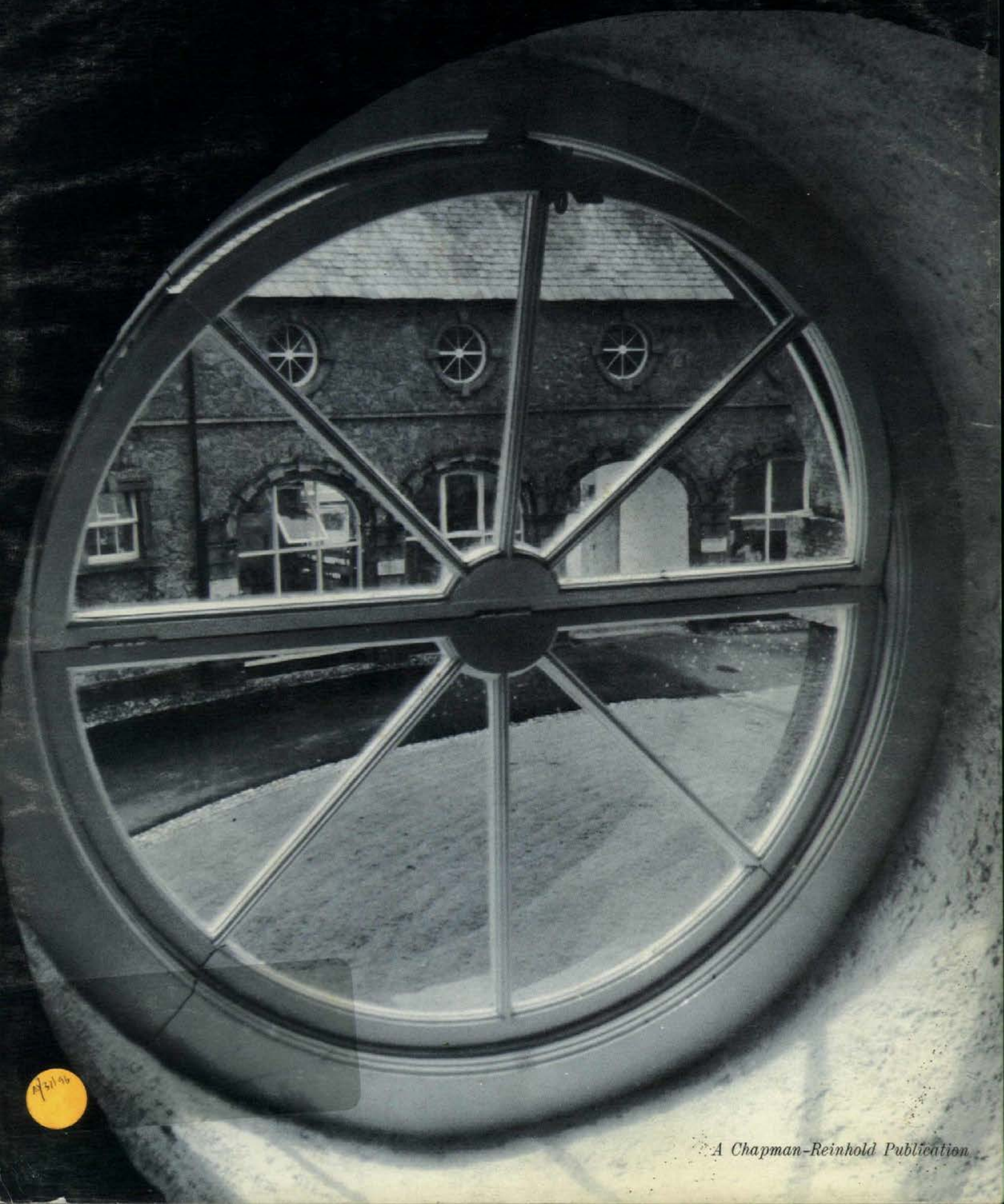




M31/96

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Flooring Contractor:
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Floor Shown:
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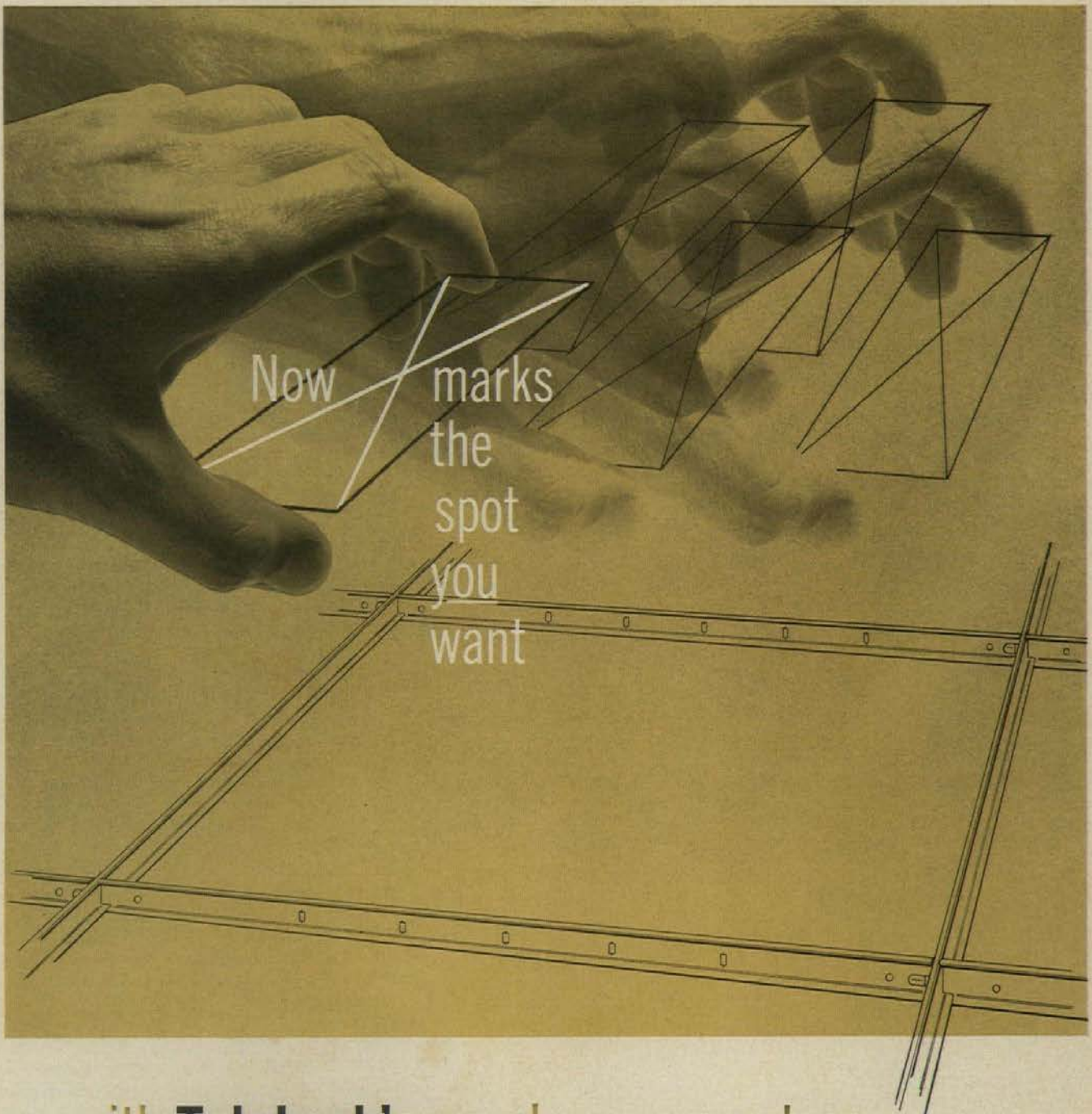
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New York brownstone undergoing demolition against the background of a modern curtain-walled office building. Photo: Richard C. Lewis.

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From remarks by Bucky Fuller at a symposium in Harrisburg, Pa., as quoted in *The New York Times*, Nov. 28, 1967.

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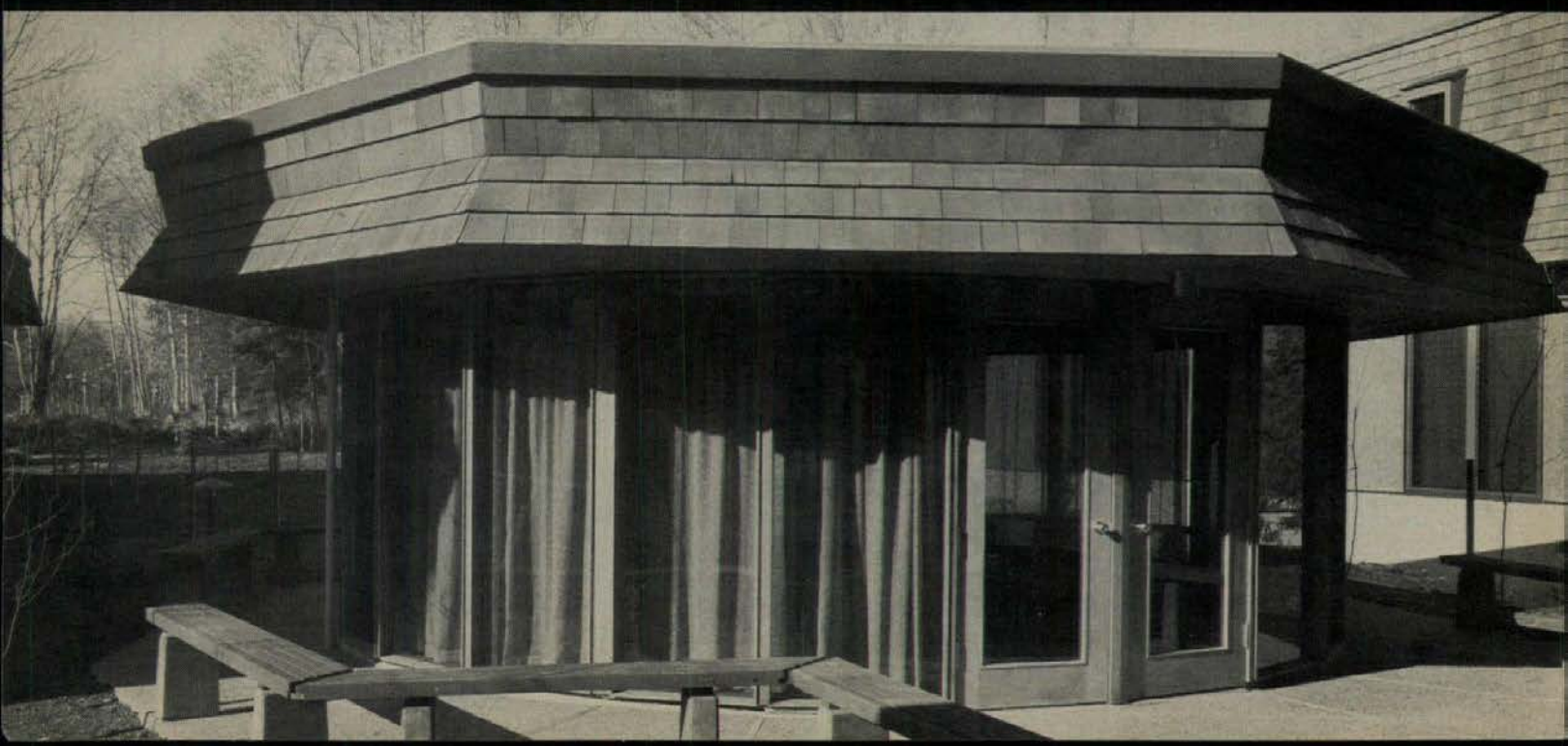
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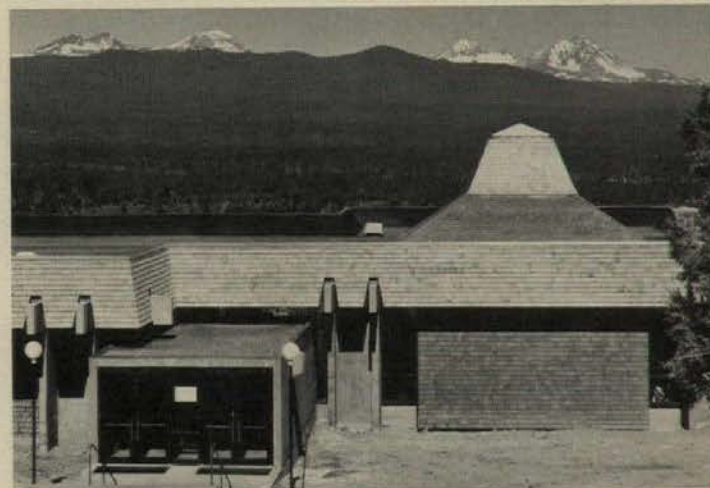
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- (5) Bayshore School, Ottawa, Ontario, Canada. Architect: Z. J. Nowak. Certi-Split Handsplit/Resawn Shakes, 18" x 1/2" to 3/4" with 8-1/2" to the weather.
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VIEWS

Design Awards Praised and Criticized

Dear Editor: The jury's choice for First Design Award was refreshing (JANUARY 1968 P/A). That is the sort of solution we should be seeking for our own slum problems. We have a tendency to ram some disconnected "expert's" solution down the throats of people who never live "as they know how" in those solutions. It seemed to me that the project proposed by the Puerto Rican group was completely in sympathy with those who were going to live there. Hopefully, the top award next year will be given to a similarly approached solution to a stateside slum problem, which could be carried to reality by our immensely powerful but blinded economic institutions.

HOWARD ALAN
Chicago, Ill.

Dear Editor: As usual, I opened up the Design Awards issue immediately upon receipt and thoroughly studied the jury's comments. My first impression was one of pleasure at the technical and professional competence of the winning projects — quite different from my first impression last year.

However, I personally have found last years' award concepts continually inspiring. This years' work, less than a week old, is becoming boring in retrospect and frightening to the spirit of architecture in its technical competence. Production line designers working in teams have produced highly proficient mediocrity. A "Machine for Living" is more mechanical than Le Corbusier ever intended in his modular controlled environments.

The one "house" is not a "laboratory for experimentation," as stated by the jury as the justification of house design, but only a competent restatement of currently acceptable ideas.

In all of the work, with the exception of the California Performing Arts Building, I find it difficult to walk through spaces and feel the architectural spirit.

WINSLOW ELLIOTT WEDIN
Minneapolis, Minn.

Dear Editor: The selection of First Design Award for Jan Wampler's concept of La Puntilla in Old San Juan was a mistake. As a former planner on the Puerto

Rico Planning Board, I have seen several proposals for the development of this area. Each one of these has proposed the establishment of a low-cost housing project on this choice if not choicest piece of land in Puerto Rico. The fact that your jury gave first place honors to this project indicates to me that your "paper review" lacks the sensitivity of relating a project to its over-all environment and the needs of the greater community.

Although I would agree that new design concepts for low-cost housing are of primary importance and I would also sympathize with the desire to eradicate slums, the utilization of La Puntilla for this type of project represents a vast misuse of land in a city that can ill afford this type of planning mistake.

La Puntilla could be a transportation center for the buses that presently terminate in Plaza Colon, for the ever-increasing number of autos that have congested Old San Juan for a number of years, for the ferries that traverse the harbor to Catano, for a future rapid transportation terminal, for open space that San Juan greatly needs, for many, many other proposals that could be of benefit to the residents of La Perla, Old San Juan, the island, and to the tourists and the economic growth of the island.

Unfortunately, your award to the La Puntilla low-cost housing project gives much new status to a mistake that must be lived with for many years to come.

JAMES M. HINZDEL
San Francisco, Calif.

New Haven Article Reactions

Dear Editor: "Urban Planning and Urban Revolt: A Case Study" (JANUARY 1968 P/A) is a sobering piece of journalism, and I appreciate the insights into the roots of urban violence that it offers those of use in public positions. . . . It is a most significant contribution to the national dialogue on the urban crisis.

RALPH YARBOROUGH
U.S. Senator (D., Tex.)
Washington, D.C.

Dear Editor: P/A's annual awards, as ever, interest me.

But P/A's "microspeciation" of New Haven interests me even more. A professional journal has turned a news event into the basis of changing the profession. A brace of editors and writers managed to juggle three perspectives — the establishment, the scholars, the street — without losing sight of the stage (the city) on which the whole act stands. The authors wound up celebrating life and not struc-

ture, which is a difficult stance for any journal.

ART SEIDENBAUM
Los Angeles Times
Los Angeles, Calif.

Dear Editor: I found your article on "Urban Planning and Urban Revolt" a major contribution to understanding what is going on in our cities.

It was a good analysis of the problems, but, more importantly, I was made to feel involved and part of these problems, not just a reader of something someone else had researched and written. I felt I was *there* personally, and so I was pleased at this constructive approach.

LAWRENCE HALPRIN
San Francisco, Calif.

Dear Editor: I was absolutely fascinated with the article, "Urban Planning and Urban Revolt: A Case Study," which appeared in the January issue of your magazine.

PETER H. DOMINICK
U.S. Senator (R., Colo.)
Washington, D.C.

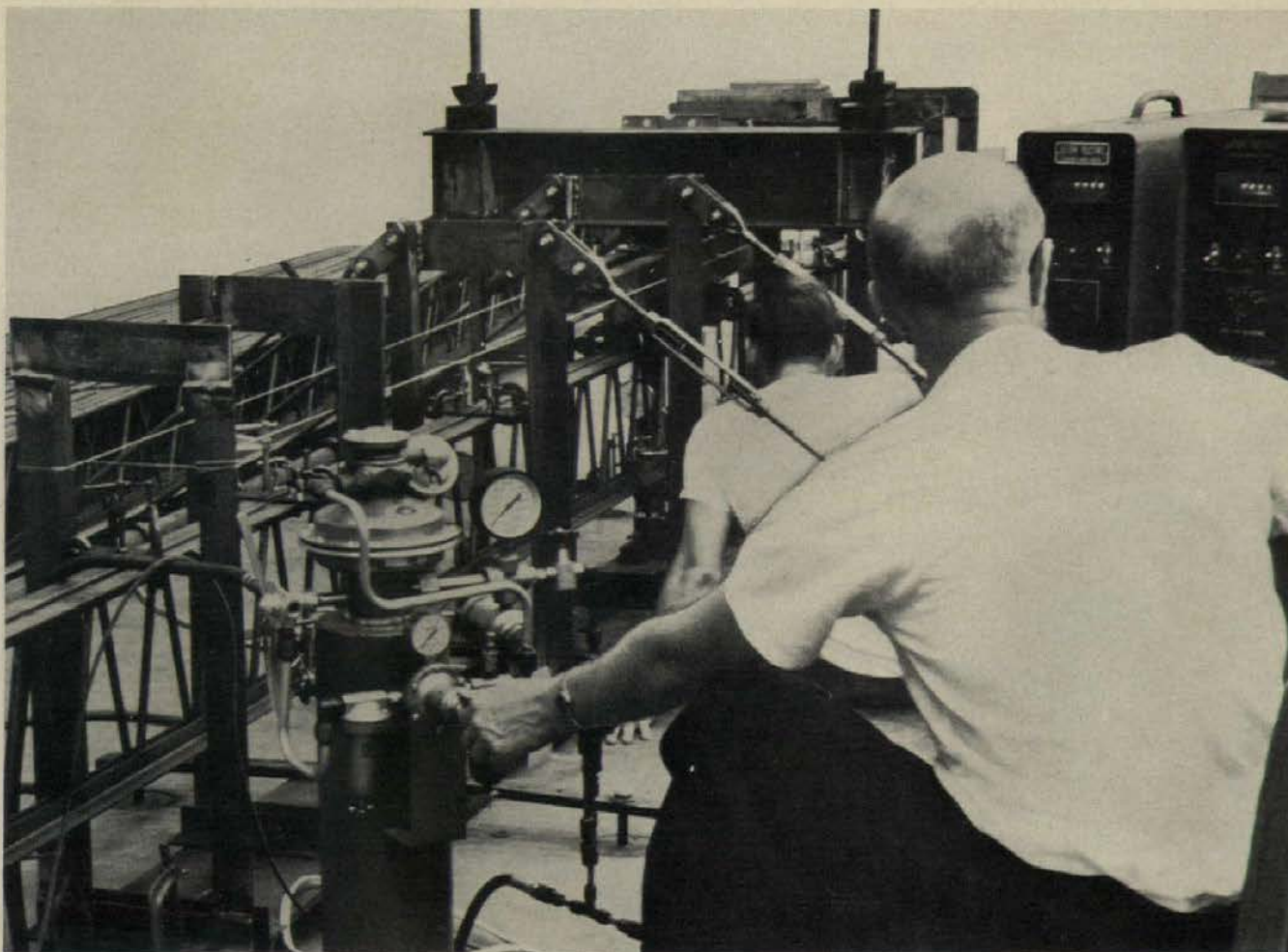
Dear Editor: I would like to correct a statement made in your story on New Haven. You quote us as saying that the mayor has done nothing to prevent construction of the East Rock Connector. Actually, the mayor was instrumental in shaping the legislation that prevents the state from taking parkland for highway use, unless this is approved by the municipality having jurisdiction over the land. The Save the Parks Committee is extremely grateful to Mayor Lee for the part he played in having this legislation passed.

However, nothing is being done to prevent construction *in the future*. As long as the number of cars coming into New Haven continues to increase, we consider the issue of the Connector not closed, but postponed. We want to see the park free of cars long after we are not here to feel the pains. We are not only interested in seeing New Haven survive financially today; we want it to remain a place of human habitat for generations to come. We even dare hope that it may become a better place, not just in comparison to Bridgeport, but with its own present self.

PAUL J. MITARACHI
Chairman, Save the Parks Committee
New Haven, Conn.

Dear Editor: Your coverage on "Urban Planning and Urban Revolt" was excellent. I hope the professional planners and the officials in charge of conducting renewal programs will take time to read

Continued on page 8



"Fact Finding Sessions" Investigate Behavior of Open Web Steel Joists

This is the engineering-research laboratory at the University of Kansas. In process is a study on the behavior of the compression chords in variously designed open web steel joists under concentrated and uniform loading.

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Continued from page 6

and learn from it. I was particularly struck by the discussion sorting out "slum" from "ghetto" on the basis of economic and social conditions rather than housing and new construction. Most of our Western city "ghettos" are made more so from economics and social relationships than from run-down buildings. If planning is a tool to aid in solving any of these problems, it's got to become more concerned with these inner workings of society.

Throughout your study runs the emphasis on communications and people-

sensitivity as one of the missing and misused factors in the whole decay-renewal-riot-reappraisal process. I had some personal experience with the so-called Century City riot here last year, which turned me from a mild-mannered citizen with respect for the police into a suspicious cop-hater, so I experienced a good deal of empathy in reading your story's comments about the New Haven people-cop relationship during "The Disturbances." If I happened to be black and ghetto-ized and poor, I think I'd throw a few fire bombs at them myself under such treatment.

Let's have more honest discussions of the P/A variety.

NANCY WILLIAMS
Daniel, Mann, Johnson, & Mendenhall
Los Angeles, Calif.

Dear Editor: The January article on New Haven forms a critical commentary on the great issues facing our cities. It would be worthy reading for everyone involved with the renewal of municipalities.

DONALD L. HARDISON
San Francisco, Calif.

Dear Editor: Please accept my enthusiastic congratulations for the article "Urban Planning and Urban Revolt" in the January issue. It is not only a first-rate critique of the urban renewal program but a contribution to the social history of architecture and planning as well.

CARL W. CONDIT
Evanston, Ill.

Dear Editor: I would like to compliment you on your New Haven article in the January issue. As vice-chairman of the Citizens Advisory Committee on Urban Renewal for the city of Champaign, Illinois, this type of in-depth coverage of what, to some people, was a surprising situation, is very valuable. All of us are, of course, concerned with keeping such things from happening here or elsewhere.

I also called the article to the attention of our director, Professor Rudard A. Jones, AIA, and he requested that I write to you to determine the availability of copies of this case study for use in teaching his graduate-level course in Urban Housing at the University of Illinois Department of Architecture.

HENRY R. SPIES
Editor, Small Homes Council —
Building Research Council
Champaign, Ill.

[Reprints of "Urban Planning and Urban Revolt: A Case Study" are still available at 50¢ a copy. — ED.]

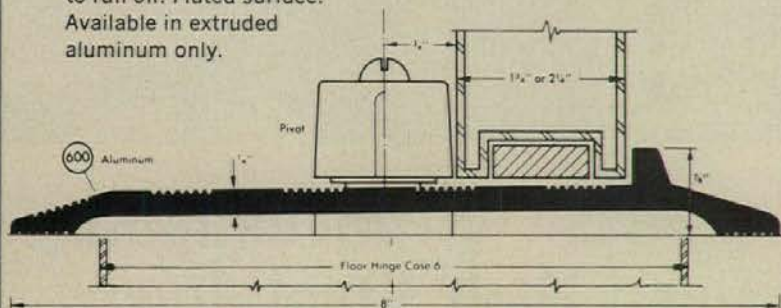
Dear Editor: As architects, we have always been keenly interested in the January Design Awards issue of P/A. As blacks, we naturally expected the usual array of white winners. What we did not expect was your unusual — for P/A — article, "Urban Design and Urban Revolt," which discussed New Haven's white losers in terms of planning and design for blacks and Puerto Ricans. In the vast game that is being played all over America with urban design, this year's Design Award winners will become losers too if they do not help provide solutions badly needed in Inner City areas.

In the light of your article on New Haven, we feel that future articles in P/A on urban design must deal with the

Continued on page 14

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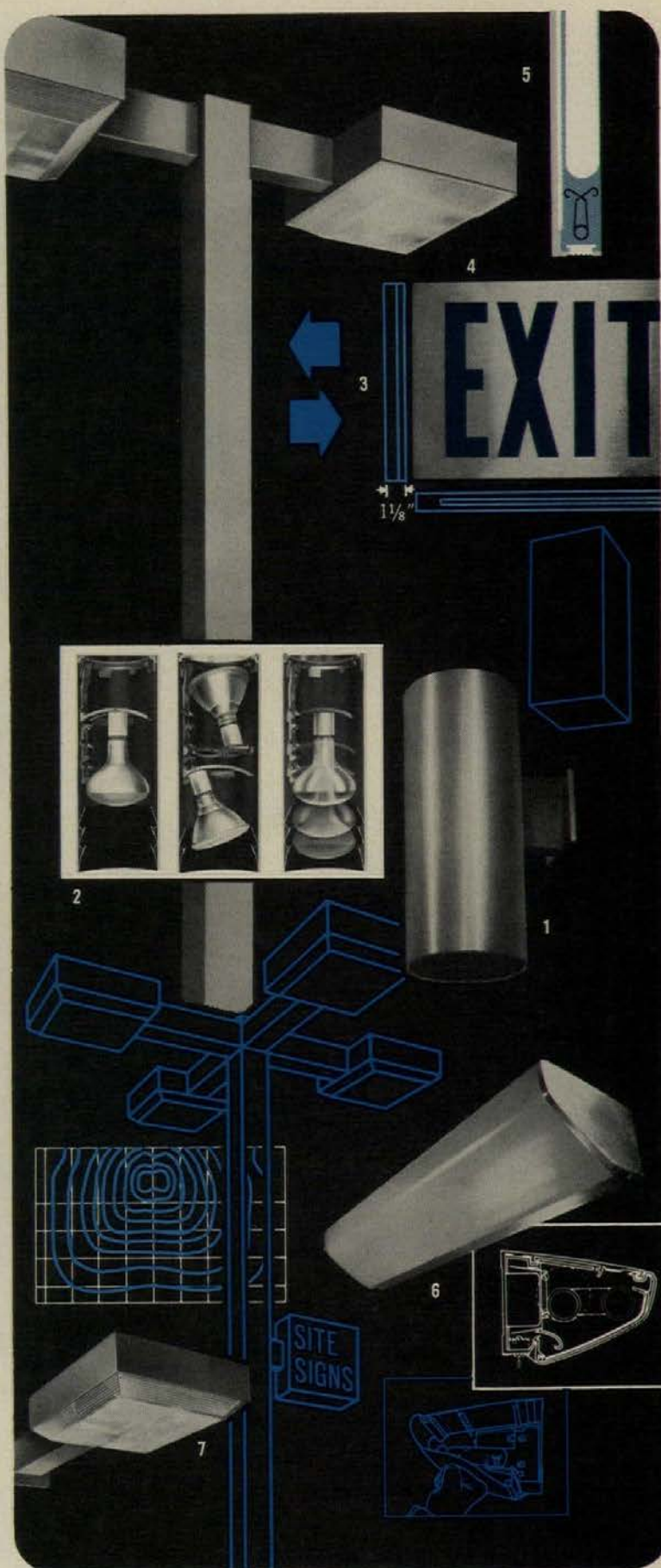
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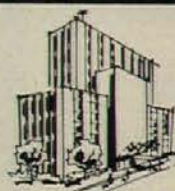
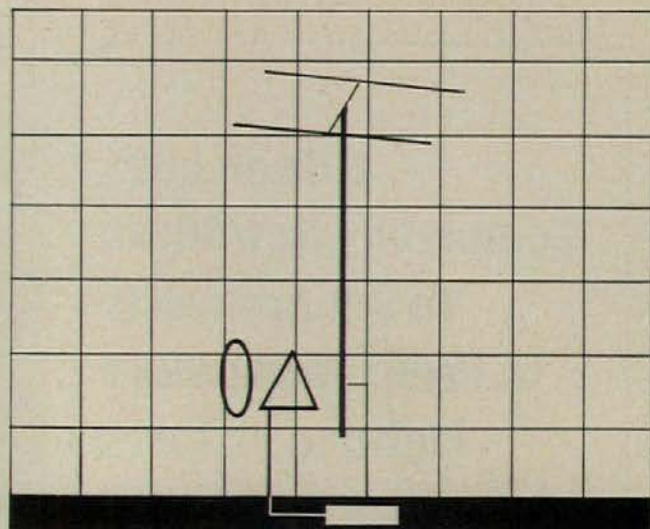


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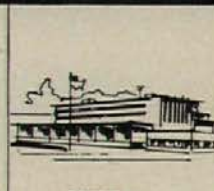
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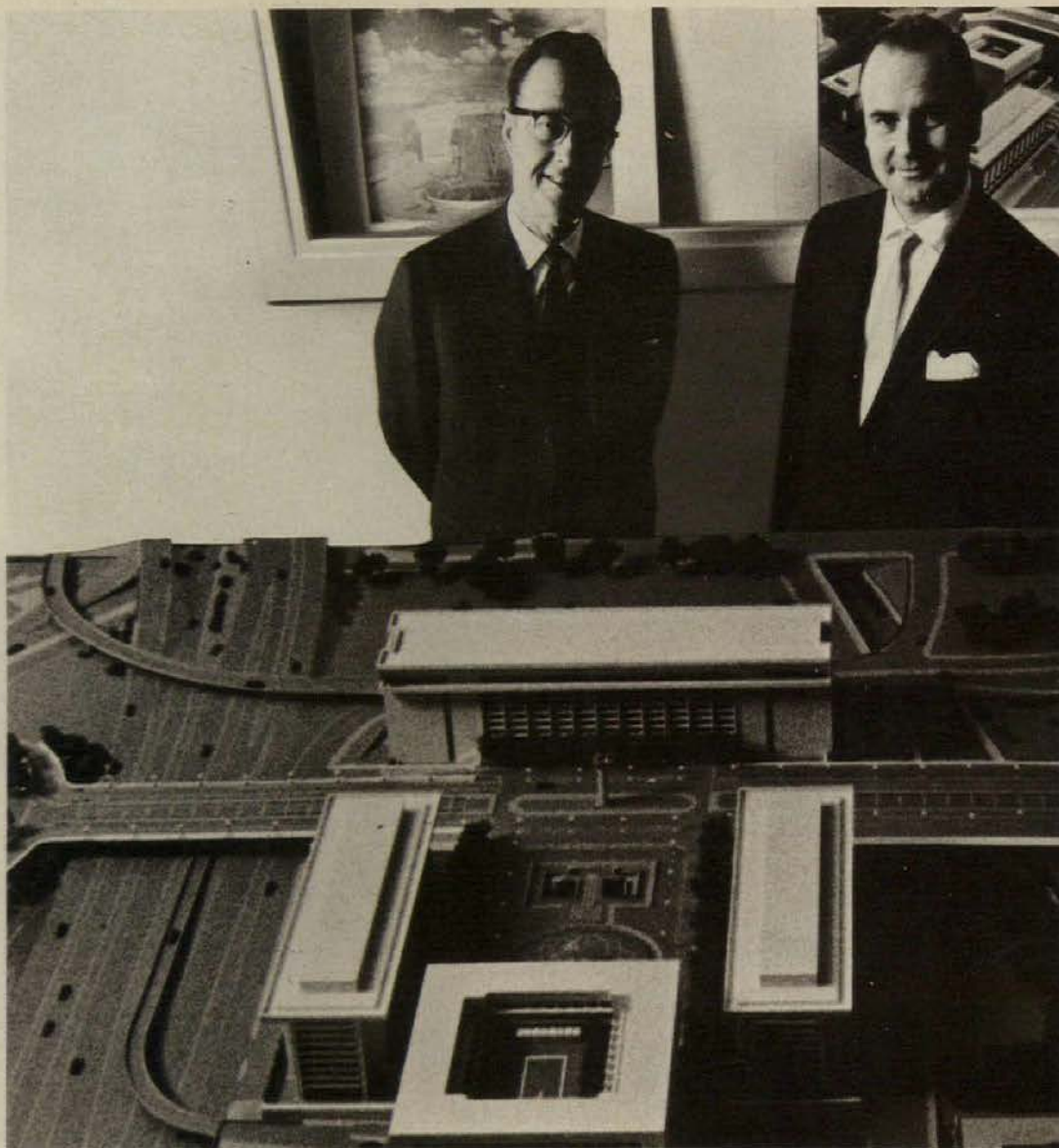
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Continued from page 8

need for community control by community residents. And the planning process is precisely where this control can begin—in fact, where it *must* begin—since it has been amply demonstrated in cities all over America, such as New Haven, that white city planners have not dealt with the problems of powerless ghetto residents.

2MJQ
Black Advocate Planners
Washington, D.C.

Dear Editor: It seems obvious from the P/A case study of New Haven that the paternalistic redevelopment agency is

quite successful, for without its calculated aggravation most of the affected individuals would still be living in their age-old filth. It is exhilarating to hear them say they want something better. The question is whether it is to be given to them outright or should they actually have to work for the so-called better things in life as do most other Americans.

On the other hand, I am amazed at P/A for publishing such a degrading, nonconstructive article against a client who supports architecture and architects. Of all other redevelopment agencies in the country, the City of New Haven has worked with more outstanding architects

to produce structures well worth study and a place in the history of architecture. It is interesting to note that the rioters did not destroy any of these buildings, but only their own run-down structures, as if they were aggravated mainly with themselves and their lack of ability to forge ahead faster than they are.

CASWELL COOKE
New Haven, Conn.

Dear Editor: Congratulations for the fine article on New Haven. This is the first time to my knowledge that a national magazine has presented an accurate account of renewal in New Haven. It should be clear to all your readers that New Haven is not a model, but a warning.

Your reporters did an excellent job, except on one point. AIM is not a group of "middle-class intellectuals," at least not as that term is ordinarily understood. While that may generally be our class background, we are committed to actively working for change with the people of the city. We do all the kinds of dirty work that has to be done to build an organization and a political force, unlike the "middle-class intellectuals," who are usually above the battle. Finally, we are committed primarily to making this a decent, humane society, rather than to "making it" in our professions.

ROBERT M. COOK
Department of Sociology
Yale University
New Haven, Conn.

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On Readers' Service Card, Circle No. 382

Schokbeton Strikes Back

Dear Editor: In the DECEMBER 1967 P/A VIEWS column, a letter from S. M. Brown, Jr., of General Stone and Materials Corp., took issue with me concerning your October "Concrete in Detail" article.

Brown apparently has failed to understand my statement, which he has quoted out of context. He also erroneously implies that I recommended the use of soft aggregates.

I am certain, based upon the many letters received, that most of your readers understood my point, so I will refrain from further comment on Brown's remarks.

It is the desire of Schokbeton and, I believe, many other precast producers, to manufacture the best quality precast while satisfying the architect's intended result. We also want to avoid needlessly increasing the cost of our product, for we believe there are sufficient inflationary pressures in the economy.

Incidentally, we think the General Stone and Materials Corporation supplies excellent aggregates—but that wasn't the subject of our article.

GEORGE J. SANTRY
Chairman, Schokbeton Products Corp.
Greenwich, Conn.

Continued on page 16



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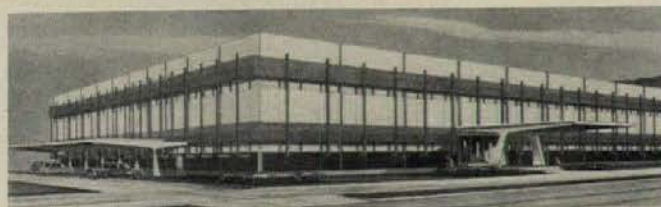
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On Readers' Service Card, Circle No. 373

Continued from page 14

Education of an Intellectual

Dear Editor: The article on Design Innovation in NOVEMBER 1967 P/A is commendable for bringing lively intellects to bear on design matters. As a planner concerned with finding and expressing the community interest through public agency planning, two themes of the article seem pertinent: *the search for functionally based images* (rather "blue sky" images) in which the community can recognize itself; and the approach which recognizes this search as a public concern, not exclusively and esoterically professional.

I believe Christopher Alexander misreads Lynch in one respect, however. Lynch's primary emphasis is on rendering the city legible by means of imaginal devices, recognizing the artificiality of image-making for its own sake. Thus, legibility, not "imageability," is the goal. Sympathy is due Alexander, whose difficulties in such discussions seem to stem from the broad generalizations he makes (must make as a theoretician) and from his not making some "sensible" correlations at times among different points in his arguments. For instance, granting his statement as true that as one cultural rule changes it affects all others, how then can he really expect to isolate and evaluate any single relation apart from its context, as he suggests we do?

The claim that an entire building cannot be criticized is curious to find in a mind as complex as his. Relatively speaking, a building is less complex than a biological organism or a social situation; it is less changeable, more accessible, hence more readily analyzed.

Perhaps the real purpose of reporting conversations such as this is to help an author sharpen and develop concepts leading to the new book about to be published. If so, your keeping an observing eye on Alexander may help all of us witness the "education of an intellectual" and be wiser for it ourselves.

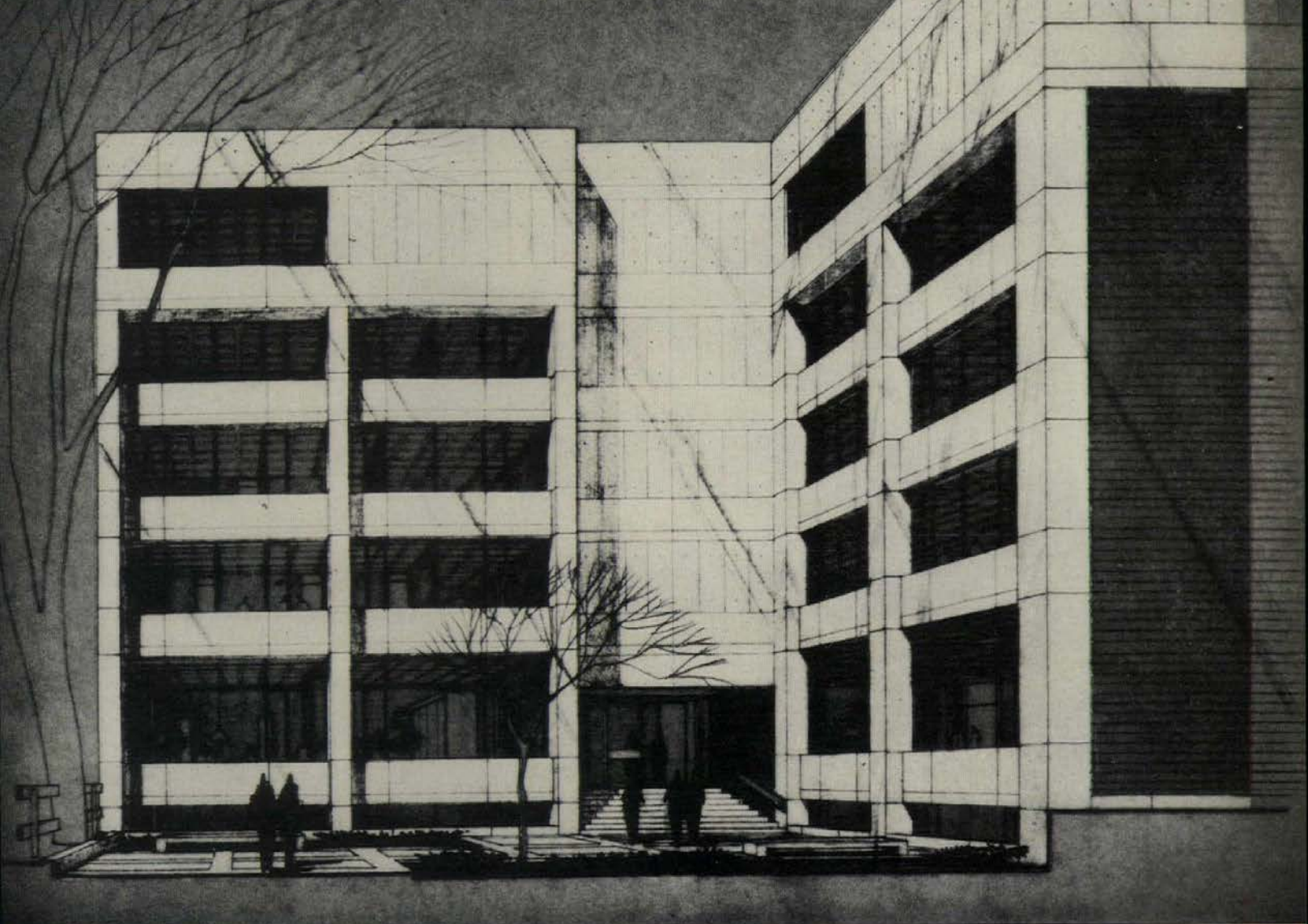
STEPHAN W. OSBORN
Senior City Planner,
City of Detroit Housing Commission
Detroit, Mich.

The Hugh Command

Dear Editor: In the article entitled "The Teahouse of the Red Beach" (p. 198, OCTOBER 1967 P/A), you conjecture that Naval Mobile Construction Battalion Fifty-Eight is under the command of General Hugh Hefner. This is to advise that it may be under the command of Commander Hugh Hefner, Civil Engineer Corps, U.S. Navy, but never, never the command of General Hugh Hefner.

PETER KIRBY
Commander, Civil Engineer Corps, USNR
San Francisco, Calif.

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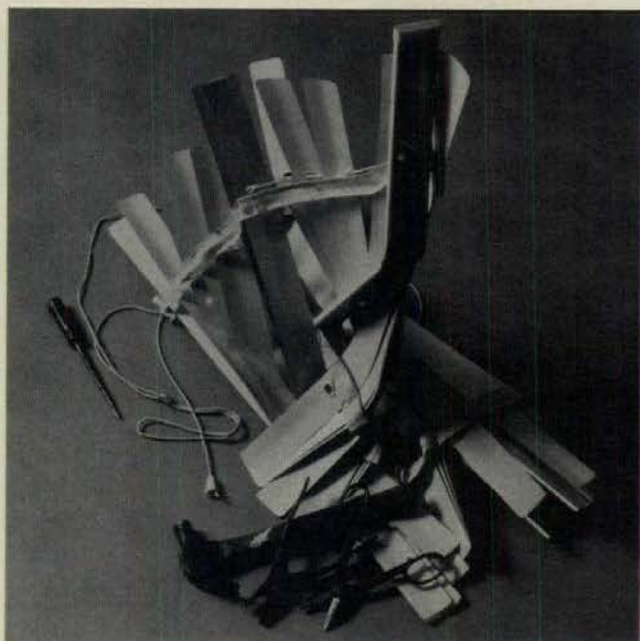
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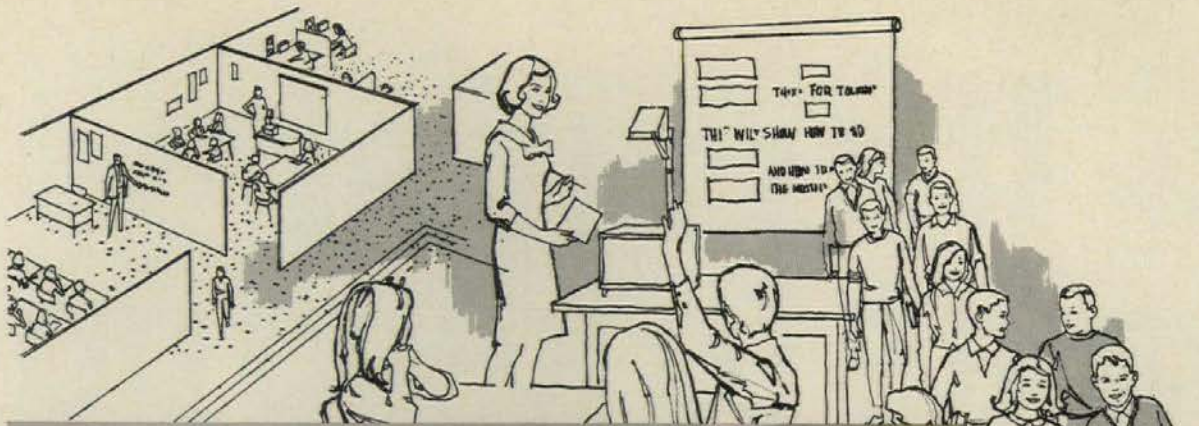
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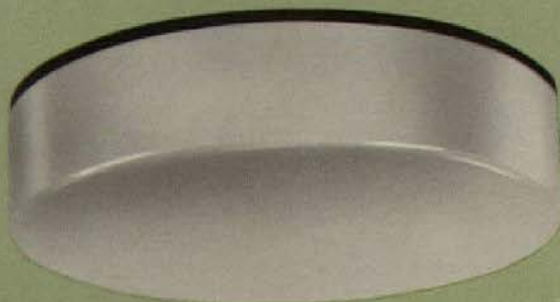
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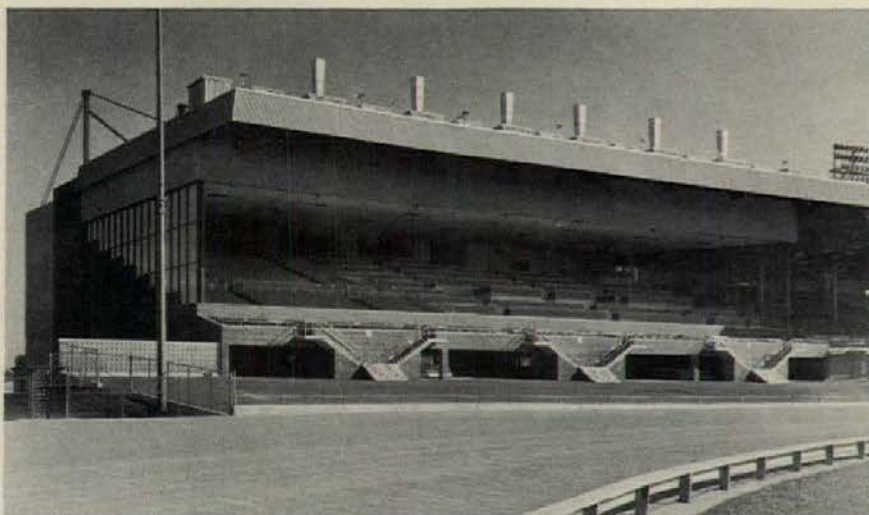
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LYTECASTER DOWNLIGHTS





Cable roof permits load-free power window system for Brandywine clubhouse

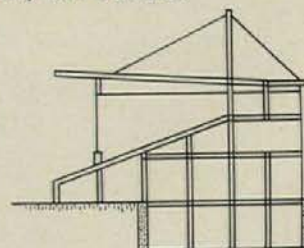


This new, \$4-million clubhouse at Brandywine Raceway, near Wilmington, Delaware, posed an unusual problem. The owners wanted to heat and air-condition the enclosure to accommodate some 2,500 spectators. However, they also wanted to move the windows out of the way so that spectators could have a completely unobstructed view of the track whenever weather conditions were suitable.

Architect Lionel Levy devised an ingenious moveable window system which can be raised entirely out of view by telescoping it into housings above the roof. Engineer Robert Rosenwasser chose a cable-supported roof scheme as the most feasible and economical way to do the job. It permits what normally would have been roof-supporting front columns to serve as mullions and tracks for the window area measuring 196 ft long and 28 ft high.

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Architect: Lionel K. Levy • Structural engineer: Robert Rosenwasser • General contractor: Ernest Di Sabatino & Sons • Steel fabrication: The Belmont Iron Works • Steel erector: McCormick Construction Co., Inc.

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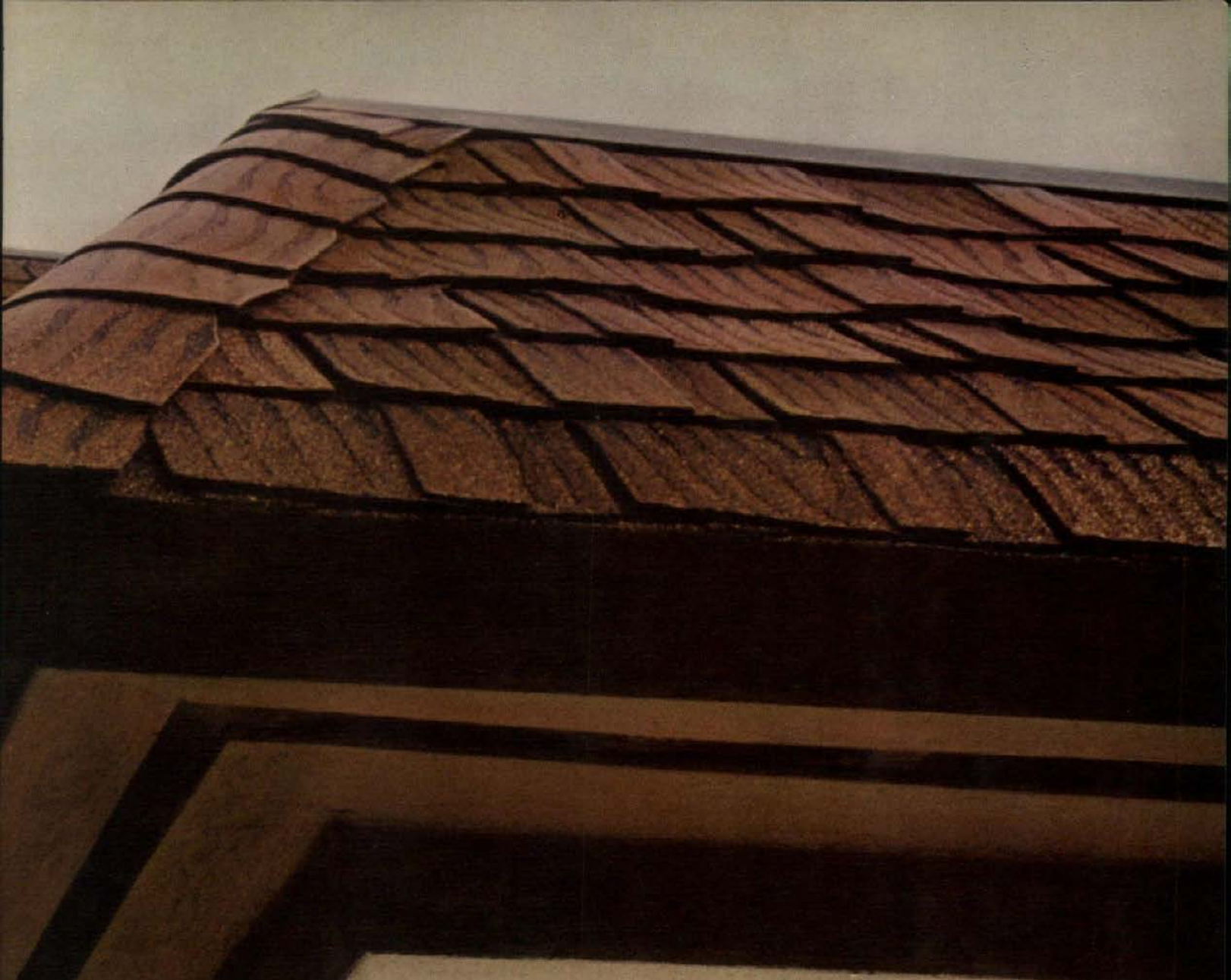
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The image is a photograph of a building's exterior corner. The roof is covered in reddish-brown tiles. A large, white rectangular area is superimposed on the building's facade, serving as a background for the title. The title 'The shangle' is written in a bold, black, sans-serif font. The word 'The' is on the top line, and 'shangle' is on the bottom line. The building's structure is visible on the left and right sides of the white area.

The shangle

Nob Hill Club Apartments, Atlanta, Ga.
Architect: Cooper, Carry and Associates
Builder: Crow, Pope & Carter



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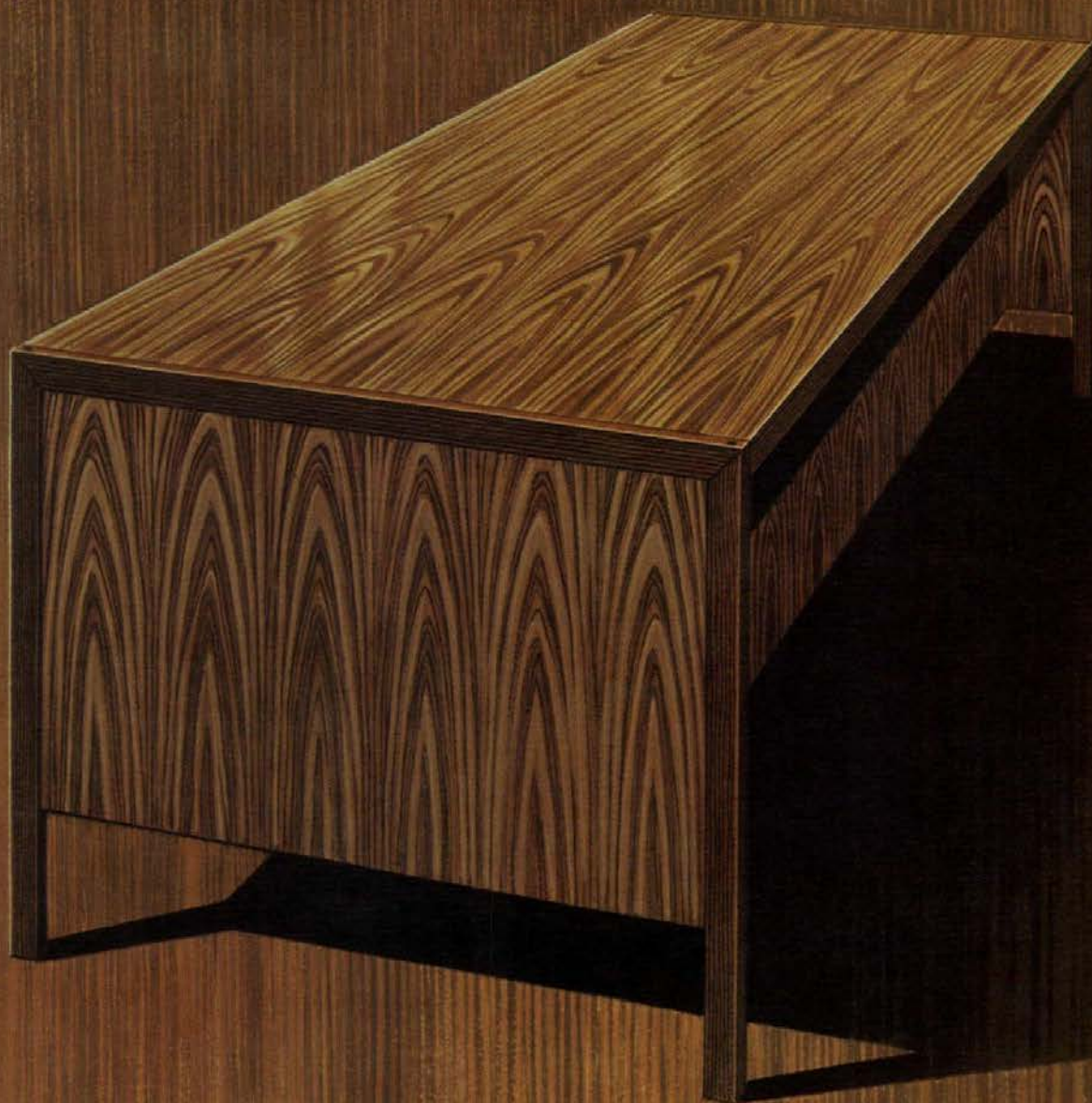
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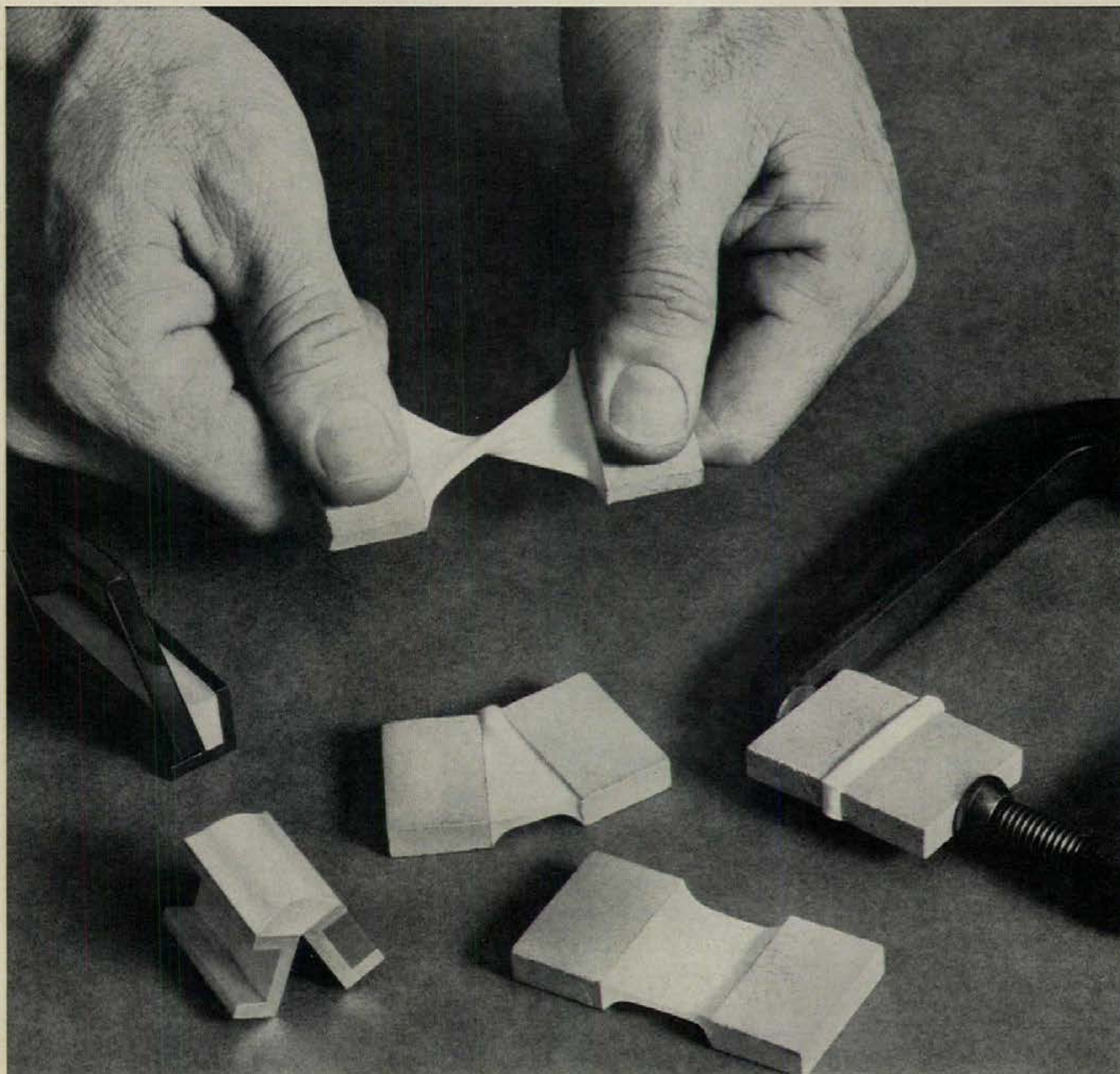
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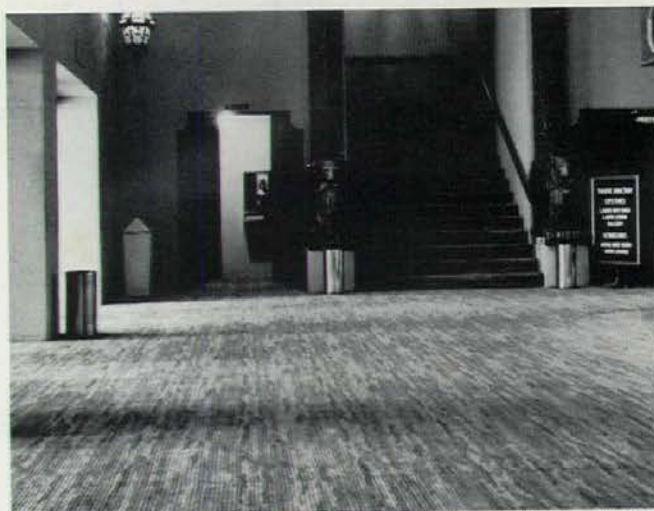
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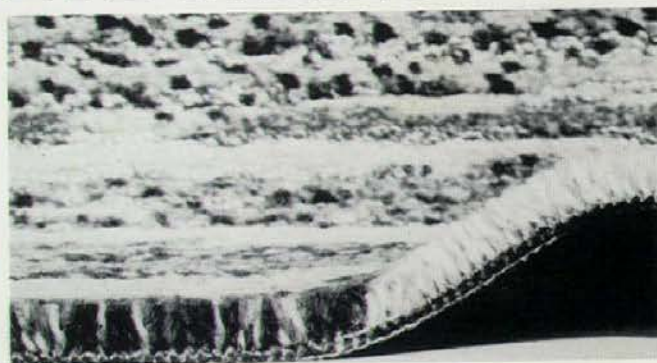
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P/A NEWS REPORT

Progressive Architecture's Monthly Digest of Buildings, Projects, People and Products

March 1968

GOLD MEDAL FOR BREUER



WASHINGTON, D.C. Marcel Breuer will be the thirty-fourth recipient of the AIA's Gold Medal, awarded for "most distinguished service to the profession of architecture or to the Institute." It will be presented at the AIA convention in Portland, Ore., in June.

A student of Walter Gropius at the Weimer Bauhaus (1920-24), Breuer subsequently headed the Bauhaus furniture department, where he developed bent tubular steel furniture. At Gropius' request, Breuer came to the U.S. in 1937 to join the architectural faculty at Harvard. From 1937 to 1941, the two men had an architectural partnership in Cambridge; in 1946, Breuer opened his own office in New York City. Among his architectural designs are the Whitney Museum, UNESCO headquarters in Paris (with Nervi and Zehruss), and St. John's Abbey Church, Collegeville, Minn. Among his most recent projects is the addition to the Cleveland Museum of Art.

This year, the Institute will honor another former Bauhaus disciple, Gyorgy Kepes, with the Fine Arts Medal.

Other medalists are:

I.M. Pei & Partners, Architectural Firm Award.

Jack Lenor Larsen, Craftsmanship Medal.

E. James Cabaro, Edward C. Kemper Award, for significant contribution to the Institute and the Profession.

Le Messurier Associates, Inc., Allied Professions Medal.

Ernest Braun, Architectural Photography Medal.

Paul Grotz, Industrial Arts Medal.

Philip Will, Jr., Citation of Honor.

The Graham Foundation for Advanced Studies in the Fine Arts, Citation of an Organization.

DESIGN TEAM PICKED FOR U.S. OSAKA PAVILION

WASHINGTON, D.C. Davis & Brody, New York architects, will team with designers Ivan Chermayeff, Thomas Geismar, and Rudolph de Harak to prepare the United States Pavilion and exhibits at the Japan World Exposition in Osaka in 1970. Their selection was made by the United States Information Agency following recommendation by a 12-man Advisory Panel composed of: William Bernbach, president of Doyle Dane Bernbach, Inc.; Peter Blake, editor of *Architectural Forum*; William N. Berger, chairman of the Architectural Design Department of Pratt Institute; Donlyn Lyndon, head of the Department of Architecture at the Massachusetts Institute of Technology; S. Dillon Ripley, secretary of the Smithsonian Institution; David Rockefeller, president of the Chase Manhattan Bank; Frank Stanton, president of the Columbia Broadcasting System; William Walton, chairman of the Fine Arts Commission, and USIA members Howard L. Chernoff, Lloyd Wright, Robert Sivard, and Jack Masey.

Before selecting Davis, Brody, Chermayeff, Geismar and de Harak, the panel interviewed ten other teams; which the USIA lists as follows:

(1) William J. Mouton, Engineers. Philip Johnson & Associates, Architects. Harper & George, Designers.

(2) Ward & Saks, Inc., Designers. James Stewart Polshek, Architects.

(3) Paul Rudolph, Architects.

(4) George Nelson, Architects and Designers.

(5) Myron Goldsmith, Skidmore, Owings & Merrill, Architects. Morton Goldsholl, Designers.

(6) Ulrich Franzen, Architects. Charles Forberg Associates, Designers.

(7) Gruzen & Partners, Architects.

(8) Isamu Noguchi, Sculptor.

(9) Hellmuth, Obata & Kassabaum, Inc., Architects. Ronald Beckman, Designers.

(10) Minoru Yamasaki & Associates, Architects.

P/A WINS AWARD

NEW YORK, N.Y. The DECEMBER 1966 P/A was cited for excellence by the American Business Press, Inc., the business magazine trade group. P/A Editor Jan C. Rowan accepted the Jesse H. Neal editorial achievement award at a luncheon at the New York Hilton Hotel on February 27. Entitled "Toward the Third Millennium," the issue took a long-range look at the world in which architects will live and practice at the turn of the century.

BREUER'S LATEST: NEW WING FOR THE CLEVELAND MUSEUM



CLEVELAND, OHIO. Hubbell & Benes were architects for the Museum building that opened in 1916. With its neo-classical, porticoed façade, its swan-studded reflecting pond, and its setting in Wade Park, the museum became a Cleveland landmark. In 1958, the museum added a rear wing to gain more space, and now, 10 years later, architect Marcel Breuer has drawn up plans for yet another wing. Breuer will consult with Paul Ruth, the Cleveland architect responsible for the 1958 addition.

The museum wants to expand its capacity for tempo-

rary exhibits, as well as increase its space for teaching. Under a recently devised program, 13 museum curators will serve also as adjunct professors at Case-Western Reserve University, and classrooms in the new addition will be made available to the university's art students.

Breuer's solution will enclose a space totalling 111,500 sq ft, including a 740-seat auditorium with a proscenium stage and an organ loft, two special exhibition galleries, classrooms, offices, shops, and related facilities.

As Breuer saw it, his prob-

Existing Museum



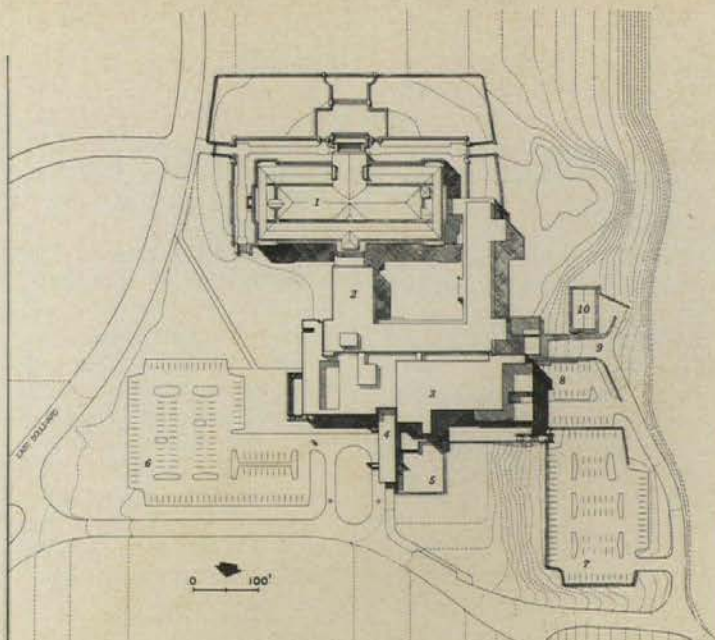


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Site Plan

- (1) Original Museum
- (2) 1958 Wing
- (3) Educational Wing
- (4) Entrance Canopy

- (5) Sunken Garden
- (6) East Parking
- (7) West Parking
- (8) Staff Parking
- (9) Truck Ramp
- (10) Greenhouse

lem was to provide a building that represented visually the strength, security, and sense of history that a museum should evoke. At the same time, he wished to keep the three wings visually related. He has kept the granite wall slabs that front his wing uncluttered. They articulate the spaces inside, folding inward to follow the lines of an entry court, or stretching out to enclose a stairwell. For purposes both of security and circulation, the museum decided to make the entrance of the new wing the museum's main entrance. Breuer's design shows an en-

trance canopy stretching out 115' in front of the building, edged to the west by a series of glass panels to keep off the wind, rain, and snow. These same considerations dictated wrapping the new wing around the north and east sides of the 1958 wing.

