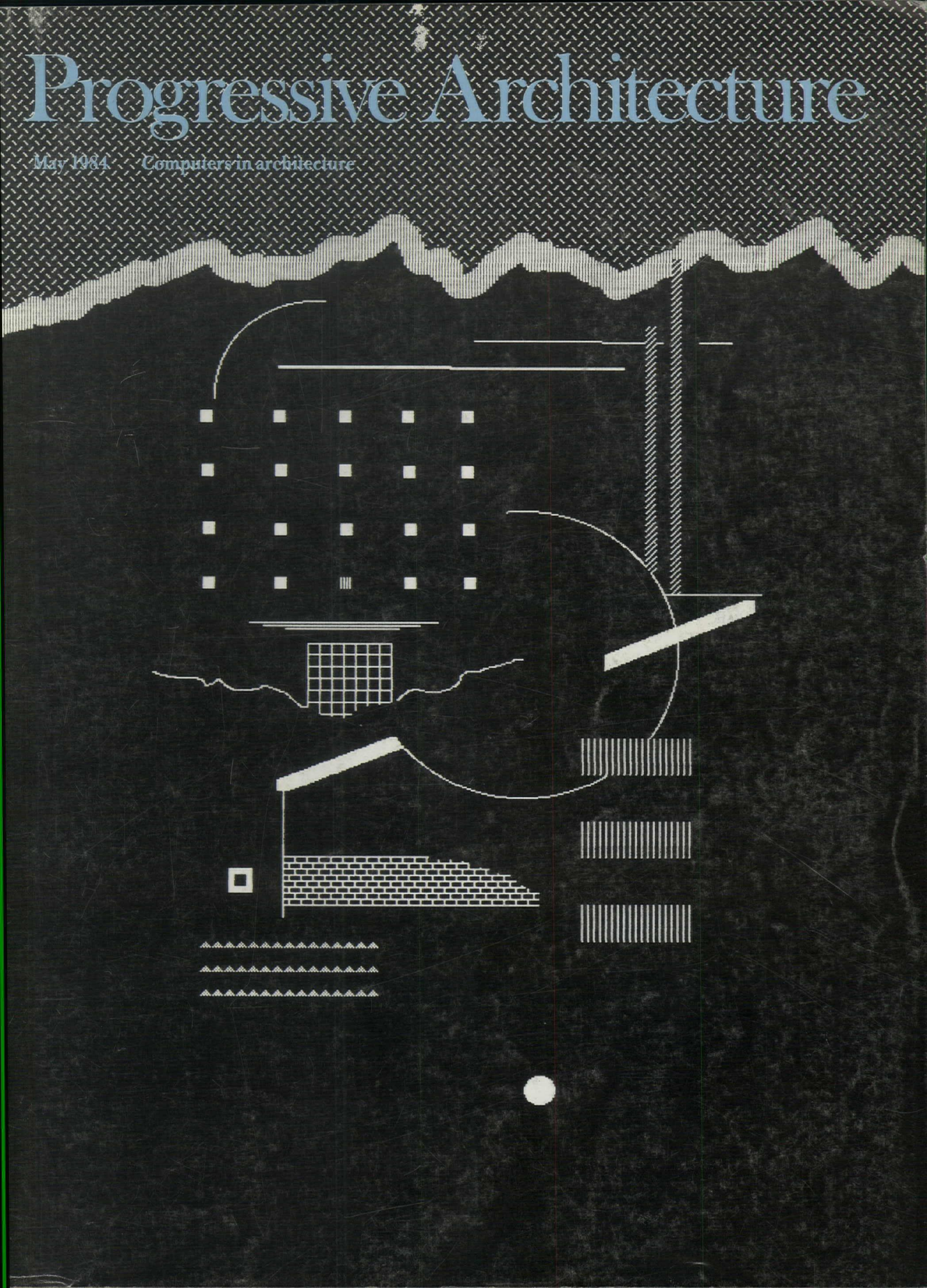
Progressive Architecture

May 1984 Computers in architecture



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Progressive Architecture

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Park Plaza, La Jolla, California. Architects: Buss, Silvers, Hughes, San Diego, California. Contractor: Nielsen Construction, San Diego, California. Finish: Kynar Silver Tri-X.

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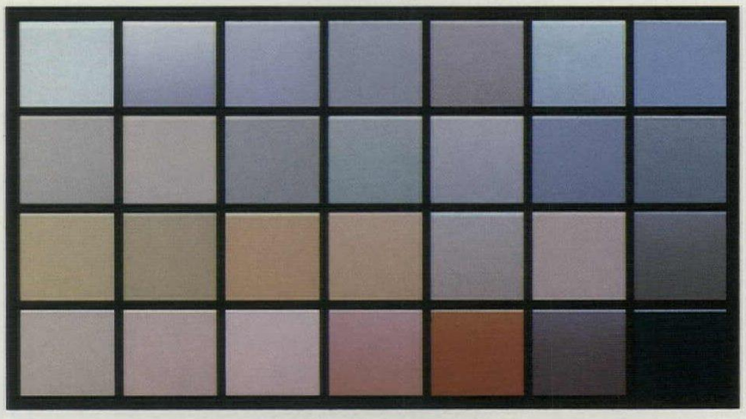

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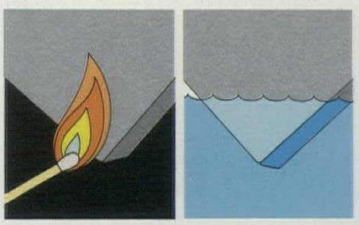
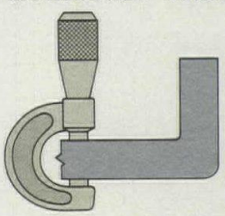


laminate because Tech Wall panels are solid .120" thick aluminum.



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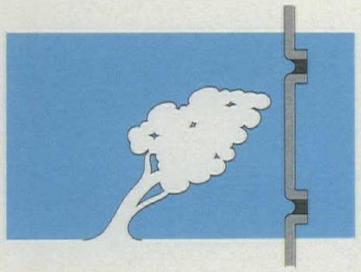
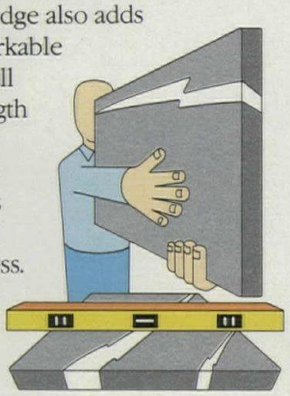


Superior flatness is assured by Tech Wall's panel edge design. The edge also adds remarkable overall strength and maximizes panel flatness.



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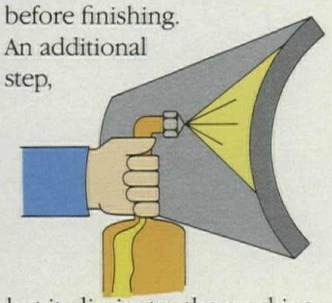

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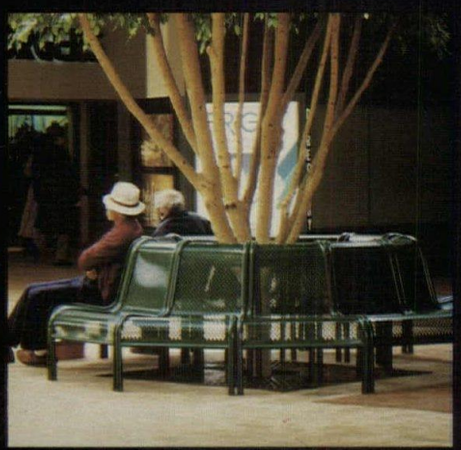
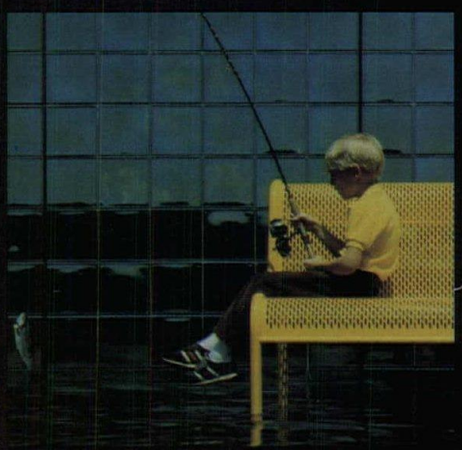
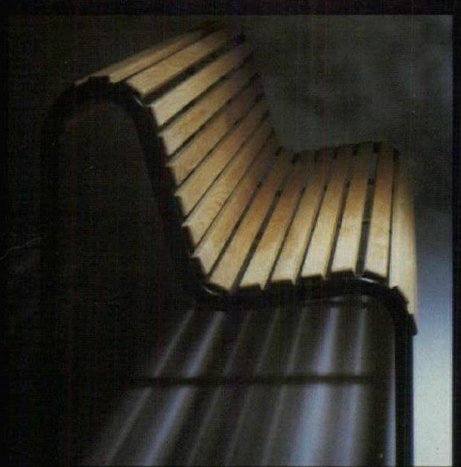
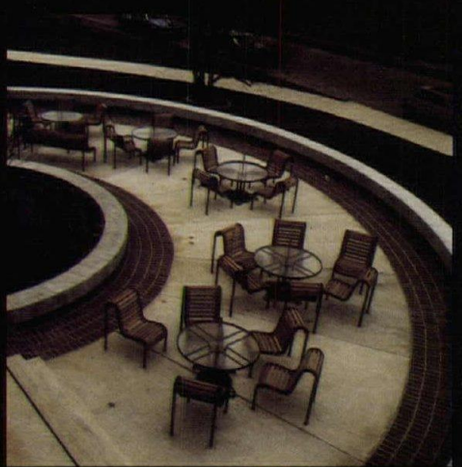
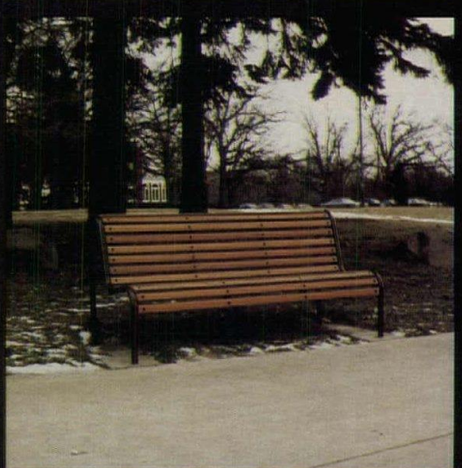




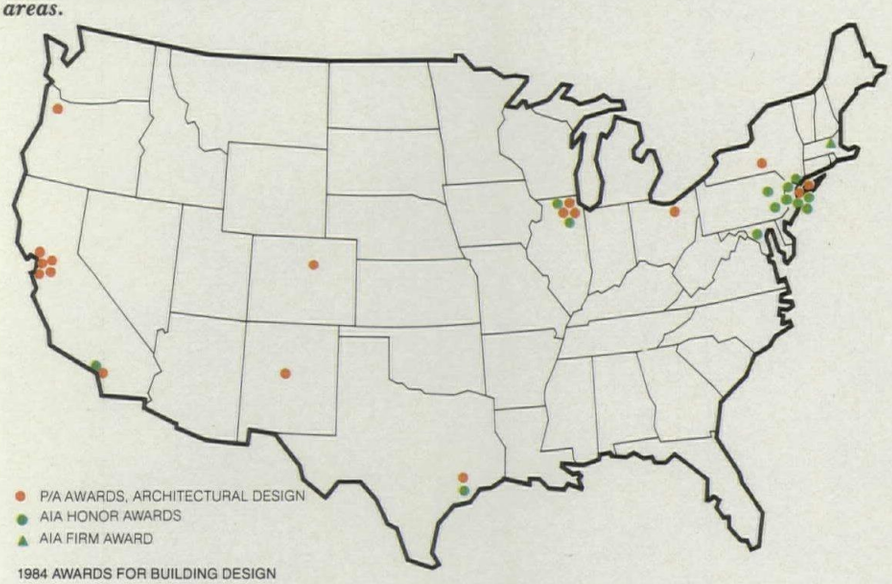






Geography of recognition

As the map below indicates, national recognition for architectural design goes mainly to firms in a few metropolitan areas.



1984 AWARDS FOR BUILDING DESIGN

Obviously, the practice of architecture is not distributed across the nation in proportion to the population. Though architects with established reputations can willfully choose rural locations—Frank Lloyd Wright chose two—most of them need at least a modest commercial center to sustain them. And firms that specialize in any way, including those that acquire distinction for design, tend to concentrate in major cities.

Though fully aware of this, we may be surprised at the pattern displayed on the map above. Shown on it are the locations of *firms* recognized this year in the two principal national awards competitions for building design, the P/A Awards and the AIA Honor Awards (see Jan. 1984 P/A and this issue, p. 22. For consistency, I have shown the location of the first firm on the official credits and included P/A winners for architectural design only—and I have added a symbol for the AIA Firm Award winner.) To a striking degree, this year's winners are clustered on the Northeast seaboard, in Chicago, and in California.

It happens this year that the P/A Awards lean strongly to the West and the AIA ones to the East. But despite year-to-year shifts, the combined distribution of these awards has been remarkably consistent over the past decade or more. Almost any year, it would include heavy concentrations around New York, in Chicago, and in the San Francisco Bay Area; there would typically be more than one winner each for the Los Angeles, Houston, Philadelphia, and Boston areas.

Clearly, size of city is a factor; all the five biggest U.S. cities are mentioned here, but their order shows other factors at work. A major one is tradition: Chicago remains the Second City in architecture—very close to first in fact—notwithstanding the highly publicized access of L.A. to second position for sheer size. In California, the San Francisco area still dominates architecture, though the city is now only *fourth* in size there. That brings up the second major factor, Schools of Architecture: the synergistic relationship of first-rank schools to major cities sustains the national prominence of Boston, San Francisco, and Philadelphia; it helps give Houston clear preeminence in Texas. Local schools are important to the architectural culture in many other cities too, but they don't play any more than a solid supporting role. The only schools outside major cities that have accumulated some noted design firms around them are Princeton and Yale, and that has been possible because both are convenient to New York.

If the map on this page showed *building* locations instead of *firm* locations, the symbols would have been scattered more evenly. Areas where firms recognized for design are concentrated *export* much of their product. Some well-known New York offices build the bulk of their work in other time zones, and New York relies little on firms outside the city for its significant architecture (if you count New Haven and Princeton firms as local). The same could be said for Chicago and Philadelphia, but in Boston, Houston, or Los Angeles many of the recognized buildings are by outside firms, even though the local ones produce prize-winning work in far places.

These are only a few simplified observations about one specialized area of cultural geography. How does this distribution of prizes relate to dollar volume of work? To the distribution of prestigious universities, or of the professional press? What about design recognition in sections of the country such as the Northwest or the Caribbean islands, where regional viewpoints prevail? In your own work, and in your participation in professional organizations, you might reflect on some of these questions.

John Morris Dixon

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photo: PETER PAIGE

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Views

Reflections on Johnson/Burgee

The Johnson issue probably should be regarded as more of a function of his social rather than architectural prowess. Just look: the PPG project is "indistinguishable from Yamasaki" (Jencks); the Cleveland Playhouse auditorium is as banal as anything by Wallace K. Harrison; and "The Crescent" in Dallas leaves one speechless. Here in San Francisco, as in Texas or India, we see several napkin sketches rising in our midst which will be embarrassingly conspicuous for many years to come. In the interest of historical fairness I hope that some future editors of P/A will, in the next century, review these noble visions in order to tell to the architects of their age just what substantiated Johnson's enormous reputation. It will be a lot tougher than anything Peter Eisenman will have to do to rationalize the political scene in the Thirties.

Paul Fisher
San Francisco, Calif.

[Whatever the writer means by "social prowess," it had nothing to do with our doing an issue on this work. This staggering amount of provocative work should interest all journalists in our field—and apparently has. The similarities noted to work by other architects are well worth considering, though we perceive significant differences, as well.—Editors]

Corporate America was sold a bill of goods with Modern Architecture and Philip Johnson's recent work suggests creative architectural accounting in the form of a resubmittal of that same bill.

There is a megalomania apparent in much of this work that I believe can be traced to two sources:

1 An Architect who, in his twilight years, is determined to add his name to the roster of "Great Architects" by subconsciously recalling enduring images from architectural history and then recreating those images in a last gasp for immortality and a place among the Ancients.

2 An American corporate client (the traditional capitalist philistine) who has again been beguiled by deft verbiage into believing that this new historical iconography conveys the proper contemporary image of power and prestige.

In general, the work is overscaled, unurban (not only must you stand across the street to view Golden Boy at ATT, you have to stand *inside* the lobby of the opposite building to avoid being trampled by pedestrians) and derivative enough to warrant quick dismissal from any self-respecting school of Architecture.

If it is true that those who forget history tend to repeat it, I find it sad that this recent work from America's premier Architect seems to suffer from an advanced case of Alzheimer's disease.

Thomas Markunas/Architect
New York, N.Y.

The many articles on Philip Johnson and his recent work in P/A of February, 1984, offered an informative, illustrative picture of this architect. However, I feel compelled to request a form of follow-up profile of his supposed partner of equal stature.

John Burgee appears to have been cast to the darkest shadow of another man in recent history (his only quotation in 36 pages of reporting was, "No, we didn't," p. 78). Information about him is scant and it makes me wonder if the somehow obligatory references to him pay due homage. Please enlighten me.

Mitchell I. Riese
Hall/Architects
Houston, Texas

[Johnson has, understandably, been the more vocal and visible partner, but John Burgee, FAIA, now appears frequently and effectively as lecturer, panelist, etc. Born in Chicago in 1933 and educated at Notre Dame, Burgee worked in the C.F. Murphy office, where he became a partner before leaving in 1967 to form a partnership with Johnson. Burgee's experience with major skyscrapers—a new field for Johnson—apparently contributed to their accomplishment at the IDS Center in Minneapolis (1968–1973) and subsequent major commercial projects.—Editors]

Consultants' value

I commend you on your efforts to give greater attention within these pages to the *practice* of architecture (Editorial, P/A, Feb. 1984, p. 7). As a decline in the use of architectural services continues (see "Money and Design," P/A, Dec. 1982, pp. 57–62), I was amused to observe that Kevin Silson's article in P/A Practice (Jan. 1984, p. 69) recommends the practice of dropping consultants who require high fees. Mr. Silson appears to regard consultants as a raw material (note that he holds an MBA), and to consider the pool of "equally qualified consultants" to be quite large.

I am compelled to point out that the number of good consultants, like the number of good architects, is actually limited. Prospective clients are not turning away from architects and toward engineers, and contractors, and manufacturers of building systems because architectural fees are too large. The profession is in eclipse because the premiums required for its involvement do not often enough produce premium results in the eyes of potential clients.

Those firms who concentrate on the maximization of the short-term gains in the *business* of architecture will continue to capture a decreasing number of commissions. Those firms who, with their qualified consultants, concentrate on the *profession* of architecture through the production of work of an increasingly high standard, will find that their opportunities, and their fees, continue to expand.

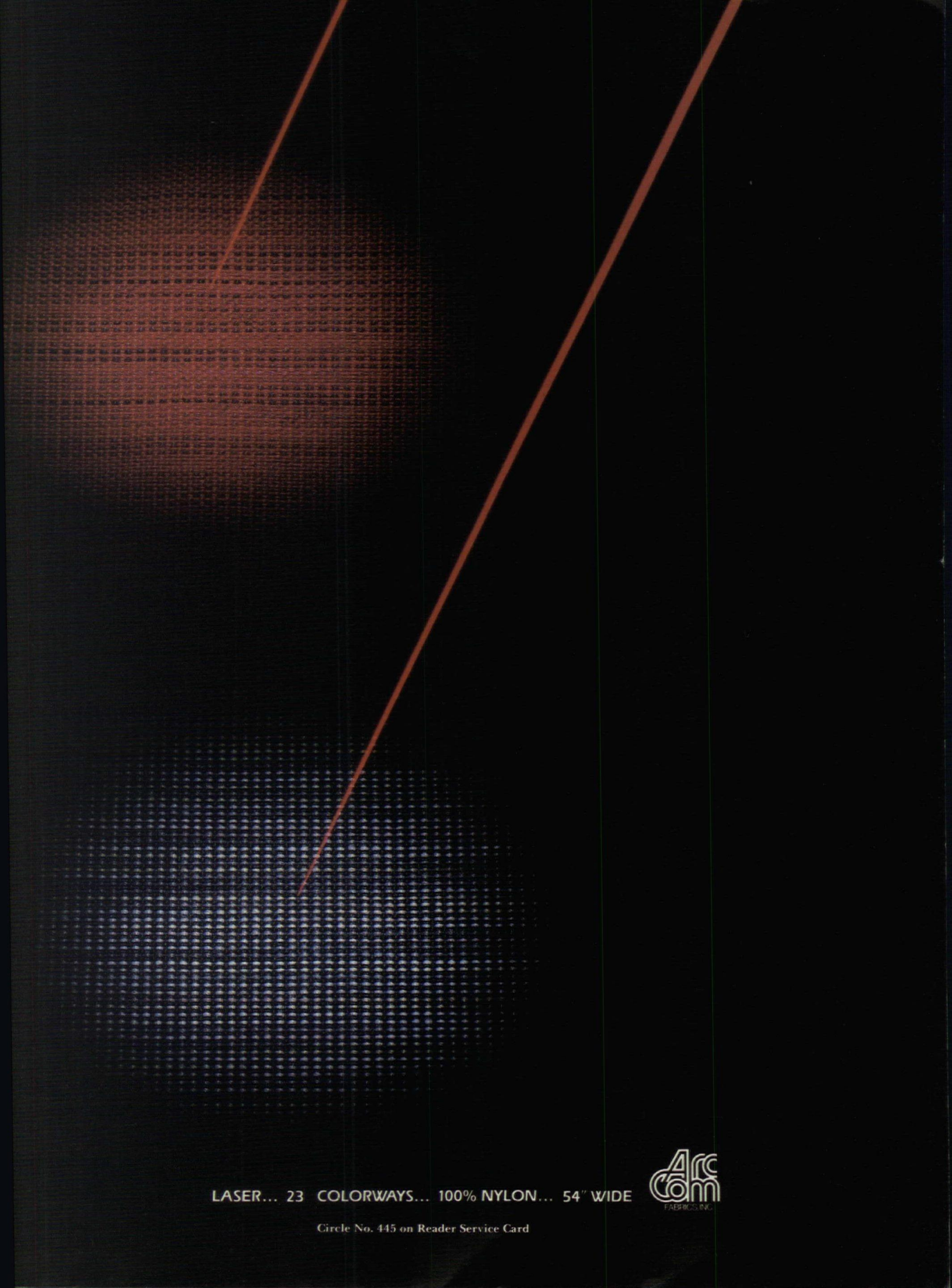
Bruce Davis Hinckley, MLA
Landscape Architect
Sun Valley, Idaho

Vienna interpreted

I was very impressed by the beautiful March 1984 P/A cover. It represents in my opinion your most beautiful and delicate cover to date.

Congratulations on a very sensitive issue on the beauty and grace of the Vienna Movement.

Bernard M. Wharton, Partner
SRW Associates
Greenwich, Conn.



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*ANSI Z 124.4—1983.

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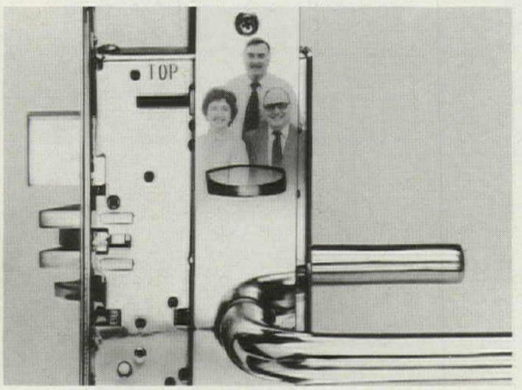

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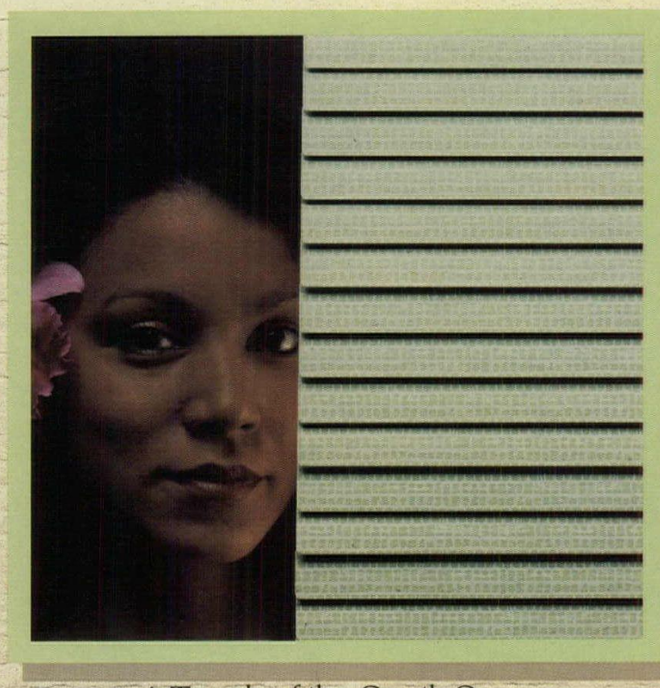

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P/A News report

This month's News report features some of the more extreme examples of art furniture as envisioned by American master craftsmen and British artists . . . plus a preview of the New Orleans World's Fair and a postlude on the 1984 AIA Honor Awards.

Mixed metaphors: The New Orleans Fair

By the time it's all over in November, some 11 million visitors will have passed beneath the papier mâché portals of the New Orleans World's Fair. The host city stands to gain some $2.6 billion income generated by the $350 million fair. Even if the economic forecast doesn't pan out as predicted, the fair will have effectively reversed the precipitous decline of the city's 19th-Century warehouse district and opened up its riverfront to public use. The new convention center built for the fair, when combined with the existing Rivergate Center and Superdome, will catapult New Orleans to third place among the nation's convention capitals, its patrons serviced by a newly remodeled airport and 40,000 hotel rooms (6000 new for the fair). Only wartime construction could accomplish so much in so little time.

That's all well and good, say the skeptics, many of them members of the press who covered the Knoxville debacle (P/A, Aug. 1982, p. 29), but what do the visitors, who after all have paid for this gigantic urban renewal project, get in return for their patronage? They get an 82-acre Midway Gardens. It's a six-month Mardi Gras with a $15 cover charge.

The serious or "educational" side to the fair is embodied in 22 international and 17 corporate pavilions. The corporate presence, however, is stronger in the categories of official representatives (Delta) and official suppliers (IBM), while the international spread is limited by political animosities, which account for the absence of the USSR, Taiwan, and South Africa. The fair's theme "The World of Rivers: Fresh Water as a Source of Life" is given some serious coverage, but it's mainly inspiration for lots of good clean fun, in the form of a Kiddie Car Wash, a boat ride through the Louisiana bayous, gondolas over the river, and Baroque grottoes where hidden fountains (à la Villa d'Este) squirt unsuspecting passersby.

Joseph Giovannini

The Wonderwall under construction.

The symbol for this all-American revelry is the wonderful Wonderwall, a mad concoction of stucco, corrugated sheet metal, wire mesh, papier mâché, and buckets of paint, dubbed locally "The Great Wall of China as built by the Marx Bros." The creation of Charles Moore and William Turnbull with Leonard Salvato and Arthur Anderson of Perez Associates, the Wonderwall is dressed with Villa Borghesian aviaries, Grecian urns, Mardi Gras busts, fantas-

Pencil points

***Richard Meier** is the recipient of this year's Pritzker Architecture Prize.*

- *Selected for his "single-minded pursuit of new directions in contemporary architecture . . .," Meier joins laureates Philip Johnson, Luis Barragán, James Stirling, Kevin Roche, and Ieoh Ming Pei.*

***The Pulitzer Prize for Criticism** has been awarded to Paul Goldberger, architecture critic of the* New York Times.

***Owens-Corning Fiberglas** has canceled its annual Energy Conservation Awards program after a survey of architects indicated that energy is no longer the urgent priority it was 12 years ago when the program was first begun.*

- *The manufacturer hopes to launch another program once a new theme of the times has been identified.*
- *One strong candidate is the office environment.*

***The Times Tower** site in Times Square is to be the subject of a design concept competition open to architects, urban designers, landscape architects, sculptors (in other words, anyone).*

- *Philip Johnson proposes that the tower be demolished and replaced by a park, surrounded by four glass-mansarded towers, but the owner isn't sure he'll sell.*
- *Competition sponsors Municipal Arts Society and National Endowment for the Arts hope to provoke general debate on the future of the tower—and its square.*
- *Registration deadline: May 22.*
- *Contact MAS at 212 935-3960 for details.*

***The Reagan Administration** has failed, for the fourth year in a row, to recommend* any *federal budget appropriation for historic preservation.*

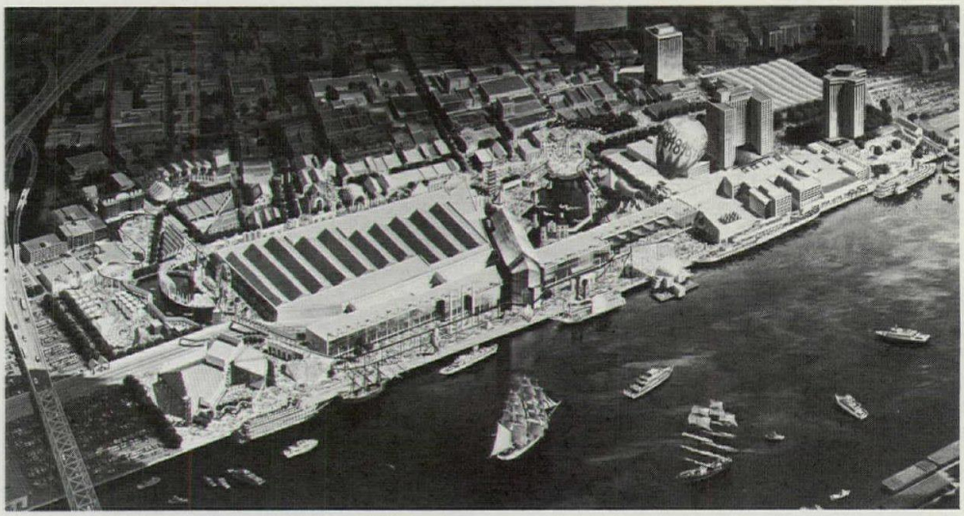
- *Last year's Congressional appropriation of $26.5 million ($21.5 for state programs, $5 for the National Trust) represents 0.0026 percent of the Federal budget—hardly a budget-wrecking amount.*
- *The Administration also proposes (again) a $35 million cut in the budgets of the National Endowments for the Arts and Humanities, and a staff cut of one-third for the Advisory Council on Historic Preservation, charged with reviewing federal projects that affect historic resources.*

***It's Fulbright season** again. Scholarship applications for post-doctoral research, college/university lecturing, and consultative positions for*

[*Pencil points continued on page 29*]

tical beasts, and other Moore-ish motifs.

This collage has also come to symbolize the fair's urban design strategy as masterminded by Perez Associates. Working collaboratively with some 25 design firms, Perez produced what project architect Allan Eskew calls a "gumbo, not a soufflé." The strategy works precisely because it can absorb—and disguise—such less-than-wonderful elements as the U.S. Pavilion, a bland box covered in concrete panels. It also lets a spectacular piece like the amphitheater designed by Frank Gehry with Perez Associates speak for itself. Budgetary problems and consequent design changes, most notably the elimination of the roof's glass "fish scales," have not reduced the visceral impact of this structure, symbol of the city's new-found romance with its riverfront.



Kim Parsons

Above: Entrance portal sculpture.

The pieces are tied together by both the Wonderwall and the monorail that snakes through each of the six "neighborhoods" into which the fairgrounds have been divided. The neighborhood plan is a Disney technique—there is no one point of arrival, but rather six themed, color-coded districts.

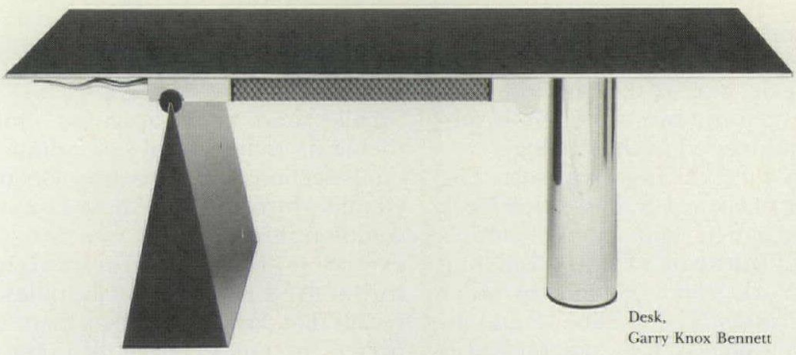
The collaged plan, mixing temporary and permanent features, makes the most of such awkward site conditions as active railways and wharves along the riverfront. Some 1.6 million square feet or 80 percent of the site is occupied by permanent development, both new and renovated. The International Pavilion will be turned over to the Rouse Company after the fair and its second story converted to use as a mall overlooking the active wharves below. The brick warehouses, upgraded by the fair to the tune of $30 per square foot, will be returned to their owners and converted to residential, hotel, and retail use.

The temporary festive pieces—the Wonderwall, lagoons, fountains, and even the monorail—are at present slated for post-fair demolition. There isn't much hope for the $5 million amphitheater, as Rouse plans to build on its site as early as November 1984. There is already talk, however, of saving a portion of the Wonderwall, replacing its ephemeral parts with more solid construction as was done for Bernard Maybeck's Palace of Fine Arts in San Francisco (at the very least, a portion will be preserved for use in future Mardi Gras parades). It should be saved as a reminder of this nonmonumental fair—New Orleans' answer to Habitat, the Space Needle, and the Crystal Palace—and of the sensible, pluralistic urban strategy that produced it. [DDB]

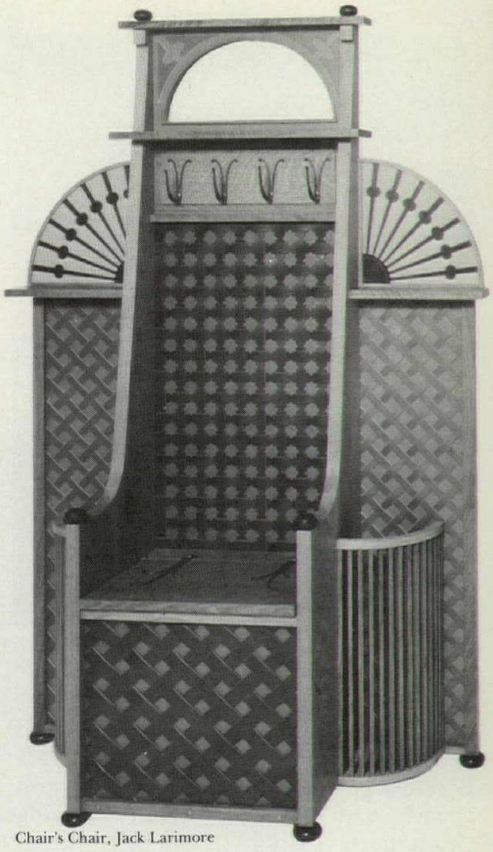
Valerie Sisca appointed

P/A is pleased to announce the appointment of Valerie Kanter Sisca as Managing Editor. She replaces Barbara McCarthy, who has accepted a position with Hardy Holzman Pfeiffer Associates, Architects, in New York.

Sisca is a graduate of Penn State University where she earned a B.A. in English and completed course work towards an M.A. in Art History. She has held several editorial positions, including that of Assistant Editor for the American Society of Testing & Materials, working on the Society's three journals. Most recently she spent four years at Junior Achievement, Inc., as Editor of the organization's magazine, which had a nationwide circulation of 140,000.



Desk,
Garry Knox Bennett



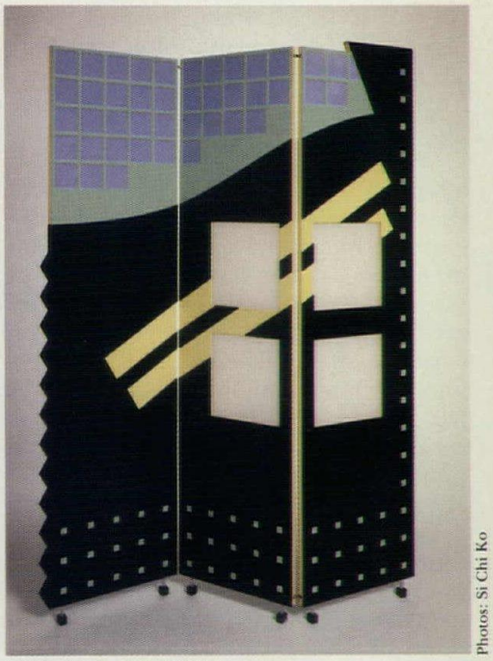
Chair's Chair, Jack Larimore

Colorcore II: The master craftsmen

For the second phase of its Colorcore® promotion program, the Formica Corporation in association with The Gallery at Workbench (Bernice Wollman, Judy Coady curators) invited 19 American furniture makers to explore the new solid-color surfacing material. The woodworkers attended a technical seminar last October at Workbench where they were instructed in the handling of the material. (Formica fabricated all prototypes from the first phase of the program, both invited commissions by architects Robert Venturi, Stanley Tigerman, and others, and the winning pieces from an open design competition. See P/A, Oct. 1983, p. 29.)

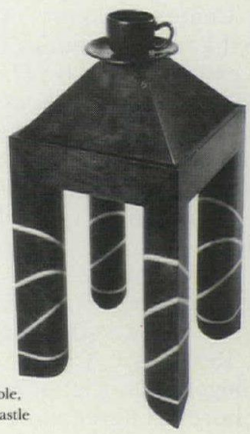
Like the first collection of architect-designed objects, this show, on view at Workbench through May 27, ranges from the sublime to the ridiculous: at one end, James Schriber's elegant folding screen; at the other, Jay Stranger's vulgar "Dress her," a liquor cabinet shaped like a corseted torso. All, however, prove the product's versatility. Used as a substitute for traditional materials, Colorcore is carved or "routed," woven, inlaid, and sandblasted. Among the most original applications are the woven latticework of Mitch Ryerson's "Hall Piece" and Garry Knox Bennett's plastic plaid—composed of multicolor plies laminated together and carved in a geometric pattern to decorate his elegant table and desk, which at $12,000 topped out the estimated price list. Also notable are Judy McKie's neo-primitive tryptych "Bird, beast, fish" and Jack Larimore's mad "Chair's Chair."

Dancing Tiered Table, Jack Larimore



Folding Screen, James Schriber

Photos: Si Chi Ko



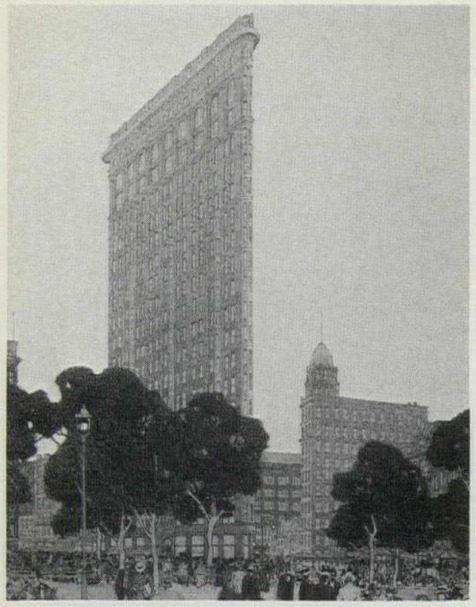
Coffee Table,
Wendell Castle

The Workbench roster was a deliberate mix of knowns, such as Wendell Castle, Edward Zucca, and Wendy Muruyama, and lesser knowns. The pieces don't give away these distinctions, however; with few exceptions, the show is of uniform quality at least in terms of craftsmanship. (We'll let *you* judge on style.) The 25 pieces were originally intended for sale, but Workbench has since purchased a majority, which will tour major museums and galleries around the country for two years.

Meanwhile, the results from the final Colorcore competition for residential, contract, and product applications will be announced this month. [DDB]

Chicago and New York

In the late 1970s, the Centre Pompidou organized a series of three exhibits entitled "Paris-New York," "Paris-Berlin," and "Paris-Moscow" examining the reciprocal relationships between the art of these cities. *Chicago and New York: Architectural Interactions*, a new exhibit on view at the Art Institute of Chicago through July 20, is based on this model. It was



D.H. Burnham, Flatiron Building, New York.

conceived by John Zukowsky, Curator of Architecture at the Art Institute of Chicago, working with Mosette Glazer Broderick, Carol Herselle Krinsky, and David van Zantan. After leaving Chicago, the exhibition will be shown at the AIA Octagon, Washington, D.C. (Oct. 17 to Jan. 6, 1985), the Farish Gallery at Rice University, Houston (Feb. 11 to March 31, 1985), and the New York Historical Society (May 22 to Oct. 25, 1985).

Chicago and New York is ambitious. It attempts through the juxtaposition of drawings to explain not only the influence architects have had on one another's work, but how the histories of these two cities and their architecture are intertwined. The emphasis is on original materials—beautiful renderings, development sketches, and working drawings.

Gone are the days of the 40″ x 40″ photo panel. Gone also from this exhibit are buildings for which no original drawings are available. These are to be found only in the narrated slide program by Robert Bruegmann or in the handsome catalog, which curiously illustrates buildings that are not in the exhibit and does not illustrate all the buildings that are. It also goes beyond the exhibit to discuss interactions that cannot be gleaned directly from the show itself in the areas of economics, land development, zoning, and policies.

The work exhibited indicates how little influence the style of early "Chicago Frame" skyscrapers had on New York buildings, and how equally limited the impact of Wright and the Prairie School was. These lauded Chicago contributions barely registered in New York, while the work of Mies van der Rohe, which did change the face of New York's corporate architecture, is conspicuously absent from this exhibition. Also absent is the work of Daniel Burnham and Charles McKim at the 1893 Chicago World's Fair, one of the great interactions between the two cities. (Both subjects are addressed in the catalog.)

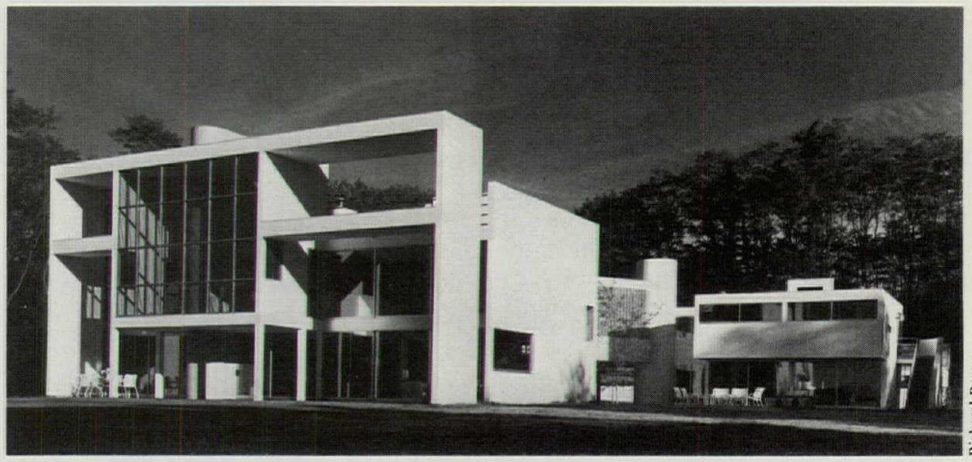
Visually the exhibition is a treat. The rendering of George B. Post's New York Stock Exchange and Jules Guerin's drawing of Burnham's Flatiron Building in New York stand out among other stunning works. The exhibition also includes a few objects, most notably Rufus Gilbert's "Inventor's Model of the First Elevated Railroad for New York," a wood and brass miniature. While these beautiful drawings and objects are reason enough for this show, the exhibition falls short of what it sets out to do. The subject makes for better essays than exhibitions. On the wall it flattens out to become in the words of its curator Zukowsky, a record of "Chicago architects who have designed New York projects and New Yorkers Chicago ones." [Stuart Cohen]

Stuart Cohen *is an architect and teaches at the University of Illinois, Chicago.*

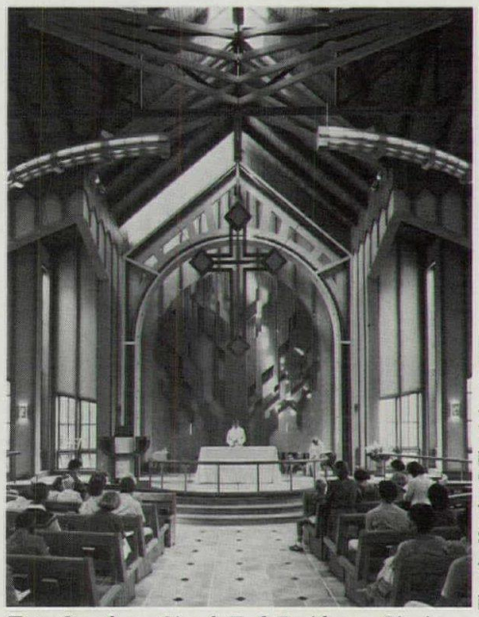
AIA Honor Awards: No duds, no surprises

"While there is no apparent unifying theme or architectural style common to our selections," reports Jury Chairman Gerald Horn, FAIA, "there is a strong common thread of first-rate design and execution." Hardly controversial criteria for the AIA Honor Awards, unless you recall that last year's chairman interpreted the jury's charge differently; he made it quite plain that Graves's Portland Building was honored more for its bold intentions than for the executed result.

There is another "common thread" among this year's winners, though, that is not acknowledged in the jury report: Most of the selected buildings are well-known, and the list of winning architects is heavy with established reputations. It's hard to quibble with the scarcity of unknowns among the winners; if the star firms are doing the best work, and if this best work has already been celebrated in the press, so be it. It is disappointing that there is only one example of remodeling among the winners—just as there was last year—since there seems to be plenty of fine work of this kind being done. All in all, however, this jury seems to have done an outstanding job of identifying what is "first-rate."



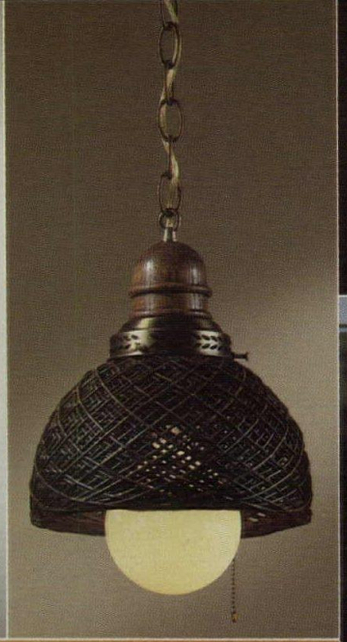
Richard Payne

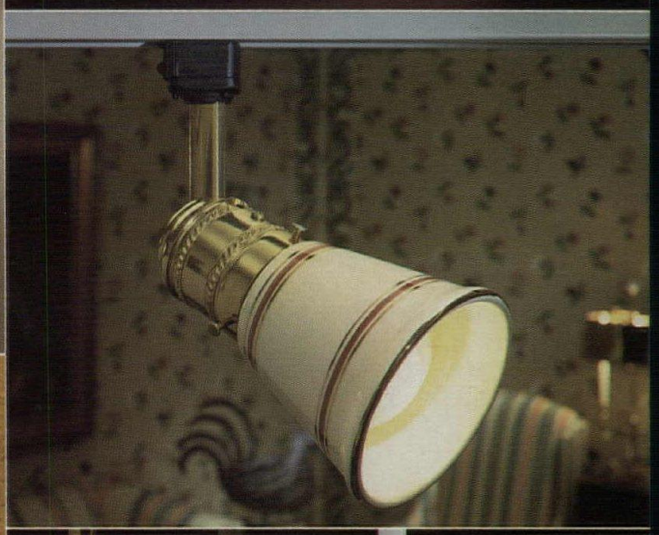


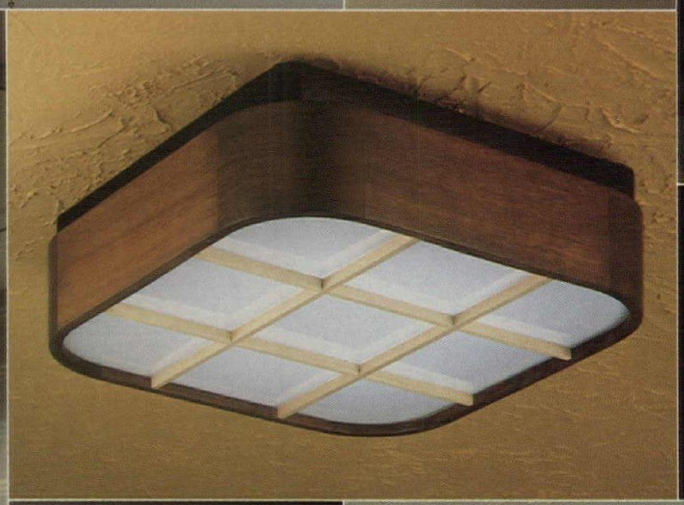
Timothy Hursley © The Arkansas Office

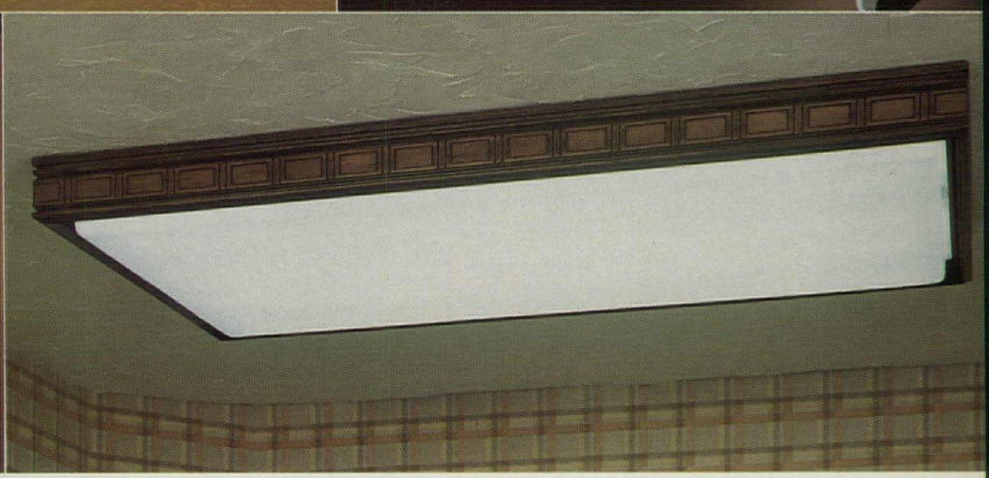
Top: Gwathmey Siegel, Taft Residence, Cincinnati, Ohio; Above: Moore Ruble Yudell, St. Matthew's Church, Pacific Palisades, Calif.

The 13 winners for 1984, chosen from among 474 entries, are: Shelly Ridge Girl Scout Center, Miquon, Pa., by Bohlin Powell Larkin Cywinski; Gainesway Farm, Lexington, Ky., by Theodore M. Ceraldi (P/A, Dec. 1981, pp. 68–73); Vietnam Veterans Memorial, Washington, D.C., by Cooper-Lecky Partnership and Maya Ying Lin; R.J. Reynolds Tobacco Co. Building (remodeling), Winston-Salem, N.C., by Croxton Collaborative and Hammill-Walker Associates; Carver-Hawkeye Sports Arena, Iowa City, Iowa, by CRS/Caudill Rowlett Scott; Taft Residence, Cincinnati, by Gwathmey Siegel & Associates; Addition to North Shore Congregation Israel, Glencoe, Ill., by Hammond Beeby &





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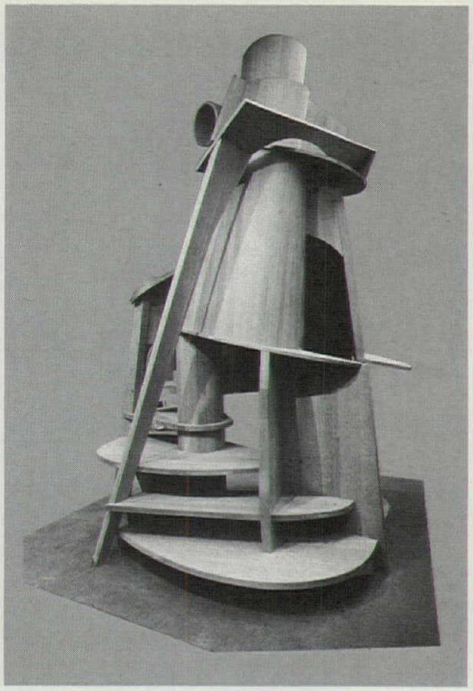
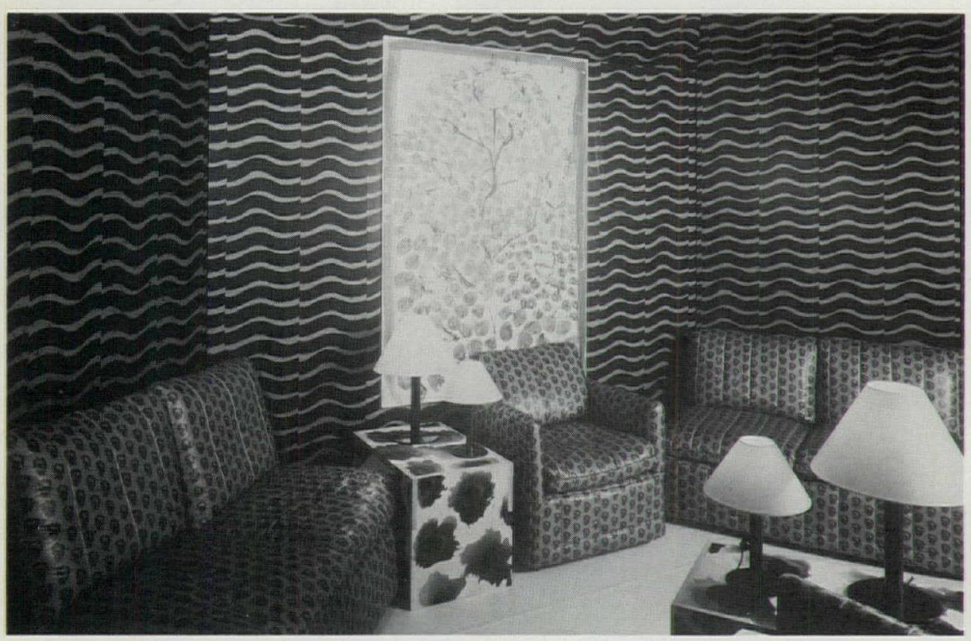
Babka; 333 Wacker Drive, Chicago, by Kohn Pedersen Fox Associates and Perkins & Will (P/A, Oct. 1983, pp. 78–83); High Museum of Art, Atlanta, by Richard Meier & Partners; St. Matthew's Church, Pacific Palisades, Calif., by Moore Ruble Yudell; Fragrant Hill Hotel, Beijing, China, by I.M. Pei & Partners; Weekend house in Michigan by Tigerman Fugman McCurry (P/A, April 1984, pp. 118–121); Gordon Wu Hall, Princeton, N.J., by Venturi, Rauch & Scott Brown (P/A News report, Oct. 1983, p. 38).

Besides jury chairman Horn (of Holabird & Root, Chicago), the jurors were: Arne Bystrom, AIA, Seattle; John J. Casbarian, AIA, Houston; E. Fay Jones, FAIA, Fayetteville, Ark.; John P. Locke, AIA, Des Moines; David Van Zanten, architectural historian, of Evanston, Ill.; Harry Wolf, FAIA, Charlotte, N.C.; Thomas M. Fabian (student, nonvoting), University of Illinois; Rochelle Vitone (associate AIA, nonvoting) of Newark, N.J.





Above: Anthony Caro, Child's Tower Room; below: Howard Hodgkin, Room.

The most revealing thing to do

Creating a room of one's own, says artist Richard Hamilton, is the most revealing thing to do. He and three other artists—Anthony Caro, Marc Chaimowicz, and Howard Hodgkin—have put themselves on view at the invitation of the Arts Council. Each was asked to design an interior of his choice, confined to a space 20′ x 20′ x 12′. The resulting "Four Rooms" exhibition, which opened at Liberty's, the London department store, and will tour municipal galleries in Britain throughout the summer and fall, was greeted by heckling from the critics and puzzlement from the public.

The project, which had the makings of a great success, provoked the voicing of uneasy feelings about sponsorship, about the relevance of commissioned exhibitions, and about the role of the artist. The Arts Council collaborated with manufacturers in the production of various wallpapers, fabrics, and furnishings designed by the artists. A nouveau-bourgeois setting, adjacent to Liberty's furniture department, caused the rooms to appear abrasively clean, smart, commercial, and completely removed from today's issues.

One artist, however, dealt with one burning issue emotively enough. Richard Hamilton's hospital x-ray room is impersonal, clean, and bare in the extreme. Marc Chaimowicz's room is a film set, furnished with works designed by Eileen Gray, Alvar Aalto, and Chaimowicz himself, in the style of the 1930s. Howard Hodgkin's room is based on multiples of two; the shape is an octagon, filled with four sofas, four armchairs, eight lamps, and four tables, at best an elegant waiting room. Less a room than a large interior/exterior sculpture, Anthony Caro's conical Child's Tower is nevertheless closest to architecture. It evokes a sense of space, enclosure, light, and material.

These Four Rooms are personal, and modest in their intention, if glamorous in execution. Their display in a department store has thrown up some misleading notions of context, but the rooms themselves offer four potent and quite distinctive thoughts about human environments, irrespective of incidental setting. [Jasia Reichardt]

Jasia Reichardt, *author of* Robot *and curator of "Serendipity" (Institute of Contemporary Art), writes frequently on art and architecture and has contributed to* Building Design *and* Architectural Design.

Young architects at the Architectural League

The Architectural League of New York has announced seven winners in the third annual Young Architects Competition. The program, open to architects who have been out of school for ten years or less and who may submit built or unbuilt work, is the only one of its kind.

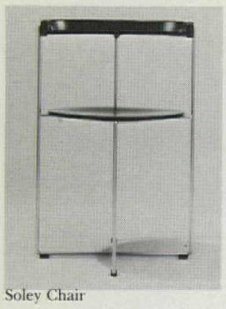
The winners, selected from 200 entries from 23 states and Canada, will present their work on three successive Tuesday evenings starting May 8 at the League. They include: Ross Anderson, Neil Denari, Billie Tsien, and Anthony Tsirantonakis of New York; Allan Shope, Robert Reno, and Bernard Wharton of Greenwich, Conn.; Alex Krieger and Lawrence Chan; Cary Tamarkin and Timothy Techler of Boston, Mass.

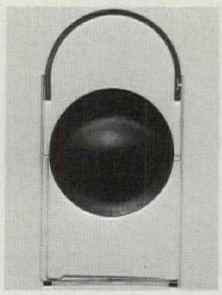
Jurors for the competition were Diana Agrest, Turner Brooks, Alan Chimacoff, James Ingo Freed, and Charles Gandee, joined by the members of the Young Architects' Committee: Ben Benedict, Daralice Boles, Ethelind Coblin, and Peter Wheelwright.

The Germans are coming

Among the foreign entries in NEOCON will be clever and attractive contract pieces from Germany, designed to that country's stringent DIN standards and produced with characteristic thoroughness in highly automated factories.

Kusch & Co. is introducing the Soley chair (p. 26). It is collapsible, mountable on a wall hook, and available in a very





Soley Chair

wide range of colors: the plywood seats are stained (not just in your usual wood-tones), lacquered, or upholstered, its metal legs chromed or brightly enameled. Kusch's fine metal-mesh Bitsch chair (P/A, Jan. 1983, p. 27), ganged or single, chrome-framed or enameled, continues to win raves since it was shown at Cologne's 1983 Orgatechnik. Voko's high-tech ACM system (p. 162) is now available with bleached wood tops and dark metal structures, as well as with other wood finishes, or Formica with colorful metal frames in which it was originally shown. All the above are available through Probber.

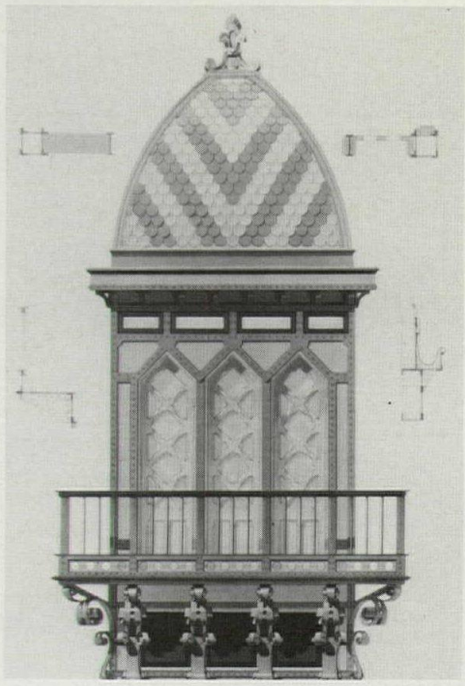
Also looking for an American distributor, and well worth a place in the American market, are Koenig and Neurath's King Alpha system (p. 162), and a series of Mauser chairs. [SD]

Architectural images

The latest blockbuster at the Centre Georges Pompidou, Paris, takes architecture—specifically European architecture, both built and unbuilt—as its subject. "Images et Imaginaires d'Architecture" (through May 28) incorporates over 600 original works from the 19th and 20th Centuries.

Half of the show is devoted to architectural drawings by such masters of the art as Schinkel, Berlage, and the more recent Piano and Rogers. The remaining pieces show architecture as represented in painting, photography (the date of the first photograph, 1826, is taken as the show's starting point), illustration, cinema, opera, and theater. Director Jean Dethier has arranged the works chronologically; objects are divided by decades in a series of 14 rooms flanking an axial gallery.

Those who can't make it to Paris in time can purchase a 432-page book on the subject, which includes 400 illustrations, 30 essays by assorted European critics, and 30 "open letters" from contemporary architects who offer their own views on imagery in architecture.



Right, above: Henri Sauvage, Paris hotel, 1928; below: H.P. Berlage, 1919.

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***William Morris**'s 150th birthday is being commemorated this spring at London's Tate Gallery and the Institute of Contemporary Arts.*
- *Sanderson & Sons, the firm that first produced many Morris designs, will open a New York branch early this summer with a commemorative collection of 24 Morris patterns.*

***The Pan Am Building,** New York, celebrated its 21st birthday last month, with 21 rooftop candles, each 21 feet high.*
- *The tower, New York's first piggyback building (over Grand Central) will also get a $10 million lobby facelift by Warren Platner.*

***Robert Stern** has designed a carpet called "Dinner at Eight" for Furniture of the 20th Century.*

***When the 28 coats of paint** are removed from the North Portico, the White House will be revealed for what it really is—brown.*
- *The restoration is being carried out as part of the White House's election-year cleanup. All but the east wing, restored in 1980, will be cleaned and repainted in time for the next inauguration.*

***Canadian architect** Arthur Erickson has been named Gold Medalist by the French Academie d'Architecture. (Last year's award went to German architect Gottfried Boehm.)*

***The XIII Biennale de Paris,** scheduled for spring, 1985, will take the relationship of interior to exterior as theme for its architecture section.*
- *The Biennale is the inaugural event scheduled in the renovated Grande Halle, Parc de la Villette (Reichen et Robert, architects).*
- *Potential candidates should write the Biennale, Grand Palais Porte J, Avenue Winston Churchill, 75008 Paris.*

***Lutah Maria Riggs,** a dominant figure in Southern California architecture, died on March 8, 1984. Riggs was one of the first women to graduate in architecture from the University of California (1919), to obtain an architectural license (1928), and to be made a Fellow of the AIA (1960).*
- *Plans are now underway in Santa Barbara to organize a full-scale exhibition of her drawings and architecture for 1985.*

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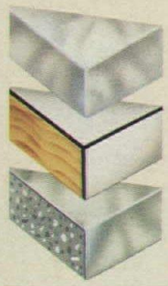

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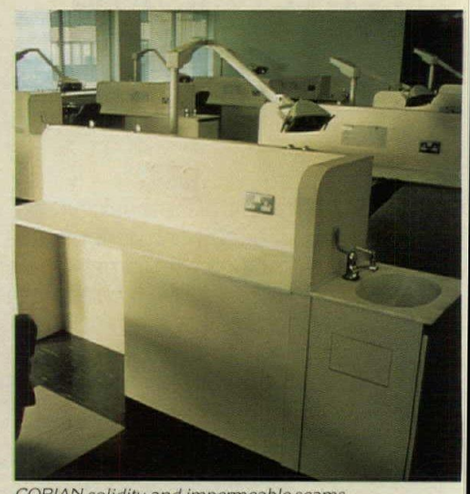

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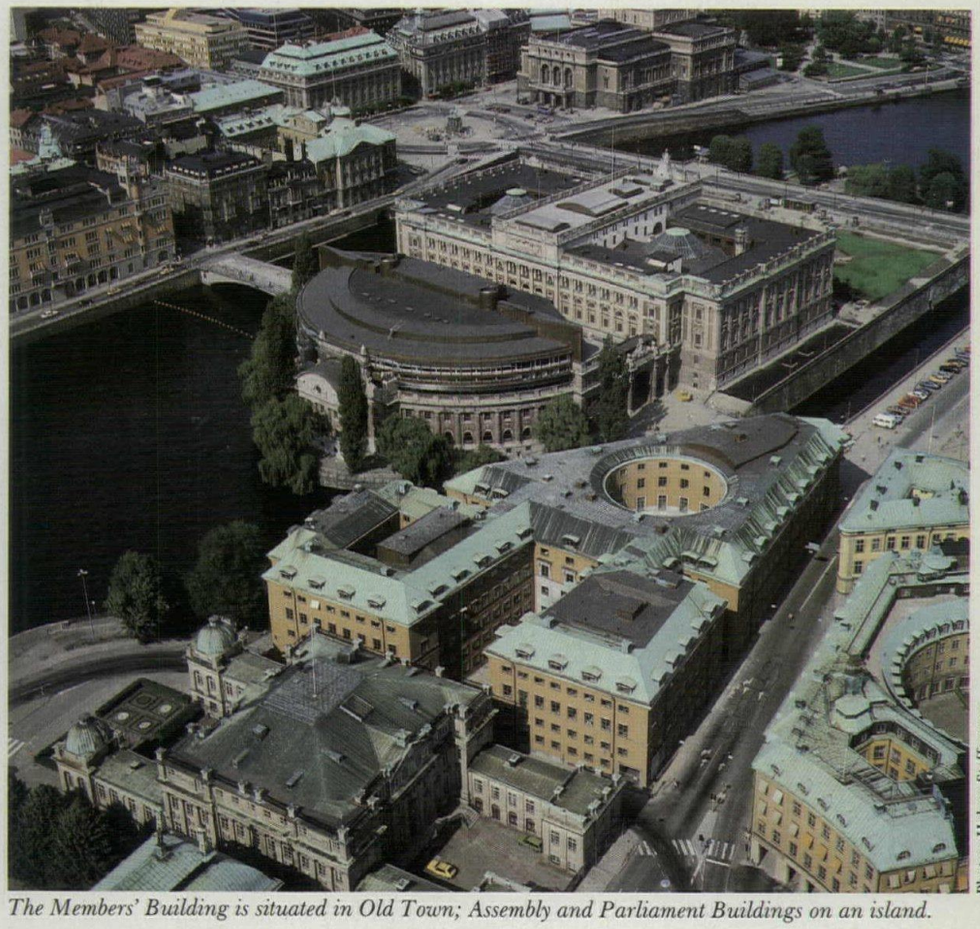
Perspectives

After twelve years of exile in Stockholm's House of Culture, the Swedish Parliament opened its fall 1983 session in the newly expanded and renovated Parliament Building.

