HE ARCHITECTURAL FORUM / APRIL 1970

FORUM

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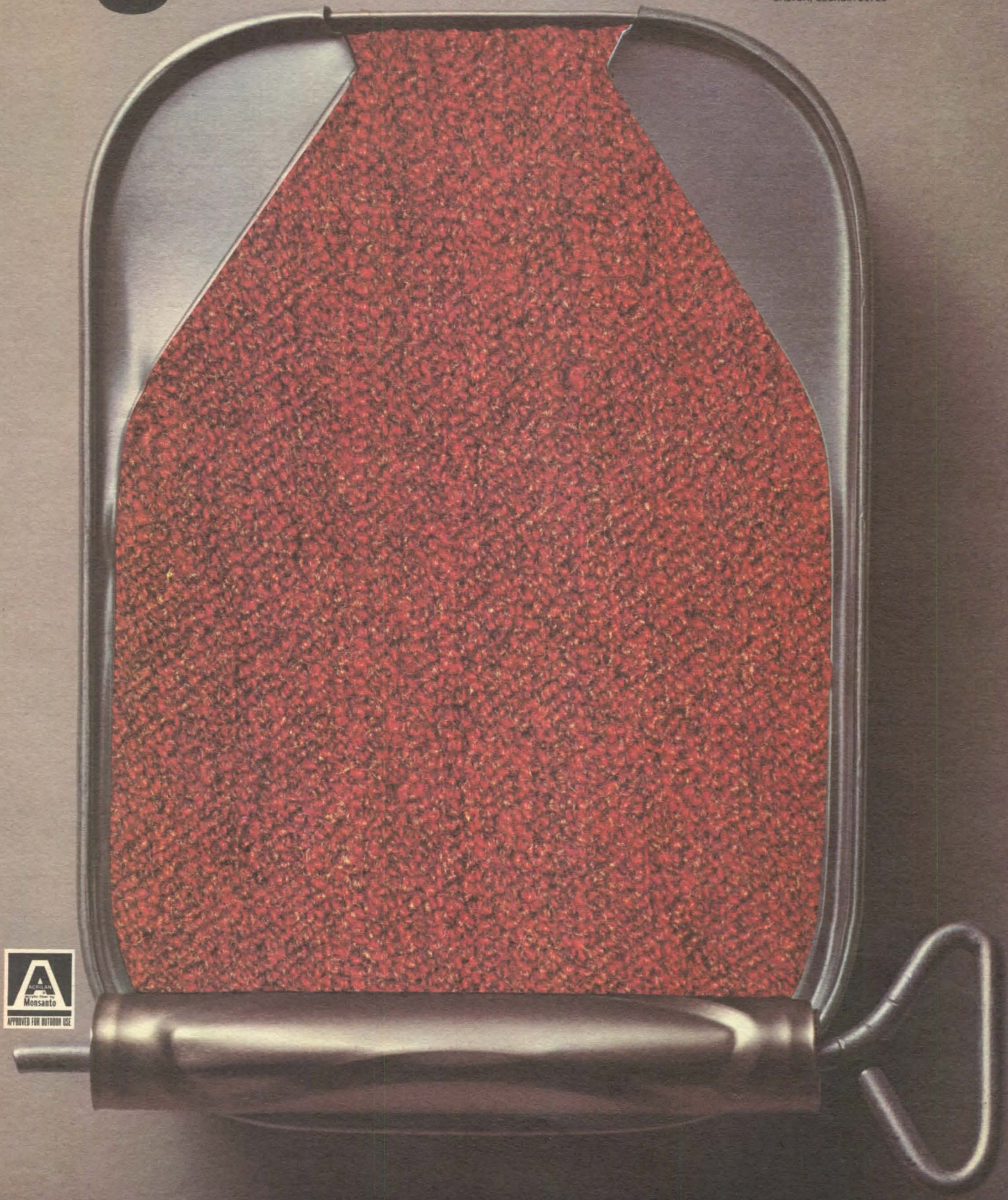

THE ARCHITECTURAL FORUM

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Cover: From a photograph by Arthur Erickson of the Canadian Pavilion at Expo 70 (p. 34).

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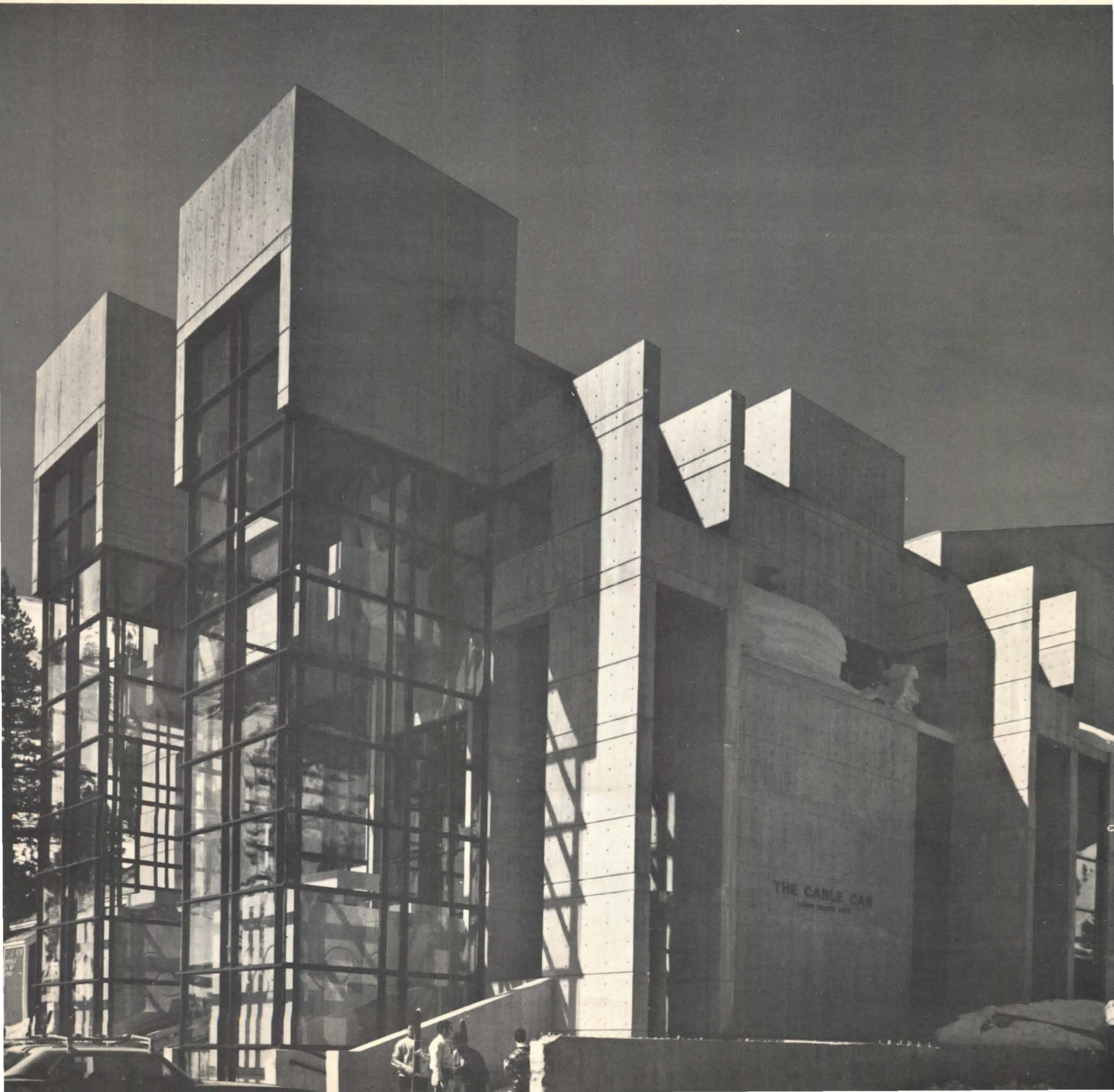
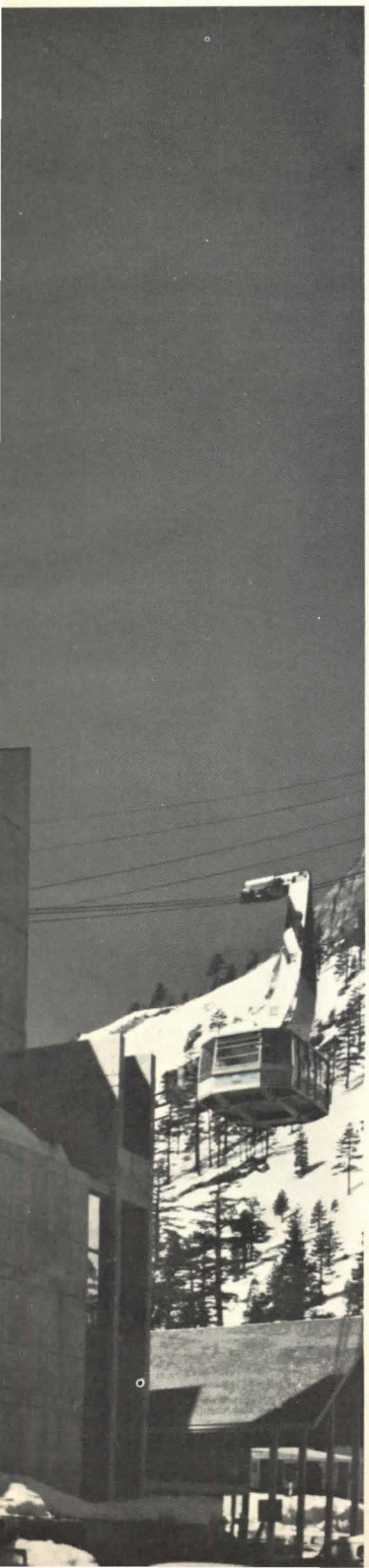
Dover designed a special Oildraulic® Elevator to meet the unusual requirements of the Squaw Valley Cable Car Terminal at Olympic Valley, California. The car measuring 11′ 6″ x 28′ will take 120 skiers (one cable-car full) from the main entrance level to the cable car level. The car is glass-walled, and moves in a glass-enclosed hoistway with no clutter of overhead cables or machinery. Total lifting capacity of 45,000 lbs. is provided by the powerful Dover Oildraulic cylinder and power unit. ARCHITECTS: Shepley, Bulfinch, Richardson & Abbott, Boston, Massachusetts. GENERAL CONTRACTOR: Campbell Construction Co., Sacramento, California. PHOTOGRAPHER: Julius Shulman, Los Angeles. Dover Oildraulic Elevators installed by Valley Elevator Co., Sacramento, California.



Dover delivers

elevators to give a lift to 120 skiers at once, or to a single handicapped child.



At Litchfield Junior High School, Litchfield, Conn., a Dover Continental Oildraulic Elevator was installed so that handicapped students might move more easily among the three classroom levels. Like the school, the elevator is distinctive, being pre-engineered to fit a specified hoistway size and thus saving on engineering costs and delivery time. OWNER: Town of Litchfield, Connecticut. ARCHITECT: John M. Johansen, FAIA, New York City. GENERAL CONTRACTOR: C. H. Nickerson & Co., Inc., Torrington, Connecticut. PHOTOGRAPHER: John Veltri, New York City. Dover elevator installed by Eastern Elevator Co., New Haven, Connecticut.

Dover Delivers Oildraulic elevators for low-rise buildings and electric traction elevators for high-rise buildings. Write for catalogs. Dover Corporation, Elevator Division, Dept. C-2, P. O. Box 2177, Memphis, Tenn. 38102.

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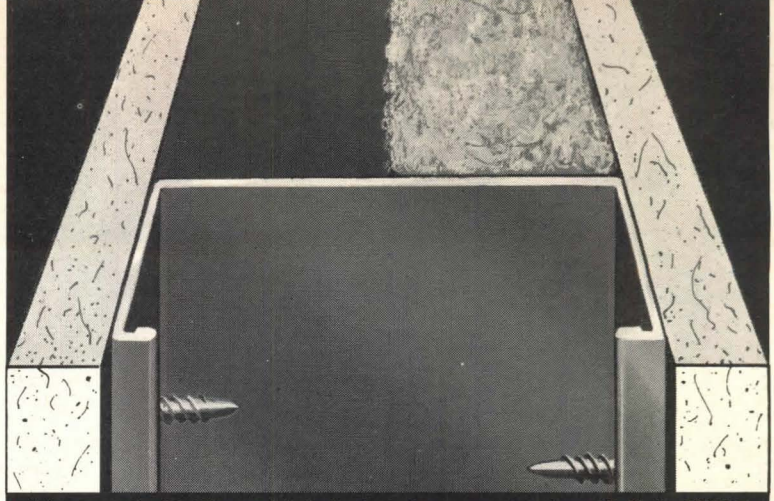

4-in. over-all with 3-in. metal stud; single-layer construction with ½-in. SHEETROCK* SW FIRECODE* "C" Gypsum Wallboard screw-attached each side; 1½-in. THERMAFIBER* Sound Attenuation Blanket in cavity. 1-hr. fire rating, 43 STC.

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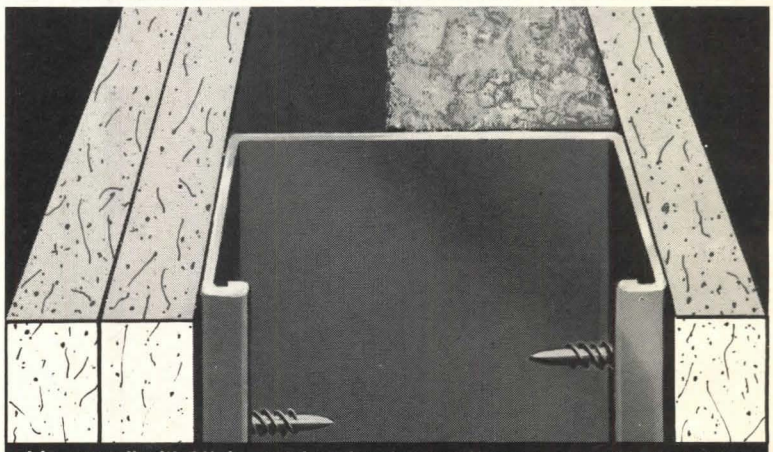
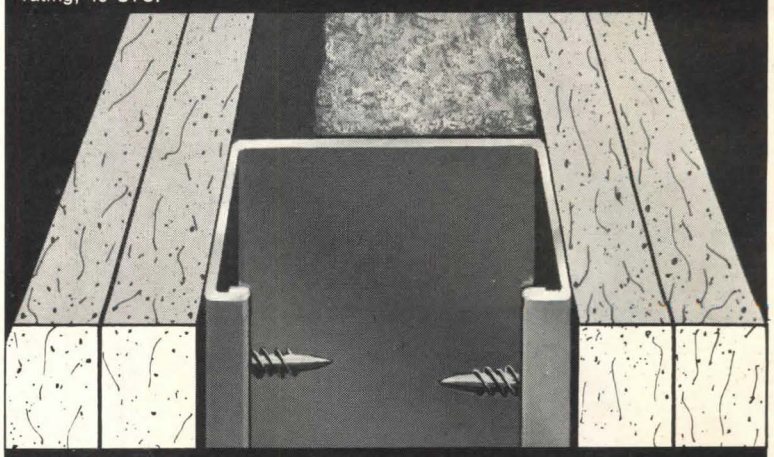
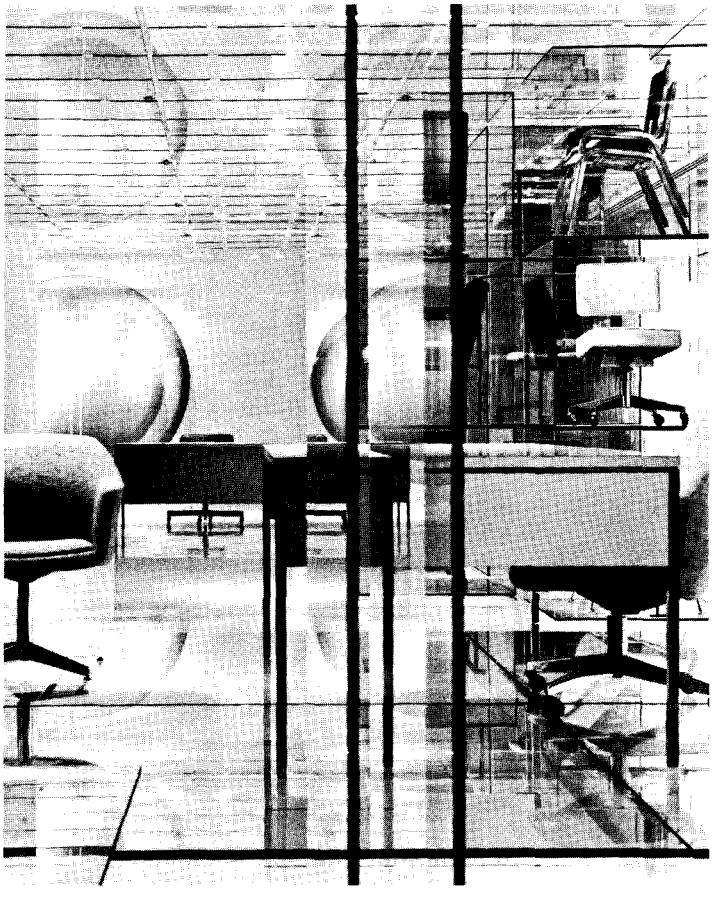


4-in. over-all with 2½-in. metal stud; unbalanced construction with single-layer ½-in. SHEETROCK SW FIRECODE "C" Wallboard screw-attached one side, two layers other side; 1½-in. THERMAFIBER Insulation in cavity. 1-hr. fire rating, 49 STC.



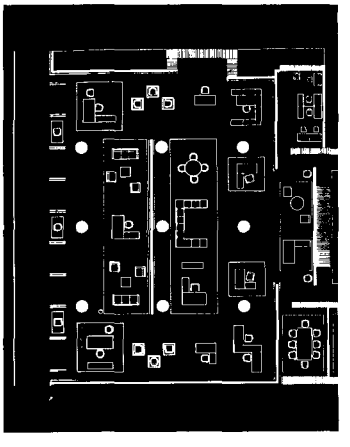
4-in. over-all with 2-in. metal stud; double-layer construction with two layers ½-in. SHEETROCK SW FIRECODE "C" Wallboard screw-attached both sides; 1½-in. THERMAFIBER Insulation in cavity. 2-hr. fire rating, 52 STC.

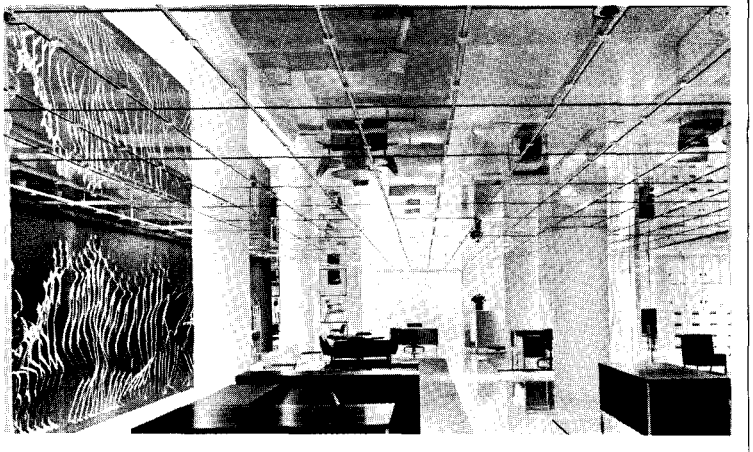
UNITED STATES GYPSUM

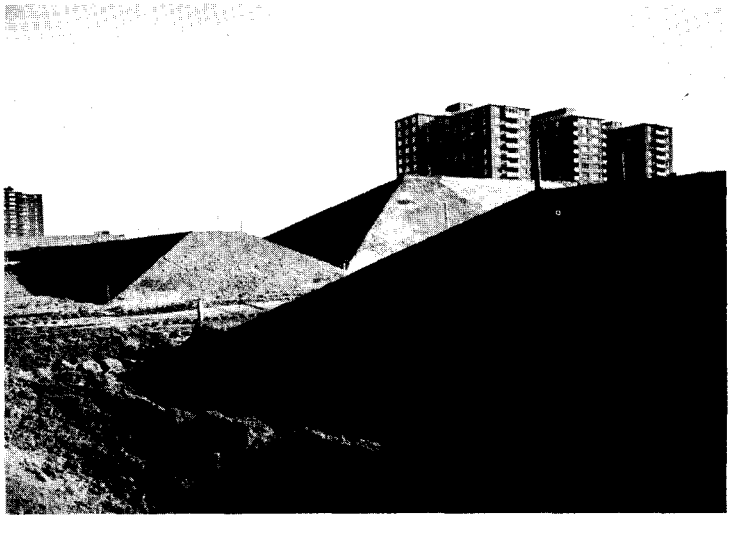


REFLECTIONS ON MERCHANDISING

Architect Warren Platner has designed the Chicago Merchandise Mart showroom of America's biggest office furniture company, Steelcraft, to look like an ice cave. Panels of clear glass suspended beneath the ceiling and set a few inches in front of the walls make the boundaries of the space a set of interchangeable reflections, scored by greenish lines of glass edges. Neither the old white-painted ceiling nor the lighting suspended from it are concealed. Some wall panels have bright silk-screen designs on their back surface. A black and white photo mural based on the movement of an office worker (left in photo below) will be replaced by other designs on a rotating basis. Furniture on display appears to float above the floor on tempered glass platforms; small pieces are stacked in tiers of clear glass cubes. The total effect is one of abstract space.

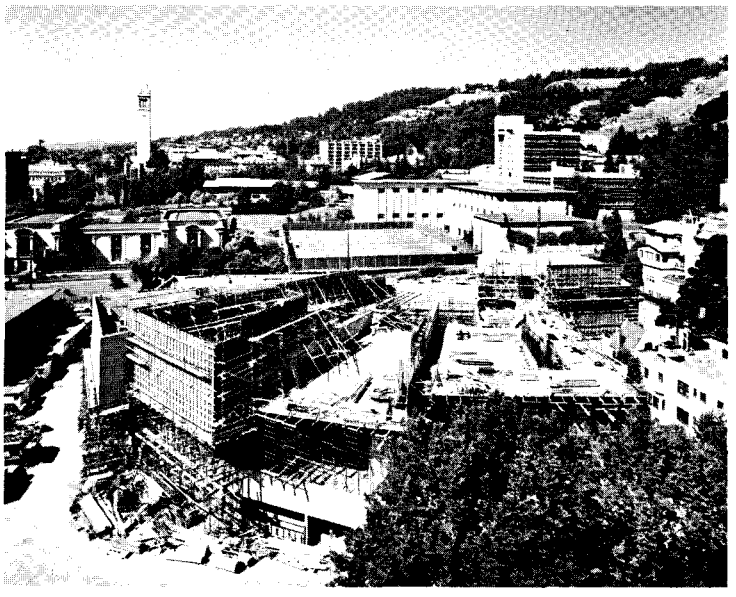


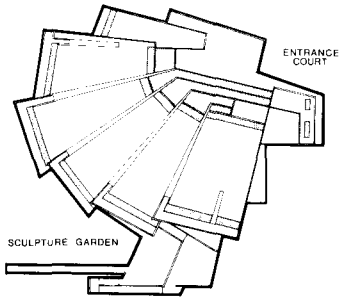




EARTHWORKS FOR FUN

These mini-Gizeh pyramidal mounds are the beginnings of a 10-acre playground-park complex for a new community for 6,000 sprouting in Queens, N.Y. Bland highrise apartments are offset by a totally flat wasteland area. Architects Richard G. Stein & Associates have molded the area into these mounds, between which will be situated game fields, sitting areas and courts. Sloping sides of the mounds will either be planted with honeysuckle or will be cut into for an amphitheater and bleachers. Walkways and ramps will connect the various areas; trees will be planted throughout the park.



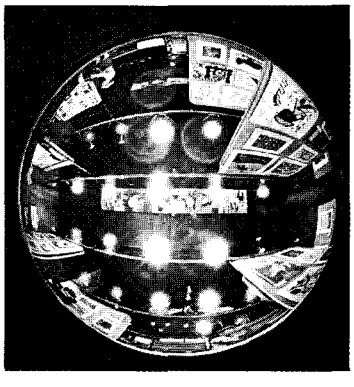


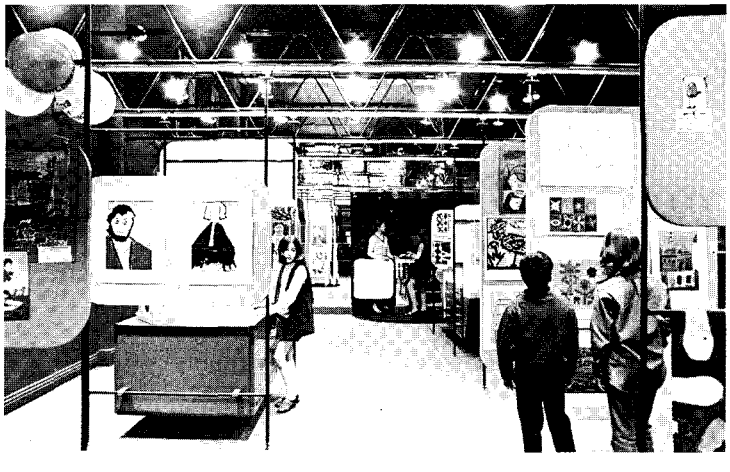
SCULPTURE FOR ART

Mario J. Ciampi's competition-winning University Arts Center at Berkeley will be completed for an October 6 opening. The center (a fan of radial terraces) will devote a third of its 95,000 sq. ft. to galleries—the rest will contain studios, offices, and a theatre. One gallery will house a superb collection of Hans Hoffman. Paul W. Reiter, associate architect; Richard L. Jorasch and Ronald E. Wagner, design associates.

THE CHILDREN'S ART BAZAAR

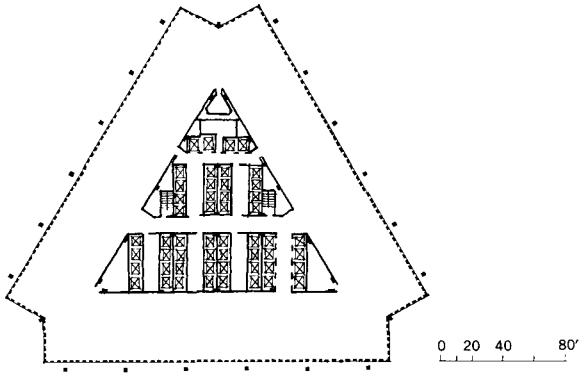
Behind a simple storefront in downtown St. Louis is a gallery devoted to the display and sale of children's art—for their benefit (eg: to buy equipment for children's hospitals, etc.). Anselevicious/Rupe/Architects designed a series of open-web steel joists with "ladders"; attached to these are removable display panels and storage elements. Dark blue walls and a rear-wall mirror add dimension to the space.

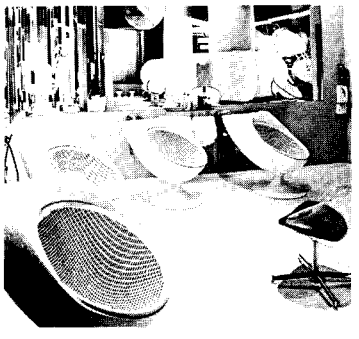


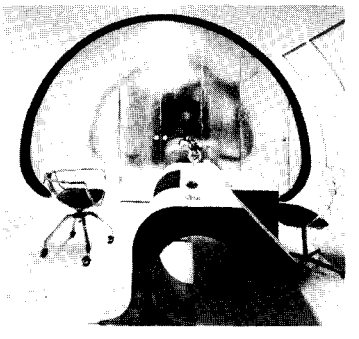


STEEL'S TRIANGLE

Under construction below is the U.S. Steel headquarters in Pittsburgh's Golden Triangle (see April '67 issue, page 31). The 64-story skyscraper by Architects Harrison & Abramovitz & Abbe will be supported by 18 exposed, hollow-box steel columns filled with antifreeze solution for fireproofing. These will stand out 3 ft. from the exterior wall. Office space on each floor, in three, column-free rectangular areas (each 221 ft. by 45 ft. 6 in.) will surround a triangular central core. The 2.9-million-sq.-ft. structure will also house an auditorium, restaurants, stores, and a heliport on the roof.

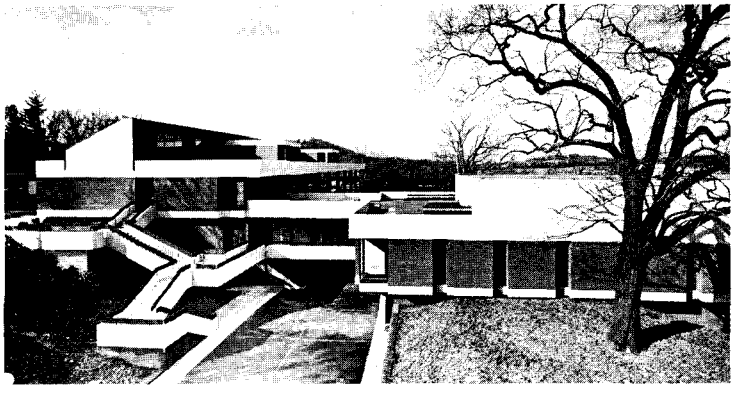






SPACE STATION SALON

Chicago has its own orbiting satellite in Frederick Glaser's fashion center and beauty salon. Walls curve and undulate between different areas, from salon to boutique to offices. Stylist Glaser designed everything: pod-like chairs, portable helmet hair-driers, separate bubbles for clients (instead of booths), paper slippers and robes, ashtrays, etc. The entire center is in white or transparent fiberglass and plastic, with trimmings in black—except for Glaser's office walls which are covered in silver vinyl. Cost: $200,000.

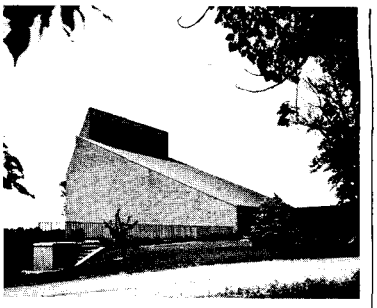


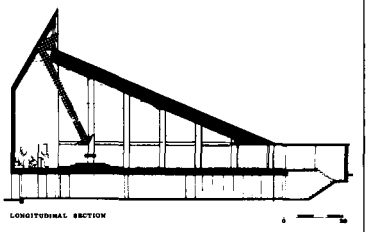
PHASE ONE FOR FINE ARTS

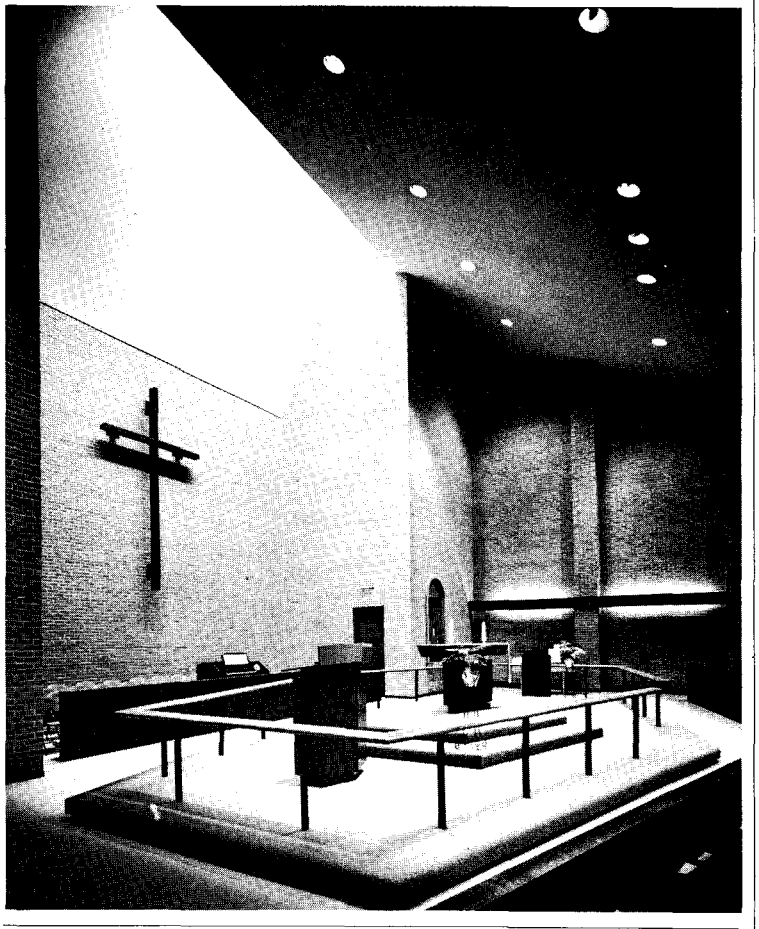
The first phase in a proposed new fine arts center for the University of Virginia is the $3.3-million, four-story brick and concrete building for the school of architecture. It contains three times the space of former facilities, and has new "environmental" labs (demonstration of light, airflow, etc.) and labs for practice with techniques and materials. Designers: Pietro Belluschi and Kenneth DeMay of Sasaki, Dawson, DeMay Assocs.; Rawlings and Wilson, architects.

SPARTAN SANCTUARY

When the Trinity Lutheran Church, once surrounded by open fields, became engulfed in St. Louis's suburban sprawl, the parish decided to expand the facilities. A fellowship hall and educational building were built, and are now joined by a new sanctuary for 400-500 worshippers. Approach to the 11,310,-sq.-ft. structure, designed by Smith & Entzeroth Inc., is from all directions. Inside, the altar, pulpit and lectern are raised, with a communion rail surrounding them. Light floods the chancel behind the altar from a clerestory window.



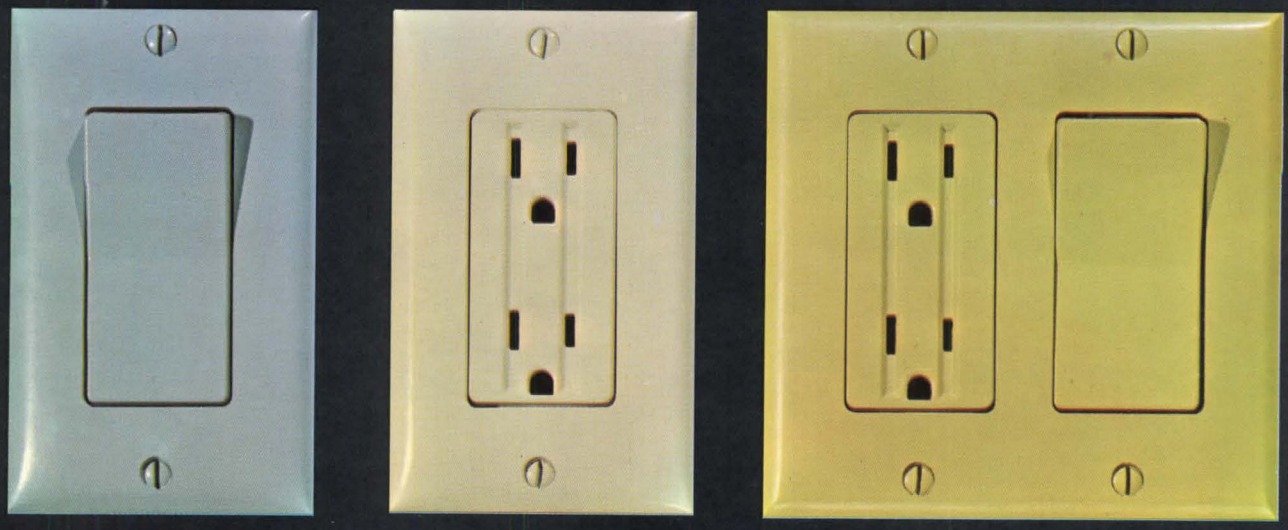




SUN SPOT

Shimmering 1,000 ft. offshore in Big Bear Lake, Calif., is the solar observation station of California State Technical College. Honnold, Reibsamen & Rex, Architects, designed the station in this acquatic setting to reduce the effect of the earth's thermal radiation upon the telescope. Access to the station is by boat. The lower levels of the structure contain a spectograph room, labs for film processing, and offices. The top level, where the telescope is located, also has an observing room with skylights.

Still installing the old-fashioned kind?



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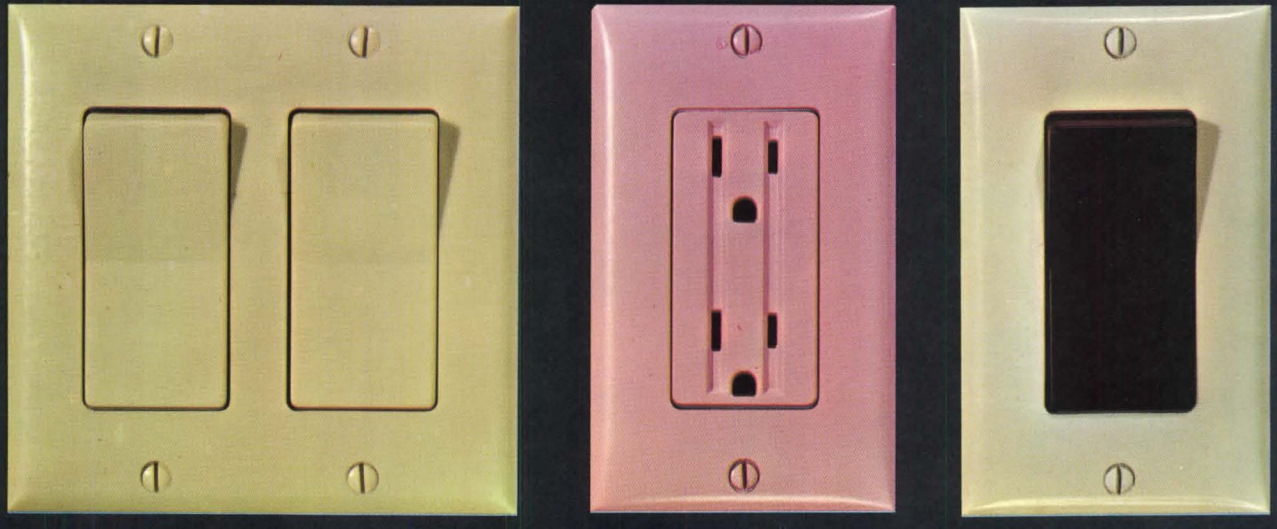

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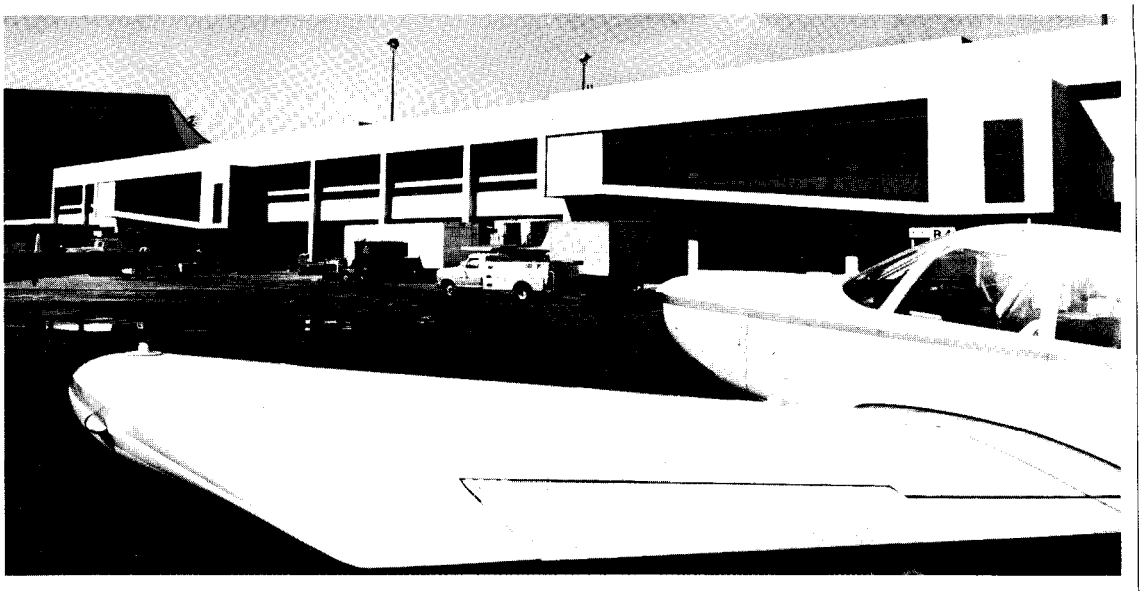
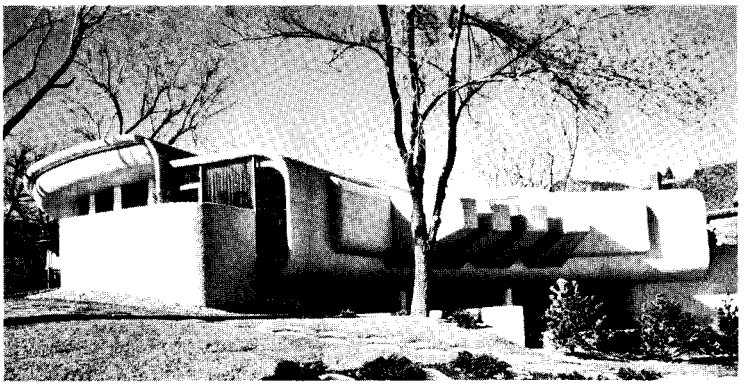


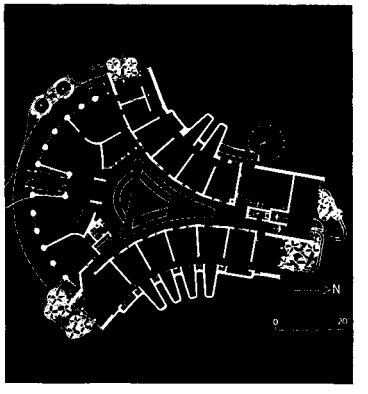
AIRPORT FINGERS

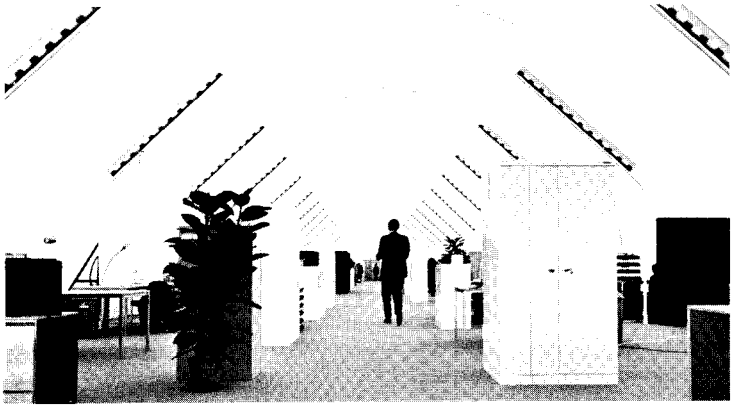
In a recent addition to the $125-million development of Boston's Logan Airport, Architects Kubitz & Pepi have shown that the lowly boarding finger need not be boring. Each of 24 boarding gates along the two 540-ft. North Terminal piers is marked by a bold projection that follows the line of a passenger ramp inside. The geometry is boldly outlined with exposed concrete framing around areas of dark glass.

EYE CATCHER

The futuristic all-white Hardenburgh Eye Clinic by Architect Charles A. Haertling fans out in two back-to-back curves across a corner lot in Boulder, Colo. All offices, examining rooms and refracting rooms in each curve are connected so that the doctors need not go out into a central waiting area. Refracting rooms are designed as tunnels; these appear as protruberances on the exterior of the building. Eye charts are projected down them.

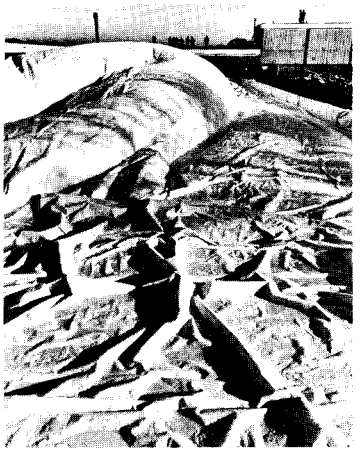


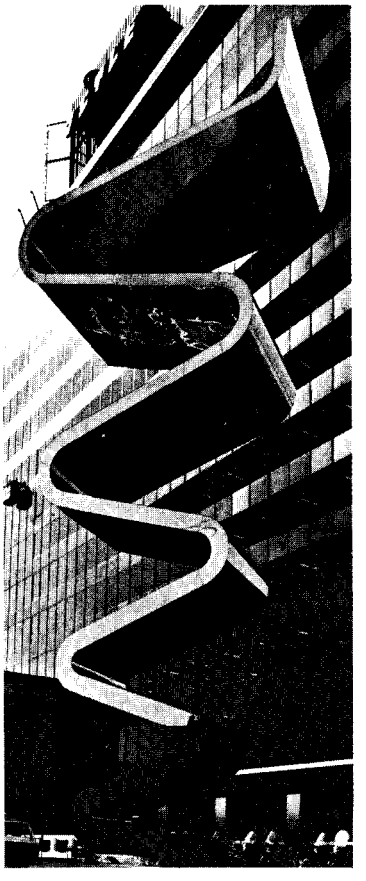




TECHNOLOGY'S TENT

Computer Technology, a British concern that has been doubling its output each year, was in desperate need of new accommodations for offices and personnel. Designer Norman Foster came up with the solution pictured here: while a new, permanent office building, also designed by him, was being erected, the company could operate out of an air tent. Foster's inflatable took only one hour to blow up. It is warm, comfortable and quiet—and with plants and a bright orange carpet is a "looker" also.





ELECTRIC WAVE

Japan is not only the scene of Expo 70. In Tokyo, the Fuji Telecasting Co., Ltd., creators of that tea cozy inflatable at the fair, recently raised a sculpture in front of their headquarters. Called simply The Monument, it "embodies Fuji's challenge to the future"—Electric Waves Revolutionize the World! Sculptor Bukichi Inoue's design was executed in welded steel frame covered with stainless buff-polished plates by the Kajima Construction Co., Ltd.

PHOTOGRAPHS: Page 5 (top), © Ezra Stoller (ESTO); page 6 (top left), Dennis Galloway; (bottom left) and page 7 (right), Mac Mizuki; page 9 (top), Ronald S. Rosenstock; (center), Bo Thorne; (bottom left), John Donat Photography.

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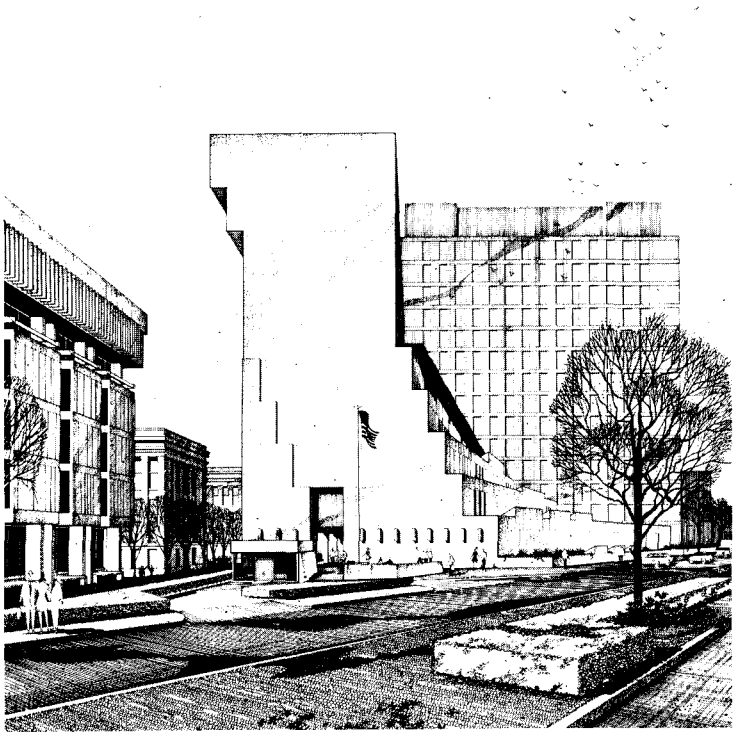
PREVIEW

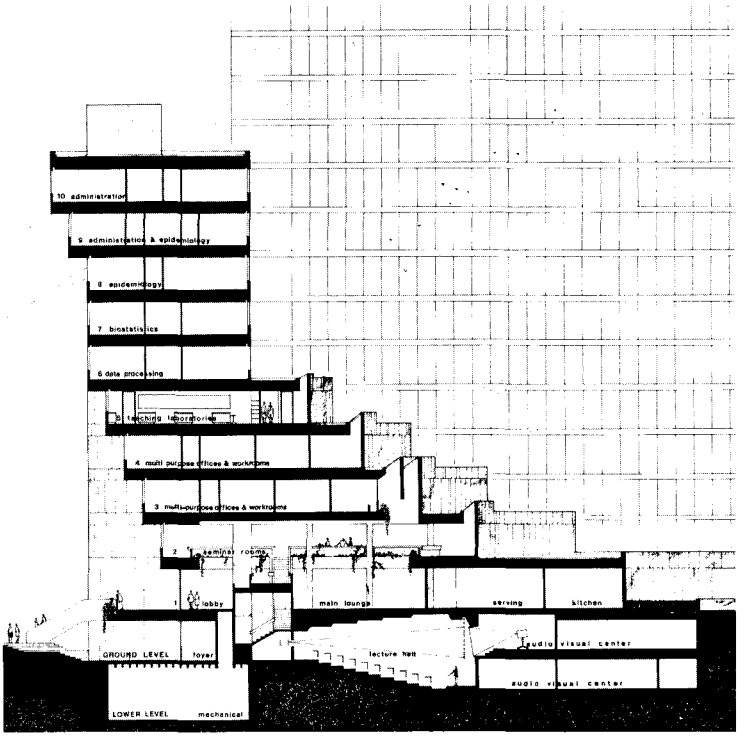
MEDICAL SCHOOL EXPANSION

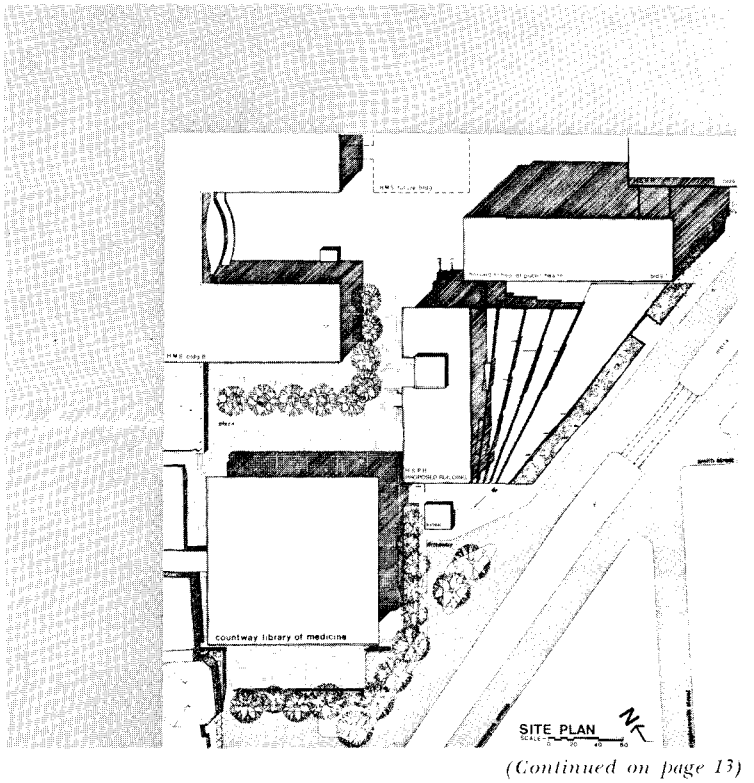
Part of the master plan for the expansion of the Harvard Medical School in Downtown Boston is the proposed new building for the Harvard School of Public Health which will occupy a triangular site between the campus and Huntington Avenue. The design, by William Kessler & Associates, relates the structure to existing buildings in scale and texture.

The building covers virtually all available land, fanning back from the avenue at five levels to a rectangular office block. The setback floors and two lower levels contain classroom, seminar, lab and research space used by students—to keep circulation at a minimum and to keep widely-used facilities near the ground. Setbacks also give opportunity for skylights over major working areas. Teaching labs on the fifth floor are connected by a bridge to similar labs in an adjacent building.

