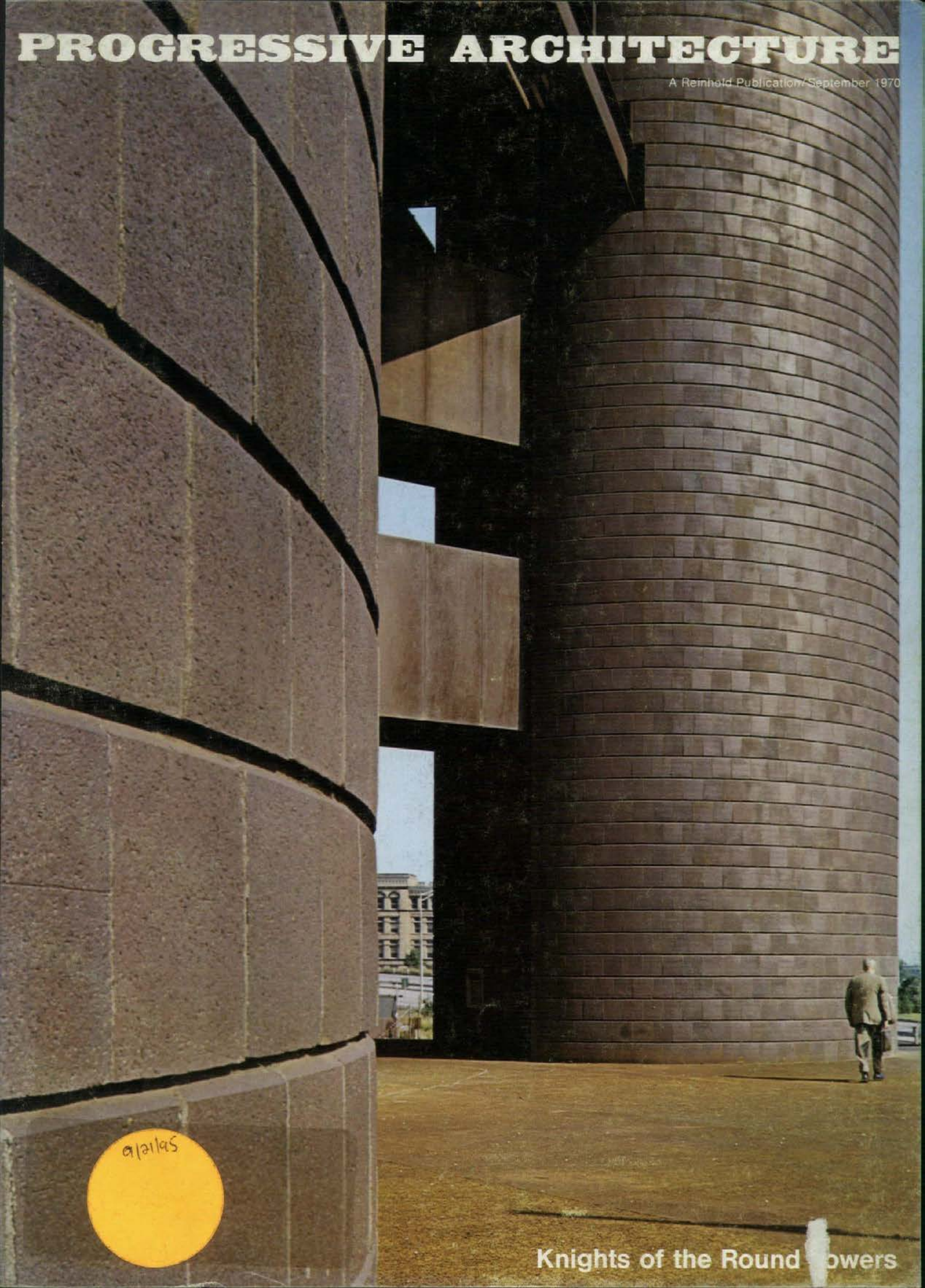


PROGRESSIVE ARCHITECTURE

A Reinhold Publication / September 1970



Knights of the Round Towers

another fine floor from Azrock



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Kinnear

"year 'round"

2 or 3-WAY protection

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Attractive, harmonious design, plus efficient protection in one compact door package. This is your most reliable closure concept—the "Kinnear Kombo" created by an assembly of the most modern rolling door products available.

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A building's service entrance is a frequently overlooked avenue for profit or loss, so consider the multiple advantages of a "Kinnear Kombo" for doorways in your building plans.



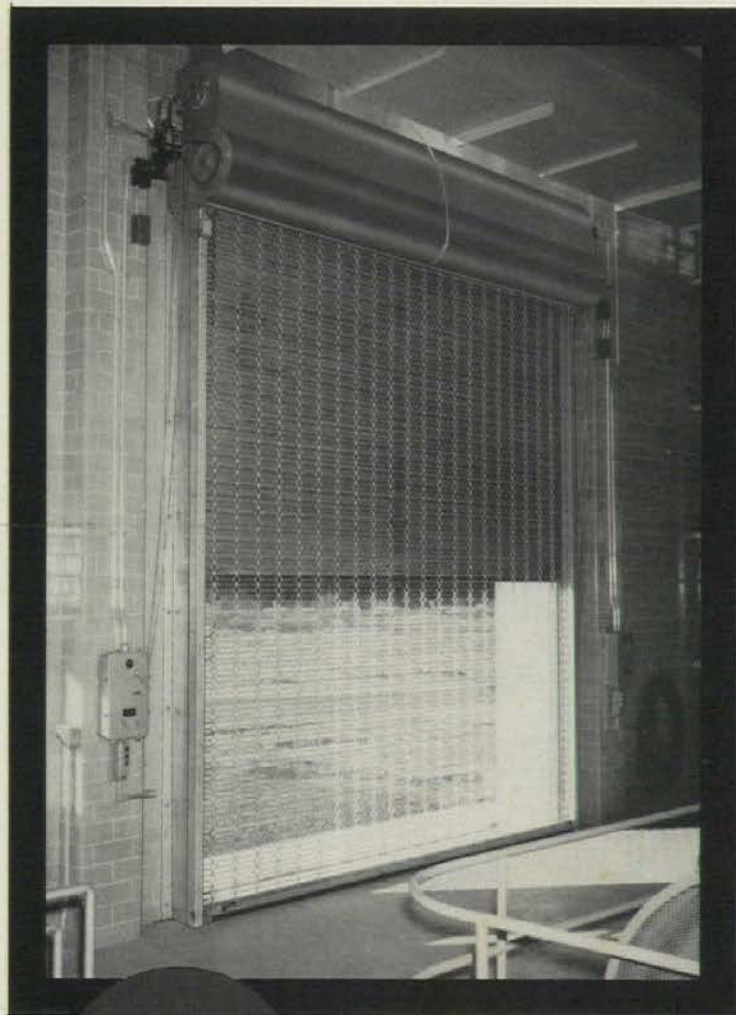
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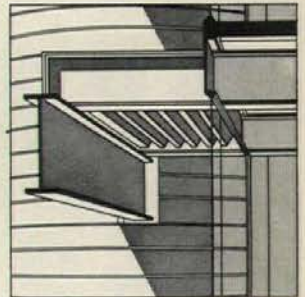


Corner detail, Knights of Columbus Building, New Haven, Conn. Photo: Chalmers Alexander

FEATURES

84 Knights of the Round Towers

Four vertical concrete towers for the Knights of Columbus building in New Haven, Conn., create a radical departure from the traditional office building formula. Visible for miles, the building acts as a signpost from the thruway and a triumphal portal to the city. *Kevin Roche John Dinkeloo & Associates, Architects.*



INTERIOR DESIGN DATA

92 Electric Demolition

To meet the demands of the new liturgy, an unexpected, entirely new image has been created for a neo-Byzantine sanctuary in Philadelphia, Penn. The old altar has been "edited" out with a line of white tubular lighting. White and yellow acrylic and vinyl furnishings create "harmony through contrast." *Venturi & Rauch, Architects.*



INTERIOR DESIGN DATA

96 Superscale Frescoes

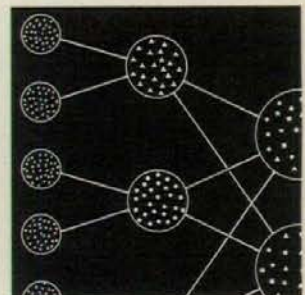
Huge religious symbols are superimposed on great continuous painted banks of wall color in a church built for the joint use of three different sects. A clear expression of ecumenism in an extraordinary church image by a Canadian team. *Dunlop, Wardell, Matsui & Aitken, Architects; Barrie Briscoe, Graphics Designer.*



MATERIALS AND METHODS

100 Systems Definitions

Is it system building or building systems? This confusion and more is explained by Guy Rothenstein, architect and systems expert in a welcome article on the subject, clarifying the correct connotation of varied systems terms.



102 Architectural Teachers Salaries . . . Why They Are Low

In a frank and documented article, salaries in architecture education are compared to those in other disciplines. Required reading for anyone planning a career in education and research without a supplementary income. By Mary Pledge Peterson and John M. Peterson, both on the faculty of the University of Cincinnati.

STARTING FACULTY SALARIES, BY DISCIPLINE				
	ASSISTANT PROFESSOR			
	Low 10%	Median	High 10%	No. of
Architecture	\$10,000	\$11,600	\$12,000	4
Agriculture	8,500	9,700	12,000	21
Anthropology	8,400	9,800	11,500	16
Art	8,050	9,400	10,800	24
Biology	8,600	10,700	12,500	13
Business	8,500	9,900	12,100	42
Chemistry	9,000	10,300	12,000	4
Communications	8,800	10,000	11,800	11
Computer science	8,800	9,700	10,300	2
Education	10,000	12,500	13,500	6
Engineering	8,600	11,700	16,800	8
Geography	8,300	9,400	10,200	8
Health sciences (all groups)	9,400	10,800	12,500	10
History	8,100	11,000	12,500	47
Industrial	9,000	10,400	12,000	12
Political science	10,300	11,900	12,000	24
Psychology	9,400	11,100	12,000	12
Social sciences (all groups)	9,000	9,400	10,000	84

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104 Out on Buffalo Bayou

Architects Caudill Rowlett Scott designed their new Houston home so that the access highway extends to a rooftop parking tray. Thus cars do not interrupt the views of sloping, densely wooded land on all four sides of the open-loft glass box building.



108 The Final Presentation

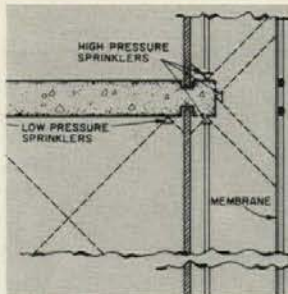
With benefit of Greek chorus, the play is the thing — taking off on architect vs. building committee et al in a tart, sharp satire that tells it like it is (and perhaps was). Architect/playwright Robert Mutrux spans cultural time and space.



MATERIALS AND METHODS

110 Pneumatic Construction

Extension of the principles of pneumatic construction to include multistory buildings is discussed by Peter R. Smith, Senior Lecturer in Architectural Science at the University of Sydney (Australia), and Jens G. Pohl, Lecturer, School of Architecture and Building, University of South Wales.



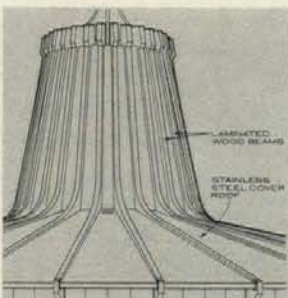
118 Morris Lapidus: "Now, Once and for All, Know Why I Did It."

Is the philosophy of giving the people what 90 percent of them want a valid art principle? Writer John S. Margolies analyzes this approach by letting the architect speak for himself.



124 Selected Details

American Potato Company, Blackfoot, Idaho. *John S. Bolles, Architect.* Detail: Porcelain Enamel Panels.
 St. Frances Cabrini Church, West Bend, Wisconsin. *Brust & Brust, Architects.* Detail: Stainless Steel Roof Flashing.



DEPARTMENTS

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Weathersealing installation flange



Welded insulating glass

Rigid vinyl sheath over core of wood

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This is the Andersen Perma-Shield® Casement—a remarkable new kind of window.

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YOUR POINT OF VIEW

Anniversary Congrats

(The editor and all of P/A's staff wish to thank our readers for their many letters praising our June anniversary issue. We would happily publish them all. However... a few of the first received.)

Dear Editor: From the ads to the articles, I enjoyed the 50th anniversary issue.

I know it is fashionable now to be without a past, but architecture in this half century is one of the richest and most fantastic stories of technological and cultural change that the world has known. Thank you for celebrating it, and the pause to consider it in perspective. It refreshes.

Ada Louise Huxtable
Architecture Critic
The New York Times

Dear Editor: I do not recall ever reading a trade publication that gave me as much enjoyment of the present and of the past, as your recent June issue entitled "A Celebration of Change."

I feel assured that I speak for many when I state that there is very little thorough reading of trade publications now with the extreme amount coming daily into our offices, but with this particular issue I was unable, nor did I have any desire, to skip any reading matter! I read it completely through!

The ads of the 20's along with the "todays" brought many fond memories of my first tiptoe steps into those very special architects' offices carrying a few samples of my work and when finally a kind architect did give me work (running errands, making blueprints, and tracing full size details for the jobs) in Tacoma, Wash., I felt I really would be able to do my bit to improve the world. *Pencil Points* was new in the 20's and my little boss architect gave me many

wonderful talks and one I do remember of the many "do's" was to read *Pencil Points* from cover to cover! I did! Because to me the architects of those days knew everything.

I've enjoyed the magazine all through the years and the present day issues are inspiring; sometimes the examples shown are a "let's-be-different" style which will only last as long as the next design appears, but the overall trend, the overall thinking cannot be denied and is part of us.

I am trying to say thank you for the work put into creating such an interesting magazine.

R.J. Bishop, ARA
Spokane, Wash.

Minimizing Miniaturization

Dear Editor: On page 180 of your June issue, Paolo Soleri points out the absurdity of our using automobiles to convey us to packages of cigarettes. He offers "miniaturization" as the solution and pictures the result for us on page 181. The drawing tells very little, however, so I would like to know what Soleri's solution to the problem is: it might reveal a great deal about the validity of Archisonti as a whole. Since it appears that the man will be living in a tower and the cigarettes will be on one of the lower plaza levels, how will the twain meet? Does the man take the elevator? Cables, pulleys, electric current, and whirling wheels conveying man to his vices seem no less absurd an image than that of the present method. Perhaps the man gets at his cigarettes by having them delivered through a pneumatic tube. How practical — move the smokes, not the man. But also, how clinical.

Assume that Mr. Soleri has not programmed smoking out of the human activity of Archisonti (think how much wasted energy that would save) I would like to know whether he has conceived of any device that would place the man in proximity to the cigarettes and also preserve the aesthetic experience, the healthful exercise and the innate simplicity that a walk to the tobacco shop on two legs affords.

I would also like to know if Mr. Soleri has reconciled Archisonti to the fact that man is not plagued merely with a few idiosyncratic delights like smoking and driving; that man doesn't merely have lapses of common sense now and then, but

rather is *inherently* absurd, and exhibits only *rare* moments of logical action. Most of the time he does very silly, impractical things and usually enjoys them. Now, has Mr. Soleri's miniaturization formula taken that radical into consideration?

One final question, if Archisonti is presumably the best solution for a human environment that minds presumably educated to the needs and desires of human beings can conceive of, then why do I find the illustration on page 181 so repulsive? If things in general are going to proliferate to the point where a walk to the tobacco shop (for everyone who wants to) is unfeasible for the same reasons that the manual operation of telephone communications is, and an Archisonti is the only feasible solution, then we're all working on the wrong problem, and perhaps the only realistic definition of architecture for the next fifty years is "that effort which lends itself towards the control and elimination of the population explosion."

William L. Nolan
7024 Palm Drive
Des Moines, Iowa

July Kudos

(When we decided to run "Advertisements for a Counter Culture" press ready, we were fully aware of its capacity for controversy. Our staff was divided — some appalled, some apprehensive, some applauding. Our decision to run these pages unedited was provoked by their eminent editability. Whether you were impressed, interested, or incensed — obviously you were not indifferent — to that we would have no "alternative." Ed.)

Dear Editor: I am very impressed with your Editorial and the "Advertisements for a Counter Culture."

I would greatly appreciate a reprint of that section or a sample copy of the issue for our library files. Many thanks.

Robert Jay Ginn, Jr.
Faculty of Arts & Sciences
Harvard University

Dear Editor: It was indeed a pleasant surprise to see that there is someone in the American architectural press who is perceptive enough to see what is going on!!! — Congratulations.

I sincerely hope that those reading the article, however, have read Theodore Roszak's book, *The Making of a Counter Culture*, particularly chapter eight, as well as the *Whole Earth Catalog*. (Ron Herron of Archimedia
(Continued on page 8)

The Acton sled

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Division Tartan Corporation



(Continued from page 6)

told me recently that the W.E.C. is the best thing he saw in the U.S. while he was here.)

Your article on "The Spheroid Grid Dome" (p.106) was of special interest to me. I became interested in the spheroid as a successful medium for building on steep sites in California. A domical structure (framework only) is constructed at an angle on the sloped site. The earth is then gently removed from within (only that which is necessary to complete the sphere). The inner frame and outer skin are then completed.

I have been having my students at San Diego State concentrate on the design of the structure and mechanics on the *inside* of spheres and domes. Much has been done about improving the structure of domes but little that I have seen has been done about the inner structure and space.

Again let me congratulate you for your fine July issue and hope we shall see a continuation of this enlightened reportage. No doubt you will receive abrasions from "head in the sanders" but don't worry — one does not have to be clairvoyant to see that the Age of Aquarius is indeed here.

Eugene Ray, Architect
Prof. of Environmental Design
San Diego State College

Dear Editor: From all of us here at the Center, congratulations on your July issue. The whole section on the Counter Groups is very well done indeed.

We have ordered a subscription to *Progressive Architecture*, but so far have not received any issues. Would you be so kind as to send six copies of this issue — it's great.

Mary Louise Rogers
Center for Environmental Structure
Berkeley, Calif.

Dear Editor: I was most impressed by the Freestone Conference "advertisements" in the July issue. This unusual approach to the problems we face is, indeed, commendable. *Progressive Architecture*, more than its

July Dissent

Dear Editor: Re The "Freestone" Report in your July issue, being a naive, literal minded guy, I have come to the conclusion that you are serious about this thing. I tried to read between the lines (although it gave me a headache) for evidence of a put-on, but your lead Editorial is convincingly earnest.

I feel impelled to save this July issue and your report of this preposterous boondoggle so that my grandchildren can embarrass you and/or your successors at P/A with it 20 years hence.

John Miller Mattingly AIA
Jackson, Miss.

(We look forward to your grandchildren's views, too, and are proud to be considered worthy of such lengthy preservation. Ed.)

Architectural Journalism

Dear Editor: The history of American architectural periodicals is much richer than your June article suggests. Beginning in the 1850s, in other words concurrent with the familiar pattern, books such as Andrew Jackson Downing's *The Architecture of Country Houses*, the American trade or commercial building journals began to appear, modeled, to be sure, after English prototypes. They were regional in scope, appeared frequently, were aimed at the vernacular builder, and typically contained, in various combinations, news items, notices of suppliers to the building trades, practical advice, occasional critical and historical articles and illustrations of current designs — the very features that were present in the first "professional" American journal, *American Architecture and Building News* which began weekly publication on January 1, 1876 in Boston. (There were also two short-lived predecessors primarily important as vehicles of illustrations, *The Architectural Sketch-Book* and the *New York Sketch-Book of Architecture*.)

American Architecture and Building News was in continuous independent existence, although it underwent several title changes, until 1938 when it merged with *Architectural Record*. Under the initial editorial guidance of William Pitt Preble Longfellow and more importantly that of William Rotch Ware, nephew

Peter Inserra
New York, N.Y.

of architecture, that at MIT, *American Architecture and Building News* consistently carried many intellectually provocative and influential articles of interest to the profession at large and to the draftsman in particular. It was peerless until 1883 when *Inland Architect* began publication in Chicago. In 1891 *American Architect and Building News* and *Inland Architect* both graciously welcomed two new magazines, *Architectural Record* and *Architectural Review*, the latter an outgrowth from the *Technology Architectural Review*, a publication of the architectural students at MIT. By 1893, *American Architect and Building News* reported that there were between 50 and 80 building papers then being published in addition to the professional publications now generally acknowledged.

Eileen Michels
Assistant Professor of Art History
Wisconsin State Univ., River Falls

(The history of American architectural journals is indeed rich and requires more space than can be devoted to the subject in a periodical, particularly in an article that was attempting to touch on more issues than purely historical ones. S.S.)

Good-bye P/A

Dear Editor: I will not be renewing my subscription to *Progressive Architecture* this year. This is not a reflection on the content of the magazine but on the way the content is made available.

I have no need for the magazine's physical fact. I require only the information it provides. I will continue to receive this information through a library and look forward to the day when a twentieth century information retrieval system will again allow me to subscribe.

One edition of The New York Times requires 320 acres of trees. But this statistic only indicates their physical loss. How many subsequent life systems do these trees support? And how many of the subsequent systems used in the production of paper have a negative and irreparable effect on the environment? What is the function of a newspaper once it has been read? Is anything disposable?

Ecological survival of man is reliant on the actions of the individual.

H.J. Feir
University of Manitoba

The beautiful movables



System designed by Woodwork Corporation of America

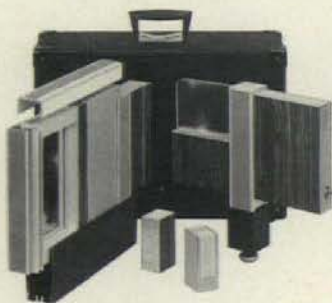
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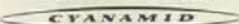
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What's more, aesthetic beauty unites with functional design. Reinforced concrete is as modern as the jet age it

serves. Provides the design freedom needed for the happy marriage of utility and beauty. Couples the strength of reinforcing steel with the sculptural flexibility of concrete. Gives economy from start to finish with low cost construction and minimal maintenance costs.

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*"Grade 60" the new term that describes ASTM specs for 60,000 psi reinforcing steels as upgraded in 1968.

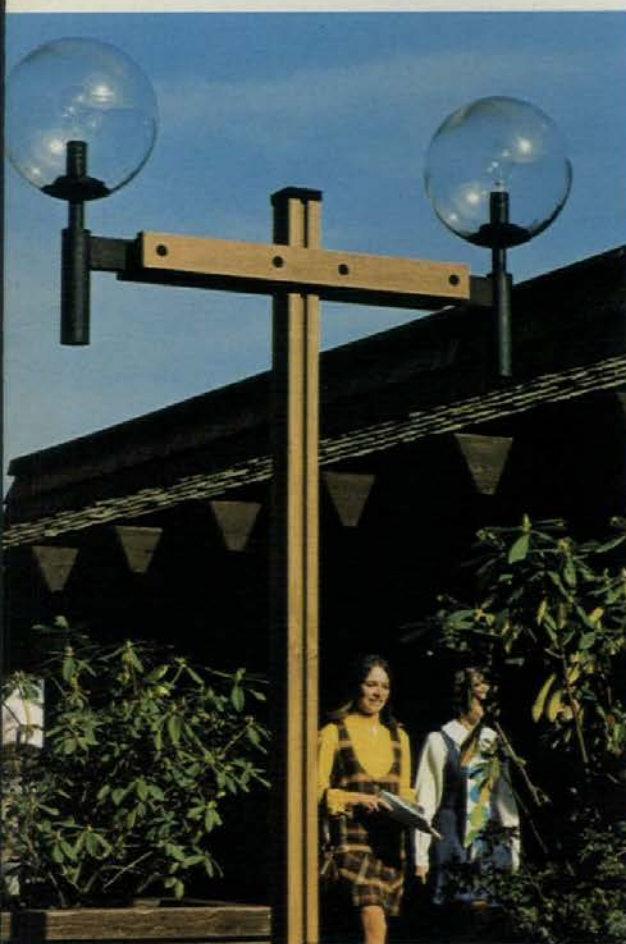
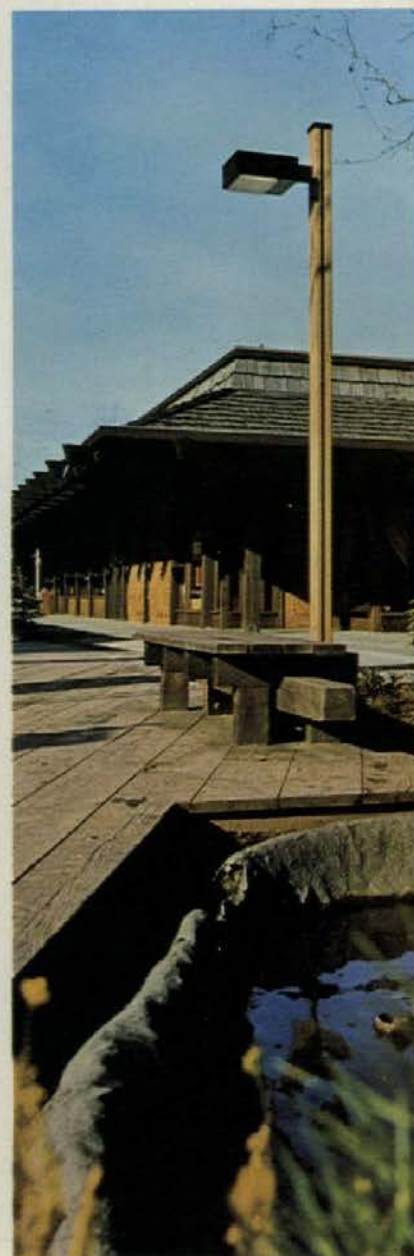
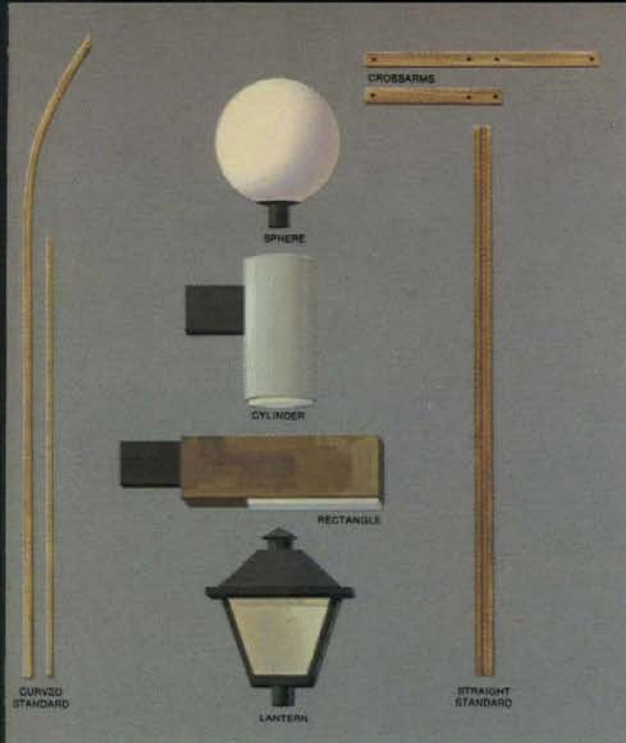


Architects: Kivett and Myers, Kansas City.
Engineers: Burns & McDonnell, Kansas City.
General Contractor: Del E. Webb Corp., Phoenix
Rebar Placing Sub-Contractor:
Albert P. Meehleis, Los Angeles

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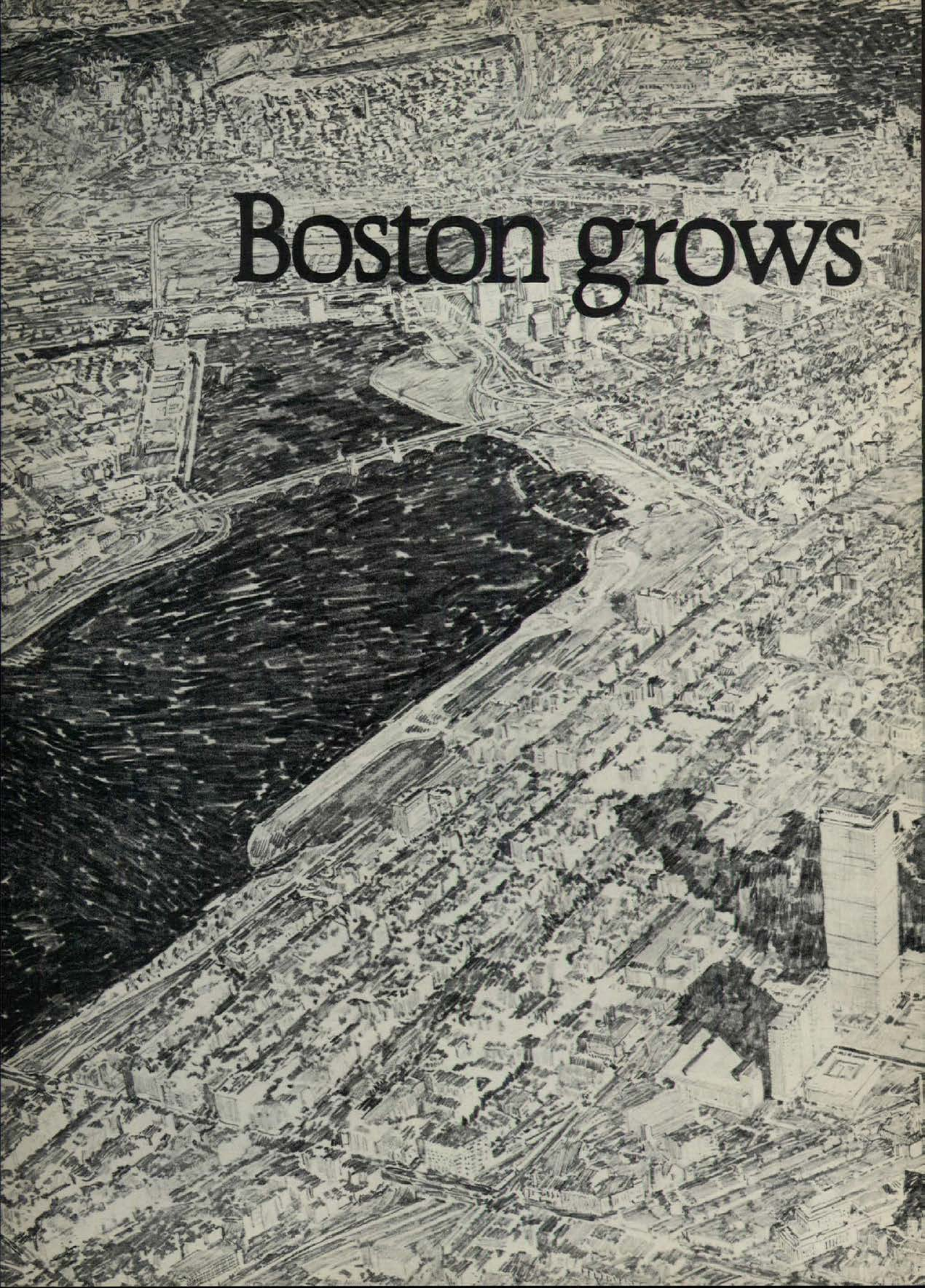
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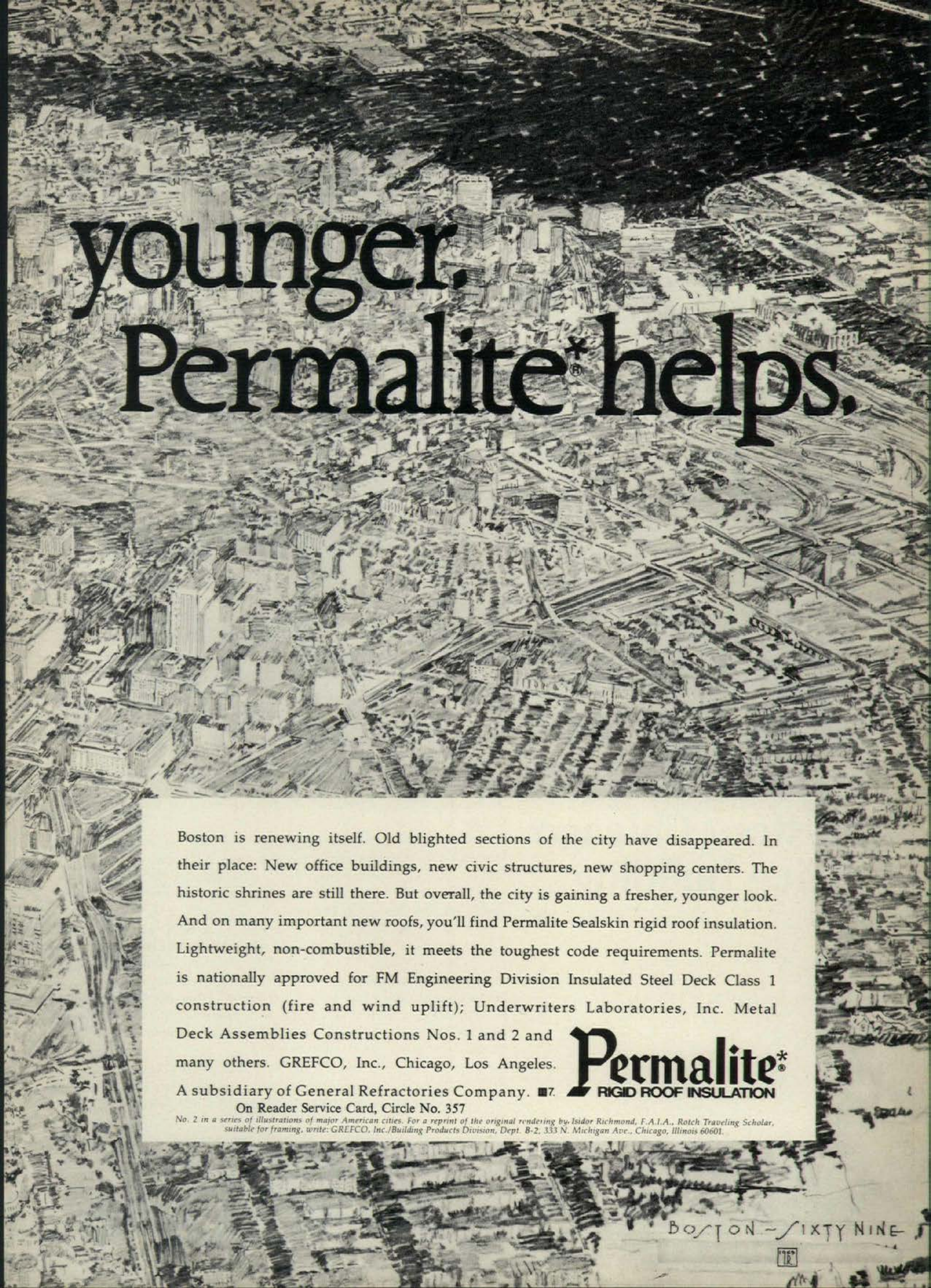
State Zip



Weyerhaeuser

Boston grows



An aerial sketch of Boston, showing a dense urban landscape with numerous buildings, streets, and a large body of water (the harbor) in the upper right. The drawing is in a detailed, etched style.

younger. Permalite® helps.

Boston is renewing itself. Old blighted sections of the city have disappeared. In their place: New office buildings, new civic structures, new shopping centers. The historic shrines are still there. But overall, the city is gaining a fresher, younger look. And on many important new roofs, you'll find Permalite Sealskin rigid roof insulation. Lightweight, non-combustible, it meets the toughest code requirements. Permalite is nationally approved for FM Engineering Division Insulated Steel Deck Class 1 construction (fire and wind uplift); Underwriters Laboratories, Inc. Metal Deck Assemblies Constructions Nos. 1 and 2 and many others. GREFCO, Inc., Chicago, Los Angeles.

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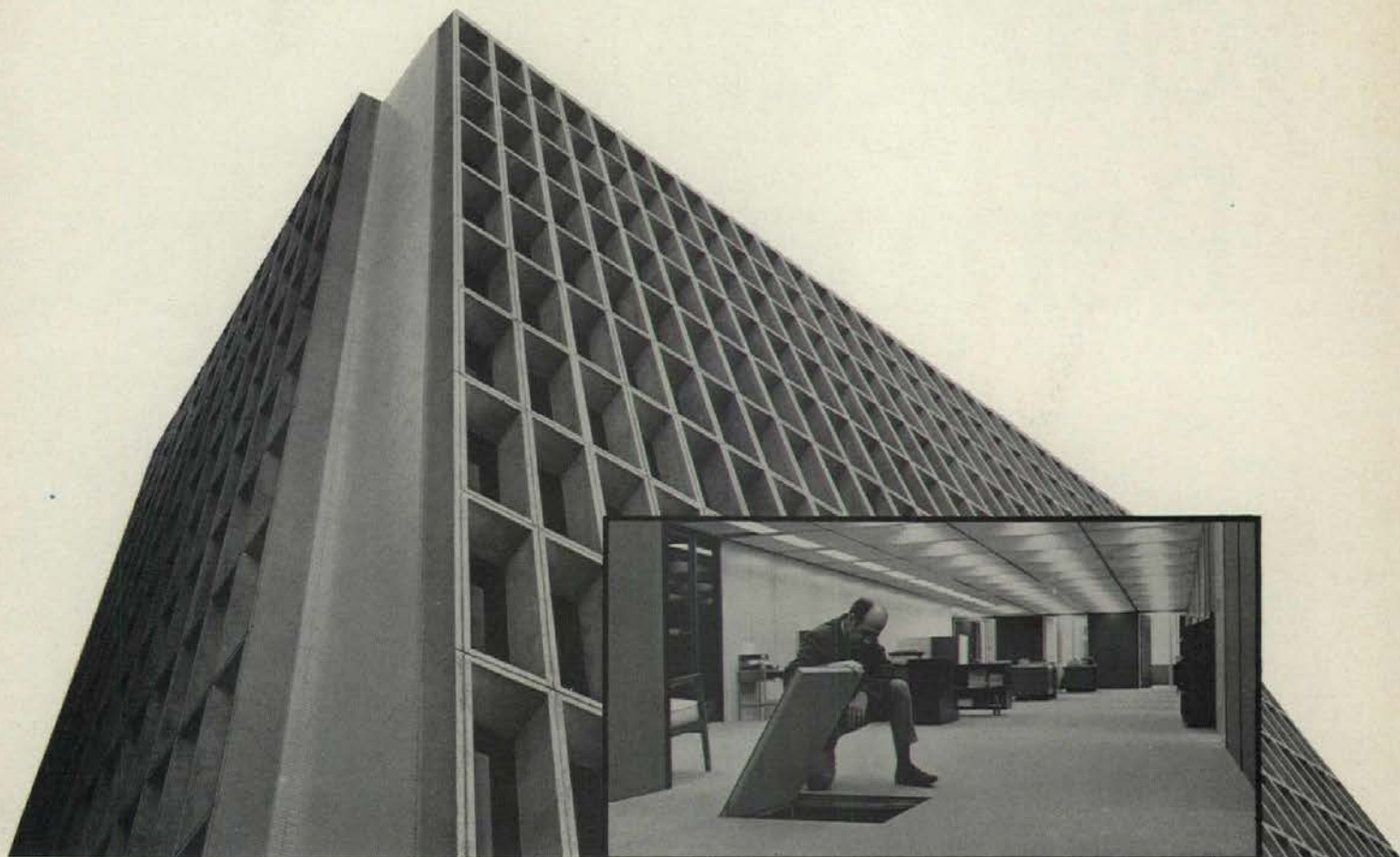
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No. 2 in a series of illustrations of major American cities. For a reprint of the original rendering by Isidor Richmond, F.A.I.A., Rotch Traveling Scholar, suitable for framing, write: GREFCO, Inc./Building Products Division, Dept. B-2, 333 N. Michigan Ave., Chicago, Illinois 60601.

BOSTON - SIXTY NINE



128,300 sq. ft. of free-access Weberfloor . . .



pays off in new 12-story Chicago office building.

Typical of the growing trend toward access flooring in general construction is the American Hospital Association's new building, designed by Chicago architect, Richard O. Evans of Schmidt, Garden & Erikson.

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By providing ample, fully accessible underfloor space for electrical services, the Weberfloor system completely eliminated the cost of headers and raceways in the floor slabs. Pedestals were installed on the semi-finished slabs and then adjusted for height. Power troweling was eliminated. Floor slabs were poured as soon as formwork and reinforcing were in, with mechanicals installed later on top of the slab. Result: a shorter pour schedule that moved completion ahead a full month.

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Write for free booklet. The use of free-access Weberfloor in two major applications and its significant advantages for general construction are covered in detail. Write for your copy to Weber Architectural Products, Division of Walter Kidde & Company, Inc., 1340 Monroe Avenue N.W., Grand Rapids, Michigan 49502.



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Project: Texas Children's Hospital / St. Luke's Episcopal Hospital, Houston
Architects (In Joint Venture): Foy Martin — Staub & Rather, Houston
Hospital Planning Consultants: O'Connell & Probst, Architects, Austin
Structural Engineers: Francis J. Niven & Associates, and Joe T. Strother, Associate Engineer, Houston
General Contractor: Manhattan Construction Co. of Texas, Houston
Prestressor: Prescon Corporation, Corpus Christi

Texas Children's Hospital and St. Luke's Episcopal Hospital, both part of Houston's Texas Medical Center, will share space in this 28-floor tower. The new addition will increase the hospitals' working space by about 1,000,000 square feet.

Structural framing for the tower consists of steel box columns with shear plates at each level to support 28-foot post-tensioned concrete floor slabs. Armco TUFWIRE® (¼" dia.) was enclosed in the slabs in galvanized flexible metal

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tubing. By using a slab system designers omitted primary girders and beams,

and did away with beam drops and web openings that often interfere with electrical, oxygen, climate control and other mechanical systems.

If you're a designer and you'd like more information on prestressing, write for our booklet, *Prestressed Concrete: a Growing Concept in Construction*. TUFWIRE is another fine Union Wire Rope product made by Armco Steel Corporation, Department K-1450, 7000 Roberts Street, Kansas City, Missouri 64125.

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Bank of America

World Headquarters Building,
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Offices feature VMP Corporate type.
52 stories—779 feet high.
Architect: Wurster Bernardi & Emmons and
Skidmore, Owings & Merrill
San Francisco, Cal.
Architectural Consultant: Pietro Belluschi.
Genl. Contractor: Dinwiddie-Fuller-Cahill
San Francisco, Cal.
Occupancy—1969.

World's Largest Steel Company

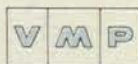
United States Steel Building

Pittsburgh, Pa.
VMP will furnish Twinline Type in what will
be one of the largest installations of
movable steel partition.
64 stories—841 feet high.
Architect: Harrison and Abramovitz, and
Abbe, New York, N.Y.
General Contractor: Turner Construction
Company, New York, N.Y.
Occupancy—1970.

World's Largest Oil Company

Standard Oil of New Jersey

Rockefeller Center Building, New York, N.Y.
VMP will install over 20 miles of
Corporate type movable steel partition.
54 stories—750 feet high.
Architects: Harrison & Abramovitz & Harris
Consulting Architects: Welton Becket and
Associates, New York, N.Y.
General Contractor: George A. Fuller
Company, Inc., New York, N.Y.
Occupancy—1971.



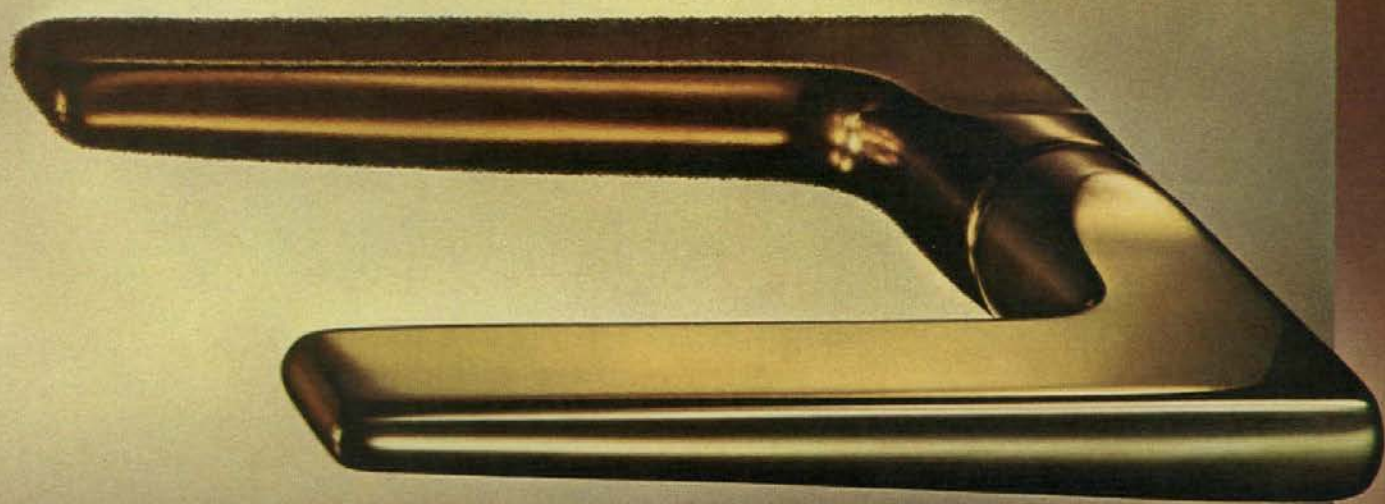
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Panels of mismatched or random-matched veneers. Panels which retain the rough natural textural beauty of wood. Panels joined in new ways with plastic or built-in reveals. Panels or battens that are available in many widths to vary surface treatment.

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Butcherbloc™—a paneling of dramatic impact inspired by the counter of the neighborhood



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Collage™—choice wood veneers of birch, elm, oak, walnut, pecan, teak and rosewood are over-

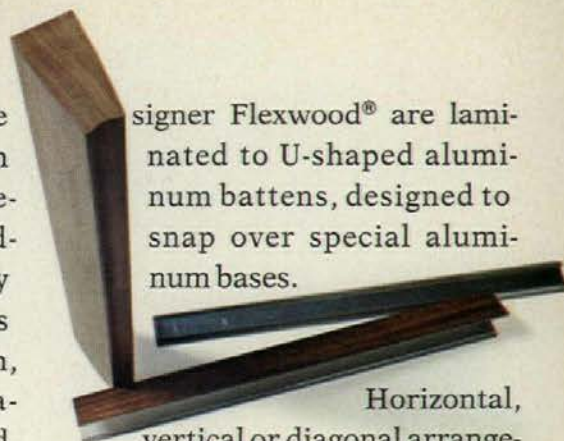
lapped in random arrangements across each panel face to form a syncopated pattern of wood grains and color shadings. Veneers vary in length and width, texturing the surface of each panel in bold three-dimensional relief.

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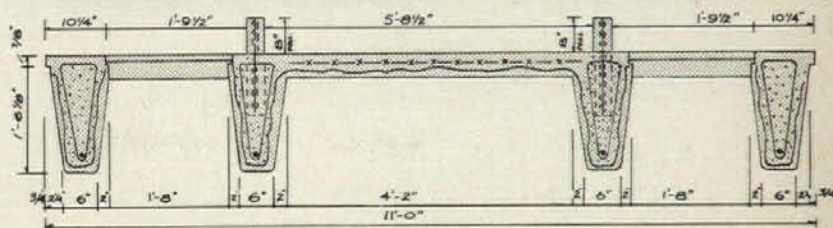
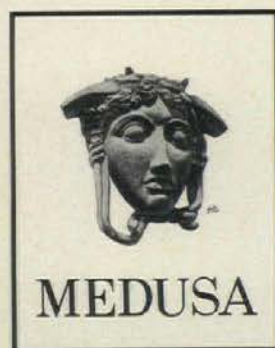




A black and white photograph of a tall, white, rectangular skyscraper under construction. The building features a dense grid of windows. A large crane is positioned at the top of the building. The base of the building shows multiple levels of construction.

Precast units of Medusa White are moldable to the architect's creativity, easy to install, weather tight, fire safe, and require minimum maintenance. Write Medusa Portland Cement Company, P. O. Box 5668, Cleveland, Ohio 44101.

CLEVELAND STATE UNIVERSITY (Library & Faculty Tower) Cleveland. Architect: Outcalt Guenther Partners, Cleveland. General Contractors: (Joint Venture) Blount Brothers, Construction Company of Birmingham; William Passalacqua Builders, Cleveland. Precast Producer: Marietta Concrete Company, Marietta, Ohio.



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P/A NEWS REPORT

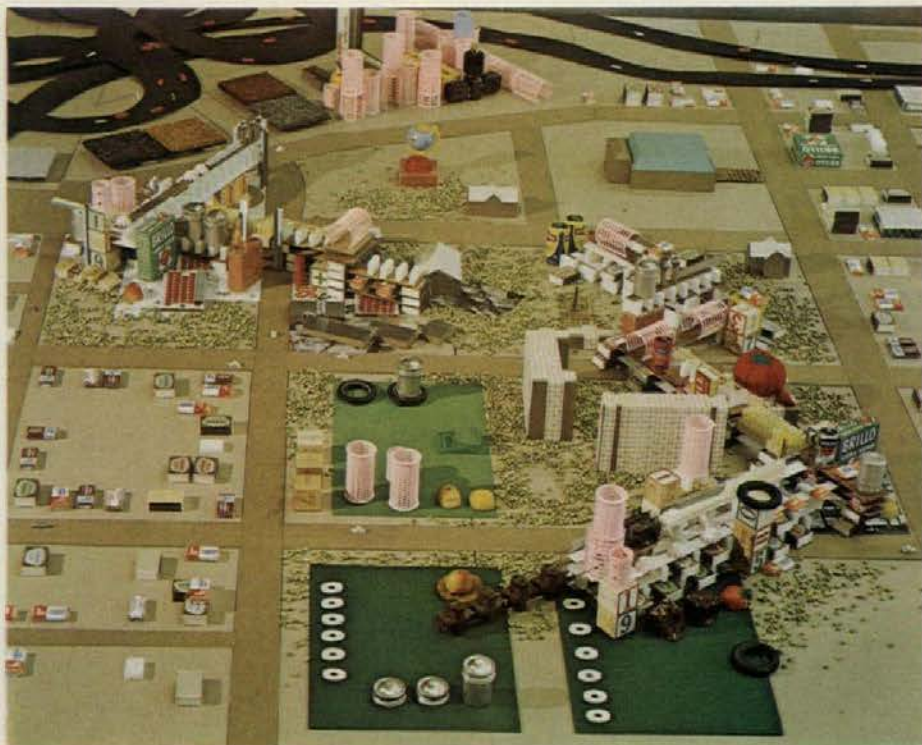
Planning Professions Lobby for Peace

On July 22, the Committee of the Planning Professions to End the War in Vietnam visited the Capitol to again make its views known to senators and congressmen. The group of 150 architects, builders, engineers, and planners from the East Coast urged the passage of the Hatfield-McGovern Amendment ending the war in Vietnam, Cambodia, and Laos, and the reordering of priorities necessary to end poverty, and to improve and save urban and natural environments. According to one organizer, Maxfield Vogel, AIA, the outcome of the trip was hopeful but "it is necessary to do more to make congressmen and senators aware that the planning professions are anxious" about these issues.