Restoring the Riksdagshus in Stockholm

The successful recycling of the Swedish Parliament Building (Riksdagshus) is an accomplishment of historic proportions in this country, and one of great symbolic importance. The debate as to whether this particular structure should survive or not started in the 1960s, when the Swedish government was reformulated. Following the change from a bicameral to a unicameral legislative system in 1971, competitions were held and extensive research was undertaken to determine how the new parliament should be housed. Early in the project it became apparent that the original building could not handle the new parliamental program. Both the former Bank of Sweden Building, situated behind the Parliament Building, and the Government Office Building across the canal on the edge of Gamla Stan (Old Town), have been subsequently converted as part of the enlarged parliament complex. (For the new home of the displaced Bank of Sweden, see P/A, June 1983.)

Staircase of the Parliament Building.



The Members' Building is situated in Old Town; Assembly and Parliament Buildings on an island.

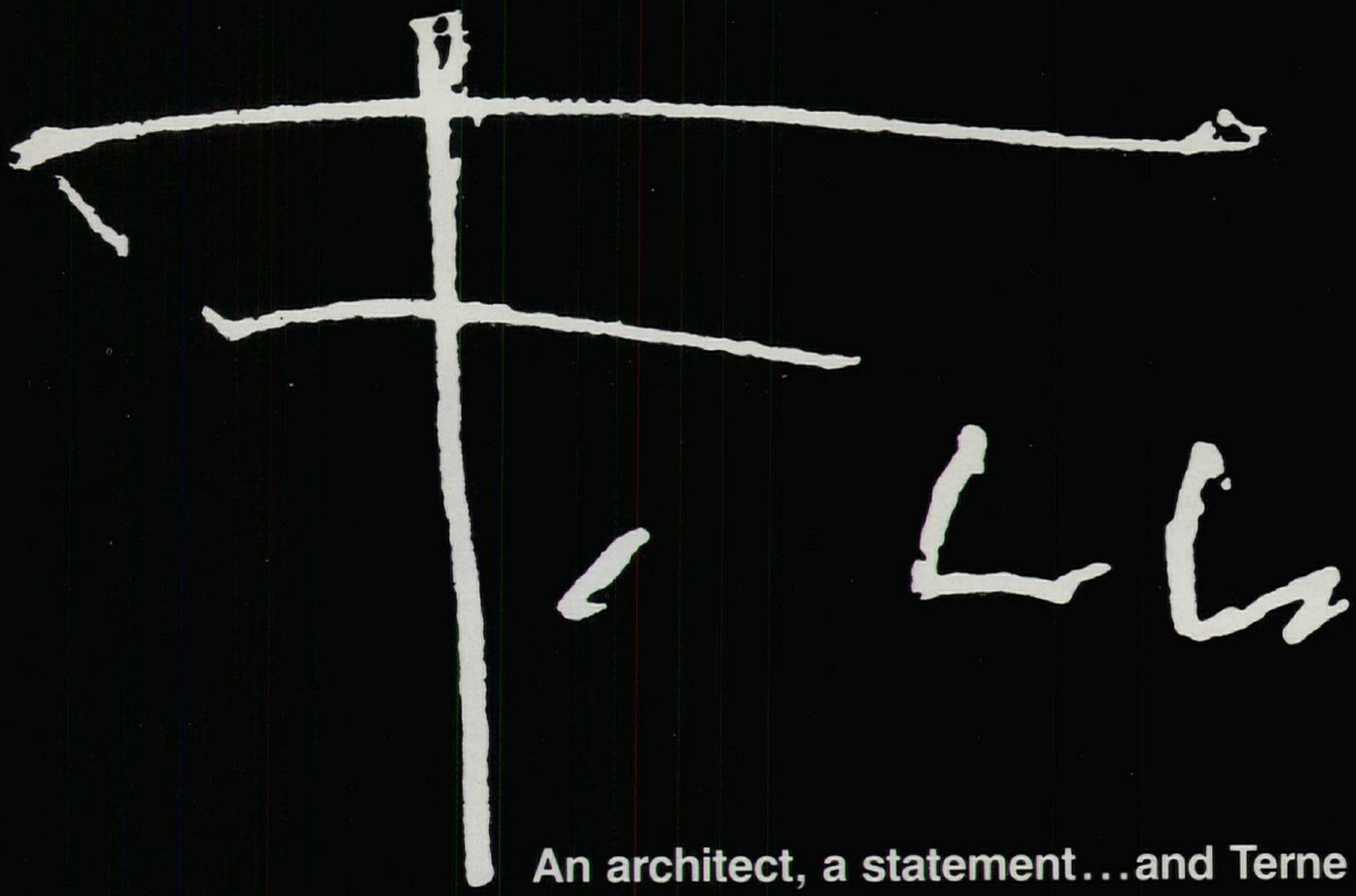
Photos: Holger Staffansson

The former bank building by Aron Johansson (1894–1906) is now the Assembly Building. Project architects Ahlgren Olsson Silow of Stockholm took full advantage of the fan shape of the former bank building, situating the new assembly chamber on top as a kind of "ancient theater." The beautiful banking hall has been restored to function as the members' main entrance. Its old skylight had to be removed because of the placement of the assembly chamber above, but two magnificent frescoes by Georg Pauli, a respected turn-of-the-century Swedish painter, have been saved and now hang from the new ceiling. In addition to the new assembly chamber, this structure houses the speaker's rooms, chamber offices, stenography facilities, club premises, and accommodations for the media and visitors.

Bath beneath Members' Building courtyard.

This Assembly Building was the only building of the three to undergo major changes in exterior appearance. Its new assembly chamber, which sits atop the Classical base like an almost too fashionable chapeau, is convincing in scale and articulation, but the copper cladding still appears too new, too fresh. Materials should blend in more successfully as the

[*Perspectives continued on page 36*]



An architect, a statement…and Terne

Frank Lloyd Wright

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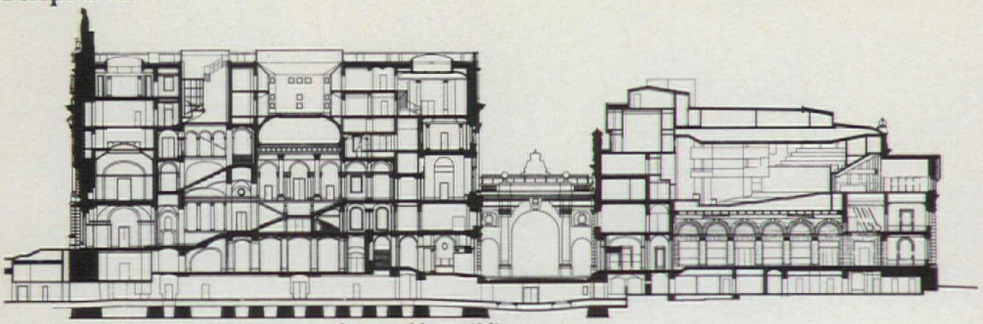
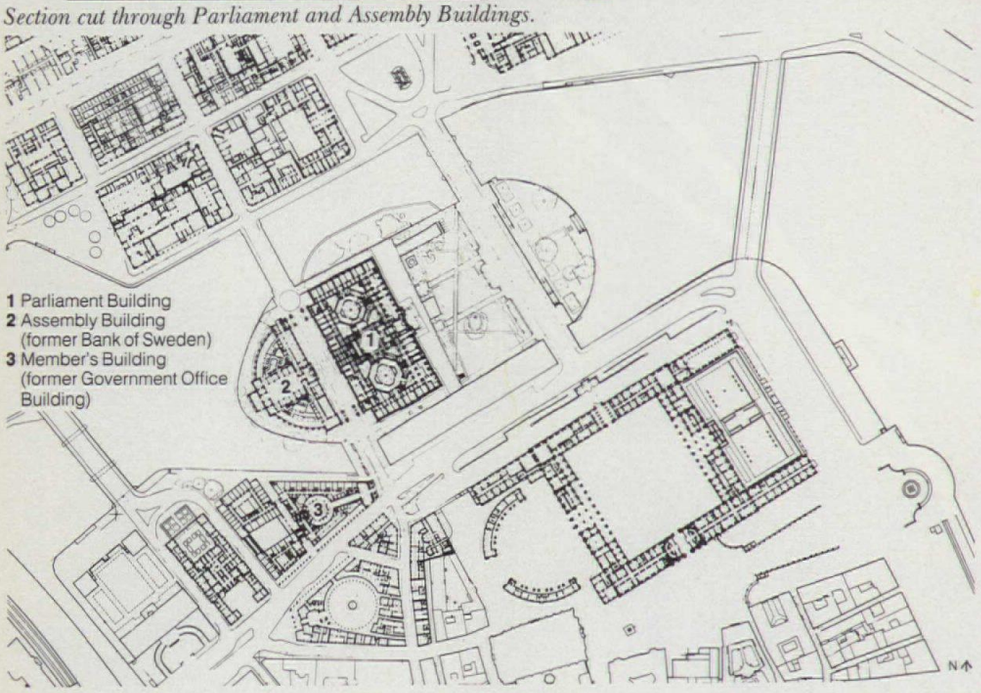


Section cut through Parliament and Assembly Buildings.



addition ages and weathers. The new chamber fans out from a high wall, also clad in copper, which reads as a border line between old and new.

The Parliament Building, which had the most significant original interiors, has been carefully restored to provide office space, conference facilities, and a parliamentary library. Across the canal, the Member's Building (formerly the Government Office Building [Clason and Gahn, 1922–36]) has been converted to office space and simple living accommodations for members of parliament.

One major portion of the initial plan, the design of an underground parking garage, underwent significant alteration "in the field" when archaeological research turned up portions of the old town wall and gun placements dating from 1520. Further investigation revealed defenses employed as early as the 13th Century.

The discovery of these archaeological artifacts sparked intense debate. One faction pressed for a kind of Forum Romanum, with historic artifacts exposed to the open air. Others advocated the enclosed museum as an alternative that would retain the open plaza in front of the Parliament Building. Nearly half the area originally intended for the garage has now been designated a museum

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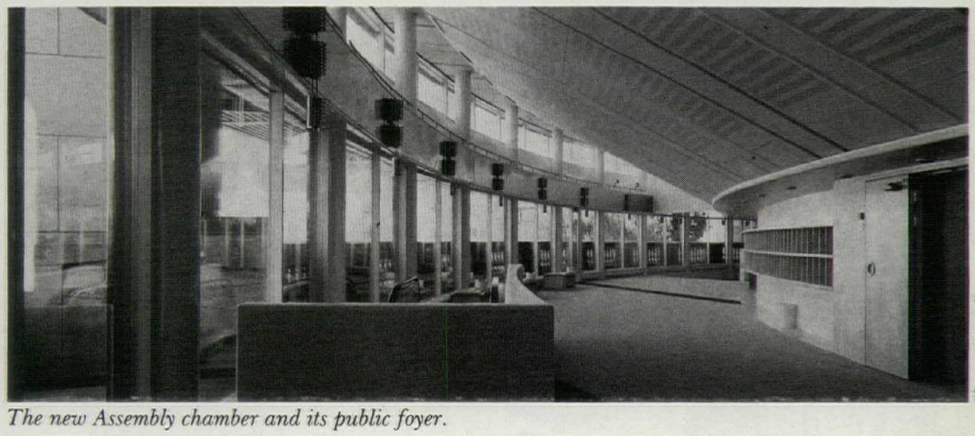
for medieval Stockholm, housing parts of the old wall, 13th-Century boats, and other relics of the city's early settlement. The park itself, however, is an unfortunately stiff and dull design that fails to fully exploit its site.

This cautious compromise solution for the park is characteristic of the adjustments necessary in any project of this magnitude and complexity. The overall outcome of this gigantic restoration project must be viewed as an impressive success. The parliament now enjoys a permanent home in a collection of well-planned and sensitively restored buildings.

More important, the decision to reuse and not replace the old buildings signals a significant change in attitude towards preservation in Sweden. The scale and complexity of this effort underlines its importance, and the success of this endeavor should provide continuing impetus and interest for future efforts of similar quality and sensitivity.
[Anders Mortner]

Anders Mortner, *who holds a masters in architecture from Stockholm University and an M.S. in historic preservation from Columbia University, is a partner in the Stockholm firm Tegner Arkitekgrupp and writes for the newspaper* Svenska Dagbladet.



Photos: Per Jalkman

The new Assembly chamber and its public foyer.

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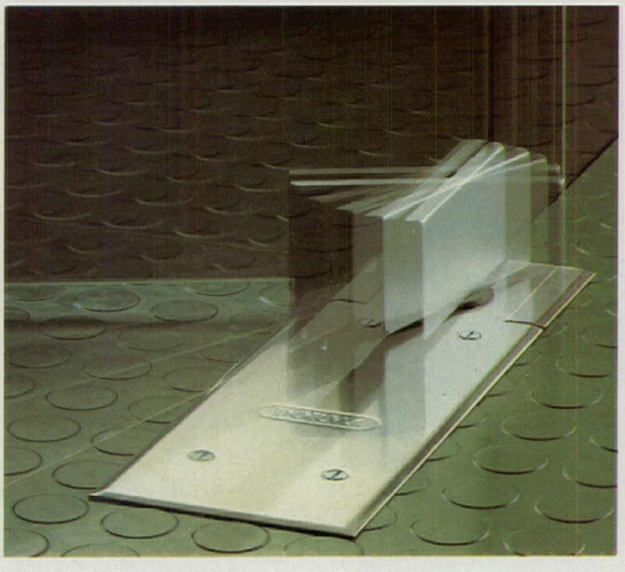

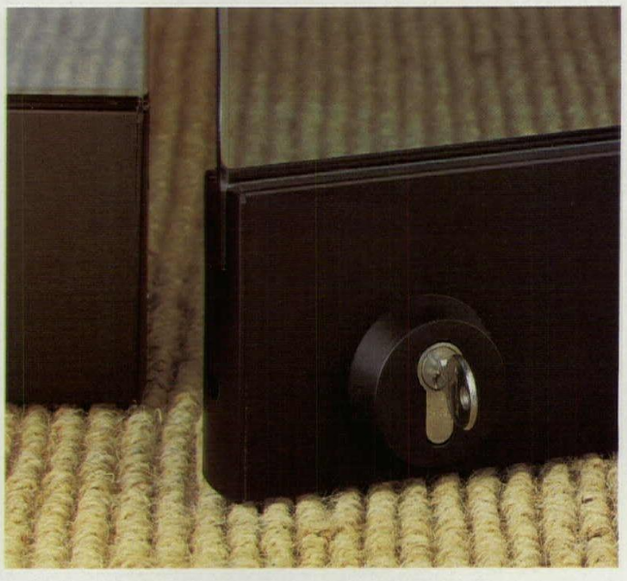

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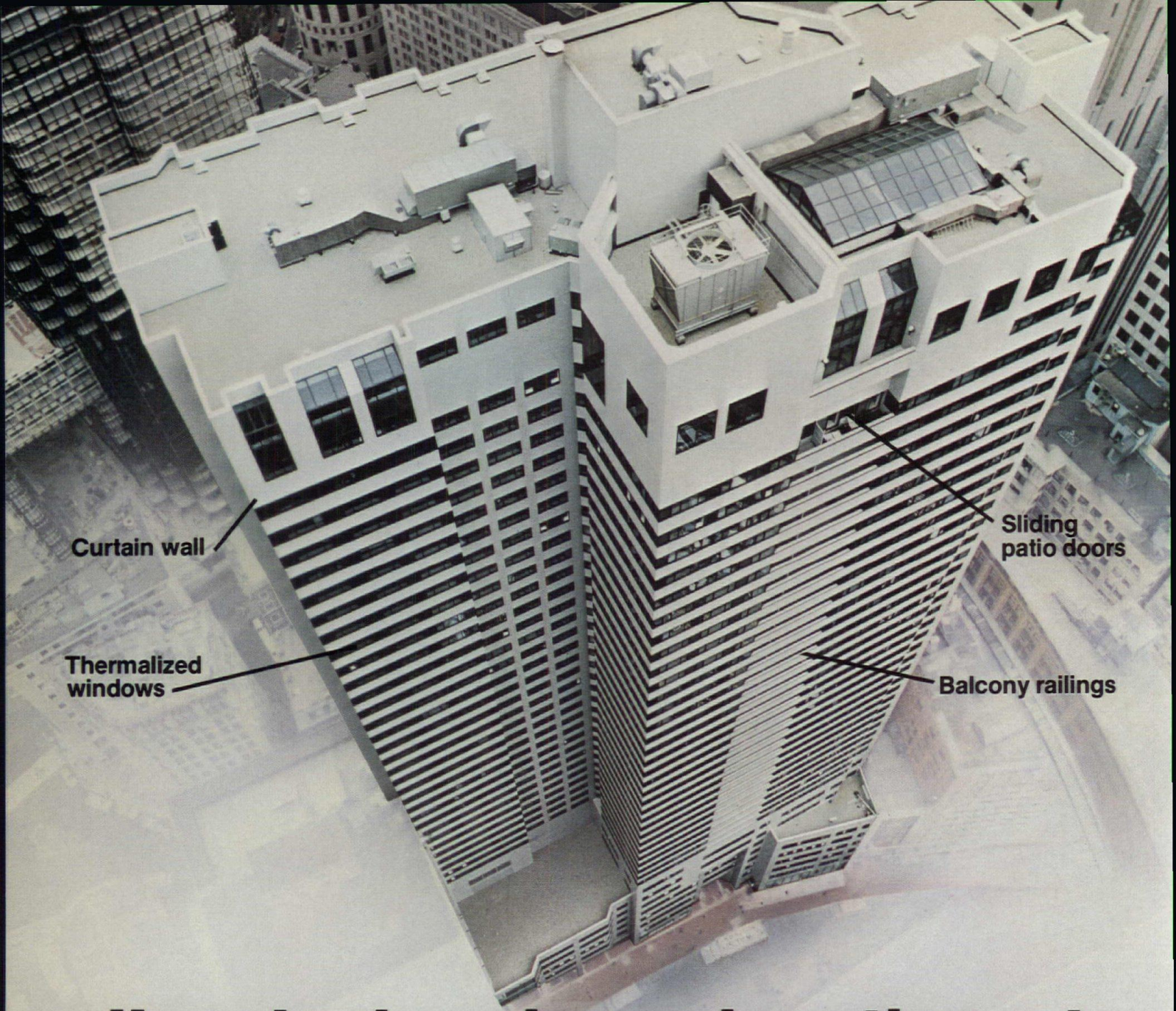

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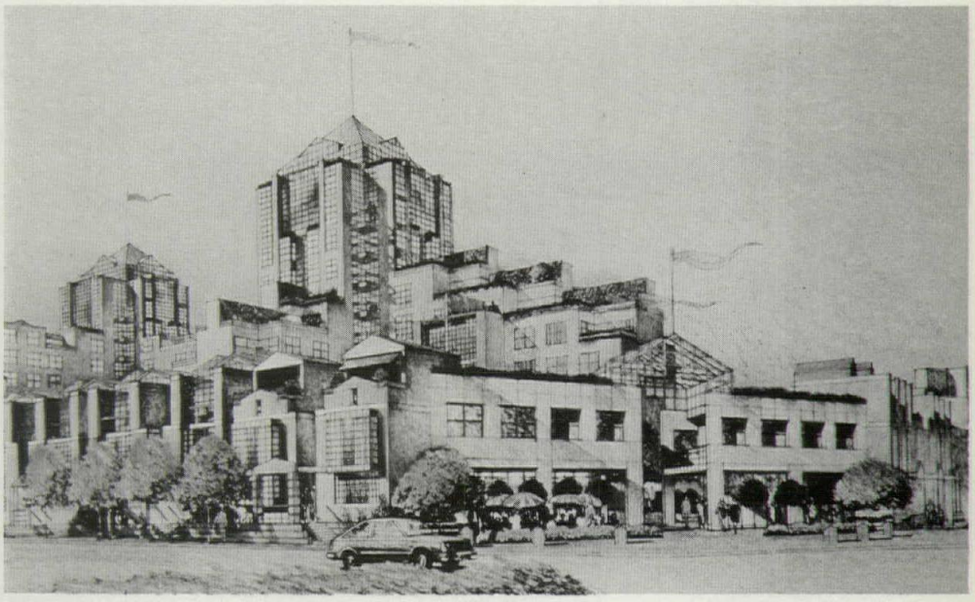
Building owner: Devonshire Associates, New York; architect: Steffian/Bradley Associates, Inc., Boston; curtain wall fabricator and erector: Maddison Associates, Revere, Mass.

MAKE IT WITH ALUMINUM

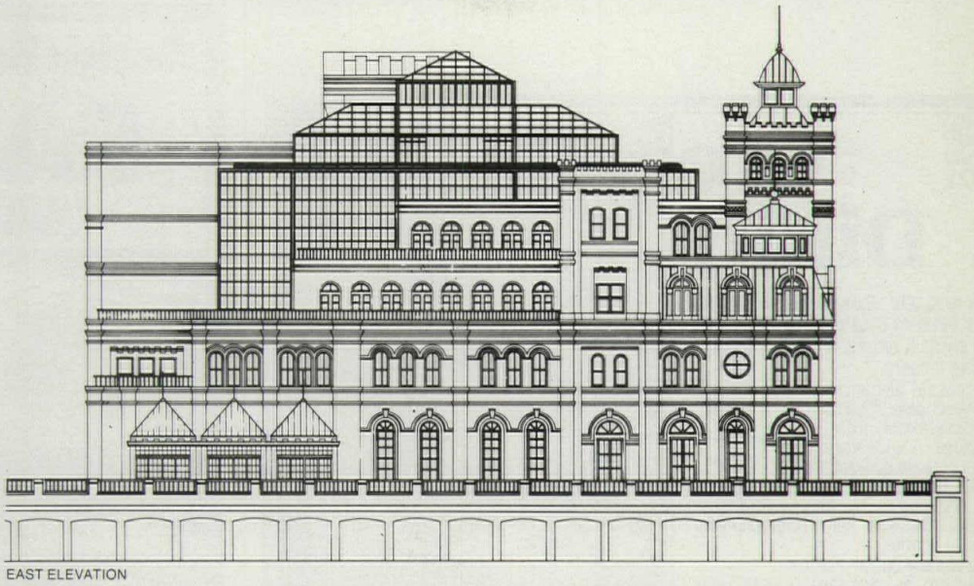
In progress

Shown here are four mixed-use developments which combine residential and office, or residential and retail programs. All occupy strategic downtown locations in their respective cities.

South Beach Properties, San Francisco, Calif. *Architects: IBI Group, Newport Beach, Calif.* Built under the aegis of the San Francisco Redevelopment Agency, this waterfront project consists of 402 housing units (52 of them townhouses) on a 3.16-acre site in a formerly industrial area. The housing blocks are terraced to maximize views, ventilation, and solar exposure; they step back from the waterfront, culminating in two towers. A warehouse on the site is to be renovated for office use and a new 85,000-square-foot office building constructed. (Right)



The Riverton, San Antonio, Texas. *Architects: Arrow Associates, San Antonio, Texas.* This 19-story condominium apartment tower occupies an irregular site on San Antonio's historic Paseo del Rio (Riverwalk) at West Market and Navarro Streets. The base element contains retail spaces at river and street levels with parking and riverfront apartments above. This, the first high-rise residential project in the downtown area, is to be built in reinforced concrete faced with brick and glazed tile accents. Southport Development expects to begin construction this month. (Below)



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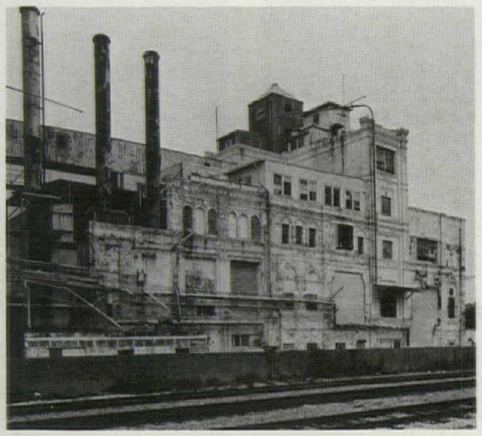
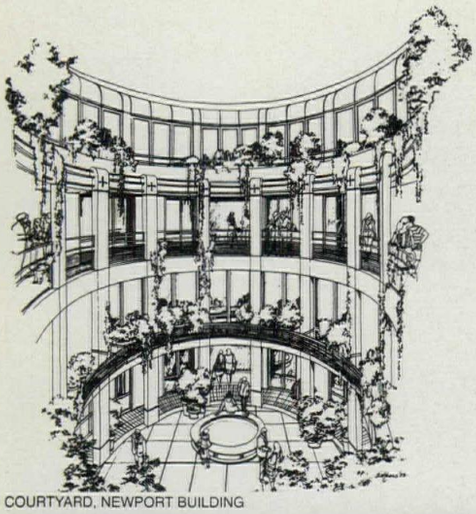
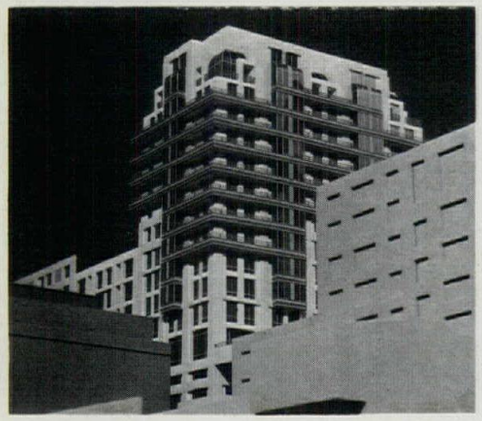
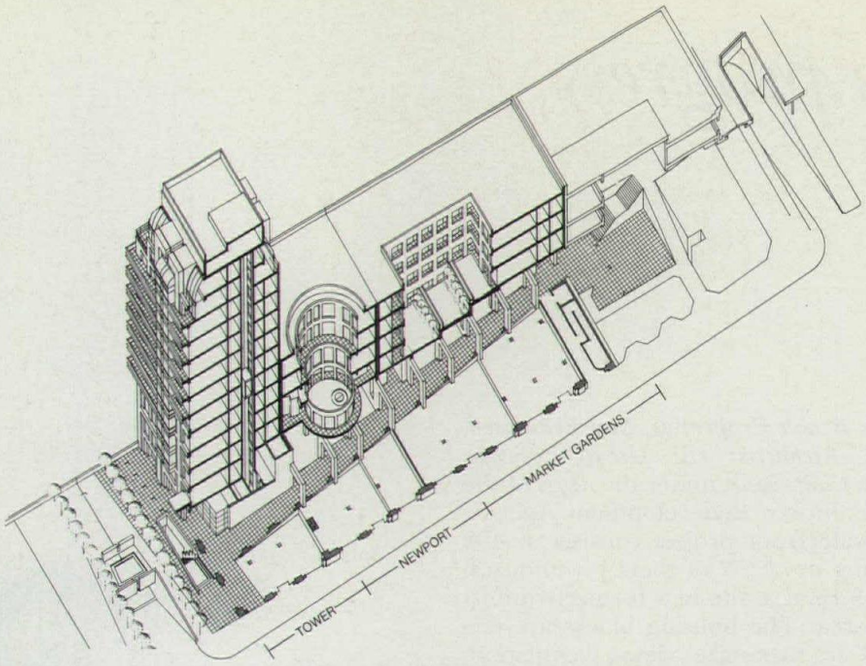


Jackson Brewhouse Renovation, New Orleans, La. *Architects: Concordia Architects; Koch & Wilson, consultants, New Orleans, La.* The renovation of the 1891 Jax Brewery on the Mississippi waterfront as a specialty retail center should be completed in time for the World's Fair opening (see p. 19). The central core of the building, heavily damaged since the closing of the brewery in 1974, will be demolished and a new six-story glass building, visible only from the water, built inside the restored shell. A second phase of 80 condominiums, new leasable area, and parking is also underway.



COURTYARD, NEWPORT BUILDING





South Arcade, Seattle, Wash. *Architects: Olson Walker Architects, Seattle, Wash.* Sited on the southernmost parcel in the Pike Place Market Urban Renewal District, South Arcade links Pioneer Square to the financial district through a street-level retail arcade. Above, mixed-income housing is organized in three buildings: 60 low-income studios (SRO's) surround tenants' gardens in the northernmost Market Garden building; the Newport's 20 duplex condominiums surround a semiprivate circular court; and 59 luxury condominiums fill the 12 floors of the corner tower. The work of local artists—including decorative grillwork, light fixtures, and fountains—has been integrated into the architecture. South Arcade should be completed in January 1985.

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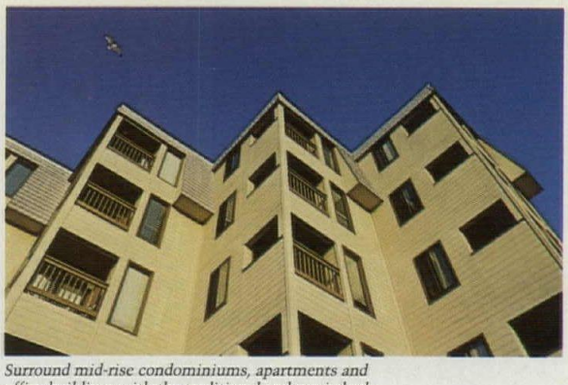

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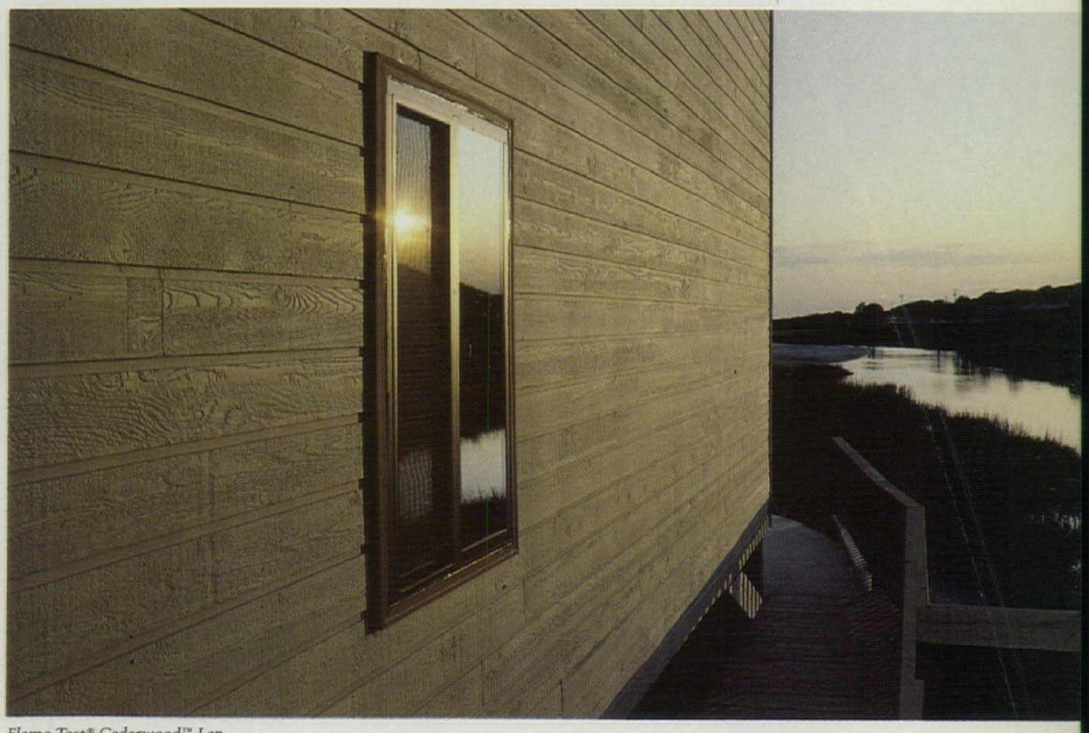

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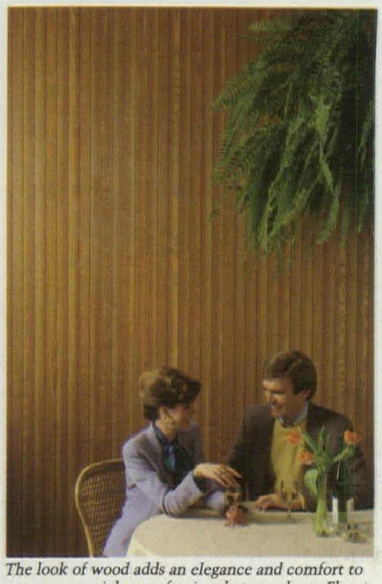

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Through June 1
City Places: The work of Arata Isosaki, Ellery Kurtz, and Norman McGrath.

Through June 3
The Experience of Architecture. High Museum of Art, Atlanta.

Through June 3
Architecture in Silver. La Jolla Museum of Contemporary Art, La Jolla, Calif.

Through June 10
Chinese Traditional Architecture. China House Gallery, New York.

Through June 17
Design in America: The Cranbrook Vision (1925–1950). Metropolitan Museum of Art, New York.

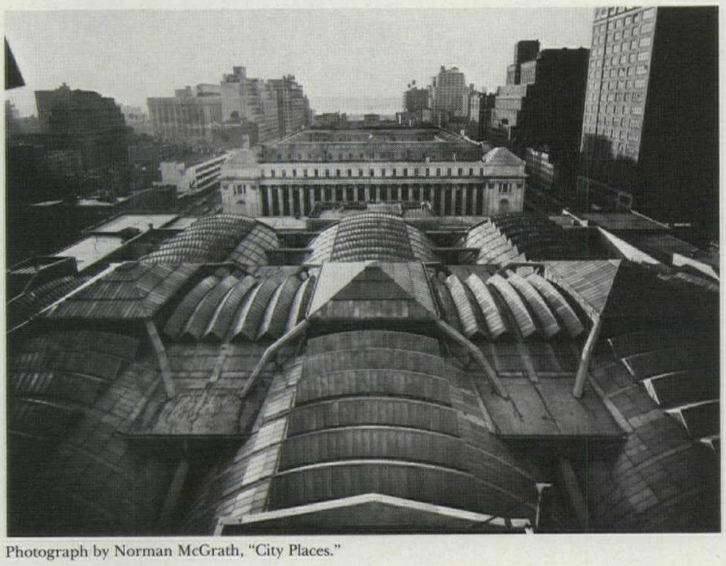
Through July 29
Chicago and New York: More than a Century of Architectural Interaction. Art Institute of Chicago.

Through August 31
Chicago Furniture: Art, Craft, and Industry. Chicago Historical Society.

Through September 3
The Folding Image: Screens by Western Artists of the 19th and 20th Centuries. National Gallery of Art, Washington, D.C.

May 17–June 23
Ilonka Karasz: Pioneer Modernist. Fifty/50 Gallery, New York. Also, **through May 12,** Venini and the Murano Renaissance: Italian Art Glass of the 1940s and 50s.

May 27–June 22
The End of the Road: Vanishing Highway Architecture in America, Columbus (Ohio) Museum of Art.



Photograph by Norman McGrath, "City Places."

May 22–July 15
Great Drawings from the Royal Institute of British Architects Drawings Collection. The Octagon, Washington, D.C. Also, **June 4–July 13,** American Architecture: Innovation and Tradition, AIA Building.

June 12–September 23
Manhattan Skyline: New York Skyscrapers Between the Wars. Cooper-Hewitt Museum, New York.

Competitions

June 10
Entry deadline, Competition for the Design of the Gold Medal, Union of International Architects. Contact Christian Laine, Suite 830, The Merchandise Mart, Chicago, Ill. 60654 (312) 527-4141 or any local AIA Chapter.

June 15
Entry deadline, Builder's Choice design and planning awards. Contact Builder Magazine, National Housing Center, 15th & M Sts., NW, Washington, D.C. 20005 (202) 822-0390.

June 28
Entry deadline, KDesign 84, for ready-to-assemble furniture. Contact KDesign 84, Design Awards, Cahners Exposition Group, 999 Summer St., Stamford, Conn. 06905.

July 1
Submission deadline, Presidential Design Awards (for government-supported projects in all design disciplines). Contact Design Arts Program, National Endowment for the Arts, Nancy Hanks Center, 1100 Pennsylvania Ave., NW, Washington, D.C. 20506.

August 4
Entry deadline, National Lighting Awards Program. Contact National Lighting Bureau, 2101 L St., NW, Suite 300, Washington, D.C. 20037.

August 20–September 3
Entry acceptance period, A Style for the Year 2001. Contact A Style for the Year 2001, Editorial Dept., Shinkenchiku-sha Co., Ltd., 2-31-2 Yushima, Bunkyo-ku, Tokyo, 113, Japan.

December 31
Postmark deadline, First Annual Kitchen Design Awards. Contact ICF, 305 E. 63rd St., New York, N.Y. 10021, or any local ICF showroom.

Conferences, seminars, workshops

May 30–31
Commercial Applications of Solar/Conference and Exhibit, Bellevue Stratford Hotel, Philadelphia. Contact Naomi Kaminsky (215) 545-2150.

June 4–6
Lighting for Museums, Art Galleries, and Displays, General Electric Lighting Institute, Nela Park, Cleveland. Contact GE, Nela Park, Cleveland, Ohio 44112 (216) 266-2207.

June 4–7
A/E Systems '84, Baltimore Convention Center. Contact A/E Systems, P.O. Box 11318, Newington, Conn. 06111 (203) 666-1326.

June 5–9
ASES 1984 Annual Meeting and Solar Technologies Conference, Anaheim, Calif. Contact ASES, 1230 Grandview Ave., Boulder, Colo. 80302 (303) 492-6017. Also, **June 5–7,** RETSIE '84, Anaheim, Calif.

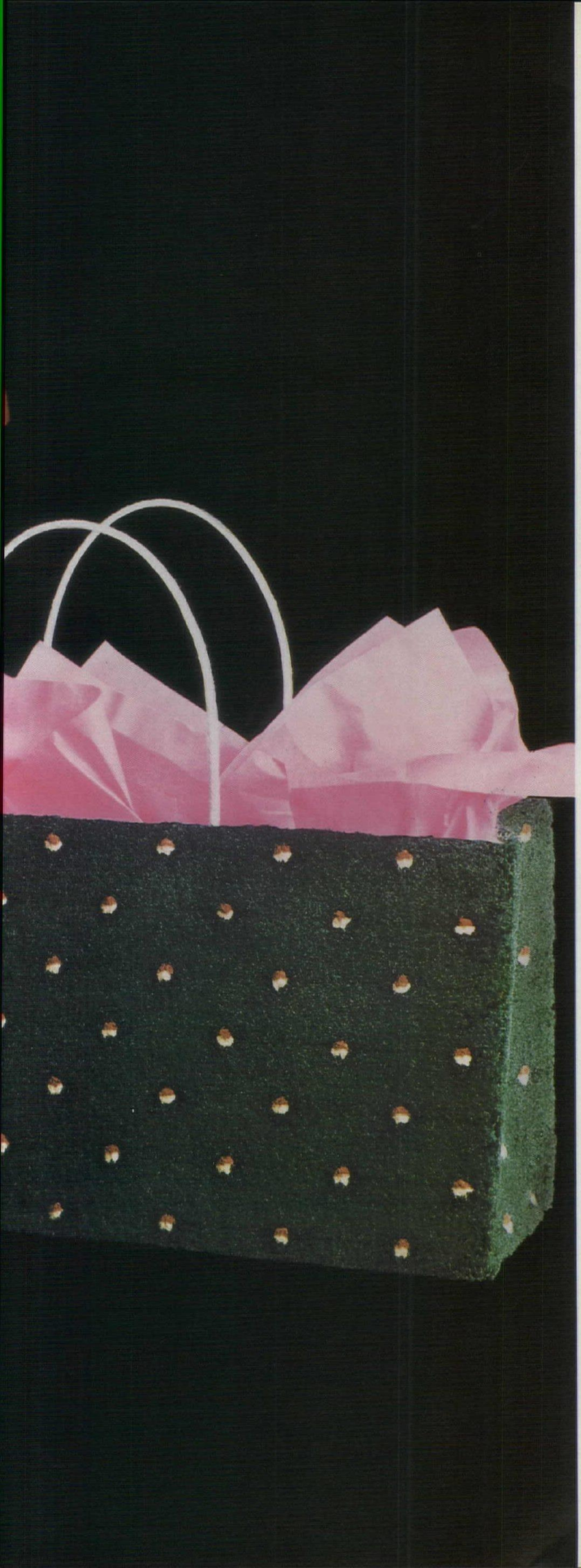
July 9–12
"Enhancing Creativity," 1984 National Computer Conference, Las Vegas Convention Center. Contact NCC '84 Registration, AFIPS, P.O. Box 3691, McLean, Va. 22103 (703) 620-8955.

June 12–15
NEOCON, national contract furnishings trade show, Merchandise Mart, Chicago. (See p. 73 for program and list of exhibitors.)

June 16–18
Construction Specifications Institute, 28th Annual Convention, Dallas.

June 17–22
International Design Conference in Aspen, Colo. Contact IDCA, Box 664, Aspen, Colo. 81612 (303) 925-2257.

July 23–27
SIGGRAPH '84, 11th Annual Conference on Computer Graphics and Interactive Techniques, Minneapolis. Contact SIGGRAPH '84, Conference Office, 111 East Wacker Dr., Chicago, Ill. 60601 (312) 644-6610.



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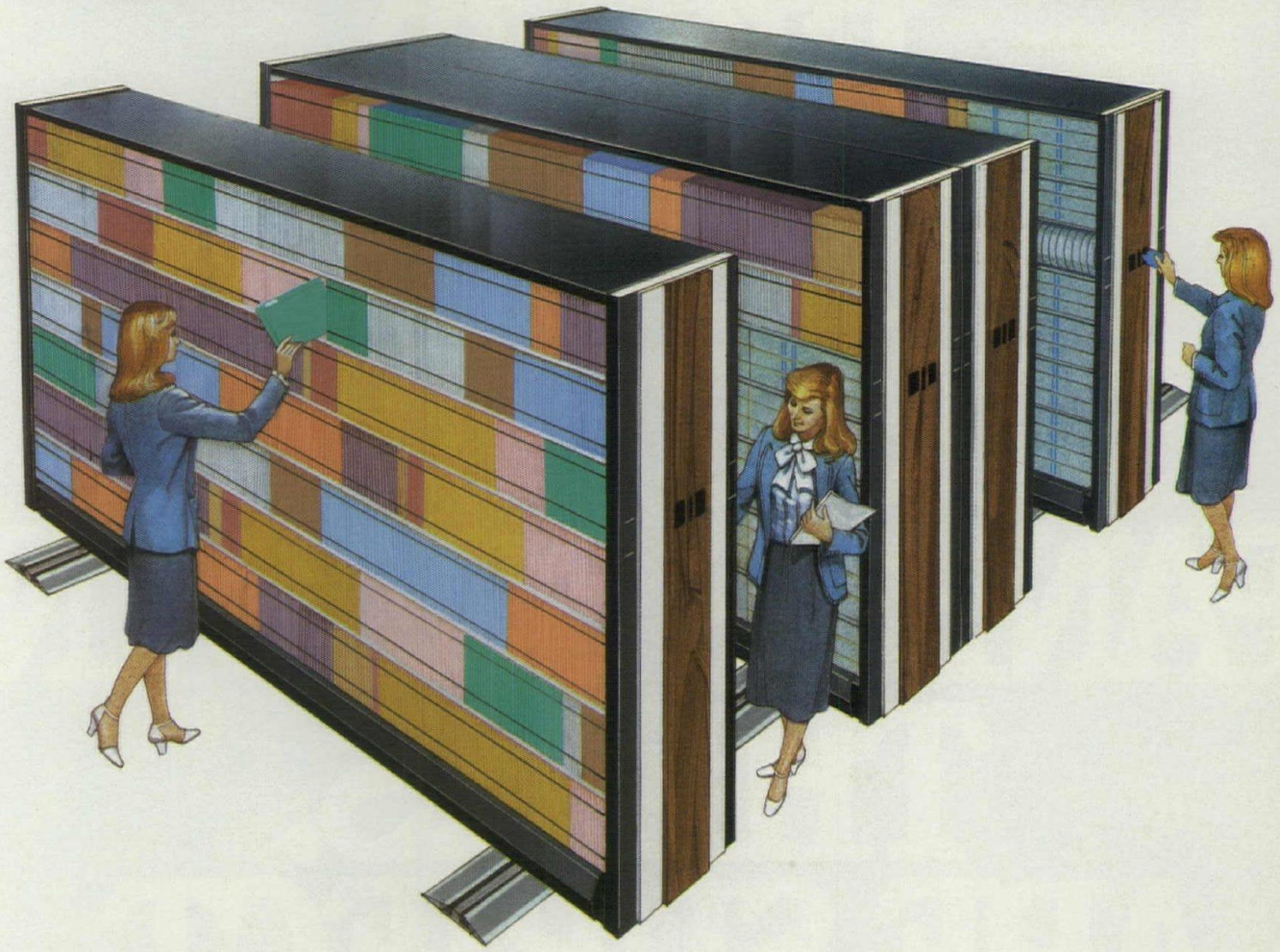

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P/A Practice

P/A practice this month has an article by Professor William Mitchell on how the computer will affect the profession and the schools. Following that, Allan Drexler and Walter Sikes suggest how best to utilize CAD systems.

What was computer-aided design?

When automobiles first appeared they were called "horseless carriages." The phrase "computer-aided design" (CAD) is a similar coinage. In a few years we will mostly forget about the computer, simply taking for granted that we use a computer to support the design process, just as we take for granted that our vehicles have engines instead of horses. "Computer-aided design," then, will sound very dated. Before we get to that point, however, there will be some very difficult transitions for the architectural profession and schools of architecture.

The information economy

Architects collect and refer to information from many different sources: clients, consultants, catalogs, building codes, and so on. Then they process it in various ways: sorting, abstracting, analyzing, checking, drawing inferences, and synthesizing. They produce drawings and text reports. Finally, they must disseminate information within the office, to clients and consultants, and to construction sites.

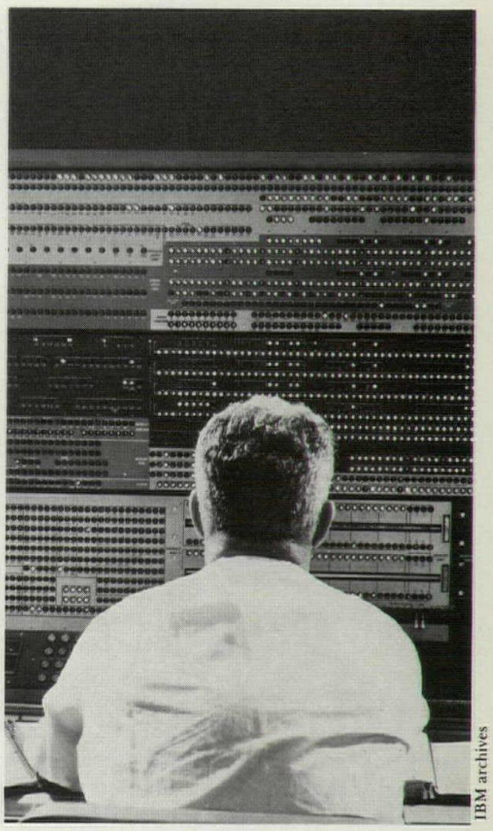
All these tasks are now being successfully automated to some degree, in a process that will accelerate. Drawing processors are to design work as word processors are to office work, so computer graphics workstations are replacing drawing boards. Drawings and other building-description data can be stored on disk and tape, and these media are replacing drawings on paper. Increasingly, reference information is becoming available in online database and electronically published form. Sophisticated software is becoming available for performance of a wide range of data processing, analysis, expert advising, and synthesis tasks in the design process. Plotters and electrostatic and laser printers are replacing manual drafting and traditional reprographics. Networking of computer graphics devices and the digital transmission of graphic data are becoming increasingly prevalent. We can also look forward, soon, to everyday use of online graphic teleconferencing.

Implications for the profession

What does all this mean for the structure of the architectural profession, the demand for architects, sizes and organizations of architectural offices, division of roles within them, the range of architectural services, the basis of fees for services, the assignment of responsibility and liability, and professional licensing?

As hardware becomes cheaper, as software becomes more sophisticated, as databases become more extensive, and as networks become more complete, it will become feasible and cost-effective to automate a rapidly growing range of architectural tasks. The automation of simple processing, storage, production, and dissemination tasks is already well underway. This mostly affects clerical workers and draftspeople. Many analysis and design checking tasks, too, are already being automated, and we can expect to see much more of this. Here the effect is mostly upon engineering consultants and middle-level architects in design and production. High-level inference and design synthesis tasks are, naturally, hardest to automate effectively, but in the long term, even the skilled and experienced professionals who perform these will be affected to a considerable degree.

The likely overall result is that architectural offices will become smaller and much more capital intensive. (At present, architecture is probably the most labor-intensive of all the professions.) There will be permanent erosion of the demand for lower level workers in the field, and this effect will progressively spread to the higher levels. There will be intense competition for the high-level positions that remain, and these will tend to go to individuals whose high qualifications justify the high associated levels of capital investment in support technology. There will probably be increasing pressure to use educational qualifications as rationing devices for entry to responsible and satisfying employment.



IBM archives

Integration of information, through centralized databases and networking, generates a potential for vertical integration of design services with space programming, construction management, and facility management, and for horizontal integration with engineering and quantity surveying. Organizations that do this will achieve a substantial competitive advantage. Architects will either broaden their services, then, or will find themselves hard-pressed by competitors who offer design services as part of a more broadly integrated package.

Within the profession, we can expect an evolving division of labor between tool-makers (producers of architectural software and databases) and tool-users (employers of software and data bases to provide particular services to particular clients). Increasingly powerful, comprehensive, and easy-to-use CAD systems may lead to the emergence of "franchise architecture," where paraprofessionals with fairly low skill levels

produce routine work at very low cost. There will be a growing disparity between "information rich" design organizations that have access to the most sophisticated design software and databases, and "information poor" organizations that do not. The former will tend to drive the latter out of business. The decreasing cost of computer hardware will not counteract this tendency, since sophisticated, specialized software and database products will remain expensive to produce and will command high prices. (In other words, we should not expect the microcomputer to save the small design office, unless its acquisition can be accompanied by substantial investment in software and databases.)

All the traditional bases for architectural fees presume that the number of hours spent on a project ultimately determines compensation. This is reasonable in a labor-intensive environment, but not in a capital-intensive one, so new fee bases will eventually have to be established as architectural work becomes more highly automated. Architects will have to worry, too, not only about their cash flows, but also about maintaining an adequate level of capital investment in new technology to remain competitive. Thus the financial frameworks within which architectural practices operate will change considerably.

Finally, there are some tricky organizational and legal questions to be sorted out. What, exactly, are the responsibilities and liabilities of the vendors of software and databases that architects use to execute professional work? How do we define intellectual property in the context of computer-aided design, and how can it be protected? What can a professional user of computer-aided design software reasonably be expected to know about its logical and technical foundations and the way that it produces its results? What is the role (if any) of professional licensing in this new context?

Implications for education

The implications of all this for architectural education show up at a number of different levels. We must understand, first of all, that the computer and communications revolution is leading, inevitably, to a leveling off and eventual reversal of the steady growth in employment in information work. In particular, we must expect that there will be fewer skilled architects as a percentage of the total work force, but that those few must be educated to a higher level. At the other end of the spectrum, there will be a demand (at least initially) for low-level trained operators of specialized equipment. Much in between will disappear. Schools of architecture will have to adjust themselves to this.

The pressure will be felt first (indeed is already being felt) on entry-level positions. The kind of drafting and other routine work that has traditionally provided an opportunity for new graduates can be automated, so positions at this level will decrease rapidly. An upswing in construction activity would not help, since many firms would choose to rebuild capacity by investing in computer equipment rather than by rehiring. Eventually, architecture schools will probably have to take much more direct responsibility for practical training—much as medical schools now do.

Next, we must begin to treat computer literacy as a basic professional skill—like writing, drawing, and mathematics. Architecture schools might provide introductory courses, require them as prerequisites, but they must have some way of assuring that graduates are computer-literate. By computer literacy, one means, I think: first, a basic understanding of the functional organization and principles of operation of a computer; second, a sound grasp of the concepts of an algorithm and a data structure; third, the ability to formulate algorithms and data structures to deal with nontrivial problems in one's specific field of interest; and finally, the ability to express algorithms and data structures in clear, concise, well-structured code in an appropriate high-level language such as PASCAL.

Until now, most architecture schools that have provided instruction in computer applications have done so within the context of specialized courses in computer graphics and computer-aided design. This was inevitable, because of the immaturity of the field, the scarcity of equipment and of teachers. But as the loosening of these constraints allows, we should move towards closer integration with substantive architectural concerns. Design studios should begin to make appropriate use of available computer technology; drawing classes should introduce computer graphics as a medium, technical courses should utilize relevant analysis software and databases, and professional-practice courses should explore organizational, financial, and legal aspects of computerization.

Perhaps the most important intellectual effect of the growth of computer-aided design has been to focus attention on the computational foundations of architecture. It has forced us to ask, in a very rigorous way, some fundamental questions. How should designs be represented? How do we establish architectural vocabularies and rules of composition? How can we partition design processes into semi-independent subprocesses? How might we interpret and evaluate design alternatives? How can we achieve reasonable efficiency in the

generation and exploration of design alternatives? These, of course, are questions of design practice, and we are finding that a computational perspective yields exciting new insights into them. Finally, it is critical for schools to provide courses that represent this viewpoint, that demonstrate the underpinnings of computer methods, and explore the similarities and differences between traditional and computer methods. Architects must be sophisticated and discerning about these issues if they are not to be mere passive consumers of commercial computer technology.

Conclusions

The architectural profession has reached the stage where the rate at which computer and communication systems replace people is beginning to outstrip the pace at which new employment can be found for people within the profession. If we view this pessimistically, we can foresee imminent and widespread technological unemployment within the profession. If we are more optimistic, we may conclude that architects will no longer have to spend their time in many of the ways that have traditionally occupied them, and that they will be able to concentrate on the things that really matter. Either way, it will not be sufficient for the profession, and for the schools, merely to embrace CAD technology. We must quickly go beyond this. When there is no longer a social need or a market for many traditional architectural skills, what is it that we should be teaching? I could suggest some answers, but I urge you to consider your own. [William J. Mitchell]

Professor William J. Mitchell *is head of the Architecture/Urban Design Program at the University of California, Los Angeles. This article comes from a talk given at the ACSA's Administrator's Conference in December.*

Making the CAD system a success

A study we recently made shows that most architectural firms are not having an easy time moving to computer graphics. We asked design firms to tell us at what level of success they would rate their present application and use of computer aided design (CAD) systems. We got responses from 309 firms and 49 percent of those that had CAD systems reported they were realizing less than 25 percent effectiveness. While this figure improved for firms that had been using systems longer, the average potential use never exceeded 62 percent (Fig. 1). Typical comments from firms were: "We need a more sophisticated integration of design and construction docu-

ments with more automated routines." "We still cannot use the system's strong points." "The problem is development and training." "More time is needed to learn all the applications, and we need more operators."

The average size of the responding firms was 91 people, while 39 of the firms had an average of 41 people. Clearly CAD is not a system only for larger firms.

The results for firms' use of computerized financial management (CFM) and computerized word processing (CWP) were somewhat different. The judgments about effectiveness were higher and did not plateau until the 75–80 percent level (Figs. 2 & 3).

We think a clue to the low level of success in the use of CAD is indicated by the fact that most of the training was provided only by vendors, and only about half of the firms had any specific training for staff other than "operators." Similarly, only about half of the firms with CAD systems have them accessible to people throughout the firms. Half of our respondents limit CAD use to those in a specific department. Only about one-fourth of the firms have the equipment available to half or more of the staff.

The following comments are representative of respondents' reactions to training needs: "Provide more hands-on experience." "Have hands-on seminar for all staff." "Give better and more realistic instruction to professional staff." "Have an in-house learning session by programmers who understand architecture and planning processes."

It is our thesis that the "seat-of-the-pants" approach to the introduction of CAD systems has cost A&E firms loss in productivity and has produced considerable resistance on the part of many employees. A study conducted by a New England group of 18 computerized systems considered only three to be successful. Technical issues were found to be not as much a cause of failure as the "lack of attention to employee resistance." The Rand Corporation also studied systems in firms, finding that the most critical problems in implementing high-technology office systems lie not in the system itself, but in "the basic characteristics of the organization: how it structures work, how it responds to change, and how carefully it considers human needs."

These findings, and our conversations with clients, point to the need for a new approach. Turning the CAD system over to a specialized department does not lead to its successful implementation. The people with the projects *most directly affected* by the CAD system should dominate it.

Three principles

First, organizations are systems; you cannot change one thing without some effect on the entire system. A firm needs to look at the implications of a change, such as installing CAD, even if it may appear to affect only a limited group.

Second, besides training by vendors, organizations need to provide well-designed educational programs for employees throughout the firm (seven steps for such a program are outlined later).

Third, people need the opportunity to learn in ways that fit their various styles. David Kolb has identified four basic learning styles that consist of varied combinations of preference for *concrete experience, reflective observation, active experimentation,* and *abstract conceptualization.* The relevance of his studies to the present problem is that some people will do better at approaching a computer by getting their hands on it right away and "messing around." Others will prefer to read about the principles and then try it out. Still others will need to observe

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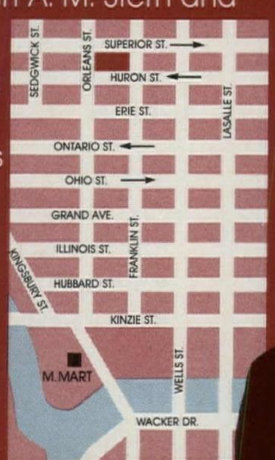

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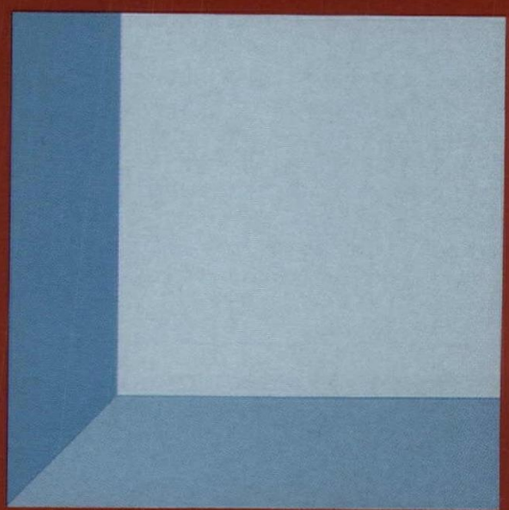

first and then apply their observations. It is important that these various styles be supported, since too frequently only one approach is seen as "proper."

We think the CAD implementation process is greatly aided by the use of teams consisting of those involved in doing a project. An early step should be the identification and sharing of the individual members' learning styles and planning, so each can learn what is needed in ways that are most comfortable and effective.

In our experience the *benefits* of using teams is that they deal more easily with complexity; are fast responders; make high-quality decisions; and collectively have strength. A successful CAD installation requires mechanisms for predicting, tracking, and dealing with varied consequences, which teams do well. The team also can provide a linking mechanism between the CAD system and various other parts of the firm. The steps for building such teams successfully are:

- Select one or more real projects on which to apply the new system;
- Choose a team that will have the hands-on involvement with the project;
- Brief the project manager and the entire team on expectations relating to clients' needs and the training and system objectives;

FIRMS WITH CAD, POTENTIAL EFFECTIVENESS RELATED TO YEARS IN USE

Years in use	Number of firms	Potential realized
1	40	35%
2	12	45%
3	6	50%
4	8	62%
5 or more	15	47%

Figure 1

FIRMS WITH CFM, POTENTIAL EFFECTIVENESS RELATED TO YEARS IN USE

Years in use	Number of firms	Potential realized
1	62	44%
2	53	69%
3	22	75%
4	9	75%
5 or more	78	75%

Figure 2

FIRMS WITH CWP, POTENTIAL EFFECTIVENESS RELATED TO YEARS IN USE

Years in use	Number of firms	Potential realized
1	58	55%
2	68	73%
3	56	76%
4	32	79%
5 or more	58	85%

Figure 3

- Develop a "learning plan" to be carried out during the project. Each team member will develop a written description of the parts of the project he or she will be working on, and its relation to the CAD;
- Teach the team to function effectively as a planning, learning, and problem-solving group;
- Have the team assess its progress at defined milestones.
- Make a thorough analysis of overall use of CAD and knowledge acquired at the conclusion of the project. Plan for the next projects to extend what was learned.

With this method, the team members make use of the system as they do their work. They create a good learning environment and find ways to accommodate CAD to the unique aspects of a firm.

However, tension and resistance exist with any change—even "good" changes—but the problem is manageable if it is addressed wisely. Organizations need to recognize that the organizational and psychological issues are at least as complex as the technical problems.

[Allan B. Drexler, Walter W. Sikes, Jr.]

