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Cover: From a photograph of The Ontario Pavilion by Architects Craig, Zeidler & Strong (p. 26).

THE ARCHITECTURAL FORUM Vol. 133 No. 3 October issue.

Published 10 times a year, combining Jan./Feb. and July/Aug. issues, by Whitney Publications, Inc., 130 East 59th St., New York, N.Y. 10022. Sent without charge to architects registered in the U.S.A. and Canada. Qualified persons are invited to write the Circulation Manager on company letterhead. Please give your principal state of architectural registration, your title, and the kind of work you do. Correspondence regarding service, change of address, etc., should be sent to M. M. Stern, Circulation Manager. Subscription rate is $12 within the U. S. A. and possessions and Canada. Elsewhere, $20. College Rate for students and faculty members of U.S. and Canadian accredited schools of architecture, $6. Single Copies, $1.50. Member of Business Publications Audit of Circulation, Inc. Controlled circulation postage paid at New York, N.Y.

CUYAHOGA COMMUNITY COLLEGE, Cleveland, Ohio. Honor award winner in the 1970 Community and Junior College Design program. The complex was honored for "outstanding handling of a very limited site in an urban renewal area of the highly industrialized city of Cleveland." Architects: Outcalt-Rode-Kaplan-Curtis. General Contractor: Turner Construction Co. Twelve Dover Oildraulic and Electric elevators installed in seven buildings on the campus by Dover Elevator Co.

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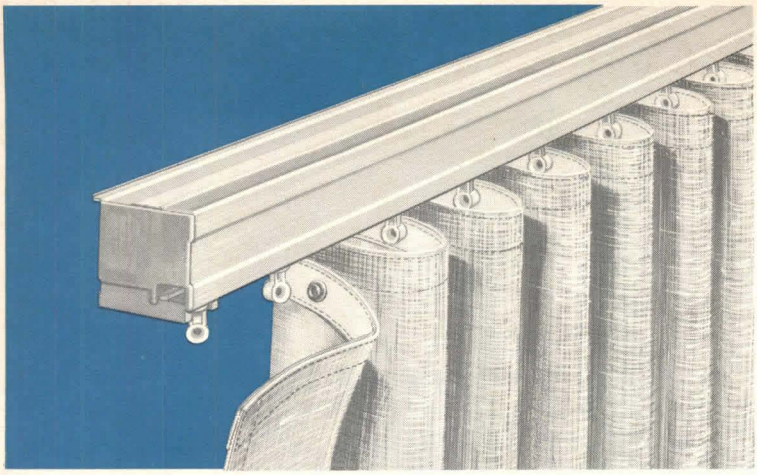
DUKE NUCLEAR LABORATORY, Duke University, Durham, N. C. Cited as one of 16 outstanding examples of campus design for the 1970s by College & University Business magazine. The massive solidity of its design evokes a feeling of security appropriate to its function. Architect: A. G. Odell Jr. & Associates. General Contractor: F. N. Thompson, Inc. Dover Oildraulic elevator installed by Dover Elevator Co.



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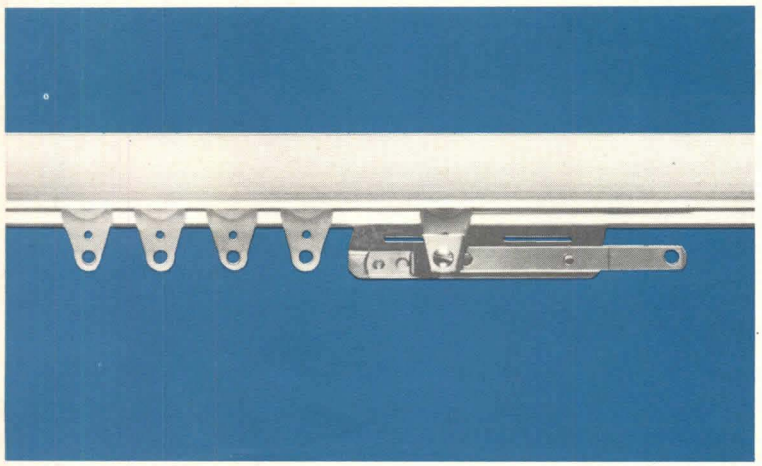

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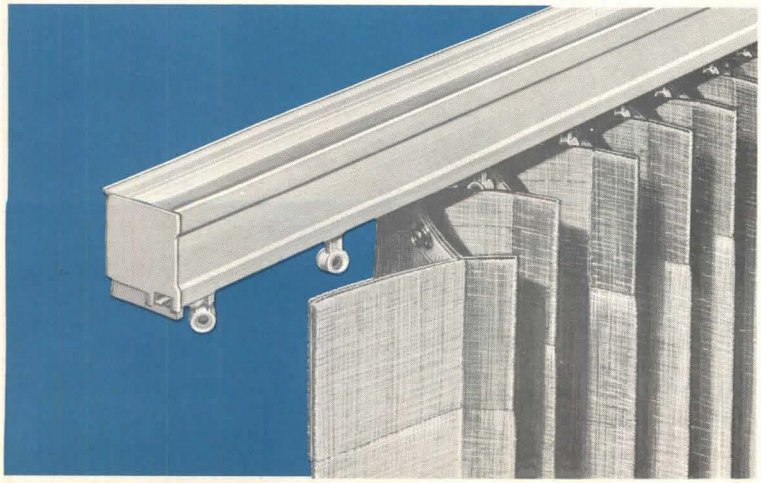

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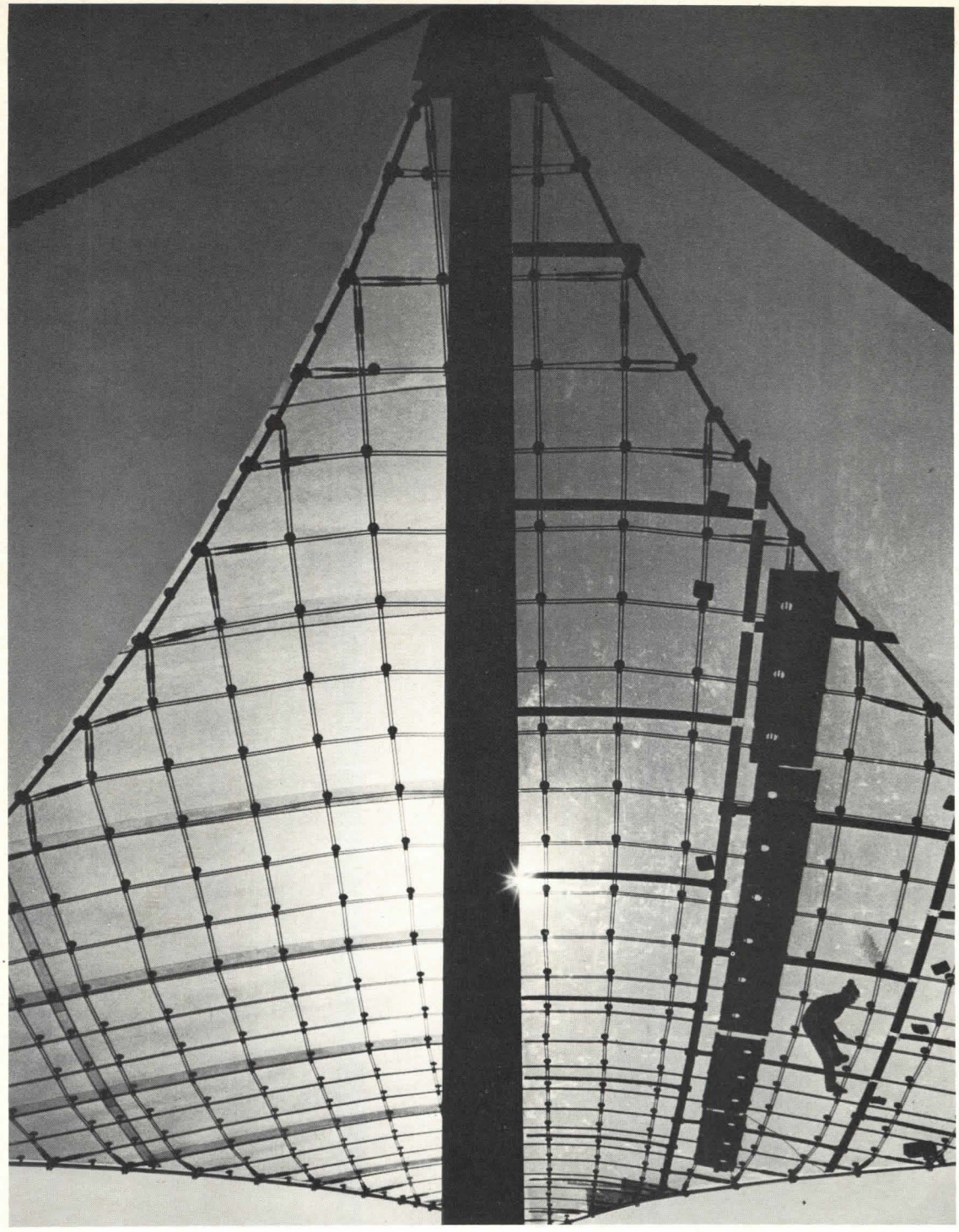
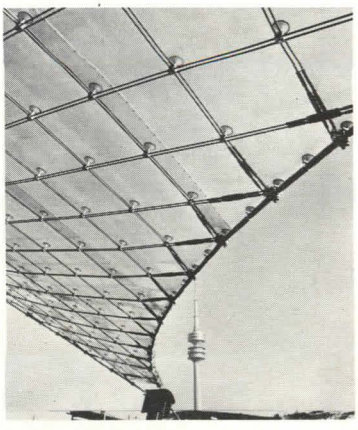
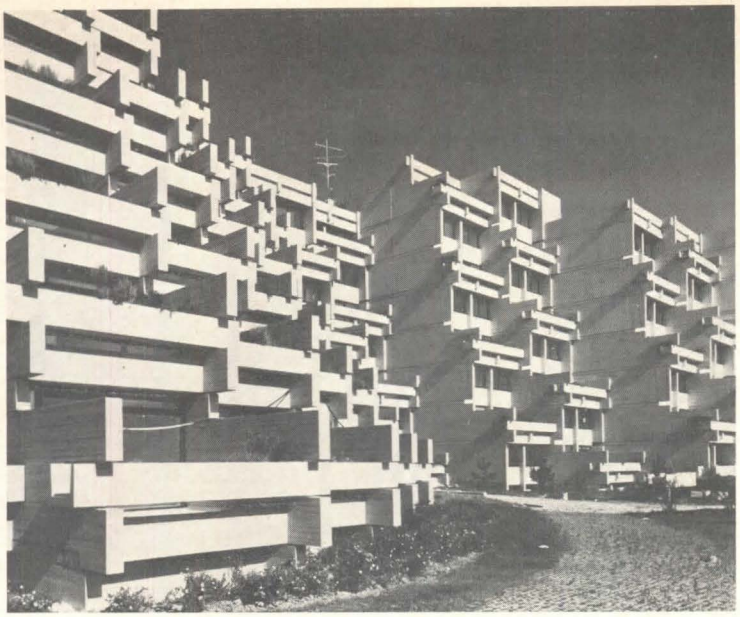
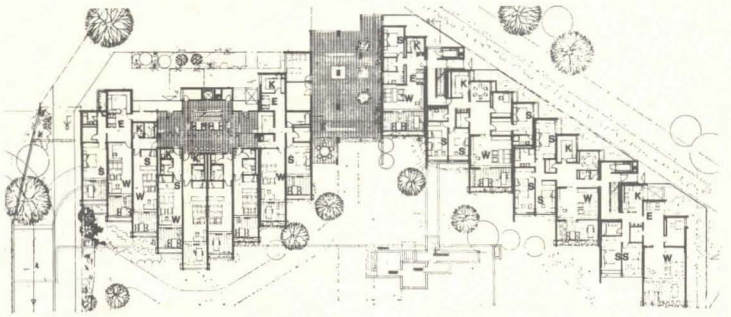


OLYMPIC SKYLIGHT

The showpiece of Munich's Olympic skyline in 1972 will be a translucent tent roof, 800,000 sq. ft. It will shelter half of the official Olympic stadium, all of a smaller one, plus the swimming stadium and some of the approaches. The roof was designed by Professor Günter Behnisch & Partner, with the firms of Frei Otto and of Professors Leon Hardt & Andrä. Pylons up to 270 ft. high will carry a steel cable grid that will support the roof fabric. The fabric is a translucent synthetic chosen to allow shadowless color television photography. Illumination plans for the official stadium call for the floodlight equivalent of 245,000 60-watt bulbs. Pictured is an experimental roof section, full-scale, of 2,000 sq. ft. erected to test the materials and construction under winter conditions. The roof itself is scheduled for completion in fall, 1971. The two concrete bases that will secure the roof hawsers are already complete and erection of the steel superstructure is under way.





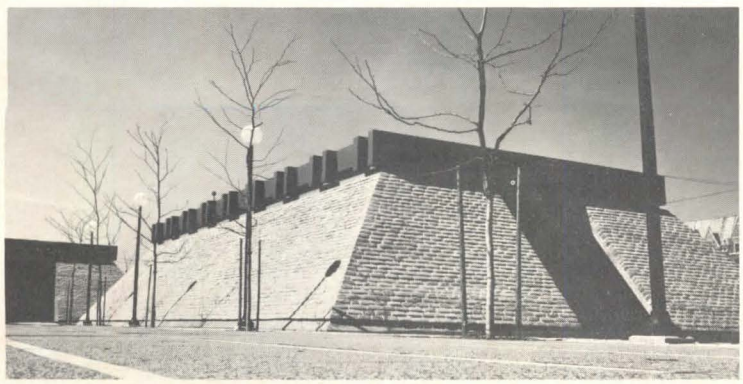


CLIFFHANGER APARTMENTS

The wall of concrete "logs" shown here is a stack of apartments completed recently in Munich. They were built for both resident and visiting scientists—the taller half of the wall is 6 to 8 stories high and contains 28 apartments; the lower half is 3 to 5 stories high and contains 31 guest units. Because of the relatively small size of the project, prefabrication proved uneconomical except in the case of a few, precast elements, especially around the terraces. The staggering of the units was determined by the configuration of the site. Architects: Ebert, Heldrich & Gramelsberger.

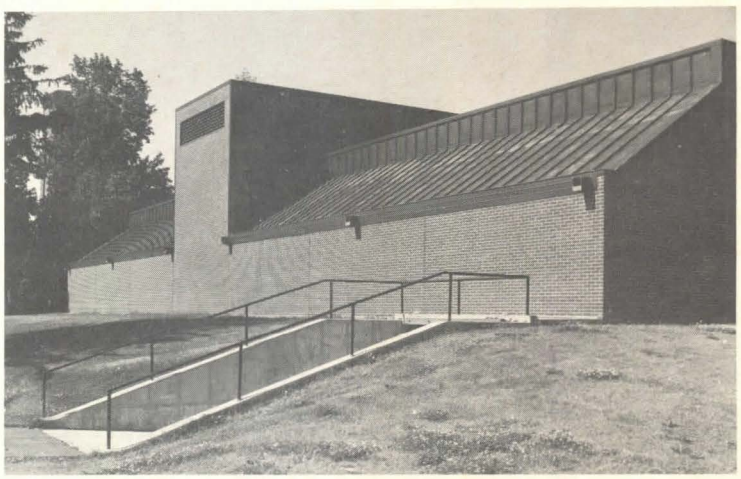
COOLING IT IN ALBANY

First structure in Albany's Historic Park will air-condition all buildings in the 100-acre South Mall. Designed by RTKL Inc., the 100-million-gallon a day facility is the largest of its type in the world. Walls are of Belgian granite, salvaged when the streets of downtown Albany were repaved. Roof is of concrete, supporting a grid of skylights. In 1961, RTKL Inc.'s plan for the capital recommended the new State Capital Center in the heart of the city (South Mall) and the two-mile-long historic park along the riverfront.



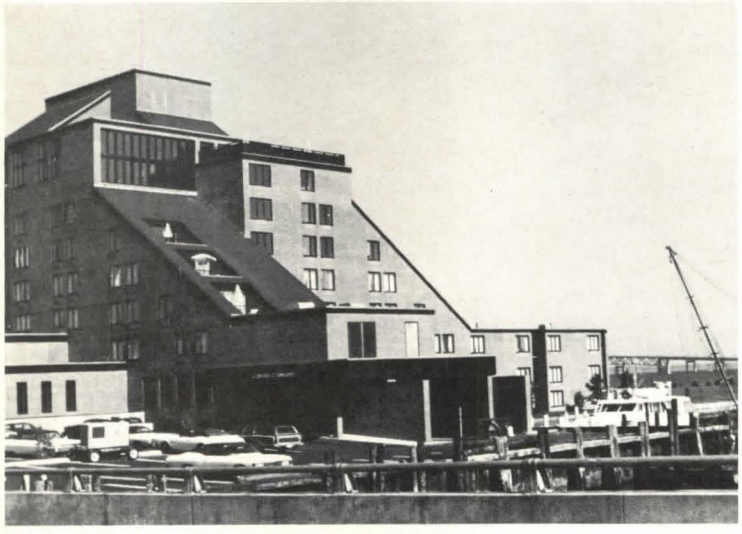
UNDER THE BIG TOP

Variously described as a space station, octopus or umbrella during construction, this auto showroom was designed for the Sanders Motor Co. of Raleigh, N.C., by Olsen Associates. The architects specified natural materials to contrast with the manufactured gloss of the cars, and designed the octagon's roof to shelter an equal amount of indoor and outdoor display area. The roof has upswept beams of dark laminated wood and honey-colored wood decking. The glass walls are framed by bronze-colored steel and floors are brick.



LOW-PROFILE GYM

For the small-scaled, park-like campus of Barrington College at Barrington, R.I., Sasaki, Dawson, DeMay Associates have designed a ground-hugging physical education building. By sinking the gym floor slightly into the ground and banking earth up around it, the architects have hidden about one-third of the gym's volume; sloping surfaces of copper sheet above low brick walls minimize the remaining bulk. The glass-walled lobby (above left) is level with the balcony inside the gym (above right) from which folding bleachers for spectator events are entered. Adjoining the lobby is a small wing housing locker rooms at gym level, with classrooms above them at entrance level. Clerestories behind the copper roof light the classrooms. A swimming pool will be added at the end of this wing to complete the athletics complex.

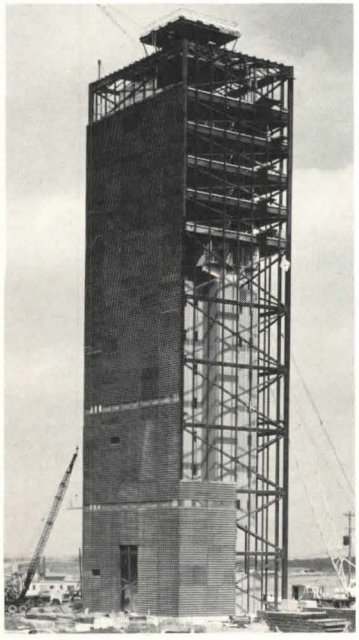


CONSPICUOUS RESTRAINT

The Colonial Hilton Inn, prominently sited in the middle of Newport (R.I.) harbor, is notable first for what it is *not*. It is neither a parody of the many genuine Colonial buildings in the old town nor an uncompromising Hilton-style slab. Architects Warner, Burns, Toan & Lunde have housed the 160-room hotel (with indoor pool, etc.) in small-scaled wings, clad in muted brown brick, which rise toward the center to produce a distinctive silhouette. A three-level cocktail lounge at the top offers broad views of town and bay. The hotel is the first step in the development of Goat Island, a former navy base, into a residential-shopping-boating center.

TERMINAL'S TOWER

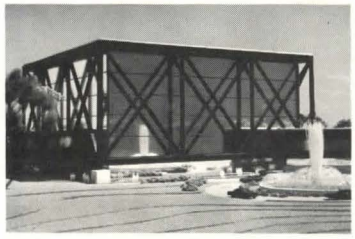
First structure to take shape at the Kansas City International Airport is the 214-ft. control tower, one of the world's tallest. The tower consists of six new stories built on top of the present control tower. New sheathing (of oxidizing steel) is in louvered panels, with the louvers angled to give light and visibility to the old building that "floats" inside. Terminal buildings, due to be finished in 1971, will be large rings in plan—aircraft along the outer perimeter and passenger service roads and parking within. Architects: Kivett & Myers.



PHOTOGRAPHS: Page 7 Sven Simon. Page 8 Barrington College (lower left) Louis Reens, (middle and lower right) Hutchins Photography, Inc. Page 9 (top left) Hopf; (top right) New York Times; (bottom right) Gordon H. Schenck, Jr.

APARTMENTS ALOFT

High above the Hudson River, perched on cliffs near the George Washington Bridge, three new apartment buildings named Bard Haven stand with a view toward Jersey. The 32-story towers were constructed by the New York State Dormitory Authority for $18 million, then leased to Columbia University for staff, faculty and medical students at about $60 per month per room. Designed by the architectural firm of Brown Guenther Battaglia Galvin, the buildings are of reinforced concrete, with the lower stories designed to project outward, then terminate at a plaza 80 ft. above grade.



EXECUTIVE OFFICE BUILDING

Four exposed steel trusses, each weighing 300 tons, surround the topaz-tinted mirror walls of a new office building in Greensboro, N.C. The building is six stories high; the four upper floors are suspended from a steel roof frame supported by the trusses. To support the trusses during construction, 12 concrete piers were erected on the building perimeter; eight of them will ultimately be removed. The building, with its low L-shaped wing, will contain offices of Burlington Industries. Architects: A. G. Odell Jr. & Associates.

Architects: Frederick Confer & Associates, Concord, Calif.

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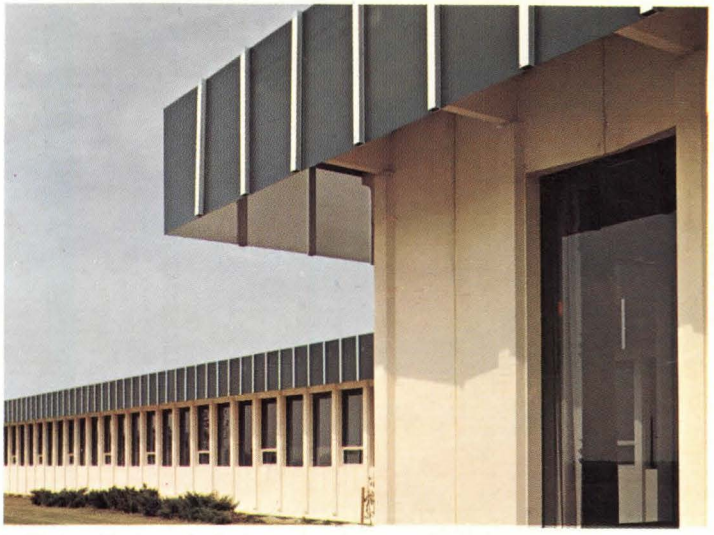
Castle Rock School, Walnut Creek, Calif. (left). Schools, plants, office buildings, and commercial establishments all across the country are putting Plexiglas acrylic sheet to excellent use as safety window glazing. Shatter-resistant Plexiglas sheet drastically reduces breakage and the costs of replacement. Additional advantages of Plexiglas in window glazing are the control of solar heat and glare through the use of gray and bronze tints in the Solar Control Series.

Hilton Inn, Northampton, Mass. (upper right). As no other material can, Plexiglas acrylic plastic captures and controls daylight. Because of its light weight and strength, Plexiglas is a practical and graceful material to use in large dome enclosures. Heat and glare are controlled in such structures through the specification of one of the transparent gray or bronze colors in the Plexiglas Solar Control Series.



Architects and Engineers: Bender Burrell Associates, Camp Hill, Pa.

Daylight without glare

Cumberland School, Camp Hill, Pa. (lower right). Effective solar heat and glare control and a distinctive appearance result when Plexiglas sheet is used as sunscreens. Pleasant atmospheres conducive to work, play, or learning are created because Plexiglas sunscreens reduce objectionable glare. Balanced combinations of light transmittance, glare control and solar heat reduction can be achieved by choosing from a range of gray and bronze tints in the Solar Control Series. The light weight of Plexiglas sheet in combination with a wide range of available thicknesses makes possible window and sunscreen clear areas up to 10 feet without intermediate support.

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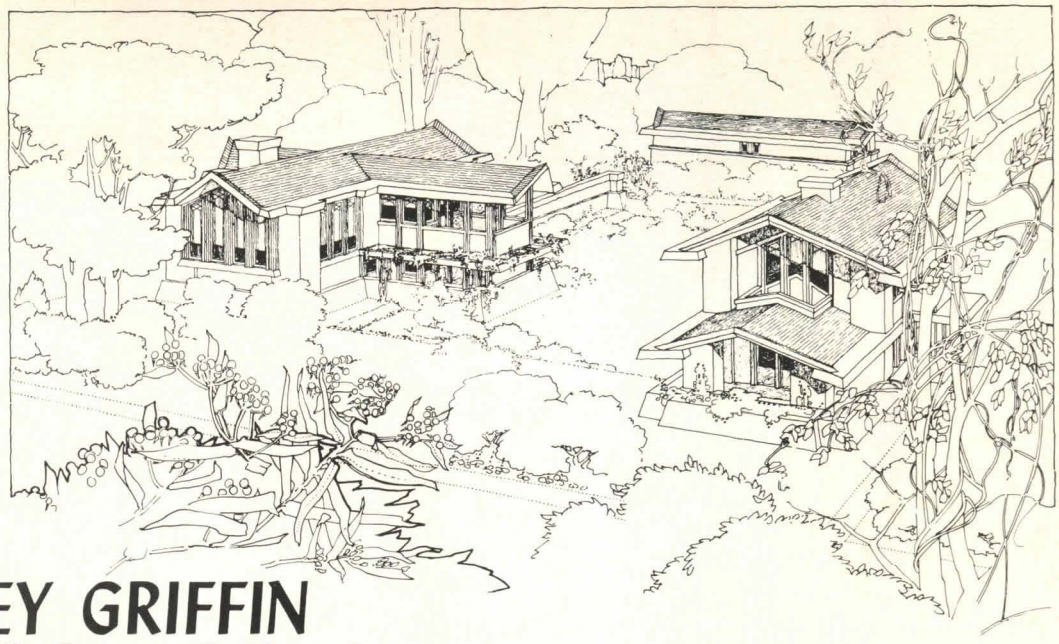

WALTER BURLEY GRIFFIN
Selected Designs, *Edited by David T. Van Zanten*

The Prairie School Press, Inc. announces the publication of *WALTER BURLEY GRIFFIN, Selected Designs* edited by David T. Van Zanten, Ph.D. This magnificent volume includes more than 50 drawings executed by Marion Mahony Griffin. They include illustrations of Walter Burley Griffin's award winning design for the Australian capital city of Canberra as well as numerous other drawings of buildings and projects.

Architect Walter Burley Griffin is usually remembered as a contemporary of Frank Lloyd Wright. His wife, Marion Mahony Griffin, worked with Wright for some 13 years and is generally credited with the rendering of most of the magnificent pen and ink drawings which were done in Wright's studio during the early 20th Century. It was during this period that the "Prairie" house was developed.

After leaving Wright and becoming the wife of Walter Burley Griffin, Marion Mahony Griffin continued to execute her splendid drawings. It is this later work, illustrating the designs of Walter Burley Griffin, which is included in this book. The drawings have been gathered from libraries in New York, Chicago and Australia for this publication.

The text for the book includes a preface and an informative introduction by Architectural Historian David Van Zanten, who has also furnished a chronology of Griffin's life and an excellent bibliography. Finally, there are seven of Griffin's thought provoking addresses and writings on architecture and planning.

The book is superbly produced on 80# laid paper with oblong pages 11-1/2" high by 13-1/2" wide. It is bound in maroon buckram with gold stamped title and is enclosed in a handsome slipcase. The price is $25.00.

This edition is limited to 1000 copies.

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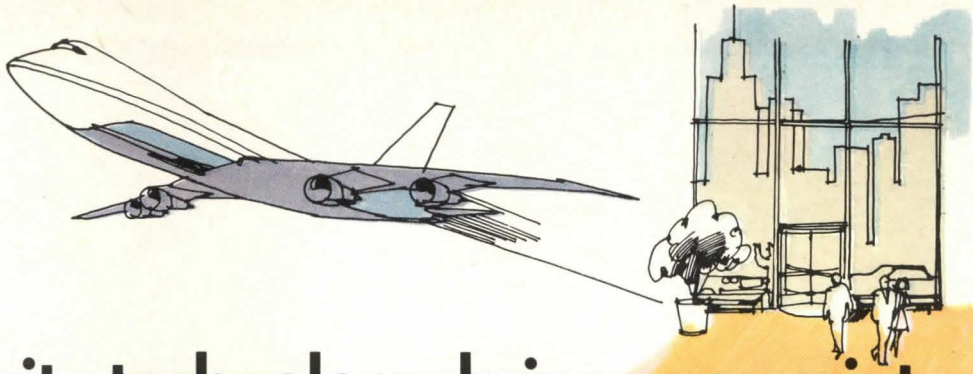

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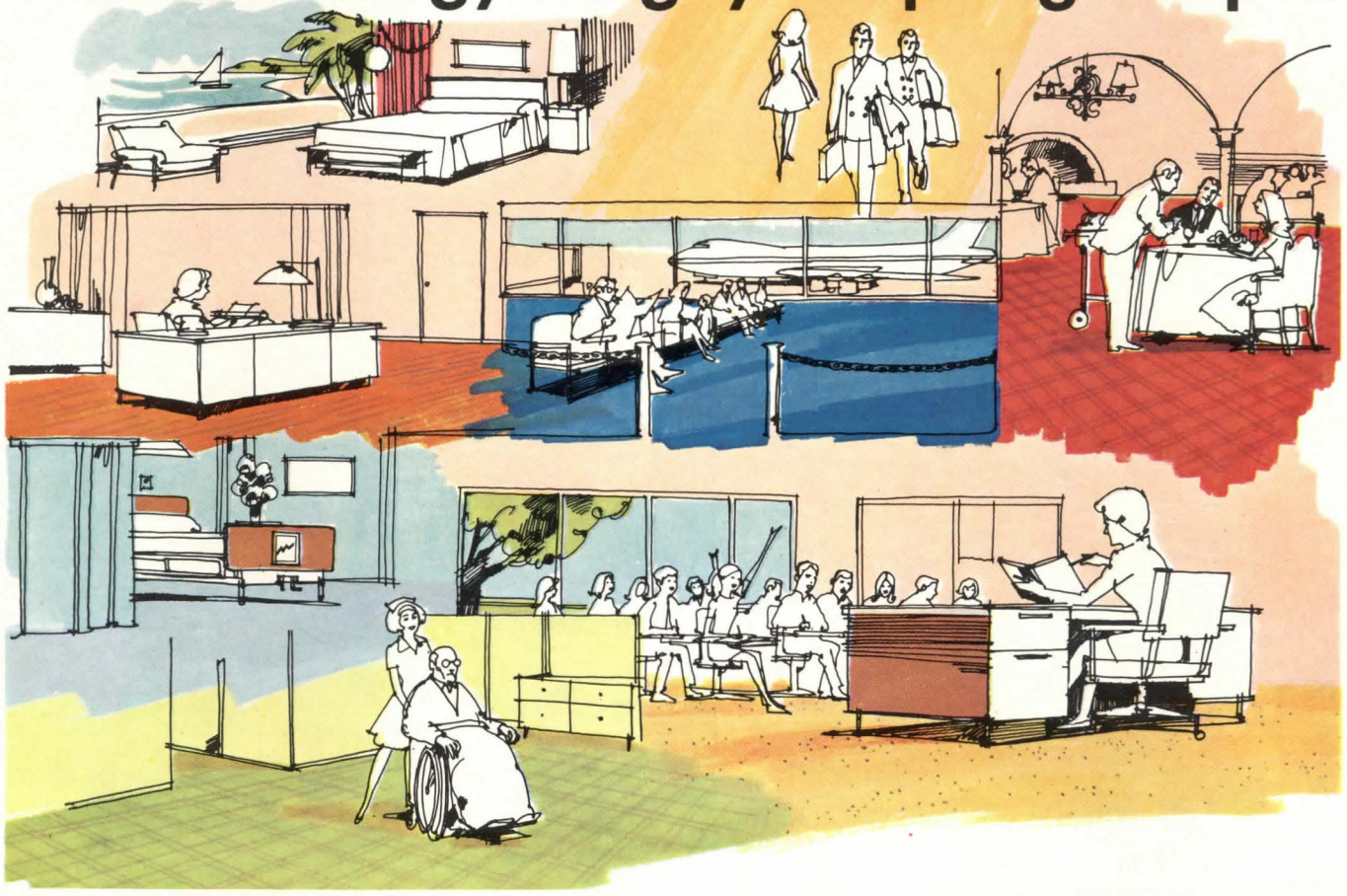

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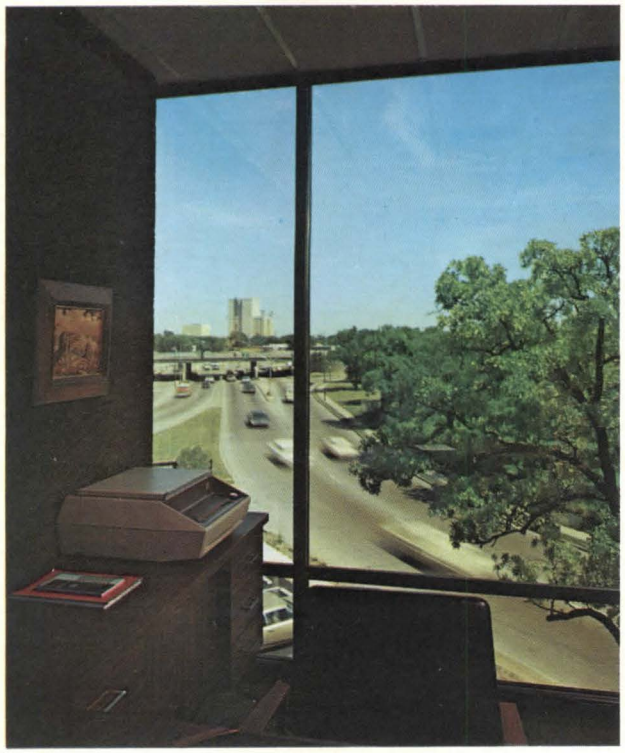

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LETTERS

SQUARE ASSAILED

Forum: I can't agree with your article titled "Boston's Open Center" (June issue) in regards to the open spaces. The open spaces are *BAD*. What bothers me the most is the fact that many architects will try to copy the Boston concept because of your article and several others like it. When you leave out man's natural environment, which are the things nature has given us, trees, foliage, greenery, etc., and try to replace it with brick after brick, you have created nothing which man can relate to; in other words, a bad environment. The human scale is lost. Yes, there are some trees, but only a token of what should have been done.

Please stop glorifying this development because it's exactly what we must not do, if architects are to design better living environments for men to live in.

ROBERT H. RICCIARDI
Palm Desert, Calif. *Architect*

Bricks and stairs are units of "human scale"—at least in Boston. More greenery would have been vital if heat were a severe problem, as in most of the U.S. At any rate, we do not recommend copying *this solution anywhere.—Ed.*

Forum: I should like to comment on the article entitled "Boston's Open Center" (June issue). I have been associated with the Boston Redevelopment Authority for six years, and have worked in the new City Hall. To me, the Government Center and Plaza are an extravagant architectural "statement," glaringly symbolic of the power and inaccessability of the City, State and Federal Government. An incredible $8 million of public funds have been used to create ten acres of empty, cold, and relatively formless "brick and granite terrain." The Plaza is largely unusable in winter because of the difficulties of snow and ice removal. Fierce sea winds in the fall, spring and winter make it a place to run through rather than linger. The comparisons drawn in the Forum article between the Trevi Fountain, Siena's Plaza, and this massive brick wasteland are ludicrous, serving only to highlight the sterility of Boston's Plaza. It is ironic that the pictures accompanying the "Open Center" article clearly illustrate the design weakness of the project.

