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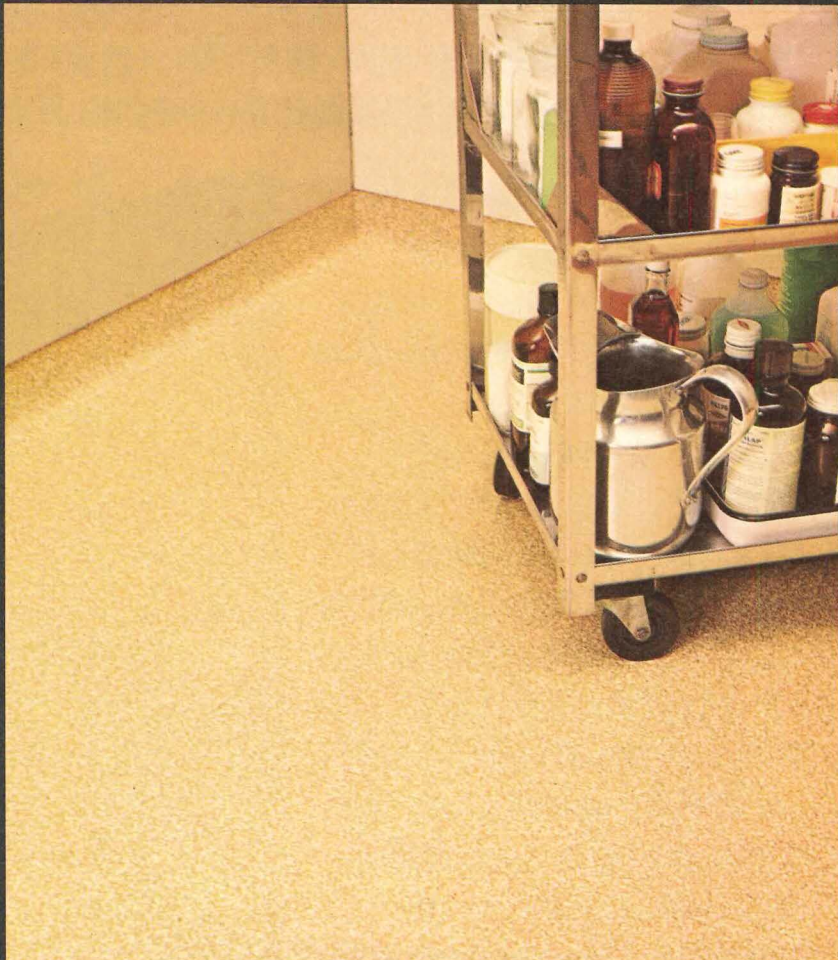
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**Cover:** House VI. View to kitchen from second floor shows intersection of columns and beams, with inverted stair (red) in reciprocal relationship to photo of real stair (57). Photo: Richard Frank.



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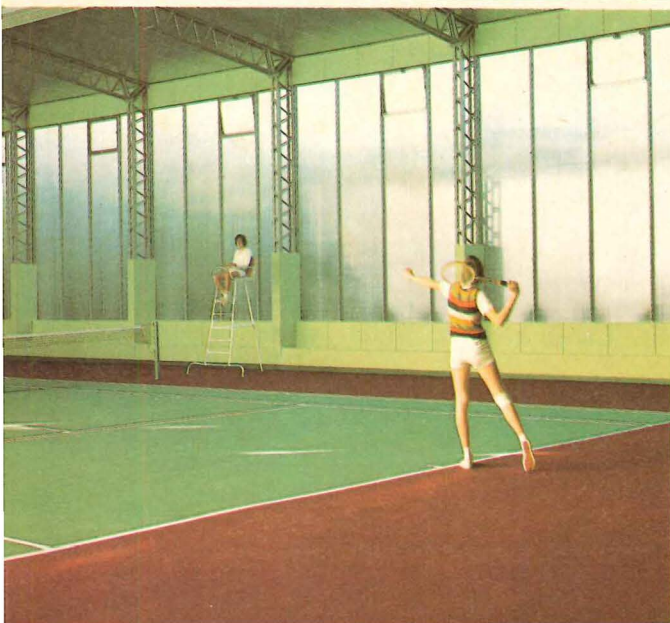
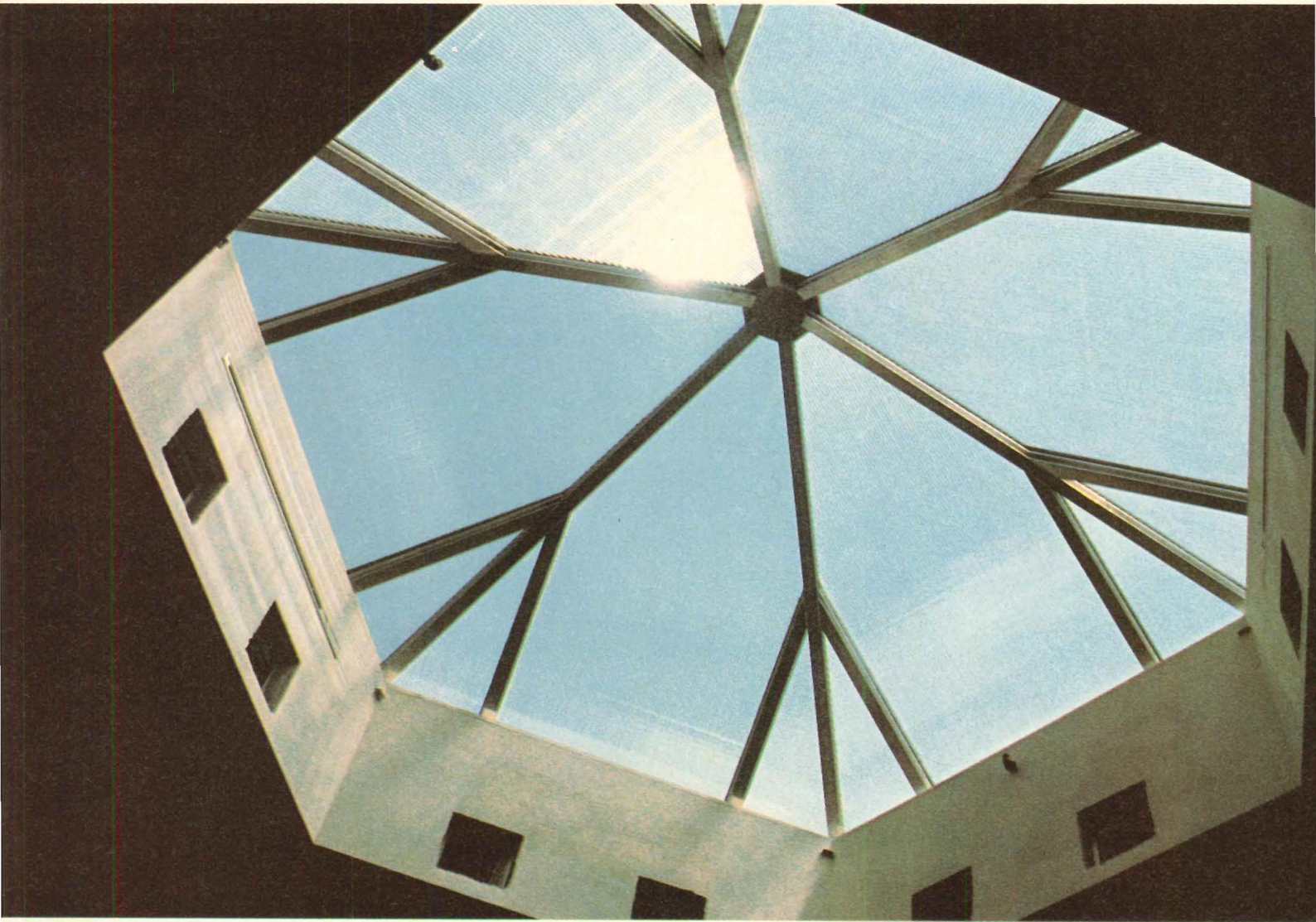
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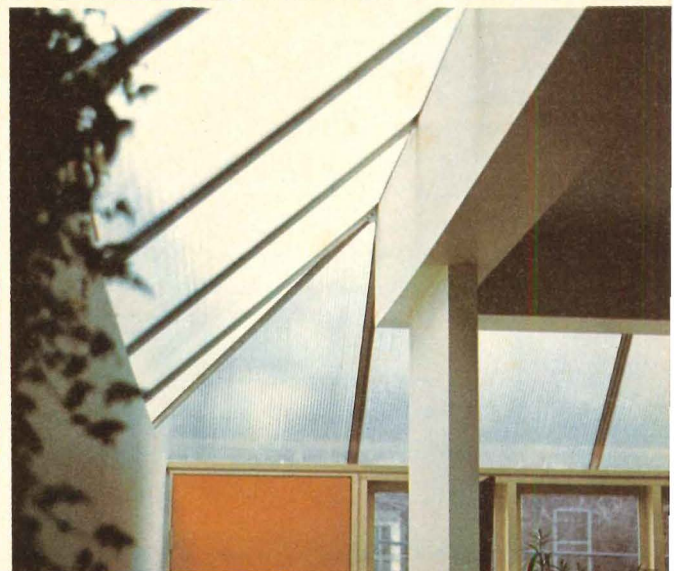
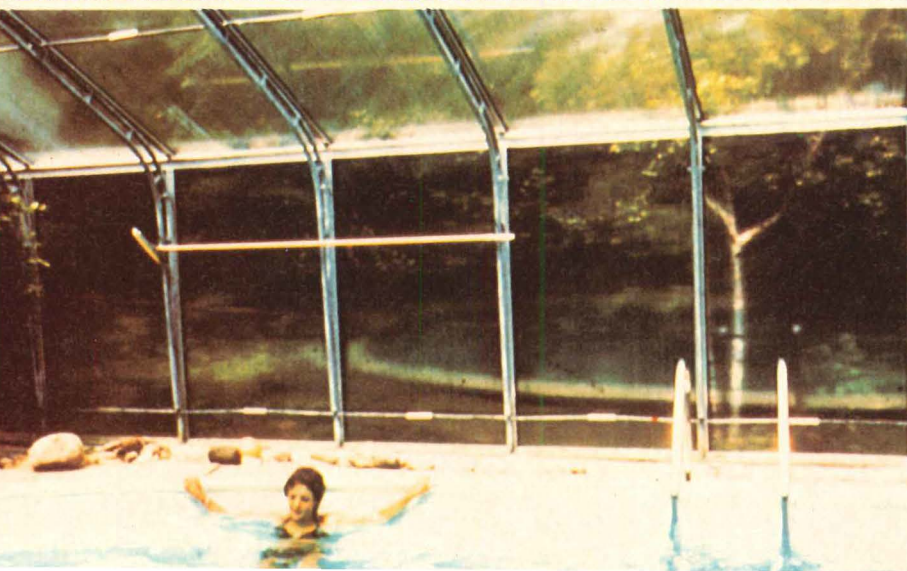
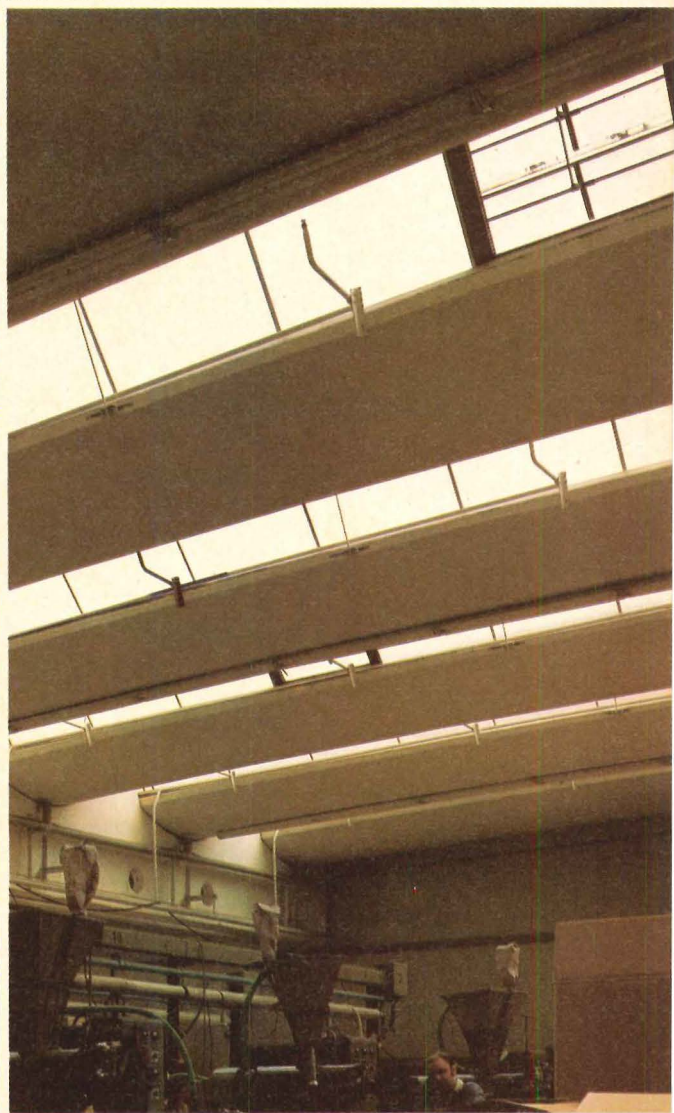
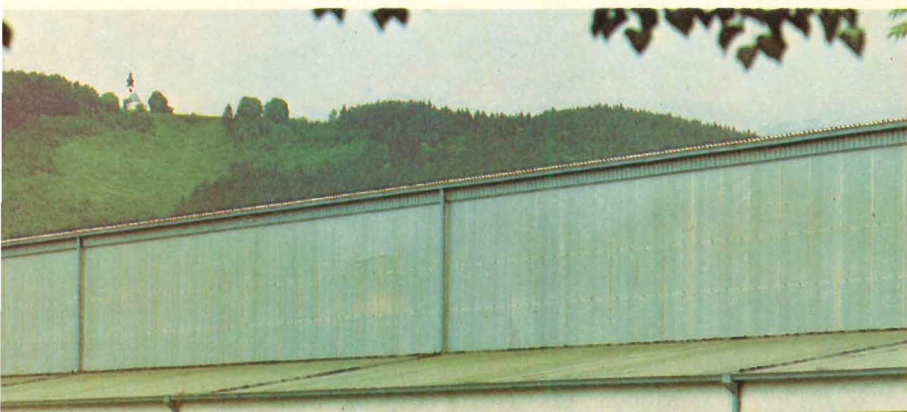
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# Awards at a watershed

June 1977

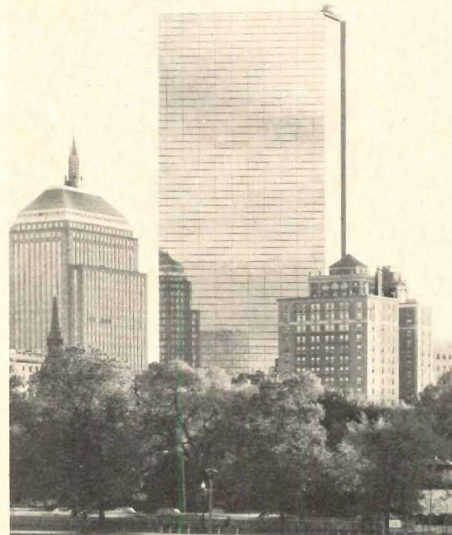
Just as our editors were assembling a jury for this year's 25th annual P/A Awards competition (details, p. 15) we got word of the 1977 AIA Honor Awards. These winners—11 new buildings and 6 "extended use" works—were reported in last month's P/A (p. 23). But the choices of this year's new buildings are disconcerting in some respects and call for further comment. (No quibbles over the decisions of the separate extended use jury, which—though new only last year—seems to have more secure standards for selection.) I have avoided seeking off-the-record insights from members of this new buildings jury; I will let their agreed-upon public statements represent their joint decisions—and their dilemma.

"Architecture is at a watershed, intellectually and functionally," states this jury's report. They acknowledge changing attitudes toward design, noting that other recent juries "have remarked on the fact that the old intellectual precepts of the Modern Movement were being supplemented by alternative and differing points of view." Jury chairman William Turnbull has been a chief exponent of these points of view, having to do with complexity, symbolism, and response to context (see, for instance, P/A, May 1974, p. 76, and Feb. 1976, p. 72). Yet most of these winners exhibit the minimal, isolated qualities of orthodox Modernism. The jury report explains that they "tried to keep in mind the premises upon which buildings were designed"—say, three to eight years ago. Very few winners represent those "differing" viewpoints, but "some of those not chosen (but heatedly discussed) indicate directions for the future." Why not the present?

In the area of energy conservation, as well, disparity is noted between current standards and those prevalent when these buildings were conceived. Though architect Richard Stein served as energy advisor to both juries, and the report notes that "examples judged represented many ideas that now seem, with respect to energy sources, outdated," the jury makes no comment at all on the energy characteristics of the selected new buildings.

We can be grateful that the judges for the P/A program need only apply *current* standards to *current* designs.

Among the AIA jury's selections, the inclusion of I.M. Pei & Partners' John Hancock Tower in Boston is cause for a different kind of concern. Whatever one's personal opinion



John Hancock Tower, Boston, by I.M. Pei & Partners, a 1977 AIA Honor Award winner.

of this tower, the public agony of its falling glass walls made it notorious worldwide before its recent reglazing (with glass of lower insulating value than that originally used) and its long-delayed occupancy. The jury acknowledges this background in one sentence: "this was a difficult building to premiate because of adverse publicity." Publicity, unfortunately, is not all. The matter of actual responsibility for this costly and embarrassing debacle is still unresolved, and litigation may go on for years (P/A, July 1976, p. 86). Though these jurors may be expressing full confidence in the Pei firm, they are nonetheless leaving the credibility of this awards program vulnerable to later court decisions. How much more prudent if projects embroiled in serious litigation involving the architects' performance ("serious" would have to be defined) were ruled out of competition—their period of eligibility for this program to commence only when these doubts have been cleared.

Legal problems also cloud at least one other of these winners, the Bronx Developmental Center by Richard Meier & Associates (also the recipient of this year's \$25,000 Reynolds Award, p. 22). Entangled in suits involving mainly the building's program and ultimate use, the Meier building has been prevented from being occupied long past the scheduled date. We at P/A, uncertain when the building will be occupied and by whom, have finally decided to publish it in next month's issue, with an article covering both its formal qualities and its public difficulties. But a jury giving the nation's highest awards for completed buildings should not have considered one that has never been occupied, especially one designed to meet the special needs of the mentally handicapped. Honor Awards eligibility should date from the time of occupancy, even if—as here—that may differ from the original program. Meier's firm, like Pei's, would have been denied gratifying consolation for a project mired down in legal problems, but the stature of the AIA Honor Awards program would have remained more secure.

*John Morris Diefen*

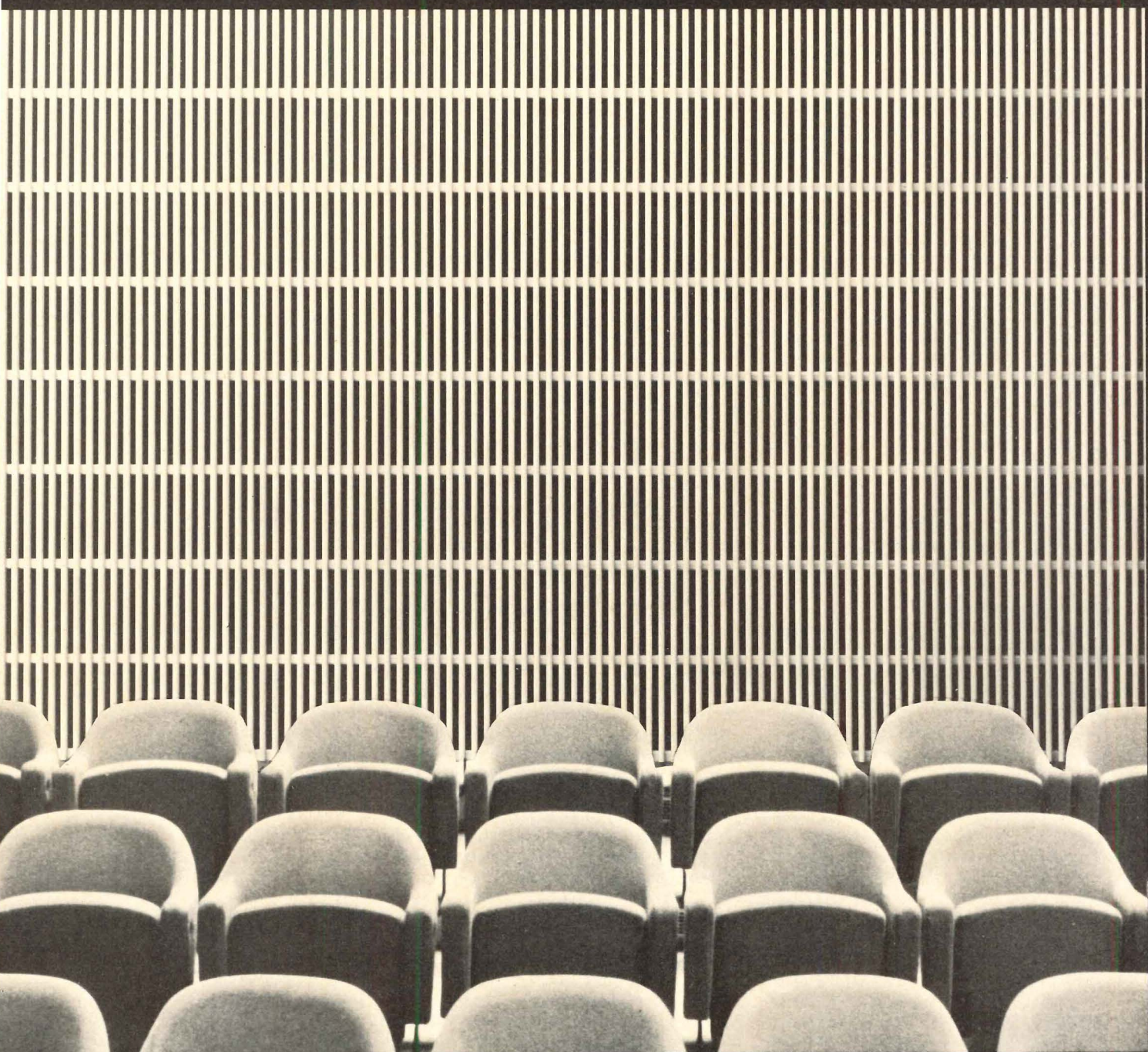


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# Views

## Women: change for the better?

The March edition of P/A is a treasure I shall keep forever.

John Morris Dixon's editorial is splendid. It compressed into one eloquent page the frustrations of women, not only in architecture, but in my own chosen profession, engineering (particularly the engineering in buildings).

The entire feature on women in architecture is a joy to behold. It is a sensitive, important statement about architects and about women. I shudder to think of how much beauty is lost to the world, generation after generation, as we, in ignorance and insecurity, continue to dismiss the talents of 51 percent of our population.

Are things changing for the better... as expressed in both the editorial and feature? I read similar comments 20 years ago, and have seen them written every year since. I have not seen that change in significance, and I don't believe it is right around the corner.

I hope I am proved wrong.

Eileen Duignan-Woods  
Supervisory Engineer  
General Services Administration  
Construction Management Division  
Chicago, IL.

## Aalto retrospective

Your issue (Apr. 1977) on Alvar Aalto is greatly appreciated, but alas several writers were not at a loss for words, nor am I. Wrede is not one of those. His critique is to the point and thankfully without Giedion's falsely romantic notions.

Rubenstein's "... Lesson in perceptible dimension" on the other hand is complete with theoretical nonsense. It is unfortunate that one of Aalto's excellent followers—the Otts in Switzerland, Federico Marconi in Italy or Edgar Kaufmann, Jr. in the U.S.—was not selected to comment on Congress Hall. As Birkerts said, they would leave us "free to respond to his work without Aalto or someone else telling me how or why."

Moreover, it seems that the *process* of creation, in a painterly sense, was the most significant factor in Aalto's work. Those who had the privilege of working under his tutelage learned that the hand and pencil making a line on paper scribe the form. That the forms are willful, concave as at Vuoksenniska or convex as at the Congress Wing (from the inside and opposite from the outside), and full of tension is most

surely derived from artistic requirements. This was most amply demonstrated in *Alvar*

*Aalto/Synopsis* (Zurich, 1970). Surely Aino and Elissa Aalto and Aalto's remarkably able lieutenants could attest to his painterly approach to design (if they would violate the "Aalto silence").

The silence that Venturi alluded to was surely real. There were two edicts which "Maestro" followed. The first was like Descartes' declaration: "I build, therefore I am an architect." In practice that meant: don't, if you please, theorize; just go, see, feel, hear. The second edict, exactly contrary to Giurgola's understanding that "... his only aim was 'good,' not beautiful work," was "for you Americans especially it is easy to be 'good' but almost impossible to be 'right.'" Implicit in that statement is the fact that we in the U.S. have such a variety of materials from which to choose. As so many noted, Aalto's material pallet was limited. And even at Baker House or Mount Angel he selected simple traditional materials. Aalto's implied admonition of my countrymen still rings: "Am I one of too many smart-aleck architects who will never be right?"

If Wright was the greatest architect of the 19th Century, perhaps Aalto, wholly unfettered by convention, was the greatest of the 20th Century. You cover gives me reason to think so.

T. Wm. Booth

Ralph D. Anderson & Partners Architects  
Seattle, WA.

We got the latest P/A last night. What a pleasant surprise: an unpublished Aalto building on the cover, and inside, lo, a flat out statement by R.V. about Aalto's importance for him. That's what I like, something clear and unmistakable. Possibly this seems an odd idea in a letter on Aalto, but I don't think so. Aalto's work, while difficult—although part of the difficulty lies with viewers who refuse to look at it—is clear and direct. This is not to deny the "contradiction and complexity" Venturi writes about. What's nice about his remarks is that they deal with the architecture, not how warm and cuddly he feels.

Take his phrase, "barely maintained balance between order and disorder." This seems more informative than, say, Price's "Aalto was most involved with solving problems for people and less with causes of forms" or Nory Miller's invoking "unity." This last seems particularly wrong-headed. Perhaps more than any architect Aalto challenged the prevailing, and persistent, demand for unity. Like Baker House (which may seem humanistic—you lived in it—but to me it's an awkward hulk making few concessions to grace or beauty, especially compared with Saarinen's chapel where everything seems calculated to please), his Congress Hall looks like two different buildings on its two main faces. And what about those strips of marble at the intersections of the curves? Conventional wisdom decrees using as few materials on a building as possible. Aalto seemed to use as many as possible. Look at the sample wall on his summer house—I know he was experimenting with different bricks, but if he didn't enjoy that disorder, he surely could have put those samples in a less prominent spot. (For an extended discussion of this question see Morris Peckham's *Man's Rage for Chaos*.) The title refers to the author's idea that the function of art is defeating the "rage for order" in most human activity. This book, as far as I know, has had no mention in architectural writing, but during the latter 1960s, it appeared

frequently in writing on art—see almost any issue of *Artforum* from that time.)

Despite lip service from "humanists," from the cry babies of architecture (that's my name for those who object, for example, to the "inhuman scale" of the *pilotis* at the Marseilles *Unité* or the "coldness" of the Seagram building), Aalto is underappreciated. This is an example of what I call the Mozart syndrome. Aalto and Mies (along with Venturi) are on the Mozart team, while Corbu and Kahn (and Stirling) are on the Beethoven team: the obviously perceived geniuses, what might be called those operating in the genius style as defined in the 19th Century, versus those operating on a more everyday level. The point, of course, is that these two groups work at equal levels of quality, but because of differing behavioral styles, they have been accorded different status. Bonnard is another instance of the Mozart syndrome.

People, it seems, want to be told what to admire. Also, there is the creation of superficial categories. Mies is "cold," Aalto, "warm." This particular categorizing may derive from the 19th Century "battle of styles": Gothic Revival humanism against Neoclassical austerity. Modern architecture is the reconciling of these two sides, taking "truth" and a Romantic outlook from the former, and simplicity and a classical attitude toward form from the latter. In the 1920s it was believed that austerity could be liberating. The Post Modernists seem not to agree. Despite Mies and Aalto each having their origins in northern European Neoclassicism, Aalto seems not to have been attracted by Miesian classicism. He saw architecture as man centered (I recall his saying something like this). Clearly he was reacting against the abstractness of modern architecture, its diagrammatic quality—which is part of his appeal to Venturi—but understanding art work requires a separation of that work from its maker's intentions and understanding of what he, or she, was doing.

Aalto's work deserves, and rewards, attention to specifics, to its idiosyncratic character, its awkwardnesses, its disunity, or to use Wrede's word, its tensions. Unlike most self-proclaimed humanists, Aalto was never, or rarely, easy on himself. Despite the protestations to the contrary, Aalto's work isn't easy on the attentive viewer. It is full of discords.

Aalto's work needs to receive intensive, and clear, formal analysis, an article in which the word "humanistic" doesn't appear.

Then someone could do a piece on Mies's humanism. (The Smithsons have, but without anyone's paying any attention.)

This isn't perverseness, but rather a demand for exactness, and completeness.

Your April issue is a beginning.

Tom Killian, Architect  
New York, NY

Thanks for the feature on Aalto's architecture—especially Stuart Wrede's thoughtful article. It was a welcome relief from the paper polemics of neo-art-deco-itecture, or whatever fad is happening this week in the U.S.

Jeremy Scott Wood  
Weston, Mass.

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The photo of the Bates College Library, by Sarah Harkness of TAC (P/A, Mar. 1977, p. 49), is by Phokion Karas.





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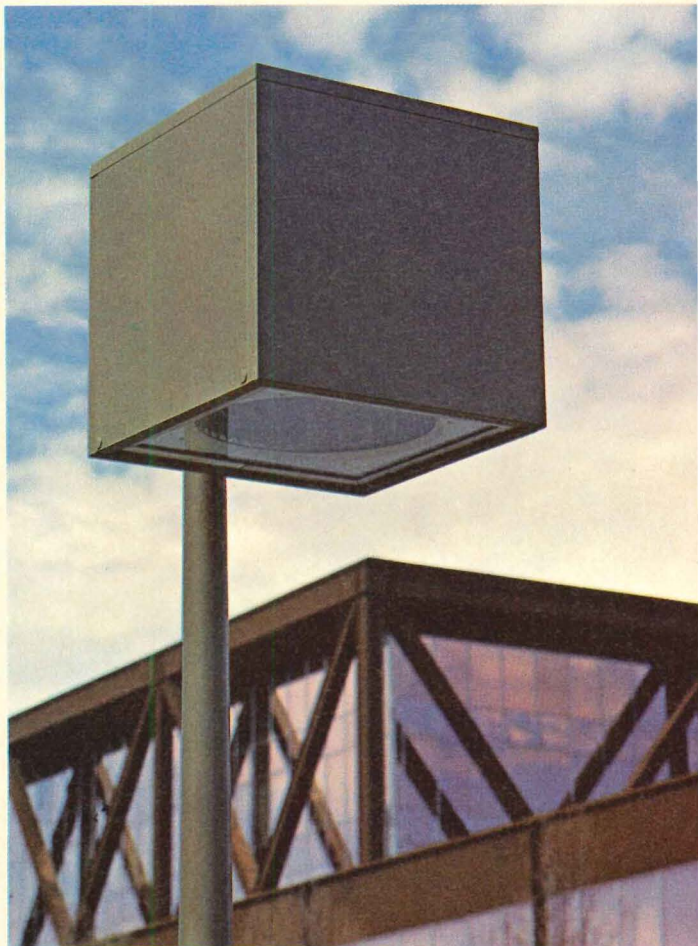
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**Progressive Architecture** announces its Twenty-fifth Annual Awards Program. Awards will be made to U.S. and Canadian architects, designers, urban planners, other professionals and their clients for projects now in the design stage and scheduled to be under construction in 1978. Any building, group of buildings or urban planning project illustrating innovative design proposals will be eligible. *In addition* entries in *applied research* will be accepted from architects or others *if they are applicable to the design or realization of specific facilities or programs and are scheduled to be completed within the calendar year 1978*. Qualification of entries in any category depends on the extent that the work is commissioned by a specific client.

**First award, award, and citation** designations may be given by the jury in any or all of the three broad categories: research; urban design and planning; architectural design. Entries will be reviewed for such factors as response to a client's program, site use and development, design excellence, conceptual advances, materials selection, and methods of implementation.

**The Jury** for the Twenty-fifth Awards Program: **William Bain, Jr.**, FAIA, Partner, Naramore Bain Brady & Johanson, Seattle; **Natalie de Blois**, FAIA, Senior Project Designer, 3D/International, Houston; **Robert Gutman**, Professor of Sociology, Rutgers University, and Visiting Professor of Architecture and Planning, Princeton University; **Alvin Hamilton**, Director of Planning, City of Los Angeles; **David Lewis**, AIA, ARIBA, AIP, Founder and Partner, Urban Design Associates, Pittsburgh; **Richard Meier**, FAIA, Richard Meier & Associates, New York; **Charles Moore**, FAIA, Professor of Architecture, UCLA, Los Angeles; **Robert G. Shibley**, Architect, Office of the Chief Engineer, Army Corps of Engineers, Washington.

**Purpose** of the Awards Program is to recognize, at the critical early stages, outstanding examples of work being done in the fields that most directly affect the built environment. Recognition will be given to both the entrants and their clients.

Judging will take place in Stamford, Conn. during September 1977. Winners of awards and citations will be notified (confidentially) before the end of September.

Public announcement of the winning projects will be made at a presentation in January 1978 at a reception to be selected. Winning projects will be featured in the January P/A. As in the past, P/A will arrange coverage of winning entries in news media, particularly in those localities of the award and citation winners. Winners must agree to provide illustrations reproducible in the press to P/A if requested.

[Continued on next page]

# P/A 25<sup>th</sup> Annual Awards Program

for projects not yet completed

in  
architecture  
planning  
and  
research



### Submission requirements

1 All submissions *must be firmly bound*. Original drawings, actual models, or mounted exhibit panels won't be accepted,

and no material is to exceed 11" x 17" in size. Each project is to be submitted under separate cover; 8" x 10" binders are preferred.

# Progressive Architecture 25th Annual Awards Program

**Entry form:** Please fill out *all* parts and submit with each entry. Copies of this complete form may be used when submitting multiple entries. (Typewriter only, please)

Entrant:  
Address:

Project:  
Location:  
Client:  
Category:

Entrant:  
Address:

**Statement of Publication Rights:** P/A has first rights to publish both the design and the finished project if it wins an award or citation (in the case of research studies, first rights to publication of the results) in the architectural press. Construction of the project is not yet completed, construction (or action on research proposals) is scheduled to begin before the end of 1978.

SIGNATURE \_\_\_\_\_

Awards Editor  
**Progressive Architecture**  
600 Summer Street, Stamford, Conn. 06904

Your submission has been received and assigned number:

Entrant:  
Address:

(Receipt)

Awards Editor  
**Progressive Architecture**  
600 Summer Street, Stamford, Conn. 06904

Entrant:  
Address:

(Return label)

2 Submissions must be accompanied by the *form*, to be found on the *left side of this page*. Each entry must have a separate form; reproductions of the form will be accepted. Please fill in (typewriter only, please) *all* appropriate spaces on the form, and sign statement of publication (part 2). Note that four parts are required for each entry.

3 No identification of the entrant may appear on any part of the submission, except concealed in an envelope attached inside back cover of binder. Entries will be kept anonymous until judging is completed.

4 In addition to the form, please include the following: a one-page synopsis of the submission in English, attached to first page inside binder summarizing program, your solution, description and reasons for your selection of materials and construction methods, site considerations, and objectives of design (for research and planning, intent and effect of the work). Synopsis must include with a statement on *why this submission should be considered for recognition*. This synopsis, plus visual material, may be sole basis for retaining submission beyond first round of judging. Any additional information should remain separate from the synopsis.

5 Graphic submissions should also include pertinent drawings such as site plans, representations of floor plans, sections, details, perspectives and model photos.

6 For purposes of jury procedure only, projects are to be classified *by the entrant* in the appropriate space on the entry form. Awards and citations will not be given by categories, but submissions must be divided into comparable groups for judging. For this reason, you are asked to list your submission as one of the following: *Education (Higher)*, *Education (Secondary)*, *Education (Primary/Early Childhood)*, *Housing (Single Family)*, *Housing (Multiple Unit)*, *Commercial (Large-scale)*, *Commercial (Small-scale)*, *Industrial*, *Religious*, *Recreation*, *Health Care*, *Planning and/or Urban Design*, *Applied Research*. If no category is listed for your submission, please write in MISC., and it will be placed with comparable entries. Mixed entries (part commercial and part housing, for instance) should be classified according to the function.

7 Submit fee of \$10 for each entry, to cover processing and handling, in an envelope marked "fee" attached inside front cover of binder. May be check or money order payable to *Progressive Architecture*.

8 Any entry not conforming to the above requirements may be returned to the entrant without being judged.

**P/A will take every reasonable precaution to return submissions intact;** P/A will assume no liability for lost submissions.

**Deadline for mailing** is August 31, 1977. Address entries to Awards Editor,  
**Progressive Architecture**  
600 Summer Street, Stamford, Conn. 06904.



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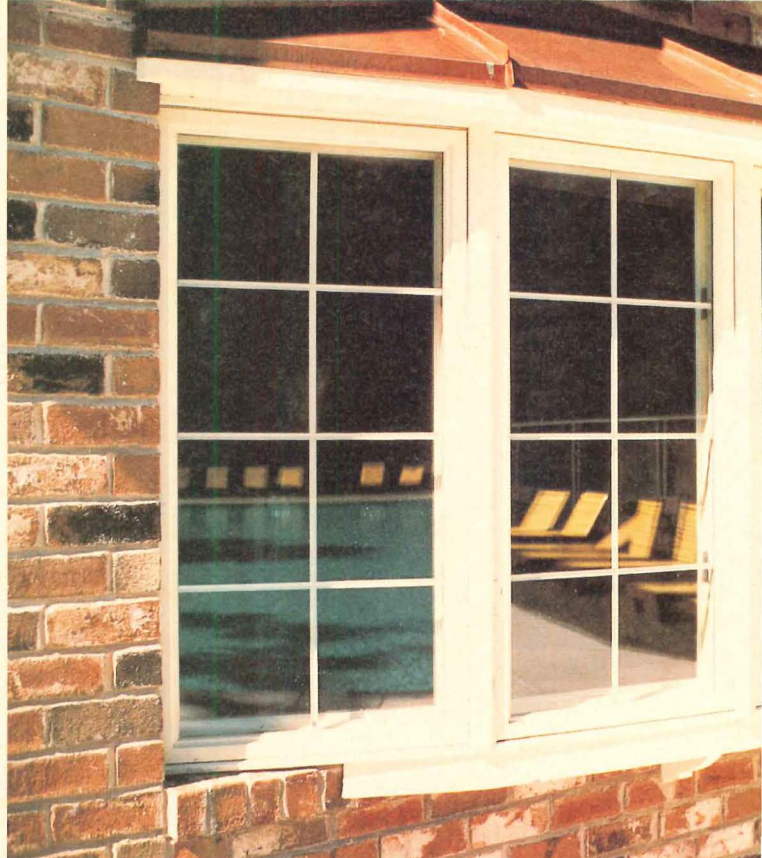
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# GRACE

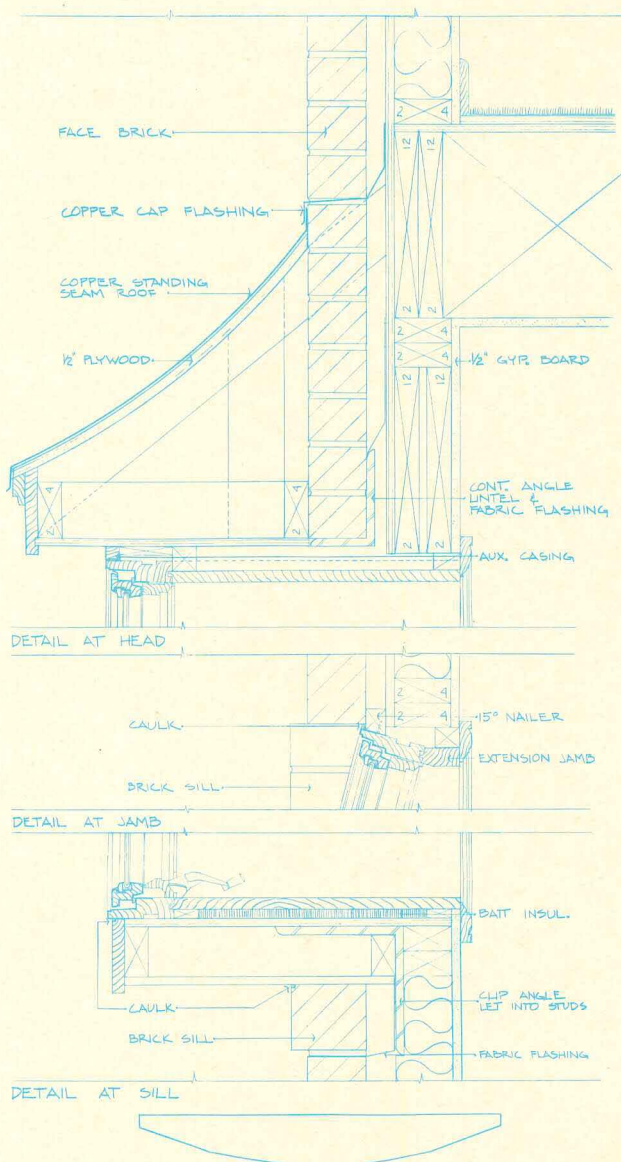






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Tunxis Village  
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# News report

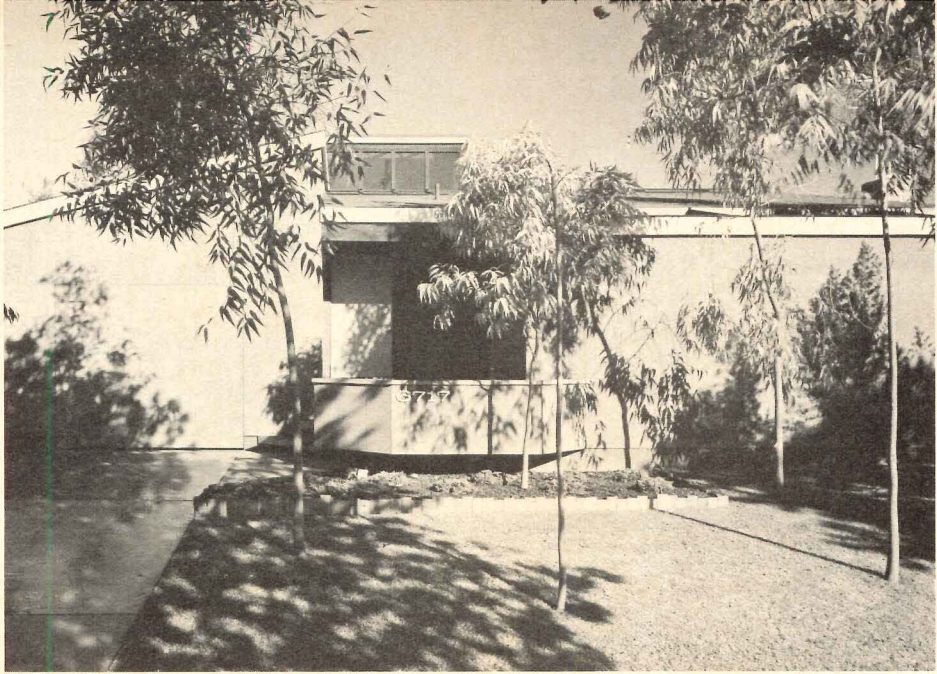
## Plywood Association's 1977 award winners

Top awards in the Plywood Design Awards program sponsored by the American Plywood Association went to William McCulloch of Newport Beach, CA. for the Ted Rankin house remodeling; Donald Sandy Jr. and James A. Babcock Architects/Planners of San Francisco for the Tree Swallow Court townhouse project; William P. Bruder, Architect of New River, AZ. for Pine-wood cabin; and Charles Herbert & Associates of Des Moines, IA. for the Wakonda branch of the South Des Moines National Bank.

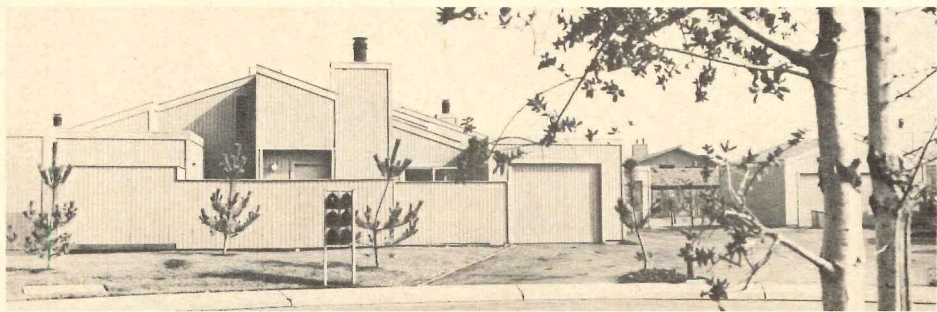
Citations of merit were received by E. Fay Jones of Fayetteville, AR., for the Sam Pallone house; Gwathmey-Siegel Architects of New York for the Purchase, N.Y., student housing; Barnett Schoor Company of Seattle for an Oregon beach house; and M.A. DeGrasse of Shavey Schmidt De-Grasse Shavey of Seattle for the Mission Peak, WA. microwave tower. Jurors were Paul Rudolph, William Bain, Jr., and John D. Bloodgood.

## Plywood awards names 1978 jury

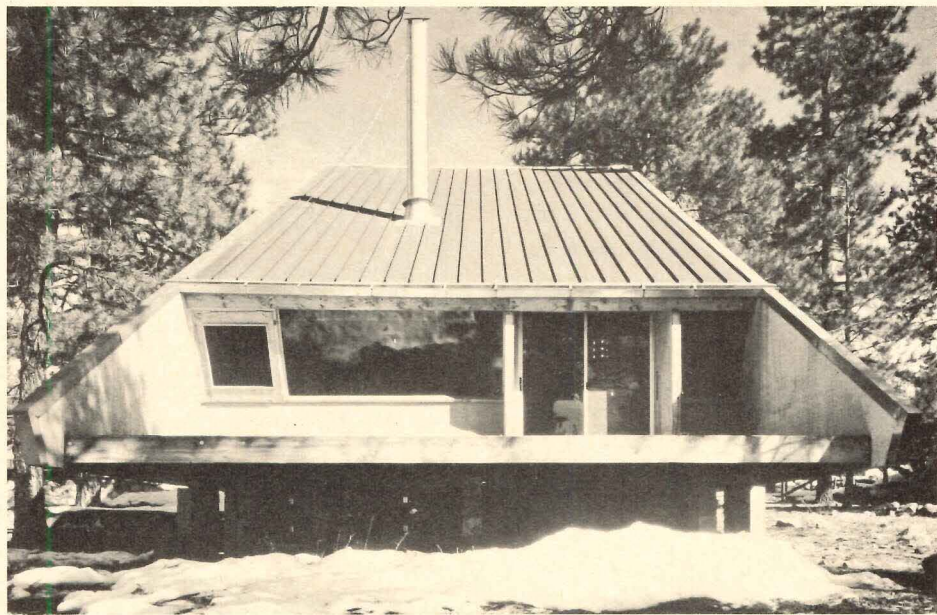
Architect John Field of San Francisco, partner in Bull Field Volkmann Stockwell, has been named chairman of the 1978 Plywood Design Awards jury. Other jurors will be John Bloodgood of Des Moines, IA., and Victor Christ-Janor of New Canaan, CT. The program, approved by the American Institute of Architects, is co-sponsored by



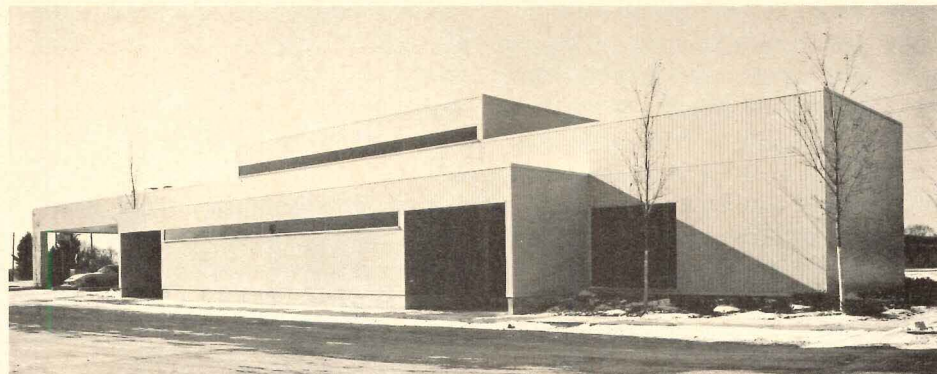
Traditional 1950s tract house updated by McCulloch Architects (above).  
Tree Swallow Court (below) by Donald Sandy and James Babcock.



Weekend retreat by William Bruder (below).



South Des Moines National Bank branch, by Charles Herbert & Associates (below).





the American Plywood Association and *Professional Builder* magazine. Entry deadline is Dec. 1; for information and entry forms write the American Plywood Association, 1119 A St., Tacoma, WA. 98401.

## Red cedar awards program announced

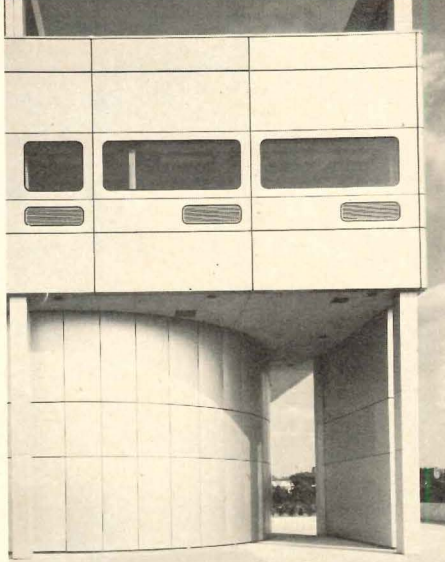
The 1977 Red Cedar Shingle & Hand-split Shake Bureau / AIA Architectural Awards program has announced July 15 as entry deadline. Entry forms are available by calling program coordinator Frank Welch at the bureau's Bellevue, WA. headquarters (206) 453-1323. The jury will be Alfredo De Vido of New York, chairman, Rodney Wright of Chicago, and A.O. Baumgardner of Seattle. Winners will be announced in September. The program is conducted to honor architects of projects demonstrating design excellence and significant uses of cedar shingles or shakes.

## Meier building wins 1977 Reynolds award

The Bronx Developmental Center by New York architect Richard Meier has won the \$25,000 R.S. Reynolds Memorial Award for distinguished architecture using aluminum. Meier is the first American to receive the award in recent years. Last year's winner was Norman Foster of London, who served on this year's jury; other jury members were architects Louis de Moll and Robert Marquis.

The Bronx facility, clad in a modular panel system with integral windows, is a residential and treatment complex for mentally retarded individuals. The jury found Meier's design "cheerful, fresh, and inviting" and well suited for the site: a flat, partially blighted, no-man's-land. They also commended the Facilities Development Corporation of the State of New York for its courage and confidence in giving the commission to an innovative architect.

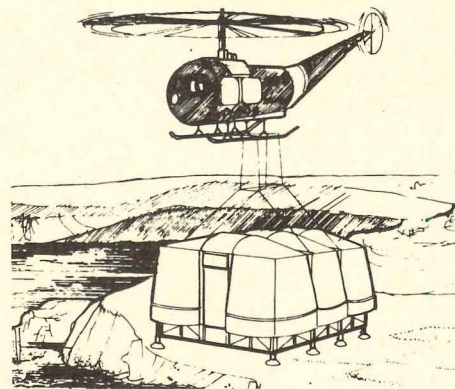
The Meier building also has won an award in this year's national honors program of the American Institute of Architects. The Reynolds award, in addition to the cash prize, includes a spe-



Bronx Developmental Center by Richard Meier.

cially commissioned aluminum sculpture created this year by artist Ilya Bolotowsky.

## Yale student receives prize



'Square-Circle Basic Shelter System' by Dolan.

Daniel Dolan, student at the Yale University School of Architecture, New Haven, CT., has received the 1977 Reynolds Aluminum Prize for Architectural Students. Dolan won for his design of an economical emergency shelter that can be transported by air or surface. The 18' x 22' modules may be assembled by a small group of people to form a variety of square-circle configurations. Dolan will share the \$5000 prize with Yale. Honorable mentions went to James Sailor of Texas Tech University, and Desmond Fletcher and David Bentley, both of the University of Texas at Austin. Judges were Robert Bliss, dean of the University of Utah Graduate School of Architecture, chairman; architect Rosaria Piomelli of New York; and Allen Koster, University of Minnesota School of Architecture, last year's winner.

## Model code being considered

United, a half-dozen professional organizations including the American Institute of Architects and the Society of American Registered Architects are opposed to certain conditions in a proposed model code on procurement of professional services. The groups are against one alternative in the code that would put selection of architectural and engineering services on a price-competitive basis. What the professional organizations endorse is an alternative similar to the currently used Brooks law that places procurement on a negotiated basis and emphasizes qualifications, not cost.

Funded by money from the U.S. Dept. of Justice, the American Bar Association has been working on a model procurement code for about three years. If approved, the code would be a model for adoption by any level of government. The necessity for such a code is to reduce waste of taxpayers' money, discourage corruption, and distribute work more evenly.

Architects and engineers are firmly opposed to competing on the basis of cost. "It's interesting to note that the Bar Association Model Procurement Code does not advocate price as a consideration in the retention of legal advisors," noted Donald Buzzell, speaking for the American Society of Civil Engineers.

Professionals contend that selecting an architect or engineer on a price basis will mean sacrifice of quality and pre-design research thereby making a construction job potentially more costly in the long run as building defects become obvious.