Allan B. Drexler, Ph.D., *and* Walter W. Sikes, Jr., Ph.D., *are consultants with The Coxe Group, Inc., Philadelphia, Pa.*

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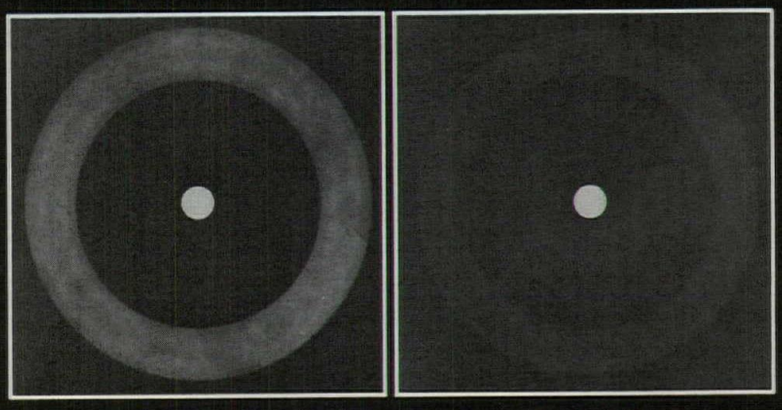

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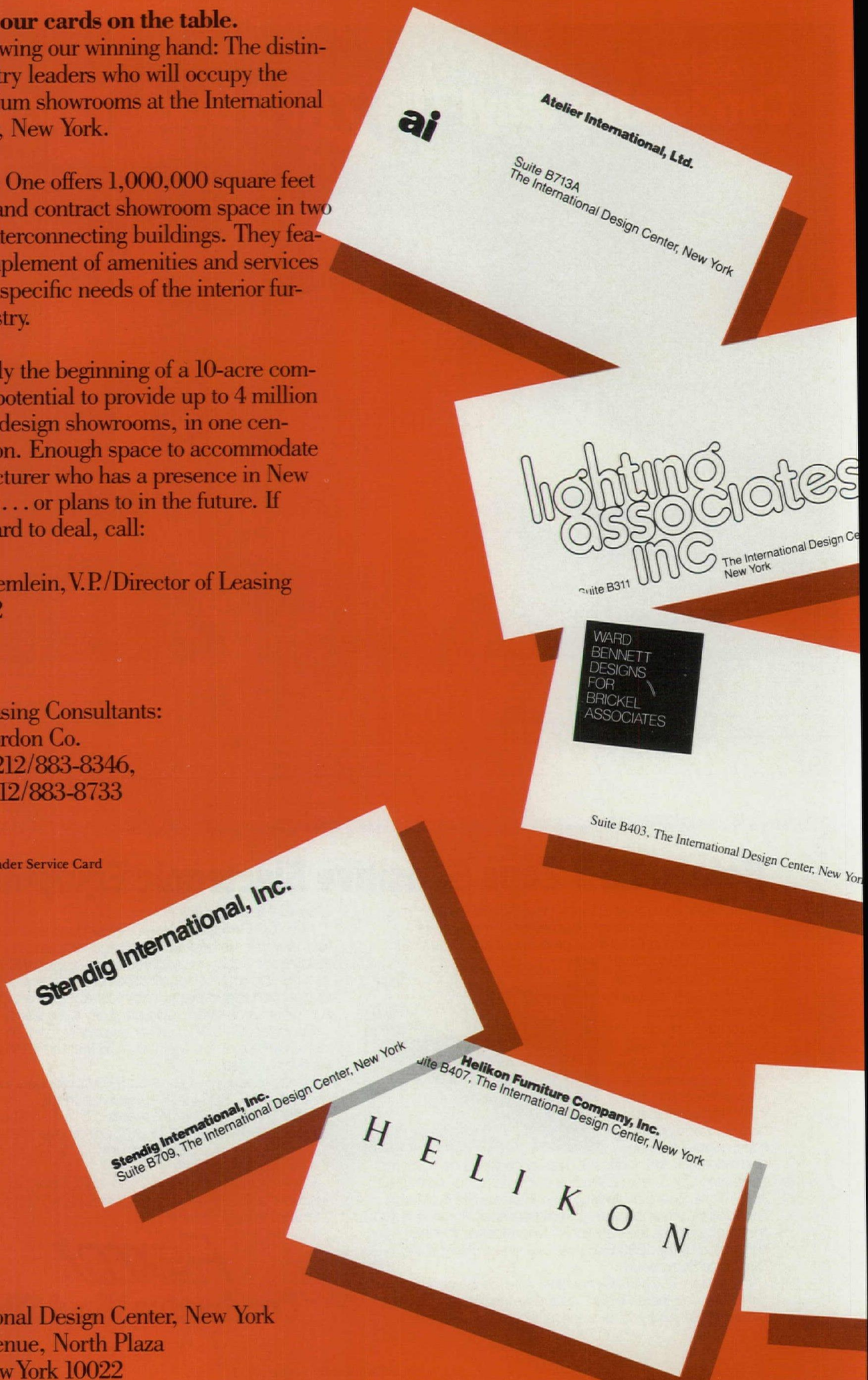
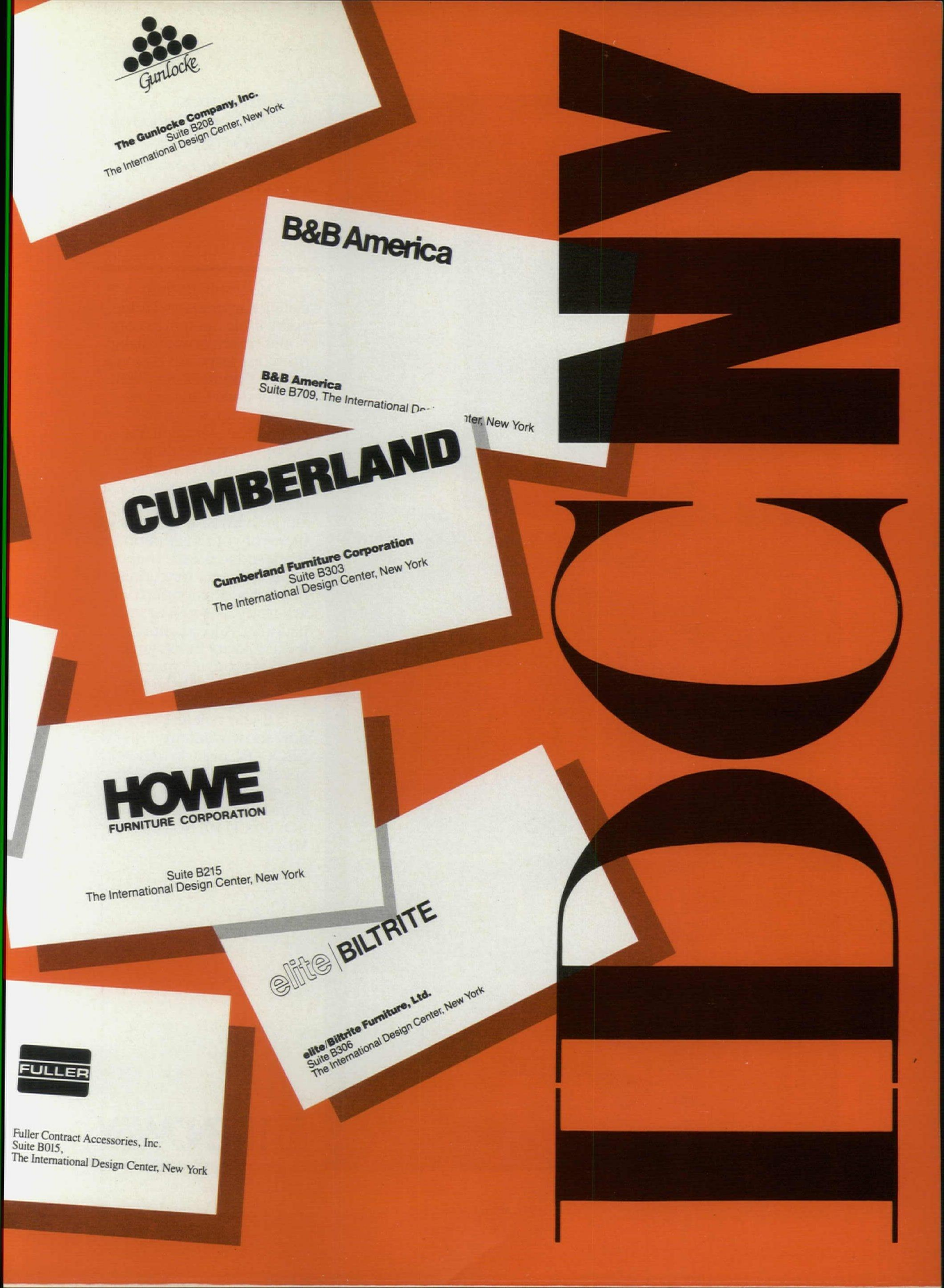


The International Design Center, New York
919 Third Avenue, North Plaza
New York, New York 10022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The Gunlocke Company, Inc.
Suite B208
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B&B America
B&B America
Suite B709, The International De
ter, New York
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Cumberland Furniture Corporation
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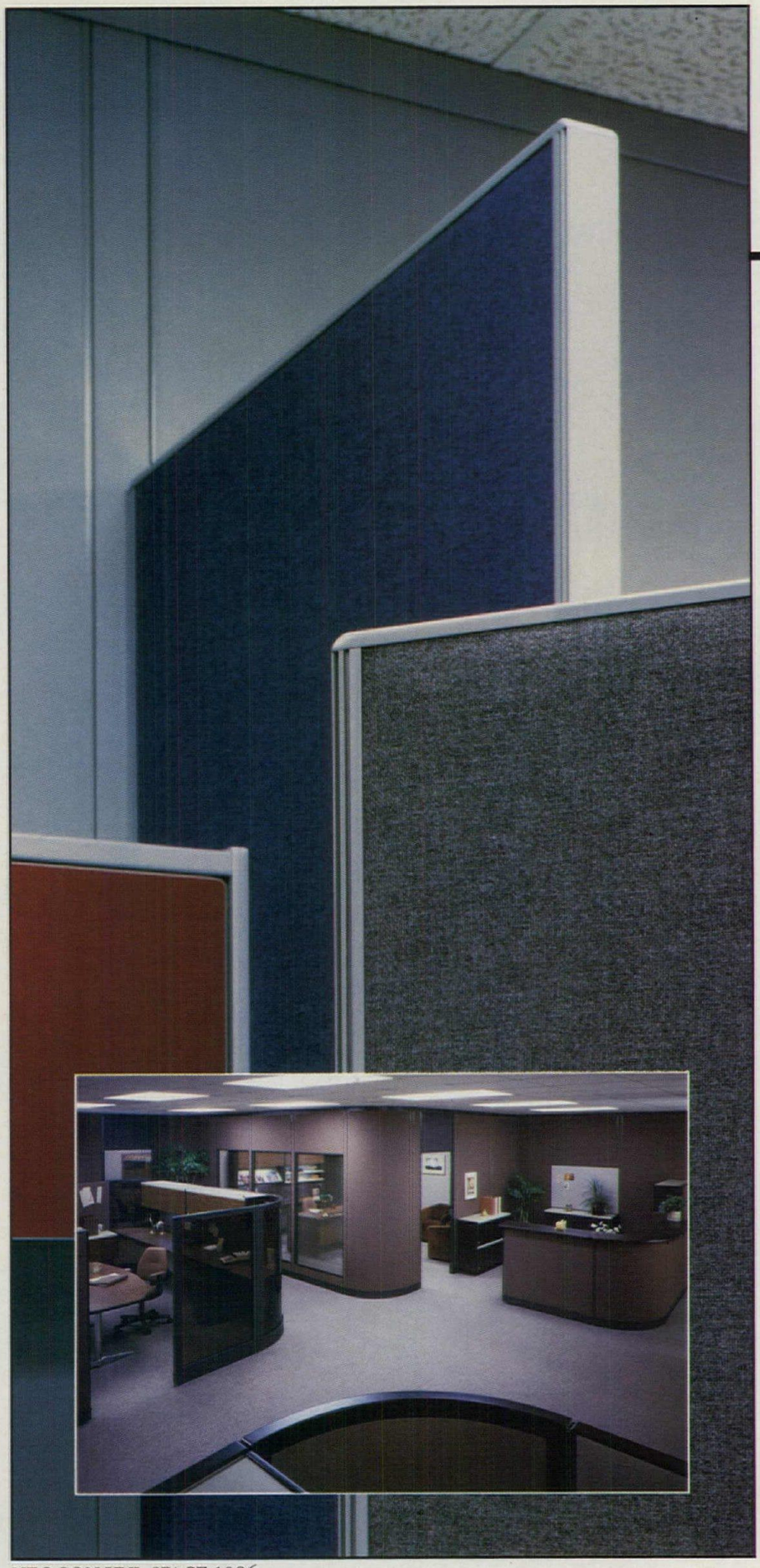

NEOCON XVI, SPACE 1086

Trendway opens it's New National Showroom this NEOCON. Examine the reasons to be there.

Moveable floor-to-ceiling partitions and fully compatible open plan componentry are now available from one responsive, single-source manufacturer. Planning options you may have thought impossible or impractical—straight and curved floor-to-ceiling partitions with complementing systems panels in a greatly expanded offering of fabrics, vinyls, and colors—there for your inspection. Work surfaces and components for every functional need or aesthetic approach (try mauve, or rose or grid patterns). And an unparalleled capacity to integrate open and private space—economically, efficiently, working as one.

If you visit just one new showroom this NEOCON, make it Trendway. Space 1086, Chicago's Merchandise Mart, June 12-15. Trendway Corporation, P.O. Box 1110, Holland, MI 49423

TRENDWAY™

Private and Open Office Environments

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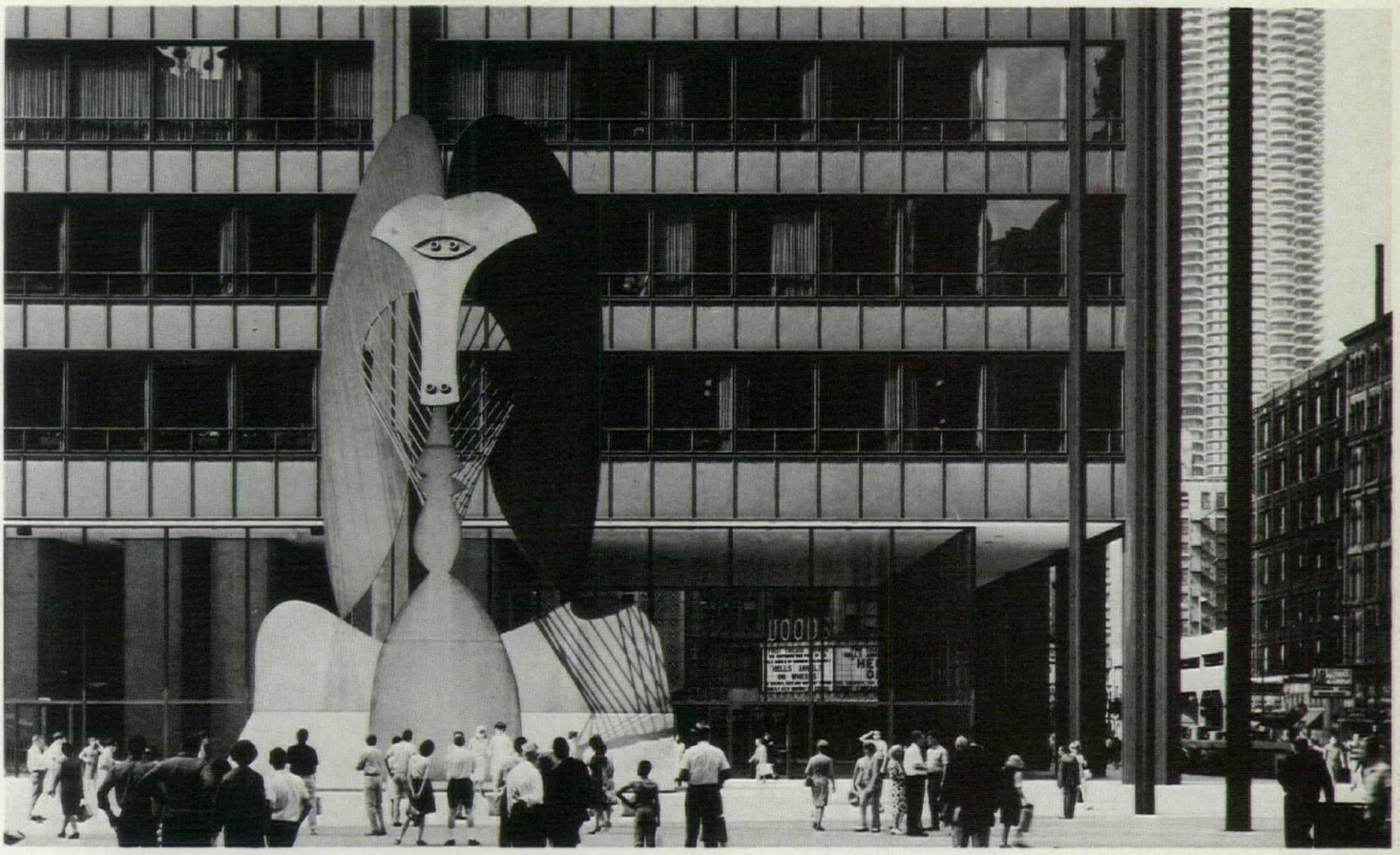
Neocon 16



Hedrich-Blessing

Picasso sculpture at the Daley Civic Center

An International Symposium on Modern Architecture at NEOCON 16 will be the architectural highlight of the event this year. NEOCON, the international contract furnishings market and congress on environmental planning, takes place June 12–15 at the Merchandise Mart in Chicago. The focus of the symposium will be to challenge the idea of a continuation of Modern architecture and to ask the question, "What *is* 'Post-Modernism'?" A distinguished panel including Christian de Portzamparc of Paris, Juhani Pallasmaa of Helsinki, Robert Venturi of Philadelphia, Henning Larsen of Copenhagen, Minoru Takeyama of Tokyo, Josef-Paul Kleihues of Berlin, Michael Graves of Princeton, Helmut Jahn of Chicago, Carlos Ott of Toronto, John Burgee of New York, and Quinlan Terry of London will be moderated by Paul Goldberger, Architecture Critic of the *New York Times*.

Also during NEOCON, an international panel of judges will choose the new Union of International Architects (UIA) medal from the submissions of architects, architecture students, and sculptors (see P/A calendar, page 53, for dates and contact). The winning entry will be struck in Chicago and given to the first international recipient at the XV UIA Congress in Cairo, January 20–24, 1985.

The opening of showrooms in the Mart will again be complemented by NEOCON International, but there will be a twist this year. For the first time, foreign manufacturers have agreed to bring the finest European standard exhibit booths to premiere their products in the United States. The new standards will not only raise the quality of the products, but increase the size of the International Pavilion to 140,000 square feet of exhibit space.

In addition to these activities, there will be various seminars and workshops, many with an architectural emphasis. Please consult the following guide for exact details and speakers.

Seminars and Workshops

Tuesday, June 12

8:30 A.M.
ASID Industry Foundation Professional Program.

Noon Workshop/Luncheon
"In Search of Differentiation: The Future for Contract Dealers," by William E. Kuhn, Principal, William E. Kuhn & Associates, Denver.

4:00 P.M. Seminar
"Cities with a Future: Survival of the Fittest," by The Honorable Richard H. Fulton, Mayor of Nashville and President of the United States Conference of Mayors; The Honorable Henry W. Maier, Mayor of Milwaukee and Past-President of the Conference of Mayors and the National League of Cities; and George Notter, FAIA, President of the American Institute of Architects.

10:30 P.M.
IBD Midnight Affair, Orchestra Hall, 220 S. Michigan.


William E. Kuhn


George M. Notter, Jr.

Wednesday, June 13

8:30 A.M. Seminar
"Beyond the Post-Industrial Horizon: Catapulting Society into the 21st Century," by John Diebold, Chairman, The Diebold Group.

10:30 A.M. Workshop
"Liveable World-Class Cities: Paris, Toronto, and St. Paul," with Michel Lanthonie, Chief Planner of the State, Paris, and Secretary General, UIA; James Bellus, Dept. of Planning & Economic Development, St. Paul; and Xenia Zepic, Director, Metropolitan Toronto Planning Board. Sylvia Lewis, Director of Publication, American Planning Association, will moderate.

2:30 P.M. Workshop
"Contemporary Latin American Architecture: An Overview of New Architecture in Argentina, Brazil, Mexico, Chile, Venezuela, and Peru," with Jorge Glusberg, Architect and Architecture Critic, Buenos Aires, and Head of Communications and Publications, UIA; and R. Randall Vosbeck, FAIA, Past-President, AIA.

4:30 P.M. Seminar
"Vernacular Architecture and the New Classicism: Prominent American and European Perspectives," with Josef-Paul Kleihues, Architect and Director of the Internationalen Bauausstellung, Berlin; Carlos Ott, Architect, Toronto; and Robert Venturi, Principal, Venturi, Rauch & Scott Brown, Philadelphia. Paul Goldberger, Architecture Critic of the *New York Times*, will moderate.

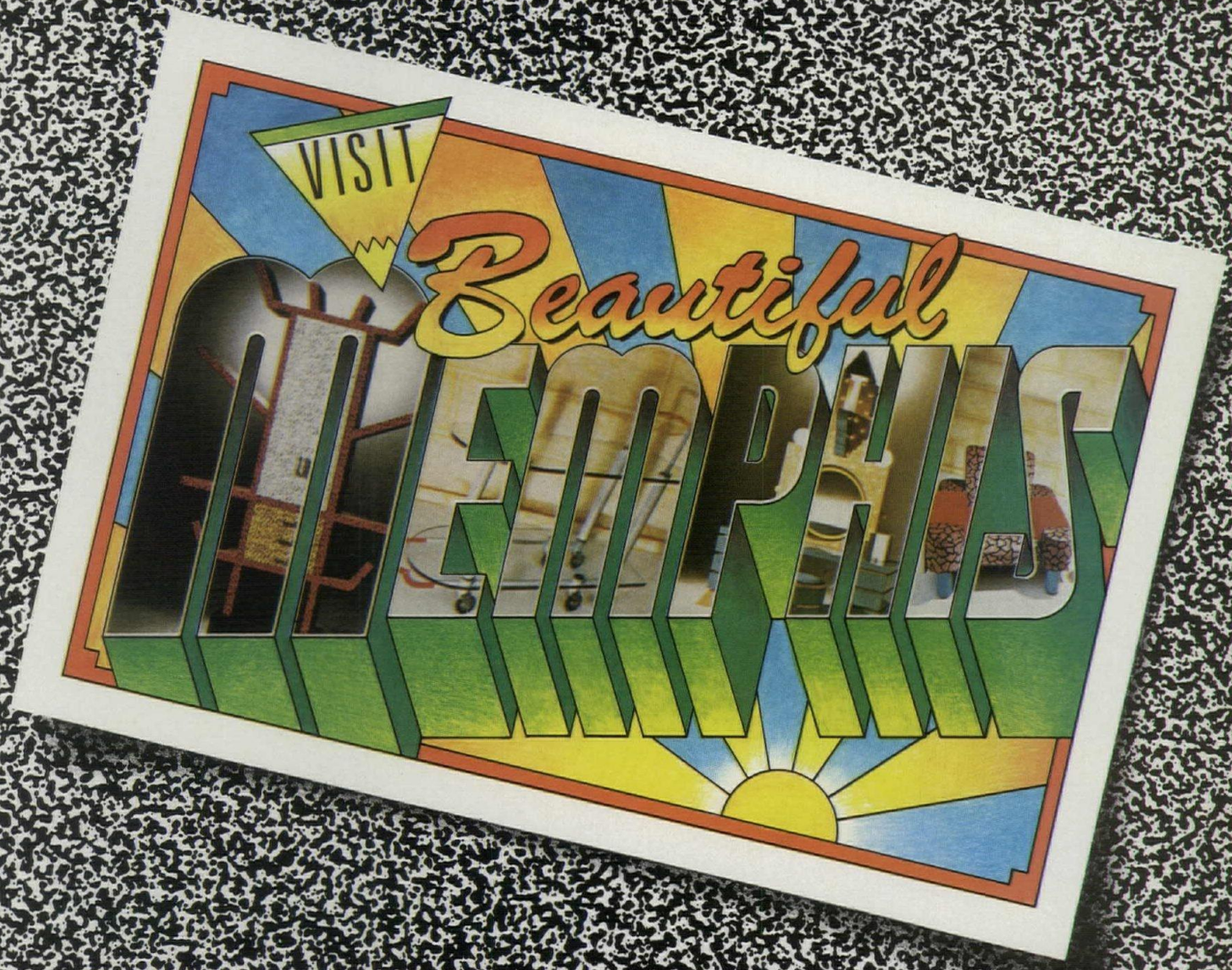
4:30 P.M. Seminar
"Breaking Through the Change Barrier, Adapting New Technologies into the Office: Will the Industry have the Right Stuff?" with Michael Bell, Director of Planning and Consulting Services, Xerox Corp.; and Peter Valentine, President, Comsul, Ltd., San Francisco.


Xenia Zepic


Josef-Paul Kleihues


Carlos Ott


Robert Venturi



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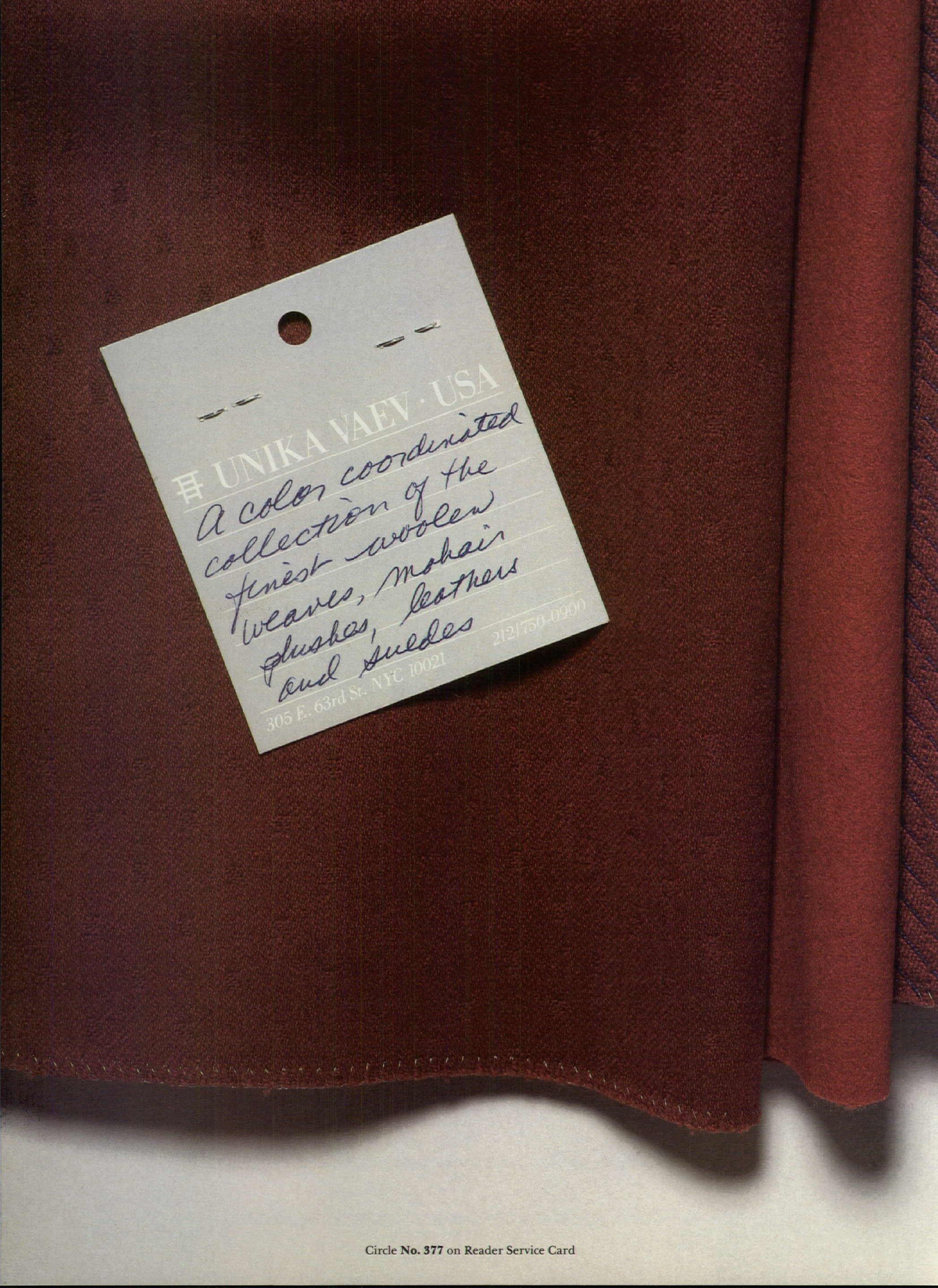

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The Office Environment Company

Thursday, June 14

8:30 A.M. Seminar
"A New Corporate Realism: Business Can No Longer Do . . . Be . . . and Have Everything," with Florence Skelly, President, Yankelovich, Skelly & White.

8:30 A.M. Seminar
"Charting the Course of Facility Management: A Long-Range Perspective on Corporate Needs," with Richard L. Eppley, Vice President/International Premises Dept. of Morgan Guaranty Trust, and Stephen Binder, Citibank.

10:30 A.M. Workshop
"The 21st Century Hospital: Accommodating the Latest in Medical Technology," with Malcolm Cutting, Architect in Residence, The Cleveland Clinic; and Frederick Alley, President and CEO, Brooklyn Hospital/Caledonian Hospital. Joseph Sprague, Director of Design, American Hospital Association, will moderate.

10:30 A.M. Workshop
"The Need for Continuing Education in the Facility Management Profession," with Dr. Marvin G. DeVries, Dean, F.E. Seidman School of Business, Grand Valley State College, Allendale, Mich.

2:30 P.M. Workshop
"Restructuring the Nation's Schools," with Dr. Harold L. Hodgkinson, Senior Fellow, The Institute for Educational Leadership, Washington, D.C.; and Dr. Ruth B. Love, General Superintendent, Chicago Board of Education.

2:30 P.M. Workshop
"The Lighting Revolution: New Concepts in Lighting and Space," with Theos Kondos, Partner, BonVini/Kondos.

4:30 P.M. Seminar
"The New American Skyscraper: Towering Ideas Taking Height in the American City," with John Burgee, John Burgee Architects with Philip Johnson, New York; Michael Graves, Michael Graves Architect, Princeton, N.J.; and Helmut Jahn, Murphy/Jahn, Chicago.

4:30 P.M. Seminar
"Facility Management Professionals: The Newest Member of the Corporate Team," with Dennis Longworth, Supervisor, Facility Management, Armco, Houston; William Sims, Chairman, Dept. of Design and Environmental Analysis, Cornell University, Ithaca, N.Y.; Larry Vanderburgh, Realty Specialist/Space Planner, General Services Administration, Washington, D.C.; and George T. Trayer, Vice President, Central Bank of Denver and IFMA President.


Florence Skelly


Ruth B. Love


John Burgee

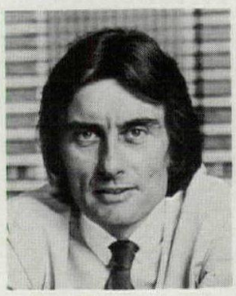
Friday, June 15

8:30 A.M. Seminar
"THE CLASH: Culture Technology, the Impact on Design Shapes, Forms and Philosophies," with Hartmutt Esslinger, Frankfurt, West Germany; Franco Raggi, Milan, Italy; and Bernard Vinick, Hartford, Conn.

8:30 A.M. Seminar
"The East-West Connection: Is There a New International Style? European and Japanese Perspectives," with Christian de Portzamparc, Architect, Paris; Minoru Takeyama, Architect, Tokyo; Henning Larsen, Architect, Copenhagen; and Juhani Pallasmaa, Architect, Helsinki.

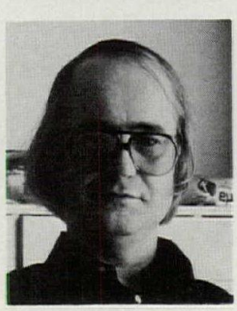
3:00 P.M. Seminar
International Symposium on Modern Architecture, with John Burgee, Michael Graves, Helmut Jahn, Christian de Portzamparc, Henning Larsen, Carlos Ott, Minoru Takeyama, Josef-Paul Kleihues, and Juhani Pallasmaa. Paul Goldberger will moderate the discussion, with contributions from members of the North American, South American, and European press.


Michael Graves


Helmut Jahn


Minoru Takeyama


Henning Larsen


Juhani Pallasmaa

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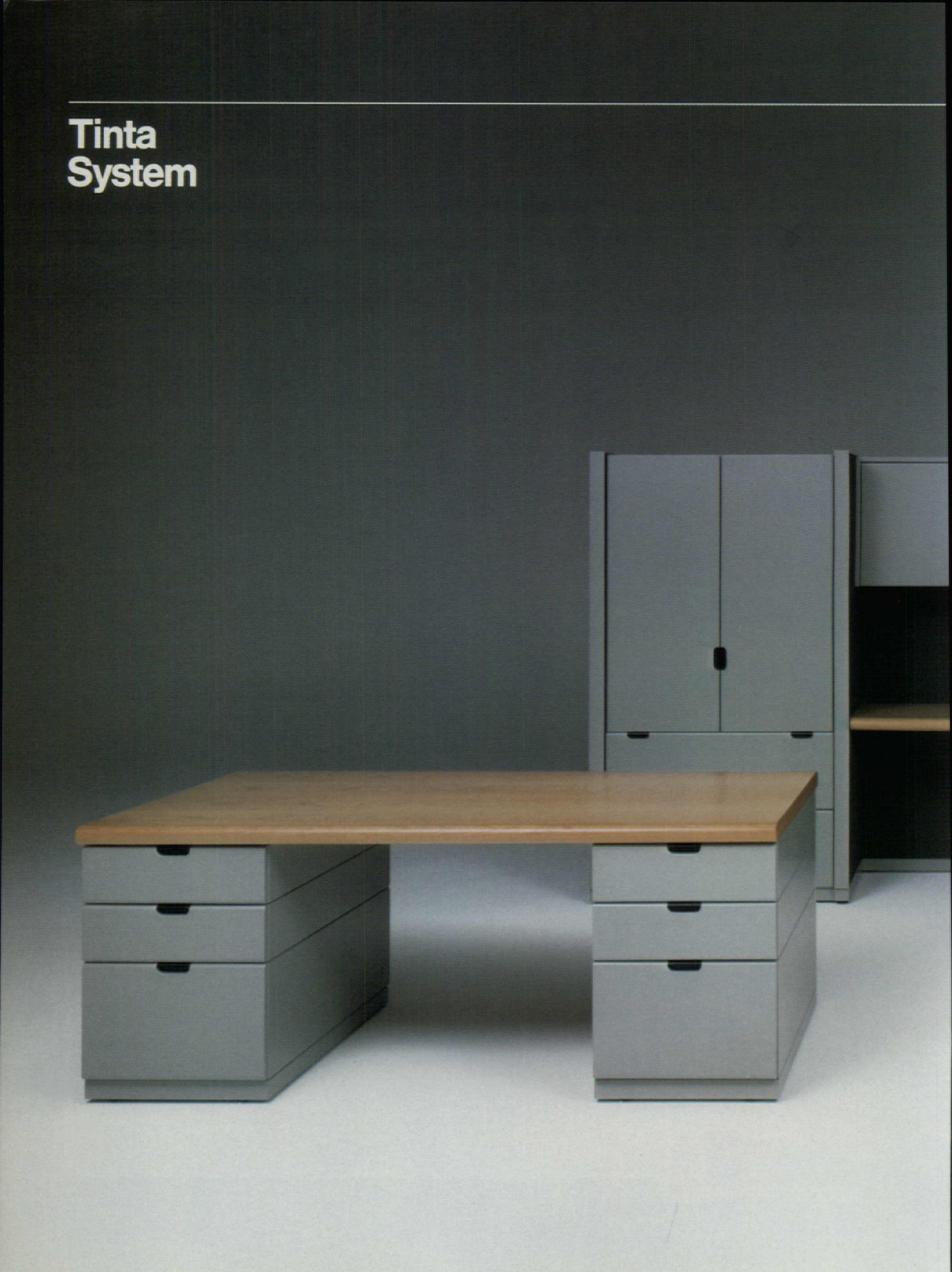

Adden
A compact solid oak loft bed unit is the newest addition to the Roommate Collection of dormitory furniture. It includes a spring-supported bed, wardrobe with drawers, bookcase, and oversized desk.
Circle 133 on reader service card

All-Steel
These are two of the six new chairs in the 600 Series for today's electronic workstations. The 600 Series chairs are available in a wide range of fabric colors and textures.
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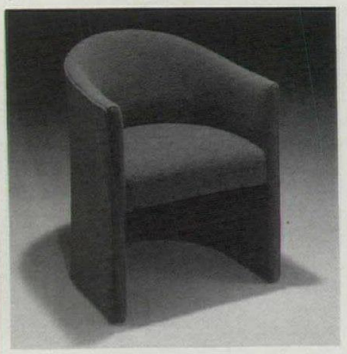

Alma Desk
The 4511 is the newest in the company's sidechair collection. It is available in a wide variety of fabrics and quality leathers.
Circle 100 on reader service card

Arconas
Fred Scott designed this leather-covered executive version of the Supporto Ergonomic Chair, which features wide arms and extra padding in addition to the standard pneumatic back and seat controls.
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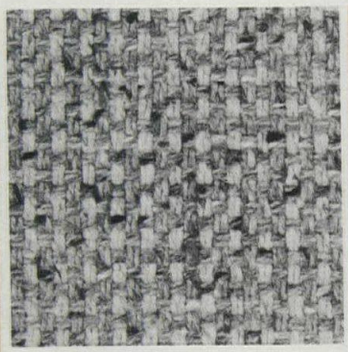

Arc Com
Banyan Wool and Banyan Knot are 66 percent wool and 34 percent rayon. Spun with five different colored yarns, Banyan Wool comes in 18 colorways, Banyan Knot in 14, and both in 51-inch width.
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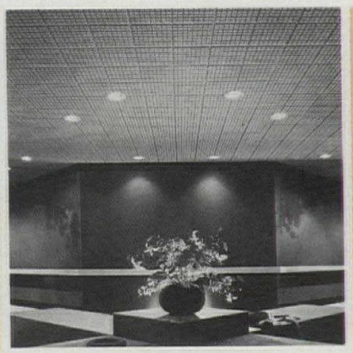

Armstrong
A tilelike appearance can be achieved with new Suprafine tegular lay-in ceiling panel, available in five small-scale geometric designs.
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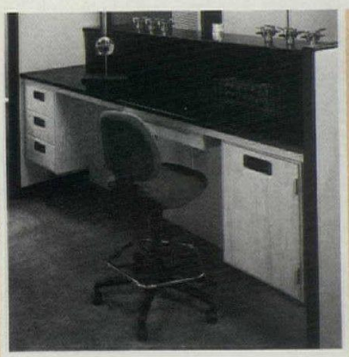
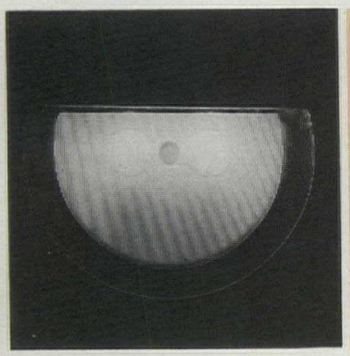
Artemide
Cyclos, by Michele DeLucchi, is a wall or ceiling fixture with gray lacquered body and partially frosted glass, which creates a neon effect.
Circle 105 on reader service card



American Seating
The laboratory and technical workplace, utilizing the System R panel frame, will be shown at NEOCON, along with major improvements in the System R/Responsive office furniture system.
Circle 104 on reader service card



AI
The Tilt wall lamp features a two-piece semicircular glass diffuser for even distribution of light from two 60-watt incandescent sources. The open top provides direct upward light and easy access for bulb replacement.
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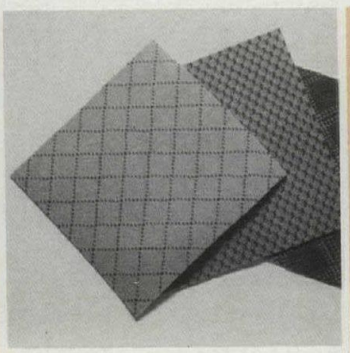

Badische
The Solution Series includes three pattern tufted carpets in Zeftron 500 nylon yarns, solution dyed. From left to right, Premiere Square, Premiere Checks, and Premiere Plaid.
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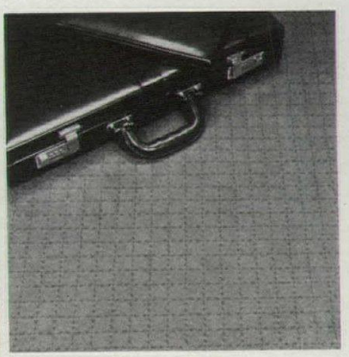
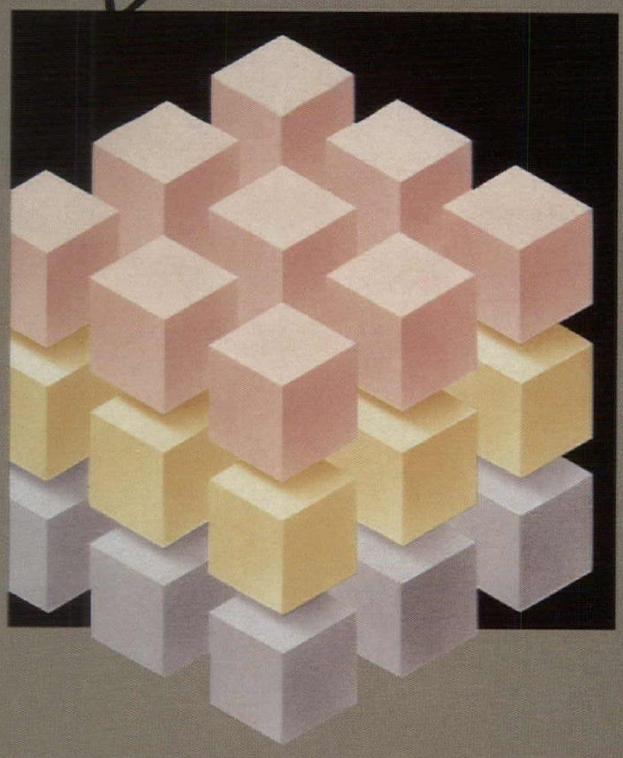


Bigelow
New for NEOCON is a woven collection of Anso IV nylon with Halofresh. Three products in the collection are patterned, and the fourth is a solid coordinate.
Circle 533 on reader service card

Explore Creative Dimensions



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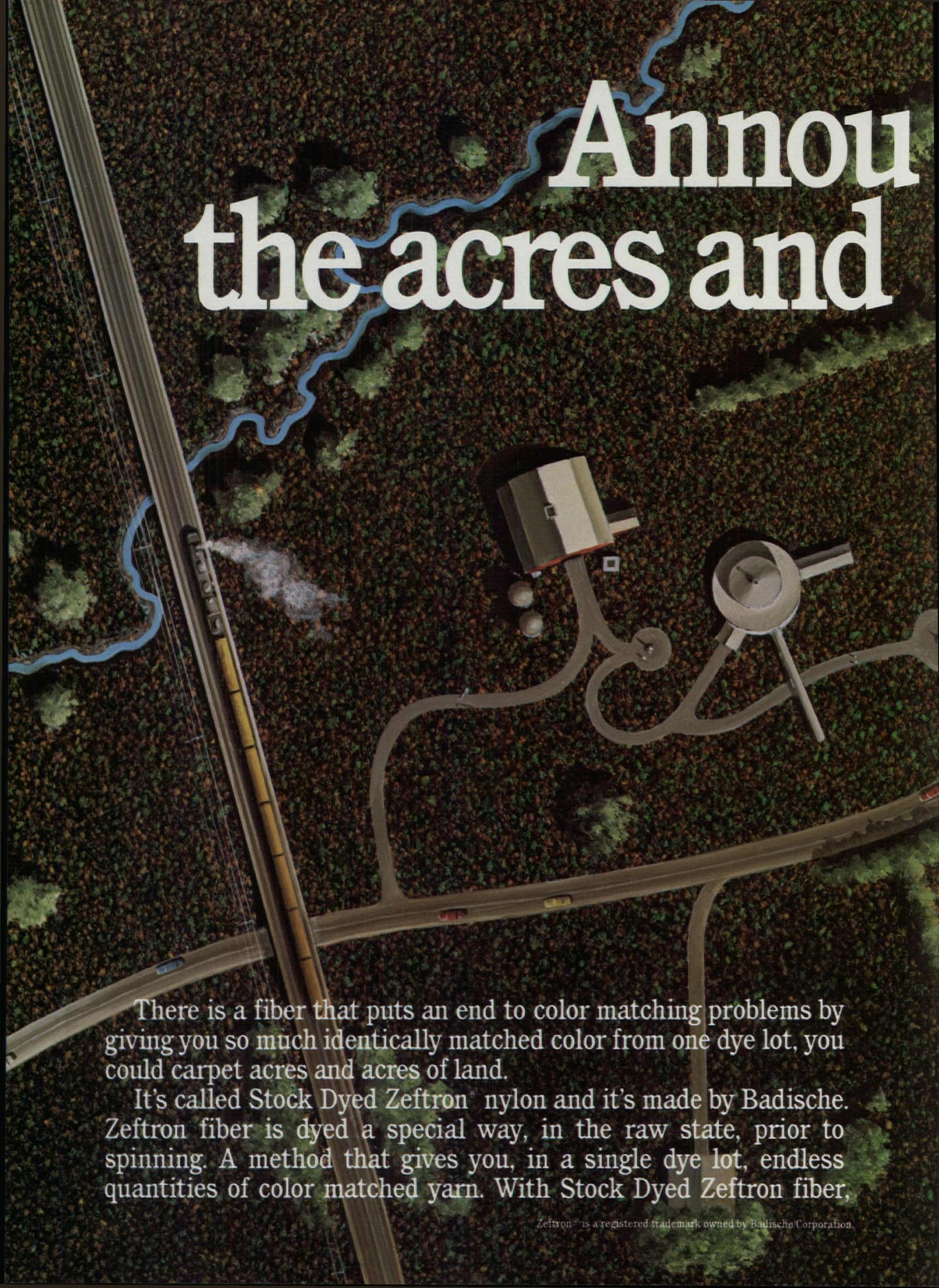

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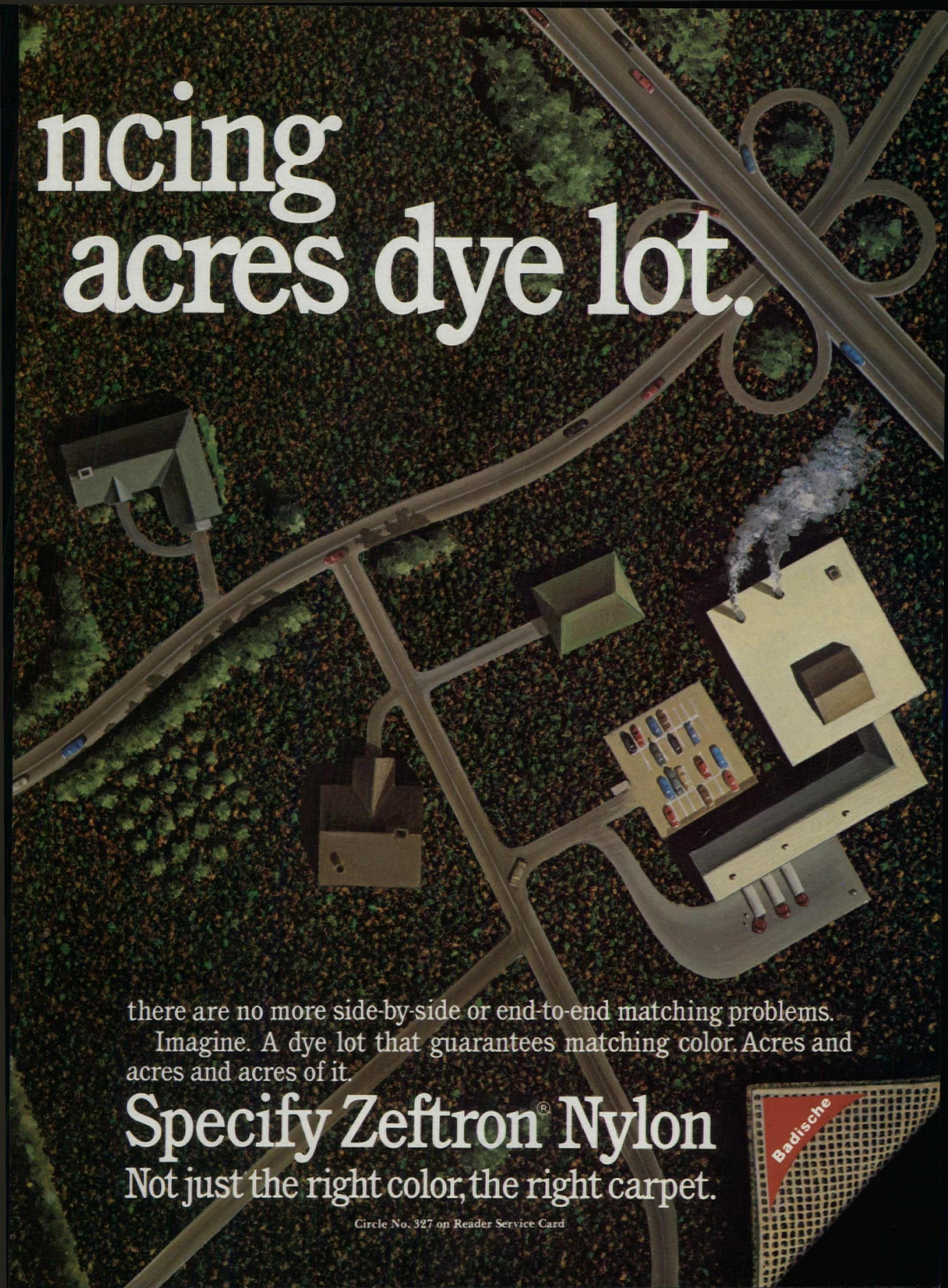
There is a fiber that puts an end to color matching problems by giving you so much identically matched color from one dye lot, you could carpet acres and acres of land.

It's called Stock Dyed Zeftron® nylon and it's made by Badische. Zeftron fiber is dyed a special way, in the raw state, prior to spinning. A method that gives you, in a single dye lot, endless quantities of color matched yarn. With Stock Dyed Zeftron fiber,



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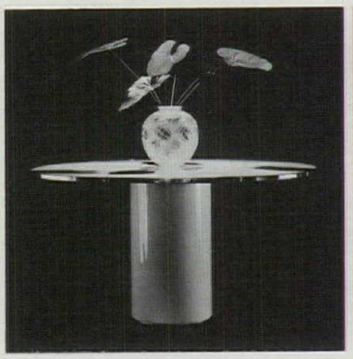
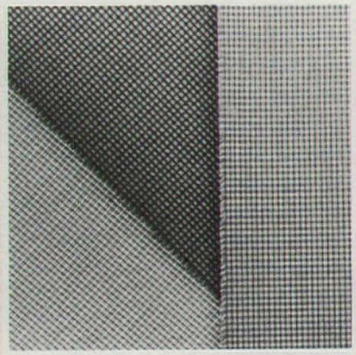
Baker
Traditional, 18th-Century mahogany has been coupled with contemporary worksurfaces and wiring pathways for new office technology in this new executive desk.
Circle 108 on reader service card

Brayton
Designed by Danilo, Corrado, Maurizio, Aroldi, this lighting system with dimmer control has a stem that comes in white, black, or red lacquer, with an 11-inch-diameter sandblasted glass top bowl.
Circle 109 on reader service card

Brickel
Ward Bennett's Yoke Chair was inspired by the yoke, one of three sacred Mayan totems. It is hand-carved out of solid ash.
Circle 110 on reader service card

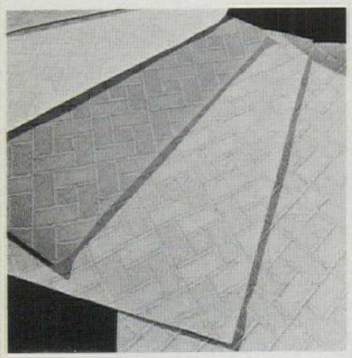


Brueton
The Cologne Table features a finished metal top and steel base accented by a 2-inch polished steel banding. It is available in a range of opaque color finishes and sizes.
Circle 111 on reader service card



Brunschwig & Fils
A pointillist surface and solid tone texture are features of the new Worcester cloth. It is available in beige, gray, cream, and burgundy.
Circle 112 on reader service card

CI
A new line of computer furniture, the Connexus Modular Office System, offers a wide range of interconnecting modules and accessories. The stations have manual or electronically controlled adjustment.
Circle 113 on reader service card

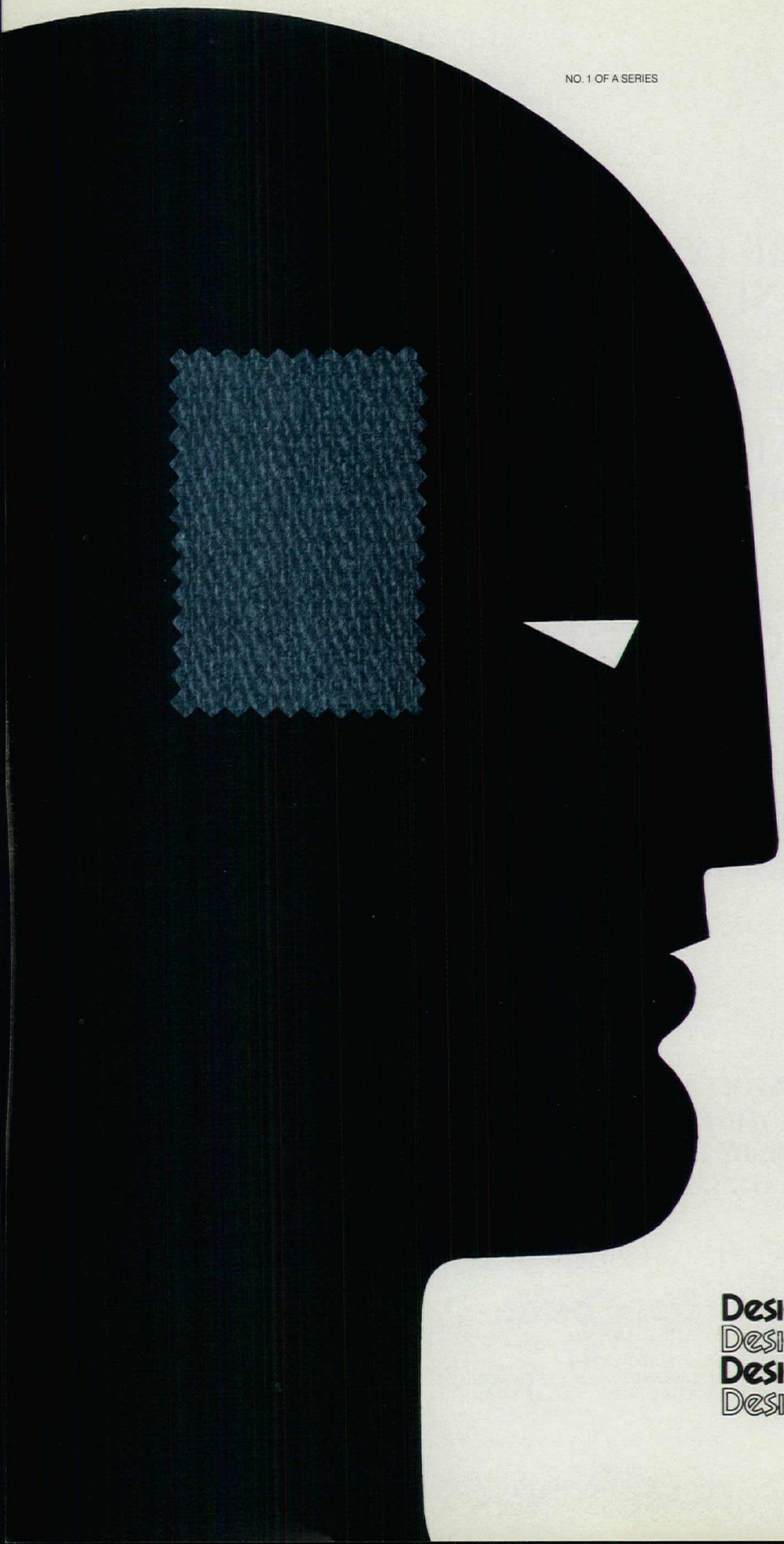


L.E. Carpenter
After four years in development, Marielle will debut at NEOCON. The vinyl-coated wallcovering comes in 16 colorways in 54-inch width.
Circle 114 on reader service card

Castelli
The much-discussed Penelope chair will be on view at NEOCON. The chair features a woven steel wire seating shell with a resin finish over a frame composed of a single 17-foot steel rod.
Circle 115 on reader service card

Cole
Specially designed to support today's electronic office equipment, this desk series features two desk-top, fully protected management channels for power and communications. It is available in double pedestal (shown) and single pedestal.
Circle 117 on reader service card

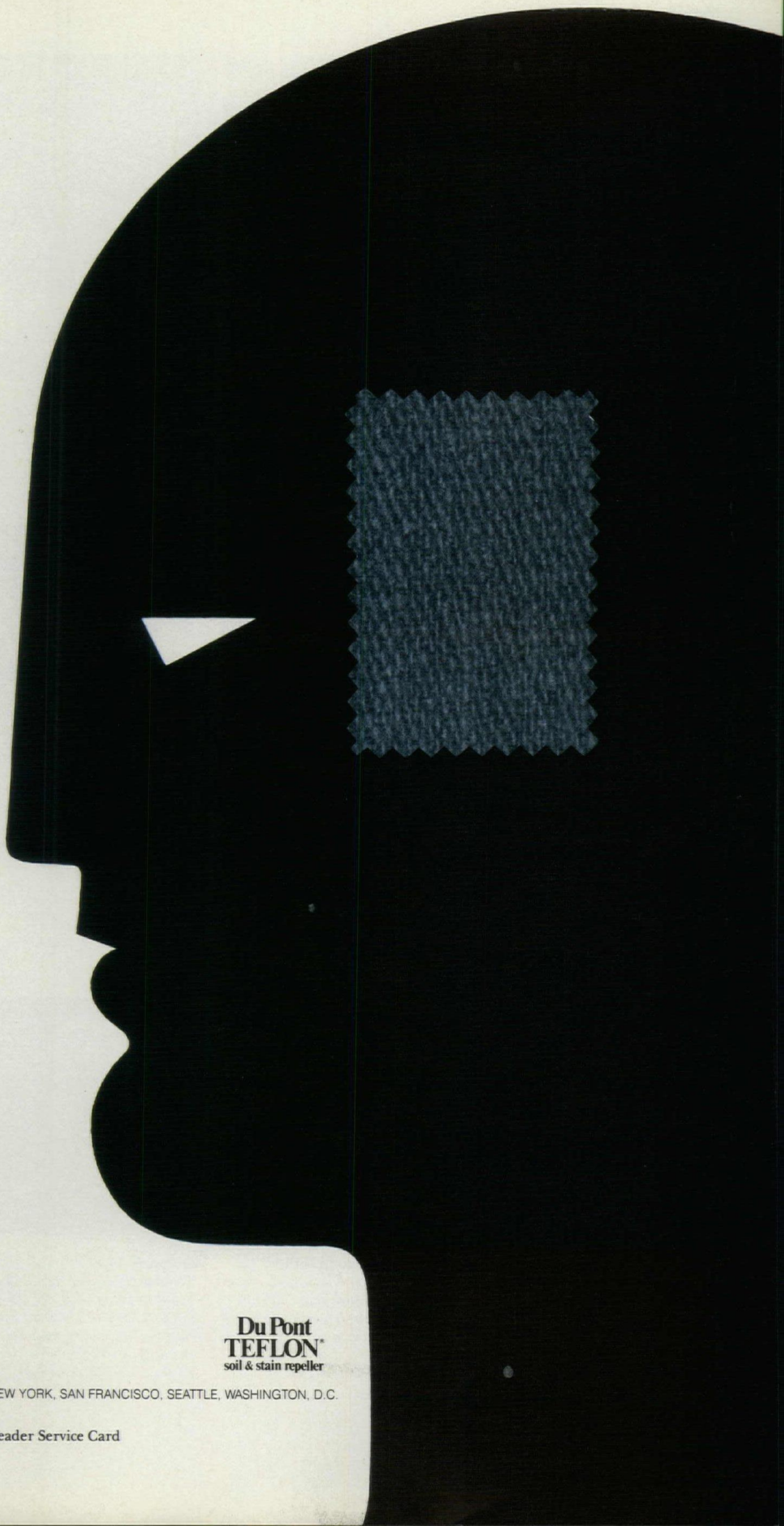
NO. 1 OF A SERIES



Reflect on

DesignTex
DesignTex
DesignTex
DesignTex®

ATLANTA, BOSTON, CHICAGO, DALLAS.



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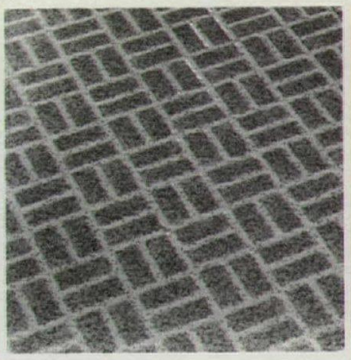
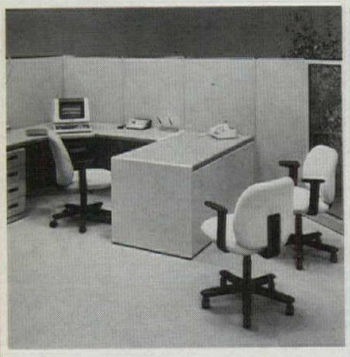
Comforto
The company's newly designed showroom at the Merchandise Mart will feature System 20, contract lounge seating in two heights with either casters or slides.
Circle 118 on reader service card



Congoleum
Stanhope, new to the Flor-Ever commercial vinyl flooring line, is available in six colorations and 9- or 12-foot widths.
Circle 119 on reader service card

Conwed
The System 2 workstation will have new features for NEOCON. Among them are a wood-capped panel and electrified base with expanded capabilities. The Interics wall and ceiling products will also be on view.
Circle 120 on reader service card



Corry Jamestown
This typical mid-management station is part of the 1000 System. It includes fabric-covered and acrylic-glazed panels, work surfaces, mobile pedestals and freestanding desks.
Circle 121 on reader service card

Croydon
The McLean Series of office furniture features solid oak bull-nosed edges in square top or radiused end models. A selection of matte black accessories are optional.
Circle 128 on reader service card

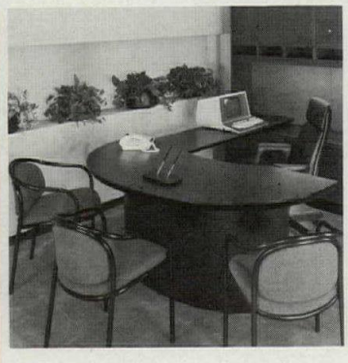
Cumberland
The 129 Group is the company's latest lounge series, available in chair, settee, and lounge, covered in the customer's own fabric, leather, or suede.
Circle 122 on reader service card

Cy Mann
The Mobius Chair features a baked-enameled metal frame and leather sling seat and back, which can easily be changed on site.
Circle 123 on reader service card

Davis
A new licensee from Dreipunkt, the Beta Series has an outer frame of eleven-ply, oval-shaped bent plywood construction. This series is designed to be covered with a seven-ounce, shrunken aniline leather.
Circle 124 on reader service card

Design Selections Int'l
Danish designer Ole Schjoell created this new laminated chair utilizing geometric forms. It is being presented for the first time in the U.S. at NEOCON.
Circle 127 on reader service card

Domore
The sharply defined details of Dick Schultz's Barto chair are actually soft to the touch. The chair comes in high-back executive, medium-back executive, and operator models.
Circle 125 on reader service card

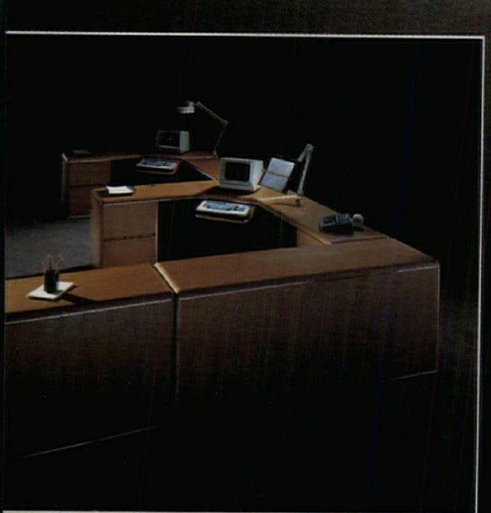


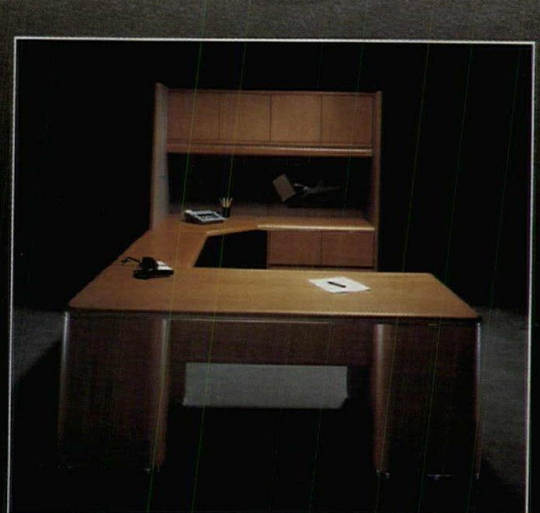
Dunbar
The S/4 Series has been expanded to include the new Crescent Space Saver Work Surface and Overhead Storage Organizer. These new additions are designed to fit into less than 100 square feet of space.
Circle 126 on reader service card

DAVIS

Woodtech 4000™

The innovative wood system for the fast changing office environment.





Innovation...the key word for Woodtech 4000™. Transitional design enhanced by the quality and warmth of wood. Yet, as functional in its applications as most other modular systems. The line contains over 80 units which will adapt to almost any office environment - from conventional all the way to an extensive modular *electrified* system for data processing.

DAVIS FURNITURE INDUSTRIES INC.
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Phone (919) 889-2009

Designed by Robert Bernard Associates

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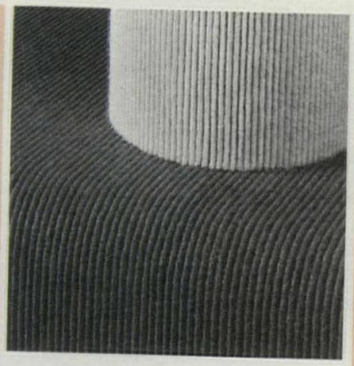
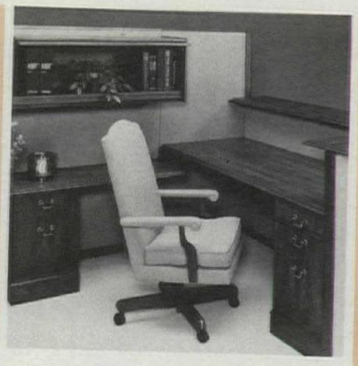


Eurotex
The Tretford Surface System consists of coordinated carpet, loose-lay modules, and Acousticord wallcoverings. These are available on a cut-to-order basis.
Circle 129 on reader service card



Executive Office Concepts
Sculptured hardwood on this panel system extends from the work surfaces through the panels, which are available in 30-inch through 80-inch heights.
Circle 130 on reader service card

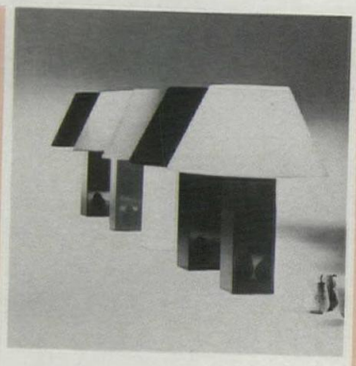
Fixtures
Featured at NEOCON will be the new "discovery" chair, which employs control buttons to adjust it to the user's shape and movements. It can be set for static position or constant movement with the body.
Circle 131 on reader service card

Formica
18 new solid colors have been added to the Color Trends Collection, featuring lighter versions of the now popular Post-Modern colors. Also new are dark, off-black tones tinted with color.
Circle 132 on reader service card

GF
A new line of Emtech electronic support furniture will be unveiled at NEOCON. The series includes seating, worksurfaces and computer media storage cabinets, all coordinated with current finishes and colors.
Circle 134 on reader service card

Helikon
To commemorate the company's 25th anniversary, the Facets collection of executive furniture has been introduced. The style of the furniture can be changed by combining options of veneers and trim.
Circle 135 on reader service card

Gunlocke
This all wood, walnut version of the Courthouse Chair by the Walker/ Group is the symbol for the line. Other models include arm and swivel versions, and various upholstery options.
Circle 136 on reader service card



Habitat
A white linen shade and cylindrical base highlight this new table lamp for NEOCON. The base can be ordered in polished chrome or brass, in one of 13 different woods, or 13 different high gloss colors.
Circle 137 on reader service card

Hardwood House
Computer support componentry is available with the Avatar Collection. It will be introduced at NEOCON along with new casegoods designed by James J. Bayley.
Circle 138 on reader service card

Harter
Featured here are tackable panels that provide acoustical and visual privacy, and the new VDT turntable. The seating is from the HarterMartinStoll "N" Collection.
Circle 139 on reader service card

Bold. Vibrant. Spirited.
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in thrilling color.
Ward Bennett's new
textiles for
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Horizon Cloth™
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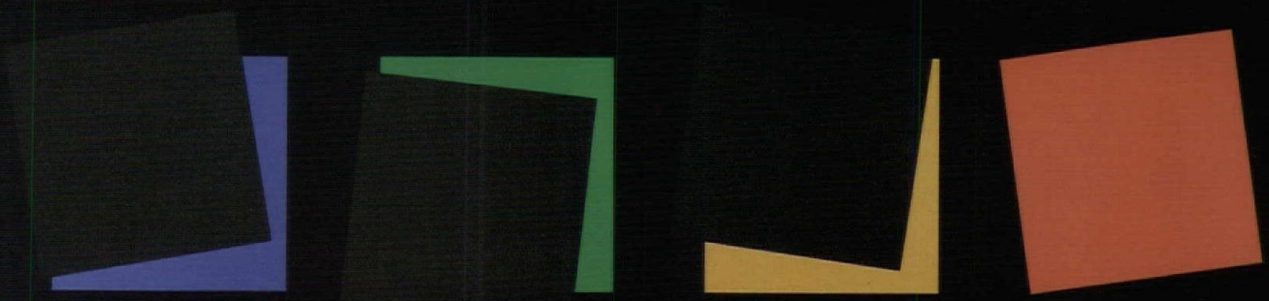

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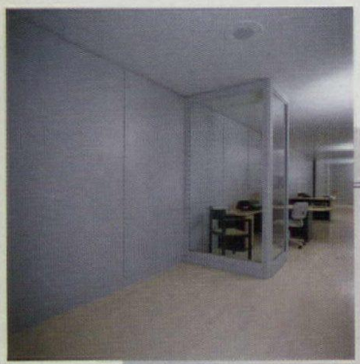
Spaced In

Sophisticated simplicity makes for easy enclosure or partitioning of space with SunarHauserman full height, movable walls.



