-Steel framing studs are nailable. So any conventional material can be used for interior or exterior surfaces. Here at the shopping center, for example, the mansard roof has wooden shingles.

But this versatility of design is not confined to one-story structures. At the recent San Antonio Fair, Keene Speed-Steel proved the ideal material for the soaring Confluence Theatre, Federal Pavilion as well as 15 other buildings.

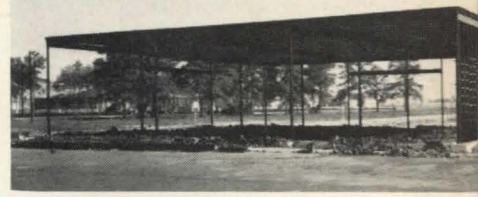
And Speed-Steel is even being used in town houses and garden apartments. In nursing homes. In sports arenas. All-in-all its uses are limited only by the imagination.

To find out more how our versatility can help your imagination, write: Keene Corporation, Metal Construction Products Division, Parkersburg, West Virginia 26101.

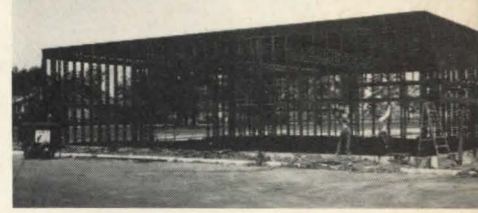
KEENE
CORPORATION

Erection of structural steel framework for building 54 of the Town and Country Shopping Center, Houston, Texas took only three days. This is one of 74 such buildings in the Center using Speed-Steel.

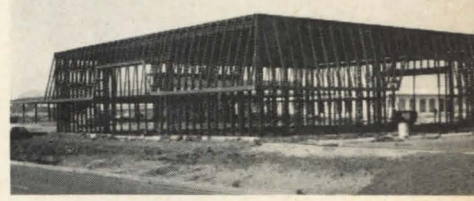
FIRST DAY



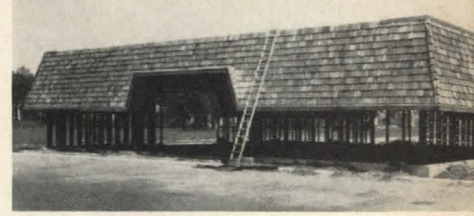
SECOND DAY, NOON



END OF THE THIRD DAY



READY FOR THE NEXT PHASE



We've just begun to grow.

On Readers' Service Card, Circle No. 371

Join the Heating Revolution!

Insist on the Chromalox® Rebel.

Meet the Chromalox Rebel—the revolu-
nary, all-new electric baseboard heater that
mbines appearance, performance and economy
one handsome package. It's the trimmest
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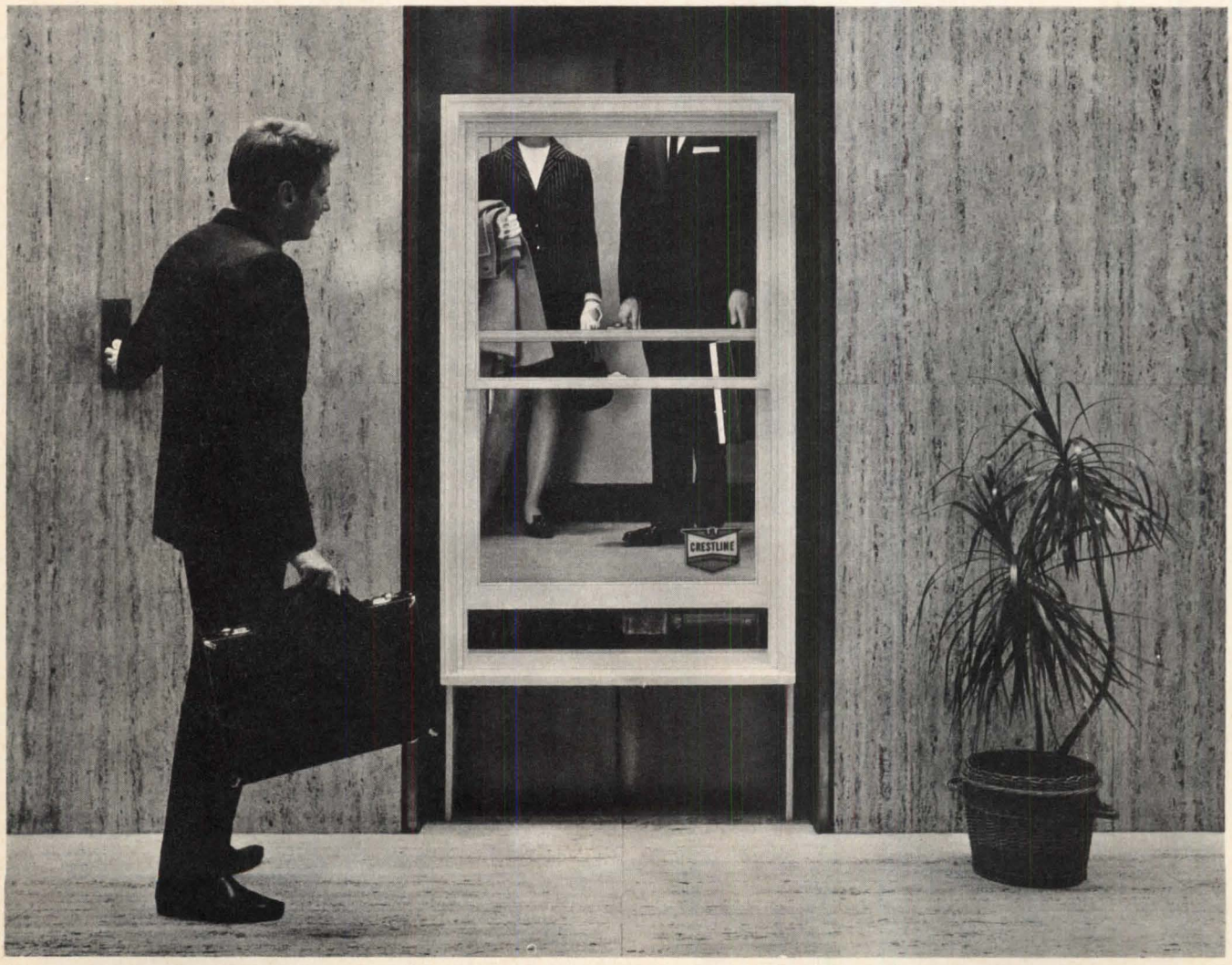

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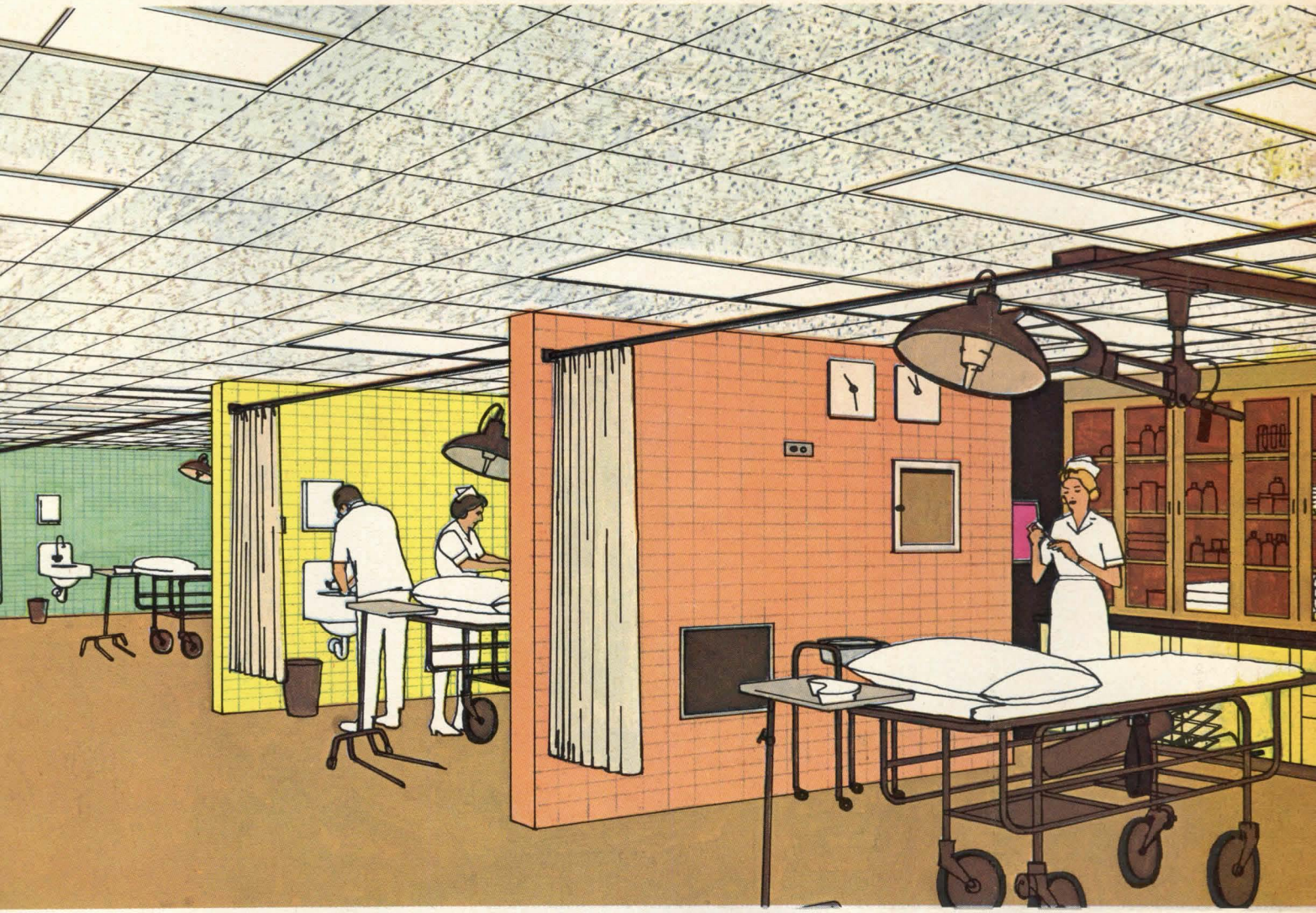

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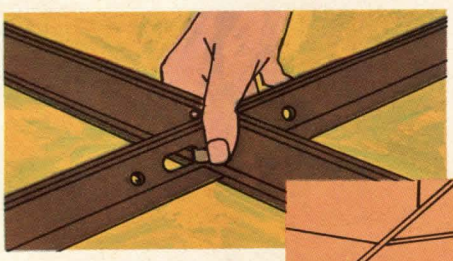
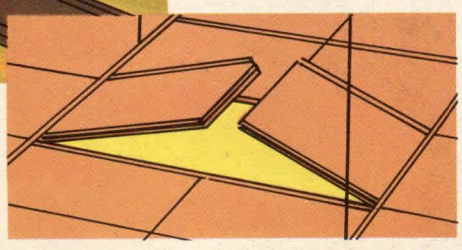


TAB-LOCK tee attachment is patented by Eastern Products Corp. You insert tee, bend tab, which locks under tension.



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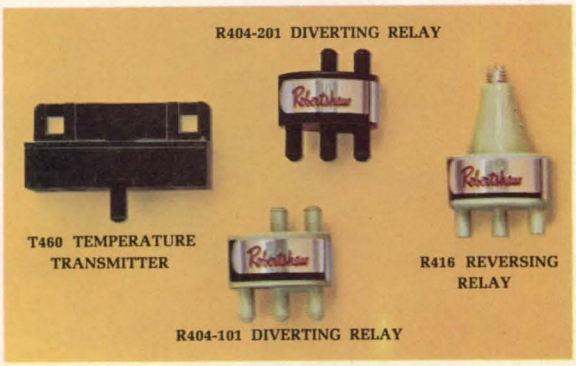
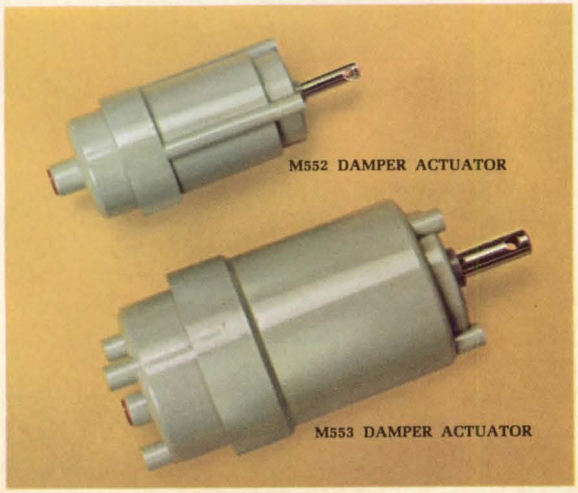
Robertshaw research tackles rising installation and servicing costs

(Actual Size)

MARK II





Robertshaw's new generation of pneumatic controls bring down mounting costs for industrial, commercial and institutional buildings:

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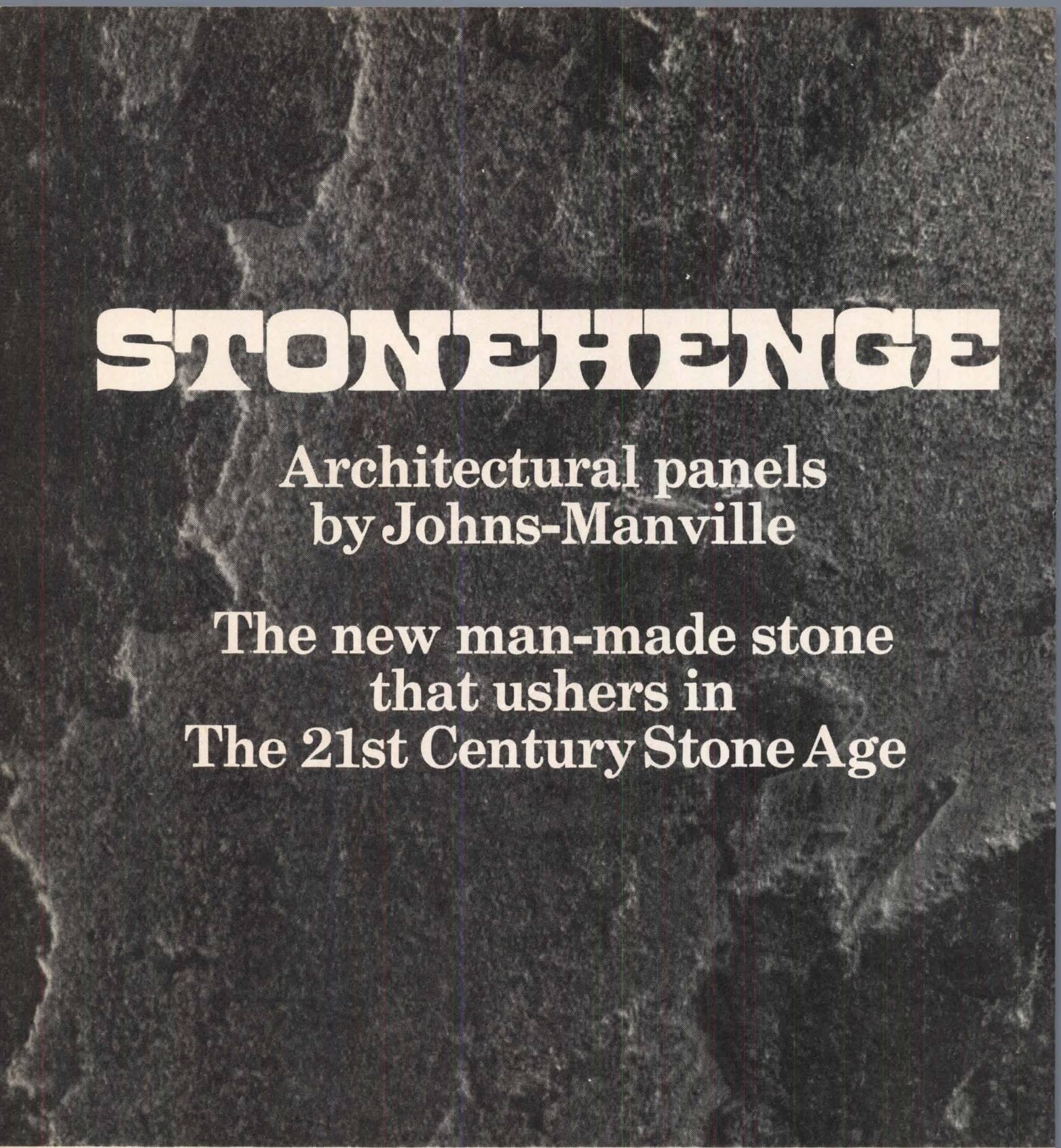

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Visual drama with PPG glass

in Westport, Conn.

At the point where the Saugatuck and Aspetuck Rivers and the west branch of the Saugatuck meet, there is a new office building. The Glendinning Companies' complex.

Ralph Glendinning picked the country place because he wanted the informal, bucolic surroundings such a site afforded. And he wanted an informal, gently rustic sort of solution that would fit into the site and carefully preserve the trees. And the water, which is all around.

The architect's solution was a three-story fieldstone and glass building. The glass-walled entrance pavilion and the two major wings are connected by glass-enclosed walkways. A stream flows under one of the walkways.

The architect used the fieldstone because he wanted a natural, rustic feeling for the building. And he used PPG SOLARBRONZE® plate glass because he wanted something that would blend harmoniously with the stone. He says, "In this case, it tied in very nicely with the rusty, brownish-hue fieldstone. And, of course, we wound up with the more practical aspects. . . ." The more practical aspect of PPG SOLARBRONZE plate glass is that it provides brightness control for visual comfort. The SOLARBRONZE glass together with an overhang forms a frame that provides some shading to reduce the sun's heat entering the building in summer.

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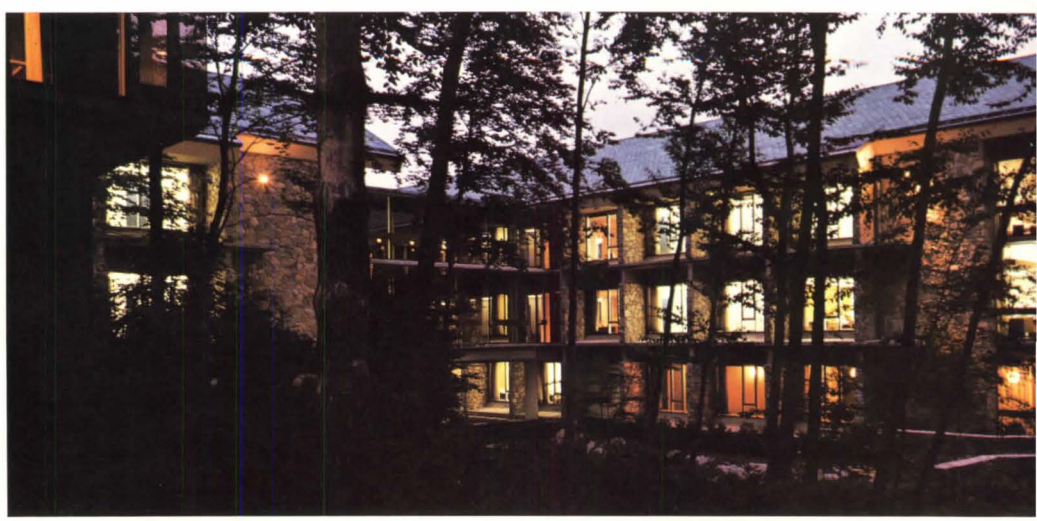

Glass wall construction gives you openness, reflectivity and color. And the design possibilities are endless. For full details, contact your nearest PPG Architectural Representative, consult Sweet's catalog file, or write PPG INDUSTRIES, One Gateway Center, Pittsburgh, Pa. 15222.

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Architect: Bruce Campbell Graham Associates, New York City

Consulting Electrical and Mechanical Engineers: Fred S. Dubin Associates, New York

Interior Designer: Roth-Robertson Interiors, New York City

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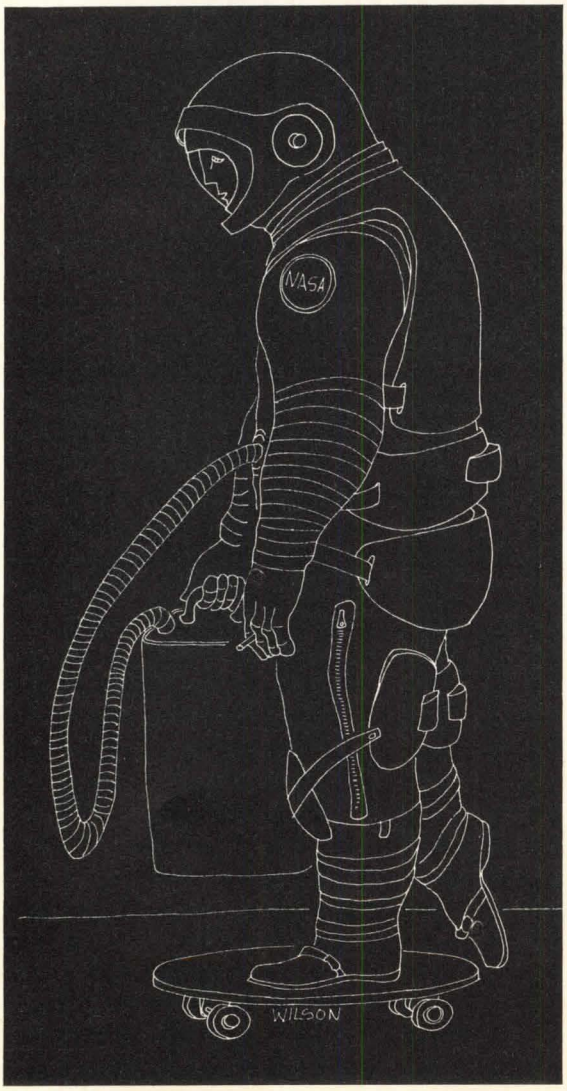
EDITORIAL

YOU CANNOT GET THERE FROM HERE. In the case of air travel "there" is any place outside of a jet in flight. You can get nearly there, that is, stacked over your destination, but as for beginning in an inner city and ending in an inner city, traveling quickly, efficiently, and with a minimum of discomfort from where you are to where you want to go, it is almost impossible to get there from here.

So long as flying and getting to your destination remain two distinct activities, then air transportation problems will not be resolved. Flying is the business of the airline, getting there is the sole purpose of the passenger. The two objectives are not necessarily compatible, a fact frequently proven, for no matter how much flying a passenger does he will never reach his destination stacked in a holding pattern over it.



The airlines demonstrate their recognition of the dichotomy of the two objectives by retaining two groups of highly skilled professionals. Aeronautical engineers strive with the utmost ingenuity to perfect means of moving passengers faster through the air, while airline public relations experts strive just as ingeniously to convince us that the air part of "getting there is half the fun" and conceal the fact that the other part is pure misery.

Contradictions permeate the entire system to varying degrees. For example, contrast the speed and efficiency of computerized ticket vending with the chaos of passenger baggage retrieval. Note the safety charades of the stewardess with oxygen mask in one hand and life preserver in the other conducted in airliners hurtling through suicidally congested air space.

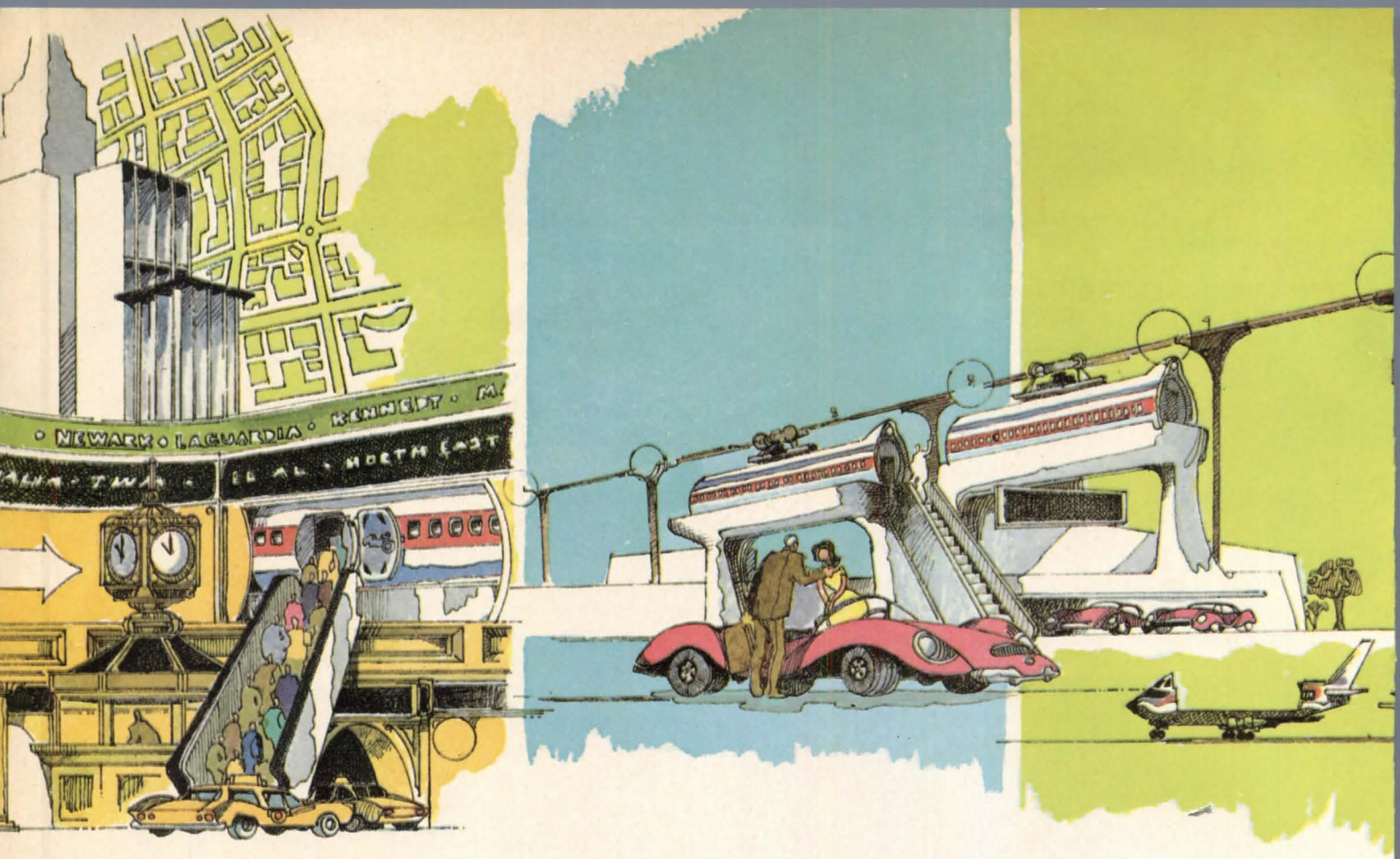
What other industry can force its customers to cue up for so called, "Executive, Red Carpet, Blue Chip," service like token purchasers at a subway booth, regurgitate into a paper bag, belt themselves into seats to be bombarded by unintelligible gibberish over faulty public address systems while being served goodies five miles above the earth?

As our editor, Don Raney, points out in this issue, the airplane is only viable in the air; it leaves the real problems of getting there on the ground. The designers of jetports furnish only "terminal" solutions.

However the problem is not insoluble. A similar Gordian knot was hacked to pieces by one beetle-browed John L. Lewis, president of the United Mine Workers, over thirty years ago when he conceived the idea of "portal-to-portal" pay. Instead of miners traveling from pit head to coal face, a distance sometimes of ten miles underground, on their own time, the portal-to-portal concept forced mine owners to pay wages in transit. Needless to say, this simple expedient improved mine transportation wonderously.

Perhaps this simple underground concept is the answer to overhead transportation. If airlines simply were held responsible for a portal to portal time package in which passengers were transported from here to there the problem might prove to be quite simple. As old John L. might say, carrying passengers should not be divorced from the responsibility of getting them to their destinations.

Forrest Wilson



People and Planes!

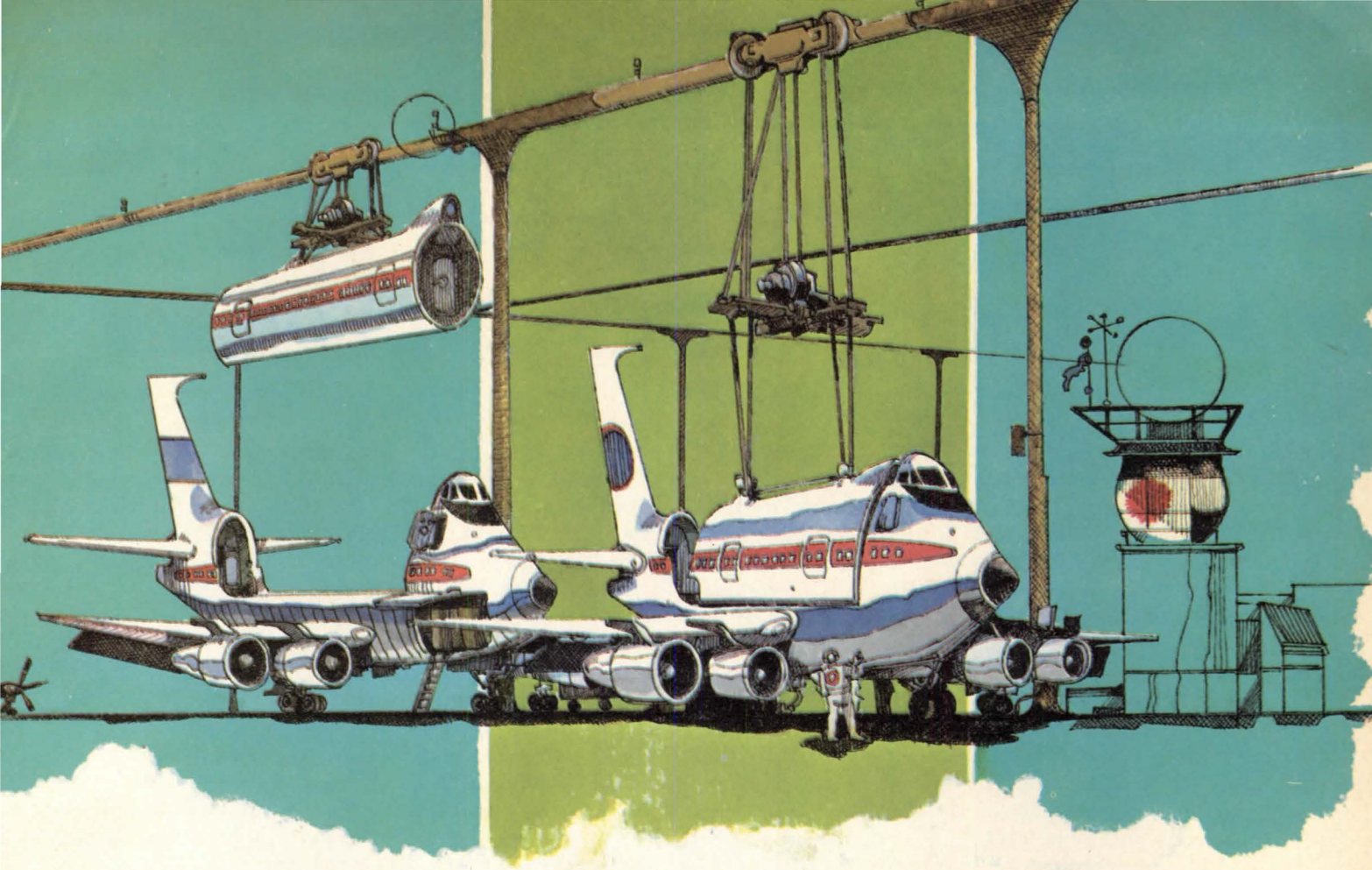
CAN AIRPORTS BRIDGE

BY DON RANEY

Ideally, an airport should function like a subway station — a simple, direct means for boarding a rapid-transit system. Planes should arrive, accomplish passenger deplaning-boarding, and leave with the same speed and ease as trains rolling in and out of subway stations. Unfortunately, in our present situation, the analogy is a utopian one. Although subway trains and their stations were designed as a single system, planes are given to the airport designer as an invariable to which the airport must accommodate itself. The designer has no opportunity to design plane and port as one system.

How much simpler passenger circulation and baggage handling problems would be if the plane itself were an airframe with engines, to which pods loaded with passengers and baggage could be fastened. The mechanized pods, loaded downtown like subway cars, could be guided on tracks by computer, making stops along the way directly to a waiting airframe beside a runway, fastened on, and flown to a destination, eliminating public space, hold rooms, and passenger circulation problems at a central airport terminal. Those passengers who still wished to drive and park could meet the pod and check in at any one of a number of stations on the right-of-way. Or, if the airport itself were nearest the passenger's home, a small parking lot and check-in terminal could be provided at the airport. By distributing the passenger and parking load over a number of small terminals, really not much more than commuter-train stations, demands on road approaches would be substantially reduced. With such a standardized system operating in all cities, costs could be substantially reduced for individual cities.

But in the foreseeable future, no one envisions attacking the redesign of airplanes, especially



THE GAP?

since three generations of them (Boeing 747, SST, Lockheed L-500 airports) are already on the boards and airports must be designed now. The first two 747's with a capacity of 480 people each will be delivered this year, and the future problems this plane represents in terms of passenger-baggage circulation are formidable, and in the present state of most airports, impossible to deal with.

No one needs to be convinced that air transportation is a problem. The airports we have are not adequate, nor are they conducive to rapid transit, which is their primary function. Delays at major hub airports are monumental. Frequently, it takes longer to arrive at, and travel through an airport than it does to fly to one's destination. When the 747's start flying this year the problems will be greatly aggravated. Three times as many people as are presently unloaded from 707's and DC8's will be deplaning from a 747 at one time — 480 people — in five minutes according to FAA safety standards.

Obviously, the airport itself is only part of the problem; transportation to the city is another part. But the airport is the part that architects are most concerned with at this time. Eventually, the answer must lie in the merging of what are now three integral design problems — the plane, the airport, and secondary transportation (ground, sea, or air) to the city. This is a problem that can be dealt with only if the airlines begin to think of air transportation as an inner-city to inner-city, portal-to-portal, problem, and not only a problem of feeding and flying. The article will take a look at the recently completed Houston Airport, some actual projects for soon-to-be-completed airports, and some ideas for future airports, pointing out pluses and minuses in how each attempts to answer the questions inherent in its third of the total problem.

Airports:
THE PROBLEMS AND POSSIBILITIES

Aside from the problem of where to put the noisy things, today a community must ask itself which, of the many extant or new airport and terminal configurations, is best suited for its particular needs.

When airports first began to appear around the country, these problems were relatively simple. The airport went nearby the town, and consisted of two runways, a taxiing and parking apron, and a small building in which to hide from the elements. Planes landed, taxied in, and, in the case of passenger planes, waited with props turning over, and brakes applied for people to enter and leave. Door shut, brakes released, the plane took off.

As air travel progressed to its present 130 million passengers per year level, the airport and its terminal underwent many form changes in order to find that perfect, most expeditious form that would allow a passenger to get from arrival vehicle to plane as easily as he had once done it when driving an automobile onto the runway had been allowed.

Three distinct types of terminals, with variations, are in use today at the 22 major hub airports that account for 68 per cent of all passenger traffic in the United States. Each type has its inherent good and bad points, but the parking problem is shared by all.

Another form, the linear terminal (see below), has created much excitement since it was introduced by Tibbetts, Abbett & McCarthy in their design — ultimately discarded — for the Dallas-Fort Worth Airport. An example of this concept will be built at Boston's Logan Airport by John Carl Warnecke & Associates, and will be shown in this article.

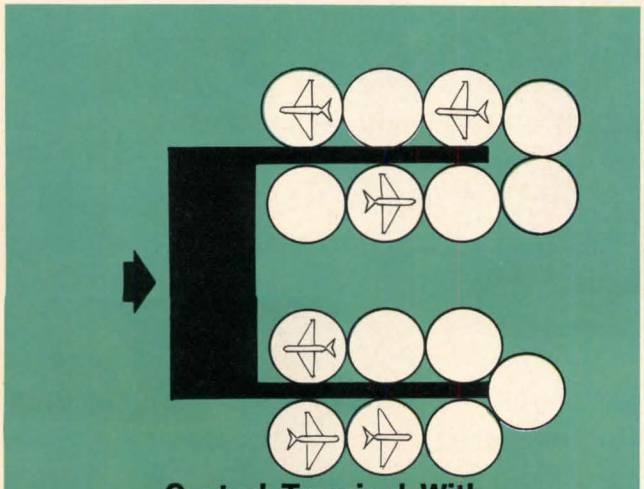
A form that ultimately all urban communities with a space problem must at least consider, if not turn to, is the vertical terminal. Just like the skyscraper in the city, the cost of land will eventually force the terminal designer to seek a vertical rather than a horizontal solution. One airport consultant, Gideon Jeremetsky, has been at work on such a design. It, too, will be discussed later in this article.

A new conception terminal design is the vertical terminal with mobile lounge. Its major points are that it: saves on land and foundation costs; parking is in terminal; walks are short; vertical expansion can occur; little duplication of facilities.

The noise envelop for an SST will reach out on a 6-mile radius from the plane. Within this swath, life could be intolerable. Those living within 12 miles of a landing SST, the 1800 mph plane which will be flying in the 70's, had better think about soundproofing their houses.

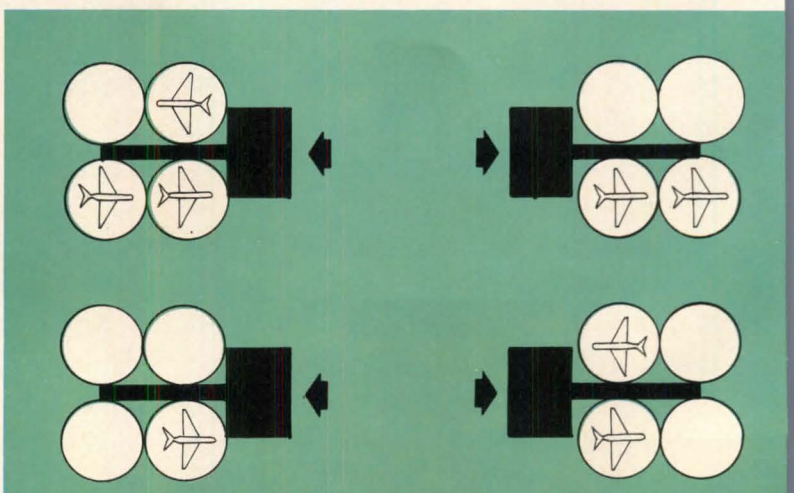
Noise and the danger factor inherent in crowded

THE PROS AND CONS OF INDIVIDUAL TERMINAL TYPES



Central Terminal With or Without Satellites

1) Passengers know exactly where to go
2) Minor duplication of facilities
3) Passenger congestion is a problem



Unit Terminals

1) Passenger congestion is minimal
2) Short walks to planes
3) Easy to get lost finding right terminal

skies have severely limited the choices for possible airport sites, as have the teamed voice of an environment-pollution-control minded electorate. "We don't want any airport around here, bub."

One answer to finding airport sites is to go farther and farther from the city. But that is getting harder to do without bumping into somebody else's city. A yet untried (except for the aircraft carrier) but old suggestion (Amancio Williams for Buenos Aires, Le Corbusier for Rio de Janeiro) is placing the airport where no political bickering over land acquisition will occur, and no one will be disturbed — that is, in the water. Airports in the water, whether they float or sit on the bottom, are the airports of the future. Two variations of this concept are discussed later in this article.

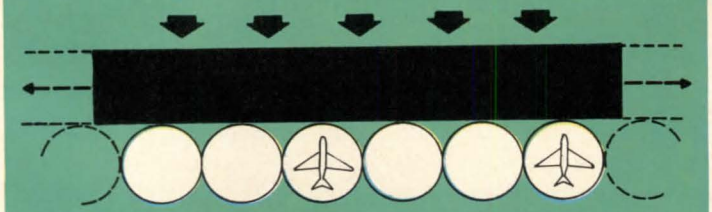
Before a city can build an airport it must have a good deal of money. Presently, the Federal Government spends an average of $65 million a year for airport construction. These funds are distributed on a 50–50 basis, with the city building the airport putting up 50 per cent of the cost. Often, smaller cities that desperately need an airport in order to attract industry cannot raise their 50 per cent of the enormously expensive total cost, so airports go unbuilt. In a report on the National Airport and Airway System to the Senate in July 1968, Senator Monroney stated that the capacity of the nation's system of public airports has not increased at the rate demanded by air traffic and that aircraft delays at airports are costing the airlines in excess of $50 million a year. No dollar value can be placed on the time lost by air travelers. Monroney further states, "The problems of congestion at the large airports, and of insufficient airports at many smaller communities, stem largely from inadequate financing. Monroney proposes, as did President Nixon in June of this year, the establishment of an airport trust fund, financed by taxes on airplane fuel and airline tickets, which would provide $150 million a year for airport development. Monroney also recommends an amendment to the Federal Airport Act that would authorize a $1 billion guaranteed loan program for terminal area development. If these two financing methods are adopted by Congress, it could mean a lot of airport work for architects.

One of the basic decisions that must be made before design work can be done on a new airport is whether it is better to bring the people to the planes or the planes to the people. Planes are air machines; on the ground they are awkward birds straining themselves while consuming expensive energy. Pilots dislike applying their airliner's brakes because they know doing so puts extra stress on the most vulnerable part of the machine, the landing gear. The most economical-for-the-airlines airport scheme, such as the TAMS design for Pittsburgh discussed in this article, puts the loading stations as near to the end of the runways as possible, in order to minimize taxiing distances. This scheme will become more and more economical as the size of planes rapidly increases toward the projected 900 passenger Lockheed jumbo-jet.

An alternative for bringing the people to the plane is to develop an economical ground guidance system, such as a platform on which an SST could ride from runway end to terminal. San Francisco-based Ground Guidance Systems Corporation is presently at work on this problem of in-airport plane circulation and noise. Their scheme utilizes a small, self-powered vehicle on which a plane's nose wheel sits. Wires imbedded in the taxiways electronically guide the vehicles to desired destinations eliminating tie-ups and the danger of jet blast.

As airports become more and more automated, the designer is removed from the direct solution of many inherent problems. Now, instead of designing the terminal complex as a whole, the designer must work with a great number of mechanical subsystems, some of which he selects, but most of which are established as givens. If the whole terminal appears not to function correctly because one of the subsystems, such as the baggage handling mechanism, not doing its job, the architect must take the blame. And since no present baggage system works well under peak loads, architects have a lot of blame to take. One airline official recently stated that the only solution to the baggage problem was for the airlines to rent clothes to passengers at their destinations.

The other problem over which the designer has no control is the long lines at the ticket counter. Airlines have tried to speed this process up by computerizing ticket sales, but the long lines are still there. One possible answer to this problem would be to sell a standardized ticket at a downtown location. If a passenger wanted to go to Chicago from New York, he would buy a ticket that simply stated New York–Chicago; then he would take any airline having a flight. The airlines could still compete for his business. These two problems have been stated to show what the airport architect has little control over. The rest of the article is dedicated to the things over which he has a great deal of control.



Linear Terminal

1) Parking is in terminal
2) Walks are short
3) Linear expansion can occur
4) Little duplication of facilities

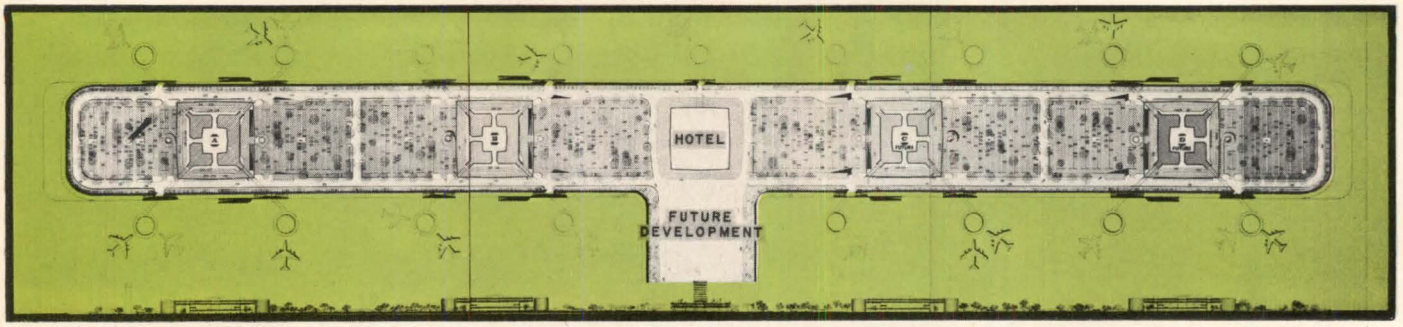
FIRST JETPORT DESIGN FOR SST

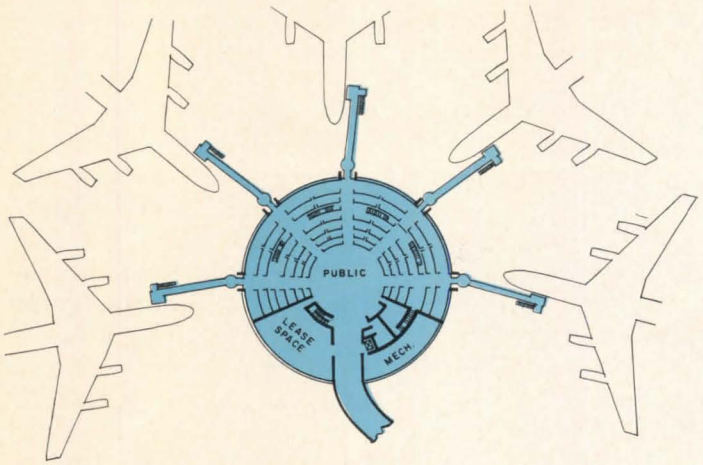
Houston is the Nation's first city to enter the era of supersonic travel with the opening of its totally new Houston Intercontinental Airport designed by architects Goleman & Rolfe and Pierce & Pierce as an airport for people as well as planes.

In-terminal parking at the newly completed phase-one of Houston Intercontinental Airport saves plenty of walking. As the only major United States airport planned and constructed within the last 10 years, and the second one designed specifically for jets — the first: Dulles, Washington, D.C. — HIA attempts to give the speed-spoiled passenger what he wants — continuous motion and curtailed walks.

The concept is quite straightforward. All functions, including parking, are provided for in and between the two identical terminals. When, at some time in the future, more space *is* needed, which is inevitable, then two more terminals will be added. Terminal interconnection is by an underground train loop.

Vehicles entering the airport drive under an apron and emerge in a one-way flow that allows turn-offs and merging without interrupting traffic. Passengers can be dropped off or leave rental cars at the second-level check-in concourses. Those parking can

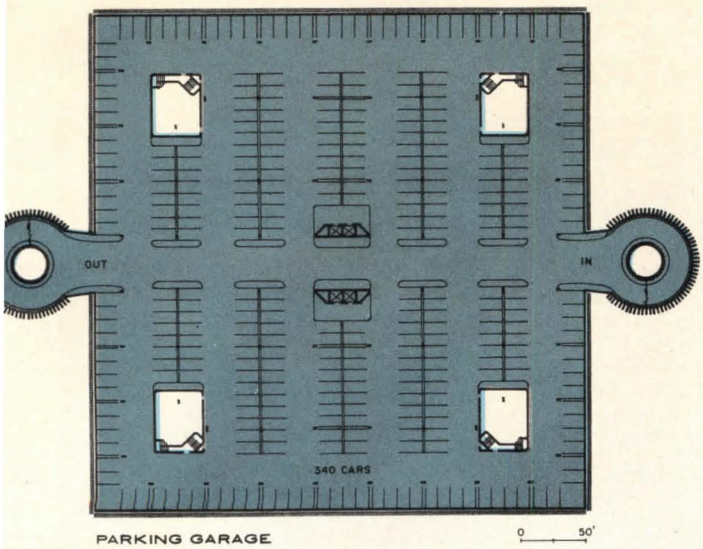




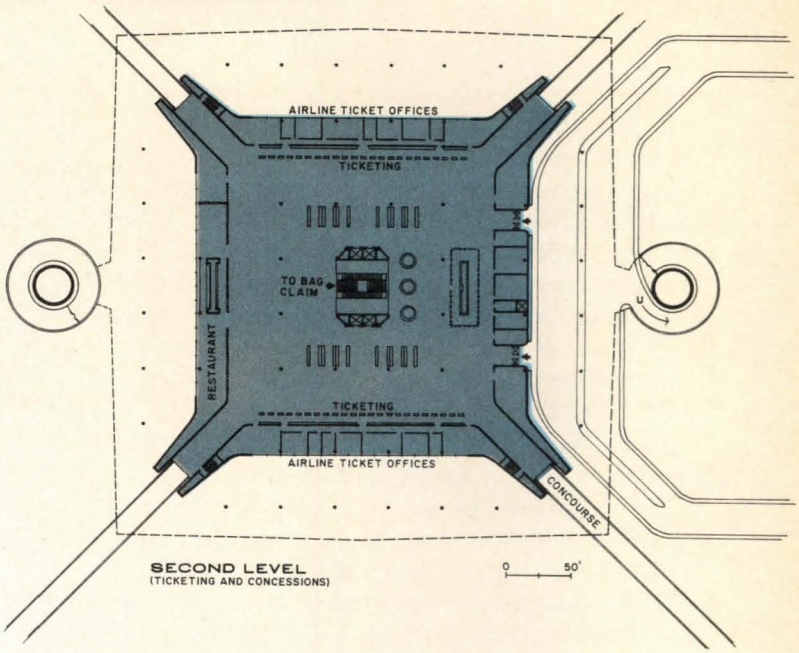
FLIGHT STATION - SECOND LEVEL 0 50'

drive to the top two levels of either terminal, which contain room for 773 cars each and then take an elevator down, or they can use the open lot with room for 1600 cars between terminals and take the underground train. In any case, no passenger will have more than a 3-minute walk, 250 feet, from car to plane.

Aircraft "come to the passenger" by clustering around satellites that project from each of the four corners of the terminals. Each satellite has five loading gates with hold rooms seating 65 persons. In or-



PARKING GARAGE



SECOND LEVEL
(TICKETING AND CONCESSIONS)

der to accommodate larger aircraft one satellite has hold rooms seating 120. Still, there could be a lot of standing around when jumbo jets capable of carrying 480 passengers start flying later this year.

One of the more exciting features of the airport is the completely automated, battery-operated mini-transit loop with four trains. The 21-passenger trains run through an air-conditioned tunnel that also contains walkways. Budget considerations forced the architects to narrow these walkways wherever the tunnel is penetrated by a stair-cove, which also happens to be the loading area for the train. The narrow width makes it hard to pass people standing, waiting or boarding the train.

The trains operate about 6 minutes apart at 5 mph. Magnetic controls below the rubber roadway guide the glass fiber and aluminum cars. In 10 minutes the $370,000 system can move 200 people between any two points, which at the airport's present capacity is enough to handle the estimated number of interline-transfer passengers (10 per cent of the total), and those coming from the outdoor parking lot. Max-

imum waiting time is said to be 2 minutes.

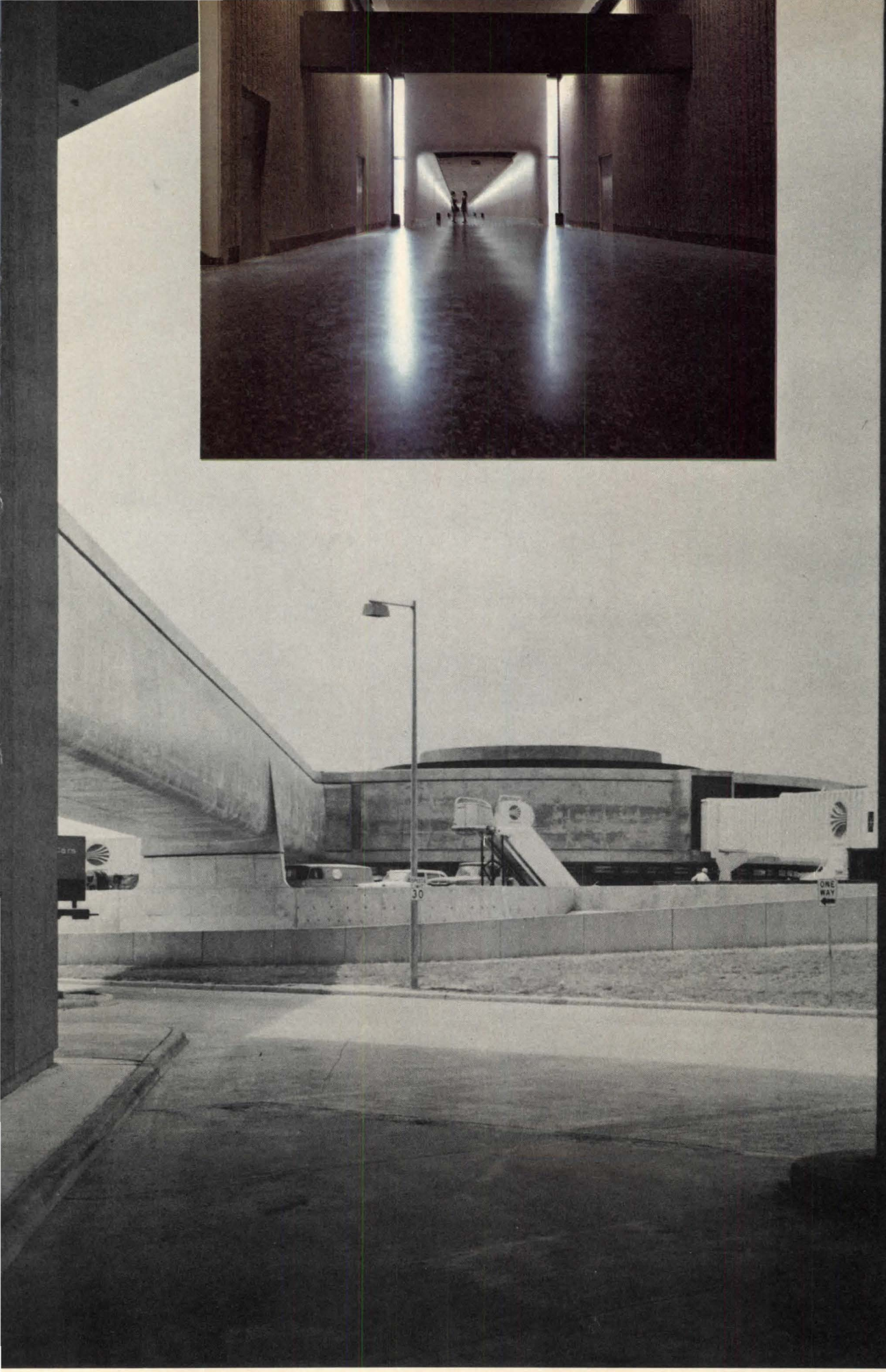
Baggage rides on conveyor belts from the check-in counters to loading carts. Incoming carts unload onto conveyor loops that consume less space than the carousels used at most airports, and provide 183 ft. of baggage delivery space. Some critics of the terminal doubt that this system will provide enough delivery counter space for luggage.

In the first year of operation 10 major airlines operating from the airport expect to move 4,500,000 passengers. This number will double in five years. If traffic does increase at the expected rate, each terminal has been designed to accommodate two more stories of parking garage to absorb the load.

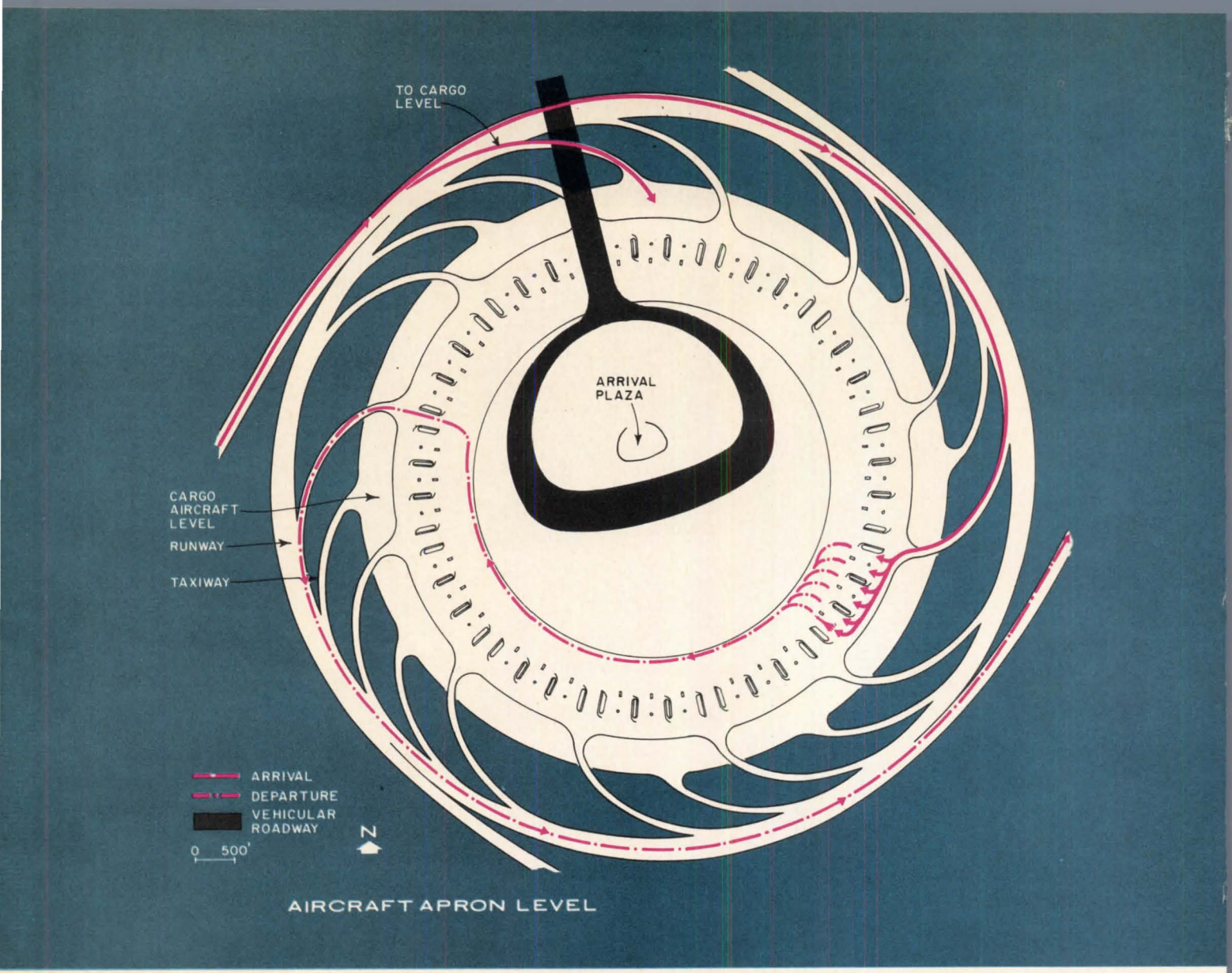
As a measure of the airport's success, airlines which usually require an hour leeway between transfer flights are selling transfer tickets to flights 30 minutes apart at Houston.

The inter-terminal train, at right in photo, at a pick-up point.

The main lobby floor in both terminals contains ticketing and check-in facilities. Satellite flight stations radiate from this space.



One of the four flight satellites which cluster around each terminal. Passengers walk along the above ground, covered walkway to reach their holdrooms. The color photo inserted at the top, shows the inside view of the walkway.



