Progressive Architecture

May 1980

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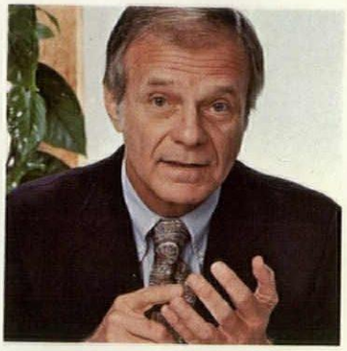

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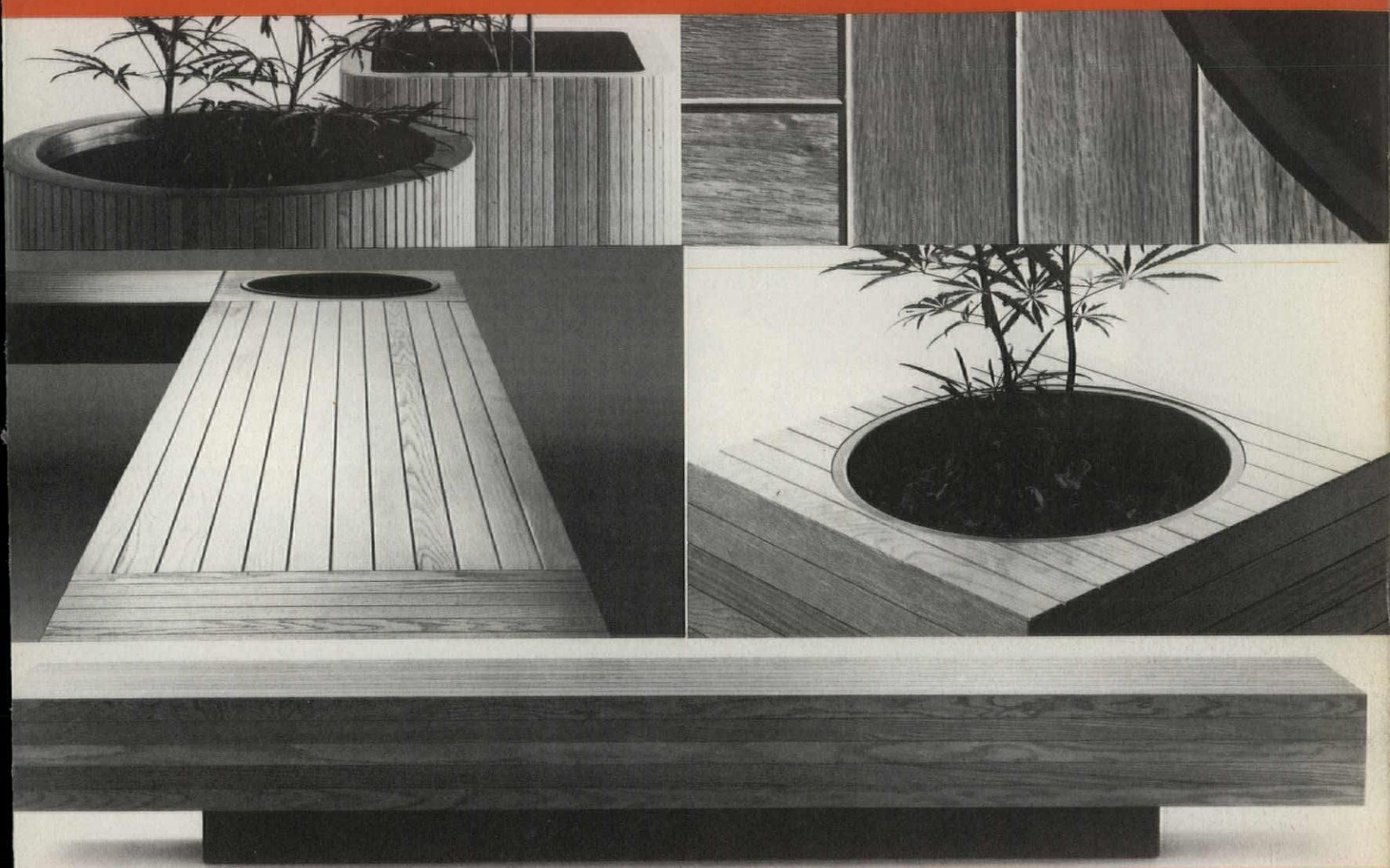

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Wesley C.—
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UniGroup Open Office Interiors System. A 10 at Neocon XII.

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HOLLAND, MICHIGAN 49423

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May 1980

Progressive Architecture

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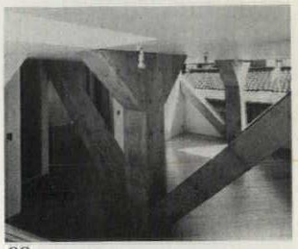
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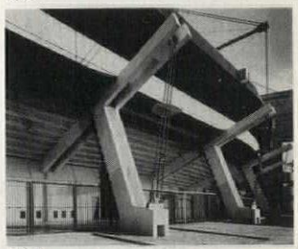
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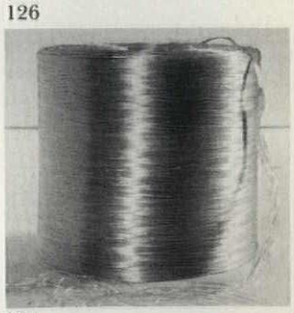
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Cover:
Central hall of "Uncompleted House" by Kazuo Shinohara, p. 100
Photo: Osamu Murai

E

When Thonet's headquarters were moved from Vienna to New York, Leopold Pilzer relocated more than just the company's administration—he transplanted the Thonet tradition. Although the name Thonet and the products it represented had been established in the United States since 1853, the shift to a New York base of operations permitted the expansion of the firm's commitment to innovative design solutions. Between 1940 and 1944, three manufacturing facilities in the United States were acquired, and Thonet began to produce furniture in new materials such as molded plywood and aluminum, as well as developing, in America, bentwood manufacturing capabilities.

In 1962, after the death of Leopold Pilzer, Thonet was purchased by one of America's best-known furnishings manufacturers, the Simmons Company. A new period of diversification and expansion began—a diversification that extended to new materials and designs and an expansion into new contract markets, among which furniture for the healthcare field became an important concern. Gulf+Western acquired Simmons, along with Thonet, in 1979. The resources of one of the foremost international diversified corporations now support Thonet's continuing growth.

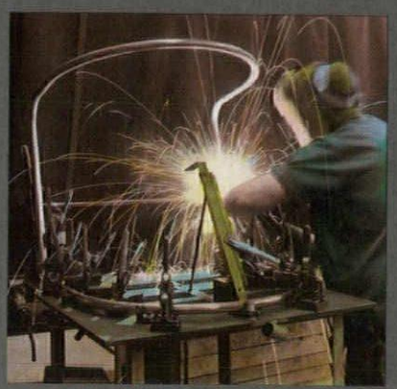
One hundred and fifty years after Thonet first began to explore new ways of designing and manufacturing furniture, the firm that bears his name remains proud of its heritage, and dedicated to the tradition of innovation and creativity which Michael Thonet inspired.

A Thonet delivery truck, pictured above, in the 1912 American catalogue. Service and delivery continue to be among our primary concerns.

This is the fifth and final capsule history celebrating the 150th anniversary of Thonet. The entire series will be reproduced as a poster. For a free copy, write us.

Thonet
Dept.: Poster
491 East Princess Street
P.O. Box 1587
York, Pa 17405

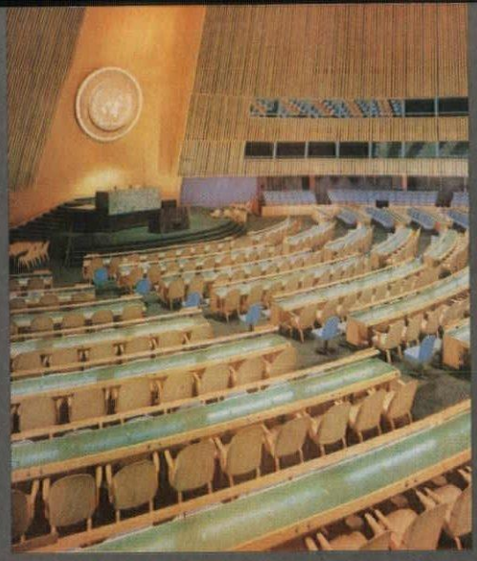
Thonet's New York showrooms, illustrated in a 1925 catalogue; 50,000 square feet in the heart of Manhattan.



The Thonet tradition—technology and craft in the service of design—seen at one of Thonet's Statesville, North Carolina factories. Other plants are located in Charlotte, North Carolina; York, Pennsylvania; and Sheboygan, Wisconsin.

T

One hundred fifty years of Thonet: 1830/1980

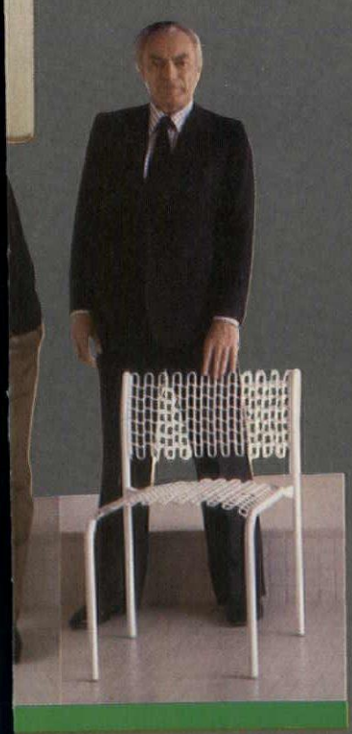


The General Assembly Hall of the United Nations. The chairs are of molded plywood, manufactured by Thonet, and designed by Abel Sorenson (1952).

The Sof-Tech Chair,™ designed by David Rowland for Thonet, is quickly recognizable as a descendant of the Vienna Café Chair, although constructed of completely different materials than its bentwood ancestor. Rowland invented a new material, Soflex,® and adapted it to an innovative chair which provides the flexibility, practicality, and elegance which have always been the hallmarks of a Thonet classic.

Research, experimentation, design—an ongoing involvement with the development of new materials, methods, and furniture solutions, for today and the future. Shown at left are some of the internationally known designers whose products are currently being produced by Thonet.

From left to right.
Joe Russo and Ric Sonder, Kangaroo Chair, (1975).
Joan Burgasser, Club Tub, (1969).
Don Petitt, Petitt Ply, (1976).
Robert Aronowitz and Bernard Katzanek, Robert Bernard Lounge Landscape System, (1978).
Ned Steinberger, Molded Ply Chair, (1978).
David Rowland, Sof-Tech Chair,™ (1979).



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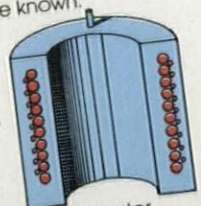

2. Unique precooler with removable baffle.
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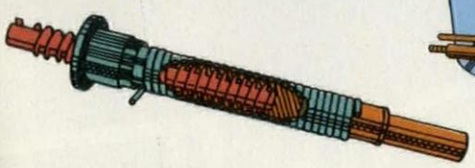

3. One-piece, expandable polystyrene insulation increases efficiency.
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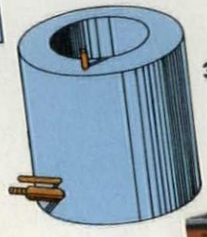

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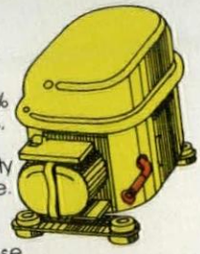

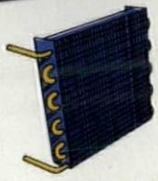

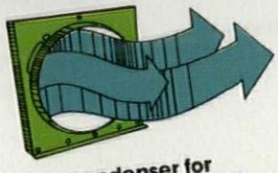

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Pencil Points 25
Progressive Architecture 35

With this issue, P/A completes 60 years of publication—25 years as Pencil Points, 35 as Progressive Architecture

In the six decades since this magazine was first published, most of the built environment you experience every day has been designed and constructed. During this period, the dominant concepts of architectural design have undergone a wrenching revolution from Eclecticism to Modernism, then split several ways in the present phase of doubt and search. Planning, generally, has followed a closely related pattern of revolution and rebound. The profession has evolved from a social and cultural elite, studiously ignoring rude nonconformists, into a more democratic, technocratic group, tugged this way and that by small bands of aesthetic and intellectual mystics. (Figures such as Kahn and Goff fit the latter role as well as do Venturi or Eisenman.)

Building technology, strangely enough, has made hardly any advances in principle—compared, say, to the 60 years preceding 1920—but there have been many crucial refinements. The same could be said for the organization and methods of practice.

It would be gratifying to say that the pages of *Pencil Points* and *Progressive Architecture* portray this period of architectural history with stunning accuracy—but it would be wrong. This magazine has never tried to be a mirror of events in its field, but always a participant, rooting for one cause or another.

Pencil Points represented, in its very establishment, an affirmation of the large firm as a dominant force in architectural practice. In contrast to older publications, which were aimed at the gentleman architect, this "Journal for the Drafting Room" recognized in its subtitle the increased numbers and influence of paraprofessional designer/draftsmen.

In its early years, *Pencil Points* stuck closely to the subjects of drafting and rendering. During the prosperous 1920s, its scope expanded into a variety of design concerns, as more and more of the draftsmen came to be university graduates with higher ambitions.

There was not a hint in the early years of the Modernism that was burgeoning during the recovery from World War I. By the mid-1930s, the magazine was printing a fascinating set of reports on Modern European work by George Nelson (later to be famous for architecture and industrial design). But in 1935 H. Van Buren Magonigle was inveighing in its pages against the ugliness of Modernism.

The *Pencil Points* of the early 1940s had outgrown the drafting room and was subtitled instead "The Magazine of Architecture." Eclectic design appeared mainly in the Cape Cod cottages that survived in the ads.

Progressive Architecture first appeared in print (stylishly lacking capital letters) in June 1944, as a new subtitle to *Pencil Points*—on the contents pages but not the cover. By January 1945, the new title had made it to the cover—in large letters but still below the old title (Did they have consultants from the movie industry for this transition?). By October 1945, *Progressive Architecture* took top billing on the cover, though *Pencil Points* did not make its final appearance (as a subtitle in parentheses on the contents page) until 1949.

The retitled magazine stood for practical architecture, based firmly on functional determinants. It was equally dedicated to idealistic community planning, with lots of green space and public facilities. The drafting-room tradition was recalled in Selected Details for the sliding doors and cantilevered stairs of the new architecture—all drawn in a consciously non-virtuoso style.

It was in those early Post-War years that P/A began developing a reputation for identifying emerging talent. A house design competition published in May 1945—sponsored jointly with PPG—yielded top honors for Jean and Norman Fletcher (later to be among the founding partners of TAC), the team of I.M. Pei and Frederick Roth (Roth eventually became a partner of Vincent Kling, who won a mention himself), Ralph Rapson, and Eduardo Catalano. P/A's emerging talent search became something of an institution in 1954, when the P/A Awards Program was launched.

With the annual awards program as the fulcrum of its efforts, P/A has become widely recognized as the American magazine most likely to recognize new talent and emerging trends. Barrages of outrage mail over the past two decades demonstrate the risks of this position, but subscription increases and various honors attest to its value.

The 1960s saw increasing criticism by P/A of Urban Renewal and planning policy generally. The 50th Anniversary issue of June 1970 conveyed a strong awareness of ecology with an intense concern for the process of architecture.

Questions of form, of course, emerged again in the 1970s. Concentration on process, it seemed, had yielded no better results, formally, than concentration on program had previously. Conscious manipulation of form and symbolism came to dominate the pages of P/A in the 1970s, along with reverent rehabilitation of past Eclectic work.

We are not now able—as we have said before—to see where this present investigation will lead. But we can assure you that P/A will strive to find out first—and report from there.

John Morris Dixon

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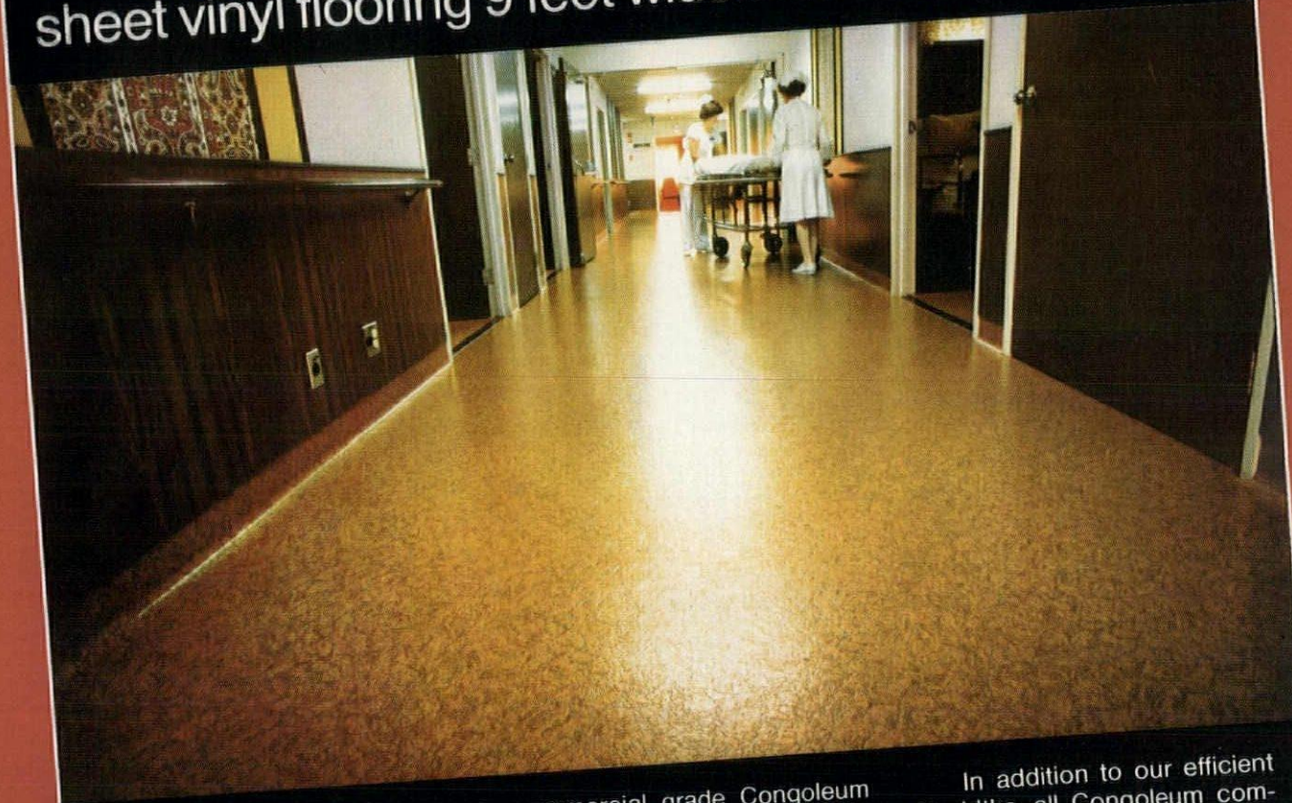

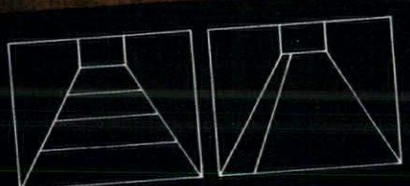

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DAVIS CUP

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Views

The street where he lives
Congratulations on your choice cover selection for the March 1980 issue. The woman in the photograph accurately depicts how I would feel were I passing such a visual junkyard; blurred and depressed.
George Gaillard, RA
Gaillard & Associates
Dacula, Ga

Pluralism and all that
Thank God for the perspective of John Dixon's March editorial on "Modernism," "Post-Modernism," "pluralism," and all that.

Pure delight in architecture is great to see again, though it equally and less self-consciously appeared in much of the work of the founding "Modernists." If only they had been granted longer life spans to show us the way!

I had been keeping my opinions about the ego exercises, not to say bad manners, of some "Post-Modernists" in the closet for fear of showing my age.
Roy Harlow, AIA
Chicago, Il

While the dramatic escape from the stultifying constraints of late Modernism is evident in the 1980 awards, so, too, is the flight from responsiveness, the flight from knowledge recently gained—in short, the flight to fancy.

A Post-Modernism should be based on the circumstances of physical, environment, program, technologic and economic realities, present culture and societal needs; these circumstances molded by the designer's mind are the elements of architecture, the new "orders" of our time.

If architects cannot make beautiful, artful buildings with these "orders," cannot synthesize the circumstances of a given place, but must instead revert to romantic trances, we are fallen. Ignoring the real opportunities inherent in architecture in favor of faraway dreams is perhaps understandable as a reaction to the bland, repetitive, and unresponsive work of the past 20 years. It is simply the wrong reaction.
Robert P. Shannon, Architect
Office of Energy Resources
Boston, Ma

New generation carpet
Your March feature on contract carpet entitled "Third Generation" was literate, well-planned, and accurately researched. You clearly track the progress of an industry which has grown from total obscurity to a dynamic enterprise, sophisticated in both style and product performance, in less than 20 years.

We in the contract carpet specialty business are keenly aware of this metamorphosis, and we appreciate P/A's educational efforts.
Anthony King
Charleston Carpets
Calhoun, Ga

Atheneum examination
I am not sure how Richard Meier's Atheneum (P/A, Feb. 1980) will affect the future thousands of pedestrians that will use it. I think it's a certainty that a few will marvel and a good many more will be very confused by this extremely complicated if interesting piece of architecture. The only thing this architect has seen more complicated lately is Suzanne Stephens' "Critique."
Caldwell R. Dial, Jr., Architect
Columbia, SC

Richard Meier's Atheneum (P/A, Feb. 1980, p. 67) provides the approaching visitor with a titillating visual experience. Dynamic shades and shadows created by a variety of sky conditions and a variety of planar surfaces produce the impressionable threshold Meier wanted. Once inside, however, the dynamic shade/shadow/planar interplay is not sufficiently reinforced by artificial lighting systems. Strategically located planes which could strengthen the "threshold" experience are not properly illuminated. Several planes which should appear as untouched, contiguous surfaces have been punctured by downlights illuminating horizontal surfaces.

Although circulation paths are, by code, required to receive a specific quantity of light, the means to this end are quite numerous. Many times the least expensive and least designed solution is one of downlights. This solution seldom relates to visual informational needs of people. In other words, the psychological impact—the effect and emotion—of the given environment are generally not what the architect had originally intended.

Whether intended or not, the Atheneum as pictured in the upper left on page 72 (P/A, Feb. 1980) reads as a middle-mix gray-scale, and is not particularly exciting. Downlights puncturing the ceiling planes introduce irrelevant dots of light. What must be a multitude of surfaces actually blends into a hazy mixture of gray slabs. The only plane onto which some thought had apparently been given to lighting does not appear as a sharp, clean surface-in-space, but rather, because of the confusing scalloping, appears as a wall moved too close to the light.

Meier's lack of attention to lighting may have a lot to do with your assessment that the ". . . stunning fragments . . . fail to cohere into an integrated whole." Daylighting will always render an exciting exterior environment when the architect pays attention to surfaces, intersections, and textures. On interior environments, however, the architect must pay attention to *lighting* those surfaces, intersections and textures.

I look forward to Meier's next major commission, because if he considers artificial lighting with the same verve with which he considers other architectural elements, then he should have a true masterpiece.
Gary R. Steffy, IES, IALD
Lighting Designer
Smith, Hinchman & Grylls Associates
Detroit, Mi

Photo credit correction
Photo credits for the Pavillon de l'Esprit Nouveau (P/A, Nov. 1979, p. 73) should be amended as follows: top left, bottom right, Jon Michael Schwarting; bottom left, Beyhan Karahan.

Planning credits
The proposed additions to the Loyola Law School in Los Angeles (P/A, March 1980, p. 73), designed by Frank O. Gehry & Associates, are based on original master plan by A.C. Martin & Associates.

Credit extended
Mention of a citation for the Les Halles competition (P/A, March 1980, pp. 30, 31, and 34) awarded to Shira Rosan should have included the names of Jerzy Pankratz and Louise Woehrle as members of the group.

See the new
Tempri group at
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a great chair is not why, but Howe.

Jens Risom's use of the suspension seating concept in Howe's new Tempri line achieves a level of comfort often missing in chairs designed for working and listening situations.

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The secret of a great chair...Jens Risom...and Howe.

Jens Risom, Designer

The Tempri Group by Howe

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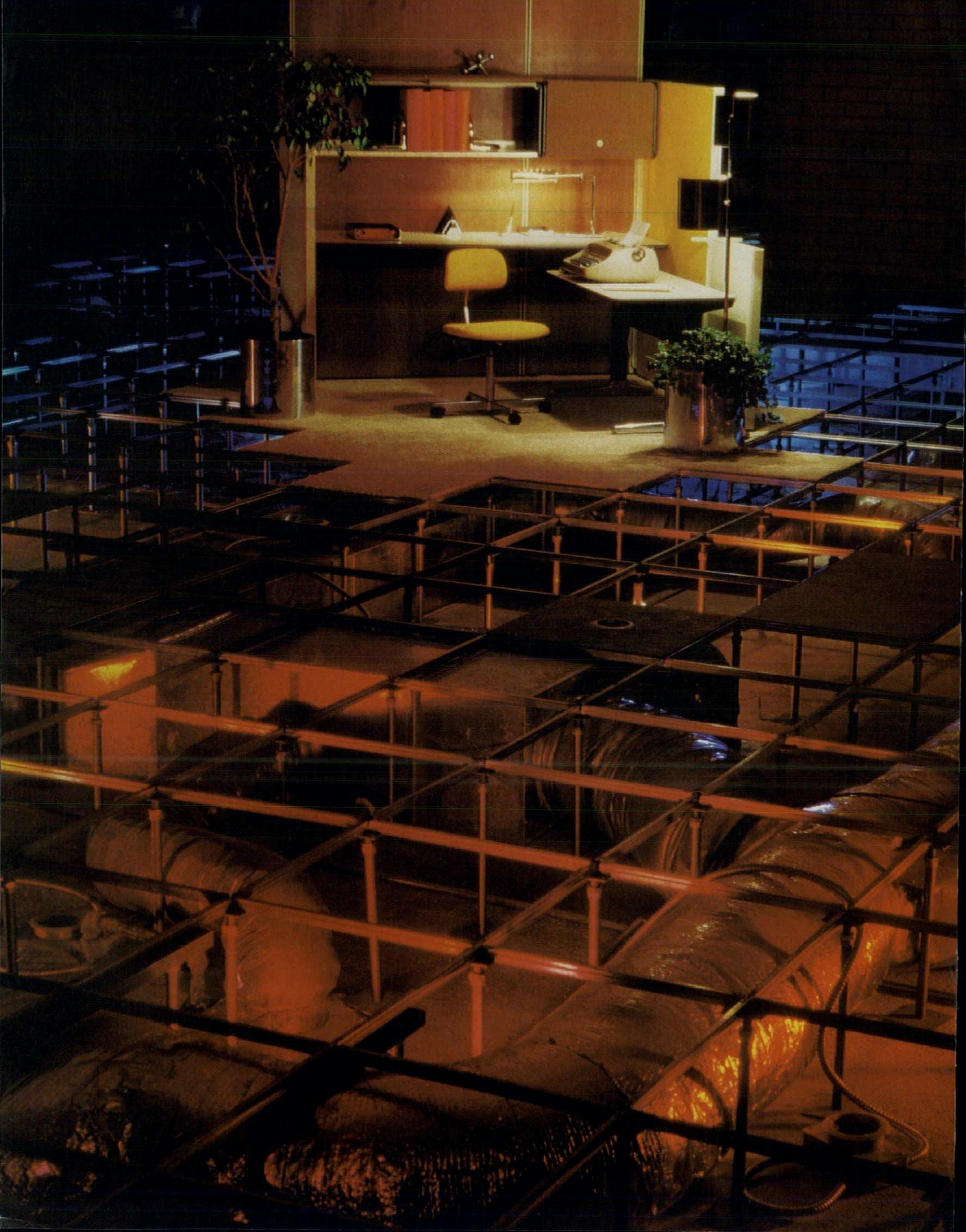

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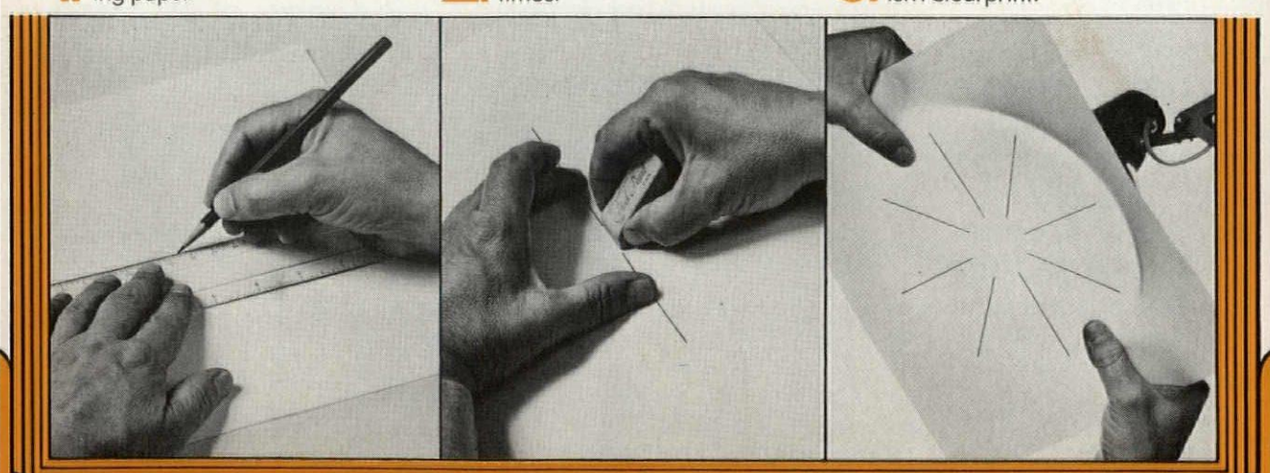

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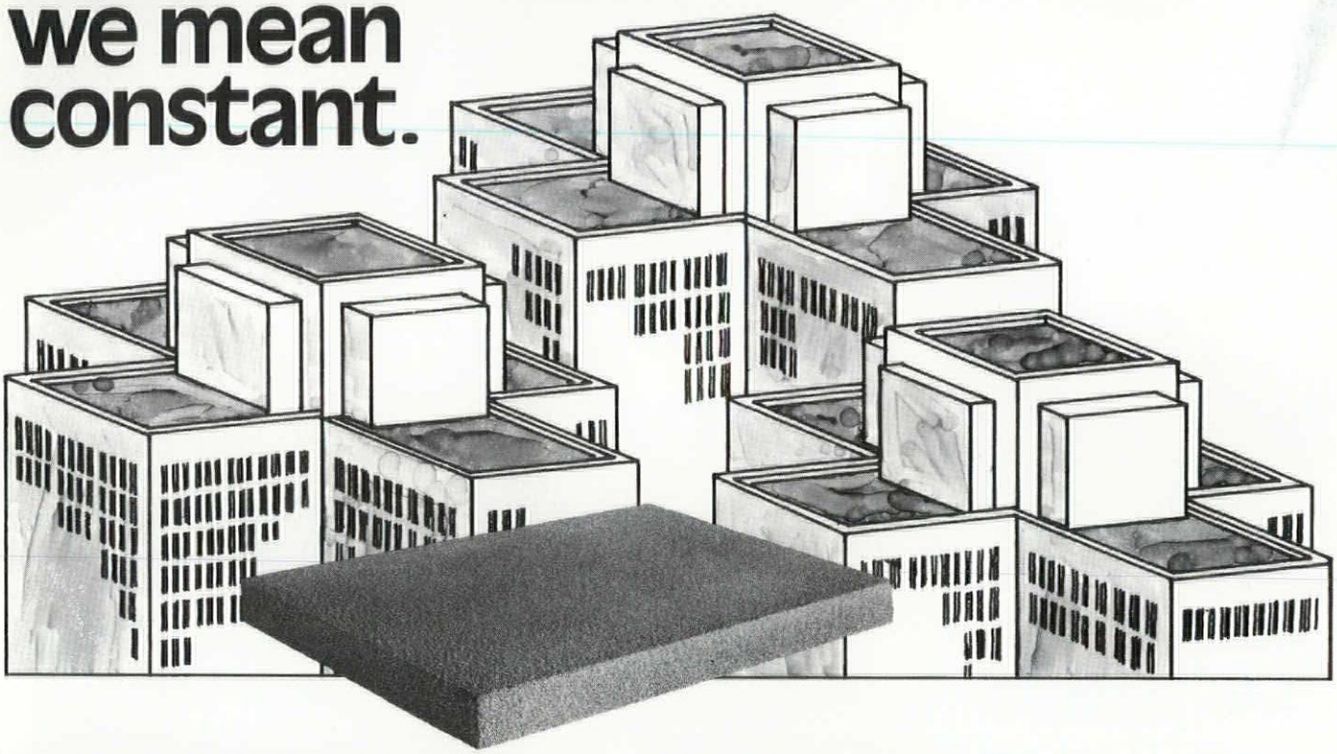

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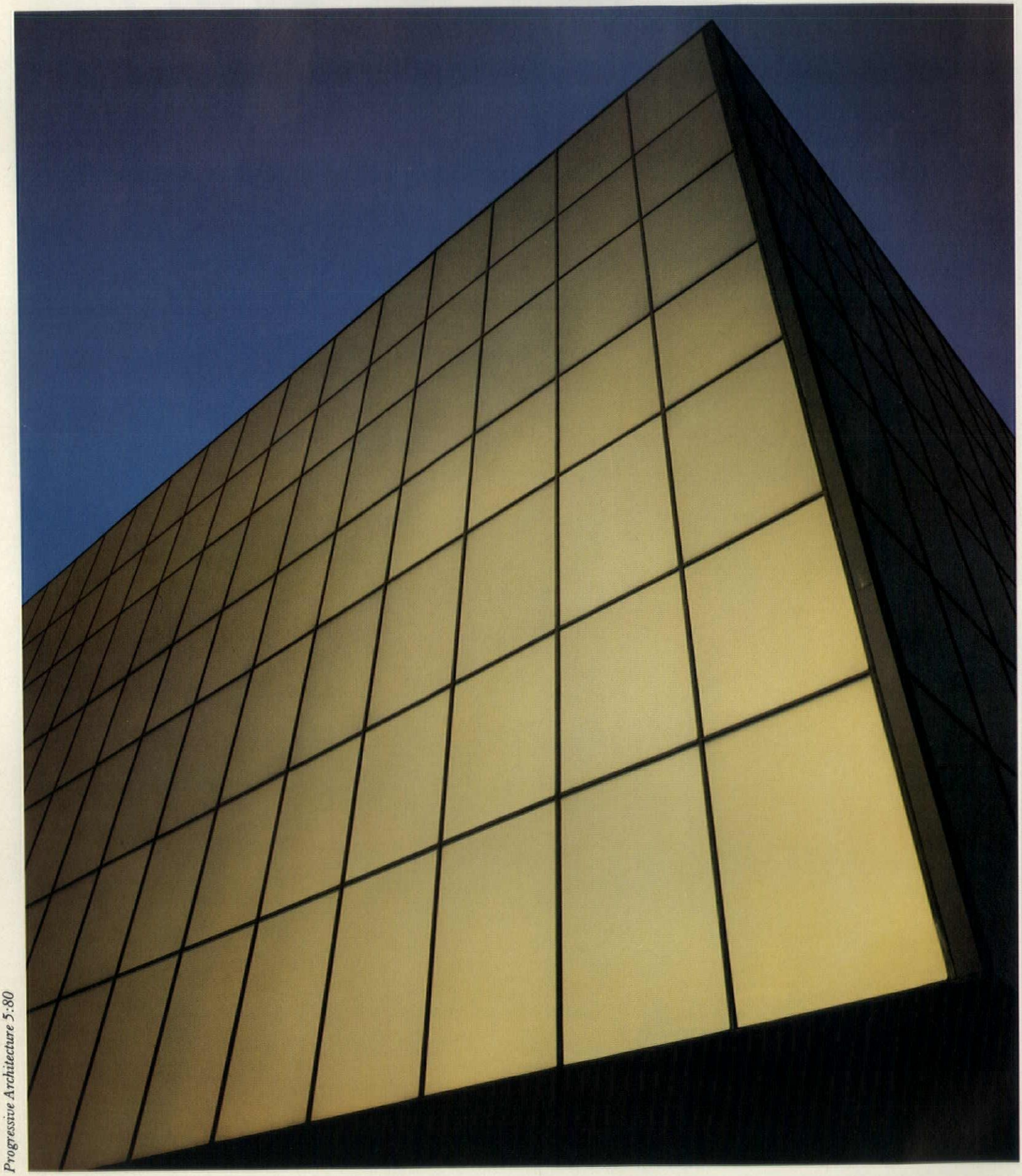

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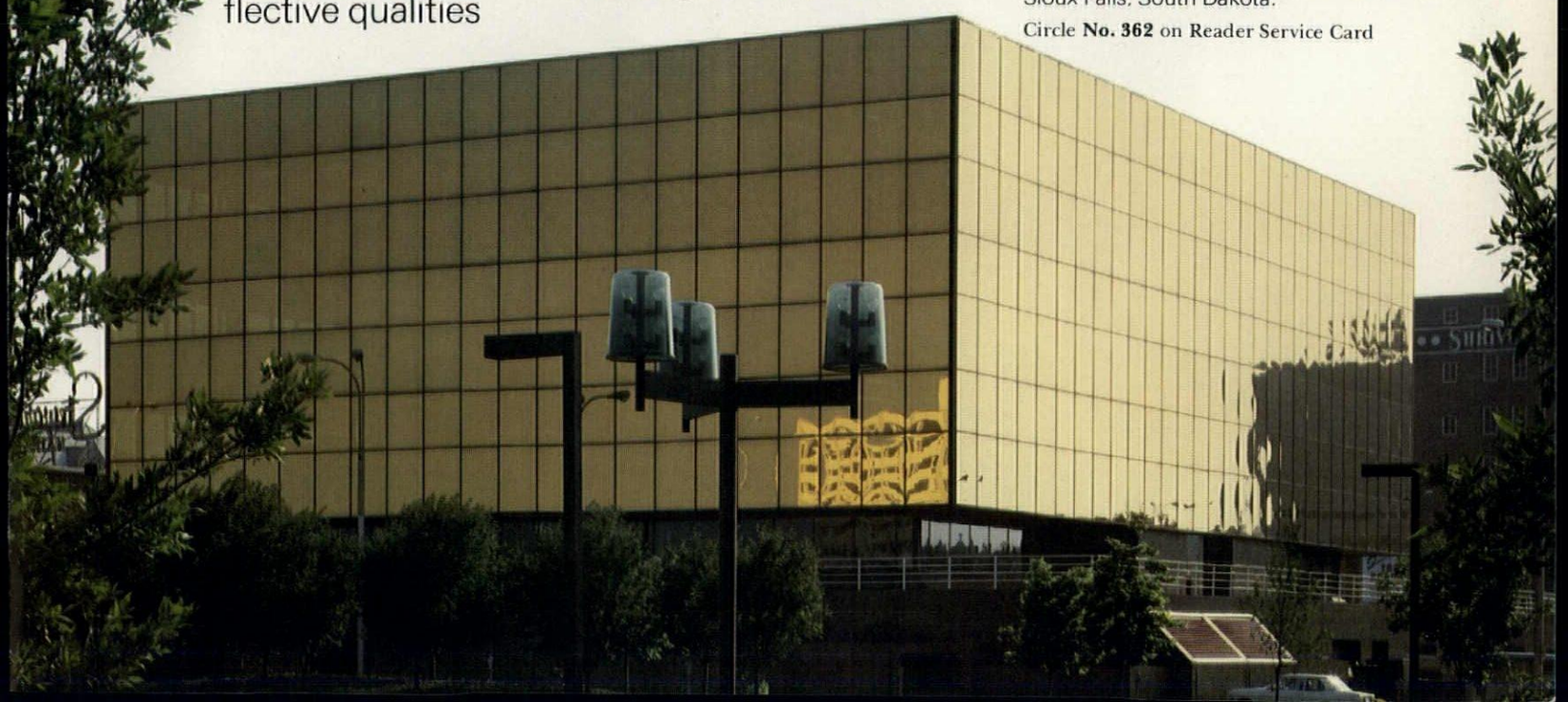

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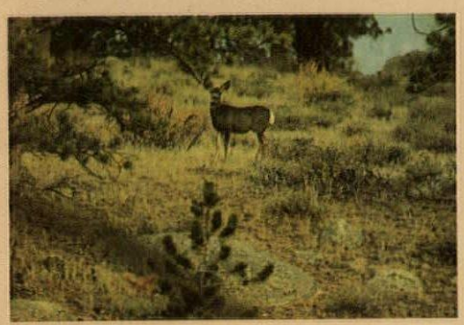

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P/A News report

Portland competition a very public issue

March and April were particularly exciting months in Portland, Or. Not only was there the reawakening of nearby Mt. St. Helens, but eruptions of quite another kind reverberated through the City of Roses as well. Two separate competitions, one for a new Public Service Building and the other for designs for Pioneer Courthouse Square, put architects and architecture at the center of public attention, challenging the volcano for news coverage. Not all the news was good, however. The Public Service Building proposals were the hottest topics in early April, becoming the focus of controversy, criticism, and cajoling, pro and con.

Acting as advisors of a citizens jury were Philip Johnson and John Burgee. Scenario one. The finalists were narrowed down to three architect/builder/developer teams including: Mitchell/Giurgola in association with Broome, Oringdulph, O'Toole & Rudolf, contractors Williams & Burrows and Howard S. Wright Construction; Michael Graves in association with Emery Roth & Sons, Pavarini Construction Co., and Hoffman Construction Co., contractors; Arthur Erickson/SRG Partnership in association with Dillingham Construction, Simpson Division.

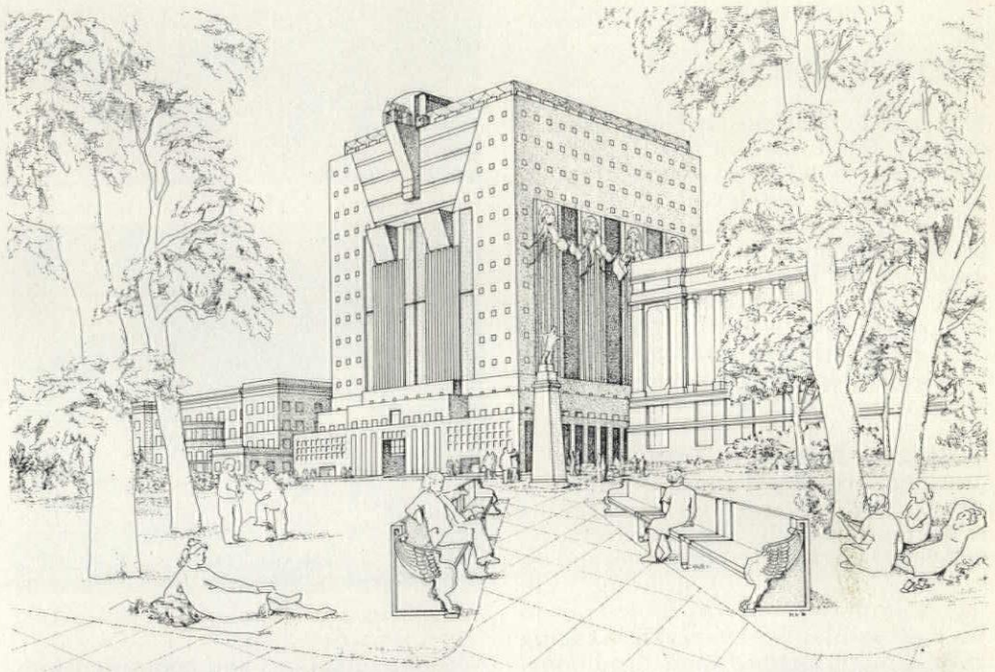
One of the key requirements of the program was that the teams produce not just a scheme but a bonded bid to the city for construction. In addition, the budget of $22,420,000 was sacrosanct. Early in the process, all three teams protested (some vigorously) that the budget was insufficient for the program, that it was nearly impossible to achieve any quality in a public building for that amount. Some even strongly considered dropping out of the competition. The city turned a deaf ear to these warning signs and insisted that the entrants proceed, original constraints intact.

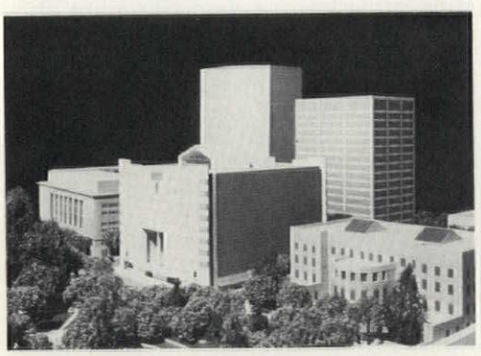
Several ways of thinking marked the progress of the teams after decisions were made to stick with it. The Graves team held that the budget must be met, and chose materials and methods accordingly. The Erickson team also struggled hard with the number/aesthetic balance. Giurgola's team fought the numbers, but maintained that it was a disservice to all concerned to cut corners on such an important building.

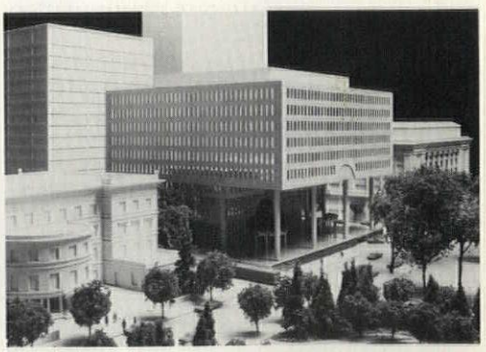
Negotiations with the City Council took on very political overtones, according to several sources. It is also charged that the lay jury might have been seduced or molded by rhetoric from Philip Johnson, who voiced judgments and witticisms even while the teams presented their proposals. On top of that, many in the Portland architectural community became very concerned as the decision drew nearer.

Giurgola was ruled out for going well over the "budget," but Erickson was deemed close enough. Armed with recommendations from its advisors, the jury chose the Michael Graves design, presenting it to the City Council for approval. To put it mildly and in vastly simplified terms, the ensuing hearings were chaotic and confusing. Were any of the proposals "responsive" to the requirements? Was the public good served? Were context and environment amply considered? Who are all those architects, and why are they saying those things? Two Portland architects, Willard Martin and Robert Frasca, stood up for the apparent winner, preferring to allow Graves to construct his scheme free of bickering.

However, the majority of architects screamed in protest. In the person of Pietro Belluschi, the Fellows of the Portland AIA submitted testimony before the City Council saying that the jury had been influenced by Johnson, ". . . the high 'guru' of a coterie of young gifted people who earnestly believe that visual chaos is the reality of today's world. . . ." He called the Graves scheme ". . . the enlarged jukebox or the oversized beribboned Xmas package . . ." which should be built somewhere else, suggesting Atlantic City or Las Vegas.







Schemes by Michael Graves' team (top) and the teams assembled with Arthur Erickson (above) and Mitchell/Giurgola.

News report continued from page 25

Although the public and the City Council were thoroughly and unfortunately confused by all the clamor, the city proceeds with its refinement with Graves. The Portland architects—an unusually talented group, by the way—are reportedly considering further outcries at the time this is written. P/A will report further developments in this and the other competition as they unfold. [JM]

Drawing and how

A diversity of techniques and styles was dramatically demonstrated in two simultaneous exhibits of John Hejduk's work at the Institute for Architecture and Urban Studies—Jan. 23–Feb. 16—and at Max Protetch Gallery—Jan. 22–Feb. 16—in New York City and the exhibit "Young Architects" curated by George Ranalli at Yale University's School of Architecture (Jan. 14–Feb. 1). P/A has asked a Columbia University architectural student **Charles Davock Warren** *to examine these techniques and comment.*

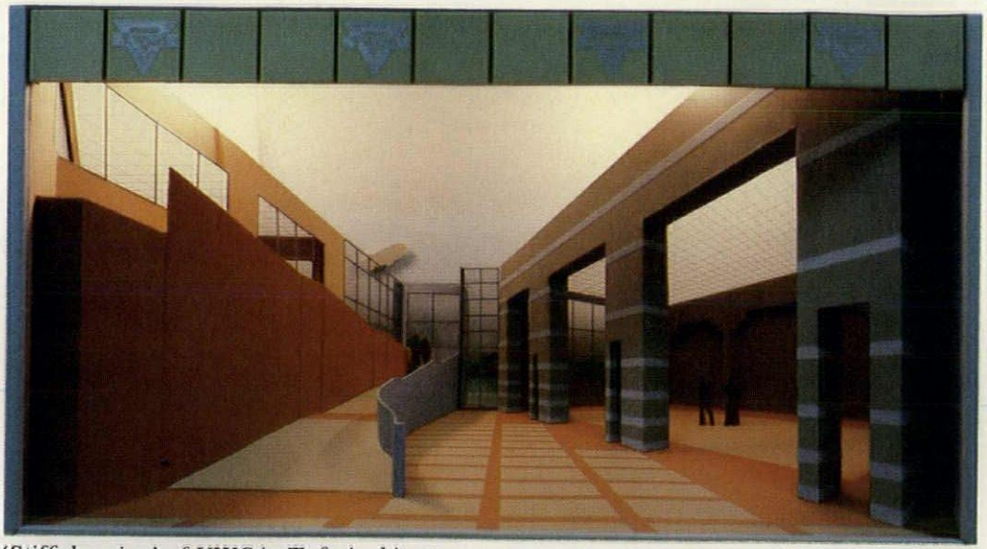
"Young Architects" at Yale

Drawings are the rhetoric of architecture. Unlike an artist who sees drawing as an end in itself, the architect uses drawings to persuade, challenge, and astound. The variety of drawing techniques employed towards these ends in the Yale exhibit is remarkable, ranging from straightforward and traditional techniques to an elaborate manipulation of graphic technology.

The most unusual presentation was that of Taft Architects from Houston who exhibited a series of dioramas called "stiff drawings." These exquisitely crafted boxes, about one foot deep (see photo), depict the building in plan, perspective, and elevation with a series of cutout cardboard planes. These autonomous fantasy worlds do convey a sense of fun and wit. They also suggest, however, an attitude towards space as a series of parallel layers that seem a not altogether accurate representation of architecture.

In contrast to the fanciful Taft presentation, the photomontages of Mark Mack were images of compelling realism. The most spectacular image, an aerial view of a proposed powerplant in Wisconsin (see photo), combines drawing with photography to produce an illusion powerful enough to surmount the unlikelihood of the building's existence.

A variety of photographic techniques were used by other architects as well. Lebbeus Woods inverted a single drawing and repeated it photographically. The photographs were then mounted together to form a larger image in which the rhythms and symmetry are created through the structure of repetition. The use of a multiple process like photography to create a Futurist machinelike image of a city was particularly apt. The concern with process, limited variation, and mass production exhibited in these drawings reflected accurately some of Woods's intentions and contrasted with Mark Mack's more pictorial uses of photography.



'Stiff drawing' of YWCA, Taft Architects.

Power station in Wisconsin, Mark Mack.

Coy Howard used offset printing plates to display his architectural conceptions. The silvery texture of the printing plates softly reflects light and contrasts very handsomely with the black ink forming the image. Howard went to rather elaborate lengths for this effect. The process involved all the steps required to print a lithograph: a full-size negative must be made of the original drawing and used to burn the image on a plate, which is then etched and inked to make the image visible. But the use of this multiple technique seems unrelated to the architectural ideas it was supposedly describing. The novelty of the process risks the danger of obscuring the meaning of the drawing.

Besides those technical explorations, much attention was paid to the handcraft of graphic presentation, for a number of architects in the exhibit relied on basic tools such as the pen, the pencil, and the drawing surface. Traditional and technologically simple means of description and expression were often manipulated for complex and expressive ends.

Color pencil replaced watercolor wash of earlier days as a preferred traditional technique for using color. Lauretta Vinciarelli and Leonardo Fodera used color pencil and ink applied to Mylar for their drawings. The pencil strokes were finely and evenly applied, creating the appearance of manufactured precision. In fact the color surface was so smooth it resembled applied color film more than pencil. The considerable patience involved in this exacting technique yielded disciplined drawings that were well integrated with the highly ordered and disciplined architectural concepts they were meant to represent.

George Ranalli applies color to his drawing in short, even pencil strokes. He uses subtle gradations to indicate shade and shadow. The overall effect recalls the watercolors of the École des Beaux-Arts, which clearly inspire his hand and perhaps inform his architecture as well.

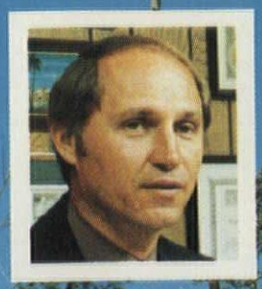
John Hejduk Exhibits

Two other shows that opened recently at the I.A.U.S. and Max Protetch galleries displayed the diversity of drawing style in the work of *one* man. The I.A.U.S. show contained the austere pencil drawings of Hejduk's seven Texas houses executed from 1954 to 1962, while the Protetch show concentrated on the more colorful recent work. Recently Hejduk has employed a wide variety of media in his drawings, such as color pencil, pencil, ink, crayon, and watercolor. He also uses a diverse selection of drawing surfaces, ranging from very fine rice paper to corrugated cardboard and brown paper. Materials are obviously very important, and the conjunction of mark and surface forms the essence of his drawings.

The color and texture of his drawings on corrugated cardboard demonstrated his ability to exploit a crude material to reveal rather than disguise rich tonal variations.

Hejduk's series of drawings for the 13 Watchtowers of Cannaregio, a project

[*News report continued on page 30*]



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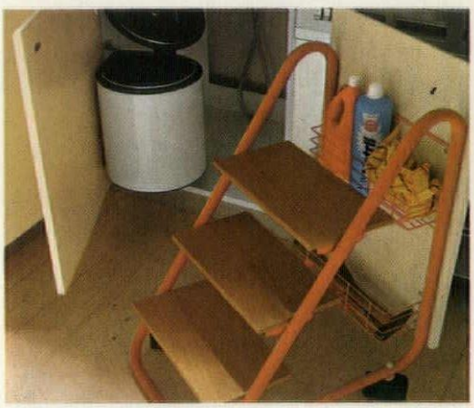

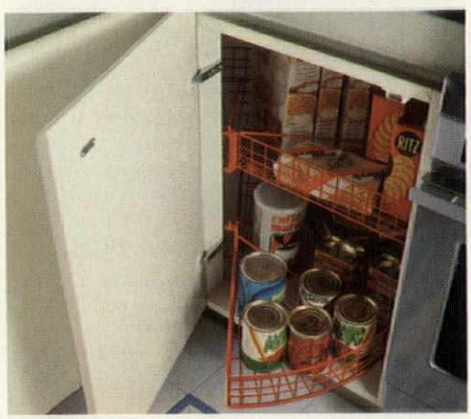

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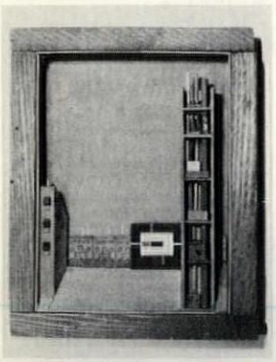
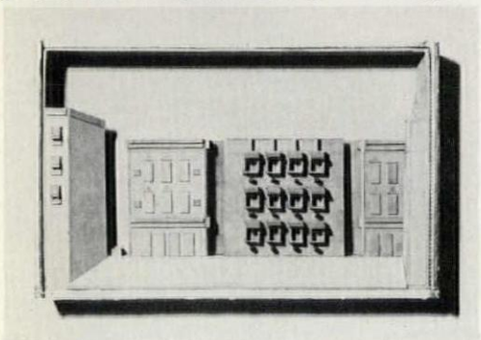
News report continued from page 26



John Hejduk's watchtowers of Cannaregio.



exhibited for the 1979 Venice Biennale, formed the most remarkable collection of drawings in the show. In many, the surface was covered with a mottled combination of somber colors, over which black marker lines were applied and more opaque paint surface then laid. This series of layers of varying luminosity and opacity created an overall effect of depth and an atmosphere of mystery. There is a joy in the crafting of these drawings that belies the pessimism they express.

Hejduk's painterly drawings are relaxed and full. They are imbued with a life of their own that propels them beyond the realm of illustration. Their success in conveying the mood of the projects is unquestionable, but perhaps these drawings do not profit in the journey across the vast gulf separating painting from architectural illustration.

All of this work demonstrates that the relationship between drawing and architecture is one of change and variation. A drawing technique can be eloquent or mute, it can enrich or obscure the architectural ideas which it is used to depict. The selection of a drawing technique or the creation of a drawing style is therefore significant. The wide range of style and technique represented in these three exhibits offers an appropriate correlation to the diversity of architectural ideas currently prevalent.

Thonet's 150th anniversary

One hundred and fifty years ago, a German cabinetmaker from Boppard-am-Rhine invented a technique for making furniture by bending wood rather than carving it. Though he was destined to start a company which now sells more than 100,000 pieces of furniture annually, things did not go so well for Michael Thonet at the beginning.

Thonet's first laminated veneer chair, 1836, in the Empire/Biedermeier style.

Years passed and not only did his small company not thrive but he was unable even to obtain a patent for wood-bending techniques. It is said that he was then discovered by Prince Metternich, chancellor of Austria and Minister to the Emperor Franz Joseph, and brought to Vienna for an audience with the Emperor. The Emperor commissioned several pieces, and shortly thereafter Thonet was finally awarded a patent. But meanwhile, in Boppard, his

[*News report continued on page 34*]

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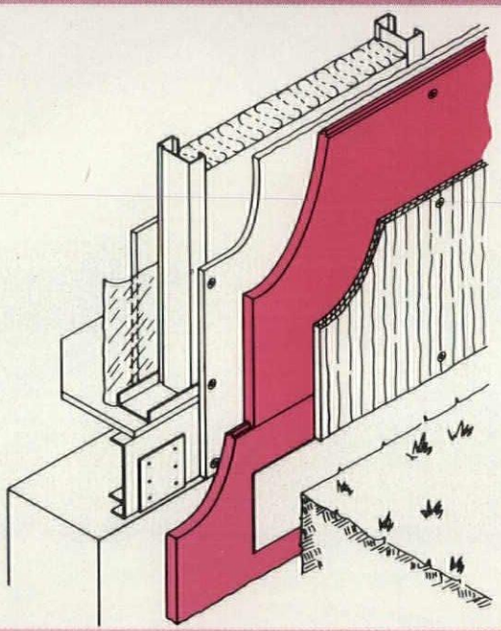

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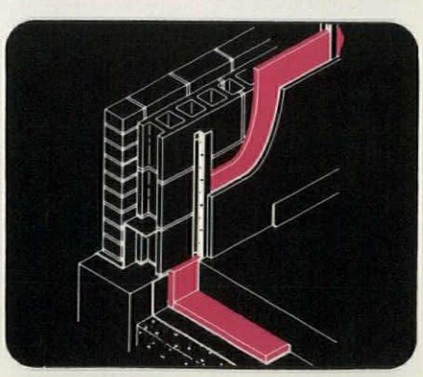

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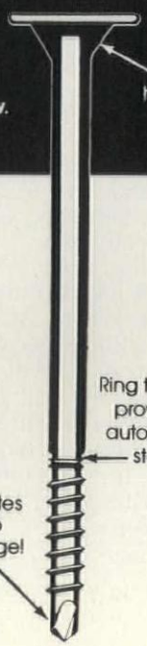

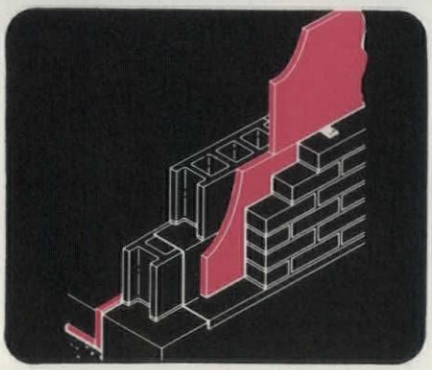

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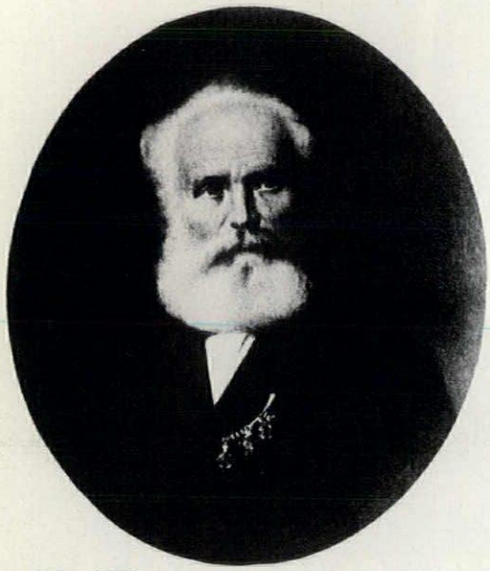


Michael Thonet.

creditors had foreclosed on his small business. There followed years of apprenticeship in Vienna—where he moved his bankrupt family—with first a cabinetmaker, then an architect, then a parquetmaker. His experiments in bentwood furniture continued, including work for the Liechtenstein Palace, and by 1849, Thonet again set up a furniture company.