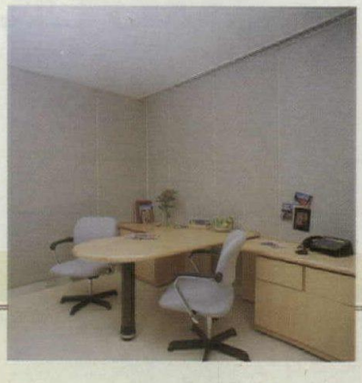
Left: Design Option Full Height Walls. Painted Steel. Cameron Secretarial Desk. Single Point Bullet Top. Runoff. S Drawers. Ball Task, Acorn Chairs.

SunarHauserman walls make complete privacy possible but are walls which can be moved more easily than most panel systems. Product tested in installations for many of *Fortune's* 1000 are Ready Wall™, DoubleWall™, and Design Option™ walls.

Ready Wall is a moderately priced alternative to drywall – easy to install and easy to move, to alter spaces when needs change. Its capacity for re-use makes it a relatively

Right: Full Height DoubleWall. Linen Covered with Hidden Speakers. Wood-Veneered Wall. Petitt Table. Marble Top, Profile Edge. Petitt Secretary/ Assistant Chairs.

SunarHa



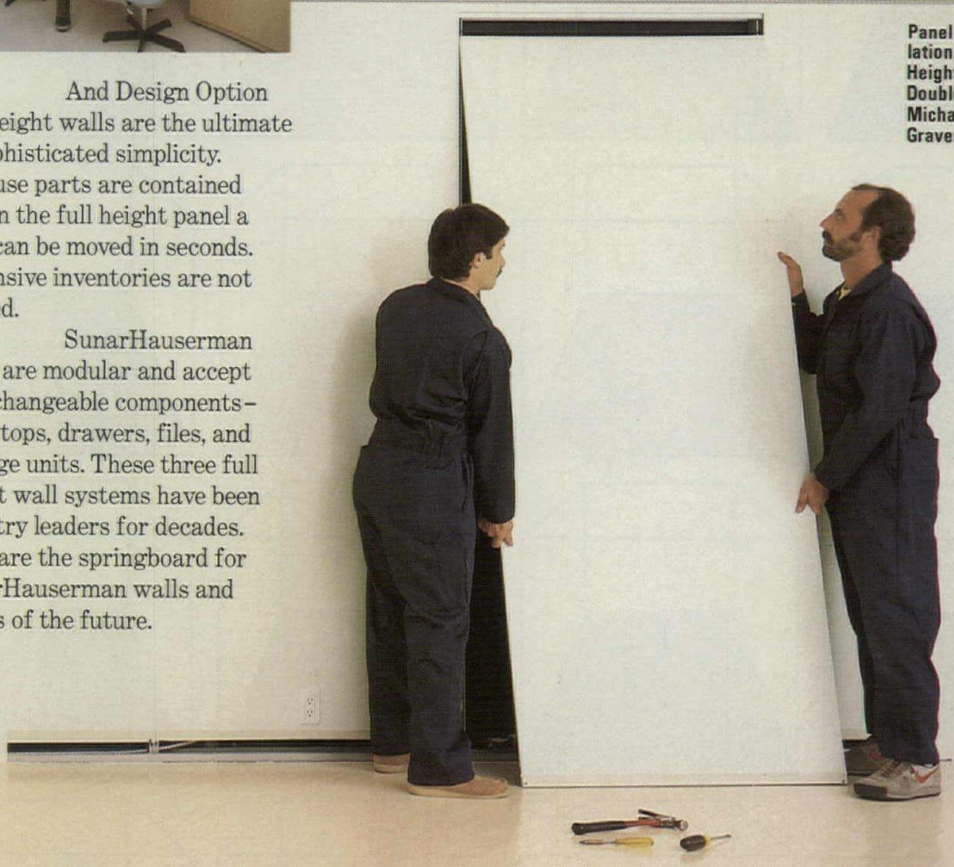
Left: Full Height Design Option Wall. Linen Covered. Shared Executive Station. Single Point Bullet Tops. Runoffs with Box, 30" Lateral File Drawers. Helena Executive Chairs.

inexpensive solution to space partitioning.

DoubleWall, a wall system of variable depth with easy access between panels to wiring and hardware, gives architects and designers a world of choice in finishes, in details, in width and height–all without complexity.

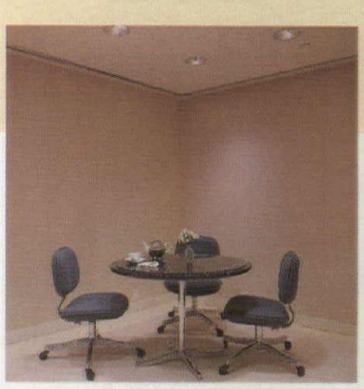
And Design Option full height walls are the ultimate in sophisticated simplicity. Because parts are contained within the full height panel a wall can be moved in seconds. Extensive inventories are not needed.

SunarHauserman walls are modular and accept interchangeable components–work tops, drawers, files, and storage units. These three full height wall systems have been industry leaders for decades. They are the springboard for SunarHauserman walls and panels of the future.



Panel Installation. Full Height DoubleWall. Michael Graves Table.

Design: Bonnell Design Associates Inc



For more details about SunarHauserman may we send you our brochure, *A Structure for the Future?*

SunarHauserman Inc.
5711 Grant Avenue,
Cleveland, OH. 44105

SunarHauserman, Ltd.
One Sunshine Avenue,
Waterloo, Ontario N2J 4K5

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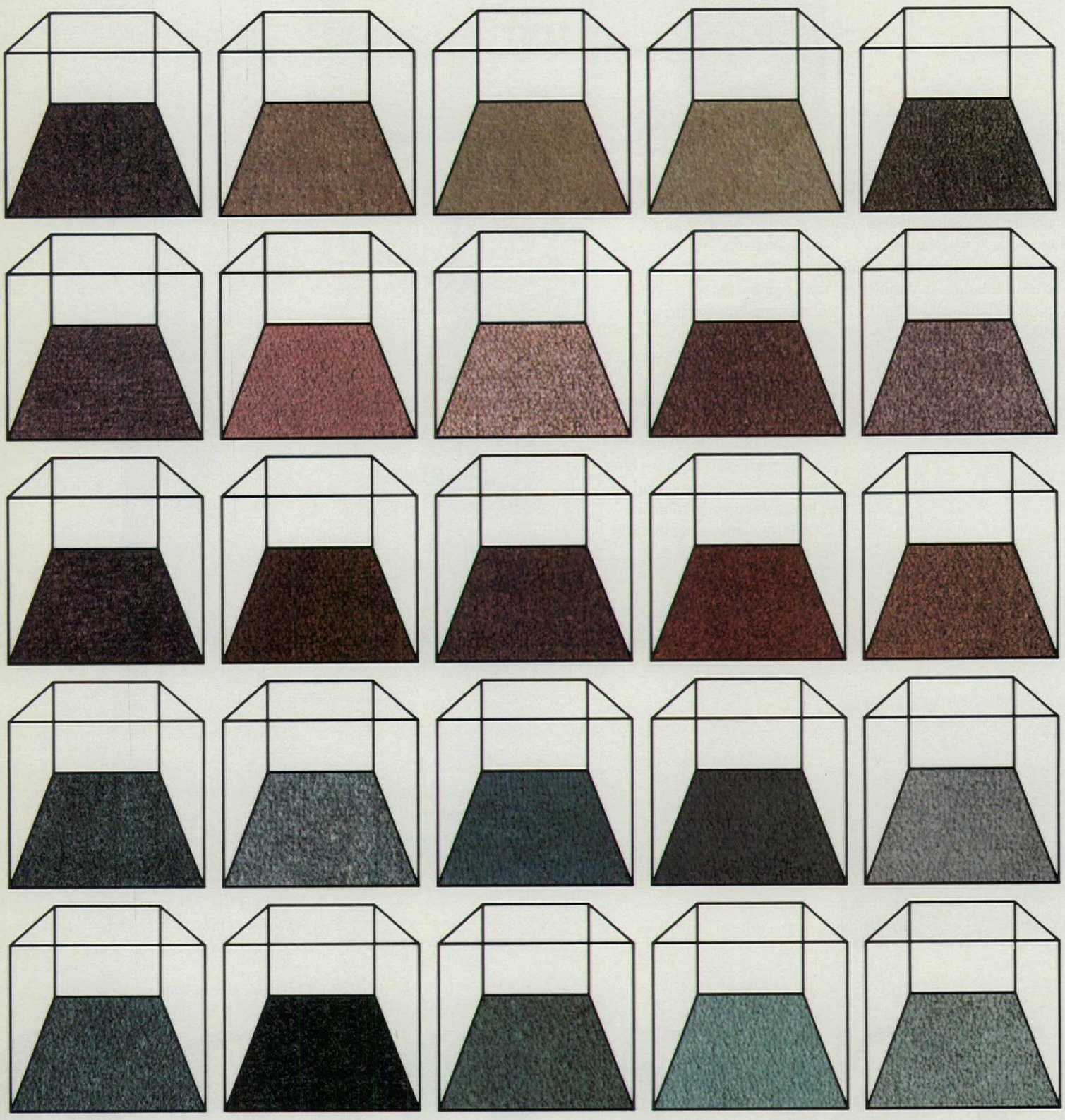
userman

What new directions in color will interiors be following? Karastan offers 50 subtle hints.



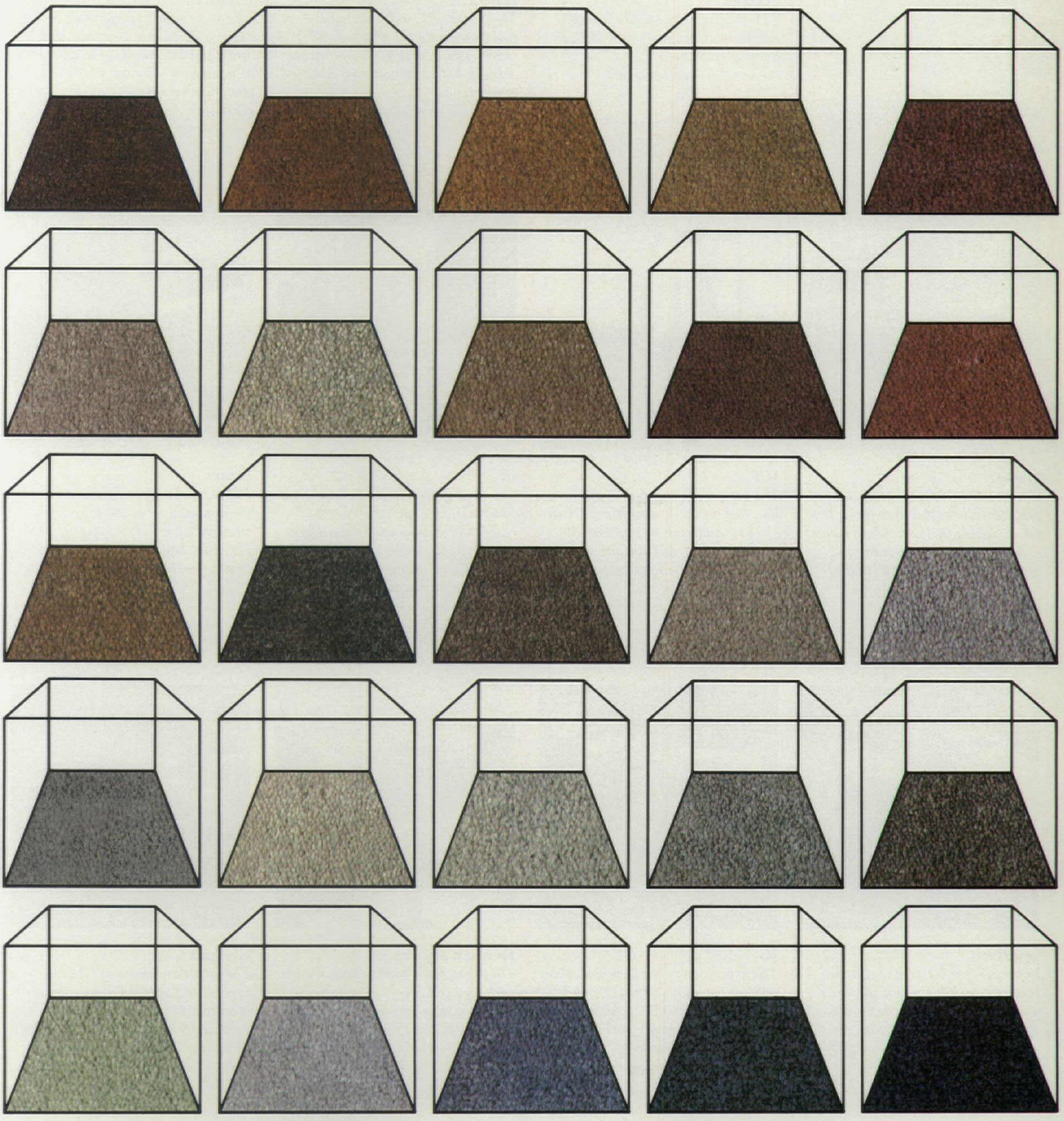
Our new Monitor line shows foresight on two levels. We've not only anticipated the color trends in interiors but your practical needs as well.

Karastan's Monitor is an ultra-dense carpet fashioned in ANSO® IV nylon with HaloFresh.™ This is what gives Monitor its outstanding resistance to wear, soil and stains, built-in static control and anti-microbial protection.

In light of all this, we can safely make one more prediction: the Karastan you buy today has a splendid future.

Karastan®

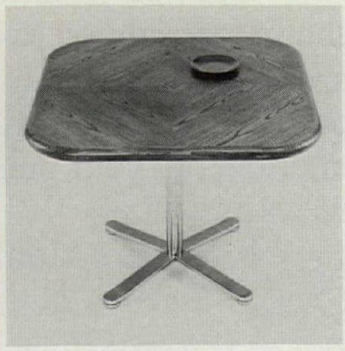
Karastan Rug Mills, a Division of Fieldcrest Mills, Inc.



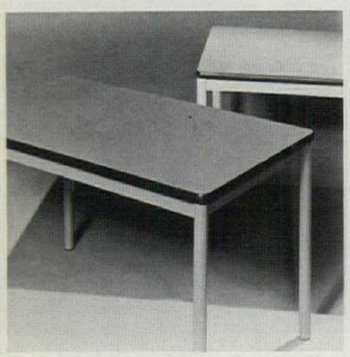
Circle **No. 385** on Reader Service Card

Haskell
This drafting stool with standard hydraulic lift is part of the Bristol Seating collection.
Circle 140 on reader service card

Haworth
The System 300 sidechair will coordinate with the SystemSeating chair series. The sled base of the chair flexes to adjust the seat and back for comfort.
Circle 141 on reader service card

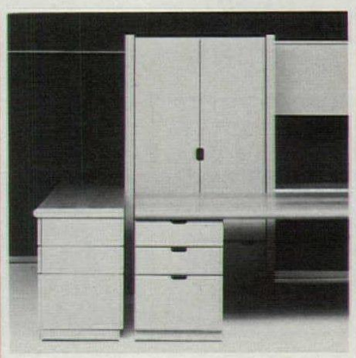


Hiebert
This new series of conference tables comes with mirror or bronze base, and standard veneers of oak, walnut or mahogany. Round, race track, boat, and rectangular shapes can be ordered.
Circle 142 on reader service card



Howe
The Spectra Group of tables emphasizes color rather than form. Tops are available in 12 standard colors, with legs in black, warm brown, gray, mocha, pearl white, and almond.
Circle 143 on reader service card

ICF
The company's re-creation program has now produced The Black Chair (1911), although no one can authoritatively identify the designer. The upholstered seat is available in a wide variety of fabrics.
Circle 144 on reader service card

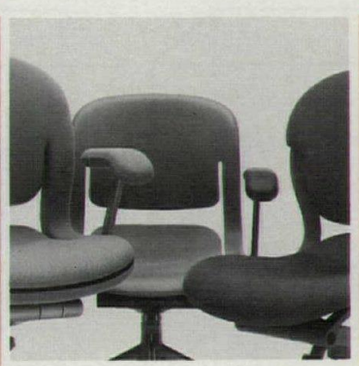


iil
Manfred Petri's Tinta System is a comprehensive modular system of casegood components, worksurfaces, and vertical panels. The elements can be freestanding or part of a larger environment.
Circle 145 on reader service card

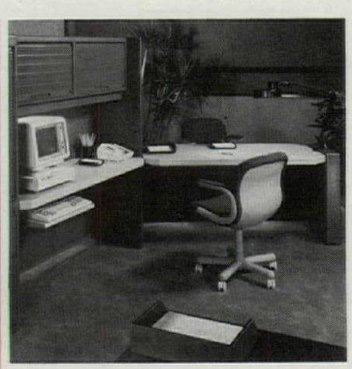
Inotec
Electronic Support Furniture moves the computer keyboard and display terminal up or down, and tilts them for easier handling or view.
Circle 146 on reader service card

Interface
Impressions is a free-lying, fusion-bonded carpet tile which combines four colors for infinite arrangement options. It can be ordered in one of 12 standard color blends or custom.
Circle 116 on reader service card

JG
The expansion of the terminal table series includes six adjustable and fixed height pieces. Top surfaces for both types are high pressure laminate with black edge molding.
Circle 147 on reader service card



Herman Miller
The Equa chair line, by Don Chadwick and Bill Stumpf, conforms to the size, shape and weight of any user. Shells come in a variety of colors and upholstery options.
Circle 148 on reader service card



Kimball
The modular nature of Network Computer Support Group allows specific configuration of storage, worksurfaces and VDT accessories, including motorized-lift keyboards.
Circle 149 on reader service card

BRUETON

introduces the "Pelican" Series

An all-fabric-covered wood office furniture system in 12 colors—using stainless steel and glass—for desk, credenza, conference table, occasional tables, high cabinet, seating and upholstered pieces.

designed by Charles W. Pelly

"Pelican" Desk

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Pat. Pending

photo: Peter Paige

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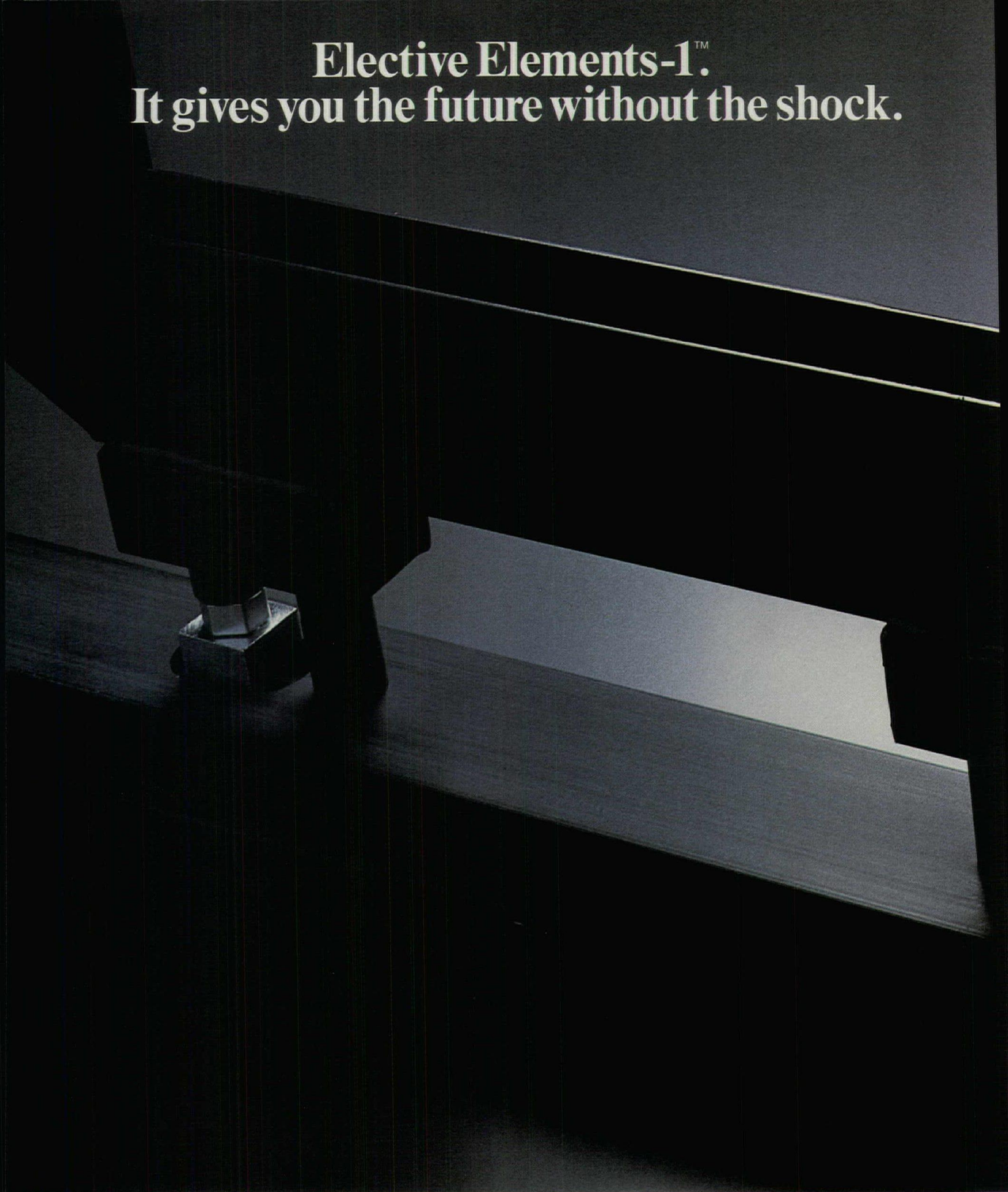
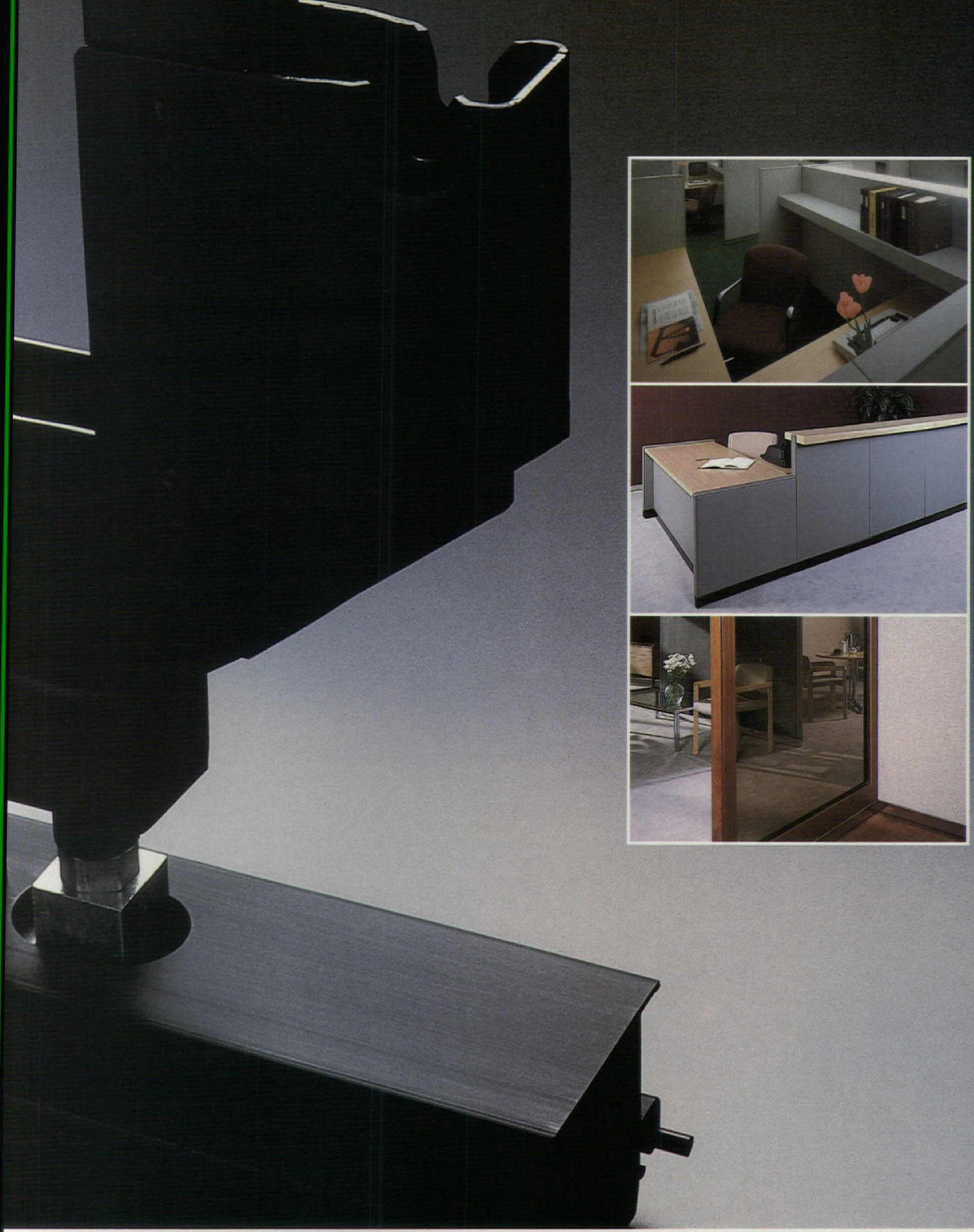
Elective Elements-1™.
It gives you the future without the shock.



Introducing Elective Elements-1™ from Stow | Davis. EE-1™ is an open-plan system that provides your clients with the unparalleled capability of blending the electronic needs of tomorrow's office with the human needs of today's worker.

For example, EE-1's tubular steel inner structure which accepts any of a wide range of panel surfaces, provides specialized passageways for handling wiring needs including the most advanced telecommunications. Our Power Distribution System provides up to four 20-amp circuits which can be designated for appliances or dedicated for computer equipment.

But what is also significant about EE-1 is that for all its ability to accommodate state-of-the-art technology, it has not forgotten the simple art of making people feel comfortable. For



instance, our matched veneers and fabric-covered panel surfaces allow you to lend an unsurpassed quality of finish and color to the work area.

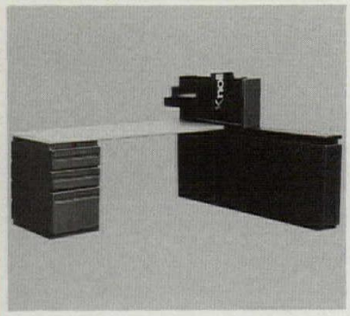
If you're interested in an open-plan office system that gives you the future without the shock, then visit our showroom at NEOCON. In fact, we guarantee the only shock you'll receive from EE-1 will be a pleasant one.

Circle **No. 410**

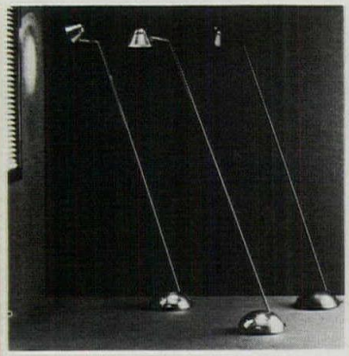
STOW|DAVIS
GRAND RAPIDS

Kinetics
Paolo Favaretto and Jim Hayward used rustproof, chip-proof, shatterproof polymers in their new line of business seating, with interchangeable parts and upholstery.
Circle 150 on reader service card

Kittinger
This replica of a Chippendale stand-up desk is made of Honduras mahogany and comes in heights of 40–46 inches. Hand-tooled leather is optional on the hinged top.
Circle 151 on reader service card



Knoll
In Bruce Hannah's modular desk system, worksurfaces can be cantilevered thanks to a new wire management channel capable of straddling floor monuments and managing unlimited quantities of cables.
Circle 202 on reader service card



Koch + Lowy
Peter Hamburger designed Perfecta's reflector to send pure white light to the subject while dispersing ultraviolet and infrared rays out to the atmosphere.
Circle 152 on reader service card

Boris Kroll
Mallard is hand-printed in eight colorways on a cotton and rayon cloth. The prints are designed to complement the piece-dyed woven collection.
Circle 153 on reader service card

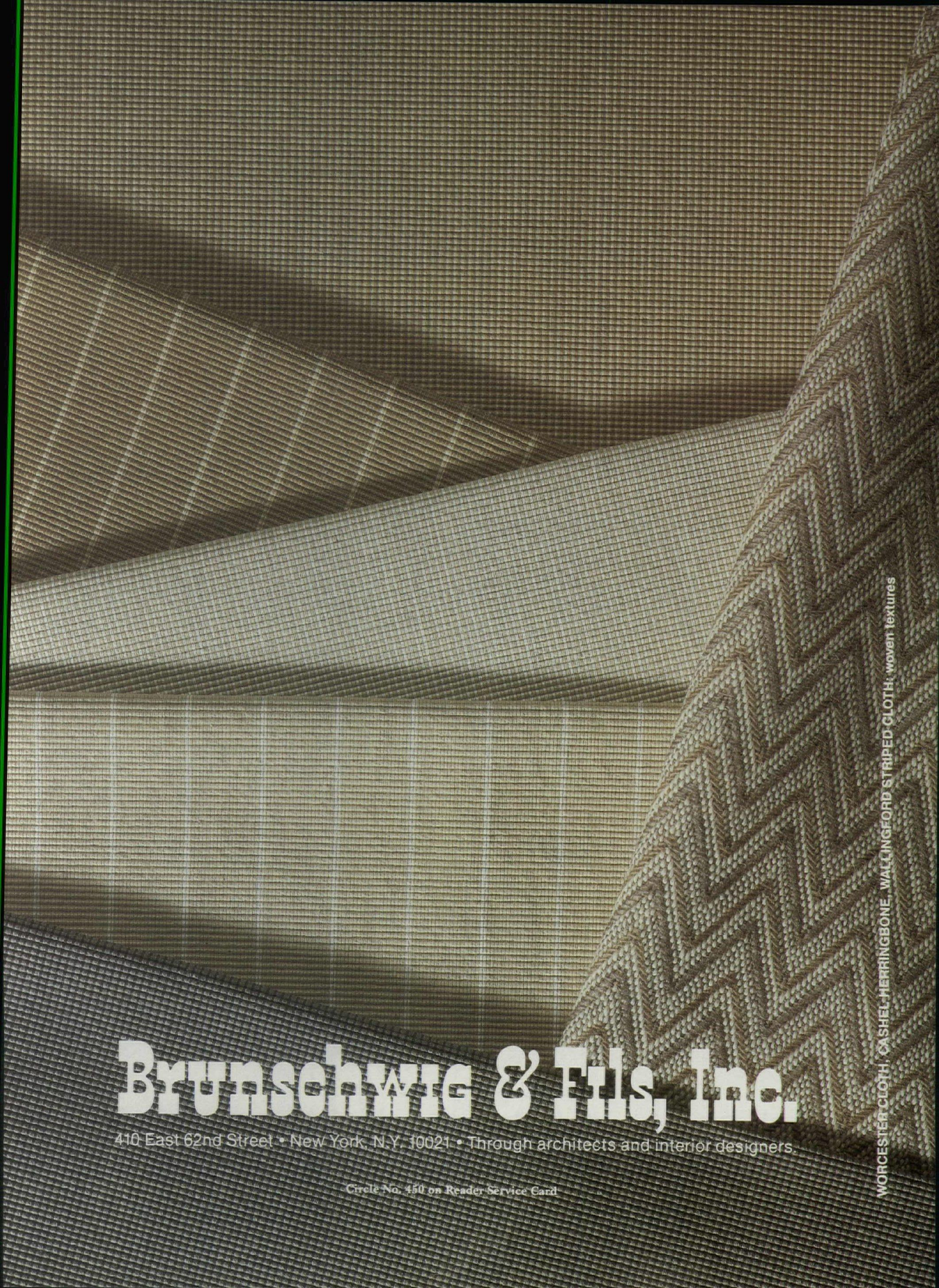
Krueger
The 1983 IBD Honorable Mention Vertebra Chair will be at NEOCON. Designed by Emilio Ambasz and Giancarlo Piretti, it comes in desk or side versions, arm or armless.
Circle 154 on reader service card

Laminates Unlimited
The new Insta Word/Data Environments computer furniture is a complete line of tables, printer stands, storage, and work stations.
Circle 155 on reader service card

Jack Lenor Larsen
The Senator series of executive leather chairs is available in swivel/tilt high back, swivel/tilt low back, and swivel low back.
Circle 156 on reader service card

Lazarus
With the look and feel of wool, the Upper Echelon Collection consists of three designs: Chev-lon, Wave-lon, and Diamond Dot-Lon.
Circle 157 on reader service card

Lehigh-Leopold
The Coda Collection, a group of desks, credenzas, and tables, and Evoe, a passive ergonomic seating system, will be unveiled at NEOCON.
Circle 158 on reader service card



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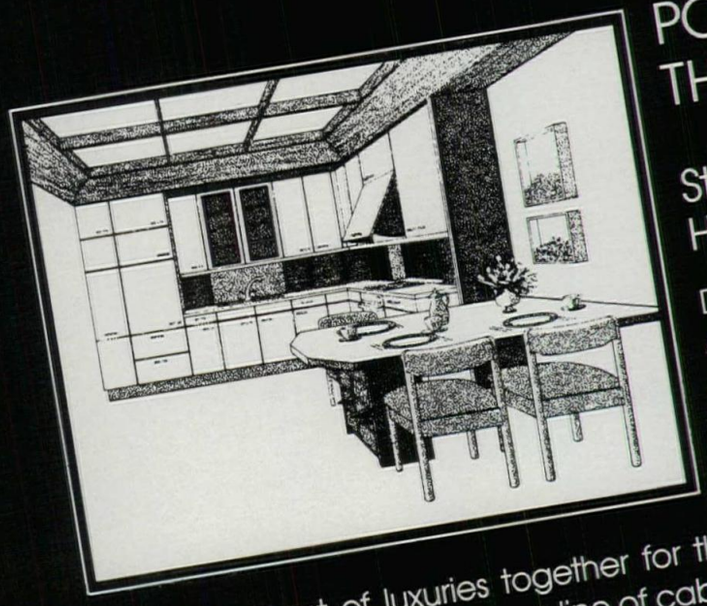
FOR THE FINE HOMES OF THE WORLD



POGGENPOHL: THE ULTIMATE CHOICE

St. Andrews, Hastings-on-Hudson N. Y.

Developer: Jack Nicklaus & Associates
Architect: Robert A.M. Stern
Model Design: Alexis Ryan
Sales Agent: RAMS Marketing Inc.

bring the finest of luxuries together for their elegant townhomes and to meet these standards the most prestigious line of cabinetry was selected, POGGENPOHL.

The st. Andrews golf community sought to

St. Andrews, an elegant townhouse complex surrounded by 136 acres of natural splendor, is designed for the discriminating few who demand the best. That is why each of the 209 homes feature POGGENPOHL for the kitchens and baths, as well as for the powder rooms and wet bars.

Timeless design, precise engineering and fine craftsmanship are three reasons POGGENPOHL cabinet systems were selected. Another, less obvious reason, is that POGGENPOHL understands the special requirements necessary for developing luxury multi-housing communities. POGGENPOHL's experts work closely with the sales office at St. Andrews to help homeowners choose from a wide range of available cabinet fronts and finishes to give each townhouse an individual, distinctive style. Few manufacturers provide the builder with the capability of offering his clientele flexible, custom-designed kitchens and baths for each unit of a condominium development.

Considering all this, POGGENPOHL is not just the Ultimate Choice, but the Only Choice for luxury residential projects.

poggenpohl

The ultimate in kitchen and bath cabinetry

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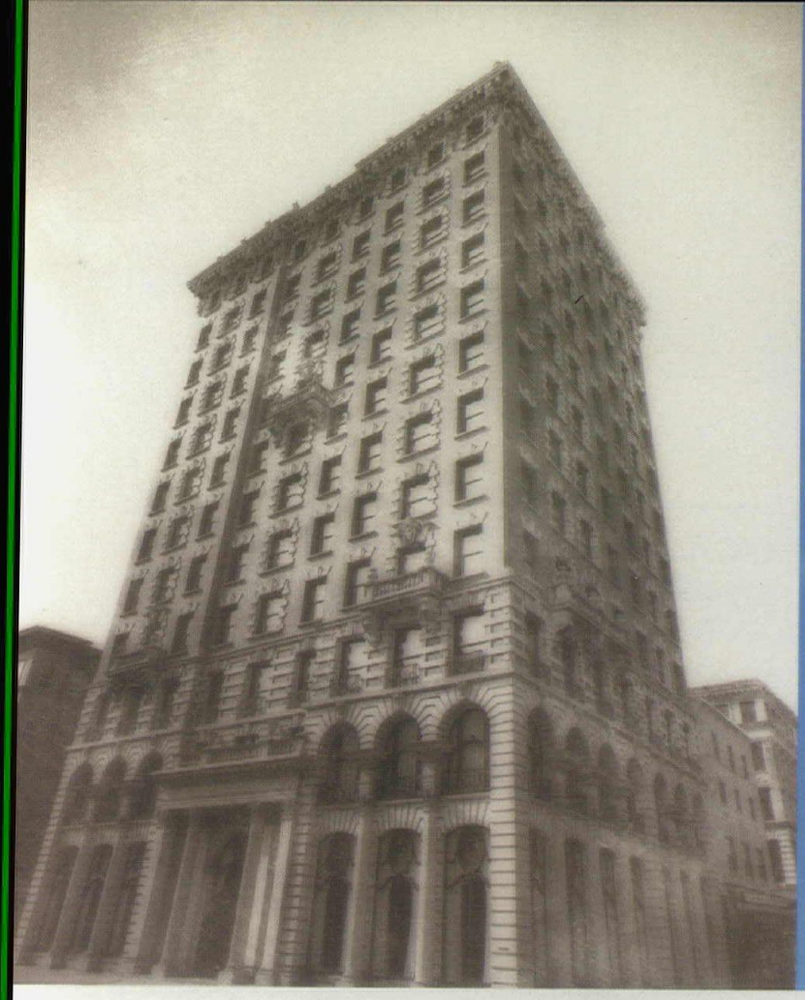

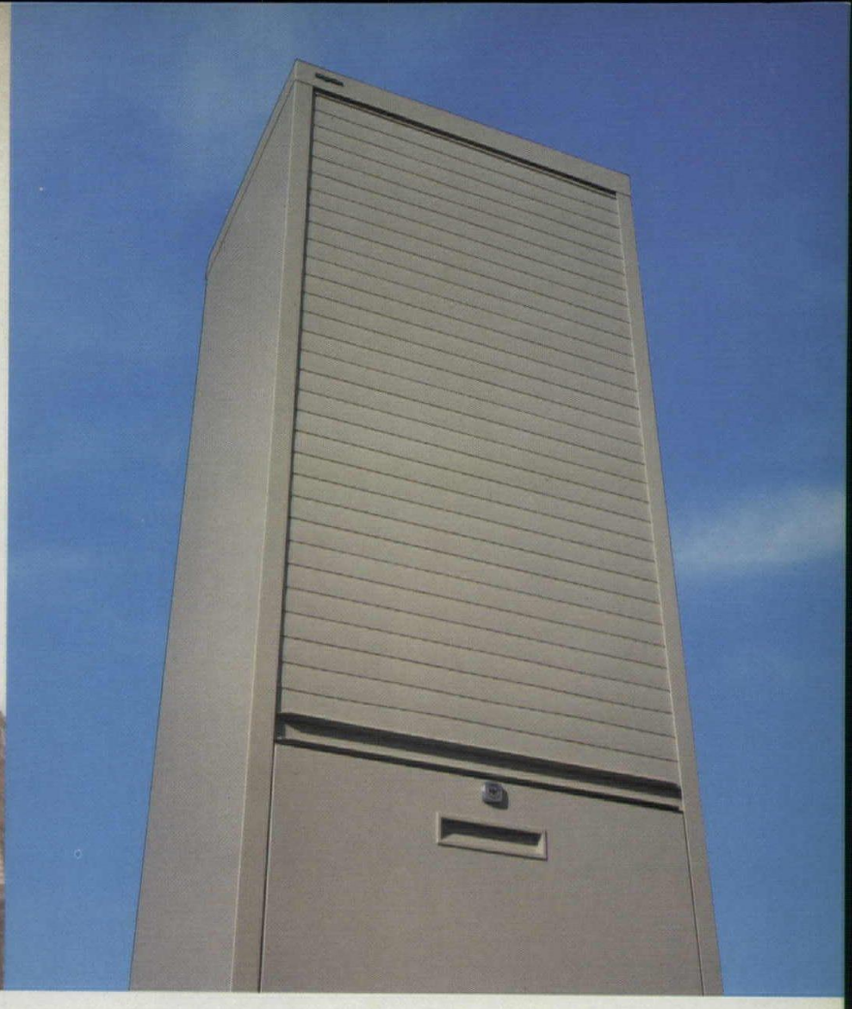

1893. Architects discover up is better than out.

1984. IBM PC users discover up is better than out.

The proposition is easy enough to grasp. When space is at a premium, build skyward.

That's why Wright Line designed its PC Work Center to take up more vertical space and less horizontal. Let's face it, few offices embracing personal computers today were designed to accommodate an additional piece of substantial furniture.

Designed particularly for IBM Personal Computer Systems, our PC WorkCenter takes as little as 18″ × 24″ of floor space. Believe it or not, that's less space than the average office chair takes.

Our vertical ergonomic design provides for more efficient and convenient access to all computer components. The unit's storage capacity accommodates software manuals, diskettes and supplies, so everything needed is all in one place. There's virtually no disruption to normal work habitat.

As for security, just roll down the locking tambour door for overnight protection against theft and unauthorized use.

An internal cable management system protects against wire damage while leaving nothing underfoot. The master switch with circuit breaker allows the whole system to be activated with just the flick of a switch. And locking casters are ready to roll in seconds for shared use in other offices.

The PC WorkCenter is available in 50″ and 63″ heights, both well within acceptable height limits of contemporary office environments.

Wright Line has been supporting IBM for 50 years. First in the computer room, now throughout the office. And the way things are going, the sky's the limit.

For more information on our PC WorkCenter and how it can fit into your office planning projects contact Wright Line, 160 Gold Star Blvd., Worcester, MA 01606.

Wright Line
A UNIT OF BARRY WRIGHT

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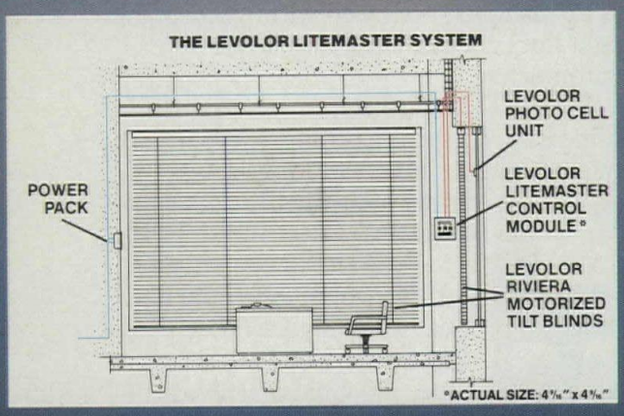
Circle **No. 432** on Reader Service Card



Levolor lets you put the sun to work.

Litemaster is a light-sensitive, computer-driven system that automatically positions window blinds for optimum light and heat control. Once programmed, Litemaster electronically adjusts motorized Levolor Riviera™ Blinds to regulate the amount of light during the day, and to reduce thermal losses at night. This modular system controls up to 30 blinds per module. It enables you to factor window shading into your design equation, to cut air conditioning loads and to minimize heating costs. Litemaster. The system that puts you in control of the sun. For details, write Levolor Lorentzen, Inc., 1280 Wall Street West, Lyndhurst, N.J. 07071. In Canada, 55 Jutland Road, Toronto, Ontario M8Z2G6.

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Architectural Resource Group

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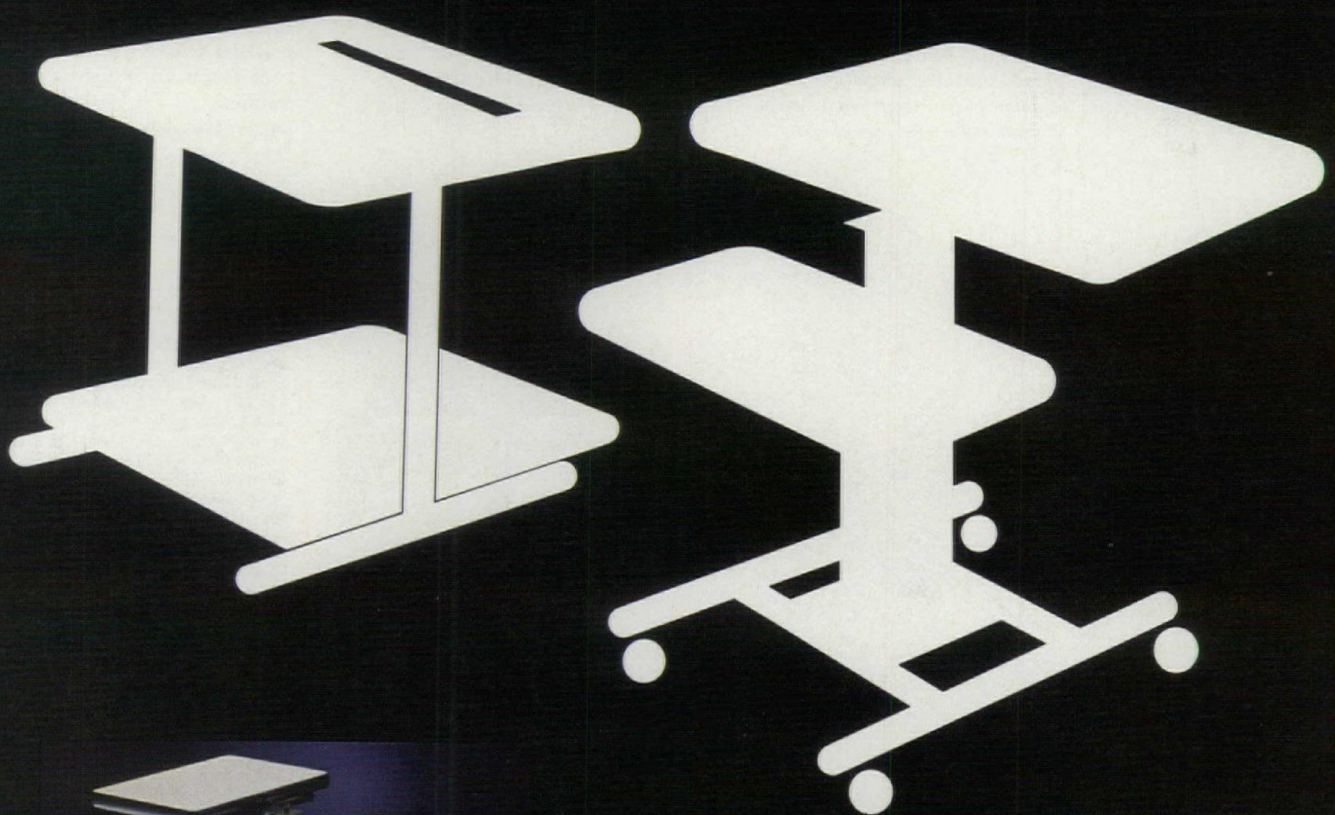
You have intelligent terminals.
We have intelligent tables.



Many of the tools of the "office of tomorrow" are here today. A lot of people are simply looking for good places to put them. Howe's split-level, adjustable terminal tables can give any terminal, word processor or microcomputer a good ergonomic home. And right next door can go one of our equally intelligent printer tables with paper storage and feeder slot.

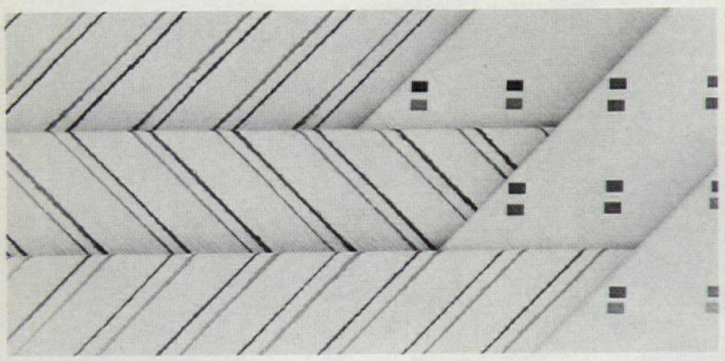
HOWE, *155 East 56, N.Y., N.Y. 10022 (212) 826-0280*

TABLES BY HOWE

Levolor Lorentzen
Jardin is one of 19 new decorative ceiling designs in urethane or fiberglass-reinforced gypsum. These modulars are compatible with the color T-grid suspension system.
Circle 159 on reader service card

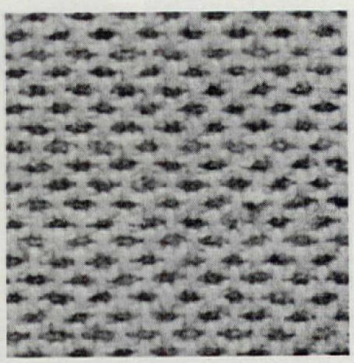
Loewenstein
Sultana is a side and arm stacking chair made of bar-stock steel and leather seats and back. It is available in brown, black, or gray.
Circle 160 on reader service card

Lunstead
System Seven, an open plan casegoods line, features a seven-coat polyester finishing process, available in custom colors or five standard oak finishes.
Circle 161 on reader service card



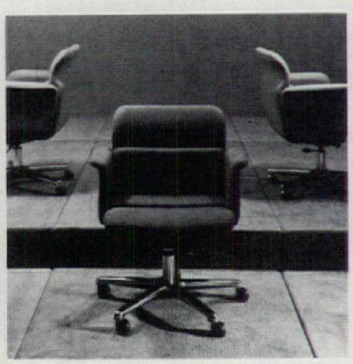
J.M. Lynne
The Vineyard Collection, Oak Bluffs, Tisbury, and Katama Bay are the four new wallcovering designs for NEOCON.
Circle 162 on reader service card

Madison
The Atrium Series of seating incorporates steel inner construction covered with CMHR foam. The upholstery is designed for ease of replacement in the field.
Circle 532 on reader service card



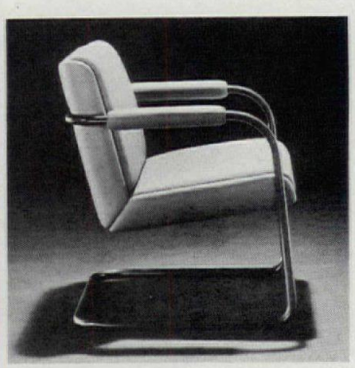
Maharam
Nylon Diamond features 48 multi-faceted colorations. It has the depth of a weave with the easy care of nylon.
Circle 200 on reader service card

Marden
The Tremulis wood chair has been translated into a highly reflective mirror chrome steel version. Like its predecessor, it can be ganged for multiple seating.
Circle 201 on reader service card



Metropolitan
Three new versions have been added to the Montara Group. Brian Kane's chairs feature gas cylinder control base and removable seat and back upholstered units.
Circle 203 on reader service card

Mira-X
Verner Panton's new Collection Diamond includes (from left to right): Mira-Quarz, -Smaragd, -Rubin, and -Opal, all in 100 percent cotton and two colors.
Circle 204 on reader service card



Modern Mode
The 20/20 series seating is the firm's first entry into the metal-frame chair market. It coordinates with the new lighter scaled furniture groups, and comes in 16 high-gloss colors.
Circle 205 on reader service card

MOHAWK'S AXMINSTER, AS TIME WEARS ON, IT WON'T

The color and design in our Axminsters are literally woven into the carpet, not printed on top like other patterned carpet. And because it's woven, Mohawk's Axminster possesses a color and clarity that is not subdued by time and wear. Mohawk Axminster comes in unlimited color and design motifs, and is available in two yarn systems: 80/20 Wool Nylon, and Mohawk's SuperNyl Nylon. Learn more by writing Axminster by Mohawk, 1755 The Exchange, Atlanta, Georgia 30339.

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Auditorium seating has always been chosen for its functionality. And maybe for its comfort. But until now, you couldn't get aesthetically appealing design.

Today there's System 20, Comforto's newest line of seating for the auditorium. And it's as beautiful as any chair in your office or reception area.

System 20's simple construction, with only four main components, allows for flexibility as well. It can be arranged either in a straight or curved configuration.

And it can be fitted to meet any multiple seating need. With flip-up seats. Writing tablets. Ash trays. And audio hook ups.

Have a seat in Comforto's System 20 at NEOCON. It's the ultimate in function, comfort. And style.

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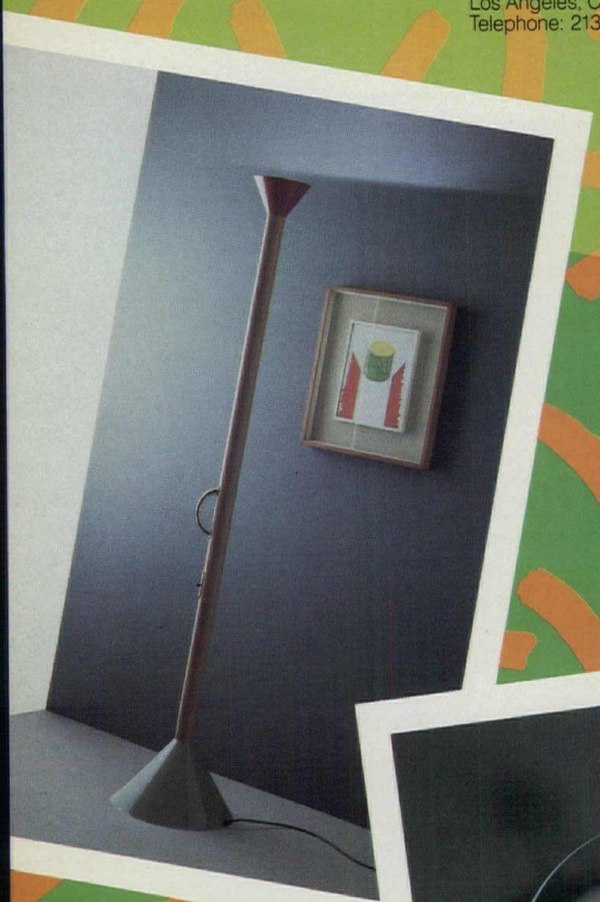
Exclusively for Artemide: Three lighting designs by Ettore Sottsass and Michele DeLucchi, from the Memphis/Milano™ design group:

Callimaco by Sottsass, a halogen floor lamp with dimmer in California multicolor lacquered metal.
Cyclos fluorescent wall/ceiling lamp by DeLucchi, in grey painted metal with frosted glass diffusor, featuring the energy efficient Norelco PL13 bulb.

Pausania table/desk lamp by Sottsass, also featuring the Norelco PL13 fluorescent bulb.

To receive a color catalog featuring Artemide's full line of lighting, furniture and accessories, write Artemide on your letterhead, or circle number **312**

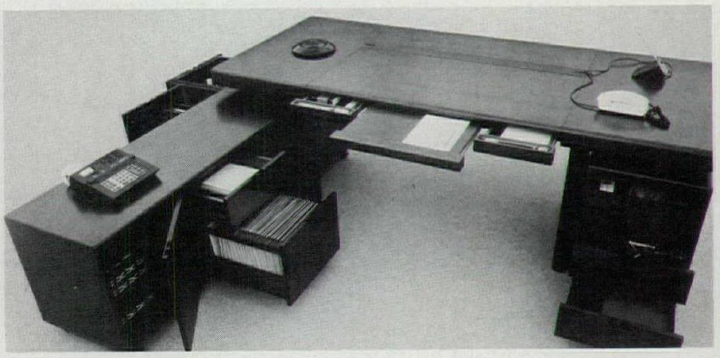


Mohawk
Wyndham, a solid-color textured loop carpet, and Waverly, a plush pile companion, are made of 1/10-gauge construction of DuPont Antron XL bcf heavy denier nylon pile.
Circle 206 on reader service card

NPM
Luigi Caccia Dominioni designed the Scala Desk in 1958, and it will be introduced to the U.S. at NEOCON this year. It is walnut with black lacquer edge detail.
Circle 207 on reader service card

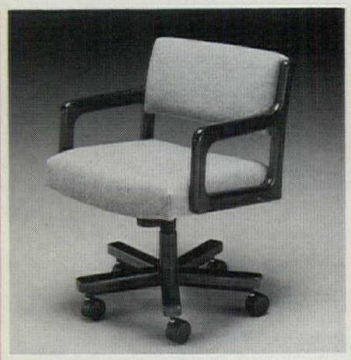
Nessen
Luci offers a high level of brightness with low energy consumption. Constructed of die-cast aluminum, it comes in red, black, or white.
Circle 208 on reader service card

Pace
This executive chair is called Kiruna Legno and features a wraparound exposed all-wood frame, wood arms, and wood base. It comes in walnut, rosewood, or black lacquer with a choice of fabrics or leather.
Circle 209 on reader service card

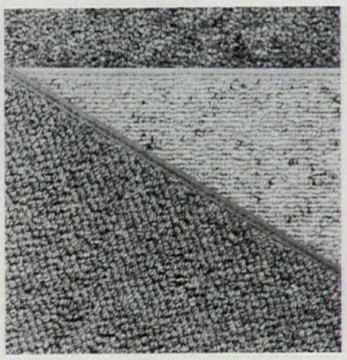


Pacific
Megalfa Systems include tables with tops that have internal conduits for telephone and other wiring leading to a special channel that can be fitted with any electrical attachment.
Circle 210 on reader service card

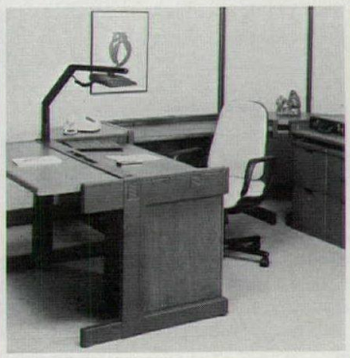
Panel Concepts
The turntable option in the System 2PLUS enables workers in adjacent areas to use the same VDT terminal. The turntable is part of a full line of computer-support components.
Circle 211 on reader service card



Patrician
The Chancellor Series is complete with this junior executive chair, available in oak or walnut finish.
Circle 212 on reader service card



Porter
A new line of Berber style contract carpets includes several different styles grouped by light, medium, or heavy use.
Circle 213 on reader service card



Precision
This electronic office furniture system is called Ergodata. A key-triggered mechanism adjusts the worksurface height and angle for differing users and tasks.
Circle 214 on reader service card

Harvey Probber
With the help of Voko of West Germany, a new, refined ACM System will be introduced at NEOCON. It comes with new colors, finishes, accessories, and complementary task lighting.
Circle 215 on reader service card


Make the color in your mind's eye...reality.
Take a closer look. Discover what makes Bigelow's extraordinary Corporate Concepts Collection™ an unprecedented achievement in woven commercial carpet. Our four inspired patterns are enhanced by the endless colors from nature's palette. And this offers you complete freedom of design.
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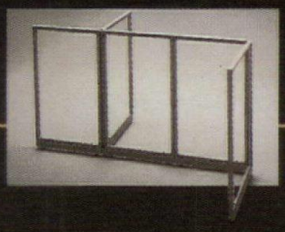
Joan, on your promotion."

impossible to foresee..."The new CEO hates turquoise."

American Seating understands the changeable nature of busi-

you the ability to reconfigure,



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that makes any change possible.

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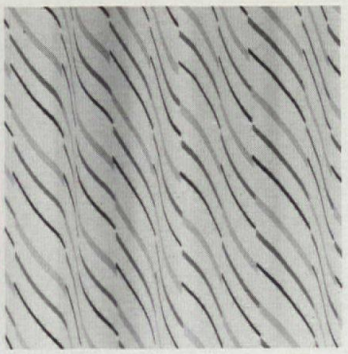
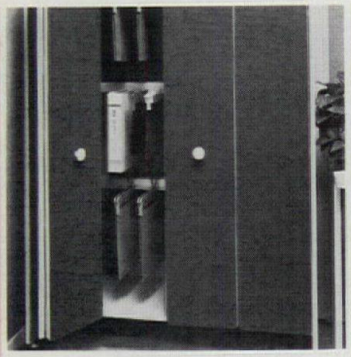
Circle No. 435

Reff
Office System 6, introduced at NEOCON 15, will be expanded for this year with several new additions to the existing grouping.
Circle 216 on reader service card

Edward Axel Roffman
This sculpted cherrywood-frame chair comes in walnut, mahogany, or solid colors, open back or upholstered (shown).
Circle 217 on reader service card



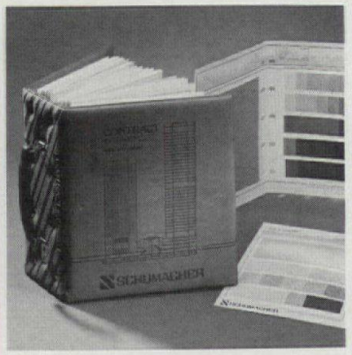
Ben Rose
Computer software and hardware are the inspiration for Keystroke II, a three-color print featuring a 3-inch pattern repeat.
Circle 218 on reader service card



Rosemount
Computer printouts are stored in the new EDP storage cabinet. It comes with two full-length sides, shelves, and three hanging bars for Wright Line center hook accessories.
Circle 219 on reader service card

Rudd
The Cyborg Office Seating Collection has been expanded to include a small-scale Executive I and Sled Base sidechair. Three new Basic Task Chairs complement the existing Advanced Task Seating.
Circle 220 on reader service card

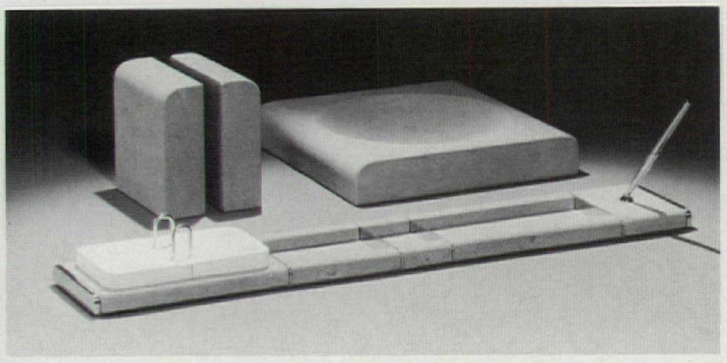
Samsonite
A new wood-grain English Oak finish has been added to the 3100 Series Information Support System of manager, programmer, and secretary furniture.
Circle 221 on reader service card



Schumacher
1200 vinyl wallcoverings are presented in the Contract Interiors Volume II. Introduced in this collection are suedes, burlap, and grass weaves.
Circle 222 on reader service card

Shaw-Walker
The 360 Series Chair, shown in pneumatic height adjustment model, will be exhibited in a variety of computer adaptive situations along with the firm's Tempo 3 system and ExpanDesk line.
Circle 223 on reader service card

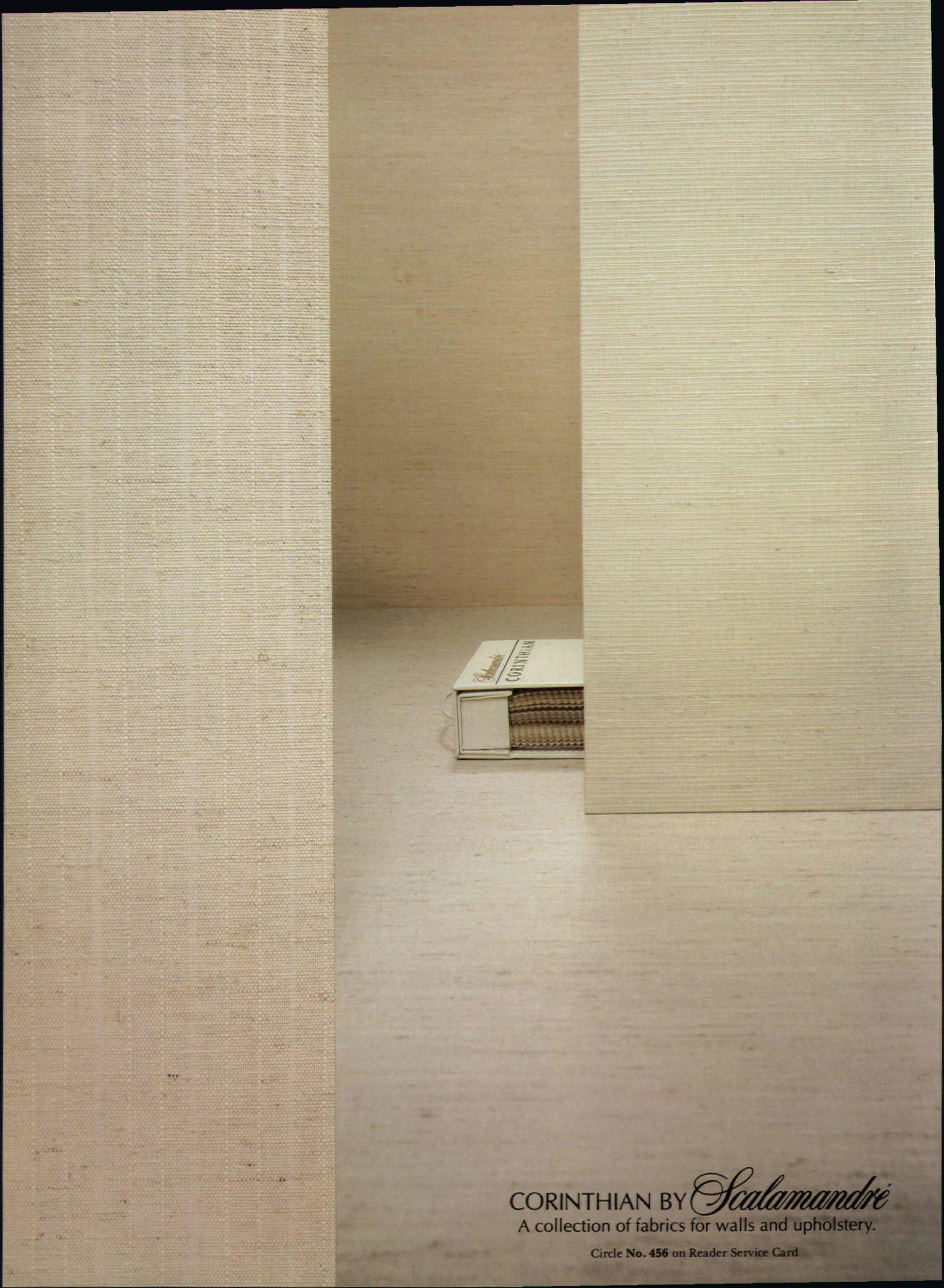
Shelby Williams
This rattan chair has an attached foam-padded spring seat and curved back covered with perforated cane stained to match the frame.
Circle 224 on reader service card



Smith Metal Arts
Radius Two will be introduced as a new Stone Accessory Collection. Metal details are available in mirror-polished aluminum, brass, and bronze.
Circle 225 on reader service card

"Barto" Chair designed by Richard Schultz Domore Corporation PO Box 1289 Elkhart Indiana 46515 Telephone 219-293-0621 Circle 307 Design: Arnell/Bickford Associates Photography: Roberto Schezen

Domore "Barto"



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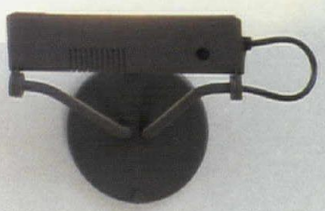

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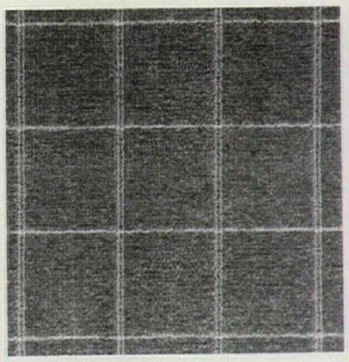
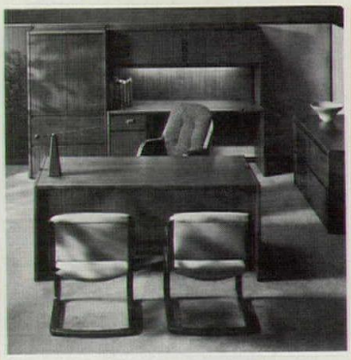
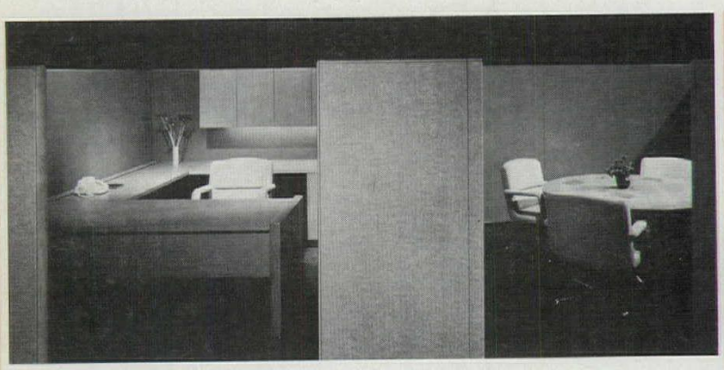


Stark Carpet
The Bedford II carpet line features a thinly ruled, two-inch Italian grid pattern, and comes in colorways of light gray, charcoal, taupe, rose, forest green, and beige.
Circle 226 on reader service card

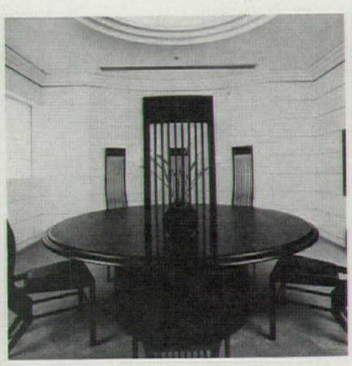


Steelcase
A variety of new Valencia products include vertical cabinetry and lateral files as well as computer-support components.
Circle 227 on reader service card

Stendig
The Garmisch chair, an Otto Blumel reproduction from 1911, offers natural finish or a choice of six glossy polyester colors, and a seat upholstered in fabric or leather.
Circle 228 on reader service card

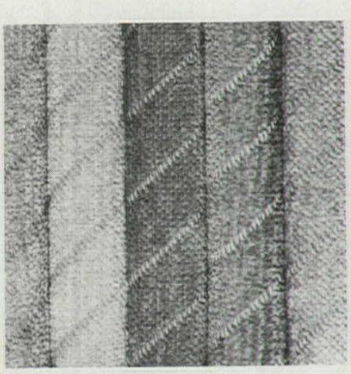


Stow/Davis
The variable nature of Elective Elements 1 allows for both big and small budgets. A wide range of images can be achieved by using different surface treatments, trims, and components.
Circle 229 on reader service card



SunarHauserman
From the Arata Isozaki Collection is this table with matching chairs in natural or black-stained wood. The table top is veneered with a radial design, and the chair seats are leather or fabric.
Circle 230 on reader service card

Thonet
Urethane-filled upholstered arm caps and arm inserts are optional on the new MGT Swivel Seating, which also features molded foam seat and back over thermoplastic inner shells.
Circle 231 on reader service card



Top Grade
Palette is a striped 100 percent cotton velour in 9 different colorways. The color line is a mixture of pastels and vibrant solid stripes.
Circle 232 on reader service card

Trendway
The T Series floor-to-ceiling movable partitions and SMS panels and components are integrated to form one complete office system.
Circle 233 on reader service card

United Chair
The Beta Line of ergonomic seating features seat and back pitch adjustment in all six models. Arms can easily be added to armless models.
Circle 234 on reader service card

flip-loc™ designs by Nemschoff let you instantly replace an attached cushion . . . without taking the chair out of service. A valuable asset in a high-traffic student union, a hospital lounge or a busy waiting room. Simple, but tamper-proof, Nemschoff's exclusive flip-loc system lets you renew the beauty of a seating unit three ways.