"With design fees usually amounting to 3 to 9 percent of the estimated cost of construction, it's a small fraction of the total project cost, . . . thus a dollar saved on professional services could result in many additional dollars spent," wrote Robert Alligood to F. Trowbridge vom Baur, chairman of the procurement code coordinating committee of the ABA. Alligood represents COFPAES (Committee on Federal Procurement of Architect-Engineer Services, a group of five professional organizations) on the ABA's procurement code advisory board.

The code has two alternatives under formal consideration and a third being



discussed as a compromise. Alternative A, which is the only one endorsed by the professional groups, calls for negotiation based on qualifications as well as fair and reasonable price. Alternative B makes negotiating according to price mandatory. Alternative C says either A or B may be employed depending on whether or not the project is "sufficiently complex."

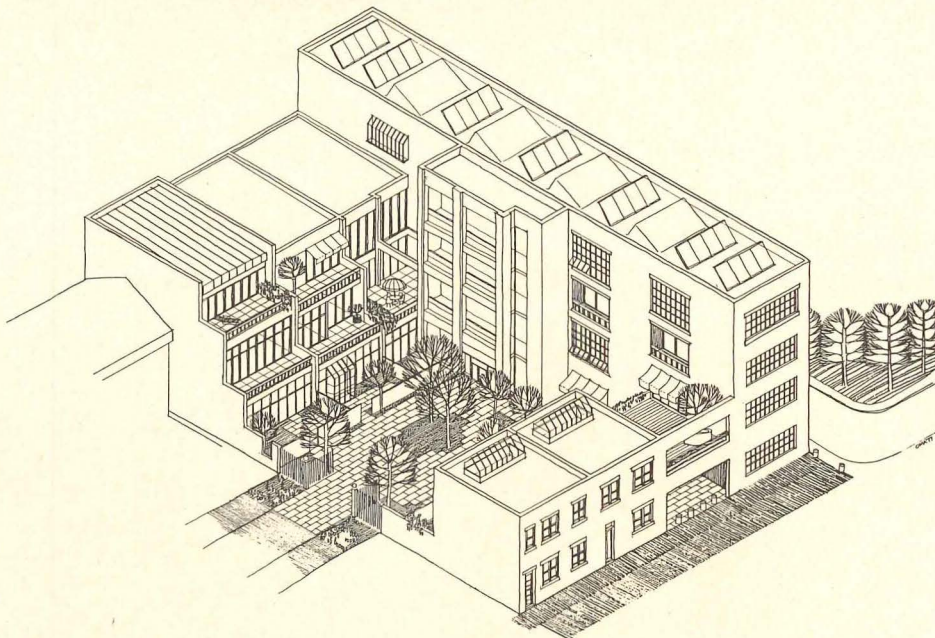
Maryland, the only state to enact legislation calling for mandatory competitive bidding, has worked with its law for three years, and recently the legislature defeated a measure to change the law. Though the process is unpopular with architects, leading firms are among those entering competition for state work; work is being distributed; and costs to the state are down. It's too soon to fairly judge the law since buildings initiated under it have not been completed. Privately, architects complain of losing money on these state jobs, and some firms flatly refuse to compete.

## Disappointment for homesteader hopefuls

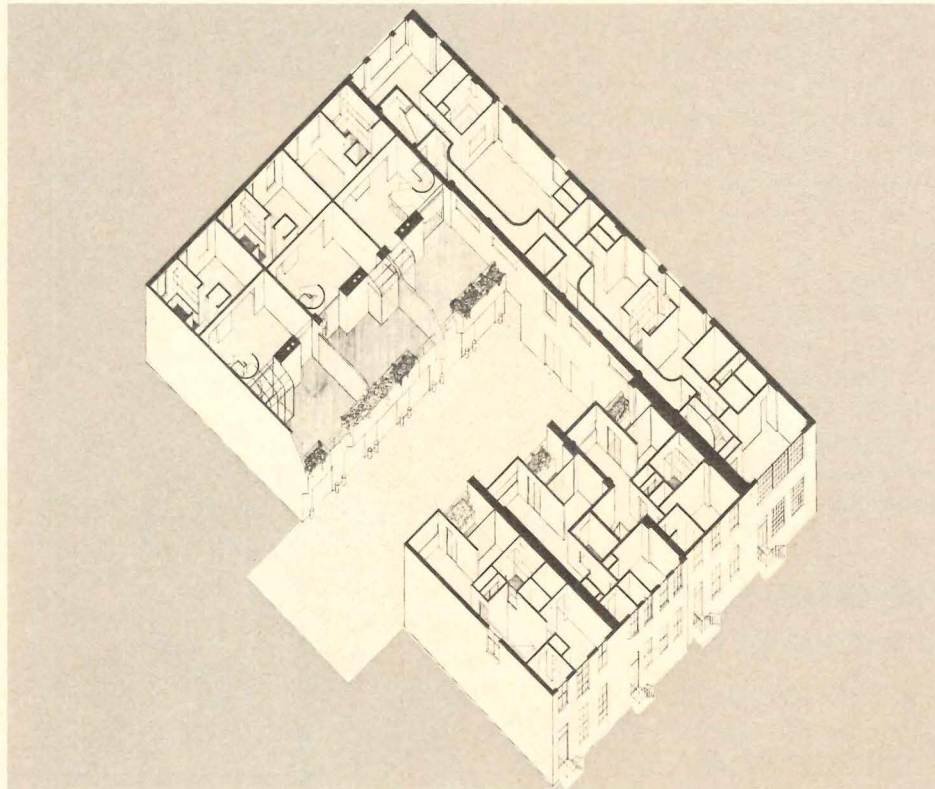
Regathering from recent scandals of construction "deals," Maryland has put on a strictly competitive basis activities in the area of building and design. Ironically, the process appears to have worked against the little guy in at least one instance. The case is a proposed redevelopment of a garment factory/warehouse in the Baltimore homesteading neighborhood of Otterbein. The proposal was forwarded by a group of young professionals called The Allon Manufacturing Co.—after the name of the factory—led by Harold Hersch, an attorney.

After persuasion on Hersch's part, the city agreed to put the warehouse and three adjacent townhouses on a homesteading basis like houses in the area. The city-owned homesteading property is sold on a lottery basis for a token sum, usually \$1, on the condition the owner refurbishes the property and lives in it. In the Allon case, however, the city decided it had to be a publicized competition.

After design and financial proposals were received from five bidders, the city announced its decision: the contract was awarded not to members of The Allon Manufacturing Co., who



The Allon Manufacturing Co. proposal, designed by O'Malley & Associates.



Developer's winning proposal, by Richard Ayers and Walter Schamu.

planned to live in some of the 16 renovated dwellings, but to a joint venture put together by Baltimore developer Melvin Pugatch. The reason he won was the strength of his financial package. Pugatch has stated only private funds will be used, but one of the members of The Allon Manufacturing Co. said Pugatch since has applied for state financing.

The Pugatch plans calls for 14 condominiums to be sold at prices from \$40,000 to \$90,000 each. The architects—and partners in the joint venture—are Richard Ayers Jr. and Walter Schamu of the firm Ayers & Saint.

Residents in the community, whose choice counted as a third of the decision, wanted either The Allon Manufacturing Co.'s scheme or that of another entrant; the developer's was their second choice. The two other decision-makers were an architectural review board and the acting commissioner of the housing and community development department.

Considering the effort it takes to bring forth grassroots preservation activity—not to mention a preservation movement of any kind—this defeat is a bitter disappointment for the cause, where the example of an enterpris-



## News report

ing citizen endeavor can go far toward sparking other redevelopment. Pugatch apparently showed an interest only when the competition was announced.

In conversations with Robert Embry, then commissioner of the department and since appointed deputy commissioner of Community Development for the U.S. Dept. of Housing and Urban Development, members of The Allon Manufacturing Co. understood the project practically was theirs, since they had researched the possibilities and proposed the idea. O'Malley & Associates of Baltimore was hired by The Allon Manufacturing Co. as architect to design their proposal.

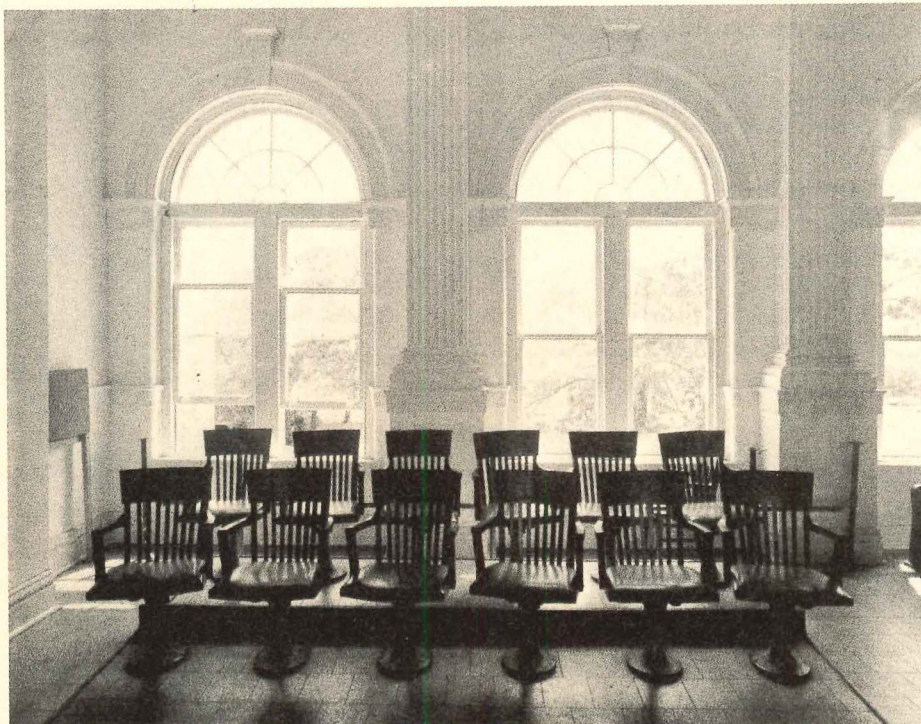
When announcement came that the Melvin Pugatch team won, shock was the reaction. "I can't say somebody was paid off," said Marsha Grayson, a research analyst and one of the 11 Allon Manufacturing Co. shareholders, "but I do say the city is switching its priorities."

Happily, the would-be developers are not totally discouraged, and some have purchased old stone houses of the 1920s and 1930s to renovate and refurbish in the Reservoir Hill section of the city. Meanwhile, it will be interesting to see if Pugatch will deliver the project as economically as promised.

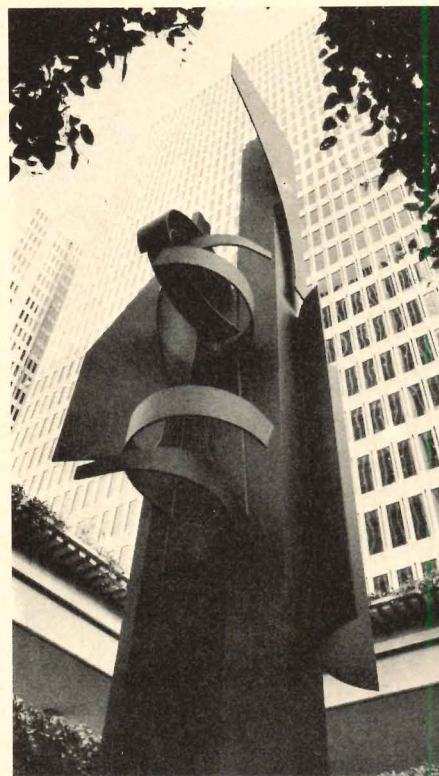
## Nevelson exhibit this summer at Purchase

Major works by the American sculptor Louise Nevelson, one of two to receive this year's artistic achievement medal awarded by the American Institute of Architects, will be exhibited through Sept. 11 at the Neuberger Museum, Purchase, N.Y. The museum is on the recently opened State University of New York campus planned and designed by Edward Larrabee Barnes. Leading architectural firms including Venturi & Rauch and Gwathmey Siegel Architects have designed buildings on the campus, and Philip Johnson was architect for the Neuberger Museum.

The Nevelson installation fills four galleries, and several works are displayed prominently outdoors. Directed by the artist herself, the installation arranges works in graceful linear curves and groupings that effectively interact



Grady County Courthouse, Cairo, GA., Alexander Blair, architect.



Nevelson's 'Sky Tree,' Embarcadero Center.

with the large, high-ceilinged galleries. Overall darkness with spot lighting brings out the spatial concepts that dominate Nevelson's sculpture and their relationship to surrounding space. Nevelson's most recent sculpture, a 54-ft-high black painted steel "Sky Tree," was put in place earlier this year at John Portman's Embarcadero Center, San Francisco.

## Courthouse photos capture Americana

An exhibit of 64 photographs of county courthouses commissioned by Joseph E. Seagram & Sons will be on view through July 10 at the Museum of Modern Art, New York. Afterwards, an expanded version of the exhibit will tour nationally under the auspices of the National Trust for Historic Preservation. From 1974 to 1975, 24 photographers working on the project documented over 1000 courthouses throughout the country as a pictorial record of buildings which have served America much as churches and palaces served Europe. The project was directed by Phyllis Lambert with Richard Pare, general editor. Selections for MOMA were made by John Szarkowski, director of the museum's department of photography.

## Sullivan building's uncertain future

Discreet inquiries have been made by owners of Louis Sullivan's Prudential Building (formerly Guaranty) in Buffalo, NY, about steps to demolish a historic landmark. "This is frightening news to the folks in this town who are still embarrassed by the demolition of Frank Lloyd Wright's Larkin Building a [News report continued on page 28]



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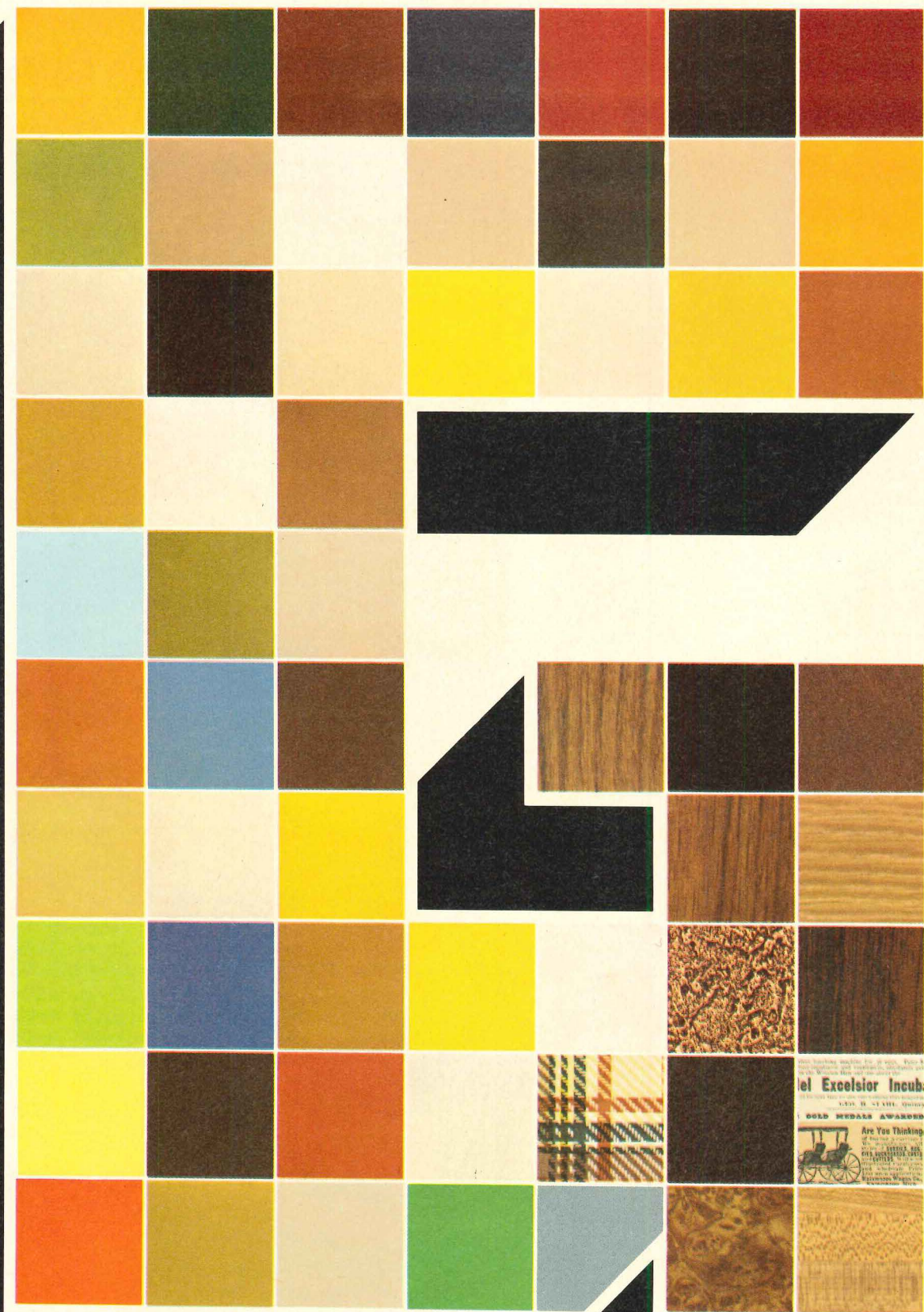
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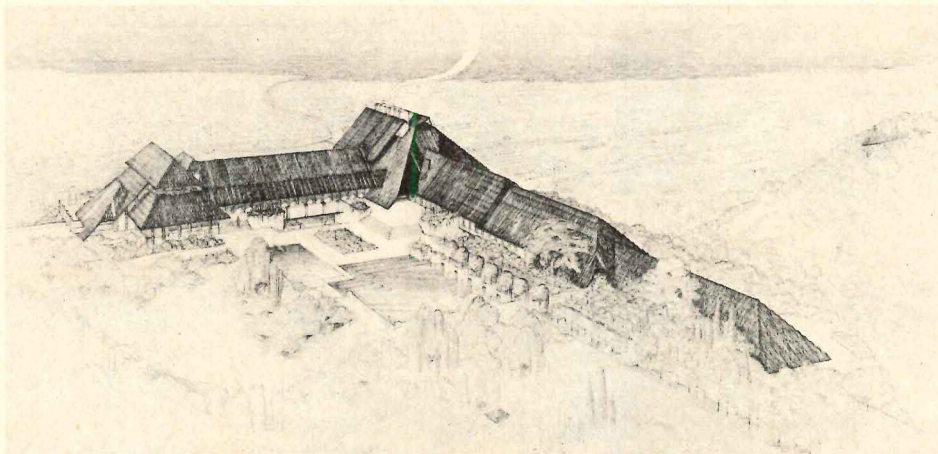
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generation ago," wrote a preservation-minded supporter in an open letter to anyone who could come forward to save the 82-year-old structure. The building is similar in appearance to Sullivan's famed Wainwright in St. Louis. One of the 13-story Prudential's distinctions is its claim as a direct-line predecessor of the skyscraper.

Richard Goetz of Buffalo, attorney for United Founders Life Insurance Co. of Chicago which owns the building, has stated the owner wants to sell the building and is seeking a demolition permit in the event the only buyer wants to tear it down. However, no formal application has been made, and according to Buffalo's landmark law, a six-month waiting period must follow the request before a demolition permit is granted. The six-month period is only an interim during which preservationists may find alternate solutions since the granting of a demolition permit automatically is given whether or not the city approves.



Villa on the Caspian Sea, Iran, by The Frank Lloyd Wright Foundation.

## Caspian Sea palace for Princess Shams

The Frank Lloyd Wright Foundation, William Wesley Peters, architect, has designed its second palace for Her Imperial Highness Princess Shams Pahlavi of Iran. The Mehrafarin residential complex is under construction on a site overlooking the Caspian Sea and includes four guest houses and a tea pavilion. The foundation's first pal-

ace for the Princess is near the capital city of Tehran. Following native structures, the Caspian Sea palace has steeply pitched roofs extending in some cases to the ground on sides facing prevailing winds. They are covered with deeply serrated blue glazed ceramic tile. The roofs and walls are steel frame and heavily insulated for energy conservation. The associated architect on the project is Nezam Amery of Kamooneh & Khosrovi.

[News report continued on page 30]

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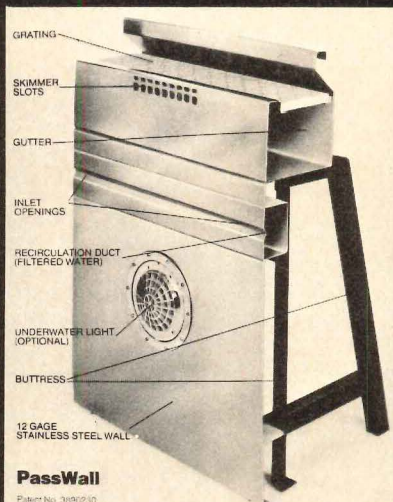
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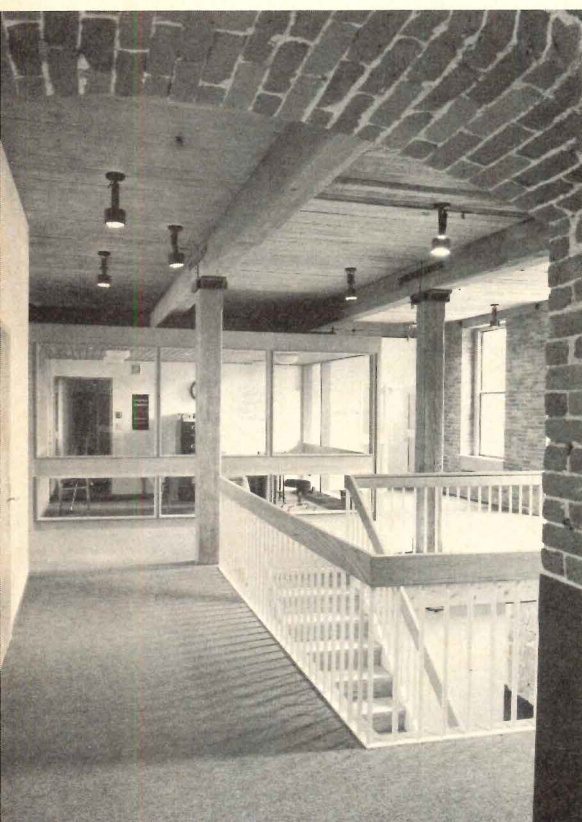
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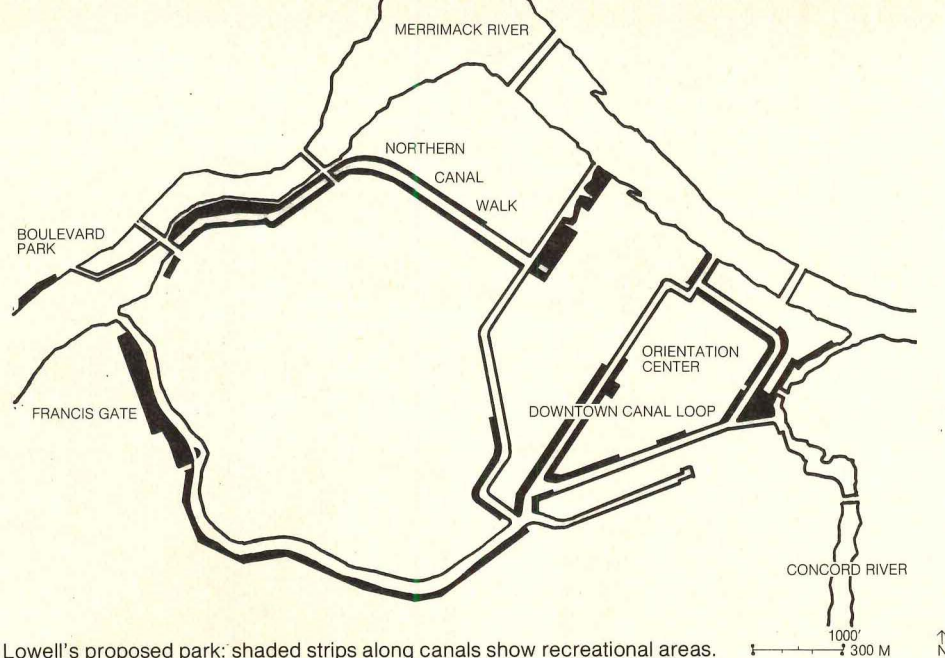
Francis Gatehouse Mill, Lowell, (above, below).



Factory to elderly housing, by Endeavor Inc.

## Congress considers historic urban park

A bill to create and fund a historic urban park in the 19th-Century mill town of Lowell, MA., has been introduced by Rep. Paul Tsongas (D-MA.) and assigned to the interiors committee. If approved, some 1.5 million sq ft of vacant mill space in downtown Lowell would be designated as park areas though most of the property would remain in private ownership. The site would be open to an estimated 650,000 visitors annually who would see exhibits



Lowell's proposed park: shaded strips along canals show recreational areas.

mounted in the old brick buildings and tour the area by barge, loop train, and foot. The park would be co-administered by the National Park Service and the Massachusetts Department of Environmental Management.

Government interest in the industrial town is not limited to the federal level. In 1975 the State created the Lowell Heritage State Park along portions of the town's 5.5 canal system and has committed \$10 million towards redevelopment. The city, as far back as the Model Cities program, has used funds for preservation improvements and more recently has earmarked major portions of its \$3 million in Community Development Block Grant money for streetscape, beautification, and rehabilitation grants to private property owners. Several industrial buildings have been converted into housing and similar projects are planned. Two local historic districts were created around the city hall and two of the canals and locks downtown. Architectural consultant to the city is Anderson Natter Associates of Boston.

With creation of the federal park, \$40 million would be required to realize the project, which would operate on an initial \$1.12 budget annually. Development would take place in two stages over a ten-year period.

Individuals behind the preservation/redevelopment effort have been Massachusetts Gov. Michael Dukakis; the Lt. Gov. Thomas O'Neill III; and Frank Keefe, director of state planning and former director of planning for Lowell. Available from the U.S. Government Printing Office is a 255-page report on the proposed urban park re-

leased by the Lowell Historic Canal District Commission established by Congress in 1975 and headed by Lt. Gov. O'Neill. The report was prepared by The Lowell Team, a joint venture of David A. Crane & Partners/DACP Inc.; Gelardin/Bruner/Cott; and Michael Sand & Associates.

## National Trust tackles main street

Speakers from locations as dissimilar as Baltimore, Md., and Chillicothe, Ohio, seemed to agree that Main Street U.S.A. should not try to compete with suburban shopping centers but instead offer an alternative. Their views were expressed at a national conference, "Revitalizing Main Street," held by the National Trust for Historic Preservation in cooperation with the U.S. Chamber of Commerce. The two-day meeting in Chicago drew an audience of 300 businessmen, city officials, architects, and citizens interested in preservation and re-use.

The conference theme was established by the Trust's new Main Street Project, an idea conceived by Mary Means, director of the Trust's Midwest regional office. The project is a three-year program of professional assistance in the areas of town planning, architectural restoration and rehabilitation, public relations, merchandising, and marketing.

Three laboratory communities selected for the project from 69 in a 10-state competition are Madison, Ind.; Hot Springs, S.D.; and Galesburg, Ill. In [News report continued on page 32]

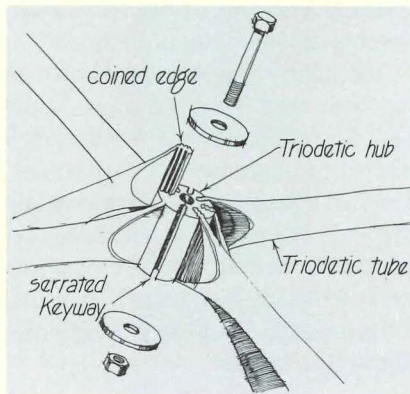


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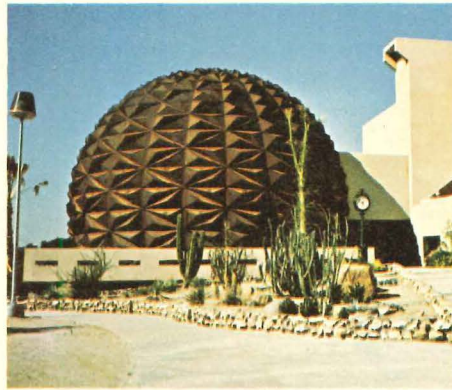


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Architect: VTN Consolidated, Inc.,  
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addition to rehabilitating the main streets of these three communities, the National Trust will develop a handbook and film on how to do it, and the Chicago conference was the first of three annual workshops to coincide with the program.

Questions raised and answered in a general way at the conference included how to evaluate the architectural character and economic potential of a main street (by noting how

much is left, whether or not there are gaps in the frontage, and whether modernization has altered significantly the integrity of the buildings); how to organize a revitalization program (by forming citizen groups to approach merchants and the banking community); how to help merchants obtain private and federal funds; how to restore storefronts to their original character; how to get sign ordinances enacted; and how to diplomatically deal with holdout building owners who refuse to rehabilitate.

In a world where the bottom line is

what counts, the National Trust's efforts to save our cultural heritage are finding a widespread, sympathetic audience; the conference mood was positive and seemed to verify that preservation is an idea whose time has come. [Stuart Cohen]

## Spaced gallery for architects

Spaced, a gallery of work by architects, is one of a new number of such exhibition centers appearing in major cities. Spaced is located at 165 W. 72 St., New York, and was opened in late 1975 by Judith Newman, herself an architect, who has maintained a schedule of monthly shows.

The gallery policy is not to emphasize architectural drawings, per se, but to reveal the artistic endeavors of architects outside their profession.

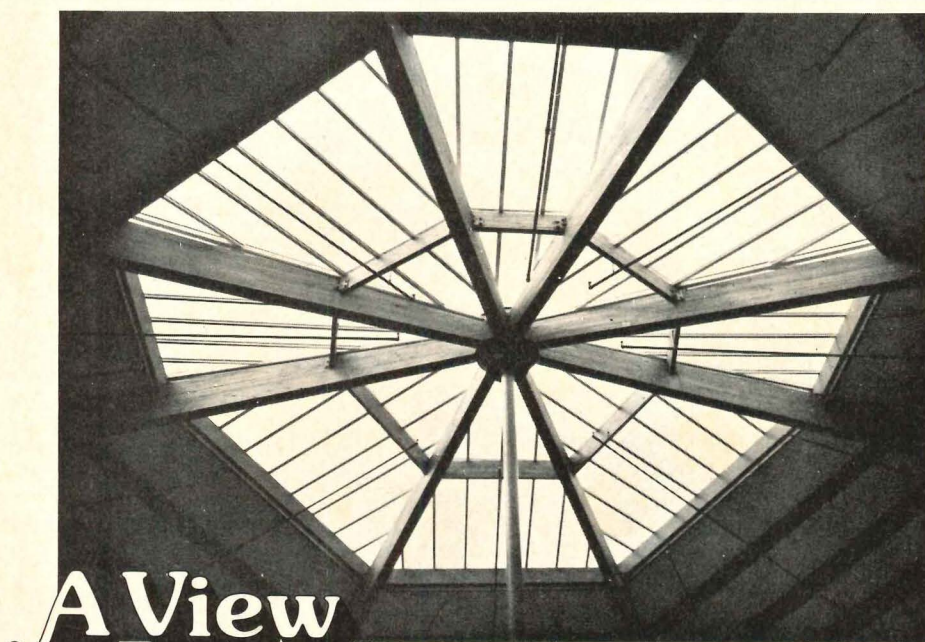
The gallery space, located on a second floor, was designed by Ms. Newman. The white walls of the corridorlike display zone are faced by a parallel series of sitting alcoves where closer inspection of print bins and other collectibles is invited. She also designed the wall display system of tracks that holds artwork mounted in ready-made plastic box frames.



Spaced, Judith York Newman, architect.

Ms. Newman also sells some of her own finds: a bit of ceramic tile salvaged from demolished buildings and brass hardware rescued from remodeling jobs (some of it makes attractive jewelry to wear).

[News report continued on page 36]



Seavor Associates / Architects and Planners / Woonsocket, R.I.

## A View That Can Save Energy

When you look up at the ceiling and see the sky or the leaves on a tree or snow flakes, your spirits are lifted. When you see a room lit by sunlight, you see it at its best.

The National Bureau of Standards has issued a publication titled "Windows and People" that discusses the psychological benefits of contact with the outdoors to people living or working indoors. Now, Wasco, the leading supplier of skylighting, has compiled significant data on the gains and losses of energy attributed to skylights. It is quite fascinating to see how, under the right conditions, skylights can actually save energy in most areas of the United States. Naturally, there are many variables, including unit design, positioning on the building, building usage, percent of roof coverage and geographical location. If you would like a copy of Wasco's summary of current information, it's yours for the asking.

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# Pfister & Knoll

"Opulence without waste" is the way designer Charles Pfister sees the 70's. "It's a direction that began with a major Italian statement in the 60's but American designers have made it their own since." If the Pfister glass bowl design for Knoll

was the beginning for Pfister (and he suggests it was) of a "...soft, enriching, more comfortable line..." his new table collection may well become a halfway mark in this design development. He plans a series of desks and credenzas which

will compliment the tables.

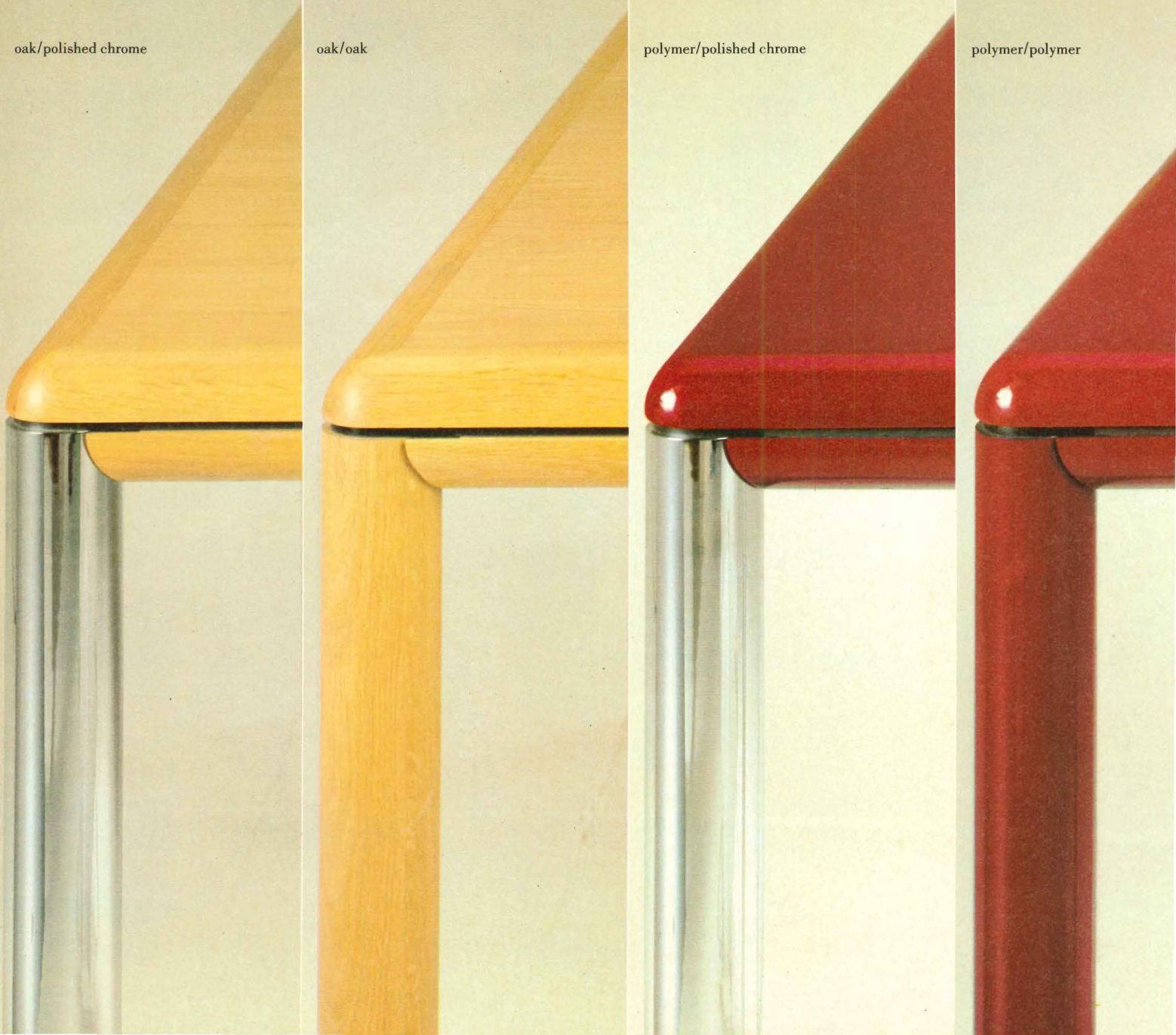
For the table collection, Pfister wanted a mix of materials, sumptuous richness, and more color. But all, careful craftsmanship: "The throw away society is becoming

oak/polished chrome

oak/oak

polymer/polished chrome

polymer/polymer





of the past. There is mounting  
st in beautiful and useful  
s that need care, that age  
ves.

nature of my design limits the  
of materials—the table's

simple profile demanding simple  
surface treatment." These include  
light and dark woods, lacquer-like  
finish in an explosion of color, and  
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tops and legs, depending on your  
need. And there is a wide variety of

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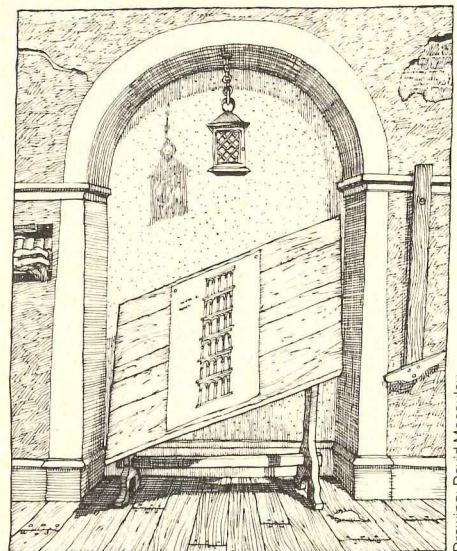


Other activities of this increasingly expanding center are promoting the preservation of architectural documents and displaying architectural photography.

Notwithstanding recent attention given to women designers ("Women in American Architecture," Hayden Gallery, M.I.T., Cambridge, MA.) Ms. Newman never intended her gallery as a women's lib platform. She has yet to feature a woman's work—even her

own—though she's interested in considering such work. "It's hard enough to find good architectural drawings to show let alone those by only women."

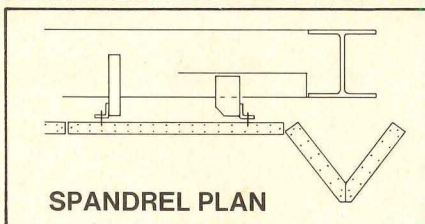
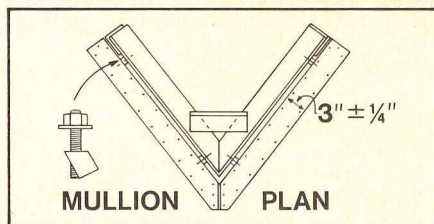
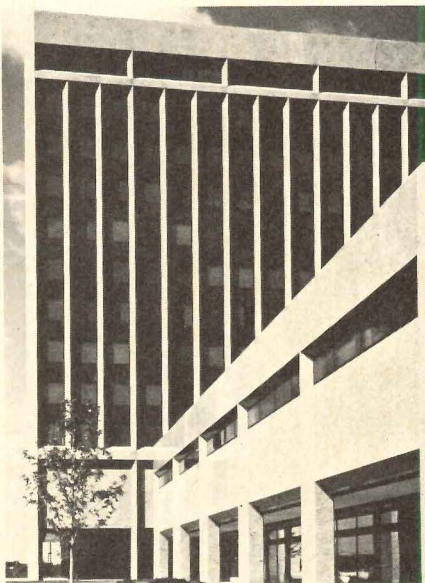
One of the exhibits she's organized, a show of 18th-Century English engravings of buildings by Wren, Hawksmoor, Jones, and others, will be shown in other cities, schedule to be announced. Her shows really are designed to appeal to nonarchitects "because architects themselves don't buy; we want to build an audience of architectural buffs."



'Great Moments in Architecture,' Spaced.

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## Women's school asks for ideas

The Women's School of Planning and Architecture, founded in 1974, is seeking input from women designers about programs WSPA could offer. Last year and the year prior the school held summer school sessions (P/A Oct. 1975 p. 24). However, the school wants to avoid institutionalized repetition of projects in its efforts to mobilize the interests, energies, and collaboration of women designers. Write for a questionnaire by sending a stamped self-addressed envelope to WSPA, Box 311, Shaftsbury, Vt. 05262.

## Housing Hall of Fame inducts 18

A newly established Housing Hall of Fame, under the auspices of the National Housing Center, Washington, D.C. has inducted 18 individuals who contributed significantly to America's housing progress of the 1940s. Next year the Hall will honor outstanding contributors of the 1950s, and so on until all periods are covered.

Those selected this first year are builders and community developers—David Bohannon, San Mateo, CA.; the late Milton Brock, Laguna Hills, CA.; Franklin Burns, Denver; Fritz Burns, Los Angeles; the late Edward Carr, Sr., Springfield, VA.; Harry Durbin, Detroit; Robert Gerholz, Flint, MI.; Kimball Hill, Rolling Meadows, IL.; Rodney Lockwood, Birmingham, AL.; the late Joseph Merriam, Chicago; Joseph Meyer- [News report continued on page 40]





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Standard Wall Model



Compact Wall Model



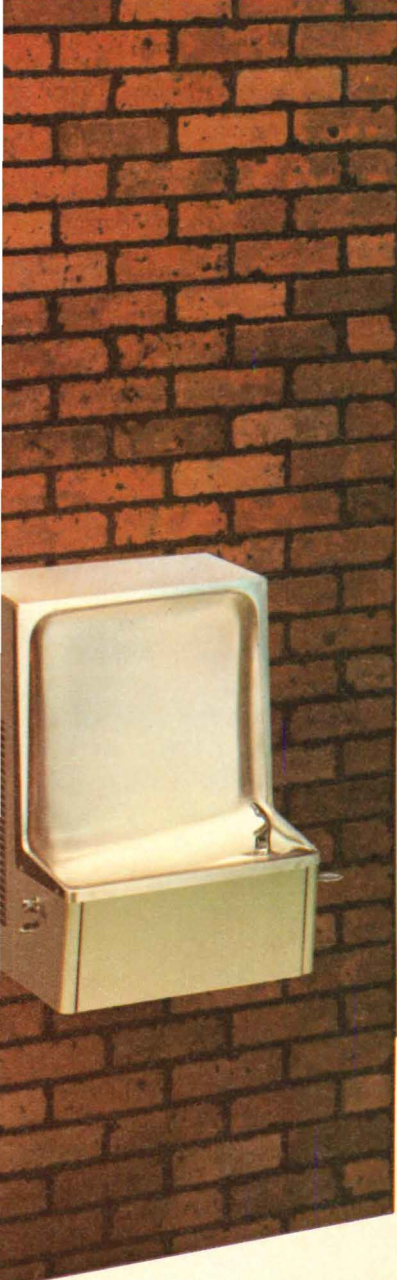
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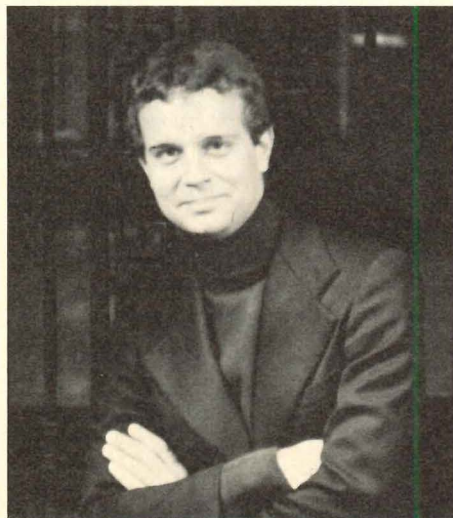
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hoff, Baltimore; the late George Nixon, Chicago; Andrew Place, South Bend, IN.; housing support—the late Ed Gavin, Denver and Paul Shoemaker, Evanston, IL.; governmental—J. Stanley Baughman, Washington D.C. and Sen. John Sparkman, Birmingham, AL.; special—Frank Cortright, Carmel.

## Filler named new P/A interior design editor

Martin Filler, the former editor of Architectural Record Books, a division of the McGraw-Hill Publications Company, has been named associate editor for interior design at *Progressive Architecture*. Filler, who is 28, received his bachelor of arts degree from Columbia College in 1970 and his master of arts degree from Columbia University's Graduate Department of Art History and Archaeology in 1972. He majored in architectural history and was one of the organizers of an exhibition at Co-



Robert Hazzon

lumbia of drawings and prints by Giovanni Battista Piranesi; Filler also was a co-author of the exhibition catalogue.

His career in publishing began at Teachers College Press at Columbia, and during his three years at McGraw-Hill he edited books by Frank Lloyd Wright, Lewis Mumford, and Charles Moore. His writings on architecture and design have appeared in *Architectural Record* and other publications.

## Personalities

William J. White has been named general manager, New Community Development Corporation, Department of Housing and Urban Development, Washington, D.C.

Richard B. Oliver has been named curator of design for the Cooper-Hewitt Museum, The Smithsonian Institution's National Museum of Design, New York.

Ada Louise Huxtable, *New York Times* architecture critic and editorial board member, has received the Thomas Jefferson Medal in Architecture at the University of Virginia, Charlottesville.

Carl V. Patton has been named director of the Bureau of Urban and Regional Planning Research at the University of Illinois, Urbana-Champaign.

John A. Quinn has been named assistant director of the bureau.

Douglas P. Wheeler has been appointed executive vice president of the National Trust for Historic Preservation, Washington, D.C.

[News report continued on page 45]

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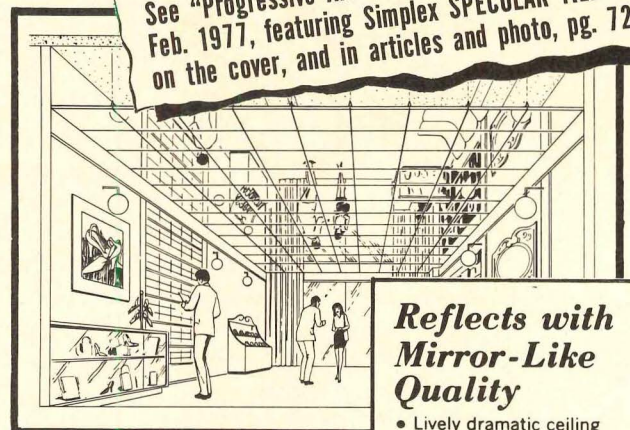
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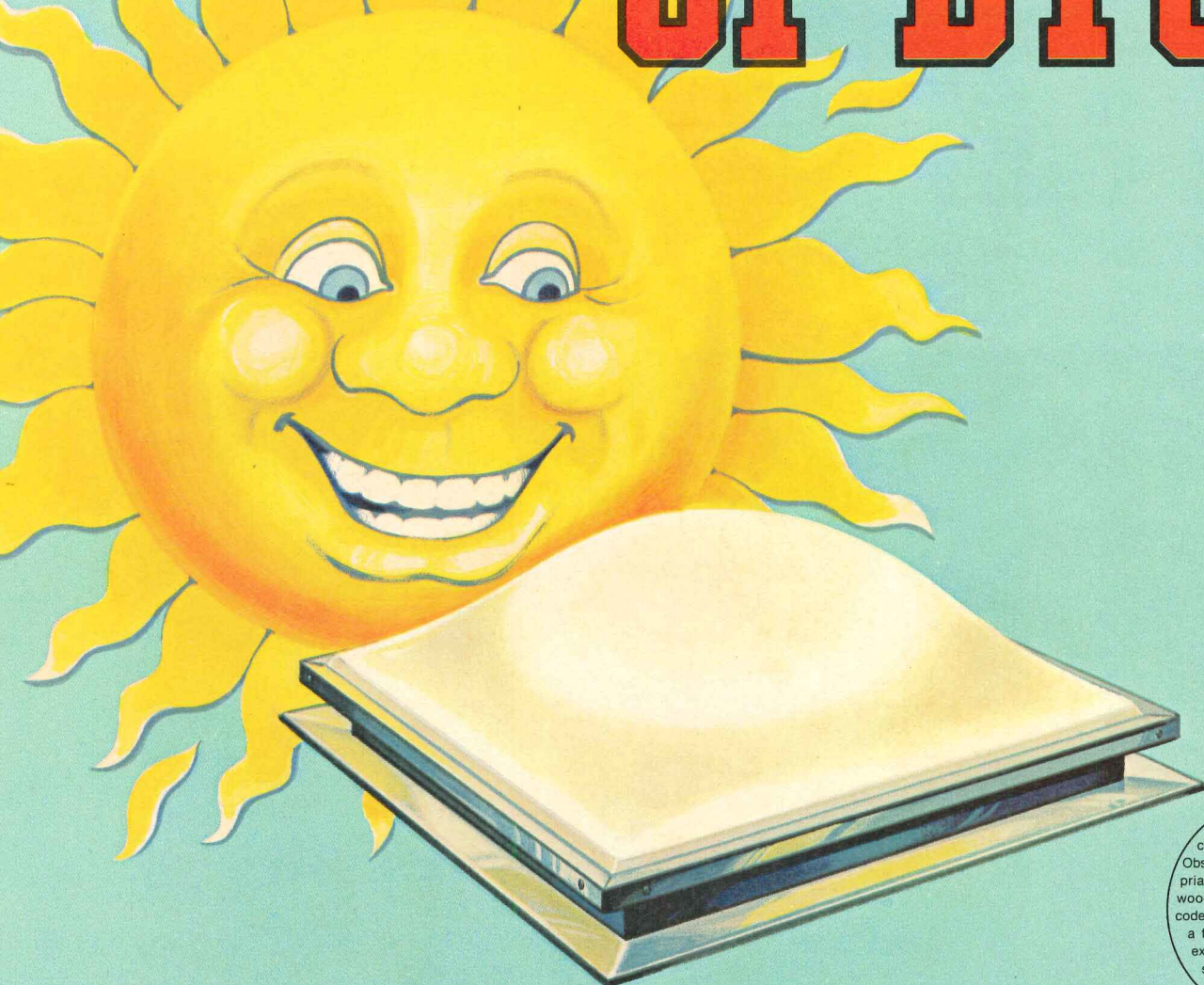
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# Steel frame saves \$2,000,000 for New Court Facility in District of Columbia

**Problem:** The efficiency of Washington, D.C.'s courts was severely hampered by having its various courtrooms housed in several buildings. The arrangement proved particularly cumbersome to its 1,100 employees.

**Solution:** Design a 700,000 sq ft building to house the required 45 courtrooms, judges' chambers, and various support areas. And, at the same time, provide completely separate circulation patterns for the judges, the public and general staff, and for prisoners.



Bethlehem furnished approximately 5,000 tons of ASTM A572 Grade 50 high-strength steel for the courthouse. Joints were designed using A-490 (friction-type) bolts. Steel frame weight: 11.98 psf.

**Owner:** Department of General Services, Washington, D.C.  
**Architect:** Hellmuth, Obata & Kassabaum, P.C., Architects, Washington, D.C.  
**Structural Engineer:** Jack D. Gillum and Associates, New York, N.Y.  
**Fabricator:** Montague-Betts Company, Inc., Lynchburg, Va.  
**Construction Manager:** Gilbane Building Co., Inc., Providence, R.I./  
Paul R. Jackson Construction Co., Inc., Washington, D.C., Joint Venture.





The courthouse features completely separate circulation patterns for judges, for the public and general staff, and for prisoners. The \$40-million structure consists essentially of two buildings connected by an elevator bank on one side and a circulation corridor on the other, creating an atrium in the center.

### Steel found most economical

Several design schemes in both structural steel and reinforced concrete were evaluated by the construction manager during the preliminary design phase. It was concluded that \$2,000,000 in structural costs could be saved by using a high-strength structural steel frame. The savings result from (1) lower on-place materials costs, (2) time saved in erection, and (3) lower foundation costs due to the lighter steel structure.

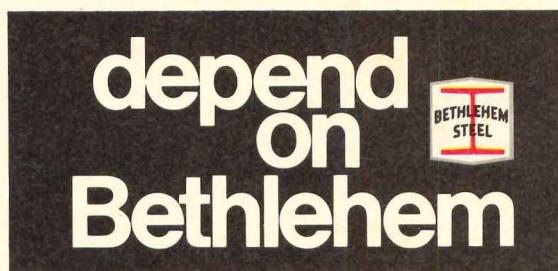
Tight budget limitations required that the project be fast-tracked to telescope the design and construction periods. By reducing overall construction time, maximum area could be provided for the funds available.

The designers were also able to take advantage of steel's excellent flexibility during the design/construction process. By making adjustments through early insights into field conditions, the designers were able to increase design quality, while decreasing costs.

### The framing scheme

The framing scheme consists of 3-in.-deep composite metal floor deck, utilizing electrified cells as required, supported by composite steel beams spaced at 10 ft 4 in. on center.

Lateral loads are transferred to the columns by 16 wind bracing towers (8 in each direction) located in the cores. Double angles, field bolted at their ends and centers, are used for the cross bracing. Typical bays are 31 by 31 ft and 31 by 62 ft.



Bethlehem provides a broad range of technical and advisory assistance programs. For example, our preliminary frame analysis program is designed to help you develop the most efficient steel frame for your building. You and your client will receive the most benefit if it is conducted before finalization of architectural parameters. This way, our Buildings Group and your structural engineer can develop an optimum frame design.

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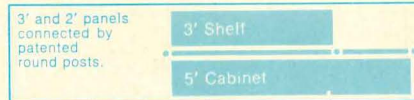
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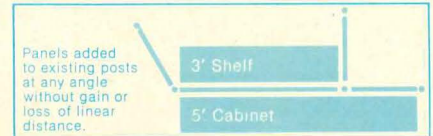
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**News report** continued from page 40

**Robert T. Dormer** has been appointed executive vice president of the New York State Urban Development Corp. **Frank S. Kristof** has been named vice president-planning, program development.