AN AIRPORT IN ONE

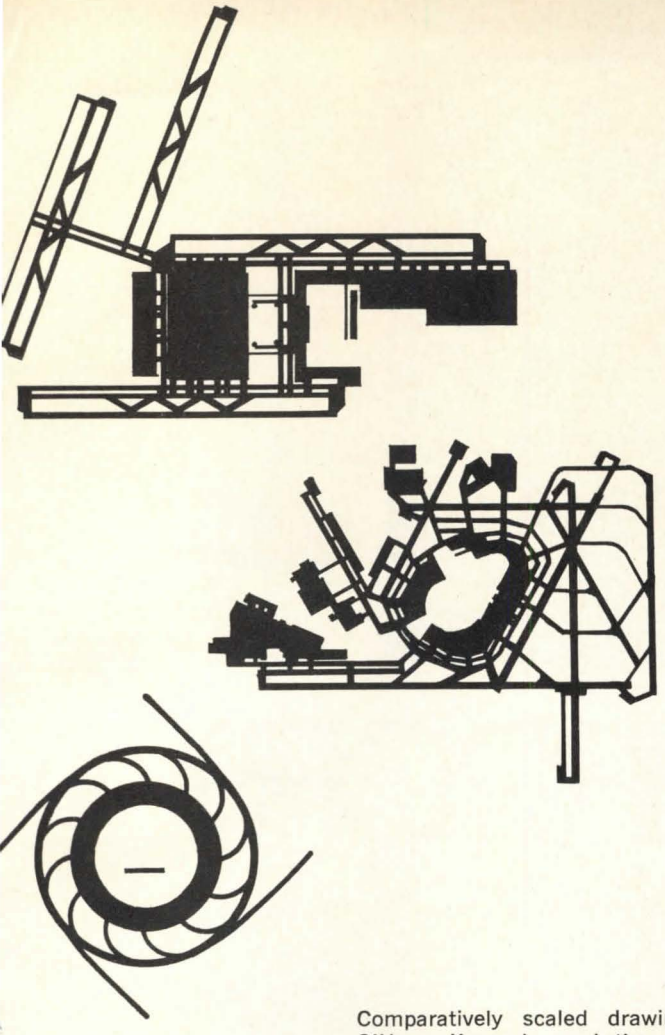
When compared to the plans of any other airport, the poetic, formal geometry of this plan stands out emphatically as apart from all others, and very definitely nearest the inherent nature of airports. The circular runway is a generator of speed, which culminates in thrust and expulsion on a tangent. It is a form free to be pure because, as conceived here, it is surrounded only by water.

Set on a man-made island in the sea near any port city, it could remove aircraft noise, pollution and danger from over our cities. Based on land, this airport, which consumes only one-third the usual required space, could save a fortune in land-acquisition costs. Judging by airport standards, this is a tiny one, only 1.5 miles on a side, yet capable of handling the traffic load of a hub airport. The cost of building a banked runway is offset by the decreased amount of runway needed — an estimated 24,000 ft.

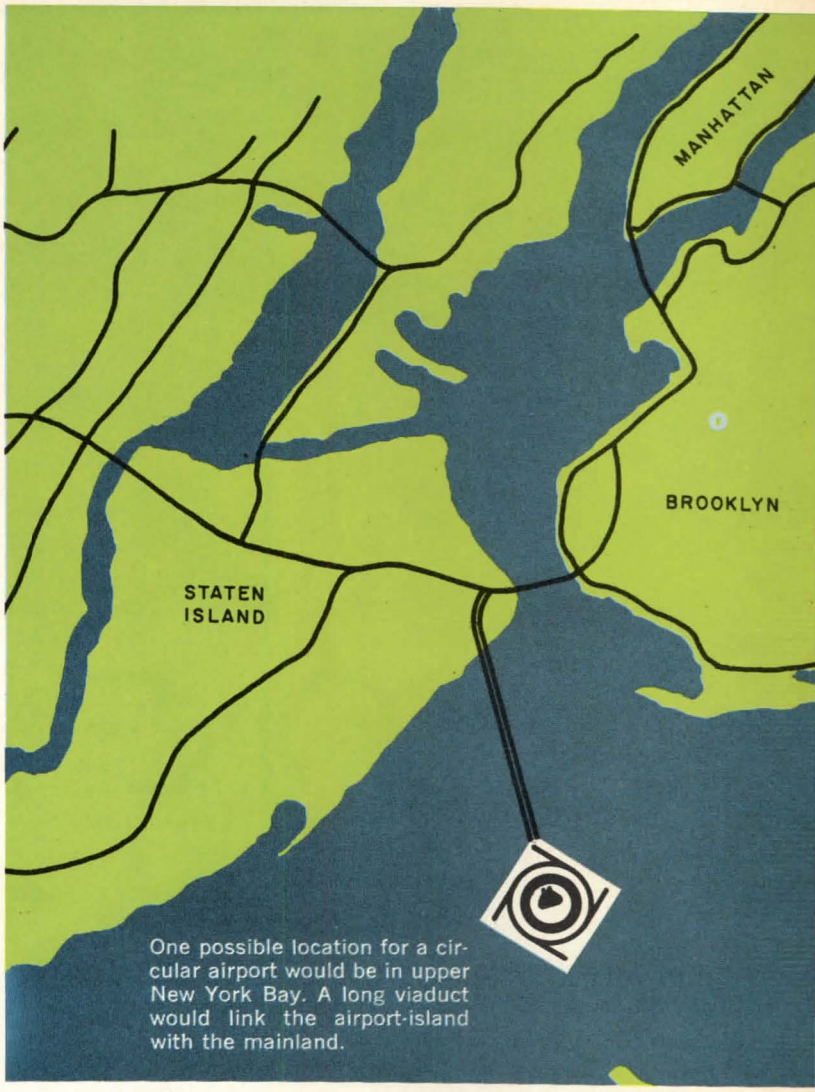
By placing it on a filled island, with runways 60 ft. above mean high-water, the problems of much-discussed floating airports are obviated. Transportation to land is over a two-road viaduct, handling rail, bus, and automobile traffic.

Having arrived at this island airport, a passenger proceeds under the runways to the central terminal. As he approaches the terminal, he can see the level he wants and follow the correct ramp up to it.

One of the things the designer, Michael Blanc, had to grapple with was whether or not the terminal building belonged on the island or back on the mainland. Although he feels the terminal will eventually atrophy when buses can come from downtown and load directly onto the planes, with present technology the terminal works best near the runways. As



Comparatively scaled drawings of O'Hare, Kennedy, and the circular airport which is the only one with extended runways for SST capability.



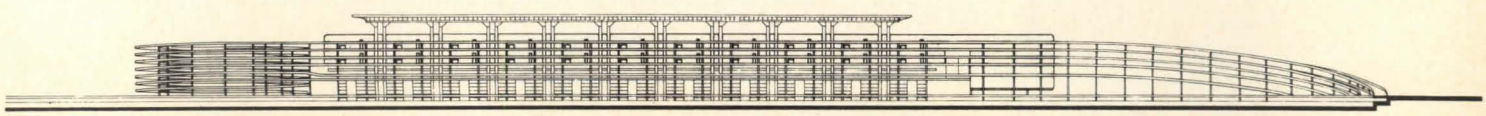
One possible location for a circular airport would be in upper New York Bay. A long viaduct would link the airport-island with the mainland.

THIRD THE SPACE

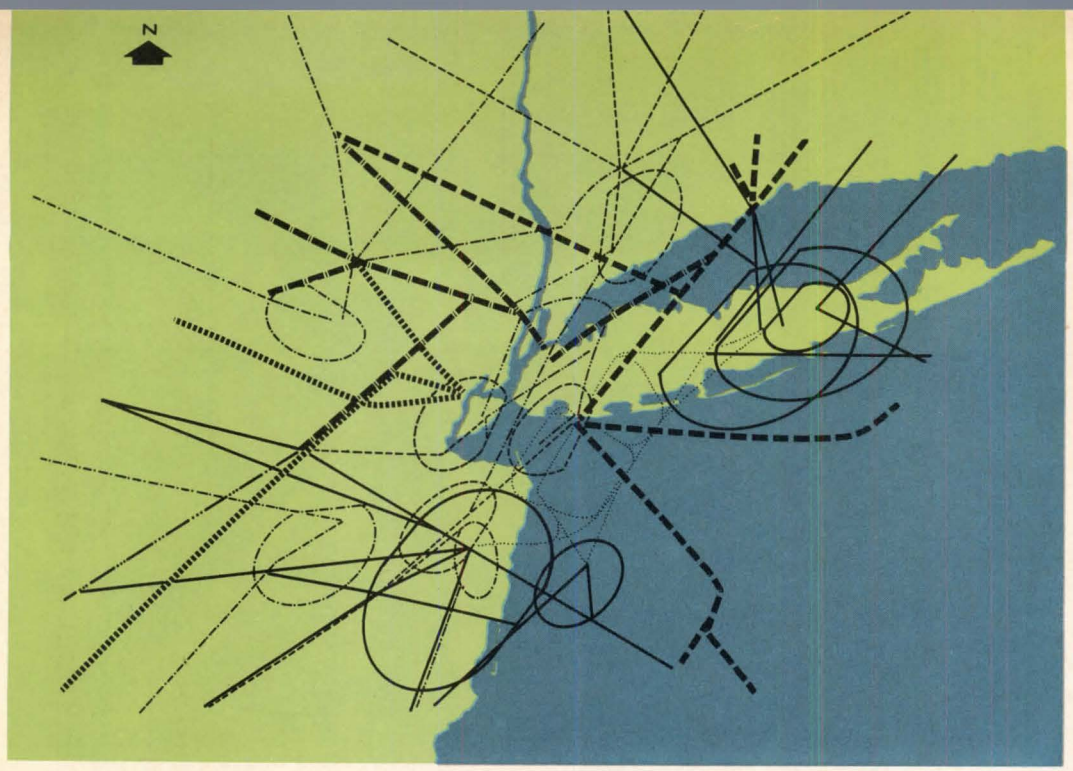
it is, mobile lounges will load the planes.

The combination of circular and straight runways gives the aircraft a straightaway on which to make air-land transitions and a banked portion, the circle, on which to accelerate or decelerate. A departing aircraft accelerates on one half of the circular portion and then enters the straightaway from lift-off. Landing aircraft do just the opposite, using the other half of the circle for deceleration, then entering the nearest taxiway, which leads to an assigned loading-unloading station on the wide apron. A bus arrives and passengers are taken back to the terminal.

The circle being a closed form, once the airport is constructed, it cannot expand within itself, but so much land is saved that it is feasible to build another airport just like this one, adjacent to it.

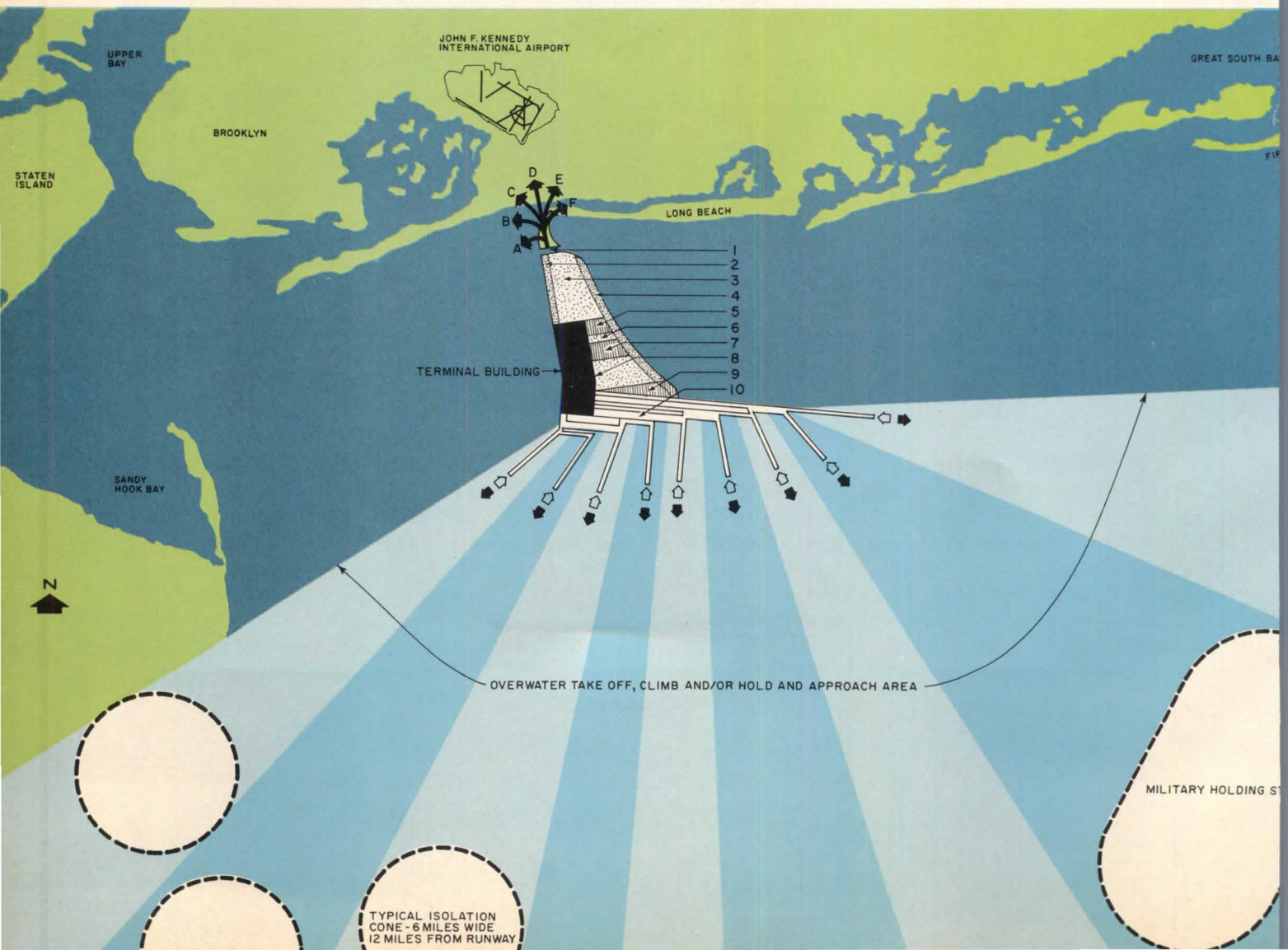


Automobiles would approach this terminal from the right, drive up the desired ramp, and exit down the spiral at left.



The state of the art: Air traffic patterns over New York City.

ONE AIRPORT IN



Designed specifically for New York City by Lawrence Lerner, this mega-airport could replace all New York airports, practically pay for itself, and in the process return valuable land to the City.

PLACE OF FOUR

New York City's three major airports are chock-full-o'-planes, and that means no more room. The answer: build a fourth jetport. At least, that seems to be the answer with which everyone is in agreement. The only haggle holding up construction is that no one in his right mind wants that fourth airport built near his home.

Having given New York's airport problem much thought, designer Lawrence Lerner has devised a unique, workable concept that calls for one airport (including the one planned) in place of all four New York City airports. Of course, the concept could be adapted by any port city.

Lerner's concept is based on a megastructure 9-miles long, sitting on the ocean bottom 5 miles off the coast of New York. There it would sit, the largest structure in the world, a harbor for all air and ship passenger–cargo movements bound to and from New York. A superhuman, superscaled transportation hub that would free valuable downtown land (presently wharf and airport sites) for much needed housing and at the same time preserve the jobs and functions now occurring on this land.

In that primary area of consideration, financing, the $6.5 billion project-cost would be offset by the sale of the land now occupied by Kennedy Airport, which, if sold as improved land, would bring $3.5 billion. The whole project, including transportation links to and from the city, would be built in increments so that only the first phase (enough airport to replace Kennedy) would have to be paid for with a bond issue.

Constructed of concrete boxes and floated to the offshore site, all fabrication could be done in a plant in the Brooklyn Navy Yard, thus producing a seven-year industry there. The lay of the ocean bottom at the site could be mapped by Sonar and computer, which in turn could control the form for the concrete boxes so that each box would conform exactly to the ocean bottom at the point where it was to be sunk. Once sunk into place by filling with water ballast, all boxes would serve as the substructure upon which the airport could be built. Once the superstructure were completed, it would weigh enough to keep the structure in place. The water ballast could then be pumped out and the resulting space used for cargo and equipment storage. Since the ocean is 180 ft. deep at the site, this interior storage space would be huge.

Runways would project at 15° radians from a 9-mile long spine. Each succeeding runway would be 30 ft. more above sea level than the previous one. In this way, when planes taxi up to the terminal structure, they would be on many levels, thus allowing

The Lerner airport would remove all air traffic from over the City, and place it in neat circular holding patterns over the Atlantic Ocean. (Left)

Capacities		JFK	LGA	EWR	Total	Offshore
Passengers per year	1970	17 million	6.5 million	5.2 million	28.7 million	
	1980				91.0 million	378.4 million
Peak hour plane movements (IPR) 1970	capacity				173	432
	demand				235	
Gates		200	41	80	321	468
Plane Movements per year		395,898	250,526	207,970	854,394	3,784,320
Automobile parking spaces		11,350	4,345	5,700	21,395	200,000 to 400,000
Cost		700 million	350 million	300 million	1,350 million	6,000 million*

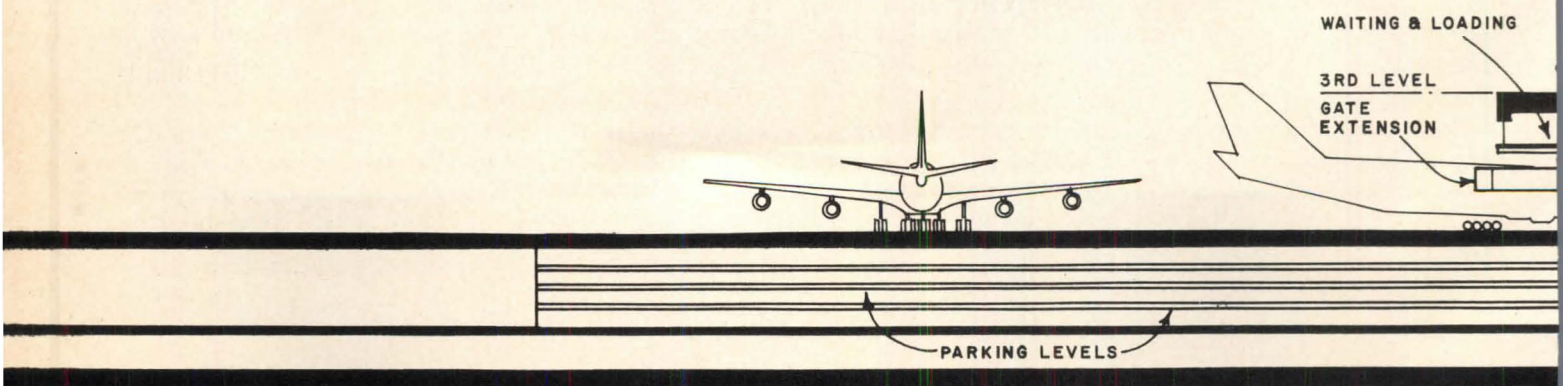
*Net cost after liquidation of JFK alone is only 1,688 million

This chart compares the potential volumes of air traffic capabilities of Lerner's airport, with the three existing New York airports.

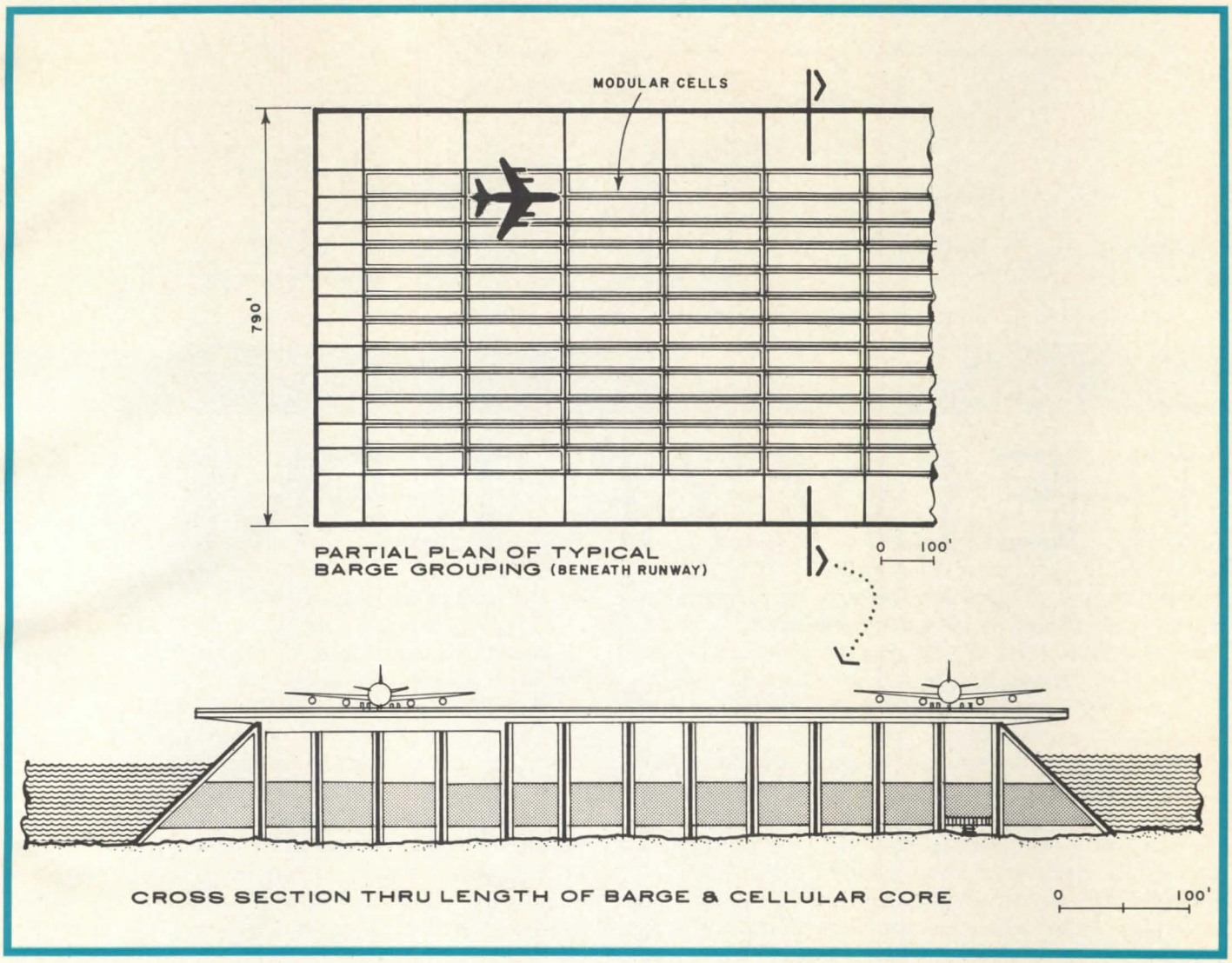
more planes to nose-in to a given space. With 15° between runways, enough space is generated between them at 5 miles from touch-down so that each runway could have an integral holding pattern. After the final phase of construction, when all runways would be in operation, the airport would be able to handle 50 per cent more traffic than four New York airports combined. Air traffic would then be removed from the city skies.

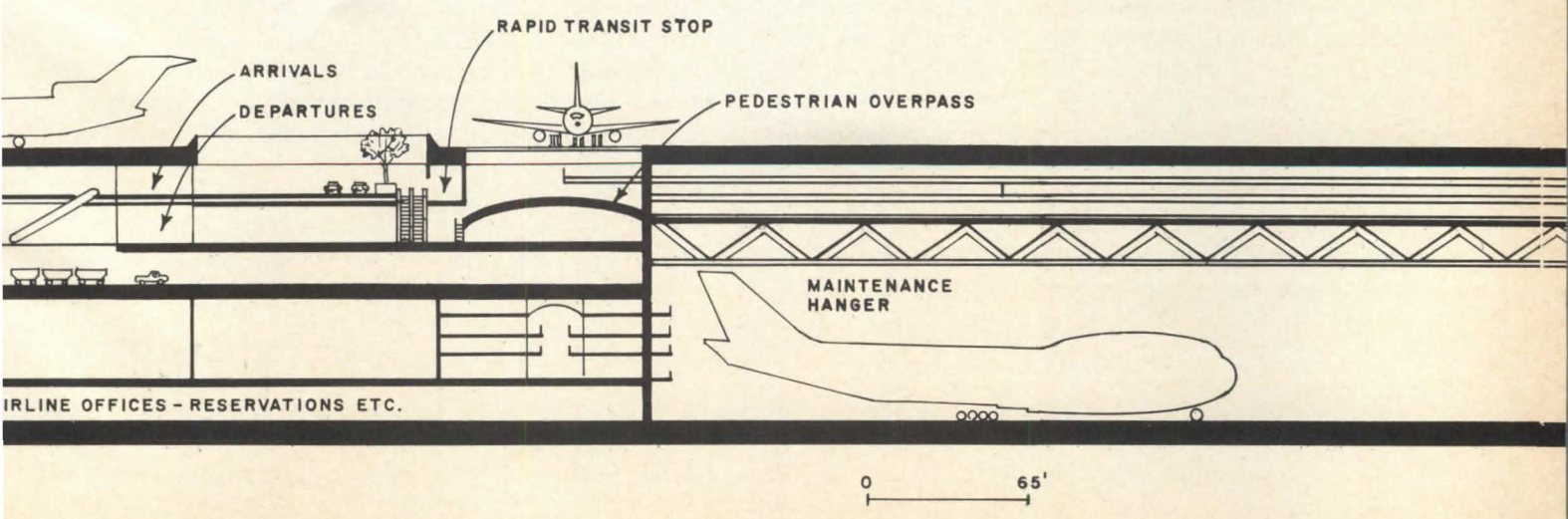
A basically linear terminal is recommended, with parking contained in the terminal building. Transportation within the terminal would be by a small loop-train.

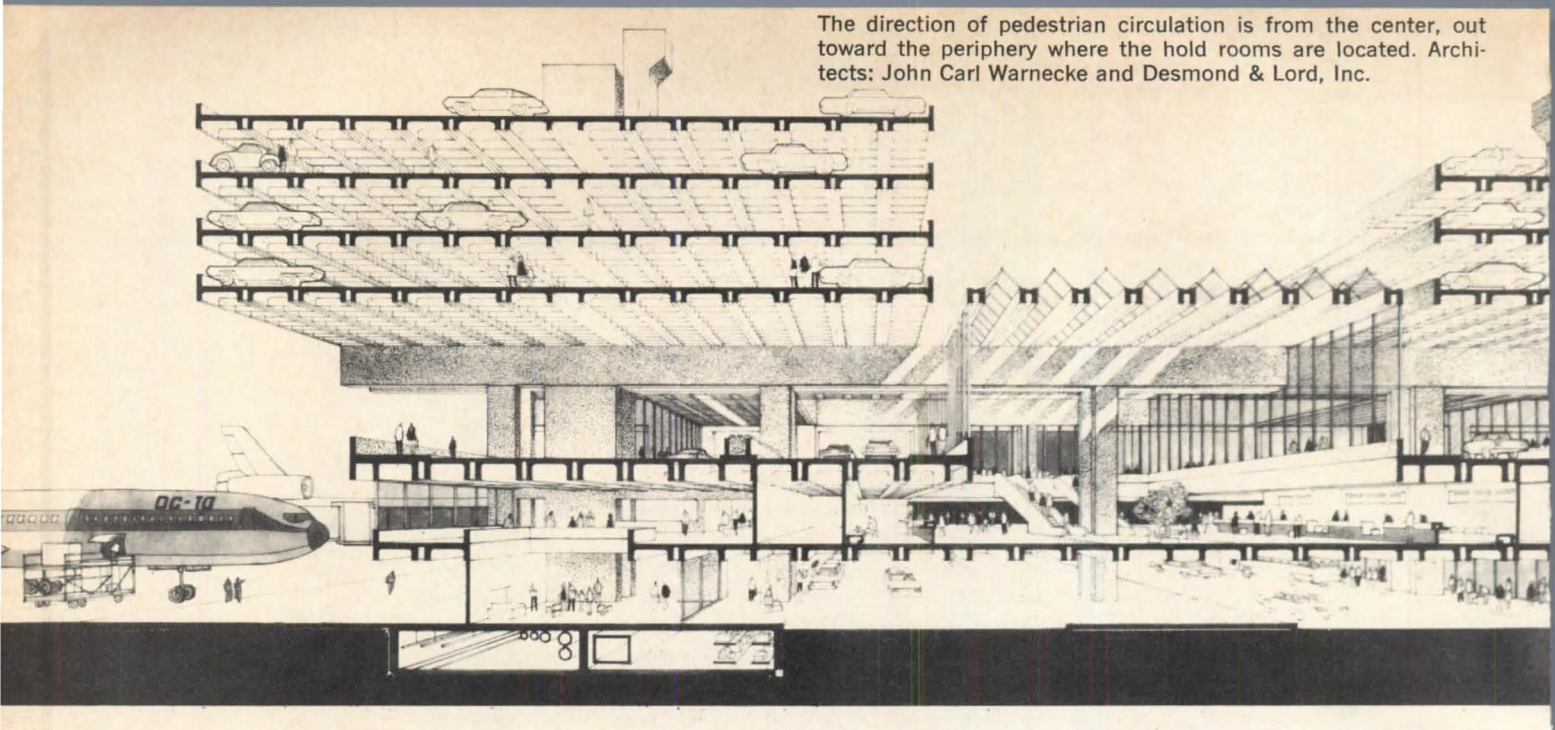
Considering the fantastically high volume of traffic projected for this complex, the transportation links to the city become equally important as the airport itself. Lerner proposes major rail links, water links using hydrofoils, air links using STOL and VTOL craft, and a road system that would use in part some of the runways of Kennedy Airport.



SECTION THRU TERMINAL SHOWING ONE LOCAL CONFIGURATION


MODULAR CELLS
790'
0 100'
PARTIAL PLAN OF TYPICAL
BARGE GROUPING (BENEATH RUNWAY)
CROSS SECTION THRU LENGTH OF BARGE & CELLULAR CORE
0 100'


RAPID TRANSIT STOP
ARRIVALS
DEPARTURES
PEDESTRIAN OVERPASS
MAINTENANCE
HANGER
IRLINE OFFICES - RESERVATIONS ETC.
0 65'



The direction of pedestrian circulation is from the center, out toward the periphery where the hold rooms are located. Architects: John Carl Warnecke and Desmond & Lord, Inc.

THE LINEAR TERMINAL

If the terminal fingers are forgiven as a necessity, used to get the most gate positions out of a tight, irregular site, then one begins to grasp that the South Terminal at Boston's Logan Airport will be the first structure built utilizing the linear concept, that is, all functions in one long building.

Although the fingers (see photo) around which the planes park do increase the car-to-plane walking distance over what it would be in a strictly linear terminal, the compromise results in what appears will be an efficient airport terminal. And, if the architect's dream comes true the silence of moving sidewalks rather than the pounding of feet will be heard along the fingers' corridors. Economically, the ratio of road and curb length to number of gate positions is more feasible with, rather than without, fingers to increase the surface of the building's aircraft-side. In plan, the aircraft-side is the outside surface of the "U." The inner surface is land-transportation oriented.

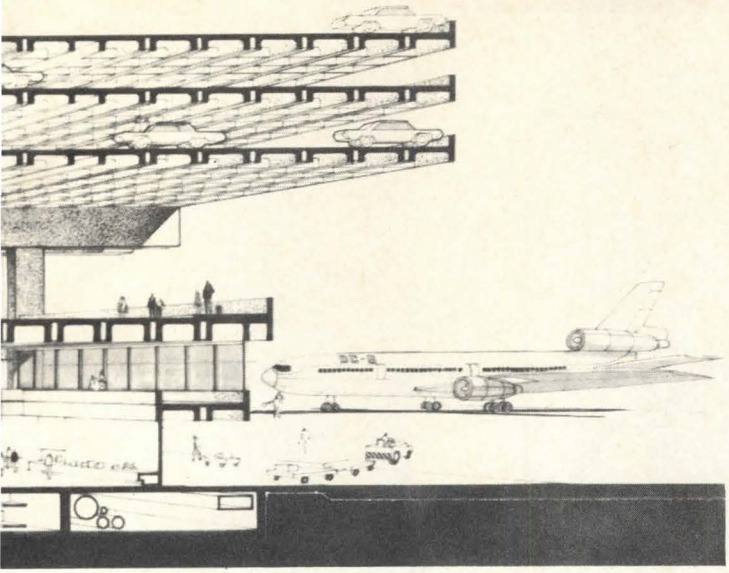
Architecturally the building establishes a vertical, layered relationship among its components: deplaning, concourse, emplaning and parking, in that order from the ground up. Interlevel transitions are made by elevators and moving stairs, spaced, to deliver the passenger from the various levels as near as possible to and from the aircraft.

In section it can be seen how the various elements stack up around the central, two-story concourse. A departing passenger can drive his car into the building and up a ramp to park, or first drive through the building to a turn-around at the other end and then up to park. Once parked, in one of the 2700 spaces provided, an elevator takes him to check-in on the concourse level. He then goes to a hold room on that level. Passengers who are not parking are dropped off at the curb-side on the emplaning level, hopefully at the center of the building in order to be near the somewhat centralized ticket and baggage check-in counters. Parking spaces near the center will fill up quickly; those unlucky enough not to get one of these central spots will have a good walk to the ticket counter, and from there to the hold room. The pre-ticketed passenger who carries his bag onto the plane with him will be in good shape no matter where he parks or is dropped off. He can take the nearest elevator directly down to his hold room.

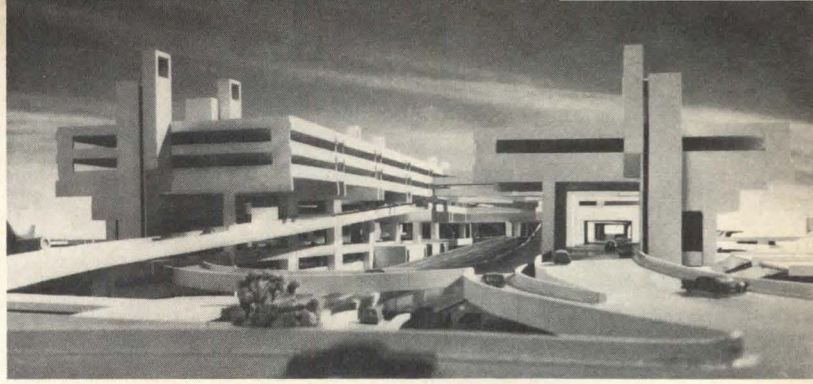
Arriving passengers will have it easier. Entering the terminal at the concourse level they will go down one level to baggage claim on the deplaning level, and from there to curb side or up the elevators to the parking structure.

Expansion of the precast concrete structure could be relatively easily accomplished by adding modules horizontally, thereby increasing the lengths of all levels. The structure and major circulation cores are designed to allow maximum variations of size and position of hold rooms — an important feature considering the ever-growing passenger capacity of new aircraft.

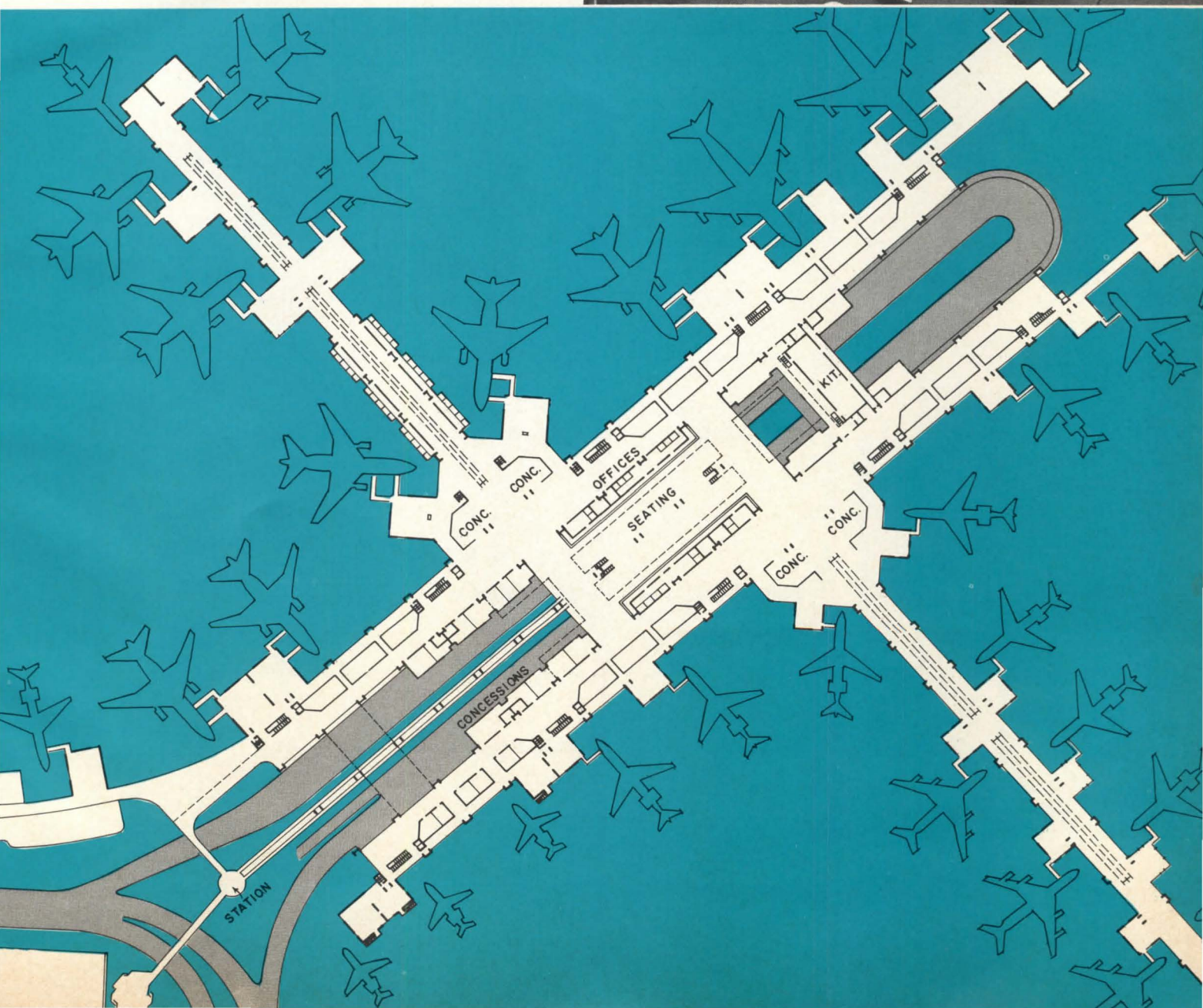
Instead of designing a strictly linear structure, the architects conserved space by bending it in half. Expansion can still occur in the direction of the upper-right of this drawing.

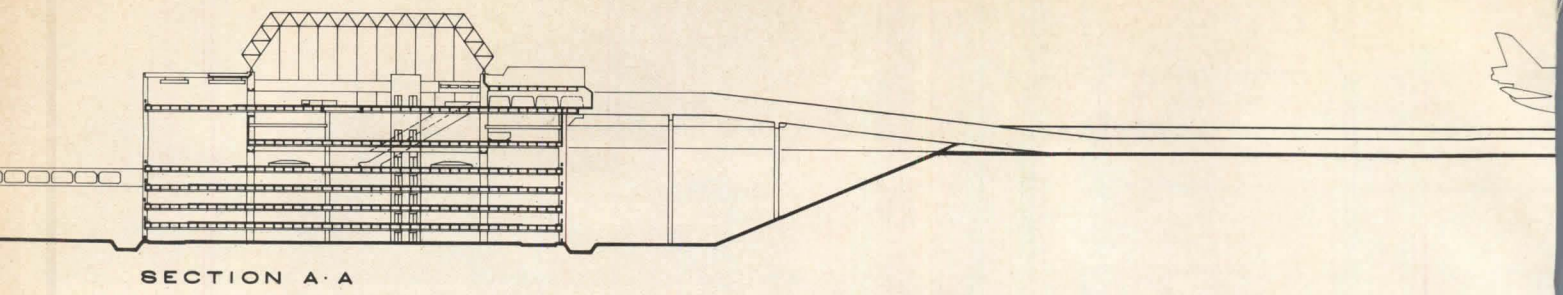


CONCEPT



The two photos, above & below, show both the interior, or land side of the terminal, and the exterior, or air side. Parking is on the upper levels.

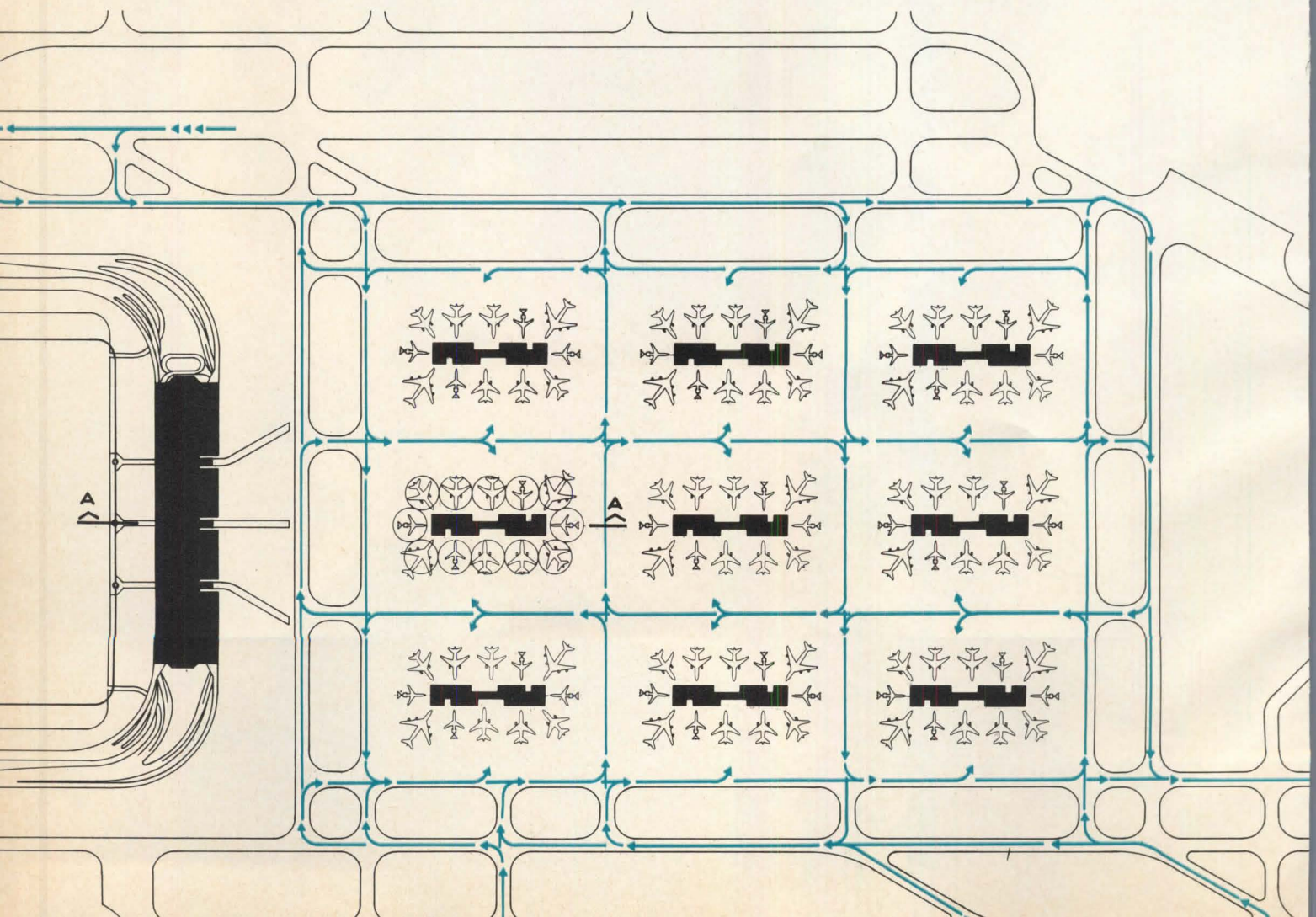


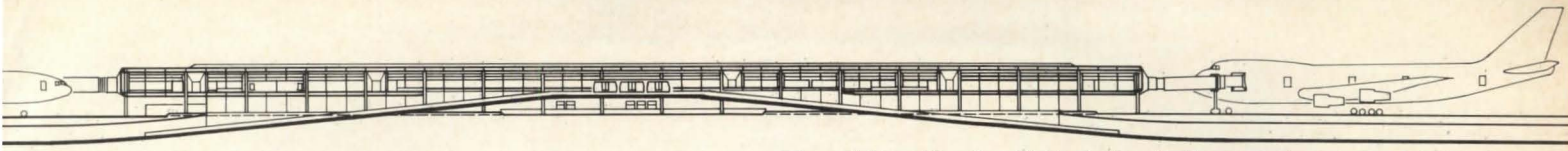


SECTION A·A

AIRPORTS UNDERGROUND?

Richardson, Gordon & Associates and Tippetts-Abbett-McCarthy-Stratton have maximized aircraft maneuvering space, minimized walks.





The relationship of a flight station to the main terminal, at left.

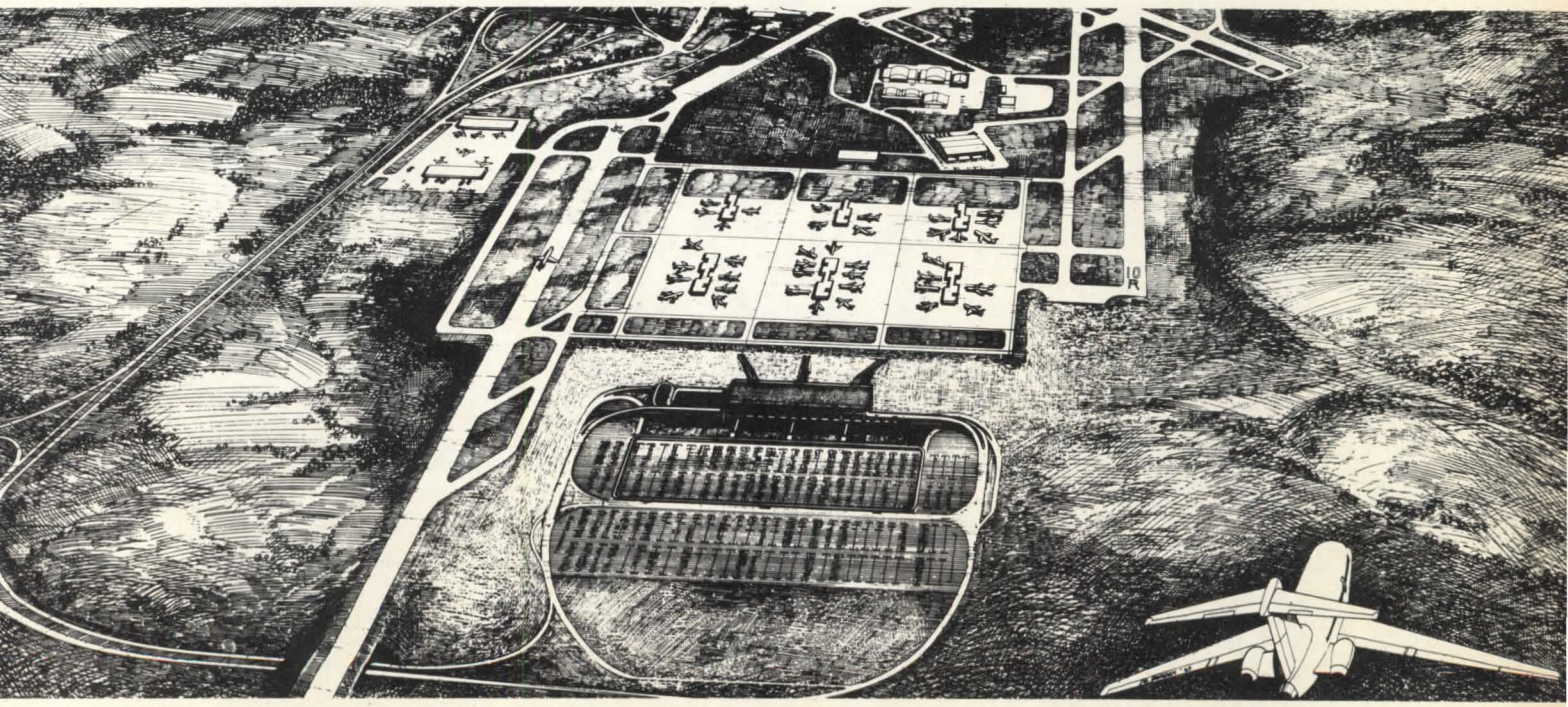
Not exactly all underground: The terminal is built into the side of a hill, and an automated transit system is beneath a "flow through" apron, but runways are conventionally on-grade.

This proposed expansion for Greater Pittsburgh Airport takes advantage of a hilly site condition in order to save both passengers and planes time and stress. Rather than taxiing planes to the passengers, which is expensive and hard on the planes, the designers felt it would be more efficient to reverse that movement. In this plan, a plane can taxi in, unload–load, then continue across the apron for take-off. At most airports planes taxi three or four miles between landing and take-off; here that distance will be cut to one mile.

This people-to-plane concept is not totally new; it was applied at Dulles Airport, where the passenger takes a mobile lounge out to the plane. The difference between the Dulles and Pittsburgh schemes is the underground train system carrying passengers between terminal and satellite holdrooms.

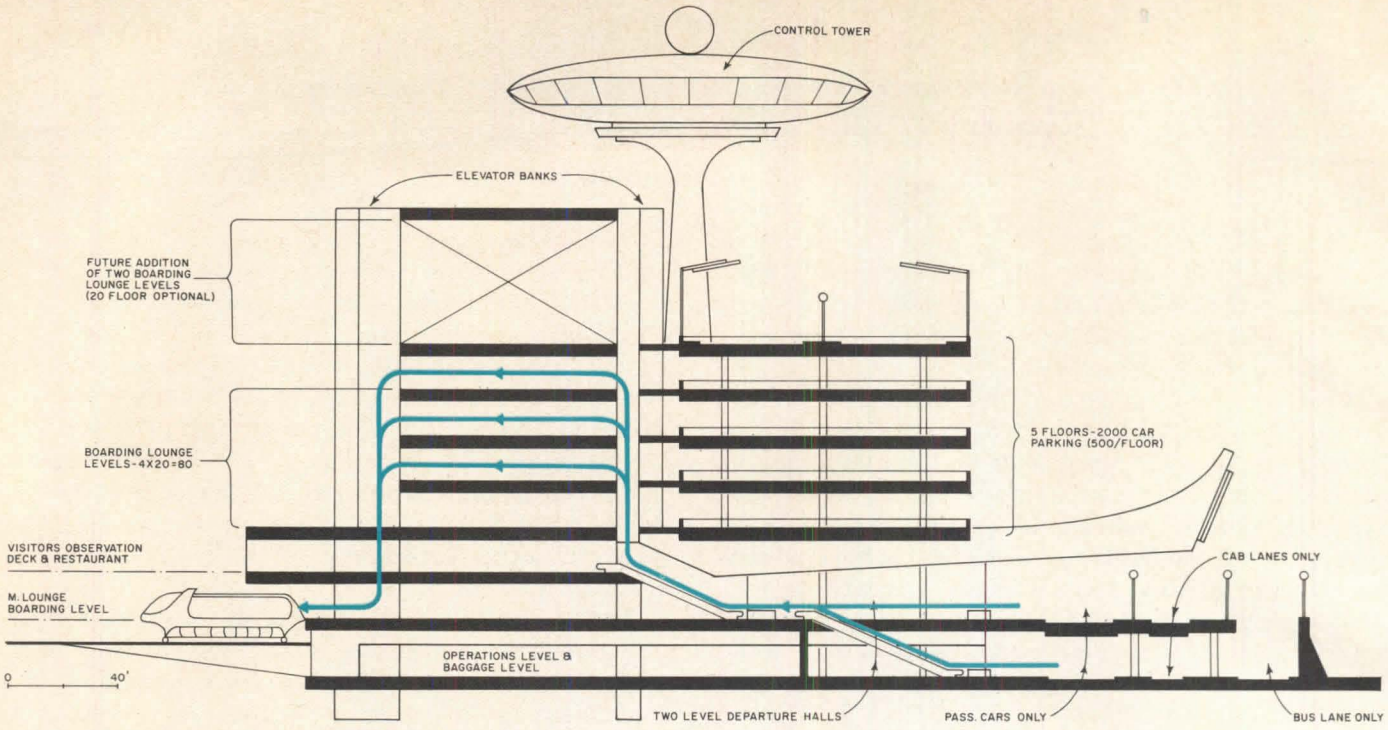
Utilizing rubber-tired cars designed by Westinghouse, the automated trains will depart from the terminal at the main ticketing, concourse floor, run under the apron in a tunnel to the first satellite, where it will rise on a slope to the hold room floor, stop, then go on again, repeating the same procedure for each satellite. Carrying both people and baggage, the trip to the farthest-out satellite will take 4 minutes and 15 seconds.

The six-story main terminal will segregate arriving and departing passengers. Its lower four floors will park 2300 cars. Other cars can be parked in a 10,000 car lot in front of the terminal. It looks as though passengers parking out in that lot can expect some pretty long walks. The architects state that the in-terminal parking will be able to accommodate 80 per cent of public parkers.



An aircraft's view, showing the relationship of the parallel runways to the left and right of the parking apron.

A plane arriving on the runway at the top of the drawing passes through the parking apron, loads, and passes on to the lower runway for takeoff. The number of planes crossing paths is minimized.

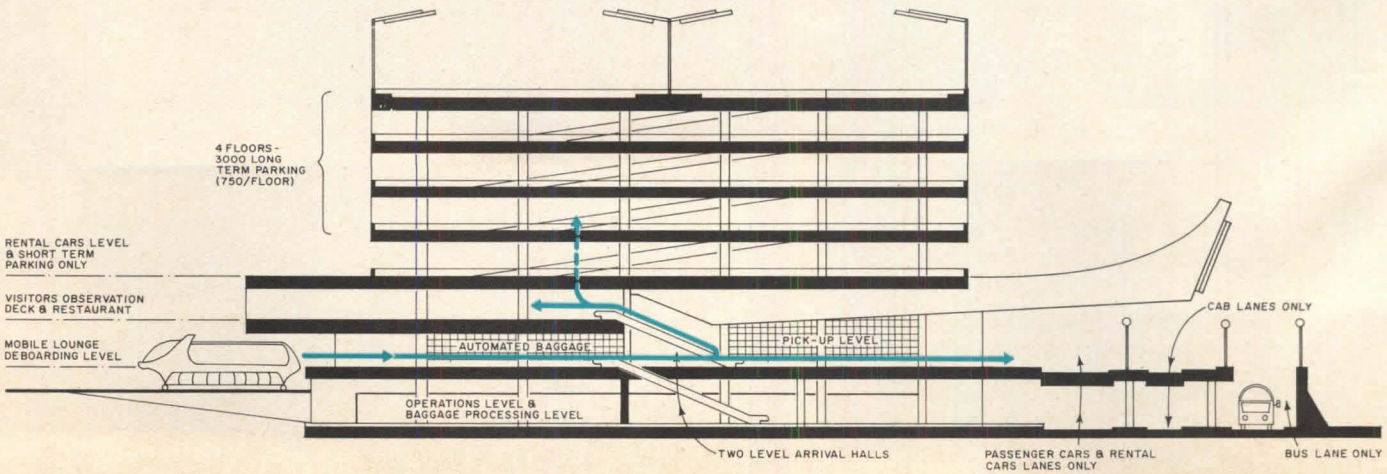


SECTION THRU DEPARTURE BUILDING

Essential to the function of this departure terminal is the complex vertical transportation system designed by Otis Elevator Company.

UPS AND DOWNS IN AIR TERMINALS

In both the departure and arrival (above) terminals parking is stacked above the passenger areas.



SECTION THRU ARRIVAL BUILDING

"An airport terminal is a location where aircraft discharge or receive passengers and cargo and refuel. It should function as a well-oiled machine and not as a glorified supermarket," says airport consultant Gideon Jeremitsky. He feels that present terminals are half functional, and half conglomerates of all those concessions which base their sales on impulse buying, which is extraneous to the meaning and function of an airport. All too often a terminal is designed as a huge space that is subdivided by the airlines according to their individual space demands. In order to preserve a buffer zone that can be used for possible future expansion the airlines rent more space than they actually need. This space is then sublet to concessionaires. In order to compensate for this buffer space, the designer must increase the already corpulent horizontal spread of the terminal building. Getting rid of this excess space is part of the answer to ever-land-hungry airports. Another part lies in changing the direction of expansion from horizontal to Jeremitsky's vertical. This new direction will become more and more economically feasible as the costs of land and building foundations increase. In some major cities, New York for instance, it is already feasible.

Another reason terminals are as large as they are is so they can accommodate visitors. The footprint area, or public space, is usually increased by 100 per cent for this purpose. Jeremitsky says, "I would not propose denying the Aunt Minnies their rights, but I would separate the visitors from the passengers, and substantially reduce the visitors' area. After all, we are talking about mass transit, not a holiday outing. The mixing of passengers and visitors creates one big congested nuisance where smooth flow is essential."

Design Parameters for a Vertical Terminal

(1) Appreciably decreased frontage without damaging the ego of airline identity, or drop-off area.

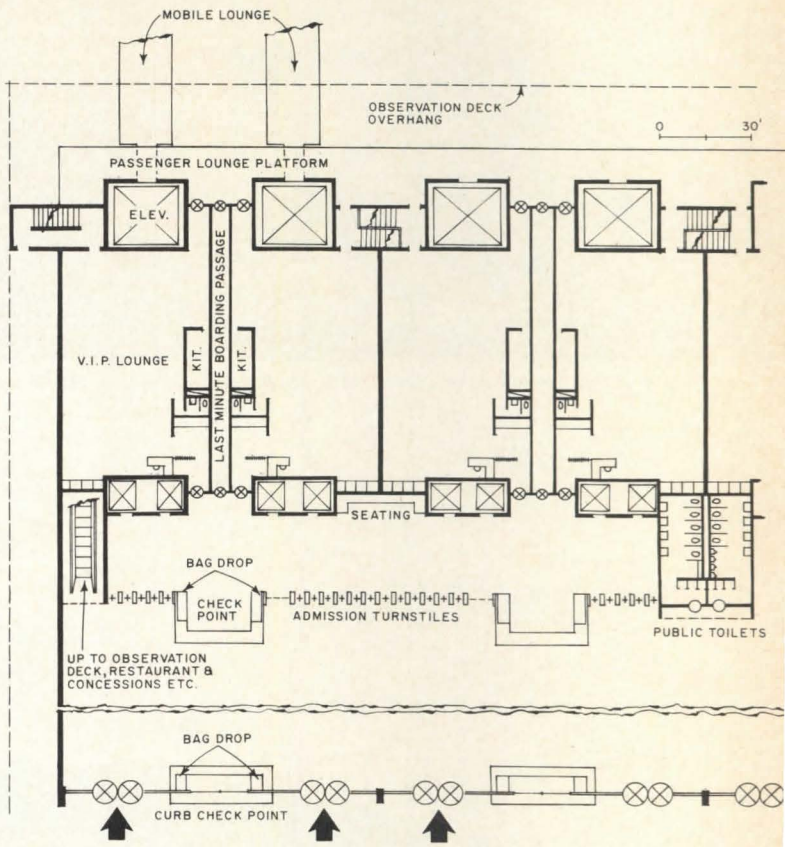
(2) Amputate exiting spaces which duplicate the functions. **A satellite is as a duplication.**

(3) Automated vertical transportation.

(4) Unified ticket and baggage processing system.

(5) Separate visitors from the normal flow of passenger traffic.

(6) Cut the total footprint area by 50 per cent if not more.