You can reverse the cushions . . . replace or clean the covers . . . or replace the entire seat or back cushion. Nemschoff flip-loc designs are available in a beautiful range of open arm and panel arm styles of single or multiple seating units . . . in all standard Nemschoff finishes. Call or write now for information on flip-loc™

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Less than a minute ago . . . this chair had a damaged cushion!

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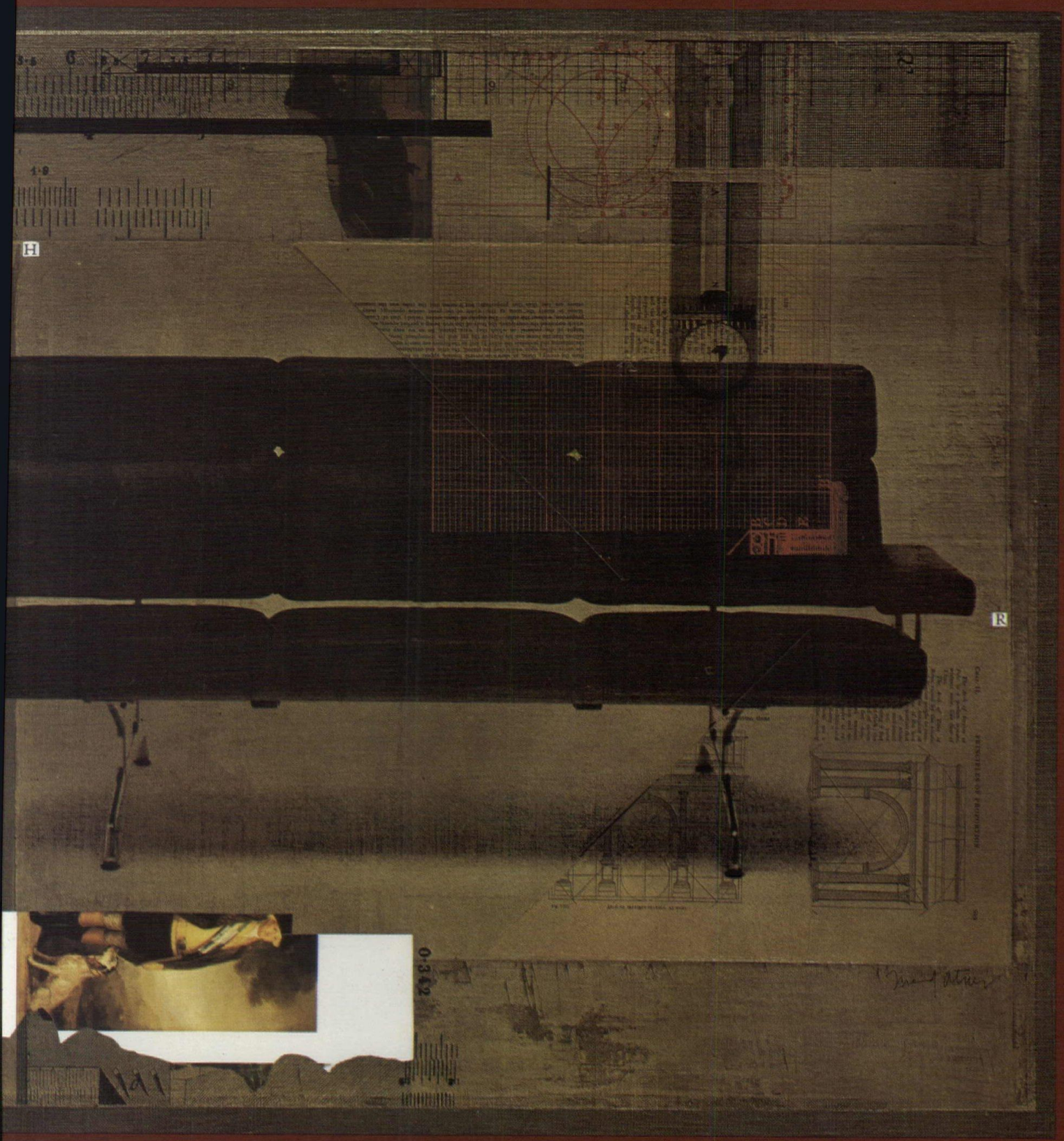


That's what the late Charles Eames was called in a Museum of Modern Art catalog. This sofa, produced now for the first time, is the last product to be designed by Eames and his wife and design partner Ray. The frame is oiled teak or walnut, and cast aluminum with polished or espresso finish. The cushions are covered in black, brown, or espresso leather.

Fred Otnes's drawing of the sofa is from *Reference Points*, a book of furniture portraits by nine artists. Other pieces in the volume have been designed by Eames, George Nelson, and Isamu Noguchi, with colors and fabrics by Clino Castelli.

For a limited time, a copy of *Reference Points* will be included with an order for any of the pieces portrayed. For information about the furniture, or *Reference Points*, call 1 800 851 1196. Within Michigan call collect (616) 772 3442. Or, write Kathy Keating, *Reference Points*, Herman Miller, Inc., Zeeland, Michigan 49464.

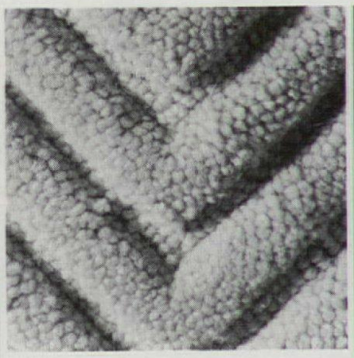
Circle No. 402 on Reader Service Card

herman miller

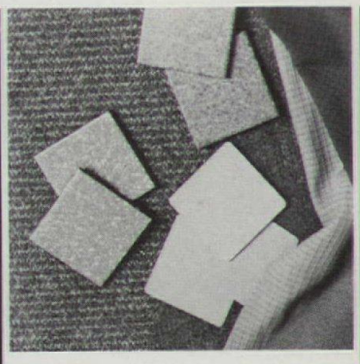
U.S. Furniture
For the open or high-tech environment, the Ergoform chair is a new ergonomic introduction that moves with the user. There are 11 models in the line.
Circle 235 on reader service card

Vecta
Sequel is an office furniture system designed in wood which suggests the character of custom-built pieces. The system includes all the standard components, and can accommodate conventional or electronic office needs.
Circle 236 on reader service card

Vogel-Peterson
A new mobile pedestal stand and an adjustable stand-up video display table have been added to the ComputerMate ergonomic furniture line.
Circle 237 on reader service card



V'Soske
A carved texture is created for Cavanaugh by combining a bulky cut pile yarn with a low loop for a three-dimensional form.
Circle 238 on reader service card



Walker Group
A cooperative effort by four contract manufacturers—Karastan, Scalamandré, Nevamar, and Franciscan Tile—will produce interior surfaces for the Coordinated Design Program.
Circle 239 on reader service card

Westinghouse
A low-cost stacking chair line that requires less storage space than most stacking chairs will be introduced at NEOCON.
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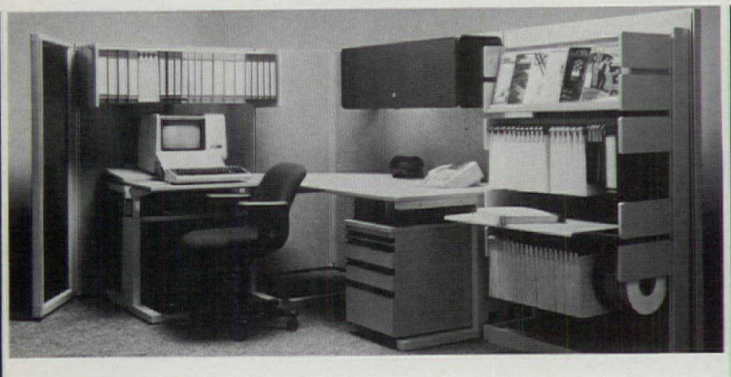

Wright Line
The Docu-Mate center-hook filing system allows users to file and handle material such as printouts, diskettes, and microfiche efficiently.
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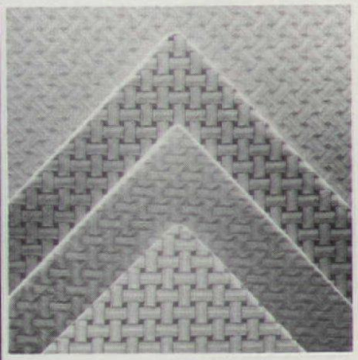

Zumsteg
The 100 percent cotton, 57-inch-wide Pique Osier fabric is a cross-hatch weave that changes direction in a perpendicular pattern to produce a deep-textured effect.
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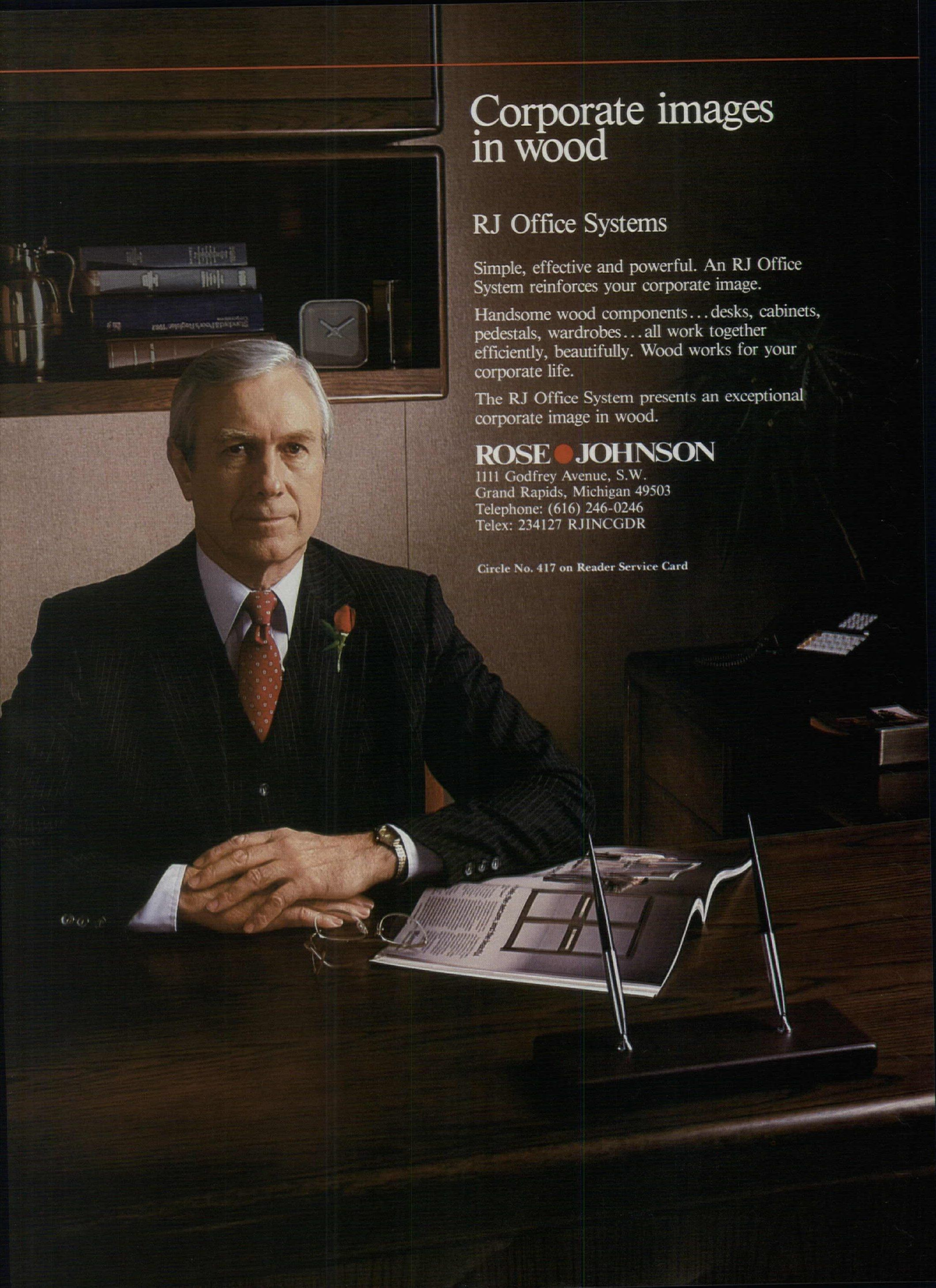

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CAD: The wows & the wherefores

Computer-aided design has been surrounded by myths, exaggerated fears, and unrealistic expectations. Relax, and become familiar with the beast.

By now, architects are convinced that computers just might be useful for writing specs and keeping books. As for computer-aided drafting, its acceptance is partly a matter of taste and largely a matter of economics. But where the other CAD, computer-aided design, is concerned, emotion eclipses reason (especially among older architects), egos shudder, the "art" of architecture seems threatened, and skeptics shake their heads at the thought of the abstract being rationally organized. Ah well. Artists (and even architects) feared the camera at *its* birth; theater aficionados feared film; film producers feared television; and so it goes. Yet the hardy survive: They adapt, consolidate their strengths, and become familiar with the unknown.

To dispel fears, we offer a mixture of "wows" and wherefores—gentle "wows" in the form of attractive buildings (e.g., an office addition, p. 138), furniture (p. 150), and unusually shaped structures (St. Albert Civic Center, p. 137), which were designed at least in part with the help of the computer, and disprove the stereotype of the dull, predictable CAD-designed building; and wherefores in the form of an examination of SOM's multifaceted CAD network (pp. 140–145), and a look at the computer graphics research taking place at universities (pp. 154–158), where training will breed familiarity.

Breaking the graphics barrier

Some architects maintain that the intimate hand-pencil-paper connection is the irreplaceable pipeline communicating their humanness to the very stones of the buildings they design. For these architects, because of years of habit, this may well be true. But graphite doesn't flow from their fingers: the pencil is just a tool . . . and so is the computer. Professor William Mitchell of UCLA notes that we don't say "pencil-aided-design," and eventually we won't differentiate "computer-aided-design," either. At the level of graphics, Morphosis's Thom Mayne's experience with the Lisa computer makes the point effectively (p. 146). After several sessions with the computer and its "mouse" device, he became familiar enough with the machine to develop his own notational system, and to realize that his scribble, his own artist's "hand," came through. At a certain stage, the interface becomes all but negligible, and the machine is no longer an insulating membrane but a responsive medium between the idea, generated by a mind and a personality, and the reality.

Even as Don Greenberg of Cornell (p. 154) and the computer team at SOM develop more and more realistic computer graphics, architects continue to supplement these graphics manually in imaginative ways, possibly using computer output as an underlay: note Roper-Ehrlich's office drawing on page 137. Taste determines whether an interpretive rendering is more effective or suitable than a perfectly lifelike one, and both choices remain available without dismissing the computer.

Roper-Ehrlich-Architects of Denver used THE CADLAB computer service to help design their office (large drawing, opposite page). They studied movement through space by producing many 3-D views, and found that collage "provides an excellent way to study materials and to produce presentation drawings."

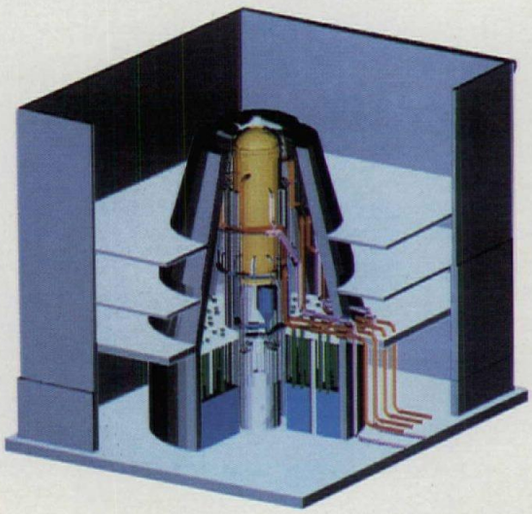
Design, unlimited

At some point, a myth sprang up; you feed a computer a building program, several operations are performed in the computer's murky innards, and complete documentation for a building pops out. No wonder architects cried (and still cry), "I don't want a machine telling me what to do!" No wonder they feared being eliminated as a profession. But the use of the computer is neither a sufficient nor a necessary factor forcing a blind and unitary extrapolation from function to form. This type of global "automated design" is not, in fact, the way computer-aided design is developing.

The computer can be used in architectural design in various ways, as exemplified by the range of material on the subject submitted to P/A: massing studies, energy analyses, program adjacency studies, elevation studies; interior design, preservation, and planning applications, and so on. For the neophyte: In every case the computer (hardware) is fed organized data (verbal, numeric, graphic) upon which it performs a series of operations (a program, a.k.a. software) which is structurally separate from the hardware and can be supplied by the user, and results are shown on a screen or plotted on paper. A program can be performed, for example, testing a designer's preconceived form against logical requirements. In the early design phase, graphics programs can help the designer visualize alternatives. Most important, it is the relationship among and build-up of the various operations, constantly directed by the preference and judgment of the designer, that brings useful results. To repeat: The designer thinks and judges; the computer helps.

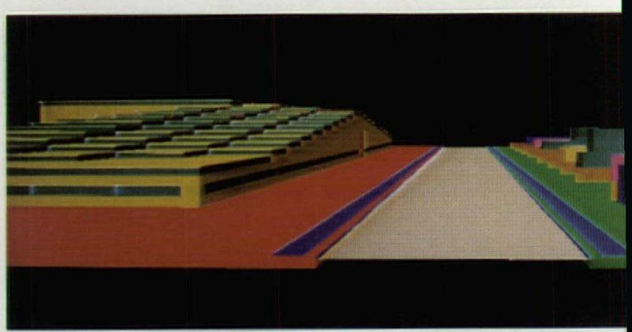
The usefulness of the computer increases with the range of operations it performs not only in design, but beyond. Data are cumulative: The results of the design phase can be fed into the contract document stage, and the results of that stage, as Nicholas Weingarten of SOM points out, are useful throughout the life of the building, for its maintenance and alterations. The architect's product, he says, is information, not drawings. As the construction industry becomes automated, the architectural data will be able to direct the manufacture of building parts.

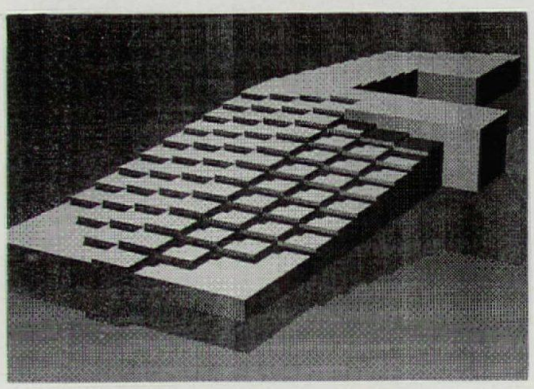
Kemper & Krebs, Architects, of Milpitas, Calif., used computers to design a machine shop (above right) with a stepped roofing system that helps reduce artificial lighting and heating requirements, allows economical ventilation, accommodates 30-foot crane heights, and introduces a fairly gentle profile into a commercial/residential neighborhood. Everett I. Brown Co. of Indianapolis uses CAD in a variety of ways, including to create a 3-D model of a nuclear reactor containment facility (right) to communicate clearly a complex design.



Beneath the surface

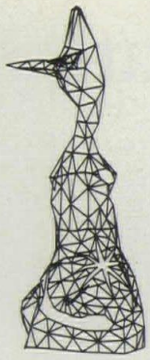
"Wow" is not enough, of course. The mouse or tablet devices may allow for easy use by an architect; a CAD system's available colors may be dazzling. But if the CAD software does not allow architects to perform operations in ways that they need and want, its benefits will be limited. Neither the "Design" nor the "Manufacturing" in the term CAD/CAM was first applied with architects in mind, and many CAD systems commercially marketed to architects are offshoots of systems for other design fields, generally with narrower and more specific needs. Some parts are useful, but there is much room for improvement. For this reason, SOM, for example, has developed its own programs, and Christos Tountas of Columbia (p. 159) argues for a more powerful and intelligent procedural modeling system. Other universities continue to investigate the relationship between design and logic. Note too: A small computer (pp. 146–149) is useful for some architectural functions, but a full range of operations requires a far larger hardware capacity.

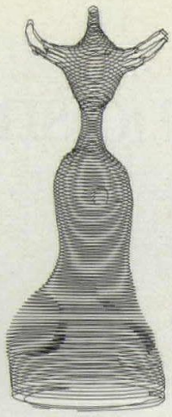


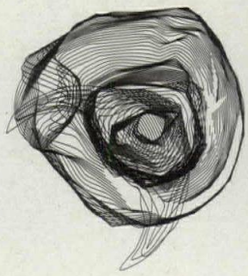


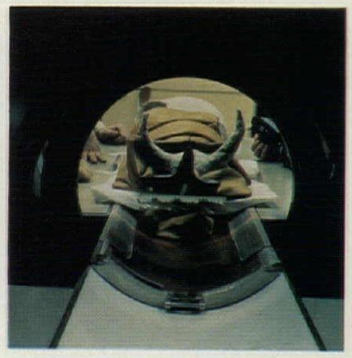
The profession

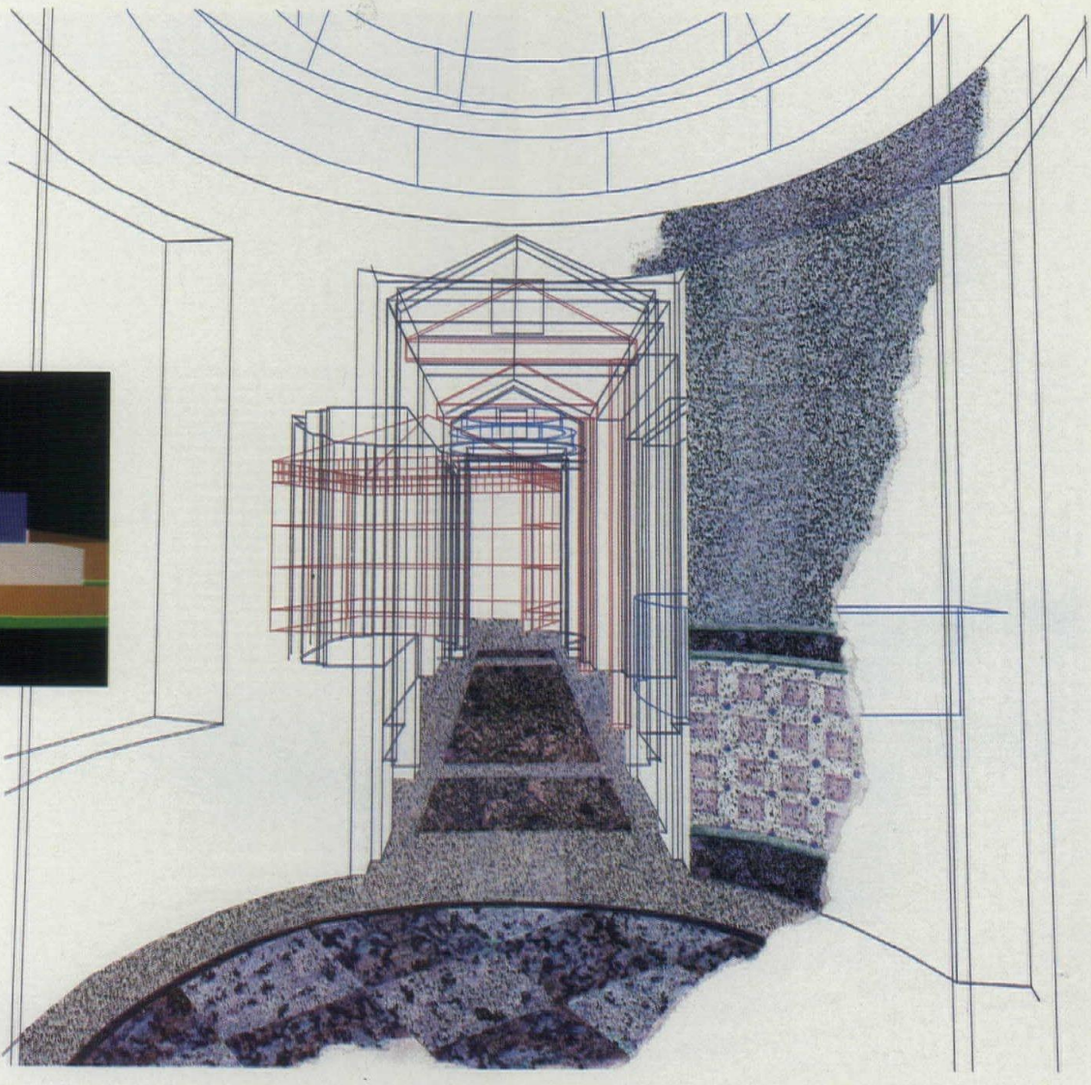
Architecture deals with a wide range of information types, and if computers are best at manipulating data given the appropriate programs, there are two obvious implications for the profession, noted by Professor Mitchell. First, high-level designers will continue to control design and production, as discussed above, but fewer low-level draftsmen will be needed. The structure of Douglas Cardinal's Edmonton office will become typical: a small design and support staff will turn out large projects. Second, as the race to accumulate and market extensive data bases and applications software heats up, the nature of compe-



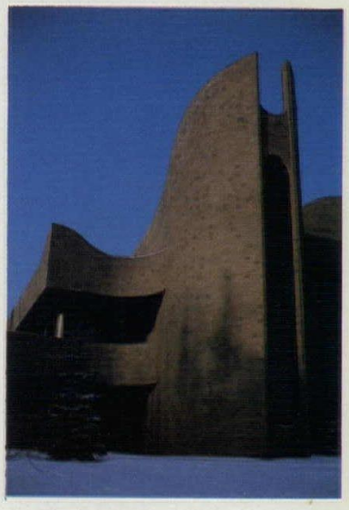




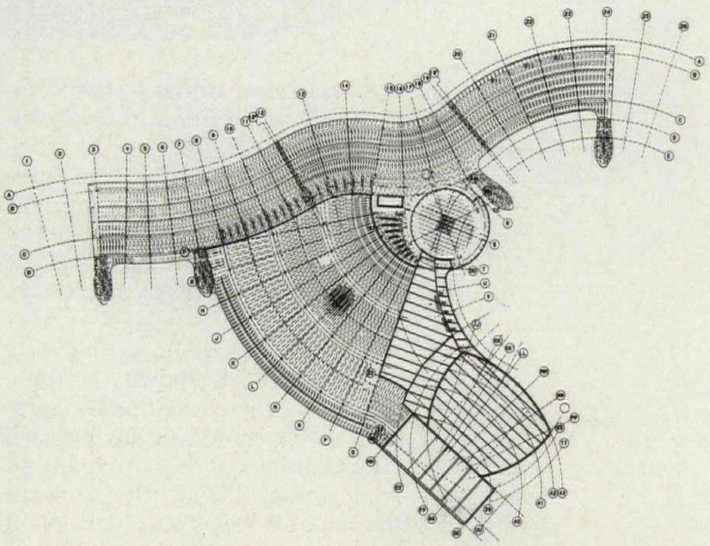




SOM/Chicago comes to the aid of Joan Miró: a 30-inch sculptural maquette (above far left) is fed into a hospital's CAT-scan machine (above), and the resultant 120 x-rays analyzed by SOM's computer to create horizontal contours (above left). These were stacked to form a framework for structural analysis, and several were used as templates for the steel discs within the final statue, now standing in Chicago's Brunswick Plaza. An earlier triangulation system (left drawing) was insufficiently accurate. Edmonton architect Douglas Cardinal's St. Albert Civic Center (stair tower, plan, below) proves that "anything," not just rectilinear form, goes on the computer. All Cardinal's office functions are computerized.



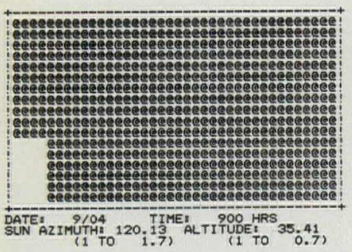
tition among and capital investment by architectural offices will change, and the area of professional responsibility will become ever more complicated. These matters are beyond the scope of this particular issue (though P/A will continue to examine these matters) except for the following well-worn but germane observation, offered for individual interpretation: If machines take over mechanical matters, architects will be left with human ones. [Susan Doubilet]

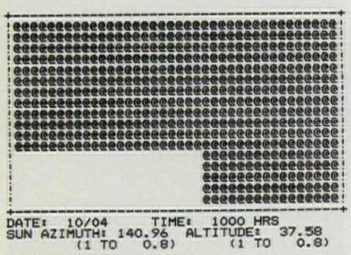


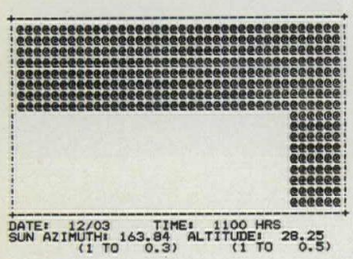
ARDCO, Inc.
Alsip, Ill.

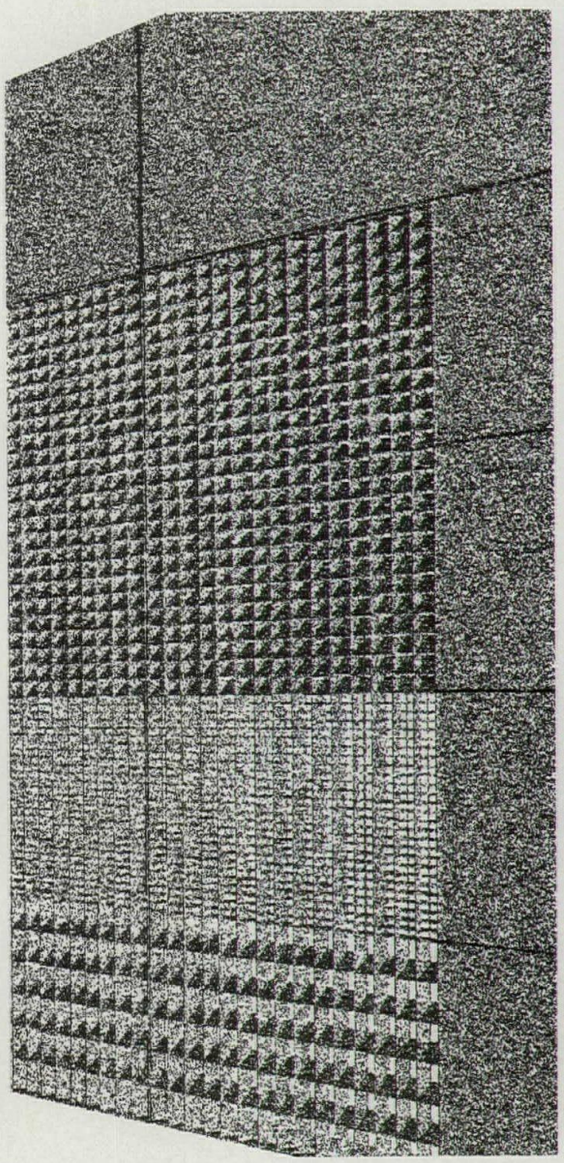
Pretty, and smart

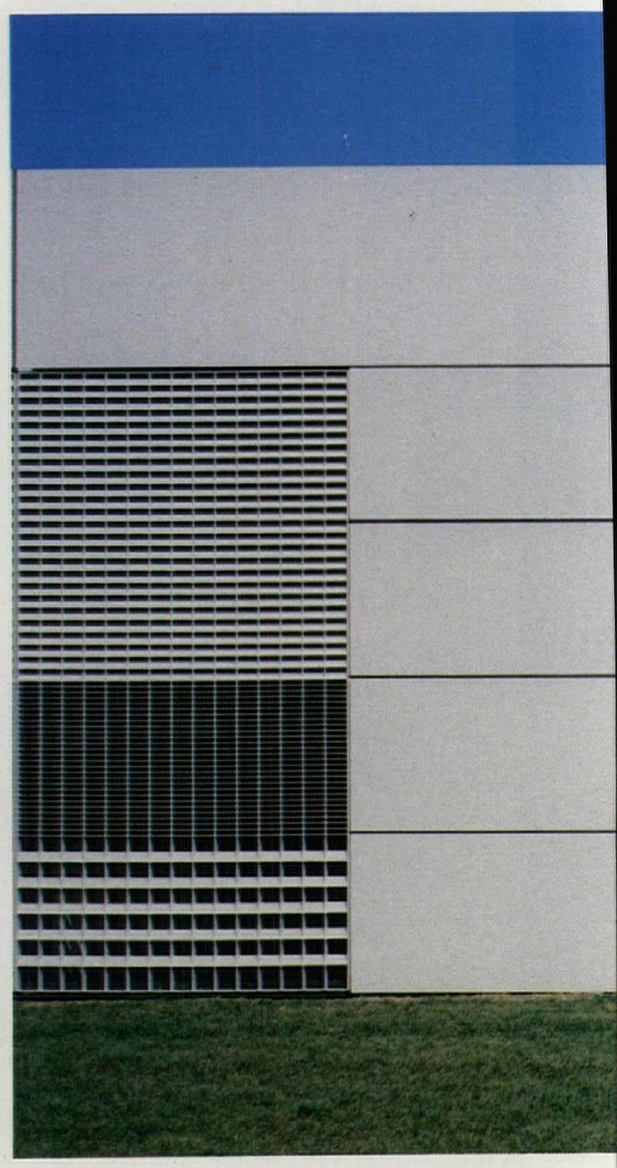
Davis Associates used their CAD system to analyze and solve sun and heat problems in a south-facing wall.











When Davis Associates of Chicago were commissioned to design an addition to the headquarters of ARDCO, Inc., in Alsip, Ill., they used their Intergraph CAD system as a matter of course. They have used computers for some phase of their operation ever since the office was established nine years ago, and now all designers and draftsmen make their drawings on CAD.

To design the sunscreen in the south-facing exterior wall of ARDCO, shown on these pages, the architects first developed a computer program to track the sun during each day to get information about solar conditions and sun penetration. "Once the concept evolved," says Charles Davis, "we developed a computer program to model designs on the screen. We adjusted the design until we arrived at the optimal design configuration for all seasons." The CAD studies were used to evaluate the views to the exterior and for presentation to the client.

The lower portion of the sunscreen allows sun to penetrate during the colder months to warm the slab. The center section admits only filtered light, thereby eliminating glare and significantly reducing heat gain. The horizontal orientation of the slats allows people to see above the horizon when seated at their desks.

The aluminum sunscreen in the south wall (below) allows selective sun penetration in its bottom section, restricted views and sun blockage in its upper section, and filtered light and views in its middle section. The view within one of the offices is shown at left. Opposite page: center, one of several perspectives of the sun screen, generated by CAD; far left, part of the printer output indicating the shading of one cell in the lower section of the screen.

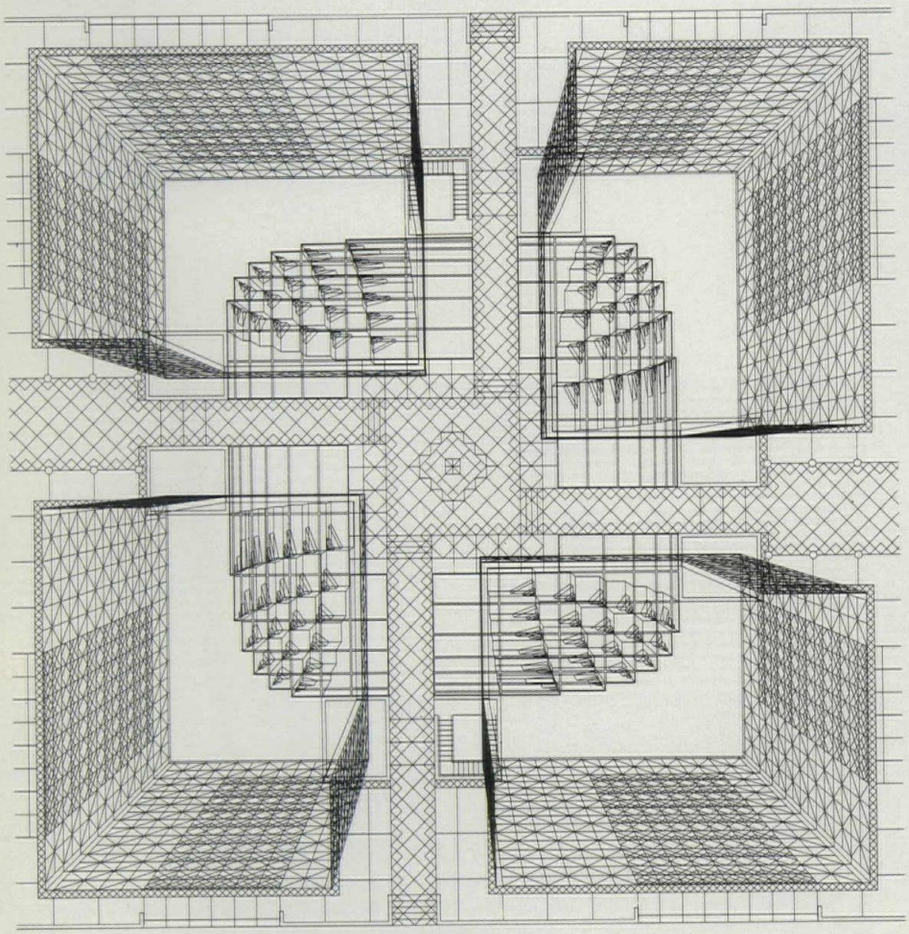
Photos: Sadin Schnair Photography

The upper section allows a restricted view, but minimizes the material required to block the sunlight. Each sunscreen pivots for ease of cleaning. The screen also acts as a design element to tie the new addition visually to the original building, which has a floor-to-ceiling glass curtain wall.

Several other automated techniques were used in the design of the building. These included programming of user requirements, evaluation of preliminary schematic designs to determine how closely each met the architectural program, and analysis of building systems costs for each schematic design.
[Susan Doubilet]

The big picture

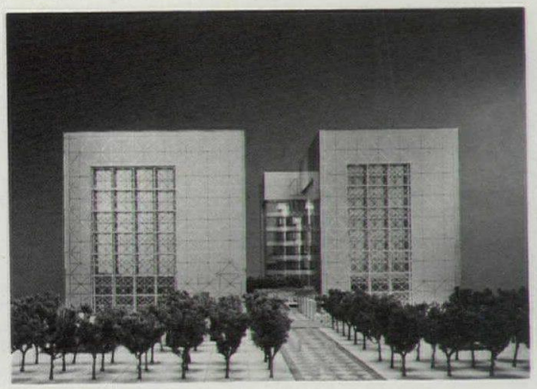
SOM makes a substantial investment in the development and integration of software, with an unusual emphasis on the design stage.

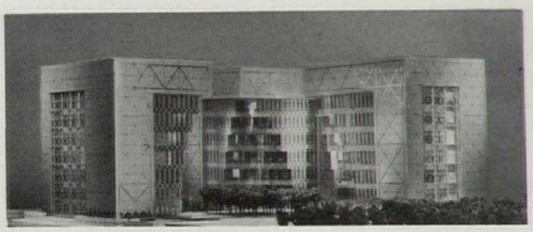


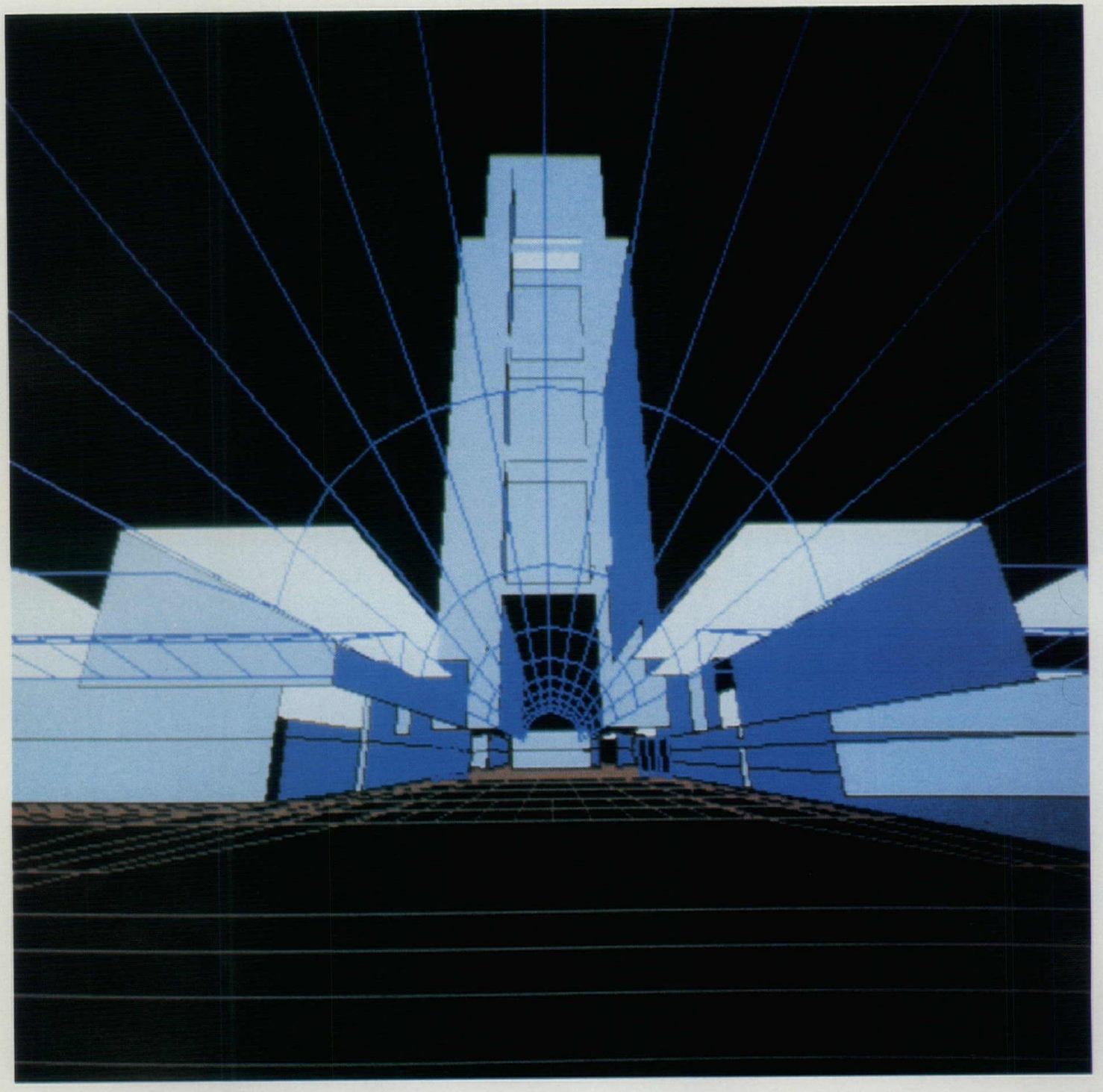
A design proposal for the Kuwait Insurance Companies Complex, illustrated on these two pages, was developed by SOM/Chicago and Pan Arab Consulting Engineers/ Kuwait in five weeks. Four buildings envelop a courtyard with faceted cantilevers that recall the Islamic tradition. The computer allowed many versions of the prismatic concave corners to be studied, in wire-line drawings (above and opposite page, top) and in solid surface worm's-eye perspectives (opposite page, middle). The proposed scheme was viewed from many vantage points (opposite page, bottom), and a number of solutions for an energy-efficient filigree screen were studied. Presentation drawings and computer-generated templates for building a model (right) were simple by-products of the design studies.

Among architectural firms, Skidmore, Owings & Merrill have an unsual level of commitment to the computer. This refers not particularly to their capital investment (a number of firms have bought extensive hardware and software packages) nor merely to the fact that they have developed their own programs (many architectural offices have software tailor-made for themselves, either by outside consultants or by employees), but it refers to the extent and type of commitment. SOM architects and engineers, many of whom have training in computer science, have written almost all the applications programs in-house (though some software, such as the DOE 2.1B energy analysis program and certain engineering programs, have been purchased and incorporated). Their system ties together all facets of design, from the initial sketching, design development, and presentation, through engineering analyses and working drawings, to project management. Much of their research focuses on the initial design phase, examining methods for visualizing movement through space and for producing lifelike renderings in order to picture, for example, the effects of specific materials. Most important, the research is based on the examination of and philosophical reflections about the nature of the profession as it is now, as it differs from other professions that also use CAD systems, and as it might be in the future. It is unusual among architectural firms to reinvest a measurable percentage of gross profits into research, as SOM does. But, as Computer Services Assistant Director Nicholas Weingarten points out, "Boeing applies a far larger proportion—about 10 percent—of its gross earnings to research." In a program coordinated by the SOM Foundation, software developed by SOM is being offered to certain accredited schools of architecture; the University of Pennsylvania has been the first to accept.

SOM introduced its first computer not, perhaps surprisingly, for management applications, but for engineering analysis, in 1963. In 1967, it developed its first specifically architectural program—BOP—a building optimization program for the layout of rectilinear office buildings. Today, all SOM offices use computers, but the Chicago office is the center for research and oversees all computer development. A dedicated high-speed telephone network links the computers in all SOM offices.





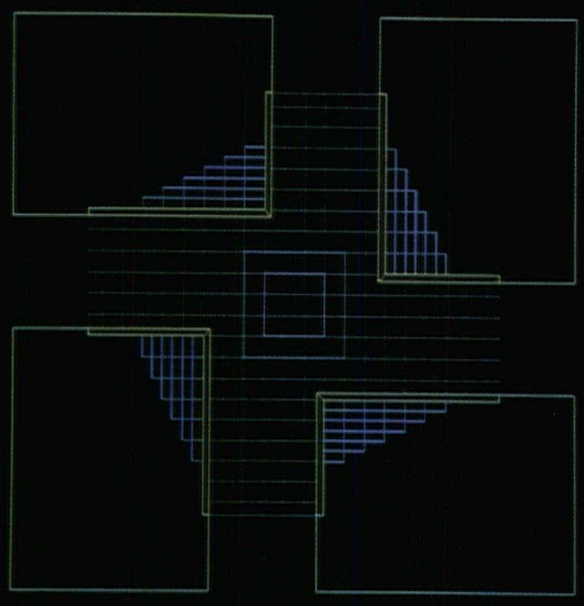


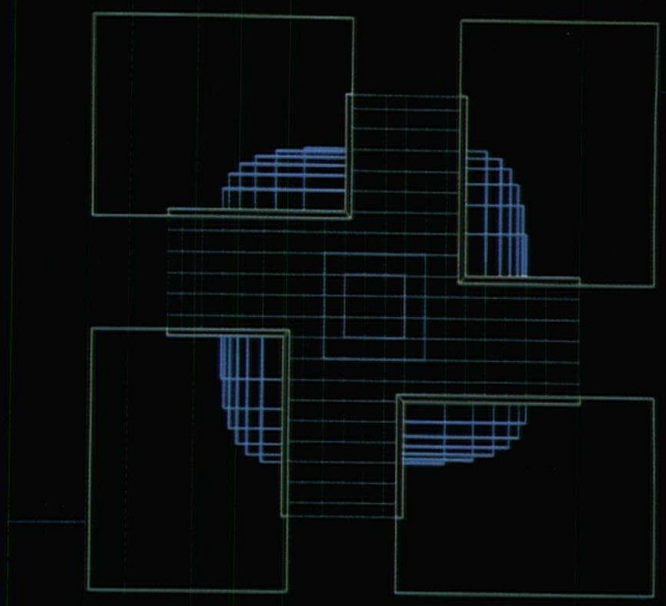
A design for a full-block center-city site was developed in two weeks by SOM/Chicago (above and opposite page, left). Urban data were interpreted (opposite page, bottom) in wire-model form, within which massing studies were made, and several schemes were studied. Three basic partis, each with a central atrium, were pursued (opposite page, top): access from four corners; emphasis on one corner; and a full-façade shopping area. A real-time imaging capacity allowed the viewer to walk towards and through the project (above).

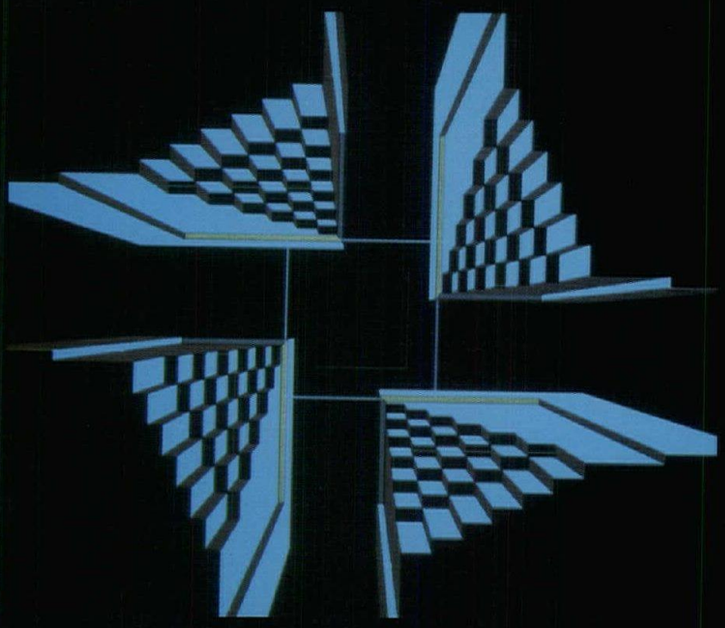
CAD vs CAD

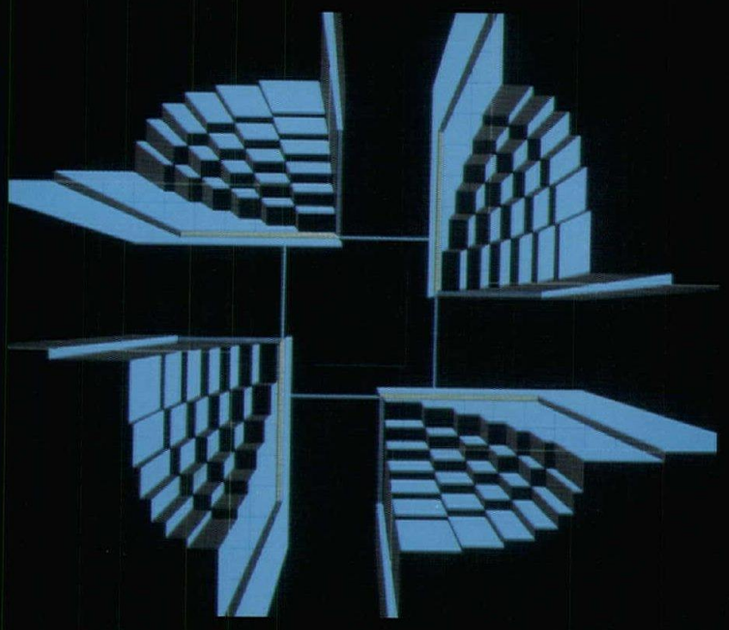
Weingarten and Douglas Stoker, SOM Computer Services Director, compare the implications of computer-aided design and computer-aided drafting, and conclude that computer-aided drafting addresses the wrong problem. While it is easier to apply cost-benefit analysis to automated drafting (and to determine, in fact, that profitability requires 24-hour-a-day operation), they ask, "Why would you spend $100,000 to make the least expensive draftsman in the firm more productive?" In fact, they say, it will be the firm's use of the computer "to improve the quality and control of its work, not the accuracy of its drawings, that will attract new clients."

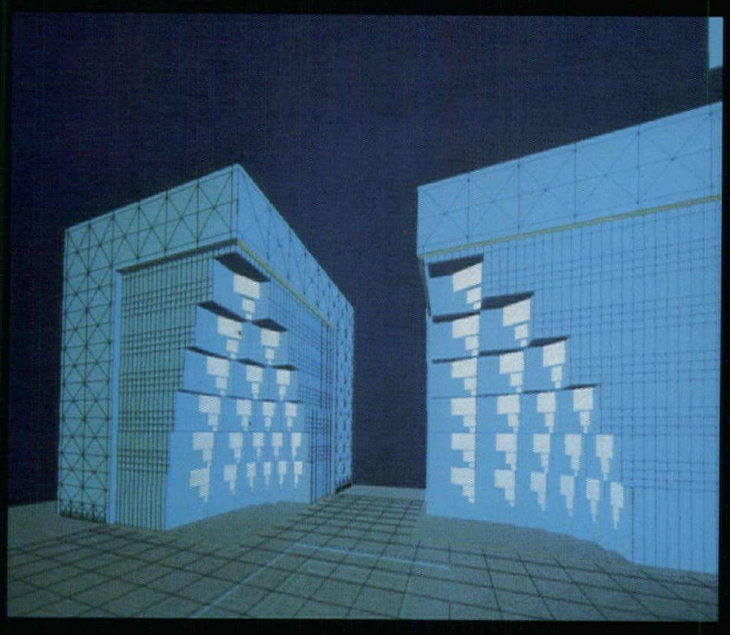
Stoker and Weingarten discuss the particularities of architectural design and the shortcomings of commercially available CAD systems (often, they say, modifications of mapping and process piping systems, or of electronics or machine part design systems). They examine the three major components of a computer-aided architectural design system: its graphics capabilities; its data base structures; and its applications programs. As for the first component, only in architecture, they say, is the visual presentation of a design problem so closely linked with its solution. Architectural solutions have a larger number of elements than most other design solutions;

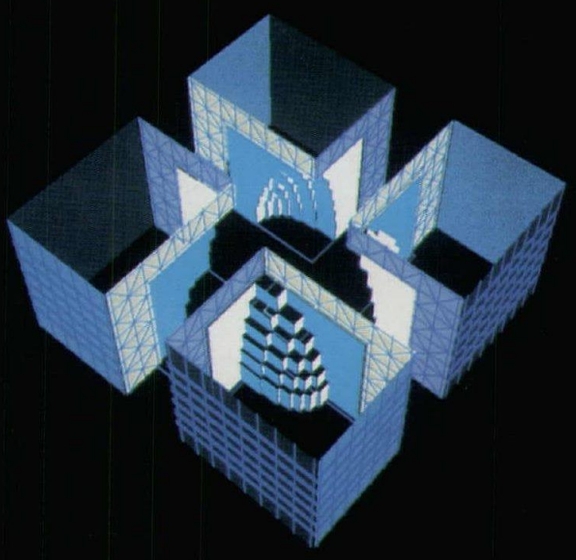




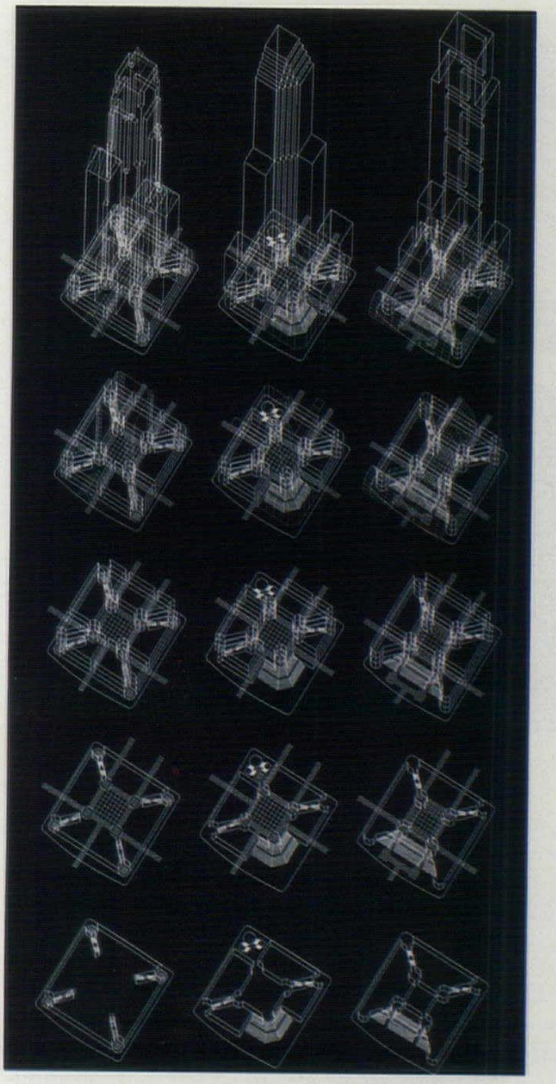


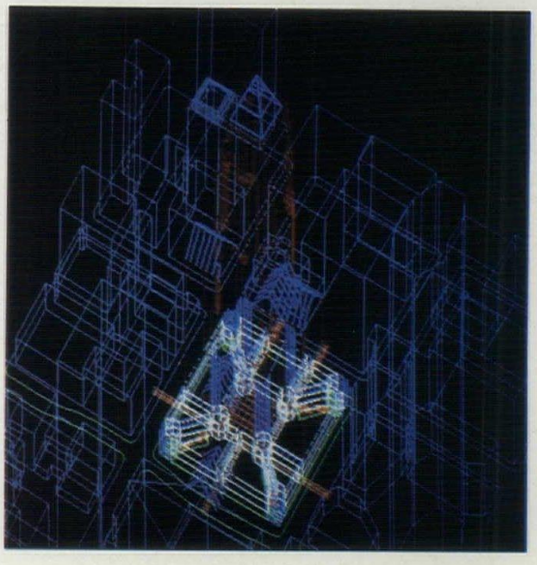






A proposed design, still tentative, for a new Kuwait Ministry (below) was developed in a few days using the computer for massing studies, for elevation studies of sunscreens based on the Mushrabeya (lattice-enclosed porch), and to visualize a walk towards and through the project. The design incorporates Islamic-style interior courtyards and a covered, diffusely lighted pedestrian street.



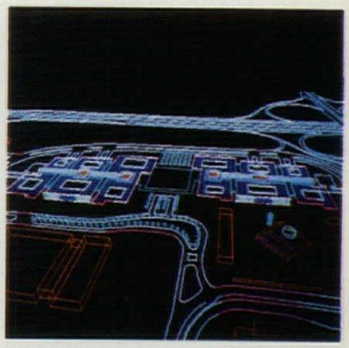


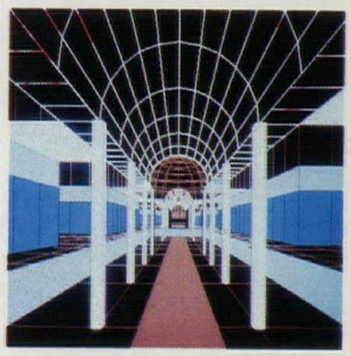
they require a vast number of colors to render shades and shadows to represent solid and void, rather than the couple of dozen colors needed for color-coding in most other fields. Also, they rely heavily on perspective and axonometric projections. As to data bases, architecture encompasses more types of data than most other disciplines, including some types that are relatively easily defined (structural analysis, elevator design), and some that are abstract and loosely linked. Necessary applications programs, too, span a broader range of disciplines for architecture than for other design fields, and these must be integrated with the graphic and nongraphic data in the system, and be coordinated by relevant project management software.

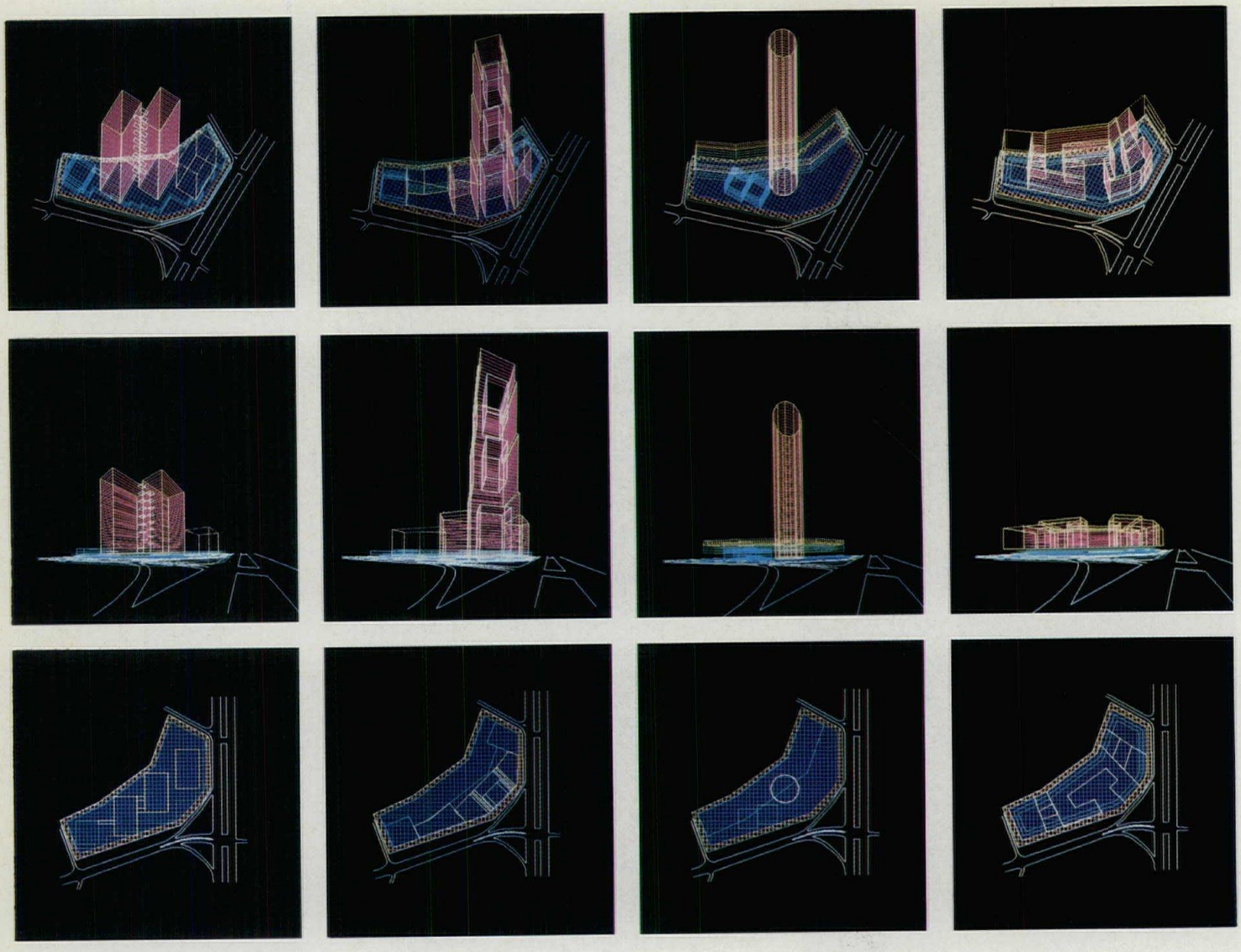
Workbench

For the computer to become most useful to the designer it must become familiar and, in fact, be subordinated to the design concept. This is the basis for a new Design Workbench system being developed at SOM. Each station will be a stand-alone operation, with its own computer (hardware cost: $35,000) integrated with, not isolated from, the drafting table. Each computer will have high resolution graphics. Eventually, the software will accommodate voice input as well as the traditional keyboard and menu techniques. The aim is to have the interface between designer and computer become less and less distracting.