To me, Boston's Government Center Complex and Plaza provoke a number of more fundamental aesthetic, socio-economic and political questions. One is impelled to ask:

1. Are the expenditures for such a facility justifiable in a city that cannot properly clean its streets or maintain its deteriorating housing and parks?
2. Couldn't many of the old historic buildings in what was formally Scollay Square have been rehabilitated to retain some of the urban vitality this area once had?
3. Why was year-round economic and social use disregarded in the architectural form of a "civic center"?
4. Why is this monumental complex, as are nearly all contemporary "government centers," so drab? Would Neo-Fascist be an unfair term to describe such complexes?
5. Why has so much space been devoted to automobile use? (A 5,000 car garage and 100 foot wide streets that only go a few hundred yards.)
6. Was this kind of development necessary to bring private investment back into Boston's downtown? If such a stimulus was needed, was it justified on such a scale?
7. How does Boston's center compare with those in Baltimore, Philadelphia and New York City? What caused this sudden growth of government construction and what can we learn from it?

EDWARD TEITCHER
Chief of Physical Planning
Boston, Mass. *Model City Administration*

The answers to these questions could make a doctoral dissertation, but briefly: 1. Redevelopment and sanitation do not compete for the same funds; redevelopment produces income *for the city. 2. Scollay Square had little "vitality," but more buildings might have been saved. 3. Climate-controlled public spaces were not seriously considered in 1961; still are not. 4. Monumental, yes; Neo-Fascist, no—that would mean rigidly orderly and isolated from context. 5. Space given to cars was actually reduced —dozens of clogged streets replaced by those few wide ones; the garage (for 2,000 cars, not 5,000) is well sited to reduce traffic, and it includes a bus terminal. 6. Redevelopment at this scale did the trick; we can't be sure that a smaller effort would have. 7. An increase in government programs produces an increase in office space, if nothing else.—Ed.*

ENIGMA SOLVED

Forum: It was delightful to see the photograph of 'La Casa del Ingles' near Xilitla, in your June issue (and reprinted here—Ed.). It brought to mind some of the stories about the legendary Theodore Kahler, the master of the house, or, rather, pavillion. Kahler was, it appears, an adventurer and charlatan of German origin who lived in various parts of the Southwestern United States and Northern Mexico during the period, roughly, from 1919 to 1942. He spoke English fluently, although with a charming accent used frequently to his advantage, which probably accounts for his identification by the Xilitlans as an Englishman.

During the time from 1919 to 1934 he apparently lived by his wits, along with some small income received at irregular intervals from Europe. By 1923 he had successfully passed himself off as a celebrated town-planner in such places as Mexican Hat, Utah, Durango, Colorado; and Las Vegas, New Mexico, for all of which he claims in his journal to have developed extensive 'guide plans for development'.

Somewhat later his endeavors turned to psychoanalysis, on which he lectured in the copper

George Cserna

mining country of Arizona sufficiently successfully to attract a following of wealthy women with whom he held individual and highly lucrative consultations. Kahler seems to have abruptly left this pursuit in 1928, at which point there is a 6-year hiatus in his journal, a period for which he never afterwards accounted to his correspondents.

Kahler's sojourn near Xilitla was from about 1934 to 1939, during which time he built the fantasy that you picture, or at least all except the enclosed room at the top, and, I would guess, the concrete pylon and stairs which appear to be more recent in your photograph. He mentions in his last pages mailed from Mexico in 1939 the completion of his 'Italian arcade open on four sides'. His journal was sent several pages at a time to various acquaintances in the United States and England, in place of personal letters, and may, when finally assembled, provide more insight into this fascinating personality. Nothing in the journal, however, indicates any concern with outward appearances (as must be obvious from your photograph), but rather with the creation of settings or 'frames', which would modify the new experience of the forest around the house.

Kahler's source of income was apparently cut off at the outbreak of World War II, for he moved from his Xilatlan house in December, 1939, in some disorder. His later life is only imperfectly documented. There was some communication from him from Tucson, Arizona in 1940, where he was, it seems, involved in some kind of unsuccessful effort to establish a community of former Bund members from Cincinnati who intended to establish a "model of the perfect society" near Tucson. The last communications from him of which I am aware are from Los Angeles in 1942, where he was having difficulty obtaining work in a defense plant, complaining, characteristically, of bureaucratic investigations into his past.

His journals, as I have indicated, are scattered and very incomplete. But from them it is evident that his interest in architecture was evidently only a passing whim. As for "La Casa del Ingles", I suspect that someone else has late piled mischief on folly. Or could it be Kahler himself?

PHILIP ATCHISON
Denver, Colo. *Architect*

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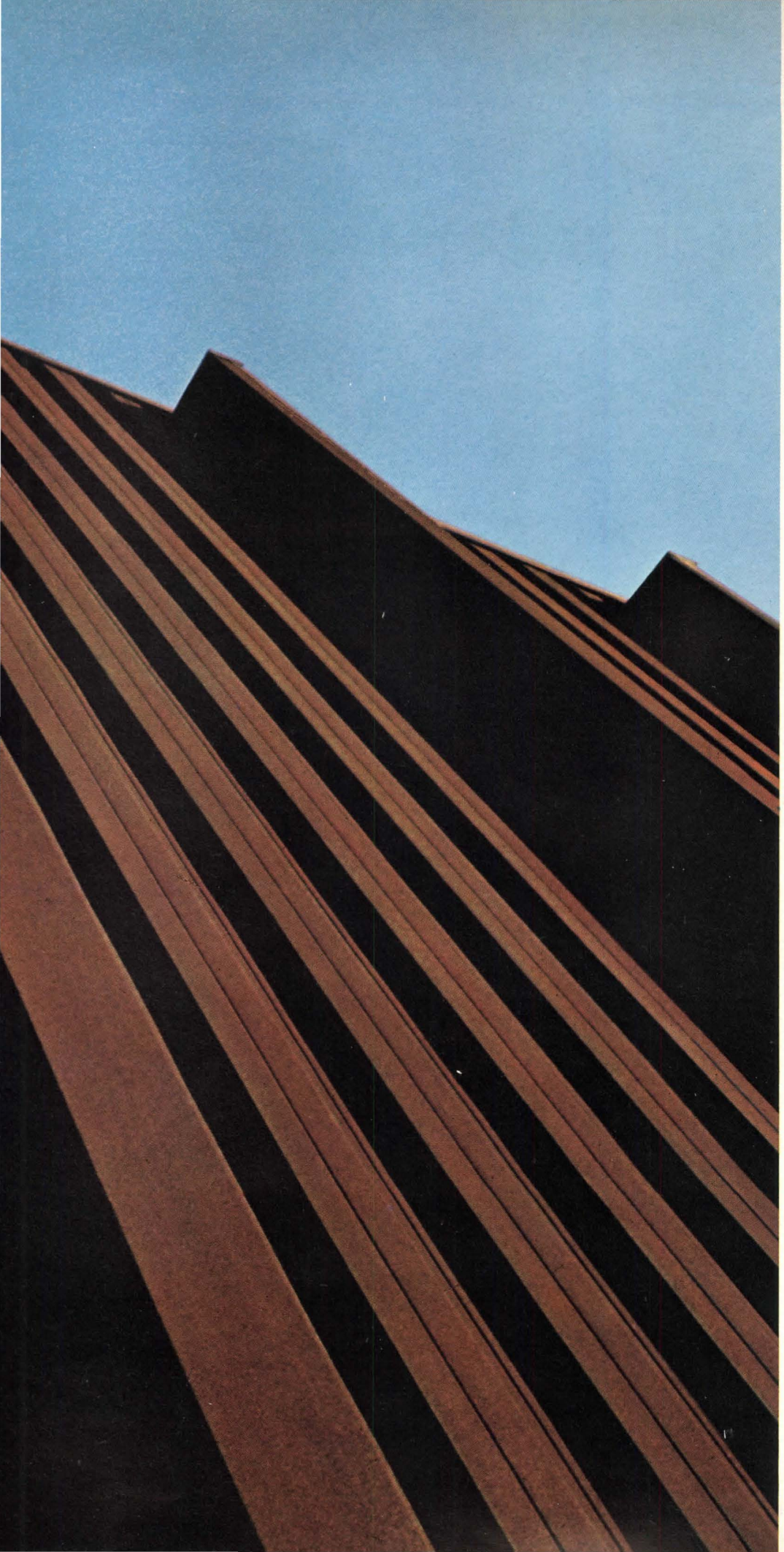

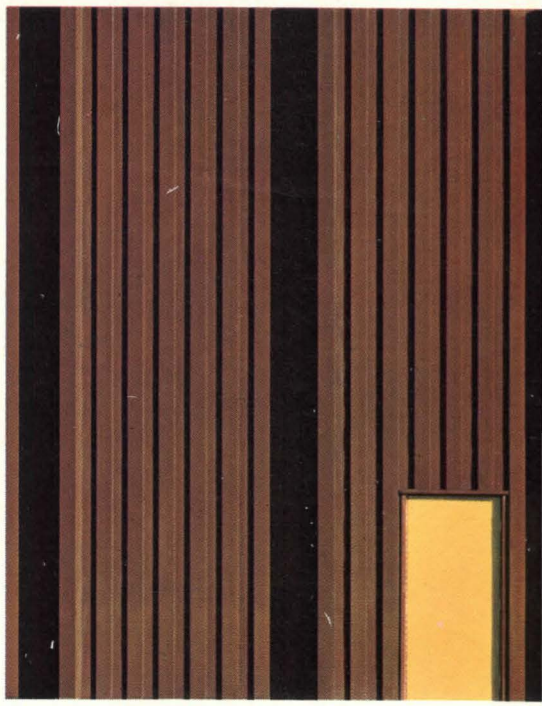

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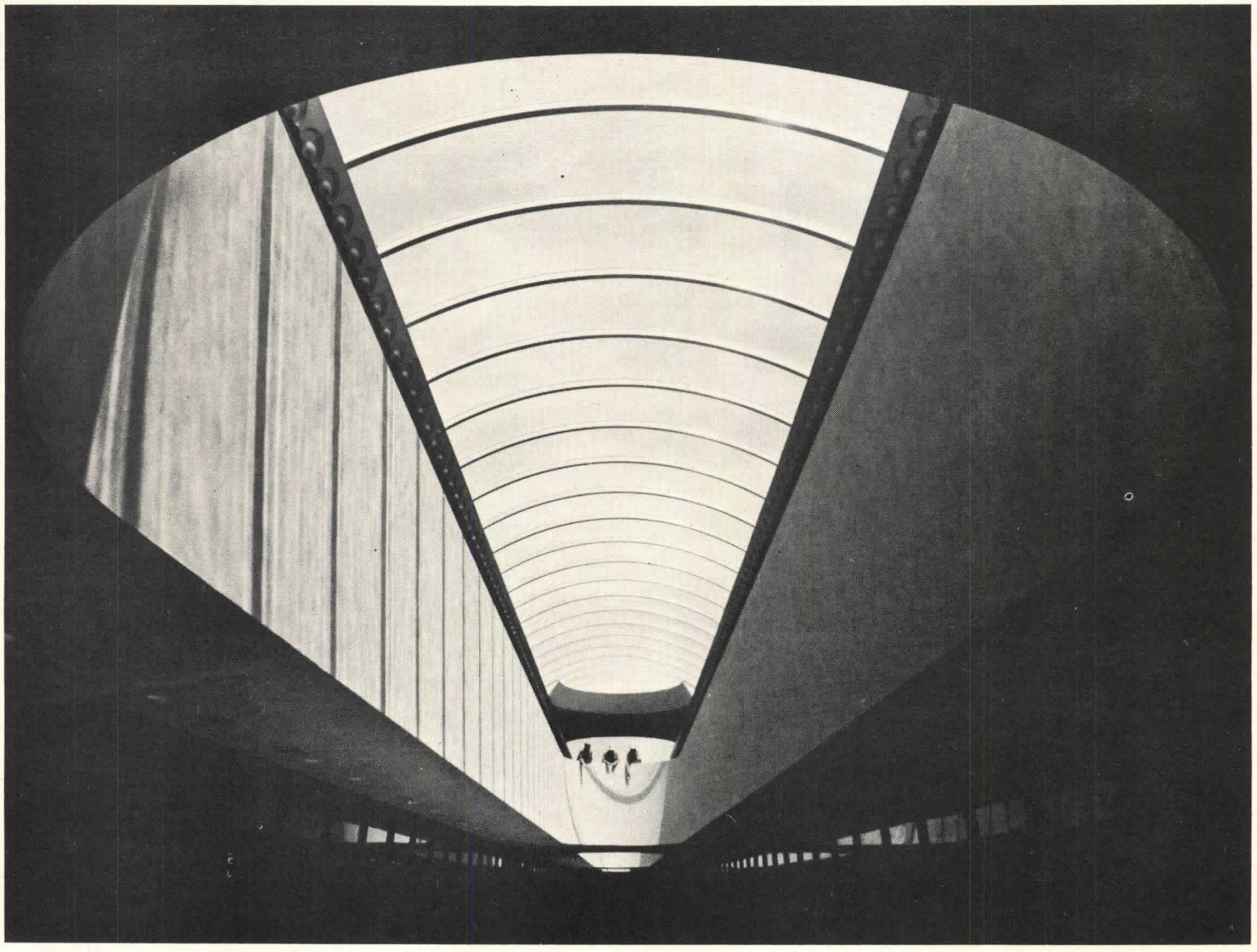

As usual, when Frank Lloyd Wright designed the Marin County, California government building, he designed a building that was years ahead of its time.

In some ways it was even ahead of the products available with which to build it.

Frank Lloyd Wright designed this building with vaulted skylights made from acrylic sheet. The only problem was that the acrylic sheet available when the building was constructed wasn't up to the demands of the design.

In the few short years since it was built, the skylights in the original wing of the building have deteriorated from exposure to ultraviolet rays to the point of opacity. And the welded seams have collected dirt particles in such quantity that they're unsightly.

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FORUM

The best thing about moving into a new office is that it means moving out of an old one, and *that* generally means, in my case, that I have to toss out all the junk that has accumulated in my desk. Specifically, there is a place in back of, and sort of underneath, my desk drawer that tends to collect all the most interesting documents that have crossed my path over the years.

Thus, about three months ago, I discovered in cleaning out my desk prior to making another move, a yellowed editorial page from the *New York Daily News,* dated April 11th, 1955. The best way to describe the *Daily News* to those of you fortunate enough to be living in Nebraska or some other distant planet is to say that Spiro T. Agnew is, probably, a figment of that paper's imagination.

Okay. The reason I kept that page was twofold: first, there was an editorial suggesting that the way to get NYC back on its feet, moneywise, was to build a huge office skyscraper on top of the New York Public Library—a wonderful neo-classic relic designed by Carrère & Hastings in 1911. The revenues, the NYDN suggested, would put the city in the black.

And my second reason for stashing away that page was a letter printed right next to the editorial column from an irate reader who signed him- (or her-) self "Overtaxed." "These city fathers make me sick," wrote Mr., Mrs., or Miss Overtaxed, "raising fares, taxes, and so forth in order to get money. They should chop down the Central Park trees, sell the wood, and then pave the place over. Set up a race track in the northern part, a Coney Island at the south end, and a mambo palace in the center. The remaining space could be rented for parking."

I kept that editorial page, of course, because I was charmed by its patent absurdity. Times have changed: The Penn-Central may yet build a skyscraper on top of Grand Central Station, and the NYC Transit Authority is planning to rip up Olmsted's preserve. What seemed excruciatingly funny fifteen years ago seems just excruciating now.

My desk drawer is very clean and neat now, except for one clipping that I slipped in yesterday. It is something I found in last Sunday's *New York Times,* and it is an ad for Anti-pollution Gasmasks. The ad reads in part: BE PREPARED for fall and winter when Sulphur Dioxide levels double over summer. WEAR YOUR MASK when air index hits "unhealthy." DON'T WAIT until the damage is irreparable. Send $20 check or M.O. to: SURVIVAL ASSOCIATES, 333 E. 55 St., New York, N.Y. 10022.

I am not going to clean out my desk drawer ever again.

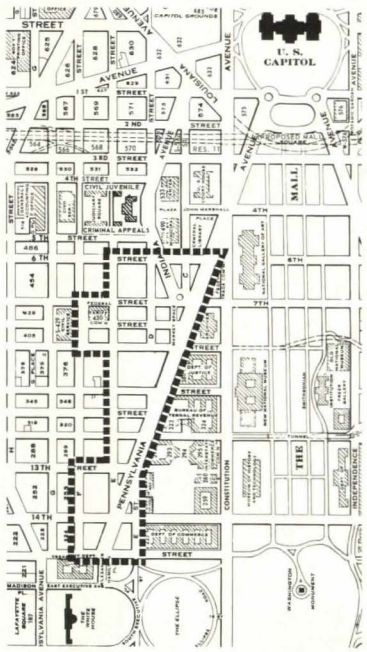
—PETER BLAKE

PARTIES

PUSHING PENNSYLVANIA AVE.

President Nixon's long-awaited decision as to how the country would mark its 200th birthday has satisfied almost everyone. Philadelphia, as the focal city, will have its exposition (which is to include foreign participants); and the other major contenders —Miami and Boston—are encouraged to do whatever they like and can afford. And every other city and town has been asked to join the party as well.

For Washington's part, the President personally toured Pennsylvania Avenue last month to dramatize his support for completion of the "Federal City" concept that has been around ever since L'Enfant—and, more recently, in the hands of the Pennsylvania Avenue Commission. Specifically, he recommended passage of a bill now before Congress which would establish a Federal City Bicentennial Development Corp. with broad powers to spur private and commercial development along the avenue consistent with the commission's eight-year-old plan. One of these powers would enable the corporation to acquire large parcels within the designated area by



Bicentennial target area in D.C.

eminent domain or with borrowings from the Treasury, for sale to private developers.

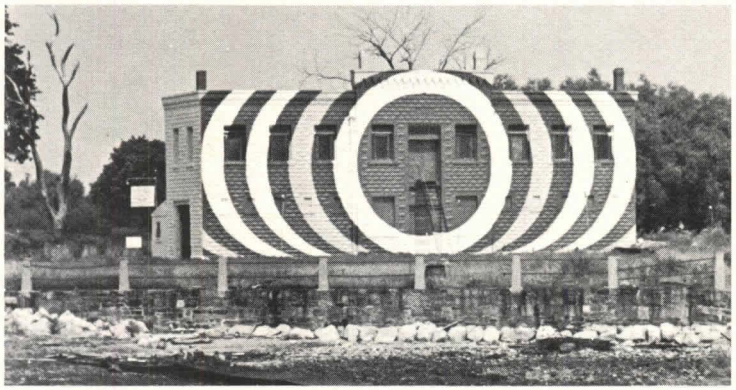
The President also suggested a competition among architecture students for a plan to turn a 12- to 15-block area near the Lincoln Memorial into a useful park.

MASTER-PLANNED ROCK FEST

Phoenix House, New York City's largest residential drug treatment program—has shown that, with expert planning, an outdoor, drug-free rock festival is not only possible, but can be profitable.

Its second-annual, one-day, "Happening" occurred August 30 on Hart Island, where Phoenix House operates one of its 15 separate facilities.

Landscape Architect Yukihisa Isobe's master plan for the 40-



Hart Island Happening: "bubble" rocks (top); building disappears (above)

acre site dealt successfully with such problems as transportation to and from the island—accessible only by ferry, helicopter and hydrofoil—for 8,000 people; sanitation facilities; circulation patterns; electrical equipment; shade from the sun; etc. Circulation was accomplished by programming the rock music at three separate staging areas—one on a barge in the sound, one in an air-inflated "bubble," and one on a bandstand – and by staggering the performance schedule.

In between concerts were such attractions as wall murals by Artist Jason Crum, sculpture displays, an underground light show, an Indian village, and a rodeo.

The air-conditioned "bubble," designed by Isobe with contributed materials and equipment, enclosed 600,000 cu. ft. of space and accommodated about 1,000 rock fans.

Proceeds for the day amounted to $235,000. With most materials and services donated by government and private agencies, most of this will be profits.

ENVIRONMENT

COLLEGE OF ECOLOGY

The nation's first college dedicated to man's new awareness of his environment is expected to enroll 60 students for its first term in June or September, 1972, on its 21-acre campus overlooking the coast at Bar Harbor, Me. The four-year, liberal arts, co-educational school—called The College of the Atlantic—will eventually have 600 students and about 40 faculty members. It will have one major: ecology.

The school has a president—Edward Graham Kaelber, formerly associate dean of the Harvard University faculty of education—and a board of trustees that is both prestigious and active. They are looking for instructors and are trying to raise $100,000 from local "summer people." Later, grants will be sought from the federal government and private foundations.

In the first two years of study, students will have the traditional areas of the humanities and the natural and social sciences focused toward ecology. In the final two years, study will be "problem centered." Kaelber says this means "looking at a situation from a knowledge of information available and tempering that with the realities outside the college environment."

The school will operate on a pass-fail system of grading, and "staff and students will together establish and enforce whatever rules are felt necessary."

The College of the Atlantic's curriculum says Kaelber, will lead to eventual careers in law, medicine, politics, teaching, journalism, advance work in American studies or biological sciences, and architecture.

A LITTLE NEST IN THE WEST

For over 15 years, some 4,000 homes and other buildings in Grand Junction, Colo., a uranium center on the western slope of the Rockies, have been built on radioactive tailings—the leftovers after uranium ore has been refined. The nearby uranium mines were giving the tailings free to contractors for use as land fill.

This was revealed four years ago, and at that time the Atomic Energy Commission said it was not responsible for "custody" of the tailings and the State Health Department claimed ignorance of the practice.

The health department has since begun testings inside and outside the buildings, and in 534 structures has found about 100 which exceed the guidelines for radiation levels set by Surgeon General Jesse L. Steinfeld. The Surgeon General, however, has recommended that no remedial action be taken until the study is completed, perhaps a year from now.

Meanwhile, Arthur Tamplin, a radiation expert with the AEC's Lawrence Radiation Laboratory in Livermore, Calif., has called the agency's handling of the case "stupid."

"At this point," said Tamplin, "I would go in and jack the houses up and get the stuff out of there, or relocate the people."

MADE IN JAPAN

American automobile manufacturers claim they cannot meet the pollution-emission standards established in Senator Muskie's anti-pollution bill, which was reported out of committee last month. This would require cars to produce 90 per cent less pollution by 1975 than they produce today.

Meanwhile, the 1973-model Datsun—which will be coming off the lines in 1972—will be virtually pollution-free. This is the claim of Research Scientist Wallace L. Minto, who has signed a multi-million dollar contract with the Japanese manufacturers of Datsun, which grants Asian rights only for the mass production of Minto's new engine.

If a car with his engine were driven through Los Angeles, says Minto, "the air that came out would be cleaner than the air that went in."

Perfected after three years of work in his Kinetics Corp. plant in Sarasota, Fla., the engine is powered by a liquid chemical now used for cooling refrigerators and air conditioners.

The chemical flows into two boilers controlled by a solid state computer the size of a pack of cigarettes. Here it is converted to gas. The gas drives the engine, then enters a condenser built into the roof of the car, where it returns to liquid form and is reused. Kerosene, or "anything that burns" can be used to fire the boilers, but it will burn at a low temperature, and—mixed with excess air—will leave no harmful exhaust.

The car will travel 25 to 30 miles on a gallon of kerosene, and the original load of 75 pounds of refrigerant gas will last two to three years. Because there are so few moving parts—the only controls are forward and reverse—the car could be virtually maintenance-free as well.

The reaction in Detroit to Minto's announcement was noncommittal. But the reaction from the California Air Resources Board was immediate. It wants to test the engine in Los Angeles.

DISPLAYS

HOUSE IN A MOAT

A four-bedroom, two-bath house was erected in 24 hours for the opening, Sept. 15, of an architecture and urban planning show at New York City's Whitney Museum. The exhibition—in models, drawings, slides and film—previewed 20 projects to be built in New York State by the Urban Development Corp.

The house, a prototype of General Shelter Corp.'s modular housing system, was set on special foundations in the museum's moat, a sunken sculpture court on Madison Ave. and 72nd St. *The two-story house was manu*factured and site-tested at GSC's plant in Waverly, N.Y. (above).

The GSC package comes complete with carpeting, electrical wiring, plumbing fixtures, and laundry and kitchen equipment. The system, designed by Wells/Koetter, architects, conforms to road load maximums of 12 by 60 ft. and can be delivered to cus-

Prefab in museum moat

tomers for an average cost of $10-$12 per sq. ft.

The show closed at the Whitney Oct. 4, but it will be at the Everson Museum of Art at the University of Syracuse from Oct. 10 to Oct. 25; and the Albright-Knox Art Gallery in Buffalo, N.Y., Oct. 30 to Nov. 25.

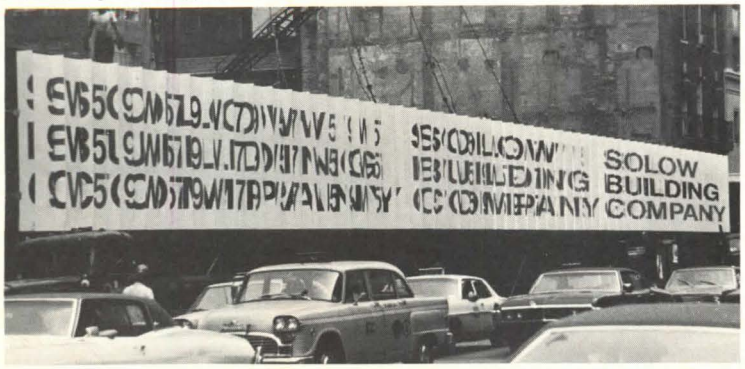
GRAPHICS ANTICS

Signs marking construction sites —at least in New York City—are getting to be more interesting than the buildings that replace them (see May issue, page 29). The latest blockbuster, designed by Ivan Chermayeff of Chermayeff & Geismar Associates, is 280 ft. long and 10 ft. high and does tricks.

The lettering, in red, blue and black on a white background, reads 9 W 57 (the building's address) when one faces the sign directly. This is repeated many times across the face. When approaching from either the east or west on 57th Street, the sign reads SOLOW BUILDING COMPANY (the builder-owner). This is repeated three times. The side-view lettering is painted on a series of vertical metal fins—or blinds—which are extruded from the background. As one walks or drives past, and just prior to the moment of transformation from one message to the other, the graphics form a dazzling abstraction.

The coming attraction, the Solow building, will be a first for New Yorkers as well. Designed by Gordon Bunshaft of SOM, the tower will be tapered in a slight curve so that it will be 64 ft. wider at its base than at the 18th floor, where the curve will end and the walls will rise vertically to a height of 50 stories.

9 W 57: preview graphics in Manhattan



SCHOOLS

HARTFORD AND EVERYWHERE

The Everywhere School, part of the innovative urban renewal proposal for South Arsenal in Hartford, Conn. (April '69 issue, pp. 36-41), is not yet everywhere in that needing neighborhood, but *is* getting somewhere.

Like any new idea, it required some minor miracles to become reality. The Board of Education voted for it 7-1 (with one abstention), and together with the Hartford Urban Coalition gave funds for an immediate demonstration. In April, the Everywhere School opened for 25 children; last month it grew to 150 children, 100 of them in the lively warehouse occupied by the South Arsenal Neighborhood Development Corporation (SAND), and the remaining 50 "traveling" to places like the Westledge School, Wadsworth Atheneum, and Connecticut General Life Insurance Co.

With $8,000, half the warehouse was transformed. The money went for column fireproofing, for carpets to make small "rooms," for home-made bulletin boards to divide the spaces, and for box-and-plank components to make benches, tables and storage units. These are the ideas of Architect Jack Dollard (previously of Huntington, Darbee & Dollard, and now of the new Hartford Design Group), who formulated the idea of the Everywhere School in the first place—out of the expressed hopes of the community—and who is largely responsible for its realization.

A few other miracles will be needed, among them FHA approval of this combination of housing and educational facilities. The federal government has already approved $11.4 million in urban renewal funds, and the money is now being used to buy the land SAND has asked to be named developer, and its chances look good since there is no competition. Clearly this is an idea whose time has come. Even the cautious must be impressed by the determination and hard work—and miracles—that have brought it this far.

GOOFS

SORE POINTS

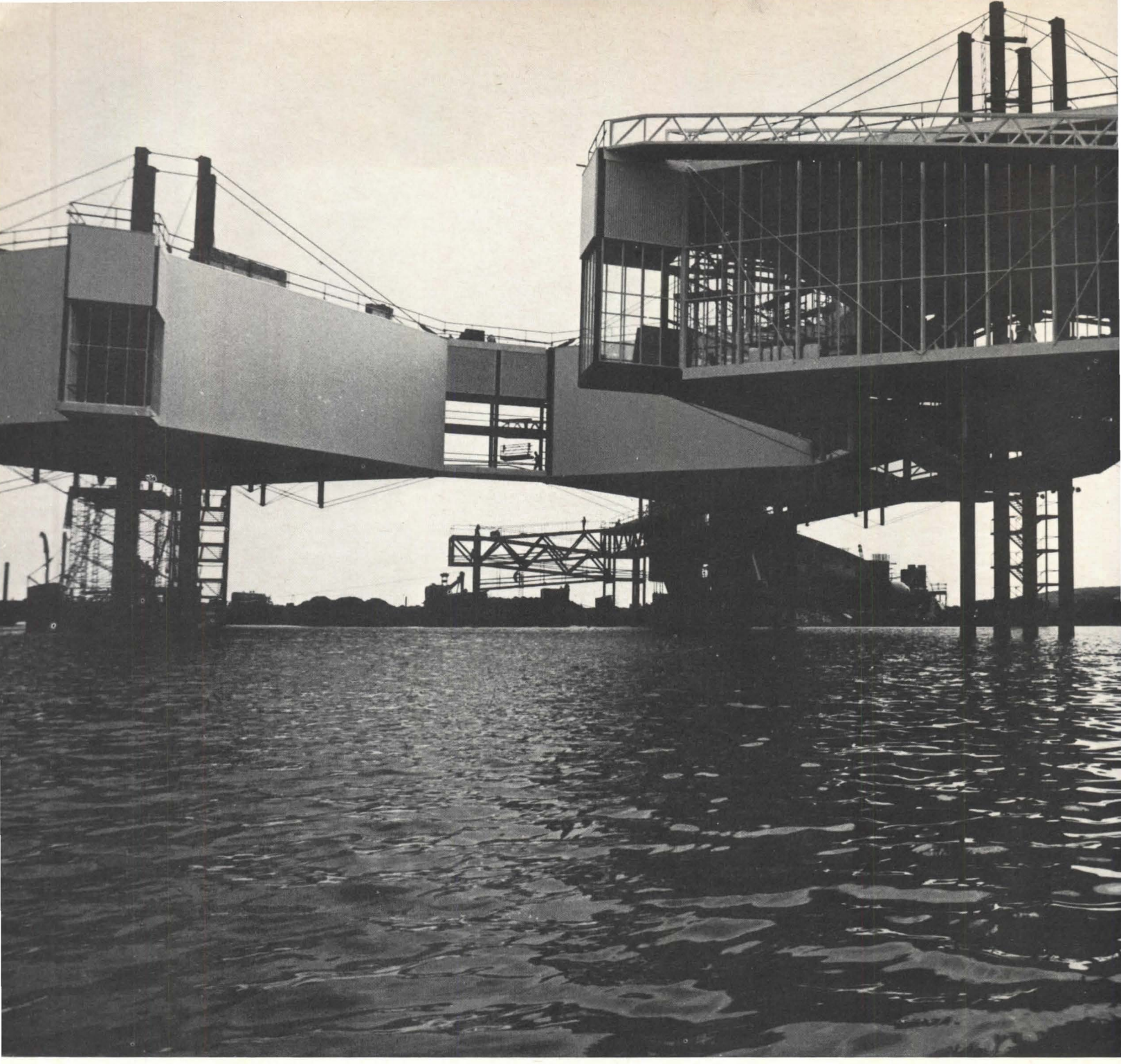
Controversy in Madrid

The twin, slip-formed elevator towers pictured above are in Columbus Square in Madrid. The entire square is being redeveloped and renamed The Place of the Americas. It will include a botanical gardens, an auditorium and amphitheater, and a new subway, among other things.

But the towers are, apparently, more American than anyone had counted on. In relatively lowrise Madrid, they were so controversial that they will be cut down to size by lopping off the top levels.

So controversial, in fact, that the Spanish government and press won't even acknowledge their existence, much less explain

(continued on page 67)

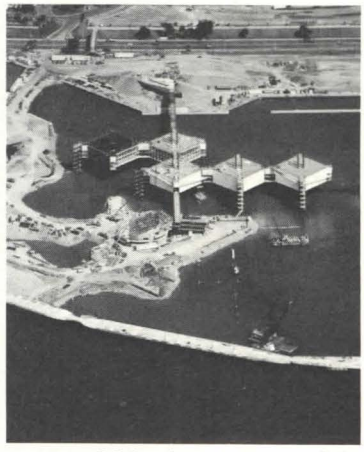


NEW WORLD IN THE WORKS

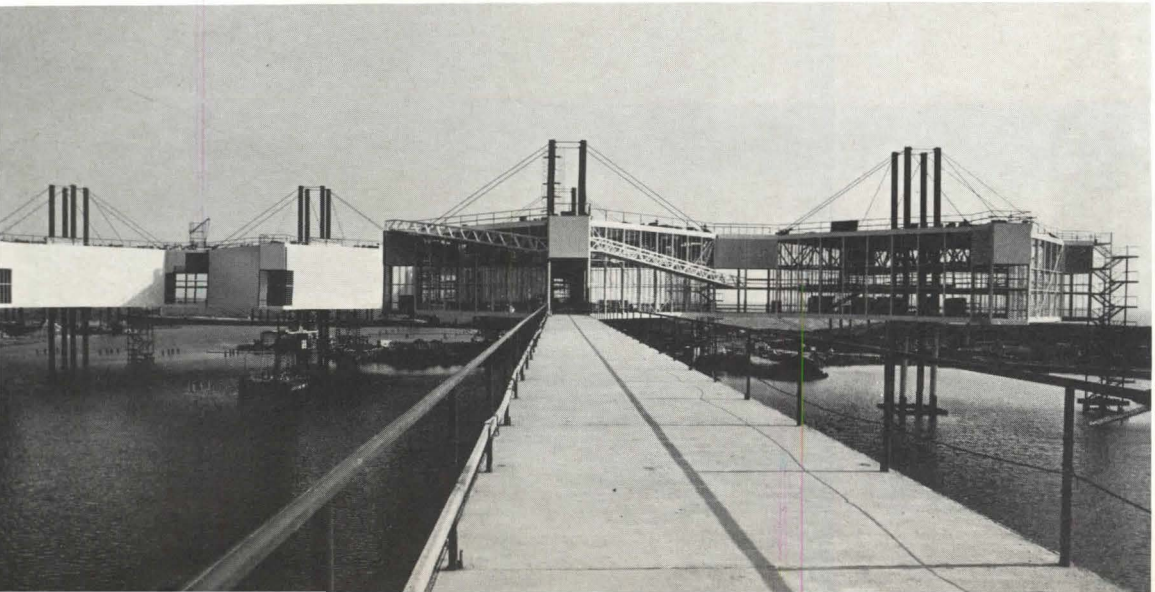
Is architecture beginning to imitate life? Only a few years ago (Sept. 1967 issue) architects like John Johansen were talking about the unaffected directness of such structures as the floating sulphur mining towns out in the Gulf of Mexico. To Johansen and others these structures were much more exciting than the high-style architecture displayed in museums (and most magazines).