DEPARTURE HALL PLAN

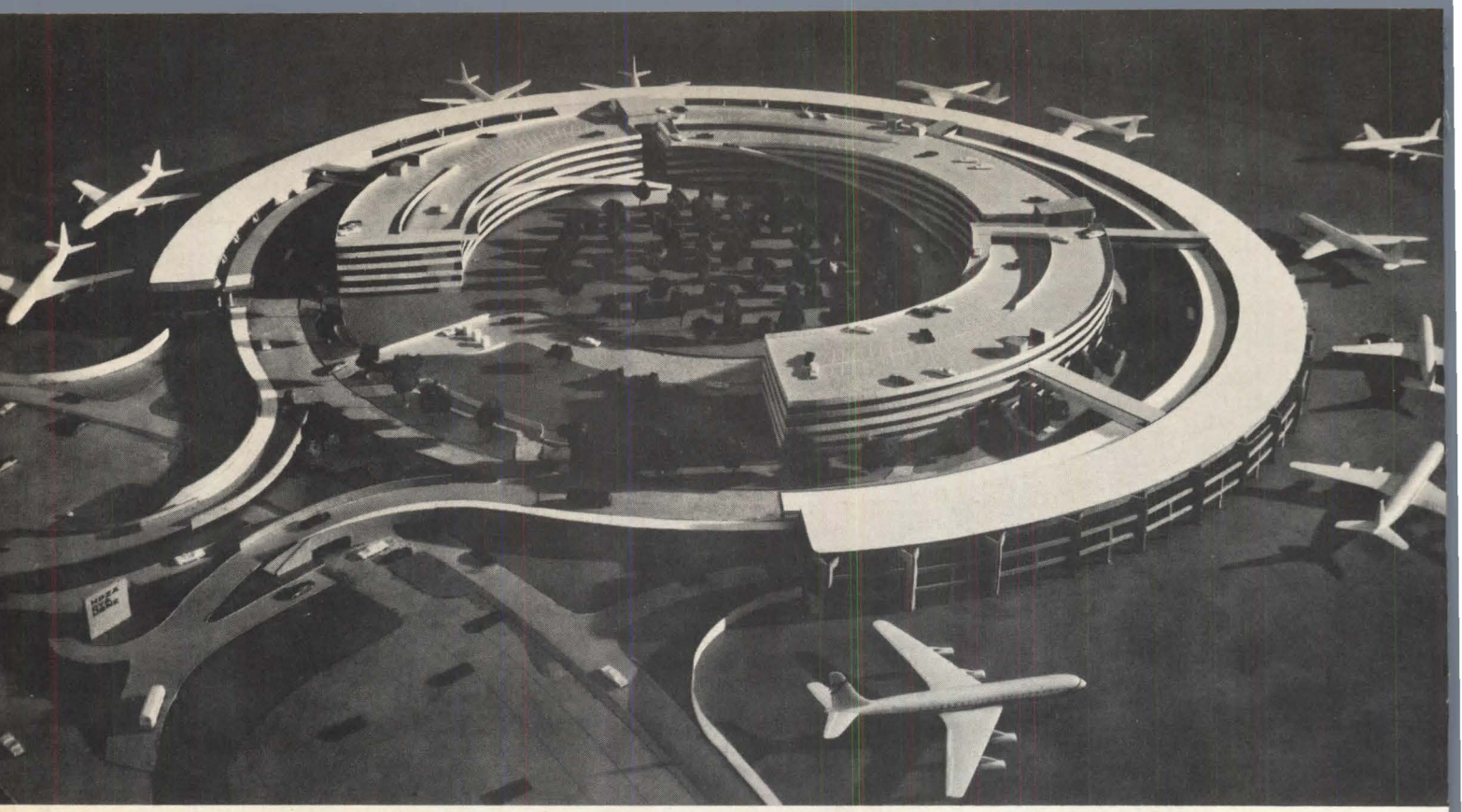
(7) Separate arrival traffic from the departing traffic by two distinct and separate buildings, without increasing expense.

(8) Separate incoming vehicular traffic according to the genus of the vehicle: i.e., separate bus, car, cab, and rental traffic.

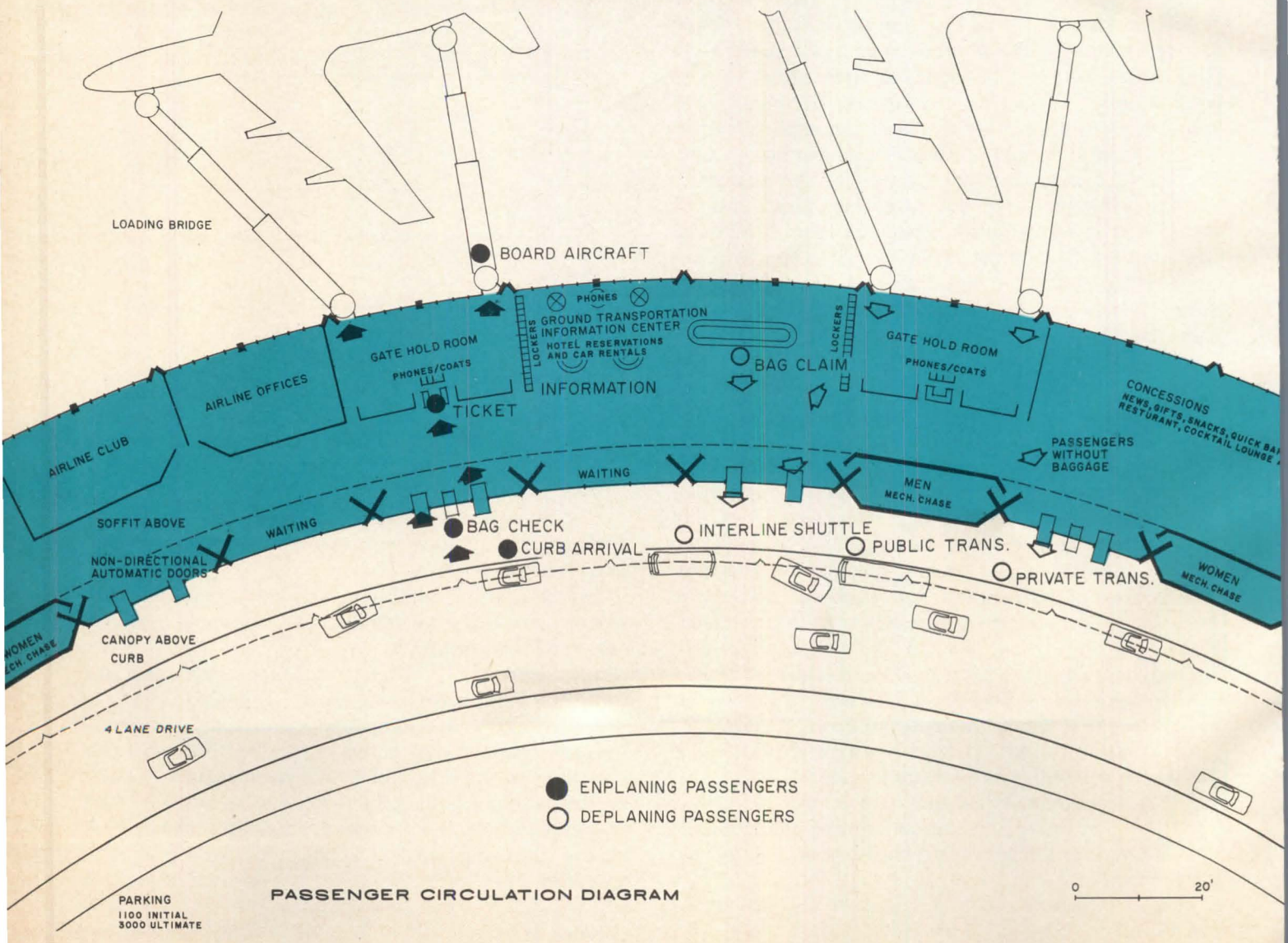
(9) Increase cost of construction, decrease unit cost for airlines, increase revenues for airlines.

(10) Accommodate any size aircraft.

As Jeremitsky sees it the key to the success of this new generation terminal is standardization. Whether the terminal is in Athens or Los Angeles, it must be designed in the image of the prototype. That means, uniformity of ticketing, baggage handling, and structure. The price of a terminal which is adaptable from 5 to 1000 gates, can be substantially reduced by standardization.

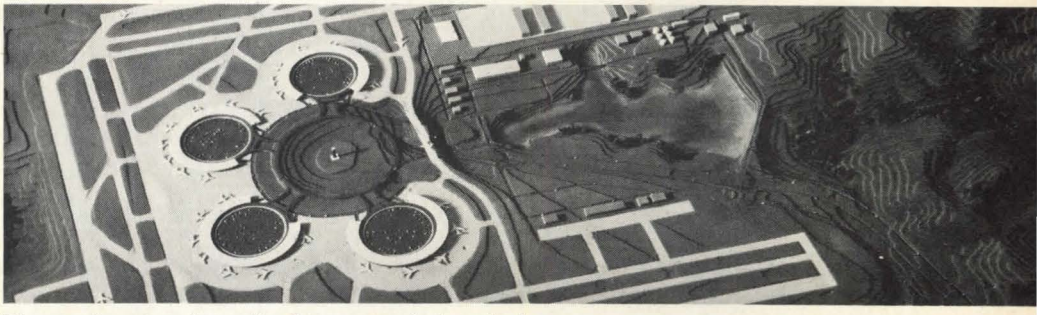


One of the four planned terminals, showing the parking structure as it will appear in 1975 inside the circumference of the terminal.



Curbside at the Kansas City International Airport designed by Kivett & Meyers and Burns & McDonell.

DRIVE TO YOUR GATE



The master plan shows the four separate terminals.

About as close to the ideal of driving right onto the plane as we can get at this time will be found at Kansas City International Airport, now under construction. The KCI design utilizes a "drive to your gate" concept that allows a passenger to drive within a 175 ft. walk of his plane, compared to Houston's 250 ft. walk. By relocating ticketing and baggage reclaim operation to the aircraft loading positions, providing for one ticket counter for each two gates and one baggage reclaim area for four gates, the passenger is saved the usual long, lug-your-luggage walk from check-in point to hold room.

This concept is one solution to the problem of form in relation to the functioning of a modern airport complex. Although a linear expression in its diffusion of functions, the complex is actually a refinement of the unit terminal design with which it shares some problems. One of these problems is the usual long walk from parking lot to check-in. During the first phase of construction at KCI parking will be on grade, contained within the circular terminals. Since parking next to one's gate will not always be possible long walks can be expected. But when the airport is completed and vertical parking structures are in, this problem will be overcome. Another problem is the extremely important role the graphic system — which in this case is good — must play in getting a motorist moving along at about 30 mph to the right gate in the right terminal. Under driving conditions it is not difficult to miss that crucial sign that points out the turn-off to that terminal containing the desired airline. At this point, one can question the complexity of a design that needs such an extensive graphic system. But once the passenger enters the terminal building he will find the most efficient and direct processing system devised for any airport.

MAGISTER GROPIUS

Walter Gropius, undoubtedly the greatest teacher in the brief history of modern architecture, died on July 5, 1969. On the day that the decision to have the operation was taken, Gropius had a long conversation with Ben Thompson, his close associate and former partner at TAC. The discussion centered on the failure of the architectural profession to meet its social obligations, a failure recently emphasized by student dissent. Gropius was completely sympathetic — to the students. Indeed, the social function of architecture had been the leading motive of his professional life. The elevation of economics and technology to the detriment of moral values as a guiding force was the antithesis of his dream — the union of all three within a humanitarian social context.

This was not the first time that Gropius had expressed his confidence in the judgment of youth. Alex Cvijanovic, another partner at TAC, recalled an address given in Berlin a few years ago during a student uprising. The students, who expected absolute dicta and logical formulae from this eminent master, were shocked when he counseled merely that "it is always best to follow your own intuitions."

The instilling of confidence was the essence of Gropius' "method." He guided not by directives but rather by questions, allowing the student to rethink the problem and arrive at new solutions entirely of his own formulation. Thus Gropius saw the teacher's role as that of a catalyst in the liberation of a student's essential creativity.

This is an extraordinary notion of a teacher, implying, as it does, so great a respect for the integrity of the individual. Most evidently, it is not a "method" but an attitude, and its success the result of genius, not of skill. As such, it could not be transmitted.

If respect and the instillation of confidence were the touchstones of his teaching, they are intrinsically bound up with his own attitude toward criticism. With the exception of Peter Behrens, Gropius acknowledged no one as his master, and found hostile criticism from students and associates decidedly painful. (Although a perfect master of the English language, he used the word "attack" unconventionally as a synonym for "criticism.") In this way, his own sensitivity produced the greatest concern for the self-respect of others. Nevertheless, Gropius remained his own harshest critic. His ultimate "attack" on the monotony of the curtain wall and concern with depth articulation to animate the facade, was, in effect, a criticism of the very system for whose development he was most responsible.

Although Gropius taught formally only at the Bauhaus and at Harvard, he was equally a teacher at TAC where his concept of architecture as a collaborative effort was perhaps most fully realized. In fact, the general consensus is that to have known Gropius was to have been his student, and, by extension, any student of modern architecture was a student of Gropius, so pervasive was his influence.

And yet, he exercised that enormous influence only at the broadest possible level. John Harkness, a student in the master class at Harvard and a founding partner of TAC, recalled that Gropius never approached a project from the viewpoint of the physical solution, but rather from that of the conceptual problem. Indeed, it was Gropius who formulated the notion of architecture as a problem-solving, environment-creating, interdisciplinary activity. That notion — modern architecture's Copernican Revolution — has become a universal basis for both teaching and practice.

It was this kind of broad influence that characterized his role at the Bauhaus. Students there would not speak of Gropius as a teacher, as they might of Klee or Kandinsky, who directed their own workshops. The institution itself was the manifestation and content of his teaching. Dedicated to the union of art and technology, in a climate of social amelioration, it served as an *environment* for teaching and the most creative form of learning. That the school's intellectual achievements were to become embalmed in academic formulae, and its visual manifestations identified as an International "Style" were sources of great disappointment to Gropius. When he left in 1928, through the combined frustrations of political opposition and the lack of opportunity to build, one student said, "You have made many mistakes,

Gropius, but there is no one to fill your shoes. You oughtn't to leave us." His capacity to discover young people of talent, entrust them with positions of responsibility, and allow them to develop according to their own dictates, was remembered appreciatively by Herbert Bayer who, through Gropius' discernment, taught graphic design at the Dessau Bauhaus from 1925–28.

While the Bauhaus was the product of revolution, Harvard was the product of reform. Gropius' achievements at Harvard, accomplished in the face of internal opposition within an established, largely conservative, institution were therefore particularly remarkable. But his very presence attracted talented young men with a concern for the modern movement and the social values of the profession. The list of graduates from Gropius' master class includes many of the most distinguished architects of this generation: Paul Rudolph, I. M. Pei, John Carl Warnecke, Ulrich Franzen, Ed Barnes, Harry Weese, Eliot Noyes, John Johansen, Victor Lundy, and Wilhelm von Moltke, to name but a few of the better-known. The fact that no "School of Gropius" could possibly be constructed from the work of these graduates attests to the success of his approach.

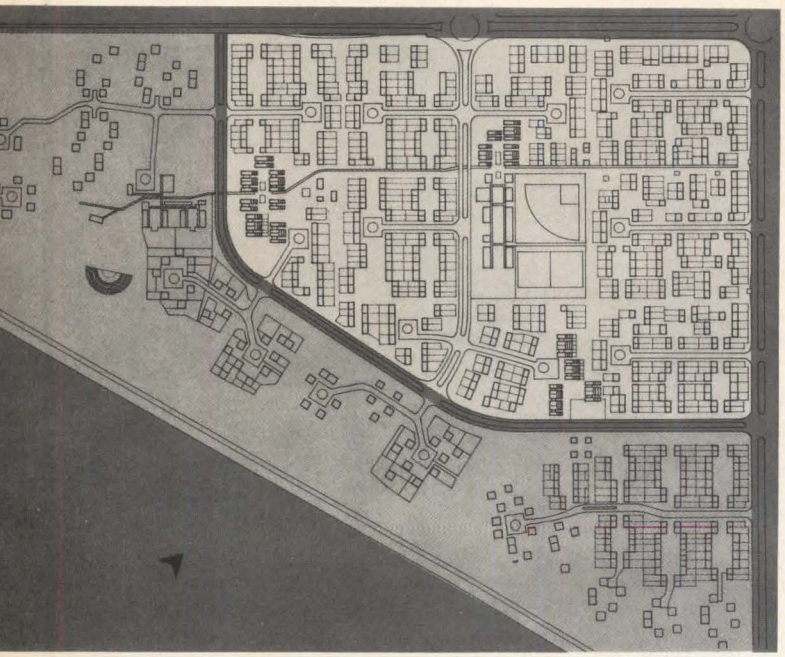
Typically, Gropius would organize team projects, emphasizing principles and facts, which he communicated with precision and elegance, rather than the physical solution. Each new class would be linked to the last through the continuity of these projects. The intimate situation provided by the small size of the group (not more than 20) was ideally suited to Gropius' manner of teaching, which depended largely on the exposure of his own political, social, and philosophical views, as well as his enormous enthusiasm. This kind of teaching which, according to Paul Rudolph, "brought out the best in every man," made students aware of the highest potentials of the profession. Less through what he did or said than through what he was, Gropius provided an ideal for the young architect, a standard of moral and professional excellence. Yet, the regard in which he was held was not without its problems. ("My position is becoming dangerous," he once said to Ben Thompson.) Gods tend to be imitated, and to be lonely. For Gropius, who despised imitation and loved human interaction, the situation was not enviable. Yet his manner was anything but godlike. He never spoke *ex cathedra*, and exhibited the most open of minds. I. M. Pei recalled a discussion at Harvard when Gropius espoused the position that, stylistically, international architecture would, and should, approach a kind of uniformity through improved communication and standardized techniques. Pei objected strongly and Gropius asked him to demonstrate his position. Pei argued well that the forces of indigenous expression would produce great stylistic diversity, and the master was moved to alter his position significantly. One can imagine the confidence and trust inspired in a student whose teacher does not remain implacable in the face of a convincing argument.

Each student drew from Gropius' wealth of qualities according to his needs and temperament. Wilhelm von Moltke, for example, an urban designer in the European sense, was offered a full partnership upon graduation in a firm that specialized in small-scale projects. Instead, he accepted a lesser position with Saarinen for the opportunity to deal with larger complexes, influenced by Gropius' concern with the total environment.

Ed Barnes remembered the magically clean quality of the Gropius House in Lincoln that seemed so fresh in contrast to the "homespun" surfaces of Wright and Aalto. When he recently visited the house again, that quality had not faded, and the emphasis on clarity and order continues to characterize Barnes' own work, although he would now distinguish between "simplistic" order, as an architecture determined by aesthetic ends, and a more complex notion that retains pragmatic values.

Gropius' patience in dealing with youthful naiveté was remembered by Paul Rudolph who worked with Gropius and Wachsman in developing the prefabricated house for the General Panels Corporation. When, for aesthetic reasons, Rudolph altered a window detail, Gropius spotted the change immediately in a very complex set of drawings (his keenness and attention to detail were legendary). Gropius was

"No 'School of Gropius' could be constructed from the work of these graduates . .



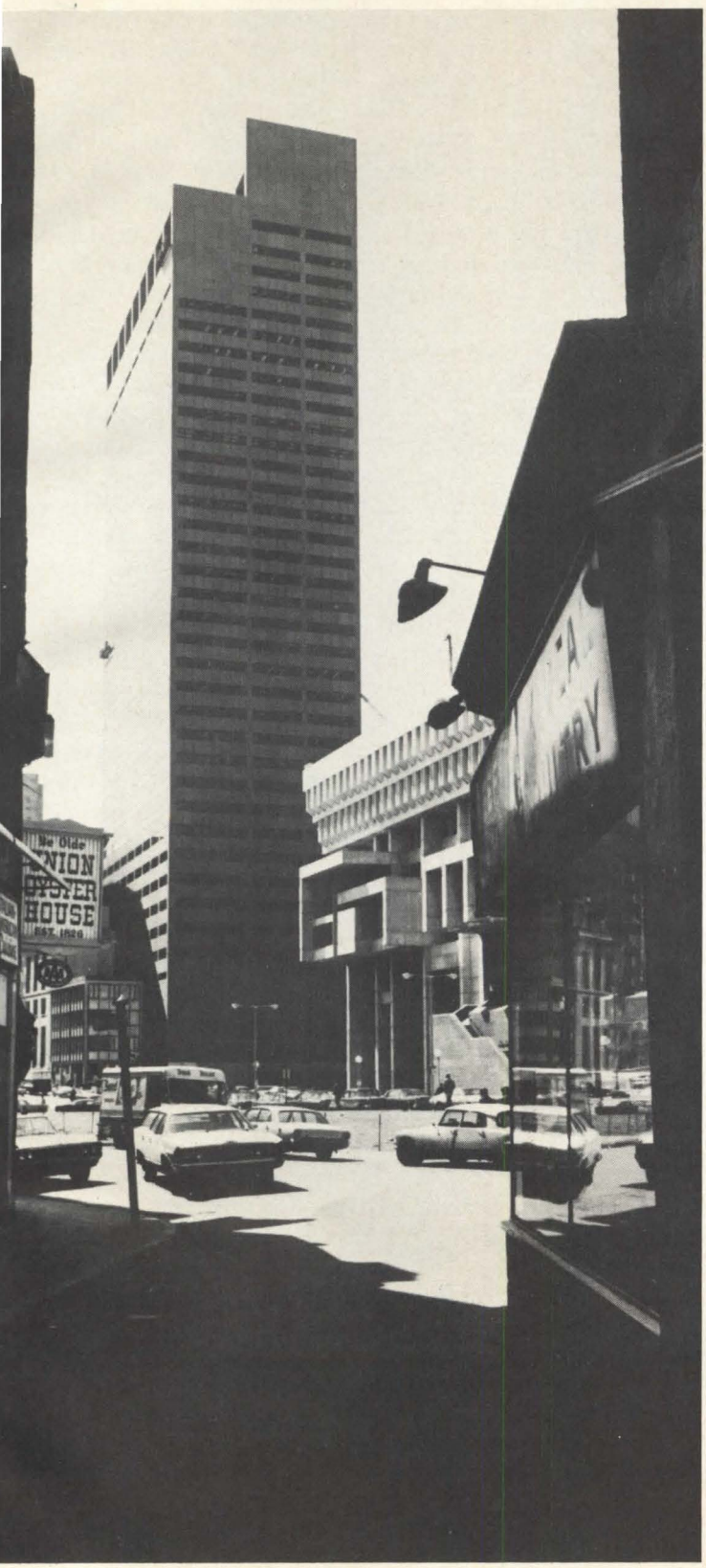
Wilhelm von Moltke—Site plan of the Guayana Project, Venezuela, for the Joint Center for Urban Studies.

John Carl Warnecke—Library, University of California, Santa Cruz.

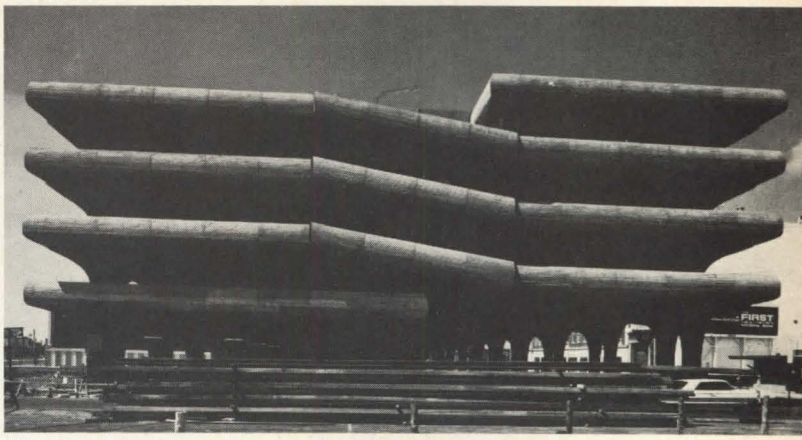
Benjamin Thompson—Student Dormitories at Colby College, Maine.

John Johansen—Litchfield Junior High School, Litchfield, Connecticut.

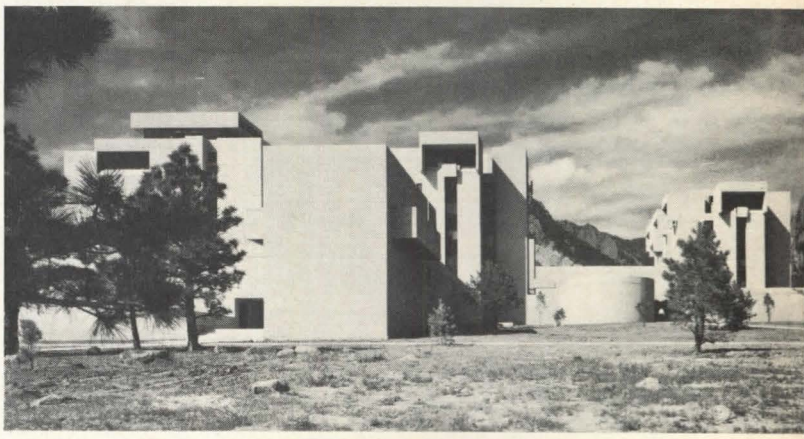
von Moltke, Thompson, Warnecke, Johansen, Barnes, Rudolph, Pei, TAC."



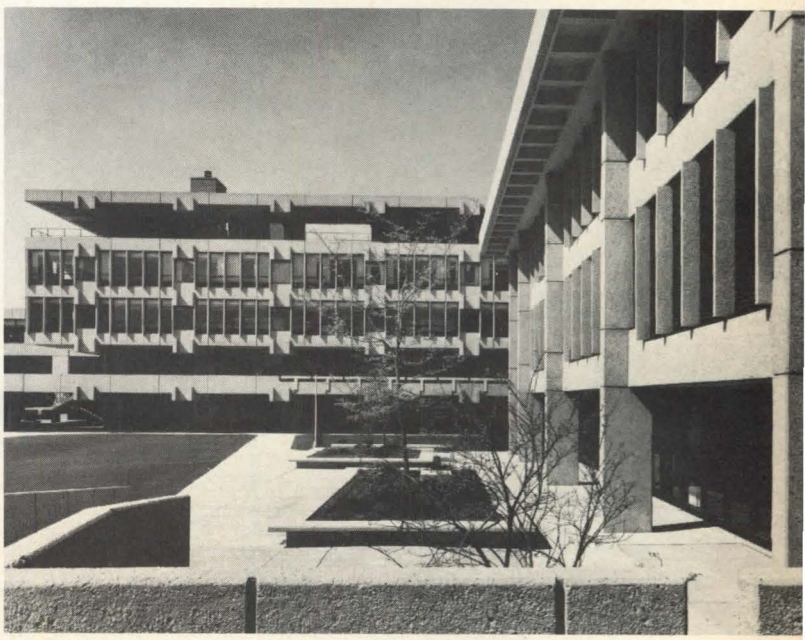
Edward Barnes—Boston Bank Building, Boston, Massachusetts.



Paul Rudolph—Temple Street Parking Garage, New Haven, Connecticut.



I. M. Pei—National Center for Atmospheric Research, Boulder, Colorado.



The Architects Collaborative—New Trier High School, Winnetka, Illinois.

able to explain the necessity of the original treatment in terms of its relation to the whole without becoming irritated or resorting to condescension.

The numbers of students whose work is less well-known, yet who quietly continue the intense seriousness of purpose that Ed Barnes spoke of as Gropius' most impressive quality, present a perhaps more adequate embodiment of Gropius' notion of "anonymity." That notion, which is difficult to spell out, meant at least the avoidance of a highly personal idiom that evidenced a degree of ego involvement incompatible with the high purpose of the profession. "When your ego comes to the front," he would say, "you will have failed the job."

In forming TAC, of course, Gropius had the greatest possibility of freedom in expressing his concept of the structure and process of an architectural team. Yet, according to John Harkness, "Gropius did not create TAC in his own image." It was and remains a "collaborative" in the best sense of the word, in which individual expression finds its most meaningful outlet in group effort. The result has been a wide variety of modes as against a single, unified style, in buildings and complexes of uniformly high quality. Gropius' concerns are reflected only at the most general programmatic levels. His interest in urban design and educational buildings, for example, led to a certain emphasis in these areas. Similarly, his belief in the psychological need for variety, and for involvement in external reality, natural or man-made, has led TAC to avoid highly controlled environments (such as completely artificial lighting and temperature facilities), even at the cost of absolute comfort, as well as highly repetitive modular facades.

The complexity of contemporary building programs demands collaboration on a scale that would have been unthinkable in the 1920's. But, equally, the very notion of collaboration might have been unthinkable today without Gropius' early efforts at the Bauhaus and the later development of TAC. TAC works collaboratively not only intramurally, but with a wide variety of outside specialists, as well as other groups of architects. That this method of working should have become the primary direction taken by the building profession in general is evidence of Gropius' remarkable foresight.

For the first time in his life, Gropius had the opportunity to devote himself equally to teaching and to building. For TAC was as much an environment for teaching as it was an association of architects. In the weekly forums held to discuss current projects, Gropius would repeatedly return to first principles, approaching the problem from the most general philosophical viewpoint. Occasionally he would launch into some tangential theoretical issue, discoursing with eloquence and enthusiasm, simply because it had been occupying his thoughts. He remained constantly accessible to his associates, ready, when approached with a problem, to ask those questions that put the entire issue in new and clarifying light.

Gropius stands behind the tradition of modern architecture not only as a teacher of architects, but as a teacher of teachers. The theoretical basis of his teaching was provided in *The Search for a Better Architectural Education* outlined at the 7th CIAM Congress in 1949. The discussion included two landmarks of modern architectural thinking, first that "the students should be trained to work in teams" in order to "prepare them for their vital task of becoming the coordinators of the many individuals involved in the conception and execution of planning and building tasks in later practice. The nature of teamwork will lead students to good 'anonymous' architecture rather than to flashy 'stunt' design." Second, "The HOW is far more important than the WHAT! In an age of specialization, method is more important than information. . . . The training of an architect should aim at teaching the student that it is through a creative attitude and independence of conception that he will arrive at basic convictions, not by accepting ready-made formulas."

But, as Gropius often repeated, "always better than saying is doing." It was his activity as a teacher, rather than his theoretical remarks, that established a new approach to teaching itself. Ben Thompson, for example, Gropius' student in all but the formal sense, was influenced by him in his own teaching at Harvard. With a similar sensitivity to the interaction of a building with its setting, Thompson often has his students visit the site at the inception of a project to capture its mood (and thereby establish an approach) in whatever form they find most sympathetic — including music, poetry, and photography. The technique itself is not derived from Gropius, but rather the attitude that informs the technique. Similarly, when Ed Barnes first taught at Yale in the apathetic '50's, the emphasis he placed on housing was, he felt, the result of Gropius' social concerns.

Through such men as Ben Thompson, Ed Barnes, John Harkness, Wilhelm von Moltke — all those, in effect, who studied under Gropius and went on to teach themselves, Gropius founded a school of architectural education. But, again, the unity of the "school" lies not with a specific theory or style, but rather with the view that architecture is not a virtuoso effort undertaken for the aesthetic gratification of a particular designer, but rather a social responsibility undertaken to enhance the quality of human life.

Walter Gropius' teaching has become so much a part of the living tradition of modern architecture as to render it, in his own sense, almost anonymous, and thus a universal legacy. In past centuries, when writing odes to the passing of great men, it was the custom to locate their souls among the stars. His will be found in any school where the purpose of architecture is taught with a respect for life and a love of men.—**SAK**

Sound Systems Equalization

Even a high-quality sound system fails if the room acoustics allow premature feedback of a few sound frequencies, but new equalizing techniques overcome this problem.

BY DON DAVIS,
Manager of Acousta-Voicing, Altec Lansing,
Anaheim, California.

Sound system equalization is a technique for putting a good system into complete harmony with the natural environmental acoustics of a given space. It is required because of the detrimental interaction between a sound system and the space in which it is installed. The acoustical environment of the space can cause extreme emphasis on some tones and almost complete negation of others. And the frequencies that the room overemphasizes are also the frequencies at which a sound reinforcement system will feedback.

The electronics of the sound system have no way of detecting that one particular frequency is being emphasized by the room to a loudness two or three times that of a neighboring tone. The sound system will oscillate (squeal) anytime *any* tone arrives back at its input with energy above a critical level. Like a slow driver in the fast lane of a heavily traveled freeway who can make all traffic behind him go at his limit, this overemphasized tone forces the sound-system operator to turn down the potential loudness of the system to match this errant tone, even if all other tones are now too low to be usable.

Pipe organ installers have long recognized this problem in church auditoriums. However, they have been able to adjust one pipe at a time to insure equal loudness for each tone through "voicing" and "regulation" of the organ after installation. Sometimes the voicing requires a month to accomplish, but it would be unthinkable for an organ installer to install an organ minus this necessary adjustment.

In the past, efforts were made to increase acoustic gain of sound systems by eliminating some portion of the audio spectrum where it was felt the preponderance of the detrimental system-room interaction took place. Unfortunately, this approach also removed an important part of the usable program material, and while such distortions were rationalized as acceptable, the performer and listener were invariably aware of the missing program material.

More recently, electrical filters have been used to reduce the amplification of the sound system only at the frequencies of the overemphasized tones. An engineer was forced to work with one frequency at a time, but this is costly, lengthy, and often unpredictable in results and with uncertain stability.

A major breakthrough and radical departure from older, cruder methods occurred when engineers and scientists found the successful critical band rejection method. Costs have dropped to the equivalent of adding another electronic component, and only two hours are needed to equalize the system. This time can be improved with the use of sophisticated real time analyzers; a sound system can be equalized in as little as 10 minutes.

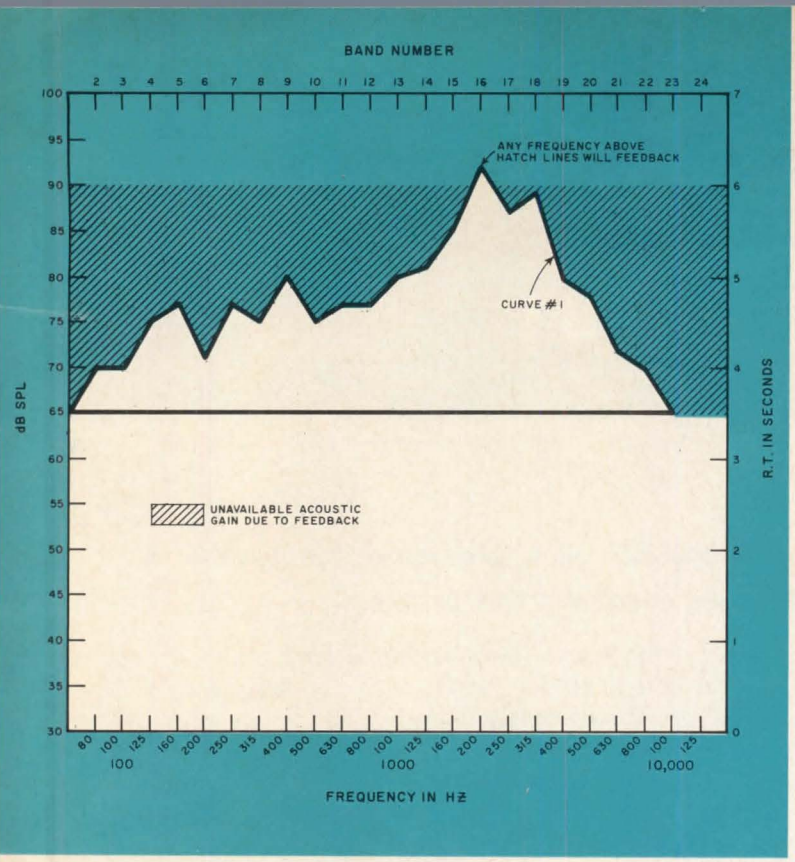
Critical band equalization is accomplished with precision, calibrated, resettable filters. Each tuning is simply dialed upon an equalizer master panel. If the room is architecturally changed, it is 10 minutes to 1 hour's work, depending on the sophistication of the test equipment, to reset the filters.

Complete versatility, reliability, and stability is achieved through the use of calibrated, resettable filters of the constant "K" type. Constant "K" refers to filters that provide a constant impedence to both source and load even at the resonant frequency, and which do not deteriorate the transient response of the sound system.

It borders on the miraculous to hear a sound system that is howling in vigorous feedback suddenly stop when the dial of a critical band filter set is turned.

Sound system engineers cannot rely on the vagaries of the human ear, but should determine the feedback frequency with a precision oscilloscope. (If the frequency is tuned by ear, the filter can be accidentally tuned to a harmonic of the desired frequency.) Through the use of precision test equipment, the overeager frequencies are tamed without the necessity of removing them entirely.

Detailed room equalization through critical band equalizers removes no usable program material, but, instead, brings the majority of frequencies into equality with those special frequencies that the room and sound system together actually overemphasize. The audible results are high acoustic gain (as much as 32 dB), wide and uniform acoustical



(1) A typical situation that can occur in an auditorium. The hatched line near the top of the chart represents the sound pressure level necessary to cause feedback. Where this line falls is a direct function of the distance between the microphone and the loudspeaker. It will fall lower when they are placed closer together (less potential acoustic gain) and higher (more potential acoustic gain) when they are separated.

The black line shows the sound pressure level output of the loudspeaker if a signal equal in level at all frequencies is connected to the input of sound system. The irregularity of the output is partly due to the inability of the loudspeaker to respond perfectly uniformly to a uniform input signal, and partly — the major part — due to the effect of the room itself on the acoustic output of the loudspeaker. In this case feedback will occur, first at 2000 Hz, where the peak is situated, since any attempt to raise the gain — increase the level of all frequencies at the same time — will find this peak to be the first frequency to push above the limit line. To follow this example through these charts, assume the acoustic gain measures 10 db.

frequency response with highs and lows in perfect balance, and remarkable freedom from reverberant coloration. Acoustic gain is the difference in sound pressure level, expressed in decibels, between the output of a sound amplifying system and the unaided voice measured at the most remote position.

Reverberant Coloration

Although spaces with excessive reverberation times are still not desirable architecturally because they support excessive noise levels, detailed room equalization has increased the range of acceptable reverberation. When a sound system is near feedback — near a regenerative state — it amplifies and increases the decay time of the reverberant coloration already in the room.

If the sound system can be used 10 to 12 db below the feedback point, it does not increase the reverberant coloration. The effect aurally is that, when a speaker talks into the microphone, the listener hears clear, intelligible sound.

It is as if acoustical treatment had been instantly applied to the walls of a reverberant space. Let the talker move out of the range of the microphone, and he excites the reverberation as badly as ever.

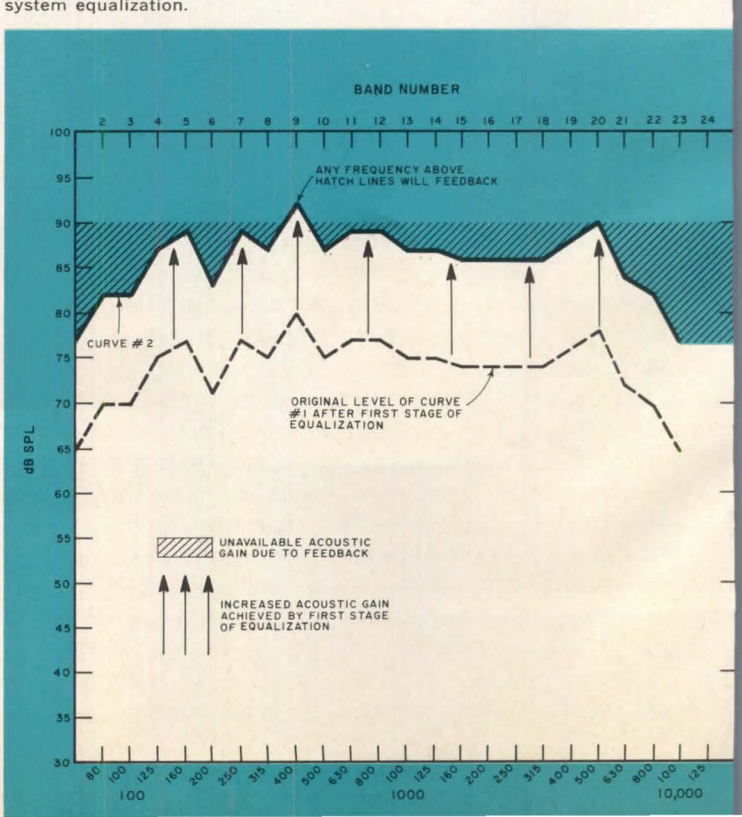
A sound system that has been equalized with critical band rejection filters to increase acoustic gain can be used well below regeneration, thereby allowing loud direct sound to reach the listeners' ears with a minimum excitation of the reverberant sound field in the room. This means, in a very practical sense, that an architect can plan a church, concert hall, or music room with the optimum reverberation time for musical enhancement. Speech intelligibility is solved by a properly planned, correctly installed, and equalized sound system. Sound-system equalization has been very successfully carried out in churches with reverberation as high as 10 seconds at 512 Hz. (Normally, it is not wise to plan a space with reverberation time over the musical optimum of 4 to 5 seconds.)

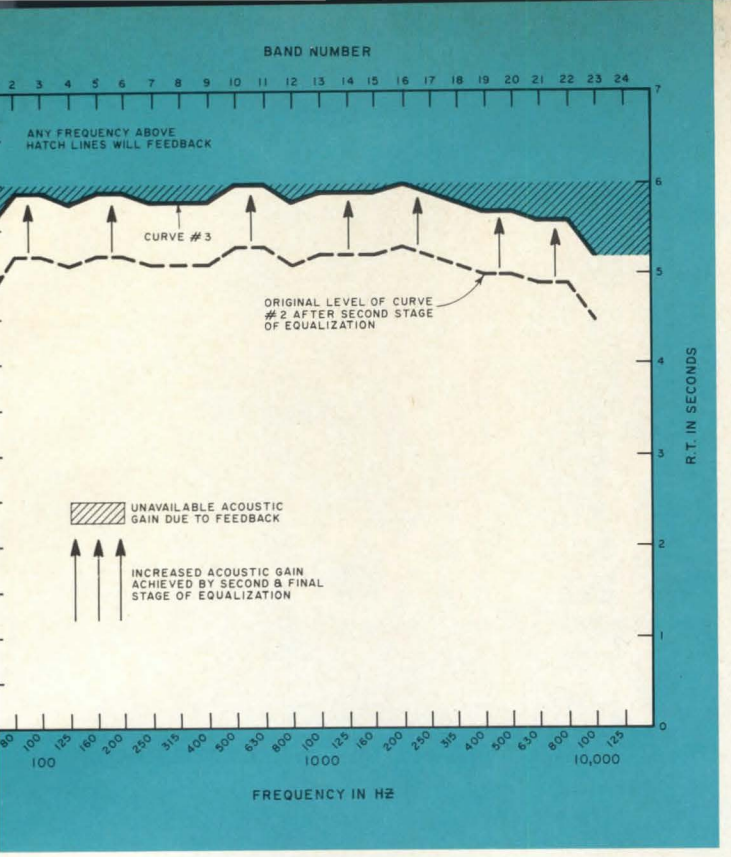
Variation of Quality

Tests show that as each overemphasized tone is brought to equality with all the normal responding tones in the room, the sound quality is vastly improved. It was also found that dips — tones lower than others — could be brought into uniformity with the rest to create a startlingly realistic reproduction of recorded or relayed sound.

In the past, a given performance of a recording could sound quite different in Room "A" (say, the recording room), as compared with Room "B" (say, the quality control room). Through the use of detailed room equalization via critical band rejection filters, a sound system in Room "A" can be made to sound identical to one in Room "B" under an amazing range of conditions.

(2) The original curve #1 (dashed line) after the peaked area between 2000 and 3150 Hz has been made equal (equalized) to the majority of the other frequencies. The arrows indicate how all these frequencies may now be raised simultaneously in gain before the new peak at 400 Hz pushes above the hatch lines and causes feedback. The number of decibels at each frequency between the dashed curve and the solid curve represents the increased acoustic gain made possible by this first stage of sound system equalization.





(3) Additional "smoothing" of the curve can allow greater acoustical gain at the majority of frequencies. However, further "smoothing," even if perfectly done, would yield only 1 or 2 db at the very most throughout the frequency region of critical importance for speech (see hatched area).

By comparing (3) with (2) we can see that, through the vital frequency response area for speech, for example, the acoustic gain at all frequencies is increased from 300 to 3000 by, typically, 10 db or more.

Originally, only 2000 Hz could be brought to 90 db-SPL before feedback occurred; now all frequencies can be brought to 90 db-SPL before feedback. For example, in "C" above middle "C" was limited to 75 db-SPL compared to 2000 Hz which could reach 90 db-SPL. In other words, 2000 Hz controlled or dictated the maximum level for all other frequencies. (3) shows that no frequency has more than a 2 db advantage over any other frequencies. Since we had 10 db acoustic gain to begin with, we will easily measure 20 db or more of acoustic gain with the equalized sound system, or subjectively twice the loudness experienced before feedback.

Versatility of Equalized Sound Systems

Because it is now possible to equalize the reverberant field to a very uniform response, microphone positioning is freed of the old requirement that it must remain behind the loudspeakers. Once the reverberant field has been made uniform, the microphone can be carried out in front of the loudspeakers without danger of feedback, the main limitation on total loudness being the distance from the loudspeaker to the microphone.

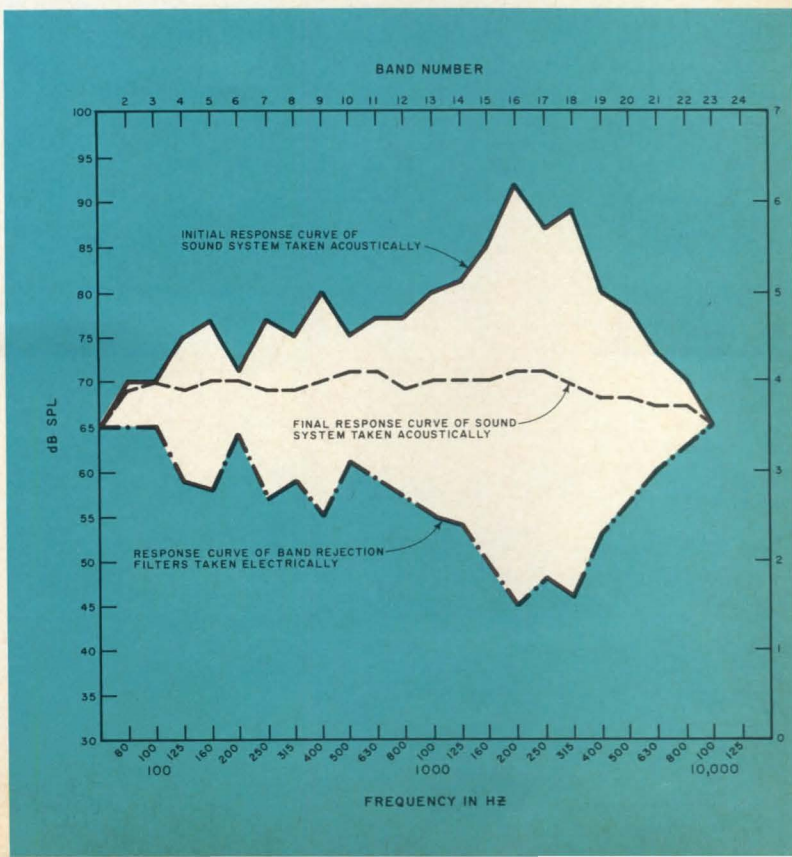
Loud amplification can be achieved while the speaker at the microphone stands as close as 10 ft in front of the loudspeaker. This makes thrust stages an acoustic as well as theatrical possibility.

For a dual purpose space such as a college fieldhouse, where a large central loudspeaker cluster is used for basketball, and another cluster is used for music on a portable stage at one end of the fieldhouse, a single set of filters can provide the necessary equalization for both clusters. The sound engineer first performs the turning with the critical band rejection filters installed in the basketball system and records the dial settings on the stepped controls on the filter set. He then switches the same filter set over to the stage system and performs the tuning for the stage cluster. Again he records all the dial settings. All the sound operator of this installation has to do for a performance is dial in the necessary tuning for either system. This takes about one to two minutes.

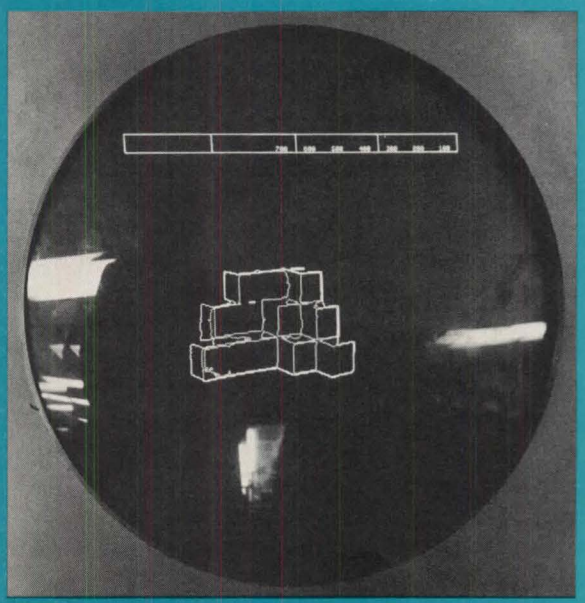
The System's Advantages

- A sound system that is specified to be equalized with critical band rejection filters while still in the planning stage, insures a known loudness at the most remote seat of the space.
- It guarantees proper sound distribution at adequate loudness.
- It allows freedom of microphone placement consistent with other time-space requirements.
- It allows a higher reverberation time to be planned than is usually considered possible for ideal speech conditions.
- It insures that program material will sound naturally balanced and consistent from space to space.
- It insures complete stability of the sound system, and rules out the chance of accidental detuning of the system.
- It allows versatility in multiple-use spaces.
- It is economical in both time and equipment.
- A sound system equalized with critical band rejection filters is guaranteed to be properly installed because sound contractors must purchase extensive test equipment and receive rigorous training before being qualified to equalize with critical band rejection filters.
- The sound contractor must carefully test the sound system before equalization to validate the design goals.

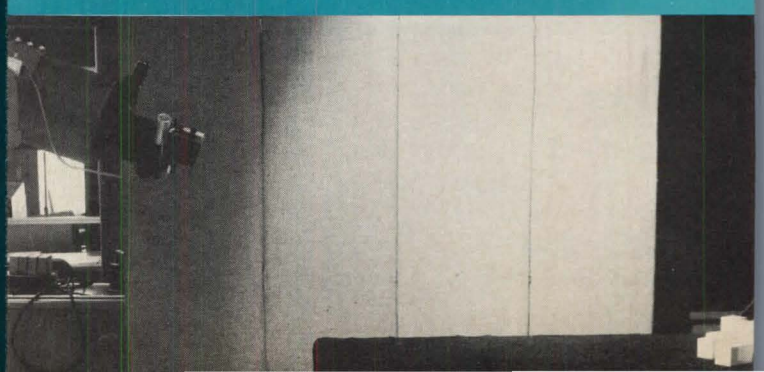
(4) The electrical response curve of the critical band rejection filters (bottom curve) join together to form the inverse of the loudspeaker-room response curve (top curve). As this inverse filter response is included in the total sound response, the resultant is the smoothed over-all acoustic response shown by the middle curve.



IN SEARCH OF URBAN EXPERTISE



Artificial intelligence in urban design: Computer aided TV camera (below) studies cubes representing urban-scale modules and reproduces what it sees on screen (above) or in printout (left). Temporary bug in computer caused upside-down numbers in printout.



Through its new Urban Systems Laboratory, the Massachusetts Institute of Technology is mounting a double-edged attack on urban problems: Interdepartmental teams of students and faculty offer aid to the cities, and serve, at the same time, as real-world training for a generation of future urbanists.

Can the university perform for the cities the same kind of research and development functions that it has so successfully performed for NASA and the Department of Defense? Can it work productively with city governments and industry to solve the difficult problems of the country's "unmanageable" metropolitan centers? The Massachusetts Institute of Technology, for one, is setting out to prove that it can.

The major vehicle for organizing MIT's search for a working urban expertise has recently become the Urban Systems Laboratory, started two years ago on Ford Foundation money. Although top men at USL are modest about its accomplishments, the Lab already boasts an impressive list of projects completed or under way — some funded directly by the Lab and others that, although funded from other sources, would probably not have come into being without the Lab's impetus. MIT is using USL both as an administrative umbrella for many of the urban research programs within "the Institute" and as a stimulus for expanding curricula in the urban field. In addition, the Lab initiates its own research projects.

Designating the new urban unit as a "laboratory" rather than a "center" was not a random choice, and reflects the action-oriented thinking that is everywhere affecting the form of American institutions. "We are not to be simply another center studying the city, but a group of people that are trying to do something about the problems," asserts Charles L. Miller, the Lab's director. He believes its principal strengths should be developed through real-world projects with heavy student involvement: "The essential quality that will distinguish our laboratory will be the students." The aim is to develop a "multidepartmental and interdisciplinary" approach that will offer technical assistance to city clients through teams of students and faculty working with citizens' groups or city officials on specific projects — specific projects, however, that will lead to results widely applicable to all city-systems.

All but one of MIT's schools are represented on the USL steering committee, but the most active participation to date has come from the Departments of Architecture, Civil Engineering, Economics, and Political Science, the Sloan School of Management, and the Department of Urban Studies and Planning (formerly City and Regional Planning). Under Architecture's Chairman Donlyn Lyndon, that department has embarked on its first major interdisciplinary efforts with apparent enthusiasm and begun a number of its own research projects.

(The shift in emphasis from study to action may explain why the Ford Foundation was willing to fund another urban unit in Cambridge, where the Joint Center for Urban Studies, also Ford-funded, has been run cooperatively by MIT and Harvard since 1959. Although change seems to be in the wind for the Joint Center, observers feel that its concerns over the past few years have been too academic.)

MIT is perhaps uniquely qualified for a venture that intends to rely heavily on students working in a cross-professional manner to solve practical problems of applying advanced technology. Its history of imaginative curricular programs is long. Its reputation in the social sciences is as sound as it is in the engineering sciences. The faculty is liberally salted with men whose careers straddle the academic-industrial consulting line, and includes a number of returnees from Washington's advisory elite who still contribute more than their share to the support of the Boston-Washington air routes. And MIT students are top caliber.

Professor Miller's background in transit led to his appointment last winter as head of President Nixon's post-election task force on transportation. He is also Chairman of the Department of Civil Engineering, and was chosen as USL Director because of his abilities as an organizer with "a long-standing reputation for being able to get things off the ground," as one staff member put it. Since the Lab's goal is urban action, the selection of a man whose profession is founded on pragmatism and public works would seem to be a good one. "We are concerned with practical applications of a lot of science and technology," Miller points out. "There is an enormous gap between research — the university kind of research in particular — and the city. The knowledge is available. What is not available is the methodology, the procedures, the techniques for applying that knowledge. And this, in itself, is a legitimate area of research, something that is very desperately needed." Miller believes that one of the more valuable functions of MIT teams working with the city will be one of educating those who must "make technology work in the city — be they contractors, or be they employees of the city."

Money and Men

Although good intentions are admirable, they are vulnerable to the corruptions of inadequate financial support. Urban Systems Lab was started with comparatively modest seed money — $800,000 for three years — that was part of a $3 million Ford grant to MIT for urban purposes. The remaining monies were

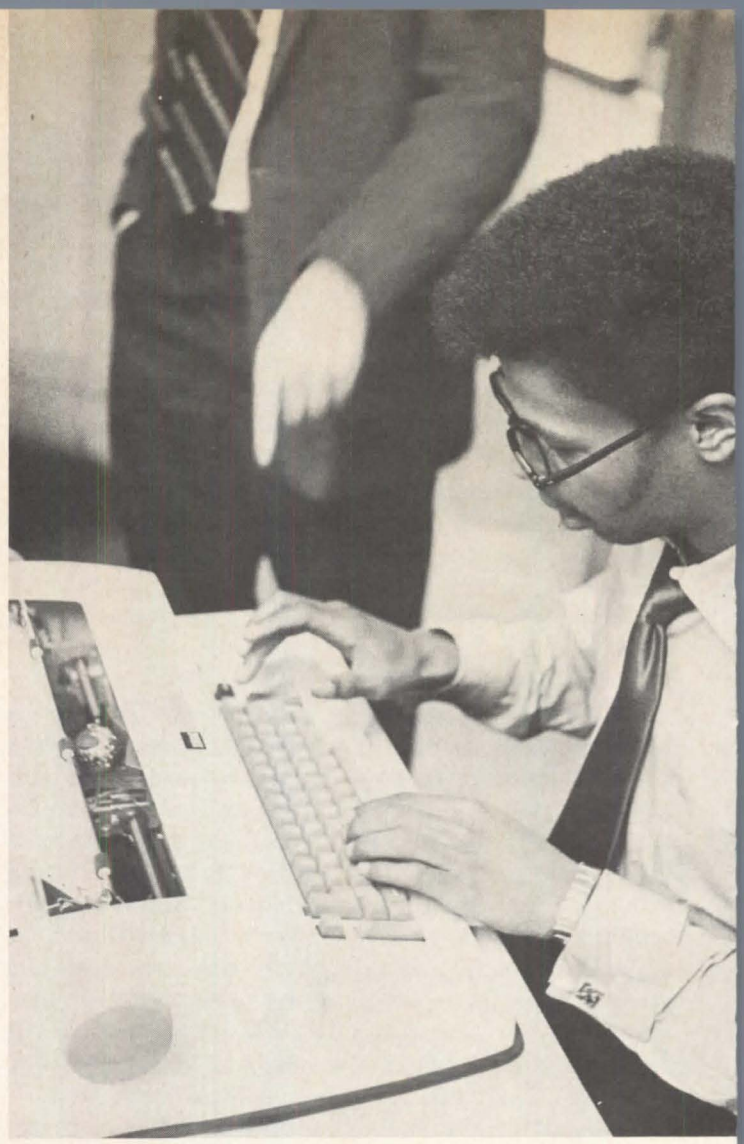
divided between an Urban Fellows Program ($400,000) and the endowment of three academic chairs ($1.8 million). The Urban Fellows Program was set up to send young faculty out into the city for a year's practical experience — for example, in city government. The chairs have not as yet been filled because, as one faculty member explained, "There are very few distinguished urbanists and we are still running around trying to find one." In the meantime, USL benefits directly from the $1.8 million endowment which supports 17 faculty members that spend a major part of their time working on research. (Some researchers view the chair money with envious eyes, and dream of how they could spend it on one project or another. But they might take comfort from the fact that an equal grant given to Harvard at the same time was used exclusively to set up chairs.)

During its two-year life, USL has worked hard to attract added support from other public and private sources, and has been most successful in the areas of transportation and computer support. IBM has invested $1 million in computer time. And the Department of Transporation has awarded another $1 million in contracts, primarily for two major projects. The first is titled Computer Aided Routing System, or CARS (also known around the Lab as Dial-A-Bus) with a 70-person staff from six departments and three of MIT's other laboratories working on a low-cost, convenient, computer-scheduled urban transit system. The second major enterprise is aimed at increasing the supply of professionally trained personnel in urban mass transportation and will include both research and curricular programs.

Although the Federal Department of Housing and Urban Development has been approached for support, HUD has been reluctant, according to Miller, to use the universities, whereas "DOT is much farther along in the really effective use of universities in research."

If USL is to become the kind of unit it aspires to become, bringing all the sophisticated techniques of advanced systems technology and social sensitivity to bear on solutions to the urban riddle, the scramble for money — free or otherwise — will continue to be a major concern of its administrators. The Ford grant was for three years, and a renewal proposal is now being drafted; the staff is naturally concerned about continuing support.

Brainpower, of course, is an asset that cannot be directly measured in dollars and cents, although *money* can buy it. "There are a lot of laboratory resources and research facilities throughout the campus that we want to mobilize, but they are only meaningful in the context of the people who make use of them," Miller points out. "Our resources are basically people." A rich fund of those resources are potentially available to USL because of the way in which it is organized. "We are not developing a new unit, separate and independent from MIT," Miller explains. "The approach is to work through the departments that have the most to bring to urban problems, and to operate the Laboratory as a joint venture of those departments." This, of course, presents problems of continuity and the allocation of professorial time, and makes USL somewhat subject to the powers of departmental empire. As one administrator put it, "The Departments at MIT are supreme." Results so far, however, seem to be encouraging, and, in some cases, the problem has been solved on an *ad hoc* basis by student initiative and liaison between faculty who are interested in certain projects.



Ghetto resident talks to computer about slum environment via typewriter computer terminal: Another of Architecture Professor Nicholas Negroponte's artificial intelligence projects.