Faced in granite panels, 6' high by 4' wide, the museum has the look of much of Breuer's work. Although it recalls past glory rather than pointing to a new direction, it is typical of the Brutalist architecture, rooted in the Bauhaus, that has led Breuer to the 1968 AIA gold medal.

LUCKMAN REJOINS CORPORATE WORLD, TAKING HIS OFFICE WITH HIM

NEW YORK, N.Y. In late January, the Ogden Corporation, a giant conglomerate (1967 sales: \$750 million), exchanged Ogden stock for the assets and good will of Charles Luckman Associates. Under the agreement, the Luckman organization will continue to operate just as it has in the past. But Luckman himself will sit on the Ogden board and become president of the Ogden Development Corp.; John B. Cogan, an Ogden senior vice-president, will sit on the CLA board.

What will Ogden gain from the acquisition? For one thing, it acquires an active architectural, engineering, and plan-



Ralph Ablon, president and chairman of the Ogden Corp., and Charles Luckman.

ning firm that has operated consistently in the black. Some believe that Ogden's recently acquired food servicing interests, which performed poorly in 1967, may be helped by an active real estate, planning, and design arm. If CLA has its way, Ogden will get strongly into the Model Cities program. With a complete architectural office under its roof, Ogden

could have an advantage in that still untapped market.

What will CLA gain? CLA employees will obtain the ancillary benefits of a giant corporation. Moreover, taking advantage of Ogden services, CLA will be able to offer more to clients: systems analysis, transportation systems research, and communications.

Perhaps though the real reason behind the acquisition

lies in Luckman's concern for the future of his organization and his heirs. Luckman has told associates that he doesn't "want the firm's liquid position to be impaired by estate taxes. My attorneys say I cannot afford to die."

What will Luckman's move mean for the profession? P/A's Editor Jan C. Rowan discusses this question in this month's Editorial.

BOSTON POST, FRIDAY, SEPTEMBER 24, 1897.

CITIZENS OF ARTISTIC TASTE RISE IN PROTEST.



VIEW FROM COPLEY SQUARE AS IT WILL LOOK WHEN THE NEW MAMMOTH APARTMENT HOUSE BECOMES A NEAR NEIGHBOR OF TRINITY CHURCH AND THE ART MUSEUM.

Determined Opposition to the Proposed Ten-Story Apartment House in Copley Square.

F. O. PRINCE EXPRESSES HIS INDIGNATION.

BOSTON, MASS. Copley Square may have had a more checkered career than any square not on a Ralston Purina box. It has been the center of almost constant architectural discussion since well before the turn of the century.

When the John Hancock Insurance Company announced plans last month to build a 60-story mirror-sheathed office building next to Trinity Church (see p. 28 JANUARY 1968 P/A), at the head of the square across from McKim Meade & White's Public Library, memories of the controversies over other buildings proposed there welled up with the sudden animation of quiz show contestants who have just said the secret word.

We heard from Hugh R. Beaton, an engineer in Wilmington, Del., whose grandfather had worked on construction of the Boston Public Library. Beaton's friend Alexander A. Arthur is nephew of George W. Arthur, one of the owners of an apartment build-

ing constructed on Copley Square in 1898. Through Beaton, Arthur loaned P/A a scrapbook of newspaper clippings kept in 1897 by his uncle.

The apartment structure was 12 stories high, and, like an 8-story apartment proposed some years earlier for a flat-iron-shaped piece of land directly in front of the church, it raised a spanking controversy. The 8-story apartment never went up. But the 12-story one—an apartment hotel known as the Westminster—did. It had a central elevator rising in a mahogany and plate glass cage; around it twined a marble staircase. Arthur and most of his co-investors were from Chicago, as were the architects, H.E. Creiger and John Addison, which added to the outrage of some partisan Bostonians. The building, designed "in the style of the Renaissance," was to be "fire-proof, the modern Chicago steel construction having been adopted," according to the



Chicago Times Herald of August 15, 1897.

If the comment about steel construction sounds quaint, it is about the only part of the 1897 controversy that is not being restated emphatically in 1968. The Boston Society of Architects came out firmly against the Hancock building last month with a carefully worded statement urging the Boston Board of Appeals to deny the insurance company's petition for a zoning variation. In part, the BSA statement said, "The architects have attempted to reduce the apparent bulk of their proposal by cladding it in mirrors. This is a device untried on such a scale in an urban setting and it may produce unforeseen problems of appearance, reflected heat, and glare." Perhaps the BSA envisions the mirrored hulk of the building teaming with the sun, the way a Boy Scout might with a magnifying glass, to set fire to Trinity Church—or vaporize a pedestrian.

But the BSA's main concern is with the structure's proposed bulk—just as in 1897 critics talked of the same thing. On September 23 of that year, the noted critic of modernity in architecture Ralph Adams Cram wrote to the *Boston Transcript*: "The man who says this monstrous structure will not blight the entire group of buildings and turn the square into a hideous deformity, lies. If the crime

is committed, Trinity Church becomes a ridiculous trifle, the Art Museum a hovel, the library a forlorn protest against modern savagery, and a memorial of decent ideals now dead, the whole square is turned into a scandal." Actually, the apartment building at 120' would be 20' shorter than the main tower of Trinity Church, but it would loom above the rest of the church and the square.

The arguments used 70 years ago for preserving Copley Square are valid today. "What do I think of it?" asked F.O. Prince, a trustee of the Boston Public Library quoted in the *Boston Post* on the evening of September 27, 1897. "Why, I think of it in the same way everyone with the slightest amount of artistic sense thinks. After all the city has done, the square is to be ruined. . . . It is almost a crime to put one of those—what do you call them?—those 'skyscrapers' in such a locality.

"I think people will come to know sometime that the shutting off of air, light, sun and what-not by these high-buildings is not healthful, not to say anything of ruining the skyline and artistic effect as is the chief matter of protest in this particular case."

F.O. Prince was an optimist. You can take the building out of the square, but you can't take the squares out of the building.

PRIVATE GROUP HOPES TO REHAB 1000 HOMES A YEAR

PITTSBURGH, PA. Whenever groups of experts get together to talk about problems being generated at a rapidly accelerating clip by our growing cities, they inevitably end up thumping one grand solution: participation of private enter-

Today, a host of corporations are experimenting with rehabilitation, hoping to find the right combination of prefabrication and on-site assembly techniques that may make possible quick, inexpensive rehab work. Recently, a group of insurance companies pledged a pool of \$1 billion for nationwide investment in low-income housing. And now

comes word from Pittsburgh of a cooperative local private venture, possibly the most promising experiment so far.

Thirty-two large corporations, almost all of them based in Pittsburgh, joined in late January to form a corporation to do rehab work "on old but structurally sound housing." Capitalized at between \$3 and \$4 million, the Allegheny Housing Rehabilitation Corporation (AHRCO), as it will be known, will work initially in the Pittsburgh area. It is the first time such a consortium of companies has organized to tackle rehabilitation, and the effects of such a massive assault could be

promising. Estimates are that Pittsburgh alone has 40,000 sound but deteriorating houses, Allegheny County 90,000, and, throughout the U.S., the number is put conservatively at 5 million.

First work will probably be on 66 houses in the Kelly Hamilton area, 24 of which are eligible for 50% rent supplements. For the first time in Pittsburgh, the FHA has given these 24 houses the advantage of a below-the-market mortgage interest rate (3%), as well as the rent supplement.

Once rehabilitated, the homes will either be sold by AHRCO, or held for long-term investment.

BELLYING UP TO THE CAPITOL



Photos: Joseph W. Mellor. Courtesy, Welton Becket & Associates.

HARTFORD, CONN. The sculptured, concrete, 26-story tower for the Hartford National Bank is probably typical of the current state of architecture. Given the dictates of the Bauhaus, carefully refined by such practitioners as Skidmore, Owings & Merrill, and by Welton, Becket & Associates, whose project this is, and given the crisp detail made possible by today's machine technology, the building, taken by itself, is a good example of the discipline. The trouble





is that it cannot be taken by itself. It is the "right" building in the wrong place.

In a way, the Hartford National Bank is as much out of date as it is up to date. The designers ignored one of today's major urban problems: how to juxtapose two buildings of disparate size, shape, and style. No apparent thought was given to how to site the bank next to Charles

Bulfinch's Connecticut State House. As a result, they stand awkwardly together on facing lots, the bank looking self-consciously off-balance, like a eunuch with a Pekinese.

It seems strange that, with the obvious attention the Becket designers have given to detail, lighting, furniture, and graphics, that some attention was not given to what the building does to the cityscape.

HISTORIC DISTRICT SITE OF MODERN MUSEUM



Photo: Kawasumi photographs

TOKYO, JAPAN. When Japan's projected National Museum of Modern Art is completed, visitors will be able to enjoy not only modern Japanese art, but also contrasting views of modern Tokyo and the ancient grounds surrounding the Imperial Palace just across the street. The museum, designed by Yoshiro Taniguchi and donated to the country by industrialist Shojiro Ishibashi, will afford a variety of views from exterior ramps and terraces, emphasizing its strategic location between the old and the new.

Since the museum lies within the historic zone of the city, in which a 20m height restric-

tion insures unobstructed views of the Imperial Palace, two of the building's five levels will be below grade, and the entrance level will be set into the slope of the site. Stone retaining walls around a sculpture garden repeat the stone of canal walls adjacent to the site.

Two entrances lead into the exhibit areas, one to temporary exhibits, the other to permanent ones. Patrons will also be able to enter the 300-seat lecture hall just below ground-level without walking through the museum itself.

Open spaces on the second and third floors above grade are broken by split-level mezzanine galleries at one end,

which are designed to allow several vantage points for people viewing large works of art. Because of the delicacy of many paintings, lighting will be artificial, except in office and corridor spaces. Sensitive mechanical louvers will control humidity.

Structurally, the building makes use of post-tensioned concrete slabs and concrete pilotis that rest on bedrock.

Since the structural concrete would stain in rainy weather and crack in earthquakes (Tokyo suffers from a plenitude of both), the museum is to be clad in tile and precast concrete panels with exposed aggregate. The curved shape of the seamed copper roof will permit water to drain off during the rainy season; the shape is carried over into the side walls.

PEACE CENTER DESIGNED FOR UNIVERSITY IN JERUSALEM

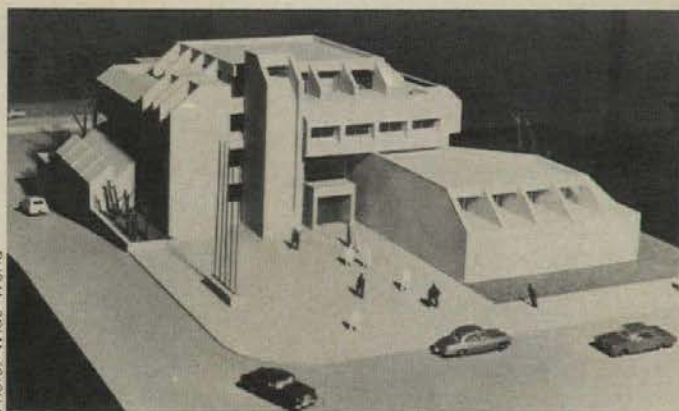


Photo: Wide World

JERUSALEM, ISRAEL. The site of The Hebrew University's original campus on Mt. Scopus, which was recently returned to Israel after 18 years of Arab control, is to be the location of the Harry S. Truman Center for the Advancement of Peace. The center, whose aim is to study means of achieving international cooperation and amity, will provide teaching and research staffs. Disciplines represented will include most of the social sciences and those branches of science and technology which treat subjects that have been sources of dissension among nations (e.g., soil and water conservation).

Recently, a model of the proposed center was put on display in former President Truman's office in the Truman Library in Independence, Mo. The design, by architects Aryeh Riskin and Gideon Aneckstein, was chosen from among 87 entries in an Israeli national competition.

The center will contain space for exhibitions, seminars, a sizeable auditorium, and a library, and will be equipped with modern audio-visual aids. Facilities will also include provision for simultaneous translation.

Since the center, set atop Mt. Scopus, will be visible from all parts of the city below, its designers have attempted to integrate it visually with the older buildings that surround the mount, partly through the use of Jerusalem stone cladding.

Functionally, the building's 3200 sq ft will be divided into three areas: A public area to contain a spacious entrance hall that can double as an exhibition gallery, a foyer leading to the auditorium, and a patio at one side of the structure. An auditorium seating over 300 people is to be equipped with modern audio-visual devices, including facilities for simultaneous translation. Other facilities to be housed in this area are a 75,000-volume library that will accommodate 30 people and two seminar rooms for groups of 50 people each.

An administrative area on the first floor above the entrance hall will be linked to the hall by a wide staircase and will contain offices and services. In the research area, students and scholars will find lounges and studies, as well as a small conference room.

Construction is slated to begin this spring with no date set for completion.

CENSUS OF ARCHITECTURE UNDERWAY

WASHINGTON, D.C. The Bureau of the Census is, for the first time, taking a close look at architectural and engineering firms. Most firms to be canvassed have already received census forms, which were mailed in February. Completed forms are to be returned to Washington by April 30.

Hopefully, what will emerge from this economic census is a composite record of the architectural and engineering professions as they shaped up in 1967. To attain such a profile, the Census Bureau sent questionnaires to all the larger architectural, and engineering, firms and to what the Government calls a "scientifically selected sample" of smaller firms. Information about one-man firms will be gleaned from Government records.

A separate Census report (part of the 1967 Census of Business) will be published toward the end of 1968 or in early 1969. It will contain detailed information on types of legal organization of U.S. firms, major sources of fees and receipts, classes of clients, types of projects, payrolls and employment.

FACE-WASHING FOR PARIS LADY



Photo: French Government Tourist Office

PARIS, FRANCE. Notre Dame, the Cathedral of Paris, is one of the last on this city's list of historic monuments to have the centuries' accumulation of dirt and grime washed from its façade. Since Andre Malraux, France's Minister of Cultural Affairs, began his clean-up campaign in 1960, the church of La Madeleine, the Arc de Triomphe, the Panthéon and other famous structures have

gone under the hose, but Notre Dame remained untouched because of fears that its ancient stones would not withstand the pressure of scrubbing nor the disintegrating effects of water. Another fear was that the cleaning would expose an unsightly layering of different kinds of stone used in constructing and restoring the cathedral through the centuries.

However, Bernard Vitry, chief architect of historic monuments in France, feels that no variation in color will be visible. An experiment conducted in 1965 under Vitry's supervision obviated concern for the preservation of the cathedral's old stones, when workers found that dirt was easily removable from the even more delicate façade of the older cathedral at Rheims, and that the cleaning process did no harm. To those who fear that removal of the protective layer of grime will open pores in the stone to more damaging effects of modern air pollutants, Vitry replies, "Dirt protects stone just as much as it would a human face that has never been washed. Stone must be able to breathe." Cleaning stone, he says, does not make it more vulnerable to microbes or to deterioration of any kind.

In the case of Notre Dame, no hoses will be used: Even a 4 lb to 5 lb pressure is too strong for the stones' surface. Early this spring, a team of four or five men will begin cleaning the cathedral with nylon scrubbing brushes and pure water and will work until cold weather sets in, for low temperatures would cause water to freeze and crack stone. Although the entire cathedral does not need to be washed—the upper parts, where air is purer, are not covered with soot—the job will take two or three years to complete.

CORRECTION

In the January "Personalities" column, Myller, Snibbe, Tafel were incorrectly listed as the architects in charge of the development for Brooklyn College; architects are Evans & Delahanty. Myller, Snibbe, Tafel have been assigned as architect-planners to York College, a new campus to be established in New York City.

CONTEMPORARY ARMENIAN CHURCH



SOUTHFIELD, MICH. Before designing a church for Armenian parishioners in this Detroit suburb, architect Suren Pilafian spent considerable time behind the Iron Curtain, visiting churches in the Republic of Armenia. In all, he looked carefully at 12 churches there, all built before the 14th Century. In his design of St. John's Armenian Church, he copied their hints of Romanesque and Byzantine architecture.

Although Pilafian adhered carefully to the early Armenian architecture, he added some eclectic touches. The 16 stained-glass windows just beneath the roof, for instance,

were made in Chartres, France, and their glass is faceted, held in place with cement, not lead. Moreover, the roof, which rises 90' to a gold-on-porcelain cross, is fashioned not of stone, as roofs are in Armenia, but of gold-on-porcelain-on-steel hollow panels. Gold, Pilafian felt, is "a higher tribute to God." These panels are laid over an inner shell of calcium concrete; beneath this shell is an air space, and beneath that an inner ceiling supported by concrete arches set on piers.

As might be expected, commercial pilots flying over Detroit often use the church as a landmark.

NEW FLIGHT TERMINAL FOR FINNISH AIRPORT



HELSINKI, FINLAND. Architects Ström and Tuomisto of Helsinki have designed a new, neat-looking terminal building for Helsinki Airport. Currently undergoing expansion, the airport will eventually accommodate an estimated

1,500,000 passengers yearly.

The airport, located approximately 10.5 miles from the city, serves both domestic and international air traffic. Plans for expansion include construction of a completely new access road and parking



pattern and a considerable extension of the present flight apron. Later, a third runway will be added to the present two. The new terminal building will replace an existing temporary structure a few yards to the south.

Passenger circulation in the new terminal, which will be constructed as part of the project's first phase, is arranged on two levels. Departing passengers enter the building from an elevated road several yards above apron level and proceed, on the same level, through a telescoping bridge to the plane. Deplaning passengers move from the bridges down esca-

lators to the lower level, where they find baggage area, customs, and exit to public transportation.

The terminal's construction is primarily concrete. The main hall is supported on two rows of concrete columns. Steel-beam roof structure is cable-suspended. Most of the exterior walls are of sun-reflecting glass and aluminum; load-bearing walls are clad in color finished aluminum.

Foundation work began in November 1966, and the building should be completed by the summer of 1969. Total cost, including all furnishings, is expected to be £2,200,000.

FOR SALE



Photo: British Travel Association

LONDON, ENGLAND "Psst. Buddy. Wanna buy a bridge?" If somebody sidles up to you and tries to sell you London Bridge, you had better think twice before calling a cop. He may be more than just a con man. The venerable old bridge is for sale, or at least part of it is, about 10,-

000 tons' worth (of a total 130,000 tons), its superstructure and granite facing. The whole thing is slated for destruction in November to make way for a modern span with a six-lane highway (see p. 39, DECEMBER 1965 P/A). If you buy it, you will have to buy all those 10,000 tons. "It

is not worthy of such a great historic monument to be broken up and sold little by little," said London City Engineer Harold King, who has turned down a host of requests for pieces of it. The present bridge, opened by King William IV in 1831, is supported on four piers, has five arches, and is 152' long.

At first, London officials thought they could incorporate the existing London Bridge into a wider bridge. But, although the present span is perfectly sound, investigators found that the timber foundations have settled slightly into

the Thames after carrying that weight for almost a century and a half. Today, they estimate it is sinking about 1" every 8 years. Any major disturbance of these timbers, they fear, would "create a structural hazard beyond the bounds of prudence."

The bridge's stonework will be dismantled and stored for any purchaser for up to six months. Offers to buy may be sent to the Town Clerk, Corporation of London, c/o The Hallkeeper, Guildhall House, Gresham Street, London, E.C.2, England before noon, March 29, 1968.



PHILADELPHIA TO PROPOSE MEGASTRUCTURE FOR '76 CELEBRATION

PHILADELPHIA, PA. In making a bid to become the site of a '76 Bicentennial, celebrating the two-hundredth anniversary of our nation's independence (if we are still independent by then), Philadelphia has decided to make their proposal a triple treat. If the city's Committee for an International Exposition in Philadelphia in 1976 has its way, the exposition, whose theme is "The Permanent Revolution," will be a national bicentennial, it will also be an official world's fair with the blessing of the Bureau of International Expositions in Paris; and it will be a megastructure convertible afterwards to a city within a city complete with transportation—"moving platforms and minirails"—schools, homes, and shops.

Philadelphia currently has consulting firms, Economic Research Associates, and Meridian Engineering working on their proposal, which will

have to compete with entries from Boston and perhaps with historic sites in Virginia for the right to be the site of the national bicentennial.

Initial plans call for a megastructure over 4.2 miles of the Pennsylvania railroad, starting from the 30th Street Station railroad yards. Cost is estimated initially to be \$1,200,000,000. But Philadelphia feels this sum would be ultimately returned to the city through taxation.

EAVESDROPPINGS

"We have simply lost control of the growth of our cities. If I asked you to build a motor for a car that would run 150 mph this year, 165 the next, 180 the year after, you would say I am crazy. Yet this is just what we expect our cities to do—to handle more shoppers, more cars, more people." C. A. Doxiadis quoted in *Business Week*.

"To deal with the necessary physical expansion, universities should plan. But most of

them simply lack the funds to finance intelligent, long-range studies, not only of themselves but their whole environment. The Department of Housing and Urban Development offers planning grants to cities. Why not extend planning aid to educational institutions which have become by their increasing size and concentration of talent so important to the future of cities?" *Architect Frank P. Hosken writing in The New York Times.*

"Yesterday the smog was so thick I couldn't smell the exhaust fumes from the buses." *Dean Martin.*

"Private enterprise will have to be a full partner in city rebuilding because it alone has the greatest competence to do much of what we are trying to do. We are talking about

new housing, and rehabilitated housing, and new community facilities, on a scale never attempted before. Private enterprise will build those structures, and provide them with all the products and services from sinks and bathrooms, to basketballs for gymnasiums, to microscopes for medical clinics. The proper perspective is not to wonder whether, if business or government fails to act, the other will have to do the job. The situation is that, unless we are all involved, none of us is going to get very far along." *Robert C. Weaver, speaking at the groundbreaking of the United States Steel Corp. headquarters.*

"I'll Build a Stairway to the Stars" is the song played on the Merv Griffin TV show whenever Philip Johnson makes his entrance.

CALIFORNIA CIVIC CENTER

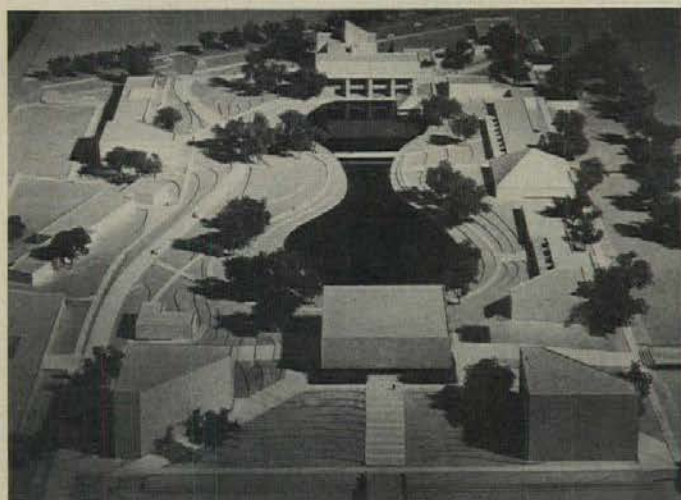


Photo: Jeremiah O. Bragstad

FAIRFIELD, CALIF. Jurors for the Fairfield Civic Center Design Competition recently awarded the first prize to San Francisco architect Robert Wayne Hawley, particularly commending his arrangement of buildings and circulation patterns on the 33-acre site.

Architect Hawley's solution consists of a four-story city hall, a one-story police building, and a pyramidal-shaped community assembly hall, all placed at one end of a man-made lake. In fulfilling the competition's program requirement of a master plan for future development, Hawley's design calls for a large landscaped park dominated by the lake, with provision for future construction of a community theater facing the city

hall across the lake. Other buildings could be grouped near the theater. A narrow band of slightly (4') depressed parking space hugs the perimeter of the entire site, so that parked cars will not be visible to passers-by outside the civic center site.

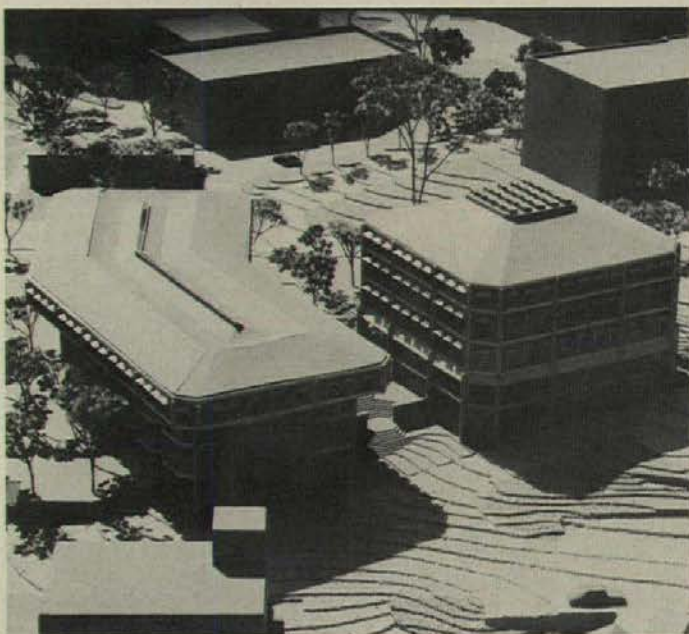
Jury chairman Gerald McCue (other members were William Corlett, Worly Wong, and Eugene Lightfoot), reporting on the selection of a winner, noted that the first increment of Hawley's plan "provides a group of three buildings that combine to form an inviting focal point from which the rest of the development may grow. The placement of the buildings takes good advantage of the outside spaces of the buildings

and permits pedestrian circulation to form in natural patterns providing access from several directions." McCue remarked further, "The exterior design is subtly distinguished; the concrete and brick forms provide variety

and contrast but with a continuity of idea that makes each of the buildings a visual part of the other."

Construction budget for the project is \$2,225,000, with an additional \$200,000 for landscaping and parking.

A-E EXPANSION ON SEATTLE CAMPUS



1

SEATTLE, WASH. By fall of 1968, architectural and engineering students at the University of Washington in Seattle will begin moving into new buildings designed to accommodate expanding enrolments in the design professions.

A two-building complex (1) for the College of Engineering will include a professional library connected by a tunnel to the classroom-administration building, whose unusual double-wing shape is determined by the arrangement of classroom seating. Since traffic near the 24 classrooms will be heavier and noisier than it will in administration areas, architects, Fred Bassetti & Company, with University Architect Frederick M. Mann, have separated the two functions on different levels. Classrooms will occupy the two lower stories; offices will be on the

top floor. To fit the area needed for spacious interconnected offices into one floor, the architects have projected the top story beyond those beneath.

The library's chamfered corners are intended to minimize the building's apparent bulk, and glass walls on the ground floor, where catalogs and reference materials are housed, give it an inviting, rather than forbidding, appearance. Skylights will let natural light into the main corridor of the top floor of library stacks. Major materials for both buildings, slate and brick (with concrete window hoods and sunshades), harmonize with most of the existing structures in the area. Total area of the complex will be 93,920 sq ft; estimated cost is \$3,500,000.

Architecture and Urban

2

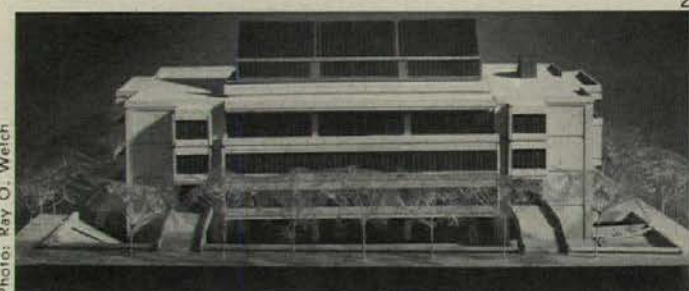
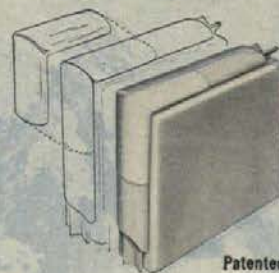


Photo: Ray O. Welch

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On Readers' Service Card, Circle No. 379

Planning Departments will be accommodated in a single structure (2), but the new building is scheduled for construction in two phases. First phase construction will provide 86,000 sq ft for design studios, library, administrative and departmental offices, shop and laboratory facilities, classrooms, and faculty offices. Later construction will include more space for each of these functions. Sharing the building with the architecture and urban planning departments

will be landscape architects and students of building technology and administration.

Architects Gene Zema and Daniel Streissguth have created a plan that distributes functional rooms around an interior court four stories high and 50' x 120' in area. The court will be covered by skylights. Structure is a cast-in-place reinforced concrete frame with concrete shear walls and large window areas. Cost of the first phase is estimated at \$3 million.

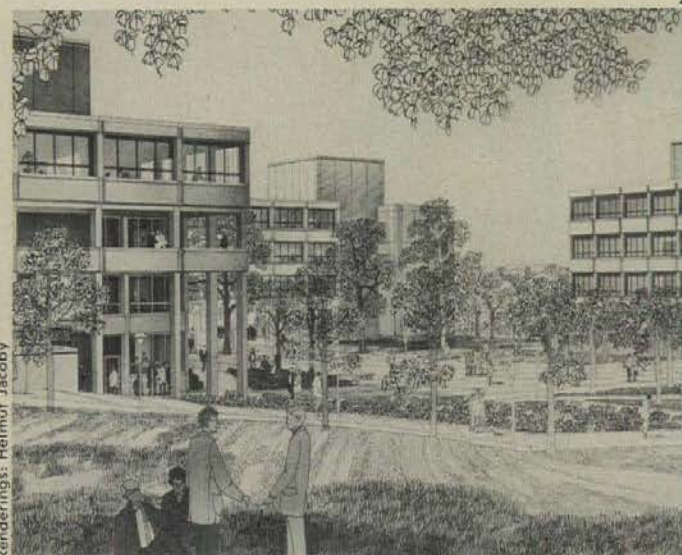
NEW CAMPUS FACILITIES FOR QUEENSBOROUGH COLLEGE



NEW YORK, N.Y. The associated firms of Holden, Yang, Raensch & Corser and Frederic P. Wiedersum Associates have received approval for their design of a student lounge and cafeteria (1) for Queensborough Community College, part of New York's City College.

Holden, Yang, Raensch & Corser master planned Queensborough's new 34-acre campus so that certain areas would offer open, informal setting and others, such as

the academic campus (2), a feeling of containment and concentration. Among the academic buildings, the library and science buildings (left and center, respectively) are nearing completion. The humanities building (right) will be built at the same time as the recently approved student lounge and cafeteria. Included in the master plan is a renovated clubhouse that has survived the site's transformation from golf course to college campus. The club-



Renderings: Helmut Jacoby

house will be connected to the student lounge and cafeteria, which will offer two lounge levels and a mezzanine. Cafeteria and lounge will have brick exterior walls and terre roofs with batten seams. Construction will start this spring. Facilities are expected to be ready for an estimated student body of 4000 by fall of 1969.

CALENDAR

March 27-28 are the dates set for a conference on factory-manufactured modules in building construction. The conference, titled "The Case for Instant Space," will be held under the auspices of the Building Research Institute at the Conrad Hilton Hotel in Chicago. For registration forms and further information, write to BRI, Suite 502, Embassy Bldg., 1424 16 St., N.W., Washington, D.C. . . The Pennsylvania Society of Architects will conduct a seminar on "Costs of Architectural Services" at the Hershey Motor Lodge, Hershey, Pa., March 30. Landscape architects and consulting engineers, as well as architects from neighboring states, are invited to attend. More information will be supplied by: J. Harlan Lucas, Chairman, 1968 PSA Seminar, 321 N. Front St., Harrisburg, Pa. 17108 . . . "Cities in Context," an international conference to be held at the Center for Continuing Education of the University of Notre Dame, will take place March 31-April 3. Speakers listed on the preliminary program include Edward T. Hall, anthropologist, Charles Haar, Assistant Secretary for Metropolitan Development, HUD, and William Slayton, Executive Vice-President of Urban America, Inc. Registration forms may be obtained from: Cities in Context, Center for Continuing Education, 7303 Box W, The University of Notre Dame, Notre Dame, Ind. 46556 . . . The Pennsylvania State University College of Engineering will conduct 14 Engineering Seminars between April and September this year. For a description of the programs, write to: Continuing Education Conference Center, J. Orvis Keller Bldg., Pennsylvania State U., University Park, Pa. 16802 . . .

The American Society for Testing and Materials has initiated **Training Programs on Standardization Principles**. The first seminar will be presented April 16-17 at ASTM headquarters, 1916 Race St., Philadelphia, Pa. 19103. Write to that address for further details . . . April 22-24 at the Washington, D.C., Shoreham Hotel, the National Association of Architectural Metal Manufacturers will hold its **30th Annual Convention and First Annual Trade Show**. Inquiries should be addressed to: NAAMM, Suite 1501, 228 N. LaSalle St., Chicago, Ill. . . **1968 Design Engineering Show and Conference of the American Society of Mechanical Engineers**, April 22-25, will present design ideas ranging in application from the consumer to outer space. The exposition will be held at Chicago's International Amphitheatre; the conference will run concurrently at the Palmer House. Registration cards and information on the conference are available from Clapp and Poliak, Inc., 245 Park Ave., New York, N.Y. 10017.

OBITUARY



Joseph Hudnut, who, as dean of the Harvard Graduate School of Design from 1935-53, was responsible for bringing the ideals of the Bauhaus to the United States, died January 15 at the age of 81.

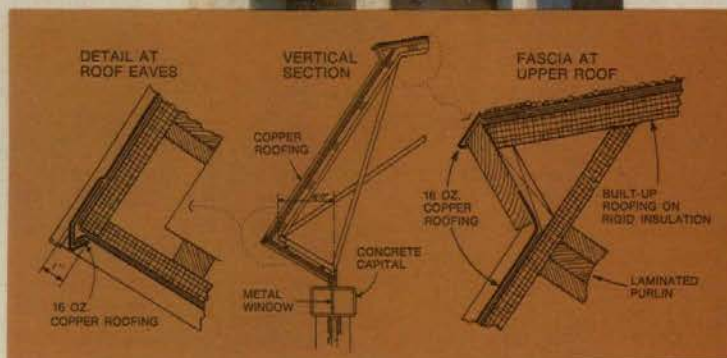
Hudnut, born in Big Rapids, Mich., studied architecture at Harvard University, the University of Michigan, and Columbia University. From 1923-26, he practiced architecture and directed the McIntire School of Fine Arts



New Field House, University of California at Santa Cruz. Copper encloses the terminal chords of the two-way steel truss that spans the large main area of the building. Repetition of copper above an open stairway unites the design. The unusually prominent drip created at the eave gives strong definition to the roof.



The workability and rich color of sheet copper were used to good advantage by architects Callister, Payne and Rosse in the design of this college athletic building. Copper combined perfectly with the buff of the concrete and deep color of the redwood. A few years of weathering should make them harmonize even more beautifully. The ease of joining and forming sheet copper simplified the installation. And the enduring copper roofing, flashing and fascia should require no maintenance for many, many years.



Details of the roof eaves and upper roof fascia are shown above. For a new 96 page handbook of sheet copper fundamentals, design details and specifications, write for "Contemporary Copper"



at the University of Virginia. In 1926, he joined the faculty of Columbia University as professor of architectural history, becoming acting dean in 1933; in 1934, he was named dean. While at Columbia, he eliminated group competitions from the curriculum and introduced a tutoring program under which each student worked with a master.

But it was his work at Harvard, begun in 1935, that gained him the greatest recognition and exerted the most far-reaching influence. There, he brought about the integration of the Schools of Architecture, Landscape Architecture, and Regional Planning into the Graduate School of Design. Drawing on the philosophy of the Bauhaus, he required students to work on actual construction as a supplement to their design training.

"The students," as he once put it, "should have some direct experience with wood, stone, glass, and the metals used in building. This experience should comprise not merely observation of qualities and uses of these materials, but also actual handling of tools which are used to give technical form."

Hudnut's most spectacular contribution to architecture and architectural education in America was that it was he who was responsible for bringing to Harvard two of the Bauhaus' foremost leaders, Walter Gropius, who came to the U.S. in 1937, and Marcel Breuer. Their presence in America is generally recognized as having been of prime importance in the acceptance of "modern architecture" and the International Style.

THE VIEW FROM THE BRIDGE

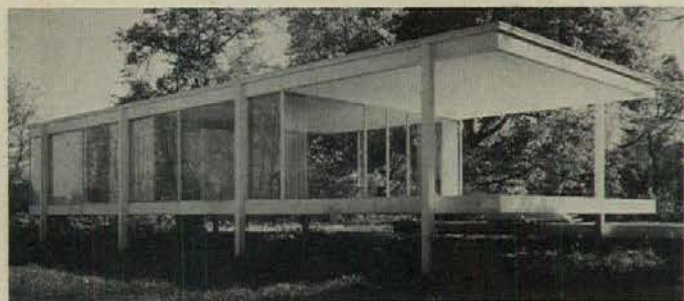


Photo: Hedrich-Blessing

PLANO, ILL. The house Mies van der Rohe built for Dr. Edith Farnsworth in 1951 may be the most refined expression of the Miesian aesthetic. It is a hovering glass cage, with floor and roof planes welded to exterior columns with such delicacy that the connections are never apparent. For 18 years, Dr. Farnsworth has lived in the house, enjoying the view and the privacy of her wooded surroundings.

Now, the highway builders plan a bridge, elevated 10'-6" above grade, across the Fox

River, just 190' from Dr. Farnsworth's porch. Drivers would be able to look into her living room, through those glass walls. Although she has had an independent engineering firm study other possible sites for the bridge, its construction on the originally chosen site seems imminent. To build the bridge, the highway department would have to remove a line of shielding trees. They may ultimately have to remove Dr. Farnsworth, and other believers in privacy.

COMPETITIONS

The \$500 1968 **Birch Burdette Long Memorial Prize** for architectural rendering will be awarded by the Architectural League of New York for "excellence in composition, facility in technique, and expression of the character of the design illustrated." Renderings submitted will be exhibited at the League, March

18-April 6. Further information is available from: Joanne Lupton, The Architectural League, 41 E. 65 St., New York, N.Y. . . Architects, engineers, designers, and consultants are invited by the James F. Lincoln Arc Welding Foundation to submit papers describing how the use of arc welded steel benefited planning, fabrication, func-

tion, or appearance of complete or component parts of a building or other type of structure. The Foundation offers a \$10,000 first prize and 23 others totalling \$50,000 in its 1968 **Awards Program for outstanding achieve-**

ment in design of arc-welded structures. Deadline for entry is July 15. Rules of entry and description of program may be obtained from: James F. Lincoln Arc Welding Foundation, P.O. Box 3035, Cleveland, Ohio 44117.

ONE PER CENT PAYS OFF



PHILADELPHIA, PA. Philadelphia's 1% for art law has produced at least one distinctive piece of art for the city. Designed by sculptor Harry Bertoia, this 4-ton, free-form piece forms a focal point for the entrance plaza of the Philadelphia Civic Center (designed by Edward Durell Stone in association with Davis, Poole & Sloan). It was welded together using 11,000' of copper tubing and bronze welding rods. It stands in the center of a 35' glass mosaic bowl and is sprayed by water from more than 100 nozzles. "I strove for the essential," says Bertoia, who

adds, "I can't put into words what I put into metal."

For Bertoia, the essential he strove for was "to echo the sound of the forest, motion of water through time, the viscera of mother earth, and the unfolding blossom, and shadow of night." Wind controls mounted on the twin flagpoles that flank the Center's plaza entrance, will regulate the height of the fountain spray. Cost of the sculpture and its basin was \$66,000, including transportation from Bertoia's studio in Barto, Pa. Its construction took Bertoia and two assistants seven months.

PERSONALITIES

The College of Architects of Peru has named five American architects to honorary membership. They are: **Robert L. Durham**, AIA president, **Marcel Breuer**, **Philip Johnson**, **Louis I. Kahn**, and **Paul M. Rudolph**. . . **Marcel Breuer** has also received an appointment as Thomas Jefferson Memorial Foundation Professor of Architecture at the University of Virginia. He will reside at the university for three months to teach a fourth-year design course during the spring term . . . The AIA announced recently that it has elected five persons as honorary members in recog-

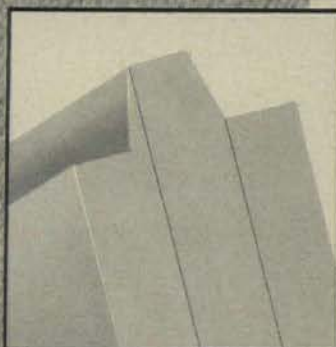
nition of their distinguished service to the architectural profession on allied fields. Those elected are: **John W. Gardner**, Secretary of the U.S. Department of Health, Education, and Welfare; **James H. Scheuer**, member of the House of Representatives; **J. Irwin Miller**, chairman of the Board of Cummins Engine Co.; **Mabel S. Day**, secretary to the Executive Director of the AIA, and **Maurice Favanoux**, Managing Editor of *Liturgical Arts* . . . Newly appointed chairman of the National Housing Committee of the AIA is **Jack C. Cohen**, of Cohen, Haft & Associates, Silver Springs, Md. Cohen has

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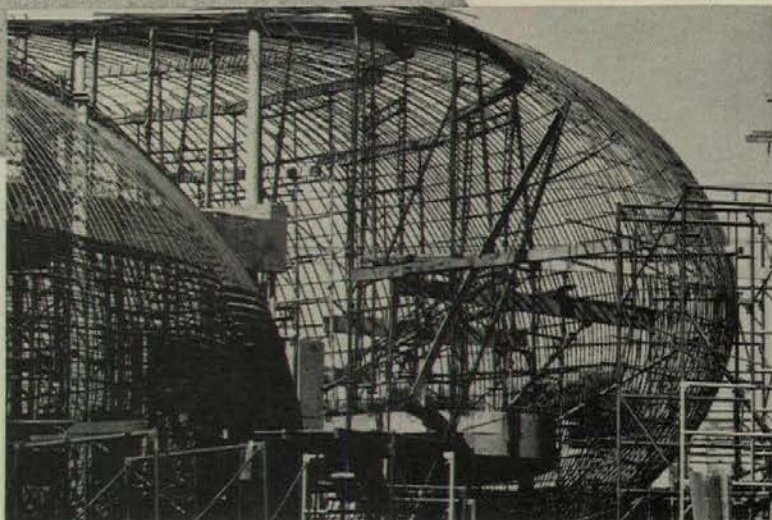
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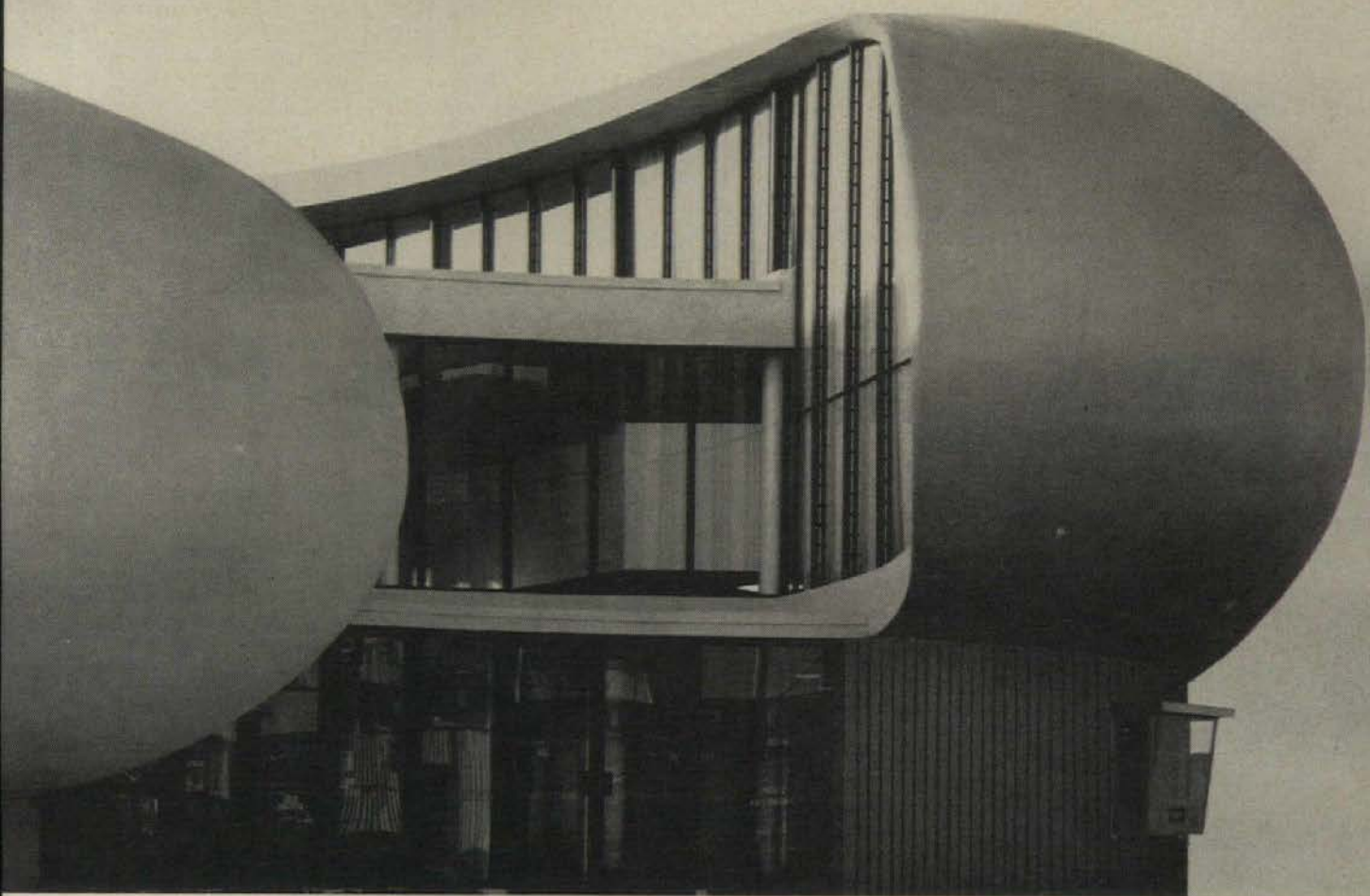
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3-68

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already begun meeting with Federal officials preparatory to formulating an official AIA position on housing . . . Scarab, the national professional service organization of the environmental disciplines, recently re-elected **Frederick D. Moyer** to a one-year term as its president. Moyer is a professor in the department of architecture of the University of Illinois . . . The trustees of the Boston Museum of Fine Arts have named **George Nelson**, whose architectural and design firm, George Nelson & Company, is located in New York City, to serve as a consultant to the faculty of the Museum School of Art . . . **Henry S. Rogers** is the new president of the General Building Contractors Association of Philadelphia. Rogers is also president of Hughes-Foulkrod Construction Company . . . The Urban Land Institute has recently named **Royal Shipp** as its new Research Director.

WASHINGTON/ FINANCIAL NEWS

By E. E. HALMOS, JR.

Preview of '68 — In a Washington atmosphere of virtually complete absorption in both political and military problems, architects are nevertheless succeeding, to some extent, in an uphill battle to gain points for the profession.

One area is the never-ending battle with Federal agencies for recognition of architecture (and civil engineering) as a professional service that should be exempted from normal Government contract procedures. An example is success in forcing the Navy's Facilities Engineering Command (formerly, Bureau of Yards and Docks) to revise a controversial A-E contract provision that originally considerably broadened A-E liability (by insisting that the A-E remain liable, apparently beyond any state statutes of limitation). NAVFEC agreed to modify the liability clause somewhat.

In other areas, as result of AIA and other professional protests, the Soil Conservation Service offered to re-write to clarify the point that

SCS won't compete with consultants; and General Services Administration changed its policies to make it clear that "condition surveys" (of vacated premises) are to be considered professional services, thus not subject to bid, as had been the case in some regional offices (notably, New York).

On a lower scale, architects continued to inject themselves into civic affairs, particularly in Washington, but also as precedent-setters for other municipal problems.

A Washington architectural firm (Keyes, Lethbridge & Condon) was selected as part of the design team planning a 25,000 population "new city" on a abandoned Government training school within the capital's limits; AIA's national officers continued to inject the group into the hot controversy over construction of an additional bridge over the Potomac (the Three Sisters Bridge) by insisting that the city's entire highway system should be restudied before such a structure is built; voiced strong support for a bill (H.J.Res. 914) that would curb, to some extent, the powers of the Architect of the Capitol over the 131-acre reserve on Capitol Hill; continued its strong support of the developers of the Watergate, an apartment complex bordering the now-building Kennedy Center on the banks of the Potomac; released a new publication ("Checklist for Cities") aimed at providing municipal officials and others in identifying problems in city rehabilitation.

Add to this a growing battle against strong moves toward unionization of professional employees, and the continuing attempt to clarify Federal law relating to bidding for professional services, and it is clear that there's a busy year ahead, even if little prospect of new legislation affecting the field.

Financial: The Federal Budget — Architects will have to look well behind the staggering mass of figures that make up that incomprehensible \$186,100,000,000 Federal budget (for Fiscal Year 1969, which begins July 1) to find implications of real effects on their business operations.

Best place to look is toward the actions of the President and the heads of the various

agencies. The budget message itself gives no real hint of where and how much any cuts that may be forced will be made. And the President's statements make it very clear that the Government's actions will be a matter of Executive financial (and political) decision.

Construction Budget About the Same — The fact is that the total amount the President seeks for identifiable construction purposes is just about the same — even slightly higher — than in previous years, despite a few relatively minor cuts that can be noted.

Over-all, it comes out to more than \$12 billion for construction, ranging from military housing to college laboratories, without counting financial operations such as those of the Federal National Mortgage Association, designed to shore up money markets.

That huge total includes, for the interests of architects, sums as small as \$6,900,000 for the Architect of the Capitol (for an additional House office building) to \$1,400,000,000 for Housing and Urban Development's urban renewal program (a rise of \$300 million over Fiscal Year 1968, by the way); \$688 million for Army military construction (double the 1968 figure); \$589 million for military family housing (down about \$80 million); \$904 million for the Army's "civil works" projects — rivers and harbors (down \$63 million); \$358 million for low-rent public housing construction (up \$23 million); \$55 million for urban planning grants (up \$10 million); and \$4,200,000,000 for highway construction (up \$300 million).

Most of the cuts shown in the budget came out of construction spending by the military services individually: the Navy loses about \$100 million, Air Force about \$140 million. They are more than outbalanced by added spending in other areas.

Significantly, the President told Congress that he would make "a determined effort to slow the pace of federally financed construction programs, as much as possible."

Some Cuts in Highway Funds — That meaning is very

clear: It was demonstrated in plans to cut back spending on highways by a complex formula designed to cut \$600 million from funds in the coming year, but which may result in considerably greater cuts, since it is based on spending by the states within the past calendar year, not on allotments made to them. (States normally can spend such allocations any time within three years, hence may get behind in any given year.) To make the message of Federal domination more pointed, the Transportation Department said it might "negotiate" with states to "adjust" their payments.

Thus, any local or state activity will be clearly subject to the dictates of the Federal agencies this year. The result may be a chaotic set of circumstances for anyone concerned with the construction industry.

Construction Work Up 6% — The President's budget message took heed of the rapid and continuing rise in construction costs: He placed the rise at 5% in 1966, and 6% in 1967.

That statement was immediately confirmed by: (a) the quarterly report on costs of the Bureau of Public Roads, which showed a 5.7% rise for the last quarter of 1967, compared to the same period of 1966; and (b) by a BPR report to Congress on costs of completing the 41,000-mile Interstate Highway system, which indicated an \$8 billion jump in estimates (some of it attributable to "beautification" and safety programs).

Housing Starts — It was also accompanied by a substantial drop in number of new housing starts in December (compared to November) and an over-all report on construction volume for November that showed the industry running only very slightly ahead of 1966, at a rate of about \$77,200,000,000 for the year.

There were also continued evidences of quickly tightening money-markets, affecting the homebuilding field. In Maryland, for instance, state legislators were considering raising allowable interest rates to 7 or 8%, thus trying to eliminate the "points" now charged both buyer and seller in house sales.

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By John Peter

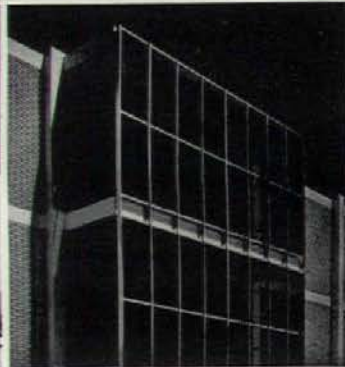
John Peter Associates, New York City

1965 160 pages \$12.00

Design with Glass inaugurates Reinhold's "Materials in Modern Architecture" Series. The books in this series are planned specifically to demonstrate the design potentials of wood, steel, concrete, glass, plastics, and clay products in modern architecture. The aim of each volume is to give insight into the materials that lie behind the surface design. The series will provide in photographic reproduction the imaginative and inspirational uses of materials by the great modern masters from all over the world. In Volume One the author surveys the historical background as well as modern developments in the use of glass. An Introduction by Professor Albert G. H. Dietz of M.I.T., one of the nation's most widely-recognized experts in construction materials and their specifications, provides an authoritative technical briefing on the function of glass in architecture. The book contains 141 illustrations, including 72 half-tones, 69 architectural drawings.

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PRODUCTS

AIR/TEMPERATURE

Stretching heat. Manufactured in 5000-w and 10,000-w units, "Electripipe" spreads long-wave, infrared heat along its 10' and 20' pipelike units. Because infrared is not affected by air movement, it functions with the length of the pipe to reduce KW input by 20 to 30%, claims the manufacturer. Electric Pipe Line, Inc., 280 Midland Ave., Saddle Brook, N.J. 07662. Circle 100, Readers' Service Card

CONSTRUCTION



Panel talk. Eleven woodgrain patterns and 18 colors are now available for those with paneling pendants. Sold in $\frac{1}{8}$ " and $\frac{1}{4}$ " thicknesses, the colors and wood patterns are protected by a plastic surface that is nonreflective and will not crack, peel, or chip; the units can be installed without furring by the use of an adhesive. Movable panels are also included in the firm's products. Matching solid core doors are also sold with the panels. Videne Products Division, The Goodyear Tire & Rubber Co., 1144 E. Market St., Akron, Ohio 44316. Circle 101, Readers' Service Card

That wet-dry cycle. A membrane sealant, "Thio-Deck," is engineered for forming a flexible, impervious coating between concrete slabs or concrete and tile. The sealant is a two-part black blend: one part of polysulfides, one part coal tar and a reactive catalyst. Adhesive qualities are claimed to be good for a variety of surfaces, and the membrane may be applied in different sections or patches because the material will bond with itself to form what is claimed to be a continuous, seamless surface. When cured, the rubber sealant ef-

fect is stable above or below grade from -40 F to 175 F without losing its elasticity. The manufacturer adds that resistance of 30 to 50 mil coats to water, salts, acids, and bacteria is excellent. Toch Brothers, Inc., 250 Vreeland Ave., Paterson, N.J. 07504. Circle 102, Readers' Service Card

Back to nature. "Filon-Stripes," a translucent panel with angular ribs and multi-colored stripes on a white background, was designed by interior designer Lloyd Faulkner to serve as "a foil for nature." Flexural strength of the plastic panels is over 30,000 psi, tensile strength, 16,000 psi; the panels meet the "slow burning" requirements of ASTM D-635. Four color patterns with varying colors of stripes are sold; lengths: 8', 10', and 12'. Width is 26". Filon Corp., 12333 S. Van Ness Ave., Hawthorne, Calif. 90250. Circle 103, Readers' Service Card

Brick, block. "Tex 4512," a clay block $11\frac{1}{8}$ " square and $3\frac{3}{8}$ " deep, is loadbearing with a compressive strength of more than 9000 psi; $\frac{3}{8}$ " mortar joints are recommended. Standard corner, jamb, and closure units are available. Colors: red, buff, and brown. Natco Division, Fuqua Industries, 327 Fifth Ave., Pittsburgh, Pa. 15222. Circle 104, Readers' Service Card



Mechanized snake. A flexible duct, "Aircon" is formed from corrugated, tempered foil strips. Zinc coats the .005" wall thickness. Available in up to 12" diam, the duct may be selected in in-

sulated and noninsulated lengths. Aluminum, heavier steel, and longer lengths may be ordered. The 10' sections of the largest diameters are said to be easily handled by one man and may be cut with a knife or scissors. Airflow in the tightest bends reportedly is within 4% of rigid ducting values. The material is UL approved, will not burn, performs to specifications from -65 F to 450 F, and requires no more support than rigid ducting, says manufacturer. Dayflex Plastics Div., Dayco Corp., 333 W. First St., Dayton, Ohio 45401. Circle 105, Readers' Service Card

FLOORING

Underfoot observance. "Texama" carpet uses a tight nylon staple available in 12 attractive colors and a subdued herringbone pattern. The manufacturer claims that the carpet survived Expo 1967. During the seven months of the fair, 43 million visitors tramped over the carpet in 25 pavilions. Fabric weight: 19-20 oz per square yard. Staple height: $\frac{1}{8}$ "; and the virgin foam rubber base is $\frac{3}{16}$ ", making for a total thickness of $\frac{1}{4}$ ". Color fastness is rated at over 60 hrs. The carpet comes in 5' widths. Glenoit-Dobbie, Inc., 111 W. 40 St., New York, N.Y. 10018. Circle 106, Readers' Service Card

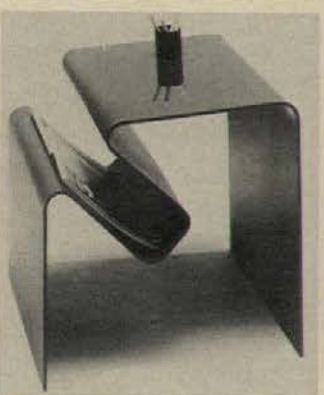
FURNISHINGS

For office tigers. "Action Series," a moderately priced seating series, features executive, secretarial, and reception chairs with contoured seats and backs. Upholstery materials and frame finishes come in wide varieties. Adjustable heights on some of the chairs supplement the posture devices. The chairs are claimed to have been designed for rugged office use. Winfield Chair Co., Winfield, Ala. 35594. Circle 107, Readers' Service Card

Arcs for art. "Coulson Range," a William Plunkett design, uses arcs in a matching table and chair. The extruded aluminum is available in polished or satin finishes, and the chair may be upholstered in fabric (wools, wor-



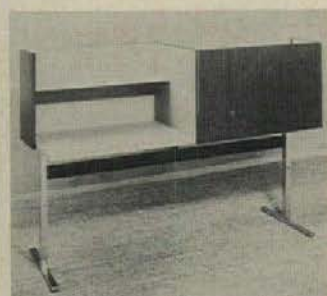
sted), hide, or vinyl. The over-all dimensions of the chair: 27" in height, 24" in width; seat depth and width are 17" and 20" respectively; and the seat height is 18". The table, which is held together by pins and also uses other pins to suspend its glass top, is 16" in height and 30" in diameter. Plunkett notes that the design has similarities with furniture from the 1920's. Tempest-Hoag International, 979 Third Ave., New York, N.Y. 10022. Circle 108, Readers' Service Card



Plastic Table. "Form," an end table with a slot for magazines, is a single piece of acrylic plastic available in highly polished red, white, or black. Designed by Andrew Ivar Morrison, the table is 18" in all dimensions. Stendig, Inc., 410 E. 62 St., New York, N.Y. 10021. Circle 109, Readers' Service Card

Clendinning designs. Armchairs, 2-4 seater settees, wood or plate glass-topped tables, and a foot-stool are the items in Max Clendinning's "Maximus Ariel Range." Angle corner brackets connect the four sides of the molded plywood surfaces and also anchor the molded rubber supports upon which the cushions rest. Upholstery is a combed Dacron fiber, and the finish

may be either lacquer or Rosewood veneer. Lacquer finishes: white, blue, red, brown, or black. Each furnishing in this series is fitted with roller casters. JG Furniture Co., Inc., 160 E. 56th St., New York, N.Y. 10022. *Circle 110, Readers' Service Card*

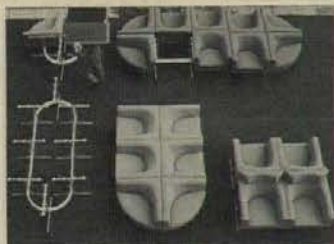


Library things and things. Robert Benhan Becker's furniture designs for libraries include 1-4 place carrels, a dictionary stand, tables, and chairs. Carrel designs are available in wood (oak, walnut) or plastic finishes, polished chrome bases, and a choice of inside surfaces. Vinyl and wood edgings protect against hard wear. The size range: 24"x36"x49"H to 48"x72"x49"H. Seating configurations come in the double-reverse version shown or in a parallel series. Helikon Furniture Co., Inc., 315 E. 62 St., New York, N.Y. 10021.

Circle 111, Readers' Service Card



Office lines. Based on Saaren staff's designs for the Deere & Co. building, the "Source Group" of office furnishings includes desks, tables, credenzas, and files. The units come in two-tone finishes in nine combinations. Other features: recessed drawer pulls, interchangeability of all desk drawers, single-key locking option, and easily read sloping label holders on files. The units were recently installed at the Ford Foundation building. Corry Jamestown Corp., Corry, Pa. 16407. *Circle 112, Readers' Service Card*



Multiply to infinity. "London Combination 630-632" by Geoffrey Harcourt mounts chairs on aluminum leg frames and lateral rails; use of the rail permits an infinite expansion of a basic single chair or its cousin with the higher backrest (631). Corner chair (632) may be used in combination with these models to provide rounded seating at the corners or circular configurations. Foam rubber pads the chairs, which are available in vinyl or stretch fabrics. If desired, a tabletop may be inserted onto the lateral rail at any interval. George Tanier, Inc., 305 E. 63 St., New York, N.Y. 10021.

Circle 113, Readers' Service Card

Think soft. "Kalymnos," an area rug with a montage-like pattern, is supposedly inspired by the shapes of houses on the Greek island for which it is named. Designed by Nell Znamierowski, the rug won the award in the Soft Surface Floor Coverings category of the 23rd International Design Awards. Dimensions: 5'-4"x7'-6", 8'x10'. Colors: ivory, bronze. Material: nylon. Richards Morgenthau Co., Inc., 225 Fifth Ave., New York, N.Y. 10001.

Circle 114, Readers' Service Card

Armchair Traveler. A swivel-tilt-return mechanism on a Jacob Epstein-designed lounge chair (with arms) offers multiple positions for comfort. The mechanism (barely visible, hinged to pedestal base) automatically returns the chair to its original position. Latex foam rubber is used for backs and cushions, the latter being reversible, and the type of upholstery may be specified. The base is a highly polished stainless steel. Over-all dimensions: 26½"x26½"x31" H. Seat height varies: 16½" for the lounge version; slightly higher heights for office models. Cumberland Furniture Corp., 40 E. 49th St.,

New York, N.Y. 10017. *Circle 115, Readers' Service Card*

LIGHTING

Compact controls. An integrated solid-state light dimming system, self-contained (except for control stations) can be operated either manually, or pre-set for a specific application. It is said to be capable of controlling loads of 14,400 maximum for 120/240 single-phase or 120/208 three-phase service. This device will not only control lights, but also any resistance load, such as heating elements. Manufacturer notes ease of installation, since internal wiring is done at the factory. Hunt Electronics, Dallas, Tex. 75208.

Circle 116, Readers' Service Card



Making ends meet. Light from a 40-w U-shape, 2' fluorescent lamp equals that from conventional fluorescent lamps and will permit wireways' locations at a single end. Because the lamps are shorter than standard 40w fluorescent lamps, they can be installed in fixtures with shapes that are almost square. Currently available in sample lots, they are expected to be in commercial production late this year. The lamp will have a rated life of 12,000 hrs (average) and will operate on standard CBM ballasts. Sylvania Electric Products, Inc., General Telephone & Electronics, 730 Third Ave., New York, N.Y. 10017.

Circle 117, Readers' Service Card

In the cove. Cold cathode lamps can be fabricated to the exact requirements of a project, have a life of up to 25,000 hrs, and can be used with standard dimmers. Seen usually in auditorium or theater installations, cold cathode lighting is now available for more exotic and exacting applications, including use in handrails, planters, and skylights. Lamps are available in 13 colors, which, with filters,

can be expanded to 35 colors. National Cathode Corp., 155 E. 56 St., New York, N.Y. 10022.

Circle 118, Readers' Service Card

SPECIAL EQUIPMENT

Is there a speaker in the house? Speaker horns for paging, background music, and talk-back are now available in 15-w units. According to the manufacturer, these units fill a need that exists for speakers between the power ranges of 7½ and 30 w. Previously, designers were forced in many cases to choose the 30-w speakers, even if only a lower power was needed, manufacturer explains. He also emphasizes ease of installation, compact size (8" x 9"), sound level of 121 db, and lifetime guarantee. Atlas Sound Division, American Trading and Production Corp., 10 Pomeroy Rd., Parsippany, N.J. 07054.

Circle 119, Readers' Service Card

Burn the pollution! A recuperative fume incinerator destroys "all types of solvent vapor air pollutants," according to the manufacturer. For economy's sake, the incinerator's recovery system uses hot stack gases to preheat the combustion air and can operate at 1400F with a capacity of 3,500,000 Btuh. It arrives on site as a shop-assembled modular unit, providing minimum field assembly and erection. Control systems are available to meet FIA or FM standards. Ross Engineering Div., Midland-Ross Corp., P.O. Box 147, New Brunswick, N.J. 08903. *Circle 120, Readers' Service Card*

SURFACING

Non-slip surface for safety. A surface of abrasive particles, such as silicon carbide and silica sand, welded to aluminum, is used for steps and walkways in areas where metal walking surfaces create a safety problem—in industry, homes, and recreational areas. Light weight and good bonding properties are said to make aluminum especially suitable for the base metal. Frank V. Seidelhuber Fabricators, 2566 Bay Rd., Redwood City, Calif., 94063. *Circle 121, Readers' Service Card*



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MFRS' DATA

CONSTRUCTION



Glass class. A complete glass family of drawn sheet glass, tinted glass, cast glass, floated plate glass, enamelled glass, and diffusing glass is the newest arrival on the glass scene from Europe. The company, which owns the largest tanks for drawn sheet glass in the world, offers three grades of drawn sheet glass in thicknesses varying from $\frac{3}{16}$ " to $\frac{3}{4}$ "; a maximum size of 256" x 126" is offered for this glass. The tinted glass is colored by metallic oxides and offers a range of $\frac{3}{16}$ " to $\frac{1}{2}$ " thicknesses; these are available in gray and bronze. The cast glass offers varying degrees of opacity in over 70 patterns. Light transmission data; brochure. 8 pages. Glaverbel Glass Distributors Corp., 350 Fifth Ave., New York, N.Y. 10001.

Circle 200, Readers' Service Card



Longspan joists, deep or shallow. Spanning up to 192', the manufacturer's longspan joists come in depths of 18" to 36" in series LJ, and 18" to 96" depths in series LH, both series spanning up to 192'. Standard load tables, given in brochure, show the capacities of the joists for

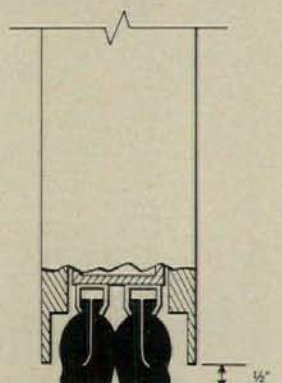
both series. It also shows standard panel dimensions, and gives load capacities of cantilevered joists. Included is explanation of two-way truss system, "Joistruss." Specifications. 20 pages. Haven-Busch Co., Grandville, Michigan. 49418.

Circle 201, Readers' Service Card

Drawing the line. Drawing the drapes should not involve squeaking or wrenching, believes the manufacturer, who uses nylon and noncorrosive metal in his drapery and curtain hardware to reduce noise, making certain there is no metal-to-metal contact. Fiberglass and wire-cored cords increase longevity. The hardware ranges from that for large auditorium installations to smaller commercial applications with easy adaptation to motor units if desired. Details, ordering information, and packaging data. 12 pages. Grant Pulley and Hardware Corp., High St., West Nyack, N.Y. 10994.

Circle 202, Readers' Service Card

DOORS/WINDOWS



Dropping out sound. Automatic "Drop Seal," a rubber acoustic door seal set in operation by the door latch, requires no sill and lowers itself only just before the latch catches. Benefits claimed: uninterrupted floor surface, elimination of carpet wear, reduction of drag-wear of the acoustic seal, and resistance to formation of a dirt sill caused by fixed-bottom seals. Used with a fixed gasket on the sides of the jamb and header, Drop Seal is said to prevent field installation errors while permitting the seamless, hollow metal, thin doors noteworthy results on

ASTM ratings. 4 pages. Pioneer Industries, Inc., 401 Washington Ave., Carlstadt, N.J. 17172.

Circle 203, Readers' Service Card

Rainbow windows. "Bayco," an enamel, factory finish for the company's steel and aluminum window frames and curtain walls, is offered in several colors. The enamel is baked onto the frames at 325 F for 15 minutes and is said not to crack, peel, or blister; exposed operating hardware, such as cam locks, are available in dark bronze and white bronze for steel and aluminum windows respectively. Concealed operating hardware, including friction arms, are furnished in natural finishes. The windows are equipped with "Bayseal," a weatherstripping using no adhesives or screws, and placing the seal in a window section groove. Window variety offers several choices for commercial, industrial, and institutional installations. Sections, specifications. 36 pages. The William Bayley Co., 1200 Warder St., Springfield, Ohio 45501.