The entrance to the building (bottom left) faces inward to the campus and steps down to a glass-walled lobby. Only the elevator core, punctured by a single, full-height slit window, breaks the pattern of the facade —bands of glass and limestone which relate to the height of the Countway Medical Library and other nearby buildings.







(Continued on page 13)

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PREVIEW

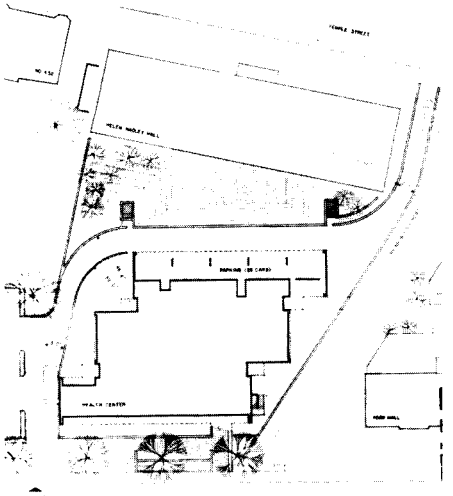
UNIVERSITY HEALTH CENTER

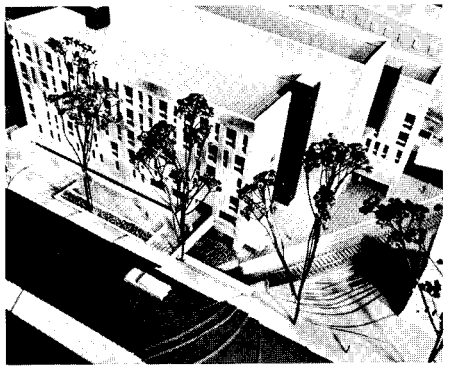
A prototype health program to serve an entire university community is being initiated by Yale for its 30,000 students, faculty, employees—and their families. The Health Plan will offer a broad range of services—and to house these and associated medical staff, a $4.5-million Health Center is being constructed which will be in operation by the end of 1971.

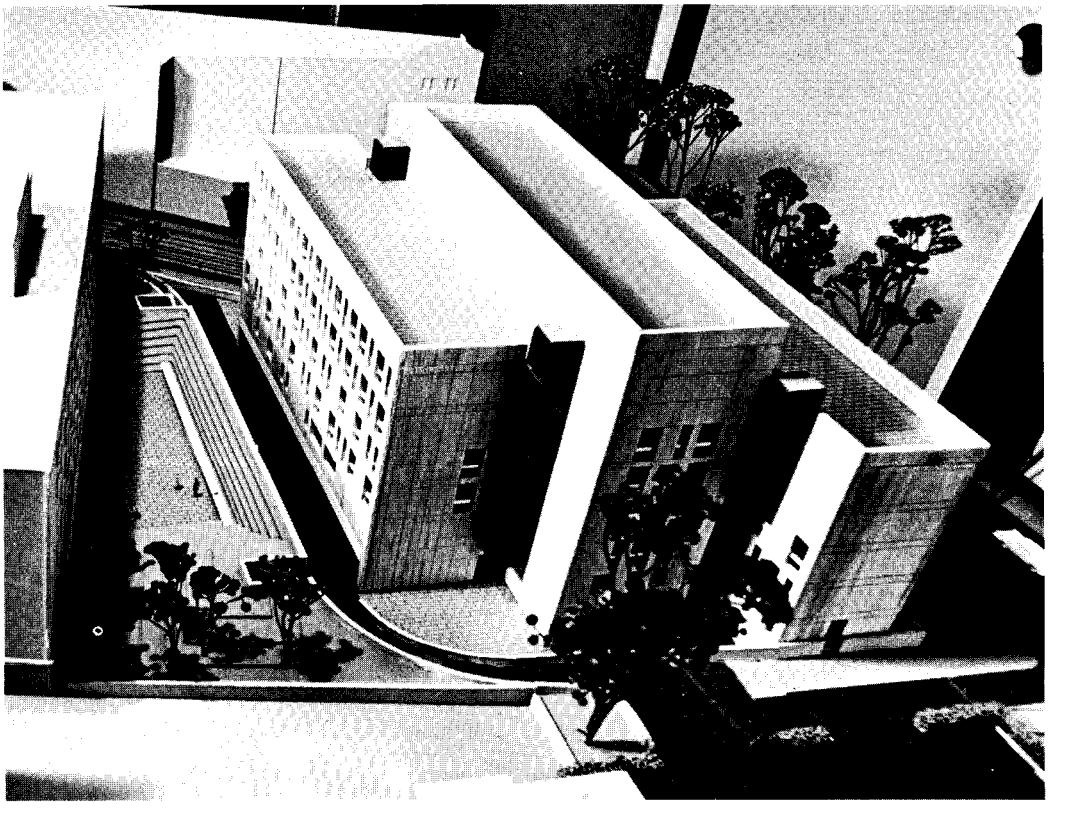
The six-story structure, designed by Westermann/Miller/Associates, will be located on Hillhouse Avenue near Philip Johnson's Kline Science complex (see July/Aug. '66 issue). It will follow setback and height limits set by existing buildings. Because of site limitations the building, which would have been a square, is stepped in three sections to fit the lot (see plan). A corridor around the service core in the center section extends arms to the outer walls; these walls at the ends of the corridors are glazed.

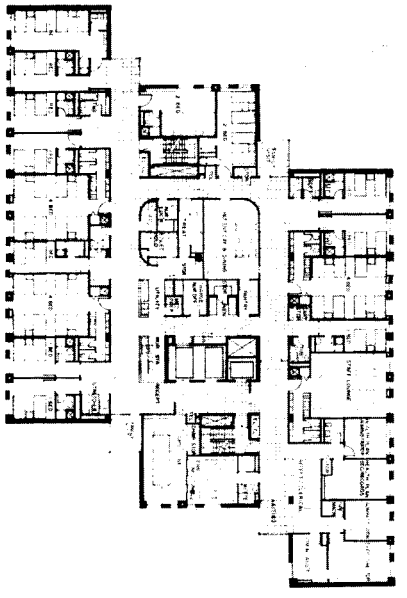
The building is designed on a 2-ft., 6-in. grid which is reflected on the limestone-faced exterior by deep-set windows phased irregularly across the facade.

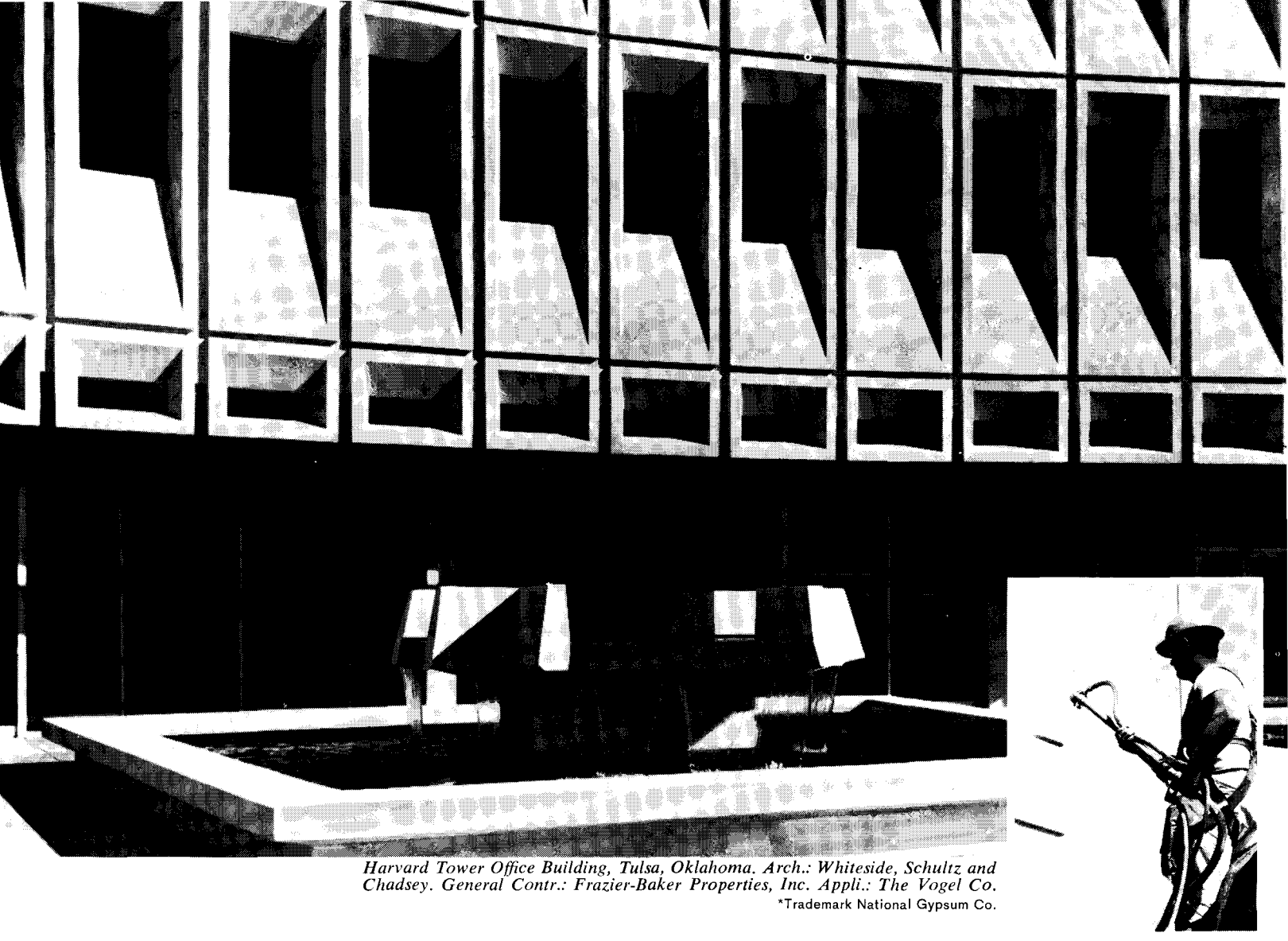
Inside, each floor has its own special function; emergency diagnostic treatment, consulting and examination, mental health, and —on top two floors—infirmary.











Harvard Tower Office Building, Tulsa, Oklahoma. Arch.: Whiteside, Schultz and Chadsey. General Contr.: Frazier-Baker Properties, Inc. Appli.: The Vogel Co.

*Trademark National Gypsum Co.

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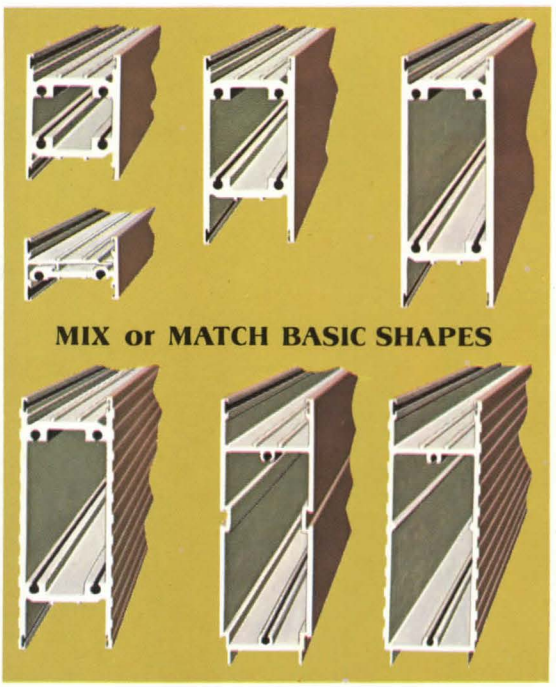

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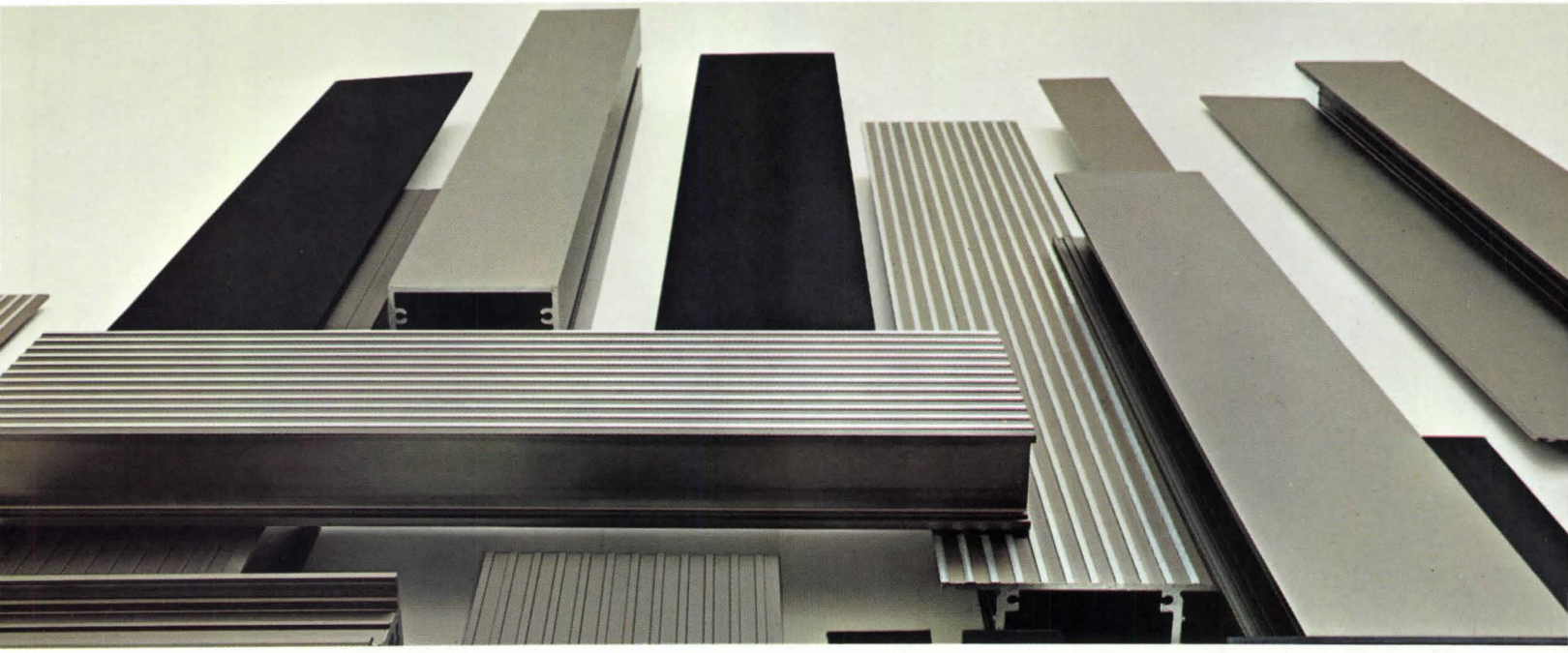

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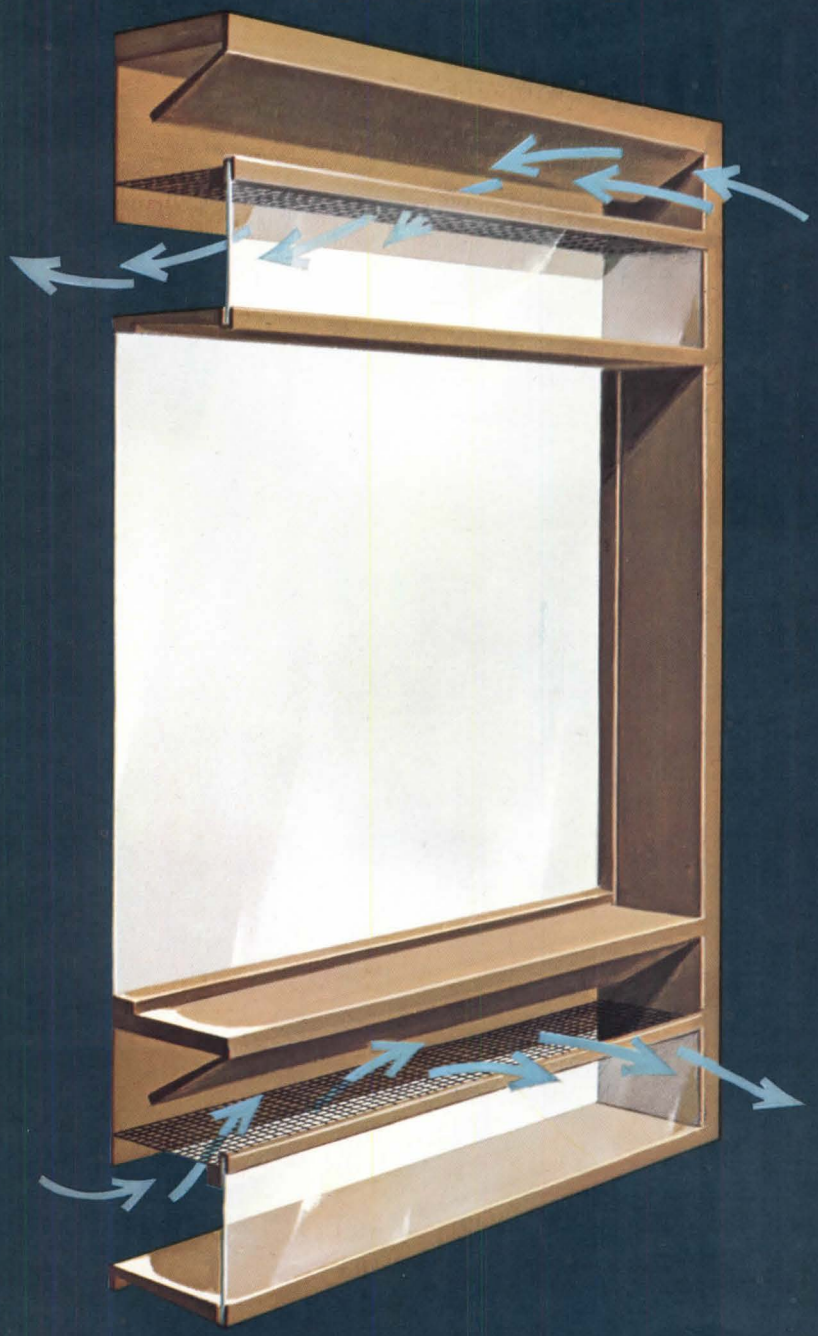

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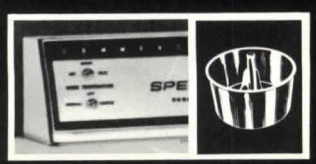

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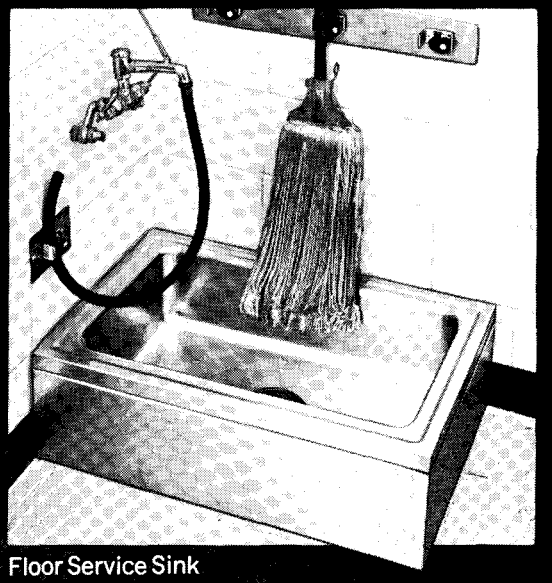

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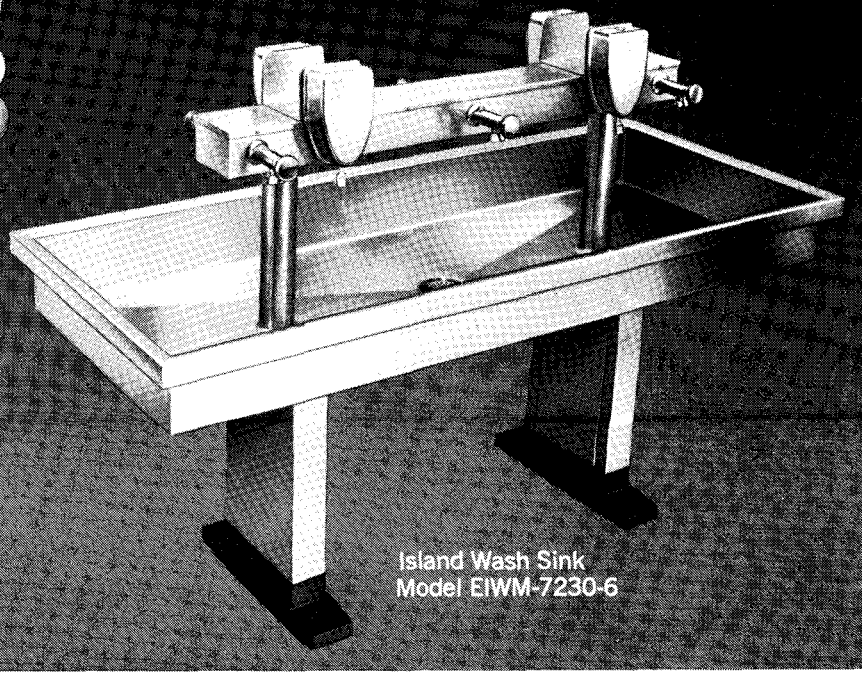

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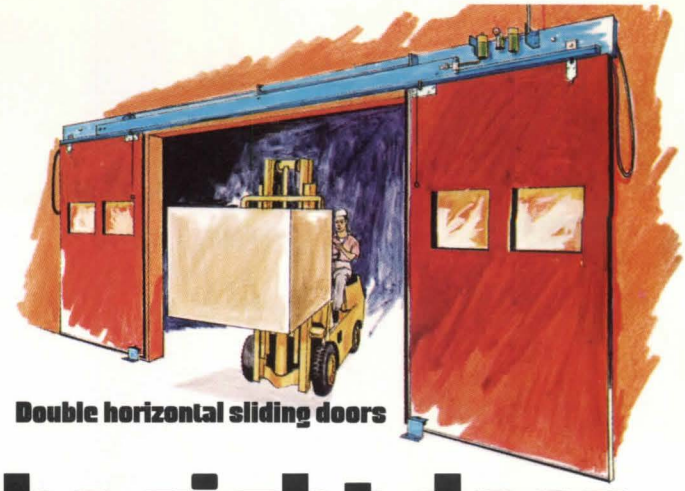

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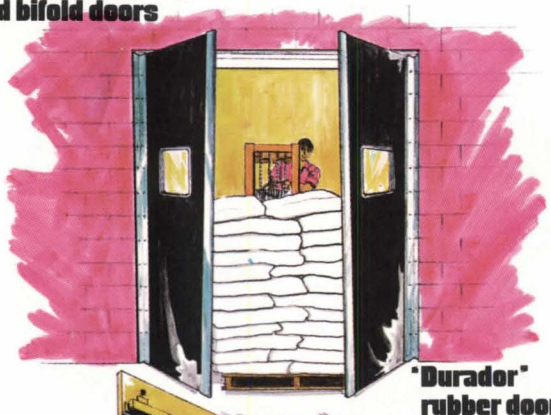
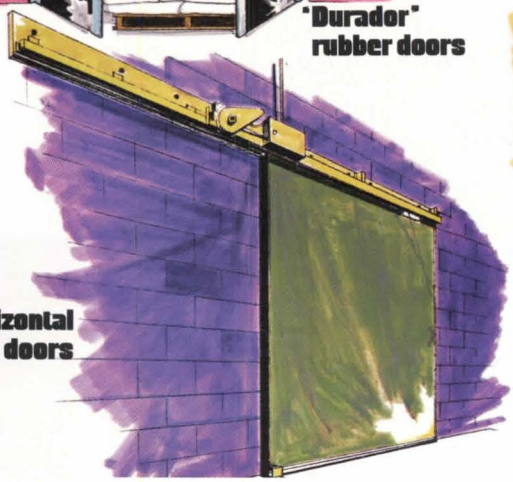


"Durador" rubber doors



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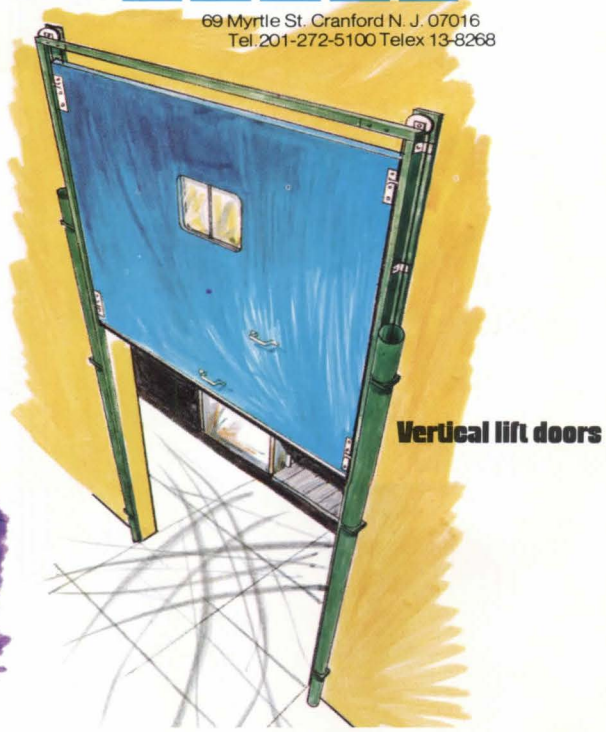


Vertical lift doors

FORUM

FROM A-DAY TO E-DAY

Julius Sterling Morton, a pioneering newspaper publisher and a kind of Johnny Appleseed, created Arbor Day in 1872 in his native Nebraska. By 1890, 35 states had followed his lead; then, over the years, Arbor Day lapsed into a ridiculed ritual of old ladies and schoolgirls with a spade in one hand and a flag in the other (New York City, 1903, below).

Nebraska still celebrates Arbor Day on Morton's birthday, April 22. Coincidentally, but appropriately, that date was selected for the nationwide Environmental Teach-In this month (March issue, page 19). Morton's simple tree-planting ceremony contained an implicit warning of environmental rape that, unfortunately, is being borne out—in spades. Concern has gone so far beyond trees that a group of coeds at a Teach-In preview at the University of Michigan last month could sing, of legalized abortion: "Round about the cauldron go/ In the poison entrails throw/ Rot with chlorox, bleed from pins/Jam the rusty hangers in/ . . . Countless women who've swallowed lye/All you men have made them die. . . ." No silly old ladies or schoolgirls these!

It was a blunt affair all around. High school students peddled books about the "population bomb"; the president of Dow Chemical Co.—reportedly a $5,000 contributor to the cost of the four-day, "Earth Day" observance—came to speak and was roundly booed, as was Arthur Godfrey, for their "reactionary" views; 15,000 turned out for a community rally; hundreds joined a field trip along the Huron River to study its ecological problems; and Walter Reuther, president of the United Auto Workers, acknowledged that it might be a better world if fewer people were making automobiles.

Many of the now-familiar advocates were present: Dr. Barry Commoner (June '69 issue); Senators Gaylord Nelson (Dem., Wisc.) and Edmund S. Muskie (Dem., Me.). The university's President, Dr. Robben Fleming, gave his support to demands for student-faculty participation in voting the school's shares of General Motors stock. The Nixon Administration had its representatives there, and Rep. Henry Reuss (Dem., Wisc.) took testimony from students for the House Government Operations Subcommittee on Conservation and Natural Resources, which he chairs.

And, of course, militants denounced environmental reform as an evasion of social and political needs; and Negro leaders heckled the speakers for their "white middle-class cop-out" from the problems of the blacks and the poor.

All in all, perhaps an accurate sampling of what can be expected at the 900 colleges and 3,000 high schools which had announced their participation in Earth Day by mid-March.

ENVIRONMENT

ON THE PEACEFUL ATOM

Plowshare, the government program that explodes atomic devices underground for peaceful purposes (Jan./Feb. '68, page 45; Mar. '69, page 28) is still new and already it is too much for conservationists and too little for the AEC, which is raising the specter of a plowshare gap with the Russians.

Dr. Edward Teller, director of the Lawrence Radiation Laboratory at the University of California, says, in *New Scientist* magazine, that he is on both sides. "I am a progressive; I believe in progress. I am also a conservationist, and I believe in clean air and clean water." He then makes the case for a broadened Plowshare program by concluding that proper control is the answer.

But, he says, "only in the case of radioactive contamination have we demanded that the pollutant be essentially no more than the natural amount . . ." If that demand were made of other pollutants, he says, automobiles, fossil-fueled power plants, and most industrial plants would be banned. Teller doesn't think this is quite fair.

As an example of the "natural amount" of radiation, he points out that anyone "foolhardy enough to live in Colorado" spends their lives closer to the sky, the source of cosmic rays, and nearer than most people to uranium deposits. The citizens of Colorado are exposed, he says, "to almost as much natural radiation as the U.S. Atomic Energy Commission permits."

One recent report (of which he makes no mention) might help even up the score in his mind. A team of investigators has charged that one plant, operated by the Dow Chemical Co. for the manufacture of

atomic devices, has itself produced enough radiation waste to endanger the health of the people of Denver.

Two proposals Teller makes for possible ways to expand Plowshare raise some doubts quite apart from radiation:

"Deep underground," he says, "much geothermal heat can be found. Logically enough, there seems to be a lot of it around extinct volcanoes, some of which are located all along the Pacific coast in the northwest part of the United States. A nuclear explosion could be used not so much to produce heat but to open up this geothermal reservoir. The explosion would produce a rubble cone, expose a lot of surface of the hot rock so that we can pump water down, convert it into steam and use it."

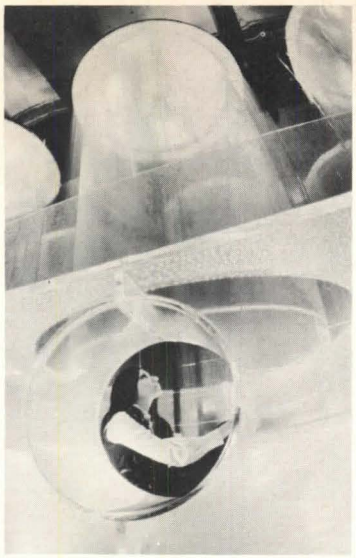
Along with those extinct volcanoes, of course, is the country's most celebrated network of earthquake faults, not exactly extinct. Considerations of the effects of such an explosion on the faults aside, it has already been shown—in Denver, of all places—that pumping water in great quantities into the earth can itself cause earthquakes (Oct. '69, page 34.)

"One may remember the increasing role that big oil tankers play in the cheap distribution of the necessities of modern life," Teller continues. "Many new ships have a displacement of 300,000 tons and ships of 700,000 tons are on the drawing boards. Compared to these carriers, one may consider the *Queen Mary* as an oversized canoe. . . . The difficulty is that neither our canals nor our harbors can accommodate these new monstrous ships. Plowshare may be the best means by which to create the appropriate waterways and the necessary harbor facilities."

With the number of recent tanker-caused oil slicks fresh in our memories, one can hardly avoid—though Teller does—pointing out that "these new monstrous ships" could also make the *Torrey Canyon* look like a canoe.

STARTING WITH A TEST TUBE

Four graduates of Pratt Institute in New York City—Peter Heer, Jon Olson, Sam Apple, and Harry Fischman—call themselves Aleph, described as "a coalition of creative forces from the associated disciplines of architecture, music, graphics, dance, industrial design, urban planning, and film."



For the future, they are planning a newspaper, a major film on the quality of the environment, and eventually hope to start a "community of brothers in the search for solutions to problems of the environment."

For the present, they have begun with the "space capsule" shown above, which was a latecomer to the Contemplation Environments show at New York's Museum of Contemporary Crafts (March issue, page 20). The young lady, having crawled through the tunnel, foreground, sits in a huge acrylic test tube, the tip of which is submersed in the tank. Water is piped up over the outside of the tube and falls all about her. The effect is multiplied by mirrors and lighted by strobes.

"Rather than 'return to nature' by avoiding technological discipline and limitations," says Aleph, "we work to return to man with technology as our matrix and nature as our teacher."

LANDMARKS

TIME BULLDOZES ON

In the last two months, Los Angeles has lost two more architectural landmarks: one down, one doomed. At this rate, before many more months have gone, it will have wiped clean its architectural heritage.

The fight to save the Walter Luther Dodge House, the 1916 masterwork of Architect Irving Gill (right), is too valiant-and-all-in-vain to recall here. The FORUM featured the struggle in its October 1966 issue at a point when some thought the house had been saved, but realists weren't counting their chickens. Its demise, however, seems like something plotted by an old-fashioned melodramatist.

The house's present owners, Riviera Management Co. of Torrance, Calif., responded to architects and preservationists by refusing to answer its telephone (unlisted) or registered letters. City Hall could furnish the preservationist sleuths no information about the absentee landlords from incorporation papers. There were none. Finally, Michael J. Elliott, executive director of the Southern California Chapter of the AIA, succeeded in arranging a meeting with Riviera on a Friday. "I left the meeting," he said, "believing we would have cooperation even though they did not commit themselves."

The following Monday morning, bulldozers razed the house in a driving rain.

The other landmark, Bertram Goodhue's downtown Central Library, completed in 1925, was doomed when the Board of Library Commissioners adopted a motion to call for proposals for development of the site as a highrise office tower complex that would include a new library. Last year a fight was waged to save a portion of the park that surrounds the building (Oct. '69 issue, page 87; Dec., page 24), which the library said it needed as a parking lot for librarians. Architect Robert E. Alexander, president of the Southern California Chapter of the AIA, called the parking lot a "smoke-screen for the city's real intentions." Last month the city proved him right.

LOOKOUT IN WASHINGTON . . .

Ominous "raze or save" battle lines are being drawn around Washington D.C.'s Old Post Office on Pennsylvania Avenue, circa 1899. Critic Wolf Von Eckardt calls it his city's "most hideously glorious pile of Romanesque granite." It is also a stumbling block in the endlessly belabored completion of the Federal Triangle area.

In the pre-Nixon era, Pennsylvania Avenue planners announced the Old Post Office would go but its clock tower would stay, grafted on to a new —but classic style—extention of the Triangle's Internal Revenue building (below). Then John

Carl Warnecke, the architect commissioned by the Democrats to finish the Triangle, discovered the clock tower could be free-standing. He would set it in a small semi-circular niche of his modern building which would close the Triangle gap. He liked its potential as a lookout tower, since it could accom-

modate twice as many visitors as the Washington Monument.

Then Vincent Kling, on becoming the Nixon regime's architect, said the whole landmark must come down, even though it is part of a designated "national historic site," because it would destroy his scheme to finish off the Triangle in "genuine replica" fashion à la Andrew Mellon's vision of 50 years ago.

Further confusing battle lines, Skidmore, Owings & Merrill are a house divided on this one. Nat Owings of the National Capital Planning Commission says leave the tower up. Gordon Bunshaft of the Fine Arts Commission says tear it down. Kling's response now is that he doesn't care one way or the other.

Von Eckardt proposes that the "glorious pile" could swing as a kind of Ghirardelli Square East. Renting out its upper floors as offices and facelifting its large inner court for shops, restaurants, and art galleries, he speculates, would pull people and action into this monumental part of town, now gloomily deserted after hours.

. . . OUTLOOK IN ST. LOUIS

Out in St. Louis, the fortunes of that Old Post Office are up for review. In a few months the building is set to be vacated by the GSA. Five years of petitions, pickets, bumper stickers and even music (there is an official "Save the Old Post Office" song), studies, and imaginative, yet feasible plans for future use of this landmark have gone into the effort to save it.

Though the heat generated by the GSA to have it torn down is temporarily off, the crucial question—what are we saving it for?—may still be asked. Building on previous studies by Joseph Murphy and Joseph Passonneau, local Architect William Peckham has a scheme showing how the 88-year-old mass and interior spaces can contribute to the city's civic and commercial life *and* turn a profit.

The major exterior change would be to raise the bottom of the 28-ft.-deep moat surrounding the landmark (probably the only downtown moat in the U.S.) up one level. This would extend the "first basement," which is a half story down from the sidewalk, into a public circulation area for an es-

planade (50 ft. by 232 ft.) of galleries and shops. Capitalizing on the great dome and on the lightwell which is now cut off by the ceiling of the mail room, the whole central area could be opened up and turned into a 6,000-sq.-ft. landscaped plaza. This plaza would be topped by a plastic dome letting in all the natural light, but invisible from the street.

Meanwhile, the Save the Old Post Office Committee would like to get the Smithsonian Institution to move some of its collections in; and the city comptroller is trying to work out a deal to trade other St. Louis land to the feds for a parking garage and getting the Post Office for private development in return. Whatever the outcome, Daniel Chester French's splendidly sculpted figures on the great dome (above) seem to have tired of the whole thing.

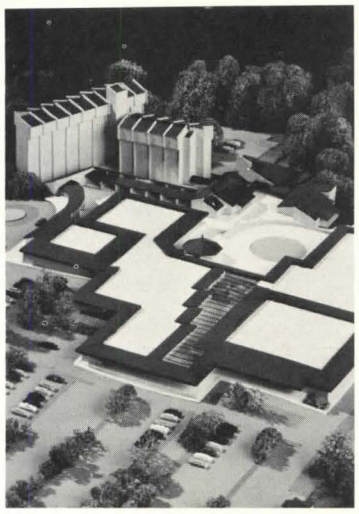
NEW TOWNS

RESTON EXPANSION

At a recent awards presentation in Reston, Va. (below), William H. Magness, president of Gulf Reston Inc., present owners and

developers of the new town, accepted the Fairfax County government's first annual Beautification Award for the Lake Anne Village Center. The village center—the highrise Heron House in background of photo is its center-piece—was designed by Whittlesey & Conklin, first master planners for Reston. The center was the first phase of construction back in the halcyon days (July/Aug., '65 issue) when Reston was owned by Robert E. Simon, who believed that innovative architecture and planning need not be unsaleable.

Gulf Reston has now announced plans for a second village center that promises to compete well in the market place, if not in future awards-programs. Designed by Architects Cohen, Haft & Associates



of Silver Spring, Md., the Hunters Woods Village Center will enclose 100,000 sq. ft. of commercial lease space in a covered mall. It will also include a church and community building, a highrise apartment building, townhouses, patio homes, and apartments. In the "heart" of the center will be "a reflecting pond and fountain, and a pizzeria in a gazebo-type structure."

Gulf has also announced plans to build 1,200 low- and moderate-income apartments over the next three years, partly to still criticism of its upper-middle-class image by many Reston residents and others. Of the 1,200 units, only 50 would be earmarked for low-income families in this "initial phase," as against 300 such units completed or under construction in the new town of Columbia, Md.

BEERSHEBA HONORED

The new-town plan for the ancient Biblical city of Beersheba in Israel, it was announced last month, is the winner of the R. S. Reynolds Memorial Award for Community Architecture. The award has been made only

(*continued on page* 76)

EXPO 70

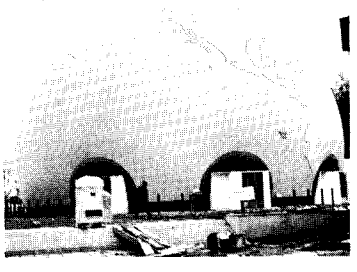
As this is written, Expo 70 in Osaka is just about complete and Emperor Hirohito will open the fair in four days from now.

He will do so from a royal box located in the center of the Expo Theme Pavilion—a building of such vastness as to overshadow, in scale and in other qualities as well, most of the great spaces built in this century (see photo, left). Its designer was Kenzo Tange; its dimensions are almost 1,000 ft. long, 360 ft. wide, and 100 ft. high to the underside of the polyester-covered spaceframe which forms the roof and is, itself, more than 30 ft. "thick" between bottom and top chords. The roof stands on six columns, was assembled on the ground, and jacked up from there. (Unhappily, the Theme Pavilion is graced by a terrible piece of sculpture, 198 ft. tall, by Taro Okamoto—a sort of puffed-up Sun God rendered in the style of Macy's Thanksgiving Parade. Unlike Mickey Mouse, however, the Sun God does not deflate.)

Although Tange's Theme Pavilion dominates Expo 70 as, indeed, it should, there are a number of lesser pavilions that are sure to take a prize or two.

Some flops . . .

The booby prizes, to consider first things first, must go to pavilions contributed by the USSR and the USA, respectively. The Soviet Pavilion (top left)—a sort of cut-rate Italian Futurist rendering, in painted steel, of massed flags parading through Red Square—is an object of such monumental banality as to make lovers of Russia despair of the descendants of Tatlin and Lissitzky. And the USA contribution—not the official U.S. Pavilion, of course, of which more will be said below—is a six-story-tall bubble inflated on Japanese soil by the U.S. Travel Service of the U.S. Department of Commerce (below), and representing—right, you got it the first time—the Globe! (It's a pretty *neat* idea—even though the most prominent landmasses displayed to potential travelers to the U.S. are those of the Soviet Union (including Siberia), Red China, Polynesia, etc.)



So much for the dropouts. There are a couple of others, but let us turn to the stars.

. . . and many hits

First, the Canadian Pavilion (cover and pages 34-35). Like all the best buildings at Expo 70, the Canadian Pavilion recognizes that exhibition architecture should not be buildings in the conventional sense. They should be daring experiments, in the tradition of Paxton's Crystal Palace or they should be wonderful theater. The Canadian Pavilion is the latter: four triangular prisms sheathed in mirrored glass or plastic, reflecting light and flags and, above all, people. In the center of this arrangement of prisms is a great stage, for live performances (for which Canada budgeted $2 million that will be very well spent). It is a happy and beautiful place.

Second, the pavilions of the Netherlands, of Switzerland, of Czechoslovakia, of Cuba, and of other imaginative nations. They are shown on pages 36-37, and they are all very different—though they are all, in their own ways, highly theatrical too, more sculpture than architecture.

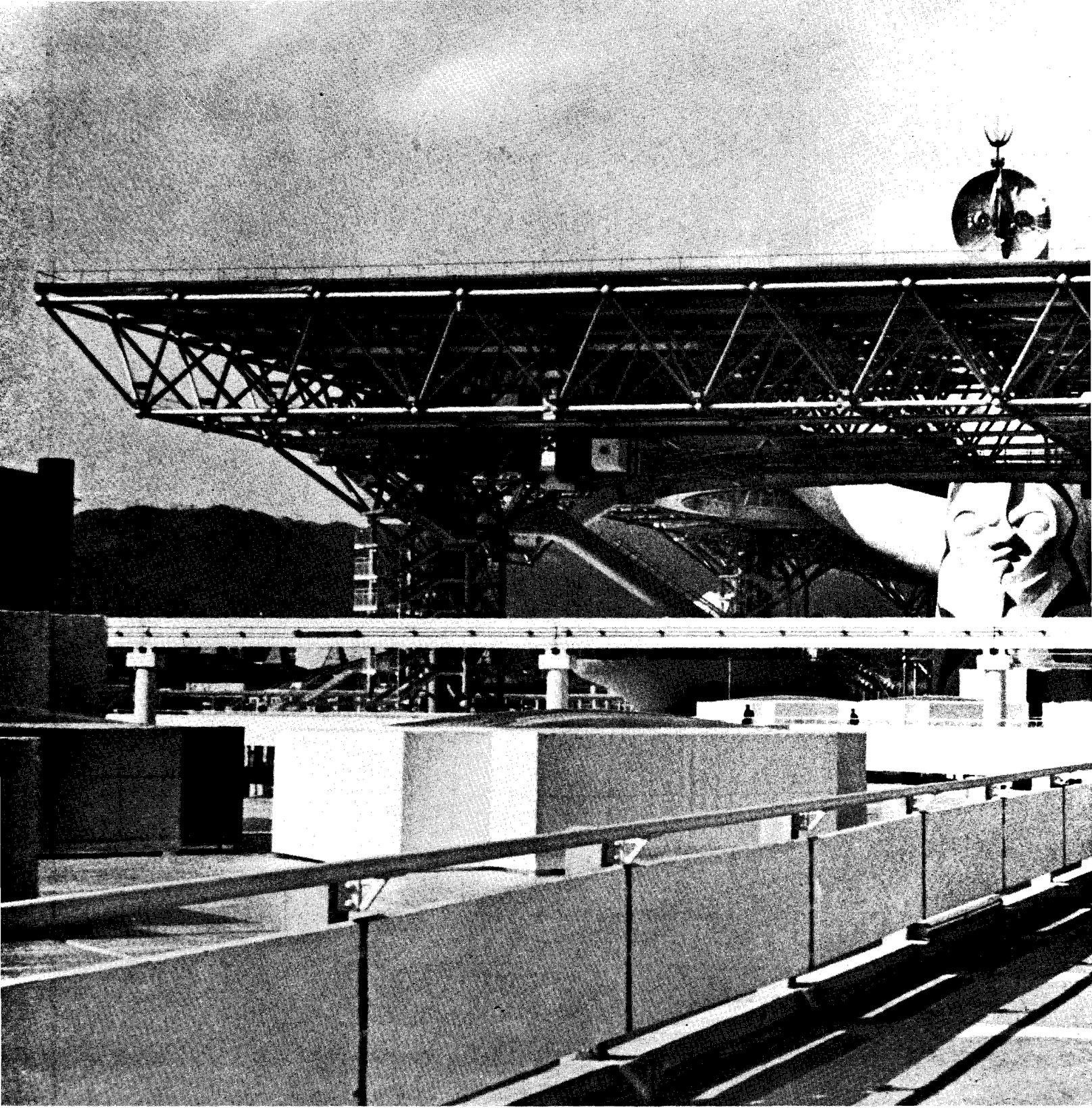
Third, there are the three pavilions designed by that extraordinary young Japanese Metabolist architect, Kisho Kurokawa. His Takara Beautilion was described in detail in our March issue. His Toshiba-IHI Pavilion is shown on page 38. And his third pavilion (also shown on page 38) is a collection of capsules built *into* Kenzo Tange's spaceframe over the huge Theme Pavilion plaza. It is a wild and wonderful collection of science fiction pop that easily outshines the very serious exhibits within, contributed by such architects as Berkeley, Calif.'s Christopher Alexander and Paris' Yona Friedman. Any visitor not subject to attacks of vertigo may climb the 200 steps up into Tange's spaceframe and view the exhibits. Cowards can see Kurokawa's capsules nestling among Tange's tetrahedra from the plaza below.

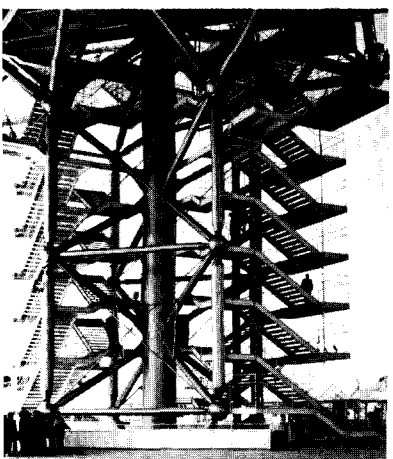
Fourth, there are all the innumerable geodesic domes (some nice, others not); there are all the innumerable inflatables (especially the huge, yellow and orange inflated tea cozy for the Fuji Industries, which must be seen to be believed and may have been rated "x" by the time you read this); there are all the innumerable plug-in jobs; and finally, there are all the sensitive, clean modern buildings—perhaps not sufficiently "expo" (they could all have been built anywhere, any time, for any enlightened client, during the past 25 years; still, they are so much better than what one once cringed to see at World's Fairs that they deserve their prizes too): Colombia, Republic of China, Great Britain, and others. Some of these are shown on pages 36-37.

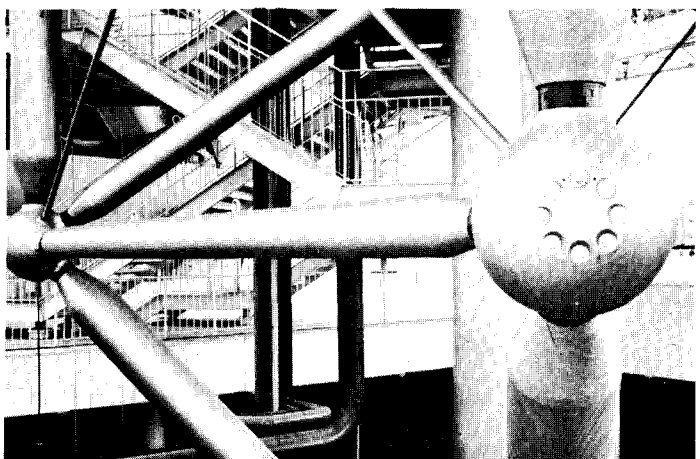
And, finally, there is the U.S. Pavilion (see also Dec. '69 issue). It is rather hard to find, since it is partly underground. Once found, it is virtually invisible. But it is, quite simply, the most daring structure at Osaka: it really advances building technology as no other building at Expo 70; and while it doesn't impress some of our civic boosters, it certainly impresses the technologists—including those from the USSR. After all, nobody has ever before spanned an area the size of two football fields with a thin sheet of fiberglass and vinyl supported on nothing but air. It's the sort of trick that reminds you of Jesus walking on water.

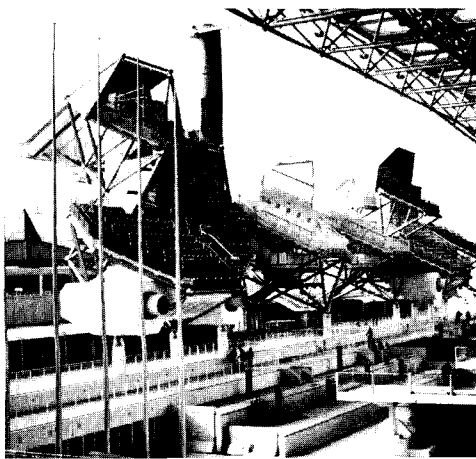
The exhibition inside the U.S. Pavilion will not impress our civic boosters, either; it is an extremely sophisticated documentation of U.S. life—such things as architecture, sports, science, folk art, establishment art, far-out art, and space. It is not a very theatrical show—and this problem, and a couple of others, are discussed on page 41—but it is, as one Japanese intellectual said, a very honest show. And in so non-egalitarian a society as that of Japan it would seem important to talk to the intellectual leadership of the country.