Now, it seems, we will not have to look too far outside the area of "legitimate" architecture to find a similar degree of excitement. Here, on these four pages, are progress photos of a remarkable new project nearing completion in Lake Ontario, just off the Toronto waterfront. The project is known as the Ontario Pavilion, and it forms the focal point of a much more ambitious development—Harbor City—that is to be built on landfill being generated far out into the lake, and may eventually house as many as 60,000 people in a setting reminiscent of Venice.

The Ontario Pavilion, the focal point of this development, consists of five great halls—four exhibition spaces and one theater—linked to each other and to the mainland by bridges. The five halls are suspended from central



masts, which, in turn, stand in the lake. Specifically, according to architects Craig, Zeidler & Strong, each mast consists of four caissons set into the lake bottom and elongated by a shaft consisting of four pipe columns. Slender tension wires support four short span trusses that are fastened to the shaft. This basic structural system supports the remaining structural elements by additional tension wires. The structure is then covered with different kinds of cladding to create the sort of environment desired in each case. When completed, the Ontario Pavilion will house

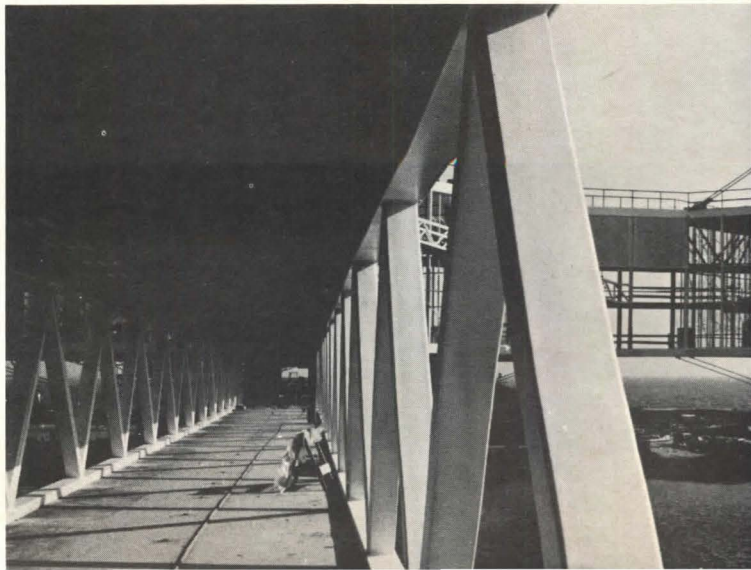


the Canadian National Exhibition (CNE) and other fairs. The CNE is an annual event presently held in outdated facilities elsewhere in Toronto. Ever since Montreal put up its Expo in 1967, Torontonians have been itching to get some equally impressive exhibition facilities—and this project is the result.

The Ontario Pavilion, according to the architects, is a permanent exhibition building—which means that it could not be designed to house only one exhibition. During its lifetime, it may have to house many activities, perhaps even different uses entirely. It was therefore designed for maximum flexibility—flexibility of space use, of movement, and of building components.

The basic requirements for exhibition facilities were a series of spaces which could be linked together, ranging in area from 2,000 to 8,000 sq. ft., requiring different heights, and permitting either natural lighting, or at the other extreme, a totally enclosed environment. Through a flexible wall, floor and ramp system, the architects have found a way to create an almost unlimited variety of spaces.

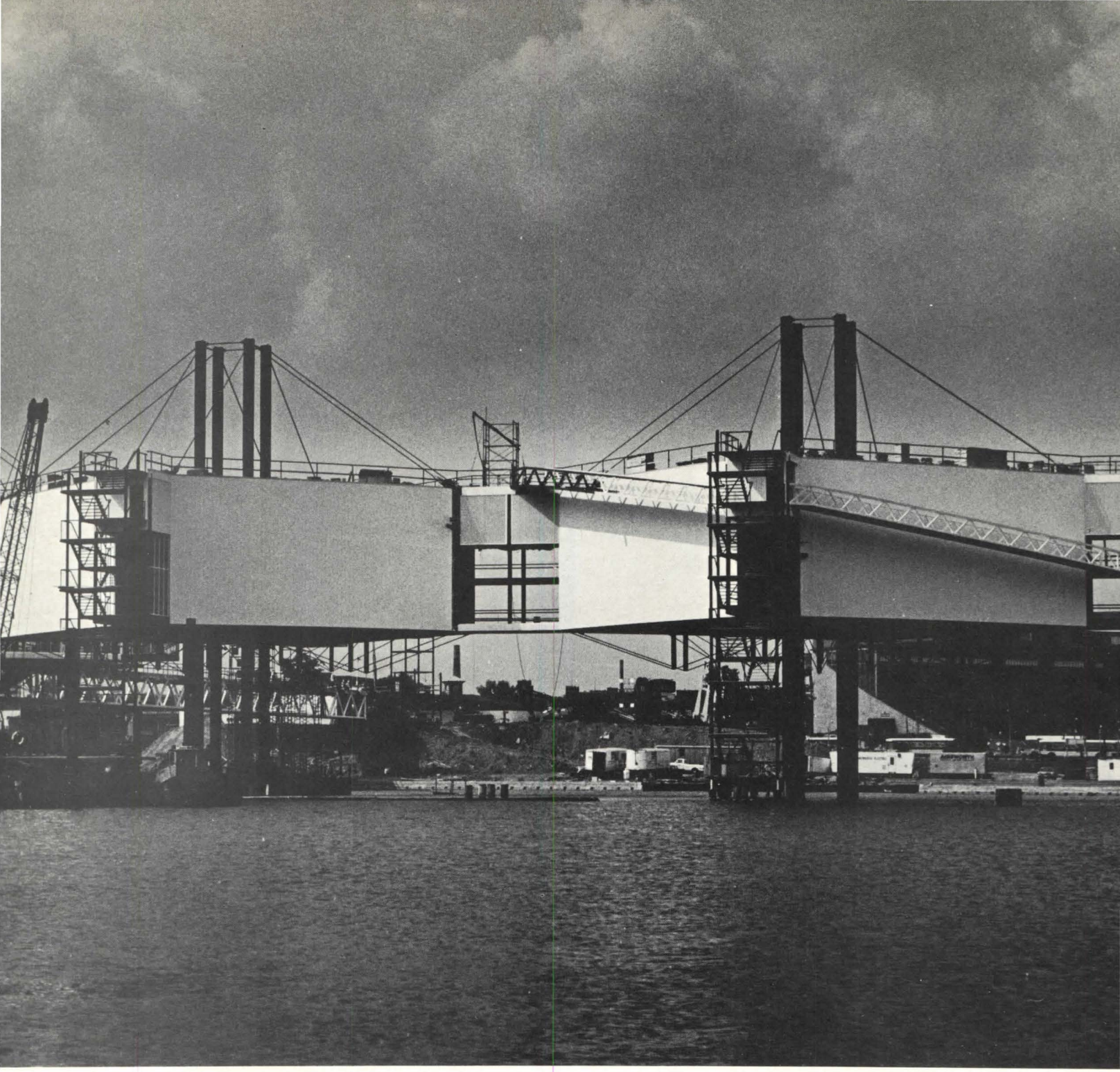
More significant than all the subtleties in structure and plan, however, is the new attitude expressed by this fascinating building. It is an attitude that seems entirely at ease in the second half of the Twentieth Century—the decades of Cape Kennedy and of other vast structures that stride across land and sea. Its structural expression is that of aircraft hangars rather than temples, say (as in 16th Century buildings like Lincoln Center); and its flexibility—including the feasibility of future additions almost *ad infinitum*—recognizes the central fact of our future: its utter unpredictability.

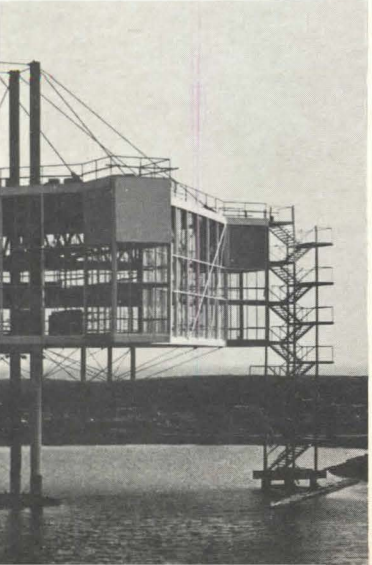


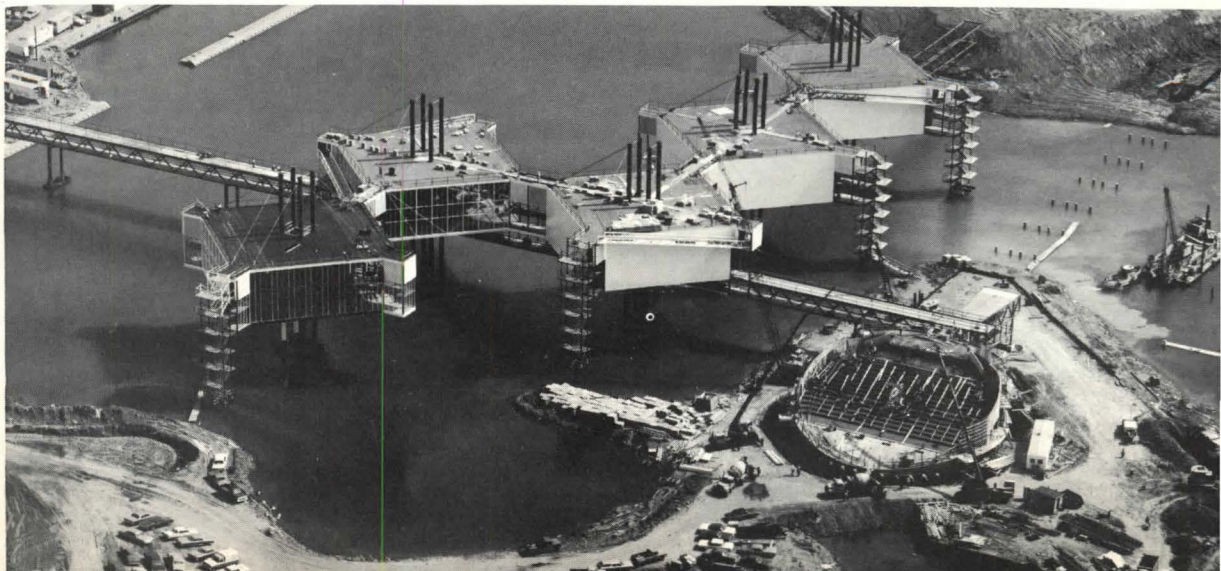
FACTS AND FIGURES

Ontario Pavilion. Owner: Department of Trade and Development, Ontario Government. Architects: Craig, Zeidler and Strong (Ebhard H. Zeidler partner in charge). Associate Architects: Noel Hancock and Allan Young. Engineers: W. Hardy Craig & Associates (mechanical); Gordon Dowdell & Associates (structural); Contractor: Secant Construction (Central) Ltd.

PHOTOGRAPHS: Hiro Nakashima; except aerials, Les Baxter.







Nordwest-zentrum

AD-HOC HEART FOR A CITY?

BY LISELOTTE AND O. M. UNGERS

The Northwest Center is the focus of Northwest City which, in turn, is the New Town located to the northwest of the old city of Frankfurt-on-Main.

Here are the vital statistics: the New Town is about 20 minutes away from downtown Frankfurt, by car on a Sunday afternoon, or an equal travel time by means of the newly installed, shiny red subway—one of Frankfurt's latest and most highly praised public achievements.

To the uninitiated outsider, the drive to the New Town (a new Mecca to architects, urban designers, and city planners) can be a painful experience, and not one recommended to anybody without prior and careful study of various road maps. A connecting freeway—the Northwest Road —will link the New Town to Frankfurt, but it won't be completed for quite some time.

Meanwhile, the commuters among the 50,000 New Towners are trying to get used to a labyrinthine street system, to a succession of ever-changing detours, and to the congested (though picturesque) passages that lead through villages in the hinterland of Frankfurt. Commuters *can* use a public bus, but it takes even longer.

Backroads are not the only way of getting to the "New Town in the Green Meadow." There is also the tangential North-South Highway—and this may be faster, so long as you avoid rush hours, vacation times, and other traffic slowdowns.

So the reason behind the location of the New Town within the northwest corner of the city limits is a matter of interest. If you study the documents and ask the planners for their reasons, all you can find is a rough sketch, dated 1957. The sketch, which was captioned "our plan," outlines an area between three existing villages—Niederursel, Heddernheim, and Praunheim—and contains a circle with the letter Z (for Zentrum) in its middle, to symbolize the ultimate location of the NW Center. Curiously enough, the NW Center, as finally built and shown here, is highly reminiscent in its plan to that first symbolic drawing.

There had, of course, been some attempts to reorganize this area in the '20s, by that effective Frankfurt planning team under the leadership of Ernst May, in which Walter Schwagenscheidt (the creator of the new peripheral town) participated. The so-called "Römerstadt"—planned and built by this same unusual group of architects—was intended to relieve pressure within the inner city. The "Römerstadt" is still attractive, and it consists of parallel, two-story high, linear "housing walls." It connected two of the three existing villages mentioned above, Praunheim and Heddernheim, and merged them into one. Both the "New Town in town" concept, and the idea of integrating existing villages with new structures are also the basic motivations of the new plan.

Goals

Two different functions have been integrated in the NW Center:

- First, that of a cultural and social center—a "downtown"—for the surrounding older and newly built parts of the New Town, with its population of about 50,000 inhabitants. The program for the international competition* held for the NW Center asked for a physical manifestation of the spirit of a community which should be more than a well proportioned service facility.
- And, second, that of a commercial center for the 50,000 inhabitants, providing also shopping facilities for the neighboring suburbs and villages, estimated at a total of 100,000 potential customers. Besides, the NW Center should attract people from the inner city of Frankfurt which is crowded and congested with traffic. Subways and buses leading from the city of Frankfurt directly into the NW Center are meant to encourage people to switch from the old city to the new center.

Program

A detailed program was evolved to meet these wide ranging goals. The following facilities were called for:

1. Public Facilities A community center, containing a big hall for 900 and a small hall for 300 visitors, clubrooms, workshops and a restaurant. Here are presented all kinds of plays, musicals, and other entertainments. Also, facilities for lectures, exhibitions, political meetings, etc. Thus the Center attracts people not only from the New Town, but from the hinterland and the city as well.

There is also a public library with about 30,000 books, a large indoor swimming pool, a post office, and a police and fire station.

2. Social Services A social center —a community-operated service, where people can get advice on educational, health or financial problems. Also a nursery and a kindergarten; a youth house with exercising rooms, workshops, and laboratories; and a club for the elderly.

3. Educational Facilities A trade school, and a school of social work, both with dormitories.

4. Offices 12 doctors' offices (different specialties); and three banks.

*Initiated in 1961, won by APB: Apel & Beckert, Architects; Becker, Engineer; D. Praeckel, Associate.

The authors, a husband-and-wife team, visited the Nordwest Zentrum this past summer to report on it for The Architectural Forum. Prof. Ungers has practiced architecture for years in West Germany and West Berlin, and serves as the chairman of the department of architecture at Cornell. Mrs. Ungers is an economist.

5. *Commercial* Four department stores, and supermarket, 55 specialty shops, and 14 restaurants and cafes.
6. *Residential* 178 apartments, ranging in size from one to four rooms.
7. *Transportation* 2,350 parking places under the Center; also, a subway and a bus station.

Organization & Financing

The American Council of Shopping Centers has praised the NW Center as the realization of a dream—particularly in its successful integration of shopping, cultural and communal facilities.

From the early planning stages on, the Frankfurt city government recognized that a special kind of organization and of financing was required for the 130-million DM project. The answer: an enterprise without any privately owned properties. The sole proprietor is a holding company especially founded for this purpose by Europe's largest and financially best equipped public housing association, Die Neue Heimat.

All facilities are rented out to tenants, and even the City of Frankfurt (which operates some of the public institutions) is not excluded from this arrangement. The only exceptions are the two schools that are run and owned by the State of Hessen; for these, air-rights were established above the parking garage, and they have bought those air-rights.

The city originally sold the land to the holding company for a minimum price. The company then built the entire Center at its own expense and now rents it out on long leases. The city pays a so-called "cost-rent" for the use of its facilities which will shrink to a minimum once the capital and interest payments have been covered. The shopkeepers and office tenants pay a differentiated basic rent, graduated according to their capabilities. Beyond that, the holding company demands an additional rent according to the turnover of the individual entrepreneur.

Under this arrangement the city budget must cover the rent for public facilities like the community center, the social service center, the fire and police stations, the swimming pool, the library, the parking garage. Total: approximately 12-million DM a year over a period of 50 years.

Some conservative critics have called this "the worst business deal of the century"; while others have criticized the fact that shopkeepers could not obtain ownership of their stores or become shareholders in the holding company. But the city government, the planners and all official participants in the venture are very proud to have realized so progressive a concept—one that was essential to the achievement of a well balanced mixture of usages in the NW Center.

Communications & Plan

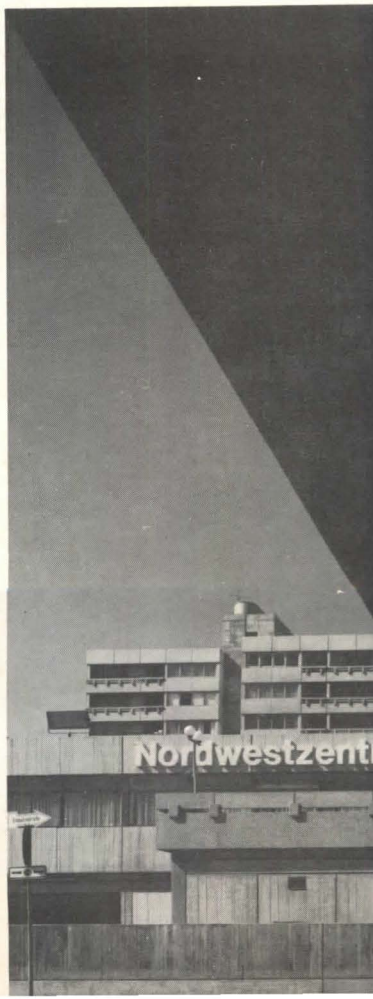
The organization of the plan follows the principle of strict vertical separation of different circulation systems so as to allow free pedestrian movement. Strangely enough, the organizing module is based on the size of an automobile. Consequently the motorized shopper reaches this commercial megastructure from the surrounding ringroad through three gates, coming into the parking level, which is filled only when there are special attractions upstairs—cowboy shows and the like.

On a typical weekday the few hundred cars parked here look rather lost in this forest of columns. (The columns, by the way, have been nicely color-coded to match the color of the ticket one picks up at the entrance barrier).

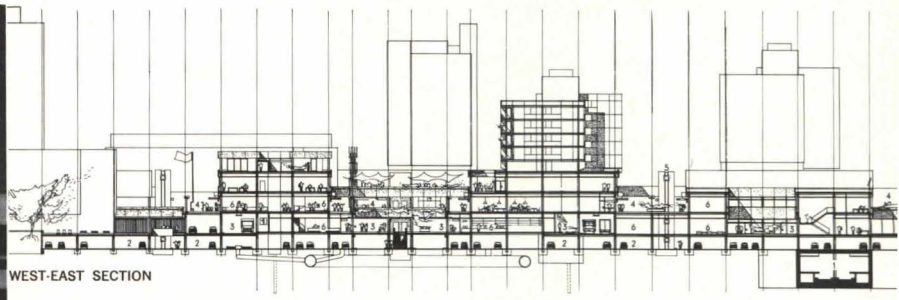
Below this parking garage is a subway terminal, connecting the NW Center with Frankfurt's most attractive inner-city shopping area, the Hauptwache. Nobody could have known in advance that the effect of this subway line would be to syphon off people from the NW Center to the busier inner-city shopping area—rather than feed them into the newly constructed market place, as intended.

Above the parking garage is the service level with its main delivery road and the public bus station. All shops, department stores and offices are connected to this service level, and deliveries are made to the stores from an inner, one-way system of smaller roads.

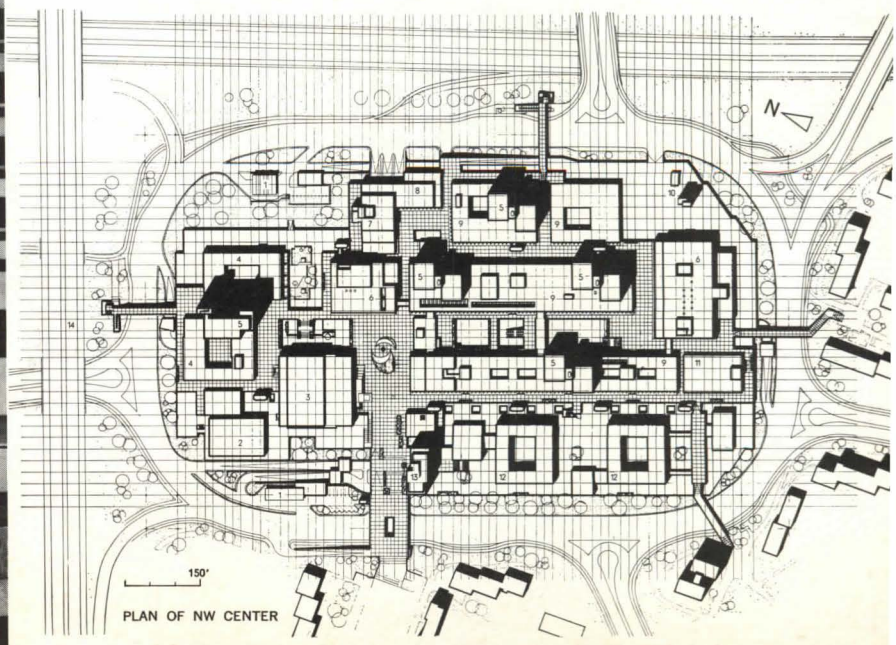
Part of this level is open to the sky, and the pedestrian can here enter his own domain. The effect is a surprisingly spacious adventure of criss-crossing bridges, overlapping terraces, ramps and stairways (no escalators) and intersecting volumes and platforms. The visitor enters the first level of the main promenade and finds it well planned, carefully designed, and nicely colored.



Top right: view of the NW Center from the east, with stairs and ramps leading up to the pedestrian access bridge visible in the foreground. The bridge (seen also in the photo at near right) spans across the peripheral highway that circles the Center. Far right: plan of the NW Center, and section taken, roughly, from west to east. The section shows the subway that links the Center with downtown Frankfurt; the huge parking garage above the subway level; and the services (incl. truck routes) on the next higher level.



WEST-EAST SECTION



PLAN OF NW CENTER

The next level up is for pedestrians only, connected with small bridges to the surrounding residential areas. A wider platform links the so-called Nida Forum—the main plaza of the pedestrian area, to the west side. Main orientation and backbone of the entire plan is the central promenade, supplemented by two subordinated dead-end streets. The basic circulation system on the upper platform seems to be based on the principle of three parallel streets with some more or less accidental cross-connections. The distribution of the buildings looks rather unsystematic, somehow reminding one of a game played with building blocks. The lack of spatial orientation is compensated by a carefully designed system of graphics, well placed and easily comprehended. To anyone used to the neon jungle of inner-city commercial streets, this new environment looks unusually tempered, clean, and well-controlled. But those who want to sell must signal where they are and what they have to sell. Greater freedom for additional advertising would benefit the shopkeepers and help create a livelier urban atmosphere.

A remarkably positive aspect of the Center is the relatively high proportion of dwelling units located in four separate towers along the central business street, overlooking the busy activity beneath. To the great regret of the architects the number of apartments originally planned was cut in half by the holding company.

Walking around on the perforated platform on an unfriendly day—as we did—is quite an experience, especially after coming out of the well-protected mini-environment of a car. One jumps from one corner to the next—and there are many of them—looking in vain for protection under the arcades. Some people say that shopping centers of this kind should be covered and fully air conditioned. Since our visit ended with wet feet we tend to agree.

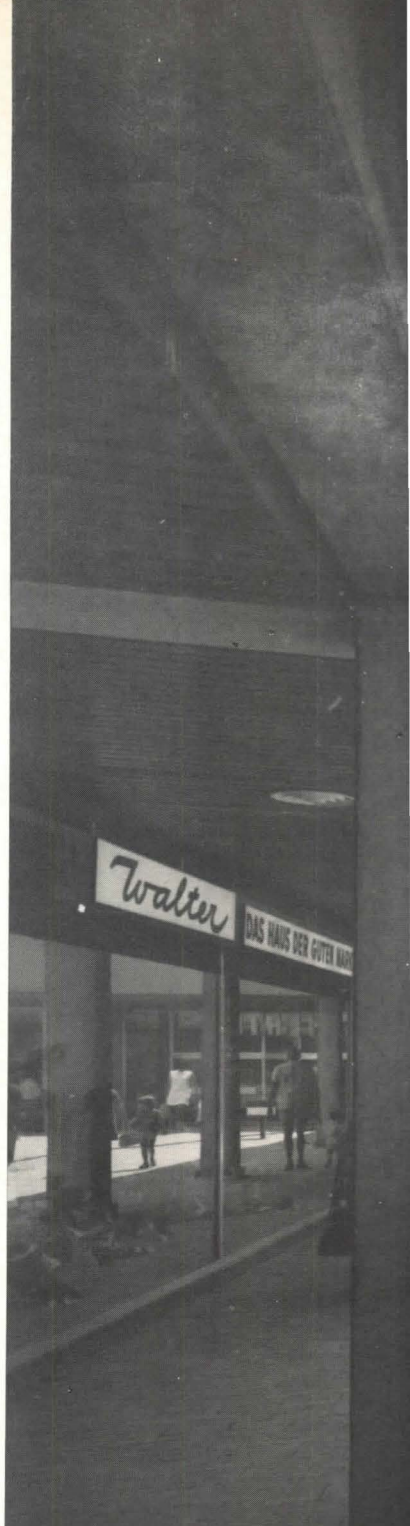
One fact is clear: the NW Center will soon reach a second stage of completion. The first one was defined by the planners; the next one—at least within the given limits—will be determined by the users.

Conclusion

The financial organization of the NW Center is novel insofar as it unites public and private interests in the hands of a single non-profit company. The resulting advantages were the chance to plan uniformly, the simultaneous construction of all buildings (which lowered building costs considerably), and the exclusion of private speculation.

The program—with its combination of public, social and commercial functions—proves to be quite successful and efficient. People are attracted for different reasons and at different times so that even on weekends and evenings—when normal shopping areas are quiet and empty—some activities take place. At the 1969 UIA Congress at Buenos Aires, the NW Center was chosen as one of the 13 most progressive works presented and discussed.

The location of the Center on a fixed, oval-shaped island, which gives it the character of a fortress, isolates it completely from the surrounding neighborhoods and streets. The only accesses for pedestrians are a few bridges which somehow remind one of drawbridges, and which are not



Small photos at top left show the bus stop, the entrance to the parking garage, and the subway station, respectively. Top right: view of sunken shopping plaza, looking south toward one of the two department stores. Bottom right: one of the five pedestrian access bridges to the Center, looking west; detail of commercial concourse with sidewalk cafe (this is on the main pedestrian level, looking north); and bird's-eye view of fountain in the main plaza, next to the community center. PHOTOGRAPHS: Ulfert Beckert, except aerials, Lutz Kleinhans.


HERTIE
KINDERSCHUH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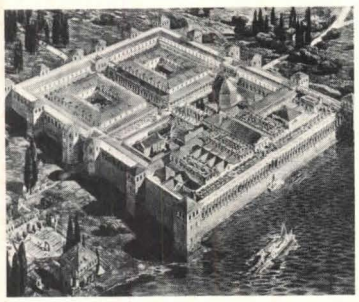
very inviting to cross, especially on cold or rainy days. The Center does not grow naturally out of the town nor can the town ever grow into the Center. So it will always retain the image of an artificial "city heart" added as an afterthought. A comparison with Emperor Diocletian's Palace—in the center of Split—may be a bit unfair, because that palace grew over hundreds of years. But both have one thing in common, and this is their fixed exterior form:



the center of Split developed out of the Palace which Diocletian built in 300 A.D. as his residence. Over the centuries it was filled with shops, bars, cafes, habitations, etc. so that, today, it is bursting with life and activity. The crucial difference from the NW Center is that the Palace of Split is at the same elevation as the other parts of the city, so that people can easily flow in and out of it through gates and lanes. Admittedly, the reasons for the elevation of the NW Center, i.e., separation of cars from pedestrians, play an important role in our time; but the solution here was achieved at the cost of vividness and of free future development.

The architecture of the whole complex is fine, and its workmanship is of high quality. It must have been difficult to accomplish the interpenetration of the four different levels so they would form a well-functioning organism. The monotony of the material—all of it precast concrete—is compensated and softened by flower beds, bushes and trees, colored sunshades and a fountain—of course! To a certain degree the architecture seems to *be too important*, too emphasized, so that the shops and their display are pushed back and unable to attract the attention of the buyer.

A disadvantage of the rigid concrete construction is a lack of flexibility and adaptability. There are few if any possibilities for variations to meet changing needs: the whole complex is a well-tailored suit which can neither grow nor shrink. Since all experience in city planning shows that it is almost impossible to foresee the changing requirements of a city, the question arises: should not the architect really provide a simple "primary structure" which leaves room for the initiative of the users, for change and chance, instead of building a thoroughly detailed form which sooner or later turns out to be a Procrustes' bed—whether too long or too short?

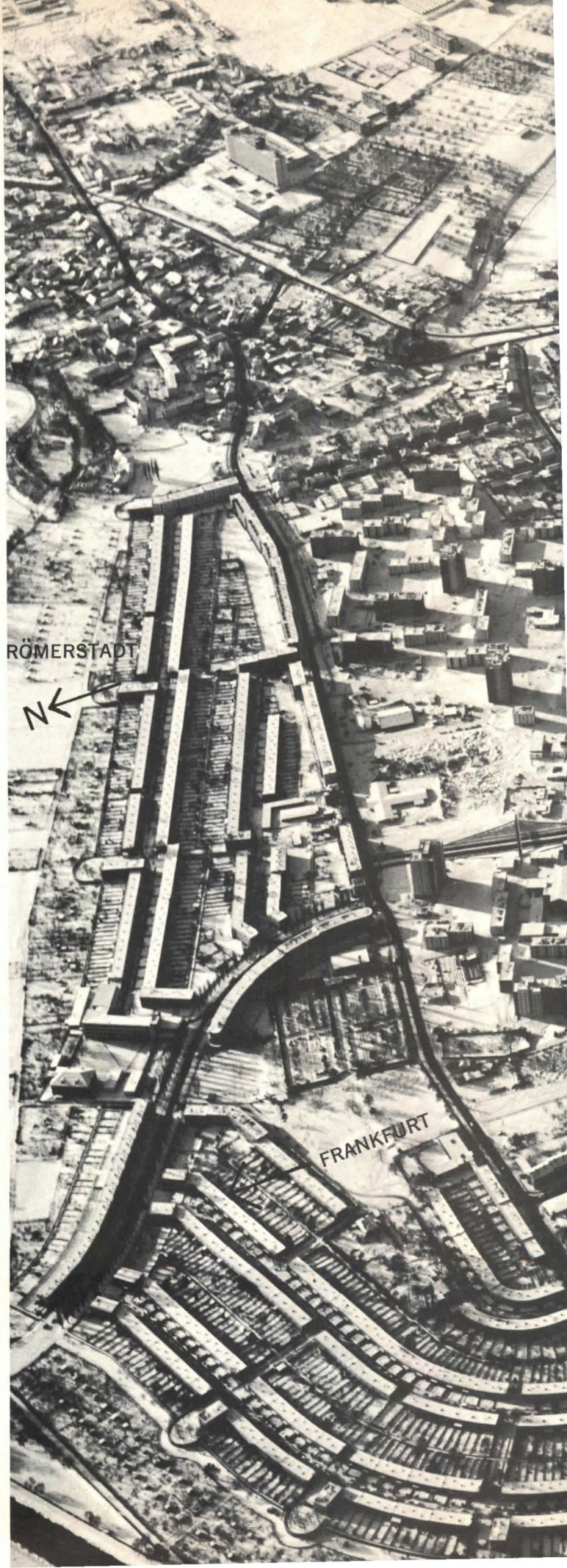
How well does the NW Center function? It is certainly too early to form a reasonable judgment after less than two years of operation. But judging by published comments, the Center functions quite well. The public and social facilities are especially well liked and well frequented.

The commercial areas do not work quite so successfully. The owners of the stores are not dissatisfied with their sales but they complain that not as many people come from the city or the hinterland as they expected. Our own impression was that there were relatively few buyers, and the streets and shops seemed to be pretty quiet. Since it was a rainy day, we went to see two other shopping areas nearby: the inner city of Frankfurt and the Main-Taunus Center, which was built 10 years ago on the outskirts of Frankfurt. We found both much more lively, full of people and activity.

The reasons for that obvious difference may be various: One of the most important—which was mentioned to us several times—could be the difficulty of automobile access to the NW Center. Once the NW road is completed, the situation certainly will improve.

Perhaps people dislike the huge parking garage underneath the Center which is complicated and somewhat confusing. The many cars which are parked outside the Center while the garage is nearly empty may indicate this. Also the greater variety of goods and choice attracts people to the above-mentioned shopping areas.

In brief: many recent urbanistic experiments show—and in this regard the NW Center is no exception—that it is a very difficult task to create, *ad hoc*, a "city heart" and to plan imponderability and chance, vividness and atmosphere. At best, the result is a substitute, the illusion of a city, but not the real thing—dense, colorful urban life.

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PROJECTED
NW CENTER
EXPRESSWAY

THE SEMANTICS OF ARCHITECTURE MACHINES

BY NICHOLAS NEGROPONTE AND LEON B. GROISSER

A paradox exists in all man-machine interactions and is epitomized in the interactions between architect and computer. The paradox is as follows: Architects are concerned with issues generally considered to be unmanageable by computers. These issues draw upon human experiences, senses, attitudes, even idiosyncrasies, none of which are enjoyed by machines at this point in time. So the standard procedure is to partition the design task: the man is given what he is good at doing (which is usually what he enjoys), and the machine is given only those tasks it can handle efficiently. This disjunction is cumbersome but can be alleviated by the nature of the so-called interface between the two protagonists. Consequently, researchers are continually trying to make this interface as smooth and as "transparent" as possible. They are trying to make it approach the interface with which we are familiar in human discourse. In the ultimate we are talking about machines that recognize expressions on our faces, tones of our voices, intentions in our doodles, and innuendoes in our gestures. The paradox is that such machines will be so intelligent they might not want or need to interact with us.

Nevertheless, we must pursue the interface problem, because of two salient features of the design process in architecture: (1) architecture evolves out of partial information; (2) architecture is (or at least should be) dependent on context. In contrast, note that the design of a bottle opener or an airplane is based on almost complete and reliable information and is independent of the context. The design of a plane does not change if the craft is to fly northbound or southbound or is to carry Italians rather than Englishmen. A bottle opener works as well on domestic beer as on foreign brews.