Circle 204, Readers' Service Card

View through the pine. Double-hung, pine-framed removable windows for easy cleaning and sash replacement have been added to this firm's variety of casement, stacking-awning, and sliding windows. The removable double-hung windows also use a white polyvinyl weatherstrip found on the firm's other residential pine windows; the concealed balance spring and a full-length compression member slide easily because of the low friction of the vinyl. A variety of glazing installed at the factory is optional. Details, specifications. 16 pages. Crestline, 100 Thomas St., Wausau, Wis. 54401.

Circle 205, Readers' Service Card

FLOORING

Carpet gambit. "Carpet base," a carpet-baseboard that matches floor carpeting, was announced after the printing of this carpet catalog. "Carpet base" comes in all colors of the manufacturer's "Hearthstone" and "Explor-

er" patterns. Both carpet-baseboard and carpet use a high-density, continuous filament nylon fabric said to be stain resistant and impervious to furniture marks because of a pile 60% denser than that of other carpets. A $\frac{3}{16}$ " sponge rubber cushion is bonded to the pile; impact noise rating is 14 FHA. Ample detailed manufacturing techniques and test data (including ASTM). 32 pages. Viking Carpets, Inc., 10 W. 33 St., New York, N.Y. 10001.

Circle 206, Readers' Service Card

FURNISHINGS



Kagan's 20 years. Vladimir Kagan's designs from 1947 to 1967 are shown, revealing the diverse range of his furniture for offices and residences. Included in this collection are desks, chairs, bookcases, sofas, tables, ottomans, stools, cabinets, and art pedestals. 66 pages. Vladimir Kagan Designs, Inc., 40 E. End Ave., New York, N.Y. 10028.

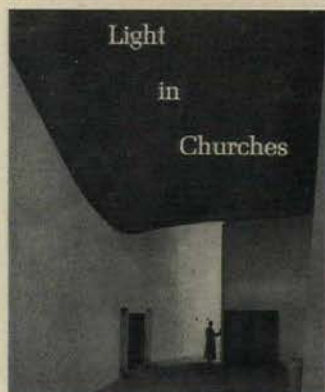
Circle 207, Readers' Service Card

LIGHTING



Luminosity, virtuosity. A complete range of architectural lighting, including the popular recessed lens fluorescent modular fixture, is fully described in this catalog. Recessed downlights offer a 45°

visual cutoff; slopelights offer 30° adjustability. Other fixtures: multiforms available in aluminum or acrylic, cone-lights, a semirecessed fluorescent "Louverglo," and "Integra," a semi-indirect fluorescent. The multiforms may be mounted on walls or in ceilings and may also be pendant hung. Details, performance data. 8 pages. Silvray-Litecraft, Passaic, N.J. 07055. Circle 208, Readers' Service Card



For light diversity. "Light in Churches," one firm's survey and analysis of the aesthetic and technological considerations in church lighting design, is a concise reference source. The designer-manufacturer advocates a collaborative effort between architects, engineers, and clergy in designing church lighting both to be functional and to create a mood. Copious photographs of religious structures throughout the ages both here and abroad illuminate the text. Five different types of lighting, ranging from functional light for reading to lighting for atmospheric effects are delineated. Ten different incandescent fixtures are manufactured by this firm. Letter-head request. The Rambusch Co., 40 W. 13 St., New York, N.Y.

SURFACING

Aggregates for decorative design. Exposed-aggregate panels and precast forms are said to be economical and to create attractively designed building exteriors. These granite and quartz aggregates absorb little water and are therefore resistant to cracking under successive freezing and thawing. Brochure points out this and other attributes; it contains color photos of the aggregate installations, color photos of true sizes of 12 aggregate



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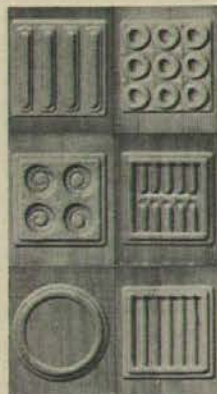
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samples, and a chart showing sizes of component stones. 4 pages. Colonna & Company of Colorado, Inc., Canon City, Colo. 81212.

Circle 209, Readers' Service Card

The concrete new look. A concrete forming system using aluminum form panels to impart decorative textures is illustrated and explained in the brochure, "This Is the New Look of Concrete." Three textures are illustrated: 12" x 14" adobe texture and 12" x 2½" brick texture, both laid in common bond, or 12" x 6" block texture, laid in stack bond. Several examples of work done are shown. International Concrete Systems Co., 555 City Line Ave., Bala-Cynwyd, Pa. 19004.

Circle 210, Readers' Service Card



Rough and ready. Redwood panels carved in rustic geometric designs can be used to form doors, wall paneling, and cabinet siding. Described by text and photograph in Brochure #6, "Panelcarve 1100 Series" is made up of panels 11½" wide and 84" long carved from ¾" thick redwood, with a tongue-and-groove edge for easy assembling. There is also a thicker series with deeper relief that comes in smaller over-all dimensions. 4 pages. Form & Surfaces, Box 5215, Santa Barbara, Calif. 93103.

Circle 211, Readers' Service Card

PROGRESSIVE ARCHITECTURE NEWS REPORT

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NEXT MONTH IN P/A

THE SCHOOL SCENE: CHANGE AND MORE

CHANGE. American schools are now at the starting gate of a new era in the way they will affect the lives of all citizens, and consequently in the ways they will be planned and designed. As generators of the form of our cities, as major elements in new towns, as curative agents for our urban ills, as increasingly involved influences on our lives from pre-kindergarten through old age, schools are prime subjects for an exhaustive study of where we are and where we are to go in school design. This study will appear as another landmark, one-subject issue of P/A in April—88 pages of in-depth examination of the future of American schools.

Among the subjects to be discussed in April are: **NEW TOOLS**, how ever more sophisticated machines and equipment are revolutionizing the learning process, bringing about a re-evaluation of instructional aims and content, and hence a need for re-examination of the goals of architects and planners involved in schools; **ASSAULT ON THE SCHOOLHOUSE**, how social, technological, political, attitudinal, and planning and design changes are radically altering what the teaching and learning place will be in the near and distant future; **THE SCHOOL AS GENERATOR OF URBAN FORM**, how schools can influence the re-creation of urban areas using three notable examples—Pittsburgh, Baltimore, and Brooklyn; **THE EDUCATION PARK**, giving the pros and cons of one of the most controversial approaches to community school planning, with important examples not published before anywhere; **NEW SCHOOLS IN NEW TOWNS: THE PRESENT**, showing what responsible builders and planners of new towns such as Columbia, Reston, Irvine, and Litchfield Park are doing to integrate education into their communities; **NEW SCHOOLS IN NEW TOWNS: THE FUTURE**, being an illustrated report on the far-thinking (but not far out) results of the recent Design Fête at Rice University's School of Architecture based on New Schools in New Towns—they were amazingly pertinent in projecting future patterns of school design and educational directions.

THE SCHOOL SCENE: CHANGE AND MORE

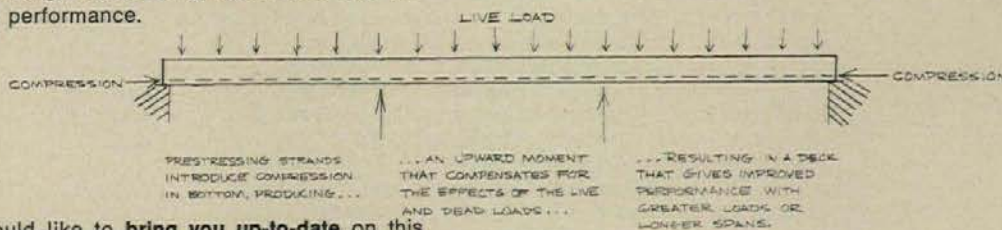
CHANGE will be required reading for anyone interested not only in schools, but also in future planning directions for our communities. It will become a valuable addition to professional libraries. You can get this powerful issue and 11 more equally forceful (we have some exciting plans for the rest of the year) simply by filling out and sending in the subscription order card at the end of this issue.

New Prestressed Concrete Deck Carries Greater Loads

Flexicore precast decks have been around for a long time and our new Hi-Stress development looks pretty much like the original.

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Included are load curves, typical spans of various sizes for floors and roofs, use on steel frame, concrete frame and wall-bearing construction. Also, information on openings, floor finish, ceiling finish, and use of hollow cells for heating and air-conditioning ducts, electrical wiring and piping.

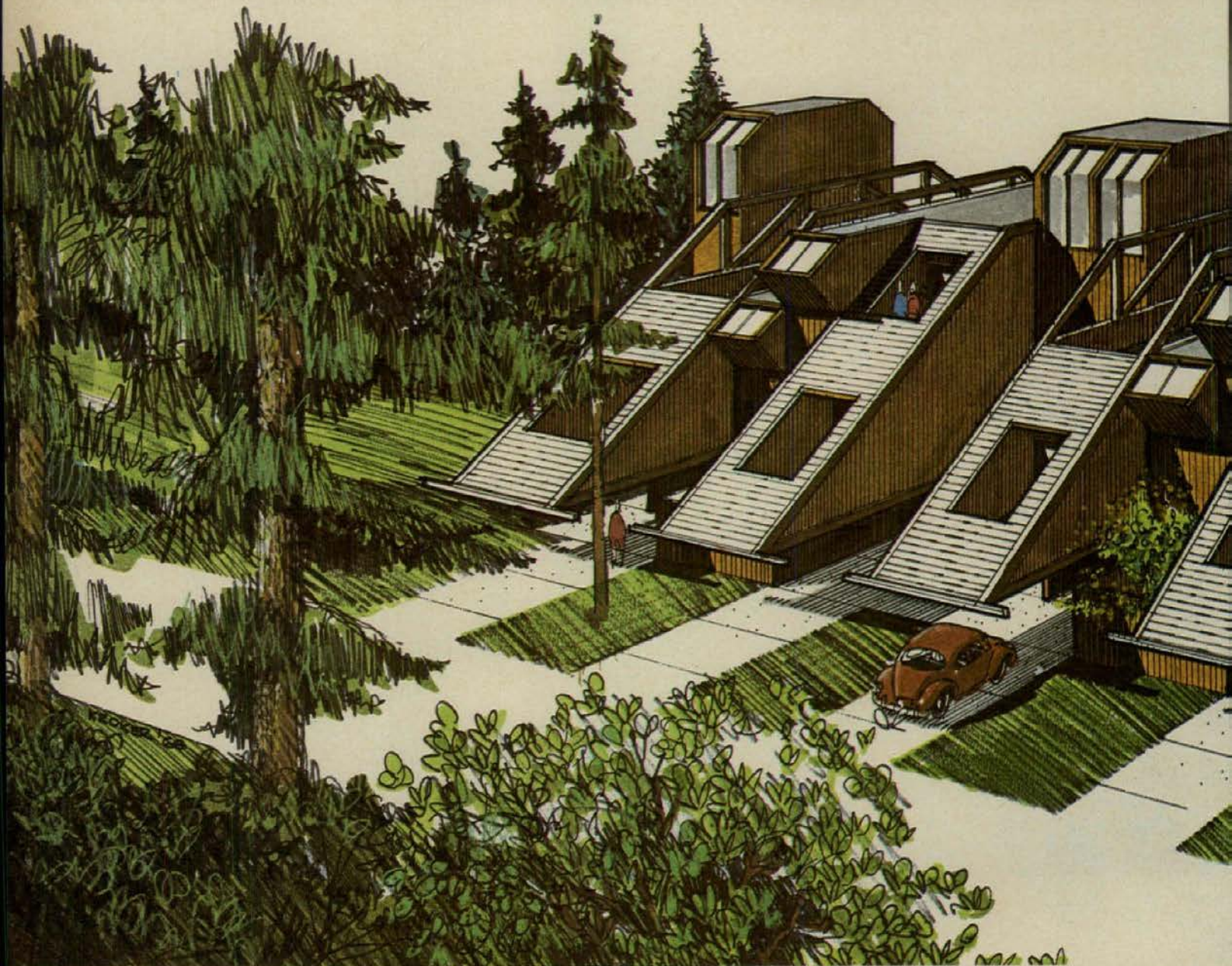
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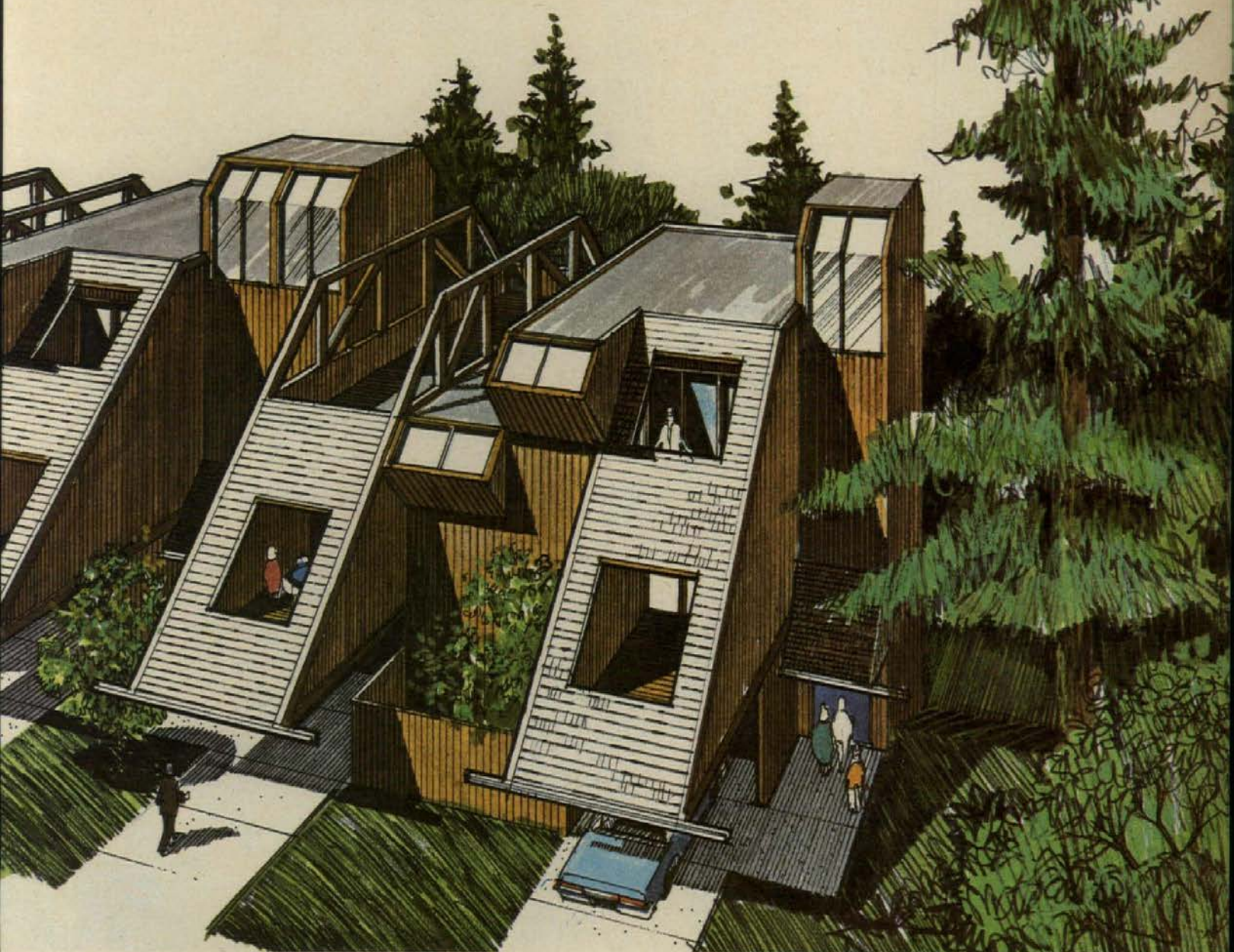
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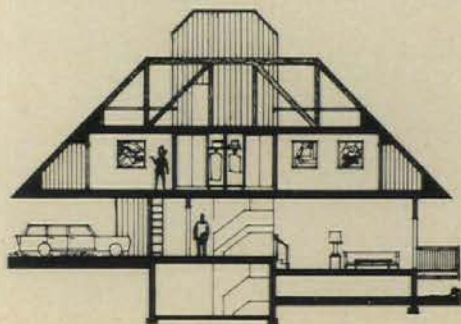
Dramatic townhouses like these create an appealing total environment, yet cost less to build. With Western Wood as both framing and finish, structural elements become dynamic design elements. Heavy beams, and timber (solid or laminated), rugged framing, decking and textured siding all work together to create the warm, luxurious atmosphere demanded by today's more affluent renters.

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Architects: Farnham • Peck • Associates / AIA

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MARCH 1968 P/A

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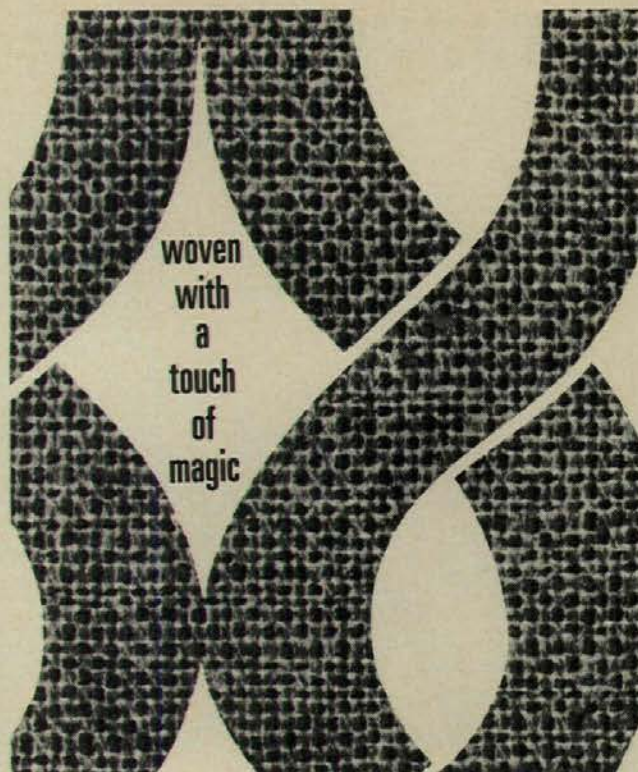
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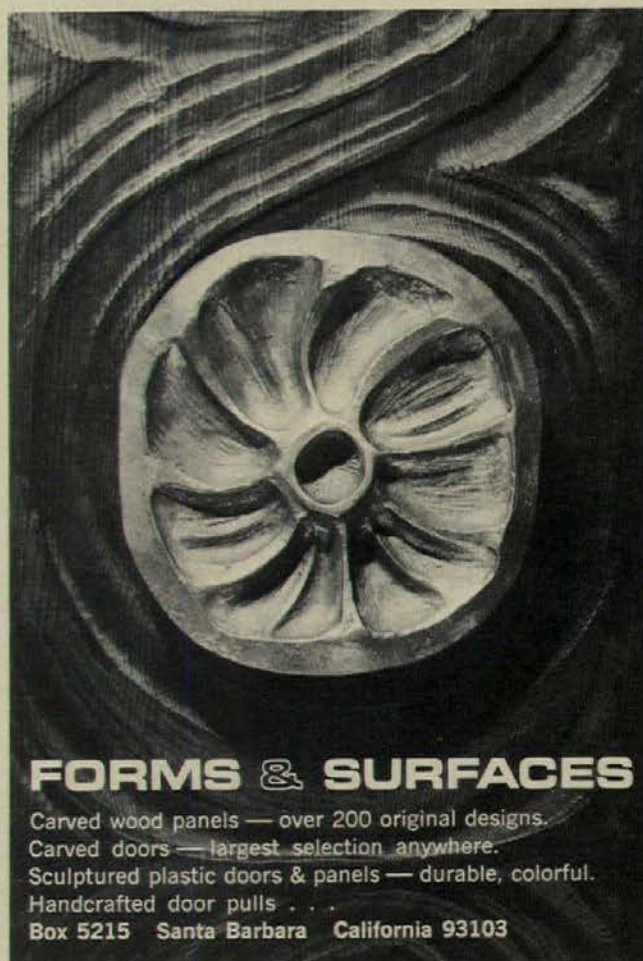
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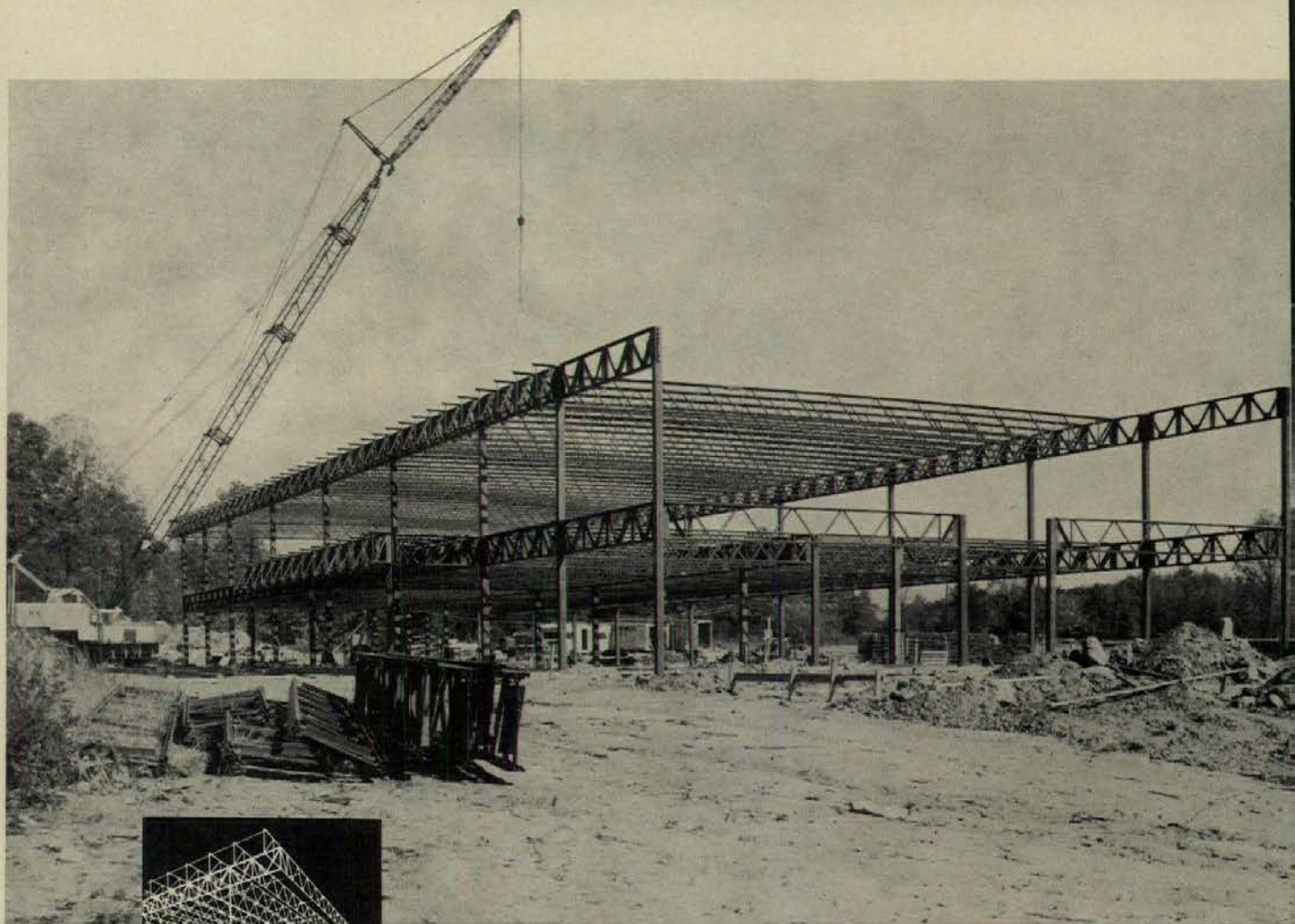
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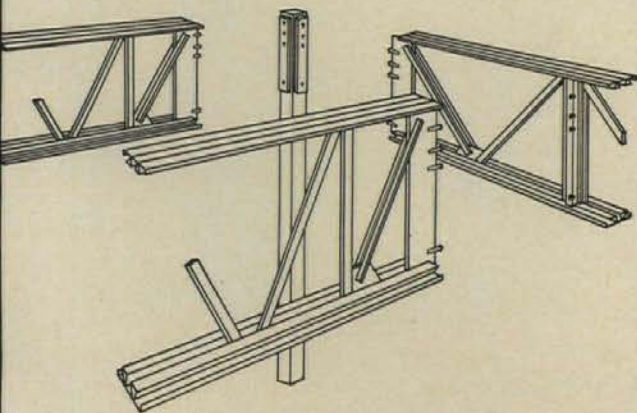
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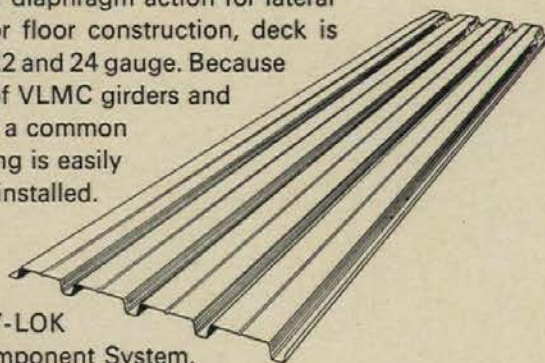
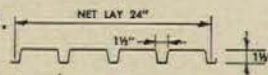
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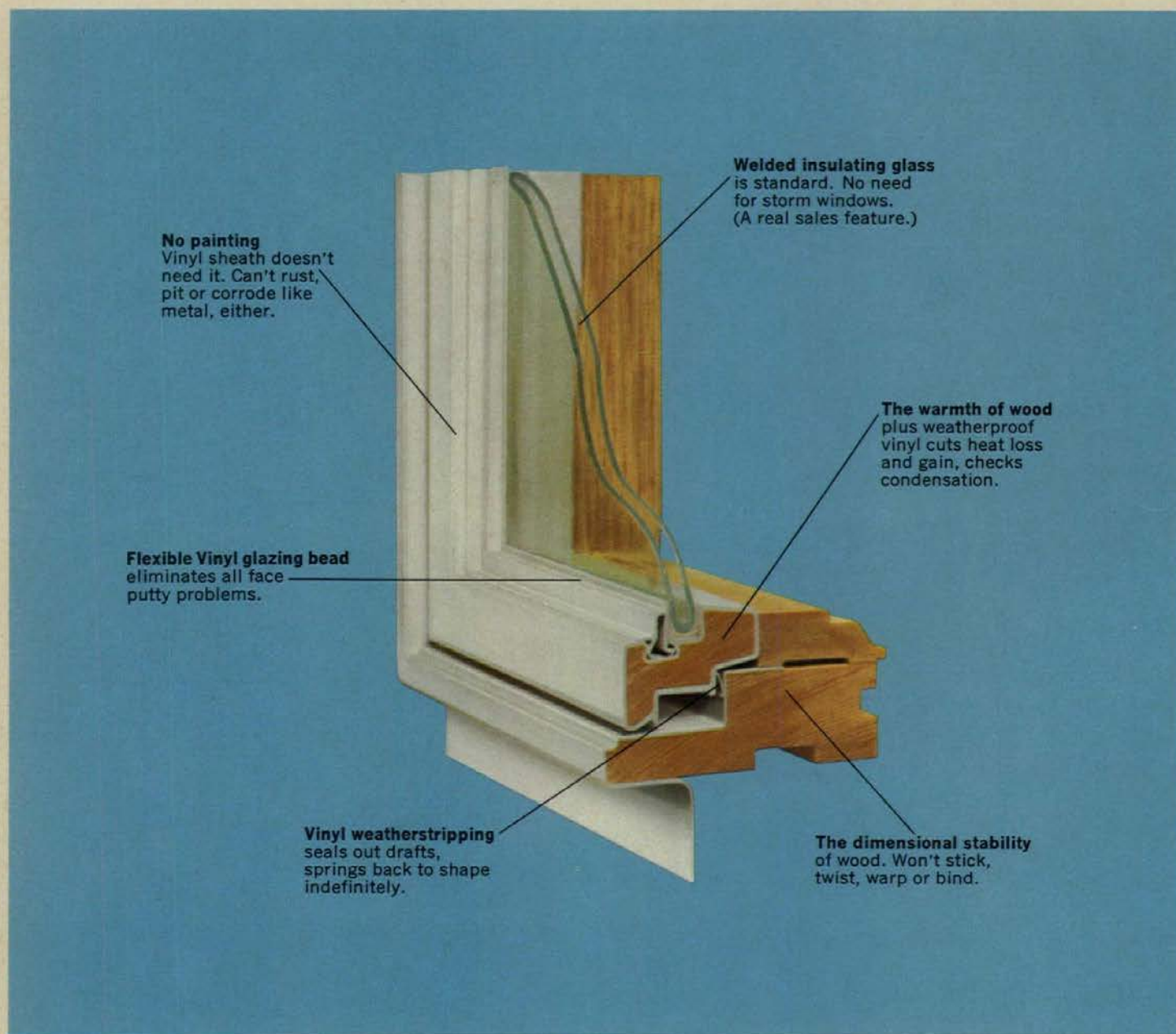


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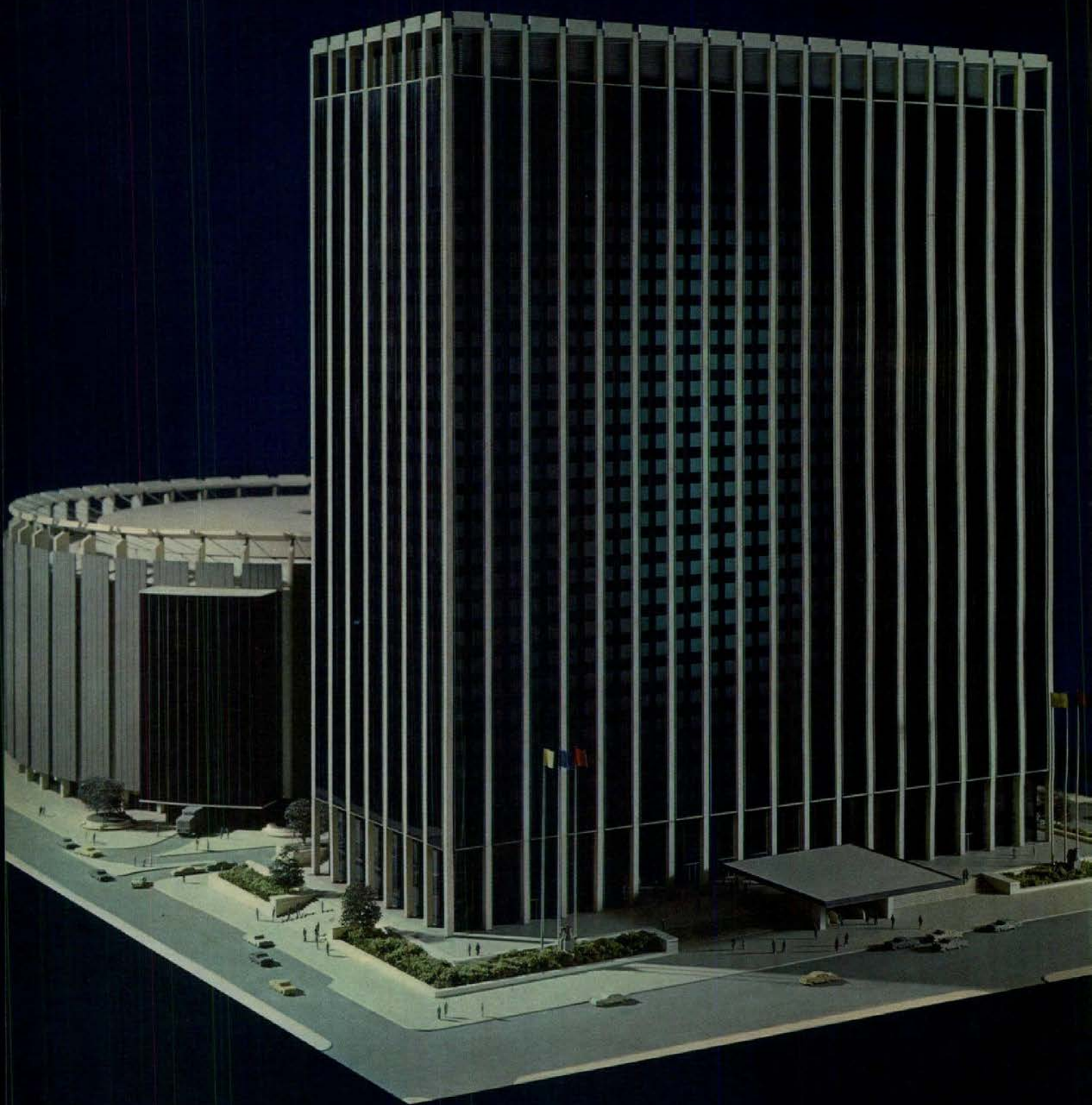
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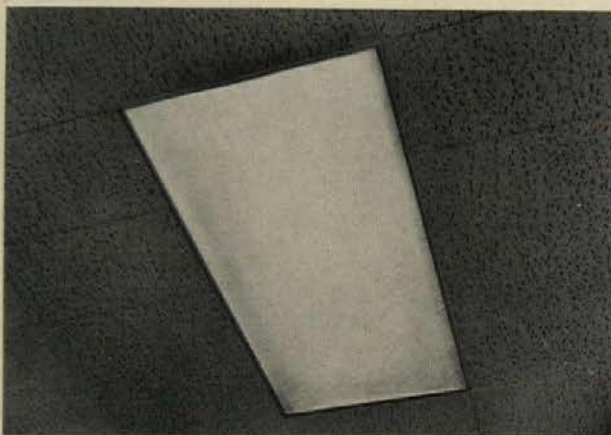
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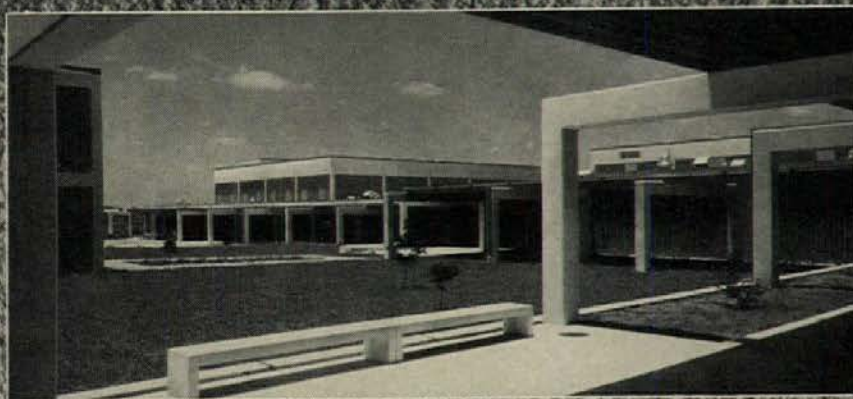


John H. Reagan High School, Austin, Texas; Architect: Page, Southerland & Page; General Contractor: Ricks Construction Company

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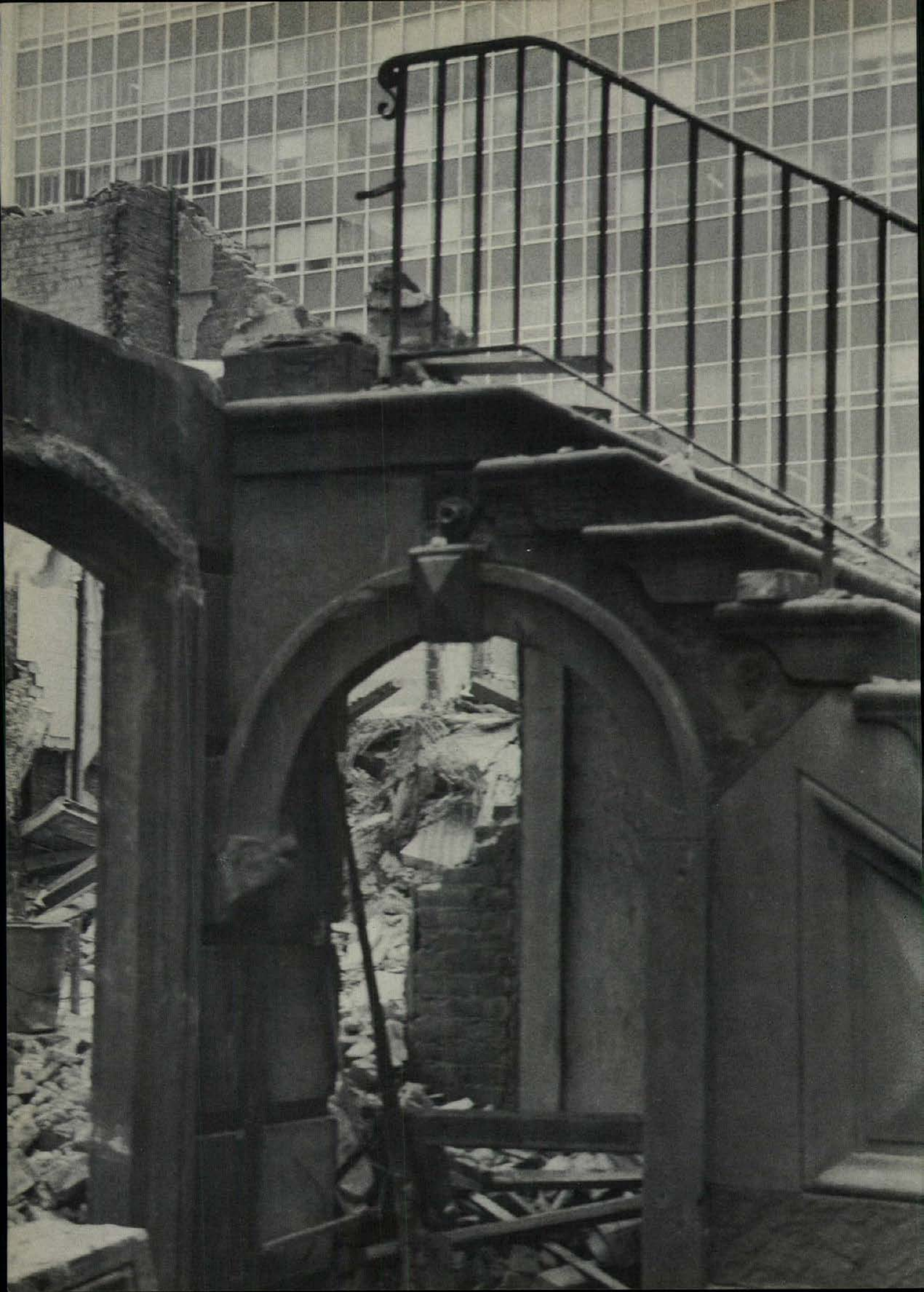


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March 1968 **PROGRESSIVE ARCHITECTURE**

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The inevitable has happened: "Ralph Ablon, President and Chairman of the Ogden Corporation, with a 1967 sales volume of more than \$750,000,000, and Charles Luckman, President of Charles Luckman Associates, one of the world's largest planning, architecture and engineering firms, whose architectural services in 1967 will result in more than \$100,000,000 in construction, today announced an agreement whereby the Luckman firm will be acquired by Ogden." Thus read the first paragraph of a news release received last month by P/A. And, although the release was printed on Charles Luckman Associates stationery, it included these comments by the architect: "When reached for a statement, Mr. Luckman said, 'All of us at CLA have great enthusiasm for the opportunity being afforded to us by the Ogden Corporation to expand and diversify the services which we can render to our clients. To meet the projected demand for the physical facilities needed by our exploding population, there will be required a marriage of imagination, capital, and management skills.'"

So here we are. The road now has been traveled all the way: The architect becomes a team, the team becomes a corporation, and the corporation becomes a subsidiary of another corporation. In the shuffle, what happened to the architect? When the AIA decided that architects should offer "comprehensive services," become leaders of "teams," think of themselves as "generalists" coordinating and directing every decision affecting man's environment, did it foresee where it all would lead? Within our economic system, the only way an architect can have controlling power over environments developed by the private sector is to do exactly what Luckman did — become a bigshot in a large corporate structure. And so the inevitable: a Fellow of the AIA is now being traded on the New York Stock Exchange. From now on, if I don't like what Charles Luckman is designing, all I have to do is pick up the phone and talk to my friendly stockbroker. I can own you now, Mr. Luckman!

Or *can* I own him? There is no point in condemning or condoning what Luckman did. The issue is much bigger than a discussion of traditional, professional ethics. What is at stake here is not only ethics, but a much larger question: what is the meaning of professionalism in this day and age?

The AIA "Standards of Professional Practice" were promulgated many years ago when it was clear what an architect's role was and when he performed this role on his own or in association with partners and co-workers who had similar background, training, and viewpoint. When the work that used to be performed by individuals becomes too big and complex for them, the job is taken over by organizations. Today, the word "practice" can mean so many things and be performed in so many ways by so many people that the old professional standards are more confusing than helpful in explaining the nature of present-day professionalism. Rules of ethics designed for individual practitioners designing individual buildings for individual clients are no longer meaningful or realistic for many situations.

Hence the dilemma the AIA — and even the registration boards — now have to face: Is "the Architect," in a professional sense, an individual or an organization? Can you continue to make an individual responsible for all the actions of a large organization with which he is connected? Can you make an individual personally responsible for technical competence of great numbers of people? Can you apply the old ethical standards to organizations existing for the purpose of maximizing profit and dealing with large amounts of borrowed capital? (Luckman once said: "For I believe it to be true that next to the influence of religion in our life and character, the next single, most influencing factor, is the profit motive.")

All above and similar questions somehow will have to be answered. A good illustration of the quandary is that I can now buy Charles Luckman Associates by acquiring enough stock of the Ogden Corporation — but that does not mean that I would be buying Charles Luckman himself. ■

Jan C Rowan

Contented sprawlers settle down for a session with the books in one of the mezzanine lounge areas of the dining wing.

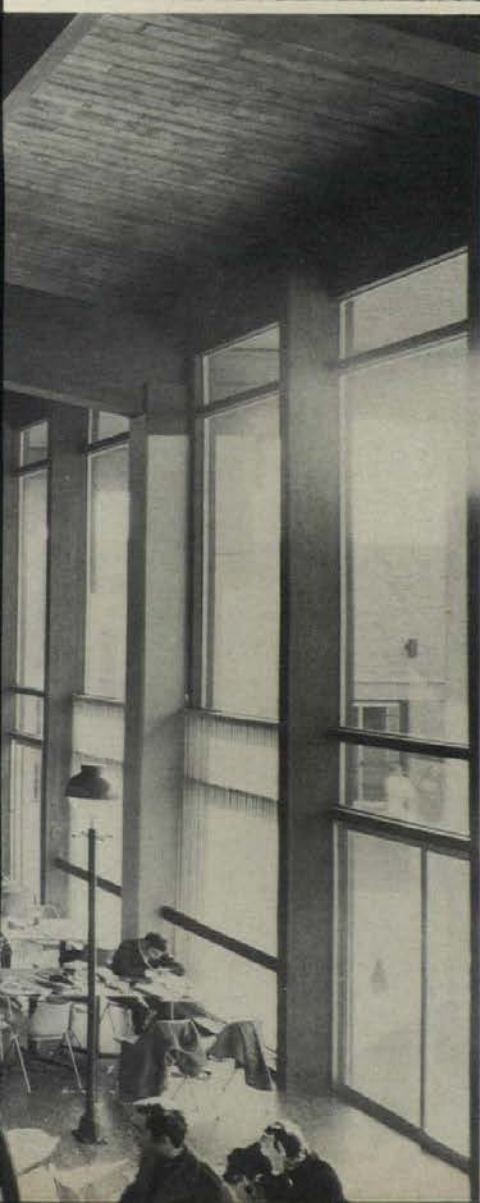


Students study, gossip, and eat in a café atmosphere on the main level where they can observe passers-by in the courtyard. Clerestory-lit mezzanine is at left.





COLLEGIATE LIVING ROOM



HOFSTRA UNIVERSITY STUDENT CENTER, Hempstead, Long Island, New York. **Architects:** Warner Burns Toan Lunde (Danforth W. Toan, Partner in Charge; George Yourke, Designer/Job Captain). **Site:** Part of the old Mitchell Field Air Force Base; a flat, barren site adjacent to the Hempstead Turnpike. **Program:** To provide an activities center that would draw students into campus life. **Structural System:** Flat concrete arch supported on concrete columns and long-span laminated wood beams supported by brick piers. **Mechanical System:** In the dining wing, an all air system with a pre-cool, re-cool design. In the activities wing, fan coil units with an all air ventilation system. Ductwork is concealed in the 2'-4"-thick masonry walls. **Major Materials:** Sand-faced brick (in white to sand tones, chosen to blend with existing campus) on both interior and exterior, exposed concrete, dark stained laminated wood beams and wood deck roofs, stained redwood window frames. Gypsum wallboard or block partitions. Variety of flooring, including composition, wood, terrazzo, and carpeting. **Consultants:** M. Paul Friedberg & Associates, Landscape Architects. Warner Burns Toan Lunde (Jane Pokorny), Interior Designer. **Photography,** except as noted: Norman McGrath.

Five years ago, Hofstra College turned into Hofstra University and began a major image-changing campaign. As one of many competing colleges and universities dotted around Long Island, the small 30-year-old college made the decision to upgrade, expand, and convert from a commuter college to a residen-

tial university in order to attract students and stay in the educational mainstream.

The broad outlines of change, formulated at an Educational Facilities Laboratories' conference held at Hofstra in 1963, stressed the importance of transforming the character of the student body and its campus-use habits. Those habits followed a Mom-Dad-Car orientation typical of commuter colleges surrounded by suburbia—students "ate, slept, and studied in their cars," says architect Danforth W. Toan, "and generally left the campus immediately after their last class." Their personal lives were, quite naturally, regulated by the home.

Participants at the conference felt that the new university would function far more effectively if students could be drawn into a closer involvement with campus life. Not only would academic participation be improved, but the school might properly serve as a kind of halfway house between early adolescence and young adulthood. Further advantages to be gained from loyal alumni are obvious.

Keeping Them Down on the Campus

The logical first step was to convert to dormitory campus. Warner Burns Toan & Lunde's master plan for Hofstra's comprehensive expansion includes both high- and low-rise dormitories that will eventually house about half the student body. Residence towers, of which four are complete and two under construction, were planned to give students the novel

experience of a high-rise view over the flat expanses of Long Island, and provide a contrasting environment for young people who had spent their lives in sprawling suburbia (see MAY 1967 P/A).

Attention was next focused on the two principal centers of campus life — library and student union — and the best way to get students to use them often and freely. The simplicity of perfect logic marks the architect's solution: library and student center have been sited between academic buildings of the older campus and the dorm/parking area, and students are drawn into and through each of the two buildings on their way to and from classes and cars or dorms.

Hofstra's expansion has been mainly on a 100-acre portion of defunct Mitchell Field situated directly across the Hempstead Turnpike from the old campus. Old and new parts of the campus are tied together by an enclosed glass and concrete pedestrian bridge over the turnpike. Anchoring this bridge on the new dorm/parking side is the student center; and, on the academic side, the library. By placing entrances to the bridge inside the two buildings, circulation is funneled through them at least twice each class day.

Getting Them Where They Live

Approach to the hub of campus activities, the student center, is between two high-rise dorms. Seen from this vantage point, framed by the crisp lines and dominant forms of the residence towers, the building is partially hidden and its architectural logic is diffused among a low, complicated variety of shapes. This ambiguity of form was deliberate on the part of the architect, who set out to design a building where complexity would intrigue, informality beguile, and non-monumentality disarm. "It is a non-building," explains Danforth Toan. At least part of its complexity derives from the design of common rooms. Shunning the comforts of symmetry, meeting room walls combine parallels and angles in a pattern that is very nearly mirrored in roof sections.

Although informal, there is a solidity about the building's 2'-4"-thick walls, deeply corbelled windows, and heavy wood beams that have led one history professor to take his class on tours of the "medieval castle."

Raised 7 ft above the undistinguished flatness of the airfield by a series of berms and mounds, the building spreads out from its one clearly identifiable landmark — a handsome concrete campanile. This bell tower not only signals the location of the student center to other parts of the campus, but is also part of a sequence of verticals — library tower, bell tower, and dorms — whose size, shape, and relationship is constantly changing as the visitor moves around, toward, or between them. These changing relationships are described by Toan

as existing in the architectural fourth dimension, or movement in time.

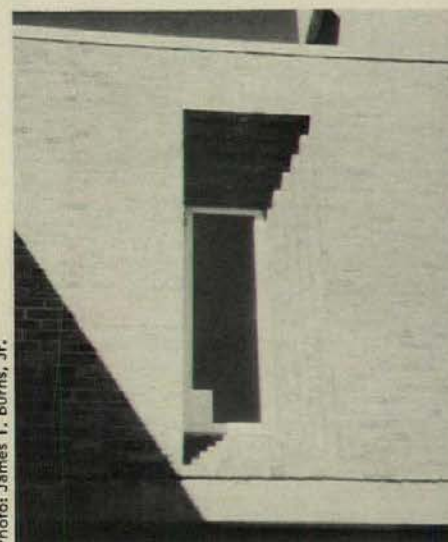
As one approaches the center's courtyard, the campanile looms up as the dominant vertical. At its base, a glass- and concrete-enclosed staircase connects the three levels of the building (one below grade), and the sky appears through open sections at the top.

Courting the Students

The building's focal point is a semi-enclosed courtyard that becomes the real center of activities in warm weather, when it is often the scene of informal sing-ins and jam sessions. Guitar play-

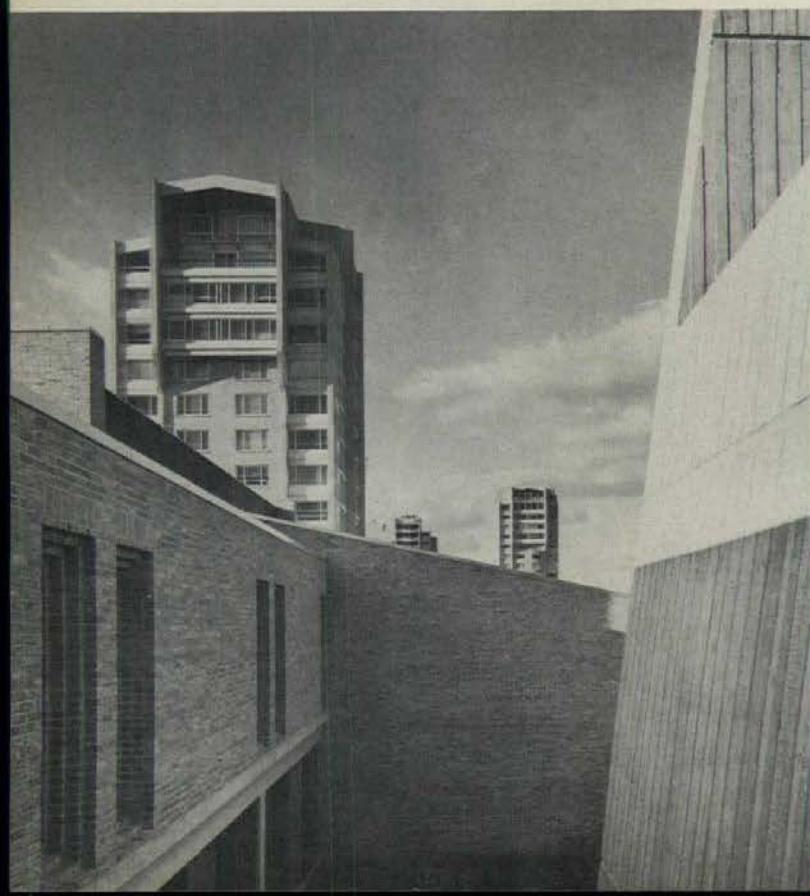
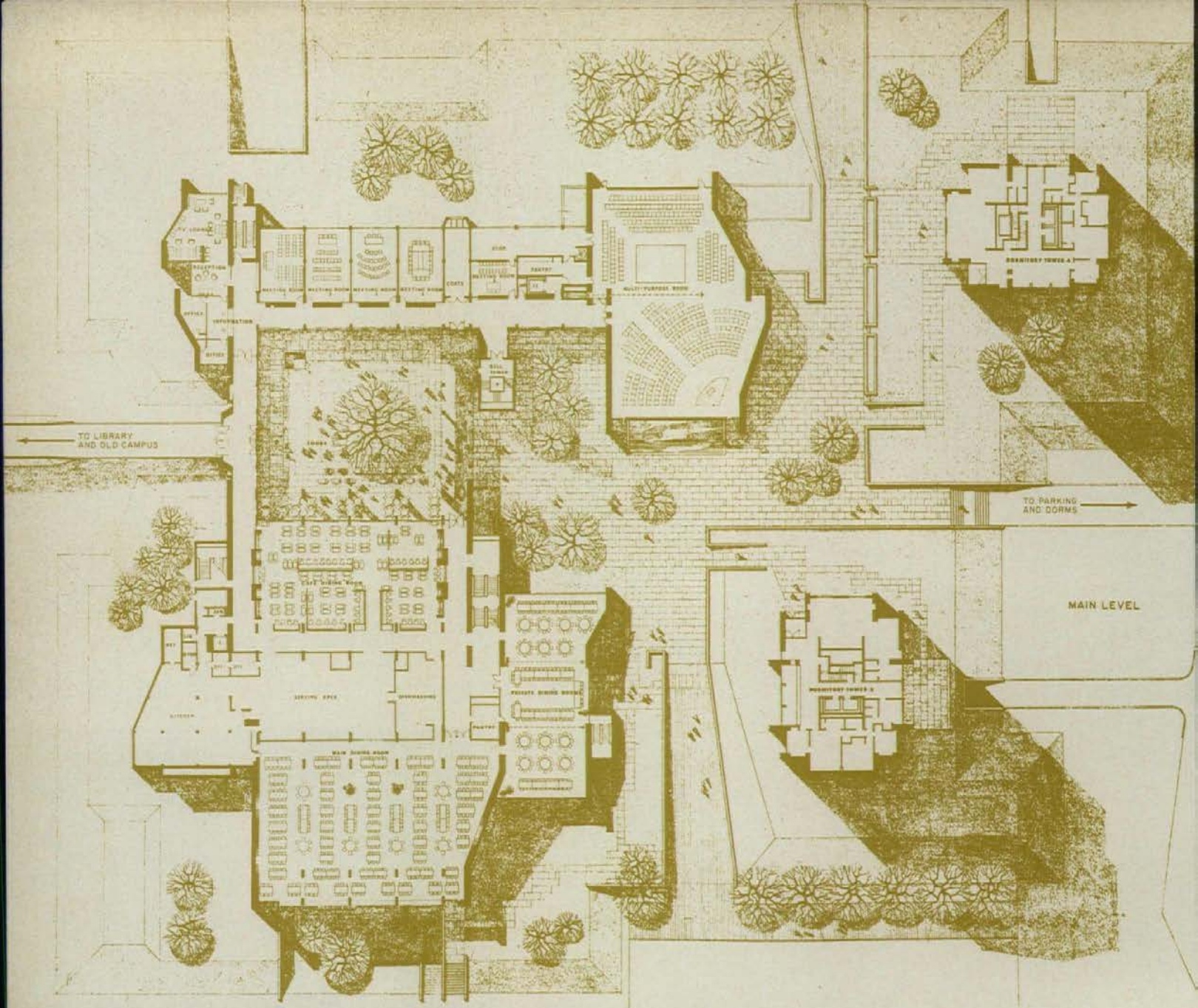
ers usually gather around four ailanthus trees planted in a 12 ft square earth-filled concrete well that extends straight down through the book store (below grade) and into the ground. The planter and the entrances to the court are set off-center in another move calculated to disconcert the eye and create a nonstatic environment attuned to the restless vitality of the young.

Proportions were carefully planned and the court space kept fairly small (80 ft square) in order to create a protected and friendly feeling, which is enhanced by the students' ability to see into the building through glazed walls

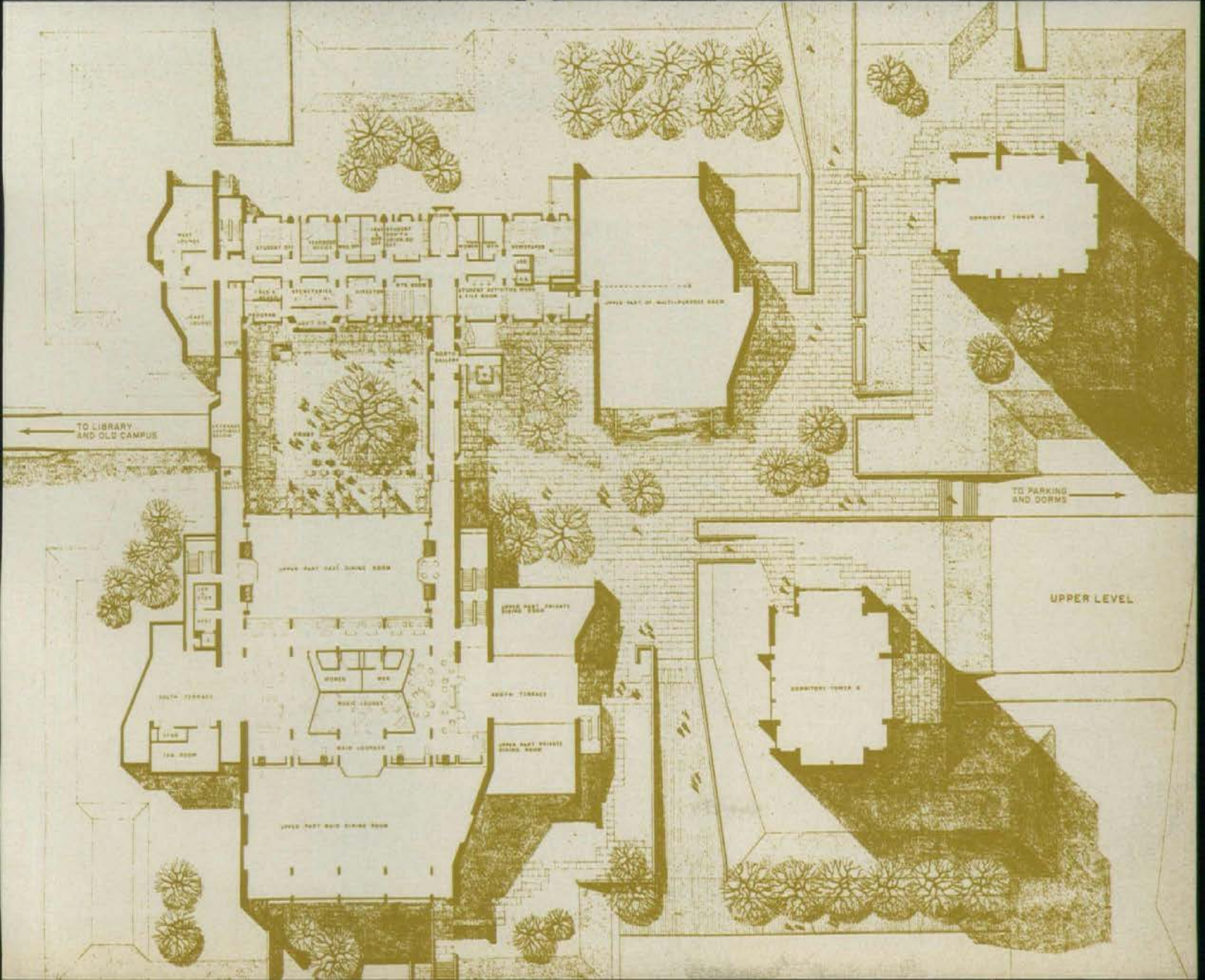


Photos: James T. Burns, Jr.





Looking past sloping bell tower base and corbelled windows of student activities wing corridor, dorm towers rise like sentries, silhouetted against the sky (left). From the library tower (facing page, top): Student center, bell tower, and pedestrian bridge in foreground; old airfield hangars can be seen in the background at right.



The two-dormitory "frame" offers a series of "varying apertures through which to see the buildings beyond," says architect Toan. Moving from east to west, photos show interplay between bell tower and library tower beyond. Toan based sightlines and proportions on the "cone of vision," which sweeps 30° around the viewer's axis of vision. Research led him to the conclusion that the eye is most satisfied when the architectural whole fills certain vertical and horizontal proportions of the cone at the point where the observer is introduced into the space. "To our amazement," he adds, "these proportions pertain to St. Marks Plaza, the Acropolis, St. Peters" and other architectural compositions.



on three sides of the courtyard.

Entry into the court is underneath a bridge that ties the two wings of the center together. Enclosing the square at the side opposite is a glazed corridor that also connects the two wings, but, more important, functions as the entrance to the pedestrian bridge over the turnpike. Movement across the bridge is a rather mesmeric experience for both the car-watching pedestrian and the people-watching motorist as the pattern of concrete and glass opens, closes, and then reopens the view.

There is no formal entrance to the student center, which was designed to invite entry from several points around the court, either into the pedestrian bridge, the student activities wing, or the dining complex.

What Goes on Inside

In the dining complex, areas of differing character, purpose, and size center around a mezzanine lounge.

The café, with its low brick divider walls, banquettes, outdoor-type lighting posts, and wall of glass on the courtyard side, was designed, as Toan puts it, "as a fish bowl for students wishing to see and be seen."

For those students who prefer to study or stretch out, but still remain part of the scene, the overlooking balcony is furnished with comfortable chairs, sofas, and a bold hound's-tooth carpet. Circling a small core (containing a music listening room, men's lounge, and women's lounge), the mezzanine overlooks the café on one side and a more formal dining area on the other; it is flanked by rooftop terraces on the two remaining sides. A slotted brick parapet forming portions of the balustrade adds another touch of the medieval.

On the first level, another dining area for special meetings and private conferences can be divided into three sections.

Across the court, the student activities wing houses meeting rooms, office space for clubs, school newspaper, and other functions. There are also several small and inviting lounges.

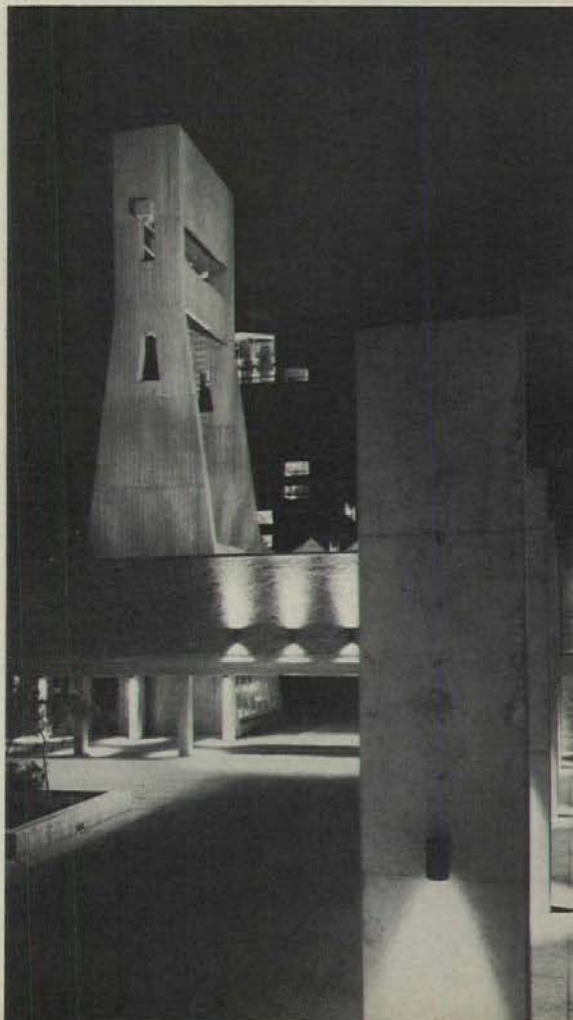
The major space in the student activities wing is a multipurpose room used for concerts, lectures, banquets,

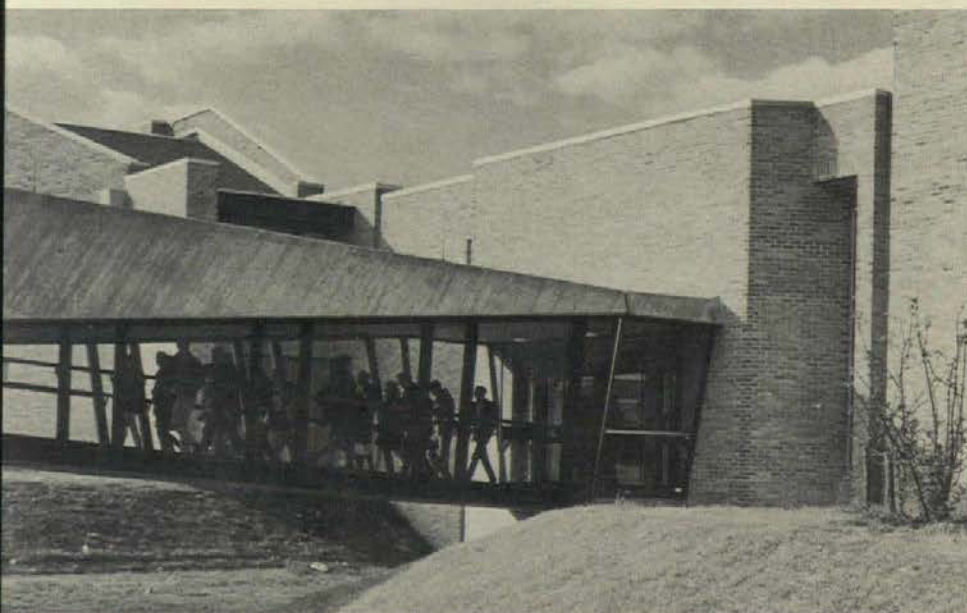


Photo: James T. Burns, Jr.



Vertical and horizontal elements, bell tower (above left) and bridge (above). Courtyard at night (below left) and during the day (right) as viewed toward the corridor bridge connecting dining and student activities wings.





and dances. Its irregular shape, heavy laminated wood beams, parquet floor, and center clerestory windows lend the variety and richness necessary for large open spaces. Heavy brick walls, extending 16 in. into the room from exterior brick courses, descend beneath the wood-deck ceiling in steps. Into each stepped section is incorporated a brick pier that supports one of the exposed wood beams. Air supply registers, partially concealed in thin vertical slots, are fed by ducts inside the wall cavities.

Down Below

"Hangouts" below grade are among the most popular spots in the building. The rathskeller's low-ceilinged and generally dim atmosphere appeals to the beer-hall instincts shared by many college students. A cross-grain wood block floor adds to its warmth, and the architect persuaded a skeptical school administration to install butcher-block tables by pointing out that if they were carved upon it would be in the best tradition of many old and revered universities. Around the corner from the rathskeller, a game room equipped with pool, ping-pong, and card tables is always crowded.

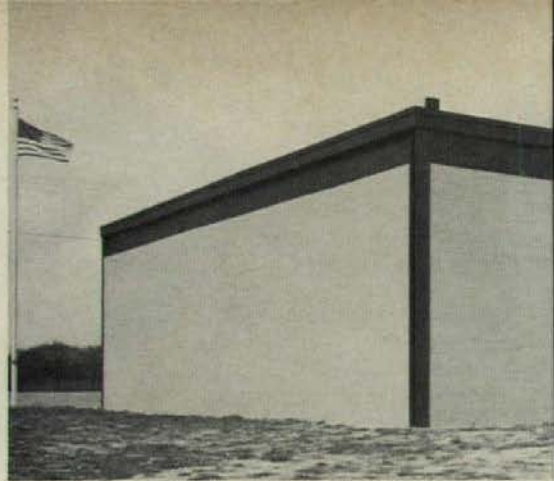
Turning Students On

An intricate jigsaw of independent shapes — connected, interrelated, overlapping — were they designed "by an acid head," one student wanted to know. Given the younger generation's present romance with psychedelia, this obviously is a compliment to the architect's (non-drug-induced) expanded consciousness.

"We wanted a building that would take students four years to figure out," Toan admits. "... an intriguing maze." This, he believes, reflects the personality of college students who tend to be complicated creatures subject to sharp changes of personality in short periods of time. A student center should be the place where those moods can be indulged, where rooms can be found to suit every mood, where a sense of semicontrolled anarchy gives the student that congenial feeling of being at home in his campus "living room." The verdict from Hofstra students seems to be that the architecture turns them on. — AR

FIRE TRUCK SHOWCASES

FIRE STATION NO. 59, Houston, Texas



Architects: Todd-Tackett-Lacy. **Site:** SW edge of the city, loosely developed with adjacent low construction; site is next to a small church and was formerly a horse pasture; climate is hot and humid with strong, consistent southeast breezes. **Program:** Station with three pieces of apparatus for chief of fire district. **Structural System:** Steel frame, masonry walls, slab floors, built-up roof on rigid insulation over metal roof deck. **Major Materials:** Exposed steel painted flat black, grayish tan brick, dark green terrazzo floors in living spaces, natural concrete in apparatus areas. **Mechanical System:** Conventional gas fired boiler with expansion type cooling, one multizone air handler, duct supply, return through attic space. **Cost:** Bid, \$131,450.00; actual, \$131,913.39; sq ft, \$18.84. **Consultants:** Loudermilk & Loudermilk, Structural Engineers. Ralph Speich & Associates, Mechanical Engineers. **Photography:** Maurice Miller.