Over the years, the firm has been associated with such eminent designers as Otto Wagner, Josef Hoffmann, Mies van der Rohe, Marcel Breuer, Le Corbusier, and Walter Gropius. Anticipating World War II, the firm moved to the U.S. in 1938 and now operates all over the world.

In celebration of its 150th anniversary, Thonet will hold an exhibit of antique and classic Thonet designs at NEOCON in June and add to the collection a reproduction of Otto Wagner's 1902 stool for the Vienna Postal Savings Bank. Two books will be published. One, due in September from Dover Publications, will be a reissue of the firm's 1904 illustrated catalog. The other, due in October from Barron's as part of its furniture design series, will be a history of the firm by Christopher Wilk. Also in the fall, the New York store of Lord & Taylor will hold an exhibit and sale of 200 Thonet antiques.

Last year Thonet and its parent company, Simmons, were acquired by Gulf & Western. From a woodcraft beginning, Thonet has expanded into metal furniture, plastics, and, through its parent company, hospital furniture. While its biggest seller continues to be the bentwood 1876 Vienna café chair, in the midst of its second century that record is being rapidly outpaced by last year's introduction, David Rowland's Sof-Tech™ stacking chair, combining tubular steel with the most advanced plastics. [NM]

AIA Honor Awards for 1980: two sets of criteria?

Again this year, the AIA is giving Honor Awards to buildings in two distinct categories—"current use" and "extended use"—chosen by two distinct juries. Even though these two panels were choosing from different pools of entries—unknown to us—their selections strongly suggest two divergent attitudes toward design. (Though the AIA release on the awards stresses energy conservation as a common characteristic, few of the winners show more than routine concern for energy.)

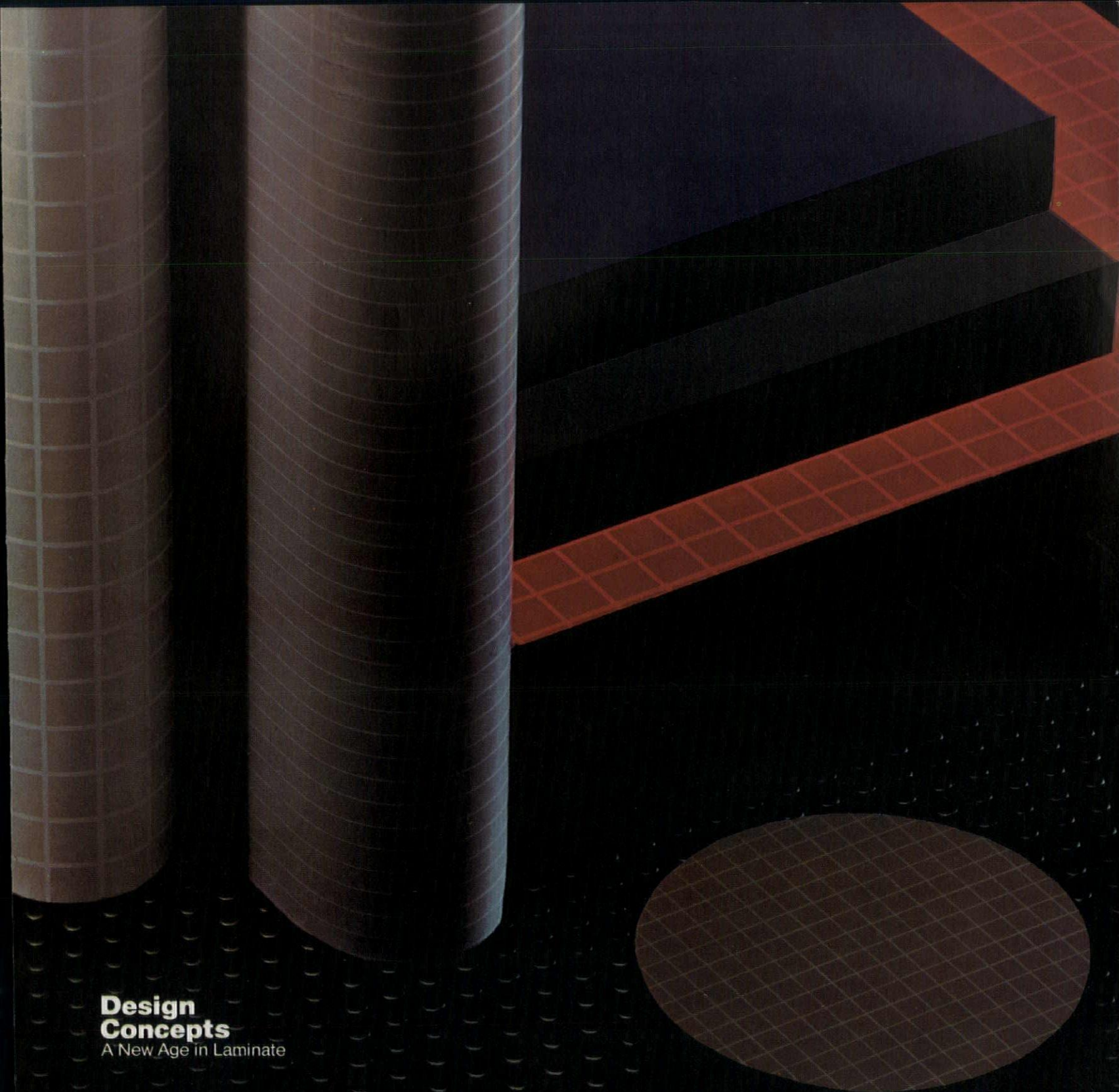
In making their seven selections (listed below) out of 333 submissions, the current use jurors seemed to favor moderate scale, serious purpose, and no radical design ideas. There were no office towers or prominent institutional buildings and, on the other hand, no single-family houses. None of the work was by internationally influential design masters, but all winning firms except one are well-known nationally. (Though authorship of the work is not, of course, a basis for choice, the list of firms fits the pattern of avoiding extremes.)

The only winners that might raise a few eyebrows are two (the church and the housing) that embrace the "Colonial" vernacular rather literally. Noting that jury members were "serious, uncompromising" people, the jury chairman reports: "My one reservation is that we should have been able to give more awards, . . . as I believe several of the projects passed over in 1980 will receive awards in the future."

In making six selections out of 80 entries, the jury for extended use took a more eclectic view—perhaps inevitable, given their task—and took more risks in the design they endorsed. Along with some fine preservation efforts, they chose two single-family houses—by Frank Gehry and Robert Stern—that were transformed through design devices that are by no means universally accepted. (Last year's extended use jury gave Michael Graves his first national AIA recognition.)

Current Use Honor Awards: Indiana Bell Telephone Switching Center, Columbus, In, by Caudill Rowlett Scott, Houston, and Boots-Smith & Associates, Indianapolis (P/A, July 1979, p. 66); Heaton Court, Stockbridge, Ma, by Goody, Clancy & Associates, Boston; Colonial Church of Edina, Edina, Mn, by Hammel Green & Abrahamson, St. Paul; Qume Corporation, San Jose, Ca, by Hawley & Peterson, Palo Alto; Environmental Health Laboratory, St. Louis, by Holabird & Root, Chicago (P/A, April 1979, p. 118); Wayne State University Health Care Institute/Detroit Receiving Hospital/Detroit Medical Center Concourse, Detroit, by William Kessler & Associates, Zeidler Partnership, and Giffels Associates, Detroit; Southern Service Center for Equitable Life Assurance Society, Charlotte, NC, by Wolf Associates, Charlotte.

[*News report continued on page 38*]



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News report continued from page 34

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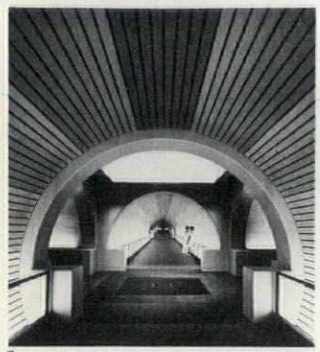

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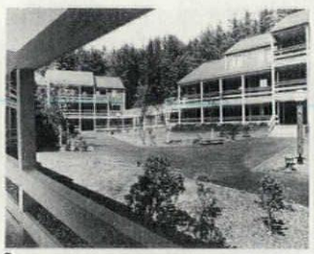

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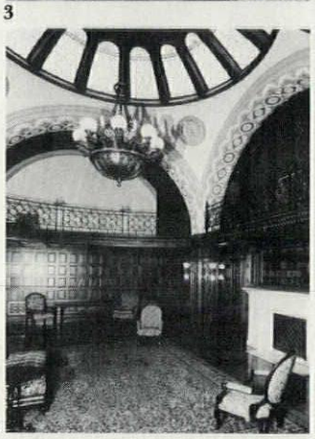

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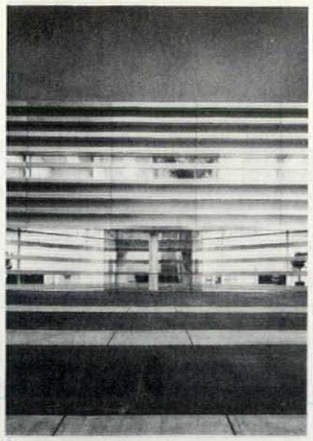

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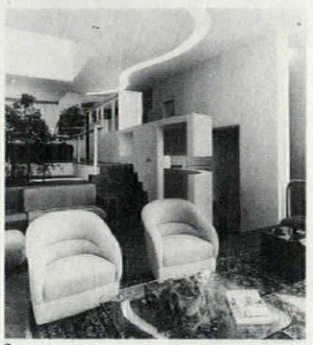

6

AIA Honor Awards include: 1) Colonial Church of Edina, Mn; 2) Wayne State University Health Care Institute, Detroit; 3) Heaton Court, Stockbridge, Ma. 4) Southern Service Center, Equitable Life Assurance Society, Charlotte, NC; 5) Landmark Center, St. Paul; 6) Townhouse, New York.

Current Use jurors: Frank Tomsick, FAIA, San Francisco (chairman); Thomas Hodne, AIA, Minneapolis; Jane Hastings, FAIA, Seattle; Donald Stull, AIA, Boston; Bruce Graham, FAIA, Chicago; David Maudlin (student), Miami University, Ohio; John Graves (associate AIA), Berkeley, Ca.

Extended Use Honor Awards: Market Square Historic District, Newburyport, Ma, by Anderson Notter Finegold, Boston; Frank Gehry Residence, Santa Monica, Ca, by Frank Gehry, FAIA (P/A, March 1980, p. 81); Arts and Industries Museum, Smithsonian Institution, Washington, by Hugh Newell Jacobsen, FAIA, Washington, and the Smithsonian Institution Office of Facilities Planning and Engineering Services; Landmark Center, St. Paul, Mn, by Perry, Dean, Stahl & Rogers, Boston, with associated architects Winsor/Faricy Architects, St. Paul; The Biltmore Hotel, Los Angeles, by Ridgway Ltd., El Toro, Ca (P/A, Nov. 1978, p. 66); New York Townhouse, New York, by Robert A.M. Stern Architects, New York (P/A, June 1976, p. 70).

Extended Use jurors: James Nagle, FAIA, Chicago (chairman); Herbert Newman, AIA, New Haven; Frances Halsband, AIA, New York; Sally Woodbridge, Berkeley, Ca; F. Blair Reeves, FAIA, Gainesville, Fl; Jerry Hann (associate AIA), Palmer, Ak; Joseph Mancuso (student), Princeton University. [JMD]

[*News report continued on page 42*]

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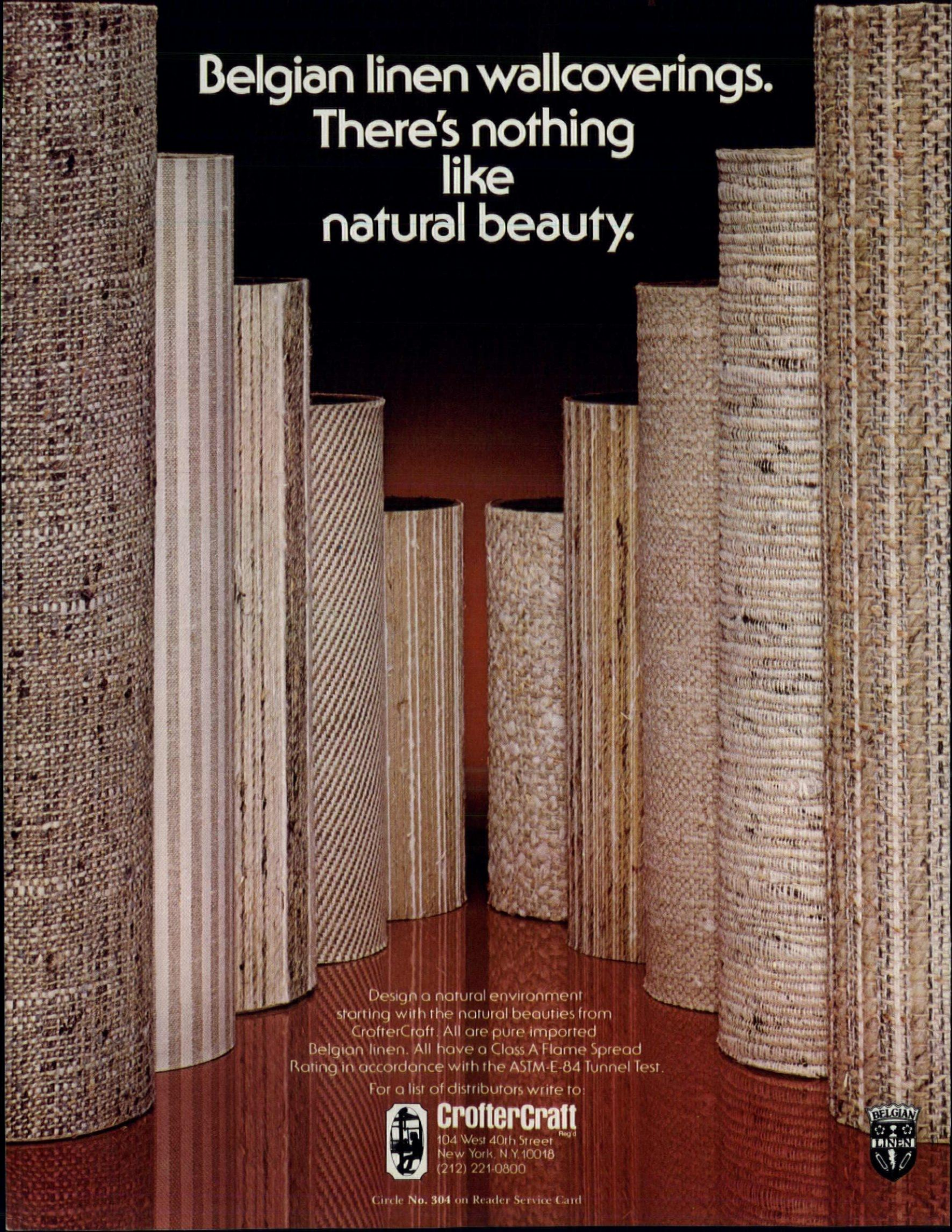

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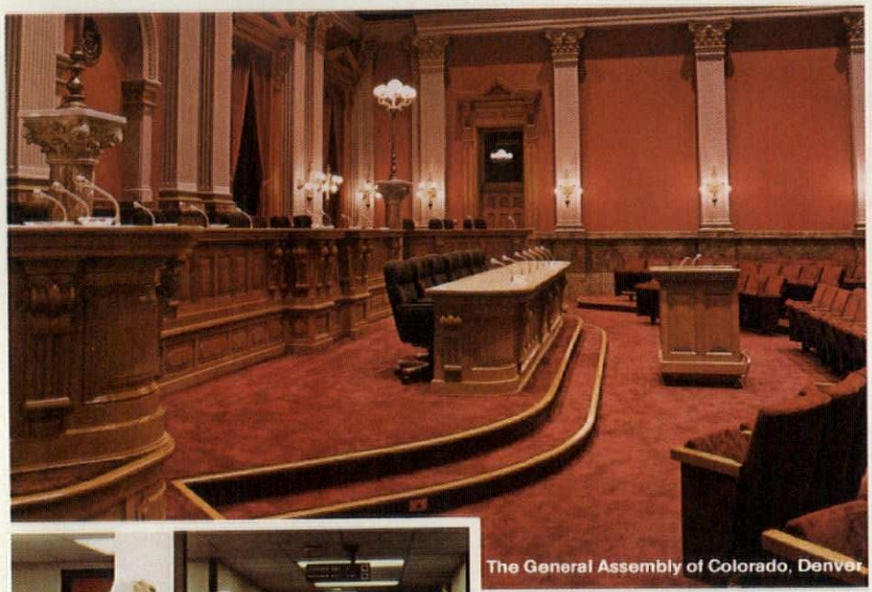
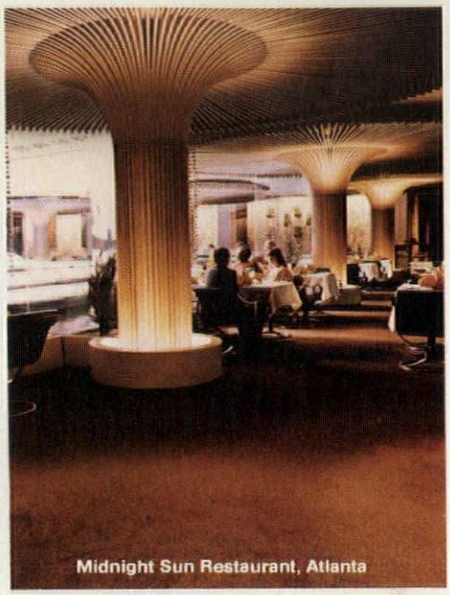
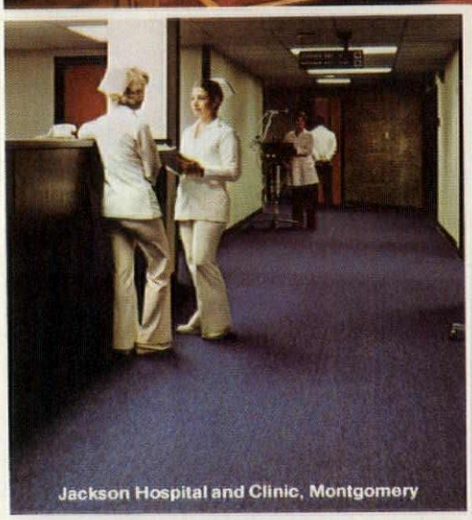


The General Assembly of Colorado, Denver



Midnight Sun Restaurant, Atlanta



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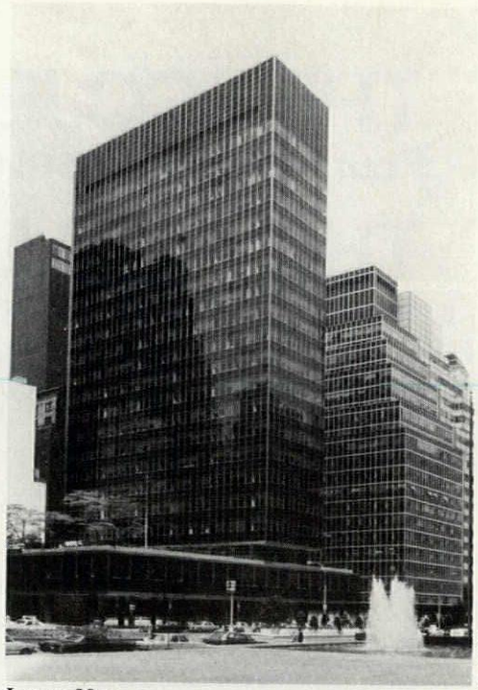
News report continued from page 38

Twenty-five Year Award to SOM's Lever House

"The structure influenced a building prototype internationally, but stands on its own as an object of art, technology, and planning." Thus James Nagle, FAIA, chairman of the jury that selected this year's 25-Year Award of the AIA, neatly summarizes the significance of Lever House in New York. Completed in 1952, this was the first office building designed by Skidmore, Owings & Merrill (Just imagine America without SOM office buildings!), and it established an instant international reputation for its designer, architect Gordon Bunshaft.

As a prototype, Lever House was not the first office building to have a tinted glass curtain wall or the first to have sealed walls for air-conditioning efficiency, but it was undoubtedly the most influential in making these characteristics standard. (The AIA release stresses that the building only *appears* to have all-glass walls and that the tinted window glazing reduces energy demand.)

Beyond that, Lever House seems to have set a new standard for corporate office structures, filling far less than its allowable zoning envelope and offering a plaza to the public, plus a lobby exhibition space. It was a first step toward widespread revisions in zoning laws affecting urban office buildings, though all too few buildings built under the new regulations have the formal elegance or appealing open space of Lever House. Still functioning well for its original purpose, Lever House remains (well teamed with Mies and Johnson's Seagram Building diagonally across Park Avenue) the embodiment of a magnificently confident moment in architecture. [JMD]



David Morton

Lever House.

Architectural Firm Award to Edward L. Barnes office

The choice of Edward Larrabee Barnes, Architect, for the Firm Award of the AIA confirms that organizations apparently dominated by one "name" architect can be judged exemplary architectural firms. Although usually reserved for firms founded on the concept of collaborative practice—such as SOM, TAC, and CRS—this award was given in 1978 to Harry Weese & Associates of Chicago.

Though Edward Larrabee Barnes, FAIA, who founded the firm in 1949, is guiding figure, responsibility is shared by associates Hildegard Bergeim, AIA, Alistair Bevington, Edward Jacobson, AIA, Percy Keck, AIA, and John Lee. With a professional staff numbering 20 architects, the Barnes office is currently at work on 20 projects ranging from the 43-story IBM Building in Midtown New York to a firehouse renovation and a small vacation house. Though its practice is quite diverse, the firm is probably best known for college and university planning and buildings (for New York State University campuses at Purchase and Potsdam, for Yale, Bennington, Bowdoin, Drake, Rochester Institute of Technology, and the Christian Theological Seminary in Indianapolis, among others) and for museums (Walker Art Center in Minneapolis, Scaife Gallery in Pittsburgh, Wichita Art Museum). Seven museums—including those for Dallas and Santa Fe and for the Asia Society in New York—are now on the firm's boards. [JMD]

[*News report continued on page 46*]

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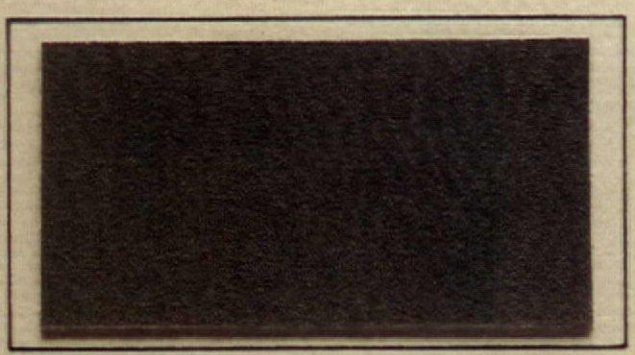
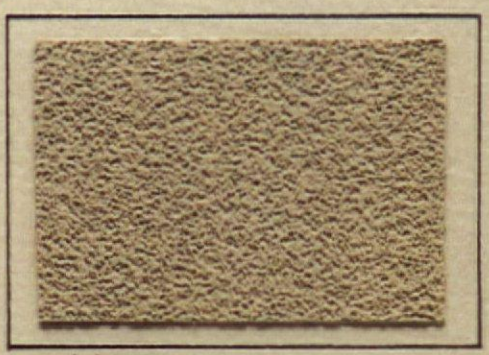


president



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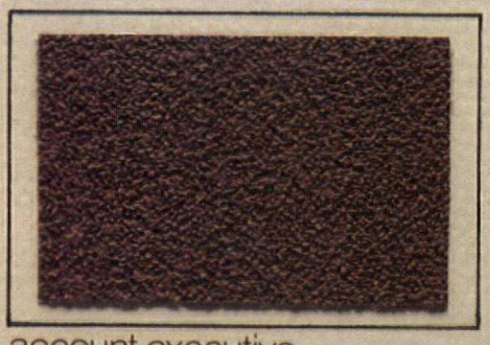
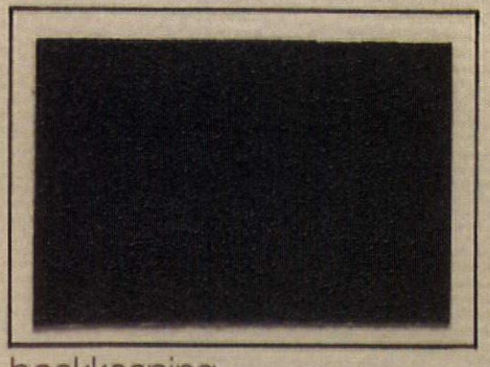
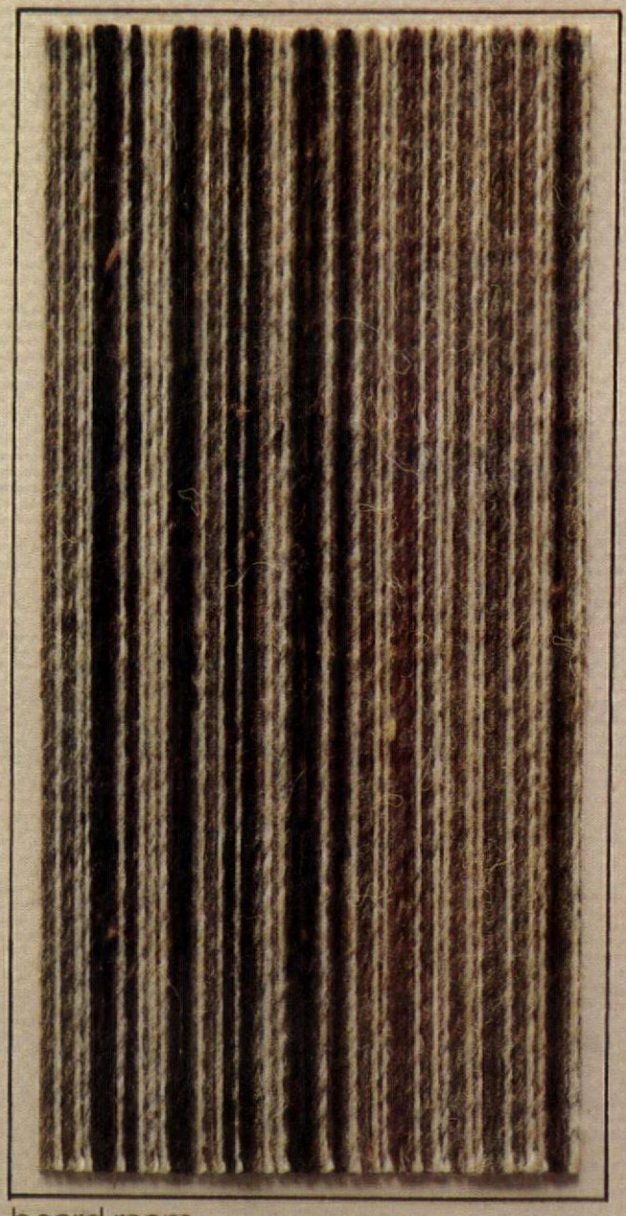


account executive



bookkeeping



board room

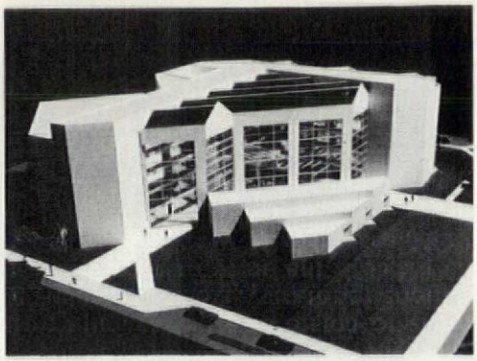
News report continued from page 42

AIA/ACSA education award to Serge Chermayeff

The AIA and the Association of Collegiate Schools of Architecture have chosen Serge Chermayeff as recipient of the fifth annual Award for Excellence in Architectural Education. Based on an entire career, the jointly sponsored award was presented to Chermayeff at the annual meeting of the ACSA this spring in San Antonio; he will be recognized again at the AIA Convention.

Born in Russia in 1900, Chermayeff was educated primarily in England, where he practiced briefly before World War II—and produced his landmark house in Sussex in 1937. After arriving in the United States in 1940, Chermayeff taught for 30 years—at Brooklyn College, the Institute of Design in Chicago (which he headed, 1946–1951), M.I.T., Harvard, and Yale. Though it is not relevant to his choice for this honor, Chermayeff is the father of Ivan and Peter Chermayeff, two partners of Cambridge Seven, Architects (Ivan is also a partner of Chermayeff & Geismar, graphic and exhibition designers).

As his nomination for the award stated, "Mr. Chermayeff's wit, charm, bullishness, intransigence, knowledge, taste, prejudices, and delights all contributed to the zest of a great teacher." Nobody exposed to these qualities—especially in school—is likely ever to forget them. [JMD]



Oregon State Capitol Office Building.

In progress

Oregon State Capitol Office Building, Salem, Or. *Architects: Zimmer Gunsul Frasca, Portland, Or.* Designing an advanced solar office building to fit a traditional architectural setting was the architects' challenge on this project. Although state officials wanted to demonstrate a commitment to energy-saving design, they doubted that the Moderne styling of the 1930s Capitol, a Beaux-Arts exercise in gleaming white marble, could be successfully translated into either high- or low-tech imagery. As it turned out, the energy-efficient nature of the design was so compelling that the legislature, in an unprecedented action, approved a supplemental budget for the building.

Although western Oregon's climate is generally perceived to be sunless, the main problem in Salem is still cooling not heating. The design addresses the cooling problem largely through orientation, configuration, and distribution of the building parts. In addition to general envelope efficiency, heat gain is reduced by means of the major north orientation of windows and the opportunity for ventilation through operable sash.

The building achieves a south orientation through a monumental, five-story solar greenhouse set diagonally across the L-shaped plan. In the summer, the air-type solar collectors on the greenhouse roof are inactive, permitting the roof to operate as a shading device for the south-facing wall. Excess heat in the greenhouse is exhausted through the combination of louvers and an exhaust system in the mechanical floor ceiling. In addition to an economizer cycle with a conventional air-conditioning system, there is also a chilled water storage tank.

In winter the rejected heat from the occupant load, lights, people, and equipment, plus the solar contribution from the greenhouse, is stored in a below-grade tank and, through a heat exchanger, is used to carry the building at night, through weekends, and at the beginning of the day before the occupant load is sufficient.

The greenhouse is used in tandem with the solar air-type collectors mounted on its roof. Air heated in the greenhouse, which reaches about 80 F, is then run through the collectors, increasing operating efficiency.

Four north-oriented blocks, three staggered off the northeast side and one off the northwest side of the building, contain five floors of open office landscape. A mechanical floor runs the length of the central part of the structure. The building's east and west sides are closed except for narrow, vertical strip bays with operable sash.

[*News report continued on page 48*]

The Complete Office. Neocon, new space: 1080

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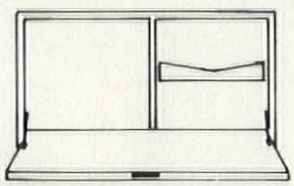
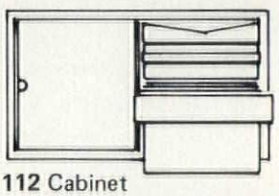
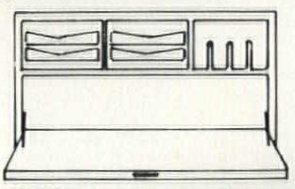
Shown are a few of the many components available to create a CADO wall system.



151 Bar cabinet with flap.

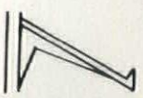


112 Cabinet with filing, tray, shelf.

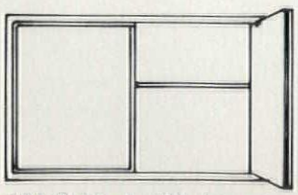


109 Desk with drop front.

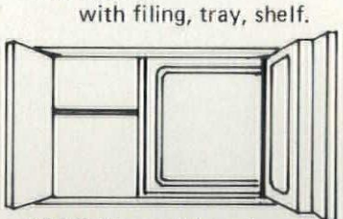
RS-204 Fluorescent light To be used with 30" track.



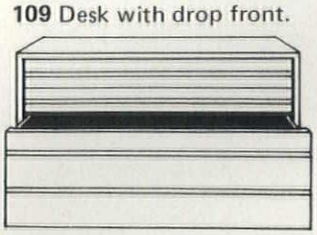
Magazine shelf.



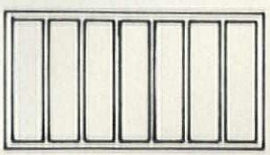
124 Cabinet with doors.



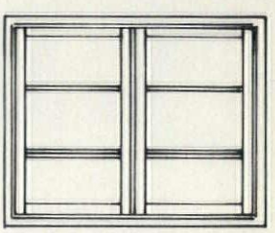
134 Cabinet with optional refrigerator.



110-F Chest of drawers with file drawer for legal or letter size.



150 Record cabinet.



139 Cabinet with wooden framed glass doors.

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Although the state set what was considered a low budget maximum of 55,000 Btu/sq ft/yr, current analyses of the design indicate that it will operate at considerably less—approximately 42,000 Btu/sq ft/yr. If the reality proves to be even better, the project, on which construction is to begin this spring, will go a long way toward demonstrating that design specifically directed to energy conservation can be compatible with the most traditional of environments and still stay within the economic parameters of this most conventional building type. [Sally Woodbridge]

Oakton Community College (Phase One), Morton Grove, Il. *Architects: Perkins & Will (Partner-in-charge, C. William Brubaker), Chicago, Il.* Work began several years ago on the design for this 214,000-sq-ft first phase of the new permanent quarters for this suburban Chicago community college. At that time, the Illinois Capital Development Board (owner of the facility) and the architects saw the project as a prime opportunity to mend the profligate energy ways of the past. Perkins & Will partner C. William Brubaker says, "Over the course of 30 years, the energy costs for running a complex of this size could easily reach $45 million given a conventional design—and that's just accounting for general inflation." The firm's energy consultants have projected that the Oakton campus will operate for about two-thirds of that amount, reflecting a considerable dollar saving over the long term.

The complex is on a 170-acre wooded site along the Des Plaines River and is situated to make use of existing mature trees as windbreaks to the north. Preservation of the natural setting was a major concern in the plan, yet the design team found it possible to profit from good orientation. The project is designed to permit natural ventilation and to take advantage of daylighting.

The cooperation of students, faculty, and maintenance people is essential in making sure that these provisions are used wisely. The scheme is linked by a 30-ft-wide enclosed "student street," which is expected to remain comfortable throughout the year and is designed to aid in reducing the amount of building surface exposed to the elements. The original concept of the student street was to provide commuter students with good, enjoyable social spaces. The energy result is also excellent.

A heat recovery system, drawing heated water from chillers and storing it in underground tanks, is expected to provide major fuel savings. During much of the long Chicago heating season, this system may provide enough warmth to carry the complex through the night. The plans also include structural provisions for future installation of rooftop flat-plate solar collectors, which will boost the system's capacity. Brubaker says that the client knew that the technology for active solar hardware would be changing dramatically over the course of the project's design and construction and did not want to get locked into a particular system too early. If fuel costs escalate further, this decision will prove to be a valuable feature.

Oakton Community College.

The design has unusually well-insulated walls and roofs, made possible in part by a novel brick exterior wall section that contains rigid foam and two dead-air spaces before reaching the gypsum board interior finish (the overall U-factor is .06). The large greenhouse on the project's southern edge is not a gesture to passive solar design. It will be used actively in botany classes and also provides a good, almost fortuitous, energy result. Brubaker views the entire project as offering a textbook approach to energy-efficient design for institutions and claims that both his firm and the Capital Development Board are finding ways to use and refine many of these strategies on other projects. [Thomas Vonier]

Gorman Towers, Housing for the Elderly, Fort Smith, Ar. *Architect: James Lambeth, Fayetteville, Ar.* Lambeth's work—and play—with sunlight and reflective surfaces has continued over the course of a decade, with such results as the entryway to a Colorado vacation home (P/A, May 1972, p. 84) canopied by solar reflecting mirrors aimed at melting snow on the sidewalk.

In this otherwise fairly undistinguished

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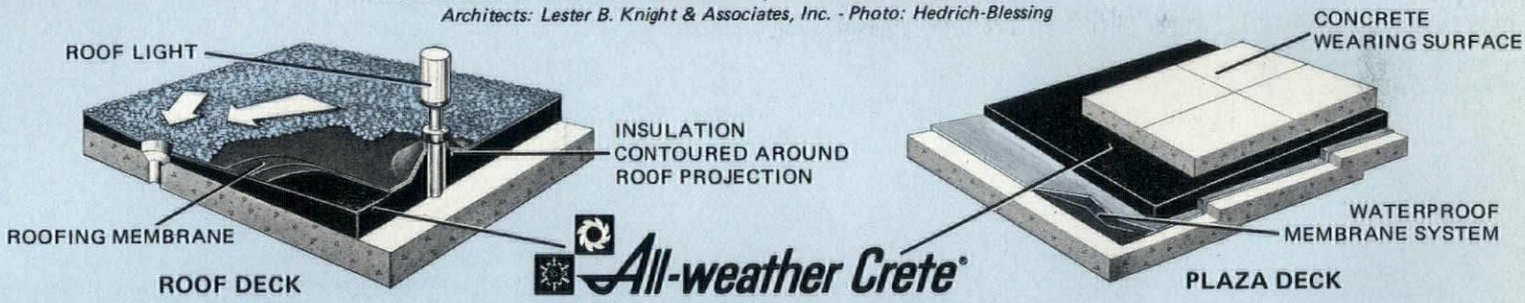
General Services Administration - Social Security Administration Payment Center, Chicago
Architects: Lester B. Knight & Associates, Inc. - Photo: Hedrich-Blessing



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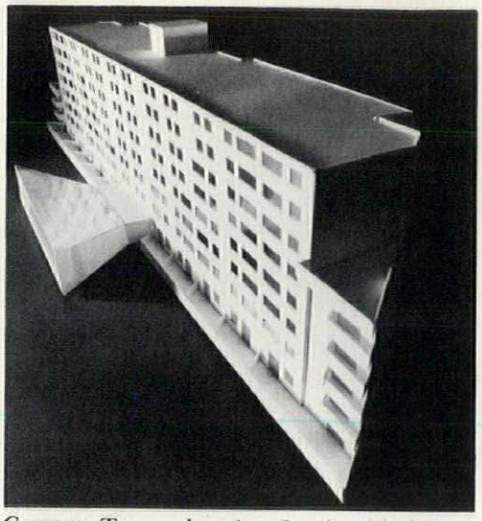
150-unit block, a HUD-funded elderly housing project, the reflective surface will produce a colorful display on the white stucco exterior walls. This design for a passive solar seven-story slab transforms the sun's energy into the visible spectrum by means of a new product, iridescent refraction foil, which has been applied to the metal roof over the south-facing commons room. "The resulting spectrum," says Lambeth, "will range from early morning opalescent purples and lavenders to midday iridescent rainbows of primary colors. The projected colors will also fall on the ceilings of apartments within the reflective zones. Inhabitants—as well as those passing the building—will sense the time of day and season by the colors projected."

The reflections will also boost solar radiation through windows within the reflective zone, which Lambeth reduced in size to maintain thermal balance. The commons room itself contains a liquid-filled prism along its south glass wall. The low winter sun will be refracted into rainbows across the interior walls and floor and will also heat the concrete mass in the room. "The prism—along with a number of other things—is really an excuse to do something else," says Lambeth. "All my work is that way. In this case, I wanted color rainbows in the room." Although the mineral-water medium in the prism will act as additional thermal storage, its contribution will be slight.

In Arkansas, summer temperatures regularly hover near the 100 F mark. What has been done about cooling? All windows are operable and the shell is extremely well insulated. From a cost point of view, sun screens or overhangs were impossible.

HUD imposed other constraints, according to the architect. It was difficult to get agreement on placement of units at the grade level, and an earlier scheme with a north-facing single-loaded corridor was rejected. The department even resisted the installation of windows that could be opened.



Gorman Towers housing for the elderly.

In the final design, first-level living areas have been placed to the south of the double-loaded corridor designed on an east-west axis. All service areas and project and recreational rooms are positioned to the north. On upper levels, residential units are on both sides of the corridor, with common balconies facing south on each level. Large roof terraces are at each end of the corridor on level three. The direct-gain solar energy is to be stored in the mass of the concrete superstructure and in its 8-in. reinforced floor slabs. Lambeth believes the building will use 58 percent less energy than similar projects of standard construction, based on his analysis of similar projects. The plans have been bid, but HUD has not yet set a date for groundbreaking. And, Lambeth says, it is still possible that the design will change again. [Thomas Vonier]

San Francisco Environmental Center, San Francisco. *Architects: Storek & Storek, San Francisco.* This two-phase project is being constructed by a design/build firm that has made a specialty of combining historic preservation with energy conservation. The project's first phase, now completed, involved the conversion of a 1916 electric power and steam-generating plant in the city's financial district into office and retail space.

After acquiring the building in 1974, Storek & Storek added three new floors from existing open space, thereby creating about 50,000 sq ft on seven levels. New electrical, plumbing, and mechanical systems, elevators, and interior finishes completed the renovation.

With its thick insulating walls, long north-south configuration, and limited fenestration, the massive structure had considerable potential for energy-conserving design. Passive measures, such as insulating the roof areas with landscaped decking, providing each climate zone in the building with its own heating and ventilating system, making maximum use of fresh air for cooling and providing individually switched lighting fixtures insured immediate payback.

Phase II of the project is a new, ten-story, 60,000-sq-ft office and retail building adjacent to the former power plant. The new building has been designed to make both passive and active use of solar energy with a solar collector array integrated with the

[*News report continued on page 52*]

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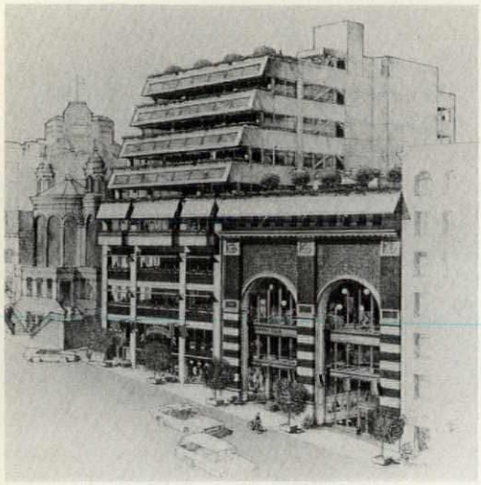
News report continued from page 50



San Francisco Environmental Center.

building envelope and the hydronic heating system. Maximum use of direct solar illumination will be made by controlled reflecting surfaces at the windows and through sun-tracking heliostats. Natural ventilation will provide most of the required cooling; remaining mechanical cooling will be done at low-demand hours using cold water storage.

The solar system is tied to the building's hydronic heating system by a standard differential controller that senses the difference between the return water temperatures of the solar storage tank and the heating system's circulation loop, powered by a natural gas boiler.

Photoelectric dimming of perimeter lighting when natural light can provide the required illumination reduces energy for lighting and cooling. [Sally Woodbridge]

Interbuild—38th International Building and Construction Exhibition Birmingham, England December 2–8, 1979

As one of the largest of the international building materials exhibitions (almost a million square feet), Britain's "Interbuild 79" this past December in Birmingham should have been just what the flyer advertised: "the place to learn about new products, new sources of materials and new ideas for cost-saving and better building." It should also have been a good place to get to know unfamiliar products and materials which might be specified or proposed for use in international work and to contact companies who might continue to provide technical information in the future. And, with Interbuild following the biennial French "Batimat" exposition by little more than a week, relocation of some of the foreign booths directly from Paris to the Midlands of this Common Market member should have emphasized still more the international character of the show.

What was most surprising to an American visitor, however, was the heavy orientation of exhibits to the British market, with the overseas potential for these building materials either taken for granted or assigned secondary importance. Thus Interbuild seemed "international" mostly because many of its exhibitors were from other countries, having come to the show in order to reach British architects and builders, rather than aiming directly at construction work in the international arena. The exceptions stood out strongly.

Although the exhibition was publicized in the United States, there was some surprise at the appearance of an American visitor, but there was considerably more interest when Middle East construction was mentioned, wherever its architects might be from. The range of products chosen for display, however, as well as most of the 15 seminars presented during the week, reflected the primary interest in the British construction scene, a large part of which appeared to be domestic in scale. Since about half of the architects in Britain work for some level of government, and a major activity of these governmental agencies is construction of housing, the exhibitors were probably being quite realistic.

Interbuild did, however, offer opportunities to investigate the British Standards system, as familiar to overseas specifiers as ASTM is at home, and to delve into the uniquely British use of quantity surveying at the display manned by the Royal Institute of Chartered Surveyors. An unexpectedly interesting exhibitor was the British Agrément Board which has begun to serve as an independent testing and certifying agency for a variety of building products in the United Kingdom.

Also worthwhile were glimpses of the new Barbour's Middle East Compendium (a modest collection of manufacturers' catalogs geared to that geographical area) and the new "Contel" system of on-line construction data retrieval and communication just now becoming available in Britain.

And, of course, there were those four interconnected buildings full of construction products. Builders' hardware, wood products, doors, sealants, and windows filled one hall; HVAC equipment, ceramic products, plumbing fixtures, and insulation filled another; a third contained concrete products, masonry, finishes, interiors, roofing, and cladding; and the fourth featured kitchens and kitchen equipment.

To the wanderer in the aisles, Interbuild often seemed like a much larger version of the product exhibition at the annual U.S. Construction Specifications Institute convention, but with a little less organizational hoopla, fewer prize drawings, and not so many buttons and giveaways.

Perhaps the most delightful part of the whole exhibition took place in Hall 5 where apprentices from each of eleven trades formed teams to compete in executing testlike designs. The sight of real construction activity in this one hall with people using and demonstrating skills with common building materials effectively clarified the often-obscured connection between the advertising, salesmanship, and glamour of the other halls' exhibits and the world of reality

[*News report continued on page 56*]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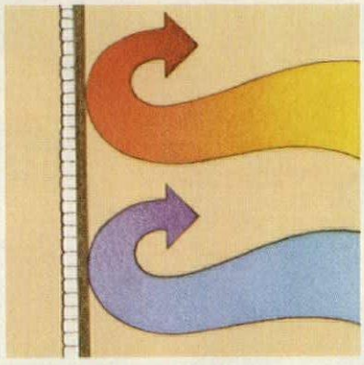

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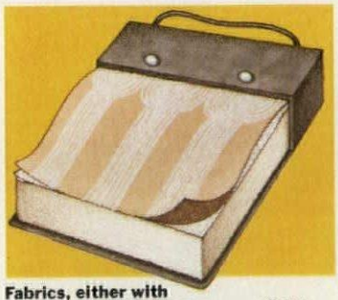

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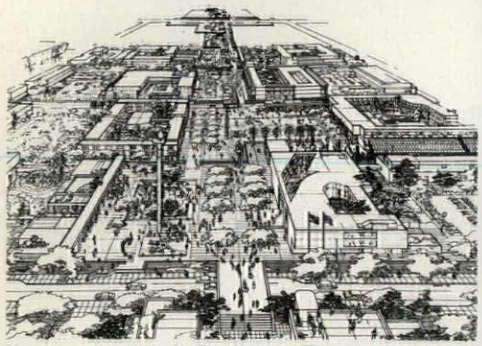
outside, a clarification both needed and appreciated.

The next Interbuild is scheduled for November 1981. [Walter Rosenfeld]



Proposed capital, Dodoma, Tanzania.

New capital for Tanzania will mix government and life

The National Capital Center planned for Dodoma, Tanzania, is notable for its restrained scale, mixed use, pedestrian circulation, and ability to function without mechanical cooling. Designed by Conklin & Rossant, Architects and Planners, of New York, the new center is part of a plan to transform this city of 70,000 into a national capital with an eventual population of 500,000.

Located on uplands 350 miles inland from the present coastal capital of Dar es Salaam, Dodoma has a temperate climate that will make natural ventilation adequate, given the building bulk controls imposed under the Conklin & Rossant plan. A close-grained mix of functions will encourage pedestrian circulation at all stages of development. Six ministries, a 200-room hotel, 400 units of housing, plus shops, restaurants, and theaters will be included in the first phase, scheduled for 1985 completion.

This initial construction will take place on four terraces, one story apart in elevation, each measuring 100m x 500m. Alternating vehicular and pedestrian streets are located at the base of each step. A central pedestrian spine, spanning cross streets, will lead from a public square on the lowest terrace toward a ceremonial plaza higher up the slope. Two more terraces on the upper slope will be developed later, and all levels can be expanded laterally.

Plan guidelines limit all construction to 13m (4 stories) in height and require certain through-block passages and courtyards. The inevitable surface parking lots will be inconspicuous but convenient to pedestrian routes. Uniform porticos lining pedestrian spaces will unify small-scaled, phased commercial and public facilities. The result should be a comfortable urban environment at all stages of development.

Appointed by the United Nations, Conklin & Rossant have designed this center as part of an overall capital development plan by Project Planning Associates of Toronto. [JMD]

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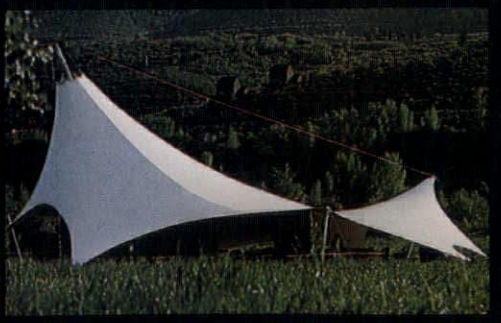

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Louis Sullivan, 1899.

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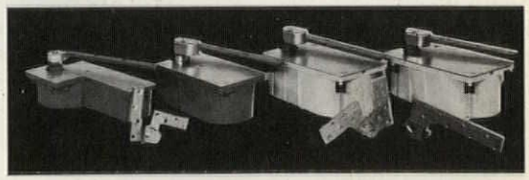

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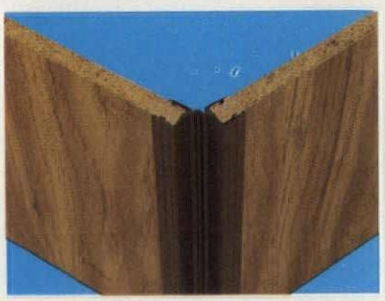

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TEXAS
Amarillo: Southern Furniture Co.
Dallas: Stewart Office Supply Co.
Houston: Suniland Office Furniture

UTAH
Salt Lake City: Salt Lake Desk

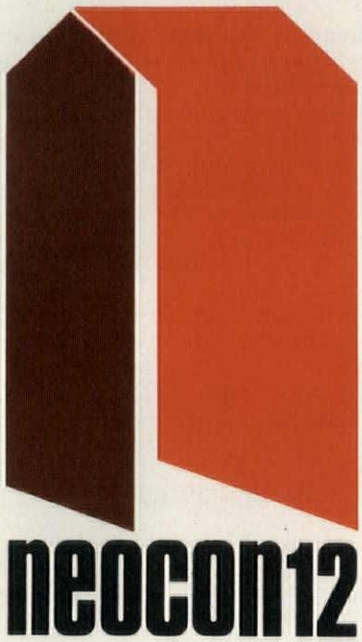
VIRGINIA
Lynchburg: Litton Office Products Centers
Norfolk: Litton Office Products Centers
Richmond: Litton Office Products Centers
Roanoke: Litton Office Products Centers

WISCONSIN
Milwaukee: Forrer Business Interiors, Inc.

CANADA

ALBERTA
Calgary: Contemporary Office Interiors, Inc.
RGO Office Furnishings, Ltd.
Edmonton: Donn Larsen Office Interiors, Ltd.

Neocon 12



NEOCON has grown so large and spawned so many other contract interiors markets that it is almost hard to remember that it is only in its twelfth year. The dates to be at Chicago's Merchandise Mart for the unveiling of product after product from more than 200 exhibitors is June 11 through June 13. NEOCON International will be held concurrently across the river on the second floor of the Apparel Center. More than a dozen countries are expected to be represented including Italy, Sweden, Denmark, West Germany, Austria, Canada, Brazil, and Belgium, among others.

For the first time ever, the Mart will offer, in addition to its seminar programs, a special series of eight workshops. Reservations will be taken in advance and participation limited to 150 people each. Workshops will concentrate on nuts-and-bolts topics such as specifying, marketing, and project management. In addition, NEOCON's traditional seminar program will offer discussions about energy and urban planning, the office of the future, computers as design aids, the productivity crisis, and an economic view of the 1980s.

Edward Cornish, founder and president of the World Future Society and editor of its journal "The Futurist," will give the keynote address on Wednesday, June 11. The Society, founded in 1966, has a membership of 25,000. Cornish's topic will be: "The Future—A Trilogy: The Optimistic, The Pessimistic, The Practical." Other speakers include visionary architect Paolo Soleri and 1980 AIA president Charles Schwing.

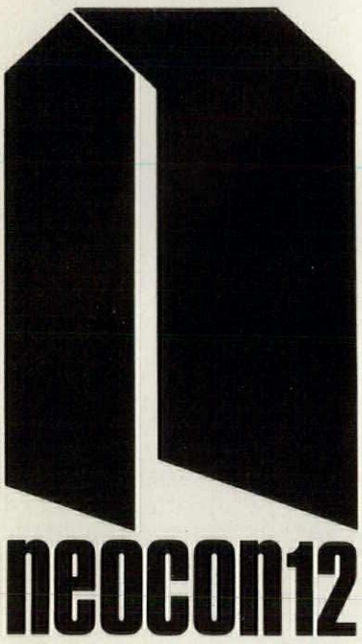
To ensure visitors as few conflicts as possible, seminars will be scheduled from 8:30 a.m. to 10:30 p.m. and from 4:30 p.m. to 6:00 p.m. Workshops will be scheduled for one hour apiece at 10:30 a.m. and 2:30 p.m. No more than two seminars or workshops will be scheduled concurrently.

A full-fledged student program is also being offered in conjunction with NEOCON 12 that will include free participation in the program and economy hotel accommodations. There will be special group discussions with professionals and prospective employers, expert assistance in resumé writing and placement, exclusive architectural tours, and a headquarters for leaving messages. One of the special seminars will be ASID's STEP program, designed to help young practitioners determine whether their skills meet the standard required to pass the National Council for Interior Design Qualification examination. The presenters of the program will be Wally Jonason, 1980 ASID president; John Allin, chairman, ASID pre-professional development committee, and Professor Ronald Raetzman, chairman, design department, North Dakota State University.

Also new this year is NEOCON's logo, designed by members of the Institute of Business Designers as an abstraction of the letter "N."

On a more practical note, NEOCON has organized "VIP NEOCON Travel Paks," including airfare, hotel accommodations, airport/hotel transportation from most major cities, and hotel/Mart shuttle service. Write NEOCON, The Merchandise Mart, Chicago, Il 60654 for further information. For more information on the student program, contact Mary Nettleton, student program coordinator, Suite 830, The Merchandise Mart, Chicago, Il 60654 (312) 527-4141.

Seminars and workshops



THE MERCHANDISE MART/CHICAGO JUNE 11-13, 1980

Session 1: Keynote address
Wednesday, June 11 8:30–10:30 a.m.

The future—a trilogy: The optimistic, the pessimistic, the practical
The founder of the World Future Society will take a close look at mankind's role in determining this future, through better decision-making and management today.
Speaker: Edward Cornish, president, World Future Society, Washington, DC; Editor, *The Futurist.*

Session 2
Wednesday, June 11 4:30–6:00 p.m.

The profession and practice of architecture: What directions?
Leaders of the architectural profession present a global overview of the many issues influencing the practice of architecture today and in the future. Of particular interest to all architects is the expansion of the profession into new spheres of activity, making the architect more accountable to society. The speakers discuss the place of the architect and his work within the community, examining such controlling factors as conservation, energy use, and geographical concerns.
Speakers: Charles E. Schwing, FAIA, Baton Rouge, La, President, American Institute of Architects.
David Hambleton, British Columbia, Canada, Royal Architecture Institute of Canada, Wagg & Hambleton.
Hector H. Mestre, FAIA, Mexico City.

Session 3
Wednesday, June 11 4:30–6:00 p.m.

Tomorrow's office: The man, the machine, the furnishings system
A look at the office of the future with special emphasis on the interrelation between man, business equipment technology, and the furnishings, with design linking the three.
Speakers: Sam Genua, Washington, DC, Special Programs Coordinator, Office of the Secretary, United States Department of Transportation.
Marisa Belissario, Tarrytown, NY, President, Olivetti Corporation of America.
Burt Richmond, Denver, Co, Chairman of the Board, RMM, Inc.

Session 4
Thursday, June 12 8:30–10:30 a.m.

Energy and its impact on urban planning: Alternatives to today's cities in structure and energy use
An internationally renowned architect, city planner, and philosopher will detail the realistic new approaches of the future to city design and energy use. He will outline his research and actual work of two decades on an alternative approach to human habitation, the city Arcosanti.
Speaker: Paolo Soleri, Scottsdale, Az, President, Consanti Foundation.

Session 5
Thursday, June 12 8:30–10:30 a.m.

Design through the next millennium: The integration of the art into planning the total development
Three top spokespeople for the profession of commercial design in America take a look at growing interaction between design and the other facets of the modern development.
Speakers: Jo Heinz, Topeka, Ks, National President, Institute of Business Designers.
Wallace Jonason, San Francisco, Ca, President, American Society of Interior Designers.
Lee Hall, Providence, RI, President, Rhode Island School of Design.

Session 6
Thursday, June 12 4:30–6:00 p.m.

The use of the computer in space-design management
The gradual influx of computers as tools and aids into the professions of commercial design, architecture, and facility management is an indication of what the future will bring. The speakers take a close look at the vital use of computers in office development processes including planning, design, budgeting, construction, and actual building management. Of special concern to those operating their own design and architectural firms are recent and expected developments in computer costs, making the systems more affordable.
Speakers: Robert L. Engel, New York, NY, Vice President Environmental Research and Development, Inc.
Mort Glatstein, New York, NY, President, Interior Facilities Associates, Inc.

Session 7
Thursday June 12 4:30–6:00 p.m.