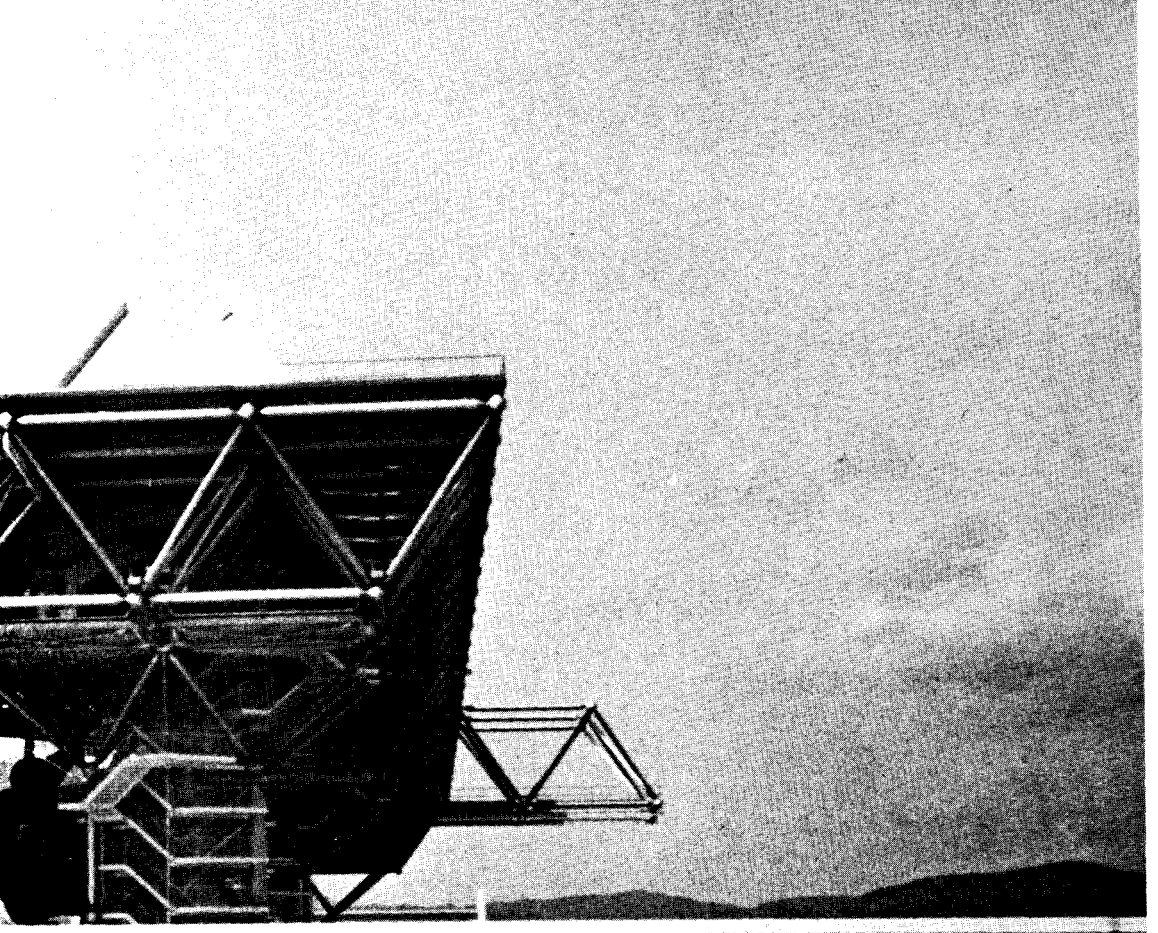
Does Expo 70 make any sense? It seems to make sense to the Japanese, very proud to have copped the first World's Fair ever to be held in Asia. But to architects and planners and designers? Perhaps the next ten pages will provide an answer—with one tentative conclusion on page 41. —PETER BLAKE

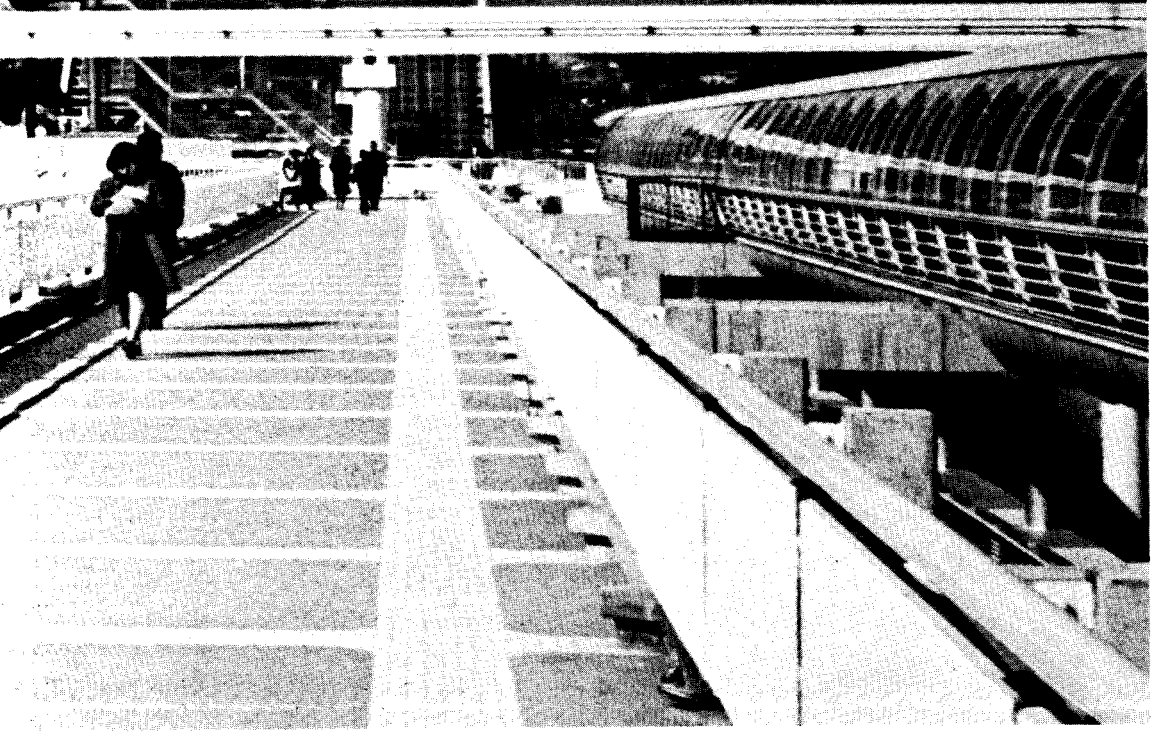


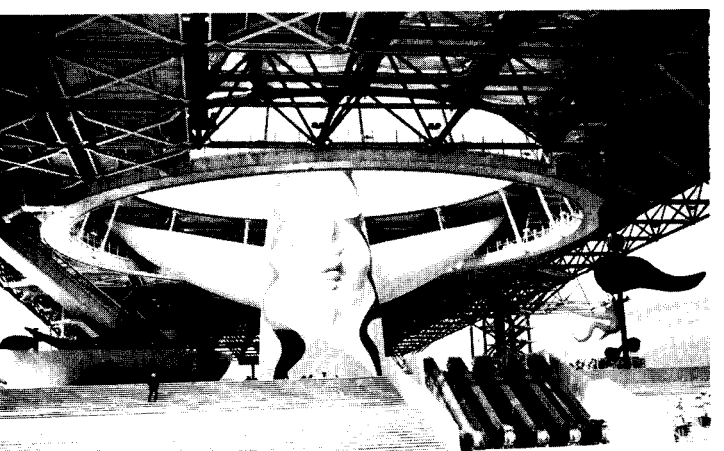


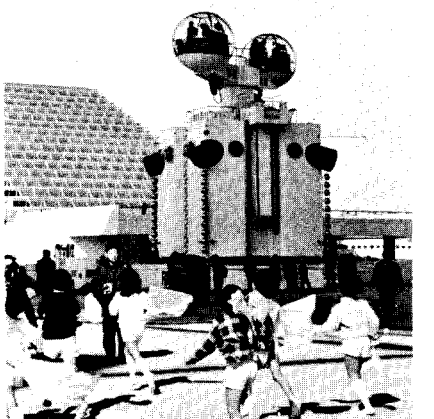












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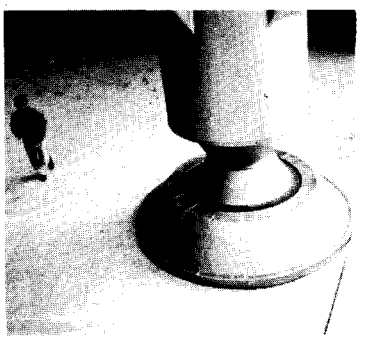
THEME PAVILION

Kenzo Tange's vast spaceframe (1) covers an area the size of four New York City blocks. It is supported on six column assemblies (2, 3), and was jacked up on these, 100 ft. into the air, after having been put together on the ground. It is difficult to convey the scale of this structure, but a close-up of the foot of one of the columns (7) will give you a rough idea.

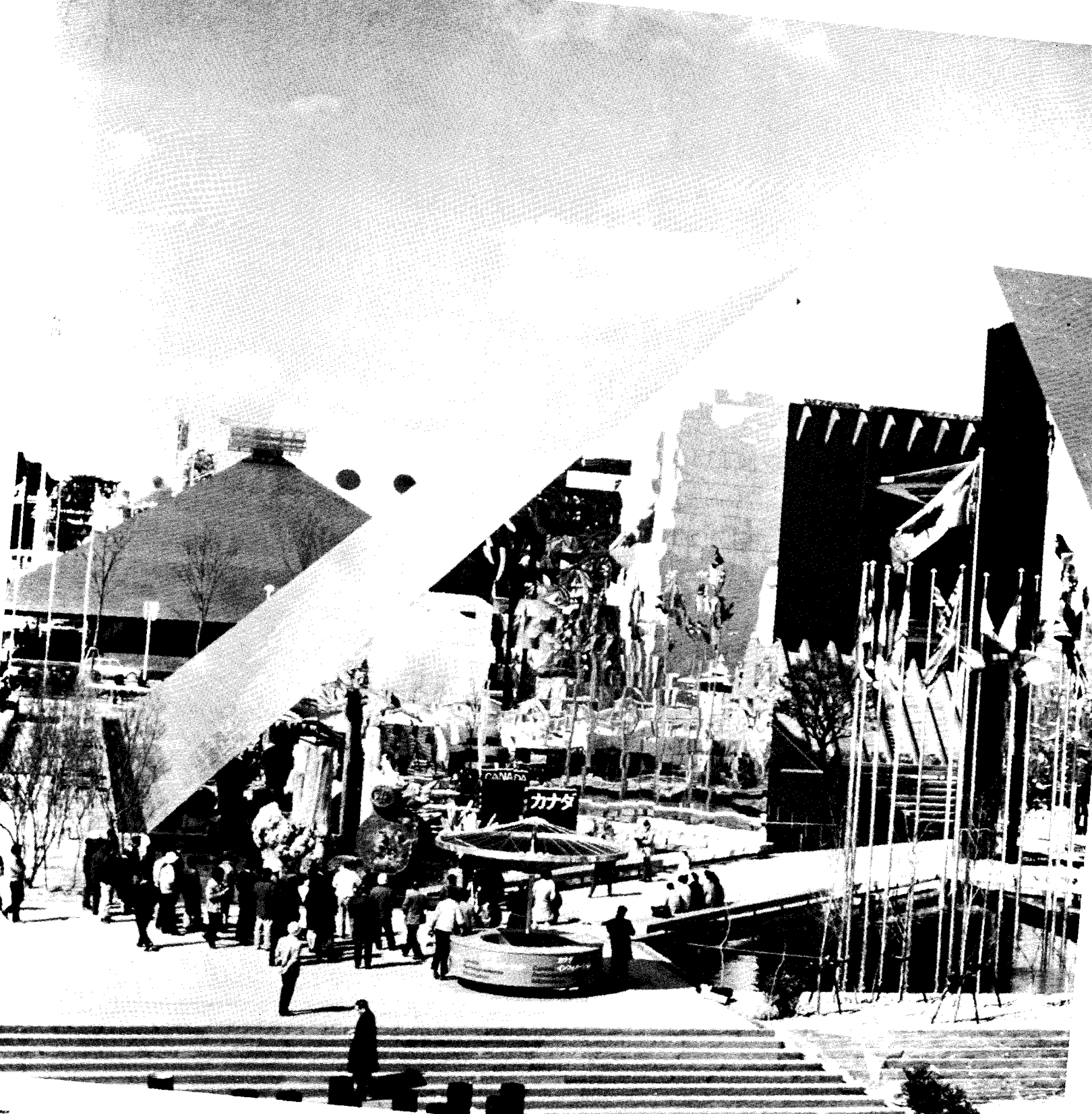
The spaceframe shelters a couple of plazas used for parades, dances, and other spectaculars. To add to the science-fiction aura of the structure, Tange and his associates have equipped the plazas with giant robots, self-propelled, that do everything from lighting the spectaculars to televising them. The tallest of these measures 70 ft. (6), and its two "eyes" contain TV cameras and crews. It was designed by Arata Isozaki. There are also self-propelled grandstands (4) in addition to the parasol-enclosed loges plugged into the sides of the space. The latter, by the way, are air conditioned—cool air simply being spilled in the general direction of the spectators.

Although Tange's magnificent structure dominates Expo 70, it is merely the hub of a system of pedestrian and vehicular transportation that the architect calls "the branches of a tree, with the attached pavilions forming the many leaves and flowers." Some elements of the transportation system are visible at left (1)—the monorail train passing in



front of the Theme Pavilion; the enclosed and air-conditioned moving sidewalk—elevated throughout the fair grounds, and visible at near left in the large photo; and the escalators leading from the suburban train station (5) up to the deplorable sculpture in the center of the pavilion.

The Theme Pavilion is, quite clearly, the biggest and possibly the most majestic building-structure built in this century—except for the Vehicle Assembly Building at Cape Kennedy. It is a breathtaking place.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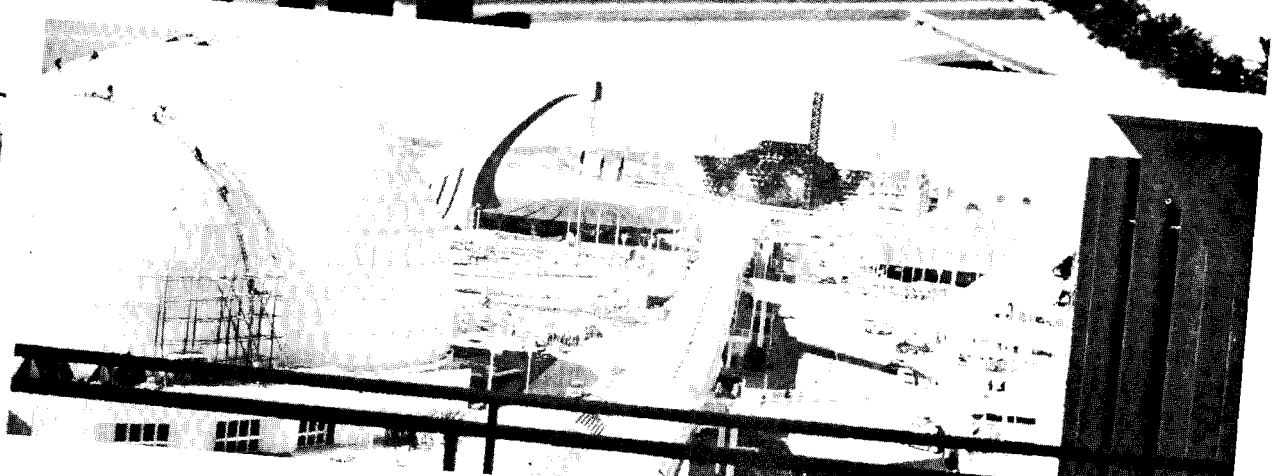

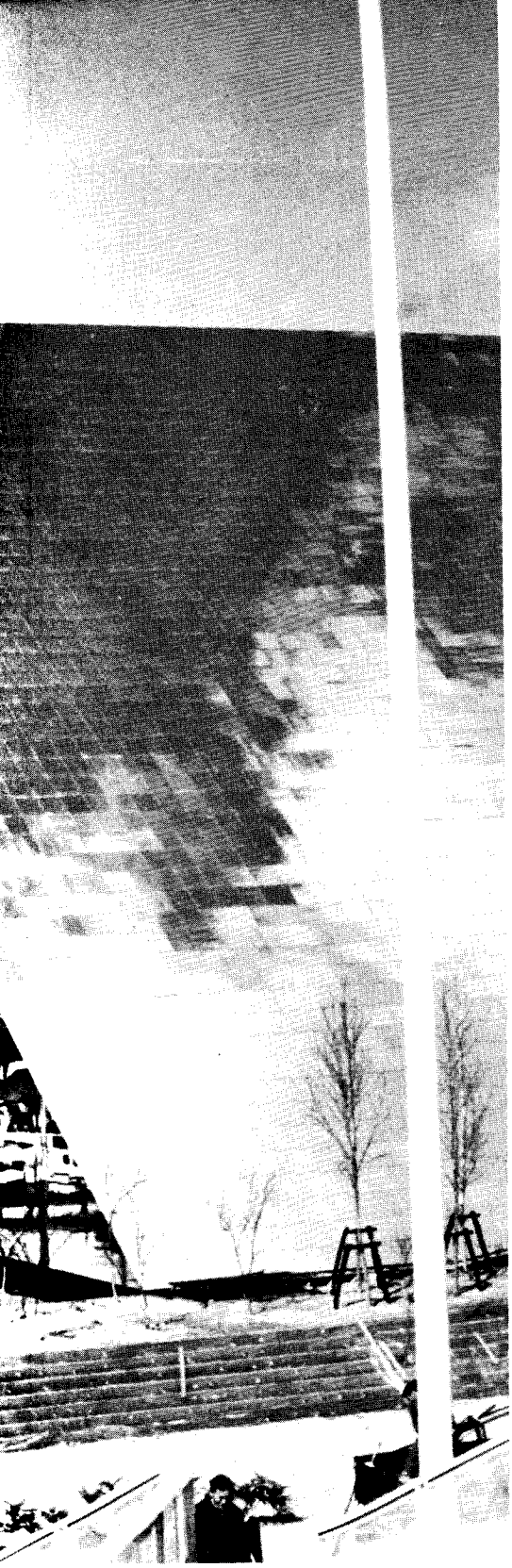

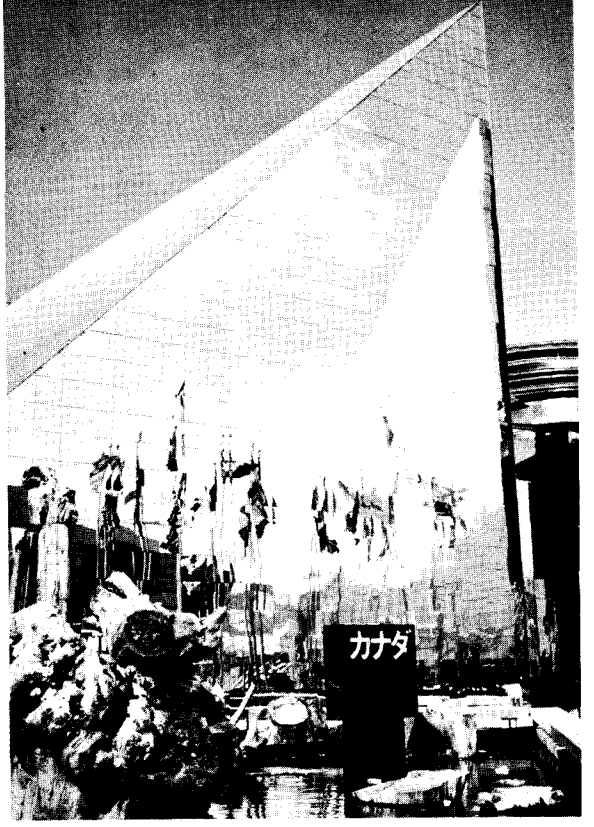

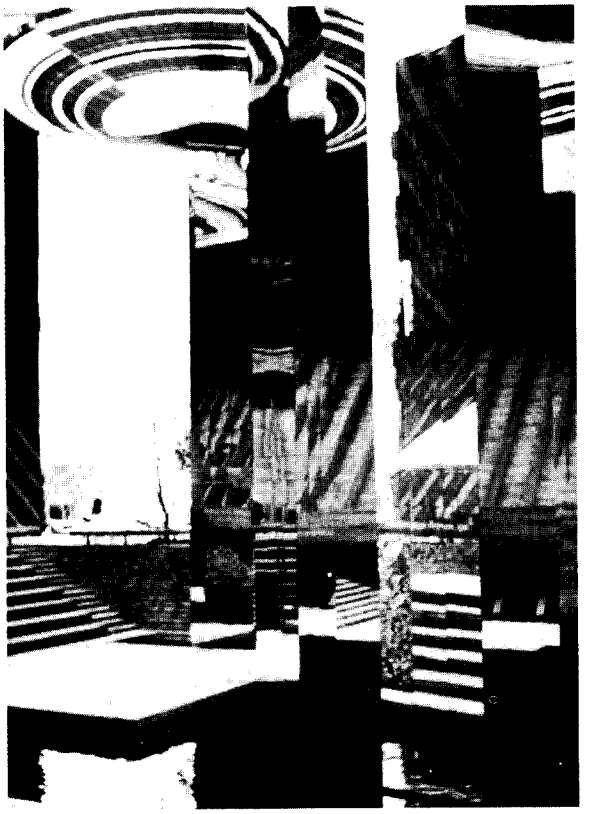

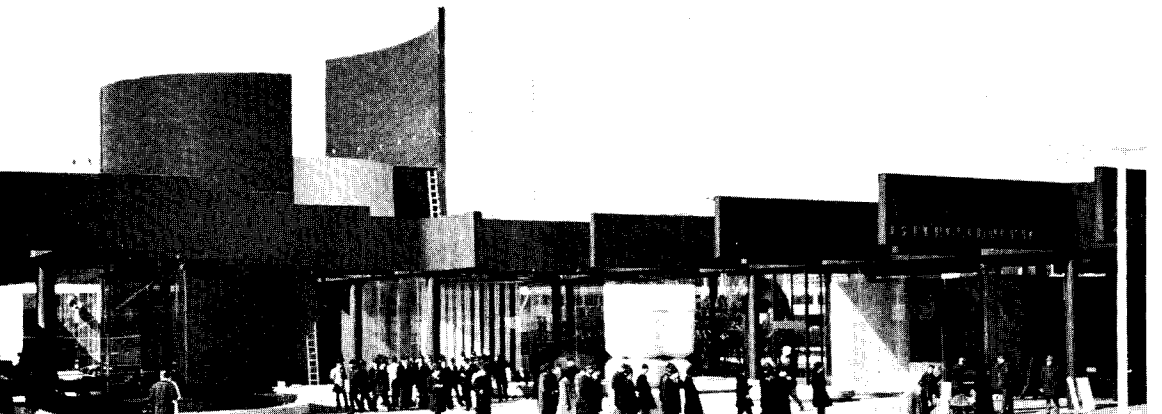

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CANADIAN SPECTACULAR

The Canadian Pavilion, designed by Erickson/Massey (see also pages 42-47) consists of four trapezoid-shaped prisms sheathed in mirrored glass or plastic (8) and placed so as to form an open, interior court for various kinds of live performances. The mirrored surfaces are a brilliant, theatrical device: they reflect everything—people, the sky, the clouds, trees, surrounding pavilions and their flags (9). In the court there are mirrored columns (10) that carry slowly rotating red, white, blue and green parasols—and these, in turn, are again reflected and refracted on various mirrored surfaces. Visitors can walk through the pavilion while passing from one part of the fair site to another, and get some sense of the vast spaces of Canada.

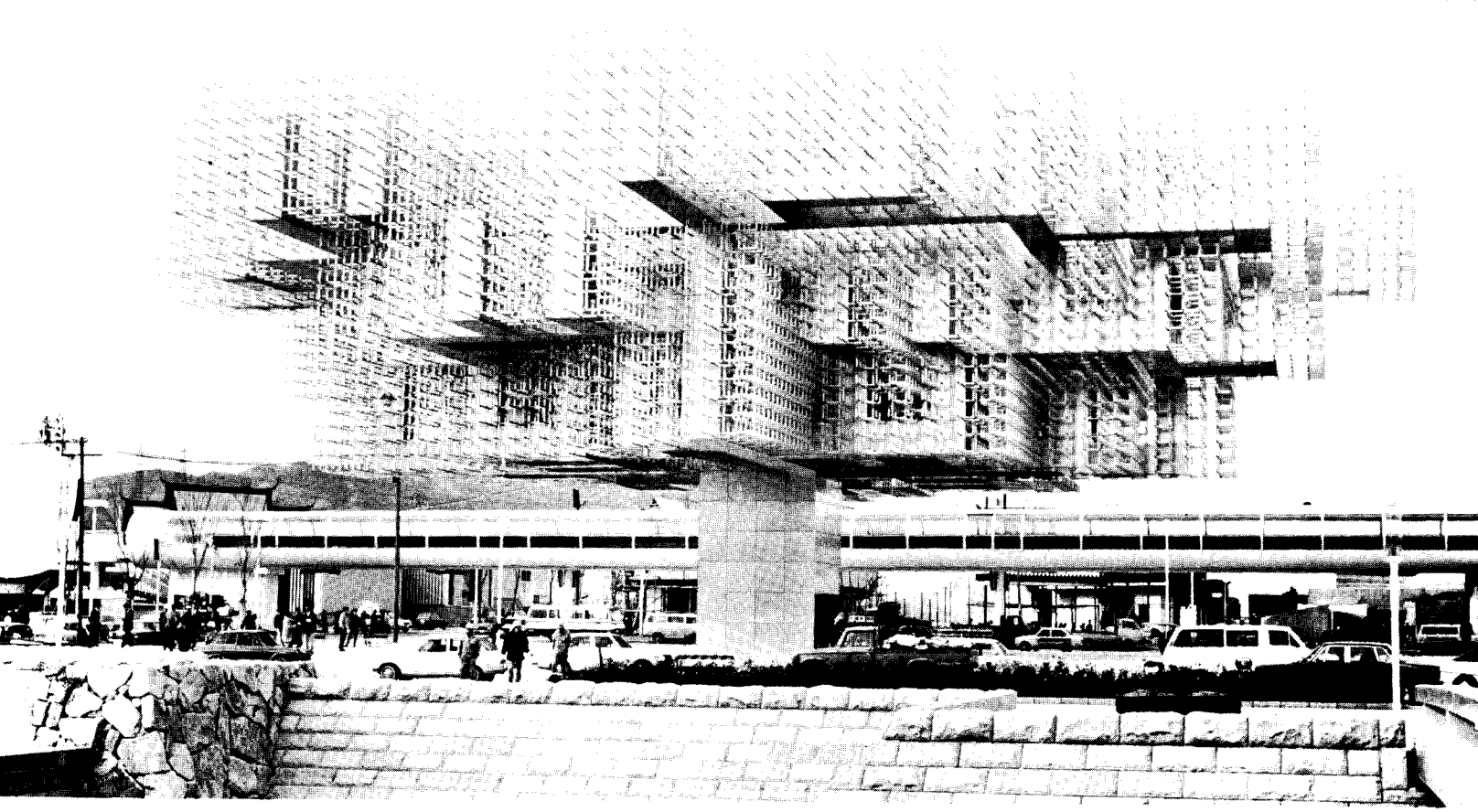
There is nothing particularly radical about the Canadian Pavilion in terms of structural design, but it is very, very good as theater—better than almost any other pavilion, in that respect, at Expo 70.

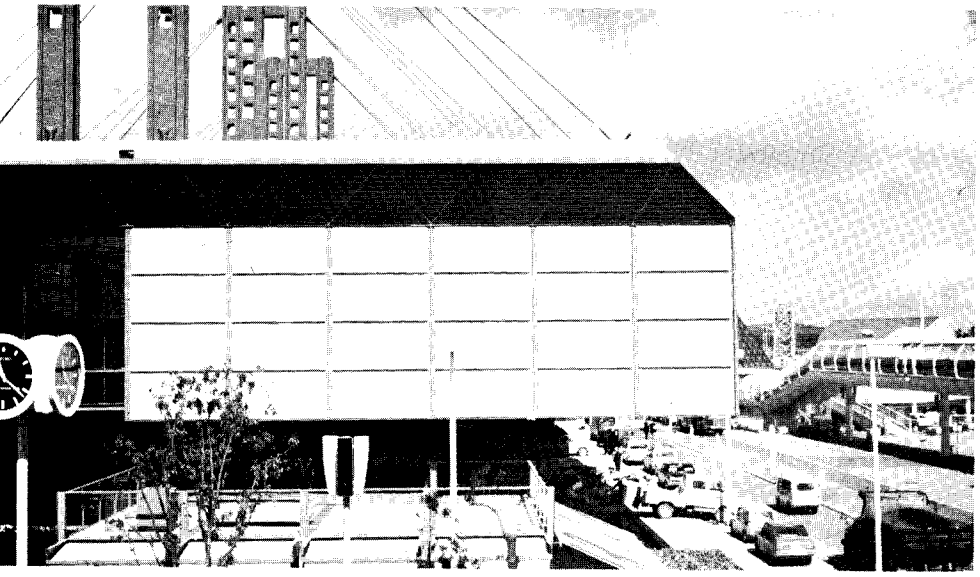
Indeed, a very large part of the exhibition budget will be spent on troupes of performers to be brought over from Canada, on movies, and on concerts. A Canadian bus (11) has been travelling around Japan for the past year, telling the Japanese about Canada and inviting them to the Pavilion.

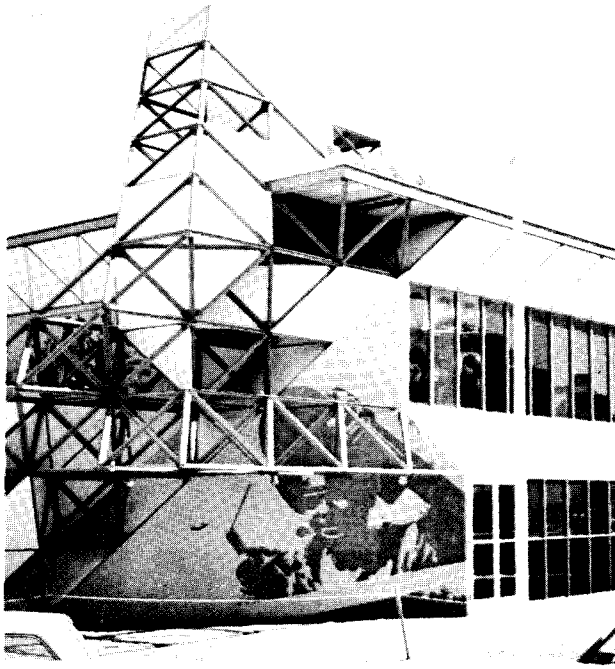
One of the main arteries—an elevated pedestrian walkway is seen in photo (12) extending from the Theme Pavilion toward the bristling Toshiba-IHI Pavilion (see p. 38). To the left of the walkway are the white geodesic domes of the French Pavilion and the gooseneck of the Australian; to the right are the black funnels of the Korean job.

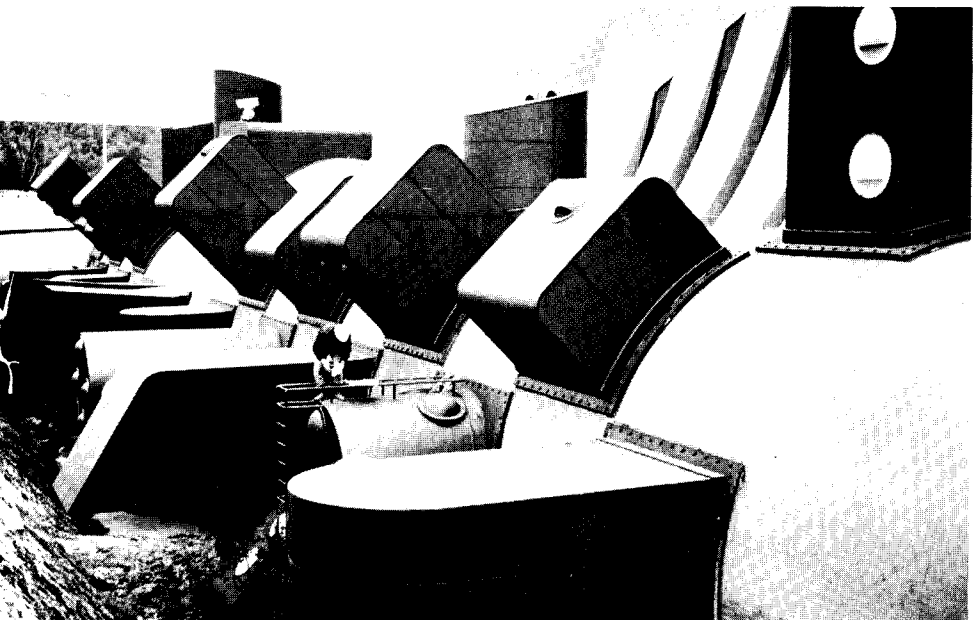
The Czech Pavilion (13) is a curiously subdued structure by comparison with that country's happy building at Montreal's Expo 67. Its roof is a framework of "lamella" girders of steel and plywood, supported on steel columns. (The roof grid is made up of 8-meter squares.) Walls are of Bohemian glass.

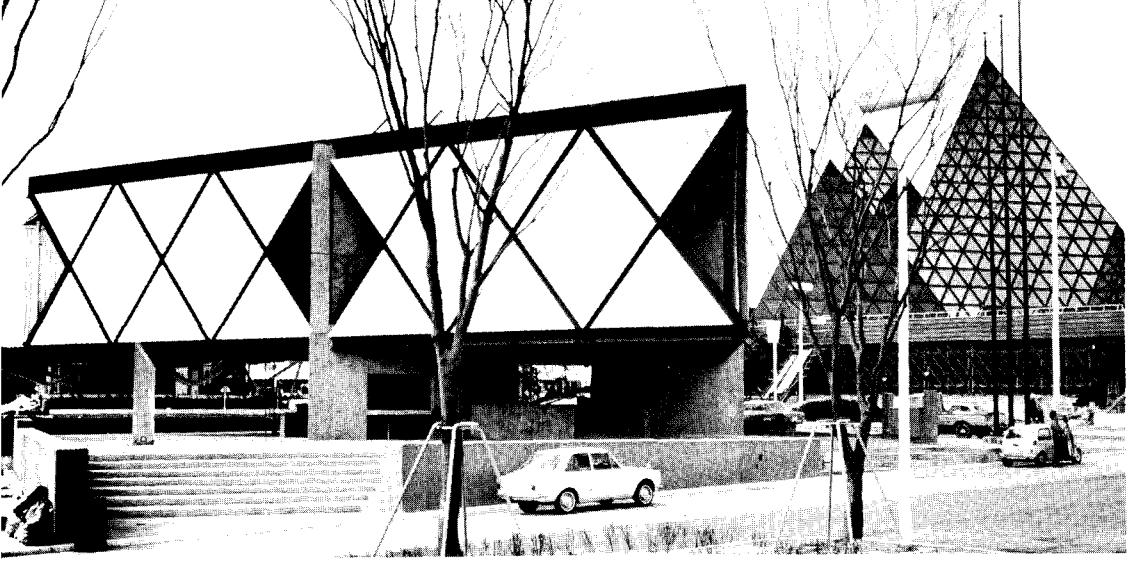
The principal exhibition inside is a beautiful show of sculpture, old and new, sensitively selected and elegantly installed. The taller, rounded structure at the center of the building is a small movie theater for performances of the kind of cinematographic trickery the Czechs made so famous in Montreal.

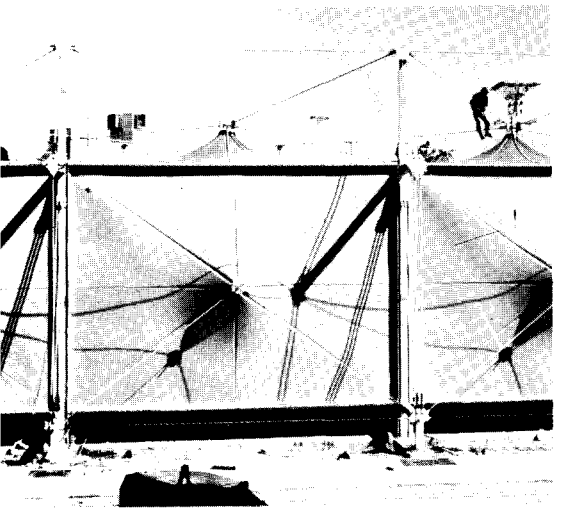


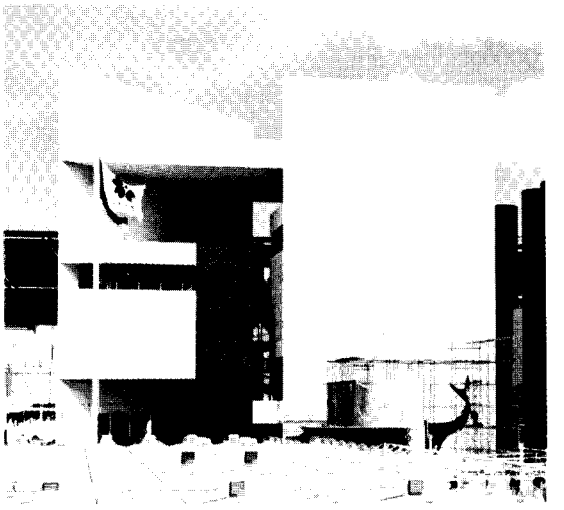


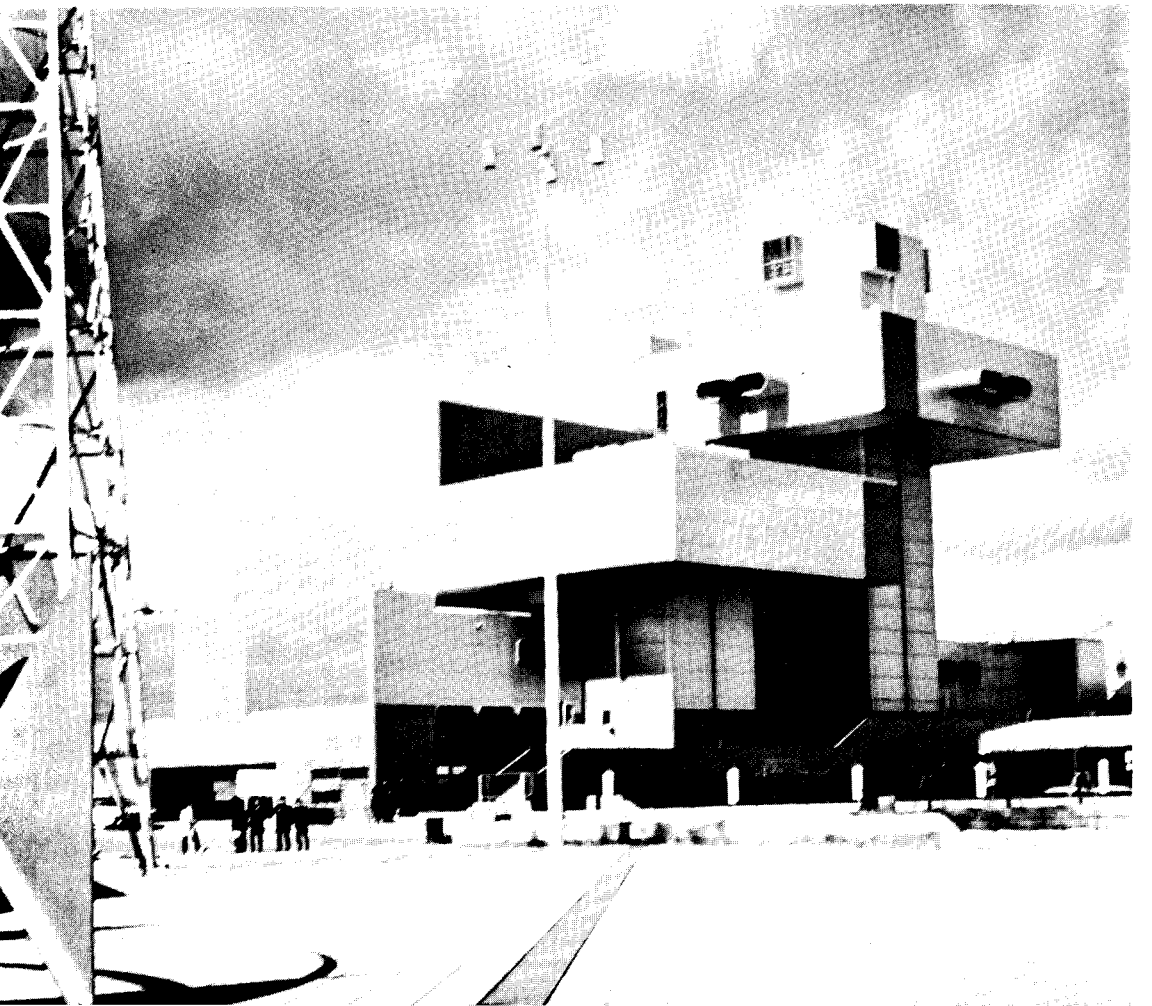


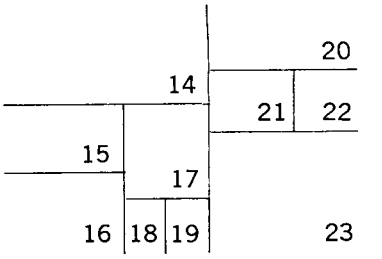












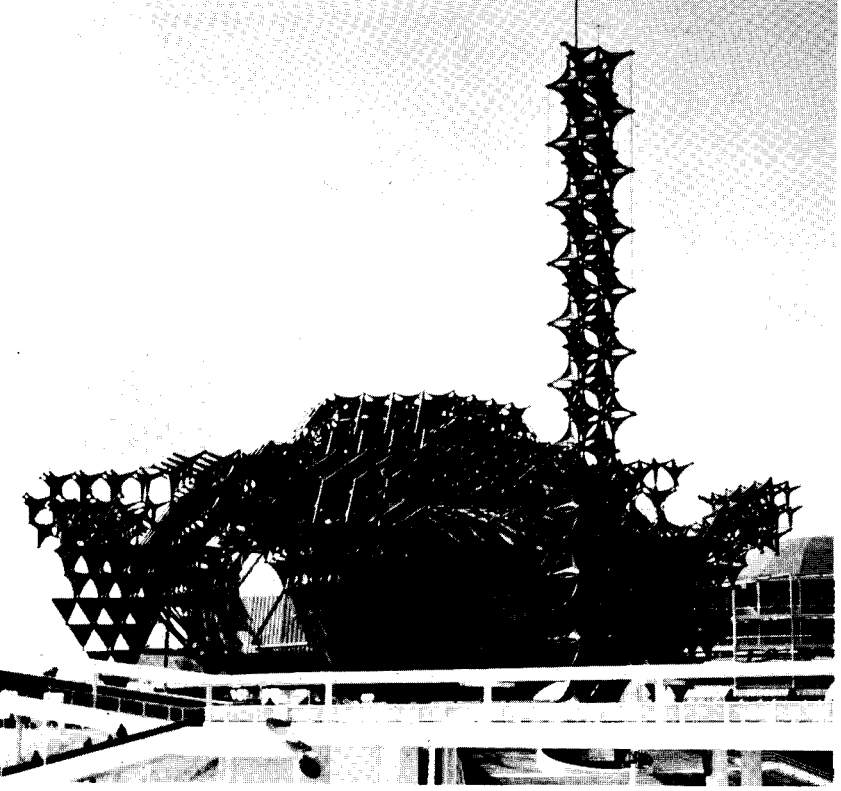
IMAGES OF NATIONS

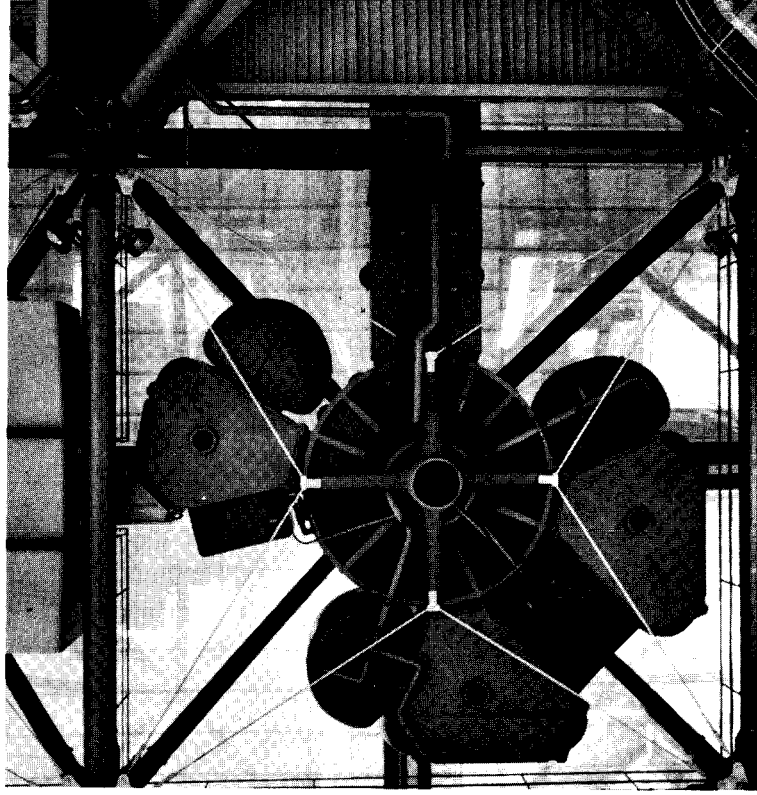
In one way or another, the pavilions shown here try to say something about the countries that commissioned them. The Thai and Saudi Arabian Pavilions (18 and 19) say it in the predictably silly way. The Swiss Pavilion (14) with its magnificently precise filigree tree of aluminum and 35,000 light bulbs says it with high sophistication. The tree and the clean white exhibition hall next to it were designed by Architects Walter, Schmid and Leber. The Cuban Pavilion (17), with its jutting and crude steel space frame, says something about that country—much of it very, very convincingly. It is a building that is best described as "action architecture."

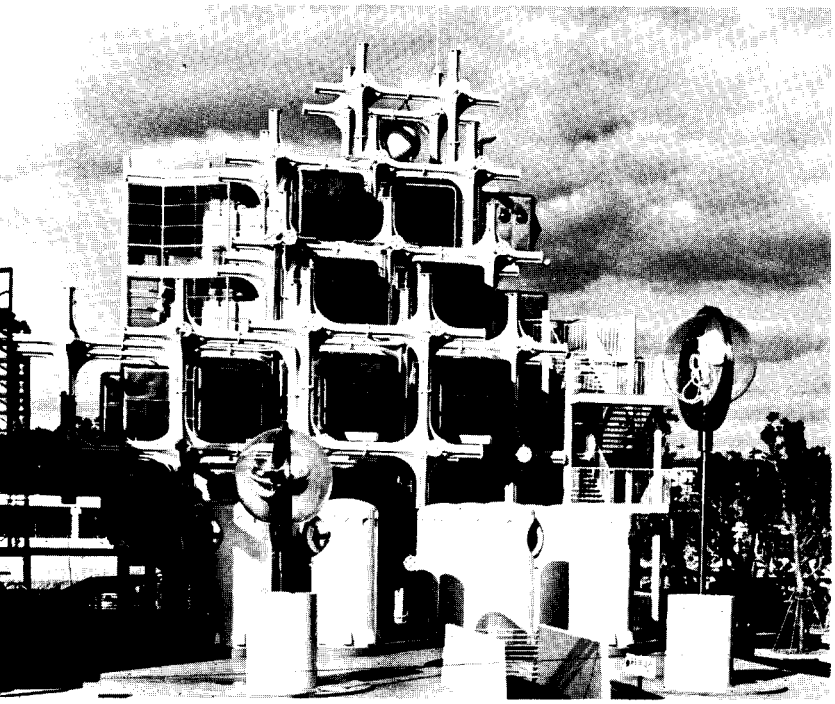
Robin Boyd's exhibition machine next to the Australian Pavilion (16) is action architecture of another kind: a prefabbed tunnel, with moving sidewalks inside, and plugged-in (and also prefabbed) exhibit capsules attached to its sides. Unlike the rather silly, official Australian Pavilion next door, Boyd's job is innovative and experimental.

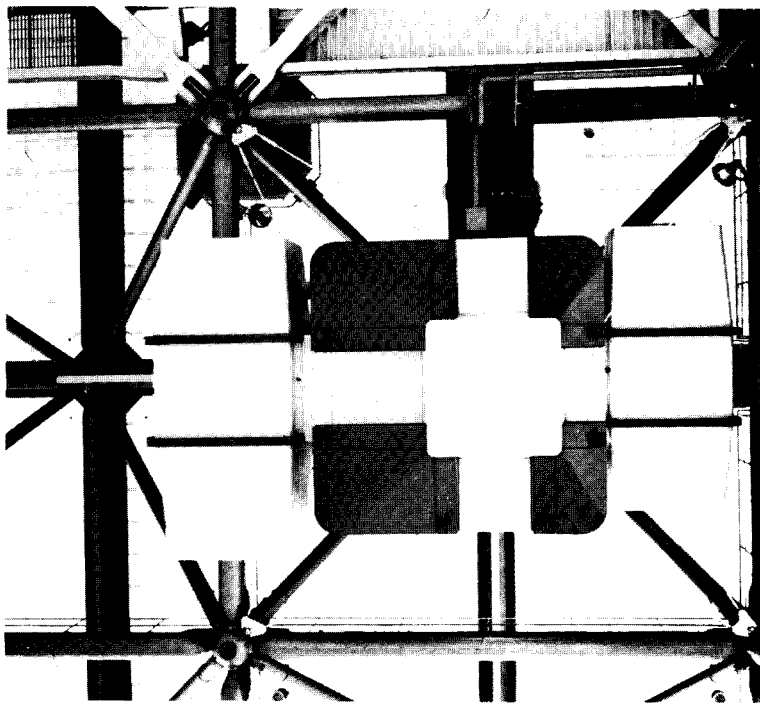
Another fine annex to a less successful official pavilion is Renzo Piano's delicate hall of light steel and prefabricated plastic panels (21), very similar in detail and feeling to his Genoa plant published in last month's issue. And most expressive is the metallic, multicolored pavilion of The Netherlands (23)—expressive of modern nautical/industrial themes. It was designed by Architects Bakema and Weeber.

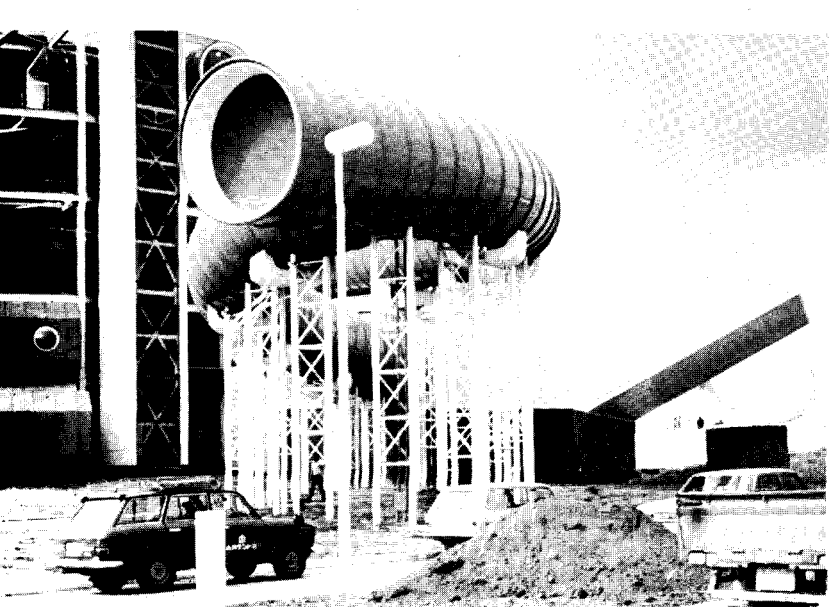
There are a number of other pavilions that go beyond the accepted standards of fair architecture: The Colombian Pavilion (29) by Architect Carlos Dupuy is a charming little triangular museum, with three identical triangular galleries grouped around a hexagonal core. The building is framed in steel cantilevered out from the concrete core. The Republic of China Pavilion (22) by Y. H. Peng and C. Y. Lee, with I. M. Pei as architect-coordinator, is another neat job well above average in competence — also triangulated in plan, as it happens. And the British Pavilion, by Powell & Moya (15) is a neat suspension structure of steel in the best tradition of British establishment architecture. It is as clean and neat and safe as the Cuban Pavilion (shown here next to it) is wild and untidy and adventurous.