Detailed and constructed like a showcase, this Houston firehouse was literally designed on the basis of past mistakes. The architects augmented the city program with their own research. They found the best way to design a fire station was to search out the worst in existing stations and use the correction of these conditions as the basis of their design.

The program given to the architects by the city of Houston included merely the number of pieces of apparatus, the number of men, and a list of the equipment to be accommodated in the firehouse. Houston fire station districts consist of two apparatus stations with a three-appa-

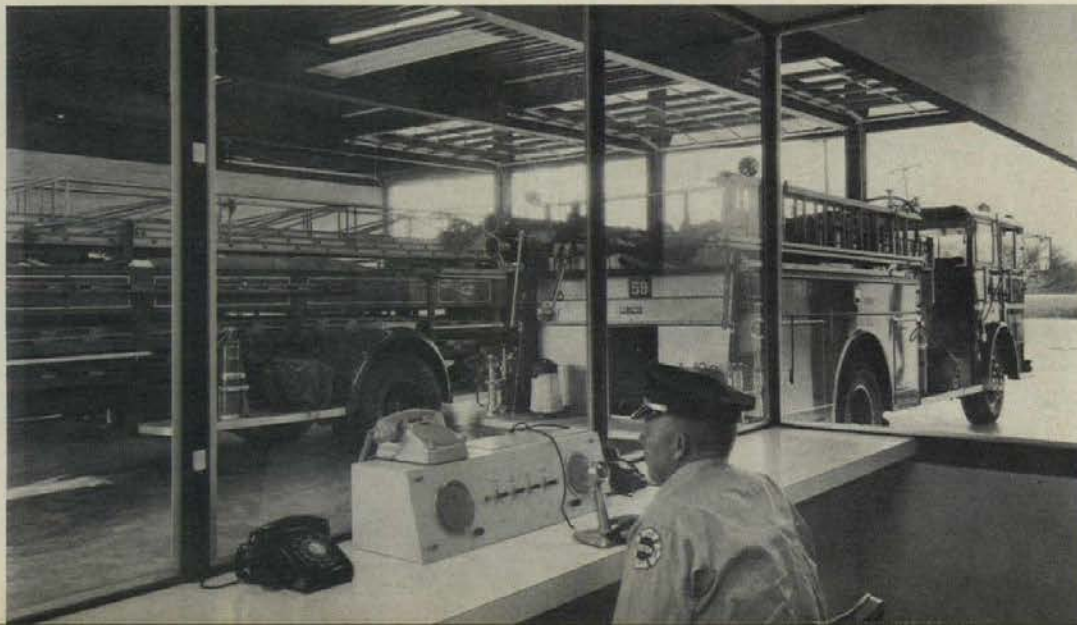
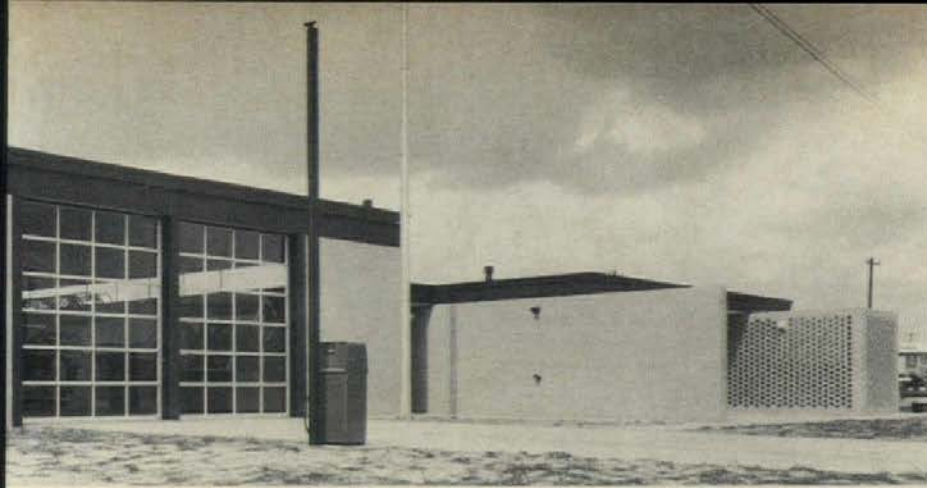
ratus station serving as headquarters for the chief of the district. Station 59 is a three-apparatus station. The third piece of equipment is a pumper truck, used to extinguish grass fires in the surrounding area.

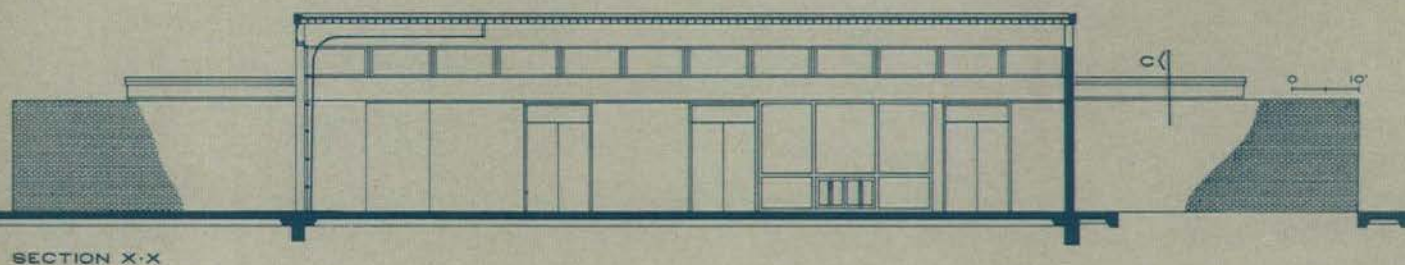
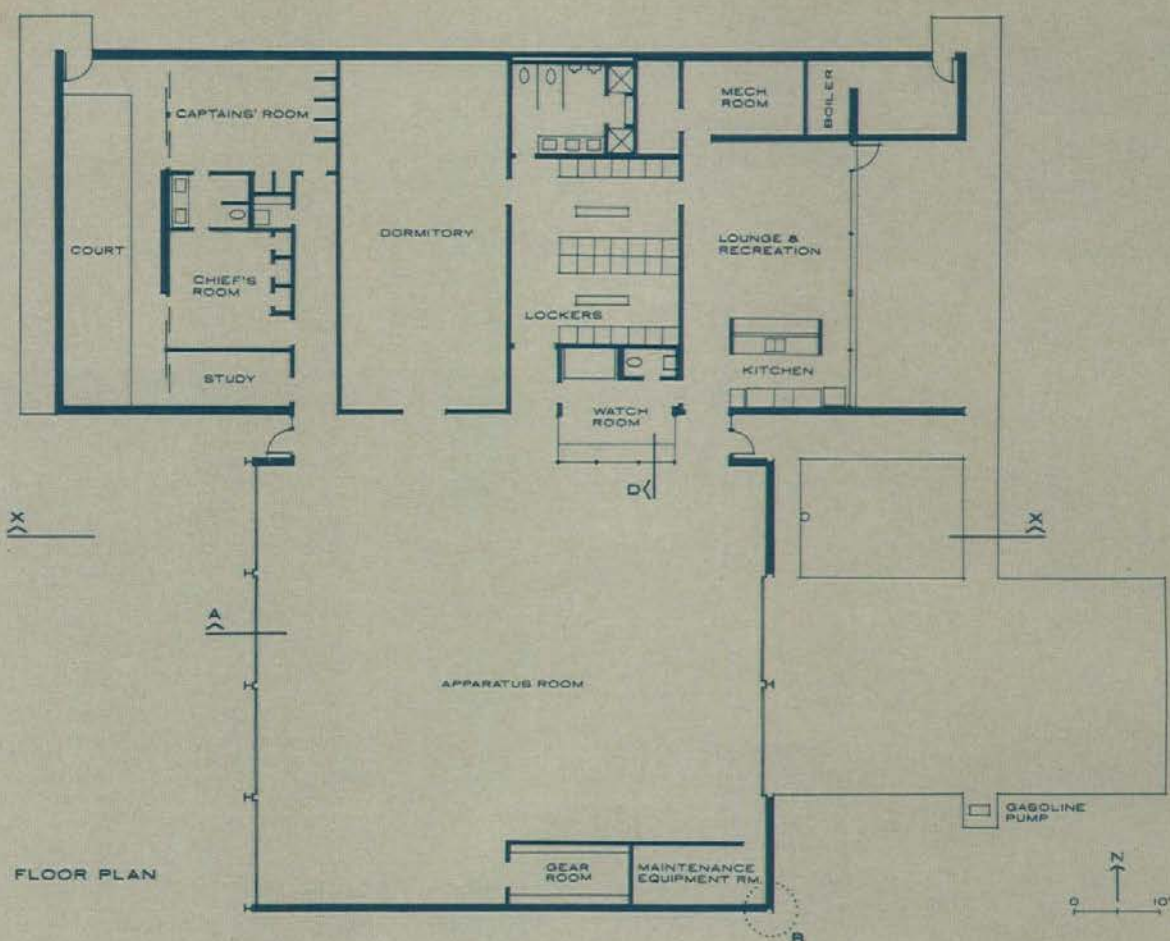
Each item of the city program was checked by the architects in personal visits to existing fire stations. They found dormitory windows covered with aluminum foil to keep out the strong sun and heat, apparatus room doors that had to be left open for ventilation, cheerless dayrooms, unused outside areas, and windows in the chief's and captain's quarters tightly shuttered.

The correction of these faults served as the basis of the planning of Station 59. The captain's room, chief's room, and a small study room were placed on the street side of the station, isolated by a small courtyard, thus providing them with natural light and complete privacy. The study room was introduced by the architects as private space, apart from the general dayroom, as a place to study for civil service examinations. The dormitory locker room and restroom, located in the interior, have no windows. The dayroom-kitchen opens to the rear with an all-glass east wall and gives access to a grass area for outside activities. A hung ceiling serves as a return air plenum for this air-conditioned space.

Furnishings were provided by the owner. All interiors are as simple as the architects could make them. The gypsum-board was given a hard finish by using epoxy-base paint. The predominant color







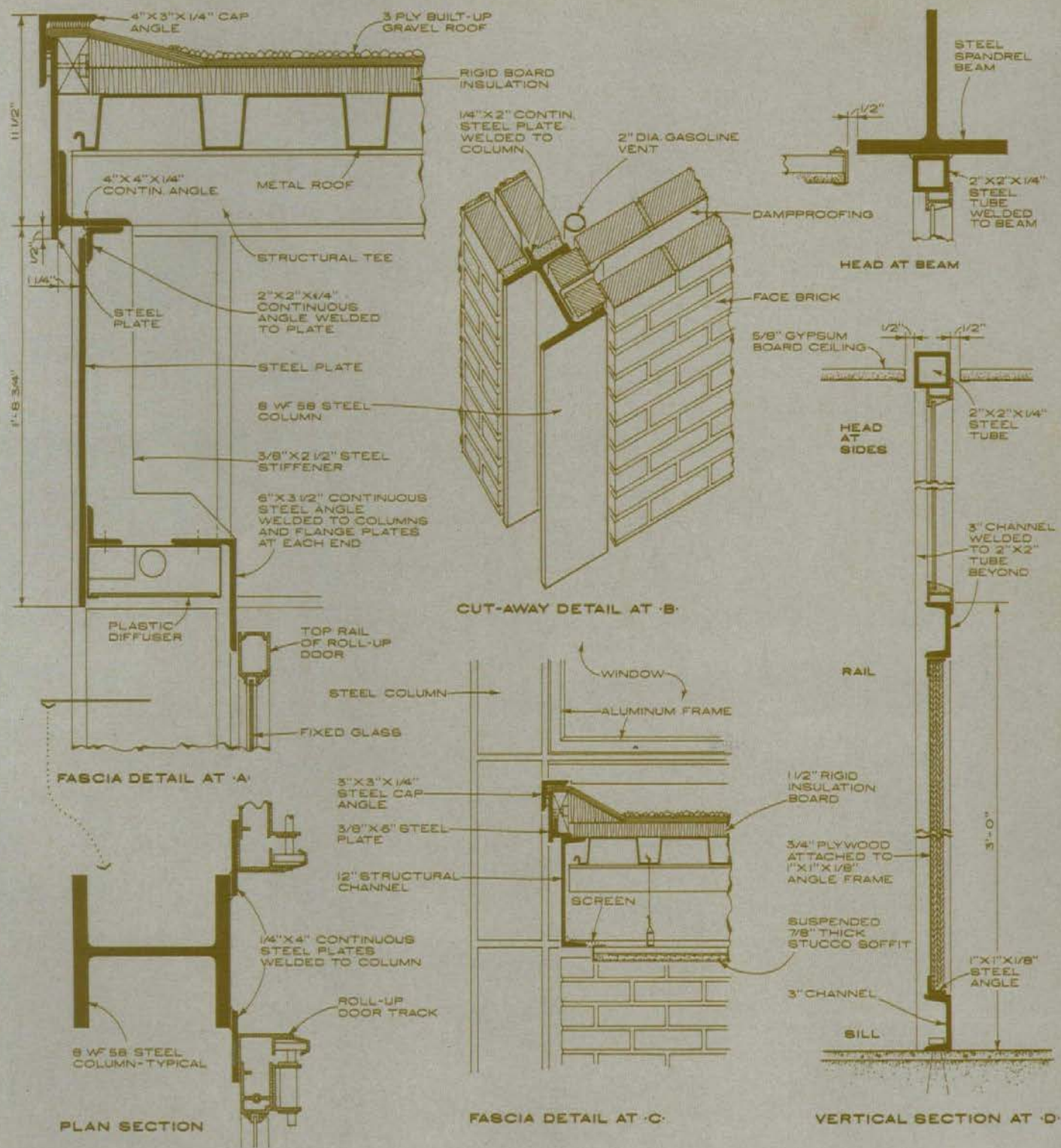
used throughout is white. In addition, use is made of natural brick, and dark green terrazzo floors with putty-gray doors, cabinets, and lockers.

The apparatus room was designed as a showcase for firetrucks, with a maximum amount of glass to display the fire-fighting equipment. An exposed steel structure for the apparatus room was chosen to provide a bright, easy to maintain space for the trucks. The slit clerestory window at the connection of the lower building

with the apparatus room provides additional natural light.

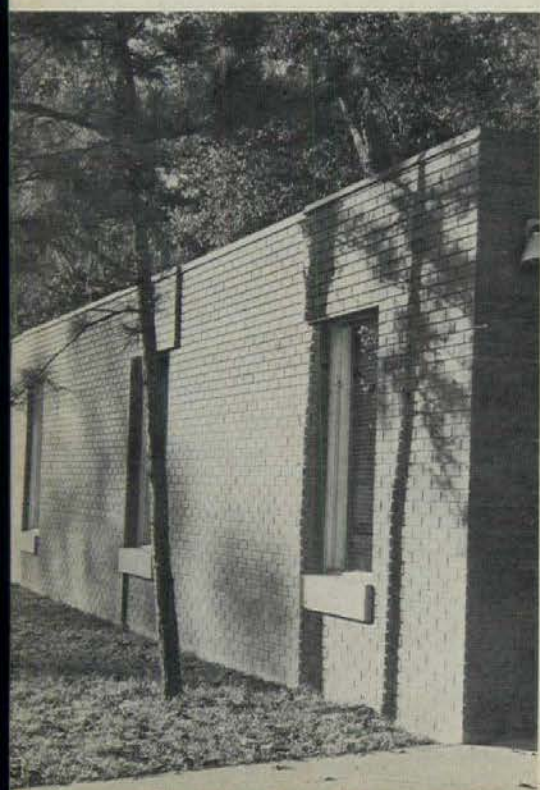
How to detail a showcase for fire engines? First, you do not have to fireproof the structure. Second, you make it as unobtrusive as possible, automatically leaving the only possibility of "architectural treatment" to the detailing.

Here, the showcase does what it is supposed to do. It is a display container for fire engines, unobtrusive, with every accent precisely where it ought to be.



Kitchen facilities in the recreation room overlook the vacant lots of the new Houston development.

FIRE STATION NO. 58, Houston, Texas



Architect: Clovis Heimsath Associates. **Site:** A road through a pine forest to the west of Houston. **Program:** A three-apparatus station for Chief of Fire District; compatibility with the residential character of the surroundings was requested. **Structural System:** Slab on grade, concrete block and brick exterior walls, wood frame and built-up roof for flat areas, steel structural frame supporting 2½-in. structural deck for apparatus room, apparatus room roof fascia and skylight, painted terne. **Mechanical System:** Dormitory wing heated and air conditioned from central system; apparatus room heated by two unit heaters suspended from ceiling. **Cost:** \$120,000. **Consultants:** Karl Krause, Structural. Joe Lee & Associates, Mechanical. **Photography:** Ron Domingue.

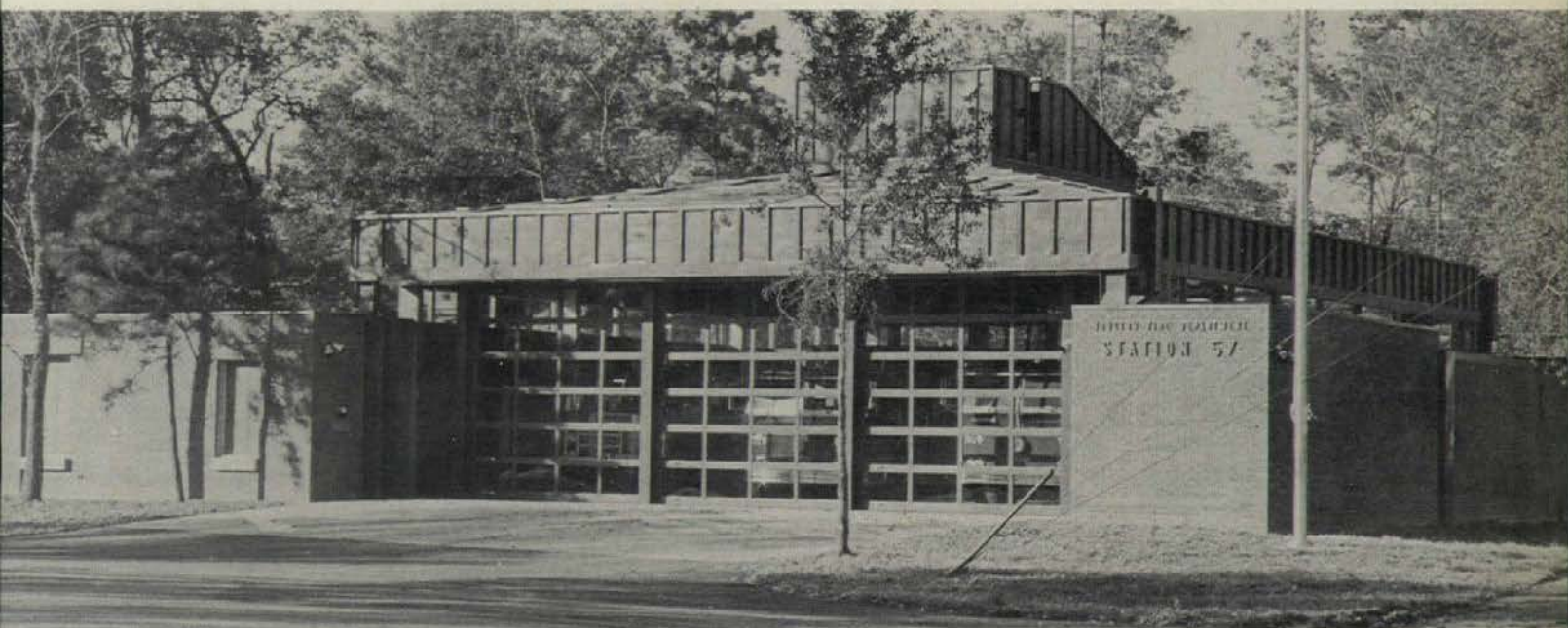
Sited in a pine forest, this showcase for fire engines was designed for a fire chief who had never before managed an efficiently designed fire station.

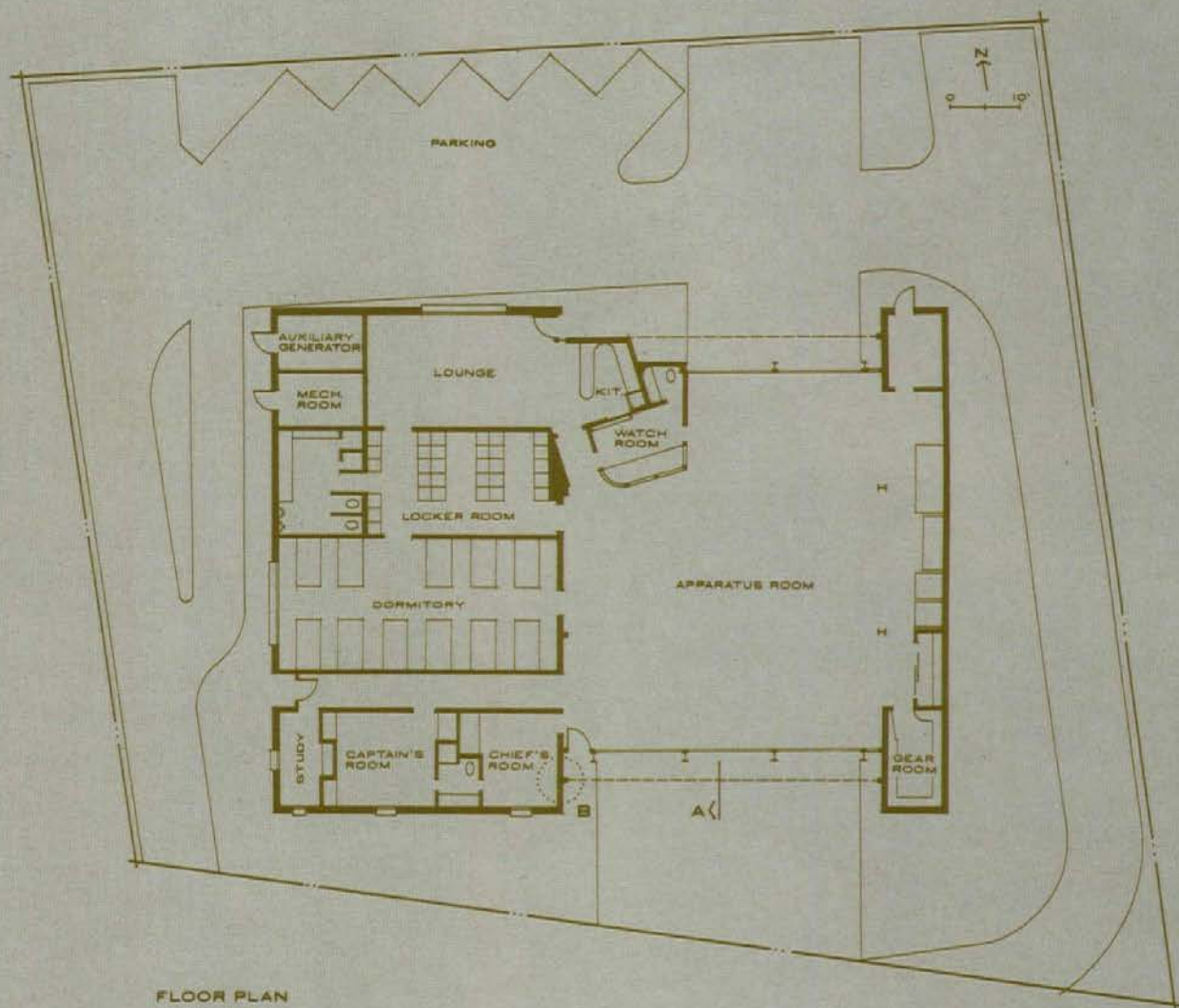
The architect's analysis of the station

revealed to them the following essentials for their design: The apparatus room is the central focus of a fire station and requires a long-span structure in contrast to the short spans of its ancillary facilities building; the passage from the dormitory, captain's and chief's rooms should be as direct as possible; the hose washing and storage units could be separated from the dormitory side of the station.

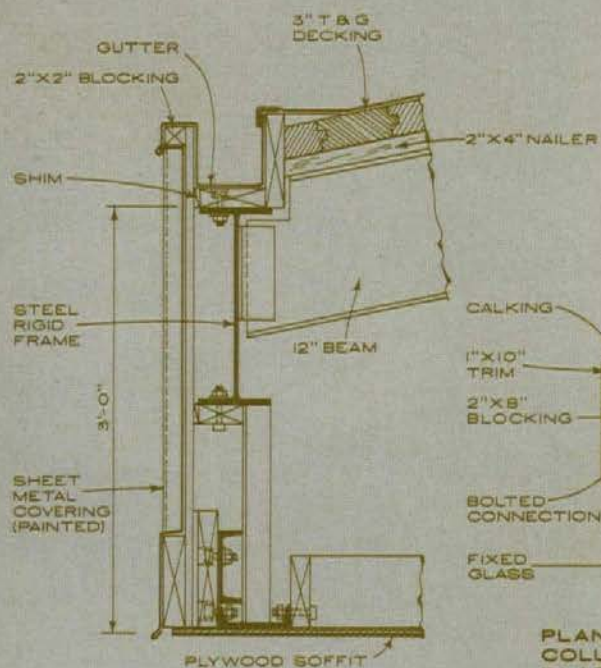
The plan, the architects say, took shape quite simply through the ordering of the necessary elements into a box and then arranging these properly according to function. The ancillary rooms were placed conveniently accessible to the apparatus room, and the study was isolated for quiet.

The apparatus space quite naturally dominates the scheme, acting as a pavilion intersecting the box. The Watch Room acts as a "hinge" between the apparatus room and the subordinate living functions. This room is the generator of the

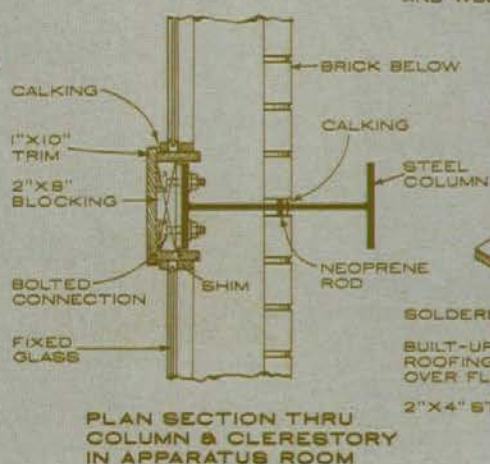




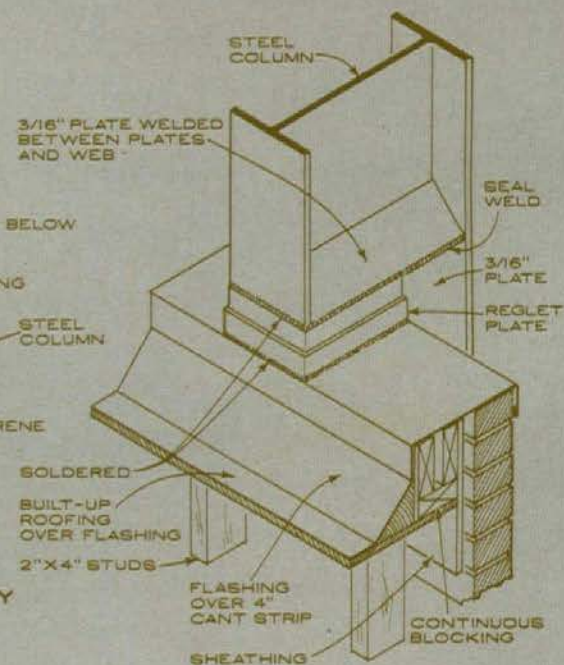
FLOOR PLAN



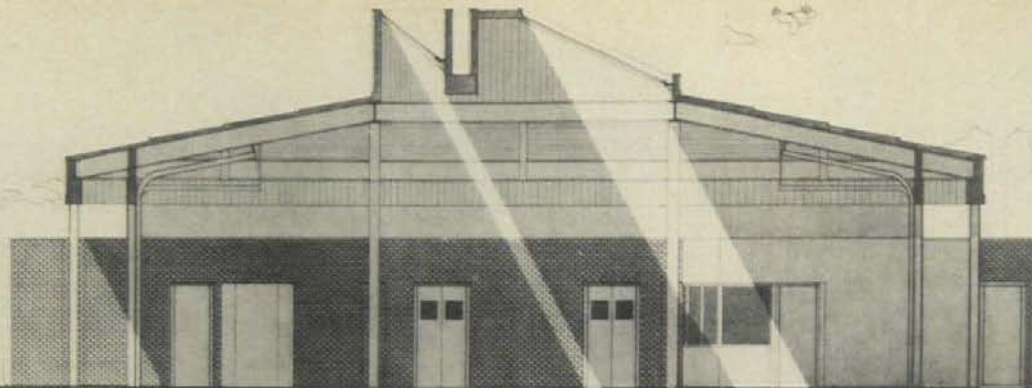
FASCIA DETAIL AT 'A'



(DETAILS KEYED TO PLAN)



ISOMETRIC DETAIL AT 'B'



Section

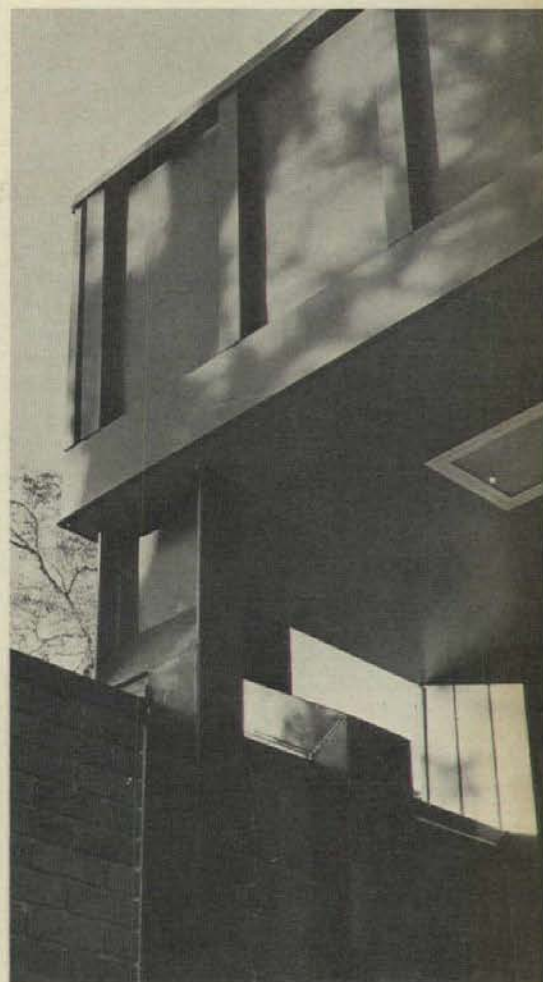
plan, calling attention to itself and reflecting its need to be in a position to oversee and direct operations. When a fire is reported, this room is ready.

The tool-jointed masonry facade is composed of ordered planes of masonry and glass calculated to cause a forced perspective, elongated from one direction and foreshortened from the other. The illusion is heightened by placing the building in coordinates shifted $7\frac{1}{2}^\circ$ from the street parallel. The architect describes the effect: "As one walks from east to west, the wall elongates and shifts itself into line in a sort of 'fourth dimension' movement involving both space and time."

The building with its exposed mech-

anisms of alarm—speaker, siren and bells, monumental downspout, exposed floodlights, and painted steel structure—has the look of a machine.

This appearance is somewhat contradicted by the false perspective induced by the graduated window sizing, brick planes, and siting. This is a showcase that acts as more than a fire engine wrapper that places its colorful contents on view as a point of contrast to the vacant lots and development housing that surround it, as is the case with the Todd, Tackett & Lacy firehouse. By comparison, this firehouse is sited amid the trees, as a visually moving showcase leading a life of its own.



The manufacture of stained glass, an estimated \$25 million-a-year industry, is almost totally dominated by the studios of the religious art industry. Can these businesses create art for modern architecture? Or is the independent stained glass artist the only one capable of designing for modern architecture?

"Today, our artists are creating masterpieces of stained-glass design unsurpassed in brilliance and in the subtlety of their color harmonies," claims a spokesman for the studios. "Preposterous," replies Robert Sowers, an independent artist. "Would that it were so. In sober fact, probably no more than 1 per cent of the more than 1 million sq ft of stained glass produced in the United States annually bears any relation to the significant work that has been done in this medium."

The artists disputing the domination of the studios are a recent force to emerge upon the scene. In contrast, the commercial studios came into being around the turn of the century. They were organized to meet the demand for revivalist windows and church decorations of the period. "It made a certain amount of sense at that time," says Sowers, "to have studio-trained designers turning out Gothic and Renaissance vocabulary work. They manufactured a very specialized form of ornamentation that required their specific training."

Modern architecture has meant the abandoning of the tradition which was the studio's specialty and hence their reason for being, claim the independent artists. In their opinion, modern architecture requires a very different talent than that supplied by these traditionalist-oriented manufacturers of religious objects. A list of important contemporary stained-glass windows, they argue, would consist almost entirely of windows designed by artists having no formal connection or affiliation with any of the major stained-glass studios.

The Studio

By way of rebuttal, the studios point out that they do by far the greatest proportion of stained-glass work and from this conclude that "they must be doing something right." However, the president of the Stained Glass Association, E. Crosby Willet, conceded in the official publication *Stained Glass* that the conflict between individual artist and studio was an "age-old controversy": "Nearly every major studio is a member of our association, which is theoretically dedicated to uplifting, not subverting, our unique craft. That we are detractors to stained glass is a serious indictment, which, like most sweeping state-

STAINED GLASS



art
or
business
?

ments, has some element of truth in it. However, the studio group has much to offer. Here we have artist and craftsman working together with the raw materials close at hand. To any honest artist, this is essential. . . . Most important is the relative anonymity in which artist and craftsman labor in stained glass, an architectural art in which any truly dedicated artist designer must submerge himself in order to create appropriate conditions of light and color in the architect's expression of form and space. Who the artist (or studio for that matter) is or was is not important."

The Architect and the Studio

That the studios are honestly dedicated to the traditions of anonymous craftsmanship is questioned by Sowers. He claims that they find the medieval tradition good business. "The studios take the prospective client through the shop with all of the build-up of grandfather, father and son, implying an unbroken lineage from medieval craftsman who brought all of these goodies to America."

Architect Lewis Davis, of Davis & Brody, claims that studio anonymity is far from altruistic. "It is the structure of the organization to have the men anonymous. Studio artists are not known. The studio can't afford to publicize any particular artist. He might take his following with him when he leaves. If I knew a particular artist was designing in a particular studio, I would go to that studio," says Davis, "but I don't know any artists in the studios."

On the other hand, architect Robert Mutrux, who has commissioned a considerable amount of stained glass, is a staunch champion of studio capabilities. He says he would question working with an independent artist without studio affiliation. He believes that the studio craft is indispensable to the successful execution of a work.

The Client: The Third Force

The client is often the final decision-maker. As part of the art budget, stained glass is the last item to be considered and the first to be cut. Mutrux says that he often designs churches with plain glazing but somehow "they always manage to get stained glass."

The result is that both architects and designers agree that the artist is never called in early enough. "We usually don't start with the artist. It wouldn't hurt to do so, but we usually don't," comments Mutrux. Designer Albin Elskus, who is a partner and sole designer in his small studio, says that he has yet to have an



architect call for advice before he thinks of the window.

Stephen Bridges of Rombrush Studios says that both architect and client seem oddly unfamiliar with stained glass. "The client does not have experience," says Bridges. "It might be the first and only time in his life that he will become involved in stained glass." However, Bridges adds paradoxically, stained glass is the easiest item of church decoration for which to secure donors.

Preliminary Designs

A major complaint of the independent artists against the studios is their practice of supplying preliminary designs gratuitously to prospective clients. They say that this "grinding out sketch after sketch" is conclusive proof of the poverty of design concept — that this is a process which, by its very nature, cannot be architecturally related.

The studios themselves are concerned about this aspect of their function. In an editorial condemning the practice, Otto C. Winterrich began by stating, "The craft of stained glass is a profession," and claims that studio craftsmen are not treated like professionals because they are not compensated as honest tradesmen for this preliminary design work.

To the independent artist, any design is a considered effort totally related to each particular problem that he cannot undertake without compensation. However, both studio and independent artist pointed out that architectural practice itself, in reality, is not always clear on this same point.

Perhaps the fairest approach to preliminary sketches was undertaken by Mutrux.

He approached five studios and asked them to submit designs assuring them that one would be awarded the contract. The remaining competitors were paid an honorarium. It was a fair transaction, which elicited the best efforts from the studios involved, says Elskus.

Elskus contrasted Mutrux's procedure with that of a famous architectural firm that approached the various studios saying that "price was no object, they had a million dollars to spend." After receiving a number of designs from American studios, the job was given to their European competitors for half the price. As a postscript, he added, a high percentage of panels arrived broken and had to be repaired by American craftsmen, anyway.

Elskus contrasts stained glass with the letting of other building contracts, in that the stained-glass designer cannot compete for the lowest bid. He must know the price range. Windows can vary anywhere from \$5 or \$10 a square foot to over \$50. Obviously, the designer must have some idea of the price range.

Designer William Schmeickel claims that although the amount of money does not always buy the best window, the overcoming of limitations can create excellent work. To this Bridges adds that often with a limited budget the client is willing to allow more freedom in design, which may produce better work on the part of the studio.

Who is correct? Who the hero and who the villain? It would seem that, as in most honest hotly contested arguments, neither the one nor the other. Sowers makes the point that when the "creative phase of stained glass or any other art is absorbed into the production lines of the religious art industry, that art, then and there, is inevitably a 'lost art.' Because, such production lines by their very nature cannot avoid being geared to the mass production of monuments of lasting insignificance."

Conclusion: Art or Business?

It seems obvious that the only viable milieu in which an independent artist can function is that proposed by architect Davis, "An architectural art has to depend on a conception, the execution can of course be done by a number of people. You commission the person who can do the best work, who understands what you are trying to do." Davis makes the artist a respected consultant. Every architect gets the art he deserves. That the stained-glass studio is at fault for supplying a demand is another question. "The foisting of spurious medieval craft tradition on unsuspecting clients is no more dishonest

than designing Howard Johnson churches in the first place. Religious art has for long been good business and the least aesthetic and the least spiritual of all the arts," he concluded.

Given the circumstances so succinctly expressed by Sibyl Mahony-Nagy, where the artist is used "to fig-leaf an aesthetic blunder or curry cultural prestige," and in addition is subject to the whims of the client and donor, it is questionable that the studios can be condemned for what they do.

For stained glass to be used as an element of architecture as opposed to an element of decoration, as artist Sam Weiner claims it should be, it obviously demands other client relationships.

The conflict is with the studio designs, not with the studio itself. No one has ever questioned the studios' ability to perform. Indeed, the independent artists are dependent upon the studios for the execution of their large commissions. The battle would seem therefore not between art or business but in what the architects themselves are trying to accomplish. Sowers claims that "the ratio of 99 plus per cent of stained glass studio mediocrity to the less than 1 per cent art glass done by independent artists is too high a price to pay." However, we might point out that this is roughly the same general percentage of good to bad religious art.

The best conditions for stained glass to emerge as an art rather than a business was expressed by Sowers in his book *Stained Glass*, "It is finally a matter for the architect to know when, in the given instance, the artist must be consulted: when decisions about a particular mural or sculptural conception must be made that clearly go beyond his own special competence. And it is a measure of his own artistic integrity to be able to recognize that moment. . . . Few artists or architects seem willing to accept the fact that for art and architecture to become a convincing unity each must in some way demand the other for its own completion."



PITTSBURGH

The Pittsburgh of the past was a dowdy place but it had character. This article examines the quality of the "pre-Renaissance" city, and speculates on how some of it may be saved.

This is a study in urban aesthetics, taking one city, at once commonplace and peculiar, Pittsburgh. Like most American cities, it has grown up along a hodgepodge of gridiron plans on which places to live, places to sell things, places to make things, and places to worship have been set indiscriminately side by side—a city whose streets are like those of many other cities of its size and like most smaller towns in its air and appearance, once you are away from the showier neighborhoods. On the other hand, no other large U.S. city except San Francisco has something like Pittsburgh's wonderful and formidable topography, and no other city, perhaps, has a past that it is so disposed to disown, at least in its official pronouncements. The stranger is still told about steel production—perhaps his informant will boast that the city is a No. 1 Russian target if worst comes to worst—but he will be shown Gateway Center and the Civic Arena as the true Pittsburgh of the emerging future. One official, the new city image in mind, is even said to have proposed camouflaging the Jones & Laughlin blast furnaces that make a spectacular introduction to the city for motorists coming in from the east.

Lacking a conspicuous and well-known neighborhood of fine old houses, a Georgetown or a Beacon Hill, lacking any nationally famous historic architecture, except for Richardson's group for Allegheny County, Pittsburgh is often thought of as bringing out of its past only a shabby, money-grubbing physi-

cal environment, something to be demolished in order that architects from New York or Los Angeles may build the new, hygienic, and cosmopolitan environment that is the symbol and implement of Pittsburgh's poisonless, daggerless Renaissance.

Some Pittsburghers, however, are not convinced that the effacement of old sights and scenes is always a good thing. Nobody, indeed, is sold on the idea of a hundred per cent redeveloped Pittsburgh, even if there were money enough. Authority tries to respect the most conspicuous of the old landmarks, to preserve them amid the new buildings. And even a redundant bridge, a neighborhood of old red brick houses, or a single Romanesque façade, may not be wholly friendless. Pittsburgh, used to massive engineering works and occasional outbursts of pompous architecture, to straggling flights of public steps and climbing streets whose pavements suddenly peter out, is a city of dramatic and casual visual accidents that irritate the tidy-minded and the image-conscious but delight the local artist. For a native, to return to Pittsburgh for a few days after a stay in some more elegant city is to spend about three days deploring the shabbiness, homeliness, and pettiness of it all, after which he gets used to, then enjoys it. Pittsburgh, after all, has acquired an identity worthy of respect; it has brought out of the past certain ways of building, certain qualities, that the cleaner and more convenient city of the future might well try to integrate into its new self if it wants to be more than a glittering nowhere.

As a capsule illustration of the difference between the old Pittsburgh and the "Renaissance City," as presented in the Sunday supplements, a look at the past and future of the Point may be worthwhile. The Point is the area of land in the Golden Triangle at the confluence of the Allegheny and Monongahela Rivers. Before 1950, it was a wild, tree-shaded area of ground, enclosed by the massive approaches to two bridges, the Point and the Manchester, that diverge to cross the rivers. Its banks were steep, flower-grown, and untended, and barges tied up at the water's edge. Office work-

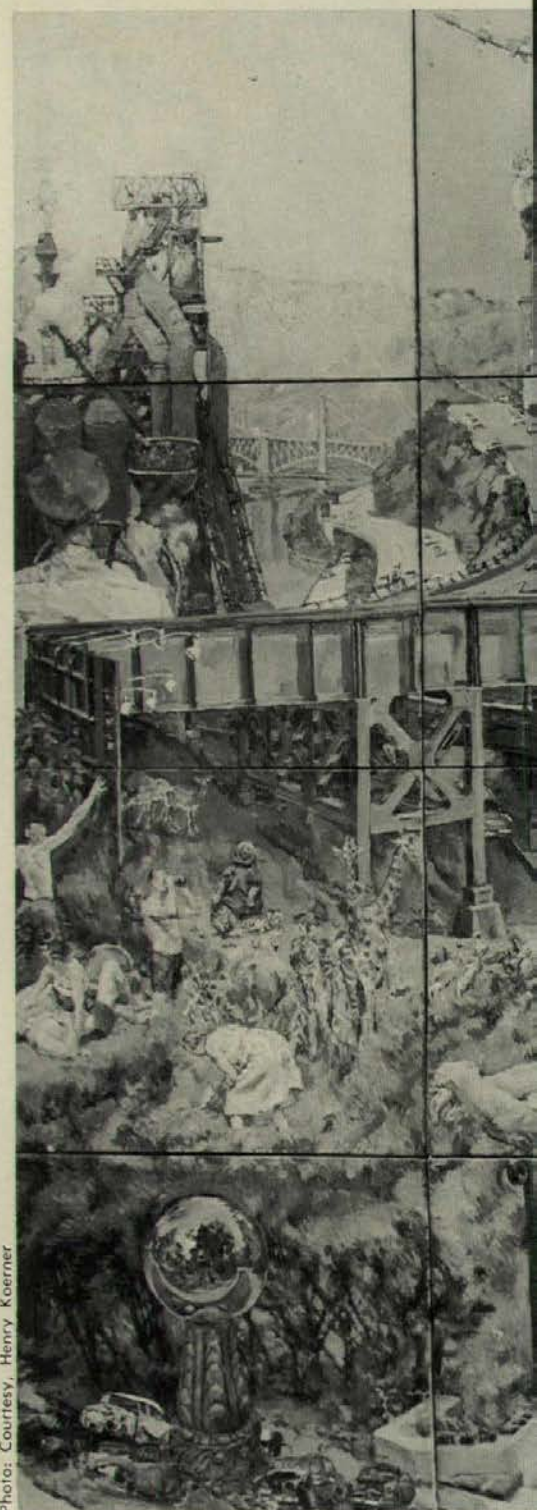
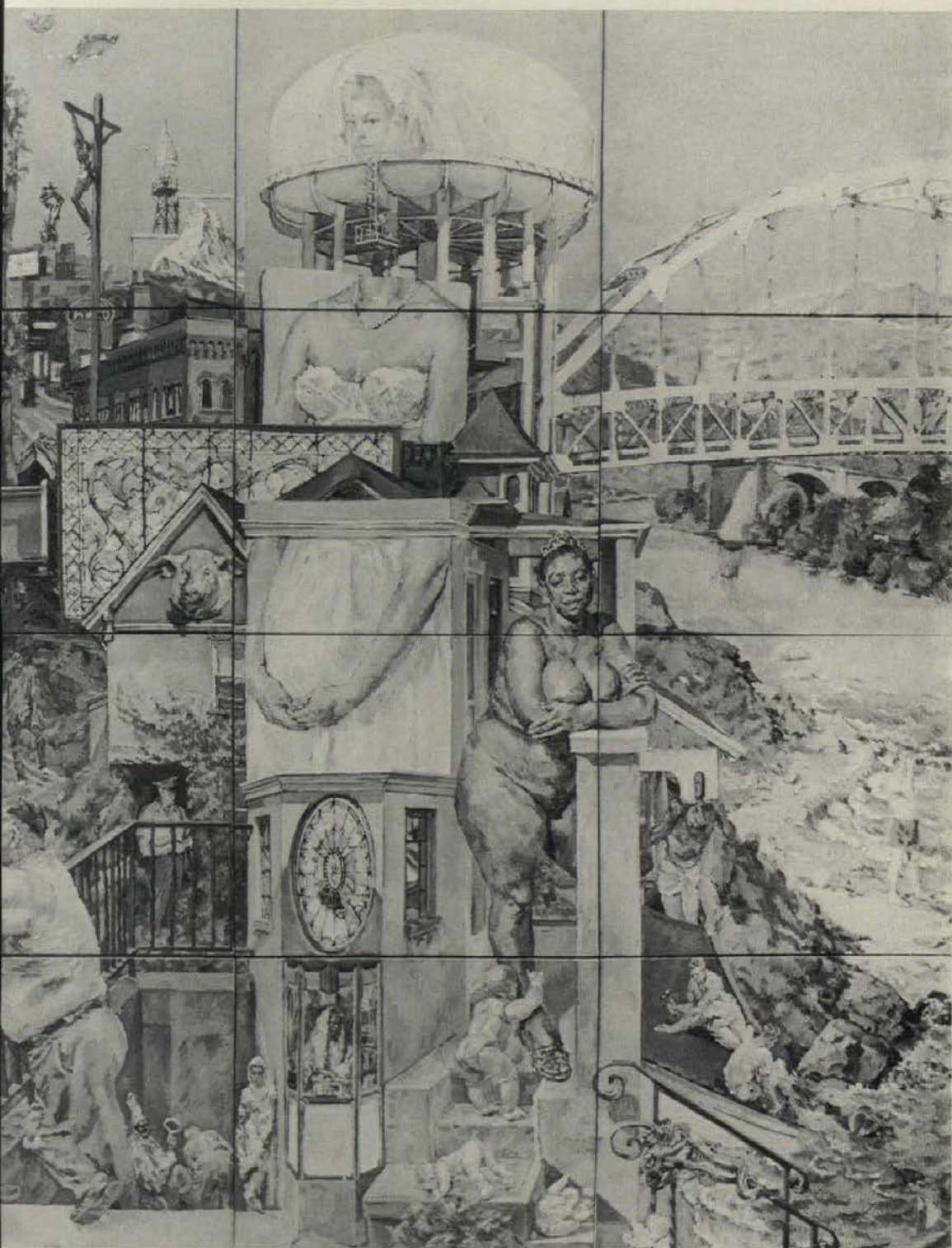


Photo: Courtesy, Henry Koerner

A STUDY IN URBAN IDENTITY



Henry Koerner is a Viennese painter who has lived in Pittsburgh for some years now. The picture *Oh Fearful Wonder of Man!* is a fantasy on Pittsburgh phenomena. To the left appears a blast furnace, possibly one of Jones & Laughlin's. In front of it is part of the substructure of the Boulevard of the Allies, which is also seen in the distance, running beside the Monongahela River. In the distance is the 10th Street Bridge, with the Liberty Bridge beyond. The crucifix and the adjoining skyline objects are probably fictitious, except for the flamelike object, which is a neon weather beacon erected by a gas company downtown. The immense water tank is real, though the face is not; it stands on a hill in East Liberty. To the right are the Manchester and Fort Duquesne Bridges, crossing the Allegheny River. In the foreground are more intimate objects, including two stained-glass windows from the house that Koerner was living in at the time the picture was painted.

Concerning Pittsburgh, Koerner says:

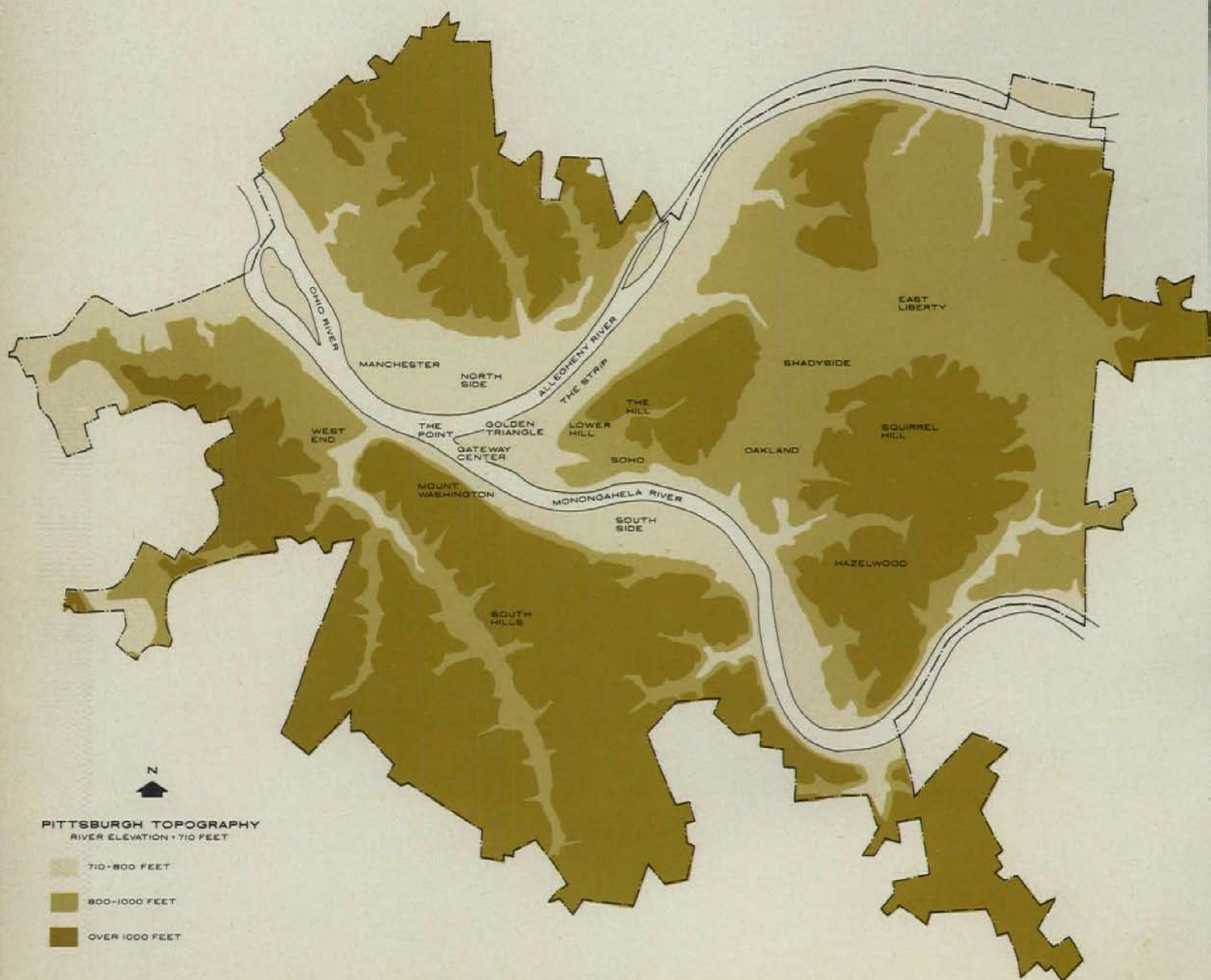
"Pittsburgh, city of my dreams.

"It is for me what Rome is for Fellini. Most everything I want to say about contemporary existence I can find visually realized here — or better, its visual realizations spark my imagination again and again.

"Emerging from the Fort Pitt Tunnel, the city is offered to you as on the palm of a hand. The mixture and diversity of buildings, houses and bridges on hills and valleys and over rivers, nature and industries, races and religions, are forever forming changing mutations of motif-possibilities. As if in a dream, but with your eyes wide open."



Photos, this and facing page: Barbara Runnette





Neighborhoods around the city: a hill in East Liberty (facing page), showing the Oh, Fearful Wonder watertank; Herron Avenue, Schenley Heights (left); Phelan Way, below Bigelow Boulevard (below); 18th Street, South Side (right).

ers made their way through the adjacent neighborhood, largely taken up by small shabby buildings and dominated by a freight terminal, to eat their sandwiches and have a nap. The mixture of massive engineering work, barges, weeds, and casual land use was typical old Pittsburgh in its quality. As now planned, the Point is to be a formal park, with neatly mown lawns, a tall fountain jet, paved walks, and a genteel approach from the Gateway Center that has replaced the haphazard old neighborhood. In the interests of history, the old Blockhouse, surviving from the 1750's, will be given a neat new setting, and the plans of Forts Duquesne and Pitt, the successive French and English establishments on the site, will be outlined on the ground. The old Point was disorderly, but, such as it was, it was real. The new Point is designed as a work of art, a civic ornament, and its ground area has been vastly increased, but it seems on paper to have a pallid, "as advertised," quality about it. Somewhere between the two extremes, part of the Pittsburgh of the past might have grown, rather than merely being transformed, into part of the new Pittsburgh.

What Pittsburgh Has Now

Pittsburgh is a jumbled affair of rivers, river shores, bluffs, hills, plateaus, and ravines on which a city has haphazardly grown up. More than in almost any other city, the third dimension is important in the look of things. You cannot go far before you find yourself looking up the side of a hill, or forward into empty space. The shape of the land has beauty of its own, and it has created a setting in which the dowdy buildings and streets of Pittsburgh take on a kind of grandeur—at a distance, anyway.

The city area is unevenly trisected by



three rivers: the Allegheny, the Monongahela, and their offspring, the Ohio. Thanks in part to their action upon the tired local mountains, the city is built over three major ranges of level. These are firstly, the areas, sometimes broad, sometimes quite narrow, of the river shores; secondly, the plateau areas east of the Golden Triangle, 200 to 300 ft above river level; and thirdly the hills, whose tops are as much as 500 ft above the water. In the historical settling-out of population and building types that took place in the latter 19th Century, the shore areas were given over to manufacturers, commerce, railroads, and river traffic, while the low flatlands in from the shore, the original built-up areas of the city, were taken over wholly by the working classes and the poor. The affluent gradually abandoned their houses in the Triangle and on the North Side in favor of Sewickley, a town a few miles down the Ohio, or moved to the plateau and hill neighborhoods of Oakland, Shadyside, and Squirrel Hill, east of the Triangle and well away from the rivers and the mills. The working classes, once



the water-level areas got thickly settled, had no place to go but up, and so built on the slopes and hilltops above the mill chimneys, making weary shanks' mare morning and night along paths and public stairs. Some of the hilltop communities are of remarkably early date, considering that even the cars and buses of today have trouble with the sloping streets, whose gradients may be on the order of 1 in 10 or even 1 in 8.

In the new neighborhoods, level or not, the Victorian surveyor's gridiron was applied as rigorously as the terrain would permit, wrenched about and amputated when the contours demanded it. The multiplicity of little streets appears to have driven town officials to desperation over nomenclature. A walk along Compromise, a street on a ridge overlooking the North Side, offers one the option of descending to the right by Habit Way, a flight of steps, of going left and uphill via Sprain to its intersection with Wigwam, or of keeping on to the end of Compromise and continuing uphill on Toboggan. Around the mills it was relatively easy to think up street names like Bloom and Ingot, but even here some odd assortments can be found, without any apparent conscious association of ideas.

As the need arose for communication between or within neighborhoods, an uncoordinated system of bridges, trolley

lines, tunnels, inclined planes, public steps, and access roads evolved, making it possible to utilize a relatively large proportion of the high ground within the city limits. The engineering work that has resulted from the concern for getting about in the city, making it habitable, and giving it its livelihood has provided not a few of the visual leitmotifs of the place. Large bridges of just about every type popular in the 20th Century were built, spanning the rivers and the ravines that penetrate the plateaus and hills; steel arches, concrete arches, cantilevers, suspension bridges, and various kinds of truss appear here and there around town, as well as a few freaks such as an arch of congealed slag and a double lenticular truss of the 1880 period. In the older bridges, the piers and approaches are of massive rock-faced ashlar, which like most Pittsburgh stonework is black from decades of bituminous soot. Similar masonry is used for the retaining walls that one comes upon now and again; the recent survey of Allegheny County landmarks, published by the Pittsburgh History and Landmarks Foundation, cites one particularly fine example in Oakland, remarking, "These heavy, rugged surfaces, so nearly allied to the hills they retain, are among the finest things in Pittsburgh visually." The inclines, which once hauled passengers and even wagons and teams to the hilltops, have dwindled from their original number of 17 to the 2 that still ascend the slope of Mount Washington. The public steps, like the inclines, have lost some of their traffic because of the automobile, but they can still be found, straggling up the hillsides for 100 ft or more between the backyards and the heaped-up houses.

Down by the rivers, of course, are the works of industry: steel mills, fabricating plants, factories and warehouses, black steel and dirty red brickwork, corrugated metal roofs acres in size, towboats, barges, wharfboats, scrap piles, railroad lines, and all the rest of it. Steel mills are less sensational now than they once were; their smoke is abated to a thin gray or pale orange, and the Bessemer converters, which used to make the sky flicker at night, have been demolished.

"Townscape"

The city has evolved without much concern for the amenities. Money spent on such things, when it has been spent, has gone to particular projects in conspicuous places. The ordinary neighborhood street is an easy-going hodgepodge of electric poles, wires, and trolley tracks, in which the only touch of conscious art comes from the recent painting of steel electric poles in yellow and black, the city colors. Many neighborhoods are spared this, however, and get along with plain poles of creosoted wood. The streets are usually lined with small houses, detached more often than not, with here

and there something like a neighborhood business center; small apartment houses, drugstores, dentists' offices, and so on. These episodes pass quickly and give way to houses again. Pittsburgh, in fact, is still a small-townish sort of place. Most areas give the impression of a city of moderate size, surviving from around 1915, which has been tinkered with rather than improved and into which newer buildings and newer features of all kinds have been inserted rather than integrated. On many streets a homely charm prevails; the trees are numerous, the hedges are clipped, the furniture on the front porch suggests relaxation on the summer evenings. In less fortunate stretches, chaos has set in. The North Side and East Liberty are full of streets, once residential, that have been bedeviled with drastic remodelings, stores, showrooms, used-car lots, warehouses, parking garages, and similar defacements, garnished with crumpled newspapers and broken bottles.

The fact is that Pittsburgh has never had much instinct for visual beauty. Although there have been capable and respected architects in local practice—Benno Janssen, Henry Hornbostel, Frederick Scheibler, Stanley Roush, and Paul Schweikher are examples—Pittsburghers wishing to build with distinction have developed the habit of looking elsewhere for their designs. H.H. Richardson's designs for the county courthouse and jail are the most famous but not the first of these cultural importations, and most of the best jobs of the years since have gone to out-of-town firms such as D.H. Burnham & Co., Cram, Goodhue & Ferguson, Trowbridge & Livingston, Charles Z. Klauder, Harrison & Abramovitz, and Skidmore, Owings & Merrill. Pittsburgh is not an intellectual city; it has cultured citizens, which is still an asset, of a lesser sort. But for a hundred years the kind of anonymous, tasteful building that created a Beacon Hill or a Georgetown has been foreign to it. The early builders created orderly red brick or gray wooden streets of houses and churches that were essentially boxes, symmetrical and of a scale and set of proportions that hardly varied from one building to the next, or from decade to decade. Only the ornamentation varied, and that was so subordinated to the box-form and the military regularity of the fenestration that not much harm could be done by lapses of taste. Romanticism and the advent of new facing materials presented new visual dangers eventually, in the later 19th Century, and to these both builders and architects quickly succumbed. The local architects thereafter contented themselves with following the latest fashions from the great world outside, not always with full comprehension. Even the houses of a "good" neighborhood like Shadyside or Squirrel Hill, built up at the height of the Eclectic period, fail to attain the sort of quaint and tasteful effects that Philadelphia and

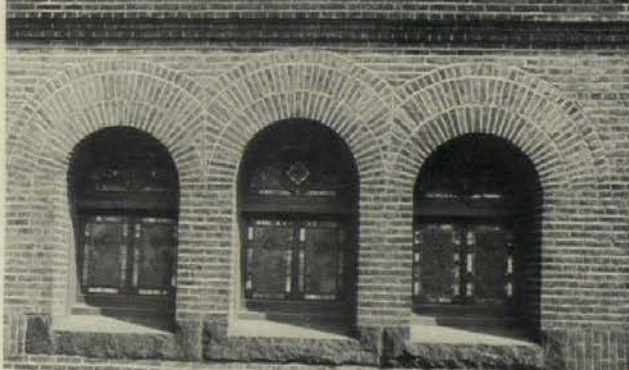
Boston architects brought off with effortless ease. There is something slightly illiterate about them; their proportions are slack, their materials harsh. They often have a kind of Jiggs and Maggie quality: You sense that a homely 20th-Century house is trying to make itself comfortable in a genteel but ill-fitting Tudor or Colonial costume.

Of the fashions that these minor architects have adopted, and the builders after them, perhaps the only really successful one was the Richardson Romanesque. Richardson began construction of the Allegheny County group in 1884, and thereby created a fashion for houses, churches, and business buildings that flourished for 15 years. By luck, rock-faced cut stone was almost an obligatory feature of the Romanesque front, and such stonework, used either as the entire facing or as a means of accentuation, had a kind of affinity with the engineer's masonry of the retaining walls and bridge piers. It was possible to spoil a Richardsonsque design with touches of cheap pseudomedievalism and elephantine whimsey, and this was indeed done; but the essential solemn masonry of round arches, flat walls, black rugged stone or sooty red brick, was somehow in keeping with the seriousness of the city. Something of the same architectural falling-in with the genius of the place occurred around 1900, when the demand for branch Carnegie libraries and some other monumental work, particularly schools, public institutions, and banks, led to the development of a style that might be called Greek Revival Revival. Executed mostly in grayish or brownish brick with classical detailing in pale terra-cotta or limestone, it dignified essentially boxy buildings with porticoes, pilasters, and grilles in a way that somehow missed the grand effect without failing to have a peculiar, rather melancholy charm of its own.

The Matrix

But the Pittsburgh townscape has gotten along largely without the benefit of the architect. The typical building of the city is not a Harrison & Abramovitz skyscraper or a black mill by the Monongahela, but a single-family house. Such houses, whether mid-Victorian red brick or gray clapboard, late Victorian "Richardsonian" with rock-faced, soot-blackened sandstone, 1900 "Colonial" in ochre brick, 1910 bungalow in red brick with raked joints and art-glass windows, or of some more recent idiom, with fake shutters, and two-toned metal door canopies, are the buildings that form the small-grained matrix into which the occasional larger constructions—boxy apartment houses, black Romanesque or grimy Gothic churches, nondescript commercial block fronts, hip-roofed schools—are set like dubious gemstones. Over and over again, multitudes of such houses, bristling with chimneys, gables, and antennas, create the fretted skyline or the undulating valley

THE VERNACULAR



Photos, except as noted: Barbara Runnette

Photo: Courtesy, ACTION-Housing

floor of a typical Pittsburgh townscape—even though their small scale may be interrupted here and there by the bulks of larger buildings—varied and garnished with trees, shrubs, weeds, utility poles, advertising signs, street signs, wires, railroad tracks, bridges, steps, columns, pediments, pilasters, cupolas, onion domes, and all the paraphernalia and impedimenta of adventitious pomp and unforeseen circumstance, clinging to the hillsides, nestling in the valleys, riding placidly on the plateau-tops, cascading down the swooping avenues. To like the look of this other Pittsburgh, where “Renaissance” has not come, you have to like the look of dirty red brick, gray clapboards, asphalt siding imitating buff brick, green and cream as trim colors, opalescent art glass, odd bits of metal rusting here and there, clumps of ailanthus growing from untended patches of dirt, and industrial buildings in various states of repair. For these are the recurring visual phenomena of the city, its vernacular, the major concretion of and accretion from a still-evident past.

Present Assets

Very well: what *does* Pittsburgh have now, in the way of beauty or character, on which it might build?

First and foremost, the magnificent topography. Gallons of sweat and gasoline have been wasted in getting about on the slopes, and no rational planner, probably, would site a new town where the foreseeable extent of its built-up area would include such a terrain. But if Pittsburgh is stuck with a lot of hard climbing, it is permitted to a rare degree to exist visibly as a three-dimensional entity. In most cities (and in parts of Pittsburgh, too, of course), the citizen is flanked by high walls, with an endless street before him; as the façades recede, they undergo a kind of Doppler effect, and far short of the horizon their details become invisible, their designs meaningless. To the resident of such an area, areas of the city not within sight and not frequently visited become mental abstractions. In such cities, you walk along street A, crossing streets Z, Y, and X, experiencing a small fragment of the town as a serial phenomenon. But a town with violent changes of level, with vantage points, has the immense advantage of allowing the passer-by not only to see the place where he is but other parts of the city, miles away; instead of seeing façades, a few at a time, he sees whole distant neighborhoods. From certain parts of Pittsburgh, particularly the 400-ft elevation of Mount Washington, half the city is visible. Rather than having in his mind the inert, factual knowledge that there are such places as Oakland and the North Side, the person on Mount Washington can point to the towers of Oakland, or train his binoculars on the North Side. The terrain encourages him to have a live perception of the city as a whole.

Akin to this is the live perception of space that any hilly site, whether in a city or in the country, affords. To get well above a valley floor or a plain is to find more than a vantage point; it is to experience the coming-alive of a truism: to be aware of one's own location in space, aware that where the earth ends, at the soles of one's shoes, the sky begins; that houses, and all the contrivances of human beings, are things on the surface of a planet, and above are the winds, the clouds, and the stars. The view from some Pittsburgh hilltop to the hills beyond, where the small houses appear to be no more than the brushstrokes on a landscape painting, with perhaps a school or a church bulking like some abstract form thrown into the composition, is a moving thing. And perhaps most moving of all at the time of evening when the shapes of trees and houses are still discernible, but when the lights have begun to come on, so that the whole scene dissolves into constellations of light as the daylight fades. But other things also give this heightened sense of the interaction of earth and sky: a great cloud of steam rising over a ridge from some mill concealed in a river valley, a radio tower through whose openwork the passing clouds are seen, or the great steel arch of a bridge, seen from a ravine.

Aside from the genuine beauty, as a whole or in detail, of the many Pittsburgh buildings that have been rather slighted here to make a generalization, the architecture of the city has other things to offer. The first is an object lesson. At its worst, Pittsburgh building has generally been of a scale that does not disrupt unduly the visual effect created by the shape of the land. The nervous skylines of little gables and chimneys are not distractions, and the cubical shapes of houses, the boxy shapes of the larger buildings, have maintained a good overall balance with the amorphous growths of trees and shrubs on the hills: chaos and geometry providing mutual relief. Another negative virtue lies in the modest range of building materials thus far in use, which makes for visual consistency. Whether architects of the future will want to repeat these materials or the dark reds, yellow, ochres, and grays of the older building vernacular is a matter of doubt. Pittsburgh, visually, is a sad city; its present colors attest to its past of Presbyterianism, soot, and hustle. The city to come, thinking of its past as something to be lived down, may be tempted into a hedonism of color that could gradually change its complexion. The first fruits of the Renaissance, at Gateway Center, already show an indifference, perhaps even an aversion, to the materials common to the building in their “neighborhood,” the Triangle, in the early 20th Century, which were white unpolished granite, white terra cotta, limestone, and various kinds of brick. The Gateway Center buildings use none of these; in

one way or another they use polished gray granite, polished red granite, white marble, greenish-gray fieldstone, stainless steel, anodized gold-colored aluminum, metallic cladding tinted medium blue, and exposed concrete. Not harmonious among themselves, they seem to be united by a determination to create a confidence-breeding bright new image.