City Clients Seek Advice

In the role of city consultant, *MIT* has cooperated on projects with several city governments, including a water supply study for New York. Two major projects are across the Charles River in Boston, where USL is working with the Boston Redevelopment Authority on a new community project, and with the Model Cities agency on a computerized urban information system based on a home-ownership survey conducted by the Lab. USL estimates its contribu-

tions to the latter project (including IBM funds) at about $75,000.

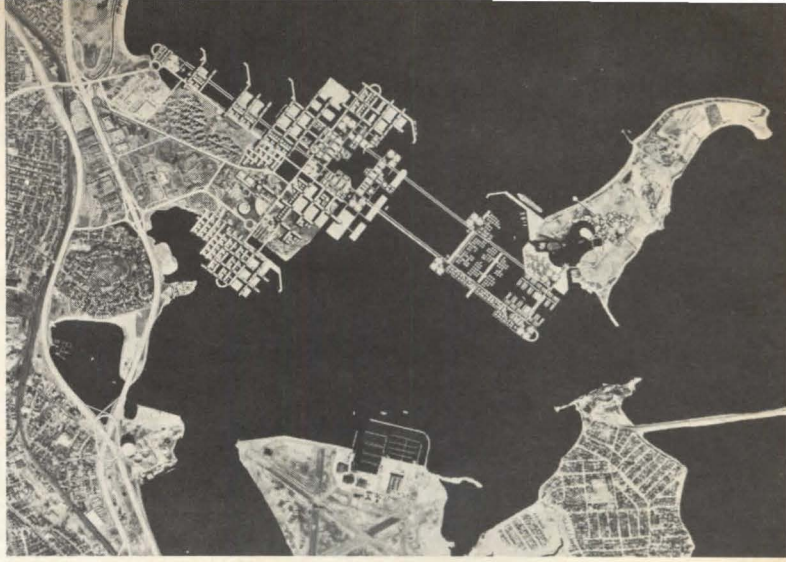
The new community project is part of the planning for the 1976 World's Fair. Boston, which is competing with Philadelphia for the combination fair and bicentennial celebration, decided that the event should be more than a carnival or assemblage of architectural *tours de force.* The BRA felt it should help to solve some of the problems of the center city, and that the Exposition would provide an opportunity for aggregating funds in amounts unavailable under any other auspices. The plan is, therefore, to build a megastructure of universal spaces that can be used for exhibitions during the fair and converted to housing, light industry, and recreation for a community of 50,000 after it is over.

The BRA went to USL primarily for engineering expertise to be used by its own planning and design staff, and, according to Charles Hilgenhurst, planning and urban design administrator at the BRA, there have been "mixed feelings about the results." On the positive side, the BRA had access to the latest thinking in each field and to the dynamic ideas that were sparked by graduate students and faculty in various disciplines. On the not so positive side, there seems to have been a misunderstanding about just how hard the information was to be. The BRA apparently expected more professional services, with all pertinent data calculated. USL's report was, instead, a conceptual framework that left the blank spaces, such as specific information on water pollution, to be filled in by others. The fledgling Lab's structure is still loose and its purposes quite broadly defined; this is an area that needs clarification. However, the actual performance of all field work would seem to be a misuse of academic time.

Students Look for the Action

"The Urban Systems Lab is a deliberate attempt to bring together hard and soft types — and keep them together and talking," says H. W. Bruck, who is a transportation lecturer at MIT, and USL's informal coordinator of interdisciplinary projects. It has been one of his prime concerns to encourage student participation and find a congenial spot for any student, graduate or undergraduate, who wants to get involved. "The greatest payoff," says Bruck, "may not come from the research we are doing, but from equipping a generation of students with the tools and perspectives that will enable them to put it all together 'out there' in the real world."

Of particular significance is the increasing involvement of undergraduates in independent research. Although graduate students commonly use research projects as thesis or dissertation vehicles, USL's support of undergraduate initiative is a new development at MIT that has far-reaching educational implications. Student initiative, particularly in the School of Architecture and Planning, is beginning to change the traditional master-disciple learning process and supplement it with ventures where cooperative learning takes place between faculty and students, between students and students, or between urban communities and students.

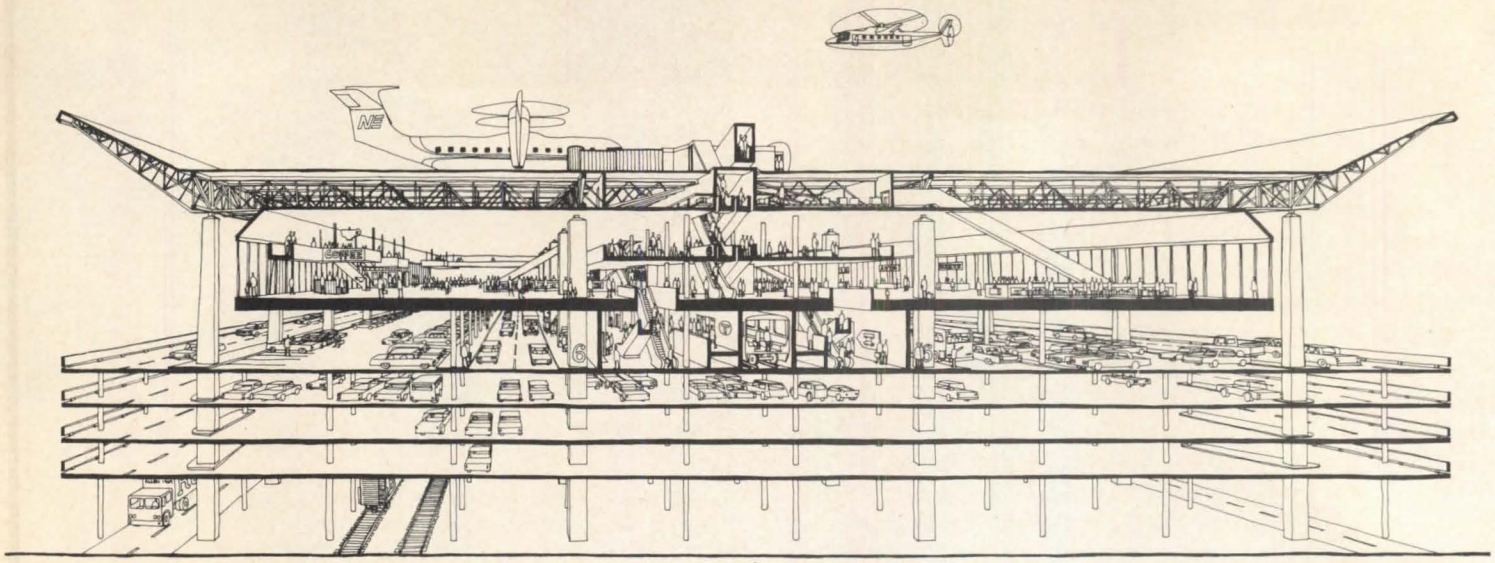


Latest proposal for Expo '76 in Boston Harbor: USL team of 20 students and 10 faculty from the fields of political science, civil engineering, and economics acts as consultant to Boston Redevelopment Authority in planning for flexible framework of spaces that could be converted to a new community after the Exposition. Site for the new-town-in-an-old-town extends from shore to nearby island.

About a year ago, two subsidiary labs were started by the School of Architecture and Planning to develop advocacy planning techniques and urban design methodology. The Community Projects Laboratory was established to explore "problem-solving techniques in environmental design and management for students, and teachers . . . and *for residents of low-income communities*" (author's italics). Chairman Lyndon believes that one of the prime purposes of CPL is not only to find ways of getting information to the academic community, but to "return information to the communities from which everybody has been taking it." After the experience of several neighborhood/university planning projects, the idea is evolving that the best way to get knowledge into the ghettos is through action — not through advisory storefronts, conferences, or workshops. One CPL group is, nevertheless, organizing a library of material that will help "groups of people without professional backgrounds in environmental design to develop the means of analyzing and acting upon their physical environment."

The second lab, the Group for Research in Environmental Design, hopes to offer a continuing base for urban design research, and was started with 16 student-proposed projects ranging from an investigation of the architect's social responsibility in the design of fallout shelters to an environmental game for children. Professor William Porter, who was instrumental in getting the two labs started, considers them a valuable asset to his department (Architecture), since, as he sees it, the techniques of social-architectural research "cannot be taught."

More by fortuitous chance than by design, USL's role in participatory education continues to emerge.



Vertiport (connected to local transit) designed for site over railroad yards close to downtown Boston: Interdepartmental project under Architecture Professor Edward Allen is developing prototype port to service intercity vertical-take-off-and-landing aircraft.

Although the subsidiary labs described above include projects that were wholly proposed and carried out by students, the units were set up and supervised by faculty. However, two summer projects begun by Planning students last June carry the participatory concept to its outer limits. The first, the Northboro study, had a faculty advisor, but the plan of action and its execution were in the hands of students. The responsibility was given to two Ph.D. candidates when the small town of Northboro, lying in the certain path of Boston's expansion, approached the Planning department for advice on land use and urban planning for future growth. Leonard and Suzann Buckle, the husband-wife leaders, drew up an outline of areas to be studied, and organized a group of 10 students with backgrounds ranging from law to urban design, even reaching democratically outside the halls of MIT for students in other universities whose backgrounds were felt to uniquely complement the rest of the team. Primary support came from USL, but Northboro demonstrated its confidence when a town meeting voted $3000 to fill out the budget.

An even more autonomous project was a group of independent studies, submitted by both graduate and undergraduate students, that was presented to USL as a package. It was coordinated and promoted by another doctoral candidate, James Hester, whose concern over the quality of the environment led him to transfer from the field of his undergraduate study (aeronautics and astronautics) to planning. Under Hester, an enthusiastic supporter of group learning, 30 students drew up individual proposals for projects that particularly interested them — housing policy in Ghana; a computer game simulating environmental control techniques in metropolitan areas; and a study of how children "learn from and use the city." Fifteen projects were finally accepted with a grant for $20,000, and the 15 students elected from among their number a five-member governing board to coordinate and administer money — an exercise that may prove as educational as the research itself.

Computers in Search of Identity

Even computers boggle at the ambiguities and paradoxes of the urban system. Lewis Carroll is reverently and often quoted around the Lab, and posters of John Tenniel's illustrations for *Alice's Adventures in Wonderland* decorate the computer-terminal room at USL headquarters.

But complex problems require complex solutions, and, as in all sophisticated idea factories, the computer is an everyday adjunct of research at USL — sometimes playing a primary and sometimes a secondary role. Computer support is provided by an IBM System/360, Model 67 time-sharing computer and a small technical staff.

Two of the more rigorous systems of computer programs for urban planning and design are being developed with Lab support, and promise to join MIT's well-known repertoire of working computer programs in other fields. CHOICE will be used as a management tool for complex evaluations of urban programs. DISCOURSE, which is being developed by Professor Porter, is devising a flexible language for the "planning and designing of large scale physical environments."

One of the more interesting — though least practical — group of projects, under the leadership of Architecture Professor Nicholas Negroponte, is searching for nothing less than artificial design intelligence. The "architecture machine," as it is called, is to be a "moral" animal and a design partner to the architect, capable of carrying on a man-machine dialogue in the manner of an associate having "the potential for self-improvement." The first phase of the

search, an experiment called Urban 5, developed a method of programming criteria for urban design and computer graphics. It has now been completed, and the second generation of studies is underway. Negroponte and his young colleagues are working on several projects: a computerized robot, GROPE, is a toy tank with photoelectric eyes that is being trained to search out "interesting" places (points of greatest diversity) on urban maps, and may someday lead to a mechanical design partner that can seek out information about the real world without human supervision; SEE is a computerized television camera that studies various groupings of 2" x 2" blocks (representing urban-scale modules), and then devises its own configurations. A program is being developed for a computer that can interview people about their urban environment, the ultimate goal being to hook it into the public phone system. Negroponte sees this as an important step toward universal advocacy: "The design of the city can start to reflect every single inhabitant — his needs and desires. This may seem completely ludicrous, but I don't think it is."

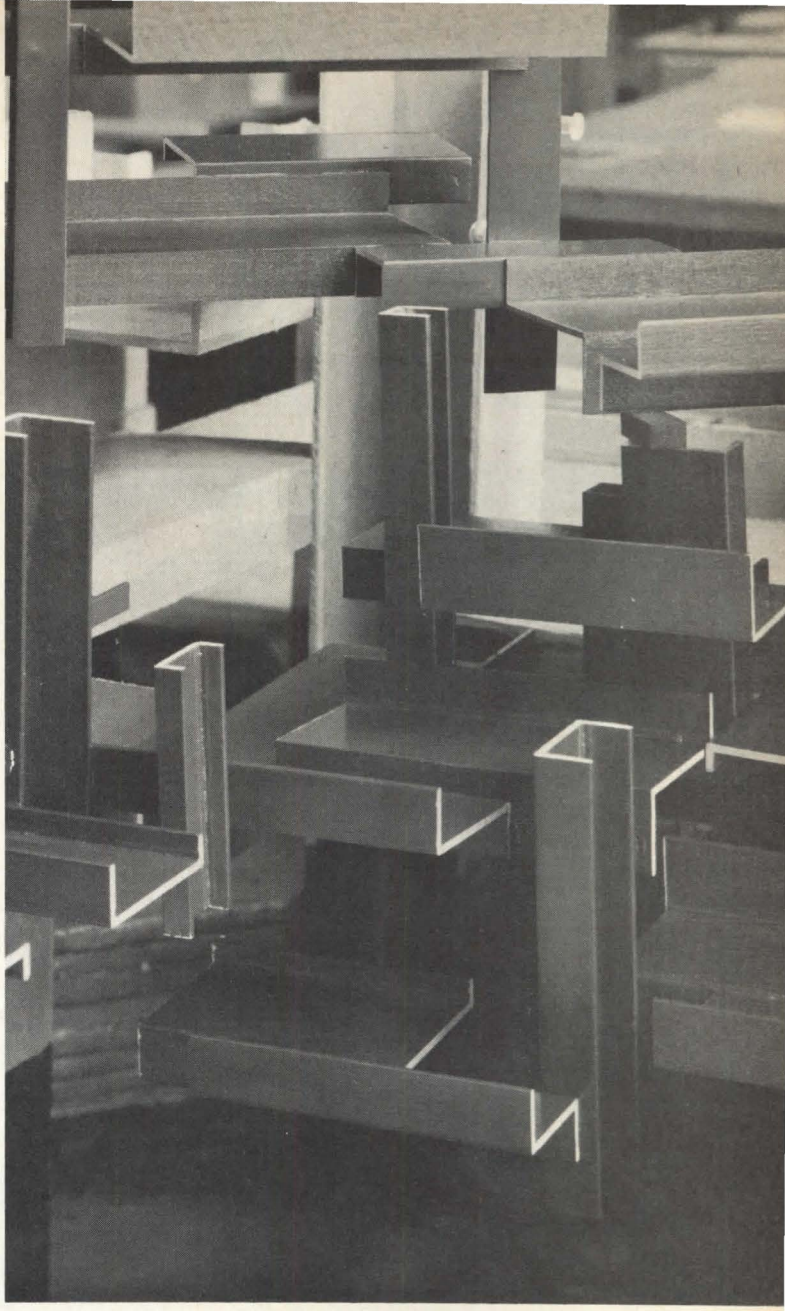
All of the computer projects, from the most sober-minded to the seemingly frivolous, have similar objectives: to create computer programs that will be more flexible and more responsive to the individual designer or urban worker. And if, as prognosticators of the future tell us, the day is coming when every man will have a computer terminal in his office and/or home, such efforts are building tools that may one day be accessible to all architects.

Urban Expertise and the White Rabbit

Is the Looking Glass World of the cities really subject to the slow and sometimes faltering progress of responsible research? It sometimes seems that practical knowledge and intuitive decisions arrived at by the human mind — a very sophisticated computer in itself — are better and faster. And that urban research is performed by socially concerned men in hopes of amassing enough public leverage to unseat the vested interests.

Not so, says Sloan School of Management Professor Jay W. Forrester, whose work in urban dynamics is being used as the basis for a USL study. Forrester's extensive computer modelling of urban life cycles and the processes of growth and stagnation in cities shows that short-term intuitive decisions in housing, industry, and labor often create problems more serious than the one they were meant to cure. And the validity of such a conclusion has indeed become painfully obvious over the past 10 years.

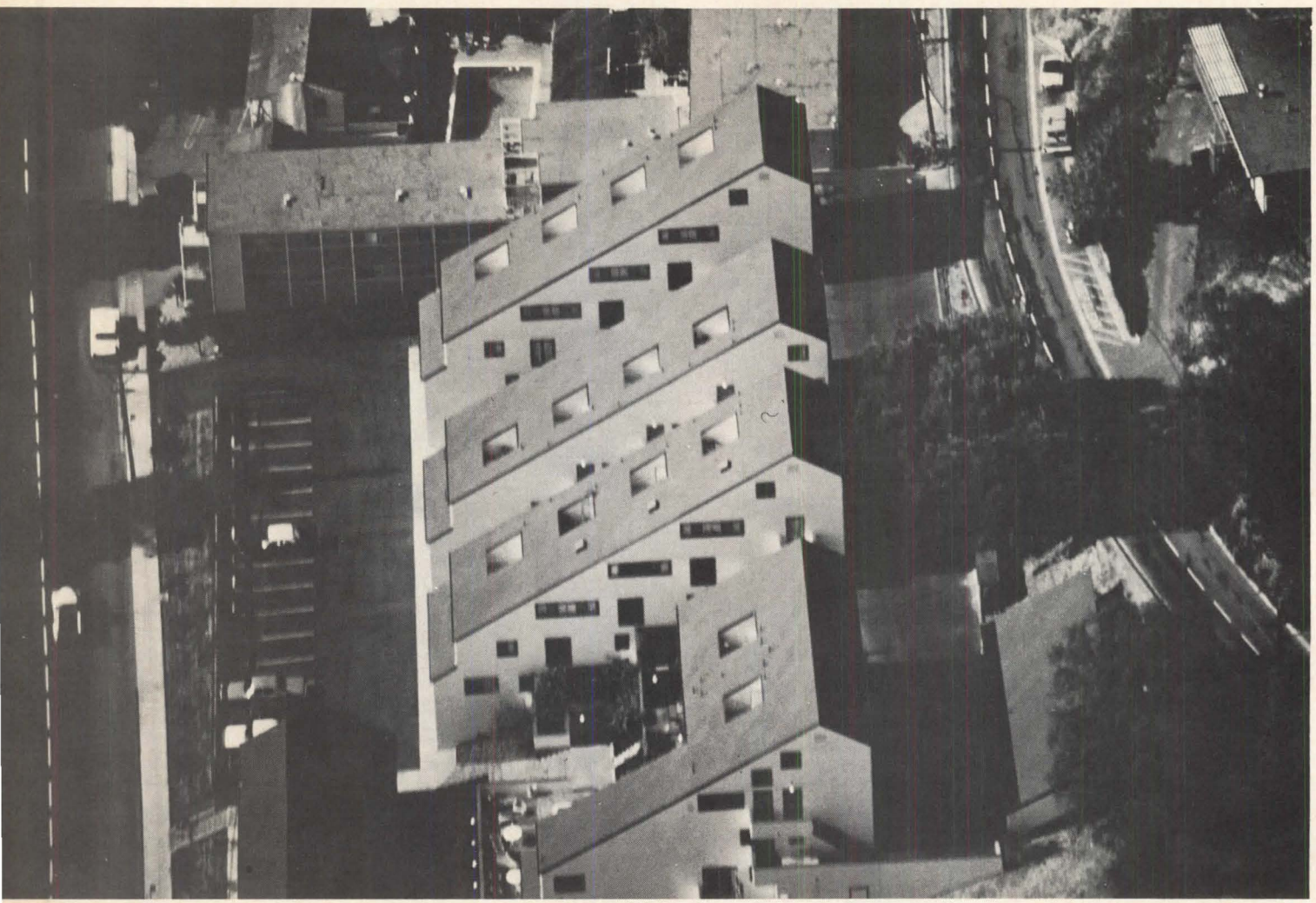
Most urban experts agree with Forrester that the understanding of city systems is not accessible except through the most intense and extended research, supported by every tool available from modern technology. The Urban Systems Laboratory has the potential for developing into a vehicle for such research, given the time and money. It has been adventuresome, quick to act, and full of promise in seeding the intellectual soil and in pushing beyond the academic sphere. Perhaps even more important, through its role as city consultant and sponsor of participatory education, it is redefining MIT's role in relationship to students and the real world.



One of the preliminary models for a habitable three-dimensional field: Mega-order latticework being developed under Architecture Professor Maurice Smith is alternative to traditional cities. "We are most interested in the anti-packing quality," says Smith who estimates that 80 to 90 per cent of the framework will "not be occupied by matter."

There is only one remaining question that nags at the outer edges of consciousness — and that is the matter of design excellence in the end product. In all fairness, it must be reported that the importance of aesthetics is duly recognized in USL studies, proposals, and reports. And that finite, individual concerns are not the proper province of those whose task it is to devise universal patterns of order for complex social, physical, and economic systems. Still, one hopes that, somewhere along the way to the execution of large-scale dreams, there will be someone who will plug in the right architect at the right place.—**AR**

DESIGNED DISCIPLINE

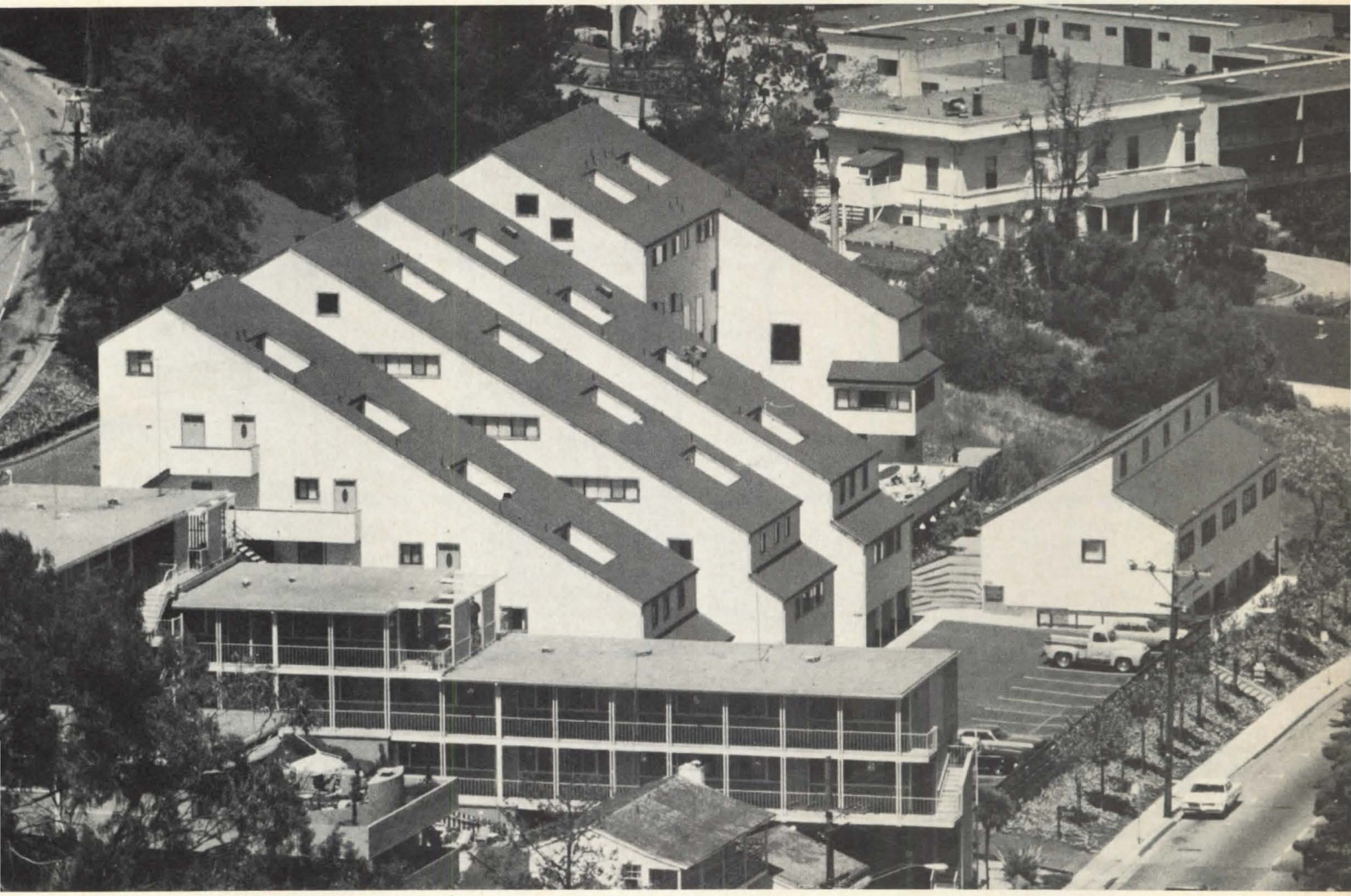


Architects Backen, Arrigoni & Ross have organized a hillside in California for the simple-but-complex Woodmont Apartment-Office development

The Woodmont Apartments in Belmont, Calif., stand with an order and precision that even an old Prussian field marshal would relish. Yet they do not have the stern rigidity you would expect such admiration to stem from. This illustrates a kind of "beauty in the eye of the beholder" syndrome, in that the ramrod stiff militarist would see the units marching briskly up the hillside while some free soul contemplating them would insist they are reclining easily with their backs pressed casually against the hill. Actually, they do both, and this is their secret.

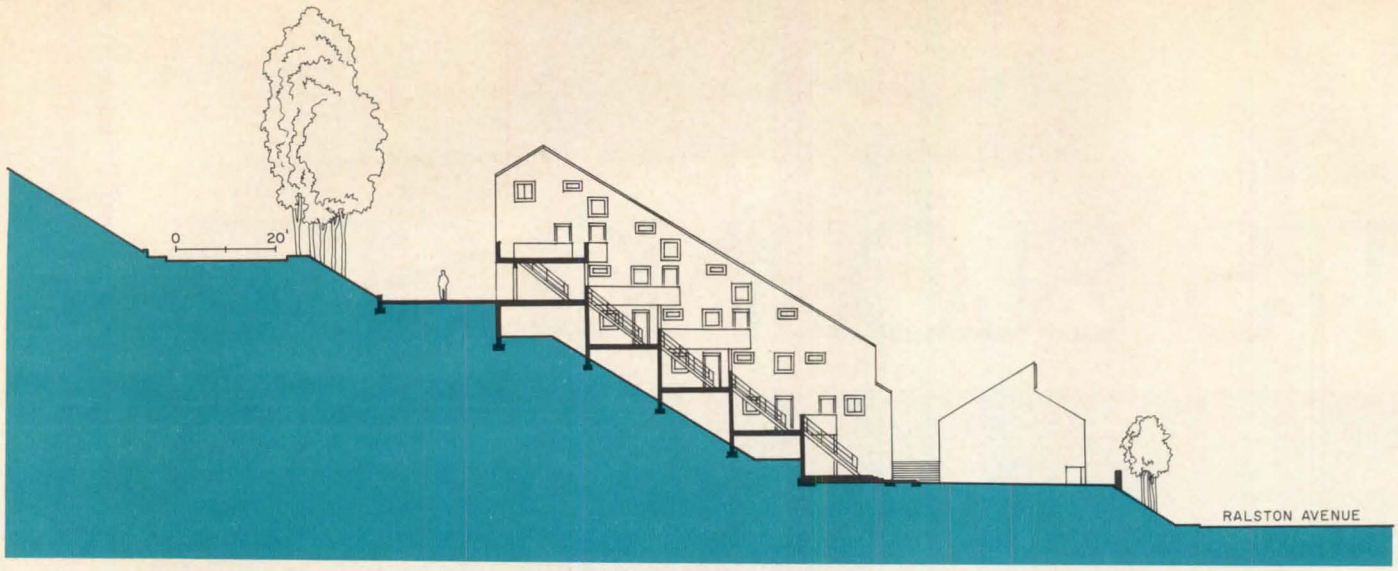
To begin with, the buildings are almost painfully straightforward, gaining more from their frankness than they would from any "charm" grounded in fantasized detailing. Referring to the standard manu-

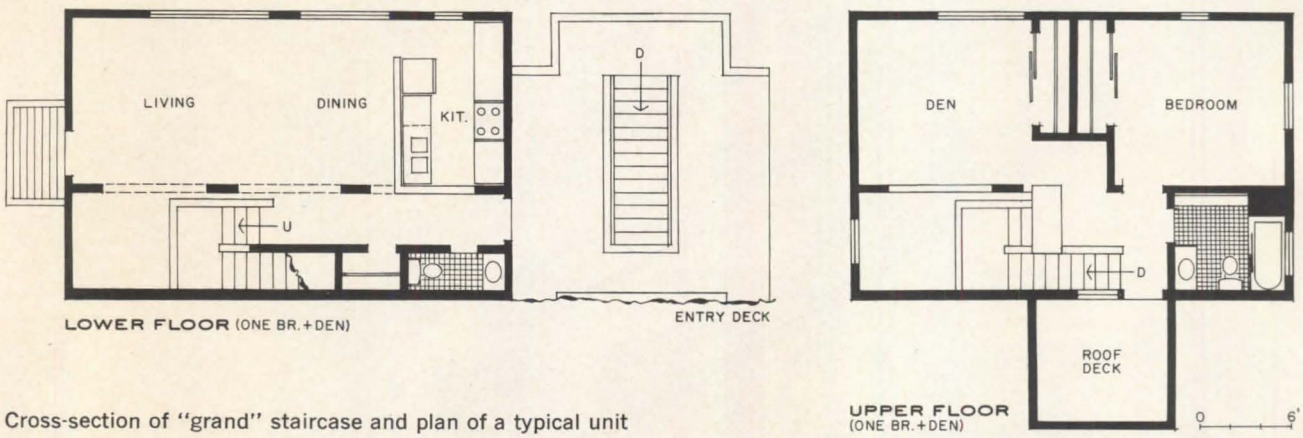
FITS SLOPING SITE



factured elements and simple materials, architect Robert Arrigoni of the new firm of Backen, Arrigoni & Ross (it is their first job) says: "It seems silly to make something *out of* typical aluminum nail fin windows, and so forth." He is right and wrong at the same time in this feeling, because the simplicity of the buildings becomes an important aspect by its relation to their superb and complex organization. The specific always interworks with the context, even if the motivations of each seem contrary, and when this relationship works successfully, as it does in Woodmont, it appears the highest form of logic.

The project is a series of transitions, both internal and external, taking a shape that becomes at once connective *and* defining. Its first and most obvious transition grows from its siting on a sloping acre of land; this initial journey from top to bottom is made through level differentials that are logical and travelworthy. The land slopes at about 30°, which is reflected in the 30° pitch given to all roofs in the project. From the lowest garage floor to the top floor of the highest apartment is seven stories, yet few tenants must walk more than one flight up or down to their apartments in the elevatorless building. This is accomplished by having top entrances to staircases at the fifth level and bottom entries at the first level. From the top parking lot, a tenant walks directly into fifth-floor apartments and a flight up or down for either sixth- or fourth-floor apartments. Since sixth-floor units are two stories internally, the main





Cross-section of "grand" staircase and plan of a typical unit

entrance at six takes care of seven as well. No apartments are located at the first level, so occupants must walk up one flight to the second floor. Third floor units—which number 3 out of the total 30 apartments—are the only ones that force an outside trip of two flights.

The apartments are transitional between single-family home usage further up the hill on which they lie and Belmont's main business district on the street on which the property fronts. Woodmont is a mixed-use project, too; it has a small complex of 10 offices at one corner that serves to buffer the apartments from the commercial area. The offices are also a shield for Woodmont's swimming pool and recreation area, which lie directly behind them. Parking for the 2-story office building is located midway between levels and off to one side. To get to the lower tier of offices, visitors go down a half flight to enter on the street side. To get to the upper level, they go up a staircase that is laid out with risers arranged like contour lines on a map. This stairway also branches out to enter the pool-recreation area. Bruce Ross, another partner in the architect's firm, says the contour scheme was arrived at to elaborate on something that would otherwise be quite mundane. "We wanted something that would go off in two directions gracefully," he says.

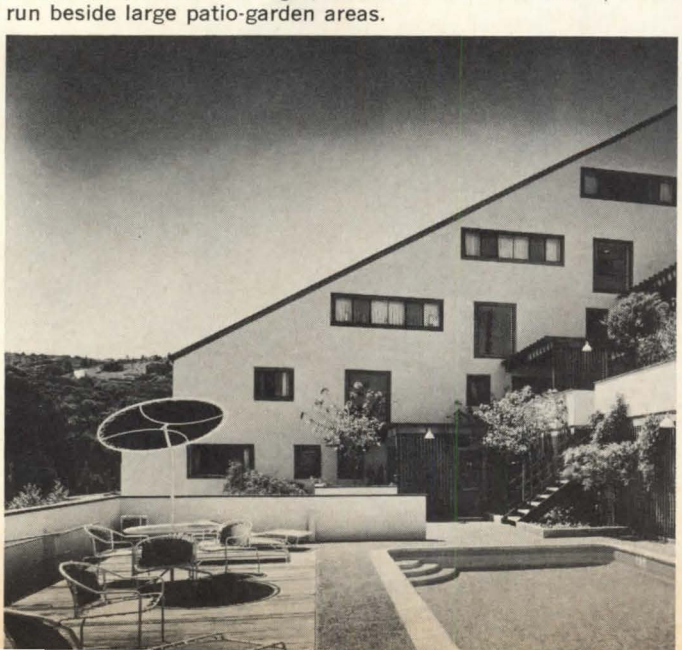
A majority of the units — those with bedrooms and dens above the living and activity areas — provide rewards for the tenants in that the upper levels have different views from the lower levels. The units with decks that peek through the sloped roof also provide pleasant variety and surprises for tenants and their guests. All units, except the few modifications fronting the buildings at the lowest level and those facing the pool area, have either a roof deck or a garden area.

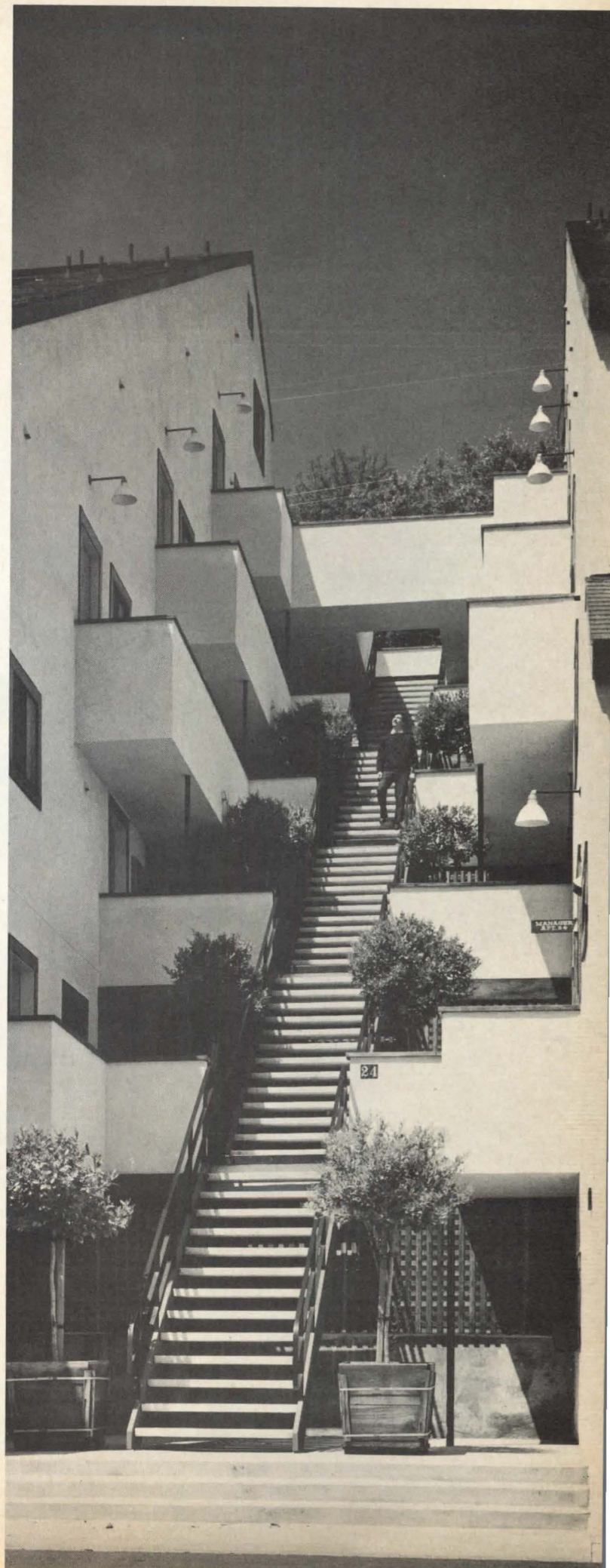
If the project were larger, pairing of the buildings would have a greater effect, but a limited point is made by having two buildings face one another across the "grand staircase" and two other buildings with decks side by side. The duplication of buildings — three of which are identical — and the duplication of apartments within buildings — each has three studio apartments above three two-story units, all precisely the same — has not only made the project interesting but feasible as well. "It would have been impossible to do the project for the same amount of money ($500,000) without repetition," Ross says.

For an example of the total effect of Woodmont, there is no need to go further than examining it in light of its nearest neighbors, which are projects sliced into the hill and kept flat and uninspiring. Where they do violence to the hill, Woodmont by contrast is really an extension of the rise, its roof paralleling the land contour and the green roofing appearing almost as vegetation. Woodmont also promises to virtually save the hill, which had slipped greatly — evidenced by the street at the top of the site, which had slid 3 ft into Woodmont's property line in the years before construction. Now, there is a retaining wall for the road and the few spots of the Woodmont site that are not covered have drain rock to carry water away without further damage. The project has rescued nature in more ways than one, all the while keeping itself by definition, as an organized work of man.—**RAW**

WOODMONT APARTMENTS, Belmont, Calif. **Architects:** Backen, Arrigoni & Ross. **Site:** Sloping 1-acre parcel of land with roads at the top and bottom. **Program:** A mixed residential-commercial project with 11 studio units, 11 one-bedroom units, and 8 one-bedroom-and-den units as well as 10 office units and a swimming pool and 850 sq ft of recreational facilities under roof. **Structural System:** Conventional wood framing and concrete footings. **Major Materials:** Wood and stucco. **Consultants:** Carlisle Becker, landscape architect; Otto Avvakumovits, structural engineer. **Photography:** Morley Baer; Robert Arrigoni.

Stairs range from the land-contour approach shown above, the central staircase at the right, to the stairs shown below, which run beside large patio-garden areas.





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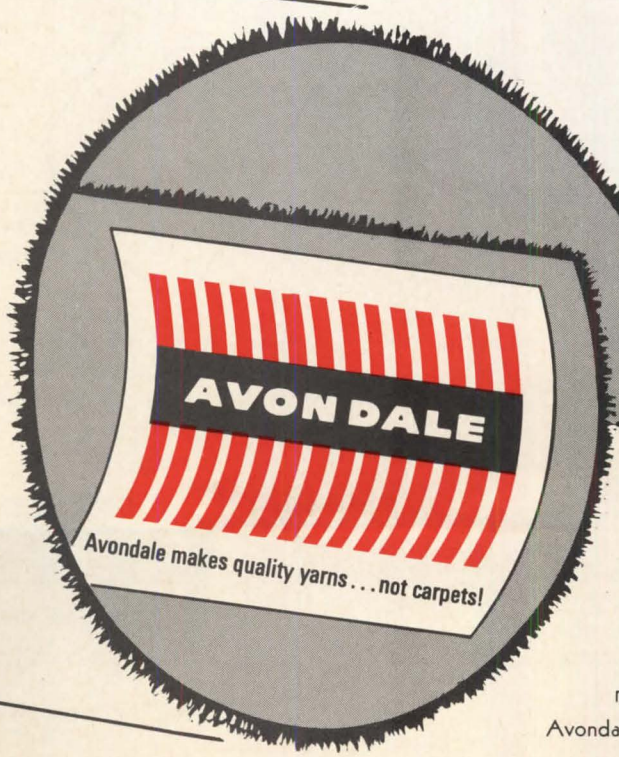

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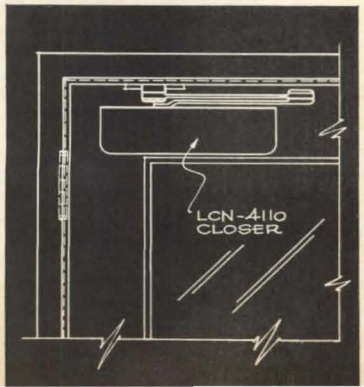
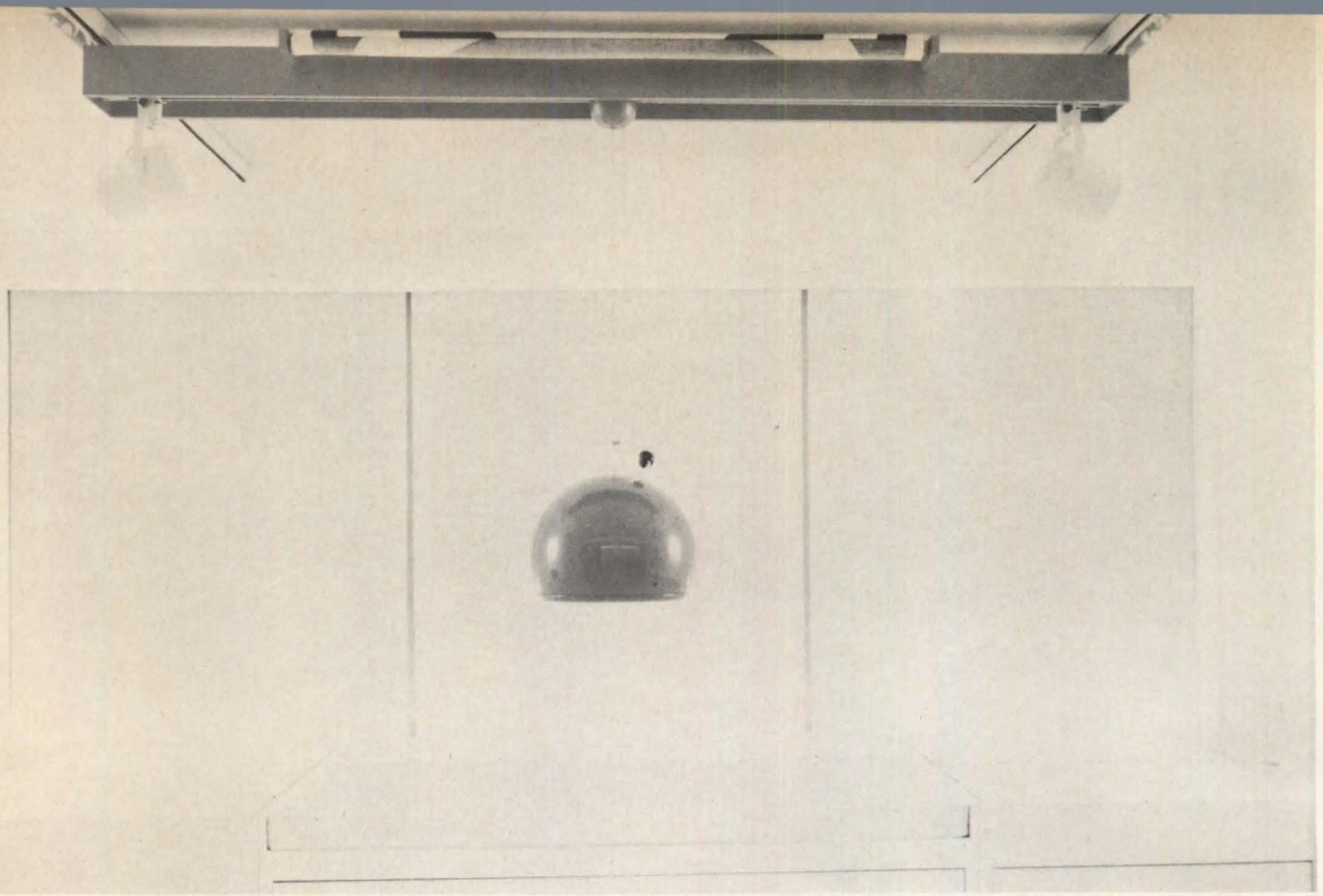




1

Photos, except as noted: Romuald Witwicki

INTERIOR DESIGN

KINETIC KIT ENVIRONMENT

A system of flexible, multi-directional white platforms interacts with elements of a yellow dining table to produce myriad complexities from minimal components.

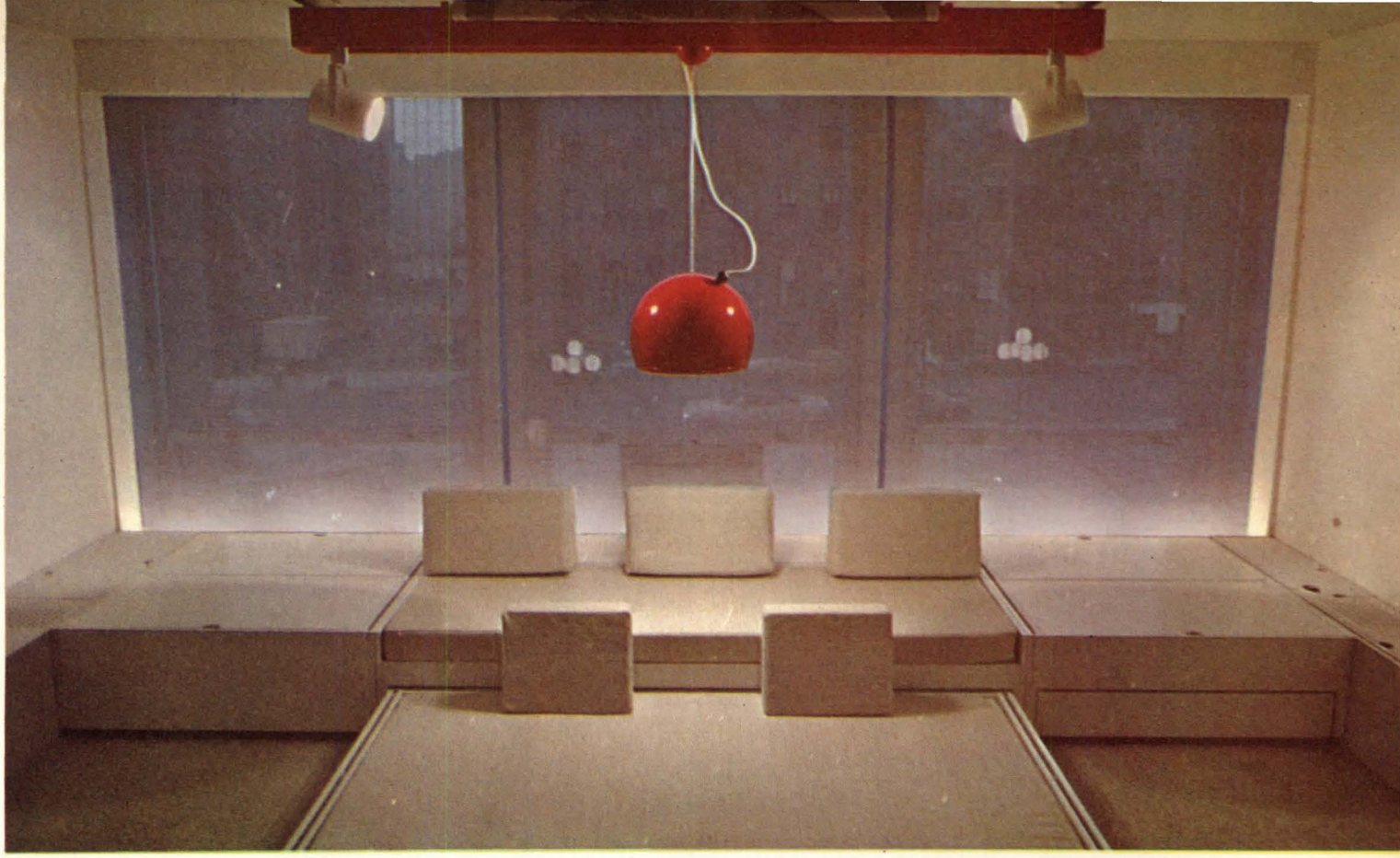
Almost completely abstract, like a painting by Adolph Gottlieb, a systems room by Romuald Witwicki combines the weightlessness of the all-white environment with a kit of floating platform furniture — which pulls out, lifts up, spins around — and also with projected decoration.

This is an appropriate combination "for our industrial context," says designer Witwicki (pronounced wit-wis-key) a young, French architect, who has worked here for I. M. Pei and S. O. M. Besides conceiving the interior, he also constructed its systems furniture.

Like all such furniture, Witwicki's caters to owner involvement with non-static objects — almost with nonstatic non-objects. It provides instant flexibility — a really practicable (if heavy) mobile environment — for the multiple functions of its owner's life-style. Its adaptability permits the space to be varied not only for physical needs but also for the psychological and aesthetic requirements of its occupant. In this way, the concept is based on "the aesthetic of change," and, for Witwicki, it is also based on a goal of plug-in consumer items.

The space is a one-room apartment in that haven of New York design world — I. M. Pei's Kips Bay Plaza apartments. (Architect Pei may have waited this long for a model room to suit his own tastes so well.)

Designer Witwicki envisions the 16′ x 20′ x 8′-2″ space as composed of two interlocked and interacting volumes — the larger, higher, and brighter one being next to the windows; the lower, smaller, and "shadow-of-white" volume being next to the inner wall (which is silver papered to reiterate the win-



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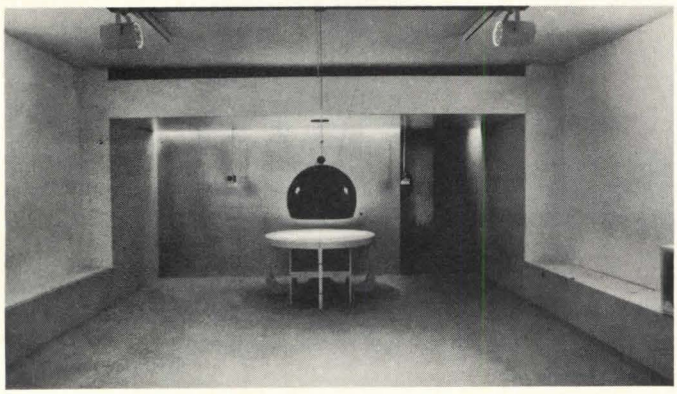

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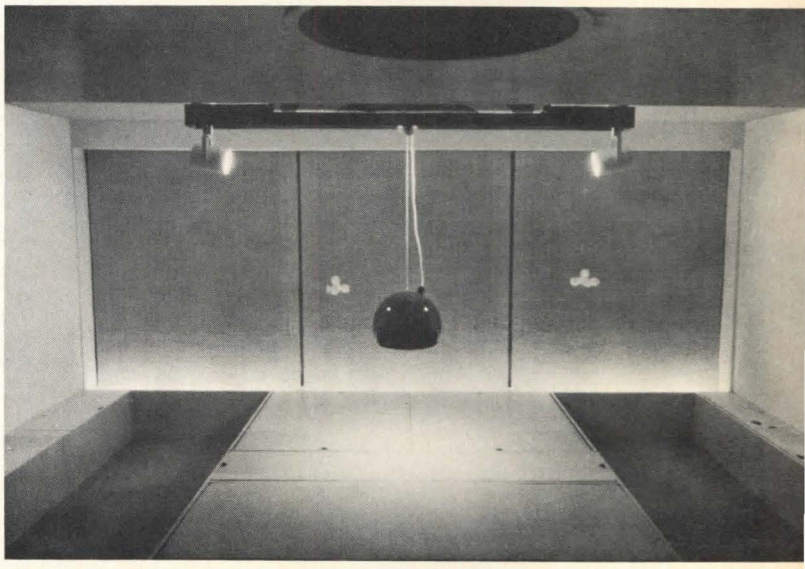

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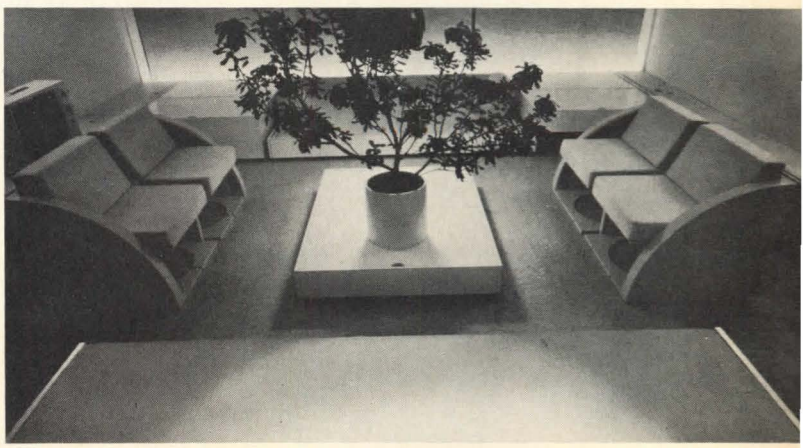

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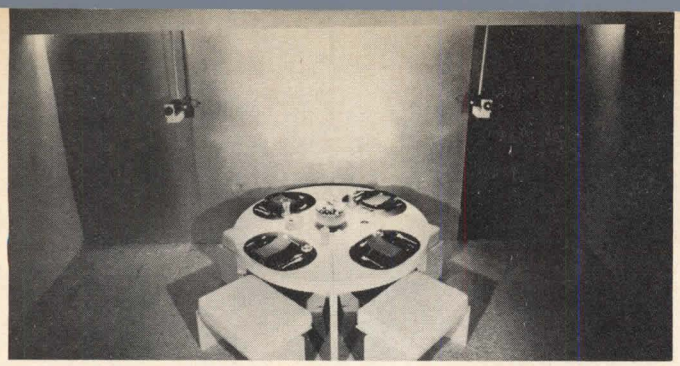
dows opposite). The change in ceiling height is effected by a built-in, overhead cabinet (15 in. deep) that spans the width of the room on the inside wall. It contains objects and equipment for the multiple uses of the space — cushions, backrests, projectors, pulldown fabric panels — and also includes recessed lighting above a yellow sun of a dining table, which is the focal point of the area defined by the overhead unit. If budget and structure had permitted, Witwicki would have made this cabinet movable — to slide overhead along the length of the room, from inner wall to windows — reflecting the mobile furniture system below.

The flexible furniture is a two-part system: First is a group of floor-standing, slide-around, floating platform units (1, 2, 4), which interact with the separable components of the yellow dining table (3). The other is a ceiling-mounted, track-sliding beam (7, 8), which streaks a red slash across the ceiling, actually



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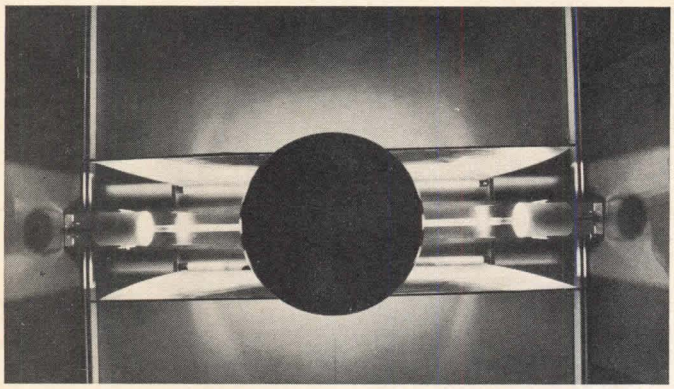

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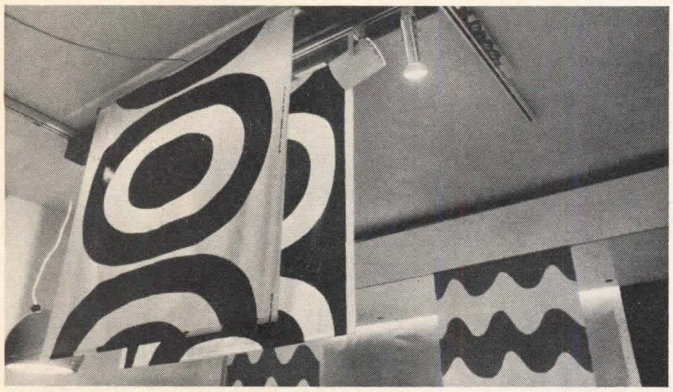

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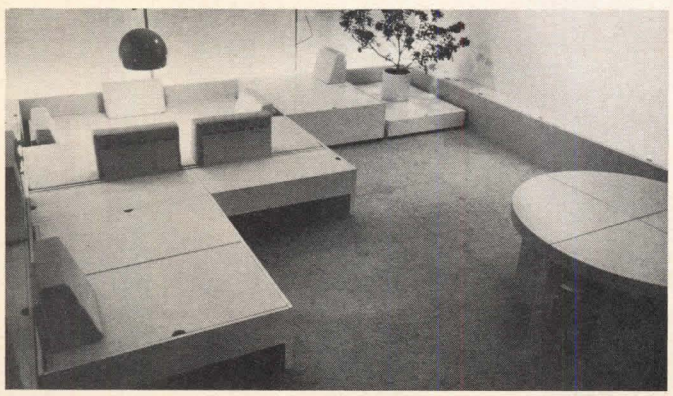

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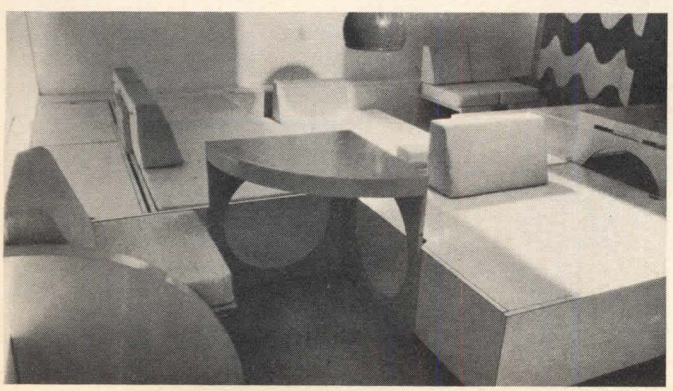

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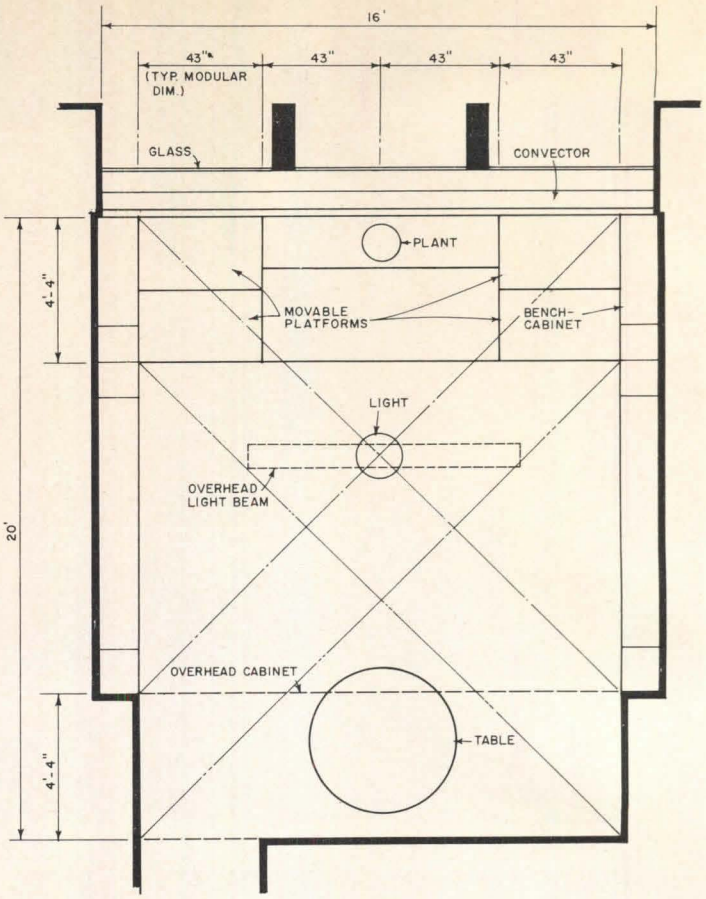


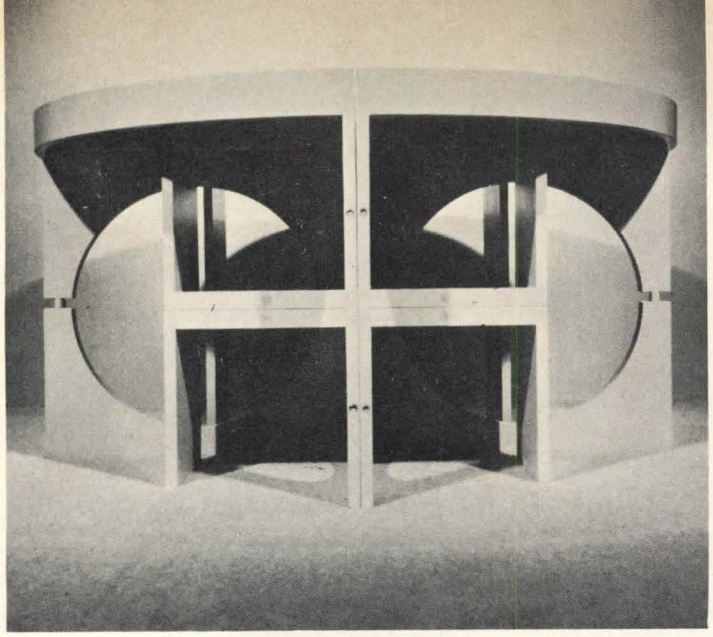
sliding toward windows or dining area. It holds lighting fixtures (including a delightful red toy of a gyroscopic, globe Italian lamp), and exposed, pole-suspended projectors, and also supports pulldown roller-shade fabric panels (shown with Marimekko's bold-scale designs but now of abstract paintings on vinyl), which provide flexible partitioning for the space.