Pedestrian Passageway Offers Relief from Midtown Bustle

Some years ago the New York Chapter of the AIA endorsed a proposal for a series of pedestrian walkways to cut through buildings from Bryant Park (42nd St.) to Central Park (59th St.). Now, one leg of that route has been realized with the creation of a midblock passageway connecting 42nd St. with 43rd St. in the City University of New York's Graduate Center building. Formerly Aeolian Hall, home of concerts in the twenties, and later an office building, the structure has just been renovated for the Graduate Center's uses by architect Carl Petrelli with the help of interior designer Marilyn Mikulsky (also assistant dean of the Graduate Center and coordinator for campus planning and design). In creating the passageway that doubles as the lobby for the center, they have used precast concrete, stucco, and bluestone masses to create variety and change the scale of the walk-through, transforming it into a strikingly pleasant haven from busy New York streets.



Process Plan by Hardy Holzman Pfeiffer

The disparate shapes, sizes, and colors of Shaw University's master plan are intended to establish a new direction and vocabulary for the university's development in order to reflect the true character of the urban campus. Breaking from past traditions that envisioned the university in a rural setting with stylistically united, free-standing buildings surrounded by trees and plazas, Shaw University in Raleigh, North Carolina, anticipates future multidirectional growth. Individual buildings for single activities, erected to a rigid timetable, will have no place. Shaw's planned facilities will no longer distinguish between classroom, dormitory, or eating hall.

To create a vital urban environment, new university-community relationships will be encouraged; the traditional dormitory will become low-rental housing for students and the community; commercial activities, beyond normal campus-support activities, will be encouraged. The plan will emphasize high density and intense interaction between activities; learning will become a continuous process where all activities intermix — from library to laundromat — in the constantly changing, living-

learning environment that Shaw has set as its future goal.

The 105-year-old multiracial school, which only seven years ago was burdened with financial problems and a diminishing student body, has doubled its enrollment in the last few years. Its multimillion-dollar expansion plan will more than double the present usable space.

Symbolic

"A visual translation of the world" is the object of industrial designer Henry Dreyfuss' collection and development of a universal graphic vocabulary. Through symbology, Dreyfuss seeks to "provide the means of visually transmitting a wide variety of 'messages' to virtually every man, woman, and child in the world, regardless of native language, geographic location, cultural background or degree of literacy." Dreyfuss has collected, classified, and filed over 8000 symbols from around the world, and welcomes any and all signs, symbols, ideas, and examples for the dictionary of symbolic language he is compiling (500 Columbia St., South Pasadena, Calif. 91030).



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Naval Architecture on Land

Little attention is ever given to the architectural accomplishments of the United States Navy, perhaps because of the no-nonsense approach this particular client takes towards its habitations. Yet a park shelter project at the Seabee base in Gulfport, Mississippi allowed one architect, John F. Skelton, to gain some satisfaction while he was doing his time in the Civil Engineering Corps.

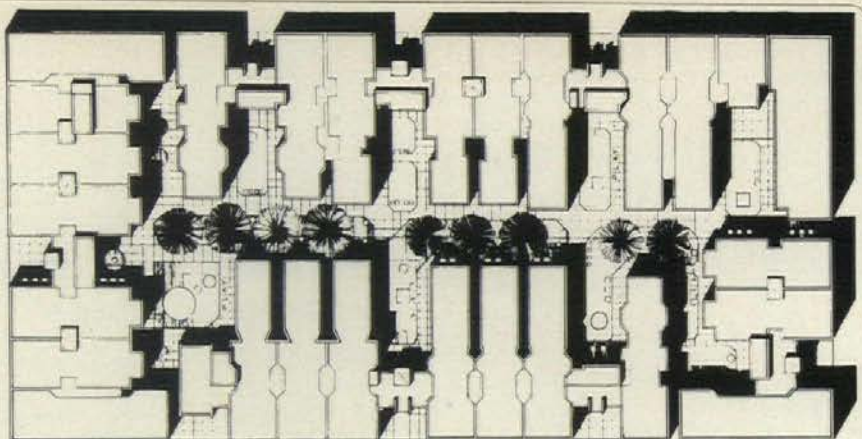
The pavilion has the symmetrical plan of a Greek cross with four 16' x 16' arms. Brick piers containing barbecue grills terminate each of the arms of the elevated wood structure. The central core area, depressed slightly below the wings, is covered by a double-hipped roof rising to 14 ft to differentiate it as a dancing area from the rest of the pavilion. The double-hipped roof, which floats above the rest of the pavilion, is carried by two outrigger beams at each corner. The combination of hipped roofs, open spaces between, and bolted joints, effectively provide resistance to the heavy winds so prevalent in that area.



Museum of the Future

The Museum of the Media in New York, a small cellar-based operation run by three brothers, Ronald, Richard, and Stephen Globus, has been creating audiovisual environments of modular construction that break down into a minimum of basic components.

The audiovisual environment consists essentially of a space enclosed by three floor-to-ceiling projection screens. Remotely controlled projectors are placed at the rear of the screen; the presentation is automated by a punched tape system. The photography of images is also computerized: functions of a camera are programmed to optically scan the material.



Milbank-Frawley to Undergo Rehab

Local initiative has finally gotten the upper hand in the rehabilitation of one of New York's slum areas. Last month FHA approved a mortgage commitment to the Milbank-Frawley Circle Community Council, a local group in East Harlem, for its HDA-approved rehab program. The concept, developed by architects Oppenheimer Brady & Associates with community assistance calls for utilizing the soundly built old tenements and vacant lots plentiful in the area. Utility and circulation cores will be built on the vacant lots to adjoin existing buildings so halls can be cre-

ated by breaking through small openings and bearing walls. These halls will run through three or four old buildings and connect to another core. The old buildings will then be completely gutted (except for sound joists) and repartitioned. Since old stairs and halls will be removed, space for apartment units will be gained. (Typical apartments offer several bedrooms.) Construction work will be done by a large housing contractor and a local construction cooperative consisting of a number of neighborhood black contractor members.



Pastoral Settings for the Freeway

San Francisco freeways recently doubled as sites for temporary bucolic scenes composed of cows, sheep, chickens, palm trees, grass, and picnic tables. These "portable parks" were conceived by artists Bonnie Sherk and Howard Levine and aided in their realization by the Vernal Equinox Special Award given by San Francisco Museum of Art's Society for the Encouragement of Contemporary Art. The parks were installed for 24- and 48-hour periods in three successive locations. Sites were chosen for their "mechanistic" nature to show the possibilities the introduction of pastoral life has in enlightening the somberness of urban character.

Model Cities Suit Re-Establishes Citizen Participation Basis

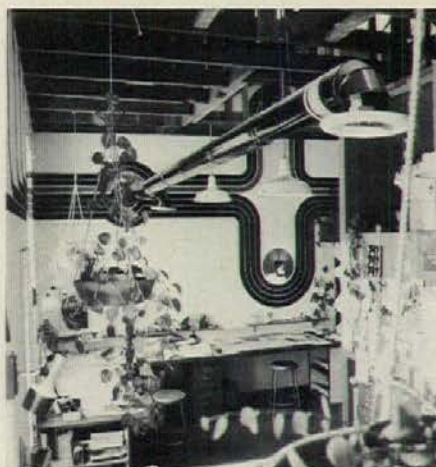
A Philadelphia citizen's group, The North City Area-Wide Council, has won a suit in the U.S. Court of Appeals for the Third Circuit against HUD for its decision that citizens have a reduced role in the Model Cities program. The Model Cities program, originated under the Johnson Administration, stressed the shared control of city government and citizen groups over Federal funds to improve urban blight. Last year, however, when Philadelphia was seeking \$3.3 million for its Model Cities program for the renewal of North Philadelphia slums, it was told it would have to revise its application to reduce the control of the Area-Wide Council over nonprofit corporations to provide housing, health, and education.

The Council then sought an injunction against the implementation of the revised renewal plan. Their complaint was dismissed by the Federal District Judge, but reversed by the Court of Appeals which has found that George Romney, Secretary of HUD, violated the Model Cities Act of 1966.

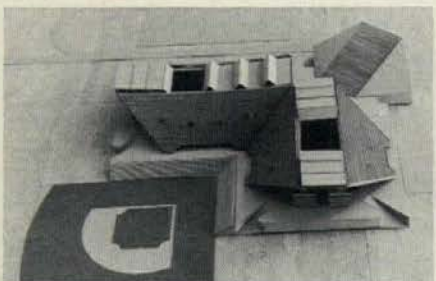


Churrigueresque and Supergraphics

With few alterations, a former newspaper building has recently become an architect's offices. Home of the Orange Daily News since 1898, the one-story building has long been a landmark in the town. Architect Leason Pomeroy made few changes on



the exterior; an entry canopy, two signs, and a coat of paint. Inside the architect enlivened spaces with supergraphics and chrome-wrapped air ducts and light fixtures in a way that blends well with the Churrigueresque character of the building.



Coli-Stadium Solves Indoor-Outdoor Viewing

The unusual form of this stadium provides ample seating for both indoor and outdoor sports. For outdoor sports, spectators sit on the laterally extending exterior walls of the boat-like structure. For indoor activities, spectators sit on the end walls of the arena, which, in reverse of outdoor seating, are broad at the base and narrow at the top. The architect, Alexander Pollack, states these two seating configurations are most suitable for viewing the particular sports for which they are intended. An operable lucite roof closes over the structure where indoor sports are held, but can be drawn back, weather permitting. Access ramps act as structural piers for the concrete form which itself is imbedded in the arena platform. Supporting facilities such as locker room and food concessions are located under the platform. In the photo above, two stadium structures have been combined for added space and flexibility. The University of Florida at Gainesville is considering the proposal for its campus.



Space Age Interiors for South African Airways

Recently remodeled quarters for South African Airways in New York have added one of the more interesting airline sales offices to Fifth Ave. (or "Avenue of the Airlines"). The long narrow interior, designed by Wilke, Davis, Mitchell Associates, divides into three capsulelike sections. The two end sections, the rear one a ticketing area, and the front one a waiting room, are raised on platforms with walls and floors forming continuous planes. The front section particularly presents a containerlike image by virtue of its continuous walls, ceiling, and floor of varnished oak. Linking the two raised end sections is a dark (walls, floors, and ceiling are gray green) waiting area, subdued enough to direct attention to the rear end wall, a floor to ceiling sculptural relief by William Daley.



New Image for Jensen's

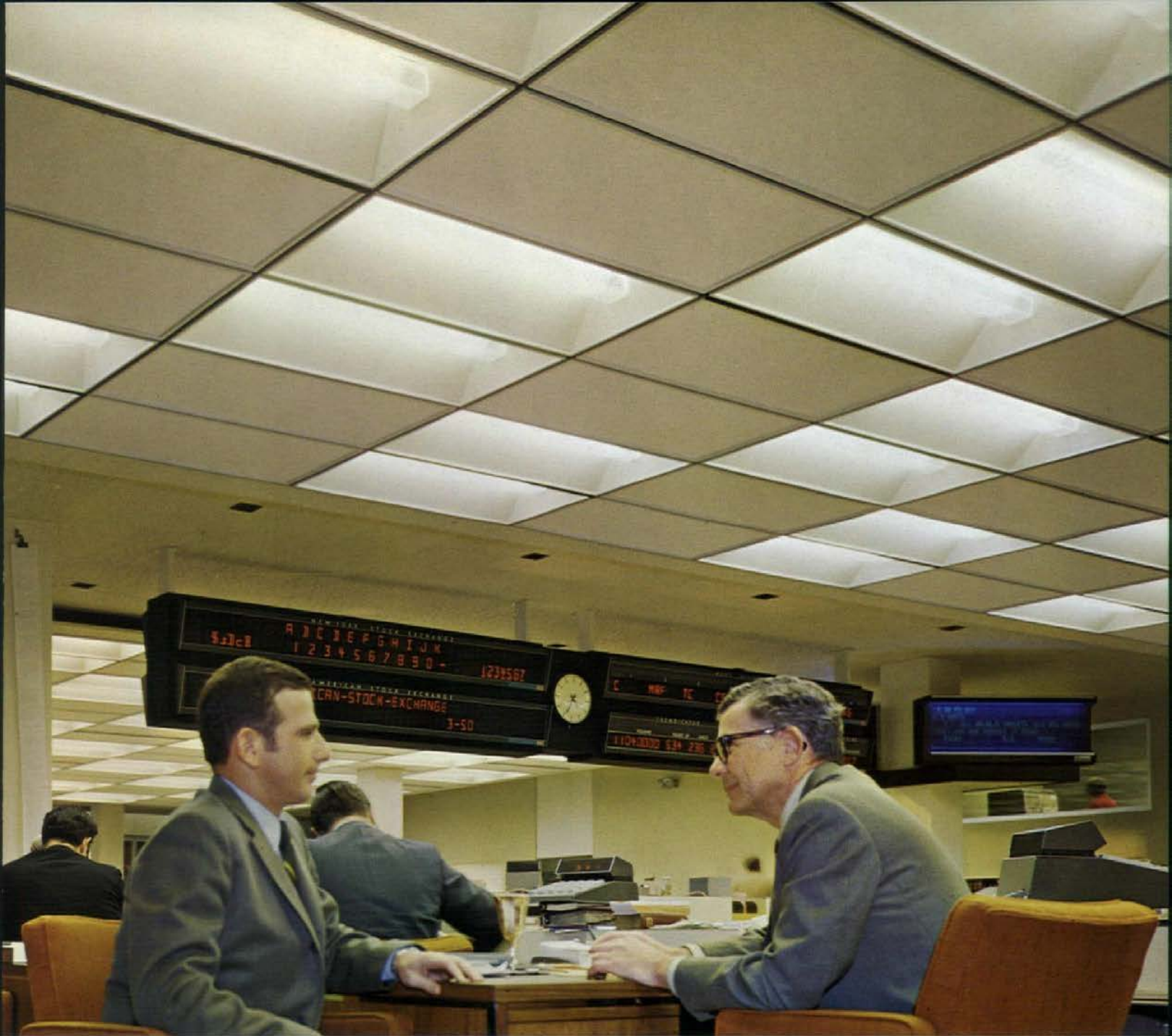
Georg Jensen has moved recently to new quarters on Madison Ave. where the presence of nearby Bonnier's, Design Research, and Bloomingdale's has created an off-Fifth Ave. circulation route for Saturday shoppers.

The store occupies two townhouses built in 1869 and unified by a classic facade long before architect James Polshek undertook their renovation for Jensen. The lower facade has been redesigned to contain modular-mullioned display windows flanking the entrance doors (aluminum-cast enlargements of the Jensen plaque). Overhead the store name is spelled out in 50 ft of recessed metal lettering; below a charcoal gray slate pavement extends from the curb through the first level.

Gray is the dominant color on the outside as well as on the interior, accented here and there by plum. Even the elevators, which are molded fiberglass and the first to be installed in this country, are gray. (This project is the second in New York's Gray Revival, seen first in the Knoll showroom (P/A Aug. 1970 p. 35). The interior design is understated to offset the merchandise, a concept well suited for the range of items from Italian plastic to German kitsch painted porcelain.

The lighting, however, is often more dominant than the merchandise, particularly the levels that are lit by a series of bare filament bulbs on matte aluminum ceiling. On other floors, the lighting, a combination of fluorescent baffle with incandescent spots angled on tracks, is less noticeable but perhaps as uncompromising.





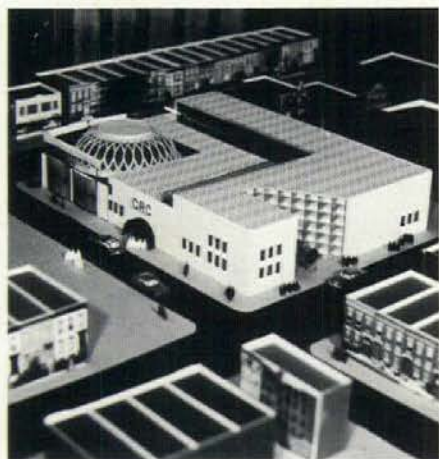
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NEWS REPORT



The model composed of familiar "found objects" is a suitable metaphor for the community center which will be made from known systems and parts easily found in building catalogs. Entry is the beginning of tunnel-corridor made by Wonder Trussless Building Inc.; classrooms are enclosed by nonstructural domes by Seal Reinforced Fibreglass, Inc.; the building's steel structure (beam trusses span 60 ft, and space trusses 35 ft) and metal skin are made by Butler. An air-inflatable dome by Birdair Structures, Inc. covers the pool where a hole has been cut in the Ruberoid T/NA 200 roofing membrane. IBG Greenhouse windows will be used for the clerestory skylight windows, and Raynor hangar doors for the entrance (over glass) and for the swimming pool walls.

Satellite Community Arts Center for Brooklyn

Following their research into the applicability of standard industrialized building systems for satellite community arts centers (P/A Aug. 1970 p. 36), Hardy Holzman Pfeiffer have brought forth a specific prototype design. The center, designated for a Model Cities site in Brooklyn, is being built with the aid of the Ford Foundation and the Brooklyn Institute of Arts and Sciences. The program was developed under supervision of United Youth Action (a nonprofit group concerned with remedial education and cultural enrichment programs in the area), the Parks Department, and the Brooklyn Public Library, and calls for day care center, classrooms, gymnasium, bowling alley, swimming pool, and art gallery.

Choice of building's structural elements was based on several considerations: component parts of the building assembly must be low cost, easily available, and flexible (even

portable), to meet changing needs of program. While standard industrialized elements separate the areas inside, they are designed to be open-ended enough for activities to shift through various areas. The building is also designed to be easily accessible to the community at large. For example, swimming pool (left corner) is directly accessible from the street by day in warmer weather but is protected from vandalism by night by hangar doors. Its air inflatable dome may also be removed in the summer so that the pool is open to the air, with the building's steel structure exposed.

The wedgelike entry on the side elevation provides more direct entry to the lower level gymnasium and bowling alley. While most activities take place on street and lower levels, the space over the gymnasium is three stories, the maximum allowable because of zoning and limitations of technology.



Three-Way Tie in Student Competition

Results of this year's C. Randolph Wedding Design Competition at the University of Florida (Gainesville) ended in a three-way tie for the students. Focusing on a rundown area in St. Petersburg, the program called for a redevelopment of the residential site to proceed in phases in order to not dislocate the entire community, and provision of housing for those temporarily displaced.

Two of the winning schemes increased the density of the residential and commercial facilities in response to growth patterns, while the third emphasized rehabilitation of the low-density neighborhood and replaced dilapidated housing with new low-rise houses.

Winners were chosen by a jury consisting of Ralph Warburton of HUD, Leonardo Ricci, Director of the Institute of Architectural Design and Town Planning in Florence, Italy, Robert Renfrow, housing consultant, Forrest Wilson, P/A Editor, and Ralph C. Wedding, sponsor of the competition. Two teams whose winners are not shown in photo above are Charles Billingsley, Thadd Blanton Jr., Samuel Holladay, and Peter Blitstein; Edward Bondi, Bernard Horowitz, Nelson Mallo and George Estevanez.



New Kind of Billboard for the Mojave

A novel approach to announcing the expansion of a shopping center has been successfully explored by graphic designer Deborah Sussmann. These different signs, the highest of which is 28 ft, symbolize types of new

buildings to be added to the center in California City in the Mojave Desert. Signs occupy a 108-ft long area in front of the parking facilities and, from their apparent appeal, should be retained after construction.

Personalities

John M. Bailey, Jr. is the winner of the Architectural League of New York's Arnold W. Brunner Scholarship for his proposal of an evaluation of advocacy planning, and the design profession's role in urban and environmental design. Mr. Bailey is Director of the Community Design Center at the University of California Extension . . . Paul D. Spreiregen, former program director for Architecture, Planning, and Design of the National Foundation on the Arts and Humanities has been named vice-president of Doxidis Associates, Washington, D.C.



HAWAIIAN STATE CAPITOL BUILDING
 ARCHITECT: John Carl Warnecke & Associates, AIA
 ASSOCIATE
 ARCHITECT: Lemmon, Freeth, Haines & Jones, AIA



LIBRARY
 University of California, San Diego
 ARCHITECT: William L. Pereira Associates, AIA

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Our acoustical ceiling tile seems to be making quite a point.

(In its own quiet way.)

The point is performance. Architects and others responsible for specifying ceiling products are beginning to realize this, and they're specifying Simpson acoustical tile for a number of large, high-prestige jobs.

Simpson PyROTECT® non-directional fissured tile is one good reason why. It is designed to combine the flame spread performance of mineral tile with the durability and handling ease of cellulose fiber tile. And because of its non-directional pattern, it lends an attractive monolithic look. PyROTECT is available with four different edge treatments.

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Simpson acoustical tile is a performer. But see for yourself. Contact or write: Simpson Timber Company, 2000 Washington Building, Seattle, Washington 98101.

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where originality
looks for you...

If someone said your company was too small to handle big pneumatic control jobs, what would you do?

Read why Barber-Colman can handle more types
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larger pneumatic control manufacturers.

Size can be deceptive—ask Goliath.

It's a fact the giants of the pneumatic control business
have many more service installers than Barber-Colman.
That's *quantity*.

It's also a fact that six years ago Barber-Colman
began to hire the top pneumatic mechanics in the busi-
ness. And we've continued hiring the top men ever
since, so that today the superintendents and lead men
who head up Barber-Colman's pneumatic installation
crews have an average of 12 years' experience. That's
quality.

It's a fact that big jobs—with unusual control and air
distribution problems—can confound the giants. For
example, interfacing pneumatic, electric, and solid-
state controls and then making them work in a tough
air-delivery situation can have some people talking to
themselves in no time.

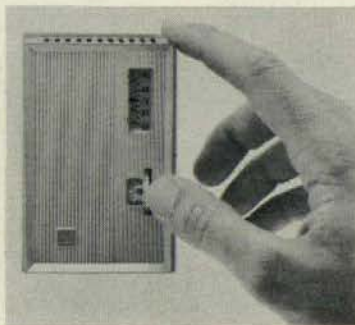
It's also a fact that Barber-Colman is thriving on
big jobs the giants won't take. The main reason is
we're the only control manufacturer that builds pneu-
matic, electric, hydraulic, and solid-state systems . . .

plus our own complete line of air distribution products.
Which means our people think and work in terms of
the total environmental system, rather than independent
functions. Things that have to work together get de-
signed together so that the tough jobs—and the easy
ones—go in faster, with fewer problems.

Today, a lot of manufacturers will give you any type
of control system you need for your job—as long as
it's pneumatic. It's also a fact that Barber-Colman
gives you the best in pneumatics—and all the other
types of control systems, too. And a comparative
analysis of job records proves it—we *do* install more
types and sizes of environmental control jobs than
either of the larger environmental control manufacturers.

If you would rather select than settle on your next
control job, get a bid from Barber-Colman. We give
you more than control. Your Barber-Colman field office
has all the facts about our total capability—including
pneumatics. Or, if you prefer, write to Mr. Peter Van
Dae, Director of Marketing.

You will be seeing
a lot more of
these around.



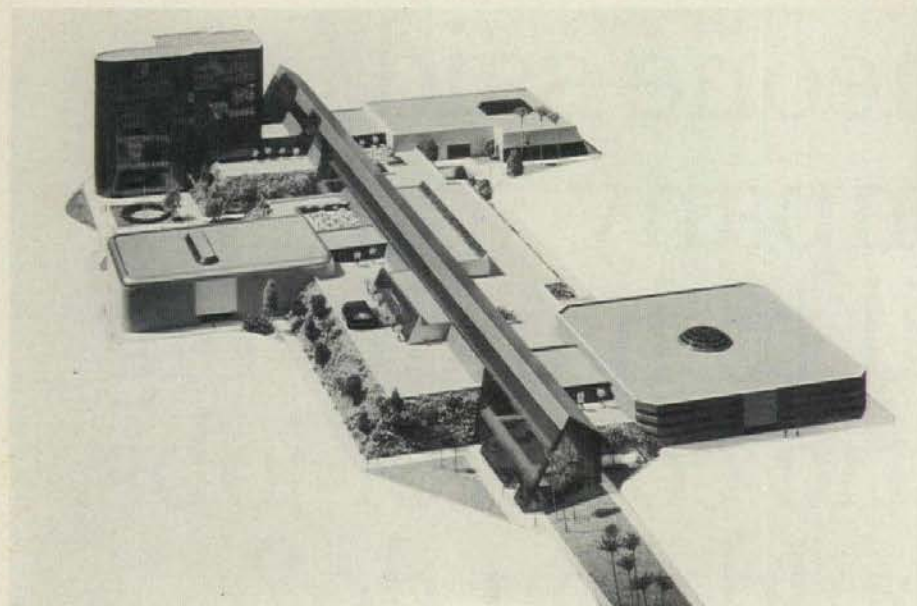
**Fact: nobody knows more about
pneumatic controls than
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More big buildings are now being
controlled by advanced Barber-
Colman pneumatic/solid-state
control systems that go in faster,
with less trouble, and at lower
cost than comparable all-
pneumatic systems.

ES/PC-70-3

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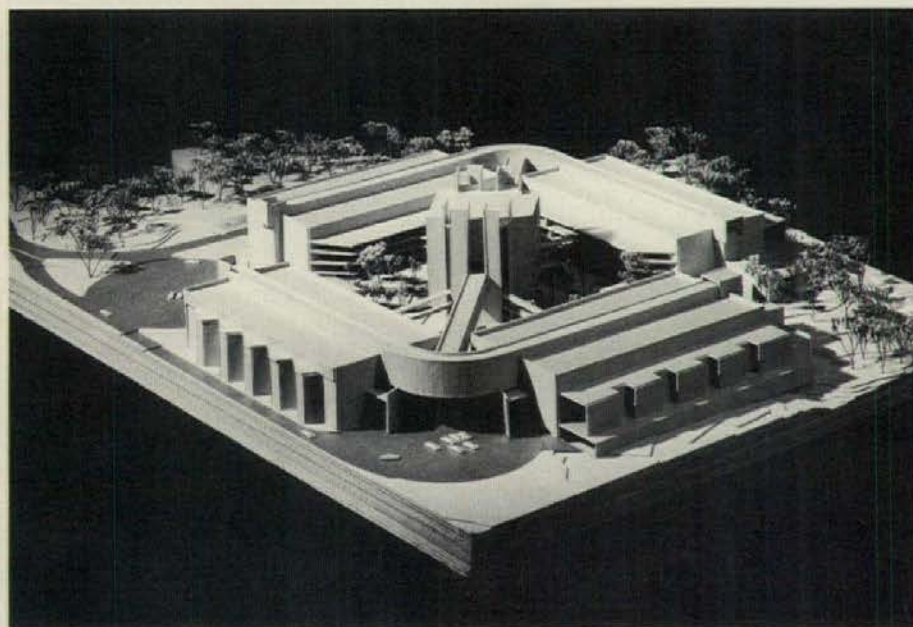


Santa Anita Fashion Park

Arcadia, California
Gruen Associates, Architects; Cesar Pelli, Partner-in-Charge of Design

This shopping center, bearing increasingly familiar hallmarks of the Gruen office, will become part of a future town near L.A. Characteristic elements in the project include reflective glass and steel structures

and earth berms combined with a spine-concourse, open-ended for expandability. The multileveled air-conditioned pedestrian mall will link three large department stores, 100 specialty and boutique shops, and office buildings. Construction of the \$50 million development is to begin in early 1971.



Smithsonian Institution Museum Depository and Support Facility

Silver Hill, Maryland
George M. Ewing Co., Architects

As part of a feasibility study and master plan, the architects recommend this additional collections-storage and laboratory facility for the Smithsonian's extensive holdings. Four storage-shop blocks surround a central sorting and cataloging office, all connected by a service spine con-

taining mechanical services and materials-movement equipment. Various functional areas will be differentiated by use of materials: storage and shop areas are to be enclosed in precast concrete panels, laboratory and office spaces have glass and aluminum curtain walls, vertical circulation elements are cast-in-place concrete.



Tempe Civic Center

Tempe, Arizona
Michael and Kemper Goodwin, Architects

A completely glass-walled building in arid Arizona would seem preposterous were it not for the inverted pyramidal form. Because of the outwardly slanting walls, the solar rays are reduced. Although interior cubage gained by the sloped solar-bronze glass is not usable as floor area, it provides an "isolation" zone for the heat that does penetrate the steel and concrete structure. An extensive "lower plaza" development, spanned by pedestrian bridges and lit by lightwells, contains citizen service-oriented spaces and the mechanical system, while the glass building houses administrative offices.



Sears Roebuck and Co.

Chicago, Illinois
Skidmore, Owings, Merrill, Architects

The world's tallest building (1450 ft) surpassing the World Trade Center by 100 ft and the Empire State Building by 200 ft, is being planned for downtown Chicago. Gross floor space will total 4.4 million sq ft (101 acres) with 3.7 million usable sq ft. The 110-story steel structure, with a black duranodic aluminum sheathing and bronze-tinted windows, will have 102 high-speed elevators, and sky lobbies at the 33rd and 34th floor levels and the 66th and 67th floor levels.



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Revolutionary dry-grinding method eliminates dust, water, pacherino — and cuts costs

The esthetic values of terrazzo flooring have been recognized since the palaces of the Doges and the castles of Castile.

But the problems created by terrazzo wet-grinding often proved to be too great an obstacle — water, pacherino, the necessity of dams, interference with other construction.

No more.

Now dry-grinding of terrazzo is no longer just a pipe dream — it's a fact.

The use of water has been eliminated completely in terrazzo grinding by the Advance Machine Company's new Dri Vac Terrazzo Grinder.

Until now, wet-grinding was the only practical method. But even the practicality of wet-grinding was dubious. Walls and adjacent areas had to be protected. Dams had to be built to keep water from spreading. And still expensive damage was sustained.

Also, it has been estimated that at least 12% of the total time and cost on a wet-grinding job is spent in handling water. Often, it takes an extra man — just to control the water and haul out the pacherino.

Add to these difficulties the problems of damage to aluminum door frames and trim, clean-up of porous brick or ceramic tile surfaces, evaporation of water into surrounding areas — and terrazzo often became only an architect's dream and a contractor's nightmare.

The solution to these obstacles has long been obvious — dry grinding.

But the filtering equipment required to handle the large volume of air required to fil-

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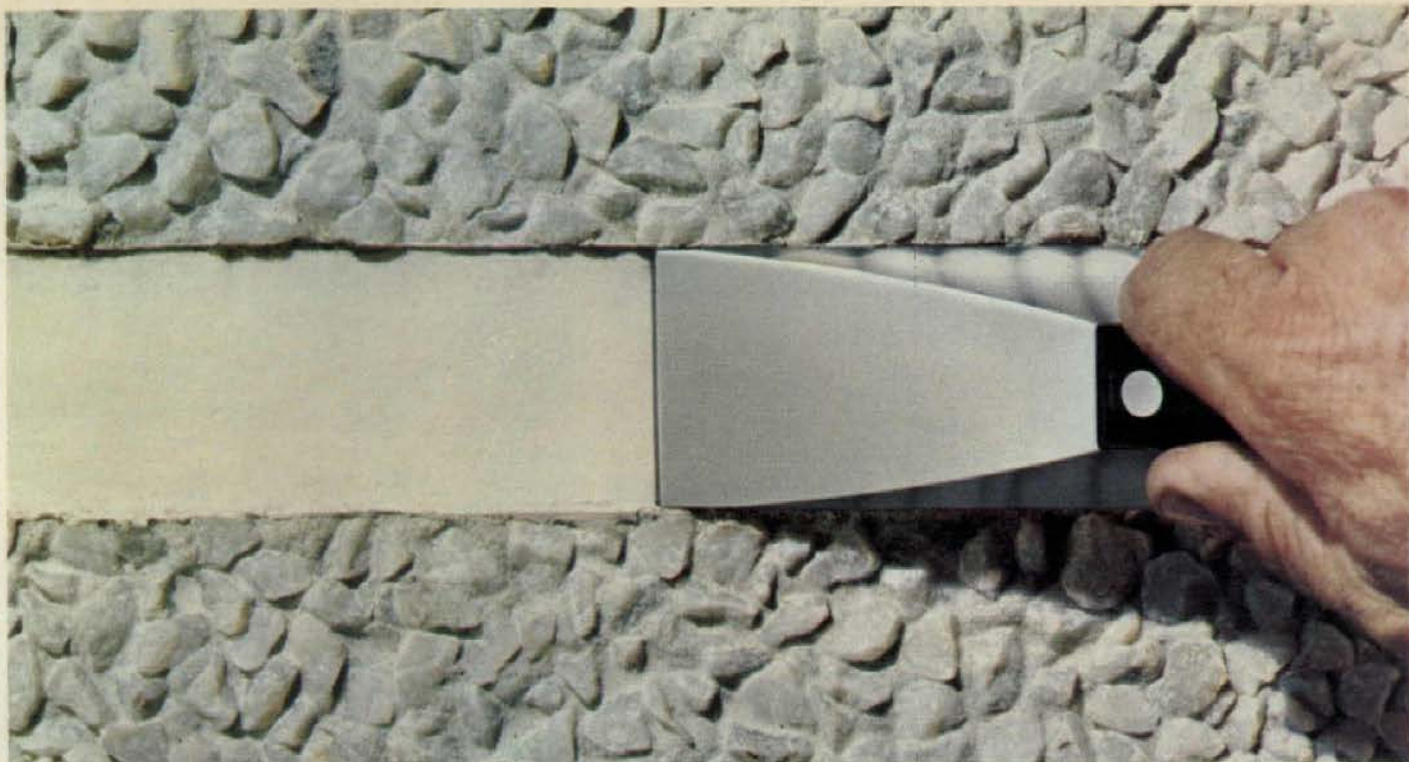
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Irvine Office and Bank Buildings

Newport Beach, Calif.
Craig Ellwood Associates, Architects

For the Irvine office and bank buildings complex at Newport Beach, Calif., Craig Ellwood Associates has adapted a system of fireproofing steel columns that was first proposed in the 1890s for a castiron building. The idea of filling hollow, cast iron columns with water was never put into practice until a research engineer at U.S. Steel developed it for the U.S. Steel Building in Pittsburgh (P/A April 1967, p. 58): perimeter columns of the steel cage building were insulated with water and conventional fireproofing was used on the others.

A decade ago, when Craig Ellwood began to cut free from the steel-framed house on which his early reputation was based, he took with him to large-scale commercial

buildings the same elegant detailing and commitment to lightweight steel framing. It was a sore point with him to heavy up the steel frame by encasing it in concrete; now his office has broken the barrier.

The perimeter columns for the Irvine office and bank buildings are 6" x 6" box-shaped tubes filled with water. For the lightweight steel framing system, the mullion columns are 5 ft on center with floor beams extending from the core of the building to the perimeter columns. The four-story office buildings are 120' x 120' with a 40-ft-sq utility core at the center, which leaves the perimeter areas free with 85 percent of the space usable. All exterior steel is natural weathering and is left exposed. The solar bronze glass is glazed into the structural mullions.



Cite Concordia

Montreal, Canada
Dimitri Dimakopoulos, Head of Design Team; Roger Montgomery, Urban Planner

From the folks who gave you Place Bonaventure — Concordia Estates Ltd — and from the Ford Foundation, comes this \$250 million project for midtown Montreal. The 25-acre site will be developed in three phases over seven to ten years and will ultimately house 7000 people plus provide offices, hotels, and recreational and commercial facilities. Significant features include two pedestrian systems (one protected), an underground trucking service, a centralized garbage disposal system, and an "agora" — a below-street level commercial and recreational plaza.

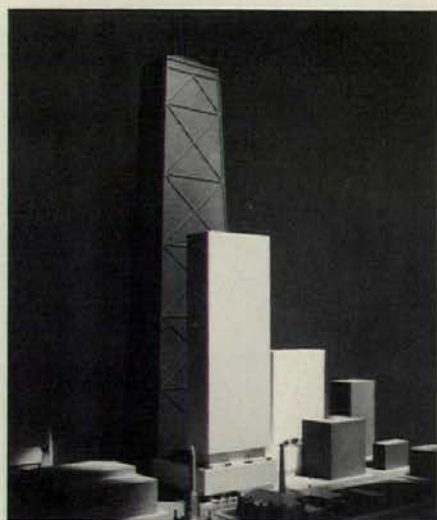


Ferry Port Plaza

San Francisco, California
Skidmore, Owings, Merrill, Architects;
Leo S. Wou & Associates, Consulting Architects

A hotel, office, and retail complex has been designed for a pierlike floating platform in the San Francisco Bay. The development is divided so that two levels of retail facilities and six levels of office space extend the length of the platform. They are divided, however, into two lengthwise sections by a glassed-over pedestrian

mall or galleria. Terminating these facilities is a 1200-room hotel with a one-acre court at its center, and glazed circulation towers at each corner. Entrance to the hotel is achieved via a landscaped esplanade that extends along the southern side of the complex. The complex will replace four existing piers, thus opening up the waterfront to view. The architects also plan a three-acre park along the Embarcadero, with parking underneath, parallel to the existing sea wall.



Marshall Field Store and Urban Center

Chicago, Illinois
Loebl, Schlossmann, Bennett, Dart, Architects

Plans have been announced by Marshall Field and Co. for the design of a multimillion dollar urban complex to be built "on the last vacant site" on North Michigan Ave. The 90,000-sq-ft site is bound by the John Hancock Center on the north and a 100-year-old water tower on the south. The \$60 million center will contain a three-level glass-enclosed mall for shops, plus office space and apartments. The Marshall Field store itself is a low-rise structure of 150,000 sq ft that forms a podium for the taller of the two office/apartment towers.



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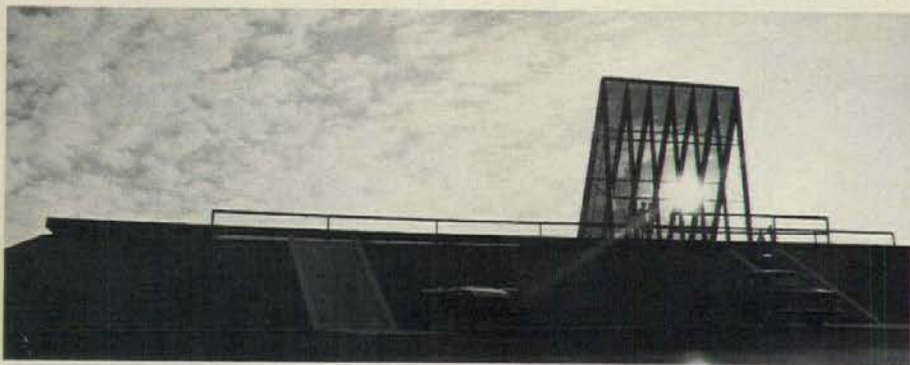
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Mini-Building for Mega-Balloon

Only a few miles from NASA's Manned Spacecraft Center in Houston is the location of Goodyear's new airship base; home of the largest blimp ever built: the *Americana*.

Few blimp ports have been built in recent years. The entire facility consists of three elements: a mooring circle, a 150' x 240' x 120'-tall hangar for two blimps, and the administration building. A fourth element, which provides the purpose for the facility, is the 192' long blimp itself. The Houston firm of Caudill Rowlett Scott—architects for the administration building only—were given the unique opportunity to design this structure for which little precedent has been set.

The major part of the structure, built of exposed concrete retaining walls with a supporting precast concrete "flexicore" roof, has been concealed within part of an expansive, grass-covered earth berm that was designed to augment the size of the relatively small building so that it could successfully compete in scale with the blimp and the hangar. Within the concealed administration building are the offices, communications center, pilots' ready room, and the entrance to the lounge.

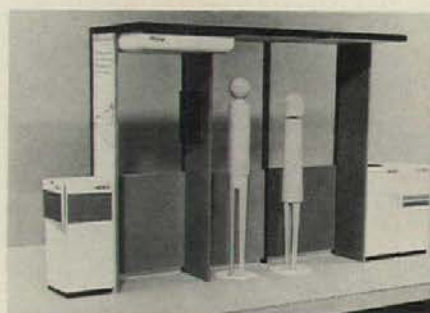
The visible portion of the 2000 sq ft administration building, constructed primarily of mirrors and of

mullioned glass set in brick steel supporting elements, forms a unique, 30' glass spire waiting lounge and observatory—the focal point of the entire facility—that soars up next to the main portion of the building. Entered from ground level, its gemlike, A-frame roof rises from a cut-out section of one side of the berm to adjoin an elevated promenade. A laminated gray mirror, on the sloping side of the mullioned-glass roof of the waiting lounge, has been designed to reflect the familiar diamond-shaped Goodyear logo that is painted with glass-beaded "glow" paint in reverse on the pedestrian way of the promenade. The architects purposely contrived this illusive billboard so that its mirrored image would constantly shift in intensity and "come and go" by day as the clouds and the sun moved. At night, flashing lights above the mirror enliven the sky-diamond billboard.

The promenade, reached by steps embedded in the side of the berm, is a 500' black asphalt open concourse running parallel to the glass spire. Structurally serving as the roof for the administration building, but continuing to the end of the solid berm, the promenade doubles as a viewing platform for as many as 3000 spectators to watch the airship's landings, launchings, and sky-show operations.

TV Series on Environment

A 32-part television series on environmental control over the next half century will be released this month for use by colleges, civic and business organizations, and other groups. Titled "The Next Fifty Years," the series features original thinking on environmental planning by 60 renowned authorities from a wide range of disciplines. Among the participants of the taped series are urban planner Charles Abrams (since deceased), microbiologist Rene Dubos, historian Pierre Bertaux, civil rights leader Bayard Rustin, physicist-researcher Herman Kahn, economist-sociologist Gunnar Myrdal, architect-mathematician Buckminster Fuller, educator Robert Hutchins, former secretary of agriculture Orville Freeman, and former SDS president Carl Oglesby. William R. Ewald, Jr., a prominent Detroit planning-development consultant, developed the project and will co-produce it with Visual Information Systems of New York City.

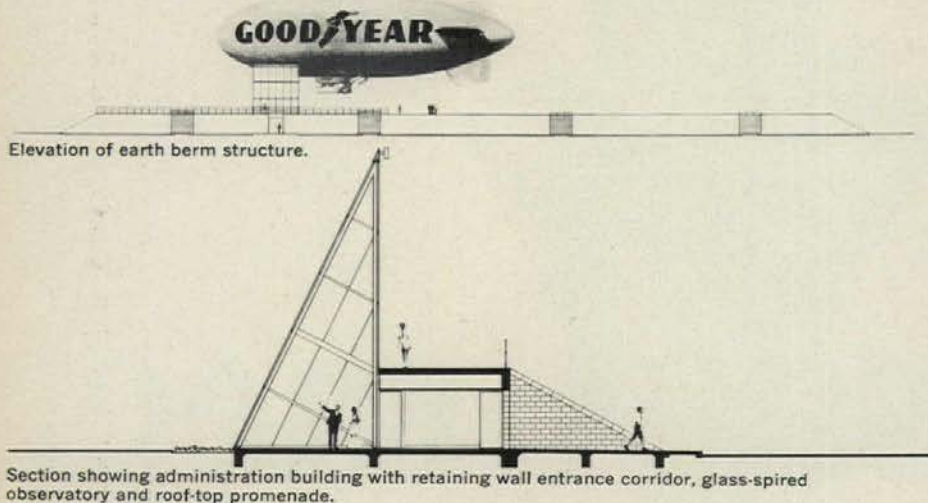


Pittsburgh to Standardize Street Elements

Many American cities have expressed considerable, if theoretical, interest in proposals to integrate signs, lights, traffic signals, and items of street "furniture."

The city of Pittsburgh is one of the first to actually implement such a plan. Peter Muller-Munk Associates, Inc., has designed a standardized system of public street equipment for Steel City which includes street lighting, traffic signals and signs, fire and police call boxes, hydrants, newsstands, telephone booths, transit shelters and benches, mail boxes, and trash receptacles. The plan calls for total replacement of existing streetware within six years.

A coordinated 18-in. modular design for such objects as telephone booths and mail boxes will permit maximum flexibility of arrangement. A trial installation in a major downtown thoroughfare is slated for the fall.





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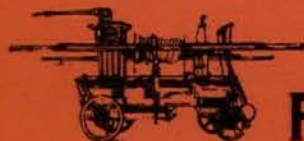
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NEWS REPORT

Chicago Landmarks Await Designation

Although the money squeeze affecting the nation's cities has tended to relegate municipal heritage to a bottom spot on the priority list, the city of Chicago has recently brought four of its turn-of-the-century school buildings under consideration.

Chicago Stock Exchange: The final word on the survival of Adler and Sullivan's 1893 building now belongs to the Chicago City Council. And, it may be a long time coming. Following a 7-1 vote favoring landmark designation by the Chicago Commission on Historical and Architectural Landmarks, the City Council passed the issue to its Committee on Economic and Cultural Development. Hearings began and were adjourned on the same day, April 30, for "further research." There it stands. According to the Chicago Heritage Committee, a partial reason for adjournment was to give the city time to consider a plan to acquire the building by eminent domain, renovate it, and have cost paid back within 20 years.

A rezoning proposal to give landmark-site owners bonus air-rights privileges to apply to adjacent sites has been submitted by the Chicago AIA. It is hoped that the proposed ordinance will be acted on before the vote on designation.

First Leiter Building: The Landmarks Commission voted 7-0 on June 17 against recommending the building designed by William LeBaron Jenney for designation. Samuel Lichtman, Commission member, said that the structure was "not a true precursor of metal skeleton buildings after all," although it is "a classic of chaste design." Located outside the city's core, the First Leiter is not as threatened by development as other buildings, and may survive without the designation.



Entrance to the Chicago Stock Exchange.

Carson Pirie Scott and Company Building: The Commission voted unanimously on June 24 to recommend designation of the Sullivan landmark, despite the opposition of the landowners (who include the Field Museum of Natural History and the Pension Fund of the Methodist Church). Most of the owners are willing to accept a nominal designation, but want the option of replacing the structure with something more profitable at a future time. The City Council will make the final ruling.

Monadnock Building: The Commission has made a unanimous recommendation for designation of the northern masonry half of the Burnham and Root structure. Thus far, the City Council has taken no action on the recommendation.

Calendar

The 20th German Industries Exhibition: Berlin, Sept. 18-27. The theme, "Man and Technology" . . . **The New York and New England States First Joint Regional Conference:** The Laurels, Monticello, N.Y., Oct. 19-22. The 1970 Honor Awards of the NYS/AIA and the New England Region/AIA will be presented . . . **The seventh annual Architect-Researchers Conference of the AIA:** Cincinnati, Ohio, Nov. 1-3 . . . **The National Conference on Nonprofit Low-Income Housing:** Washington, D.C., Nov. 15-17. Award-winning exhibits of the First Award Program for Nonprofit-Sponsored Low- and Moderate-Income Housing will be displayed . . . **A symposium on the American Concrete Institute Building Code:** The University of Miami, Coral Gables, Fla., Jan. 29-30, 1971.

Competitions

The Rome Prize Fellowships 1971-72 are being offered by the American Academy in Rome. Request details from: Executive Secretary, American Academy in Rome, 101 Park Ave., New York, N.Y. 10017.

Notice to Competition Sponsors: Please send announcements of competitions to P/A at least three months prior to entry deadline to allow ample time for publication.