The productivity crisis: Measurably increasing output through better environmental planning
The necessity of progressive office design to increased productivity is a vital topic today. This seminar looks at the influence of the environment on productivity and its concomitant effects on inflation and general profitability.
Speakers: Michael Brill, Buffalo, NY,

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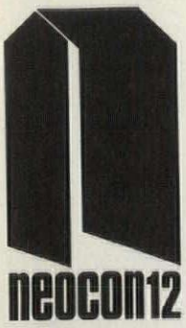

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Professor of Architecture, State University of New York/Buffalo.
Allan Reynolds, Chicago, Il, Vice President, First National Bank of Chicago.
Pamela Clayton, Buffalo, NY, Vice President, BOSTI.

Session 8
Friday, June 13 8:30–10:30 a.m.

Behavior patterns and the modern worker: Productivity in terms of man's environmental activity
The panel delves into the complex theoretical relationship between the worker and his office environment. The integration of job responsibilities, psychological needs, and business effectiveness is the heart of any company's future record of success.
Speakers: Aristide Henri Esser, Orangeburg, NY, Association for the Study of Man-Environment Relations.
Gerald Davis, Ottawa, Canada, President, The Environmental Analysis Group.

Session 9
Friday, June 13 8:30–10:30 a.m.

The client speaks
Commercial developments and building projects today have become true team efforts, and, increasingly, the client is the ultimate decision-maker in questions of architecture and interior design, facility planning, and management. The panel examines the necessity of the client's early involvement in the project and focuses on the benefits of an in-house planning department and other issues.
Speakers: Ralph L. Stadler, Chicago, Il, Dir. of Facilities Engineering, United Airlines.
Allan G. Lunsford, Colorado Springs, Co, Vice President, The Navigators.

Session 10
Friday, June 13 4:30–6:00 p.m.

Energy—Fossil and nuclear: The supply, cost, and risk factors
Industry presents its case for the effective utilization of existing energy. Environmental considerations which affect our total society will be discussed.
Speakers: George Travers, Executive Assistant to the Chairman, Commonwealth Edison, Chicago.
Charles Dibona, President, American Petroleum Institute, Washington, DC (pending).

Workshop 1
Wednesday, June 11 2:30 p.m.

Issues in hotel design and use: What does the future hold?
Chairpersons: Porter Parris, Chairman, American Hotel & Motel Association, Chicago, Il.
Raymond C. Ellis, Jr., Dir., Research & Security, American Hotel & Motel Association, New York.
Joseph McInerney, Sr. Vice President, Sheraton Corp., Boston, Ma.

Workshop 2
Wednesday, June 11 2:30 p.m.

Standard/custom carpet designs: A total inventory of design alternatives to the specifier
The new technology provides a vast array of style, texture, and pattern alternatives. The workshop will present the full product picture.
Chairpersons: Walter Guinan, West Palm Beach, Fl, former president, Karastan Rug Mills. The only man to hold the position of Chairman of the American Carpet Institute and the Carpet and Rug Institute.
Norman Rosenblatt, President, Contract Distributors Corp., New York.

Workshop 3
Thursday, June 12 10:30 a.m.

Planning the university conference center:
Coping with the demand for effective utilization of educational facilities
Chairpersons: C. William Brubaker, FAIA, Chicago, Il, Senior Vice President, Perkins & Will.
Dr. Thomas E. Morgan, Auburn, Al, President, Council of Educational Facilities Planners; Professor, School of Education, Auburn University.

Workshop 4
Thursday, June 12 10:30 a.m.

Avoiding the costly specifying errors
A contract carpet consultant takes a close look at the many steps in carpet specification and how proper technique can avoid later mishaps. She covers space analysis, design considerations, brand names, dye methods, installation options, and the written specification itself.
Chairpersons: Dianne Jemmott, Los Angeles, Ca, Contract Carpet Consultant, Badische Corporation.
Walter Guinan, North Palm Beach, Fl, former president, Karastan Rug Mills.

Workshop 5
Thursday, June 12 2:30 p.m.

Tracking the process of a restaurant design project: A case study
A step-by-step development of a restaurant project from inception through completion.
Chairpersons: Lynn Davis, ASID, Chicago, Il, International Design.
John Moran, AIA, Oak Park, Il, J.G. Moran Associates.

Workshop 6
Thursday, June 12 2:30 p.m.

Hospital design and construction issues for the 1980s: Planning space for effective recuperation
The design and construction of hospitals is a fast-growing field in the 1980s. The panel and audience discuss the quality of hospital design, the cost of health facility construction, the need for modernization and physical plant evaluation, and other topics relevant to providing the client with better service.
Chairpersons: Joseph G. Sprague, Senior Staff Specialist, Health Delivery Systems, American Hospital Association, Chicago, Il.
Daniel S. Schechter, Editor/Publisher, Hospitals Magazine, Chicago, Il.

Workshop 7
Friday, June 13 10:30 a.m.

Who's listening to whom: Designer-client communications
A unique workshop that illustrates the many complicated aspects of a presentation to a client. A mime performance will be presented to elaborate on several of the issues raised. Securing the project is the most crucial event in a designer's life, and this workshop offers some helpful approaches to this situation.
Chairpersons: Christina A. Johnson, IBD, principal, Business Design Associates, Bellevue, Wa.
Patty Lou Younts, IBD, Interior Designer, IN-EX Designs, Lexington, NC.
Gloria Bailey, IBD, The Liston Co., Columbus, Oh.
Martha Scudder, IBD, Interior Design, Whisler-Patri Architects, San Francisco.

Workshop 8
Friday, June 13 10:30 a.m.

Taking advantage of the opportunities for business growth in the design field
An outlook into the new opportunities in marketing design services.
Chairperson: H. Davis Mayfield III, AIA, Director of Business Development, S.I. Morris Associates, Houston, Tx.

«sofdesk»

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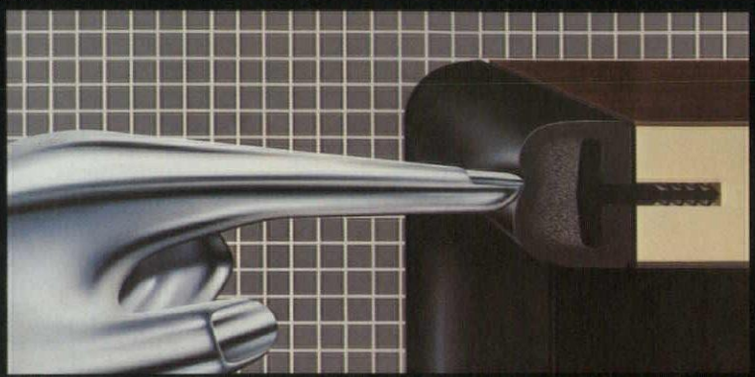

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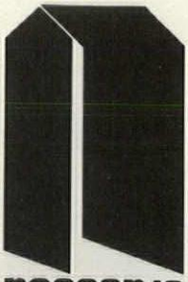

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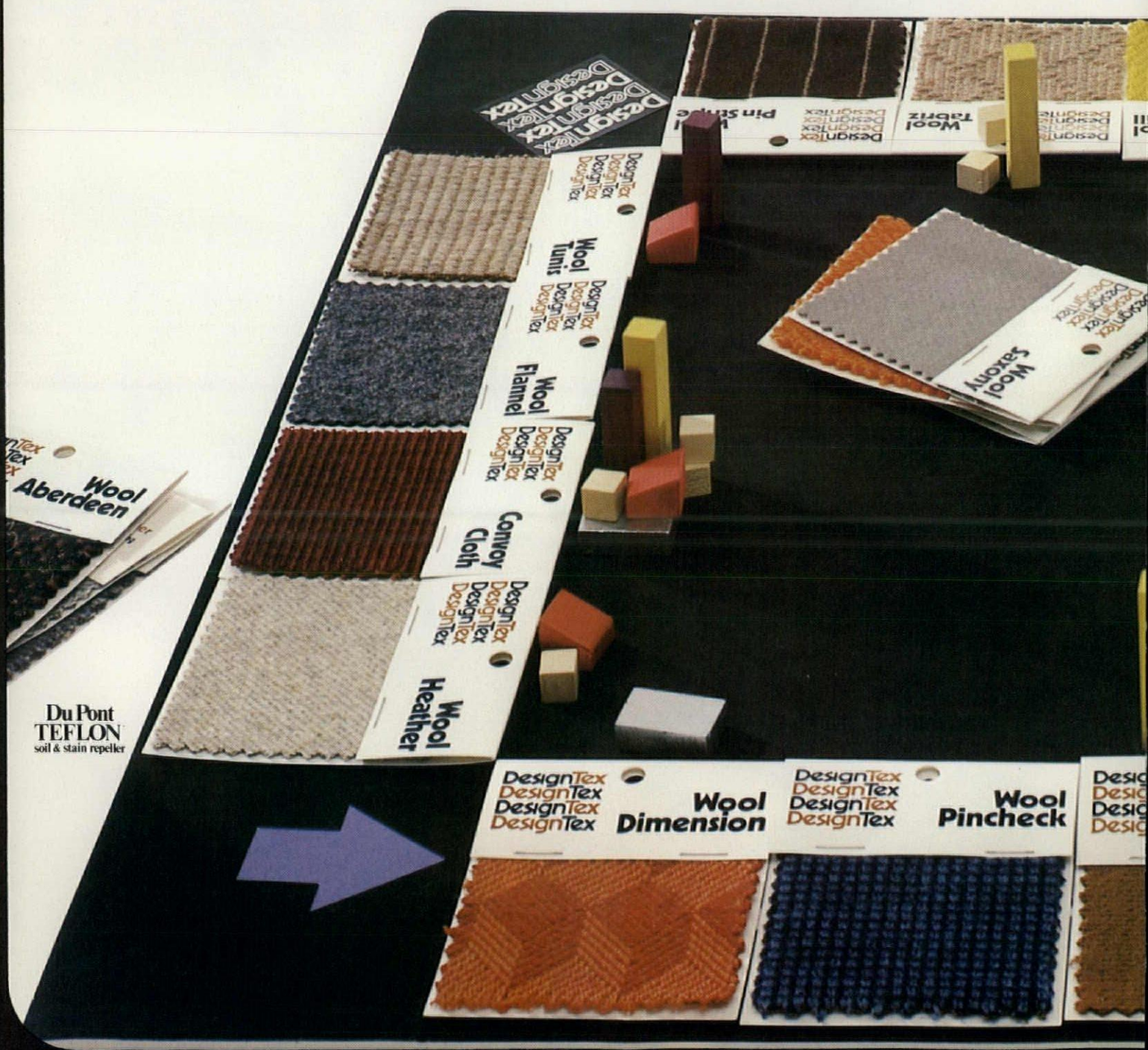

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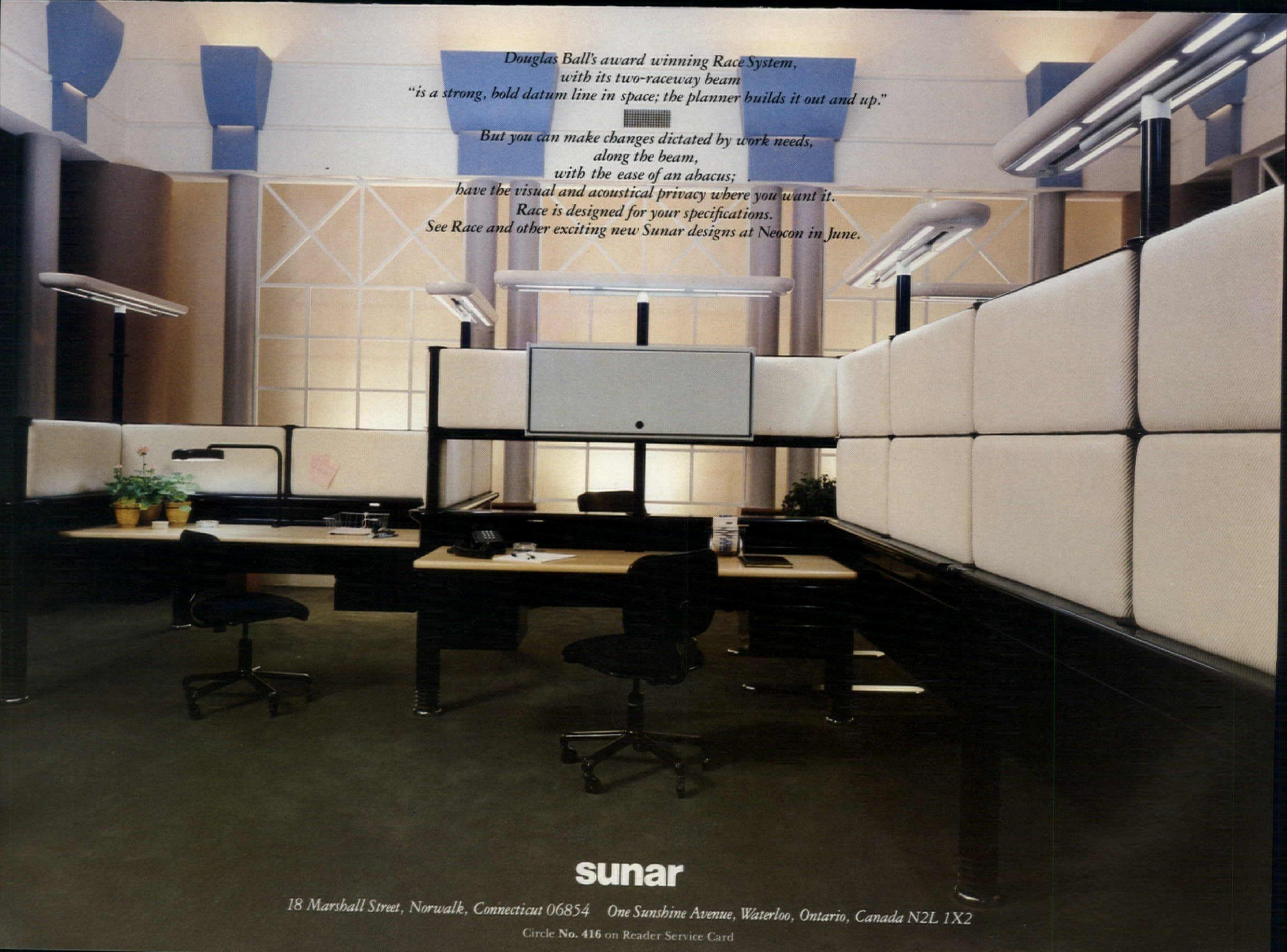

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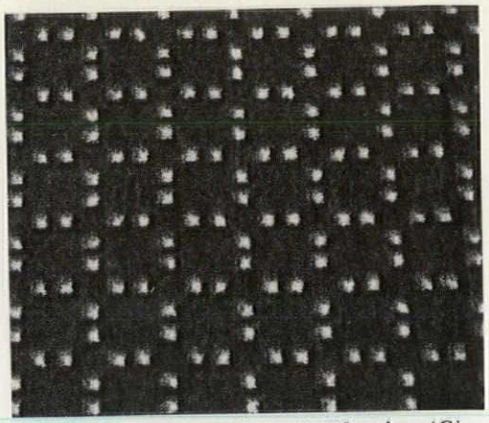
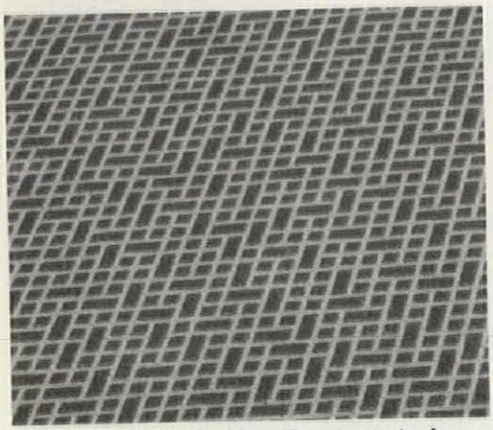


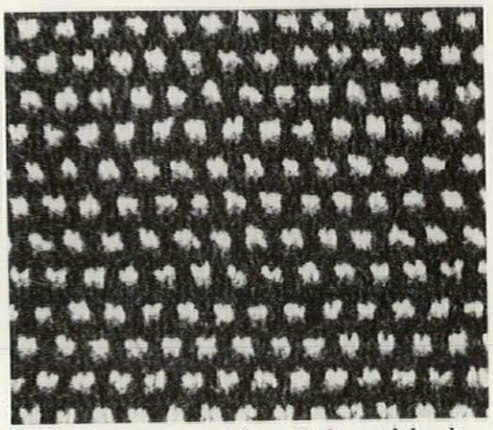
Allied Chemical Fibers & Plastics: *'Circle Square' nylon cut pile carpet.*
Circle 100 on reader service card

Arconas: *Primavera seating by André Vandenbeuck.*
Circle 101 on reader service card

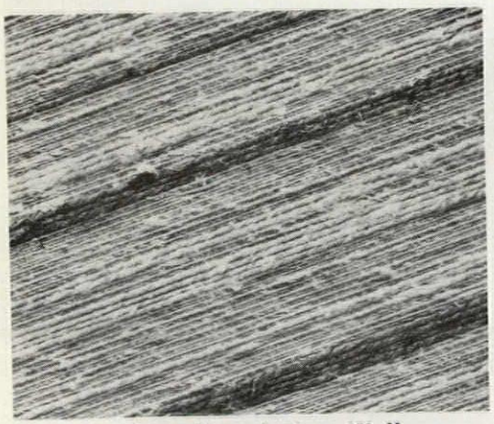


Armstrong Cork: *New Era sheet vinyl flooring.*
Circle 102 on reader service card

Atelier International: *Leonardo Collection of contract chairs.*
Circle 103 on reader service card



Badische Corporation: *Zeflon subdued luster nylon yarns.*
Circle 104 on reader service card

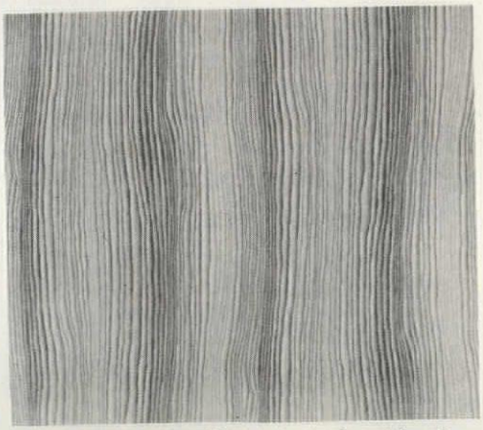


Belgian Linen Association: *Wallcoverings of linen-blend yarns.*
Circle 105 on reader service card

Beylerian Limited: *'Strips Sheep' seating.*
Circle 106 on reader service card

Brayton International: *LOGOS chair, high or low back.*
Circle 107 on reader service card

Brickel Associates: *Shellback Swivel pedestal-base chair.*
Circle 108 on reader service card



Brunschwig & Fils: *Teawood woodgrain fabric and wallpaper.*
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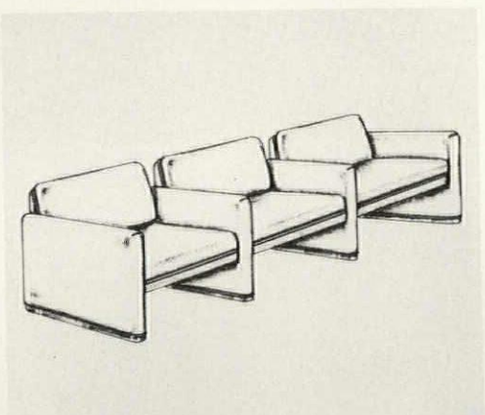

Carolina Seating: *Triple modular seating unit by Marcel L. Beck.*
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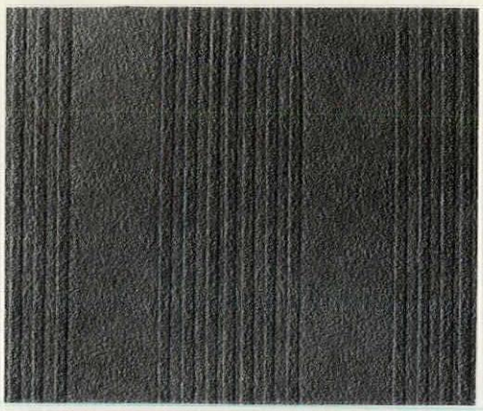
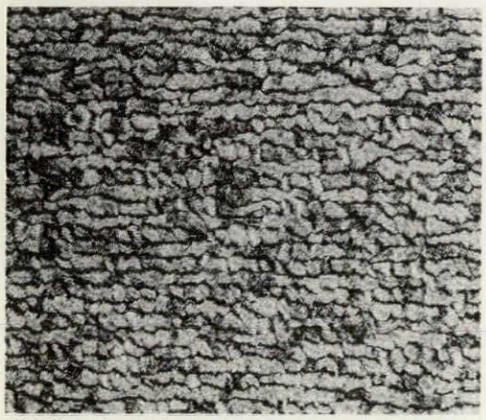


L.E. Carpenter: *Lugano Vicrtex vinyl wallcovering collection.*
Circle 111 on reader service card

Castelli Furniture: *Axis 5000 multiple seating designed by Kramer & Scott.*
Circle 112 on reader service card



Collins & Aikman: *Kensington textured loop contract carpet.*
Circle 113 on reader service card

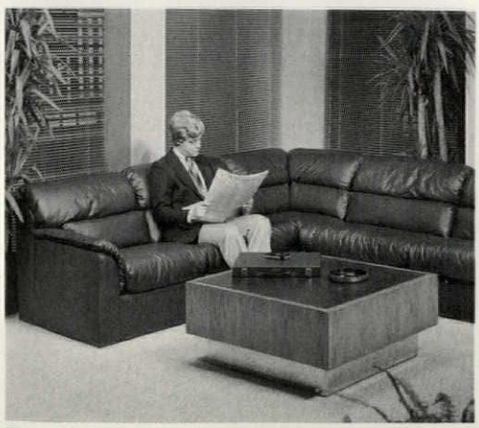
Conwed: *Office screens and coordinated furnishings.*
Circle 114 on reader service card

Coral of Chicago: *Wishbone Verel casement fabric.*
Circle 115 on reader service card

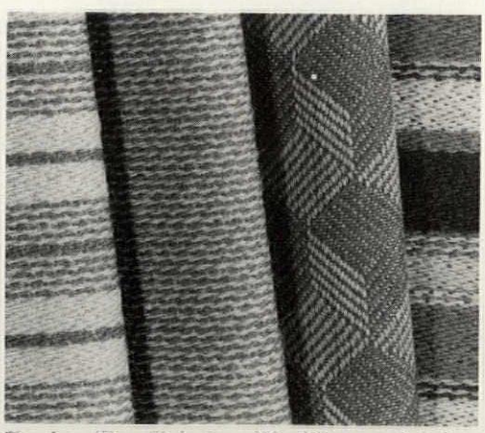
Corry Jamestown: *D-6000 Cube series right pedestal desk.*
Circle 116 on reader service card

Couristan: *Burbatron cut and loop nylon carpeting.*
Circle 117 on reader service card

Cramer Industries: *Special purpose chairs 9427, 9428.*
Circle 118 on reader service card



Davis Furniture Industries: *Mobby collection seating.*
Circle 119 on reader service card



Design Tex Fabrics: *Wool Systems fabrics by Hazel Siegel.*
Circle 120 on reader service card

Krueger plus Wilkhahn Program 400 equals new harmony in wood

Krueger has launched a new venture in conjunction with Wilkhahn of West Germany. You can now purchase Wilkhahn's classic Program 400 furniture in the United States or Canada and have it shipped from Krueger's Green Bay manufacturing facilities.

Program 400 is a landmark design. Honored with awards here and abroad, Program 400 was first introduced over a decade ago by Wilkhahn and has since been widely imitated. Its technical achievement of laminating plies of hardwood into multi-directional frame configurations provides a distinctive delicate linear appearance. Though lightly scaled, Program 400 frames are stronger than solid wood.

Program 400 is available in side and arm chairs as well as tables. Contact Krueger or showrooms for more information.

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Introducing ConCentrx™

Synchronized Articulation.

Only ConCentrx offers this new body support concept. A unique pivotal design allows the chair to follow natural body movements in leaning forward or back. Feet stay firmly on the floor throughout the full tilt range. Result – less fatigue, blood flow is not interrupted. Since the seat pan drops as the user leans back, knees aren't pinched under the worksurface and line-of-sight is not changed.

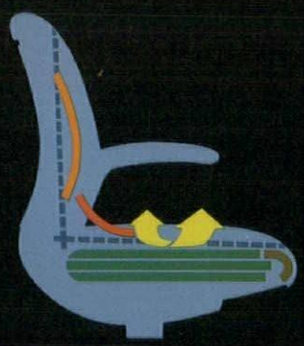
Touch-Adjust Control Panel.

(A) Back attitude control. This button locks the chair in an upright position, or puts ConCentrx in the full-tilt mode. (B) Pneumatic height control. Available as an optional adjustment to automatically adjust seat height. (C) Seat attitude control. No other chair offers this feature. The seat front is adjustable from five degrees to eight degrees, or any position in between.

(D) Personal comfort control. This small knob permits tension adjustment to exactly suit individual body weight and height.

Human Factors benefits – six features to help people work better.

These benefits begin with the size of the chair itself. ConCentrx has been precisely scaled so that its narrower back gives people elbow room on the job. And a smaller size = less space.



- Tri-density foam. Three densities, precisely distributed. Relieves pressure on sitting bones and insures correct body support at every contact point.
- Properly contoured back support. Distributes upper body weight better.
- Precise seat-to-back angle with posture correct lumbar curve. Result: better support.
- Waterfall front. Relieves thigh pressure.
- "Comfort Pocket" Computer-designed side-to-side radius encourages proper seating while allowing for free movement.
- Side-to-side contour. Distributes body weight, prevents discomfort which occurs when hips come in contact with cushioning.

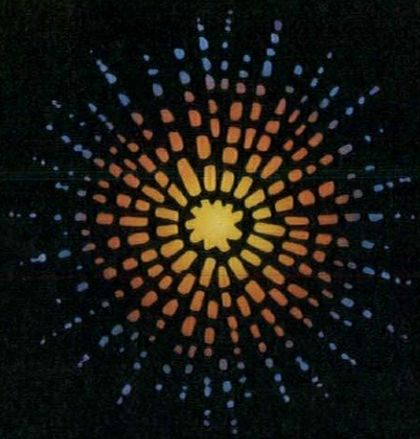
Sixteen styles.

ConCentrx is available in a choice of manager's or operator's model in sixteen styles, six shell colors, six monochromatic color combinations. You can choose from three arm options in the manager's model, cantilever arm or armless in operator's model, and more than 250 fabrics, including the new Steelcase Counterpoint Collection.

Fits 5th to 95th percentile.

People come in all sizes. And ConCentrx is designed to fit nearly all of them.

ConCentrx fits different jobs as well as different people. The importance of this is underscored by the new Lou Harris Poll findings – "86% of office workers use a chair that's like that of other workers... *even those who do different work.*"



The "workstation" of the 70's is obsolete...along with shorthand, carbon copies, and the fountain pen.

In its place are Control Centers...the new work areas of the 80's...systems furniture-oriented with consoles to accommodate CRT terminals, interactive printers, digital plotters, and related equipment so vital in today's computerized offices.

And the seating for the Control Center operator is even more vital...requiring more than average support and comfort; greater freedom of movement and more and easier comfort/function adjustments.

For a close look at this new seating concept, visit your Steelcase Regional Office, or see your Steelcase representative.

Control Center seating for today's computerized office.

Steelcase

For worldwide product, service and sales information, write P.O. Box 1967, Grand Rapids, MI 49501. Call toll-free 800-447-4700. In Illinois, 800-322-4400.

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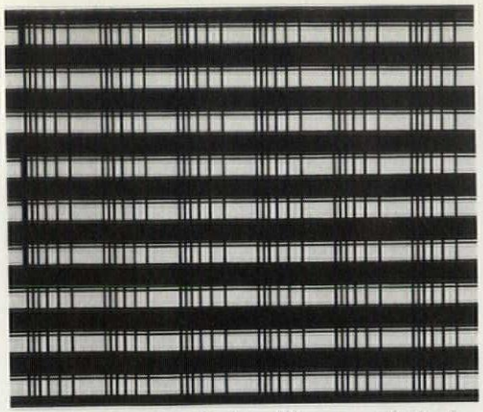
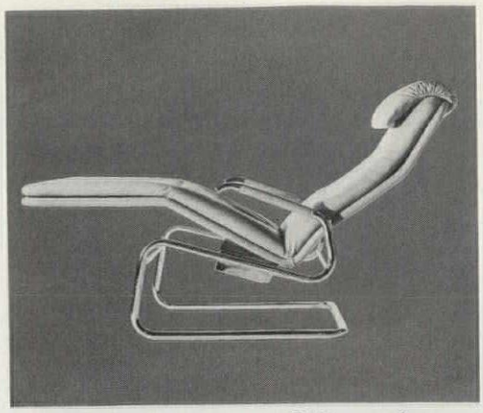
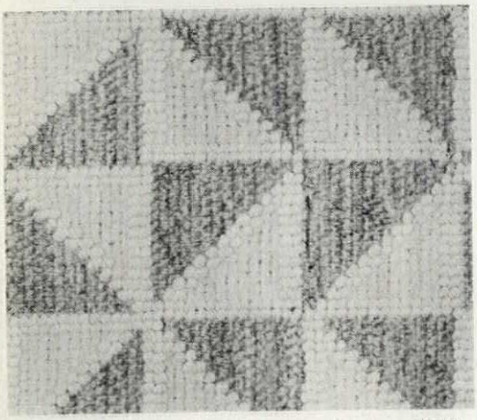


Durawall: *Silvie Stripe silk-screened vinyl.*
Circle 121 on reader service card

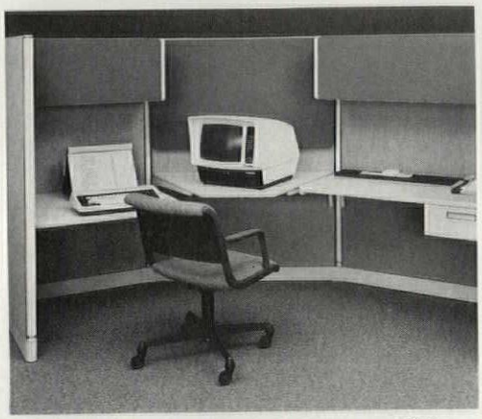


Dux Interiors: *Cicero reclining motion multi-position chair.*
Circle 122 on reader service card



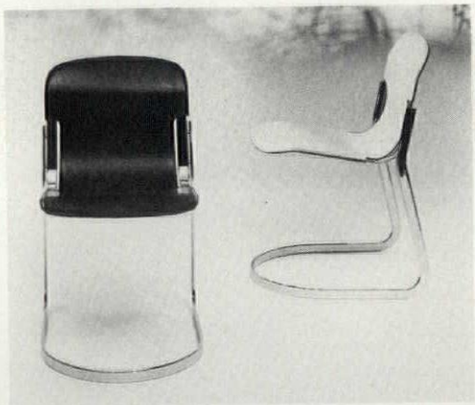
Eurotex: *Nador 6600 textured woven Wilton carpet.*
Circle 123 on reader service card

Falcon Products: *Hannah/Grasso welded wire seating.*
Circle 124 on reader service card



GF Business Equipment: *Trapezoidal work surface, GF 570 chair.*
Circle 125 on reader service card

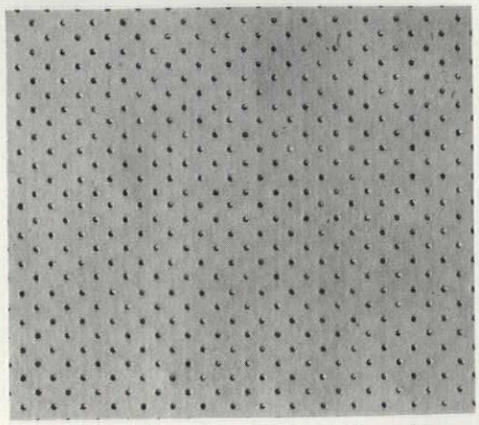
Galaxy Carpet Mills: *Carpet using Vividye dyeing process.*
Circle 126 on reader service card



Gia Internationale Designs: *Linea chair designed by Nava-Citterio.*
Circle 127 on reader service card

Gold Medal: *901 Mojave chair and 915 Mojave table.*
Circle 128 on reader service card

Gregson Furniture Industries: *3353-HB-AB executive swivel chair.*
Circle 129 on reader service card



Groundworks: *'Gomma' suedelike rubber fabric with nylon backing.*
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Gunlocke: *Techtonic seating designed by Jonathan Ginat.*
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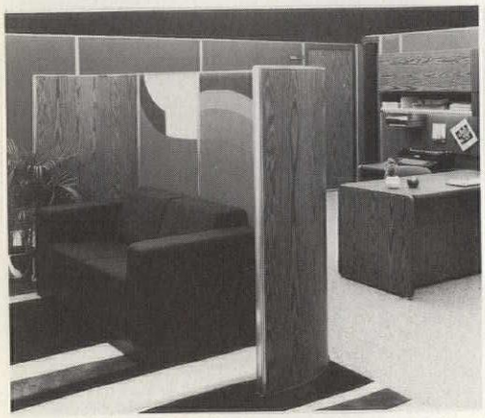
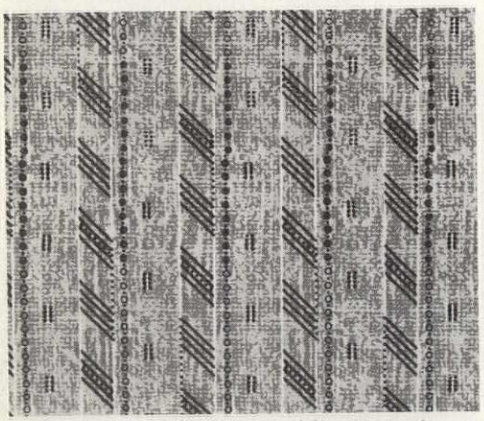
Harter: *Mark I Oak Chair Series designed by Louis E. Mark.*
Circle 132 on reader service card



Haworth: *Panel-mounted graphics for TriCircuit ERA-1 panels.*
Circle 133 on reader service card

Helikon Furniture: *UDL540-543 lounge seating series.*
Circle 134 on reader service card

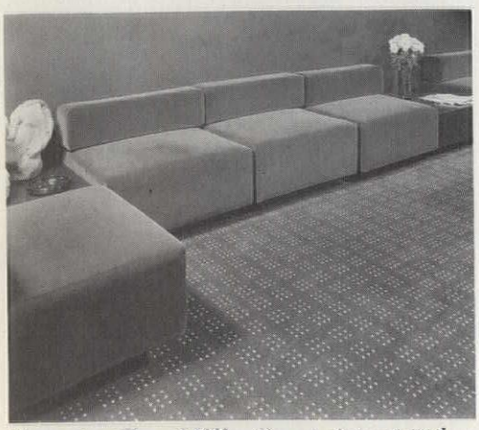
Hollytex Carpet Mills: *Abaris loop/ribbed nylon carpet.*
Circle 135 on reader service card



House of Verde: *'Dot and Dash' vinyl-backed wallcovering.*
Circle 136 on reader service card

Howe Furniture: *Mobile Pedestals group of office furniture.*
Circle 137 on reader service card

International Contract Furnishings: *Glacé kitchen by Luigi Massoni.*
Circle 138 on reader service card



Karastan Rug Mills: *Karapoint cut and loop nylon broadloom.*
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Kittinger: *The Georgian Collection of office furniture.*
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Obviously, evolution rewards patience. It also exacts a penalty: as of now, every chair in your office is obsolete. The remedy we propose is simple. Make your office more productive through a process of natural selection. It is as easy as taking the next step.

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Knoll International: *Zapf Open Office Systems additions.*
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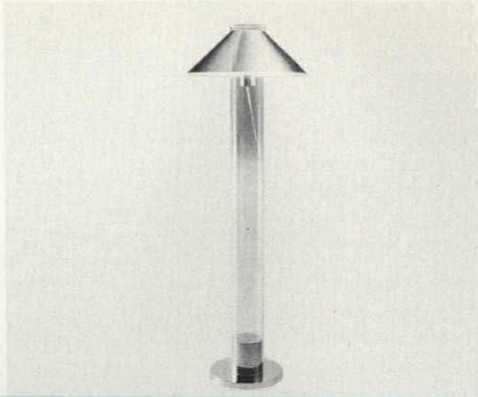
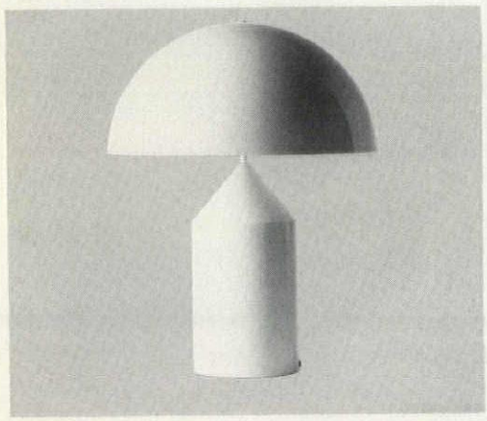


Koch & Lowy: *The Glasslight Collection by Peter Hamburger.*
Circle 200 on reader service card

Kodak: *Photo Decor: Photography as a design tool.*
Circle 201 on reader service card

La-Z-Boy Contract: *C92061 swivel-tilt office seating chair.*
Circle 202 on reader service card

Lehigh-Leopold: *The Personal Chair 9-model seating system.*
Circle 203 on reader service card



Lighting Associates: *Atollo lamp by Vito Magistretti.*
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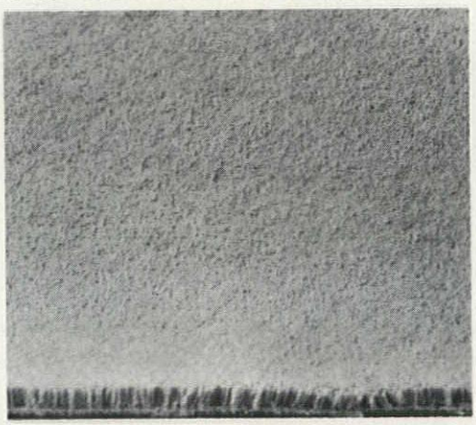

Masland Carpets: *Haviland nylon cut pile carpet.*
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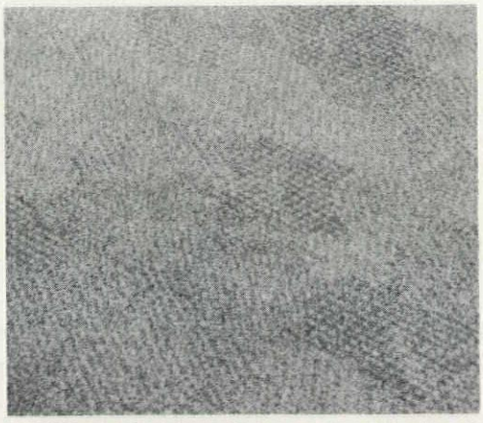
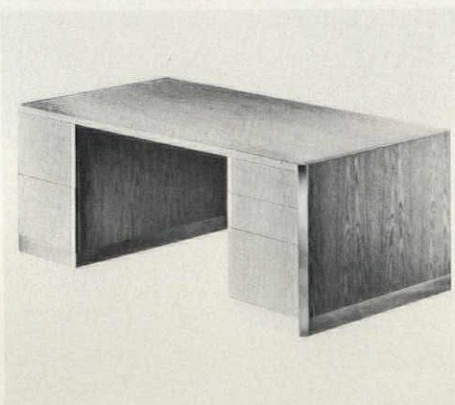
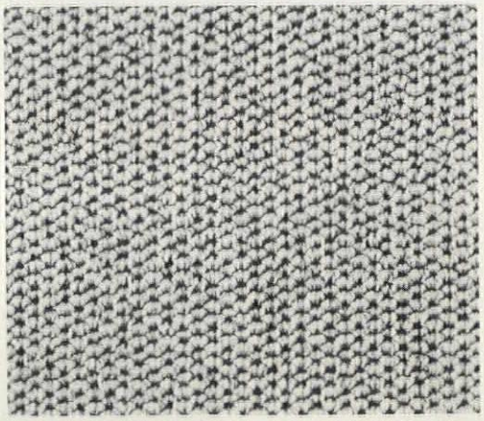


Milliken Contract Carpets: *International Coordinate nylon carpet.*
Circle 206 on reader service card



Modern Mode: *The Trident executive desk series.*
Circle 207 on reader service card



Mohawk Carpet: *Impressionaire level-loop nylon carpet.*
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Myrtle Desk: *6700/6800 contemporary oak office furniture collection.*
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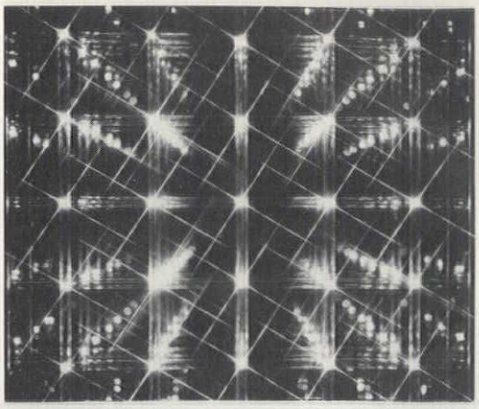
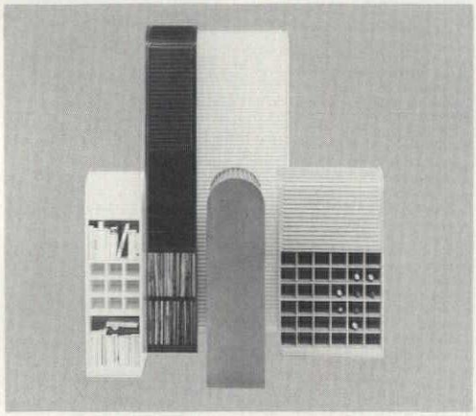


Neo-Ray Lighting Systems: *Innervision Series 1000 modular lighting.*
Circle 210 on reader service card

Office Suites: *Nexa series office seating by Bert Andrews.*
Circle 211 on reader service card

The Pace Collection: *Tucroma chair by G. Faleschini.*
Circle 212 on reader service card



Rudd International: *Manhattan group storage system.*
Circle 213 on reader service card

Schumacher: *Mini Metrics geometric print wallpaper and fabric.*
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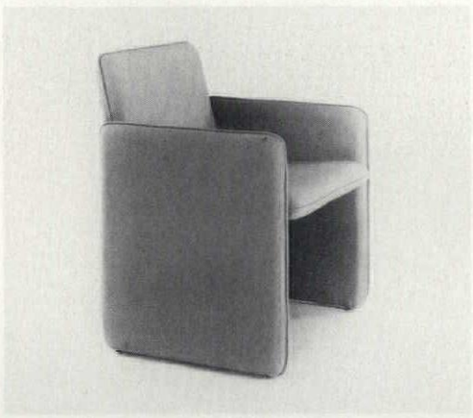

Scope Furniture: *"S" boardroom or office side chair.*
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Shelby Williams Industries: *Contemporary spindle armchair.*
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Stendig: *Lounge chair and ottoman by Hans Eichenberger.*
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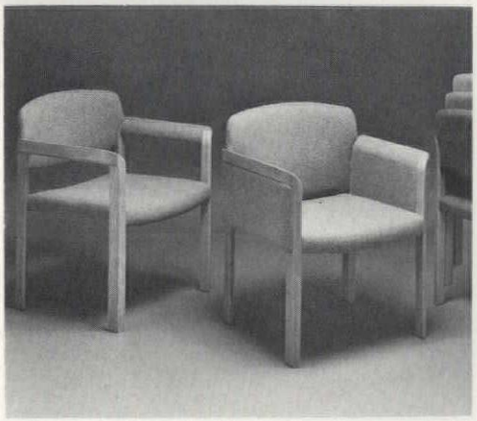

Stow/Davis: *Continuum series chairs by Warren Snodgrass.*
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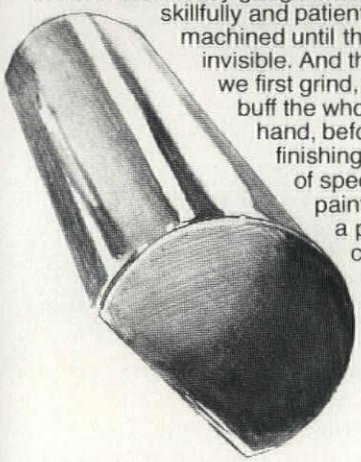

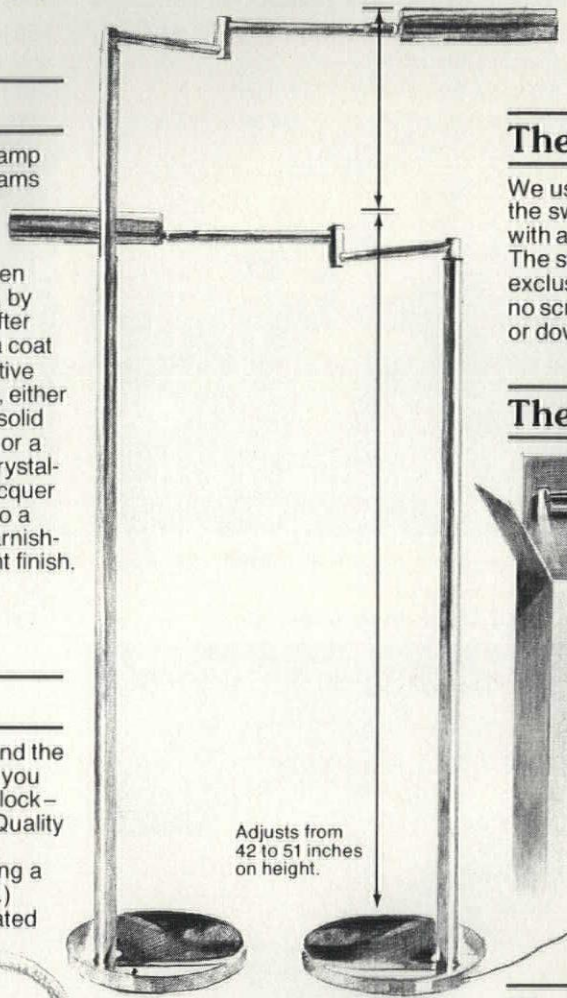

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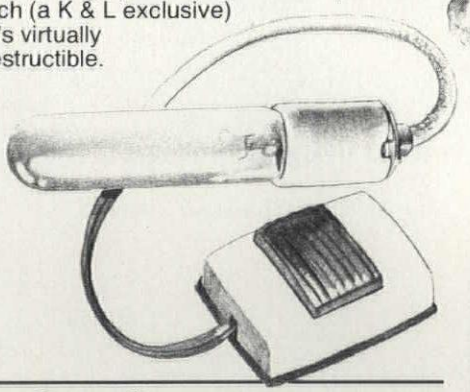

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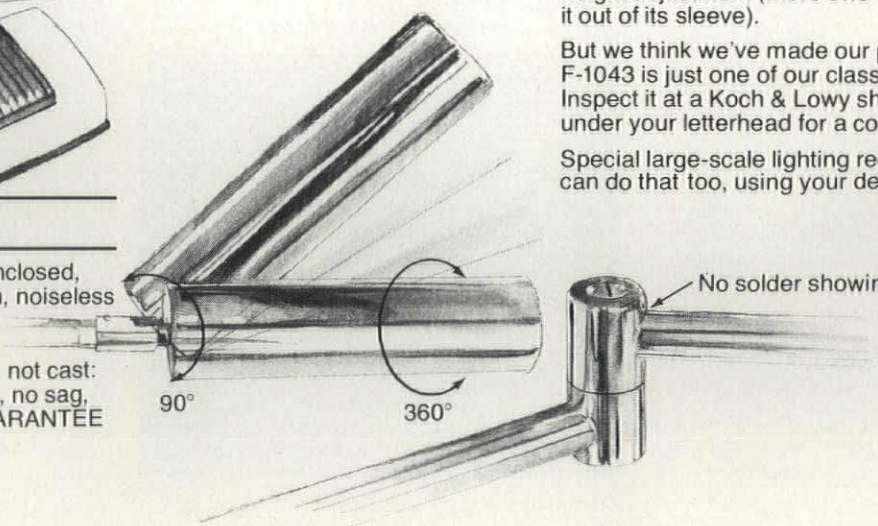

Stroheim & Romann: *'Ladies of the Court' glazed cotton chintz.*
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John Stuart: *Ero Dynamic executive chair with adjustable height.*
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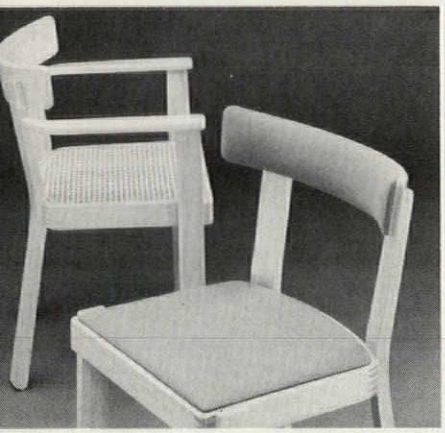

net: *Arm and side chairs designed by rt DeFuccio.*
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Turner: *Hello There cast aluminum chair by Jeremy Harvey.*
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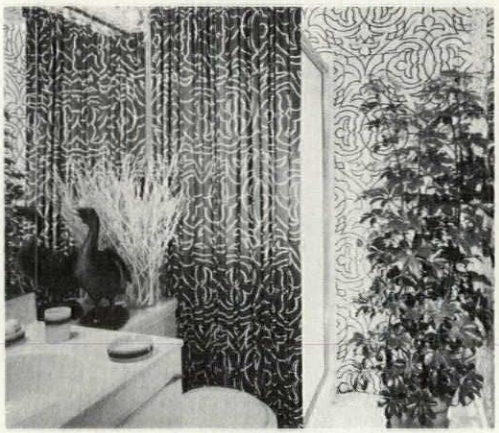

Albert Van Luit: *'Prince Regent' fabric and vinyl wallcovering.*
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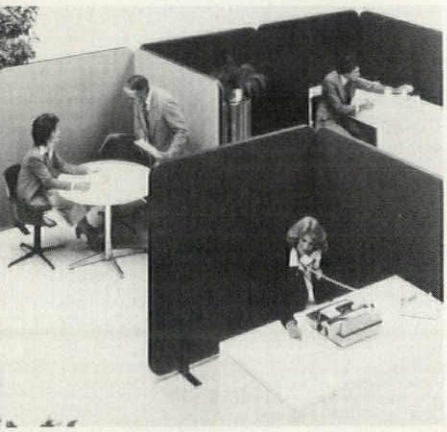

gel-Peterson: *VistaScreen portable sight der.*
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Vecta Contract: *Miko modular lounge seating group with table.*
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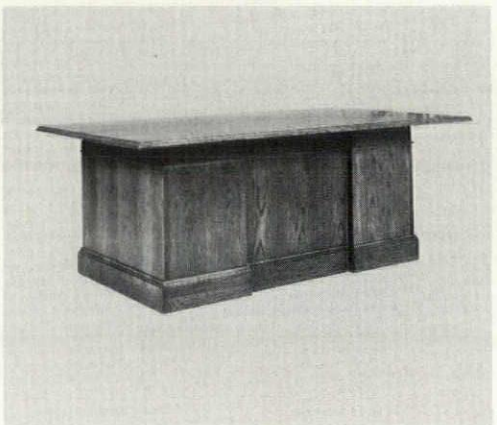

Wood Design: *Oak Traditional office furniture.*
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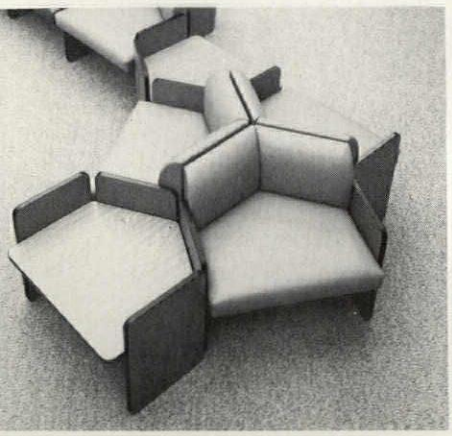

rden: *Three-component Pentagonal ster Seating.*
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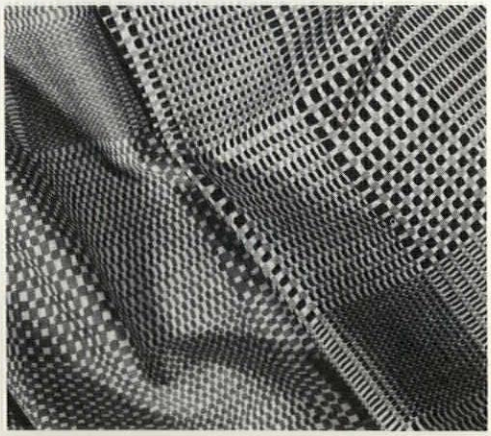

Zumsteg: *'Plaid,' a new design in cotton chintz.*
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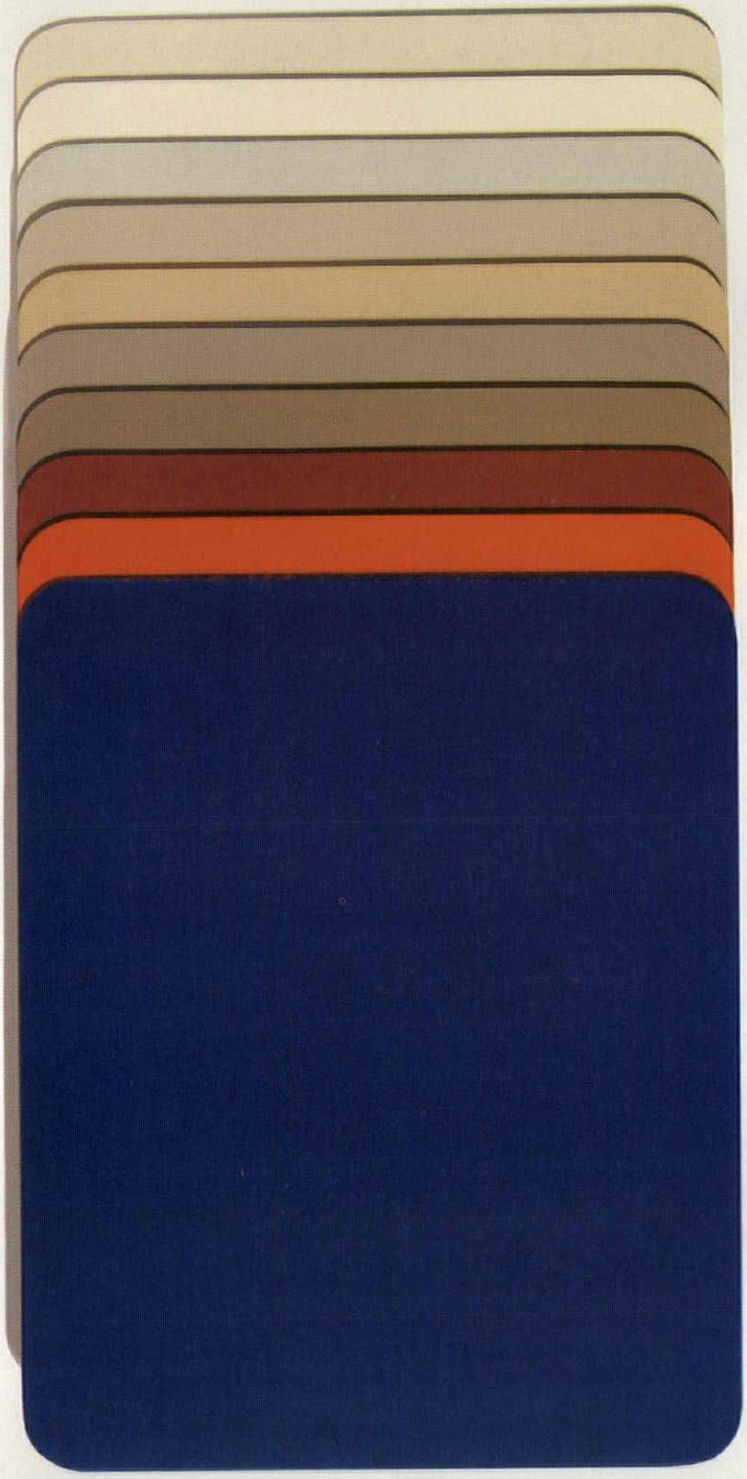

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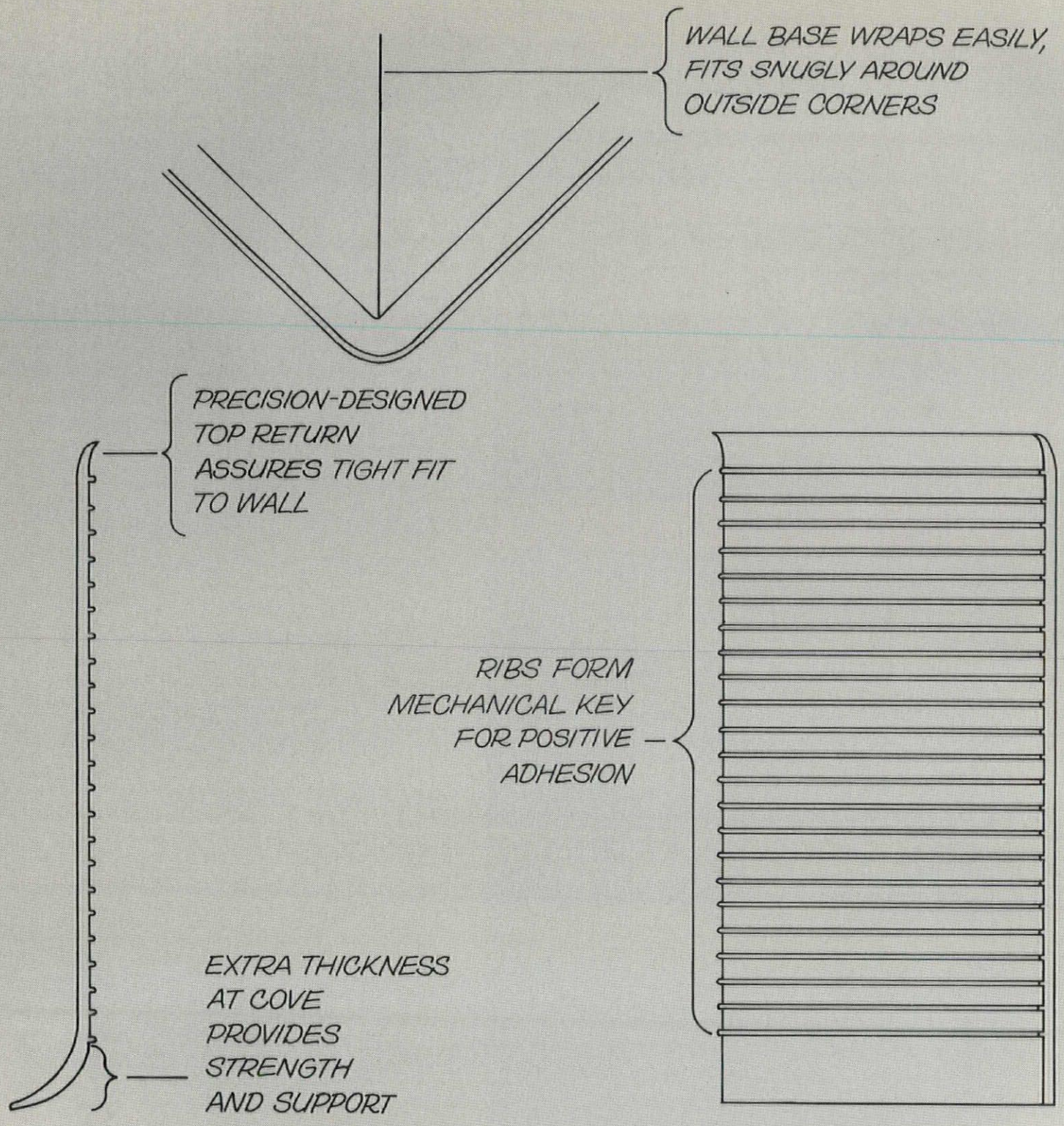