The units of the white platform-furniture system, when compacted against the window wall, form a mass that corresponds to the overhead cabinet (1, 3). As these units break out of this long, box-like cocoon to perform the support for life-functions, first a bed pulls out from beneath the sofa (2); cushions from the overhead storage (or from the storage space in the platforms themselves) can make a low sofa of the bed also. Lift-up tops of the side platforms can be propped to produce neo-roman recamiers (22). More elaborately, the units can be moved about the room to make various conversation groups, which designer Witwicki negotiates with virtuosic variety.

At the other end of the space, the yellow supertoy dining table breaks down to form a number of table-and-chair combinations (6, 11-16), and also to work in with the platform units as seating and occasional tables (5, 9, 10).

Making a framework for the movable units — and establishing a floor area that admits a constant 43-in. module (see plan) — are built-in bench-cabinets that line the walls to fill in between structural jogs.

Adding to the flexibility of the furniture system is red, ceiling-



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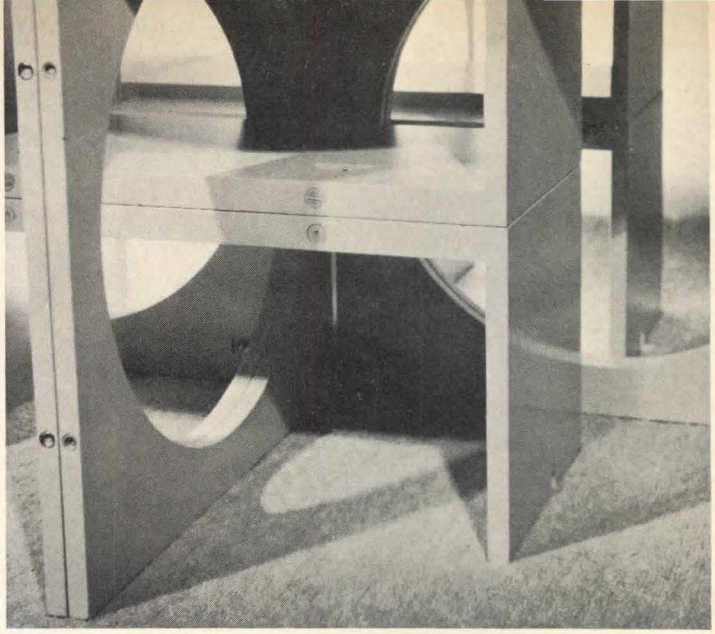

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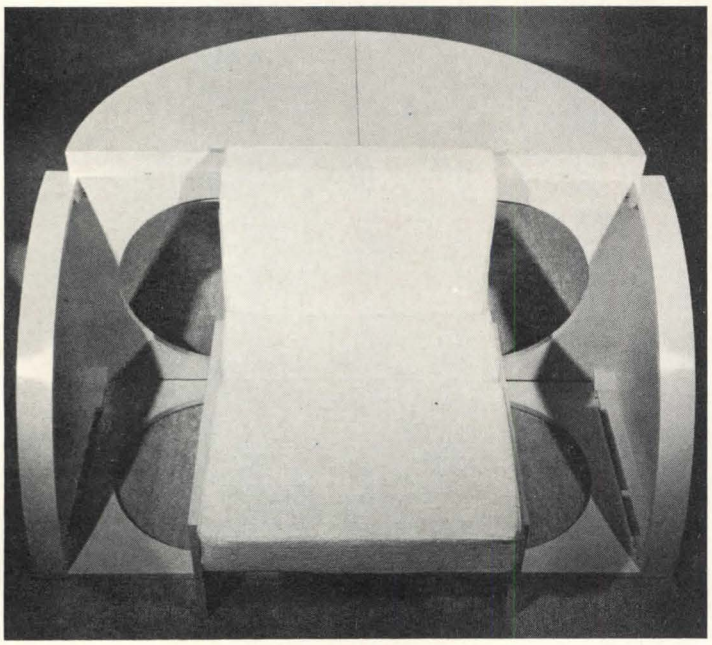

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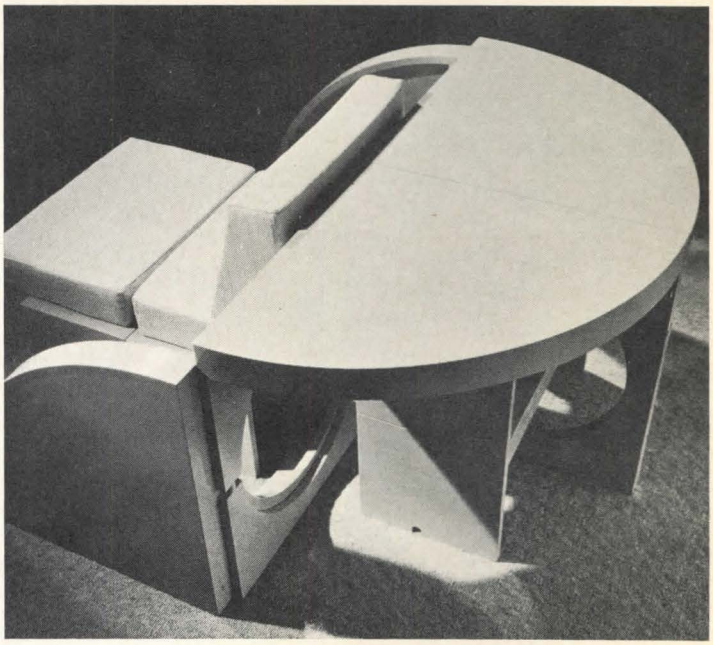

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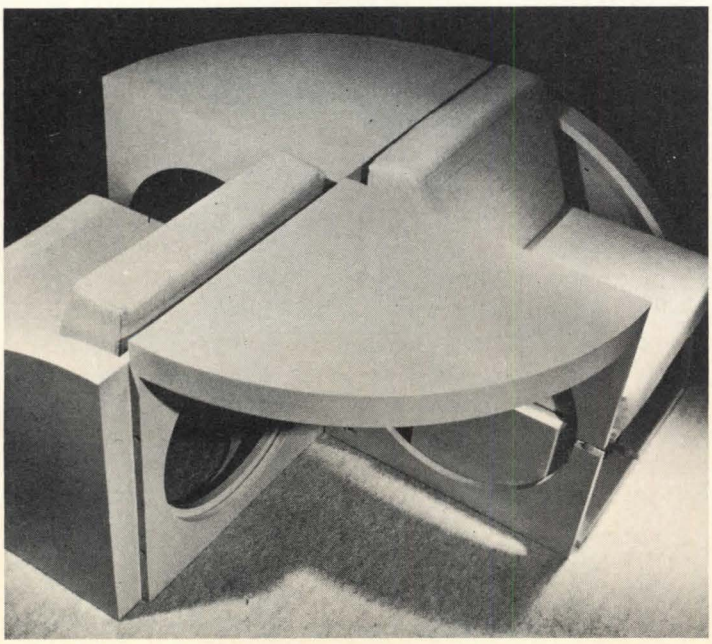

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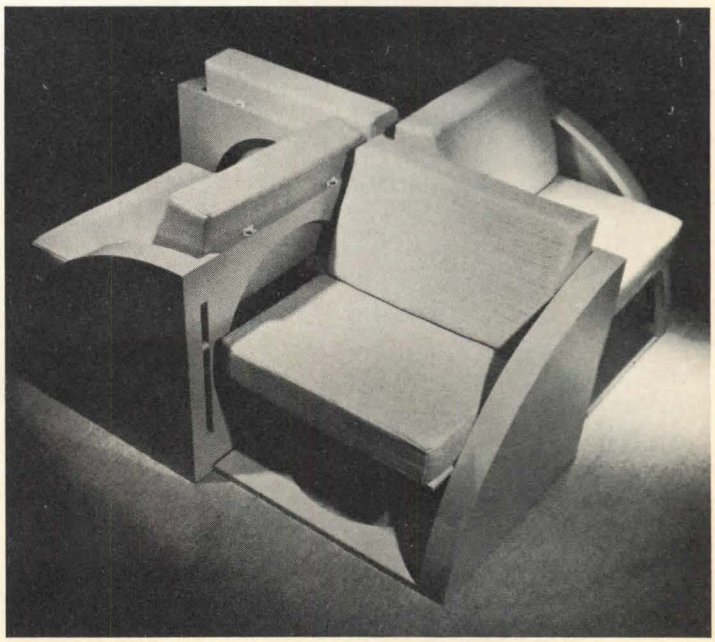

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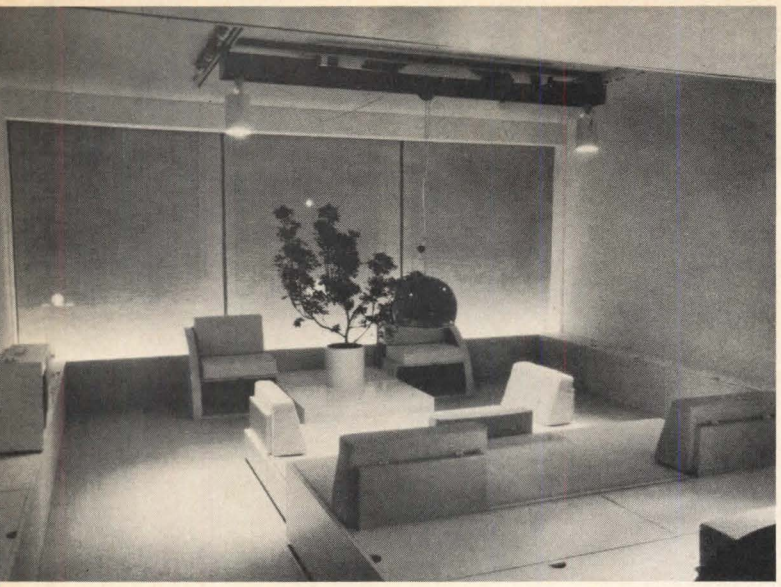
The yellow supertoy dining table is a system of components that can be rearranged to form seating or table units of different proportions. The components also interact with the platform units to provide back rests and occasional tables.



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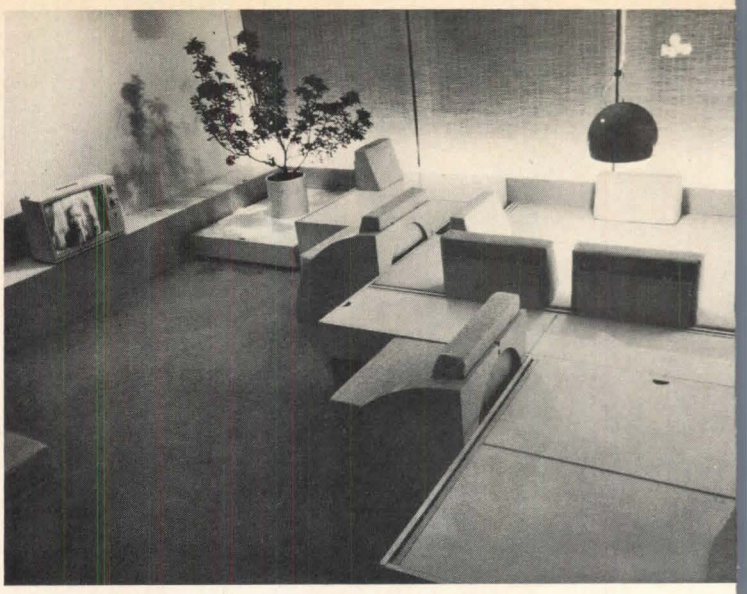

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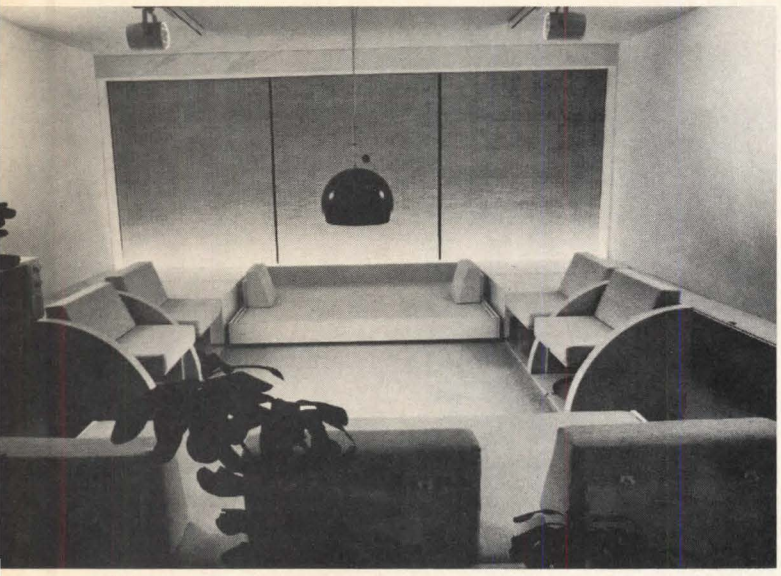

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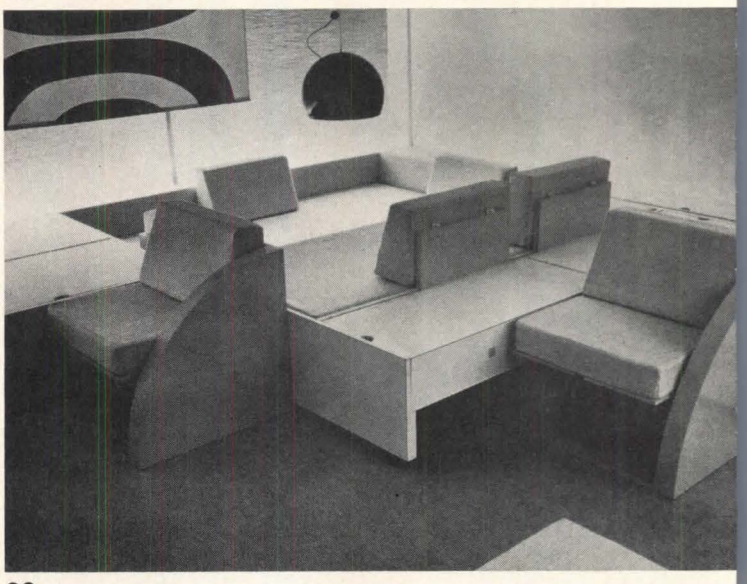

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Modular mobility of a virtuosic variety makes the uncommitted space of the one-room apartment flexible for many life-styles.

In addition, these floor cabinets conceal controls for air-conditioning and television cable (across the room from the tube), and extra storage space.

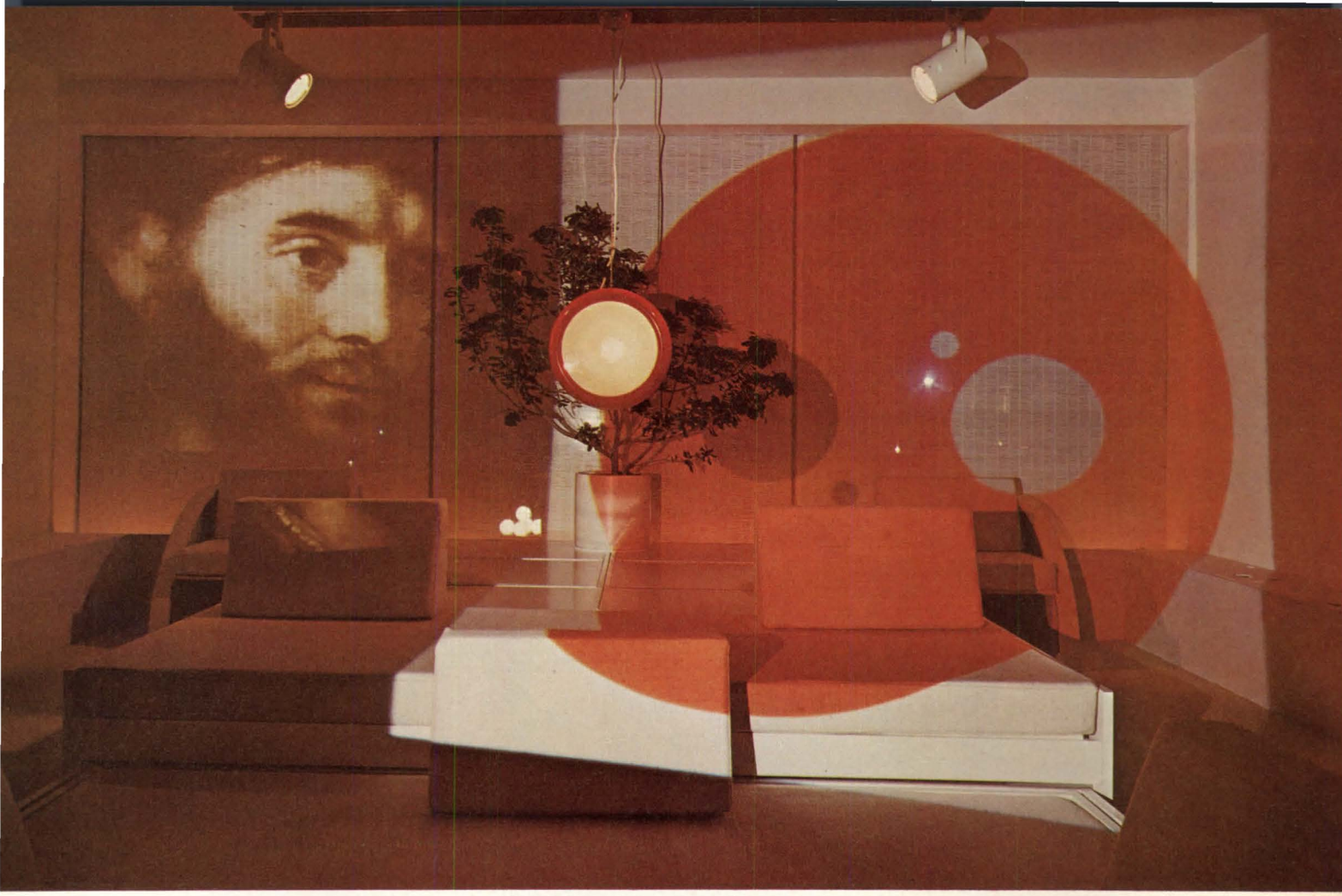
This line is continued across the windows by the building's convector system, behind which designer Witwicki has installed strip lighting on dimmers. Above the windows, a built-in valance squares up the wall, provides a pocket for the bamboo blind, and carries wiring to the center of the windows, whence it hangs freely and exposed to the ceiling track.

Except for the pendant red globe light and the sunny dining unit, the main space is all white — a muted all white. Carpeting is a textured pale sand; walls are slightly off-white; the window covering is a white bamboo-stick blind; upholstery is a Jack Lenor Larsen off-white textured wool. The roll-around platforms are of white lacquered plywood with white plastic-laminate tops.

The units roll on standard 1-in. rubber wheel casters, which are not as smooth over the textured carpet as Witwicki would have liked, but since the purchase order for floor covering was not large enough to permit a special color of linoleum or vinyl sheeting to match the walls, as the carpet does, Witwicki sacrificed actual mobility to static visual prettiness. Fortunately, he had an architect for a client — Mrs. Ivanka Mihailovich, who works with I. M. Pei — but the units are heavy even for a lady architect.

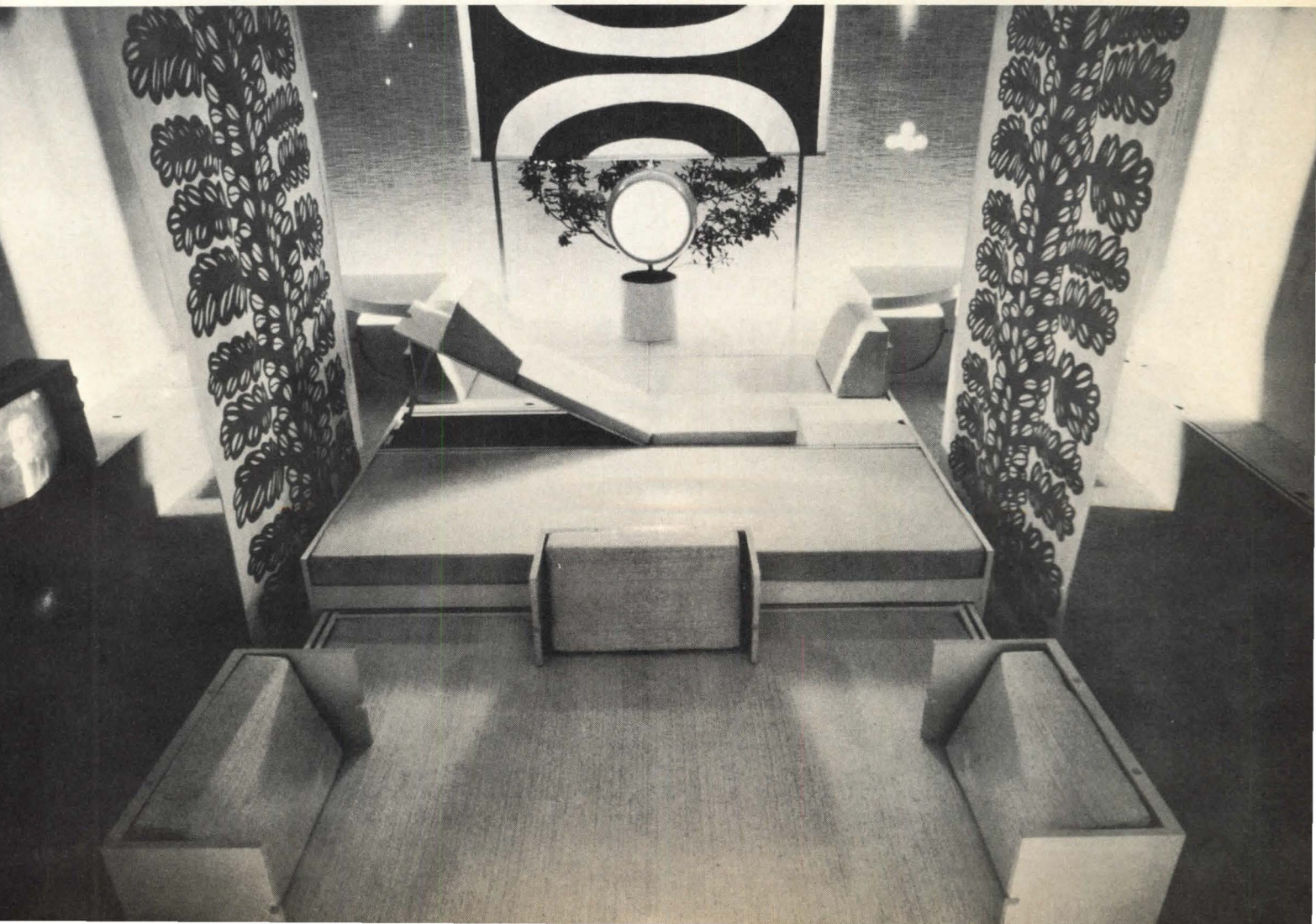
As a homemade prototype, then, this design is less insecure than most display-like prototypes, but it remains only a model of all the right things not yet finally engineered in detail. Those right things are: Flexible furniture in systems interiors and a universal system of interacting, plug-in consumer goods.

Witwicki's apartment design stands squarely astride the contradictory design forces of our complex transitional period, in that it combines a generous system of flexibility for various life-styles within a rigid, package-like, almost-too-pretty visual order. It may prove to be truly important in that it can make the point clear to industry, at last, that in interiors, also, there is a need for versatile, flexible, interlocking, mass-produced systems like Witwicki's ultimate model of modular mobility. — **CRS**



21 Pole suspended projectors overlay instant decoration and further complexities to the ultra-tidy box. Projections executed by Bolt, Beranek & Newman. Slide selection and photography: Louis Reens.

22



Photos, except as noted: Ian Samson

Urban Supertoy Subdues Renewal Bulldozer

The first urban development to be designed in the new aesthetic idiom proves that bulldozer levelling is not the only means to popular – or financial – success

With the twinkle-eyed daring of donning Mod in her advancing years, York Square is swinging like a flapper again, and luring the action — and the money — to her seasoned, but restyled doorsteps. The name for a new center of commercial buildings in Toronto, York Square is on the main strip of Yorkville — where the action is. As in New York's Greenwich Village and San Francisco's Waterfront, most of what's happening in Yorkville is housed in old buildings.

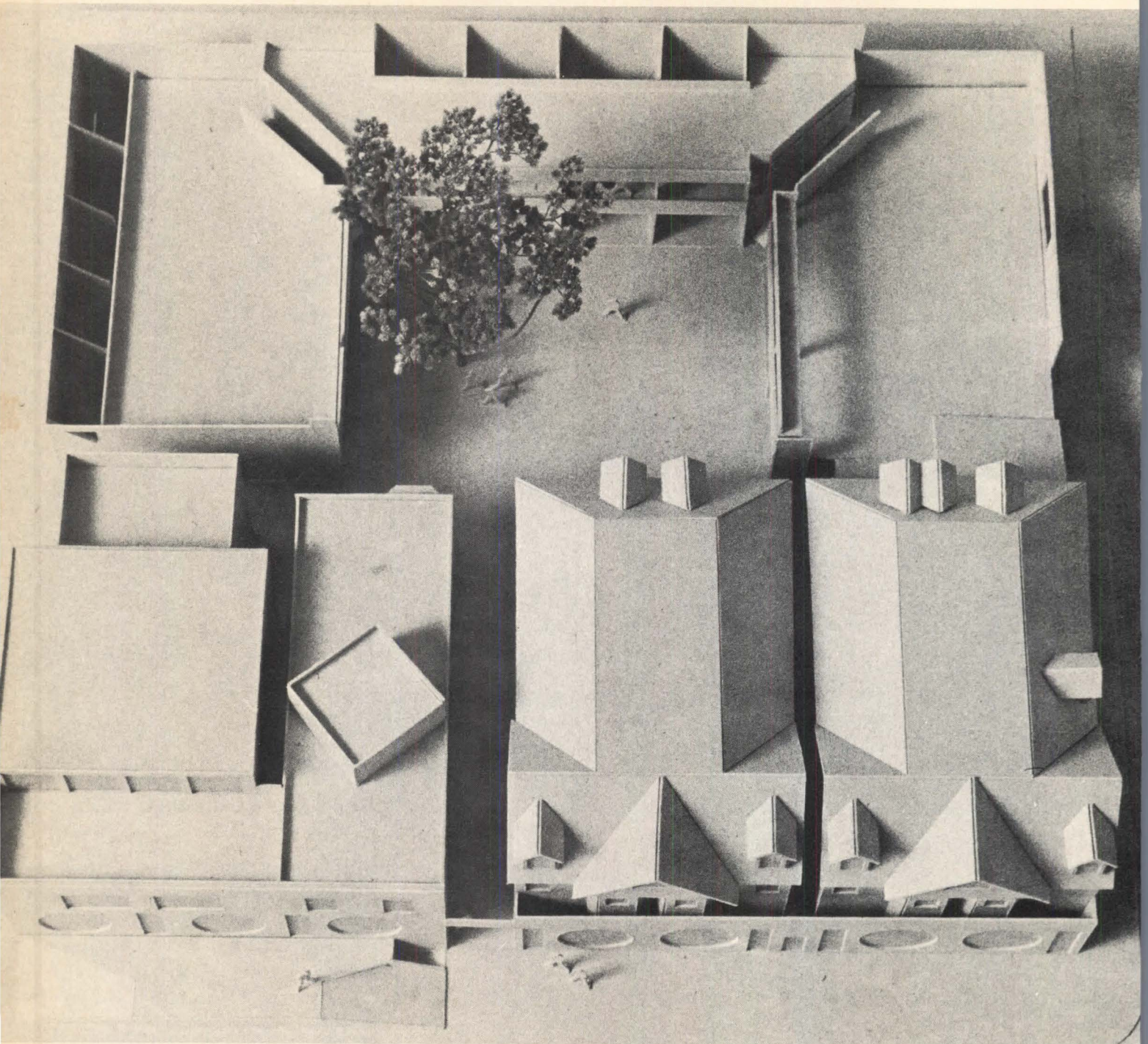
York Square, also, was originally a half-block site

Photo: David Sierens

Photo: Robert Title

Photo: Robert Title

Photo: Panda Associates



Birds-eye view of York Square model shows the central courtyard, the U-plan building that encloses the back of the site, and the main passageway to the court from Yorkville Avenue (bottom center of photo).

When developer I.R. Wookey took over the site, the Yorkville Avenue front was a ricky-ticky row of undistinguished buildings.

CREDITS

LOCATION — Yorkville Avenue and Avenue Road, Toronto, Ontario

CLIENT & BUILDER — Iaver Investments (1963) Ltd. I. R. Wookey, President

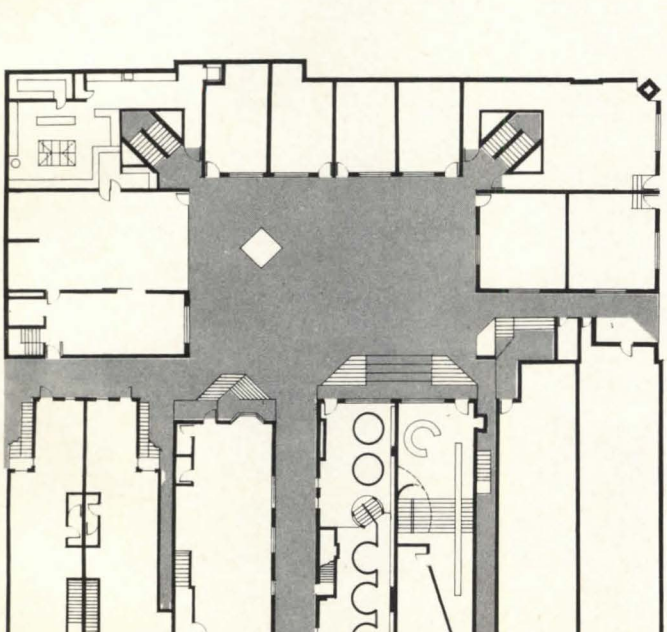
ARCHITECTURAL, PLANNING & INTERIOR DESIGN — A. J. Diamond and Barton Myers

GRAPHICS — Barrie Briscoe; A. J. Diamond and Barton Myers

FURNITURE DESIGN — Muller & Stewart; A. J. Diamond and Barton Myers

ENGINEERING — M. S. Yolles Associates Limited

MECHANICAL & ELECTRICAL ENGINEERING — Rybka, Smith & Ginsler Ltd.



of decayed and mutilated structures when Toronto developer I. R. Wookey commissioned architects A. J. Diamond and Barton Myers to plan and design a scheme to renovate the site and make it an economically viable urban commercial center.

As Diamond & Myers point out, when development capital is invested in a decaying urban area, usually the bulldozer is brought in immediately to level and destroy whatever made the area attractive in the first place. The reasoning behind this still prevalent "urban renewal" methodology is that renovation is more expensive than new construction and that, in any case, maximum coverage of a site must be accomplished in order to amortize the current high cost of new construction. "The consequence is," say the architects, "that maximum capital outlay is required for competitive rental returns."

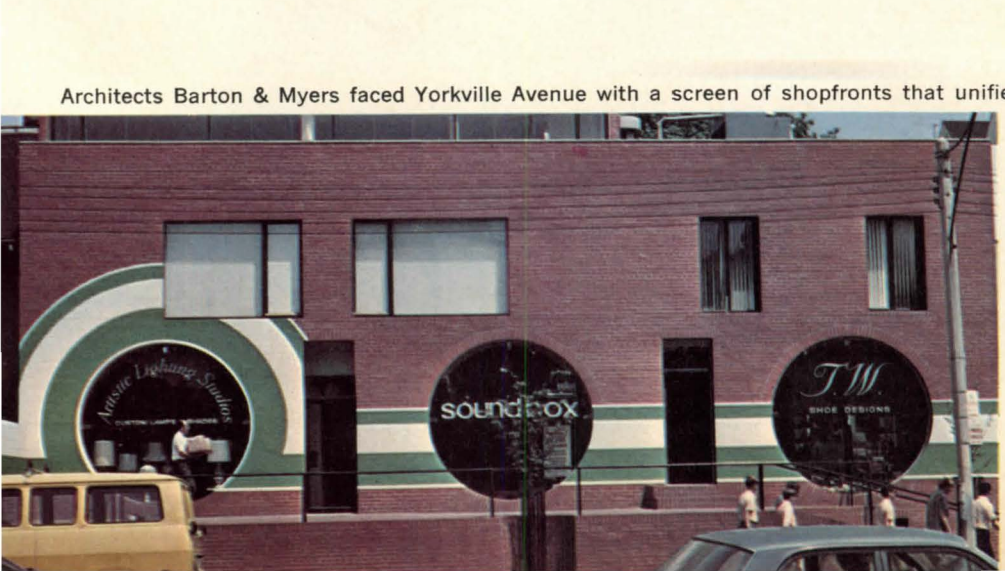
This is the "urban renewal" method that Jane Jacobs so vehemently and outspokenly opposed in New York and other great American cities. If Toronto has lured urbanist Jacobs as a resident, York Square can show why. It will warm the hearts of all city dwellers for whom she has been the popular spokesman.

At York Square, the general condition and the scale of single buildings, "which were arrived at empirically," as the architects point out, were maintained specifically so as not to disturb the established flow of already interested people to the location. In fact, York Square now increasingly attracts a true urban mix of Toronto's population to its shops, activities, and restaurants: the young and the old, the curious and the dedicated, the window-shopper and the spender, the square and the hip.

This alternative renewal method — preserving the continuum of urban growth — minimizes fiendish leaps of scale in both size and financing. It is a method "that ought to be obvious," the architects say, "since, if pursued successfully, it allows high rental returns for small capital outlay, making the economic venture more feasible on smaller capital outlay."

York Square, therefore, advocates urban evolution over urban revolution. Although the mainstream of

Architects Barton & Myers faced Yorkville Avenue with a screen of shopfronts that unifies the facade.



Photos: McAlister/Van Nostrand

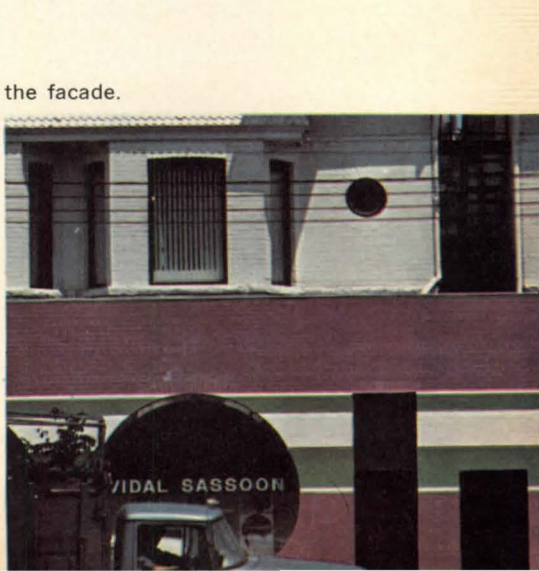
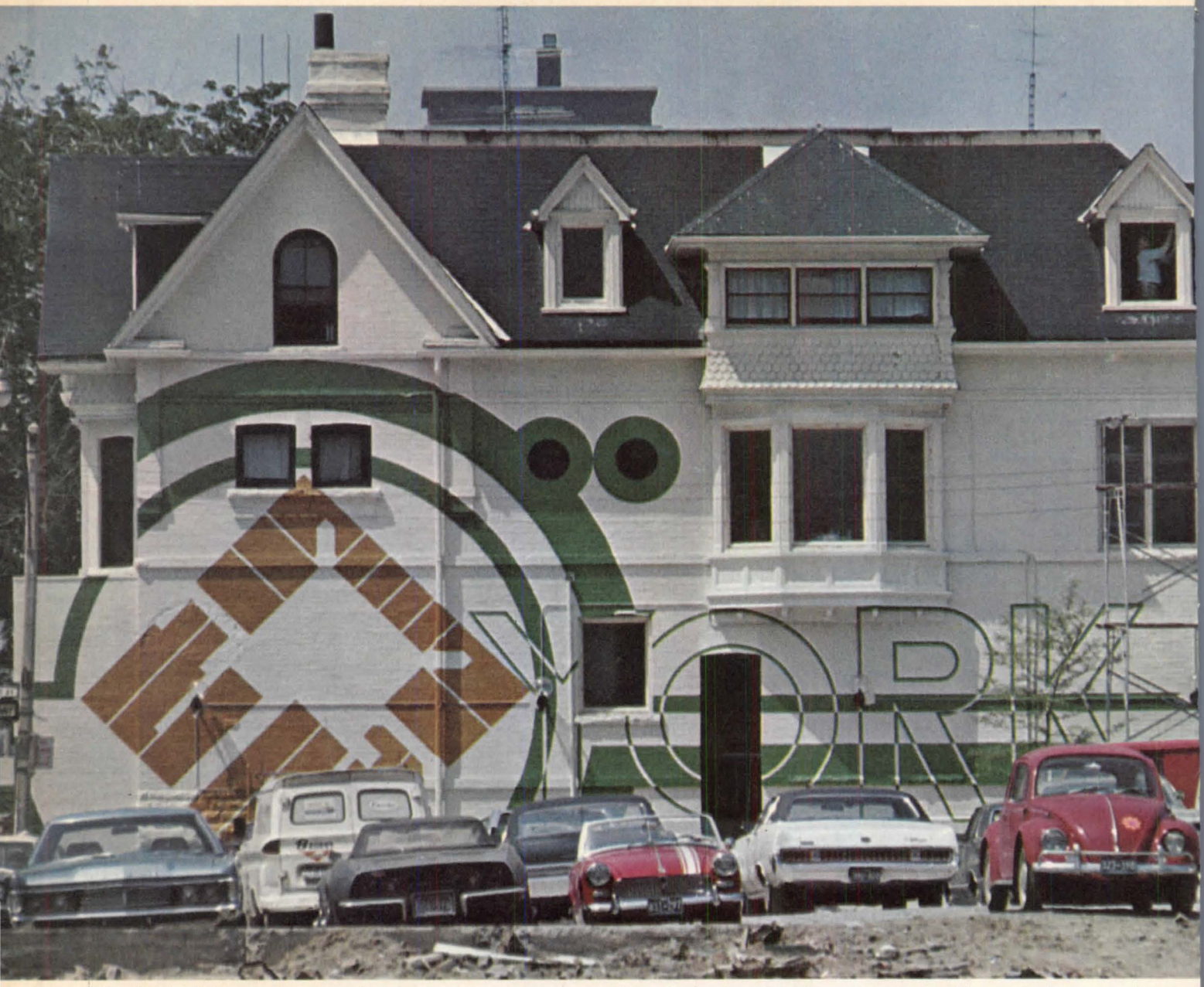


Photo: McAlister/Van Nostrand



Artist Barrie Briscoe painted a giant logo — the ochre plan of York Square on the diagonal — along with green signage and green-and-white circulation graphics on the Avenue Road facade.

current activism is against this approach, the development is an undeniable urban and commercial success. One store that was in operation before the renovation, for example, now reports that its sales have increased, first to 40 per cent, then to 100 per cent of its original figures.

The method used at York Square preserves the character and familiar charm of the old and adds a seductive set of hippy new accoutrements to make people take notice of it again, see it afresh, and therefore be attracted to it. This statement, in fact, is a basic definition of all art. In addition, as South African architect Diamond points out, "What is new today is old tomorrow; therefore, working with the old is perhaps the single most important aspect of design in cities." On the other hand, urban designers must always bear in mind that the only thing permanent in life is change.

Supertoy Shopfront

To change the old brick buildings on Yorkville Avenue, which were painted white, Diamond & Myers have overlaid a new row of shopfronts — "replacing the tickytacky stores that had collected over time," as they recall (see p. 146). The new fronts are designed as a one-story high, perforated screen, linked to the old buildings by skylighted roofs.

The design motif of this peek-a-boo facade is that of a simple primitive signage at giant scale: huge, circular openings for show windows alternate with rectangular openings for doorways. Circles say "look through"; rectangles say "walk through." It is a Supertoy billboard.

"The language of the openings is really dumb," says Barton Myers, who not surprisingly studied with Kahn and Venturi at the University of Pennsyl-

vania. Its geometry separates the shops from the customary, undifferentiated, continuous glass shopfronts and focuses on individual establishments, since the architects see small openings as being no longer relevant to the scale of the new urban street. The geometry therefore also relates the Victorian detached and semidetached structures to the megascale of the new metropolis and the new mobile scale of the speeding auto. Everyone can read it. It is a linear motif that ties together a number of disparate elements and unifies the complex. An unflinchingly modern addition to the old buildings, York Square's shopfront screen is in the best traditions of Supermannerism.

Supergraphics

In collaboration with Barrie Briscoe, whose wraparound murals we have seen before (October 1968 P/A), the architects have superimposed Supergraphics on the Avenue Road and Yorkville Avenue facades, both as signage and as circulation indicators. On the wall of Bill Brady's Men's Wear, the Avenue Road corner store, a diagrammatic site plan of York Square set on the diagonal is painted in ochre inside a giant green circle — "the O of York," Briscoe says. Alongside, the name of the area is telegraphically billboarded in green letters. The entire design is superimposed over walls, windows, and doors indiscriminately — or "permissively," to use the language of the new idiom.

The overlayed site plan is about one-eighth the actual size of the site itself, but it is mammoth compared to the usual orientation diagram on a signpost, and even compared to an architect's customary documents. As a result, it makes a new-scale transition between the physical actuality and the in-orbit view of it, as well as providing a logo and identifying signage. Although this double-scale interaction is fundamental to all Supergraphics, the painted superimposition of representational material is a device that Briscoe has made particularly his own.

In the architects' minds, this technique is associated with the integral decoration of brick stringcourses that unifies single Victorian structures nearby (photo right); they also see it as related to the more modern stripes on airplanes. At York Square, as they intended, the Supergraphics are at a new giant scale that not only ties together the entire half-block complex, but, like the supertoy shopfront screen, relates the complex to the superscale of the street and the city. This is an exterior use of the technique that is exemplary of its potential in economically brightening our too-often drab urban environments.

A final element of the Supergraphic design — a

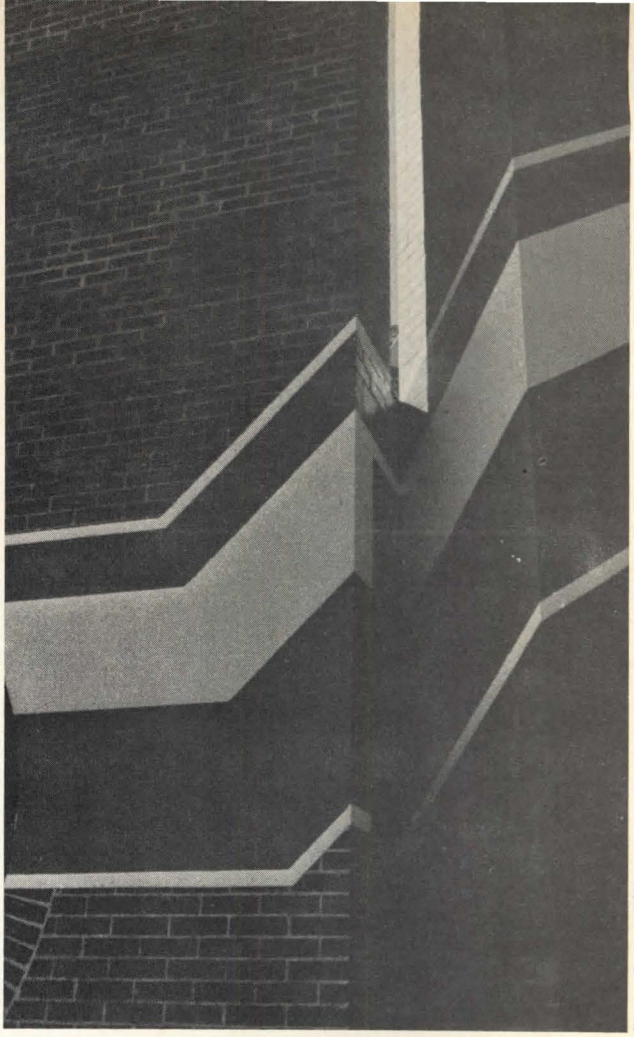


Photo: Robert Title

Architects Barton & Myers see the exterior graphics, which were done in collaboration with Barrie Briscoe, as a device that enhances the larger scale of the new complex and ties it together, "much as the Victorian string course once did," they say. "Toronto is rich in such examples of Victoriana (photo below) "the architects explain," but where once diverse building elements were combined into a whole, now groups of buildings are united together for the superscale of the street."

green circulation strip — leads the eye around the corner to an arrowhead indicator toward a passageway at the center of the Yorkville Avenue facade.

York Square's Square

The passageway between the stores leads past the irregular backs of the old buildings to a brick-paved courtyard that gives York Square its "square." It is a more pastoral respite than the busy street traffic can provide — "a place for pedestrians away from the automobile," as the architects say — presided over by a grand old maple tree, perfectly sited years ago, which spreads a leafy shade over the court.

Already the court has become a popular place for performing groups: carollers at Christmastime, and, during this summer, the recitals of the Toronto Dance Theatre. Local papers have acclaimed this sequestered open-air arena as Toronto's "mini-center for the performing arts."

To frame this courtyard, Diamond & Myers demolished half of a semidetached house and designed a new two-story brick building at the back of the deep site as a social center; it houses ground floor shops (with large circular shop windows such as those on the street front) and a restaurant, a glass-enclosed lunch terrace, open-roof coffee terraces, and a small fondue-and-chocolate shop. This U-plan building has stairs set in its corners diagonally, "making obvious by breaking the building, where the access to the roof is," the architects explain. Since the corners are the dark spots in the square plan, they are also used for the service cores. Industrial designer Earl Helland executed the restaurant interiors.

Diamond & Myers in addition designed the interiors of two of the old buildings, one for Vidal Sassoon, the English hairdresser of Mod-bob fame, and one for the Poupee Rouge Boutiuqe, a woman's dress shop. Both of these interiors (see next pages) fulfill the promise of the exterior with its permissive interflow of scales and history.

Conclusion

York Square, then, is a paradigm of our inclusive design age: it exhibits the double scale of our all-at-

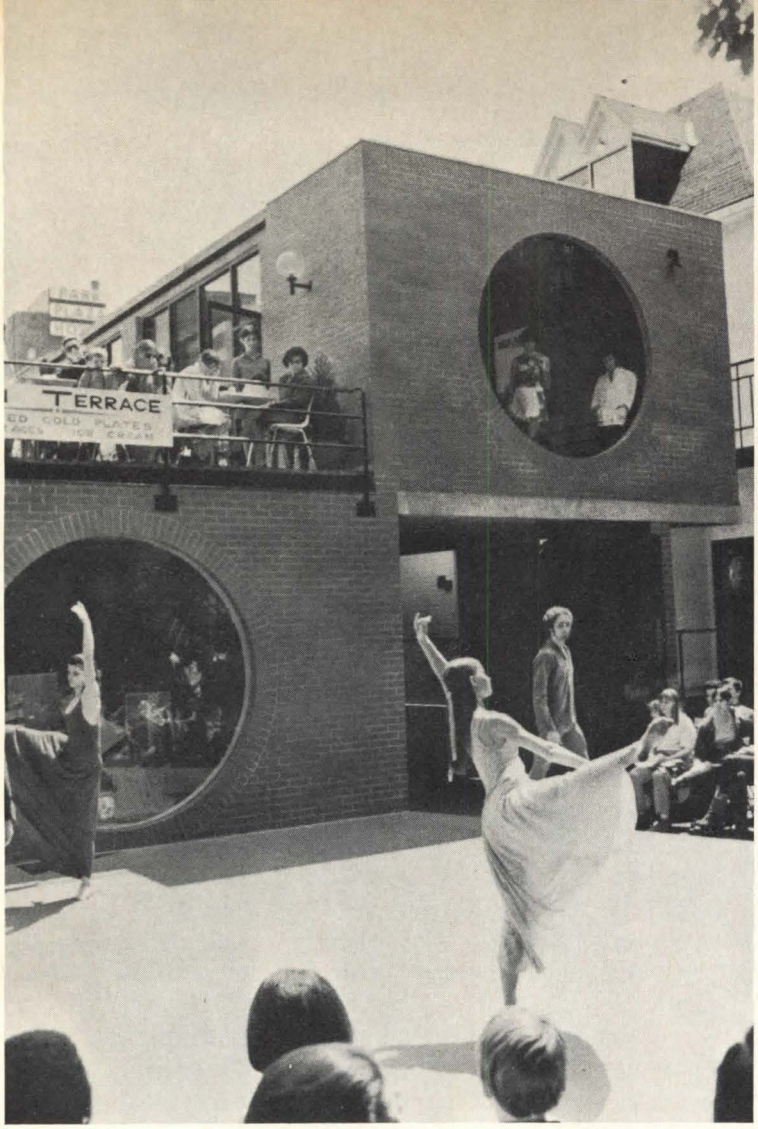
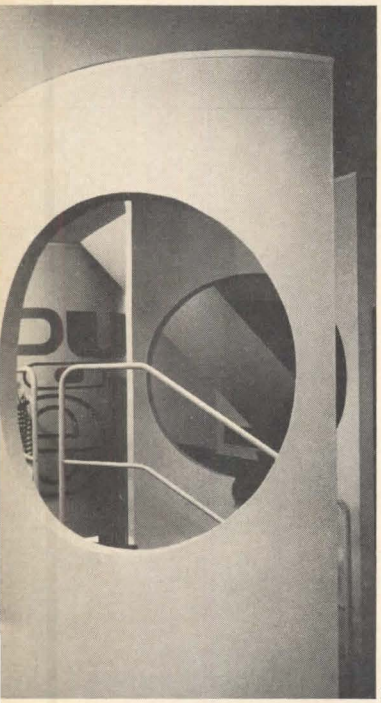


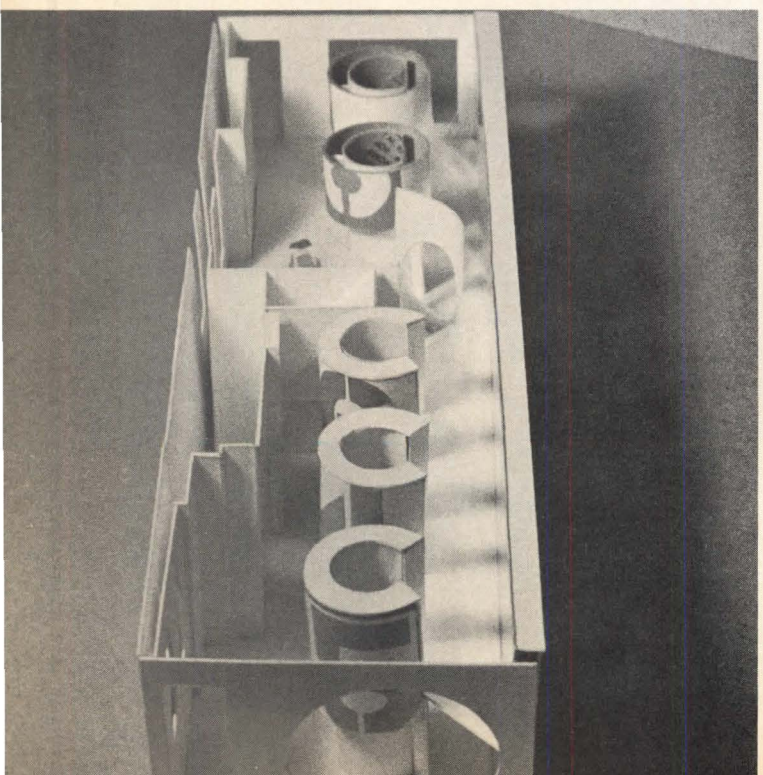
Photo: Robert Title

The courtyard at York Square (this and facing page) is a social center that is also becoming an outdoor setting for the performing arts. Shops, restaurants, and open-roof terraces surround the tree-shaded court — all with the motif of the street-front screen.



Poupee Rouge Boutique is one of two interiors at York Square designed by Barton & Myers. For a long narrow space, which had been completed to the point of wall-restoration and electrical and air-conditioning work, the architects designed a series of cylindrical "dress towers" to display the stock and to serve as changing booths. The straight long wall is mirrored; the irregular one painted Poupee-Rouge rouge. The circle motif of York Square is reiterated.

Photo: Soltay



once vision — the overlay of old and new, preservation and construction, pedestrians and cars, bustle and peace, facade and mass, structure and paint. All are put at the service of urban revitalization. If last month P/A published two different banks to show the widely separate dual design directions current today, this month we show these two dualities in the same project.

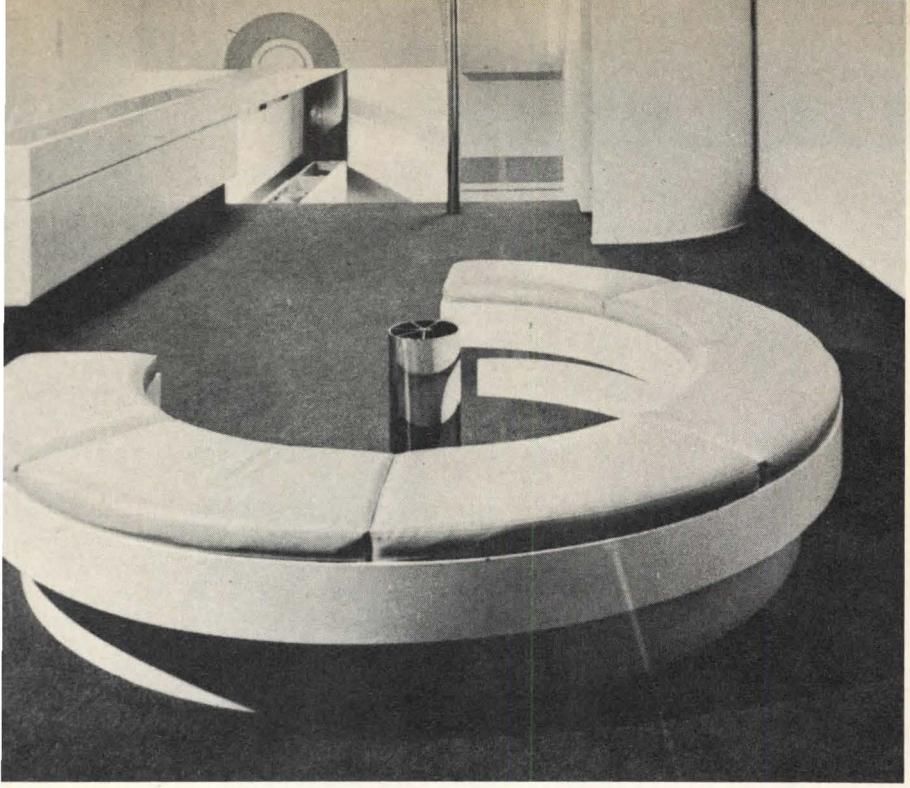
Furthermore, York Square is not merely a project entirely within today's most avant-garde aesthetic; it is also the first large-scale exterior project in that idiom. As the first urban renewal development in the idiom, it helps to prove, at last, that the "super games" (as the *Architectural Review* has sardonically dubbed them) are valid and meaningful when put to urban uses.

This artistic contemporaneity is responsible not only for the artistic success of York Square's design, but for its popularity with the citizenry of Toronto — however controversial the new idiom, mysteriously remains within the architecture profession.

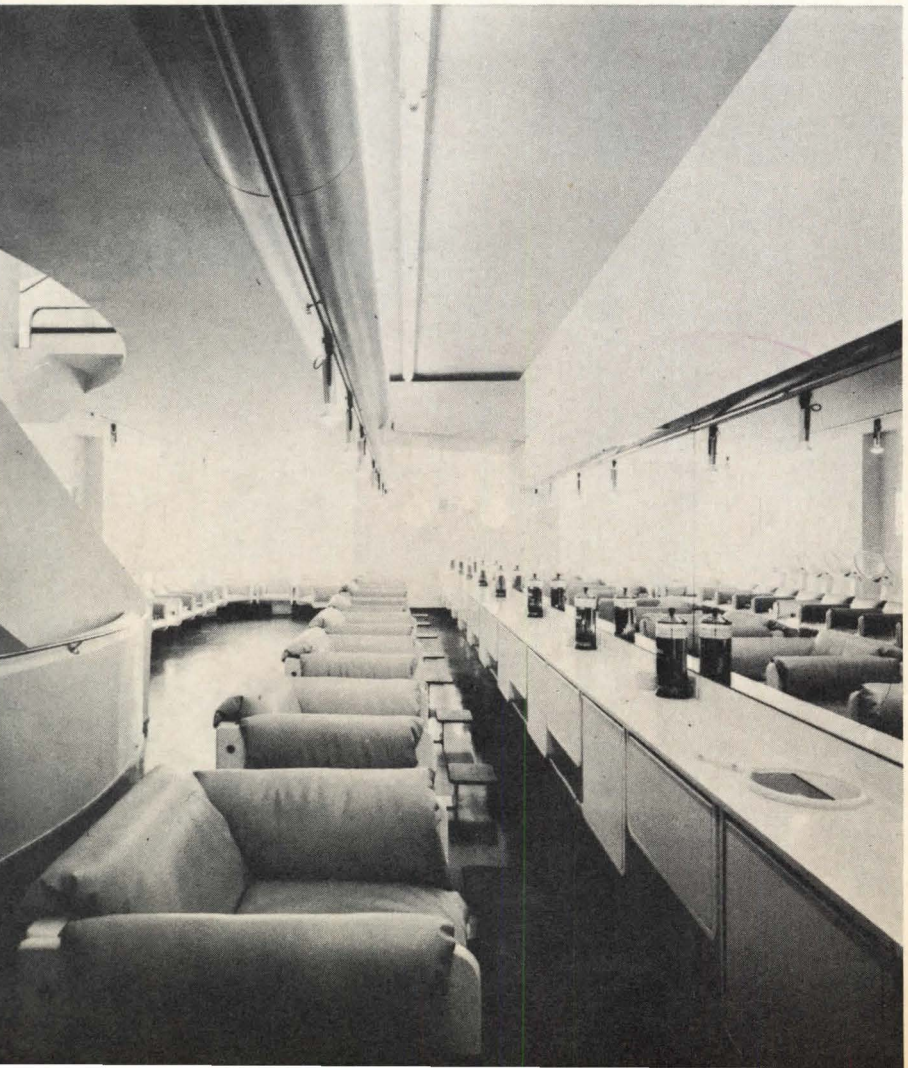
Jane Jacobs told P/A that she is highly gratified by York Square. "It is a Pygmalion operation. Inevitably, in a healthy, developing city," she explains, "buildings built for one purpose are transformed for other purposes. Diamond & Myers have sensitively used the old buildings without trying to pretend they are something else; they have made them not in the least bit quaintsy, but of our times. To see the possibilities in what to most people would have appeared the most humdrum materials is one of the great contributions that architects can make." Urbanist Jacobs concluded, "The uniqueness and promise of York Square, though it cannot and should not be copied in carbon, should be an example to all developers."