Architecture is different. Not only must physical structures respond to local contextual characteristics (site, climate, culture, even the whims of the user), but the process by which buildings are designed depends on these characteristics. This is what hurts computer-aided design. The rules are not absolutes; one set of rules might work in one situation whereas their opposites are appropriate in another context. People can deal with this, but machines cannot (yet)—hence the partitioning of the design task between man and computer.

We are trying to make machines better at context recognition, better at handling missing information, better at being adaptable. Not to do so is to foster solutions that are generated from incomplete, if not irrelevant, information and are surely out of context. As a result, great investments might be diverted toward automating only those procedures that are most easily understood. Such design aids might find the users unwilling, unable, or too unsuspecting to divest themselves of inappropriate work methods (because machines do them!).

Working on interfaces

Thus we work on interfaces, not only the interface between computer and architect, but also the interfaces between the machine and the nonprofessional, the real visual world, pictures, books, and so on. We give machines many sensors and effectors, those which people have and then more. We do this because (1) we want our machine partners to have the potential of perceiving those aspects of the physical environment that would become biased or incomplete when transmitted through other modes (such as a verbal description); (2) we want machines to be able to solicit information directly from the real world on the initiative of internal computations, rather than depend upon the intervention of a human designer and his conscious or subconscious interpretations of that information; (3) we want computers to be able to witness and handle concepts and relationships (and even experiences) which are concerned with those environmental qualities that human designers understand and handle through metaphors and symbols (which, in turn, are established from meanings gained through many sensing-effecting channels).

Given this interface, this whole host of sensors and effectors, we can consider the *semantics* of architecture—the meanings of forms, the intentions of users, the recognition of context, the behaviors of machines and men—as opposed to the *syntax* of architecture—the construction materials, the (Alexander) patterns, the structure, the flow of circulation. Syntax is measured in kips, feet, decibels, acres, coulombs. Semantics are measured with calipers of participation, contentment, responsiveness, adaptability, diversity, resilience, and so on.

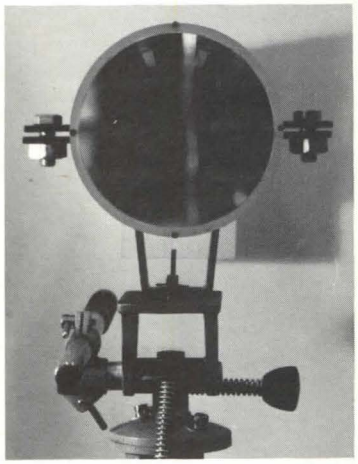
Consider the example of "corner." It is a simple matter for a machine to assimilate the geometric description of two intersecting lines, whether described symbolically through algebra or graphically through geometry. The simplest computer can understand this definition of corner. But the most complex machine cannot go on from this context-independent, sensor-effector-independent definition to understand, for example, "let's corner the troops," or "go to the corner store."

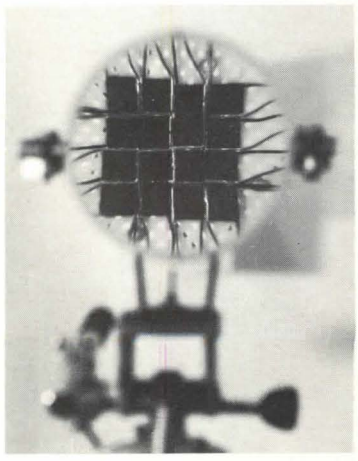
However, a child can. The child has learned the semantics of corner. He has done so through touching "cornerness," bumping into it, observing his own response to it. This can happen through such channels as his eyes, his fingertips, or his mouth. He has not only sensed but also affected and observed his own behavior toward "corners."

The unanswered question is this: if we give our computers behavioral abilities similar to people's, will they by definition evolve into intelligent designers? The double negative, at least, seems to be true: If machines do *not* have this sort of real-world interface, they *cannot* evolve into an artificial intelligence. Our experiments are based on the hope that if machines are given the faculty for sophisticated interaction with the real world (people, places, pictures, and so forth), they can learn to develop their own design methods and methodology, perhaps better than our own.

The following experiments are part of the Architecture Machine Project at the MIT School of Architecture and Planning, sponsored by the newly created Urban Systems Laboratory. The experiments are concerned primarily with interfaces, the first group between computer and physical world, the second between computer and man. The interdisciplinary team working on the Project is composed of graduate and undergraduate students in

Mr. Negroponte is an assistant professor of architecture at MIT, and the author of *The Architecture Machine* (MIT Press, 1970). Mr. Groisser is an associate professor in the Department of Architecture at MIT. They are co-directors of the Architecture Machine Project, funded largely by the Ford Foundation.





Top: The Architecture Machine is a mini-computer with 16,384 bytes (eight bit chunks) of memory. So far it is linked to 16 peripheral devices and maintains communication with a "parent" time-sharing facility at MIT. Its entire cost is under $20,000. Middle and bottom: STARE is composed of two interlocking tubes, with a 6-in.-diameter lens at one end and 16 photocells at the other.

architecture, planning, electrical engineering, physics, and mathematics. The projects use a satellite computing facility driven by an Interdata Model 3 computer with a 16K memory connected to a remote IBM 360/67 time-sharing service.

Machine vision

A machine with eyes has loops into the real world that could be initiated without the proverbial human "operator." The machine could surely solicit some of the information we draw upon: it could read books, look at pictures, take trips through the city. Give a machine vision, and you have opened up an entire category of sensory inputs, one that human architects rely upon, and one that often embodies information that *cannot* be transformed into text, or into smells, or into any other medium.

We have treated machine vision in two separate ways: high-resolution and, more recently, low-resolution vision. "High" includes over a million resolvable points on the machine's retina and "low" between sixteen and twenty-four. Our high-resolution vision studies employ a device called a vidissector, which is, in effect, a random-access television camera. It is not particularly sensitive to low light levels but is extremely effective for nonsequential scanning where subsequent observations can be a function of previously resolved points. Thus it is suitable for following lines, locating silhouettes, and scanning regions with complex boundaries.

The vidissector returns points with their coordinates and light level. The points are then grouped into regions of similar tone, where each region might be as small as the width of a line or as large as an entire surface. Consequently, there are two approaches to the "physiology" of machine vision: (1) to search for lines that can be either actual black or grey lines, or whitish lines formed by the highlights that appear at edge conditions; (2) to search for the limiting contours of regions. The latter appears most appropriate for the resolution of physical models.

The outcome of such scanning for regions is a contour map formed of dots that can be pieced together to compose line segments. But what is missing in the vidissector's scan are the lines that separate overlapping planes of similar orientation by different depth. Such planes appear as single continuous surfaces while in fact they merely overlap because of the point of observation of the vidissector.

The computer programs employ heuristics ("rules of thumb") to complete the image. Similar techniques of "probably this" and "probably that" are also employed in the transformation from the two-dimensional image into its three-dimensional description. What the machine does is to make guesses: "This is what I saw, and/but this is what it probably must be." The importance of this approach is the ability to make errors and to recover. Decisions are made on the available evidence, but future and stronger evidence may contradict a previous "probably." A heuristic program must not only recuperate from the "bug," but its subsequent decisions must be improved by the "experience" of the error.

In addition to giving our machine the visual channels into the real world, two added benefits accrue from studies in machine vision. First, the heuristics of recognition appear to be very close to the heuristics of classification. In other words the way we see things may map directly into how we employ these images. The recognition of commonalities in patterns, intentions in forms, and perhaps meaning in architecture may be related to the heuristics, even semantics, of recognition. Second, not only does heuristic programming have an obvious use in machine vision, it has a still more significant and unexplored potential in computer-aided design. After all, the handling of initial design concepts is a matter of "probably this, probably that."

In experiments on low-resolution vision, the inputs are restricted to a maximum of twenty-four photocells or photovoltiac cells. As a result, discrimination can only be achieved by making the interface more active than in the high-resolution case. The eye must become an actuator: moving in order to affect the patterns on its own retina and observing the resulting changes and its behavior in response to these changes.

As an analogy, consider the problem of buying the one toy that is the most fun for a five-year-old child. One method would be to list all the variables involved, their interrelationships (to the best of our knowledge), and the so-called utility function (or parameters of maximization). A computer program might be able to consider all the combinations for this relatively simple problem, but even here, because of missing information and misinterpreted and misused (context-dependent) information, it probably would come up with a mediocre answer. A second method, one we believe to be more appropriate, is to send a five-year-old child into the store and simply ask him to play with the toys. By observing his behavior, it will be obvious which of the toys is the most fun.

It is in this vein that we handle low-resolution vision. We give the device a *role* as opposed to a *goal*; looking as opposed to recognizing. Then we, or another machine, as an onlooker, follow the behavior of the device and extract information from its behavior rather than from the scene itself.

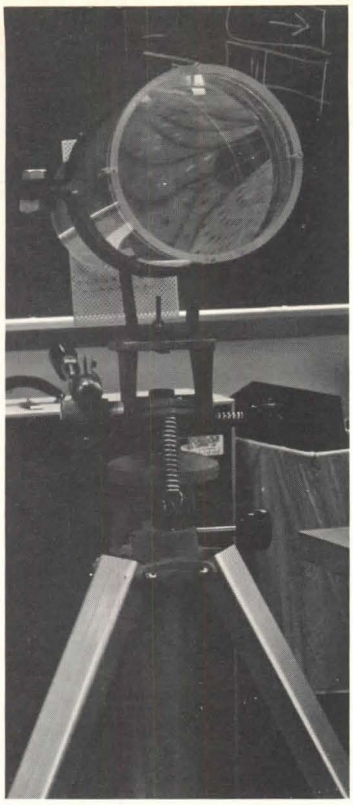
STARE and GROPE are two examples of such devices; each has a retina composed of an array of light-sensors which can be individually sampled by the machine. The retina can, for example, be actuated to move or rotate for the purpose of reexamining the status of its photocells. This technique can deal with moving objects, with major delimiting lines in a scene, and with large bodies of constant tone.

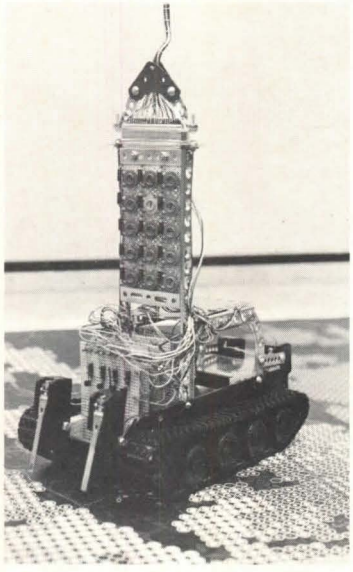
Fingers into the real world

The sensors and effectors of touch are too often associated with bodily titillation rather than with serious learning. However, the hands of a child (and before that his lips) carry most of the information about the real world, not only through their sensing but also their reacting. Was not the concept of "corner" learned through the hands?

SEEK and ARM are the Architecture Machine's fingers into the real world. They are both controlled by a general-purpose analogue-digital interface, which connects the Interdata processor with most of the sensors and effectors.

SEEK senses its physical environment through a meager array of seven pressure-sensing inputs. It can affect that environment by transporting physical elements. But its most important role consists of sensing, affecting, and managing *unexpected* events in that environment under the control of its processor. SEEK deals with toy blocks, which it can stack, align, and sort. At the same time these blocks form the built envi-





Top: STARE has a retina composed of an array of light-sensors that can be individually sampled by the machine. Bottom: GROPE is similar (it is an $18 toy tank with 16 photocells mounted on it). GROPE samples its visual environment only digitally — yes/no — "I see light" or "I don't see light." Two later GROPES have been built to investigate tactile qualities. One gropes by bumping into obstacles; the other samples surfaces for texture discrimination.

ronment for a small colony of gerbils that live within SEEK's three-dimensional world; hence the unexpected events.

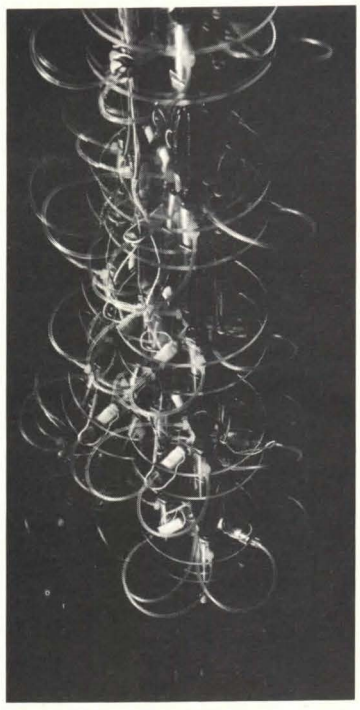
Unknown to SEEK, the little animals are bumping into blocks, disrupting constructions, and toppling towers. The result is a substantial and continually changing mismatch between the three-dimensional reality and the computed remembrances residing in the core memory. SEEK's role is to deal with these inconsistencies. In the process SEEK does exhibit inklings of responsive behavior, inasmuch as the actions of the gerbils are not predictable and the reactions of SEEK are modeled on a probabilistic basis programmed specifically to correct or amplify (not both) gerbil-provoked dislocations.

Even in its triviality and simplicity, SEEK (if only metaphorically) goes beyond the current situation where machines cannot respond to the unpredictable nature of people (or gerbils). Today, machines are poor at handling sudden shifts in context or changes in environment. This lack of adaptability cannot be attributed solely to the mechanics and kinesthetics of effectors. Local processing, distributed processing, sensor-effector loops, and a host of the purely "interface" problems of information processing remain unexplored. The distinction between an input-output device and a sensor-effector remains unclear and unresearched.

ARM is a recently initiated experiment that studies this distinction. ARM consists of sixteen pneumatic muscles individually actuated by computer-controlled solenoids which regulate air pressure. Local strain gauges will provide very local loops within ARM, in effect a form of local processing. The Interdata computer in turn furnishes the loop between ARM, and, for example, the vision system. The remote 360/67 allows even more widespread intercommunications.

Each man his own architect

Inhabitants of primitive cultures and affluent members of industrialized societies have something in common—both have the means to affect their physical environment, even to design it. The aborigine builds it himself, albeit with a limited pallet of materials and techniques. The wealthy man employs an architect whose job is first to understand his client's



Top: SEEK has been funded by and shipped to the Jewish Museum in New York City (along with an Interdata) for its current exhibit, "Software." Subsequently SEEK (with the gerbils) will go to the Smithsonian Institution and then return to MIT to be cannibalized (without the gerbils) for other problems of three-dimensional interfacing. Bottom: ARM is another of the Architecture Machine's fingers into the real world. ARM's 16 pneumatic muscles can be activated with 15 lbs. per sq. in. of air pressure to lift a total of 60 lbs.

character, needs, and desires, then to embody these requirements in a built environment, and finally to use his trained ability to preexperience that environment.

Let us consider the possibility of providing similar participation in the shaping of one's "local" environment to other groups in industrialized societies. We seek the participation of low- and middle-income groups in the design of their high-density urban environment, particularly housing. In the ultimate case we are talking about each man being his own architect. Or from another standpoint we are suggesting that each man have his own architect; this architect would be a machine. This prospect assumes both the existence of physically adaptive, resilient systems of industrialized housing and home computer terminals as ubiquitous as present-day televisions and telephones. We believe that neither assumption is fanciful —perhaps, in ten years. Though we do recognize that such an interface may be an unseemly direction for the design of airports, hospitals, and similar civic services, it does present the amenities of personalization which are often lost in the processes of industrialization.

In order to let each man be the designer of his own habitat, two interfaces are necessary: the soft interface of human discourse, at least that of natural language, and the hard interface of low-cost, "consumer" terminal hardware.

The natural-language interface implies machines that can, for example, understand English. Researchers have spent many hours in programming machine recognition of the English language. Their experiences are perhaps analogous to present computer-aided architecture efforts. Natural-language recognition has been treated until recently as a syntactic problem. Computer programs look for nouns/verbs/adjectives (structural elements, circulatory elements, partitioning elements); they break down sentences (decompose the criteria), and they look up dictionary definitions (apply associated patterns).

It has not worked. Metaphors are garbled, the use of nouns as adjectives and verbs is a "bug," and the decompositions are contextless (hence irrelevant). The semantics have indeed been forgotten, and no one is sure how to look at semantics (we can only start with interfaces).

But we can look at English-language communication between the nonprofessional and the machine-architect as means of promoting dialogue. (Admittedly, this partially overlooks the deep-rooted meanings and connotations.) It takes a great deal less to respond correctly enough to an English input in order to encourage the speaker to say more, than it does to understand the sentence and furnish the "correct" answer or reply. We can do the former.

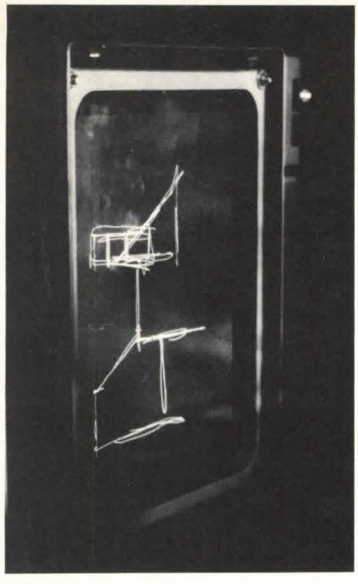
We are working with the Bell Telephone Company's PICTUREPHONE because it is a good first approximation of the future home-computer terminal. It is also a low-resolution device which is certainly compatible with the "incompleteness" of information with which we deal in the nonprofessional interface. With touch-tone input, a keyboard, audio output, and half-tone graphic displays, we feel that this sort of interface will foster the kind of architecture that at present is uniquely available to the aborigine and the plutocrat.

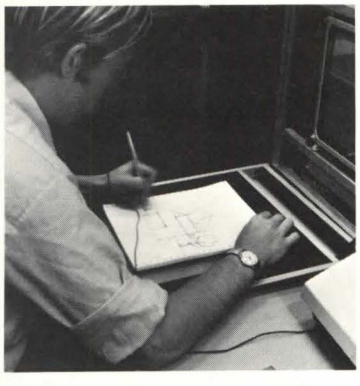
Interpreting nebulous ideas

Though it is generally agreed that architecture is no longer the heart telling the elbow controlling the wrist driving the pencil, architects accept the notion that at the onset of a design process they are dealing with unclear and incomplete ideas. These ideas seem to benefit by a looping into the real world through different media, for example, from hand to paper to eye, changing state as they change media. One such loop is the sketch.

The word "sketchpad" (which was coined in 1961) has generated a false association between light-pen-and-cathode-ray-tube techniques and the doodlelike drawings designers so often make on the backs of envelopes. The term "sketch" has been preempted by computer-graphics systems that expect such explicit actions as pushing buttons to denote the end of lines, pointing to make associations, and typing to specify horizental-vertical orientations. On the other hand, sketching is really a medium for negotiating hazy ideas with oneself, and the inexplicitness of the drawing technique is directly related to the dynamics of modeling (by computers) vague notions (of humans).

One of our ongoing research projects. HUNCH, employs a Sylvania tablet, a graphical device that allows actual paper-pencil interaction between man and machine (and includes a limited third dimensional capability). The existing program does indeed look at the syntax of sketches and does try to make wobbly lines straight. Its algorithms try to locate corners and piece together straight lines.





Top: Bell Telephone's PICTUREPHONE is being converted to have "random access" abilities and low-speed communication (over regular telephone lines) with the Interdata. The PICTUREPHONE is a first approximation of the future home-computer terminal. Middle and bottom: HUNCH uses a combination of a Computer Display Inc. Advance Remote Display Station (ARDS) and a Sylvania data tablet to investigate the syntax of sketches.

But what is more interesting is, once again, the semantics of a sketch: What does a designer intend by it? In the simple case this involves the heuristics of machine recognition of sketching. When does a local nook or bend result only from a jiggle of the hand as opposed to an intentional demarcation or "corner?" When are two lines that almost touch, in fact, meant to be touching? And when does an overtracing actually mean two lines.

One application of this work is a "squiggle-recognizer." This is a filtering mechanism that can detect the differences among squiggles designating a shading gesture, a rubbing out act, or the delineation of a curved line. It works—but it does get confused when the user draws a flower.

Semantics of a sketch

But even more exciting is the higher level of the semantics of a sketch: What are its underlying architectural meanings? Can the nature of the lines provide a qualitative description of a designer's own attitude toward his design?

It appears to be possible to recognize some qualitative aspects of designs, or attitudes toward them, by looking at the way sketches are drawn. For example, rapidly formed lines appear to be the designer's context or background, and they represent elements about which he either knows a great deal or almost nothing at all. On the other hand local concentrated detailing seems to indicate the areas of highest concern and information input. When the lines are formed at lower velocities, the interaction between the designer's concept and the machine's model of the concept appears to be the most revealing. Crookedness appears, and there are uncertain gestures and highly reworked lines; this all may represent important (perhaps semantic) dispositions toward a design such as being "concerned about," "sure of," "puzzled by," and so forth.

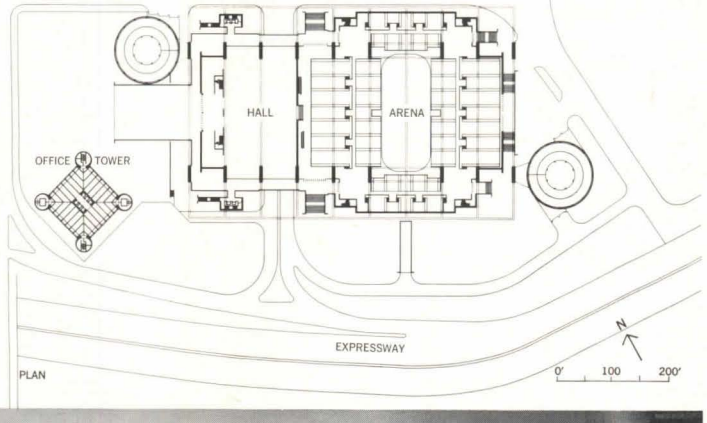
It is important to consider why most researchers in computer-aided architecture are studying the syntax of problems rather than the semantics of issues (while the architects are dealing more and more with the latter). This is partly because machines are commonly assumed to be "doers" rather than "understanders." It is also because machines are thought of as slaves: you do not need to understand; just do what you are told and in the way that you are told to do it. Anyway, why should machines understand what they are doing?

The main reason has evolved with The Complex Program. Though it can be argued that society has always faced complex problems, the present crucial importance of machines and the recent recognition of their contextual dependencies have forced the design and implementation of such complicated computers and computer programs that some remain "undebugged" and, perhaps, "undebuggable" by humans. One problem is the unresolved difference between complicated and complex (indeed semantic); so-called sophisticated programs tend to be more complicated than complex. Researchers try to build computer aids with the best of all possible mappings between their understanding of what humans do and the constitution of machines (which the most sophisticated mathematicians only partially understand). This transposition is very complicated and has not worked well. So we are trying another alternative: to give machines those devices (particularly interfaces at first) that humans have used to understand context and complexity.

This all means that we must seriously entertain the notion of giving machines an artificial intelligence, one not necessarily limited by that of humans. The old wives' tale that a machine can do no more than it is programmed to do is not only a farce but is injurious to the computer-aided architect. Of course machines can do more; a machine provided with direct loops into the real world and with the faculties to control its sensors and effectors does more. And in this manner the design task is no longer partitioned, but is mutually reinforced.

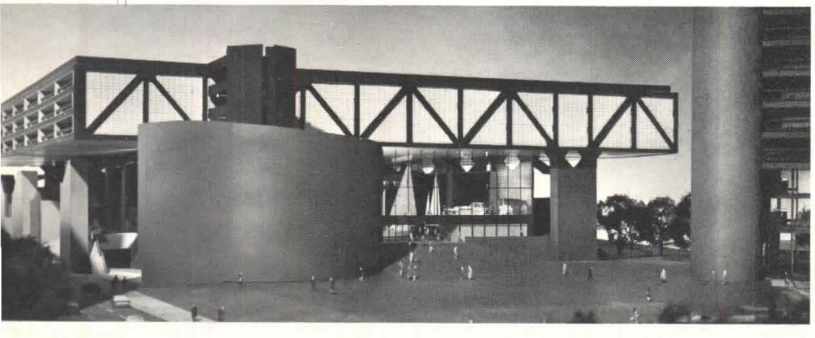
To get to this point, we must preface doing with understanding. Semantics comes before syntax. Interfaces come before grammars. Roles come before goals.

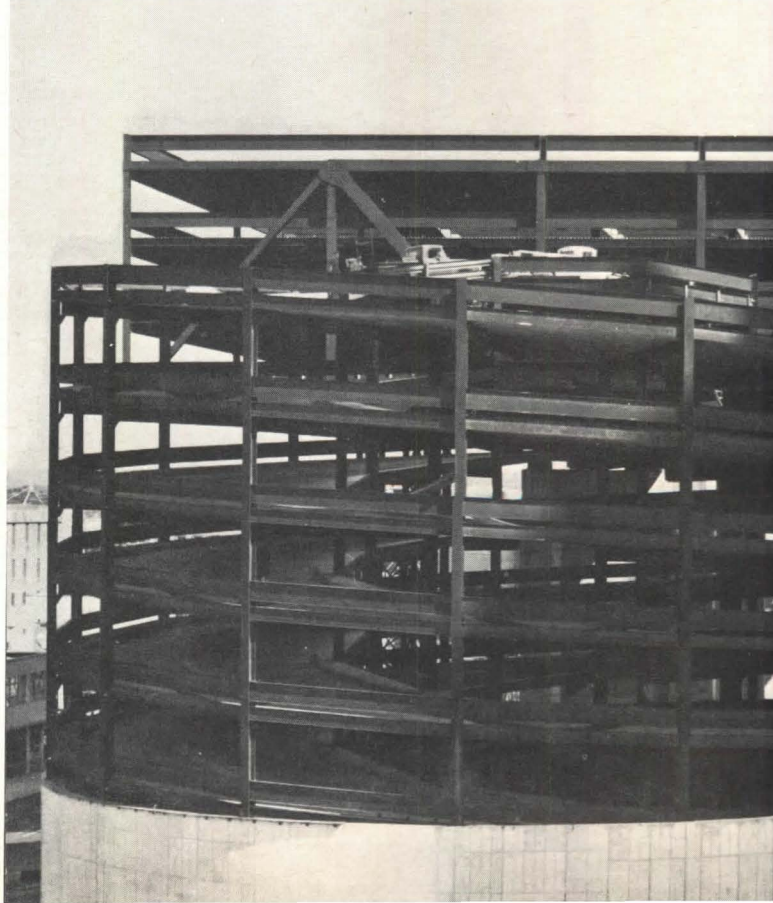
GREAT GARAGE AT THE TOP



When you first see it from the highway leading into New Haven, it looks like an isolated section of some enormous expressway—a multilevel viaduct on 70-ft.-high piers that stretches 560 ft., stopping abruptly at either end. Actually, this is not part of another megalomaniac highway (of which New Haven has enough!), but the skeleton of the city's Coliseum and Convention Center, designed by Architects Kevin Roche John Dinkeloo & Associates.

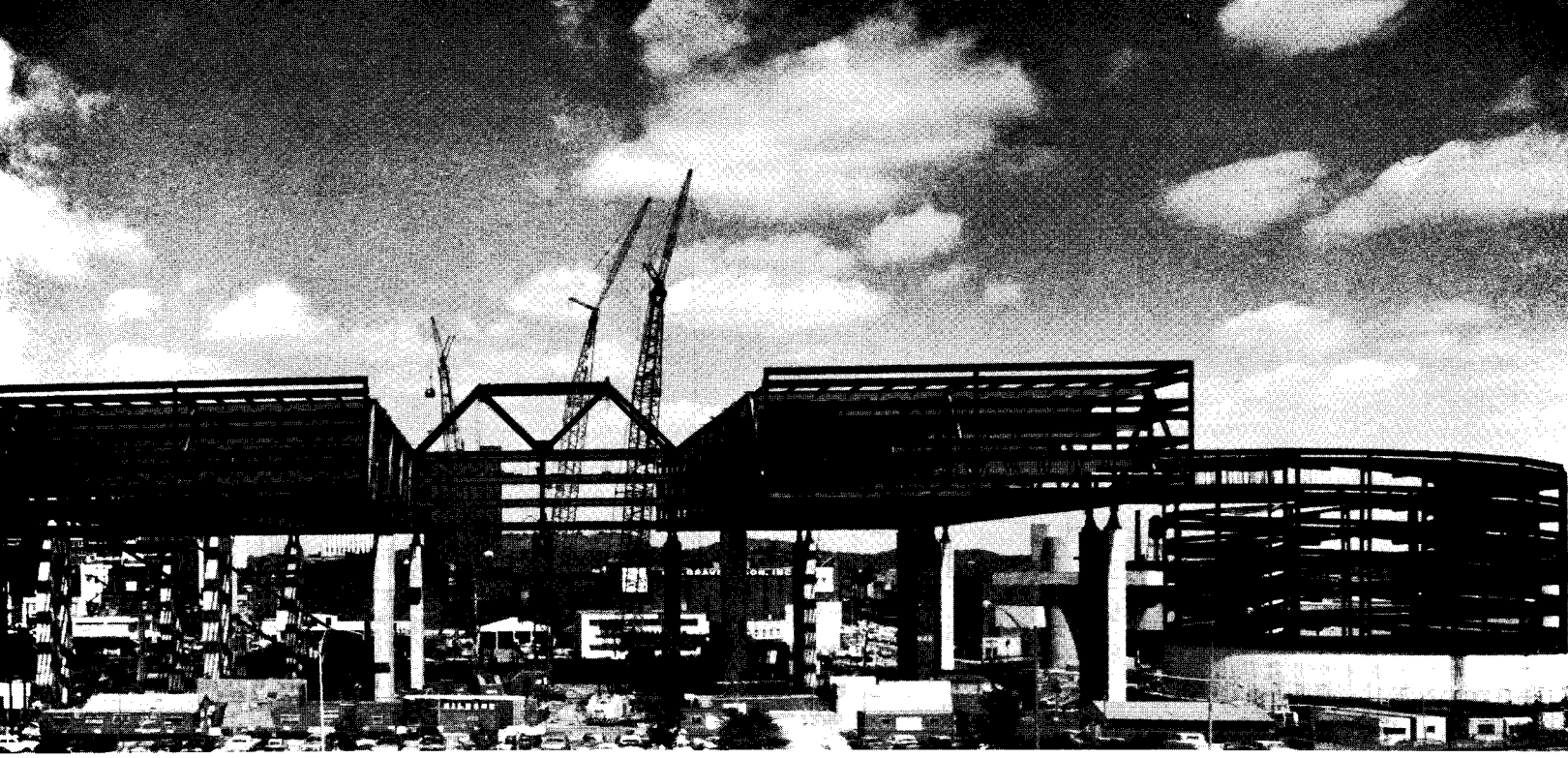
The four-level superstructure of weathering steel, poised so high above the ground, will house a 2,400-car parking garage. In the 4½-acre area beneath it will be a 9,000-seat sports arena (expandable to 11,500 for conventions) and a 38,000-sq.-ft. exhibition hall bridging a city street (plan, left). These spaces will be completed in 1972.





New Haven's Coliseum and Convention Center, by Architects Kevin Roche John Dinkeloo & Associates (model photos above), is rising next to the recently completed Knights of Columbus office tower (left in top photos) by the same architects. Within its vast roof structure will be a 2,400-car garage, and beneath it an arena and an exhibition hall (plan above). Two double-helix ramps will serve the garage from opposite corners of the structure.

FACTS AND FIGURES
Coliseum and Convention Center, New Haven, Conn. Architects: Kevin Roche John Dinkeloo & Associates. Structural engineers: LeMessurier Associates. General contractor: Gilbane Bldg. PHOTOGRAPHS: Chalmer Alexander.



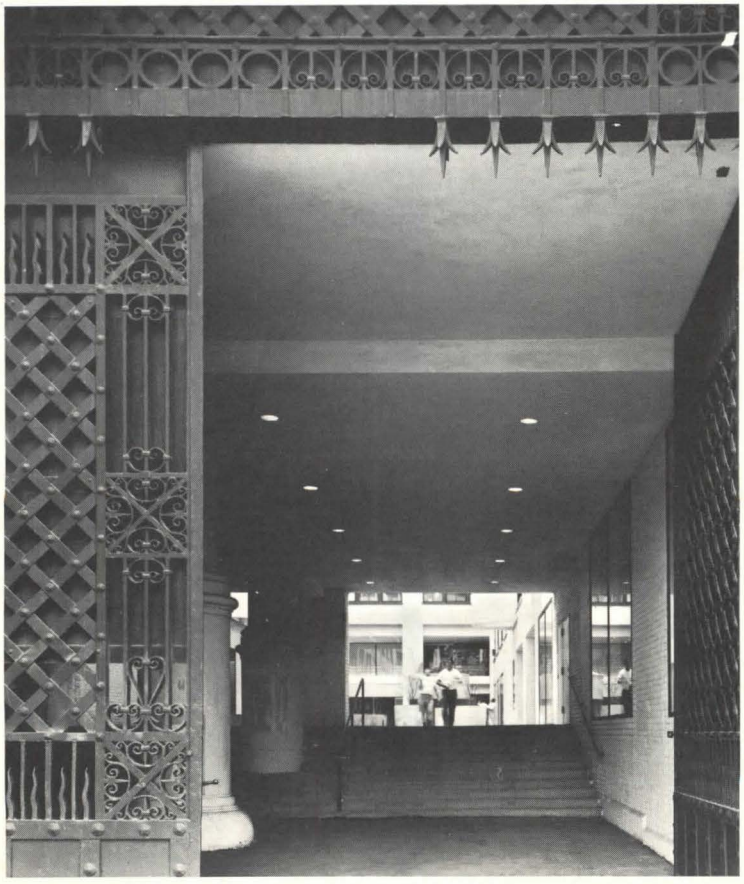
The garage-on-top scheme is dramatic in form, but it was also the most practical alternative for this site. An underground garage of this size was ruled out by underground water conditions, and an on-grade garage would have meant raising the main interiors above street level, isolating them from pedestrian activity in the adjoining downtown office-shopping core.

Drivers will reach the garage by two helical ramps—with separate up and down roadways—located as far apart as possible and both convenient to the expressway that passes the site. Escalators will link the parking levels to the arena and exhibition hall, and elevators to street level will serve shoppers and office workers using the garage.

Three levels of parking fit within the depth of the transverse trusses that span 184 ft. between concrete piers (below); the fourth level is the exposed roof deck. Above the arena, one pair of piers has been omitted, and the truss they would have carried will be suspended from two rooftop trusses bridging the 128-ft. gap (one of which is shown in place, above).

Much of the weathering steel framing will be exposed in the completed structure (model photos, left). Solid in-fill walls below garage level will be surfaced with purplish-brown salt-glazed hollow tile. The same kind of tile, traditionally used for silos, was used on the adjacent Knights of Columbus headquarters (left, above) also designed by Roche-Dinkeloo. Although the clients for the two structures are unrelated, they agreed from the outset that the adjoining projects should be integrated architecturally.

WESTBETH: ARTISTS IN RESIDENCE



Most dramatic view of Westbeth is its inner courtyard (opposite); the added balconies give second egress from duplex apartments, and give privacy from windows across the narrow chasm. Westbeth is in the far western part of Greenwich Village (above right), in a mixed area — produce, printing, oddments — that now has many residents. Westbeth is actually 11 buildings, some dating from the turn of the century. Below right: formerly the truck entry.

Westbeth lives!—and on several levels. As a building, it is the largest residential rehab in the country (perhaps in the world), with those special qualities of space and scale that are free for the rehabilitating and too expensive for new construction.