Key to the Workbench system is the designer's control over the application of mathematical procedures (cost analysis and building code applications, for example). Whereas the traditional perception of computer-aided design, says Stoker, is that these procedures are systematically applied to discrete components of the design and actually *create* the elements—that is, form follows function, quite literally—that is not how architecture should be developed. A design is conceived and *then* checked against the mathematical procedures, and this is how Workbench is set up: The decision to apply a procedure to quantify or refine a design element is the *result* of the state of completeness of the geometry of the design.







To explore the variety of solutions possible for a proposed corporate complex on a large site in Malaysia (above), SOM/Chicago prepared five schematic massing studies, including a single office tower, clustered towers, and a low building covering the entire site. All five schemes were constructed and visually analyzed on a color raster graphics terminal. The designers were quickly able to generate plan, elevation, aerial perspective, and a view from an adjacent major artery for each massing model. Wire-line techniques were employed to express project phasing, while color aided in delineating various uses.

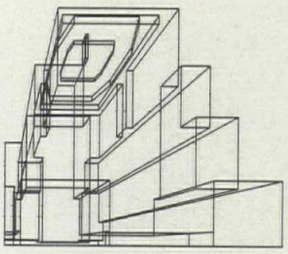
Visualizing, presenting

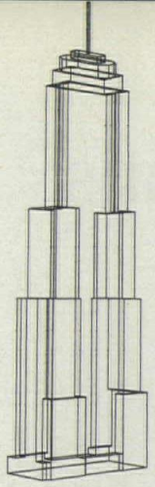
From the very inception of the design process, the computer helps designers visualize options. Massing studies can be made (see Malaysia Corporate Headquarters, above) within a site constructed from topographical or urban context data. Elevation design studies can be made, as for the Kuwait Insurance Company (pp. 140–141), where a number of solutions for an energy-efficient filigree screen were quickly explored. Also for the insurance company, the computer was able to generate, based on a special algorithm, a number of different options for the concave prismatic corners of the courtyard—options nearly impossible to visualize with any accuracy without the computer. Forms can be defined by wire-lines or by solid surfaces; color, light, and shadow studies can be carried out.

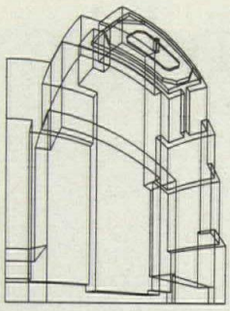
To allow the designers to view the design options from any vantage point, there is also a real-time imaging capacity that gives the sense of actually moving around and through a project.

As Julia Rivkin, director of SOM's Chicago computer group, says, "The nature of computer-aided design allows information to be accumulated, expanded, or changed in a continuous process." Thus the data used and produced in the design phase can automatically produce presentation drawings (and can eventually form a base for working drawings). Images developed in the design study/visualization phase can be plotted on an electrostatic plotter (faster than the older flatbed plotters) for use directly as presentation material or as underlays for hand-rendered drawings. Slides or photographs can be shot directly off the color raster screens (as were most of the images shown on these pages). The data can produce templates from which to build models (see the Kuwait Insurance Company). Films can be shot from the real-time imaging screen, though these must be built up by key-frame animation of a series of stills photographed from the screen, because of the refresh system by which the computer image is created and maintained. SOM's Richard Rogers assembled a computer and built a triggering mechanism to control the movie camera.

Rogers is also developing and improving techniques to produce images that combine a variety of media and yet look continuous, have better resolution than magazine photo-







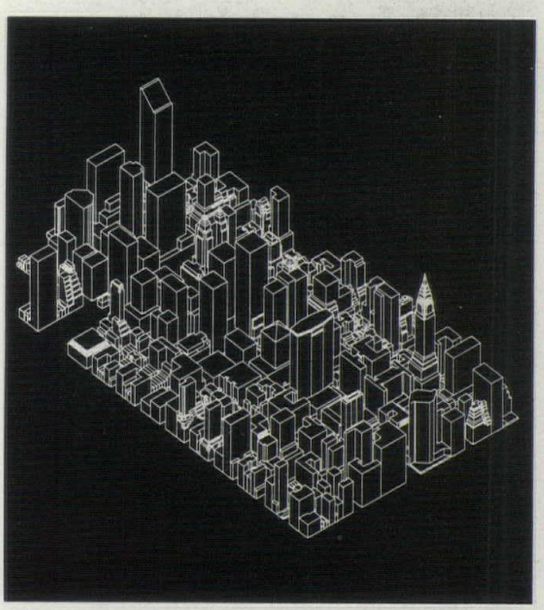
SOM maintains data to produce models of the centers of several American cities. A part of Manhattan is shown below left. To facilitate the use of New York's midtown zoning Alternate Height and Setback Regulations, SOM developed a rectilinear chart (bottom) as an alternate to the complex Daylight Evaluation Chart (below). Design solutions can more quickly (by a factor of 15) and comprehensibly be studied (left).

graphs, and defy detection as computer output. Drawings, whether produced by hand, by machine, or by rubber stamp, whether consisting of continuous lines or dots, as well as photographs from various sources, will be scanned by laser or by video camera and be combined in a single, seamless image.

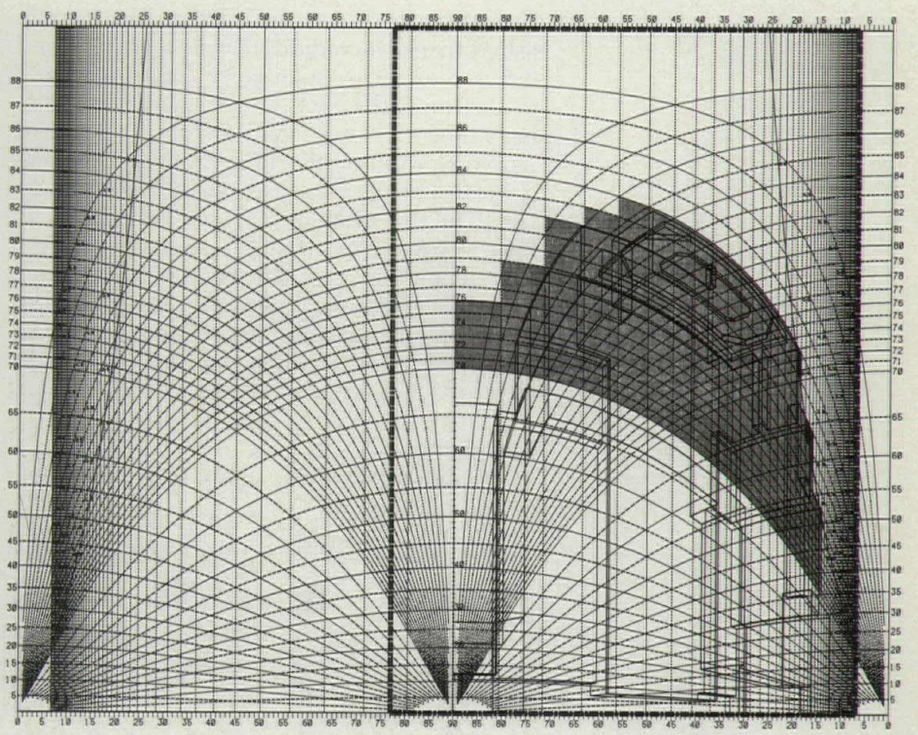
The open end

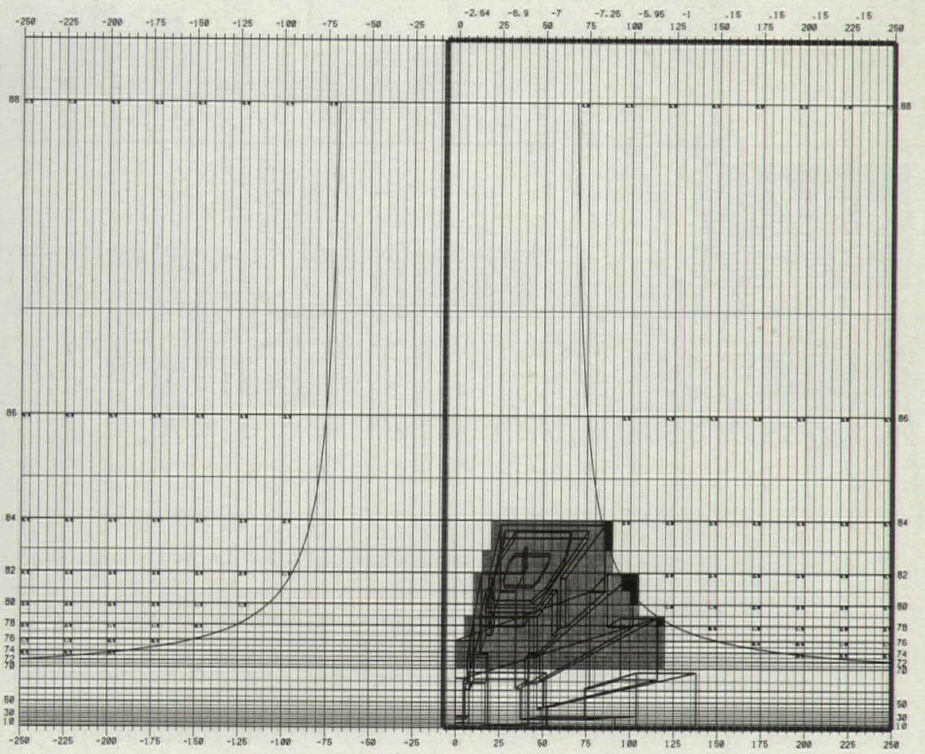
For architects, the computer is not an end in itself, of course, nor are the drawings it produces. The computer is a tool to help design a building, but its usefulness continues into the life of the building. Just as the data amassed and organized in the design phase can be used for presentation and can form a base for working drawings, so the data accumulated in the analysis and working drawing stages, which allow the building to be constructed, can be used throughout the years for maintenance, for alterations, or for extensions. The architect's product, then, is information, not drawings, say Stoker and Weingarten.

Furthermore, the working drawings need *not* be limited only to their traditional role



within the construction industry, they point out. Data governing details and parts can be transmitted directly to manufacturers, whose computers (if they exist) could help produce elements (formwork, metal parts) from the architectural information. Unlike the automobile industry, the construction industry is not quite ready. But when it is, SOM will be, too. [Susan Doubilet]





Lisa and the swains

Three young award-winning architectural firms experimented with design on Apple Lisa computers.

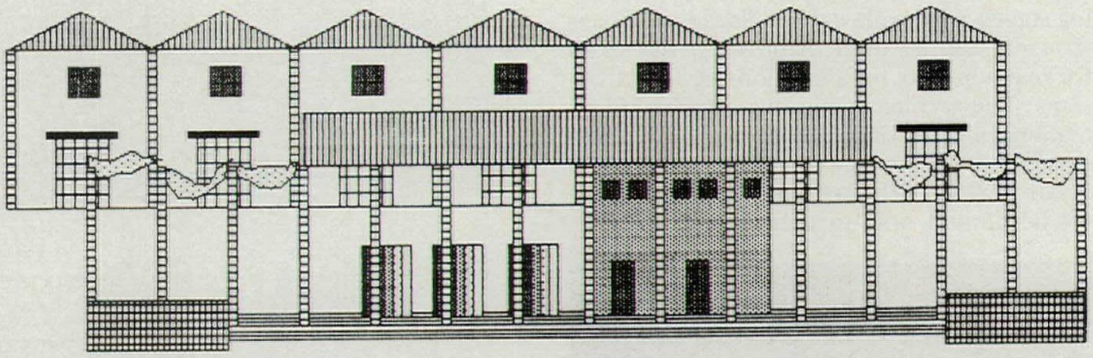
To offset the advantage held by large, established firms who could afford to acquire and develop expertise with large computers, and to document the experience of architects coming to the machine "cold," P/A arranged with Apple Computer the loan of their Lisa machine (relatively inexpensive and more powerful than the smaller personal computer) to four young firms (all P/A Award winners). The firms had had the computers about a month at the time this report was filed, and will continue to use and experiment with them for another few months. So far, three firms have presented material.

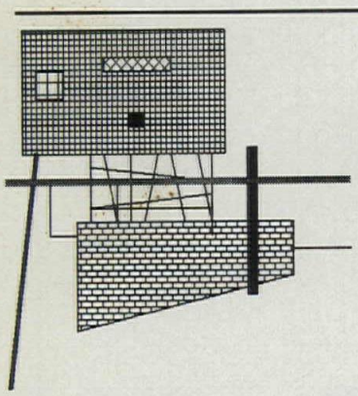
Morphosis

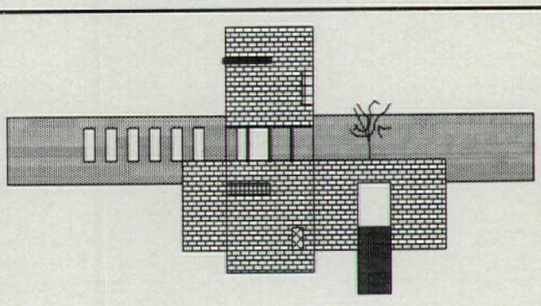
Morphosis architects Thom Mayne and Michael Rotondi of Los Angeles, with their associate Tony Bell, have used the Lisa in three design-related ways: graphic analysis; preparing a 200-page preplanning study; and developing new software. They are also using the machine for bookkeeping and contract writing, and plan to input specifications.

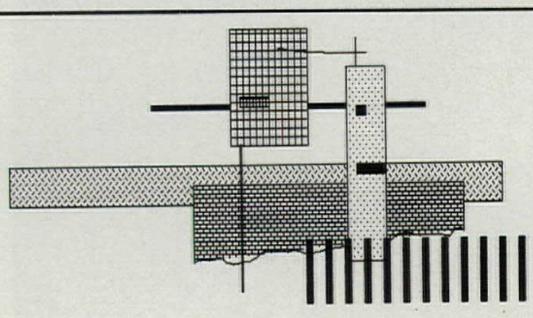
Thom Mayne, who was skeptical at first about the electronic "zip-a-tone machine," is now fascinated by the use of the computer as a graphic analytical tool. His drawing (at right) is one in a series that explores the relationship of elements—functionally, rhythmically, syntactically—of a Morphosis house in Venice, Calif. Since the house has already been designed, the computer is not assisting in that process, but, says Mayne, "We always continue analyzing our buildings, and the computer enriches the experience.

"Furthermore," says Mayne, "the artist's hand comes through on the computer. If you can't draw, the computer will not create great graphics for you; and vice versa. You scribble, say, with the 'mouse' input device, and your scribble immediately appears on the screen and can be printed: *your* artistic signature is unmistakable." To explore this aspect, Morphosis is inviting several recognized artists to the office to develop drawings on the machine and to discuss the results.

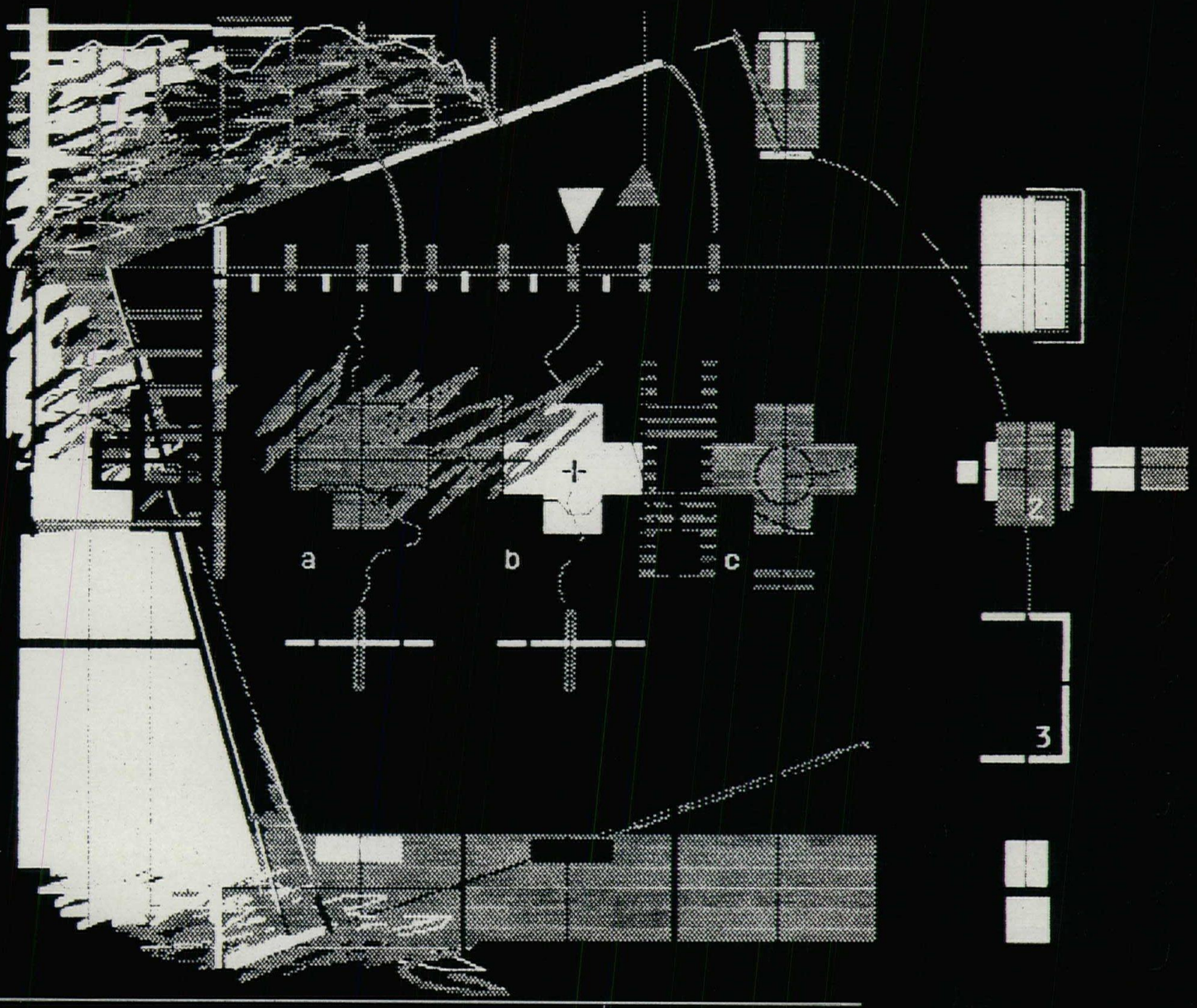


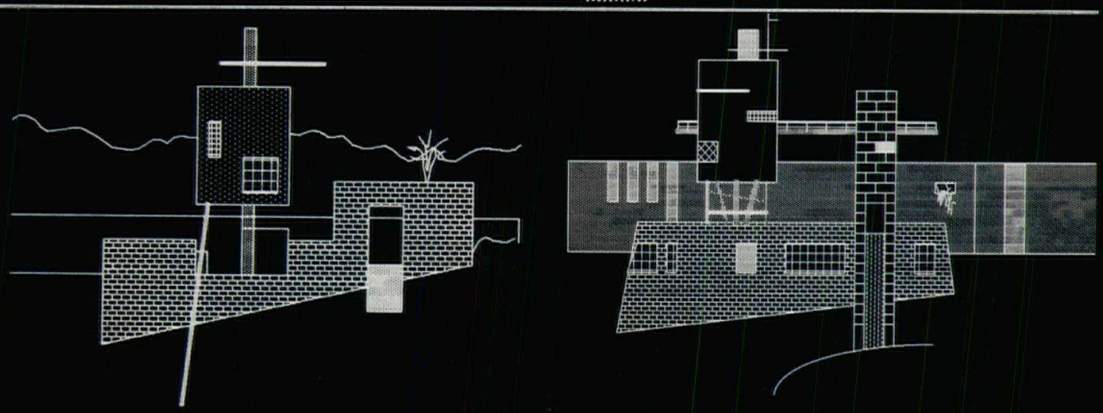






While Morphosis found the existing software somewhat useful for expanding, contracting, and repeating elements in a sketch, for example, the group wishes to multiply Lisa's efficiency as a design tool. Assisted by students of UCLA's Bill Mitchell (p. 158), they are developing PASCAL-language programs, for both two- and three-dimensional applications (though the Lisa is not ideal for 3-D), that will combine sequences of rules, some





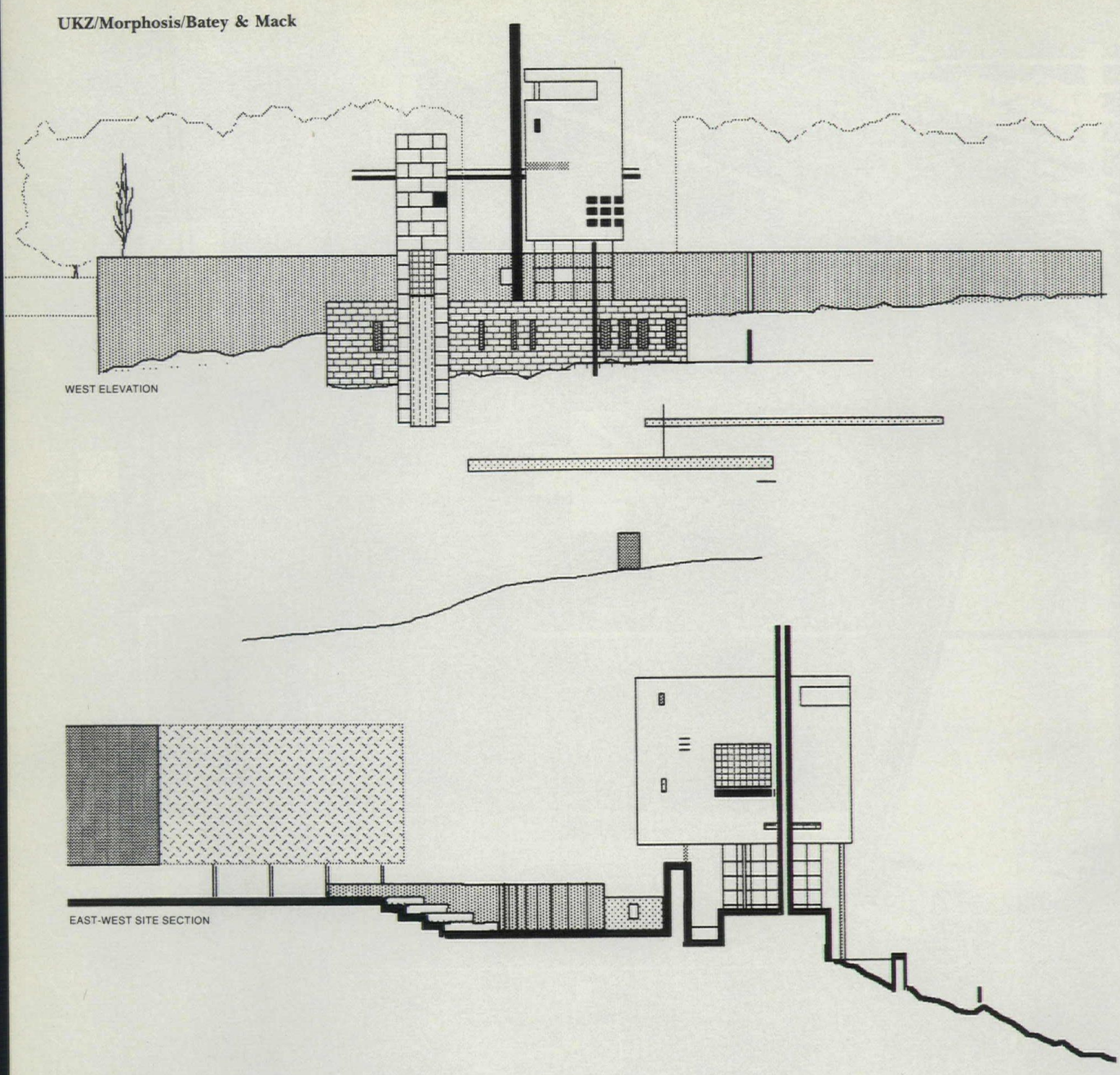
In Thom Mayne's graphic analysis of a Morphosis house (above) three cruciforms represent the main volumes; above them to the left is the library in elevation and isometric; and three rectangles at the right represent the study, deck, and bathrooms. Other notations represent skylights and doors, and lines indicate relations of elements. The series of drawings (left) are steps in UKZ's design development of a house, shown also on the next two pages. The design began as two parallel, basically solid volumes—the entrance/family area base, and the bedroom wing at the top—capturing between them a glazed living room. The basic parti remained, but orientation of some parts shifted. Batey & Mack's prototype winery (opposite page, top) has a row of two-story storage units set into a slope, with a covered colonnade in front.

that relate to generalized architectural processes and some that reflect their own personal design tendencies.

UKZ

Architects Simon Ungers, Laszlo Kiss, and Tod Zwigard of Ithaca, N.Y., together with their design associate Michael Whitmore, found the machine an effective sketch design tool, once they accepted its software limitations. They could quickly explore design alternatives, varying the size, shape, and relationship of elements with ease; and the sketches, drawn freehand, were automatically produced as hard line drawings: The step from freehand to drafting board was eliminated in the sketch phase. UKZ used the machine for design development of a residence on the New Jersey Palisades for developer/architect Richard Weinstein. They found the machine particularly suited to their constructivist vision of the house and developed a "collage" of three distinct parts. Eventually, as the

UKZ/Morphosis/Batey & Mack

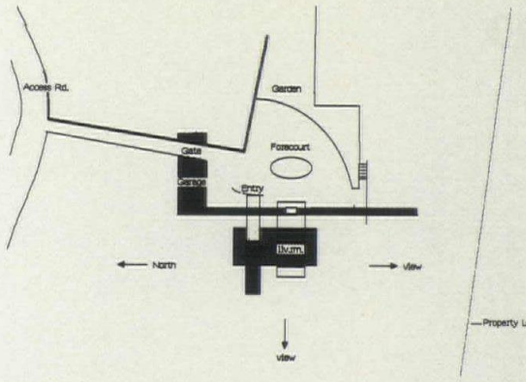


design progressed, they used the computer in tandem with the drafting table, as accurately scaled drawings were awkward to produce with the available software. Laszlo Kiss, who works as well with SOM/New York's highly developed computer system, is particularly aware of the limitations of the smaller machine, as data cannot be reused for further applications. Still, he appreciates Lisa's spontaneity as a design tool. UKZ is also using the computer for letter writing and office management. Like Morphosis, UKZ now plans to develop software for three-dimensional graphics on Lisa, with the help of a student of Cornell's Don Greenberg (p. 154).

Batey & Mack

Andrew Batey and Mark Mack of San Francisco have used the Lisa for bookkeeping and billing, and are developing a catalog of their concrete furniture designs. They have only begun to explore the possibilities of design with the computer, developing a design for a prototype winery and applying it to a specific site. They found the limitations of the software disappointing and, so far, feel they design more efficiently on the drafting board. As software more suitable to architects is developed, and more extensive libraries are provided (such as a broader range of patterns), and if they build up their own data files, they foresee the computer's usefulness.

The winery consists of a two-story storage facility, like little houses set into a slope, with underground cellars, a covered colonnade for processing and sales, and a road in between. [Susan Doubilet]



UKZ's house is based on three principles: first, the clear distinction between base (with entrance, kitchen, dining room, family room) and "temple" above (containing children's and master bedroom suite); second, the studied sequence of movement—the withholding of the dramatic mountain view until the approaching car penetrates the estate wall, then the entry down *into the base, then the progression upwards via a separate stairway into the glazed living room; and third, the concept of a room (the living room) that is a space "between buildings," and is both indoors and, with the glass walls slid away, an outdoor covered court.*

MAIN LEVEL PLAN

Playing the VAMP

Computer-aided design by the Baier Rose Partnership produces contextual furniture for a classic 1930s English house.

Herbert Felton

St. Anne's Court, Surrey, England, 1936, by Raymond McGrath, from Glass in Architecture and Decoration, *The Architectural Press, 1961.*

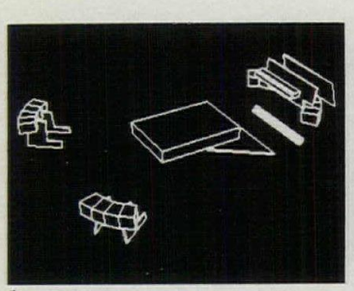
This bed looks as if it were made for its 1930s room, and indeed it was—in the 1980s, on a computer. Its designers, Fred Baier and Chris Rose of the Baier Rose Partnership, studied furniture design at London's Royal College of Art, but they combine industrial design skills with a knowledge of woodworking, antique furniture, and restoration, with the result that they see little reason to segregate craft from technology. When they were asked to design the master bedroom furniture for the recently restored St. Anne's Court, Raymond McGrath's landmark British Modernist house of 1936, their challenge was to arrive at design that captured the spirit of McGrath's architecture without being a "period pastiche." They wanted to break what they felt was the insistently vertical quality of the interior spaces by playing on the circular-based plan of the house, to develop surfaces that caught the play of light, and to use natural materials for a softer effect.

In spite of their extensive craft backgrounds, there is nothing nostalgic about Baier Rose's attitude towards craft; they felt that using a computer would help them make design decisions that might otherwise have resulted by more circuitous trial-and-error routes. Complex structural and geometric calculations would have been too costly without a CAD system, the designers assert; furthermore, they believe that computers allow a three-dimensional development of design that is impossible with drawings, making the process somewhat analogous to the preindustrial methods of design-in-construction. Fred Baier explains, "So far as I can ascertain, the 1930s movement was committed to the use of the most modern technology available, and it therefore seemed right for us to involve the computer as a design aid."

Their software consisted of a program called VAMP (Visualization and Modeling Program), developed by Paul McManus of Teeside Polytechnic in response to the need for designer interfaces for such three-dimensional modeling. The process, as Baier outlined it, began with the creation of a model, or assembly of components, which was then analyzed, pulled apart, reassembled, tested, or revised, as the designer chose (see drawings and captions below).

The finished product in this case is made of fiddled sycamore panels, with burr ash sectional cabinets that incorporate electronic panels that can control security systems, indoor and outdoor lighting, stereo and video systems, and even turn on the coffee maker. The designers are currently at work on a piece of furniture that is conceived and executed from full-size outline drawings of components straight from the plotter to the board profiles, which they claim "could link up with numerically controlled woodworking equipment."

The owners of the house had McGrath's drawings for the original furniture (which had long since vanished), but rather than reproduce it—or even buy furniture from the period—they opted for a modern interpretation of the era. When the precision and efficiency of the computer are combined with the craft-consciousness of two craft-oriented designers, as they are here, the results demonstrate that Baier Rose's determination to unify craft and technology is more than wishful thinking. [Pilar Viladas]



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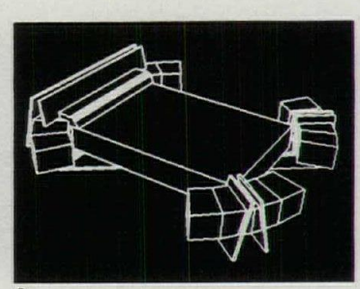
The VAMP program was used to create the model of the bed design as an assembly of components, which are themselves extrusions or revolutions of cross sections. The sections are produced with an interactive drafting program run from a graphics workstation. Models can be



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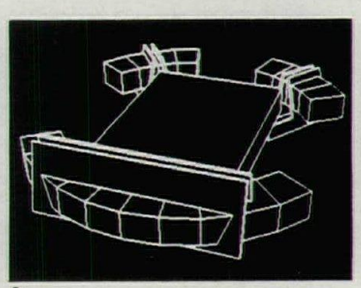
combined (1), and the assembly of these models (2) can be seen from any angle (3). At this point, the user can rearrange or modify the assembly or a single component at will: with hidden lines removed (4); as a wire



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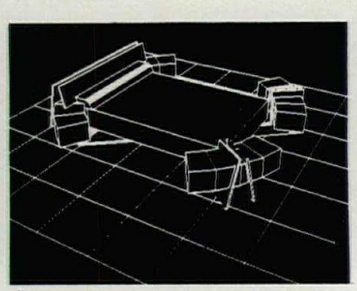
grid (5); or shaded, coloring in solid areas of visible surfaces, or simulating light sources to produce tonal effects (5 and 6). The designers found the program helpful in detailing and drawing up their design (7), especially for isolating curves of intersection and accurately reproduc-



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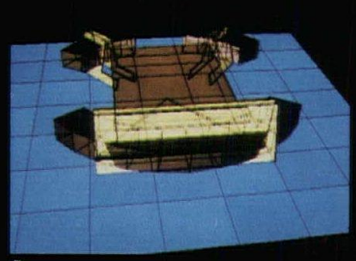
ing the shapes of the individual board components at the intersections of one geometric form with another (8).



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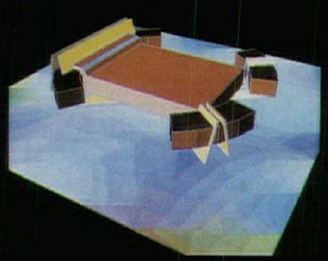

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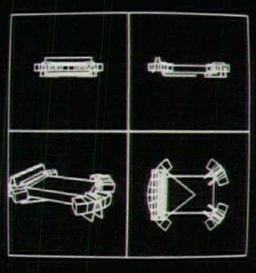

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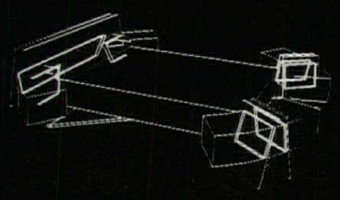
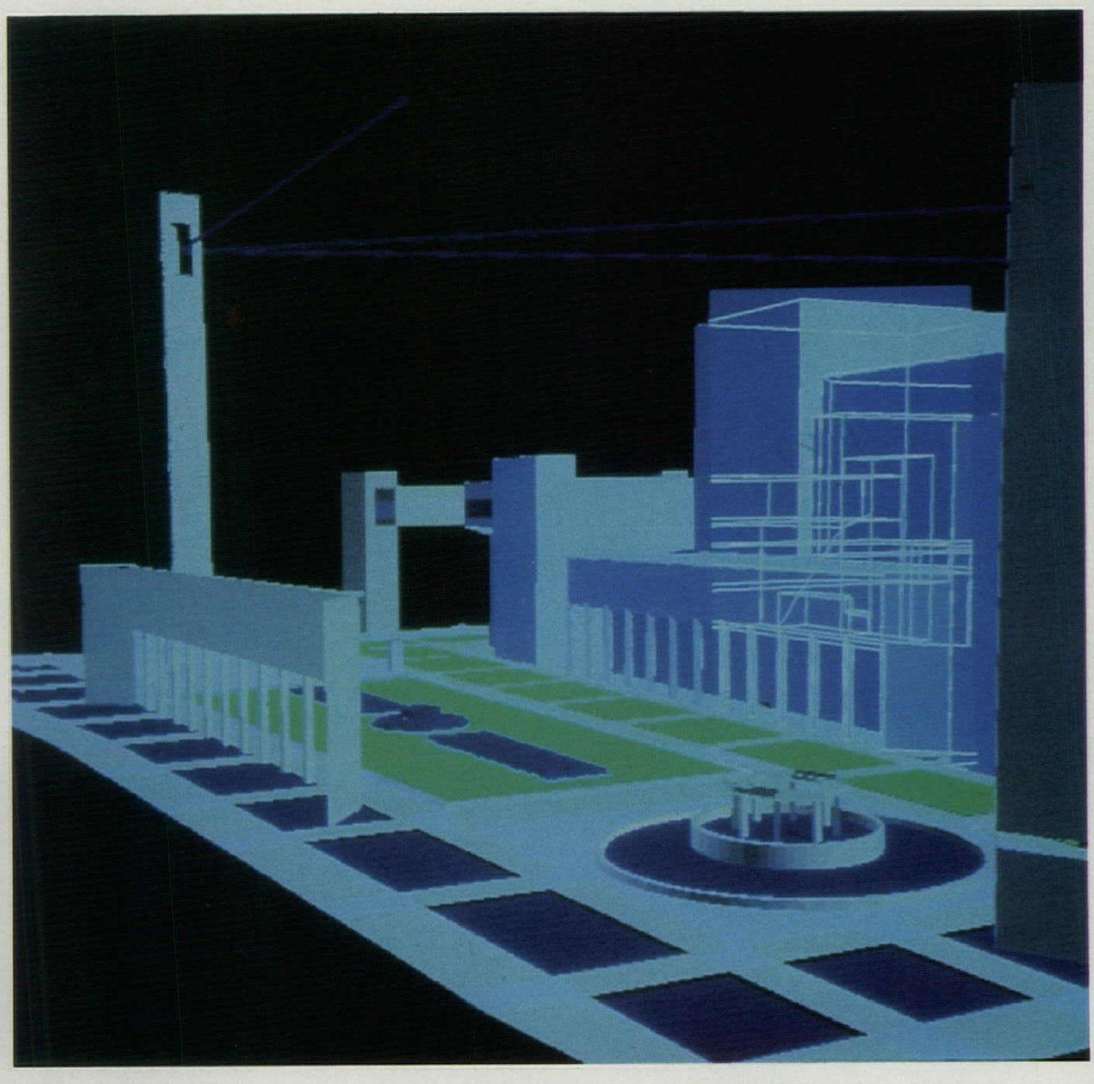


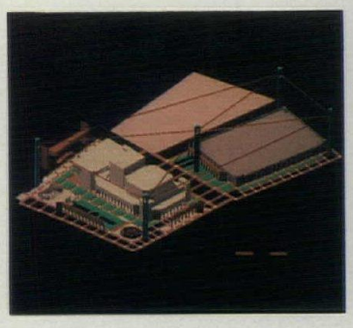
8

Milwaukee Performing Arts Center proposal

Lasers and minarets

Design Professionals, Inc., uses computers to develop a modern-day minaret scheme to unify the Milwaukee Performing Arts Center.





First, the coordinates of the existing site and buildings were entered into the computer, and a three-dimensional line model was created. Next, proposed design elements were added, viewed from various vantage points, and evaluated: the heights of the laser towers were adjusted and refined, for example, still in line drawing form (this page). Then, a model with solid shaded surfaces was created (opposite page). From the basic data, sections could be extrapolated and details reworked.

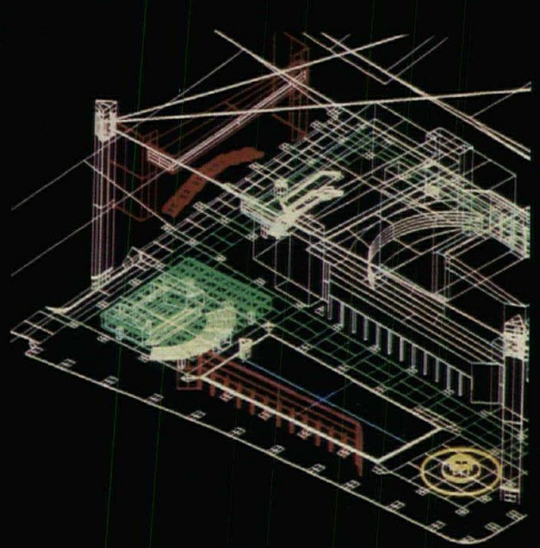
In 1983, Harry Wirth and Jerry Rubin of Design Professionals in Milwaukee entered the Environmental Arts Competition whose challenge was to integrate the varied structures of the Milwaukee Performing Arts Center. They used computers to develop their design, and part of their submission is shown here.

The architects used the computer graphics lab of the Milwaukee Area Technical College to enter into the computer the existing design conditions. These comprised the original building and site arrangement as envisioned by Harry Weese & Associates, including the main structure of the Center, the horse-chestnut grove, and the Conrad water fountain; the parking structure and overpass, added at a later date by another design firm; and the outdoor Peck Pavilion. The three-dimensional computer model allowed them to view the existing buildings and site from any vantage point, and then to visualize and manipulate various design proposals.

The scheme they developed was inspired in part by Edmund Bacon's *Design of Cities*, in which he examines the use of minarets around a mosque as a device for defining space in Islamic architecture—establishing "a transparent cube of space infused with the spirit of the mosque." For the Arts Center, the architects proposed "minarets" (based in form on the column detail of the original Weese building), which would not wait for the spirit of Allah to establish a cube of space, but would transmit laser beams into the sky, enclosing the site in a staccato colored ring and

creating a holographic effect that would broadcast events at the Center to the entire city. Lighting effects were redoubled in reflective glass entrance arches and in reflecting pools encircling the site, defining the property, tying the site to the Milwaukee River, and reinforcing the formal Islamic theme.

Having developed their design in a three-dimensional line drawing form, they used the data in two ways: to create, with the help of Computervision of Bedford, Mass., computer models with solid surfaces, shaded at various sun angles; and to derive dimensioned drawings. Material specifications were added in note form, and parts were refined and reinserted in the overall design. "The computer," say the architects, "essentially afforded us time to reevaluate the many component parts of the design." [Susan Doubilet]



A series of "minaret" columns transmitting laser beams are proposed for unifying the disparate elements on the Milwaukee Performing Arts Center site (above), with a formal arrangement of reflecting pools to reinforce the Islamic-inspired theme.

The schools

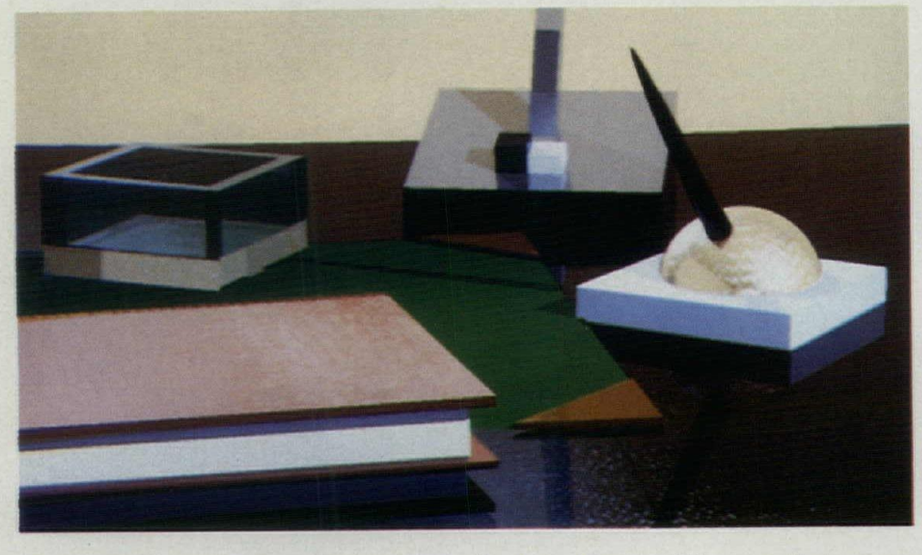
Pioneering work in computer-aided design is being carried out at institutions of higher education.

As might be expected, much of the imaginative research in computer graphics and computer-aided design is being done at the universities. Approaches vary, but it can be expected that all will contribute importantly to the growing expertise in the area. A sampling of university work is discussed here.

Rensselaer Polytechnic Institute
At RPI, every architecture student receives basic computer education in the freshman year. The exposure to the computer continues in a series of elective courses, as well as in technology courses. Says Professor Richard Quadrel, "Computer graphics helps in teaching structures, for instance, because it enables students to visualize the effect loads have on buildings."

Graduate work in computer-aided design at RPI occurs mainly in the area of resource-conscious urban design; one recent thesis developed software that analyzed projects according to the solar envelope ideas of Ralph Knowles (P/A, April 1979, p. 76). As in other schools, RPI generates most of its own software. Likewise, its research focuses on the predesign and early design phases of architecture. "We assume that the vendors of CAD systems will develop the software necessary to do production drawing. The gap that we see is with software that helps the architect make the initial decisions in a project, decisions that have the greatest impact on a design and that must be made with the least amount of information." [TF]

Cornell graduate student Rikk Carey recently created the two images shown here (below and opposite page) on the test-bed imaging system of the Program of Computer Graphics.



University of Michigan
Michigan's architecture school requires all students to take computer programming in the second year, since they use computers in structures courses for graphics analysis; in energy courses to model energy flows within buildings; and in economics courses for financial analysis.

Michigan also offers a Ph.D. in computer-aided design. "A major research direction," states Professor Harold Borkin, "has been the integration of spatial modeling and data base systems." Work currently underway for the Army Corps of Engineers has integrated a sketching program with programs that analyze a project's compliance with energy, handicap, and fire-safety codes, and also analyze its cost and structural subsystems. Other research activities include logic programming or artificial intelligence, and voice-input computers (which Borkin claims "need much more work before they're viable").

Borkin thinks that the development of new spatial concepts remains the next step in computer research. "Geometric computer models allow us to perform new operations on architectural space—to subtract one space from another, to weld, shift, intersect spaces. All of the tools are in place, but we've only begun to explore their design implications. I'm excited about the possibilities." [TF]

Cornell University
At Cornell's Program of Computer Graphics, established in 1974 and directed by Donald P. Greenberg, basic research is carried out in graphic input and graphic display techniques, as well as collaborative application research in areas such as structural engineering, medicine, animation, geological sciences, astronomy, and architecture.

Computer graphics research topics include modeling, visible surface algorithms, color science, and realistic image synthesis. The modeling routines (not illustrated here) use primarily vector display technology and are useful, says Greenberg, at the preliminary design stage.

But the program's most spectacular current research has been dedicated to the simulation of realistic images, as illustrated on these pages. An environment is geometrically modeled on the computer, material properties are assigned to the surfaces, viewing parameters are established, and the visible scene is computed using "ray-tracing" to simulate on raster video display devices the propagation of

The Cornell graphics indicate the degree of realism that can be attained currently. Features to be noted include diffuse and specular reflections, intra-environment reflections, transparency and background effects, and textures. The problem of aliasing (or jagged lines) has been minimized by increasing the image resolution and by assigning an average of the adjacent colors to pixels (picture elements) that straddle a boundary line.

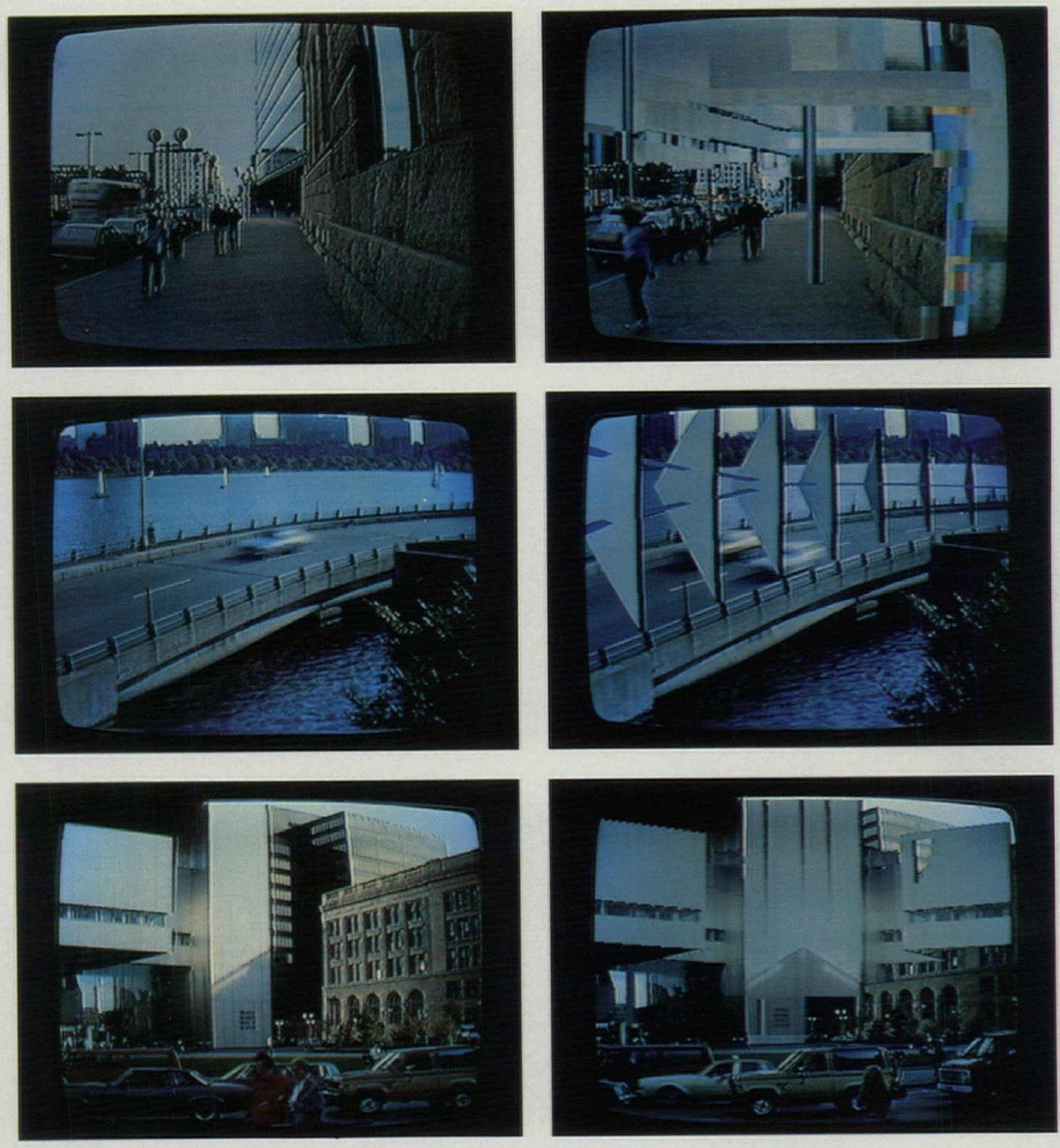
light through the environment. Color intensities, explains Greenberg, are computed using a light reflection model, which accounts for the spatial and spectral distribution of light-emitting sources, as well as the texture and surface finish of the materials.

The realism of these constructed images renders them valuable to architects as visualization aids in the design stage and for presentation to clients. They can also be combined with scanned photographs, and can be used in a system that integrates other architectural data bases and operations such as structural, energy, and cost analyses. They are therefore potentially more intelligent and architecturally relevant than the computer animation techniques developed by movie mogul George Lukas (and Greenberg claims to have captured the behavior of light better than Lukas has).

Greenberg's most important product—trained graduates—has been providing leadership in computer-aided design in architectural offices, academia, and industry for many years. [SD]

MIT

MIT has been a pioneer in the use of computers for graphics from the very inception of the technique. In the early 1950s, solutions to differential equations were being displayed on a cathode-ray oscilloscope in its Lincoln Laboratory. In 1962, MIT's Ivan Sutherland developed the SKETCHPAD system, giving birth to interactive graphics. At the end of that decade, Nicholas Negroponte came to prominence with his publication of the book *The Architecture Machine*, in which he discussed research and theories in computer graphics and in artificial intelligence, and proposed an architect-machine partnership, with machines that would be able to learn, evolve, self-improve, and discern shifts in context. The Architecture Machine Group was established and has since evolved, and now deals with a range of man/machine matters far broader than that relating to the architectural profession, but which includes several architecturally relevant ones, discussed below. Negroponte returned to MIT over a year ago, after serving as director general of the French Center for Computers and Human Resources, and is now director of the Media Lab,



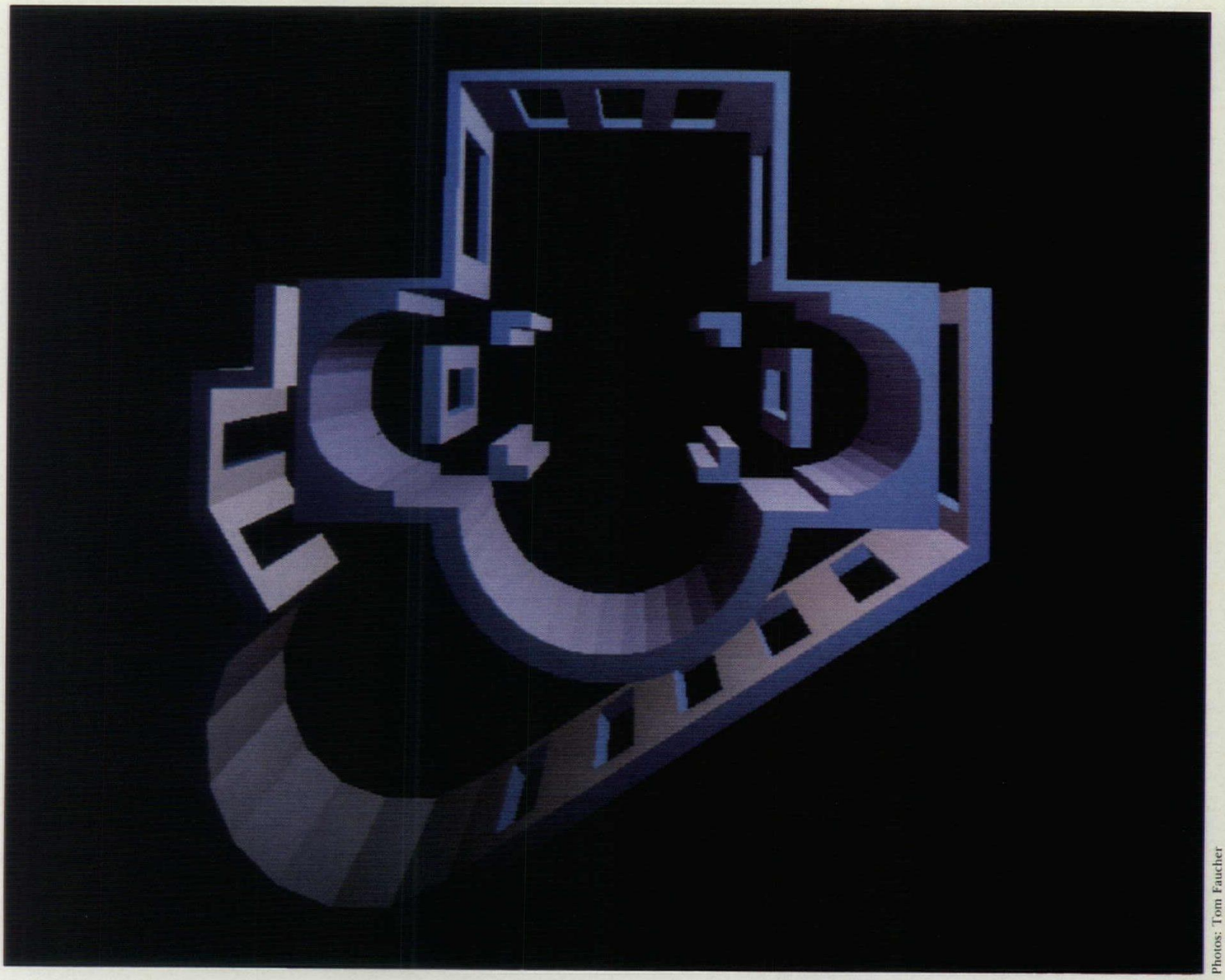
Stills from a videotape produced by Tyler Peppel at MIT's Visible Language Workshop, using computer graphics in combination with live action video. Frames from a videotape of various urban scenes were digitized at a resolution compatible with the video tape, stored in the computer memory, keyed to the original video scene, and manipulated in various ways, thereby allowing a free restructuring of the analog environment by overlaying the digital manipulations. New structures can be added, others taken away, others changed in shape or color, others enlarged by repetition of their parts, digitized photos or drawings or programmed imagery added. Motion can be simulated through the use of digital fades or dissolves.

the research arm of the Arts and Media Technology Program for which a new building by I.M. Pei & Partners is now being completed. The Media Lab is devoted to advanced research in broadcasting, publishing, and computing, and their overlapping uses in education, entertainment, and scientific pursuits. It is composed of ten groups, including imaging arts and sciences (computer graphics and animation, holography and holographic movies, high-definition television, and modern print media), human-machine interfaces, and computer music and drama. The Architecture Machine Group, directed by Professor Andrew Lippman, is a unit within MIT's School of Architecture and Planning, and its program of research will be incorporated into the Media Lab.

One project developed by Tyler Peppel of the Visible Language Workshop combines computer graphics and live action video (see next page), and can assist in the redesign of the urban environment. A video representation of an urban scene can be altered by using digitized frames from that video sequence or from other digitized sources (photographs, drawings, programmed images, and other videos).

Professor Patrick Purcell and Art Historian Henry Okun of the Group have also been developing a video library, or graphics information system, for architecture, called Archfile (as well as Picassofile, a prototype for the fine arts) in which the optical video disc is linked with the interactive data base. The architectural data base currently comprises over 5000 building records from MIT's Rotch slide collection, which the user can see as video images on a color monitor according to classifications selected on a touch-sensitive screen (all buildings in Connecticut after 1890, all schools in the U.S. by Aalto, etc.). As the selected video images are being projected on one monitor, basic reference materials concerning those buildings are being displayed on the other screen.

The Group has also developed "how to" manuals (how to repair a car, for example) that combine movie film and text and are activated by touch; Alter Ego which can, among other things, read electronic mail messages, talk to you (in a computer-produced voice that sounds like a hoarse toad), and pass on mes-

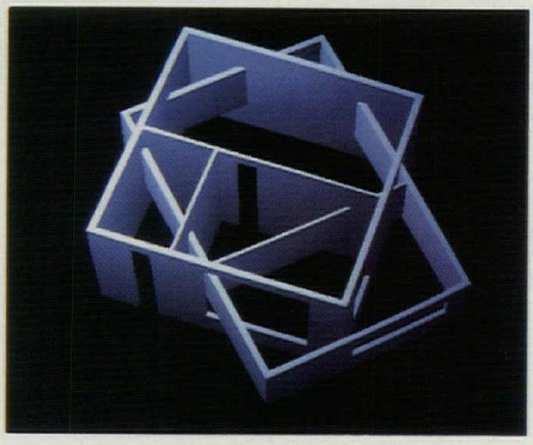


Photos: Tom Faucher

sages to you—*if* it recognizes your voice; and other programs. Professor Purcell has also prepared a "Strategy for Computer Education in a School of Architecture," part of the Athena Project, a major initiative on the MIT campus linking computers and education, and is presenting a new course for architecture students, covering digital modeling, information processing, and calculation, in a new Computer Research Laboratory of the School of Architecture and Planning. [SD]

Ohio State University

Ohio State's School of Architecture requires that every student take an introductory course in programming and graphics. For those who wish to continue, there are three elective courses in the development of computer-aided design tools—not simply computer graphics. Says Professor Chris Yessios, who heads the school's computer laboratory, "There's a considerable difference between those schools that teach computer graphics as an end in itself and those that view it as a design tool. The graphics-oriented schools have produced some amazing computer images, but they've moved away from the needs of the architectural profession."



Ohio State's master's degree program in computer-aided design involves about an equal number of architecture, computer science, and computer-aided design courses. Current thesis work includes software that, from a table of room adjacencies, develops bubble diagrams and schematic floor plans from which the architect can then select and manipulate; software that quickly builds up three-dimensional models from a library of

Ohio State's computer lab has developed a geometric void modeling system (left and above) that generates primitive objects (cones, cylinders, etc.), transforms those objects, and composes them (through union, intersection, and subtraction) in ways that reflect the designer's methods and stylistic preferences. Two-dimensional architectural drawings are generated as a by-product of the three-dimensional void model, allowing any changes made in one drawing to be reflected automatically in all others. Current research in geometric modeling (also going on at Michigan and Carnegie-Mellon) includes texturing the model, animating it, and linking it to data bases and expert systems that can perform everything from simple calculations to complex analyses.

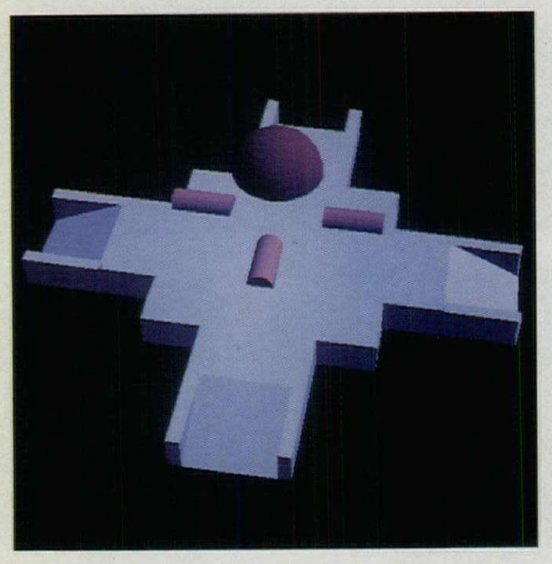
shapes; and software that generates lettered and dimensioned plans, sections, elevations, and details rapidly by zooming in or slicing from those models.

That software will form the basis of a computer-aided studio to begin in September. "Computerizing the design studio," says Yessios, "has become a fad, with several schools that have done little computer work up to now buying CAD systems. That won't work. The commercially available software is just not adequate for design education; you must develop your own, which takes time and an experienced faculty." [TF]

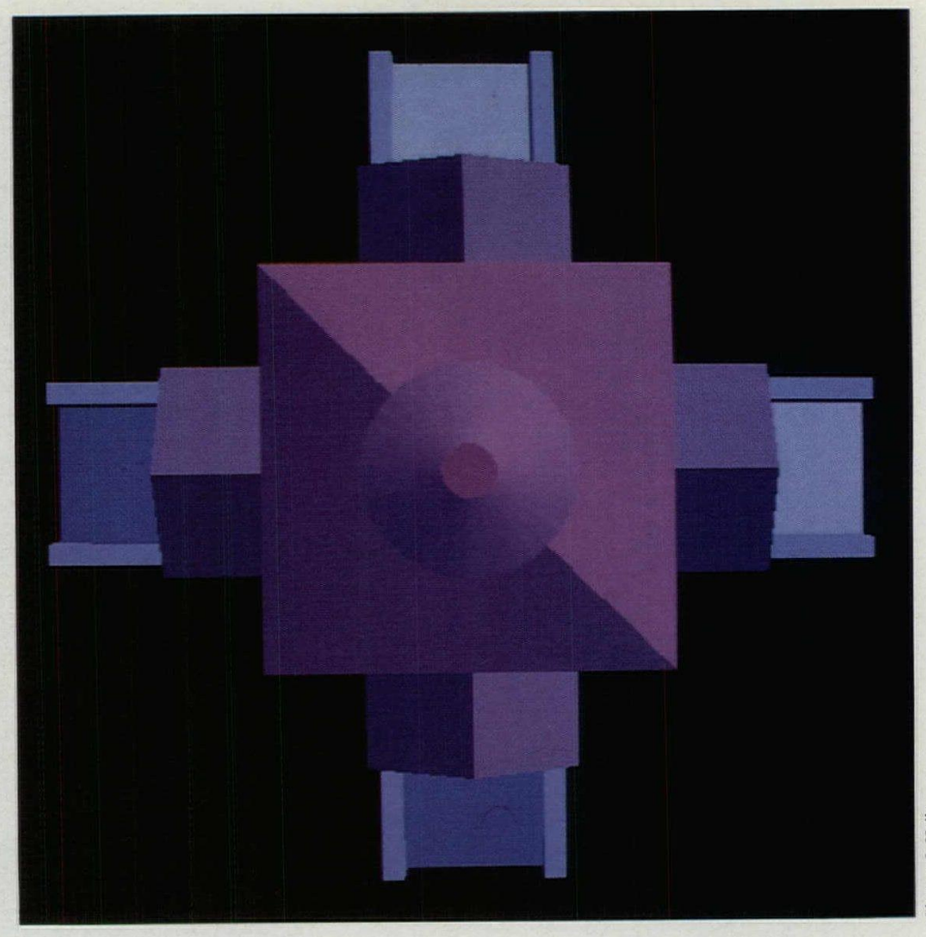
University of California, Los Angeles

UCLA's graduate school of architecture offers two introductory computer courses that most students take. The school emphasizes the importance of concise, elegant, well-written programs, taught through a series of exercises that generate increasingly more complex drawings using Pascal programming.

Completion of the two introductory courses allows a student to enroll in a computer-aided design studio that will explore the effect computers have on design. As Professor William Mitchell, head of UCLA's architecture and urban design program, states, "Some people fear that computers will limit their creativity. If there are any limitations, they are due not to the computer itself, but to a lack of understanding of it as a design medium."



Research at the school has focused on the programming of various formal languages: "Students have developed a program that will generate Usonian house plans based upon Frank Lloyd Wright principles. The same could be done for Le Corbusier, even Gaudí. By modeling the compositional ideas in their work, the student understands it in a different and more profound way," according to Mitchell. He also sees the computer "increasing architects' sensuous involvement with a design by allowing them to experience a building more fully than is possible through drawings or models" as well as "providing architects with more time to explore design options and details." [TF]



Photos: J. Heile

UCLA leads students through a series of graduated exercises in PASCAL programming that results in some sophisticated graphics (left and above). The students develop simple vector drawings, compose them to form a vocabulary of architectural elements, and develop constructs that repeat elements, set conditionals, and nest elements within each other. As a culminating step, the students learn how to express the vector drawings as data structures, allowing them to manipulate the drawings more efficiently. They then develop, as the final class exercise, a program that draws a fairly complex building, with grades established not only on the quality of the drawing but on the elegance of their programs.