**Julian H. Levi** of the University of Chicago has been named to an advisory board on planning for growth and development of the U.S. Capitol, Washington, D.C.

## Calendar

**Through July 10.** "Improbable Furniture," La Jolla Museum of Contemporary Art, La Jolla, CA.

**Through July 17.** "200 Years of American Architectural Drawing," Cooper-Hewitt Museum, New York City.

**Through Aug. 14.** "Calder's Universe," Walker Art Center, Minneapolis, MN.

**Through Sept. 11.** "Palladio," Cooper-Hewitt Museum, New York.

**June 20-22.** Construction Specifica-

tions Institute convention and exhibit, Denver, CO.

**June 22-24.** NEOCON, National Exposition of Contract Interior Furnishings, Merchandise Mart, Chicago.

**June 24-26.** Toward Tomorrow Fair '77, University of Massachusetts, Amherst.

**July 11-16.** National Society of Professional Engineers annual meeting, Anaheim, CA.

**July 13-17.** Institute on design of environments for the elderly, sponsored by the Gerontological Society, University of Notre Dame, Notre Dame, Ind.

**July 15.** Deadline for entries in the Red Cedar Shingle & Handsplit Shake Bureau/AIA Architectural Awards Program, Bellevue, WA.

**July 22-25.** American Society of Interior Designers national conference, Houston, TX.

**Aug. 1-5.** Course on designing for winds, tornadoes, and hurricanes, Institute for Disaster Research, Texas Tech University, Lubbock.

**Aug. 24-28.** Society of Architectural Historians annual tour, Upper Hudson Valley, NY.

**Aug. 31.** Deadline for entries in the P/A Awards program.

**Sept. 5-10.** International Federation for Housing, Urbanism, and Territorial Planning congress, Geneva, Switzerland.

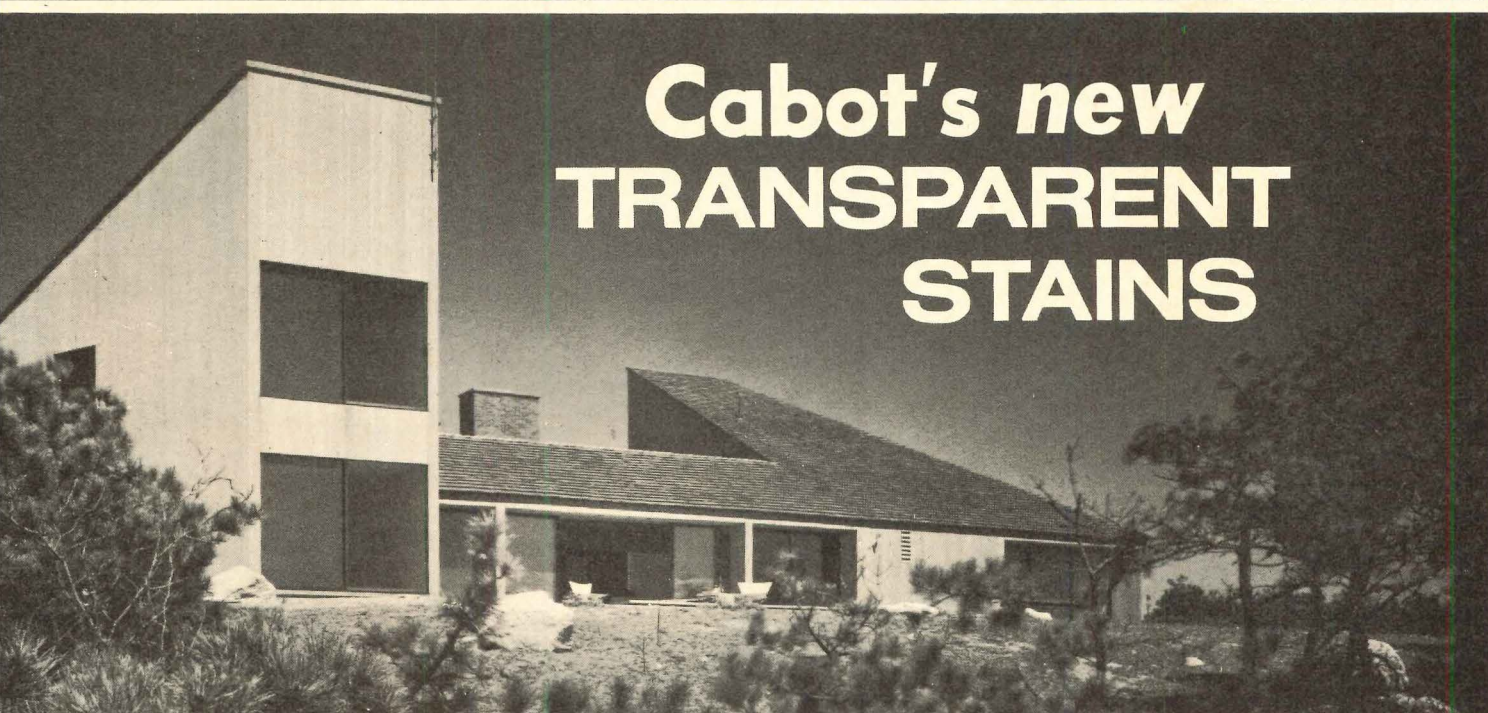
**Sept. 14-18.** First international conference on the history of urban and regional planning, Bedford College, London, England.

**Sept. 19-24.** ICSID 10, International Council of Societies of Industrial Design Congress, Dublin, Ireland. Send registration by July 16 (fee slightly higher after that date) to ICSID 10 Congress Secretariat, 44 Northumberland Rd., Dublin 4, Ireland.

**Oct. 10-13.** Producers' Council national conference, Williamsburg Inn, Williamsburg, VA.

**Oct. 24-28.** First International Conference on Energy Use Management, Tucson, AZ. Organizers are University of Arizona and Interdisciplinary Group for Ecology, Development and Energy.

**Nov. 1-3.** Second annual Building & Construction Exposition & Conference, McCormick Place, Chicago, IL. [News report continued on page 48]



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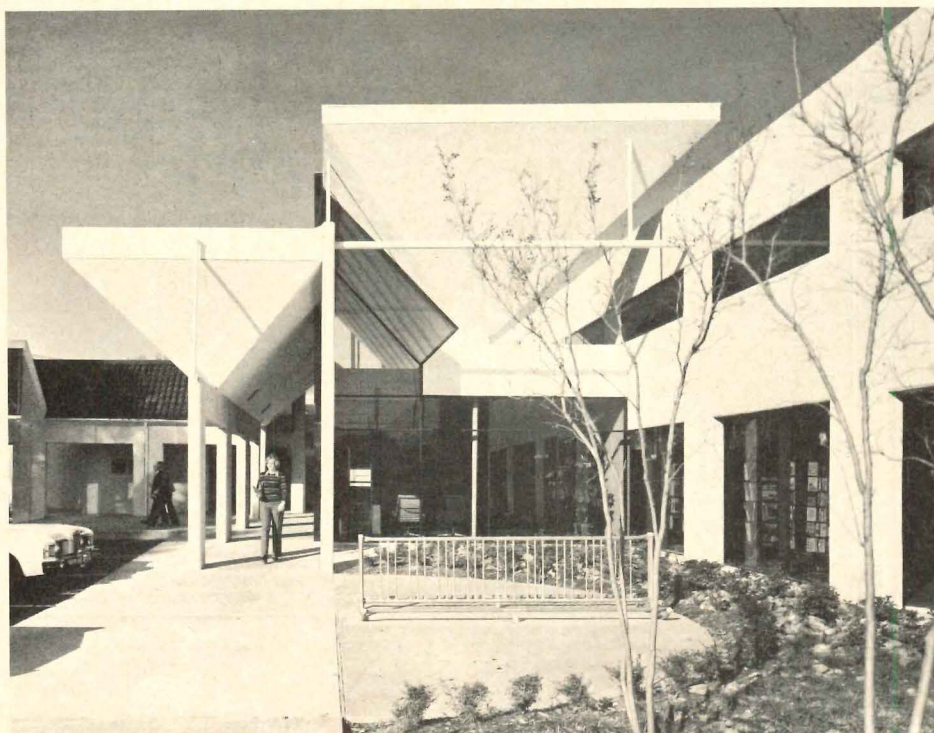
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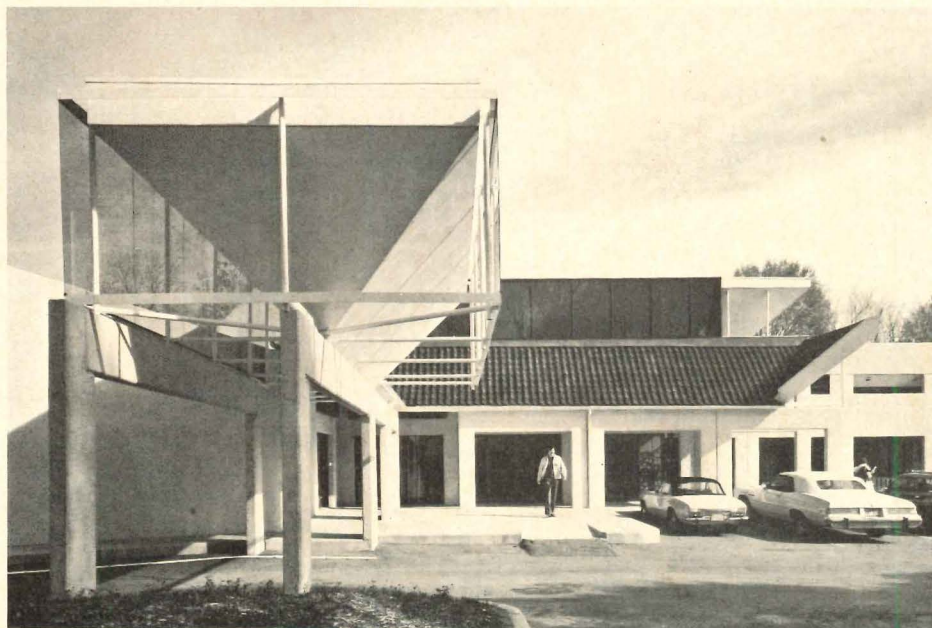
# In perspective



Photo: Richard Payne



Houston Public Library branch by Phillips & Peterson.



## A different literary angle

Frequently the presence of an "architect designed" building in a fairly everyday context creates an apparent dichotomy between "art" and "life." Institutional buildings often underscore this separation, but the J. Frank Jungman branch of the Houston Public Library by the firm of Phillips & Peterson deliberately attempts to sympathetically settle the differences.

The challenge was a bit awesome. A strict municipal budget characterized the program, which was to be sited directly on Houston's Westheimer strip. Irving Phillips saw his task to deal with the strip's vocabulary as one that was "gaudy and boisterous with questionable taste but familiar, and for better or worse, memorable to the majority of the population."

A direct, shopping-center technology was applied to the major stack and reading room areas while greater consideration to design details was given to the small neighborhood auditorium, main lobby areas, and the entry. Phillips set out to "gather the materials of the neighborhood," and he presents a building which both inflects at an angle to the major direction of vehicular movement and contains a collage of formal references to the surrounding franchise and strip commercial buildings.

Included among these elements are zoomy forms which trumpet the entrance and blue tiles that frame the approach. All this is to compete effectively in the existing visual environment inducing the viewer to "read" rather than "eat"—perhaps a metaphorical reference to literature as food for the mind. [Peter Papademetriou]



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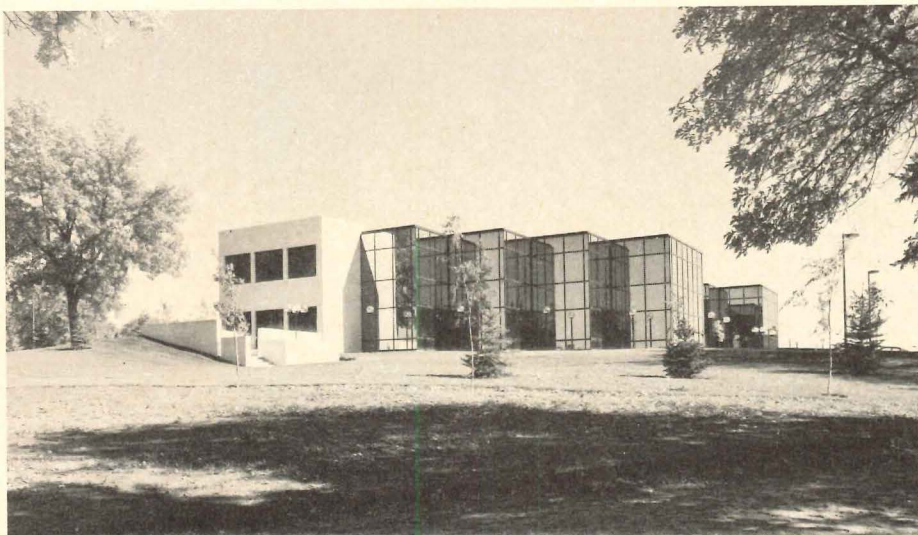


**herman miller**





Bank interiors first award, by Sanford Hanauer.



Joel Strasser

North Dakota honor award: headquarters by Koehnlein Lightowler Johnson

## Hexter 'Interiors of the year'

First Award winner in the nonresidential category of the S.M. Hexter Awards for "Interiors of the Year" is architect Sanford Hanauer of Syosset, N.Y. for the Heritage Federal Savings & Loan Association branch office in Huntington, N.Y. The Cleveland-based Hexter company deals in fabrics, wall and floor coverings. This is the 19th year it has sponsored the competition.

The five-member jury selected the winner for consistency in the use of color and design elements. The four-teller Heritage Federal office was created in an existing, 24' x 31' space. The First Award winner in the residential category is Robert Ledingham of Vancouver, Canada, for an entry/living-room/dining room created in a house built in the 1950s. The jury stated this winner showed great elegance with no jarring elements. Two honorable mentions in the nonresidential category went to Peggy Nye of Design Matrix, a division of Ferendino, Grafton, Spillis, Candela of Coral Gables, Fla., for her design of the courtroom for the State's Third District Court of Appeals, Miami, and for the court's library. Honorable mentions also went to Robert DiLeonardo of Cranston, R.I., for a restaurant/lounge in the basement of a 100-year-old building near the waterfront; and to Stuart Glass of New York for a photography studio created in a loft space.

Honorable mentions in the residential category were received by Georgia Roulo of Chicago, Ill., for her own multifunctional living space in a high-rise

apartment building; and to Juan Montoya of M.I.W. Design Co., New York, for a study/sleep/entertainment space in a Manhattan apartment.

Jurors were Joan Blutter of Chicago, foreman; Albert Hadley of New York; Bruce Rabbino of New York; Paige Rense of Los Angeles; and Otto Zenke of Greensboro, N.C.

## North Dakota AIA honor awards

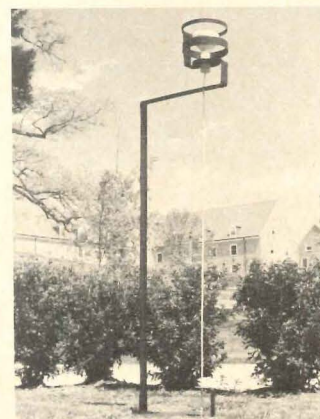
Recipients of honor awards in the 14th annual Design Awards program of the North Dakota Chapter of the American Institute of Architects are Koehnlein Lightowler Johnson for the American Crystal Sugar Co. headquarters in Moorhead, Minn., and Mutchler, Twichell & Lynch for the home economics building at North Dakota State University, Fargo, N.D. The only two merit awards conferred also went to the Mutchler, Twichell & Lynch firm for two other Fargo buildings: the Michael Herbst residence and the firm's own office building. Jurors were Minneapolis architects Leonard Parker, John Rauma, and Bruce Abrahamson.

## 'Hands on Steel' reaches first decade

"Hands on Steel" should be familiar to architectural graduates of the last ten years: it's a program operating in 18 schools, and its purpose is to give firsthand knowledge of the properties of steel to architectural students. The program, begun a decade ago, is co-



Award building by Mutchler, Twichell & Lynch.



Steel lamp project, U. of Maryland.

sponsored by the American Iron and Steel Institute and the American Institute of Steel Construction.

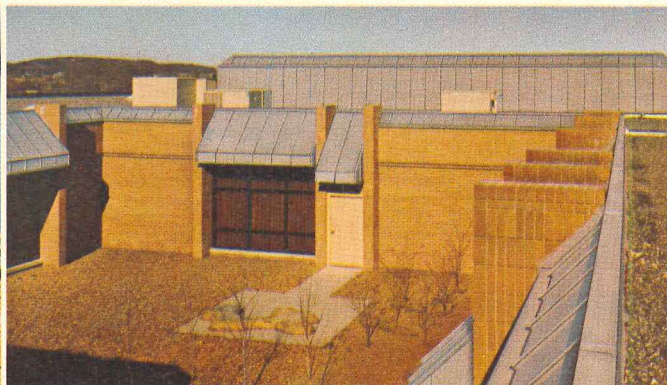
Some projects include a courtyard cover at Clemson University; steel sculpture at the University of Nebraska; a tensegrity mast at State University of New York at Buffalo.

Schools cooperating with the "Hands on Steel" program are free to organize it either as a competitive effort among individual students or as a class project. As part of the program, teachers receive assistance in the form of field trips to job sites and steel fabrication plants and help in selecting raw materials.

[News report continued on page 54]



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Karns School, Knoxville, Tn., Architect: Guay & Associates, Inc., Installation: Tri-State Roofing Co., of Tenn.

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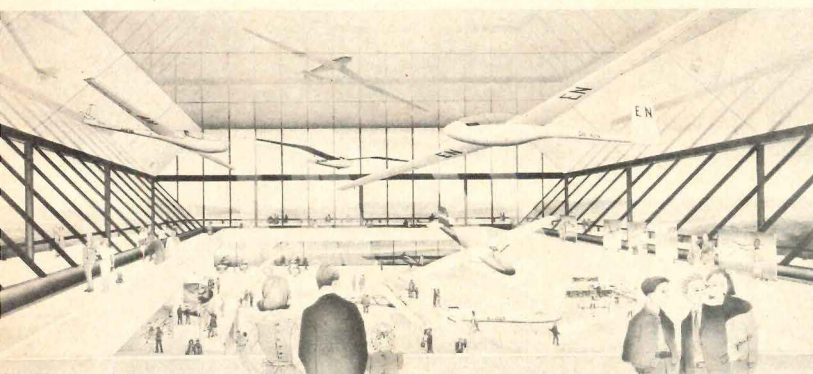


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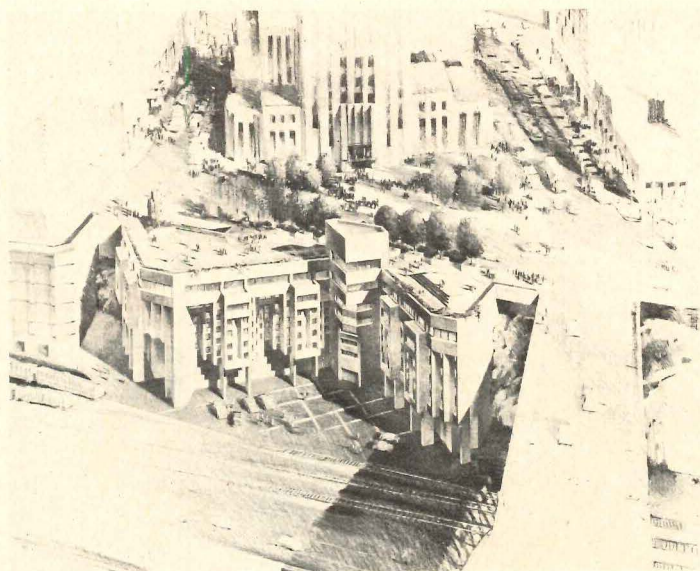


# In progress



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Allen Mitchell



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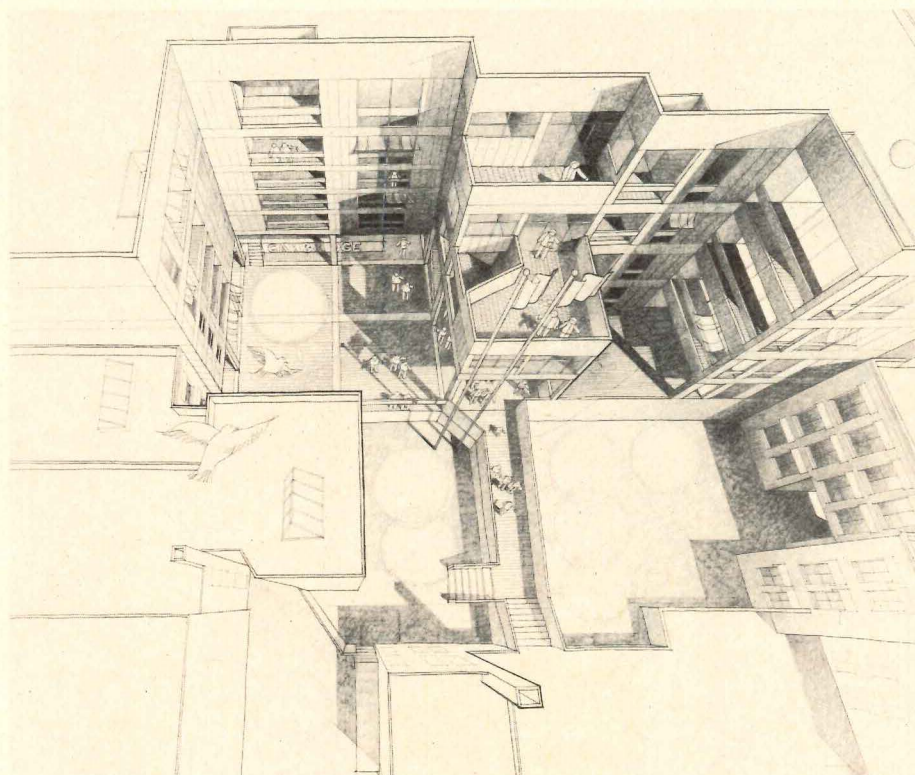


3



4

Gerald Ratto



5

**1 Soaring museum**—Proposed for a hilltop site in Elmira, N.Y., is the National Soaring Museum, to be constructed of tubular steel; windows are canted at deck level to prevent direct incoming sun rays. Architects are Eliot Noyes & Associates of New Canaan, Conn.

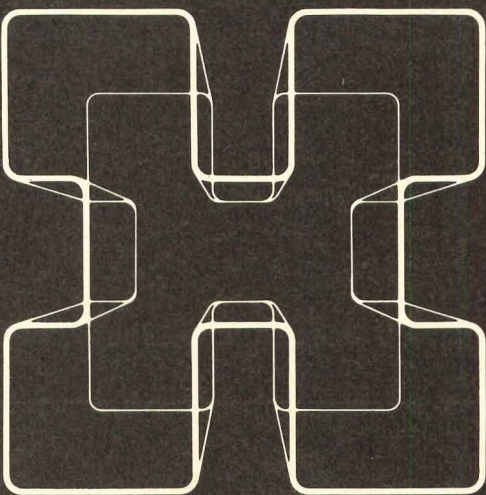
**2 Adult detention center**—A court and security facility for Ramsey County, Minn., is under construction along the Mississippi River in St. Paul. The building, by The Wold Association of St. Paul, backs into the river bluff; it connects with the nearby courthouse, and public entry is from a plaza at the top.

**3 Urban park stage**—The Milwaukee County Park Commission has asked architects Chrysalis East to design a stage for a large urban park in Milwaukee, Wis. The solution is a two-sided pre-stressed membrane structure supported by a steel space frame. Dressing rooms and storage are enclosed in space below the stage.

**4 Key Biscayne condominiums**—Under construction in Miami is the first phase of a 1230-unit condominium project—Fininvest, Ltd., developer—by the architectural firm, Donald Sandy Jr., James A. Babcock of San Francisco. The first 286 units will be finished around mid-1978. All parking will be in a garage beneath the condominium structures.

**5 Hebrew center**—Stull Associates of Boston has designed an \$8 million elderly housing project under construction on an oceanside site in Revere, Mass. The sponsoring group for this development funded with federal 236 assistance, is the Hebrew Rehabilitation Center for Aging. Since the site is remote, the center is contributing \$25,000 towards installation of service facilities along a mini mall on the ground floor. Amenities will include a social room with fireplace, kosher kitchen, and a dining room seating 325. A pure white cement asbestos panel so dense that it resists salt air will be the cladding over masonry bearing walls. The building will step down to a beach elevation two or three stories from a height of nine stories.





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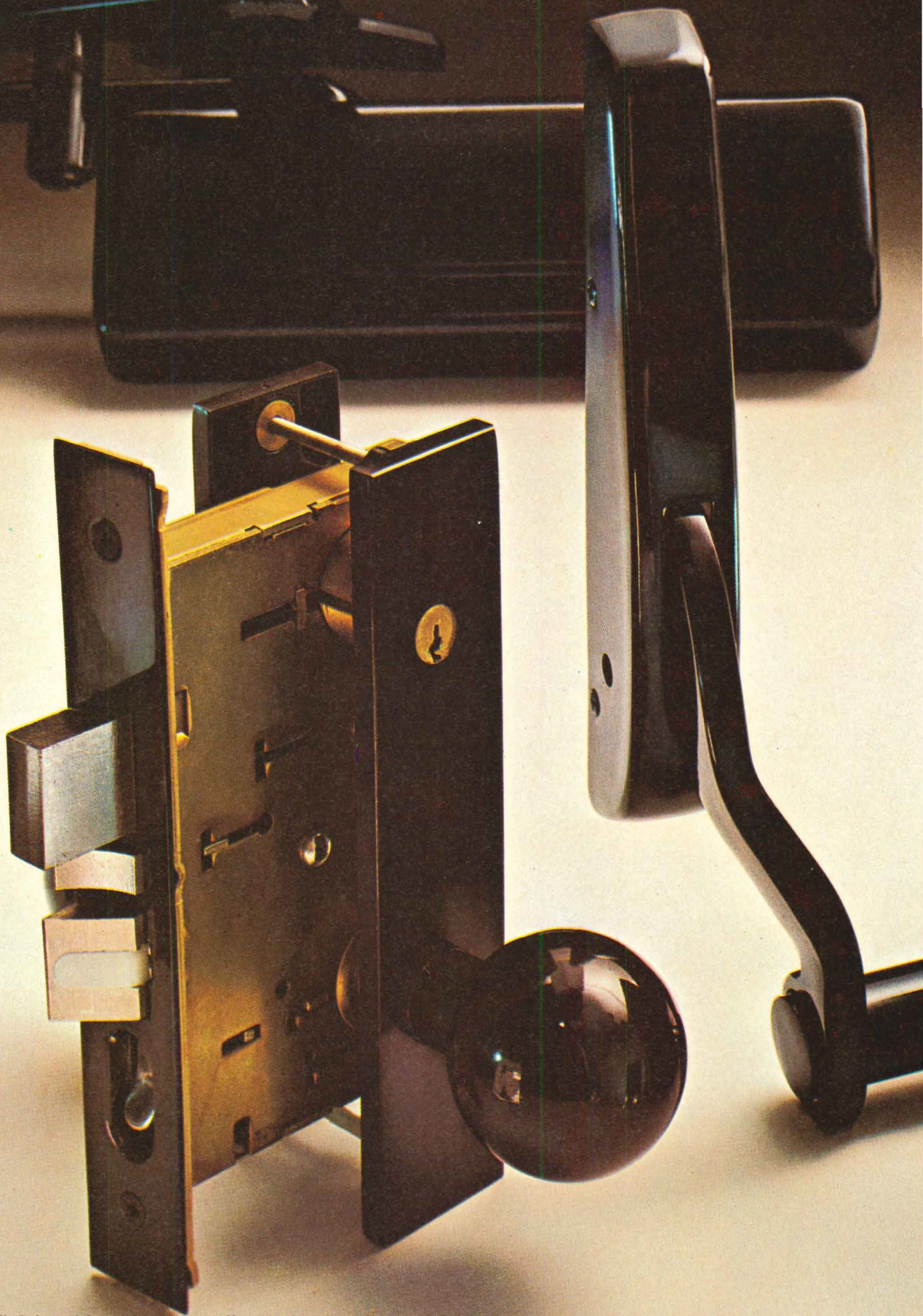
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# House VI

**A weekend house by Peter Eisenman is interesting from three viewpoints: as a theoretical exploration, a formal construction, a programmatic solution. P/A asked the architect, a philosopher, and a sociologist to comment.**

## Peter Eisenman:

**Author:** Peter Eisenman is an architect and director of the Institute for Architecture and Urban Studies, N.Y. These excerpts will appear in *House of Cards*, to be published by Oxford University Press in March 1978.

John Hejduk has said that House VI is the "second canonical De Stijl house," but for me this perception tends to overlook or obscure the basic intentions of the house.

There seems to be a limited number of spatial relationships that can be considered archetypal—that is, pertaining to the basic nature of space itself and to our potential capacity to conceive these relationships. For example, notions such as "frontal" and "oblique" describe a basic relationship in space. While there seem to be an unlimited number of what might be called spatial strategies in any singular stylistic development certain sets of these

strategies seem to confirm certain aesthetics. For example, De Stijl houses exhibit a marked preference for conceptually dense centers—that is, the understanding of the formal vocabulary originates at the center—and for horizontally vectored space—space which emanates from the center in horizontal vectors rather than planes. On the other hand, in many of Le Corbusier's early houses—Garches, Cook, Citrohan, etc.—he prefers a dense edge condition and a frontal, vertical planar layering. When these pairings become frozen, accepted as architectural canon—that is, something beyond style—they become imbued with an aesthetic imperative rather than being taken for what they are: singular, stylistic manifestations. Because of this imperative, certain strategies are often thought to be mutually exclusive; for example, a dense center seems to demand a sparse edge, and vice versa.

A consideration of a number of these seemingly mutually exclusive or opposing spatial strategies revealed that merely by inverting the accepted canon certain other spatial strategies would present themselves. For example, it is possible to work with both a dense center and a vertical layering of space (as opposed to a dense center with horizontally vectored space). This proposition of inverting the accepted canon was a first step in the development of the architectonic program for House VI.

My first four houses were essentially variations of white cubes: they were hermetic, self-contained environments. While

A drive through the five-acre site ends at east elevation, with entrance on north side around corner.

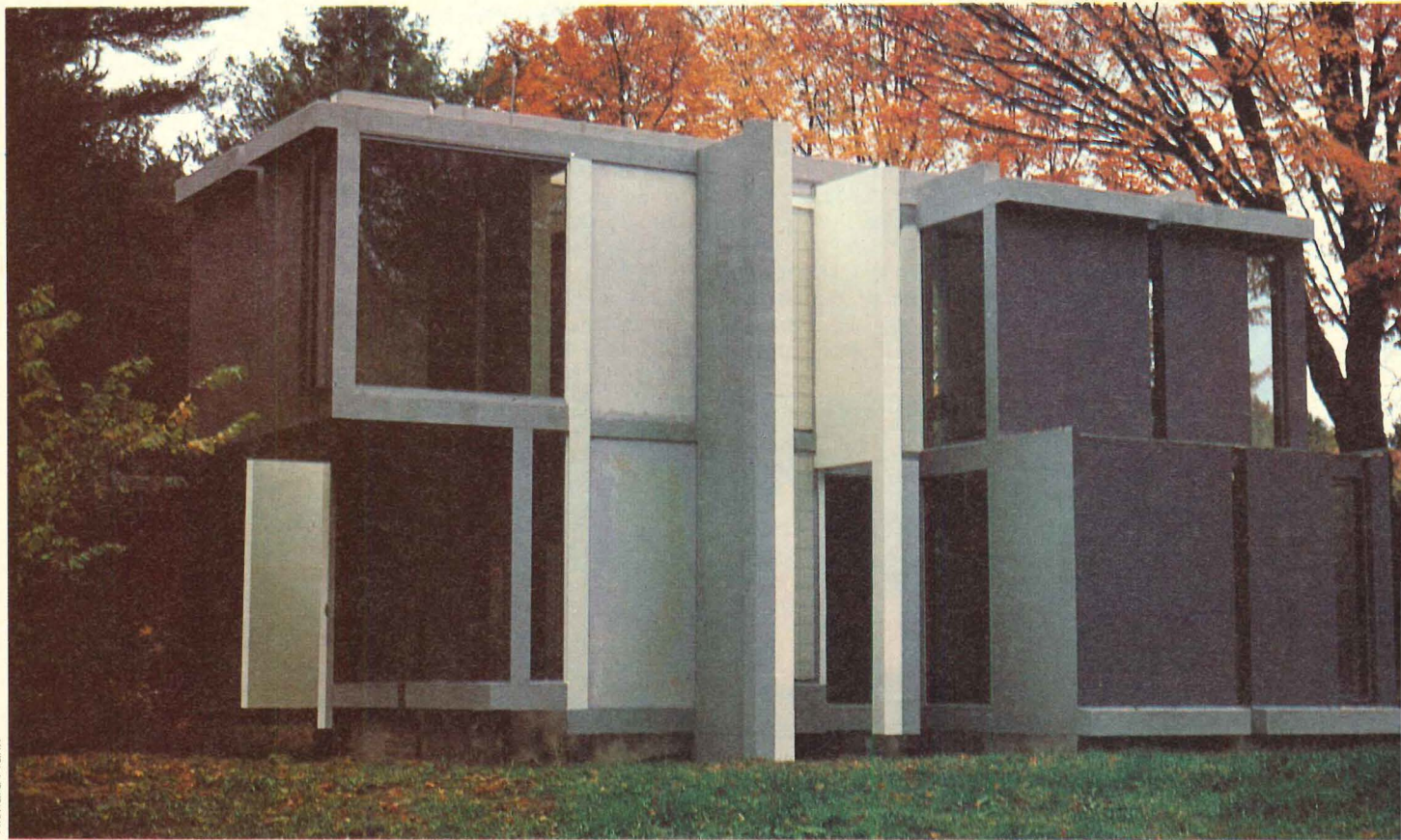
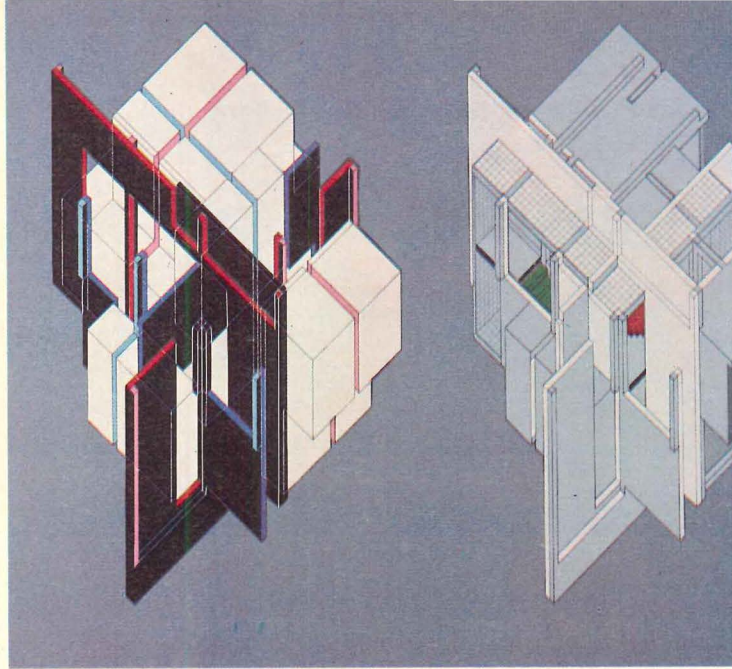




## House VI

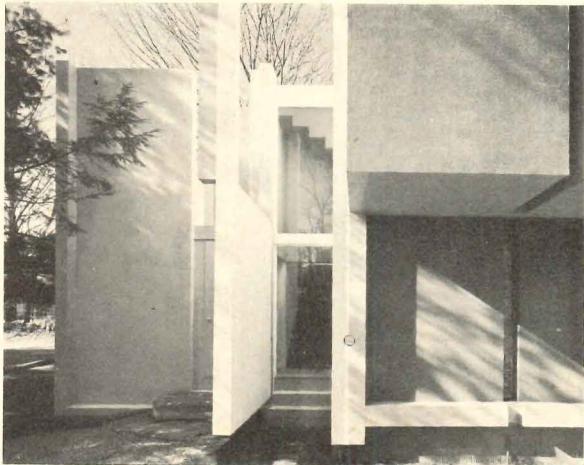
Figures (right) summarize entire sequence of transformations of planes into volumes. Drawing on right represents actual building; one on left, the coded notation. Notation drawings show two reciprocal transformations: the actual transformation through the development of a volume; and the signification of that transformation by means of an identical volume, located in a reciprocal relationship with respect to a diagonal axis (perpendicular to page), which acts as a marking of the first.

The quadrants marked by the red and blue armature are given a notation of 0-1-3-2 (clockwise from entry). The transformation of planes into volumes works in the following manner: In quadrant 0 there is no volumetric transformation or marking; in quadrant 1 there is one transformation and no marking; in quadrant 2 there is a second level of transformation with two sets of volumes; in quadrant 3 are the markings of the first and second transformations plus the initiation of a new sequence through a third unreciprocated volumetric transformation. Each marking represents only itself and its reciprocal transformation about a diagonal axis. It has no meaning outside this architectural sequence. It is signification without meaning.



Richard Frank

Rear elevation, facing west (above), entrance in north elevation, (below), and south elevation (below right).



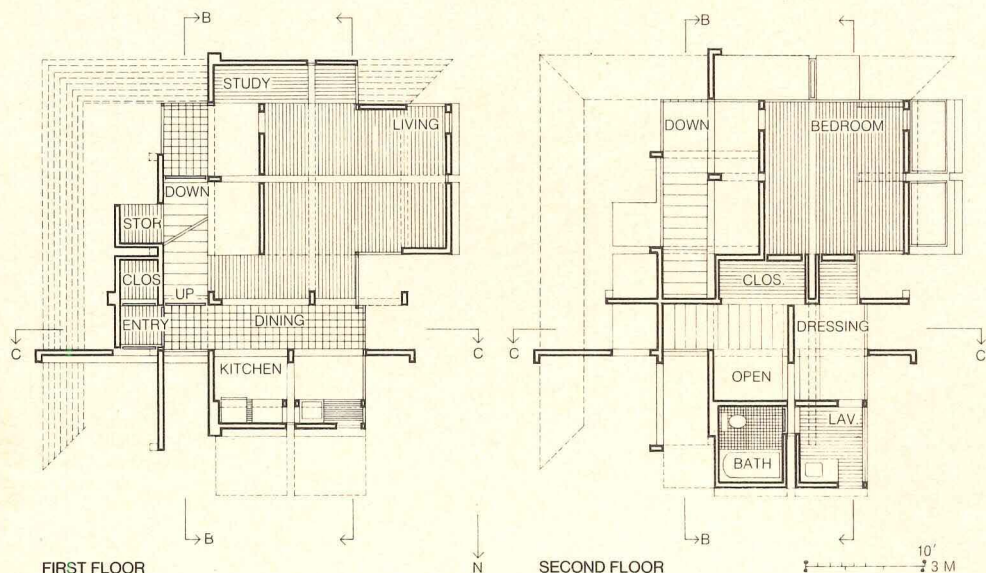


it was not apparent at the time, they contained many preconceptions which upon reflection seemed to me to be culturally conditioned. The inversion of these preconceptions in House VI seemed to make it possible to look at the nature and meaning of, say, a façade or a plan in a new way, and thus to cast some light on aspects of architecture previously obscured.

The idea of inversion also suggested a more general proposition: that is, the detachment of the fundamental modes of conception and perception. These two operations are usually assumed to be simultaneous and corresponding. For example, most De Stijl propositions are both perceived and conceived from the oblique. One has only to look at a number of drawings or photographs of De Stijl houses to understand this point. They have no façades or, more appropriately, no frontal, vertical reference planes. Conversely, the houses of Le Corbusier—in particular Garches, and to a lesser extent Poissy—are conceived and perceived frontally. Now, if one takes an object that is frontal and experienced frontally and overlays it with an oblique conception, this traditional correspondence of conception and perception tends to be broken or inverted, and a new relationship between traditionally exclusive attitudes can be created.

Therefore, despite a certain superficial and metaphorical resemblance to De Stijl, House VI is actually an inversion of many De Stijl ideas. Moreover, its energy is directed to the reduction of metaphor. For example, although House VI implies a horizontal datum at a vertical midpoint, a characteristic of De Stijl, De Stijl architecture used this shifted datum as a metaphor of weightlessness and a polemic against the presumption of gravity. But House VI uses the horizontal datum lifted off the ground plane merely as a mark or a visual cue: first, to signal a series of formal inversions—right side up and upside down, inside out and outside in; and second, to mark a diagonal axis that passes through this horizontal datum above, then below, the crossing of the planar armature. This midpoint horizontal datum is intended to unload the *actual* density that exists at the edges of vertical planes in order for these edges to take on, inversely, a conceptual density. The midpoint horizontal datum also makes for a further detachment of perception (experience) and conception, since experience takes place mostly from the ground plane.

Furthermore, there is almost no vertical datum in De Stijl architecture despite the use of vertical planes. In the houses by van Doesburg, van Eesteren, and Rietveld, the vertical and horizontal planes are arranged in a pyramidal fashion; the center is always the highest point of the composition and the vectors move out and down in space. Thus, in both the horizontal and vertical plane the emphasis is on the center as the focus. In fact, there is little distinction made between the horizontal and vertical. In House VI, however, the horizontal dimension (the plan) is dense centrally and



the vertical dimension is layered frontally with stress at the periphery.

Another inversion, which again has nothing to do with De Stijl, is also suggested. My first four houses had no exterior context. This seemed to imply certain preconceptions. What was a façade? Why should it be on the outside? Was it a cultural or formal referent? Would it be possible to invert the conception and reality of the façades of the first four houses and place them in the center and throw the interior space to the 'outside'—in other words, to turn the white boxes inside out and thus have conception begin at the center? That is, one would walk through the space to come to the 'entry' (or beginning) of conception. Hence, one marked for the first time the notion of outside (white) as inside; and inside (gray) as outside. A similar notation was developed for back and front, whereby the backs of surfaces were articulated and, conversely, the fronts of surfaces made smooth.

Finally the overall concept and, in fact, its generation were from an oblique or diagonal set of references; yet the actual physical presence of the building is meant to be experienced from an orthogonal or frontal set of references. Thus, the physical object's initial perceptual experience corresponds to kinesthetic experience. Yet the conceptual structure of the house cannot be understood from any physical movement or perceptual experience; it is instead formulated only from a reference point outside the house.

House VI, then, represents a change. In House II and IV the architectural notations existed to produce a mental landscape, to suggest an alternative reality and an alternative experience and meaning of architecture. But in House VI, the experience of the physical environment does not lead to any mental structure—the experience is, in fact, quite the reverse. Once the conceptual structure is understood, it detaches itself from the initial physical experience. Thus, the marking in space is not merely an end in itself, or the parts to a puzzle, which when understood complete the experience; rather the marks lead to a

structure that modifies experience. In House VI, in other words a particular juxtaposition of solids and voids produces a situation that is only resolved by the mind's finding the need to change the position of the elements. This mental attempt to reorder the elements is triggered by the precise size, shape, and juxtaposition of these elements. This produces within the mind a sense of a tension or a compression in a particular space that is not created through the juxtaposition of real walls, but is instead in our conception of their *potential* location. The sense of warping, distortion, fluctuation, or articulation occurs because of the mind's propensity to order or conceptualize physical facts in certain ways—such as the need to complete a sequence A-B, or to read symmetries in a straight line about a fulcrum or along a diagonal line in relation to a datum.

Finally, the diagrams for House VI are symbiotic with its reality; the house is not an object in the traditional sense—that is the end result of a process—but more accurately a record of a process. The house, like the set of diagrammed transformations on which its design is based, is a series of film stills compressed in time and space. Thus, the process itself becomes an object; but not an object as an aesthetic experience or as a series of iconic meanings. Rather, it becomes an exploration into the range of potential manipulations latent in the nature of architecture, unavailable to our consciousness because they are obscured by cultural preconceptions.

In such a process the architect becomes detached from the object. He is no longer the originating agent, but merely acts discursively to excavate and interpret this latent nature.

All transformations do not make architecture. Architecture is based on a dialectic between what is real and what is virtual. Architecture is the synthesis or transcendent state that arises out of that dialectic. This synthesis can only take place in the mind. Design involves creating the necessary conditions of dialectic between virtual space and real space. House VI proposes that dialectic. □



## William Gass:

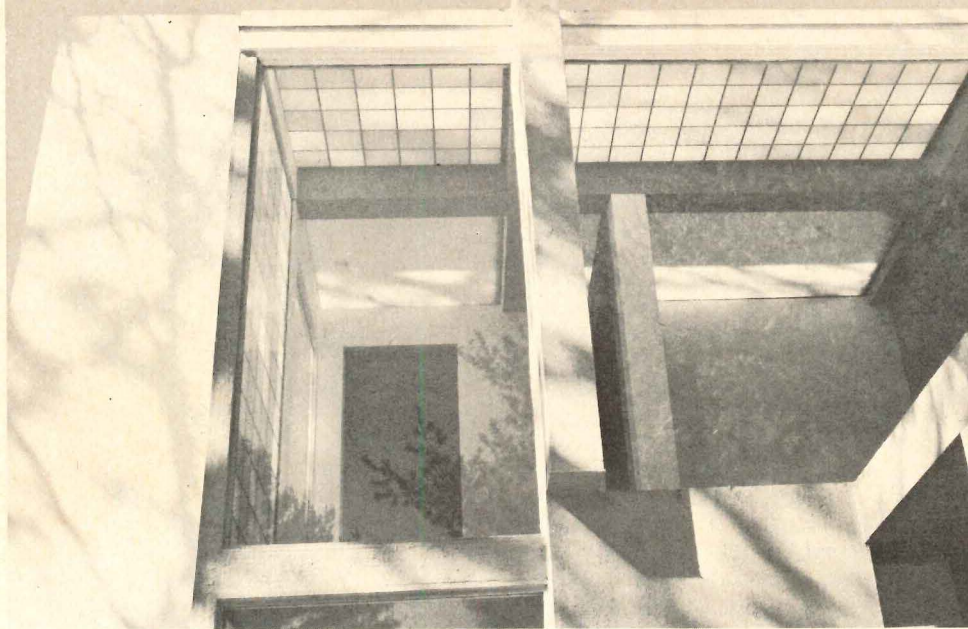
I tried to remember if I'd ever seen a house without a façade, or a house where a wall emerged like an elbow through a jacket, but on this day I was to be an animal, all eye, and impressions would follow one another too thickly for thought or recollection. A light spring rain had begun to fall and the air was cooling rapidly. Moisture seemed simply and suddenly present on things—like sweat on a highball glass. The heavy streaming sky was not an altogether happy omen, and the gravel under our feet had already lost some of its crunch.

I had read enough to know there'd be surprises. The building was theoretically aggressive and raised as many issues as the walls of which it spoke so eloquently. I was afraid it might be an unrealized idea, a thought without a body. My experience with the other arts had convinced me that the deepest concern for the medium was all that mattered; that theory was sometimes a helpful crutch but often simply a screen; that intention was nothing and execution everything; that a purely conceptual art was a contradiction and a fraud. My prejudices remained firmly in favor of the craftsman, the builder, the patient mason of space like the bee, because I knew that even in philosophy the best thinking has always been done by hand. Of course mindlessness is never a virtue, and every work of art must have all the qualities of demonstrator. But would I find myself in a place of peaceful confirmation, or walking instead on uneasy planks of polemic, surrounded by cubits of hectoring concepts as though by those unique architectural demons who devour time to excrete space, and scream through both acts like eagles?

Sure enough, we entered in on an angle, stepping across a large ungainly stone put there by the owners. Perhaps this rough rock would fasten the house more firmly to the site, soften its abrupt sides. It did not. It was as out of place and yet predictably present as a derelict ragging some subway's dirty stairs. One more normally placid moment would pass before I'd realize that although we had entered, we were still outside, outside the unbalanced cross that constituted the core of the building, two thick planes—the stairwell and dining hall—terminating in translucent panels whose almost modular grids named squares which had combined like cells in the programmed growth of the house.

You see it initially between trees across a ravine (softly white in that grave day's remote light), but what you see first are those two intersecting walls and their attachments, their openings and other rup-

**Author:** William Gass, a novelist and frequent contributor to *The New York Review of Books*, is a professor of philosophy at Washington University, St. Louis, Mo.



Exterior view towards stair landing on second level, east elevation.

Judith Turner

tures—an exterior completely expressive of an inner order. I had to wonder whether the house lived like an insect all its secret life behind its bones.

The serenity and excitement of the house were as immediate as an opened eye. And so was the presence of strangers, interlopers, aliens. Just inside the unfront door a child's toy sat alone on the painted floor like a gull on the sea. Across the house I saw a crib, but this intricate interlace of surface, space and line was a playground for the absolute mind, nothing younger, while the kitchen sink was a cough in the midst of a kiss.

These walls did not guard or shelter or enclose, the windows did not cower to me, or frame scenes, or provide an excuse for drapery. The world of this house was Copernican. Its spaces did not flow from me as though I were their source and center. Its surfaces were not the limits of my sight and movement, places for paintings, shepherds of privacy, backgrounds for my furniture. Nor did the floor exist to support rugs or serve to assure me, always, that I was safe on the hard and even earth.

I was reminded of those quaint old apologies for the universe, those arguments that explained how God had raised grass in tempting green meadows where it would be cropped close by calmly ruminating cows, but only so that shortly there'd be milk for our mouths and calcium for our bones; how He had designed death to create blank spaces for new babies, and put pain in our lives as a welcome warning light and regulator. So that when I had to slide sideways through some spaces and duck my head to climb the stairs (you don't have to be divine to contrive a little clearance, Clarence complained); when I had to watch my step because there were small ups and downs between rooms (what has happened to safety and convenience, Sally asked); when I gazed from a bedroom window to find my view perversely blocked by an especially blank bit of the house itself, a room where there was a stripe of glass across the floor that would allow anyone reclining on the sofa in the living space below a look up the family

skirt (and I tell you something, Charlie, I'm not going to crawl up a ladder just to Windex the ceiling); when I learned I might have a post as a dinner partner, and discovered one door as thick as the wall (well, not a door, really—what the hell is a door in a house like this?), I realized that God might have had something else on His mind when He made the light to appear in the darkness. Perhaps it was the business of man to get used to the matter he was made of, and that perhaps each inconvenience was a bounty paid to Beauty, if not as well to Truth (thoughts that probably made for no better theology, but better art); that in any case this house was the way the world was actually, and, like real space, free men, and Milton's Satan, would not serve.

The court painter was expected to beautify the queen and ennoble the king; the muralist was to squeeze seven scenes from the life of Christ into a trapezoidal darkness; donors wanted their pious physiognomies painted into canvas corners; composers were once expected to create quartets the count could play and minuets the duke could dance to. Architects, of course, were required to do what they were damn well paid for: demands of every kind rained down on them like stones. The Victorian novelist had his patrons too, a vast and sentimental public that wanted romance offered them as reality, the ugly made quaint or curious, evil made shuddery and amusing, a pure and simple goodness, in the end, unbesmirched and totally triumphant.

Thus the artist developed, in addition to his natural skills, the crafts of accommodation, compromise, and indirection. He nagged and whined and begged and pleaded; he flattered and plagiarized and publicized and lied; he pushed and elbowed and crawled and climbed. Meanwhile architects who aspired to independence and to greatness became megalomaniacs and bullies, for they found themselves willynilly in the business of intimidation. Scarcely a building got built on any less rigid or any more secure founda-





Judith Turner

Interior view, second level stair landing.



Translucent panels dramatically alternate with clear glazing in walls to admit natural light.



Richard Frank

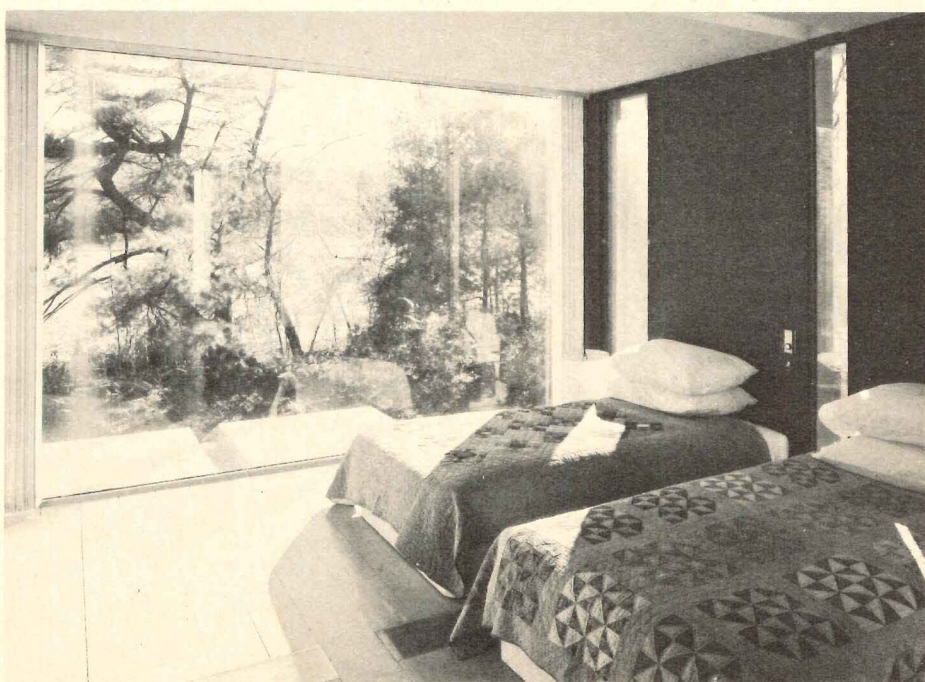
Dining alcove (above), dressing room (below).



View from living room toward kitchen (above); from bedroom to outdoors (below).