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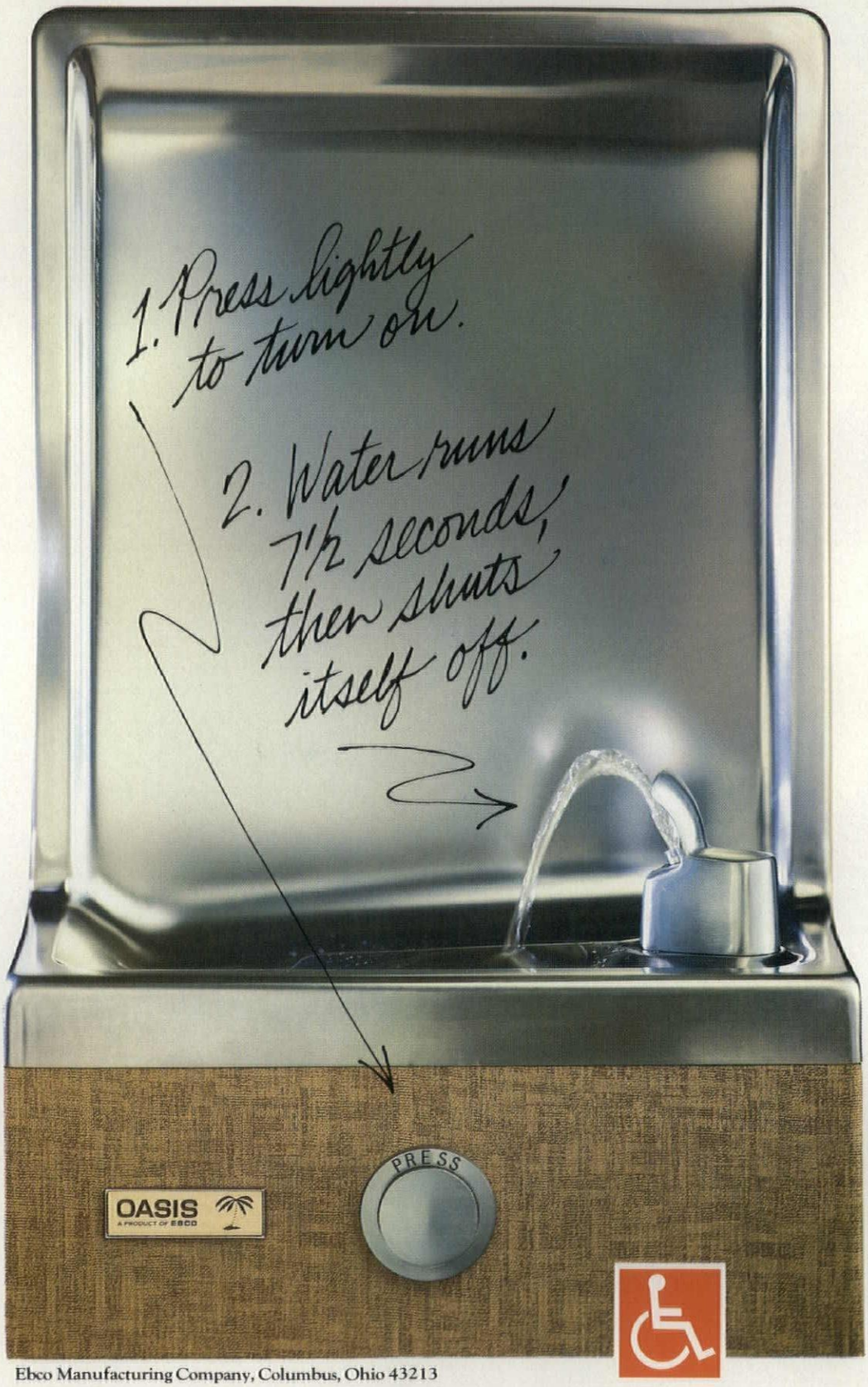

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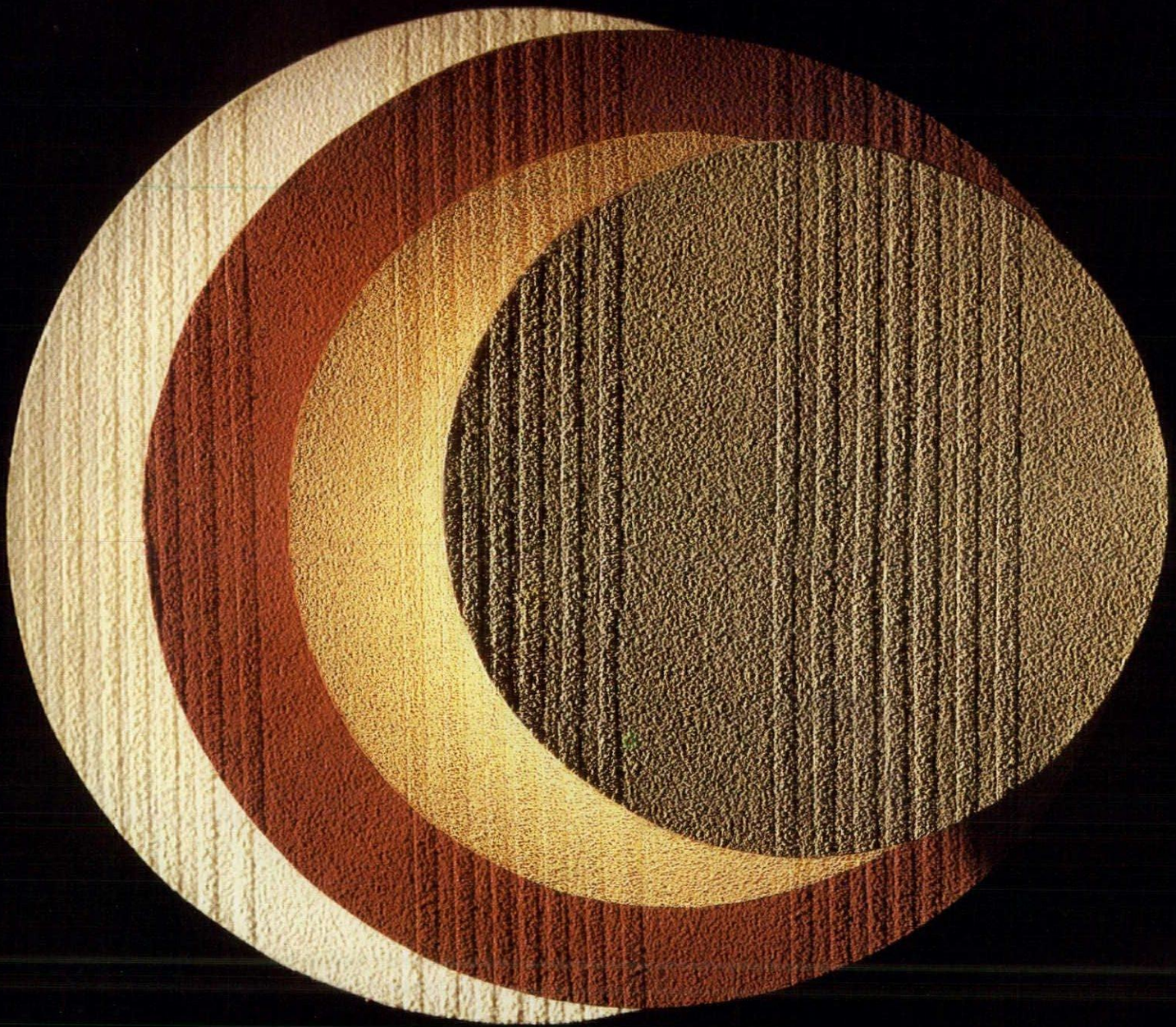

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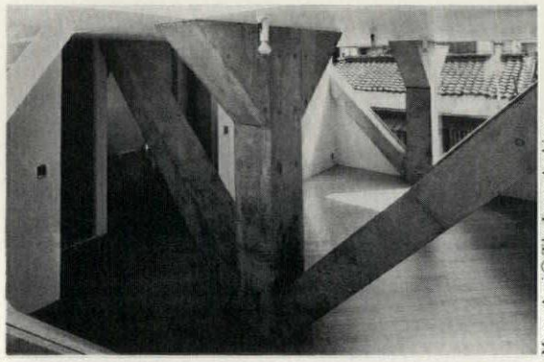
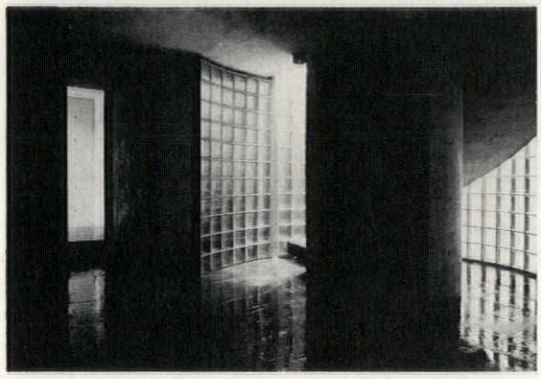
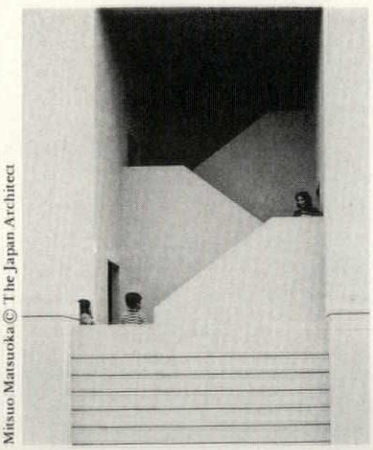
Japanese Minimalism

Some recent architecture in Japan looks to both the West and Japan. It is unusual not in doing that, but in the way it does it.



Masao Arai© The Japan Architect





Mitsuo Matsuoka © The Japan Architect

In the following portfolio of recent Japanese Minimalist architecture, the work of three firms is presented. They are introduced here with details of Kazuo Shinohara's Uehara House (top), Tadao Ando's Ishihara House (middle), and Riken Yamamoto & Field Shop's House of Gate (above).

The work of the three architects presented on the following 18 pages is not typical of that being done in Japan today, nor is it in any way representative of anything being done in the West. What the architecture of Kazuo Shinohara, Tadao Ando, and Riken Yamamoto & Field Shop does express, however, is a certain attitude toward design that is rooted both in the Japanese and in the Western tradition.

Although a combination of aspects from the two traditions would not be new either in Japan or in the West, the particular elements singled out for attention in these works is. In this respect, the Japanese work shares certain similarities with the work of some of the more theoretical architects in the West, particularly in its interest in the simpler, more basic types of architecture of the past, in the more traditional ways of building and of designating the use of space.

All of the works shown are houses, which in Japan as elsewhere have traditionally been a laboratory for working out new ideas. What these houses have in common is their rejection of the ideology (or idolatry) of technology; there is no "high-tech" design, exposed mechanical system, or other building or furnishing artifact designed to be overly expressive of their fabrication or function. In all of the houses, the Japanese post-and-beam tradition so favored by Modernists, and the Japanese tradition of wall-supported structure are being reinterpreted. Rather than depending on any architectural gymnastics, all of the houses employ fairly simple and straightforward means of achieving their ends. In addition, all of the houses are inward-directed; those in urban areas turn their backs on the environment and in effect reject it. One other thing the houses share is that each can be seen as expressive of certain historicist tendencies that have emerged within the past decade in the West.

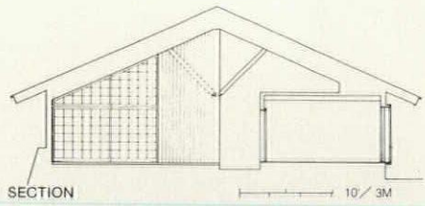
The oldest architect of the group—Shinohara, who is 55—is now being accorded increasing recognition in Japan, mostly from younger architects in rebellion against things Western. His work appeals to this group partly because it has always followed its own path, with little concern for the current trends of the day. The work looks to the simple, vernacular forms of Japan's past. It endeavors to express mythic forms of the subconscious, and in so doing it shares some concerns with the work of, among others, Aldo Rossi and, before him, Louis Kahn.

As a member of the younger group of Japanese architects fostering a change from the eager assimilation of Western attitudes, Ando also looks to the native tradition of building. The enclosed, inward-directed courtyard house of highly articulated functional areas is an urban type that has persisted for centuries in Japan. But here it is reinterpreted with glass block—rather than shoji screen—laid up in sections more reminiscent of the Italian rationalists of the 1930s or of the European and American Rationalists of today than of the Japanese of the past.

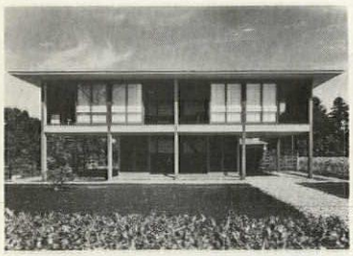
The youngest of the group, Yamamoto, also adheres to traditional Japanese building types, but will alter them radically through a particular method of styling or through an unconventional means of delineating functional areas. Of the works shown here, his House of Gate is certainly the most directly historicist, referring as it does to the proto-Modern architecture of the West. Like the other houses on these pages, it is unusual or remarkable not in looking to both Japan and the West, but in what it sees.

[David Morton]

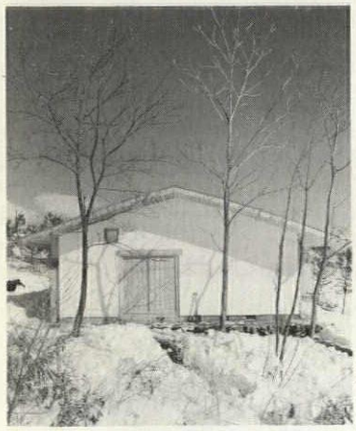
Primary spaces



A series of houses by Kazuo Shinohara represents a process of reduction, from Japanese vernacular toward space itself as symbol.



Chuji Hirayama



Takashi Oyama

The 1954 House in Kugayama (top), the architect's first work, combines aspects of prototypical Japanese raised-floor structures with a Modern pilotis *scheme. The 1963 House with Earthen Floor (above), with its bowed roof planes and rustic details, is hard to distinguish from traditional structures in its mountain region.*

For two decades architect Kazuo Shinohara has been exploring his own alternatives to the established ways of Modernism. After turning first to spare versions of traditional Japanese house forms, Shinohara has gradually purged his work of overt vernacular references, concentrating on the pure elements of volume and structure. This process has been catalyzed by some adaptations from Western traditions, but these references, too, have lost their identity in a design approach that is highly abstracted, yet charged with primal symbolism.

The medium of Shinohara's design evolution has been the private house. "The house," he has observed, "represents the minimum unit of architectural space, and it has been my belief that if I can straightforwardly express a clear theme in this small shell, it should suffice."

Shinohara's first house (left) dates from 1954, a year after his graduation from Tokyo Institute of Technology, where he still teaches. It represents the same kind of refined Modern-vernacular hybrid as Kenzo Tange's own, conceptually similar house of the same period. While Tange, 12 years his senior, moved rapidly on to design some of the large-scale landmarks of international Modernism, Shinohara concentrated on modest private houses, related to indigenous types.

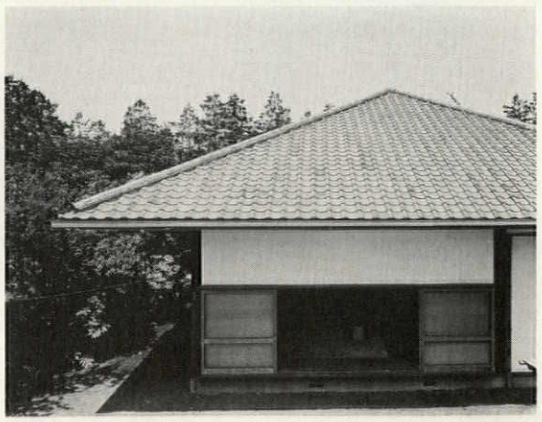
At the end of the 1960s, Shinohara changed course sharply—without changing scale—in a series of cubic houses characterized by axial internal "fissures," related to the central hall of Western Classical tradition, but radically abstracted. Following these, Shinohara again took up native house forms, now reduced to essential silhouettes and triangulated supports. Turning exclusively to concrete as a structural material in the mid-1970s, Shinohara tried some more elaborate geometries, involving cantilevers and curved surfaces, but returned by the end of the decade to more severe forms.

In the past few years, the work of Shinohara—now in his mid-50s—has become a subject of widespread interest among his Japanese colleagues and architects abroad. Like the work of Aldo Rossi in Italy, it represents the potential of an architecture based on archetypal forms. The ten houses illustrated in this article were chosen to indicate his evolution toward the primary qualities of his current work. (A more detailed survey of 20 Shinohara houses appeared in *SD,* Tokyo, Jan. 1979.)

The continuous cast-in-place concrete envelopes of these recent houses may look like structural overkill to American eyes, but are not exceptionally costly in Japan, according to Shinohara. The structural concrete planes are lined inside with 7 cm of insulation and a layer of painted plywood; roofs are coated with waterproofing and a layer of mortar. Shinohara would like to design a prototype for mass-production houses using a system of this kind.

As for the forms of his houses, Shinohara speaks of them with the qualification that his intuitive designs are not easily analyzed verbally. To explain his formal concerns, he has formulated a set of concepts expressed in terms that are, in his own words, "bizarre-sounding." His four concepts: "naked things," bare structural elements stripped of associations; "gap," the discrepancy between ideal forms and the exigencies of real sites; "machine," his somewhat ironic word for arrays of "naked things" that *produce meanings;* "savagery," by which he means consciously *not* reconciling awkward connections and juxtapositions.

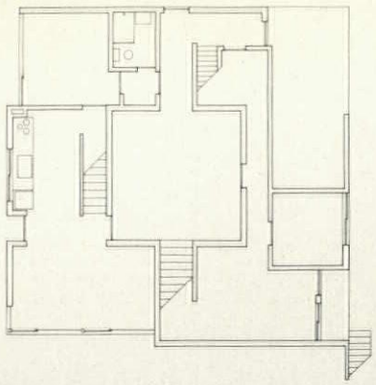
More words on Shinohara's concepts would be unlikely to explain his intentions as effectively as the illustrations that follow.
[John Morris Dixon]



Osamu Murai

Two houses from the late 1960s show progressive variation on traditional house design. The 1966 House in White (left and right photos) has a square plan, 10 m x 10 m, under a broad, tiled roof. A central polished log column rises in front of the wall that separates the main room from the two bedrooms—one above the other—behind it. The composition of column and openings recalls the historical sukiya *style. Triangulated roof framing is concealed by a hung ceiling 3.7 m above the floor. In the 1968 South House in Hanayama (photo and section above) Shinohara has eliminated the ceiling, exposing diagonal log struts that pass above a low bedroom block.*

Photos this page: Osamu Murai



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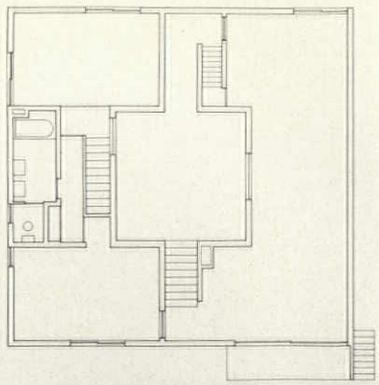
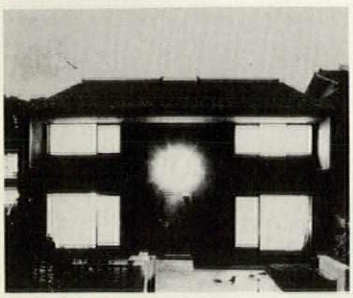
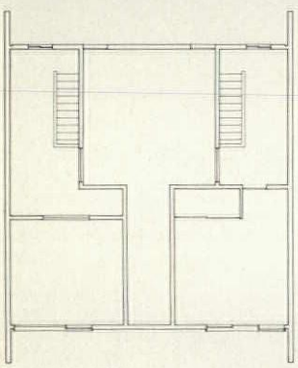


SECOND FLOOR

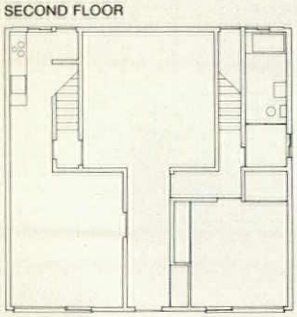
10'/3m



Koji Taki



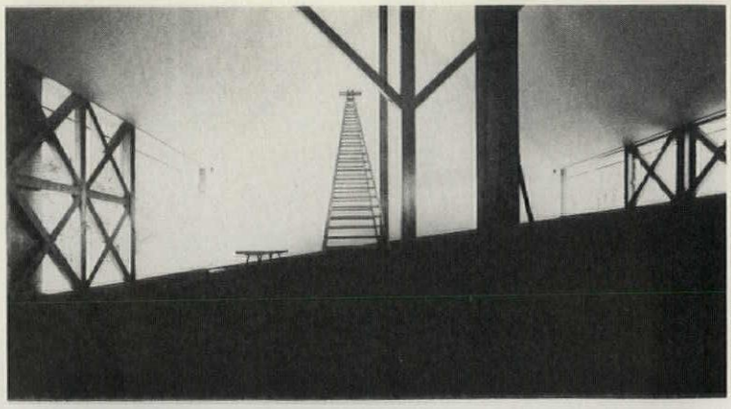
SECOND FLOOR



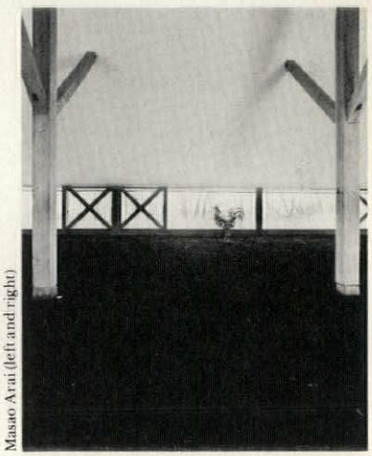
GROUND FLOOR 10' / 3m

Shigeo Okamoto

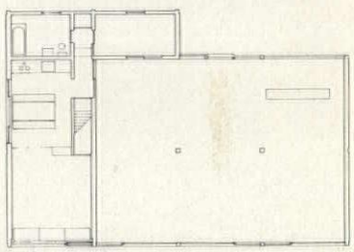
Two houses of 1970 illustrate the introduction of central "fissures" into compact, rectangular blocks that Shinohara calls "un-Japanese." In the Shino House (above and right), Shinohara intended the T-shaped hall as a "neutral" space, but the skylight playing on walls of gold book cloth suggests religious symbolism. The front of house expresses its interior symmetry. In the Incomplete House (top right and front cover) a central square hall leads to an axial stair to a living room a half-level above.

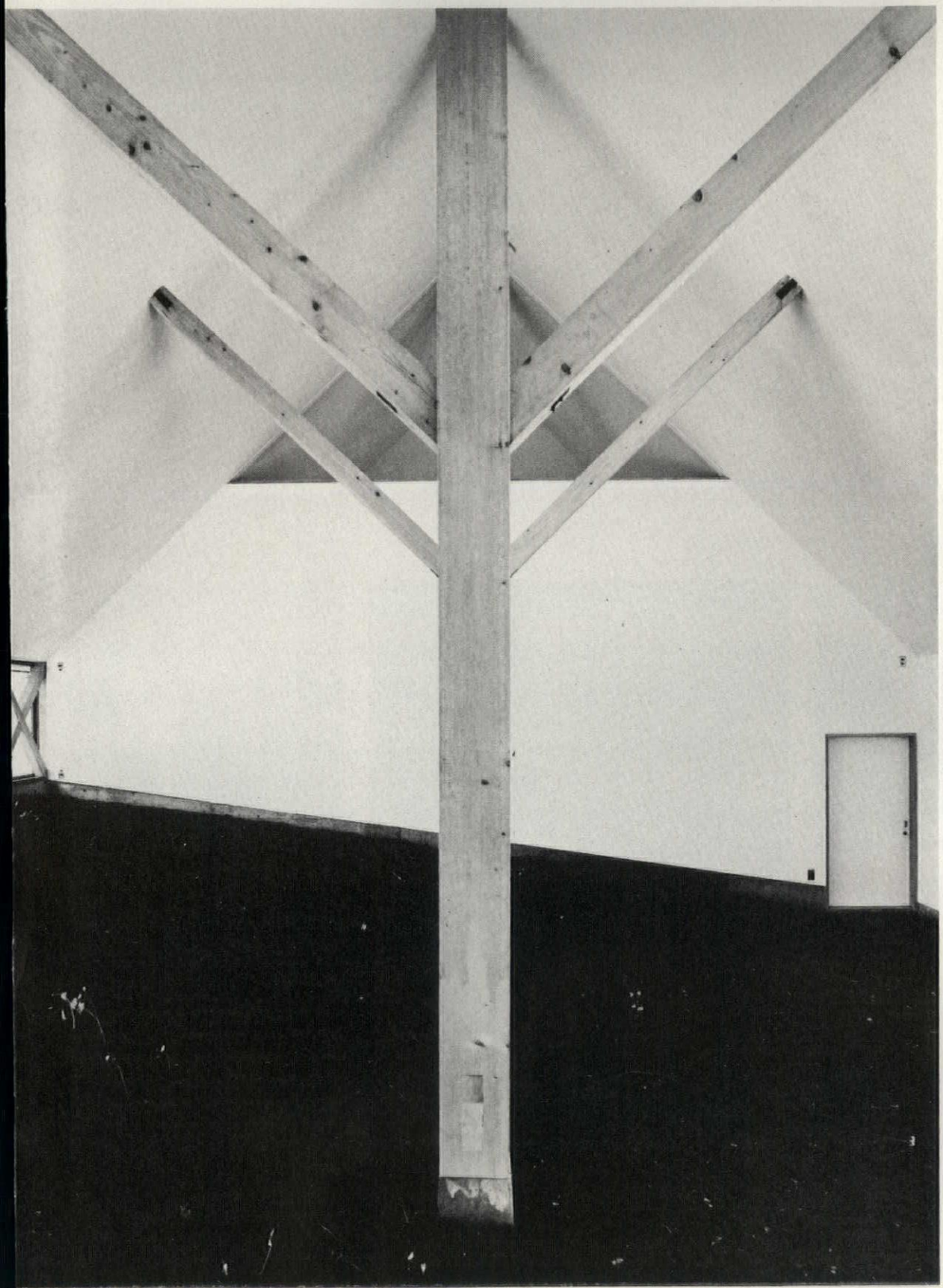


Koji Taki (left and right)

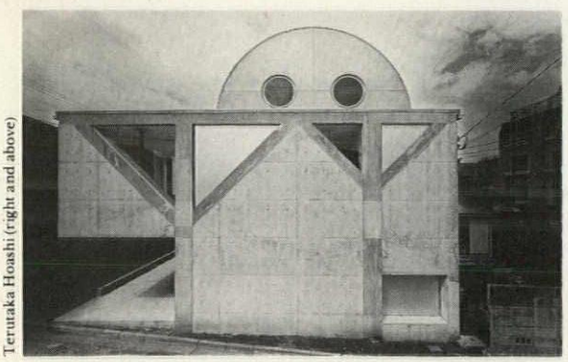


Masao Arai (left and right)

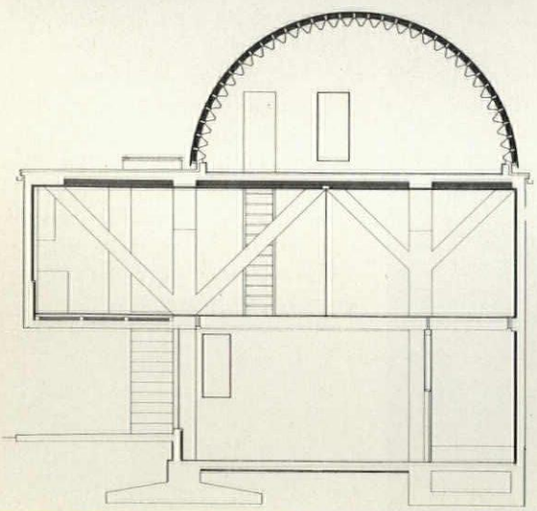


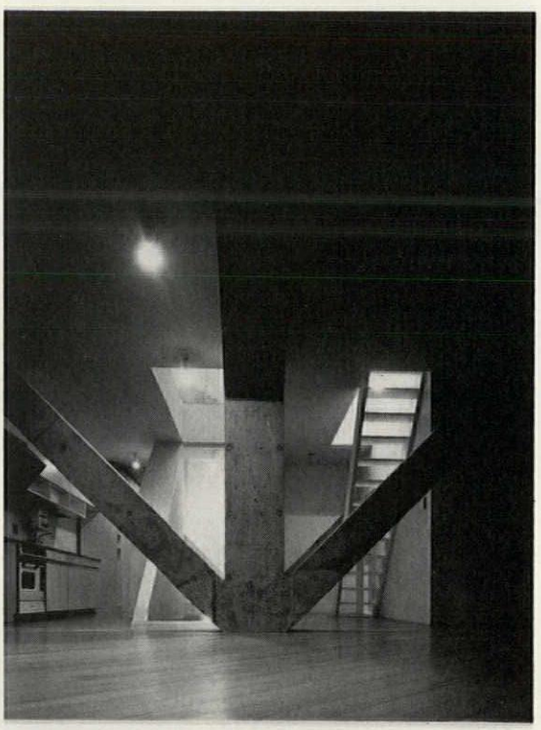


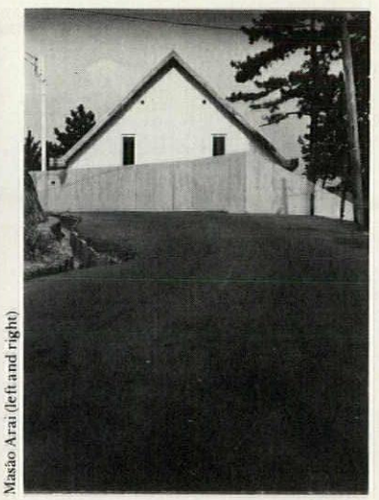
In the 1974 Tanikawa House, Shinohara uses traditional structural elements to powerful effect. Relegating conventional rooms to a band at one end of the gabled structure (see plan), he devotes most of the volume to a single space with an earth floor that slopes 1.2 m in a span of 9 m. For him, the space has no function except the occupant's experience of structure interacting with terrain. Through this design, he came upon the concept of a "machine" for producing "meaning" out of "naked" elements, which are made more abstract by their simple geometry.



Terutaka Hoashi (right and above)

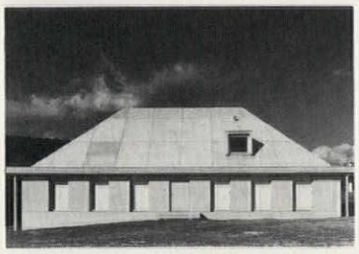






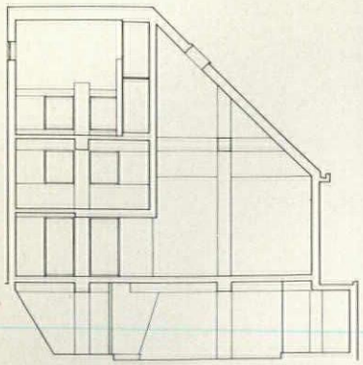
Masão Arai (left and right)

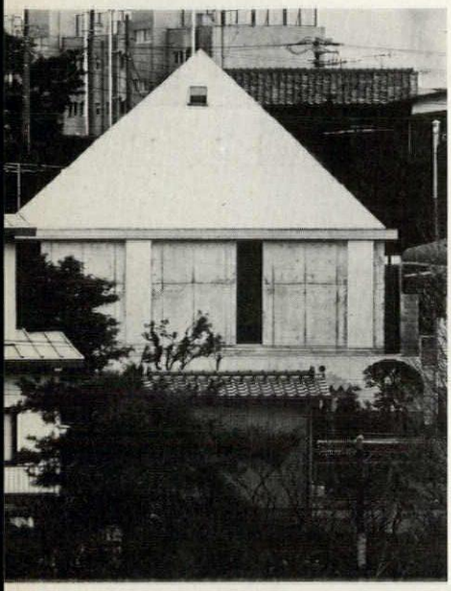
The 1976 House in Uehara (photos and section left), in which haunched concrete columns and struts make a "jungle" of the interior, best expresses Shinohara's "savage" mode. The vaulted studio at the top was an afterthought, added during construction. The 1977 Hanayama House No. 3 (photos above) displays similar concrete columns in the purist volume of its gabled interior.



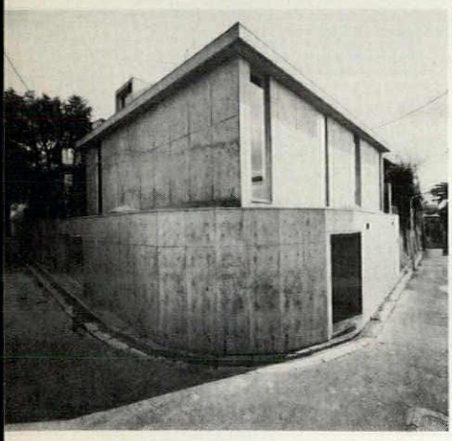
The 1977 House in Ashitaka, like the Hanayama house of the same year (facing page, top) is mainly a simple geometrical volume enclosed in a continuous envelope of concrete planes. A simple wood wall (upper photo) is both a means and a sign of separation between conventionally partitioned rooms at one end of the structure—with lofts above them—from the open living-dining space (lower photo) that occupies 40 percent of the main floor area. Uniformly spaced windows, equipped with sliding shutters, overlook a forest preserve. The regular openings and bold roof form make the exterior reminiscent of the clay houses of prehistoric Japanese haniwa *sculptures.*

Tomio Ohashi (color), Masoa Arai (other photos)





Tomio Ohashi



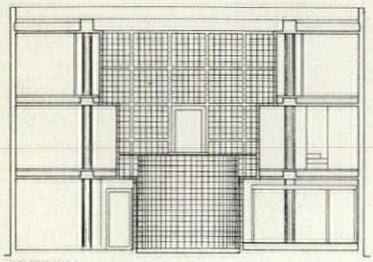
Masao Arai (left and right)

The 1978 House on a Crooked Road combines elements of previous houses. A utilitarian base story following the site boundaries gives way abruptly (photo above) to an upper volume with strong geometrical order. Its steep roof planes (top photo) enclose a three-story portion (see section) and a single living-dining space (right) rising 8.3 m to the peak. Here, Shinohara lets the accidental surface features of untreated concrete columns and beams contrast with smooth white surfaces of envelope and partitions.

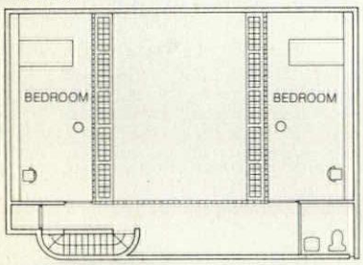
Ishihara residence, Osaka

The courtyard

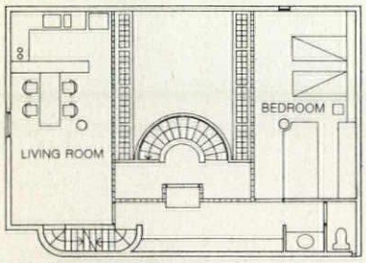
Tadao Ando, one of the so-called rebellious new wave, finds a rapport with zen concepts of abstinence and hermeticism though the influence of modern technique and Western form is indelibly present.



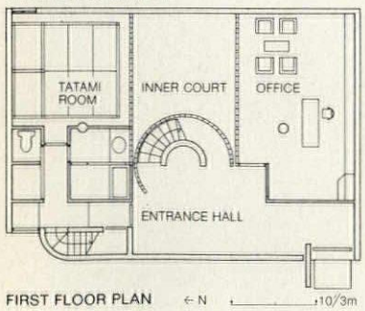
SECTION



THIRD FLOOR PLAN



SECOND FLOOR PLAN



FIRST FLOOR PLAN ← N 10/3m

In Japan there has always been a distinction between public and private space. A society which keeps its individual homes immaculate nonetheless throws food wrappings on the floor of a train compartment as a matter of course. Public space is anonymous; there are no obligations. Traditionally, Japanese homes have turned away from their happenstance surroundings. Translucent paper screens divided inside from outside. Views were carefully constructed, generally of an enclosed garden.

The situation has become aggravated beyond anyone's expectations by modern materials, forms, and scale. The result is an urban chaos that seems to extend from one end of the country to the other along the crowded eastern coast with scarcely a letup between cities. Architects have responded in different ways. During the 1960s, there was widespread interest in urban planning. Among the architects just reaching maturity are an increasing handful whose reaction is an investigation of what one designer calls "an architecture of silence."

Thirty-nine-year-old Tadao Ando is unusual among them for two reasons. He is based in Osaka—almost every "maestro" architect in Japan works out of Tokyo—and he is self-educated. His practice has included an occasional apartment building or multiuse complex, but consistently it has been individual houses.

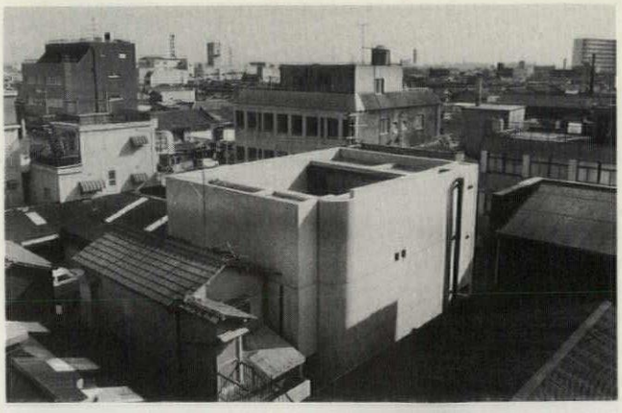
There are two principles in his houses. First, Ando surrounds his houses with thick concrete walls. "Today," he insists, "the major task is building walls that cut the interior off entirely from the exterior," which he indignantly describes as "the cheap sprawl and crowded conditions of the modern Japanese city."

The second is to make of the interior "a new place in which to experience self-knowledge." "Architecture," he says, "ought to contain living spaces conducive to the physical and psychological development of the individual." Intentionally related to the *sukiya* concept from zen tea ceremonies where architectural arrangements and detailing were an evangelical tool for awakening the sensitivities and philosophical awareness of participants, Ando's houses relate to some traditional forms as well. He uses only a "chosen few" materials and uses them in their naked state, concentrating on their characteristic texture. Shape is abstracted and the function of certain spaces always remains generalized. Light increasingly is his vehicle for establishing the separateness of the interior.

Among the more celebrated is the Ishihara residence. Located in an area of Osaka characterized by mixed small factories, shops, and houses, this house is cut off from its neighbors by a barrier of concrete. The house itself consists of two three-story blocks, deployed on either side of a stepped light court. On the lowest level is the office of Ishihara's furniture company and a traditional tatami room. Above are private quarters: Ishihara's family in the south block and his son's family in the north.

The interior is crafted, with a precise eye toward definition of material and a subtle eye to rhythm. But it is the light court that creates the character of the house. As a practical matter it is the real source of light, for the perimeter walls are almost uniformly blank. As an aesthetic device, with its edges lined in grids of glass block, it modifies the quality of light that enters the private zone. There is, in Ando's words, "a tender quality of shade and shadow"; the interior appears "as if covered with numerous waterdrops."

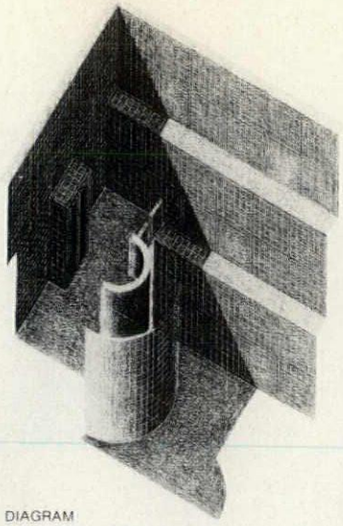
Glass block bears an interesting resemblance to the paper-filled shoji screens of traditional Japanese houses. It is gridded, translucent rather than transparent, ambiguously penetrable and impenetrable. Elaborating on the point, Ando inserts into the courtyard's edge actual shoji screens that can be slid upward (traditionally it would have been sideways) for a view. The view is not, however, the traditional Japanese garden but a slate-paved central court with stairwell, more identifiably European with specific Mendelsohnian references. The emphases on abstraction, ambiguity, and philosophical significance also can be traced to sources in the



Ishihara residence, Osaka

West—primarily in Italy and New York —as well as to pre-Meiji restoration Japan.

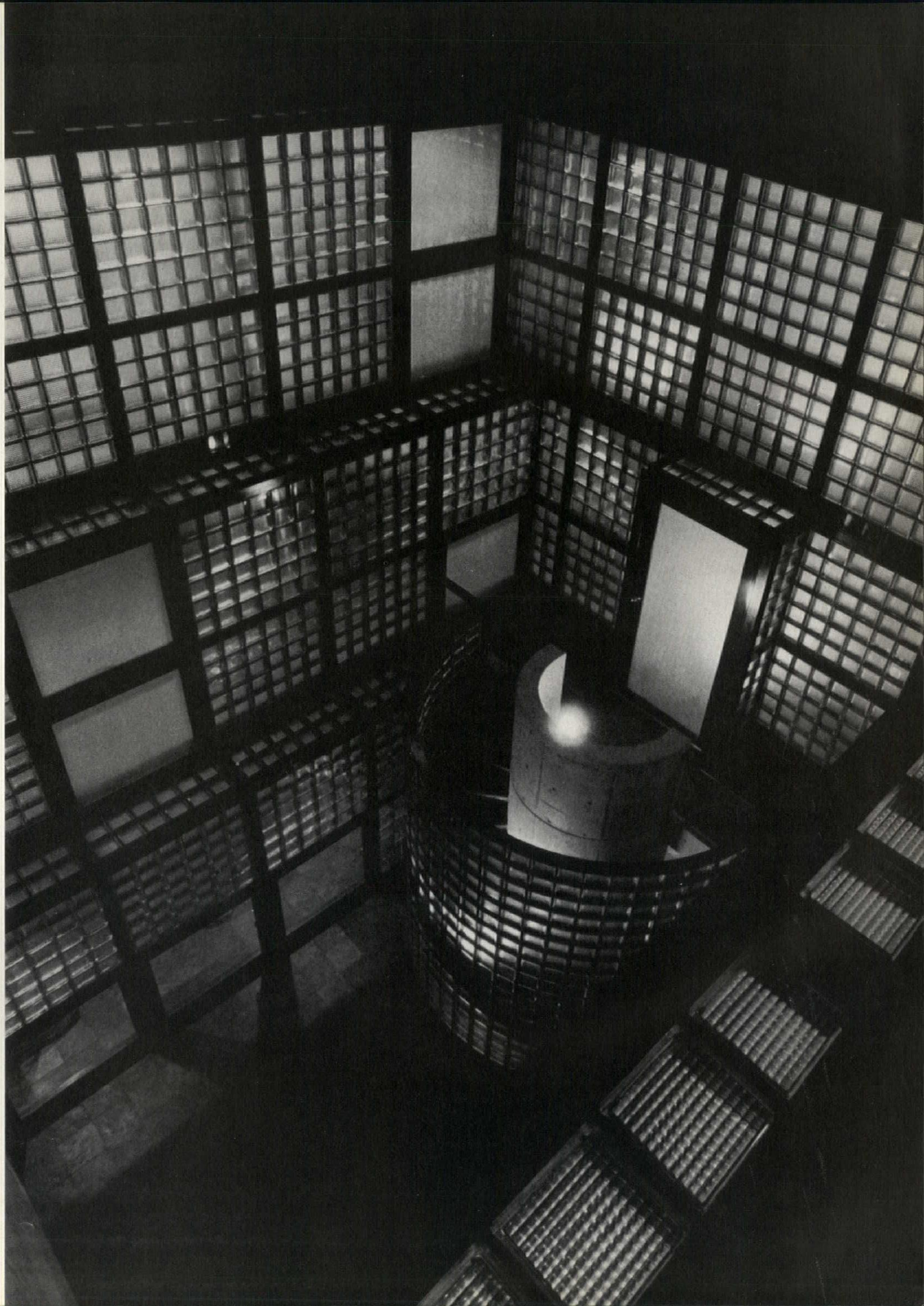
There is a confluence of influences here, a sympathy between what is being suggested from outside, including a revival of regionalism, and what is being suggested by that revival. The difference between the traditional approach to the separation of public and private spaces and Ando's is perhaps in the thickness and indecorousness of the concrete wall. The public domain has always been no man's land in Japan. But the result before "modernization" did not make anyone so angry. [Nory Miller]



DIAGRAM

Data

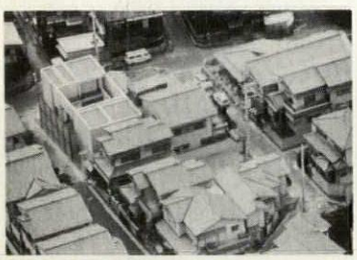
Project: *Ishihara residence, Osaka, Japan.*
Architect: *Tadao Ando, Osaka.*
Site: *5000 sq ft in mixed area of factories, shops, and houses.*
Program: *2400-sq-ft house to accommodate two families and office. Entrance hall, office, tatami room, and utility room on ground floor; master bedroom, living room, dining on second floor; children's rooms on third.*
Structural system: *box frame reinforced concrete.*
Major materials: *exposed concrete, glass block, oak flooring, slate paving.*
Mechanical system: *heat pump.*
Consultants: *structural, Ascoral Engineering Associates.*
General contractor: *Kumada Komuten Co.*
Cost: *$225,000 including landscaping and furnishings.*



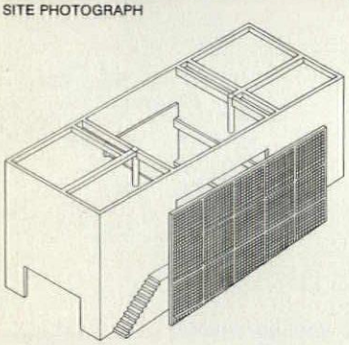
Horiuchi residence, Osaka

The wall

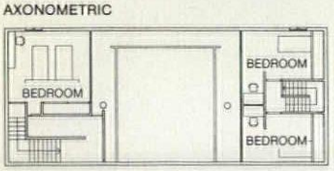
At Tadao Ando's Horiuchi house, the glass block is set against the street. Inside, an open colonnade meets the courtyard.



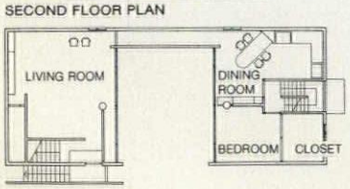
SITE PHOTOGRAPH



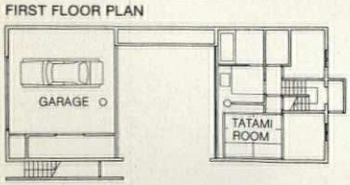
AXONOMETRIC



SECOND FLOOR PLAN



FIRST FLOOR PLAN



BASEMENT FLOOR PLAN N→ 10/3m

A single wall severs, interrupts, opposes, and violently alters the scene in which it is placed. At the same time, the wall can blend with the setting through such things as the shadows cast on its surfaces by the leaves of nearby trees. Generally, various elements coexist in a series of mutual rhetorical relations. But, in the urban environment surrounding us in Japan today, in spite of an overabundance of material things, it is difficult to point out such mutual rhetorical relations. The vagueness and unrelatedness of this environment contribute to a boring space that can only tire people. I believe that the first step to take for the sake of revitalization of such an environment is a reconsideration of the basic, primitive significances of the post and the wall.—Tadao Ando

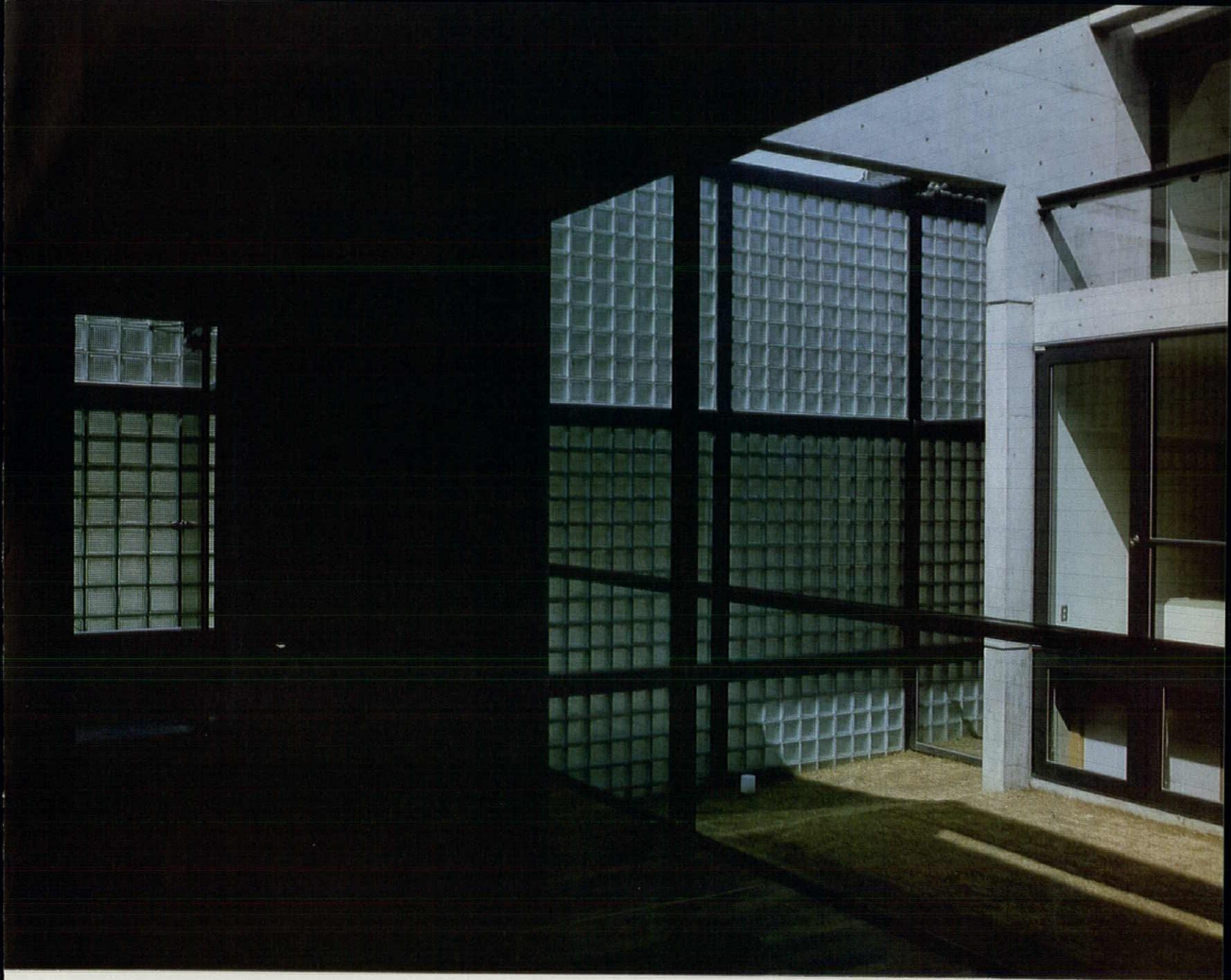
The Horiuchi residence (completed in 1979) was designed a year later than Ando's house for Ishihara and is very much a thematic variation. It is organized in two blocks, one to the south, one to the north, with an open-air court between. Occupied by only one family, its master bedroom and living room are in one block with dining room/kitchen and children's rooms in the other. At basement level is the garage and a tatami room.

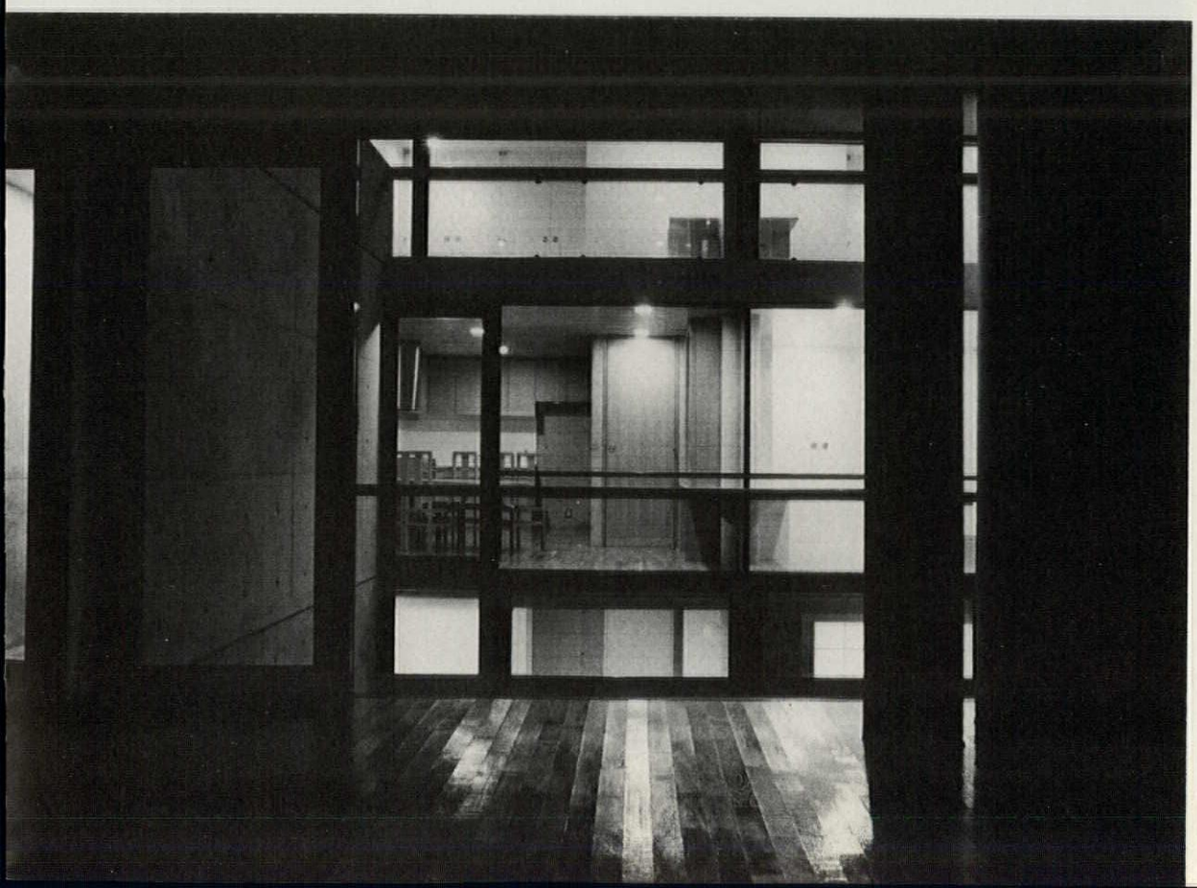
The courtyard is planted with grass and opens to the east. In front of the opening, facing the road, stands an independent glass-block wall. The wall mediates between the public street and private court, filtering light into the court during the day, out onto the street in the evening.

The less harsh territorial definition is a response to an area which, though full of subdivision houses as well as finer ones, is nonetheless homogeneously residential. The wall is intended to be as much a contribution to the environment as a demarcation.

On the interior, walls and ceilings are precisely detailed raw concrete. Floors are planks of Japanese oak. The balcony provides Ando an opportunity to reconsider the post, a motif also of his earlier houses.

He makes clear distinction between two things. One is the symbolic, mythic meaning of the single post. Traditional Japanese farmhouses had a massive post, the *daiko-kubashira,* that symbolized the authority of the head of the house, a kind of Atlas holding up the heavens. Here, each block has its own such singular column. The second is the establishment of rhythm by means of rows of posts, colonnades, here setting up a flow of movement of the balcony around the court. [Nory Miller]





Data

Project: *Horiuchi residence, Osaka, Japan.*
Architect: *Tadao Ando, Osaka.*
Site: *2561 sq ft in suburban area.*
Program: *2626-sq-ft single-family house on three levels.*
Structural system: *box frame reinforced concrete.*
Major materials: *exposed concrete, glass block, oak flooring.*
Mechanical system: *heat pump.*
Consultants: *structural, Ascoral Engineering Associates.*
General contractor: *Kumada Komuten Co.*
Cost: *$221,000 including landscaping and furnishings.*

The stairs

A house in a dense section of Tokyo, and other works by the same architects, show both historical and minimal means to functional ends.

Frank Lloyd Wright, Larkin Building, Buffalo, 1903.

Adolf Loos, Steiner House, Vienna, 1910.

References in Yamamoto & Field Shop's House of Gate (right) to the early Modern architecture of the first decade of this century in the West seem clear, as witnessed by its similarities to Wright's Larkin Building (top) and Loos's Steiner House (above).

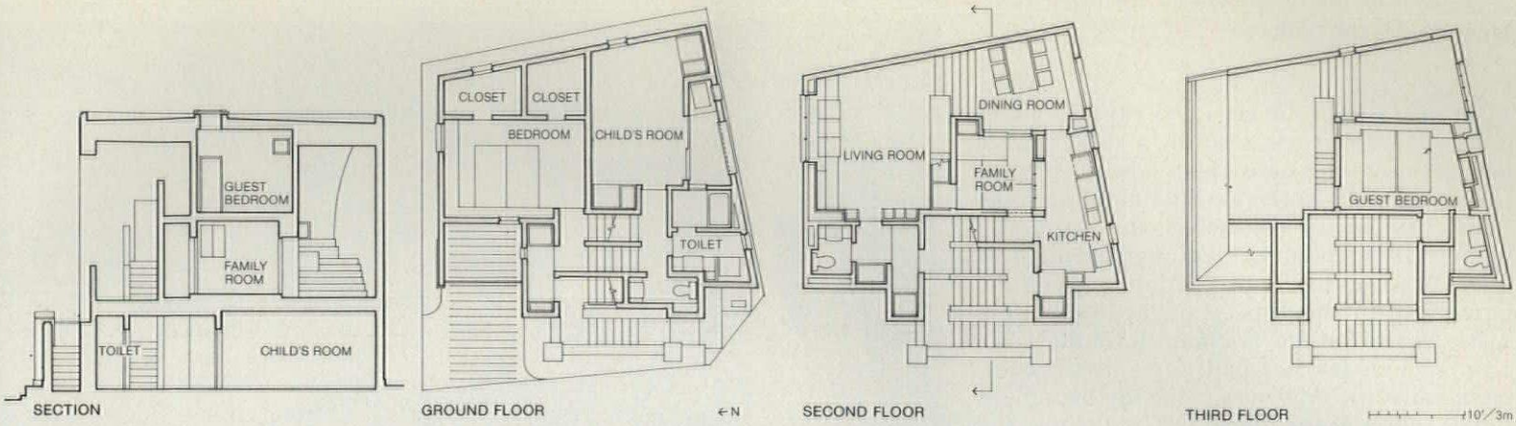
Many young architects in Japan today, as elsewhere, look to the architecture of the past as well as to that of other cultures. In this new pluralistic attitude, one is as likely to find references to Italian Baroque in Tokyo as in Los Angeles. With this more relaxed attitude toward the older constrictions of time and place, it is not surprising to find a house in the center of Tokyo in 1980 that could have been built in the West at the beginning of this century.

It is hard to look at the house Riken Yamamoto & Field Shop have designed for a manufacturer and his family without seeing certain, seemingly clear antecedents in it. The bold massing, the volumetric quality of the heavy form, penetrated only by deeply cut openings, surely speaks of the early Modern works of the first decade of the 20th Century, before the thin steel column, free plan, and banded window were to liberate building form.