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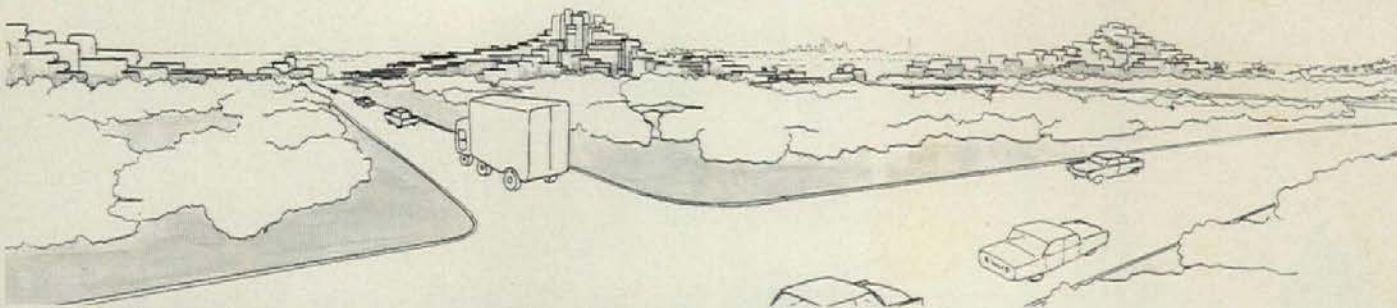


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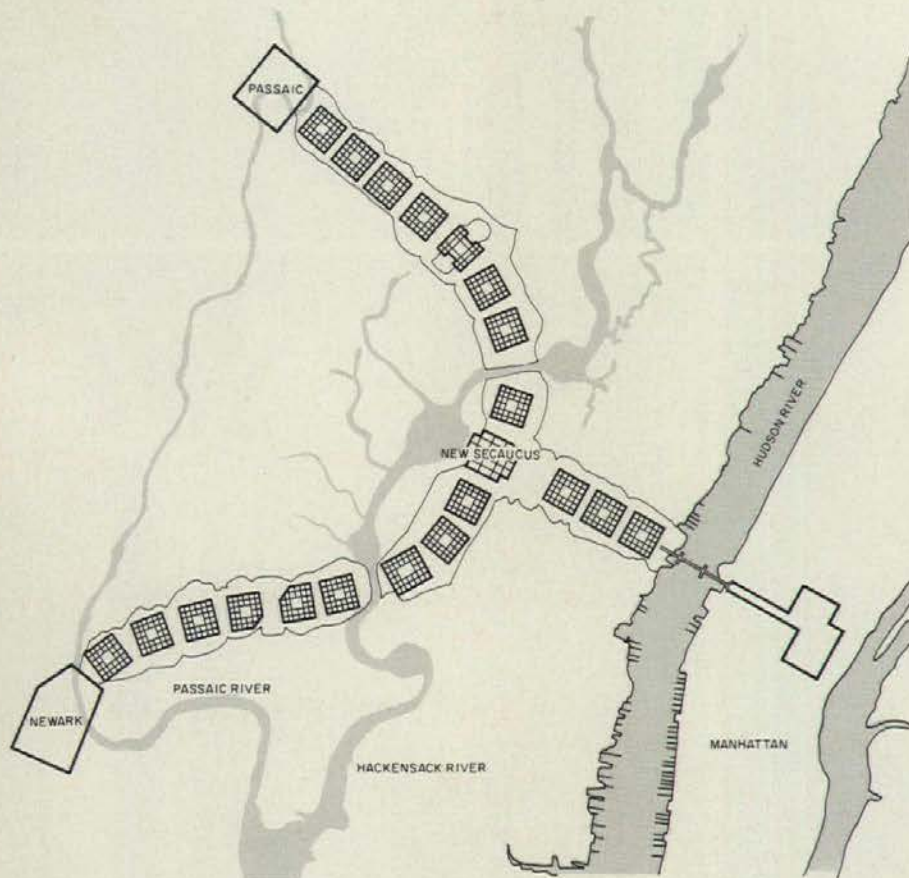
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On Reader Service Card, Circle No. 377

NEWS REPORT



Linear City scheme for New Jersey flatlands connects to New York City via an inhabited bridge with pyramidal nodes for plug-in units similar to the land-based complexes.



Another City for New York City

Within 30 years, 11.2 million additional people will cram into the New York City region—a 59 percent increase in population, with office workers increased 87 percent. To the west, within what could be a 15-minute subway ride to Manhattan, lies one of the city's potentially most valuable assets—New Jersey's Hackensack Meadows—a large area of relatively undeveloped marshland bordered by the urban subcenters of Newark and Passaic. New York designers Jan Dabrowski and Woods Mackintosh have devised a plan for linking the area to Manhattan. Their plan is to extend the forthcoming 48th Street crosstown subway across the Hudson—via an inhabited bridge—to Secaucus (3 miles), and

then on in separate directions to Newark (7 miles) and Passaic (6 miles). Station points would be introduced along the transit system, and one city unit would be developed around the center of each stop, creating a Linear City that could accommodate almost 650,000 people.

The size of the unit's grid will be limited to a 10-minute walk from the subway stop. Each unit is zoned for density, highest at the center and lowest at the edges. Commercial facilities will be located at the unit's core and cultural and educational facilities between city units, in close proximity to recreational land. A continuous linear park area would parallel the city. Access roads provide secondary service, with most ve-

hicular traffic terminating at one of the four corner parking garages. In addition to the rapid transit service, inter-unit short distance transportation by electric surface buses or mini-trains is planned.

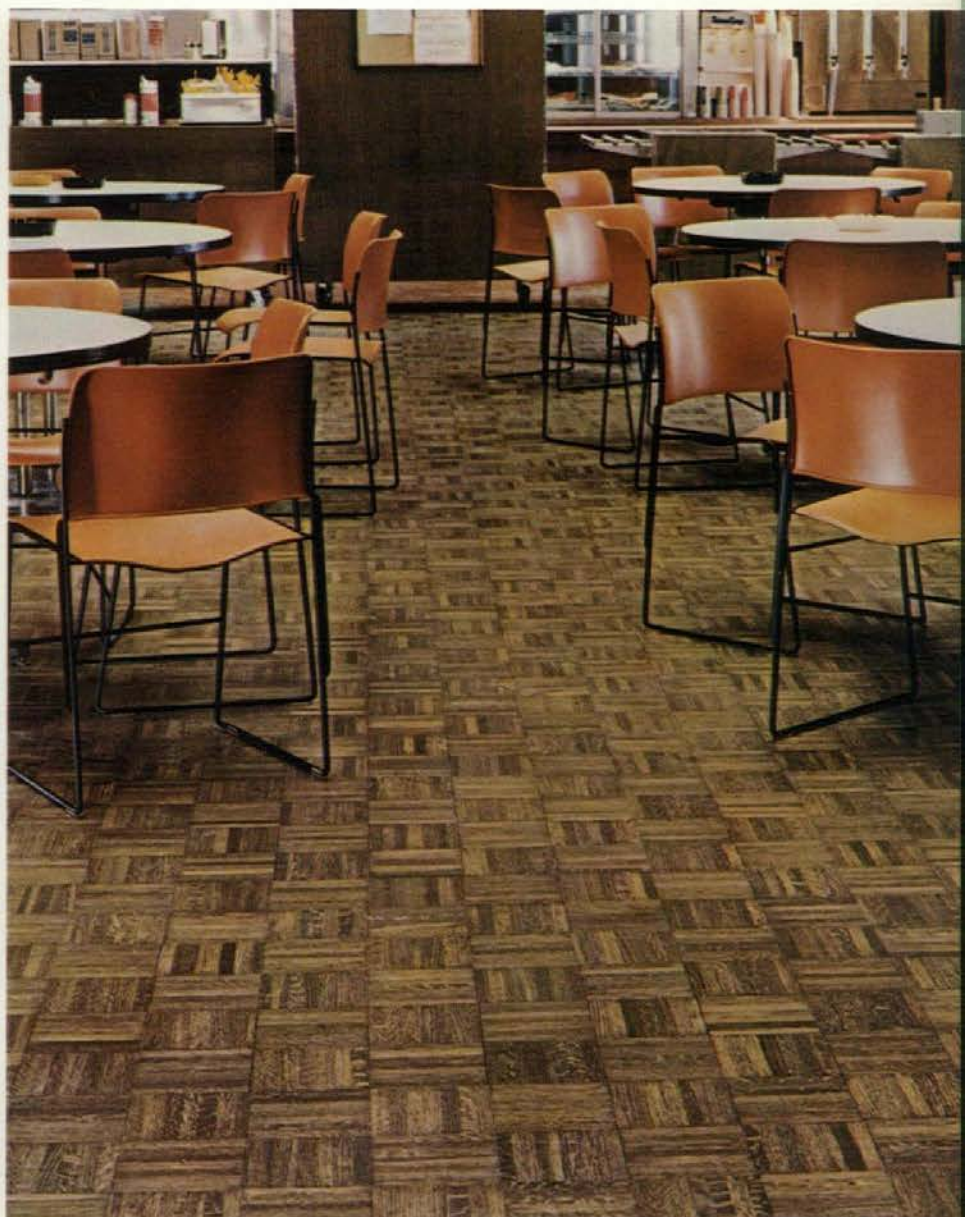
Perhaps the most fascinating aspect of the Dabrowski and Mackintosh scheme is its space frame carless bridge, which would house up to 11,000 people in lightweight prefabricated living units. The bridge's three towers each contain a local rapid transit stop and vertical access elevators. A pedestrian and commercial spine provides a continuous line to New Jersey, connecting the towers. An access road for service and emergency use only runs beneath the pedestrian path. Habitation units will be connected by access galleries off the vertical circulation spines. Neighbor-units will be developed to contain 7 to 12 habitation units, depending on space requirements. One would lease a space in the structure and then have a habitation unit (consisting of plastic or fiberglass "utility" and "room" elements) assembled according to need. Prefabricated elements would be brought to the site by boat and hoisted into their place in the matrix of the steel frame.

The east tower of the bridge will hold office space and a hotel serving the port and business district, a heliport and hovercraft port; middle and west towers are largely residential with some commercial service and cultural-educational facilities.

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No Summer Doldrums in Capitol Yet

By E.E. Halmos, Jr.

Bidding for Government Contracts Favored by Comptroller General

Construction industry professionals—tending their own concerns amid the excitement over war and the national economy—reached some agreements among themselves, and ran into heavy going on Capitol Hill.

They appeared in large numbers on the Hill, representing all of the professional societies (and some contractor groups) before a friendly House Government Operations subcommittee, to push for passage of HR 16443—a bill that would flatly end any taint of "bidding" from government procurement of A-E services.

But they ran into the unexpectedly a d a m a n t opposition of Elmer Staats—the rock-ribbed Comptroller General of the U.S. (whose General Accounting Office is the fiscal arm of Congress). Staats' report three years ago set off the present controversy: he suggested then that Congress had never authorized nonprice negotiations with A-Es (although the process is enshrined in procurement practices) and suggested that bidding would be the legal answer. (GAO deferred any action on its finding, pending some action by Congress.)

Undaunted by the solid phalanxes of professionals at the hearing, Staats insisted that what he called "price negotiation" would be the proper and economic way to handle these matters, questions of professional ethics notwithstanding. In fact, he suggested the sort of "two step" procurement that is already used by military agencies for research and development work: he said A-Es might first submit proposed designs, with the selected designer to be paid for his efforts; then all A-Es might bid (negotiate) for contracts to supervise the construction based on the winning design.

And, although it was apparently coincidental, GAO put another nail in its argument by issuing a report protesting the "lack of uniformity" in A-E contract clauses that cover responsibility for designing within construction cost estimates. GAO "suggested" rewrite contract clauses to federal agencies to make the A-Es responsible for bringing the job in within estimates.

Intraprofessional Discussions

Among themselves, the professionals were having better luck:

- The AIA and the Associated General Contractors announced publication of revised "General Conditions of Contract" and "Instruction for Bidders," which clarify legal responsibilities of the contractor and duties of the architect. The agreement ends more than a year of discussion between the two groups, started when contractors objected strenuously to earlier versions.

- The AIA and the Construction Specifications Institute reported progress on development of "Masterspec" and "Comspec" systems—both aimed at developing automated specifications, data retrieval systems, and similar "communications" techniques. (Masterspec [copyrighted] has been under development by Production Systems for Architects & Engineers, Inc.; Comspec [also copyrighted] is the product of Stanford Research Institute and other groups.)

- The Consulting Engineers Council urged the Department of Housing and Urban Development to revise the draft of its "Design and Construction Standards" manual, to say "Architect-Engineer," rather than simply "Architect."

- Professionals should note also the Presidential "reorganization plan" that will go into effect this month (if Congress raises no objections). It would put many of the Federal Government's scattered pollution-control efforts into a new "independent agency" to be known as the Environmental Protection Agency—the Federal Water Quality Administration, various services now in agriculture, HEW, and elsewhere (but omitting the Army's Corps of Engineers to nobody's surprise); and creating what Washington has dubbed the "wet NASAP"—a National Oceanographic and Atmospheric Administration, to include the weather bureau and other agencies—all under the aegis of the Department of Commerce.

New Twists on Highway Legislation

Funny things were happening to the 1970 highway legislation on its way through Congress in midsummer:

- The Administration was backing away from an adamant stand on the sanctity of the Highway Trust Fund; it seemed to be willing to accept using the fund as a money source for beautification, housing, and mass transit despite the strong opposition of many Congressmen and highway-oriented groups.

- Vociferous—if numerically tiny—components to in-city highway construction had made enough noise for the Nixon forces to seriously suggest that Congress might simply drop the roughly 135 miles of interstate system that is in controversy, in the interest of getting the over-all job finished.

- Senators from rural states were plumping for a share of the Trust Fund for rural highways—once interstate work is well in hand (some 29,000 miles are now open to traffic, 4850 miles are under construction).

Thus, what started as an almost routine bill to fund the highway program for another few years could well come out as a complex document that won't please those who count on the money for roads.

Financial Matters Concern the Construction Industry

- The construction economy continued its slow drift downward, according to latest pulse-taking in Washington. In May, said the Census Bureau, the industry was running at an adjusted annual rate of \$86.2 billion—down from April and well under last year's \$92.3 billion rate. As has been the case for months, biggest drag on the figures was housing, down to an annual rate of 1.2 million units, compared to nearly 1.5 million a year ago.

- Formation of a \$2.9 million revolving fund to aid minority contractors could have some effect on big prices at least on smaller jobs, the commerce department thinks. Fund is made up—under auspices of The Urban Coalition—of money supplied by the Ford Foundation, a number of insurance companies, and the commerce department's Economic Development Administration. It will be used for loans and to finance employment of professionals to aid minority contractors in bidding, management, and other business details.



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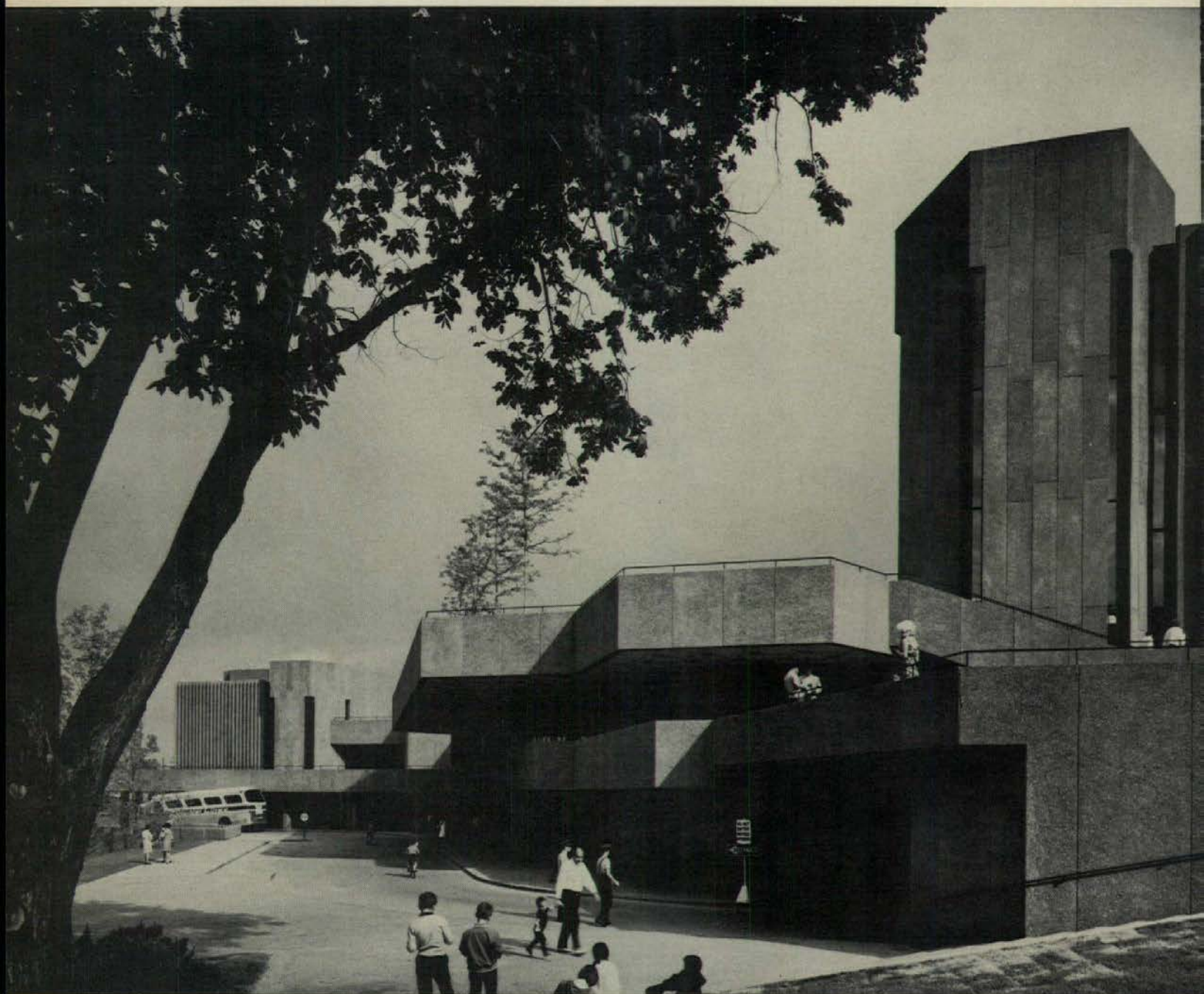
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**Write for Architectural
Guide Specification**

Prepared by
William E. Lunt, Jr., C. S. I.

Concrete with **POZZOLITH**—expressive
medium for housing the performing arts



Owner: Government of Canada. Architect: Affleck, Desbarats, Dimakopoulos, Lebensold, Sise. Structural Consultants: Adjeleian & Associates. General Contractors: C. A. Pitts General Contractors Ltd. (Phase I); Foundation

Conceived to "nurture and encourage growth and excellence in the performing arts," Canada's National Arts Centre in Ottawa is itself a showplace of artistic expression.

The complex is a succession of concrete terraces overlooking the Rideau Canal. A triangular grid repeated in the building design reflects the shape of the site and accents the geometry.

Throughout the structure, intricate angles, clean cubes, and bold textures testify to the versatility and character of fine concrete. The structural system is cast in place; precast concrete panels are utilized functionally and decoratively.

On the exterior, variation in concrete finishes identify, or "code," interior activities. Inside, large and colorful aggregates are exposed for dramatic decor.

Both architecture and structure demanded optimum performance from the concrete. Consistent with this objective, POZZOLITH admixture was specified for the entire project.

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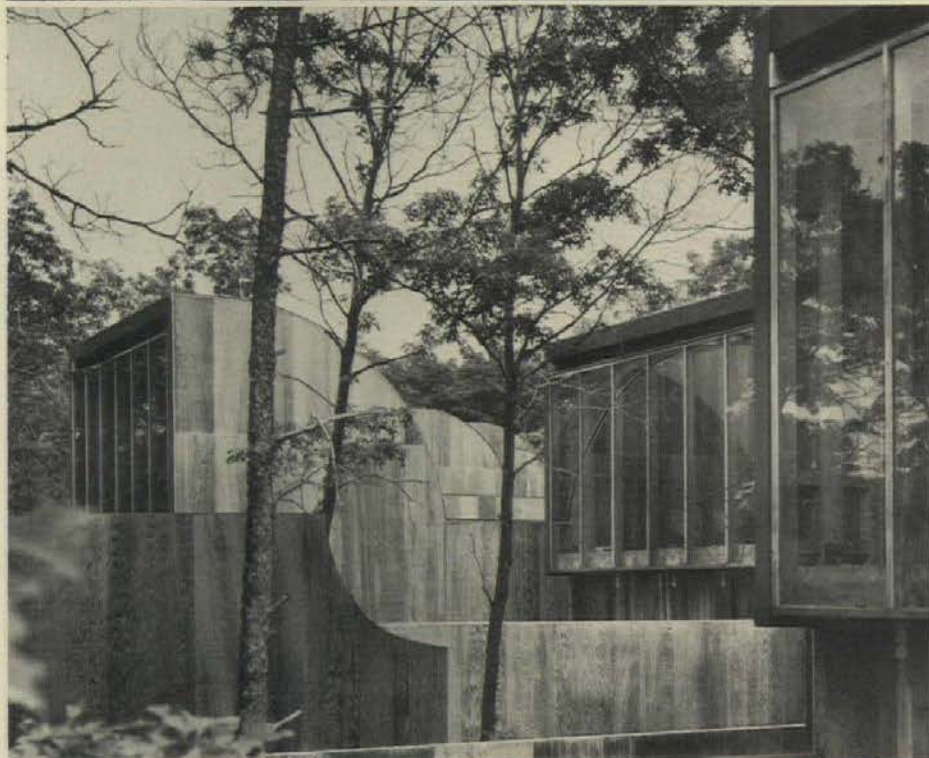
Owner:
Henry Kaufmann
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Jewish Philanthropies.

Architects:
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Structural engineers:
Lev Zetlin & Associates.

Contractor:
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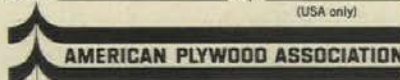
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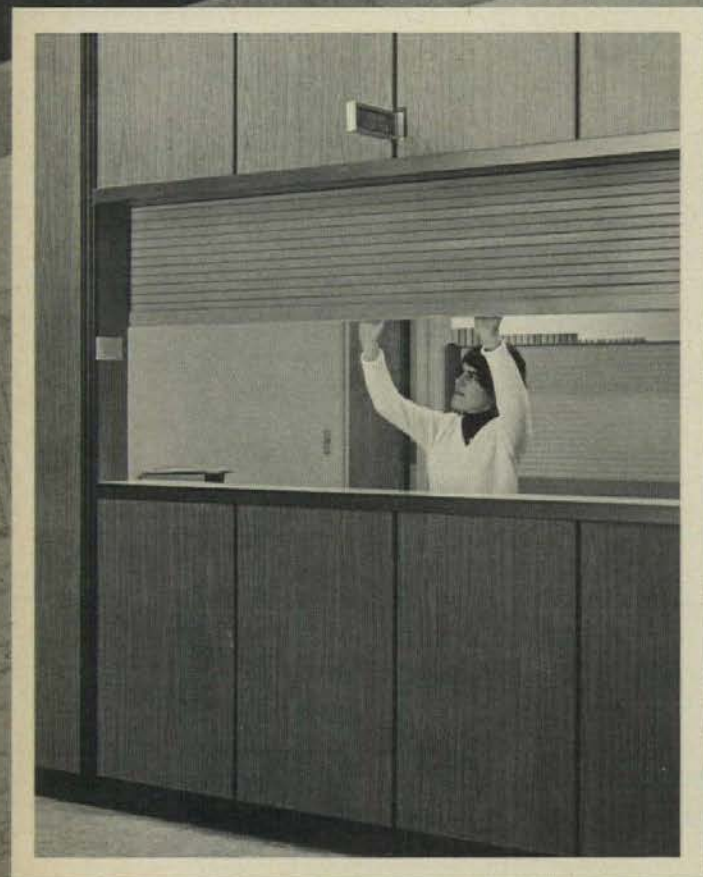
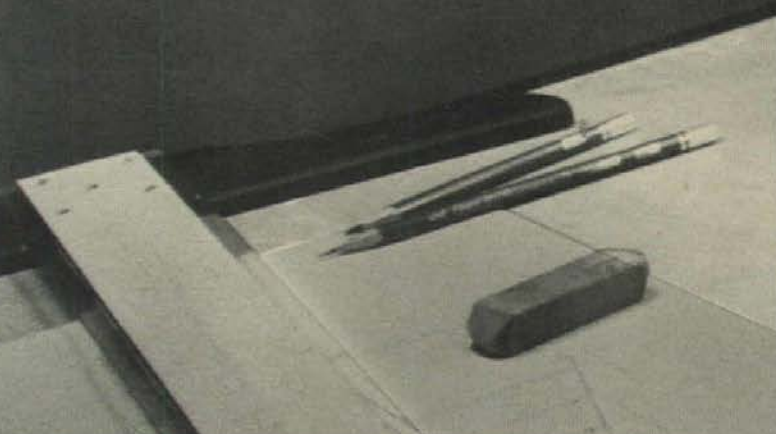
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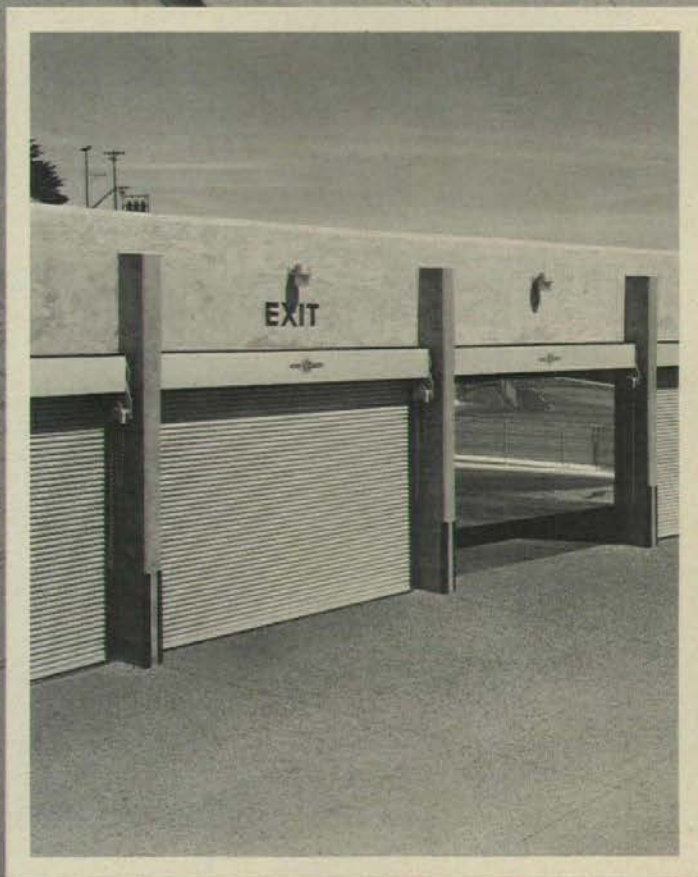
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Mr. Glenn Malme
Altec/Lansing
1515 South Manchester Avenue
Anaheim, California 92803

February 6, 1970

Mr. Malme:

Five years ago the Board of Trustees for the Municipal Auditorium hired me as their Manager. The first week on the job I discovered my number one problem was sound. It is impossible to describe how bad our sound was.

Our Auditorium is known as a multi-purpose building which automatically dares one to put in an adequate sound system. We have a permanent stage so we not only play stage presentations but also rodeo, circus, hockey, ice shows, basketball, wrestling, dances, banquets, etc., and we expect one sound system to be good for each type of event.

At the time I assumed the managership our sound system was only four years old. Naturally we assumed that the system would only need some service work. We spent four years with various sound engineers and several thousands of dollars trying to get satisfactory sound from the system but to no avail. Our local paper and other news media were constantly "bugging" us about our sound and rightfully so. As a result the Board of Trustees for the Auditorium finally contracted with Electronic Supply Company of Omaha, Nebraska, for an Acousta-Voiced, high level sound reenforcement system.

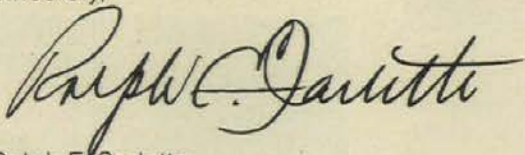
We now get nothing but good reviews on all events we have in the building. As proof of the acceptance of our facility now, we recently played the stage show "I Do, I Do" starring Phil Ford and Mimi Hines to a complete sell-out and we turned away nearly 1,000 people. This is the first time this has ever happened to us.

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It is my feeling that with improved sound we will increase our attendance enough to pay for the new sound system in a reasonable time.

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Sincerely,



Ralph E. Sarlette
Manager, Sioux City Municipal Auditorium
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PRODUCTS & LITERATURE



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Italian architect Tobia Scarpa has developed an innovative technological solution to the problem of upholstered seating; he has reduced the complex procedure of upholstered seating manufacture to the simplicity of a bent upholstered form restrained by an armature. Called the Soriana group, it comprises an armless chair, two-seat sofa, three-seat sofa, lounge chair, and ottoman. It is constructed of a thin layer of urethane foam wrapped in dacron, covered with fabric or leather, and held in position by a lightweight chrome steel armature secured to a wooden platform employed as the base. Suited to institutional, commercial, and residential use. Atelier International Ltd.

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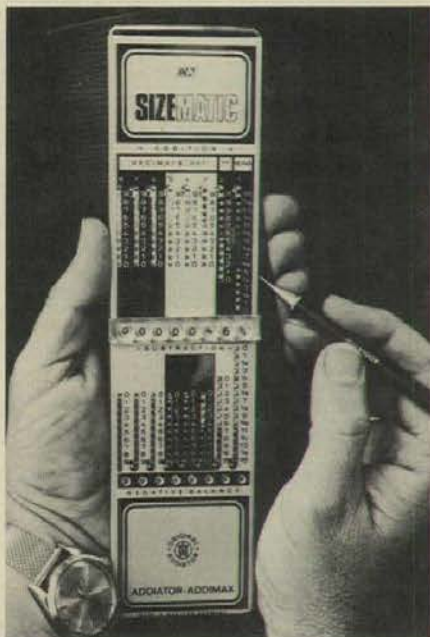
The University Residential Building System project (URBS), created to develop better student housing at the University of California, has resulted in a flexible new partition system. Using durable, fire-rated partitions developed in conjunction with the United States Gypsum Co., these Vaughan Walls are compatible with ducted floors and ceilings, heating, ventilating, air-conditioning, plumbing, electrical, and communication systems. The demountable partition is erected with aluminum ceiling and floor runners, which provide space for horizontal electrical conduit; panels also accept installation of vertical conduit. Fixed partitions use 2½" wide metal studs with panels screwed to either side. Both support wall-mounted furniture. Vaughan Walls, Inc.

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Ceiling Fans

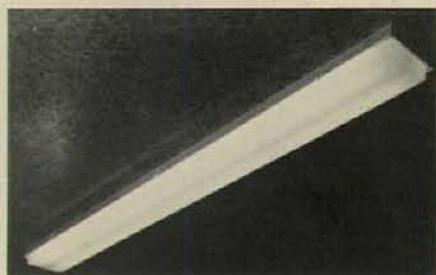
Super-quiet centrifugal ventilating fans for eliminating smoke, odors, and stale air are dynamically balanced to prevent vibration. Rubber isolators on the motors and fiberglass insulation within the cabinets are reported to completely deaden all sound. In four sizes from 46 cfm to 1072 cfm. ILG Industries, Inc.

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(More products on page 72)

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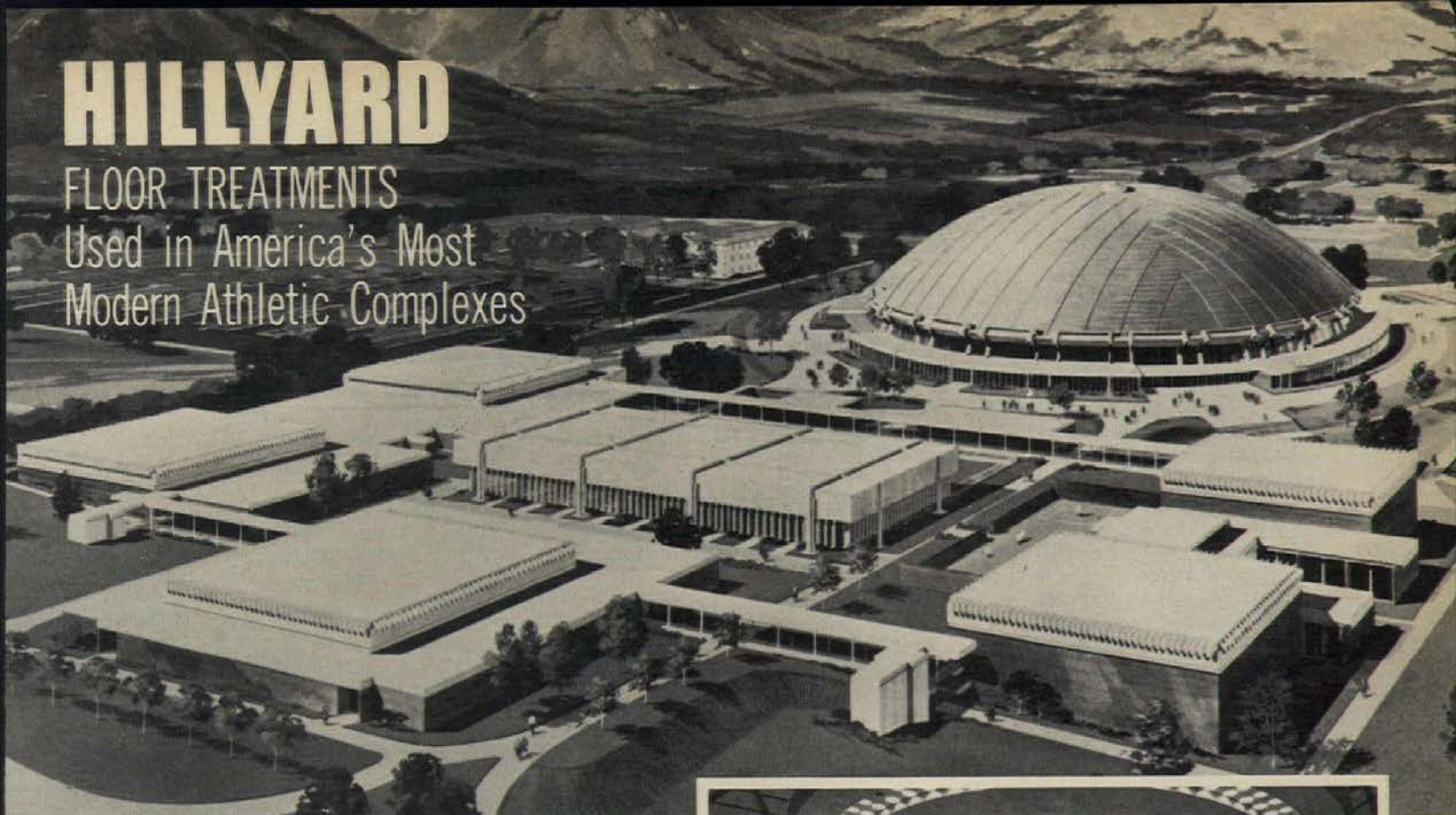
The image is a composite of four panels, each showing a different type of roof flashing or fascia material against a green background. The top-left panel shows a dark, textured metal flashing with a bent edge. The top-right panel shows a smooth, light-colored metal flashing with a bent edge. The bottom-left panel shows a dark, textured metal flashing with a bent edge. The bottom-right panel shows a smooth, light-colored metal flashing with a bent edge.

SEPTEMBER 1970 P/A

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Other facilities include two exhibition areas, offices, classrooms, a three-pool natatorium, and men's and women's physical education departments. In addition to the basketball floor in the Special Events Center, the complex has five other multiple-use gym floors and six handball courts. All are finished with Trophy Seal and Trophy Gym Finish.

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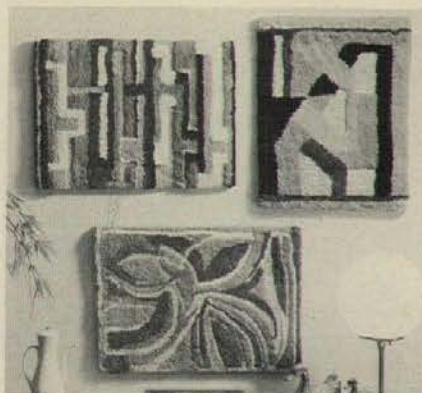
(Continued from page 68)

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The "No Insecticide" Approach

Insect-electrocutor devices for ridding flying pests are described and illustrated in a 12-page catalog (No. 302). Includes a diagram of a "zone defense" system in a typical plant layout, and features an escape-proof design for use in areas of open food processing, packaging, and critical chemical and paper processing. Indoor, outdoor use. Gardner Mfg. Co. *Circle 110 on Reader Service Card*



Rugging the Wall

Museum-quality wall-art rugs designed by Dorothy Liebes, whose textile designs have been on exhibit at the Museum of Contemporary Crafts in New York and are currently being exhibited at the Smithsonian Institution in Washington, D.C., comprise this new Bigelow Gallery Collection. Six handmade, hook-craft original abstract designs, in cut and uncut skein-dyed wool pile are sized like paintings and come ready to hang. Bigelow-Sanford, Inc. *Circle 111 on Reader Service Card*

Guide for Purchasing Chairs

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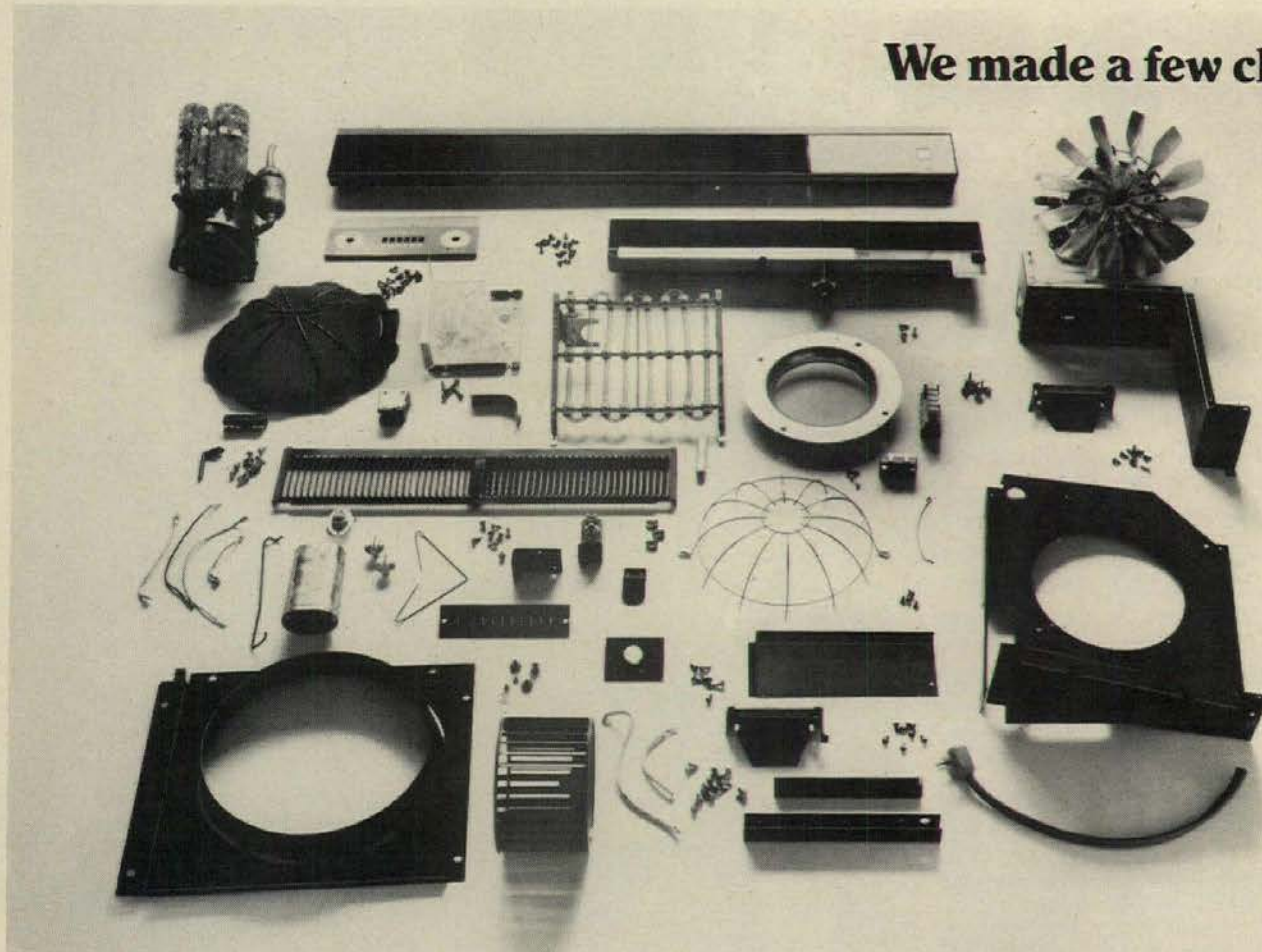
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Stainless Steel: 44 Standard Types

Typical properties of 44 standard AISI types of stainless steel are contained in an 8-page brochure. Includes: chemical composition for each; mechanical properties at room temperature by mill form; nominal properties at room temperature — such as elongation, tensile, and yield strengths at cryogenic temperatures; recommended temperature ranges for thermal treatment — annealing, stress relieving, and melting; recommended forging temperatures; and characteristics and typical applications. The Committee for Stainless Steel Producers, American Iron and Steel Institute.

Circle 113 on Reader Service Card

We made a few changes





The Plotting Is a System

A unique graphics system, which can automatically draw a different axonometric or perspective view with each playback of a digitized tape, teams the new Recordamat 1250 and the Illustromat 1200. The Recordamat digitizes, stores, and reproduces two- and three-dimensional graphics data; the Illustromat converts two-dimensional drawings into 3-D illustrations. Perspective Systems, Inc.

Circle 114 on Reader Service Card

Silicone Sealant

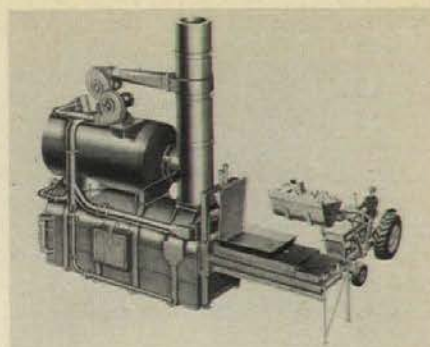
General Electric Silicone Sealant 1600, used successfully where other sealants have failed, offers unique protection against joint failure. Specially designed to meet the needs of the professional calking and waterproofing contractor, this nonsag elastomeric barrier is used above grade to close and seal expansion and static construction joints. A formed-in-place gasket, factory or field applied, it bonds to various metal, wood, stone, ceramic, and masonry materials, in many cases without need for a primer or surface conditioner.

Circle 115 on Reader Service Card

Mail Lock Boxes

Twelve-page spec guide on horizontal, front, and rear loading mail lock boxes includes data on module cabinet construction, installation details, descriptions of lock and door styles, hinges, trim, and numbering and identification. A new "continental" lock box and maximum securing lock box are introduced. New and existing postal regulations are given. American Device Mfg. Co.

Circle 116 on Reader Service Card



Non-polluting Incinerator

This new Radicator incinerator consumes a ton of waste per hour, as well as the accompanying smoke and odors before they escape from the stack, thus meeting stringent air pollution codes. Suitable for a variety of large-size industrial, commercial, and institutional uses, this new Mark XX (big brother of the Mark VI, a 600/lb/hour unit) is complete with an automatic loader holding up to 1.6 cu yd and a gear-driven ram head which provides 2000 lb of force. It has a total heat release capacity of 13 million Btu and is specified for three waste classifications or any mixture thereof. Ross Engineering Division, Midland-Ross Corp.

Circle 117 on Reader Service Card

(More products on page 74)

in our new Zoneline heating/cooling unit.

We've made changes. Over 90 of them. Not just for the sake of change. To be better.

The new Zoneline is quieter! We redesigned the air flow system and added a new two-motor fan system that automatically modulates air flow to cooling and heating requirements. We built a stronger room cabinet and gave it a urethane foam acoustical treatment for greater quietness.

The new Zoneline is more rugged!

We're using heavier gauge metal in the outer case. The air/water seal has been laboratory tested in winds up to 75 miles per hour and the equivalent of 8 inches of rain per hour. This is rugged, heavy-duty commercial equipment built to withstand constant year-round usage.

And the new Zoneline is beautiful!

Inside and out. From an exterior grille that can be integrated into the building design to the new optional simulated molded wood-grain finish of the interior cabinet, Zoneline is new and good-looking. All controls are concealed under a door on top where they are easily reached.

If you're looking for terminal thru-the-wall heating/cooling units, see the new Zoneline for office, hotel/motel, apartment, school or hospital. Available in deluxe and standard models for 208 V., 230 V., and 277 V., and a variety of installations. See your General Electric Central Air Conditioning distributor right away. Or write the Air Conditioning Dept., Commercial & Industrial Sales Section, Louisville, Kentucky 40225.



Our new GE Zoneline heating/cooling unit.

Progress Is Our Most Important Product

GENERAL  ELECTRIC

PRODUCTS & LITERATURE

(Continued from page 73)

Five Waterproofing Products

Eight-page brochure on "Volclay" waterproofing products (essentially a high-sodium bentonite) describes five basic products: panels for waterproofing below-grade concrete walls and under hydrostatic slabs; under-slab panels; "Water-stoppage," a dry bentonite for special sealing such as wall-footing joints; "Joint Seal," a prehydrated bentonite for parging and for use as a mastic in applying Volclay panels; and "Joint-Pak" for concrete construction joints. Includes application details and specs. American Colloid Co., Bldg. Materials Div. Circle 118 on Reader Service Card

Hose Selection Guide

Eight-page, illustrated, selection guide (No. 330) for metal hose and fittings lists capabilities of steel, bronze, stainless steel, and Monel hose; describes types of motion they can handle, and offers charts to aid in selecting appropriate sizes for specific motion problems. Flexonics Div. of UOP. Circle 119 on Reader Service Card



Tectum Panels

Ceiling and wall paneling of long-strand wood fibers bonded with a hydraulic cement binder, Tectum 1" has a new swirl-textured appearance. Acoustical and durable, the lightweight panels can be attached to exposed ceiling joists or cross furring, to wood furring on basement masonry walls, or to stud or finished walls. In 2' and 4' widths; 8', 10' and 12' lengths. The National Gypsum Co. Circle 120 on Reader Service Card

Steel Decks for Floors and Roofs

Manufacturer of roof deck, floor deck, and permanent concrete forms, has released a 24-page catalog that lists nine different steel sections and accessories, their load bearing capacities and sectional properties. Installation details and information on finishes included. Bowman Building Products Div., Cyclops Corp. Circle 121 on Reader Service Card

Construction Adhesive

"Fast Floor Builder" (TG-90), a special construction adhesive for the housing and modular construction market, works equally well for plant assembled and field glued systems. Also used for bonding subfloors to joists, panels to studs, panels to dry-wall, or panels to masonry. For field glued or plant assembled single layer plywood floors, stiffness is increased up to 70%. No nail pop and 25% fewer nails required. Increases T-beam strength and has excellent noise level control. Applied with caulking gun. Hadley Adhesive & Chemical Co. Circle 122 on Reader Service Card

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Depths from 52" to 72"
Clear spans up to 144 feet.



A new help to structural designers... the first standard specifications for deep longspan joists—DLJ and DLH-Series... adopted by the Steel Joist Institute. Covers materials (36,000 psi and 50,000 psi), connections, camber, painting, application, bridging, erection—and all pertinent design information, including Standard Load Tables.

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7005

The best part of Powerbond® is the part you never see.

Our vinyl backing is like nothing else. Like nobody else's.

The base material for Powerbond pile vinyl has closed-cell construction which means water—or anything else—can't penetrate the base material. Unlike sponge rubber, it can't deteriorate.

Matter of fact, it's the only material that flushes back water.

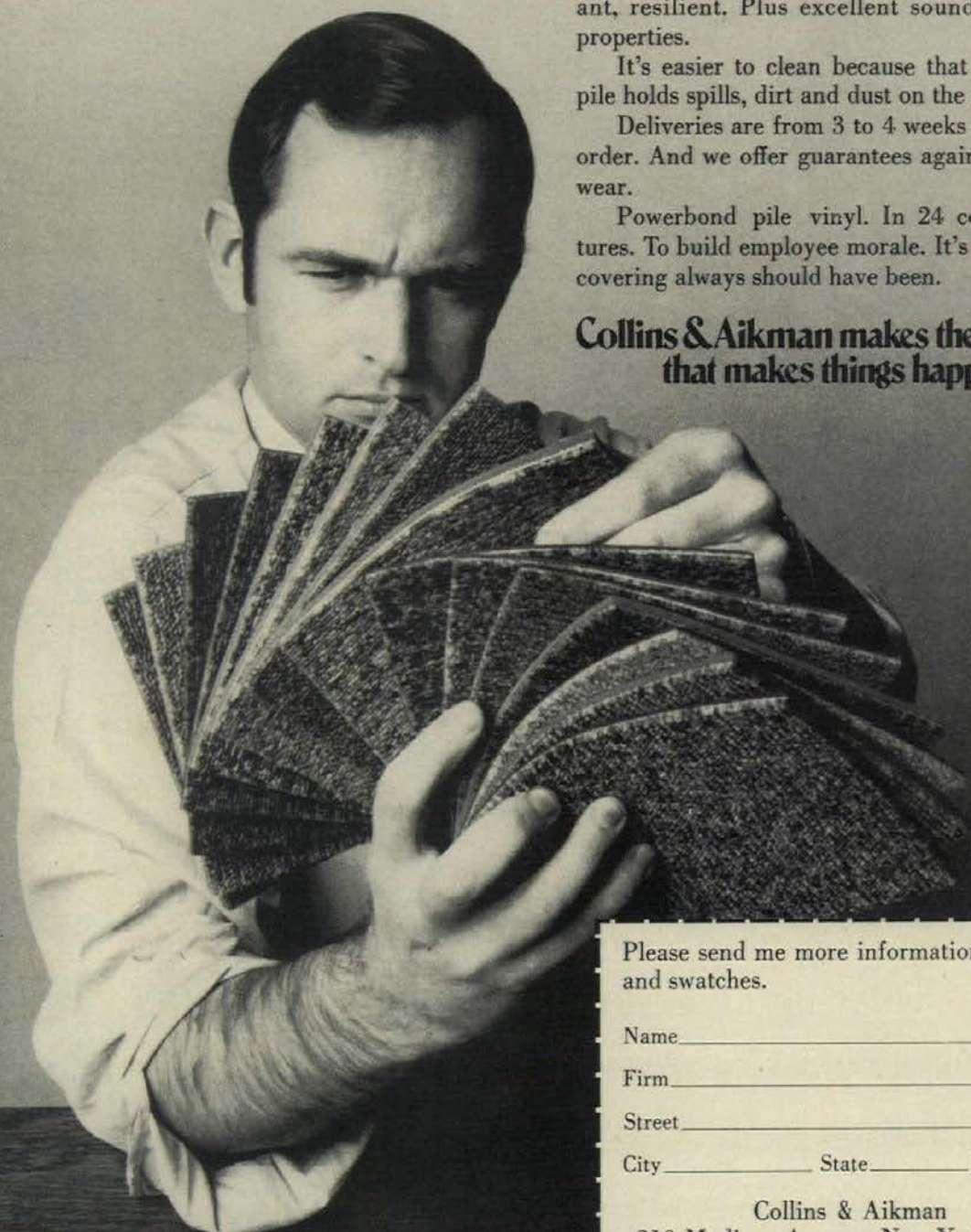
There are some pretty terrific other things going for Powerbond. Like a luxurious, super-dense pile of Anso™ nylon by Allied Chemical that's extraordinarily rugged, abrasion resistant, resilient. Plus excellent sound deadening properties.