As a community, it is the only such artists' facility in the U.S. (and largest in the world), with 383 apartment-studios that let artists work where they live.

As a pioneer in other ways, it is the first effort by the federal government to provide housing exclusively for artists—moderate-income artists, at that (it is under the 221d3 program). It is also the first time the FHA has waived its usual requirements and given tenants a "loft space" to divide up as they wish. Westbeth is *also* (here ends the list) the first of New York City's special zoning districts; although only one block square, this "artists' housing" project triggered the enabling legislation that has allowed special districts in the theater area and around Lincoln Center.

These buildings had already made history. Before the Bell Labs left this site in Greenwich Village for the Jersey suburbs, Bell developed the world's first talking movies here, showed the public its first TV, and put together the first transistor. When the block came up for sale in the mid-'60s, William Zeckendorf made plans to acquire it, then turned it over, at cost, to the J. M. Kaplan Fund and the National Council on the Arts.

The Kaplan Fund had renovated a few small buildings for artists; the architect chosen for Westbeth, Richard Meier, had designed a few living lofts for artists. But Westbeth was far more complicated. It took money —$1 million from the National Council, and slightly more from the Kaplan Fund. And a generous tax abatement from the city. And commitment of all sorts: Bankers Trust granted the loan only after many turned it down. Meier himself ran a round-the-clock operation during the nine months between the first meeting with the client and the start of construction.

But in the end, Westbeth is built and is unique, and at a construction cost of about $15,000 per unit, *including* all community facilities—or about half the cost of new construction with the same facilities.

Westbeth is like a Corbusian *Unité,* says Richard Meier, in its size—1,200 people—and its varied facilities.

An ample park (facing page, top) serves the wider community; across the street will begin the controversial West Village Housing project.

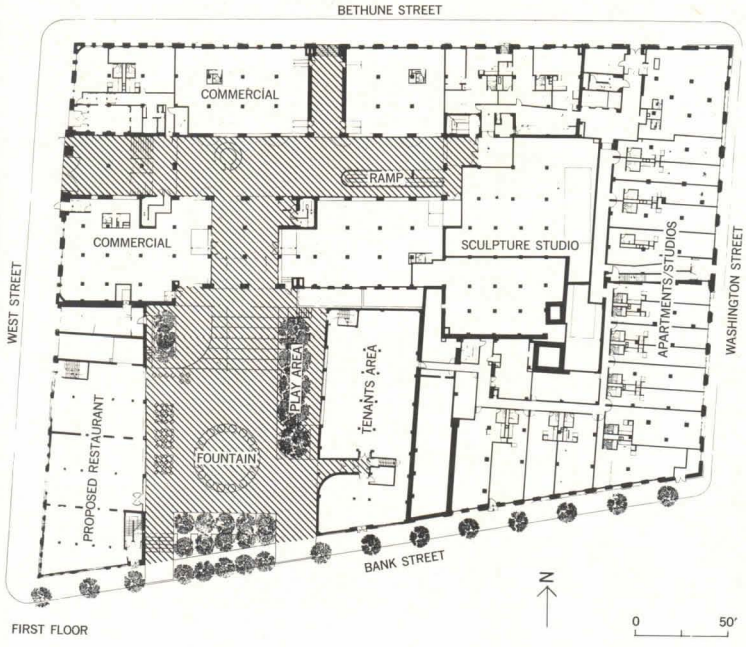
Some of Westbeth's facilities are for the artist. The vast boiler room, now visible from the courtyard, will become a communal sculpture studio for large-scale work. A similar studio for painters is being considered. Nine photographers are collaborating on a $35,000 basement lab, to be financed by Westbeth and repaid by the photographers over the years. There is hope for a theater in a huge found space.

Some facilities serve the needs of the resident. Tenants are helping to plan a rooftop playground, and are seeking space for a day-care program. "This building will never be finished," says Meier; "it's a living building. Some things were intentionally left open."

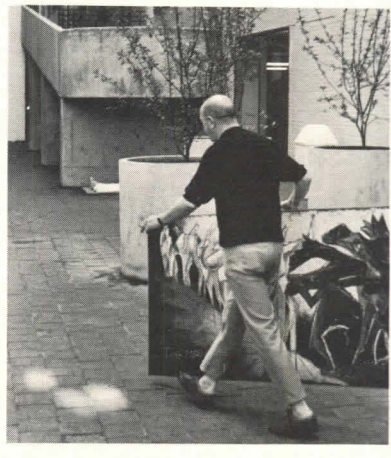
The needs of artist *and* resident meet head-on in the project's commercial areas. The original intention was to ring the courtyard with art-oriented tenants—a gallery, an art store—and a restaurant. It hasn't happened. "Perhaps we've been too insistent on the kind of store we've wanted," says Joan K. Davidson (daughter of J. M. Kaplan and president of Westbeth); "the courtyard should be a real street, with real things on it—not a living room." There is talk now of a supermarket, or a health food store. The only commercial tenant thus far is Mourlot Graphics, the lithographer. (Merce Cunningham's Dance Theater will fill a sizeable space on the top floor.)

Not everyone who wants to live at Westbeth is eligible. Maximum income is $7,500 for one person, $12,500 for a family of four. (The FHA has agreed to a three-year averaging of income.) Some artists wouldn't be caught dead here, even if they *could* get in. Still, the waiting list had 1,200 names on it when it became ridiculous to add more.

Westbeth is developing as a dynamic community—a place where things are happening. "If it becomes a commune, it has failed," says Peter Cott, executive director of Westbeth; "and if it is just an apartment house, it has also failed."



FIRST FLOOR



Westbeth has many meeting places; not surprisingly, collaborations among the artists are burgeoning. Facing page, top: entry from the south; bottom: from the west. The courtyard had been a loading dock, open only above the second floor. Other changes: two timber structures (five and seven stories) were removed to make the park. A spur of the Penn Central runs through the building and ends at the southeast corner; all attempts to negotiate for the space have produced nothing ("it would make the greatest foundry").

Westbeth is important in two ways, Meier feels: it demonstrates rehabilitation as a way of building in the city, and it establishes a precedent in giving tenants an open plan to do with as they please.

It was not a distinguished old building, says Meier, only an ordinary one. It did, however, have qualities especially suited to rehab—lavish floor height (up to 15 ft.), thick outer walls, good window spacing. Some factors are not important—a good electrical system, for instance, since totally different residential requirements would probably dictate an entirely new system. At Westbeth, only 70 percent of the heating system was salvagable. The electrical system is completely new. Elevator workings are new, in the old shafts.

It wasn't easy for the architect. Meier had up to five men on the job during construction. But there are "possibilities in rehab that are quite marvelous," he says; "you get a quality of space that is economically impossible in new construction."

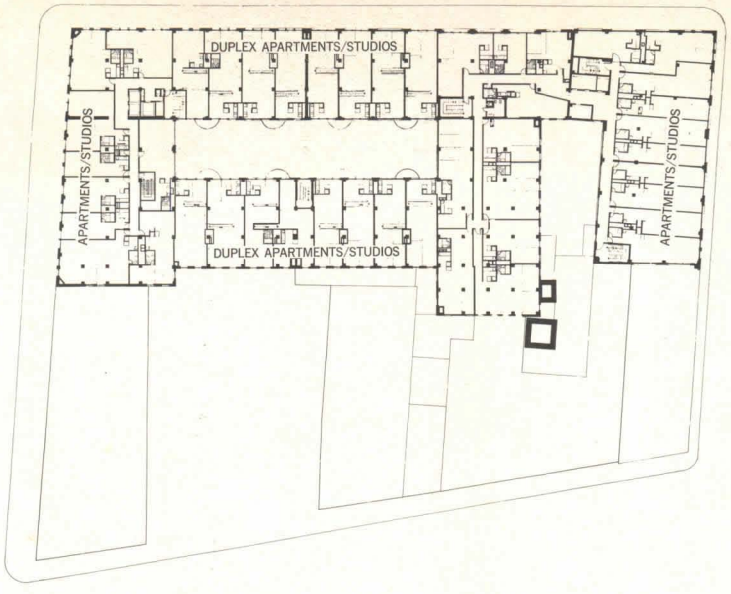
About the open plan, Meier says, "The fact that Westbeth is housing for artists is incidental. Others would welcome this kind of living space."

The only interior doors are those closing off the bathrooms. Bedrooms exist on paper as dotted lines, and in reality as sleeping platforms built by tenants or as spaces loosely screened by movable wardrobes (each unit gets some, larger apartments get more.)

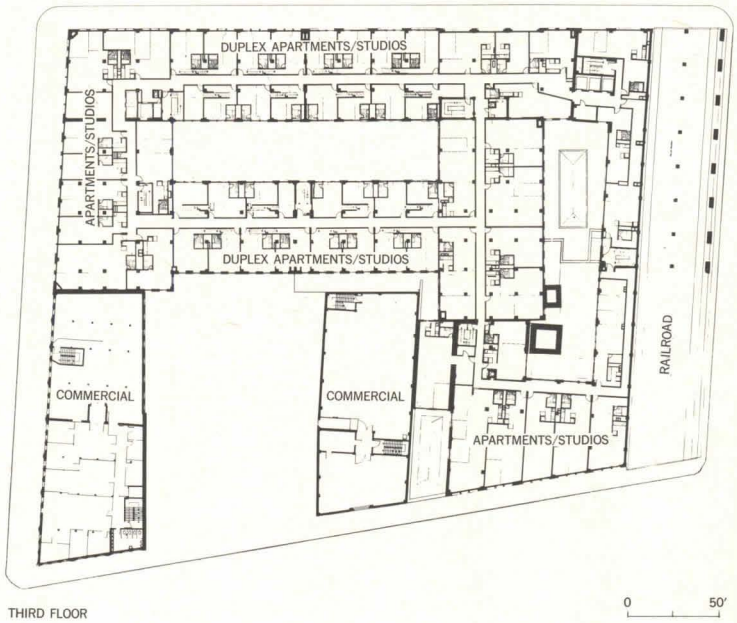
The project would never have been built, says Meier, if interior layouts had been conventional. And, responding to some criticism of the available space in each unit, he says that bigger apartments and fewer people would simply have made the project impossible to finance.

All concerned emphasize that Westbeth is only *one* answer to the critical problem artists have in finding studio space at manageable rents. It is no substitute, for instance, for the urgent need to save the city's existing lofts in the cast-iron district south of Houston Street (SoHo). But for what Westbeth *has* done—rehabilitate a full city block, create a whole new community, break numerous administrative barriers—it has provided an answer to some important questions posed throughout the country.

—Ellen Perry Berkeley



SEVENTH FLOOR



THIRD FLOOR

0 50'

Of the 383 units, 96 are duplexes that give floor-through layouts to apartments around the long central courtyard. Interior layouts are completely open. An incredible number of FHA and city requirements was waived—there are no bedrooms as such, no closets, no enclosed kitchens, no variety in size of kitchens. (Also waived: all parking and setback requirements.)

FACTS & FIGURES

Westbeth Artists' Housing, 463 West St., New York, N.Y. Owner: Westbeth Corporation Housing Development Fund, Inc. Architect: Richard Meier (Murray Emslie, Gerald Gurland and Carl Meinhardt, associates in charge; John Chimera, project representative). Engineers: Felcher Atlas Associates (structural); Wald & Zigas (mechanical). General contractor: The Graphic-Starrett Co. Building area: 626,808 sq. ft. Cost: $5,945,000 (including park).

PHOTOS: Leonard Freed, except page 45 bottom, page 47 and page 49 top, Ezra Stoller; page 44, Ann Douglass.

TECHNOLOGY

TANDEM ELEVATORS SAVE SPACE, IMPROVE SERVICE

Installing elevators can easily be taken for granted—simply a question of how many and where. But now there is something new to consider.

Tandem elevators may provide the speed and service desired and consume a minimum of rentable floor space. The first installation made in a commercial building was in the Time-Life Building, in Chicago, designed by Harry Weese & Associates (see Sept. issue), and three more installations are already under construction. These are the John Hancock Building in Boston, the Canadian Industrial Bank of Commerce in Toronto (both designed by I. M. Pei), and the Standard Oil (Indiana) Building in Chicago designed by Edward Durell Stone and Perkins & Will Partnership.

The consulting engineers for all these jobs are Cosentini Associates of New York City. According to Marvin Mass, Cosentini's senior partner, tandems can make the difference between a building being commercially feasible or not, especially in the case of tall, narrow towers over 50 stories high with a large per-floor population, where going to double-deck elevators would save as much as 30 per cent in floor space. Tandems, also increase handling capacity 25 per cent to 50 per cent.

General criteria

Each double deck elevator has an upper and lower cab in a car frame about twice the usual elevator height. Entrances and interiors look the same as conventional single-deck versions. Passengers enter from either of two lobby levels, connected by escalator or stairs, depending on whether their destination is an odd or even numbered floor.

During peak load hours tandems are programmed to maintain a strict even-odd stop pattern. During slower periods, however, the elevator will operate on a regular floor stop basis and people can get on and off any cab at any floor. For pickups in off-peak hours, the bottom cab can be programmed to answer calls going up and the top cab will pick up passengers going down. This allows the lead cab to pick up a passenger going in the same direction.

Designing elevator systems is an empirical science, says Mass, based on years of trial and error by engineers. Tandems are an exception because they are new. (The first tandem was put in a building over a New York City subway entrance, with the bottom cab to give access to the subway. But it was never used.)

General criteria for selecting elevator systems, however, remain valid: quality of service, or interval (the waiting period necessary for an elevator to arrive for pick-up), and quantity of service, or handling capacity (percentage of the building's population that an elevator can handle in a five-minute period). About 30 seconds is the maximum interval allowed for office buildings generally. Handling capacity varies according to building function.

A multi-tenant building generally requires an 11 per cent to 13 per cent handling capacity because such buildings usually have staggered morning and evening peak loads. A building occupied largely by a single tenant requires a 13 per cent to 15 per cent handling capacity since people are more likely to have the same work schedules, arriving and leaving simultaneously. (Such buildings also have more stringent interval requirements because they have a lot of inter-floor traffic.) A completely single-purpose building, such as a bank, with a large personnel pool could require 14 per cent to 20 per cent handling capacity.

Generally, tandems should be considered for buildings 50 stories and over because their principal saving to the owner is by providing a more efficient core and additional rental space. The Time-Life Building is an exception because it is only 25 stories high. In this case, however, the tandems made feasible a 25 per cent handling capacity.

There are many combinations of elevator systems available. The variables include the number and configuration of banks, the number and size and speed of elevator cabs (the practical limit is eight elevators in a group), the style and width of doors. Beyond these is the larger choice of systems: conventional elevator systems, shuttle systems (large elevators running from the ground floor to sky lobbies for upper-floor service), tandems, plus combinations of all these.

One study

The choice of an elevator system has serious impact on the structural and architectural design of the building and its core, so it must be decided in the earliest design phase. The studies for the 80-story Standard Oil (Indiana) Building were made before height was determined and included both 70- and 80-story versions.

The 70-story plans (pictured) compared conventional elevators to shuttles (with sky lobbies) combined with conventional and tandem elevators and to a wholly tandem system. The three primary objectives were to find the system that would require the fewest elevators for at least 15 per cent handling capacity; one that could best be grouped to make the core architecturally feasible; and one that would cost least in terms of volume and space.

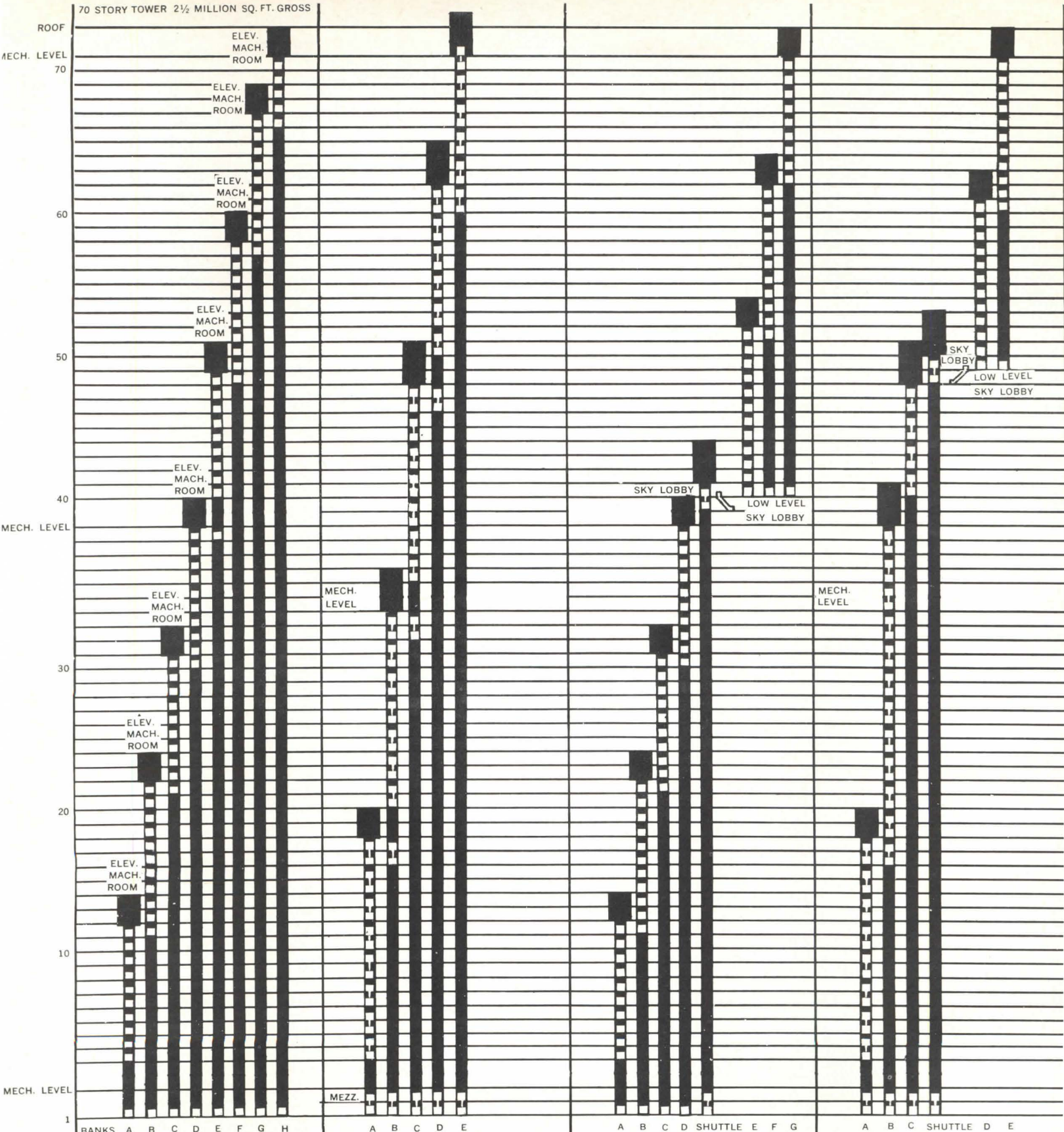
While the studies indicate that the tandems answer these three criteria, they are not the cheapest to install. Tandems reduced the number of elevators needed in the 80-story building from 76 to 40. But the tandems required 80 sets of doors, while the conventional elevators required only 76. Also, the tandems are twice as heavy, so need more costly equipment to lift them.

The studies showed that conventional elevators were the least expensive to install, tandems the most, and shuttles somewhere in between. Bids were solicited on both conventional and tandem systems (shuttles were eliminated because they required transferring). Tandems cost about 15 per cent more than a conventional system but made up for this in efficiency and space. Based on $8 per sq. ft., the building can make up the installation difference in four years of renting the added space.

Design requirements

There are no design restrictions on the elevator cabs or doors, but there are requirements elsewhere:

- Graphics are extremely important for instructing passengers on how to use the elevators.
- There can be little or no variations in floor-to-floor heights in any one bank of elevators and tolerances must be very close.
- Machine rooms for the elevators must be located at the top of the shafts. An extra floor level is needed if the bottom cab is to reach the top floor and at cross-over floors.
- There must be a double-strength emergency system in case of power failure to handle the extra weight of the tandems.



SINGLE DECK SYSTEM

ELEVATORS	60
DOORS	648
CABS	60
TOTAL ELEVATOR SPACE	314,800 SQ. FT.
% OF FLOOR AREA FOR ELEVATOR SHAFTS AND MACHINE ROOMS	12.6%

DOUBLE DECK SYSTEM

ELEVATORS	38
DOORS	664
CABS	76
TOTAL ELEVATOR SPACE	232,100 SQ. FT.
% OF FLOOR AREA FOR ELEVATOR SHAFTS AND MACHINE ROOMS	9.8%

SKY LOBBY SINGLE DECK SYSTEM

SINGLE ELEVATORS	55
SHUTTLE ELEVATORS	8
DOORS	660
CABS	71
TOTAL ELEVATOR SPACE	232,400 SQ. FT.
% OF FLOOR AREA FOR ELEVATOR SHAFTS AND MACHINE ROOMS	9.3%

SKY LOBBY COMBINATION SYSTEM

TANDEM ELEVATORS	24
SINGLE ELEVATORS	16
SHUTTLE ELEVATORS	6
DOORS	664
CABS	76
TOTAL ELEVATOR SPACE	197,100 SQ. FT.
% OF FLOOR AREA FOR ELEVATOR SHAFTS AND MACHINE ROOMS	7.9%

COMPUTER FIRM PROGRAMS STRUCTURAL DESIGN ANALYSIS

Little has so far been said about it, but hundreds of buildings are now being designed and constructed on the basis of an integrated computer program that converts basic design and structural information into complete design calculations. The whole process can take as little as three to five minutes on a large computer.

The computer output includes data for working drawings and estimating. A plotter will also draft floor plans. Similar computing and plotting service is available for bridge, highway and sanitary projects.

Complete structural design calculations can cost as little as $300 to $400, based on actual computing time.

The firm making such rapid design computations possible is Omnidata, Inc. of New York City, a small computer firm staffed entirely by professional engineers. It has developed a series of integrated design programs over the past six years for bridges, highways, buildings, soil mechanics, water supply, sanitary and sewage systems and accounting for professional offices. Still being developed are programs for heating, ventilating, air conditioning and plumbing.

Omnidata's board chairman, Charles P. C. Tung, is in charge of developing the programs, and its executive vice president, David Carsen, heads engineering. According to Carsen, Omnidata's programs are unique because they attempt to solve all the problems of structural design in a single step.

The programs will calculate the theoretical analysis portion of design, involving loads, moments, thrusts and shears; transfer these values to a design procedure that selects final shapes and sizes; then estimate material quantities.

Buildings

In general the programs are designed for conventional structures and, in the case of buildings for example, would exclude such structures as thin shell and cable roofs. But, as these structures become more common, Omnidata plans to include them in their program library. For now, engineers may design such structures in part on the computer, saving only the highly specialized computations for hand analysis.

Buildings now account for

West building of L'Enfant Plaza

```
          L'ENFANT PLAZA E WIND ANAL DL+LL+W

 ------------------------------------------------- -----

 NUMBER OF STORIES=              20
 NUMBER OF COLUMN LINES=          4
 SUPPORT CONDITIONS               FIXED
 NO.OF BOTT. STORIES LATERALLY SUPPORTED      1
 1ST STORY COLUMN HEIGHTS         UNIFORM
 COLUMN TYPES                     PRISMATIC WITH GIVEN I
 BEAM TYPE                        PRISMATIC WITH GIVEN I
 NUMBER OF LOADING CASES=         1
 ACCURACY OF MOMENT DISTRIBUTION= 1.00 K-FT
 MODULUS OF ELASTICITY=             3000. KSI
 REVISION REQUESTS                NONE

 LEFT TO RIGHT SPAN LENGTHS IN FEET
   1     20.00   2     20.00   3     20.00

 BOTTOM TO TOP STORY HEIGHT IN FEET
   1     10.00   2     15.00   3     10.00   4     10.00   5     10.00   6     10.00
   9     10.00  10     10.00  11     10.00  12     10.00  13     10.00  14     10.00  1
  17     10.00  18     10.00  19     10.00  20     10.00

 COLUMN PROPERTIES-PRISMATIC
 STORY   1 IN INCH 4TH
   1    13800.00       13800.00       13800.00       13800.00
   2    13800.00       13800.00       13800.00       13800.00
   3    13800.00       13800.00       13800.00       13800.00
   4     SAME AS    3
   5     SAME AS    3
   6     SAME AS    3
   7     SAME AS    3
   8     SAME AS    3
   9     SAME AS    3
  10     SAME AS    3
  11     SAME AS    3
```

Portion of problem statement

```
 COMBINED DEAD LOAD, LIVE LOAD AND WIND
 **********************************************************************
                                          LOADING CASE   1    LOADING TYPE   5

 ***** VERTICAL LOADS

 COLUMN MOMENTS AND SHEARS
                                                                    TOP DSP F
 STORY  COL  BOT MOM FK  TOP MOM FK     SHEAR K    AX LOAD K   TOP ROT RAD

   20    1      59.305      107.507                   40.466
   20    2     -16.739      -34.135                   88.187
   20    3      16.888       33.377                   88.170

 BEAM MOMENTS AND SHEARS

 FLOOR SPAN   LT MOM FK   RT MOM FK   LT SH K    RT SH K   INT MOM FK   DIST F

   20    1    -108.243     157.208     40.466    -45.119      84.405      9.500
   20    2    -147.372     147.032     43.067    -43.031      73.085     10.000
   20    3    -157.438     107.942     45.139    -40.433      84.392     10.500
   19    1    -122.388     151.526     41.291    -44.068      78.101      9.500
   19    2    -144.504     144.609     42.836    -42.846      72.668     10.000
   19    3    -151.449     122.393     44.062    -41.294      78.120     10.500

 ***** LATERAL LOADS

 COLUMN MOMENTS AND SHEARS
                                                                    TOP DSP F
 STORY  COL  BOT MOM FK  TOP MOM FK     SHEAR K    AX LOAD K   TOP ROT RAD

   20                                                                0.4053205854
   20    1       1.024       -5.792       0.476      -0.337   0.0000596386
   20    2      -2.541       -8.720       1.126       0.041   0.0000463650
   20    3      -2.513       -8.683       1.119      -0.060   0.0000466350
   20    4       1.185       -5.210       0.402       0.357   0.0000654579
   19                                                                0.4039932496
   19    1      -3.420      -13.345       1.676      -1.396   0.0001781989

 ULTIMATE STRENGTH OF CONCRETE  6000. PSI    YIELD STRENGTH OF STEEL  75000. PSI

 COLUMN MK CX IN DY IN      P K   BMX FK   BMY FK  NSX  NSY BARS SIZE CODE  AS SI  ASPCT

 3 1   21   26  15715455.00  400.00  800.00    3   34   74   11    C 115.54   2.8315

 2 1   21   26  15715703.00  400.00  800.00    3   36   78   11    C 121.79   2.9815

 1 2   18   28    110 8177.00 6788.00  400.00    3    7   20   11    C  31.22   1.01 9

 1 2   18   28    110 8578.00  400.00  400.00    3    7   20   11    C  31.22   1.01 9

 TOTAL OF THIS FRAME - WT. OF STEEL= 38.70 TONS, VOL. OF CONC= 161.46 CU YDS, NET
 TIES ARE ASSUMED AS NO. 2 AT 12   IN.
```

Portion of structural analysis

about 30 percent of Omnidata's work, with highways and bridges accounting for half. The basic system for buildings is STRUC V, a third generation program for the analysis and design of multi-story structures in any combination of steel or concrete. The frame may have prismatic or non-prismatic members, fixed or hinged supports, and concentrated or distributed loads.

STRUC V will automatically place live load in the spans to produce maximum moment and then combine the results with a complete wind analysis. It also includes provisions for introducing column live load reduction factors and out of plane moments for the design stage.

Concrete design includes reinforced concrete beams and columns, flat plate floor slabs, shear walls and spread footings. Also included are working stress and ultimate strength analyses, member sizes and dimensions and longitudinal reinforcement specifications. For steel structures, the system will design columns and beams with composite or non-composite sections within prestated parameters. Final output includes material estimates.

The engineer simply feeds in such general design parameters as materials, story heights, loadings, specifications and shape. The buildings that can be entirely processed with one set of data on the computer include circular, L-shaped, Y-shaped, U-shaped, square and rectangular configurations, up to 60 stories.

Codes included in the buildings programs include AISC (American Institute of Steel Construction) for steel, ACI (American Concrete Institute) for concrete, the New York City Building Code, the National Underwriters Code and variations of these.

An example of a conventional building processed by STRUC V is the West building of L'Enfant Plaza, in Washington, D.C., designed by Vlastimil Koubek. Enis Y. Baskam was consulting engineer. The building has 18 stories, with six of them below plaza level.

The architect provided the engineer with the basic shapes and layout for design, and after several studies and a few days of preliminary calculations, he prepared the data for the computer in a few hours. The building, now under construction, is essentially a one-way slab design with deep beams at the columns.

The project resulted in a 15 percent saving of labor and a 25 percent time saving, according to the engineer, because of the computer. There could have been far greater savings if he had had a remote terminal in his office.

A more unusual structure processed by Omnidata is the Nassau Coliseum designed by architects Welton Becket & Associates and now under construction at Mitchell Field, Long Island. Farkas, Barron & Partners are the consulting engineers on the project.

The stadium could not be wholly designed by computer, but large portions of the repetitive calculations were computerized. The roof structure design was the primary structural problem and the loads, moments, shears and axial stresses of the trusses had to be determined. The engineers did a basic mathematical analysis, then used Omnidata's Stress program for a stress analysis. After the special cases were studied in detail, the computer completed the analysis portion of the design.

Part of the value of a system like Omnidata's is that it can help the architect and engineer determine costs before the building is designed and under construction. For example, Omnidata processed the 38-story U.S. Fidelity and Guarantee Building in Baltimore for Baskam, in both steel and concrete. In the final analysis, it was proved that steel would be the most economical structural solution.

The firm

Omnidata was founded in 1964. Seven major engineering firms joined immediately to form a working laboratory for developing programs. For the first two years, Omnidata performed mostly research, on a fixed and limited income. It based its program development priorities on dollar volume of construction; highways and bridges were the first programs.

Then, in 1966, additional member firms joined and they were charged according to size and type of work. The group grew until it formed an association of about 30 members.

One year ago Omnidata opened its facilities to the public, charging a fixed fee, based on program and computer time. Omnidata trains engineers to prepare their own data. It takes about ten hours of instruction for STRUC V.

Omnidata then planned to put its programs on line for network use and testing of this concept is still in progress. The present schedule calls for completion of such a network system by the end of this year.

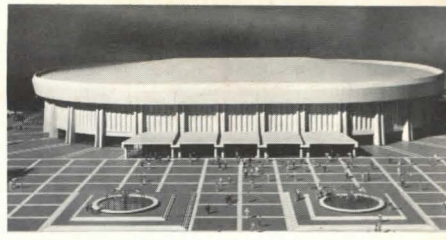
At present most of the computing is done on Omnidata's own IBM 1130/32K computer and a high-rise building will typically take 30 to 45 minutes. Omnidata is now testing on a larger IBM 360/67 network computer that cuts computing time (and cost) to three to five minutes on a comparable project. The franchise terminals will operate off such a system.

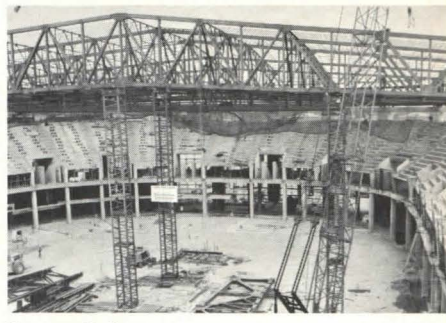
With the computer networks on line, Omnidata will have accomplished two of its primary goals, says Carsen. The first was to develop universal structural programs that would be flexible enough to solve entire building projects from one set of data. Previously, he says, projects would have to be processed on a series of programs, each designed to solve a particular problem, such as beams, columns, wind analysis, etc. Individually, such programs could cost about $5,000 to write and an entire library could cost up to $250,000.

The second goal was speed. Using the larger computers generally involves time-sharing or remote job entry. This is based on assigning participating firms priority for just a few minutes.

Sanitary and pollution programs now have top priority in development. By the end of the year, Carsen hopes to have a new program on line that will design an entire sanitary system for a town of 25,000 population or less in two to four weeks, from contract to final report. Using conventional means, it now takes an engineer about one year.

Looking further into the future, Carsen becomes philosophical. "The computer is a tool that enables the architect and engineer to retain full control of design, while enlarging his capability tenfold. But what happens to professional fees and practices when engineers can complete several structures in a few hours, instead of one structure in several months? The professions, as we know them today, could change drastically."