This building, called the House of Gate, seems to acknowledge Frank Lloyd Wright's Larkin Building (Buffalo, 1903) and Adolf Loos's Steiner House (Vienna, 1910), among other precedents. This house differs from those, however, in one major respect with regard to its formal composition. Where their apparent symmetries are carried through with a rigorous consistency, the architects of this house and its companion works (shown on following page) with equal consistency—and in the Japanese tradition—upset the symmetry, often simply through the placement of one architectural element.

The design of the House of Gate was not dictated, however, by a desire to express historicist attitudes, but by some very real functional concerns. In that house and in the architects' other works, the primary concern has been to make a clear distinction between the public and private realms—the need for which has not declined as much in Japan as it has in the West.

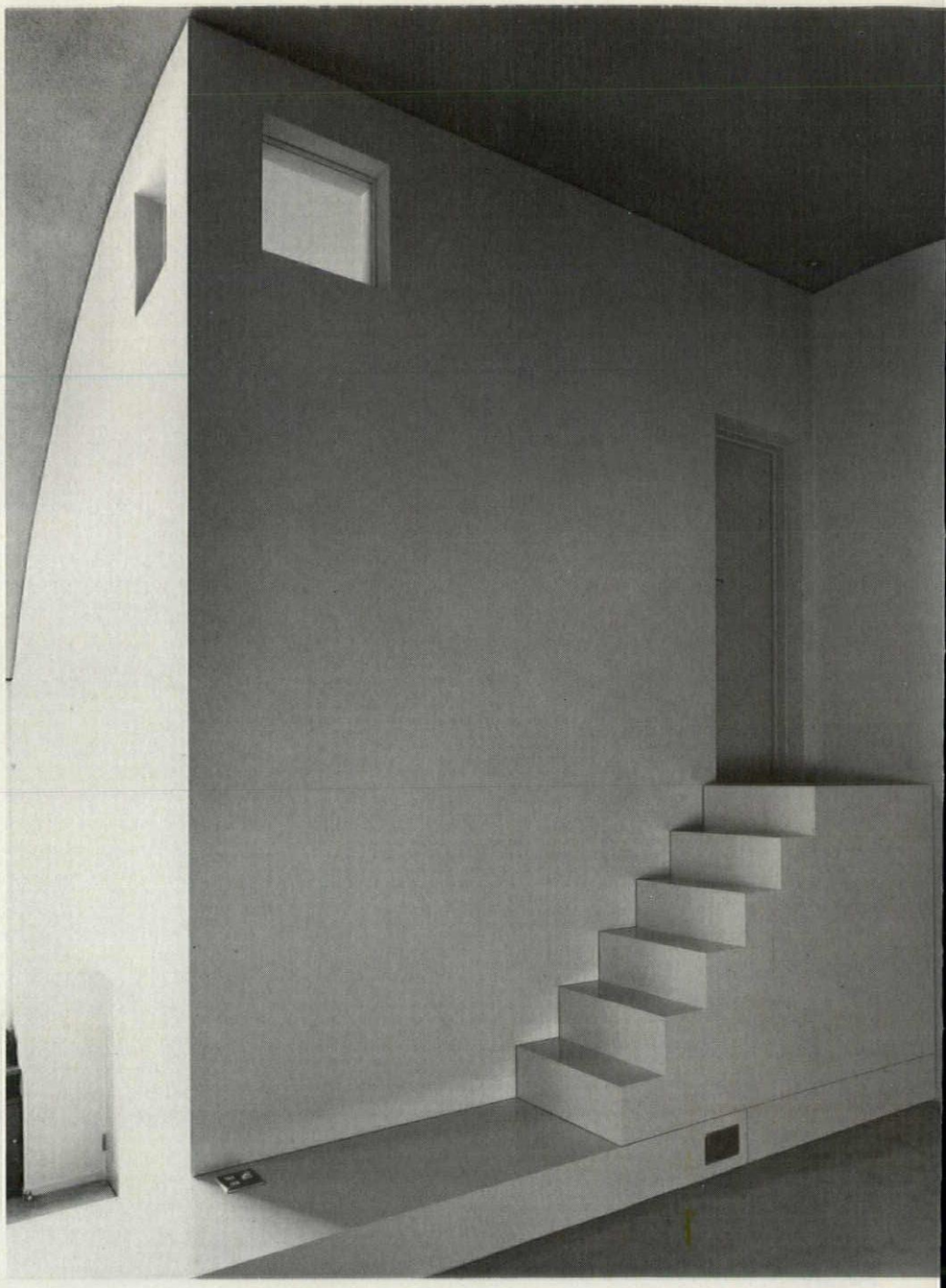
The owner of the house manages a machine manufacturing company and, because of that, has foreign guests staying at the house quite frequently. To satisfy the private needs of the family, the need for public space, and the accommodation for guests, the 2000-sq-ft house had to be stacked on its

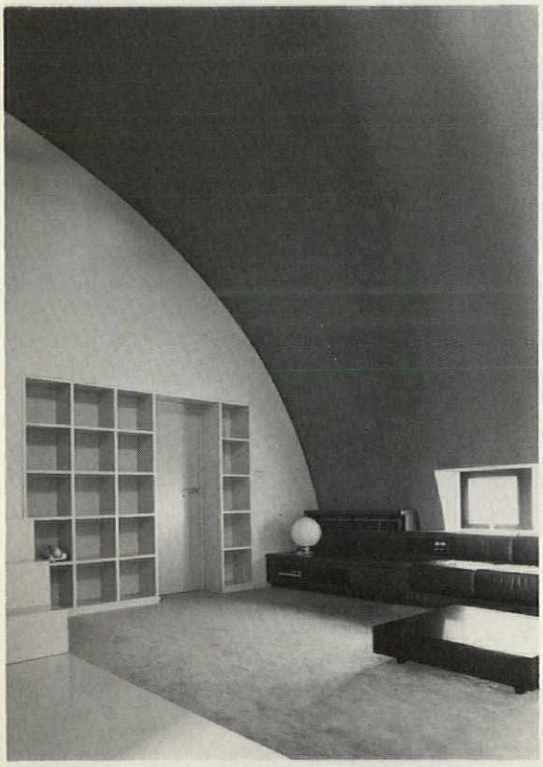

GUEST BEDROOM
FAMILY ROOM
TOILET
CHILD'S ROOM
SECTION
CLOSET
CLOSET
BEDROOM
CHILD'S ROOM
TOILET
GROUND FLOOR
←N
DINING ROOM
LIVING ROOM
FAMILY ROOM
KITCHEN
SECOND FLOOR
GUEST BEDROOM
THIRD FLOOR
10'/3m

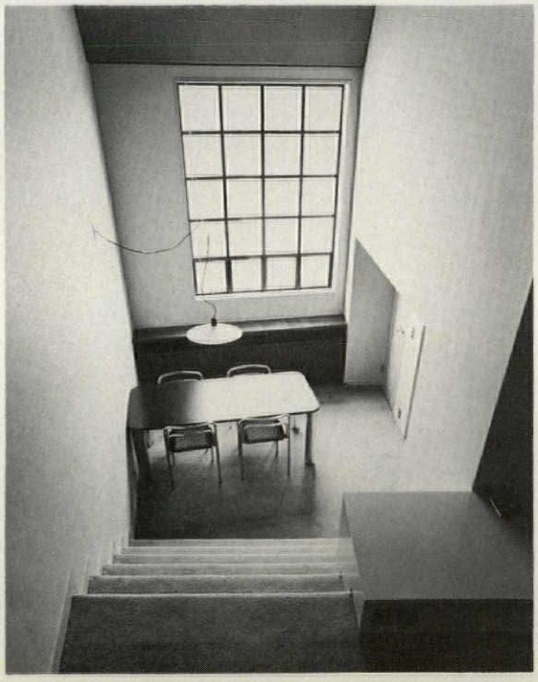
1150-sq-ft site in the crowded city. To attain the kind of privacy desired, a rather large proportion of the house had to be given over to the stairwell. As the most demanding functional element of the house, the stairs also became the predominant design element as the expression of the distinction between the public and private aspects of the house.

Above the garage/basement level there is a ground-floor level of bedrooms that is completely private. Above that are the living and public spaces of the house and, at the top, the private room for guests.

The architects' other works—the House of Tower and the House of Air—share the same concern for functional distinctions, but because of the circumstances of their sites and of their clients' needs, these ideas are expressed quite differently. Within the two-story-high open space of the Tower house, a lower level provides communal and private space for the artist wife, while the upper level provides the same for the designer husband. Because the other house is in a remote mountain resort, the need for functional distinctions was not so strong, and only the kitchen, bathroom, and bedroom have been enclosed in the otherwise open pavilion. Although the three houses may differ in specifics, they share a single attitude toward design, which is further expressed through the absolute economy of means by which they attain an undeniable presence. [David Morton]





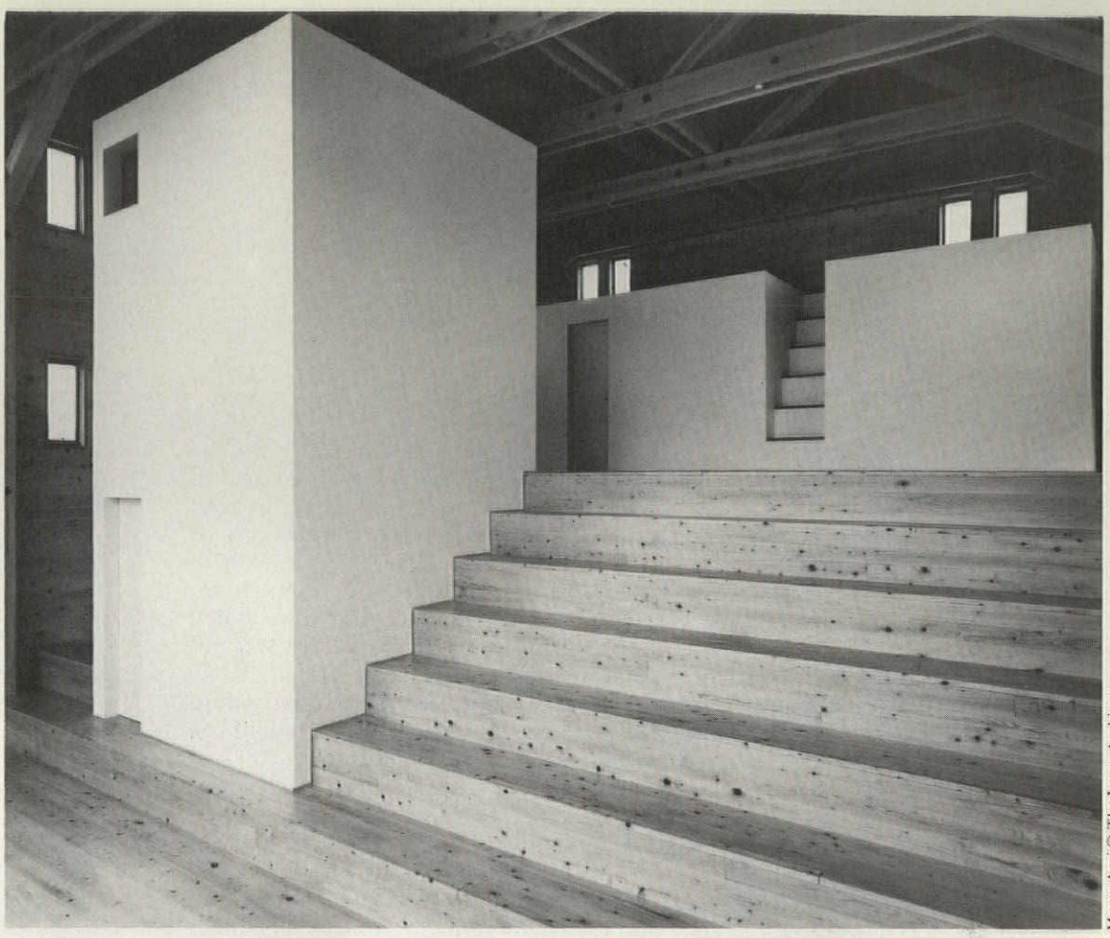


Data

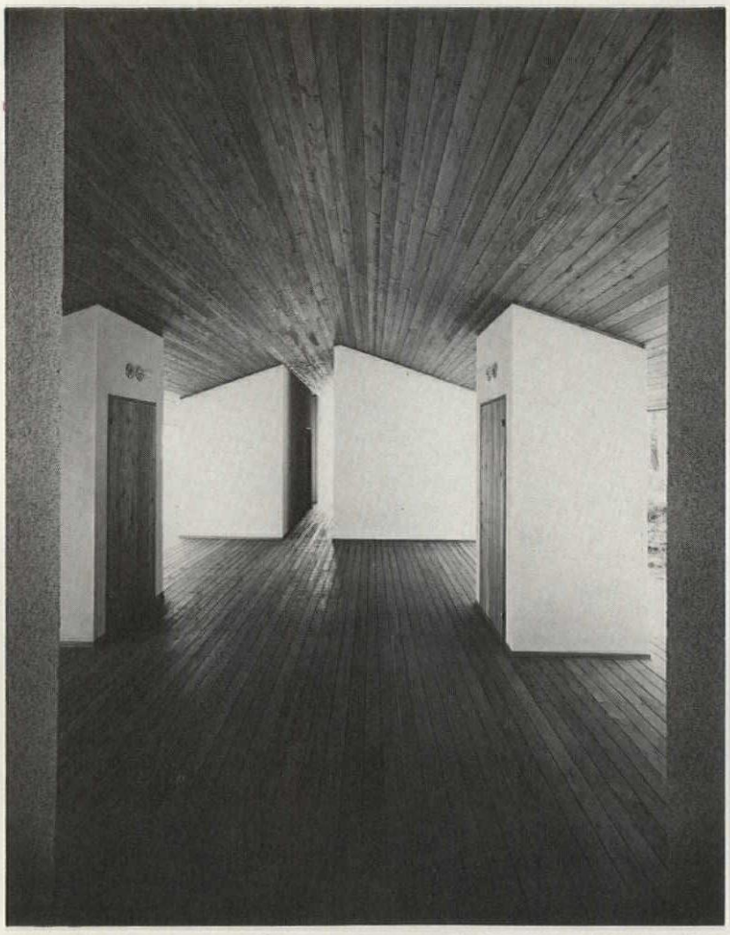
Project: *House of Gate, Tokyo.*
Architects: *Riken Yamamoto & Field Shop.*
Site: *1150 sq ft in densely inhabited part of city.*
Program: *residence for businessman, who has frequent guests, and family; distinctions to be clear between public and private parts of house.*
Structural system: *box frame type reinforced concrete.*
Mechanical system: *gas-fired*

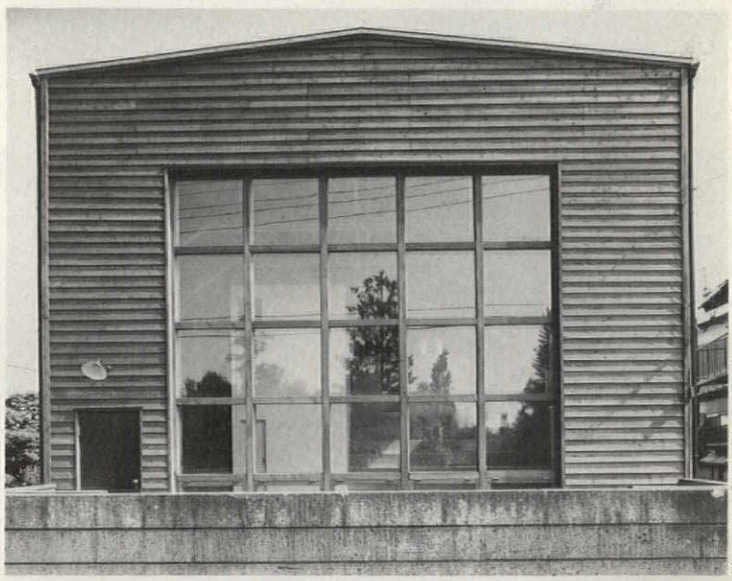
heater and heat-pump cooler for each room.
Major materials: *inorganic spray finish on exterior; interior walls of painted gypsum board over foam insulation.*
Consultants: *Kazuko Fujie, furniture; Takashi Kojima, Kojima Construction Co.*
General contractor: *Kadowakt Construction Co.*
Costs: *$148,000; $78/sq ft.*
Photography: *Mitsuo Matsuoka, © The Japan Architect.*

Minimalist attitudes of the architects are seen quite clearly expressed in the interior of House of Gate (facing page) and in the interior and exterior of House of Tower (right, middle right) and House of Air (below, bottom right).

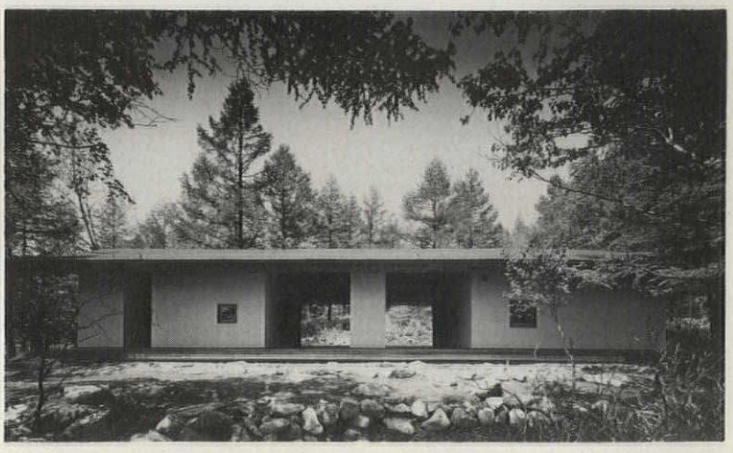


Masao Arai © The Japan Architect





Masao Arai © The Japan Architect



Juan Ramon Loubriel Stadium, Bayamón, Puerto Rico

A big hat in the sun

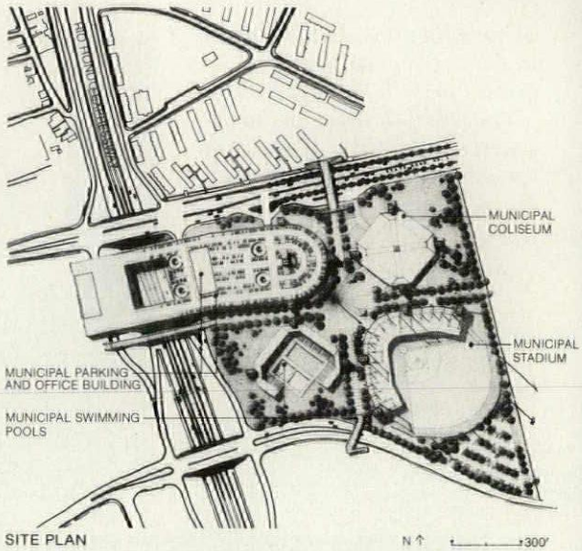
Architects for a tropical stadium turned a difficult roofing problem into an architectural achievement. The result is befitting both to the town and to the sport.

The sport of baseball is known for its color, precision, and drama. The Bayamón Stadium demonstrates the same character traits. On the interior (below and opposite, mid-page), the drama comes with a deep overhanging roof. On the exterior (opposite, top and bottom), the tensile members and cocked lights result in a stadium poised for action.

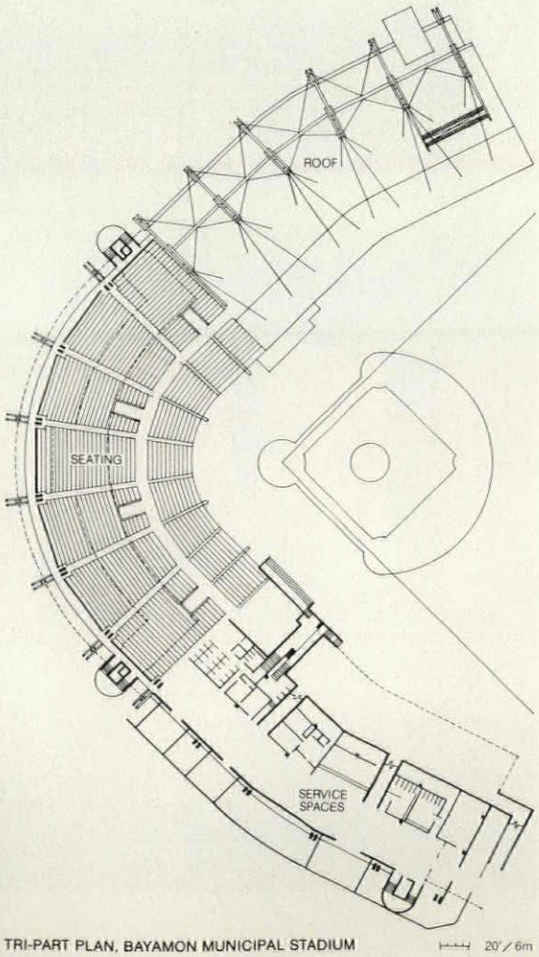
For six months of the year baseball gives the fans in Boston and New York an excuse to drink beer, eat hot dogs and grow hoarse. The rest of the time the sport and many of the same players flourish in the Winter Baseball League in places like San Juan, Puerto Rico. In a suburb of San Juan called Bayamón, 17,000 or so people of all ages and sizes come to root for the home team. Howard Cosell finds "architecture" in baseball up north. The Puerto Ricans find baseball in the architecture of Bayamón stadium.

The sport of baseball is more than a game in Bayamón. The stadium is a symbol of the social progress and economic growth that has occurred in the last 20 years. There are still slums in Puerto Rico but not so many, and they don't seem to grow so rapidly. The birth rate is lower, the agricultural economic base is changing to industrial, bringing people to the city. And the cities are growing in a more orderly fashion.

It was in the urban plan of Bayamón that a



SITE PLAN



TRI-PART PLAN, BAYAMON MUNICIPAL STADIUM


Gil Amiago

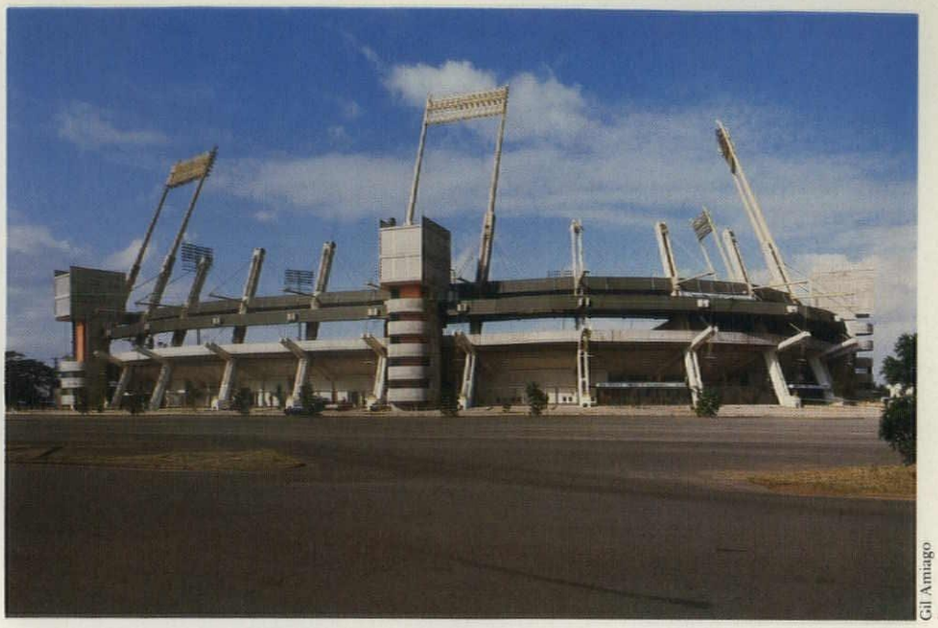
spectator sport stadium first appeared. The same architects, Reed, Torres, Beauchamp, Marvel, who did the urban plan were asked to design the stadium as well as an adjacent coliseum, swimming facility, and parking structure to accommodate the crowds. The complex is itself a stage of a long-range planning proposal which is continually updated and eventually may include a regional rapid transit system. The stadium location in the center of the downtown area for Bayamón guarantees its continuing transportation access and role of prime importance to the town.

The Bayamón Municipal Baseball Stadium is not the only such facility in San Juan. It is, however, the only covered one. It was mayor Ramon Luis Rivera who requested that the architects "cover all of the seats," seeking protection from the hot sun—and brief showers of the winter months. The mild 75–85 F temperatures are easily accommodated, but the climate also demanded hurricane protection as well as seismic safety precautions. The fans, of course, wanted a column-free view of the field and lights for night games. The result was, as design architect Tom Marvel dubbed it: "like sitting under a big hat in the sun."

In the great Latin tradition of Nervi, Torroja, and Candella, the sweeping romance of the tropical structure is laced with solid structural logic. The suspended lightweight steel "wings" that spread to cover the seats are topped with concrete and built-up roofing to keep roof flutter under control in a high wind. The masts that support the roof are pinned at the top of the cast-in-place seating. They are doubled to allow a chase for the wiring, cables, and miscellaneous "spaghetti" leading to the lights and TV needs from below, as well as to contain hidden roof drains. The masts were precast and post-tensioned flat on the ground before being hoisted and guyed into place. The steel roof and 2-in. galvanized bridge cables then rigidly tie everything together. The 100-ft-deep roof plane is tilted up towards the field to allow the sportscasters in the press box to be able to see a high fly ball.

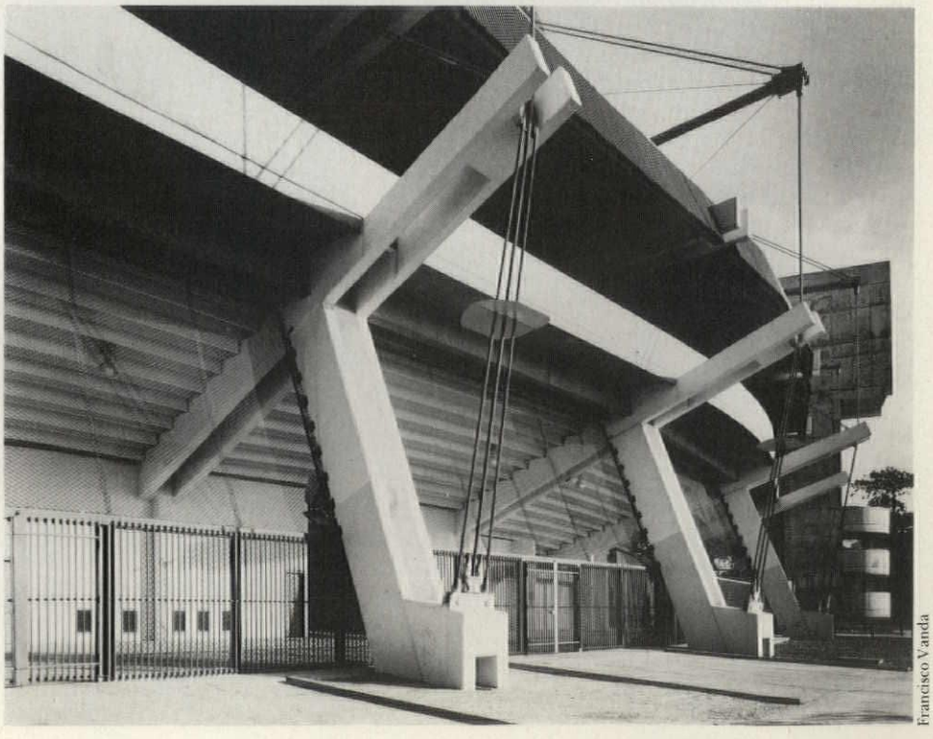
Concrete is the most abundant local building material in Puerto Rico, and the rest of the stadium structure makes economic use of that fact. The cast-in-place beams and canted columns are designed to maximize use of concrete and express compressive forces. Precast double tees span the distance between the seating supports. The stairwells are also cast in place.

Part of the structure's design clarity is a result of the wind testing which was done at Virginia Polytechnic Institute. The tilt at the end of the roof was found to have unexpected aerodynamic advantages, and a light and ventilation slot between the upper and



Gil Amiago

Gil Amiago



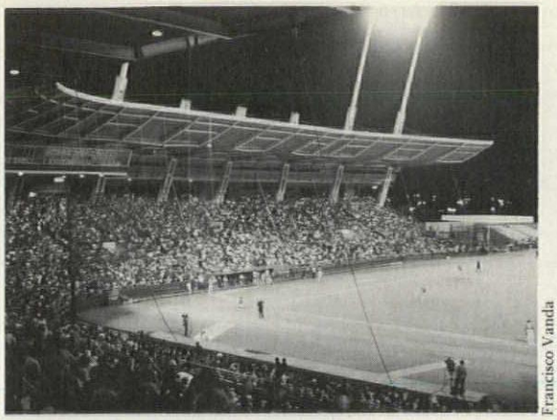
Francisco Vanda

lower roof sections was increased in size to help alleviate roof pressures in 150 mph winds. Cable tie-downs on the field side of the roof were added as a result of wind analysis. Says Marvel: "The wind tunnel really made some final decisions for us in terms of geometry."

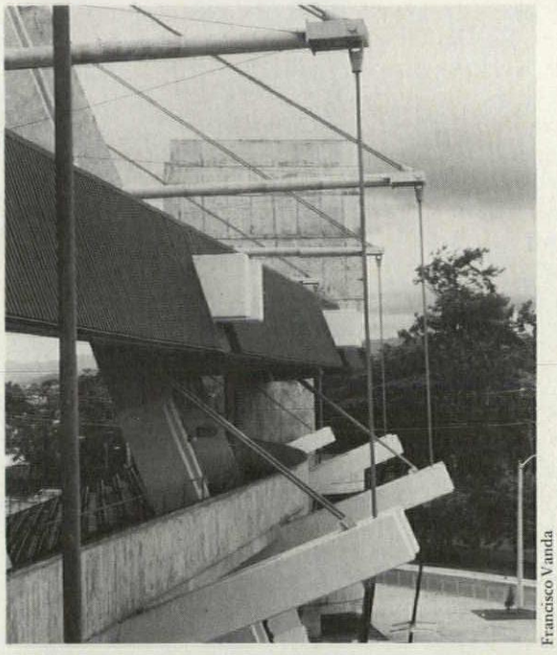
From the inception of design to the completion of construction, the architects went through a six-year process. Two years of that time were spent waiting for building funds with the caissons already in the ground. The job had a construction manager but no general contractor, resulting in some economies, and the steel was purchased early, minimizing losses from inflation. The building cost nearly $1 million more than anticipated, however, because of the long delays. Labor in Puerto Rico is not expensive but not necessarily as productive as in the states. Most of the non-cement products involved in the construction had to be purchased from southern states. The Roebling Bridge Company (of Brooklyn Bridge renown) closed permanently shortly after it produced the cables for the roof support, after nearly a century of existence.

Using mainland products is common in local construction, and language is not a barrier. Architectural offices in Puerto Rico are bilingual. Spanish is spoken in the office, and the correspondence is in Spanish. The drawings are in English, and the units of measurement used on buildings are feet. The site drawings use meters. Marvel is himself a New Yorker while his two engineering partners are native Puerto Ricans.

After several seasons, the stadium has proven to be a great success. It may eventually reach its designed expanded capacity of 25,000 people. In summer, it is used for basketball and competes with other arenas as an outdoor entertainment facility for the whole city. The "wide-brimmed hat" has proven to be very effective at its designed purpose of keeping the rain and sun off the crowds. Architect Marvel insists that he has watched the rain actually bend away from the seating due to unforeseen air currents and that he can remain dry while sitting in a first-base box seat. The addition of a roof has been an attraction for crowds, and the protected sensation and resulting acoustics give the spectator experience an intimacy uncommon in such large structures. As a result, the sport of baseball survives admirably in Bayamón in winter and so, apparently, does the art of architecture. [Richard Rush]



Francisco Vanda



Francisco Vanda

Data

Project: *Juan Ramon Loubriel Stadium, Bayamón, Puerto Rico.*

Architect: *Reed, Torres, Beauchamp, Marvel, Hato Rey, Puerto Rico.*

Client: *Municipal Government, Bayamón, Puerto Rico.*

Site: *flat site, centrally located with excellent access from surrounding highways.*

Program: *the client needed a new baseball stadium for a Winter League team, capacity 17,000 people. All seats were to be protected from sun and rain.*

Structural system: *steel roof and cables hung from post-tensioned concrete masts supported by cast-in-place concrete base structure.*

Major materials: *galvanized bridge cables; steel beams and decking topped with concrete and built-up roof; post tensioned and normal cast-in-place concrete with precast seat supports (see Building materials, p. 183).*

Consultants: *Victor Garcia & Associates, mechanical; Hernández & Hernández, structural; Virginia Polytechnic Institute, wind analysis.*

Construction manager: *Martinez & Torres.*

Cost: *$6,500,000.*

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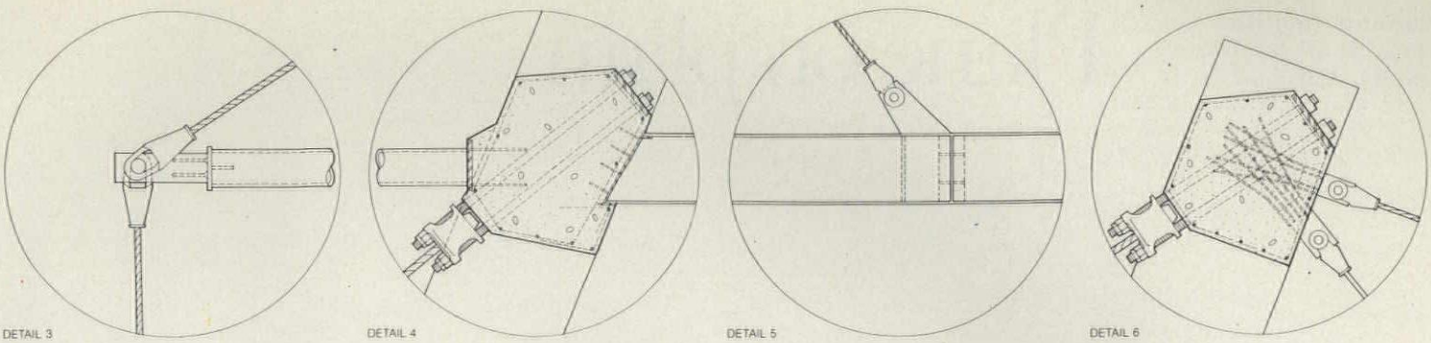
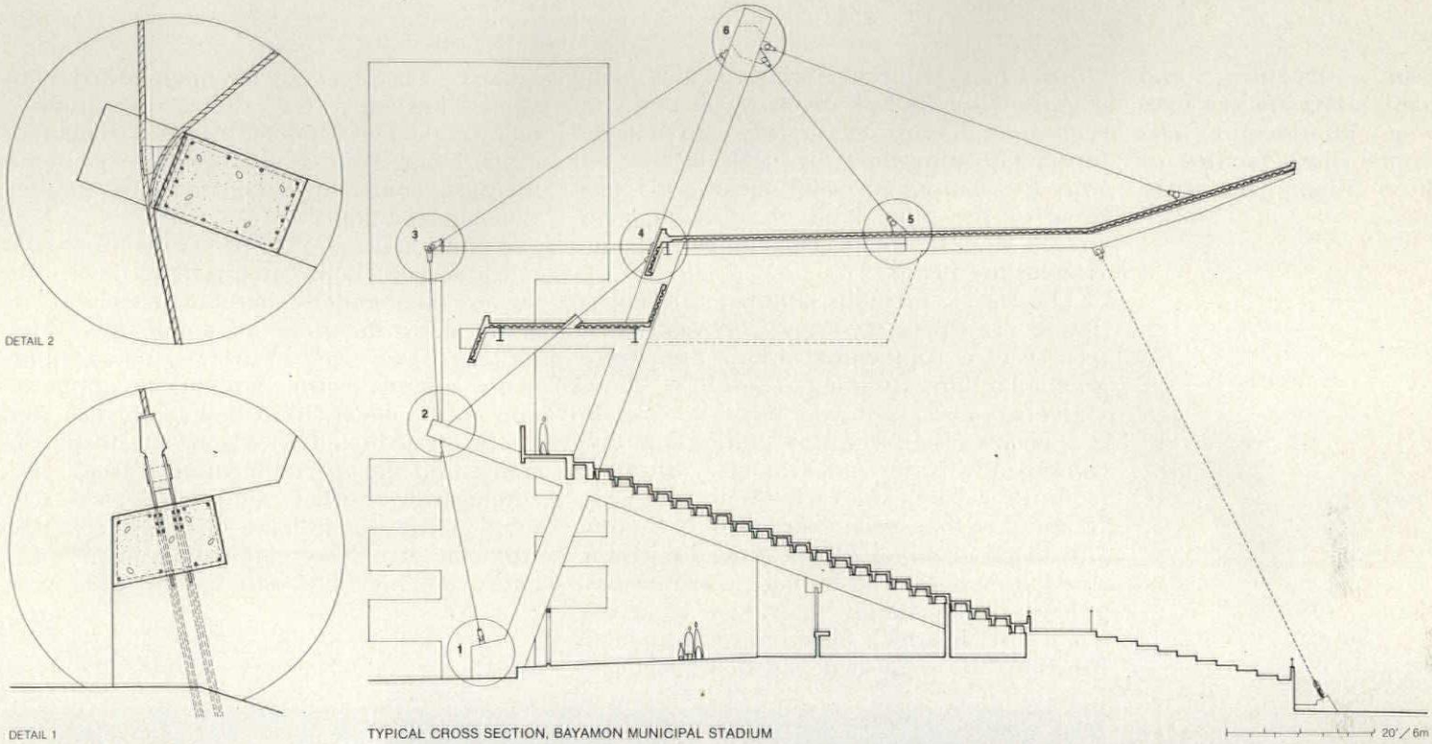




TYPICAL CROSS SECTION, BAYAMON MUNICIPAL STADIUM

The architects for the stadium capitalized on Puerto Rico's most abundant building material, concrete. The weighty stair tower shown at left contrasts handsomely with the spindly tensile members needed to support the lightweight steel roof structure. To optimize costs and structural efficiency, concrete was assigned the majority of the pure compressive forces, and the steel cables were assigned pure tension. The steel roof structure contains bending moments in wind and from the layer of concrete and built-up roofing added to reduce roof flutter in high wind. Structural detailing was also carefully considered to avoid bending moments in the concrete. The result is a triangulated "truss" action and column-free view for the spectators, rain or shine. At right, the roof structure is exposed during construction.

Francisco Vanda

Recreational Facilities Building, Southern Illinois University, Carbondale, Il

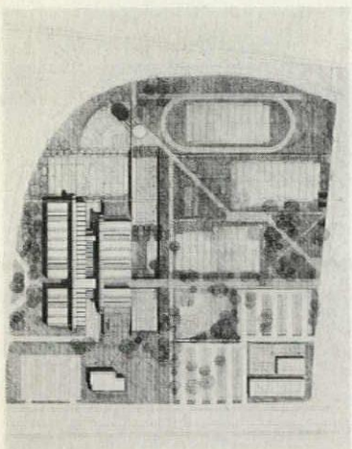
Plane on plain

Program, structure, and mechanical system are handled as interlocking elements in a sports facility for Southern Illinois University campus.

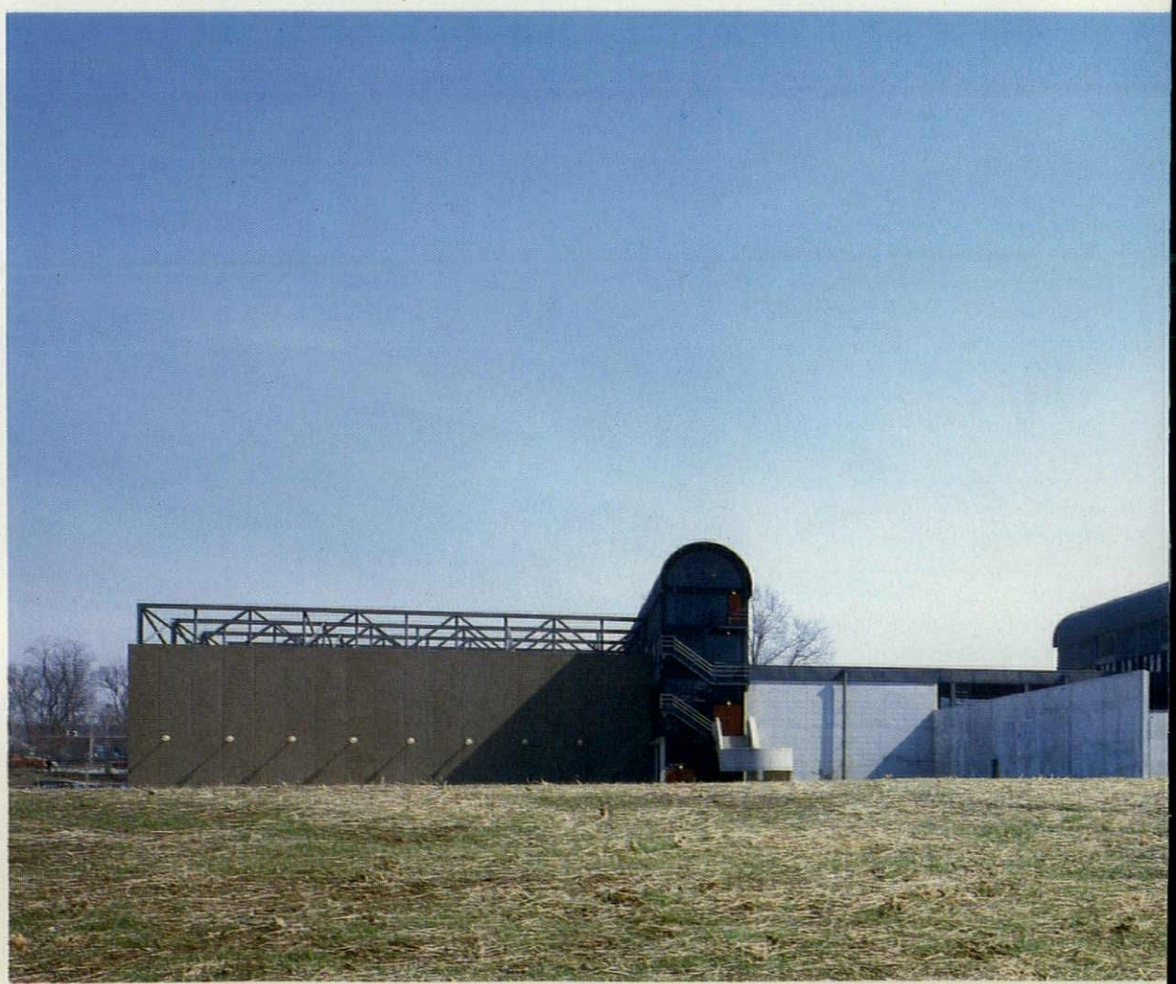
Now, when Modern Architecture is being dismissed for its lack of character and content, one still must occasionally leap to its defense. Throwing the baby of Modernism out with the bathwater could mean we repeat some of the same kind of mistakes mainstream Modern architects made 30 years ago vis-à-vis the Beaux-Arts.

The forms, methods, and overall modern design principles, we know, can yield architecture of a compelling vision. The Recreational Facilities Building at Southern Illinois University in Carbondale illustrates to a degree such a case: it employs a rational attitude combined with vernacular imagery springing from the work of the early Modern masters. Its tougher-than-nails exposed steel framing and metal cladding placed atop the aggressively honest poured-in-place concrete base adheres unflinchingly to Modernist tenets. The clarity in which different programmatic functions are separated and made legible is notable. The logic of its open-ended plan allows flexibility for future expansion—following one of Modernism's important precepts. Using a site and program to generate the *parti* conscientiously continues another valuable tradition.

A site that drops 15 ft from the south to the north prompted the architects to devise the linear, open-ended solution stretched laterally along the slope of a hill (see plans, sections). Two types of architectonic components dominate the building's configuration—one a linear circulation spine, the other a clear-span box. In its *parti*, the main entrance and the spectator viewing areas, plus administrative offices and lounges—spaces used by the nonathletes—are kept separate from the actual recreational facilities: spectators can enter the building from the top of



On a hilly site that drops 12 to 15 ft, Ralph Rapson & Associates place a 520-ft-long building along the slope of the hill. The three-level structure, partially below grade, has mechanical equipment contained in the top level under barrel vaults spanning long corridors.



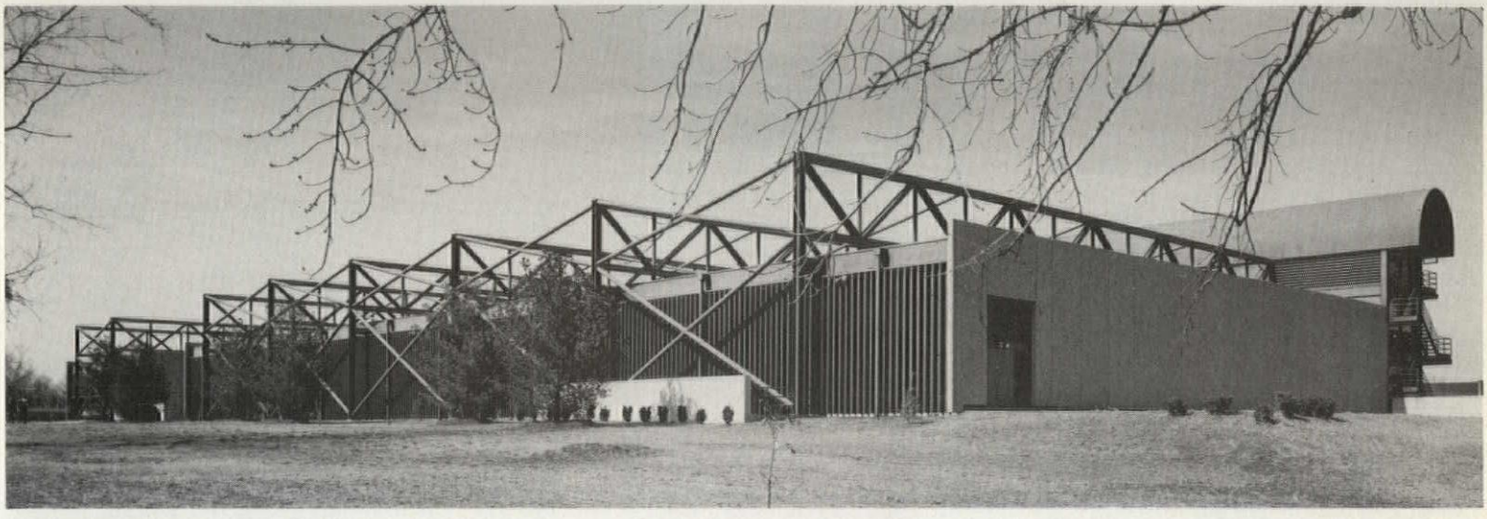
The poured concrete foundation walls, fin walls, and beams of the lower portion of the building are exposed as the site drops down to the north. Steel framing, including continuous steel beams, tie beams, trusses, plus insulated metal panels and curved roof panels create a straightforward response for the earthquake area.

the hill at the second level and view the various athletic activities taking place below. Downstairs, an entrance from the rear parking lot leads directly to lockers, gyms, and pools. Subsidiary activities such as handball courts, dance and exercise rooms are housed in the concrete base between the two lateral spines.

Juxtapositions

While logical enough in plan, the below-grade and above-grade parts of the structure seemed to call for more exposed concrete than the architects knew what to do with. The treatment of the cross walls and the base of the building is one of the most dissatisfying aspects of the solution. The tacked-on precast aggregate panels cheapen the whole effect in a way that too closely recalls Pizza Hut architecture. Globe lights help not a bit. Juxtaposing these flimsy-looking elements with the exposed reinforced concrete foundation walls and fin walls of the building only dramatizes the problem. Moreover, the concrete walls have been treated perfunctorily as anonymous masses without sufficient detail or interesting texture.

These lapses are serious in that they perpetuate the clichés of "Mediocre Modern." They take on those features for which Modern Architecture is blamed—uniformity, lack of human scale, over-abstraction. If the same attention had been given to the base that was paid to barrel-vaulted galleries with their crisply louvered openings, planar fenestration, the elegant linearity of the fire stairs and



framing elements, the total effect would have been quite different. The gallery spines, along with the exposed-truss and metal-paneled containers, maintain the straightforward simplicity of the Modern idiom, but avoid its pitfalls.

Interior treatment

The interior is legible and lively, even though large ducts painted bright colors may seem now too convenient a way of giving "visual interest" to big spaces. But they do the job rather effectively. The sculptured ganglia of ducts, pipes, and raceways dropping down two levels of an open well next to the pedestrian passageways, break up the horizontal length of the corridors and accentuate the vertical height. Originally Rapson and his team wanted to open the galleries all the way up to the top of the barrel vault. Acoustical and thermal considerations, however, called for the third level, containing the equipment, to be sealed off.

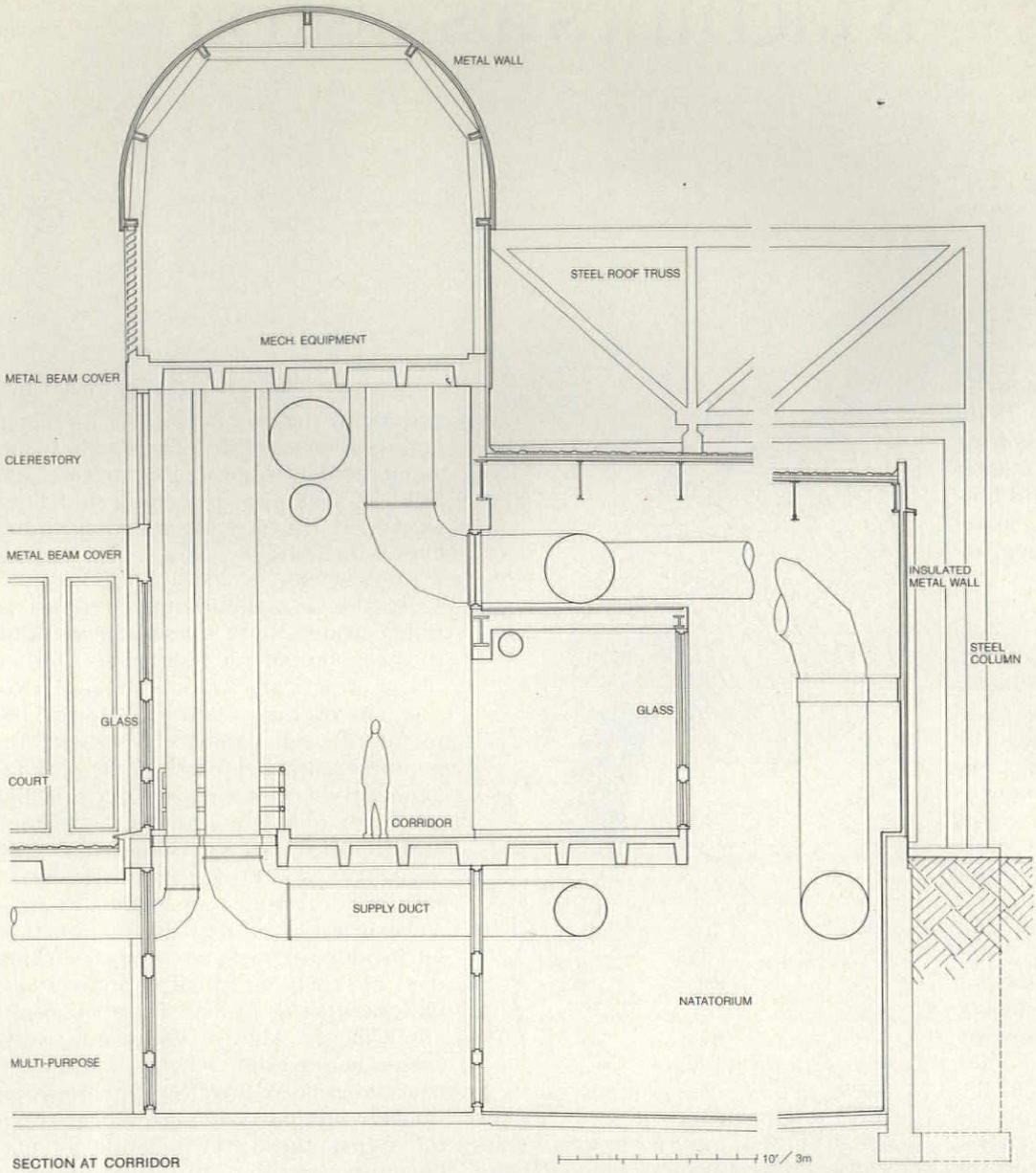
Since cooling and ventilating a recreational building form major portions of operating costs, the university specified that no windows be installed in the gym and pool. The architects gave in, glassed in the corridors, and used more painted ducts to offset the gloom in those areas.

Strengths in imagery

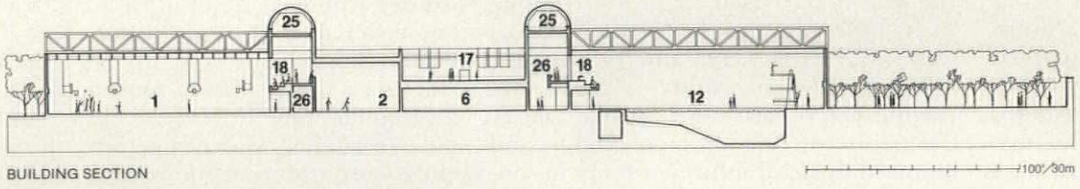
The gallerylike spines, the strongest part of the formal composition, form an inevitable association with the work of Italian architect Aldo Rossi, particularly his house in Borgo Ticino of 1973. The mention of Rossi is not done with any intent of arguing derivations. The same genetic pool of architectural elements served Rossi and Rapson, although the recreational building does present a less rigorous version. Nevertheless, looking at the work of visionary architects helps us appreciate certain attempts undertaken literally in our own backyard.

The affinity of this design for regional vernacular forms in the rural countryside around Carbondale is striking. Grain silos dotting the land recall the earlier images that stimulated Modernist transformations in the 1920s. Nearby, the glimpse of a Quonset hut at the rear of a junior high school further demonstrates the richness that can be seen in past building forms previously dismissed. This freshness apparent in some parts of the building serves as a reminder that the Modernist vocabulary, when pushed and manipulated, still yields buildings nicely anchored in their time and place. [Suzanne Stephens]

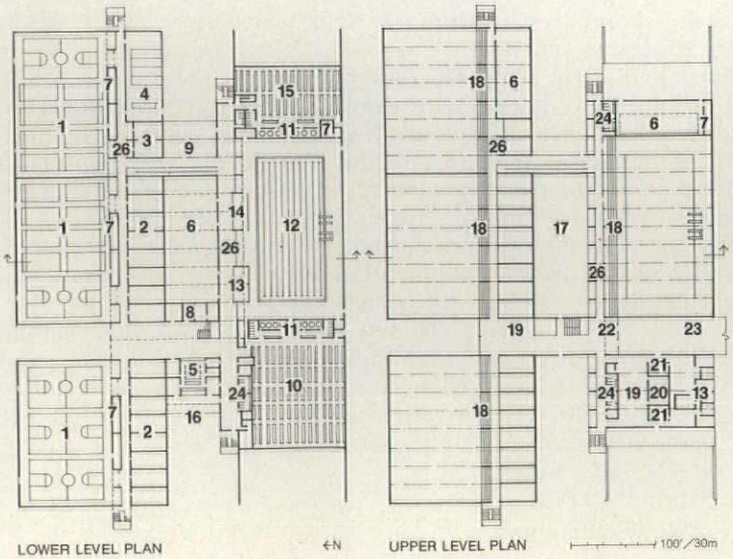
Gallery and lounge areas (right) overlook pool from upper level (above) and lower level (below). Gym, pool, and wrestling facilities are shown opposite.



SECTION AT CORRIDOR



BUILDING SECTION



LOWER LEVEL PLAN UPPER LEVEL PLAN

LEGEND

1 Main gymnasiums
2 Handball courts
3 Squash
4 Golf
5 Equipment issue
6 Multi-purpose
7 Storage
8 Scuba
9 Vending
10 Men's lockers
11 Showers
12 Natatorium
13 Offices
14 Classroom
15 Women's lockers
16 Receiving
17 Open—future expansion
18 Spectators seating
19 Lounge
20 Television
21 Conference
22 Control
23 Entry bridge
24 Rest rooms
25 Mech. equip.
26 Corridor

Data

Project: *Recreational Facilities Building, Southern Illinois University, Carbondale Il.*

Architects: *Ralph Rapson & Associates, Minneapolis. Ralph Rapson architect, Richard Morrill, associate in charge.*

Site: *10 acres of hilly terrain with a 12- to 15-ft south-to-north drop at edge of campus; 50 acres including playing fields.*

Program: *provide 235,000-sq-ft recreational facility with Olympic-size (156' x 75') pool, three large gymnasiums (115' x 160'), plus handball and squash courts, game rooms, lounges, offices, outdoor terraces at upper level extending from circulation and lounge areas. Spectator seating for 600 overlooking the pool.*

Structure: *steel framing, decking, steel paneling, cast-in-place concrete base.*

Major materials: *steel, precast concrete panels, metal panels, V.A.T., exposed concrete.*

Consultants: *Robert G. Burkhardt & Associates, Chicago, mechanical and electrical; Bakke, Kopp, Ballou & McFarlin, structural.*

General contractor: *J.L. Simmons Company.*

Cost: *$8,696,802; $35 per sq ft (completed 1977).*

Client: *Southern Illinois University.*

Photography: *Barbara Martin.*

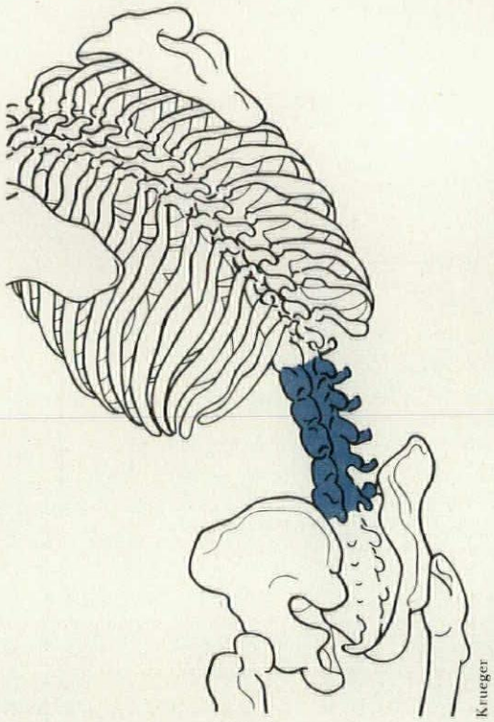
Machines à s'asseoir

If the most dramatic development in office chair design during the 1970s was the introduction of ergonomics, the most important task of the 1980s is to assess what we really know and how we might apply it. Meanwhile, materials and mechanical devices keep improving.

It was the late 1950s, as one manufacturer recalls, and the European doctor came directly to the point: "Sitting in an ordinary office chair for a long time," he said, "is like having a minor heart attack." There are all kinds of assessments of exactly how serious a problem exists for the 75 percent of us who sit while working. But the orthopedic surgeons, cardiologists, and public health authorities seem to agree on certain fundamentals.

Back disorders are the number-one cause of absenteeism in the workplace and the second most prevalent disease in the U.S. (after sinus problems). They affect between 50 and 80 percent of the population and include complaints ranging from discomfort to degeneration of intervertebral discs. Pressure under the thighs restricts circulation in the legs and can cause muscle cramps and swelling of feet. A similar pattern which occurred in England during World War II when people brought folding chairs into the air raid shelters, was written up in medical journals as "shelter legs." The arrangement of the body in various chairs can, according to many doctors, affect a wide range of muscles and nerves and interfere with the functioning of vital organs.