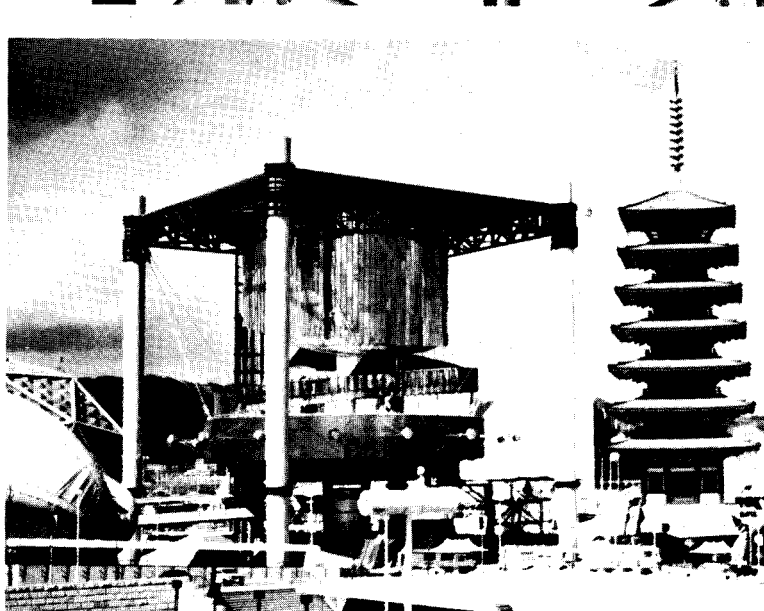


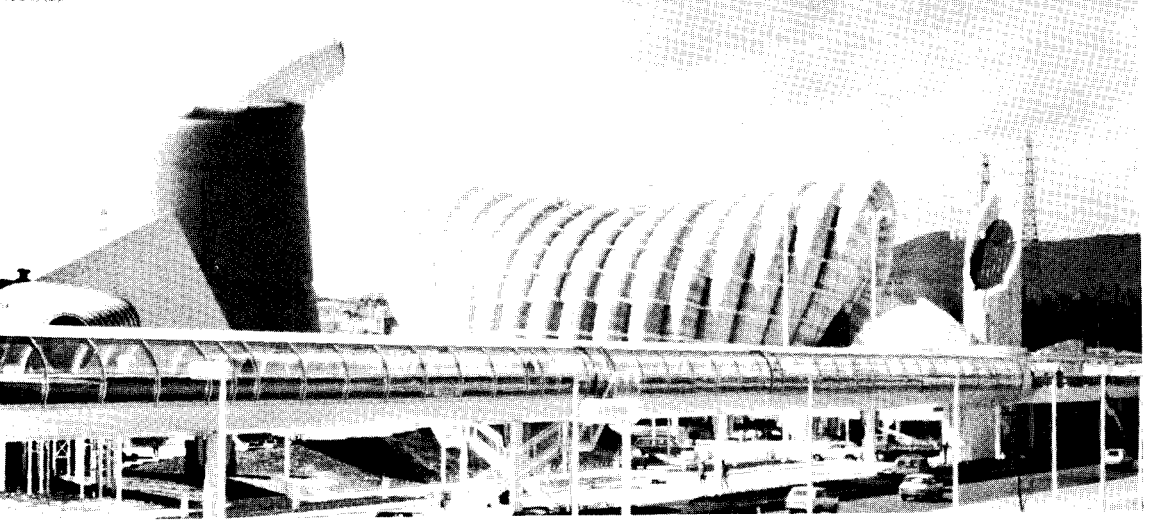


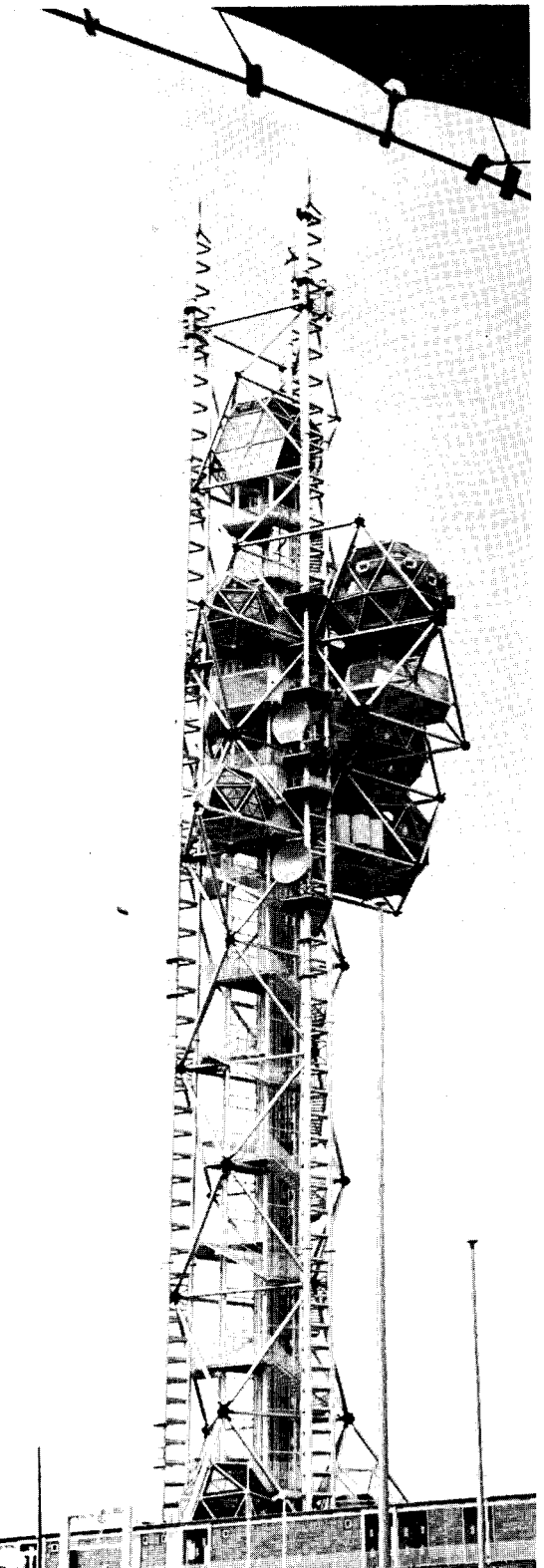


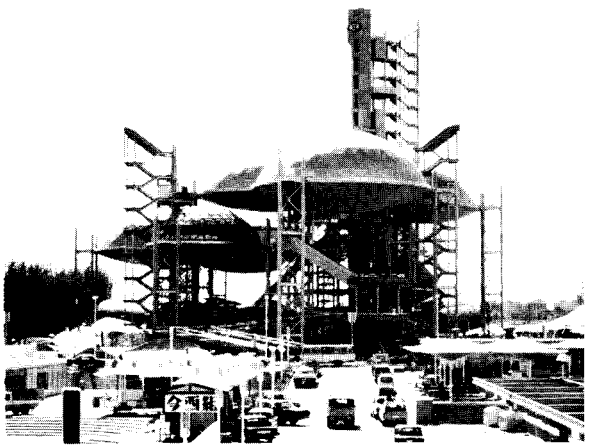


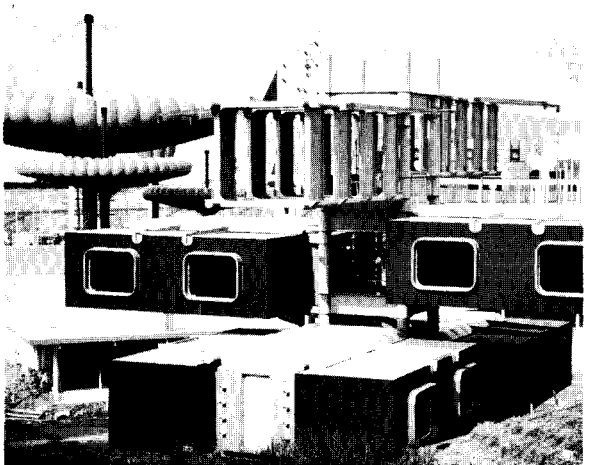












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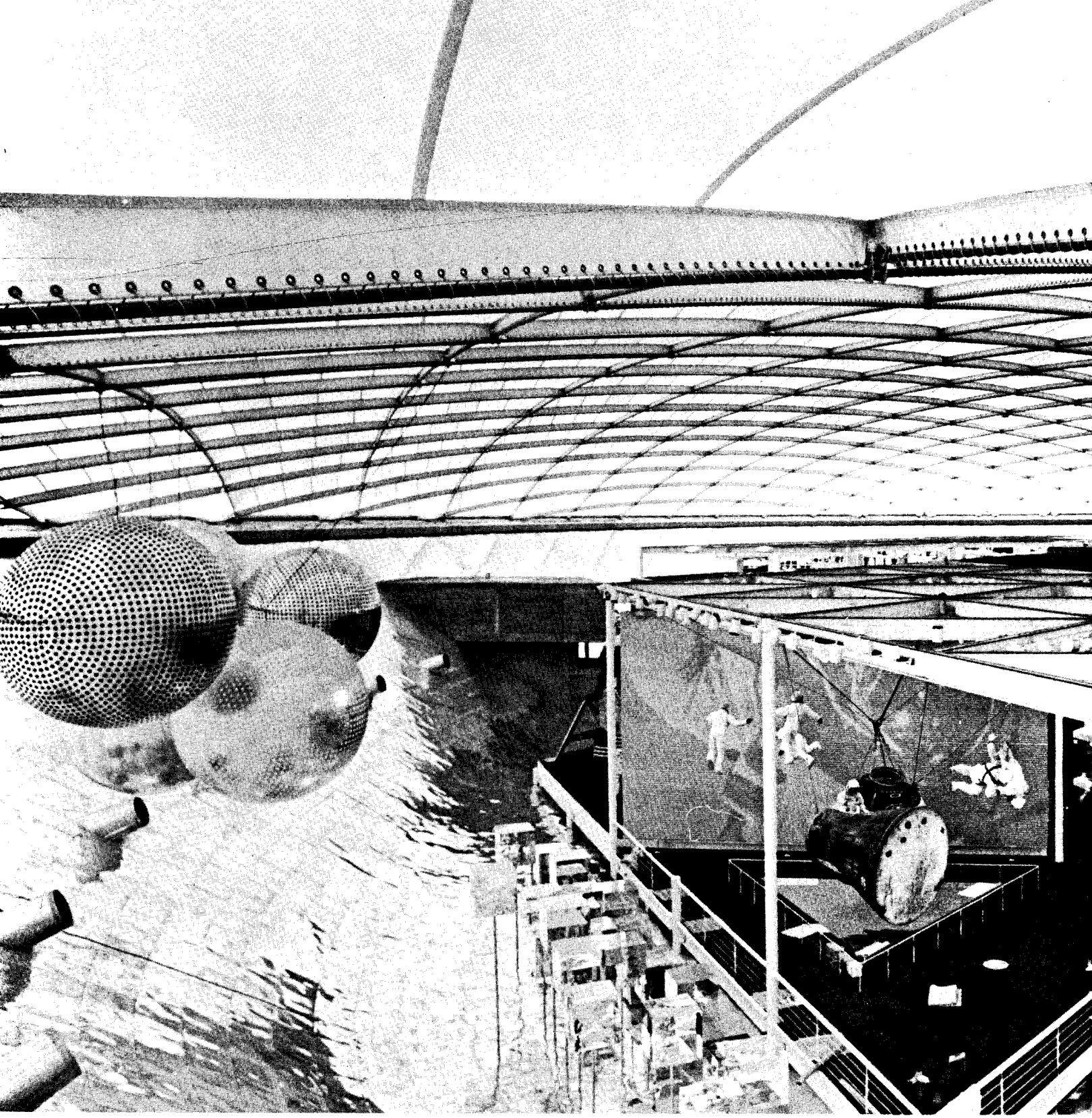
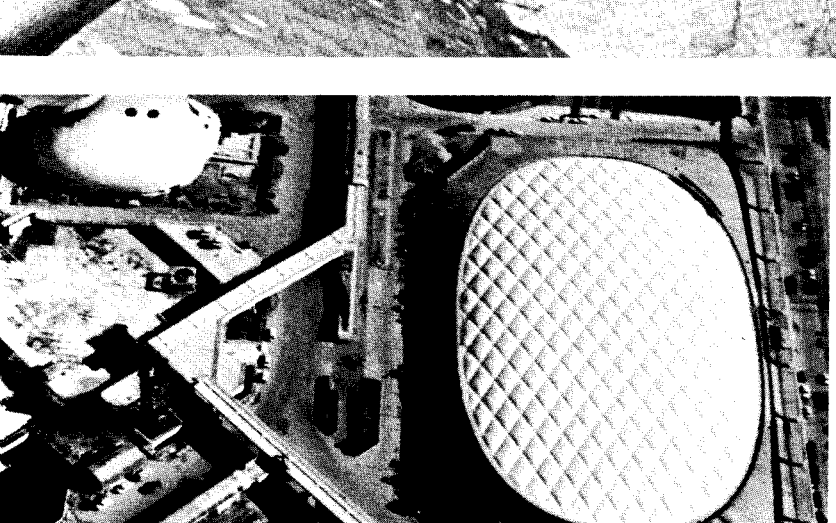
IMAGES OF THE FUTURE

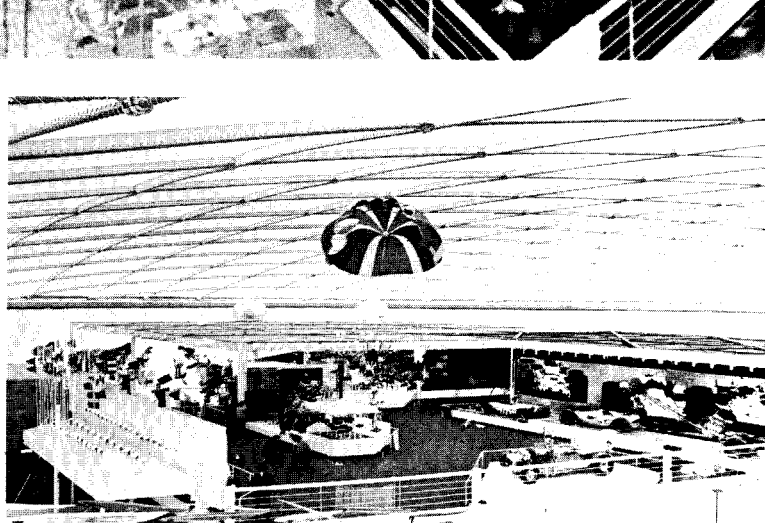
Some of the pavilions at Expo 70 are straight science fiction, much of it very successful. The pavilions designed by Kisho Kurokawa are Metabolist: the wild Toshiba-IHI Pavilion (24), a spaceframe of 1,338 steel "jacks" that were, apparently, designed with the aid of a computer and become less massive as they rise to the top; the Takara Beautilion (25), a pipeframe grid with stainless steel capsules inserted; and some of the little capsule-pavilions that sit inside the framework of Kenzo Tange's huge Theme Pavilion roof (26 and 27). These capsules contain exhibits by invited foreign architects, most of them members of Team Ten or related groups. (Tange himself designed several of the capsules.)

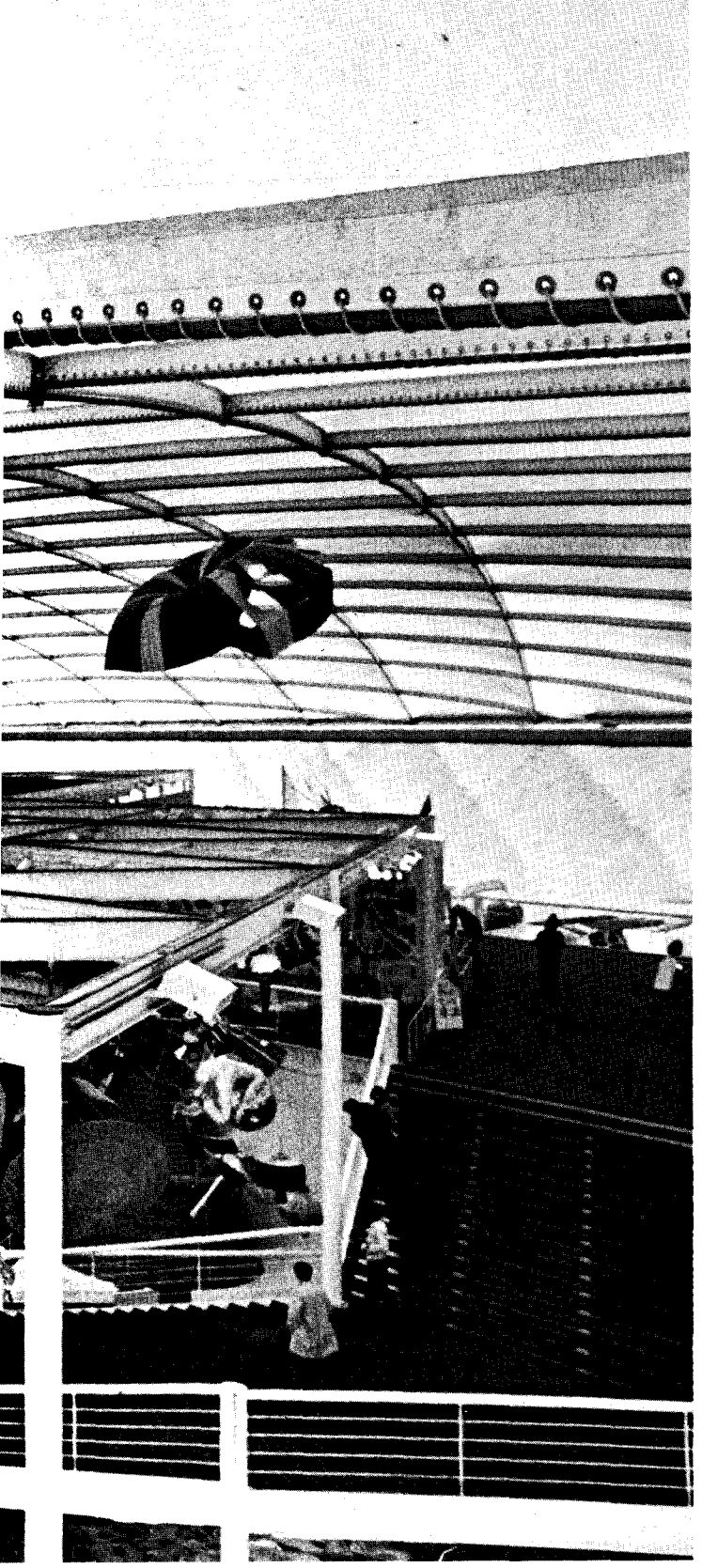
Some of the other images of the future are equally far out: The brightly colored Mitsui Group's "Garden of Creation" (28) looks like a vast vacuum cleaner with tubes sucking people into the central canister; the mirror-finished "Electrium" (29)—an exhibit put up by Japan's Federation of Electric Power Companies—looks high-voltage enough to light up the whole fair; the Expo Tower, an observation and fun structure designed by Kiyonori Kikutake (31), is straight out of Cape Kennedy via Archigram; and the Sumitomo Group Pavilion (33), a construction of huge saucers that are, actually, exhibition halls and theaters. It was designed by Sachio Otani, and its theme is, of all things, "The World of Fairy Tales."

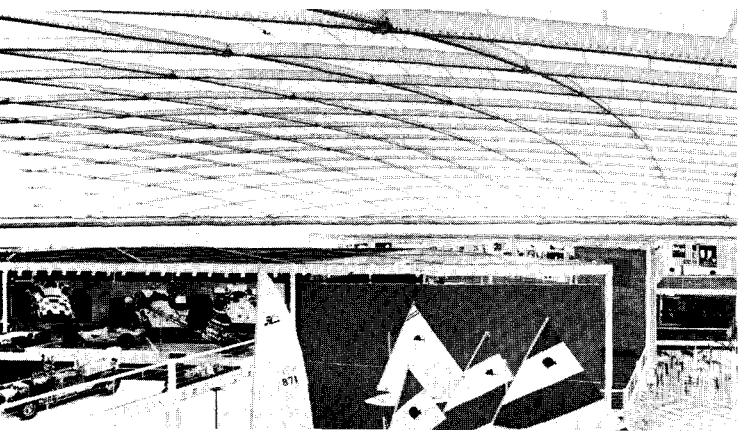
Among the numerous inflatable jobs, the bright yellow and orange tea cozy put up by the Fuji Industries group (30) is the most prominent. It holds a strange fascination: although uglier than really necessary, it does represent a degree of technological innovation absent in such silly buildings as the Gas Pavilion (32) which contains exhibits from the "World of Laughter," wherever that may be. Other experiments can be found in the amusement area of the fair (34)—e.g.: more inflatables, more tents, more geodesic domes, more plug-ins. One of the biggest structures there is the Pepsi Cola geodesic, whose exhibits were prepared by "Experiments in Art and Technology" (EAT). One of EAT's experiments: to shroud the entire building in a cloud of dry ice—a spectacular idea that might be copied elsewhere, e.g.: on our Main Streets.











35

36 | 37 | 38

THE U.S. PAVILION

To take a vinyl-coated fiberglass membrane, in the shape of a super-ellipse 465 ft. long and 274 ft. wide (36), and to support it completely on a mere .03 lbs. per sq. in. of extra air pressure is, quite clearly, an impossible feat. Yet that is exactly what the architects and their engineers have done here.

The membrane is translucent, and it is given its arch-like configuration by steel cables arranged in a diamond grid. While these cables give the roof its shape, they do not support it; the only support is the slight increase in pressure above the local atmospheric pressure.

This is a staggering feat of engineering, a feat that opens up a whole new world of structures. There have been many air-supported structures before, and there are several others at Osaka. But no single-wall structure has ever even approached the dimensions of a city block!

Nobody really knows everything there is to be known about such structures, but everybody is going to know a great deal more now that the U.S. Pavilion is an accomplished fact. It was designed to resist all known natural and unnatural forces, from earthquakes to 125 mph typhoons to Molotov cocktails to perforation with giant hatpins. (The air pressure is maintained by four blowers, each with a capacity of 8,000 cu. ft. per minute, and there are two additional stand-by blowers to spring into action in case a leak develops.)

It is entirely possible that roof membranes of this type will develop new and (to date) unpredictable problems if their spans are stretched far beyond this one. But even this span is remarkable, and could easily be used in warehouses, sports arenas, markets, and a host of other big spaces.

In section, the Pavilion is a bowl, with a berm forming its rim. The roof membrane is tied into a reinforced concrete compression ring along the edge of that rim.

Inside, the exhibition designers have constructed a fairly conventional, triangulated, two-story steel structure which houses a series of elegant, sophisticated, and beautifully detailed exhibits on different facets of American life—sports, the arts, space, architecture, and the rest (35, 37, 38). There is no effort here to sugarcoat some bitter pills, or to talk down to a foreign audience. The exhibits assume, by implication, that the Japanese visitors are just as bright as the exhibit's designers—and the Japanese are responding to the exhibition with extraordinary enthusiasm.

It has a couple of flaws, too, though not the kind that will be brought up by Congressional critics from the U.S. One is that it is not really quite theatrical enough—it is, perhaps, just a little too relaxed. Another, and more serious flaw, is that the two-story, steel-framed exhibition structure, with its wall panels and overhead beams, is really in conflict with the great space created by the mirrored bowl and the translucent roof above. The photos shown here were taken from the rim of the bowl, and show views that visitors will not see. The views from the exhibition platforms do not reveal more than one tenth or so of the vast space from any given vantage point. This is unfortunate, for it might have been possible to install all exhibits on terraces on the perimeter of the bowl (or in caves dug into the berm surrounding the bowl), and to leave the great space largely unobstructed. Still, the exhibits are so fine as to leave most Japanese visitors breathless. (The design team of the U.S. Pavilion was Davis, Brody, Chermayeff, Geismar, de Harak Associates.)

PHOTOGRAPHS: Peter Blake, except for interiors on pages 40 and 41 by Tami Komai, and aerials on pages 30 and 40 by official Japanese sources.

Was Expo 70 really necessary? The Japanese are delighted to have been awarded the first World's Fair ever held in Asia—and Kurokawa has said that this sort of mad celebration is invariably a great popular success, if not always a critical one. As a method of communication it may be less successful, however. After all, there are easier ways of absorbing images and ideas than to wait in line, for hours, to shuffle through a multimedia pavilion.

Still, Expo 70 has fulfilled its promise in a number of ways. In the areas of technological advance, it has given us the spaceframe roof of Tange's Theme Pavilion and the inflated roof of the U.S. building. In the area of theatrical innovation, it has given us the many-mirrored Canadian Pavilion. And in the area of urban design, it has given us Tange's multilevel grid of people-movers. None of these things would have been investigated in the real world of practical building and city planning. Only in the unreal world of World's Fairs do such things finally get built. —Peter Blake


BURNABY CIVIC OPERA

TWIN TOWERS IN CANADA

BY JOHN S. MARGOLIES

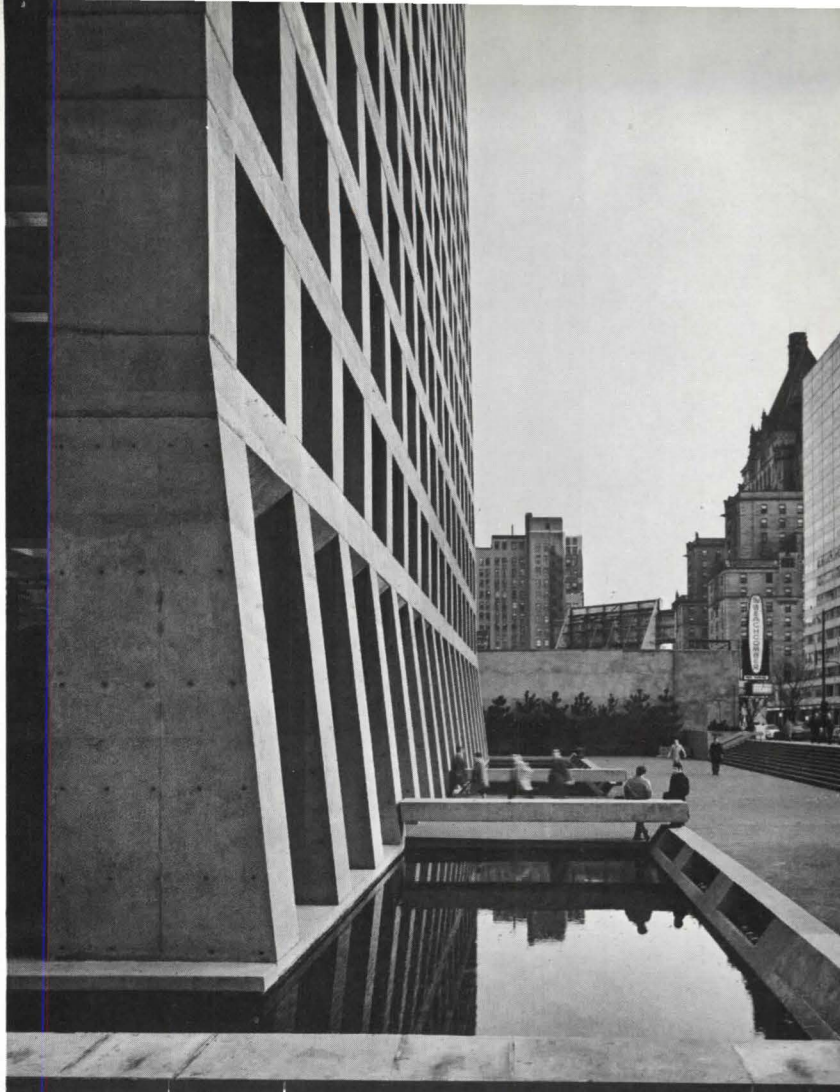
The twin-towered headquarters building for MacMillan Bloedel Ltd., a large forest products company in Vancouver, B.C., Canada, is a straightforward expression of comprehensive design: the direct statement of structure and function on the exterior is consistently coordinated with the development of column-free office space inside. The 10-ft. building module is reflected on major facades with 7-ft.-square windows separated by 3-ft.-wide poured-in-place concrete columns.

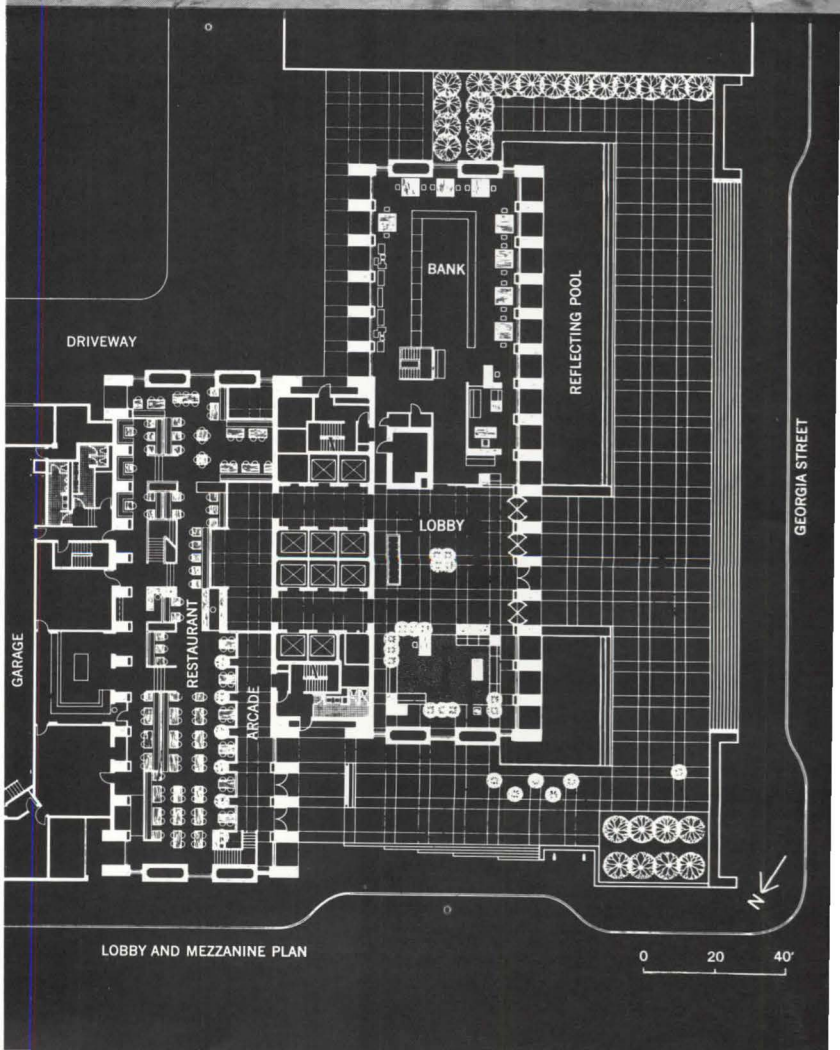
This subdued and dignified monument came into being after the company had investigated and rejected four previous schemes for their headquarters on Georgia Street in Downtown Vancouver. The clients came to architects Erickson/Massey with their fourth scheme—a stocky, square curtain wall building with a central core—and asked them "to make it look better" without increasing the cost. Before suggesting a redesign, Erickson/Massey insisted upon making a complete restudy of the building program.

As part of the study the architects made a survey of the immediate downtown area. This survey included the consideration of adjacent property and development of a soon-to-be ignored overall redevelopment plan. "The fact that Georgia Street was Vancouver's very modest nod to Park Avenue determined the frontage, the setback and eventually the concept of the sunken plaza," explain the architects.

Erickson/Massey's unusual double tower plan (similar to the TAC-Glaser plan for Boston's Federal Office Building—Jan./Feb. '69 issue) evolved as a response to the client's very special program requirements. MacMillan Bloedel is made up of some 50 separate "companies," each handling one aspect of a forest product. Since the building houses all the "brass" of each of these 50 units, a very high ratio of private offices, private secretary space and private file space was required (as opposed to the usual office secretarial pools and central file rooms). Therefore, the new design provided a number of advantages over the earlier, con-

Mr. Margolies, a frequent contributor to the **Forum,** is Coordinator of Experimental Programs at The American Federation of Arts.





LOBBY AND MEZZANINE PLAN

After splaying out sharply at lobby level, the planar surfaces of poured-in-place, load-bearing concrete window walls taper upward according to stresses—from a thickness of 4½ ft. at the second floor to a thickness of about 1 ft. at the 27th floor. The thickened wall serves as a partial sunscreen to the mullion-free window apertures punched through it, and enlivens the play of light and shadow on the facade. End walls in the twin towers are comprised of twin concrete mechanical shafts separated by strip windows.

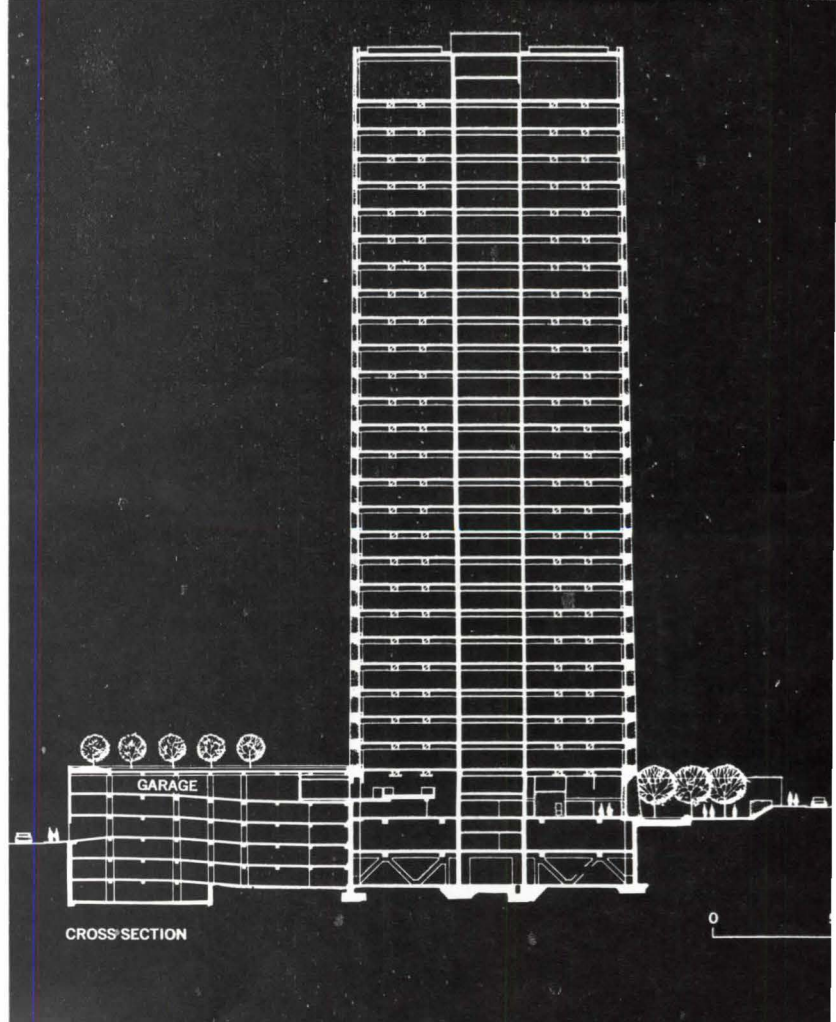
ventional scheme: the building profile is less squat and clumsy; the interior is free of columns; there is closer access to natural light and a view from interior areas; and, most importantly, more window offices are created.

The double tower plan has only 12,000 sq. ft. per floor, but this floor area is now the largest available in Vancouver. MacMillan Bloedel occupies 12½ floors; and another tenant uses three floors. The remaining space effectively meets the needs of a variety of smaller enterprises, many in the 2,000 to 5,000 sq. ft. range.

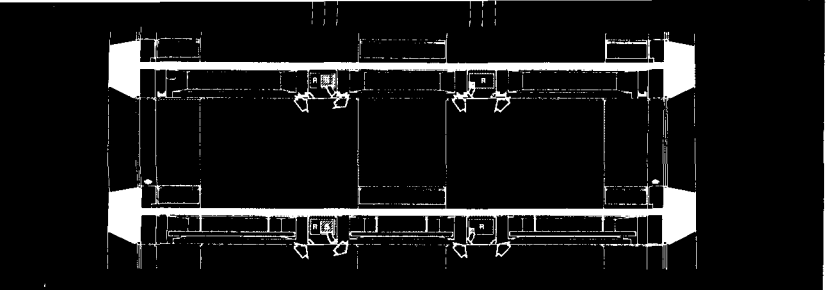
A variety of facilities, amenities and design refinements contributes to the totality of the design solution: a sunken, landscaped plaza is bridged by a walkway that spans a reflecting pool and leads to a 21-ft.-high lobby; a separate entrance to a 3,400-sq.-ft. shopping arcade with a 4,500-sq.-ft. restaurant at mezzanine level; and large storage areas on each floor in the core, connected vertically by a conveyor system. A five-level garage structure, complete with a landscaped roof terrace, is connected to the rear of the building.

The structural system utilizes a clear span of 42 ft. from bearing wall to bearing wall throughout the length ot each tower. The window walls, tapered in thickness according to stresses, act in effect as vertical cantilevers from the ground. Resistance to lateral forces (wind or earthquake) is provided by the combined action of the multistory frames and the central core. To achieve full interaction of these various elements, four trusses (occupying the height of the sub-basement) span across the width of the building and tie together the pad foundation under the core and the strip foundations under the wing walls.

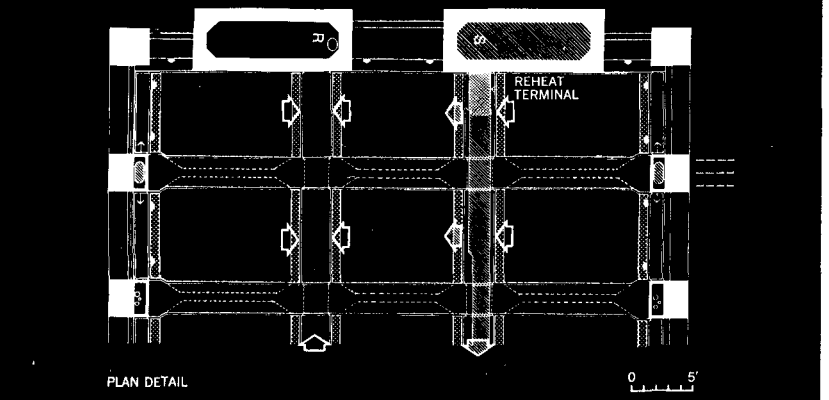
The detailing of the window walls was a major concern of the architects who wanted them to read as continuous solid planes punctured by windows, rather than as a system of columns and spandrels. The walls were poured in place in plastic-coated plywood forms, and given a very lightly sandblasted surface. "All 'detail' was avoided in achieving an uncompromising junction between glass and concrete—void and solid. No pour joint or construction joint could be hidden by a reveal—no reveals!" explains Arthur Erickson.



The 40-ft.-square, 21-ft.-high entrance lobby, right, creates a subdued and "solid" corporate image for MacMillan Bloedel Ltd., a large forest products company. The theme of the forest is expressed in a simulated grove of planting around the green carpeted, green velvet-upholstered seating area. The floor surface is polished terrazzo while the wall surfaces are of natural concrete. The lobby is lighted by a system of concealed indirect lighting troughs within the modular ceiling structure—a system originally intended for the entire building and finally rejected for office floors because it did not meet specified footcandle requirements.

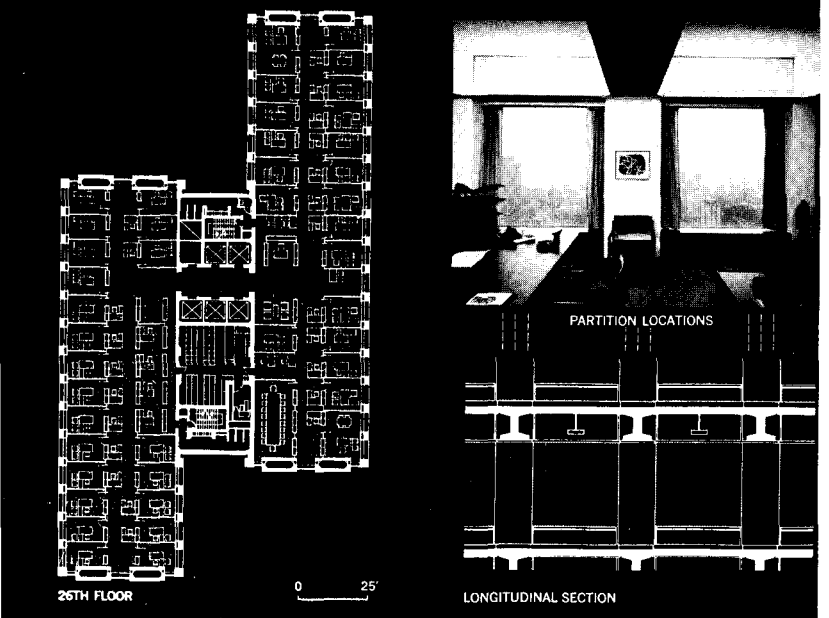


CROSS SECTION



PLAN DETAIL

0 5'



26TH FLOOR

0 25'

LONGITUDINAL SECTION

On the interior a ceiling grid is formed by 3-ft.-wide transverse concrete I-beams, on center with facade columns, crossed lengthwise in each tower by two 3-ft.-wide air ducts. This grid integrates the air-conditioning, telephone, electrical supply and partition systems (see drawings). The longitudinal ducts tie into the twin concrete mechanical shafts which make up the towers' end walls. These ducts supply air to interior zones (with perimeter zones heated and cooled by under-window convector units) and also serve as the heads of a semi-permanent partition system.

The interiors are spacious and uncluttered, reflecting the architects' intent of relating them to the simplicity and dignity of the exterior. After a precise analysis of interior elements, the architects made a number of design refinements "to minimize the chaotic aspect of the typical busy office": specially designed, modular corridor wall storage units house such disparate things as coats, books and files; secretarial desks fit along the storage walls to open up corridor areas; the modular ceiling grid eliminates the need for a hung panel ceiling and allows a full 11-ft. floor to ceiling height; and the single, one-by-10-ft. lighting fixtures are positioned high enough in each bay so that it is impossible to see more than two rooms of fixtures when looking down the length of a tower.

The use of only three major materials and textures further contributes to the solidity of the interiors and the totality of the design—exposed natural concrete surfaces, greenish-gray carpeting and the white oak furniture. "The positive effect," say the architects, "is to substitute overall quiet for confusion and to gain a background where the people themselves can become important."

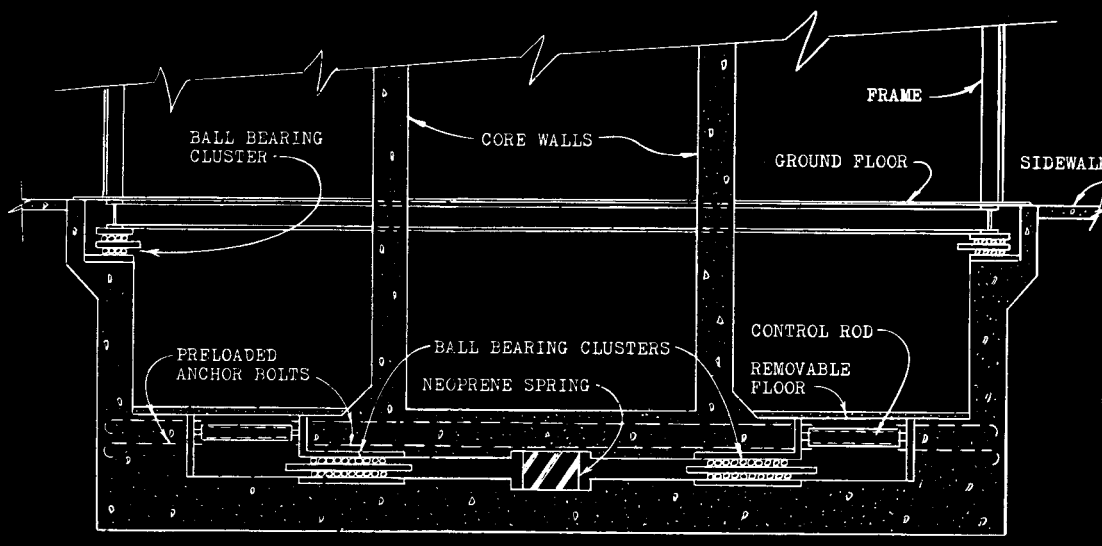
FACTS AND FIGURES

Headquarters building for MacMillan Bloedel Ltd., Vancouver, British Columbia. Architects: Erickson/Massey (Arthur Erickson, partner in charge; Jim Strasman, project architect) and Francis Donaldson (Procter Lemare, project architect). Engineers: Otto Safir (structural); Reid Crowther & Partners Ltd. (mechanical). Consultants: William M. C. Lam (special lighting); Bolt, Beranek & Newman Inc. (acoustics); Lester Beall & Associates (graphics). General contractor: John Laing & Son. Building area: Tower—463,000 sq. ft. Cost: Tower—$12,400,000.

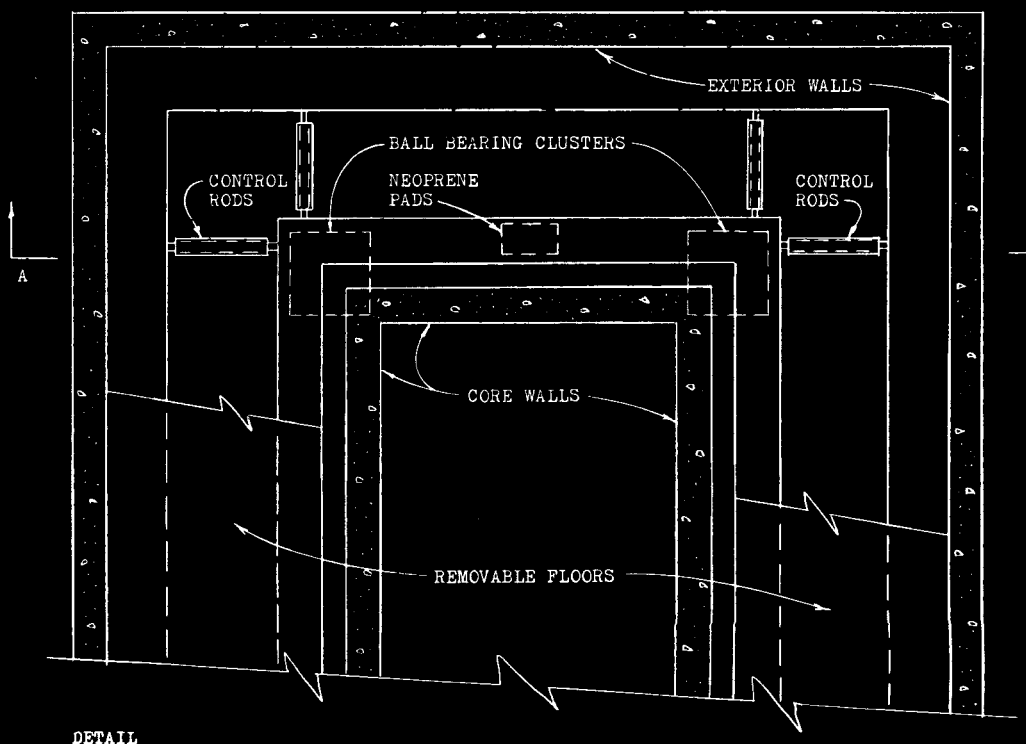
PHOTOS: © Ezra Stoller (ESTO).

Transverse I-beams and longitudinal ducts form a modular ceiling grid which consistently reflects the 10-ft. module of column and glass on window walls. Integrated within the ceiling grid are the mechanical, electrical and partition systems, allowing a full 11-ft. height within the 7-ft.-wide coffer (corresponding in width and on center with the windows). The building rises directly from a sunken plaza, right, with the entrance bridging a reflecting pool to the lobby.

TECHNOLOGY



SECTION A-A



DETAIL

A new building technique damps earthquake forces at basement level.

The Isolation Technique, a new building system, stops the effects of earthquakes where they start: foundations can shake, but buildings won't topple.

Developed by civil and structural Engineer Marc S. Caspe, of Belmont, Calif., the Isolation Technique changes the conventional practice of building the foundations and superstructure of a building integrally. Caspe's system replaces the usually rigid connection between the two with movable, shock-absorbing devices that essentially divide the building into two distinct parts capable of independent lateral movement. The principle of the isolation technique is to check lateral earthquate forces at the foundation, so they won't be transmitted up through the frame of the superstructure, causing extreme distortions.

The system's devices include ball bearings for movement, neoprene springs and horizontal control rods for shock absorption and control. "Simple," says Caspe, "once we get over our previous conditioning."

Caspe's primary design criteria were safety, liability and cost. He says the Isolation Technique can be used on new construction projects or on completed buildings. He hopes it can reduce insurance rates by reducing liability for personal or property injury during an earthquake. And, he says, the system cuts initial construction costs in earthquake zones because new superstructures can be designed to resist wind forces only—the isolation devices do the rest.

Installing an isolation system underneath an existing building would be expensive because the structure would require temporary underpinning. But Caspe says that the only feasible alternatives might be condemnations or total collapse.

System's design

An isolation system comprises three major devices. Stainless steel ball or roller bearings eliminate shear transfer between a building's superstructure and foundation when either is pressured laterally. Such bearings, however, would not limit movement. So Caspe has devised horizontal control rods, made of mild steel pipe sections. Neoprene springs also check movement and absorb impact. The size and settings of the control rods are determined by the pressures they must withstand.

The control rods are rigid under most conditions. During severe windstorms they control movement elastically. This is feasible, says Caspe, because a windstorm can exert less lateral force on most buildings than a major earthquake can. (This may not apply to skyscrapers, where the great amount of exposed wall surfaces may make wind the greatest horizontal load factor.) The rigid connections, however, release and the control rods become flexible at a predetermined force—some point before the structural frame reaches its elastic limit. Caspe says concentrating the inelastic yield in the control rods makes an isolated building safer under earthquake conditions than a conventional structure could be. In a conventional building, the superstructure's structural frame and walls would have to absorb foundation movements. Caspe's system directs the impact to the control rods, which are not part of the building's vertical support system. At high-stress levels, the control rods can stretch inelastically 30 in. to 40 in. before they will rupture.

To make sure the control rods are not pushed to the rupture point, Caspe says a limit-stop system is necessary. The neoprene springs can both check movement and absorb impact, helping to make the system failsafe. The control rods are bolted in place, so they can be easily removed, replaced or adjusted by removing sections of flooring.

Several versions of the earthquake Isolation Technique have been tested in Caspe's mathematical model under different lateral forces. It seems to cut base shear limits to 25 per cent those on the same elastic structure built conventionally.

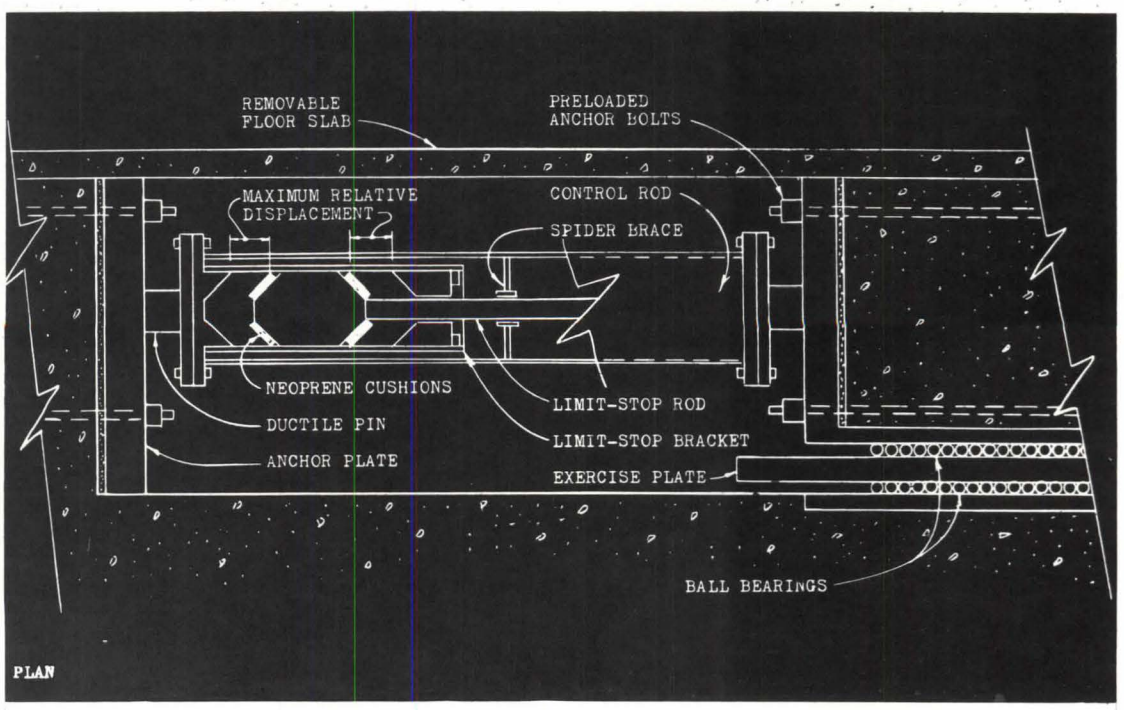
System at work

An isolated systems building should not abut adjacent buildings. During an earthquake, for example, there will be some movement, so the building should be as far away as the maximum calculated distance the system will allow it to move. Generally, this will be about 6 in. to 9 in.

Elevator shafts, stairwells, piping and mechanical ductwork require no special treatment if they are in the superstructure's central building core. If this is impossible, however, they must be designed to accommodate movement.