David Morton





## House VI

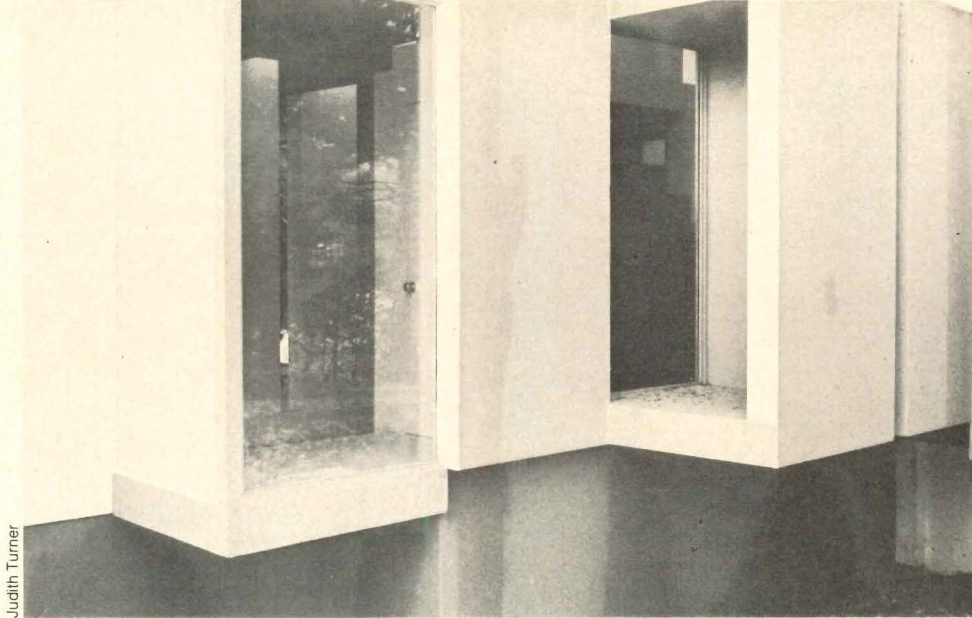
tion than ego; apartment towers and country villas were willed, walls were commanded. Told that their buildings were social statements, architects decided that every edifice should edify; their dreams became epical like *War and Peace*; they would round the world with concrete and enclose the sky in a dome.

The sky so surrounded would be their sky, and their buildings were like nets with you and me as the funny fish, but the structure in which I was presently swiveling my neck did not enclose the body so much as encourage the spirit. It did not welcome or embrace anyone or belong to anyone who might come along, even if he brought the gift of his oohs and aahs. Nor did it belong to the owners who commissioned it, nor to Peter Eisenman who discovered its design, but to the art of architecture whose cause it advanced.

I, for one, would always prefer an architect who had a desire to build—and had many designs for buildings—to one who instead had beliefs about living and a single design on my life. Thank God, I thought, this house has no concern for me and mine, over which it has no rights, but displays in every aspect and angle and fall of light the concern for the nature and beauty of building that is the architect's trust and obligation.

Most of us have had to adapt to other people's houses all our lives; we have had to endure other people's notions of our welfare and ideas of how we ought to live. Buildings gather at our corners the way the curious are randomly drawn to an accident. Even so, this helter-skelter putting up and bringing together and tearing down is often more easily survived than those squares filled with structures which, in their eagerness to help us out, like the slovenly good wife or the knuckle-rapping teacher or the antiseptic nurse, ignore themselves and let their souls slip. So when I saw how adrift that crib was, and when I began to hear the inner speech of all these spaces, and to see even the dis-envelopment of volumes, I immediately felt at home. I realized that this house asked nothing of the mind or the imagination but responsiveness; that it was not a place you could get used to in order to ignore, that it had a utility exceeding those we pay our daily dues to. It was a place to *be*, to *be* beyond the ordinary, to *be* at the apex of being, and I needed that boost, that formal exhilaration. . . . I wanted immediately to move in.

Imagine a cross of roughly the Christian kind drawn upon the ground by some dubious magician. Then imagine a second which is set down in such a way that its bar is parallel to the upright of the first: the pattern produced will resemble two intersecting tracks. If all these lines were to thicken and rise as walls the two principal corridors of the house would have been formed. Next, we must think of the red T as



Judith Turner

Volumes used for storage extend out from vertical fulcrum plane (see quadrant 1, drawing, p. 58).

passing through an opening in the black. Finally, against the arms of these interlocked Ts, the real rooms burgeon the way packages appear in the crooks of our arms. Skylights join the tops of these Ts and seal off the ends, so that the heart of this extraordinary house is formed, if I read it rightly, the way two buildings incidentally make an alley. It is our habit to see enclosing walls as if they had come to create the enclosure. But suppose, in a sense, they just happened to be passing, and their meeting set up some right angles, and in the angles grew rooms like windblown seeds?

I am not suggesting that we think of House VI as an unmeant event (no construction could be less accidental), but I am suggesting that our view of space and the elements that normally define it for us are persistently self-centered and parochial. One should be confronted and shaken by many other changes in perspective. Perhaps they will dizzy and free the mind.

Every element of the geometer's art is variable, relative, plurally significant. To a mouse in a wall, a wall is a room, a set of tiers, a tower. A point can be the criss-cross of countless curves, a lonely location, the needlelike end of an absolute edge. A line, in turn, can be a sliver off the surface of a cylinder, the hinge between two planes, a scratch on a bowl, a crack in reality.

What is a column—for instance, this column which interrupts my dinner? Is it the Roman remnant of a wall? The erasure of a wall? Simply a wee wall, youthful as a sapling? No pure plane ever held up another. Is a wall a row of columns in lockstep? Or are all walls immortal, planes intercepted by matter in space the way moths used to clog the grilles of our cars so that we feel their reality first as plenums, though they've always been voids? It is certainly the case that walls cross these rooms without walling off, their presence felt through a palpable absence. So it is perhaps not proper to consider these columns as columns at all; certainly they are not supports, since we can see one rise without quite reaching, another fall without

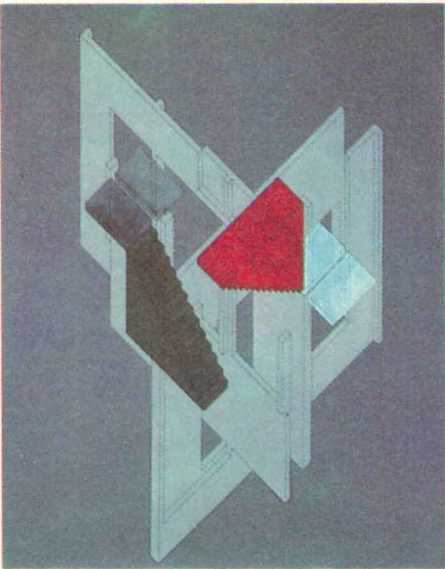
quiet touching down. Only when a column rounds itself like a log can it call itself a column. Then it denies itself any place in a plane. Maybe those beams, though, so stubbornly rectangular, are the momentary materialization of a wall—the invisible man's Achilles' heel—a physical weakness in a world of conceptual strength.

Not only do we expect every region of a room to relate like dear old mom and daddy to us—solicitous, forgiving, fond. We believe each element is a word that speaks its function, so that if we were wealthy and had a staff, the butler, chef, and chambermaid would be gathered before us every morning to do our bidding, not because they were a troop of clowns, a family of any kind, people who might be importantly connected, but only because we had hired the lot and tied them to their tasks with uniforms that told on them as bluntly as bathrooms. Aren't most houses little more than an awkward clutch of servants in silly livery?

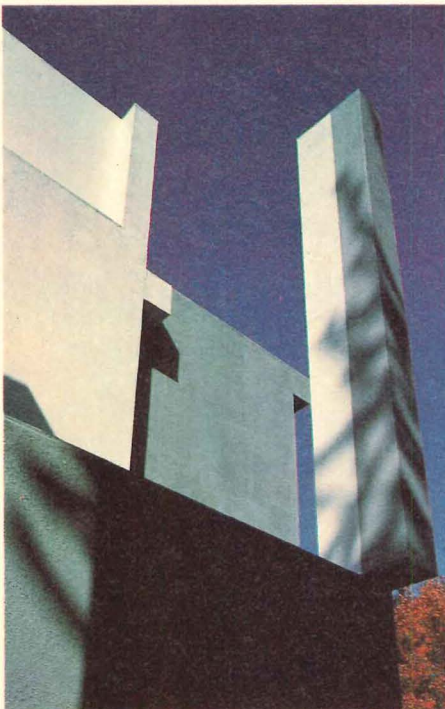
But like the words in wonderful sentences, the elements of House VI pay attention to one another—respond, relate, react to one another. The entire house begins to tip. The ceiling of the living room, which is the floor of the bedroom, has this lash of acrylic glass across it, just like one of the walls. From the point of view of the house, which is which? We are on our way to Oz. But what is a window when I can look out and still see it, when there are clarities plop in the middle of things (what sounds do windows make when they transmogrify opacity?), when there are openings that allow my eyes to clatter like jacks or marbles down through Mondrians proceeding slowly upward like balloons (and I wonder whether they fall safely like a rabbit through a thicket)? Are these the house's points of view? What an outrageous idea indeed, but what a sound one all the same.

One cannot follow every revolution of the house in a single visit, sense every repetition, reach every intersection, or move through every turn around in relations. A visit (what is a visit?) so brief, so provisional, so uncommitted, can scarcely be



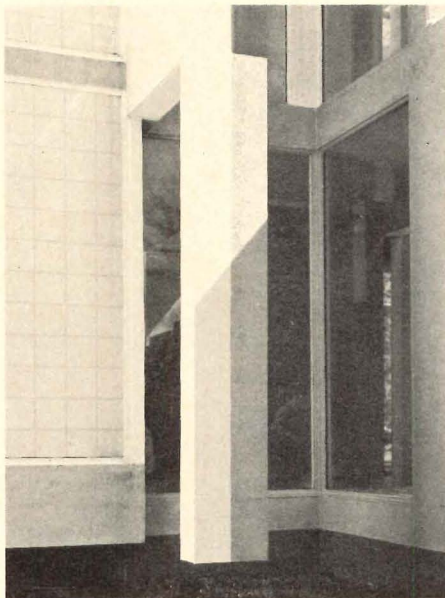


Reciprocal stair transformation (above).

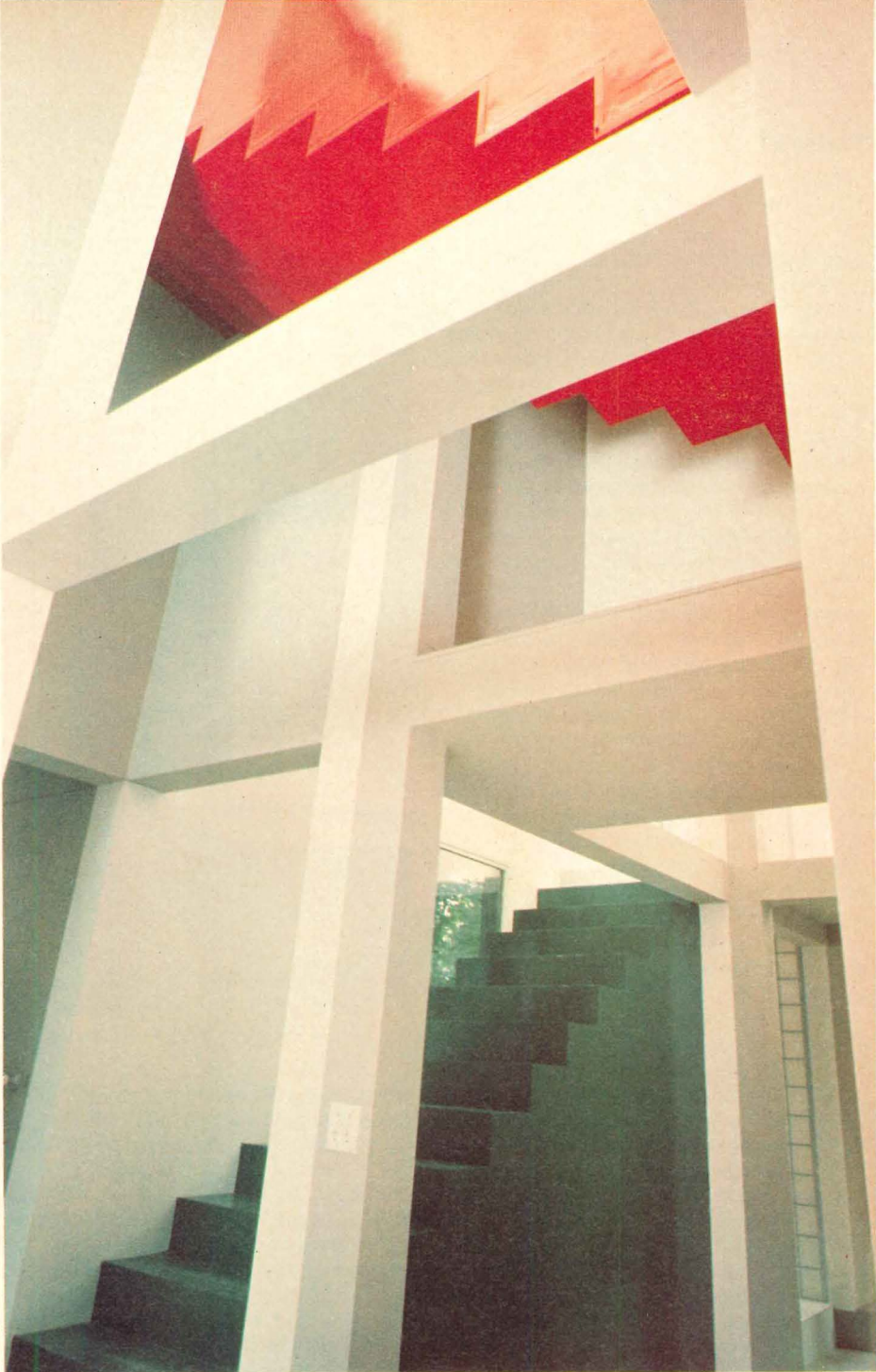


David Morton

Reciprocal locations of two columns, upright (above), suspended (below) express marking.

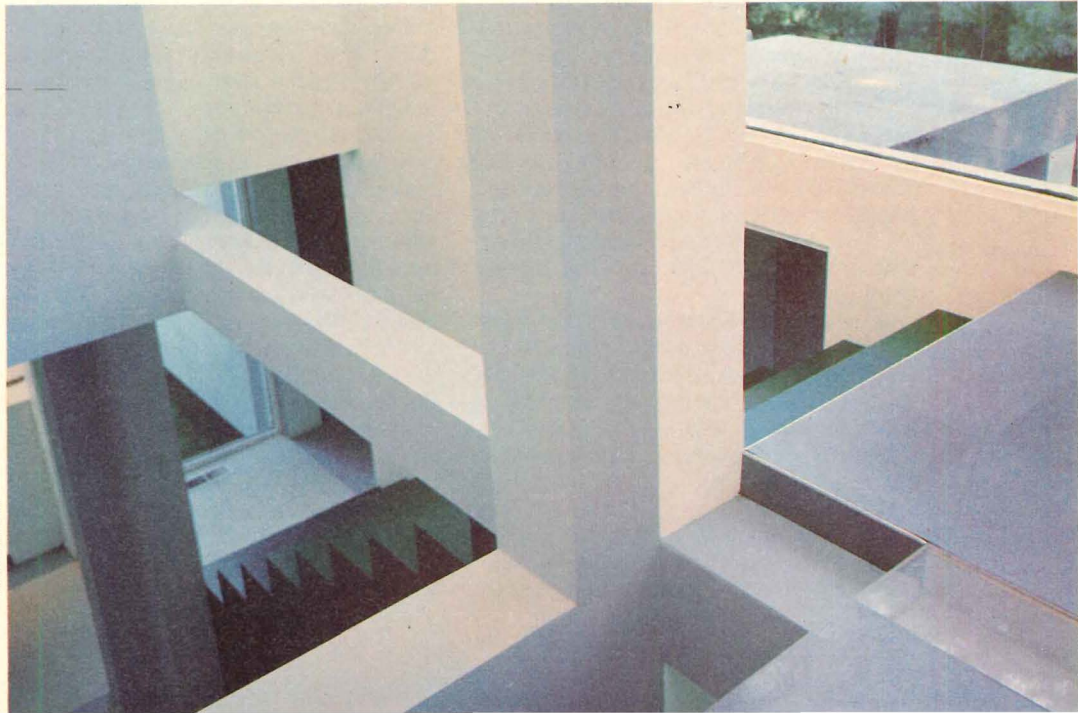


Richard Frank



Richard Frank

Entrance, where interplay of beams, columns, and volumes with stair turned inside out overhead (red) in counterpoint to real stair (green), marks dense center of house.





## House VI

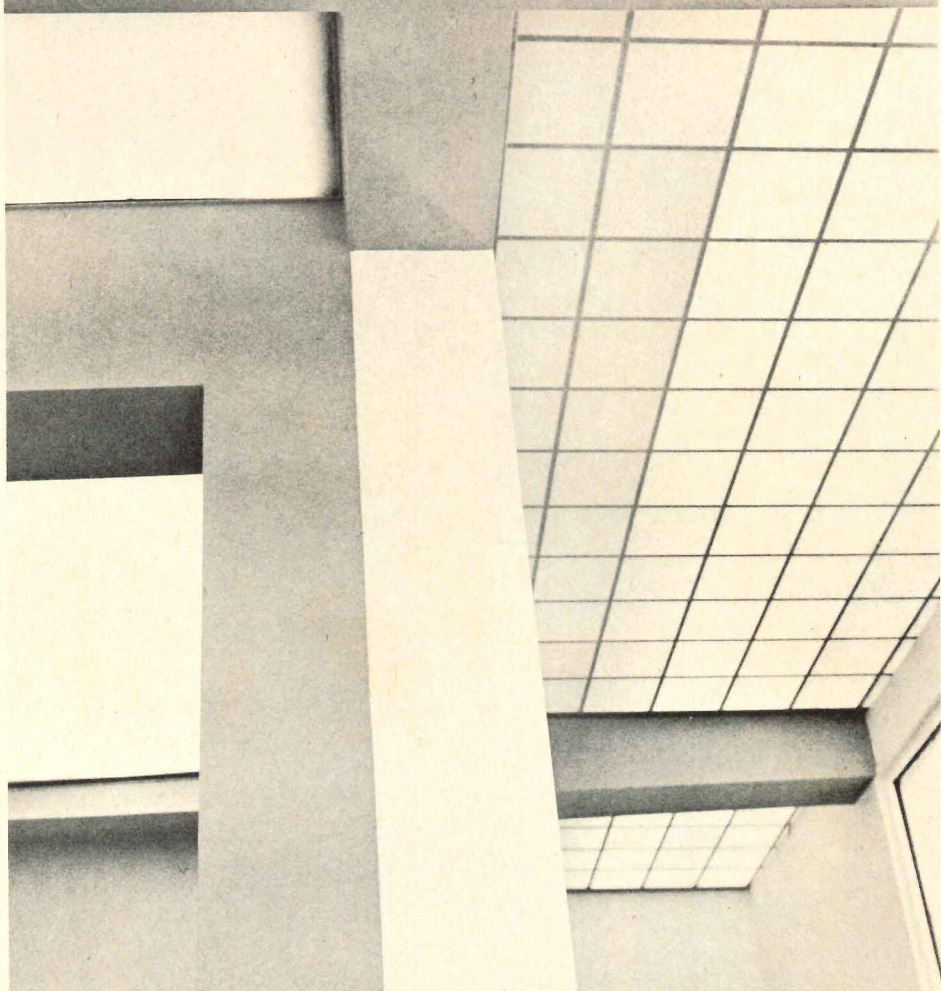
part of a life. Yet the house is as immediate as music. Like music, it hears only the sounds it makes itself; like music, it deals with elements that take on meaning, come to exist, only in combination; it is an interplay of themes and variations. Like music, it is fussy about the purity of its tones.

House VI ruthlessly erases textures, the natural characteristics of its materials, and anything else that will draw away and lose the eye in that seductive swirl of hair which hides protruding ears, a scrawny neck, and cheekless bones, because walls are not boards or bricks, but ideas. Finally, like music, it is the slow exfoliation, through layer after layer, of a single structural concept whose present expression in a rippling surface of notes is simply the final ruffle from a bomb exploded in its depths. Here the child is surely present in the man, the seed in the stalk, the stamen. The house has the simultaneity of the stair (the stair that doesn't quite reach its "landing"); for a stair is a set of stages, an unfolding that is equally and instantly as much up as down, as much floor as ceiling, as much a tier of sleeping beams as a tumble of hesitations or a stutter in space; and what does that false stair do, so brazenly painted, but tuck the upstairs under?

The parts of most houses aren't parts. They contrive to obscure one another. Even in our own homes, how often are we confused about what, exactly, is above or below us? If the volume of a closet repeats the volumes of an entry, how are we to know? When we are up, do we sense any upness? All the bottoms and beyonds of our houses disappear like the bodies of the men playing donkey, and there is nowhere any integrated space—volumes cut by planes, spaces turned inside of spaces, walls that rush from their containing toward the world as if the world weren't there and they did not contain, windows that do not open for the view. We do not live there, nor do we ever have any feeling for a ceiling or a floor, any sense of the structure that surrounds us. Whereas in House VI, those sudden openings like lifted lids (or slots for cardboard compositions, a critic might contend) let us appreciate a fierce and unrelenting order that we would otherwise never sense, although Eisenman can afford to do this because his house exists to maximize and manifest such connections, just as through this structure a thoroughly rational light runs like a system of trains.

Many modern buildings wear their basements on their heads while the ground floor freely spreads itself in space like the air between their stilt-like legs. House VI has holes through it larger than the cheese. But we understand the mechanical advantages of such moves. What are the formal ones?

It is true that many of the techniques of House VI force us to re-examine the nature of planes and pillars, apertures and light



Gray and white colors indicate volumetric boundaries in system of vertically layered spaces.

sieves, even floors and doors. Each of these is so familiar to us that, like the fat of our spouse, we've ceased to see or even feel it, and only when a post becomes a companion can we learn to talk and listen to it. But if the building had only this function, it would be a schoolhouse with classes constantly in session, with unremitting lessons laid on by unbending teachers, and, of course, in alien corners many stools for dunces. However education is not a problem for form. Form, like justice, is blind to persons. Form answers only to itself, and when form contains surprises, the surprises are as eternal as the triangle; whereas we shall just get used to ducking while downing the stairs and no more notice the width of doors than we do the pattern on our china. The column that comes up incompetently short must not be simply saying to us: "You see, I do not reach, think again about support." It must also, and more essentially, say: "I am where I am, and I fall short the way I do, because the maximum expression of the nature of this structure requires both—precisely by this much, right now, right here."

No wonder a window looks out on a wall. No wonder shafts of relation pierce the house like spears. No wonder the width of the boards becomes expressive of a grid. No wonder one is aware of the presence of a superior being, superior in precisely that sense of which Rilke wrote so beautifully in his poem about the archaic Apollo, because there, too, the light was gathered up by every surface of the

statue's breast to burst out blazing like a star; and there, too, the beauty of a humble bit of ordered area shamed its observer who, in clumsy hat and shoes, remained less real than the naked stone, or in the parallel I've drawn, could not take the measure of some plainly painted boards. Rilke imagined an observer who felt that difference as a commandment: you must change your life.

For the final effect of House VI is after all intensely spiritual, and perhaps that's why many feel a Japanese peace in the building that far exceeds anything suggested by the delicate translucent screens. What could one do here? One could meditate or paint or think or write. It is an environment for the mind and, like a lyric, romantic in its fierce embrace of form, its search for truth. If the work escapes plans and programs finally, elusively relating in ways unforeseen and thrilling, that is right; in Vallery's noble nomenclature, *the building sings*.

Later the gray sky would break like an egg and release the sun, but now the windows were beginning to streak with rain. The house sat calmly enough in the increasing grass and had no sides. I decided that a certain shrub should be removed. "I would Windex you well," I thought, addressing the interpenetrating planes before me, beneath a loom or two of upper story. "There would be moments when I would be equal to you." It was an unseemly burst of pride. Not a stone spoke beneath our feet now. We got into our rented car and drove away. □



# Robert Gutman:

As one comes upon it set among evergreens and open fields, House VI is literally breathtaking—one of the superb visual experiences of modern design.

There is no front or back, no sides to this house, but a plethora of surfaces. Coming to it against a background experience in the culture of modern architecture, as anyone today must do, there is the ambition to explain this proliferation of walls and columns by asking: what rooms are hidden within these volumes, what structural system is revealed by these columns? The visitor rushes in to unravel the puzzle.

Once inside the visitor realizes immediately that he will be asking the wrong questions if he expects the forms and structure of House VI to disclose its programmatic or technological requirements. This is not what the building is about. The underside of the red staircase, embedded in the ceiling over the dining area gives the first clue. It is not really a staircase, and most important of all, it does not correspond to any form visible from outside the building. Eisenman is trying to tell us as soon as we enter that one should not expect to "read" this building according to the conventions of modern architecture.

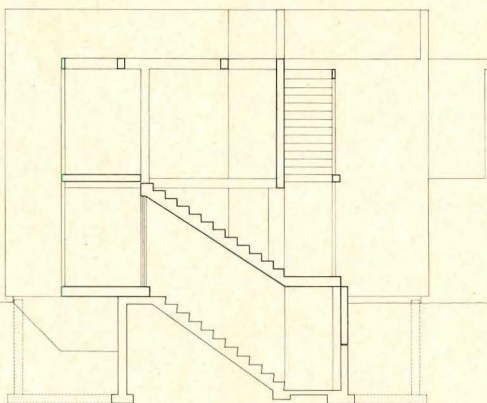
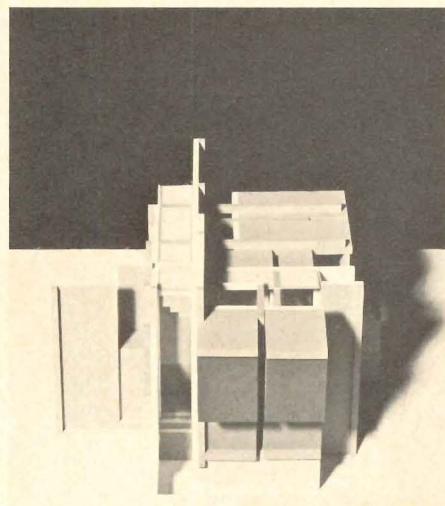
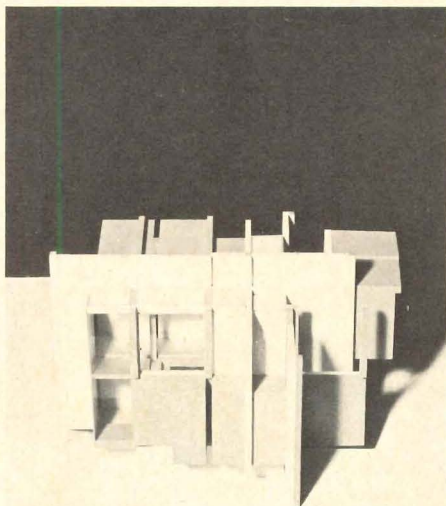
At the same time that the unreal staircase says what the building is not, it instructs us about two things that it is. The staircase is one of the staircases that Alberti found difficult to incorporate in his designs, and in introducing it as an element without a useful purpose, Eisenman is informing us that he regards his building as a new exploration of problems of construction and the geometry of form last dealt with systematically in the Italian Renaissance.

In juxtaposition to the green staircase, which is a response to a programmatic requirement, the red staircase is an allusion to the Muller-Lyer effect, one of the classical experiments of 19th-Century perceptual psychology, frequently shown in textbooks on the psychology of art. With this reference, Eisenman wants us to recognize that this building is not simply the revival of an architectural theory of five centuries ago. House VI represents a contemporary approach to architectural theory based on researches in the new social sciences. For one who used to be concerned that Eisenman had forsaken the origins of his architectural ideas for an infatuation with semiology and structural linguistics, it is nice to find a sign that he has not neglected his debt to the Gestalt movement.

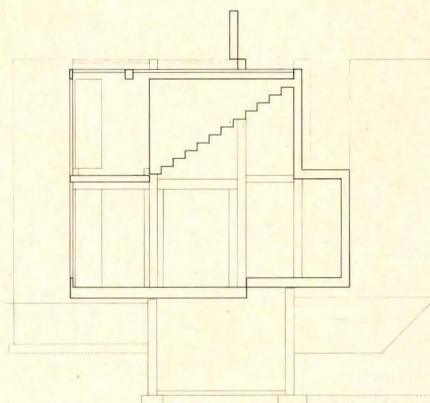
## He finally did it

Anyone familiar with Eisenman's writings could have expected that he would

**Author:** Robert Gutman, a sociologist, is a visiting professor in the School of Architecture and Urban Planning at Princeton Univ. and professor of sociology at Rutgers Univ. He writes frequently on the behavioral aspects of architecture and design.

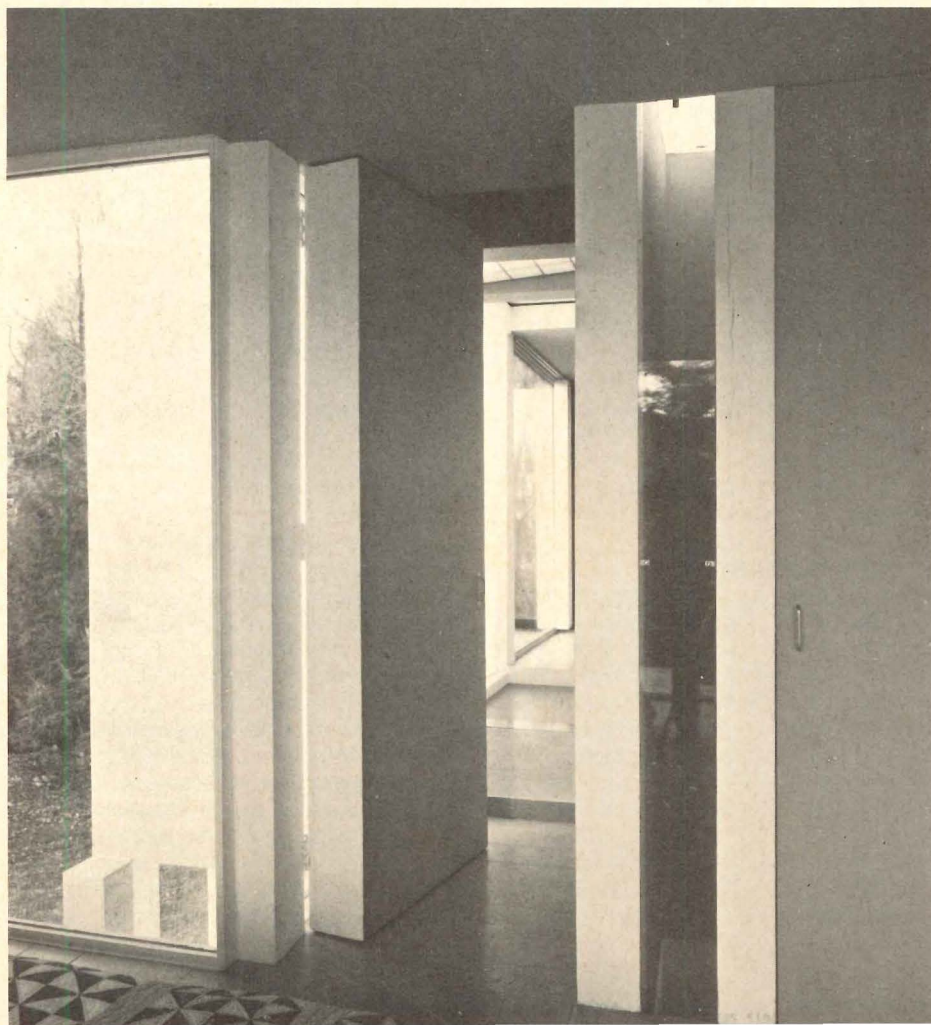


SECTION B B



SECTION C C

Rotating wall becomes doorway between bedroom and dressing room.





## House VI

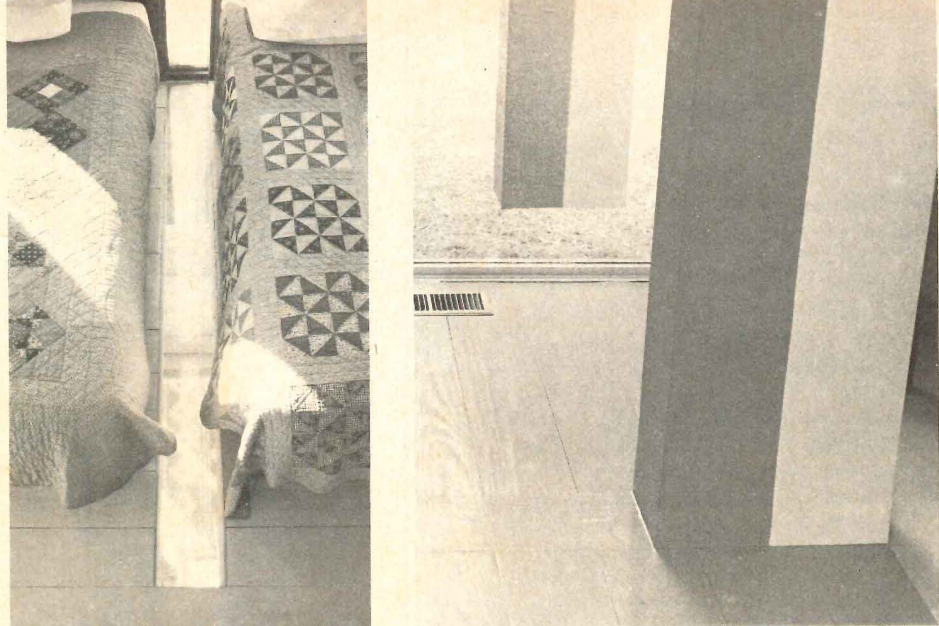
one day build a house that would ignore its program. Over six years ago, when he started articulating the idea of conceptual architecture, Eisenman wrote as follows in *Casabella*: "To make something conceptual in architecture would require taking the pragmatic and functional aspects and place them in a conceptual matrix, where their primary existence is no longer interpreted from the physical fact of being a bathroom or a closet, but rather the functional aspects bathroom or closet becomes secondary to some primary reading as a notation in a conceptual context."

It should come as no surprise that in House VI there is no bathroom, but rather a toilet joined with a bathtub in one space, and a separate lavatory hidden in a closet. The lavatory is covered by a door that is really a rotating segment of one of the planes running vertically through the house, thus fulfilling Eisenman's dictum that the functional aspects should be suppressed in favor of the conceptual system. There is a shortage of closet space in the house for much the same reason, and the closets provided have dimensions that accommodate still other combinations of vertical and intersecting planes.

What is true for House VI in relation to its program also applies to its structural system. The building is full of columns—many of them double columns, that is, single forms with each half painted a different color so that they look like two columns standing side by side. One column stops just short of the ground level. Most of these columns have no role in supporting the building planes, but are there, like the planes and the slits in the walls and ceilings that represent planes, to mark the geometry and rhythm of Eisenman's notational system. His determination to separate issues of architecture from problems of engineering structure, and thus to challenge the form/function dialectic of the modern movement is underscored by two I-beams added on the insistence of the building inspector to keep the toilet and bathtub walls and floors on the second floor from shearing. These beams have no role in the notational system: it is a demonstration of the consistency and force of Eisenman's construction that it is immediately apparent they don't belong in the building.

### Living with a landmark

House VI is going to strike many laymen as a spooky environment, but it will get a good deal of support from the architectural culture. Younger architects, and students in particular in the last several years have been much taken with the idea of regarding architecture primarily as an art form. They are concerned that the arts of painting and sculpture, even of music and theater, have explored the nature of their mediums more explicitly and thoroughly. Several architects have manifested this view of their discipline through theoretical



Floorlights (above, left) in bedroom, like suspended column (above, right) reflect cerebral concerns.

writings, publications of drawings, and exhibitions of models. Sometimes the term, "conceptual architecture" is used to identify the current focus on the art of architecture—but it also is known as "autonomous architecture" or "post-functionalism." House VI will be a landmark in the history of this movement because it is the only building yet constructed that fully exemplifies this approach.

Now that we have available the first example of the new "new architecture," it is interesting to consider the kinds of questions it raises. One question concerns the quality of interior space the attention to architectural form itself is likely to generate. If House VI is representative of what we can expect, then it would seem that along with a different kind of exterior appearance, the self-conscious attention to geometrically oriented notational systems will produce spaces that must make up by careful attention to detail what they lack in grandeur. The experience of House VI is not uplifting: it does not fill this visitor with joy or wonderment, but it is very intriguing. House VI is a space that stimulates the mind more than it excites the emotions. This makes for a very appealing encounter during the first few hours, while one is finding out what the architecture means and when one is still trying to plot the disappearance and then the reappearance of the fragments out of which the building is composed. I am not sure, however, what it would be like to live in House VI for any period of time.

Another question we can ask about this architecture is whether it requires the degree of suppression of the program represented by House VI. As a building type, House VI approximates the week-end vacation house, thousands of which have been designed and built by architects for affluent middle class urban clients in capitalist countries since the end of World War II. But compared to the standard house of this type, it has many bizarre features.

The arrangement of the kitchen facilities departs from the standard U-form, making for extra and unnecessary movement during the preparation of food. To accord with

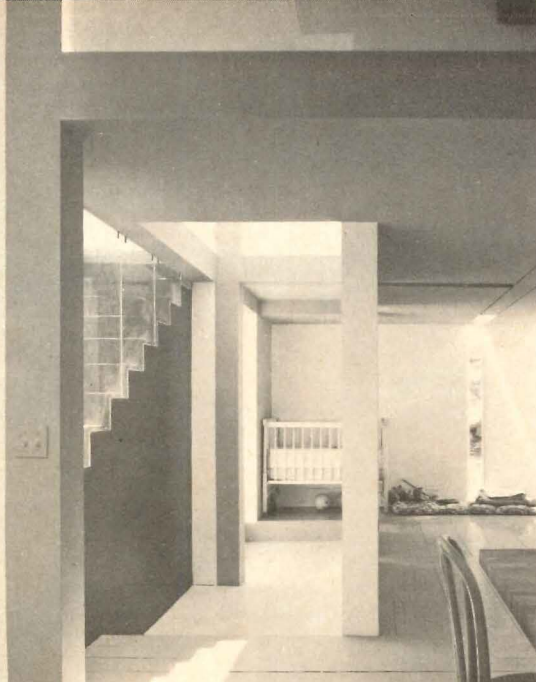
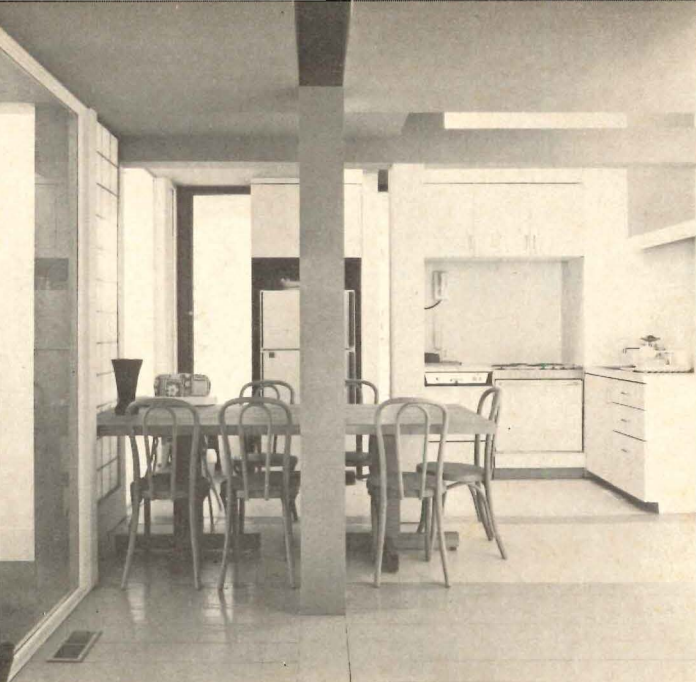
the system of horizontal planes, the counter tops are set lower than usual. This is all right for small people but it forces others who cook or wash to continually bend over. Also the cabinets are set high for esthetic reasons, requiring the use of a stool to reach items usually within arm's reach. Easy conversation during meal times is hard to sustain because of the notational columns that for no structural reason descend into the only convenient space for a dining table. This is a problem when more than three persons are seated.

There is now a child in the family, an addition not accounted for in the original program. Thus no bedroom is provided for her, and the rigid formula according to which the house is designed precludes an extension. At present the child's crib is shoved into a corner originally intended for the wife's study space. This arrangement is also a problem since the design theory does not allow for partitions that provide aural or visual privacy.

There is one bedroom for the parents on the second floor, with the closet lavatory and the toilet-bath combination beyond it. Guests thus have to travel through the bedroom by day or at night to use the facilities. The visual delights of the New England landscape are shut off by the planes painted white, gray, and black inside, so that there are no good views of the trees and fields from the living room, dining space, or kitchen. Physical access to the surrounding grounds is limited to standard doorways.

These design features are deliberate. Eisenman has admitted as much in his statement to *Newsweek*, (October 4, 1976) in which he said that his houses are intended to shake people out of their needs. One other innovative detail of House VI is the flooring in the bedroom, which incorporates plexiglass strips, or "floorlights," thus requiring that the owners sleep in twin beds rather than their usual double bed. Is this what is meant by shaking people out of their needs? Is it really the task of the architect to upset people's normal lives, interfere with their preferences, and reverse their values? Is





Gutman observes that usable area of 1800-sq-ft house is only about 1000 sq ft, notes technical problems with exterior joints and finishes.

this architect warring against commensality? Does he think housewives don't work hard enough now? Is he hoping to make life tougher for kids? Does he think guests in a country house a nuisance? Is he opposed to outdoor-recreation? If not, why should his house make so many ordinary household activities so awkward?

### Unresolved issues

The problems presented by these questions are serious. In the modernist aesthetic, was the price for liberating the artist or the medium the suffering of the audience? Of course, modernism in the arts did want to alert people to new forms of consciousness, and sometimes this made hard work for the mind and for the sensibility. But the pain associated with the labor of the intellect and the senses was transformed into a renewed sense of satisfaction, awareness, and delight. The new architecture does not seem to work this way, however. The column that interrupts your dining room conversation is still there even after you become aware of what the column is intended to mean. And the wall that blocks your view of the New England fields is no substitute for glass simply because you understand why the wall was put there. Curiously, these design imperatives become more intrusive after they are understood: not less, but more insupportable.

Is there no way of reconciling a conceptualist approach to architecture with the legitimate requirements of the program? Or to put it more directly, could not House VI have been much better than it is? For example, how many faults of the house can be traced to the fact that it contains only about 1000 feet of usable space? Would a larger house have made it easier to introduce both grandeur and commodity into the design?

The clients obviously took a very passive role in the design and building process. Indeed, they still refer to it as "Peter's house." Perhaps what the conceptual architect needs is to be *not* left alone to work his will on the design. The theory under which the conceptual architect operates inclines him to ignore the program, so the

design process for this kind of architecture needs the involvement of another party who will fight, and fight hard to keep the architect's attention on the program—to fill the role Mrs. Schroeder played in relation to Rietveld. The absence of a vigorous, protesting client may go a long way in explaining why House VI is not a more successful piece of architecture; just as the independent, forceful and very critical position taken by the clients for House II could be an important reason why this may be the best of the structures Eisenman has built up to now.

Although House VI and its architect may be thought of as very singular phenomena, it is important that we be aware of how they connect to other events now taking place on the architectural scene. I am thinking not only of the resemblance of Eisenman's work to that of some other members of the New York Five, especially to Hejduk, but also its ties with movements that at first glance seem quite different. It amuses me to have to suggest, for example, that conceptual architecture is most successful when it is confronted by a thoughtful, tough client. The development of such a clientele is just what the advocacy architecture movement has been calling for—although at another level since the aesthetic, or anti-aesthetic position of this group is unsympathetic to the kind of cultural event represented by House VI.

It should be noted that Eisenman, in his dependence on the social sciences and in his use of a geometrically based, dis-aggregated notational system as a method for generating architecture, is very close to the work of the Design Methods Group in England. The Group has focused on programmatic concerns while Eisenman, both in House VI and in his theory, deals with elements of construction. Yet the intellectual style of the two is similar. It is also interesting to realize that two of the leaders of the Group, Christopher Alexander (living in Berkeley) and Lionel March, were students (along with Eisenman) at the architecture school of Cambridge University, England in the late 1950s and early 1960s.

The Design Methods people have been

figures on the architectural scene for a longer time than the conceptual architects. One important conclusion has already resulted from their work: although criticism and understanding of architectural phenomena has been advanced by the exploratory efforts to build new structures through combining program elements, *building design*, as distinguished from the *analysis of buildings*, requires additional inputs. These inputs must be less schematic and intellectual, but more casual and intuitive. Architecture they are telling us is not a mathematical problem, it cannot be achieved by formulas, but requires skills and talents that are more than merely cerebral. This may seem like an old fashioned notion that takes us back beyond the modern movement to the Victorian aestheticians and architects. However, I wonder if there may not be an important message here. Would not Eisenman's work and House VI in particular had more *affect* if he would pay less attention to the idea of architecture and instead respond more to its spirit?

### Data

**Project:** House VI (Frank residence) Cornwall, Connecticut.

**Architect:** Peter Eisenman, architect; Randall Korman, assistant; Caroline Sidnam, Read Ferguson, and William Jackson, drawings.

**Site:** Five-acre wooded site in a rural part of Connecticut.

**Program:** 1800-sq-ft weekend home for art historian and husband, a photographer.

**Structural system:** post-and-beam wood joist construction, steel ties for rigidity.

**Major materials:** plywood, polyurethane coating; sheetrock, pine planks, wood framing.

**Mechanical system:** oil-fired forced hot and cold air; individual unit heaters.

**Consultants:** Robert Silman & Associates, structural.

**General contractor:** Arthur B. Deacon & Sons, Litchfield, CT; Robert Finney, Canaan, CT.

**Client:** Suzanne and Richard Frank.

**Photography:** Cervin Robinson except as noted.



# The open office: does it work?

John F. Pile

**System for use in planning open office installations are proliferating. With manufacturers listing so many options, P/A offers an update for design professionals.**

Despite many tests and an increasing number of complete installations, the question "Is open office planning really successful?" remains open for debate. If it is a sound approach, why is it not universally adopted? If it is not sound, why is it still discussed? Projects that have been in use for some time offer some answers to such questions.

Confusion about this subject begins with terminology. Should we speak of "Bürolandschaft," "Office Landscape," "Open planning," "Action Office," or can we assume that all of these terms refer to the same approach? Looking into the history of the open office suggests that there are, in reality, two concepts involved. Either one can generate a new kind of office space and the two ideas may intermix or may conflict.

## **Bürolandschaft and the Quickborner Team**

Brothers Eberhard and Wolfgang Schnelle, management consultants—whose firm name, "Quickborner Team" comes from the name of the suburb of Hamburg where their offices were located—were led to study the physical planning of offices as one of the factors that influence the effectiveness of office work. In the 1960s, a number of projects in Germany were planned in an unconventional way under Quickborner Team direction. The complete projects exhibited shocking characteristics that have since become the familiar earmarks of "office landscape." These are an absence of partitions, a nongeometric "scramble" furniture arrangement, and a profusion of large growing plants scattered through the space. These visible characteristics are not arbitrary, nor are they based on visual design considerations; they are rather by-products of theoretical convictions that the conventional partitioned office, planned on the basis of an organization chart of command structure

hinders office work. It tends to position workers on bases of rank, status, and departmental affiliation and, by building in an original plan in the form of fixed (or semi-fixed) walls, it discourages rearrangements to accommodate work and organizational changes.

Quickborner theory assumes that an office exists for the primary reason of facilitating communication within its staff. Actual communication between individuals in an organization is studied over a period of time and analysis of the patterns discovered (through matrix charts and interaction diagrams) is used as the basis for planning. Surprising patterns that may result are accepted without reference to any preconceived planning principles while the avoidance of partitioning makes revisions to accept change easy.

A first American experiment with this set of ideas was the "Test Space" built by DuPont in Wilmington in 1967 with the Quickborner Team as consultant. A number of tests (often with ambiguous results, as discussed below) and a number of permanent facilities have been built since, in accordance with Quickborner Team theory.

## **Action Office**

This term was coined by Herman Miller, Inc. to identify a new office furniture system developed for that firm by an inventor-researcher, Robert Propst. In 1960, Propst began work for Herman Miller and soon focused on office problems—his own working space and that of other company office staff members. His approach was concerned with re-examining the work-place needs of the individual office worker in the light of an intuitive conviction that a standard desk and chair was rarely an optimum solution. Investigating what office workers *really* do, what materials they need, and how they would prefer to work led to some unconventional furniture proposals that were embodied in a system called "Action Office" (later renamed "Action Office 1" to distinguish it from its successor, "Action Office 2"). As introduced in 1964, the system included some moderately unconventional desks (including one at stand-up work height with an accompanying stool-perch) and storage units. The user was offered more flexible and accessible work surfaces and storage that could be tailored to unique individual needs.

This product group was user-related, not plan-related.

**Author:** John F. Pile, a practicing New York City designer and adjunct professor of design at Pratt Institute, is author and co-author of several books on interior design.



The Du Pont test space. Panels and boxes hanging from the ceiling provide extra acoustical material and also act as light baffles.

The units could stand in a conventional room or in an open space as a planner might prefer, but no necessary connection with the ideas of "office landscape" was involved. Since both Action Office and Bürolandschaft were new and experimental ideas, it is not surprising that office planners became aware of both at about the same time and began to explore use of the two ideas in combination.

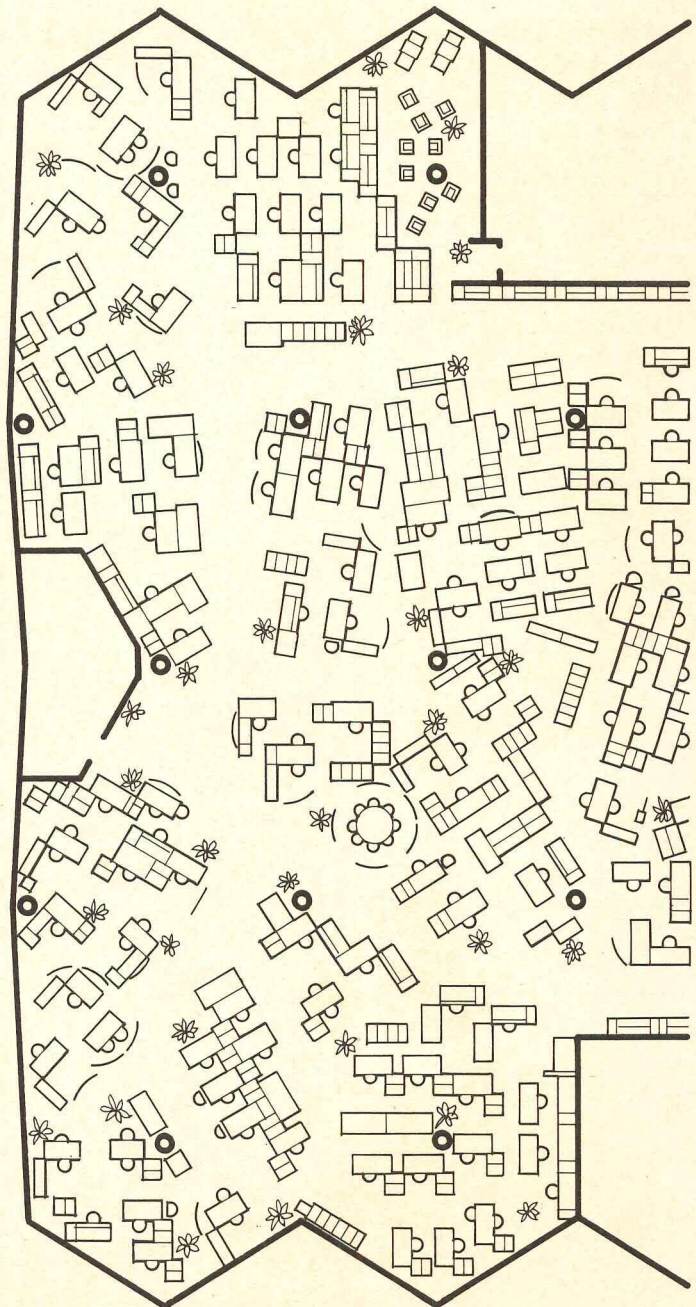
Do 'Landscape' and 'Action Office' mix? From the first the Quickborner Team has insisted that its approach does not require special furniture—indeed it requires the omission of many standard furniture types in order to achieve a maximum of openness. Desks become merely tables; files are movable open racks or are banished to remote central filing areas; cabinets in which miscellany can be squirreled away are forbidden; tables and file carts can come from any standard office furniture line. Only the special curved acoustical screens are a new product need and these are so simple that they can easily be made by any furniture company or cabinet shop.

Propst recognized a possible compatability between Action Office and open planning and developed a number of changes in the Herman Miller system with this in mind. Under the designation "Action Office 2," the system appeared in a generally revised form which incorporated screen panels (flat, not curved in Quickborner manner) as key elements. Although free-standing elements are available, the screen panel is, in fact, the key element. Work surfaces and storage units can be hung from the tracks that edge these panels. The panels connect to form clusters which support furniture elements while they also provide a certain amount of visual and acoustic privacy.

A large number of systems that follow Propst's Action Office approach have now appeared—some imitating it almost directly while others take somewhat different approaches. It is reasonable to ask whether this proliferation of systems results from an effort to solve problems that open planning generates, or whether it is merely a reflection of the desire of various furniture manufacturers each to offer a group that can claim to be particularly suitable to open office use.

**Are landscape offices too open?**

Most architects and designers have worked for major parts of their working careers in open drafting rooms totally without partitioning and have found this a workable, even a stimulating environment. Most other American office workers, in contrast, associate an open work space with a "clerical pool" or some similar routine work scene and regard a "private office," at least of some minimal sort, as the proper setting for any work of more than routine sort. The American office worker, as his or her work becomes more complex and more important also tends to accumulate a large amount of stored material, files, reference books, research documents, samples, and all sorts of oddments that must be put somewhere. As a result, the classic Quickborner work station, a table with one small pencil drawer and, possibly a file cart or machine stand in open space, tends to seem unacceptable to the American office worker. The typical example of open planning in the U.S. is, therefore, most often not so open. Screens proliferate in clusters



A typical European "Bürolandschaft" plan. One of the three floors in the Ford building in Cologne planned by the Quickborner Team. 200 work stations, two rest areas, 69 plants, and 90 screens.