The disorders thus described are called ergogenic diseases, produced by exposure to a work environment, and several related branches of applied science have evolved to address the situation. Ergonomics, from the Greek *ergos* (work) and *nomos* (natural laws) refers to attempts to study the interaction between man and his workplace. Human



Krueger

Lumbar vertebrae in blue.

factors engineering, offered at the graduate level of quite a few universities nowadays, has as its intention to expand the knowledge used in product design to include findings from the fields of anatomy, physiology, and psychology. Sub-branches of study include anthropometry—size and weight measurements of the human body; and biomechanics—the human body in motion.

Though now applying themselves to everything from hair dryers to moonshots, these disciplines had their real start in World War II as more and more complicated airplanes kept crashing because of pilot error. Redesigning the pilot seat and relocating points the pilot had to reach for the controls made the difference. Even today, the vast majority of members of the human factors professional organization are employed on defense contracts.

But there is an increasing interest from the private sector, with the United States trailing a good bit behind the Europeans and Japanese. Office chairs have been the subject of much research—primarily in Switzerland, Sweden, Germany, and Japan. Back disorders, doctors say, are not only prevalent, they seem to have increased greatly in recent years. They point to our accelerated biological growth rate and lack of exercise as children. Thus weakened, they say, we spend our adult lives hunched over work tables making matters worse.

Besides a magnanimous interest in public health, there is a certain attention to the potential for increasing productivity. Americans have increased productivity on farms and in factories, but in the office it has barely budged. Ergonomic seating research in the past has generally been aimed at precisely this goal—for airplane cockpits, tractors, and fork-lift trucks. Some, like E.R. Tichauer, New York University human factors professor, state flatly: "A well-constructed chair may add as much as 40 productive minutes to the working day of each productive individual." Others, such as human factors consultant Charles Mauro ("within a wide range, better doesn't help") and industrial designer William Stumpf ("a questionable one percent") are more skeptical. What they are debating is not, obviously, greater productivity of a worker who is at home with a bad back but faster and more accurate work by those who are showing up regardless. The area where chairs may make the most noticeable difference is at computer terminals which, like aircraft, require close attention and where, also like aircraft, the tiniest error can cascade into a serious problem.

Doctors' orders

With the help of gadgets that measure blood flow, electrical potential of muscles during contraction, and quantify in analog fashion or digitally the changes in angle between body segments, researchers have put together various recommendations. There are some on which most agree:

1) The front of a work chair should be rounded off—often called a scroll edge or waterfall cushion—in order to avoid restricting blood flow in the underpart of the thighs.

2) Support for the lumbar vertebrae should be provided, helping the back to hold a slight forward arch.

3) The seat cushion should have only light padding so the buttocks can change pressure areas easily. If it is too soft, it puts pressure under the thighs, rocks the hip bones upward, and pinches the underside of the socket joint.

4) Backrests should be high enough to allow for relaxing, at least high enough to hit the lower few inches of the shoulder girdle, giving the arm a stable base against which to move.

5) Just above the surface of the seat, the backrest should be either left open or so strongly concave that the ischium can be rotated backwards without hindrance. This also allows for air circulation and shirttail room.

6) Seat height should be adjustable. Different researchers recommend ranges from 6 to 9½ in.

7) Footrests should be provided for two reasons: for very short people who must adjust their chairs too high in order to comfortably work on their desks, and to improve the angle of the foot in repose.

8) A headrest is suggested if the chair reclines. However, large rolls that push the head forward are apparently worse than nothing at all.

9) There should be some mechanism for inclining back and seat, resting strained back muscles. Movement back and forth, according to research by Dr. Juergen Krämer, encourages diffusion of essential nutrients to the viscous material in the intervertebral discs, without which they may degenerate, lose firmness, become flat, and in some cases bulge out, leading to various nerve disorders.

Many new chairs are being fashioned with some of these recommendations clearly in mind. Most chairs claiming to be ergonomically designed have scroll edges and space where the seat meets the backrest. Many have higher backrests, including secretarial versions. And these new chairs incorporate a number of other features, considered important for safety. Sharp corners and protruding parts are eliminated. Care has been taken with moving parts to avoid pinching. Chair arms are shorter or lower to avoid hitting the desk and sometimes cantilevered to permit lateral leg movement. Some of these characteristics have been encouraged by government-set standards—the DIN regulations in Germany and equivalent rules in Sweden and Japan. While there are no such standards in the U.S., these chairs have begun to develop a market here both in imports and, increasingly, home-grown varieties.

R-Way Lo Chair.

Charette's German import Egosit RS 89.

HAG's 2030 executive model.

Confusion in the ranks

There are reasons for caution, however. In the first place, despite claims, a number of clearly agreed-upon recommendations are ignored by manufacturers because of the cost involved. Among these are height adjustments of more than three or four inches and footrests. Even more to the point, there are some recommendations that are only agreed on in the most general of terms, and others—including fundamental aspects of chair design—that are hotly debated, with doctors taking diametrically opposing sides.

Among the recommendations only generally agreed upon is how much seat padding to use. All say not too much, but the exact amounts vary. Similarly, all are in favor of lumbar support, but vary widely on exactly where the backrest should be located above the seat, how high it should be, and of what contour.

Many suggest that the seat should be contoured to distribute weight evenly over the buttocks, thighs, and feet. But Tichauer, for instance, counters that contouring inhibits movement.

There is not even agreement on whether the seat of a work chair should be parallel to the floor, angled forward, or angled backward. A famous in-print controversy raged when Dr. Aage Christen Mandal, a Danish surgeon, introduced a chair in which the seat pivots forward as the office worker leans closely over his desk. Typical backward tilting or right-angled chairs, argued Mandal, leave people hard at work sitting on the edge of their chairs, with their lumbar region bent forward, stress placed on discs and haunches, and thighs cut into by seat edges. Commenting in the same issue of the British journal *Design,* professor Joan Ward argued that the Mandal chair might well put too much weight on the thighs, neglect to support the vertebrae, restrict movement, and run the risk of sliding back as the occupant tried to sit down, leaving him or her on the floor. Wrote Mandal in an angry letter to the editor: "All her objections seem to be based on old 'principles' that have never been scientifically proved. As long as we accept these old 'principles,' no improvement can be obtained." His chair is still available from HAG of Norway (which has begun distribution in the U.S.), but no consensus has ever been approximated.

Meanwhile, scientists Schneider and Lippert propose a wedged seat to tilt the pelvis forward. Grandjean suggests a slight backward incline to the seat with a double wedge. Burandt suggests tilting the front half backwards three to five degrees. Akerblom suggests tilting the whole thing back three to five degrees, and Kroemer thinks at least six to seven is called for.

Then there is the question of adjustments. There are two kinds of adjustments, those for size and those for movement. Size has to do with fitting one chair to a varied population. There are size variations between individuals, sexes, ethnic groups, and generations.

And those variations include not just height and weight but the height and width and weight of all the parts.

The classic study by G.S. Daniels called "The Average Man?" illustrates how varied the populace is. He took the ten most common body measurements of 4063 Air Force flyers to see how many would fall within average range. Not only was he working with a population in which real extremes had already been sliced off, but he defined average as the full middle 30 percent. By the time he had sifted through nine measurements, only two men were still average. None at all made it all the way through ten.

Statistics on all the human weights and measures have been accumulated for decades and are arranged in their most commonly used form in percentiles. Manufacturers as a matter of course ignore the very largest and very smallest. The rest are presumed to be accommodated by adjustable parts.

Most chairs have height adjustments. Some have adjustable backrest heights and seat-pan depths. A few take a kit-of-parts approach and provide a variety of seats and backs which can be used in a frame interchangeably.

One of the more heated aspects of the size question is the tradition of secretarial chairs being designed for women, management and executive chairs for men. Says industrial designer Don Albinson: "Most designers are men and the [executive] chairs they design are for men. They are too big for most women. An average woman is less than 5′-5″. That is the same as the lowest fifth percentile for men. Women have longer legs and shorter waists. When a man tilts back, his weight is over the pivot point and the chair holds back. With a woman, the pivot plane is different, and she must work to hold the chair back in a tilt position. The woman sitting in a chair designed for men may tilt back, but the spring tension is difficult for her to overcome. If she releases too fast, it might just catapult her out of the chair."

Adjustments for movement are another question altogether. All the research shows that people change position every eight to ten minutes while sitting. Doctors point out that this allows muscles to lengthen and shorten that, if kept still, would be subject to spasms; allows weight to shift between buttocks and torso; allows back muscles to relax; and keeps blood from pooling in the extremities.

What is not agreed upon exactly is what needs to move and how much.

Knoll International's management chair.

Herman Miller's Ergon operational chair.

Krueger's Vertebra, executive models.

Since the first wooden swivel/tilt chair on rolling casters was introduced in the mid-1800s as a preventive to sea sickness, we have had moving chairs that swing around and lean back. The seat and back of these move together, so it is as if the body is placed in a pivoting, rotating bucket. Many chairs, including some that are described by their manufacturers as ergonomic (referring to contouring, for instance) have for movement this same traditional tilt/swivel mechanism. And there are medical specialists who consider this quite good enough.

On the other hand, there are also specialists who suggest that the angle of the body should be regularly changed. In response, there are chairs that allow sitters to change the angle of the back while the seat or the seat and arms remain stationary. These chairs do not just lean back but must be locked into place at each angle. There are chairs in which the seat and back both incline but either independently or at a ratio that is not 1:1. There is a chair in which the seat slides forward as the back reclines and others in which only part of the seat inclines and part stays still. There are chairs in which the pivot point has been moved back further than is typical in order to sit directly under the pivot point of the body. The idea is that any other design slides lumbar support to the wrong part of the back as it reclines.

One thing that is leading some manufacturers either to the traditional swivel/tilt approach or to chairs which move automatically as the sitter moves is the question of how willing and able people are to adjust chairs properly and keep adjusting them as they move. If a chair is left in recline as a person moves forward, it provides even more stress than a non-adjustable chair. (There seem here to be some national differences between, for instance, the way Germans and Americans use chairs. One manufacturer puts more adjustments on the German version of its product because it has found that "the Germans will adjust any screw that's calibrated." On the other hand, adjustable reclining chairs may simply be too new in the U.S.)

As for movement that doesn't require moving parts, there seem also to be differing schools of thought. Some European chairs are contoured carefully to encourage office workers to sit correctly. Dismissing that approach as "only important if the chair runs at 120 mph and takes sharp corners," American (and other European) designers describe chairs more as squirming platforms, and provide room to wriggle about. Industrial designer William Stumpf goes even further and designed his chair for Herman Miller with the express intention that people sit right-side-up, sideways, and upside-down as they please, lumbar support or no. He sums the whole subject up when he says: "Ergonomics is not a hard science in the sense that some sciences are. If it were, chairs would tend to look more alike than they do now."

A roundup

There are several dozen chairs in the world market described by their designers as ergonomic, of which not quite half are either manufactured or available in the U.S. Among the major ones introduced or just about to be introduced, and with apologies beforehand for the many salient details for which there is insufficient room:

1) Knoll International's new line designed by Niels Diffrient of Henry Dreyfuss Associates, to be available summer 1980. There are two versions. One is the executive chair, aimed at providing a tilt mechanism in a bucket seat without incurring the problem of the sitter's feet being raised off the floor when he leans back. The key is a hinge in the seat about one-third of the way back so that while most of the seat reclines with the back, its front edge stays still. The less expensive management chairs have no hinge, but when the back is reclined, the seat automatically lowers. The chairs have short arms to clear desk edges, contoured cushions, a 3-in. height adjustment, and deeply concave silhouette where backrest joins seat. The secretarial version has a 4½-in. height adjustment. Dr. Janet Travell, former physician to John F. Kennedy, served as consultant.

2) Krueger's Vertebra (licensed by Open Ark of the Netherlands), designed by Emilio Ambasz and Giancarlo Piretti. Mechanisms unlike tilt/swivel or adjustable backrests allow chair to "move as the sitter moves." For instance, when the sitter leans back, the backrest tilts back and seat slides forward. Seat and backrest are contoured; executive model has headrest sprung at slightly forward angle; neoprene bellows conceal operating mechanisms; pneumatic lift is optional. Arthur Mattmiller, director of the Back School of California, has testified to the chair's effectiveness in exercising the vertebrae.

3) Herman Miller's Ergon, designed by William Stumpf. Admittedly designed to "look benign and comfortable and fun like gumdrops," as well as conform to some ergonomic principles, these chairs are essentially bucket in action with certain special provisions. "The stuff from Germany," says Ergon's designer, "is overkill." The backrests adjust up and down and thereby automatically deepen or shorten the seat pan. The backrest can be angled forward 10 degrees or moved back up to 20. The seat is angled forward 5 degrees (the only chair besides Mandal's that involves a forward tilt). And the tilt adjustment has been modified to accommodate a far wider range of weights than standard. Dr. Alton Ochsner, who developed the operation used on Richard Nixon's thrombophlebitis, advised Stumpf.

American Seating's Bio Chair.

International Furniture Industries' Swiss import Polytrop.

Westinghouse ASD's medium work chair for women and small men.

4) Westinghouse ASD's chairs designed by Don Albinson. This is one of the kit-of-parts series aimed at fitting a full range of people at any level of management including women executives. Several different tilt mechanisms are available including the standard tilt/swivel; a tilt that reclines the back and arms only, leaving the seat stationary; and a synchronized mechanism that reclines back and seat together at a 3:1 ratio.

5) American Seating's Bio, designed by Hugh Acton, to be introduced in June. Two kinds of movement are provided. The angle of the backrest can be adjusted and locked in. Without pulling a lever, the backrest tilts 27 degrees forward and back and—the only chair to do this—30 degrees side to side, pivoting from the post connecting back to seat. Gas cylinder is optional.

6) HAG's 2000, 2010, and 2030, Norwegian chairs designed by Peter Opsvik, introduced to the U.S. last year. Seat depth adjusts independently of backrest; seat-tilt tension adjusts; chair can be locked upright or tilt back freely; height adjusts pneumatically. Mandal's tilting-seat chair is also distributed by HAG.

7) Steelcase's Concentrx, to be introduced in June. Backrest and seat move in synchronized 2:1 ratio. The rear section of the seat pan drops as the back reclines. The angle of the front edge of the seat adjusts three degrees, and the chair can be locked in an upright position. The manager's chair has a 3½-in. height adjustment; the operator's chair, 4 in., pneumatic lift optional.

8) Arenson International's "S" Range, designed by orthopedic specialist Dr. Bernard Watkins in England. The thrust of Watkins' design is its contouring—an S-curved backrest in two sizes for shorter and taller people. Different seat sizes are also provided. In contrast to the theory of providing adjustable backrests, Watkins provides fixed backs adjusted to individual clients, insisting that inaccurately adjusted chairs are extremely harmful. Management and executive chairs have selective adjustable tilt actions.

9) Hanseatic Seating's Program 236-238, designed by Hans Roerricht. An affiliate of the German Company Wilkhahn, Hanseatic is being liquidated and the chair will be made available to the U.S. in future by Fine Art International Furniture of Scarborough, Ontario. Both seat and back adjust on a synchronized tilt system with backrest following sitter forward as well as back. Gas cylinders adjust height and tilt.

10) International Furniture Industries' Pasal, Rembo, Polytrop, and Lig-

nus, licensed by Stollgiroflex of Switzerland. Gas cylinder adjusts height and back angle. A modification of the mechanism allows a constant spring action at any setting. The executive lines (Pasal and Lignus) have a divided seat assembly (similar to and actually preceding Knoll's) that allows the front edge of the seat to remain stationary as the rest of the chair reclines. Rembo comes in two body sizes. Swiss doctor Ettienne Grandjean advised the company.

11) John Stuart International's Ero Dynamic, designed in Norway. The mechanical pivot is located on the same axis as the human body's pivoting point. Backrest and seat adjust angles independently, but are locked and unlocked by the same lever. Pneumatic lift is standard.

12) Charette's Ergosit RS89, licensed by Wilde & Speth of Germany. Seat and back adjust independently; mechanical pivot on same axis as body's; seat height adjusts 4⅜ in. with pneumatic lift.

13) Cole Business Furniture's 500 Series, designed by Jerome Caruso. Seat moves forward and back, backrest height adjusts, seat height adjusts. Standard tilt/swivel mechanism with tension and balance controls, optional gas cylinder.

14) R-Way Lo Chair. Contoured, high backrests even on secretarial models, standard swivel/tilt mechanism on executive models.

15) Atelier International's Babar, designed by Andre Vandenbeuck and Alex Strassle in Switzerland. Contoured, with standard adjustments for secretarial model (back angle and height) and bucket with standard tilt/swivel mechanisms for larger versions. Gas cylinder optional.

16) Designcraft's Superchair, designed by Hans Kriecks. Back and seat move independently. Seat height and back incline pneumatically.

17) Kimball's Focus One. A contoured bucket seat with lumbar support and standard tilt/swivel mechanism.

Some ergonomic chairs, such as Haworth's German-designed Function Formula Seating, have already been discontinued. Others, soon to be available, are not yet ready for publication.

Consultant Charles Mauro cautions that the chair alone is only a partial approach and that the real answer lies in the design of the whole workplace—desk, cabinets, business machines, etc. Again, the increasing use of computers is expected to generate industry interest in this approach. Several systems already offer adjustable desks.

John Stuart International's Ero Dynamic.

Arenson International's "S" Range executive seating.

Materials and mechanisms

One of the specifications almost all of these and other new chairs have is a five-star base. Introduced in Europe where legislation like Germany's DIN regulations require it, the base is considered more stable. If a caster or even a leg breaks, there are generally at least three points firmly touching ground, and the sitter doesn't wind up backside down. The five-leg base is also considered more stable at a smaller circumference, providing less tripping as well as tipping and more efficient use of office territory. However, Germany is expected to be passing a new DIN standard that will require the blades of the five-star base to be as long as the blades of a traditional four-prong one, for even greater safety but without space gains.

The news in casters for the past ten years has been the double wheel, introduced by the Danish firm Kevi and imitated in almost 150 versions. German DIN standards have added a new rule: casters must have automatic brakes that lock when the sitter stands up. The idea is that the chair won't slide away as you try to sit down or follow you like Fido when you get up. The drawback is that you lose the ability to roll the chair over to the files while you are standing. This has yet to be introduced in an American-manufactured product.

Mechanical controls are always being tinkered with. Steelcase has a new dual torsion spring; Faultless (a control, base and caster producer) has brought out a fiberglass spring only 1¼ in. high, and designers are building their own controls into the columns and arms and backs of new lines. Most of the new chairs have height controls that operate automatically by rotating the chair when you are not sitting in it and disengage when you do sit down, with no need to crawl under.

But the last word of course is pneumatics. Invented in Germany in the 1950s for furniture, they have been used here largely to open hatchbacks or raise dental chairs. In office chairs, they can be used to adjust height or the incline of either back or seat and back. The pneumatic controls or gas springs operate roughly like this: there is a piston within a cylinder containing pressurized nitrogen. The piston has a hole so the pressure on either face of it would tend to be equal. However, the piston rod on one side reduces the area on which the pressure can be exerted on that side, which creates a net force tending to extend the piston. Gas springs have been developed which lock at any point and have been joined so that one lever can operate either of two springs, depending on which direction it is pushed.

For office chairs, they provide quick adjustments from a seated position and a cushioning effect when sitting down or getting up, with a movement that is smooth throughout the entire range. In Europe, 30 to 40 percent of the office chairs manufactured are equipped with these. Here, only 10 percent are thus far. Among the main reasons is a $15 price tag per chair control to manufacturers instead of the $1.25 to $4.00 tag on standard mechanical controls. Another caveat from manufacturers concerns leakage through the seals of the gas cylinder. Pneumatic device suppliers say leakage is a problem only if the chairmaker doesn't design the chair correctly.

Faultless, meanwhile, has patented but not put into production a gas lift with a valve that can be recharged with nothing much more complicated than a CO_2 canister. But first it is waiting for a

bigger U.S. market, says product manager Ron Dame. Two companies do distribute gas springs in America: Gas Spring Co. (under license from the German inventor Stabilus) and Suspa.

Chrome is less and less *de rigeur* on chair bases and in its stead is a range of possibilities. Wood and plastic caps over steel legs are common. So are plated finishes—including "antiqued" brass. Epoxy paints (two-part chemical mixes of a color base and a hardener) provide a strong finish. And a number of companies have turned to powder coating, a technique that involves electrically charging the metal base with one charge and the spray gun with the opposite charge, then heating to 420 F to melt and bond the powder.

High resilient foam

There is another trend in bases—and arms and cushioning and even structure—and that is the development in flexible polyurethane. Nearly 80 percent of upholstered furniture relies on urethane for cushioning, a technique learned from Europe and the American auto industry. All flexible urethane is produced by a chemical reaction between isocyanate and a polyether or polyester-based polyol. Adding a little water produces carbon dioxide which makes the mixture rise.

There are two methods of production. The most common is slabstock. The foam machine lays the chemicals on a conveyor belt; foam is formed and rises 40 to 45 in., is cut in lengths like loaves of bread, and then cured. The solid pieces of urethane can be cut in various shapes, sanded, layered with Dacron, etc., to make the cushioning required. Office chairs, however, generally use the molded or cold-cure urethane process. The chemicals are injected under pressure into a shaped die, sometimes at two different points. The glop falls to the bottom and slowly rises to fill the die. When the die is removed, what is left is a finished object. Labor can be unskilled; many procedures are eliminated; any shape is inexpensively produced; and inventory is reduced to merely chemicals. Pieces are then taken out of the mold and crushed to break the bubbles and ensure uniform density. Steel frames can be embedded within urethane as well.

Several developments have made this process even more attractive. In the early 1970s, high resilient foam was invented. Its advantage is differential density. It has a soft feel at the surface but becomes more solid as it goes in. Called a high sag factor, this characteristic allows for cushy comfort in a high-load bearing piece of urethane. Secondly, it has a quick rebound ability

Cole Business Furniture's 500 Series, management model.

Atelier International's Babar collection from Switzerland.

when pressed, called hysteresis. Urethane arms or bases, unlike metal, don't scuff shoes, mark painted walls, or chew up furniture.

A variation of the formula is integral skin urethane, which some believe will be the material of the future. Also called self-skinning, this foam can be scratched or even cut and, in most cases, will heal itself overnight.

Chemical Chairhouse has been experimenting with coloring urethane. It comes out of the mold white but turns brownish from sunlight if left alone. In the past, the dark browns and black were the safest colors. Ultraviolet light tended to discolor tenderer shades. But according to spokesman Roger Tornero, the company has had favorable results from putting UV absorbers into the formula, changing the vehicle of dispersion (the material that holds the pigment in suspension), and using a static mixer instead of a dynamic one.

Sears Manufacturing Company, through its associated company Fabriform, has developed methods of bonding fabric directly to the foam by laying it into the mold. Since the late 1960s, it has been bonding vacuum-formed vinyl-backed fabrics to foam for automobile and tractor seating.

Most of the improvements with fabrics have to do with eliminating costly skilled upholsterers. A German firm has developed a woven fabric as stretchable as stretch knits, achieved by a technique that takes a little backstep at regular intervals and also mixes elastic fibers into the material. With this, as well as with stretch knits, precut pieces can be bonded, heat-glued, or stretched like a sock over cushioning in minutes. Based on the same principle is another German invention, a rubber girdle—a prewoven cylinder of rubber—that can be stretched over a metal frame, replacing webbing or straps and springs and all the connections they require.

Wool is still the luxury material and nylon the most enduring. Processes that blow air or other gases at the monofilaments of nylon as they are extruded have improved its approximation of multifilamented wool.

If Niels Diffrient had his way, the chair industry would be radically changed. "The furniture industry," he says, "generally designs for semi-handcraft techniques. This leads to more mechanically produced knock-offs later."

The Knoll chairs adapt what Diffrient has learned from tractor technology, based on stamped steel frames, snap-in upholstery, and unskilled labor. Proving his argument if not his case is that Knoll cannot take full advantage of this cost-saving, mass-manufacturing process, at least not yet, he says, because it is not equipped to provide major elements, such as steel shells, in-house.

If highly tooled, mass manufacture does become the pattern of business in office chairs, it will only be one more technique—like ergonomic design, polyurethane and gas springs—adapted from the automobile, farm machinery, and aircraft industries. It may, however, be close to the only one with an American pedigree. [Nory Miller]

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For product and literature information on office seating, see p. 165.

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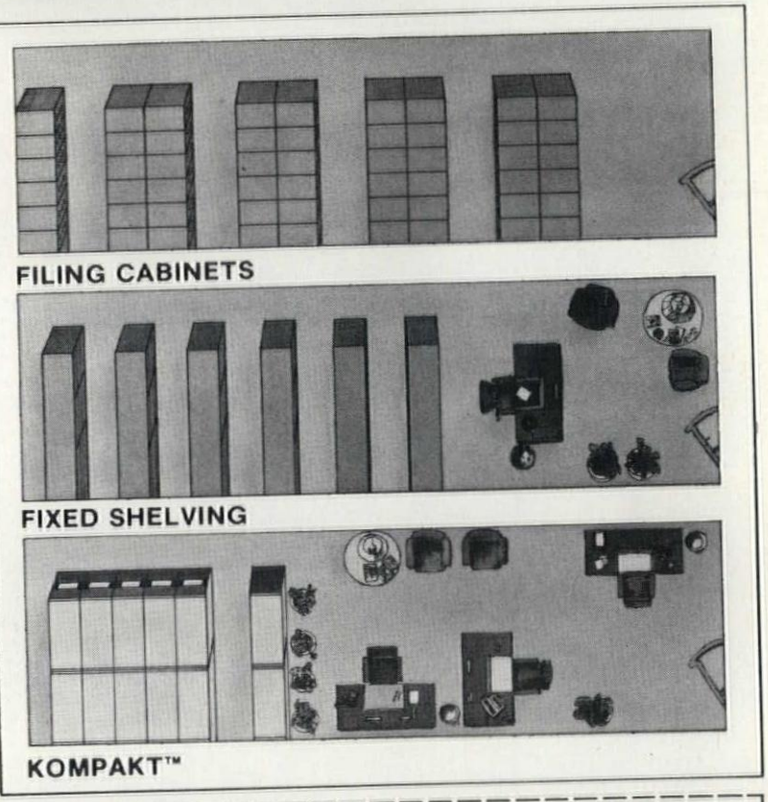

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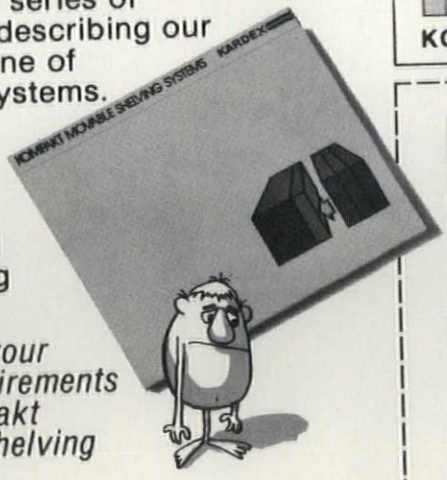

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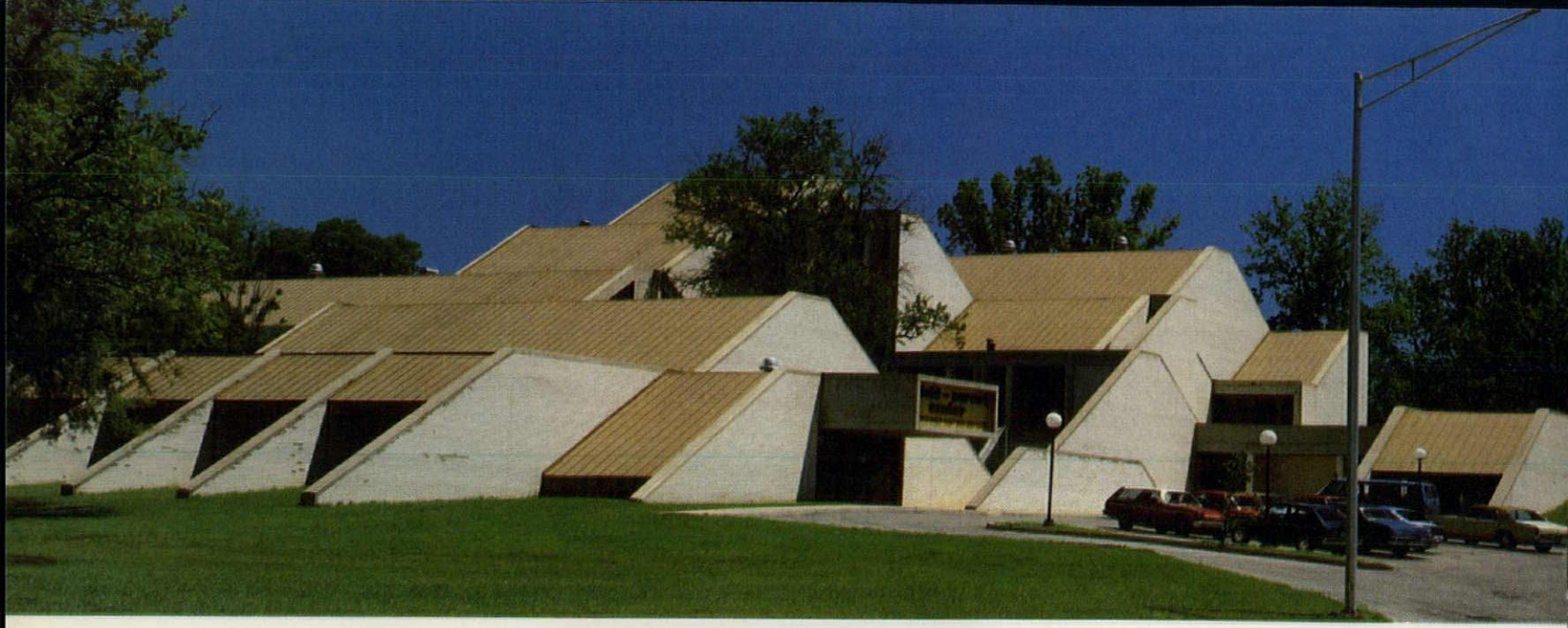

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Glass fiber reinforced concrete is proving to be a lightweight, versatile addition to the family of building materials. Its rapid growth is a model of well applied technology.

The glass strands and the sand-cement slurry do not meet until they are about to reach their formwork destination. These criss-crossed chopped fibers steeped in gray "mud" do not call forth memories of the business end of a concrete truck. The fabrication environment resembles a fiberglass factory more than a precasting plant. The fresh appearance of glass-reinforced cement, however, most accurately characterizes the material.

After it has been rolled and cured, the exterior surface material mirrors its formwork precisely and takes the molded imprint of one of a thousand familiar disguises. In place on a building, it can be practically indistinguishable from conventional reinforced concrete. It can easily be designed to match a limestone facing and, from a distance, it can be mistaken for a metal panel. It precisely duplicates natural rock formations or trees for zoos or can even match complicated terra cotta work for rehabilitation (P/A, Nov. 1977, p. 98). It may be smooth, rough-surfaced, textured, flat, contoured, or rounded. The exterior appearance is limited only by the architect's imagination and the material's cost.

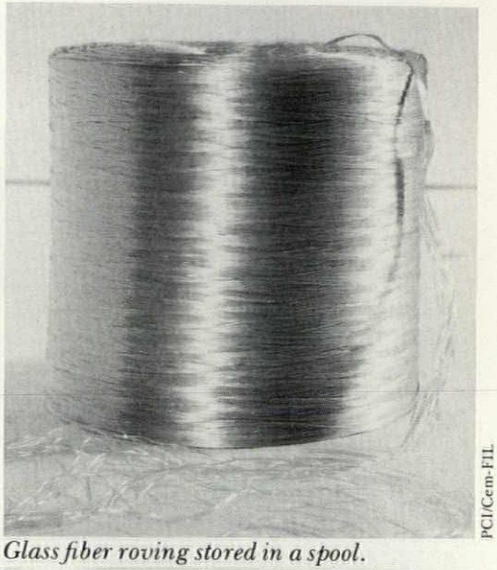
The name of the material, GFRC, is also self-effacing: glass fiber reinforced concrete—or is it cement? When the product was born in England, the manufacturer also made GRP, glass-reinforced plastic, and naturally called its newest product GRC, glass-reinforced cement. In this country the FRP (fiberglass-reinforced plastics) people also had a name for their new product, FRC: fiberglass-reinforced concrete. As the material matured and needed official generic nomenclature, the natural combination was GFRC. Some industry figures would rather insist on calling it "C" for cement, as the material contains no large aggregate—just cement, sand, and water mixed with glass fibers. (Just as asbestos cement products are not asbestos concrete.) Or alphabetically, GRC+FRC=GFRC.

The international history

GFRC as it has come to be used in this country in the last five years originated in England at a Building Research Station in the mid-1960s. Encouraged by Russian research and other work in China in a similar direction, Dr. A. J. Majumdar came to the conclusion that to incorporate glass fiber into a concrete mix required some changes. Borosilicate glass, or E-glass as it is more commonly known, can be drawn into glass fibers for use in GFRC, but is destroyed by the alkali in cement. The Russians decided to use E-glass but alter the cement to reduce the alkali effects on the glass. Dr. Majumdar approached the problem by experimenting with zirconia glasses. Zirconium dioxide is available in foundry sand and, when added to the glass composition, produces an alkali-resistant (AR) glass which could also be drawn into fibers. Such AR glass was in production at that time for the specific use of boiler gauges. Majumdar's work in the laboratory resulted in 1968 in a collaboration agreement between the British government and Pilkington Brothers Glass Company. Pilkington agreed to supply the Building Research Station with the zirconia glass it needed in return for the worldwide rights to develop the market for the experimental results.

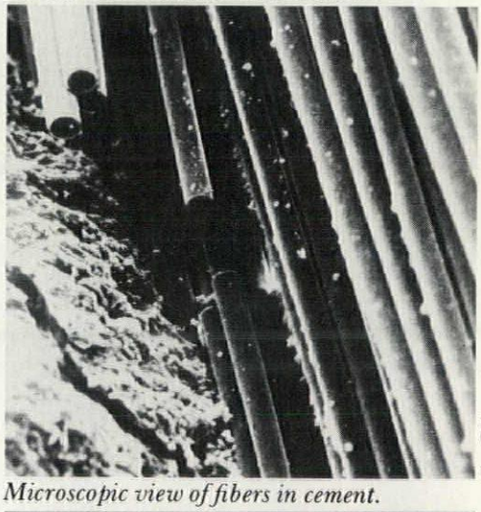
Part of the laboratory work of the first two years was spent determining precisely how the AR glass fiber would be most effectively distributed in the cement mixture. The physical properties were studied and some 400 compositions tried. The most satisfactory results were achieved with a spray applicator. A continuous strand of alkali-resistant glass fiber was fed into a compressed-air-powered gun, where the strand was chopped into short, 1½–2-in. lengths and combined with a sand and cement slurry.

Variations were studied. If the sand



PCI/Cem-FIL

Glass fiber roving stored in a spool.



Cem-FIL

Microscopic view of fibers in cement.

Cem-FIL

GFRC is sprayed into its formwork.

particles were too large, the spray nozzle would plug up. Sand that was too fine reduced workability of the concrete. Natural rounded sand proved superior to angular sand, which was abrasive on the machinery. Too much cement added to the cost and increased shrinkage in both curing and weathering in place. The panel thickness—less than 1 in.—and expense of the materials required factory-control conditions for optimum results.

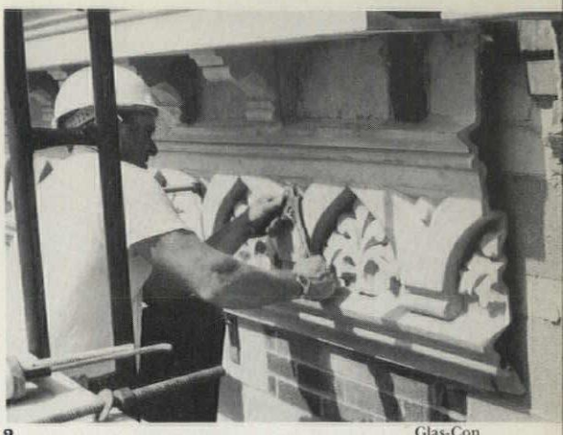
By 1970, Pilkington officials were confident that they had a composite material of exceptional strength-to-weight characteristics, high impact strength, and durability, but they weren't quite sure where to place it in the building market. By 1972, the research indicated a viable first market for GFRC was the architectural panel.

The use of GFRC would expand the capabilities of most precasting plants. The material was nonstructural, very thin, and could be used for lightweight fascia and spandrel panels. The weight meant that shipping and erection costs were improved, and the component that resulted could be matched to other cementitious products and members of the building. In the precasting plant, the GFRC, therefore, found a physical plant and a market ready-made. New companies were licensed in England, Japan, Australia, and South Africa in the early years, but the Pilkington product did not come to this country until 1975.

Surface bonding: Studies of glass reinforcing of cement had already begun in this country with early work in "surface bonding." The original research was done by the Department of Mechanical Sciences of the Southwest Research Institute, San Antonio. In this process, a ⅛-in.-thick coating of glass-reinforced cement was parged onto both sides of a dry-stacked concrete-block wall. By the mid-1960s, both the Army Corps of Engineers and the U.S. Department of Agriculture were involved in perfecting the technique. Owens-Corning Fiberglas was using an alkali-resistant glass composition by 1969 in its research. Parallel work was being done using E-glass and modified cement.

Early technical problems had to be overcome to ensure the future success of the process. Control of the mix at the site was difficult. Mixing the glass and the cement was sometimes crude and resulted in destruction of fibers, and the inconsistency of the mix resulted in wide variation of material properties. The lack of seismic strength was generally regarded as a restriction on use west of the Rockies. Proponents of the system, however, demonstrated that walls could

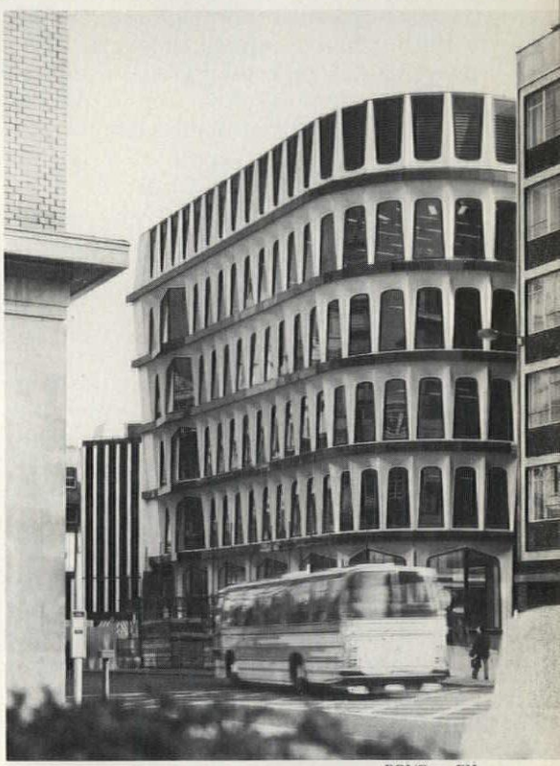
1 Owens-Corning Fiberglas



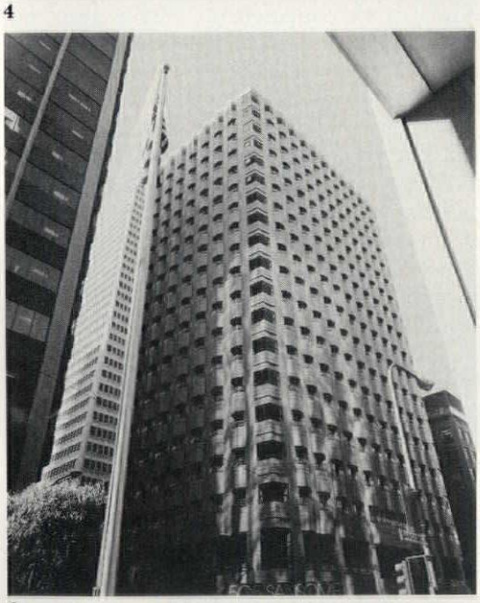
2 Glas-Con

3 Cem-FIL

4 Forton



5 PCI/Cem-FIL

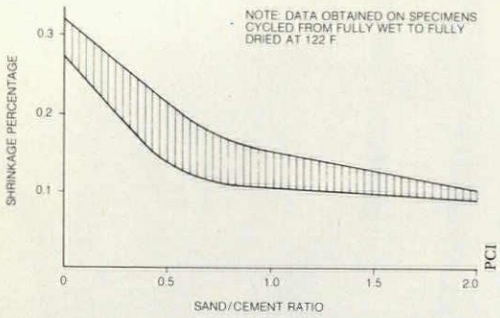


6 PCI

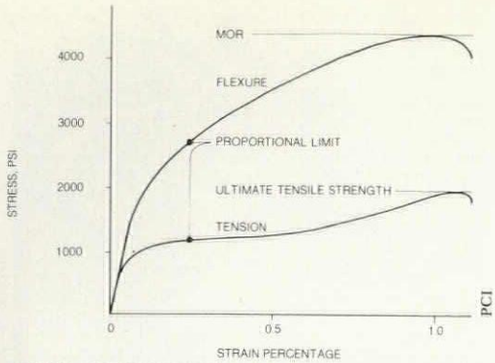
7 Ceramacor

1) The rocks and trees shown at the Los Angeles Zoo are made of GFRC. 2) GFRC is being used to replace terra cotta. 3) Surface bonding applied on dry-stack concrete blocks. 4) Mondial Building at Tiel, Holland (Jan Brower Assoc.). 5) Credit Lyonnais Hdqtrs., London, the first major building to be clad in GFRC both inside and out (Whinney Son & Austen Hall). 6) Pacific Mutual Building, San Francisco (William L. Pereira Assoc.), the tallest GFRC structure. 7) The one-piece molded coffers are made of GFRC.

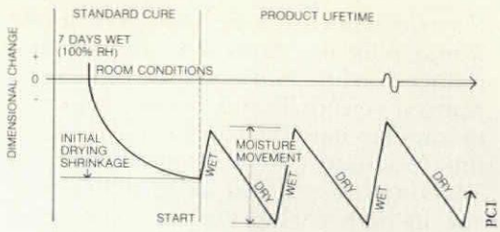
Glass fiber reinforced concrete



EFFECT OF SAND ADDITION ON SHRINKAGE



GENERAL STRESS-STRAIN BEHAVIOR OF GFRC TESTED AT 28 DAYS



DIMENSIONAL STABILITY: MOISTURE MOVEMENT OF GFRC

The material properties of GFRC change over time. The shrinkage patterns displayed here demonstrate the dimensional change due to moisture exposure.

be constructed in less than two-thirds of the time of a conventional masonry wall, with improved impact strength. This property has generated great popularity for the system recently for racquetball courts. The walls also show about double the flexural strength of a normal concrete masonry wall, improved moisture penetration characteristics, and a full two-thirds of the compressive strength of a similar conventionally constructed concrete masonry wall. The surfaces may be spray-applied or hand-troweled.

AR arrives from England: By the mid-1970s, however, the British formula for alkali-resistant glass was imported into the U.S. Owens Corning has been licensed to manufacture and market the Pilkington AR glass product in America. Pilkington's own subsidiary in North America, Cem-FIL Corporation, is supplying the glass-fiber materials directly from England.

The technology has advanced abroad to production of non-pressure sewer pipe, street furniture, and formwork. In the last 18 months in the U.S., flat 4′ x 8′ sheets of GFRC are being produced for asbestos replacement products in thicknesses ranging from ⅛ in. to 4 in. A Canadian producer has also been exporting to the U.S. GFRC ceiling systems which simulate concrete coffered slabs.

The GFRC technology today: Since January of this year, an improved glass fiber is available for use in GFRC. It is called Cem-FIL2 and is meant to replace the original Pilkington product. The new glass has the same composition and physical form as the original but has been given a special treatment which further counteracts and resists attack by alkali in the cement.

Glass manufacture and testing has been rigorous from the beginning of GFRC production. The industry has experimented with structural applications of the material but has explicitly discouraged such use in buildings. Alkali attack on the glass apparently continues over time and causes changes in properties when the material is exposed to moisture and weathering. The ten-year report issued last November by the Building Research Establishment explained: "When used in wet or natural weather conditions, over a period of time GRC becomes essentially a brittle material."

The new Cem-FIL2 fiber is designed to reduce and delay such problems. The material has long-term toughness and impact strength superior to the first fiber design. There is, however, no immediate intention to alter the original design recommendations. A recommended practice for GFRC is under development by Prestressed Concrete Institute and is expected to be released late in 1980. The conservatism inherent in the original design amply covers the new material.

The Dutch connection: Also within the last three years, an alternative GFRC technology has been developed in Holland and is just now beginning to be imported to the U.S. The process rejects the use of alkali-resistant glass entirely and pursues the cement modification option originally suggested in the Russian research of the 1960s. Adding a soft elastic polymer to the cement is designed to reduce the alkali attack of the cement on E-glass.

Dutch researchers concluded that the long-term alteration of GFRC properties was due to salt crystal accumulation in the interfilament spaces of the material and have attempted to fill these spaces with an additive-improved cement. The parent company, Forton, claims its material is 10 to 15 percent stronger than conventional GFRC (better bending and tensile strength for its glass), and has more surface coloration options, improved shrinkage characteristics, lighter weight, and a cost incentive due to the use of the less expensive E-glass. No wet room is needed for curing with the Dutch "Forton" system. The glass fiber can be introduced into the mix in mat or woven form, and the cement may be vertically applied. There are no examples as yet in this country, but trials are starting in four American locations. The Dutch experimental buildings are three years old. The company, Forton, is itself only one year old.

GFRC in use

The fact that GFRC has no particular surface qualities which distinguish it from other materials means that the effective use to which it has been put in recent years in this country may have gone unnoticed. There are some distinct architectural advantages to GFRC. The economic advantages of the material aim directly at the breadbasket of building types which play such a key role in today's building market.

The first buildings with GFRC panels in this country used them for replacing heavier concrete panels in the design. The light weight meant that more sections could be shipped longer distances, and the finish on the panels could match conventional concrete perfectly. Thus, GFRC is attractive for rehabilitation.

Architects and engineers in seismic zones also took careful note of the weight advantages of GFRC panels. Reducing the weight of the surface cladding meant reductions in horizontal earthquake loading. The West Coast is the largest growth area for the material. There are three producers in San Francisco alone. The Basalt Rock Company of Napa, Ca, has taken the lead in GFRC construction. Both the 19-story Pacific Mutual Building in San Francisco and the 12-story Watergate II Tower in Emeryville, Ca, use lightweight cladding produced by Basalt Rock.

The light weight also meant the panels could be fabricated in the western U.S. and shipped to Alaska, providing a new cladding option for Alaskan hotels and office buildings. Olympian Stone Company of Seattle fabricated preglazed 150-sq-ft panels and shipped them to Anchorage for use on the Calista-Sheraton Hotel, CCC/HOK, Architects. The panels were shipped complete with glazing and insulation.

The shipping radius for a precaster is extended in mainland states as well. A

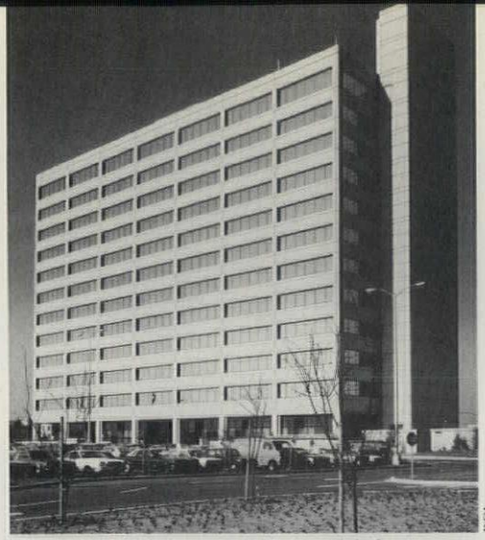
Minnesota precaster can supply panels for a building in Dallas. A Connecticut firm can ship to Virginia. Even at the building site, the lightweight panels reduce the size and cost of the cranes needed for construction.

The real competition is not the conventional precast panel. GFRC places concrete construction in a good, competitive position with the metal or lightweight fiberglass exterior panel. Through GFRC, the architect can achieve traditional concrete detailing and surface characteristics but at one-third to one-tenth the weight of conventional concrete panels, with the option of either single- or double-skin panels. If they are incorporated from the beginning of the design, tons of structure can be saved. Early choice of the material also allows the designer to capitalize on the repetition of units and detailing situations. By understanding the restrictions of the material early in design, the architect is free to incorporate the material's good qualities.

Detailing: The reason GFRC is light in weight is because the material is essentially a thin shell. The dimension is accomplished through the combination of 5 percent glass by weight and a high cement content in the mix. Normal reinforced concrete may contain 30 percent cement. Normal precast may contain 50 percent, but GFRC typically uses as high as 80 percent cement. This high cement content in the absence of large aggregate means shrinkage during curing and also means that the panel must be allowed to move in place on the building. The temperature and moisture variation from outside to inside of a panel ⅜ to ⅝ in. thick can mean warpage or bowing. Increased movement also implies that joints between large panels must be larger.

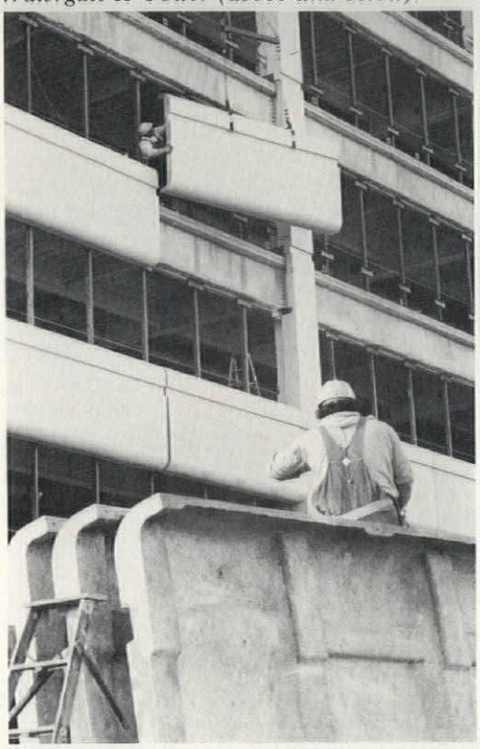
Finish: Because it is a cement product, GFRC is completely compatible with other normal concrete surfaces. It is possible, for example, to lay tile in a mold prior to spraying the GFRC and produce a tile-surfaced, lightweight panel. A surface mix of aggregate can be placed in the form and result in an exposed aggregate finish. A ribbed or "fractured fin" texture can be introduced with a form liner filled with normal concrete and then sprayed with GFRC. The high cement content guarantees great accuracy if a surface pattern in low relief is desired. Dimensions should be large enough to keep the 1½-in. glass fibers from bridging indentations and leaving the resulting protrusion unreinforced.

Industry figures do not encourage leaving a panel surface completely natural in color and flat in geometry.



PCI

Watergate II Tower (above and below).



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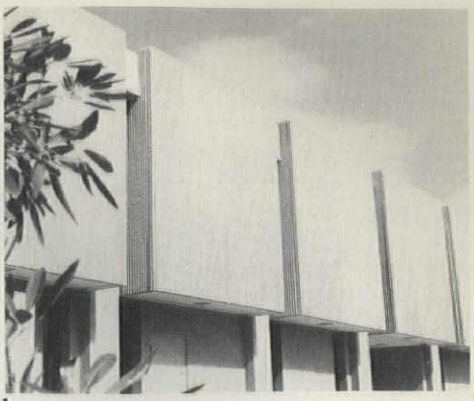
Mo-Sai Institute

Panels (below) for Alaska hotel (above).

Mo-Sai Institute



Owens-Corning Fiberglas

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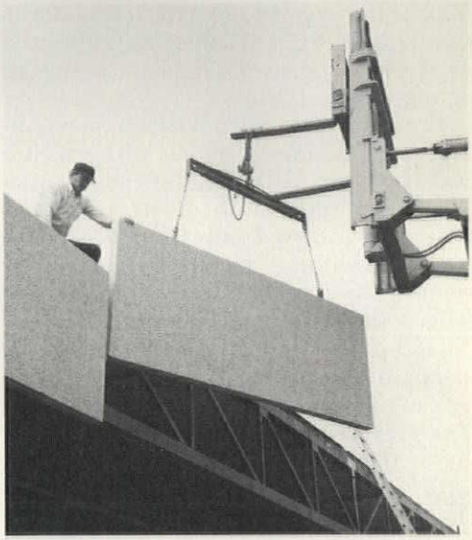

Preco

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Owens-Corning Fiberglas

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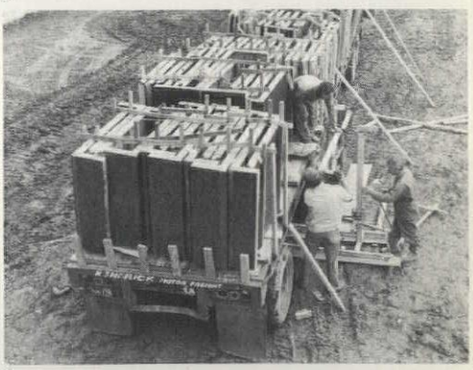


PCI

4

1) The "fractured fin" GFRC panels used here are part of a renovation. 2) Exposed aggregate can be used very effectively with GFRC panels. 3) With complex geometries, structural ribs are sometimes needed to control bowing or warping. 4) Because of the thinness and resulting light weight, GFRC panels in large numbers can be shipped long distances.

Discoloration during production leaves panels uneven in color, and staining panels a light color has been very successful. A flat surface is also prone to efflorescence, and white, chalky patterns will show up on darker colors. Exposed aggregate or ribbed surfaces, of course, minimize such problems. Such treatments become somewhat difficult to produce on angled surfaces and do add weight to the panel. The face mix aggregate is usually restricted to a maximum size of ½ in. Adding material of any kind to the surface amplifies the expansion and shrinkage characteristics of the panel.

Precasters have also been experimenting with preglazing panels with varying success. The diverse thermal characteristics of aluminum or steel make it necessary to avoid entrapment of such materials within a panel. The most successful solutions have been applications where the window frame can be supported not by the panel but by means of a separate structure.

Hamden Industries

The ITT Office Complex, Shelton, Ct (GSGS & D), shown here makes use of spray-applied GFRC for the curved panels and factory cast-in-place flat panels.

The GFRC system design team

After the initial decision to investigate GFRC as a panel system for a building, the detailing and design decisions are usually made in conjunction with GFRC producers. Regardless of the glass fiber or cement system employed, the use of GFRC is limited to precasters or entrepreneurs who have been trained and prepared by the GFRC glass manufacturers. Glass producers are not anxious to have early failures mar the potential of their material. The liability for a GFRC panel lies, however, squarely with the panel producer, not with the material supplier. Of the 100 or so qualified precasting factories in the U.S., two or three dozen experienced companies have done the majority of the work. Each producer has his own preference as to precisely how the panels should be made and attached.

Glas-Con: Glas-Con of Minneapolis is a good example of how GFRC has grown in recent years. Company owner Iver Johnson was a contractor six years ago when he first recognized the potential of GFRC and decided to begin his own precasting plant. His early jobs included additions to existing buildings, where the material's matching capabilities were particularly important, and remodeling where the lightweight panels actually covered other existing panel materials.

As the manufacturing expertise increased, Johnson saw the necessity to perfect the connection details. Using conventional steel reinforcing or clip design presented problems. Embedding steel in the panel caused thickening in the panel and further expansion and shrinkage problem potential.

Glas-Con developed instead a system which incorporates a steel-stud framework to support the thin GFRC panel. The stud-reinforced panel is then connected directly to the structure of the building, and the windows are also supported by the stud framework. Once in place, the wall can be filled with insulation and the interior wall finish applied. By incorporating the framing (which would possibly be present in the interior wall anyway), the panels could be made larger and easier to handle. The bigger the panel, the fewer and the less handling. The largest panel Glas-Con has fabricated is 12′ x 30′, a dimension largely limited by transportation.

The steel-stud trusses are jigged and prepared separately. L-shaped round steel rods are welded directly to the stud frame. The first thin layer of GFRC is then sprayed into the mold. When the frame is placed into the wall form, the steel rods act as feet to hold the frame above the GFRC layer. The feet are then covered with a layer of fresh GFRC which is still flexible and "green." Another layer of cement and glass is then sprayed over the "feet," embedding them permanently in the panel surface. In addition to securing the panel in place on the building, the steel rods allow the cement panel to expand and contract freely. When the bar flexes, the stud also can move by twisting. The GFRC weighs about 5 to 6 lb per sq ft and the steel frame adds only another two pounds. The 6-in. hollow wall so produced is compared with the weight of a 6-in.-thick precast panel that might weigh ten times as much.

The unique system is now being used on a second building, the new Hyatt Regency Hotel in the center of Minneapolis. Architects Peterson Clark & Associates called for 144,000 sq ft of panel surface, which will be the largest installation of GFRC in the nation. Another advantage has proven to be the speed of erection. A new panel can be cured and in place on the building within one week after the spray hits the form.

Hamden Industries: Hamden Industries is an East Coast precaster which has chosen a completely different approach to GFRC panels. A 3-in.-thick urethane foam panel is completely encapsulated into a 4-in.-thick GFRC panel, providing a U-value of .04. The panel can weigh as little as 10 lb per sq ft. Siegmar Knebl is a specialist in insulated panel design and is president of the company.

To produce the panels, Hamden manufactures its own urethane and uses both a spray GFRC process and the option of factory cast-in-place GFRC. Knebl finds casting most useful for flat panel shapes and four or five times faster than spraying. Says Knebl: "Spraying is the slowest way to produce a concrete product." For the new ITT offices in Shelton, Ct, Hamden Industries used both spray and cast-in-place procedures. The complex rounded corner panels were sprayed, and the flat panels cast in place in the factory. A form liner and surface mix were identical for both panels so the exterior is matched.

Knebl prefers to see two lines of support for his panel, and support ribs occur in the panel section where the urethane sections are separated. Light steel reinforcement is used with the resulting ribs. Knebl's company is practically alone in use of casting and owns the six-year-old patent on the particular technology used.

Industry experts do not encourage cast-in-place applications of GFRC. James Ford of OCF cautions: "If you deviate from the specifications, we don't really have a good peg on the long-term properties. All of the real-time aging studies have been done with the spray system." Spraying is the strongest method by weight, but precise thickness is difficult to control. GFRC spokesmen are also uncomfortable with steel reinforcing longer than six inches embedded in the panel, another Knebl procedure. They also insist, however, that connections cannot be standardized and

Richard Rush

vary with the job situation. As long as the panels are supported from below and not constrained from moving, detailing will vary widely.

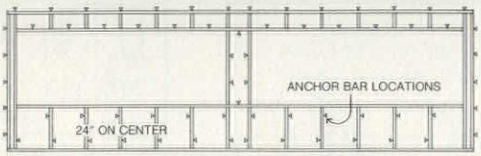
The future: So far the loudest voice in favor of GFRC has been economics. Such panels, especially when insulated and systematized, are highly competitive in the medium- to high-priced panel market. With simple surfaces, the price range is $6 to $10 per sq ft in place, and with exotic aggregates or face mixes, the price can reach $20.

While the challenge of economics will always provide an incentive, the real progress in the field of GFRC will occur when the thin-shell character of the material leads architects into geometries and surface shapes unique to its physical properties and method of manufacture. We will have to learn to think GFRC. We may never be able to recognize a GFRC face panel from its surface texture, but perhaps its profile will give it away. [Richard Rush]

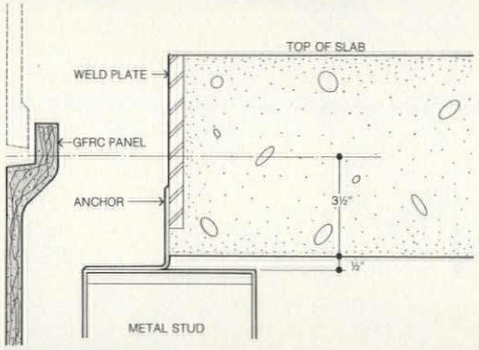
Acknowledgments

We wish to thank the following manufacturers, organizations, and precasters for their help in preparing this article: ACI; Cem-FIL Corp.; Ceramacor; Concrete Technology Inc.; Forton; Glas-Con; Hamden Industries, Inc.; Hydro Conduit; Mo-Sai Institute; Owens-Corning Fiberglas; PCA; PCI; Preco.