A final thing, aesthetically, that the city has had, but is having less of as time passes, is a sometimes wonderful quality of the casual and accidental. The Pittsburgh of the past was a place of improvisations and abandonments; expedients and rough edges, in which the standard solution to a problem might or might not be used, and, if used, would be used in isolation in the midst of an unregenerate environment. Progress will regularize the existing situations, at the very least. Straggling fences will be torn down, scrapyards and steamboat hulks cleared away. These things were picturesque, but the picturesque cannot abide in a context of self-consciousness. Disorder may be interesting, seen in a certain way, but it cannot be preserved, once noticed, except as a kind of artificiality.

What Pittsburgh Is Planning On

Any comment on the Pittsburgh of the future must be made in terms of the goals the city has set itself. There is no need to review again the history of the “Renaissance” to date; the story has been told repeatedly, perhaps the best recent account being that in Jeanne Lowe's *Cities in a Race with Time*. The Renaissance is continuing, with goals still to be attained and some continuing losses in population and housing to be cut. The Pittsburgh region would like to do a number of things simultaneously, but perhaps its most important problem is that of how it will make its money. In the past, Pittsburgh was a big steel town in the midst of little steel towns. Steel was not its only major source of income; other materials and manufactured products have been important to its economy, but steel was long the symbol of the city's livelihood and in a sense of its philosophy of life, one of hard physical labor without much time or inclination to look up and about. But many of the region's past troubles have come from excessive reliance on manufactures such as steel, for which demand fluctuates. A drop in the demand for steel or glass has meant mass lay-offs and a serious loss of income to the region. At present, an attempt is being made to diversify more widely the region's sources of income, not only by encouraging new kinds of industries to move into the area, but also by developing on a greater scale the kinds of white-collar work that the city has been doing all along. At present, the headquarters of 23 of the nation's top 500 companies, in terms of sales, are located in Pittsburgh. The Pittsburgh region has 120

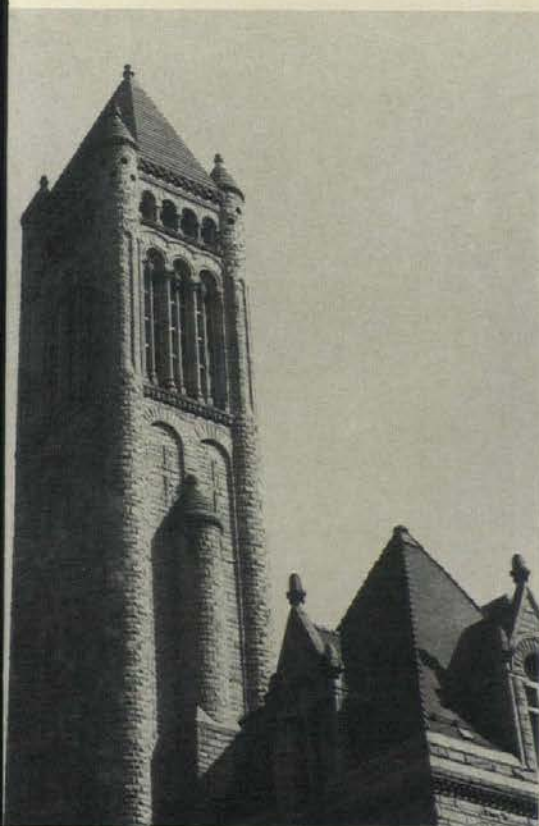


Photo: Courtesy, Pittsburgh History & Landmarks Foundation

Pittsburgh landmarks: the Courthouse tower (left); a street in the Mexican War Streets area (above); the Point Bridge (below); the Union Station rotunda (bottom).



Photos, except as noted: Barbara Runnette

of income that the city is anxious to industrial laboratories. These are sources cultivate further.

Much of this hoped-for new activity for the Pittsburgh area depends on the kind of people who can be persuaded to live there. Allegheny County has been suffering a slight decline in population, and the greatest part of those leaving are skilled persons in the prime of life, able to put in many years of work. In order to get these to remain as an available labor force, and to convince the personnel of companies that might consider the region that Pittsburgh is not Siberia, an ambitious program of building, rebuilding, and general tidying-up has to be taken in hand. The city needs not only bright new office buildings and neat industrial parks, but good and plentiful housing, new schools, new shops, and amenities of all sorts, for both its present inhabitants and the newcomers.

Much of the foreseeable reworking of the city to attain these varied goals will take the form of simple rehabilitation. Neither the Urban Redevelopment Authority nor other local organizations favor the mass destruction of neighborhoods, if their substandard housing can readily be fixed up. They prefer to work with the individual householders, offering advice and training for those wishing to repair their homes. All the same, there is a housing shortage, threatening to become acute, and rehabilitation will not be enough. No one means will be used to close up the gap. Apartment buildings will become more numerous in the city than before, but most of them, probably, will go in the large areas downtown that have been or will be comprehensively redeveloped. It is possible that all but the worst present-day residential neighborhoods will remain dominated by the small, one-family house for quite a while to come.

The really radical alteration of old neighborhoods is taking place in and alongside the Triangle. Gateway Center is about to acquire its last unit, the Westinghouse Building by Harrison & Abramovitz, built of weathering steel; when that is up, one of the very first enterprises of the Renaissance, and still the symbol of its viability, will have been completed. On the Allegheny shore opposite the Triangle, an area of scrapyards, railroad tracks, miscellaneous small buildings, weeds, and steamboat hulks is being cleared away to provide space for a new stadium, an expressway, a public promenade, and possible commercial or residential development. The possibility of some sort of development is being considered for the corresponding Monongahela shore, under Mount Washington. The Strip, an extension of flat land up the Allegheny from the Triangle, is to change not only its character but its name. Its present railroad yards, produce markets, warehouses, and miscellaneous small buildings are to be cleared away

and replaced by Penn Central Park, a commercial-residential development that will grow as the demand for spaces dictates according to a general plan by Vincent G. Kling and Associates. The Lower Hill district, which until a few years ago was an area of shabby houses and commercial buildings, is being developed, not without controversy, as a kind of municipal showcase, a civic center that will take over some of the functions of the old one in Oakland, with residential and commercial development along the fringes. In dispute now is the construction on the Lower Hill of a new home for the Pittsburgh Symphony, long an Oakland institution.

Outside the center of town, two projects will change the look of the city in many places.

The first of the new projects is the rapid-transit system planned for the city. In all probability, the chosen medium will be a version of the Westinghouse "Skybus" system, demonstrated for some years now in an Allegheny County park. In the Triangle this will operate as a subway, but in the outlying districts it will probably be both underground and elevated.

And the second is the famous quintet of "Great Schools" that are planned to house the high school system of the city, and to serve its answer, along with the rapid transit, to the problem of neighborhood isolation and de facto segregation. Nobody knows what a Great School looks like yet, because they are still being designed. But the philosophy behind them, and the very impressionistic models developed by the Pittsburgh firm of Urban Design Associates, which did the preliminary study, suggest that they will mark the total abandonment of the old concept of a high school as a place with hard and fast boundaries and a street address, intended for youths between certain ages. The Great Schools are intended as complexes that will grow into the neighborhoods in which they stand (if stand is the right word), open to the community as a whole for various educational and social purposes, with shops and perhaps housing along their peripheries, and communicating with the ordinary streets of the neighborhood via ramps and pedestrian streets. It is interesting to note that three of the five will probably be on challenging steep sites.

And perhaps one other thing should be mentioned. A Pittsburgh industrial design firm, Peter Muller-Munk Associates, has been hired by the Urban Redevelopment Authority to work on a pilot project, involving the general aesthetic coordination of public and private color schemes, graphics, street furniture, and so on, in the commercial center of the East Liberty neighborhood (which Ralph Adams Cram, who built there once, called "architecturally unfriendly"). If the visual untidiness of East Liberty is redeemed to the satisfaction of the URA

by the Muller-Munk project, the partly mandatory, partly voluntary system will probably be applied to other commercial areas around town.

Problems and Possibilities

When Gateway Center was proposed and initiated, the point of the exercise was not primarily to create something beautiful, but rather to get Pittsburghers and outsiders both to believe in the city, and to be willing to stake something on its future. Officials and others who brought

beautiful enough in themselves. Sympathy having been granted, however, it must still be said that Gateway Center gives the effect of something cold, disunified, and alien, a foreign body that the adjoining tissue of the city has nothing to do with. Aside from the first three units, which were planned together and joined by a system of landscaping, the buildings on the individual parcels have gone up with whatever façade treatments struck the fancy of architect and owner, with no attempt being made to have them



A street corner in East Liberty, as it is now and as it might be if the plans of Peter Muller-Munk Associates are carried out. The present corner is untidy indeed, and probably no East Libertyite would regret a general cleaning-up of the street scene. At the same time, the actual designs of the lump, the kiosk, and the genteel shop fascias belong rather too much to an industrial designer's bright never-never land.



Gateway Center and Mellon Square into being as the first tangible fruits of the Renaissance are tired to the point of exasperation with the criticisms that have been leveled at the architectural qualities of these projects, and with this one can sympathize; the task of the Renaissance promoters was hard enough without their attempting to insist on exacting aesthetic criteria, even assuming that they were not in a mood to regard new buildings, open space, and planting as

harmonize with other Center buildings or to echo the materials of other tall buildings in the Triangle. Such diversity in small buildings is not so bad; but these are huge, flat-faced prisms and slabs, with all the ennui of the business world in their stolid forms. And even as abstract shapes, they seem casually assembled; the narrow, teeming streets of the Triangle stop abruptly at the edge of the Center, and the spaces that suddenly open up to the west are purely

negative, the left-overs of building.

Matters seem presently to be taking a turn for the better, at least on the verbal level. Architects and officials who are influential in shaping the city today discuss ideas and projects with expressions of appreciation for the aesthetic possibilities of the terrain and the historic or associative value of certain buildings and neighborhoods. The slabs that have in recent years begun to squat on the hilltops have made officials thoughtful, and some of the steep slopes, which have been no more than the disused space left over from building, are going to be preserved as a kind of tilted green-belt system and left wild so that masses of vegetation will remain as a foil to the built-up areas. The rapid transit system, in crossing the valleys, will provide its own incidental contribution to the city's aesthetic, in the form of new experiences of space, both for the traveler and for the person in the hilltop neighborhood, who can conceive of himself on a kind of phantom plateau, a short, level ride away from his neighbors across the valley, spatially isolated and yet temporally close.

Of greatest importance, though, to the visual quality of the city in the future are the comprehensive redevelopments going on in the immediate vicinity of the Triangle. In these areas, even when an occasional old public building or church is saved, it will be insufficient to carry the memories and associations of the old neighborhood into the new one, not least of all because the redeveloped neighborhoods will serve different people, and usually in different ways, from those of the old ones. When an area builds from scratch, its history and traditions begin with the new building; its past is dead. There are two ways in which the new developments can avoid the danger, common to their kind, of continuing on the site to look like models or renderings of themselves. One way, often the easiest and often the best, is to imitate some of the visual properties of the surrounding urban matrix, assuming that this is to remain: use the same materials, continue the street pattern, build to the same scale, keep the same spatial qualities. The other way is to make a clean contrast with the surroundings, whether in scale, materials, or layout, and do it so well

that the contrast is noted and accepted. This way puts the architect on his mettle. Because he departs from precedent, his design is conspicuous, and anything slack or insincere in its appearance will make it an eyesore. The mistakes that can be made are big ones.

How the developments now on paper will actually look is anybody's guess. Not only are some of the published plans contested to the last, but some of those planned primarily to bring in revenue for private developers are being evolved cautiously as systems out of which apartment, office, or other buildings can grow in an orderly fashion, if and as the demand arises.

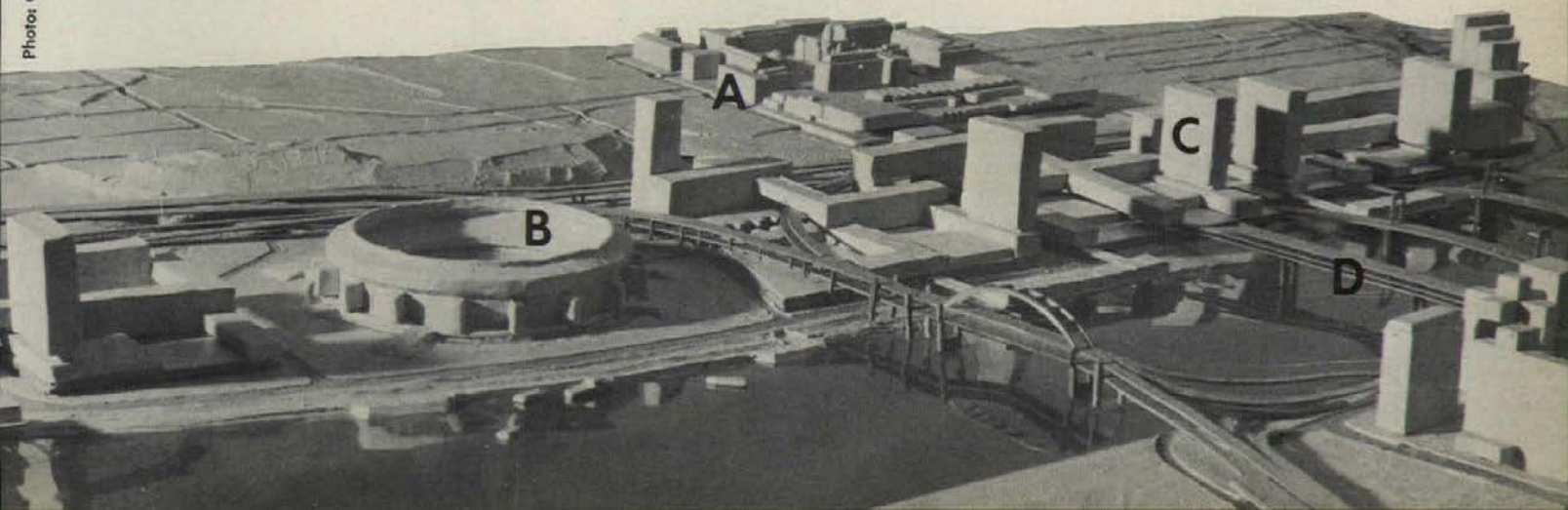
Keeping Things

The description of the existing urban matrix at the beginning of this article implied that there was not much architecture of distinction in Pittsburgh, and that little the result of special effort rather than of a widespread taste for good building. This is true, but there are nonetheless buildings and streets, both "landmarks" and anonymous structures, that say something about the city's past, and whose continued existence can be justified or at least rationalized. At present, this existence is usually precarious, not only because such objects stand in the way of developments but because they are often so shabby looking. The URA, although the development of land parcels is its business, is not bulldozer-happy, and has a conscience about landmarks that is can be persuaded will justify themselves in the future. Still, it has the pragmatic concern of working with developers, and cannot save everything on its own initiative. The situation in Allegheny Center, where the developer was a private company, is an instance of the luck of the preservation game. Existing on the site were four "landmark" buildings: the Buhl Planetarium, a building of 1939, in excellent condition and much used; the original Carnegie Library, Richardsonian and towered; the North Side Post Office, in 1890-period Renaissance; and the Market Hall of the 1860's. There was no question of destroying the Planetarium, an obvious cultural asset to the city, and the Library, although dubious in the role of a modern information-retrieval machine, was also

preserved. The Post Office, theoretically, no longer exists; the government wants it no longer, the URA is not convinced of its value, and the developers want to build on the site. All the plans call for it to go. Nevertheless, an effort is being made by preservationists to keep it. They say that Pittsburgh has here the opportunity to establish the historical museum that it presently lacks. The city has at present no way of putting its past on display, and the location of the Post Office, next to the Planetarium and not far from a public aviary, would make such a museum a good way station on Sunday outings with the children. As to the Market Hall, it is already gone. It was a handsome structure, and the oldest of the four, but most of its stalls were empty at the last, and nobody succeeded in convincing the URA that it could pay its way or that it was vitally important in and of itself.

The organization principally concerned with the preservation of local buildings is the Pittsburgh History and Landmarks Foundation. This organization, whose board of directors includes a number of distinguished Pittsburghers, is run from the offices of Van Trump, Ziegler & Shane, a publishing and public relations firm that also publishes *Charette*, the local architectural magazine. Under the authorship of James Van Trump, an architectural historian, the Foundation has been publishing an historical series called *The Stones of Pittsburgh*, which has had the valuable function of calling attention to individual architectural monuments of the city, and thereby getting people to realize that they are of interest. It has just come out with its most ambitious work, *Landmark Architecture of Allegheny County Pennsylvania*, a sizeable book in which "preservation districts" are named, monuments of architecture and engineering described and illustrated, and

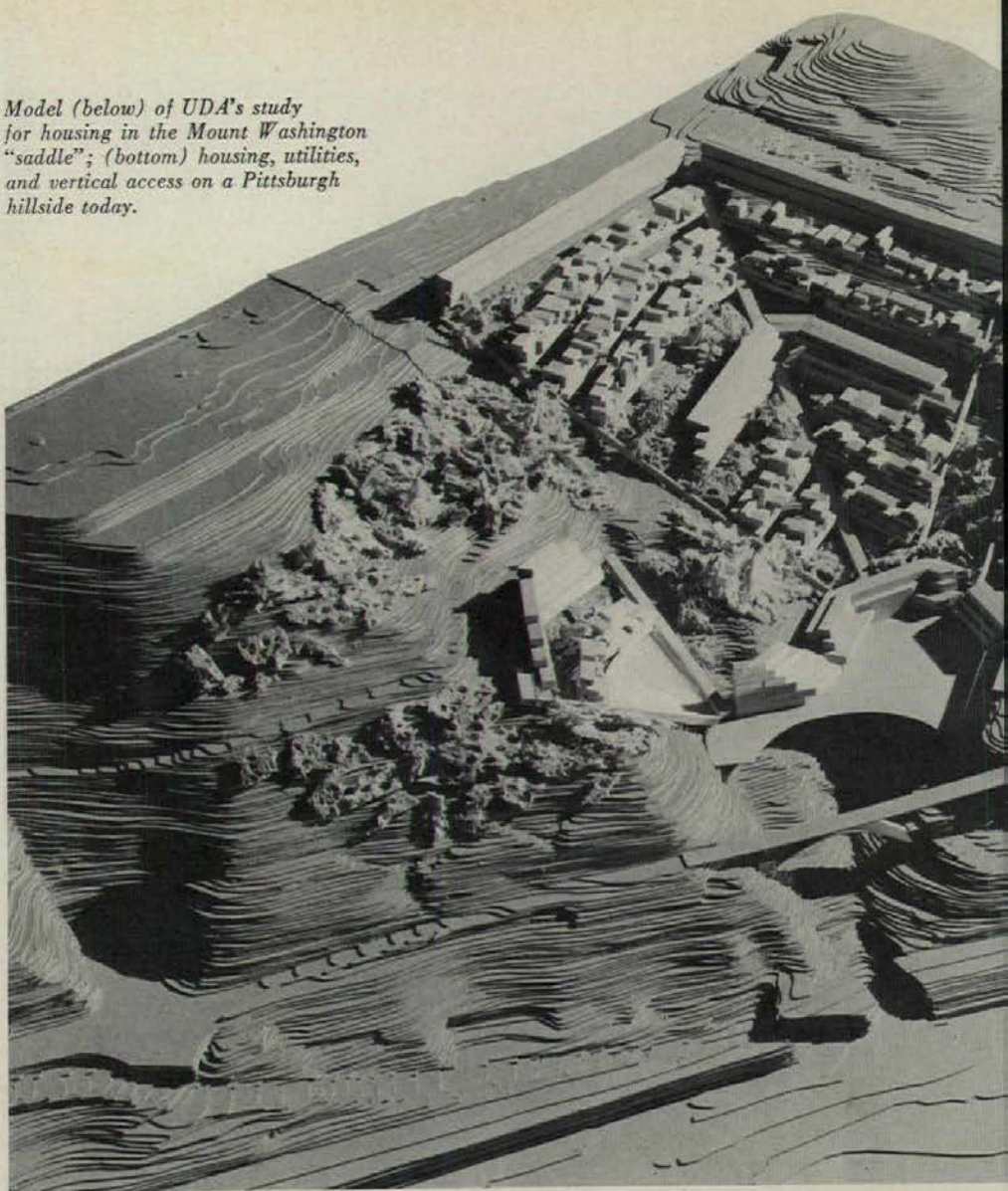
Model of the north shore of the Allegheny River, opposite the Triangle, showing Allegheny Center (A), now under construction, the new stadium (B), designed but not yet begun, and a volumetric study (C) for possible development of the shore, with a two-level bridge (D), proposed as pedestrian, processional, and rapid-transit route. In the foreground, right, are the Point and Gateway Center.



their present condition and value assessed. The Foundation does more than publish. It has been over in the South Side, a steel-workers' neighborhood next to Jones & Laughlin, urging inhabitants to treat their Victorian houses with respect and to rehabilitate their neighborhood. In Manchester, it has seeded preservation efforts in two streets, rather literally, by getting the inhabitants to plant flowers, which has led them to take pride in their homes, which has led in turn to increased confidence in the inhabitants on the part of the landlords, which has resulted finally in some much needed fixing-up of houses. The Foundation has hopes of doing the same elsewhere. The effort to save the North Side Post Office is being led by the Foundation. Finally, it is campaigning actively to save an area of the North Side, between Allegheny Center and the hills to the north, known as the Mexican War Streets because of the street names: Taylor, Buena Vista, Resaca, and so on. This tract of streets is a good illustration of a "preservation district" in Pittsburgh terms. Most of the buildings in the area are quite undistinguished, even though there are some interesting façade treatments and some good carved ornament. At the same time, the area is quiet and pleasantly small scale, most of the houses are in good condition, out-of-place features are few in number, and, most importantly, the whole section epitomizes 50 years of house building in Pittsburgh. To save any one house would probably be pointless, but to save the whole tract would give the city something like the historic neighborhoods of Boston, Philadelphia, or Charleston—with none of the Georgian graces, but with some of the same pleasure-giving quality as a well-preserved old city area, still in use.

Another Pittsburgh group is attempting, among other things, to take two condemned bridges under its protection. These are the Point and the Manchester Bridges, the ones that diverge at the Point itself to cross the Monongahela and the Allegheny. Until they are gone, the designs for Point State Park, already executed in part, cannot be finished. Two new bridges, the Fort Pitt and the Fort Duquesne, have been built to handle cross-river traffic. The Point Bridge, the handsomer of the two older structures, has been closed for several years, and in a few years both will be redundant as traffic carriers. The group that is attempting to save them, in the face of almost certain defeat, is Group STL, a small but active organization of Pittsburgh architects, artists and industrial designers. (STL is pronounced Steel, and stands for Stop, Think, Learn, if it must stand for something at all.) The Group's concern is with the cultural development of the city in general, not primarily with preservation, but it wants to retain some features from the past, as an aspect of the new Pittsburgh, that the local "Es-

Model (below) of UDA's study for housing in the Mount Washington "saddle"; (bottom) housing, utilities, and vertical access on a Pittsburgh hillside today.



tablishment" would like to see demolished. Recently, STL published a manifesto in which they called, in effect, for abandonment of the part of the Park plans as yet unexecuted in favor of a new design, to be determined by an international competition. They foresee that the old bridges might become pedestrian walks, and suggest "restaurants, shops, public meeting places, theatres, night

spots, art galleries, studios, offices, even living quarters, on and adjacent to the bridges." (This "Ponte Vecchio" idea is not unique with STL. It has been suggested a couple of other times, most notably by Deeter, Ritchey & Sippel, the Pittsburgh architectural firm that designed the stadium for the Allegheny shore and that is studying the shore's further development. They propose a new bridge,



Photo: Barbara Runnette

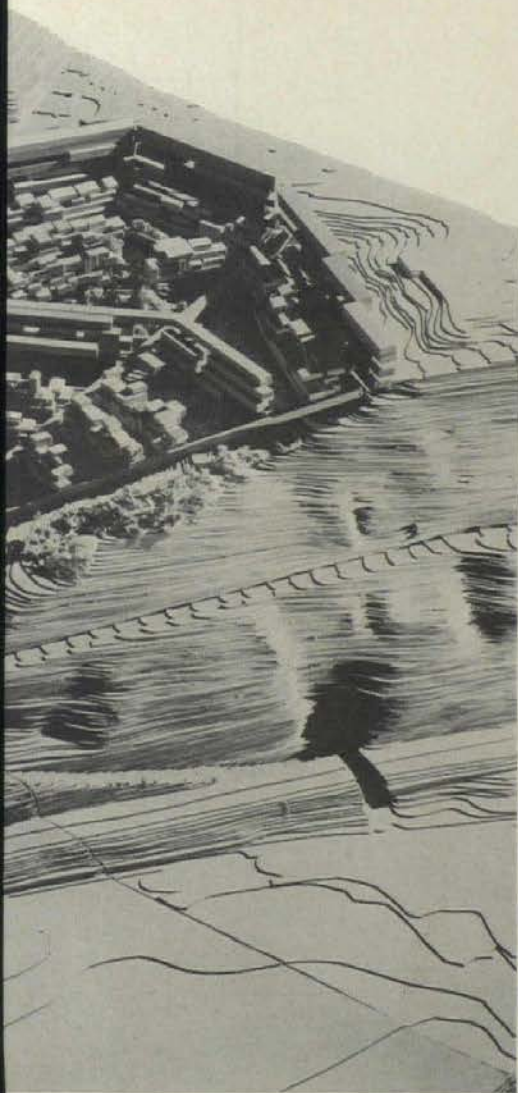


Photo: Courtesy, Urban Design Associates

building anew is sooner or later going to be desirable everywhere. The routine slabs that have gone up on some hilly sites already are not visual assets to the city, although their siting in some cases was certainly determined with the view in mind. One new apartment building on Mount Washington is definitely a piece of grandstand architecture, taking from the scenery and giving nothing back, a small counterpart of the London and Athens Hiltons.

That local housing might come to do better is suggested by two general studies done by Urban Design Associates, a firm of architects and urban planners in Pittsburgh. One, a very general study done in connection with UDA's preliminary work on the Great High Schools, shows a cluster of apartment high-rises at the foot of a hill. With slabs or towers set in this position, at the foot of rather than on top of a hill, there is a chance to contrast hillsides and apartment buildings in an interesting and harmonious way. Moreover, this particular kind of setting has an advantage for high-rise apartments, as it becomes possible to use bridges for direct access to the hillsides.

A more detailed housing study by UDA was done for ACTION-Housing, a private nonprofit civic organization concerned with housing in Allegheny County. On Mount Washington, on axis with Grant Street, a major north-south street at the eastern edge of the Triangle, there is a "saddle"—a natural amphitheatre that commands magnificent views east, north, and west. Thus far, not much building has been done on this site, despite the view, for two reasons. In the first place, Pittsburgh has generally been tempted to use up its flatter building land, rather than attempting to build on the slopes, insofar as the flatter land was readily accessible. In the second place, Mount Washington once had the more humble name of Coal Hill, and not in vain. The interior of the bluff is honeycombed with worked-out coal seams that make the bearing inadequate in many places even for a frame house. Now, however, the flat land is just about used up in the areas with reasonable access to the Triangle, and the view from the Mount Washington saddle is not to be denied. These considerations tempted ACTION to have a study made to see how the saddle could be covered with housing of a density that would satisfy the city, which has been accustomed to seeing money spent lavishly on facilities in steep-slope areas with not much return in the way of revenue. UDA's particular solution for this site is affected by the need to use the widely separated layers of good bearing soil to the utmost, but the general principle of the plan and construction has application to many other steep-slope residential developments. Essentially, the UDA plan proposed a series of uphill members, includ-

ing two "spines" for utilities and non-automobile transit, that would radiate from two closely set points. The uphill members would support a series of horizontal Vierendeel girders, following the site contours approximately: these would support a double layer of duplex housing units, of light metallic construction, which would straddle them. The spines, which would contain funicular elevators, utilities, and a central vacuum system, would feed to and tap off from walkways, utility lines and vacuum ducts in the Vierendeels. The whole housing complex would thus function as a kind of machine, or more aptly still, as a kind of tree, with the Vierendeels as branches and the duplex housing units as twigs. In many places, the units would ride free of the ground, which would there be given over to parking, roads, and walks. On the areas of good bearing soil would go apartment houses of moderate height, and the top of the slope would carry town houses and a commercial center. But the duplex units are the significant thing about the design. Lightly built, planned for a versatile modular construction, sharing a common substructure, they offer a promise of replacing the little gray houses, which were not built for the centuries, in a way that would retain what local architect Paul Schweikher calls the "scale and grain" of the city. This project for ACTION was never fully worked out; it was always more of an elaborate feasibility report than a detailed plan. Still, it suggests a creative method of exploiting a difficult site without killing it outright.

Conclusion

The character of a city does not take well to the freezing process. If the Pittsburgh of the past had a gloomy grandeur, a virility and vitality that captured the imagination of some of its citizens in spite—or because—of the smoke and disorder, there still can now be no cult of Joe Magerac that can effectively resist change. The city is going to be more white-collar, more intellectual, more sophisticated than it once was, just as the processes of industry are becoming tidier, less obtrusive, than they once were. Pittsburgh, as ever, has its commercial way to make in the world, and its visual character must change as the means of its citizens' livelihood and their concepts of the good life change. But the quality of the change is important and can vary. A bright new image is not enough. A new building is not *ipso facto* a good one. The hills, river, and ravines are still there, offering pleasure, demanding respect. If they are respected, and if the newly built Pittsburgh develops a style suited in materials and scale and detailing to the character, visual and otherwise, of the place—with a respectful look, perhaps, to its architectural past—then the city will be a remarkable place indeed. —WCK

possibly lined with shops, that would provide a pedestrian access to the stadium and form one section of a route of march for parades through the city.) The park itself would be used intensively, and form a setting for open-air social activities of all sorts, not the least of which might be an international sculpture exposition, to be held every three years as a counterpart to the international exposition of painting at the Carnegie Institute. The state's architect and landscape architect for the job, both Pittsburghers, are understandably indignant about the proposal to scrap plans adopted years ago and well on the way to execution, and the state has said that there will be no competition.

Maintaining the Scale

The saving of an old neighborhood or an old bridge is an exceptional matter, however, in the greater matter of saving a city's visual character. The real question bearing on the way in which the city will or will not keep something of its present character is that of what happens when the existing houses, and neighborhood centers are demolished. Rehabilitation can go only so far, and

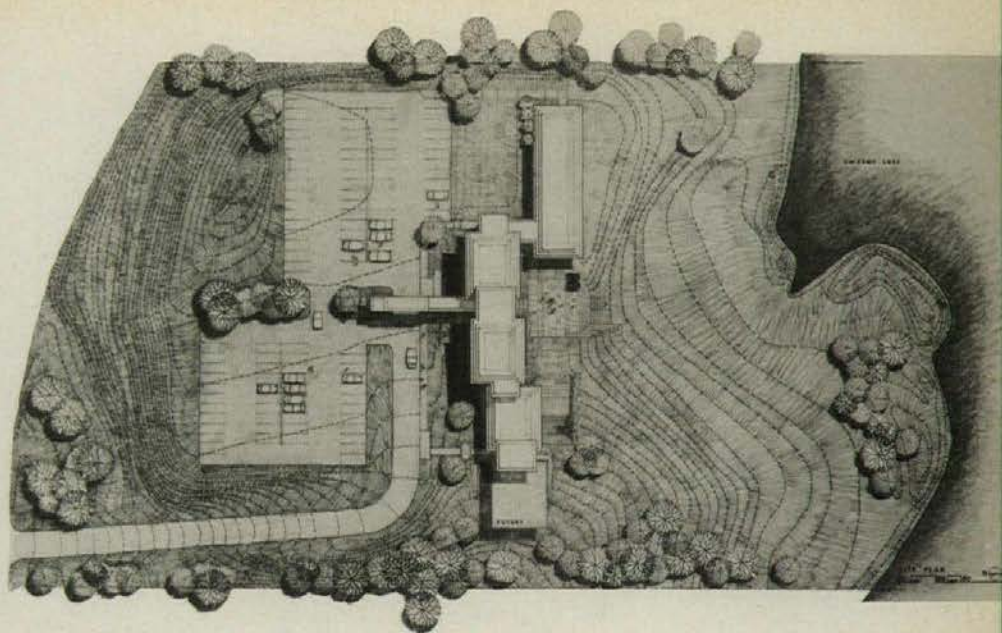


PATIENTS COME FIRST



Residential character of Minneapolis Clinic of Psychiatry and Neurology is part of patient therapy. Generous use of natural materials, noninstitutional scale, and handsome lakeside site all contribute to an environment that is designed to put patients at their ease.





AT PSYCHIATRIC CLINIC



MINNEAPOLIS CLINIC OF PSYCHIATRY AND NEUROLOGY, Minneapolis, Minn. **Architect:** Hammel Green & Abrahamson. **Site:** Lakeside site (sloping from road to lake) in a suburban area. **Program:** To create a comfortable environment with lake-oriented views; offices for 12 psychiatrists, 9 neurologists, and ancillary facilities. **Structural System:** Wood and steel frame. **Mechanical System:** Individual package units. **Major Materials:** Redwood siding and window frames, copper-faced fascias, and granite boulders on compacted berms to sill height. Interiors are sheetrock and a variety of hardwood plywood paneling; slate floor at main entry and carpeting; redwood soffit carried inside from overhang. **Cost:** \$445,720, or \$25 per sq ft. **Photography:** Warren Reynolds.

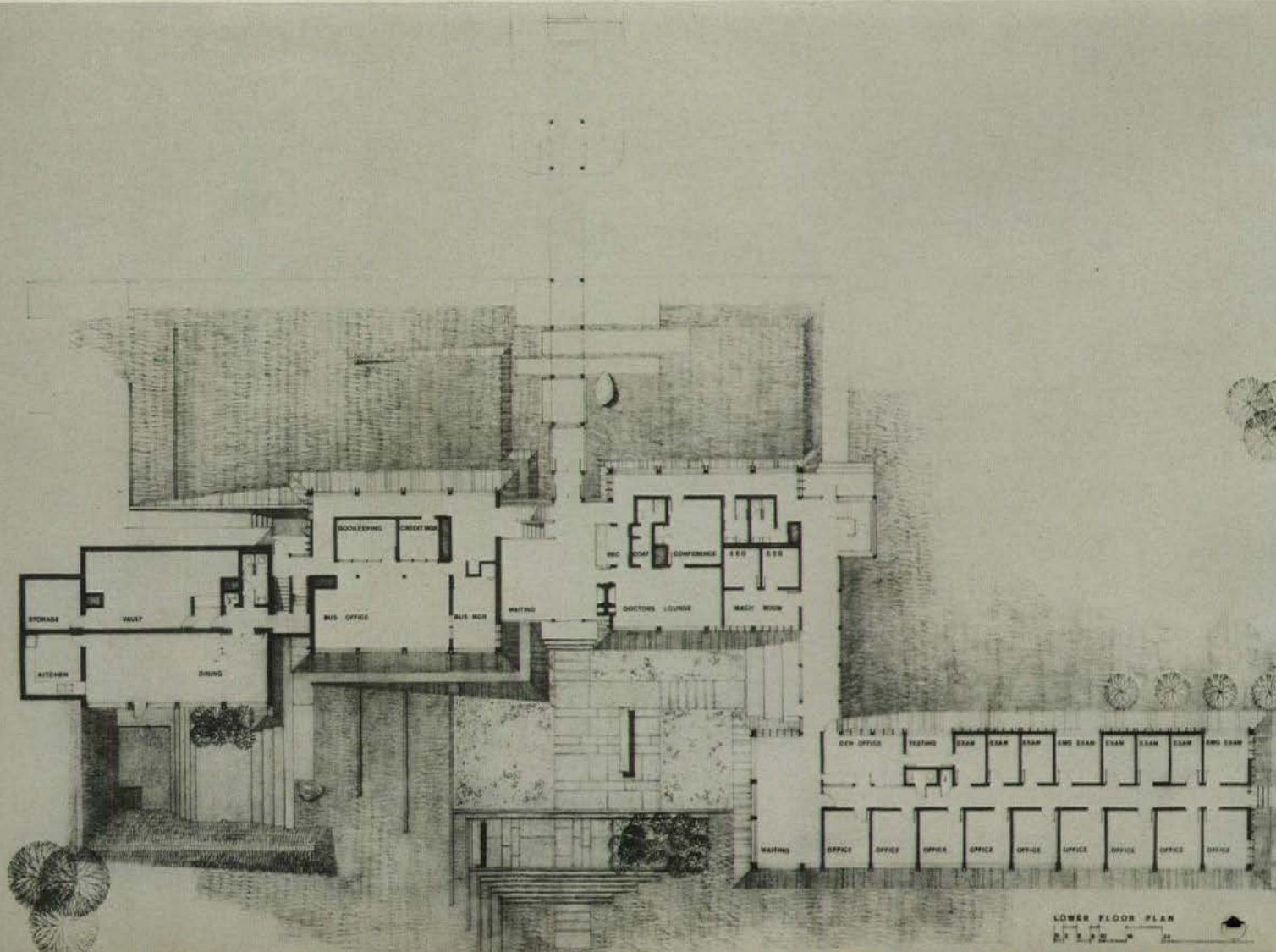
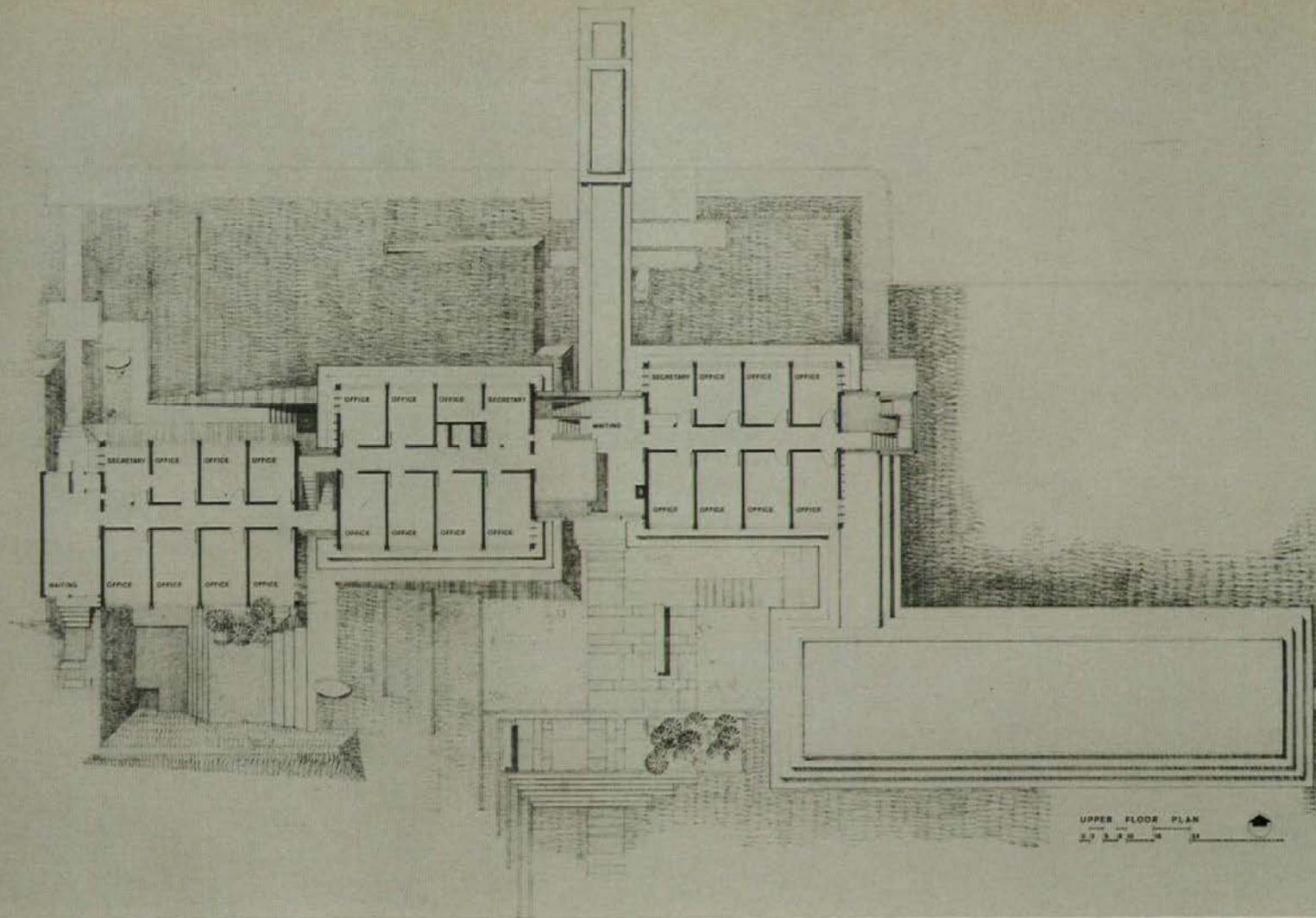
In designing their first psychiatric clinic, Hammel Green & Abrahamson found

themselves involved with a client group whose world of double meanings presented a totally new experience in the planning process. The psychiatrists' penchant for translating architectural language into their own idiom gave client-architect meetings a peculiar air of ambiguity and prompted Bruce Abrahamson to report that it was indeed an "unusual architect-client relationship."

However, a line of communications was apparently devised, since the plans were approved and the building built.

Five psychiatrists and three neurologists on the building committee (the clinic is private and includes a neurology wing) approached the architect with very definite aesthetic and space requirements. The building was to be warm, inviting, and residential in character—primarily for the welfare of patients, but







COPPER ROOF EDGE AND FASCIA

ROOF: WOOD FRAME CONSTRUCTION

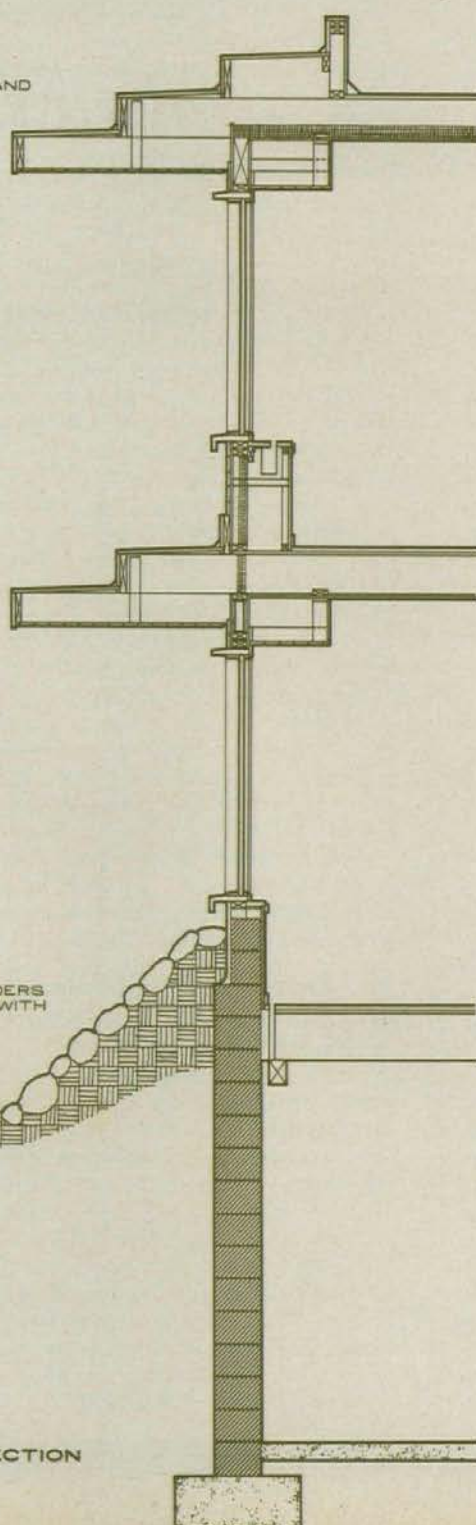
FIXED GLASS IN REDWOOD FRAME

MECHANICAL UNIT

FLOOR: WOOD FRAME CONSTRUCTION

BERM: GRANITE BOULDERS ON COMPACTED SOIL, WITH CLAY JOINTS

TYPICAL WALL SECTION



also because local zoning restrictions limited structures to one-and-a-half stories. This height restriction was met by berming up to the window sills.

The site, in a middle to high-middle income suburb of Minneapolis, fronts on a small lake, which is also shared by a public park, golf course, and large hospital used by the clinic staff.

Although of generous size (approximately 400' x 800'), the site was strictly limited by easements and setbacks that played a large part in determining the stretched-out plan of the building. The most limiting of these was a 300 ft setback from the road, a concession that was necessary to get approval of the clinic in a residential neighborhood. Part of this space has been used for a parking area.

Space requirements for the two groups of physicians differed, both for their own offices and their ancillary facilities. Twelve psychiatric offices fitted neatly into a modular pattern of "pods" separated by waiting rooms and/or stairwells. Each pod has four doctors' offices, a waiting room, a secretarial office, and office space for social workers and psychologists whose work supplements psychiatric treatment. The arrangement fulfills program requirements calling for small waiting rooms and two means of exit from each office group. Another way of leaving the building was felt desirable for psychiatric patients who might not want to re-enter the waiting rooms.

The location of the neurological wing, at first glance, seems to be located at an awkward distance from other clinic facilities. However, the design is accounted for by several factors. Neurologists needed to be grouped together for frequent cross-consultation and to share examining rooms, and their nine offices did not fit into the four-office "pod" module. They also required ground-floor space, since neurological patients are not always ambulatory.

Business offices, the general waiting room, doctors' lounge, a lunch room, and kitchen, and other facilities are fitted under psychiatric offices on the first level.

The building that grew out of the program consists of a long series of inter-related, but semi-independent forms that hug the ground and are kept in the horizontal plane by berms and deep overhangs at second-floor and roof levels. The staggered series of units is laid out in subtle variations of level and joined by transparent stairwells. Stairs become a part of the exterior geometry as silhouettes seen through open wells glazed front and back. Generous use of natural materials contributes greatly to the warm character that the architect set out to achieve.

Recently honored by a Minnesota Society of Architects' 1967 Honor Award, the clinic's "human quality" was commended by a jury, which also noted a "great concern for the satisfaction of the patient as well as the client."

INTERPERSONAL ASPECTS OF THE ARCHITECT-CLIENT RELATIONSHIP

By F. I. Steele, Assistant Professor, Department of Administrative Sciences, Yale University.

Many architects tend to deal with their clients more on the basis of what they would wish them to be than what they actually are. Indeed, it often seems that architects attempt to eliminate as much as possible the interpersonal aspects of their occupation, rather than acknowledging them and attempting to deal with them.

This is in many ways similar to the stance of the business world for a good many years in this country, where decisions about increasing worker motivation or productivity were frequently based on management's wishes as to how people behaved rather than on reality.

In the past 20 years or so, however, an entirely new field has emerged that might be called "organization theory," which suggests that our views of human beings are becoming much more complex, as are our views of interpersonal processes.

As this field has grown, we have gained increasing knowledge of the nature of interpersonal relationships: how they can be described and understood; the qualities that individuals bring to relationships; how individual and collective goals are affected; how such relationships can be changed.

This increased knowledge has brought with it new responsibilities. People who work or live together are now less justified in saying, "The process between us is ineffective and unsatisfying, but there is nothing we can do about it." There are things that can be done—thanks to a new attitude toward interpersonal relationships, which sees the interpersonal process as a fact of life that is nevertheless variable, capable of being influenced, and dependent on our ability to face up to problems and difficulties in process.

Architect and Client

Our purpose here is to explore some of the ways in which these more complex views of human nature may be applied in the field of architecture. The basic orientation to be used here is that the architect-client relationship may be viewed as a helping relationship, not just as a seller-to-customer or artist-to-patron relationship. Each of the last two capture only a part of the process between architect and client. The *service* and *creative* aspects are there, of course, but the *collaborative* part of it is just as important.

To achieve the specific problem-solving or output, which is the goal of the relationship, each person has to provide some

vital pieces of information and lend support to the other. Accordingly, some complex and interlocking role relationships will result and will be maintained during the life of the project.

The Three Role Relationships

First, there is the traditional role relationship in which the architect acts as consultant and provider of service, and his client is the receiver or the one who is being helped in some way. A second role relationship is needed so that the first may succeed: The client serves as consultant to the architect to provide the latter with essential information about the client—his needs, values, experiences, plans, self-image, and so on—so that the architect has these available in thinking about the program. In a real sense, then, the architect at this point is helpee, the client is the helper. This leads to a third role, where the architect serves as consultant or educator to the client on how the latter can be a helper to the architect. Unless the architect succeeds in teaching the client to be his consultant, a vital source of information will have been lost in the relationship. Part of this teaching must involve making the client aware of new spatial dimensions of psychological and physiological experience he may be unaware of, but that may greatly influence his life in the structure being designed.

These are three roles, then, that can be played simultaneously by the architect during his work on a single project.

The Areas of Crisis

A major crisis often occurs when the architect should be taking the role of *helpee* to the client, who is in the role of helper or consultant. It seems tempting to the architect to put down the client and reject him as having no creativity or sophistication in the area of design, and therefore no useful ideas to contribute. This may partially be due, we suspect, to the architect's dislike of being in a dependent position, of having to receive help. This is an example of the pitfall of assuming that you know what is good for the client, that he will go along with it if he has any sense, and that if he does not it is a sign of ignorance or intransigence. If this sort of thinking is communicated to the client, it may make him generally careful about what he says in order not to appear foolish or naive in the architect's eyes. This would then result in his hiding many of his most important feelings and wishes about the project and the process in which he is engaged.

In terms of these role relationships, what should the architect be doing? One implication seems to be that both parties to the relationship should strive to be as aware as possible of what the relationship is like at a given time, and whether they want it to remain that way or change it. A second implication is that each party has to serve as both helper and helpee, which represent very difficult roles that can get bogged down at many different points.

With these difficulties in mind, we can now discuss a number of specific points, questions, or guidelines that seem to me to be emerging from our work in the fields of organizational, group, and interpersonal behavior.

Key Aspects of the Relationship

In an interpersonal relationship, each person has an individual set of needs, values, and feelings that influence his perceptions, reactions, and behavior. These values and needs will differ widely among various individuals, and may make mutual understanding difficult. At frustrating points in the interpersonal process, it may be useful for each person to ask himself whether the other—who seems at that moment quite unreasonable and distorted in his perceptions—is really just missing the boat, or if he is in fact starting with a different set of assumptions and needs in this particular case. If people could articulate their own values and needs, and understand those of the other person, then many of the apparent misconceptions could be turned into valuable differing perceptions that could be used to arrive at a synthesis of a given problem.

In essence, the relationship described here is a creative re-

lationship, or can be one. Therefore, difficulties such as blocking of alternatives, narrowing of standards and norms, overevaluation or too early evaluation (both of ideas and people) are all hazards in the process. Creative problem-solving requires genuine collaboration. This obviously requires that people be able to propose new ways of thinking about a problem that may, on the surface, seem quite ridiculous. It is therefore important that they not be ridiculed for making such proposals. Another pitfall is that relationships attempting to be creative often have ways of defining what a "creative" person ought to be, which may be as confining or restraining as would some traditional needs to be conventional.

One of the most important needs of the architect-client relationship, in terms of the persons involved having some influence over how the relationship develops, is that they be able to look at the process as it evolves. They must, that it is, assume a stance of very observant participation. This requires a willingness to take risks—in the sense of being willing to talk about difficulties as they occur, not afterwards. Another aspect of this process is being willing to think about how the relationship changes over time: One may not be able to do some things at the beginning of the relationship, for example, that can be done quite easily at the middle or the end, after trust, interdependence, familiarity, and so on, have been built up.

From the standpoint of the helping aspect of the relationship, several questions arise: "If I am a helper, does the helpee really want help? If not, I must ask myself what I am doing, since I continue to give help anyway. Whose needs am I really satisfying, and how much am I actually helping him? If I am in the role of helpee, how am I responding to being in this position? How do I feel about receiving something from someone else? Am I listening and trying to understand, or do I tend to reject it and get angry? If the latter is the case, is the reason that I am actually not being provided any help, or because I do not like to be in a position of receiving help. If he is not being very helpful to me, why don't I let him know as much, so that he can change his behavior to a possibly more helpful stance?"

These questions indicate how complex a given "helping" situation may be. It is often quite difficult, especially in our society, to acknowledge a need for help. This is especially true for architects, whose training always seems to push in the direction of thinking for one's self, a self-image of individuality, even though many architectural schools, while expounding these values, seem to produce a strong push to conformity.

The Problem of Defensiveness

People have a tendency to feel threatened if some aspect of themselves, or some opinion of theirs, is called into question—a feeling that often leads to defensiveness and closing-off on the part of the person involved. When such defensiveness occurs, the person tends to deny the validity of whatever the threat might be; the person who posed the original threat then becomes defensive in turn and begins to argue and "tell" the other person what the right answers are. This leads to increased defensiveness on the part of both parties, as well as increased argumentativeness. This is a very common process, and one in which almost all the parties to a relationship get drawn into at one time or another.

It is therefore quite important that such defensiveness—whether one's own or that of the other person—be watched for through the self-consciousness of looking at process described earlier. For it is all too easy to be quite sharp in recognizing defensiveness in others, yet be blind to it in ourselves.

What Is Power?

What about power in the relationship? What kinds of power are there, and who has them? In the field of interpersonal relations, much work has been done in identifying and exploring different types of power, as contrasted with the usual assumption of a single, over-all type power. The architect often has a kind of "expert" power through his knowledge of a given field, which can be quite influential in how the client thinks about

a certain problem and to what extent he accepts the architect's point of view.

The client, on the other hand, usually has a basic economic power, in terms of his ability to reward the architect by continuing the relationship and paying the fee, or by punishing him by terminating the relationship. In addition, each of them may have a kind of power of "identification," depending more on their personal qualities, so that either may be able to influence the other simply by being the kind of person the other would like to be. An important question to keep in mind is, "When am I using power inappropriately to resolve an issue that should really be arrived at through problem-solving?" This entire problem of power tends to be embarrassing and difficult to talk about, but it deserves a major focus of attention.

Establishing Trust

Two additional factors that contribute importantly to a creative architect-client relationship are the degree of trust they have in one another and the extent to which they try to communicate with one another.

In many relationships, the degree to which people have mutual trust (the feeling that one party will not do things to injure the other because of his own vested interests) is usually either taken for granted or ignored. As with power, there are several different dimensions of trust that may be present or absent in a relationship: trust in one another's confidence or ability; trust in each other's integrity, reliability, and willingness to be open; trust that the other person will not be judgemental or subject one to ridicule when one takes a risk and makes oneself vulnerable. One very important point to remember is that many of these kinds of trust cannot, by definition, exist at the beginning of a relationship; they must be built up in the course of the relationship.

Facilitating Communication

The second factor involves the free flow of communication—the exchange of information, whether it be ideas or feelings—between architect and client. Again it is of central importance that both parties continue to work through their frustrations and interpersonal difficulties, rather than wishing they did not exist. This is a central means issue, because often when it is most important for architect and client to continue to be in contact are just those times when each feels he would most like to get out of the contact process. At such times, it can be most useful to share with each other these feelings of not wanting to share information.

A great deal of time and energy needs to be invested in the relational aspect of the architect-client process, partly because a certain amount of common energy is necessary to maintain such a relationship in any case, and partly because such energy tends to be unproductively used, as in expressions of hostility, shows of frustration, long arguments over minor points, and so on. It is a fact of life that when people have to collaborate to attain a common goal they must come to terms with each other, and find some arrangement that will allow them to work together or divide up operations and work separately.

Since interpersonal relationships are an inevitable facet of the design process, it is no longer legitimate for this side of the process to be ignored on the supposed argument that there are no ways of dealing with it. Schools of architecture might consider exposing their students to some knowledge of the behavioral sciences. As for practicing architects, in order that they might take a step toward greater awareness of the interpersonal process, they might avail themselves of such short programs as those presented by the National Training Laboratories, NEA, of Washington, D.C.

No matter how such training is obtained, the important points here are that human behavior—especially one human being interacting with another—is a complex phenomenon, and that it requires conscious planning and considerable effort on our parts to become more aware of this process and deal with it productively.

ACTIVE BUILDING ON ACTIVE CORNER



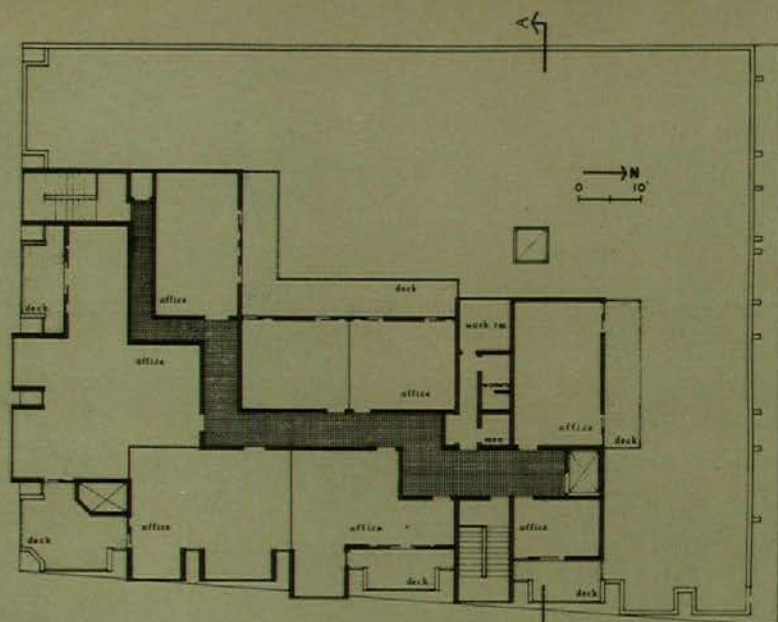


MILVIA CENTER BUILDING, 2118 Milvia St., Berkeley, Calif. **Architects:** L.L. Freels & Associates; Takuo Kanno, Project Associate. **Site:** Downtown Berkeley, near the civic center and one block away from a projected Bay Area Rapid Transit station. **Program:** Provide approximately 25,000 sq ft of office space, not to exceed three floors; major spaces to accommodate insurance agencies or similar tenants; third floor to accommodate small area tenants. **Structural System:** Exterior concrete block bearing walls with interior steel girders and columns; wood joists with plywood and lightweight concrete. **Mechanical System:** Package roof-mounted heaters and air conditioners with 18 zones. **Major Materials:** Concrete block painted with thick granular waterproofing paint; solar gray glass; tile floors in public areas; plywood finishing; wire glass; plaster. **Cost:** About \$16/sq ft. **Consultants:** Jon J. Read, Landscape Architect. Alan McKay, Structural. Richard Friedman, Mechanical. Herb

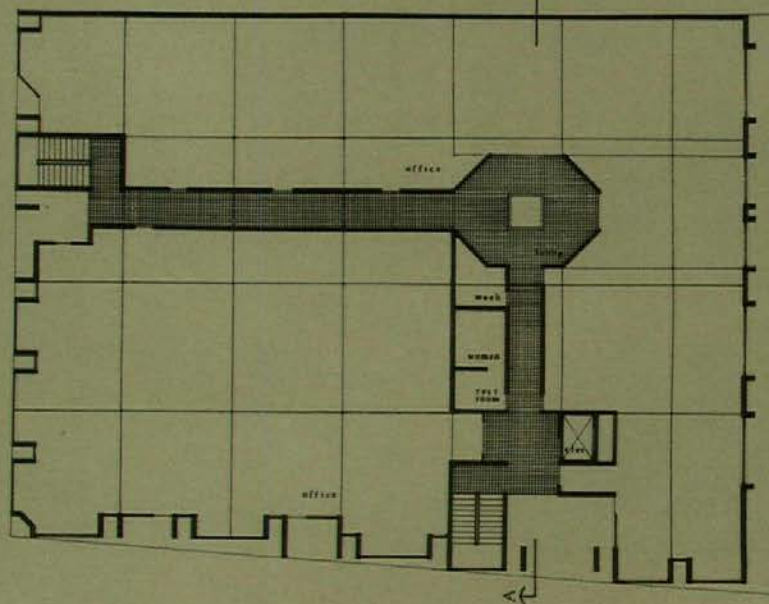
Bowen, Electrical. Kirkham, Chaon & Kirkham, General Contractor. **Photography:** C. Ray Moore.

To get a building to live in its present environment; to foresee a future, better, one; and to exist in the dimensions of time and movement on a busy downtown intersection all on about \$16/sq ft, is no small accomplishment, especially for so small a building as the Milvia Center Building, a three-story rental structure in the polyglot center of Berkeley. Sited across from a service station ("Win instant cash. Play Tigerino. Win up to \$1000") on one side and the City Hall park on the other, with a constant swirl of delivery trucks, business and civic vehicles, and university students' motorcycles going around it (there is the ubiquitous parking lot on its north side), the building either had to give in and become just another speculative commercial envelope, or get

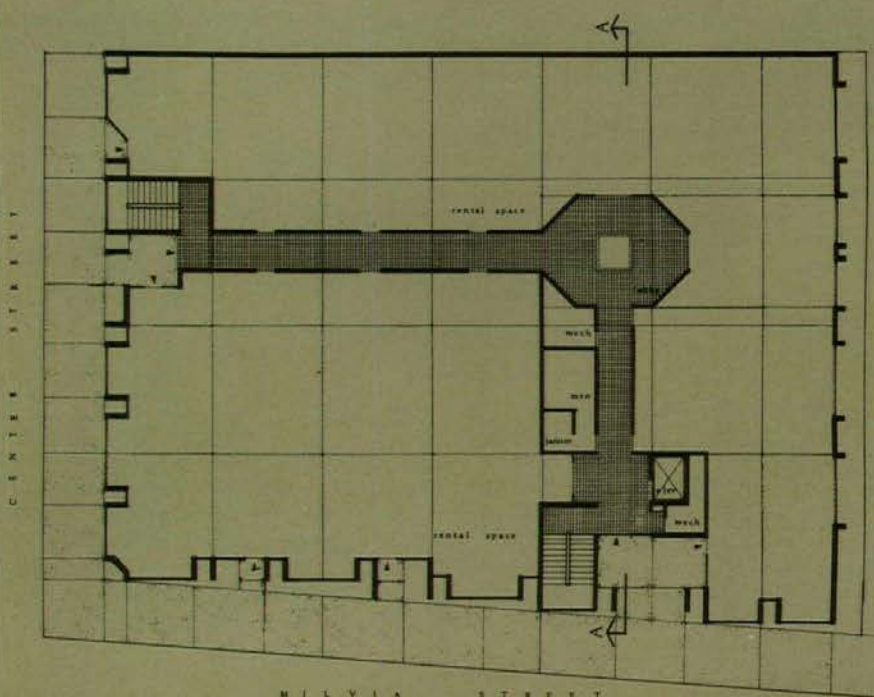




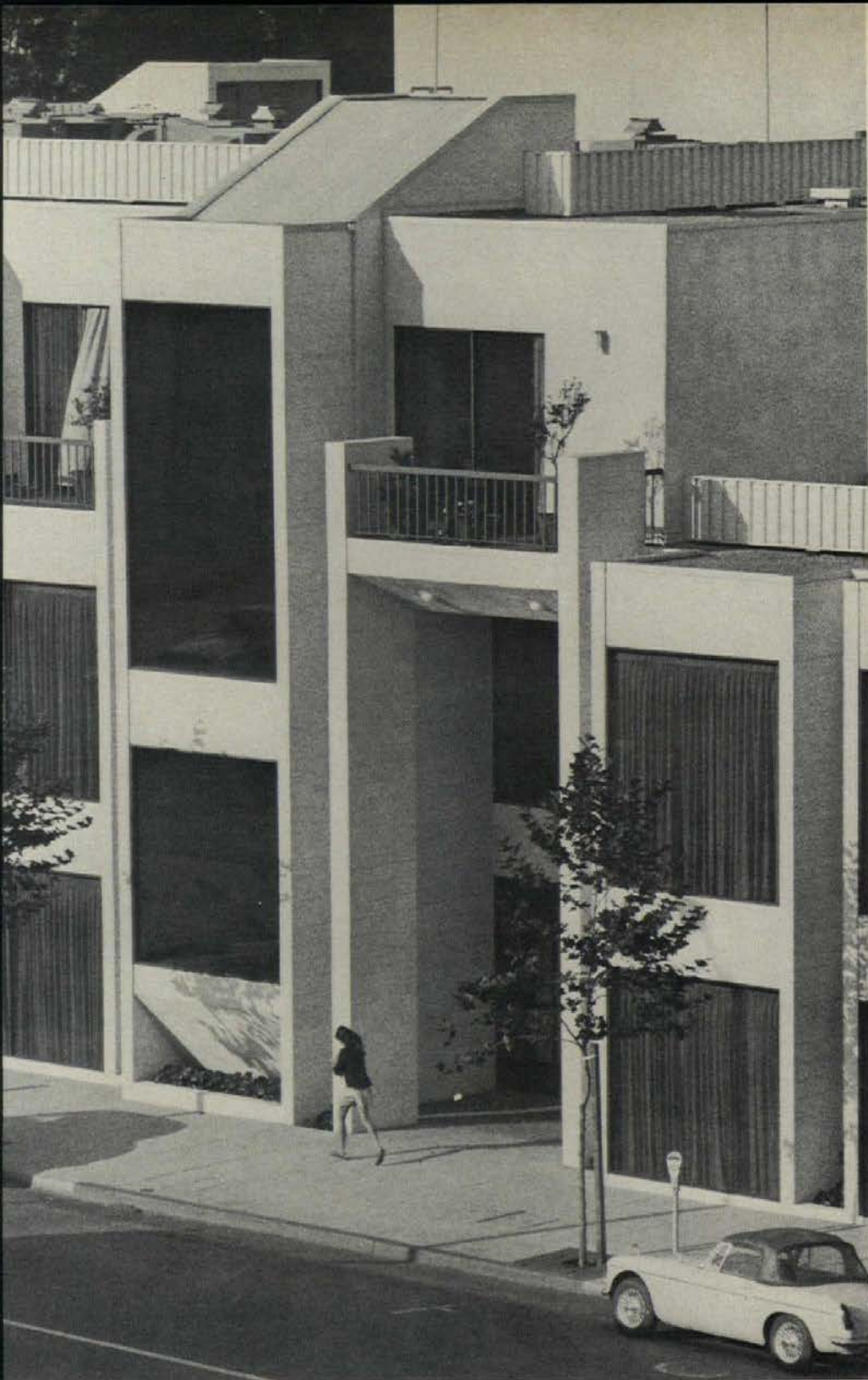
Penthouse



Second Floor



First Floor

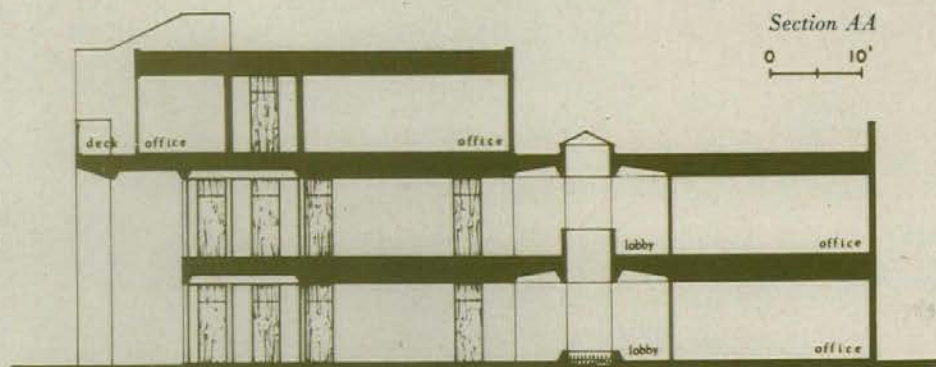


itself into the action and *be* something on its corner. The architects decidedly chose the latter role for it.

The building is entered from either Center Street (the park side), or Milvia Street (the Esso side), and consequently can present a strongly stated form to the corner. Circulation is simple; Hallways make an L, to connect at a central lobby on the first two floors, and thread between the smaller offices on the third floor. Two stairwells are expressed as bold, glazed verticals on the exterior, while the elevator and vertical mechanical facilities are buried in the plan. Offices push themselves out of what might have been an ordinary curtain-walled façade to become separate, articulated elements in the moving street scene. Some of these are chopped off on the third floor to form terraces for the offices there (giving a bit of green to echo the park and sidewalk trees). Light and dark strips and voids contrast with each other, as do cut-out and filled-up spaces. The result is a building that seems imbued with Berkeley impetus and motion even as seen in the frozen act of being photographed. It is a building that can be gotten close to, also: the recesses, balconies, and sudden little surprises like a diagonal seemingly supporting the stair tower give it a close-up intimacy that is pleasing.

There are a few questions that might be asked. Why, for instance, after working to such good effect to bring the building up to the corner, did the architects feel it necessary to water it down at the ultimate moment with a negative corner form that makes one want to go out there and turn it around the other way? And why, with such sure handling of flat, unadorned rough and glazed surfaces in the rest of the building, was the rooftop mechanical area cover suddenly treated to some kind of dentilized scoring effect? And — last one — why were the two entranceways treated so meanly, appearing almost as stock doorways cut into an otherwise emphatic series of street experiences?