Caspe suggests these design solutions: Piping and ductwork that extend from the superstructure to the basement should have offset joints and flexible couplings to permit rotation without rupture. High speed elevators could run to the floor just below ground level with no impact problem, but those extending lower would require separate hydraulic units for these areas. Specific adjustments, however, depend on the specific building and the stresses it must withstand.

The isolation system damps lateral earthquake forces in the foundation with expandable steel pipe control rods, inserted between the core and foundation walls. The section and plan opposite show how the control rods interact with ball bearings, placed to insulate the superstructure from foundation movements. The expansion and stop/limit mechanisms for absorbing earthquake shocks is detailed at right.



BREAKTHROUGH?

How does a young, struggling government agency use $50 million to turn a traditional-and-proud-of-it building industry into a modern production line for 2.8 million housing units per year, in only two years?

The Department of Housing and Urban Development's answer is Operation Breakthrough, a bureaucratic war cry that says the industry *will* change or HUD will replace it with something else, using technology already successful in Detroit and in space. And to prove it, HUD is doing it—building 2,000 housing systems units on 11 sites across the country and, most important, challenging every building constraint in the process.

Will it work? Operation Breakthrough will have to speak for itself.

The program's structure is simple: There are three phases, following a proposal stage that has been in process for the past year. The first Breakthrough stage is designing, testing, and planning the prototype systems and sites, and this is well under way. Twenty-two systems producers (see following pages), from building and other industries, will build the demonstration projects. They are now being assigned to a minimum of two sites each and are working on final designs and production plans, along with site developers and planners. The second phase starts this summer, when construction on the sites will start and HUD will start testing and evaluating the units, physically and socially, on site. The third and final Breakthrough stage is mass production, which depends not only on the success of the demonstration projects and their ability to break down constraints to innovative housing, but also on HUD's ability to aggregate markets large enough to make systems building profitable.

It took HUD five months to select 22 systems from among 236 Type A—full system—proposals. (The 385 Type B submissions—for individual components or techniques—are only now being evaluated.) Type A selection criteria were by no means limited to physical design; HUD spokesmen stressed repeatedly that the sponsors' management capability and financial resources were crucial—along with such factors as minority participation and geographical reach.

The evaluation committee, made up of 50 men from various government agencies, balanced their selections with almost computer-like precision.

The list of winning systems is not dominated—as many feared—by big corporations making their first entry into the construction field. General Electric and Republic Steel are there, but Westinghouse and Dow Chemical, among other competitors, are not. Big developer-builders such as Levitt are represented, and big prefabricators like National Homes. European systems—which many predicted would carry the field—are involved in only three of the 22 systems. The key word for most of the winners is *consortium:* there was an obvious advantage in teamwork. Big business joined with struggling promoters of new technologies; banks were drawn into teams, as were engineers, sociologists, management experts, and, of course, architects (in all but six cases).

There were so many overlapping memberships on consortiums that one architect—Ezra Ehrenkrantz—worked on one winning submission and two losers. Engineer Neal Mitchell was a member of one winning consortium, but the submission he made under his own name was rejected. Some consortiums both won and lost: Alcoa, for instance, had only one of its seven distinct proposals accepted.

The products that these consortiums plan to turn out range from the familiar factory-built wood box (which some manufacturers prefer to call "sectionalized housing") to exotic configurations of glass fiber, polyesters, and paper.

A quick look at the illustrations that accompanied HUD's announcement of Breakthrough winners could lead to a snap conclusion: that architectural quality was not one of the selection criteria. In part, this is accurate—*final* architectural design was not required. HUD expects some producers to thoroughly redesign before construction.

Like other characteristics of the chosen systems, architectural sophistication—as shown in the submissions—ran the gamut. Some established manufacturers (Home Building Inc., Scholz Homes) retained features with proven market appeal—half-timbering, pseudo-mansards, etc. On the other hand, National Homes gave up its shutters and came up with unit designs by Edward Durell Stone—embellished only by real amenities like balconies and bay windows. Backers of more technologically innovative systems generally invited widely recognized design firms (Keyes, Lethbridge & Condon; Warner, Burns, Toan & Lunde) or young architects with solid housing experience (Armstrong & Salomonsky, David Bobrow and George Buchanan) to join their consortiums. At HUD's urging one of the most technologically adventurous producers, Materials Systems, is now working with SOM-Chicago to replace the fake-adobe ranch house it had been selling.

Harold Finger, HUD's Breakthrough director and Assistant Secretary for Research and Urban Technology, is quick to concede that "some designs need improvement" and he obviously expects to get it. What worries him is that even the bravest sponsors of clean design may be tempted—when they begin to court the mass market—to tack on some of those old-fashioned consumer-appeal gimmicks. Dean Bernard P. Spring of the CCNY School of Architecture, warns, "What happened when systems were introduced in Europe—and might happen here too—is that sponsors pressed to demonstrate *economies* let their production experts call all the shots, often at the expense of good design."

The project sites, chosen from 213 proposed by state and local officials, disappointed those who hoped Breakthrough would stress inner-city renewal.

Only three of the ten selected, plus a portion of a divided site, are located in downtown areas. But considering the many qualifications HUD imposed, it is easy to see why so few sites are located downtown. For one thing HUD was striving—as it did in system selection—for even distribution: coast-to-coast, big city and small city, low density and high, etc. Ideally, each site was to be adaptable to "a mixture of housing types" and to family incomes.

Downtown sites presented many problems: Most were not suitable for low density or nonfireproof construction and many would not be attractive to open-market homebuyers or tenants. They also might involve time-consuming relocation or demolition, or protracted periods of "community participation."

The inner city sites selected were: Jersey City (David A. Crane, architect/planner for the site), Memphis (Miller, Wihry & Brooks), St. Louis (Hellmuth, Obata & Kassabaum), and Seattle —one of two separate portions— (Building Systems Development). Sites on the city fringe include: Indianapolis (SOM-Washington); Kalamazoo, Mich. (Perkins & Will); Macon, Ga. (Reynolds, Smith & Hills), Sacramento (Wurster, Bernardi & Emmons). Suburban sites are in: Harris County, near Houston (Caudill, Rowlett & Scott), King County, near Seattle (Eckbo, Dean, Austin & Williams), and New Castle County, near Wilmington, Del. (RTKL Inc.).

The eleven site planners will have to reconcile market analyses of the sizes and types of units needed for a particular site, with the number of units and systems that HUD and the producers agree to build on that site. They will have to coordinate the work of the producers' architects and negotiate with local officials.

In one sense, by requiring the winning consortiums to build relatively few units on at least two—and possibly as many as five—sites, Breakthrough deliberately sacrifices process for product. HUD wants to demonstrate as many systems in as many areas as possible, then evaluate them. Finger reinforces this when he says, "If we had larger sites, we would probably introduce additional systems on each one, rather than increase the volume of those systems already designated." This places a tremendous burden on the consortiums, which must reconcile high-volume systems with dispersed prototype construction.

Many consortiums still don't know how they will solve the problem. There is even speculation that some systems will drop out of Breakthrough or resort to conventional building techniques for the demonstration units. HUD will help by compensating firms for specific overcosts in production, transportation, and erection.

But HUD will not compensate firms for capital investments in factories and equipment and herein lies a major problem. For example, HUD has asked one consortium to build a total 350 units on three sites. The company must either build three factories, transport components thousands of miles, or build conventionally.

HUD's apparent failure to test the full-scale production process has caused controversy. David Pellish, Housing Technology Officer of the New York State Urban Development Corporation, says, "Private industry is most effective when it gears up to fill specific, large-scale demand. It can produce the technology if it is assured of such a market. Unfortunately, there doesn't appear to be that assurance in Operation Breakthrough at this time."

HUD, in fact, is not unaware of either the production or marketing problems. It selected consortiums it felt had enough financial and management depth to cope with short-range problems and organize for long-range returns. HUD will also guarantee that the systems are safe and is supporting their development. And, HUD will give preference to these systems in other federally-supported housing projects. HUD is confident that its seal of approval and the publicity from Breakthrough will open doors to private markets.

Finger is convinced that Breakthrough's ultimate success depends on its ability to overturn the traditional obstacles to volume housing production. HUD, he says, is not out just to promote the 22 Breakthrough building systems, but to use these systems as a lever.

Breakthrough copes with local code restrictions by simply ignoring them. Cities offering demonstration sites were required to waive local ordinances for the Breakthrough project. In return, HUD agreed to test the systems' safety on the basis of a new performance-based code that HUD is distributing to participants. The National Bureau of Standards will do most of the testing.

Finger hopes that gaining acceptance for the 22 Breakthrough systems will open the door to others. "We hope to work out a program whereby the government will issue approvals for other building systems if they perform the testing at their own expense." In stressing a national government approval system for building materials and innovations, Finger avoids the problems of trying to impose a national code on the U.S., but hopes to achieve similar goals. Many code experts believe this strategy is naive and ignores the politics of regulating building codes—no cast iron pipe manufacturer is going to look at plastic pipe with an open mind.

HUD is dealing with construction labor problems by going out of its way to court national building trades leaders. Many were present when the Breakthrough winners were announced. But the local level is another problem. If there is a building trades shortage in a given area, the union is unlikely to object strongly to putting some construction processes into a factory, where unskilled workers can do the job, especially if it would help provide their own men with year-round work. But no local union will tolerate anything that either puts its men out of work or forces them into lower paying jobs.

Some consortiums already have national and regional trade union agreements that could apply to Breakthrough. Others have not started negotiations.

Minority groups are particularly interested in the new, unskilled labor force that factory-produced housing requires, seeing this as their passport into what many consider the "lily-white construction industry." Civil rights leaders point to the section of the 1964 Housing Act that requires HUD to actively advance equal opportunity employment in its programs.

But black leaders will not settle for factory jobs alone, they say, especially for inner-city sites. Specifically, NAACP Housing Director William R. Morris cites section 3 of the 1968 Housing Act: It requires that, "to the greatest extent feasible, opportunities for training and employment arising in connection with the planning and carrying out of projects assisted under such programs be given to lower income persons residing in the project area." It further states: "To the greatest extent feasible, contracts for work to be performed in connection with any such project shall be awarded to business concerns located in or owned in substantial part by area residents." Morris also notes that HUD required each Breakthrough bidder to develop a "Community Involvement Plan," a method for "involving neighborhood contractors and subcontractors in the *production and installation* of the housing and its related environment."

Breakthrough also tackles money constraints. Winning consortiums were selected partly for their approach to financial problems today and for the workability of innovative proposals, some of which require new legislation. The most common proposal was for the consortium itself to provide or obtain mortgaging for the individual and institutional buyer.

Educating consumers to accept industrialized housing is another Breakthrough goal. To many, "prefab" conjures up images of lookalike housing, quonset huts and trailers.

Some Breakthrough winners clearly give the consumer what they know he wants. Levitt, for example, consumer-tested industrialized housing and decided to market it only after the tests proved that "the consumer doesn't know the difference—it looks the same."

HUD is particularly concerned that Breakthrough housing not be labeled low-income or ghetto housing and hopes to attract a variety of residents. This could be crucial to HUD housing programs, especially as low-income families tend to be conservative and measure quality by what more affluent families accept.

Zoning is the most complex housing constraint that Breakthrough aims to break. The Breakthrough sites will demonstrate new land-use planning concepts and HUD hopes, again, that communities will see it as a good example. But zoning, though legally a state prerogative, is regarded as a God-given, if recent, right by most localities. In practice, zoning codes have become the last legal way to discriminate. Exclusionary zoning practices include large minimum acreage requirements, or regulations prohibiting multifamily or multistory housing. Says Finger: "Suburbs are zoning out the very service people their life style requires. They are even zoning out their own grown sons and daughters, who have no choice but to live with their parents or move into the cities."

What can HUD accomplish with its $50-million program?

At the very least, it will have stimulated private corporations from many fields to develop marketable housing systems.

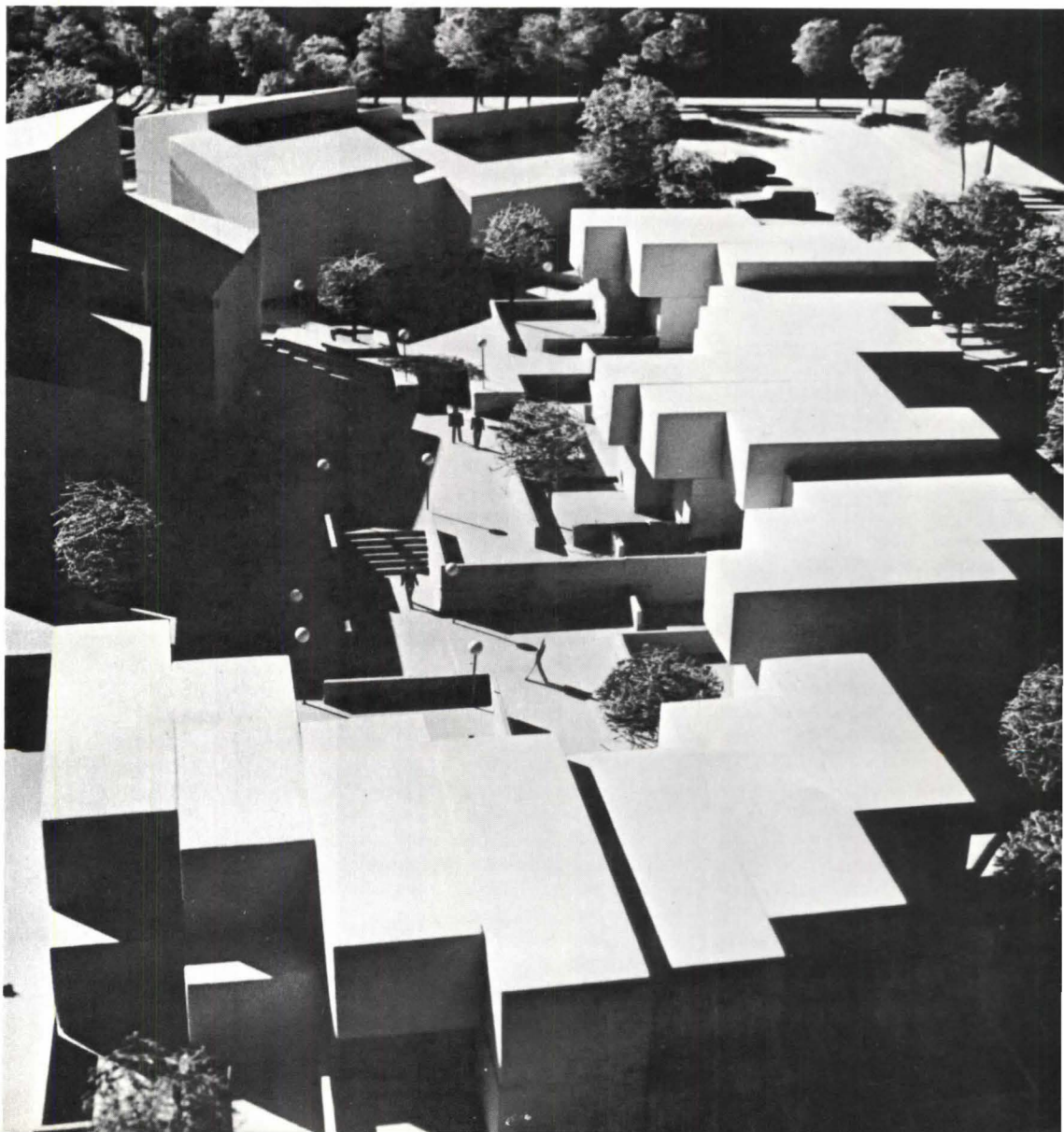
At most, Operation Breakthrough will start a revolution in the building industry.

—Marguerite Villecco & John Morris Dixon

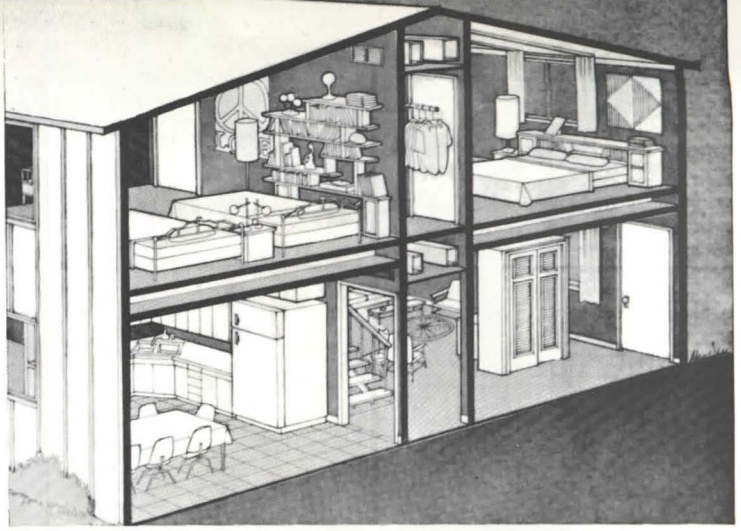
BOXES FOR LOWRISE

Stirling-Homex Corp.
A lowrise, wood-framed box system is one of two proposals by the company accepted for the Breakthrough program (for their highrise system, see page 55). The 12-ft.-wide boxes are stacked two stories high to form rowhouses or apartments (three or four boxes forming one unit). In its two years of operation, Stirling-Homex has produced and erected over 1,300 dwelling units. Landmark contracts with AFL-CIO carpenters and joiners (July/Aug. '69 issue, page 110) cover both factory and site labor, and include an agreement on a job-training program now under way in Rochester, N.Y. Stirling-Homex is participating in Breakthrough independently, without forming a consortium.

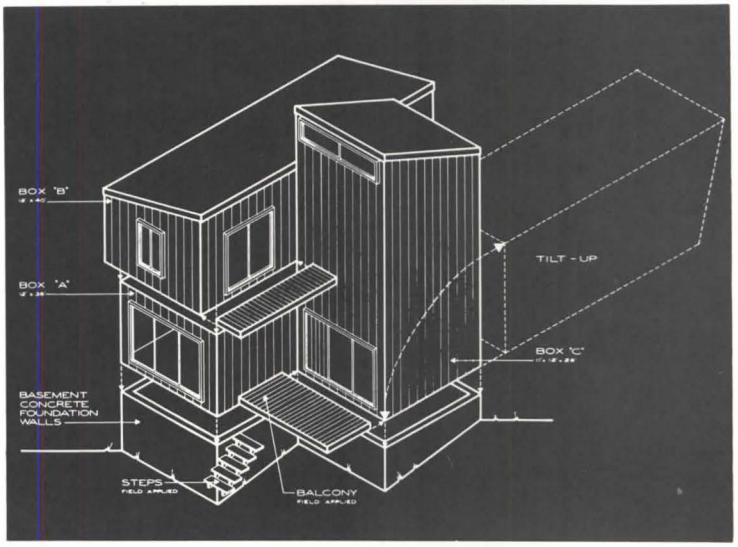
Boise-Cascade
Included in the consortium's diverse "product line" are both box systems and panel systems (page 58), fabricated out of wood, steel, or combinations. Boise's proposal stressed the need for neighborhoods of mixed housing types, "not just variations on a single system." A typical area (right) would include townhouses, garden apartments, and "mid-rise" apartments, with carefully integrated circulation and community facilities. Variety is part of Boise's marketing strategy, which is based on wide consumer choice. Several methods of easing financing for home-owners are proposed, including reduced closing costs, lease-purchase options, and a new system of first and second mortgages. Prototype box units have already been erected in Baltimore, and additional plants are under construction in other states.
Consortium members: Boise-Cascade; Dalton-Dalton-Little, architects; Frank Hall Associates; Computer Applications Inc.; National Building Agency (England); David Crane Associates; Brevard Engineering; MIT Urban Systems Laboratory.



Home Building Corp.
A manufacturer with 20 years' experience in prefabrication of houses proposes a wood-framed box system for one- and two-story detached houses only. The main design innovation is an extra section inserted between the two factory-finished boxes at the site. This central strip accommodates stairs, corridors, closets, etc., without reducing the 12-ft. width of living spaces; it also provides duct space above dropped ceilings. Post-and-beam framing in 4 ft. by 12 ft. bays allows freedom in interior layout and in locating glass areas and other openings. Home Building advocates cluster developments, under the control of homeowners' associations, and has worked out a "home-owned, land-leased" plan to cut occupants' carrying costs. Home Building Corp. is an independent participant in Breakthrough.

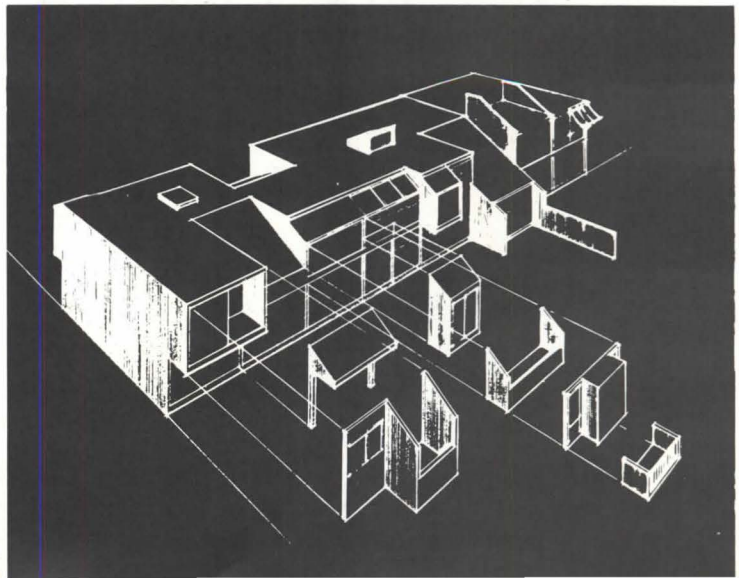


Hercules Inc.
One of two different systems by this consortium (highrise, p. 54) is based on wood-frame modules already erected at several sites in the Northeast by Modular Structures Inc., a member of the group. Three-bedroom rowhouses of the type shown here have been erected in a development at Mt. Snow, Vt. They would be combined in rows with houses of different heights and depths, some with the unusual tilt-up module and some without.
Consortium members: Hercules Inc.; Modular Structures Inc.; Armstrong & Salomonsky, architects; Harlan, Betke & Myers Inc.; Univ. of Utah.



Scholz Homes Inc.
In its 22 years of manufacturing prefabricated housing, Scholz has produced about 40,000 units. In the past decade, lowrise townhouse and apartment units have accounted for an increasing share of their output. Scholz is now capable of producing 1,000 units of this type per year at its Grand Rapids, Mich., plant. The wood-framed boxes can be clad in either factory-applied siding or masonry veneer added at the site. Scholz has developed special box-stacking equipment which can be used instead of conventional cranes.
Consortium members: Scholz Homes Inc.; Stiles-Hatton Inc.

Levitt Technology Corp.
The nation's largest producer of houses by conventional (but highly systematic) means has established a subsidiary specifically to meet the aims of Breakthrough. Its product will be rowhouses and lowrise apartments, assembled from two basic types of structural boxes—"wet" ones with standardized mechanical assemblies, kitchens, baths, etc., and "dry" ones with more flexible layouts. To the exterior of these structural boxes will be added a variety of facings and extensions, such as balconies, bay windows, projecting closets, and pitched roofs. Construction will be wood frame, with some use of glued-skin walls and ceilings, stressed-skin panel trusses, and box beams. The consortium may use the production facilities now being constructed for another Levitt subsidiary —Levitt Housing Systems Corp.— which is scheduled to turn out 2,000 dwelling units per year, beginning in 1971.
Consortium members: Levitt Technology Corp.; B. A. Berkus Associates, architects; The Stanley Works; Auerbach Corp.; Dunham-Bush Inc.; Hamilton-Howe Inc.; Simpson Timber.

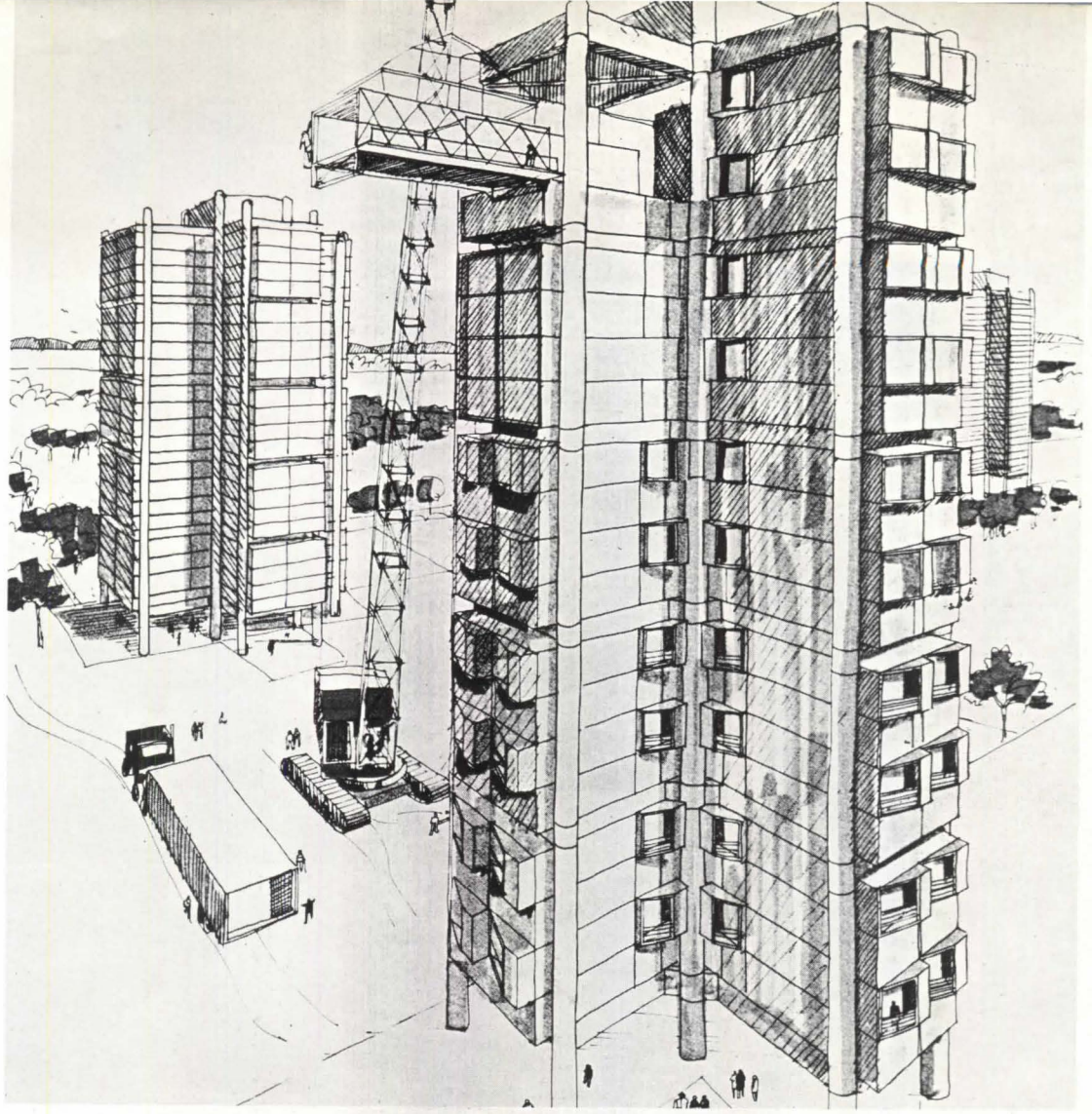


BOXES FOR HIGHRISE

National Homes

For highrise buildings up to 24 stories, National's lightweight box units are inserted into a precast, post-tensioned superframe (right). Up to six stories, the box units can simply be stacked. Under agreements with Swedish producers, National plans to introduce new, light, fireproof materials: exterior surfacing of sprayed polyester mixed with natural granules; floor slabs of 1¾-in. foamed concrete on a corrugated metal base. More conventional materials can be substituted to satisfy local officials. Attached to the 14-ft.-wide boxes will be "climate control modules" providing such features as balconies and window projections angled for privacy. Another technical innovation imported from Sweden is a vacuum sewage disposal system, which would sharply reduce water supply needs, hence cut the cost of piping for a whole development.

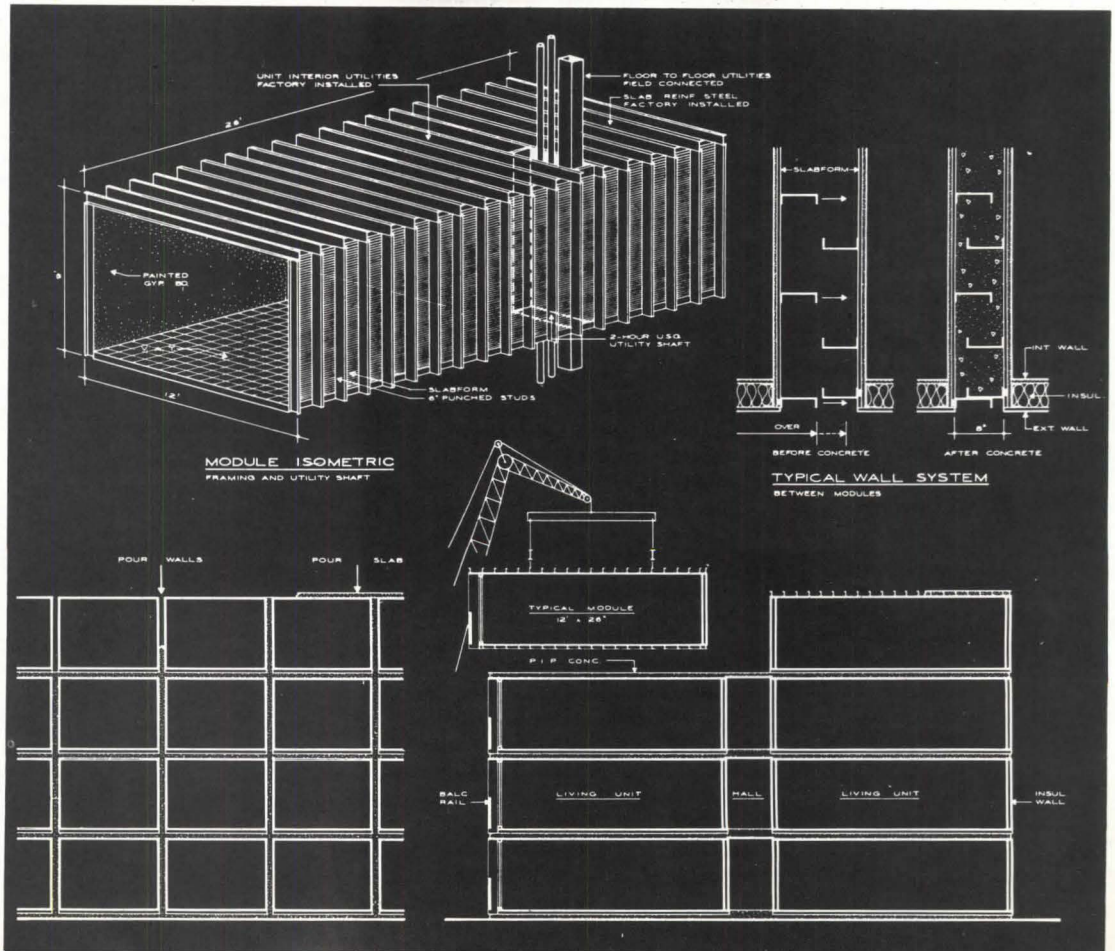
Consortium members: National Homes Corp.; Edward Durell Stone & Associates, architects; Edward D. Stone Jr. & Associates, landscape architect/planners; Semer, White & Jacobsen; Praeger-Kavanaugh-Waterbury, engineers; Cosentini Associates, engineers; Computer Applications Inc.



Hercules Inc.

Hercules' unique highrise system calls for pouring a concrete structure around box units with factory-finished interiors. The steel-framed boxes would serve both as formwork and as reinforcing; only concrete need be added to complete fireproof, highrise buildings (12 stories high in the prototype design submitted to HUD). The box units, 12-ft.-wide and variable in length, depending on layout, would have essentially the same interior finishes and equipment as Hercules' lowrise units (page 53).

Consortium members: Hercules Inc.; Modular Structures Inc.; Armstrong & Salomonsky, architects; Harlan, Betke & Myers Inc.; Univ. of Utah.

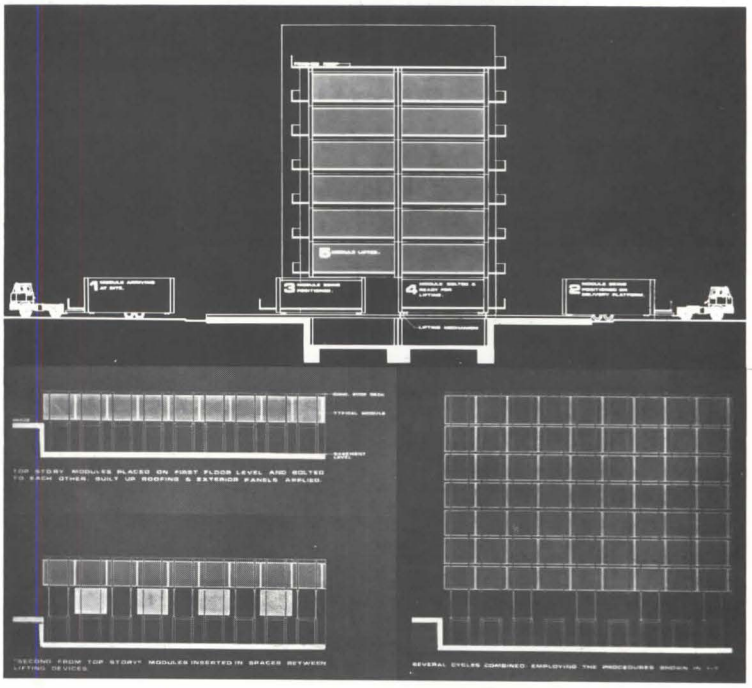


Pemton Inc.

The Pemton system, like National's (left), is based on boxes that can be inserted into highrise superframes, or stacked (only up to three stories). The 14-ft.-square Pemton box, available in 12 basic layouts, can be supplemented with accessories such as pitched roof attachments or decking for flat rooftops. The boxes can be linked horizontally to support cantilevered modules. Stressed-skin plywood walls will give the boxes structural rigidity in all directions, providing both interior finish and exterior sheathing as well. Polymer bonding secures piping and wiring in floor channels so that, despite their number, connections between boxes can be made quickly and accurately. Consortium members: Pemton Inc.; Interdesign Inc., architects and planners; Lorimer, Chiodo & Associates; 3M Co.; Jacus & Amble Engineering; Community Involvement and Development Associates Inc.

Stirling-Homex Corp.

The company's highrise system employs a construction sequence unlike any other now in use. Steel-framed boxes are erected using hydraulic jacks that lift the whole structure one floor at a time. Top-floor boxes are joined together first, then each new floor is inserted at the bottom of the stack. As the building goes up, a steel skeleton is formed by joining columns built into the corners of the box frames. The boxes have lightweight fireproofing and concrete floor slabs, and weigh about 11 tons each. Although the highrise boxes are structurally unlike Stirling's lowrise units (page 52), they will include the same factory-installed interior finishes and equipment. Stirling-Homex is participating in Breakthrough independently, without forming a consortium.



Shelley System

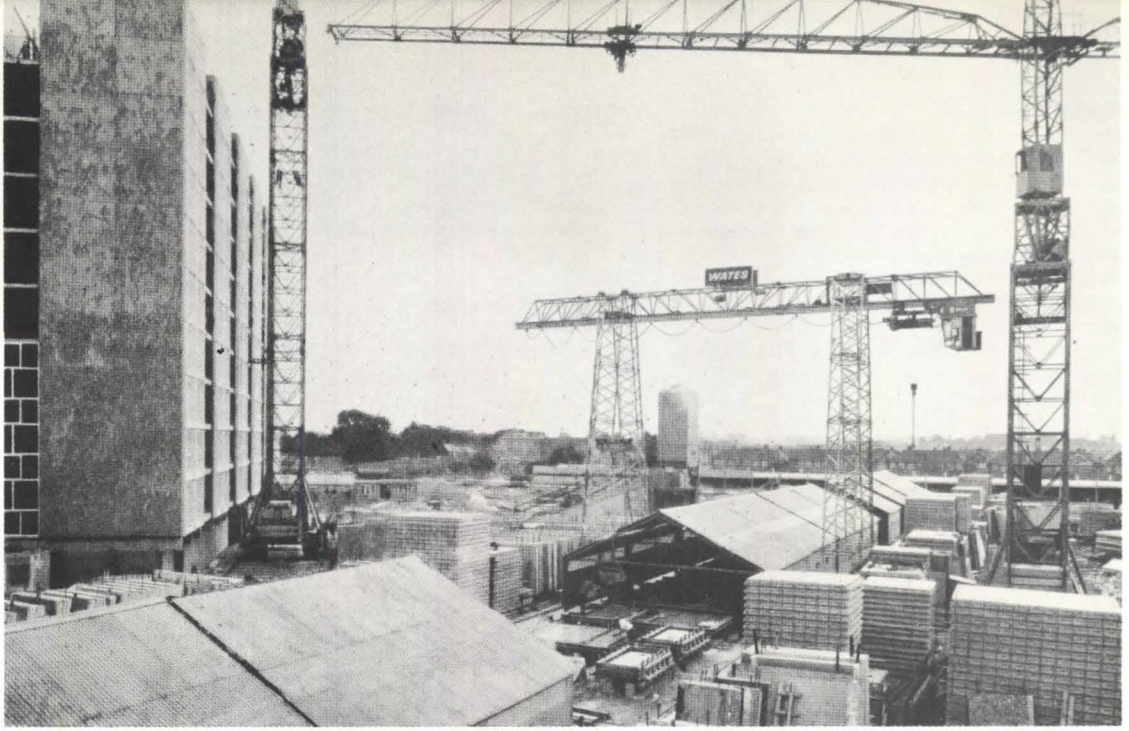
The only concrete box system selected for Breakthrough is a recently developed one that has moved rapidly into production for a 500-unit project in San Juan (right). The Shelley boxes are erected in a checkerboard pattern that eliminates costly (and heavy) doubling up of walls and floors. The process of turning voids between the boxes into living spaces has been simplified by concentrating utilities and plumbing in the boxes themselves and by precise casting of concrete surfaces (just add paint for finished interiors).

One of Shelley's advantages over other checkerboard systems (April '68 issue, pages 85, 86) is that the boxes overlap enough for cavities in the walls to form continuous vertical utility chases. The overlap also allows the structure to be tied together by post-tensioning rods running up through box walls. Loadbearing ribs in slabs and walls make the boxes strong enough for stacking up to 22 stories, yet light enough (50 tons, maximum) for conventional cranes and truck trailers. The boxes are produced in plants on the site or close by; a $1-million plant can turn out four units per day.

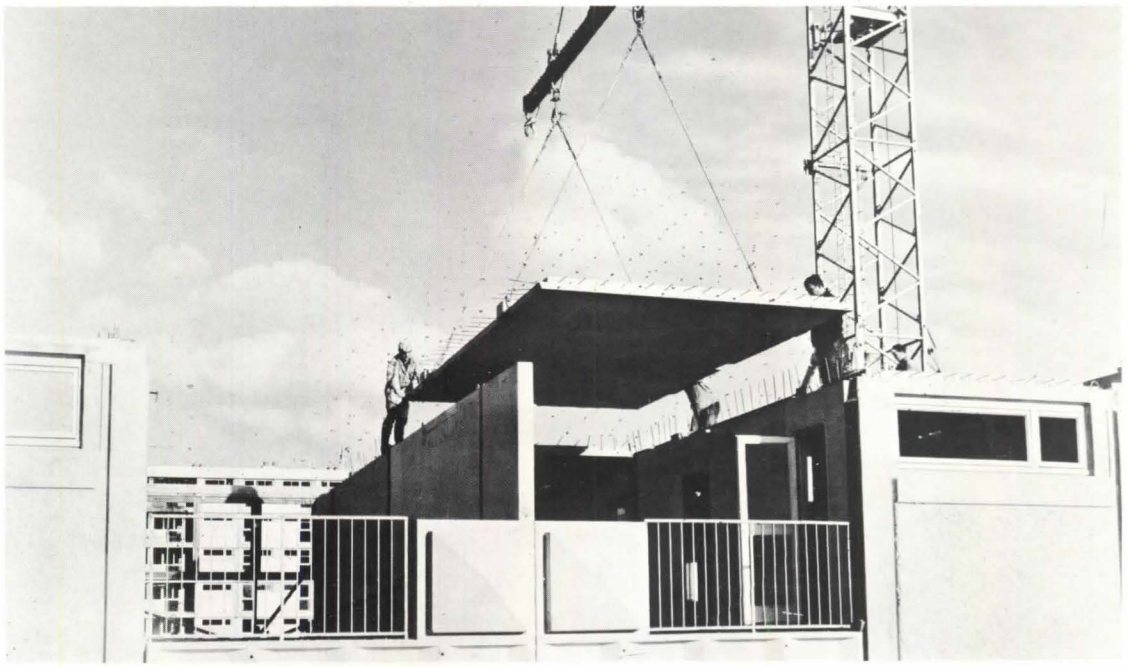
Consortium members: Shelley Systems Inc.; Banco Popular de Puerto Rico; Shelley Engineering Corp.; Hampton Development Corp.; Shelley Equipment & Financing; Caribilt Construction Corp.; Shelga Corp.; Carlos Alvarado; Luis E. Mora, Univ. of Puerto Rico; U. S. Home & Development Corp.; H. R. Stanton, Clark University; N. P. Loomba, CCNY; HRH Construction Corp.; Urban Systems Research & Engineering Inc.; Robert Phillips, Charter Mortgage Co.; August Komendant, Univ. of Penna.; S. K. Schiff, Univ. of Chicago.

CONCRETE PANELS

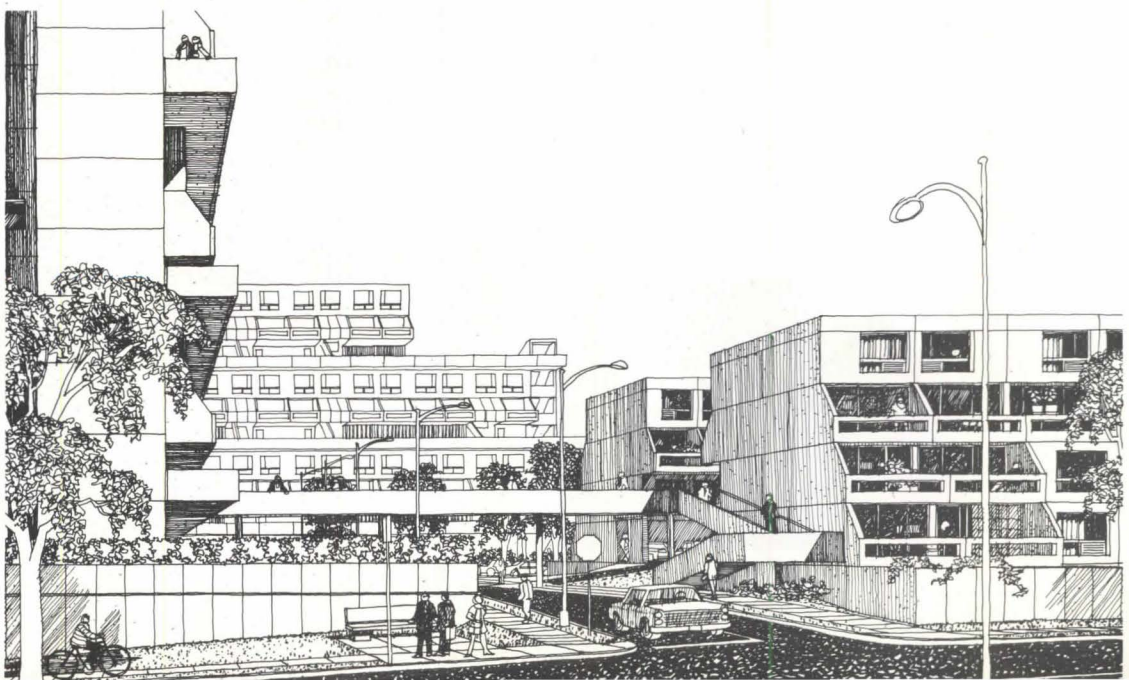
Rouse-Wates Inc.
The Wates system has been used since 1965 in England, where it claims it has produced about 20 per cent of London's recent housing. The system has poured joints between concrete story-high panels and room-sized floor slabs, which are cast in an on-site factory. Suitable for low- and highrise units, the system permits varied subsystems and designs. Consortium members: Rouse Development Co., of Rouse Co.; Wates Systems Inc. (USA), of Wates Ltd.



Module Communities Inc.
MCI has American rights to Tracoba I, a factory-produced concrete slab and panel system used in France to produce 70,000 dwelling units. Suitable for single-family, townhouse, garden and highrise residential construction, the system is estimated to cost about $6 per sq. ft., based on a $500,000 factory producing 500 units per year for three years. A U.S. plant is under construction in New York. Consortium members: Module Communities Inc.; Celanese Corp.; American Standard Inc.; Industrialized Building Systems Inc.; Paul Weidlinger, engineer; Cosentini Associates, engineers; U.S. Trust Co.; Skidmore, Owings & Merrill, architects; Hudson Institute; National Urban League; Columbia University; Architects' Renewal Committee in Harlem; Urban Technological International; United Contractors of America; F. D. Rich Co.; Royall, Koegal & Wells.



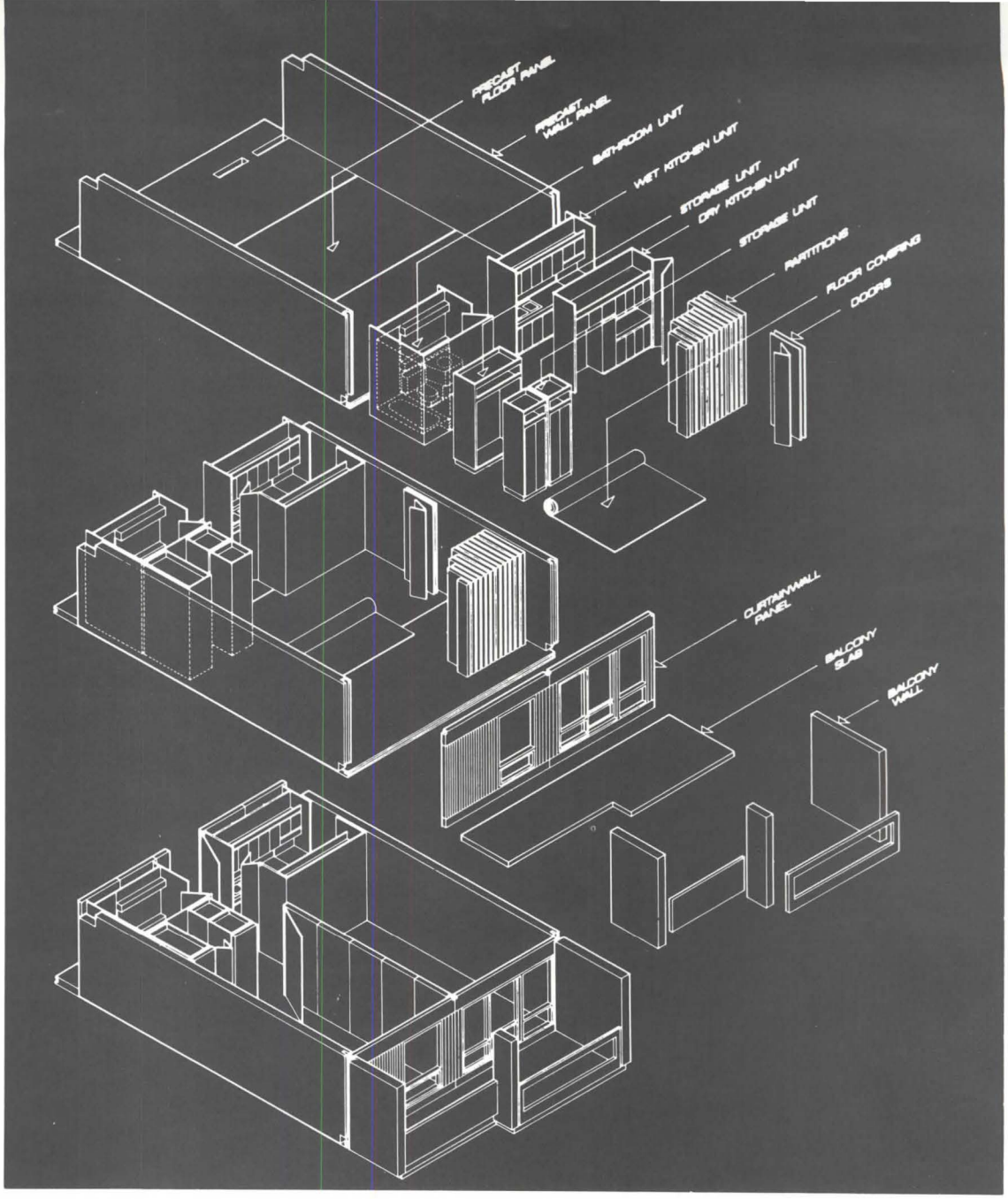
Henry C. Beck Co.
Beck proposed a third European concrete panel system: Balency, of Paris and Milan, the principal method used for the British new town Thamesmead (July/Aug. '69 issue). Wall panels, precast in an off-site factory, may be combined with either precast or poured-in-place floor slabs. Subsystems may be integrated during casting. Balency is particularly suited to high-density, large-market areas, but can be used for detached houses. Breakthrough will include only lowrise, deck and highrise designs. An annual market of 500 units for five years justifies a factory. Consortium members: Balency-MBM-US Corp.; William R. Morris, of NAACP; Henry C. Beck Co.; Raymond D. Nasher Co.; Keyes, Lethbridge and Condon, architects; R. G. Greene Development Co.; Borg-Warner Corp.; Sulton and Campbell, architects.



Descon/Concordia

A Canadian/U.S. consortium, D/C proposed a concrete panel system designed to make maximum use of off-the-shelf components and subsystems. Suitable for any type of residential construction except single-family detached houses, the system stresses the fact that it relies on existing manufacturing processes. The structural panels may be prestressed, post-tensioned or simply reinforced, either in an off-site factory or on site. Dry mechanical joints make all-weather assembly feasible. Subassemblies can include wide varieties of prefabricated wall partitions and bathroom/kitchen units. Wall panels also include raceways for electrical and utility distribution and outlets, plus provisions for snap-on vinyl baseboard. HUD particularly cited the consortium's management concepts, which include the total construction process, from land acquisition through design, construction and financing, to facility management and maintenance.

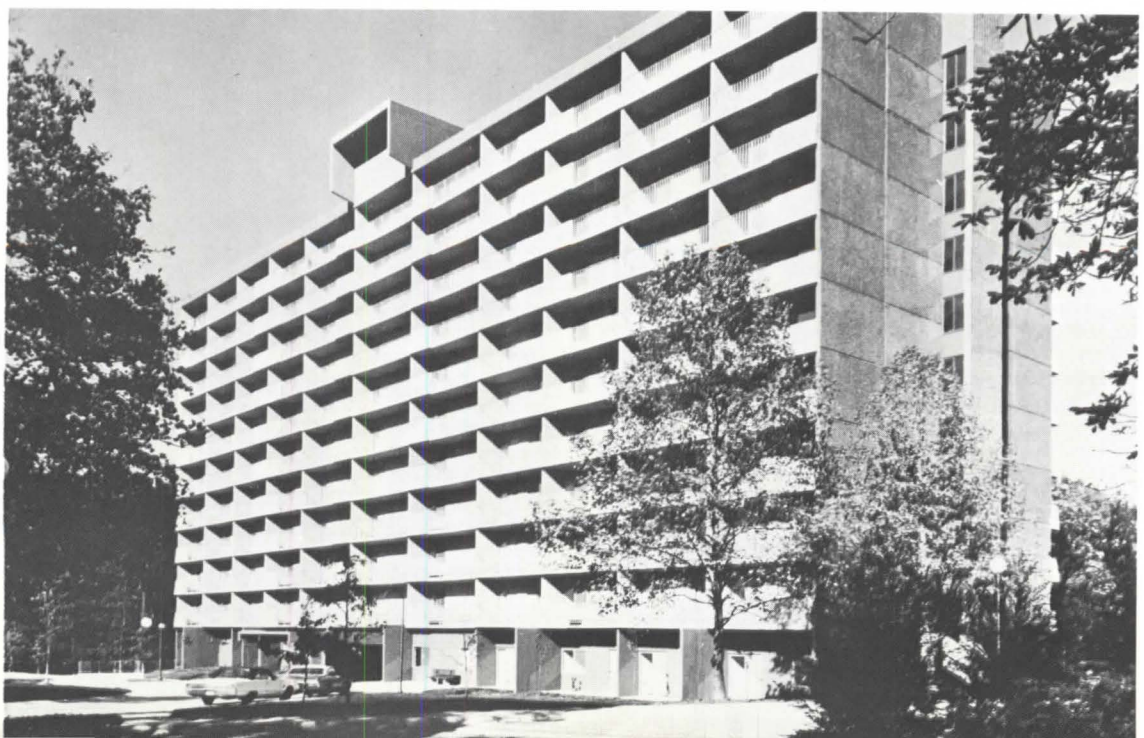
Consortium members: Descon Management Corp. Ltd.; Concordia Management Ltd.; Philip David Bobrow, architect; Gamze, Korobkin & Dolphin Associates, engineers; Colin Davidson and Seymour Glauberman, University of Montreal; Neal Mitchell & Associates, engineers; Hackett Housing Systems Inc.; Paul Spindell, systems analyst; Michael Brill, State University of New York at Buffalo; George E. Buchanan, architect.