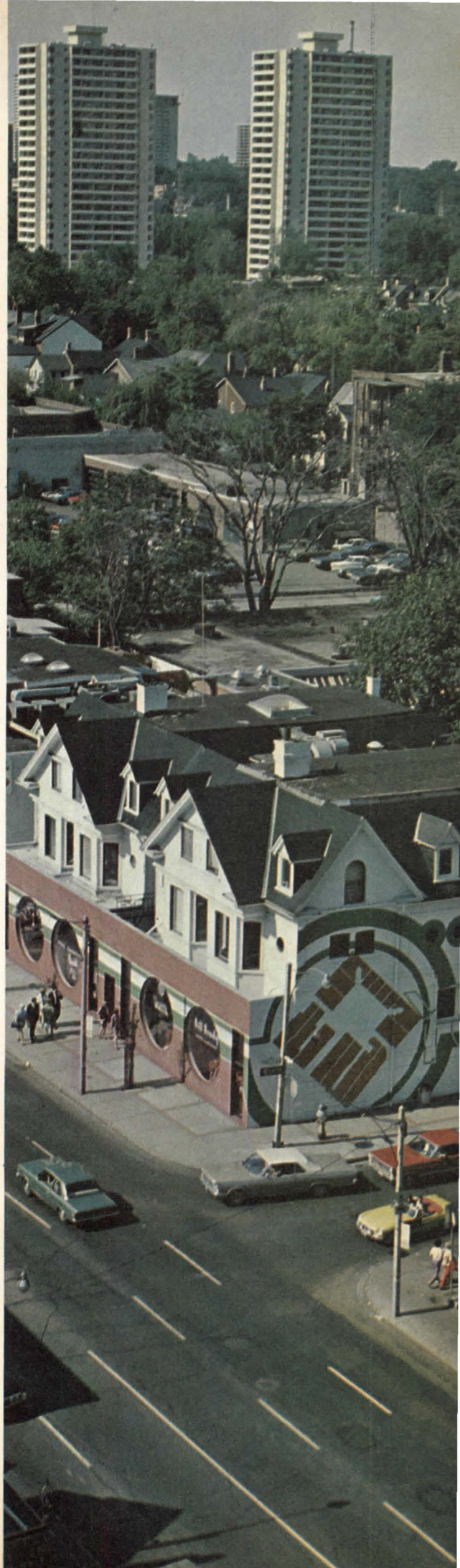
These are meaningful words, especially to Toronto's Yorkville, which is even now threatened by other developers who want to demolish blocks of old buildings under the ironic guise of cleaning up the hippies. Those developers propose, as one solution, a 21-story apartment hotel on a sweetly arcaded, one-story podium — that high-rise towers can "preserve the character" of the present low-density, low-rise area. Nor have Toronto civic officials been exactly the watchdogs of urban continuity, since they have somehow permitted an unsympathetic parking garage to rise in the midst of Yorkville.

York Square, however, sets a better example. And developer Wookey and his architects, Diamond & Myers, can be proud of their achievement. Other developers and architects, and especially other civic officials, would be well advised to consider York Square's respectful yet hip new example.—**CRS**



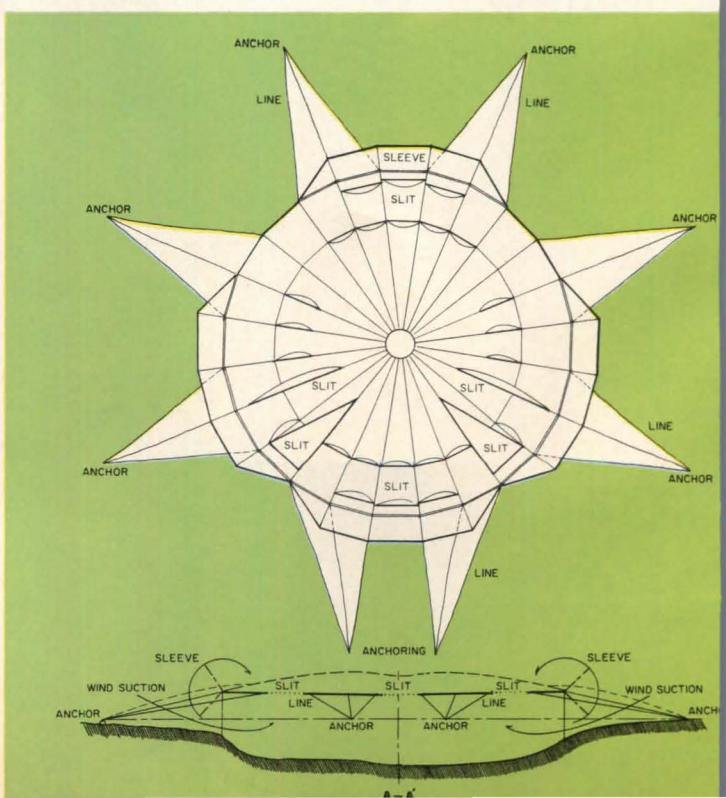
For the Vidal Sassoon Salon, another branch of the English hairdresser who popularized the mod-bob, Barton & Myers continue the circular motif of the complex and give the salon a distinct look at the same time. The salon is unified by the stair that penetrates the entire building. "This is the vertical extension of the horizontal street-square movement," according to the architects. The stair rises in a cylindrical well to a skylight; it connect floors in an ascending order of privacy and function — from entrance on the ground floor to changing on the mezzanine, to cutting and shampoo on the second floor, and so on. Landings are made when the stair intersects the curved well, which maintains the continuity of each floor. All furniture was designed in collaboration with industrial designers Mike Stewart and Keith Muller.





AIRBORNE ARCHITECTURE

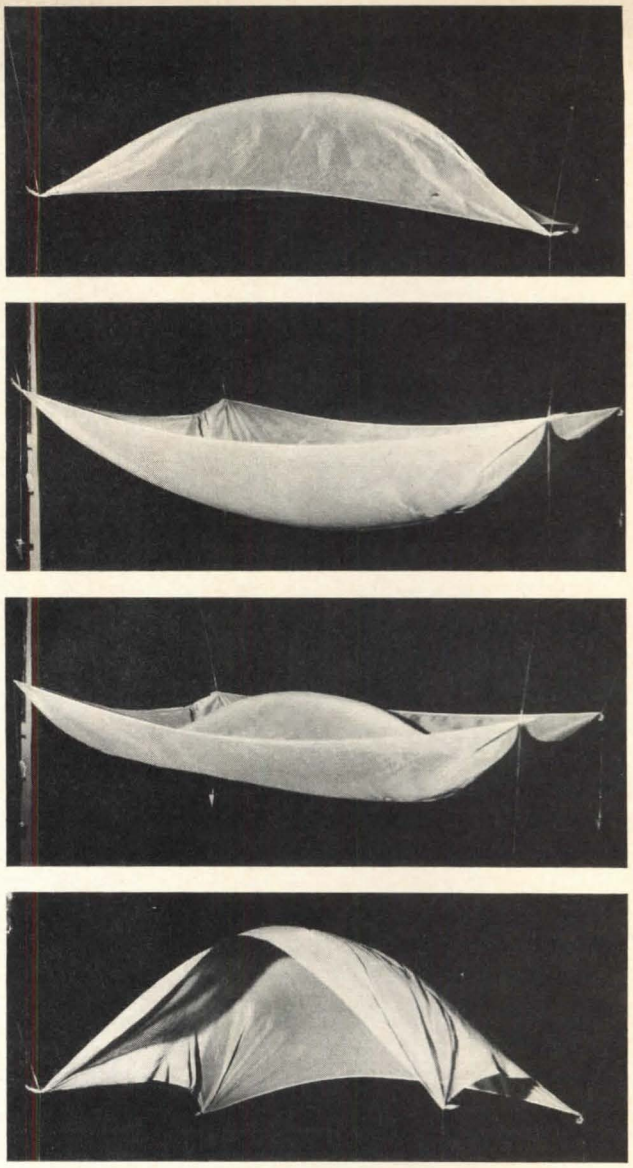
Lacking both technical training, and the use of costly equipment, a young Japanese sculptor-architect has conducted exciting experiments with the oldest and least understood of pneumatic structures —sails and parachutes.



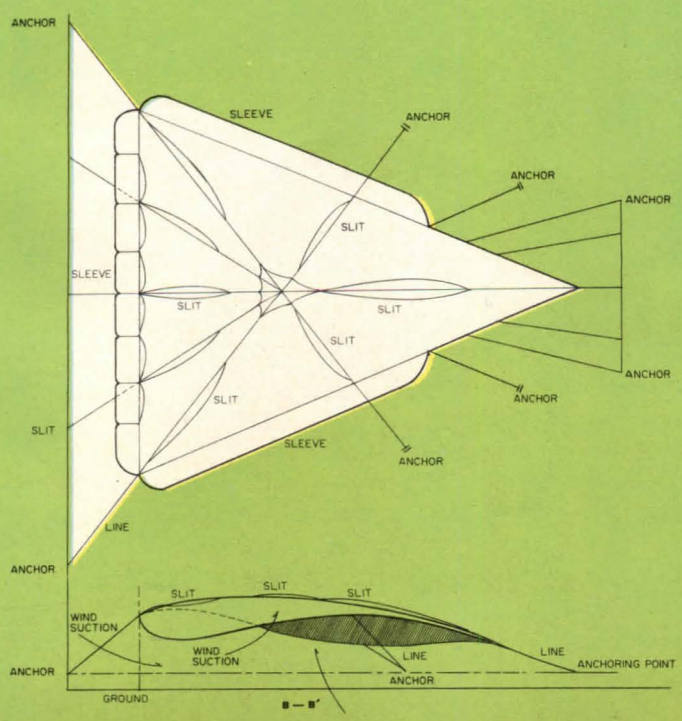
Sails and parachutes are perhaps the most ancient, primitive, and least explored of all pneumatic structures. Technical ignorance and the scarcity of architectural projects involving such forms account for the few pages devoted to them in Frei Otto's comprehensive survey. Yukihisa Isobe, a young Japanese architect living in New York, is one of the few creative minds to have tackled the problem, and he has arrived at a number of intriguing solutions.

It seems fitting that Isobe, quite untrained in aerodynamics, should have been drawn to the architectural use of sails, whose forms and principles of operation have been developed, largely by their users, through centuries of unprogrammatic experiment. The principal barrier to a more systematic approach is our ignorance of the behavior of natural wind. Its ability to radically alter direction and momentum within a few seconds makes its use in the construction of stable architectural forms highly problematic. Nevertheless, in many parts of the world there is, according to Isobe, sufficient constant wind pressure to keep many sail and parachute structures in continuous operation.

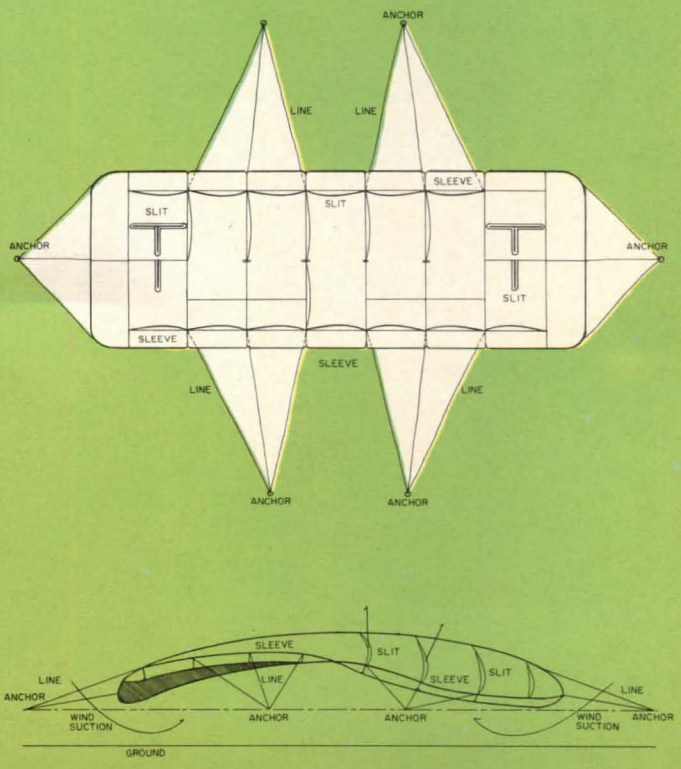
For Isobe, who considers himself a sculptor rather than an architect, stability is of primary concern. Although the kinds of structure with which he is involved are certainly capable of movement, he sys-



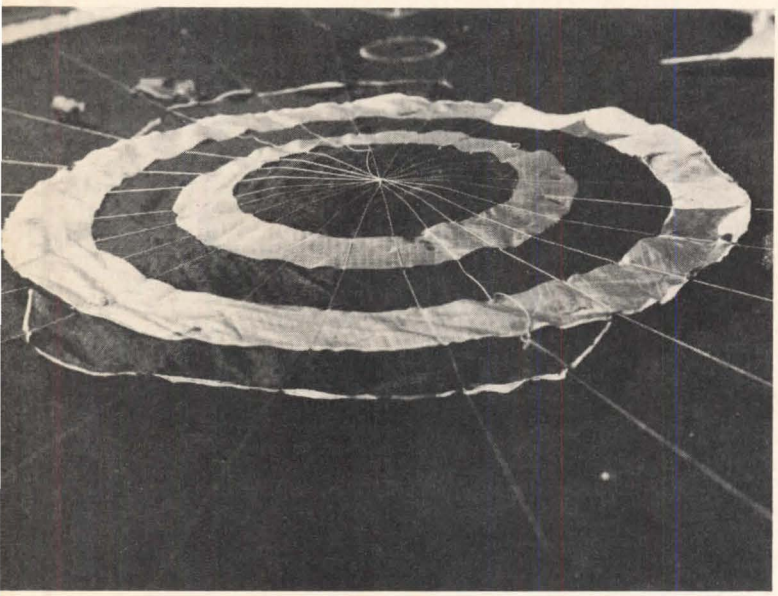
Square parachute, supported from above by its corners and activated from below by a low-powered fan, produces a variety of forms determined by the force of the air-flow.



Triangular chute for situations in which wind flows from one direction.

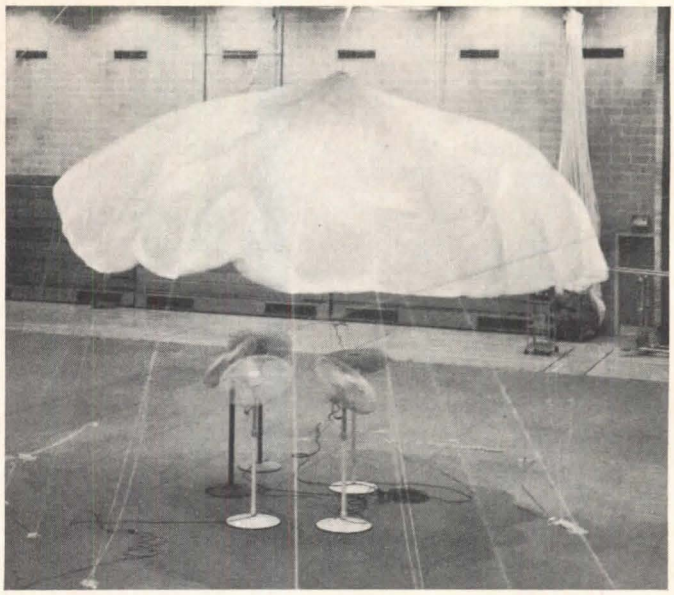


Rectangular chute forms an arch when activated and can bear stronger tension stresses than the circular model.



Model of a vented and sleeved parachute to be used as a tent structure. Since the fabric is stretched on cables anchored at some distance beyond its edge, sufficient auxiliary support is provided to prevent total collapse in the absence of wind.

Parachute for a multi-media projection screen used in a performance at the State University College in Oneonta. It was activated from below by four fans, providing an air flow of 10–15,000 cubic feet per minute.

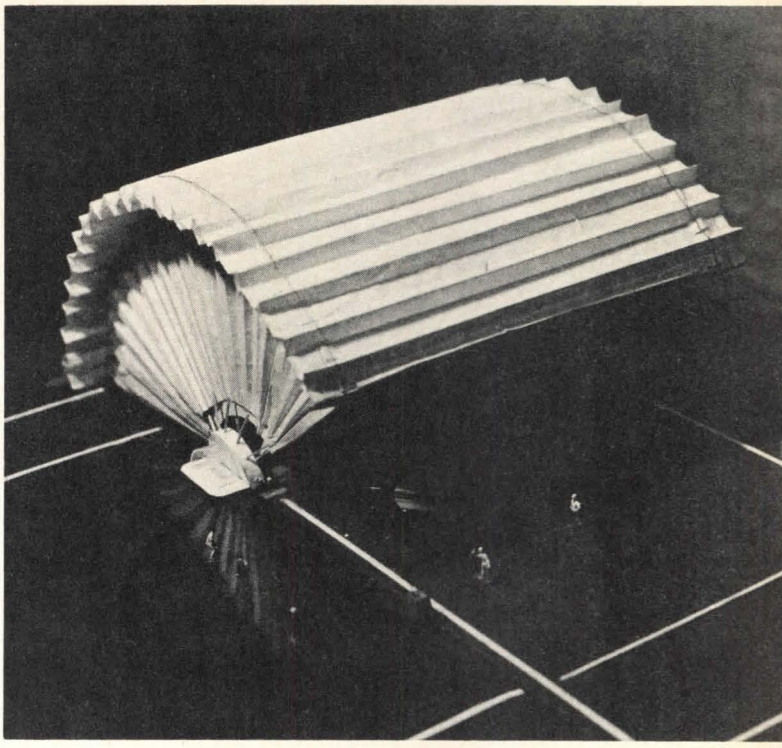


tematically avoids the kinetic aesthetic. In one of his first experiments in this idiom, Isobe fabricated a square parachute, supported from above by its corners, and activated from below by a low-powered, centripetal fan. Although its variety of forms, determined by the force of the air-flow, were quite lovely, the piece proved relatively unstable. The stability of a parachute structure is achieved through the uniform entrance and egress of air. When air is trapped inside or is permitted to escape in a nonuniform manner, a circular motion is set up inside the 'chute that produces an undesirable rotation. In the case of the square, nonuniform egress of air was produced by the corners. The same problem arises in one of the few sail structures found in traditional architecture — the canvas-canopied market stall. Isobe's initial approach was to round off the corners, and then, ultimately, to design a circular structure. But even that piece of pure geometry did not yield a sufficiently stable form. Although the air in the square chute escaped unequally at the corners, some escape at least was permitted by its convex edges; air inside the circular chute, however, was completely trapped. Isobe solved this problem by introducing a system of vents cut into the fabric at strategic points. Typically, the number and shape of the vents (in the case of the one illustrated, two large triangles, one central circle, and 21 semi-elipses) were determined experimentally, with aesthetic and stability requirements in mind. Their placement, however, was conditioned by the requirements of tension distribution, which dictate that they be cut either parallel or at right angles to the gores that mark each segment of the membrane. An additional problem remained, arising from the fact that natural wind enters the chute not from below, but from the side. To guide this lateral air flow into the structure, Isobe added subsidiary extensions or sleeves at three or four points. The resulting form is both functionally and aesthetically more satisfactory.

Isobe has developed a model for this type of vented and sleeved parachute to be used as a tent structure. Since the fabric is stretched on cables anchored at some distance beyond the edge of the structure, sufficient auxiliary support is provided to prevent total collapse in the absence of wind. Given a continuous air flow, the tent should rise to nearly twice the height insured by the auxiliary supports. Due to its

Parachute canopy for a Spring Festival in a valley of Brooklyn's Prospect Park. Helium balloons functioned similarly to the sleeves, lifting the edge and directing the wind inside.

Model of a flexible, pleated shell, reminiscent of a Japanese lantern, that expands and contracts within a limited range under varying wind conditions. More than any of Isobe's structures, it resembles the true sail by being perpendicular to the ground.



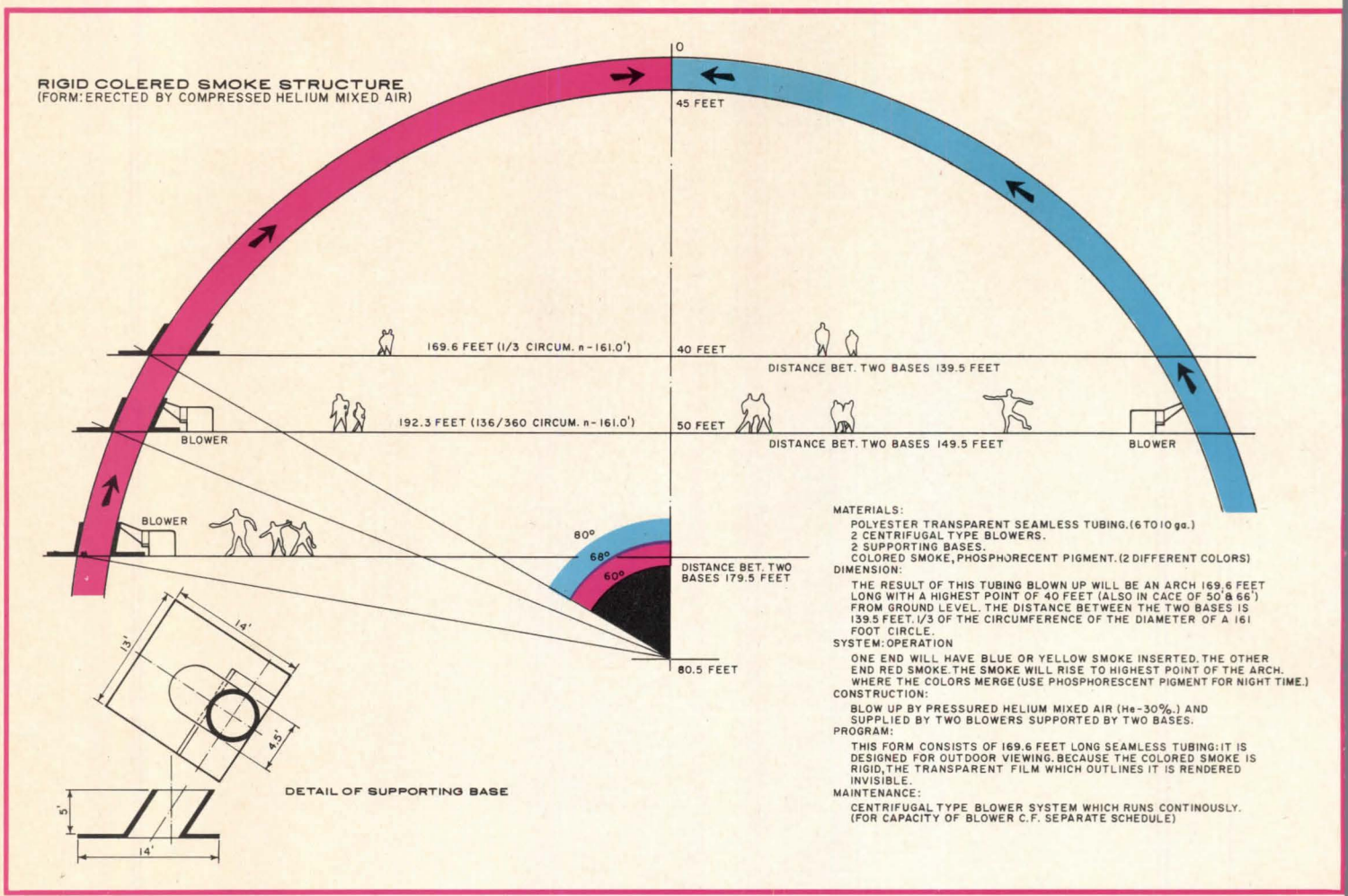
low-lying situation, the ground beneath the structure must be excavated to secure proper air flow. It is an asset that, at this level, the total shape of the structure could be viewed from higher ground, since sculptural-aesthetic considerations were important determinants of its form. In a series of alternative designs, Isobe has grouped several of the anchoring cables together to permit freer passage around the perimeter.

To date, two of Isobe's parachute projects have been realized, one using natural and another mechanically produced air flow. For a multimedia performance at the State University College in Oneonta, film maker Jud Yalkut commissioned a floating, hemispherical projection screen. Isobe suspended a circular parachute 32 feet in diameter, activated from below by four fans, providing an air flow of 10–15,000 cfm. Since the air flow was generated mechanically, the subsidiary sleeves and most of the vents could be omitted, leaving only a circular "oculus" at the top of the canopy.

A recent commission for a Spring Festival in a valley of Brooklyn's Prospect Park did utilize the natural wind. By suspending the canopy from a line strung between two trees on the hilltops surrounding the valley, Isobe was able to provide the necessary auxiliary support. Although the earlier system of vents was maintained, only two sleeves were used, supplemented by helium balloons that functioned similarly to lift the edge of the chute and direct the wind inside. Although its independence of mechanical forces makes this project intriguing, the use of the auxiliary balloons yields a somewhat less elegant solution than the earlier, purely structural design.

Considering more specialized conditions, Isobe has designed two new parachute forms that depart from the circular model. A vented, triangular form is meant for seaside or valley situations in which a continuous air flow can be expected from a single direction. Another rectangular chute, which forms an arch when activated, is capable of bearing stronger tension stresses than the circular model.

Isobe has developed another structural form that, since it is perpendicular to the ground, more closely resembles the true sail. This flexible pleated shell, reminiscent in construction of a Japanese lantern, expands and contracts within a limited range under varying wind conditions.



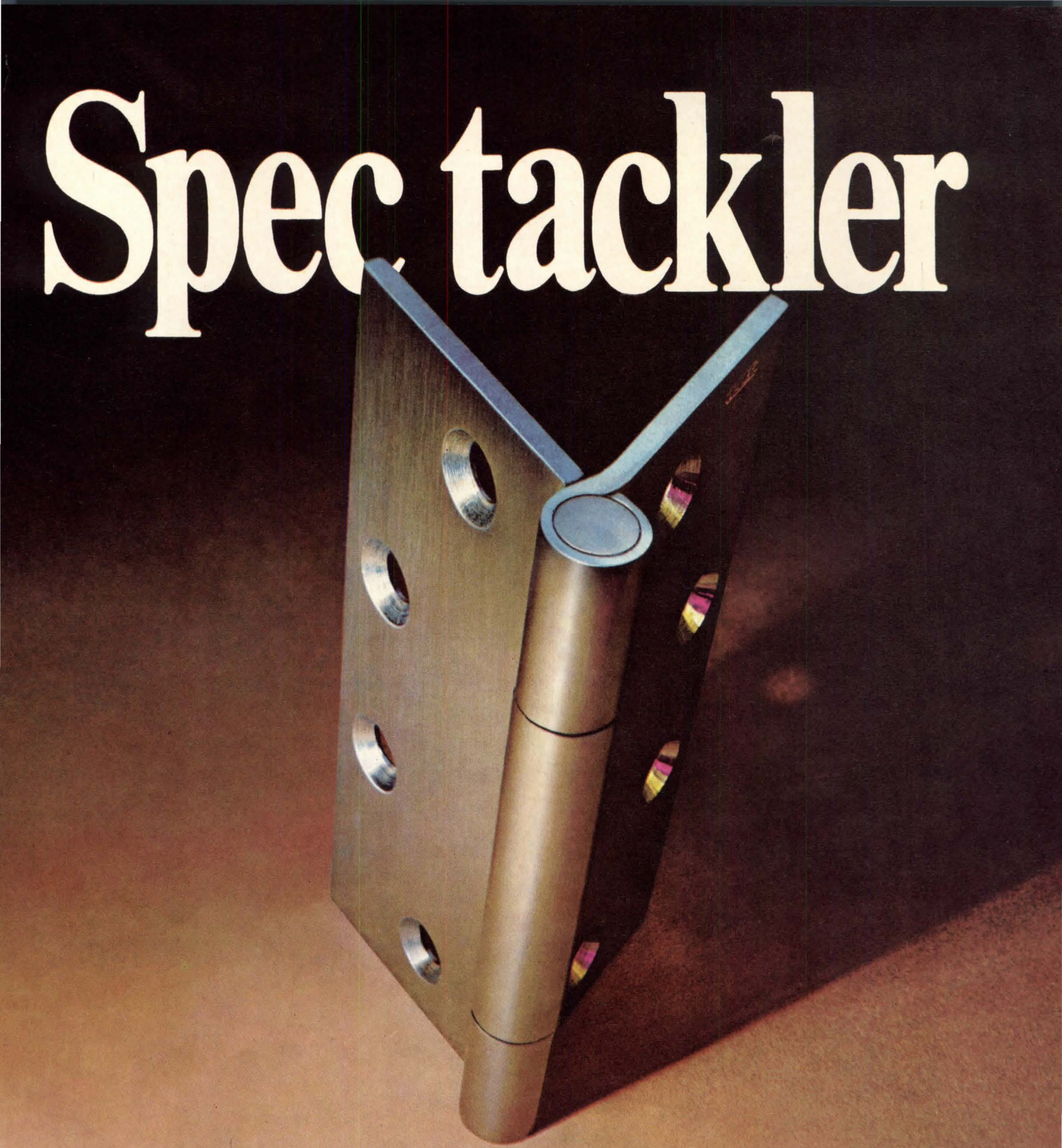
The popular tendency to identify pneumatic with inflatable structures is something Isobe abhors, and indeed his most original work has been with forms activated by differential air pressure — sails and parachutes. Yet, although technically less innovative, his experiments with inflated structures have produced some startling results. Among the most attractive is a design for a huge inflated arch of clear plastic tubing, activated from each end by blowers. When blue theatrical smoke is pumped into the arch from one side, and red from the other, the tubing visually disappears. Moreover, the colored smoke mixes only slightly at the apex, since the pressure from both ends is equalized. Of all his projects, this is the most clearly sculptural and the most magical in effect.

As a sculptor, Isobe cannot divorce principles of construction from aesthetic form. Indeed, his criticism of most contemporary sculptors — Kenneth Snelson is a significant exception — concerns their attitude toward engineering as a means of achieving a predetermined form, rather than as a determinant of form in itself. For this reason, he feels, engineers are more likely to produce structurally and aesthetically integrated works than are sculptors.

Nevertheless, Isobe would argue that the difference between sculpture and architecture largely reduces to one of scale. This definition, which shares the problems of all such definitions, reflects Isobe's concern with scale at several levels. First is the consideration that, as with Fuller's domes, the operational efficiency of the parachute structure increases with its scale. Similarly, the aesthetic properties of the structure may alter with changes in size. Since Isobe has been forced to work largely with models — sculpture on his definition — the problem becomes particularly acute.

His own concerns with producing anti-gravity structures have necessitated research into the properties of lightweight tension materials and methods of construction. Although hampered by the lack of costly equipment and sophisticated engineering skills, Isobe has managed, quite independently, to produce structures that are technically innovative and aesthetically intriguing. — **SAK**

Spec tackler



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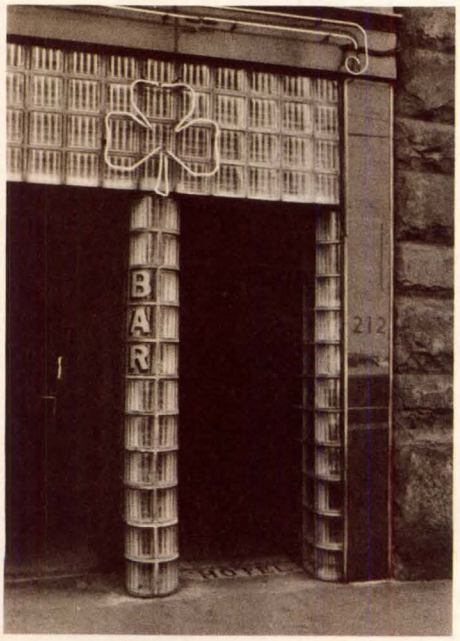

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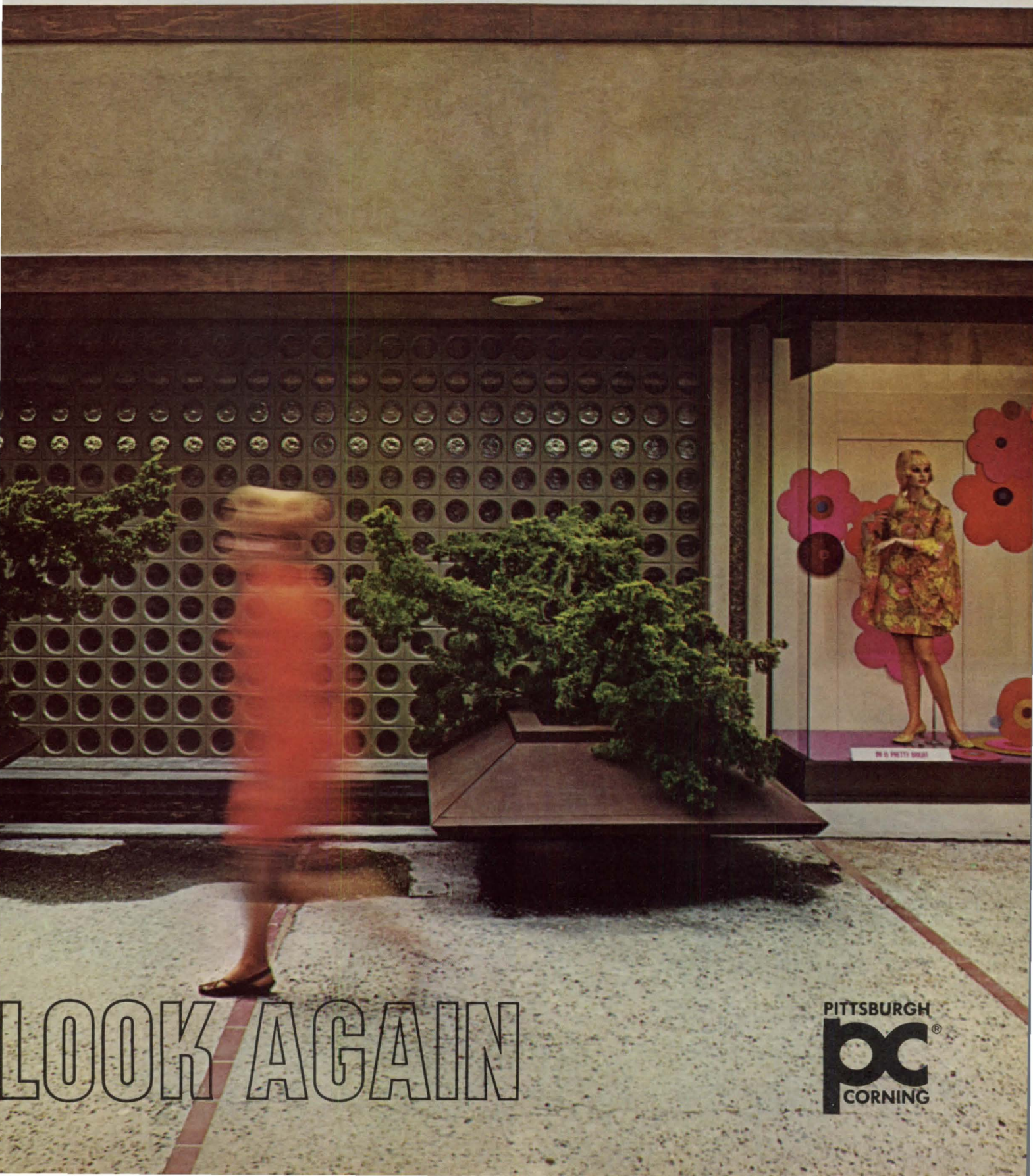

The Future of Specification Writing - Part 1

Because of a trend toward the computerization of specifications without any apparent concomitant trend toward a new learning process for specification writers, new problems are confronting the profession. Rosen is Chief Specifications Writer for Skidmore, Owings & Merrill, New York City.

What is the relationship between the specification writer and specification writing? Is specification writing performed only by a specification writer or does the specification writer engage in research into materials and methods and then organize the information into a carefully arranged master specification for use by others?

These provacative questions are being raised because suddenly we find a trend toward the computerization of specifications without any apparent concomitant trend toward the creation of a learning process that would produce properly trained new specification writers. The need for a specification document is self-evident. The architect and engineer must still furnish a written contract document to complement his design drawings. In addition, the chemical and metallurgical age has produced materials that are somewhat beyond the ken of our present day practicing architects and engineers. Furthermore, our schools are not yet engaged in an educational process that will produce individuals skilled in the area of specification writing.

The requirement for specifications exist, and since the vacuum must somehow be filled, practitioners are demanding a guide or a master that an individual in his office can edit to produce a project specification. They now view the computer as a device to help solve the problem of preparing project specifications. Since we have not produced specification writers, let's develop a machine that can write the specifications for us.

The AIA has embarked on a program to develop master specifications that will be encoded on a computer together with instructions on the selections to be made. Presumably this approach will provide the practitioner with the information he needs to prepare his project specifications. However, the computer does not write the specification. Someone must still make the selections and press the button. The key is still the master specification and the individual who edits it. We have had master specifications for some time now. The AIA in recent times produced the Specification Work Sheets by Ben Dyer in 1949. A new series of AIA Work Sheets, begun in 1960 by Ben Dyer, was subsequently taken over by Olive and Hardy. These work sheets are, in effect, guide or master specifications with notes to aid the user in the selection of paragraphs and materials. Whether one uses a master specification and edits it manually or manipulates its use on a computer does not alter the fact that the project specification must be prepared from a master by an individual who must have some proficiency in the art of specification writing.

What is a specification writer? What are his duties? What service does he perform when employed full time in an architect's office and what service does he offer as a free lance consultant? With the complexities of today's architectural design utilizing a myriad of man-made materials and the incorporation of mechanical and electrical requirements, a properly trained in-house specification writer can offer an architect an assurance of reduced errors and omissions and a more fully coordinated set of contract documents. The free lance specification writer for the most part is engaged solely in writing a specification from drawings that are well along in preparation incorporating decisions that have been made by others with respect to materials. His schedule and his involvement with other architectural offices does not usually permit him to criticize or offer suggestions for changing any details. He writes what he sees on the drawings since he has several additional clients he must service who are waiting for the next set of specifications. His time is limited and he cannot provide the close coordination that is required between the varying consultants who are also preparing the mechanical, structural, and electrical sections that are to be incorporated in the total contract specifications.

The in-house specification writer, in addition to his duties concerned with specification production, also checks the submission of samples for compliance with the specifications and occasionally checks information on shop drawings to determine acceptability under the specification requirements. He is called upon to interpret contractural responsibilities when questions arise as to the meaning of conflicting statements in the general conditions, specifications, and drawings. Likewise, he is consulted during the early design stages when decisions on materials and systems must be made in order to arrive at a workable solution.

The problems confronting the architectural profession stem from the fact that few specification writers or other specialists are being created while the complexities of modern-day designs, materials, and coordination increase enormously. What can be done to alleviate or solve these problems?

Next month's issue will be devoted to a search and recommendation for solutions.

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Interdependence of Contractural Relationships in Building Products

In a contractural arrangement for a building project, what is the legal relationship between two participants in the project when there is no direct contractural relationship between them?

Each agreement which is part of the contractual arrangement for a building project may have consequences for persons who are not parties to such agreement. Thus, for example, the architect's performance of his contract with the owner may affect the status of the contractor or the bonding company. The owner has a direct interest in the consulting engineer's performance of his contract with the architect. The subcontractor and the owner will each be affected by the other's performance of his contract with the general contractor. This interdependence of relationships has often engendered litigation involving the rights, duties, obligations, and remedies of one participant in a building project as it relates to another participant with whom he has no direct contractual relationship.

Contractors have, for example, contended that they have a right to assert a claim against an architect for damages allegedly sustained because of the failure of the architect to properly perform his architectural contract with his client. The courts have unanimously rejected this contention, holding that a contractor is not a beneficiary of the architect's contract with the owner and may not therefore assert any claim against the architect arising out of the architect's breach of that contract.

In one of the leading cases on this subject, the Supreme Court of Arizona in **Blecick v. School District No. 18 of Cochise County** (406 p.2d 750) held that an architect owes an obligation only to his client and is not liable to the contractor for alleged defective performance. The Court said: "Assuming the truth of plaintiff's allegations as to the defects in the plans and specifications, we agree with the trial court that no claim has been stated against the architects. We must bear in mind that there are two separate and distinct contracts involved here: (1) a contract between the School District and the architects for preparation of plans and specifications and supervisory activities to be performed by the architects and (2) a construction contract between the School District and the plaintiffs. There is no privity between plaintiffs and the architects by virtue of the first contract nor are plaintiffs third-party beneficiaries thereof. The obligations of performance due thereunder by the architects are owed solely to the School District and only the School District can assert claims for breach of said contract."

In a recent case in New York (**Cerp Construction Co. v. J. J. Cleary Inc.,** 299 N.Y.S. 2d 560), a subcontractor contended that it was a beneficiary under the general contractor's contract, with the owner which was on a cost-plus basis. The subcontractor had not been paid by the general contractor for work performed by it and had instituted suit against the owner for such compensation. The court pointed out that the subcontractor had failed to show that it was a third-party creditor beneficiary under the primary construction contract which provided for payment of construction costs plus 10 per cent commission thereon.

However, the court did grant judgment in favor of the subcontractor and against the owner on the theory that the general contractor was the owner's agent and the subcontractor was therefore entitled to recover his fee from the owner as principal. In support of this conclusion, the court pointed out that under the construction contract, the work of the general contractor was to be supervised, not by the architect, but directly by the owner. From this contractual arrangement and the nature of the fee, the court concluded an agency was the reasonable construction of the relationship between the owner and the general contractor. The court said:

"The arrangement (cost-plus nature of the contract) does, however, substantiate plaintiff's theory that (the general contractor) was truly the (owner's) agent. Although the method of payment is not determinative of the relationship between the parties, it is an element to be considered in determining that relationship, indicative of the fact that the (general contractor) was other than a completely independent contractor. . . . It should be borne in mind, too, that the right of the alleged principal to control the performance as well as the results of the agent's work is an essential element in the principal-agent relationship. . . ."

The *rationale* of the Court in this case would appear questionable. In any event, however, this decision illustrates the importance of providing protection to the owner in the construction contract, such as affording the owner the right to audit the general contractor's books, to insure the payment of subcontractors.

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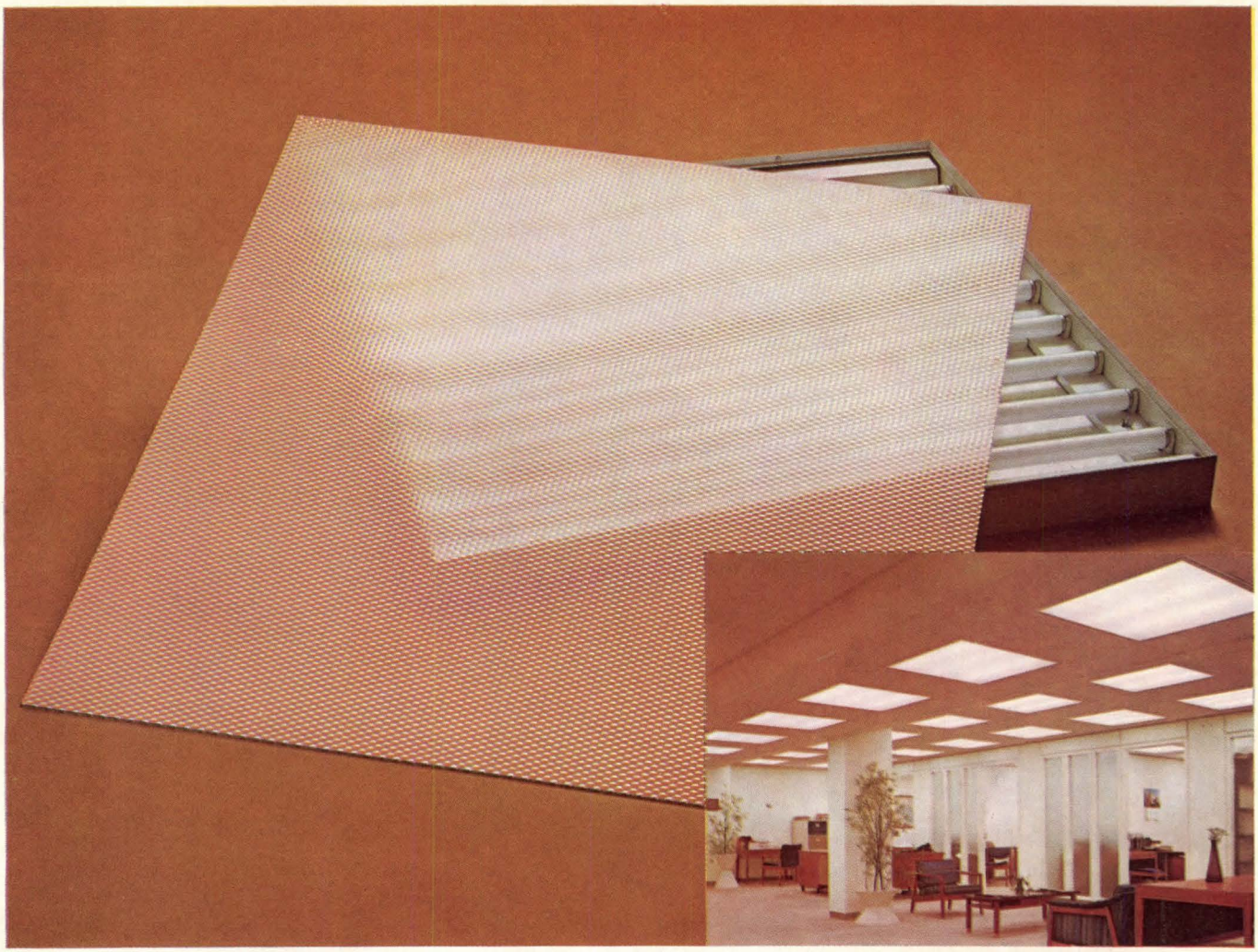

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BOOK REVIEWS / Conquest or Coexistence

BY H. H. WAECHTER

DESIGN WITH NATURE. *By Ian L. McHarg with an Introduction by Lewis Mumford. The Natural History Press, Garden City, N.Y. 200 pp. ill. $19.95. The reviewer is a practicing architect and consultant in Oregon, and lectures at the California State Polytechnic College.*

This book, a great document on humanism and a mercilessly clear statement of our dangerous planning condition, identifies the cause of the dilemma in our contradictory decision-making processes.

Mr. McHarg uses a poetic, manifesto like style to present us with our own images mirrored in the septic waters of streams and lakes. His perceptive comments on our deteriorating situation, which will ring in our ears for some time to come, make important contributions to our possible salvation from the waste and ruin of natural resources.

We now invade our environment and design against it in the name of progress. This view of nature as something to be exploited may be understandable as the manifestation of a hunger for possession and power; but it contradicts the equally important desire for survival.

Although we possess expert knowledge of commercial land development, highway building, and industrial development, no satisfactory answers exist to the pollution, erosion, and ecological disturbance that result from these processes. The value of McHarg's far-reaching study, as pointed out by Lewis Mumford in his moving introduction, consists in demonstrating in specific terms, how we can deal with these difficult problems. The introductory chapters on his philosophy and philosophic development illuminate his approach.

The strength of McHarg's argument lies in the fact that his criticism is never merely negative, but rather points to solutions that lead out of the dilemma. In an historical survey he reveals a country that once possessed beautiful towns and the political knowledge to stage a most successful social revolution. Implicitly he suggests that this nation will again muster strength to find the right path.

He sees our failure, however, as that of the entire Western world, which, "with its image of the anthropomorphic man . . . seeks not unity with nature but conquest." McHarg feels that the time has passed when man could afford to have "but one explicit model of the world . . . built upon economics." By "economics" he means, of course, exploitation for profit, that with "the claim of convenience for commerce — or its illusion — . . . drives the expressway through neighborhoods, homes and priceless parks, a taximeter of indifferent greed. Only the merchant's creed can justify the slum as a sound investment or offer tomato stakes as the highest utility for the priceless and irreplaceable redwoods."

McHarg repeatedly points to the earliest failure of our civilization in insisting upon the "dominion and subjugation of nature." The pathos expressed in his philosophy, which tries to promote the "deferential and creative" as opposed to the "destructive" instincts in man, paves the way for understanding why "environmental degradations" persist around us. While credit is given to an increased awareness of the need to manage resources and develop new concepts of regional planning, a full broadside is fired at "the expression of the inalienable right to create ugliness and disorder for private greed, the maximum expression of man's inhumanity to man." Particularly important for planners and designers are McHarg's practical applications of ecology to design — perhaps the first successful attempts of this kind since Haeckel coined the word "ecology" a century ago.

In establishing his naturalistic outlook, McHarg refers to the traditional, and admirable Japanese sensitivity to nature. However, he recognizes that "man has fared less well than nature here." McHarg's belief that western and oriental views of man are not mutually exclusive provides the basis for his practical proposals.

One of McHarg's projects was to investigate planning problems along the New Jersey coast. The discussion of ecological conditions in this area centers largely around the respective functions of beach, dunes, bayshore, and bay. Each tolerates development for human use to different degrees, but current practice largely ignores these differences. McHarg demonstrates, for example, why the back dune is usually most suitable for development while complete protection of primary and secondary dunes is so essential, and must be enforced by new ordinances, as well as ownership responsibility.

In discussing urban problems, the author points to the importance of sustaining the countryside for the city dweller in order to rediscover nature's "corollary of the unkown in the self, the source of meaning." In this regard, pictures of the city's visual disorder, smoke-covered masses of crowded buildings, and the superimposition of man-made rigid patterns upon Nature's meaningful geometry, provide a clarifying accompaniment to the exciting text.

The most relevant details of the book for the professional reader are the descriptions of methods and techniques used to investigate and solve a host of complex problems. The underlying principle is actually rather simple, as is so often the case with great thoughts. Instead of viewing a problem in a narrow and limiting way, all aspects are thoroughly identified, analyzed, listed, tabulated, presented graphically, and reconciled. In Interstate Highway design, for example, all "Price Benefits," "Non-Price Benefits" and "Sav-

(Continued on page 170)

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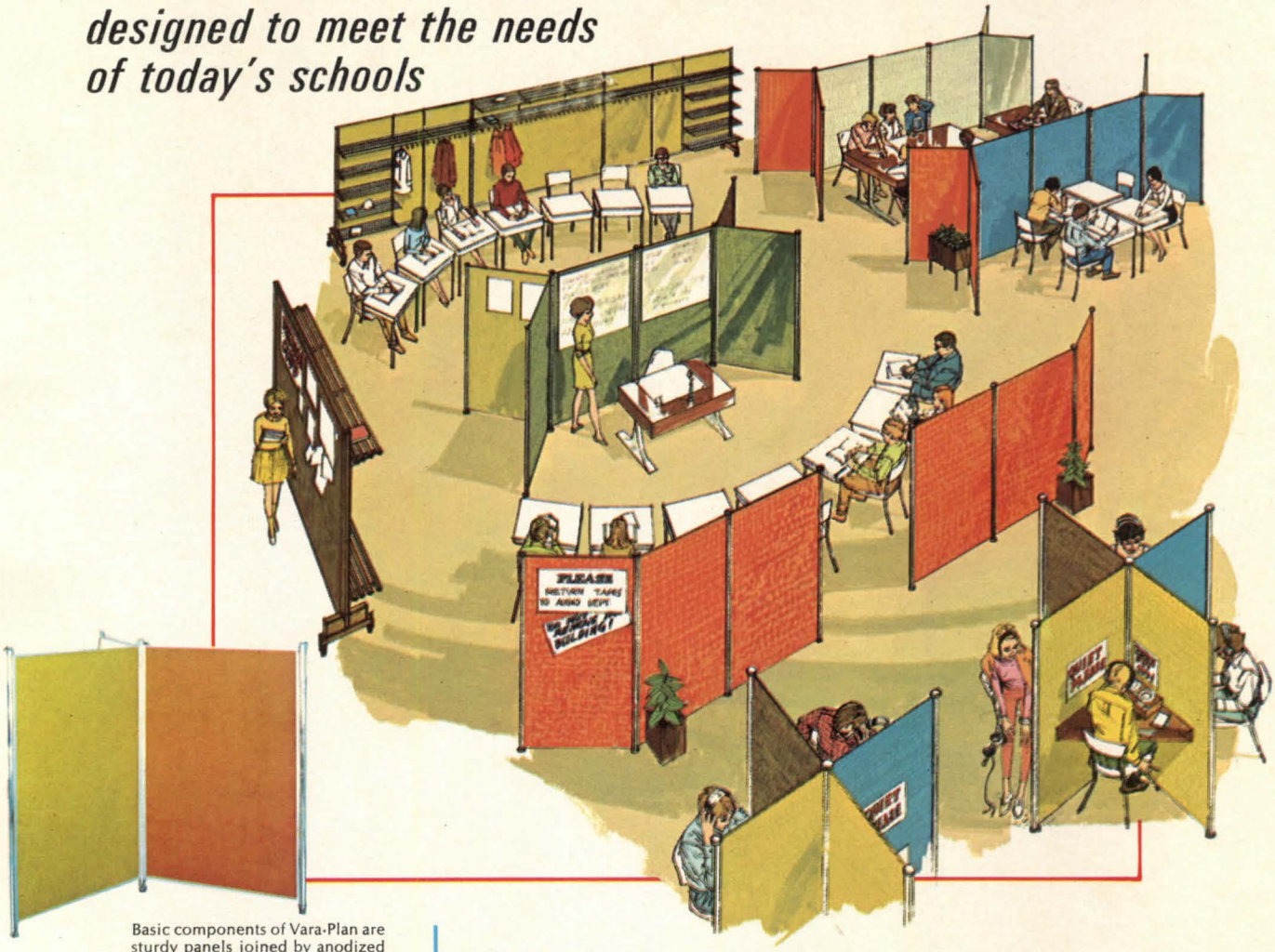

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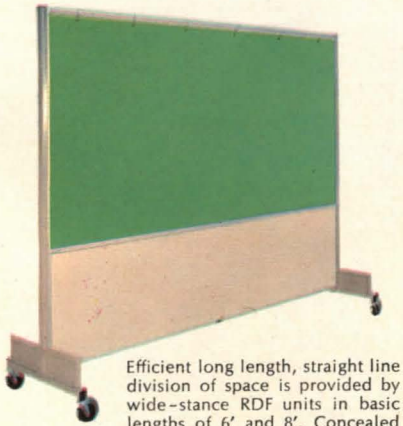

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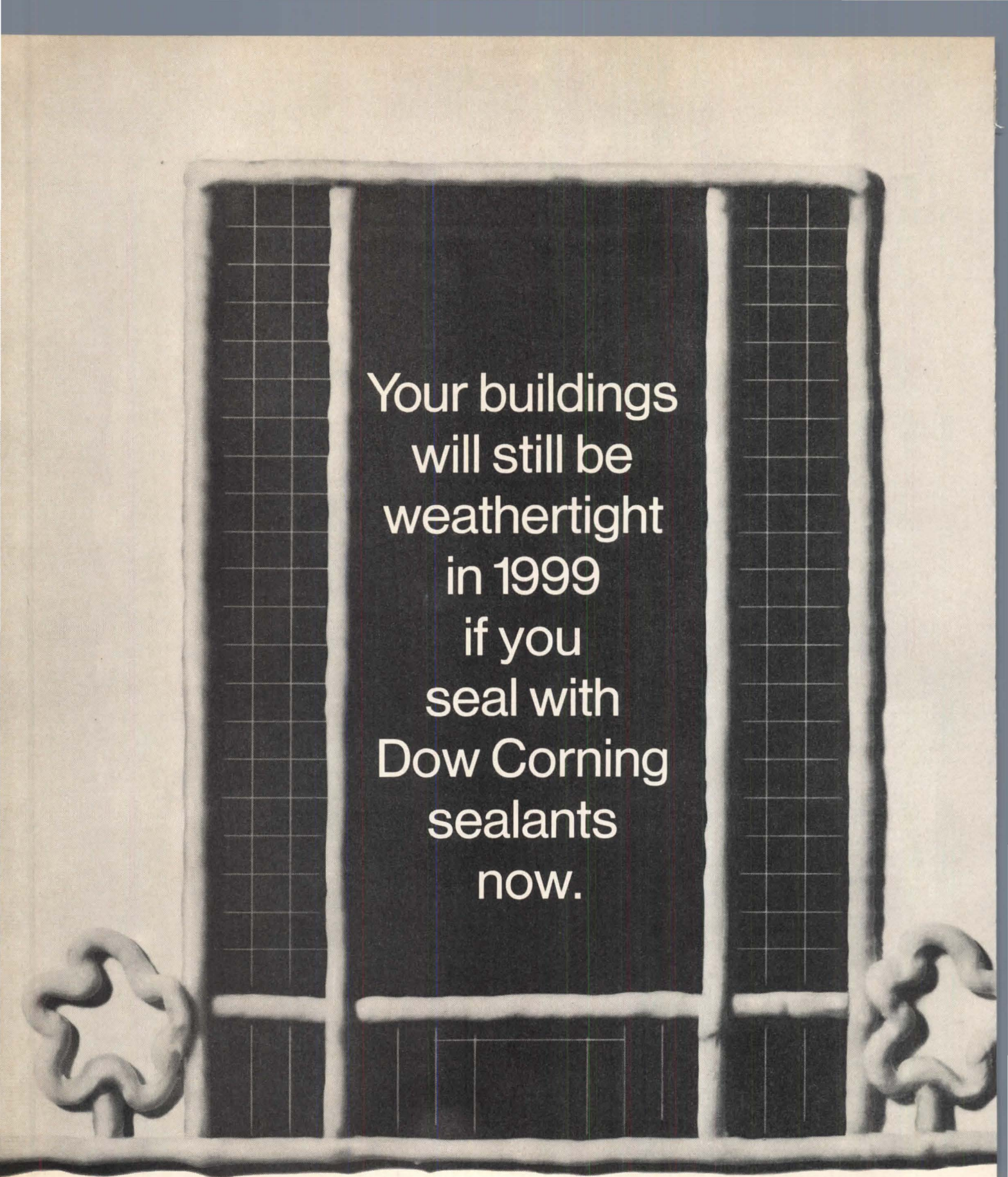

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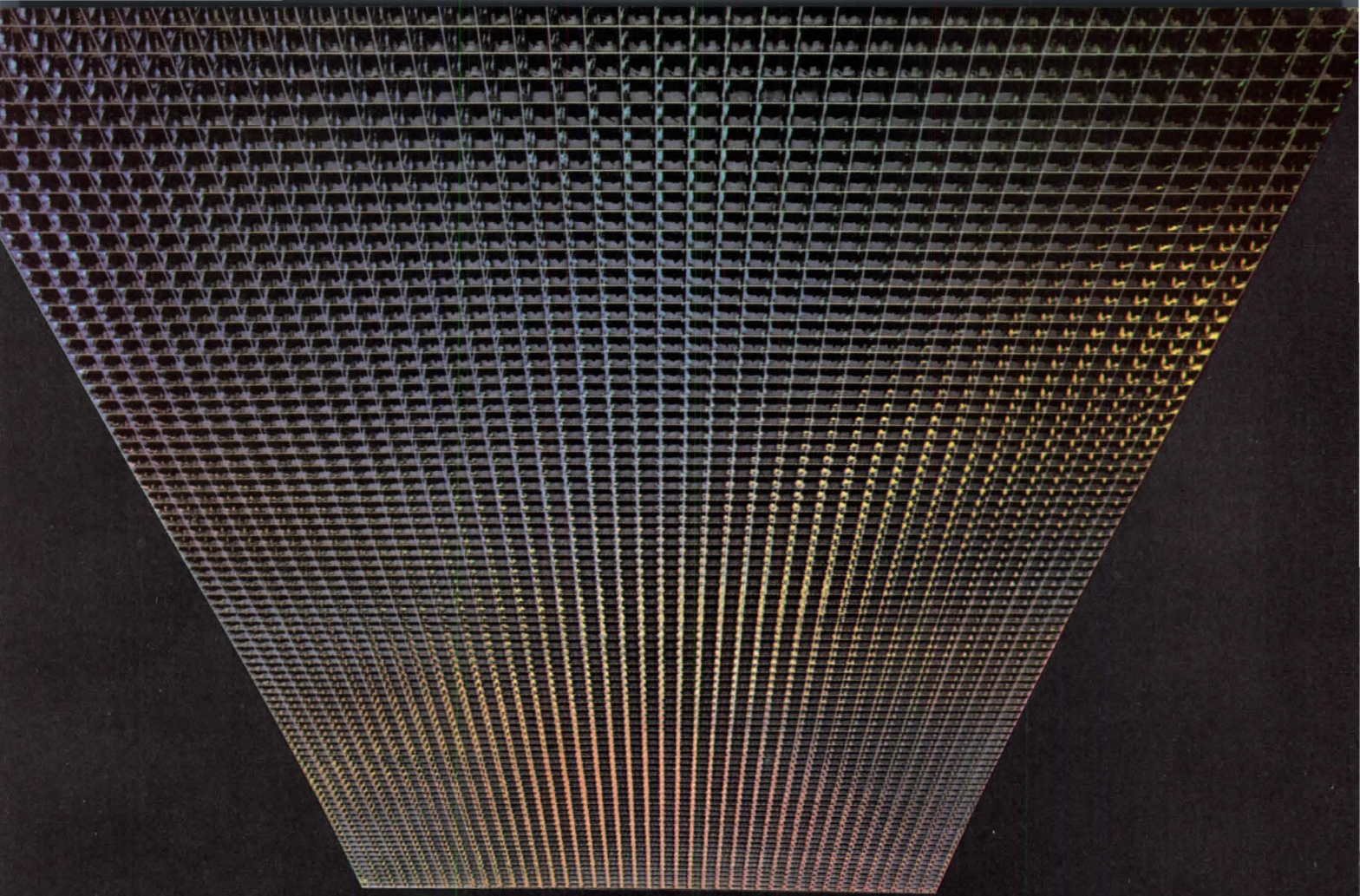
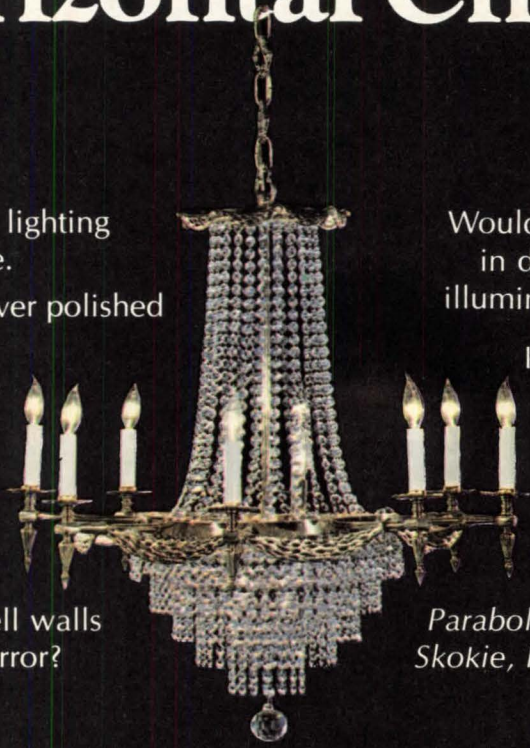


Presenting The Horizontal Chandelier.