It's easier to clean because that super-dense pile holds spills, dirt and dust on the surface.

Deliveries are from 3 to 4 weeks from day of order. And we offer guarantees against excessive wear.

Powerbond pile vinyl. In 24 colors. 3 textures. To build employee morale. It's what a floor covering always should have been.

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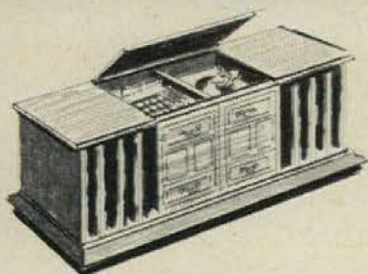
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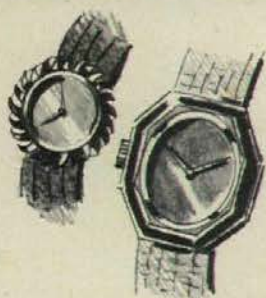
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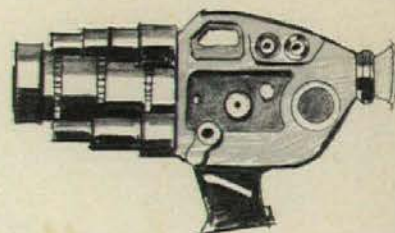
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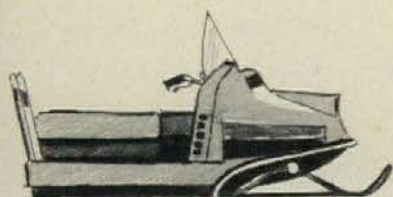
**ULTRAPHONIC STEREO
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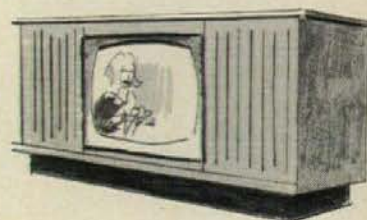
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If you haven't discovered Eagle Turquoise yet, this contest offers you the perfect opportunity... while you try for a valuable prize.

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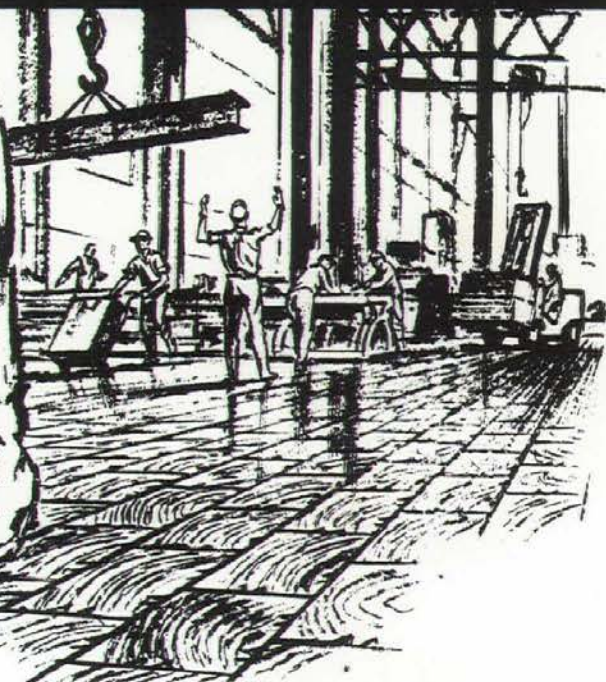
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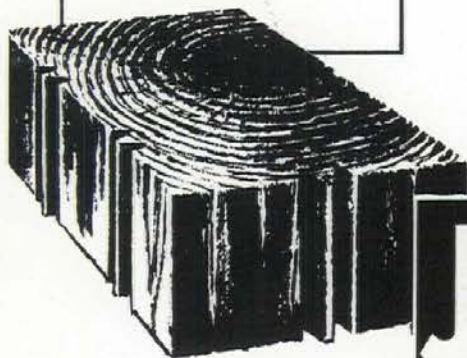


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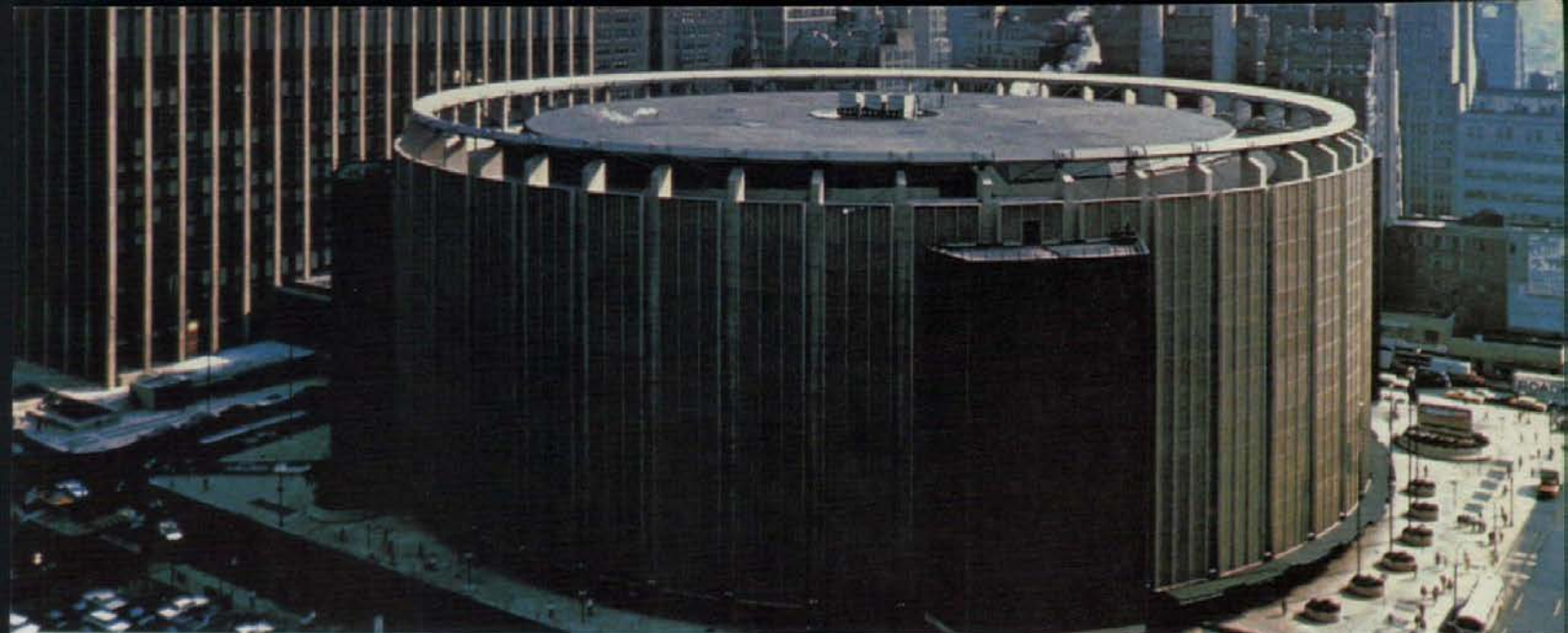


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Madison Square Garden Center ARCHITECTS: Charles Luckman Associates

Architects are accepting the invitation to High-"T" — TITANALLOY — the alloy of good taste and substance. Job-captains and specifications writers, too, appreciate its four-squareness that seems to match the design, the construction, the permanence, the practical-cost considerations of their most critical building assignments.

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This utterly corrosion-resistant alloy has no peer for roof, flashing, valley, gravel-stop or thru-wall applications. Forms easily and solders in the shop or roof-site.

Both time and the elements are kind to TITANALLOY, which weathers to a delicately-distinctive even-dark-grey patina consonant with all architectural styles. Won't streak or stain adjoining materials and requires no maintenance after installation. Superior to aluminum and galvanized sheet under extreme corrosive coastal atmospheres.

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On Reader Service Card, Circle No. 375



TITANALLOY THE ARCHITECT'S METAL



Let's face it, Malaysian meranti doors impress people.

And that's a very good reason for spending the few extra dollars it costs to carve them.

These doors give your prospective buyer an impression of luxury from the moment he walks into your house.

It's not only that they're exquisitely carved. That's impressive enough.

But the big thing is, they're made of an exotic hardwood.

It's Malaysian meranti.

And that's very impressive. Because Malaysian meranti is basically a furniture wood. And looks a lot like its cousin, mahogany.

So these doors can give just the touch of elegance that often helps close a sale.

But, frankly speaking, we think Malaysian meranti is better than mahogany in many ways.

It's lighter in color. So it's easier to finish. Especially if you want to use a light stain.

Of course, the style shown here is just one of the many St. Regis door styles. We'll be glad to send you the catalog on all our Malaysian meranti and other fine doors.

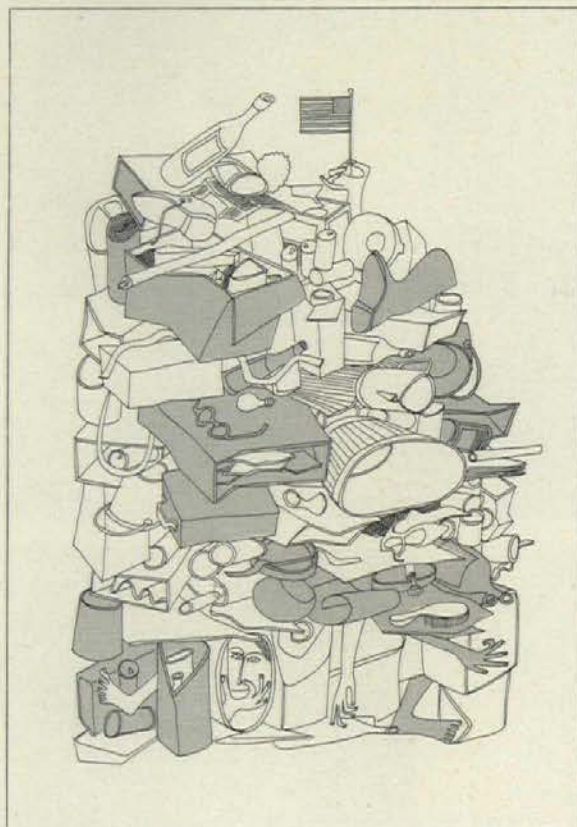
And if you don't see what you want, we'll custom-build it for you. Impressed? Write us at Box 1593, Tacoma, Washington 98401.

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EDITORIAL

The design of lasting monuments upon which cultures have expended the major portion of their energy and resources have usually had results other than those intended. No matter how we now treasure them as historic memorabilia, the Egyptian pyramids in homage to the dead, the Gothic cathedral in reverence to an Almighty God, and the chateau of the Loire for self aggrandizement, only succeeded in bankrupting the societies that created them. Every age of monumental building is destroyed by its ideals, not by the ideals themselves, but by the byproducts of their implementations.



It has been said we have no great architectural monuments to bequeath posterity. It is further claimed we lack the deeply instilled national drives that will generate lasting edifices by which posterity will remember us. Not so. Our national goal, the consumption of everything — fossil fuel,

light, silence, trees, animal coverings, air — anything that can be worked and marketed is producing a whole series of national monuments — the garbage heaps. These are the vernacular art, the indigenous architecture, the monuments of our time, and they will bankrupt us as have all major building efforts from the pharaohs to Louis XIV.

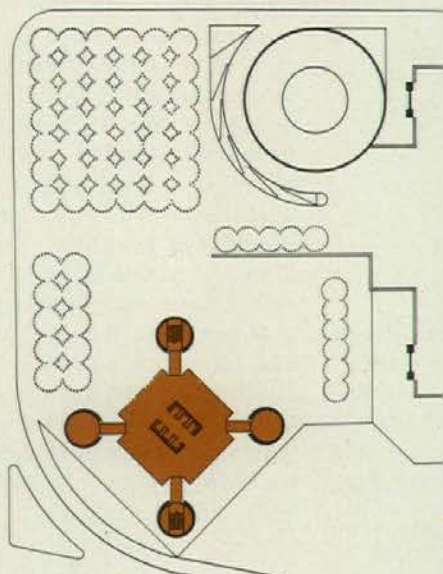
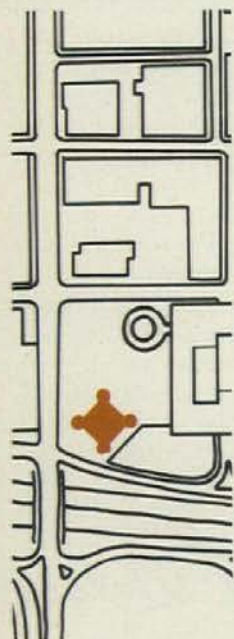
Gross National Product is measured in terms of items produced with no value scale other than production. There is no measuring device for use, recycling, or ecological balance. Major design efforts are devoted to the production of destructible products and indestructible byproducts. For example, the bubble gum wrapper outlasts the bubble gum. A simple kitchen gadget self destructs long before its discarded styrofoam packing disintegrates. The average automobile spends more of its physical life in the scrap yard than it does on the highway. Our rubble outlasts our buildings.

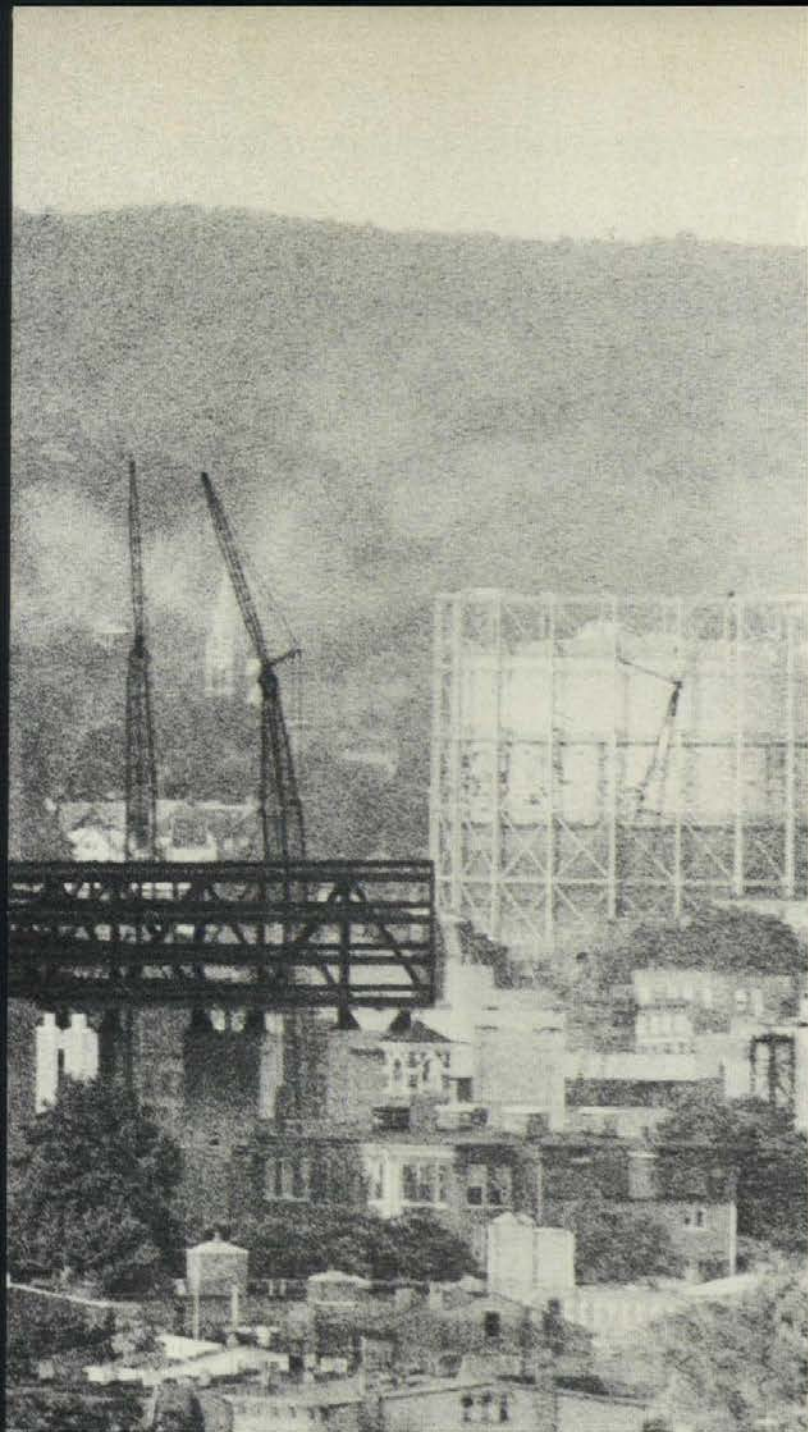
Perhaps we are able to monumentalize garbage because it is essentially democratic. Now even the most humble of us can leave something in this world that, but for us, would not be there. Ironically enough, those who have the least economically, are left with the greatest monuments. Ghetto streets are always piled high with garbage while the affluent sections of town have no such monuments whatever.

We are truly building our edifices on a monumental scale. One day's mounded refuse from a major city would make the pyramids look like warts by comparison. We could easily fill the interior of a Gothic cathedral with the no-deposit bottles discarded from even a minor league baseball game, and the chateaux of the Loire could be boxed like Dresden china in the packaging generated from any modest cut-rate drug store.

However we might fool ourselves (as did the societies of the past) concerning our other objectives, our real goal is garbage. Wake up America, fellow monument builders, let us learn to love our garbage. It is the stuff of which history is made and by which posterity will remember us. Forward then, with an optimization of offal, deification of dirt, reverence of refuse, love of litter, give your devotion to debris. Let us make America sacred soil.

Farrest Wilson





Kevin Roche's Knights of Columbus Building offers New Haven a monumental gateway to its rich architectural collection.

If one has come to believe that imperial gestures are somehow in questionable taste, and that monumentalism is ill-suited to the more fundamental needs of a lackluster urban fabric, then Kevin Roche's Knights of Columbus Building (hereafter KCB) becomes a problematic consideration. The building, of course, is magnificent; that's not the problem. It occasioned one of those rare aesthetic reactions that itself becomes a hard-core datum of experience. Its impact could not be denied. Secondarily (and perhaps as if to validate that reaction), it seems to be a landmark in the history of solutions to the tall office building problem. The difficulty — a classic one — lies in the resolution of an undeniable feeling with an incompatible set of convictions. In such conflicts, beliefs only (if not principles) are subject to manipulation. There is, *a priori*, something wrong with a theory in which the KCB would have no place.

First of all, its monumentality can be justified, even urbanistically, since the building is situated at one of the city's main points of entry. The KCB is thus a gateway and a signpost. Its 23 stories, which make it New Haven's tallest building, herald the city from a considerable distance. Moreover, when the traveler reaches the building he has also entered the city, and the signpost becomes a

Knights of the Round Towers

triumphal portal. Formally, it is well suited to this symbolic function since, viewed head on, the massive tile-sheathed towers, laced by heavy beams, are reminiscent of Druidic megaliths and Norman citadels. This effect is enhanced from the east or west where the space between the elevator banks makes the building more immediately transparent.

That a transition can be made from signpost and gateway to landmark and symbol is a measure of the KCB's quality. Uniqueness, here, is of prime value, but KCB's structure is not unique because esoteric — its formal innovations depend entirely on the manipulation of many accepted features of design and construction. The design derives in part from the location of core functions (stairs and toilets) in four concrete corner towers that, together

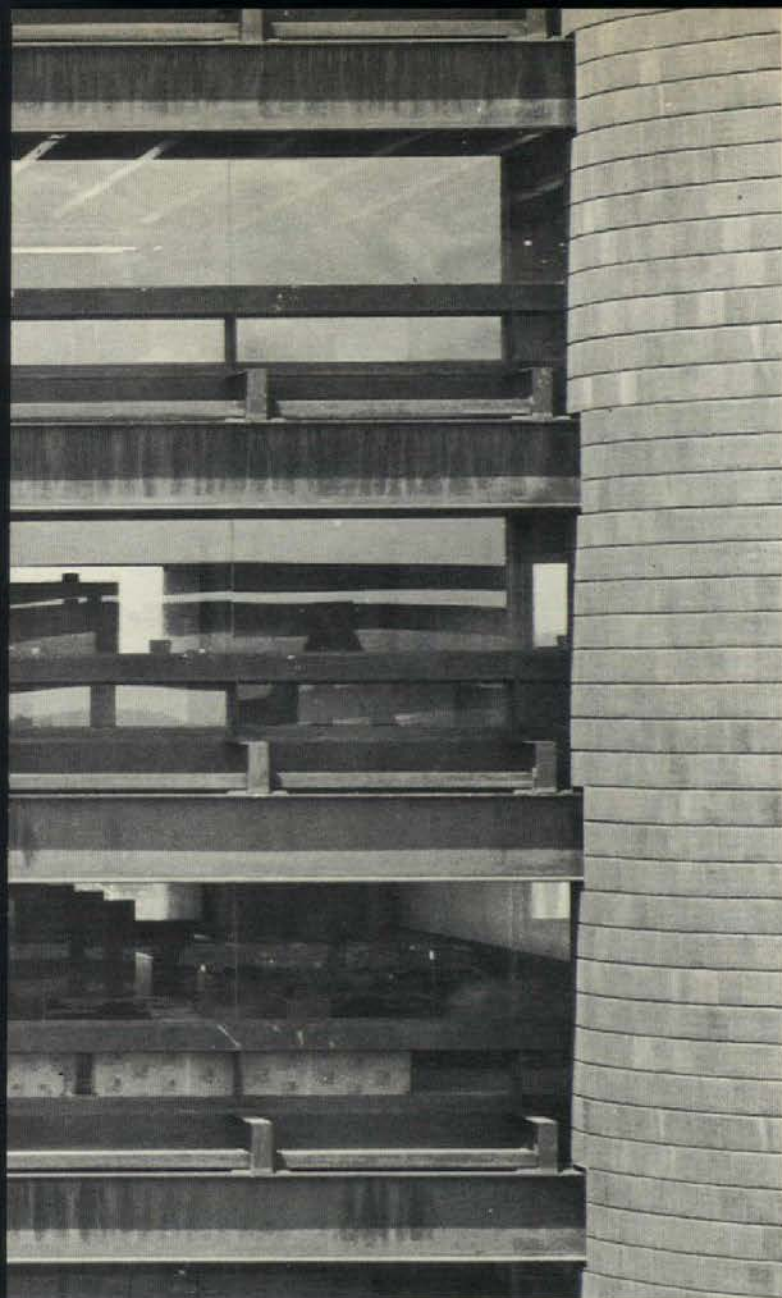


with the central elevator core, provide the foundation for a network of exposed weathering steel girders slung between them. These in turn support 32 beams per floor to complete the essential structure. Epoxy is used to unite the glass panels of a recessed "wall" that, shaded by horizontal steel lattices and unbroken by mullions, offers a rare and exciting sense of openness.

The lightness of the interiors contrasts with the sober monumentality of the exterior, similarly achieved through the quality of its materials. The purplish brown tiles (standard elements in silo construction) that sheath the concrete towers will blend perfectly with the ultimate patina of weathering steel members to create a brooding, masculine presence. This sense of masculine force is owing equally to an emphatic, some might say Mannerist, use of structural elements. "Mannerist" here would mean "anticlassical" since it is only by reference to a supposed norm of quiet discretion — an aesthetic that glorifies the rationale of structure — that this becomes "aggressive" and "expressionistic." The brilliance with which Roche exploits the expressive qualities of structure, obviates the need to justify his departure from an anyway moribund classical standard. The KCB's emphatic structure expresses the notion of a space cage — the essence of the tall office building — with a new and exciting clarity.



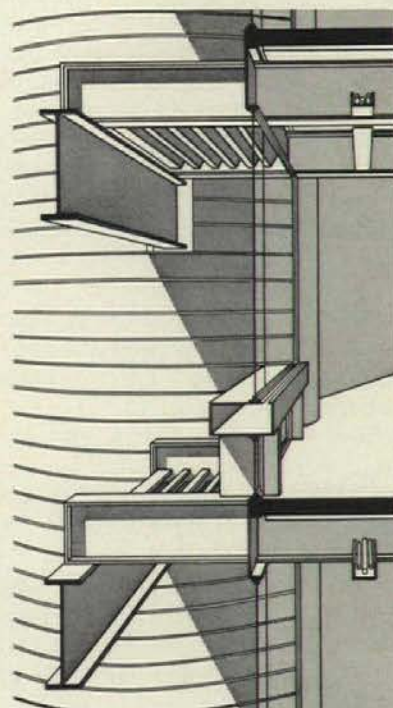
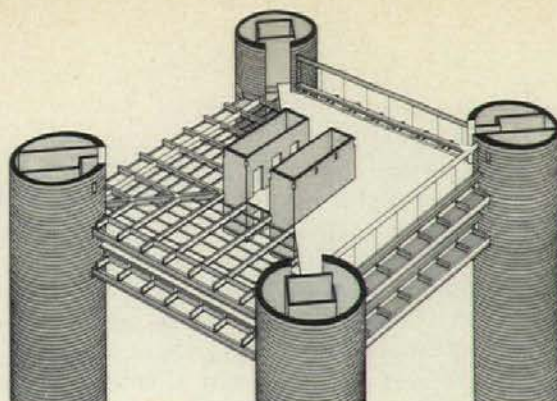
An ambulatory between the towers and glass enclosure is inflected at the corners for added interest.



This expressive image depended partly on fire department approval of exposed steel members, obtained only when the building could be conceptualized as a very safe stack of independent units.

The often ignored problem of relating the monumental landmark to pedestrian scale is treated here with sensitivity on several levels. It is no mean accomplishment that the KCB can function so well on the superscales of signpost, gateway, and urban structure (foreshadowing New Haven's future height as part of a megalopolitan network), and yet integrate ground-level accommodations to the pedestrian perspective.

The man-in-the-street's initial impression may be one of beetling monumentality, but as he approaches the entrance, a number of changes put him at his ease. First of all, the three lower stories — ground floor and two mezzanines — are indented 13 ft (measuring from the girder), leaving a more modest expanse of steel and glass, and offering a sense of invitation between the arms of the towers. An ambulatory is thus developed between the towers and the glass enclosure, which is inflected at the corners for added space and interest. The latter is enhanced by the flattened inside surfaces of the rounded forms where entrances to stairs and mechanical facilities are located. These intriguing corner spaces are covered by



Weathering steel girders, slung horizontally between the towers and diagonally to connect with the central core, support floor beams and horizontal sun grilles.



enclosed bridges that, although acting as passages, have the look of exaggerated beams, and thus emphasize the structural connection between the towers and the core.

The corners not only complicate and qualify the spaces near the building, but, as a consequence of siting, join the highway with the city's grid. This is accomplished by placing corner towers at the two points of curvature linking the Oak Street connector with Charles Street. The building thus belongs neither to the city nor to the highway, acting instead as a glissando between them. Ultimately, the KCB will relate to its more immediate surroundings when Roche's New Haven Coliseum is completed. The conjunctions of round and rectangular forms, and of concrete foundations with steel superstructures, will then pull the KCB out of its splendid isolation into a new complex of formal relations.

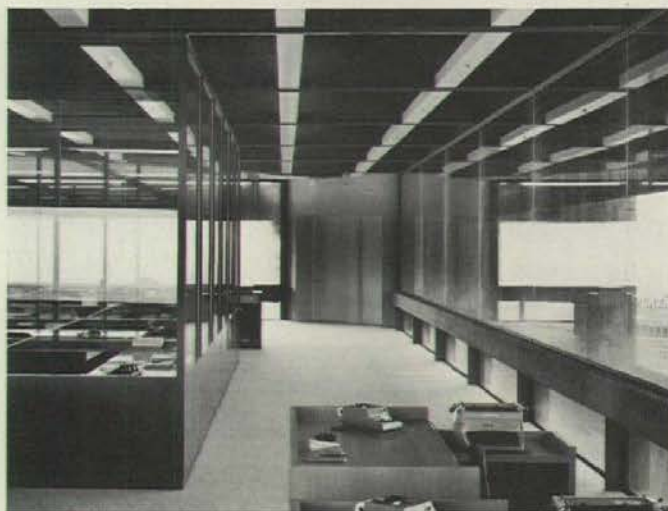
Internal formal relations are reflected in the beam pattern of a modular ceiling grid, integrated with an indirect lighting-cum-sprinkler system. Indeed, the ceiling most clearly indicates the KCB's modularity since, from the interior, the usual window-bay module is absent. Such a unit does appear on the exterior where beam ends meet horizontal girders at intervals of 10 ft.

But it is above all in plan that a concern with modularity and Vitruvian proportions appears evident. The 90-foot major square, divided in 10-foot units, surrounds a 30-foot square core, and is intersected at its corners by round towers of nearly 30-foot diameter. These figures, combined with the plan's outline, make it difficult to avoid a perhaps specious connection with the Renaissance investigations of Filarete, Bramante, and da Vinci. But however specious, it is an indication of the building's interest that such a connection can be made.

Kevin Roche seems to be one of the rare architects of his generation whose qualities of originality and strength of conception compare favorably with those of the preceding. As a designer who finds favor with the ruling class, he has not compromised his vision nor proffered a chic and palatable product in the manner of an elder architect laureate. Indeed it is only through the power of that Ledolcian vision, and its quality, that the aesthetics of Roche's architecture can be isolated from the politics of his clients. That aesthetic — monumental and unique — makes no contribution to a needed urban vernacular. He has not coined a vocabulary that can pass easily into the common language. Rather he has exercised the prerogative of genius to create an aristocracy of form whose aesthetic impact implies its right to exist.

SAK

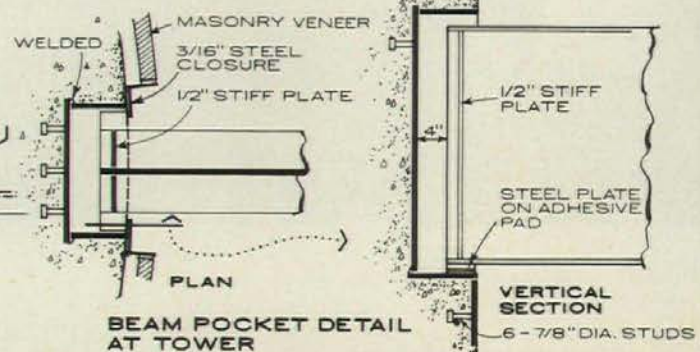
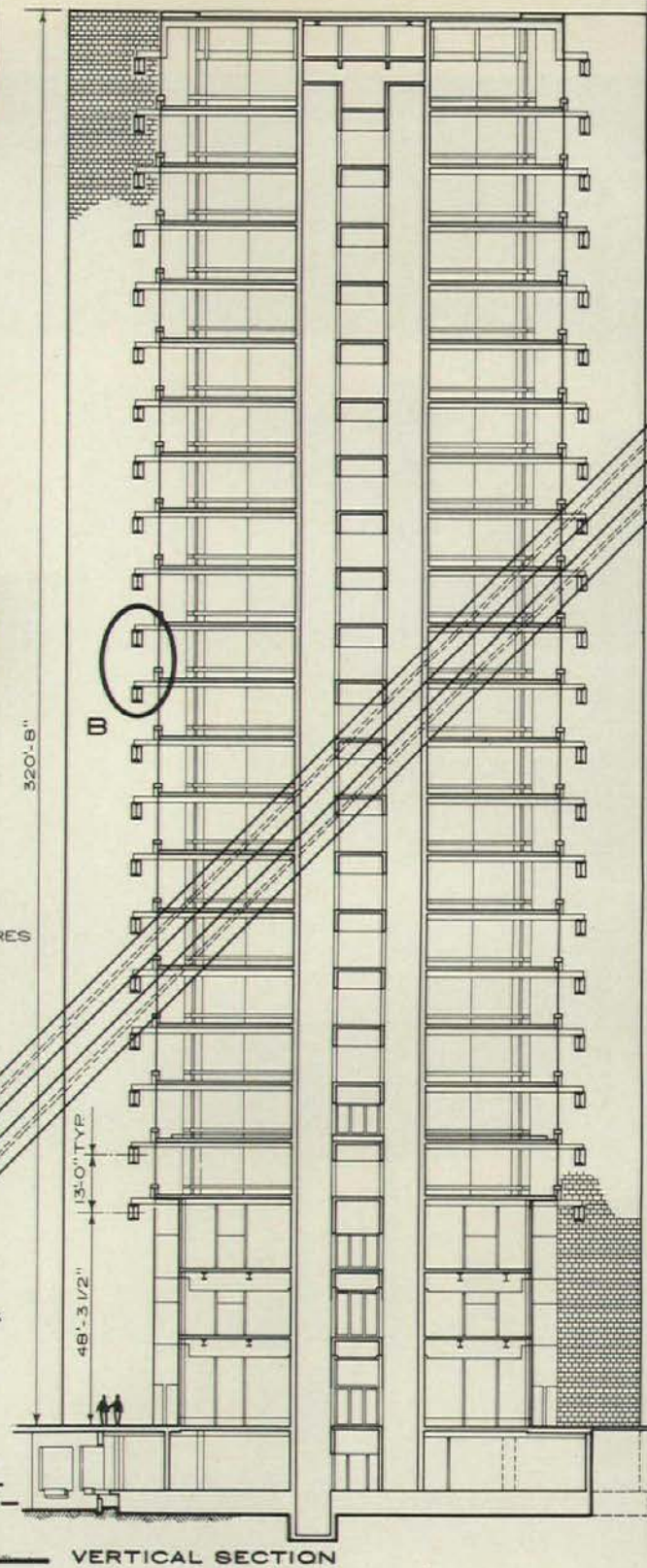
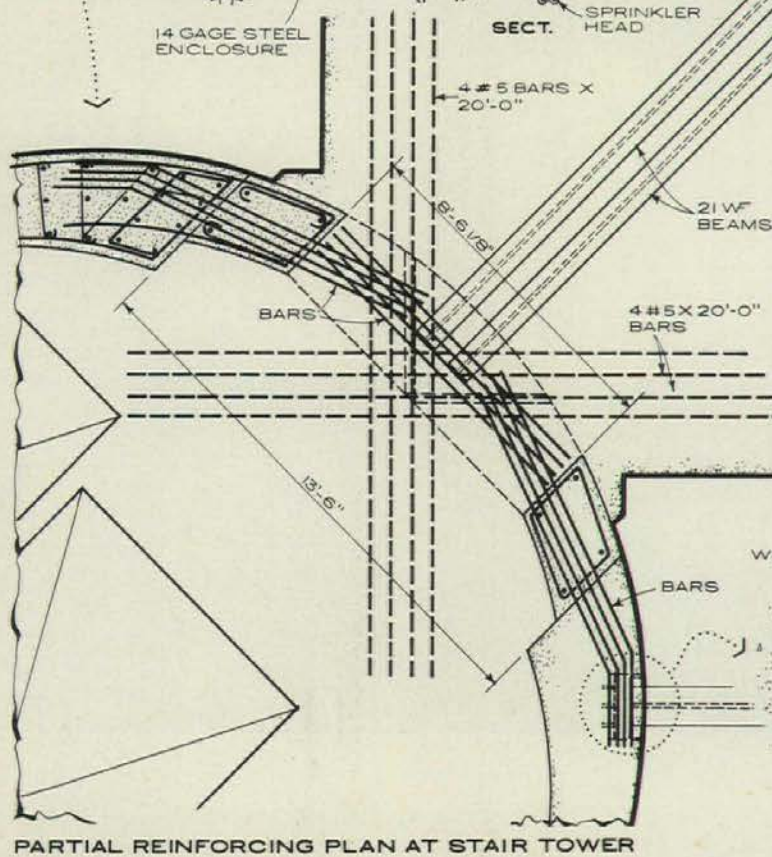
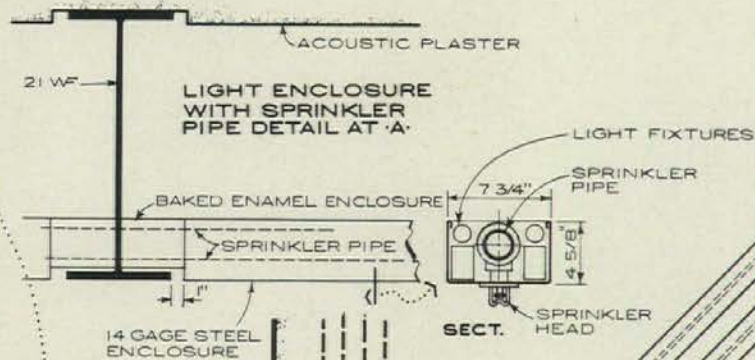
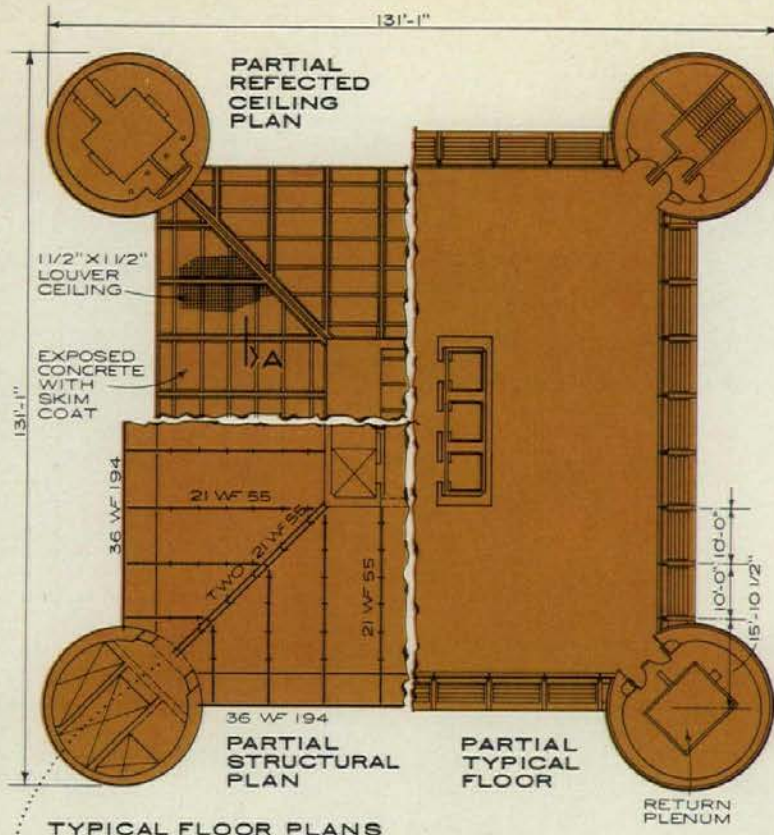
KNIGHTS OF COLUMBUS BUILDING, New Haven, Conn. **Architects:** Kevin Roche John Dinkeloo & Associates; **Project Associates:** David Powrie, Bruce Detmers. **Site:** 280'x320' landscaped plaza at the juncture of Church St., a principal downtown thoroughfare, and the highway connector, a major entrance into the city. **Program:** To provide open office space for the insurance program of a fraternal organization with over 700 employees. **Structural System:** Vertical concrete towers, slip-formed on a continuous around-the-clock basis, support a floor system of concrete slabs on structural steel members. Exterior members of weathering steel, spanning 72 ft between the towers, are not anchored laterally at ends to permit thermal expansion. Towers are supported on a common concrete mat of approximately 16,000 sq ft. **Major Materials:** Slip formed, post tensioned concrete, weathering steel, and structural tile veneer. **Cost:** \$9.6 million; \$31 per sq ft. **Consultants:** Pfisterer Tor & Associates, Structural; Cosentini Associates, Mechanical. **Photography:** Chalmer Alexander.

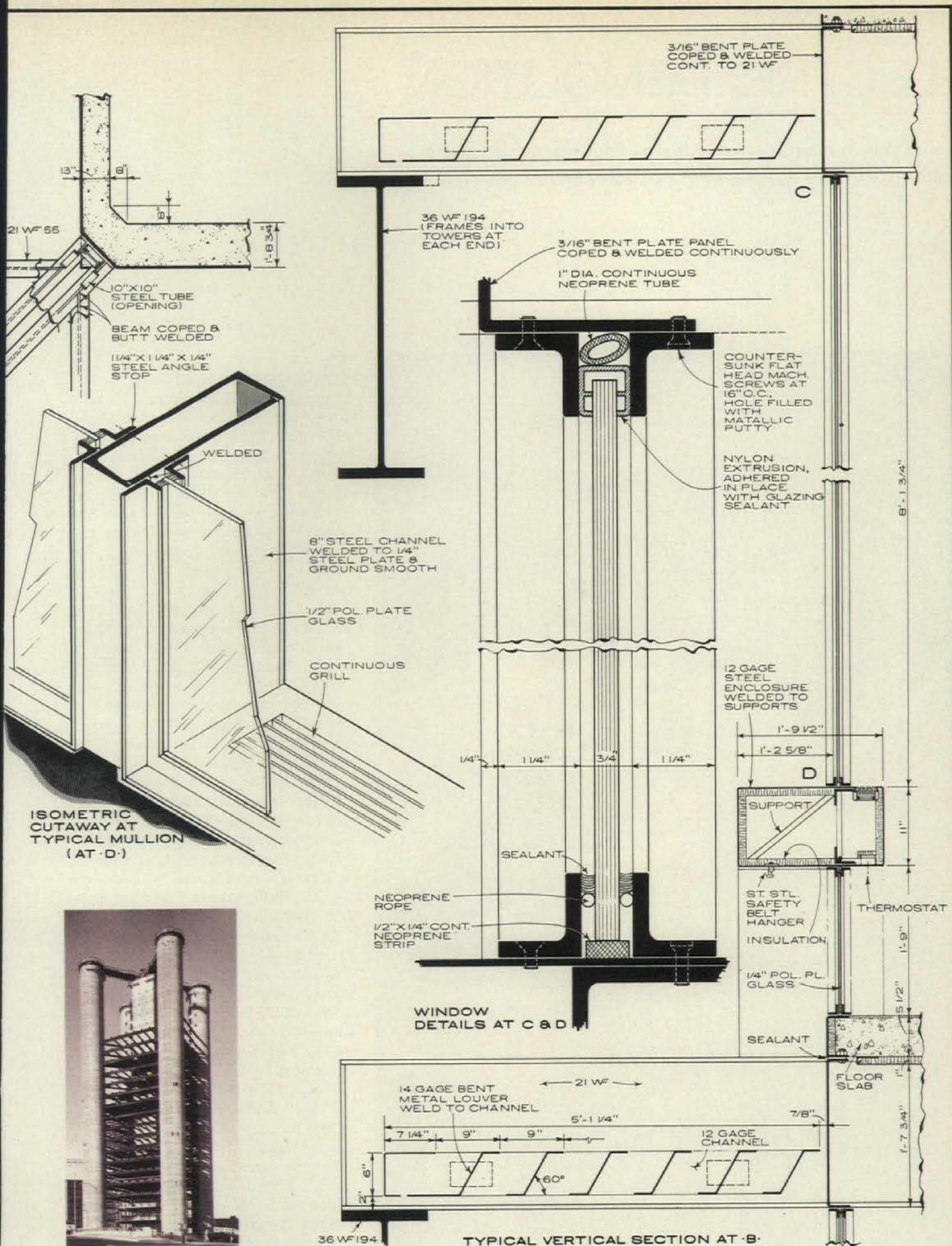


The airy relaxation of interiors, aided by natural daylight through mullionless windows, is augmented by Roche's elegant desks and cabinets of blond oak. Tables in executive suites consist of oak supports with tan leather tops, bound in tubular brass.









Knights of Columbus Building:

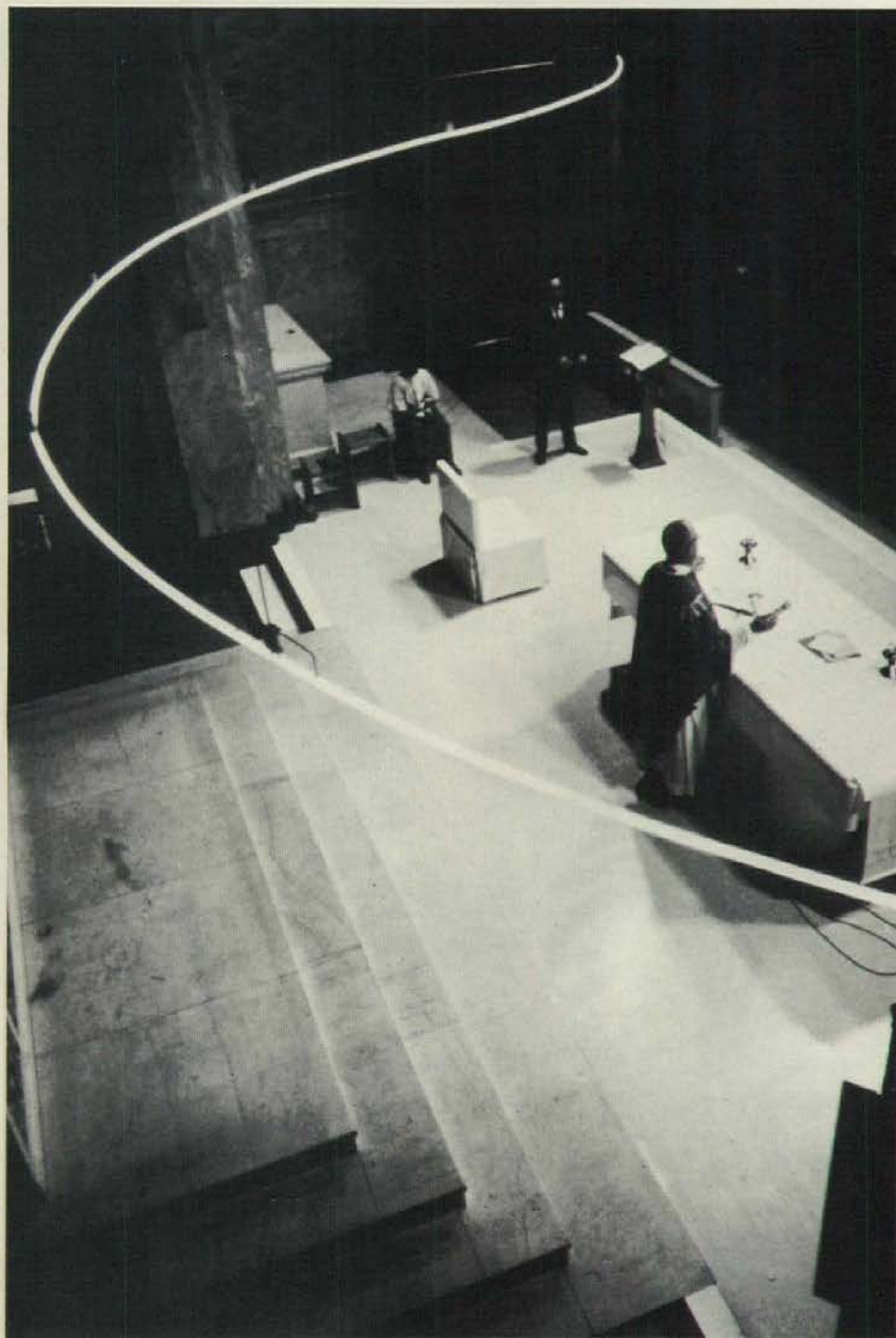
New Haven, Connecticut

Kevin Roche John Dinkeloo & Associates: Architects

Construction Details

ELECTRIC DEMOLITION

A milestone in church art is achieved with plastic sanctuary furniture and with tube lighting that edits out an old altar.



Cold cathode lighting haloes a new sanctuary.

Designing new sanctuaries to accommodate the new liturgy presupposes that decisions be made about demolishing old sanctuaries first.

Architects Venturi & Rauch have changed the focus in the Philadelphia church of St. Francis de Sales from its original neo-Byzantine sanctuary to a set of new-liturgy appointments and furnishings by means of a kind of electric demolition.

As if they were making an editor's deletion on the statement of the original sanctuary, they literally drew a line through the old altar and its reredos. That line is a cold cathode tube that cancels out the old with the intensity of its light. Yet the original statement can still be seen behind, as if in the dim historical distance.

This demolition is almost purely literary, that is, it is analogous to a deletion or a cancellation rather than being an actual demolition. It is doubly analogous since its allusion is to literary or editorial procedures. To the Architecture of Allusion this is a notable contribution.

The decision to preserve the old altar was made by the architects, who felt that its jewel-encrusted craftsmanship should be retained as an expression of the church's historical continuity. Yet they needed to focus on the new furnishings of the new sanctuary.

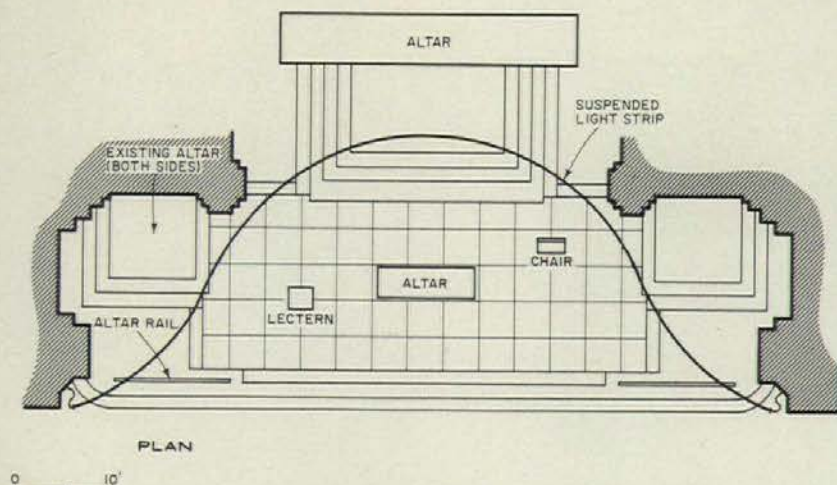
"The shape of the magic line of cathode," as Robert Venturi calls it, is not the only element that defines the new sanctuary. In addition, the floor was raised in front of the old altar to provide a higher platform on which the priest could be seen behind the new free-standing altar.