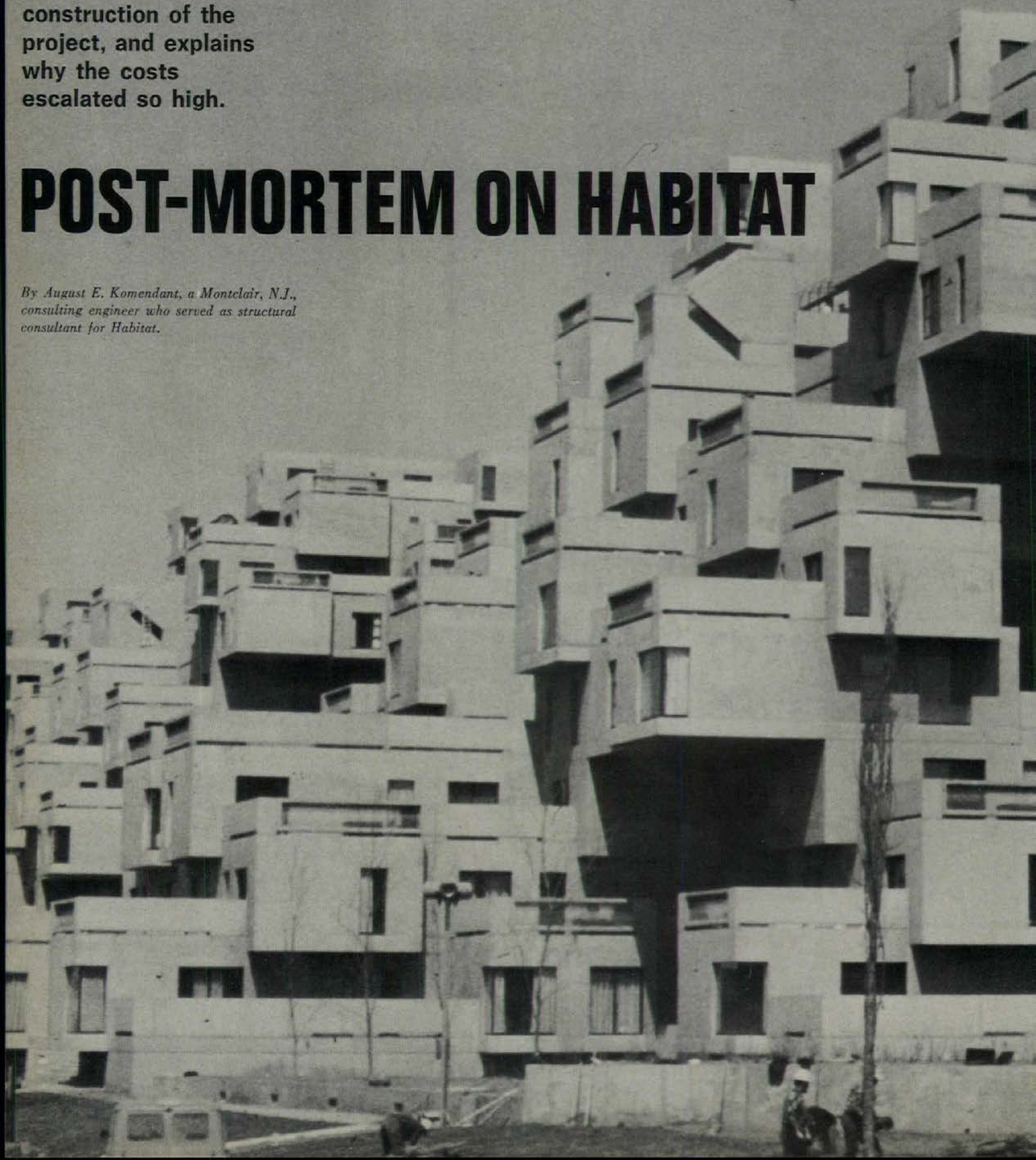
That these criticisms might seem lint-picking points to the fact that the building is for the most part handled with assurance, being part of the Pop scene across the way at the filling station without becoming gratuitously Oppy or Poppy itself, and being able to present a very similar face to the more tranquil civic park on the other side and be pleasurable to look at from that aspect. And, as noted, being decidedly an action part of the street for people whizzing by in cars or on bikes, and for people strolling past its moving composition of bays, voids, openings, and flat surfaces. — JTB



A consultant's view of Habitat, the controversial housing project in Montreal (October 1966 P/A), details the discrepancies between intent and realization in engineering and construction of the project, and explains why the costs escalated so high.

POST-MORTEM ON HABITAT

By August E. Komendant, a Montclair, N.J., consulting engineer who served as structural consultant for Habitat.





The world-wide criticism of Habitat consists mostly of relative and subjective responses made by observers of the structure. Unfortunately, this type of criticism lacks any objective evidence for evaluating the structure, so its good and bad qualities are just as often attributed as denied. Because of this, and since Habitat breaks through the conventional approach to urban development, it deserves a more objective evaluation than merely recording peoples' feelings, likings, and tastes.

Inside knowledge backed by facts are essential in evaluating the conception and realization of a structure. As the consulting engineer responsible for the structural design, producing and checking the structural drawings, and also in charge of general supervision of the project, I feel it my duty to offer, as impartially and honestly as possible, my own opinion of the design and construction of Habitat. Furthermore, I believe this type of evaluation is an obligation to the architectural and engineering professions.

Before starting a critical evaluation of any project, we must establish the basis

for the evaluation. During this analysis I have been guided by the following criteria:

- Rationality
- Aesthetic quality
- End-means relationship

For a complex design like Habitat, where architecture and engineering are inseparable, I believe that only these criteria are adaptable for all the eventualities to be confronted. Accepting this, we must next decide upon their order of importance. This usually creates conflict among the engineer, architect, owner, and public. Generally, the owner's role is to fix limits for expenditures and establish the program to be completed within these limits. However, the confinement of the program and the funds available do not restrict the role of the owner of Habitat; it only establishes the size of the project, because the owner (Expo 67) is, in fact, the public.

The aesthetic quality is discussed in this context only so far as the structural design is concerned. As the rationality in most cases serves also as a basis for aesthetics and economy—or at least they are closely related—the degree of order here has secondary importance.

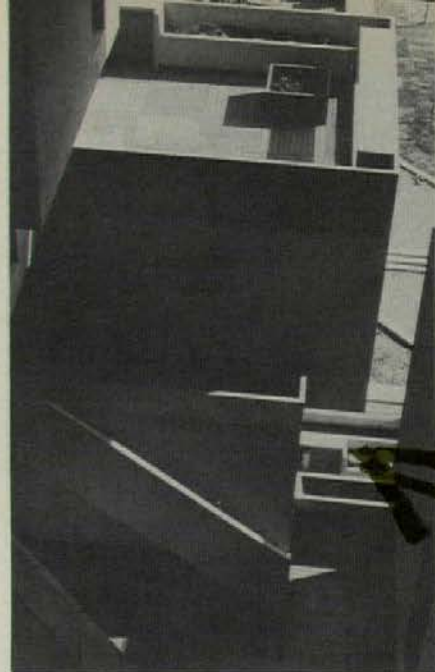
Rationality is a quality supported by reason—something that is objectively true, connected with knowledge and understanding. It is basic for all professional activity having value. In an architectural (aesthetic) as well as an economical context, rationality is expressed by the end-means relationship, or, more simply: Are the two criteria (aesthetic and economical) obtained rationally by the best intellectual and economical means?

Habitat: Why and Where

To understand the evaluation properly, one must be aware of the purpose of Habitat as well as the conditions under which the project had to be carried out. The purpose was to provide a high-quality, medium-density urban, middle-income housing development to suit the "Man and His World" theme of Expo 67.

The ceiling of the expenditures (design phase, land and roads excluded) were set at \$10 million. The location was MacKay Pier, close to downtown Montreal. The site was reclaimed land, about 1000 ft long, and varying from 300 ft to 220 ft in width. A relatively limited area was available for construction operations, and an approach road to the site was complicated by detours through city streets because new highways to Expo (and hence to Habitat) were under construction. Heavy traffic in and around the site caused tremendous congestions.

In the surrounding area, surfaces were soft, muddy, and intersected by excavations, piles of earth and materials. Bedrock lay 25 ft below finished grade. The total period allocated for design and construction—October 26, 1964 to March 1, 1967—was 28 months, including two wintertime construction periods, which



meant reduced productivity.

Objectivity requires that all three phases—conceptual image, design, and construction—must be impartially considered.

Conceptual Image

The original concept of Habitat is rational but not new; earlier, extensive and far-reaching studies sought to provide a socially conscious urban environment with outdoor space, and other desirable amenities. Work was done by architects Kenzo Tange, Noriaki Kurokawa, Yona Friedman, Eckhard Schulze-Fielitz, and many others. Universities such as Harvard and MIT also carried out studies in this field.

The merit of Habitat over its forerunners is that it is the only one actually constructed on such a scale (354 units). Even considering all the deficiencies and so-called "unjustified expenditure and effect," it proves that human dreams to provide noble urban living can be accomplished—at least technically; but it does not prove that it is right in the context of end-means relationship. However, I am not qualified to discuss what the value of this accomplishment is in an architectural and social context. The "unjustified expenditures" will be discussed under economy.

Design-Realization of the Conceptual Image

Many studies were made for the layout of the complex, which includes house units, elevators, stairs, and elevated streets. In the very first acceptable layout (model phase I and II), the individual house units were arranged approximately in the same pattern as Habitat was finally built. The clusters of house units were stacked in a reverse pyramid formation with more units at higher levels than below. This offered more privacy and more opportunity to exploit the beautiful views toward Montreal and the distant mountains across the St. Lawrence River.

Structurally, this arrangement allowed



more use of an arch action where the tie-rods of arches at each level could be arranged to balance the compression in house units due to beam action between the arches. The structural function of the streets was mainly stabilization between the arch and beam actions. This highly sophisticated idea was abandoned by the architect because the structural arrangement of streets was not acceptable. The street arrangement proposed by the architect required considerably greater length of streets per house unit.

Habitat, as built, stacks house units in pyramid style. Its layout and arrangement of streets and supporting elements is the only one that satisfies the utilities as well as the structural requirements. This statement is substantiated by the actual construction and behavior of the streets and structure as a whole. The house unit layout gives separation, but lacks privacy, and does not allow snow to be removed or melted in the garden areas. Privacy could have been improved with different shapes and arrangements of windows and balustrades.

Structurally, there are many deficiencies which reduce the rationality and economy of Habitat. For instance, due to the cantilever arrangements, relatively large loads have to be carried by almost constant shear forces in the entire length of the house units. In addition, all house units are subjected to heavy torsion, which creates enormous structural difficulties, especially at door and window openings.

Heavy structural steel beams embedded in the concrete walls had to be used to resist this torsion. The extra cost could have been avoided if the architects had agreed to install larger windows, which would have considerably reduced the concrete weight. I personally believe that the present windows extending from floor to ceiling lack safety and privacy.

Open vs. Closed Boxes

Where housing units cantilever one from another, the bottom slab forms the roof for the unit below. Originally, however, each housing unit was planned as a complete closed box, but the architect was advised that a roofless box would be more economical. This resulted in considerable difficulties: a special 5-ton lifting frame

was required for erection, and temporary roofs had to be built on each unit to protect the interior from rain and snow before and during erection. It is questionable if the roof construction of the housing units can be kept completely watertight during the course of time.

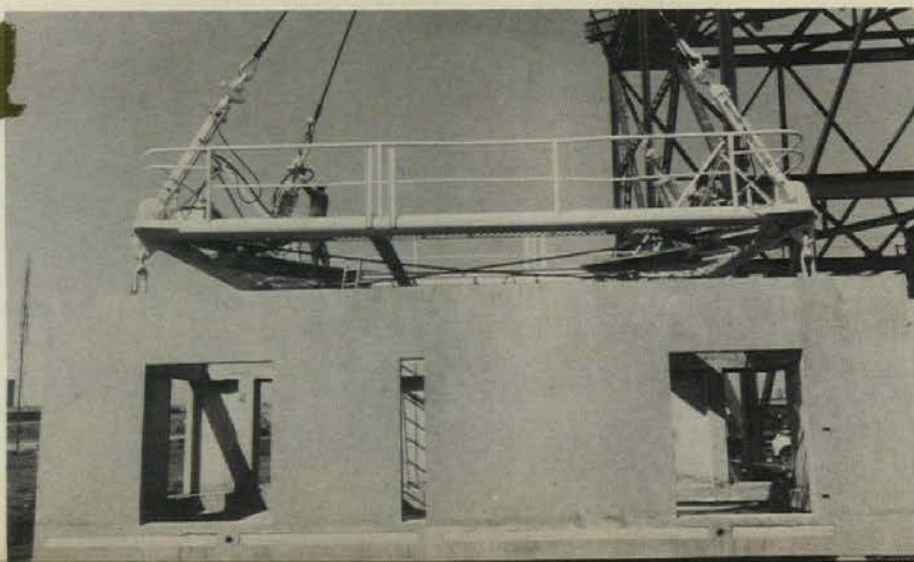
In the original design, the closed-box house units weighed more than open boxes, but they could have been designed with thinner slabs. The open top creates a lintel only 16-in. deep above wall openings, and it is unable to carry the moments and shears in heavily loaded house units without the addition of rolled steel sections.

A Wasted Lateral Shift

House units are stacked in a pattern that insures that the center of gravity of a cantilevered unit is always within its supports, so that it will balance during erection. The units stacked one above another were shifted 3'-6" laterally with the intention of providing space for vertical piping and ducts, but the space was never fully used. This 3'-6" displacement cuts deeply into the structural economy, which was assumed to be balanced by the economy developed from the easy arrangement of vertical utilities. However, in the present mechanical arrangement, the vertical piping rises outside the house units. Because of this, the units could not be completed at ground level with all their vertical pipes and ducts installed, as had been conceived at the start of the program.

The layout of street girders and house units was based upon the principle of erecting the entire complex without scaffolding. To suit this principle and stay within the available crane capacity, the fourth- and eighth-level house units were used as temporary supports for street girders during erection. To carry it out economically, the temporary erection weight upon the house units had to be reduced to a minimum. This was facilitated by precasting the girders in longitudinal halves that were later post-tensioned to form a box section, and also by dividing the span into three sections that were post-tensioned after erection.

The girders were originally designed so that one-half would span between the supports, and after prestressing would

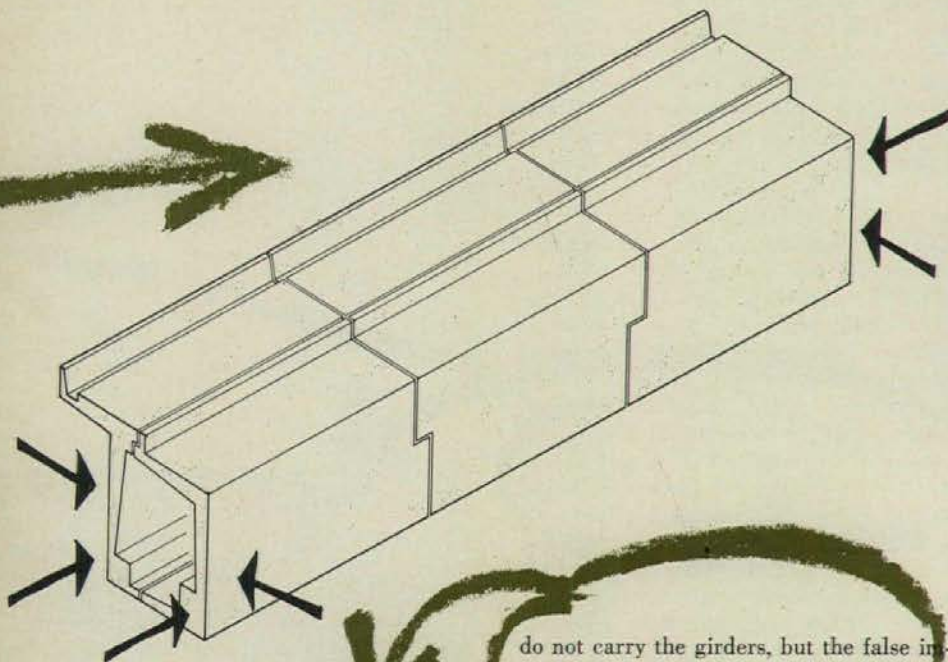


carry its own weight, the weight of its matching half, and the load from house units supported directly on the street girder. This two-stage erection sequence permitted the engineers to control the deformations and torsion within the girder, and allowed the two halves to change length without warping under prestressing forces.

Regrettably, this principle was abandoned by the structural engineers responsible for the house-unit working drawings, and by the contractor, both with the approval of the owner, Expo. The reason given by the engineers was that they were seriously pressed for time and there was no time available to complete the necessary extra computations. The contractor supported this justification, but, I believe, only for the company's own convenience.

Boxes Seem to Support Girders

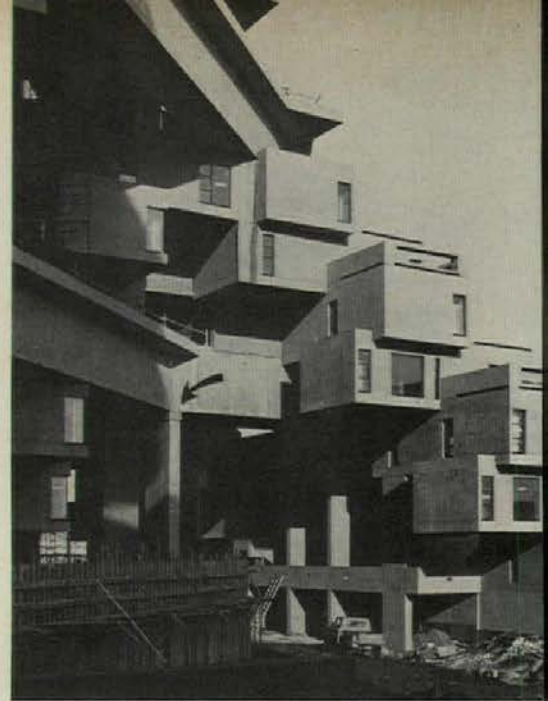
The design team overlooked the possibility of house units appearing to serve as intermediate supports for the streets. They



do not carry the girders, but the false impression considerably reduces the elegance and boldness of the structure. It could have been avoided if the ends of these particular house units had been completely opened up with windows.

This remedy was suggested after the erection of the first street girder, and could have been done without too much difficulty by cutting the 5-in.-thick end walls of the three units and installing windows. However, the idea was rejected by the architect.

Another false structural impression occurs where the cantilevered walks of the lower street girders are set level with the bottom of the girders. This makes the lower street girders look heavy and clumsy, giving the impression that they are more heavily loaded than the upper street



girders, which do not have the cantilevered walks. The visual effect of the girders is further spoiled because the column appears too slender at the junction where the heavy lower street changes direction.

The longitudinal street girder and the house clusters along the riverside area are far from being a perfect design. The longitudinal street is a simple beam supported by columns close to its ends and loaded heavily at midspan. The proper solution had been a two-span beam supported at the ends by columns, and at midpoint by a cluster column directly under the heavy loads. This column could also be used to support the heavily inclined escape stair between the end and center section of the complex.

The riverside clusters' arrangement is random, accidental, and leans too much against the clusters on the opposite side. This creates unnecessarily dense interlocking of the house units at the top. If the clusters above level three had been shifted toward the river, their support of the transverse street girder would have been simpler and more visually expressive. These planning deficiencies result from superficial studies of this particular area caused by pressure of time.

All Agree on Concrete

One aspect of Habitat meets unanimous agreement: the choice of construction materials. During the development of plans, Canadian steel companies hired consultants to find an alternate material, but they all agreed that for this particular concept where every element is a part of a loadbearing system, prestressed concrete was the only feasible material.

Over-all, Habitat keeps to a rather rigid geometric pattern following the shape of its site; but although it appears to have a pronounced gravity flow, the layout looks restless, random, and arbitrary. This seems to be caused by overdesign of the garden areas, where balustrades and planters vary too much and are unnecessarily complicated. In other areas, balustrades have been cut to pieces and so are



unable to harmoniously unite the components. Street shelter design lacks structural elegance, and does not carry out the functions it was designed for. The randomness and restlessness results from the layout of the openings and the arrangement of access stairs.

Provided that the rational and aesthetic criteria are justified in Habitat's social and architectural context, the end-means relations of the structural design and planned construction is the best to meet the circumstances.

Delayed Engineering Start

The structural design of Habitat went through some hair-raising experiences. First, the structural engineers originally engaged to make the complete structural working drawings did not provide a single acceptable drawing during the five months between October 1964 and April 1965 because they claimed they had no contract for their work. In the middle of March 1965, there were only some structural sketches and one general house unit drawing intended for the guidance of the structural engineers. But the schedule called for a complete set of drawings and specifications not later than April 15, which left only one month to prepare the structural bid documents.

This was accomplished only because the structural sketches had been quite complete to start with, so that with some additional information they were transformed into bid documents. Also during that hectic month, the cast-in-place concrete work for the plaza level, retaining walls, and pile foundations was designed.

In July 1965, after the contracts had been awarded, a new structural engineer was engaged to prepare the working drawings for the house units. The schedule was set to start manufacturing on October 1, and to start erection in December. This illustrates what had to be accomplished in such a short period in order to be able to finish the project on time. Despite the short time available for bid documents and final architectural and structural design, there has been practically no changes or serious misjudgment in the concept, except the usual minor changes in details during the development of shop drawings.

General Planning and Organization

It is a well-established fact that proper planning and efficient organization can reduce the cost of construction considerably, especially when mass-production is possible. The reverse is also true, and in the case of Habitat, severe mistakes were made in over-all planning and organization.

Let us look first at the construction site. Originally planned early in 1964 during the preliminary design for phase I and II, the manufacturing plant, storage and finishing areas were to be located behind

the Victoria Bridge, at a large site intended to be used for parking during Expo. This location was abandoned in October when phase I of Habitat was approved for construction as an Expo exhibit. So, for this drastically changed condition, the manufacturing plant was located in the limited area available north of the actual construction site, and used the relatively small remaining area between the plant and Habitat for storage and finishing.

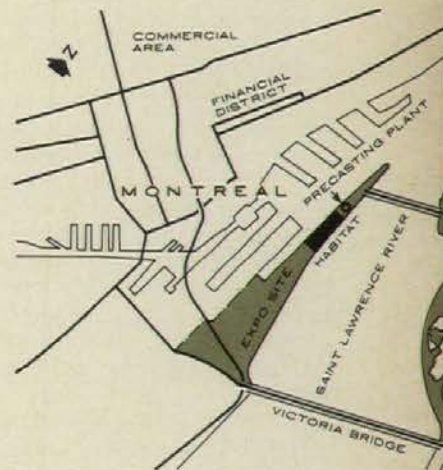
The plant and pavement of the storage area (reputed to cost \$2 million) were temporary, and had to be written off as an expense charged against Habitat. The area available was far from adequate for efficient manufacturing operations. Units had to be handled many times before they were hoisted into place, and there was no possibility of using expensive equipment and labor economically.

The reason given for changing the location was that the bearing value of the soil was inadequate. This, however, is not valid, because the pile foundation designed for the original building and casting beds would have been even more economical than the heavy reinforced concrete foundation actually used at the present location. In addition, the pavement required around the plant could have been used for parking during Expo, and the well-equipped and constructed plant could have served as a construction exhibition, as originally intended.

Lack of Construction Planning

The erection planning was made during the preliminary design phase before bids were called because the erection sequence controlled the structural design. The erection plans, preliminary structural drawings for the precast work, and the finished structural drawings for cast-in-place work were part of the bid documents, which were almost completed by the end of 1965.

The first casting started on February



15, 1966, but even with all the drawings for the repetitive geometric pattern of Habitat, the contractor ordered the post-tensioning tendons (SS-bars) and other accessories in relatively small quantities.

Disregarding the expense involved, it caused considerable delays, reduction of quality and even safety, because, to keep the erection going, rods and anchor plates specified for one location or purpose had to be substituted in another. In some places where SS-bars should have had a threaded end, the threaded couplers or nuts were substituted by wedge-type couplers or nuts.

Other details of the general planning, such as casting concrete, topping, floors, insulation, finishing, seemed never to have been planned, as the following example shows. By the end of September 1966, the south end of Habitat was completely erected. However, the concrete topping for streets and the plaza level was not laid until after the cold winter weather started. Similarly, the whole of the west side was erected by mid-October, but again, toppings, access stairs, insulation, and so on, were completed in severe winter weather. Joints were made and post-tensioning anchorage recesses finished in cold weather conditions with practically no protection against severe wind, snow, and cold.

There was never any authority on the site to enforce order and quality. Vital technical decisions were often made at relatively low professional levels, even by nonsupervisory labor. The general contractor refused to take direct orders from the consulting and structural engineers. Thus, every engineering order to the contractor and to Expo had to go through the architect, because the consulting and structural engineers had made their contracts with the architect.

It is easy to imagine the difficulties, caused by improper organization and poor working relations, for carrying out such an advanced and complex structural design as Habitat when the majority of the people involved never understood the basic structural principles, even after it had been constructed.

Shop Drawings

When construction contracts were signed, structural working drawings (except the cast-in-place foundations and plaza level) were not available. But the information on the contract documents, including a complete specification, allowed the contractor to start almost immediately with cast-in-place work; the design and construction of a manufacturing plant, forms, and a steam curing plant; and to order required materials and equipment.

Because of the lack of time, the final structural drawings, together with house-unit working and shop drawings, had to be completed almost simultaneously. For this reason, it was suggested that through a close relationship between contractors and supervisory engineers, the structural

drawings, including rebar lists, should be made more complete than usual.

By doing this, checking could be almost eliminated and so save considerable time. Also, the contractors and supervisors could get thoroughly acquainted with the peculiarities of this exceptional design. This suggestion was not acceptable to Expo, and the work had to be carried out independently by all parties. Unfortunately, during this phase of the work, the supervisory engineer's part was ignored entirely.

New structural engineers were finally engaged in August, 1965, but naturally it took time to get familiar with the computation methods and the over-all design, and organize the high-quality design staff required for this project.

As a result, the work started in a hurry and was treated as any ordinary design work would be, thereby ignoring entirely the mass-production methods advocated for the project. The first house unit drawing was issued in November 1965, before it had been competently checked. The pre-casting subcontractor started his first shop drawing, but after proper checking, the engineer recalled the first drawing and shop detailing had to start from the beginning again. This by itself was not critical because the plant was not ready for operation until February 15, 1966, and the first house unit was erected on April 11.

Departure From Agreed Principles

The first structural drawings, other than house units, were ready for the south section of Habitat in October 1965, but the precasting contractor was busy organizing his work and considered the house unit manufacturing more critical than anything else. The company did not start making the other shop drawings until February 1966. By mid-June, the molds for the first street girder were ready, and on June 29, the first cantilevered section of street girder was erected.

Thus, there was a considerable delay and deviation from the original critical path schedule, which had predicted the start of erection in December 1965. In addition, the delays in producing the house unit structural and shop drawings were compounded by their poor quality and methods.

The engineering and drafting staff that produced the shop drawings was large, but it was below the required quality standards. Both the engineering and drafting teams almost completely ignored the agreed-upon basic principles of post-tensioning arrangements and the details worked out on the large-scale drawing that had been issued in January 1966 before any shop drawings were ready or approved.

If this guidance drawing had been followed, the contractor would have had to make only a few basic detail drawings. The rest could simply be additions indicated on the so-called hardware or mason-

ry drawings where the openings for mechanical requirements, doors, windows and other accessories were indicated.

Instead, shop drawings were made for each individual house unit, but they were difficult to check, and far more difficult to use in the production shop. To make matters worse, there was no communication between the technical staff in the office and the men in the plant. Supervisory personnel were below required standards, and not even familiar with such an advanced design, and thus were unable to check the production quality. For example, reinforcing bars required only for the width of openings were extended for the entire length of the walls, thereby making it impossible to install pipe sleeves, post-tensioning tendons, end anchorages, and grouting tubes.

Standard grouting through anchor plates was rejected in favor of plastic pipes with grouting ends usually at the outside face of the units. During casting and handling, the tubes were very often disconnected, displaced or filled with concrete, so that in addition to patching, grouting was difficult, and holes often had to be drilled to accomplish it. Under these circumstances, production of cages was very low, and many prefabricated cages had to be changed.

Poor shop drawings caused welding plates to be displaced, and dowels, pipe sleeves and the metal sleeves for post-tensioning tendons to be misaligned. In order to keep the work moving, the contractors and Expo asked the consulting engineer for help. The quality of most of the shop drawings was so poor that the reinforcing and hardware had to be checked against the structural drawings, which were more complete and readable than the shop drawings.

How the House Forms Should Have Been Built

The design and construction of the pre-casting plant was very good, except that the foundations were too heavy and not designed as continuous supports on semi-elastic ground, which would have resulted in considerable economy in time and money. The equipment for handling the precast units was excellent. However, the methods and procedures for casting were wrong in principle, especially the procedures for house units. The specifications called for the forms to be self-aligning; but neither the inside molds nor the outside forms for the street girders were self-aligning.

The recommended manufacturing procedure was as follows: The inside metal forms, to meet the requirements of changes, were composed of six large hinged units, four corners, and two changeable intermediate units. The entire inside mold should be hydraulically stripped and lifted out as one unit. It had to be positioned for casting after laying the reinforcement in the bottom slab. These bottom bars were supported by spe-



how the house units were actually cast. The reinforcing cage for an entire box was manufactured in four operations: Each wall cage was independently fabricated, but not completed, then moved to an assembly rig where the bottom slab reinforcing was fabricated.

After assembly, the half-fabricated cage was removed from the plant by a 50-ton travel lift, equipped with a heavy-steel frame to avoid excessive deformations. Outside the plant, the post-tensioning tendons, end anchorages, grouting tubes, numerous pipe sleeves, welding plates, and so on, were installed and welding connections completed.

Because of poor shop drawings and manufacturing, the reinforcing was so heavy and the stirrups so closely spaced that this work with difficult and in most cases impossible without cutting some reinforcing steel. This usually caused an inaccuracy in the locations of connections between boxes. After this operation, the travel lift took the cage to the mold.

After closing the outside forms, a special steel frame was lowered into the box to form the sides of beams in the bottom slab and provide a working platform for casting the bottom slab and beams.

cial, disconnectable dowel supports.

Blockouts for openings in the walls were to be provided with rubber gaskets to fit tight against the side forms, and were attached only to the inside forms. The reinforcing cages, complete with accessories and post-tensioning tendons, were intended to be fabricated as separate units for the bottom and four walls. The side cages would be erected first, then the ends against the inside mold and corners connected by automatic welding. The outside forms were the last to be closed. Plastic spacers were specified.

The casting operation was scheduled for one operation, using the extended bottom flanges of the inside forms for screeding the bottom slab and holding back concrete from the sides. Immediately after finishing the bottom slab, the walls could be cast by pumping concrete into the forms. After about four hours, the supporting dowels would be disconnected and the forms stripped horizontally in zig-zag fashion, sliding on the bottom slab, and then lifted out for re-use. Then the outside molds were to be loosened and allowed to slide about 1/2-in. downward and tilted outwards about 12 in. from the top.

Next, the corners of the outside molds and the top of the box were ready to be closed and steam introduced for curing. The forms blocking out the openings were to be stripped after the box was removed from the plant. By using this method, one house unit per casting bed could have been easily manufactured in 24 hours.

How the House Units Were Cast

The above recommended manufacturing procedure was rejected by the precasting contractor, and the following describes

While cages were being transferred from the out-of-doors assembly shop to the mold inside the plant, they often suffered damage which necessitated adjustment for post-tensioning tendons, and repairing broken reinforcing connections.

The work carried out in the mold was usually a time-consuming and difficult job. After the bottom slab and beams were cast and hardened enough (12 hours minimum) the inside wall forms, comprising up to 16 panels, were assembled on the bottom beam form. Special ties installed between the inside and outside forms resisted lateral pressure. About 5 hours after the walls were cast, the inside forms were completely stripped and the outside forms hinged back from the bottom. Then the entire box was covered with canvas and the concrete cured with steam. The casting cycle was a minimum of 48 hours per casting bed.

What Was Wrong With the Forms?

Although the forms were well constructed, they were overdesigned because the pre-caster had intended to force concrete upward by pumping. The heavy reinforcement made this impractical, so concrete was pumped from the top.

It is quite obvious that this type of operation is very expensive, time-consuming and difficult because the only access to the box was from the top. Two main deficiencies in quality soon showed. Concrete coverage could not be controlled, so reinforcing bars and tie wires were often forced against the outside form because of the inaccuracy of the cages. Joints between casting lifts and special tie holes were clearly visible, and required considerable patching and finishing. But regardless of how carefully repairs were made, the so-



called cold joints remained, and as a result the specified quality was not obtained.

Despite these handicaps, the men in the precasting plant carried out their extremely difficult work amazingly well. The concrete quality, delivery and placing throughout the project was exceptionally good.

How the Crane Controlled Erection

Two closely related, basic mistakes were made in the Habitat erection procedure. When the crane was selected before the bid date in April 1965, the critical path schedule foresaw that the crane must be operational before September, 1965. The original intention was for a tower-type crawler crane with a horizontal beam and counterweight. But because of the time limit, it could not be obtained.

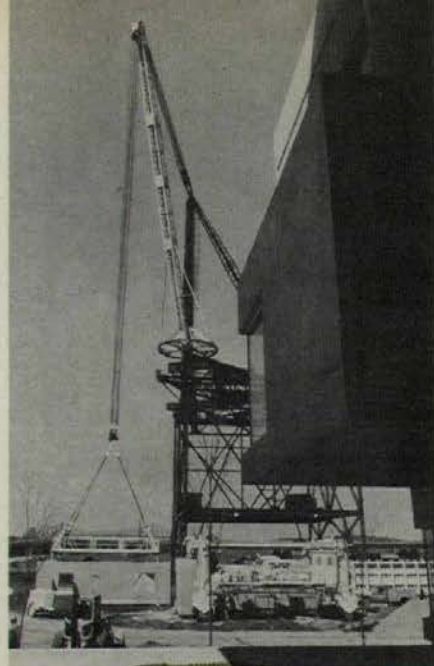
The second acceptable choice was the crane built by the Dominion Bridge Company. Its operating capacity of 70 tons at 120 ft, and 100 tons at 60 ft was adequate for about 75 per cent of the conditions the crane had to handle. And, the manufacturer's engineers asserted that for a few extra hoistings the crane could work 20 per cent above the operational capacity. Beyond the maximum hoisting capacity, an additional crane had to be used for lifting large loads such as street girder units.

In the erection plan, the crane was expected to operate back and forth along a track for which the manufacturer suggested a special "puller arrangement" fastened to the rails. The general contractor claimed the back and forth movement of the crane was unnecessary, and planned to erect the structure with a crane only moving forward. For this, the proposed puller system was accepted, but when the contract was signed, the 20-per-cent extra capacity was not written into the agreement. A suggestion to make the crane self-propelled was ignored.

The reduced crane capacity led to the second mistake. The erection procedure called for boxes to be completed at ground level, with top slabs in place, utilities installed and inside work finished as much as practical. Between 60 and 70 per cent of the house unit boxes were within the limits of the crane capacity; and if the 20 per cent overweight was included, almost all the house units could have been erected with it. Had this been so, the vertical post-tensioning and grouting operations would have been much simpler when made above the top slab.

As it was done, top slabs were erected after each box was in place so that post-tensioning, grouting and setting the base plates were done without work platforms about 10 ft above a solid base. Meanwhile, before the concrete roof slabs were installed, temporary roofs were built on the boxes.

The temporary roofs consisted of timber trusses enclosed with polyethylene sheets. They were inadequate, expensive



and tied up one crane for handling them. Due to this inadequate arrangement, the house units could not be made weather tight, and this caused damage to the wall and floor insulation, which then had to be replaced. The interior finishing operations were chaotic, and most of the finishing work was done after the boxes were put in place.

An Accumulation of Errors

The contractor very soon realized that erection with only a forward movement of the crane was impossible. The crane had to move backwards and forwards, and this required considerable time. As a result, only about 30 per cent of the crane efficiency could be used. Further inefficiencies in the use of the crane were caused by the lack of discipline in handling units on the ground. The contractor practically never checked the readiness of the units for erection. Often they had to be finished (cleaning the tubing, pipe sleeves and welding plates, even drilling new holes) while hanging from the crane hook.

As stated earlier, there was practically no quality control, so that realignment of welding plates and post-tensioning holes was almost a standard procedure. More delays accumulated because temporary scaffolding for erection of the street girders obstructed work at the plaza level.

The erection crews, like the fabricating crews, were generally good, and carried out the work with the best possible care and efficiency. There was practically no damage during erection — providing one overlooks such things as the flame-cutting of lifting hooks, and welding without protecting the surrounding concrete. But overall, the erectors' achievement was good.

After the erection was finished, the erection foreman and crane crew said they could have erected the complex in half the time if the accuracy of manufacturing work had been to specification, if there had been less unnecessary handling and waiting for proper SS-rods, less climbing to the top of walls to set base plates, and less chiselling concrete up in



the air without work platforms.

The men in charge of the practical work in the plant and the field erection carried out their complicated tasks with excellence. They were always cooperative, and they deserve most of the credit for completing Habitat on time.

Conclusions

Before arriving at a rational conclusion about any project, one must go back to its roots to see the real value of an idea. From an engineering point of view, the real value of an idea depends first upon its validity, which is tested against the reality; and second, whether it can be afforded in the context of economy.

The validity of the concept of Habitat has been tested in the engineering context simply because it has been built. In a social context, it will be judged in the course of time; at present, no answer is possible because the experience of occupancy is not yet available.

Can Habitat be afforded? From available data, the answer is positively yes; but in the way it was constructed, the answer is no. This inconclusive answer—yes and no—leads to a more profound truth: It is not only important that a concept can be realized, but it is equally important *how* it is realized, and at what expense.

The first part of this statement proves ability, and the second part the quality of the ability. This can also be dramatically illustrated by the Sidney Opera House project. The original concept was excellent, and could have been built easily within the limits of available funds. But now the project costs have soared to an improper level, which is caused mainly by out-of-date planning and execution.

At the present level of engineering development, almost any conceivable concept can be realized. Thus Habitat, as built, proves that it could be realized only within the framework of Expo 67 because the funds were available, and economy took secondary importance or no importance at all.

As can be concluded, Habitat could have been built in its own right within reasonable time and economical limits if there had been a single executive authority completely in charge of all phases of the project. This authority would need up-to-date technical knowledge and be well experienced in construction and mass-production methods. Habitat failed economically only because of technical ignorance, lack of team-work and co-operation at a decision making level, and by lack of proper organization and planning.

The explanation frequently given for the excess expenditures is that Habitat was a research project. Assuming this justification is valid, what has been gained by the research project? Are the gains, if any, worth the effort and cost?

Since I have the design and field experience, I feel qualified to answer these

questions from the structural and construction viewpoint. After any design is completed, especially an advanced project, every progressive designer and contractor is dissatisfied with the results, and intends to avoid making the same mistakes in future work. If this were not so, there would be no advances in techniques.

Despite Its Weaknesses, Habitat Is a Success

The thorough analysis just presented points out the differences between intentions and achievement that result in over-expenditures. But regardless of this, Habitat is a great achievement from which valuable experience and results have been obtained. It is hoped that all the valuable test results can be compared with the theoretical calculations. Such data as measurements of deformations due to various loadings, temperature changes, plastic flow, foundation settlement under various loading and ground water levels should be made available by Expo for interested professions.

In addition, this project gave an opportunity to apply advanced structural theories using exceptionally high stresses, and enabled us to study the behavior of unusual structural systems under various loading and climatic conditions. The results open up possibilities that are badly needed for the future development of the construction industry.

Regardless of the failure of the mass-production methods and complete prefabrication of houses, Habitat gave plenty of evidence that it is possible and rational if our conventional concepts can be overcome, and new approaches and methods are adapted.

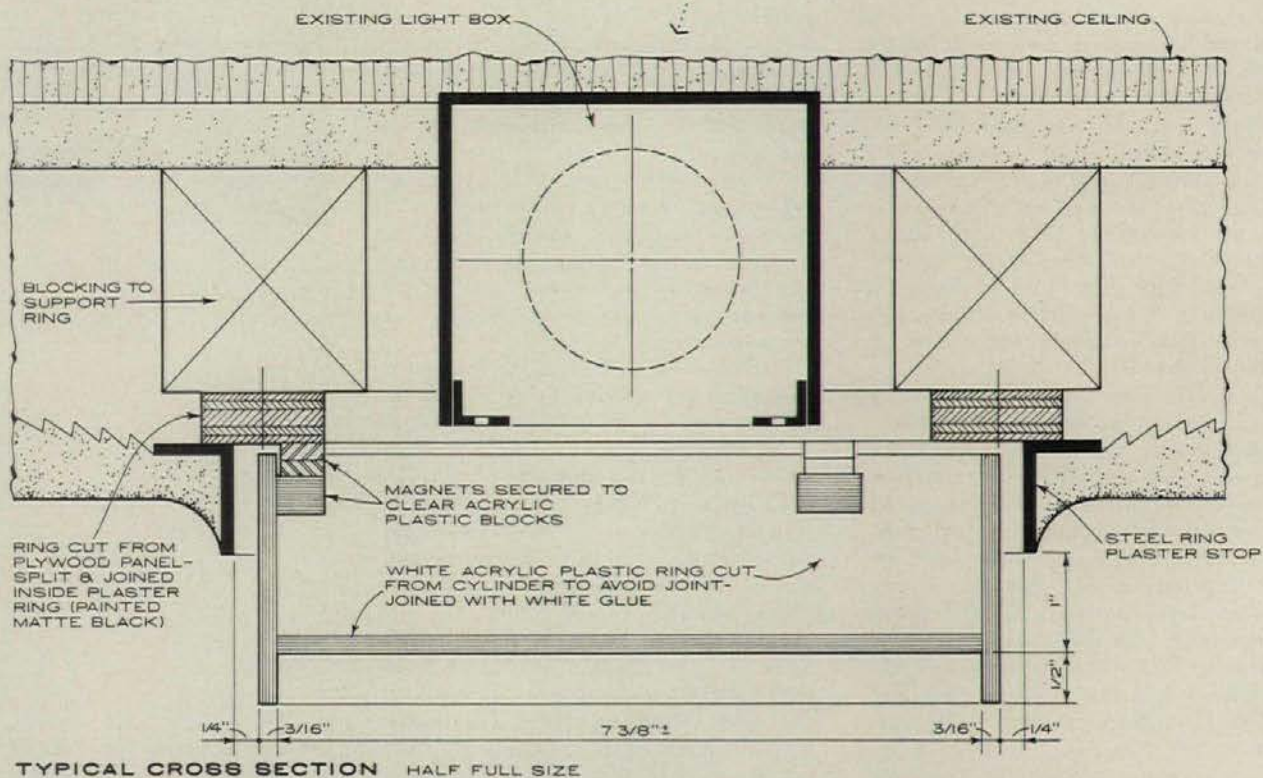
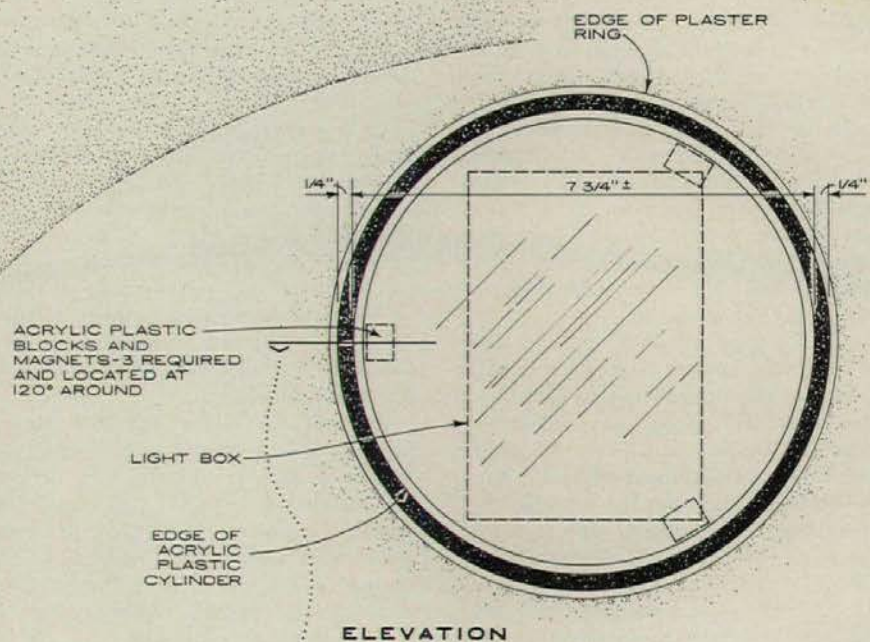
Furthermore, it also proved that the construction industry must accept the plain fact that, with advanced designs, technical and operational decisions have to be made by professionals and not by operators, committees, and certainly not by politicians.

Taking an over-all view, the excess expenditures are well balanced by the experience and results obtained when compared with many other research projects whose concepts and aims are often questionable in a human context. Besides, Habitat was one of the most significant attractions of Expo 67, and having created world-wide interest it opens a new vista—research for the future.

Finally, two questions arise: Will there be other Habitat-type projects in the future? If yes, can they compete with conventional building types? The answer to both questions is positively yes, but not just as Habitat phase I or II. Experience with phase I suggests there are better solutions available for all income levels, solutions more powerful, expressive, more in a human scale—and far more economical. What these solutions are, however, is beyond the scope of this analysis.

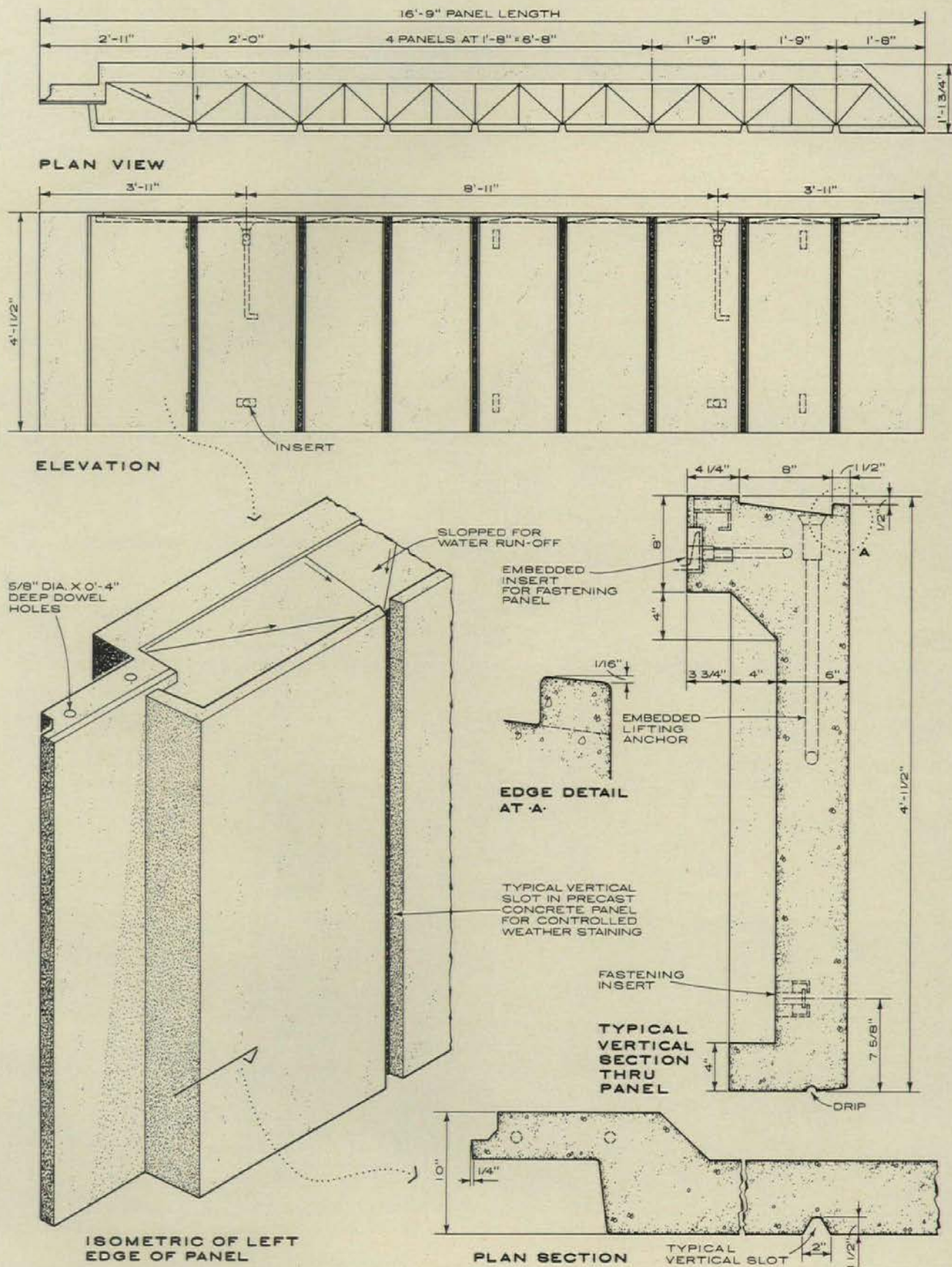


Associated Architects: Moshe Safdie & David, Barott, Boulva. **Structural Consultant:** Dr. A. E. Komendant. **Structural Engineers:** Monti, Lefebvre, Lavoie, Nadon & Associates. **Mechanical & Electrical Engineers:** Huza-Thibault, and Nicholas Fodor & Associates. **General Contractor:** Anglin-Norcross Quebec Ltd. **Concrete Subcontractor:** Francon Ltd.



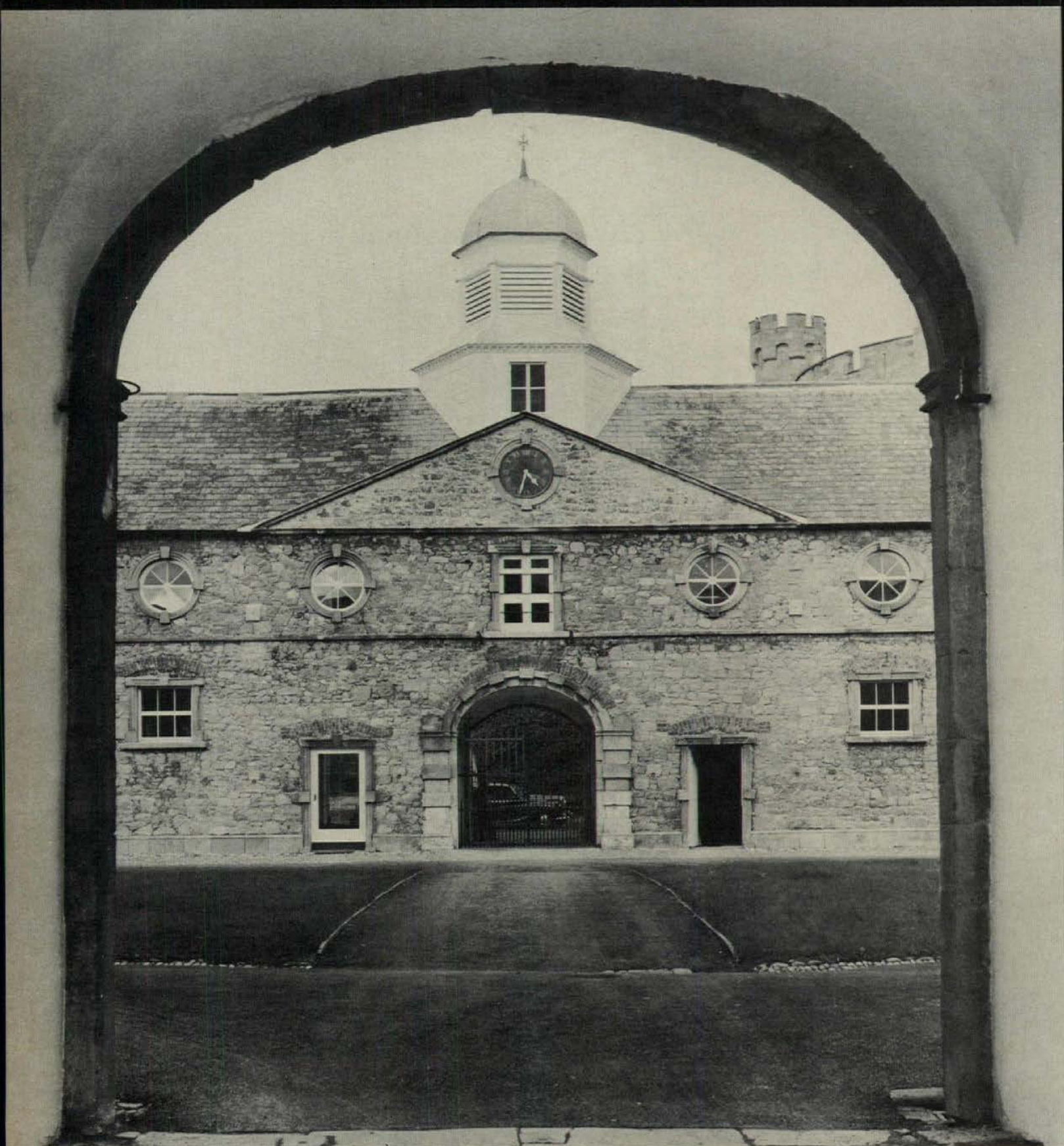
CHLORMETALS, INC: New York, N. Y.
 PLANNED OFFICE INTERIORS: Designers

SELECTED DETAIL
 ELEVATOR INDICATOR LIGHTS

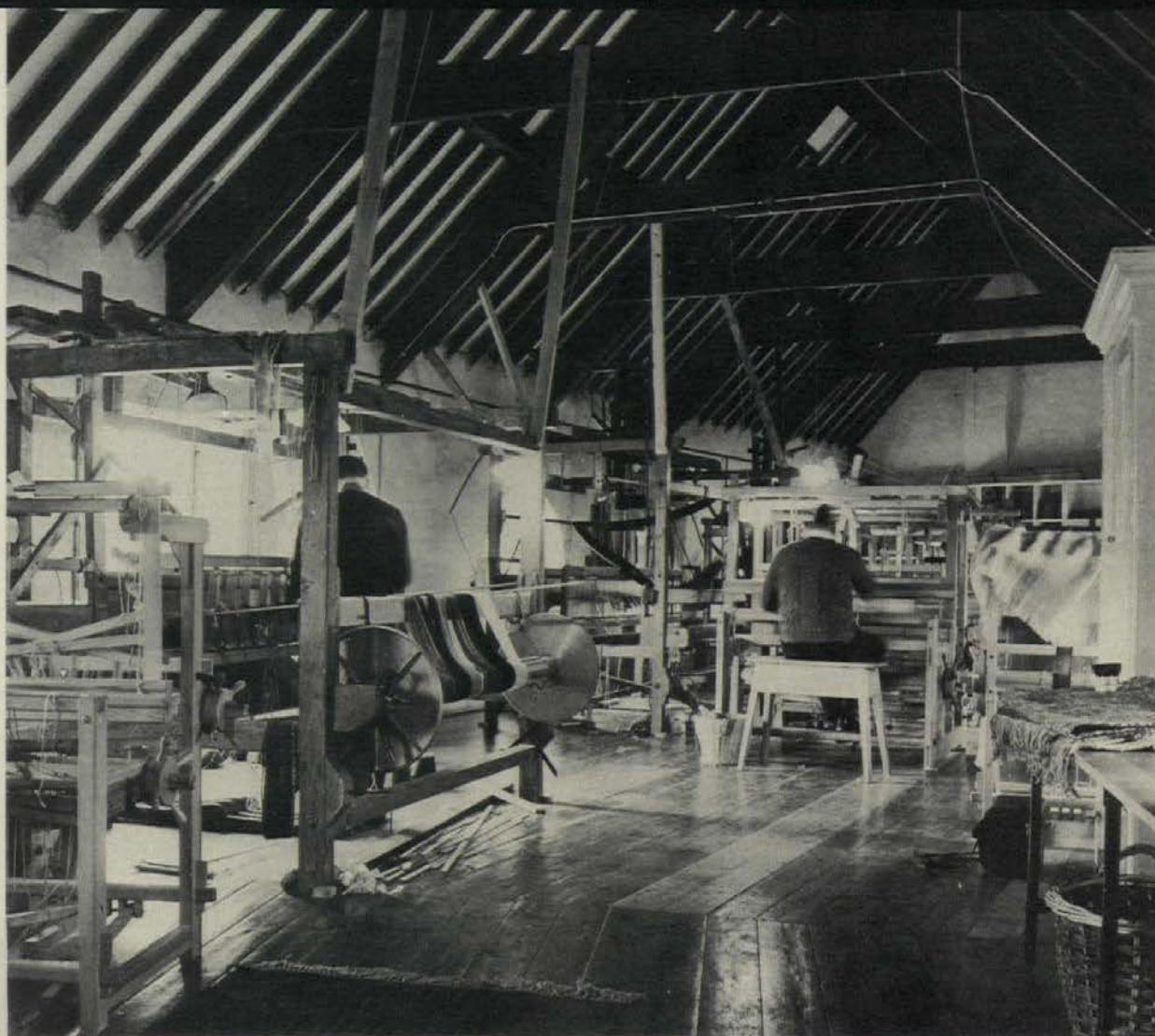


LINCOLN CUYAHOGA BUILDING: Cleveland, Ohio
 SCHAFFER, FLYNN: Architects

SELECTED DETAIL
 PRECAST CONCRETE PANEL



“I REMOVED MY HAT”



The second-story fabrics studio.

Photos, except as noted: Louis Schnakenburg, Copenhagen

Kilkenny Design Workshops revive a nation's crafts and a splendid work of architecture simultaneously.

Some 75 miles southwest of Dublin on the River Nore is a town with all the attributes of historicity and picturesqueness for a Disney film, except that here everything is real and convincing. There is the Ninth Century tower next to St. Canice's Cathedral (13th Century), built to fend off sieges. There is the Protestant school (now Kilkenny College), where Swift and Congreve matriculated. There is Kyteler's Inn, where Dame Alice Kyteler, the local Lucrezia Borgia, allegedly ran a profitable business in disappearing husbands in the 1320's (you can wine and dine there now—safely and well). There are the winding streets, narrow alleyways, and sheltered

courtyards of earlier days. There are more "up-to-date" hostels and pubs with solid early 19th-Century charm. And there is the castle, started in the 12th Century by Strongbow (the Englishman Richard de Clare, second Earl of Pembroke), and until 20 years ago the abode of the Butlers, marquesses of Ormonde (also English, who moved in around 1391).

This observer was a delighted visitor to Kilkenny, for that is the name of the town and county, last summer, for the purpose of investigating what had been done across the street (or Parade) from the castle to the imposing complex of stables that were built in about 1760. In this grand hippic dormitory, the Kilkenny Design Workshops have taken up residence in a work of impeccable remodeling and rejuvenation by Dublin architect Niall Montgomery.

The Workshops are one of the developments of the Irish Export Board, which was founded in 1959 to explore means of increasing Ireland's overseas trade. Although Ireland



Photo: Con Connor, Dublin

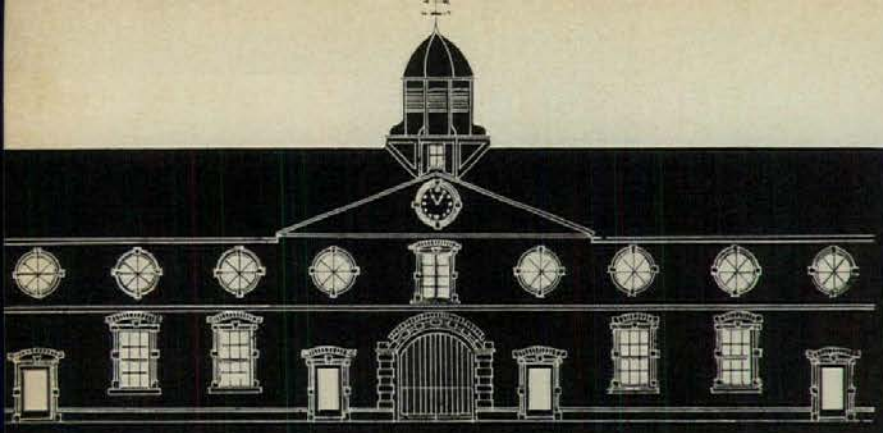


Photo: J.T. Burns, Jr.

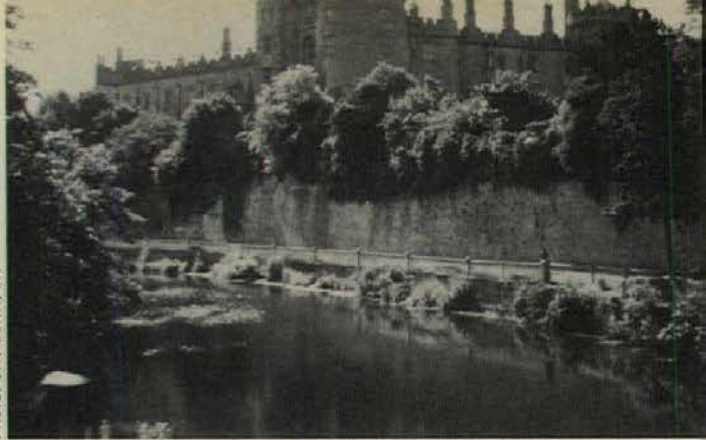


Photo: Irish Tourist Board

New Design Center showroom by Montgomery and Middelboe (above and below).



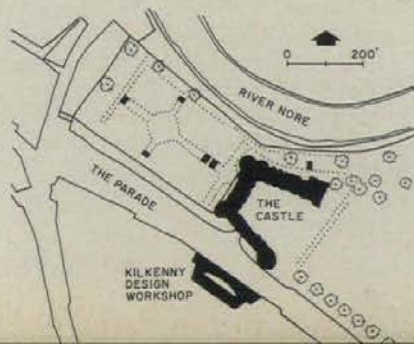
Photo: J.T. Burns, Jr.



possesses abundant talent and good resources in raw materials for arts and crafts industries, there is not a strong, living tradition of Irish design. In order to create a body of superior contemporary design, to give birth to a new generation of Irish designers, to encourage Irish industry and manufacturers to upgrade their product design, and to accelerate greater foreign sales through the medium of good design, the Kilkenny Design Workshops were established as a sort of national design center. William H. Walsh, chairman of the group, went outside Ireland for talent to start the young enterprise, luring top names in fabrics, silverwork, furniture, ceramics, metalwork, woodwork, graphics, and other fields from Denmark, Finland, Sweden, The Netherlands, Germany, and even (surprise!) England. The Workshops are going full force now, under Walsh and general manager James King, turning out designs that will stand out in any milieu, instructing a bright group of Irish assistants and apprentices, and giving Irish manufacturers an aesthetic (and economic) shot in the arm.

When the Irish decide to do something like this, they go ahead and do it. When the idea of the Workshops got around, Percy le Clerc, the Inspector of National Monuments, suggested to Walsh that the Ormonde stables would make an ideal design center, an enthusiastically accepted suggestion. From then on, things moved swiftly; as architect Montgomery says: "To move in and get going, playing it by ear, on Time and Materials, plus profit." Montgomery notes that "we moved into Kilkenny with the survey scarcely finished, sixteenth-scale sketch designs, and a two-page specification. I still can't quite believe it." But it worked, and worked beautifully. "It worked because for about four years I made something like weekly inspections, confirming all instructions in memoranda which were, in fact, detailed specifications; because we had intelligent and sensitive clients; and because we had a good, conscientious quantity surveyor."

The result is a series of workshops downstairs where the Ormonde horses were once so impressively in residence, and studios upstairs where feed and tackle were presumably stored. The stable, in plan, surrounds a court, with the front facing



Kilkenny Castle from the Parade.

the castle and Parade curving back inside to a long, horizontal element connecting the ends of the bowed element. The public is permitted into a richly contemporary showroom opening just off the Parade, designed by Montgomery and Rolf Middelboe, head of the textile design workshop. Offices are across the vaulted entrance to the court from the showroom, and studios above. At the rear, in addition to workshops and studios, there is a kitchen and dining room, a library for the staff, and a back court containing, among other things, a staff-designed prototype small residence and some huge fragments of Nelson's Column, blown up in Dublin's O'Connell Street a while ago ("We are going to have some fun with it," King told P/A). Right now, staff members and apprentices live in digs all over Kilkenny, but it is a dream of Walsh's that they be brought together and lodged in the refurbished Kilkenny Castle. Since years of non-use have wrought havoc with the castle as a habitation, this will take thousands and thousands of pounds, but it is a noble prospect.

Aside from the pleasures of visiting Kilkenny and the Workshops, a genuine delight for this writer, literarily as well as architecturally, has been corresponding with architect Niall Montgomery. He will, consequently, have the closing words on Kilkenny:

"There are what I consider to be exciting parts of the work for which there are no drawings — notably the breaking out of the large, semicircular-headed windows from the Exhibition Hall. When first we saw the dressed voussoirs of the blind arcading facing the Parade, we thought

that modesty or fear of the mere Irish had caused the Ormondes to build up these arches after the stables had been built. In matter of fact, Percy le Clerc was of the opinion that in medieval times the Kilkenny streets were arcaded, protecting Kilkenny shoppers from the seldom-ceasing rain. But the stone arches are only a facing. I am ashamed to say that I suggested leaving the facing, forming ope, forming a continuous trabeation over the crowns of the arches inside and providing intermediate supports in the shape of rectangular reinforced piers. The contractor gently and politely asked me to permit him to discuss the matter with his masons. What they did was beautiful. They used the existing wall as centering, chased the back of the wall and formed two-ring brick arches, springing them off the existing masonry at the back. Then, when the arches had set, they removed the walling. I removed my hat.

"The men on that job were grand. Many of them were middle-aged, and they did not appear to be affected by trade demarcations. I made no comment when I met the plasterer on the roof, dressing the soakers and the flashings with the same skill and concentration he exhibits as a plasterer. One of the men has died since the job started — little Mr. John O'Brien from Jerpoint — 'born in the shadow of Jerpoint Abbey' they told me. At 80, he was still cycling to work. He it was who in course of forming an ope in one of the stable walls discovered a carved angel, which Percy le Clerc says is probably 14th Century."

Thank you, Niall Montgomery. I remove my hat to you. — JTB

INSTANT

When P/A predicted last year in discussing "Instant Interiors" that projections on building exteriors would be the next investigation of the Supermannerists (pp. 176-181, JUNE 1967 P/A), we had no idea that our mental projection would be electrically realized so soon.

One evening several weeks ago, while the self-appointed "beautifiers" at the District of Columbia's Kennedy Center for the Performing Arts were lobbying for a clean-up of the distant Georgetown waterfront's industrial buildings, two tyro architects in the District, Doug Michels and Bob Feild, crashingly put down this establishment by working out a series of startling projections on the soffit of the Whitehurst Freeway in Georgetown and on the near-by silos of the Potomac Sand and Gravel Company, which was one of the very objects of the "tasteful" Washington cleanup.

Executed with the unlikely cooperation of Lloyd Green, responsive owner of that Georgetown industrial firm, and with a grant from Washington's Gallery of Modern Art to investigate ways of revitalizing the waterfront buildings, these electric environments included Oppy patterns, drawings of naked women, and slides of singers Bob Dylan, Paul McCartney and Joan Baez. Drivers and passers-by may have stopped in their tracks, but they were also as certainly cheered by the sights.

Kinetic artist Eric Sepler, who has worked with such Rock groups as The Fugs and The Doors, was the projection technologist. He used three overhead projectors of his own design with 600-w quartz-iodine bulbs; simultaneous multiple projections from the same location provided strange color mixes and moiré patterns on the silos and sheds.

Sepler is intrigued by the potential of his medium as "urban lighting." The implications for instant horror are as great as for instant beauty: instant billboards may flash up everywhere.

Actually, exterior projection as an advertising medium has been used before to some degree. At New York City's Waldorf-Astoria Hotel, a notice for a Benny Goodman engagement was projected onto the sidewalk on Park Avenue, somewhat mystifying passers-by (or passers-through). And fabrics designer Jack Lenor Larsen, who has done a great deal to foster

Photo: Steve Northrop, "The Washington Post"

EXTERIORS

electric environments in the design world, projected his firm's logo onto the branch shopfront in Zurich on its opening night, like a nighttime curtain of light.

For the future, rumor has it that the New York telephone company is also considering projections on exteriors so as to liven up its mam-

moth, windowless equipment buildings. Wags have suggested that they might project windows — perhaps even movies of uncurtained windows with people doing interesting things inside.

Exclusively a decorative device in their present form, these instant exteriors may prove worthless for other

than such advertising and some transitory amusement. On the other hand, they may serve as a provocative testing device for architects: They demonstrate the relative inconsequentiality of single buildings in comparison to megalopolitan superscale, toward which our vision must inevitably move. — CRS



FLOWER CITY MARKET CENTER

The once-bustling area of trade and industrial activity between San Francisco's Embarcadero and Telegraph Hill will again become a commercial crossroads when the \$100-million International Market Center replaces dilapidated, half-empty warehouses that have, for years, occupied much of the valuable land near the city's waterfront.