Forest City Enterprises Inc.

FCE proposed a U.S. structural concrete panel and slab system that has already been used in highrise apartment construction, but is adaptable for virtually all types of residential construction. The concrete components can be manufactured at existing facilities or cast on site. Prefabricated wood framing is used for infill exterior walls, all interior partitions and the roof. Components include total bathroom, kitchen, heating and other utility packages. Materials for the facade and roof may vary according to architectural specifications, including wood and aluminum siding and rolled or shingled roofing. The structural floor slabs and wall panels have fused concrete connections.

Consortium members: Forest City Enterprises Inc.; Forest City Materials Co.; Thomas J. Dillon & Co. Inc.; Top Rac Precast Corp.; Barbitta-James & Associates, architects.

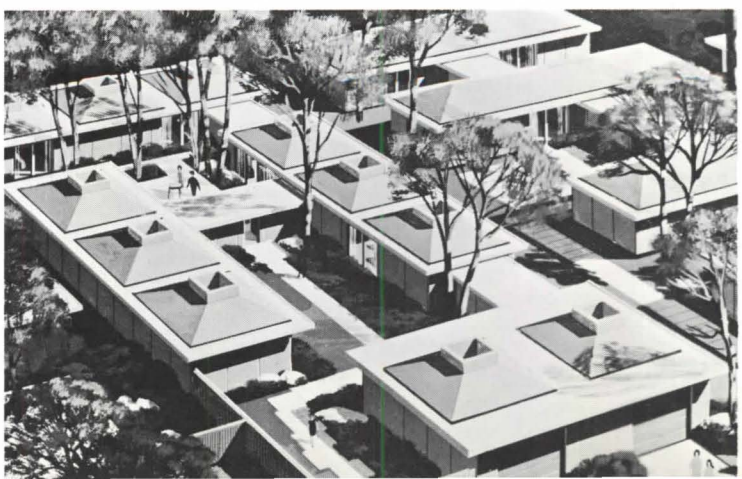


LIGHTWEIGHT COMPONENTS

Boise-Cascade
Boise's lightweight panel system rounds out a product line that emphasizes flexibility and market concern (page 52). The panel system can be produced in the same factory as the box system and includes a similar range of materials. Wood and steel are the primary structural materials, separately or in combination. Boise has been involved in panelizing housing since World War II and it has completed about 80,000 units. Panels are particularly suited to self-help programs.
Consortium members: Boise-Cascade; Dalton-Dalton-Little and Frank Hall Associates, design consultants; Computer Applications, Inc.; National Building Agency (England); David Crane Associates, planners; Brevard Engineering; MIT Urban Systems Lab.

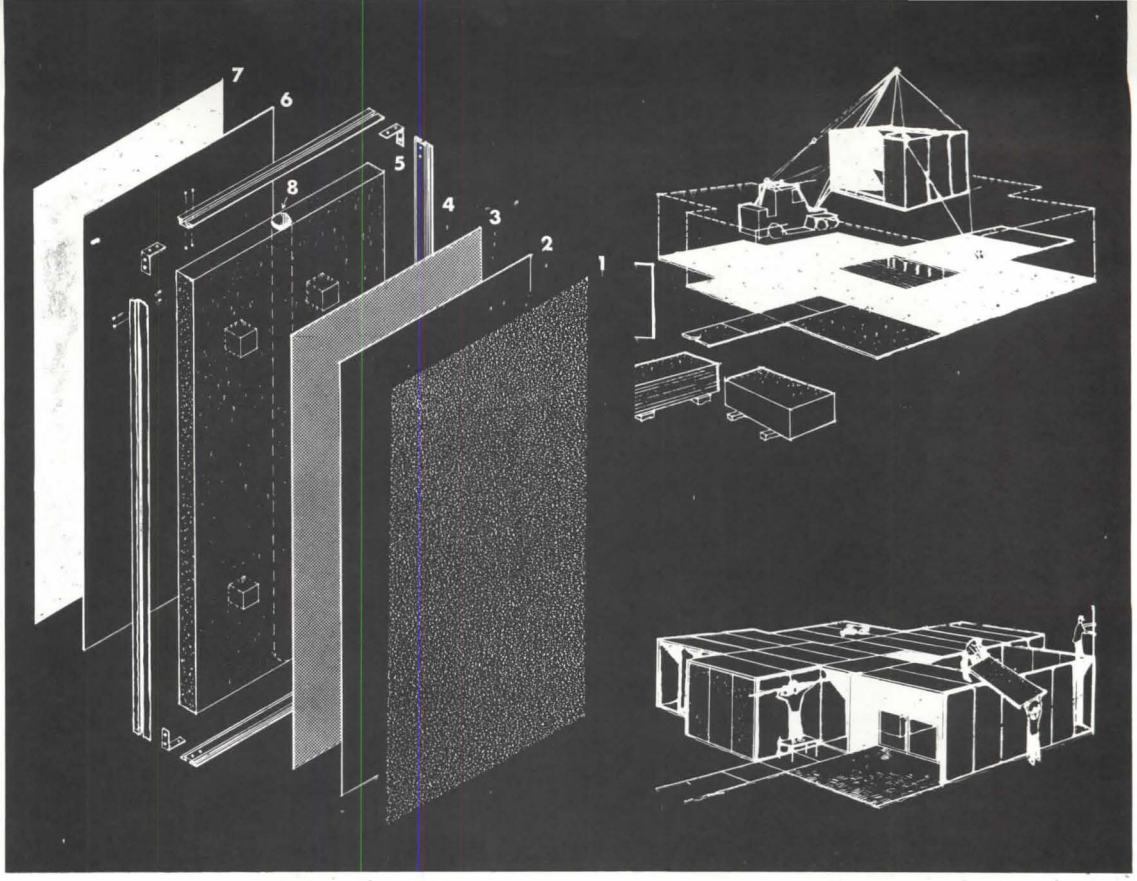
Christiana Western Structures Inc.
Wood is the primary structural material for this panel system, which has already produced 5,000 homes from a factory in California. The system is suitable for single-family homes, townhouses and lowrise apartments. What makes the panels special is a variety of architectural and protective coatings that may or may not be painted, but resist wear and abuse and eliminate some mechanical or structural joints. Interior and exterior walls are coated with 1/32 in. of matte-finished polyester resin, reinforced with glass fiber. Applied to a full-length plywood base wall, the coating provides the required bond between individual panel components. Ceilings have an acoustical plaster coating, applied in the field. Kitchen cabinets are prefabricated with a plastic coating for exposed surfaces. As much of the mechanical systems as possible is installed in the plant and consists of off-the-shelf products.
Consortium members: Christiana Western Structures Inc.; B. A. Berkus Associates, architects; Mutual Ownership Development Foundation.

Aluminum Company of America
ALCOA proposed a variety of building types and systems. Its lightweight component system for townhouses and multifamily walkup apartments was selected. The structures include factory-manufactured, three-dimensional modular service cores that serve two living units. Panels are used for floor, wall, ceiling and roof construction, allowing wide variations in both space and materials. A prototype townhouse proposal called for ribbed aluminum loadbearing panel walls, factory-produced core units complete with kitchens, bathrooms, doors, stairways, water heaters and heating-air conditioning equipment. Erection of the prototype begins with a conventional concrete block foundation, with or without basement. A crane sets the core units in place, followed by floor panels, then side walls, then a second-story floor system and core, interior partitions and, finally, roof panels.
Consortium members: Aluminum Co. of America; Urban Design Associates; Ryan Homes; Urban Systems Research and Engineering Inc.; Perkins & Will Partnership, architects; Collins & Kronstadt, architects; Slayter Associates Inc.; Andrew T. Kostanecki Inc.; Rohr Corp.; Sectional Structures Inc.; Tappan Co.; Bryant Air Conditioning Co.; Amstore Corp.; Crossgates Inc.

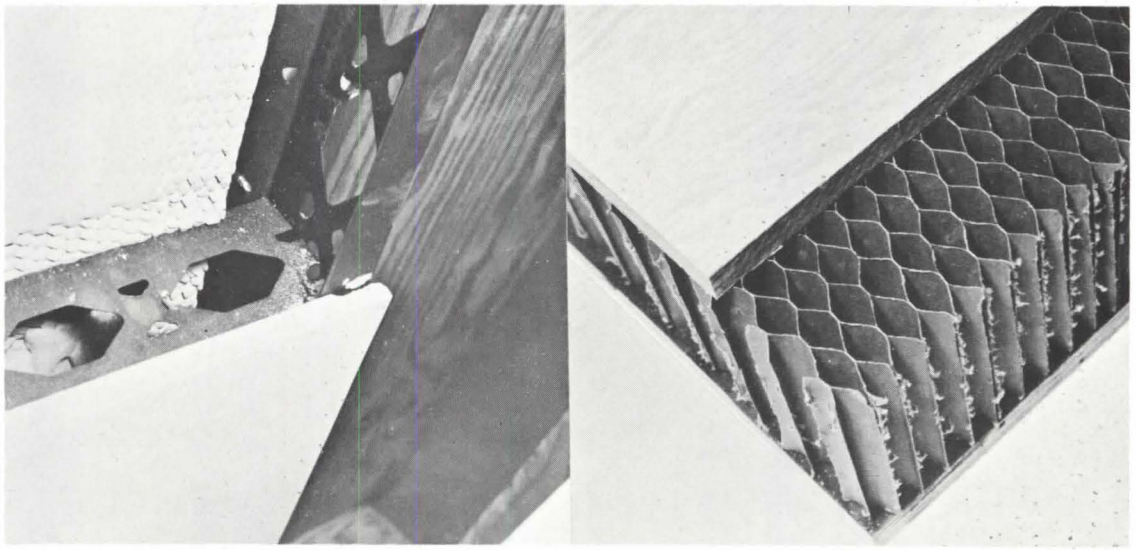


Republic Steel Corp.
Republic's is a lightweight component system using steel as the *primary structural* material for a variety of housing types, from single-family detached houses to lowrise apartment units. The structural panel for floors, roofs, and walls consists of structural steel facings with an insulated core for thermal and acoustical benefits. Conventional siding can be applied over the steel exterior surfaces, and conventional wall coverings and paints can be used for interior areas. Wall and floor panels are attached to box-type grade beams. Kitchen units, complete with clothes washers and dryers, and complete bathroom units are factory-assembled. Additional living space can be built as a do-it-yourself project. Republic's land-use proposal called for high-density cluster housing on cul-de-sac access roads, with at least one private patio for each structure. Units will have glass sliding doors.
Consortium members: Republic Steel Corp.; Bob Schmitt Homes Inc.; Tappan Co.; American Standard Inc.; Climatrol Industries Inc.; Emerson Electric Co.

Ball Brothers Research Corp.
This consortium will form Pantek Corp., a new company to produce and manage housing. The system is a structural composite panel type. The panels are made of polyurethane foam (5 in drawing, right) poured between cement asbestos board (3) and hardboard (6) and surrounded by an aluminum extrusion (4). Before the panel cools, the exterior is covered with an epoxy matrix coating (2) and stone aggregate (1). Interior surfaces (7) may vary. The panel may contain a non-combustible cardboard utility raceway (8).
Consortium members: Ball Brothers Research Corp.; Borg Warner; BOCA; Elliott Brenner, architect; Leo Zickler, architect; American Fletcher Mortgage Co.; Board for Fundamental Education; Oxford Development Corp.; Tectron Inc.; Floyd E. Burroughs & Associates; Ball Corp.; Bradley & Bradley, architects; Jack Goldberg; Ewing Miller & Associates; Applied Decision Systems Inc.; Bolt, Beranek & Newman Inc.; G. Foley; Harbridge House; B. Bernhard; Foundation for Cooperative Housing; Blyth & Co. Inc.; National Urban League.



General Electric Co.
GE's proposal is to manufacture major subassemblies for townhouse and apartment units and supply them to builders, along with technical assistance. The system consists of rigid floor panels, made with a cardboard honeycomb core and stressed plywood skins. Prefabricated metal stud panels form the walls, and prefabricated trussed roof assemblies complete the structural system. Interiors are finished with precast, wall-sized plaster surfacing. Utilities are preassembled.
Consortium members: General Electric Co.; Hugh Gibbs, Donald Gibbs and Leon Julius, architects; Candeub, Fleissig & Associates, planners; FSH Services Inc.



Material Systems Corp.
MSC, a small, developing company, has a panel system using a new resin-filled fiber composite material that is still being tested and modified. The company has produced a few houses, including a prototype on an Indian reservation, where Indians staffed the factory, assembled the housing, and managed the entire project. This house (Dec. '69 issue, page 22) was Spanish-colonial in design, with the composite elements resembling carved oak doors, beams and other conventional materials. The actual Breakthrough units will not resemble the Indian house in design. The system could become modular instead of panelized.
Consortium members: Material Systems Corp.; U.S. Material Systems Ltd.; U.S. Financial; Skidmore, Owings & Merrill, architects.

TRW Systems Group

TRW proposed a mandrel wrapped, lightweight composite shell structure —by far the most technologically innovative Breakthrough winner. By selecting TRW for prototype construction, HUD demonstrated its willingness to experiment within the Breakthrough program by helping to move the TRW proposal out of the laboratory and into the construction and community arena.

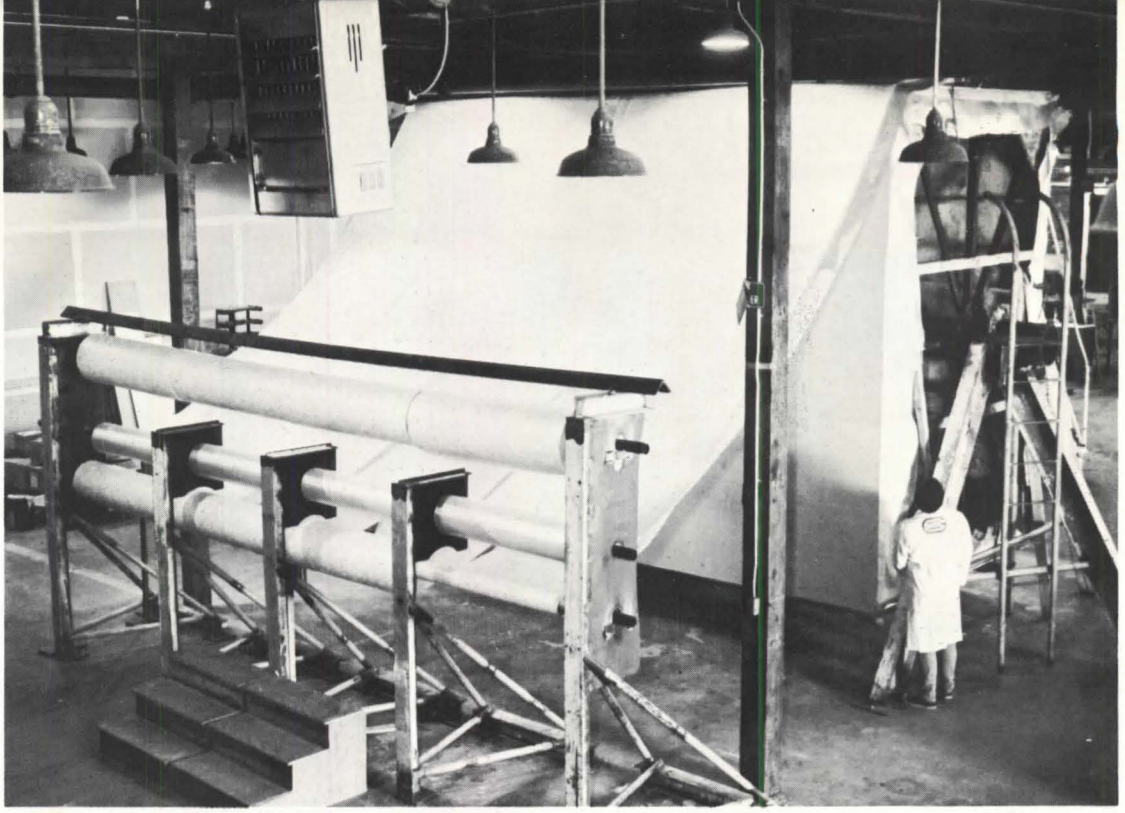
The system itself calls for both off-site and on-site production facilities. An off-site factory will produce small components and panels. The on-site factory is the heart of the proposal. It will use unconventional materials, formed on a mandrel, to produce room-sized structural units for a variety of housing structures, including single-family detached houses, townhouses, low- and highrise apartments, and office buildings as well.

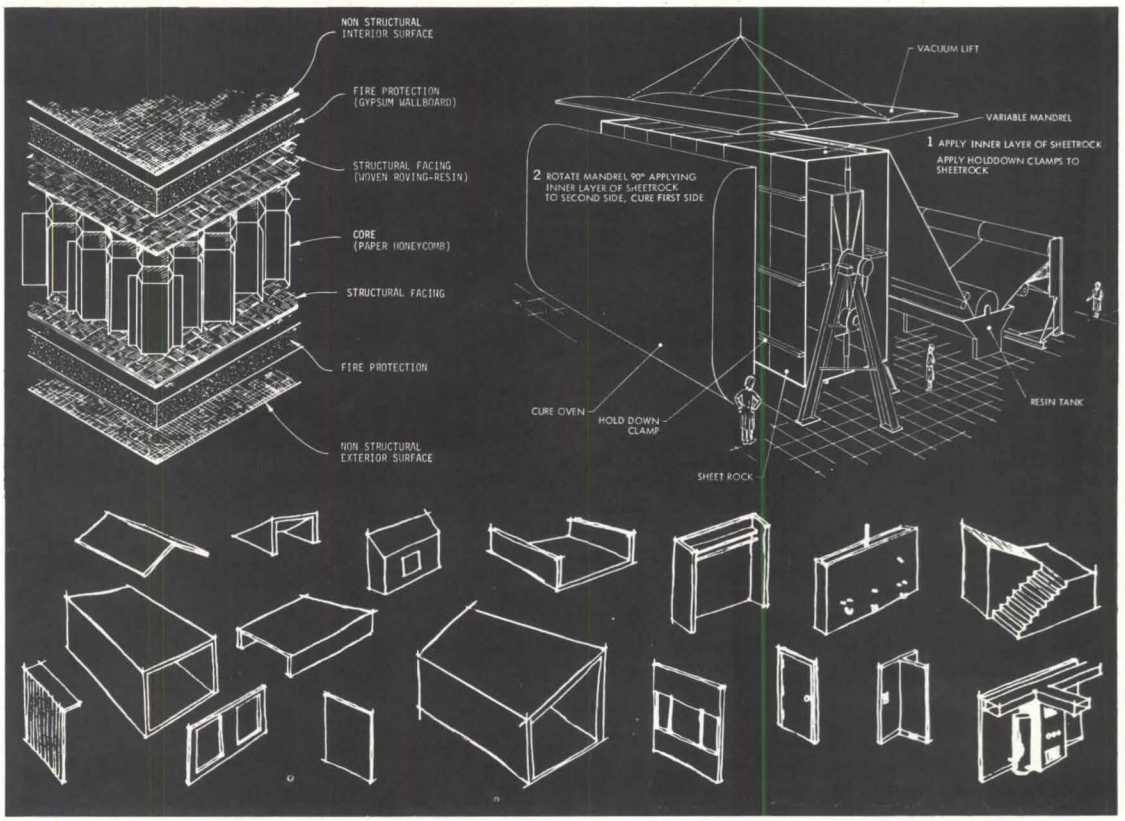
Unique to the housing industry, the mandrel has an adjustable form that will produce any structural shape in only four hours. The structural units will be open ended and can have from three to eight sides of varying and unequal dimensions, as well as curved and sectionalized forms. Dimensions can go up to 30 ft. by 50 ft. and two stories high. A single shell has the structural strength to be stacked or cantilevered and may be sliced and rearranged for architectural variety.

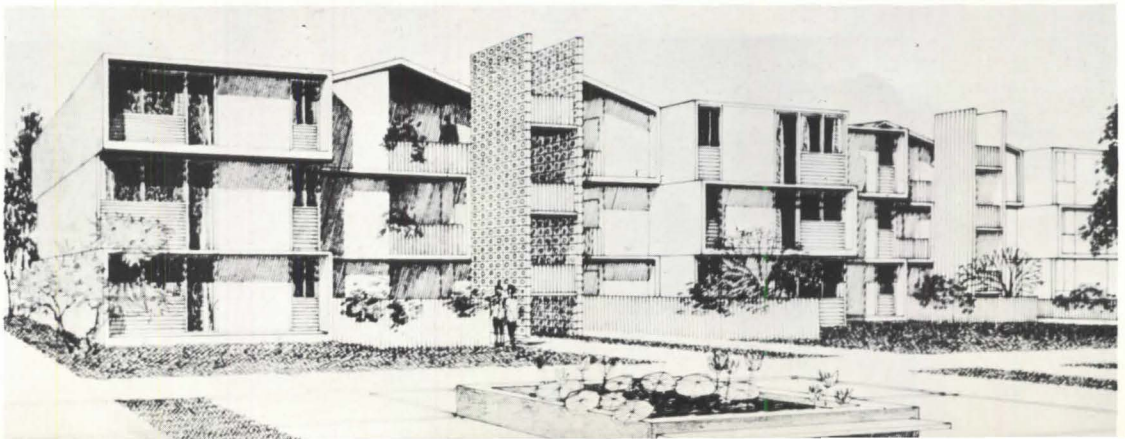
The mandrel method means that a variety of materials may be added to the structural shapes in layers, working from the inside of the unit outward. For example, wrapping begins with the wall, floor, wall and ceiling interior facings; the next turn applies insulation, etc. One material application can be stopped and a new material started at any point.

Winding materials are stored on rollers and fed through a resin dip tank onto the mandrel. Hold-down bars keep the material in place as the mandrel turns to face a heating unit, which hastens curing and brings the materials up to full strength.

The forming materials may vary considerably. Decorative interior and exterior finishes can include stucco, wood paneling, vinyl, sheet rock or any other surface that adheres to the adhesive used in wrapping. Structural materials are chosen for low cost, high strength and resistance, light weight, and low maintenance. A proposed cross-section uses gypsum board for fire protection, a woven resinous material for structural facing, and a paper honeycomb core. Development is still in progress.
Consortium members: TRW Systems Corp.; Building Systems Development Inc.; Kaufman & Broad Inc.; Mid-City Developers Inc.







Keene Corporation

A radical approach to urban design turns up in only one of the winning proposals: Keene's "Townland" system. It calls for decks of "synthetic land" on which "house units" would be erected—each one entered from an elevated pedestrian "street" and opening out to an earth-filled "back yard." The system would combine the land economies of highrise construction with some of the outdoor amenities and construction savings of townhouses.

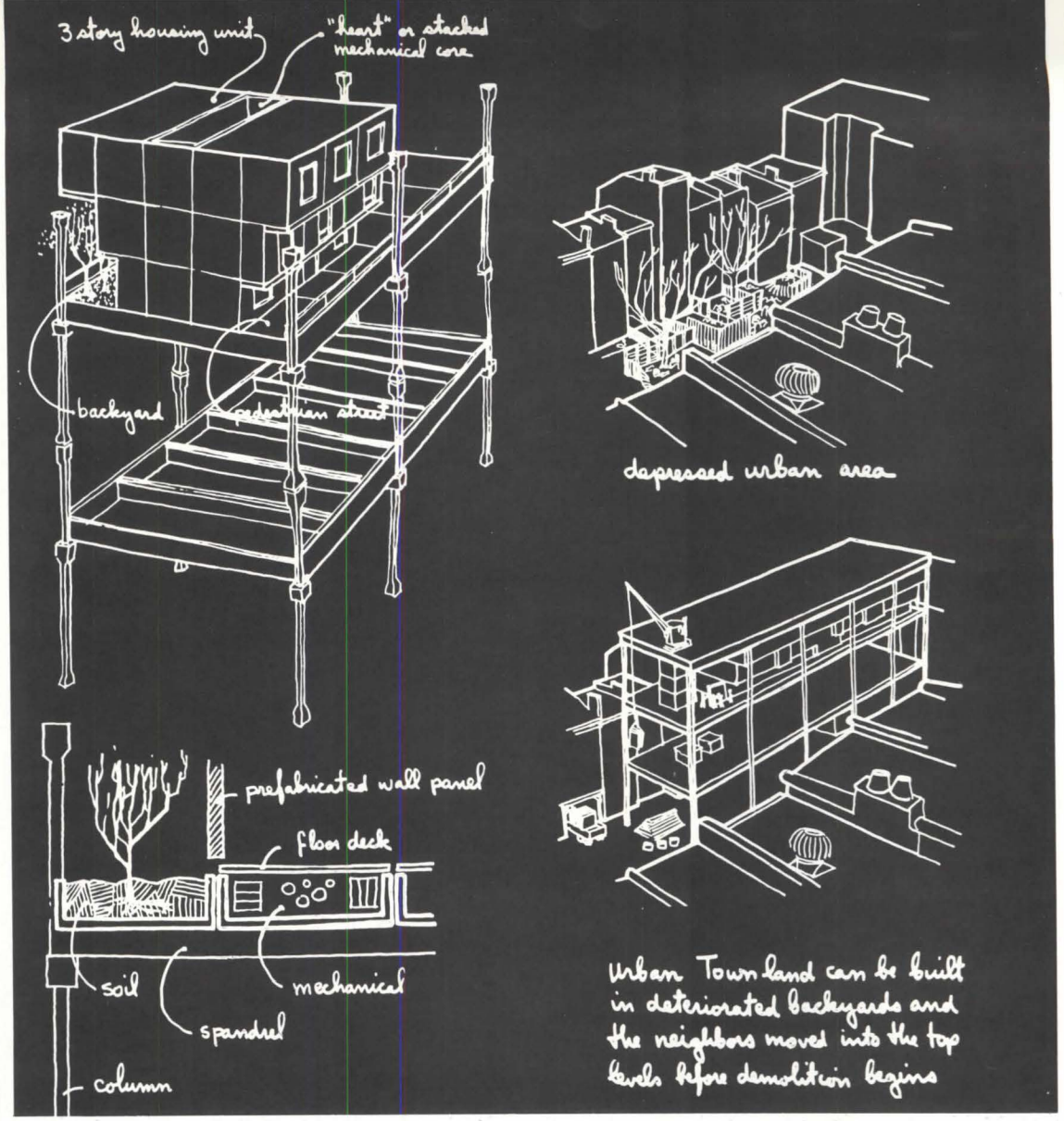
None of the structural components of Townland is revolutionary. Precast concrete members would form a superframe with platforms at three-story intervals (up to a maximum of 15 stories). Three-ft.-deep structural channels spanning the 30-ft. by 55-ft. bays would contain earth fill and utility lines. The house units could be made up of any available lightweight panel system, erected around factory-assembled cores containing baths, kitchens, stairs, and mechanical equipment. Structural components could be drawn from other Breakthrough systems—or from systems yet to be developed.

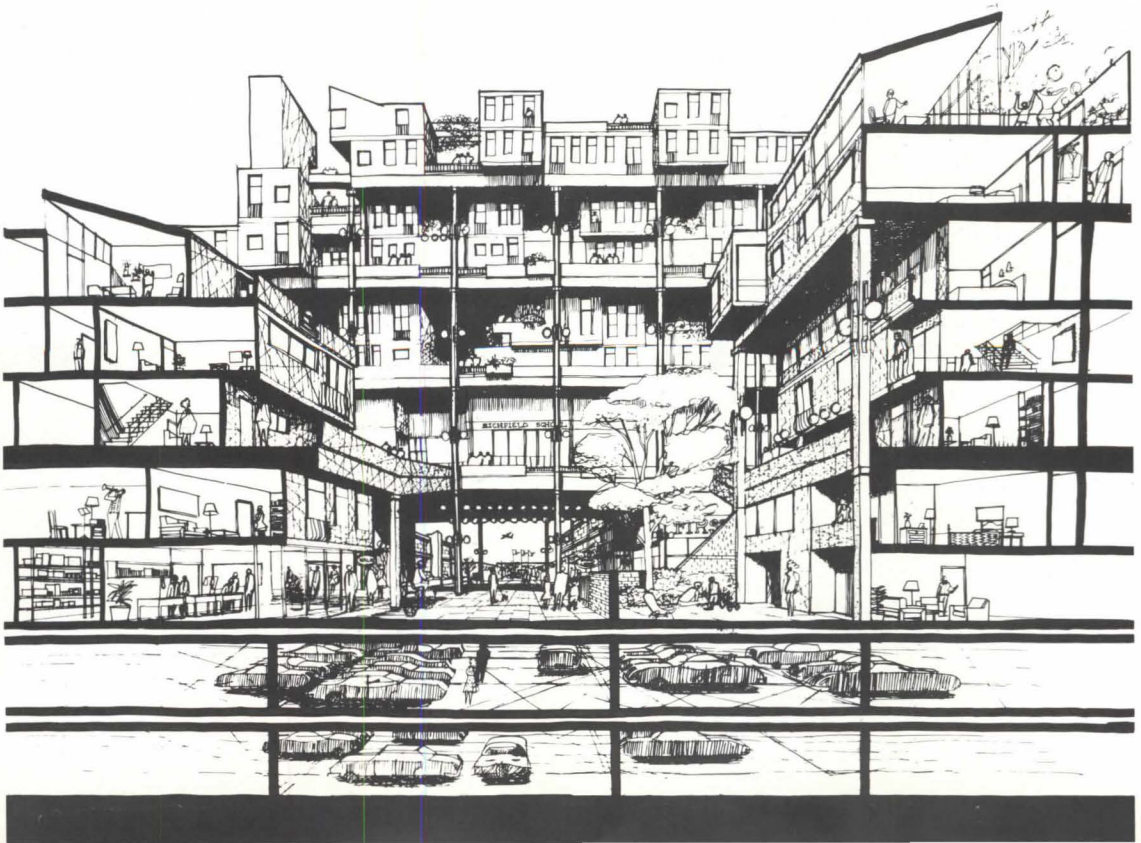
Unit design would not be limited by layouts of units above or below; alterations or construction in stages would be feasible. Commercial and communal facilities (even large ones such as churches or swimming pools) could be introduced at any level.

The "synthetic land" concept would permit new kinds of ownership or tenancy arrangements: sites and house units could be sold or leased separately; rent subsidies could be applied to site, housing, or both. The freedom of owners to determine their own unit design could be limited for visual harmony, Keene suggests, by establishing a "family of esthetically related facade treatments" for each development, or by setting up a design review process. But Keene's proposal questions whether control is needed—whether "highly individualized expressions of what is conceded to be bad taste" might even "add to the visual richness of the whole."

Townland could be used to rebuild urban neighborhoods without displacing residents (sketches, top right). The system is adaptable to many air-rights opportunities—for instance, conversion of shopping centers into suburban cores by building above their wasteful parking lots. *Townland* is not just a system of components and management, but a system for allocating urban space. Its implications can barely be explored in a Breakthrough demonstration project, but—with HUD's help—its ideas may catch on.

Consortium members: Keene Corp.; Warner, Burns, Toan & Lunde, architects; Grumman Corp.; Node 4 Associates, architects; Formigli Corp.; Alvin E. Gershen Associates Inc.; 3 H Building Corp.; Robert Hughes Associates Ltd.; Lennox Industries Inc.; Portland Cement Association; Ryan Inc.; Wickes Corp.





CHARLES ABRAMS 1901-1970

BY LOUISE COOPER CAMPBELL

Charlie—as he was known to enough friends to fill Grand Central station—was a rare bird among uplifters. He would not have been at home in the Bloomsbury set, whose comfortable inherited incomes may have had something to do with the unrelieved earnestness with which they confronted the fate of London's poor.

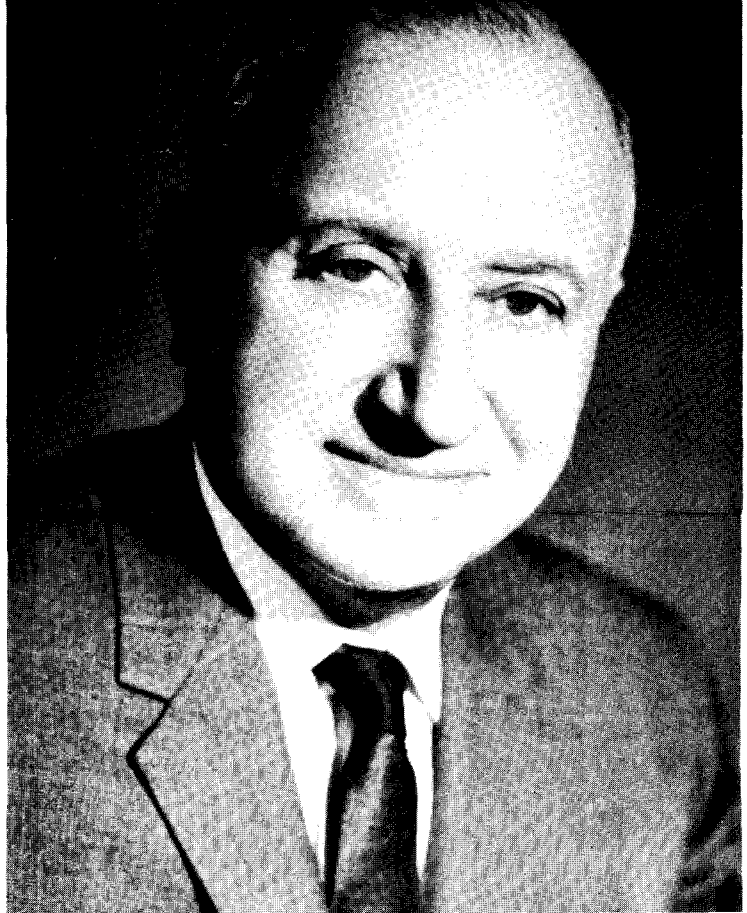
Still less was Charlie kin to the aggrieved U.S. reformers of the thirties, whose Marxist solemnity was soon to vanish like a stone in the vast bland pool of American politics. Yet it is an indication of his durability that he was very much at home in recent years with some lively representatives of the young black left, whose humor and energy matched his own.

For Charlie was that most durable of reformers—or of men, for that matter. He showed us all how to be serious without being solemn. He liked to make a joke almost more than he liked winning, and he was able to do both a good deal better and a good deal longer than most people. He kept revising his will over the years because new puns and jests kept occurring to him, calculated to make his posthumous occasion a positively mirthful one.

While Charlie's lifework was securing housing for those who, by income or skin color, were denied a fair share of it, and while his achievement in this field probably exceeded that of any other American, this effort was an indivisible part of his own long love affair with the city. For Charlie, metropolitan life was like an endless party, a larger version of the conviviality he was so fond of assembling in his high-ceiling New York brownstone, and he simply wanted everyone to be able to come to the party in a comfortable way. Subsistence homesteads out in the boondocks were not what he had in mind.

There was no indication that he felt particularly sorry for the housing-short "third of a nation," whose needs pre-empted almost all of his working life. In fact, he told Bernard Taper, a *New Yorker* writer who succeeded in getting down Charlie to the life, that he found life endlessly stimulating in the Williamsburg tenement where, supported by his father's earning's as a pickled-herring vender, the family lived surrounded by a warm circle of neighbors, most of whom, like the Abrams, had recently arrived from Poland. In this unheated, rat-infested, highly combustible, wooden six-story structure, the Abrams family of six shared three small rooms, and repaired to the public baths for pre-Sabbath cleansing. Charlie recalled that his mother set pots of water to boil on the wood-burning stove to keep the neighbors from noticing the occasional days when the family ran out of food.

Not until he was obliged to define a slum while writing the first U. S. public housing law, the state act that established the New York City Housing Author-



Mrs. Campbell, a former associate editor with the **Forum,** was senior editor at **City** magazine.

ity, did it occur to Charlie that the lively and colorful scene of his childhood was exactly that. In fact, the verve and bounce and—yes—the security of life in a crowded tenement shaped his devotion to what others saw as a jungle.

In *Man's Struggle for Shelter,* which he finished in 1964, he wrote:

"From earliest history the city has been linked with man's freedoms—a refuge in the days of Cain and Joshua, the hub of a vigorous political life in Greece, the impetus to law in Rome. When man's mind roamed free in Utopian dreams, it was the city that was so often closest to his conception of heaven. . . . The city still harbors the hope, in an increasingly hazardous and complex society, that the social and economic fluidity which was its historic attribute can be maintained against the chaotic forces that challenge it. It is still the marketplace for goods and ideas, the locus of a contractual society, the mirror for emulation, the meeting place for diversities, the center of culture."

Charlie, who was a lawyer out of Brooklyn night school, liked these grandiloquent periods. But he liked action more and he brought to a series of public jobs the tough savvy of a man who had assured his career as a social reformer by several years of brisk initial activity that quickly rolled up a substantial fortune in Greenwich Village real estate. He served New York mayors from LaGuardia to Lindsay and was appointed by Governor W. Averell Harriman (who became one of Charlie's thousands of intimate friends) first as State Rent Administrator and then as chairman of the State Commission against Discrimination.

This last was perhaps the public job Charlie loved best. He thought of housing, he said, as a "package of rights." He won an early breakthrough victory against the Metropolitan Life Insurance Company with a court ruling that housing built with public aid could not be constitutionally withheld from any ethnic group, a ruling that he immediately set about applying to the Federal Housing Administration. He worked quietly for many years with the National Association for the Advancement of Colored People, assisting in the preparation of the brief that persuaded the U. S. Supreme Court to declare racially restrictive covenants unconstitutional—first of the landmark decisions that finally delivered the Constitution to the 12 per cent of us who are black.

Charlie's innate passion for civil rights was nurtured at the beginning of his career, when he served for three years as clerk to Arthur Garfield Hays, who was counsel to the American Civil Liberties Union and an associate of Clarence Darrow in the Scopes trial.

As counsel to the New York City Housing Authority and consultant to the U. S. Housing Authority, Charlie's originality and acumen helped establish the public power to provide housing for those who could not afford it. The same gifts much later made him housing adviser to some 21 developing nations, most often as the head of U.N. missions.

"When you come right down to it, he told Bernard Taper, "what I am is a finagler. In real estate I learned to finagle for myself. After that, I began finagling for society."

What Charlie meant was his unparalleled ability to come up with a gadget or a gimmick—some application of an old law that nobody else had noticed, some politically feasible bit of social purpose that could be tacked onto a new law, or an argument that could persuade some holder of either power or money to put it to use.

"Finagling" was a characteristic understatement, for Charlie refused to take himself seriously and usually made himself the butt of his own jokes. Yet he was the unrecognized author of one of the most fundamental social insights of our generation. About 1940, in a speech to the National Association of Real Estate Boards, he spoke of the realtors' success in getting the government to remove virtually all risk from the real estate and housebuilding business without interfering with its even-then abundant profits. At the time, the realtors were trying to destroy the public low-rent housing program by denouncing it as socialistic. "Apparently," Charlie suggested, "you believe in socialism for the rich and private enterprise for the poor."

In the 30 years that followed, the "socialization to the right" that Charlie had discerned in the FHA spread to almost the whole of U. S. industry, made both riskless and profitable beyond the dreams of earlier defenders of free private enterprise by military and space contracts. Charlie's phrase became the battlecry of the black revolt.

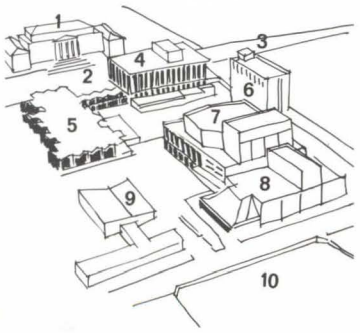
Charlie taught at a number of universities, serving in the last year of his life as Williams Professor of City Planning at Harvard. He was on leave from Columbia University, where he had been chairman of the Division of Urban Planning. It was at Columbia that he lost a fight, for one of the few times in his life. For four years there, he had tried without success to convince the Administration that it must form a positive relation with the black community around it. The day Columbia was shut down by student protest against, among other things, its oblivious extension of itself at the cost of the homes of its black neighbors. Charlie was busily occupied with neighborhood black youths, who had enrolled by the hundreds in a Ford Foundation-funded community planning workshop he had organized.

At the time they enrolled with Charlie, these young people were not qualified for university admission, although many of them later were able to do so. In Charlie they found what so many of the rest of us—all newcomers in one way or another—had found: the openness, civility and urbanity that made and, in spite of everything, still make the city the place where we want to be.

CENTER OF ACTION

With its last structures in place, the Berkeley Student Center is a model of urban design.

BY ROGER MONTGOMERY



The Student Center links the campus (far left) to the town of Berkeley. Classical Sproul Hall **1** faces the center across Upper Sproul Plaza **2** which leads out to Telegraph Avenue **3.** The center buildings include the Student Union **4,** the Dining Commons **5,** Eshleman Hall **6,** Zellerbach Hall **7,** and the Playhouse **8.** The Alumni Building 9 and the gym 10 predate the center development.

Mr. Montgomery is professor of urban design in the Department of Architecture and the Department of City and Regional Planning at Berkeley.

At noon, October 1, 1964, when Mario Savio climbed on top a police car and triggered the Free Speech Movement, student dissent in America crystallized in Sproul Plaza at the University of California. This was the students' Haymarket Square, a then new civic space sensitively laid out by a competition-winning design team. Vernon DeMars, his partner Don Reay, Donald Hardison, and Lawrence Halprin had designed the Berkeley Student Center intentionally to serve as the social focus for the university community. They succeeded and then some.

The student center has been growing piece by piece since 1961: Sproul Plaza, the Student Union building, the Dining Commons, Lower Sproul Plaza, Eshleman Hall student activities office building, and the recently completed Zellerbach Hall (students prefer King Hall) auditorium and theatre. Most of the time, these facilities serve peaceful, happy, often culturally improving functions. They do this very well indeed.

What makes Berkeley's center different from other campus centers? Two things, mainly. The university planners made a perfect location choice which the designers matched by a splendidly responsive design concept. This made it the "natural center" for people to meet, for things to happen. Both the plan concept and its architectural detail was approached as if providing a stage for human drama—a "behavior setting" is the currently *in* phrase.

This corresponds to Lewis Mumford's view of architectural purpose. What he wrote years ago in *The Culture of Cities* might as well have been the program for the Berkeley Student Center. If we substitute "center" for "city," Mumford writes: "It is in the center (city), the center (city) as theater, that man's purposive activities are formulated and worked out, through conflicting and cooperating personalities, events, groups, into more significant culminations."

Skeptical reactions

Architecture as behavior setting is not a very popular subject among professionals who mainly stick to more tectonic values or admit user needs only in terms of narrow, "functional" considerations. Lewis Mumford has observed, "There is a tendency in our age to regard the mechanical functions as the dominant ones, even to view with suspicion any deliberate attempt to produce visual animation or excitement." DeMars and his colleagues have been viewed with suspicion ever since 1957 when the design appeared.

Initially the project generated some interest from the organized profession (Oct. '57 issue). In its first year, while still a set of competition drawings, it received its only national prize (a P/A Design Award). But even then the jurors mainly worried about formal problems, "unity," "clutter," and some misread it totally as a "little island" walled off from campus and town.

Nine years ago, after the first part of the project was up and in use, Alan Temko, then a FORUM associate editor, wrote a major critique of it (Oct. '61 issue). In that review he came close to predicting its success while simultaneously condemning it as architecture.

Temko found the site plan "excellent," "adroitly organized," "deliberately city-like," and having affinities "most notably with the Piazza of San Marco in Venice." Nevertheless he found the architecture of the first two structures "fatally at odds," "a clutter of forms," marked by "anarchic detailing," even "carelessness tinged with sentimentality." (Oh horror of horrors!)

Ten years of hard use

In the time since Temko wrote these words, almost a decade has passed and the Berkeley Student Center has been completed. A generation of students has come and gone. The Free Speech Movement has been followed by countless others. A new generation of students—and faculty—have been radicalized by the events of May 15, 1969, when the Alameda County sheriff's deputies fired on students—killing one, maiming others—and of May 20, 1969, when a California National Guard helicopter blanketed the Student Center with CS gas, a chemical warfare agent outlawed by the Geneva Convention. Between crises, all manner of people have inhabited its spaces. In daily life it has become one of the most used places in the Bay Region.

By now almost everyone—students and townfolk, architects and non-architects, radicals and conservatives, old folks and

young—digs the general layout of the center. Its openness—compositionally and in terms of use; its sequential elasticity in time—people have used it for nearly ten years, yet it has only recently been formally completed; its easy accommodation of an immense multiplicity of clients, users and designers; all make it a classic, textbook work of urban design.

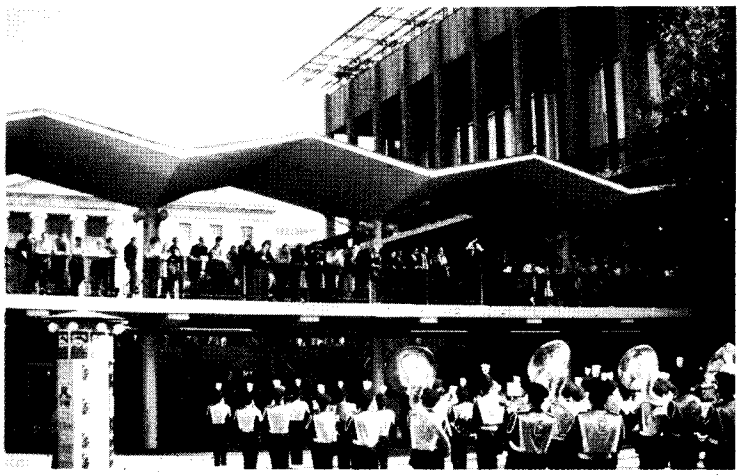
A successful site design

The Center occupies a former city block of business property and the streets which once bounded the block on three sides. This block lay between the stiff white stone hulk of Sproul Hall administration building on the eastern or uphill side, and the squat, homely men's gym sprawled across the west end. The site sloped down more than two full story heights east to west between these two monuments.

The designers took the direct approach. They made a big space in the middle, on the middle level. The functions of union, dining commons, offices and theatre which many architects would have shoe-horned into a single box were disposed separately instead to define the space. This had the advantages of making buildings which do not seem outsize in contrast to their neighbors, which phased easily in time, and which made the *space*, not the architecture, the real center of attention.

Under this big plaza DeMars and his colleagues put parking and building services, entered neatly at grade to the west. And still farther west a piece of the old street right-of-way gives entrance to the gym, the existing Alumni House and the new small drama theatre, the Playhouse. Eshleman Hall, an eight-story office building, forms the southern street edge along Bancroft where town and campus meet. On the north the Dining Commons forms a softer, less definite boundary along Strawberry Creek only partly masking the view of the campus behind.

The most active edge of the big plaza occurs on the east where the Union Building straddles the story height step between this space and Upper Sproul Plaza (photo above). Inside the Union and on through the Commons parallel to the line of this step lies the interior street along which the designers



have strung most of the daily services provided in the Center.

Between the Union building and Sproul Hall lies the linear space, more street than square, which has come to be known as Upper Sproul Plaza. It is here that Mario Savio first spoke to the world, and it is here that the most intense everyday life of the campus is concentrated.

Upper Sproul, which runs on the old Telegraph Avenue right-of-way, connects the historic campus portal, Sather Gate, with the town and the world beyond. Telegraph, which begins (or ends) here, runs straight for nearly five miles to the heart of Oakland, but it is the four blocks immediately south of the student center which form the campus-oriented shopping area.

Organized around six axes

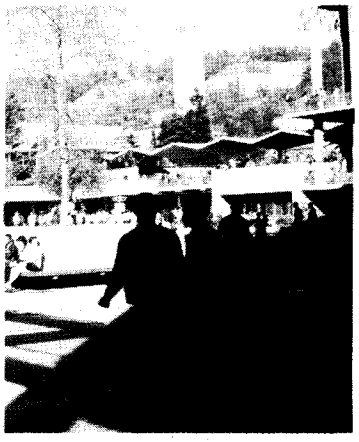
A row of bollards across Telegraph at Bancroft marks the new campus entrance at the corner of the Student Union. This was intended as a Hyde Park corner by the designers and so it has become. Pushcart peddlers, religious orators, and all manner of street life clot this gateway.

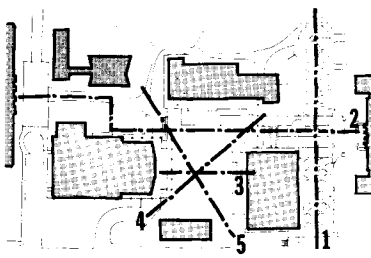
Upper Sproul Plaza is about 550 ft long, but only 75 to 100 ft. wide, and forms a transition space between town and campus. There, both elements mix in an improbable linear room—actually a chain of softly defined spaces—which forms the chief axis of the design.

This axis is the most active and important of the six axes which organize the plan (see drawing, right. Each of the axes has clear visual and functional purposes. The second axis in importance is the longest: it extends from Sproul Hall to the gym, tumbling down a monumental stair from the Upper Plaza, running along the north edge of the lower plaza, then flowing down another broad stair, cranking to the north so that it hits bottom aligned with the gym's symmetrical facade.

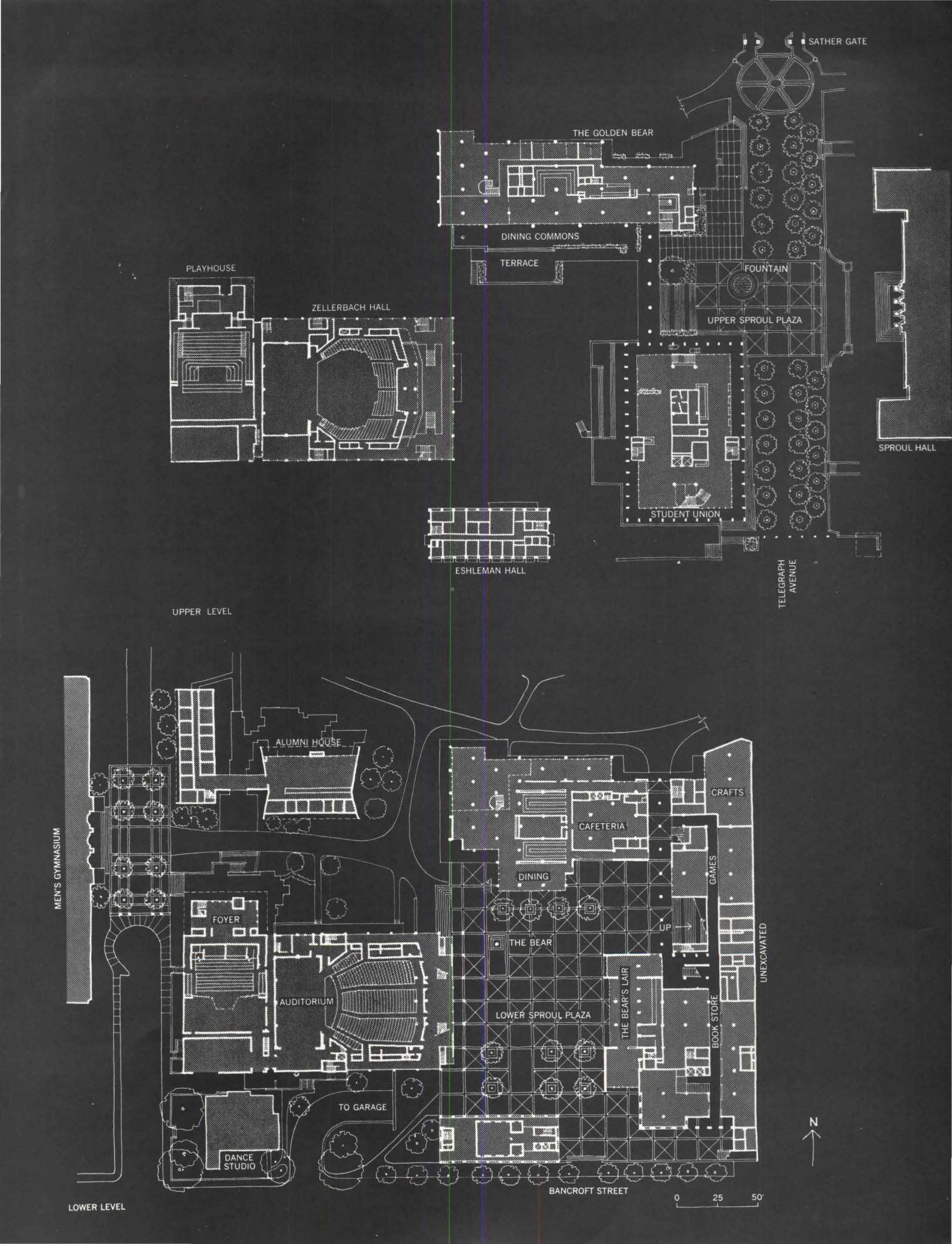
A third axis, less clearly defined, organizes the main space around the center line of the theater facade. Its influence instantly locates speakers and organizes activities in space. The ribbon of balconies and terraces which runs around the plaza focuses on this axis. They make it function as an outdoor arena—a scene of tremendous power when 6,000 to 8,000 people assembled there in the rain to hear Herbert Marcuse.