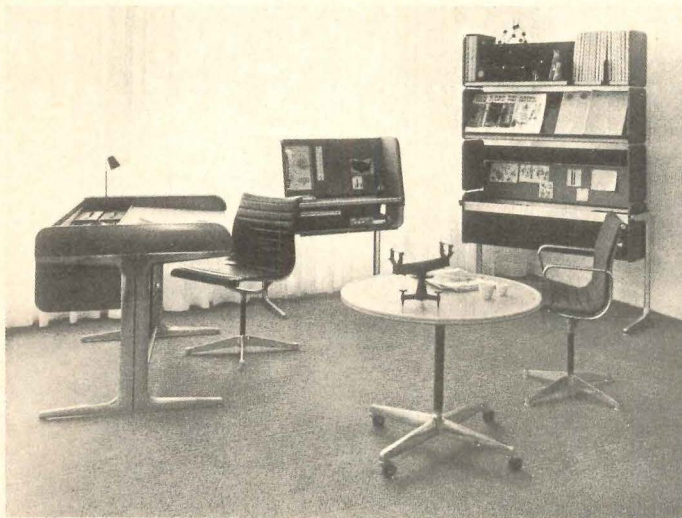


## The open office

that attempt to create pseudo-private offices for individuals who claim special need for privacy. Files, cabinets, and shelf units become necessities to hold office clutter. The limited success and acceptance of the original Büro-landschaft seems to be the result of these two issues: the need, real or fancied, for more privacy and more storage.

If these issues stood alone, open planning might have already disappeared from the American scene, but there are other reasons, some recognized from the first and some more unexpected, that make the open plan still attractive to any organization considering new or remodeled offices. These advantages are:

1 Omission of partitions eliminates the cost of partitions (inevitably) and even when certain extra costs are consid-



Action Office I as developed by Herman Miller. Work stations use unusual desks and storage units—all floor supported. Panels are not part of the system, partitioning can be conventional or nonexistent.



Action Office II. Panels have become a key element with most work surfaces and storage units panel-hung. Openness decreases, visual privacy increases.

ered (screens, acoustical treatments) there is almost certainly a saving in first cost of an installation. This saving may be used to upgrade other aspects of the project, so not show up clearly, but it is still real.

2 Flexibility is vastly increased in open planning. Layouts can be kept currently effective as work organizations and processes change with a minimum of cost and dislocation. Even the most flexible of "movable partition systems" require far more effort to change than no partitions at all, and changes in lighting, air conditioning, and decoration can make moving even movable partitions very costly and troublesome. Modern organizations tend to show a rapid pace of change so that ability to respond to changing needs is far more important than it was in the past.

3 Computer techniques, "word processing," and similar changes in methods of office work are tending to decrease the need for "clerical pools" and to increase the middle-management and specialist categories of office staff. Office workers of these types are not well served by "pool" layouts, but the rows of tiny cubicles that conventional planning usually substitutes are not desirable work environments either. Open plans serve these categories of staff particularly well.

4 Modern management style tends to reduce emphasis on rank, authority, and status in order to encourage individual initiative and development. The open office is inclined to appear democratic and "open" in a sociological sense (at times to such a degree that the lack of status differentiation is seen as a problem).

5 Although the original claims that open plans would improve communication and so improve efficiency have proved to be hard to document, there is at least a supposition that there is some improvement of this kind.

With so many advantages either obvious or at least plausible possibilities to hope for, it becomes clear that there is a strong incentive to look for solutions to whatever residual problems may be preventing a total acceptance of the open plan idea. The makers of the furniture systems now available have addressed themselves to that list of problems with considerable success. But there is not yet a "perfect system."

### Privacy

The original Quickborner approach reduces privacy for every office worker except those who would have occupied open pools in conventional planning. We tend to think of privacy as a quality having self-explanatory virtues, so that the worker who sees his work situation made less private tends to feel that a down-grading has taken place. Logical argument to the effect that privacy may hamper easy communication and lead to a boring and claustrophobic isolation is met with certain claims that have to be dealt with realistically. These are: 1) noise is irritating and interferes with work; 2) private conversations will be overheard; 3) it is distracting to see activity unrelated to one's own work at a given time; 4) it is uncomfortable to be constantly visible to other workers and to superiors.

Means were found for dealing with all of these problems very early in the history of open planning. Modern systems offer solutions to each, but the solutions must be used intelligently and it must be remembered that physical remedies can only deal with realistic problems. If the problems



### GSA study

What is probably the most thorough comparison study of conventional vs. landscape office planning ever made was undertaken in 1967 for the U.S. General Services Administration by Brooks Barr Graeber & White with Pitts Mebane Phelps & White. The published results in a booklet "Office Landscape, a Feasibility Study" has never been made publicly available (the writer's copy was obtained through unofficial channels). The study is focused on the U.S. Department of labor office building project in Washington, but the findings would seem broadly applicable. They include, for example, the area allocation comparisons cited below and efforts to compare first cost and annual cost for space for the same functions planned conventionally and in "landscape" fashion (with the Quickborner Team participating as consultants). Typical portions of the building were planned and studied in detail as they might be realized in each of the two planning approaches and projected figures were generated each way. Some typical comparisons are:

	Conventional	Landscape
Density of occupancy (sq ft per person)	150	135
Initial occupancy installation cost (partitions, floor coverings, blinds, etc.)	\$4.18 psf	\$3.47 psf
Annual costs: Maintenance (cleaning, plants, relocations)	.89 psf	.46 psf
Replacements (floor coverings, partitions)*	.152 psf	.127 psf

\*This figure is based on an assumption that all floors in the conventional plan will be vinyl tile with a life of 30 years, all landscape floors will be carpet with a life of 10 years. If carpet was assumed for all (or part) of the conventional offices, the comparison would be even more favorable to open planning.

This study also concludes that cost of furniture (not including screens) would be the same in both instances; an assumption that may be open to some question.

seems to apply to a small number of sensitive situations that do not arise very often: highly personal phone conversations, reprimands, transactions with genuine requirements for secrecy. These matters can be dealt with by including a few truly private spaces in several sizes.

### Status

This fashionable word from the world of social-psychology describes a source of stress and dissatisfaction in all office planning, whether conventional or open. Office workers are encouraged to show ambition and strive to rise in an organization, and the person who *has* risen expects that fact to be recognized in some visible way. In addition, the classic office politician in an upwardly mobile society will strive to make it appear that he or she has risen even more than is in fact the case. The classic status designator of conventional planning is the quality, size, and location of private offices.

### Acoustics

A number of rules have surfaced that, taken together, deal with whatever acoustical problems are inherent in open planning. These are:

- 1 The floor must be carpeted and the carpet should have good sound-absorbing qualities.
- 2 The ceiling must have a surface with a good NRC and ceiling lights should present a minimum hard surface (flat lenses, for example).
- 3 Noisy equipment should be isolated and surrounded by as much sound absorbing material as possible.
- 4 People who need verbal communication should be seated close together to discourage loud talking.
- 5 Density should be kept up—125 sq ft per work station in actual work areas even if a lower average density exists, so as to keep up the level of general background sound and avoid the extreme quiet that makes distant conversations too audible. A 40 to 50 db. level of background sound is ideal.
- 6 Where the natural background sound is insufficient, artificial masking sound ("white" or "gray noise") can be added electronically.

The last item can be approached in several ways. A sound system can be installed with speakers in the ceiling spaced regularly throughout the offices. A central sound generator feeds all speakers, but volume is adjusted at each speaker for the local situation. This type of installation is costly, may prove to be unnecessary (at least in many areas), and is hard to readjust if the open plan flexibility is taken advantage of with frequent rearrangements. A second approach is to move in without any background sound system and then install self-contained or portable sound generators at any problem spots that may develop. This approach is likely to be economical, but has the disadvantage of making users of the space aware of problems and making it seem that the "fix" is a make-shift correction of an error.

are advanced as a cover for other forms of resistance, no "cures" will work until the real resistance is located. The cures for realistic problems are fairly simple and most product systems provide for them. Screens or panels of some sort can be used to block sight-lines so as to deal with the visual privacy issues 3 and 4. Many systems provide workstation units, which include some kind of surround that contains the user's visual field to some degree. These means of aiding visual privacy, if they incorporate acoustically absorbent materials aid in dealing with the auditory issues as well. Issue 1, noise, is further controlled by the now routine use of acoustical ceiling materials of good efficiency and the use of carpeted floors. Indeed, it is a common experience that these techniques are *too* effective and drop the level of ambient noise to such a degree that issue 2, overhearing of nearby voices becomes very real. The loss of privacy to the person overheard is usually less significant than the distraction felt by the overhearer. The routine remedy for this problem is the introduction of artificially generated background sound.

With the realistic problems of privacy solved, there remain issues bordering on reality—even if one cannot be overheard, it is possible to *fear* being overheard. This

With private offices eliminated, the situation suggests an army deprived of uniforms: generals and privates look surprisingly similar in underwear and organizational bureaucrats are similarly embarrassed when deprived of the symbolic code made up of room sizes, numbers of windows, thicknesses of carpets, and similar traditional rank descriptors.

From the point of view concerned with organizational performance, this is an advantage. The supervisor can no longer hide in a corner office, he becomes visible and, if ef-



## The open office

fective, more in touch with his staff and so more effective than ever. The ineffective supervisor comes under pressure to become effective or face replacement. Emphasis on rank and status tends to lower morale of workers and to be most popular with the least effective members of management. Working staff tends to like the more democratic feeling of the open office and the competent manager or executive usually adjusts to it.

There remains a certain irreducible need for visible status marking, most particularly in the case of those who have contact, in their own office, with representatives of other firms or organizations. The executive who occupies a paneled corner office in his own conventional headquarters, when he goes to visit an opposite number elsewhere, instinctively looks for evidences that his host *is* an opposite number. The open office cannot offer the paneling, the corner window, the thick rug, and similar trappings of conventional status marking, but it can and usually does substitute other signals that have some of the same meaning. These include area, kind, and quantity of furniture (a conference table grouping, for example) and the level of enclosure established by screens, wardrobes, and other elements.

### The core of resistance

Once persuaded to give the idea a try, and given time to make adjustments in habitual ways of doing things, most open office users, including those at the top levels of management, become supporters of the concept. There remains a hard core of resistance, however, and a planner together with client representatives should face its nature and decide what can be done about two categories of typical resisters that might be designated "illegitimate" and "legitimate."

The "illegitimate" resister is usually in middle-management, of doubtful or limited competence but a "climber" seeking to rise in an organization, more through "office politics" than through performance. This is the person who, in a conventional office, has just recently been assigned to a private office or who anticipates that assignment at a next advancement. That office is or will be a symbol of a step up and will be used as a tool in maneuvering for the next step up. Removal to a milieu where that symbol is not available is a bitter prospect to such a person, and innumerable rationalizations will be produced as evidence that the concept will never work. The planner is likely to see that this problem can be solved to the organization's benefit by urging such resisters to leave, but few organizations are prepared to take such a stiff-necked approach. The next best defense is to make well-known in the organization the view of resistance described above. This will usually at least drive objections underground where they are less likely to create any serious problem.

The "legitimate" resister is one whose actual work, or at least habits of work, make a genuine demand for conventional, closed-door privacy. An extreme example might be a medical doctor—the idea of a suite of doctors' consulting and examining rooms totally unpartitioned is simply too remote from the generally understood and accepted mores to be a serious possibility (although it might well improve per-



Status in the open plan office. The absence of solid walls is not an impediment to the sense of "executive territory." Montgomery Ward headquarters in Chicago. Rodgers Associates, office planners.

formance in group practice). In the business world, the analogous problem that most often arises concerns lawyers. The typical lawyer has been trained and developed his work experience in a tradition that involves a confidential relationship between attorney and client and that provides a traditional office as a setting for this relationship. The lawyer turned executive, or still practicing law within an organization other than a law firm, tends to expect to retain the setting that he feels his work requires. Whether to yield to this demand and plan a conventional law department within an otherwise open facility, or to insist that such special treatment will undermine acceptance of the concept elsewhere, is a decision that must be made on an individual case basis. A point in favor of the latter approach is the fact that, in modern business, there is so much mobility that planning to suit the habits of an individual incumbent in a particular position is unwise. The lawyer who is general counsel today may be vice president or chairman tomorrow. He can hardly expect to carry walls with him as his assignment changes and so might be wise to accept a facility that does not attempt to make him a "special case."

Certain other functions, usually present at sub-executive levels, may have legitimate privacy demands because of real needs for place for concentrated work. This may describe researchers, mathematicians, or writers. In practice, it turns out that such people, whose work may be called "creative," are less concerned about privacy than might be expected. The total openness of the original Quickborner concept might present some problem to them, but many furniture systems provide work stations that offer enough enclosure at the immediate work surface to be quite satisfactory for such work.

### What can furniture systems offer?

Awareness of the growing interest in open office planning has brought to the world of office furniture manufacturing a race for innovation and imitation that has transformed a rather stagnant field into an interesting and complex one. It is possible to sort out several approaches to what open of-



fice furniture should be, each with its own possibilities and problems. They are:

1 Tables, rolling files, and movable acoustical screens as recommended by the original Quickborner Team in Europe. The system called TAG, offered by Art Metal before that firm discontinued production, was of this type, and the Designcraft system developed by Hans Kriecks approaches it. As a furniture product group, it is almost too easy to achieve and, perhaps, less rewarding than the furniture manufacturer might desire. The U.S. resistance to total openness has tended to supplant this approach with the directions described below.

2 The Action Office of Robert Propst and its several more or less precise imitations can be called "panel systems." The screen panels, linked together to become self-stabilizing walls are at the heart of the system and are used to support work surfaces and storage units. The number of panels tends to be determined by the need for supports for other equipment and so tends to generate a more "closed" plan than might otherwise be desired. There is a tendency to approach a conventional office in plan terms, but to have the flexibility of partitioning which is totally movable. Hanging components on screen panels can also generate certain problems—when a work station is moved a panel that supports components on both sides presents a problem. If

it moves it leaves components orphaned behind; if it stays, the components that are moving require new support panels in their new location. The interconnections of such systems also tend to generate problems of complexity. What can be connected to what, at what heights, and with what restrictions on what can adjoin? What small hardware is needed to complete each new rearrangement, what parts are in stock, what are surplus, and what must be order new? Merely knowing what is on hand, where it is, and how it can and should be rearranged can become a very complex study.

3 This might be called a "storage wall" type using a somewhat massive storage unit as its basic element with work surfaces within the unit, attached, or both. The storage unit is both space divider and work station equipment. This approach has a long history dating back to such systems as that devised by S.O.M. for Armstrong offices in Lancaster, PA. in 1964 and produced thereafter by General Fireproofing (GF). The same approach was used again by S.O.M. for the Weyerhaeuser headquarters in Tacoma with equipment developed in detail by Bill Stephens as a product for Knoll. A similar approach developed for the McDonalds offices in Chicago generated the group known as TRM (Task Response Modules) produced by J. Eppinger. In these systems each work station is a self-contained

### An insight from England

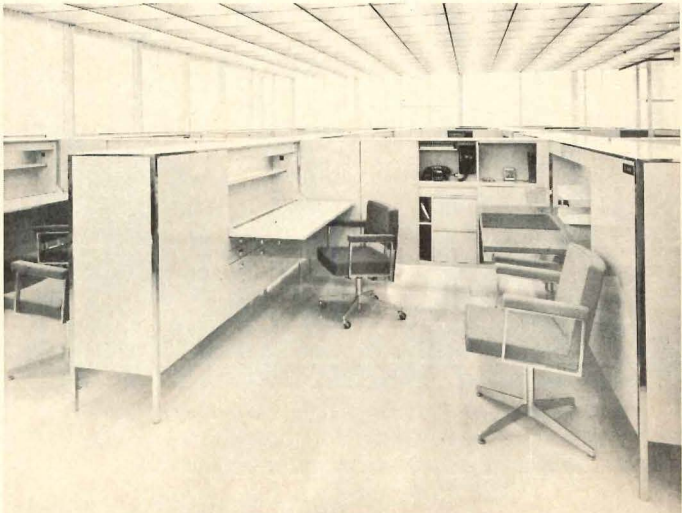
Frank Duffy, an English researcher into office work and environmental problems, has suggested that the suitability of open planning (any kind of open planning) for any organization should be evaluated by characterizing the organization as to its standing on two high-low scales. These are a scale of "bureaucracy" and of "interaction." A bureaucratic organization is defined as one with strict routinized procedures, clearly defined ranking and lines of command—its opposite is the informal organization that does not run by a rule book. Interaction is the index of the amount of cooperation and communication between workers. He then suggests that any office can be characterized as one of four types:

Nonbureaucratic Highly interactive (a design firm, e.g.)	Bureaucratic and interactive (a clerical office)
Nonbureaucratic but noninteractive (a research group)	Bureaucratic and noninteractive (a corporate headquarters).

These types will best fit four different types of office plan:

Fully open landscape	Open plan with clearly marked status indications
Closed (conventional) plan of identical private spaces	Conventional plan with some open, some closed areas and marked status indication

Most organizations will not exemplify the most extreme forms of characterization and may involve some mixture of typing, but the analysis can still give clues as to where open planning is likely to be best accepted.



The work station approach as developed by S.O.M. for Armstrong. A GF product generally available thereafter.



A recent GF installation in the Federal Reserve Bank in Minneapolis, MN by Gunnar Birkerts & Associates.



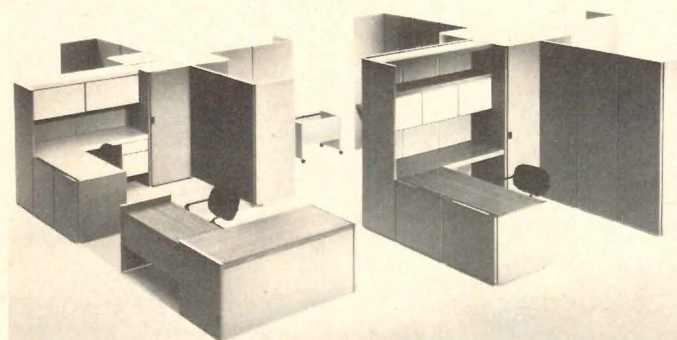
## The open office



For McDonalds headquarters, the planner William Plumb developed a work station system of luxurious scale. Produced by Eppinger Furniture under the name TRM (for Task Response Modules).



Knoll Stephens furniture in the installation for which it was developed to S.O.M. requirements, Weyerhaeuser headquarters in Tacoma, WA. Rodgers Associates, office planners. Photo, E. Stoller © ESTO.



A new system from Knoll designed by Otto Zapf. The basic concept of the Stevens system is extended and reworked in more economical materials.

group of furniture units, less flexible than the panel type work station, usually more massive, sometimes more costly, but less complex in terms of variations and options offered. These systems also tend to produce a higher level of visual and acoustical privacy than the original Quick-borner concept proposes and so represent a compromise

between that direction and conventionally partitioned space—to the dismay of the landscape theorist but to the satisfaction of the privacy-seeking middle- or upper-level executive.

4 A number of systems now available combine several of these concepts to give the planner or user a choice among them or, possibly, to take advantage of production practices already in being. Such systems are usually based on an existing system of desks and files and generate work stations by connecting versions of these units to form "storage wall" type units while also providing screens to make possible an approach to a panel system or a fully open "landscape" office. Steelcase has developed several such systems, most recently the system known as 9000, first used in the Montgomery Ward Chicago headquarters.

Some "combined systems" are totally new; for example, Modulo 3 based on the use of a KD connector of interlocking aluminum extrusions. The ability to provide several types of work station (fully open, panel related, or storage wall) all from related components from one source has made this approach particularly versatile.

The architect and planner of offices faces a problem that results from so much innovation in office furniture that did not exist only a few years ago. Conventional office furniture had become so well standardized that it was possible and normal to plan without any one furniture product line in mind. Every manufacturer made desks and files in the same sizes and a standard furniture template served for planning long before purchasing decisions were undertaken. This situation still applies to the totally open landscape, but any plan using a storage wall or panel system must be developed for a particular product line—a decision to substitute Knoll Stephens units for Action Office, for example, involves something close to total replanning. Once a system is chosen and planned for, the client is locked into a particular product almost regardless of what may happen to price or availability. Different manufacturers' products can be mixed (screens from A and storage walls from B, for example), but only with great care if there are not to be disconcerting mismatches in heights, finishes, and problems of flexibility in future replanning.

A few other characteristic problems of the open office continue to challenge manufacturers and planners.

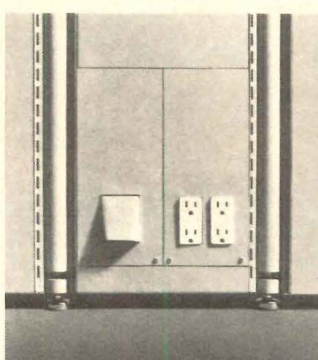
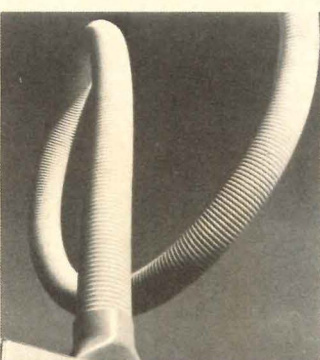
### Telephones

Telephones trail wires and provision for those wires are among the most troublesome minor problems of the open office. With the convenient raceways of partitions unavailable, phone wiring must be brought to the individual work station in some other way and, if the flexibility which is a prime value of the planning system is to be used, the wiring system must also be flexible. Underfloor ducts are the familiar and most used system, but outlets are expensive and cutting new outlets can be both very expensive and a nuisance. An ideal open office space would have outlets on a four or five foot grid to permit telephone location virtually anywhere, but the cost of so many outlets makes this almost impossible. A common compromise is to use a grid based on ducts 5 to 8 ft apart with outlets 10 to 16 ft apart in staggered locations. This makes an outlet always available within a fairly short distance from any location, but still calls for a very large number of outlets.





Open work areas of the Montgomery Ward headquarters (Rodgers Associates, planners) are equipped with Steelcase 9000 furniture. This is a system that includes both freestanding and panel-attached components permitting either work-station or totally open planning or both together within one project while still retaining the consistency and easy interchangeability of one furniture system (above).

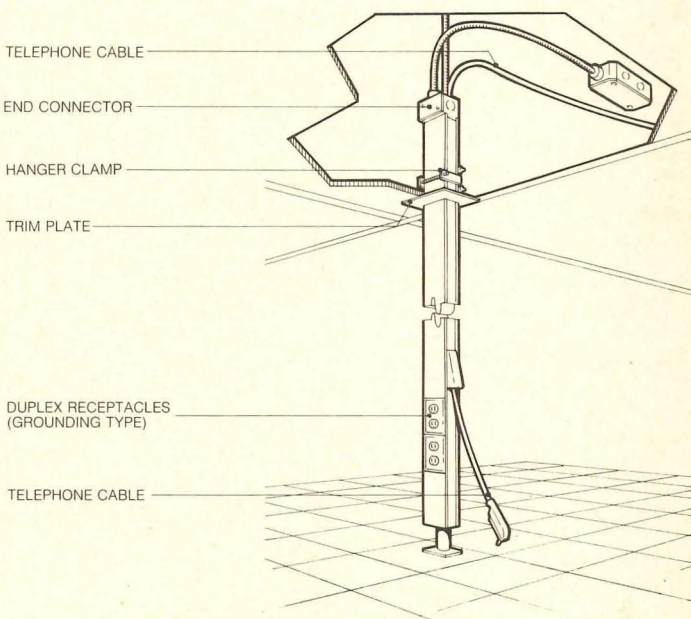


In the Westinghouse system, flexible tube connectors are offered as a device for overhead wire connections. The connectors boldly express their function. System features round post panel connections.

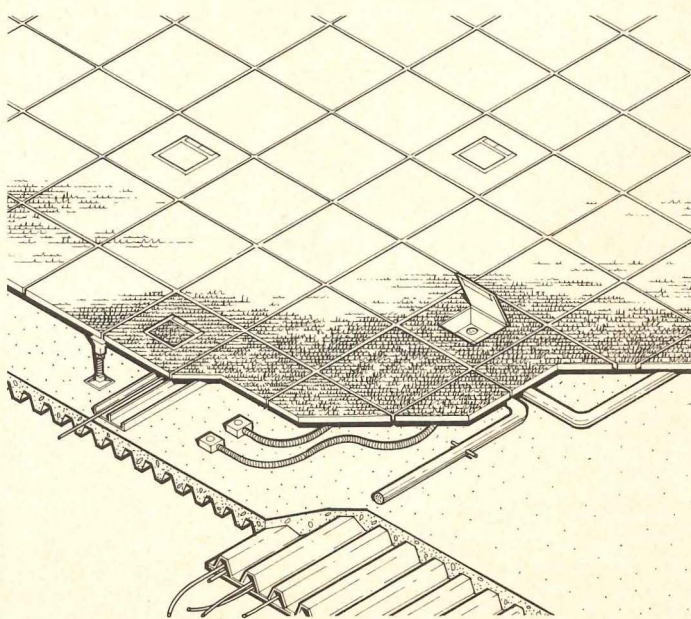


Alternatives are overhead feed through poles or hanging flexible tubes, solutions that offer easier flexibility, but a degree of visual prominence. I.F.A. (Interiors Facilities Associates) has developed a system for Citicorp in New York for use in their computer center that uses the raised floor familiar in computer rooms throughout office space. Telephone and ac wiring comes from ducts in the permanent floor into long leads that can sweep a circle with a 10-ft radius, thus making service easily available anywhere with a small number of floor outlets. The cost and loss of headroom associated with the raised floor makes this a solution that will probably be restricted to areas with an unusually dense concentration of wired equipment.

The writer has proposed a "mini-raised floor" only 1 in. in height made up of a simple metal pan that would permit a similar flexibility for telephone wiring with access by lifting carpet tiles and pans as necessary to feed wires to any lo-



A telephone and power pole produced by Wiremold as a convenient device for overhead phone and AC connection.



Drawing by I.F.A. showing the raised floor and access box in use in their Citicorp project.



## The open office

cation. The system has yet to find a manufacturer.

Other telephone problems associated with open planning are not unique to it. These include the acoustical problem posed by the loud telephone talker, and the problems of receiving calls when away from one's regular phone. Location of telephones within a work station unit having some degree of enclosure and acoustical treatment helps with the first problem, but the second remains unsolved. The use of code ringing to help identify a ring near enough to be heard but otherwise not recognizable, or a flashing light annunciator often used in hospitals are possibilities, but do not seem to have found significant acceptance.

Wireless telephones, both at work stations and pocket portable, seem to be needed to solve all of these problems fully, but there is no indication that this will become an affordable possibility in the near future.

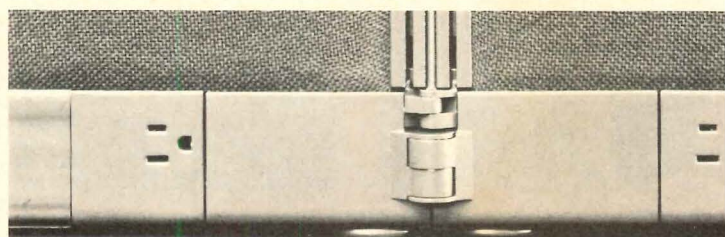
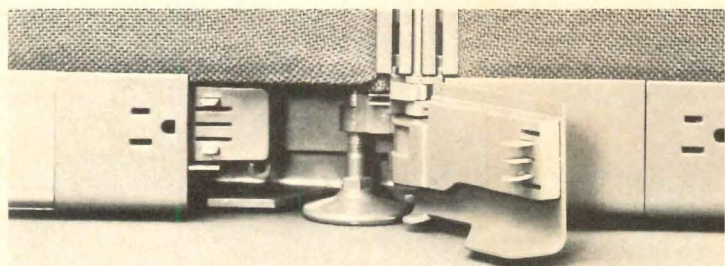
### AC wiring

The problems of telephone wiring are duplicated for ac. The electric typewriter has increased the demand for outlets just as battery powered calculators, inter-coms, and clocks promised to diminish that demand and the new fondness for local, in-furniture lighting (see below) has multiplied that demand. All the possibilities and problems of telephone wiring have their twin in power distribution. Many furniture systems provide internal raceways and other provisions for stringing wiring through clustered units, but power must reach the cluster at some point from floor, ceiling, wall, or column. More often than not, a planner can, by considering this issue as clusters are laid out, provide for a point of contact with a perimeter or core wall, a column, or a floor outlet for each cluster with a minimum of problematic floor outlet work. If an occasional ceiling access (via a power pole) can also be accepted, the problem can usually be reduced to a manageable minimum. Every rearrangement must, however, be planned with an equally alert eye for the possible telephone and ac connections. This need tends to limit ad hoc replanning and to make clear the need for professional skill in even the more minor rearrangement of work stations that open office planning encourages.

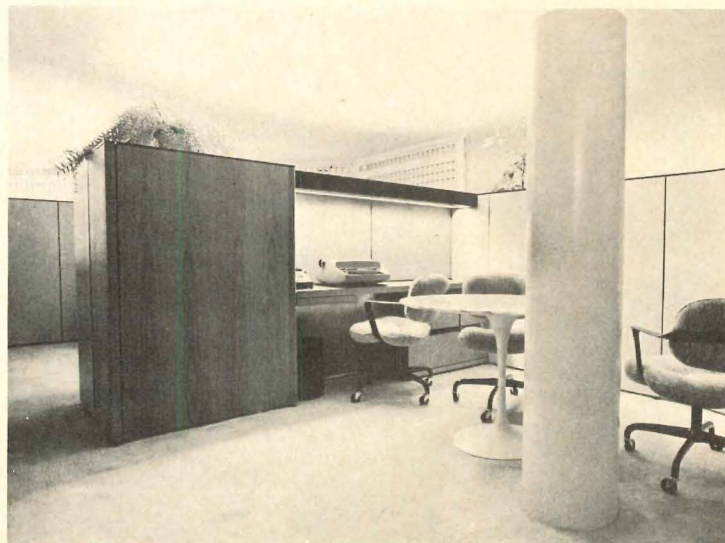
### Lighting

The flexibility of open planning makes it imperative that satisfactory lighting be available at work surface level anywhere within the office space in question. The standard solution has been to provide a desired foot-candle level throughout the space from ceiling fixtures. If the fixtures are of a low-brightness type that keeps brightness contrast within reasonable limits, satisfactory lighting is, at least in theory, assured. While this approach presents no problem in fully open areas, screens, panels and, particularly panels carrying cantilevered components can, in areas where these are present as elements of subdivision, create shadowed work surface areas that may be troublesome. Most furniture systems offer some kind of local lighting attachments to deal with this problem.

In a typical situation, the full work level of lighting delivered throughout the area is needlessly bright, and therefore costly in areas of circulation, storage, and similar second-

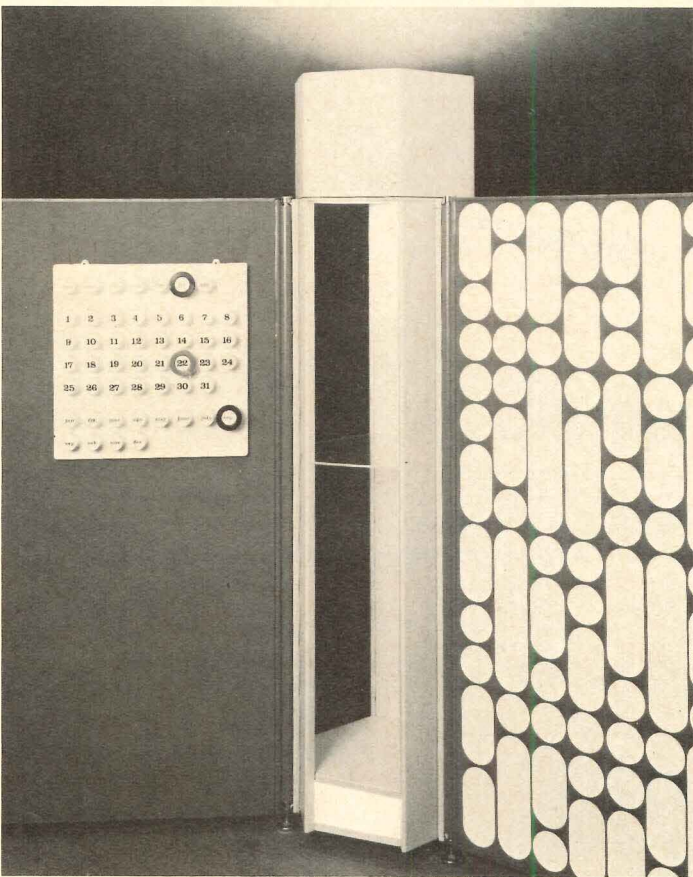


One of the features of Haworth ERA-1 system (top) is the electrical connector and enclosure (two photos above). Power may travel in either direction through connector, and polypropylene hinge panel joint allows for angled arrangements. Power may be floor- or ceiling-supplied.



Task lighting in the Knoll Stephens system, with Sylvan R. Shmitz & Associates.





Hauserman task lighting equipment.

ary functioning. Also, the law of inverse squares (light level varies inversely as the square of the distance from the source) means that ceiling lighting is inherently wasteful as a result of the long distance from ceiling to work top. The new awareness of energy problems, presented in the form of constantly increasing electric bills, has led to a reexamination of standard approaches to lighting and so to the re-discovery of local lighting, now clothed in the new term "task lighting." By placing light sources close to the areas of need, and omitting all but minimal general lighting in all other areas, a dramatic saving in energy costs is available; a saving doubled up because of the reduction in air conditioning loads achieved when lighting wattage is reduced.

Every furniture system appropriate to open office planning either now offers—or will offer within a few months—a "task lighting" package. Many systems now include lighting components to provide close-to-the-work-surface downlighting, integral up-lighting and free-standing up-light units to help fill-light any otherwise dark areas. Data on anticipated energy savings have been developed in considerable detail making it clear that this kind of lighting must be taken seriously in future office projects.

The economic benefits are somewhat hampered by the fact that most rental office space is offered with a standard ceiling lighting package as a part of a "building standard." It may not be easy to obtain a credit for omission of this routine "benefit" since the building owner will insist that the standard lighting may be required by some future tenant. To rent *with* ceiling lights and leave that amenity unused while paying for an alternative "task lighting" installation in cash, may be a difficult plan for the average tenant to accept in spite of assurances that savings in energy bills over a few years may easily justify this procedure. Where

the occupant is the owner, or can fully control the building services to be offered, the economic advantages of task lighting are destined to become very persuasive.

**In the end, does open office planning really work?**

The trouble with this question is that we are not usually certain what is meant by an office "working." If we mean, "do open office installations turn out to be so unsatisfactory that they are quickly abandoned or converted to conventional planning?" the answer is clearly "no." Once put to use, the open office is usually accepted, well-liked with a few limited exceptions, and often gradually extended through an organization. The occasional exception does not seem decisive. Du Pont, the first experimenter with a landscape office floor, did not adopt the concept further, and finally, after some years, moved the first experimental group into conventional offices. The experiment was, it is admitted, flawed (too small a space, less than ideal equipment and acoustical controls, and, possibly, a lack of commitment on the part of higher-level management). The ambiguously negative result might have been different if one or more of these problems had not existed or had been corrected early. The last, a lack of management commitment, is a factor that makes objective appraisal of open office planning (or any other kind of office plan) particularly difficult. The measure of the success of an office is largely in terms of how well they "believe" it performs. Is communication *really* better, are people getting more work done, or doing better work? We are short on clear measures of such matters and so rely on more subjective judgments which are very much influenced by morale of the group in the office in question and by the attitudes of the management that has opted for the planning approach in question. Office users who know that they are guinea pigs, testing a concept regarded as having doubtful merit, tend to have less than enthusiastic reactions. Users who feel part of a progressive and forward-looking move tend to find favorable results.

All evaluation suffers from unclarity about what is being compared. Is the open office better? One must ask how good the particular open office being examined is in absolute terms, and then what the standard of comparison is for the word "better." Is it better than an old office—perhaps itself an office slum? If so, "better" is a very difficult relative to satisfy. Is it better than a conventional office? Is the standard then some real, actual office or an ideal that only exists in some dream. Research that attempts to study these questions comes up against the subtleties of the "Hawthorne Effect" in which the subjects of a study tend to respond well to *any* experimental circumstance because the process of being studied is in itself a favorable motivating factor; or against the reality that many people resist change—any change including change for the better. If serious research on user reactions has failed to find a consistent and certain evidence that the open plan is always best, it has certainly failed to produce any clear showing that it is not at least as good as the conventional office. Any dislocations felt by the new user of an open office space are clearly equalled by those experienced by the open office user moved back into a conventional office.

Management perception is based in part on user reactions, but on other factors as well, which are not so visible



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to—or so much the concern of—the office user. In this area, the flexibility of the open office is universally viewed as an enormous advantage. How important this advantage may seem relates to the pace of growth and change in the user organization. The more rapidly an organization changes, the more valuable flexibility of office space will seem. The next management concern, economics, will weigh in favor of the open office similarly; the more changes take place the more the open office will save. In terms of first cost, open and conventional offices can be kept in the same brackets if comparable equipment is selected, but with every replanning and rearrangement, the open office will show increasing savings. Total rearrangement of an area [continued on p. 81]

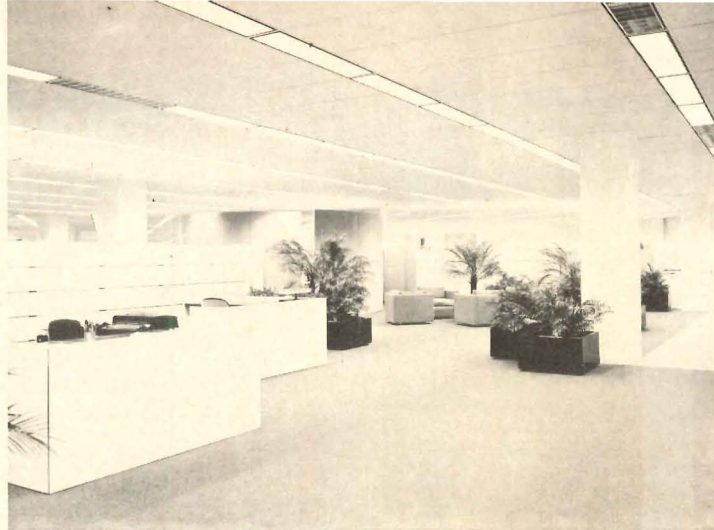
### Density

The question of how many square feet a typical office worker must be allotted is obviously one with a powerful economic impact on any office planning project. Early reports on office landscape suggested that a substantial saving in area requirements might be anticipated with this planning approach but, perhaps as a reflection of concern that this system might come to be understood as no more than a cost-cutting technique, emphasis on this issue has diminished. It remains a fact that the open office, because of its ability to pool circulation and other "waste" spaces, has a potential for putting more people into less area for a given level of comfort and amenity. Taking full advantage of this possibility may eliminate "cushion" space for future growth and may also aggravate real or imaginary problems of acoustics and privacy, but possibilities still exist. Comparisons of densities in different projects are difficult to make because the mix of types of staff (level, type of work, equipment provided) can vary so greatly and because allowances for circulation, filing, and other storage and conference space are hard to allocate in a way that makes comparison logical. It may still be informative to list density figures for some typical projects:

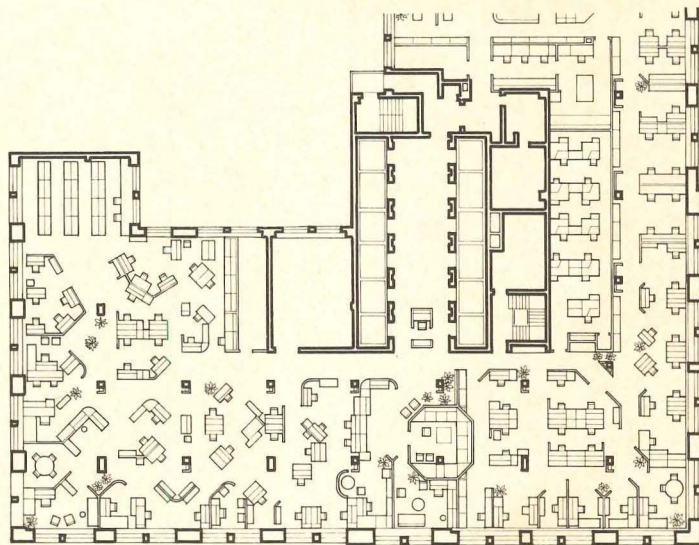
1961 Buch & Ton (Germany)	125 sq ft per person
1966 Ford Motor Co. "	157 "
1967 DuPont (USA)	160 "
1967 Corning Glass (USA)	151 "

The GSA study discussed below attempts a comparison of areas needed by different types of work stations (exclusive of circulation, filing, and conference space). The following are examples from that study:

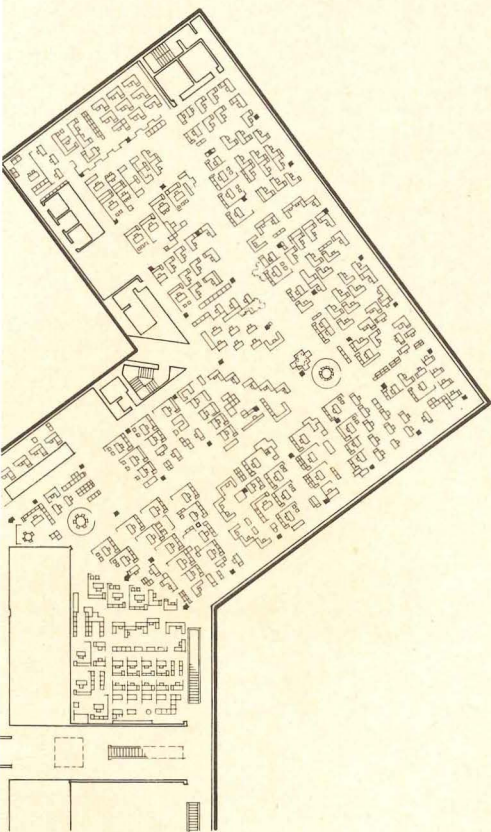
	Conventional office standards		Landscape equivalent
	GSA Standard	Dept. of Labor Stand.	
Executive	500	600	440 sq ft
Mid-Management	300	300	244
Supervisor	150	150	125-85
Minimum	60	75	45



Two case study offices, IBM World Trade (above and opposite page) and Young and Rubicam (below) indicate two approaches to open office planning. Joseph A. Grimaldi Design Associates, designers for Young and Rubicam, consult on ongoing space planning changes as needed by client.







## Open office: case studies

### Young and Rubicam, Business Affairs, New York

*Joseph A. Grimaldi, Design Associates: Office planning and interior design.*

After four years of service, user satisfaction in this Madison Avenue advertising agency business office remains very high. An entire floor is without partitions except for a closed room for nine machine work stations and a closed octagonal conference room. The remainder of the space, occupied by a staff of 150 is fully open except for the screening which is a characteristic part of this system's installations.

Two factors that support the project's success are worth noting. The department is headed by an enthusiastic supporter of the open planning concept and the Grimaldi office is retained on a continuing basis to plan and supervise changes as they become necessary. The department manager is Burton Vaupen, a Senior Vice President of Y. & R. who became aware of landscape office theory in 1968 when he was with Y. & R.'s West Coast office. He tried, unsuccessfully, to persuade his management there to test an open-plan installation, but was more successful after he returned to New York in 1970 to head the Y. & R. Business Affairs service there. Grimaldi was retained to plan a test area in 1972 using Herman Miller's AO 2 system and, after six months of favorable experience, the entire 15,000-sq-ft floor was changed over to open space, holding originally, 95 people. Vaupen's own space and the areas assigned to managers are located in corners or seeming corners and screened with adjacent spaces for assistants,

secretaries, or conference use in most cases. General work areas use panels to support work surfaces and therefore seem quite "closed" from sitting position eye level.

Grimaldi specified a flat acoustical ceiling with parallel linear bands of lighting. The lighting strips also locate bands for access to overhead telephone and ac services which are tapped by tele-poles. Wardrobe-storage units are provided in fixed locations at the building columns. There is a central file area, but a large number of files are distributed through the space close to related work stations. Overhead acoustical panels were designed to hang from the ceiling and reach to panel top level. These were intended to aid in solving any noise or acoustical privacy problems that might develop (there is no background sound system) but, in practice, they do not seem to have been needed. A few are still in use around managers' spaces, but appear to have more significance as status designators than as functional devices.

Vaupen's report of success emphasizes two considerations. He found that the typical observation of clerical staff using the original test space was that they "felt a little lonely" in comparison to the previous conventional work environment. This appears to result from the fact that the screen panels make the clerical worker somewhat *more* isolated than would be the case in a conventional "bull-pen." As a result, there tends to be less social conversation and a corresponding increase in work output. The "lonely" sense is a subjective report of this change, but does not extend to becoming an over-negative reaction, possibly because the increased sense of privacy is traditionally interpreted as a benefit. Managers, in contrast, feel more "exposed" and both have and feel less privacy. This also, Vaupen is convinced, is a favorable development since it involves the manager more directly in the work of his staff.

The other striking advantage that Vaupen has exploited, is the flexibility of open plan. Shortly after occupying the space, he instituted a general departmental reorganization in which the former, conventional functional organization was changed over to a project-team organization in which each team relates to the affairs of a particular client group and performs all functions for that group. This changeover took some time and was made in steps—a process that would have been extremely difficult in conventional space, but that was made painless by the flexibility of the open plan. Over a weekend, work stations could be rearranged to accomplish an increment of change without significant loss of work time. In the end, the space came to hold 150 people (instead of the original 95) doing work that had formerly occupied 40 percent more staff. The staff reduction is partly the result of the organizational change, but is at least in some part a product of the efficiency of the open space. Changes continue to be made—on the average every 60 to 90 days—with Grimaldi's office planning the revision in detail so that actual work can usually take place on a weekend.

A further changeover will be taking place within the next year as a new generation of computerized accounting system comes into use. A CRT station will be needed for each one to four workers, with corresponding changes in other equipment. The open plan is expected to accommodate this revision with a minimum of inconvenience.

### IBM World Trade Americas/Far East Corporation Headquarters, Mount Pleasant, N.Y.

*Edward Larrabee Barnes, FAIA, Architects. Office layouts by IBM with original consultation with the Quickborner Team, consultation for space planning/furniture, Barnes office.*

This large and handsome W-shaped office building was planned to minimize the impact of its 370,000-sq-ft bulk on the pleasant surrounding landscape. The decision to make it internally an open plan project was based in part on the interest of the corporate user management, and in part on a confrontation with the reality that conventional planning would mean a vast warren of small cubicles with minimal contact with exterior light and view. Perimeter circulation and open planning make it certain that all staff will be in touch with exterior glass to a degree that makes any claustrophobic sense impossible.

An organizational decision changed the assignment of building occupancy with the result that the management group that finally occupied the building was not the one that had made the original decisions about planning. As a result, some adjustment was made from a total open plan through the provision of fully private space for some managers.

A careful study of available furniture systems was made in the Barnes office—all systems were identified as being A) storage-wall type B) panel-hung units C) free-standing with totally separate panels.

The decision to use files distributed through the space led to preference for systems incorporating major filing and storage and the final choice of the Modulo 3 system resulted from comparison of design quality, features available, and matters of availability on a continuing basis. Electrical and telephone service is from Robertson Tap-Mate under-floor duct floor boxes on a staggered 3' x 5' module. Only about 10 percent of the available outlet locations were activated for the original installation. There are some 800 30-in-sq sq planters holding plants of four or five species with a full-time "gardener" charged with maintaining their well-being.

User reactions were, at move-in time, somewhat mixed. With the passage of time and resultant adjustment to relocation tended to fade out. Also, as some employees were, for one reason or another, transferred back into other locations with conventional office layouts, word circulated about their preferences, in retrospect, for the open office.

At the same time, there was some systematic study of the basis for some complaints about acoustical problems (most typically "lack of privacy") leading to adjustment (so-called "tuning") of the background sound system. In the end an "acoustic index" was developed and validated by test that was clearly superior to that of comparable conventional offices in similar facilities elsewhere. In the course of about a year, overt objections have disappeared.

The striking advantage of the open plan has proved to be, as so often reported, its great flexibility. It is estimated that about 25 percent of the work stations are relocated in a year, and the ease with which these changes are accomplished is an inescapable convenience. Planning of such on-going revisions is done by IBM staff "in-house" working with general design guidelines provided by the Barnes office.



# Abbreviation Key

A: Acrylic  
Ad: Adjustable levelers  
AF: Adjustable feet  
AG: Adjustable glides  
Al: Aluminum  
AP: Acoustic panel  
BB: Baseboards  
BF: Base frame  
C: Closed  
Ca: Carpet  
Ce: Cellulose board  
CB: Chipboard  
Ch: Chrome  
CI: Cast iron

Ck: Cork  
CL: Chalkboard  
ES: End stabilizer  
F: Fluorescent  
Fa: Fabric  
FB: Fiberboard  
FL: Flat legs  
Fr: Freestanding  
FS: Floor strut  
G: Glass fiber  
Gy: Gypsum  
HB: Hardboard  
HC: Honeycomb  
HID: High intensity discharge  
HPL: High pressure laminate  
L: Leather

LG: Leveling glides  
M: Metal  
MB: Mineral Board  
Me: Melamine  
MF: Metal Foot  
Mo: Molular  
MP: Moulded plastic  
MW: Mineral wool  
My: Mercury  
O: Oak  
P: Plastic  
Pa: Paint  
PB: Particle board  
PG: Plexiglass  
PL: Plastic laminate  
PS: Panel supports

S: Steel  
SB: Stabilizer bases  
SEP: Solid end panels  
SF: Steel foot  
SL: Steel legs  
SpF: Spaced foot  
SS: Spantex sheeting  
V: Vinyl  
W: Wood  
WL: Wood laminate  
WV: Wood veneer

		System components												Panel construction	type of framing	core materials	Surface materials	panel surfaces	work surfaces	drawer fronts	other component surfaces				
		freestanding screens	connecting panels	work surfaces		level: panel-supported	level: floor-supported	tilted: panel-supported	tilted: floor-supported	wardrobes	filing units: panel-supported	filing units: floor-supported	filing units: suspended	drawer units: panel-supported	drawer units: suspended	storage cabinets: panel-supported	storage cabinets: floor-supported	storage cabinets: suspended							
Alma	AD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	W S	HC	Fa WV	HPL	HPL WV	HPL WV	
American Seating	AmSeCo	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AI	FB	C Fa S WV	HPL WV	S	•	
Armstrong Cork Co.	Soundsoak Panels	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		PB	Fa				
Atelier International, Ltd.	Marcatre	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			PL WV	HPL WV	M WV	MP S	
William Bloom & Son	Microstructures	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S	HC	HPL WV	Ca Ck Fa	HPL	Fa V	
C.I. Designs	Magic Office System	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	O	HC	Fa PL	L PL	O		
Conwed	To be determined	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	M W	G MW	Fa WV	HPL WV	WV	1	
Eppinger Furniture, Inc.	Emetric	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		CB	WV	WV	WV	1	
Eppinger Furniture, Inc.	Task Response Module (TRM)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		CB	WV	WV	WV		
Facit-Addo, Inc.	Facit 80 Ergonomic II	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S	①	Fa HB P	SS WV	PL SS WV		
GF Business Equipment, Inc.	ESP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S	HC S	A Fa Pa	HPL	P		
Group Artec	Thompson System R/S	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AI GF W WV	G HC	Fa HPL W	HPL W	HPL S W		
Harter Corp.	Harter/Wall	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AI O S	Fa G HB	Al Fa O	HPL		W	
Hauserman	Hauserman Office System	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S	G HC	Fa PG S	HPL PB WV	HPL O PB		
Haworth, Inc.	UniGroup/ERA-1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S	HC S	Fa V	HPL	V	V	
Haworth, Inc.	UniGroup/Standard	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AI W	HC	Fa S V	HPL	V	V	
The Haws Corp.	serieSeven™	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AP S W	AP HC	Fa V	HPL	V	V	
Helikon Furniture Co.	Options	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S W	G	Fa P W	P W	W		
Herman Miller	Action Office	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S W	G HC S	Fa V WV	HPL WV	HPL WV	HPL WV	
ICF, Inc.	Interwall	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		PB	Me WV	Me WV	Me WV	Me WV	
Interroyal Corp.	Acoustical Screen System	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S W	G	Fa	HPL	P		
Interroyal Corp.	Openscape	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S W	G	Fa	HPL	P	Ck	
Interstate Industries, Inc.	Space Management One	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AI	G	Fa V	HPL	S	HPL	
JG Furniture	Illuminated Open Planning (IOP)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	PB	HC	Fa O	Fa O	Fa O		
JG Furniture	Reveal Wall	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	PB		Fa	Fa O HPL	O		
JG Furniture	Upholstered Panel System (UPS)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	HB	Ce	Fa	O	O		
Knoll International	Stephens Plus Office System	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	W	②	AP Fa O	O	O HPL		
Knoll International	Zapf Office System	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S	AP G MB	Fa	O Me V	M		
Lehigh-Leopold	Task Ambient Office System	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Fa S	G	Fa	HPL W	HPL W		
Marlite Division	Open Plan Screens	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AI	G HC MB	Fa V	HPL			
Modulo 3	Modulo 3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AI	AP	Fa HPL	Fa HPL	Fa HPL	Fa HPL	
Monitor Products	Unicell	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	P	P		HPL	MP	MP	
Myrtle Desk Co.	Environmental Module System (EMS)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	PB	WV	FI WV	WV	WV	
Nelson-Adams	NACO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	W	G	Fa				
Glen O'Brien Partition Co.	Space Change®	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AI	HB	Fa V	HPL		1	
Office Suites, Inc.	P-Series	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	WV	PB	WV	HPL V WV	WV	WV	
Omni Products	Alpha (oak) Unlimited (walnut)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	WV	W	WV	WV	WV	WV	
Open Office Products, Inc.	OOPS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S	S	Fa				
Owens-Corning Fiberglas	Sound Screen II	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AI	G	Fa			•	
Panel Concepts, Inc.	Landscape Look	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AI W	G	Ca Fa HPL V	HPL	HPL		
Partition Specialties, Inc.	PS 120	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AI	HC P	③	HPL	HPL	HPL	
Partition Specialties, Inc.	PS 340	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AI	HC P	⑦	HPL	HPL	HPL	
Harvey Probbler, Inc.	Advent III	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AI	CB W	④	⑧	⑧	⑧	
Reff Products, Ltd.	Reff "5000"	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Ch S W	G	Fa W	HPL V W	Me W	Me W	
Rockaway Metal Products Corp.	Co-ordinator Group III	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S	HC	S	HPL	HPL S	HPL S	
Scandiline Industries, Inc.	FSO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	W WV	MB WV	Fa	WV	WV	WV	
Steelcase	Moveable Walls	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S	G PB S	⑤	HPL WV	Pa	Pa	
Steelcase	Series 9000	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S	PB S	⑥	HPL WV			
Stendig	Omega	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S W	G M	Fa WV	HPL W	HPL WV	WV	
Stow/Davis	Free-Dimensional System	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S	G HB	Fa	HPL WV	WV	WV	
Vogel-Peterson	PlanScape	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S	G HB	Fa				
Vogel-Peterson	ScreenOne	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	S	G HB	Fa				
Vran Associates	Office Landscape Accessories	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AI		Fa				
Westinghouse Architectural Systems Div.	Westinghouse ASD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AI AP	HC AP	Fa HPL	HPL	P		

The information given in this chart was supplied by the manufacturers of the respective open office systems. As in any chart, there have been necessary simplifications to fit the chart format. For more detailed information on any of these systems, contact the manufacturer.



continuous base	utilities	integral raceways panel/panel raceway connections overhead power connections	Lighting task lighting components ambient lighting components	Acoustic control absorptive panel treatments	absorptive components surfaces	other sound-deadening features	background noise equipment	Mobile components mobile work surfaces mobile files mobile cabinets	Accessories coat racks drawer fittings
		• •	F •	F	G Fa AP Fa O FB			• •	• •
		•	•			Fa			• •
		• •	F •	F				• • •	• •
HP	• • • •	• •	•	⑨ Fa AP G G	AP Fa Fa	• •		• • • • • •	• • • • • •
M	• • • •	• •	F • F	HID F My AP Fa G Fa G HB	Fa MW Fa G Fa G HB	• • HB	• • • • • •	• • • • • •	• • • • • •
AI P	• • • •	• •	F • • • •	HID Fa G G S Fa G AP •	A Fa A Fa AP AP Fa	• •	• • • •	• • • •	• • • •
AG M HPL	• • • •	• • • •	• •	AP Fa G Fa Fa G	AP Fa G Fa	• MW	• • • •	• • • •	• • • • • •
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C BF HPL W	• • • •	• •	•	AP Fa Fa FB				• • • •	• • • •
MW	• • •	• •	• •	AP Fa Fa G					• • • •
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		•	F My	G HC					•



# Royalty's exotic residence

Effi Bantzer

**Can a palace, the traditional home of royalty, find expression in terms of modern architectural concepts? Taliesin addresses the question with confidence.**

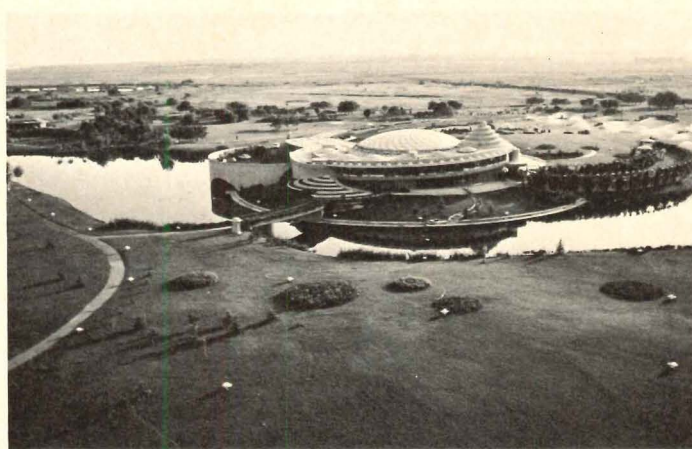
Her Imperial Highness Princess Shams Pahlavi has answered this question in the affirmative in her new residence outside Tehran. The palace is a contemporary interpretation of the essence of Persian culture. Princess Shams, the senior member among descendants of Reza Shah the Great, founder of the modern Pahlavi Dynasty, is sister to the Shah of Iran.