Nassau Coliseum

```
STRUCTURE TRUSS E J.F.K. COLISEUM
TYPE PLANE FRAME
NUMBER OF JOINTS 34
NUMBER OF MEMBERS 65
NUMBER OF SUPPORTS 2
NUMBER OF LOADINGS 1
TABULATE ALL
JOINT COORDINATES SYMMETRY X 1507.
1 1507. 264.
2 1507. 12.
3 1329. 252.661
4 1329. 10.582
5 1151. 241.322
6 1151. 9.165
7 973. 229.983
8 973. 7.748
9 795. 218.644
10 795. 6.330
11 596.25 205.983
12 596.25 4.748
```

Portion of problem statement

LOADING 1 DEAD LOAD ON ENTIRE SPAN

MEMBER FORCES

MEMBER	JOINT	AXIAL FORCE	SHEAR FORCE	MOMENT
1	2	-67.681	-0.000	-0.00
1	1	67.681	0.000	-0.00
2	3	2128.691	2.053	-296.43
2	1	-2128.691	8.380	-267.73
3	4	-55.727	0.001	-3.44
3	1	55.727	-0.001	3.90
4	4	-2087.938	1.991	-53.94
4	2	2087.938	-1.991	408.41
5	4	7.871	0.052	5.74

APPLIED JOINT LOADS, FREE JOINTS

JOINT	FORCE X	FORCE Y	MOMENT Z
1	-0.028	-94.998	-0.31
2	-0.035	-38.398	-0.01
3	0.003	-0.000	-0.08
4	-0.004	-3.798	-0.29
5	-0.017	-114.790	-0.15
6	-0.011	-29.702	-0.12
7	-0.017	-0.000	-0.23
8	-0.004	-3.804	-0.13
9	-0.027	-1.402	-0.06

REACTIONS,APPLIED LOADS SUPPORT JOINTS

JOINT	FORCE X	FORCE Y	MOMENT Z
18	0.112	637.399	-0.00
34	0.012	637.404	0.00

FREE JOINT DISPLACEMENTS

JOINT	X-DISPLACEMENT	Y-DISPLACEMENT	ROTATION
1	1.0965	-9.0616	-0.0000
2	1.0965	-9.1172	-0.0000
3	1.2364	-9.0273	-0.0006
4	0.9568	-9.0211	-0.0008
5	1.3004	-9.1424	-0.0015
30	2.0065	-4.3026	0.0088
31	0.5494	-2.3314	0.0108
32	2.1737	-2.3280	0.0108
33	0.5634	-0.0914	0.0103

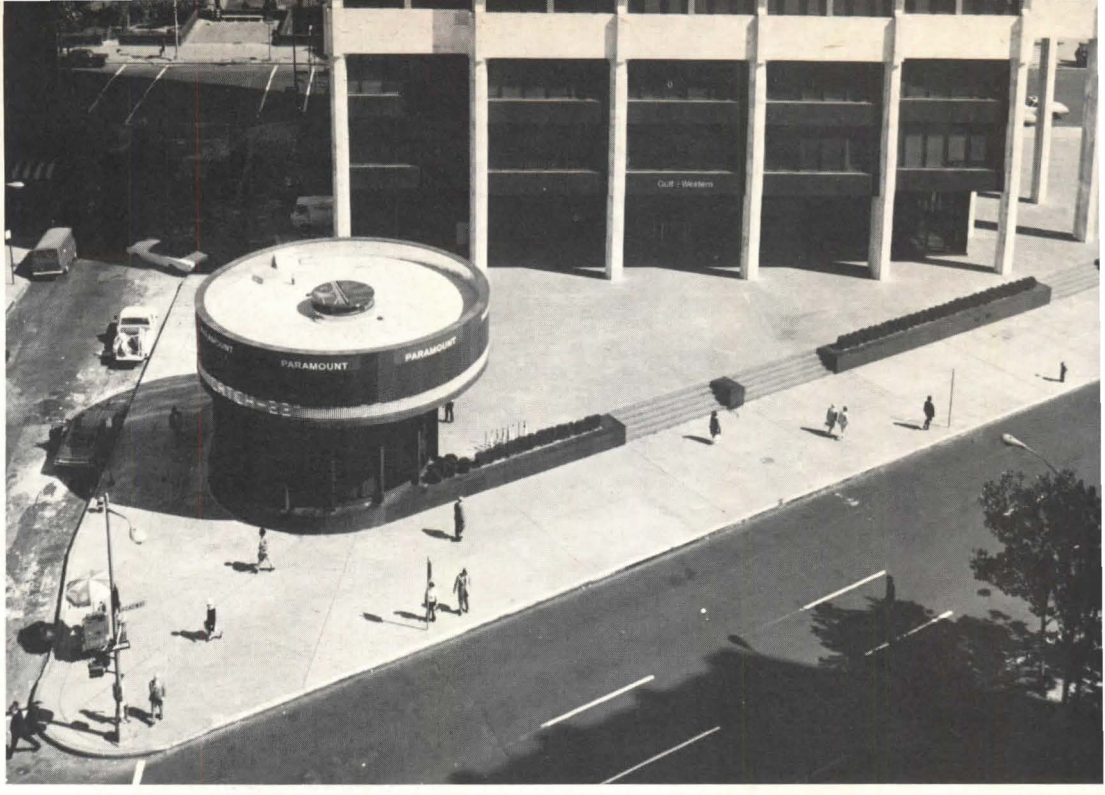
SUPPORT JOINT DISPLACEMENTS

JOINT	X-DISPLACEMENT	Y-DISPLACEMENT	ROTATION
18	0.0000	0.0000	-0.0109
34	2.1930	0.0000	0.0109

// XEQ RDCDS

Portion of stress analysis

SNORKEL THEATER

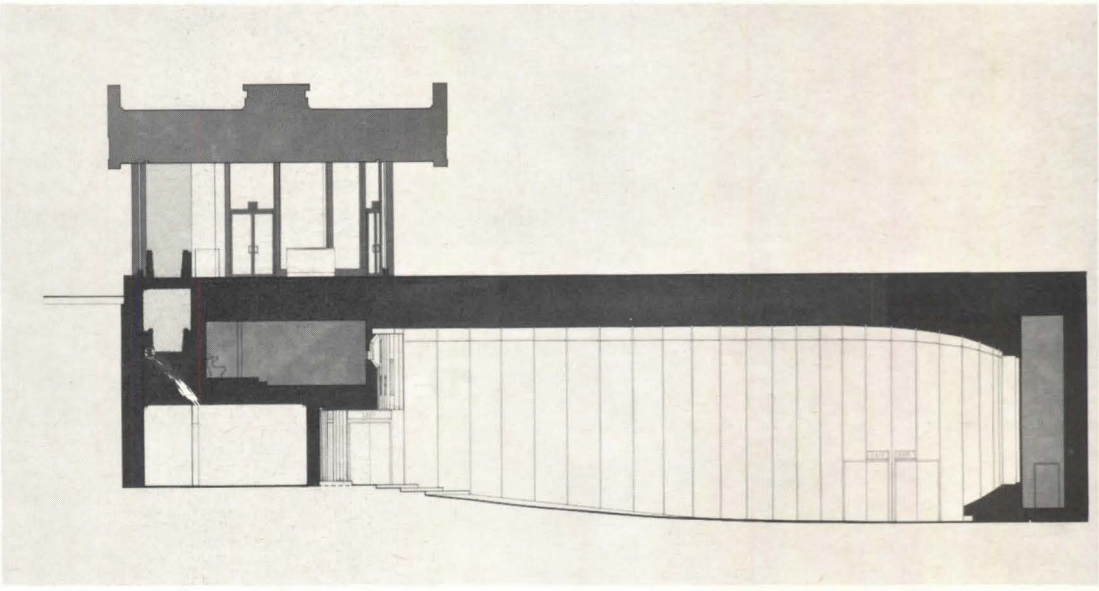


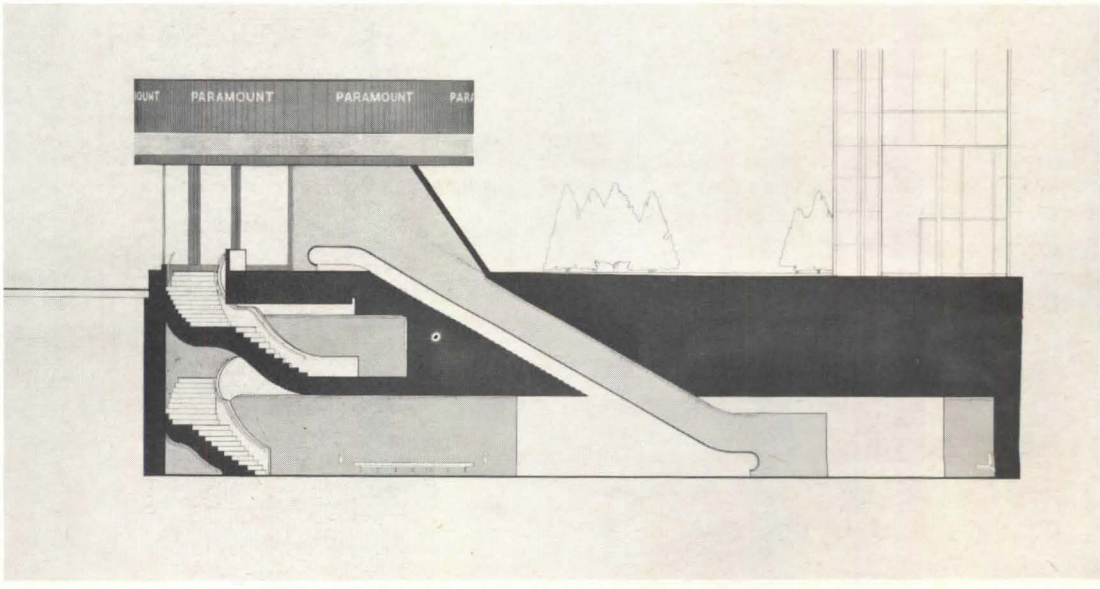
The little glass kiosk shown on these two pages both advertises and attracts people to the latest movie theater built in Manhattan: a 532-seat underground cinema located beneath the plaza of the new (and undistinguished) Gulf & Western Building north of Columbus Circle. All that is visible of the new Paramount is a 30-foot diameter entry and ticket booth; everything else is out of sight.

As in the case of Lenin's Tomb in Red Square, would-be visitors line up outside, file into the kiosk, and then head downstairs by means of stairs or escalators. After walking through a pleasant little lounge, they enter the neat auditorium.

The movie being shown is advertised on the circular "marquee" by means of a continuous news flasher of the kind used in places like Times Square; and the long lines outside the kiosk are proof that it is an effective device to attract movie goers.

What makes this little building especially interesting, though, is that it is really a *non*-building. On an increasingly congested urban scene, there isn't enough space, at pedestrian level, for every new building to display itself in all its glory. Plenty of buildings can and should be stashed away underground: files, storage spaces, computer facilities, many automated industrial facilities, etc., would be much nicer out of sight, and often much more efficient as well. This theater is one of the handsomest non-buildings of recent years. We could use more of them.





FACTS & FIGURES

Paramount Theater, 2 Gulf & Western Plaza, New York. Owner: Paramount Pictures Corporation. Architects: Carson, Lundin & Shaw (Joseph Marrow and John Hornus, associates in charge). Engineers: Office of James Ruderman (structural); Cosentini Associates (mechanical and electrical). Consultants: John McNamara (theater). Kodaras Inc. (acoustics). General Contractor: HRH Construction Corporation. Area: 9050 sq. ft. Cost (furnishings and equipment only): $125,000.

PHOTOGRAPHS: George Cserna

Entrance kiosk to new Paramount Theater is located at the corner of West 61st Street and Broadway, in Manhattan (see bird's-eye view on opposite page). Sections explain relation of kiosk to underground cinema, shown also at near left. Below: View up Broadway showing the kiosk on the corner of the Gulf & Western Plaza. The base of the new G & W Building is seen at right.

PORTLAND'S WALK-IN WATERFALL

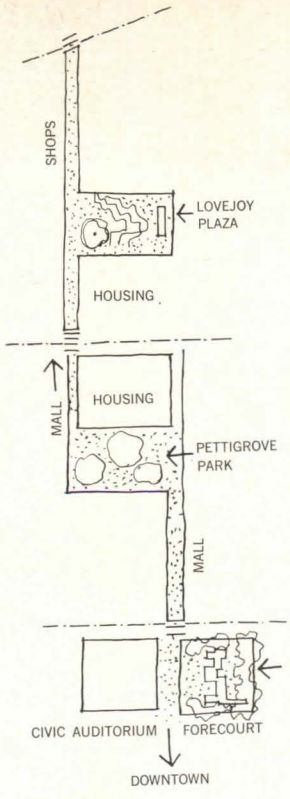
For years, Landscape Architect Lawrence Halprin has been trying to transfer some of the principles of improvisational theater and environmental art into the design of public spaces—which he works out in terms of "scores" for the human activities they are meant to encourage. In the Lovejoy Fountain in Portland, Ore. (July/Aug. '66 issue) he introduced the idea of a public fountain designed for *participation*.

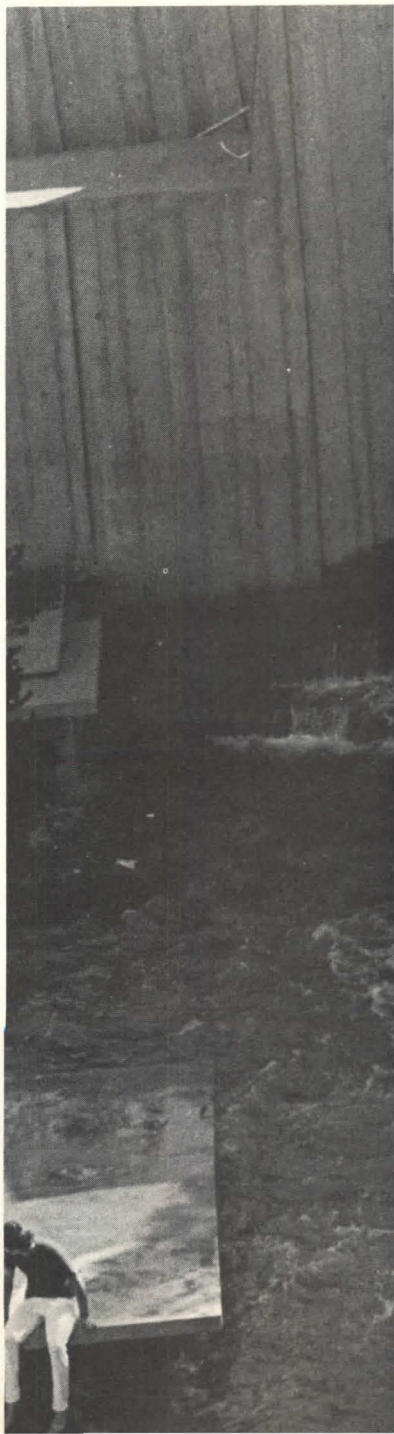
Now Halprin has completed a much larger version of the walk-in waterfall, on a full city block in Portland. In this work, dubbed prosaically the Auditorium Forecourt Fountain, 13,000 gallons of water per minute fall over a series of cascades 20 ft. high and 100 ft. wide—with a roar that blots out all other sound. After a visit to Portland, Architecture Critic Ada Louise Huxtable of *The New York Times* asserted that the Forecourt "may be one of the most important urban spaces since the Renaissance."

One admitted shortcoming is that the space is not adequately defined by surrounding buildings. The only structure with any relationship to the open space is the Civic Auditorium (left in bird's-eye view), which is so bland that it is, paradoxically, no more than an innocuous backdrop for its own forecourt.

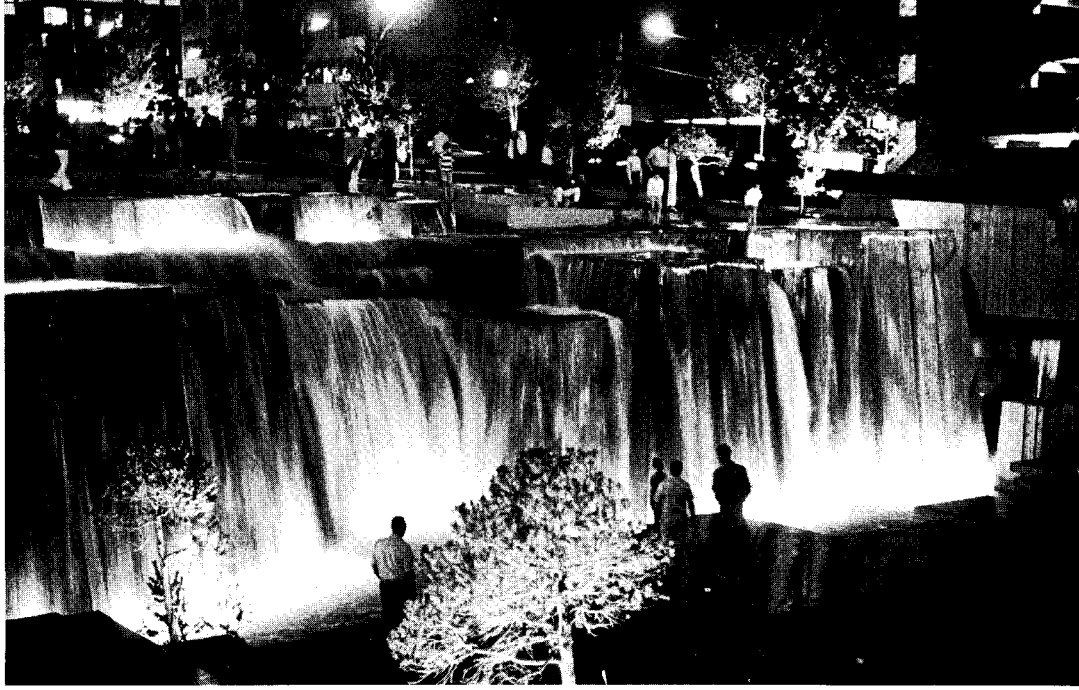
But Halprin was aware of this drawback from the start and designed the space to be effective even without a sympathetic enclosure. Right from the start, however, the Forecourt plays an important part in a sequence of open spaces—a matter of great importance to Halprin. This sequence (plan right) starts in the adjoining Portland Center redevelopment project, where a system of planted pedestrian malls, also by Halprin, link Lovejoy Plaza to Pettigrove Park—a cluster of shady green knolls—and continues on to the auditorium. Even though the Forecourt was not originally part of the plan, it adds to the sequence effectively by repeating the water experience on a larger scale—and in a significantly different form.

Lovejoy was a series of pools rising in the center of a pedestrian precinct, but the Forecourt site is bounded by busy streets, so Halprin dug down instead, creating a refuge from the traffic. And while the Lovejoy fountain twists picturesquely, the Forecourt fountain makes a massive rush in one direction.





The Auditorium Forecourt Fountain occupies a full city block in front of Portland's colonnaded Civic Auditorium (top right) and is linked to a series of earlier plazas and malls (plan above), also designed by Halprin. The water emerges at the uphill end of the site and falls a total of 20 ft. into a pool at the auditorium end, where a series of stairs forms an irregular outdoor theater. Low mounds planted with maples and oaks shield the space from surrounding traffic. Ornamental twisted pines in pockets between the streams (right) are accentuated with lighting at night (top, opposite).



Halprin bases his manipulation of water on the dynamics of mountain streams—not imitating them but using their underlying patterns of motion. At the Forecourt Fountain, water rises in rivulets cut through a concrete plateau at the uphill end of the site, gathers volume, then plunges over a series of parapets varying in height up to 18 ft., ending in a sunken pool.

At each stage in the water play, different kinds of activity are encouraged. On the relatively quiet street-level plaza at the upstream end, elderly people sit and talk and babies dabble in the shallow water. The brink of the falls is obviously for the more adventurous; there is real danger, but anyone who has waded into knee-deep pools to reach the edge is bound to be aware of that. (The city does keep guards on duty, however, to protect toddlers and disoriented drug users.) For those who want to be enveloped by the sound and energy of the water—without necessarily getting wet—there are concrete platforms at the base.

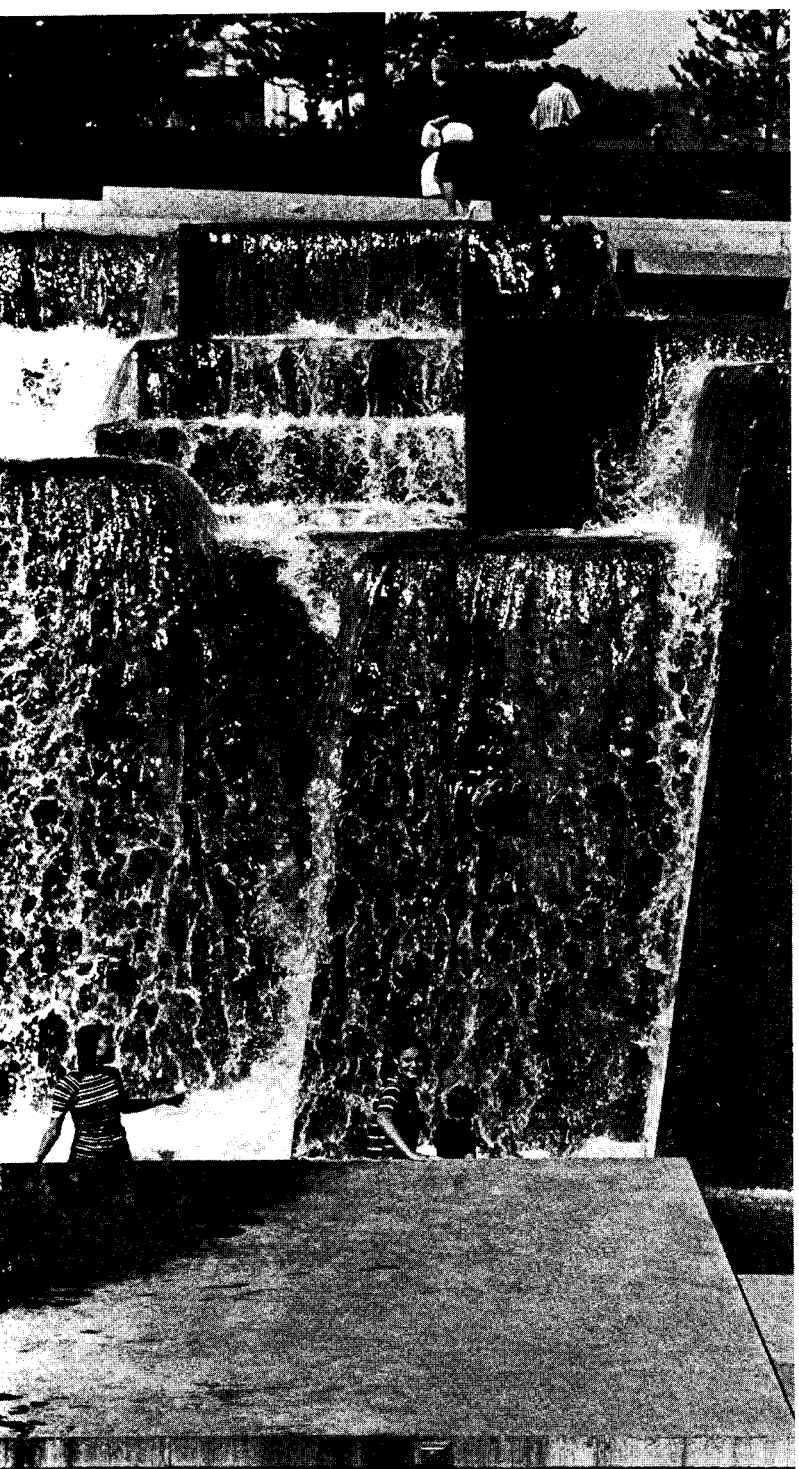
The night aspect of the fountains is, of course, critical, since most of the auditorium's activities take place in the evening. Uplighting is concentrated on the water and on the twisted pines.

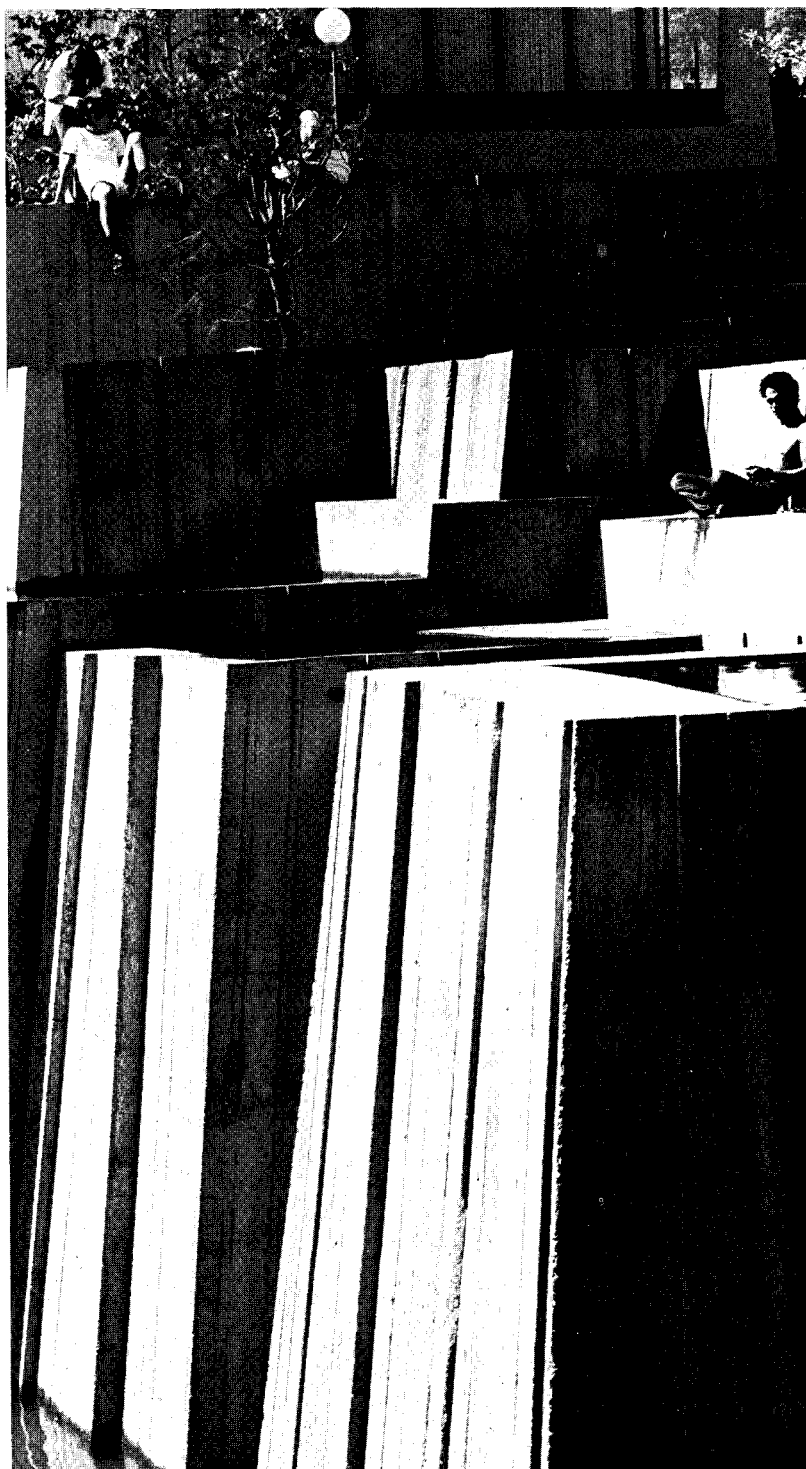
The Forecourt also has to look good when the flow is turned off, as it must be at times—when its filters are being cleaned or when performances take place in the theater-like space in front of the auditorium. (The acoustics are, largely by coincidence, excellent.) On typical days, the water flows from 11 a.m. to 10 p.m. Morning passersby and crowds leaving the auditorium at night see still pools between the boldly ribbed concrete walls. The act of turning on the fountains—shrewdly scheduled for late morning—has become a daily event; crowds, sometimes including busloads of school children, collect at the appointed time and cheer when the water starts to move.

FACTS AND FIGURES

Auditorium Forecourt Fountain, Portland, Ore. Owner: Portland Development Commission. Designers: Lawrence Halprin & Associates (Satoru Nishita, partner in charge; Byron McCulley, project director; Angela Danadjieva Tzvetin, designer). Engineers: Gilbert, Forsberg, Diekmann & Schmidt (structural); Beamer/Wilkinson (mechanical, electrical). General contractor: Schrader Construction Co. Area: 40,000 sq. ft. Construction cost: Approximately $500,000.
PHOTOGRAPHS: Paul Ryan.

Activities in the fountains vary with location and conditions. The green edge at the head of the streams (top photo) invites relaxation and offers small children a place to wade. A stairway of short cascades along one side of the main falls (near right) is a challenge for active children. The pool at the base (middle right) envelops bathers in the roar of the tallest cataracts. In the morning, before the flow is turned on, still pools between the rugged concrete walls (far right) inspire contemplation.





BACK BAY'S SEDATE SQUARE

When Sasaki, Dawson, DeMay Associates won the competition for the redesign of Boston's Copley Square (April '66 issue, page 82), the jury's praise was as elegantly understated as the design itself: "The location of the fountain and pool is sensitively chosen, in relation to the spaces through which pedestrians move. The plan diagram is skillful in scale, suggesting beautiful spaces."

Now, after years of delay, the square is completed. Some of the subtleties of the original design have been lost in the arduous process of bringing it to reality. But the design is still remarkable for the way it draws the disparate buildings around the square into a unified spatial composition.

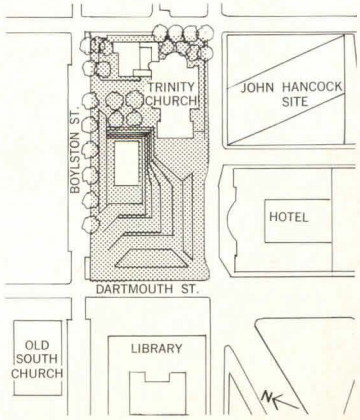
Copley Square is flanked by two of the most revered landmarks of American architecture, H. H. Richardson's massive, picturesque Trinity Church (1877) and McKim, Mead & White's serenely classical Public Library (1887). Between them, there used to be just two triangles of grass (below right), one of them embellished with a floral clock. Little wonder that people shunned the middle of this so-called square.

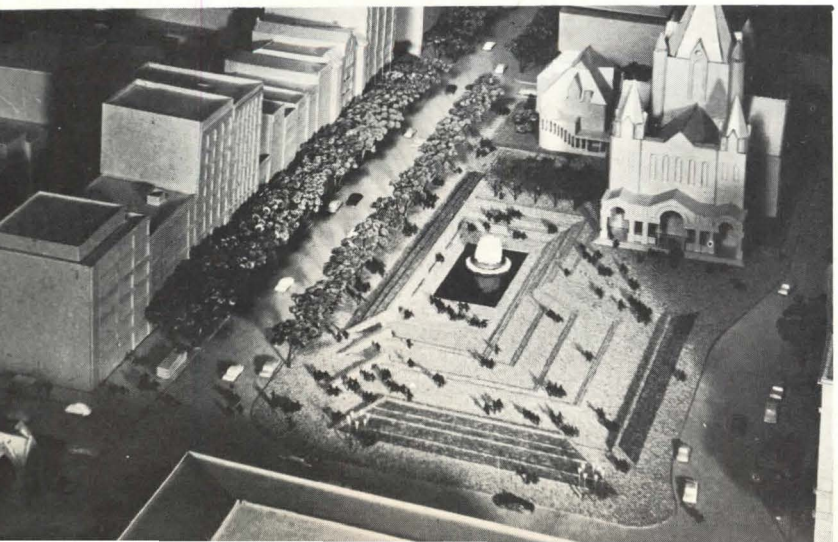
The strengths of the Sasaki design were apparent in the competition model (opposite, below): paved terraces forming an asymmetrical podium for the church; planted banks shielding the sunken center from street activity; entrances placed at the corners, where pedestrians approach; planting concentrated along the north side, where it does not obstruct views of surrounding landmarks.

The weak point of the design was the frugality of its materials. To stay within the $500,000 budget, the Sasaki firm had specified asphalt block for paving and concrete for steps—serviceable materials but somewhat dowdy ones in the company of such richly detailed buildings. The jury, in its report, "hoped that the execution might be done in more substantial materials"—presumably brick and stone.

They hoped in vain, for the city failed to come up with additional money and wasted almost two years on indecision and red tape. Inflation effectively cut the budget by 18 per cent, and the cost of moving unsuspected utility lines strained it further. Even though money was donated for the fountain, it was necessary to

Boston's rebuilt Copley Square (right) is a paved precinct, shielded by low banks but otherwise left open to preserve views of surrounding landmarks (plan below). It replaces a useless stretch of avenue between two forlorn grass patches (below), and follows—in diluted form—a competition-winning design by Sasaki, Dawson, DeMay Associates (opposite, below).





scrimp severely on planting, eliminate benches from the grove next to the church, and reduce the turnaround in front of the church to a featureless slab.

One obstacle the jury could not foresee was the inaccuracy of data on subsurface conditions. A large water tunnel, found to be 1½ ft. closer to the surface than expected, forced modifications in the design. The number of steps between terraces had to be reduced—thus flattening the whole surface—and the enclosing banks had to be raised almost 1 ft. higher than originally planned. This small adjustment significantly reduces the view into the square for automobile passengers and for pedestrians across the street, who see only forbidding banks, spottily planted with juniper.

In time, of course, the planting will grow. The double row of spindly locusts along the north side (city officials vetoed pin oaks) may eventually thicken into the green backdrop that the paved space so badly needs.

One element of the design—the fountain—actually *improved* in the face of obstacles and delays. The conventional fountain pool first proposed could not be built, partly because there was no clearance for its sunken pool, partly because there was not enough money for massed water jets and the controls they require. Instead, the designers raised a small fountain on a concrete pyramid—making the most of a little water by letting it spread across the slopes and roll over the boulders at the bottom.

And during those years of delay the designers had come to realize that a fountain is not just something to look at. They made it easy to wade in the pool here—and challenging, but not hazardous, to climb the pyramid. On hot days, children and adults play under the spilling water, and nobody interferes. For Boston, that marks a significant change in public behavior.

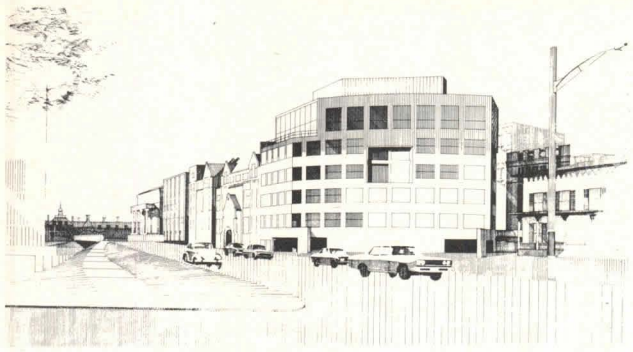
A grove of linden next to Trinity Church (top right) provides a bit of shade but, for the present, no benches. The planted bank and rows of locust along Boylston Street (middle right) will need years of growth before they shade concrete walls and walks. The fountain—the square's big initial asset—looks like a liquid bonfire when lighted from within (bottom right). The flow of water over its concrete surfaces and boulder-lined basin can be either contemplated or actively enjoyed (opposite).

FACTS AND FIGURES

Copley Square, Boston, Mass. Landscape architects: Sasaki, Dawson, DeMay Associates. Consultants: Haley & Aldrich, Inc. (soils); Cleverdon, Varney, & Pike (electrical); William M. C. Lam & Associates (lighting); Fountains, Inc. (fountain). General contractor: D. Antonellis, Inc. Cost: $516,000 (excluding fees).

PHOTOGRAPHS: Hutchins Photography Inc. (except p. 60, bottom, New England Survey Service, Inc.)

MATHEMATICS AT YALE: READERS RESPOND



Rarely does a single building engender the kind of response that has greeted publication of the winning design for Yale's new mathematics building (July/August issue, pp. 62-67). Letters have come from architects who did and didn't enter the competition, and from numerous others who felt strongly enough to send us their views. We asked Charles W. Moore, Dean of the Faculties of Design and Planning at Yale's School of Art and Architecture—and professional adviser for the competition—to respond to certain points raised by readers. (It will be obvious that Mr. Moore is replying in particular to only the few letters that time permitted him to see.)

Forum: When in the latter part of 1963, the Yale School of Art & Architecture was completed and all the media bowed to the newly arrived on the horizon, genius-architect Paul Rudolph, unaccompanied, the writer inspected the much touted building and after some reflections, considered it a miserable failure.

Nearly 3½ years later (*Forum*, July/August '67), Ellen Perry Berkeley described the great Rudolph masterpiece as "a favella, a spontaneous shanty-town." Presently, inspected in August 1970, the A & A Building is a shambles.

After a lapse of three years, Ellen Perry Berkeley writes in the July/August 1970 issue of the Forum about the recently held Yale mathematics building competition, giving the salient facts of the program, quoting the professional adviser and members of the jury, quoting Mr. Venturi, the winner, and concluding with a pious statement that "it is disturbing to see architects so certain of the rightness of their own views that they cannot imagine a jury of integrity choosing another kind of building. It is disturbing too, that their architectural frame of reference has no room in it for a building that may well belong more to its users and its surroundings than have many recent buildings at Yale."

Based on these remarks, it becomes quite obvious that E.P.B. did not study the program carefully nor has she seen the surroundings of the new building site. Had she done so, she would be aware, as many others are, that the professional adviser and the jury ignored the program when Mr. Venturi, a professor at Yale's School of A & A, was allowed to participate in the contest.

His participation was in contravention of the exclusion clause contained in section 4 of the program which states in part: "associates and employees of Jury members and of Professional Adviser and employees or relatives of the Trustees of Yale University are excluded from the competition."

Mr. Moore, the professional adviser and dean of the School of A & A at Yale is a faculty associate of Mr. Venturi, and so is Mr. Scully, a professor of the history of art at the same school.

The exclusion clause was intended to safeguard all contestants against partiality and undue influence; it was intended to preclude a conflict of interests, which alas, was permitted to creep in.

The professional adviser, subsequent to issuing the program, ruled "that for the purpose of being eligible for University work, faculty members are not regarded as 'employees or relatives of the Trustees' and are therefore not excluded from . . . entering into competition for University building," but he did not reflect on the relation of associates on the faculty of Yale's School of A & A, which obviously affects the status of Messrs. Moore and Scully vis a vis Mr. Venturi.