Developers of the center, North Waterfront Associates, Inc., began acquiring property on the east side of Telegraph Hill several years ago, and commissioned Wurster, Bernardi & Emmons to give form to their concept of a complete trade complex, including a home furnishings mart, an apparel mart, a commercial-institutional (contract) furnishings mart, and facilities for trade shows and conventions. Planned to incorporate a maximum variety of services within a compact, convenient location, the project will also provide a number of ancillary facilities and amenities for both public and commercial use. The developers have wisely sought a plan that will inject some economic life into a neglected area, and architects and landscape architects (Lawrence Halprin & Associates) have given the structures a dignified, well-integrated, and appealing aspect, an uncommon — and welcome — undertaking for this type of building.

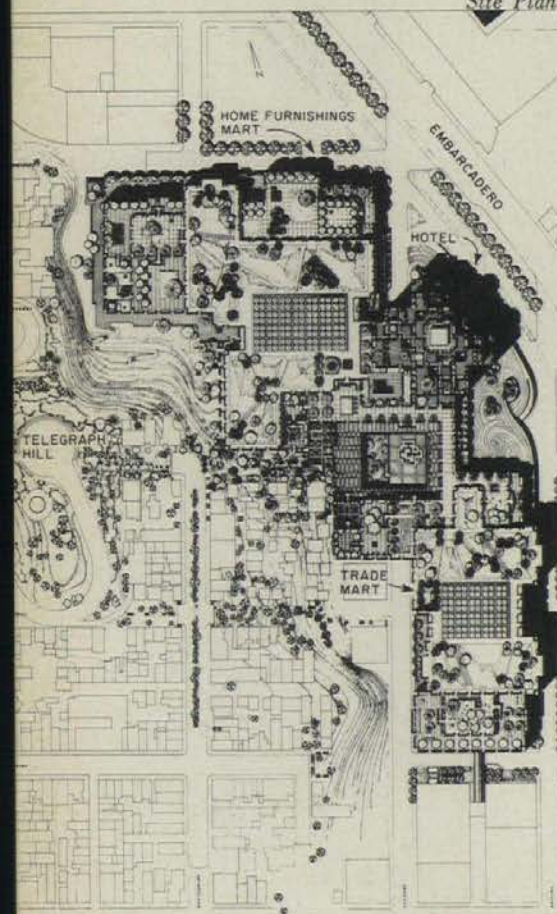
Two great halls, each containing 30,000 sq ft of space for exhibitions and large public or private gatherings, constitute the center of operations for the complex. Set into the grade, they will have seven galleried stories around their perimeters for mart tenants. Galleries will be linked to the Grand Concourse (shades of the Bronx!), a plaza at the core of the plan, by escalators and glass-walled elevators. Parking and access roads for 2000 cars will be below grade, leaving the entire 15.4-acre site open for pedestrian traffic at and above ground level. At the edge of the complex nearest the Embarcadero will be a 550-room hotel, and visitors as well as San Franciscans will be able to enjoy retail shops, restaurants, and artisans' studios located conveniently throughout the complex. A funicular railway running from the Grand Concourse up Greenwich Street to Coit Tower will make the center's facilities, including parking, easily accessible to residents of Telegraph Hill.

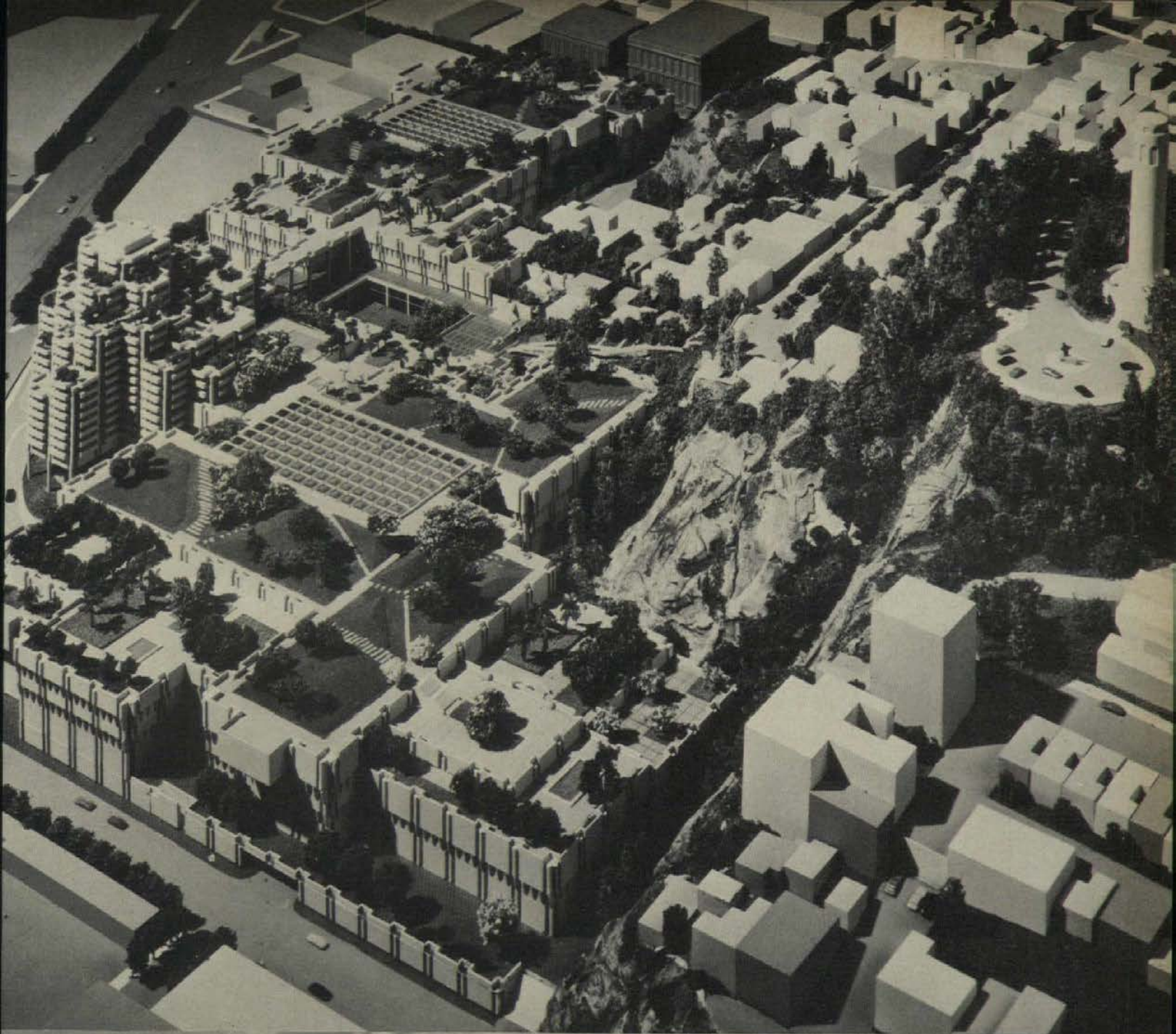
Market center as it would appear at base of Telegraph Hill. Grand Concourse is at upper left center.

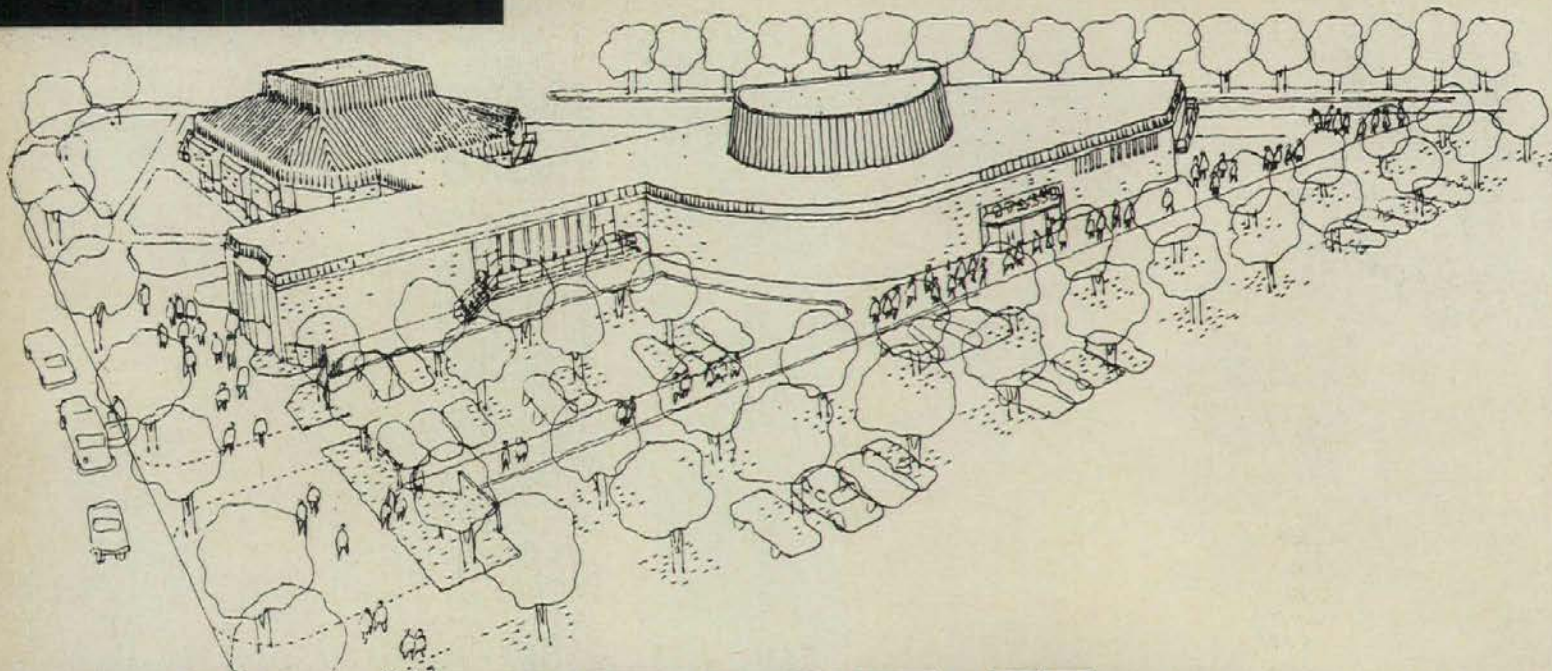
The most striking feature of the plan in its entirety, and most likely to attract and benefit the residents of the hill area, is the coordination of structures and topography, together with the maximal integration of a system of parks with the advantages of the existing landscape. Designers reportedly worked with a constant awareness of the physical proximity of Telegraph Hill; some structures, with their multiple levels, will work as an extension of the hill, relating to its small-scale dwellings, while others will stand away from the hill in deliberate counterpoint to it. The effect of a continuation of the hill's topography will be enhanced by 11.5 acres of rooftop parks, whose fountains and pools will reflect the Bay beyond, and which, seen from the city above, will give the appearance of an open landscape. In places, the hill actually flows directly onto the tops of buildings, and from some of the rooftop gardens, it is possible to reach out and touch the hill.

Before construction can begin, developers must await an approval of a variance in the city's building height law, which requires that structures on the east side of the hill not exceed 84 ft. All structures in the market center meet the requirement with the exception of the hotel, which would rise 160 ft. However, the many advantages, aside from aesthetic ones, that will accrue to the city if the center is built are likely to overcome any reluctance to approve a variation in present law. According to an Arthur D. Little, Inc. study made for the Department of City Planning in 1966, only 15,000 persons are employed throughout the entire waterfront, and in the territory comprising the site of the market center, warehouses nearly outnumber workers. The annual payroll for tenant firms in the new center would approximate \$50 million, and the center is expected to effect a change in the city's tax structure to the advantage of homeowners, in that real estate property taxes returned to the city would amount to a sum between \$2,500,000 and \$3 million annually. The project is funded privately, with the Travelers Insurance Company financing the acquisition and construction program on a participating basis up to \$51 million. If construction starts soon, the center should be open by 1970. — JP

Site Plan







ARENA STAGE II: New App

Washington's vital Arena Stage company has announced plans for a \$1,500,000 expansion program called "Stage II," which includes a second theater for the company.

Actually, "Stage II" might be termed "Stage 1½," since the focal new theater, designed by Chicago architect Harry Weese, adds a three-quarter stage to his original four-sided arena (pp. 124-132, FEBRUARY 1962 P/A). The total of Arena Stage's two theaters, however, in terms both of the growth in Washington's performing arts and of the progression in Harry Weese's architecture, will doubtless be greater than the sum of its parts.

Plans call for a three-level addition sharing and expanding the facilities of the present building and envisioned as "making of the two buildings an aesthetic, functional whole."

The first floor will include a 490-seat theatre with its separate glass-walled lobby and lounge, a scenery shop, property and costume room, greenroom, administrative offices, and a rehearsal hall that duplicates the size of the present arena stage, including its tunnels and trapped floor.

The second floor will contain a shallow balcony for the theatre, and administrative offices, studios, workrooms, classrooms, study and conference rooms, and a reception space. In the basement are dressing rooms and a greenroom, storage, toilet facilities, kitchen and service bar, and the "Old Vat Room," which will commemorate the company's former home in a brewery and will serve as a meeting ground for the company

and its 18,000 subscribers.

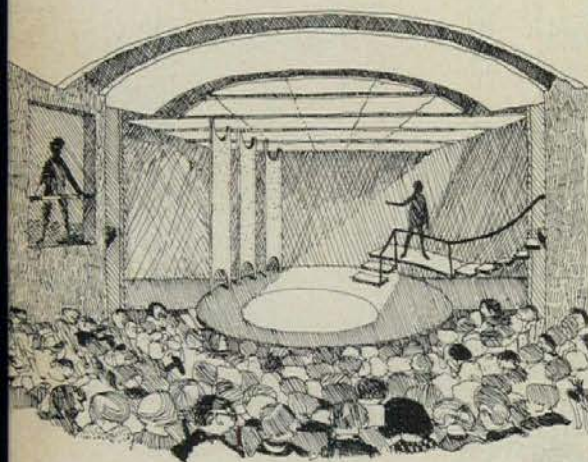
Announcement of an addition to a building does not often merit special notice, but so much has happened in architecture during the last six years that adding in an "open-ended" manner to a classical plan of linked rectangles, such as Weese's first increment for the Arena Stage, makes for a special problem.

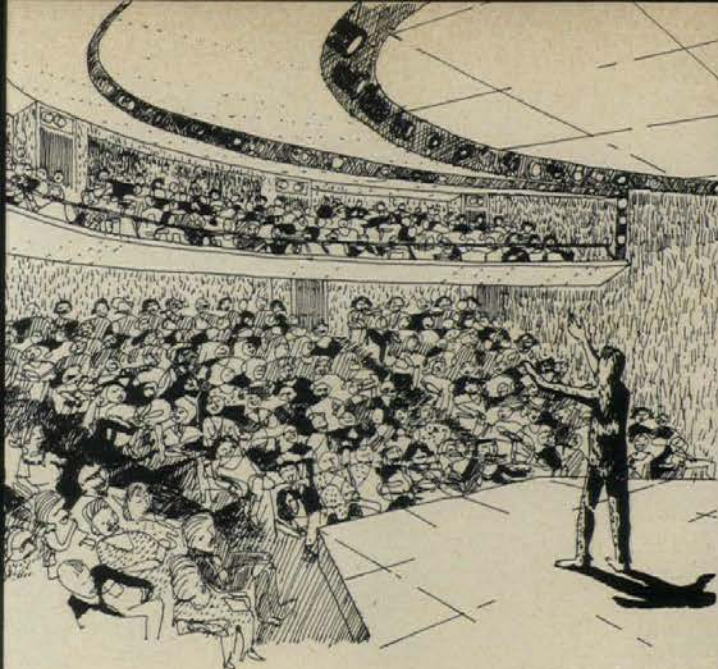
In this design, Weese shows that he has been stimulated by a current tendency toward ambiguity. The plan of Arena's Stage II looks a bit like a psychedelic squiggle. But it is based on a simple additive logic and an utter honesty of exterior forms expressing site conditions and interior functions.

To the west of the present administration block, the building will sprout a huge triangular form following the site limits and a semicircular bulge reflecting the auditorium interior. Semicircular wells on the perimeter of the auditorium will admit light and air to the basement-level dressing rooms and the greenroom. The addition gives a completely new impression to the plan of the present building.

Weese points out that a high-density apartment complex will rise to the north of the site and, since no one thereafter will be able to see Arena Stage as an entity again, it need not appear in the formal, volumetric manner as the first element.

Nevertheless, Stage II is a polite and respectful design in that it will maintain the roof height and the same exposed concrete, gray-buff face brick, and dark-gray painted sheet metal roofing as the present building.





roach for Weese

The structure will be of reinforced concrete, masonry bearing walls, and steel framing.

Inside, the new theatre will distribute its audience in 10 semicircular rows on the main floor and 5 rows in an overhanging balcony. The semicircular stage design has a false proscenium to hide a rigid asbestos fire curtain, both of which follow the perimeter of the curved stage. A grid over the rear acting area also steps forward to provide fly space over this semicircular stage, which is trapped.

Front-of-house lighting will be exposed on suspended catwalks and controlled from a booth at the rear of the balcony. Provisions are made for future installation of rear projection equipment. A musicians' gallery will be at balcony level on stage left.

The purpose of Arena's Stage II expansion is to increase the scope and efficiency of their present programs for experimental plays and children's theatre and for teaching both of stage production and of theatre techniques for classroom use.

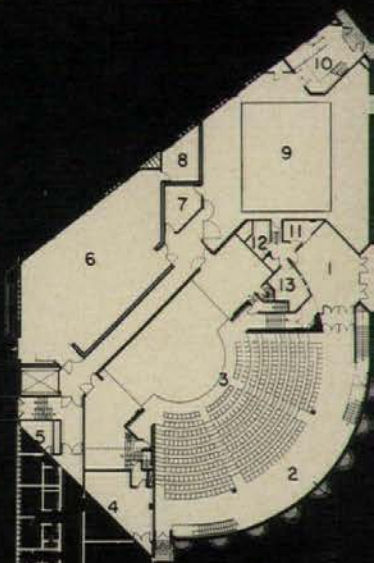
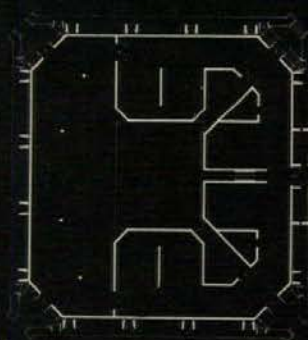
Ground breaking is scheduled for this spring, with opening of the theatre planned for the summer of 1969.

Funding for the \$1,500,000 program is dependent on the company's raising \$500,000 from public contribution. On this contingency, grants from foundations are already pledged up to \$1 million.

As campaign chairman William B. Wallace points out, "Every dollar contributed to Arena Stage is worth a \$3 gift." Similarly, the three-quarter arena adds up to a full Stage II, because of its growth and development potential for both the company and the community. — CRS

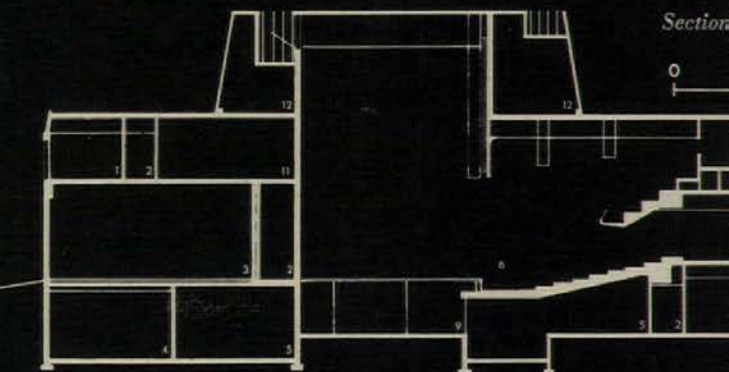
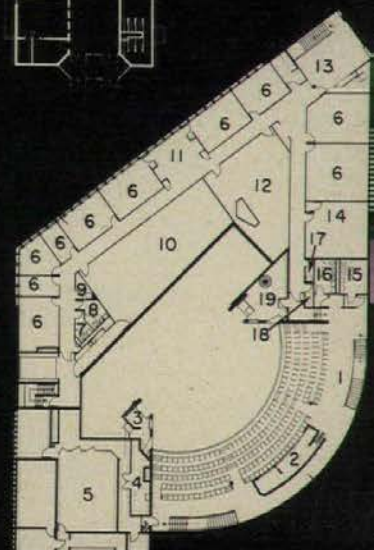
First Floor

- (1) lobby
- (2) lounge
- (3) auditorium
- (4) property and costume
- (5) existing dressing rooms
- (6) scenery setup room
- (7) green room
- (8) office
- (9) rehearsal room
- (10) lobby
- (11) coat room
- (12) house manager
- (13) box office



Second Floor

- (1) lounge
- (2) control room
- (3) gallery
- (4) storage
- (5) existing mechanical equipment
- (6) office
- (7) women
- (8) men
- (9) janitor
- (10) unassigned
- (11) secretaries
- (12) office workroom
- (13) reception
- (14) conference
- (15) women
- (16) men
- (17) janitor
- (18) storage
- (19) orchestra gallery

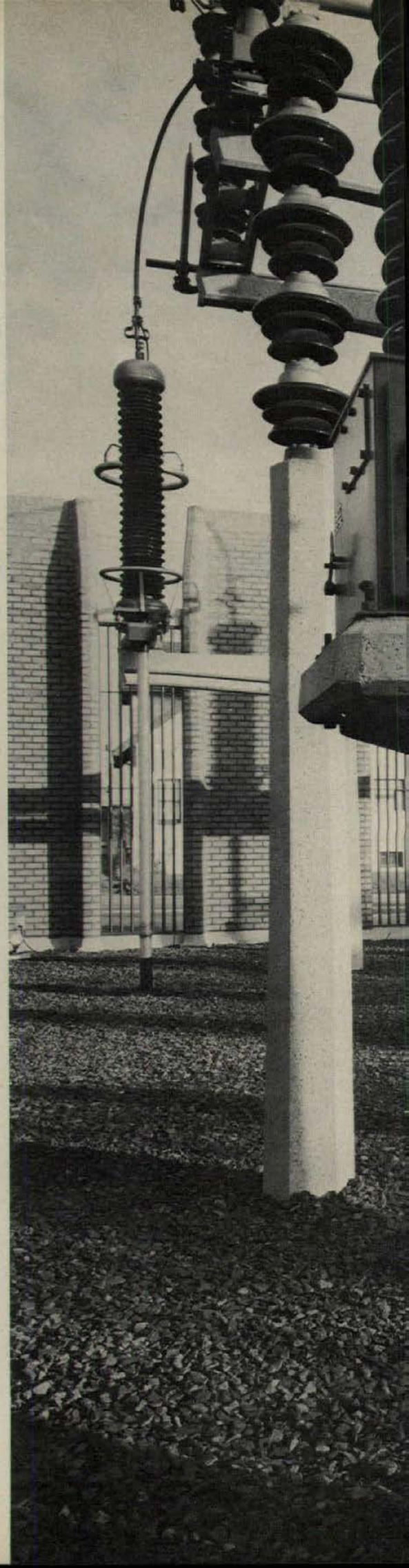


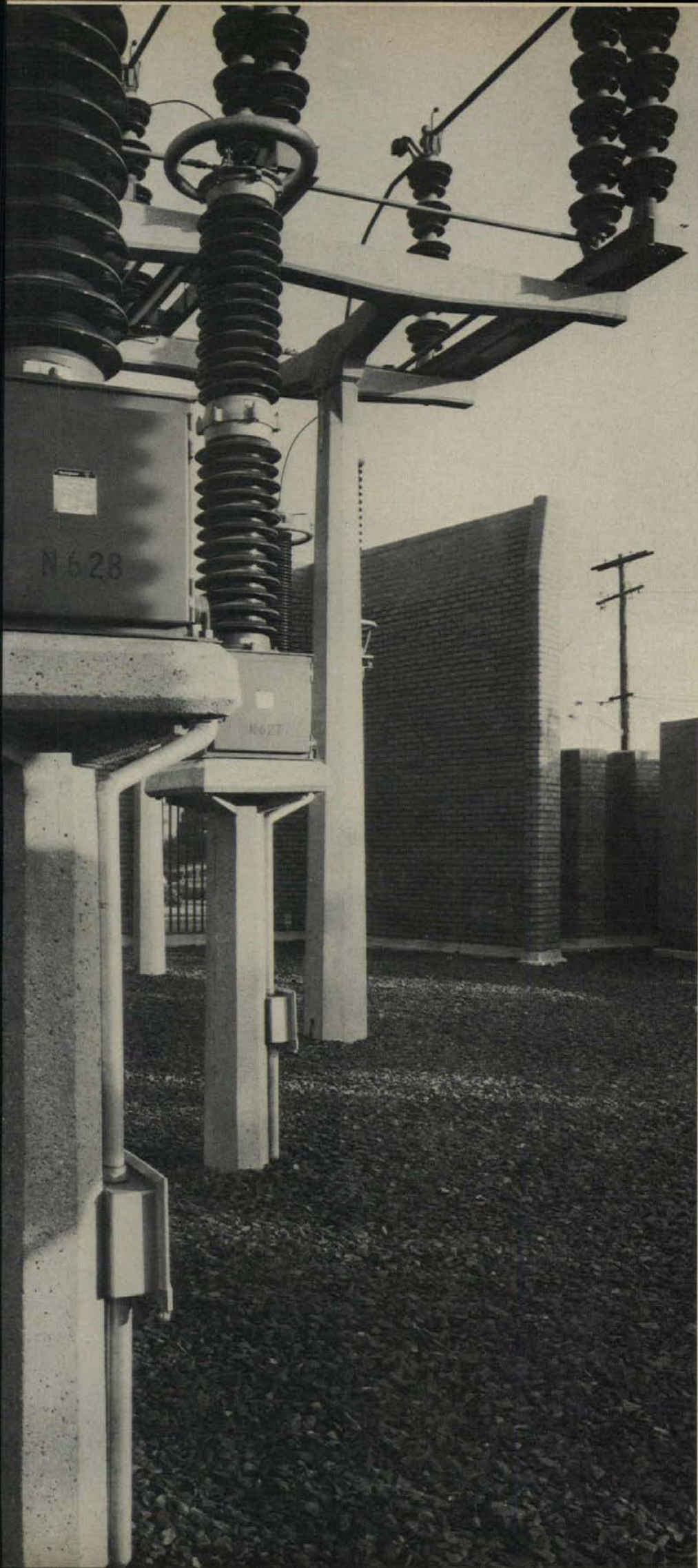
- (1) office
- (2) corridor
- (3) scenery setup room
- (4) old vat room
- (5) storage
- (6) auditorium
- (7) control
- (8) lounge
- (9) trap
- (10) green room
- (11) unassigned
- (12) fan room

BASSETTI'S



**ELECTRIC
CIRCUS**





While Consolidated Edison in New York is painting its smokestacks a different color and exclaiming, "See what a pretty boy am I!" a public utility 2500 miles away has quietly gone ahead and done something really constructive about the needed but usually offensive intrusion of the paraphernalia of power transmission on our cityscapes.

Seattle City Light (which, incidentally, really is a public utility, being owned by the people) decided, when planning its East Pine Street Substation, to abjure the usual hedge and shrubbery cover-up treatment and go for an architectural concept celebrating electricity, at the same time making a dramatic appearance for its multiracial, generally lower-income neighborhood of wood-frame houses and small community businesses. To this end, Fred Bassetti & Company was commissioned to "sing the body electric." What Bassetti came up with is not just a handsome architectonic fence to screen the equipment from the passing eye. It is, in effect, an electric park surrounded by a "corrugated" masonry wall pierced with bronze-grilled viewing ports and sporting a jaunty tower for visitors to oversee what goes on inside. There are landscaping and trees in the composition, to be sure, but they are in a supporting role to the architectural intent.

Inside the compound, the architect's influence does not cease. In place of the standard angle-iron towers supporting equipment, the Bassetti firm designed several configurations of precast concrete elements that emphasize what they do — support. The colorful insulators and copper conductors above are thus, in Bassetti's words, "clarified in their specific functions." For further show-off of what happens in the substation, the control building has a large glazed area so that dials, con-



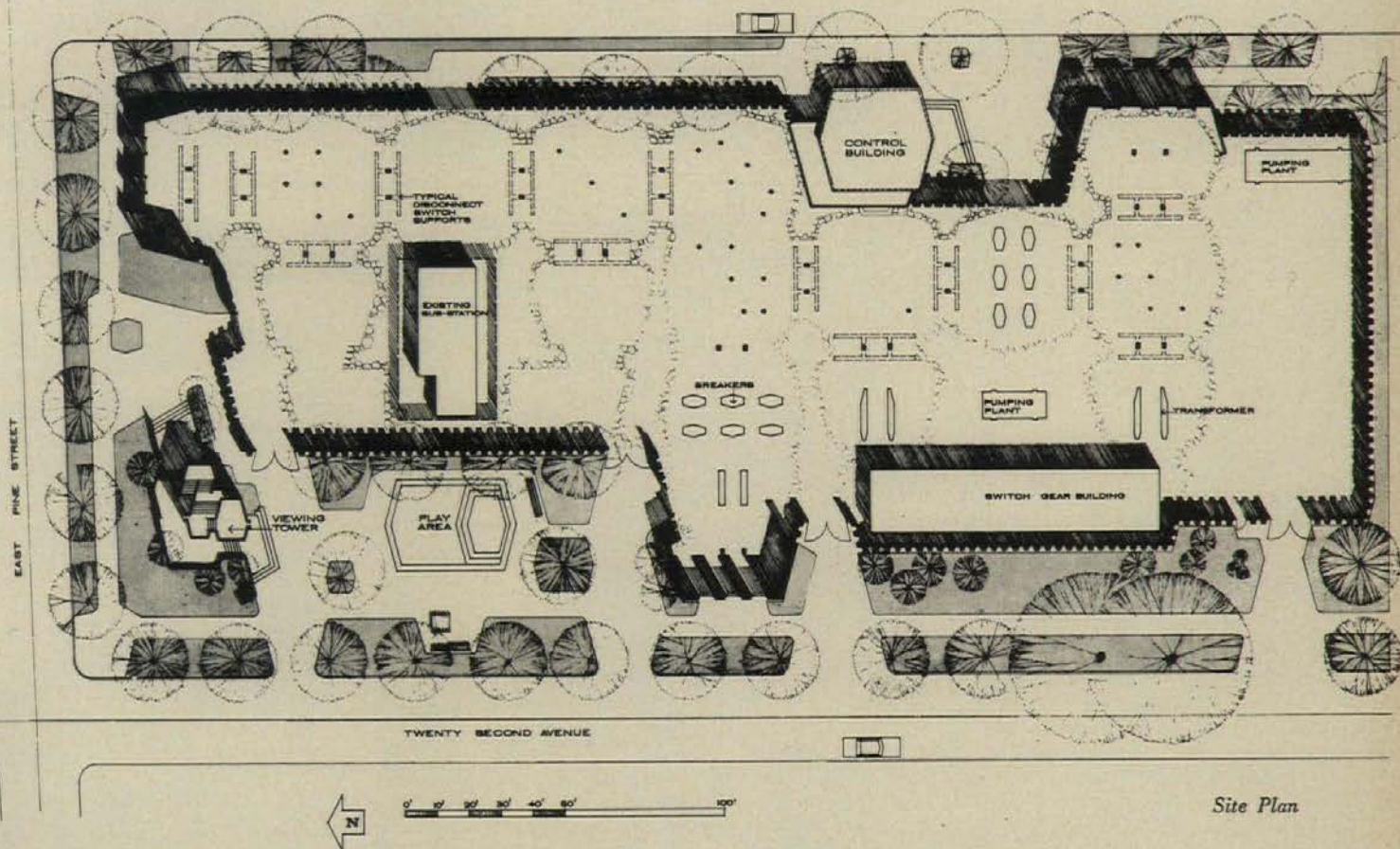
trols, and various operations can be seen from the sidewalk and the heavily traveled road at the east side of the site.

Since the enclosing envelope is basically just a brick wall, particular attention was given to its design. The corrugated arrangement of the wall in plan, according to the architect, "made it possible to use only one wythe of brick to get the necessary strength" (shades of Thomas Jefferson). Since the wall is to keep people, particularly children, away from dangerous equipment and not to protect the installation from the elements, it was possible to have the brick laid up with approximately 1-in. joints so that it can be "read" easily by passers-by. Other special brick designs included angled units

for some corners, and the architects also designed precast support bases with a pattern for the bricklayers to follow.

The observation tower — 16 ft high — not only affords interest for the casual visitor (it has a panel explaining the workings of the substation at its summit), but also acts as a tremendous plaything for neighborhood kids, who have been given their own castle to defend and to storm. There is a minuscule sidewalk park at the base of the "castle," complete with sand box (or "pit" for enemies of the castle to be cast into). Further along, the wall grows taller again, this time for a practical purpose: to protect the sensitive "pot heads" (not what you think; this is electrical in talk for the porcelain-

TWENTY THIRD AVENUE

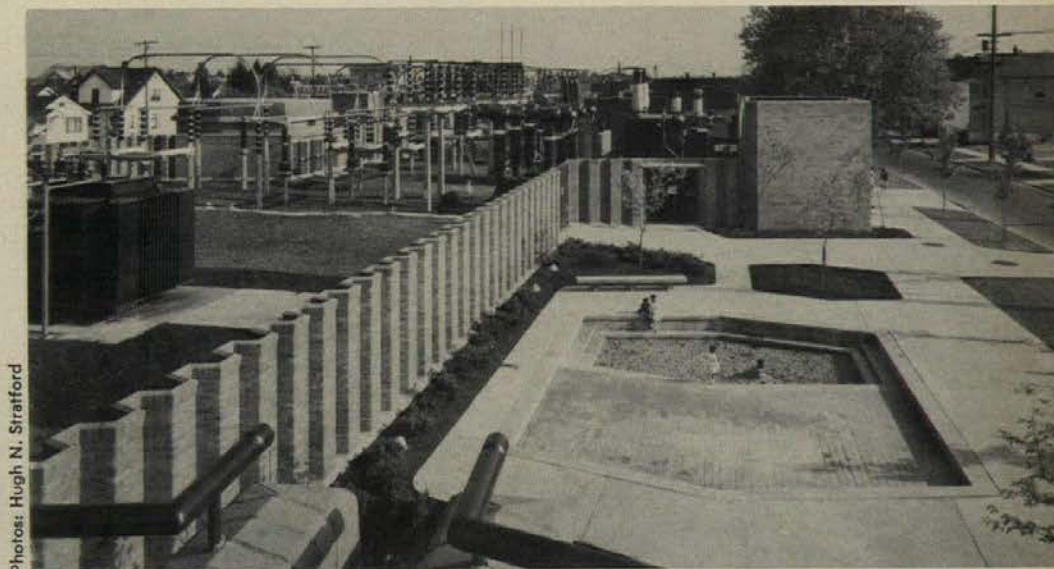


Site Plan

capped electrical parts that are most liable to injury).

The East Pine Street Substation is the first urban substation in the state of Washington to be supplied completely by high-voltage underground transmission, according to Bassetti (just half the capacity has been realized so far, although the basic, architectural structure is complete). It stands as a not-so-silent rebuke for other utilities that think they can get away with soft-soaping the clientele with a little paint and public relations.

Not so incidentally, Bassetti's splendid client was represented by Seattle City Light's Chief Engineer Herbert V. Strandberg, Chief Electrical Engineer Robert L. Skone, and Project Engineer Arthur L. Talbott.



Photos: Hugh N. Stratford

Down Under, Down Under . . . Or, HOW NOT TO BUILD UNDERGROUND

By Malcolm B. Wells, architect and conservationist of Cherry Hill, N.J.

The desert of central Australia is scorchingly hot, but it is among the most beautiful of all the beautiful places still left on this planet. Where man has not defiled it, it is pure visual delight: endless form and ever-changing color. But man—the bad (modern) kind of man—has already come to some parts of that desert and has begun to leave his inevitable scars.

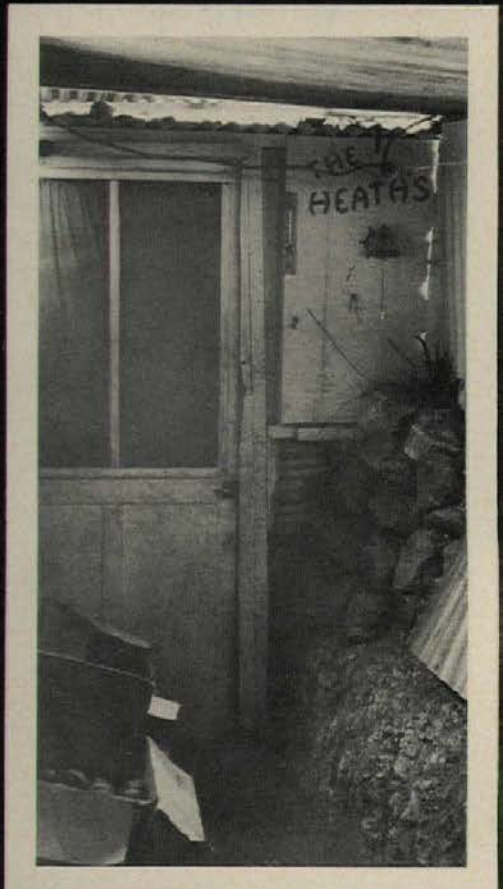
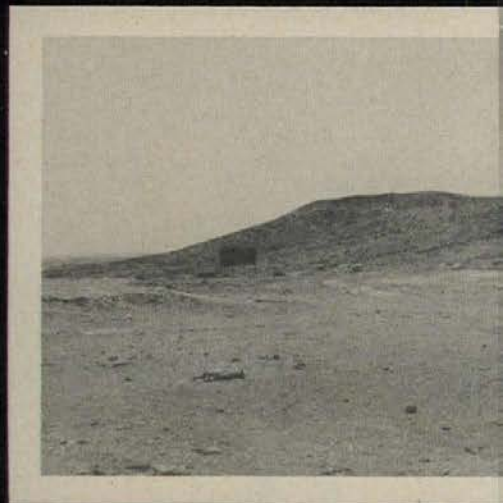
In a place called Cooper Pedy, a group of itinerant opal miners has built an underground town in order to escape the hostile climate. The town—if you can call it one—looks for all the world like a scene from "After the Bomb." Scattered along both sides of "Main Street," the barren track that stretches back toward civilization hundreds of miles away, is a series of low mounds studded with 20th-Century junk: old cars, drums, machinery, sheds, aerials, rubble and trash. A few tattered clothes flap disconsolately on a line. Now and then a child cries or an unseen bird calls. Nothing moves. The town has no government, no police, no schools, and no taxes, but about 100 miners and their families live there in earthen dugouts hidden away from the shimmering heat.

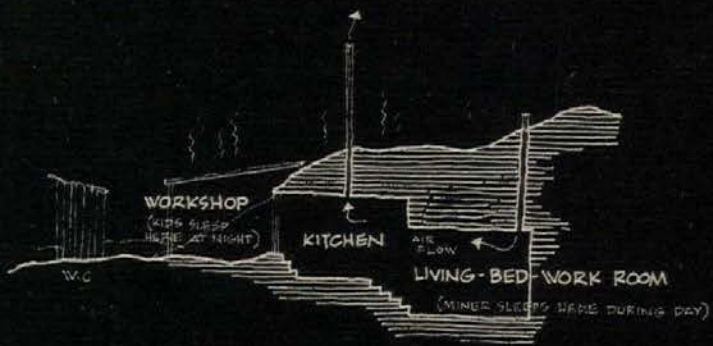
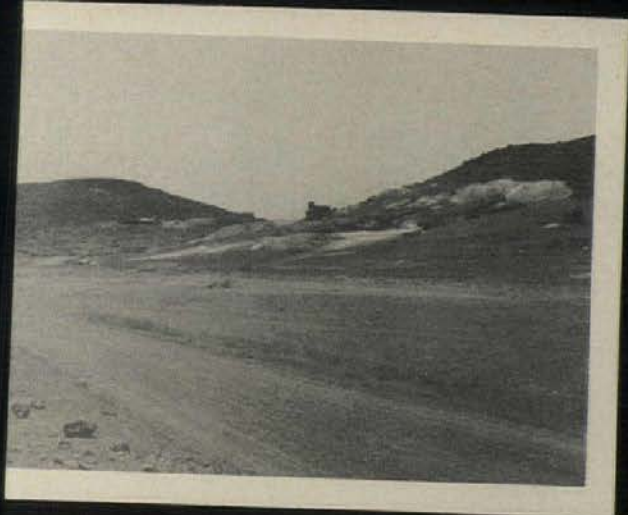
A typical day in the life of an opal miner begins at sundown, when he leaves for the mines some two or three miles away. There, in the cool of the desert night, he works until a few hours before dawn, returning home to sleep until noon. He sleeps in the "living room" of his dugout, a room kept cool by the sheltering earth and kept fresh by gravity ventilation. Afternoons at Cooper Pedy are spent in washing or cutting stones in the "kitchen," or in repairing equipment outside. Electrical power is provided by diesel genera-

tors or by windmills; water is trucked in over the desert in 44 gallon drums, refrigerators run on kerosene; and the privies squat above pits hacked 60 or 100 ft into the sandstone below. The "workshop," a metal-roofed shed outside most dugout entrances, is so hot by day that only the shortest chores can be done there, but after sunset the structure's low specific heat lets it cool off in a hurry, making it a delightful spot for rough work and for use as the children's bedroom. Thus, the modern cavemen of Australia take not only their wealth but their homes and comfort from the beautiful earth and leave her nothing but scars for her pains.

Each miner works and waits for the day when his little cache of gems will buy him five or ten years of retirement. Often, little more than a year's work is required for this. Then the home is abandoned, forgotten, in the rush to leave. Small wonder that little is done to improve the town. The cut-out-and-get-out philosophy so often associated with miners, loggers, and others who rob the land is all too clearly expressed at Cooper Pedy. No attempt is ever made to heal the raw earth-wound, nor does there seem to exist any feeling of gratitude to the land for its riches. "I got mine," is the old, familiar attitude. The beautiful earth is abandoned like a slut whose favors have been exhausted, leaving in Australia another reminder that will stand for years with all the other ghost towns of the world as the fruit of our man-centeredness.

For those of us who see underground construction as one of the valid ways of preserving some of the land until man learns to reduce his numbers, this faraway town in Australia is a sobering reminder that things can really go sour if we use the earth without a deep respect.





CROSS SECTION THROUGH TYPICAL HOUSE
COOPER TERY, AUSTRALIA



JUSTING TORIUMS USTICALLY

J. J. McGUINNESS

hor reviews some of
rs involved in design-
toriums used for more
e purpose. McGuin-
a practicing New York

iums are changing
times to accommodate
audiences, to adjust to
performance needs, and
ide greater protection
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cal perfection might be
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and different chambers
ama, symphony, opera,
comedy and other
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st collaboration between
cal producer, perform-
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tants. Periodic up-dat-
also essential for these
related professions. The
need was adequately met
recent two-day symposium
ew York City sponsored
e firm of Bolt, Beranek &
nan, Inc., a consulting
specializing in acoustics
theatre. The following
ments cover some of the
lights of the numerous
s discussed at this sym-
um.

Reverberation

iting our discussion to mu-
and speech, we find that

the classic "reverberation time" as midfrequencies (500-1000 cps) should be about 2 seconds for music and about 1 second for speech. In a 1-second space, music goes dead, and a 2-second space speech becomes muddled.

Early in this century, Sabine set up the formula

$$t = \frac{.05 V}{\sum sa} \text{ in which}$$

t = time, seconds

V = volume of chamber

$\sum sa$ = summation of the products of each area times its absorptive coefficient, e.g., Marble .01, velvet .59 (both approximate)

As simply interpreted, the reverberation time increases with the volume (V) and decreases with the softness and the amount of sound absorbing material (sa).

Multiuse auditoriums must now seat as many as 2000 to 3000 persons. As the volume thus increases, the hall be-

with baffles to achieve a smaller chamber volume.

■ Covering panels and other hard surfaces with soft materials of high absorptive value.

Building Sound Electronically

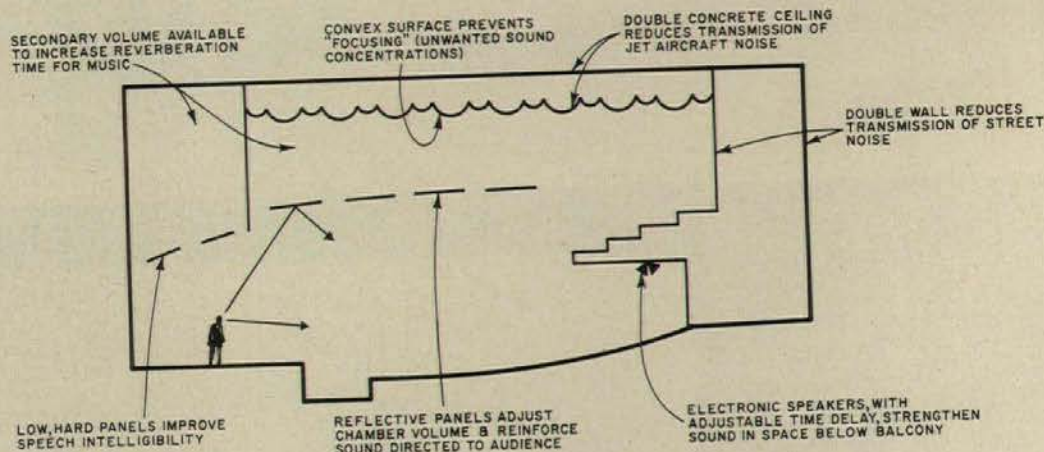
Until recently, performers have been largely opposed to electronic amplification, because of the poor fidelity, but with improvements, its use is increasing. This is fortunate, because with the greater volume and depth of halls, an unamplified voice, even when strengthened by hard, reflective panels, lacks sufficient strength.

Special problems also arise in the space below balconies. Former attempts to strengthen the voice electronically by instantaneous sound from a loudspeaker in the underbalcony area resulted in echoes. The sound from the loudspeakers was heard first and

adjacent loudspeakers. Otherwise, the echo sensed by the reception of sounds spaced more than one-fifteenth or one-tenth of a second apart prevents a clear understanding of the speaker's words. Adjustable time delay on signals to the local loudspeakers solves this.

Quietness

In a concert hall with the performers silent, the ambient sound should be no greater than slightly above the threshold of hearing. For purposes of specification, the criteria are expressed as single numbers that refer to "Noise Criterion (NC) Curves" given in terms of noise levels at given frequencies. In a concert hall, the criterion is NC-15 (about 15 db). Since a jet aircraft produces something in excess of 90 db, two heavy layers of masonry are needed to reduce this. Double walls similarly exclude street noises.



SCHEMATIC SECTION, MULTIUSE AUDITORIUM

comes easier to design for music, but could then be unsuitable for speech.

It is in this situation that adjustability becomes important. A music hall designed for the appropriate 2-second reverberation can be adjusted for speech by reducing its reverberation time to 1 second. This has been done by:

- Decreasing its volume by separating unwanted space

the second echoing sound wave of the speaker's own voice was received later after 100 or more feet of travel. An echo can destroy intelligibility as effectively as too long a reverberation time.

Optimal electronic strengthening at rear locations is correct when the sound is heard first as it comes from the platform and not more than one-fiftieth of a second later from

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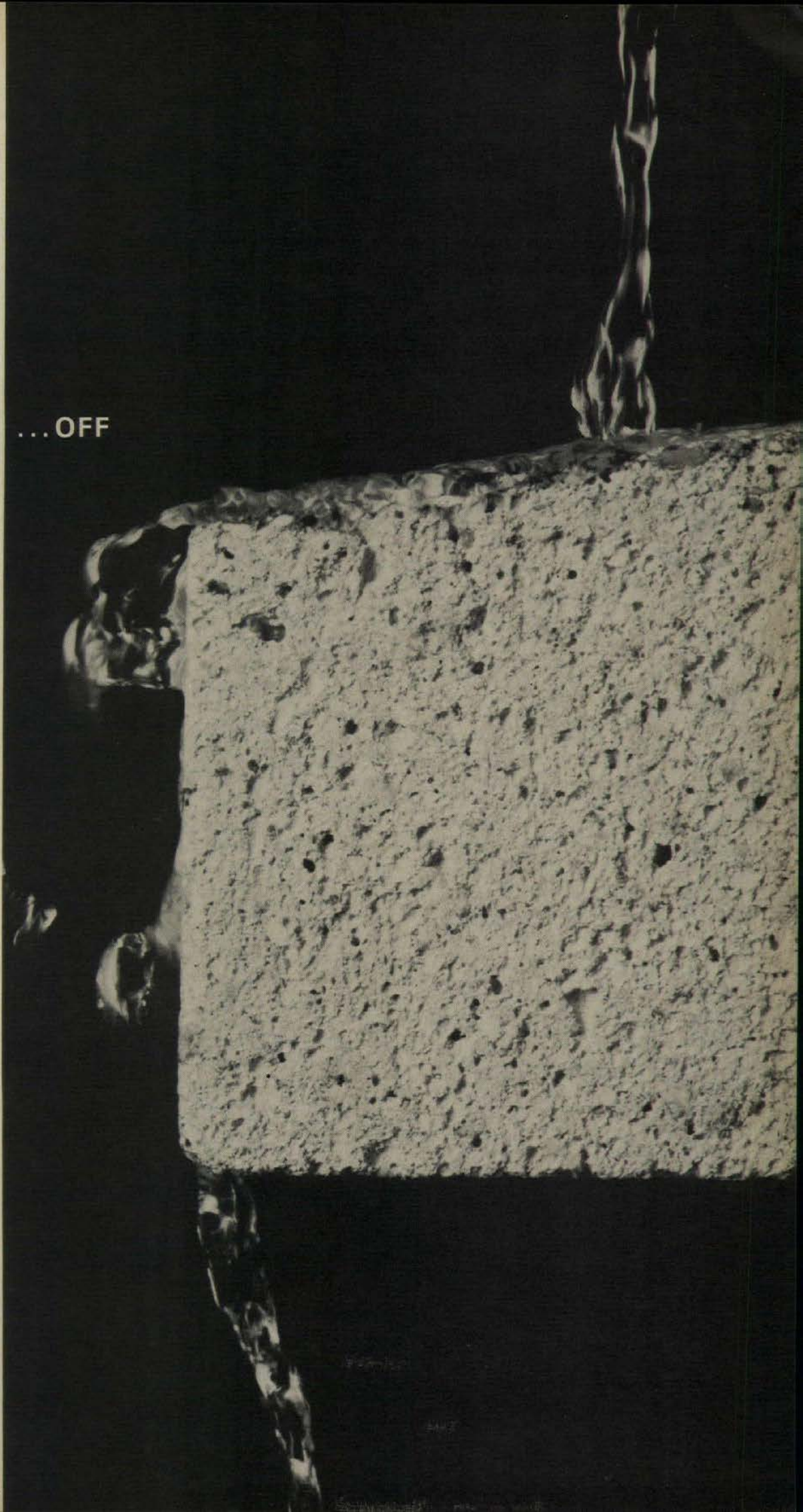
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REFERENCE STANDARDS

BY HAROLD J. ROSEN

A survey of organizations that write standards affecting construction. Rosen is Chief Specifications Writer for Skidmore, Owings & Merrill, New York City.

Architects and specifiers constantly make use of reference standards in specifications, but many professionals are completely unfamiliar with the processes by which these standards are developed and promulgated. Furthermore, many are not aware of the contribution they can make in participating in the development and improvement of these standards.

Standards provide several important benefits. They reduce the number of types, sizes, and qualities of materials. They standardize methods on testing, and several provide standards on the quality of workmanship.

One major benefit is the reduction in size of construction specifications. By incorporating a reference standard in a specification, the volume of words required to specify a material and the method of testing it is reduced one-hundredfold. This assures the specifier some degree of quality since the reference standard reflects the combined knowledge and experience of

the people engaged in its development.

Nevertheless, it is imperative that if the quality of reference standards is to be improved, there must be greater participation by users. This means affiliation of individuals and companies as members of associations producing standards. Practicing architects, engineers, and specifiers are particularly encouraged to participate, since their interests are more objective and less colored than individuals representing manufacturers and industry.

Generally, most committees producing standards are a balanced working group representing all the interests concerned with the particular standard. Typically, they are composed of manufacturers of the basic ingredients of the material, the manufacturers of the end product, suppliers, independent testing agencies, consumer groups, contractors' associations, representatives of public authorities, and others who have special interests in a particular standard.

The reference standard most widely used in the private sector of building construction is the ASTM standard. The American Society for Testing and Materials is an international, private, technical, scientific, and educational society devoted, in its words, to "the promotion of knowledge of the materials of engineering and the standardization of specifications and the methods of testing."

Since 1898, this organization has conducted research into the properties of materials, and has developed numerous standards concerned with the specifications for materials, methods of testing, and definitions. An index to ASTM standards and information on membership may be obtained from the society headquarters at 1916 Race Street, Philadelphia, Pa. 19103.

In the sector of public con-

struction, the reference standard that is mandatory for Federal agencies, and that is also used by state and municipal agencies, is the Federal Specification. Many of the Federal standards are also used in private work, especially for materials not presently covered by other standards organizations. The Federal Specification is promulgated by the General Services Administration, which establishes engineering practices. Copies of the Federal Specification Index may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Another widely used reference standard is the U.S.A. Standard, promulgated by the United States of America Standards Institute (formerly known as the American Standards Institute). In addition to developing standards on materials and testing procedures, many standards used in construction include workmanship and installation procedures. This standards body works closely with other technical societies engaged in developing standards, and many U.S.A. Standards bear corresponding ASTM, AASHTO, NGPA, and CS standards numbers. An index of U.S.A. standards may be obtained from the association at 10 E. 40th Street, New York, N.Y. 10016.

The American Concrete Institute is a nonpartisan organization that gathers and disseminates information about the properties and applications of concrete, and promulgates recommended practices referred to as ACI Standards. A catalog of publications of this institute is available from P.O. Box 4754, Redford Station, Detroit, Mich. 48219.

The National Fire Protection Association develops fire protection standards that are widely used as a basis for laws and ordinances. The more widely known standards used

in construction are the National Electrical Code and the Life Safety Code (formerly known as the Building Exits Code). Information on membership, technical committees, and NFPA Standards may be obtained from the Association at 60 Batterymarch Street, Boston, Mass.

The American Association of State Highway Officials publishes standards on highway materials in two parts, one dealing with specifications for materials and the second with methods of testing. These AASHTO standards may be obtained from this organization at 917 National Press Building, Washington, D.C.

Commercial Standards and Simplified Practice Recommendations are voluntary standards issued by the National Bureau of Standards and developed cooperatively with industry groups. CS (Commercial Standards) establish quality requirements for products and SPR (Simplified Practice Recommendations) establish size and classes for stock items.

The Bureau of Standards had decided to consolidate these two types of standards and to provide a new name, Product Standards (PS), to describe these new standards being developed. The list of standards may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.



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REVISED AIA CONTRACT FORMS

BY BERNARD TOMSON
AND NORMAN COPLAN

P/A's legal team discusses the care needed in using the AIA form documents, and cites the slow pace of modification of existing forms.

At various times over a period of almost 20 years, this column has analyzed and commented on the AIA form documents and upon the revisions that have been made in these documents at intervals through the years. It has always been our position that these forms serve a significant and important function, that they should not be used by rote, but rather adapted to the particular circumstances and factual situations involved. It has also been our position that forms can always be improved and that the profession should analyze and view these forms with a critical eye, with the objective of securing those changes that time and experience would dictate desirable.

A well-prepared contract should serve several functions: It should inform the contracting parties of their precise duties and obligations; it should define the manner of performance and establish standards for that performance; it should limit the area of potential future dispute and provide a procedure for the speedy determination of such disputes; it should be oriented to cover

the particular problems indigent to the construction project involved; and it should establish a basis for a healthy and cordial relationship between the parties. The use of the form contract or the need for modification or adaptation should be measured in terms of those objectives.

Changes to the forms, no matter how desirable, come slowly. For example, in commenting on the form AIA contract between owner and architect in the FEBRUARY 1948 P/A, we noted that this form did not adequately protect the compensation of the architect. We also suggested that a form contract should provide for periodic payments of the architect's fee not only during the construction stage of the architect's services, but also during the preliminary and working-drawing stages of his services. It was also pointed out that when an architect's fee is based upon the cost of the project, no clear-cut provision was made for establishing the base for periodic payments prior to the time actual cost was ascertained. Several years later, the AIA document was modified to correct both of these inadequacies.

In the same article, it was urged that a form contract between owner and architect should provide for a retainer fee payable at the time the agreement is signed. We stated:

"This is particularly advantageous since it guarantees a minimum fee and indicates to the client at the outset that the architect's time is valuable and that reimbursement is expected therefore—an elementary principle, but one very often overlooked."

In a subsequent article, we further urged that in order to avoid the architect financing the client, the retainer should be applied to the final payment for the architect's services. Thus the architect, if he received periodic or monthly

payments, and if he applied or credited the retainer to the last payment, would be at least even with the client in billing for his work.

In 1959, the AIA owner-architect forms were modified to include a provision for a retainer fee, but this provision was still inadequate. In commenting on this revision, we stated that some of the value of this provision is lost, since the retainer is to be applied against the first phase of the architect's services (schematic phase) rather than the final payment of the architect's fee. Further, no provision was made that the retainer would be the minimum compensation under the contract. This would be of particular importance if the owner should abandon the project and terminate the architect's services in a very early stage after utilizing a substantial amount of the architect's time.

In 1963, the forms were again modified to include a retainer provision, which did state that the client was to pay to the architect "a minimum preliminary payment of 5 per cent of the compensation for basic services, payable upon the execution of the agreement," and that such payment would constitute the "minimum payment under the agreement." Although an improvement, this provision still did not permit the application of such retainer to the final billing of the architect rather than the fee for the initial schematic design phase.

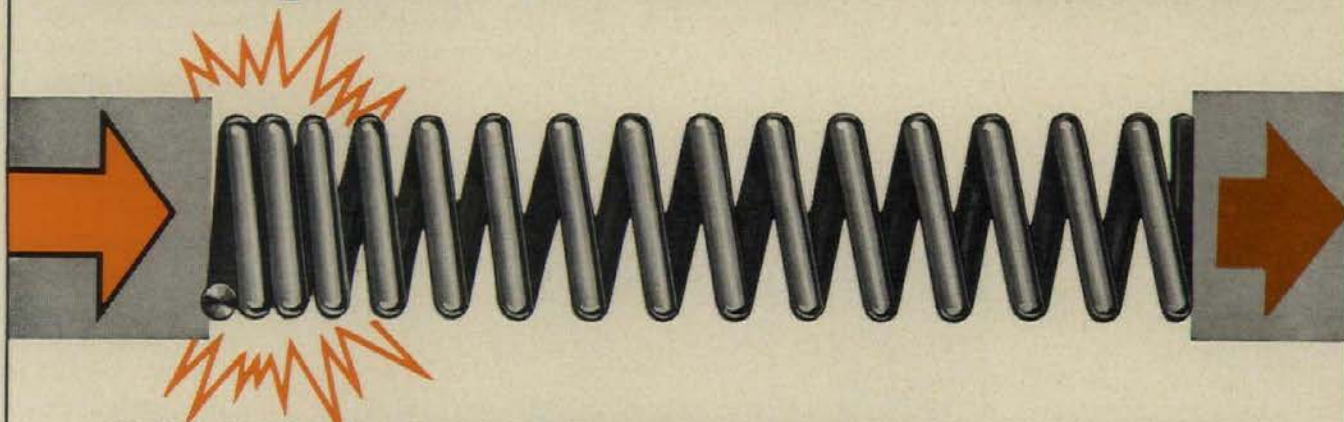
This concept was finally adopted in the latest edition of the "Standard Form of Agreement Between the Owner and Architect" issued in September 1966, at least in that form in which a fee is based upon a multiple of direct personnel expense (AIA Document B-321). This form sets forth the principle that the retainer will be applied to the last payments rather than

the first payments, stating, "An initial payment of — (\$—), payable upon the execution of this agreement, is the minimum payment and shall be credited to the owner's account at the time of final accounting."

However, this modification was not incorporated in the "Standard Forms of Agreement between Owner and Architect," also issued in 1966, which are based upon a percentage of construction cost (AIA Document B-331). It is not clear why such a provision would not be equally desirable for all owner-architect forms.

Those individuals and committees of the AIA who are responsible for the contract documents have diligently worked on these forms and have been continuously interested in their improvement. The result of this effort has been reflected in the substantial improvements in the forms over the years. Of necessity, however, change usually comes slowly, and even where a need is recognized, there may be a lag between such recognition and its reflection in a revision of a form document. Consequently, continuing caution must be exercised to use the forms only after analysis and a determination of what modifications are desirable for application to a particular project. There is also a continuing need for members of the architectural profession to press for modifications in the forms if their own experience indicates areas for improvement.

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MEASURING SPACE

BY ARCHIE KAPLAN

THE MEASURE OF MAN. By Henry Dreyfuss. Whitney Publications, Inc., 18 East 50 St., New York, N.Y., 1967. \$12.50. **DESIGNING FOR PEOPLE.** By Henry Dreyfuss. Grossman Publishers, 125A E. 19th St., New York, N.Y., 1967. Illus., \$3.95. The reviewer is head of his own firm, Environment Planning, Inc.

Anthropometrics, the science of the measure of man, can be a useful tool for architects. It has been receiving increasing attention as one of the "man" sciences that include the behavioral and social sciences. The questions to which this field addresses itself are, from an architectural point of view: How much space do people need and how do they move through space? The answers to human space requirements should be investigated on three levels: physical, psychological, and cultural.

Physically, we are dealing with a dynamic situation. Man is in constant motion. There are no static requirements. The architect's principal concern is kinematics, the human patterns of motion. These are patterns described through the motion of the limbs, not as mechanical mannequins, but as free, human, organic movements, and secondly, the pathway of

the total body in walking and movement.

Psychologically, movement is a sensory experience. The kinesthetic sense of muscles and joints relates our movement perception of the total world. As we walk through space, the kinesthetic and visual sense join to bring us to a greater awareness of space, because space is visually and kinesthetically determined.

Culturally, man's space requirements relate to his cultural background, status, and motivation. The physical distances he places between him-



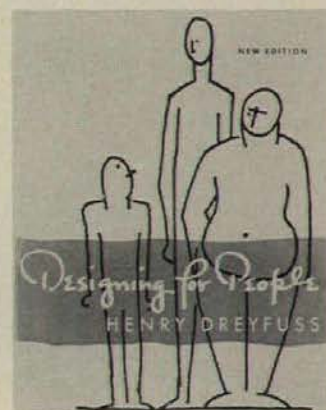
self and other people, his evaluation of minimal spaces, the use of space, and the manner in which he moves his body, are all culturally determined.

In *The Measure of Man*, Henry Dreyfuss gives us a handbook in the tradition of *Graphic Standards* and *Time Saver Standards*, a collection of data from multiple sources. As the architectural profession well understands, a handbook is as good as the reader and the prior comprehension he brings to the material. There are some 34 anthropometric charts prepared with statistical data. However, no back-up information is supplied for the sources of the data, the number of subjects measured, age categories, geographic area, or the date of the studies. The lack of this information limits our capacity to evaluate its usefulness.

As an example, a great deal of Dreyfuss' data, as with most

anthropometric data, comes from the military. This represents a select, pre-screened group of young men, 18 to 25, in good health and physical condition. The architect is faced with the problem of how to extrapolate from these charts anthropometric data for the population to be covered in his project.

The full-size wall mounting charts, and many of the smaller charts, represent the fiftieth percentile, the least-used category of human dimensions. The anthropometric principle of accommodation provides for



designing for the largest numbers of people (95 per cent of the population). The use of the commonly known average that approximates the fiftieth percentile usually provides for only half of the occupant population. The average is misleading. We usually accommodate to the largest or to the smallest people.

The architectural space standards are much like those in architectural standard books. Files are not 16 in. wide x 28 in. deep, average for planning purposes, but files are either 15 in. wide for letter, or 18 in. deep for legal; there is no average.

A new evaluation ought to be made for architectural space standards, in view of the growing concern with the effects on people of crowding and other emerging sociopsychological factors.

On reading through *The Measure of Man*, one could not

help feel that man is being dealt with mechanistically, as another nuts-bolts component in a system. All notes are for the static figure, and no allowance is made for the ever-in-motion character of man and his natural patterns of flow and motion, his psychological and cultural interaction with other people, and his psychophysiological requirements. Architects are concerned not with the minimal physical human requirements, but with the whole man.

The industrial designer is mainly hardware-oriented. He thinks in terms of things. Today, the architectural world, faced with the overwhelming problems of the cities and human life, is rejecting this orientation, and turning its attention to process—the processes of human activities in the context of the whole human being.

During the heyday of the independent design consultant, the 40's and the 50's (industrial design has since become a mostly corporate function), the industrial design giants wrote books about their work and personalities. In 1955, Henry Dreyfuss wrote *Designing for People*. Although it was only 12 years ago, the acceleration of technology and technique puts it in a by-gone era. Dreyfuss' thoughts, accomplishments, and philosophy are always of interest; his main idea is that design is either good or bad, there are no gray areas—and always the industrial designer to the rescue. The concluding chapter, added this year, is a projection of things to come. The hardware orientation is still very much present. He believes that people at the beginning of the 21st Century will have more and better convenience. But the concept of "conveniences" may very well change. How people will relate to these conveniences and

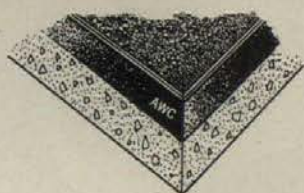
Continued on page 180



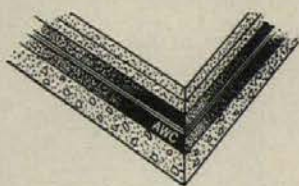
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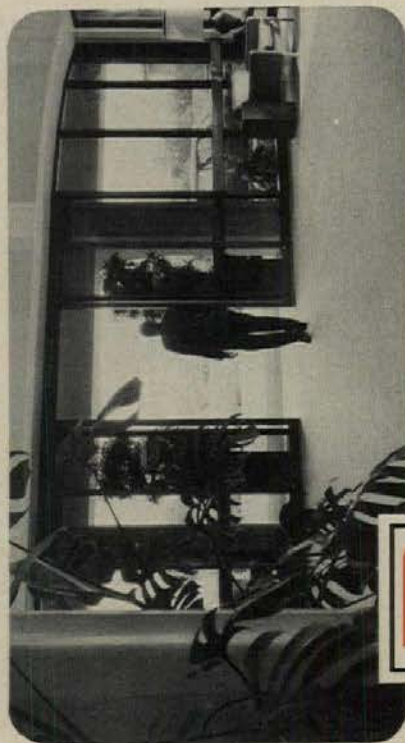
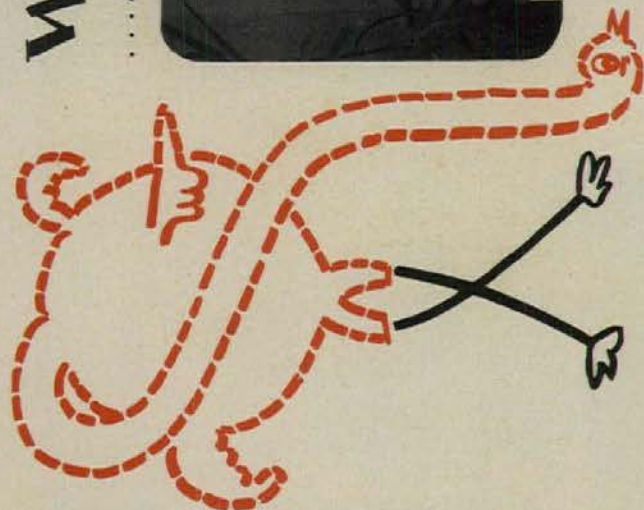


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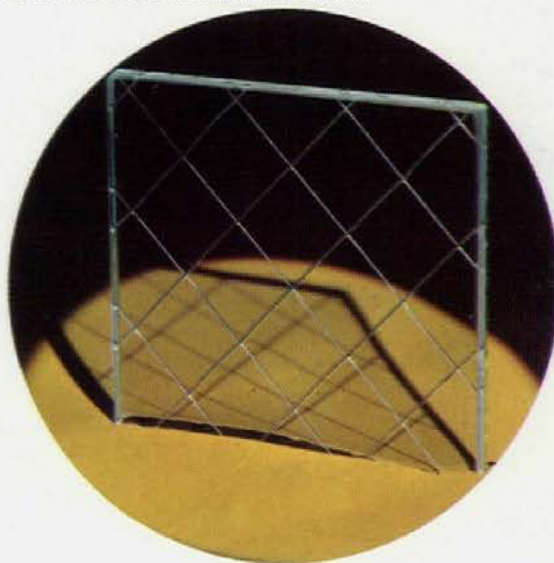
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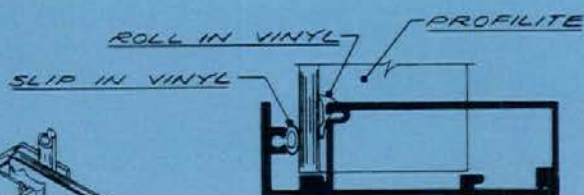


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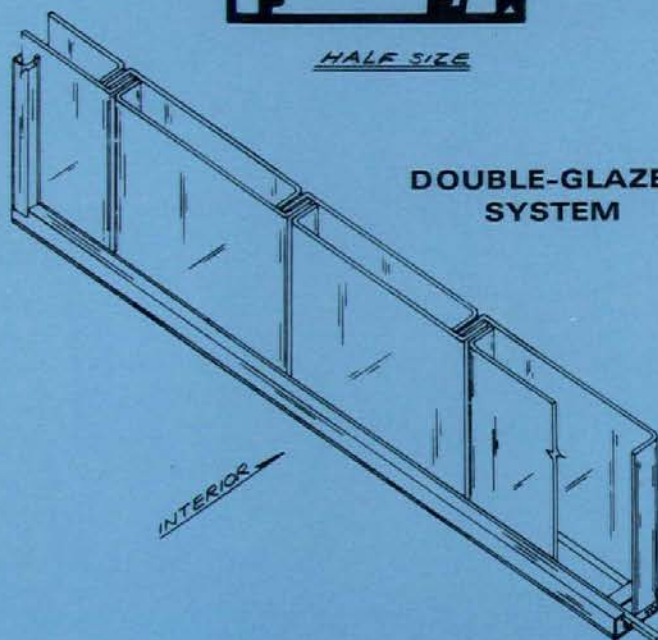
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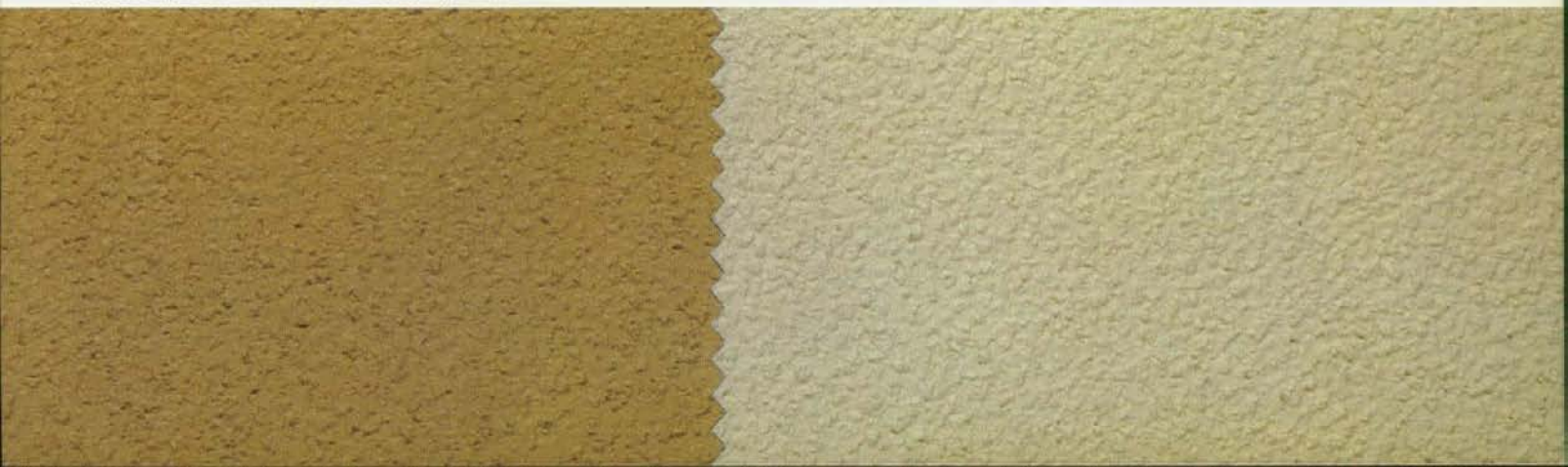
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Continued from page 172

how new conveniences will improve the quality of human life is not mentioned. But more is not necessarily better.