As new furnishings, the congrega-



STOPPRESS: "Electric Demolition" took on a double and sadder meaning at press time when the church removed the chancel tube-light to a storage room, thereby blindly demolishing the architects' imaginatively allusive scheme. Seven months after

installation, then, only the acrylic and vinyl furniture remained intact. Once before, in a similar Kafka-esque occurrence, the architects unknowingly suffered the destruction of a scheme by a client — at Grands Restaurant, also in West Philadelphia.



With soft curved, hard plastic, white sanctuary furnishings, Venturi & Rauch create a transcendent new church image.

tion required a lectern and a priest's chair in addition to the altar table, which is the most prominent departure of the new ritual. The architects provided a completely new image for these furnishings to match the new liturgy. Three pristine, shiny modern objects of white plexiglass and white vinyl, with accents of yellow vinyl and plexiglass are set amid the neo-Byzantine surroundings. The translucent plastic panels and the soft, "wet," white-and-yellow vinyl used in a church look like Claes Oldenberg gone pious.

The architects knew, as Robert Venturi says, that they "could not get harmony through similitude" in these new furnishings because they could not afford, much less surpass, the richness of materials — marbles, jewels, and mosaics — that had been possible when the church was built by its wealthy congregation in 1907. As a consequence, they sought "harmony through contrast."

"There is a luscious quality to the plexiglass," architect Venturi says, "that is in contrast to, yet has a quality similar to that of the marble of the original sanctuary. There is also a contrast in the soft vinyl furniture, which is in opposition to the usual hard church furniture — though we were not consciously thinking of Claes Oldenberg when we designed it."

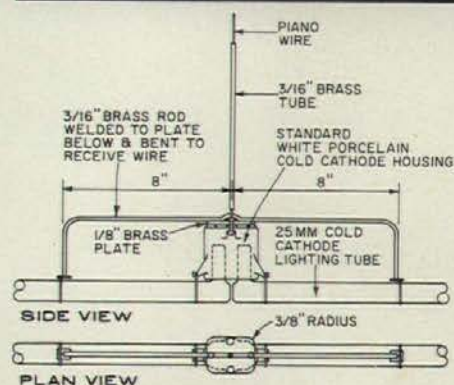
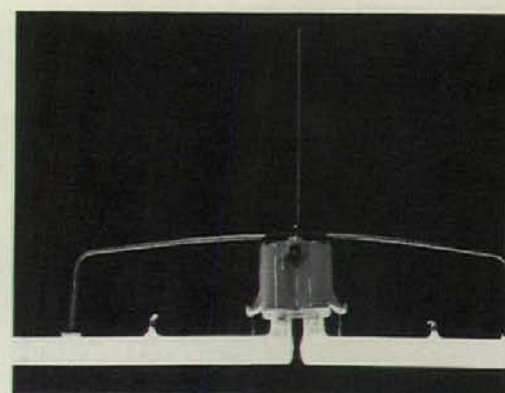
At another scale of contrast to the modern plastic materials is the cloth for the new altar, which was worked by the ladies of the church. Their participation in designing and working what the architects call "a Victorian Gothic, fancy-Irish cloth" to the length specified by the architects shows a traditional participation of church ladies' work.

To emphasize a newer kind of congregational participation which is a reflection of the new liturgy, the sanctuary is no longer separated from the congregation by either an altar rail or by dramatic lighting. Instead, the joint participation of the people in the celebration at the altar is expressed by a more consistent and uniform lighting throughout the un-partitioned church interior.

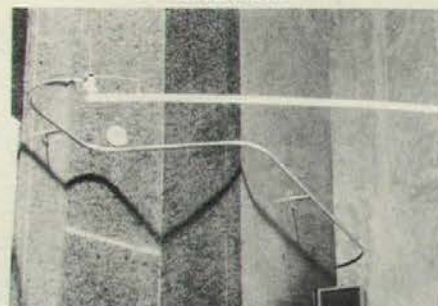
As another sign of the new vitality and contemporaneity of the Church, the opening mass of the newly decorated church was a folk mass performed by a rock group. That kind of occurrence is no longer rare in churches, but the kind of image that architects Venturi & Rauch have produced as a visual expression of that contemporaneity is totally new to church design — and electric in its dealing with the old.

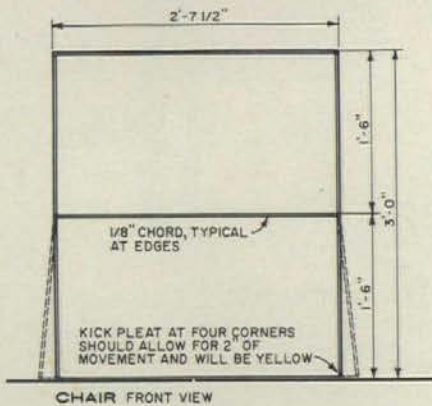
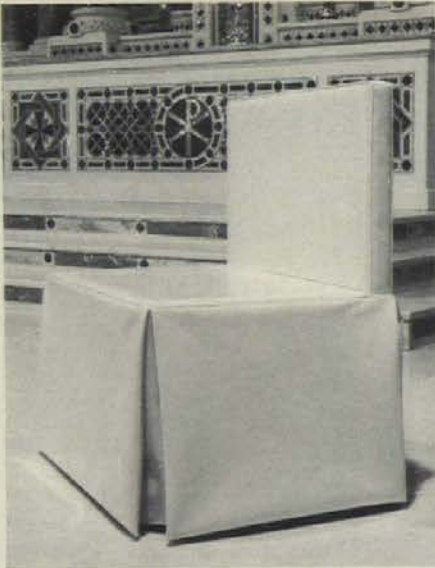
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Project Manager: John Anderson, **Photography:** (first three pages) Stephen R. Hill; (last page) Louis Reens

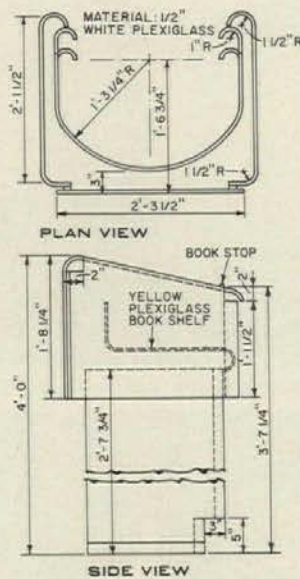
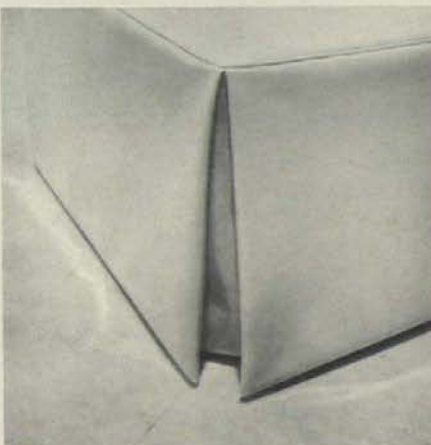
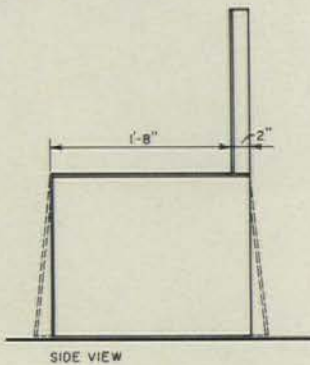


Cold cathode tubing in 8 ft lengths is suspended on piano wire at 10 ft above the floor, following the gentle arc of the apse. Connector housings are brass with standard white porcelain enamel insulators. The lowest intensity produces a mystical glow.

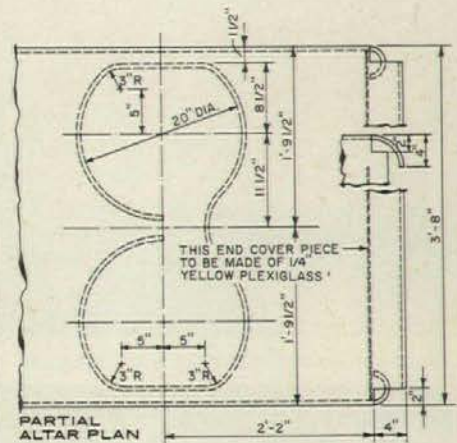
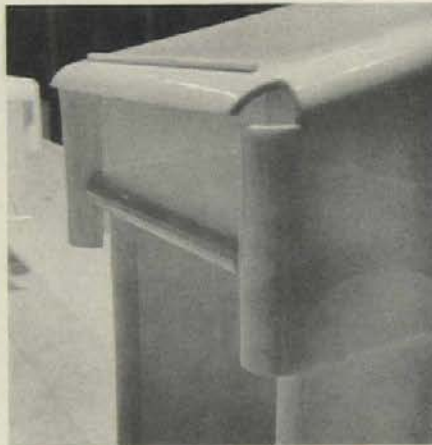




The sedilia, or priest's chair, is designed as a hard-looking, marble-like throne yet it is covered in soft patent white leather vinyl. Kick pleats of yellow vinyl at the chair legs provide glimpses of new-gold richness.



The lectern is a 4-ft high unit of 1/2-in. thick off-white acrylic sheeting, folded to look solid yet soft and flowing. Its base is a half-cylinder, the top a multi-fold design that suggests its own cloth hanging. Inside is a yellow acrylic book shelf for the priest.

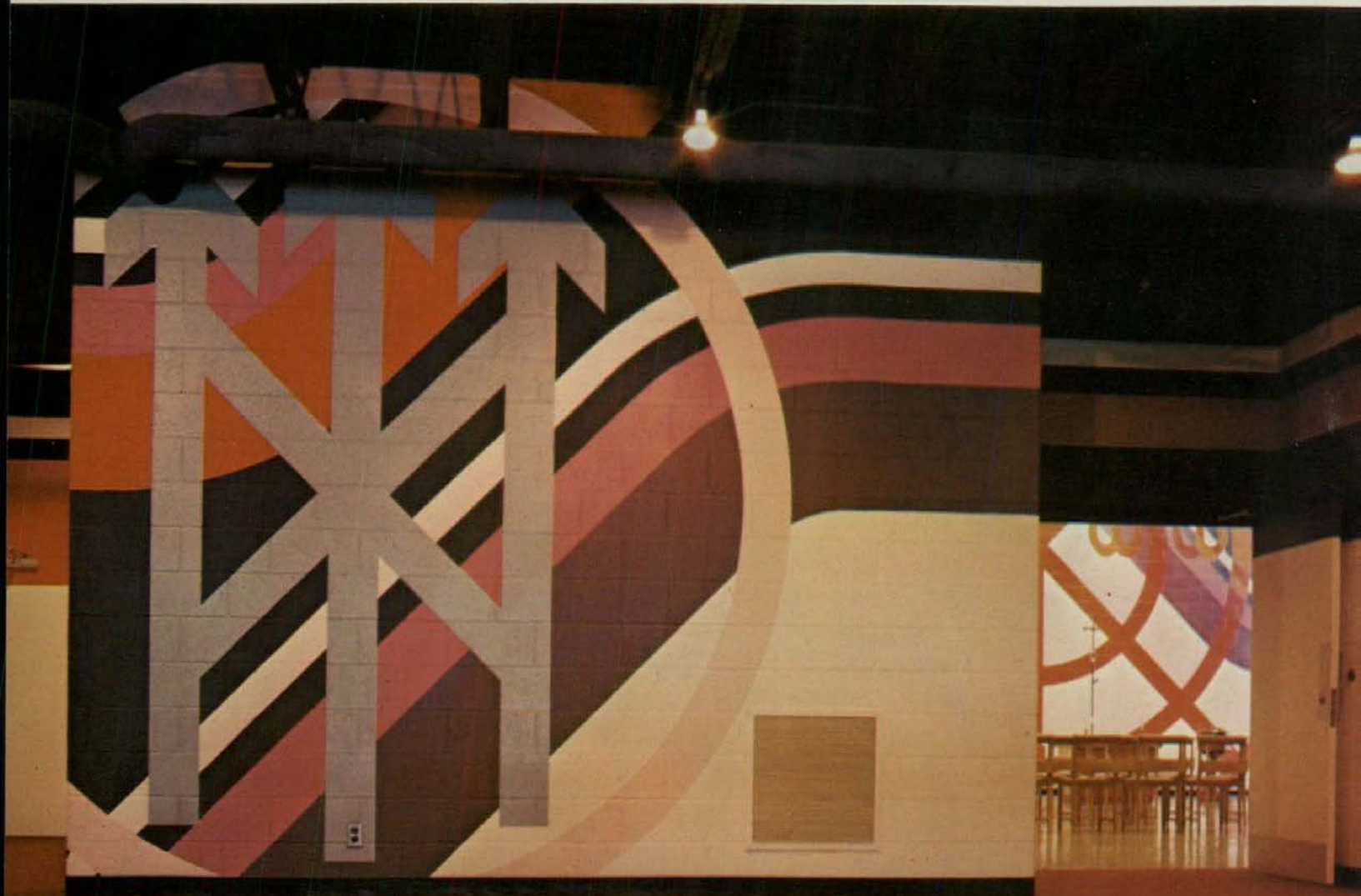


The altar is a 10 ft by 4 ft by 3 ft high table of off-white 1/2-in. thick acrylic plastic sheeting. Gently folded bases suggest four table legs. At the ends, the top flows in soft curves into the fall of the altar cloth. A yellow lining-like acrylic sheet is used at the ends to reiterate the rich gold of the original altar design.





Mammoth intersecting religious symbols, of paint superimposed on concrete block, band together three ecumenical congregations.



SUPERSCALE FRESCOES

Paint returns to the church interior
to symbolize today's mammoth ecumenism.

When three different religious sects band together to build an ecumenical church, what clearer contemporary architectural expression of their united venture could a designer make than continuous bands of wall color that tie all their interior spaces together?

That is the method used at Toronto's Hillcrest Church designed by architects Dunlop, Wardell, Matsui & Aitken of Islington, Ontario. The architects' graphics designer, Barrie Briscoe, of Toronto's "Supergraffiti" whose mirage murals have been seen in these pages before (P/A Oct. 1968) and at Toronto's York Square (P/A Sept. 1969), banded together the three congregations — Anglican, Presbyterian, and United Church of Canada — then superimposed religious symbols in multiples of three onto those unifying ties.

The result is an extraordinary church image. It is as though the spaces were immersed in a mammoth, all-encompassing Celtic illuminated manuscript. Its architectural antecedents, though a miniature of this superscale designing, are the all-over Gothic decoration of stained glass walls.

Yet at such a new scale, one wonders how so unconventional a scheme was ever accepted by a group of churchmen. They started out with a small sum set aside for art work in the lobby. The architects then suggested that they enrich the low-budget building (concrete block, exposed steel joist, metal deck, and

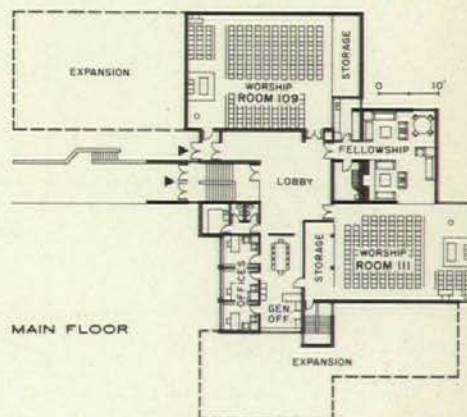
brick facing) by means of light and color. Probably a group of congregations that unite to build an ecumenical building might be expected to be open minded enough to adopt so vibrant an interior scheme; in any case, they accepted it immediately and without dissent.

"It was possible," says Barrie Briscoe, "because the design is all symbols and has a very religious feeling."

The lobby of the church sets the mood and pattern of the interior scheme. On the south wall facing the entry is a pink circle; inside the circle are three pale blue arrows tied together. The device is a pre-Christian symbol for unity that designer Briscoe found in a research book, and it aptly connotes the unity of these three churches as well as the unity of the Christian Trinity.

Behind that symbol, the stripes on which it is superimposed meet in a symbolic gesture — one side pointing to earth, the other to heaven. This also is a device of joinery — for in the series of colors that rises above a white-painted base to a dark blue ceiling, the bottom band on one side of the building is purple and on the other is orange.

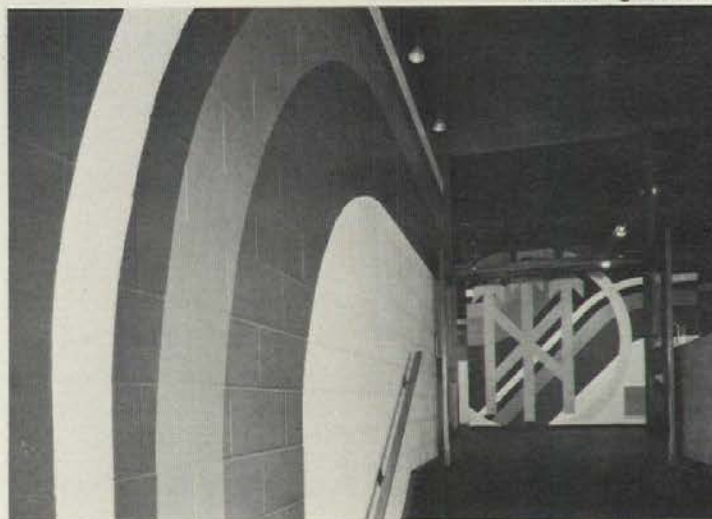
Beyond the lobby, the stripes run continuously around two "worship rooms" and a "fellowship room," which are all used interchangeably by the three congregations as a multipurpose community center — for Girl Guides, displays, and dances — as well as for services. The stripes or bands rise to pointed arches —





Photos: Roger Jowett

Stripes lead parishioners up the entry stair to the lobby (left) with its three arrow symbols. Beyond is the taller worship room with its Chi-Rho's and Alpha and Omegas (above and working drawing, bottom). Squared orbs are used in multiples in the other worship room (facing page and drawing middle).



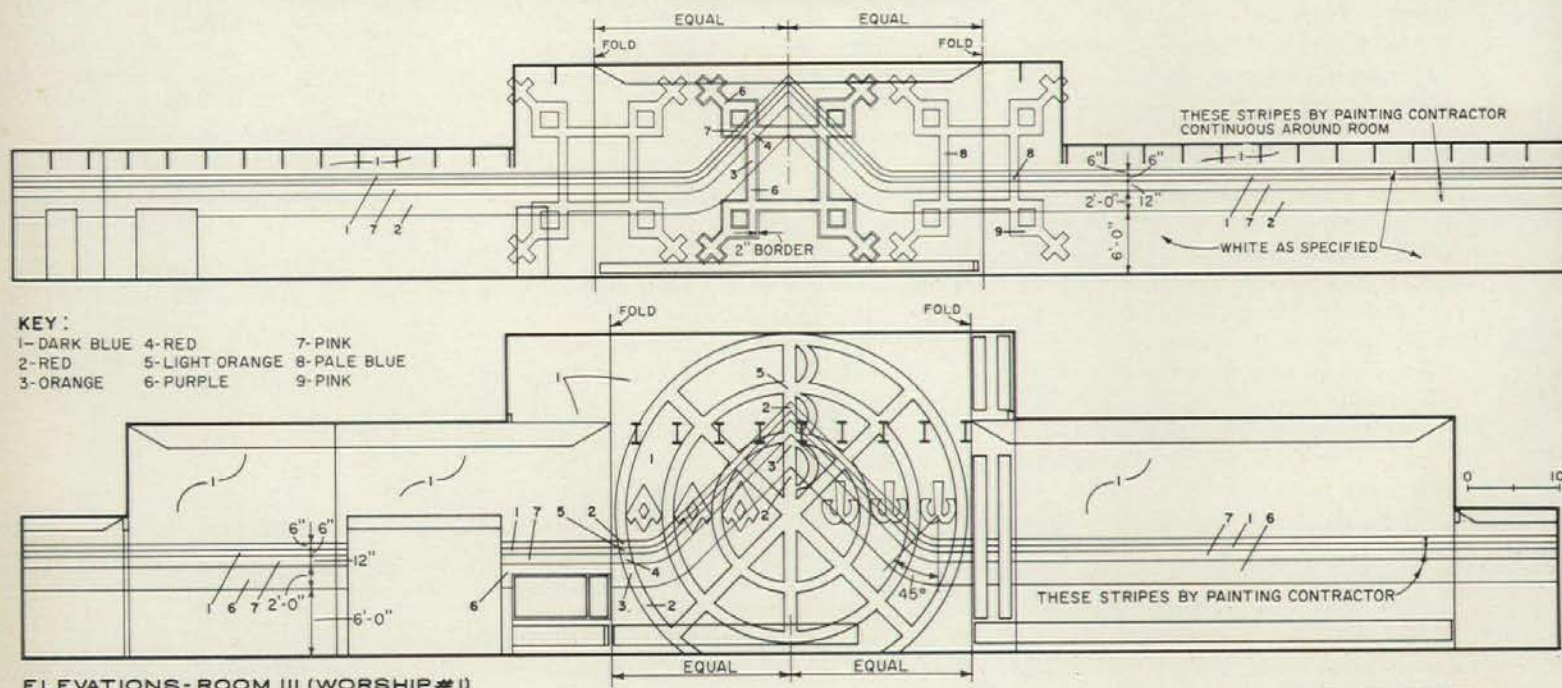
heavenward — on the accent walls of the worship rooms, and at these points the trifold symbols are superimposed.

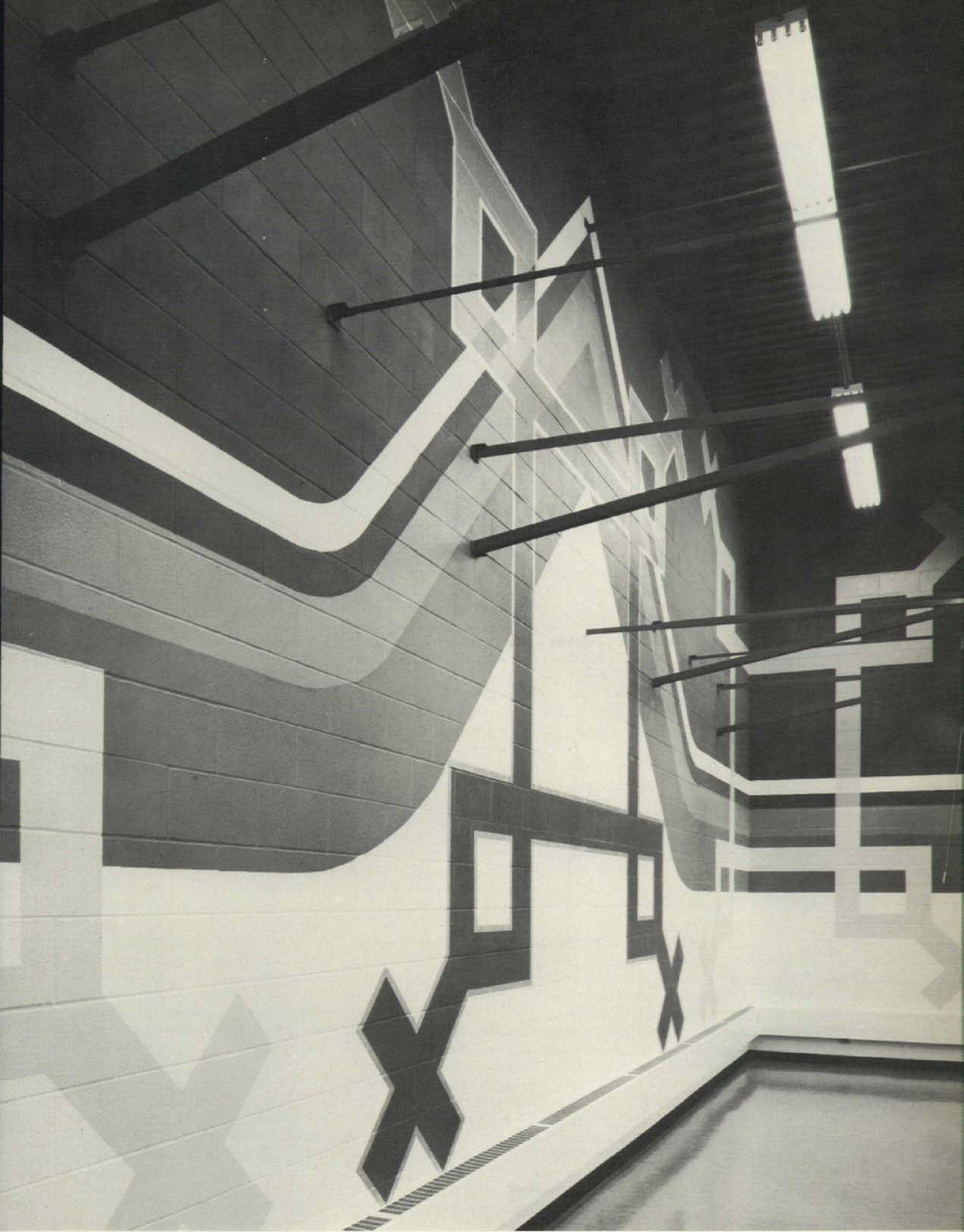
One of the "worship rooms" has a symbol of multiple squares and crosses that was devised from the "orb" — a circle with a cross on it. "This is a symbol that has many interpretations," designer Briscoe explains. "It signifies all encompassing, all powerful, all being, and also the earth itself. So I used three of them in a row, again to signify the Trinity and the three churches that built the building." As these crossed-square symbols rise from floor to ceiling, they change color at the intersections with the stripes on which they are superimposed — the center one changing from purple through orange and red back to purple at the top, and the two side ones from pale pink at the base to pale blue at the ceiling.

In the taller of the two "worship rooms," Barrie Briscoe has devised a symbol of three circle-bounded, superimposed Chi-Rho's (the Greek letter for "Christus Rex") into each of which are inserted an Alpha and an Omega (Greek designations that God is both the beginning and the end of life). This device is "more baroque" than the others, designer Briscoe notes. Its colors change as it intersects the background stripes on which it is superimposed — changing to one shade darker or lighter orange as the stripes go through the symbol.

From the liveliness of the Hillcrest Church congregation and from the liveliness of its interior design, we ought to conclude that the "Death of God" theory so widely reported several years ago was, indeed, grossly exaggerated.

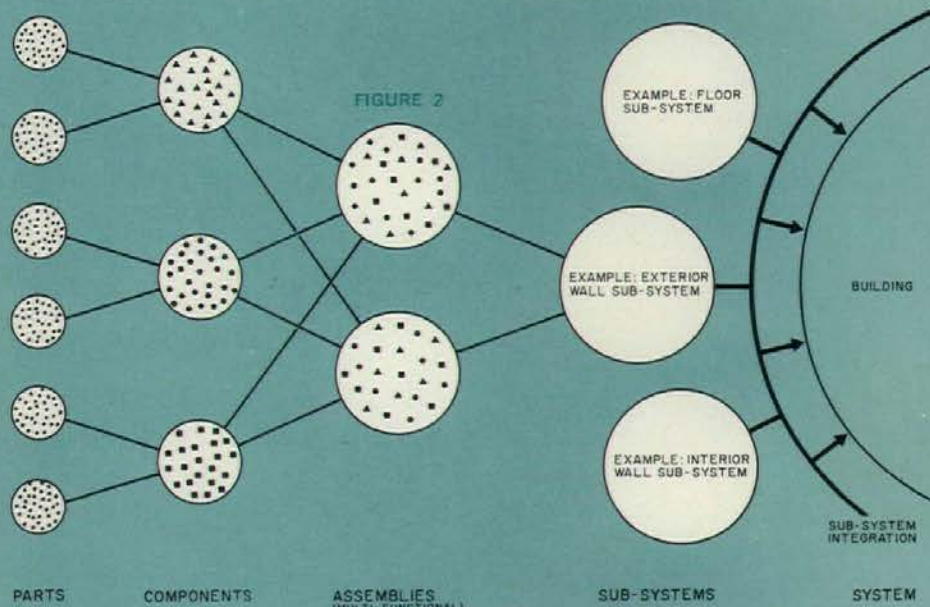
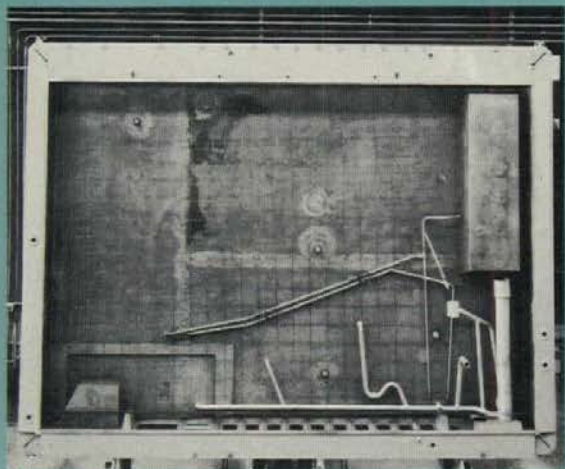
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Systems Definitions

FIGURE 1: MECHANICAL CORE SUBSYSTEM



System building, building systems, open and closed systems, prefabrication, industrialized building, rationalized building, unitary construction, and other terms have become popular and sometimes fashionable in building circles.

Architects and builders make claims on "Building Systems," editors frequently report on new systems, and manufacturers promote their lines of products as "Roofing Systems," "Retailing Systems," "Gutter Systems," ad infinitum.

The result of the often indiscriminate use of technical terms is utter confusion. Vague terminology is reaching a point where it impedes proper communication and hinders progress in technology. The main problem is created by the multiple uses of the term "system." A dictionary definition of system is: "An orderly arrangement according to some common law; combination of parts in a whole; connected body of principles in science and art; method of transacting business."

For the discipline of system building, "combination of parts in a whole" is the most appropriate definition. However, for conventional building, the term system is used either for "combinations of parts" of part of a building, or for describing "methods of transacting business." More specifically, in conventional building, the term system is used for

complexes forming different work sections (subcontracts) closely related to the traditional trade divisions such as plumbing, heating, electrical, or, in the case of structure, to the basic material used such as steel or concrete.

The lack of differentiation between meanings of the term system has led architects and manufacturers to label as building system innovations that which, in effect, are merely structural alternates for erecting otherwise conventionally built structures.

There is no direct reference to industrialized methods in the definition of system building, yet it is generally implied that a high level of industrialization is intrinsic to it. A list of definitions follows:

Building System: In system building, the term building system is used for an entity comprised of subsystems that are fully coordinated and inter-related. Coordination, in system building, means a positive interface relationship, whereas, in conventional construction, "noninterference" is usually considered as satisfactory coordination. In contrast to conventional building, these subsystems are not necessarily based on work sections or trade divisions, but are designed or arranged for the most efficient combination of performance and production (including installation).

A typical example is the Mechanical Core Subsystem, used extensively in European system-built housing. It consists of a factory-produced wall panel (1) usually forming the separation between kitchen and bathroom. The subsystem fulfills the following functions:

- structure (loadbearing)
- separation (visual privacy and sound resistance)
- plumbing distribution (waste, supply, vent)
- electric distribution (light and communication)
- gas distribution (cooking)
- finish (integral, or base for tile or paint)

The panel is factory made, since it is the most efficient way of producing it, and site work is reduced to merely connecting piping and hanging fixtures. In respect to performance, this subsystem responds to all criteria set forth by client and code.

Partial Building System: The combination of several essential, but not all, subsystems is referred to as an incomplete or partial building system. SCSD, which comprises five subsystems, is a good example of a partial building system.

Assemblies: Subsystems are composed of assemblies. In the mechanical core subsystem mentioned above, each of the wall panels, stacked one on top of the other, forms an assembly.

Components: Assemblies are made up

FIGURE 3

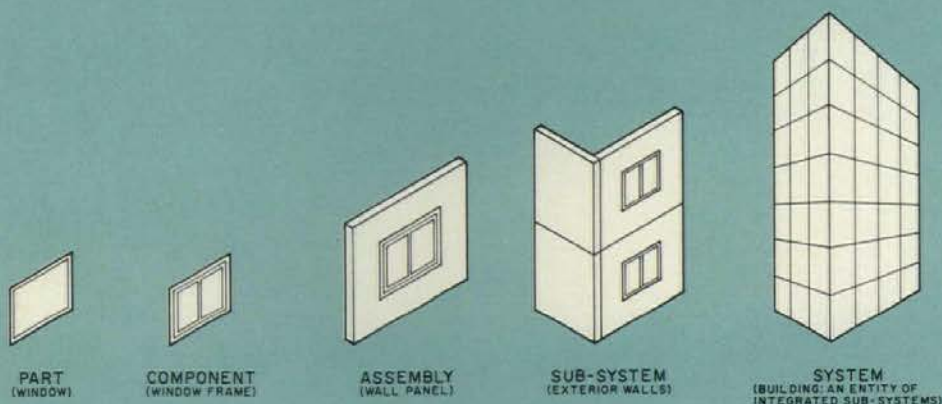
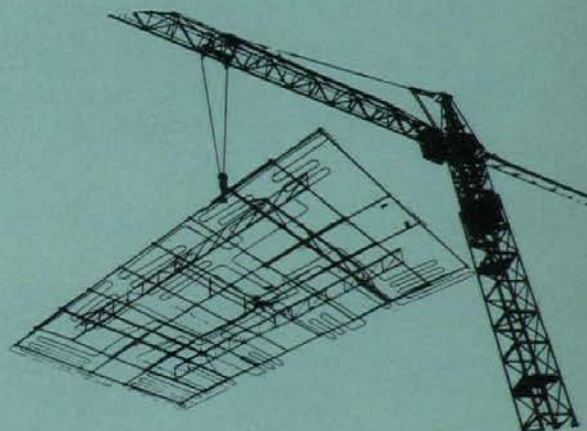


FIGURE 4: PREFAB FLOOR ASSEMBLY



of components such as the plumbing roughing in the mechanical core panel.

Parts: Components consist of parts such as pipe sections or fittings of the plumbing roughing. A part may be defined as the least complex fabricated item having its own identity (2, 3).

Open Systems: Building systems in which components, assemblies, or subsystems of different make available in the open market can be used to form a complete system. This requires a high degree of modular coordination and unification of building codes.

Closed Systems: Building systems in which assemblies or subsystems of a specific type, not available in the open market, are used to form a complete system.

Many construction systems fall in between the open and closed classifications. Certain mechanical equipment, such as elevators, can usually be used in more than one closed system. It is reported from Denmark that one stair subsystem is used by all Danish closed building systems.

Rationalized Building: The designation for conventional building with adaptation of some of the principles and techniques of system building. In Europe, rationalized building inspired by system building is replacing conventional building almost completely in housing construction,

narrowing down the margin of cost savings through system building.

Prefabrication: Prefabrication in building is the offsite fabrication of components or assemblies. It is not new, and can be part of craft building as well as industrialized system building.

Industrialized Building: Programmed and systemized building using a highly mechanized flow line production throughout the entire operation. This contrasts with the traditional craft process of building with current U.S. practices, which may be described as a partially mechanized craft operation.

Prefabrication is not a prerequisite to industrialized building, even though it usually plays an important role in it. For example, reinforced concrete floor slabs can be cast in place using an assembly of reinforcing steel fabric combined with radiant heating piping and a pre-wired electric harness that are fabricated on the ground and hoisted into place (4). Prefabrication per se does not necessarily mean industrialization: for instance, the precast concrete panels currently produced in the U.S. fall under the heading of partially mechanized craft process.

Industrialized building encompasses both system building and prefabricated building. The two differ in their response to the needs of consumers and manufacturers. In sys-

tem building, an architect designs individual buildings or projects within the framework of the system discipline. This has evolved from combining traditional site building with prefabrication of assemblies using industrial organization and mechanization, and responds to varied consumer performance requirements.

With prefabricated building, sectionalized "packages" are pre-designed like any other industrially made product. These buildings evolved from the industrial concept of mass fabricating a product intended to respond to consumer needs as interpreted by the manufacturer.

Unitary or Unitized Construction: A type of system building in which three-dimensional units (usually boxes) form assemblies, or in its most sophisticated form, complete subsystems. This type of construction was used in the early stages of system building in the Soviet Union after World War II. It has been increasingly replaced by large panel systems, but was revived with Habitat 67 and shows promise by using lighter materials than regular concrete.

Module: In architecture, module usually refers to a three-dimensional unit with specific dimensions. In system building, module is used more specifically to designate three-dimensional repetitive design and production units such as classrooms or paired dwellings with common stairs.

Architecture Teachers Salaries... Why They are Low

By MARY PLEDGE PETERSON and JOHN M. PETERSON, AIA.

Both are on the faculty of the University of Cincinnati where Mrs. Peterson lectures on Economics and Mr. Peterson is Associate Professor of Architecture.

Salaries in architecture education are low and the reasons are: collusion in hiring, lack of a formal market place, insufficient faculty knowledge of alternative opportunities, limited faculty mobility. Each of these factors is an imperfection in a competitive labor market. Their implications will be discussed here.

The results of a survey (see table) made by John Caffrey of the American Council on Education showed that 1968-69 starting salaries for assistant, associate, and full professor at 253 institutions were higher in most disciplines than in architecture ("Beginning Pay Found Higher in Most Fields," *The Chronicle of Higher Education*, Vol. III, No. 14, Mar. 24, 1969, p. 8). If the starting salaries are low, there is no reason to believe that the whole salary structure is not low relative to other disciplines.

In the real world we do not observe a perfectly competitive labor market, so it is not surprising that imperfections exist in the market for architecture faculty. Nevertheless, the nature and operation of some of these imperfections are interesting. The first imperfection concerns the hiring of experienced teachers. Administrators in the academic community behave as though there were an agreement among them not to "pirate" faculty. They rarely make offers to faculty members at other schools, but when they do, they usually inform their fellow administrator. If there were a competitive flow of faculty members, one would

expect to observe it among neighboring schools where administrators would be familiar with other faculty members and their work. Such a flow is rare indeed. Offers for promotion to administrative jobs are the exception to the rule. It is not important whether the bond among administrators takes the form of an open agreement, a tacit agreement, or loyal friendship; the results are the same. There is a lack of competition among schools for the experienced faculty members, and this has the effect of collusion in hiring.

When new staff members are needed, the acceptable sources are the local practicing architects and the current graduating classes from master's degree programs. The competition is not keen in either case. The practicing architect either accepts or rejects the exchange of some teaching time for some guaranteed income. The competition for the master's degree candidates can be keen but only to the extent that the candidate can maintain secrecy about his job shopping. Unaware of the importance of secrecy, he may try to bring some competition into play to improve his bargaining position. That is a serious mistake because the administrators will not knowingly compete for his services.

Another imperfection is that there is no formal market place for architectural educators as there is in most other academic disciplines, which provide a confidential opportunity for school representatives and job candidates to get together at their

annual national meetings. The lack of a market place inhibits competition among schools for the available candidates, and among candidates for the available positions. Without such a market place it is difficult for faculty members to have knowledge of alternative opportunities necessary for a perfectly competitive labor market — without it the market is imperfect.

Another impediment to the competitive market is an indirect limitation placed on faculty mobility. Most architecture schools require their professors to make additional contributions to the field of architecture through private practice or participation in research. Although scholarly research is not without precedent in architecture, it is still in the embryonic stage, making practice the usual choice. As is well known, a great deal of time and effort is required to establish either a viable practice or a productive association with an established firm. A successful practice then, is a function of permanence, not mobility. If academic promotions even partially reflect a productive practice, and such a practice requires permanence, then it is obvious that mobility is limited and architects are not completely free to move to better teaching jobs.

All of these imperfections in the faculty labor market in architecture have an effect on the salary levels. Administrators' behavior proves there is a scarcity of teachers in the field; otherwise they would not have to protect themselves from piracy. It

STARTING FACULTY SALARIES, BY DISCIPLINE

	ASSISTANT PROFESSOR				ASSOCIATE PROFESSOR				PROFESSOR			
	Low 10%	Median	High 10%	No.	Low 10%	Median	High 10%	No.	Low 10%	Median	High 10%	No.
Aerospace engineering	\$10,000	\$11,600	\$12,000	4	\$ —	\$ —	\$ —	2	\$ —	\$ —	\$ —	2
Agriculture	8,500	9,700	12,000	27	10,500	12,800	14,600	14	12,700	15,100	16,100	4
Anthropology	8,400	9,800	11,500	18	—	—	—	—	—	—	—	—
Architecture	8,000	9,400	10,800	24	7,500	12,000	14,000	8	13,700	17,600	30,000	4
Biochemistry	8,600	10,700	12,000	13	—	—	—	—	—	—	—	—
Biology	8,500	9,900	12,100	42	9,900	12,200	14,300	11	22,000	23,700	28,000	4
Botany	9,000	9,300	10,300	4	—	—	—	—	—	—	—	—
Business administration	9,000	11,500	13,200	78	11,200	13,500	16,300	29	10,000	17,400	25,000	8
Chemistry	8,800	10,000	11,800	63	8,500	12,900	16,500	5	20,000	25,000	28,000	3
Civil engineering	9,700	10,800	11,800	12	—	—	—	—	—	—	—	—
Classical languages	8,800	9,700	10,200	3	—	—	—	—	—	—	—	—
Computer/information sciences	10,000	12,500	13,500	6	—	—	—	—	—	—	—	—
Dentistry	8,600	11,700	16,800	8	—	—	—	—	13,500	18,000	19,700	3
Dramatic arts	8,500	9,400	10,200	6	—	—	—	—	—	—	—	—
Earth sciences (& geology)	9,400	10,600	12,000	10	10,100	12,800	14,600	4	12,100	17,000	24,000	4
Economics	9,100	11,000	12,500	47	13,000	13,500	16,500	7	15,500	15,700	22,000	3
Education	9,000	10,400	13,000	93	11,000	12,900	15,300	27	12,000	18,900	21,000	9
Electrical engineering	10,300	11,300	12,500	24	13,500	14,000	14,400	4	18,000	19,500	20,200	4
Engineering (misc.)	9,400	10,700	15,000	10	—	—	—	—	—	—	—	—
English	8,000	9,400	10,900	84	9,300	12,000	14,300	8	—	—	—	2
Fine arts	8,100	9,700	12,000	22	12,000	13,500	15,000	4	—	—	—	2
French	8,500	9,900	12,400	9	—	—	—	—	—	—	—	—
Geography	9,000	10,300	13,500	6	11,200	12,500	13,100	4	—	—	—	—
German	8,500	9,500	10,000	14	—	—	—	—	—	—	—	—
History	8,100	10,000	11,500	41	10,100	12,300	14,500	9	—	—	—	2
Industrial engineering	10,500	12,500	13,000	7	—	—	—	—	—	—	—	—
Journalism	7,500	10,100	12,500	4	—	—	—	2	—	—	—	—
Languages (misc.)	8,300	9,900	11,500	18	—	—	—	—	—	—	—	2
Law	10,000	12,500	15,000	28	10,100	11,700	13,100	4	15,000	21,000	27,800	7
Library sciences	7,500	9,500	11,500	3	—	—	—	—	—	—	—	—
Mathematics	9,000	10,300	12,500	94	11,300	13,500	16,000	18	18,100	21,000	26,000	3
Mechanical engineering	10,000	11,500	12,800	22	9,700	15,000	22,900	3	—	—	—	—
Microbiology	9,700	10,000	10,100	3	—	—	—	—	—	—	—	—
Music	8,100	9,800	12,200	32	11,000	11,600	13,500	6	—	—	—	—
Nursing	7,300	9,000	10,800	25	—	—	—	1	—	—	—	2
Pharmacy	9,800	11,600	13,000	8	—	—	—	—	—	—	—	—
Philosophy	7,200	9,600	10,500	21	—	—	—	—	—	—	—	2
Physics	8,800	10,200	11,800	48	10,800	11,500	13,500	4	—	—	—	2
Physiology	9,000	11,200	12,300	6	—	—	—	—	—	—	—	—
Political science	8,500	10,000	12,000	30	12,100	13,200	15,700	4	8,500	18,000	23,500	3
Psychology	9,400	10,300	12,200	58	—	—	—	1	19,000	19,500	21,500	3
Russian & Slavic	9,000	9,500	21,300	6	—	—	—	—	—	—	—	—
Social work & welfare	8,900	10,300	13,500	20	12,300	13,700	16,000	4	—	—	—	2
Sociology	9,000	10,200	11,200	29	—	—	—	—	—	—	—	2
Spanish	8,500	9,500	10,500	16	—	—	—	—	—	—	—	—
Speech (general)	9,200	10,500	12,500	17	—	—	—	2	—	—	—	—
Statistics	9,900	11,000	12,200	13	—	—	—	—	—	—	—	—
Theology	6,600	8,900	10,400	8	—	—	—	—	—	—	—	—
Veterinary medicine	9,700	10,700	12,200	11	12,000	12,700	15,000	4	—	—	—	—
Zoology	8,600	10,000	11,700	13	—	—	—	—	—	—	—	—

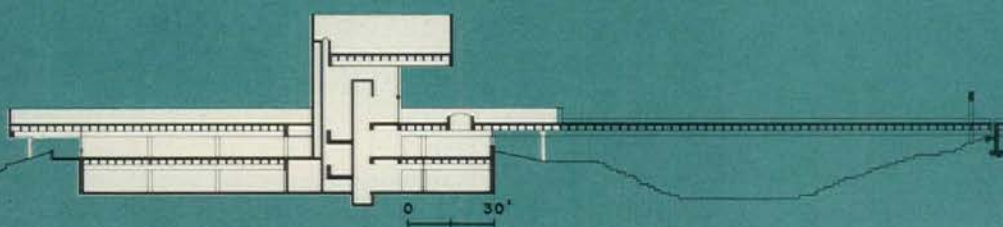
is general knowledge in economics that if supply is limited, competition will bid up the price, but market imperfections described above hold down increases in salaries. With competition among schools for faculty members who are aware of their options and their freedom to move to the job of their choice, salaries in architecture education would rise until they compare more favorably with those in other disciplines. If this were the case, administrators might find that an increase in salary structure would induce more architects to enter teaching and ease the scarcity.

Another consequence of the restrictions on competition and limited faculty mobility is the stagnating effect they have on the schools of architecture. People who do not move stay — and stay — and stay. Under such circumstances it is much more difficult to achieve a faculty balance of mature stability and youthful vigor.

Supplementary income from private practice also affects the academic salary level. Since successful practice generates income, the pressure to raise the salary levels of architecture educators is reduced.

Even if the practice produces only a small supplementary income, it is still a factor in the willingness of faculty to accept lower salary levels. Unwillingness on the part of faculty to accept the going rate, on the other hand, would enhance competition for institutional dollars, which appear to be going for other disciplines.

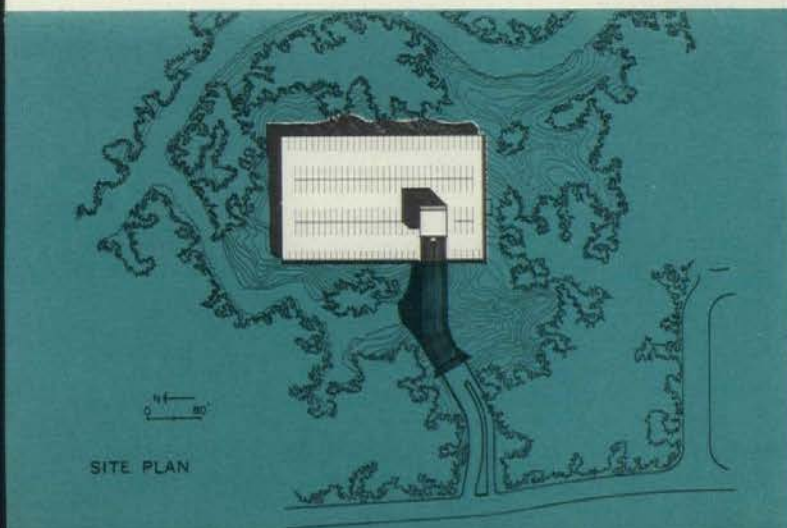
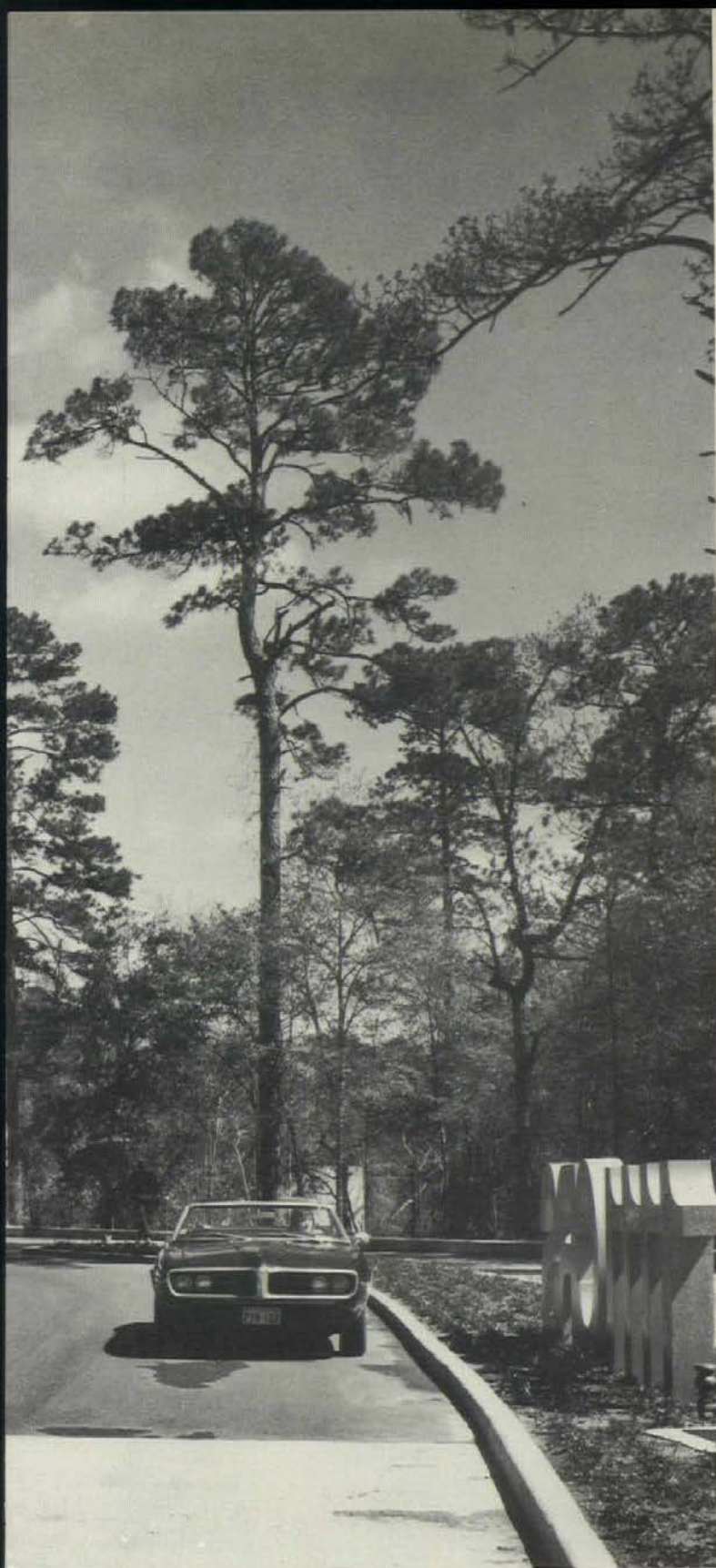
In effect, the future of much needed scholarly research in architecture is at stake. As long as salary levels are kept low, people will not want to forego the income supplement from practice to undertake research — there is no incentive!