Carnegie-Mellon University

"Carnegie-Mellon has completely reoriented its architectural curriculum around the computer," says Professor Robert Woodbury. "We've done so with two premises. First, architectural education has needs other than those of industry, which has used computers essentially to increase productivity and efficiency. Second, the architectural profession is undergoing major structural changes because of the computer, allowing us to generate and evaluate far more data than ever before possible and forcing us to be more explicit about design decisions."

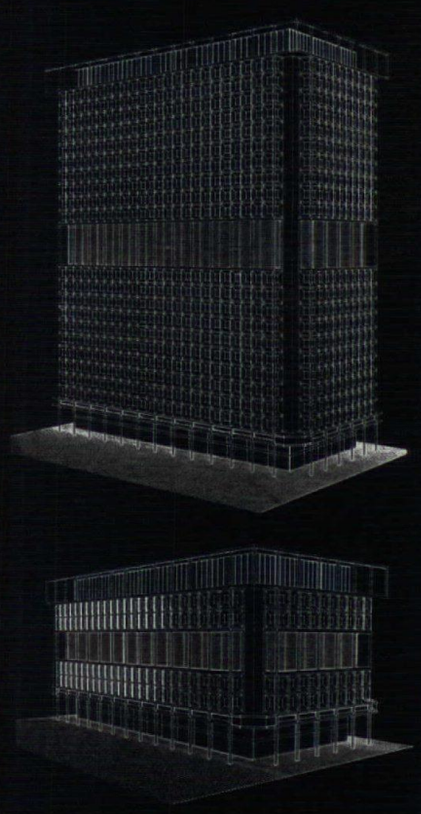
Carnegie-Mellon mandates that architecture students take courses in programming and computer modeling. And the school uses computers in its various technology courses, with a trial computer-aided design studio scheduled for next year and the complete computerization of studios scheduled within the next four years. "The goal in studio," says Woodbury, "will be to make the design process more explicit and to show students where different software fits into that process."

Of the research going on by faculty and graduate students in the master's and Ph.D. programs, two areas stand out. One involves the development, says Woodbury, "of software that makes using the computer as facile as using pencil and paper." The other, spearheaded by Professor Ulrich Fleming, involves software that rapidly generates and evaluates design alternatives. [TF]

Procedural modeling in CAD

While accepting the value of user-friendliness, Columbia University's Christos Tountas argues that most CAD systems underexploit the computer's power in exchange for it.

Impressive though it seems at first, interactive computer graphics, such as that making use of a digitizing tablet and stylus or cursor, for example, creates drawings that use very little of the capability of the computer. Many of the spatial manipulations an architect should be able to do require a parametric model, that is, one on which adjustments can be effected by changing just one number or a relationship, as with an accountant's spreadsheet program, and with a word processor. Economists, engineers, planners, businessmen, all use intelligent parametric models on their computers. Only the architect's interactive CAD system is dumb: It is not parametric, because this important capability has been sacrificed in return for the user-friendly, like-pencil-and-paper interactive drawing interface. Interactive CAD is only powerful and intelligent as an input medium of drawings; but the internal representation of these drawings lacks the structure necessary for subsequent powerful transformations or for an organic connection between two-dimensional and three-dimensional representations. (An intelligent computer model of a structure is not just a three-dimensional drawing, but a representation of the essential elements and internal relationships of a system that allows relevant manipulations and "what if" explorations to be performed easily. An intelligent model is necessarily parametric; nonparametric representations have about as much intelligence as drawings made by hand.)



These two buildings, and any other variation, were produced by one set of parameters. No redrawing was necessary—only the value of a few parameters was changed to create the alternative. The illustrations were produced on the GSDL system by Christos Tountas and Rupert Maddock.

Beyond eliminating the possibility of intelligent models, the interactive graphic interface makes anything other than two-dimensional drafting harder than it should be. Three-dimensional modeling, for example, is cumbersome with tablet and stylus except for the simplest types of models.

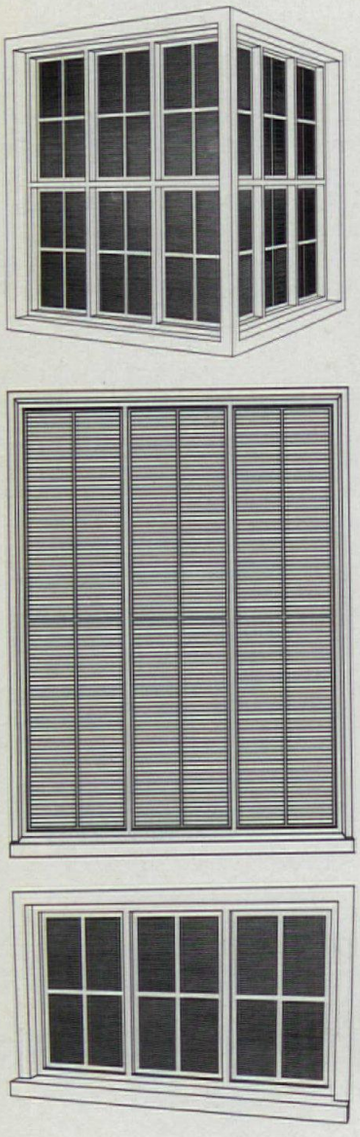
Although computer-aided drafting is faster than manual drafting, many have expressed doubts that any significant economy is achieved when the CAD system's cost is considered. It is CAD's other promise—that it can go beyond drafting and help in the design process—whose fulfillment would make the real difference.

The alternative to interactive graphic input is to describe a model in a "procedural" design language that the computer can understand. With such a language, one writes procedures (symbolic programs) that create the desired result in their execution. The power of this approach comes both from its ability to represent numbers as symbolic parameters (whose values may be changed every time the procedure is executed) and from the flexibility with which spatial and other interdependencies can be specified. Procedural design languages can be either "low level," requiring considerable programming effort, or "high level," incorporating enough prepackaged capabilities for a particular type of application to make modeling much easier. Using a language implies typing model descriptions on a keyboard, usually with no immediate visual feedback.

The mere mention of the word "language" evokes protests (architects will not be programmers) and brings us back to square one. After all, it was the interactive tablet that broke the architect's resistance to the computer in the first place. But some of this resistance is based on a false perception: It is thought that interactive graphics is the most advanced, the most powerful, the most sophisticated way of interacting with the computer. It is not; it is simply the easiest, the most user-friendly. If we consider the capabilities that are sacrificed for this user-friendliness (and the associated opportunities for cost saving), other alternatives quickly become more attractive. To be sure, this is no argument for the elimination of interactive input. That will always have its place, and it is superior for many applications (tracing maps, elevation contours, existing or fixed structures, as well as menu selection). But for any design activity involving exploration of alternatives, frequent changes, integration of 2-D and 3-D modeling, and flexible quantitative evaluation, it is a very limiting technology.

Parametric models specified in procedural languages can make full use of the computer's capabilities and actually deliver all functions promised by CAD in an integrated way. Rough models can be built in the design phase to evaluate alternatives, and they can easily produce plans, elevations, perspectives, statistics, and reports of any desired type (not only item counts preprogrammed into the system by its vendor). Data can be produced in whatever format is required for further analysis (structural, environmental, landscape, etc.). Models can be structured in ways appropriate to a particular project. There need not be any distinction between overlays, for example,

These windows (and an infinite number of others) are generated by a procedural modeling system without any drawing necessary. A standard library procedure is called up, and the value of a few parameters varied.



and object libraries. Procedures can perform any mixture of these functions, and more: They can incorporate project-specific user dialogue, numeric or qualitative attributes of any type, menus, and so on. Modifying one parameter can cause all drawings to be automatically adjusted and redrawn. Although no system, parametric or not, will be able to handle every global modification with the same ease, a parametric model that has been constructed by someone who knows the constraints and negotiables of a particular design project will provide maximum modification and exploration flexibility.

Procedural modeling systems have other advantages: They require less expensive hardware, since there is no need for costly interactive workstations for every user; they make possible very flexible and powerful three-dimensional modeling, which can be integrated parametrically with two-dimensional plans containing a different type of detail; and they can make use of viewpoint-specific information (where appropriate) to optimize hidden-line computations, thus making possible the use of smaller and cheaper hardware. In terms of final presentation, the same display devices and techniques (plotters, color-shaded images, etc.) are available with procedural systems as with interactive ones.

In a procedural modeling environment, libraries of standard objects are also parametric, and each item can yield a much richer variety of instances than is possible with nonparametric libraries. A window procedure, for example, can be made to generate a large variety of windows differing from each other not only in size and shape, but in many other ways as well. With an interactive system, it is generally possible only to scale an object up or down or to stretch it in a particular direction. Such operations seem impressive at first, but are in fact only seldom useful because there is no selective control over which features of an object could be scaled. (A larger window need not necessarily have a thicker frame, and a larger door probably does not need a larger doorknob.) Stretch operations are particularly dangerous because they do not preserve equal-width dimensions, so usually only simple rectangles can be used with such interactive transformations.

The only disadvantage of the procedural approach, and it is an important one, is that it is not user-friendly. Passing from signs to symbols is always a transition involving some effort, but bringing superior results. Procedural modeling requires more training and analytical skills on the part of the modelmaker. But it is perhaps not unreasonable to accept a higher level of required training on the part of the modelmaker as a price to be paid for significantly greater capability.

Such words are not likely to offer comfort to those who already have some fear of the computer. In most real situations, however, CAD systems are used productively only by specialized and trained operators—often a selected group of architects within the office. When architects find that procedural models can give them significantly greater power in exploring spatial alternatives and integrating all their operations, they may well get a different sense of what "user-friendly" really is.

A computer-literate modelmaker can actually set up procedural models which themselves provide highly interactive interfaces. These are interfaces not to the modeling system, but to the model itself. For example, menus can be presented incorporating items or operations specific to a project. Even untrained users can then use such models to explore alternative configurations much more meaningfully, easily, and powerfully than could ever be possible without a parametric model. The power and ease of use of such model-specific interfaces depends, to a great extent, on the talents of the modelmaker, who always serves as the intermediary between the design team and the computer.

The complete dominance of interactive graphics has not created many opportunities for research into the full potential of procedural and generative systems. CAD vendors are happy with flashy systems that seduce and amaze their prospective clients, whereas university researchers have mostly passed up the topic of man/machine interface in pursuit of the elaboration of the latest display hardware capabilities (realistic color renderings, interactive videodiscs, etc.). Certain types of procedural languages are used in research environments, and others are offered as part of the better CAD systems, but they are often either ad hoc tools or limited supplements of the interactive interface, not meant as primary modeling tools for an architectural environment. In many cases, the languages offered are carryovers from electrical engineering applications (the origin of most commercial CAD systems). The development of powerful and easier-to-use procedural CAD languages appropriate for architectural applications has received relatively little attention. As the field matures and the issues and tradeoffs become clear, however, we can probably expect that procedural languages will be used increasingly to make computers intelligent modeling tools rather than just fancy drafting aids. [Christos Tountas]

Christos Tountas *is an adjunct assistant professor and senior staff researcher at Columbia University. He is also president of Graphics Information Systems Technology and is the creator of the GSDL procedural modeling system, with which the drawings shown here were made.*

Minding your VDUs

The computer places demands on the office worker and on the office environment. How to meet those demands and not lose sight of people's needs is the challenge.

A quiet revolution is occurring within interiors, a phenomenon that has nothing to do with the current stylistic debate over post- or neo-. Rather, it focuses on the rapid growth of office automation, predicted to affect 100 million users by the turn of the century.

Not only is the computer changing the way work is performed, but the space in which it is performed. The typical office hierarchy of the executive in the corner office with a secretary and support staff down the hall is becoming obsolete with the instant communication of electronic equipment. Function is no longer dependent on physical proximity.

But all is not well in the land of the VDU. (Video display unit is the preferred term of the computer industry; VDT refers only to the terminal and not the keyboard; CRT for cathode ray tube is no longer the only means of display.) A counterrevolution has begun by white collar workers who are finding out that using a VDU results in repetitive work and that their environments are uncomfortable and poorly designed for automated jobs.

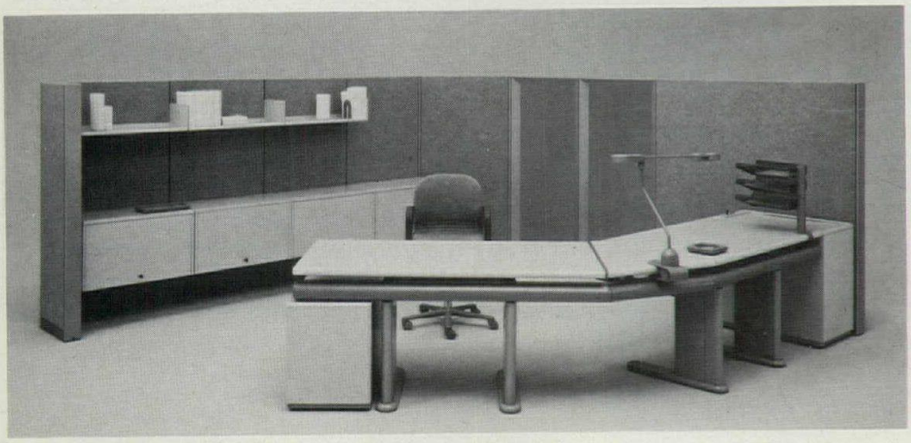
States Karen Nussbaum, president of Working Women: "Despite the glowing, science-fiction-like descriptions of the office of the future, we find it is little more than a re-creation of the factory of the past, complete with piecework, monotonous tasks and incredibly high rates of stress."

The increasing numbers of VDU-related complaints, ranging from eye and back strain to headaches and depression, have spawned numerous studies both in this country and abroad to determine methods of coping with physical and emotional ailments. Legislation governing the use of VDUs has been proposed in 12 states, calling for mandatory occupational safeguards such as eye exams, work rotation, and adjustable furniture. Computer-related hazards also are being scrutinized by a U.S. House of Representatives subcommittee on health and safety for possible federal action.

Adoption of computer technologies results in a variation of spatial and functional changes in the office, as indicated by this chart (right), adapted from a study of two major U.S. corporations. Because of the constant change in computer hardware and VDU user demands, some furniture manufacturers have turned to European imports, designed to strict ergonomic standards. Examples of this trend include the ACM system from the German firm Voko (available through Probber, below), the German King Alpha system (Koenig + Neurath), and Italian-designed Com (available from Krueger, preceding page).

DESIGN OF THE AUTOMATED OFFICE

	CONVENTIONAL OFFICE	AUTOMATED OFFICE	POSSIBLE DESIGN IMPACT
INFORMATION/MANAGEMENT SYSTEMS			
Record storage & management	Paper files	Electronic files, Limited paper,	Less space for file cabinets Added electronics require added cooling load
Internal mail generation & distribution	Paper	Electronic	Smaller mail room, more electronics
Document distribution	Typed copy	Optical Character Recognition devices (Hard copy readied for electronic distribution)	Need for physical separation of system due to noise, special acoustic design
Document preparation	Separated functions; Manual typing, artwork, graphics	Centralized and electronic	Large work station for preparing documents
Organization of activities	Specialized and decentralized	Work stations — clerical, managerial, professional	Change in adjacency locations — e.g., management-secretarial More electronics and capability to access information from various sources
Expansion of capabilities	Space set aside	More power, wiring to accommodate future needs	Added capacity for electronics power; plan for "local" cooling
Planning activities for organizational needs	Minimal necessary	Detailed planning of systems essential, building, mgmt, communication, info.	Much greater need for detailed architectural programming activity
POWER SYSTEMS			
Emergency power	None	Batteries, Generator— Support for electrical equipment during outage	Additional space, special venting systems, fuel storage, special flooring for acid, fuel runoff; fire protection, security
Wire distribution techniques	Conduits Under floor systems In-wall outlets	Flat wire cables under carpet; Raised floors	Increased size of floor/ceiling systems Less power load per local circuit, more runs Changed wire closet space Special protection for cables
OFFICE TECHNOLOGY BASED ACTIVITIES			
Typing	Electronic typewriter	WP system	Glare free lighting, additional workspace
Communication-individual	Telephone, mail, memos	Electronic mail	Video display terminal, wiring
Filing	Paper files, individual	Centralized data base	Specialized computer facility — raised floor, clean, emergency power, less paper storage space
Facsimile production	Hands-on duplicating	Duplication at a distance — FAX machine	Specialized facility to accommodate a variety of devices, acoustic treatment, cooling
Reading	Paper copy	VDT's, microfiche	Special lighting, additional desktop area for more equipment



Ergo, ergonomics

While the research concerning VDUs is fraught with contradictions, most studies indicate that furniture and lighting are the most crucial elements to the successful integration and worker acceptance of office automation. Corporate employers, however, have been reluctant to spend money on design: only 2 percent of their expenditures go to equipment. On average, a white collar worker uses $2500 worth of equipment, far less than a farmer or factory worker. Yet effective office design has been calculated by the Buffalo Organization for Technological and Social Innovation (BOSTI) to save $1600–1700 per year for

every manager or professional employee. In marketing their products for the computer, the furniture industry also has produced its own studies to prove that high quality design results in high productivity.

As the fastest growing segment of the furniture market, computer support products are available in a vast array of shapes and sizes. This diversity reflects the fact that there are no U.S. standards governing design, manufacture, or correct use of computer support furniture. But pressure from white collar unions is forcing the industry to develop voluntary standards. The American National Standards Institute (ANSI) currently is working on guidelines for VDU operator safety that will be released sometime next year.

Manufacturers of both computer hardware and support furniture are wary of too much regulation within an industry known for its seemingly overnight innovations and entrepreneurial chutzpah. Some experts point out that the much-touted European standards such as the German DIN are written for the clerical/dedicated user who spends the entire day working in front of a computer screen. They claim that the standards, requiring flat keyboards to be positioned in front of the screen, and frequent work breaks, are not realistic for computer applications within the American office, which include occasional use by higher levels of management.

And while ergonomics has become the buzzword within the industry, even the human factors experts cannot agree on the "correct" dimensions for comfortable furniture. For example, one European study (Cakir, et al., 1979) recommends that the height of the home-row keys on a computer keyboard be 28¼–29½ inches (720–750 mm), while the U.S. military standard specifies a working surface height of 29¼ to 31 inches (740–790 mm).

As Don Korell, Director of Research for Steelcase, Inc., says: "Ergonomics is as much an art as a science." Adds Jon Ryburg, Senior Associate of the Facility Management Institute and a contributor to the newly proposed ANSI standard: "Just because you are using a VDU doesn't mean you necessarily need so-called ergonomic furniture. Ergonomics becomes really important when you are spending over 30 percent of your time at the computer."

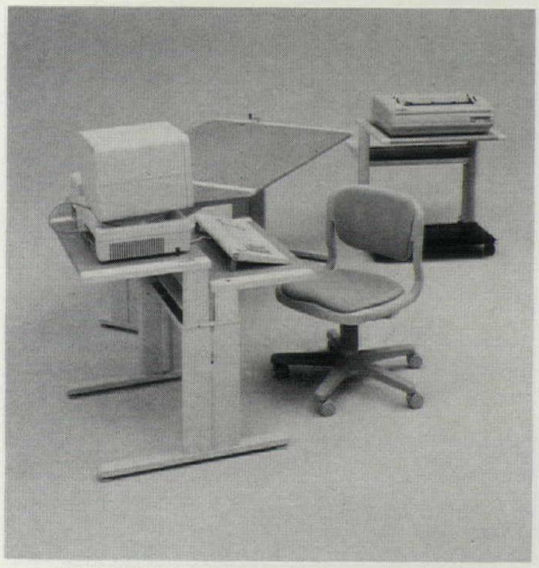
Hesitant to spend large sums for research and development of products for a rapidly changing technology, manufacturers have approached the design of computer support furniture conservatively. They are revamping their systems furniture lines with components such as angled platforms placed below desk height for the terminal, keyboard drawers, tilting work surfaces and ergonomic chairs (see P/A, May 1980). Adjustable VDU stands and acoustical housing for printers are other typical additions to systems furniture.

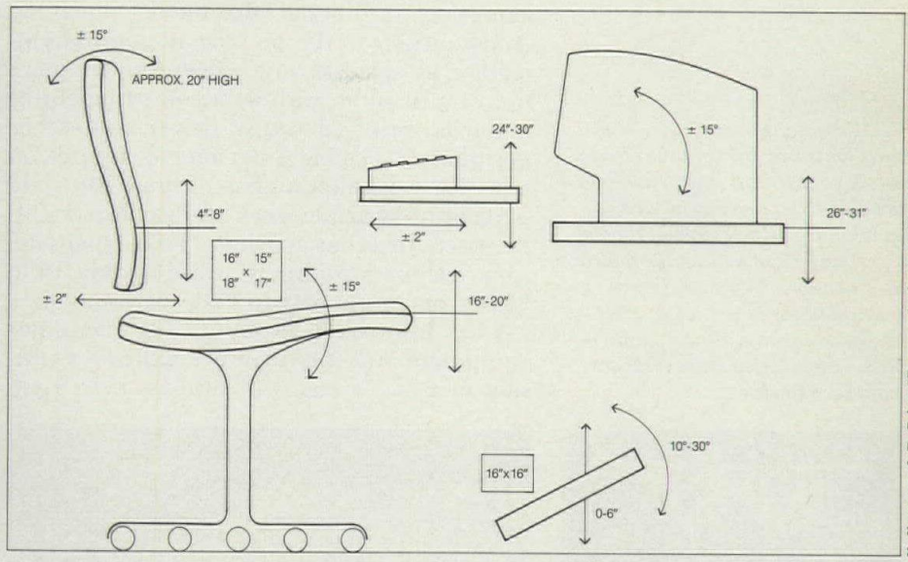
Like the automotive industry, systems furniture manufacturers are witnessing a large influx of foreign imports, designed to strict, government-controlled standards as a result of lobbying by strong white collar unions. Many of these products not only offer a high degree of adjustability but also tend to boast playful, colorful, and imaginative designs for their technical applications.

In addition to foreign imports, the manufacture of furniture by computer firms for their own hardware (IBM's Synergetix line is one example) is forcing conventional furniture firms to introduce computer-support products rapidly in order to keep pace within a highly competitive marketplace.

Despite all the choices on the market, the computer continues to be treated as a traditional office fixture sitting on a desk, like a typewriter or telephone. Many product designers and manufacturers feel integration of computer hardware into furniture must become the wave of the future in order to increase operator comfort and environmental control. As a result, several major furniture companies are scheduled later this year to introduce workstations that incorporate equipment, signaling the start of a new generation of systems.

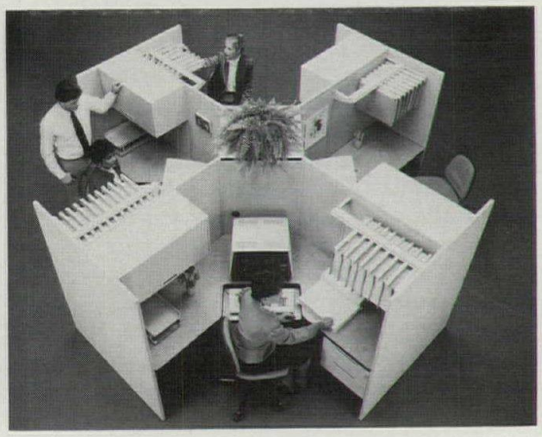
Workstations with separately adjustable surfaces for the computer terminal and keyboard are fast becoming integral parts of systems furniture. The Swedish-designed DataBord 920 line (available from Krueger, below left) features a work surface that adjusts vertically up to seven inches and horizontally up to six inches. One suggested range of dimensions for the comfortable operation of computers (below) requires adjustments to terminal, keyboard stand, footrest, and chair.





K. Kroemer & D. Price, "Ergonomics in the Office: Comfortable Workstations Allow Maximum Productivity," *Industrial Engineering*, July 1982.

The U.S. lacks standardized VDU-related components. Open office workstations typically have angled surfaces for terminals and lower drawers or platforms for keyboards (Shaw-Walker, right). Other options for housing equipment include clustered workstations with a central utility core (Tab, below right); furniture adapted for a specific computer system (Wright Line's IBM PC workcenter, below); and wall-mounted VDU supports (Tumac Industries).



VDU stands, printer closets, and carts for transporting hard copy are becoming standard fare in addition to panel-hung components and workstations. Knoll's system (below right) includes a kit to support local area networks. Wiring raceways must allow for power, data, and telephone cabling; Kinetics Powerbeam system (below) uses them as a major design element.

Spatial flexibility

As the automated office becomes more commonplace, its occupants are discovering that the paperless office is a myth. In fact, computerization initially may create more paper, as "hard copy" is generated by printers alongside traditional document shuffling. And contrary to the popular notion of automation as space-saving, the computer takes up a lot of room with its accompaniment of manuals, print-outs, disk drives, and other peripherals. Placing a personal computer on top of a workstation can consume 30 to 40 percent of available work surface, leaving little space for other activities. To compensate, some planners routinely advise adding 10 to 20 percent more space to VDU workstations.

The fast-paced evolution of computer equipment and the furniture industry's revision of office systems to support new hardware is forcing the architect to adopt a flexible approach to space planning, furnishing, and building systems. As BOSTI Director Michael Brill concludes in his study of over 4000 office workers: "If furniture is flexible but the building is not, flexibility is compromised. Systems furniture generally provides more flexibility than our buildings do. This may be a waste of systems capability purchased at some cost."

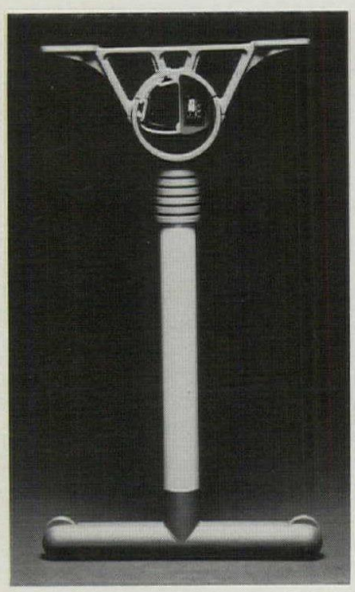
Although architecture needs to be flexible, it must convey a memorable identity. Francis Duffy, author of the 1983 "Orbit Study of Information Technology and Office Design" found that with the erosion of the traditional work day through job sharing, part-time work, and at-home computer operation, "a stronger manifestation of the physical boundary of the office, with emphasis on security and screening, will be needed to compensate for the irregular and uncertain comings and goings of its occupants."

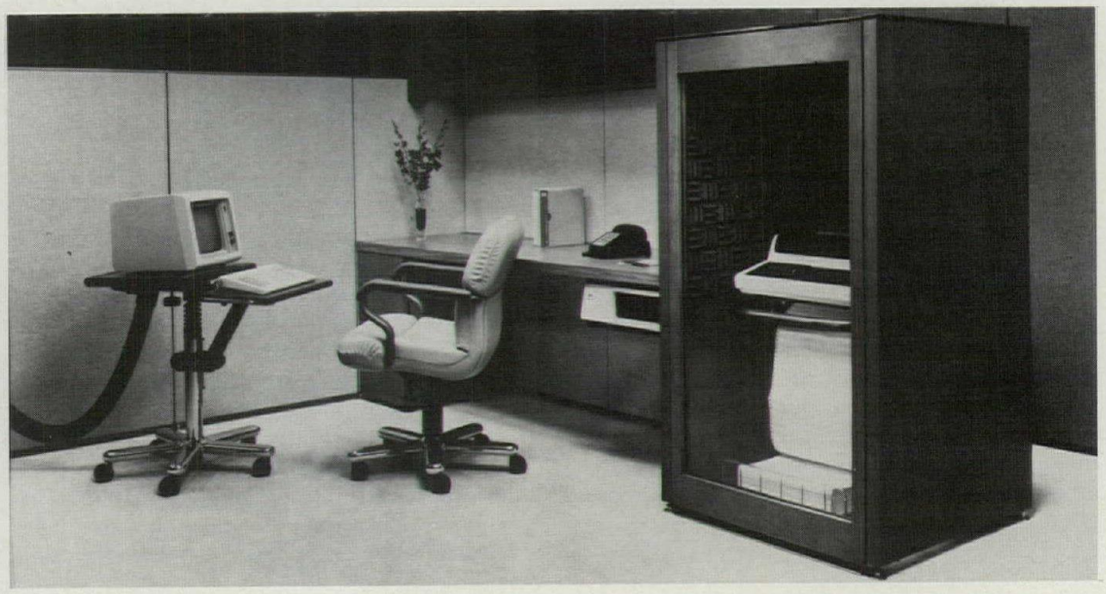
Change in the automated office is required less at the building level and more at the level of the individual workstation. According to Brill: "We may see a trend to less relocation due to the nonspatial nature of electronic communication and more reconfiguration of workstations to accommodate human factors and workstyle differences."

Wire management

But a major impediment to flexible design of computerized offices is cabling. At the workstation, vertical and lateral raceways to hold power, telephone, and data wiring are now standard features; some systems boast raceways as major design elements. Problems occur when these wiring systems are connected to existing cables, often resulting in choked ducts and poor access to trunk lines.

In alleviating the proliferation of tangled wiring, local area networks (LANs) are gaining popularity, and are predicted to grow from 6000 systems currently in use to 22,000 systems by 1990. LANs are in-house communication systems comprised of coaxial, fiber-optic, or twisted wire pairs. They have the capacity to link different computer devices to a single central processing unit for file





transfer and peripheral sharing, eliminating the need for separate communication systems within an office (see page 167 for examples of other "intelligent" building systems).

The major advantage of LANs is that they preserve the independence of each workstation while enabling users to share information and peripheral devices. On the negative side, their network configurations may create a restrictive office hierarchy. The star network in which all devices are connected to a central multiplexer emphasizes a centralized decision-making structure. The circular ring and linear bus configurations stress a decentralized system. In adopting these networks, architects should arrange office layouts carefully to establish user priorities.

Methods of power distribution are equally varied in their potential to aid office flexibility, and include raised access flooring, flat cable, integrated floor ducts, ceiling distribution, and poke-through access. Access flooring, practical in offices in which over half the employees use VDUs, provides a high degree of flexibility, but is the most expensive of these systems. Flat wire generally is recommended in retrofitting existing methods of distribution or as a supplementary system (see P/A, July 1983). The other methods are less costly, but are restrictive in their ability to be frequently changed.

Lighting design

Of all the environmental factors affecting office automation design, lighting is the most critical. Studies of VDU users invariably cite complaints of glare, eyestrain, blurriness, and other problems related to vision.

And no wonder. Not only must lighting in computerized offices illuminate the VDT without glare or reflections, but it must emit enough brightness for traditional desk-top work, filing, and other office activities.

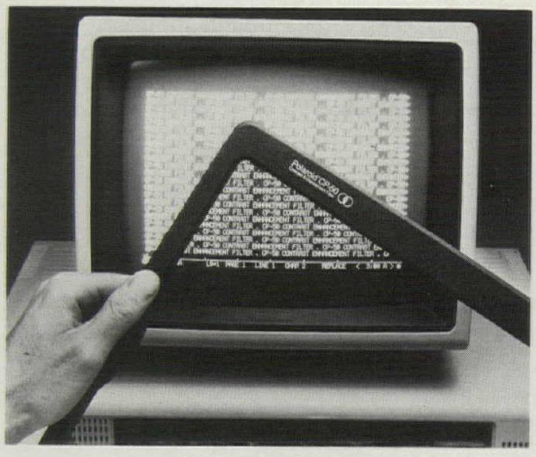
Working at a computer screen and reading printed copy lying flat on a horizontal surface also require the consideration of two different sets of human factors. Conventional lighting assumes a worker's sightline to be 20 to 40 degrees lower than the horizontal, a distance of 16 inches between the eyes and printed copy. Working at a VDT (a light source in itself), however, necessitates an operator's line of sight to be 24 inches from the screen, at or near the horizontal, thus closer to ceiling fixtures and potential glare.

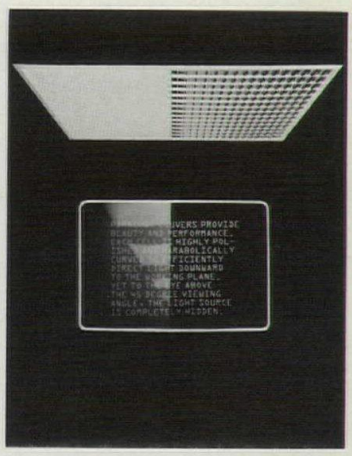
The most common way of striking a balance between both working conditions is to shield ceiling-mounted fluorescents with low-brightness baffles, parabolic louvers, or lenses that narrow the distribution of light to a 90-degree cone. The drawback of these systems is that the ceiling appears much darker than surrounding walls, creating a gloomy atmosphere throughout an office. And if open-plan panels are moved, the relationship betwen the work surface and distribution of light on that surface is altered, diminishing the effectiveness of the original lighting design.

Another alternative is to incorporate uplighting within the systems furniture—fixtures manufacturers refer to it as task ambient. The advantage of this type of illumination is that when the furniture is moved, the lighting goes with it, conforming to new workstation configurations. Its disadvantage is that, as reflected light, it requires a higher level of output to achieve the same amount of brightness as ceiling-mounted fixtures. The brightness of uplighting depends on a ceiling's reflectance value. Also, hot spots on a ceiling from metal halide or high-output fluorescent lamps can result in veiling reflections and VDT glare.

For controlling light at the workstation, adjustable task lighting remains the most flexible solution (the ubiquitous Luxo works fine). Lighting consultant Sylvan Shemitz has patented several two-fixture designs for lighting the VDU. One lamp with reflector directs light at the surface behind the screen, and another is aimed at the keyboard.

In addition to lighting fixtures, daylight is a potential source of glare and irritating reflectances, especially in frequently relocated open office areas. Apart from blocking views with heavy curtains, an effective way of screening daylight is to install fiberglass mesh blinds. Coated with Mylar on the outside, they reflect light out the window while permitting views through their gauzy surfaces. Windows with tinted, glare-free glass also are recommended. Whatever the treatment, VDUs should never be positioned directly in front of any window.





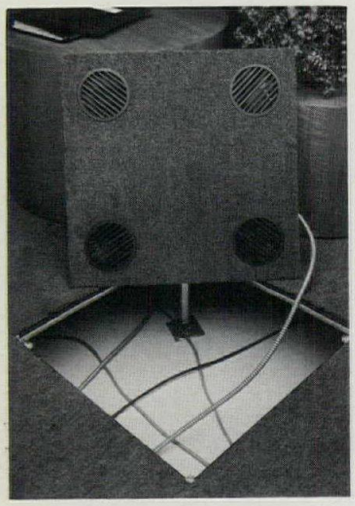
Parabolic louvers placed over ceiling-mounted fluorescents (American Louver, above) and polarizing filters (Polaroid, above left) are common ways of controlling glare.

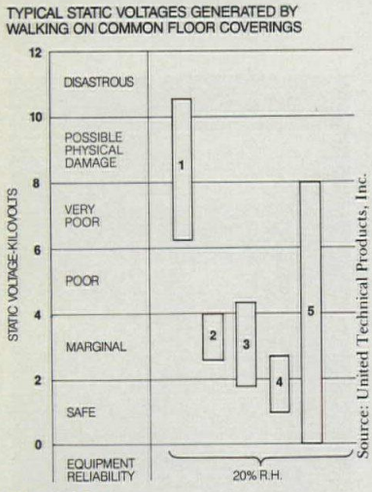
Neutral-colored, matte desk top finishes with a reflectance factor of 30–60 percent help prevent light bouncing from horizontal surfaces onto the terminal. Vertical surfaces behind the VDU should feature a 50–70 percent reflectance factor. Light striking the work surface and area surrounding a VDU should be more than one-third and less than two-thirds of the brightness of the computer screen.

Filters are another method of reducing glare, but retrofitting VDUs with them is expensive and may diminish screen contrast, character visibility and brightness.

A better way of minimizing image problems is to install a screen that displays a black-on-white format similar to the typewritten page.

New access flooring systems include individually controlled fans to reduce heat loads generated by computer equipment (Tate Architectural Products, below). Antistatic carpet that discharges less than 3.5 kv helps to control electricity build-up (United Technical Products, bottom).





Material Code
1 Nylon
2 Anti-static nylon
3 Vinyl asbestos tile
4 High pressure laminate
5 Acrylic, polyester, olefins

Referred to as "negative contrast" or "positive presentation," this type of terminal with its light background and dark characters is available from many vendors.

Asserts a National Research Council study of VDTs and vision: "Negative contrast helps to reduce the effects of veiling reflections on the screen and may help to reduce problems adapting to the different luminance levels of the VDT and surrounding objects."

Other visual problems symptomatic of computerization may stem from VDU users themselves. Notes Dr. Melvin Schrier, a fellow of the American Academy of Optometry who has developed a method of testing VDU operator vision: "The major reason operators have VDT-related eye problems is that they have not been tested for this type of work, which requires visual skills such as near-point acuity, binocularity, and convergence."

Environmental comfort

VDU operator comfort is not limited to ergonomic furniture and glare-free lighting. Consideration must be given to heat loads, which are increased every time a computer is added to a workstation: one VDU generates as many Btus as its operator. A recent study sponsored by the National Office Products Association predicts that systems furniture will integrate heating and air-conditioning units into its components to increase user comfort and vent excessive heat. Manufacturers of access flooring already offer individually controlled, small fans in their systems.

Humidity levels within offices that house large numbers of computers also require strict control. They should be maintained at a level of 40–60 percent. Drier air can promote generation of static electricity; moisture can be detrimental to magnetic and paper storage. On floors, antistatic carpeting with a discharge rating of 3.5 kilovolts should be installed to prevent build-up of electricity discharged from electronic equipment, furniture, and occupants.

User-friendly offices

With rising worker dissatisfaction and pressure by corporate management to raise productivity, design professionals must assume a more visible and vocal role in ensuring that the office of the future is as humane as it is efficient. As one architect pointed out in a survey undertaken by the federal government: "The advent of automation has heightened client awareness of the environment. It is as if the intensity which the VDT imposes on the participants requires an immediate antidote that must be provided by the space around them." In creating this "antidote" during the current transition from conventional to automated interiors, architects have the chance to change the function and form of the workplace with design solutions that are conceptually as challenging as the computer itself. [Deborah Dietsch]

Deborah Dietsch *is special features editor of* Interiors *and has written for P/A.*

Acknowledgments
We wish to thank the following individuals and organizations for their help in preparing this article: Computer and Business Equipment Manufacturers Association; Buffalo Organization for Social and Technological Innovation; Niels Diffrient; Janice Blood, 9 to 5; James Nuckolls, IALD; Jon Ryburg, Facilities Management Institute; David Schowalter, Welton Beckett; Melvin Schrier; Sylvan Shemitz; Don Korell, Steelcase.

Further reading

The Automated Office: An Environment for Productive Work, or an Information Factory? written by Arthur Rubin for the Center for Building Technology, National Bureau of Standards, Washington, D.C. (publication NBSIR 83-2784-1) provides an excellent overview and complete bibliography of the research concerning automated office design. *Designing the Automated Office* by William Pulgram and Richard Stonis (Whitney Library of Design, New York, 1984) is specifically written for architects and advises on integration of equipment and future planning. A basic text on ergonomics is *Human Factors in Office Automation* by William Galitz (Life Office Management Association, Atlanta, Ga., 1980). One of the most quoted government studies on the effects of VDTs on the eyes is *Video Displays, Work and Vision,* available from the National Academy Press, 2100 Pennsylvania Ave., N.W., Washington, D.C. ($14.50 prepaid). For a broader view of the problems inherent in the "office of the future," *Office Hazards: How Your Job Can Make You Sick* by Joel Makower (Tilden Press, Washington, D.C., 1981) is a highly readable and informative source.

(See p. 266 for related product and literature information.)

Intelligent architecture

The computerized environment holds great promise for the office worker, the building manager, and the elderly and disabled. For others, it may only breed dependence.

e Newberry

Technology so pervades our lives—and so affects the form and performance of the built environment—that we often forget how much we lose as well as gain by it. True, the gains usually outweigh the losses, but we sustain losses, nevertheless, with almost every new technology we adopt. The automobile, for example, destroyed neighborhoods as it improved mobility. We accept such losses because we often are unaware of them until we've become dependent on the new technology, and because the things we lose are often qualitative, and thus easily taken for granted.

Computers present such a dilemma. What we have to gain by them is obvious: the rapid storage, retrieval, and manipulation of vast amounts of information; eliminating drudgery and improving (although not assuring) our chances of making correct decisions. What we have to lose is less apparent—but not beyond guessing as the computerization of the built environment shows.

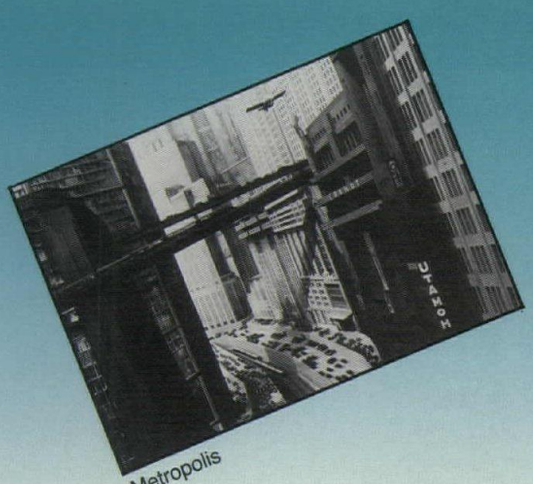
Energy management systems

The most common, and perhaps the most cost-effective use of computers in buildings is in energy management systems. Those systems maintain comfort levels within buildings while minimizing the consumption of energy. While that may not seem a difficult task, it's almost impossible to do efficiently without benefit of a computer, given the large amount of data that must be weighed—from the current price of various fuels and the outdoor weather conditions to the occupancy levels in different spaces at different times.

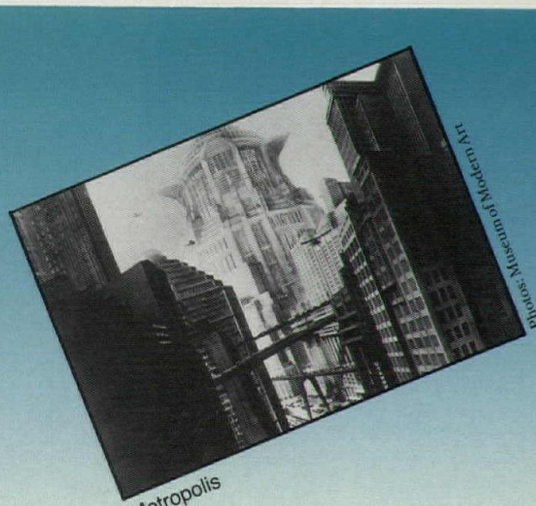
Some energy management systems operate with a central computer monitoring all of the conditions and controlling all of the equipment in the building. That centralized control, however, can create environmental problems in the building if the main computer shuts down. Also, many energy management systems contain pneumatically controlled thermostats and valves, requiring transducers to convert the pneumatic signals to the computer's digital signals and back again. Those hybrid systems, though, can increase maintenance costs because of their greater complexity and larger number of parts.

The newest energy management technology addresses both problems. It uses a network of microprocessors, rather than one central computer, to monitor the conditions and operate equipment in a building. And it does its monitoring and operating through direct digital control, sending and receiving digital signals directly to and from the "points"—the thermostats and other controls in the building—eliminating the transducers and greatly reducing the number of other parts. (With

The city of the future, as visualized in movies over the last 50 years, is invariably automated, with robots and computers acting out (or in the case of Hal in 2001, not acting out) our every wish. But at least on film, we've become more ambivalent about the future as it approaches. The benign and efficient technology in *Metropolis* gives way to the autonomous technology in *2001* and to the environmentally destructive technology in *Blade Runner*.



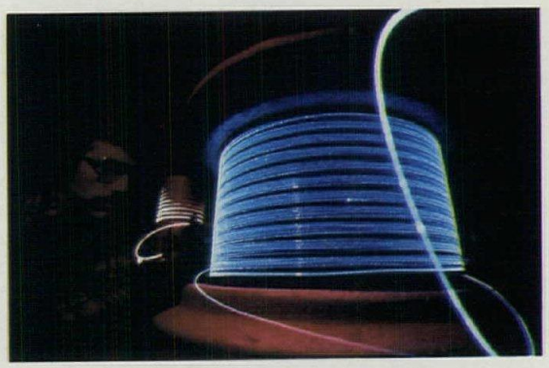
Metropolis

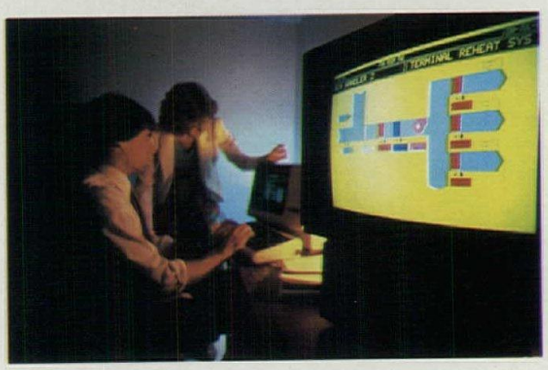


Photos: Museum of Modern Art

Metropolis

direct digital control, one point in a room can perform several functions.) A central computer is still necessary in the newest energy management systems. Linked to the network of microprocessors (via everything from copper wire and coaxial or fiber optic cable to microwaves, radio waves, or telephone lines), the main computer coordinates equipment operation and contains information, such as occupancy schedules and outdoor weather conditions, pertinent to the entire system. Should the main computer shut down, battery packs in each microprocessor continue to operate the building.





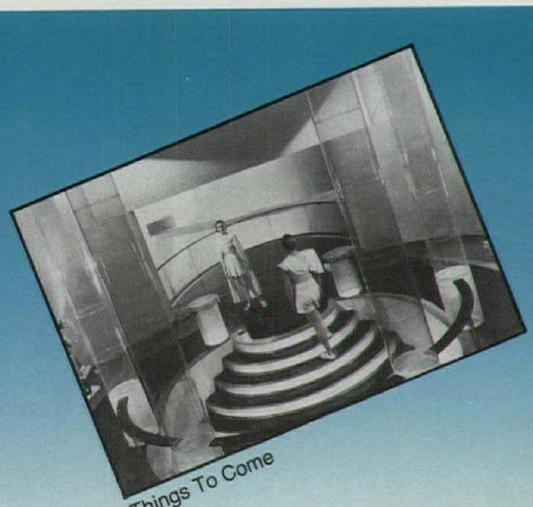
The intelligent office building uses computers and fiber optics (right) to monitor and control the operation of several systems within the building (opposite). While they vary slightly among manufacturers, the features of the intelligent office building include: the computer "brain" that controls transportation, communication, mechanical, electrical, fire protection, and security systems; shared tenant services that include data processing and database available through a local area network; teleconferencing rooms; and a fire control center for monitoring fires and other emergencies.

Energy software

What distinguishes one energy management system from another is less its equipment than its software—what the system can do. The most common functions include scheduling, which turns equipment off when it is not needed; optimum start/stop, which, based on outdoor temperatures, calculates the best time to start up the mechanical system in the morning and to stop it in the evening; duty cycling, which turns equipment on and off for a few minutes every hour or so to reduce energy consumption; and load shedding, which reduces the electrical load to avoid peak demand charges during the day. Most energy management systems also record and summarize data in the form of printouts or reports.

The energy reductions with such systems are impressive—as much as 20 percent. But they have had their share of critics. A recent survey by the National Bureau of Standards indicated that more than 50 percent of the owners of buildings with energy management systems were dissatisfied, largely because the systems' energy-saving potential was exaggerated, the systems were not properly installed or serviced, and the systems were not well integrated with the rest of the building's equipment. (Many manufacturers, in response to that criticism, now train installers and help engineers integrate the controls with other equipment.)

Questions about the value of some energy management features, though, can still be heard. Some engineers argue that computerized scheduling, in buildings with regular occupancies, offers no real advantage over time clocks; that duty cycling increases the wear of equipment and thus long-term costs; and that load shedding can reduce occupant comfort and violate ventilation codes. Alfred Guntermann, an engineer and head of the firm Energy Economics, echoed the sentiments of others when he said that "energy management systems are ideal for scheduling the optimal start/stop of equipment and lighting based upon occupancies and outdoor conditions. But there are alternatives to duty cycling and load shedding that may be less expensive over the long term, such as reducing the fan's CFM to achieve the same average air flow rate as duty cycling." What emerges from the criticism of energy management systems is that, while valuable, they must be evaluated against existing technologies and against the real needs of the building owner. It's a matter of using the computer for what it does best, not simply for what it can do—an important distinction since, in the words of



Things To Come

photos: Movie Star News

Things To Come

one engineer, "companies tend to oversell computerized controls as the answer to every problem."

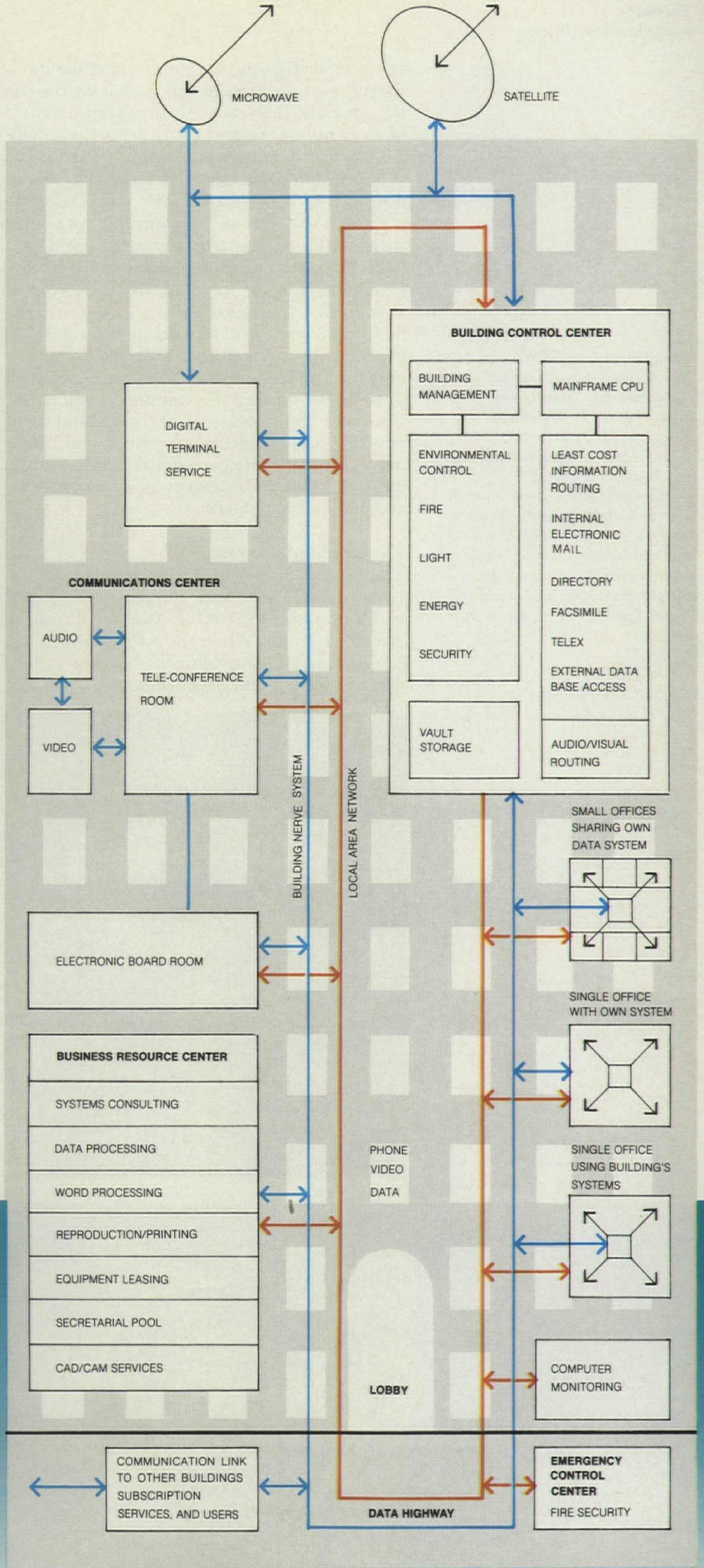
Intelligent office buildings

The intelligent office building takes energy management systems one step further, using computers not only to control energy consumption, but to operate most of the other systems in the building as well. While United Technologies has dominated the intelligent building market, with a few systems already operating, several other companies now offer some form of intelligent building package. In the case of a fire, a breach of security, or malfunctioning equipment, the intelligent building's computers will automatically notify the proper authorities, be it the police, the fire department, or the building engineer; print out instructions on what to do; give voice instructions to tenants on where to go; commandeer the elevators; and operate such things as smoke removal or fire suppression equipment. Firemen can monitor emergency conditions from a ground-floor control center, where a computerized data panel indicates the location and intensity of a fire. The computers do more than just monitor and control the building's own equipment, though. They also can provide shared tenant services in the form of data processing, electronic mail, teleconferencing, message services, data bases, CAD/CAM services, and satellite communications. Signals for those tenant services go to and from the central computer, usually located in the mechanical penthouse, via a local area network cable, separate from the cable that carries the building's operating information.

What are the architectural implications of the intelligent building? At current prices, the minimum size for an intelligent building, especially one with shared tenant services, is about 500,000 square feet. Also, under current code requirements, the intelligent building poses some code questions. For example, the optimum placement of cable for the transmission of signals to the central computer is up the elevator shaft—a location that local fire officials have resisted since that cable is necessary to the operation of the fire protection


Movie Star News

Things To Come



INTELLIGENT OFFICE BUILDING

system. Perhaps the greatest impact the intelligent building concept will have is on the design process. Because of the integrated nature of the equipment and controls in the intelligent office building, manufacturers of those systems want to be involved at the very beginning of the project and have a good deal to say about the type and organization of equipment. While such an arrangement would help prevent later coordination and compatibility problems, it does, for good or bad, bring in a major new partner to the design team. Some building owners and tenants have questioned the security and privacy of shared computer networks or the amount of individual control over the workplace the computers will allow. But most seem pleased with the added security and convenience of the intelligent building, having already grown accustomed to the limits office environments place on privacy and individual control.

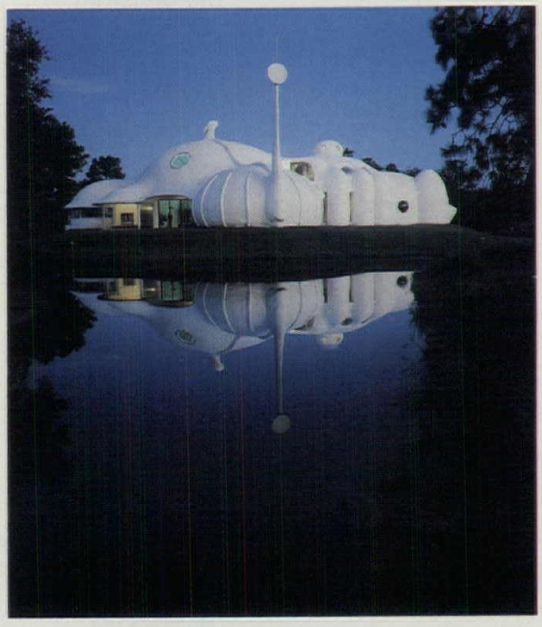
The intelligent house

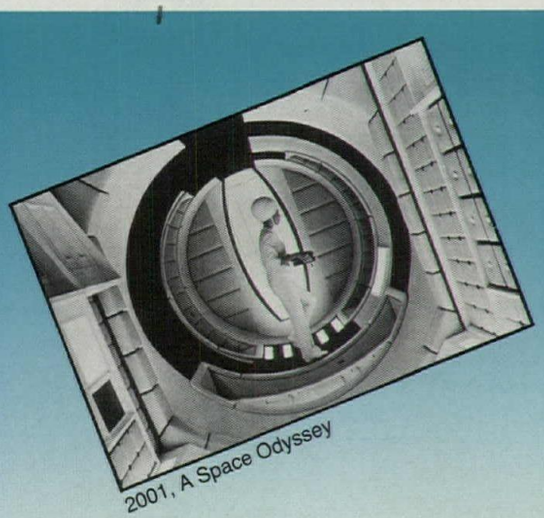
The same cannot be said about the residential environment, however. There, privacy, control, and simply the willful variation of routine are all essential. While the automated house can enhance those qualities, it can, depending upon its design and organization, also restrict them. Says Charles Owen, a professor at IIT, "The intelligent house offers the architect the challenge of making the machine supportive and not antagonistic."

There are clearly ways in which the intelligent house can be supportive. For instance, Carolyn Dry, a professor at the University of Illinois, has studied how "the intelligent house can physically adapt to the various needs of the disabled or elderly, compensating for their limited strength and mobility." She has several suggestions. "A home computer connected to an ultrasonic device could, through voice instructions, control the temperature and air conditioning, call for help, turn appliances on and off, or give reminders to take pills. A push button telephone can call the resident to report changes or allow the resident to make changes to any system in the house, while a special 'ability' phone that works independently of the computer can be used to give signals." Certainly the most dramatic aid to the elderly and disabled will be the household robot, scheduled to be on the market within the decade at a cost somewhere between $5000 and $15,000. Japanese researchers are developing robots for simple hospital chores such as lifting patients in and out of beds and bathtubs. In this country, work is underway to modify industrial robots to respond to simple spoken commands and to mimic simple household tasks such as vacuuming or setting the table, although the complexity and changeability of a house requires that the robot be able constantly to update its internal "map." Dry acknowledges that "the critics of domestic robots think they will be lying around idle. What they don't see is, as caretakers for invalids, robots will be very much in demand."

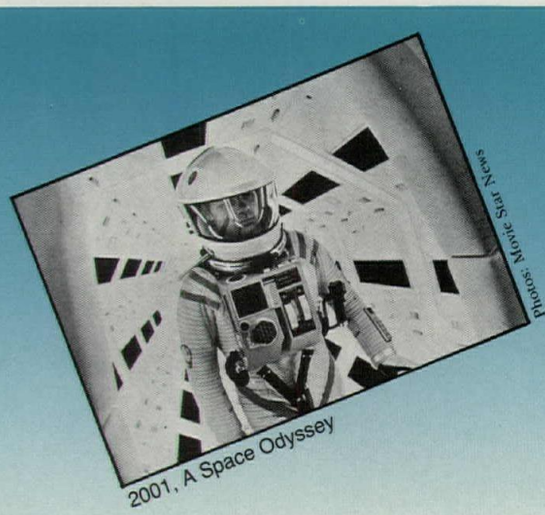
Where the benefits of the intelligent house seem more dubious is as a servant for the able-bodied, fulfilling a fantasy that goes back almost 2500 years to Aristotle's vision of a mechanized house "do(ing) its own work at the word of command or by intelligent anticipation." Residential computer controls do exist that can operate appliances, stereo, and television, as well as the heating, air-conditioning, and electrical systems. That raises two questions. First, are those controls cost effec-

Xanadu (below right) by the architect Roy Mason demonstrates how an intelligent house might work. (It is explained in a book entitled Xanadu, *Acropolis Books, 2400 17th St. N.W., Washington, D.C.) The house, constructed of polyurethane plastic foam sprayed over vinyl balloon forms, features complete computer controls; an electronic video hearth; a household robot, an electronic art gallery, a computerized office and learning center, video windows, and a sensorium.*



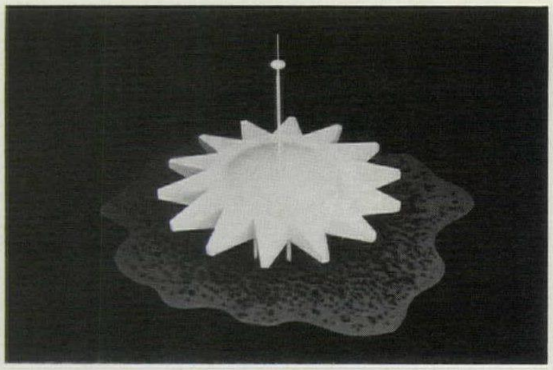


2001, A Space Odyssey

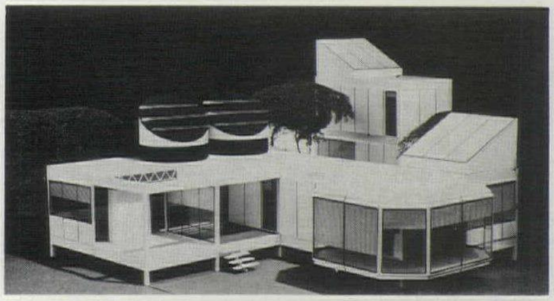


2001, A Space Odyssey

Photos: Movie Star News



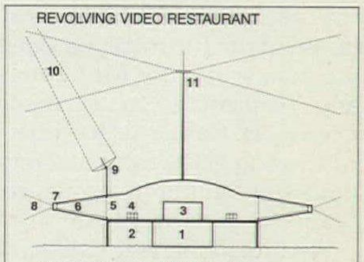
Michael Jantzen has explored the impact of video technology on buildings. In his project for a restaurant that uses video equipment to simulate a revolving rooftop location (left and below), a revolving television camera, mounted above the building or in a remote location, sends signals to rear screen projectors that, in turn, project the televised images onto the walls of the restaurant. The IIT house of the future, winner of an international competition (far left),



tive? That does not ask: are they affordable; it asks whether residential computer controls serve a real need, regardless of their price. After all, if time clocks and simple pneumatic sensors and switches are more cost effective than computerized controls in some office buildings, what justification is there for integrated computer controls in the typical house, with its much simpler equipment and occupancy schedules?

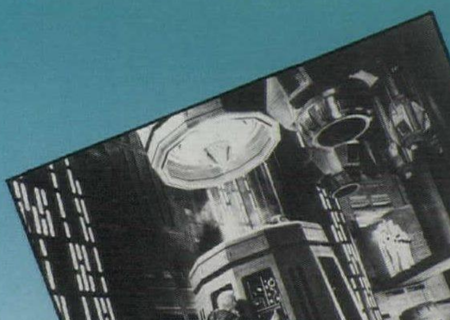
Second, what is their human impact? Not only is it slightly absurd to have a computer perk the morning coffee, dim the lights at dinner, or pull the draperies at night automatically. It's humanly debilitating. As more than one environmental psychologist has shown, by reducing the demands our environment places upon us, we actually reduce our physical competence, becoming dependent upon the machine. If that occurred, we would lose far more with the intelligent house than we would gain.

A clear benefit offered by the intelligent house is as a place for work. Forecasters anticipate that, over the next ten years, there will be a 12 percent increase in the estimated 40 million houses with home offices. Computer networks and videophones will allow people to communicate with their coworkers and receive mail and other work electronically. As in the intelligent office building, integrating mechanical and electrical systems with the office computer in the house is an inevitable step, even though it may take some time for those computerized services to become cost effective within the individual house. An interim solution may entail sharing computer services among a group of houses.

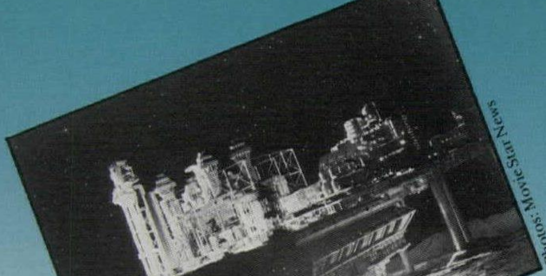


1 Entrance and lounge area
2 Exterior dining area
3 Food preparation area
4 Interior dining area
5 Television Screens
6 Video projection housing
7 Video projector and camera housing Visual information seen by the lower
8 TV cameras
9 Dish antenna
10 Visual information sent via satellite
11 Revolving TV camera module

uses a kit of parts: steel framing, deep floors and ceilings, wall and partition panels, and prefabricated service units. A household robot handles such chores as vacuuming, setting the table, or helping prepare meals.



The Empire Strikes Back



Outland

Photos: Movie Star News

The form of the future

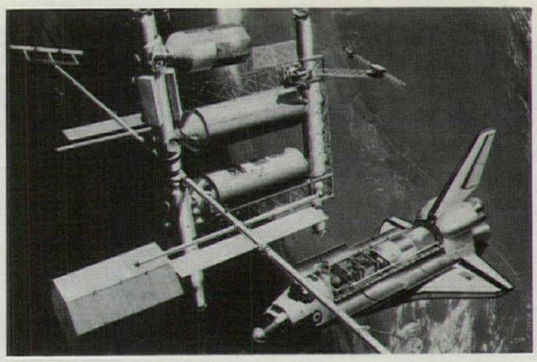
Between falling computer prices and what Leo Marx has called our "heedless, insatiable passion for the newest . . . technologies," acceptance of the intelligent house seems only a matter of time. What form it takes is less certain. The popular image of the house of the future tends toward the anthropomorphic, as if the house's computer "brain" and fiber optic "nervous system" demand a lifelike form. More likely, though, the house of the future will be rectilinear, lending itself to compact sites and flexible interiors. Donald Sullivan of Arthur D. Little sees the automated house of the future being smaller and containing fewer objects, with robots moving walls and furnishings to accommodate different needs. As Carolyn Dry puts it, "The house with a capacity for movement and adaptation—containing a home computer as the brain—is in itself a form of robot."

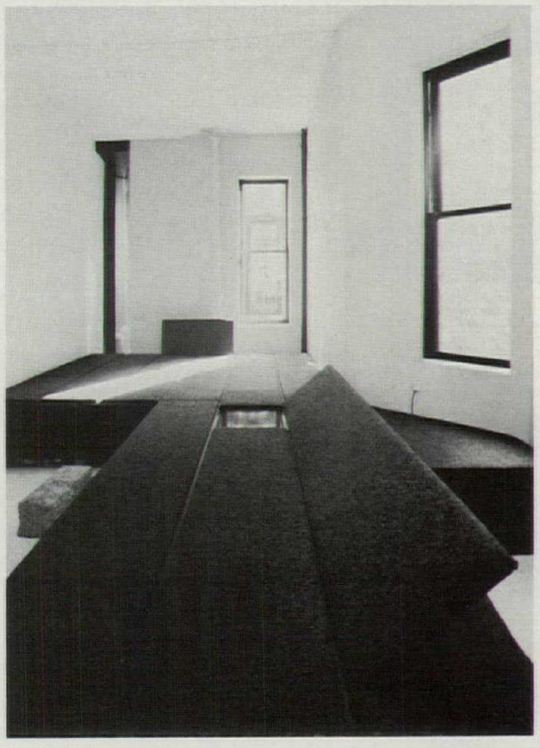
Architect Michael Kalil has taken that computerized reductionism perhaps the furthest. He has designed interiors almost devoid of furniture except for a floor of carpeted panels that, through computerized controls, tilt to form backrests, raise to form tables and benches, and move to expose bathing and cooking areas. Kalil not only sees the automated environment as an opportunity to "explore ideas about space by minimizing the number of objects" in a room. He sees it forcing the architectural profession to go beyond the "archaic pushing around of sheetrock" to give form—and "soul"—to the body and mind of the intelligent building. Kalil's opportunity to do just that will come as a member of the human factors group for NASA's space station, where the interiors can be seen as "a continuous ribbon in which space unfolds" within the station's 20-foot-diameter cylinders.