To repeat, if "associates . . . of Jury members and the Professional Advisor . . . are excluded from the competition," how come Mr. Venturi was allowed to enter the contest and win it to boot?

Mr. Christiansen, a member of the Jury is, according to E.P.B., a M. Arch. degree student at Yale. The exclusion clause does not cover this particular situation, but surely a modicum of fairness would establish that this singular relation is not conducive to objective and impartial judgment.

And as to the "building that may well belong to its users and its surroundings," the writer can vouch that the winning design does not accommodate its users well and that the building does not really blend with the fabric of its surroundings, opinion of E.P.B. and the jurors to the contrary notwithstanding.

Some of the other requirements of the program, which the winning design did not resolve are: a) separation between Leet Oliver Memorial Hall and the new building, b) integrity of Leet Oliver Hall, c) access to the new building from Hillhouse Avenue, d) access for the handicapped to all levels, e) separation of undergraduates from graduate students and the faculty, f) an economical building, g) limit of zoning coverage, h) concentration of faculty and assistants in instruction facilities and close proximity to the library and the common space, i) required areas of some 90 rooms and spaces, j) the need for comfortable and quiet faculty studies, k) the administrative offices requirements, l) the common space requirements, m) the lecture halls location and their exit requirements and n) the library requirements.

In a detailed analysis of the winning design, the writer counted some 38 deviations from the

program or malfunctions of the requirements, some of which would make it well nigh impossible to have the new mathematics building constructed as presently designed.

The all-intriguing question is, how in the world did all of this escape the scrutiny of the professional adviser and the jury, which so glowingly and enthusiastically awarded a unanimous verdict in favor of Professor Venturi. The acceptance of the winning design by, according to E.P.B., Yale's president, the provost, the building and grounds department and the development office is yet another reason for questioning the propriety of the entire affair.

Certainly, there is something malodorous at Yale; it prompts the writer to wonder whether it would not be proper at this time to alert the venerable Trustees, so that they upon consideration of all the facts in the case, institute an investigation for the purpose of ascertaining whether the conduct of the professional adviser and the jury was beyond reproach and if found otherwise, to order corrective measures so as to ameliorate the injustice done to the 467 other contestants.

If this were to happen, perhaps the fate of the new mathematics building would not match that of Paul Rudolph's masterpiece.

JOSHUA D. LOWENFISH
Bronxville, N.Y. *Architect*

Forum: No matter how long the article or clever the words the winner is still a piece of Junk.

SAM CARSON
Los Angeles, Calif. *Architect*

Forum: Vincent Scully is quoted as having said that the Venturi & Rauch project "is so much more modest than any of the others." To paraphrase the late Sir Winston Churchill, it has so much more to be modest about.

CONSTANCE STICKLER
New York, N.Y.

Forum: Your comment that the Yale Mathematics Building competition "has major significance for the 1970's" prompts me to wonder if it really might. A significant sponsorship and the rarity of competitions that you point to are factors that should make it so. The pity is that 474 entries (the losers) cannot be surveyed. Surely they must have something to say. In spite of the fact that the program warned that they would not be published, Yale (an educational institution) should be given a plea in their behalf. Fashions change (pace the jury) and that great tome of the Chicago Tribune competition is still a standard reference—not least of all because it presents the losers.

JAMES LAMANTIA
New York, N.Y. *Architect*

Forum: In view of the great interest in the Yale Math Competition among architects throughout the country and considering the premiated designs, I suggest that Forum owes us a look at what the jury had to select from. You have made copy out of a controversial event. If Forum has the intent of serving the profession, show some of the alternatives.

WARREN PLATNER
North Haven, Conn. *Architect*

Forum: In the Yale Mathematics building we encounter the architecture of the absurd. I have a lurking suspicion that Mr. Venturi is putting us all on, and that the gullible, self consciously academic jury members have been seduced by his casual iconoclastic approach. For what does this building represent to the clear-minded architect or intelligent layman?

Here is apparently a brand new building designed to look like an existing renovated old loft building, with maybe a couple of stories added (in different colored brick to give the impression that the "old existing" brick couldn't be matched). Here is evidence of men revelling in mediocrity. Architecture of the Philistines.

To justify this building in terms of its meeting, in general terms, implied program requirements such as simplicity, modesty and directness does not suffice. Architecture must embody qualities such as these, but on a higher esthetic plane than that in evidence here. If this design represents a new architectural millenium, then what's the use of continuing to practice architecture? Why don't we all become technical consultants to contractors who could give form to creations such as this by merely abjuring any tendency toward giving a building character. Around the turn of the century architects got a bad reputation for concentrating on architectural effect to the detriment of function. Now we may get into trouble for just the reverse (if this building does indeed function well).

What ever happened to the venerable goals of commodity, firmness and delight? This building may be commodious, although it seems full of awkward, unpleasant spaces (and not just because they're irregular). The building may be constructible though not, apparently, without contrivance. As far as delight is concerned, I'm afraid that the only delightful aspects of this design are the facts that (1) it isn't any bigger, and (2) there isn't more than one.

ROGER TAYLOR PANEK
Mill Valley, Calif. *Architect*

P. S.: I was not a contestant so this isn't sour grapes.

Forum: Competitions can be a meaningful experience for architects, clients and society in general. However, your article served none of these purposes. The text demeaned all entries except the second stage winner and the illustrations of the four other finalists' work failed to even show the most fundamental drawing of any building, a floor plan. This is all very unfortunate for Forum is the best of the American architectural magazines but it should always aspire to something more than a mere reporting of the new.

MARVIN VERMAN
Philadelphia, Pa. *Architect*

Forum: How refreshing a "Contradiction" to use Robert Venturi's favorite category—to find that the design of Yale's Mathematics Building will now fill a conspicuous gap in her Architectural Collection.

"Choosing a non-monumental building"—"which met all the program requirements down to the minutest detail"—"workable" —"economic"—in fact a good old-fashioned "Functionalist Building" (circa 1925).

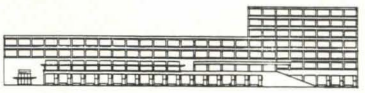
How delightful to find that Vincent Scully's ever ready rhetoric still flourishes in spite of stormy weather. "So intense and so controlled in its attempt to deal with the program"—" a door opening on the future for architecture." This may be quite a shock to some of his students who have seen him keeping this very door steadfastly closed for a decade or two. In any case even if the key has been in strange hands awhile, it is good to have it open again. Never too late to remember. The model suggests that the new Yale building was designed by Connell, Wood and Lucas in the '20s, before "monumentalism" revived by Sigfried Giedion seduced the Scully generation.

I look forward to its completion in my time.

SERGE CHERMAYEFF
New Haven, Conn. *Architect*

Forum: In every boxtop contest, employees are barred from participation—not at Yale.

In every architectural school, NEUE SACHLICHKEIT a la '20s is considered 50 years behind the future—not at Yale.



J. J. Oud, Project for the Rotterdam Stock Exchange, 1924.

In every architectural competition, specifications concerning environmental response must be met by the winner—not at Yale.

Every family affair made respectable by a supporting cast of 479 would treat the losers with gratitude rather than derision—not at Yale, not even by The Architectural Forum.

SIBYL MOHOLY-NAGY
Architectural Historian
New York, N.Y.

CHARLES MOORE REPLIES:

It is always a pleasure to read Chermayeff and Moholy-Nagy opinions. Since their historical perspective exceeds mine by over a generation, a historian's response from me would be presumptuous. I do allow myself, though, a romantic's as well as an historian's pleasure in noting that the Yale Math Building Competition has achieved, for what I believe is the first time, the agreement of Serge and Sibyl. If it has done nothing else, it has perhaps by this accomplishment justified itself.

Mr. Lowenfish's letter, on the other hand, is not so much fun; it would be libellous were it not so inept. But since his accusations could seem at first glance to have some import, they should be answered one by one. First, let me agree with him that the Art and Architecture building at Yale was indeed a shambles last August; but it only seems fair to Paul Rudolph to point out that the fourth through seventh floors of the building had been gutted by fire and were in the process of

being rebuilt when Mr. Lowenfish paid his visit.

Of Mr. Lowenfish's assertion that Robert Venturi was ineligible to enter the Math Competition because he teaches at Yale, all that must be said is that Mr. Lowenfish's own interpretation of the eligibility requirements is different from that of the authors of the program, the professional advisor, and the jury, who accepted entries not only from Venturi but also from another finalist, John Fowler, who has taught at Yale, and from at least one Yale student who is a licensed architect. Mr. Lowenfish's tangential claim that "objective and impartial judgment" would have been maintained by excluding John Christiansen, an architect and advanced student at Yale, from the jury seems idiotic. Why not, in that case, exclude Vincent Scully, who teaches History of Art at Yale, or Edward L. Barnes, who is the campus planner, or Edward Dunn, who is director of Yale's Building and Grounds Planning, or Charles Rickart, the chairman of the math department? Why not, indeed, exclude everyone from the jury—except perhaps someone who might have voted for Mr. Lowenfish's entry?

Mr. Lowenfish obviously has his own strongly felt conception of what the winning solution should have been and is therefore able to "vouch" that the one actually chosen is unsatisfactory. This seems quite simply a difference of opinion, as he himself has indicated. But there are fourteen specific questions that he raises about the success of the winning design in meeting requirements that he takes to have been set out by the program; they are:

a) "Separation between Leet Oliver Memorial Hall and the new building." The program nowhere calls for a mandatory separation of the two buildings; on the contrary, it goes to some length to point out the advantages of some kind of connection, though this is not made mandatory either.

b) "Integrity of Leet Oliver Hall." Perhaps Mr. Lowenfish is confusing Leet Oliver Hall, south of the new building, with the Dana House, which is to the north. In any case no mention is made in the program of preserving the integrity of Leet Oliver, though that is certainly an admirable goal, and one which the jury apparently felt had been achieved by Venturi, who himself has pointed out that his building "could not stand alone without Leet Oliver."

c) "Access to the new building from Hillhouse Avenue." The program states that "it is anticipated that pedestrian traffic flow to the new building will be gradually divided between Becton Plaza and Hillhouse Avenue routes," and Venturi's building can be entered from Hillhouse Avenue by way of Leet Oliver Hall.

d) "Access for handicapped to all levels." It ". . . is desired," the program reads, in the requirements for the remodelling of Leet Oliver Hall. Venturi has provided wheelchair access from Trumbull Street and Becton Plaza, and there are of course elevators to all levels of the new building, and ramps from there to Leet Oliver.

e) "Separation of undergraduates from graduate students and the faculty." This has been achieved; see plans in *Architectural Forum* (July/August, 1970).

f) "An economical building." According to the Office of Building and Grounds Planning at Yale, which made detailed surveys of all five final entries, the winning entry can be built and maintained economically—more economically, in fact, than any of the other four final entries.

g) "Limit of zoning coverage." The maximum allowable was 12,000 square feet; by my count the Venturi building's coverage is under 7,500 square feet.

h) "Concentration of faculty and assistants in instruction facilities and close proximity to the library and common space." This requirement has also been met very neatly around an elevator core; see again *Architectural Forum* (July/August, 1970).

i) "Required areas of some 90 rooms and spaces." The number of rooms set out by the program has been exactly met, except that there are two supply and storage rooms, instead of the one required, and there are only 43, not 50, carrels in the library. The square footages of the rooms approximate within even the most scrupulous tolerances the abstract requirements of the program; for example, faculty offices, which were to have 200 square feet each, have 193; and the undergraduate lecture hall, which was to have 2,000, has 1866.

j) "The need for comfortable and quiet faculty studies." This has been achieved by limiting heavy circulation to the basement and only a part of the first floor, and by allowing most of the faculty offices above to face towards the more residential part of Hillhouse Avenue, a particularly pleasant and reasonably quiet prospect.

k) "Administrative offices requirements." These have been met in number and in space with the accuracy described above, and the rooms have been placed in the basement and on the first floor within the patterns of heavy circulation.

l) "Common space requirements," m) "Lecture Hall location and their exit requirements," n) "Library requirements." All of these have been met in a manner similar to that already described above and apparent from any careful perusal of the final drawings.

In the light of this examination of Mr. Lowenfish's questions I have to conclude that his fears are as bogus as his charges and that his assertion that it is "well nigh impossible to have the new mathematics building constructed as presently designed" absurd. Behind Mr. Lowenfish's charges, however, lies an implication much more worthy of response: that this was an "inside job," that the competition's conclusion was foregone, and that to demonstrate this one had to note only how heavily the jury, the program, and eventually the winner were involved with an architectural persuasion identified with the Yale scene. I think this demonstration would be accurate, but the malodorous implication incorrect. There are, one gathers from the journals, among the many regional and individual styles of architecture now practised in this country probably three which stand out. One is sometimes identified with Chicago and always based on the insights of Mies; another is an academicized and sometimes technicized extension of Le Corbusier, convincingly advocated by Colin Rowe (and these days the most frequent competition winner); a third, first identified with Philadelphia and based on the insights of Louis Kahn, is now much in evidence at the Yale School of Architecture. Almost all of the architect members of the jury for the Yale Mathematics Building Competition, the Art Historian jury member, and the professional advisor have been identified with the latter persuasion. It can then come as no surprise that when this jury found an entry which met the program requirements with unusual felicity and also carried a stylistic message of particular interest to them that they gave it the prize. I could not have predicted that such an entry would be there; but it seems to me a tribute to this jury's connoisseurship that their prize went to such a simple solution instead of to one of the numerous entries which bore a much larger burden of devices generally associated with Robert Venturi's "style."

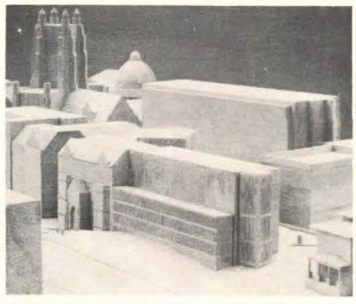
ELLEN PERRY BERKELEY REPLIES:

To answer the reader who finds it "quite obvious" that I didn't see the site, I can say I have known Hillhouse Avenue for almost 20 years; my brother, as a law student at Yale, lived at No. 51 Hillhouse, when that grand house provided quarters for married students. For this article, I visited Leet Oliver for several hours, poking around, walking up and down the street, and probably getting myself photographed by the FBI.

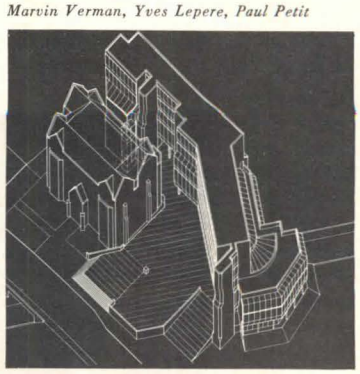
To the reader who sees derision in the article, I can only register surprise. None was intended.

To the reader who argues that the runners-up were given scanty treatment, I must agree. A special apology is due two of the four runners-up; the identification and brief description for the Verman-Lepere-Petit solution was inadvertently switched with that of the Fowler-McGowan solution.

Like many others, I hope there will be a book on the competition, presenting in greater detail than was possible in this journal the results and implications of the competition.



Marvin Verman, Yves Lepere, Paul Petit



John Fowler, John Paul McGowan

FORUM

(continued from page 25)

their construction. This photograph appeared prominently with three other views of the towers in an article in a Spanish publication, and no reference whatsoever was made to them in the extensive copy.

Architect of the redevelopment is Javier Carvajal, the designer of the enormously popular Spanish Pavilion at the New York World's Fair.

EXHIBITIONS

THE JOY BOY

On October 8th an exhibition entitled "The Architecture of Joy: Morris Lapidus" opened at that hotbed of radical thought, The Architectural League of New York. We have asked Ulrich Franzen, the former President of the League, to give us his report —and here it is:

"Once upon a time, or about four short years ago, the Architectural League of New York took a deep breath and plunged into the bright new world of experimentation leaving the recording of conventional achievement to more staid institutions, or so it seemed. After many a bitter confrontation, the Young Turks pursuaded their elders that their hour had struck. For only they knew the course through the multi-media sea since they were anointed with the taste of grass and were raised in the light of flashing strobes.

"This month, the now fully-installed revolutionists are making their trendsetting debut, hoping to send every museum curator into tantrums of despair while collecting the knowing giggles of the INs.

"What we find displayed with radical vigor is an examination of alleged silent-majority taste in architecture. The show gives an all-too-comprehensive impression of the work of Architect Morris Lapidus, the Lawrence Welk of hotel architecture. Small surprise then that the show has been blessed by several aging architects —John Johansen and Philip Johnson among them.

"This show entitled 'the Architecture of Joy' is a fine illustration of the developer's destruction of place and nature. The Miami Beach hotels shown are the common examples of phony settings created to pile up as many dollar-producing rooms and facilities as possible all at the expense of the beaches, nature, and the feeling of a unique place in a subtropical climate. Endorsing this spirit John Margolies, the show's producer, has stated it is time designers gave the people what they want.

"When comparing the Lapidus hotels to the Mauna Kea Beach Hotel by S.O.M. on the island of Hawaii, the contrast is explicit. The Mauna Kea Beach Hotel is carefully sited to enhance a crescent shaped beach. The existing vegetation has been developed as a park, and the interiors capture glimpses of gardens, sky, and sun, as well as spatial sequences designed to exhilarate the guest with an architectural setting that is in harmony with climate and resort.

"The shape of joy as defined by this reactionary show includes samples of bellhop uniforms—Roxy Theater era—as well as selected items of decor, all of which demonstrate about as much wit and invention as a Sears and Roebuck Fall Catalogue. As a Johnny-come-lately Pop Art show, the exhibition misses the energy of Pop Art entirely. The energy of Pop Art lies in viewing it out of context. A hamburger displayed on a sculpture stand against the pristine walls of a museum becomes a powerful device, while on your plate it is just a hamburger.

"This exhibition presents the whole context thereby missing any new information that might have been gained with selectivity. What is documented instead is the most common fact of life in a commercial country, namely that most packaging is designed to create a phony glitter around a worthless product.

"What we are offered at the League is neither Pop nor Folk Art, but a misunderstood effort in the same direction, ten years too late. The show is news indeed for it reveals an aesthetic backlash paralleling the political and social backlash evident in the rampant anti-intellectualism of far right and far left. When the building of sucker-traps, in the name of giving people what they want, is honored by institutions of leadership, we are getting close to trouble. It is, after all, a time of an unprecedented human and environmental crisis, and a show by young activists which says only 'Look Ma—I am still with you,' is simply leading from the rear."

SOM courtyard in Hawaii (left); Lapidus lobby in Miami (right)

HOUSING

HUD VS. NON-PROFITS

A memo circulated for final approvals in the U.S. Department of Housing and Urban Development has caused a massive outcry from minority and community groups alleging that HUD is trying to limit non-profit housing sponsorship. Attributed to the office of Eugene Gulledge, Assistant Secretary for Federal Housing Production, the memo would change the criteria for qualifying non-profit mortgagors. Gulledge has denied seeing it before it was circulated and leaked.

According to Roy Wilkins, executive director of the NAACP, the new policies, if effected, would "remove upwards of 90 per cent of presently eligible sponsors from HUD's non-profit housing programs, most of whom are minority groups or racially

PHOTOGRAPHS: Page 24, Gil de Vega (top); Peter Britton (bottom). Page 25, Arriba (right). Page 67, Bruce Davidson © 1966 Magnum Photos (left); Ezra Stoller Associates (right).

integrated." He further called the new requirements "ill-timed and ill-advised" and requested HUD to "abandon this clearly repressive approach before great harm is done."

The memo includes the following requirements:

- To be eligible for 100 per cent mortgages, non-profit sponsors must include such social services as day care centers, social and job counseling, provisions for the elderly, etc. in their plans. Without these, they could obtain mortgages for only 90 per cent of a project's estimated replacement value.
- Non-profit sponsors must place in escrow construction capital equal to 2 per cent of the mortgage amount. Such funds must be obtained from a disinterested source only.
- Operating capital requirements would be left to the discretion of local offices.

In a letter of protest, Wilkins analyzed these sections in order, writing:

- There is "no evidence that similar requirements for social services will be imposed on profit-making concerns, although the same disadvantaged families will live in the housing."
- The new construction capital requirements would require an estimated $20,000 for a 50-unit project and up to $120,000 for an economy 300-unit project. "Non-profits simply do not have access to such funds." As for disinterested sources of funds, Wilkins asks, "Does any such animal exist?"
- Operating capital requirements should not be subject to local offices' discretion because many "have demonstrated hostility to non-profits and minority groups."

These and other provisions of the memo, including the implied loss of federal start-up funds, were also criticized by the National Urban Coalition, the National Association of Real Estate Boards and many other such groups. Most of them have now banded together to initiate legislation that would prohibit future administrative action against non-profit housing sponsorship.

Gulledge, former president of the National Association of Home Builders, has been the center of such controversy before. Last spring, rumors that he would try to curtail the activities of non-profit groups caused HUD Secretary George Romney to deny such policy at HUD and to allege that Gulledge had been misquoted.

As for the recent memo, the unofficial word is that it has been withdrawn.

PEOPLE

PLANNER DIES IN AIR CRASH

Clarence Funnyé, 38, architect and planner whose articles "Deghettoization" (April '69 issue) and "Zoning: The New Battleground" (May '70 issue) have stimulated and enlightened the readers of the Forum, was lost over South Carolina on August 3 while piloting his small plane home to visit his parents in Georgetown, S.C. An extensive air search was made in the 60-mile corridor between his last stop (Florence, S.C.) and Georgetown, but family and friends in Georgetown charge that local authorities did "practically nothing" about a ground search because both Funnyé and his companion were black. Their bodies and the wreckage of the plane were found on September 19, in dense woods five miles outside Georgetown.

Dr. Funnyé's first academic degree was in architectural engineering from N.C. State University; he went on to a master's degree in city planning at Pratt, and this past year completed his doctorate in planning. Until recently, he served as director of planning for the National Committee against Discrimination in Housing. He opened his own planning office this past year, and was also lecturing at Pratt. He had served on the board of directors of Planners for Equal Opportunity for several years, and this year became the third black man elected to the board of the American Society of Planning Officials.

Clarence Funnyé

An articulate man, Clarence Funnyé spoke out strongly on the issues as he saw them. He believed steadfastly in racial integration, not separatism, at a time when it would probably have been easier for him to go along with the new movement than to stand up for a belief grown (in some circles) unfashionable. He had his own style and his own mind.

DEATHS

- Cecylja B. Rother, executive secretary of the National Institute for Architectural Education (NIAE), died in August. She was 73.

For over 50 years, Miss Rother was a leading figure in U.S. architectural competitions as an officer and a principal fund-raiser for the Beaux Arts Institute of Design, a precursor of the NIAE and a very important force in its time. During those years many obscure young architects gained national prominence through the Beaux Arts Institute's many competitions.

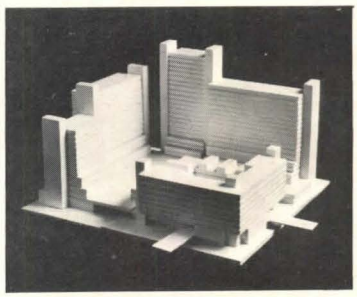
- Robert Brownjohn, who died in London a little over a month ago, at the age of 46, may have been the most talented student ever to have graduated from Chicago's Institute of Design. A partner in the firm of Brownjohn, Chermayeff & Geismar before he moved to England, Brownjohn designed everything from exhibitions to packs of cigarettes, from book jackets to the titles for James Bond thrillers. (He even acted in some of those, wearing a beat-up trench coat and a sneer.) His death was a painful loss to the world of design, and to those who knew him.

AWARDS

The first recipient of the Thomas Jefferson Award for Architecture, established this year by the Bricklayers, Masons & Plasterers International Union, is Architect Ulrich Franzen. The award is to be given every two years as "tangible evidence of the concern felt by masonry craftsmen over the need to improve our environment."

Franzen accepted the award Aug. 31 at the union's convention in Washington. But accompanying the award was a prize of $5,000, and Franzen had decided to donate his prize money to help encourage young blacks to become apprentices in the building trades unions. So Bayard Rustin, executive secretary of the A. Philip Randolph Institute, accepted the donation in behalf of his organization's "Outreach" program.

COMPETITIONS



Denver winner by RTKL

RTKL Inc., architects and planners, have won a design competition sponsored by the Denver Urban Renewal Authority for a $20-million project that will include highrise apartments, a 400-unit motor hotel, shops, a restaurant, a recreation center, and an office tower built on air rights over the street. There will be major plazas on the grade level and on the second level, where a pedestrian walkway system will link this 1½-block area to adjoining developments.

RESIGNATION

Burnham Kelly, long a member of the Forum's Board of Contributors, last month announced his resignation as Dean of Cornell's College of Architecture, Art, and Planning. He has held that post for ten years, and feels that the time has come for him to return to research and teaching. His resignation becomes effective at the end of the current academic year, and he is expected to continue as a member of Cornell's faculty.

ANNOUNCEMENTS

The first Industrialized Building Exposition and Congress will be held Nov. 3-6 at the Louisville, Ky., Convention Center. Keynote speaker will be HUD Secretary George Romney.

Other speakers will include HUD Assistant Secretary Harold Finger, who is in charge of Operation Breakthrough; industrialized systems builders from here and abroad, many of them Breakthrough winners; legislators; zoning experts, educators; and representatives of building trades unions and minority organizations.

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SAFDIE TEAM 10 SOLERI

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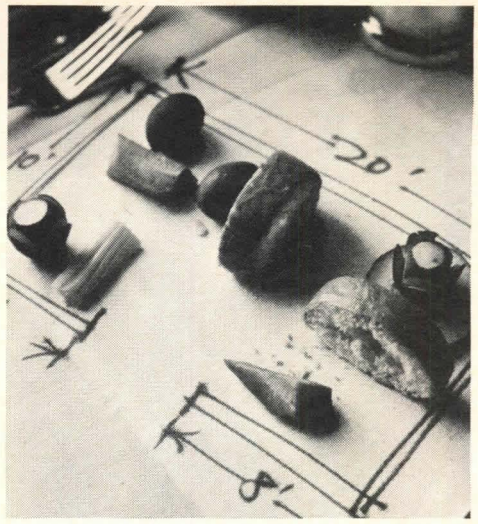

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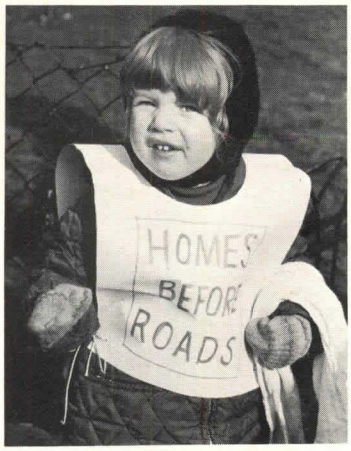
BOOKS

MOTORWAYS IN LONDON. Report of a Working Party led by J. Michael Thomson. Published for The London Amenity and Transport Association by Sage Publications, Beverly Hills, Calif. 194 pp., $7.50.

REVIEWED BY SHADRACH WOODS



This child accompanied her parents to a rally in London before the election. Their party, "Homes Before Roads", put up 80 candidates but won no seats. It was the first consumer-oriented party ever organized in England.

Ever since the advent of the first limited-access road, which was the logical expression of a massive 10-fold increase in the speed of non-tracked transportation, people, some of them professionals involved in planning and building, have had some serious reservations about the social and economic implications of government funding of urban expressways. These doubts, variously expressed or repressed at first, have been continually growing and coalescing to form activist anti-highway lobbies in many countries, often associated with groups propounding other anti "progress" points of view. They have more often than not been ineffectual, although a few impressive kills have been credited to them, such as the Embarcadero Freeway (whose cadaver remains to terrify us with thoughts of revival), and the Lower Manhattan Expressway (which has a long history of death and resurrection). They are often frustrated in their legitimate concern, and this reflects to some extent their inability to muster solid evidence for their arguments, however convincing these may seem at an instinctual level.

In fact, the whole business of public spending on limited-access roads has been, and continues to be, a surprisingly irrational activity, surrounded by mystification and cant, with the arguments of proponents and opponents alike being fairly matched in their disdain for logical development. Thus we have the highways fraternity cloaking an activity which is often extremely offensive to the physical environment in the mantle of "National Defense", presumably acting on the theory that a good offense is the best defense. Thus we have freaky groups opposing all highways without discrimination, thereby devaluating the legitimate arguments which might be made against specific instances of road-building. It often seems that there is more sentiment than good sense involved, on both sides of the question. The Department of Transportation (DOT) needs to make clear, to itself and to us, its reasons for pursuing a program which is on a level with the moon shot as far as spending goes, and we need to make clear our reasons for opposing some or all of the elements of that program. The two sides do not however dispose of equal resources. The adversaries can never match the vast financial power of the advocates of highway construction. They must seek then to institute processes where the resources of the government can be used for investigation and evaluation, rather than for the justification of dubious decisions.

"Motorways in London" is the report of a working party of experts, organized by the London Amenity and Transport Association (LATA) and led by J. Michael Thomson. The purpose of this group was to inquire into and assess the Greater London Council (GLC) proposals concerning transport, as presented in the Greater London Development Plan. As might be expected in a consumer-directed bureaucratic society, they found the same depressing inversion of priorities with which we have become familiar in America. Lip service is paid to the pressing need for improvement in the public transportation systems and equipment while vast sums are budgeted for urban expressway construction. The social impact and economic implications which were ignored in the Plan do not escape LATA's working party, however, nor do the absurdities inherent in an unbalanced system such as that proposed by the GLC.

The LATA report is an extremely well-structured document. It will no doubt be taken as a model for similar investigations in other cities which are faced with the problem of deciding what direction to take in planning for transportation improvements consequent to urban growth. Although it does not draw any sharply defined conclusions about London's problems, it does succeed in putting the motorways proposals into a proper perspective, relating them to other transportation options and to existing or prospective technology, as well as to a general planning strategy which needs to account for the distribution of activities over the metropolitan region, and for expected social and economic effects of transportation policies. It is especially significant to see a place proposed, in the cost-benefit analysis of highway *proposals, for* imponderables such as amenity and social disruption. The wanton disregard for imponderables has too long exposed us to the harmful effects of ill-considered decisions.

This report also makes the point that many real costs which are directly attributable to urban expressway construction, such as environmental impact with attendant loss of the best use of property, the effect of subsidized competition on public transportation systems, and costs from injuries and deaths, are in fact excluded from cost-benefit computations, thereby producing a biased analysis. It suggests that even without these costs which, though real, are most difficult to assess accurately, most inner-city motorways would sustain a loss if toll charges, covering the costs of building and operating them, were imposed, whereas under the same conditions public transport systems would generally show a profit.

We hope that public transport, as well as anti-highways lobbies will take the time and trouble to read this report, and will consider the application in the American context of some of the principles of evaluation outlined in it. We also hope that DOT will reflect on the many excellent suggestions which it contains, and perhaps reconsider in this dispassionate light the priorities which are revealed in its proposed budgets for highways and public transport, and which currently run at more than 4 to 1 in favor of highways.

The report is often tedious to read. It is written in that curiously non-communicative language which technocrats working in commissions tend to produce, and which seems destined to be read only by other technocrats, or optical scanners. Perhaps, like the phenomenon which it surveys, it *generates its own congestion.* However, all those who question present highway construction and public transport policies, i.e., most of us who are concerned with urban dvelopment, would be well-advised to study this report carefully, not only for the methodology which will be useful to us, but also for the hope and confidence which it conveys.

Shadrach Woods, who was long associated with Le Corbusier, has practiced architecture in France and in Germany, before returning to New York to open an office in partnership with Myles Weintraub. His work includes the new town of LeMirail, near Toulouse (June '63 issue), and the Free University in West Berlin.