The Dreyfuss offices have been one of the first to consider human factors and anthropometric data for design, and this is amply documented in the second-mentioned book. He has created two abstract people, Joe and Josephine, against whom he measures all of his designs, but somehow he has failed to imbue them with any human qualities, and they remain mannequins.

The military and space programs have spent great quantities of money to in-

vestigate man in unusual environments. As a result, we have a Human Factors profession of some 1600 people, as indicated by the membership of the Human Factors Society. Some 30,000 documents have been published, not counting related publications from associated fields. The main concern of these investigations has been man-machine-environment interaction. The spin-off could be meaningful for the architectural profession. However, how to transmit and present this information to architects is still to be developed. It is much to Dreyfuss' credit that he has long recognized the value of human factors.

Squinting Through the Concrete

BY JEFFREY ELLIS ARONIN

SUN PROTECTION: AN INTERNATIONAL ARCHITECTURAL SURVEY. Ernst Danz, Frederick A. Praeger, 111 Fourth Ave., New York, N.Y., 1967. 150 pp., illus., \$13.50. The reviewer is an architect practicing in New York City and the author of *Climate and Architecture*.

This book took me 48 minutes to read—the train time from my New York office to my Long Island home. I read the complete text, which is in parallel paragraphs of German, English, and Spanish. If it did not already have a title, it could have passed as a volume on the work of Skidmore, Owings & Merrill, since about 25 of their projects are mentioned. But this is very understandable, in that the German author's previous book was on SOM. Hence, Le Corbusier, who pioneered *brise soleil* devices, is mentioned on only four pages, while Neutra has two, and Saarinen, Tange, Stone, Jacobsen, Noyes, each are given only one.

By and large, it is a picture book of different sunshading devices. It starts with trees, continues with projecting roofs, projecting floor slabs, the loadbearing skin of a building, shades, louvers, blinds, glass and screens. It is not a how-to-do-it book. It is merely, as the subtitle denotes, an "international architectural survey." Although the philosophy is excellent, it is not comprehensive. There are few details that show methods of construction.

Most of the pictures are of building exteriors, whereas in the case of sun protection it would seem that interior shots would be more useful. Two of the subjects glossed over are the effect of color and the materials used in sun-protection devices. The method of orienting a building to obtain the desired results is scarcely mentioned. Nor do the examples illustrate the necessity of treating different façades in different ways resulting from the various forces exerted upon them.

In other words, the examples do not emphasize the correct lessons for a student. An experienced architect, however, might find something in the book to enrich his vocabulary of architectural forms for sun protection.

Malice in Blunderland

BY EDWARD K. CARPENTER

THE SYDNEY OPERA HOUSE AFFAIR. By Michael Baume. Thomas Nelson Ltd.,

Continued on page 188

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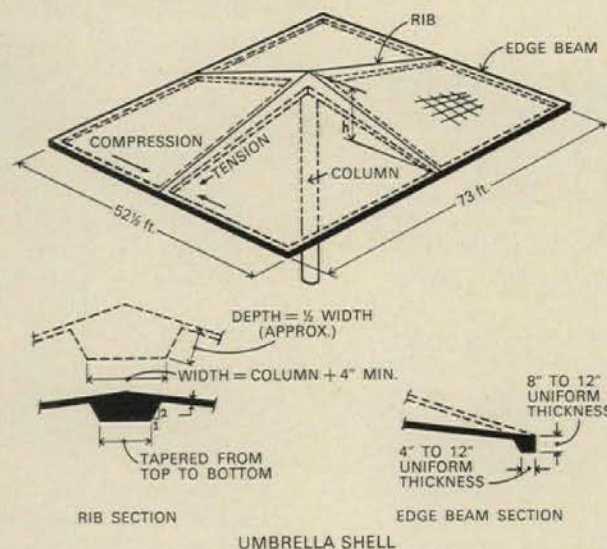
Throughout the plant complex attractive concrete treatments and structural systems are in evidence.

Of particular note is the HP umbrella shell system that roofs the distribution warehouse area. Here again, an important cleanliness contribution is made by the concrete surface of the shell ceiling. And the shell system with its widely spaced columns provides more uncluttered, usable storage space. Only concrete could offer the long spans of shell construction combined with freedom from dust-catching projections.

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188 Book Reviews

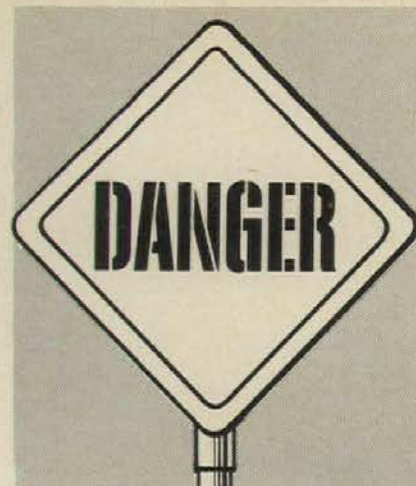
Continued from page 180
597 Little Collins Street, Melbourne,
1967. 174 pages. UTZON AND THE SYDNEY
OPERA HOUSE. Editor: Elias DuekCohen,
Morgan Publications, 104 Bathurst Street,
Sydney. 1967. 128 pages. \$1.20. The re-
viewer is an associate editor of P/A.

The Sydney Opera House debacle looms just a little larger than life. It has everything to titillate the imagination of a practicing architect, with none of the preaching Ayn Rand would bring to the story if she had made it up. And she might have. Joern Utzon is Every Architect — still unrecognized, waiting for the big break. His struggles with an irascible client and the vagaries of politics become legendary as he fights significant odds, for nine years, never yielding to pressures. Finally, when he walks off the job, still unyielding, he is the martyred hero, striking a note of independence Every Architect secretly longs for. If such an interpretation explains the appeal of the Utzon saga, it does not explain what really went on during the design of the Sydney Opera House. Both books are an attempt to fill the void. Neither wholly succeeds.

Neither book includes a description of how Utzon got the commission in the first place. One currently circulating story has it that Eero Saarinen, a juror for the opera house competition, showed up late for the judging. The other judges, who had started without him, had narrowed the field down to a few finalists. Looking through the selections, Saarinen saw nothing that fired his enthusiasm; then, turning to the rejects, he came across Utzon's soaring sail-shaped roofs. "Here is the winner," Saarinen is said to have announced and proceeded to talk the other jurors into it. Utzon's design had originally been discarded because it failed to conform with the contest rules. His disregard for rules was to become even more obvious in the next few years.

In the *Sydney Opera House Affair*, the more impartial and better of the two books, blame for Utzon's departure, and the hardships of ballooning costs and tempers that preceded it, are equally distributed. Both the title and the jacket design (shadowy green shapes of the opera house against a dark blue background) hint that the book is a mystery story. And in a way it is. But in his slow, careful unraveling of events in the wild scramble to give Sydney a concert hall, author Michael Baume omits what is the key to any good mystery and what is probably the key to this one: the personalities involved. Although

Continued on page 196



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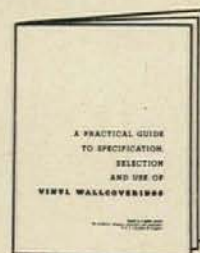
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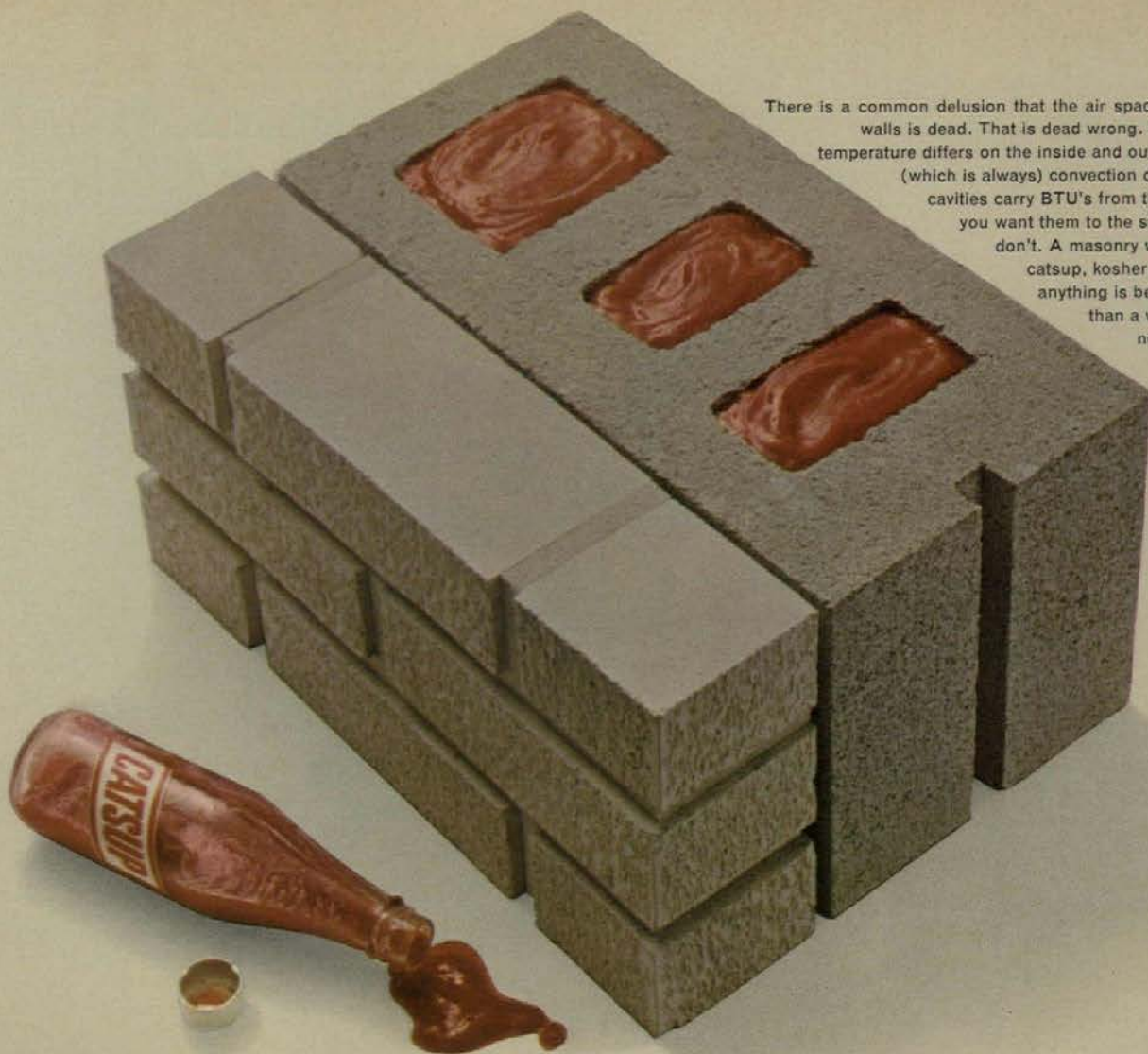
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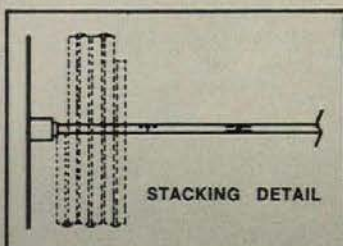
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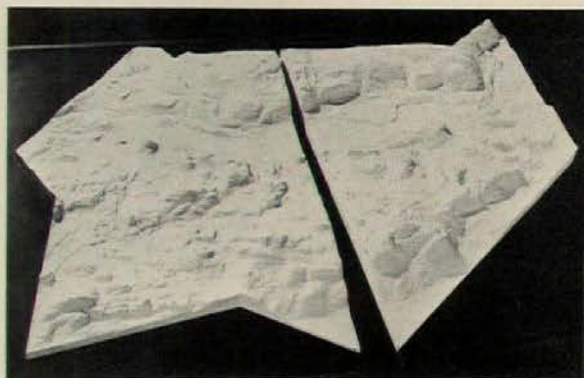


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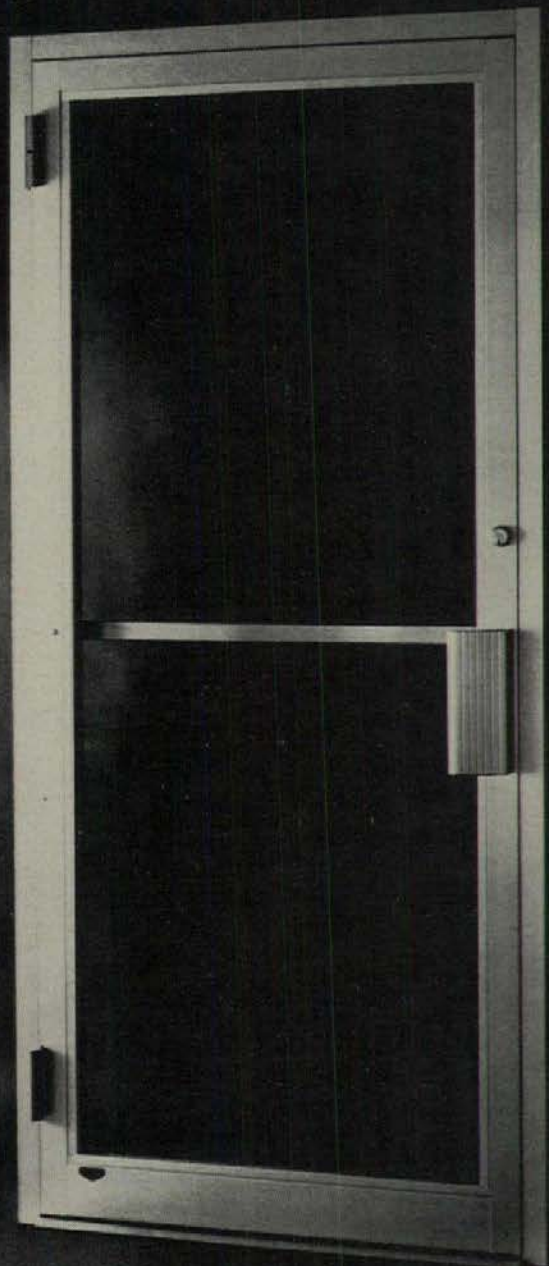
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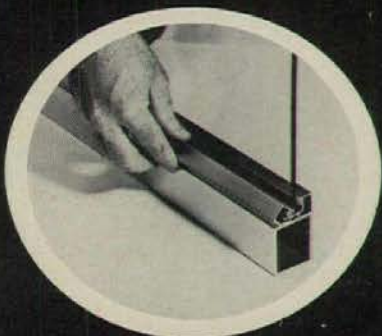


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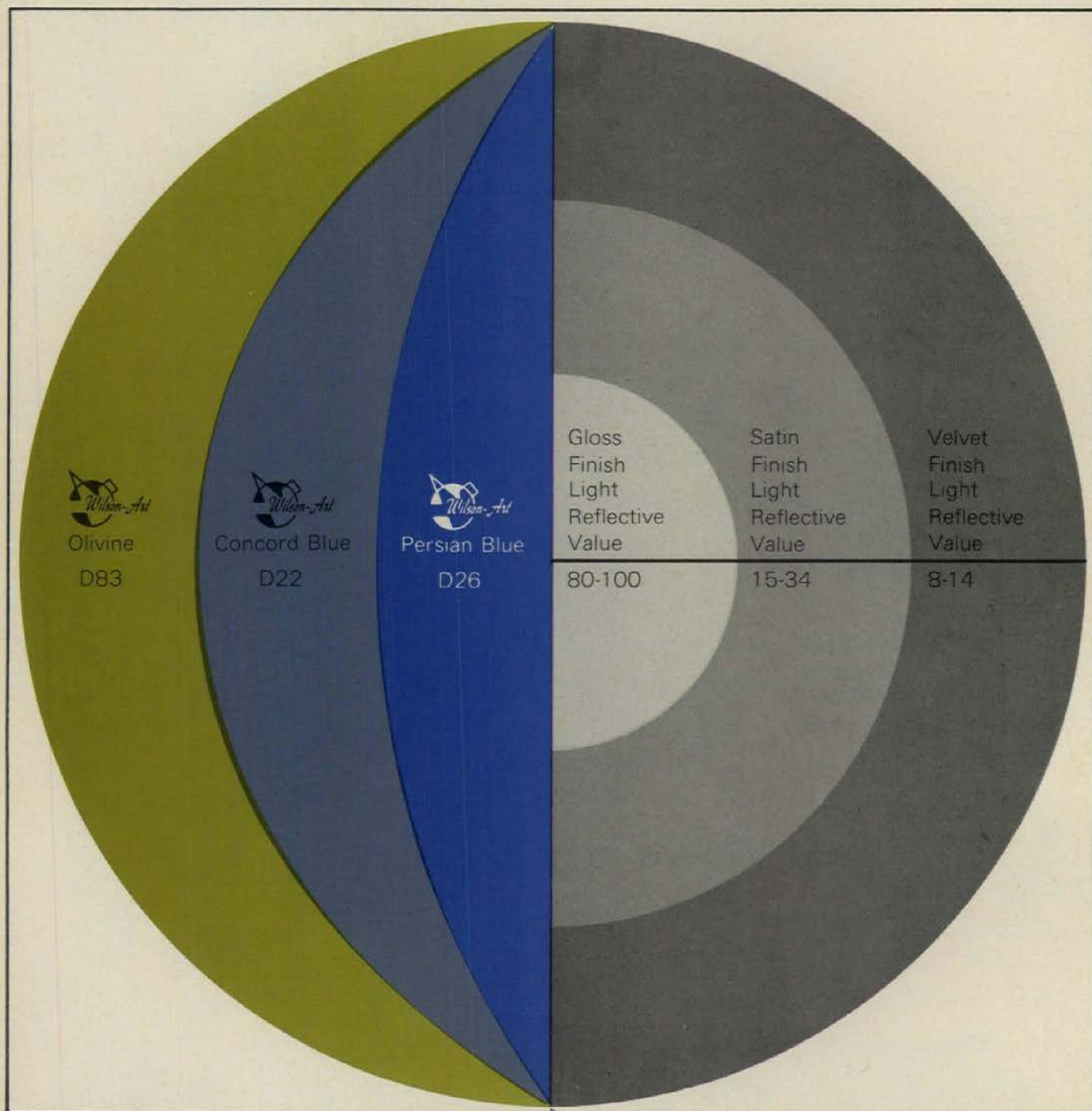


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Q. What are the finishes and characteristics?

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Continued from page 188

one gets to know the players through their actions, one is left to guess their motivations, and at the end of it all one still wonders what the real reasons were for Utzon's leaving the job. One suspects, having read the chronicle of his nine years of agony, that he simply got fed up with the whole thing. You can hardly blame him. But obviously Utzon's personality is as complicated as his unfinished design for the opera house, and the full unraveling of the emotions and rationale that led to his departure from Sydney are going to have to await another examiner.

I suspect that a purist would classify *The Sydney Opera House Affair* as a horror story, despite Michael Baume's insistence that it is a tragedy. Utzon is said to have called the whole affair privately "Malice in Blunderland." The horror is in the political maneuvering that led to foundations being built before working drawings of what they would support were ready. Horrible are the escalating costs as Utzon took false starts towards a finished design. Horror lurks in the realization that here is the ultimate struggle between man and petty events. The men are losers, and although the opera house will be finished eventually, the men who wanted it and the men who are finishing it will be blamed if it turns out badly and will be ignored and forgotten if it turns out well. What will be remembered, briefly, is the affair.

Utzon and the Sydney Opera House purports to be a "Statement in the Public Interest." Its interest is in defending Utzon, and it does so with a spritely array of cartoons and drawings that the affair has engendered. It succeeds only in putting a patina of make-up on a rapidly aging subject.

BOOK NOTES

Architectural Essays From the Chicago School: from 1900 to 1909. Wilbert R. Hasbrouck, Editor. The Prairie School Press, 117 Fir Street, Park Forest, Ill. 60466. 20 pages, 2 foldouts, many illustrations.

The publishers of the *Prairie School Review* have put out an anthology of writings by Frank Lloyd Wright, Jens Jensen, and Thomas Tallmadge, with two reproductions by Sullivan for an amusement park near Philadelphia, and other material.

Architecture in Michigan: A Representative Photographic Survey. Wayne Andrews. Wayne State University, Detroit, Mich., 1967. \$6.95 cloth, \$2.95 paper.

After a brief introduction, this book presents nearly 100 representative examples of Michigan architecture from 1837 to 1966. Two-thirds are of the 20th Century, with much emphasis on Frank Lloyd Wright, Albert Kahn, and both Saarinens.

A Guide to Finnish Architecture. J. M. Richards. Frederick A. Praeger, 111 Fourth Ave., New York, N.Y., 1967. 287 pages, illus., \$10.

A rather plodding but detailed and factual account of the architecture of Finland: the famous medieval churches, the famous modern housing, and what happened in between.

Landmark Architecture of Allegheny County Pennsylvania. James D. Van Trump and Arthur P. Ziegler, Jr. Pittsburgh History and Landmarks Foundation, 906 Benedum-Trees Building, Pittsburgh, Pa. 15222. 1967. 294 pages, illus., \$8.50.

Although the photographs are not glamorous, this survey of architecture in the Pittsburgh region is a handy, factual guide of the sort that every urban area should have. It begins with essays by the authors on the need for preservation efforts, the impressions gathered on the survey, and the historical architecture and best-known architects of the region. It then goes on to specific districts and specific buildings, in the latter instance giving the names, addresses, architect, date, style, and type of construction or major materials, and condition of each.

Palladio. James S. Ackerman. Penguin Books, 39 West 55th St., New York, N.Y., 1966. 195 pages, illus., \$2.25.

A good but spare account of the life, works, and influence of one of history's most admired and most despised architects.

NOTICES

New Branch Offices

DESMOND-MIREMONT & ASSOCIATES, Architects, Hammond, La., have opened an additional office at 703-705 Laurel St., Baton Rouge, La.

HAMMEL GREEN & ABRAMSON, Architects and Engineers, St. Paul, Minn., have opened a new office at 329 Park Ave., S., New York, N.Y. 10010. RONALD W. HAASE is partner-in-charge of the new office.

JONES & MOCENSEN, Architects and Planners, announce the opening of a branch office at 601 Plandome Rd., Manhasset, N.Y.

New Addresses

STANLEY M. BRENT & ASSOCIATES, Architects, 11950 San Vicente Blvd., Los Angeles, Calif.

DAVID HIAT, Consulting Engineer, 112 W. 42 St., New York, N.Y. 10036.

GALE A. HILL, Architect, 11901 Olive Blvd., St. Louis, Mo. 63141.

IRA KESSLER & ASSOCIATES, Architects, 135 E. 44 St., New York, N.Y.

A.M. KINNEY ASSOCIATES, INC., Architects and Engineers, 4747 Dempster St., Skokie, Ill. 60076.

ALBERT C. MARTIN & ASSOCIATES, Architects, 445 Figueroa St., Los Angeles, Calif.

MULLER, LONDON & SNYDER, Architects, 155 E. State St., Westport, Conn. 06880.

Continued on page 205

On Readers' Service Card, Circle No. 397



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There's an evolution in the kitchen





E. J. Dalton Youth Center, Rockton, Illinois. Harold Diehl, Architect

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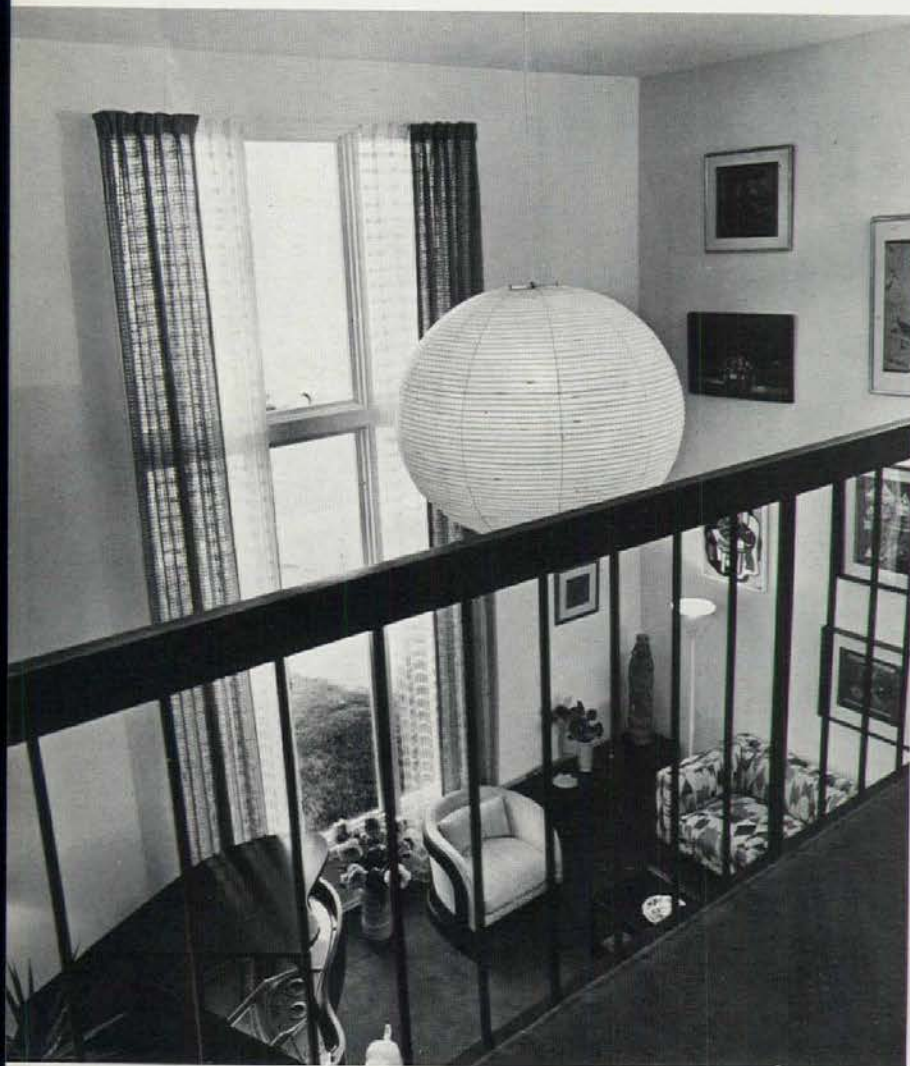
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Dry-film finishes, the microthin miracles

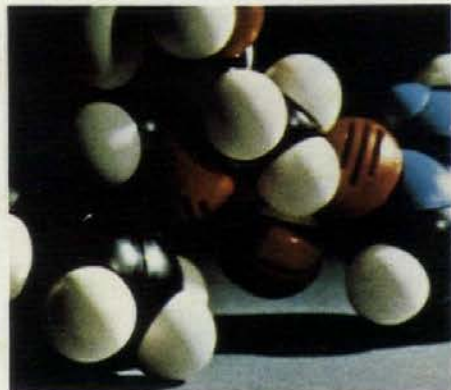
It's not hard to believe that modern chemistry can produce microthin plastic films tougher than any paint. But it is rather hard to believe that a polyester film can be produced that is more than twice as resistant to rubbing wear as high-pressure laminate—and that a polyvinyl fluoride can be unsurpassed in stain resistance. Yet these are facts.

Molecules used as building units.

In both polyester and polyvinyl fluoride films, the process of extruding the film arranges the molecules in a definite structural order. And that is the secret of the microthin miracles.

If you applied the same material in liquid form, the molecules would be randomly placed and you would get no better wear-resistance than with paint. Essentially, this is the difference between a pile of bricks and a brick wall.

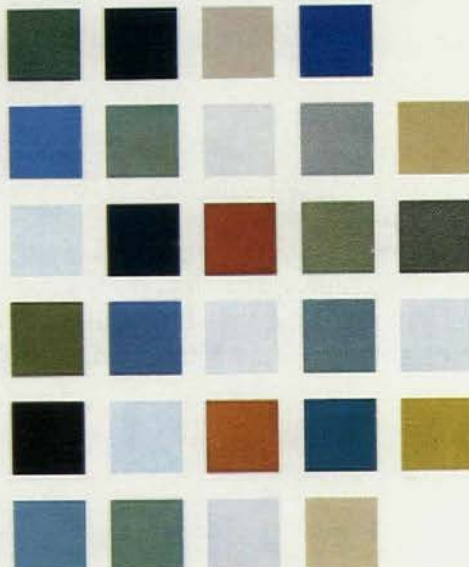
This physical structure has another important advantage. Preformed films have fewer surface flaws to collect dirt and stains or



increase the action of solvents and acids. So these films are exceptionally easy to clean—soap and water is usually enough. They are also highly resistant to most common staining agents, alcohol and germicidal detergents. As a result, maintenance costs are significantly reduced.

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Clear films allow wood grain to show perfectly—revealing the natural beauty of fine hardwood. They also protect hardwoods in high-wear locations. For interior applications U. S. Plywood supplies



hardwood paneling, doors and partition panels with Permagard®, which is our trademarked name for plywood surfaced with clear films. These products are recommended for use in high traffic areas of dormitories, hospitals, schools, motels and the like.

U. S. Plywood also makes solid-colored paneling and doors surfaced with Permacolor®. The outer layer of Permacolor is a clear 1/2-mil film of polyvinyl fluoride laminated to an 8-mil film of colored polyvinyl chloride. This overlay gives a lightly embossed colorfast finish which is highly wear-resistant and easy to clean. Permacolor is available in 28 colors.

For exterior applications U.S. Plywood also surfaces doors, panels and siding with a 2-mil opaque, pigmented film of polyvinyl fluoride. This coating on doors and panels is called Vigilar®; on siding,

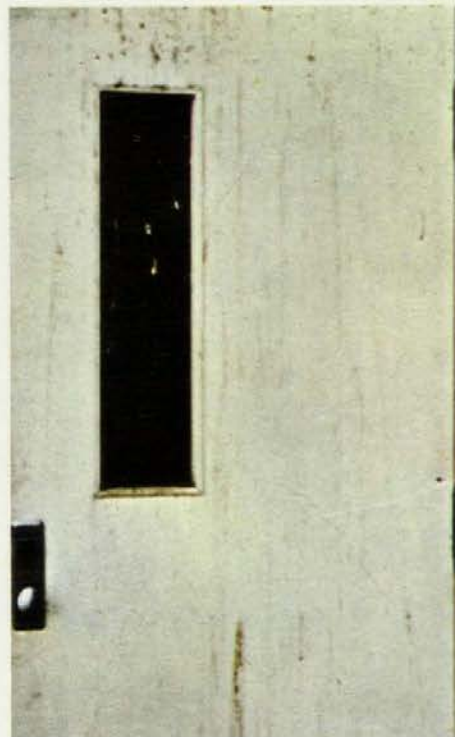
PF-L.® It is available in 11 colors. Vigilar is also recommended for interior use in swimming pool areas, showers, toilets and other areas requiring constant cleaning with harsh cleaning agents.

No aging.

All these films are laminated to wood substrates with adhesives under heat and pressure. This is necessarily a factory process, which cannot be duplicated in the field. The preformed films undergo no further change during application, so there is minimum shrinkage after application.

These films are highly resistant to cracking, checking and crazing, resulting in a new class of materials of a higher order of durability.

Equally important is the fact that sunlight resistance is considerably enhanced.



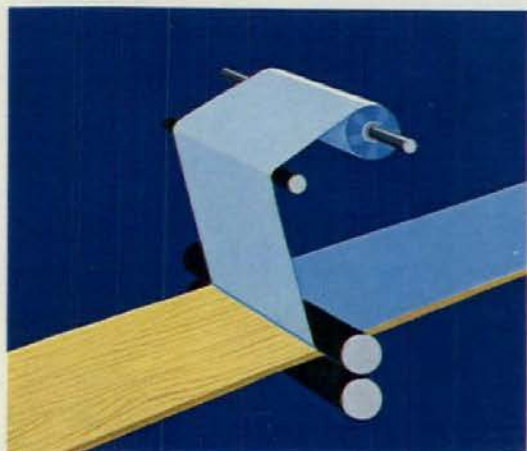
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Three dry-film finishes from U.S. Plywood.

Vigilar—A 2-mil opaque, pigmented film of polyvinyl fluoride is available on Weldwood® Exterior-Interior doors, paneling, partitions for use in hospitals, showers, toilets, swimming pool buildings, etc., where frequent cleaning with harsh detergents and germicides is common practice. Vigilar is also available on siding products under U.S. Plywood's trade name—PF-L.

Permacolor—A ½-mil film of clear polyvinyl fluoride laminated to an 8-mil film of colored polyvinyl chloride, Permacolor is a cleanable finish which is wear- and stain-resistant—and colorfast. It is lightly embossed. It will not flake, peel or chip. It is available in 28 standard colors on interior doors, paneling, partition panels, casework parts and fire-retardant products.



Permagard—A clear 3-mil polyester film which is an ideal cleanable finish for Weldwood custom-designed hardwood paneling and doors. Also available toned to change the natural color of the wood while retaining and enhancing the grain pattern.

Custom prefitting and machining. Paneling, doors, case goods, shelving and fire-retardant products can all be supplied precut to blueprint specification. A wide variety of custom machining is available: edge banding, edge rabbeting, tongue and grooving, dado, square edge, bevel, miter, and miter and shoulder.

For full details, drawings and assistance with specifications, call the Architects' Service Representative at your nearest U.S. Plywood Branch Office.



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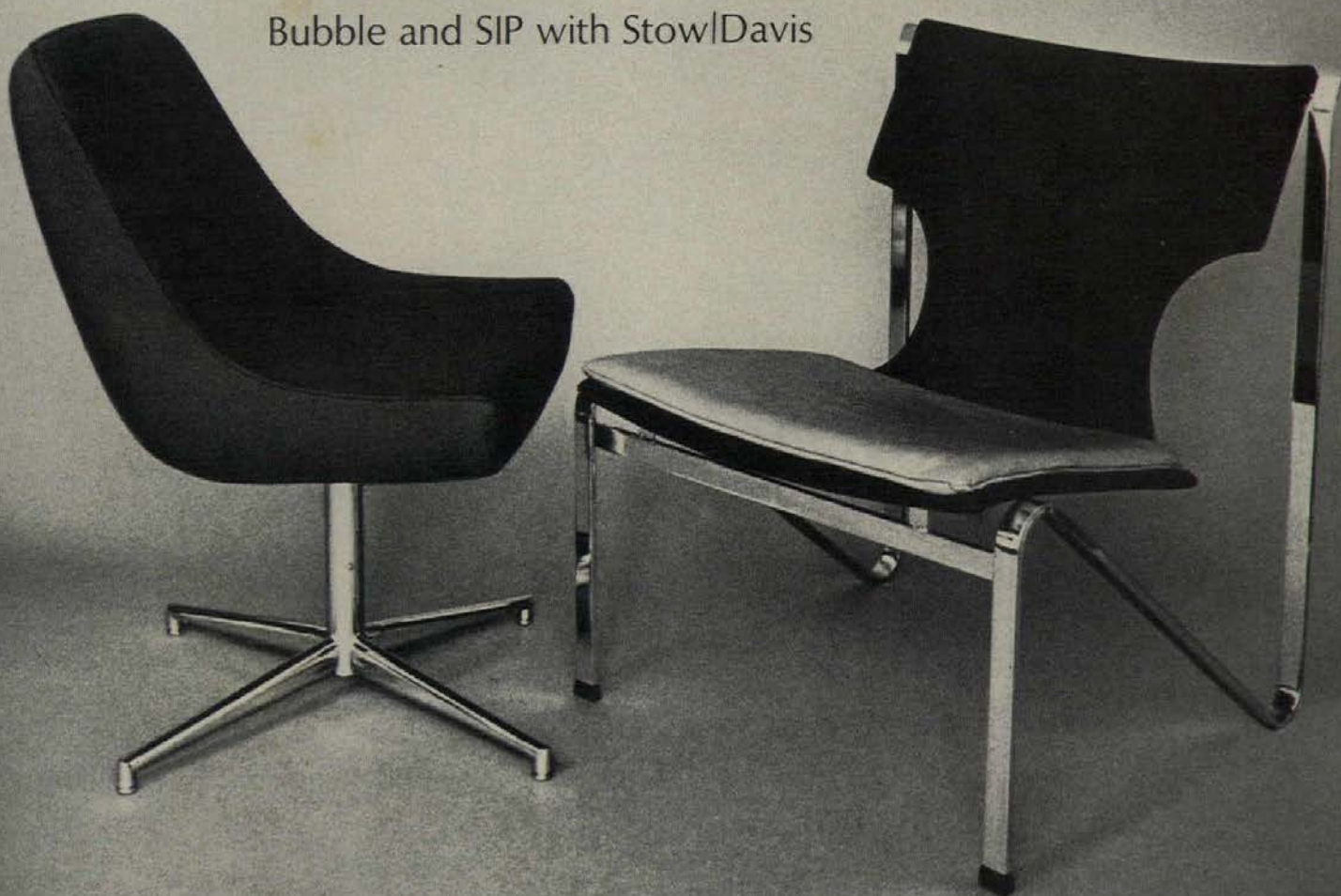
**Performance Chart of
U. S. Plywood Dry-Film Finishes and Comparable Service Materials**

Test	Weldwood Permagard (Interior)	Weldwood Permacolor (Interior)	High Press. Laminate (Interior)	Weldwood Vigilar (Exterior)	Enamel (Exterior Type)
Accel. Aging by Humid-Dry Cycling ASTM D2571-67T	Outstanding No checking or Crazing	Outstanding No checking or Crazing	Excellent Crazes at 12-15 cycles	Outstanding No checking or Crazing	Satisfactory Checks at 12-15 cycles
Tape Adhesion ASTM D2571-67T	Excellent No Damage	Excellent No Damage	Excellent No Damage	Excellent No Damage	Excellent No Damage
Hoffman Scratch Test	Excellent 500 Grams	Excellent 600 Grams	Outstanding Over 1000 Grams	Excellent 600 Grams	Satisfactory 200-300 Grams
Taber Wear CS-17 Wheel 1000 Gram Load Fed. St'd FS141-A (6192)	Outstanding 3000 Cycles/Mil	Satisfactory 500 Cycles/Mil	Excellent 800 Cycles/Mil	Excellent 450 Cycles/Mil	Satisfactory 150 Cycles/Mil
Resistance to Color Fading NEMA LD1-2-06	*Outstanding Exceeds NEMA requirements by over 1000 hours	Outstanding Exceeds NEMA requirements by over 1000 hours	Excellent Exceeds NEMA requirements by over 200 hours	Outstanding Virtually fade-free	Satisfactory Exceeds NEMA requirements by over 100 hours
Resistance to Staining NEMA LD1-2-05	Satisfactory Stains 7 out of 29 agents	Outstanding No staining	Excellent Stains 2-4 out of 29 agents	Outstanding No staining	Satisfactory Stains 9-12 out of 29 agents

*Rating refers to clear finish only—substrate will have normal wood color change.

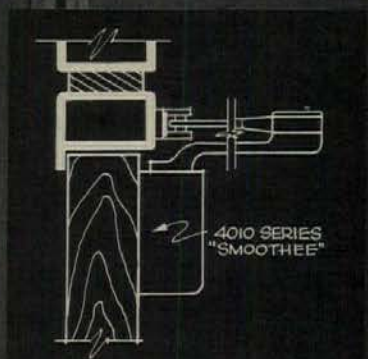
Note: Performance ratings should be compared only to the finish(es) shown in the adjacent column(s) in same category.

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Continued from page 196

PISANI & FALCO ASSOCIATES, Architects and Planning Consultants, 33 W. 54 St., New York, N.Y. 10019.

WILLSON & WILLIAMS, Architects and Planners, 2855 East Coast Hwy., Corona del Mar, Calif.

New Firms

THE OFFICE OF NORMAN G. BYAR, Architect, 1701 Arch St., Philadelphia, Pa. 19103.

DESIGN & COMMUNICATIONS COLLABORATIVE, Design and Communications Consultants, 572 Washington St., Wellesley, Mass. 02181.

DESIGN-SCIENCE INTERNATIONAL, Architects, Planners, and Landscape Architects, Independence Court, Concord, Mass.

DAVID R. GALLAGHER, Architect, 1707 Duke St., Alexandria, Va. 22314.

EDMUNDS OZOLINS, Architect, 4899 North Shore Dr., Eau Claire, Wis. 54701.

SCHWAB & TWITTY, Architects, 400 Palm Way, Palm Beach, Fla. 33480.

YUILL-THORNTON, WARNER & LEVIKOW, Architects, 442 Post St., San Francisco, Calif.

New Partners, Associates

BURKE, KOBER, NICOLAIS & ARCHULETA, Architects and Engineers, Los Angeles, Calif., announce the association of J. SMITH BENNETT.

RICHARD HAAC ASSOCIATES, INC., Urban Designers, Site Planners, Landscape Architects, Seattle, Wash., announce that LEROY K. LEHNER has joined the firm as an associate landscape architect.

KAHN & JACOBS, Architects, New York, N.Y., announce the promotion of DER SCUTI and ELIJAH TOMPKINS to associate members of the firm.

THE OFFICE OF JERRALD L. KARLAN, Architect, Valley Stream, N.Y., has made known the appointment of DON FORST as an associate in the firm.

MORITZ KUNDIG ASSOCIATES, Architects, Spokane, Wash., have made DONALD H. MCKINLEY a partner.

A.C. ODELL, JR., & ASSOCIATES, Architects, Charlotte, N.C., have named JOHN ALLEN MARFLEET an associate in the firm.

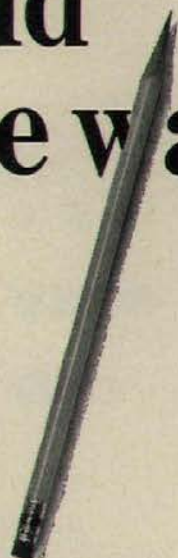
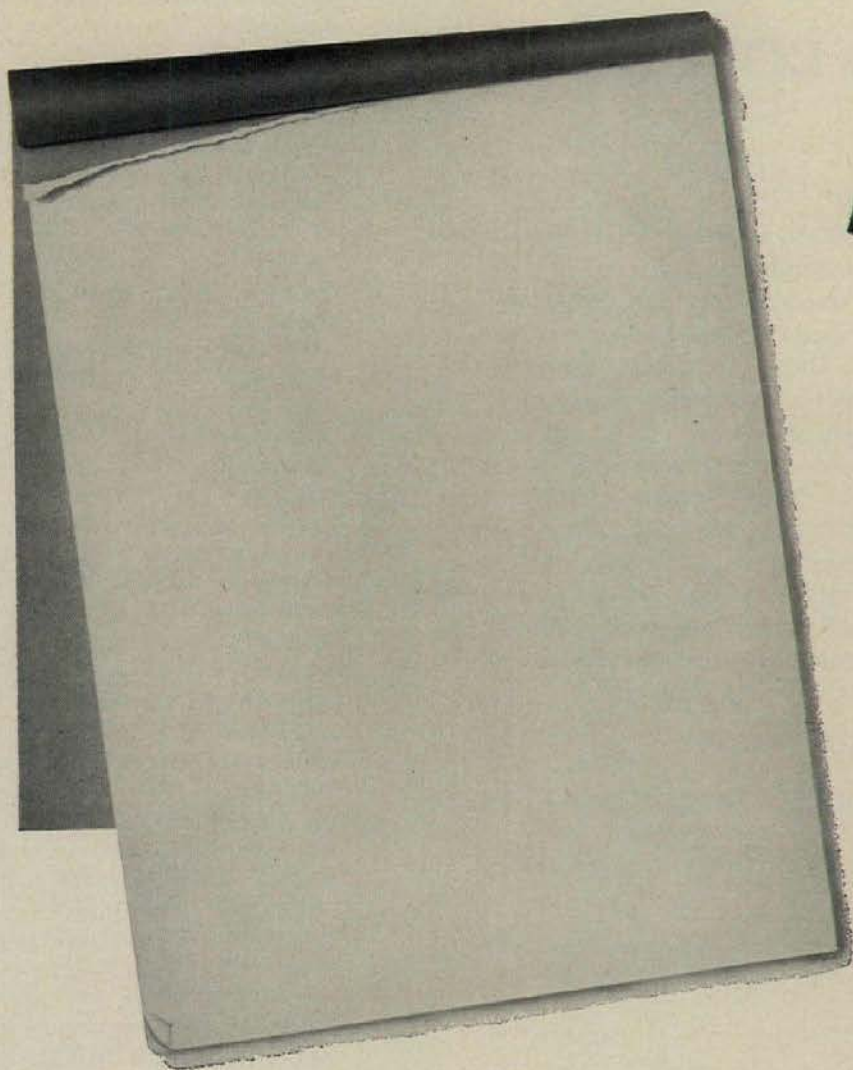
PANCOAST/FERENDINO/GRAFTON, Architects, Miami, Fla., announce that HILARIO CANDELA and PETER SPILLIS have been named senior partners in the firm.

THE PERKINS & WILL PARTNERSHIP, Architects, White Plains, N.Y., announces the appointment of ROBERT H. LEVINE as a senior associate.

REYNOLDS, SMITH & HILLS, Architects and Engineers, Jacksonville, Fla., announces the admission of ROBERT F. DARBY and DR. C.L. HARDING to partnership in the firm.

Continued on page 210

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ceiling that cools, heats,
lights, communicates,
controls sound and
beautifies just the way
you want it to...**



I will install it. And guarantee its performance, too!

By combining many essential functions into one system, today's electric integrated ceiling gives you new freedom in interior design. Take full advantage of that freedom. Create the ceiling that does what you want it to do, looks the way you want it to look. Then make it part of the electrical specifications and let your qualified electrical contractor take it from there.

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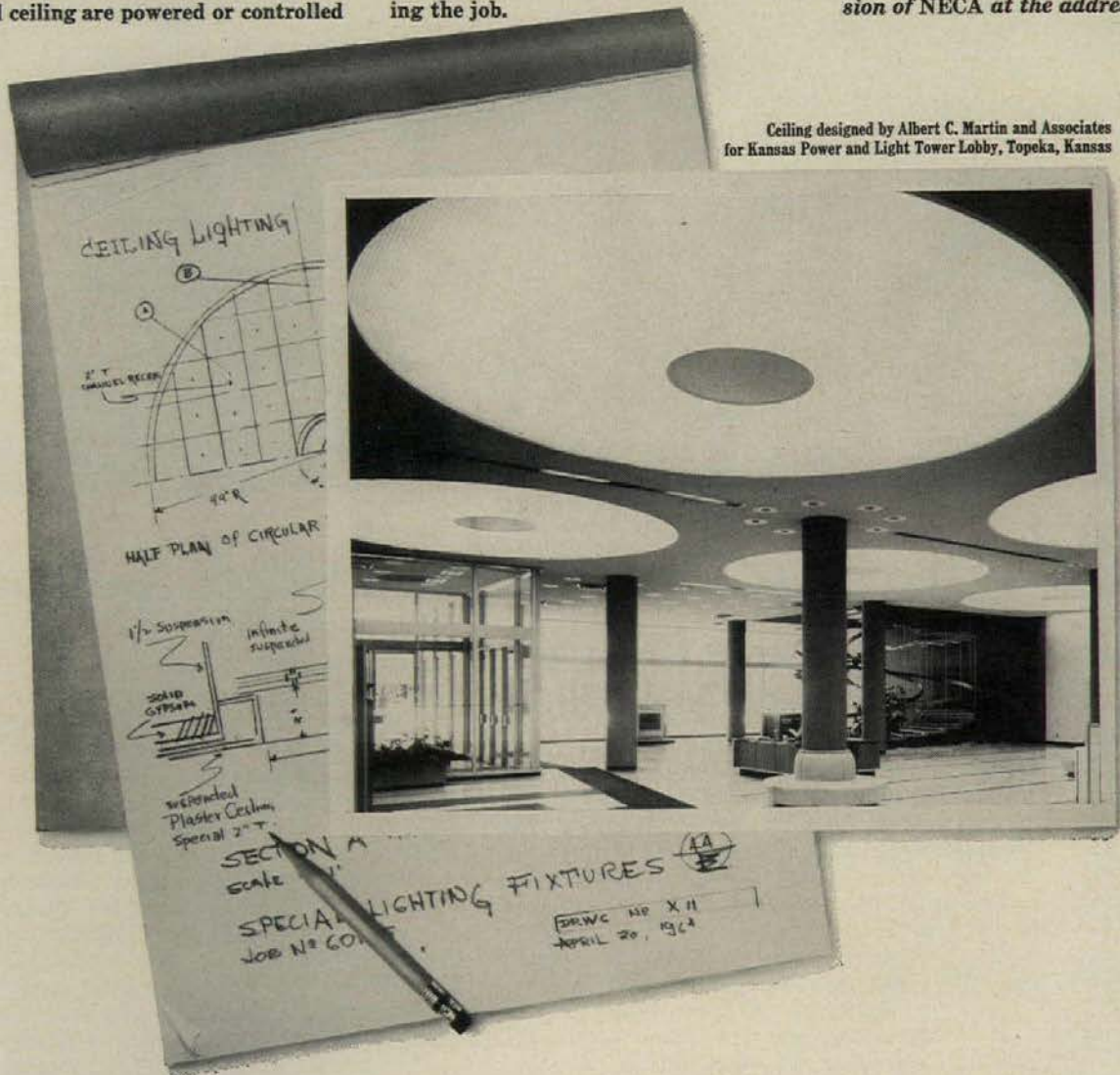
by electricity... and electricity is the electrical contractor's business.

Of course, proper installation will require the services of carpenters, sheet metal men, plasterers, plumbers, heating and refrigeration men. But your qualified electrical contractor has plenty of experience in coordinating the efforts of these specialists—and he has available to him established and recognized procedures through which jurisdictional questions can be settled without delaying the job.

And that's not all. Place the responsibility for your integrated ceiling in the hands of your qualified electrical contractor and he'll guarantee the performance, not only of the electrical functions, but of the entire electrically space-conditioned ceiling system.

NECA has prepared a film on integrated electric ceilings. To arrange a showing, contact the Marketing Division of NECA at the address below.

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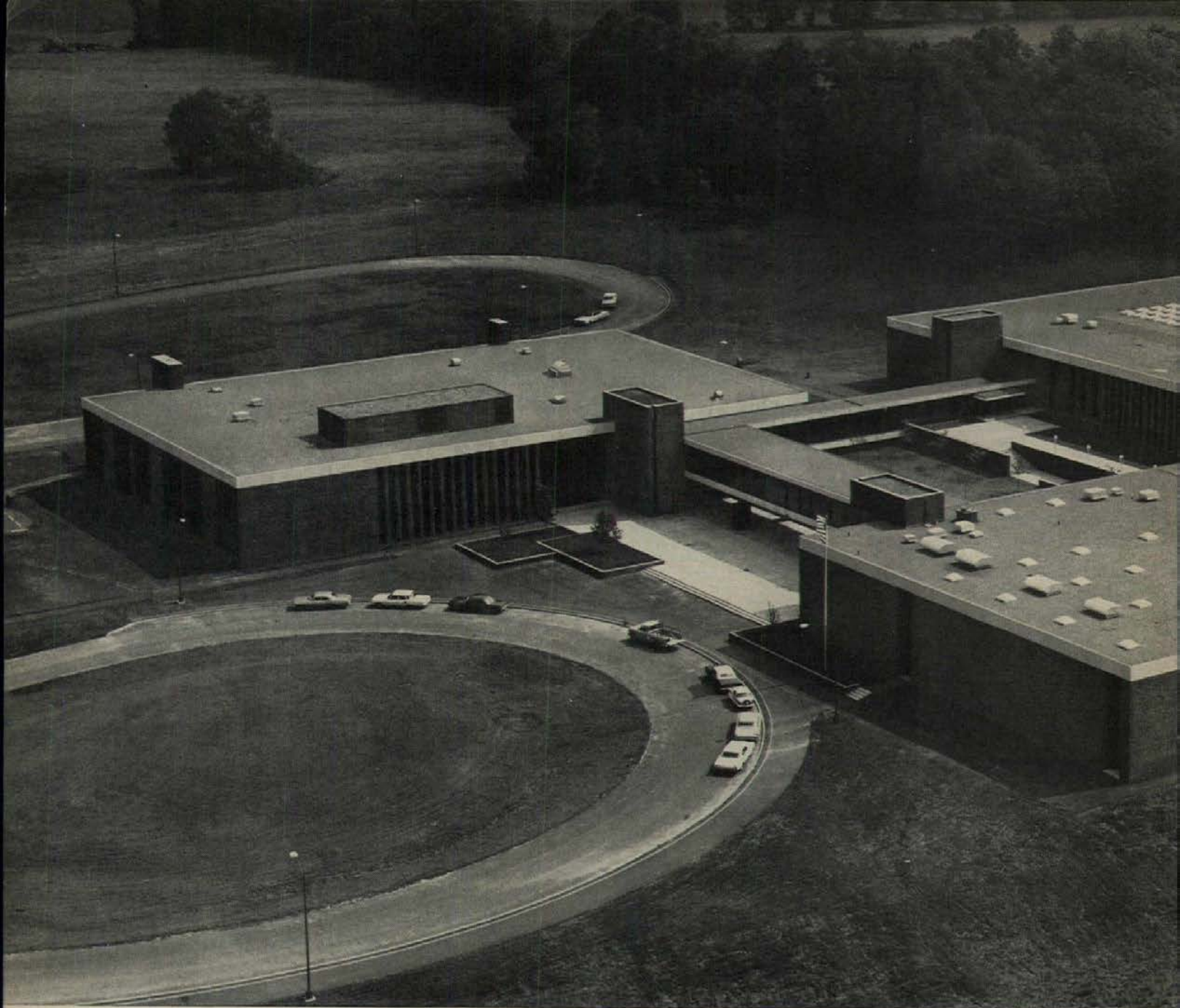


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Award-winning Whitesboro High School:

framed in steel to assure flexibility, easy expansion

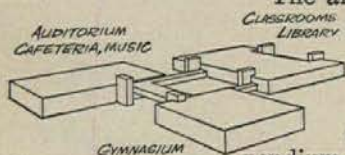
In Whitesboro, New York, about five miles west of Utica, they now have an impressive new high school for some 1,400 students. The school recently won one of the 1967 Architectural Awards of Excellence, sponsored by the American Institute of Steel Construction.

The architects developed three steel-framed, two-story buildings around a central open-air court to create a pleasant and stimulating study environment. Commented the awards jury: "This school building represents a good compendium of the best standard thinking of today.

The massing of the forms is impressive, and the handling of the materials is pleasingly restrained."

Structural steel was chosen for the framework because it permitted broad flexibility in design, and because of its matchless adaptability to future expansion. As a matter of fact, the designers have already envisioned an addition to accommodate 400 more pupils, when needed.

Steel framing offers so many advantages for school construction: economy, fire-safety, speed of erection, durability, fewer columns required, design flexibility. Before *you* start designing, ask a Bethlehem Sales Engineer what today's new steels and new design techniques have to offer. Bethlehem Steel Corporation, Bethlehem, Pa.

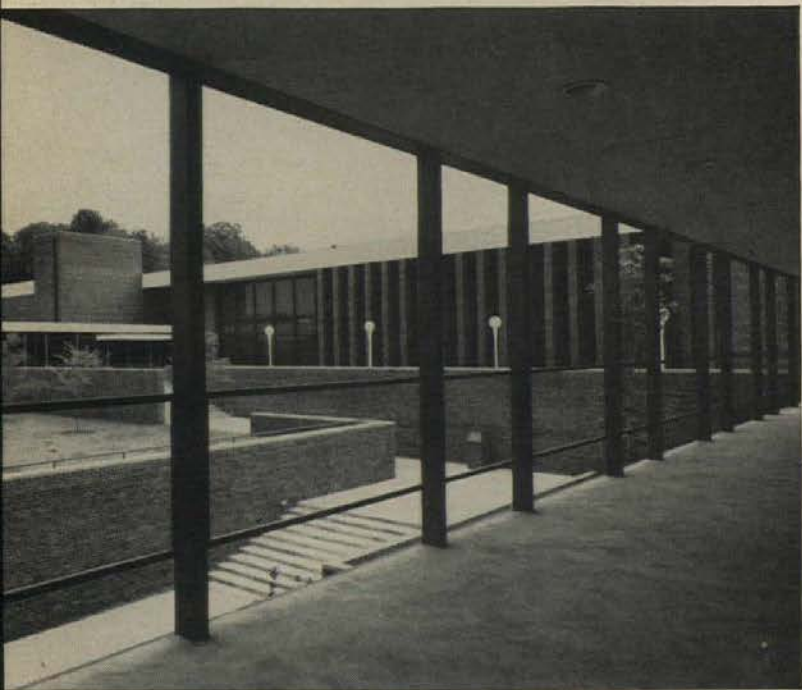
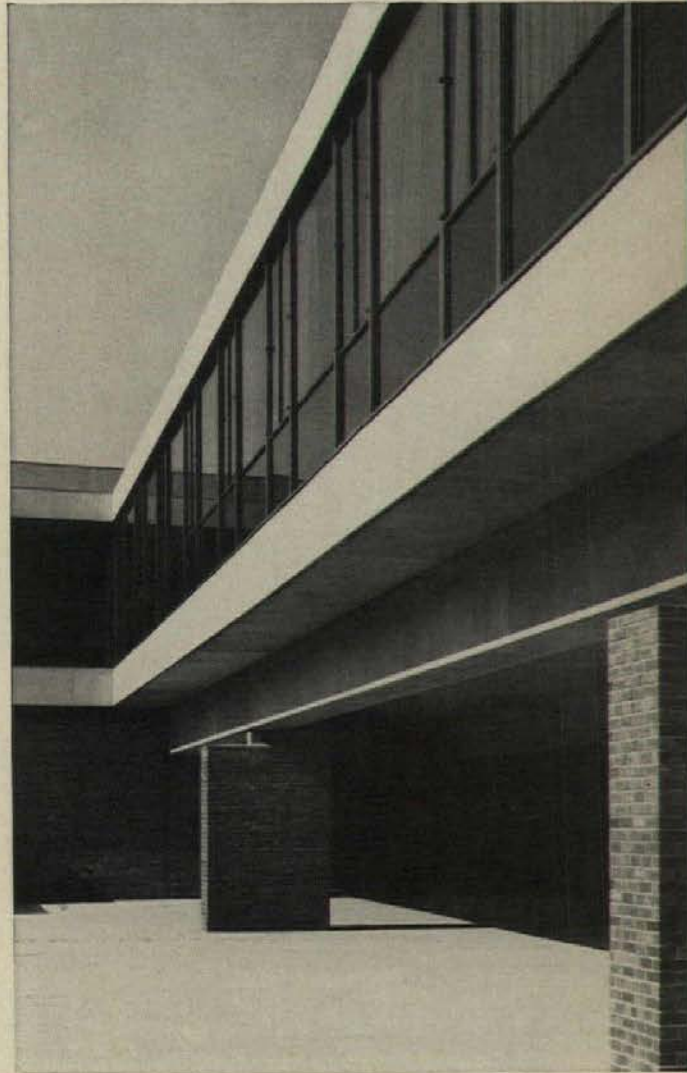


BETHLEHEM STEEL





Over its sturdy steel framework, the Whitesboro High School is enclosed in dark brown brick, with windows of gray tinted glass.



Corridors, both open and enclosed, feature vertical accents of exposed steel framing members.

Architects: The Perkins & Will Partnership, New York, Chicago, Washington.
Frank C. Delle Cese, Utica, N. Y.

Steelwork fabricated and erected by Gouverneur Iron Works, Gouverneur, N. Y.





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- DEPOSIT TOWEL
- TAKE A LOOK

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Continued from page 205

SARGENT-WEBSTER-CRENSHAW & FOLLEY, Architects, Engineers, & Planners, Syracuse, N.Y., have elected ARTHUR V. SERRANO to partnership in the firm.

SIEGAL ARVIN ASSOCIATES, INC., Architects, Detroit, Mich., have named W. ALLAN TUOMAALA and ARNOLD SERLIN associates of the staff.

SMITH, HAINES, LUNDBERG & WAHLER, Architects, New York, N.Y., announce the following appointments to the position of senior associate: GREGORY E. BROOKS, ETTORE S. COIRO, ARNOLD D. HACKEL, WILLIAM B. NORTH, BRONISLAUS F. WINCKOWSKI. The following men have become associates: WILLIAM E. BALZ, FRED BRIEGER, ROBERT A. DJEREJIAN, ANTHONY J. FLAHERTY, JOHN S. FOUNTAIN, MICHAEL MAAS, VINCENT MELLO, THOMAS V. POLI.

TROGDON-SMITH, Architects, Spokane, Wash., have made BENSON A. NIELSEN an associate in their office.

Elections, Appointments

BROWN & MATHEWS, INC., Architects and Engineers, Union, N.J., announce the appointment of KEITH W. DAWSON to the position of chief architect.

FREEMAN, FOX, WILBUR SMITH & ASSOCIATES, Consulting Engineers, London, England, have made ROBERT A. HUBBARD associate managing director and a member of the board of directors. He will hold prime responsibility for the London office.

HELLMUTH, OBATA & KASSABAUM, INC., Architects, San Francisco, Calif., announce the addition of J. THOMAS BEAR and ROLF E. MUENTER to their staff.

CHARLES LUCKMAN ASSOCIATES, INC., Architects, New York, N.Y., announce the appointment of JOSEPH LOWY as director of production. The firm has opened a new branch office in Phoenix, Ariz.

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, Architects, New York, N.Y., announce the appointment of JOSEPH GOLDBLOOM as chief specifications writer. JOHN J. WHITE, formerly chief of the firm's specifications department, will remain as an associated consultant.

WILLIAM L. PEREIRA & ASSOCIATES, Los Angeles, Calif., have made AKIO ITAMURA director of interior design.

SMITH-ENTZEROTH, INC., Architects and Planners, St. Louis, Mo., announce the appointment of four vice-presidents: KLAUS H. KATTENTIDT, PAUL E. MARTI, JR., JOHN KOCH, and DANIEL E. GREEN. JAMES S. HENTSCHELL has been designated secretary-treasurer of the firm.

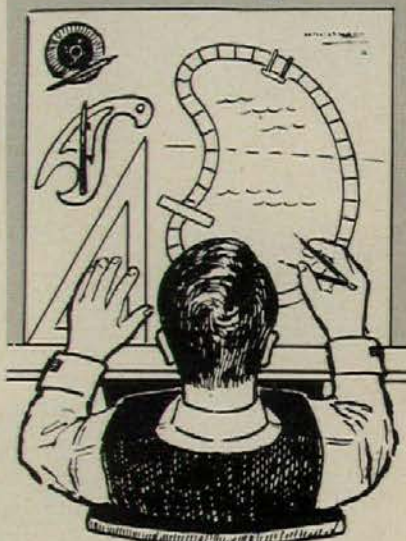
SVERDRUP & PARCEL & ASSOCIATES, INC., Architects and Engineers, St. Louis, Mo., make known the appointment of NORBERT W. MAURER to the newly created position of structural consultant. The firm has also

Continued on page 212

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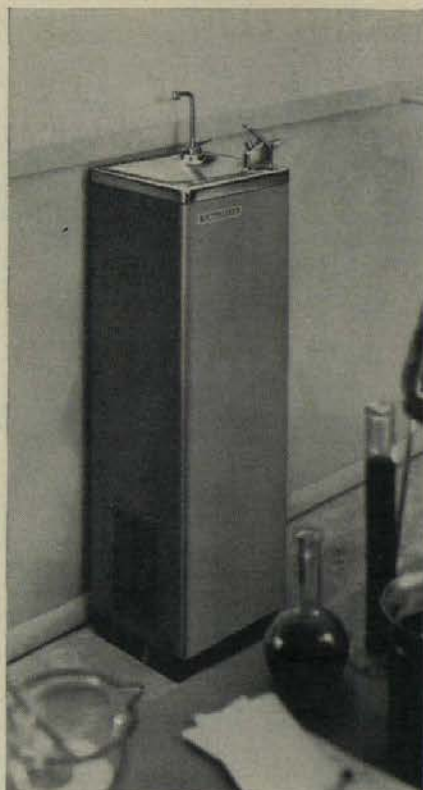
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named THOMAS J. DOWNEY head of its special structures section.

WIESINGER-HOLLAND, LTD., Structural Engineers, Chicago, Ill., announce that ROBERT H. BEER, formerly an associate, has become a principal of the firm.

Name Changes

WILLIAM MILO BARNUM ASSOCIATES, Architects, New York, N.Y., formerly, PHELPS BARNUM & SON.

ARNE BYSTROM, Architect, Seattle, Wash.; formerly, BYSTROM & GRECO.

FROST ASSOCIATES, Architects, New York, N.Y., upon the appointment of A. CORWIN FROST as partner-in-charge of design, and P. WHITNEY WEBB and OWEN L. DELEVANTE as administrative associates: formerly, FREDERICK C. FROST, JR., & ASSOCIATES.

HANDREN, SHARP & ASSOCIATES, Architects, New York, N.Y., upon the admission of ARTHUR D. GREENFIELD, MARVIN K. GEASLER, and RAY E. CUMRINE to partnership and the retirement of WIN L. SCHOLFIELD; formerly SCHOLFIELD, LINDSAY, LIEBIG. DAVID G. HOLLOWAY and S. ROY JOHNSON have become associates in the firm.

LINSCOTT-McARTHUR & ASSOCIATES, INC., Architects, Kansas City, Mo., upon the election of FRANK P. McARTHUR as vice-president; formerly, TANNER-LINSCOTT & ASSOCIATES, INC. GORDON C. JARCHOW has been elected assistant vice-president.

SCHUTTE-MOCHON, INCORPORATED, Architects, Planners, and Engineers, Chicago, Ill., upon the retirement of RALPH J. PHILLIPS, who will continue as an engineering consultant with the firm; formerly, SCHUTTE-PHILLIPS-MOCHON.

WOLFF-ZIMMER-GONSUL-FRASCARITZER, Architects and Planners, Portland, Ore., upon the admission of OTTO R. RITTER to partnership; formerly, WOLFF-ZIMMER-GONSUL-FRASCAR.

ZETLIN, DESIMONE, CHAPLIN & ASSOCIATES, Consulting Engineers, New York, N.Y., upon the admission to partnership of VINCENT J. DESIMONE and JAMES E. CHAPLIN; formerly, LEV ZEITLIN & ASSOCIATES. CHARLES H. THORNTON has joined the firm as an associate.

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