Historically, enlightened rulers of Persia were quick to employ foreign architects and artists to enrich the culture of the empire. In this respect, Princess Shams recalled a well-established precedent in choosing a "Western" architect dedicated to the idea proclaimed by Frank Lloyd Wright that "principle is the only safe tradition."

William Wesley Peters, chief architect of The Frank Lloyd Wright Foundation, responded to this commission with a design which was motivated by a deep understanding and appreciation of Iranian history and culture; the desire to restate these essential and timeless principles in new forms resulting from the use of modern materials and contemporary technology; and finally by a commitment to create a residential building which would be the individual, personal expression of an unusually discerning and discriminating client, having a rare understanding of beauty and an exceptional appreciation of quality and excellence.

The close relationship of buildings with enclosed garden courts, fountains, and cascades lined with lofty trees, is apparent in the architecture of Persian antiquity, both in domestic and public buildings. It was this traditional concept that inspired the architect to encompass a lush garden and living quarters under large domes, thus protecting both from summer wind and heat and freezing winter.

**Author:** Ms. Bantzer is a painter and musician and wife of supervising architect Thomas Casey. The article was written with the consent of the Cabinet of Her Imperial Highness and was approved for publication by His Excellency Mr. Mehrdad Pahlbod, Minister of Culture and Fine Arts.



East view showing ramp from which family rooms have private access.

The site is located about 30 miles from the center of Tehran in an open river valley spreading south from the great Elburz mountain range which extends east and west across northern Iran just south of the Caspian Sea. Resting against a gentle hill, the palace is surrounded by a man-made lake with fountain jets in spiral clusters.

Winding paths and roads through flowering, circular-patterned gardens lead to the main entrance. Introduced by this approach to the geometry of circles and spirals, the palace interior crystallizes into a most imaginative display of form, ornament, and color.

The larger of two translucent domes, 120 ft in diameter, encloses the main reception hall which overlooks cascades of fountains and exotic gardens below. The lightness and grace of this delicately structured dome create an interior ambience that maintains the ancient symbolic imagery of a "cosmic tent."

The eastern half of the larger dome is embraced by a gradually ascending ramp on which the library and the marble-panelled formal banquet hall are grouped along with successive family rooms all culminating in the uppermost chamber, the suite of Her Imperial Highness. The rooms along the ramp have an inward view of the interior gardens below as well as an outlook over the lake and gardens to the distant mountains in the north. A ziggurat with small diamond-shaped clerestory lights surmounts the suite at the upper end of the ramp.



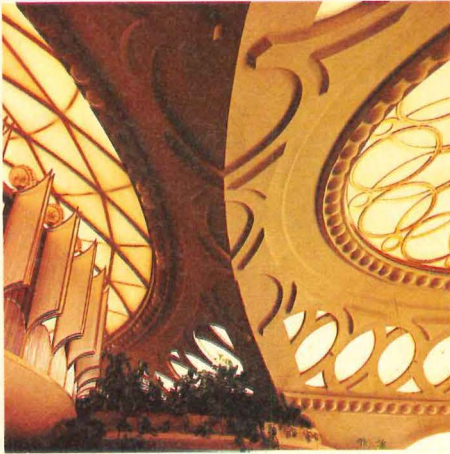


Under large dome (above) is the reception hall and garden; the Princess' suite is in the ziggurat; the small dome (below) covers the pool and lounge.





## Pearl Palace



Hemispherical chandeliers custom-designed for the banquet hall (right). Intersection of the two domes (left).



Adjacent to and interlocking with the major dome is an intricately patterned smaller dome covering the recreation area, indoor swimming pool, cascades, and lower gardens.

A fully equipped theater complete with dressing rooms, projection room, and related facilities accommodates 90 guests in an intimate atmosphere for such cultural events as musical concerts, dance performances, and films.

The commission called upon the architects to provide the complete design and correlation of all the elements, extending in many cases to the smallest details. Designs were provided by the architects and designers of The Frank Lloyd Wright Foundation for all interiors, furnishings, murals, patterned carpets, and chandeliers as well as interior and exterior landscaping. Mrs. Frank Lloyd Wright, president of The Frank Lloyd Wright Foundation, created the richly colored interiors. John deKoven Hill designed the custom furnishings; Cornelia Brierly did the landscaping as well as interior design work, and many other associates participated in the detailed work which included even the design of the Imperial Crest for the Princess' stationery. Realization of the numerous custom-designed elements was not easily achieved. Artisans from many countries were found, and they often remained in residence at the site to complete the work.

The imagery of opulent palaces in the Mid-East is often associated with visions of unlimited wealth. In contrast, the kings who built Persepolis, the legendary ceremonial center of the Persian Empire, kept accurate records of construction expenses. In sealed subterranean vaults thousands of clay tablets have been discovered which carefully recorded the wages paid to workmen over the many decades of building. With startling similarity the construction and furnishing expenses of the Pearl Palace were closely supervised by Princess Shams. Premium quality was always demanded, but extravagance or waste was consistently rejected. In consequence, the total expense of the furnished building was surprisingly modest and compares favorably with current construction costs.

For architect Thomas Casey, who was sent from Taliesin in 1969 as resident project supervisor, it was a tremendous task to realize this unique palace, that was four years under construction. He was assisted by Iranian architect Nezam Amery, who like Casey, is a former apprentice of Wright.

The determination of Her Imperial Highness to have a palace of her dreams and the equally determined wish of the architect to fulfill this extraordinary request produced a unique interpretation of modern Persian culture.

Without imitating or copying traditional forms, the fabric of the palace is infused with undeniable traces of Persian spirit and tradition that give the lifestyle of its modern society the special charm and poetry which project so strongly to the foreigner. With penetrating vision of the future, Her Imperial Highness Princess Shams Pahlavi and her architect have unified the spirit of Occident and Orient in forms which could well guide the creative exchange in modern Persian culture.

Behold yon azure dome, the sapphire sky,  
Rear in impillared might its canopy!  
The vast pavilion gemm'd with world of light  
Whole circling glories boast a boundless flight.

Saadi, "Persian Poems"  
trans. A.J. Arberry

### Architect's statement

The greatness of Iran in the ages of the past lay in the ability to correlate and unify the divergent thought of the East and the West and to inspire the efforts of architects and artists from all corners of the known world to produce work which was still essentially Persian in character. The rulers who built Persepolis brought the finest talent from Greece, Egypt, and the far-flung reaches of the confederated empire to create buildings and an environment which was not Greek or Egyptian but an expression of the spirit of Iran.

Inculcated in the principles of Frank Lloyd Wright, who proclaimed that architectural focus should proceed from an innate understanding of the essence of the materials, the purpose of the building, the character of the environment, and the highest aspirations of the people they serve, the architects welcomed with enthusiasm the opportunity to design a building for a sensitive and appreciative client who has recognized and valued these same principles and who has fulfilled the historical function of the past leaders of Persia by bringing architects and designers from afar and by inspiring them to produce new expressions of the eternal verities of Persian Culture. [William Wesley Peters]





Translucent plastic stairs (above) leading to the pool/lounge; the formal reception hall (above, right) and entrance area (below) are canopied by the large dome. Dusk descends on the Pearl Palace and Mehr-dasht ("Prairie of the Moon," bottom): the Princess' lifelong fondness of pearls and the full moon inspired the circular motif throughout the palace and grounds. Family rooms and building plans are not published at the Princess' request.

## Data

**Project:** Pearl Palace, Mehrshahr, Karaj, Iran.

**Architects:** The Frank Lloyd Wright Foundation; Mrs. Frank Lloyd Wright, president; William Wesley Peters, designing architect; Edmond Thomas Casey, structural engineer, supervising architect; R. Joseph Fabris, John Aubrey Banks, Stephen Nemtin, associated staff architects; Nezam Amery, associated Iranian architect; Kenneth Lockhart, specifications.

**Associated designers:** Cornelia Brierly, fabrics, carpets; Arnold Roy, Anthony Puttnam, Heloise Swaback, furnishings, cabinetwork; Paul Wagner, chandeliers, lighting fixtures; Ling Po, Kay Rattenbury, Vernon Swaback, murals; Heloise Swaback, sculptured reliefs; Arnold Roy, sound system.

**Client:** Her Imperial Highness Princess Shams Pahlavi.

**Program:** dwelling for the family and household of Her Imperial Highness and accommodations for public or semi-State functions, entertainment, and social events.

**Site:** level, semi-arid rural land northwest of Tehran with views of the Elburz Mountain Range to the north.

**Structural system:** lower domes, structural floors, columns, and piers, poured-in-place concrete; walls and bearing partitions, masonry; translucent domes, double-thick acrylic, aluminum tube structure.

**Mechanical system:** electric-powered, year-round air conditioning, heating, ventilation, and humidity control for the entire building.

**Major materials:** masonry walls coated on the exterior with exposed marble chips; concrete dome and wall surfaces; interior wall surfaces, gypsum plaster with gold leaf, fabric, or paint; doors and screens of clear glass or translucent tubes; interior woodwork and cabinetwork finished with gold leaf or enamel.

**Interior design:** The Frank Lloyd Wright Foundation, Mrs. Frank Lloyd Wright, personal supervisor of design and color selections; John deKoven Hill, designer.

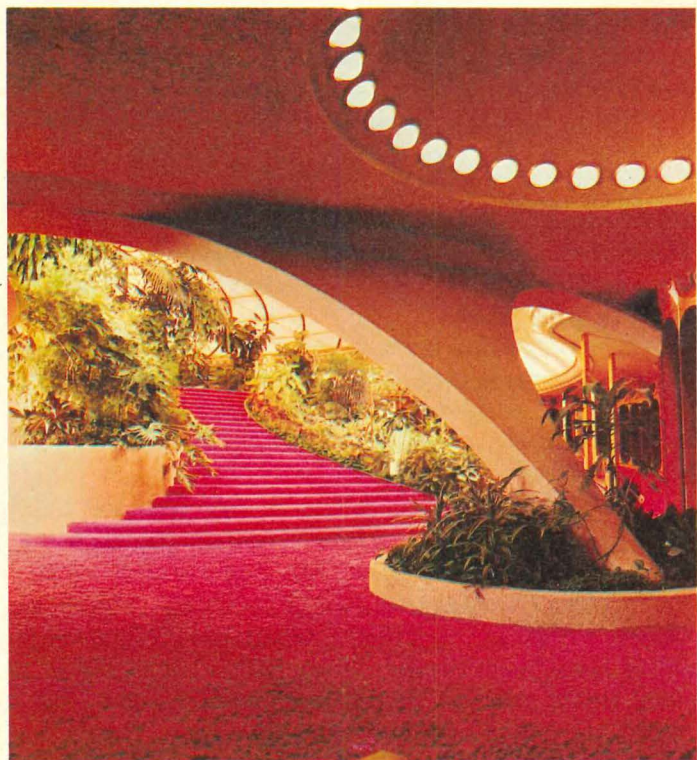
**Landscape and sitework:** The Frank Lloyd Wright Foundation, Cornelia Brierly, designer; Frances Nemtin, supervising landscape architect.

**Consultants:** E.R. Ronald & Associates, mechanical; George Thomas Associates, stage lighting; Vern Knudsen, acoustical; Western Contract International, Spencer & Co., interiors; Hela Norman, interior planting.

**General contractor:** Behsaznow Construction Co., Ltd., Tehran.

**Cost:** withheld.

**Photos:** Prince Shahbaz Pahlbod, except as noted.



Courtesy: Taliesin, Stephen Nemtin.





# Green lid for I-5

**Lawrence Halprin's five acres of landscaped concrete span Seattle's downtown freeway linking severed halves of the city. Enthusiastically received, the \$24 million park still leaves room for improvement.**

On July 4, 1976, the city of Seattle took a giant step toward proving that freeway blight is not a terminal disease. It dedicated a five-acre park of mostly concrete to span its river of concrete, Interstate 5.

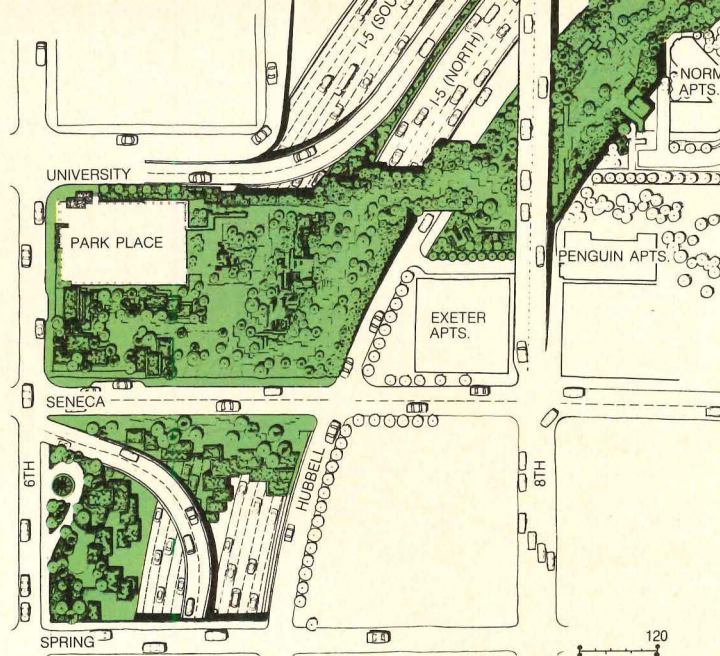
Designed by Lawrence Halprin & Associates with Angela Danadjieva as project designer, Freeway Park is a significant contribution to urban design concepts. Its high cost of nearly \$14 million in public and \$10 million in private funds is also significant.

In 1961, Paul Thiry proposed, for an estimated cost of \$9 million to cover the freeway, then in the planning stage, with a seven-block concrete lid. Although this plan would have preserved the alignment with the residential district of First Hill and supported a tree-studded parkway, it was rejected. The present freeway "ditch," said to have cost a million a mile, was built. As is often the way, the final cost makes the first plan seem like a real bargain.

Still, the end product of eight years of planning and two of construction is a rewarding experience. Most of the action is packed into the one-block lid over the freeway between Seneca and University Sts., a third of the total area.

Access to the main attractions of the park—the East Plaza Water Display, the Central Plaza Cascade, and the Central Plaza Canyon—is from the Central Plaza. From the Plaza level three stairways lead to the upper park, actually a roof garden over the municipal garage. One is simply for access; the other two are interwoven with the climatic moments of the design. The south stair descends to the bottom of a 33-ft canyon where a waterfall veils a freeway window-screen.

The dramatic level changes, the roaring presence of the water rushing over the concrete precipices, the narrow wall openings along the trail giving views into the watery depths—all these create a peerless, man-made-natural experience with a twist of dramatic irony. For in this concrete composition plugged into a concrete ditch, edged with the urban mountainscape of office towers and apartment



Aerial view of Seattle's Freeway Park.







Proximity to urban areas has given the park instant popularity.

houses, an urban disaster is transformed into work of high art. Its magic ranges from recapturing, for the trapped city-dweller, the rapture of a spray-spattered walk beside a mountain cascade to the witty transformation of cars into efflorescent fish streaking by the window in the Canyon depths. A major triumph is that the "white noise" of the water, as Halprin calls it, drowns the voice of the freeway.

This year's drought has permitted unusually hard and enthusiastic use of the park. To those watching the urban mountaineers plunging full clothed into the waterfalls and scaling the canyon walls, the children frolicking in the lower fountain, and the elderly evening strollers, the park seems a complete success. But beyond the aesthetic high-jinks, the design responds less adequately to user needs. In general, park access is poor. Of the four entrances to the central section from the downtown side, the two from University St. do not clearly indicate entrance to the park. More related to the Park Place Building, their corridor character suggests that the park link was an afterthought. The main, midblock entrance becomes a narrow neck between the building forecourt and the Central Plaza, constricting the flow of entering traffic. Limited by too few benches to function as a social gathering place, the plaza too becomes an awkward corridor.

The eastern park section, a roof garden for the municipal garage (site designated by the city) is primarily a circulation route for garage traffic. Here the park fails a major program requirement: repairing the break with First Hill. Though it is the only access route separated from auto traffic, no attempt has been made to gentle its grade. The user must descend a flight of steps, cross a gravelly wasteland, and climb back up a flight of steps to the garage level. Since the city excluded this land from the project, Halprin's office is not to blame, but it is reprehensible that no plan was made.

Night lighting from five directional poles is well-designed and effective, though a safety problem with the unlit 8th St. overpass may arise. Ironically, the overpass and the passage under the Park Place Building provide the only overhead shelter even though rain is most predictable.

Of the \$4 million spent on the park proper, the most obvious expense is concrete—3990 cu yds of it. In the present, immature state of the landscaping, the irregular board-form rhythm of retaining walls and planter boxes, which



also serve as a sound baffle, provides a visual format eventually to be masked by foliage. Invisible but necessary was the expensive piping system which delivers water and fertilizer, recirculates the water, and ensures proper drainage. As in the heart of an ocean liner, the pump room feeds a self-sustaining environment.

Finally, public funds are visible in the wealth of vegetation, selected chiefly for pollution tolerance. If all goes well, a densely green oasis worthy of nature herself will endure. But only time will tell whether nature is willing to assist man in correcting his mistakes. [Sally Woodbridge]



# Sweet life in North Beach

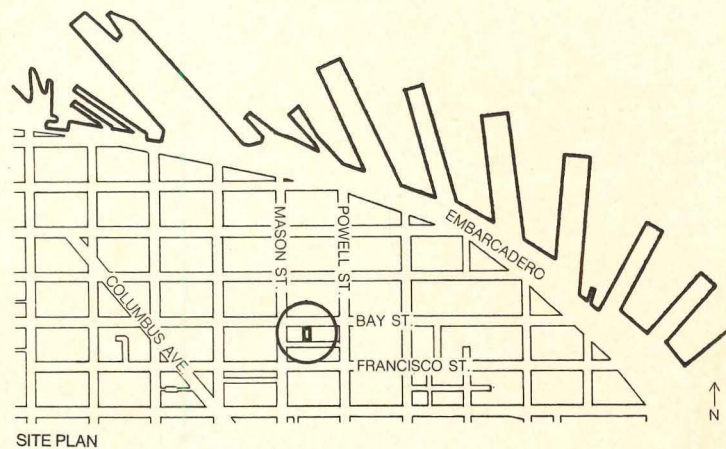
**In San Francisco, a residential and office complex in North Beach recalls the *dolce vita* of the neighborhood's predominantly Italian-American past.**

Three thirty-three Bay St. is a rich recall of Italian-American San Francisco. Designed by Esherick, Homsey, Dodge & Davis with interiors by Deborah Sussman & Co., the building's intent is to advertise the *dolce vita* awaiting those who occupy the hundreds of rental units developer Sangiacomo owns throughout the city. In addition to his Trinity Properties' offices, this building also contains 24 studio apartments. Residential access is properly sequestered on quiet Vanderwater St., while the public sales area, with drive-ins as well as walk-in entrances, opens off Bay St.

The formerly Italian North Beach area is a densely populated neighborhood of mixed residential and low-rise commercial buildings. Over the past decade or so it has become increasingly desirable as a place to live. It is near the Bay, convenient to major urban attractions such as Fisherman's Wharf and the city's great rehabbed shopping district with Ghirardelli Square and the Cannery (the latter also designed by the Esherick office). A 40-ft height limit and stringent zoning of use, density, and bulk have contributed to the homogeneity of the area.

Since Bay St. is a major traffic corridor, the designers put considerable energy into attracting the eye of the automobile passenger as well as pedestrians. Color is a major tool giving a warm, Latin twist to the conforming San Francisco boxy, bay-windowed image. The gold-leaf intaglio sign in concrete over the entrance is easily read at auto speed; the sidewalk and driveway pavements are laid in bold terra-cotta, white, and black tile patterns. A polygonal, glass wall gives a panoramic view into the comfortably appointed lobby.

Moving to the rear of the lobby, circulation zigzags past the receptionist's desk and front office, opposite which are three black leather-covered armchairs with end tables, angled to form a waiting area. At the entrances to the accounting and construction offices the space widens, narrowing again before the level change that announces the executive office suite. On the east wall the space is occupied by a pleasant, ample kitchen and an attractive dining



area for employees.

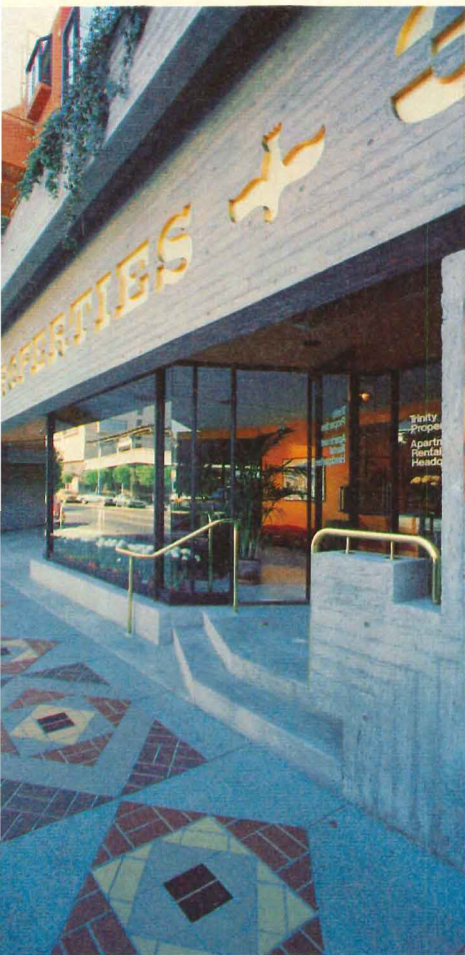
The executive suite, though very small, is divided into three gracious, well-defined areas: conference, office, and inner sanctum. The pivotal, space-focusing element is the fireplace with three hearths. One hearth faces the end of a long couch, forming a cozy inglenook; the other two address the conference and office spaces. At the other end of the inner sanctum couch a skylight creates a conservatory image, complete with potted palm. Thus one miniature space runs the gamut from indoor to outdoor delights.

Two things strike the eye most forcefully throughout this spatial sequence: the successful flow of space and the balance of warm and cool colors in a range which is glowing but not glaring. Within a narrow format the designers have created an interesting composition while avoiding complication for its own sake.

Like the ground floor, the studio apartments have a compact plan and rely on color to enrich the design. In typical unit plans, kitchen and dressing-bath-closet spaces are divided by a storage partition. The living space is small but amenable, with a fireplace and alternating balcony or ter-

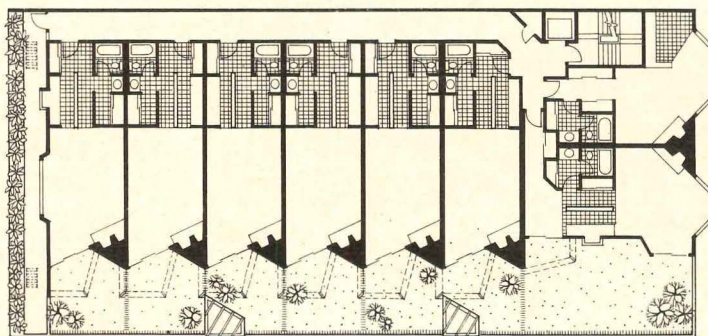
Ground floor offices at Trinity Properties face Bay Street and are designed for high visibility. Inside, rich materials that belie low cost of project suggest Italian ambience. Above the offices, three floors of furnished efficiency apartments reflect Bay area styles (top right).



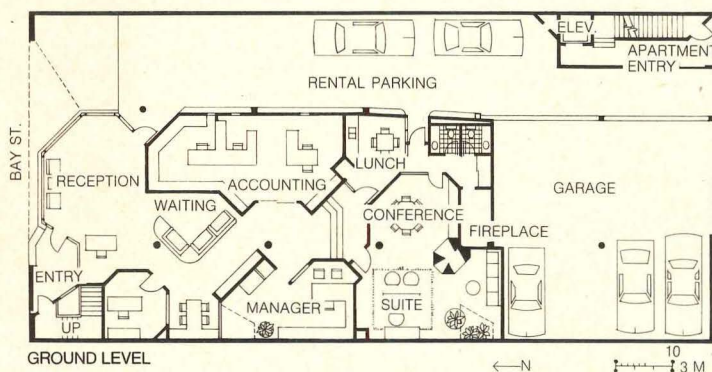




## Trinity Properties



UPPER LEVEL



GROUND LEVEL

race. Terraces are screened from view of the adjacent building by a fanlike lattice. Of necessity the Sussman-designed furnishings are multi-use.

The desired Italian ambience is a product of the color scheme (carried out in integral-colored stucco, plush, and other fabric wall finishings, carpets, teak herringbone-pattern floors, and marble floors and tables), the richness of the chosen materials, and the furniture design. The luxurious effects Sussman creates belie the low cost of the building. This is a crucial part of the story because the client is well-known for his concern with the cost/benefit of every design idea. Etched in the wall of the executive office is a cryptic motto: " $2 + 2 = 4$ ." It is said to express San-giacomo's business philosophy. However, in choosing to hire good designers for his low-cost projects, he has shrewdly counted on their ability to make  $2 + 2 = 4 +$ . [Sally B. Woodbridge]

### Data

**Project** Trinity Properties, San Francisco, CA.

**Architects:** Esherick Homsey Dodge & Davis.

**Site:** urban block in North Beach section of San Francisco.

**Program:** ground-floor offices with three floors of efficiency apartments above.

**Structural system:** all wood structure with poured-in-place concrete foundation with wood piles.

**Major materials:** wood, stucco, redwood siding, gypsum board, tile, aluminum casement windows.

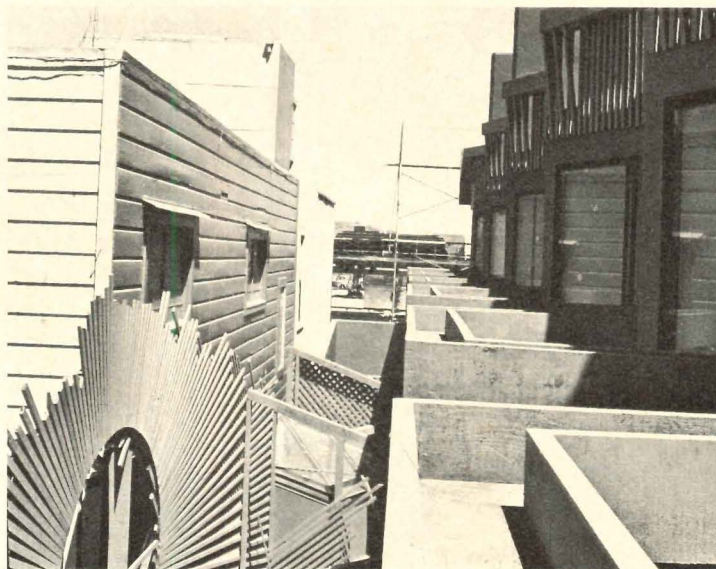
**Consultants:** Deborah Sussman & Co., interiors; Miles Suda & Assocs., mechanical engineers; David Wellisch & Assocs., structural engineers.

**General contractor:** Angelo Sangiacomo.

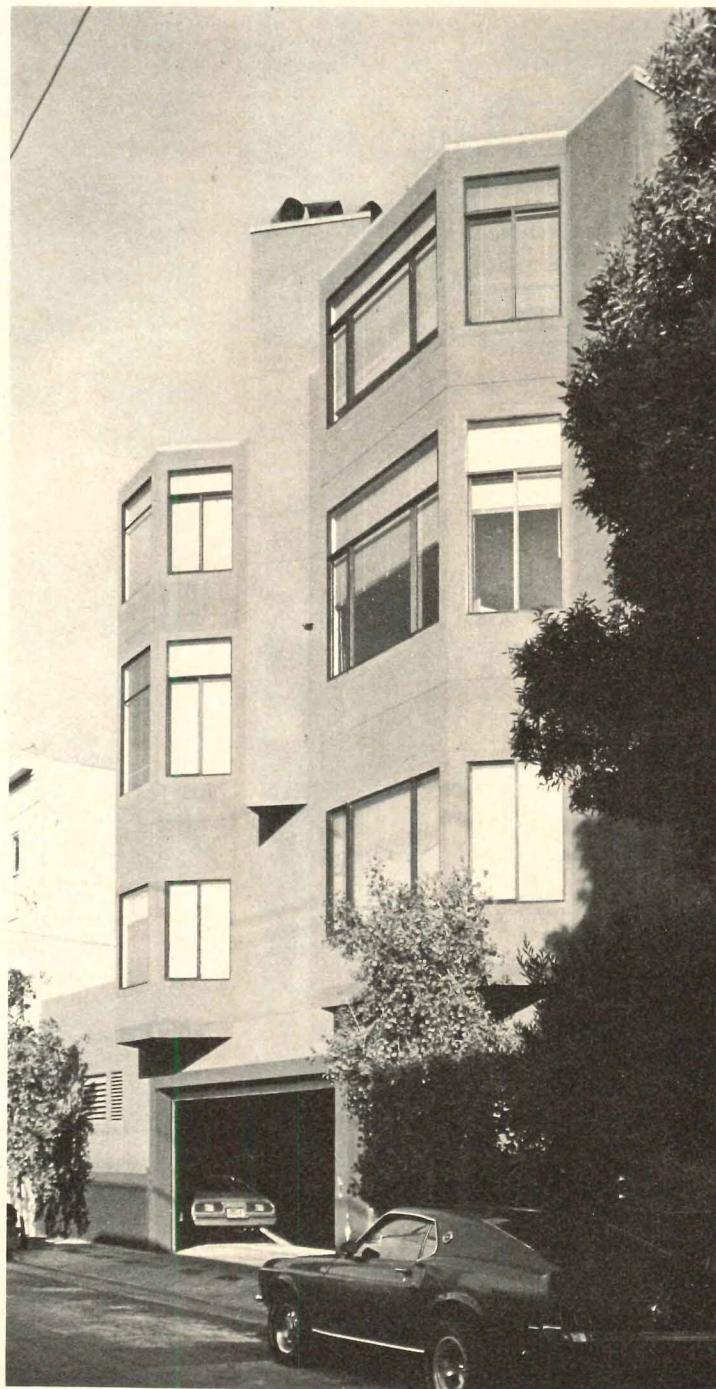
**Client:** Angelo Sangiacomo, Trinity Properties.

**Costs:** withheld.

**Photography:** Rob Super, except top right, p. 89, Kathleen Kershaw; top right, p. 90, George Homsey.



Residential tenants' entrance is on street opposite office entry (below).







Most apartment units have terraces or balconies (above and left), which are obscured from neighbors' views by wooden lattice screens.

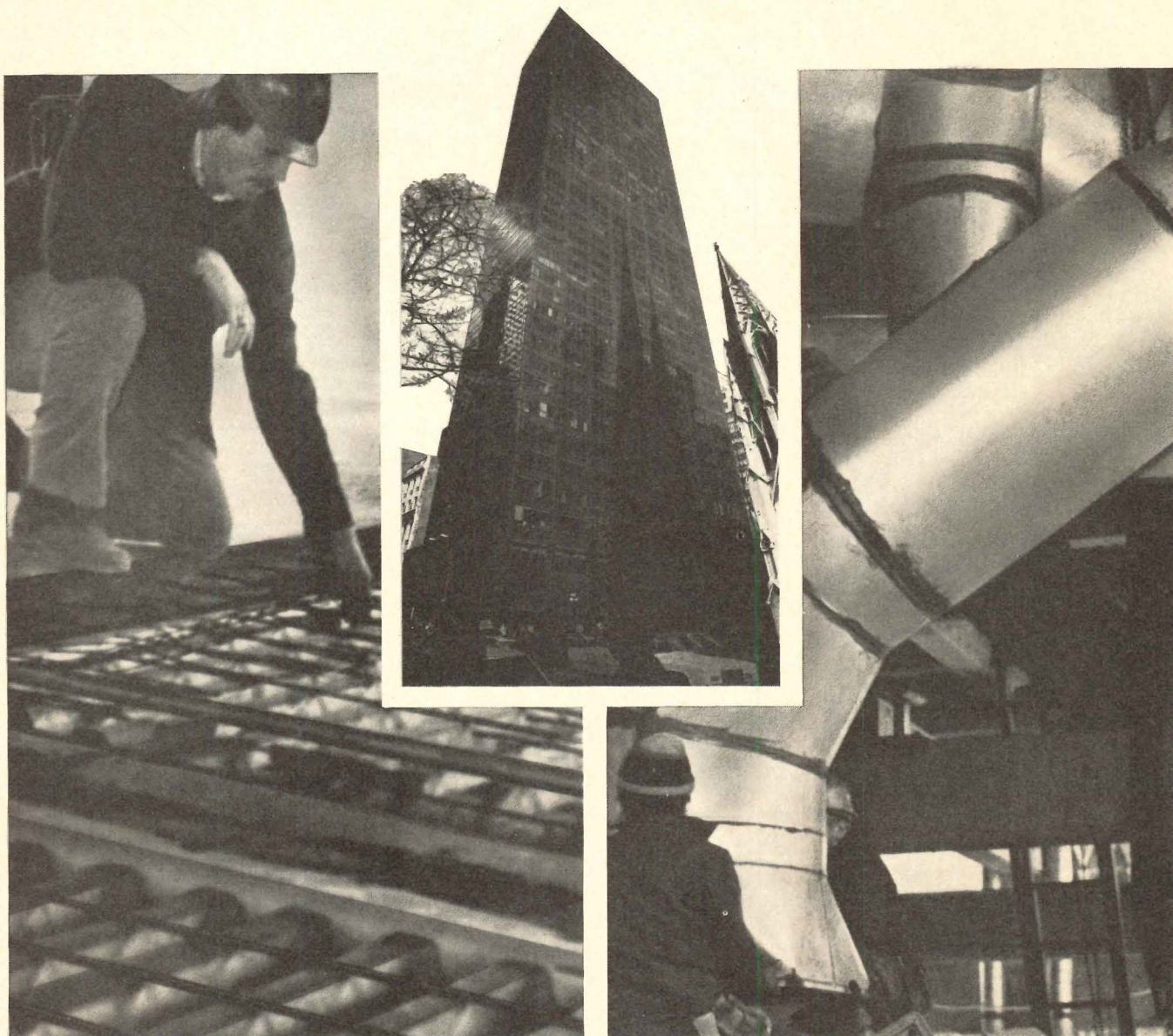


Italian ambience is continued in the apartment interiors, where units are handsomely furnished down to the last details (above and below).





# Specify galvanized steel now and avoid headaches later.



Doesn't it make sense to build with steel that's galvanized and head off damage due to corrosion in the future? The designers of the Olympic Tower thought so.

In this midtown New York building the lower floors are commercial, upper floors residential. Since the floors in the commercial portion had to carry more structural weight, the architects specified corrugated steel decking welded in place and covered with 3 to 5 inches of concrete. Looking ahead, they also required that the steel be galvanized.

Steel provides great strength but even locked in concrete it's subject to corrosion. Galvanizing can

protect against this possibility. The steel ductwork and pipes in the Olympic Tower are also shielded against corrosion with a coat of zinc.

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NE			SW		
E			W		
SE			NW		

\*Type of window  
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Polished plate 1/4 inch—2

Typical tinted glass—3  
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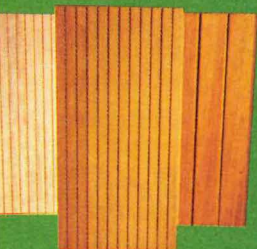
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# Alternates— effective selection and specifications

Josephine H. Drummond

**The last minute decision to add alternates to bidding documents looks deceptively simple. Here the author points out some of the pitfalls and how to avoid them.**

Often an architect or owner becomes concerned, shortly before issuing bidding documents, that his project may be over budget. He decides it is simpler to add some alternates, considering that they can be inserted by a line or two on the proposal, than it is to redesign and rebid the project. However, careful planning and preparation of the alternates and establishment of rules for their selection are necessary to avoid costly extras. Much more is involved than a line or two on the proposal.

Alternates can be used in any type of proposal but for consideration in their simplest and clearest form, we will assume a lump sum contract. Typically, this proposal calls for a lump sum for the construction as drawn and specified. Bidders are also required to quote on a number of alternate concepts, which may range from simple substitution of materials to complex omission or inclusion of floor space, finished space, or building wings.

Alternates can be additive or deductive. If used in combination, they can be selected to arrive at virtually any price and any bidder. Many contractors and most governmental contracting entities will not bid this type of proposal, since it is not competitive. At the outset then, we can say it is fairer, and in some cases the only legal process, to use all additive or all deductive alternates.

Deductive alternates are, in most cases, easier to handle. The drawings and specifications show the project as fully designed, and each alternate reduces the cost of some part of it. But if other considerations require one alternate to add to the scope of work, then all alternates should be written as additive.

Description of alternates should be included in a separate rate section in Division I of the project manual. Tacking them on at the last minute to the end of the technical sections, or sketching a detail onto an unrelated drawing promotes misunderstanding by the bidders. The description of alternates should be addressed to the contractor (the bidder) who is responsible for the project. The specification section covering alternates should state that all coordina-

tion of the work is part of each alternate. Omissions or additions in one trade must be accommodated by all other trades. Each alternate should be numbered, titled, and fully described.

The bidding procedure for the alternates should be covered in the instructions to bidders. Bidders should be advised whether bidding the alternates is mandatory or optional, what to do if no price change is involved, and how the alternates will be accepted. To retain the maximum competitive bidding process, alternates should be taken in the order or the reverse order in which they are presented. The instructions should state that the price for each alternate is to be the amount added to or deducted from the base bid and that the bidder shall indicate which it is.

The proposal form should include the number and title of each alternate and a space for bidders to write the cost, both in words and in figures. The words "add" or "deduct" should also be included, even if it is obvious.

Several basic types of alternates are as follows:

The simplest type merely substitutes one material for another, such as marble in lieu of granite. If the substitute material is similar in all respects, and its effect on related and adjoining work is the same, a statement of the change will suffice.

Slightly more complicated would be a change in type of material, such as the substitution of vinyl wall covering for granite. In order to realize the full cost impact, changes must be made in the backing, supports, and adjoining construction. Details, as well as specifications, should be provided for changes of this type. If the alternate is not comprehensive, one trade may eliminate the backing for the granite, while the other may not include the backing for the vinyl wall covering. At change order prices, the owner may spend more for the vinyl than he saved on the granite.

Much more complicated, and to be avoided wherever possible, are alternates which modify the physical size or scope of the project. Unless comprehensive drawings and specifications are provided, bidders usually misunderstand the intent of this kind of alternate. If a wing of a building is omitted, drawings must show what happens to the utilities, to interior and exterior walls, windows, and doors. What is to be done to the ground otherwise occupied by the deleted wing. What provisions are to be made for future construction of the omitted portion. The same is true for an added wing.

Alternates to alternates are even more troublesome and accomplish so little they should be avoided. To use our granite and marble example, it would be unadvisable to have another alternate changing the extent of the granite (or marble).

Alternates are a useful tool. Especially in times of rapidly changing prices, they provide a means of awarding a contract near a project budget price and can prevent costly redesign and time-consuming rebidding. For the greatest benefit, alternates should be: limited to four in number; of the simplest type possible; arranged in order of their acceptance; preferably as deductive types.

**Author:** Josephine H. Drummond, CSI is Specifications Writer / Construction Administrator, Gruen Associates, Los Angeles.



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**Technics: overhead glazing**

# Let there be skylight

**A balanced look shows that energy, conservation, and skylights need not be incompatible. There are energy tradeoffs that should allow architects to continue their imaginative development of overhead glazing.**

The energy crunch has forced architects to reexamine many of their design ideas. It is true that aesthetics, physical feasibility, and cost continue to play their major roles in design. But now the architect must more carefully than ever before also tailor his structures to the energy cloth.

The rules telling him how this is to be done are not fully written yet, but the outlines seem to be fairly clear. Either a building as a whole will have to conform to a specified energy budget, or entire elements of a building—such as walls and roofs—will have to meet specified energy standards; probably both approaches will be combined.

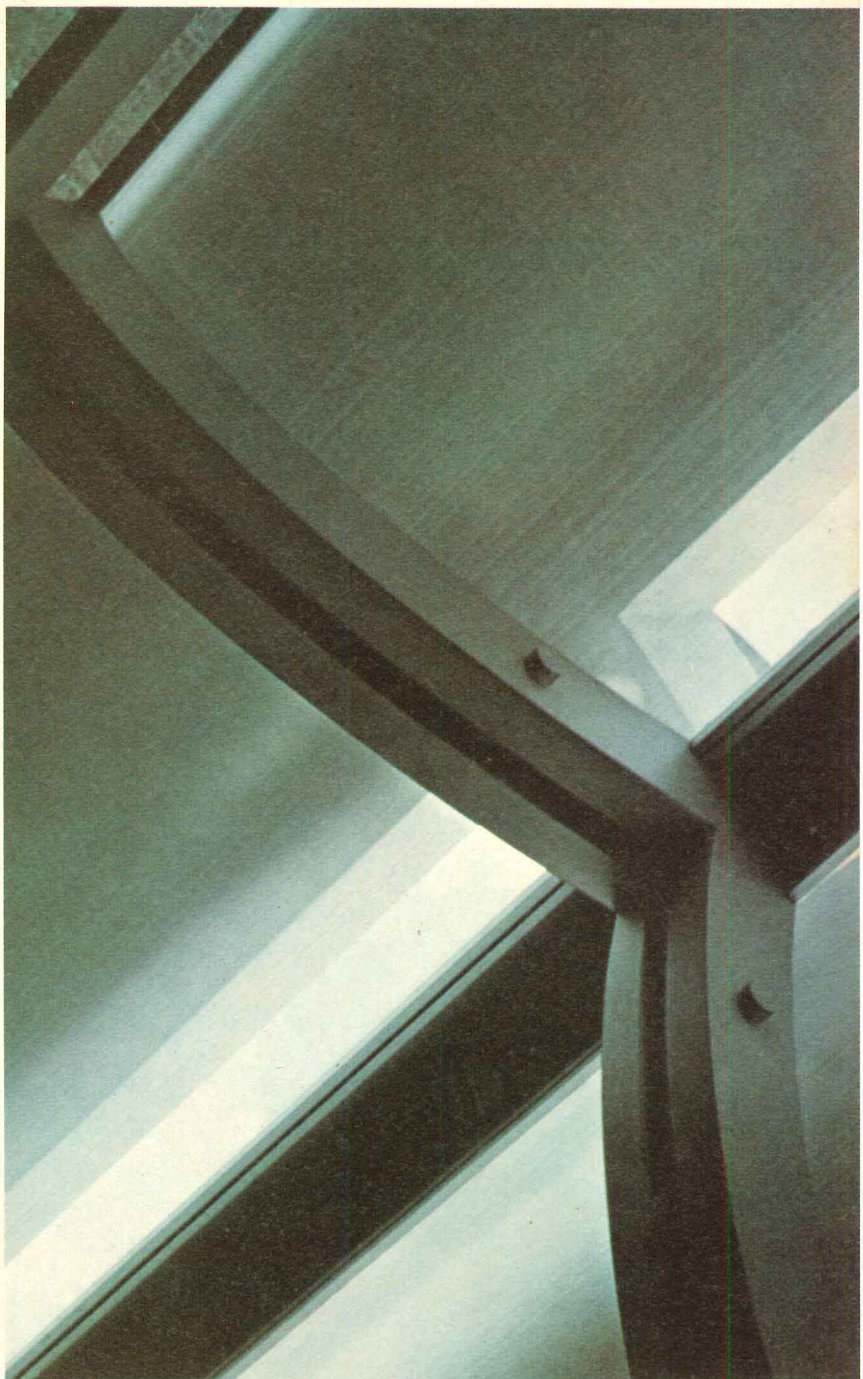
This has happened just at a time that the impulse to bring the outside in has tremendously strengthened interest in the skylight. Fears about leakage and breakage having been laid to rest by new or improved glazing materials, systems, and techniques, architects in the last several years have been using sloped or overhead glazing in unusual and even daring ways, going to war when necessary with local code-enforcement agencies to win approval of their designs.

The emphasis on energy conservation has focused attention on the insulating properties of building materials. Can skylights meet the energy test posed by standards like ASHRAE 90-75? It would be impractical and certainly very costly to build a skylight with insulating properties as good as those of an equal area of conventional built-up roof. But to conclude that this dooms the skylight is to look at the situation with only one eye.

## **The energy balance**

Among the many purposes for which most buildings use energy, space heating/air conditioning and lighting are primary. When an energy balance sheet is drawn up, it is

Kimbell Art Museum, Fort Worth. Daylight washes over concrete cycloids but is deflected from paintings. Louis I. Kahn and Preston M. Geren designed museum, which won 1975 AIA Honor Award. Naturalite skylights.





## Technics: Skylights

Wilson Commons campus center, University of Rochester, New York (below). Triodetic space frame (Butler Manufacturing) uses galvanized steel tubular members, painted white, in extruded connector hubs, with dark aluminum supports for the glass. Roof glass is tempered, laminated, reflective. Walls are clear glass. Architects: I. M. Pei and Partners.

W. Frank Steely Library, Northern Kentucky University, Highland Heights (top and center, right), has sloped glass wall of PPG laminated glass; outer skin is tinted glass with reflective coating, inner skin is clear glass. Architects: Fisk, Rinehart, Hall, McAllister, Stockwell.

Children's Hospital, Philadelphia. High-rise atrium is flooded by sunlight from skylight system. To get approval for atrium, designers included automatic smoke and heat venting panels (Wasco design), actuated by smoke detectors. Architects: Harbeson-Hough-Livingston & Larson.





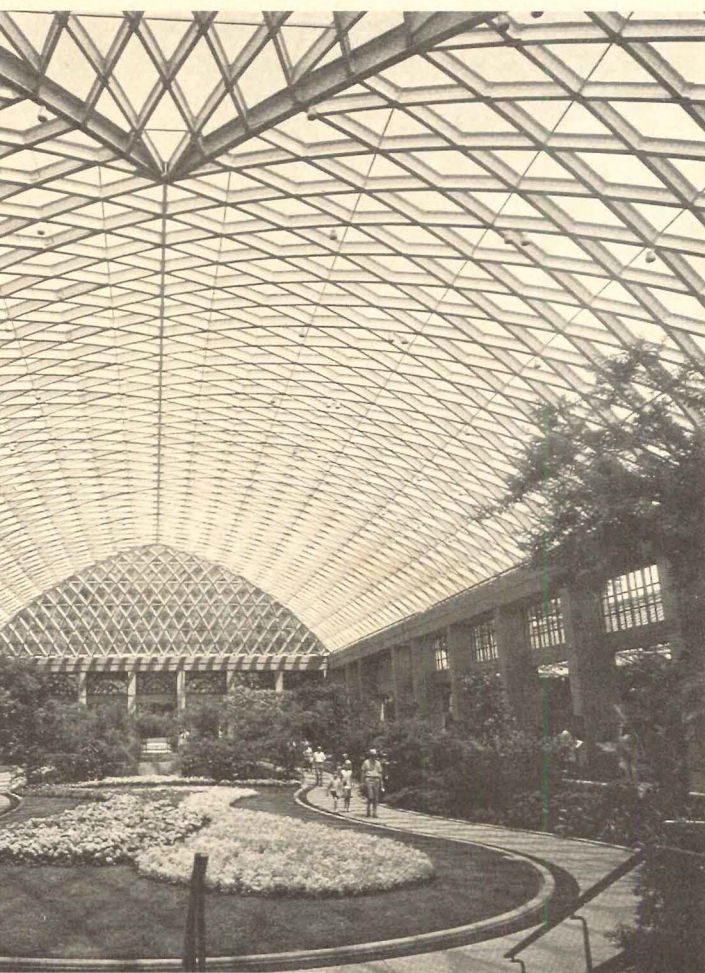
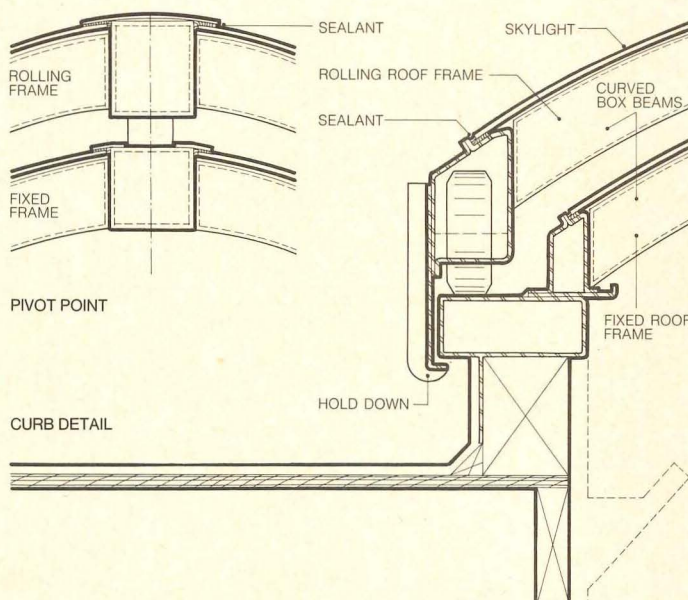
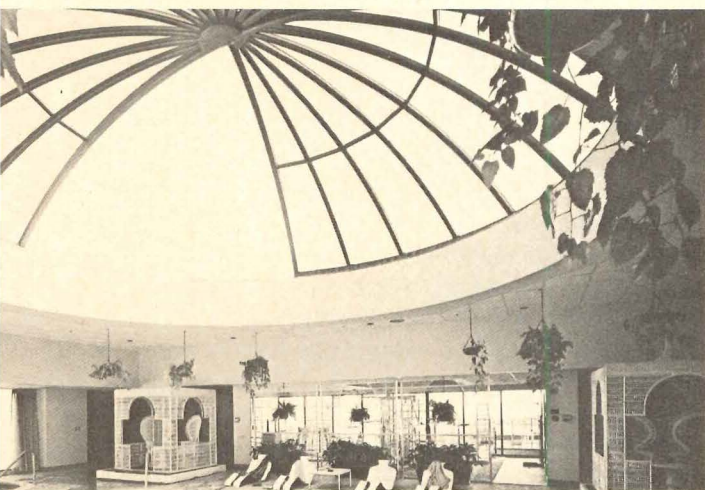


Eatons Center, Toronto (left) has long, skylit gallery and glazed screen at main entrance of the center. Glass from Pilkington, skylight by Lord & Burnham. Architects: Bregman & Hamann and Zeidler Partnership.