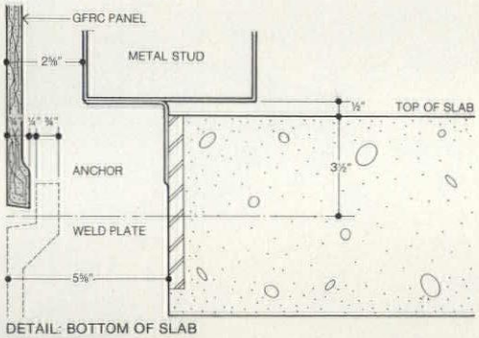
For GFRC product and literature information, see p. 169.



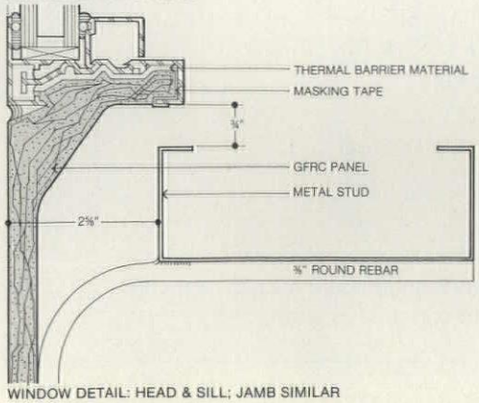
STUD FRAMEWORK DESIGN: TYPICAL WINDOW PANEL



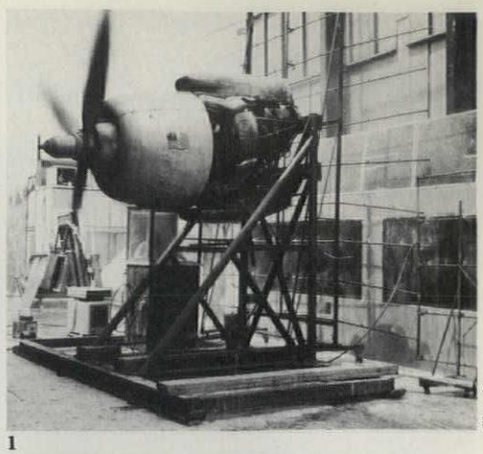
DETAIL: TOP OF PANEL



DETAIL: BOTTOM OF SLAB



WINDOW DETAIL: HEAD & SILL; JAMB SIMILAR



Glas-Con

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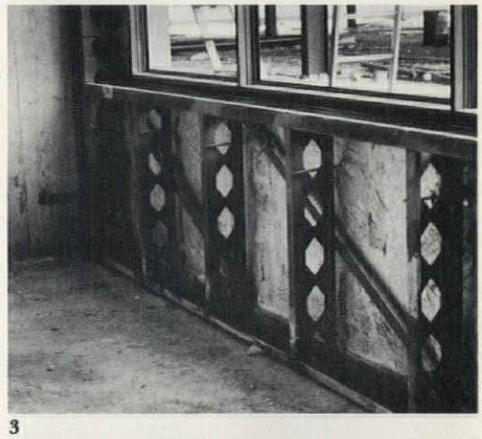

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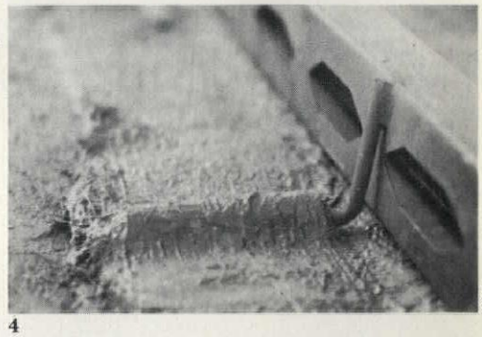

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The new Hyatt Regency Hotel in Downtown Minneapolis will be the largest surface area of GFRC when it is completed. Glas-Con of Minneapolis has devised an ingenious solution to the panel shrinkage problem. 1) A mockup of the panel construction being tested in high wind. 2) The thin stud framing reinforced panels are light and easily transported. 3) The panel ready for insulation and glazing. 4) The key to the system is the L-shaped steel bars which anchor the GFRC to the stud frame and flex when the panel expands and shrinks.

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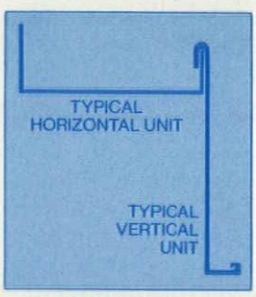

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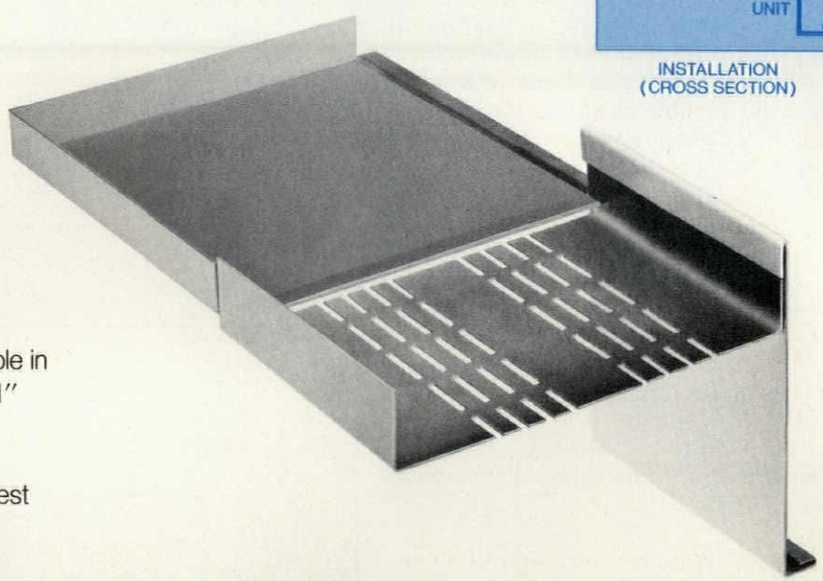

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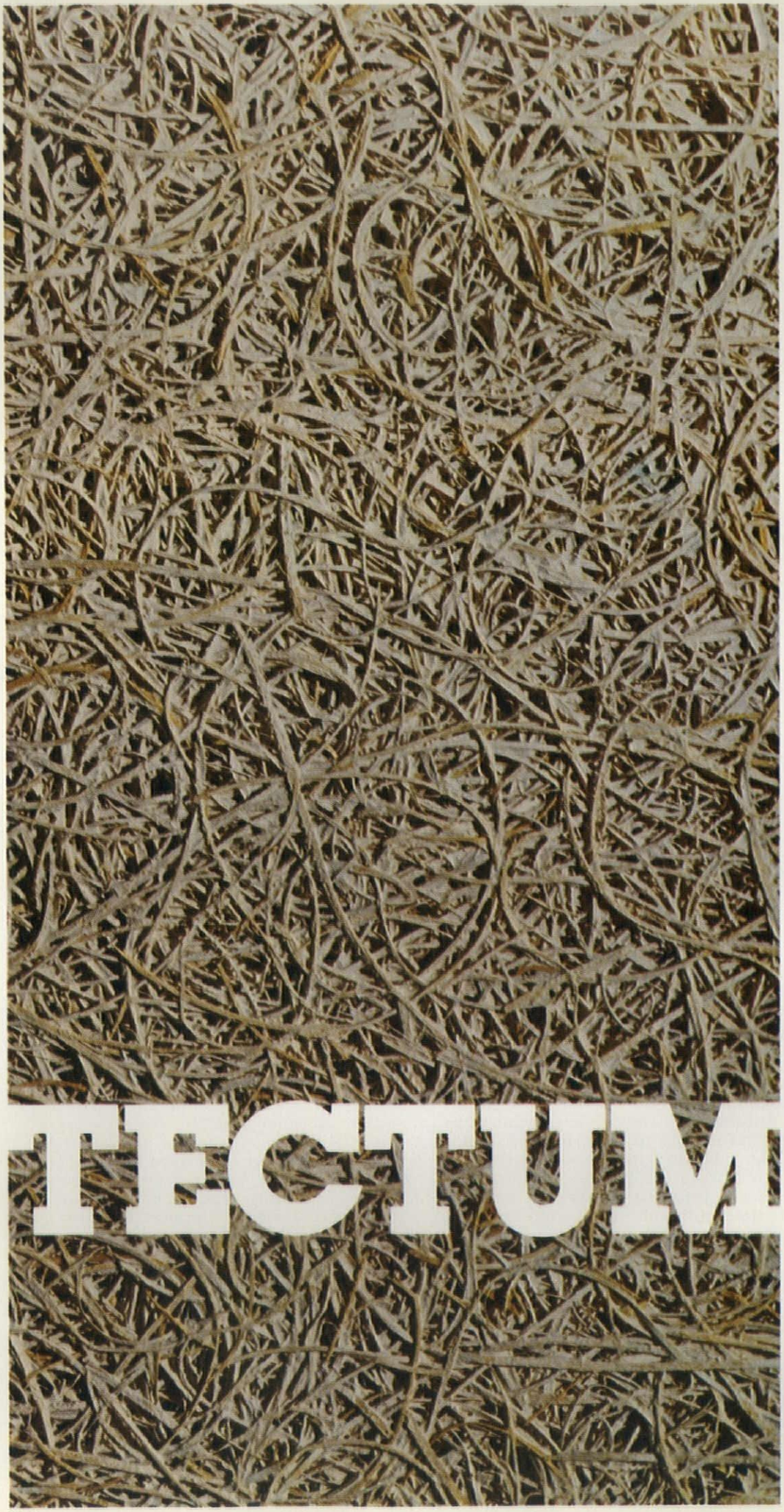

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Disputes involving subsurface conditions

Norman Coplan

To avoid disputes, responsibility for costs involved when unexpected subsurface conditions are encountered must be clearly stated in the contract to reflect the true intent of the parties.

If a contractor encounters subsurface conditions on a building project which differ from those anticipated, an issue may develop as to whether the contractor is entitled to extra compensation because of the additional work involved, or whether he has assumed the risk of such differing conditions. When information concerning such subsurface conditions is incorporated in and becomes part of the contract documents upon which the contractor bids, additional work that he must perform because subsurface conditions actually differed from this information ordinarily justifies a claim for extra compensation. Many construction contracts, however, even though including information and data on subsurface conditions, disclaim that it is intended as part of the contract documents and seek to place the risk of conditions not in accordance with such information upon the contractor. When a dispute arises in this context, the wording of the construction contract is critical to the resolution of such dispute.

Illustrative of the problems which may arise, when subsurface conditions differ from the information furnished to the contractor when the job is bid, is the New York case of *Wrecking Corporation of America* vs *Memorial Hospital For Cancer And Allied Diseases,* 63 A.D. 2d 615. In this case, the plaintiff-subcontractor successfully bid to perform excavation work on a 20-story hospital to be constructed in the City of New York. The subcontractor bid on the project after reviewing all relevant documents and design drawings which were furnished to it by the general contractor and construction manager. In excavating the project, the subcontractor discovered subsurface conditions which differed materially from the design drawings which had been furnished to him by the construction manager, and accordingly, the subcontractor claimed an "extra." The plaintiff relied upon a provision in the "general conditions" of the contract which permitted recovery for extra costs when conditions at the site were materially different from those shown in the drawings or from those recognized as inherent in the work to be performed. In addition, the subcontractor contended that the owner had withheld relevant information concerning subsurface conditions and had failed to determine subsurface conditions in a reasonable manner.

On the other hand, the defendant claimed that the agreement between the parties placed the responsibility and risk of unanticipated subsurface conditions upon the subcontractor and referred to certain other terms of the contract which provided:

"No representation is made by the General Contractor, Owner, Architect or Engineer in any contract document regarding the existing subsurface conditions. . . . The Owner, Architect and Consulting Engineers make no representations regarding the character and extent of the soil data or other surface conditions to be encountered during the work and no guarantee as to their accuracy or interpretation is intended."

The trial court, despite the disclaimer provisions quoted above, perceived the existence of triable issues of fact as to whether the owner or construction manager negligently or willfully withheld information which, if disclosed, would have resulted in a higher bid. On appeal, however, this decision was reversed, the Court stating:

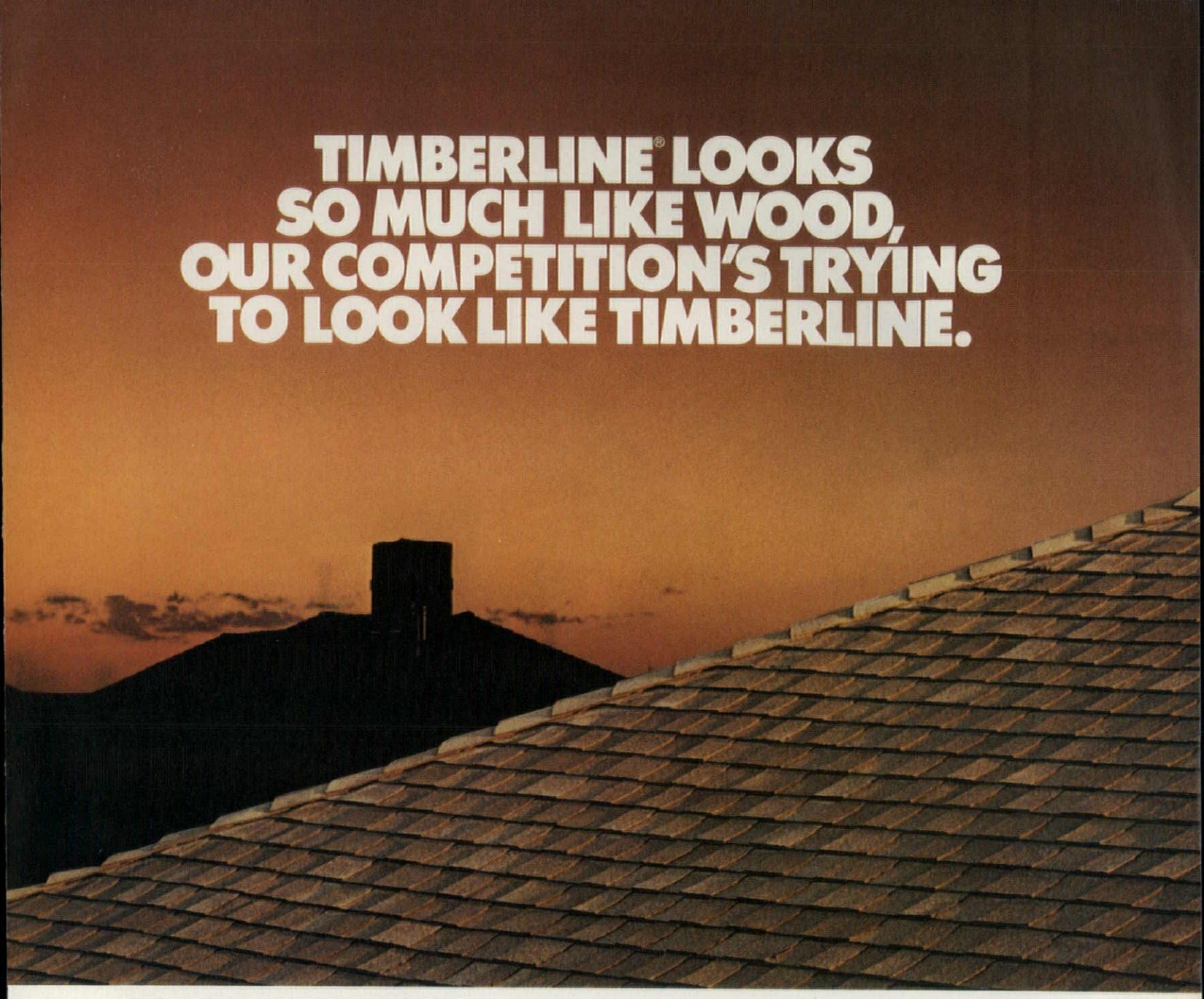
"Plaintiff clearly assumed full and complete responsibility for all excavation and construction costs relating to the foundation. There is no merit to plaintiff's claim that it should not be bound by its agreement to assume total responsibility for subsurface conditions, because material information was withheld which, if furnished, would have affected plaintiff's bid. Although plaintiff asserts that it was not supplied with as-built drawings of a previously demolished building on the site, there is no showing that such drawings were actually in existence, let alone that they were in Memorial's possession or control and withheld by it. . . . The deposition of plaintiff's president concedes that since the foundation loads for the prior building were less, the borings taken prior to construction would be of limited value because they would not have proceeded to sufficient depth to show hard rock."

The Appellate Court further pointed out that the boring logs and other relevant information, such as soil samples and a report of site investigation, were available for inspection by the subcontractor at the office of the architect. Moreover, stated the Court, there was no showing that the pits were not available to be physically inspected nor any proof that the subcontractor requested that boring logs be submitted to it.

In respect to the subcontractor's reliance upon the design drawings which reflected subsurface conditions different from those actually found, the Court said:

"Plaintiff's reliance upon the 'disputed work' clause is similarly lacking in merit. That clause, contained in General Conditions 16(a) and (b) of the contract, permits recovery for extra costs when conditions at the site are materially different either from those shown, or from those recognized as inherent in the work to be performed. It is patent that the documents plaintiff relied upon contained only estimates and further that the owner had expressly disclaimed the accuracy of such documents respecting subsurface conditions. Moreover, even were the clause applicable, which it is not, plaintiff does not allege that appropriate notice was furnished to the architect with respect to the disputed work. In accordance with the clear provision of the 'disputed work' clause, the failure to give such notice constitutes a waiver of any claim."

This case illustrates the need for unambiguous and uncontradictory language in a construction contract to reflect the true intent of the parties. □



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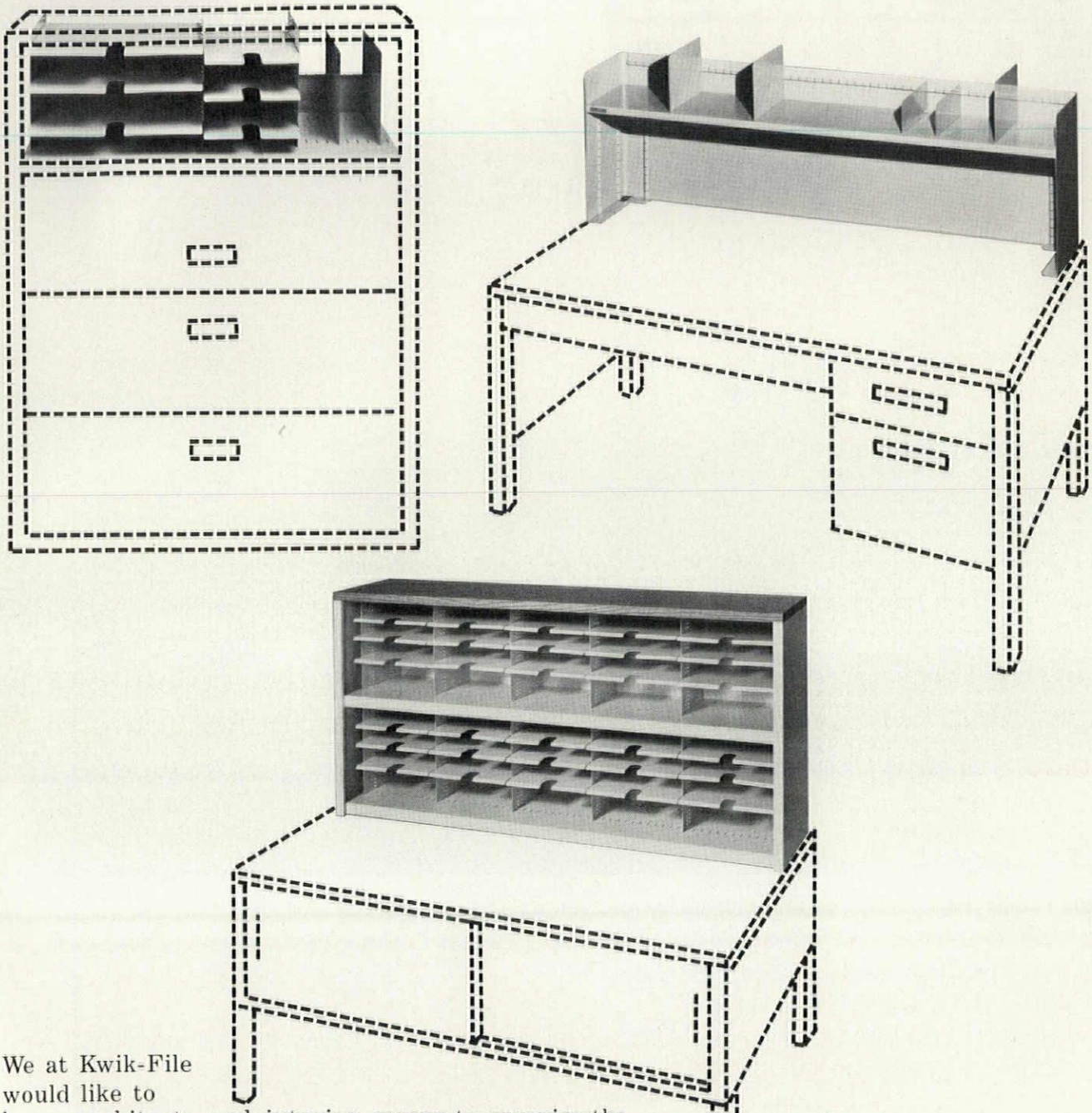

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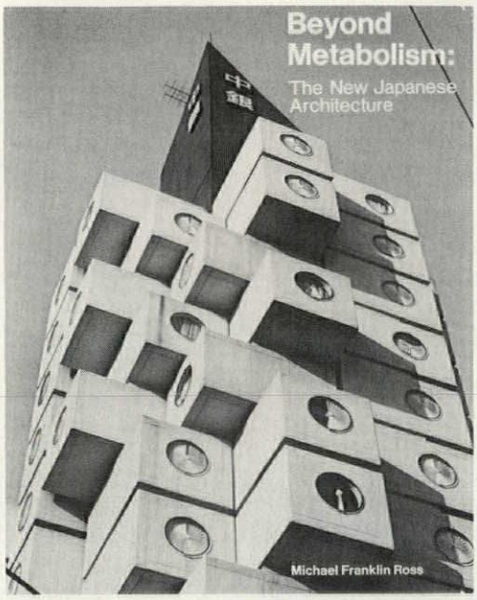
Japan update

Books



Beyond Metabolism: The New Japanese Architecture *by Michael Franklin Ross. New York, 1978, McGraw-Hill. 200 pp., $19.95.*

Reviewed by Reyner Banham, professor and chairman of design studies, State University of New York, Buffalo.

More than a survey course, but not a definitive analysis; not an in-depth probe, but full of informed insights, Michael Ross's review of Post-Metabolist Japanese architecture gives us the first general, synoptic coverage of "the Nippon scene," since the late Robin Boyd's slim but invaluable *New Directions in Japanese Architecture* of 1968. A great deal has happened to Japanese architecture (and Japanese architects!) in the 11 years between the two books. More important, a lot has happened to architecture worldwide—the high hopes, grand projects, and confident ideologies of the 1960s have mostly gone down in flames to be replaced by modest caution, tentative explorations of an unpromising future, and the self-congratulatory equivocations of the Post-Modernists. *Except in Japan.* The body of architecture reviewed by Ross is in such spectacular contrast to what has been happening in the West that it could almost come from another planet, an astral plane where Modernism is alive and well, if almost unrecognizable in some of its transformations. In the process, Metabolism's successors pose some important questions about Modernism which cannot be answered from the viewpoint of Ross's both/and, Tradition/Technology posture. Modernism is nowadays represented as a cramping, reductionist doxology of aesthetic deprivation. Post-Modernists and Neo-Vernacularists alike claim richness, ambiguity, gratification, and popular response as the virtues they possess and the Modern Tradition does not.

This has been proven false once before—in Brazil in the 1940s and 1950s. What was done in Rio, São Paulo, and [*Books continued on page 156*]

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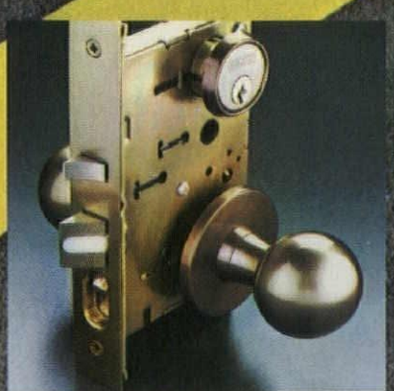

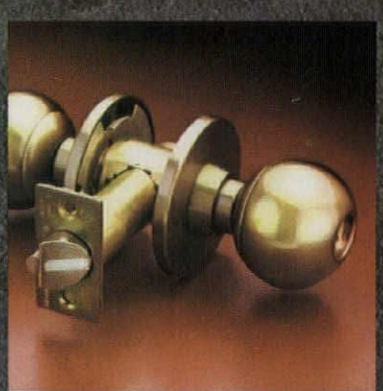

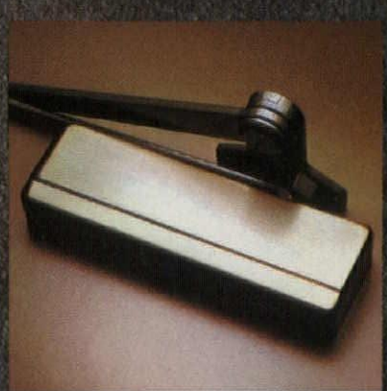

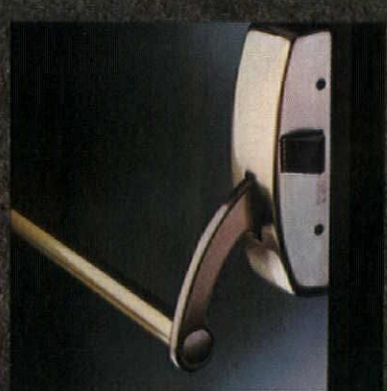

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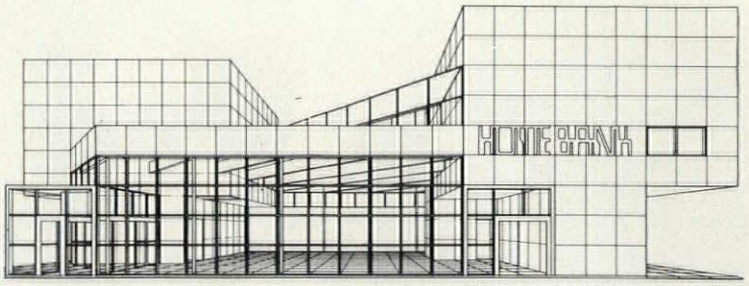


Arata Isozaki, Fukuoka Sogo Bank, Saga Branch, 1971.

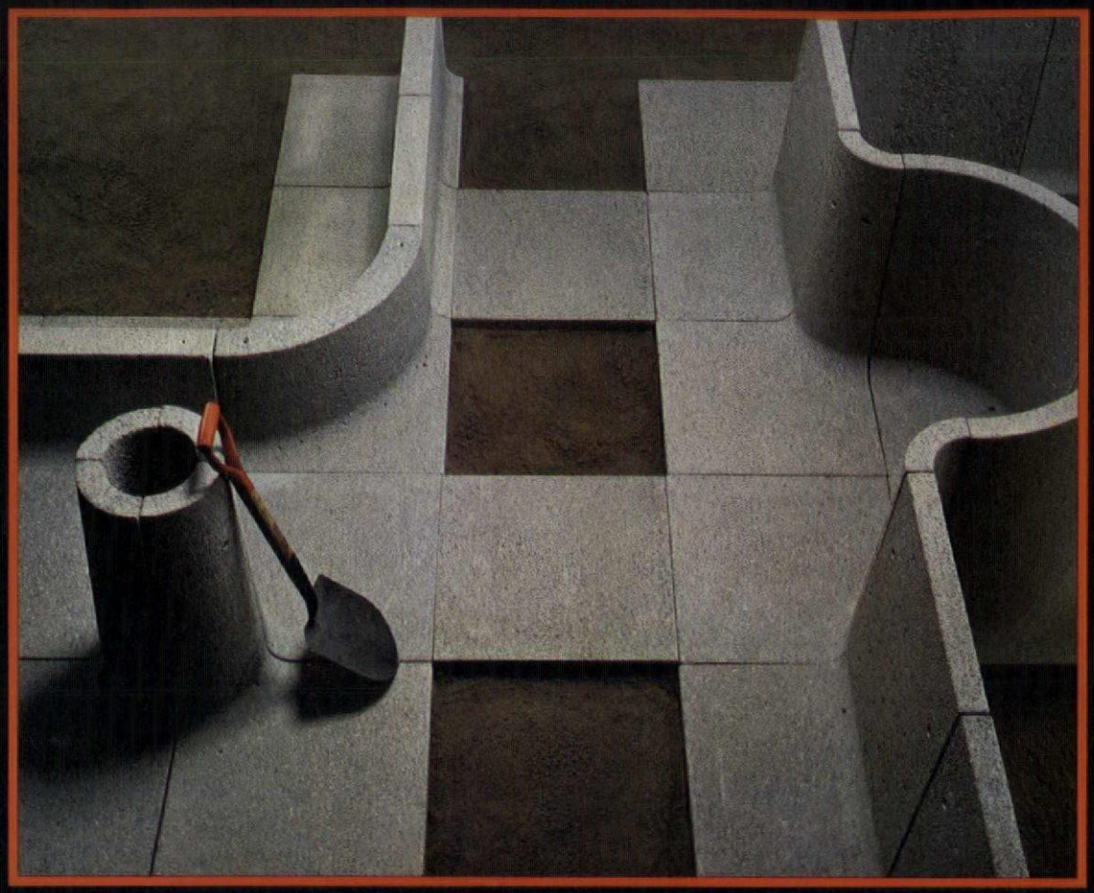
elsewhere in those days may look tame now, but the curvaceous plans and the shadow-filled grids of the *brise-soleils* were as shocking and stimulating as anything coming out of Japan today, and the newest works of a Reidy, Niemeyer, or Mindlin were as eagerly awaited as those of Tange, Kurokawa, or Maki today.

Interestingly enough, both the Brazilian and the Japanese movements derive, ultimately, from the same period of Le Corbusier's work in the 1930s, when the Master himself was traveling in Latin America, and his most consequential Japanese apprentices—Kunio Maekawa and Junzo Sakakura—were working in his studio. If one compares the resultant work, however, there is an important difference. The Brazilians made a "quick read"; Niemeyer's pavilion at the New York World's Fair of 1939 possesses the complete vocabulary of Brazilian *Neo-Baroco* and had virtually reached its ultimate limits already.

Against this, Sakakura's pavilion at the Paris Expo a couple of years earlier catches him barely off the tatami, a spare, woodsy rendering of Corbusian themes in terms of the *sukiya* (tea house) tradition. Yet there are only the subtlest hints of where Sakakura himself, let alone the other Japanese, would be going two or four decades later. There had to be a convulsive change in attitudes and ambiance before the Japanese could crash out of the elegent cage of concrete variations on the Katsura palace in which they—and their Western admirers—had trapped themselves. The convulsion came in 1960 with the World Design Conference in Tokyo and the much publicized "bid for world domination in architecture." The Metabolist Movement was launched, and with it a roster of new, or nearly new, reputations: Kikutake, Kurokawa, Otaka, Maki, under the tutelage of their master, Kenzo Tange, and their team critic Noboru Kawazoe. In the process, there was a kind of quantum jump, both in stylistic pretensions and public relations activity, and the whole movement now found itself operating on a super-elevated plane from which descent could hardly be anything but catastrophic. And it nearly happened: the Osaka Expo of 1970 was Metabolism's triumph but also, in many ways, its funeral. If it was not a complete holocaust of busted expectations, it was largely because the younger generation had learned well the lessons of the Metabolist decade. Even so, remaining on the commanding heights of architecture has been quite a balancing act, requiring increasingly frenetic design activity, ever louder self-promotion, ever glossier magazine hype, and ever more unscrupulous ripping off of other people's ideas.

Kisho Kurokawa is the acknowledged superstar of the current phase; the complete Metabolist, he already has a monograph all to himself with a scholarly preface by Charles Jencks (who else?). A valuable document in many ways, it presents its subject matter in such a blaze of high-wattage narcissism that he is barely visible in the disco glitter. Ross, showing him in the context of his peers and (near enough) equals, effectively cuts him down to size—which is still pretty big, for Kurokawa has considerable talents in architecture as well as in mystification and self-merchandising.

[*Books continued on page 160*]



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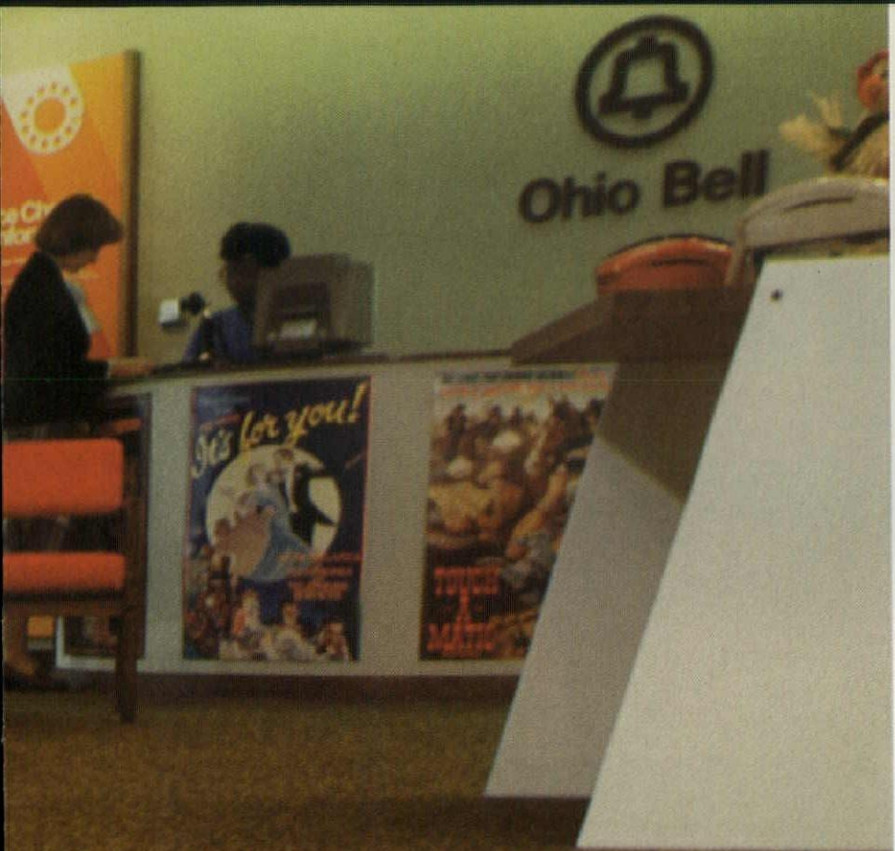

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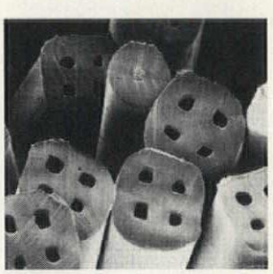

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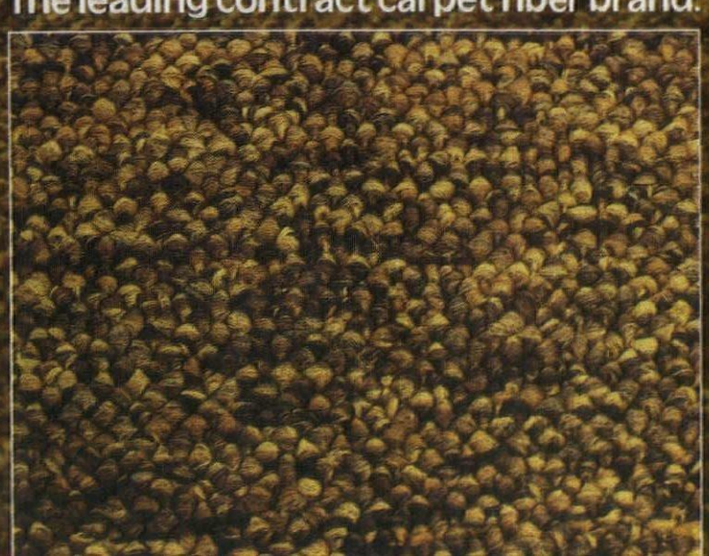

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Not that Ross has come to bury Kisho—like the rest of us he is here to praise him—but in the context of this broad survey of more than a dozen other substantial architectural talents and his old master Kenzo Tange, he looks a lot less extraordinary. In any case, the intentions of this book are fairly sober: to bring us up to date (as nearly as possible) and expound upon a substantial body of built work that has happened since the Osaka non-event.

That Expo seems to be such a total non-event that Ross never really discusses it. It's as if Japanese architecture were, in an appropriate metaphor, a bright, pop-art robot spaceship that had narrowly avoided disappearing into a Metaphysical Black Hole and preferred not to be reminded of it. Yet Osaka must haunt all histories of Post-Metabolism; it revealed how parlously thin had been the stock of ideas (megastructure, capsules, whiz-bang technology) around which the brilliant Metabolist packaging had been wrapped. Already at Osaka there was massive borrowing, as Ross inevitably demonstrates, from drawingboards as far-flung and as different as those of Peter Cook and Konrad Wachsmann.

Since then it seems to have been the movement's fate—and it is worth remembering that it is still basically the same group of personalities as Robin Boyd described—to build other people's ideas, often better than the original drawings. Some have found this praiseworthy, or have used it as a way of putting down the "mere paper projects" of the originators. It looked at one time as if Ross himself might be of the latter party (the subheading to his article in *Architecture Plus*, May/June 1974, reads "Japanese architects use high technology to build what others have only dreamed"). The present text is more sober about this, too; the borrowings are more frankly acknowledged, the progress of concepts from sketch to completion taken as a more natural process. The tone is more tempered but the effect is visually more sensational, because the Japanese can now be seen as the building department of a world-wide visionary industry, most of whose members are for the moment condemned to draw, not build. Or in current Post-Modern jargon, the high pluralism of the late 1970s creates a plethora of formal languages, codes, and typologies on which eclectic preferences can operate without the tyranny of a single establishment style. Ross has his own jargons and stylistic labels and trend indicators, all more or less apt, but beyond the words is the insistent visual demonstration that if any idea is in good currency, then someone has built it in Japan, or is about to. It's all there, from Contextualism to Capsule Revival, from Charles Moore to Superstudio, from New York Five-ism to where-have-you-been-El-Lissitsky-all-these-years?

It will be interesting to see if current Western High-Tech has any effect in Japan; Centre Pompidou and the Sainsbury Centre may be a bit too closely competitive to attract imitators. Certainly there is no direct sign of them in Ross's information-packed pages. What there is, obviously, is evidence of unbounded architectural vitality, but behind the print and the pictures there is something else which may be more important, which seems to be something like this. To go back to the Brazilian comparison: the Brazilians creamed what they wanted off Le Corbusier, but looked no deeper because their tradition was Western and effectively French anyhow. No Japanese could simply skim the surface in that way and come back with anything more than candy floss. To understand what was going on in Le Corbusier's office (later, Maekawa's or Tange's) required a deeper understanding of what that alien Western Architecture and its unspoken traditions were all about. Culture shock has its uses; maybe that is what the convulsion of 1960 was all about—absorbing the culture shock. The upshot, anyhow, is that in spite of all the intriguing complexities and mysteries of Japanese traditions, Japanese architects are *also* very good Western Architects! □

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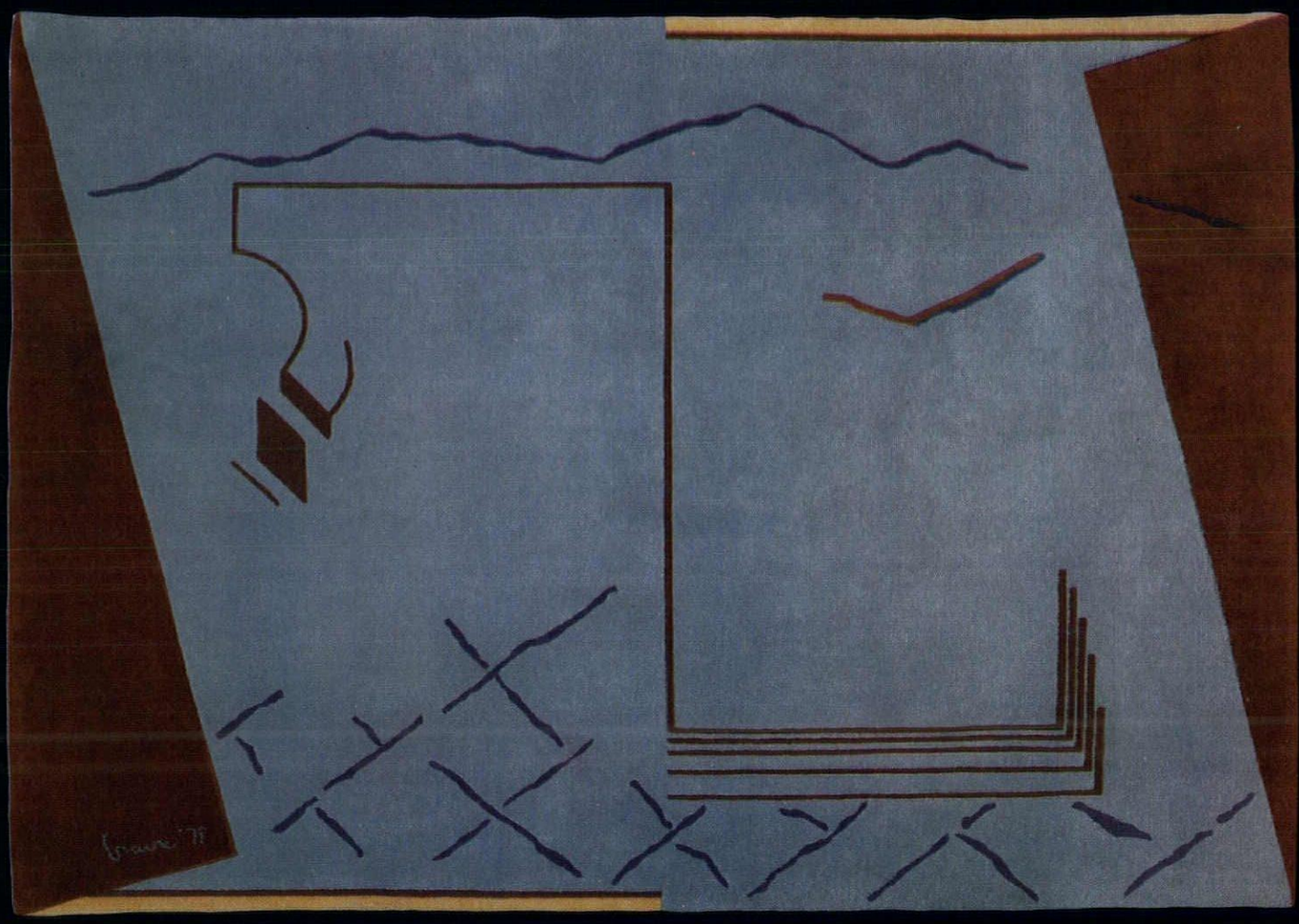

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ATLANTA, Thomas P. Carr; BOSTON, George & Frances Davison; CHICAGO, E. Virginia Kemper & Associates; CINCINNATI, DeCioccio Showroom; COSTA MESA, Gerridy's Ltd.; DALLAS, Pedlar & Company; DENVER, Linn Ledford Showroom; HONOLULU, Steve McClaran; HOUSTON, Ellouise Abbott; LOS ANGELES, Paul Singer Floor Coverings; MIAMI, Bob Collins, Inc.; MILWAUKEE, Carol Snyder; MINNEAPOLIS, Frank & Audrey Leavenworth; NEW YORK, Lord & Adams, Inc.; PHILADELPHIA, Charles R. Stock; PHOENIX, Linn Ledford Showroom; PITTSBURGH, Gaymar Company; PORTLAND, Wayne Martin Inc.; SAN FRANCISCO, John W. Ledford, Inc.; ST. LOUIS, Dennis Kaim Showroom; SEATTLE, James Goldman & Associates; TORONTO, H & I Broadloom, Ltd.; TROY, MICH., E-J Enterprises Ltd.; WASHINGTON, Duncan-Huggins Ltd.

PURE WOOL PILE

Circle **No. 385** on Reader Service Card

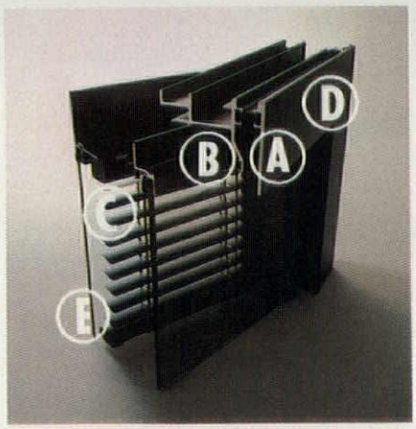
In a World of Ordinary Windows,

Double Hung. It's been around long enough to have earned the title "Old Undependable." If you want to heat or cool the great outdoors, double hung should be your first choice. What the Packard was to the car, double hung is to windows. A good idea whose time has passed.

Insulated Glass. Sometimes the obvious answers aren't so obvious. Ask owners who've experienced seal fracture failures. They've found that insulated glass delivers improved shading coefficients when it clouds up. An unorthodox way to save energy. But tough on folks who want to look outside.

Fixed. The most popular commercial window system in the world today. The fixed window is simplicity in itself. Non-operable, no emergency ventilation and no chance for easy repair. If your father-in-law is a window washer, be sure to specify fixed windows.

A. The DISCO T-2001 reduces the initial heating and air conditioning requirements. Provides the ultimate in heat and cold transfer reduction. Reduces noise pollution by as much as 50% and dramatically lowers cleaning and maintenance costs.



B. The first side hinged, in-swinging aluminum casement window featuring a poured-in-place polyurethane thermal barrier. A full ⅜" separation is provided between the interior and exterior surface of the frame members. U value .47.

C. Wedge-glazing system provides a high compression seal between glass and aluminum, preventing air and water infiltration.

D. Heli-arc welded corners provide greater in-place frame stability.

E. Fully enclosed narrow slat venetian blinds help provide shading coefficients as low as .10 when set at 45 degrees. Virtually maintenance free.

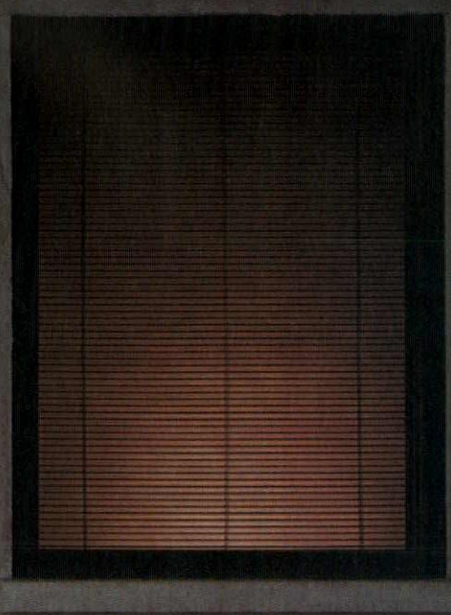
S 8.15/Di

Meet Disco...The Overachiever.

Slider. Try to wash this one from the inside. Better yet, try to keep it on track. Famous for easy air and water infiltration. They work best when accompanied by a repairman.

Pivoting. You don't have to be a fortune teller to predict the future of pivoting windows. Because they pivot across the weather stripping, they invite damage to the thermal seal. As they get older, pivoting windows let people inside know what's going on outside.

The Overachiever. The DISCO system. Operable, double or triple glazed. Inexpensive to clean and maintain. Side hinged, casement inswing is our favorite. The DISCO T-2001 has a U value of .47 and a shading coefficient as low as .10. No other window does more to save energy and reduce life cycle cost.



No Other Window Does a Better Job Of Reducing Energy Waste and Life Cycle Cost.

Even good windows have a way of becoming mediocre when faced with the challenge of reducing energy and life cycle costs. What was right for the 1970's may not meet the needs and government regulations of the 1980's and beyond.

Enter the overachiever. DISCO. A customized window system which assures maximum thermal efficiency and minimum air and water infiltration in an operable design. Perfect for combating energy waste and maintenance expense.

Our double and triple glazed systems are as malleable as you are imaginative. Each can be customized to meet your exacting specifications.

DISCO's ready for an age when good is no longer good enough...with windows that reflect the solid ideas of forward looking design.

Test us. If we don't have answers to your challenges, chances are they don't exist.

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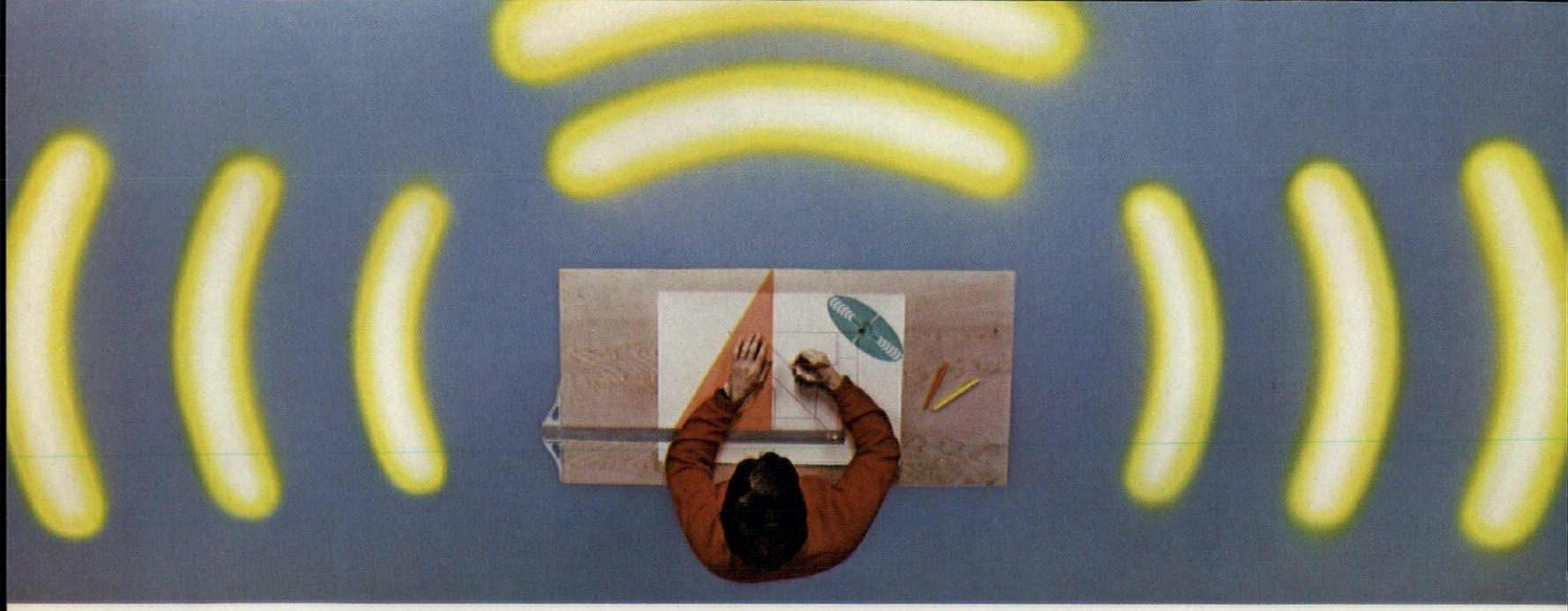
ALUMINUM PRODUCTS COMPANY, INC.

Write or call today for a free copy of "WINDOWS," a question of cost vs. worth. Should you want to meet with a DISCO architectural representative or require aid with drawings or specifications, contact Steve Berryman, DISCO Aluminum Products Company, P.O. Box 1019, Selma, Alabama 36701, (205) 875-9283.



To expand, stay put.

We can make your meetings outside the office more productive and save you time going and coming.

We offer architects an alternative to travel very much in keeping with today's emphasis on energy conservation and office efficiency. We offer teleconferencing in a surprising variety of forms.

The simplest and most familiar is the conference call. Any operator can arrange it so you can talk with the client, contractor and engineer all at once.

By adding a speakerphone or a portable conference phone, an entire planning committee could join the discussion. Also, with teleprinters and facsimile machines, written specs and drawings can be readily exchanged.

By having our electronic blackboard in your office, you can illustrate design concepts and changes. Standard TV monitors will allow groups anywhere to see every mark you make and join the discussion.

Teleconferencing is a professional way to manage information. You save time and energy. You hold the line on office expenses. You "call" meetings that busy colleagues are more likely to "attend." And, by expanding your area of activity, your office prospers.

Just as you use your knowledge to come up with innovative solutions to problems, we use ours to help you manage a limited resource—your time. A call to your Bell Account Executive begins the dialogue.

The knowledge business

Products and literature

The following items are related to the interior technics article on office chairs. They are grouped here for the convenience of the reader.

Products

Daria 270–280 executive chair series includes high-back and low-back desk chairs and a conference chair. Arms are of molded polyurethane or are upholstered, and the base is black molded polyurethane on casters. Upholstery is leather, suede, or fabric. Most come with swivel/tilt and pneumatic lift adjustments. The Pace Collection, Inc.
Circle 229 on reader service card

Executive swivel armchair, in a group designed by Norman Cherner, is available with black walnut or white oak frame. Sides, back, and seat can be upholstered in a choice of coverings ranging from leather and vinyl to wool and stain-resistant nylon. Modern Mode, Inc.
Circle 230 on reader service card

Xanadu executive or boardroom chairs, one with high back, have dacron and urethane foam padding for comfort and support. Bases are chrome steel with casters in rubber for hard floors or steel for carpeted floors. Leather upholstery is available, or covering can be in customer's own material. Stendig.
Circle 231 on reader service card

Office chairs in the 570 Series are contoured for comfort and adjustable to suit individual proportions. Frames are of self-skinned urethane to protect adjacent furniture from damage. Bases are either four- or five-prong styles with rubber bumpers for added protection. Vinyl, cloth, leather, and suede upholstery materials come in a wide choice of colors. GF Business Equipment, Inc.
Circle 232 on reader service card

The Davis chair, with heavily padded back and seat, is said to offer anatomically correct support. Both tilt and height are easily adjustable. Arms are black vinyl coated to prevent marring the desk, and black bases are five-point style. Covers can be removed for cleaning or replacement simply by removing one screw from beneath the seat. International Contract Furnishings, Inc.
Circle 233 on reader service card

The Phoenix seating collection, designed by John Duffy, includes high- and low-back posture swivel chairs and a guest chair with either open or closed arms. The group is offered in ash and walnut with a wide choice of textiles and leathers. Posture chairs have a tilt mechanism that permits the back to move independently of seat. The Gunlocke Co.
Circle 234 on reader service card

Executive office chairs Model CH-101 have black textured four- or five-prong steel bases, automatic gas lift, double carpet casters, and urethane-finished arms. They are available with high or low back, with arms or armless. Coverings can be leather or stretch fabric. Zographos.
Circle 235 on reader service card

Continuum series chairs come in three versions: 463, with full panel arm, for conference or guest chair; 462, with open arm; and 461, an open-arm style with stacking capabilities. All have wood frames of either white oak or black walnut and flame-retardant polyfoam seat and back. Stow/Davis.
Circle 236 on reader service card

Literature

Executive office furniture, described and illustrated in a 32-page catalog, includes desks, cabinets, conference and occasional tables, tilt/swivel chairs, conference chairs, and lounge seating. Unusual wood veneers and solid woods,
[*Literature continued on page 169*]

Introducing the StarTherm™ Energy Efficiency Analysis!

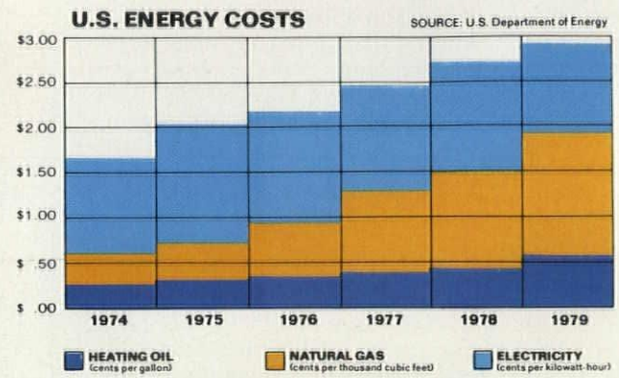
It won't cost you a penny. and it could save your clients thousands.

StarTherm insulated roof and wall systems are so remarkably energy efficient we think they'll out-perform almost any conventional construction materials. And we're willing to prove it with a free StarTherm Energy Efficiency Analysis.

Just give us the location and specifications of your proposed building project and your Star Builder will ask our computer to determine the energy savings you could realize with a StarTherm building of the same size. The results can be dramatic.

The StarTherm system's remarkable insulating properties will significantly reduce operating and maintenance costs, which account for about 50% of the total life cycle costs of any building. (The rest is initial construction and finance costs, plus improvements or building additions.)

You'll find it pays impressive dividends to build with StarTherm insulated panels.



$1,839 Annual Savings in Chicago.

In one example, the computer compared a 100′ wide by 150′ long by 20′ high structure with 4″ normal density blanket insulation in the roof and 12″ corefilled concrete block walls, with a building of the same size equipped with StarTherm roof and wall panels.

Our energy savings calculations were based on heating loads only. We told the computer that our example buildings were located in Chicago, and we specified that each building had two 3×7′ walk doors, two 10×10′ insulated overhead doors and two 3×6′ thermal pane windows. We assumed gas heating at $3.50 MCF.

The results?

The StarTherm building consumed 68% less energy than the conventional building, resulting in an annual dollar savings of at least $1,839. And when you consider the current rapid inflation in energy costs, this savings will be even more significant to the building owner 20 years from now.

Remarkable but not surprising.

StarTherm insulated panels offer some of the lowest U factors money can buy: 0.043 for roofs, an even lower 0.040 for walls. They have no through fasteners or compressed insulation points. Joints form a positive energy tight seal, and, according to ASTM-E-283 testing procedures, allow no detectable air infiltration.

Tax incentives. Reduced maintenance costs. Even lower insurance premiums.

The StarTherm system's low thermal transmission properties might qualify your structure for energy-related tax incentives.

Additional savings will occur through reduced maintenance costs. And our Class 1 low fire hazard rating and UL 30, 60, and 90 wind uplift ratings could lower insurance premiums. So over the life of your building StarTherm panels really pay off.

Ask for your energy efficiency analysis today.

Your Star Builder wants to help you design the building your client will thank you for—both today and in the future.

So ask for your free energy efficiency analysis today.

Call toll-free 800-654-3921.
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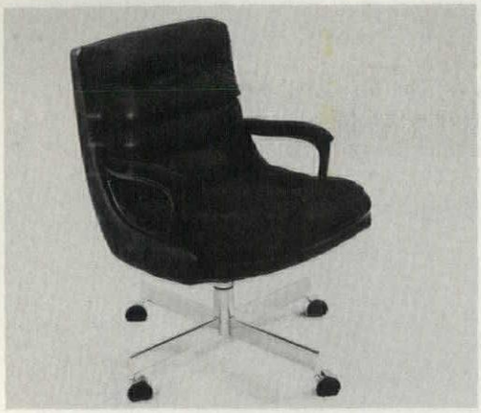
Or write Star Manufacturing Company.
Box 94910, Oklahoma City, OK 73143.