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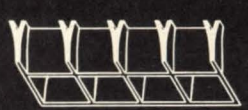

This is it in cross section.

The Parabolic 2020
by American Louver Company

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(Continued from page 166)
ings" are compared with "Price Costs" and "Non-Price Costs." All possible criteria are thus made visible, in order to provide "the maximum social benefit at the least social cost."

McHarg offers an extensive discussion regarding the establishment of priorities in the analysis of social and economic values, drawing on the extensive experience of his own firm — Wallace, McHarg, Roberts, and Todd.

Overlays of transparent sheets, adding up to a composite picture that reads like an X-ray photograph, are used to present engineering data combined with historic, scenic, recreational, and residential values. The Baltimore, Staten Island, and Potomac River Basin studies provide perhaps the most detailed demonstrations of this effective method of physiographic determinism. This method yields a new and fruitful way to determine land use that reflects a total landscape comprehension.

McHarg outlines the relative compatability of land use in relation to all possible uses of our resources with zoning based not on coinage but on the value of the environment. The overlay technique also makes clear where multi-uses of land are possible and admit alternatives, and where single use is necessary.

Interspersed between discussions of the projects, are several poetic chapters dealing with our orientation toward nature. Of these, the most autobiographic is one called "The Naturalists." Though somewhat repetitious, McHarg again uses a rich language to summarize his philosophy (based on Henderson and Darwin) in a renewed admonition to "respond to physical and biological laws that are intrinsic and self-enforcing."

This "patchwork quilt" of his memories and notes, that is yet "one piece of cloth," is so rich in material and thought that one reading will not do to fathom its full depth. McHarg is vitally concerned with survival in the little time allowed us before all top soil is gone and oxygen depleted, so that our environment becomes unbearable. We need not pessimism but a search for alternatives.

The model proposed by McHarg "contains the possibility of an inventory of all ecosystems to determine their relative creativity in the biosphere." His excellent study opens new avenues of approach and provides the impetus to take them — if we wish to create a worthwhile environment for living.

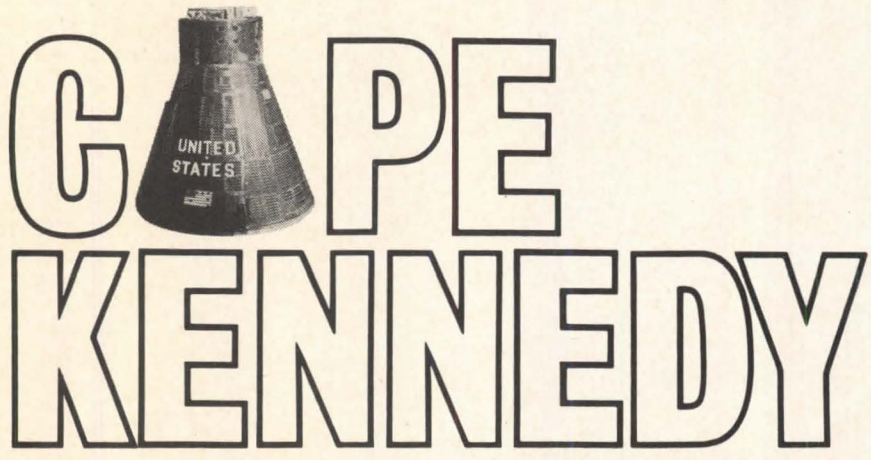
Environment: Economy and Ecology

BY CHARLES A. SCHWEIGHAUSER

QUALITY OF THE ENVIRONMENT: AN ECONOMIC APPROACH TO SOME PROBLEMS IN USING LAND, WATER, AND AIR. *By Orris C. Herfindahl and Allen V. Kneese, Resources for the Future, Inc. The Johns Hopkins Press, Baltimore, Md., 1965, 1967. 99 pp., $2. The reviewer is a chairman of The Center for Environmental Studies at Williams College, Williamstown, Mass.*

"Whatever the degree of (environmental) deterioration that is in prospect for us — and opinions differ widely on this, often reflecting radically different tastes — it

(Continued on page 182)



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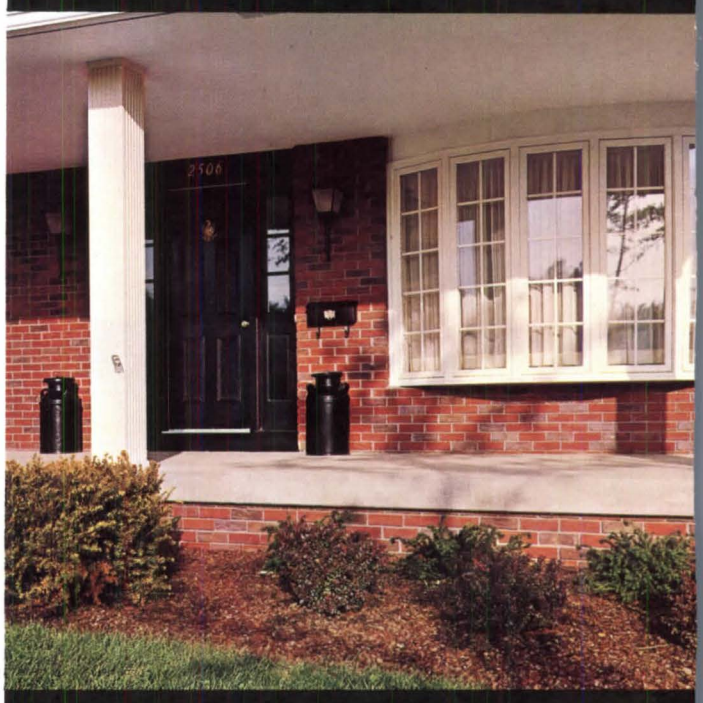

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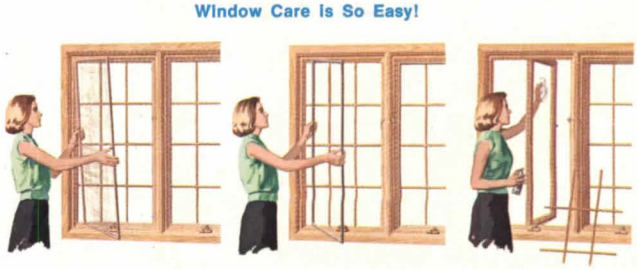

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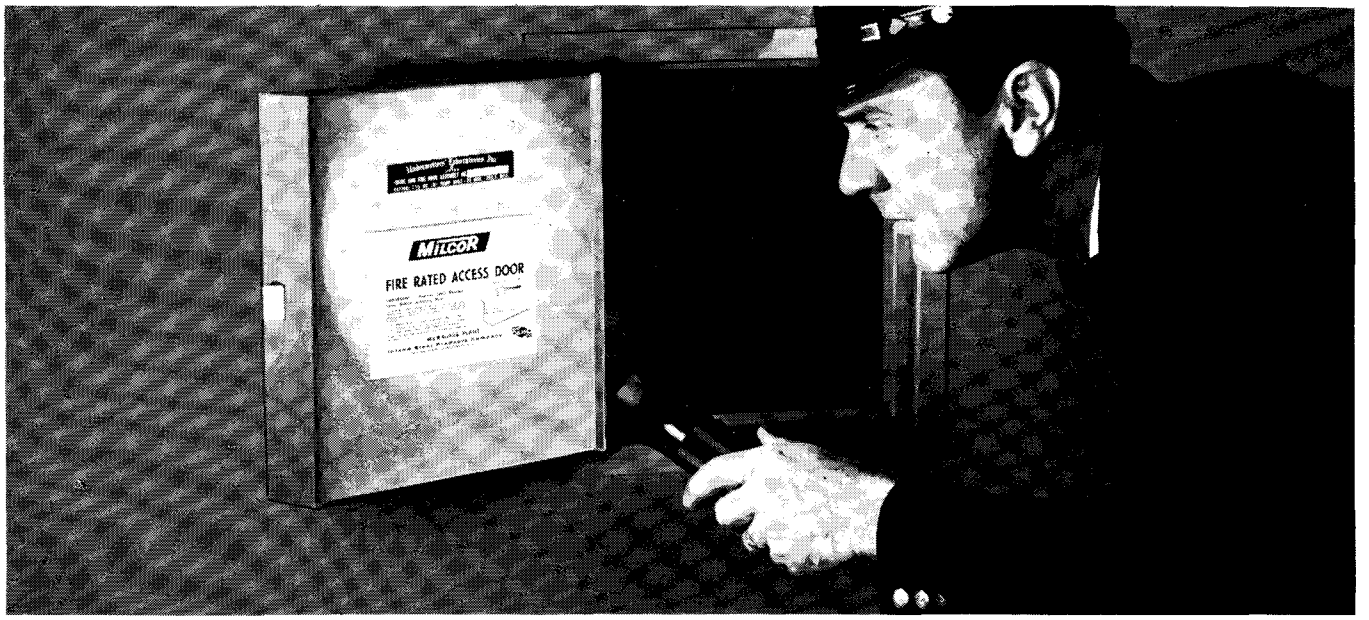

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Southern Standard Building Code: section 701.1.
Uniform Building Code: sections 1706 and 4306; table 17-A; chapters 30 and 33.

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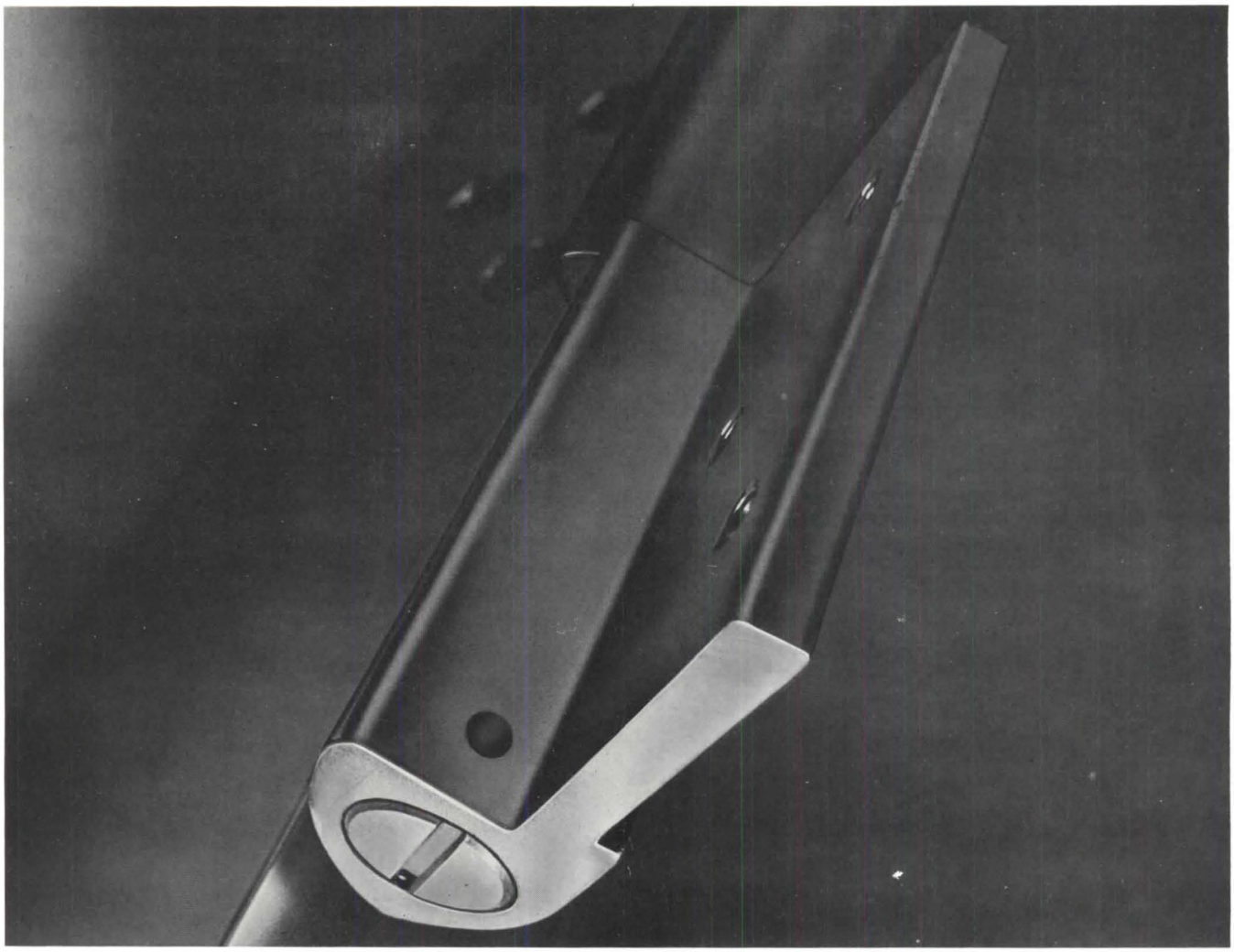

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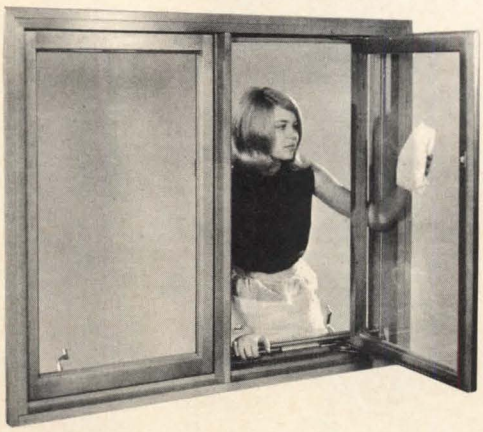
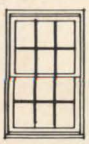
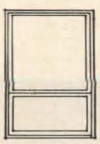
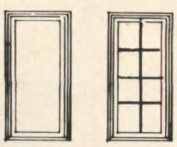
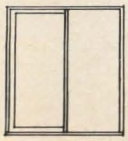
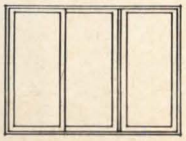



Double-Hung Windows


Awning Windows


Casement Windows


Slider Windows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CARADCO Patio Doors and C 200 Casements are powerfully attractive to both single dwelling and multiple unit clients. C 200 Casements, for example, are double weatherstripped. Hinges are concealed. Insulating glass with vinyl glazing and removable vinyl grilles are featured options.

CARADCO Patio Doors offer 7/8" insulating glass, complete weatherstripping and easy operation. For eye appeal and for satisfaction . . . specify CARADCO: the best in windows and doors.

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Pemberton, New Jersey

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inner strength
ROOFS

from **Keystone**

New physical education building, Graceland College, Lamoni, Ia. Designed to house the college's varsity and intramural athletic programs as well as large public functions. Roughly oval in plan, the end walls are parabolic curves and side walls are formed of two inverse parabolic curves. This column-free structure 305′ long, 174′ wide and 70′ high has space for five basketball, tennis or volleyball courts to operate at the same time within a 6 lane, ⅛ mile track. Floor area is covered with synthetic, resilient athletic surfacing to accommodate all those activities as well as indoor football and baseball practice.

Architect:
Shaver & Co., Michigan City, Indiana
Engineer:
Bob Campbell & Co., Kansas City, Mo.
General Contractor:
Lawhon Construction Co.,
St. Joseph, Missouri
Construction:
Keydeck Truss-T subpurlins and mesh reinforcement over steel ribbons with polyurethane roof material.

Super-light, monolithic roof combines polyurethane foam with Keydeck Truss-T subpurlins

The Graceland College Fieldhouse was constructed during 1968 for a total of $640,000 or only $15.90 per sq. ft.; about 25% less than the average cost of similar facilities built at the time.

The structure itself is mostly roof. Three identical parabolic arches support the entire roof structure. The center arch is vertical; the end arches canted at 30°. Their curvature generates the shape of the entire structure.

The welded steel plate arches are 1½′ x 2½′ tubes with a span of 174′, rise 60′ and are set atop 10′ high reinforced concrete walls.

Steel straps 2″ x ¾″ are draped between the arches and from the end arches to the end walls on 5′ centers. Keydeck Truss-T subpurlins serve as tiedowns; they are placed over the straps every 2½′.

More than 5,000 welds connect the Keydeck Truss-T subpurlins to the straps, arches and perimeter walls.

Formboard was placed between the Truss-T's, Keymesh roof deck reinforcement was put in place, and two to three inches of polyurethane was foamed on, followed by three coats of sprayed on synthetic elastomeric roofing.

The entire structure required only 113 tons of structural steel, or only 5.7 lbs. per sq. ft. to cover a clear-span area of 40,800 sq. ft. and enclose a volume of 2,300,000 cu. ft.

Keydeck Truss-T and Bulb-T subpurlins and mesh reinforcement are only a few of the Inner Strength products for roofs, walls and floors available from Keystone Steel & Wire Division of Keystone Consolidated Industries, Inc., Peoria, Illinois 61607.

Open webs of Keydeck subpurlins permit the polyurethane foam to form a monolithic sheet. Keydeck reinforcement rolls out flat and easy.

from **Keystone** Steel & Wire
Peoria, Illinois 61607

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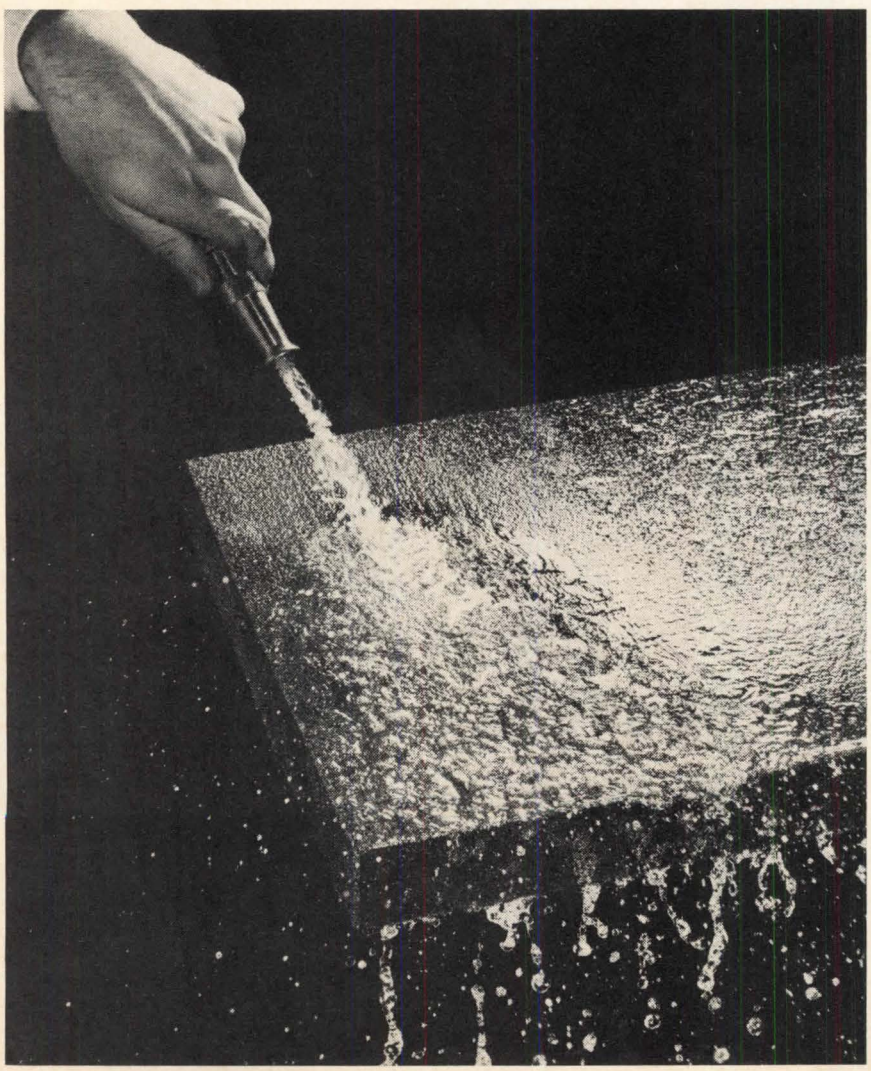
FOAMGLAS is available in FOAMGLAS-Board and the Tapered FOAMGLAS system, for a sloped roof on a flat deck. FOAMGLAS is the only roof insulation guaranteed for 20 years. For more information, write Pittsburgh Corning Corporation, Dept. PP-99, One Gateway Center, Pittsburgh, Pa. 15222.

The Insulation People

PITTSBURGH PC® CORNING



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(Continued from page 170)

is our view that economic reasoning can make a substantial contribution to the handling of these problems."

Few would disagree with this introductory statement, and the authors have admirably presented a number of ways in which economic considerations are brought to bear on environmental problems. Water and air pollution, the intentional introduction of chemical substances into the environment (pesticides, insecticides, preservatives, coloring agents), the use of urban space, and the development and preservation of rural environments, all are discussed from the viewpoint of economic considerations, with an emphasis on a description of the pollutants and on the interdependencies of economic systems.

The authors discuss "externalities," a term defined as the costs that result from the production of one economic unit and are assumed in the input (and hence output) of another such unit. To use the book's illustration, the water pollution caused by a fish cannery may, in turn, compel downstream industries and communities to spend money in cleaning the water for further use. The existence of externalities may lead to a misallocation of production: that is, if all costs of an economic unit (a can of salmon, for example) are assumed — including the costs of cleaning the water — consumers may be buying a less valuable product while at the same time giving up other, perhaps more valuable goods that could have been produced.

Four ways of controlling externalities are suggested. First, an agreement could be reached between producer and buyer about proper levels of external effects. A second method of control takes into account all the costs and benefits associated with the external effects and then enlarges the size of the economic unit. A regional agency responsible for both water supply and sewage treatment exemplifies this kind of control.

A third suggestion involves the control of production through Governmental intervention to keep external effects in check.

Finally, new processes and new

(Continued on page 190)

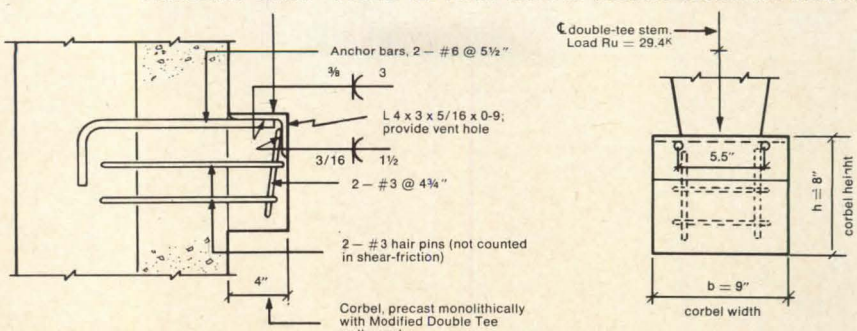
considered prestressed?

Trailways Bus Terminal — Atlanta, Georgia.
Owner: Conbus Corporation.
Architect-Engineer: Edwards and Portman.
Contractor: George A. Fuller Co.
Prestressed Concrete Fabricator: Concrete Materials of Georgia, Inc., Forest Park, Ga.

Bloomingdale's Department Store — Short Hills, New Jersey.
Architect: Skidmore, Owings & Merrill.
Structural Engineer: Alvin Fromme.
General Contractor: Diesel Construction Co.
Prestressed Concrete Fabricator: Prefabricated Concrete, Inc., Farmingdale, N.J.

Headquarters Fire Station — City of Tacoma, Washington.
Architect: Robert Billsbrough Price, AIA.
Engineer: Anderson, Birkeland, Anderson and Mast.
Contractor: McKasson Bros. Construction, Inc.
Prestressed Erection: Pacific Crane and Construction Co.
Prestressed Concrete Fabricator: Concrete Technology Corporation, Tacoma, Washington.

CONNECTION DETAIL — DOUBLE TEE FLOOR UNITS TO MODIFIED DOUBLE TEE WALL PANELS



Note:
Corbel designed to accommodate eccentricity of load (construction and erection tolerance of 1")

BASIC DATA AND REFERENCES AVAILABLE UPON REQUEST: CF&I STEEL CORPORATION, P.O. BOX 1920, DENVER, COLO. 80201

CF&I
STEEL
D-940

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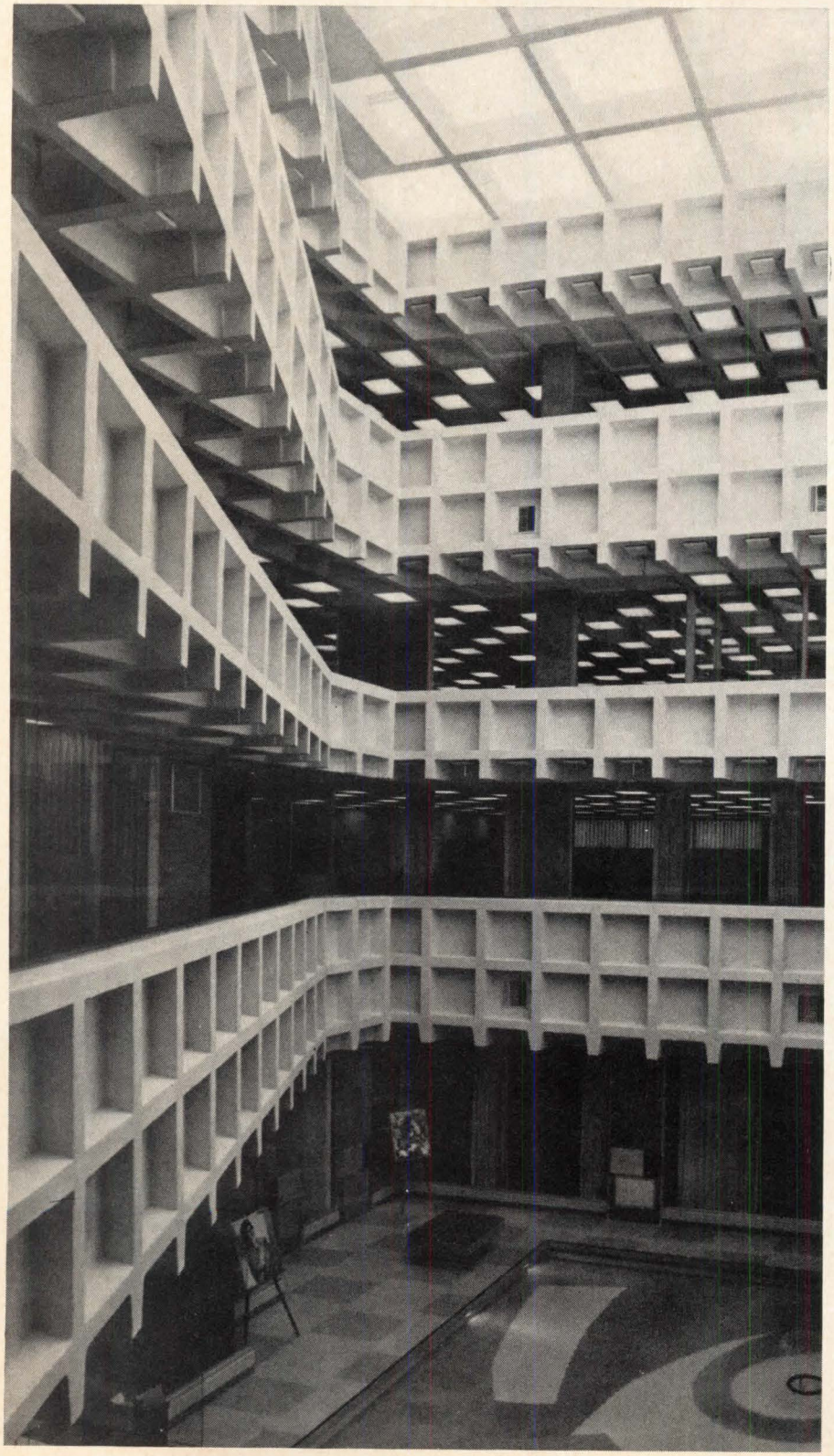
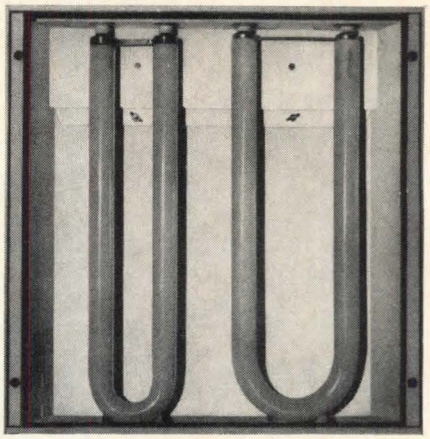
25% more light thanks to U.





Keene's new family of 24" or 30" square fixtures give you 25% more light than similar units using straight fluorescents. You get high light output with complete interior design freedom. Reason: the new 40-watt U-shaped fluorescent just coming into use.

Being square and non-directional the new fixtures are ideal for modular construction and for large areas where the commonly used 1 x 4, or 2 x 4 linear fixtures would be disruptive to design or construction.

Use any U-tube

What makes our fixture truly one-of-a-kind, however, is that it uses any major manufacturer's 40-watt U-shaped lamps... the ones with the 6" leg spacing or the 3½" leg spacing... as demonstrated above.

Sliding sockets

This flexibility's possible because our unique fixtures have adjustable sliding sockets* that secure the lamp, provide the power. What's more each fixture needs only one standard 40-watt ballast versus the two expensive ones required on units that use straight fluorescents. A feature that saves on cost and lets the fixture run cooler.

You save on installation and maintenance as well. Recessed models feature a hinged assembly that puts all electrical components on one side. There are 3 types available: surface, air and non-air, recessed. Want us to shed more light on our new fixture family?

Write: Keene Corporation, Lighting Division, 4990 Acoma Street, Denver, Colorado.

*Patent Pending

KEENE
CORPORATION
LIGHTING DIVISION

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Redondo Beach, California

■ ARCHITECT-ENGINEER: Albert C. Martin & Associates, Los Angeles ■ GENERAL CONTRACTOR: Swinerton & Walberg Co., Los Angeles ■ POST-TENSIONING: Atlas Prestressing Corp., Los Angeles

Good design enhanced by superior quality materials is portrayed by the 3-story Research and Development buildings in the new TRW® complex at Redondo Beach, California. All post-tensioned beams and post-tensioned structural slabs in these efficient structures employed ChemComp® shrinkage-compensating cement concrete to obtain the highest possible degree of dimensional stability and to minimize cracking. ChemComp cement is produced by a group of leading manufacturers of superior quality cements, and is available nationwide.

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For further information contact:
Chemically Prestressed Concrete Corp., 14656 Oxnard Street, Van Nuys, California 91401
or the sales office nearest you.

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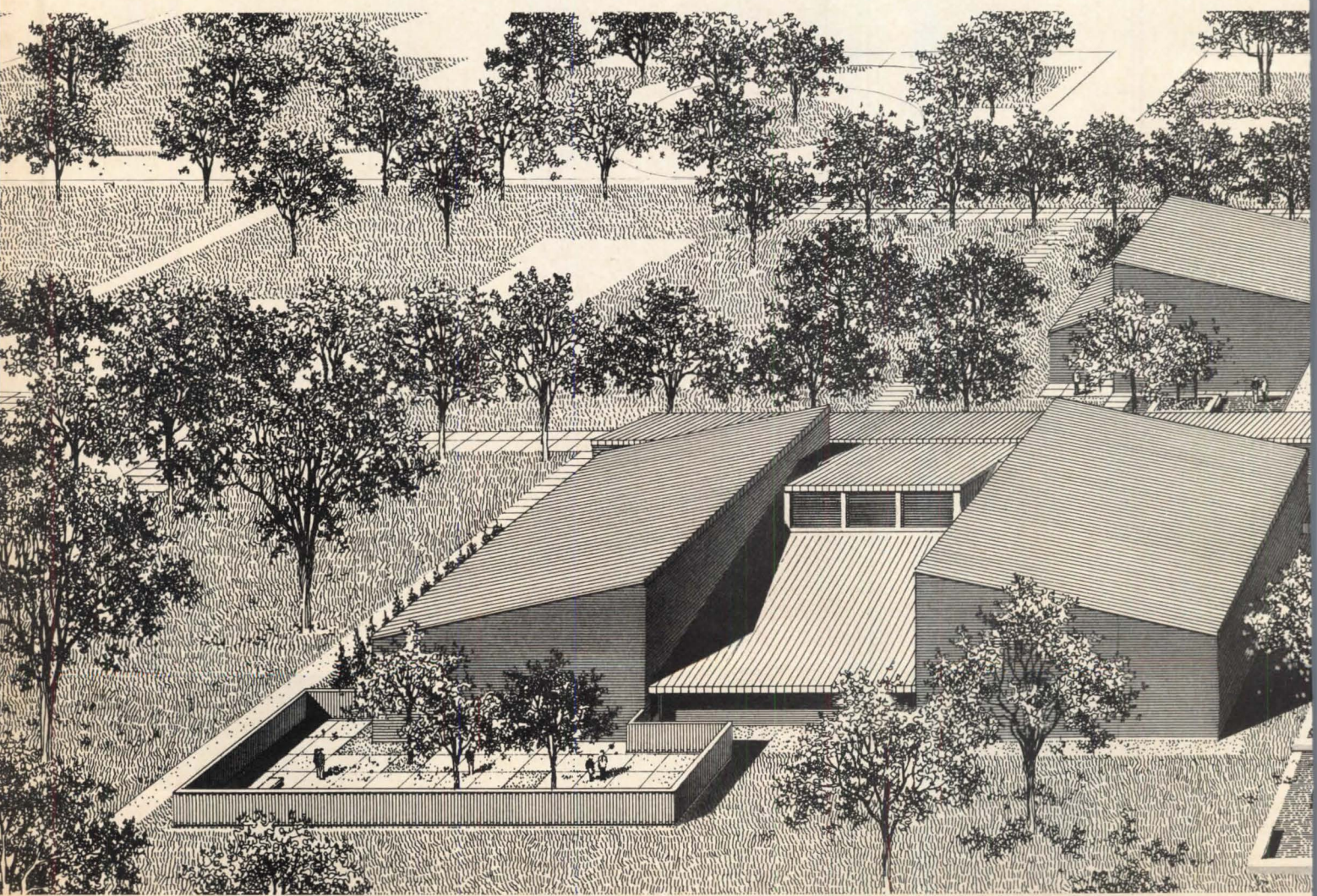
TCS:

Rehabilitation Center
Buffalo State Hospital
Buffalo, New York

Rendering by Brian Burr

Architects: Milstein, Wittek, Davis & Hamilton
Buffalo, New York

A project of the New York State Health and Mental Hygiene Facilities Improvement Corporation for the New York State Department of Mental Hygiene



THE LOGIC OF ITS USE.

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May we send you the substantiating evidence?

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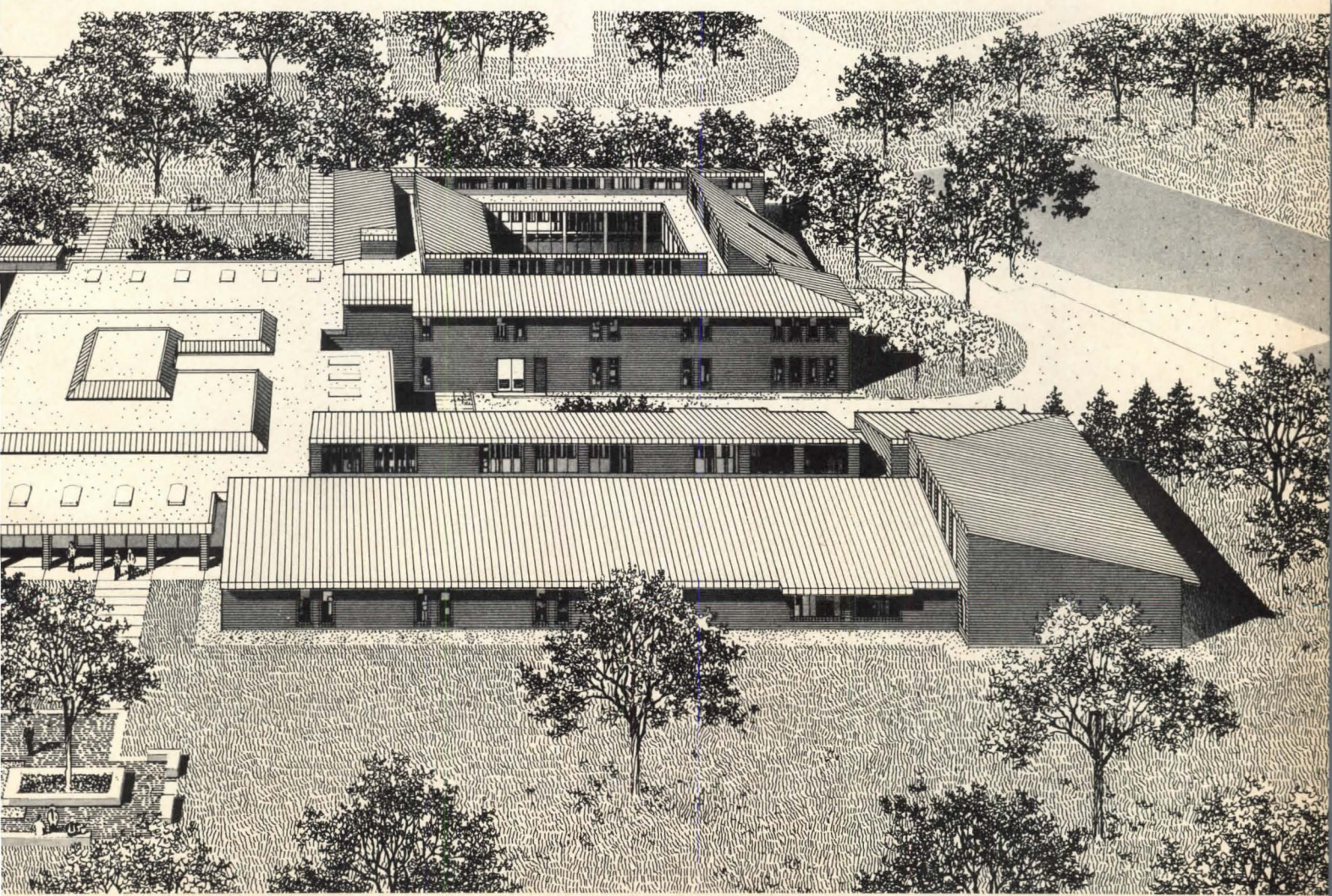

You can shampoo and shampoo and shampoo a carpet specified on Poly Bac till it's clean in the face.

Carpets, like people, need to have their faces washed now and then.

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When a carpet has been specified on Poly Bac you can wash and shampoo it as often as you want without fear of "browning."

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These unique qualities make carpeting in hospitals, schools, kitchens and nurseries, more practical.

So when you contract for carpeting, be specific about the primary back.

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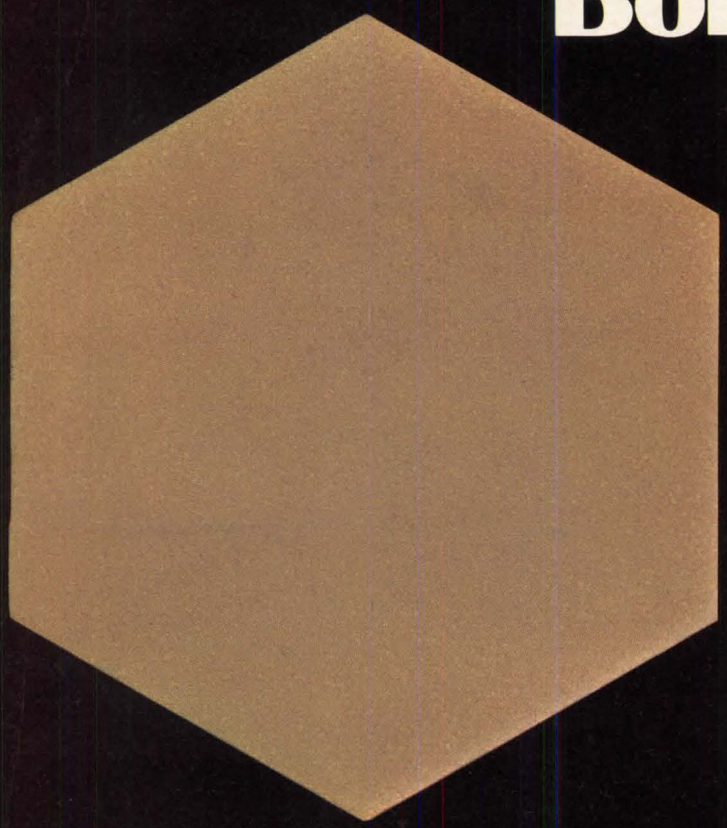
(Continued from page 182)
ways of organizing production may include methods of efficiently controlling undesirable externalities.

So far, so good. However, the authors also state in their preface that ". . . the discipline of economics is central to progress on these problems, for it is economics alone that can formulate these problems in terms in which they must finally be reduced — namely, the balancing of our varied desires in these matters against the costs of satisfying them in various degrees."

This kind of statement was certainly true in the past, when we had a smaller population with fewer demands, and may even be true in the present. It will not be true in the very near future. Decisions about the environment will not be able to be based solely on economic, or even political, expediencies, since the environment operates independently of these considerations. It does not, however, operate independently of activities that fail to consider its capacity to sustain and regenerate itself. Economic criteria must not command top priority when a decision is to be made that involves externalities, if we are to continue to expand population and simultaneously demand a quality lifestyle in a quality environment. The priorities in the environmental decision-making process must be determined by the complex principles on which the ecosystem operates. The most important question that can be asked as priorities are established is: "Will the environment continue to function efficiently?" Put another way, no decision that affects the environment should be made without license from ecologists and other life scientists.

There is, of course, inevitable friction between economists and life scientists in establishing priorities. This friction occurs in what may be called a conflict of maximums. The ecologist, as an example of a life scientist, states that maximum biomass support is essential for the health of the ecosystem (which includes human beings). On the other hand, the human economic goals with which the economist is preoccupied, are often based on the notion of maximum yield from the environment. The economist involved with maximum production may be correct within his own framework but, unfortunately, his framework is not that of the life processes.

The economist's increasing awareness of environmental problems, as well as his humanitarian instincts and concerns, must be applauded. The authors of *Quality of the Environment* display these attitudes when they write that "Our fear is that such effects (water pollution, for example) may grow in importance as population and incomes increase, to the point where we shall be all too conscious of a deterioration in the quality of the environment." Humanism, however it is expressed, must for the first time consider a set of ingredients that until very recently has been negligible; these ingredients are the facts of the physical world. In different terms, the spirit of man, the usual, ultimate concern of all humanism, has been shown to be



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inseparable from the substance of man. Human rights must also include environmental rights. It is the burden of this truth that we must bear if the spirit-substance of the ecosystem, including man, is to survive.

The problem is how to make a priority marriage between life scientists and economists, how to obtain the license of approval so that economic reasoning can make a substantial contribution to the handling of these problems. The answer is contained in the inquiry: given a problem in the environment, it is the first priority that the life scientists state the limits to which the environment can be stressed and still maintain itself. These limits will usually provide a number of alternatives, thanks to the ability of the environment to regenerate itself if not stressed severely. When these alternatives have been determined, the economists can then tell us how best to manage costs and benefits.

This is a simple solution, made complex because it is based on the frailities of human personalities and temperaments. Nevertheless, only by learning how to institutionalize our involvement with the environment into a workable pattern of human concern and activity will we be able to maintain its quality.

Books Received

AIA Guide To New York City. Edited by Norval White and Elliot Willensky. The Macmillan Company, Riverside, New Jersey, 1968. 464 pp., illust., $6.20.

An updated edition of a popular guide for a walking tour of New York City, noting the significant architectural works.

Candilis. Josaic. Woods: Building For People. By Shadrach Woods. Frederick A. Praeger, 111 Fourth Avenue, New York, N.Y., 1968. 226 pp., illust., $20.

A College In The City: An Alternative. By Evans Clinchy. Educational Facilities Laboratories, 477 Madison Avenue, New York, N.Y., 1969. 52 pp.

Decorative Art in Modern Interiors. Edited by Ella Moody. The Viking Press, Inc., 625 Madison Avenue, New York, N.Y., 1968. 158 pp., illust., $14.

The Design of Foundations for Buildings. By Sidney M. Johnson and Thomas C. Kavanagh. McGraw-Hill Book Company, 330 W. 42nd Street, New York, N.Y., 1968. 385 pp., illust., $16.

Directory of Engineering College Research and Graduate Study. Published by the American Society for Engineering Education, 2100 Pennsylvania Avenue, N.W., Washington, D.C., 1969. 255 pp., $7.

The directory details $246 million in engineering college research for 14,200 projects.

The Elements of Structure: An Introduction to the Principles of Building and Structural Engineering. By W. Morgan. Sir Isaac Pitman & Sons Ltd., 1968. 275 pp., illust., $6.75.

Experimental Tension Structures 68. By Washington University School of Architecture. Washington School of Architecture Press, St. Louis, Mo., 1968. 38 pp., illust., $2.

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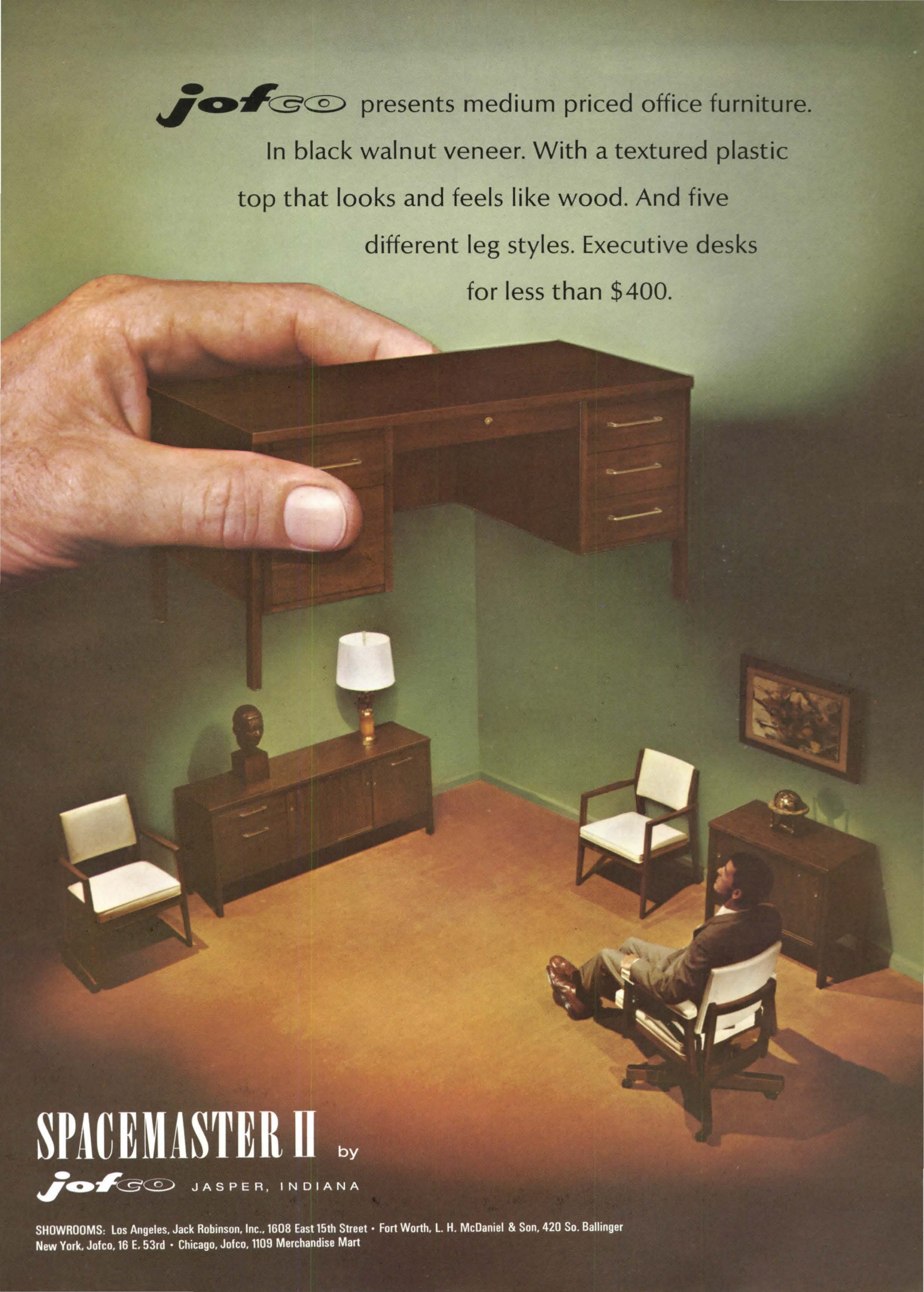
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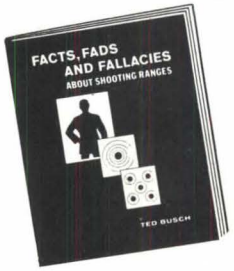
FREE BOOK
For Range Planners



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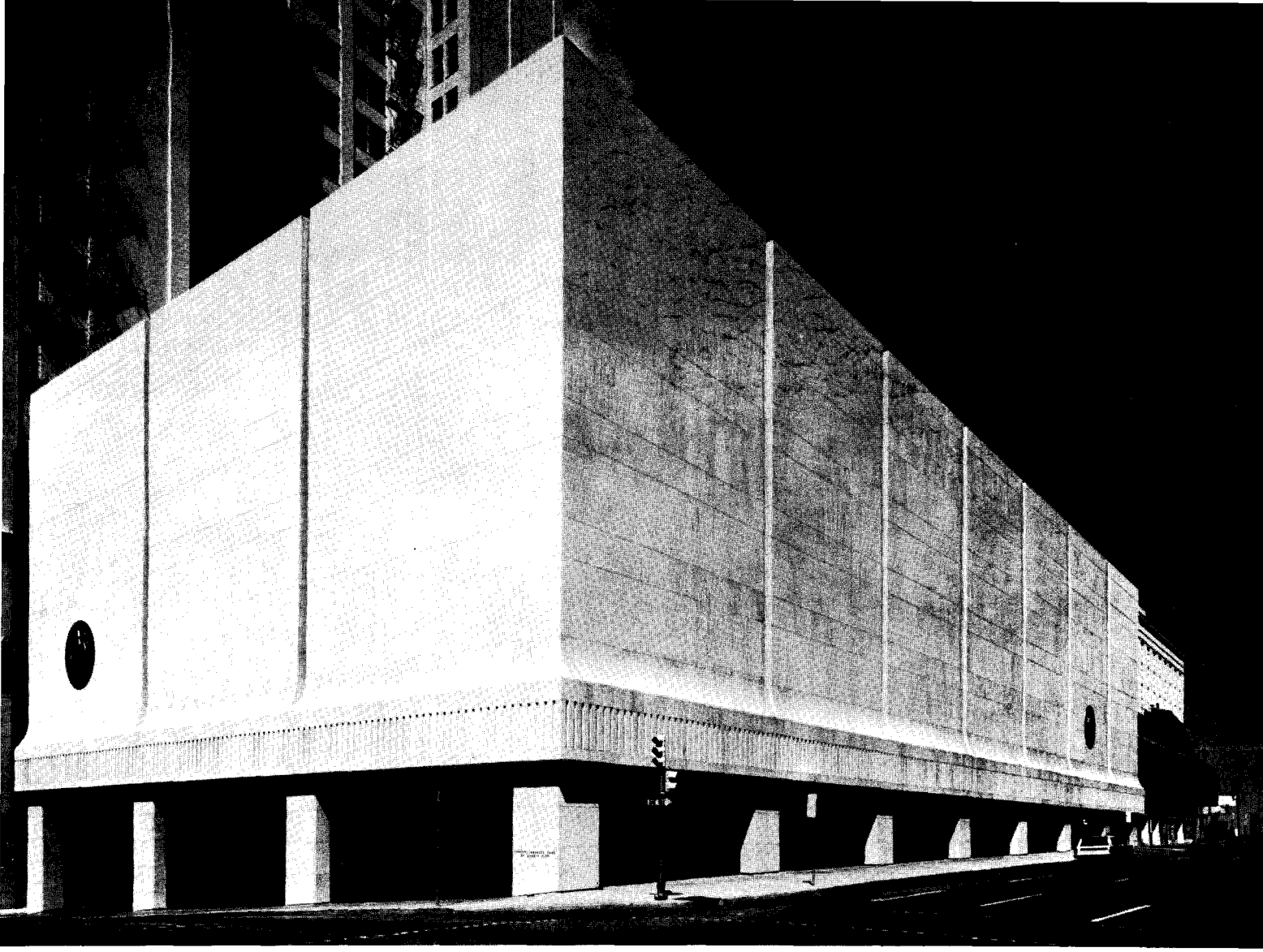

Architect: Kivett and Myers, Kansas City—Vice President in Charge: William Love **Structural Engineer:** Bob D. Campbell & Co., Inc., Kansas City **General Contractor:** Sharp Brothers Contracting Company, Kansas City
Post-tensioning materials supplied by American Stress Wire Corporation, Englewood, Colorado

The Federal Reserve Bank of Kansas City... a bulwark of security built with prestressed concrete

The new addition to the Federal Reserve Bank of Kansas City is designed for complete security control. A master control center houses the latest security devices including closed circuit television, alarms and traffic control. The lower two floors of the building are atomic blast-resistant; the basement level qualifies as a fall-out shelter, having its own stock of provisions and stand-by electrical generator.

The building also contains a 13-level parking garage for 450 cars. Prestressed concrete helped solve structural design problems here. Efficient traffic flow necessitated a minimum of interfering columns. Prestressed concrete's high length-to-depth span ratio was used to bridge long distances between columns while keeping the deck within depth limits for adequate vehicle clearance.

Another problem was solved by using post-tensioned prestressed concrete to cantilever one parking bay next to the wall of an older building where supporting columns could not be placed. The design for this addition to the Federal Reserve Bank was granted an Honor Award by the Kansas City Chapter of the American Institute of Architects.

As the producers of dependable Union Wire Rope TUFWIRE® and TUFWIRE Strand for prestressed concrete, we would like to show you other examples of prestressed concrete's versatility. Write for a free copy of our booklet *Prestressed Concrete: a Growing Concept in Construction.* TUFWIRE and TUFWIRE Strand are made by Armco Steel Corporation, Department W-1079, 7000 Roberts Street, Kansas City, Missouri 64125.

ARMCO STEEL ARMCO

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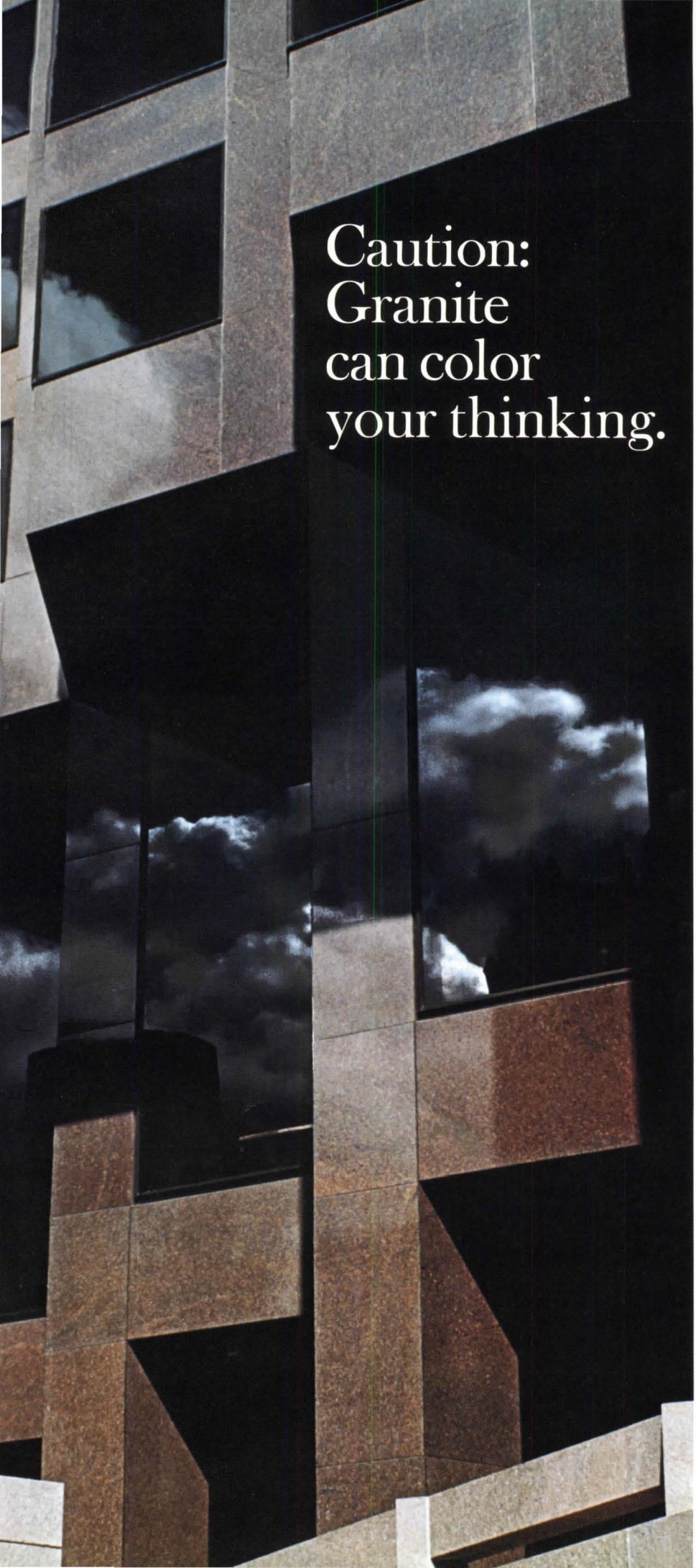
ROLL'S
GARAGE
PARKING
Van Ness Ave. California
49
& Market Streets



Caution: Granite can color your thinking.