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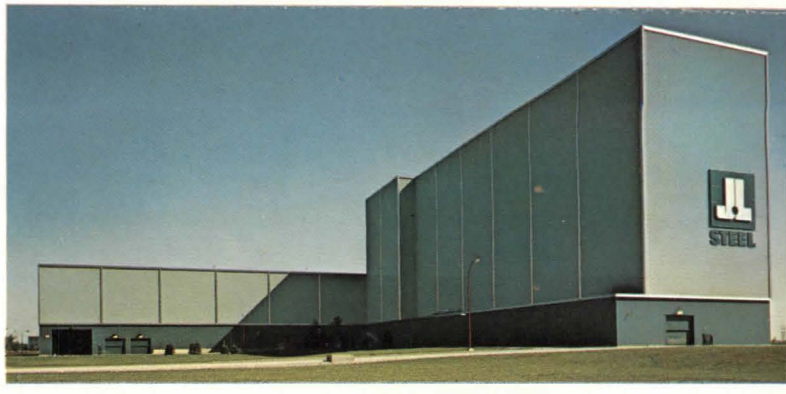

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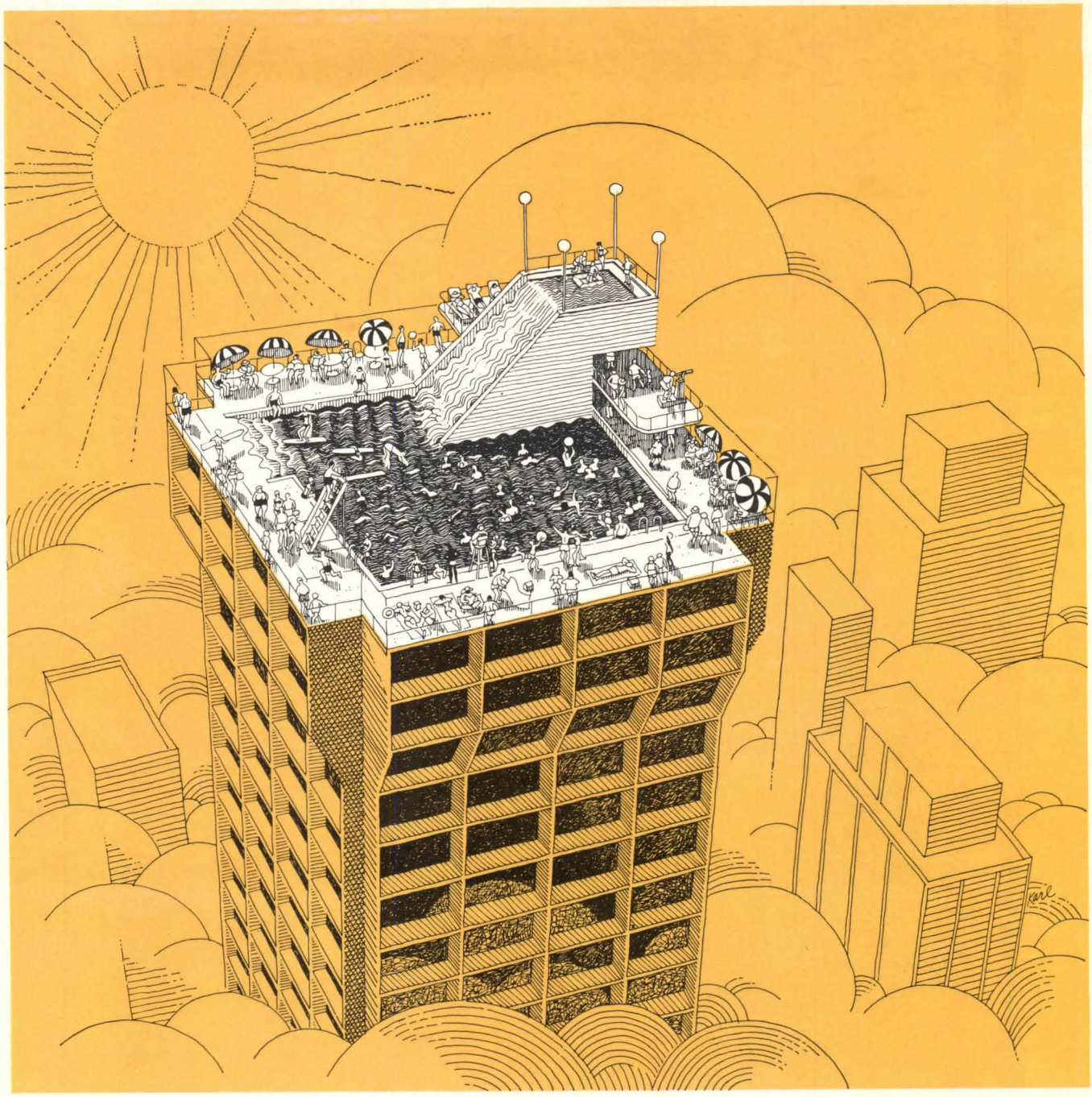

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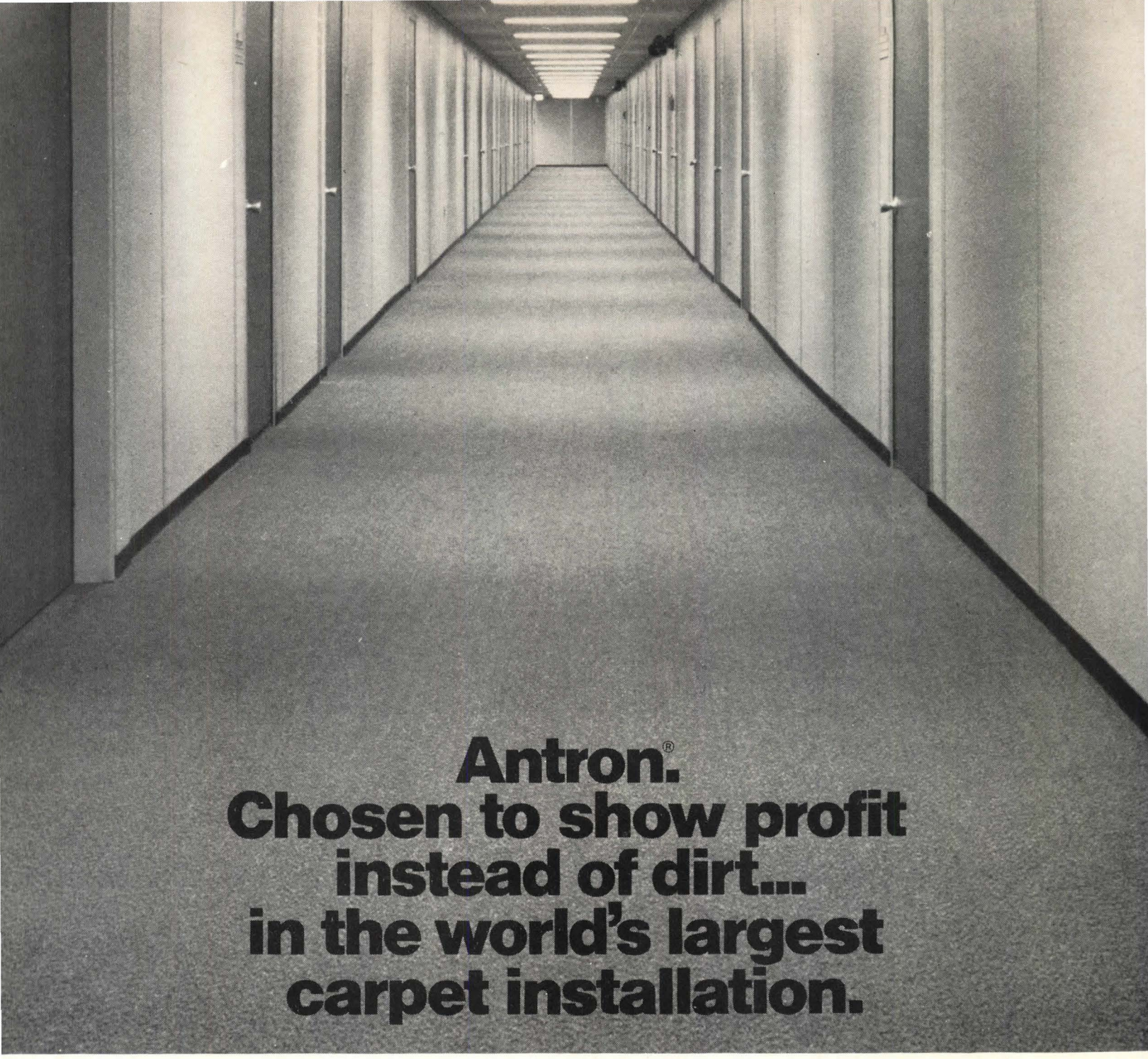

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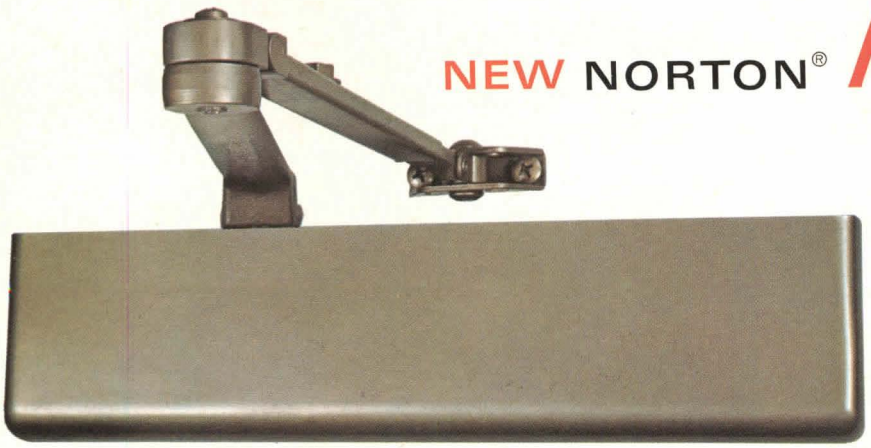

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Contemporary, narrow-projection styling to meet the needs of today's architecture . . . today's decor. With covers; in anodized bronze, brass or clear aluminum; in 67 exotic and native woodgrains for on-the-job finishing; plus all other popular finishes.

For fine-tuning its power to the environment, a plus or minus 25 percent spring power adjustment. For exact control despite traffic abuse, a new rack-and-pinion design and adjustable-backcheck protection for all types of mounting. For easy application, non-handed installation. Just specify regular arm, parallel arm, or top-jamb mounting.

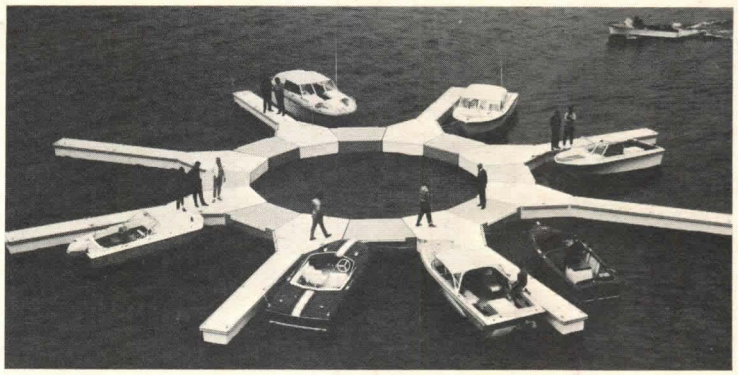
A new Norton closer, designed for today's architecture.

7700 R

EATON YALE & TOWNE INC.

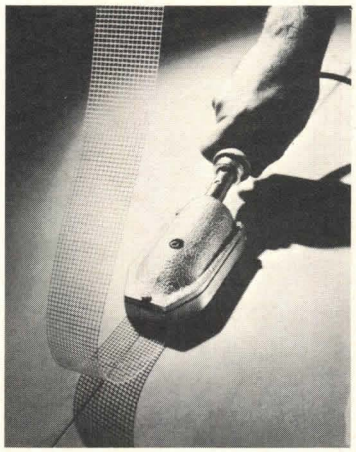
NORTON DOOR CLOSER DIVISION
372 Meyer Road, Bensenville, Illinois 60106
Also Available in Canada.
On Readers' Service Card, Circle 222

PRODUCT REVIEW



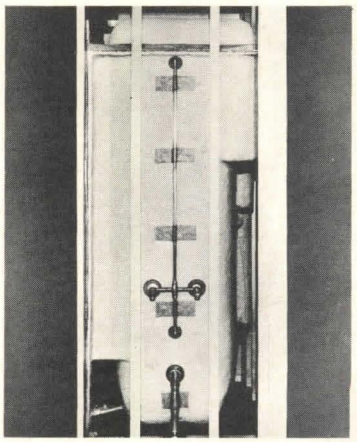
LIGHTWEIGHT MARINA

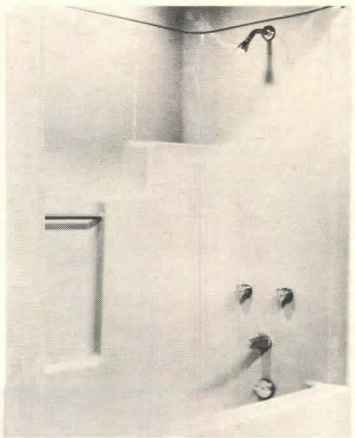
"Harbor Host," a modular floating docking system, for up to 48-ft. boats, is designed to withstand 120-mph winds and 6-ft. waves. The modules are made of fire-resistant fiberglass, steel reinforced and filled with polyurethane foam. The system—a basic, paddle-shaped float, plus space floats and "straight" extension and walkway floats—can be arranged in unlimited patterns. Contact: ABC Marine Enterprises, 201 East Ogden Ave., Hinsdale, Ill., 60521



DRYWALL FINISHING

A new system reduces from days to hours the amount of time needed for joint treatment of gypsum wallboard. "Thermo-Weld" consists of 1½-in.-wide glass fiber mesh tape, which is coated with a thermosetting adhesive, and an electric iron, or "activator," makes the tape adhere firmly to the wallboard. A quick-setting compound is then applied to cover the tape. Panels can be moved before the joints are dry. Contact: National Gypsum Co., 325 Delaware Ave., Buffalo, N. Y., 14202





TUB AND WALL SYSTEM

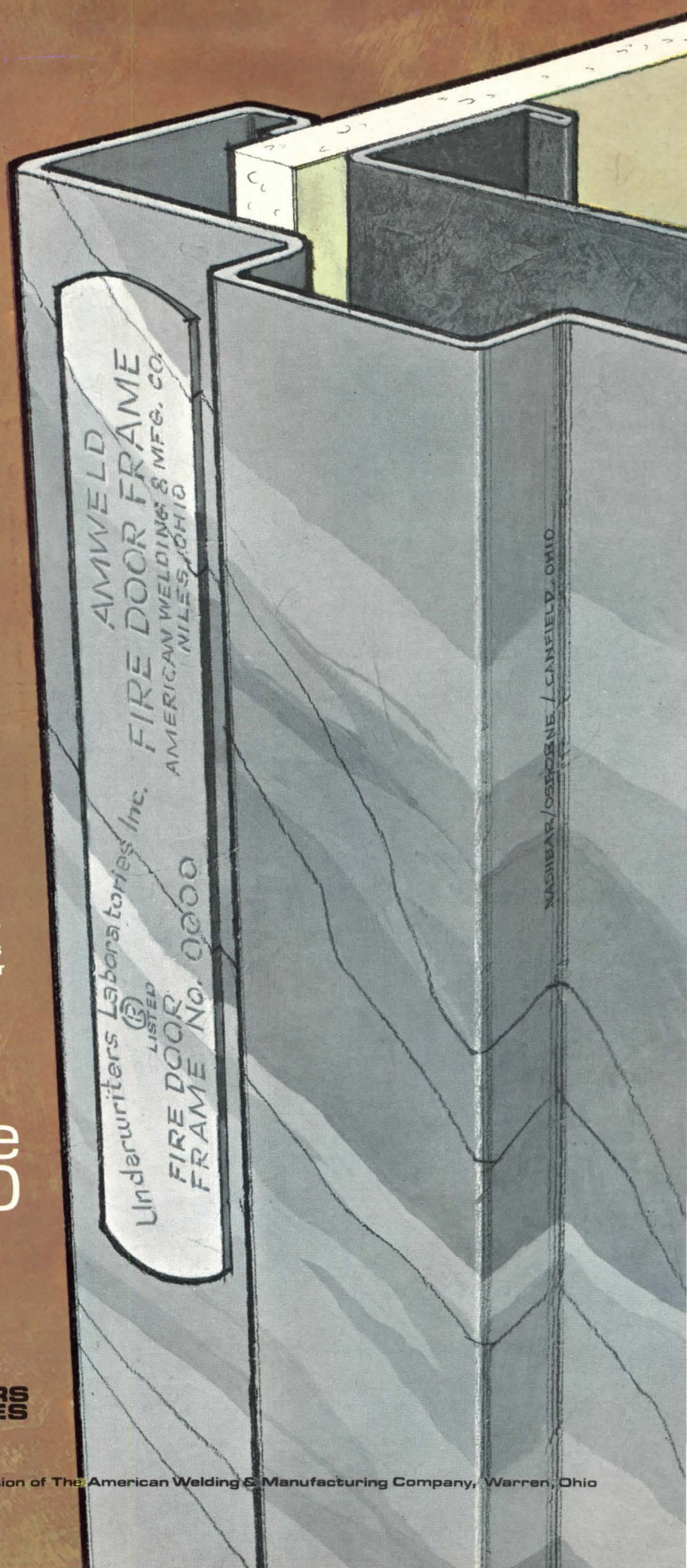
A completely preplumbed, one-piece fiberglass tub and wall system features a factory-mounted drain and overflow; finished trim (factory or site-installed); and off-the-floor rough design. The manufacturer claims that the unit can save over $15 per unit in installation costs and two hours of plumbing time. It also claims that the unit eliminates the need for field inspection and minimizes the need for skilled laborers. Contact: Universal-Rundle Corp., New Castle, Pa.

(continued on page 85)

THAT LITTLE LABEL

Now Available on Amweld's Drywall Frame

That little label signifies Amweld's Series 600 Frames will endure the ordeal by fire without flinching. It was earned in the cruelest tests for performance under intense heat devised by dispassionate engineers in the Underwriters' Laboratories. For architects, builders and specifiers, the message rings clear—You can count on Amweld's integrity in adversity. Because the frames remain true, doors can swing open easily for the quick exit essential to saving lives in fires. That little label reinforces Amweld frames' other persuasive qualifications: Speed, four-minute assembly by one man after the wall is up; Versatility, can be used anywhere gypsum wallboard goes; Adaptability, lock onto rough wall edges and over most any finish, whether vinyl, fabric, synthetic or paper, and without leaving annoying gaps. Specify the Amweld Series 600 Drywall Frames for your next garden-type or high-rise apartment, motel or office building. They're fire-safe, as UL is our witness. For full details, check the Yellow Pages under "Doors—Metal" for Amweld distributors, or write directly.



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AMWELD® METAL DOORS AND FRAMES

725 PLANT STREET, NILES, OHIO 44446 · A division of The American Welding & Manufacturing Company, Warren, Ohio

On Readers' Service Card, Circle 224

READERS SERVICE FILE

PRODUCT LITERATURE

To order material described, circle indicated number on self-addressed Reader Service Card, facing page 84.

DOORS/WINDOWS 601

Pre-cured, expanded Foam Core Door. Available in full-flash and seamless styles. Limitless variety of hardware applications. Complete details in 8-page brochure. Amweld Building Products. On Reader's Service Card, circle 101.

Announcement brochure of new Sliding Door which eliminates all tracks or grooves. Shows installation method and hardware requirements. Bara Industries. On Reader's Service Card, circle 102.

New four-page bulletin describing the Clark Shock Absorber Door, a double acting door designed to withstand many years of daily punishment by fork lift trucks. The illustrated technical bulletin provides detailed data on the door's uses, construction, sizes, limitations, installation, guarantee and maintenance. Clark Door Co. On Reader's Service Card, circle 103.

Jamolite, durable lightweight doors for food service applications described in full color bulletin. Shows technical details and colors available. Jamison Door Co. On Reader's Service Card, circle 104.

Catalog includes technical information on LOF glass; includes VariTran® and Vigilpane® SA 68. Libbey-Owens-Ford Co. On Reader's Service Card, circle 105.

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 106.

4-page performance data sheet details acoustical, visual and structural characteristics of Acoustic Twindow® new environmental control window unit, for noise applications reduction. PPG Industries, Inc. On Reader's Service Card, circle 107.

Plexiglas in Architecture-24-page full-color catalog shows full range of architectural uses for acrylic sheet: glazing, fascia, sunscreens, domes. Rohm & Haas Co. On Reader's Service Card, circle 108.

Metal Doors & Frames from Steelcraft shown in detail drawings, gives size availabilities and spec. data. Steelcraft Manufacturing. On Reader's Service Card, circle 109.

ELECTRICAL 602

Series of 6-color brochures showing elevators for many different building types. Cab designs, dimensions, freight elevator information are all part of the package. Dover Corp. Elevator Div. On Reader's Service Card, circle 110.

4-page 4-color brochure on Norelco intercom systems. Describe applications and features. Philips Business Systems, Inc. On Reader's Service Card, circle 111.

FLOOR COVERING 604

"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 112.

The 16 page catalog contains full color illustrations of all colors and patterns of Azrock vinyl asbestos floor tile, Azrock asphalt floor tile, and Azrock feature strip and cove base. Also included are information on sizes gauges, uses, recommended installation, light reflectance values, and brief specifications guide. Azrock Floor Products. On Reader's Service Card, Circle 113.

Full-color 16-page catalog illustrating many of the 150 parquet floor patterns in Thai-Teak. Complete technical specs and installation details included. Bangkok Industries. On Reader's Service Card, circle 114.

ANTRON II the no-show carpet fiber fights dirt not profits. This new brochure designed to guide specifiers in specifying right fiber and fabric for installation being considered. Particular emphasis on ANTRON II carpet fiber and profits. E.I. DuPont de Nemours. On Reader's Service Card, circle 116.

Color brochure showing complete line of GAF vinyl asbestos tile. More than 22 patterns featured and 100 different color combinations, including new 1970 index tile introductions, Ankora and Casablanca II GAF Corp., Floor Products Div. On Reader's Service Card, circle, 117.

Bruce Plank Floors color brochure shows several styles of solid Oak planks in random widths. Prefinished or unfinished. Distinctive floors for special rooms in commercial, institutional and residential applications. Greenhaw & Rush, Inc. on Reader's Servce Card, circle 115.

Complete catalog file in true color reproduction is available for LATCO featuring specialty and popular mosaic tile such as: Venezico, Valencia, Granada, Candysticks, many others. Latco Products. On Reader's Service Card, circle 118.

Handsome, colorful, fact-filled folder on Acrilan 2000 and acrylic carpet fiber. Gives information on static electricity, maintenance thermal insulation and flammability from Monsanto on Reader's Service Card, circle 119.

A new full color brochure describing many advantages of a Signet Seamless Flooring System. Products Research & Chemical Corp. On Reader's Service Card, circle 120.

FURNISHINGS 605

Full-color brochures on all types of protection systems—physical and electronic. Discusses protection of records, cash and valuables, building perimeter, etc. Mosler, An American-Standard Co. On Reader's Service Card, circle 121.

New 8-page full-color brochure of Emeco Contour Chairs. Features executive, secretarial and guests chairs for luxury, distinction and comfort. Emeco Industries, Inc. On Reader's Service Card, circle 122.

Full line furniture catalog 1-71 available from Fixture Manufacturing Corp. on Reader's Service Card, circle 123.

Handsome, full color, 36-page catalog showing world's broadest line of bathroom cabinets, mirrors and accessories. Shows details and specs. Grote Mfg. Co. On Reader's Service Card, circle 124.

New Lyon catalog #100-V contains photographs, drawings and detailed specifications for the entire Lyon Line of over 1600 steel equipment items for business, industry and institutions. Numerous suggestions for product applications and "in use" photos of equipment installations are also included. Lyon Metal Products, Inc. On Reader's Service Card, circle 125.

Outdoor furniture by Troy shown in colorful catalog from The Troy Sunshade Co. Illustrations show commercial and institutional use. Troy Sunshade Co. On Reader's Service Card, circle 126.

HARDWARE 606

"Electrac by Kirsch. 12-page full-color brochure with complete technical information on linear motor-powered drapery traverse rod. Kirsch Co. On Reader's Service Card, circle 127.

Fire control devices—8-page 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 128.

1970 Condensed Catalog. New 20-page catalog describes full line of advanced architectural hardware including specs and function charts. Sargent & Co. On Reader's Service Card, circle 129.

HEATING/AIR CONDITIONING 607

Details on Series 16.
Self-contained Nelson/aire airconditioners. New Series 16 designed for use in dormitory rooms, hospital and nursing home rooms, hotel-motel rooms, etc. Department J-103 American Air Filter Co. On Reader's Service Card, circle 130.

New Dunham-Bush consolidated catalog lists airconditioning line. 12-page catalog lists all D-B airconditioning components. Unit descriptions, dimensions and performance data clearly presented Dunham-Bush, Inc. On Reader's Service Card, circle 131.

Catalog AT 770 fully illustrates and describes the new ADAPTA-TEMP rooftop heating — cooling — ventilating

equipment. Catalog lists standard and optional features, performance and selection data, and operation information. Mammoth Div. of Lear Sigler, Inc. On Reader's Service Card, circle 132.

Elements of efficient clean room design and contamination control given in new 16-page bulletin from Weber Environmental Systems. Details of major clean room components and complete general specs included. Weber Showcase & Fixture Co. On Reader's Service Card, circle 133.

LIGHTING 610

A new 8-page catalog, showing many new architectural and engineering innovations for the lighting field has just been issued by the Devoe Lighting Corp. The catalog will assist the architect and designer in designing their own concepts by use of modifications. It, also, lists the new use of mercury lighting for indoor and outdoor applications. Devoe Lighting Corp. On Reader's Service Card, circle 134.

Attractive full color catalog of COMPAC-ceiling system for control of lighting, acoustics and air supply and return. Gives full particulars. Emerson Day Brite Lighting Div. On Reader's Service Card, circle 135.

New 124-page catalog of modern lighting and lamps, award winning lamp and lighting designs (commercial and residential) by leading architects shown in detail. Koch & Lowy, Inc. on Reader's Service Card, circle 136.

Execuline-simple versatile and decorative. A new completely coordinated lighting system. Specification features, ordering information and accessory information shown in new colorful catalog from Lightolier. On Reader's Service Card, circle 137.

Handsomely illustrated new brochure showing world wide installations of Venini specially designed lighting fixtures. Venini. On Reader's Service Card, circle 161.

MASONRY 611

Full color, 16-page book. Theme color, texture, scale and pattern—covers broad range of SPECTRA-GLAZE glazed Masonry applications. Includes scored, design and standard series. Also installations, details, technical data, spectacular color chart, etc. Lists world-wide manufacturers. The Burns & Russell Co. On Reader's Service Card, circle 138.

Four-page photographic and text feature "New Artistry in Concrete" shows seven recently completed structures in U.S. and Canada. All seven buildings are noted for their uncommon design. Master Builders. On Reader's Service Card, circle 139.

METALS IN BUILDINGS 612

Spec-Data Sheets. Alliance Wall porcelain-on-steel building panels with 1½ hour fire ratings. Contain technical info, maintenance, installation and cost details. Alliance Wall Corp. On Reader's Service Card, circle 140.

Information and literature, 16-page full color brochure, USS COR-TEN Steel, the original weathering steel. United States Steel. On Reader's Service Card, circle 141.

COATINGS 614

Color card and full information on stains. Samuel Cabot, Inc. On Reader's Service Card, circle 142.

Sealtight Catalog No. 8, containing comprehensive product information and application information on insulations—underlayments—W. R. Meadows, Inc. On Reader's Service Card, circle 143.

Stain samples on wood: AIA information manual and 16-page Stained Wood Idea Book. Olympic Stain Co. On Reader's Service Card, circle 144.

PLUMBING EQUIPMENT 615

12-page 2-color catalog shows American's complete line of laundry machinery. American Laundry Machinery Ind. Div. McGraw-Edison. On Reader's Service Card, circle 145.

Illustrated brochure shows refuse packer for commercial, industrial and institutional use. Details and specifications included. E-Z Packs Co. On Reader's Service Card, circle 146.

Comprehensive 4-page 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 147.

Full-line catalog for architects and builders describing general design and operation of WASCON waste control equipment. Gives details and specs on Compact Package Systems, Remote Systems for general waste handling, Food Service Systems, etc. Wascon Systems, Inc. On Reader's Service Card, circle 148.

ROOFING/SIDING 616

8-page color catalog showing preformed roofing and siding panels. Shows insulated and non-insulated panels, technical details, available accessories, and colors of vinyl finish and complete architectural specs. Glaros Prod. Inc. On Reader's Service Card, circle 149.

STRUCTURAL 617

Full catalog of Armco joists in Eight series. Gives full technical details. Armco. On Reader's Service Card, circle 150.

Macomber, Inc., announces new eight-page, two-color PANELWEB Design Manual. Catalog includes installation details, dimensions properties, load capacities, diagrams, complete specs of the product in use. Macomber, Inc. On Reader's Service Card, circle 151.

WALLS/LAMINATES/ PARTITIONS 618

New line of decorated ceramic wall tiles for commercial and architectural applications shown in new 32-page full color brochure from Amsterdam Corp. On Reader's Service Card, circle 152.

"Panel Systems 1970". 8-page 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 153.

Kaiser Gypsum offers new catalog and Technical Bulletin on the new movable partition system KW-500. Brochures feature the patented "hook-on" concept for fast, independent removability of panels. Kaiser Gypsum Co., Inc. On Reader's Service Card, circle 154.

Spec information on all panels includes Marlite plank and block, Korelock and firetest panels. Marlite Div. Masonite Corp. On Reader's Service Card, circle 155.

Metal Wall panels, including new Foamwall. 20-page catalog includes complete specs with color photos of walls in place. Elwin G. Smith & Co., Inc. On Reader's Service Card, circle 156.

Flexwood, thin wood veneer laminated to cloth backing. Size availabilities, suggested specs and color samples shown in colorful brochure. Listing of distributors also shown. U.S. Plywood. On Reader's Service Card, circle 157.

A new eight page bulletin describes Westinghouse Kent Line Series Movable Partition Systems for complete and visual privacy in offices, factories, schools, hospitals and other areas where low-cost partitioning with high durability and lasting beauty are desired. Westinghouse Electric Corp. Architectural Systems Dept. On Reader's Service Card, circle 158.

PROFESSIONAL SERVICES 619

Lippincott—fabricators of sculptures for many leading artists offers an illustrated folder showing completed sculptures and work in progress. Lippincott. On Reader's Service Card, circle 159.

Catalog listing of books on all phases of architecture. MIT Press. On Reader's Service Card, circle 160.

READERS SERVICE FILE

ADVERTISERS INDEX

ADVERTISERS INFORMATION SERVICE

To order all the material listed under any of the categories below, circle the category number of the Reader Service Card on the opposite page. To order material from a single advertiser, circle the advertiser's number only.

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PRODUCT REVIEW

(continued from page 80)

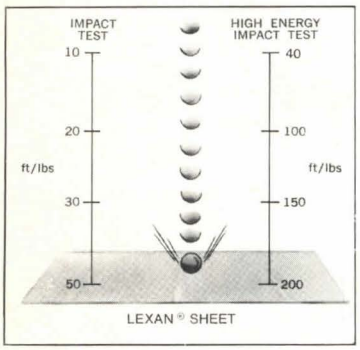
TONGUE AND GROOVE DECKING

A new laminated decking material will minimize in-place cupping and twisting, and help reduce shrinkage, checking, warping and waste, according to the manufacturer. It is made of pine, spruce, fir or larch wood, bonded to two additional layers of pine or other softwood species in two grades: "Architectural" for a fine finish, or "Industrial" for a more rustic appearance. The decking is available in 3-in. to 5-in. thicknesses, 6-in. and 8-in. widths, and 6-ft. to 16-ft. lengths. Contact: Boise Cascade Building Products, P.O. Box 7727, Boise, Idaho, 83707

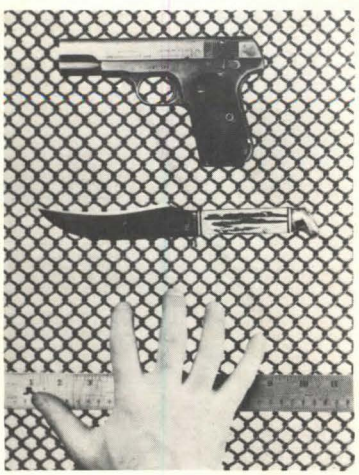
DISPLAY-GLASS SEALANT

Dow Corning 781 building sealant was used to seal the ¾-in.-thick plate glass panes in the lounge of Irish International Airlines offices in New York City. The 17 panes were joined with the silicone rubber sealant, and without the aid of metal supports or mullions, leaving only a ⅛-in. translucent bead between. The corner panes were sealed in the same way. Contact: Dow Corning Corp., Midland, Mich.

BURGLAR-RESISTANT GLAZING



A new glazing material called Lexan claims it is the first and only transparent plastic glazing listed as burglar resistant by the Underwriters' Laboratories, Inc. According to the manufacturer, the glazing is 250 times stronger than glass and 30 times stronger than any other transparent plastic. It offers transparency, light weight, dimensional stability, weather resistance and is self-extinguishing. It also comes in a variety of colors, sizes and thicknesses. Contact: Sheet Products Business Section of General Electric Co.'s plastic department, Mt. Vernon, Ind.



ESCAPE-PROOF MESH

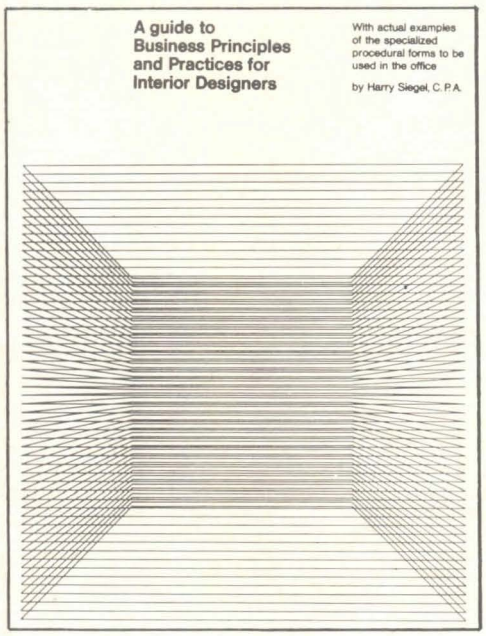
"Colorbond," a maximum security, chain-link fence, cannot be penetrated by fingers, gun muzzles, knives or other weapons. Corrosion-proof, vinyl-clad galvanized steel is woven into a ⅜-in. diamond mesh "fabric" that never needs painting and cannot tear skin or clothing. Recommended for police stations, prisons, reformatories, etc., the fence's colorful vinyl surface "lends an important note of cheerfulness," say its manufacturers. Contact: Colorguard Corp., 1 Johnson Dr., Raritan, N. J., 08869

A guide to Business Principles and Practices for Interior Designers

With actual examples of the specialized procedural forms to be used in the office

by Harry Siegel, C.P.A.

This book won't tell you one blessed thing about design but it may well be the most important book ever published for interior designers, space planners, architects and students.



A long time consultant to design firms, Mr. Siegel has put together a clear-cut guide to the business routines which often frustrate the independent designer. He explains everything from the mechanics of setting up as a professional to estimating job time, billing and collecting.

This business guide includes actual samples of specialized work forms, letters of agreement, and contracts designed by Mr. Siegel for such satisfied clients of his as Melanie Kahane, Michael Greer, Daren Pierce and Ellen Lehman McCluskey.

His book tells you what you need to know to protect yourself from financial losses . . . to estimate the value of your talent and effort . . . to calculate operating costs . . . to arrive at satisfactory fees . . . and to explain your charges to your client.

He shows you how to make initial proposals for a job . . . to make safe and binding agreements . . . to collect from clients . . . to protect yourself from losses due to client defections and vacillations . . . to control the flow of orders to suppliers, work rooms, carriers, contractors . . . and helps you protect yourself from errors and financial hazards.

He guides you to simple business routines that help you take the business side of your profession in your stride—without being obsessed by business problems.

This is a book that is a must for the man who knows much about designing but not enough about making money.

Chapter Headings

A guide to Business Principles and Practices for Interior Designers
by Harry Siegel, C.P.A.
176 pages
more than 40 illustrated forms
$13.95

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copies @ **$13.95** $

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The beautiful movables

System designed by Woodwork Corporation of America

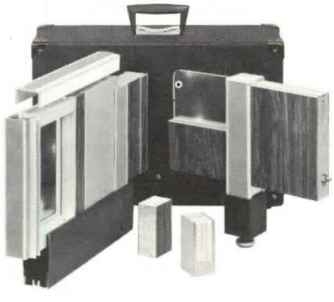
FORMICA® brand laminate adds new durable beauty to versatile partition systems

When these partitions stay in place, wear-resistant FORMICA® surfaces cut maintenance costs. When they must move, the same durability withstands transit damage, virtually eliminates replacement and refinishing expense.

FORMICA® movable walls are complete with hardware and electrical fittings, in a variety of color patterns and woodgrain finishes.

Standard, acoustical or fire-rated cores, including Class I (ratings available on request).

Years from now you'll be glad your movables came from Formica. They put a sensible price on beauty and design that's built to last. For specification data and systems' description, see Sweet's Architectural File 13a/Fo or write Dept. AF-10.



Call your representative. He'll build a wall in your office in 90 seconds.

Leadership by design

FORMICA® BRAND
movable walls

On Readers' Service Card, Circle 230

Mossy Pecan Marlite has the beauty of rare hardwood, but is priced to fit anyone's budget.

Marlite paneling is color-coordinated, so Linen Stripe and Tapestry panels look great together.

Mediterranean influence is here to stay. Marlite captures its style in lovely Riviera paneling.

This authentic reproduction is Cathedral Oak Marlite, a new addition to the Trendwood line.

7009

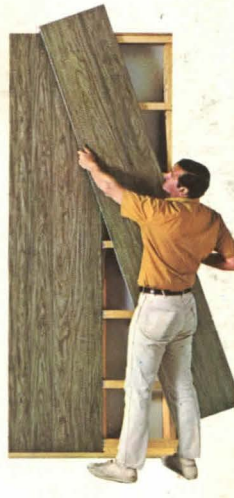
Four new Marlite wall ideas to make everybody's job a lot easier.

When you're looking for a really new and distinctive wall idea, look at Marlite. We have more than 80 different textures, colors and designs —including the four beautiful new panels shown above.

And Marlite makes it easier to create interiors with perfect color harmony. Our complete line is carefully *color-coordinated*. So there's a solid-color panel to match the basic color in every pattern or design. (Marlite is also available in Fire-Test Panels to meet building code requirements.)

Marlite makes the builder's job a lot simpler, too. In fact, one man can install Marlite Planks by himself in a jiffy. They're only 16" wide.

What's new in soilproof, wash-and-wear walls? The answer is easy. Marlite. See it at your building materials dealer or write Marlite Division of Masonite Corporation, Dept. 1007, Dover, Ohio 44622.



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Marlite®
plastic-finished paneling

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