Grosvenor Towers, San Francisco (left center), has all-weather swimming pool covered by Rollamatic electrically operated retractable dome, made of 1/4-in transparent bronze acrylic, in two half shells. Detail of the rolling roof frame is shown below. Architects: William Schuppel & Associates.

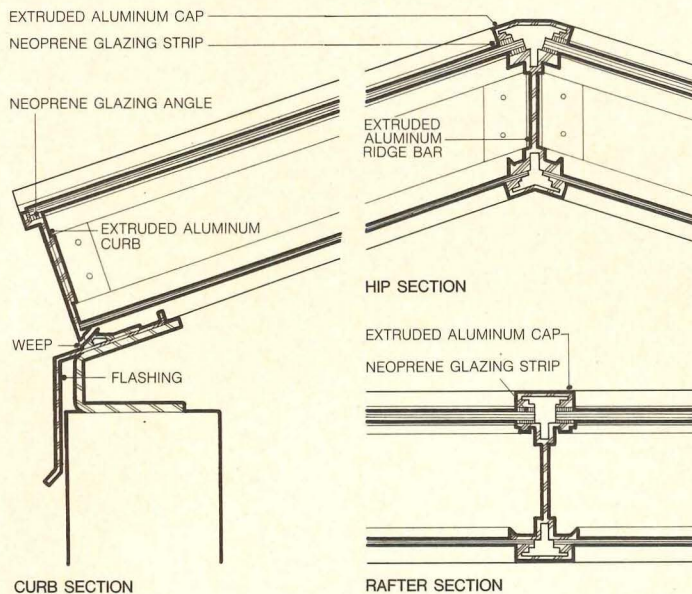
Longwood Gardens, Longwood, Pennsylvania (lower left). Diamond-shape acrylic panes in deep aluminum extrusion framing of Bohem skylight create interesting woven pattern over the interior. Architect: Richard Phillips Fox.

Philip Johnson Sculpture Studio, New Canaan, Connecticut (bottom right). Composite steel and glass roof by Fisher Skylights is single-glazed with LOF 1/4-in. tempered, reflective glass, the first skylight use of this type of glass, Fisher believes. Architects: Philip Johnson, John Burgee.





## Technics: Skylights



Abelson residence, Long Grove, Illinois. Designer has used glass pyramid skylight from Super Sky and glass patio wall to open the room visually. Pitch and bar pattern of skylights may be varied, with appropriate extrusions in framing system. Architects: Fraizier, Orr, Fairbanks & Quam.

often the case that a well-designed skylight system saves more (through reduced lighting loads) than it costs (in increased heat transfer in or out of the structure). A skylight may admit five or more times as much light as a vertical window of the same area. Therefore, the emphasis on energy conservation may well enhance rather than lower the attractiveness of the skylight as a design element, depending on the geographical area.

Among the tools available to architects for evaluating skylight energy design variables is Rohm & Haas' computerized S-U-N (Skylight Utilization Network) program. It considers the effects of solar heating, solar lighting, heating/cooling degree-days, and conduction and infiltration flows in relation to the energy required for heating, cooling, and lighting. It produces an energy analysis which may be used to arrive at design tradeoffs that may enable roofs containing skylights to meet ASHRAE 90-75 and similar standards.

The intertwining of the paths of skylights and energy is not new. For example, architects in the old days designed sawtooth roofs over factories not because they were beau-

tiful but because they could augment the artificial light sources in the plant. Then, as sources improved and cheap energy—apparently unlimited—became available, architects started to move toward solid roofs (and, in many cases, windowless buildings).

The confidence in an unending supply of cheap energy, paradoxically enough, also persuaded many architects to look closer at the design and functional possibilities that follow from the more extensive use of glazing—in skylights, curtain walls, and larger window areas. They understood the effect this would have on energy demands. But the concern was more often with how to satisfy the demands than with how to reduce them.

During this period, one saw the usual push-pull interplay between the architectural profession and the building materials industry: the aspirations of the one and the products of the other mutually evoking new aspirations and new products. Glazed systems began rapidly to change the roofscape of America. Today there is a wide variety of glazing materials available, including the architectural glasses, acrylic and polycarbonate plastics, and reinforced fiberglass. There is also a wide variety of structural members and systems designed for the special requirements of non-vertical glazing installations.

## Stars in the sky

With the disclaimer that this is not an attempt to referee claims as to who did what first, let's briefly mention some notable designs of the last decade or so, that illustrate how architects have used overhead glazing to ornament and open their structures. For example, John Portman & Associates' soaring, skylit hotel lobby atriums, as in the Atlanta Hyatt Regency, and acres of skylights in Detroit's Renaissance Center project; I.M. Pei & Partners' glass and steel space-frame Wilson Commons campus center at the University of Rochester; Philip Johnson's sculpture studio in New Canaan, CT, with the reflective glass in its composite steel and glass roof applied as a weathering skin; Harbeson-Hough-Livingston & Larson's Philadelphia Children's Hospital, whose sunlit atrium conveys the feeling more of a neighborhood playground than a hospital adjunct; Donald Stull Associates' Jackie Robinson Middle School in New Haven, whose continuous sweep of translucent fiberglass and polycarbonate roof and wall floods the interior with essentially shadowless light and appears to grow out of its hillside site.

Also, Kevin Roche, John Dinkeloo & Associates' Metropolitan Museum of Art Lehman Wing, whose 100,000 sq ft of tempered, reflective, insulating glass opens the building to Central Park; Beran & Shelmire's World Trade Center in Dallas, with its lively eight-story atrium, whose twenty 35-ft square acrylic skylight assemblies were helicoptered into place; the gemlike Kimbell Art Museum of Louis Kahn, in Fort Worth, whose analytically curved ceiling and reflectors work with the skylight roof to wash the interior with light while shielding the paintings from direct sunlight; not to mention uncouned skylight shopping centers, galleries, arcades, and domed all-weather recreational centers such as swimming pools.

Most of the striking skylight installations that one sees are custom designs. But many manufacturers also offer off-the-shelf standard units—flat single slope, flat double slope,



bubble, domed, arched, pyramidal—in single- or double-glazed models, many of which lend themselves to interesting variations, including assembly into larger skylights. Some companies also offer movable skylights, which may be rolled or retracted to open the interior to the air.

### Glazing materials

Each of the various glazing materials makes its own claims for attention. A brief review of the development of these materials will help bring some of their features into focus.

As a preface, it should be borne in mind that, regardless of the properties and characteristics of the materials, many building codes severely limit the architects' options; most of the restrictions are based on fear of pieces of the skylight falling. Variances are often granted, of course. Skylight specialist firms and materials producers can help greatly when a variance is sought.

Early skylights were made of 1/2-in. clear wire glass (with housings usually made of sheet metal). Today, almost every type of architectural glass that is used for vertical glazing may also be used for skylights and slope glazing. The early applications, which were primarily in industrial applications to admit natural light into work areas, were of simple construction—usually single slope, oriented north. Heat-absorbing and translucent wire glasses led to more ambitious designs, such as ridge and hip skylights.

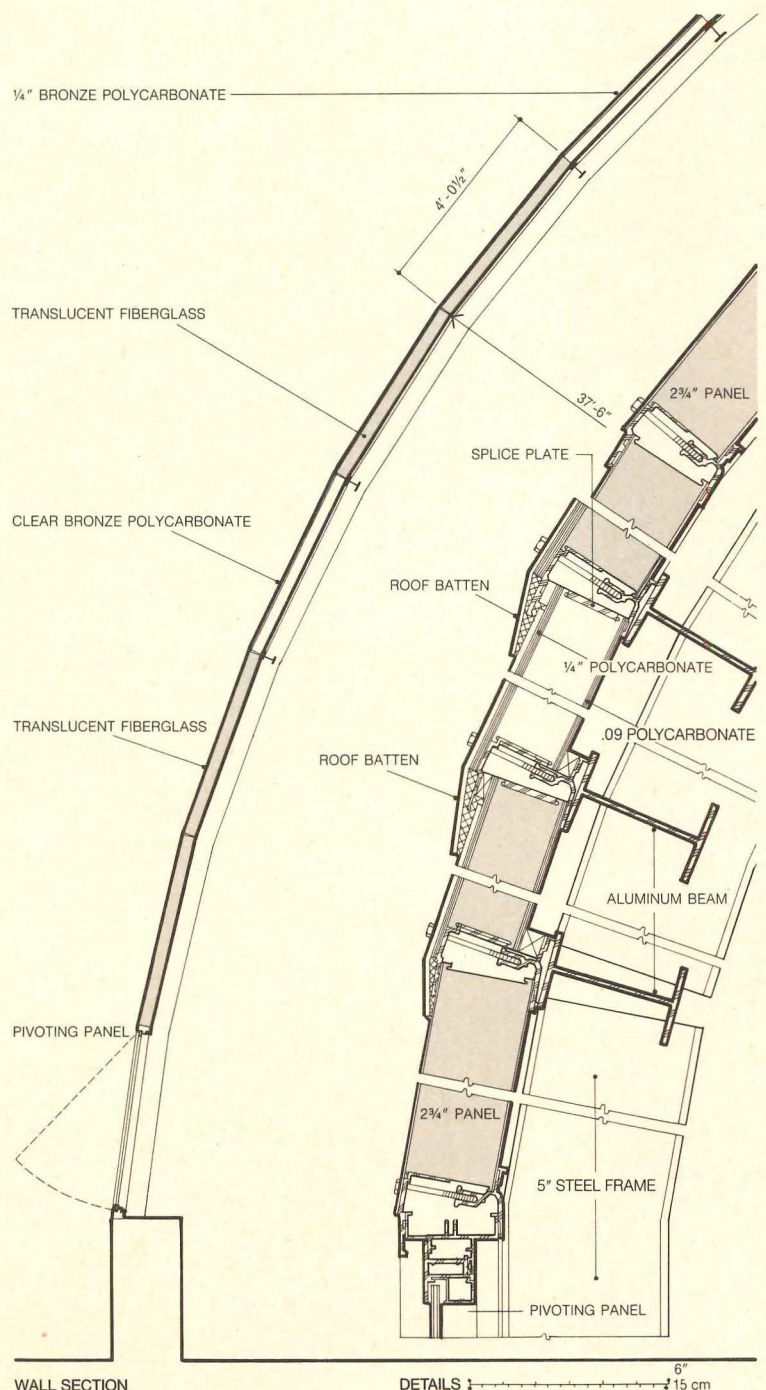
Laminated safety glass began to be used in skylights in the late 1950s. Consisting of two lights of glass laminated to an inner layer of polyvinyl butyral, it proved stronger than wire glass and, like wire glass, retained its shards when broken. It was available in clear or bronze-tinted versions, with light transmissions of 28 and 55 percent and good solar heat-absorbing qualities.

More expensive and higher performance materials entered the market, such as tempered glass in clear, bronze, and gray, and other laminated glasses, such as translucent white and gray or bronze plate glass laminated to clear glass. In the 1960s, reflective glass became available. Although more expensive than other heat-absorbing glasses, this type offered the greatest ranges of light transmission and heat control.

Acrylic skylights became feasible after World War II, as a result of a thermoforming and stretching process developed during the war to form aircraft canopies. The technique gives the formed acrylic a rigidity that the flat sheet lacks. It makes the material suitable for inexpensive and watertight prefabricated bubble or dome skylight assemblies and indeed for any designs that require other than flat glazing. Early acrylic skylights were clear. Now translucent white and very high density plastic are available for glare reduction, and tinted and reflective for solar heat control.

Polycarbonate plastic, which has extraordinary impact resistance, has seen wide use as a vandal- and burglar-proof glazing material in schools and shop windows. It is used in such overhead installations as covered walkways, where its higher cost is justified by its toughness.

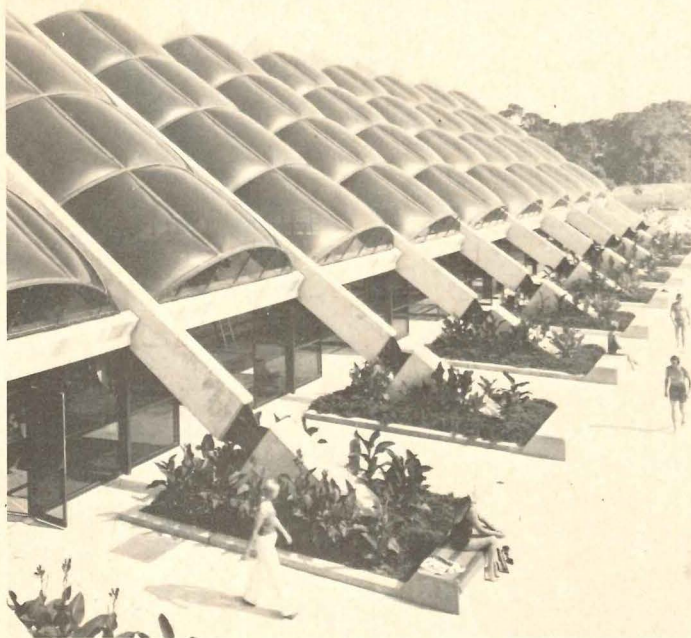
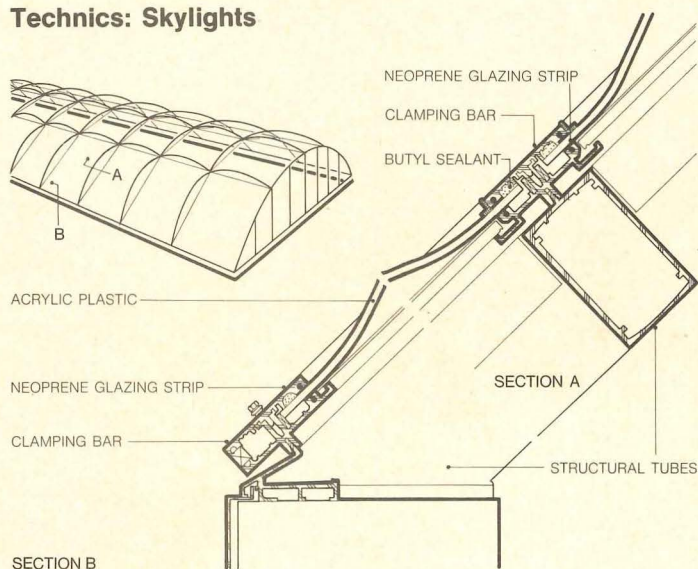
Reinforced fiberglass is strong, light, and has high resistance to abrasion. It is available in translucent flat panels



Jackie Robinson Middle School, New Haven, Connecticut. Skylight roof and wall form a continuous sweep in double-skin, resin-reinforced fiberglass and tinted polycarbonate Kalwall installation. Architect: Donald Stull



## Technics: Skylights



Echo Park Pool, Long Island, New York. Formed panels of tinted acrylic are assembled into barrel vault units that let the sun in but keep the glare and much of the heat off the bathers. Skylight by Roper IBG.

and curved sheets. It retains its rigidity at temperatures where other plastics sag and deform.

### Double glazing

In the northern States it is likely that skylights will have to be double-glazed in order to reduce heat transfer and attain U values in keeping with stricter energy requirements.

Double glazing may consist of combinations of any of the materials discussed above, with the second layer glazed to the underside of the skylight framework. A drawback to this kind of installation is that it is not hermetically sealed and condensation may form between the layers. However, most manufacturers' glazing systems make provision for carrying the condensate off. On the other hand, insulating glass units are hermetically sealed, but they may not be available in some of the shapes that are required and their great

weight in large sizes may make installation more difficult.

Another form of double glazing is available in some proprietary skylight products. These are double-skin sandwiches. One acrylic type is extruded with integral longitudinal ribs between the skins, another has the two skins fused to an acrylic honeycomb core. A fiberglass sandwich panel has the skins cemented to an aluminum honeycomb core. Double-skin panels are much stiffer than single sheet.

In many cases, double-glazed skylights may be filled with translucent insulation to improve its U value. However, this will reduce light transmission.

### Picking winners

The choice among the various glazing materials is seldom clear cut, especially in custom designs. Many factors should be considered, with an eye to possible tradeoffs. For example: suitability of the material to the design; cost of the material, the skylight assembly, and the complete installation; light and heat transmission characteristics; weight; maintainability; weathering characteristics; fire resistance; strength; impact resistance, and availability.

It's difficult to generalize about these materials, but there are some base points. Obviously, codes must be considered; although all accept wire glass and some accept acrylic, variances, as mentioned before, may be granted for other materials. Where formed shapes are required, glass is ruled out. On the other hand, only glass will not burn, and it is unmatched in resisting scratching. Where a transparent material is required, fiberglass is ruled out, since it is available only in translucent form.

Wire glass is physically weak (although it retains shards when broken), so is limited in useable size. It is not available in tinted or reflective form. On the other hand, it is very economical and has good fire-resistant properties.

Annealed float glass is twice as strong as the same thickness of wire glass; tempered glass is seven times as strong.

There is a continuing controversy between major glass manufacturers, with partisans on each side, as to the types of glass that should be used over populated spaces. Says Libbey-Owens-Ford: Fully tempered glass of the correct thickness has a better chance of surviving a hard impact than laminated glass. Says PPG Industries: Laminated glass—heat-strengthened when tinted or when reflective units are used—or protective screens should be used to reduce the risk from glass fall-out. Defenders of tempered glass point to its very high impact resistance and the fact that it breaks into relatively harmless pebbles. Antagonists state that although use of an appropriate safety factor may reduce failure probability to nearly zero, undetected damage during handling or imperfect glazing may lead to failure of even the strongest glass.

Acrylic is light, inexpensive, has very good impact resistance, is available in a good range of colors and tints in both the clear and translucent plastic. It is easy to form into complicated shapes; at Portman's Peachtree Plaza Hotel in Atlanta, each acrylic panel had to be differently formed, with all four edges in different planes, according to Roper IBG, which fabricated and installed the skylight.

But acrylic is flammable, susceptible to scratches, may discolor in time (although an extra-cost coating is available to prevent this). It has a much higher coefficient of expansion than the aluminum framing, something the designer



must consider to ensure watertightness. It tends to build up static charges which attract dust and dirt particles, so may require periodic cleaning. It sags in large flat panels, but this can be overcome by thermoforming.

Polycarbonate has high impact strength, does not shatter, and is self-extinguishing, but it is expensive.

Fiberglass is light, strong, does not shatter, and is relatively inexpensive. Its coefficient of expansion is close to that of its aluminum framing. But it is not available clear.

**Glazing systems, details**

As mentioned before, early skylights used to be fabricated of sheet metal—basically a metal frame with lights of glass set in the roof. For watertightness, sealants such as putty were used, but they dried out, cracked, and leaked. The frames themselves also deteriorated and leaked. Today's standard-unit skylights are prefabricated assemblies which give many years of leakproof service when installed according to the recommendations of the manufacturers or the National Association of Roofing Contractors. Sealants, too, have improved.

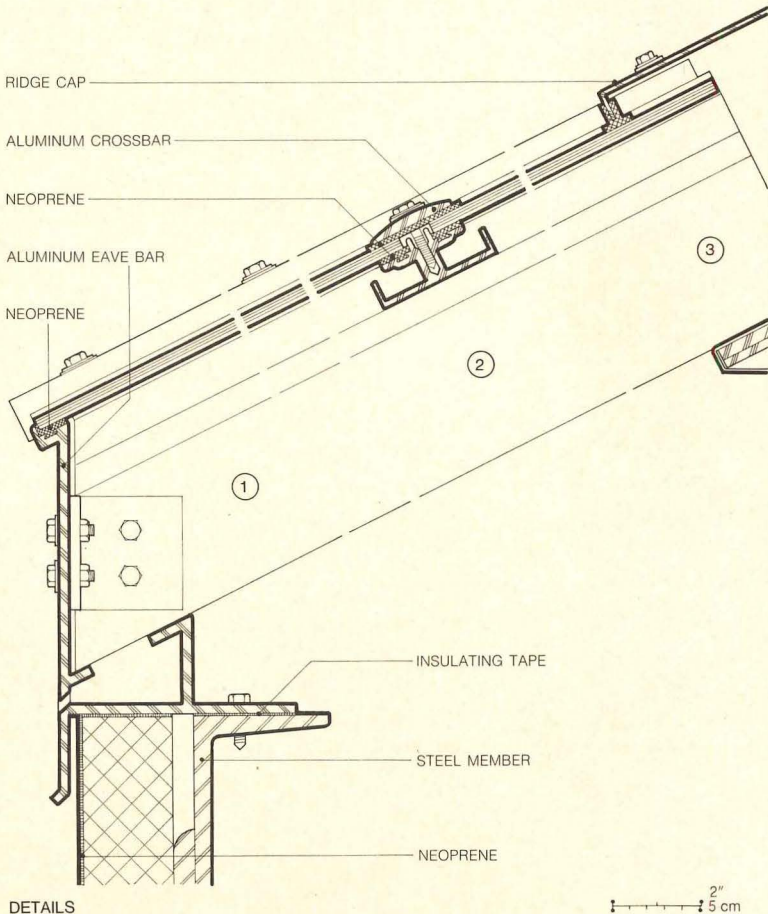
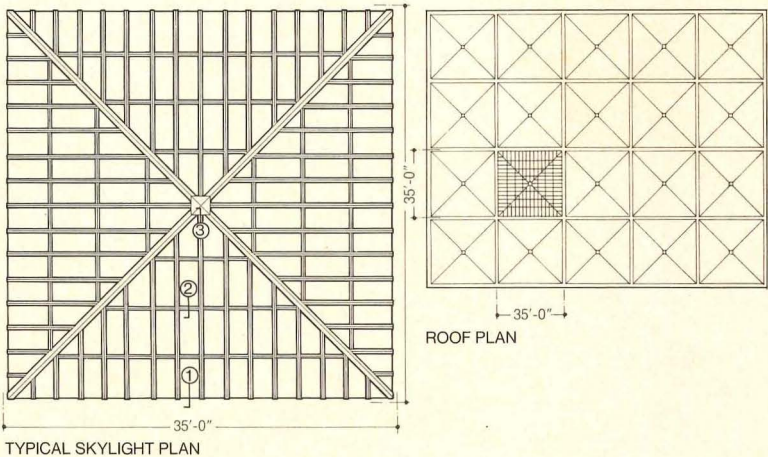
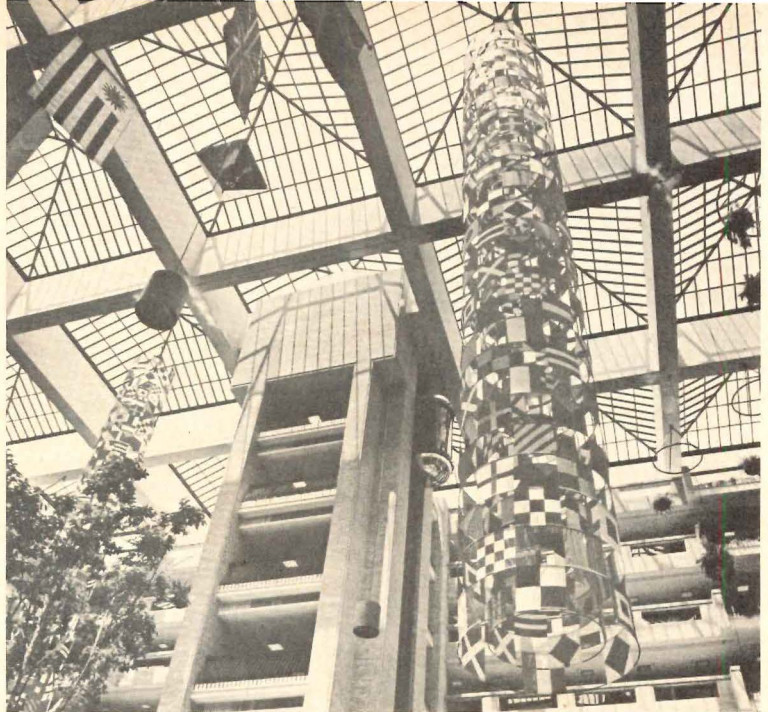
Larger, custom skylights are usually glazed with standardized framing systems—usually organized around extruded aluminum members. While details differ from manufacturer to manufacturer, the extrusions accommodate the glazing material and snap-in sealant gaskets such as neoprene. They also include weep holes and run-off channels for carrying away interior condensation. External joints may be caulked or capped, or depend on shinglelike overlapping to keep the roof tight. In some designs the extrusions serve as main or supporting structural members, often as elements of efficient space-frame systems. The important role of standard extrusions is stressed by Robert Fisher of Fisher Skylights: "Regardless of the skylight's size or shape, with standard extrusion systems we have standard treatment of runoff and condensate, and of glazing, so we don't run into surprises."

Like the smaller, off-the-shelf skylight, a large installation, even one covering an entire roof, will not leak if well designed. Larry Huffman of Super Sky Products points out: "The key to leakproof design is good mechanical design; gaskets and sealants are necessary, but they are the backup, not the primary defense."

Manufacturers' literature can be helpful in working out skylight details. Two exceptionally good sources are Roper IBG's series of "Glazed Structural Systems Design Portfolios" and Super Sky's skylights catalog.

**Design help**

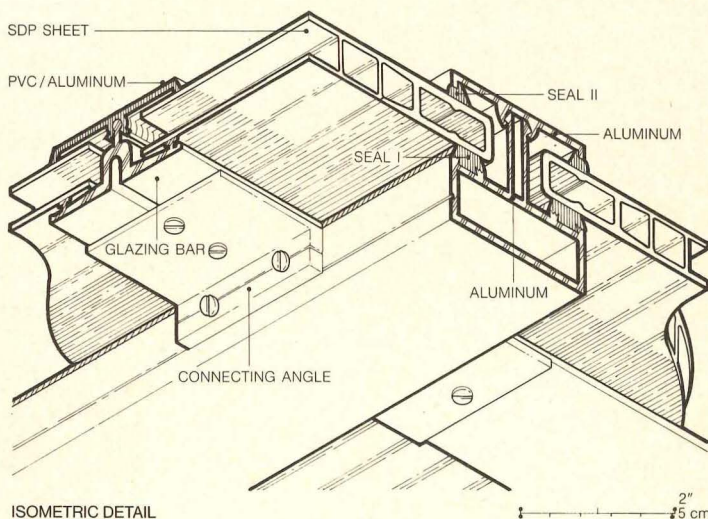
Skylight experts are weary of reminding designers that a sloped glazing installation is more than merely a vertical installation tipped over (PPG calls it an "unconventional curtain wall"). It really can benefit from the experience of experts. Says Robert Fisher: "The time for the architect to call for help is when he has the initial design concept. At that point the skylight specialist can advise him on critical areas and costs, and confirm that the concept is compatible with



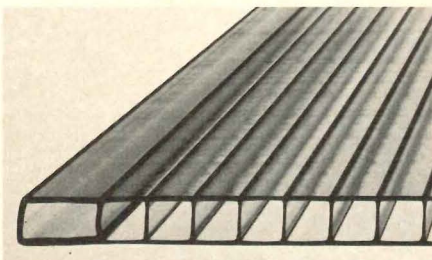
World Trade Center, Dallas. Fisher skylight has laminated reflective glass to cut heat in atrium. Framing extrusions are silver-anodized on exterior to match glass, baked enamel on interior. Architects: Beran & Shelmire.



## Technics: Skylights



Automobile showroom, Toronto, has sloped roof of Cy/Ro double-skin acrylic for heat insulation, and integral ribs (right) for strength. Architect: H.A. Swanson, of Akitt and Swanson.



good skylight design. If the architect proceeds on his own, not calling in the skylight manufacturer until it is time to bid the job, the result may be an overly expensive job." This could be because the design entails too many different shapes and planes, too many different sizes, and more expensive material than necessary.

In general, rectangular glazing lights are cheaper than other shapes; multiple units of the same size are cheaper than a variety; joints and corners are expensive to install on the job, so the design should aim for the largest assemblies that can be shop-fabricated and transported to the job for erection.

Stronger materials may permit wider spacing of support members. Similarly, lighter materials may permit a lighter support structure.

With flat skylights, pitches less than 15 degrees make condensate difficult to control; it tends to drip instead of collecting and running down into the provided channels. It also makes the roof more vulnerable to leakage.

PPG suggests a number of guidelines for sloped glazing design. Naturally, they're based on glass, but some thoughts are applicable to other types of glazing materials. Among the points not discussed elsewhere in this article:

**Loads.** The conventional vertical glazing loads should be considered, plus the dead load of the glazing weight and, depending on the geographical location, ice and snow loads. Generally, the greater the angle from vertical, the greater the live and dead loads.

**Glazing system.** The setting, opening size, and framing member stiffness also influences deflection of the glazing material and are factors in its resistance to loads. The glazing system should provide sufficient edge bite for the glass. Shearing forces set up at the edge of insulating units may require special fabrication and setting blocks. Outdoor surfaces of sloped installations should be designed with a lip to prevent water from accumulating along the lower edge of the glazing.

**Air movement.** Forced-air movement may be required in the winter to minimize condensation above high-humidity areas. Provision may also have to be made to vent heated and stale air.

**Maintenance and cleaning.** Access, both indoors and outdoors, should be considered for these functions.

It's clear that materials and techniques are available to build almost any skylight an architect may design. The great challenge will be to design them to meet the stricter energy standards which are ahead. [Henry Lefer]

### Acknowledgments

We acknowledge with thanks the help we have received from the following individuals and companies: APC; ASG; Bohem Manufacturing, George H. Reiff; Butler Manufacturing; Cemcel Corp.; Cy/Ro Industries; Du Pont Plastic Products and Resins; Faulkner Plastics; Fisher Skylights, Robert Fisher; Ford Glass; Fourco Glass; Guardian Glass; General Electric Architectural Products; Globe Amerada Glass; Hillsdale Industries; Inryco; Kalwall Corp.; David Lopatich.

Also, Libbey-Owens-Ford, Paul Corad; Lord & Burnham; Naturalite, James J. Wozniak; Pilkington Glass; PPG Industries, George H. Crossett; Rohm & Haas; Rollamatic Roofs, David S. Miller; Roper IBG, Raymond G. Miller; Shatterproof Glass; Solartron; Donald Stull Associates, Donald Stull; Super Sky Products, Larry Huffman; Temcor; Twin Pane; and Wasco, Joseph Anghinetti and Arthur P. Jentoft.



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# Exclusionary zoning law upheld—Part I

Bernard Tomson and Norman Coplan

**The United States Supreme Court upholds exclusionary zoning law of an Illinois village in a case similar to one in which it was invalidated by the New Jersey Supreme Court a few years ago in precedent-shattering case.**

We previously reported on the precedent-shattering New Jersey case involving the town of Mt. Laurel in which the Supreme Court of New Jersey invalidated, as violative of the New Jersey Constitution, the zoning laws of that community on the ground that their practical economic effect was to exclude low-income, minority, and other groups from residence in the Township. (See *It's the law*, P/A, Aug. and Sept. 1975) However, the United States Supreme Court has recently upheld, by a five to three margin, the zoning laws of Arlington Heights, IL. turning down a similar concentration that such laws discriminated against low-income and minority groups in violation of the Fourteenth Amendment to the United States Constitution (*Village of Arlington Heights v. Metropolitan Housing Development Corporation*, 45 U.S.L.W. No. 26). The rationale of the decision of the United States Supreme Court appears to be in direct conflict with the rationale of the decision of the New Jersey Supreme Court, and this latest decision will undoubtedly have substantial impact on litigation which is pending throughout the United States on this subject.

Arlington Heights, the village involved in the United States Supreme Court case, is a suburb of Chicago. The land in this community was zoned for detached single family homes, which was the prevailing land use. The village experienced substantial growth during the 1960s, but only 27 of the village's 64,000 residents were black. A religious order which owned an 80-acre parcel in the village determined to use a portion of its land for the development of low and moderate income housing, and sought to accomplish this objective through a nonprofit developer known as Metropolitan Housing Development Corporation. The developer proceeded with plans for the project which called for 20 two-story buildings totaling 190 units, half of such units being single bedroom apartments, presumably attractive to elderly citizens, and the remainder to be two to four bedrooms. The plan called for large open areas with shrubs and trees to screen the one-family homes abutting the site.

The proposed development could not be constructed without a change in the zoning laws to permit multiple family housing on the subject property. In making the application for such change in zoning, the developer indicated that the cost of the development would be subsidized through §236 of the National Housing Act and that a requirement of such Act was a plan designed to assure that the development would be racially integrated.

The Planning Commission of the village held public hearings at which the opponents of the development emphasized that the area had always been zoned for single family use, that the property owners of the village had built or purchased their homes in reliance on that classification, and that a change in zoning threatened to cause a drop in property values for the neighboring sites. Eventually, the Planning Commission recommended to the Village Board of Trustees that the application be denied.

Thereafter, suit was instituted by four individuals who were members of minority groups and the nonprofit corporation who planned to develop the property challenging the constitutionality of the zoning ordinance. The trial court, in upholding the zoning ordinance, ruled that the village was not motivated by racial discrimination or intent to discriminate against low-income groups when they denied rezoning, but rather by a desire "to protect property values and the integrity of the village zoning plan." Upon appeal, the United States Circuit Court of Appeals, although concurring that the village was not motivated by an intent to discriminate, ruled that the zoning ordinance was unconstitutional because its impact resulted in discrimination.

The decision was further appealed to the United States Supreme Court. That Court, in its majority opinion, reviewed the standards by which it would judge the constitutional validity of a zoning statute claimed to be in violation of the Equal Protection Clause of the Fourteenth Amendment of the United States Constitution. The Court said: "*Our decision last Term in Washington v. Davis, 426 U.S. 229 (1976), made it clear that official action will not be held unconstitutional solely because it results in a racially disproportionate impact. 'Disproportionate impact is not irrelevant, but it is not the sole touchstone of an invidious racial discrimination' . . . Proof of racially discriminatory intent or purpose is required to show a violation of the Equal Protection Clause. . . .*

*"Davis does not require a plaintiff to prove that the challenged action rested solely on racially discriminatory purposes. Rarely can it be said that a legislature or administrative body operating under a broad mandate made a decision motivated solely by a single concern, or even that a particular purpose was the 'dominant' or 'primary' one. In fact, it is because legislators and administrators are properly concerned with balancing numerous competing considerations that courts refrain from reviewing the merits of their decisions, absent a showing of arbitrariness or irrationality. But racial discrimination is not just another competing consideration. When there is a proof that a discriminatory purpose has been a motivating factor in the decision, this judicial deference is no longer justified."*

In next month's column, we will discuss the conclusion of the Court in evaluating the validity of the zoning ordinance of the village of Arlington Heights, and the significance of this decision. □



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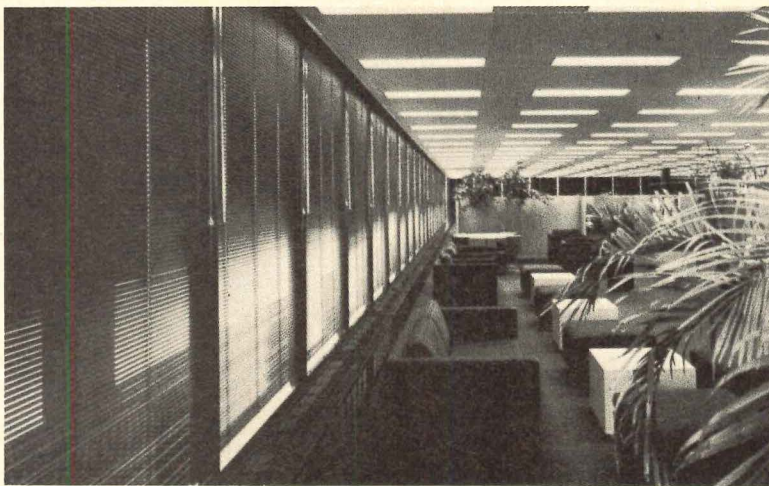
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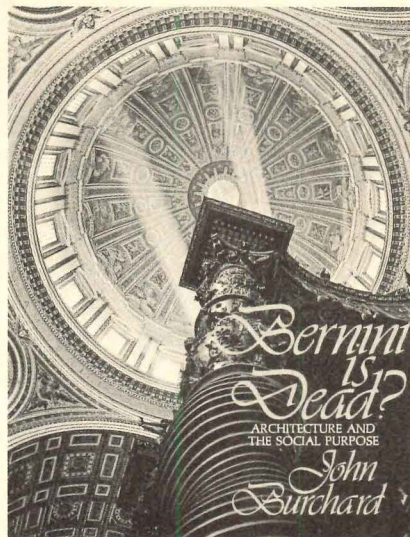


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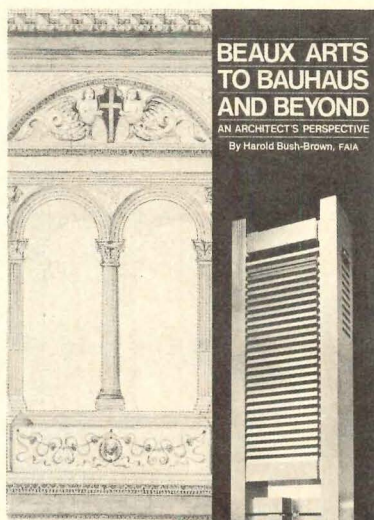
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## Books

# Looking back



**Bernini is Dead? Architecture and the Social Purpose**  
by John Burchard. New York, 1976. McGraw-Hill Book Co., 631 pp. plus 388 plates. \$30.



**Beaux Arts to Bauhaus and Beyond: An Architect's Perspective** by Harold Bush-Brown; Foreword by Hugh Stubbins. New York, 1976, Watson-Guption Publications, 128 pp., illus. \$12.95.

Both of these books are personal memoirs—idiosyncratic and imperfectly organized. Both are by educators who lived through the establishment of the Modern Movement—lending it strategic support—who can survey this revolution in their retirement years with detachment. In format and style, the books could hardly differ more.


Burchard is a generalist writing a travel guide (his title notwithstanding) for both laymen and professionals; he tries to pack every opinion he has about architecture into [continued on page 112]



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**Books** continued from page 110

one hefty volume. The Contents page has a 19th-Century encyclopedic quality (On Travel in General; On Architectural Travel in General; On Architectural Travel with Particular Ends in View . . .). He then goes on to divide all architecture first by material (wood, stone, brick), following that with a discussion of the recent, self-conscious styles of the West, one by one.

Concluding chapters cover such encompassing subjects as "Desecration and Decay" and "The Urban Aesthetic" and—finally—the place of the architect in society. There is even a 16-page "Critical Bibliography." Burchard's personal tone—sometimes witty, sometimes gushy, sometimes of a dead-pan "next slide, please" flatness—is maintained throughout. (He even discusses with the reader his adoption of a Yiddish construction for a title—a usage which remains unassimilated and baffling.)

In the end, you feel you have spent a long time with this very talkative man, and you wish he had subjected his ruminations to some ruthless editing. But he could not. After 16 years as the first Dean of Humanities and Social Studies at MIT (a title that hardly even hints at his contributions to the general education of professionals—of which I was among the thousands of beneficiaries) Burchard had "retired" in 1964 to become visiting professor—and for a period acting dean—of the School of Environmental Design at Berkeley. Along the way he had co-written *The Architecture of America* for the AIA (Atlantic-Little Brown, 1960) with Albert (not Harold) Bush-Brown. In his actual, final retirement, he poured out all he could tell the younger generation about seeing architecture; he died in December 1975.

In some cases, Burchard takes independent stands, as in his strong enthusiasm for non-Western architecture; in other areas, he conforms to the beliefs of his generation—for instance in his dismissal of all Mannerism or unorthodox Baroque; Giulio Romano is mentioned derisively, Wren only obliquely, Hawksmoor not at all. Closer to our time, Furness is dismissed, Mackintosh and Guimard—among others—ignored.

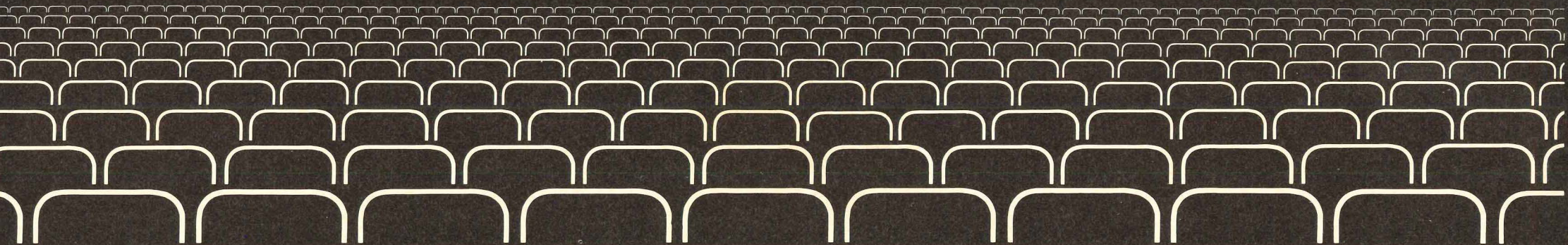
Bush-Brown, by contrast, is taciturn, limiting his narrative almost exclusively to his personal experiences and leaving unanswered questions even there. His slim volume is a straightforward story of how a Beaux-Arts-trained professional found himself on the front lines of Modern Architecture as it captured Atlanta, followed by a somewhat more protracted account of his retirement role—as member of a building committee—in the sympathetic expansion of a small classical library in Duxbury, Mass. Behind a tendency to understatement that sometimes makes him seem passionless, Bush-Brown reveals a steadfastness which—multiplied by thousands—has helped even out the wild swings of architectural beliefs and attitudes. In the architecture school he designed for Georgia Tech in the early 1950s—at a time when younger stars on his faculty wanted to burn all history books—Bush-Brown gave the library a central position.

Both of these books shed new light on the pivotal generation just passing, but neither is essential reading for anyone except historians of that period. For their sake, let us hope that the notes and archives behind both of these books will be properly safeguarded. [JMD]





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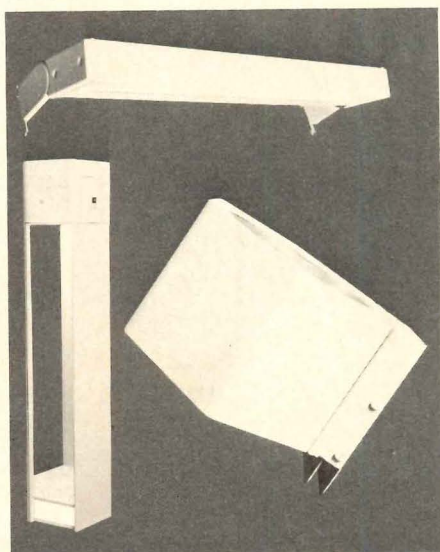
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# Products and literature

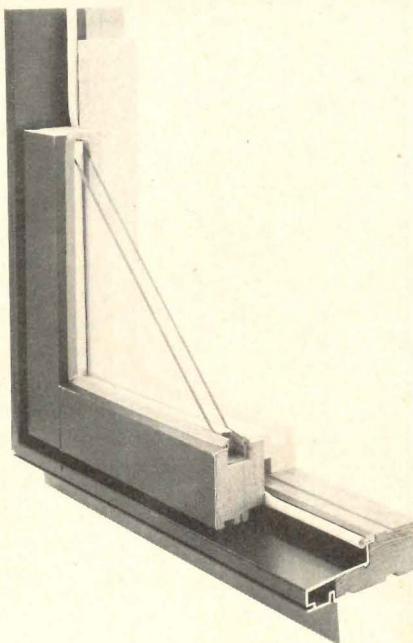


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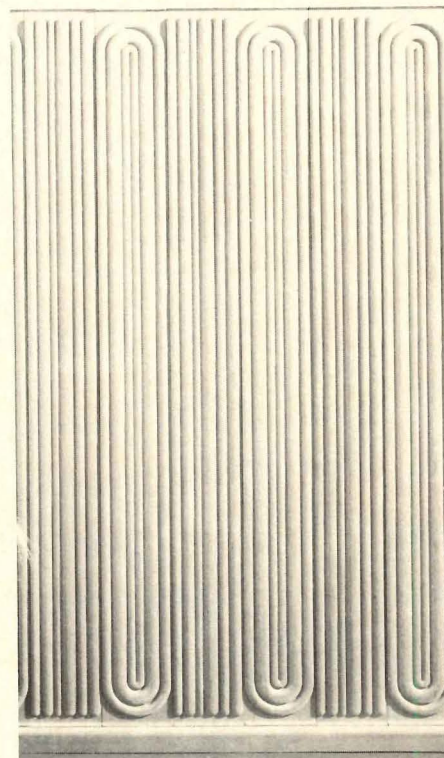


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[continued on page 116]





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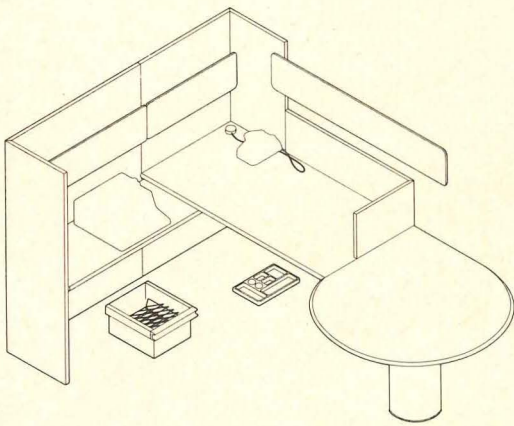
# ASG



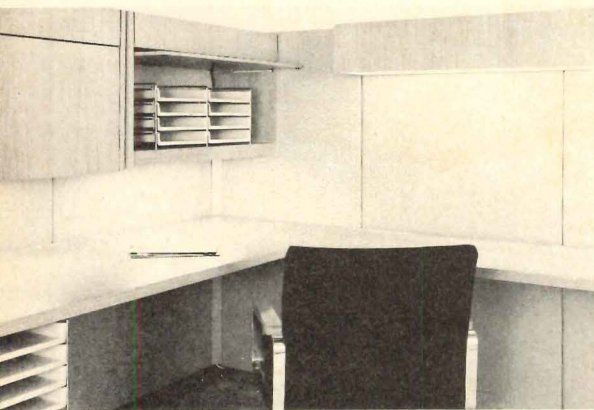
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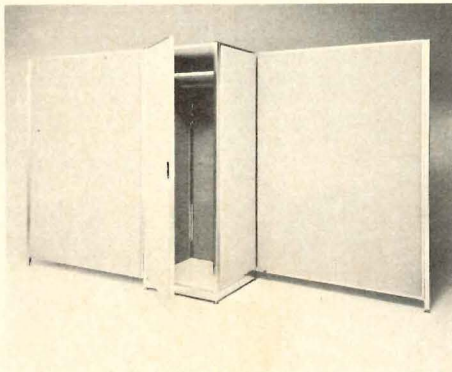




Marcatré/Office System



UPS Upholstered Panel System



Enclosed wardrobe

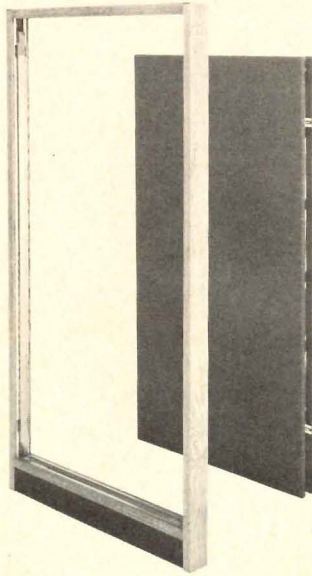
## Open office products

The items below are specifically related to 'The open office: does it work?' (p. 68) and grouped here for the reader's convenience.

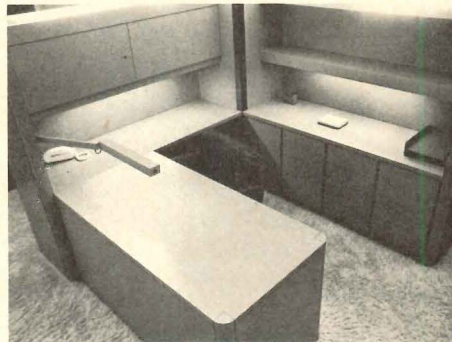
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Harter/Wall



Advent III

### UPS Upholstered Panel System.

Additions to this fully upholstered panel system include: task/ambient lighting fixtures specifically designed for application to each of the three panel heights; a series of hang-on overhead storage cabinets with integrated lighting, wire managers, center drawers, file bins, shelves with dividers, and letter trays. The letter tray accessories can be installed in an overhead cabinet or shelf, specified as a free-standing unit, a panel-hung unit, or as an under-work surface unit. JG Furniture Company Inc.

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**Enclosed wardrobe** attaches to office screens, holds up to 12 coats, plus hats, umbrellas, or shelves for packages and office storage. Panels are available in same colors as screens and can be free standing as well as connected to screens. A semiconcealed space is provided by Hang-On-Wardrobe, which holds up to four coats and has full fabric edge, available in all colors. Vogel Peterson.

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**Unigroup™ System** consists of panels, shelves, work surfaces, drawers, file bins, lateral files, tackboards, etc. Electrical accessories include supplemental task lighting plus various means of carrying power and communication wiring to station areas. Panels come in choice of surfaces: vinyl, carpet, fabric, glazed, and open-framed. UniGraphics™ are silkscreen graphic designs that are available on certain fabric panels. Haworth, Inc.

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**Harter/Wall.** An acoustical wall for open-plan office design based on an expandable, movable acoustical wall which comes in three standard heights and two structural finishes—aluminum extrusions in three basic colors, and oak frame, in light, medium, and dark. Two fiberglass acoustical panels are separated by a 1/4-in. hard-board septum which forms a barrier to sound transmission. Outside surfaces of panels are fabric covered. Power and communications cables are concealed in the base. Harter/Wall comes in 42-, 58-, and 73-in. heights and 18-, 24-, 30-, 36-, and 48-in. widths. Harter Corp.

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**Marcatré Office Systems.** Both faces of vertical panels from high density cores are covered with PVC or wood veneer laminates. Edges match the faces and 45 degree external corners have a PVC extruded edge guard. Work surfaces are covered with nonreflective plastic laminate or wood veneer. System includes storage units, and accessories. Atelier International, Ltd.

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**Advent III.** A group of free-standing components (workstations, machine-stations, wardrobes, lateral files, enclosures, etc.) that form work areas. Panel construction is aluminum extrusion for framing and high density chip core and wood solids for core materials. Inside surfaces of workstations are high pressure plastic laminate, structural corner channels are aluminum. Electrical convenience panels contain switches, outlets, and cable pass throughs. For exterior panels there is a choice of plastic laminate or upholstered acoustical panels. Both task and ambient lighting are optional as an integral part of the furniture. Harvey Probbler, Inc.

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**Free-Dimensional open office system.** Major elements include modular work station/storage components and straight or radiused panels, all in a range of heights, task/ambient lighting, file storage, acoustic control, and concealed power and communications wiring. Modular storage components 60-, 30-, and 15-in. wide are from 50 to 82 in. high. Components offer door, bookcase, box drawer, and file options. When components are combined with desk runoffs and panels, versatile workstations are created for managerial, clerical, or secretarial functions. Stow/Davis.

Circle 115 on reader service card

**Open Office Furniture System.** Distinguishing features are said to include the basic steel frame which accommodates any of a wide variety of insert panels. The inserts which snap in without tools, include steel, vinyl, chalkboard, tackable noteboard, two choices of genuine wood, and a choice of 31 color fabrics including contrasting stripe accent patterns bonded to either steel or acoustical surface. Frames will also accept open or glazed panel inserts. Panels may be split: steel on the lower half with glass, wood, or fabric on the upper portion. Steel cabinets have flipper doors in steel, wood-faced, or fabric covering. Work surfaces have laminate or wood finishes. The system will be introduced at NEOCON this month. American Seating Co.

Circle 116 on reader service card

[continued on page 118]



# 50-year-old building converted into flexible learning center

This 850-student school is a good example of how an out-dated facility can be renovated into a flexible learning center.

Like other schools dating back to the 1920's, Rogers Elementary in Stamford, Connecticut had small, overcrowded, closed classrooms which did not meet current educational needs.

Non-load bearing partitions were removed to create larger open areas and a track mounted panel system was installed to give flexibility to the building.

Right-angle turn panels can be used to form corners or complete walls . . . structure space as needed. Changes can be made by teachers themselves. For a complete description of this system, write "Divisiflex Brochures," your name, title and phone on your letterhead. Mail to Modernfold, P.O. Box 310, New Castle, Ind. 47362.



Corridor at Rogers Elementary, Stamford, Connecticut, before remodeling.



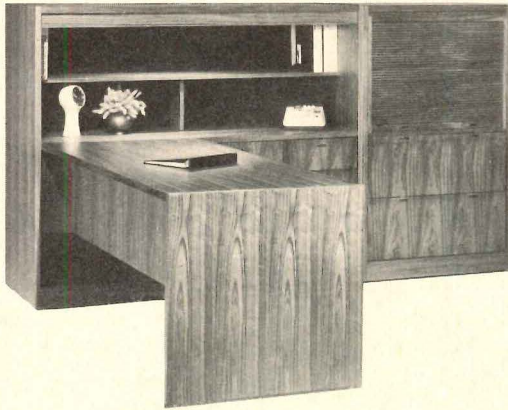
Same corridor after permanent, non-load bearing walls were removed. Placement of panels creates teaching clusters; tackable surfaces serve as teaching tools. Fletcher-Thompson Inc.—Bridgeport, Ct., architects/engineers.