STAR BUILDING SYSTEMS

Circle No. 375

Literature continued from page 165

and metals such as stainless steel, bronze, and brass, as well as onyx, marble, and leather are used. Eppinger Furniture, Inc.
Circle 237 on reader service card



Office seating series. Data sheets show chairs in full color, with specifications and available options for each on reverse. Included are high- and low-back executive chairs, secretarial chairs, and conference room chairs. La-Z-Boy Contract Div., La-Z-Boy Chair Co.
Circle 238 on reader service card

GFRC

The following items are related to the technics article on glass fiber reinforced concrete. They are grouped here for the convenience of the reader.

Literature

Fiberglas®-reinforced concrete. Sixteen-page brochure discusses the architectural applications of glass fiber reinforced concrete (GFRC). It describes the material and covers the economics of its use. Included are physical properties and design guidelines for using FRC. Owens-Corning Fiberglas Corp.
Circle 239 on reader service card

Cem-FIL alkali-resistant glass fiber for glass-reinforced cement is discussed in a 36-page brochure. Materials used in glass fiber reinforced cement are listed and described. Methods of production include hand spray, mechanized, and premix. The material has structural and wall system applications and is also used to make prestressed components. Photographs of typical uses are included, along with data about physical properties. Cem-FIL Corp.
Circle 240 on reader service card

Ceramacor 3 ceiling coffers of one-piece glass fiber reinforced cement (GFRC) are strong enough to support light fixtures. They are available in a variety of colors and textures in standard or custom shapes. Design considerations and illustrations of typical installations are shown in an eight-page, full-color brochure. Technical data and a specification guide are included. Integrated Lighting Canada Ltd.
Circle 241 on reader service card

Tacboard is general-purpose, glass fiber reinforced cement building board. Product data, application details with detail drawings, specifications, and sitework instructions are included in a 10-page brochure. Cem-FIL Corp.
Circle 426 on reader service card

CEM-LITE glass fiber reinforced concrete is said to have high impact strength, high bending and tensile strengths, and to be noncombustible and lightweight. It is described and illustrated in a four-page brochure which shows the various textures available and typical buildings on which it has been used. Also in the brochure are photos and information about MO-SAI precast, prestressed concrete with exposed aggregate. MO-SAI.
Circle 427 on reader service card

Forton polymer glass fiber reinforced cement (PGFRC) brochure discusses the use of soft elastic polymer to prolong the life of glass fiber reinforced cement. The eight-page brochure discusses working with Forton and lists its applications. Mechanical and physical properties of the material are included. Forton.
Circle 428 on reader service card

Other products

Dowelok grilles, GR-2100, are constructed of wood frames with dowels at
[*Products continued on page 171*]

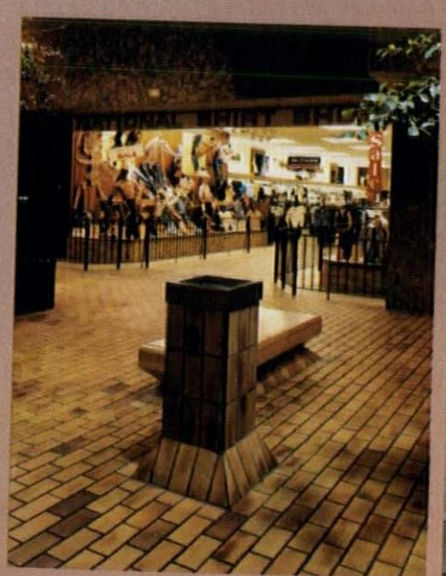
The uniqueness you get in each Normandie Ceramic Tile Paver begins with fine French clay.

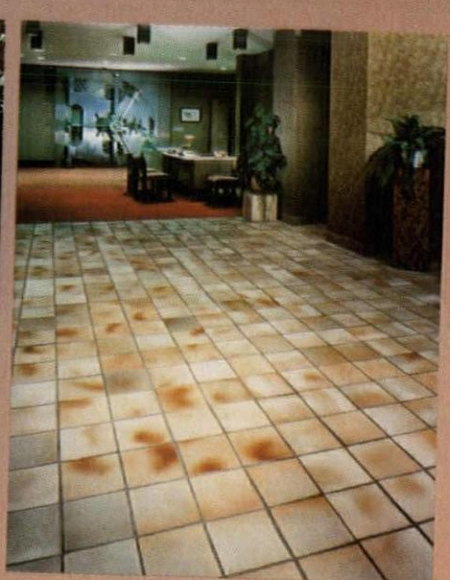
Tile Pictured:
Normandie Bronze – Nominal 4″ x 9″ x ½″

Normandie Pavers are made from selected French clays, considered among the best in the world. These superior clays are flame-fired in the traditional method to give Normandie Pavers their special natural hardness, durability, slip-resistance, and their infinite variations in shading and color.

Give your installation, either indoor or outdoor, the unique look of Normandie: the natural complement to the integrity of your design. See your local tile distributor or write for our illustrated brochure.

Right: The Plaza, New Orleans, Louisiana
Far Right: The Harter Bank & Trust Co., Canton, Ohio





Normandie fine French tile exclusively from

Metropolitan Ceramics
P.O. Box 9240 • Canton, Ohio 44711

Circle **No. 410** on Reader Service Card

Products continued from page 169

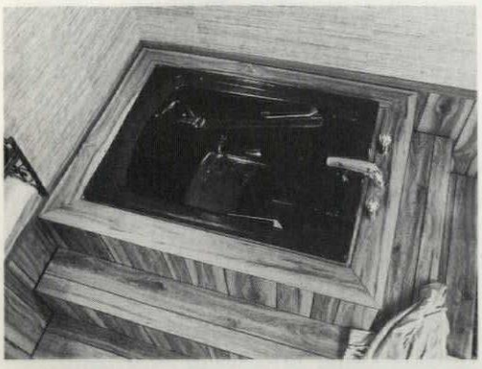
12-in. intervals. Woods include oak, mahogany, redwood, white fir, and others, and they are available unfinished, finished, or with a fire-retardant finish. Forms & Surfaces.
Circle 429 on reader service card

Series 10 seating units consisting of seat/back, seat, table, and arm can be combined in straight-line and right-angle layouts. The units fasten to a tubular steel frame. Seating and arm sections can be recovered on site. Resin tables, in satin or high-gloss finish, come in 18 colors. Metropolitan Furniture Corp.
Circle 430 on reader service card

Two- and three-drawer files, equipped with folders, hold A, B, and C size drawings. They will accommodate up to 60 18" x 24" sheets per folder. Each drawer holds 50 full-size or 100 half-size folders, which are held in a vertical position by spring pressure. Files have locks as standard equipment. Bases are counterbalanced to prevent tipping, with the added precaution of permitting only one drawer to be opened at a time. Plan Hold Corp.
Circle 431 on reader service card

Dri-Dek interlocking floor tiles have a black beveled safety trim called The Edge. The 12" x 2" trim provides smooth access to the 9/16-in. tiles. Dri-Dek is suitable for locations requiring a dry, anti-skid walking surface. Kendall Plastics, Inc.
Circle 432 on reader service card

Litter receptacles with natural wood panels of yellow pine are framed in anodized aluminum, based on a 30-gallon steel drum. Other woods are available to customize the receptacles. They can be used with disposable plastic bags or with permanent plastic liners. Clean City Squares, Inc.
Circle 433 on reader service card



Whirlpool tubs recently introduced include a 6-ft inset model with high back and armrests for reclining; a 5-ft model also for reclining; and a 4-ft sit-in tub with seat molded in. There is also a standard-size tub and a tub-shower unit. All have four-jet whirlpool units with directional and water-force adjustments. Universal-Rundle Corp.
Circle 434 on reader service card

Drywall furring channels are offered in ⅞-in. and 1½-in. depths made of 25- or 20-gage zinc-coated steel. The deeper channel provides extra space for routing electrical services, and the heavier gage provides greater load capacity. Allied Structural Industries.
Circle 435 on reader service card

Pictorial signs for the blind incorporate raised letters in almost any language and/or Braille, along with engraved symbols. The signs use international symbols and come in white and black, beige and brown, or in red when the international symbol calls for it. Best Mfg. Co.
Circle 436 on reader service card

VAM security intercom system has a telephone handset for room use. A loudspeaker at the door permits hands-free operation. There is an optional electric door release. The system can be used in apartments, condominiums, and other multiunit buildings. Aiphone.
Circle 437 on reader service card

A thermal break window is double-glazed with General Electric's Lexan® polycarbonate sheet to provide thermal insulation and impact resistance. It is also available with Lexan sheet on the exterior and glass on the interior. The windows can be used for either replacement or new construction. Amcor Industries, Inc.
Circle 438 on reader service card

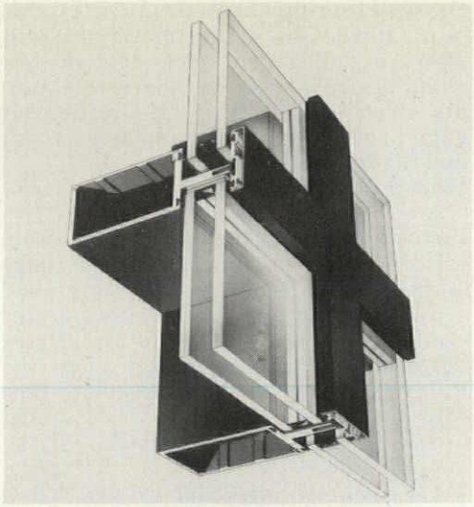
Sunflake Window provides an insulating panel (R-14) consisting of 1¾ in. of
[*Products continued on page 172*]

Products continued from page 171

urethane covered by textured white steel. The panel covers the window opening to prevent unwanted heat gain or loss. When not in use, the panel slides into a pocket concealed in the wall. Both window and pocket are contained in a single frame. The glazed part of the window comes in a variety of sizes and styles. The panel also reduces penetration of outside noises. It has an optional deadbolt for added security. Sunflake Window Co.
Circle 439 on reader service card

Aluminum-clad wood casement window sash and frames have insulating glass and two independent tubular weather-strip systems for energy efficiency. The electrostatically painted exteriors offer years of low maintenance service, according to the manufacturer. The casement windows open a full 90 degrees for easy cleaning. Hurd Millwork Co.
Circle 440 on reader service card

Windows with solid wood, double weather-stripped frames have double or triple glazing set in weathertight flexible vinyl gaskets for superior insulation. The glass has a slight tint that permits transmittance of more visible light than bronze or gray glass, yet cuts heat gain compared with ordinary glass. Caradco Div., Scoville Mfg. Co.
Circle 441 on reader service card



Arcadia C-350 framing system for curtain walls accommodates 1-in. insulatng glass and allows the glass to be set ½ in. deep for strength and safety. The framing is 2⅝ in. wide, 5⅜ in. deep, and comes in 24-ft lengths. It is intended for use on buildings with floor-to-floor spacing of 10–12 ft and up to 30 stories high. Northrop Architectural Systems.
Circle 442 on reader service card

Caribe outdoor luminaires offer a choice of shapes: spheres, cubes, cylinders, and lanterns. Prismatic refractors direct light downward for maximum energy efficiency and light utilization. Lamp choices are high-pressure sodium, metal halide, mercury, or incandescent. The luminaires can be mounted singly or up to five to a pole. Areas of application include office buildings, shopping centers, condominiums, parks, schools, and hospitals. Holophane Div., Johns-Manville Service Center.
Circle 443 on reader service card

Ther/Miser windows consist of two independent glazed assemblies insulated from each other by a thermal break. They are available with either or both the prime window and Ther/Miser units single or double glazed, with U-values ranging from .49 to .325. For comparison, U-values are 1.22 for single-glazed windows and .65 for double-glazed windows with a ¼-in. air space. Crossly Windows, Energy Conservation Products Div., Instrument Systems Corp.
Circle 628 on reader service card

Model DV Sky-Vue venting skylight, made from weather- and corrosion-resistant metals, has an insulated double dome. A hand crank, with extension rod for high ceilings, opens the skylight for ventilation as needed, allowing fresh air in and hot air out. Integral insect screens are included. The skylight has a self-flashing curb for easy installation. APC Corp.
Circle 629 on reader service card

Therm-a-Frame window framing has all interior trim pieces thermally separated from exterior counterparts to
[*Products continued on page 174*]

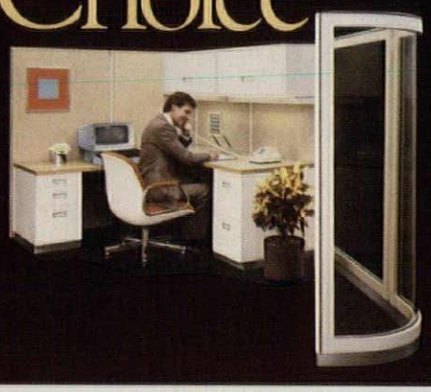
Freedom Of Choice

Choosing All-Steel furniture is only the first of many choices.

All-Steel makes complete lines of components for today's office. But you make the choices about how and when to introduce them into your office plan.

You see, our 8000 Series components are compatible not only with each other, but also with your client's existing contemporary office furniture. So you're not limited to an all-or-nothing choice.

You can retain as much of your client's traditional office plan as you wish. Simply introduce All-Steel 8000 Series components a few at a time.



Choose from a variety of furniture styles... a variety of panel sizes and components... a variety of shapes, colors, textures, wiring and communications capabilities. Choose only what you need to serve your requirements.

Discover all the choices that can be yours when you choose All-Steel. Call Wayne Wilkins at 312/859-2600, or write for our new 8000 Series Systems Furniture brochure. All-Steel Inc., Aurora, IL 60507.

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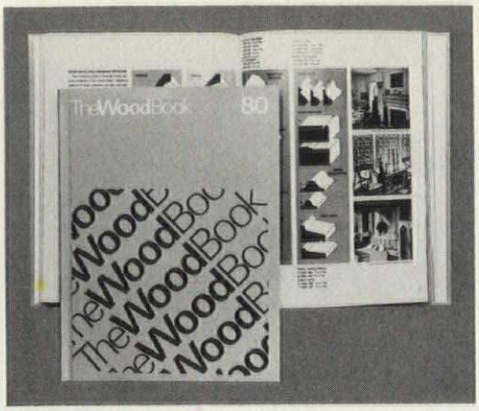
Circle **No. 305** on Reader Service Card

Products continued from page 172

prevent moisture condensation. Designed to be used with the company's Foamwall insulated metal wall construction system, it can be used with ¼-in. single pane glazing or 1-in. insulated glass. The framing can be installed from either the exterior or interior of the building, and glazing can be done from the inside. Each unit will accept a maximum of 30 sq ft of glazing. Glazing gaskets are made of closed-cell neoprene with factory-molded corners to prevent air or water leakage. Elwin G. Smith Div., Cyclops Corp.
Circle 630 on reader service card

Other literature

'The Berger Building Cost File' for 1980 is revised to reflect current price trends. Material and labor costs have been projected to anticipated mid-1980 figures. It is intended for use by architects, engineers, builders, and institutions as a means of estimating for budget or construction cost analyses. The file is available in four regional editions. Represented are general trades (8000 items), mechanical trades (2000 items) and electrical trades (1000 items). Cost of the book, published by Van Nostrand Reinhold, is $27.95 for each edition. Further information is available by telephoning in New York (212) 683-5498.



The WoodBook 1980 contains nearly 400 pages of applications of wood, such as recommendations for subfloor and underlayments, siding and paneling, coverage rate for shingles and shakes, recommendations for construction systems, and specifications for all wood products. Copies are available to specifiers at $10 each. Order from: The WoodBook, Dept. A, 3516 Sacramento St., San Francisco, Ca 94118.

Tables and planters of spun metal, with descriptions, drawings, and prices, are included in a 42-page catalog. There are cocktail, dining, conference, and bank checkstand tables with a choice of laminated/veneer or glass tops. Planters are hanging, freestanding, and desk-top designs. Folder includes illustrated color brochures. G. J. Neville.
Circle 631 on reader service card

Public area luxury carpet is described in a four-page brochure, which also shows typical installations. Construction and performance guide to 18 grades includes information about fiber, gauge, pile, backing, size, colors, and wear. Customweave Carpets, Inc.
Circle 632 on reader service card

Roto roof windows can be installed in any pitched roof to provide light and ventilation. They are available with clear or tinted glass and have a built-in ventilator as well as a burglar-proof ventilation opening. A four-page color brochure illustrates the windows, provides technical specifications, and includes detail installation drawings. Roto Frank of America, Inc.
Circle 633 on reader service card

Vaporstream electric steam humidifier for residential use can be incorporated into a forced-air heating system to provide sufficient moisture (5.7 to 227.2 lb/hr) for even large residences. The controlled bleed-off feature reduces mineral build-up. Heater elements are self-cleaning, automatically flaking off scale as they heat and cool. A 20-page brochure provides details and specifications of the humidifier. Dri-Steem Humidifier Co.
Circle 634 on reader service card

Extruded aluminum louvers catalog provides construction details and suggested specifications for fixed-blade and
[*Literature continued on page 177*]

A dash of dazzle in a shopping center.

ELEVATOR BY DOVER

It's quite a trip for shoppers when they move from the main level to the promenade level of the Rolling Acres Mall in West Akron. Designer James B. Heller of Keeva J. Kekst Associates combined glass, chrome, and incandescent lamps to create a "vista" elevator that dazzles and delights. At the heart of these glamorous trappings is a Dover IVO Elevator, the high quality, pre-engineered Oildraulic® elevator made for add-on or new construction of three stories or less. For more information on the complete Dover line of traction and hydraulic elevators, write Dover Corporation, Elevator Division, P.O. Box 2177, Dept. B, Memphis, Tenn. 38101.

DOVER®

The elevator innovators.

Rolling Acres Mall,
Akron, Ohio

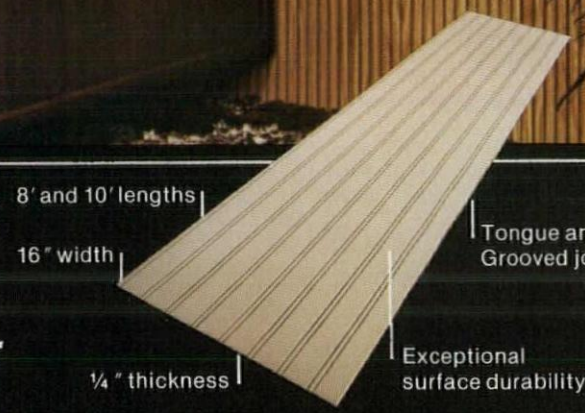
Developer:
Forest City Rental Properties Corporation and
Richard B. Buchholzer

General Contractor:
Forest City Dillon, Inc.

Architects:
Keeva J. Kekst Associates, Architect, Inc.

Cab Designer:
James B. Heller

Dover IVO Elevator sold and installed by
Dover Elevator Company



The functional aesthetics of Marlite® Brand Plank

Marlite® Brand Plank. It's so much more than a pretty face. It's a unique combination of design features critical in the specification of commercial interiors. Design trend aesthetics that meet color, texture and pattern requirements. An exciting collection of finishes, including deeply-textured and richly-embossed woodgrained designs. A nominal 16″ wide product in 8′ and 10′ lengths for total design flexibility and ease of application. And it's highly functional. Abrasion, stain and scratch resistant. Won't splinter. Resists warpage. Easy to clean and maintain. Compare it to wood. It's not an imitation. It's an improvement. Write for details.

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COMMERCIAL DIVISION
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Literature continued from page 174

adjustable-blade louvers. The 16-page catalog shows frame styles and mullion and jamb details. Louvers come in standard mill finish or in a choice of other finishes at extra cost. Dowco Corp.
Circle 635 on reader service card

'Who's Who in Wool Carpets' is a four-page brochure that lists names and addresses of wool carpet manufacturers in table form. Included in the data are wool type, carpet construction, and whether carpets are in stock or special order. The Wool Bureau, Inc.
Circle 636 on reader service card

'Natural stone panels' is an eight-page, four-color brochure that explains how aggregate-surfaced panels are made, used, and installed. Detail drawings illustrate how the multilayer panels are constructed and show typical construction details. Photos of panels show the various aggregate sizes and colors available. Sanspray Corp.
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Clay roof tile brochure illustrates and provides specifications for one-piece and two-piece roof tiles, which have the advantages of being fireproof, permanent, maintenance-free, and energy-saving. Detail drawings show methods of installation at chimneys, ridges, and other roof elements. United States Tile.
Circle 638 on reader service card

Master tile specifications brochure provides specifications for one-piece lines with illustrations of trim shapes. The 16-page guide includes specifications on field and trim sizes, basic uses, limitations, composition, installation, and availability. A folder of color bulletins illustrating colors available and typical installations is also included. Huntington/Pacific Ceramics, Inc.
Circle 639 on reader service card

'Series IV Gypsum Shaftwall Assemblies' described in a 16-page brochure, are one-, two-, and three-hour rated for fire resistance. Detail drawings show component features, construction of each type, and methods of installation. Table of limiting heights is included, along with recommended procedures for location of gypsum board joints. The Flintkote Company.
Circle 640 on reader service card

'Compendium: Architect Selection Laws' contains the statutes of 17 states that currently have specific legislation regulating the selection of architects and engineers for public construction projects. States in which the laws are applicable are California, Colorado, Connecticut, Delaware, Florida, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Nebraska, New Hampshire, Oklahoma, Pennsylvania, and South Carolina. Copies are free to AIA members, $5 for nonmembers. Order Catalog No. 6N509 (members) or 4N509 (nonmembers) from AIA Publications Marketing, 1735 New York Ave., NW, Washington, DC 20006.

Wood accessories shown in a four-page brochure include lighting standards, trash receptacles, guide rails, signs, custom millwork, and benches. The wood used is western red cedar, which is long lasting because of natural preserving oils, and resistant to moisture and insects. Specification instructions are included. Ryther-Purdy Lumber Co.
Circle 641 on reader service card

'Glass for Construction' for 1980 has an expanded technical data section of general glazing information and product selection. The 32-page catalog discusses the role of glass in remodeling and restoration, and for use in passive solar energy design. Also covered are special glazing applications and products. Libbey-Owens-Ford.
Circle 642 on reader service card

Photometric data brochure provides tabular information about lighting options available with the Synercon 60 integrated ceiling. Intended to help lighting engineers to determine the best system for the job required, it provides data about the basic troffer system and the Tascon pendant-type lighting fixture. The troffer is 14½" x 48" and has 1-, 2-, or 3-lamp capacity. Tascon has a low-energy requirement of one watt per sq ft. Armstrong Cork Co.
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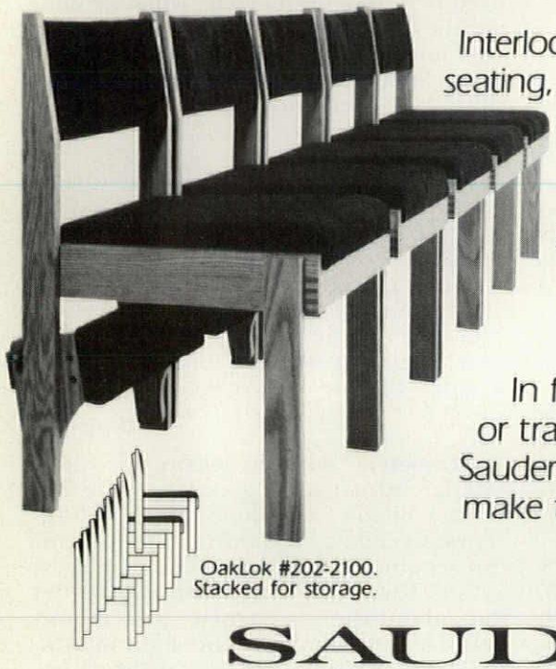
For the most efficient use of church space... Sauder flexible seating.



Interlocking wooden seating, for straight or radial rows. Self-stacking, for minimal storage space. Choice of styles and finishes. In flexible seating or traditional pews, Sauder makes wood make the difference.

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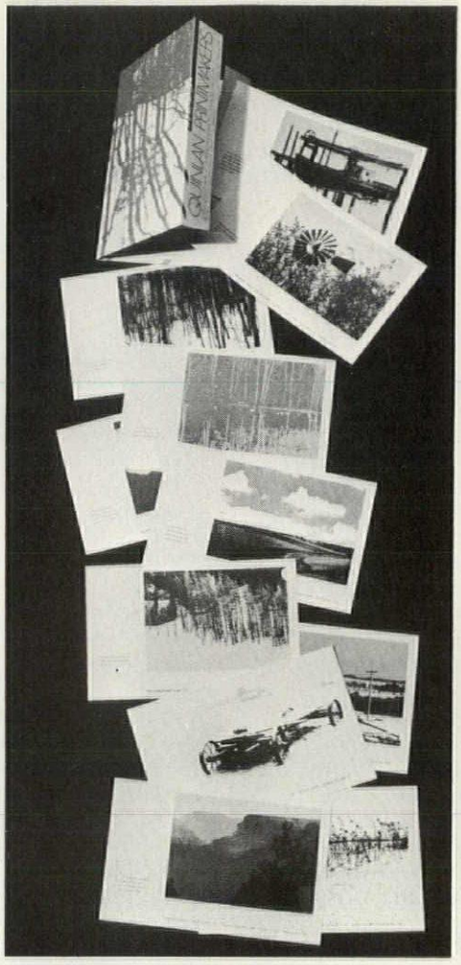

New Quinlan Printmakers catalog is a specially designed selling tool.

Albert Quinlan's photo-serigraphs blend the old technique of silk-screen printing with photography, showcasing his intuitive feeling for light and textural harmonies.

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The new catalog presents each print on an individual sheet of appropriate size to provide a real feeling for the colors used. A single print can be pulled and placed in a specific location to check compatibility with existing decor, sent to your customer for approval, or arranged with Other Quinlan prints in groupings to determine the over-all effect.

Quinlan Printmakers work closely with designers, decorators and architects and offer custom color service for special projects.

For a catalog, please send $2.00 to: Quinlan Printmakers, Dept. P-2 Box 3308 Merchandise Mart Chicago, IL 60654

See us during Neocon. Call (312) 441-6539 for an appointment to visit our downtown Chicago showroom.

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CONTEMPORARY ARCHITECTS

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For the first time ever, information on the world's foremost contemporary architects is available in one place. *Contemporary Architects* provides detailed information on 600 architects of international reputation, selected for inclusion by a distinguished advisory board. Similar in format to the award-winning *Contemporary Artists*, the entries in *Contemporary Architects* provide: a biography; a complete list of constructed works and projects; a signed critical essay; a bibliography of articles and books on and by the architect; and a black and white representative illustration of the architect's work. In many cases, a comment by the architect on his or her own work is also included. This timely publication will satisfy the growing need for data in the field and reflects both the diversity and continuity of architecture as it enters the 1980's.

1000 pp. 9x12. 600 b&w photographs. ISBN: 0-312-16635-4. $60.00. April 1980.

ST. MARTIN'S PRESS

Reference Books Division 175 Fifth Avenue New York, N.Y. 10010

Circle **No. 370** on Reader Service Card

Above: Bullock's Department Store in San José, Cal. Note Grinnell Quick Response Sprinklers installed in a sprinkler line suspended from a cable below the fabric roof. Photo courtesy of Virgil R. Carter, Architect, Environmental Planning & Research, Inc.
Right above: Grinnell's Model F930 Quick Response Sprinkler.

The sky's the limit.

Grinnell® Sprinklers Can Meet the Challenge of Your Most Challenging Designs.

When Bullock's in San Jose, California's Oakridge Mall installed the first fabric roof ever used in a department store, they chose Grinnell sprinklers.

The problem that faced the owners, the architects and the insurance company was how to provide needed sprinkler protection that could respond quickly and effectively to a fire when the sprinkler lines were suspended from cables as much as 17′ below the fabric roof.

The roof structure, with its Teflon* coated fiberglass construction, made conventional pipe hangers impossible. The only practical manner to support the sprinkler system was from the suspension cables which were an integral part of the overall building design.

This innovative design called for an innovative technology, which was met by the use of Grinnell's Model F930 Quick Response Sprinkler. This sprinkler combines the time-tested Duraspeed Sprinkler with an additional heat detection device sensitive to a temperature rate of rise of 20°F. per second.

The sprinkler's quick-response device attaches in a matter of seconds to any standard Duraspeed soldered-type sprinkler. Thus, standard upright and pendent sprinklers (as well as horizontal sidewall models) were available for use in this overall design.

This unique fast-acting sprinkler, listed by Underwriters Laboratories, proved its capabilities in a test program witnessed by the owner's representatives and representatives of the insurance authorities.

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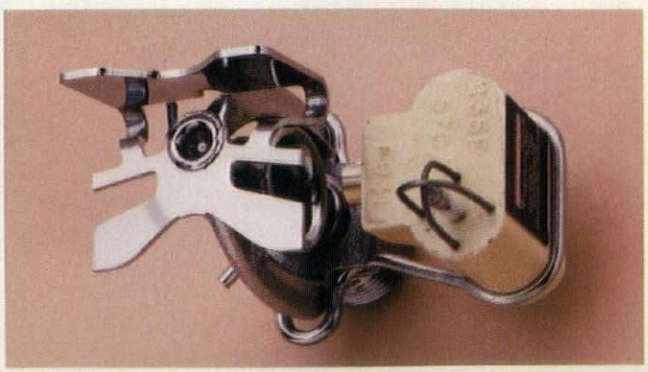
*TM DuPont Co.



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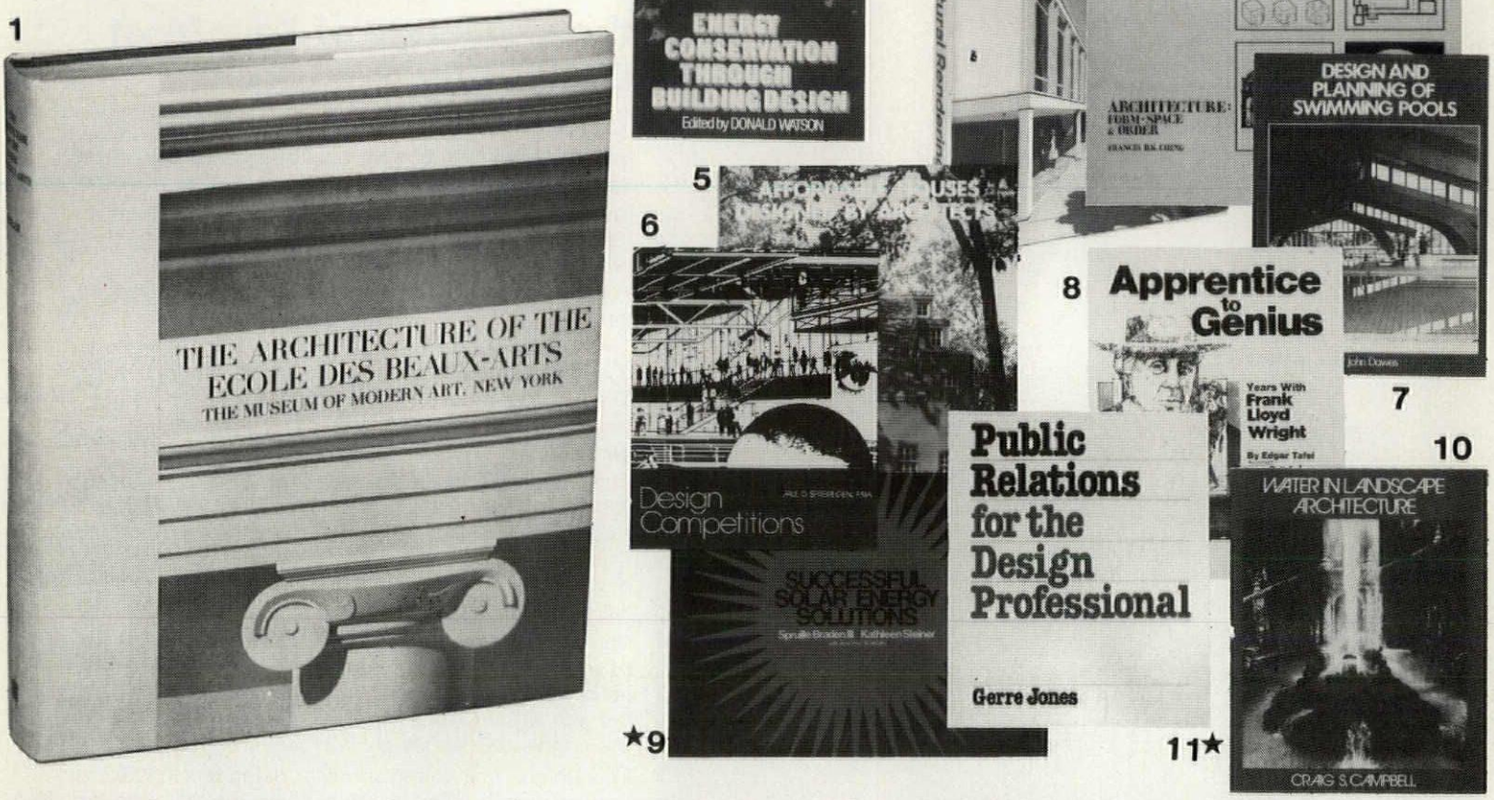

P/A Book Store

Each book has been selected for it's usefulness to you in your professional practice. **Prices slightly higher in Canada. Foreign orders must be accompanied by payment.** It is not necessary to send payment with the order. Circle appropriate numbers on the Reader Service Cards in the back of this issue, add your name and address and mail. Local sales tax **must** be included with payment. Prices subject to change.

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1 The Architecture of the Ecole des Beaux-Arts

Edited by Arthur Drexler with essays by Richard Chafee, David Van Zanten, Neil Levine and Arthur Drexler
423 pp., illus. . . . $55.00

The most comprehensive analysis and documentation of Beaux-Arts architecture ever published. Includes large-scale drawings of elevations and plans and photographs of major French and American Beaux-Arts buildings (including Pennsylvania Station and Grand Central Terminal).
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2 Energy Conservation Through Building Design

Edited by Donald Watson,
305 pp., illus. . . . $19.50

This precedent-setting book provides the bridge between architect and engineer, practitioner and researcher, so necessary to the development of a rational approach to energy conservation. Not limited to new building designs, it also includes methods of analyzing existing structures and specific ways to reduce their energy consumption.
Circle B602 under Books.

3 Architectural Rendering: The Techniques of Contemporary Presentation

By Albert O. Halse, 326 pp., illus., 2nd edition, 1972 . . . $37.00

This completely up-dated revision of the most widely used guide to architectural rendering covers all working phases from pencil strokes to finished product — and shows how to obtain the desired mood, perspective, light and color effects, select proper equipment and work in different media.
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NEW★

4 Architecture: Form, Space and Order

By Francis D.K. Ching,
294 pp., illus. . . . $22.50

Written to foster understanding of design concepts, this rich source of architectural prototype demonstrates how to extract the fundamental principles of form and space from the environment, whether in the architectural one views or inhabits, in architectural visualization, in drawing, or in actual design.
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5 Affordable Houses Designed by Architects

Edited by Jeremy Robinson,
168 pp., illus. . . . $18.95

This lavishly illustrated volume shatters the myth that architect-designed houses are more costly than developer-built houses. The superb photographs, floor plans, drawings, and details of interiors and exteriors present a wealth of ideas on how to construct beautiful and unique houses within limited budgets.
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6 Design Competitions

By Paul D. Spreiregen,
310 pp., illus. . . . $24.95

The first comprehensive guide to design competitions based on American practices, it examines in detail all important aspects of this timely subject, including how competitions work and the ground rules that govern most competitions.
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7 Design and Planning of Swimming Pools

By John Dawes,
276 pp., illus. . . . $49.95

A comprehensive manual that describes the essential characteristics and consequent design requirements of every type of pool imaginable. Also deals in great detail with more technical matters, such as structural problems and how to solve them, finishes, filtration, circulation and water treatment, heating and ventilating.
Circle B607 under Books.

8 Apprentice to Genius Years with Frank Lloyd Wright

By Edgar Tafel,
228 pp., illus. . . . $19.95

This rare piece of biography answers hundreds of questions about America's greatest architect and those much gossiped-about Taliesin years (and later). The author, a former student of Wright's brilliantly portrays the many moods of this genius, from the tenderness hidden behind the strictness of Wright the teacher to the wellsprings of the unfailing creative surges of Wright the architect.
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NEW★

9 Successful Solar Energy Solutions

By Spruille Braden & Kathleen Steiner,
288 pp., illus. . . . $24.50

This information-packed book proves that the demands of efficiency and aesthetic quality can be met in one structure by presenting some of the most innovative, positive and well-defined solar energy designs of the past 25 years.
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10 Water in Landscape Architecture

By Craig S. Campbell
128 pp., illus. . . . $15.95

This profusely illustrated book is the first published work that deals in substantial detail with the technical as well as the aesthetic principles of fountain design. Covers basic hydraulic principles, practical limitations, environment and available equipment.
Circle B610 under Books.

NEW★

11 Public Relations for the Design Professional

By Gerre Jones,
278 pp., illus. . . . $18.50

An authoritative book on public relations written in easily understood language for architects, engineers and other design professionals. Explains how to plan, set up and carry out a PR program that meets special requirements, as well as how to take advantage of some often overlooked opportunities for free publicity from the media.
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12 Anthropometrics for Designers

by John Croney,
176 pp., illus. . . . $4.50

This unusual book provides an illustrated account, principally through diagrams, of man's dimensions and other physical data, his limitations and his peculiarities — data essential in many specialized fields of industrial or commercial design.
Circle B612 under Books

NEW★

13 Design of Long-Term Care Facilities

By Laszlo Aranyi & L. L. Goldman,
298 pp., illus. . . . $29.50

How to humanize nursing homes through proper design is the purpose of this volume, which covers every step from site selection to interior color schemes. Includes guidelines and layout plans ready-to-use format.
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14 Architectural Illustration The Value Delineation Process

by Paul Stevenson Oles,
288 pp., illus. . . . $34.50

In this copiously illustrated, clearly organized explanation of his value delineation system, the author presents a detailed description of the process which has resulted in these award-winning delineations that show realistically how a designed structure will appear when built.
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15 Earth Sheltered Housing Design Guidelines, Examples, References

Prepared by the
Underground Space Center,
University of Minnesota
318 pp., illus. . . . $17.95

This comprehensive and timely study offers a comfortable and economic approach to underground housing based on modern construction techniques. Provides plans, details and photographs of existing examples, and shows how to design homes using such low-cost natural resources- and energy-saving systems as layers of soil insulation and passive solar heating.
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NEW★

16 Solar Energy Utilization

By Tim Michels,
272 pp., illus. . . . $18.50

This valuable handbook not only provides ready-to-use information on designing a wide range of passive and active solar energy systems, but puts it into a context of why or why not certain choices in system components and materials are made.
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17 Drawing File for Architects, Illustrators and Designers

By Marc Szabo
251 pp., illus. . . . $14.95

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.
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NEW★

18 Design Cost Analysis for Architects & Engineers

By Herbert Swinburne,
317 pp., illus. . . . $18.95

This first-of-its-kind book shows architects and engineers how to analyze and estimate the costs of building construction during the design stage when the potential for controlling costs is greatest.
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19 Architectural Stained Glass

Edited by Brian Clarke
234 pp., illus. . . . $29.50

The contributors to this book (through their stunning designs) emphasize stained glass as a constructivist art form, taking it out of its medieval ecclesiastical context and putting it into a contemporary framework, both secular and architectonic.
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20 Working Drawing Handbok A Guide for Architects & Builders

By Robert C. McHugh,
166 pp., . . . $14.95

This guide is a step-by-step presentation on how to produce working drawings as an integral aspect of communication between designer and builder. Includes convenient check-lists, budgeting information, and data on dimensioning that helps minimize chances of error.
Circle B620 under Books.

21 The Architecture of Frank Lloyd Wright A Complete Catalog Second Edition

By William Allin Storrer,
456 pp., illus. . . . $15.00

This second edition, which documents all of the buildings designed by Wright, replaced a number of photographs with new ones that show the buildings to better effect, changed some copy in the text, and incorporated factual information that has come to light since the original publication in 1974.
Circle B621 under Books.

22 New Profits from Old Buildings

By R.M. Warner, S.M. Groff,
and R.P. Warner
291 pp., illus. . . . $22.50

This first business-oriented guide to building preservation is based on 71 case studies of actual preservation projects of old structures, industrial facilities, neighborhoods and commercial districts. Explains how these companies became involved, what problems they faced, how they financed the projects, what benefits they reaped.
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23 Architectural Presentation Techniques

By William W. Atkin,
196 pp., illus $17.95

This book includes presentations ranging from simple sketches in pencil and pen-and-ink to elaborate drawings, photographs, slide presentations and various combinations of media achieved with overlays, camera techniques and modern reproduction methods.
Circle B623 under Books.

24 Rendering With Pen and Ink

By Robert W. Gill,
368 pp., illus. . . . $9.95

This paper-back edition is a copiously illustrated guide to the techniques and methods of rendering, including sections on perspective, projection, shadow, reflections, and how to draw cars, ships, aircraft, trees, and human figures. The author also describes the very wide range of instruments and equipment currently in use.
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25 Trees for Architecture and the Landscape Condensed Edition

by Robert L. Zion
208 pp., illus. . . . $11.95

This attractive book will aid communication between landscape architect, architect and layman with a comprehensive collection of photographic portraits of trees whose structure, habit and other characteristics make them especially useful in relation to buildings and outdoor spaces.
Circle B625 under Books.

NEW★

26 How to Recycle Buildings

By Laurence E. Reiner,
244 pp., illus. . . . $18.50

The concensus of opinion by many authorities in the building industry is that recycling is here to stay and to expand. Here is an excellent reference on how to find, evaluate, survey, finance and market recycling projects profitably.
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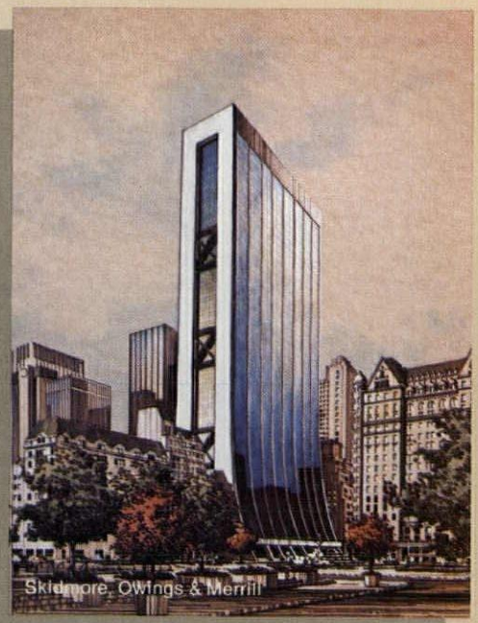

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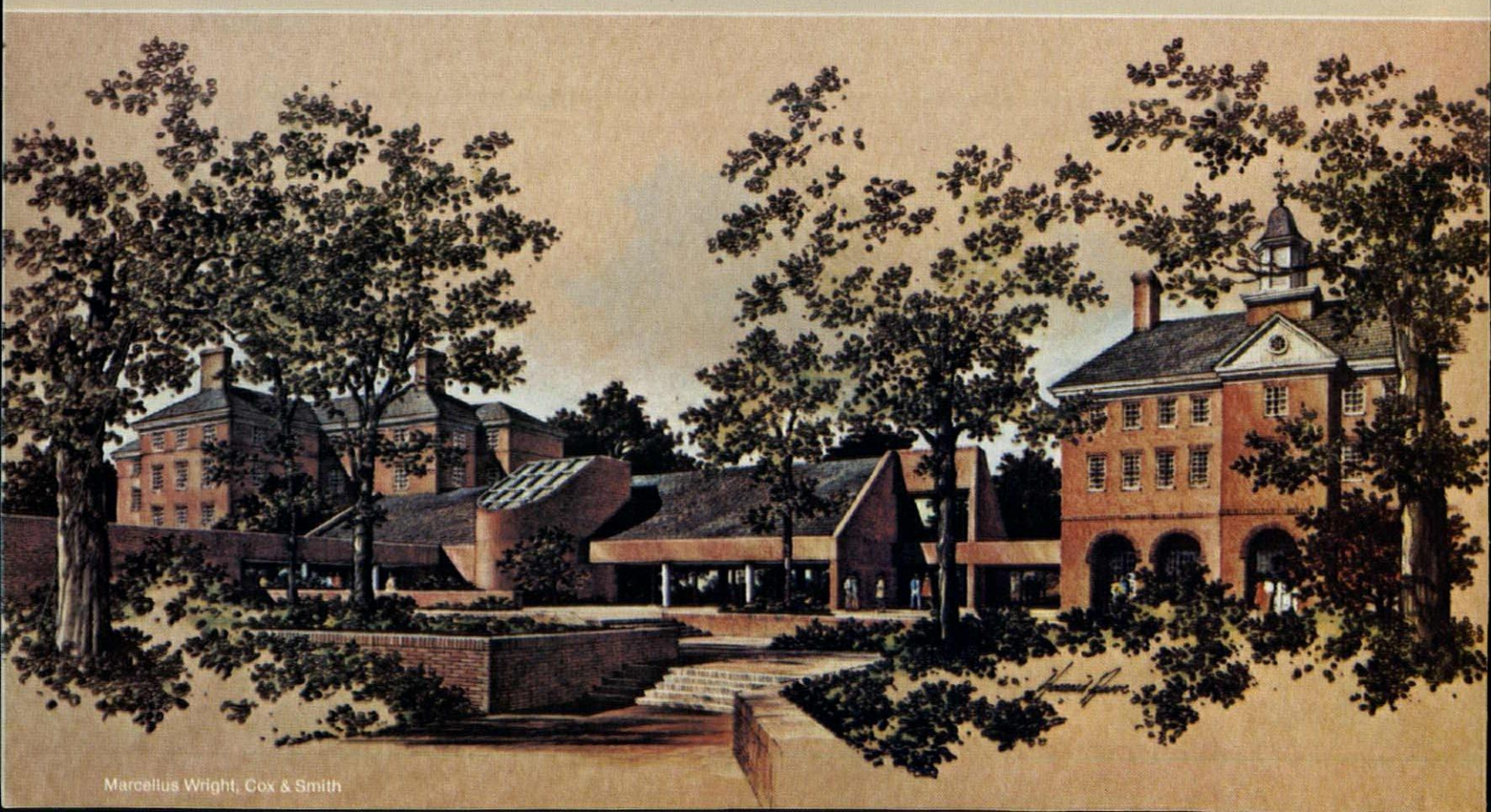

Building materials

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

Recreational Facilities Building, Southern Illinois University, Carbondale, Il (p. 122). *Architects: Ralph Rapson & Associates, Minneapolis, Mn.* Structural steel: Mississippi Valley SS Co. Precast concrete panels: Arkansas Precast Concrete Co. Metal curved panels, metal insulated panels, exposed metal panels: E.G. Smith. Metal decking: H.H. Robertson. Built-up roofing: Celotex Co. Ceramic tile wall surfacing: American Olean. Synthetic floor surfacing: Robbins Co. V.A.T. flooring: Armstrong. Waterproofing: Anti-Hydro (mixed in the concrete) and Volclay Benonite panel system, by American Colloid. Foamglass membrane dampproofing: Koppers Co. Insulation: Dow Chemical. Concrete block wall partitions: Carbondale Concrete Products. Spectra glazed block partitions: Midwest Glazed Products. Metal windows: Superior Fireproof Co. Wood doors: Weyerhaeuser Co. Metal overhead doors: Cornell Iron Works. Elevators: Dover. Metal entrance doors: Superior Fireproof Door Co. Mortise locks, doorclosers, rolling door: Sargent. Hinges: McKinney Hinge Co. Electric strikes panic exits: Folger-Adams. Expoline paint: Tnemec Co. Epoxy and alkyd paint: Devoe. Wood gym and handball court floor: Robbin Loktite Floor. Seating and saunas: Petersen Planing Mill. Lighting: Abolite (mercury), Stonco (inland flood), Marco (mercury vapor), Kurtzon (fluorescent), Sterner (mercury vapor). Heating: Vulcan Radiator Co., American Air Filter Co. Air-conditioning units: Trane Co.

Juan Ramon Loubriel Stadium, Bayamón, Puerto Rico (p. 118). *Architect: Reed, Torres, Beauchamp, Marvel, Hato Rey, Puerto Rico.* Concrete piles: Fuemtes Concrete Pile-Bayamón Foundation Co., Inc. Steel frame: Aetna Steel Co. Prestressed concrete: Interstruct Corp. Steel cables: Roebling Bridge Division. Aluminum cladding: Reynolds Aluminum. Carpet: Aladdin Carpet. Tile: American Olean. Insulation: Airlite. Roof drains: Josam. Toilet partitions: Global Steel Products Co. Wire partitions: Superior Wire and Metal. Entrance and rolling doors: North American Rolling Door Corp. Strong room door: Diebold. Locksets: Sargent. Hinges: Stanley and Hager. Paint: Mobile. Seats: American Seating. Scoreboards: All American Scoreboards. Elevators: Armor. Site lighting: Premier Electric International Corp., Benjamin, mcPhilben, Keystone, Daybrite, Zinsco. Air-conditioning system: Carrier, Canbridge Filter Co., Loren Cook.

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Architect: M.S. in Architecture and Urban Design or equivalent with one yr. work or work/teaching experience. Capability to follow through on big projects from conceptualization to construction documentation. Responsibilities include preparing presentation drawings, models, working drawings and coordinating with consulting engineers. Must send design portfolio and production drawings to demonstrate technical skill. $16,530/yr., 40-hr. wk. Contact J. Gwin, Golemon & Rolfe Assoc. Inc., ste 1200, 3000 S. Post Oak, Houston, Tx 77056, (713) 840-9988. Equal Opportunity Employer.

Architects or Non-Architects, wishing to grow in the comforts of a well established firm, and eager to contribute and be part of its growth, are needed in the areas of Project Managing, Senior Drafting, Specifications Writing and Cost Estimating. Applicants should have a minimum of five years experience in an Architectural Office. Send resume to FLETCHER AND VALENTI, ARCHITECTS/PLANNERS, INC., 2005 Pan Am Circle, Suite 500, Tampa, Fl 33607, or call (813) 870-1460.

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Architectural Draftsmen: Positions available with expanding architectural firm for persons with 2–5+ yrs. experience in preparation of working drawings. Florida East Coast firm offering outstanding location, advancement opportunities and company benefits. Send resume, work samples, salary range, to: Riegler/Orr Associates, 2733 Morningside Blvd., Port St. Lucie, Fl 33452.

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Associate/Full Professor: 1980–81/AY. Teaching Building Support Systems including principles of design and selection of equipment for electrical, plumbing, HVAC, vertical transportation systems; principles of utilization of alternative energy sources. Required: terminal degree in Architecture or related field, emphasis on electrical and mechanical systems for buildings; professional experience with architectural or engineering consulting firms. Professional license, teaching experience at collegiate level and extensive practice preferred. $20,604–$31,416. The CSUC Board of Trustees has recommmended a general 11% cost of living increase effective July 1, 1980. Send vitae to: Chairperson of Selection Committee, Architecture Department, California Polytechnic State University, San Luis Obispo, Ca 93407. Closing date: May 24, 1980. Affirmative Action/EO/Title IX Employer.

Auburn University's Department of Architecture is seeking applicants for nine-month, faculty positions beginning fall 1980. The Department offers degrees in architecture, interior design, landscape architecture, and regional planning.

The Department anticipates openings in each professional degree program. Applicants should possess a terminal degree in appropriate discipline and have professional and academic experience. Teaching includes design studio and lecture or seminar in area of applicant's expertise. Salaries are competitive.

Forward resume and representative examples of work to: Professor Wayne Drummond, Head, Department of Architecture, Auburn University, Auburn, Al 36830. Auburn University is an Equal Opportunity, Affirmative Action Employer.

Construction Technology: Faculty position beginning June or late August 1980 at University of Southern Mississippi. Can be at assistant or associate professorial level. Applicants should have at least a master's degree in Construction Technology, Architecture, or Civil Engineering. Interest in teaching quantity surveying, estimating, cost accounting, scheduling, and construction administration is desirable. Construction experience helpful. Resumes should be sent to the Chairman, Construction and Architectural Technology, Southern Station Box 5137, Hattiesburg, Ms 39401. Names, addresses, and telephone numbers of three professional references should be included. The University of Southern Mississippi is an Equal Opportunity/Affirmative Action Employer.

The Department of Architecture at the Pennsylvania State University has full and part-time faculty positions open, beginning September 1980, in the areas of Architecture and Urban Design. Teaching assignments would include studio teaching at the beginning and advanced undergraduate professional level and seminars in areas of specializations such as energy, preservation, theory and/or urban design. Rank and salary are negotiable. Requirements include terminal degree in the field and experience in teaching, research and/or practice. Application deadline: May 30, 1980. Submit application and resume to: Head, Department of Architecture, The Pennsylvania State University, 206 Engineering Unit C, (B) University Park, Pa 16802. The Pennsylvania State University is an Equal Opportunity/Affirmative Action Employer.

Department of Architecture: University of Washington, seeks nominations/candidates for faculty positions September 1980 or January 1981 in Building Sciences, Structures and Computer Graphics. Submit resume: Search Committee, Department of Architecture, University of Washington, Seattle, Wa 98105. Information: (206) 543-4180. Application deadline: June 1, 1980. UW is an Equal Opportunity/Affirmative Action Employer.

Design Architect position avail. with prominent firm located in Pacific NW for person with 3–5+ yrs. exp. in the design and planning of HEALTH FACILITIES/HOSPITAL projects. Qualified person should have degree, comprehensive design and plan. exp. and ability to function effectively with clients and other disciplines while maintaining a high degree of professionalism. This is a growth position with a well known firm offering comp. compensation and a very desirable location. Contact our representatives in confidence at: G. Marshall Assoc., P.O. Box 66083, Chicago, Il 60666.

Faculty Position: Division of Architectural Engineering Technology, Roger Williams College. Appointment beginning September, 1980, for teaching courses in Architectural Design and Technology. Masters Degree in Architecture required. Teaching experience, work experience, and interest in historic preservation helpful. Architectural Registration desirable. Send letter of application/resume to Personnel Office, Roger Williams College, Bristol, RI 02809, no later than May 30, 1980.

Faculty Positions: University of Cincinnati School of Architecture and Interior Design has assistant and associate professorships available in the following specializations: Architectural Construction Technology, Space Planning and Behavioral Theory, History of Interior Space and the Decorative Arts, the Landscape Context of Architecture, the Art of Drawing Architecture and Interior Design, and Professional Ethics and Economics. All full-time faculty are associated with design studios. Women and minority applications are encouraged. Send letters of interest, brief resume, and names of three references to: John Meunier, Director; School of Architecture and Interior Design; College of Design, Architecture

[*continued on page 187*]

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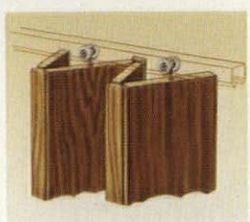

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Job Mart continued from page 184

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Plans Examiner: The City of Rockville, Maryland is seeking a PLANS EXAMINER for its Licenses and Inspection Division. Person will be responsible for reviewing site and construction plans for code compliance. Will inspect buildings to determine legality of proposed changes. Degree in civil, structural, fire protection engineering, or architecture, or equivalent combination of education and experience. Familiarity with BOCA codes desirable. Salary range: $14,483–$18,484. Submit resume to: Mr. Paul E. Radauskas, Superintendent, 111 Maryland Ave., Rockville, Md 20850, (301) 424-8000, ext. 231.

Princeton Architecture: Faculty positions expected to be available in 1980 and 1981, teaching one or more of the following: (1) Architectural Design, (2) Urban Design, (3) Analysis and Theory of Architecture and Urban Design, (4) History of Urban Design. Send resume to: Dean Robert Geddes, School of Architecture and Urban Planning, Princeton University, Princeton, NJ 08544. Princeton University is an Affirmative Action/Equal Opportunity Employer.

Project Architect req. by well known A/E in the MidWest. Qualified person should possess degree and reg. plus 4–6+ yrs. exp. in the design of inst., comm. and office bldg. projects. Individual should also be capable of assuming project leadership role; supv. all project phases and maintaining client relations. Contact our representatives in confidence at: G. Marshall Assoc., P.O. Box 66083, Chicago, Il 60666.

Project Architect position avail. with growth oriented design firm in the South. Qualified person should have degree and 3–5 yrs. exp. in the design of comm., office and inst. projects. Also req. is the ability to lead projects; supv. production and contribute key design input; along with interfacing with clients. Firm offers excellent growth potential and compensation. Reply in confidence to our representatives at: G. Marshall Assoc., P.O. Box 66083, Chicago, Il 60666.

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Senior Draftsman—Architectural, Senior Draftsman—Engineering, Field Inspector—Experienced, Architectural Designer. Challenging work, professional environment, salary commensurate with experience. Send resumes to: TAG Architects, P.O. Box 1629, Charleston, WV 25326. All inquiries confidential.

Sr. Interiors Architect required by leading design firm located in the MidWest. Position requires degree and reg. with 8+ yrs. exp. in the comprehensive design and planning of architectural interiors assoc. with major office, inst. and comm. projects. Qualified person must also possess the exp. and/or ability to direct a design staff, interact effectively with clients and maintain a successful interiors design profit center. Successful growth oriented firm offers comp. salary, excellent prof. environment and living location. Contact our representatives in confidence at: G. Marshall Assoc., P.O. Box 66083, Chicago, Il 60666.

Specifications Writer required by well known design firm located in MidWest. Qualified person should have 3–5+ yrs. exp. in the prep. of comprehensive Architectural Specifications relating to major institutional, comm. and office bldg. projects; coupled with ability to function with min. of supv. and assume major respon. Degree and computer based exp. desirable but not mandatory. Firm offers excellent compensation, stability and future growth potential. Contact our representatives at: G. Marshall Assoc., P.O. Box 66083, Chicago, Il 60666.

Specifications Writer: We are seeking an experienced specification writer to join an internationally-known design-oriented architectural firm located in Harvard Square. We offer an unusual opportunity to participate significantly in major architectural projects. The successful candidate will be familiar with construction methods, working drawings, and contract documents. CSI certification desirable. Send resume and salary requirements to: Personnel Manager, The Architects Collaborative, Inc., 46 Brattle Street, Cambridge, Ma 02138, (617) 868-4200, ext. 340. An Equal Opportunity Employer.

University of Arizona, College of Architecture, invites applications from design educated and professionally experienced persons who are capable of organizing and integrating into the lecture/studio sequence in an imaginative and responsible way comprehensive programs dealing with: 1) architectural technology and engineering; 2) architectural communication; 3) socio-cultural-economic issues; and 4) site analysis and design. Positions 1, 2, and 3 are full-time, position 4 is one-half time. Rank and salary are negotiable. Appointments are for the academic year beginning 15 August 1980. Application deadline is 1 June 1980. The College offers both B. Arch and M. Arch degrees. Its population is 500 students and 25 faculty. Apply to Ronald Gourley, Dean, College of Architecture, Tucson, Az 85710. The University of Arizona is an Affirmative Action/Equal Opportunity Employer.

University Planning Consultant (Architect): College grad, degree in architec-

[*continued on page 189*]

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ture. Five years experience in position of responsibility for overall coordination and development of facilities plans and construction, preferably in university environment. Registration required. Salary negotiable. Send resume to: Mr. M. H. Patterson, Director; OPM 102; University of South Florida, Tampa, Fl 33620, by June 30, 1980. Equal Opportunity Employer.

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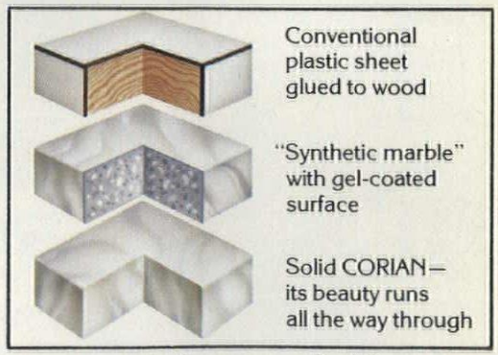

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