EAST-WEST SECTION

Out on Buffalo Bayou

In Houston, Caudill Rowlett Scott's new home extends the access highway to a rooftop parking tray.



A bar across the elevated entranceway prevents large trucks from entering. (above) A well-placed skylight doubles as turnaround in front of the entrance tower. (left)

The primary design factor in CRS's new office building was the site itself: eight acres of dramatically sloping land (with a 40-ft topographical differential) in the densely wooded Buffalo Bayou just eight minutes from downtown Houston. Building on the only remaining good natural site in Houston, the architects wanted to preserve the natural beauty of the land and, furthermore, they wanted to make the dramatic views available to all 200 members of the staff. This was done in two ways: by making the building an open-loft glass box that looks onto the woods from all four sides, and by putting the cars on top of the building, out of sight. The rooftop parking tray generously overhangs the four sides of the building to provide for ample control of the hot Texas sun; also, calculations showed that air-conditioning loads could be reduced due to the shading created by cars on the roof. To enter the 200-car parking tray, one drives through the wooded ravine on a 150-ft bridge that is level with both the roof and the service highway. An entrance tower reception area at the parking level penetrates the horizontal space of the building, leading down into the office area, and under that to a storage basement.

The deceptively simple building is purposely, and admirably, restrained, due in large part to certain physical and psychological program requirements. With directness and a sensitive commitment to its site, the building is exactly what it was intended to be, without timidity and without loss of its own integrity. It is essentially a one-story, open glass box reinforced with concrete frames. Not only is no prime space given over to executives in the spacious loft space, but there are no enclosed offices at all. Instead, there are multiwork stations where constant interaction and team work are encouraged among the entire staff — from directors to mail clerks, from engineers to graphic designers — in one of the largest installations of the "office landscape" concept in the country. The easily movable furniture system can be arranged into new configurations as need for new spaces and facilities arises. The need for privacy was taken into account by providing 14 small conference rooms that are enclosed to prevent noise from disturbing the neighboring work areas. The entire inside space is accented through the use of vivid colors and bold graphic designs, and through the juxtaposition of brick floors with carpeting, and shining glass set into rough concrete.

The new building is expected to fulfill CRS's space needs for the next 10 years. However, they have no problem if they run out of space before that time. Using only half of the site now, there are still four acres left for future expansion or developments.

DAM



The glass and concrete box . . .

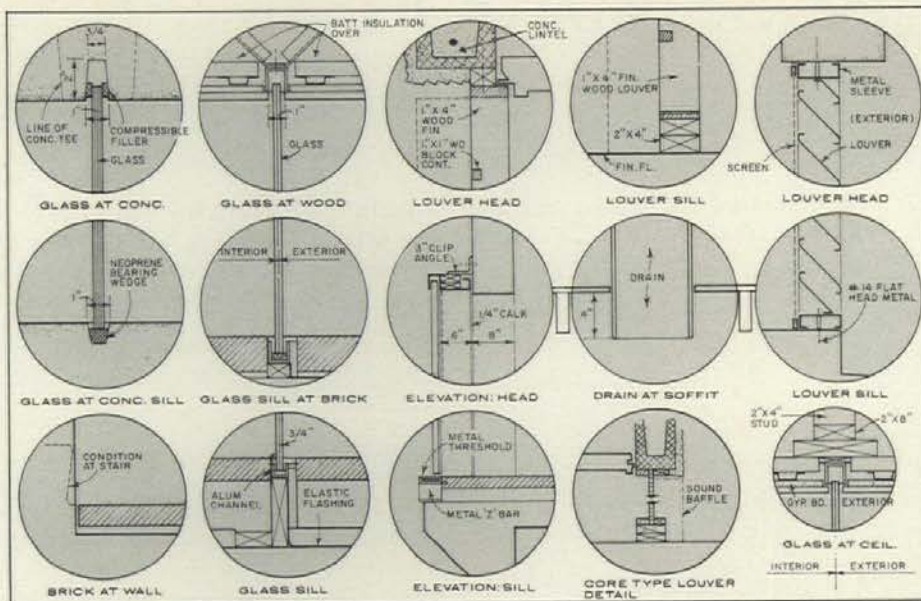


is opened on all sides under the parking tray . . .



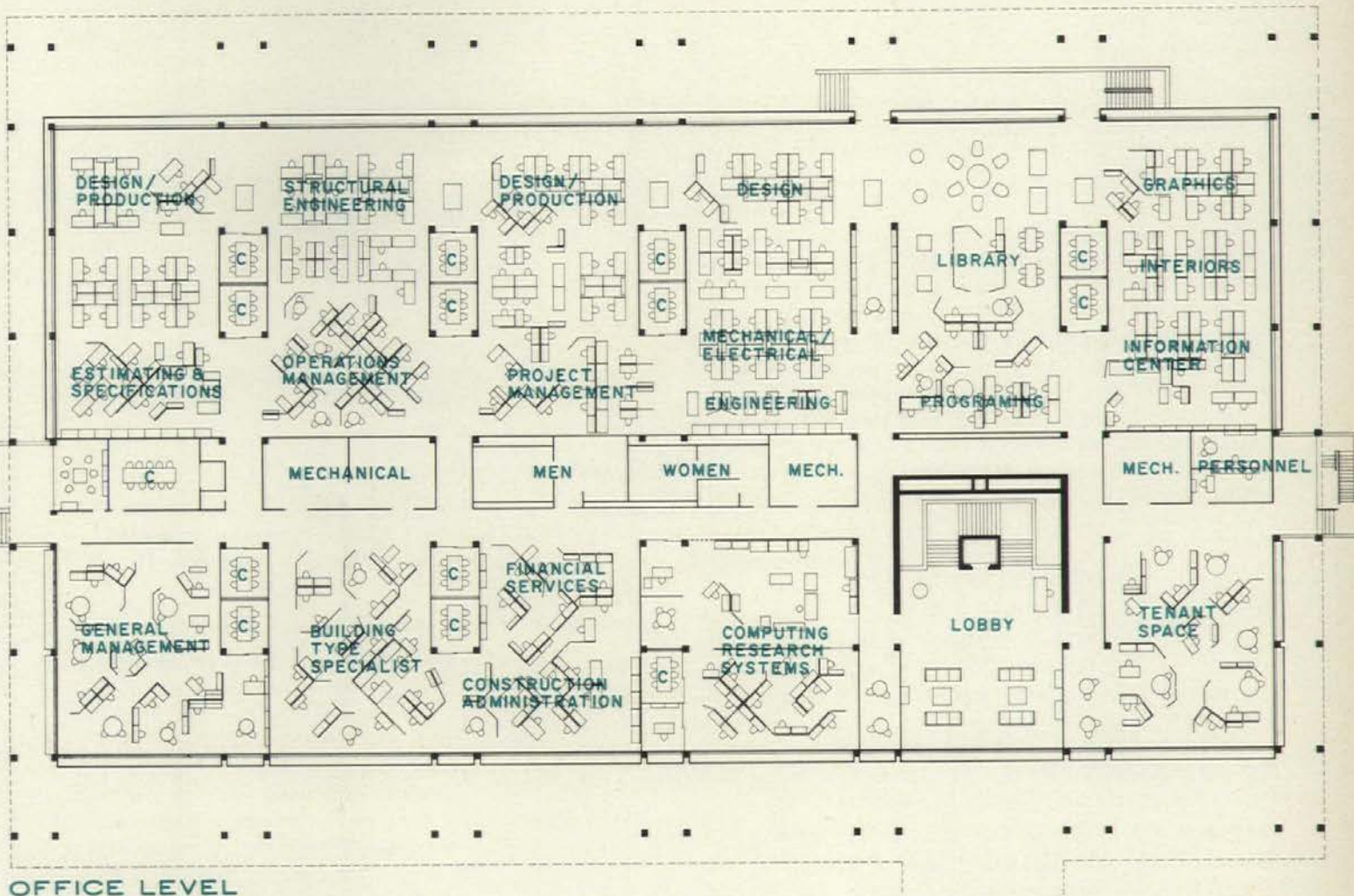
to provide views for all the staff . . .
in the office-landscaped working area.





Window and door details show the architects' special graphic presentation style. (left)

Floor plan shows the 14 private conference rooms, and a possible furniture configuration within the open space. (below)



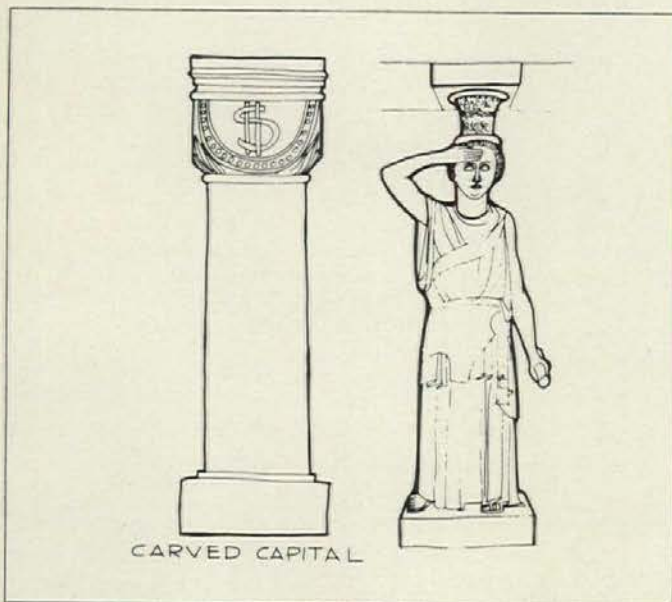
OFFICE LEVEL

CAUDILL ROWLETT SCOTT OFFICE BUILDING, Houston, Tex. **Architects:** Caudill Rowlett Scott, Architects, Planners, Engineers. **Site:** An 8-acre, deeply contoured site with bayou on two sides. **Program:** 54,760 sq ft of architectural offices programmed as loft building to accommodate firm's anticipated growth for next 10 years. **Structural System:** 40-ft spans of precast concrete structural tees and 10-ft spans of precast planks (that contain supply lines for light and air) form repetitive 40'x10'x40' bays with 24-ft spans on concrete girders. Concrete frames support glass on all four sides. **Mechanical Systems:** HVAC system uses multizone

units distributing in 10-ft bay ceilings with side wall diffusers. Lighting is 8-ft long power groove fluorescent fixtures placed between double T beams. Indirect illumination; fixtures custom designed. **Major Materials:** White painted concrete contrasts with natural cedar ceilings in corridor and walls in conference spaces. Brick floor at entry. **Interior Design:** Open planning throughout — Herman Miller Action Office II systems used — loft areas carpeted. **Cost:** \$1.25 million (\$23 per sq ft). **Landscape Architect, Interior Designer, Mechanical and Structural Consultants:** Caudill Rowlett Scott. **General Contractor:** Schnieder Construction.

THE FINAL PRESENTATION

By **ROBERT H. MUTRUX**, an architect who is an associate in the architectural firm of Fletcher-Thompson, Inc., Bridgeport, Conn.



The action takes place in a second-floor office facing the Agora in Athens, in the year of the eighty-second Olympiad (circa 447 B.C.). Present are Pericles, Mayor and self-appointed chairman of the building committee, which includes Anaxagoras, Democritus, Zeno, Hippocrates ("Hippie" to his fellow students), and several others. Herodotus is there representing the press, and Socrates representing himself. Finally, a local architect named Ictinus (who has been cooling his sandals for at least an hour), and his associate Calicrates.

Pericles (rapping on the table): Well, gentlemen, let's get started. We've got a lot on the agenda. Mr. Ictinus, you've got some sketches you'd like to show us?

Ictinus: Better than that, your honor. I've made a scale model of your project that I think you'll like.

He walks over to a nearby table and removes a cloth to reveal a mock-up resembling a Greek temple. The guests all gather round for a close look. Except for a tentative murmur and the clearing of a few throats, however, there is embarrassed silence. Finally, Anaxagoras speaks.

Anaxagoras: This is supposed to be our temple?

Ictinus: This is it. Perfectly tailored to your program, as you can see. Form follows function, you might say.

Anaxagoras: Why is the back the same as the front?

Ictinus: I'm glad you asked. I tried several other solutions, then I tried the new systems approach, and that's how it came out.

Democritus: I think it looks rather plain. I saw one like it in a museum in New York, and it was all colored. Beautiful.

Ictinus (quickly): We can ask for an alternate on painting the exterior, to see if we can fit it into the budget. But the budget is awfully tight.

Zeno: Why are there so many columns, and all alike? When you've seen one, you've seen 'em all.

Ictinus: So that they can be prefabricated, using the same shop drawings. Together, they should give a nice play of light and shade, and if we buy in quantity they're sure to come in at a low figure.

Zeno: The columns look as if they're leaning.

Ictinus: There may be a slight warp in the base of the model. You see, it was raining hard when I came in. But we can correct that in the final drawings.

Hippocrates: I saw something like it at a medical convention in Nashville, Tennessee. Have you seen it?

Ictinus: Indeed I have. It's very handsome. It's in reinforced concrete, the latest thing. But I'm afraid we can't afford that. And besides, concrete is still in the experimental stage. However, I think we can do something very attractive using marble, which is available locally. That's what Frank Lloyd Wright would have done.

Anaxagoras: Is the roof marble, too?

Ictinus: I'm afraid not. We'll have to use wood beams. But we can make the ends out of marble, where they project. It might look kind of interesting.

Democritus: What about maintenance?

Ictinus: You can wash the whole thing out with a hose. I even curved the exterior platform so the rain water would run off. The whole thing should last a good 20 years, 30 maybe, with a minimum of repairs. By that time, styles may change, or your city planners may replace it with a shopping center, or run a super-highway through it. When the population explosion hits this place, all Hades is bound to break loose and change everything. It will make that Turkish bombardment look like a Sunday school picnic.

Pericles: What does the inside look like?

Ictinus carefully removes the roof. The inside is a bare room, with a model of a huge, seated figure in its center, nothing more.

Committee in Greek chorus: What's that?

Ictinus: That's a figure of Athena the Virgin, in chryselephantine.

Zeno: Is that some new kind of plastic or something?

Ictinus: No, it's a combination of ivory for the skin tones, and gold for the drapery.

Zeno: Who needs gold and ivory? I've seen a beautiful statue by Picasso at NYU, all polystyrene and wire covered with plaster. Why couldn't we use that here, and touch it up with gold-anodized aluminum? Even at Lincoln Center all they had was milky white marble. And no clothes at all.

Socrates: Who needs a temple, anyway? The old lady stays home on Sundays; the old man watches the Olympics on TV, and the kids are either freaked out in some discothèque or revolting against something.

Pericles: Say! You're starting that gadfly approach rather early, aren't you? Who shall be the first to say, "Sock it to me, Socrates"?

Democritus: You're not really serious about this virgin bit, are you, Mr. Architect?

Ictinus: I have the impression, after seeing a few *nouvelle vague* tragedies, that virgins are getting scarce, like whooping cranes. So you might say that we're striking a blow for conservation in this particular field.

Hippocrates: By the way, where are the johns?

Ictinus: I thought we might minimize the mechanical work in order to cut the cost. After all, there are no johns in the *Erechtheum* next door.

Pericles: That's true, and no air-conditioning either. Now, how much do you think we can build this for?

Ictinus: My chief estimator, Mr. Will Durant, estimated that it should cost approximately \$4 million, give or take a few hundred grand. That's excluding the cost of the land, of course, and my fee.

Democritus: How are we going to pay for this thing?

Ictinus: That's really not my problem. But I'm sure you could sell tickets. It will make a swell tourist attraction, especially with the view you get from the Athens Hilton. And you know those Germans with their two cameras.

Pericles: Maybe the FHA can help us out with the financing. But we'll work that out later. Mr. Ictinus, thank you very much. Would you mind leaving it here? The populace would like to see what they're getting for their drachmae. We'll take good care of it.

Ictinus: Well, OK, if you insist.

Pericles (addressing Herodotus): Have you any questions for the record? We could use a good PR buildup for this thing. The old glory-that-was-Greece, grandeur-that-was-Rome routine.

Herodotus: How about, "This represents a concrete embodiment of Hellenic culture and civilization"?

The Greek Chorus: But he just said we can't afford concrete!

Herodotus: Well, then I'll just say "an expression." But I agree with Ictinus, it would be beautiful, all natural, the way Corbu would have done it.

Pericles: We can discuss that at our executive session. Mr. Ictinus, thank you very much.

Ictinus: My pleasure. When will I hear from you?

Pericles: We'll be in touch with you.

Ictinus (muttering to himself): I know. The Greeks had a word for that too, and it doesn't lose in the translation. "Don't call us, we'll call you!" And I thought I had this job all sewed up because I knew everybody on the committee!

Greek chorus (echoing over two-and-a-half millennia): Good night, Mr. Architect.

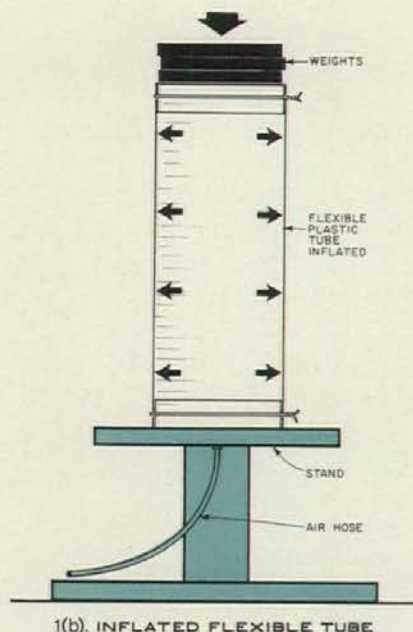
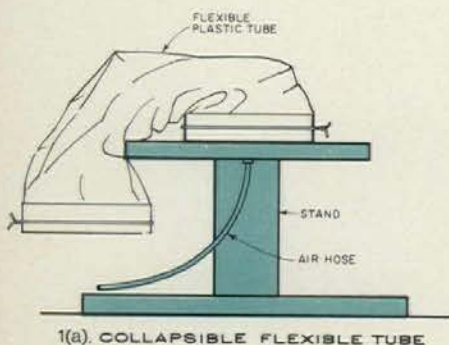


Pneumatic Construction Applied to Multistory Buildings

Extension of the principles of pneumatic construction to include multistory buildings is discussed by Peter R. Smith, Senior Lecturer in Architectural Science at The University of Sydney (Australia) and Jens G. Pohl, Lecturer, School of Architecture and Building, University of New South Wales

The possible utilization of sealed membranes supported by a small internal air pressure¹ has now become a practical solution for a number of architectural problems. We are familiar with the application of pneumatic enclosures to sports arenas, hermetically-sealed food stores, and warehouses, as well as temporary convention and exhibition stadiums. In all of these cases, lightness of weight, mobility, and the possibility of accommodating large spans (sometimes in excess of 200 ft) have led to the adoption of air-supported structures. Even though these air-halls form a unique class of construction, and unquestionably provide an economically enclosed space suitable for specific functions, they are nevertheless of relatively small importance in a building industry pre-occupied largely with multistory construction.

The potentialities of a newly developed structural system may be gaged, in part at least, by its versatility in being able to satisfy expected future trends on a broad basis. Accordingly, pneumatic con-

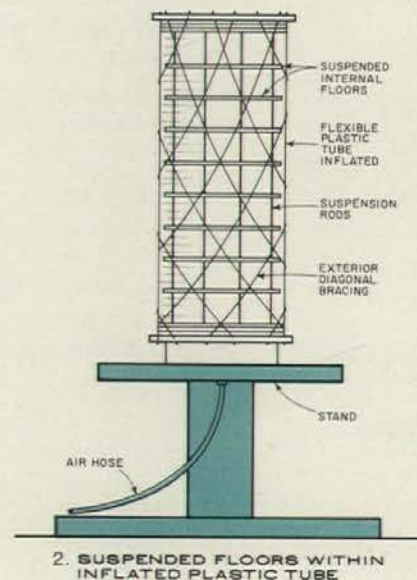


struction will develop into a more significant structural system, if its principles may be extended to include multistory buildings. Recent research conducted at the Department of Architectural Science, University of Sydney (Australia), dealing with specific aspects of pneumatic construction has culminated in the development of pressurized multistory membrane buildings^{2,3}. The underlying principles of the proposed system are illustrated (1,2). Let us consider a flexible plastic tube sealed at both ends (1a). Although this tube has no load-bearing capacity in the deflated state, it becomes a stable compression member when subjected to a proportionate internal air pressure (1b). A membrane column depends upon internal pressure for its

shape, resistance to bending, local buckling, and torsion. For short columns, this resistance will be a function of the magnitude of the internal pressure as well as membrane thickness, section modulus, and elasticity.

It is thus possible to utilize the load-bearing capacity of this type of column, whether the load is applied externally to the free end or suspended internally in the form of floors (2). Furthermore, taking into account that the normal floor load considered in the design of high-rise buildings is in the vicinity of 140 psf, it is logical to expect that for every 1 psi (i.e., 144 psf) internal pressure above external atmospheric pressure we will be able to support one floor of a multistory structure.

While the structural morphology of this pneumatic system is straight-

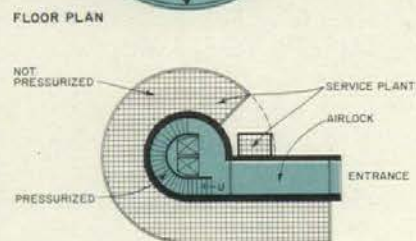
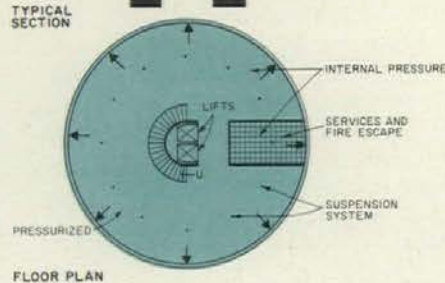
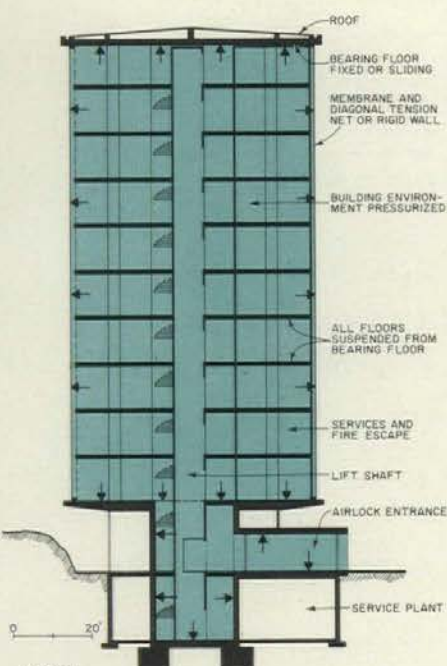


forward and may indeed appeal to the progressive architect and engineer due to its simplicity, its practical application will nevertheless require the solution of a number of complex, technical problems:

- (a) Physiological effects of the compressed air environment.
- (b) Performance of suitable membrane materials.
- (c) The nature of the relationship of internal pressure to load-bearing capacity (i.e., pressure-utilization efficiency).
- (d) Safety, in respect to maintenance of design pressure and fire hazard.
- (e) The mechanical problems associated with entry and exit from a pressurized environment.

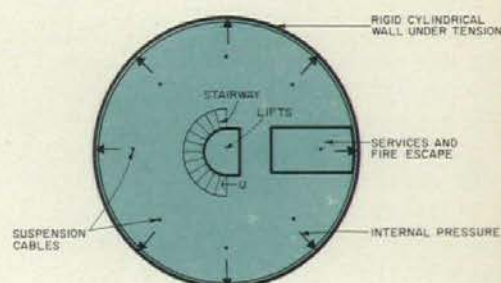
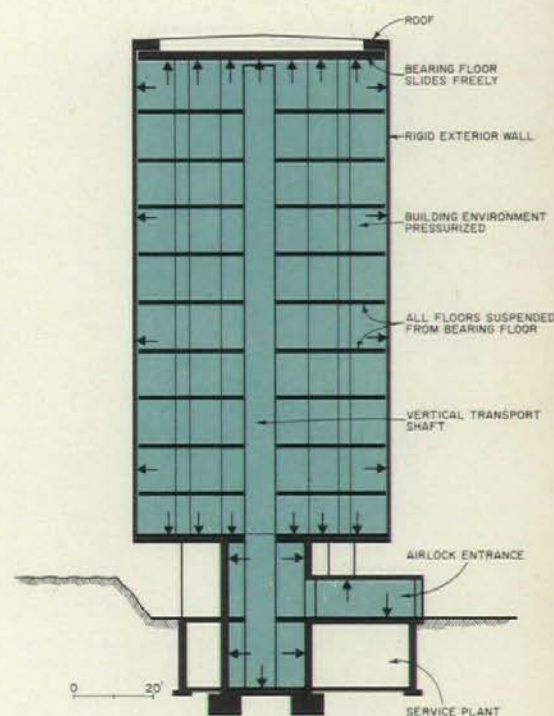
The physiological aspects of ambient, hyperbaric conditions and the performance of membrane materials have been dealt with extensively,^{2,3,4} so that a brief summary of the conclusions reached will suffice here. According to medical research reports, it seems likely that there will be no long-range physiological effects after subjection to pressures below two atmospheres absolute, regardless of duration or rate of decompression. For this reason a tentative pressure range of 1 to 2 atmospheres absolute (i.e., 0 to 14 psi internal pressure, above external atmospheric pressure) has been adopted for the design of multistory, pneumatic buildings.

The most distinguishing characteristic of membrane buildings is undoubtedly that structure and encl-



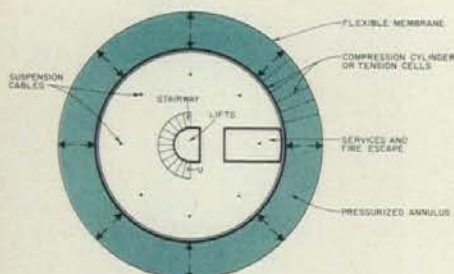
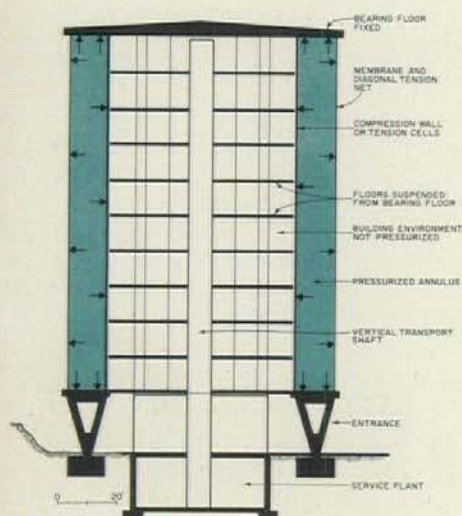
AIRLOCK ENTRANCE

3. PNEUMATIC CRITERIA FOR 10 STORY OFFICE BUILDING

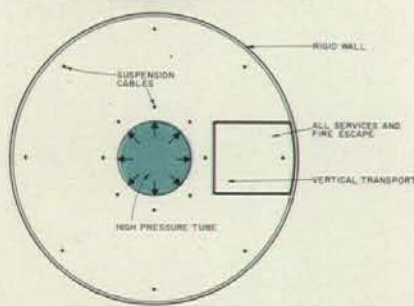
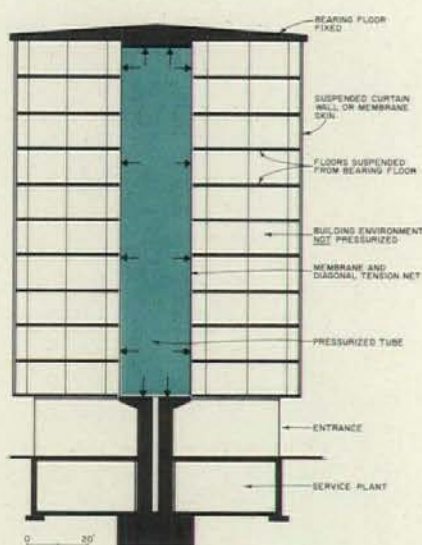


4. RIGID OPEN-COLUMN BUILDING

Following a discussion of basic structural variations, the authors report on several aspects of fire protection, offer a discussion of erection techniques, and analyze the problems of pressurization and air-conditioning equipment.



5. CELLULAR MEMBRANE-NETWORK BUILDING



6. HIGH PRESSURE MEMBRANE CORE BUILDING

sure are synonymous. In this regard it is likely that we have found a means of utilizing plastics as an efficient structural material. As the result of a recent investigation regarding suitable, commercially available membrane materials, it was concluded that nylon scrim-based laminates capable of developing a yield strength of 1000 lb per in., or more, are most suitable for this application. However, indications are that for most projects it will be desirable to use an external tension net as a means of reinforcing the membrane. Under these conditions the required membrane strength will be simply a function of the mesh-size. A tension net in direct contact with the building membrane may be more efficient in stabilizing the building laterally.

Experiments conducted in our laboratories have indicated that the structural pressure-utilization of membrane buildings (i.e., the ability of a membrane column to support an axial load in proportion to its internal pressure) diminishes rapidly for slender columns and high pressures. In this respect we have been able to develop relatively simple formulas for the design of multistory, pressurized, membrane buildings with slenderness ratios (i.e., $\frac{L}{r}$) of less than 30. From a general point of view, if the tentative physiological pressure limit of 2 atmospheres absolute and a height to diameter ratio of 2 to 1 are not exceeded, then the pressure-utilization will be above 80 percent.

The safety of a membrane building will depend on the satisfactory

performance of two structural elements—the internal air-pressure and the membrane envelope. In this respect the satisfactory performance of the membrane material is critical in regard to tensile strength, tear resistance, weatherability, and fire resistance. Furthermore, to offset any decrease in pressure as a direct result of leakage or localized membrane rupture, the duplication of critical mechanical equipment will be justified.

Basic Structural Variations

A typical design of a 10-story office building based on pneumatic criteria is shown (3). Access to this building is gained by means of an airlock tunnel at ground floor level. It has been assumed that the rate of pressurization will be slightly less than the time required for an adult person to walk at a comfortable pace the distance between airlock-doors. Having entered the ground floor lobby, the normal choice of vertical transport is provided (i.e., lifts or staircase). Each floor level is planned to incorporate a service space comprising sanitary requirements, ducts, and fire-escape staircase. At the perimeter of these floors, movable screens are fitted and these serve the dual function of allowing acoustical and visual privacy as well as providing an effective fire barrier if necessary. At ground and basement level, substantial plant areas are required for air-conditioning and pressurization equipment. These areas are not pressurized. An interesting variation of these principles is illustrated (4), where mainly for convenience of erection the top bearing floor is not rigidly fixed to the membrane envelope. Accordingly a rigid, self-supporting membrane has been chosen so that the building envelope can be erected to full height before the building is pressurized. From a technical point of view we are concerned here with an open, pressurized column supporting a load on a piston,

which is in itself supported by internal pressure.

Objection to a pressurized building environment does not necessarily rule out pneumatic construction systems. Two systems that do not require pressurization of the building environment are illustrated (5,6). In the cellular membrane-network building (5), a pressurized annulus (which may be of a cellular nature) provides structural support for 10 suspended floors. In fact this is basically a double-skin system carrying with it the advantage of thermal and acoustical insulation. The extra expense of cellular systems may be warranted when design considerations, such as minimum heat transfer, indestructibility, etc., predominate.

Normally, in this type of building the cross-sectional area of the annulus would be equal to the floor area, so that our assumptions regarding pressure-utilization would still apply. However, this is not the case when a high-pressure column is situated at the center of the building and annular floors are suspended from a cantilever beam system (6). Here we may expect a pressure-utilization of as low as 40 percent. Thus, a column of cross-sectional area A_c sq ft (slenderness ratio less than 60), pressurized to 100 psi, may be capable of supporting 10 floors of $4A_c$ sq ft area each. While benefits that are fundamental to the fully pressurized, flexible, membrane-network buildings (3) are sacrificed in the high-pressure system, the latter may nevertheless provide a convenient compromise solution to the conservative investor and building authority.

Aspects of Fire-Protection

Within the context of presently accepted standards of fire-resistance, multistory membrane buildings will present problems that may well seem insurmountable at first sight. However, since existing regulations can-

not be amended to fully realize the potential structural applications of plastics, it may be necessary to re-evaluate fundamental concepts on the basis of relating fire-hazard to the complete structure. In the case at hand, it is clear that economic risk must be sacrificed in relation to the danger to human life. The problem of fire-protection for multistory, pressurized, membrane buildings will thus be tackled in respect to:

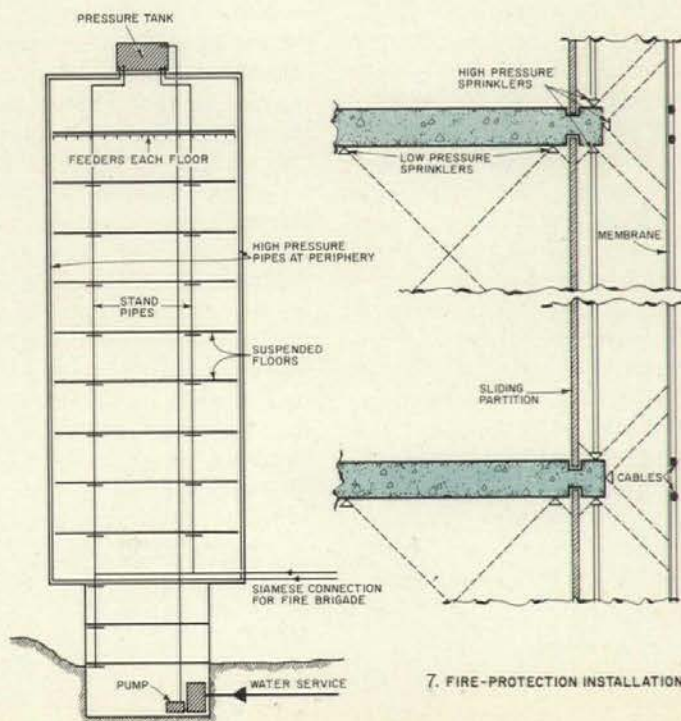
- (a) Minimization of fire-load⁵ in relation to structure, cladding, and contents. It seems likely that the effective fire-load of a building could be reduced by providing separate fire-rated storage units for areas containing a high density of combustibles. In isolating combustible content we are able to reduce the fire-protection of the noncombustible structure and concentrate treatment in smaller areas more effectively.
- (b) The installation of effective fire-services in the form of detectors, shielding systems, and deluge sprinklers that will allow sufficient time for mass evacuation before structural

failure can take place. It may be desirable to plan evacuation in two stages: first, to a fire-rated shelter at basement level within the building confines; second from this shelter to the exterior.

Consideration must be given to shielding of the membrane envelope from radiation, and heat insulation of the suspension cable system. In the first case, the authors have proposed the installation of automatically controlled, reflective, sliding screens positioned at the perimeter of each floor (7). In the case of a fire at any point, these screens will slide between the fire and the membrane acting as shields against radiation, heat transfer, and flame penetration. At the same time, deluge sprinkler nozzles will spray water against the membrane and the reverse side of the screens.

Erection Techniques

Pneumatic structures of the type described will require new procedures for erection, new sequences of assembly, and different allocations of manpower. The suspension scheme depends upon a framework of Viendeel-type trusses or a beam sys-



7. FIRE-PROTECTION INSTALLATION

Since continuous maintenance of internal pressure is essential for structural stability, the topic of safety leads to several vital considerations.

tem at the top, with main supporting fixtures at the perimeter. From these, whole floors or units are suspended by means of high-tensile steel cables. First floor to basement level will be a normal compression structure with circular, prestressed-concrete walls enclosing all pressurized areas. Suspended floor slabs will be prestressed and poured sandwich fashion similar to normal lift-slab construction routine. In most cases trades will be able to commence work inside the building at an early stage in construction (i.e., as soon as membrane and cable-network are in position). A more detailed master program based on main erection operations is outlined (8) for the four building types previously described. Time schedules have been expressed as a percentage of total time to obviate the need for specific time allotment at this early development stage.

There is some justification in the thesis that the shortage of skilled craftsmen and experienced labor in the Western World will, in the face of greater demands, increase the cost of those buildings that are planned and constructed by conventional methods, requiring a large amount of skilled labor. The problem is particularly acute in urban areas where multistory buildings are required in increasing numbers. In this context the pneumatic-suspension system will realign the work of skilled labor for greater efficiency. The construction program, by virtue of a higher content of prefabricated components and the ability to mechanize on-site erection operations, will lower erection time with subsequent savings in labor costs and investment losses. A variety of advanced technologies applicable to buildings can be utilized. In addition to the industrial techniques that are readily applied to the construction of membrane, cable-network, and the high percentage of nonload bearing elements, one can employ the latest techniques for lifting heavy loads that have already

been developed in other construction fields. It is thus apparent that the erection of pneumatic buildings requires little development work, by being able to draw upon existing methods of engineering construction.

Pressurization and Air-Conditioned Equipment

The concept of a sealed, pressurized building at once eliminates the infiltration of dust, unwanted hot or cold air, and even rainwater leakage into the building, but introduces a stringent requirement for conditioning and changing the air and maintaining its pressure.

The range of pressures indicated, 0-14 psig, is well below the usual range of reciprocating compressors but above that of centrifugal blowers. The most appropriate method of achieving pressures toward the upper end of this range would probably be with a rotary vane compressor, that could conveniently be directly coupled to a high-speed motor or to a turbine. The output of the compressor would be at an elevated temperature so that aftercooling would be necessary in summer. The winter requirement would depend upon the rates of air exchange between the building and the outside air. Since the building is sealed against air exchange with the atmosphere, fresh air will need to be supplied to the occupants; and since the membrane is envisaged as a thin and partly transparent envelope, considerable transfer of heat by conduction and radiation can be expected. Therefore, an air-conditioning system will be required which provides enough make-up air to supply oxygen to the occupants, and which controls the temperature and humidity within a comfortable range. The make-up air will replace air lost through accidental leakages and through the entrance air-lock. It is intended that the total make-up air should be considerably greater than these losses, so that an additional self-balancing air escape will be provided to control

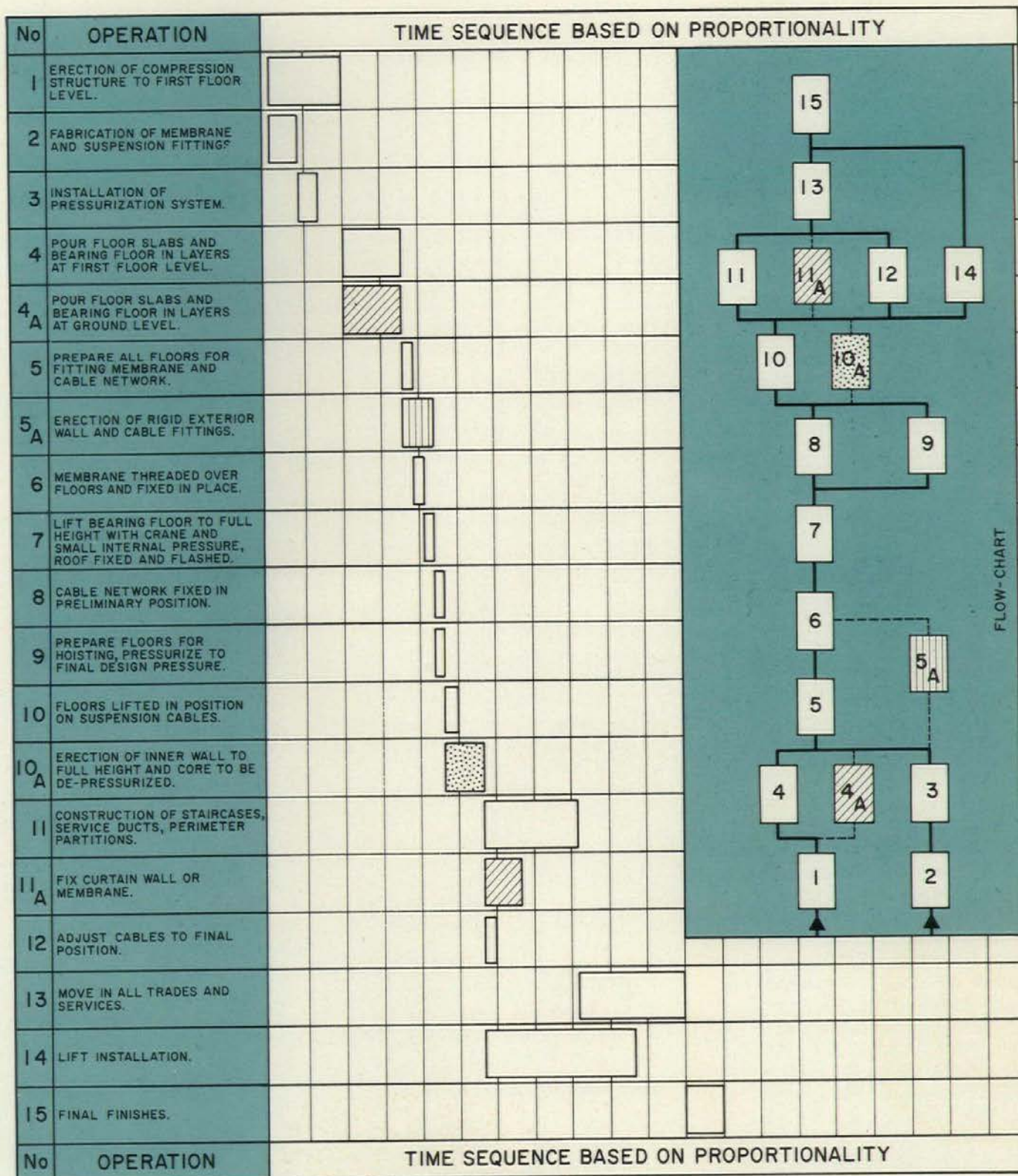
the internal pressure and allow any excess air to escape. This will also take care of changes in air pressure due to diurnal temperature changes. Accidental leakage up to the amount of air which would escape through this valve will therefore cause no harm to the building.

The total heat gain in sunlight conditions is likely to be much higher than for a conventional building because:

- (a) There is no optimum orientation for a circular building.
- (b) There is no provision for sunshading in the basic pneumatic building as described.
- (c) The transmission of heat by radiation and conduction through a thin membrane will approach that of the glass in a conventional building, and will occur over the whole of the vertical surface.

The maximum solar heat falling on a cylindrical surface occurs when the sun's altitude is in the range 30-40 degrees. (The intensity of radiation normal to the sun's rays falls off as the altitude decreases. This falling-off is much more rapid at altitudes below about 30 degrees. The sun strikes a maximum projected area of the cylindrical surface when the altitude is zero.) This maximum corresponds to about 4 P.M. on a summer afternoon in Sydney, at which time the air temperature may be also close to its maximum. It also occurs even in midwinter, so that on a sunny winter day considerable cooling may be required.

Let us assume a building 60 ft in diameter and 120 ft high, with a design temperature difference of 20 degrees between inside and outside, and a thermal transmittance (U-factor) of 1.10 for the membrane. This will be compared with a conventional square building of similar area, having windows occupying 25 percent of the external wall area, and using typical values for U-factors of the walls and roofs. Ap-



8. SCHEMATIC ERECTION SEQUENCE AND FLOW-CHART FOR FOUR VARIATIONS OF PNEUMATIC BUILDINGS

Apart from the direct savings that tend to favor the membrane building, the authors conclude that there will undoubtedly be considerable indirect savings in respect to labor and erection time.

proximate figures for external heat gain are tabulated below:

Heat gain (Btu/hr) due to	Membrane Building	Conventional Building
Wall conductivity	500,000	237,000
Wall direct radiation	1,060,000	324,000
Wall diffuse radiation	340,000	110,000
Roof conductivity	22,000	22,000
	1,922,000	693,000

Thus, the heat gain of this membrane building at the worst time is about three times that of a conventional building. The radiant heat gain through the membrane can be substantially reduced by coating all but the "vision strips" with an opaque, reflecting surface such as a metallic coating or a highly reflective white paint. Using a reflectivity to solar radiation of 0.80 over three-quarters of the surface reduces the total external heat load of the membrane building to about twice that of a comparable conventional building.

In the example taken above, an air-supply at the rate of six air changes per hour (at atmospheric pressure, i.e., three changes per hour at two atmospheres) would permit a heat exchange of 700,000 Btu/hr with a temperature difference of 20 degrees between inlet and outlet. For the peak cooling condition, it would be necessary either to increase the air supply to about 12 changes per hour at 1 atmosphere, or to use secondary cooling such as chilled-water fan-coil units within the building. If additional air-handling is used, it should be carried out in a high-pressure circuit with the acceptable minimum of make-up air, since the energy required to compress the make-up air to building pressure could otherwise add greatly to the energy needed for cooling the building.

Although the thermal performance of the pneumatic membrane building in its simple form is substantially inferior to that of a conventional building, the situation could be greatly improved by the addition of

reflective coatings to the spandrels, and even of partially-reflective coatings to the window strips; by adding flexible insulation material to the opaque sections of the membrane; and by the addition of sunshading devices externally. Horizontal sunshading louvers could be hung from the top bearing floor on the external side of the membrane and attached at intermediate points to the existing cable-network. In this case, that portion of the heat load which is produced by solar radiation impinging directly on the building enclosure could be reduced at will as a function of the vertical spacing and horizontal projection of the louvers. The desirability of doing any or all of these must be evaluated by considering also the essentially simple, demountable nature of the building. The effect any such addition would have on the speed and ease of erection of the envelope needs to be viewed against the cost of operation over the expected life of the structure.

From the considerations of heat load, air supply, and access, it becomes clear that the pneumatic building has particular merit where the number of occupants is small and the anticipated life is not great. In the case of a building housing mainly equipment or materials, the delay of ingress and egress through the airlock, the problems of fire escape, the need for fresh-air supply and the need for transparent areas in the membrane are all reduced.

General Safety Considerations

Since continuous maintenance of the internal pressure is essential to the structural stability of a multistory pneumatic building, the topic of safety is heavily dependent upon:

- The satisfactory performance of the pressurization equipment in being capable of sustaining an increased air-input under emergency conditions.
- The ability of the building membrane to resist tearing after punctures have occurred.

Because of the requirement of reliability, the design of the mechanical equipment will present problems not usually encountered in building construction. The provision of standby plant, and probably alternative energy sources, will be necessary. It may be pointed out that single-engined aircraft and helicopters are accepted as a reasonable risk, being solely dependent on a single power unit. A better analogy for the pneumatic building would be the multiple-engined airliner, which is capable of operating with part of its power system out of action.

Let us now consider the performance of the building membrane. One type of plastic material, at present available to satisfy the performance requirements, such as tensile strength, weatherability, etc., is a nylon scrim base laminate coated with a PVC or PVF film externally and polyurethane internally. The nylon scrim has the ability to localize rupture by developing a fairly high tear-strength. Should the building membrane be punctured by accident or as an indirect result of civil disturbances (e.g. bullets and larger projectiles), and this perforation remains localized due to the tear-resistance of the material, then the continuing stability of the building structure will be purely a question of pressurized air-input. The design of the mechanical equipment can therefore be dealt with statistically; i.e., what is the probability of failure in relation to the effective size of a puncture that may occur in the lifetime of a building?

i.e., lower material
cost and insurance
must balance
lower equipment cost risk

In fact, the designer is taking a calculated risk (i.e., insurance risk) that the conditions which would cause the building to collapse will not occur during its lifetime. It may be noted that the proposed theory of "differential load factors" is based on

Building Component	Increase or decrease in cost as % of conventional building	Remarks
Foundations	-40%	Lighter overall weight.
Floors (incl. beams)	-10%	Smaller spans are possible with suspension system.
Columns	-70%	Suspension cables only above first floor.
External Walls	-60%	Plastic membrane and cable-network only.
Air-Conditioning (incl. pressurization)	+100%	More elaborate plant required.
Fire Services	+30%	Greater protection needed for membrane.
Internal Finishes	-20%	No wall finishes required.

identical premises.⁶ A similar sort of risk is taken in any structural design. The natural desire to have the greatest economy compatible with a sufficiently improbable risk is reflected in the gradual reduction of factors of safety in structural codes. In the present case, the risk is one of total collapse in the event of an appreciable, sudden loss of pressure, and therefore the probability of this happening must be made extremely remote by adequate design safeguards.