Two diagonal axes also work in the ordering of Lower Sproul Plaza. One enters from the town at the southeast corner and moves across the square toward the big trees along the creek on the lower part of the campus. The other diagonal forms one of the scenic high points of the Center. As it enters from the town at the southwest corner it goes under a covered walk and emerges dramatically targeted on the Campanile, the best known, (photo below) feature of the campus, framed between the Union and the Commons.





The center is laid out around several axes (plan above). The Upper Sproul Plaza axis **1** follows the line of Telegraph Avenue, the traditional approach to the campus. A cross axis **2** runs down from Sproul Hall to the gym, linking the upper and lower plazas at Sproul Stair (top photo). The center's two largest buildings are lined up along a parallel axis **3**. Two diagonals **4, 5** cross the lower plaza, one aimed at the symbolic campanile (photo, left). A sixth major axis runs indoors through the lower levels of the Student Union and the Dining Commons (plans, right).


SATHER GATE
THE GOLDEN BEAR
DINING COMMONS
TERRACE
FOUNTAIN
UPPER SPROUL PLAZA
PLAYHOUSE
ZELLERBACH HALL
SPROUL HALL
STUDENT UNION
ESHLEMAN HALL
TELEGRAPH AVENUE
UPPER LEVEL
ALUMNI HOUSE
MEN'S GYMNASIUM
CRAFTS
CAFETERIA
DINING
GAMES
FOYER
UP
THE BEAR
UNEXCAVATED
AUDITORIUM
LOWER SPROUL PLAZA
THE BEAR'S LAIR
BOOK STORE
TO GARAGE
DANCE STUDIO
BANCROFT STREET
N
0
25
50'
LOWER LEVEL

The last of the major axes runs *indoors* as a real, live "activity spine" through the lower level of the Commons and Union buildings. It ties together shops, the main cafeteria, recreation rooms, barber shop, post office and check cashing service, all-hours snack bar (designed self-consciously as a hangout), and finally a great two-level student store. DeMars and his collaborators gave the store an enclosed small shopping center layout, with the various departments in open-fronted pouches off the main interior street.

Self-conscious townscape

This account of the axes only begins to explore the richness of the site design realized in the Berkeley Student Center. What does all this compositional richness mean? In an era caught up with other themes—systems building, megastructures, and a narrow behavioral-environmental determinism—this sounds like turning the clock back to the townscape enthusiasm of the late 1940s. And so perhaps it is.

DeMars recalls, "Much thought and very positive goals shaped these spaces. They were meant to accommodate people —encourage them to be there and tarry. Loggias and overhangs at the people level offer friendly shelter and the steps of the Union and the Auditorium are there for sitting and to raise the back rows of spectators a bit for 'events' taking place in the open, and so they are used." And he admits, "We were very interested in the whole vocabulary of considerations that Gordon Cullen discussed in his book *Townscape*, published in 1961, the year the Commons and Student Union were completed."

Donald Reay, another of the collaborating designers, reinforces DeMars' recollection of the design intentions. In 1957, Reay had recently come to the United States. Before that he had designed the center of Stevenage, one of the first round of British new towns. He was steeped in the townscape spirit that then pervaded English architecture.

Reay remembers that the design group always had Piazza San Marco before them, drawn to the same scale. The main plaza at the student center turned out to be almost exactly the size of the Piazzetta.

Both spaces measure about 250 ft. by 150 ft.

Another aspect of the townscape movement shows up in the detail of the public spaces. When Temko wrote about it, he found it "easy to grasp the intention of the architects to transmit the mellow, variegated charm of the European cityscape into American terms . . . to install stage scenery," to scatter "cylindrical kiosks stuck with placards just like those on Paris boulevards."

Kiosks, pavements, benches, all manner of street furniture, trees, fountains, and the bottom edges of buildings have all been treated with loving care. Some will find the results "cutesy." *The fact is the designers have produced thousands of different places to sit outdoors on a seven-acre site half covered by buildings.* They have made an environment with a visual wealth corresponding to the wealth of ways it gets used.

DeMars, who more than the other designers has lived with the project over the 14 years of its existence, exhibits a fascination with special effects in the Hollywood sense. He made sure the Union was decorated with spiral striped flag poles and heraldic shields, that a golden bear announces the Golden Bear Restaurant in the Commons, that the entrances to the internal activity-shopping street have appropriate graphics.

It seems perfectly clear that this self-conscious townscape has produced an unusually adaptable setting for social action. From early morning until well into the evening, 365 days a year, indoors and out, it forms the central stage on which the University community plays out its life. And other communities too: the plaza-like spaces of the Student Center resemble more than anything else the summertime street-park culture of Washington Square in New York and Dupont Circle in Washington.

The center as Architecture

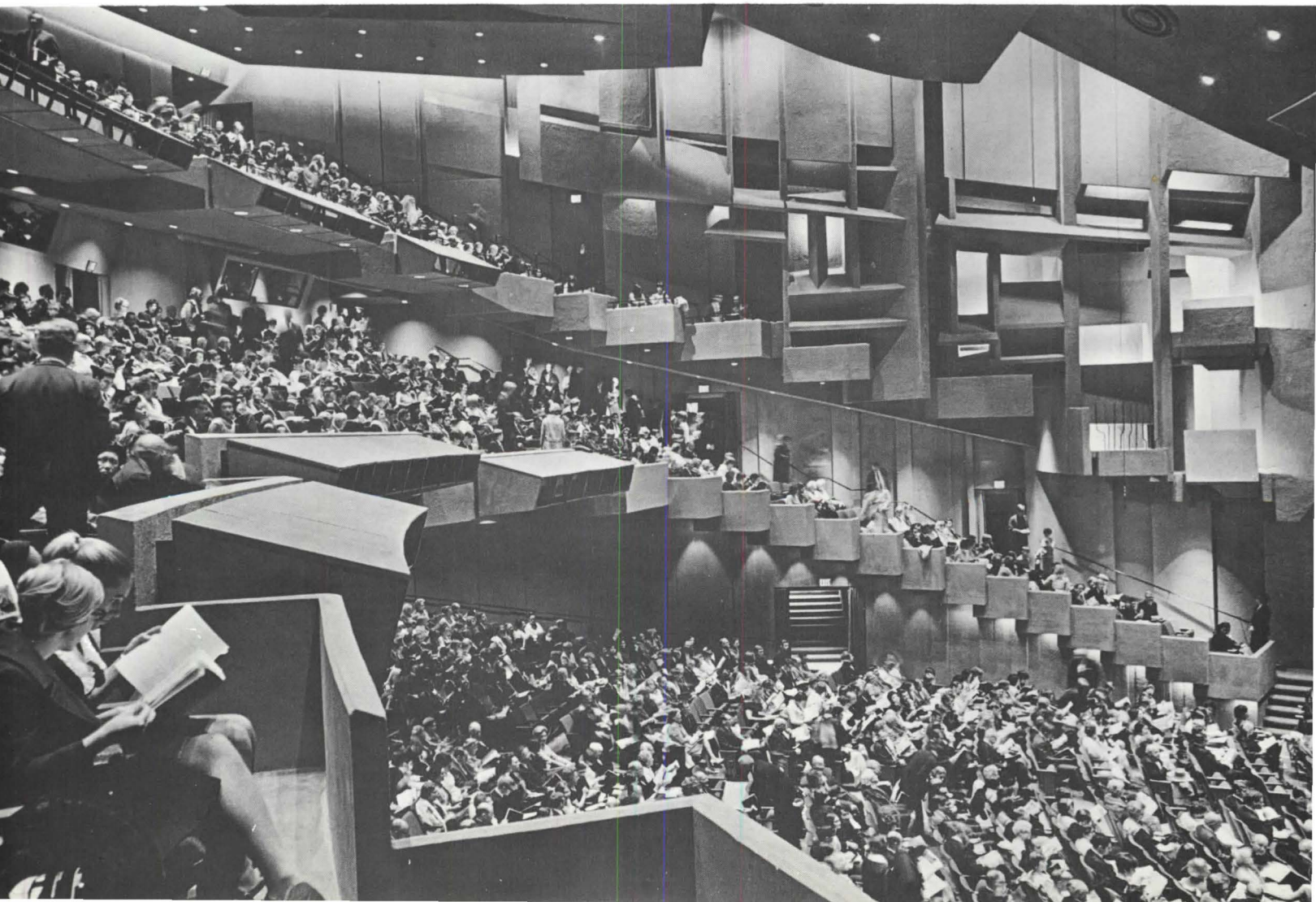
Time has taken the edge off Temko's discontents with this design. Even he has mellowed. He eats frequently in the Golden Bear and freely admits that the center's success as social space outweighs his reservations about its architecture.

Not only have the critics relaxed, but the architecture has improved. As Don Reay puts it: "The theatre is very much better due to the fact it took longer and we had some very good designers involved in it with us." He ascribes much of what disturbed people about the Union and Commons to "a function of time." These buildings went almost immediately from competition plates to working drawings. The theatre took ten years to jell.

Zellerbach Hall, in both its main auditorium and its small Playhouse, exhibits a more architectonic organization than the earlier buildings. In detailing, too, the wealth of materials is still there, but somehow managed in a more orderly way. The decorative detail vastly enhances the main spaces, particularly the magnificently festive banners by Betty DeMars which hang in the main lobby (above). The auditorium makes a noble new room for a university which sadly lacks such spaces.

Mechanically, the architects feel they have achieved a high level of success in layout and equipment in Zellerbach. Unfortunately this discussion of the Berkeley Student Center as ur-

Recently completed Zellerbach Hall (top right) closes the big lower plaza on the east side. Its banner-decked lobby (above left) looks out toward the Student Union. Lighting and acoustical treatment of the main auditorium inside (right) are incorporated into sculptural side walls and balustrades.



ban design cannot report properly on the theater technology of the auditorium and playhouse. Here it simply remains to be said, it is a joy to witness performances in these spaces.

Some lessons learned

One main facility in the center has been totally redesigned by Hardison. The student store was torn out during 1968-1969 and reconstructed to follow the interior street concept set forth in the competition design. Apparently the store's original management could not imagine the store departmentalized as open-front small stores along a busy pedestrian street. Their original discount-store layout, with checkout counters at the entrances to the lower level of the Union, did not work. It is gone now. The interior activity spine is complete. Its detailing exhibits more confident tectonics and materials use. The center improves with remodeling, a testimony both to the strength of original concepts, and to the skillful design of the changes. Again, as Don Reay says, "Nine years show."

Altogether the center now follows with astonishing precision the exact outlines set forth in the hectic few weeks of the competition charette.

The jury which unanimously selected the DeMars-Hardison entry, praised it then in these thoughtful words: "Although competitions may not always be the best method of selecting an architect, it is fair to say that in no other way could such an extraordinary solution be found for such a complex problem."

The student center proves against all criticism that it *is* possible to build a great urban space in the last half of the 20th century. Vincent Scully was recently reported to have dismissed this possibility in our cyberneticized world. Demars, Hardison, Reay and Halprin have proved Scully wrong.

Some younger architects may take heart and reassert the validity of townscape for people on foot. It seems sad to think of a generation of architects caught up in a drawing-room abstraction which makes socially valid art of the Las Vegas Strip.

Another lesson from the Berkeley Student Center concerns the importance of constructional and style purity in the urban design context. This project strongly suggests that successful public space can be achieved independent of some of the conventional architectural verities. To reread Alan Temko's 1961 criticism of its tectonic failures is to confront their relative irrelevance in urban design. Here the dominant issue is what Sigfried Giedion called "social imagination," just as it was in Laclede Town (Nov. '68 issue).

A final irony

DeMars spends a lot of time in the center he played such a leading role in creating. He uses almost any excuse to walk the half mile from his office for lunch. Obviously he is terribly pleased and proud. He has every right to be.

But Vernon is troubled too. He loved his university just the way it was before FSM, Mario Savio, Eldridge Cleaver, the Peoples Park people, the University Administration, campus cops, sheriffs' deputies and Governor Reagan found Berkeley the perfect stage for their confrontation politics. A troubling thought enters DeMars' mind and the minds of every thoughtful observer: perhaps if it had just another building group—perhaps if it had been just another campus or civic center untouched by social imagination—the student movement in America would not have found Berkeley such a perfect strike base.

There lies the irony: the very success of the student center as urban design may have contributed the fatal blow to a great university.

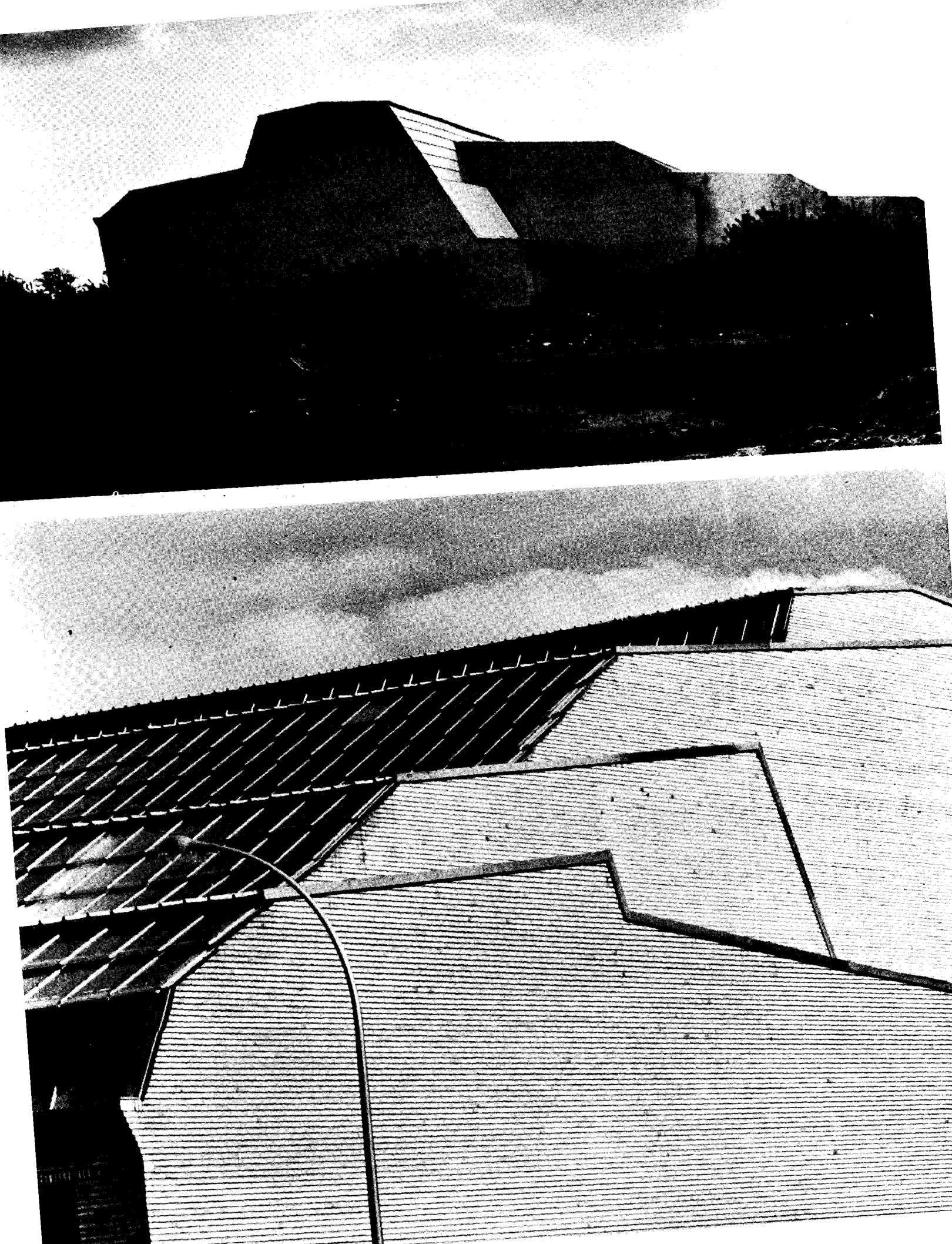
Or it may not. The civilizing influence of the center may have prevented worse events. John Kenyon, sometime Berkeley correspondent for the *St. Louis Post Dispatch*, writes, ". . . during last May's National Guard occupation it was hard to doubt its civilizing effect. Lower Sproul Plaza provided a quiet setting for a day-long ecology teach-in, while the tree-shaded concourse with its fountain allowed for cavorting and comic happenings that would have led to quick arrest on the public street."

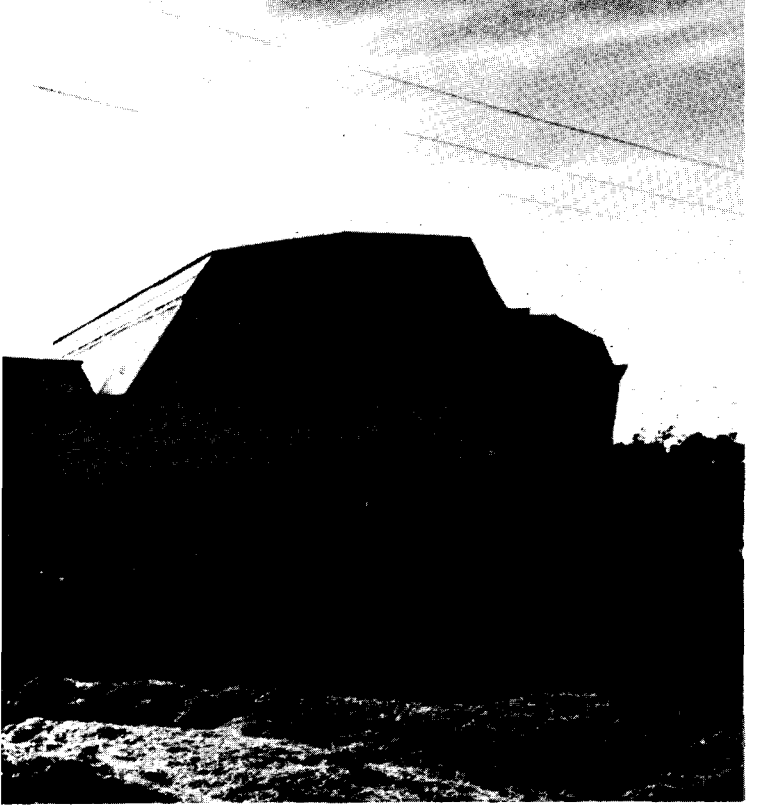
Truth lies in both views. The Berkeley Student Center's success as urban space must often catalyze action. More often, it simply provides a stage for everyday human association, the drama of everyday life in Berkeley. What more could we ask for? That, after all, is the highest purpose of urban design.

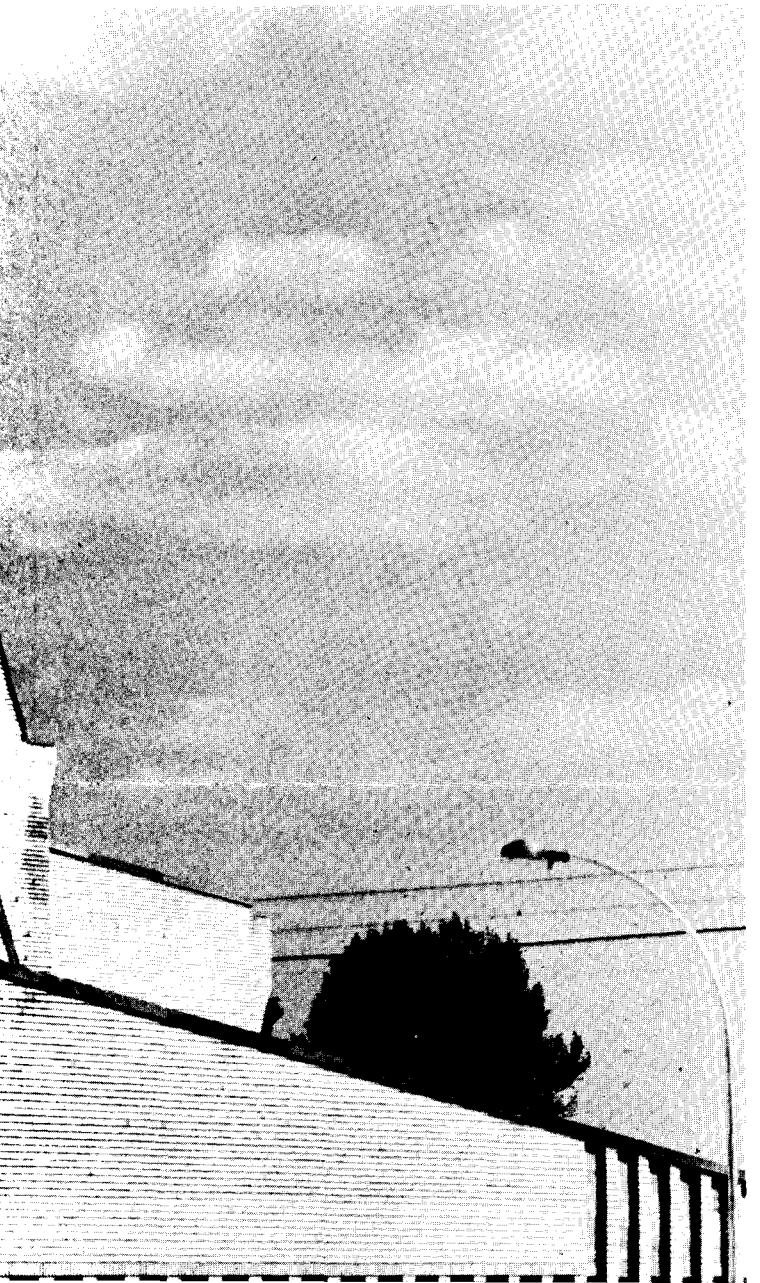
FACTS AND FIGURES

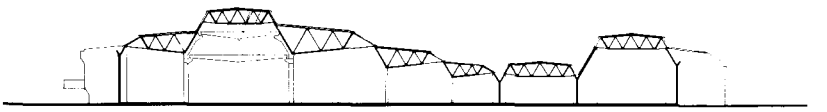
Zellerbach Hall and Playhouse, Univ. of California at Berkeley. Architects: DeMars & Hardison (joint venture of DeMars & Wells—Hardison & Komatsu); Vernon DeMars, project architect. Landscape architect: Lawrence Halprin & Associates. Engineers: S. J. Medwadowski (structural); Keller & Gannon (mechanical, electrical). Consultants: Dr. Vern O. Knudsen & Walter Soroka (acoustical); Paul Landry (stage lighting, rigging); Ben Schlanger (seating, sight lines). General contractor: Engstrum & Nourse. Building area: 154,000 sq. ft. Cost: $5,500,000 (excluding land, site work, fees; including fixed equipment).
(Other student union buildings by Architects Hardison & DeMars (joint venture of Hardison & Komatsu—DeMars & Reay). Donald Hardison, project architect for Eshleman Hall; Vernon DeMars, principal in charge of design for student union, dining commons, garage and piazzas.)
PHOTOGRAPHS: Dennis Galloway, except page 62, Kaiser Graphic Arts and page 64, Vernon DeMars.

Attached to the rear of Zellerbach Hall is the Playhouse (above left), its mass minimized by the downward sweep of its tentlike roof. The Zellerbach auditorium lobby (right) is in itself a kind of theater.









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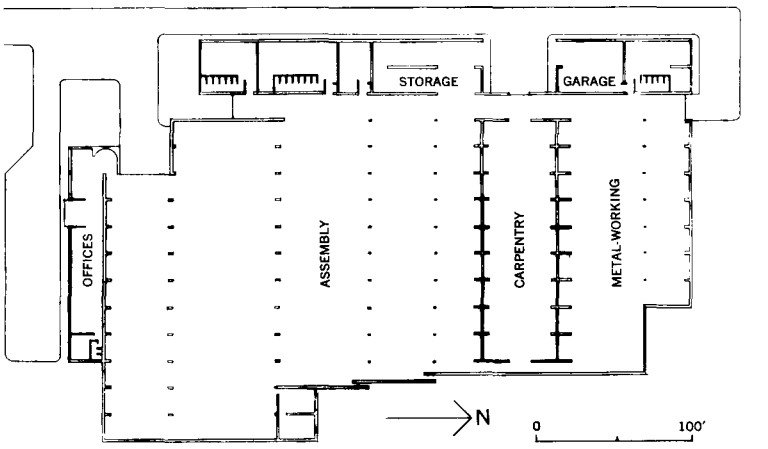

STEPPED FACTORY

A quick glance at the Diestre plant for manufacturing electric transformers near Zaragossa, Spain, reveals a stark, totally simple building. The factory, just off the main highway from Madrid and designed by Architect José Rafael Moneo, rises and falls in a series of steps, each "step," or bay, housing a particular stage in the manufacturing process. The flow is continuous both outside and in, in complete harmony with the work going on inside and with the landscape outside.

Reading the plan and section of the plant from right to left (above) shows the gradual sweep of bays towards the highest one which, appropriately, serves as area for the final and most complicated activity—the assembly of the transformers. The first two steps, metal-working and carpentry, are slightly separated by function (involving preparation of materials rather than fabrication), and therefore by design. Carpentry, the only stage involving work with inflammable materials, is isolated by solid walls from the rest of the factory. The rest remains open, with only a visual separation between bays by rows of slender columns.

The next three steps in production – including shearing, pressing and annealing, triple-threading and winding—evolve

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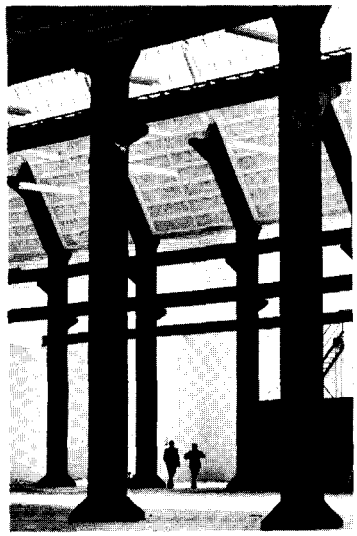
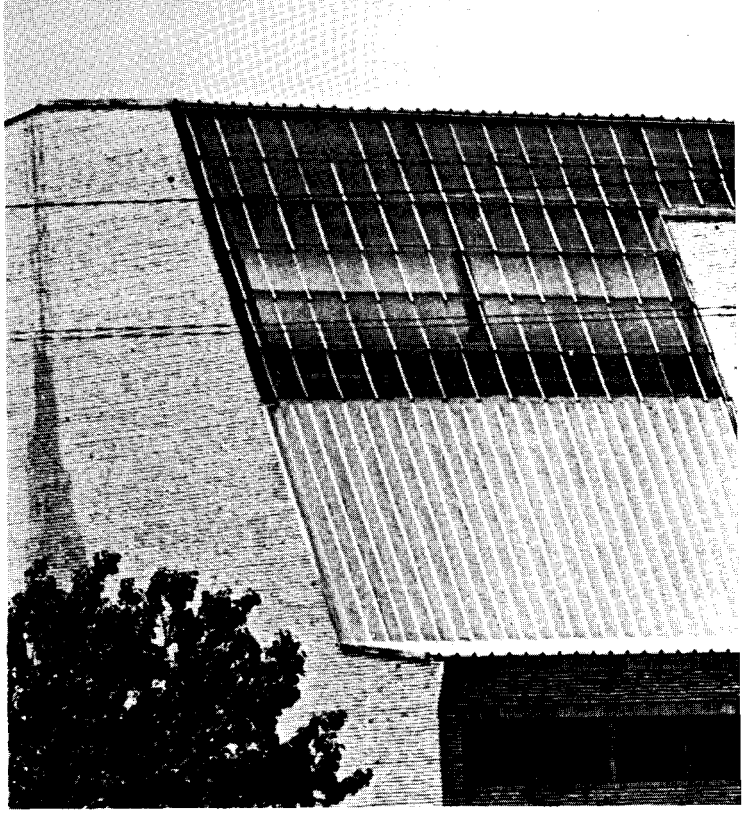




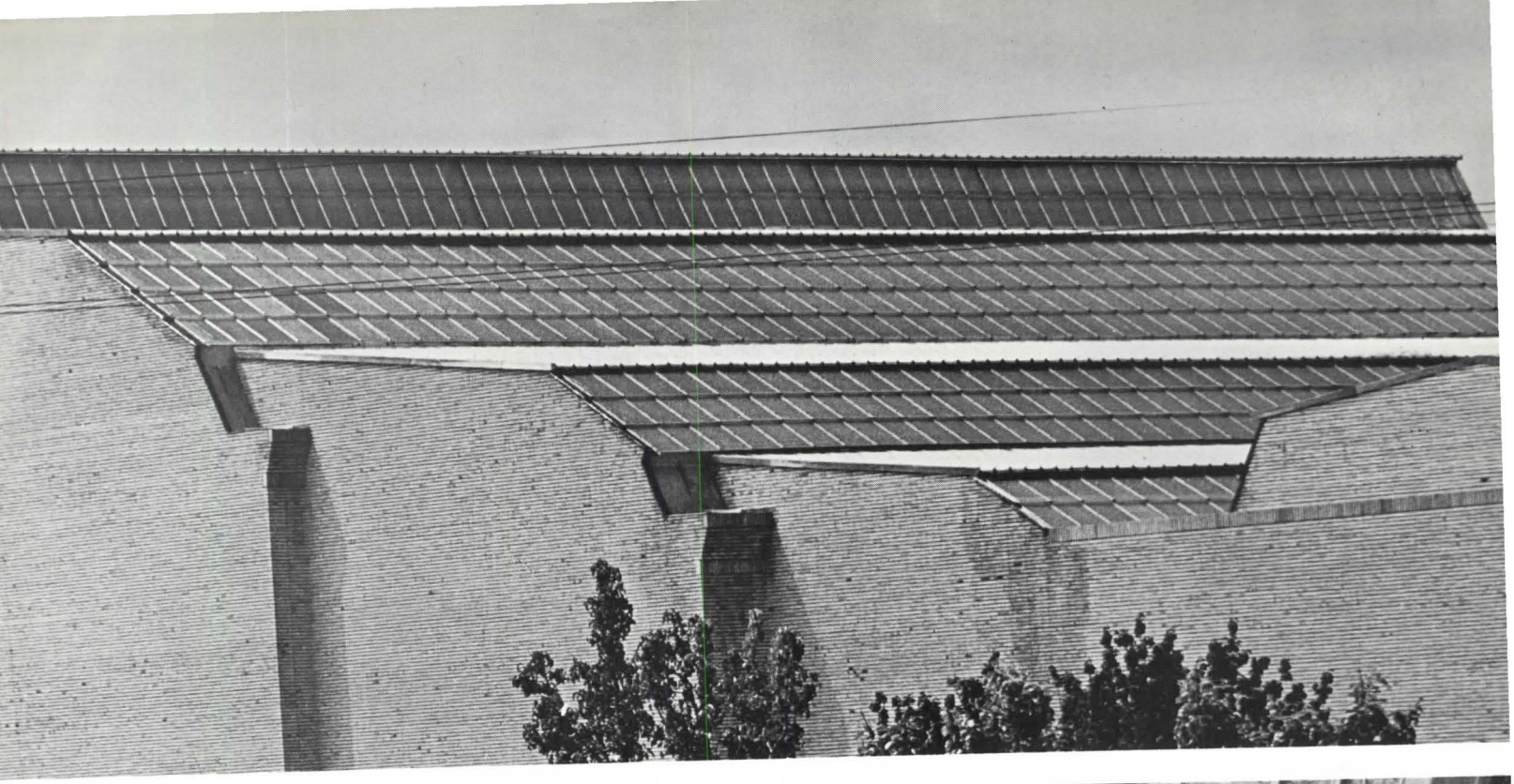
The upward sweep of bays towards the assembly bay (right) is based on an asymmetrical truss system (above) where one end of each truss rests on the one below it. The assembly bay (left) is supported by columns on which rest two sets of tracks for horizontal cranes. Most of the factory is open; only the carpentry bay (in background, photo below right) is enclosed.
PHOTOGRAPHS: Maspons & Ubiña.

in three smaller bays, each rising slightly above the preceding one to finally join the assembly bay. An asymmetrical truss system links these bays, one end of each truss resting on the one below it. The last, lowest, facet of each truss faces north and holds a skylight. Northern exposure is essential in this factory because of the severe heat of summer. The main assembly bay, being higher, and the carpentry and storage areas have dual exposure and these skylights have louvres for temperature control.

The assembly bay has moving horizontal cranes on two levels for lifting the finished transformers to the inspection and shipping area.

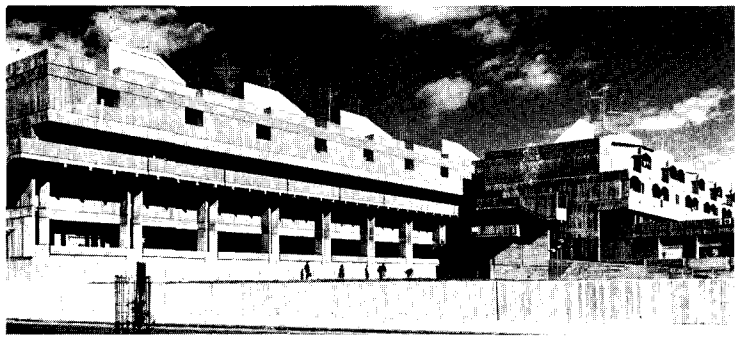
Additional space, for administrative, management and technical service personnel, is provided, as well as a machine shop for repairs, storehouses and a garage. These are separated from the main working space by walls, and are closer to the highway, thereby facilitating delivery of raw materials and entry of personnel.

The exterior walls of the factory are practically windowless—another temperature control—and are of brick. Its ruddy texture is another detail which lends to uniformity of its design and integration with its surroundings.



FORUM

(*continued from page* 29)



once before, in 1967, to Scotland's new town, Cumbernauld (Nov. '66 issue).

Jury members toured a series of new, reconstructed, and substantially enlarged towns in Israel's "new urbanization" program and cited Beersheba, the oldest and largest of some 25, for its "dynamically evolving" plan. They praised the Ministry of Housing for scuttling an earlier plan, drawn up in the '50s and based on the English garden city concept, as unsuitable for a desert community.

The present plan, developed in the mid-'60s, calls for the elimination of some structures and the reconstruction of the commercial - entertainment district to integrate the old into the goals of the new. A key element of the new plan is the Town Center Building. The Town Center (above) is a linear megastructure, which can be extended down its axis through the community as new facilities are needed. The competition-winning architects of the Town Center—R. Karmi & Associates—have placed an open-air gallery and shops on the ground level, stores and offices above, and apartments at the top.

The award, administered by the AIA, will be presented at the AIA convention in Boston, June 25. The $25,000 prize will be used for study grants in urban design under the administration of Technion, Israel's technical university.

EXHIBITS

NEOCON II

The second National Exposition of Contract Interior Furnishings will be held in Chicago's Merchandise Mart, June 17-19. Registration, without charge, will be open to all professionals involved in design specification, purchase, and use of products for non-residential interiors. Speeches, seminars, and other presentations will accompany the three-day showing.

SOLERI'S SOLUTION

Wall-sized drawings and room-sized models (bottom) occupied the stately rooms of Washington's Corcoran Gallery last month, when an exhibition of Paolo Soleri's works and schemes began a nationwide tour (schedule not determined at press-time). The big Soleri show gives a public recently bombarded with warnings about environmental problems a chance to consider something else again—environmental *possibilities.*

It was presumably the message that the cure for environmental ills could be positively exhilarating which prompted HUD to co-sponsor the exhibit (under section 314 (b) of the Housing Act of 1954, as amended) with The Prudential Insurance Company.

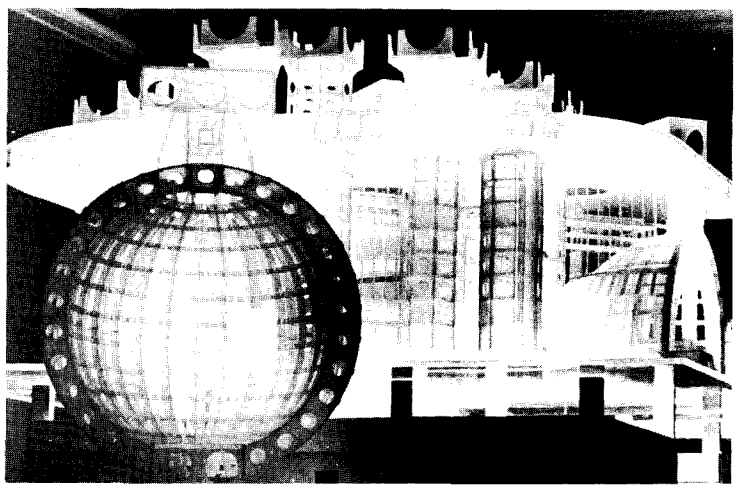
The public turned out in unprecedented crowds to see something both optimistic in content and beautiful to look at. Soleri's designs for single-structure cities spanning canyons, floating in the sea, or sprouting from the earth on slender stems—with unspoiled nature all around them—are presented in models of drawings so handsome just as objects that they must have given gallery-goers second thoughts about recent sculpture and painting. Soleri's materials are not always elegant: raw corrugated cardboard appears in the models and ordinary *crayon in the* drawings. But whatever media he uses, he works with painstaking artistry.

Maybe Soleri lavishes so much attention on the presentation of his ideas because his ideas hardly ever proceed to construction. As if to counteract this suggestion of futility, the exhibition included a multi-image slide show on the real environment of Soleri's school near Phoenix. Here viewers saw an intricate sequence of spaces, half buried in the ground, with the Arizona sun filtering in through filigree roof structures. And they saw the actual growth of the school—views of Soleri's friends and students casting concrete in earth forms and lifting them into place. Occasionally, there is a glimpse of Soleri himself—pitching in or standing by with a smile of modest satisfaction.

NEW LOOK AT NOUVEAU

Hector Guimard, whose works will be on view at New York City's Museum of Modern Art through May 10, was the multi-disciplinary Parisian "Pontiff of Art Nouveau." He was also called the "Ravachol of architecture" by some contemporaries. (Ravachol was an anarchist who bombed churches.)

Best known and, until this comprehensive exhibition, known to many *only* for his Paris Metro subway entrances, Guimard is here represented by some 200 items and photographs of recently uncovered objects and projects ranging from buildings to nail covers. The show



culminates at the Metro entrance archway which was permanently installed in the Museum Sculpture Garden in 1958.

Guimard, the first of his countrymen to break away from neoclassicism into Art Nouveau, was also the last to cling to its romantic, non-figurative abstractions of plant life. In a recorded interview with his Belgian contemporary, Victor Horta, in 1895, they discussed "abandoning the leaf and the flower, retaining only the stem." Guimard retained it, in ever more restrained form, through the late 1920s when the influence of the Bauhaus became major in European design.

Of his earlier, more flamboyant exercises in total environment, the house and shop which he designed for a Monsieur Coilliot in Lille (the building still stands, above) is particularly appropriate to the clients trade. The lettering on the facade announces "enamel-washed ceramics and decorative floor tiles." The building itself is faced with green enameled lava blocks. Guimard signed the Coilliot House in the lower right-hand corner of the sign.

The exhibition was assembled in cooperation with the Musée des Arts Dècoratifs in Paris, where it will be seen from January 15 through April 11, 1971, after visiting San Francisco (July 23-August 30, 1970) and Toronto (September 25-November 9).

ACADEME

STUDENT POWER BACKLASH

The Architectural Association School, Britain's first and still its largest architecture school, doesn't take lightly the fact that it was founded some 120 years ago by a boy of 19. Ever since, students have enjoyed a degree of participation in the administration of its affairs that, even in this age of student power, would be the envy of many. Very unexpectedly, in February, the school's future came seriously into doubt when the six-year-long negotiations for its merger with the Imperial College of Science and Technology of London University were suddenly broken off by the college.

Everyone had apparently thought the negotiations were going swimmingly. The merger had been formally approved by London University, the third party to the agreement, and the University Grants Committee, which, in 1968, had agreed to take over financial control of the school provided the association could raise £500,000 for a new building for architects on the Imperial College campus.

Nearly half that amount had been raised, the second phase of a competition for the building's design had just been announced, and the association's president, Miss Jane Drew, was in the U.S. raising more money when the letter of termination came from Lord Penney, college rector.

John Dennys, acting president of the association, expressed "amazement that such a distinguished body should have behaved so irresponsibly," and students of both institutions began a series of demonstrations that included a "protest moratorium" and the wearing of black armbands.

The merger had been necessary for the association. The buildings they presently occupy on Bedford Square—described in one London newspaper as "three wholly inappropriate knocked-together terraced houses"—are historical and protected by statute, but renewal of the lease in 1976 would boost the rent from £850 to £50,000 a year.

The key to the abrupt abandonment of talks seemed to be contained in this sentence from Lord Penney's letter: "The stress laid on the participation of architectural students in negotiations about the terms and conditions of appointment of academic architectural staff, and also in examination processes raise matters which . . . are wholly unacceptable to Imperial College."

MILLION DOLLAR BOOST

The Ford Foundation last month joined the AIA in a scholarship program for minority-group youths by matching the institute's $500,000 already set aside for that purpose. The new $1-million fund, for scholarships leading to a first professional degree in architecture, will be allocated to youths who are not students but demonstrate sufficient aptitude and potential.

The AIA will conduct the search for candidates as a major program in its Professional Responsibility to Society Program, which was created following the institute's convention last summer in Chicago. Assisting the AIA will be architecture students, AIA Community Design Centers in inner-city locations, the Urban League and other civil-rights organizations.

The first beneficiaries of the scholarship fund will be enrolled in the fall of 1970. Applications are now being accepted by Elliott Carroll, FAIA, the American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C. 20006.

TRANSIT

DOWNTOWN MOVER

The city of San Jose, Calif., will install the country's first downtown "people mover" of any consequence, with first-phase construction linking a parking facility on the downtown perimeter with two renewal projects. Installation will begin in 1972.

The "Carveyor" system (Jan./Feb. '68 issue), developed by the Goodyear Tire and Rubber Co., will carry up to 22,000 persons an hour at speeds up to 15 mph in wheelless cars that move on a conveyor belt track. Passengers board from parallel moving platforms synchronized to the station speed of the cars—1½ mph. As cars leave a station they move over a bank of accelerator wheels which increase car movement to cruising speed. Decelerator

wheels reverse the process at the next station. The difference between cruising and station speeds causes cars to arrive at stations bumper-to-bumper, assuring continuous availability of cars. The Carveyor system is designed for adaptability to elevated, surface, or below-ground operation.

A series of interconnected loops within the central business district, including a tie-up with a proposed BART station, are slated for future phases.

Installation costs are estimated at from $5 to $7 million per mile of belt track.

COMPETITIONS

MATHEMATICS AT YALE

Five semi-finalist winners in the Yale University competition for a mathematics building (Nov. '69 issue, page 89) have been announced. The five schemes, selected from 468 entries, have been awarded $10,000 each. The final winner will be selected some time this month from the designs of: John Fowler, John Paul McGowan, of New Haven (with associated engineers Herman Spiegel, Frank Zemecnik); Office of Fitzhugh Scott of Milwaukee (with David Kahler, Thomas Briner, Gordon Pierce); Van Slyck, Callison, Nelson, of Seattle; Venturi & Rauch, of Philadelphia (with W. G. Clark, Jim Greifendorf, Steve Izenour, Arthur Jones, Doug Southworth); and Verman, Lepere, Petit, of Philadelphia.

DUBLIN FOR THE DUBLINERS

An international architectural competition to design a complex of civic offices for Dublin, Ireland, has been won by Sam Stephenson, the young Dublin architect who designed the Irish Pavilion at Expo 70.

The design consists of four office blocks varying in height from five to ten stories on four acres overlooking Wood quay on the Liffey River, near Christchurch Cathedral (below). The buildings will rise from a podium, stepped down in 5-ft. increments from the cathedral to the quay. Below this open plaza will be a concourse linking the four blocks, which can be entered from all four sides of the complex. Below the concourse are levels for parking.

The stepped plaza and the height of the blocks opens a view of Christchurch Cathedral's tower and trancept to strollers along the quayside.

An alternate scheme by the veteran Dublin Architect Michael Scott, consisting of a single tower of 20 stories, was chosen should Stephenson's scheme—the most economical at £2,672,000—"fail to proceed."

LAWS

RULING IN PHILADELPHIA

The controversial Philadelphia Plan (Dec. '69 issue, page 21), the Nixon Administration's attempt to wipe out discriminatory hiring practices in federally aided construction projects costing $500,000 or more, passed its first legal test in a federal district court on March 14.

The suit, seeking an injunction against the plan and a declaration that it was unconstitutional, was brought by the Contractors Association of Eastern Pennsylvania. Since it was first tried under the Johnson Administration in 1967, unions and contractors have held the Philadelphia Plan to be discrimination in reverse.

Under the Nixon Administration, the plan's language has been softened. Contractors need only demonstrate "good faith efforts"; and "goals" were substituted for "quotas." Therefore, in Judge Charles R. Weiner's opinion, the plan does not violate the Civil Rights Act of 1964, which forbade quotas, because it "does not require the contractor to hire a definite percentage of a minority group."

The plan for Philadelphia—where more than a third of the population is black—does, however, specify the "goals": at least 4 per cent this year, 9 per cent next year, 14 per cent in 1972, and no higher than 26 per cent in the years following 1972.

The plan, then, constitutes guidelines similar to those drawn up to enforce desegregation in the schools and, as such, is helpful but no panacea.

TIMBER!

A lumber industry bill, which would have "developed into optimum timber productivity as soon as possible" some 97 million acres of national forests, was axed last month in the halls of Congress. It never got into the House chamber itself. Following weeks of fierce lobbying, House members declined to debate it on the floor, apparently as confused over who were the good guys and who the bad as they were certain of the prevailing climate for the protection of environmental resources.

The bill, which had been kicking around for years, picked up momentum in late 1968 when lumber prices soared—plywood was up 124 per cent in two years—then fell off sharply (July/Aug. '69 issue, page 110). The timber interests attributed the rise in prices to the short supply of timber and the subsequent decline to a slump in building. The loggers and the Nixon Administration agreed that an increased supply of timber will be needed to keep prices down once credit conditions ease up and homebuilding resumes on an increased scale.

Conservationists maintained that the bill did not provide adequate protection of the "multiple use–sustained yield" principle applied by law to the national forest lands. Wildlife protection, recreation, and wilderness values, they felt, would be subordinated to logging. In addition, the increased revenues would have gone into a fund from which Congress would be expected to appropriate sufficient money each year for replanting, thinning, and fertilization. That is an unsure process at best, as the Forest Service is now some five million acres behind in reforestation of cleared lands.

If the Administration's anti-inflation policies work, and homebuilding booms again, the bill may be back next session.

PHOTOGRAPHS: Page 27, from the Byron Collection, Museum of the City of New York page 28, Harry Hartman (top), Marvin Rand (bottom); page 29, HABS: Piaget (top); page 76, Ran Erde (top), The Washington Post *(bottom); page 77, courtesy The Museum of Modern Art (top); page 78, Norman McGrath.*

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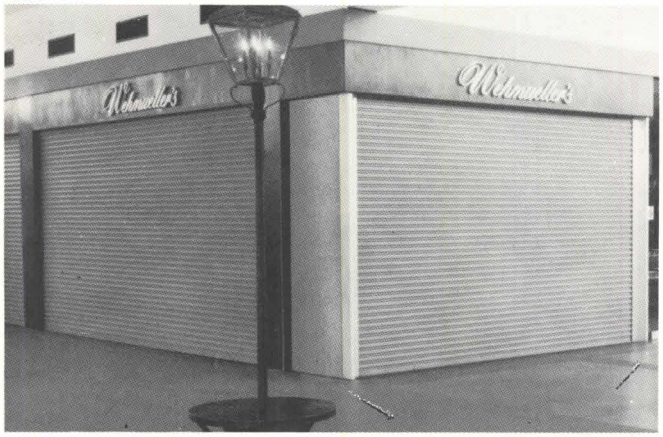

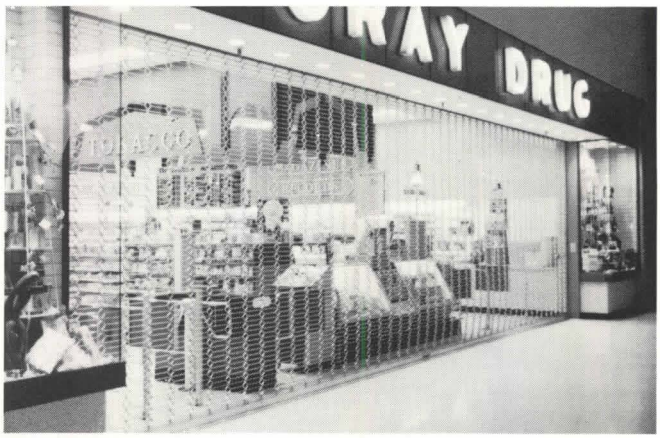

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LETTERS

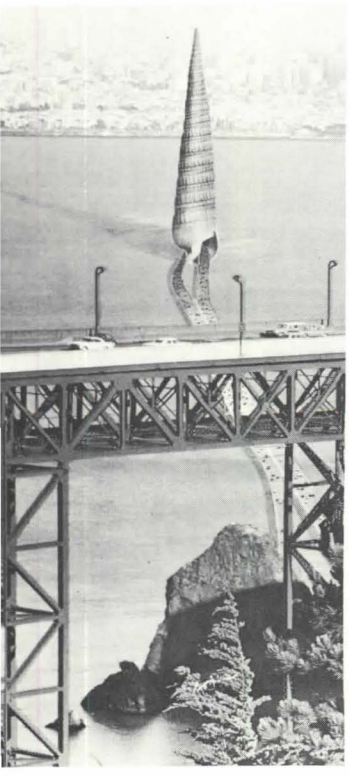
POINTING UP THE SPIRE

Forum: The recent acceptance of the Transamerica building has not only broken design tradition, but has also opened up new avenues of investigation with respect to highrise buildings. As an architecture student, I find the transition fascinating. The shell in the montage (below) is a continuation of thought stimulated by the Transamerica project.

The Bay Area's growing pains are being felt more and more. Reclamation of land from the bay itself has recently been vetoed. What I believe is needed is a complex of island apartments, represented by the shell which I call "Circum Modular."

The shell has built-in design solutions. Its tapering form flows closely Architect Pereira's "seismic stress" used in the Transamerica spire.

Commuting would be no problem. As cars exit from highways from the bridge, they enter a huge slot at the base of the shell where ample space is provided for parking. Elevators then transport these commuters to their designated floors. The huge opening also provides excellent ventilation for fumes without ever directly exposing the cars to the outdoors.