## Modernfold

An American-Standard Company

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EMS Environmental Module System

**EMS Environmental Module System.** Free-standing modular units come in walnut solids and veneers in a light walnut finish or oak solids and veneers in two finishes. EMS is offered in a high version (77 in.) or a low version (53 in.). Filing/storage units, wardrobe units, desk/workstations are part of system. Myrtle Desk Co. Circle 117 on reader service card

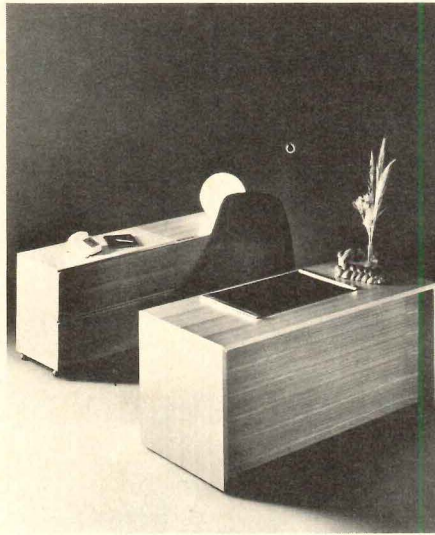
**Free-Standing Office System** in all wood offers a choice of 70 modular components. Free-standing posts and panels provide one-, two-, three-, or four-sided enclosure in three standard heights. Angled and hexagonal posts allow special configurations. Acoustic panels are fabric covered. Furniture components can be used independently in fixed-wall offices. Scandline Industries, Inc. Circle 118 on reader service card

**Ad Infinitum.** Panels in three heights—43, 53, and 68 in. and four widths—21, 30, 36, and 42 in., all use a corrugated core material. Customer has a choice of walnut or oak veneer, plastic, or fabric acoustic surfaces for the panels. Work surface and cabinet height can be varied to individual needs. Work surfaces come in six different sizes with wood veneer or plastic finishes and can be attached to the panels or free-standing wood furniture can be used. Alma Desk Co. Circle 119 on reader service card

**Open-Plan™ SpanAcoustic®** is a series of fiberglass, vinyl-faced lay-in ceiling panels designed specifically for the noise reduction requirements of open-plan interiors. The panels feature noise reduction coefficients of .85 to .95 and a flame spread rating of 0 to 25 (ASTM E-84). Holophane Div., Johns-Manville. Circle 120 on reader service card

## Literature

**OOP free-standing screens** are either straight or curved, with either radius corners or square corners, black vinyl welt or self welt, in nylon and acrylic fabric. Descriptive literature is available. Open Office Products, Inc. Circle 121 on reader service card



Modulo 3

**Modulo 3.** One of the two basic elements of the system, the desk/table is made of panels which are joined at the corners by a patented interlocking aluminum extrusion. The other element, the cabinet, comes in three basic types—drawer units, bookcases, and storage units with or without doors. The components are available in four standard finishes: white high pressure plastic laminate, African walnut veneer, natural oak, and Indian rosewood veneer. Brochure illustrates components in use. Modulo 3. Circle 122 on reader service card

**Co-ordinator Group III.** Panels are steel with bonderized and baked enamel surface in 23 standard colors; laminate; drawer fronts are steel or laminate. Color brochure illustrates components and accessories, describes features, Rockaway Metal Products Corp. Circle 123 on reader service card

**Tele-power systems.** Brochure explains and illustrates how wiring for electrical, communications, and other services is brought to the action centers in open-plan offices. Poles have separate channels for power and low-potential services, are equipped with electrical outlets and egress for phone cables, and are easy to install or move. The Wiremold Company. Circle 124 on reader service card

**Thompson R/S system.** Metal space frames delineate and support individual work station or complex of stations. Panels may be specified in numerous combinations of vinyl skins, acoustic materials, high pressure and wood laminates, woven fabrics, and transparent or translucent acrylics. Planning guide showing various configurations and component dimensions is included in literature packet. Group Artec. Circle 125 on reader service card

**Acoustical screens/partitions.** Exterior frame is solid oak, fir, teak, or walnut, finished in oil or clear lacquer. Fiberglass core surface is covered with 100 percent modacrylic fiber flame-proofed and scotch-guarded, in wide range of colors or COM. Support legs are from steel with polished mirror chrome finish and have one adjustable leveler. Brochure. Nelson-Adams. Circle 126 on reader service card

**Magic Office System.** Designed by Warren Platner, each work station has 64-in.-high panels on three sides composed of a 72-in.-wide longitudinal panel and two transverse panels. Typewriter runoff is 27 in. high; desk top extends 74 in., and is supported by a free-standing two- or three-drawer unit. Desk top is available in a choice of leather or white plastic laminate. Typewriter return and vertical panels are white plastic laminate, all with solid oak edges. Tops and panels are channeled to receive cables, and are equipped with electrical outlets. Literature describes and illustrates. C I Designs. Circle 127 on reader service card

**ASD Group.** Color brochure illustrates the variety of acoustical and hard-surfaced panels, work surfaces, case goods, shelves, tackboards, display shelves, paper organizers, and system of drawers, lights, wardrobes, that make up the group. Separate color brochures cover open office lighting system, and furniture systems that are coordinated with the entire system. Westinghouse Electric Corporation. Circle 128 on reader service card

**Synercon 60.** An integrated ceiling system designed especially for open plan office spaces is detailed in color brochure. It uses a new grid, specially designed lighting fixtures, wide-ranging air-handling options and a new high efficiency acoustical board, states maker. Brochure also includes illustrations and technical data on company's complete line of ceiling systems, lay-in ceilings, tile ceilings. Armstrong Cork Company. Circle 129 on reader service card

**Furniture systems.** The alpha collection in oak consists of pole- or panel-supported, freestanding cabinets and components, desks and credenzas, seating and tables. The office collection consists of cabinets, shelves, work surfaces and furniture in walnut, and also lighting fixtures. Literature is available on both systems, OMNI. Circle 130 on reader service card

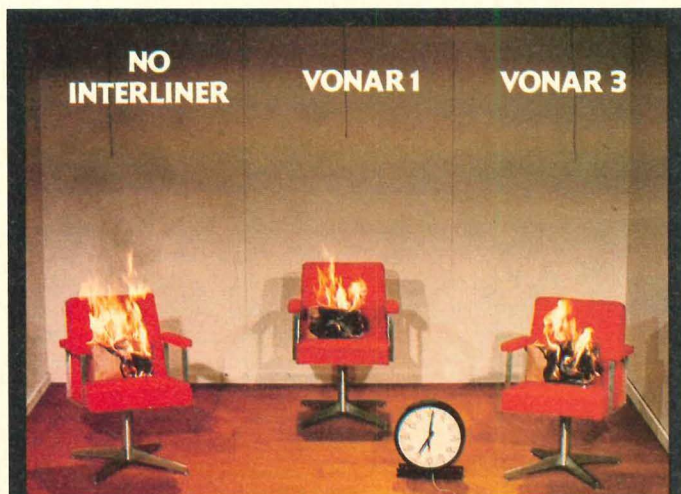
**'The Facit 80 Office Environment.'** A complete catalog of the parts that make up the whole system: screens, chairs, desks, and shelves, bookcases, drawers, and accessories. Components are clearly illustrated, sizes and descriptive data are included. Color photos show system in use. Facit-Addo, Inc. Circle 131 on reader service card

**Ceiling lighting.** A series of low brightness fluorescent, Parabolume luminaires use semi-specular anodized aluminum baffles as a light diffusing medium. Descriptive literature includes photometry, illumination calculators, air handling and performance data. Columbia Lighting Inc. Circle 132 on reader service card

**System 7 Office System** offers a broad range of free-standing and connecting acoustical screens including vertical transparent panels, power panels and poles, right-angle corner units, connecting and free-standing furniture, storage units, signage. The basic material is wood. Ambient and task lighting is included. Request color brochures from Upstate Precision Mfg., Inc. Circle 133 on reader service card [continued on page 120]



# Only the chair with VONAR 3 Interliner did not burn up in this limited ignition fire.



Time: 1 minute  
Identical ignition sources used.



Time: 2 minutes  
Standard chair (left) involved.



Time: 18 minutes  
Chair with VONAR 1 (center) involved.  
Chair with VONAR 3 (right) is out.

This comparative flame test was conducted to demonstrate the relative effectiveness of two different grades (thicknesses) of VONAR\* interliner in reducing the burning rate of upholstered office chairs in this limited ignition situation.

In this test, both chairs with VONAR burned at a reduced rate when compared to the standard chair.\*\* But the chair with VONAR 3 performed best because of its greater ability to absorb heat and reduce the burning rate.

## Test details

The chair on the left was constructed using standard nylon fabric and cushioning foam, plus steel, wood and chrome structural parts. The center chair was identical except that it contained VONAR 1 (1/16" - thick layer) adhered to and enclosing the cushioning foam in its seat, back and arms. Similarly, the right hand chair contained VONAR 3 (3/16" - thick layer). The VONAR in each case was added at a modest increase in cost.

Two and a half minutes into the test, the standard chair (left) was consumed by flame. Both chairs with VONAR exhibited reduced burning rates.

At 18 minutes, the chair with VONAR 1 (center) was heavily involved, and considerable melting and dripping of the burning polyurethane cushion was observed. The chair with VONAR 3 (right) was out and had sustained relatively little fire damage.

## More information

Determine what a difference VONAR 3 can make in your furniture or in your future specifications. Use the coupon or write: Du Pont Company, Room 35692, C, Wilmington, DE 19898.

\*Du Pont trademark for interliner made by licensed manufacturers according to Du Pont specifications. Du Pont supplies the basic elastomer to such manufacturers, but Du Pont does not make interliner.

\*\*The test described here does not demonstrate that all furniture using VONAR interliners will perform in this manner or will not burn under all actual fire conditions. The test was not conducted to assign "numerical flame spread ratings" to any materials involved. The results show only that specific types of chairs, which used VONAR interliner properly, performed as indicated under the test conditions. Since Du Pont does not make furniture or make or install interliner, we assume no responsibility for furniture performance.

Mail to: Du Pont Company, Room 35692C, Wilmington, DE 19898



Please send me:

- ☐ further technical data and test results.
- ☐ a list of furniture manufacturers using VONAR.
- ☐ a list of licensed manufacturers of VONAR.

Name \_\_\_\_\_ Phone \_\_\_\_\_

Title \_\_\_\_\_ Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Application \_\_\_\_\_



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Literature continued from page 118

**Zapf Office System.** Panels are of metal frame construction with vinyl hollow or solid core, or fabric covered, tackable and/or acoustical solid core. Work surfaces and storage units are honeycomb core construction with American white oak veneer or plastic laminate. Drawer fronts are metal. Tabloid is available. Knoll International. Circle 134 on reader service card

**Environmental Systems Program.** Color brochure illustrates some of the numerous configurations of modular units that are possible for different applications and usage, and includes a planning guide in back of book. Elements include steel panels and storage units with baked enamel, fabric or PVC painted finish, and high pressure laminate work surfaces. GF Business Equipment, Inc.

Circle 135 on reader service card

**PlanScape.** A one-piece internally braced tubular steel frame is faced on both sides by hardboard panels separated by a hollow core. The hardboard may then be 1) padded on each side by a layer of foam, 2) the core filled with fiberglass material, or 3) the septum covered on both sides by aluminum foil and fiberglass. Frames are mirror stainless steel, walnut vinyl-clad steel, or bronze Duranodic aluminum. Surfaces are covered in nylon velvet or polyester fire-rated fabrics. Illustrated brochure is available. Vogel Peterson Company.

Circle 136 on reader service card

**Acoustiwall II.** Screens of both straight and curved configurations have three base options: 5-in.-high open or closed base and flush screens with a  $\frac{1}{8}$ -in. opening at the floor. Bright chrome double-faced foot is standard support on all screens but a satin chrome or black enamel foot is optional. Four screen heights and widths from 24 in. to 78 in. in 6 in. increments are available. Four-color brochure gives descriptive data, shows edge and connector details. InterRoyal Corporation.

Circle 137 on reader service card

**Space Management One** consists of free-standing screens, connecting panels with level or tilted panel-supported work surfaces, filing units that are either panel-supported, suspended from work surface, or standing. Panel construction is anodized aluminum framing with fiberglass cores. Panels come in choice of fabric (16 colors) or hard surface vinyl (8 colors); work surfaces are high-pressure laminate; drawer fronts are steel. Literature illustrates components. Interstate Industries, Inc.

Circle 138 on reader service card

**Stephens Plus Office System.** Panel construction is hardwood framing. Wood panels are of hollow core construction and face-veneered both sides with sliced reversed slip matched American white oak. Fabric-covered panels (choice of 25 colors) are steel reinforced, hardwood frame with sound transmission barrier center. System includes storage units, and work surfaces. Tabloid is available. Knoll International. Circle 139 on reader service card

**Series 9000 Workbook.** Section 1 features 27 different solutions and shows how they work together in private and open office settings. Color, acoustical, wiring, and lighting data are included. Section 2 illustrates with oblique drawings how Series 9000 saves space and adapts to meet specific user needs. Section 3 provides a complete statement of the products that comprise Series 9000 (modular work surfaces, storage units, panels, free-standing desks, credenzas, and unit assemblies, task and ambient lighting). Steelcase, Inc.

Circle 140 on reader service card

**TRM (Task Response Modules).** Units are built of standard cabinet-wood panels. Each unit is complete, with provision for concealed attachments to create the work station required. Standard wood is walnut, with optional choices of oak, rosewood, etc. Central desk components come equipped with overhead pre-wired 48-in. fluorescent lighting fixture concealed above grid, and each is pre-wired with three electrical outlets. Color brochure illustrates typical installations, suggests configurations, gives product data. Eppinger Furniture, Inc.

Circle 141 on reader service card

**Movable walls & partitions.** Brochure illustrates solid, glazed, or half-glass, half-solid panels which may all be interchanged. Adjusting bolts in the bottom of each panel accommodate variations in floor to ceiling height of up to 2½ in. Choice of surface materials. Trendway Corp. Circle 142 on reader service card [continued on page 122]

## Today's exorbitant energy costs demand a whole new approach to a building's exterior design!

# The KALWALL<sup>®</sup> SYSTEM is that NEW APPROACH!

The demand is for buildings that use sunlight as much as possible. *At the same time,* the buildings must be insulated as much as possible.

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Circle No. 338, on Reader Service Card

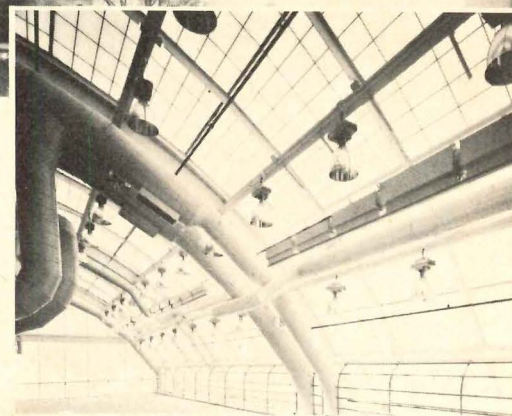
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Full color literature gives complete details and specifications. Call or write Bruce Keller. By return mail, you'll get all the literature plus the name of an installation nearby!

## Kalwall Systems Save Energy

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New Haven, Conn.  
Stull Assoc. — A



Some specifications of the Kalwall System:

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|----------------------------|------------------|
| • Light transmission range | 3% to 83%        |
| • U-Factors                | .40, .24, .15,   |
| • Shading Coefficients     | .85 to less than |
| • Weight per Square Foot   | 1½ pounds        |
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**Ultimate door control and  
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Circle No. 349, on Reader Service Card





**Recessed fluorescent lighting.** Comprehensive catalog is guide to selection of lighting systems. It deals with quality of light as well as quantity, makes use of extensive charts and graphs covering all technical data, and illustrates the various luminaires and describes their uses. Lightolier.

Circle 201 on reader service card

**Unicell.** A storage and materials management distribution system that is designed to adapt instantly to changes in the user's requirements, states maker. Cell units are positioned on the wall rails and fitted with components. Fronts, shelves, trays, drawers, and subcontainers inter-face. It is a unitized system molded from structural foam which is available in a wide choice of colors. Brochure illustrates how components fit together. Monitor Products.

Circle 202 on reader service card

**Cluster 120.** A 120-degree work surface forms basic module of system which includes screens, files, and accessories. The module is available in standard and machine heights, in left or right hand configurations, with hexagonal, pentagonal, and rectangular work-station extension tables. A wide choice of colors is available for plastic laminate work station tops and pedestals, steel cabinets, and fabric-covered screens. Oxford Pendaflex Corporation.

Circle 203 on reader service card

## Skylight products

The items below are specifically related to 'Let there be skylight' (p. 99) and are grouped here for the reader's convenience.

**Skylume industrial skylight.** Made of Protect-A-Glaze, a grade of Lexan® polycarbonate sheet, it has a pebble finish for light diffusion, obscures, and minimum glare. Maker states it resists sunlight, atmospheric chemicals, erosion, and temperature change. Cadillac Plastic.

Circle 204 on reader service card

**Double-dome insulated skylights** designed especially for the do-it-yourself installation and remodeling contractors are made of high impact PVC. The inner dome is permanently sealed to the outer dome to provide a 2-in. dead air space. They are double glazed for insulation. Both domes are clear. The units are available in three models for roof openings 14 1/4"x14 1/4", 30 1/4"x30 1/4" and 14 1/4"x22 1/4". APC Corp.

Circle 205 on reader service card

## Literature

'Glass in Architecture' brochure gives glass capabilities in chart form, glazing recommendations for clear float, heat absorbing float, and tempered safety glass. Ford Glass Division.

Circle 206 on reader service card

**Triodetic® space frames.** Grids, arches, domes, and free forms are described and their uses illustrated in color-brochure. Framing components, consisting of aluminum hubs and galvanized steel tubing (usually) are shown in cut-away section. Glazing panels are acrylic, and depending upon structural requirements, overall geometric configuration, and desired physical and visual properties, may be any of a variety of shapes and colors. They may be transparent (either colorless or tinted) or translucent. Butler Manufacturing Company.

Circle 207 on reader service card

**Skylights** are custom-designed, engineered, and fabricated to individually meet a variety of job conditions, architectural specifications, and budget allowances. Brochure illustrates all types of skylights; cutaway sections are shown, and typical specifications are given. Fisher Skylights, Inc.

Circle 208 on reader service card

**Roof system** for "skyroofs," "Geo-Roofs," canopies, and skylights is described in 1977 full-color brochure. Primary element of the system is a "sandwich" panel formed by permanently bonding reinforced, translucent fiberglass sheets to a grid core constructed of interlocked, extruded structural aluminum I-beams. The panel can have an extra insert of translucent fiberglass insulation to increase the total insulation of the panel. Kalwall Corporation.

Circle 209 on reader service card

[continued on page 126]

## 3-PHASE PROGRAM SAVES 36% IN FUEL COSTS

Smithville School in Smithville, Ohio initiated a program in 1975 to conserve significant energy.

Architect, Kenneth Derr of Derr & Cornachione and school superintendent Richard Holmes working together, computed a program of precise temperature control based on classroom occupancy, heat loss and gain through windows and average ambient temperatures in the central Ohio area.

The second phase included the installation of insulated dropped ceilings.

In the final phase, new aluminum windows were installed, replacing old 3-



lite steel windows. The new L-P INS windows were more thermally efficient, reduced air infiltration and were high performance rated (Commercial: DH-A3-HP(70)).

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For further information on how Altec systems can enhance your acoustical environment, write to: Commercial Sales Dept., Altec Sound Products Division.

*Location photography courtesy of The Wayfarers Chapel*

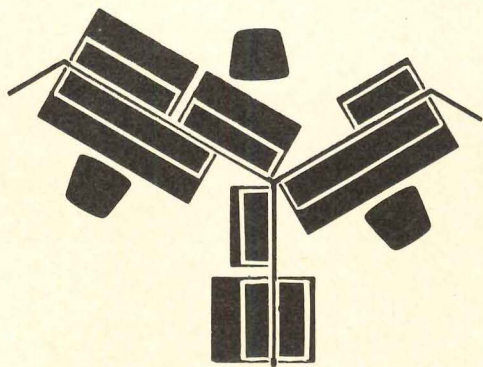
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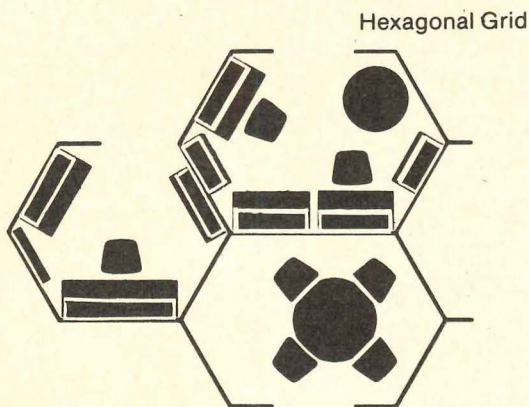
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ALTEC CORPORATION





3 Man Work Station



Hexagonal Grid

## The Office Landscape Source



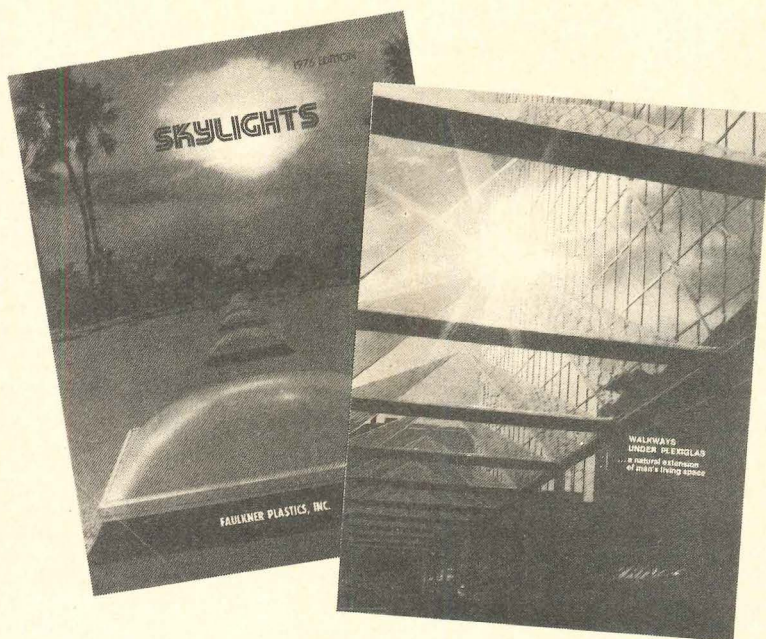
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Circle No. 317, on Reader Service Card



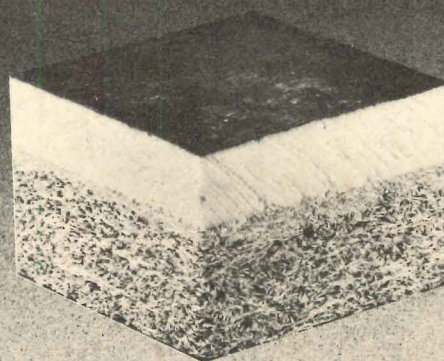
Faulkner Plastics skylights in both acrylic and polycarbonate materials in a comprehensive range of standard sizes and models are covered in brochure. Both single and double glazed, clear or solar control tints are available. Also offered are custom designed shapes and models, many in stock.

A brochure which illustrates canopy or walkway covers on a custom order basis is also available.

**Faulkner Plastics, Inc.**  
4504 E. Hillsboro Ave., Tampa, Fla. 33610  
Telephone: 813-621-4703  
In Florida call toll free 800-282-2780.

Circle No. 371, on Reader Service Card

## PetriCal/Urethane SAVES MORE THAN ENERGY



PetriCal/Urethane is a new insulated roof deck or wall panel developed by the Cornell Corporation which dramatically lowers a building's energy requirements—to a U factor as low as 0.066, with a single panel & built up roofing. PetriCal/Urethane has a foam core of the highest quality which eliminates the problems of on-site foam application saving costly man-hours. PetriCal/Urethane is a composite board of PetriCal® structural cement fiber integrally bonded to urethane foam, with a top layer of asphalt-saturated 15-lb. roofing felt, which gives both beauty and durability.

Write or call for new PetriCal/Urethane brochure.

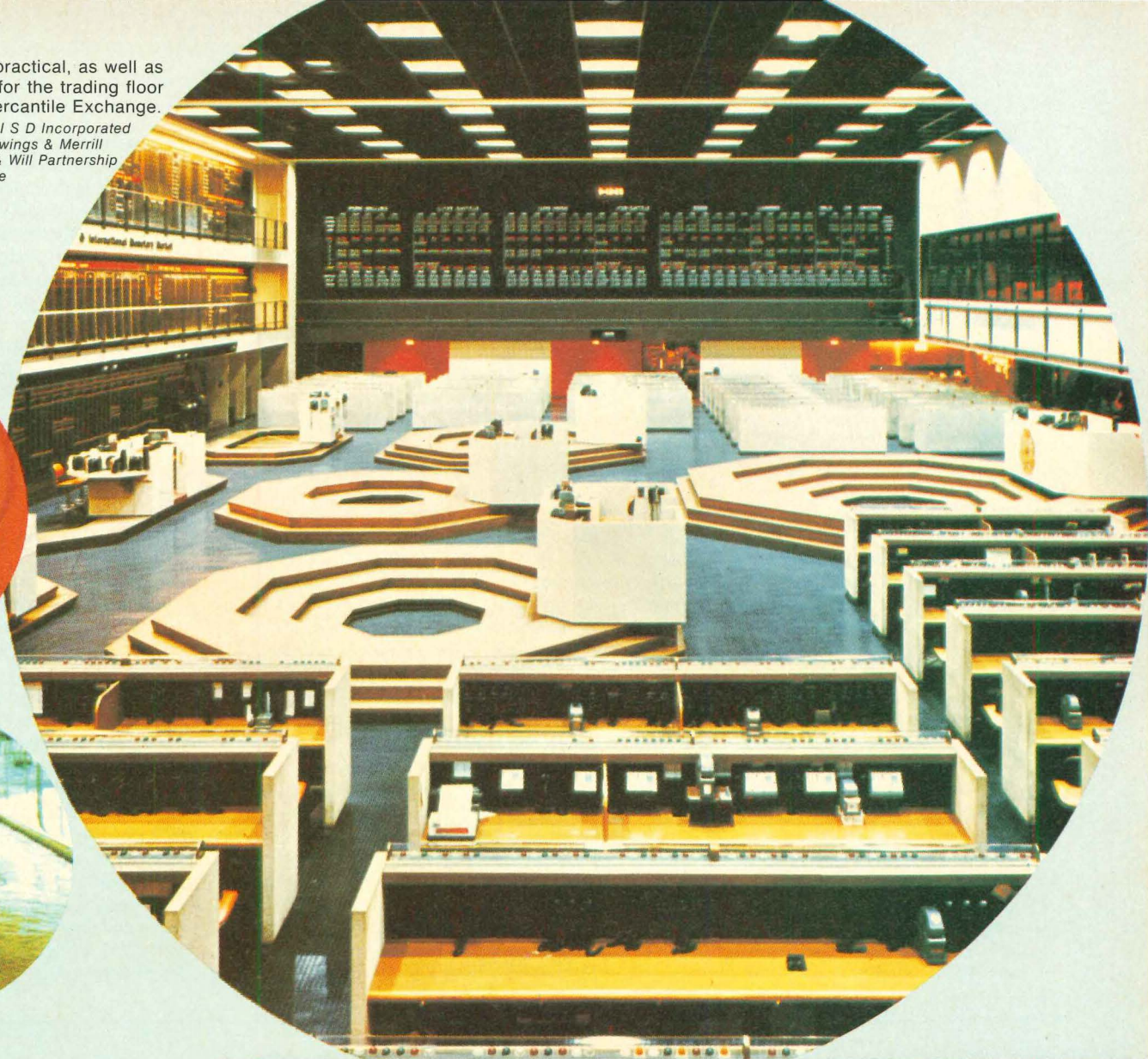
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Circle No. 363, on Reader Service



NORAMENT is a practical, as well as attractive, choice for the trading floor of the Chicago Mercantile Exchange.

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**Acrylic skydomes/glass skylights.** Product information, dimensional drawings, specifications, and illustrations of various units are included in brochure. A second, **'Skylighting and Energy Conservation'** is a summary of current conclusions on the relationships between skylighting and energy conservation in commercial buildings. It reviews current building trends, the psychological aspects of reduced fenestration, the energy equation including heat, and illumination and methods of estimating this equation in advance. Both brochures are available from Wasco Products, Inc.

Circle 210 on reader service card

**Skylight roof hatch** serves the double function of skylight and hatchway for passage onto the roof. The torsion bar spring, which provides lift force, is contained within the cover framework, leaving the hatch opening virtually unobstructed. Construction is all aluminum with a clear or translucent, dome-shaped thermoplastic light panel. The hatch frame provides a 12-in.-high roof curb with integral counter-flashing and 3½-in.-wide, predrilled mounting flanges. Size is 3'0"×2'6". Milcor Division, INRYCO, Inc.

Circle 211 on reader service card

**Architectural glass products.** 1977 color catalog contains a guide to company's vision glasses: single and double glazing, clear, tinted, and reflective. Illustrated usage, product data are included. PPG Industries, Inc.

Circle 212 on reader service card

**Glass and plastic enclosed structures** for greenhouses, botanical gardens, conservatories, domed display areas, glazed laboratories, pool enclosures, skylights, solariums, atria using all types of glass, fiberglass, and other glazing plastics are copiously illustrated in color brochure. Enclosure details and specifications are given. Lord & Burham.

Circle 213 on reader service card

**Acrylic skylights.** Many of the standard type of skylights are illustrated in brochure. Dimensions, specifications, and installation details are given. Company also produces skylights to customers specifications. Faulkner Plastics, Inc.

Circle 214 on reader service card

**'Glass for Construction'** brochure covers every type of glass for all types of applications including special glazing situations such as skylights. Technical data consists of strength charts, cooling and heating load calculations, general glazing guidelines, and specifications are given. Libbey-Owens-Ford Company.

Circle 215 on reader service card

**Sandwich panel skylights.** A translucent, insulating, structural, impact-resistant sandwich panel is adaptable to many types of installations, states maker. Single panels are available in 5'×25' size; grid core is nonmetallic, nonconductive; fiberglass-reinforced skins transmit light over a 160 degree arc. Choice of core patterns, skin colors, surface finishes, light transmission values are available. Brochure gives typical installation details. Cemcel Corp.

Circle 216 on reader service card

**Moduspan.** Space-frame components form roof, deck, and special structural elements of varying modular configurations. The system is available in 4 ft and 5 ft as well as 1.2 and 1.5 metre planning modules. Factory-applied finish coat comes in a choice of six colors. Polyester paint contains rust inhibitors. Unistrut Corp.

Circle 217 on reader service card

**Solar-controlled plastic skylights.** A single, joint-free unit has a sandwich, grid-core construction with two flat fiberglass-reinforced, acrylic polyester sheets separated by 1½ in. of dead-air insulation space. Units are curb mounted and are available in 18 standard sizes. Special sizes up to 54 in. wide and 144 in. long are also available. Solartron Corporation.

Circle 218 on reader service card

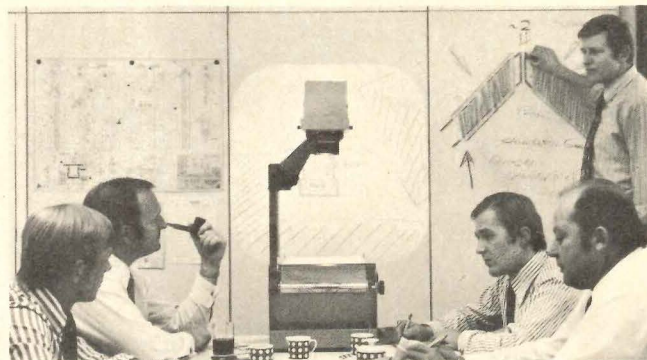
**Glass** catalog contains descriptive and technical data on clear float, tinted plate, clear sheet, insulating, safety, wired, laminated, tempered, spandrel, transparent mirror, solar products, and patterned glass. ASG Industries, Inc.

Circle 219 on reader service card

**Plexiglas® solar control series.** Each of the basic colors—neutral gray and bronze—is produced in five densities ranging from light to deep providing a scale of visible light and solar energy transmittance values. Different densities of each color can be used in combination. Brochure gives tables of transmittance values, spectrophotometric curves, and other technical data. Rohm and Haas.

Circle 220 on reader service card

[continued on page 128]



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**'Design Oriented Glazed Structures.'** Capabilities, applications, and structural and glazing characteristics are described and illustrated in brochure, which is complemented with a series of design portfolios. Each portfolio contains a set of detail drawings which may be traced or used in place as original drawings. Each set of drawings shows perspective cutaway of main structural system, typical plans and elevations or perspective of each type, cross sections, configurations, tables of standard sizes, number of components per size, and design loading data, plus complete specifications. Brochure explains how portfolios may be obtained. Roper IBG.  
*Circle 221 on reader service card*

**Skylights** as energy savers are subject of brochure which illustrates their various commercial applications. The line consists of custom and standard skylights, fire vents, and roof scuttles. "A Residential Builder's Guide" explains in non-technical detail the advantages and benefits of skylighting. Naturalite, Inc.  
*Circle 222 on reader service card*

**Skylighting.** All standard as well as special configurations are possible by using either of two extruded aluminum structural systems shown in brochure: the "I" beam and the "tube." In both, the glass is set on and sealed with custom extruded neoprene glazing strips. Basic design does not depend on sealants alone for its water tightness and there is never any metal-to-glass contact, states maker. Brochure contains color

photos of numerous installations, gives details for various types of skylight construction, glazing solutions, aluminum finishes, and specifications. Super Sky Products, Inc.  
*Circle 224 on reader service card*

**Crystogons** are large, aluminum-framed structures with clear spans up to 200 ft with transparent or translucent acrylic panels and an integral condensation control system. The acrylic glazing panel can be flat or formed, clear or tinted. Brochure. Temcor.  
*Circle 225 on reader service card*

**Skyroofs and enclosures.** Modular, independent structures which are completely pre-designed/engineered, insulated, and translucent are shown in full-color 1977 brochure, together with design and test data and specifications. The enclosure is a combination of the Kalwall® Panel System and the Structures Unlimited aluminum box beam framework. Structures Unlimited, Inc.  
*Circle 226 on reader service card*

**'Lexan®/Lexgard® for architectural glazing.'** Bullet-resistant laminate Lexgard is for use in maximum security areas; Lexan, available in clear or tinted, translucent, is suitable for industrial windows, skylights, and dividers. Brochure includes technical data. General Electric.  
*Circle 227 on reader service card*

**Daylitter™** Industrial and residential skylights and fire vents are detailed in brochure. Tables of sizes and specifications are included. APC Corp.  
*Circle 228 on reader service card*

**Operative skylight roofs** are manufactured in domes, cones, barrel vaults, rectangular, pyramidal, multi-sided, operable and stationary ridge types. Sizes range from smallest stationary skylight up to single installations of 10,000 sq ft. Materials include materials such as fiberglass sandwich panel, wire glass, tempered plate glass, or acrylic bubble. Rollamatic Roofs Inc.  
*Circle 229 on reader service card*

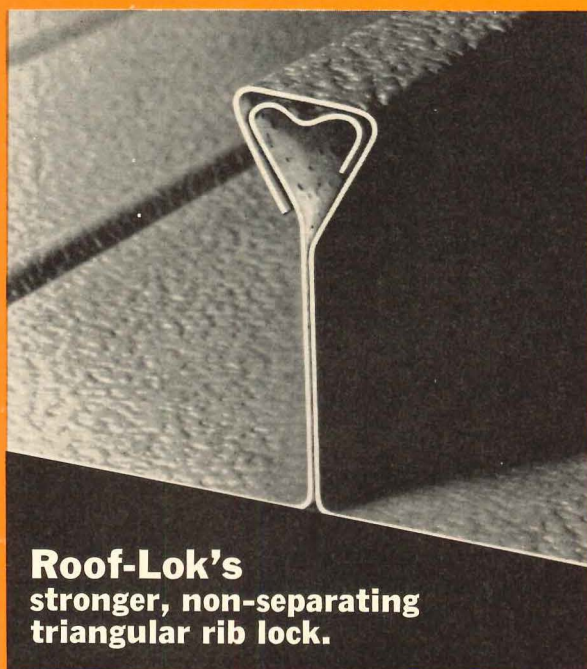
**Architectural glazing.** Brochure describes Lucite cast acrylic sheet, tables give complete technical data. E.I. du Pont de Nemours & Co., Inc.  
*Circle 230 on reader service card*

**Skylights, curbs, and hatches** are illustrated in brochure. Specifications for each type of skylight and installation details are also included. Bohem Manufacturing Co., Inc.  
*Circle 231 on reader service card*

**Skylights/space enclosures.** Color brochures illustrate various types of skylights and roof accessories. Technical data, installation details, construction features, and specifications are included. Hillsdale Industries, Inc.  
*Circle 232 on reader service card*

**Acrylite® SDP** double-skinned sheet is an architectural and glazing material available in a thickness of 16 mm in either acrylic or polycarbonate versions, in clear, white translucent or solar tints. Its applications include greenhouses, swimming pool enclosures, sports arenas, industrial, commercial, and area glazing, skylights. CY/RO Industries.  
*Circle 233 on reader service card*

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triangular rib lock.

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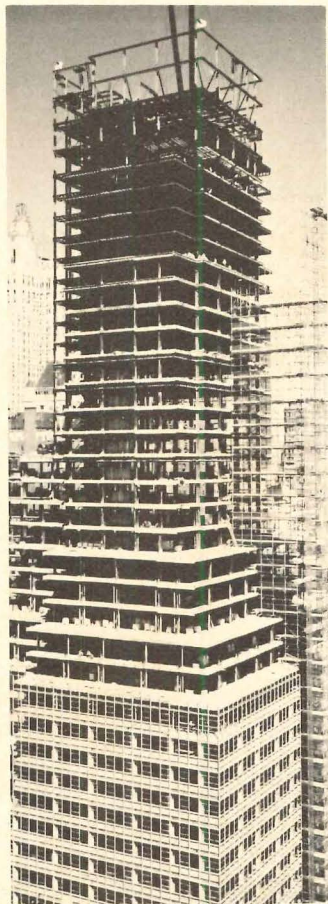


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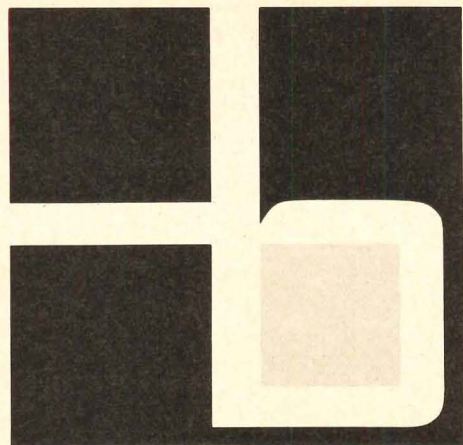
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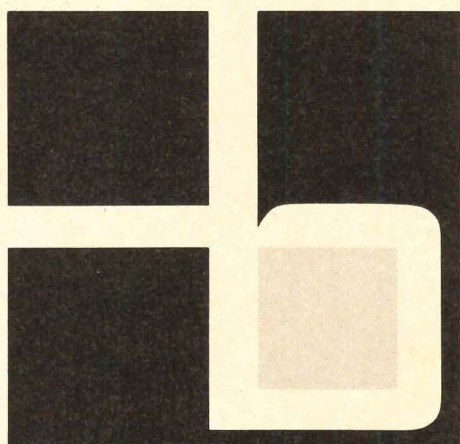




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## Progressive Architecture

# Notices

### Appointments

John Paul McGowan has joined John Carl Warnecke & Associates, Washington, D.C., as vice president for design.

James F. Smith, PE has been named senior vice president, director of the health facilities division of Heery & Heery, Inc., Atlanta, Ga. Louis A. Bacon, PE has joined the firm as senior vice president and director of the engineering division.

Ronald Williams Ford has been named a senior associate of Marshall & Brown, AIA, Architects/Engineers/Planners, Kansas City, Mo.

Ronald W. Kilpatrick and William E. Ferro have been promoted to vice president of Bernard Johnson Inc., engineers, architects, and planners of Houston, Tex.

### Reorganizations

Atchison, Kloverstrom & Atchison, Denver, Colo., has been dissolved due to the retirement of Carl Kloverstrom. Philip Atchison will continue in practice as Philip Atchison, Architect, 1353 S. Eudora St., Denver 80222.

Justin Gray Associates, Cambridge, Mass., is now Community Resources Group.

Carducci/Herman Associates, Inc., landscape architecture and site planning, is the new name for Larry J. Carducci & Associates, Berkeley, Calif.

Ezra D. Ehrenkrantz & Associates, PC has become The Ehrenkrantz Group, PC, with offices in New York, Washington, Chicago, San Francisco, and London.

## Building materials

**Major materials suppliers for buildings that are featured this month, as they were furnished to P/A by the architects.**

**House VI, Cornwall, CT. (p. 57).** Architect: Peter Eisenman AIA, New York City. Sheetrock panel wall surfacing: U.S. Gypsum. Polyurethane coating for roofing waterproofing and dampproofing: 3M. Translucent skylights and ceilings: Kalwall Corp. Polyurethane paint over plywood exterior surface: Lord Corp. Individual unit heaters: General Electric.

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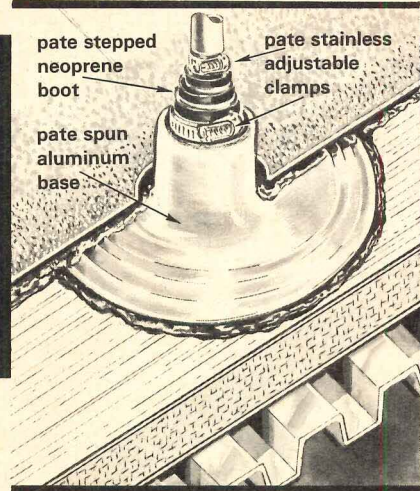
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# Frank Lloyd Wright's Usonian Houses

John Sergeant, 198 pp., illus., . . . \$24.50

This well-illustrated and thoroughly documented book, the late period of Wright's prolific career is reassessed. His philosophy of building with nature rather than against it is analyzed. Wright's Usonian houses, his design working communities and his plans for Broadacre City has a new relevance as energy conservation and ecological integrity have become the dominant concerns of the environmental design professions. Circle B611 under Books

# Designer's Guide to OSHA

Peter S. Hopf, A.I.A., 198 pp., illus., . . . \$19.50

This practical volume translates OSHA's tens of thousands of words into easy-to-use drawings, diagrams, charts and graphs. With OSHA violations increasing, engineers obviously need a working guide to compliance with government job safety and health standards. This book fills that need. Material is presented in the same sequence as the OSHA regulations are written. Circle B612 under Books.

# Solar Energy and Building

S. V. Szokolay, 198 pp., illus., . . . \$18.50

The leading solar architect describes principles and collection methods, presents practical examples and forecasts of the future of solar energy in buildings, with emphasis on water and space heating. 30 "solar houses" are featured, complete with published design and performance data. Circle B613 under Books.

# 14 Energy and Form

By Ralph L. Knowles, 198 pp., illus., . . . \$27.50

This is a scholarly, theoretical book, a major work that will be used for years to come. The projects described concentrate on reducing environmental problems in individual or groups of buildings by controlling shape and structure, scale and surface, volume ratio, location and orientation, isolation and insulation. Circle B614 under Books.

# 15 Decorative Art and Modern Interiors 1977, Vol. 66

Edited by Maria Schofield, 184 pp., illus., . . . \$24.95

This annual review of international trends in furniture, glass, ceramics and other fine crafts illustrates 20 interiors that show the many ways in which art can become part of our environment. Circle B615 under Books.

# 16 Site Planning for Cluster Housing

By Richard Untermyer & Robert Small, 306 pp., illus., . . . \$22.50

An invaluable guide to planning low-rise, medium-density cluster housing environments. Also covers jurisdictional and technical considerations of site planning, and includes more than 600 drawings and photos that illustrate design principles and techniques. Circle B616 under Books.

# 17 Drawing File for Architects, Illustrators and Designers

By Marc Szabo, 251 pp., illus., . . . \$12.50

This book provides over 200 pages of figures — in the most common and natural positions, activities, and types of wearing apparel, as well as dozens of drawings of boats and cars, all of which can be copied freely — by

direct tracing, photostats, or photocopying machine. The pages tear out easily to form an easily accessible fingertip scrap file. Circle B617 under Books.

# 18 Shopping Centers: Planning, Development, Administration

By Edgar Lion, 224 pp., . . . \$16.00

From the original design concept and planning to the various stages of development and construction, right on through to their ultimate existence as successful business entities, every aspect of the shopping center is discussed and examined. Includes methods for dealing with existing centers which require improvements. Circle B618 under Books.

# 19 Trees

By Robert L. Zion, 168 pp., illus., . . . \$12.95

An inexpensive paperback version of the book with virtually everything you want to know about using trees to complement the buildings you design. Both aesthetic and practical considerations are given, including tree characteristics, as well as cost considerations, planting, maintenance, rate of growth, and city and seashore recommendations. Circle B619 under Books.

# 20 Building Construction Illustrated

By Frank Ching, 320 pp., illus., . . . \$17.95

Charmingly hand-lettered by the author, this book presents step-by-step techniques in residential and light construction. Containing over 1,000 drawings, it covers materials, finishes, fastenings, posts, trusses, slabs, wood joists, light steel/aluminum, structural calculations, planning and site work, cost estimating, and construction sequencing. Circle B620 under Books.

# 21 Architectural Graphics

By Frank Ching, 128 pp., illus., . . . \$9.95

This book presents graphic techniques available for conveying architectural ideas. Included is knowledge on equipment and materials; drafting; architectural conventions for orthographic, parallel and perspective drawings; devices for rendering tonal/textural values and context; graphic symbols and lettering; free-hand sketching and diagramming; and effective presentation of design proposals. Circle B621 under Books.

# 22 Hotels, Motels and Condominiums

By Fred Lawson, 238 pp., illus., . . . \$39.50

This is a book on design, planning and maintenance. It is an exhaustive, international survey with hundreds of on-site illustrations and examples. A must for all architects, engineers, owners, developers and financiers worldwide. Circle B622 under Books.

# 23 Specifications: An Introduction for Architecture and Engineering

By Chesley Ayers, 448 pp., . . . \$16.50

This is a comprehensive introduction to the field of architectural and engineering specification writing which has, in previous editions, established itself as a leading reference work. The entire field, and every phase of the specification writer's work, is thoroughly covered, including legal citations by name and number, industrial specifications, value engineering, computerized specifications, and government safety regulations. Circle B623 under Books.

# 24 Women in American Architecture: A Historic and Contemporary Perspective

Edited by Susana Torre, 224 pp., illus., . . . \$25.00

The first in-depth survey to summarize and evaluate women's role in the American architectural profession, this book is an essential resource for all concerned with the growth and development of that profession. Because of its comprehensive research and extensive illustrations, this book also provides a vital chapter in the documentation of women's changing social roles. Circle B624 under Books.

# 25 Homes Are for People

By St. Marie, 400 pp., illus., . . . \$11.95

Although the title refers to homes, its remarkable sampling of interiors can greatly help in designing, building, decorating or furnishing virtually any environment demanded by clients or tenants. Gives ready-to-use information for layouts, dimensions and coordination of colors, material and furnishings. Circle B625 under Books.

# 26 Residential Designs

Edited by David E. Link, 192 pp., . . . \$14.50

Hi-rise or low cost, condo, multi-family, custom or townhouse, here's a design book that shows you the very best in every class. Complete collection of designs with over 200 illustrations featuring techniques used by some of the nation's leading builders, planners and designers. Circle B626 under Books.



# Job mart

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**Architectural Illustrators:** Immediate openings, pros preferred, top firm in field and salaries. Complete information on receipt of samples, resume, wage requirements. Prompt return, confidential, Art Associates Inc. 4041 W. Central, Toledo, Ohio 43606, 419-537-1303.

**Assistant Hospital Planning Officer:** This position requires the expertise of one who has been involved in a major hospital planning and development project—preferably in a teaching hospital. Candidates should have four years of administrative experience in hospital program, facility, and capital fund planning and development. A Master's degree or an equivalent combination of education and experience is required. Send resume to: Larry Warren, Mgr. of Professional Employment, Room 2260 Hospital Finance and Personnel Bldg., University Hospital, Ann Arbor, Michigan 48109. A Non-Discriminatory Affirmative Action Employer.

**Director, School of Architecture** (a dean's level position): School of Architecture's Director Search: The Director is the harmonizing force who provides the philosophical leadership for the four disciplines in the School—Architecture, Construction Management, Urban Design, and Planning. With four chairpersons, the Director is responsible for all curricula and programs within the School. The Director works with five other peer deans at the Institute under the direction of the Provost and President. Pratt's School of Architecture offers B. Arch., B.P.S. in Construction Management, M. Arch., and M.S. in Urban Design or Planning. Enrollment is 643 undergrad., 160 grad.; faculty is 125 members. School is uniquely managed and governed by a system of participatory democracy that includes all students and faculty. Qualifications sought: Degree in architecture or related field; demonstration

of professional/managerial experience; demonstration of competence in teaching/academic planning; and strong personal qualities as scholar, professional, manager, leader, budget-maker, and cooperative team member. Applications with resume and statement of qualifications must be submitted to: Chairperson, Search Committee, School of Architecture, Pratt, Brooklyn, N.Y. 11205. An equal opportunity/affirmative action employer.

**Faculty:** The University of Maryland School of Architecture solicits applications for a teaching position opening fall 1977 from persons qualified to teach environmental control and analysis courses with emphasis on HVAC and energy conservation. Graduate degrees in architecture, architectural engineering, or mechanical engineering required; experience in teaching and/or design desirable. Applications should be sent to Poppy Ratcliff, School of Architecture, University of Maryland, College Park, Md. 20742, and will be accepted until position is filled. The University of Maryland is an equal opportunity employer.

**Faculty:** The Environmental Design Department, Texas A&M University is accepting applications for 9-month faculty positions in and to instruct at the undergraduate level (beginning and/or advanced classes) in the subject area of architectural and environmental design. A Master's degree from an accredited school is required as well as a professional license or intent to obtain professional registration. Candidates should have office practice experience. Salaries are commensurate with full-time, 9-month employment at Instructor, Assistant Professor and Associate Professor ranks. Texas A&M University is an Equal Opportunity/Affirmative Action Employer. Applications should include a resume, academic credentials and letters of reference. Applications should be sent to: John O. Greer, AIA, Head, Department of Environmental Design, College of Architecture, Texas A&M University, College Station, Texas 77843.

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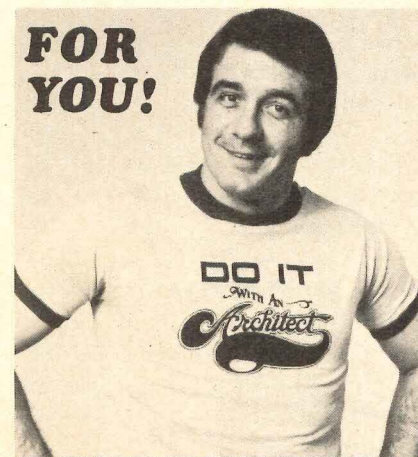
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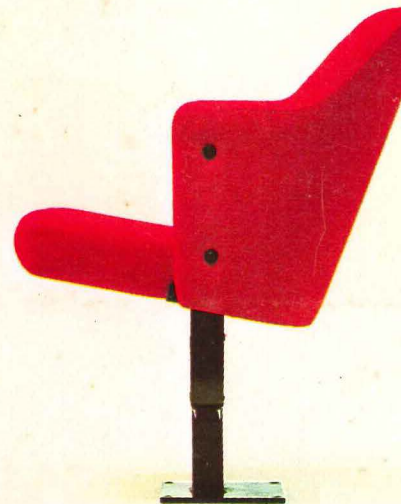
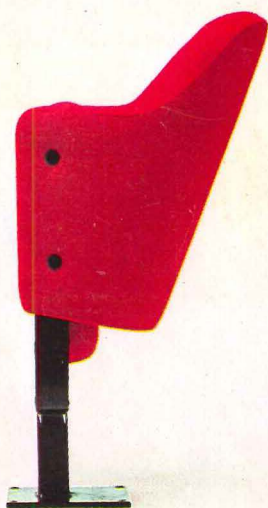
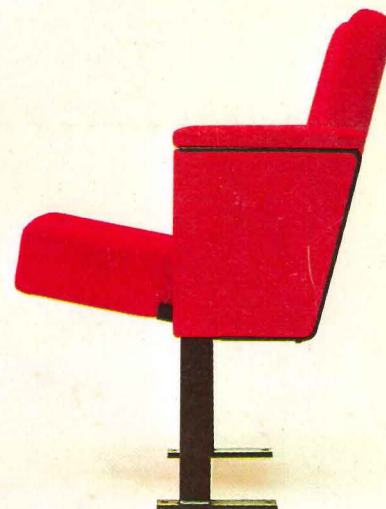
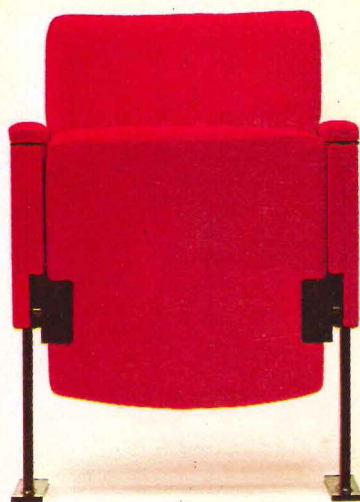
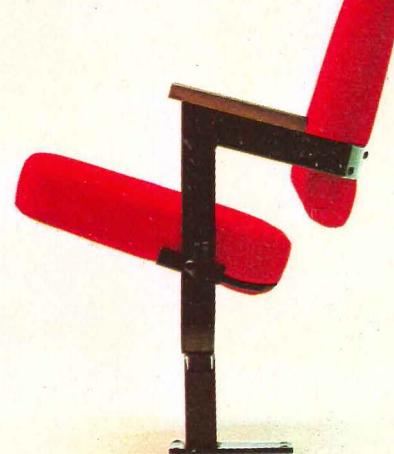
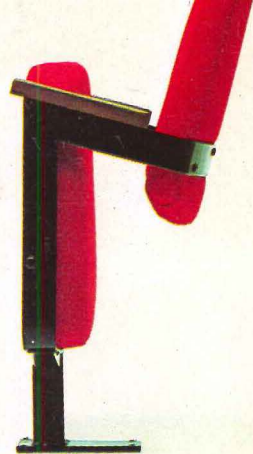


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