On the other hand, the pressurized membrane-cable-network building, by virtue of its flexibility, is much more resistant to damage by earthquake or by the blast from an explosion than a conventional building constructed of more brittle materials. This property could be exploited in regions subject to seismic disturbances.

The Mechanical Building

The economical aspects of pneumatic buildings are strongly influenced by

a set of variables not so far considered in multistory, architectural construction.

- Full realization of material strength due to the conversion of axial load forces into tensile stresses. In this regard pneumatic structures will invite the use of high-strength materials, leading to the application of more accurate and critical design theories.
- With the efficient use of materials in tension, minimum weight design criteria become relevant as a means of optimizing the strength-weight ratio of the structure.
- In those cases where the building environment is required to be pressurized, we are able to consider *structure* and *enclosure* as one entity. Moreover, the enclosure will be continuous, thus eliminating problems associated with joint sealants, drainage, expansion, and moving parts.

The type of pressurized building envisaged here has obviously not yet been developed to the stage of practical construction, although a design has been prepared for an experimental three-storied prototype. Therefore, any attempt to estimate costs will be largely intuitive, based on the assumption that some previous experience had in fact been gained in erecting a building of this type. The principal differences are listed (see table).

Apart from the direct savings which tend to favor the membrane building, there will undoubtedly be considerable indirect savings in respect to labor and erection time. The desirability of predetermining life-span on the basis of a dynamic, replacement policy will become a necessity for this type of multistory building. We may in fact treat pneumatic structures as mechanical buildings, designed for specific requirements and governed by critical performance standards on par with aeronautical engineering concepts.

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- ⁶"Principles of Modern Building"; D.S.I.R.—Building Research Station; Vol. 1; H.M.S.O., (1962): p. 4-6.
- 1a Plastic membrane tube sealed at both ends
- 1b Same tube in the pressurized condition acting as a stable compression member
2. With the addition of suspended floors, a multistory building evolves
3. Typical multistory pressurized, membrane-cable-network building.
4. Rigid open-column building
5. Cellular membrane-network building
6. High pressure membrane core building
7. Fire-protective installations
8. Master program of main erection operations

"NOW, ONCE AND FOR ALL, KNOW WHY I DID IT"

MORRIS LAPIDUS

After an active and beleaguered career as the undisputed king of the "give 'em what they want" school of architecture, Morris Lapidus continues to masterfully execute one *tour de force* after another in the worst taste imaginable to esthetes within the architectural establishment. Good taste? Bad taste? Such arbitrary value judgments are meaningless and interchangeable as concepts within the realm of human experience. The important aspect is taste for whom, and Morris Lapidus thereby transcends aesthetics: "If 90 percent of the people have bad taste," he says, "then I'm going to design in bad taste. There's an old Russian saying: if three people say you're drunk, lay down and go to sleep because you're drunk — don't argue. And so if 90 percent tell me that I'm right and 10 percent have damned the hell out of me, I'm going to continue to do what the 90 percent want."

After such superficial considerations of taste are set aside, the true genius of Lapidus can be analyzed. A re-evaluation of Lapidus' work shows him to be a sophisticated humanist; an eloquent spokesman of popular taste. His aesthetic is concerned with *people* and the multisensory development and psychological use of space.

In his career, which has spanned more than 40 years, Lapidus has reacted against the intellectual elitism and stylistic clichés of so-called modern architecture. His reaction against modernism and ascetic Bauhaus principles stems from his strongly expressed conviction that the human race has never lost its love and need of "adornment": "As you go through history, at no stage have people divested themselves of this original seventh sense or initial desire for adornment. I'm afraid that contemporary architecture got off into a tributary which is running dry — when we reached the 20th century and asked, well, what the hell do we need it for? This is absolutely meaningless. We're living in the machine age. It doesn't do anything. It doesn't produce anything. It costs money to turn out. Get rid of it. And at that time, at first I thought it was great, but little by little I began to feel this emptiness, this barrenness — and I knew I hadn't lost my love of adornment."

With the intent of becoming a scenic designer, Lapidus graduated from Columbia with a Beaux-Arts education in 1927. Unable to get a job in the theater, he took a job with an outfit that designed retail stores. From about 1930 to 1950, Lapidus had a renowned and innovative career as a store architect, developing many of the principles that he then applied to his hotel designs. In his quest for "an architecture of emotion," Lapidus analyzed the function of stores as a "machine for selling": "I wanted to find out what was that certain something about a store that made people react in one way or another. I wanted people to buy what I had to sell. If I had pantyhose to sell, I did it through my designs."

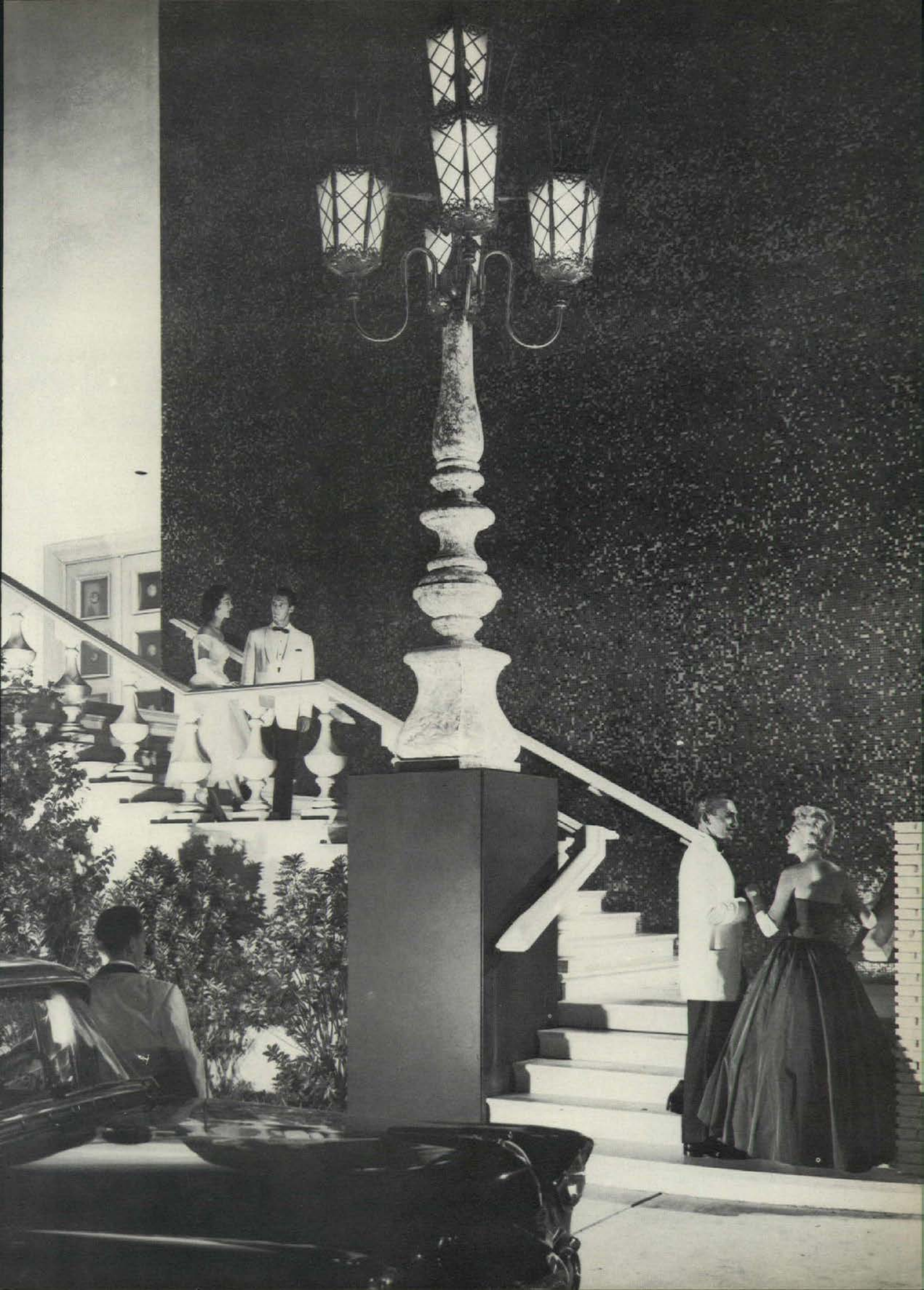
Out of these studies emerged a number of architectural merchandising techniques that became the basis for all of his designs:

Use of adornment: "I had to adorn my shops because if they saw some decor that was meaningless, absolutely meaningless, it just pulled people in. So dress it up. And that's where I left Mr. Bauhaus completely."

Use of color: "People love color. I would purposely do the damndest things in my stores, and I found where I put a real splotch of color, they'd walk towards it for no apparent reason."

By JOHN S. MARGOLIES

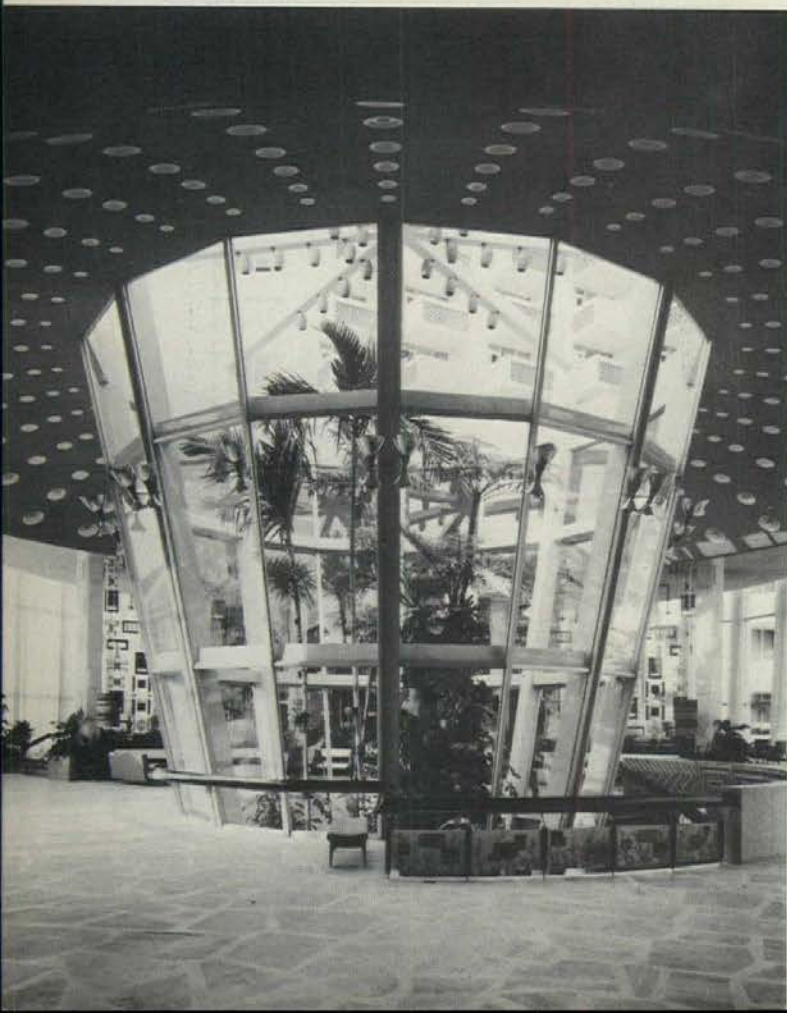
John Margolies is Coordinator of Experimental Programs at the American Federation of Arts and a freelance writer on architecture, the arts, and mass media. An exhibition of Morris Lapidus' interior design, sponsored by the Architectural League of New York and coordinated by John Margolies, is scheduled to open at the League on October 8. The exhibition will then be circulated nationally by the AFA.





Morris Lapidus' apartment, Miami Beach, 1962. Lapidus' son Alan, an architect, has nicknamed the apartment, "The Palazzo," and his son Richard, a lawyer, has noted that "if F. Scott Fitzgerald were Jewish, he would have lived there." Photo: Alexandre Georges

Terrarium, Lobby, Americana Hotel, Bal Harbor, Florida, 1956 (severely damaged by a hurricane and redesigned by a local interior decorator in 1964). The glass-enclosed terrarium, open to the sky, contained tropical plants and "a sculptured mountain." Lapidus' plan to screen it over to house "monkeys and parrots and the like" was vetoed by the client, who finally settled for two very lethargic alligators. Lapidus has commented that "it's ridiculous to have a glass-enclosed hole in the middle of a building, but it gives people a lift." Photo: © Ezra Stoller (ESTO)



Use of light (the moth principle): "I experimented by placing a bright light over one showcase and an ordinary light over another. Twice as many people stopped to examine the merchandise in the brightly-lighted case than in the poorly lit one."

Use of sweeping curvilinear plan (inspired by Mies' Tugendhat House!): "It's such a visual delight to have a sweeping surface that from then on I said, people don't like rectilinear living or walking. It's only because our real estate was laid out in rectangles. But if you look at the old cities — London, Paris — people meander. And so I started experimenting with that in my stores. Do people like straight aisles, or shall I make them meander? And I found that they love to meander."

In 1949 Lapidus executed his first hotel design (as associate architect) — the Sans Souci in Miami Beach. "I was convinced," he says, "that just as stores had to be designed to make people want to buy what the merchant had to sell — so a hotel had something to sell also. What do people want to buy when they walk into a hotel? To begin with, I said a hotel should be no place like home. When people go to a resort hotel they want to get away and forget everything that happens at home. So I went out of my way to develop the most unhomelike atmosphere that I could create; applying color, light, adornment, sweeping lines, and going further, because now I could play with levels. Instead of breaking walls, I was breaking floors, too."

"People are looking for illusions; they don't want the world's realities. And, I asked, where do I find this world of illusion? Where are their tastes formulated? Do they study it in school? Do they go to museums? Do they travel in Europe? Only one place — the movies. They go to the movies. The hell with everything else."

"Now I wanted to be a set designer. I'm going back to designing settings. This is a play. These people are here and they think they're going to have a grand vacation. They want to feel like millionaires. They want to feel that this is just one of the greatest experiences in life. So I put them on stage at all points."

And thus followed Lapidus' series of famous and controversial hotel projects in Miami Beach, the Caribbean, and New York City — uncompromising and exuberant expressions of eclectic decoration so that "people can do one thing only — get on stage and act." The hotel environments are pure Lapidus: "I go out of my way not to get tied into any one period. That would be disastrous because then I'd have a poor copy of, let's say, a Louis XV. No one has ever accused me of making a poor copy of any period because you can't identify my periods. They're so confusing that you just give up and say, well I don't know what it is. That was done by design."

In hotels such as both Americanas (Bal Harbor, Florida, and New York City) and the Fontainebleau, Lapidus has provided comprehensive planning solutions: every detail is planned from the use of Muzak to the design of graphics and uniforms for the hotel staff. All of the furniture is either Lapidus-designed or Lapidus selected; the bric-a-brac and antiques come from auction sales of mansions or from the many shops along New York's Third Avenue. When he wanted paintings he would commission the copyists in the museums and "just say I wanted so much by so much, that's the size, and I'd like to spend about \$300." His preference is for the use of fine natural materials, but for reasons of

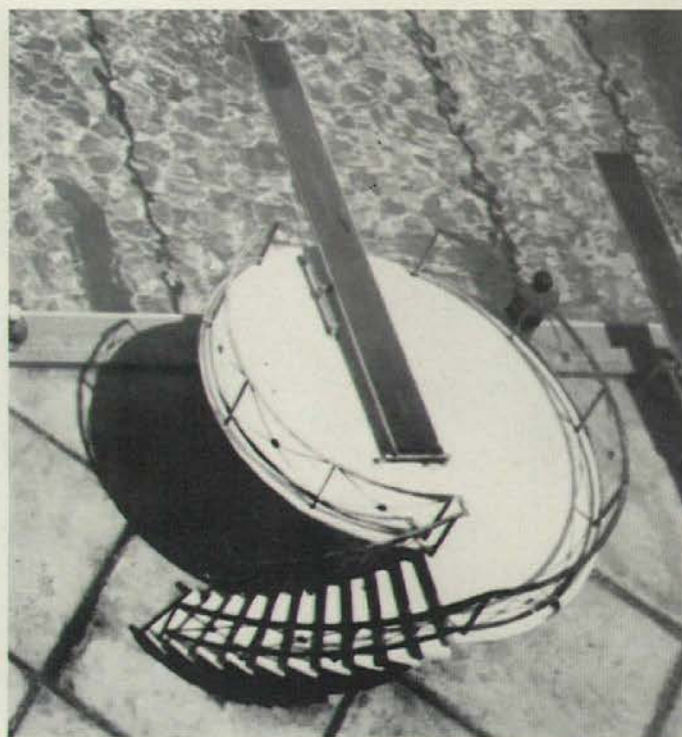


Lobby, Fontainebleau Hotel, Miami Beach, 1952 (above) and 1969 (below) as designed and redesigned by Lapidus.
Photo: Gottscho-Schleisner, Inc.





The Bali Bar, Aruba Caribbean Hotel.



Diving Board, Eden Roc Hotel, Miami Beach, 1954.
Photo: © Ezra Stoller (ESTO)

durability and economy, he has been forced to use synthetic materials.

Lapidus has influenced a whole generation of hotel designers as he has ordered the complexity of functions within his hotels. He uses a number of design refinements and theatrical devices to create these "nonsense places":

Façade curved around pool deck (as at the Fontainebleau): "When you get out on the pool deck and look back at that monster, it sort of says, well here I am and you're my children."

Change of levels (as in the Fontainebleau): "To get into the dining room you walk up three steps, open a pair of doors and walk out on a platform, and then walk down three steps. Now the dining room is at exactly the same level as my lobby, but as they walk up they reach the platform. I've got soft light lighting this thing up, and before they're seated, they are on stage as if they had been cast for the part. Everybody's looking at them; they're looking at everybody else."

Grand circular staircase to nowhere (in the lobby of the Fontainebleau): There's a card room up there—that's all. All people ever do is walk halfway up, turn around and walk back down again. But they love that stairway. And they've seen it in the movies—the princess walks down the stairway."

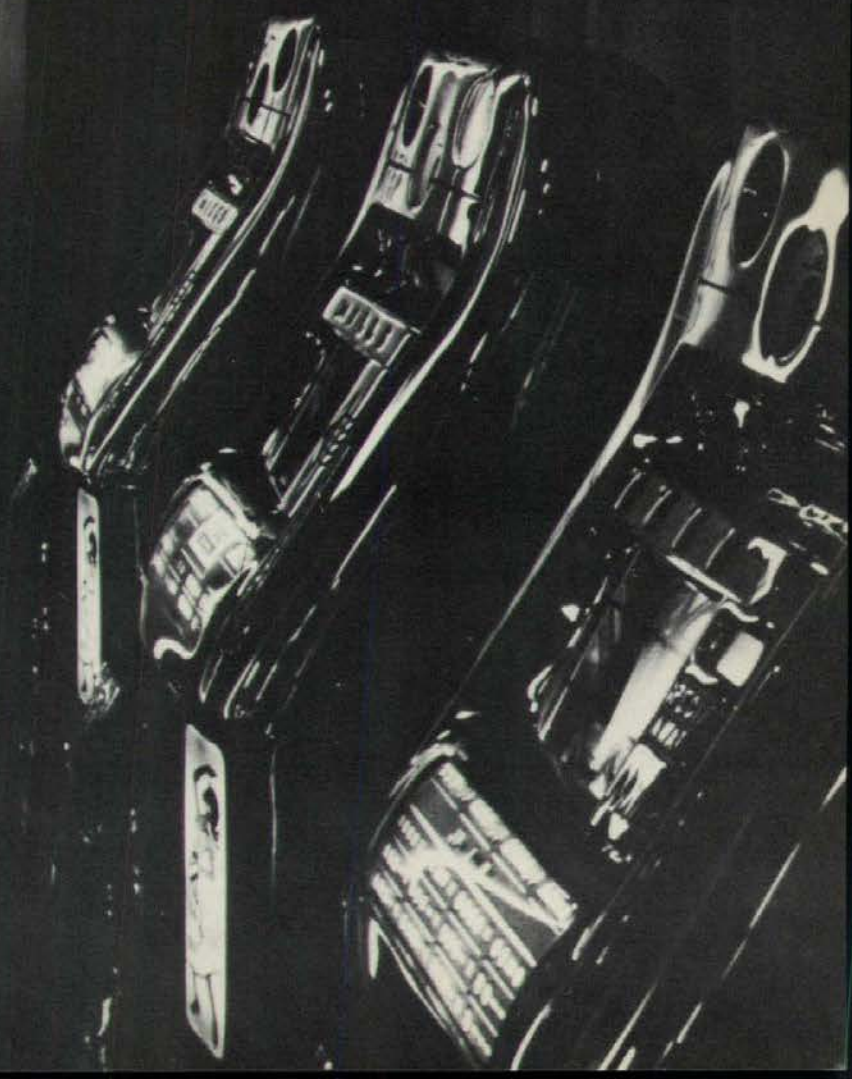
Elimination of long, institutional corridors on guest room floors (in many of the hotels) through use of

curved plan and placement of decorative elements: "to avoid the Kafka-esque oppression of parallel lines."

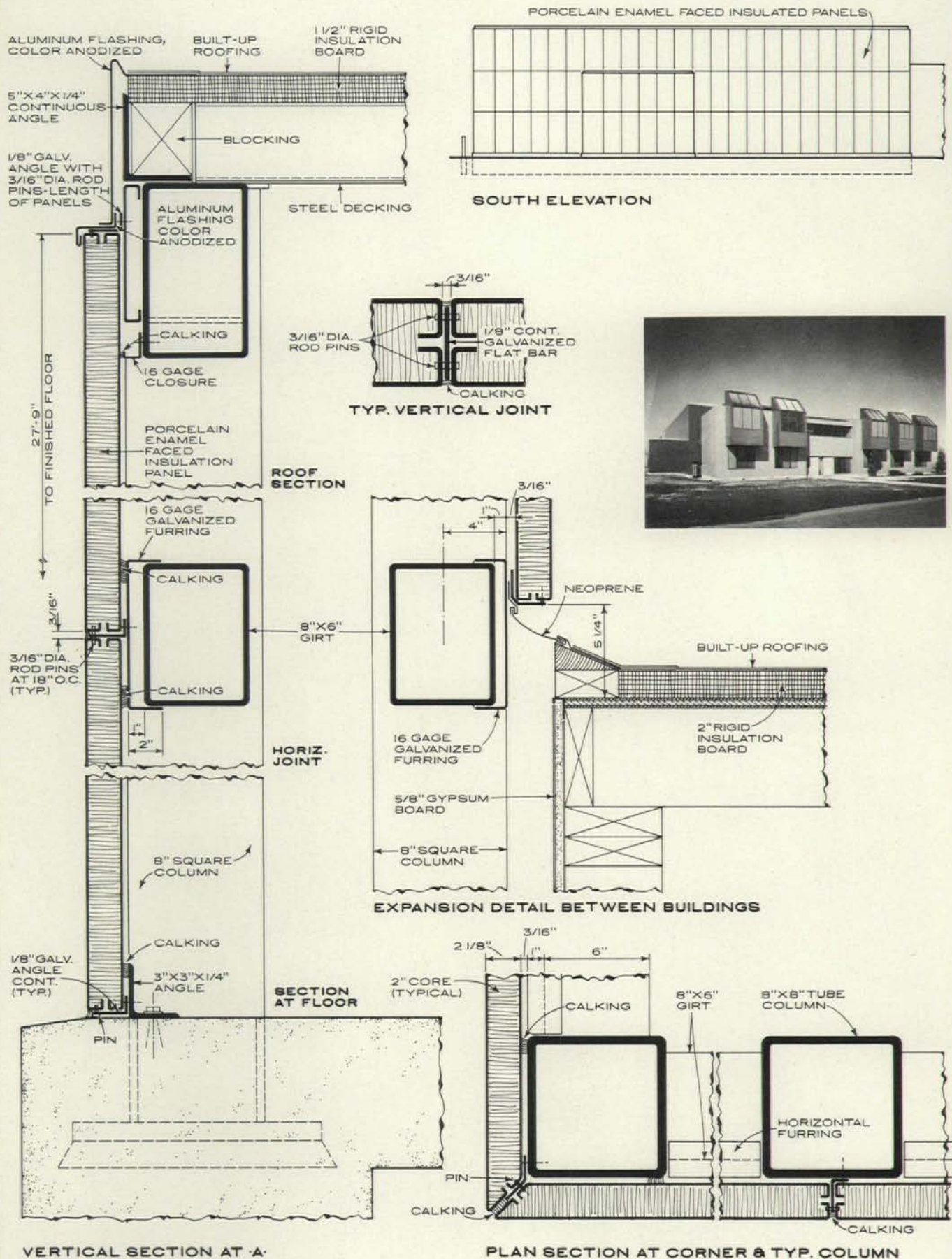
Mirrors in elevators (in many of the hotels): "The first thing a man does before he walks 'on stage' is to check his fly. And the woman checks her hair, the length of her dress, sees if the hem is straight. There's always a mirror there. I'm thinking of coming and going."

Use of Muzak (in many of the hotels): "I use it differently than other people. If I take them into an interior where I've titillated them enough, I don't want the Muzak. You'll find it out on the pool deck because I've got nothing to distract them with, so then the aural sense takes over. But in the lobbies I've never introduced Muzak (although it has since been added in many of them). I feel that I've overwhelmed them enough through their visual and tactile senses."

Today, 68 hotels (built or under construction) and 18,000 hotel rooms later, Lapidus continues his practice as the head of Morris Lapidus Associates-Architects, with a 32-man office in Miami Beach and a 25-man office in New York City. The Lapidus tradition is being carried on by his son Alan, a practicing architect in charge of the New York office. With \$200 million in anticipated construction now on the boards (hotels, office buildings, housing, and recreational facilities), Morris Lapidus continues to prove the merchandising adage that "the customer is always right." And nothing succeeds like success.



Porcelain Enamel Panels



Porcelain Enamel Panels

American Potato Company, Blackfoot, Idaho
 John S. Bolles, Architect

Selected Detail
Porcelain Enamel Panels

The architectural drawings illustrate various components of a roof assembly:

- ISOMETRIC CUTAWAY AT TYPICAL LAMINATED ROOF BEAM:** Shows a cross-section of the roof beam assembly. Labels include: STAINLESS STEEL COPING OVER TOP OF LAMINATED WOOD BEAM; 2"x3" CLEAT; 1" RIGID INSULATION; FLAT-LOCK SEAM; EXPANSION SPACE.
- SHEET EXPANSION JOINT DETAIL:** A circular inset showing a close-up of the joint between two sheet metal panels, labeled SEALANT.
- COPING DETAIL AT 'A':** A vertical section showing the coping profile at a specific location, labeled COPING DETAIL AT 'A'.
- TYPICAL STAINLESS STEEL GUTTER DETAIL:** A detailed cross-section of the gutter system. Labels include: 12" x 12" x 3/8" BENT STEEL PLATE CONTINUOUS AROUND PERIMETER OF BUILDING; 3"x3/4" STL. REINF. BAR; ST. STL. GUTTER SHEET WRAPPED AROUND 3/32" X 3/4" METAL STRAP ANCHORS AT 3'-0" O.C.; MOISTURE BARRIER; 4" WOOD DECKING; 2"x3" WOOD CLEAT ATTACHED TO BEAM; CONTINUOUS 2"x4" BOLTED TO PLATE TO SECURE WOOD DECK; 3" DIA. STAINLESS STEEL DOWN SPOUT; LAMINATED WOOD BEAM; STAINLESS STL. FLASHING COLLAR AROUND CUT-OUT OF BEAM.
- PARTIAL ELEVATION:** A perspective view of the building's exterior, showing the conical roof structure supported by laminated wood beams, covered with stainless steel roofing, and featuring a central spire.

St. Frances Cabrini Church, West Bend, Wisconsin
Brust & Brust, Architects

Selected Detail Stainless Roof Flashing

Waterproofing Materials and Systems

Six waterproofing systems available to the architect are enumerated and described by the Chief Specifications Writer of Skidmore, Owings & Merrill, New York.

There is a veritable host of materials and methods available to select a waterproofing system, in detailing the system, and in specifying the materials and their application. In each instance, the selection should be governed by the nature of the waterproofing problem, its location in the structure, the related economics, and the details that are most suitable.

Water penetration may occur as a result of hydrostatic pressure below grade, necessitating the application of waterproofing to walls and slabs at that location. Water problems may occur within the structure at mechanical spaces, toilet rooms, and other areas where water storage tanks, pumps, and plumbing accessories may require the waterproofing of interior slabs. Waterproofing may also be required for above-grade locations at exterior portions of the structures, such as plazas with below-grade spaces and roof areas that have a finished surface other than built-up roofing.

Waterproofing materials and systems can be classified as follows:

- Built-up membrane
- Hydrolithic systems
- Integral waterproofing
- Elastomeric sheet waterproofing
- Elastomeric liquid system

Bentonite waterproofing systems
Built-up membranes consist primarily of bitumens of either coal tar or asphalt and plies of bitumen saturated organic or inorganic felts. Rag felts and wood-fiber felts are being supplemented with asbestos, cotton, and glass fabrics. To increase tensile strength and to resist rupture at corners and other points of stress, glass fabrics provide these necessary attributes. They also resist bacterial soil action when used for below-grade waterproofing. As for the bitumens, coal tar is more stable in the presence of water for below-grade installations than is asphalt. The number of plies of built-up membrane to be used with respect to the

hydrostatic head of water is based on the following table:

Head of Water In Feet	No. of Plies	Bitumen Moppings
1-10	3	4
11-25	4	5
26-50	5	6
51-100	6	7

Built-up membranes can be used below grade, within the structure, and for external portions of the structure. However, when small areas within the structure are to be waterproofed, such as toilet rooms or similar spaces, the application of built-up membranes becomes onerous.

Hydrolithic waterproofing systems are coatings consisting primarily of portland cement mortars with additives of either metallic iron or proprietary admixtures. These systems are usually employed for the interior surfaces of below-grade walls and slabs. Metallic waterproofing consists primarily of brush coats of metallic iron filings and water, and slush coats of metallic iron, portland cement, and sand. This builds up to about $\frac{1}{8}$ in. or $\frac{3}{16}$ in. and is then protected with a cement mortar coat of about $\frac{5}{8}$ in. to 1 in. Cement coat waterproofing consists of portland cement mortars with proprietary admixtures applied to walls and slabs below grade to thicknesses of approximately 1 in.

Integral waterproofing systems consist of the introduction into concrete of proprietary admixtures of liquid, paste, or powder for walls or slabs below grade to render the concrete impermeable. With integral waterproofing systems, the concern lies in the integrity of the manufacturer and the integrity of the structural system. Hairline cracks or structural cracks cannot hold back water with integral systems whereas applied membranes may bridge these cracks.

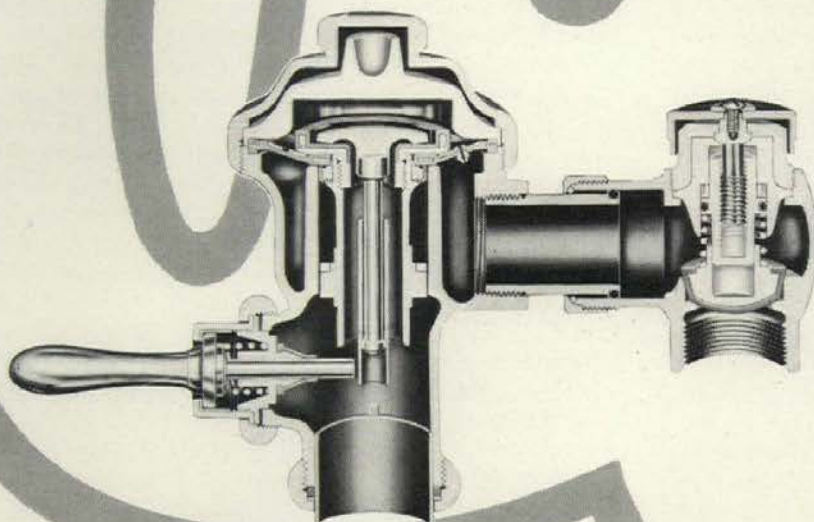
Elastomeric sheet waterproofing consists of single plies of butyl rubber, EPDM rubber, neoprene, and polyvinyl chloride installed with adhesives, cements, and in some cases with coal tar or asphalt. These systems can be employed for all areas where built-up membranes are used. However, the field lapping of seams for some of these systems is very exacting and requires men especially qualified for this installation. During construction, they must be protected since only one ply lies between the structure and water.

Elastomeric liquid waterproofing systems are the most recent development. Currently these systems utilize coal tar or asphalt with polysulfides, polyurethanes, or reclaimed rubber. These systems are not yet recommended for wall applications. Theoretically on horizontal surfaces they can reduce or eliminate lateral movement of water when a leak occurs, so that the source of the leak can be readily established and repaired. However, the thickness build-up of the system requires careful supervision in the field. In addition, little use experience has been amassed with these varied formulations to assess their long term characteristic with respect to aging.

Bentonite waterproofing systems utilize these natural materials in loose powder form or in powder contained in panels. Bentonite is used primarily for below-grade foundation waterproofing and acts on the principle that the powder forms a gel when it encounters water. This reaction forms a gelatinous membrane which resists the further penetration of water. As the water recedes the gel reverts to a powder.

By understanding the water problems in various locations in the structure, and the materials and systems available, the architect and specifier can be in a better position to select and specify waterproofing systems.

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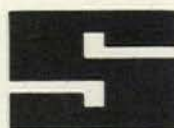
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Illumination Sources

In this new monthly column, a review of present illumination sources plus a prediction for uses of lighting in the coming decade are reviewed by an associate of Syska & Hennessy, Inc., Consulting Engineers, New York.

This year has seen the production of countless books and articles predicting trends for the coming decade. In our field, we have read about new building products, new and promising materials, and whole new concepts around which to design.

For close to three decades, one product has been under-utilized, misused, and underdeveloped. In recent years, it has become a most important architectural material, a material on the threshold of new avenues of usage. The material is called LIGHT.

Before looking ahead to where we are going, a brief word about where we have been. Three types of light sources are currently available for commercial use. They are the incandescent source, the fluorescent source, and the high intensity discharge (H.I.D.) source.

Incandescent lamps were the first commercially available light source. They are relatively small in size and provide a pleasant warm color but are inferior to the other two sources in efficiency and rated life. Incandescent lamps are available in varied shapes and sizes, including clear and frosted general service lamps, Par and R reflector lamps, silvered bowl lamps, and tubular luminaire lamps. The tungsten halogen lamp, also called the quartz-iodine lamp, is popular because of its compact size, prolonged life, and sustained lumen efficiency.

Fluorescent lamps are the most widely used commercial light source today. They have been optimized with respect to efficiency, rated life, and price, and, therefore, annual owning and operating costs are low. There is a wide range of sizes, types, and colors.

H.I.D. lamps are relatively new light sources. They are small, compact packages whose impact on the field of illumination has not been fully realized. Work is being done on the problem of initial start-up or

start-up after power interruption, or both. There are three basic categories:

- **Phosphor coated mercury lamps** are the ones most commonly used today. The blue color of standard mercury has been improved to within acceptable limits by means of a phosphor coating on the inside bulb wall. It is an extremely long life lamp, rated at up to 24,000 burning hours.

- **Metal halide lamps** are a variety of mercury lamps. Color rendering qualities of this source, in high wattages, are excellent.

- **High pressure sodium lamps** produce a distinctive golden yellow light. They are the newest source and are distinguished by their high lumen efficiency.

Where are we today? In the broad category of commercial buildings, the single most important product introduction was the U-shaped fluorescent lamp. S & H can write about the lamp with some authority since we were responsible for its volume production by the three major domestic lamp manufacturers. As a result of a research project sponsored by the U.S. Steel Corporation, as well as the continued demand of the architectural community for square, nondirectional lighting elements, the lamp's potential in today's modular building concept was recognized.

Instead of rectangular luminaires, which had to be used for economic reasons, there are now available the additional option of square fixtures at about the same cost to the owner.

What, then, can we look forward to in the coming decade? The 1970s will see the further development of "light art" through expanded use of neon tubing, electro-luminescent panels, laser beams, xenon, and fibre-optic materials. Light sources themselves will be further developed as a design element and, possibly more significant, they will play a most important role in creating a healthy atmosphere

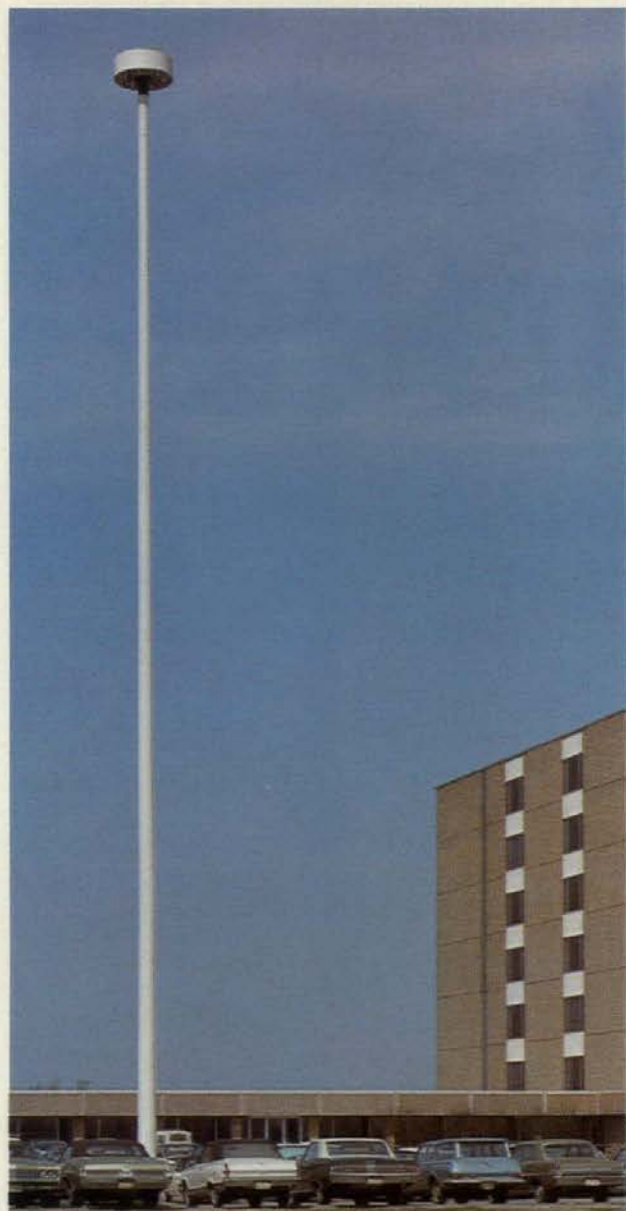
for commercial interiors.

Further, development of light sources will more than likely take place in the H.I.D. category. How often have we asked for an incandescent light source only to have it rejected due to short life and high generation of radiant heat? H.I.D. lamps will provide the necessary characteristics at reasonable economy in maintenance and load factors. The whole category will be expanded into lower wattages so that they may be utilized in lower ceilings. Lamp life will be increased, cost will be reduced, and color rendering qualities improved.

Is it, then, not reasonable to expect "lamp fixtures" — lamps that fit into ceiling cavities; that are complete optical packages; that last from five to 10 years; and, when burned out, are discarded and replaced to create a completely new lighting system? It is possible.

In the field of health, light sources will play a role that at present sounds like science fiction. It has been proven that certain types of artificial light reduce the frequency of common colds in school children; exposure of experimental animals to selected bands of artificial illumination has greatly increased their sexual activity; exposure to artificial light has been used extensively to cure a condition in newborn infants similar to jaundice that previously was cured only by total blood transfusion.

One can only speculate as to how this field will develop. In decades passed, we air-conditioned buildings. It is conceivable that we will light-condition buildings in the future: light-conditioning for hospitals, to bring the infirm back to health; for schools to promote the healthy growth of our children; for office buildings and factories, to keep us alert, in good spirits, and more productive for longer periods of time; and, even light-conditioning to add to our exhilaration in being alive.



Photos show TLD-200 at ground working level, half-lowered and in the fully raised position, in front of The Dow Chemical Co., Adm. Ctr., Midland, Michigan. Building complex was designed by Architect Skidmore Owings & Merrill.



Meyer TLD-200... TULITO Light Lowering Device for Ground Level Maintenance

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Construction Contract Complexities

P/A's legal team discusses two cases illustrative of the complexities involved in preparing a construction contract intended to relieve the owner of contractors' claims for delay.

In last month's column, we discussed claims by contractors for extra expenses or damages arising from delays in construction, and construction contract language which seeks to limit this type of claim. We pointed out that a contract which is designed to minimize delay claims must be artfully worded, and that the considerations that should go into it are not always obvious. A contract provision which exempts an owner from liability for delay occasioned by his inability to resolve certain problems will not necessarily excuse him from responsibility for all delays. Thus, for example, a prime contractor who has been delayed by another prime contractor, and who claims that there has been a failure of coordination on the part of the owner, will not be barred from asserting a claim against the owner unless there is specific language in the construction contract which bars the same.

Two recent cases are illustrative of the complexities which may be involved in preparing a construction contract which will relieve the owner of contractors' claims for delay. In one case (*Peckham Road Co. v. State*, 300 N.Y.S. 2d 174), a road contractor sued for damages based upon increased costs arising from delay in the performance of his work. This delay was occasioned by difficulties on the part of the State in acquiring certain lands. The contract between the parties provided that "no claim shall be brought against the State for failure to obtain early possession." The court stated the general rule as follows:

The rule is well established that a contractor is entitled to a reasonable opportunity to perform his contract without obstruction or interference and that the State may be held liable for failure to furnish such opportunity unless it has relieved itself by express language in the contract. . . .

Delays and obstructions are actionable if they are not within the contemplation of the parties at the time the contract is made. . . .

If the delay or obstruction is within the contemplation of the parties at the time the contract is entered into the 'no damage' clause will be valid and enforceable unless the delay was caused by conduct constituting active interference with the contractor's performance. . . .

The court concluded that since there was no active interference on the part of the owner, the exemption clause would bar the contractor's claim. This conclusion rested on the fact that the contractor completed his work within the construction time provided under the contract, whereas his claim was based on his inability to finish his work earlier. The court distinguished its conclusion from another case (*Bianchi & Co. v. State of New York*) where a delay resulted in the inability of the contractor to complete his work within the scheduled time. The court ruled as follows:

Although the facts in *Bianchi* and the instant case are quite similar they differ in the important respect that the delay in *Bianchi* caused the contract to be completed several months later than scheduled, where, in the instant case the claimant still managed to complete the work on time. Since the law in this State has always been that a "no delay" clause will not bar claims for delays which prevent the completion of the work within the time fixed by the contract unless it is expressly so provided for in the contract, the clause involved in *Bianchi* did not serve to bar the claim.

The exculpation clause in the above case apparently would have been insufficiently comprehensive to protect the owner if the contractor had been delayed beyond the scheduled date of

completion. Similarly, another recent decision (*Shalman v. Board of Education of Central School District No. 1*, 297 N.Y.S. 2d 1000) casts doubt on the effectiveness of an exculpatory clause which the owner sought to apply to a claim arising from the delay of one contractor by another. The clause involved in that case provided that "the Owner shall not be responsible for any delays whatsoever that may be occasioned by a Contractor's failure to meet the time schedule decided upon." The court questioned whether this clause excused the owner from liability occasioned by its alleged failure to insure that one contractor did not delay another. The court said:

A duty is imposed upon the employer not to interfere with the prosecution of the work of his contractor, and he impliedly agrees that the contractor will not be unreasonably delayed by the failure of other contractors to perform work which is essential to the performance of the work in question. . . . For a breach of that duty the contractor may recover his resulting damages. . . . Whether or not the supposed exculpatory clause reaches the present situation is open to doubt. But, in any event, such clauses are strictly construed against the person seeking exemption from liability. . . . As has been indicated, the effect of the clause must depend upon the facts as developed at the trial.

Courts differ as to whether one prime contractor is entitled to sue another prime contractor for damages resulting from delay and arising from unsatisfactory performance by the latter. If the contract between owner and contractor subjects one prime contractor to the suit of another, as a third party beneficiary, it is probable that clauses exculpating the owner from liability arising from delay might be more favorably received by the courts.

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Architecture Since 1945: Sources and Directions

By Jurgen Joedicke, Frederick A. Praeger, New York, N.Y. 1969, \$18.50, 179 pp., translated by J.C. Palmes.

Reviewed by Oscar Newman. *The reviewer, author of CIAM '59 in Otterlo, is Adjunct Associate Professor of Architecture at Columbia University, a distinguished planner, and author of numerous articles on urban design.*

With *Architecture Since 1945* Jurgen Joedicke has brought his excellent reference text, *A History of Modern Architecture*, (Hatje, 1958) up to date. This was, of course, a much more difficult book to assemble and write. Architecture has its equivalent in the science explosion, and, while it boggles the imagination that of all scientists that ever lived, over 90 percent are alive and working today, so it is equally true of modern architects. The problem of what to include or exclude in such a history is further complicated by the impossible task of having to evaluate current work objectively, let alone perceiving relevant trends.

Within the space limits of a 180-page book, it is surprising therefore to find the first 30 pages given over to prewar architecture. This is justified in that it has given Joedicke the opportunity to illustrate a range of prewar work notoriously absent from the standard texts of modern architecture—work which an increasing number of contemporary architects look to as their predecessors: Bijvoet and Duicker, Hugo Haring, Ernst May, Otto Bartning, Owen Williams, Van der Flugt, Van Tijen, Erik Asplund. Strangely absent are American predecessors other than F.L. Wright; that is, Albert Kahn, Bernard Maybeck, Howe and Lescaze, Green and Green, and R.M. Schindler, to mention the most obvious.

The next 50 pages labeled "Antecedents" consist of work built from 1945 to 1955. These are projects which have appeared in book after book devoted to the genius of individual architects. Many are prewar projects realized in the early postwar period. Their inclusion here is a sacrifice of the precious space available in so small a book. It would have suf-

ficed to have taken one page and typed:

The Guggenheim
Johnson Wax
Unité d'Habitation
Chandigarh
Ronchamp

There probably isn't an architect around who doesn't receive an accurate image of each project at the reading of the names of these and other such monuments. Of the work in these 50 pages, that of Hans Scharoun and Egon Eiermann is probably the only material neither known first hand nor assimilated into the libraries of American architects.

Which now brings us to the meat of the book. The previous 80 pages were devoted to history and allowing the pioneers of modern architecture to catch up with the dryspell of World War II. The second part of the book, which deals with postwar architecture, is divided into the following categories: First Phase 1949-58: Technical Excellence; Second Phase 1958-66: Brutalism, Formalism, and An End to Formalism; with a final 10 pages given to defining New Attitudes. Each phase and designation is explained by the work of individual name architects, with occasional dual appearances by such superstars as Paul Rudolph, who shows both under Brutalism and under Formalism.

Joedicke's comments, however, are incisive; he lets very little slip by. Witness:

"The trend toward technical excellence continued, indeed in some respects it was only now spreading from USA to the world as a whole, but it was no longer typical of the period. In its place came a movement distinguished by the name of Brutalism. In defining it one must be very careful, in order to avoid misunderstandings, to differentiate between the English contribution, based on the theories of Alison and Peter Smithson, which are concerned more with ethics than aesthetics, and international Brutalism whose aims are primarily of an aesthetic kind."

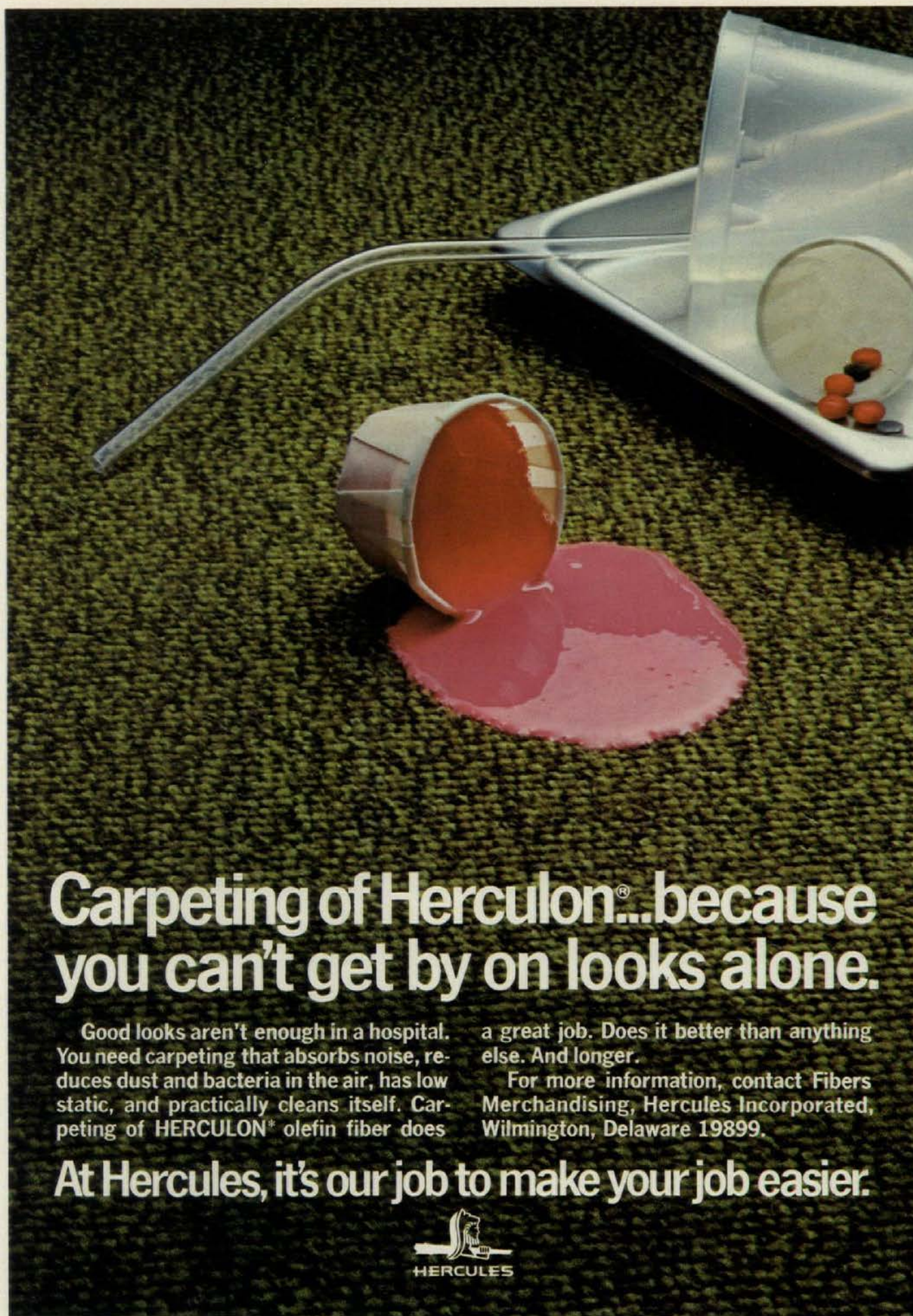
Within these final 80 pages is a broad range of the architectural spectrum; architecture serving every taste both stylistic and intellectual. By quantity alone, Philip Johnson comes off as the most prominent American architect and second internationally only to Hans Scharoun who gets all of eight pages.