Perhaps the concept I present is a bit far-fetched, but the realm of possibility is always present, even in San Francisco.

E. KEVIN SCHOPFER
Architecture Student
Syracuse University
Syracuse, N. Y.

Forum: In reading Mr. Alvin Zelver's timely account of how a building like the Transamerica spire [Jan./Feb.] can come to blight a declining but still beautiful American city like San Francisco, I note that the author has understandably missed a point or two.

Mr. Zelver states that the San Francisco Planning Commission apparently did not know that Transamerica planned to jam a huge structure into the Portsmouth Corridor. Several key factors would suggest otherwise. In the first place, the Telegraph Hill Dwellers, the Citizens' Planning Committee, the Russian Hill Association, San Francisco Beautiful, and other neighborhood and civic organizations began, in the spring of 1967, to warn of:

1: The need to protect the Portsmouth Corridor from being overwhelmed with downtown highrises, and

2: The particular danger posed by very large developments to the fabric of a hill-city like San Francisco.

We pleaded first before the Planning Commission, and later before the San Francisco Board of Supervisors that adequate controls in these two vital areas be included in the proposed downtown zoning ordinance then under consideration.

These pleas, needless to add, went unheeded. At the time it was generally acknowledged by members of the Planning Staff and others that pressure to grant zoning concessions was being applied by a "large developer" who owned property at Washington and Montgomery Streets. Two years later we were to discover just how large!

Further evidence that municipal insiders were aware of the controlling Transamerica juggernaut was revealed by Transamerica's attorney on August 25, 1969, during one of the Transamerica hearings conducted when he reminded the ten Board members present that

(continued on page 87)

PPG Performance Glass is saving money for the county government in Fairfax, Virginia.

By reducing heating/cooling equipment and operating costs in the new Administration Building.

PPG Performance Glass enabled the designers of the new high-rise County Administration Building in Fairfax, Virginia, to achieve the exact esthetic effect they desired. It also enabled the building's mechanical engineers to lower the capacity, equipment and operating costs of their specially-designed heating/cooling system.

Design studies indicated that with glass areas exceeding 35%, reflective insulating glass should become an economic probability. And because, in this case, maximum use was to be made of a "heat-of-light" HVAC system, with the lowest possible energy input and without supplementary electric heat input, a high-performance insulating glass was considered strongly desirable.

The unique all-air "Dual Fan–Double Duct" system is shown in the accompanying diagram. Seventy percent of the heat from the lights is picked up by the return air. Interior rooms use ceiling fixture introduction and return grilles. Outside rooms use a perimeter system of sill diffusers.

Study data for the mechanical design was handled by a computer. It favored PPG *Solarban® Bronze (3) Twindow®* Units and indicated that they would permit a savings of approximately 200 tons of capacity in the heating and cooling system.

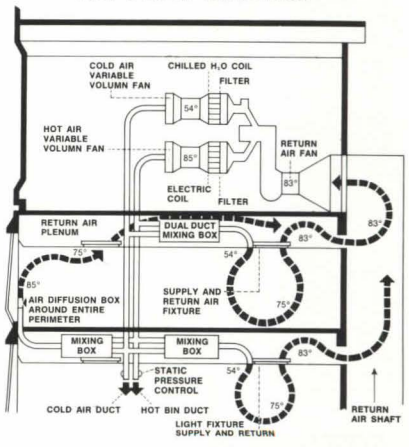
According to Lee Kendrick, Mechanical Engineer, this low energy mechanical system was made possible with Solarban Twindow Units (insulating glass constructions with a low-emissivity coating and a ½" air space). He attributes all the savings realized to the U value of 0.35, significantly better than that of the rest of the building's basic wall structure.

The *Solarban Bronze (3) Twindow* Units also implemented all the designers' esthetic considerations for the building. The lower portion of the glass (18%) slants in and picks up the reflection of any objects on grade level. The upper portion (82%) slants out and reflects the sky. This canting of the reflective *Solarban* Units results in a smooth, unbroken-looking surface.

Put the esthetic and cost-saving advantages of a PPG Performance Glass to work for your clients. Contact a PPG Architectural Representative for technical assistance, or write: PPG INDUSTRIES, One Gateway Center, Pittsburgh, Pa. 15222.

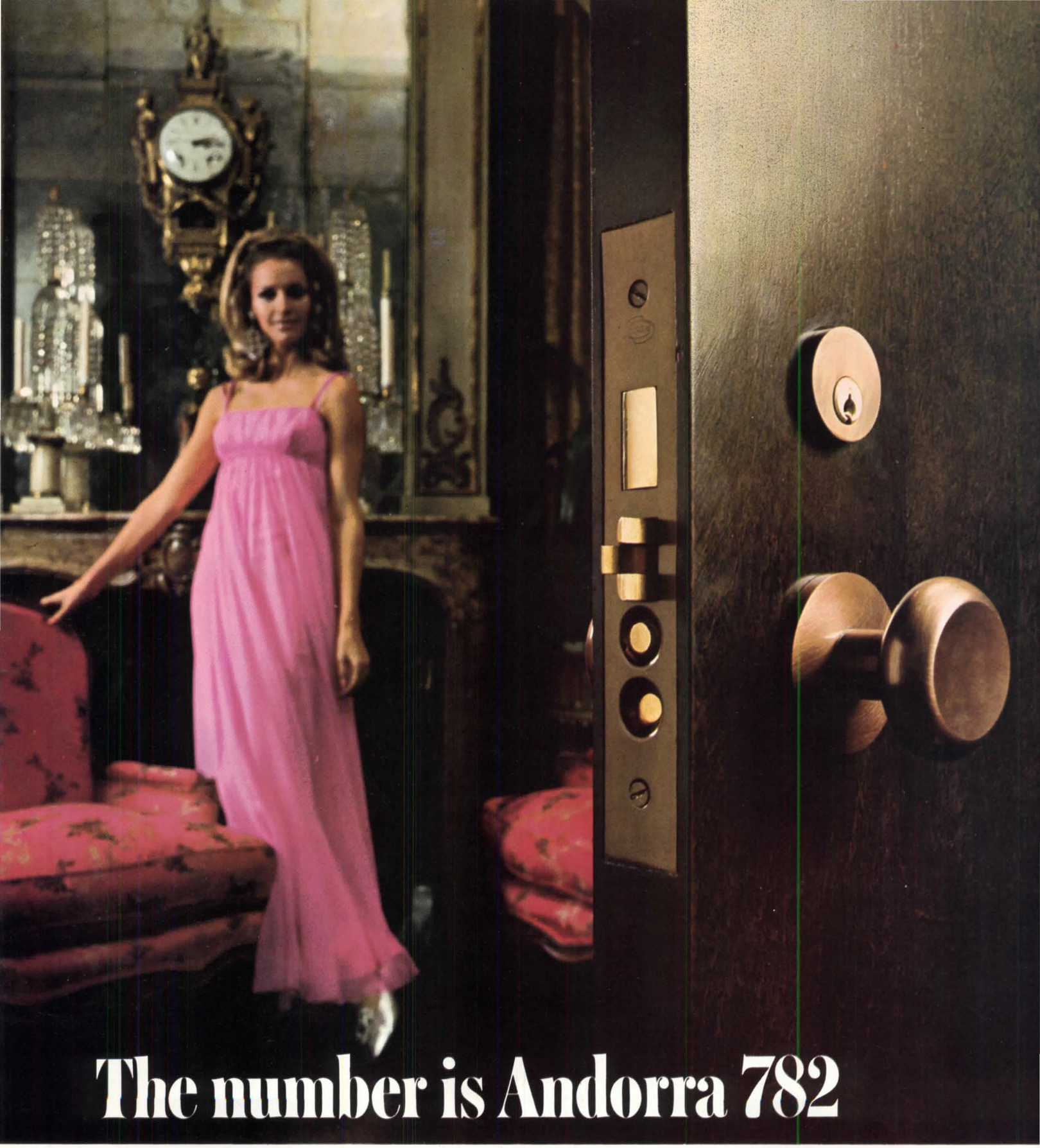
Architects-Engineers: Vosbeck, Vosbeck, Kendrick and Redinger, Alexandria, Virginia.

AIR FLOW DIAGRAM



PPG INDUSTRIES

PPG is Chemicals, Minerals, Fiber Glass, Paints and Glass. So far.



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CORBIN

LETTERS

continued from page 83)

'you all know it takes ten years o assemble a piece of property his large." There is the fact hat the real estate development irm which assembled the prop-erty turned out to be none other han the Milton Meyer Co., whose president, Walter Shoren-stein, had close and immediate ies with many public officials including our eagerly-develop-ment-oriented mayor. It doesn't ake much imagination to con-clude that the municipal red carpet was unfurled for Trans-merica at least *18 months* be-fore the issue came up for public scrutiny and debate.

The real question: How can a great city like San Francisco, which has excited and attracted people from all over the world, *possibly* treat its beauty and liveability so lightly as to allow a spate of huge and insensitive development projects to destroy that greatness permanently?

Cities like Budapest, Paris, ancient Athens, Prague, etc., did not evolve under a process whereby new structures were allowed to brutally affront and degrade their surroundings. San Francisco can't stand much more of it either.

GERALD P. CAUTHEN
President
San Francisco The Telegraph Hill Dwellers

VIEWING THE ARTS

Forum: Your story "Art on Wheels" [Jan./Feb.] was of particular interest to us here at the Virginia Museum since we are in our 18th year of servicing the Commonwealth of Virginia with such vehicles.

Leslie Cheek Jr.'s first Art-mobile took to the highways in 1953 and since then, three more have been added to meet Virgin-ia's enthusiastic response. One of the newest mobile galleries, the Collegiate Artmobile, carries exhibitions of art exclusively to 16 Virginia colleges and uni-versities.

In the past two years, it is conservatively estimated that 140,000 visitors have been aboard our vehicles to view the chang-ing exhibitions.

FRED HASELTINE
Assistant to the Director
Virginia Museum of Fine Arts
Richmond, Va.

Mr. Cheek was formerly an As-sociate Editor of the Forum.—ED.

Architects for the Armstrong Rubber Building were Marcel Breuer and Robert F. Gatje. General contractor: The Dwight Building Co. Structural engineer: Paul Weidlinger. Mechanical engineer: Segner & Dalton/Consulting Engineers. Steel fabricator: The Standard Structural Steel Co.

Emphasizing the separate functions of headquarters and research, the office tower is suspended over the laboratories.

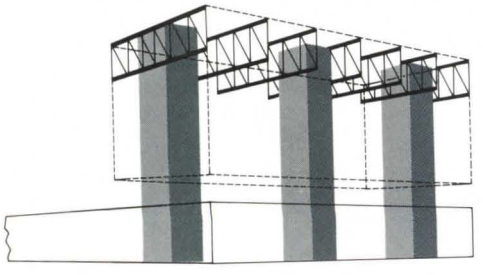

Diagram shows the cantilevered trusses and suspension system of the office tower.

Four-story office tower suspended from overhead steel trusses

This is the new corporate headquarters and research and development laboratories of Armstrong Rubber Co. in New Haven, Connecticut. In order to emphasize the two separate functions of the building—research laboratories and executive offices—yet express their interdependence, the architect has hung the office tower from seven huge steel trusses over the two-story research and development wing.

The seven steel trusses from which the tower is suspended weigh about 50 tons each. From the end of each truss, a 14-WF steel column drops 52½ ft, the height of the four office floors. These hanging columns are held in place by single pins measuring 4½ in. in diameter and 19 in. in length. Thus, the four floors are suspended by 14 huge pins. The structural steel for the four floors is connected to the columns that support the trusses, and to the hanging columns as well. The steel is Bethlehem A36 structural shapes.

Steel is versatile, adaptable, economical. It can lighten a structure, shorten construction time, provide more usable floor space. We'd be happy to discuss your next building with you. The Sales Engineer at the nearest Bethlehem office is available to talk with you at any time. Or write us at Bethlehem, PA 18016.

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BOOKS

THE FUTURE OF THE FUTURE. By John McHale. Published by George Braziller, New York City. 300 pp. Illustrated. $7.95.

BY SIBYL MOHOLY-NAGY

John McHale has identified himself so thoroughly with Buckminster Fuller that it comes as no surprise to find in this new volume of his an earnest attempt to paraphrase the philosophy of his master, augmenting it in the beginning with a random survey of historical ideas about the future and toward the end with an amazing proposition for the future of cities. The result sheds more light on Buckminster Fuller than on the future, because his "charisma" reveals itself by its total absence. If nothing else survives, the mad oratory of Bucky's genius will stand forever as the first and last attempt to interpret the Electronic Age in terms of a World Religion based on a Synergetic Confession. Who else could transpose lovemaking into

When one of the phantom captains (man) seeks a mechanism of the complementary type to join with his in the manufacture of an improved model replica of their mutual custody mechanisms, he misinterprets his unself-conscious appraisal of the adequacy of the observed complement to his own half-plant as constituting suitable hook-up conditions in the terms of superficial or sensorial-surface-satisfactions.

or dare

Discovery of the primary and corollary laws of constantly coordinate relative abundance of pattern function-aspects of totality as an omni-rational regularity governing all local patterning of universe as a minimum-maximum family of complexedly complementary yet uniquely identifiable conceptual function-patterning relationships followed upon intuitive formulations of the seemingly most comprehensive self-querying question I was capable of propounding to myself regarding possible detectable pattern significances accruing to progressive life experience integration and overlays.

One does not argue with the Prophet on the Mountain, no matter how questionable his revelations. The revelations are for good and evil a force of nature. Transposed into industrial hardware and sociological application, these same revelations become highly challengeable. It is the very attempt of John McHale to bring "World Science Revolution" down to earth, and to predict from it an invincible future that defeats both him and his master.

It would go far beyond the scope of a review and the expertise of the reviewer to enumerate the inconsistencies of all the electronic devices described and illustrated by McHale as the carriers of a perfect future for all of mankind. Even the layman is aware of the deadly effect of immobility and paralyzed initiative in the extravagantly praised space capsule as a "microminiaturized version of the earth"; of the side-effects of the Pill which have rendered oral contraceptives almost obsolete; of the blatant discrepancy between medium and contents in the global transmission of sound and pictures via orbiting satellite (despite Fuller's praise for TV as "the third parent of the young generation"); of the fallout from military primary purposes that renders most electronics research suspect of unbiased evaluation for civilian use; and of the cultural paraplegics from the present down who deny the value of "a vast range of personal and household objects which were previously craft-cultural forms . . . that may be replaced by others with the same functional capacity." What really matters is McHale's contention that

Creation and production were formerly geared to a small culture-making elite at the top of the social pyramid; they are now directed by the plurality of goals and preferences representing the wider range of society.

This claim to social equity through electronics industry simply ignores the fact that the space programs are financed by a crippling tax burden borne mainly by the wage earner; and that all the other electronics research projects, so ardently recommended by McHale, would be impossible without profit sharing by private investors. This omits the vast majority of the people from involvement into a new golden age, even if they were willing or capable of understanding new life patterns which deprive them of the scant traditions based on purely emotional satisfactions.

Any cross reference to nonphysical values is missing in keeping with Buckminster Fuller's emphasis on "physical conquest of the universe." It is therefore not surprising to see McHale as the truly post-historical man get involved in a frightful muddle of movements and periods.

Significantly accompanying the Romantic Revival in the 19th century, therefore, is the "Werkbund" to elevate the esthetic taste of the lower classes. Indeed, the whole of what we term the "modern movement" in architecture, design and town planning arose out of an esthetic reaction against both, the products of the machine and the so-called dehumanization of man's labor through the machine.

If this is, say, startling, considering the *actual* Werkbund program, the Bauhaus, Le Corbusier et al, McHale's solution of "the urban crisis" is even more perplexing. Tucked between 300 pages of self-justification through lengthy quotations by "qualified" Futurists (whose names can only be learnt by leafing back to numbers and chapter headings), is the Future City. With the same penchant for historical misinformation as above, he blames the 19th century for

The multipurpose city as a static [!] agglomeration of commercial enterprise/industrial production and distribution points related to materials transportation and warehousing. Urban living was tucked into the interstices of a system for earning a living or controlling the production and flow of material goods and wealth. . . . This specific evolution of the urbs has continued into the post-industrial period, and shows signs of grave instability and obsolescence.

After reiterating the fallacious argument that technology and electronics have made city living obsolete, he proposes "to reconceptualize our model of the urbs and allow for a number of possible and alternate models." With a sudden reach for historical justification, he proposes

The Ceremonial City, as administrative and political capital.

The University City. "These latter centers have often been in relatively remote locations and are of proven viability for such further development."

The Scientific City, "for space, atomic energy and other research."

The Recreation, or "Fun" City whose model—Venturi, here we come—is of, course, Las Vegas. "*Strip* development may be considered as such form."

The Festival, or arts, City.

The Communications City, the center for communications industries of television, radio, newspapers, advertising, and publishing.

The Convention/Conference City.

(continued on page 92)

Mrs. Moholy-Nagy is visiting professor at Columbia University's School of Architecture and a frequent contributor to this magazine.

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BOOKS

(continued from page 90)

The Museum City. "This is the city in, and of history."

The Experimental City. . . . "within which the physical social functions of urban living may be experimentally studied, as in a variable controlled laboratory environment . . . where people may go to experiment socially." . . .

Any commentary on the documented failure of the one-industry city would be redundant. The facts are too well known. What McHale's absurd classification illuminates is his total omission of any economic references. There is a vague and implausible chapter on post-economic man reduced to a public ward and deprived of the three main springs of civilization: performance, competition, gain. But it is this future prophesy of city specialization by some central authority without any reference to the creative stimulant of maximum diversification and exchange, of freedom of movement and occupation, of the tension stimulants inherent in the coexistence of living and working, that tastes badly of Ciam and Ville Radieuse dictatorship. Ultimately it reveals a computer-programmed future in designated city systems as a fearful blend of mass culture and fascist control.

McHale's book comes 40 years too late. Perhaps we would have bought in those adolescent years of technical euphoria his opening sentence: *Man survives uniquely by his capacity to act in the present on the basis of past experience considered in terms of future consequences.*

Today we know that it is the tragic human predicament to act out the present and nothing but the present, and that it might very well be the inability to anticipate the future consequences of his acts that is the incentive for further development. And we can hardly rejoice in the glorious spectacle of "unprecedented material control" and "total physical potential" which invents "the necessary means to graft our technological knowledge on all branches of the human tree," when the price demanded by our prophets of the future is cultural amnesia, spiritual and material dispossession, and a new elite class which deals in electronic progress that is meaningless to the vast majority of mankind. The indifference of the young student generation to the moon landing, and the declining enrollment in engineering schools, should serve as a warning that 19th-century determinism, whether mechanical or electronic, has no future at all.

On a simpler level, this book and the entire Buckminster Fuller-inspired electronics *Weltanschauung* can be blamed for magnifying a strictly circumscribed invention into a world-transforming philosophy with browbeating moralistic tendencies and arrogant threats of imminent perdition (reiterated in McHale's last sentence). No contemporary mind can deny the usefulness of computer science for mechanical work which absorbed in the past valuable human energy. But none who has a truly global knowledge (unrelated to the utopian non-existant universe of Fuller), can escape the fact that all other nations blessed or cursed with equal electronic devices, have kept them in their place, aware of a Pandora potential that would devour what cannot be replaced or missed in the historical continuity of man. Reading McHale on "the new symbiotic partnership" of man and computer, brings to mind a lapidary judgment made 160 years ago by Alexis de Tocqueville: "In America, everything is progress!"

A Single Society, Alternatives to Urban Apartheid by Donald Canty, published by Frederick A. Praeger, New York. 181 pp., $5.95.

REVIEWED BY JACK ROSENTHAL.

It takes courage to write a topical book in our current Ninety-Day Culture. Slogans slip past so quickly that "maximum feasible participation" and "cultural deprivation" already are almost camp. The Green Beret affair was forecast as the Lidice of our time. It is not only forgotten, but exceeded, by Songmy.

Even whole causes now fade as suddenly as hem lengths. Civil Rights was to have been the cause of a generation. Then came the Urban Crisis.

For that matter, whatever happened to the Urban Crisis, now that we're all jumping over the side and swimming like hell for the good ship Environment?

Now comes Donald Canty with *A Single Society*, a pressing reminder that the fad may have passed but that the problem—and its consequences—have not. Mr. Canty is a former managing editor of the ARCHITECTURAL FORUM, the founder of Urban America's splendid *City* magazine, and now an executive of the Urban Coalition. He commands respect as a man of wit and intellect and one of the most serious students of urban problems; he is not a faddist.

So it is notable that he begins his book by saying, "I find it astounding how comfortable we can be sitting atop a volcano." He, like the Kerner Commission, sees America as two societies, separate, unequal, and unstable—and in this thoughtful study he outlines a sensible route to the goal of one nation, indivisible.

The book is, first, an analysis of recent divisive vectors. In the beginning came the massive migration of Southern rural blacks to Northern cities. Before long, they became victimized not only by ghetto life, but also by rhetorical rape—the new visions proferred by the federal government. However well-meaning, the feds were unable to deliver. Dollars were too few and the complexities too many. Small wonder, then, at the result: black pride, black power—and black rage.

And, finally, even less wonder at a second result, what used to be known simply as white backlash or white racism. (We now evidently feel constrained to use politer labels, like "middle" or "forgotten" followed by the reassuring "American").

This portion of the book alone, admirably concise, would be rewarding for casual students of urban perplexities. Mr. Canty does not, however, stop with description. Unlike some, he is willing to put his ideas where his complaints are, and he proposes a national urban policy of three broad parts.

The first is to improve the everyday life of the disadvantaged. Funds would come from revenue sharing, "provided without small strings, but with a couple of big ones"—expansion or innovation of services would be mandatory, as would community involvement in their development.

Second, Mr. Canty recommends "building choice," purposefully developing new communities, not only to bring rationality to the nation's ballooning urban growth, but also explicitly to give new options to the disadvantaged, imprisoned in slums and ghettos.

The third policy proposal concerns local government. The current debate is between cities and states over "block grants" with the latter winning. In Mr. Canty's view, the proper issue is between cities and sub-cities. Recognizing faults in both massive city government and in decentralization, he says:

"It is possible to combine elements of the two—metropolitanization and decentralization—into a kind of metropolitan federalism" to provide economies of scale and of spirit.

Mr. Canty's policy package is an informed and sensible recipe, analogous to the Kerner Commission's conclusion that we must not only gild the ghetto nor encourage movement out of the ghetto, but both at once.

Like any policy proposal for so intricate and volatile a subject, this one is open to debate. The ghetto gilders, bolstered by the passions of black separatists, can denounce new communities as a device to fragment rising black political strength. The dispersers can argue that to im-

(continued on page 99)

Mr. Rosenthal is urban correspondent for the **New York Times**, Washington, and general editor of the **Kerner Commission Report** (National Advisory Commission on Civil Disorders).


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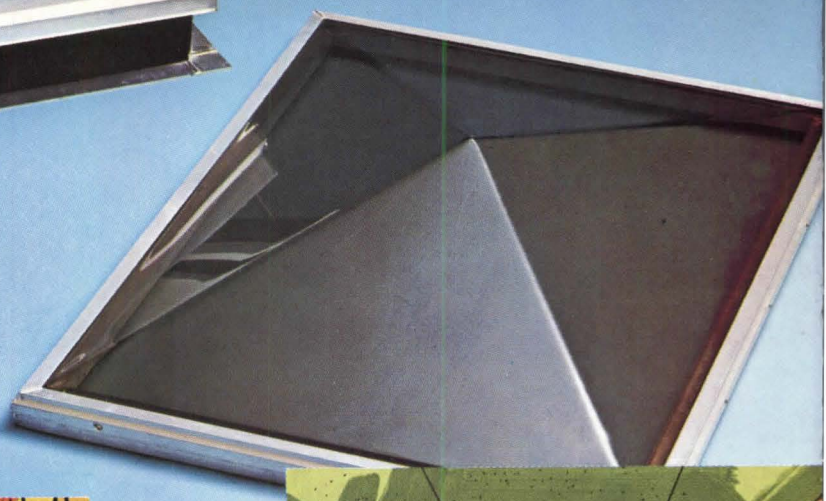

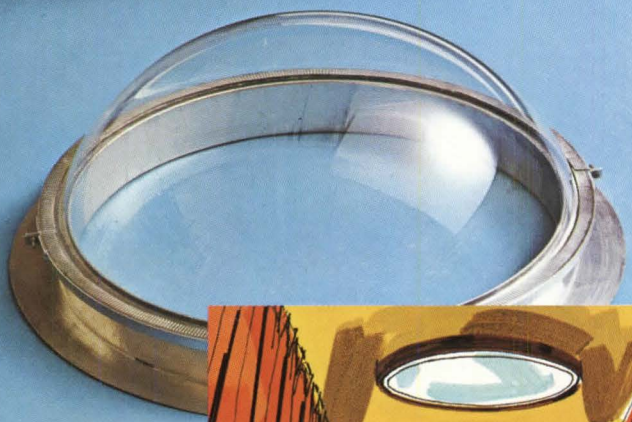

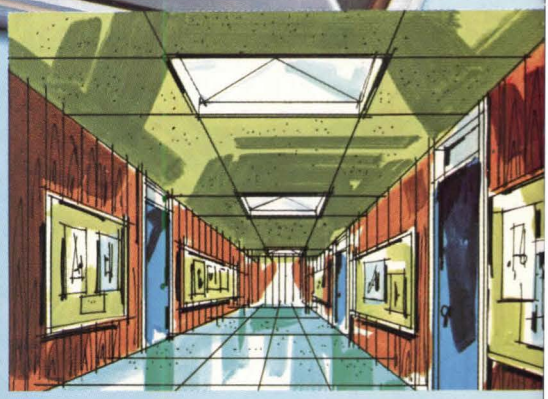

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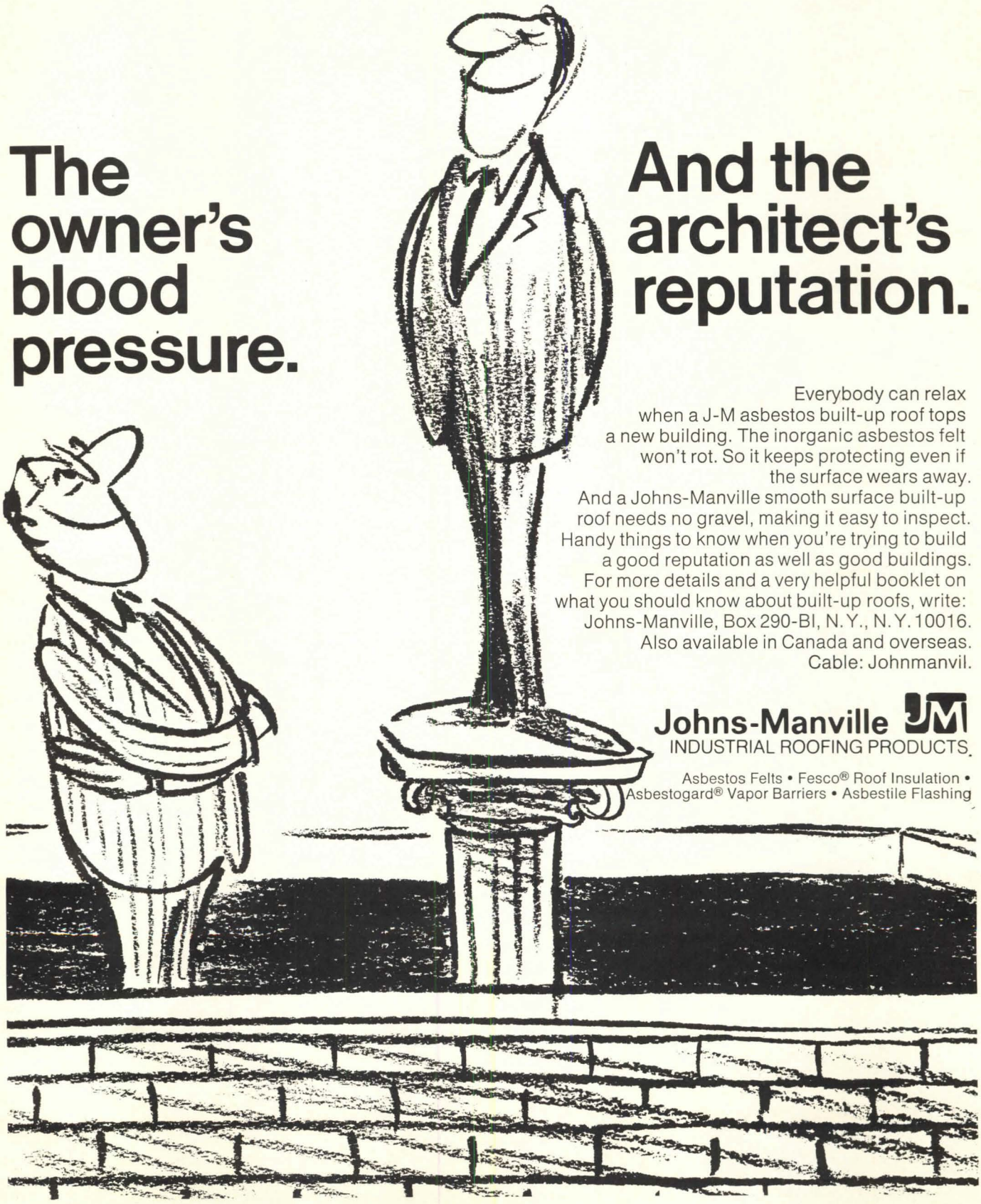

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Bulletin 161 details complete line of rolling doors, fire doors, counter shutters, rolling grille and other metal doors. Dimensions tabulated and keyed to line drawings. Complete specs. Kinnear Corp. On Reader's Service Card, circle 104.

Catalog 170/OV covers typical installations, specs, test performance data, ASTM acoustical testing and rating procedure. Door, frame, acoustical seal details. Overly Mfg. Co. On Reader's Service Card, circle 105.

4-pg performance data sheet details acoustical, visual and structural characteristics of Acoustic Twindow®, new environmental control window unit, ideal for applications requiring noise reduction. PPG Industries, Inc. On Reader's Service Card, circle 106.

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ELECTRICAL EQUIPMENT 602

Catalog on exit control devices and remote indicating systems. Specs, line drawings and application examples shown in detail. Detex Corp. On Reader's Service Card, circle 108.

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"Anso is the Answer." A color brochure answering the most frequently asked questions about commercial carpeting. Allied Chemical Corp. On Reader's Service Card, circle 114.

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Illustrated brochure describes Steelcase stacking chairs—moderately priced, durable and designed for volume seating needs. Various styles, coverings and other options available. Steelcase, Inc. On Reader's Service Card, circle 119.

HARDWARE 606

12-pg booklet on Architectural Hardware for Schools and Colleges covers wide variety of hardware items; many unusual designs, information re Corbin's Master Keying Systems. Form No. K-873. P & F Corbin Div. Emhart Corp. On Reader's Service Card, circle 120.

24-pg fully illustrated booklet gives information on choosing correct type of hardware for every type of entrance. Kawneer/Amax Co. On Reader's Service Card, circle 121.

Fire control devices—8-pg brochure contains illustrations and diagrams of complete line of fire control equipment for doors. Norton Door Closer Div. Eaton Yale & Towne, Inc. On Reader's Service Card, circle 122.

Color catalog listing construction details, size availability, advantages of Soss hinges. Lists sales representatives. Soss Manufacturing Co. On Reader's Service Card, circle 123.

HEATING/AIR CONDITIONING 607

Catalog C-500 contains complete information and specs on baseboard, ceiling cable, bathroom, walls and industrial unit heaters. Bryant Electric Co. On Reader's Service Card, circle 124.

New 4-pg bulletin describes Janitrol's complete line of air conditioning and heating equipment for residential, commercial and industrial markets. Information also on unique new Series 44 round air cooled condensing unit. Janitrol Div. Andro Corp. On Reader's Service Card, circle 125.

INSULATION 608

New 8-pg catalog, offering complete information on Philip Carey Spray-Craft Mineral Fiber for one-application fireproofing, soundproofing and thermal insulation. Philip Carey Corp. On Reader's Service Card, circle 126.

MASONRY 611

New 8-pg booklet explains how Flexicore precast concrete decks and masonry walls were used in apartments for the elderly to produce a striking appearance at a favorable unit cost. The Flexicore Co., Inc. On Reader's Service Card, circle 127.

New 4-pg brochure describes a new system called Fabriwall®, a brick reinforced panel wall section with load bearing qualities, and its application for erecting one-story type brick buildings. Kurtz-Gery Corp. On Reader's Service Card, circle 128.

METALS IN BUILDINGS 612

Full color brochure—"Man, Nature and Time, a collaboration"—the story of Inland weathering steel. Brochure gives specs, properties, suggested welding practices and fabricating checklist. Inland Steel. On Reader's Service Card, circle 129.

"Nickel Stainless Steel Ornamental Tubing," a new 16-pg booklet, illustrates more than a score of the many nickel stainless steel tubing applications and discusses fabrication and finishing techniques. The International Nickel Co., Inc. On Reader's Service Card, circle 130.

60-pg 4-color catalog on Mahon metal panel walls, materials and finishes, steel deck and floors, ceiling system, rolling steel doors. Complete specs, illustrations. The R. C. Mahon Co. On Reader's Service Card, circle 131.

COATINGS/SEALANTS 614

Manual of sealant caulks and glazing products shows techniques and materials used as architectural sealants. Form 3568. DAP, Inc. On Reader's Service Card, circle 132.

Pre-engineered buildings in a wide spectrum of colors are now a practical reality—thanks to silicone-based coatings. New colorful brochure illustrates color retention performance in actual photographs. Dow Corning Corp. On Reader's Service Card, circle 133.

New 4-pg bulletin containing specs, application instructions and numerous performance charts on Curon cure-control sealing, hardening and dust-proofing liquid compound for concrete. Maintenance Inc. On Reader's Service Card, circle 134.

Catalyzed epoxy enamel is decorative tile-like finish with high corrosion resistance. Details in color card, data sheet. The Sherwin-Williams Co. On Reader's Service Card, circle 135.

Thoroseal brochure explains how to waterproof basements, foundations, concrete and block buildings; how to eliminate rubbing concrete. Standard Dry Wall Prods. On Reader's Service Card, circle 136.

PLUMBING EQUIPMENT 615

A new, 24-pg condensed catalog of Bradley's complete line of design-coordinated washroom accessories. Specs, dimensional drawings and optional feature data included. Bradley Washfountain Co. On Reader's Service Card, circle 137.

Cast Iron Soil Pipe & Fittings Handbook—comprehensive and authoritative, fully illustrated, covering use and specs of cast iron soil pipe and fittings. Cast Iron Soil Pipe Institute. On Reader's Service Card, circle 138.

Form C 150. 12-pg color catalog of water coolers. Architect illustrations. Cordley Prods., Dispenser Div. Eaton Yale & Towne, Inc. On Reader's Service Card, circle 139.

New line of water coolers, drinking fountains, 20-pg catalog offers performance specs, detailed photos, data charts and index, color chart. Elkay Mfg. Co. On Reader's Service Card, circle 140.

Comprehensive 4-pg color brochure together with reply paid postcard enabling enquirer to obtain specific quotations/information from manufacturer quickly. Richard Fife, Inc. On Reader's Service Card, circle 141.

New 16-pg brochure for architects, engineers and spec writers on proper design, arrangement and mechanical facilities in coin-op laundry rooms for hi-rise apartments and dorms. Speed Queen Div. of McGraw-Edison. On Reader's Service Card, circle 142.

ROOFING/SIDING 616

GAF Stratalite Thatch Siding. 4-pg, full-color folder #1813 describes new, all-mineral siding with look of wood. GAF Corp., Building Prods. Div. On Reader's Service Card, circle 143.

12-pg brochure gives complete information and specs on Gold-Line, a 2-ply gravel surface asbestos built-up roof. Johns-Manville Corp. On Reader's Service Card, circle 144.

STRUCTURAL 617

New folder describes 2-story application of Armco Building System. Examines loading considerations, available floor spans, building heights and bracing and floor-opening design of 2-story structures constructed from pre-engineered steel components. Armco Steel Corp. On Reader's Service Card, circle 145.

New 24-pg 2-color booklet lists nine different steel sections with accessories as manufactured by Bowman. Complete information tables on load bearing capacities and sectional properties of each shape. Typical installation details useful to architects. Bowman Bldg. Prods. Div. Cyclops Corp. On Reader's Service Card, circle 146.

Handsome color brochure on Carawall I, a modular-square ceramic glazed building unit that fits right in with any system as just the face or the actual wall. Straightline design assures low in-the-wall costs. Glen-Gery Corp. On Reader's Service Card, circle 147.

"Modern Dock Design"—a 16-pg fully-illustrated booklet to help you in the planning and building of docks. Includes descriptions, specs, applications of various types of dockboards and other dock equipment. Kelley Co., Inc. On Reader's Service Card, circle 148.

6-pg color brochure introducing new PANELWEB® girder. PANELWEB® consists of top and bottom flanges joined by ribbed web, and is designed to reduce weight without sacrificing strength. Macomber, Inc. On Reader's Service Card, circle 149.

1970 Steel Roof Deck Design Manual contains standard load tables for narrow, intermediate and wide rib decks. Information on site storage, erection and accessories, plus design specs and fire ratings. Steel Deck Institute. On Reader's Service Card, circle 150.

32-pg brochure shows outstanding applications of glued laminated timber arches, beams, domes, rigid frames and trusses. Includes details for the various components together with tables of their loads, spans and dimensions. Timber Structures, Inc. On Reader's Service Card, circle 151.

WALLS/LAMINATES/ PARTITIONS 618

1970 Product Portfolio highlights features of Customwood® architectural carved wood products—grilles, panels and doors in beautiful full color illustrations with descriptions. Customwood® Mfg. Co. On Reader's Service Card, circle 152.

12-pg catalog of glazed and unglazed handmade tile. More than 100 full-color decorated sections included from a countless number of design possibilities. Elon, Inc. On Reader's Service Card, circle 153.

"Panel Systems 1970." 8-pg 4-color illustrated booklet gives installation, application and maintenance data on panels for high-moisture areas and large-area commercial applications. Formica Corp. On Reader's Service Card, circle 154.

New 16-pg catalog contains illustrations and catalog numbers for every part needed to order counterheight, door, or full-height partitions. Shows new scratch resistant vinyl finishes. Otis Steel Prods. Corp., subsidiary of the General Fireproofing Co. On Reader's Service Card, circle 155.

A different kind of structural, decorative paneling, surfaced with burlap, virgin cork or vinyls-insulating and noise-deadening; a full 15/32" thick in standard and extra-large sizes. Described in new full-color literature from Homasote Co. On Reader's Service Card, circle 156.

Full-color 16-pg catalog on Demountable Partitions. All heights. Technical information. National Gypsum Co. On Reader's Service Card, circle 157.

Full-color 8-pg brochure describes Westinghouse movable partition systems. Outlines design features and construction details of each system and gives sound control information where applicable. Westinghouse Electric Corp. On Reader's Service Card, circle 158.

PROFESSIONAL SERVICES 619

12-pg fully illustrated brochure showing cubes and stamps for trees, cars, people, etc. in plan and elevation. Shows details of all designs. Clearstamp. On Reader's Service Card, circle 159.

READERS SERVICE FILE

ADVERTISERS INDEX

ADVERTISERS INFORMATION SERVICE

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BOOKS

(continued from page 92)

prove the ghetto is to enshrine and rigidify it even further when what we should be seeking is the elimination of ghettos.

To state another view, Mr. Canty has perhaps underestimated the strength of an additional force: the natural dynamic of upward mobility among large numbers of blacks.

Increasingly, they are showing that they want precisely what everyone else wants—more space, more nature, more amenities, more middle-classness. Drive five minutes from Oakland's most dispiriting ghetto to Capistrano Drive. There one sees a curved boulevard of attractive homes, GTOs in driveways, kids on tricycles, fathers watering lawns. All the people are black.

Oakland is hardly unique. What major city is not now seeing its own black upward-mobility chain uncoil out into the suburbs?

What this suggests is that it is not so much our priorities that are out of order as our hopes. Integration must, surely, remain the goal, but perhaps we need to acknowledge that true integration and an honestly unified society flow from black self-confidence, not white charity.

If these impressions are correct, the income strategy explicitly adopted by the Nixon Administration may then, theoretically, be the right one. "Theoretically" because these are long-term considerations. It is the present which gnaws at Mr. Canty and which animates his book.

This Administration, he feels, is "coldly remote" and meanwhile, what do we see happening? Two societies, and two time cycles, one "the accelerated cycle of rising expectations, the other the slow-motion cycle of response and readjustment. Can the first be slowed and the second speeded before time runs out?"

While Mr. Canty may not be hopeful about the Administration's capacity to synchronize these watches, he is, even so, optimistic. If they will only look around, he believes, whites will come to their senses before blacks are driven angrily out of theirs.

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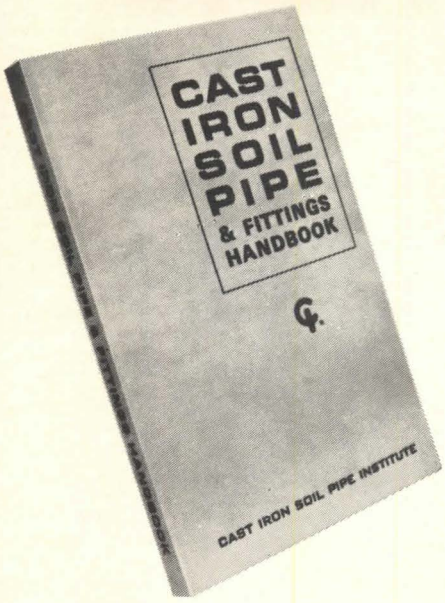

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On Readers' Service Card, Circle 227

"Laundlee velly different now"

The needs of today's in-plant laundry are changing. They require a greater degree of automation—to keep operating costs down—and they need to handle the growing influx of new synthetics as easily as they do cotton work.

American has equipment that lends itself readily to automated processes as well as the handling of both blended materials and cotton. They also have experienced teams who can plan your laundry down to the last detail. They can give complete floor plans, equipment recommendations, staffing suggestions, and capacity data. And they are supported by a nationwide network of field servicemen who can supervise or handle the installation.

So whether your installation is to be a small laundry or a high-volume automated laundry system, count on American for knowledgeable help. Just call our nearest office, or write: American Laundry Machinery Industries, Division of McGraw-Edison Company, 5050 Section Avenue, Cincinnati, Ohio 45212. Get your laundry done the American way.

American
American Laundry Machinery Industries

On Readers' Service Card, Circle 231

Can any synthetic flooring match the floor maintenance of the St. Bonaventure gym?

MFMA HARD MAPLE FLOOR

ANNUAL UPKEEP

7¢

per square foot per year

MFMA hard maple flooring installed in gymnasium at St. Bonaventure University, St. Bonaventure, New York

Low maintenance cost, all-purpose versatility, lasting beauty highlight a few reasons why MFMA Hard Maple makes the best gym floor . . . unsurpassed for basketball. And 7c per sq. ft. per year for upkeep is a solid reason why it pays to "think twice" before ordering any type of synthetic flooring! Compare. We think you'll agree!

MFMA

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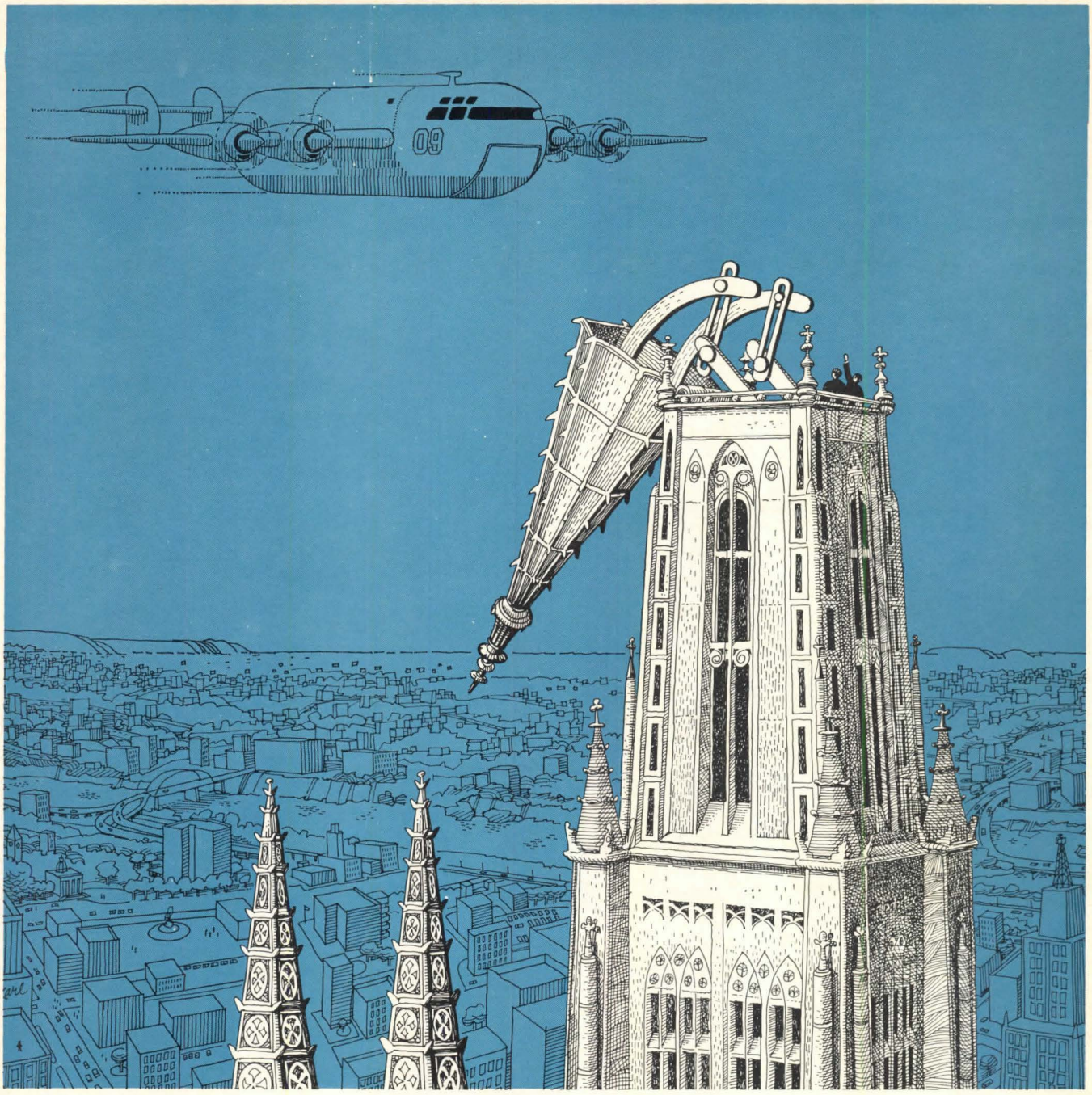
MAPLE FLOORING MANUFACTURERS ASSOCIATION

424 Washington Avenue **Oshkosh, Wisconsin 54901**

On Readers' Service Card, Circle 228

We're known as difficult people.



We do the difficult spire jobs.

Not many churches require top-tipping spires, but all of them have unique characteristics which indicate *specialized* design. At Overly, we've designed and erected 1400 spires, and all of them had their own special qualities. In 1926 we designed the first prefabricated spire in the United States for a church in Pittsburgh.

Our spire-framing systems are computer-designed to withstand windloads typical of the prevailing local conditions. We also can give assistance in the selection of materials and finishes. And, through detailed drawings, we can illustrate our design.

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Overly Manufacturing Co., Architectural Metals Division, Department 1D, Greensburg, Pa. 15601.

Overly
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On Readers' Service Card, Circle 229

Berven Carpeting vs. George's Birthday

Practically every grade school throws George a party. And half the party always end up on the floor. Great for school kids. Bad for school budgets. To keep those maintenance costs down may we suggest the carpeting that Berven calls Extra Point. Extra Point is made with new Anso®—the nylon fiber that fights back. And it's tough enough to resist the kind of soiling you get with a classroom full of kids. Yet for all its toughness, Anso has rich color and texture. And it wears so well, Allied Chemical guarantees it for five years.* If you'd like to have more information on new Anso nylon, write to Berven of California, 2600 Ventura, Fresno, California 93717.

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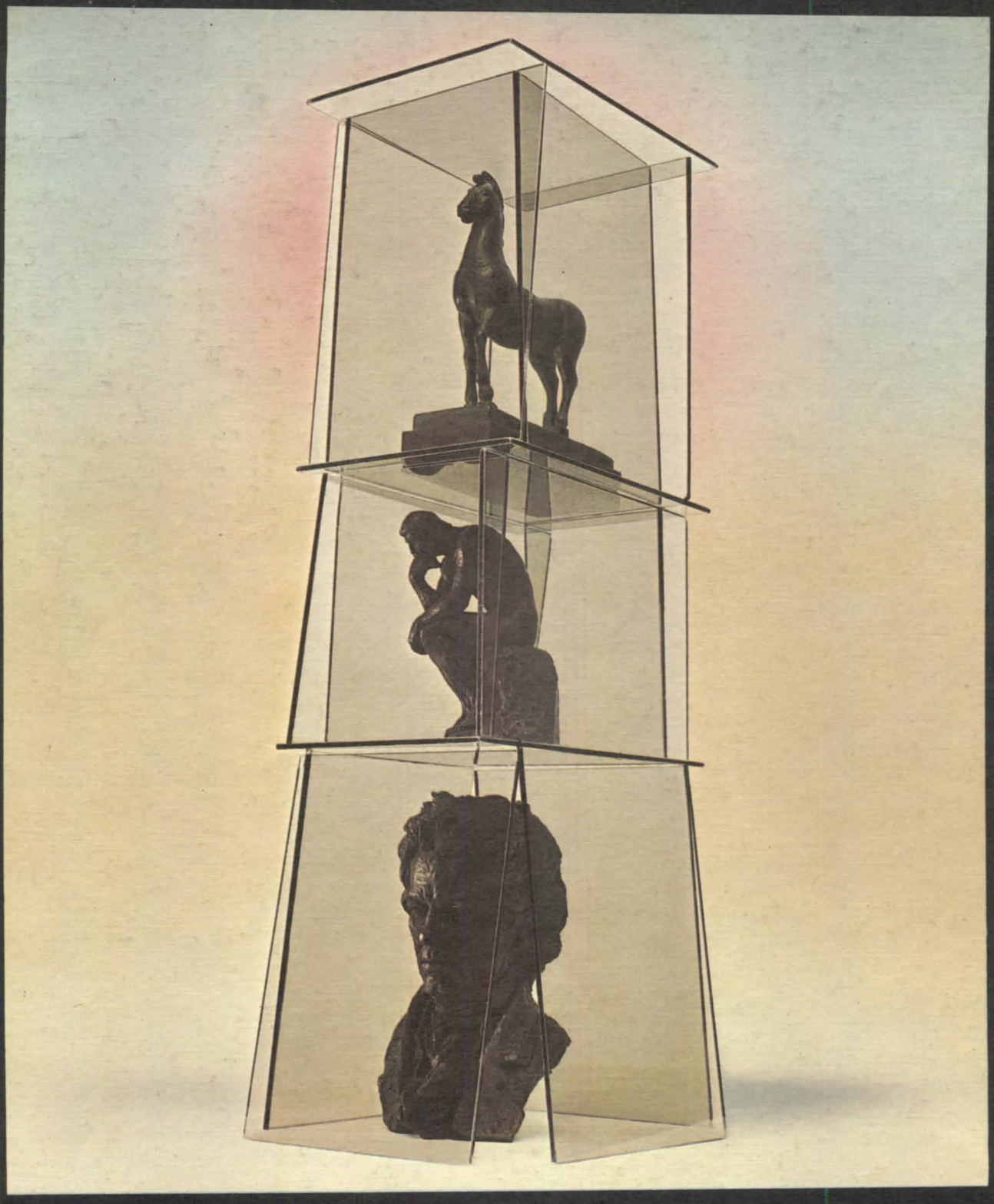
ANSO®

THE VERSATILE FIBER THAT'S MADE TO FIGHT BACK.

*This carpet is guaranteed by the Fibers Division of Allied Chemical Corporation. If it is properly installed and maintained and the surface pile in any given area wears more than 10% within 5 years, it will be replaced at our expense. The guarantee does not cover tears, burns, pulls, cuts, or damage due to improper cleaning agents or methods.



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