The Bank of America World Headquarters Building, San Francisco, California
Architects: Wurster, Bernardi & Emmons, Inc./ Skidmore, Owings & Merrill
Consulting Architect: Pietro Belluschi
Contractor: Dinwiddie-Fuller-Cahill
Granite: Carnelian, polished and natural cleavage

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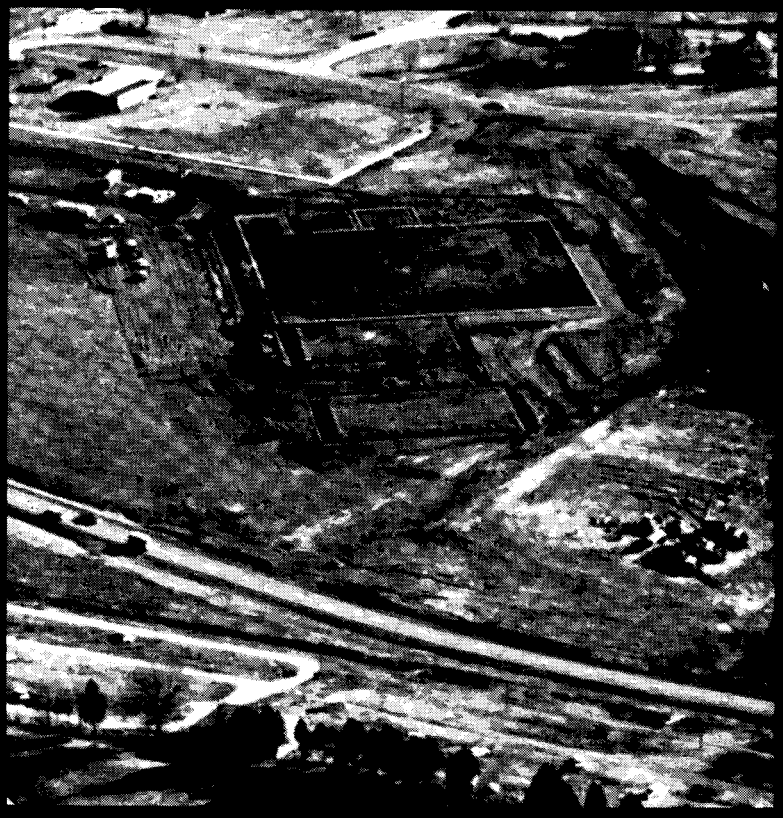
Whatever you design for this shopping center, General Electric can air condition with a unitary system.



Your General Electric central air-conditioning contractor is a visionary.

Tell him your vision and he'll find a way to air condition it, no matter how high or wide you build it.

Depending on what you have in mind, GE's Weathertron® Heat Pump may be best. It heats as well as cools.

Or a GE gas/electric combination. Or maybe rooftop cooling units with built-in electric heaters.

Or for perimeter-type area-by-area cooling and heating, there's always the GE Zoneline system.

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Protectopane U-V is almost totally impervious to break-through. Repeated heavy blows may break or crack the glass, but will not cause it to easily shatter or fall out.

Provide a double shield against display window property destruction! Write Dearborn today for complete details and specifications on Protectopane U-V!

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Lanterns in the French Provincial series (Hadco Series 3800, large; and 3700, small) are available in post, bracket, pier base, ceiling and hanging models. And they're available in a choice of handsome finishes so they can be color-coordinated with virtually any motif or architectural application.

Whenever you want your buildings to speak fluent French, choose the French Provincial by Hadco.

For more information on the French Provincial, or on the hundreds of other Hadco cast metal electric lanterns, write to Dept. 22A-106.

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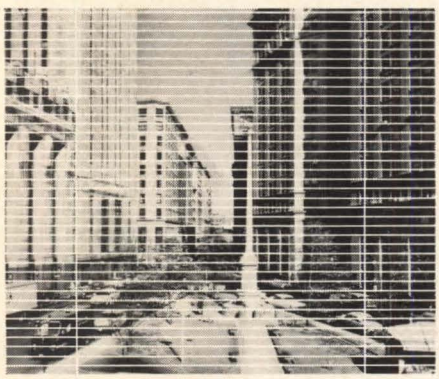
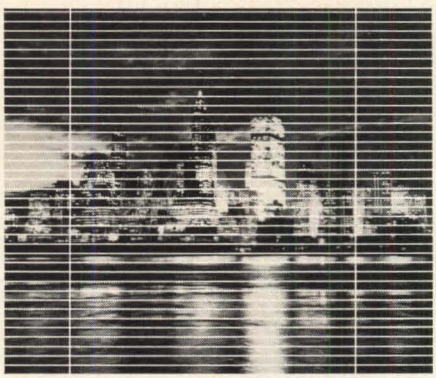
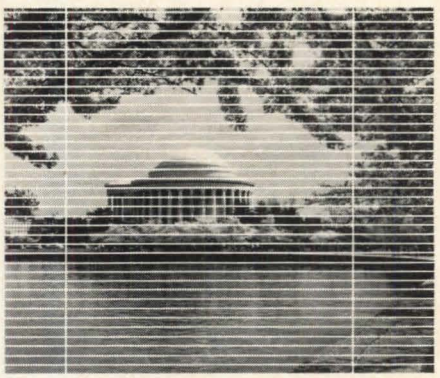


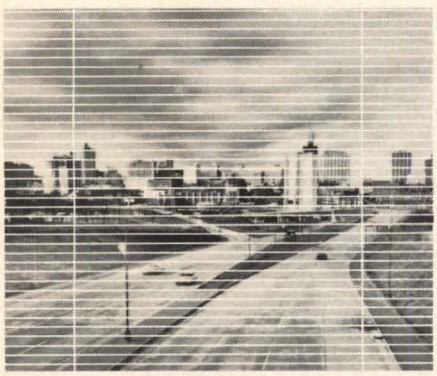
Boston



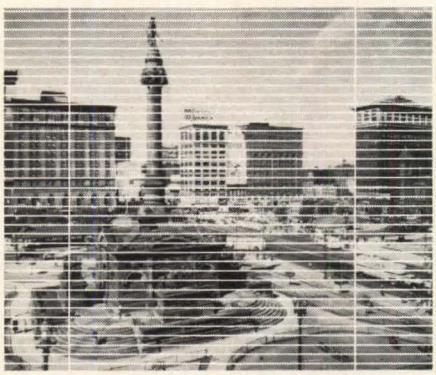
New York



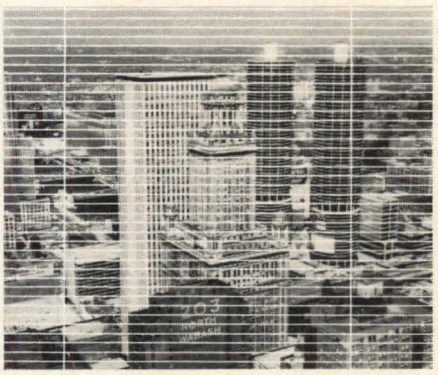
Washington



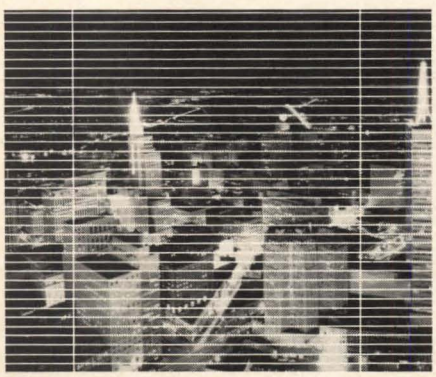
Atlanta



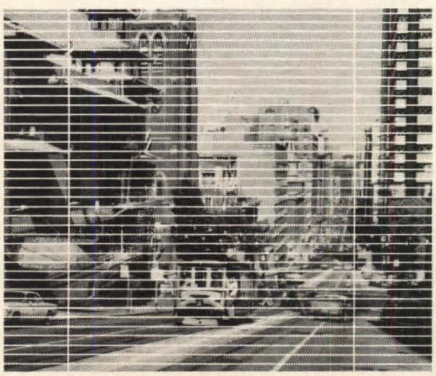
Cleveland



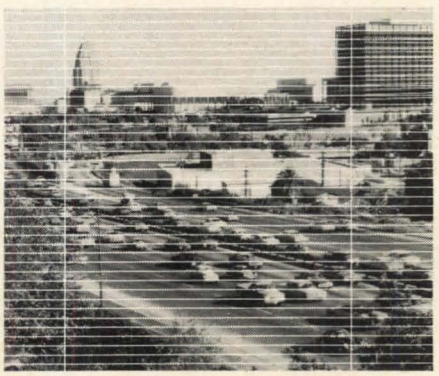
Chicago



Dallas



San Francisco



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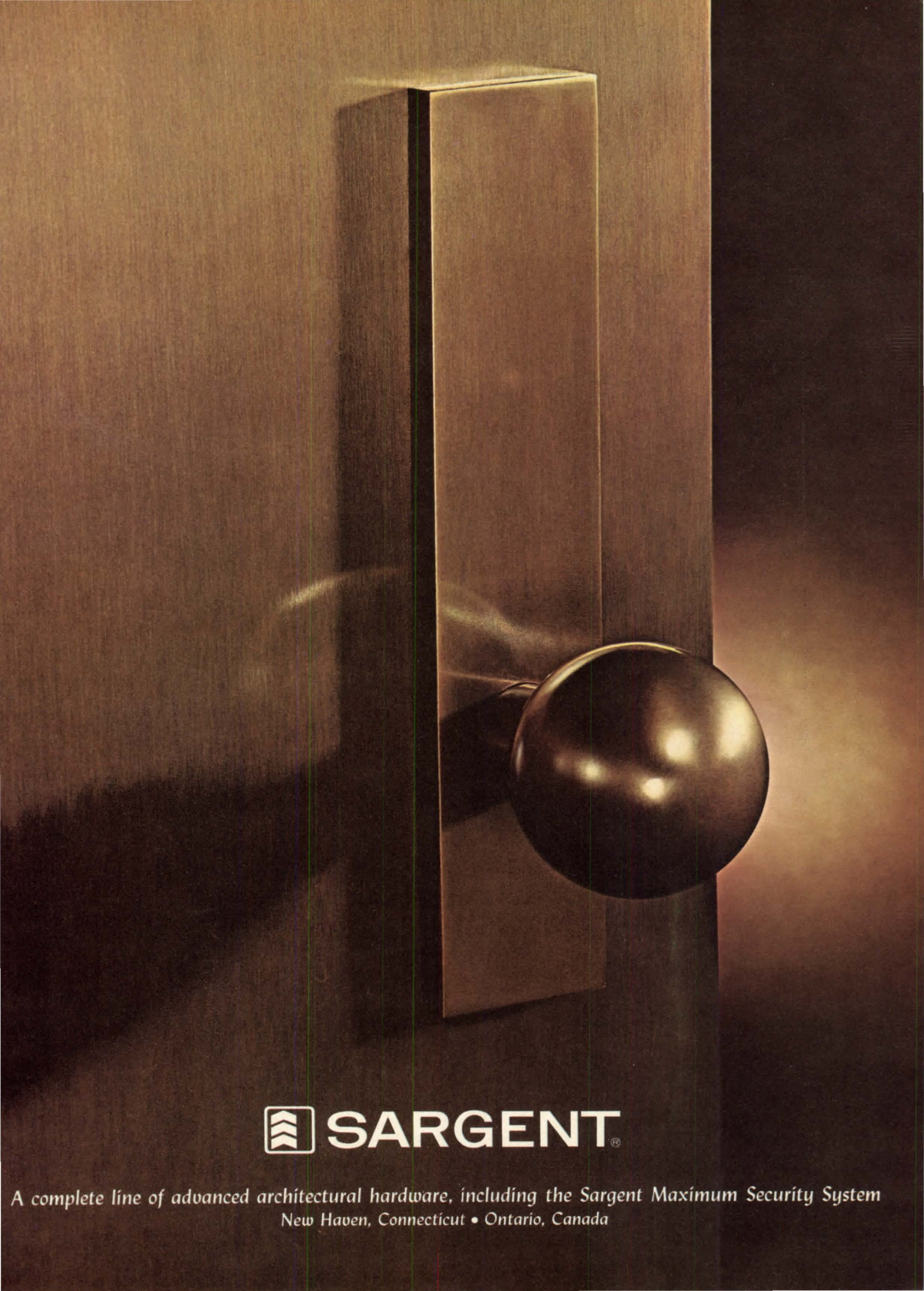
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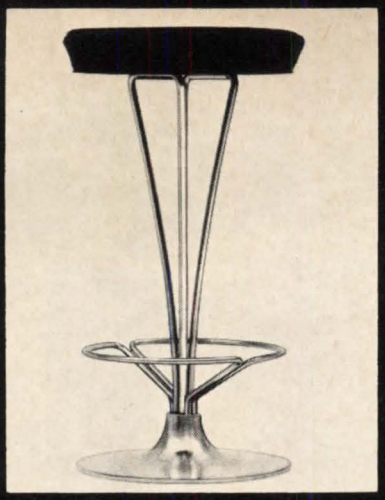

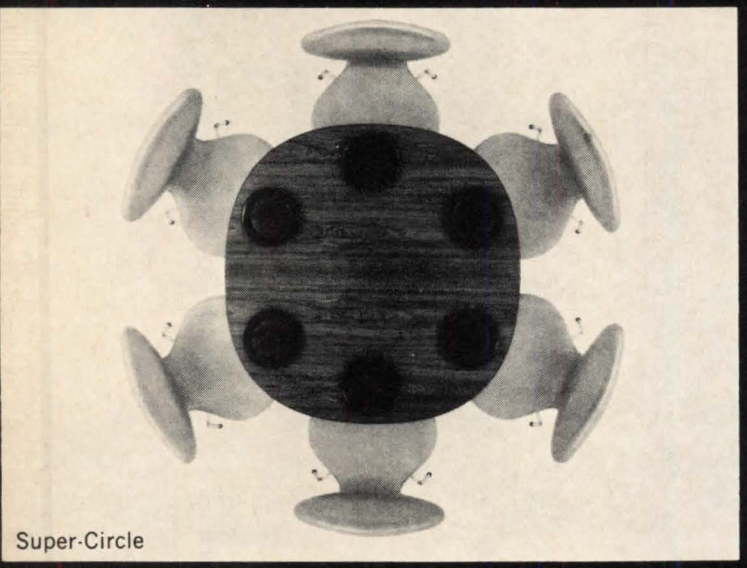

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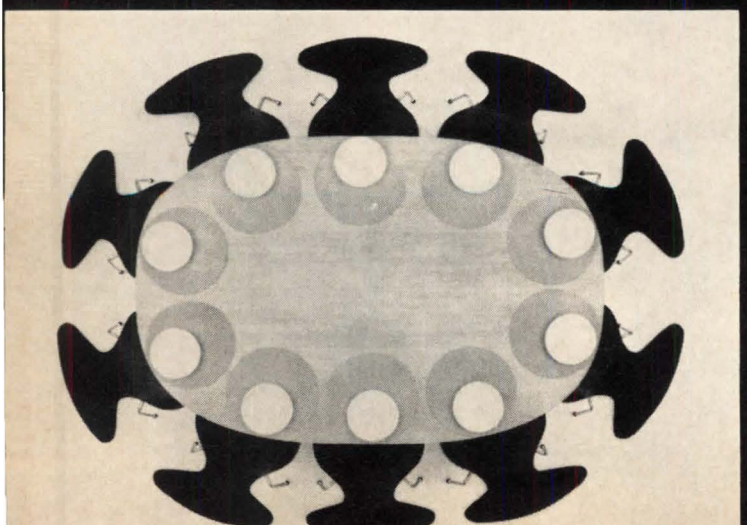

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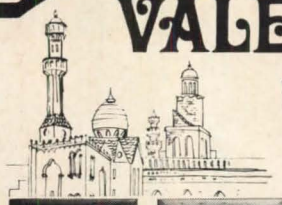

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Publishing House of the Hungarian Academy of Sciences, Budapest. 321 pp., 393 figs., 28 tables, 17 x 24 cm $12

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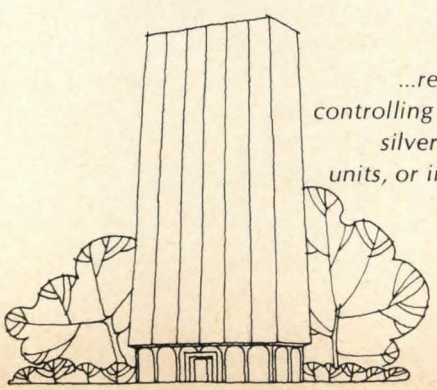

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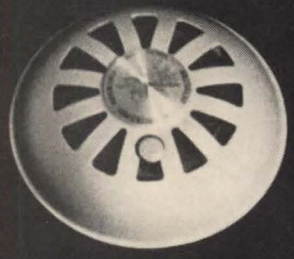

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NOTICES

NEW FIRMS

EUGENE AUBRY, Architect, 1914 West Capital, Houston, Texas.

BALENCY–MBM–U.S. CORPORATION, New York, N.Y., with ANDRE BALENCY BEARN, RICCARDO MEREGAGLIA, RENE CAMBON, and GUY G. ROTHENSTEIN on the board.

CAUDILL ROWLETT SCOTT, architects, planners, engineers, Houston, Texas, announced the formation of an independent affiliate — COMPUTING RESEARCH SYSTEMS CORP., to provide computer services to architects and institutions concerned with space planning.

JOSEPH R. THIMM, Architect, 404 Fifth Avenue, Indialantic, Florida, 32901.

THOMAS WELLS and ASSOCIATES, Architects, 320 Ward Avenue, Honolulu, Hawaii.

NEW ADDRESSES

CALTRON INDUSTRIES, INC., 2526 Butler Place, Bronx, New York, 10461.

MECHANICAL ENGINEERS, INC., 700 South College Street, Charlotte, North Carolina 28202.

JEAN ROSENTHAL ASSOCIATES, INC., 369 White Plains Road, Eastchester, New York.

SCHOKBETON PRODUCTS CORP., 3200 Second Avenue North, Birmingham, Alabama 35222.

SOUTHERN STEARNES CO., 2020 Lunt Avenue, Elk Grove Village, Ill. 60007.

WALZ & MacLEOD, ARCHITECTS, 50 Queen Street, San Francisco, California 94111.

NEW PARTNERS — ASSOCIATES

AU, CUTTING, SMITH and ASSOCIATES, Architects, Honolulu, Hawaii, have appointed ORRIN A HAWORTH an associate in their firm.

CROOKS, MICHELL, PEACOCK & STEWART, Architects, Engineers, Planners, Chatswood, Australia, have appointed J. R. SCOTT as associate.

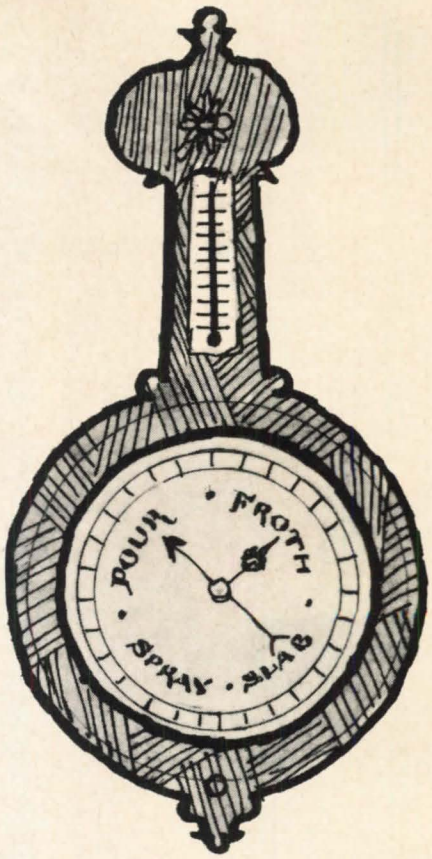
PORTER & RIPA, ASSOCIATES, Consulting Engineers, Newark, New Jersey, have appointed JAMES A. MITCHELL as vice president and associate.

PECK ASSOCIATES, INC., Architects, Paducah, Kentucky, has announced that G. ANTHONY JOHNSTON & ASSOCIATES has joined their firm.

GEORGE PIERCE–ABEL B. PIERCE, Architects, Engineers, and Planners, Houston, Texas, have announced the appointment of three new associates: O. C. BAR-

(Continued on page 218)

URETHANE



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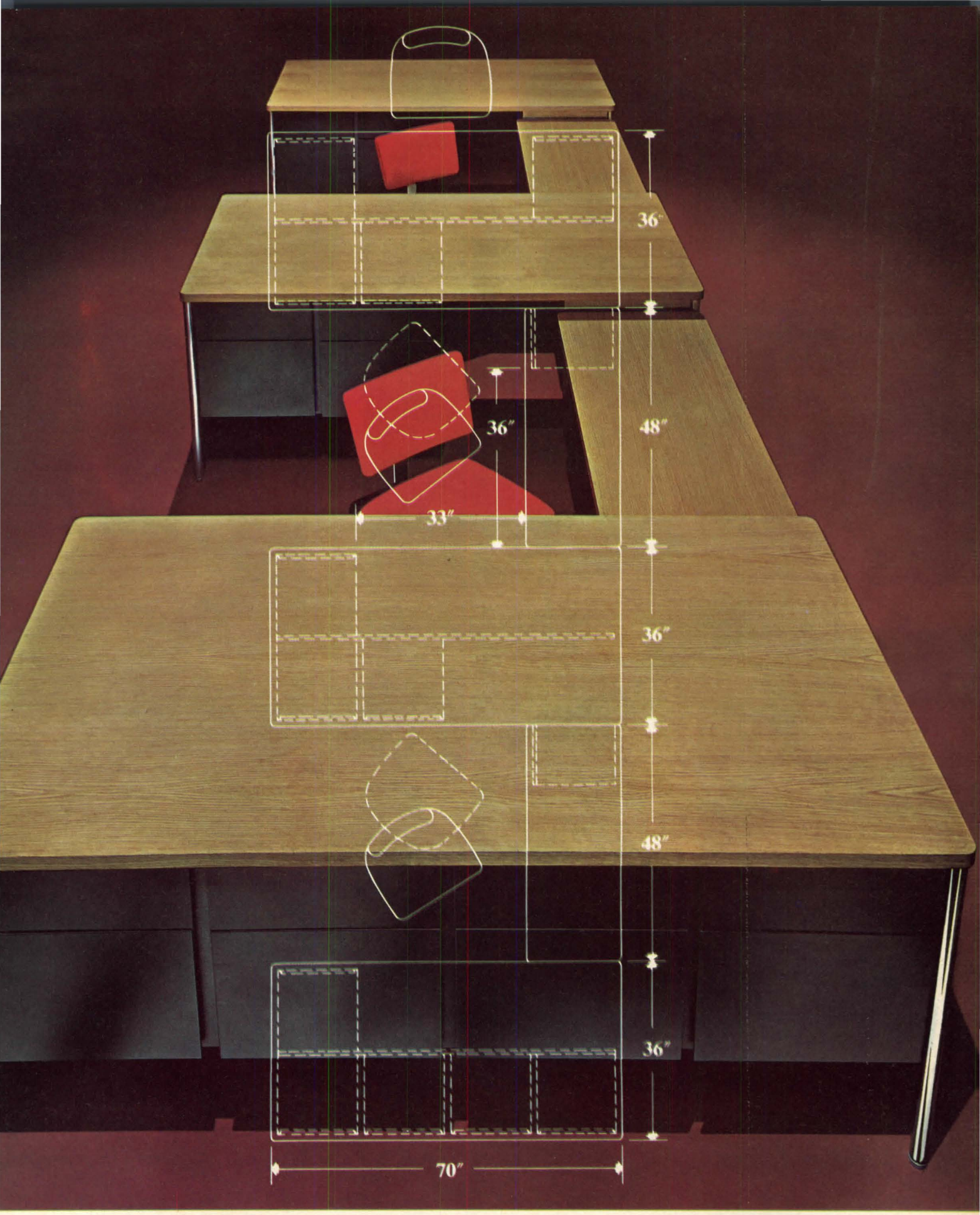

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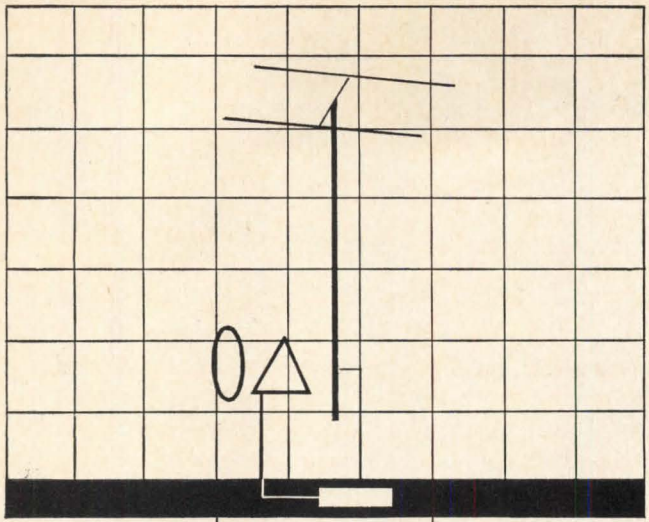

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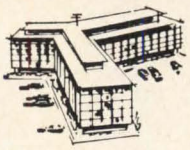
SCHOOLS



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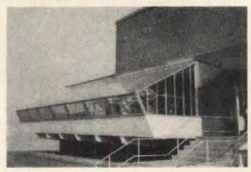
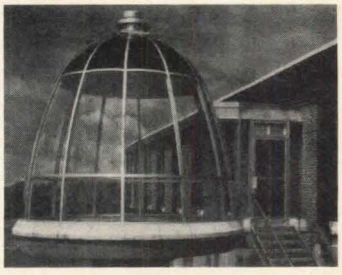
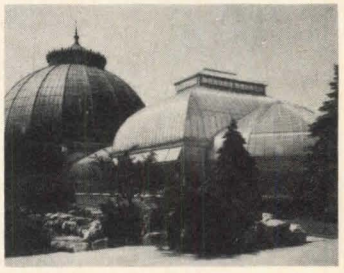
Notable glass structures* blend the architect's imagination with LORD & BURNHAM engineering







* Botanical, zoological gardens
Conservatories
Pool enclosures
Solaria, atria
Glazed arcades, canopies
Domed display areas
Glazed pavilions
Skylights
Glazed school and industrial laboratories

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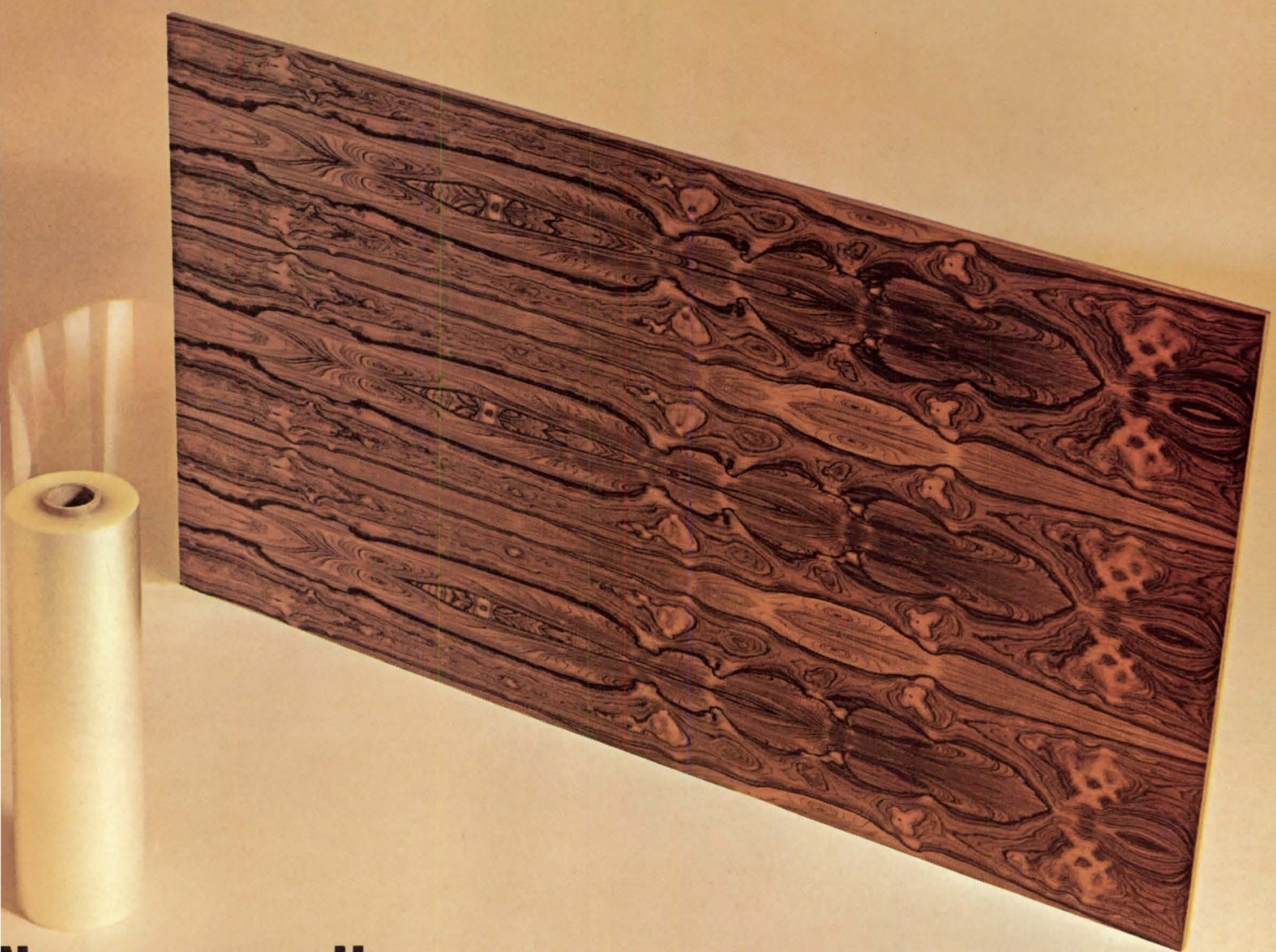

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Now you don't.

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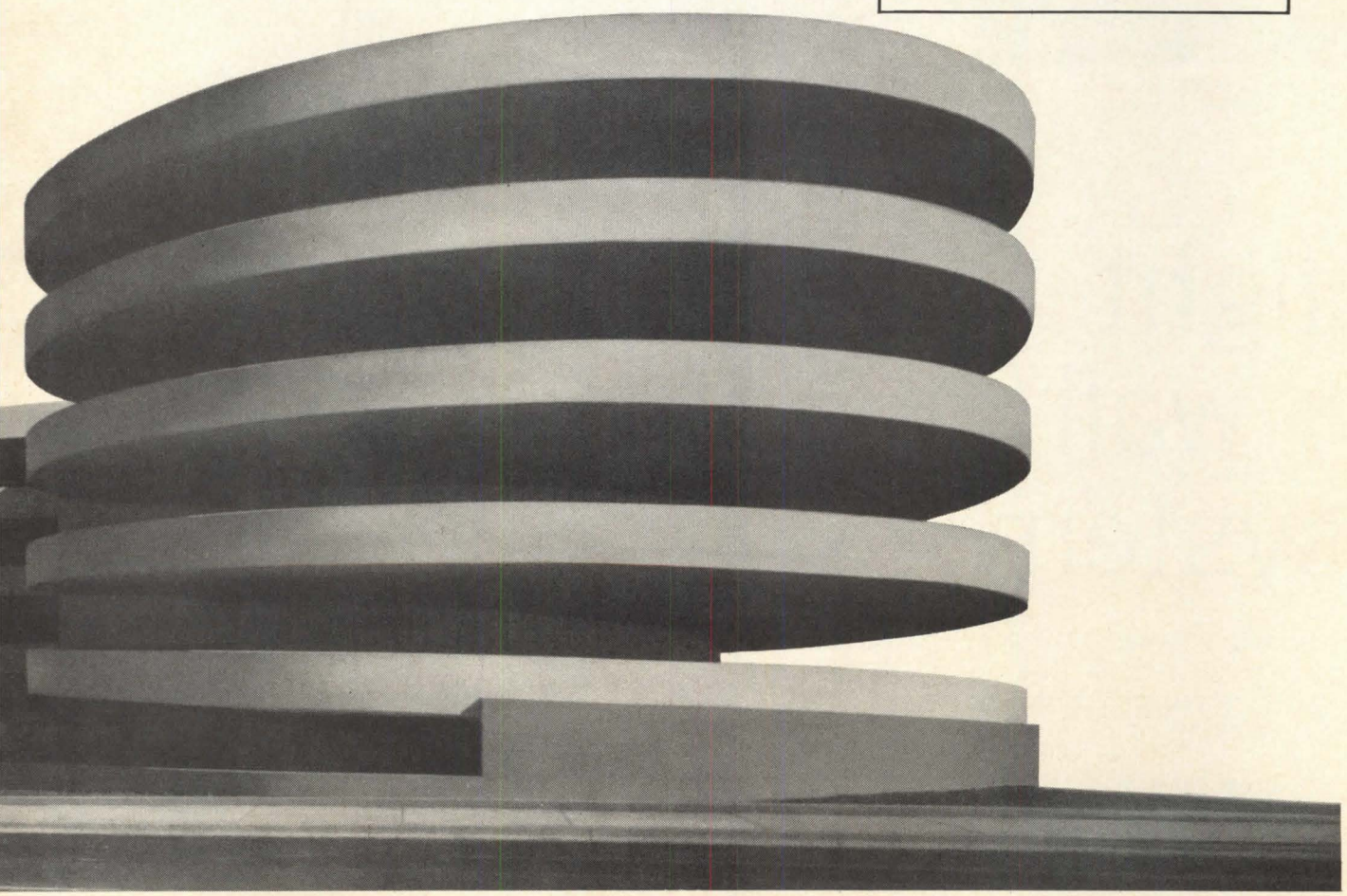

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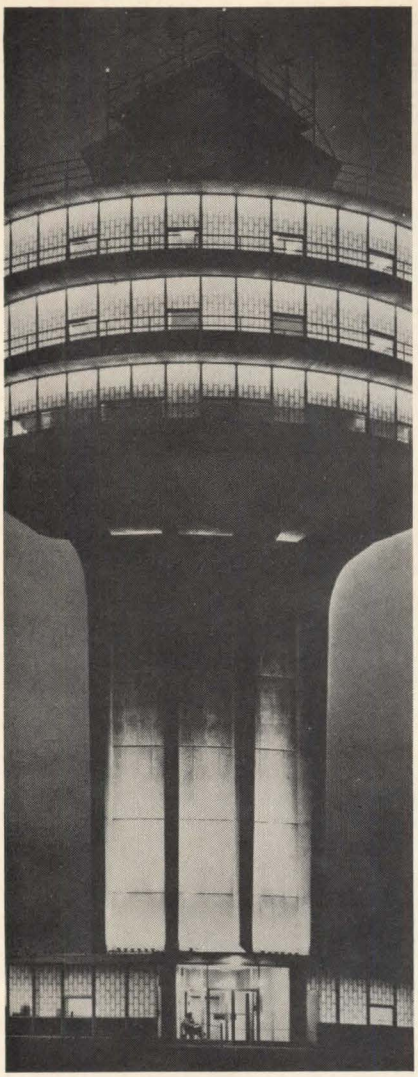

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(Continued from page 208)

THOLOMEW, JR., TOM K. RODGERS, and LOGIC TABOLA, II.

RATCLIFF–SLAMA–CADWAUADER, Architects, Berkeley/Oakland, Calif., announce the appointment of SANFORD S. POLLACK and SYED V. HUSAIN as associates in the firm.

ROBERT VENTURI and JOHN RAUCH, Architects and Planners, Philadelphia, Penn., have taken into partnership DENISE SCOTT BROWN and GEROD CLARK.

NAME CHANGES

HONNOLD, REIBSAMEN & REX, Architects, Los Angeles, Calif., upon the admission to partnership of P. K. REIBSAMEN.

ELECTIONS & APPOINTMENTS

ABBOTT, MERKT & CO., Architects, New York, N.Y., have appointed RICHARD J. BUSH as manager of their new mechanical and electrical consulting department.

AUBURN UNIVERSITY, Auburn, Alabama, has appointed SAMUEL P. SNOW as director of their Urban and Regional Planning Center.

BOLT BERANEK and NEWMAN, INC., researchers, developers, and consultants, Cambridge, Mass., has elected ROBERT B. NEWMAN, JEROME I. ELKIND, and JOHN A. SWETS to senior vice president positions.

COMBUSTION ENGINEERING, INC., Windsor, Conn., has named ALVA J. CHUBB vice president and general manager of their Raymond Division.

ELLIS–NAE YAERT ASSOCIATES, INC., architects and engineers, Warren, Michigan, have named MERRILL M. BUSH and J. EDWARD GENHEIMER to their staff.

H. K. FERGUSON CO., engineers and builders, Cleveland, Ohio, have elected RALPH W. OLMSTEAD as chairman of the board.

HENNINGSON, DURHAM & RICHARDSON, Architects and Engineers, Omaha, Nebraska, has named PETER A. COLLINSCONA as managing director for Latin America.

ALBERT KAHN ASSOCIATED ARCHITECTS and ENGINEERS, INC., Detroit, Michigan, have appointed JAY S. PETTITT, JR., manager of professional services, SAMUEL D. POPKIN, chief of architectural development, and MAURICE LOWELL, technical assistant for architectural development.

KAISER–AETNA CORP., real estate and land developers, Oakland, Calif., have appointed J. W. TEMPLE, vice president, New Products, F. J. LATHAM, vice president and controller, R. R. ELLSWORTH, vice president and treasurer, and R. G. GALLOWAY, vice president, legal.

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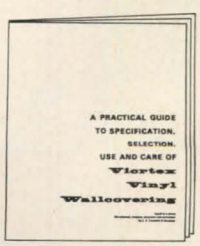

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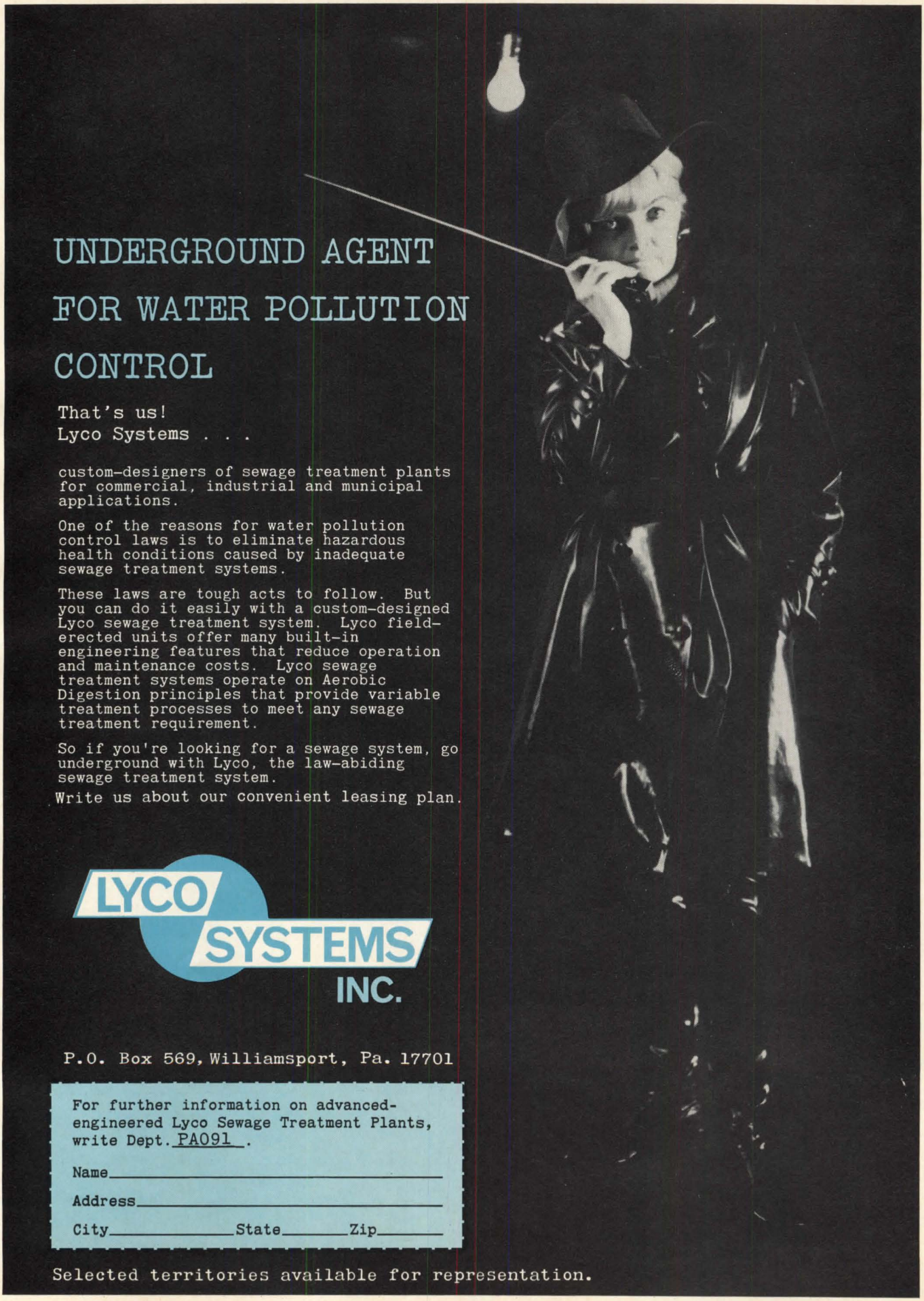

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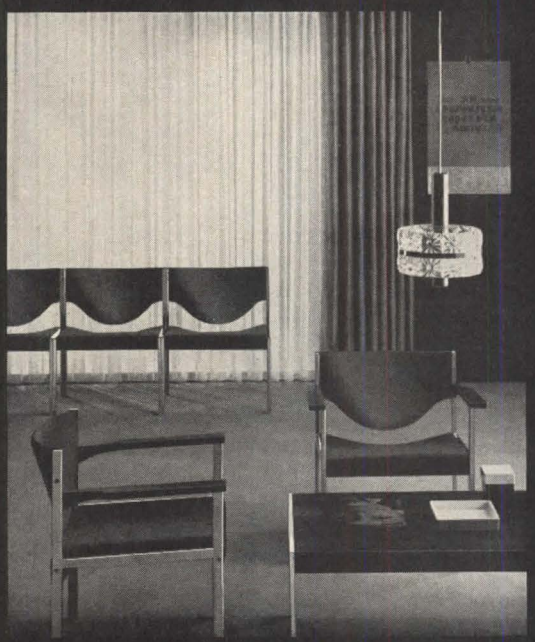

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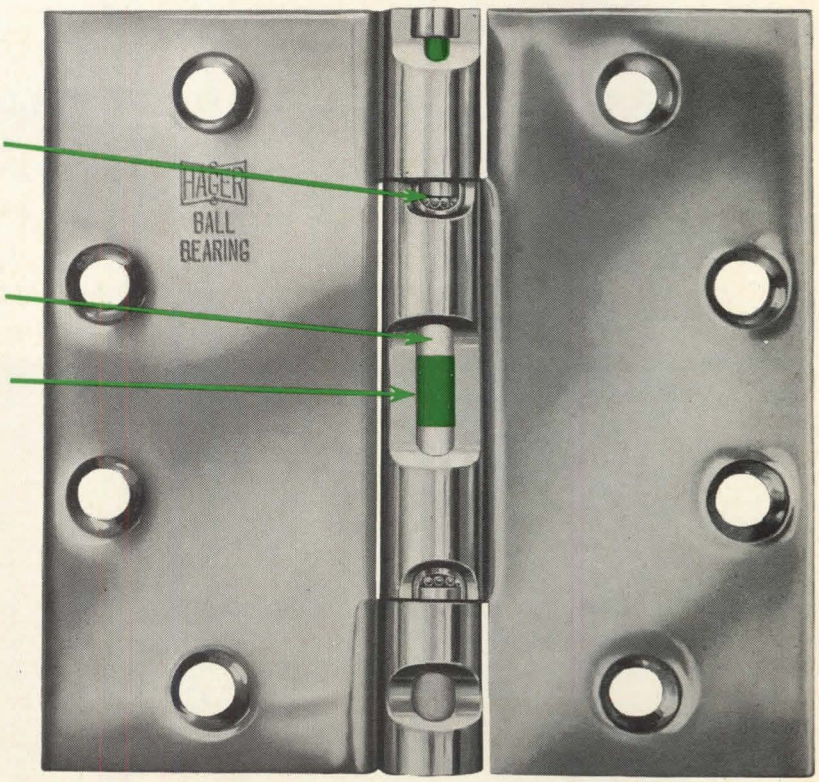

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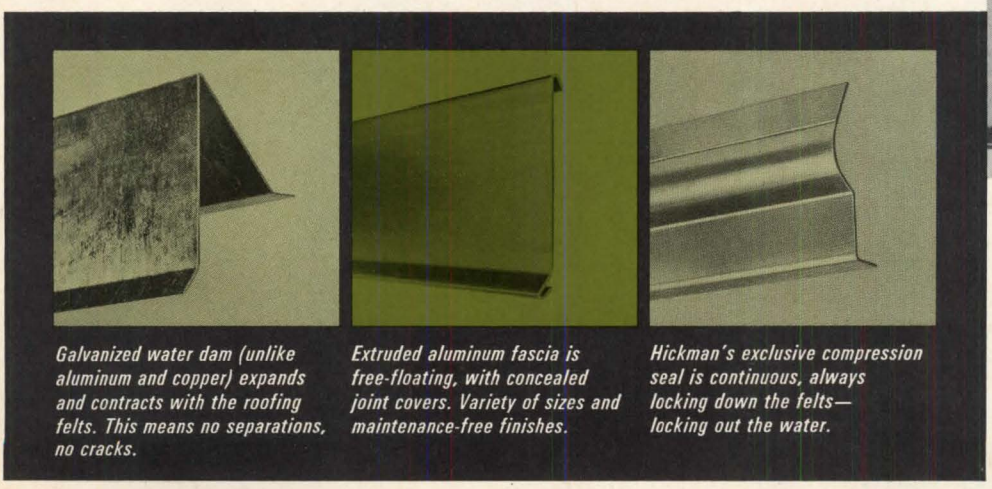

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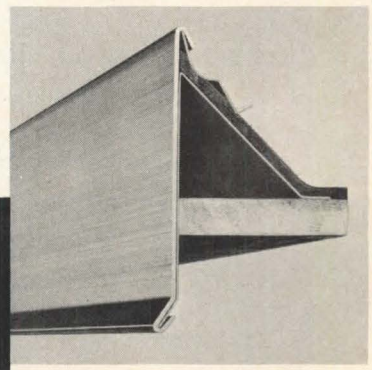

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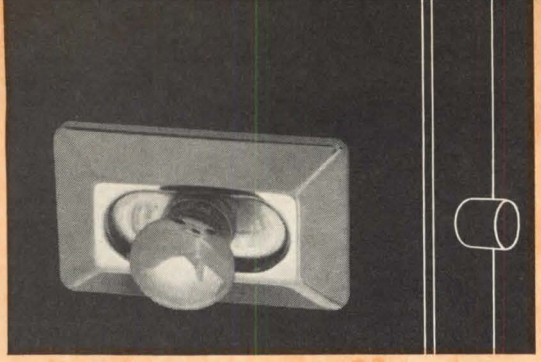

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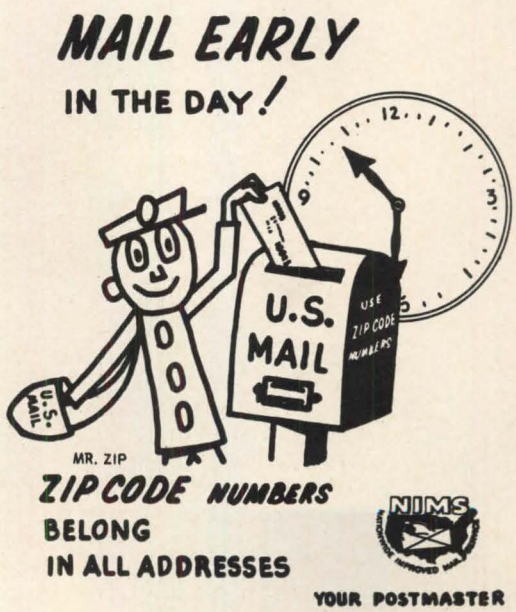

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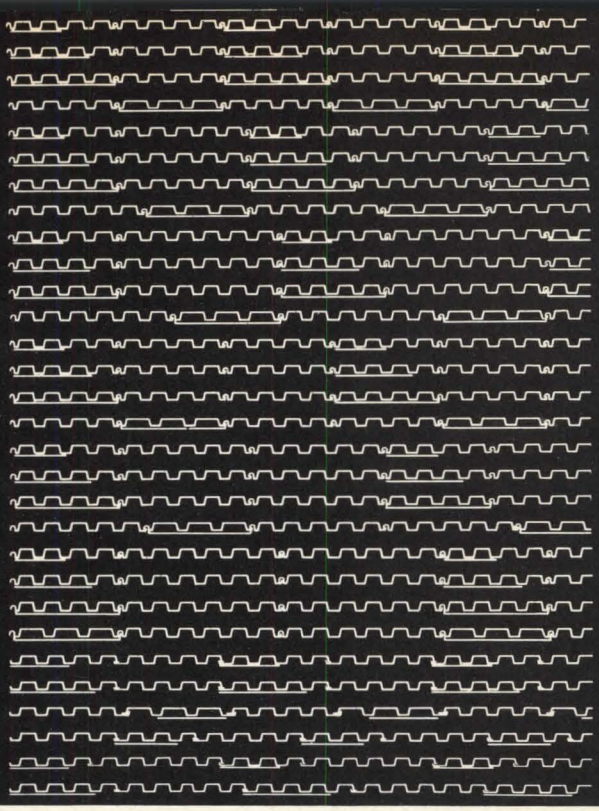

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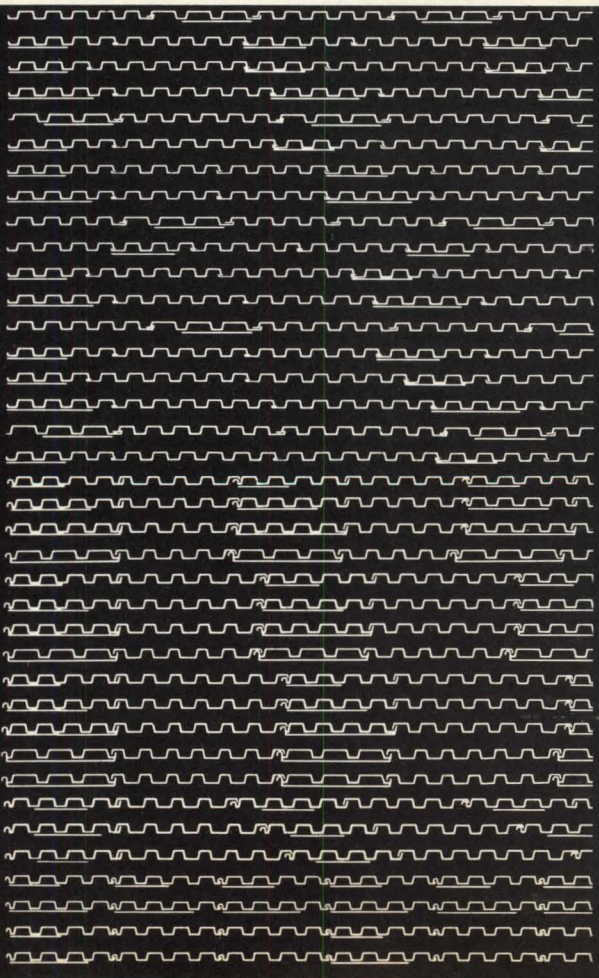

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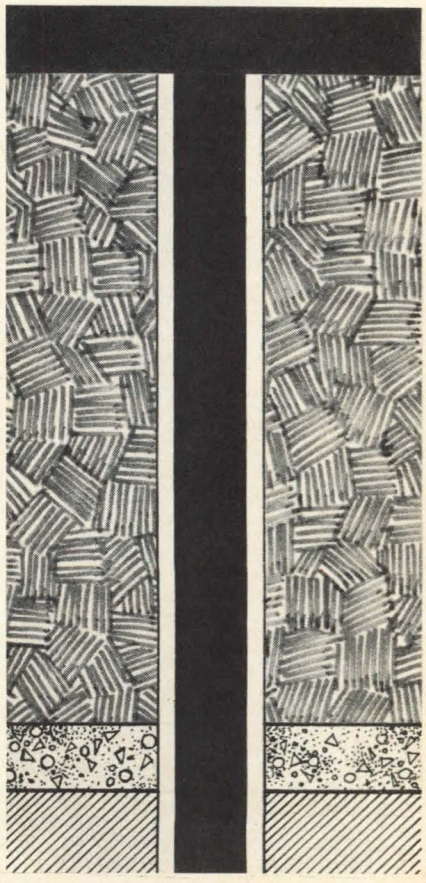

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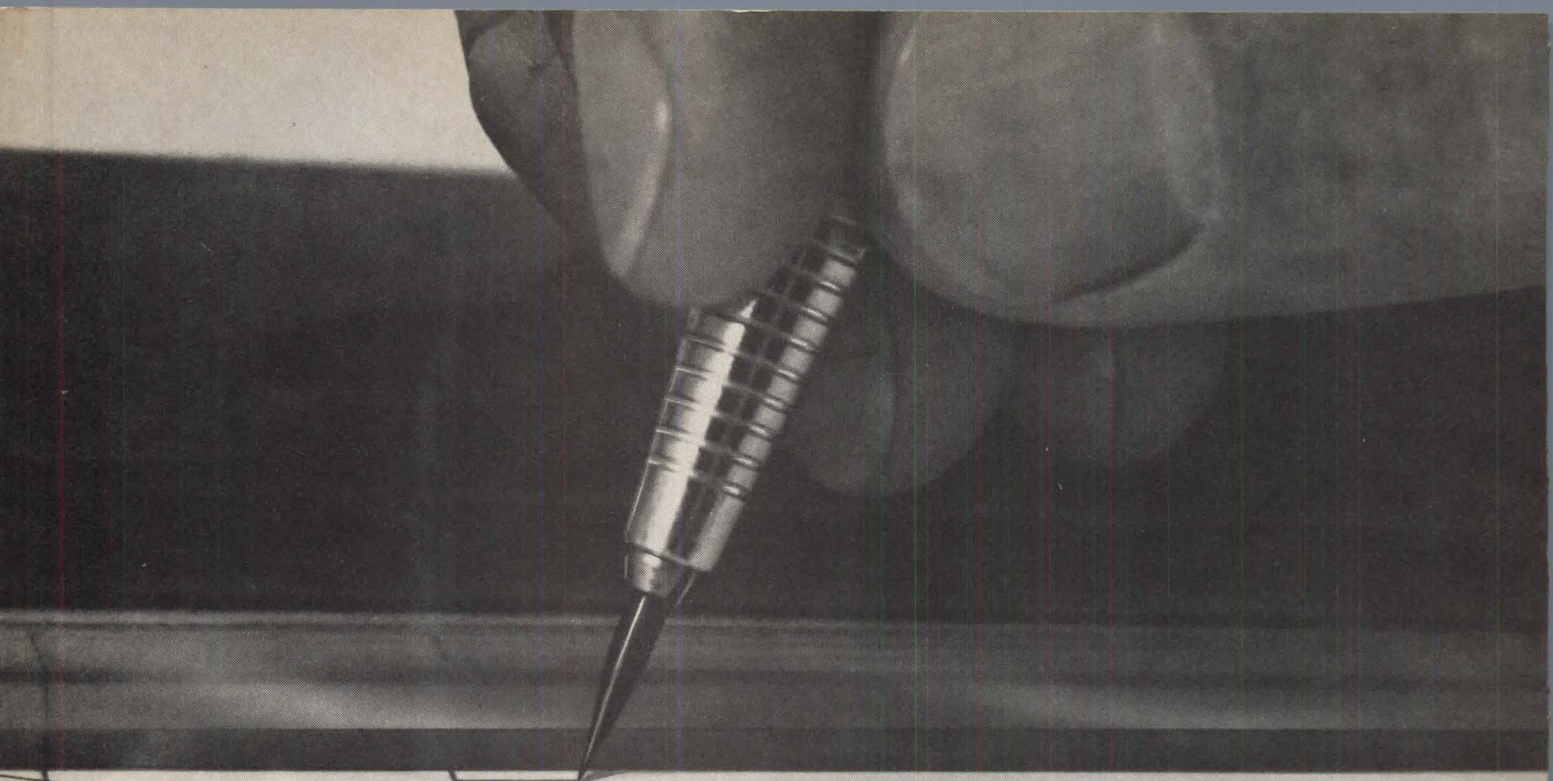

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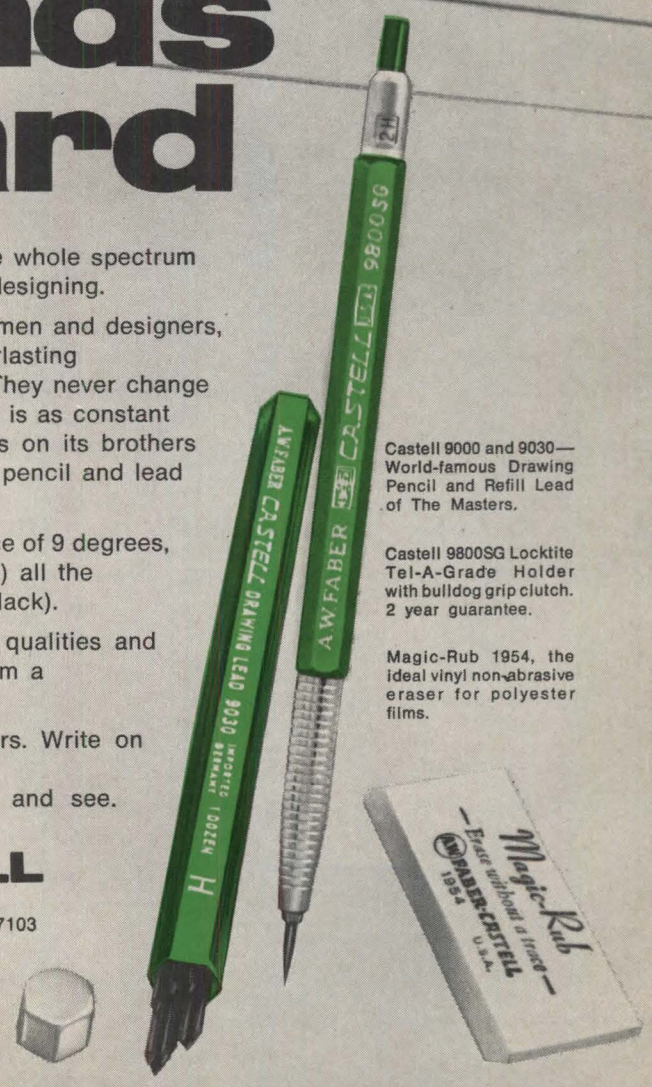

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