There are, of course, a few things missing from the book. If one realizes that (a) the consuming task of postwar architects in Europe and America was the construction of housing, and (b) aside from the few stabs made by the CIAM crowd in the thirties, architects were previously uninvolved with low- and middle-income housing, one could very well consider a history of architecture since 1945 a history of modern housing. And yet with the exception of the Unité d'Habitation and Ham Common there is no housing in the book: No Millcreek (Kahn), no Pei Towers or row-housing; no Riverbend (Davis Brody), no Dutch or Russian high-rise prefabs (not even Bakema's), no American pre-fab bungalows or trailer-homes, not even a Levittown sample.

While one realizes that this was not a book on town planning or urban design, it is still difficult to dismiss the fact that some 80 percent of the land area of our cities was built up since 1945. Nowhere in the book does one receive an image of the architectural components which make up that fabric. It seems inconceivable that architects in the sixties could still have so narrow a vision of architecture as to limit it to the individual building seen in isolation.

Joedicke, however, is hardly asleep on his feet: "The same fallacy undermined the Smithsons' thesis as it does most other protagonists. . . the society for which they claim to build does not exist. It lives simply in the architect's imagination. Present society stands for the most part in uncomprehending opposition to the aims of avant-garde architects."

But the book is filled with little
(Continued on page 138)



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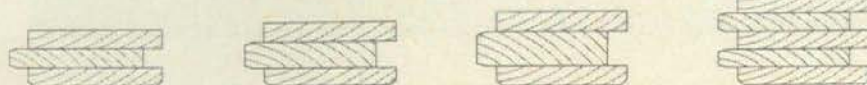
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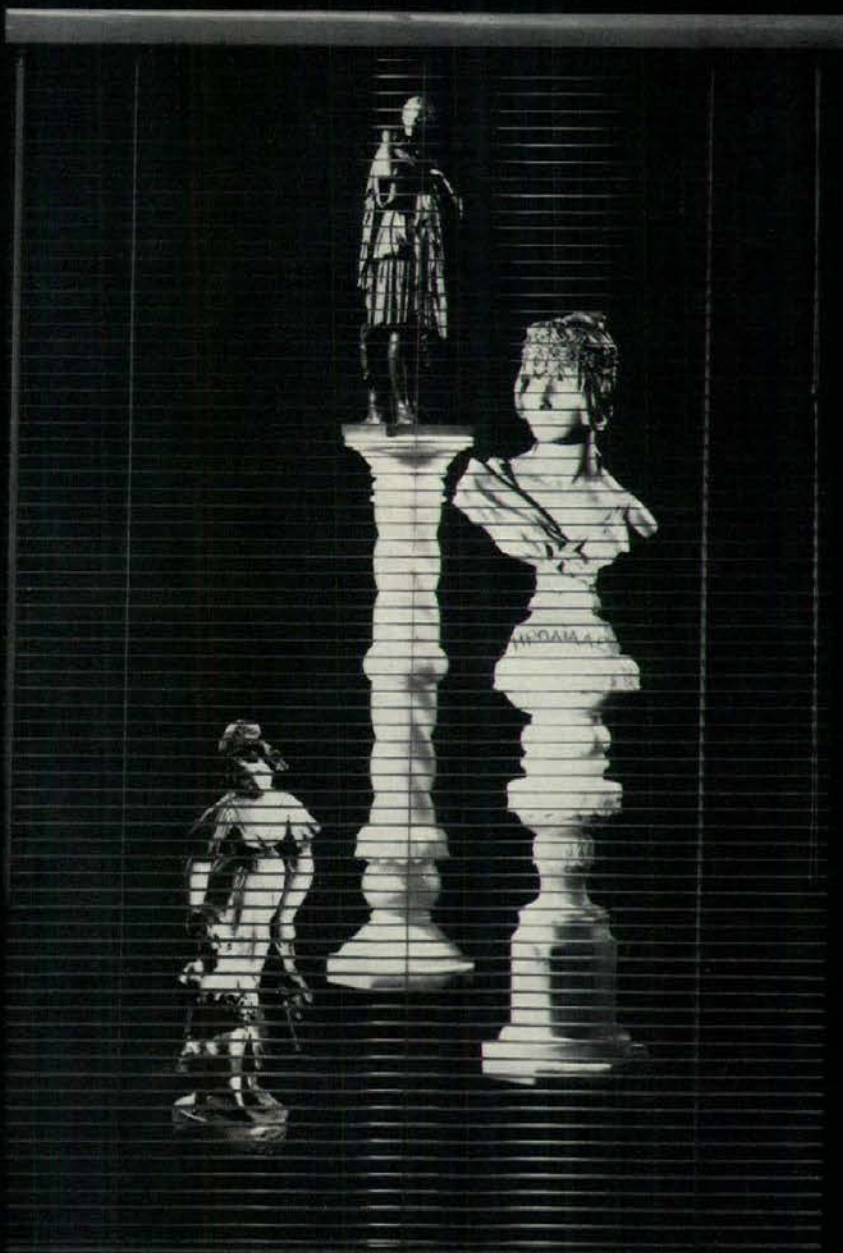
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BOOK REVIEWS

(Continued from page 132)

else. It is a book of architects' architecture and where it may have the most "significant," "pure" or "avant-garde" work, it is a poor representation of the architecture of the post-war period. As an example, SOM's Lever House, the aluminized, economized, mass-produced rendition of Mies; the single building which in 1951 revolutionized commercial architecture in the USA, gets tucked into the lefthand corner of a single page. The fact that plans are now un-

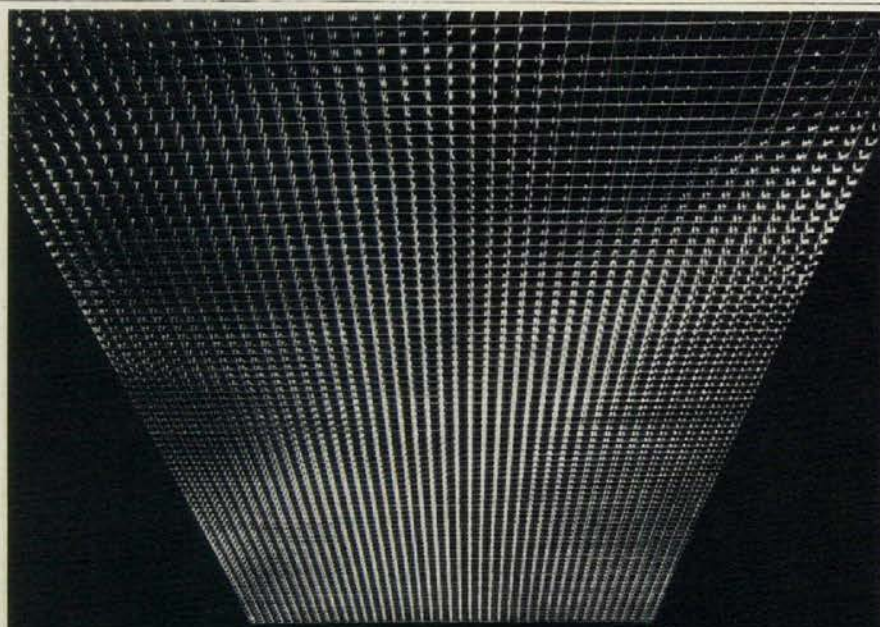
derway to have it torn down and replaced further speaks to its achievement as contemporary architecture.

Mies is less important to America than Bundshaft, his translator, just as Le Corbusier's influence is less in evidence here than is Sert's. But Sert does not appear in the book at all: no Married Student Housing or Harvard Square Holyoke Center. Gropius' work in America is much less significant than his early interpreters, Hugh Stubbins and Carl Koch, but their work does not appear.

West Coast American architects will be disappointed for their having been so completely snubbed, as will their colleagues in Italy, France, and Scandinavia. The profession in all countries east of Berlin, responsible for more building than their western brethren, may also pause to wonder. (Though come to think of it, they may have ceased to wonder a long while ago; one is reminded of the team of visiting Russian architects descending on the School of Architecture at the University of Pennsylvania in search of the genius whose progress they were following — having been grandly introduced to Louis Kahn, it took over an hour for them to extricate themselves and find Le Ricolais operating out of a room in the basement.)

After a 60-page discussion of the evolving modern style in Europe and America in the 1950s, Joedicke spends a page and a half introducing a notion called "Design Principles." But instead of exploring concepts of programmatic planning, he chooses to discuss the service-core expressionism of Louis Kahn and Aldo van Eyck. It was an opportunity missed. From this quick digression, Joedicke leads us on to discover the world of Formalism — excellent in its historical and critical analysis but not the tour-de-force of Peter Collins' review of 19th-century architecture. Problems in Formalism and eclecticism, regardless of how erudite their discussion, just don't add up to very much in today's scene. It is unfortunate that Joedicke did not see fit to discuss more members of the profession involved in other facets of architecture, decidedly modern: Caudill Rowlett Scott through their design principles for the layout and site planning of elementary schools adopted almost universally around the country; Ezra Ehrenkrantz Education Facilities Laboratories for their research and development of prefabricated school design, School Construction Systems Development (the English CLASP system is not discussed either); Herman Field for his opus on design methodology applied to pediatric centers; Sim van der Ryn for his application of the sociologists' discipline to obtaining design directives for college dormitories. These are all architects expanding the frontiers and

(Continued on page 142)



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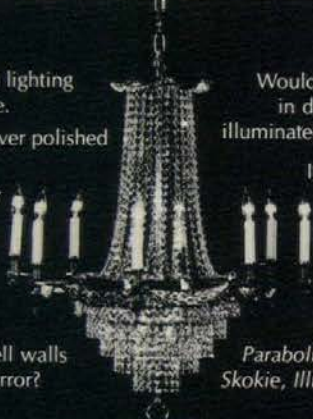
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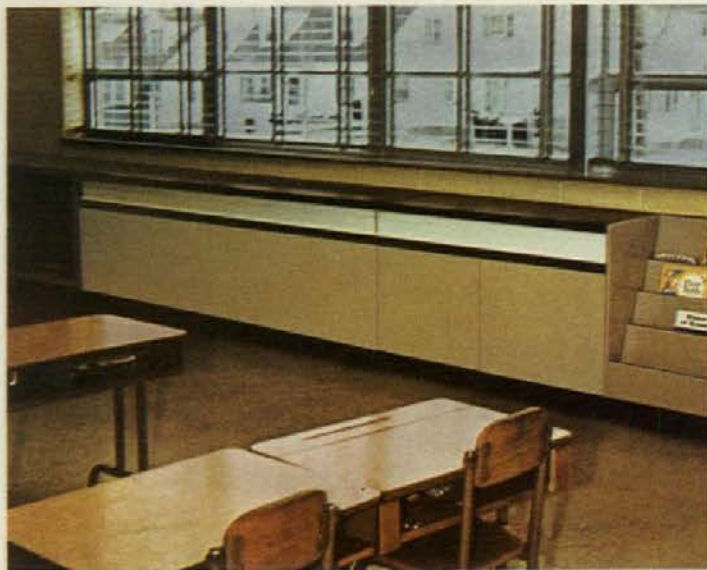


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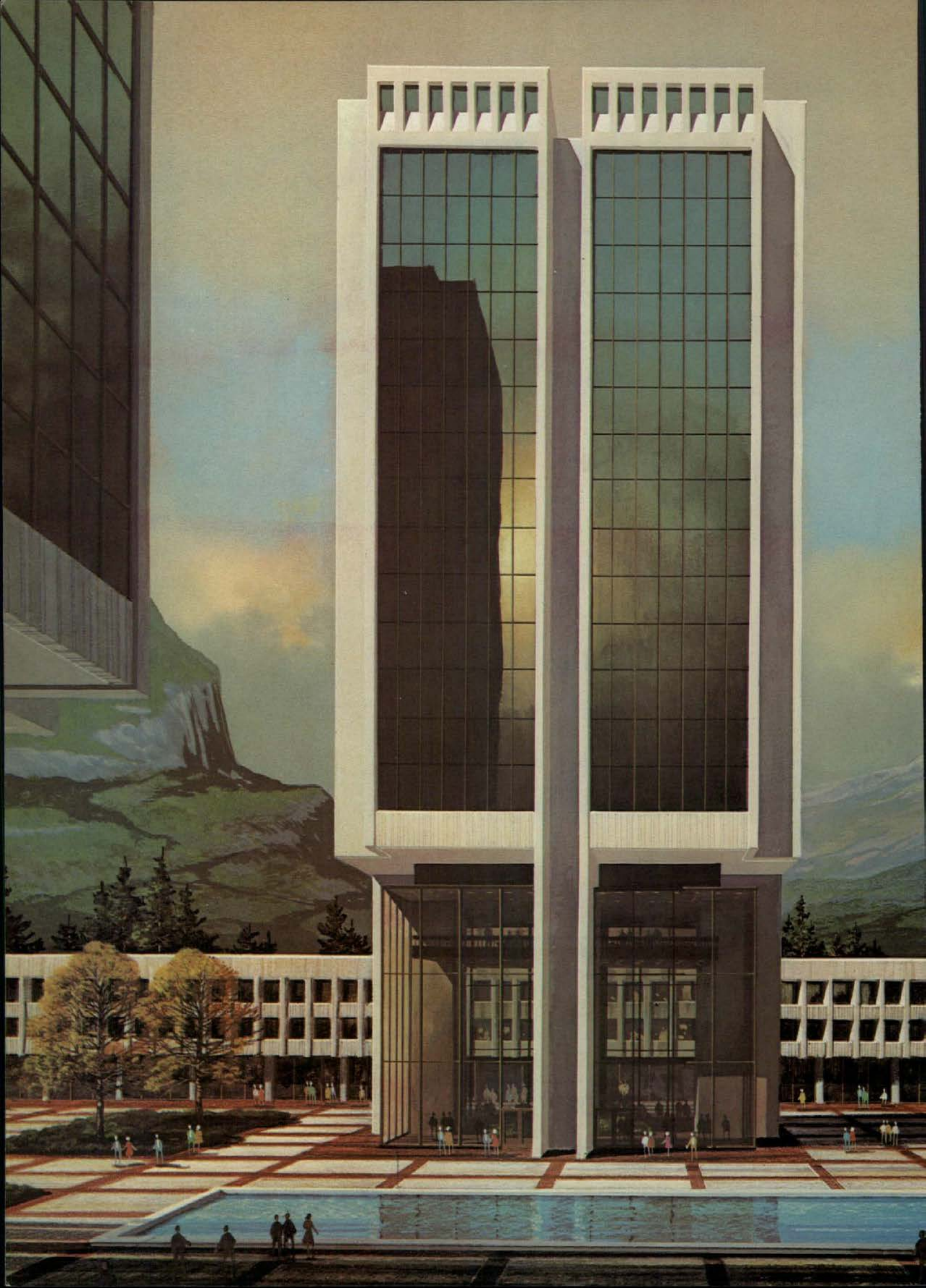
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(Continued from page 138)

relevance of the profession in a way made possible by the liberated spirit of a modern movement of the thirties confronting the problems of building for a mass society.

"Prefabrication and Industrialized Building" is introduced and dismissed in one page under a chapter entitled "New Attitudes: Effects of an Altered Conception of Architecture." There is no discussion or illustration of any of the postwar European systems: Tracoba, Camus, or SECTRA; nor any mention of American prefab, from suburban bungalows and trailer homes to Karl Koch's Techcret or the California Uniment system.

Another evolving facet of modern architecture, and possibly the one which will mark the modern movement of the 1970s, is the architecture of make-believe. This includes the theatrical sub-worlds of Hans Hollein, Walt Disney, Claithill Smith: architecture as stage set—built big enough to live in by inhabitants dressed, as most of us now do, in the clothes and hair-styles of other periods. You pick your period and you take your trip.

The urban-design facet of modern architecture is lamely introduced on the final page with a discussion of Candillis' and Woods' Toulouse le Mirail, a project unlikely to reach maturity as conceptualized.

The book is, of course, heavy on pictures with only some 45 pages out of 180 involving any text. This is to be expected with books directed at architects. Unfortunately, there are only 18 plans in the entire book, a fact which some may find indicative. Only two sets of drawings are included that explain the design concepts behind projects and they are, significantly, the Smithsons' Golden Lane and University of Sheffield.

The structuring of the book into stylistic periods may very well have proved its undoing. Having decided to group Alto's MIT dorms, Lasdun's East Anglia, and Wilson's Harvey Court under Brutalism along with Rudolph's Art and Architecture, Kallmann's Boston City Hall, and Kahn's Medical Center, where is there left to go? These tired classifications have only served to cloak projects in costumes that hide their relevance behind the superficial external detail they share with other projects of decidedly different intent.

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BOOK REVIEWS

Medical X-ray and Gamma-Ray Protection for Energies up to 10 MeV-Structural Shielding Design and Evaluation. NCRP Report No. 34

National Council on Radiation Protection and Measurements, 4201 Connecticut Avenue, Washington, D.C. 20008. 117 pages, \$1.50 Reviewed by Carl B. Braestrup, F.A.C.R.

The reviewer is a Consultant Radiological Physicist at the Lenox Hill

Hospital in New York City. Chairman of the NCRP Committee on Shielding Design.

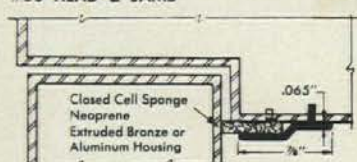
X-rays and radioisotopes are playing an increasingly important part in diagnosis and therapy of patients.

There is, therefore, a growing need for the expansion of the radiological facilities in hospitals and clinics. In the planning of the radiation rooms special attention should be given to their structural shielding to protect the personnel and the public in nearby areas against possible harmful exposure to the rays.

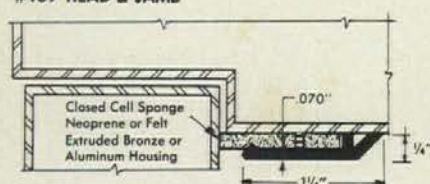
The NCRP handbook provides recommendations and technical information on how to deal with this problem. Of particular interest to architects are the sections dealing with the special protection requirements of the different types of radiation rooms and their layouts. It is stressed that these factors should be considered in the early planning stages of the hospital. For instance, megavoltage X-ray and cobalt therapy installations require heavy concrete radiation barriers, often several feet thick, depending upon occupancy of nearby areas. On the other hand, the shielding requirements of diagnostic rooms are relatively low; often a slight increase in the thickness of the concrete slab may eliminate the need for lead in the floor and ceiling. Other sections of the report discuss the factors to be considered in the selections of the appropriate shielding material and the parameters that determine the barrier thickness. One section is devoted to shielding details of joints, baffles, doors, and observation windows. Faulty installation of the shielding has been found to be the most common cause of inadequate protection. A complete evaluation of the finished installation, including a radiation survey, is therefore considered essential and is discussed in some detail. The extensive appendix contains numerous tables, charts and equations; these are of interest mainly to radiological physicists and others specializing in radiation protection.

Finally it should be pointed out that radiation facilities may be subject to Federal, state, or local regulations and these should be considered in the design. Most regulatory codes, however, follow the basic standards set by the NCRP.

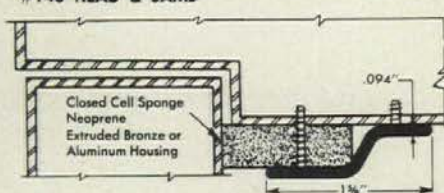
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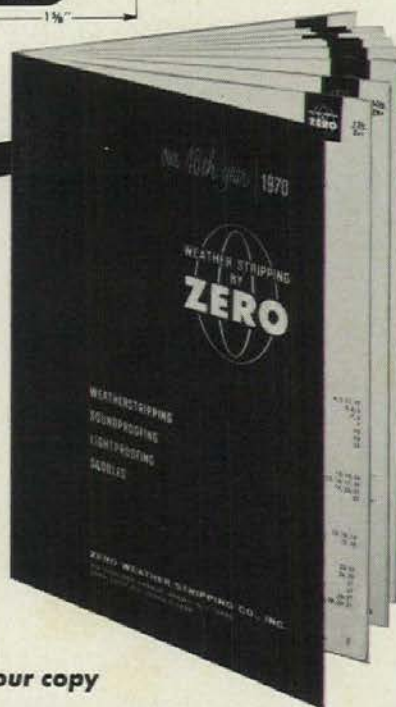


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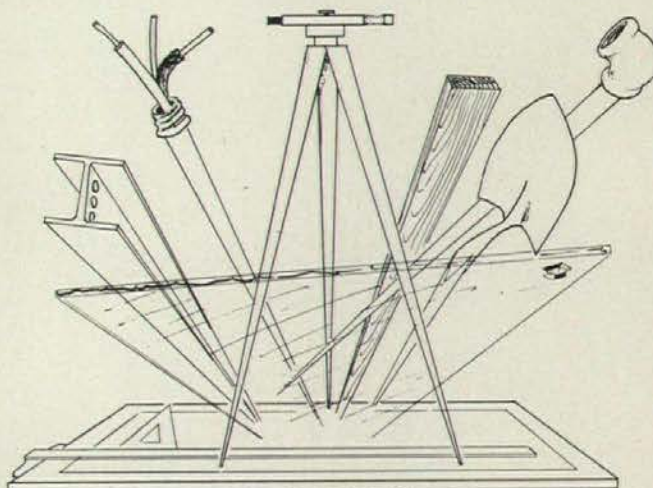
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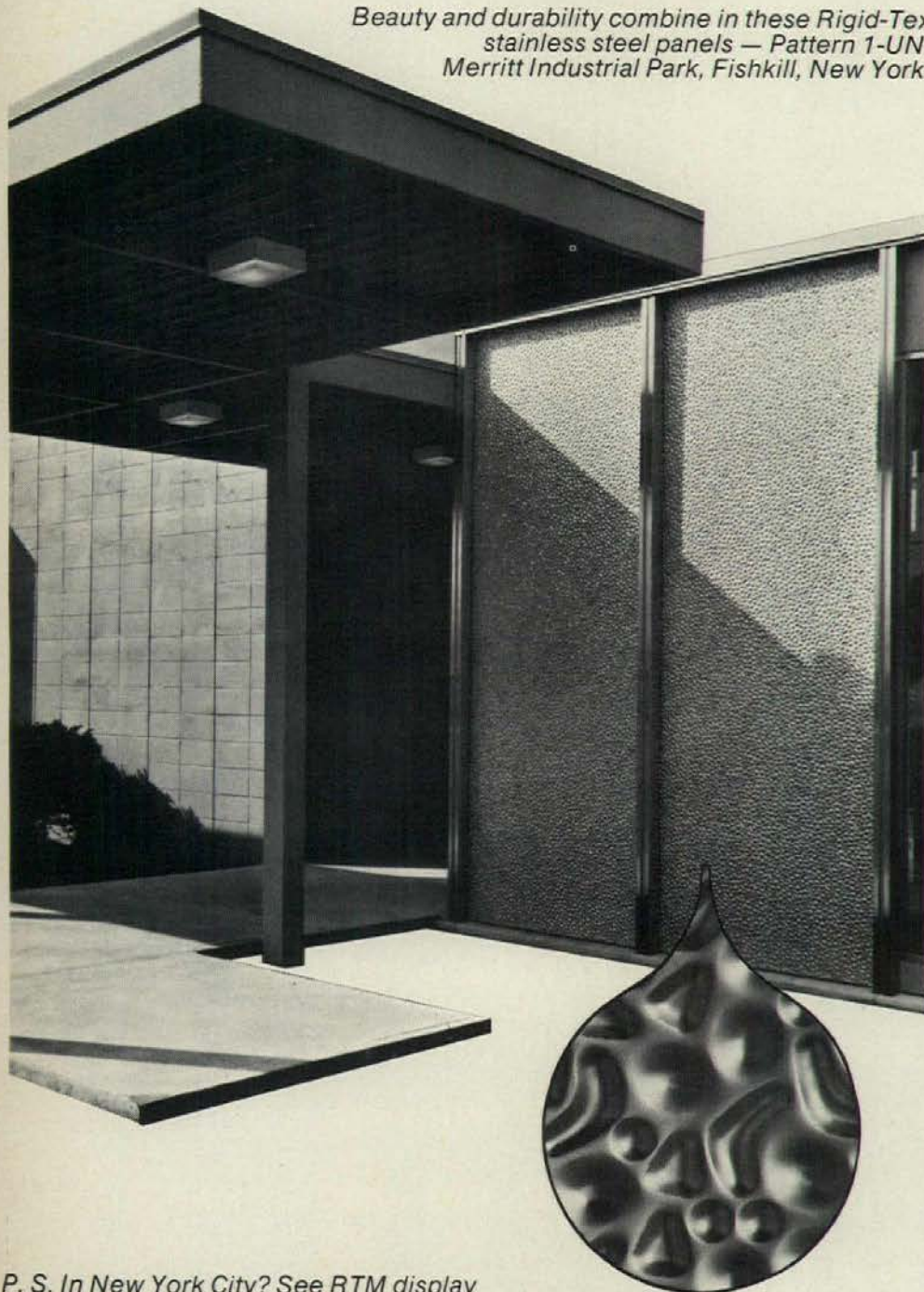
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R. JERRALD VINCENT has become a partner in the firm of PRATT BOX HENDERSON & PARTNERS.

DUANE M. PETERSEN has been named a partner in the architectural firm of PHILIP R. BALSIGER & ASSOCIATES.

E. VERNER JOHNSON/ROBERT N. HOTVEDT AND ASSOCIATES, INC. announce that KENNETH F. Di NISCO and ROBERT L. PILLSBURY have become principals, and GEORGE ADLER and DAVID A. MILLER have become associates in the firm.

JOHN GRAHAM AND CO., New York, N.Y., has appointed PAUL REISS as principal.

JAMES J. FITZGERALD, MARK R. MENDELL, GLENN R. MERITHEW, WILLIAM E. PALK, JR., JAN K. STERLING, and SAMUEL C.M. WANG have been named partners in the firm of CAMPBELL, ALDRICH AND NULTY, Boston, Mass. VICTOR CROMIE has been appointed planning director.

New Firms

TEAM 70 ARCHITECTS, a consortium of design professionals, has opened offices in the St. Paul Building, 6 West Fifth St., St. Paul, Minn. 55102.

JAN C. ROWAN and GEORGE J. SANTRY have formed R & S INTERNATIONAL, INC., for the development and marketing of products and systems for the building industries. Offices are at 100 Putnam Green, Greenwich, Conn. 06830.

Mergers and Expansion

H.J. SEXTON & ASSOCIATES and FITZGERALD & KAPLAN have merged their practices and formed the new firm SEXTON, FITZGERALD & KAPLAN, ENGINEERS, 681 Market St., San Francisco, Calif. 94105.

The firm of THALHEIMER AND WEITZ has formed a partnership with JOSEPH T. SCHWINDT, JR., EUGENE J. MCCARTHY and JOHN MCCLAIN. The firm will remain at 1315 Walnut St., Philadelphia, Pa. 19107.

ROYAL A. MCCLURE and ROBERT J. NIXON announce the formation of MCCLURE/NIXON, ARCHITECTS, 1502 I.B.M. Building, Seattle, Wash. 98101.

(Continued on page 169)

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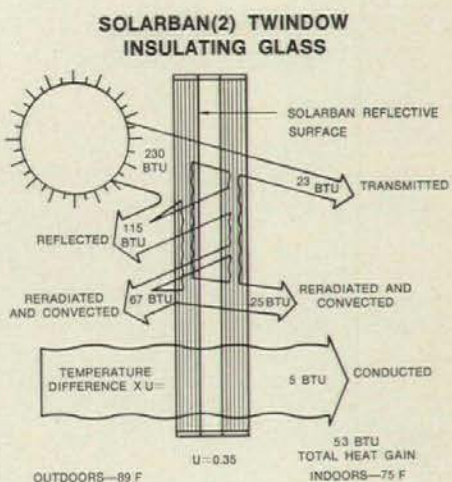
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Name Changes

F.A. STAHL AND ASSOCIATES, INC. is changing its corporate name to STAHL/BENNETT, INC., 177 Milk St., Boston, Mass. 02109.

HAMILTON, GRAHAM, AND ASSOCIATES has been reorganized and will now be known as HAMILTON, GRAHAM, LOVE ASSOCIATES, INC., 506 North Main St., Muncie, Ind. 47303.

TUROFF AND SANDE, ARCHITECTS has been changed to TUROFF ASSOCIATES, ARCHITECTS, 335 Angell St., Providence, R.I. 02906.

ENLOE, WEST & GRANADE, INC. has been changed to ENLOE, WEST & ASSOCIATES, INC., 1409 Peachtree St., N.E., Atlanta, Ga. 30309.

PETER S. LEVATICH, JOHN CLAIR MILLER, LAWRENCE HOFFMAN have formed the partnership of LEVATICH, MILLER, HOFFMAN, ARCHITECTS.

OMNIPLAN is the new name for HARREL & HAMILTON ARCHITECTS.

EGGERS & HIGGINS is now known as THE EGGERS PARTNERSHIP, New York, N.Y.

JONK KLEIN ARCHITECT AIA, 414 Mason St., San Francisco, Calif., has announced the dissolution of his partnership with Messrs. Garretson, Elmendorf, and Reibin.

Finger tip opening... No gut busters!

*The Stubborn Dutchman—Too stubborn
to build anything but the best walk-in*

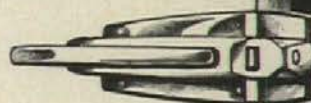


C. Schmidt walk-ins are specified by leading food consultants and architects. These fine coolers and freezers are built to last as long as the structure.

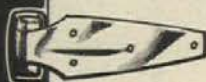
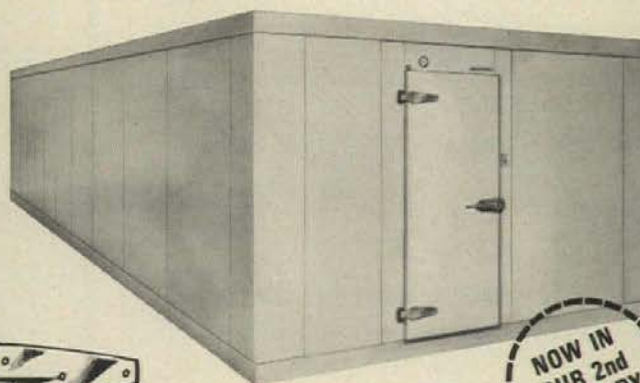
Typical of this fine craftsmanship are the doors. People leave heavy doors open. A heavy door can cause other walk-in problems. Result: Excess moisture. Poor refrigeration. More operating costs.

Schmidt walk-ins have doors designed after lengthy research. Finger tip opening and closing. Heater cable are built around door perimeter and jamb. This prevents moisture and frost. Keeps vinyl gaskets warm and pliable for a tighter seal. There are heater cables even under the steel sill.

Learn more about these fine walk-ins. Circle number on reader service card.



C. Schmidt equipment also meets NSF and the Wholesome Meat Act for Federal Requirements.



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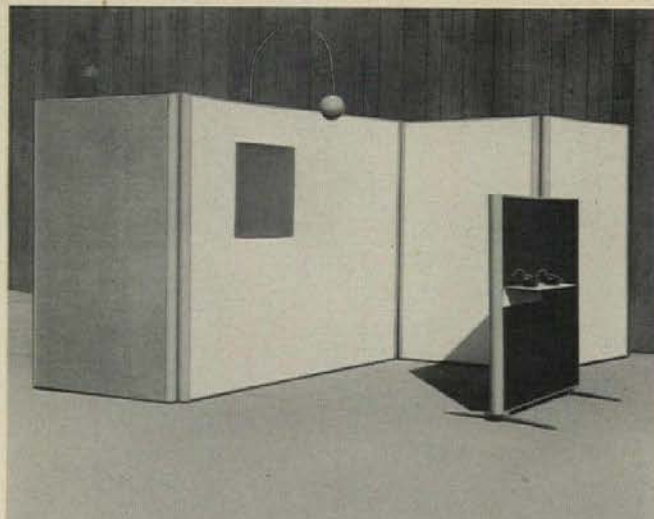
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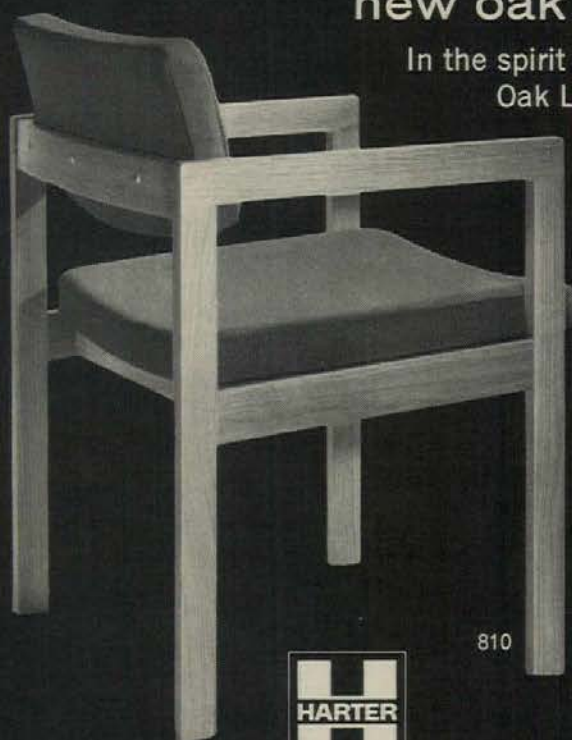
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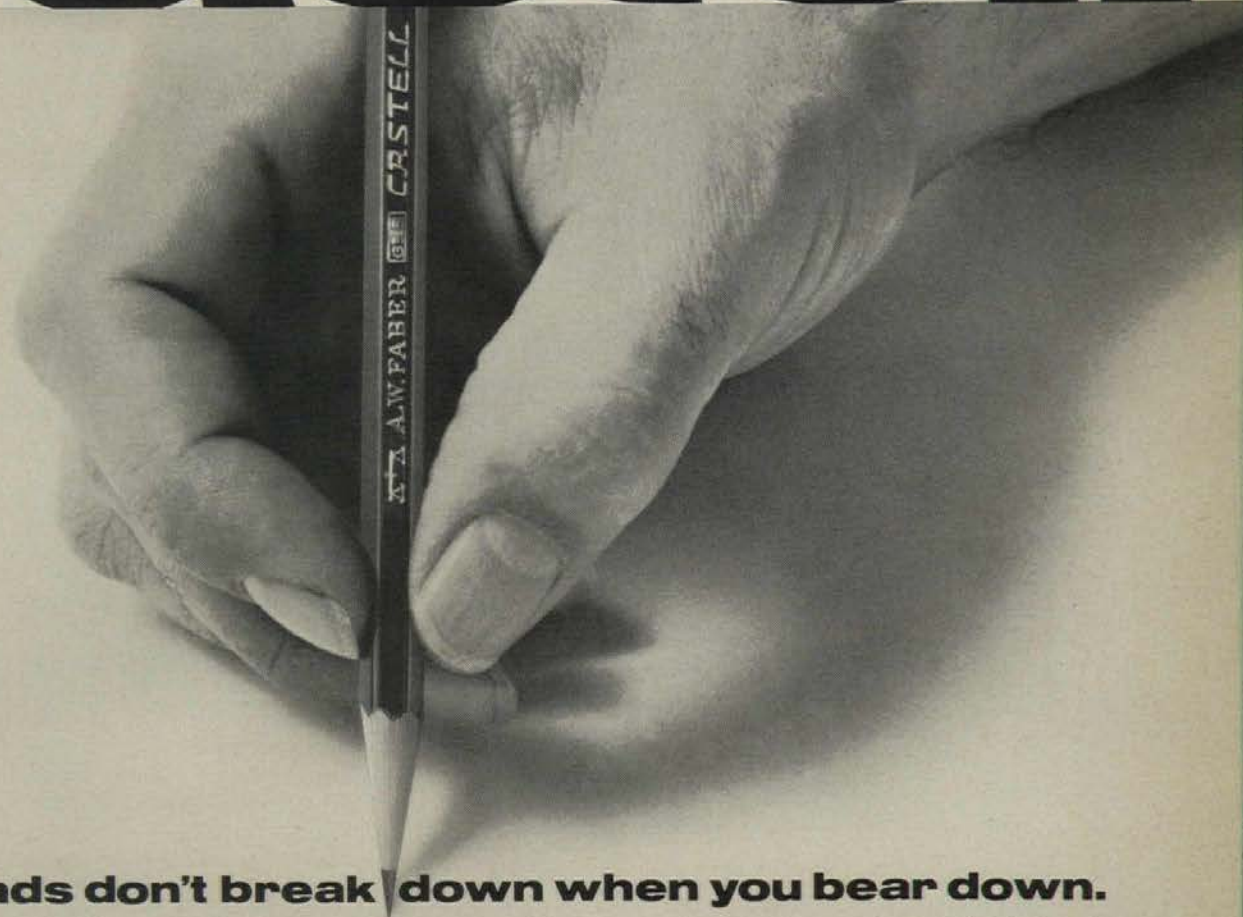


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The interior design of 3M Company's new multiple-purpose office building in St. Paul called for office partition flexibility and mobility. Sound transmission is an inherent problem with this kind of partition design. It was easily controlled with the use of lead.

Since the building is designed to house administrative, marketing, sales, purchasing and other personnel, there was a plan to build office partitions that would be easily relocatable as need might dictate. Partition design, in turn, called for a soundproofing system that would prevent noise pollution from office to office or from noise-producing workrooms located in the building.

Lead plenum barriers' renowned ability to block

sound and their ease of installation, especially around difficult piping, duct and conduit areas, dictated their use. 67,700 square feet of lead sheeting were used to soundproof the building. In addition, the company's own Scotch Brand lead foil tape was used to seal the joints and seams.

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JOBS AND MEN

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ARCHITECT—Key position for designer-planner for hospital and medical facilities. Should have in-depth background for responsible assignments. Daverman Associates, Architects, Engineers, Planners, 200 Monroe, N.W. Grand Rapids, Michigan 49502.

ARCHITECT—Major midwest architectural, planning and engineering firm with a nationwide practice has opening for architect, involving educational, institutional, industrial and planning projects. Opportunity to progress with quality oriented firm into key position. Applicant must possess high professional standards and leadership capability. Moving expenses paid and liberal salary commensurate with qualifications. Send resume in confidence to Box No. 1361-134, PROGRESSIVE ARCHITECTURE.

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ARCHITECTS—Facilities planning consultants. International planning and design consulting firm with offices in New York City and London seeks professionals whose primary responsibilities will concern researching client facilities requirements problems, defining and solving them in written programs, working with others to implement recommendations. Problem types include corporate headquarters, governmental office space and educational institutions. Opportunities for personal growth, salary commensurate with qualifications, increases based on merit, comprehensive benefit program including deferred profit sharing. Submit confidential resume of experience and earnings to: Becker & Becker Associates, Inc., Seagram Building, 375 Park Avenue, New York, New York 10022.

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ARCHITECTURAL JOB CAPTAINS—One with hospital experience, two with general institutional experience, capable of directing large projects through working drawings. Excellent opportunity with medium sized firm involved in wide variety of challenging work. Send resume: Bellante, Clauss, Miller & Nolan, 130 North Washington Avenue, Scranton, Pa. 18503.

ARCHITECTURAL PROJECT MANAGER—Medium size architectural firm located in Fox River Valley area of Wisconsin needs experienced project manager. Position involves client relationships, programming and coordination from start to finish of projects. Registered architect preferred. Business experience desirable. Demonstrated management abilities essential. Good salary, fringe benefits and profit sharing program. Future part ownership for right man. Send resume to Business Manager, Shattuck, Siewert and Associates, Box #396, Neenah, Wisconsin 54956.

ARCHITECTURAL SPECIFICATIONS—Experienced architectural specification writer needed to help us implement our newly developed computerized specification and project coordination system. Responsibilities will also include materials and systems research. Please submit confidential resume of experience and earnings to Mr. Bradley Storrer, AIA, Bertrand Goldberg

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INSTRUCTORS—Architect and City Planner Fulltime or Part-time, to teach courses in respective fields. Send resume to Mr. George Rusu, Chairman, Department of Architecture and City Planning, Voorhees Technical Institute, 450 West 41st Street, New York, N.Y. 10036.

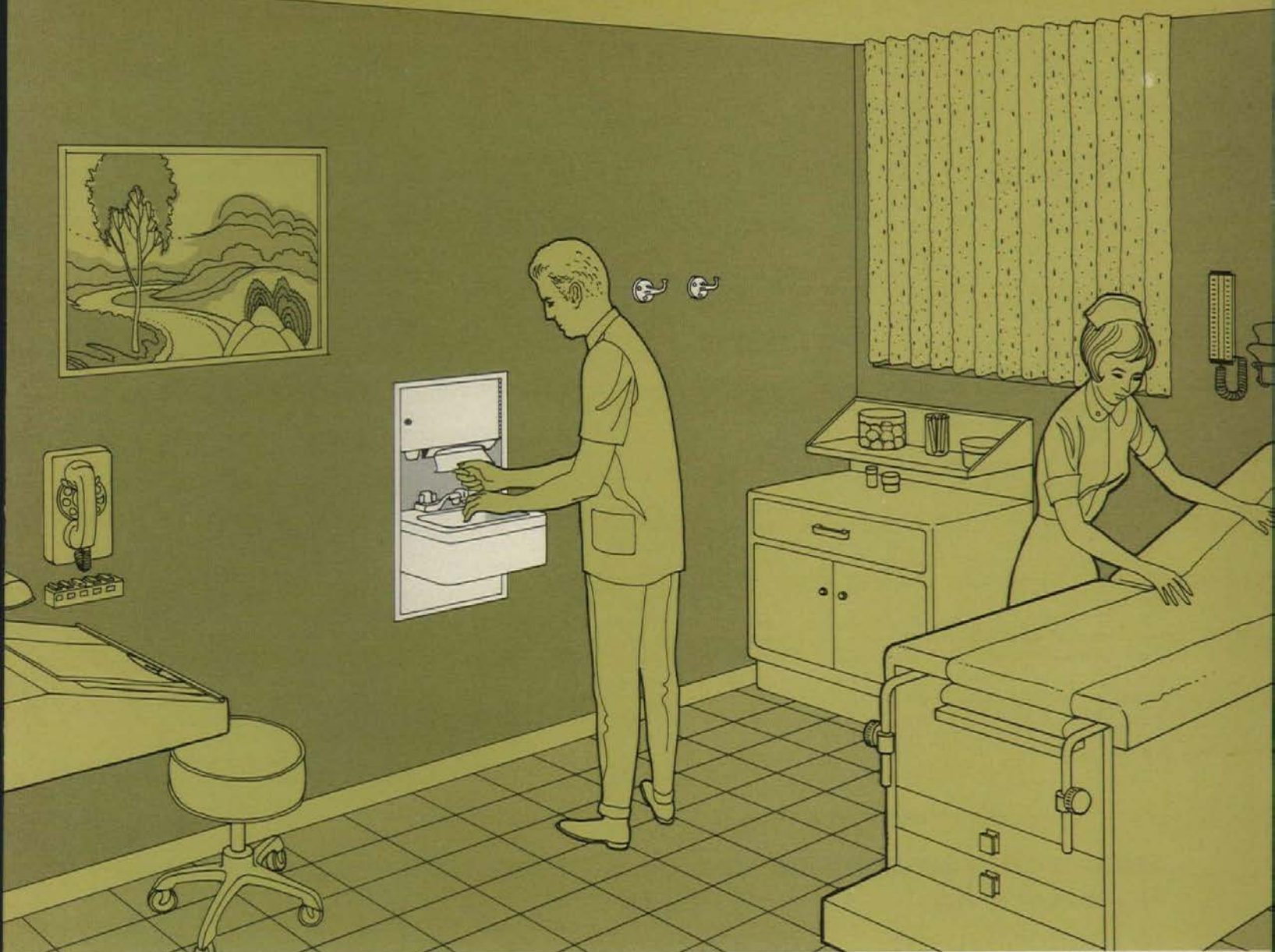
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Continued on page 180

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JOBS AND MEN

Continued from page 178

resume including salary requirements to: Mr. Franklin D. Guidone, AIA, Director of Design, The Cannon Partnership, 2637 Main Street, Niagara Falls, New York 14305.

SITUATIONS WANTED

ARCHITECT—Age 34, with 12 years comprehensive and diversified experience in the hospital, institutional and industrial fields including own practice seeks senior position leading to associateship or partnership in small to medium firm. Resume upon request. Location in or near large metropolitan center. Box #1361-141, PROGRESSIVE ARCHITECTURE.

ARCHITECT—AIA, NCARB. Bachelor of Arch. 1950. 7 years specialized experience hospital design, partner in charge: programming, concept, contract documents, administration, inspection, equipment, automated systems, communications, total energy, analysis of existing hospitals and community needs. Client contact all phases. Desire position with progressive firm. Box #1361-142, PROGRESSIVE ARCHITECTURE.

ARCHITECT—33, married, 11 years ex-

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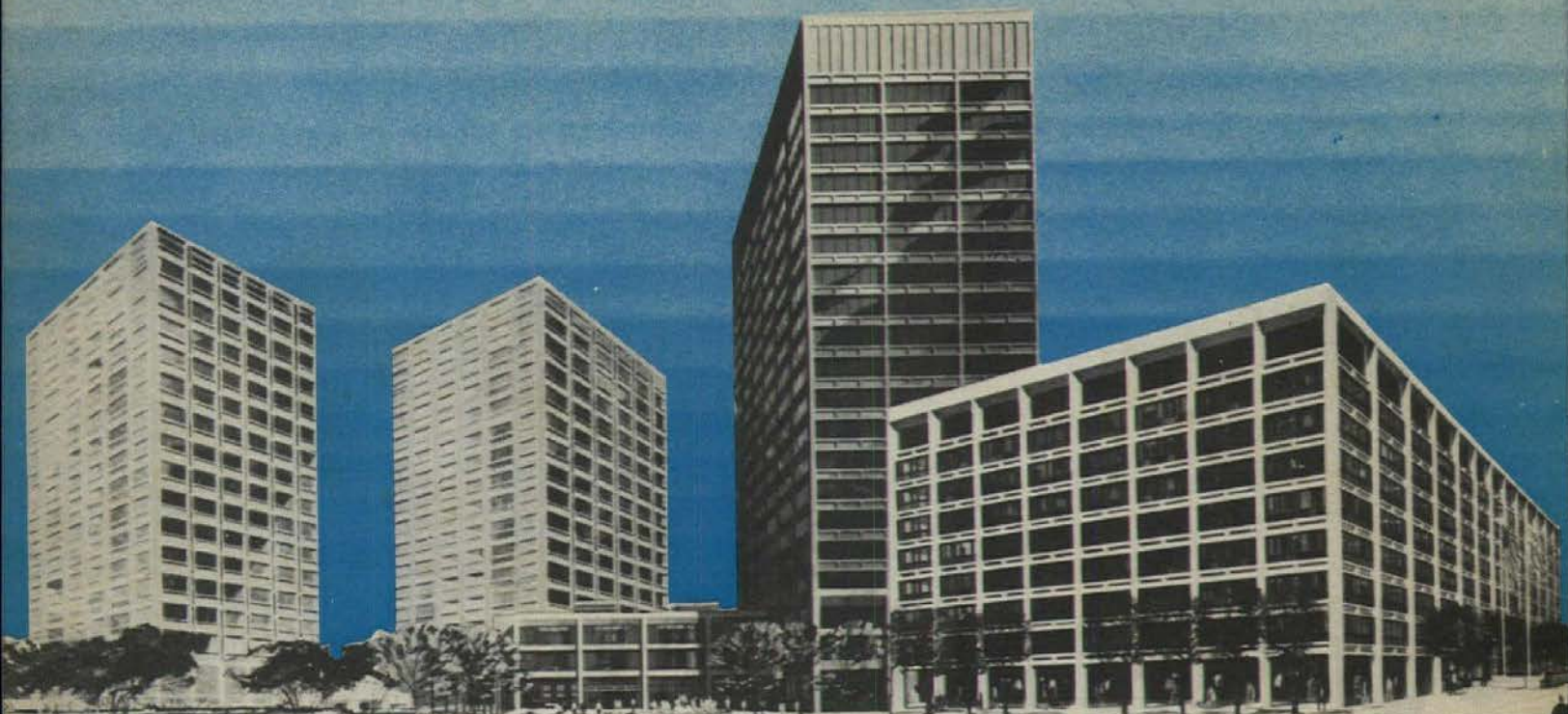
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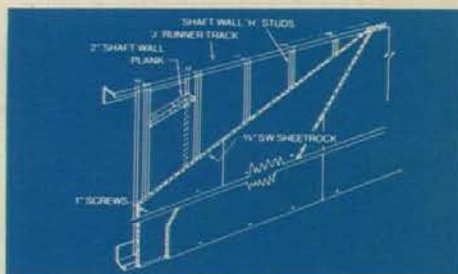
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