The solution and the problem

Should all of this seem far removed from architecture as we know it, consider such technologies as the elevator or air conditioning and how quickly they became standard equipment in buildings, how much they changed the form of buildings, and how different was the practice of architecture after their widespread use. Whether the computer will have a similar effect can be argued either way. But there is no doubt that it will have some effect; it's already happening. What we gain and lose in the process depends upon our recognizing when to use and when not to use the computer, when it solves a problem and when it is simply a solution in search of problems. The computerized environment, in other words, has yet to be designed.

[Thomas Fisher]

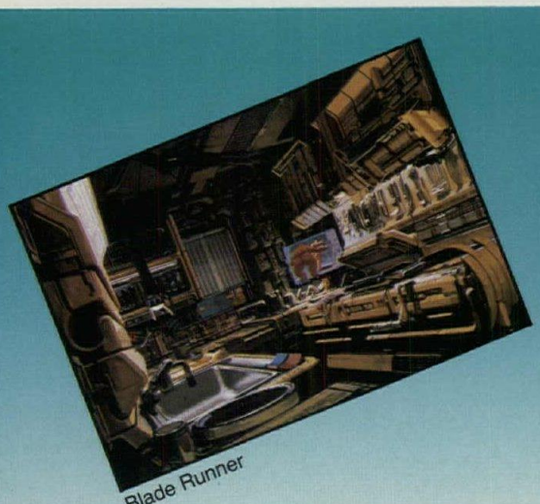




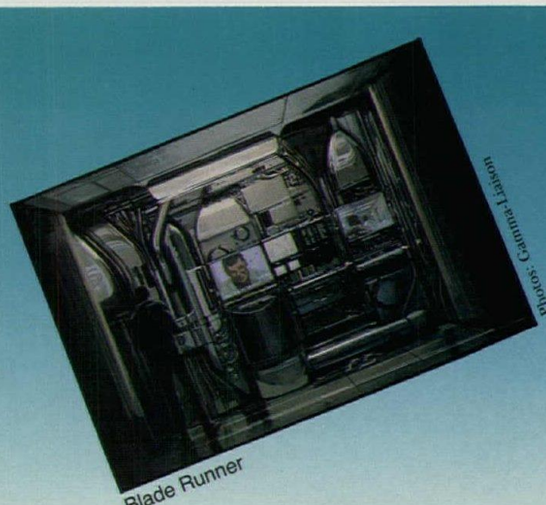
NASA's space station (above left) contains several 20-foot-diameter cylinders joined to a central, cylindrical corridor. While designs call for rectangular rooms packed full of equipment, NASA's "human factors" group has explored ways of visually expanding the station's interior and eliminating injurious corners with cylindrical rooms, rounded edges, and objects flush with the wall. Designing for space deserves more attention from the architectural profession, for plans are already underway for a city on the moon. The automated environment envisioned by Michael Kalil (left) has computer-controlled floor panels that tilt, lift, roll, and push together to form furniture or to disclose cooking and bathing areas, eliminating most objects in the room.

Acknowledgments

We would like to thank the following people for contributing to this article: Steven Kiltonic, Maxwell Warren, James Revette, Leonard Cozza, United Technologies; Michael Kalil; Alfred Guntermann, Energy Economics; Ava Tinfo, Cosentini; Roy Mason, Architron Associates; Thomas Colligan, IBIS; Carolyn Dry, Natural Process Design; Charles Owen, IIT; Michael Jantzen; Michael Bruzzoni, Nova Systems; Berry Mumm, Jerry Drewry, Honeywell; Gary Benson, Trane; Arthur Orans.



Blade Runner



Blade Runner

Photos: Courtesy Ladd/Silva

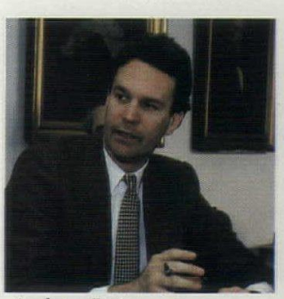
P/A Fourth Annual International Furniture Competition

Whither pluralism? Reconciling the historical and the rational was the key issue facing this year's jury.

In this, the fourth year of P/A's International Furniture Competition, the issue of pluralism seems to have triggered a debate among the jurors: Are we, in fact, headed in too many directions at once in design? In spite of the wide diversity of viewpoints and variety of disciplines pursued by the jurors, the one point on which they were in total agreement was that design seems to be in a state of confusion at the moment.

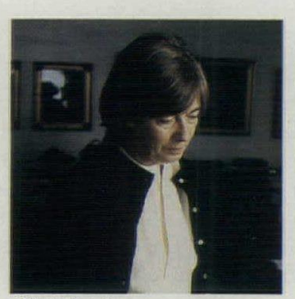
While this year's competition drew 781 entries from 23 countries, out of that number only eight were selected for honors by the jury. Only one was given an award, two were given citations, and four received honorable mentions. It is interesting to note that, while the jurors bemoaned the lack of direction shown by many of the entries, the winning projects did not favor any single design philosophy, but rather they represented a good cross section of outlooks, from openly historicist to mass-production industrial. The jury was disturbed by what it saw as too many projects that were clearly derivative, not only of historical prototypes, but also of previous competition winners. There were half a dozen *homages* to John Scofield's award-winning music stand from the second year of the competition (P/A, May 1982), and one entrant even went so far as to adorn his Michael Graves look-alike submission with little sketches, à la M.G. Those who assumed that imitation is the sincerest form of flattery went unrewarded.

It may seem surprising that the only entry to receive an award was a stove; it was, as one might guess, the only stove submitted to the competition (chairs, that most devilish of design problems, once again constituted the majority of submissions). But it wasn't nearly so much its offbeat type as its simplicity and rigor that made it virtually the only piece the judges voted on unanimously—which does *not* mean that the jury hopes to see two dozen cooktop tables submitted to next year's competition. For clues in that direction, we refer you to their conclusions on page 182.
[Pilar Viladas]



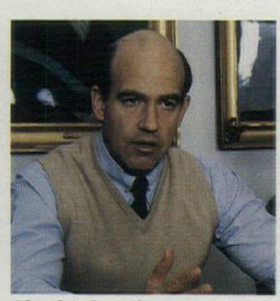
Andrew Batey

Andrew Batey is a partner in the firm of Batey & Mack, architects, San Francisco, Calif., and has designed numerous pieces of furniture for the firm's commissions.



Cini Boeri

Cini Boeri is the director of Cini Boeri Associates, Milan, Italy, a firm that deals in architecture, interior design, and industrial and furniture design.

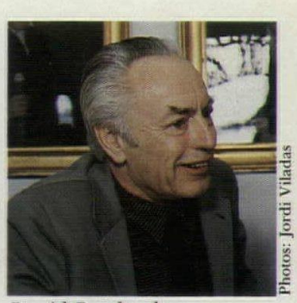


Charles Gwathmey

Charles Gwathmey is a partner in the firm of Gwathmey Siegel & Associates, New York. He and his partner, Robert Siegel, have designed furniture for both residential and contract use.

Michael McCoy

Michael McCoy is co-chairman of the design department at Cranbrook Academy of Art, Bloomfield Hills, Mich., and a partner in the graphic, industrial, and interior design firm of McCoy & McCoy.



David Rowland

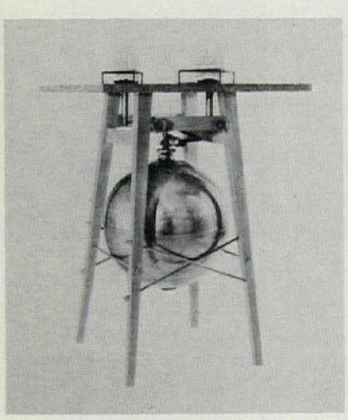
David Rowland is an independent furniture designer in New York and a winner of the Grand Prix at the Triennale di Milano.

Photos: Jordi Viladas

Cooktop table

Bruce Tomb
San Francisco, California

Photos: Charlie Daniels



Project: A cookstove consisting of a steel grill and burners, rose granite top, maple frame, 12-gallon steel propane tank, brass valves, and plastic knobs, the piece is 40 inches high, 29 inches wide, and 29 inches deep. The autonomous nature of the ancient cooking fire inspired this redefinition of the conventional gas stove. The self-contained fuel source allows the stove to be freed from the kitchen wall and stand as a piece of furniture.

Jury comments

Gwathmey: As a constructivist piece, it is complete from idea to object. Whether it's useful or not, it's very interesting.

Boeri: It might make a better barbecue, no?

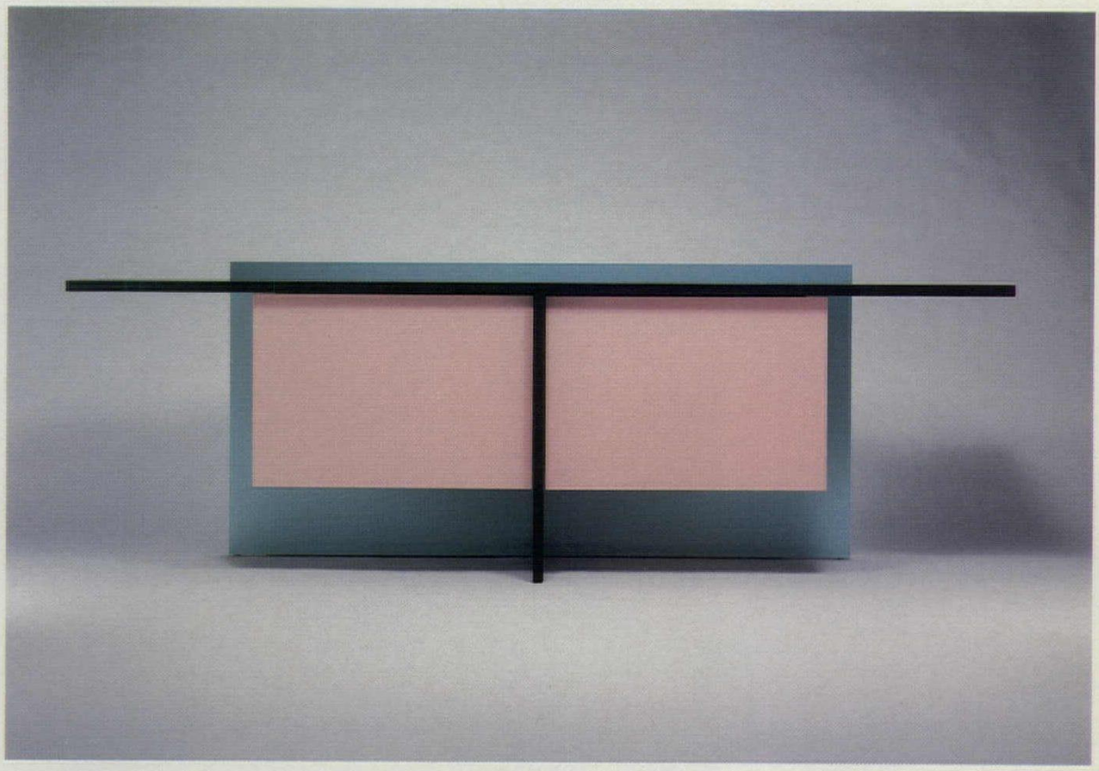
Batey: There's something else here, and that's the Newtonian image, inspired by Boullée or Ledoux, of the sphere of fire.

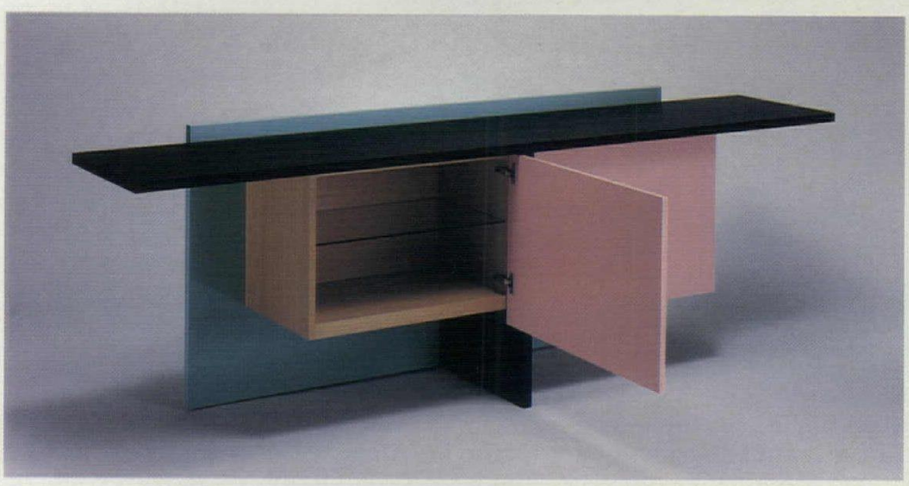
McCoy: There's a current mode of high-tech expression that has to do with lunar-landing modules, where all the parts are expressed, like the sphere within the structure here.

Gwathmey: I think it shows a kind of honesty of interpretation, and a clarity of expression that is direct, and that has a structural and formal integrity. This is really a pure assemblage that results in an object.

The Great Plains

Demir Hamami
Bethesda, Maryland



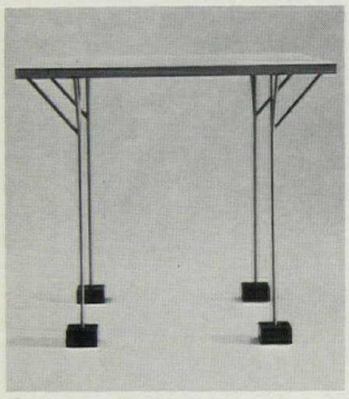


Project: "The Great Plains," a cabinet of lacquer-finished plywood, wood veneer, and glass. It is 94 inches long, 30 inches high at counter height, and 19 inches deep. Simplified aesthetics and unconventional structure provide function and dimension.

Jury comments
McCoy: It is well done within its genre.
Batey: Did we say that it's Rietveld-inspired? The thing that we didn't think was very effective was not taking this black piece all the way through, integral with the inside of the cabinet.
Gwathmey: It's sort of a disappointment when you open the door and find that the black divider, which implies that the cabinet is a Constructivist piece—and therefore integral—is not integral. Or that it is a separate box that is just screwed in, right? That's probably what it is. Then it has to go through the back.
Rowland: I'm going to confess to being taken with this piece, mostly for its aesthetics. It would have to be screwed to the wall, because if someone came along and leaned on a corner, it would tip over. It's not that stable.
McCoy: It's definitely wood against the wall.
Rowland: You'd have to screw it to the wall, but I love it even so.
Batey: These are very Fifties colors.

Table

Joseph Catalano
New York



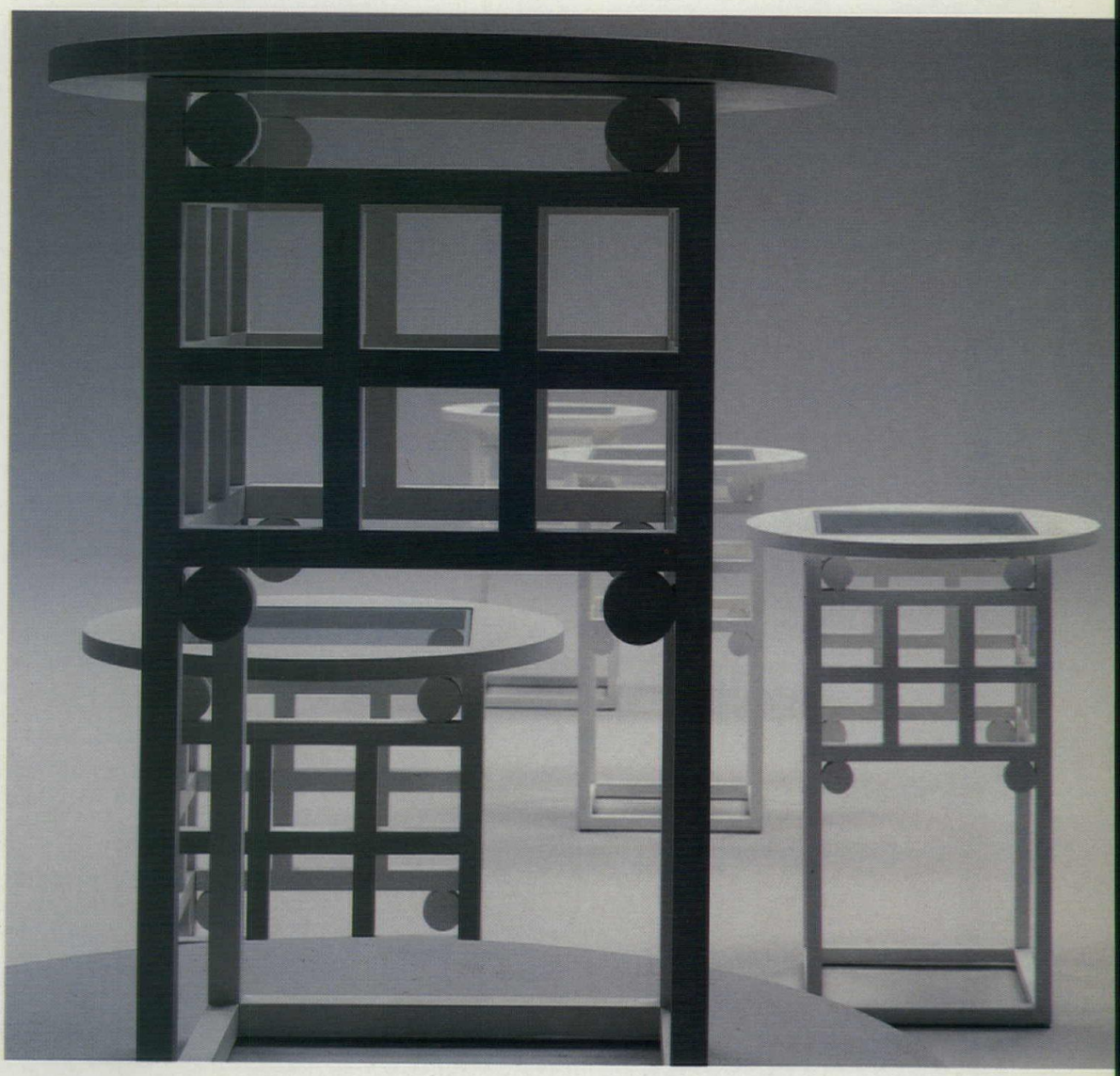
Project: A table of hardwood veneer laminated to a hardwood frame and core of honeycomb or rigid foam, with laminations exposed at the edge, and legs of tempered steel tube with polyurethane finish. The table measures 33½ inches square and 29½ inches high.

Jury comments

McCoy: It is elegant without being pompous.
Rowland: I think the word "elegant" is a misnomer.
McCoy: Elegant in proportions, not materials.
Boeri: The image is of a very thin woman with very big shoulders.
Batey: It's whimsical rather than elegant; it almost crosses the line of Memphis.
McCoy: To me it's elegant enough not to be Memphis, which would truly be a caricature. Those feet would read as ridiculous "shoes." But it stays comfortably on the other side of that.
Rowland: I appreciate their courage in using those rubber blocks; they're very practical for feet.
McCoy: But will it set up a torsion in plan?
Rowland: It relies totally on those pin connections. It would be even more stable if those corners were plates that held the two.
McCoy: The jury redesigns the projects . . .
Gwathmey: The thing that saves this table is the feet. If it weren't for them, you would say, "Oh, it's just another wire table."

Grais side table

Stuart Cohen/Stuart Cohen and Anders Nereim Architects
Chicago



Project: The Grais table, a lacquered side table, 24 inches high, 12 inches wide at the base, with an 18-inch-diameter top. The frame is solid birch, with an inset ¼-inch plate glass top, 12 inches square. The table is based on a ¾-inch module forming six 3-inch squares per side within a 12″ x 24″ double square. The ¾-inch-thick disks are 1½ inches in diameter. The round top overhangs the base 3 inches and the glass inset is intended to complete the sixth side of the double-cube base visually, while also resolving the optical problem of placing a round top on a square base by keeping the top from appearing off-center of the base when seen diagonally.

Jury comments

Gwathmey: The disks are gratuitous. They don't have the presence of the ball (of the Josef Hoffmann forerunners). The ball was a way to make the connection rigid. In this case the disk is totally decorative. And it's interesting that you don't know whether it turns the corner or not. Are there two of them, or one?

McCoy: There were two balls in the Hoffmann joints—one in each elevation.

Batey: So in this case, they have intended us to think of Hoffmann, but then we blink and Modernize ourselves and flatten him out.

Gwathmey: In terms of solid/void, base/middle, it is much clearer than many of its type. The giveaway is that it has no base.

Tux II chair

Haigh Architecture + Design
New York

Project: The Tux II stacking chair, of epoxy-coated steel wire and perforated steel. The chair, which measures 17½″ x 18″ x 28¾″, is suitable for indoor and outdoor use, and has an optional Neoprene backrest. The chair, which has a removable seat and back, and which has no mechanical connections, is intended to represent a formal approach to the problem of designing furniture for low-cost, mass-production methods.

Jury comments
Rowland: That looks like a very uncomfortable chair . . . there's no lumbar support, no shaped seat, and a hard front edge.
McCoy: I presume that the perforated steel seat deflects.
Gwathmey: My objection to this is that the back is unsupportable. You are relying almost totally on a continuous weld joint. That looks very fragile to me.
Rowland: I think the little triangle in there is going to support it. The lower part in back is forward, and this back member here supports it in the center.
McCoy: I think it's considerably more comfortable than it looks, because of the flex in all the components. It's quite elegant, really, crisp and minimal.
Rowland: The back is designed to give. At first it looks as if it's structurally rigid, but it can give, and I think that's unique.
Gwathmey: The thing that worries me is not structural—it doesn't have the structural integrity of a "normal" chair; the back and back legs tend to be integral, and then they support the seat and front legs. In other words, this chair denies that basic principle so that when you look at the back it seems terribly fragile; and the mechanism for making the back with this weld has a lot to do with making a graphic and not a lot to do with making a back.
Rowland: You are talking about a back and back leg supporting a chair, and conventionally that is true. However, the leg part is quite heavy on a chair to serve as a leg and carry that very heavy weight, and support a back, and its size is usually superfluous in that it usually goes up to support a back. In this case you have a different piece that is much lighter, and probably gives us a more comfortable back than a conventional chair would have.
McCoy: It does have, for a light chair, a very formal quality, which is, I think, what they were after and fairly successfully resolved.

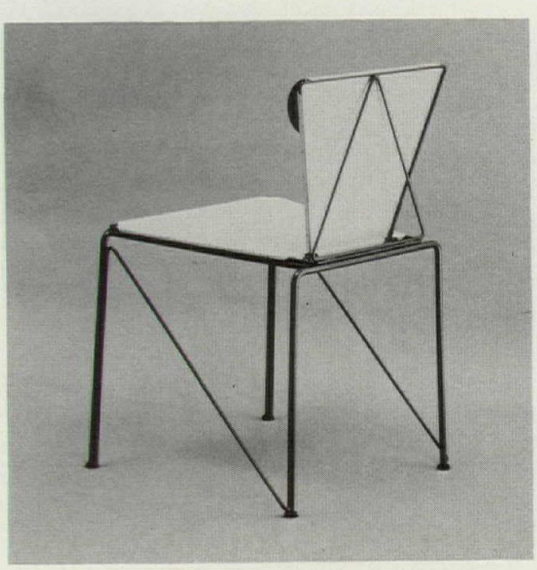


Table of two elements

Pierre Jequier
Geneva, Switzerland

Project: A table, 30 inches high, 31 inches wide, and 47 inches high, with a metal base and a wood top. It is intended to suggest a duality of expression between man-made metal and "natural" wood, cold vs. warm, light vs. dark, and rational base vs. the irrational, "precarious" top.

Jury comments

Gwathmey: It is interesting for our discussion because it addresses the Corbusian idea of separating the support from the supported.

Batey: The designer says it's the rational modernity of the structure supporting the irrational, implying that history is irrational. It's rather silly. . . . Can, in fact, those balls support the hollow top? There are pins through it, so there must be all kinds of hidden structure.

Gwathmey: It is really an assemblage of pieces that are tenuously put together, both literally and intellectually . . . it doesn't deal with transparency or separateness, as the Corb table does in such a compelling way.

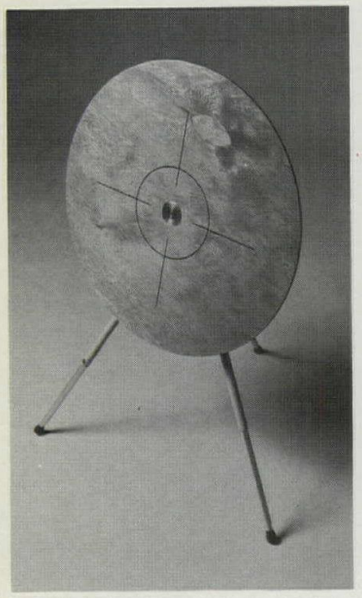
Boeri: I don't find any value in this piece . . . in my opinion, it is two primary shapes put together in an irrational way for an impossible use.

Rowland: The leg structure would have to be very heavy to be rigid enough to support the top, and the top is so sharp-edged that it might dig right into someone's legs.

Gwathmey: It is symptomatic of the dilemma of connecting precedent and image, and of a whole unresolved way of thinking today. We want to single this piece out for that reason.

Tripod table

Martin Kohn
Toronto, Ontario



Photos: William Deacon

Project: A table, with a 24-inch-diameter, chamfered-edge plywood top bolted to an aluminum tripod. The surface of the top has a routed cross-hair design that is filled with red resin. The table is infinitely adjustable from coffee table to counter height, suitable for indoor or outdoor use, and tilts or folds for storage. The off-the-shelf tripod base allows for high quality at low cost.

Jury comments

Batey: This has a nice, 1950s quality for me. I like the stained, glitched plywood, implying that it's not really important, that it's cheap. The only part I don't like is the decoration.

McCoy: There's an attempt to make an archery target reference, which is good in that it's a fairly humble, ad hoc gesture. . . . Its stability depends on the quality of the tripod; the more you pay, the more stable a lightweight tripod is.

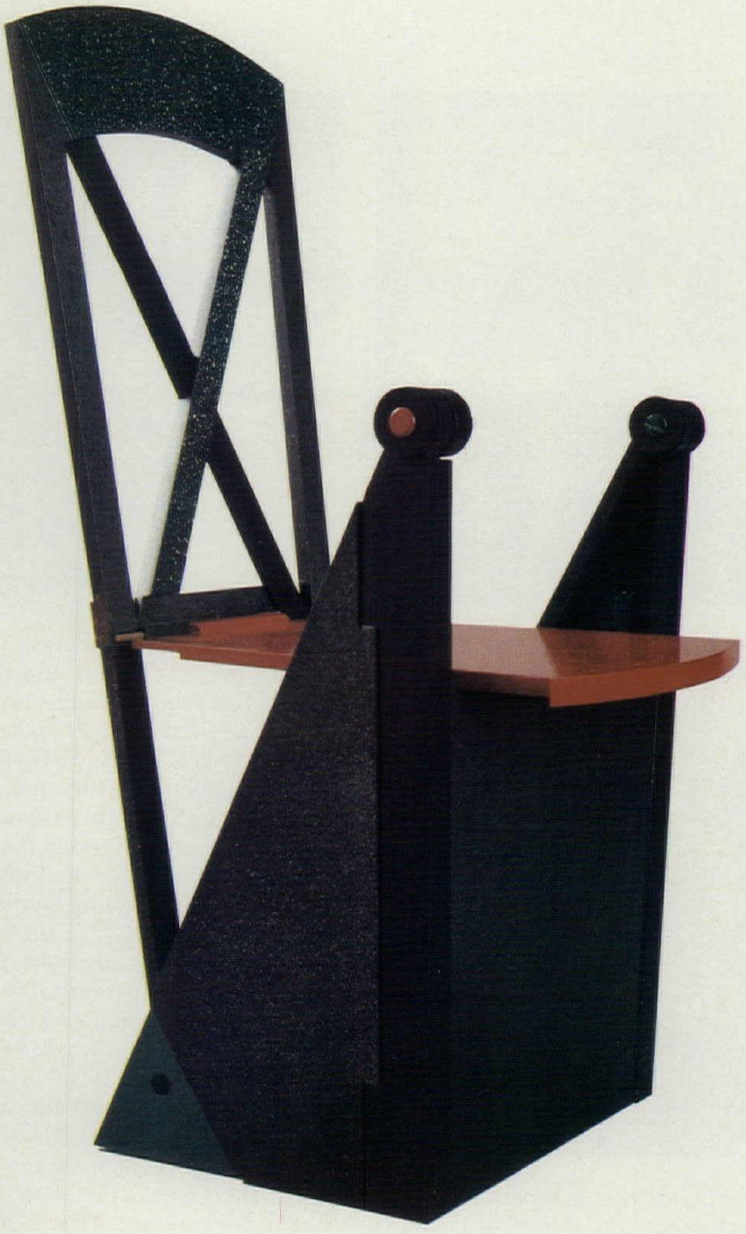
Boeri: But it works.

Batey: And it's modestly stylish at the same time.

Gwathmey: I'll bet that if we didn't accept the fact that it's a found object with a plywood top, we would regard this as a very different proposition. It's almost undesigned; what we react to is the part that *is* designed, which I find contradictory.

Collapsible chair

Joseph Perilla
New York



Project: A chair, of wood, metal, and lacquer, that measures 37 inches high, 20 inches wide, 14 inches deep, and has a seat height of 16½ inches. When folded, the chair measures 2 inches thick. The seat of the chair folds up, the back frame pivots forward and nests, covered by the sides, which fold over to close the chair. When folded, the chair can be hung on the wall, to be seen as a painted relief.

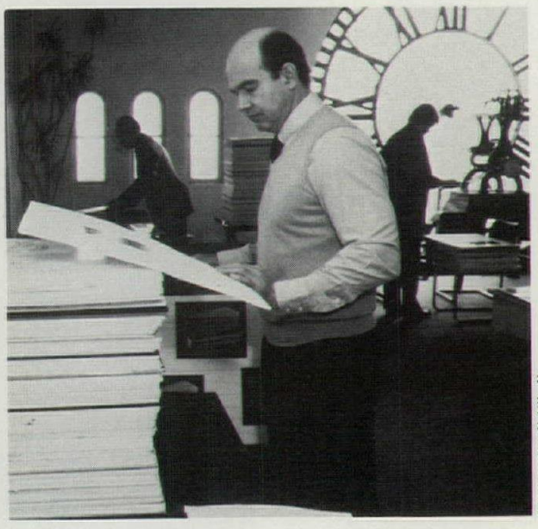
Jury comments

Batey: To me, this is sort of a Fellini version of Casanova's sedan chair, and for that reason I think it has a lot of charm; plus, it folds up, which is an added bonus. I also admire the craft of the chair, and the actual materials are as interesting as the chair itself.

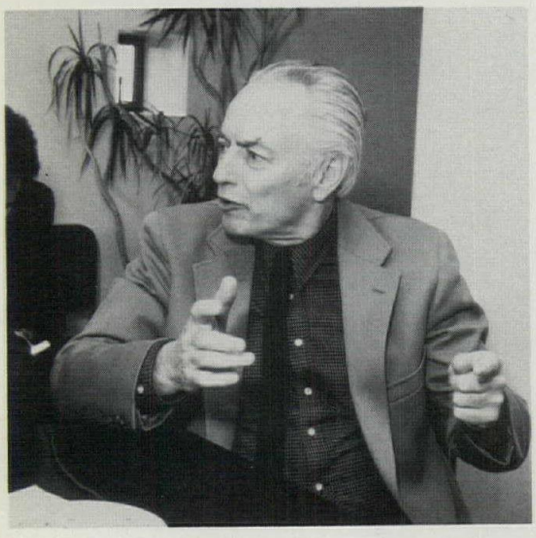
McCoy: It's a celebration of the grotesque in furniture design.

Batey: For which there is a tradition. The whole Empire tradition takes Classical or Neoclassical forms and subverts them—extends, pushes, and pulls them, which I think this chair does.

Rowland: A folding chair is usually one that's portable, and this is so cumbersome.



Photos: Jordi Viladis



Boeri: The reality of this competition is that confusion on the conceptual level of design is at its limit. I think that everyone has to think seriously now about the meaning of the word "project," because a project is a proposal, and everyone has to be socially responsible. We have to begin to say in the schools and to the younger generation that to do architecture and design is a serious thing; it is not a laughing matter. I have found this same thing to be true in other competitions, in other countries.

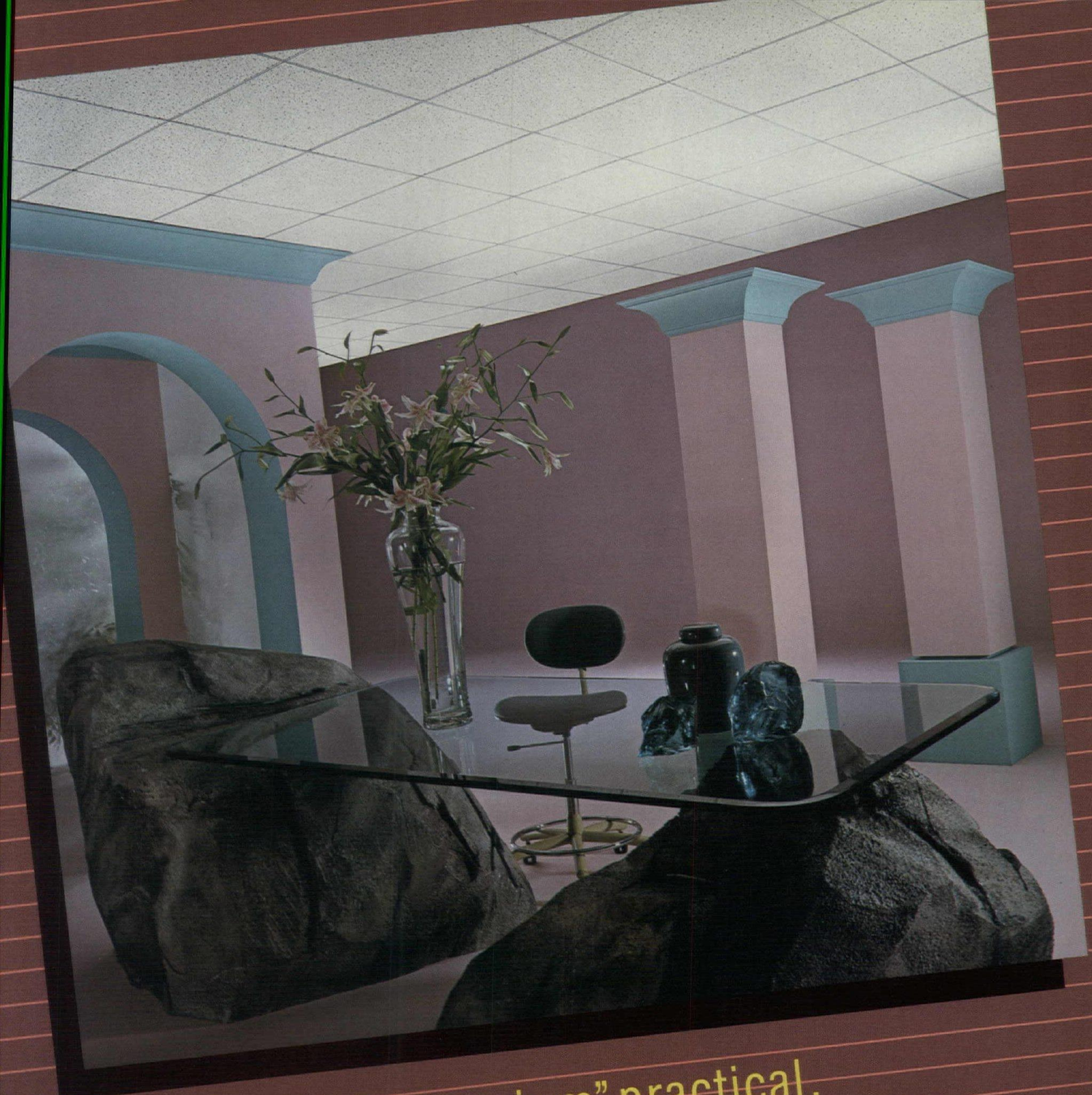
Rowland: I think that we may be witnessing a lack of direction, and I think we—both contestants and judges—find our direction by adhering to principles of purposefulness rather than trying quite consciously to find something that's different. Maybe we want to find that which is better.

Boeri: To do a project is to take into consideration the psychology and sociology of life.

Batey: But then the question comes up: Why do we need new stuff, when the old stuff works? We're always believing that there is something better, which means we believe in progress. I think with furniture, which is a traditional craft, this is not necessarily the case. I mean, we're always looking back (at least I am) to when it was done better—not necessarily for innovation. . . . the interesting thing about the stove [the cooktop table] is that it wasn't really an invention, but a recombination of common materials and things that are around. Maybe that works better and we find it more real.

Gwathmey: You're saying that invention can only occur when there is a new need? And that as long as we have historically solved a need, then we might as well use the best of what's been done? That is a very antidesign statement.

McCoy: But as Cini previously pointed out, as the world becomes more dematerialized through microelectronics, the machine really becomes invisible. There is a counterreaction toward craft and toward objects that reflect society in terms of culture. A lot of the objects aren't very well done, but a lot of them reflect issues and ideas that are current in art, architecture, and design. Furniture happens to be one of those categories of objects in which the culture's aspirations have always been expressed.



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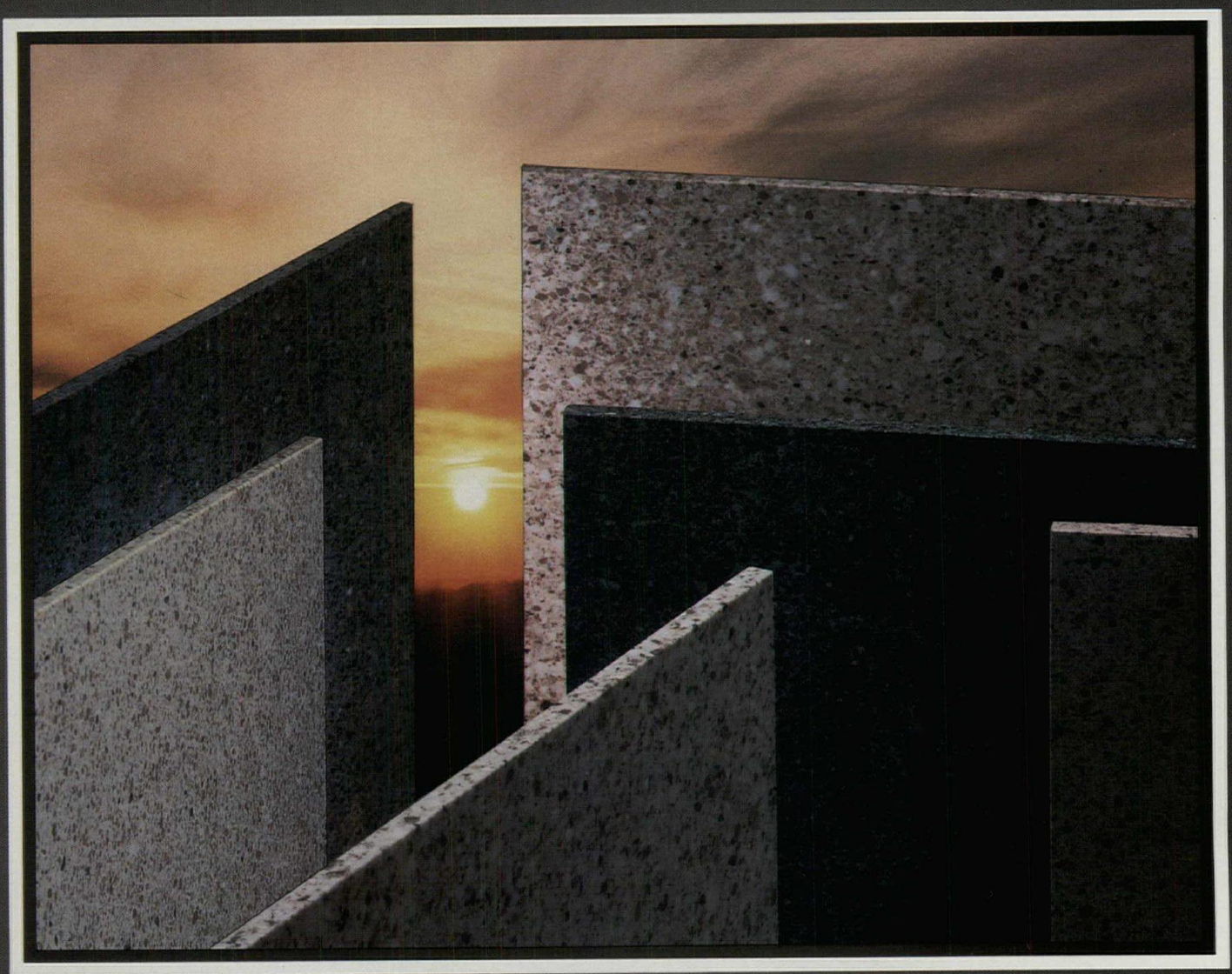

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Books

Modern Architecture Since 1900 *by William J.R. Curtis. Englewood Cliffs, N.J., Prentice-Hall, Inc., 1983, 16 color, 350 b/w illus., 416 pp., $35.95 cloth, $21.95 paper.*

Revisionist Modernism

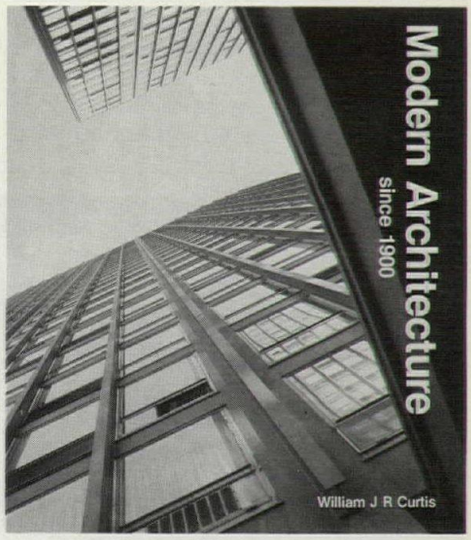
For the past 50 years we have been presented the history of Modern architecture as polemic, or at its least dogmatic, as justification for the subject of architecture itself. The most influential history of Modern architecture, Sigfried Giedion's *Space, Time & Architecture,* published in 1941 from the Charles Eliot Norton Lectures at Harvard of 1938, was an attempt to sell Modern architecture as the inevitable result of the decay of 19th-Century architecture and the virtues of true, honest structures such as bridges, factories, and other utilitarian buildings. Giedion maintained that Modern architecture resulted naturally from the new visual sensibilities in art (Cubism, etc.), the new technology (steel, glass, reinforced concrete), and the moral bankruptcy of eclecticism. Other historians of the modern movement have taken a similar and equally limited view of the origins and progress of 20th-Century architecture.

There was more to it than that. The chief virtue of William J.R. Curtis's new book *Modern Architecture Since 1900* is that Curtis is able to put the history of Modern architecture in context and in perspective. Curtis understands better than most what goes into the making of architecture. His previous book, *Le Corbusier at Harvard, the Genesis of the Carpenter Center for the Visual Arts,* which described in exquisite detail the designing and construction of the Carpenter Center, and his personal relationship with several architects, gives Curtis an understanding of the creative process that is critical to the success of this new book. The history of architecture, Modern architecture in particular, is more than the evaluation of styles in a history-of-fine-arts sense. The 20th Century is a time of pluralism, of the breakdown of authority, of a lack of consensus as to moral, social, and visual order. The old way of looking at architectural history, typified by Bannister Fletcher, will not do. And the later way, typified by Giedion, will no longer do either.

A change in the way we look at and understand the history of Modern architecture is particularly important now, which makes Curtis's book especially useful. We are in danger of being swept over by a rising tide of pseudo-historicism in the design of today's buildings (a Ruritanian guard house for Harvard Yard, a new high-rise office building in Boston that looks like a Wurlitzer record player, to mention only two), all designed in a silly pursuit of historical roots and relevance. Curtis's book makes it clear that the Modern revolution abandoned historical precedent in outward form only. He shows that the best of modern work and the examples likely to live on through history are those that have a deep-seated sense of architectural values and that deal with fundamental issues of space, light, and form.

His book also contains a chapter, "Totalitarian Critiques of the Modern Movement," that demonstrates the shallow results from the misuse of historical forms, a misuse arising in the 1930s from attempts of totalitarian leaders to impose social order. In our own time, this misuse arises from an ignorance of historical forms and a lack of understanding of the real reasons for the vacuousness of so much Modern architecture and the built environment.

Although Curtis covers the conventional timetable, from just prior to 1900 up to the present, he departs from the standard format in several important respects. The introduction makes clear his thesis; that is, that Modern architecture (and architects) emerged from a historical context, not newborn, free, and pure, as historians frequently would have us believe, and that architectural precedents and social context continued to shape the development of the period. The first chapter discusses the idea or notion of a modern architecture as it emerged in the 19th Century. This is a well-handled and necessary prelude. The idea precedes the fact. Scattered throughout the book are very lucid monographs on specific architects shaping the Modern movement. The one on Le Corbusier is particularly good, especially for understanding the transition



from his "white" period to his more expressionist later work. Only in a pardonable excess of chauvinism does Curtis, English by birth, seem weak in his attempts to demonstrate a significance to pre-war Modern architecture in England and to raise the work of Denys Lasdun to historical significance.

In the later chapters, Curtis discusses recent work and places it in the stream of history. This is a dangerous occupation, but at this point in the book he has laid down such a thorough and principled definition of the true spirit of Modern architecture that he can with confidence assess recent work and say which work is in the mainstream or, as he puts it, is a continuation of the "strands" of history. Curtis is a confirmed Modernist. That is, he believes that the development of Modern architecture was a true revolution, on the order of the Gothic or the Renaissance periods, and that history will be pushed forward by selecting the best and rejecting the ordinary works of the Modern tradition.

We are all, layperson as well as professional, called upon to assist in this selection and to judge knowledgeably our rapidly changing physical environment. Curtis's book is a clear, balanced, and useful tool in this task.

Reviewed by Brett Donham, principal of Brett Donham & Tadhg Sweeny, Boston.

[*Books continued, next page*]

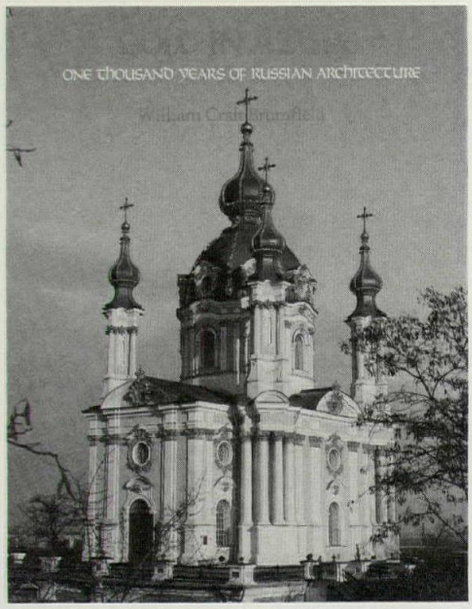
Gold in Azure: One Thousand Years of Russian Architecture
by William Craft Brumfield. Boston, David R. Godine, 1983, 81 color and 194 b/w photos, 429 pp., $60.

Russian architecture

For some of us there is no architectural form as evocative as a gold and azure onion dome. Now there is a splendid book celebrating one thousand years of Russian architecture. The author is a Slavic scholar who made the photographs during three extended study visits in Russia between 1970 and 1980.

The book is organized chronologically from the 10th-Century arrival of the Byzantine influence to Soviet architecture of the 1970s. Up through the Revolution, most of the architecture presented is religious, of masonry construction. Medieval Russian architecture traces its origins to Byzantium and thus shares in the stylistic peculiarities of Balkan, Armenian, and even some Venetian architecture, yet Russian work remains distinctly earthy, vigorous, and strong in its interpretations of Byzantine sources. The medieval Russian churches are also more vertical than any of their counterparts.

It is a treat to have so many photographs of the churches and monasteries



from Kiev, Novgorod, Vladimir, Vitebsk, and most of the other less known cities of European Russia, as well as the familiar monuments of Leningrad and Moscow, including two large and glorious color plates of Saint Basil's (Cathedral of the Intercession). The color photography and printing are very fine. Many plan and section drawings in the margins avoid the frustration of many architectural books where the unseen becomes the predominant question mark. Etchings, old drawings, and city plans expand the enjoyment of this book, which considers issues of urban design and city planning, as well as architectural design and social history.

One might wish that more of the 18th-Century estates surrounding Moscow had been included, as well as the enormous estates of the distant provinces, but Moscow and St. Petersburg families of prominence are represented by the Yushkov, Lopukhin, and a dozen other mansions. The author's travels were restricted, so we must still rely on Russian films for views of many of the notable country estates.

The wooden churches of 16th- through 18th-Century Russia have long been admired by foreigners. Several museums of wooden architecture now exist where wooden churches and houses from various parts of the Soviet Union are brought together and reassembled in a rural setting creating a sort of Russian Williamsburg. The effect of so many rural wooden churches all in one spot is odd and does not have the impact the churches would have individually in their original village settings, but it is very convenient for the visitor. It was in two of these architecture parks that the author photographed 15 churches, one windmill, and one house. He carefully framed these centuries-old wooden structures in isolation with snow flattering and surrounding each so the

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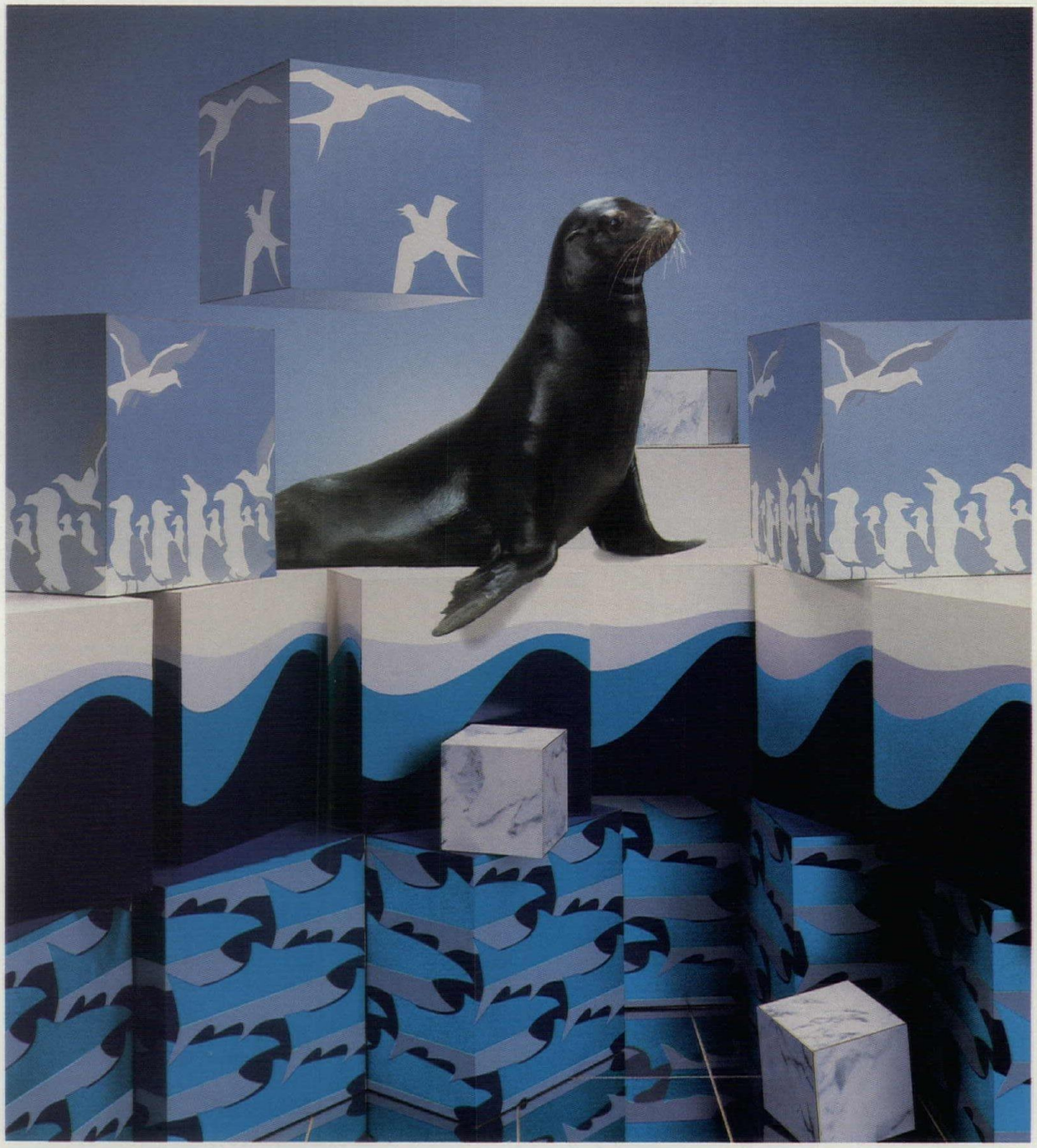

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reader is led to imagine the appropriate rural context.

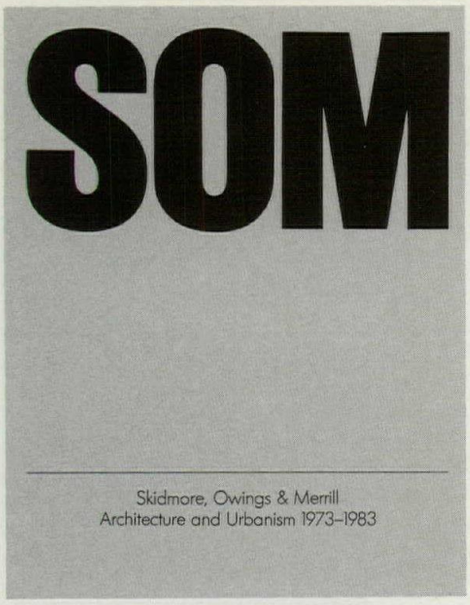
The chapter on 20th-Century Russian architecture includes the advent of Style Moderne, Neoclassical Revival, and Constructivism. The text discusses the influence of Le Corbusier on Moisey Ginzburg and the Stalinist repression in architecture and post-Stalinist revival. Buildings by Ginzburg, Le Corbusier, and Konstantin Melnikov and others in the post-Revolutionary Soviet Union conclude this beautiful book.

Reviewed by Susan Southworth, principal of Michael & Susan Southworth/City Design & Architecture, Boston.

Skidmore, Owings & Merrill: Architecture and Urbanism, 1973–1983. ***Introduction and Prefaces by Albert Bush-Brown. New York, Van Nostrand Reinhold, 1984. 393 pp., $50.50.***

SOM

In the introduction to this large, beautifully produced and lavishly illustrated volume, with text in both English and German (the latter translation by Oswald W. Grube), Albert Bush-Brown outlines how the past ten years have revealed "the architectural response of Skidmore, Owings & Merrill to a decade



that greatly changed American society." This book, he notes, "reveals a marked narrowing in America's sponsorship. Both federal and state governments slowed their construction programs, and except for the ascendant pharmaceutical, energy, and electronics industries, few manufacturing corporations commissioned new buildings. Like the industrial corporation, the university was no longer expanding, and although a few notable museums added large wings, America's enormous postwar expansion of its cultural institutions came to a pause. The decade 1973–1983 belonged to the urban office tower. Supplying rental office space, many towers were built by developers who, managing investments made by foreign and American speculators, set architectural constraints SOM had seldom known in earlier work for corporate patrons."

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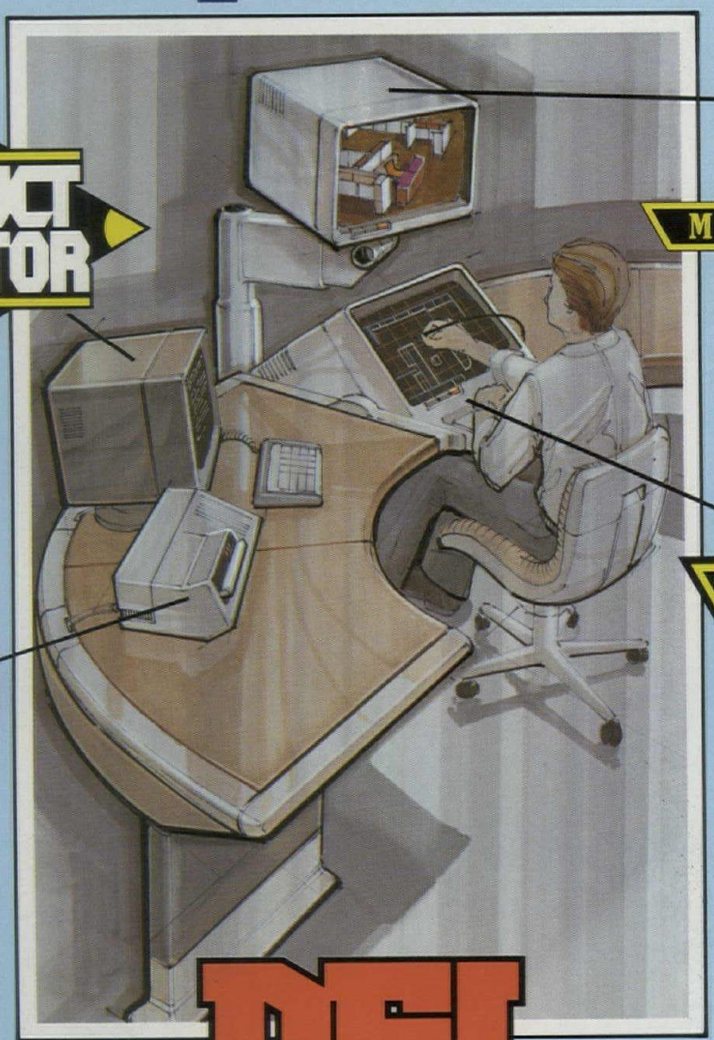

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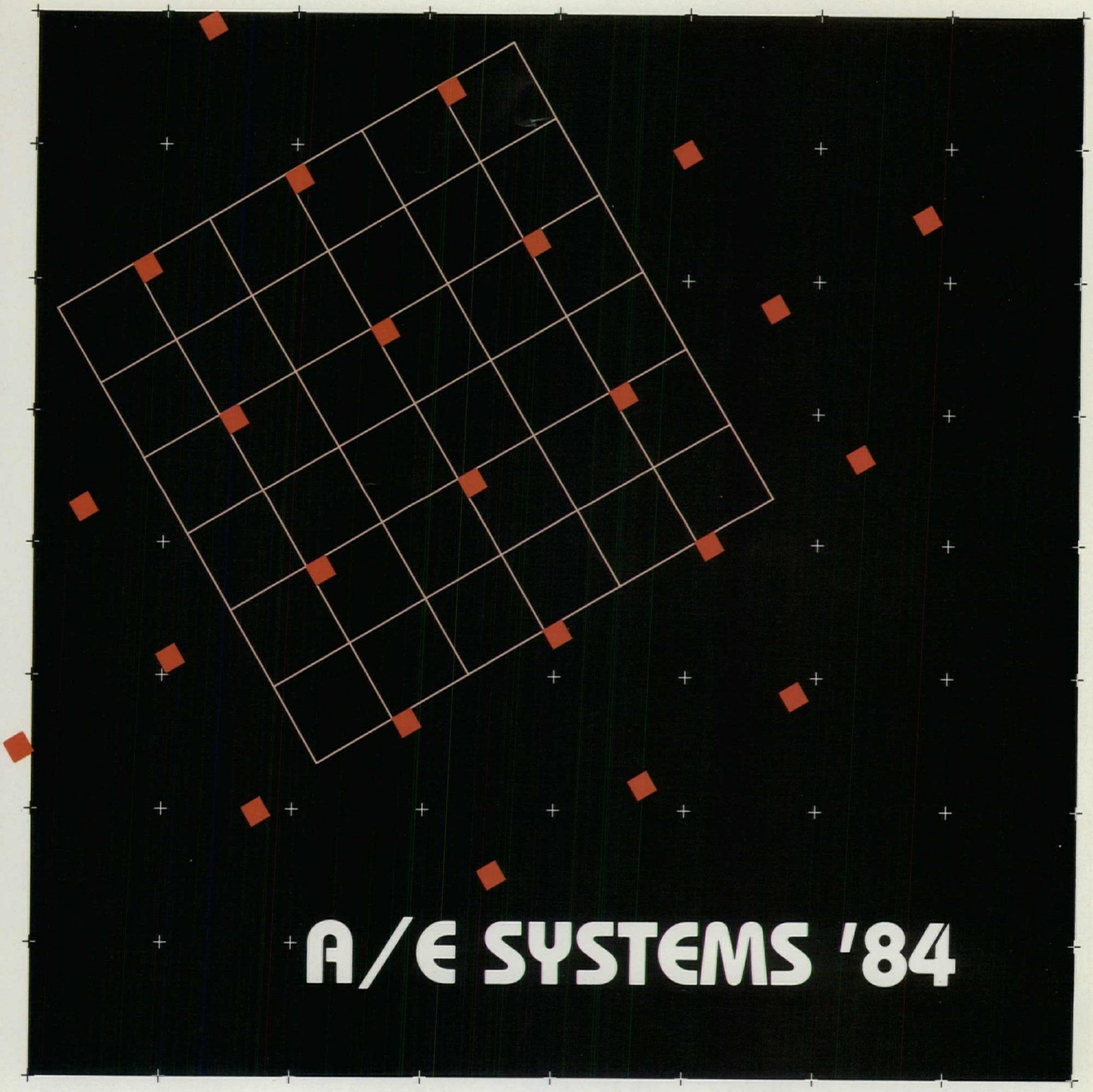

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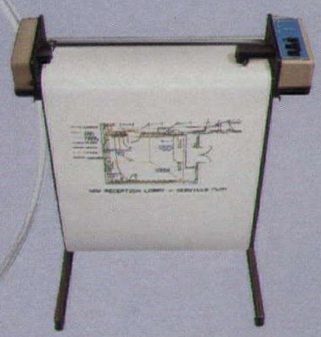

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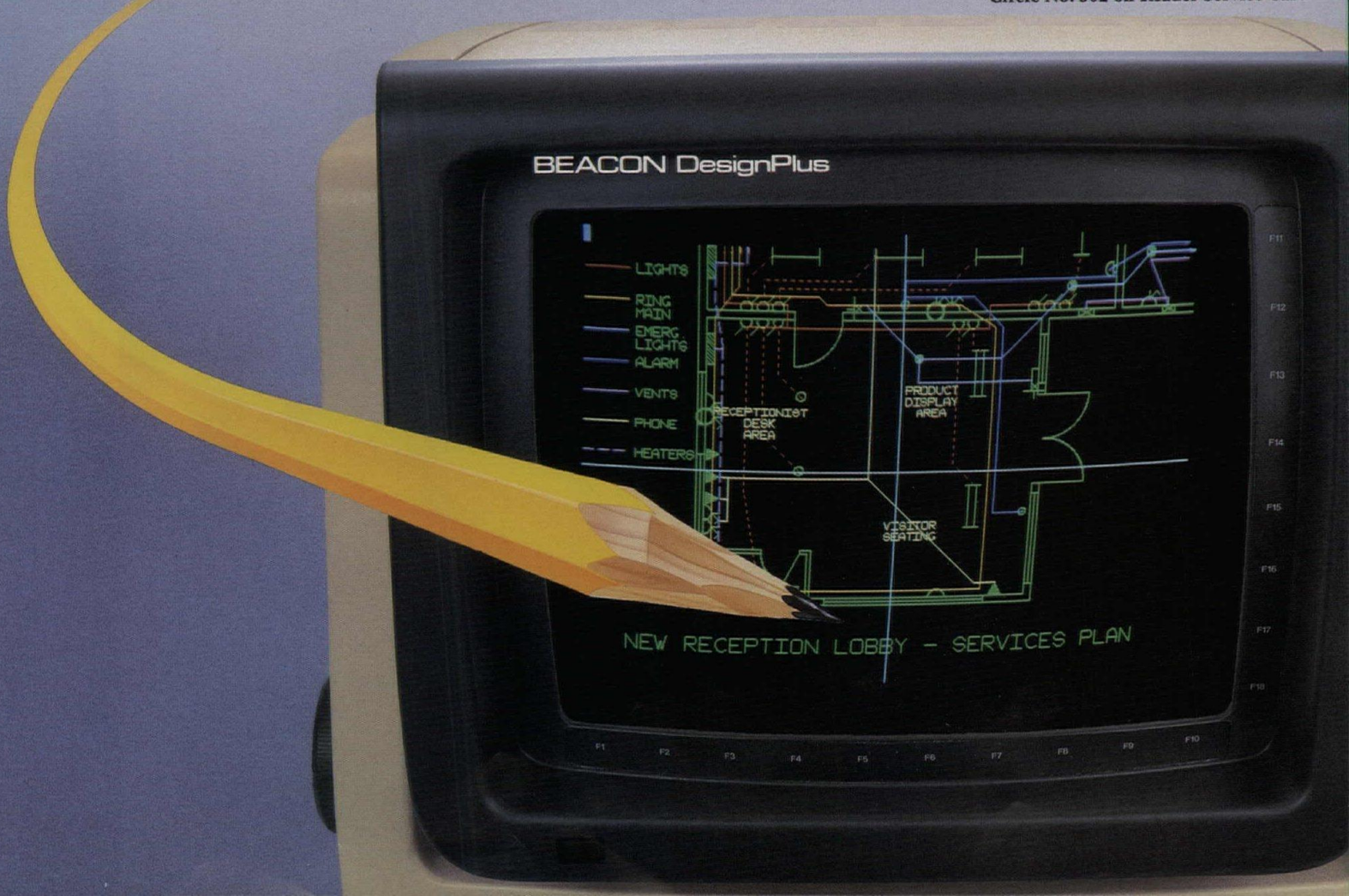

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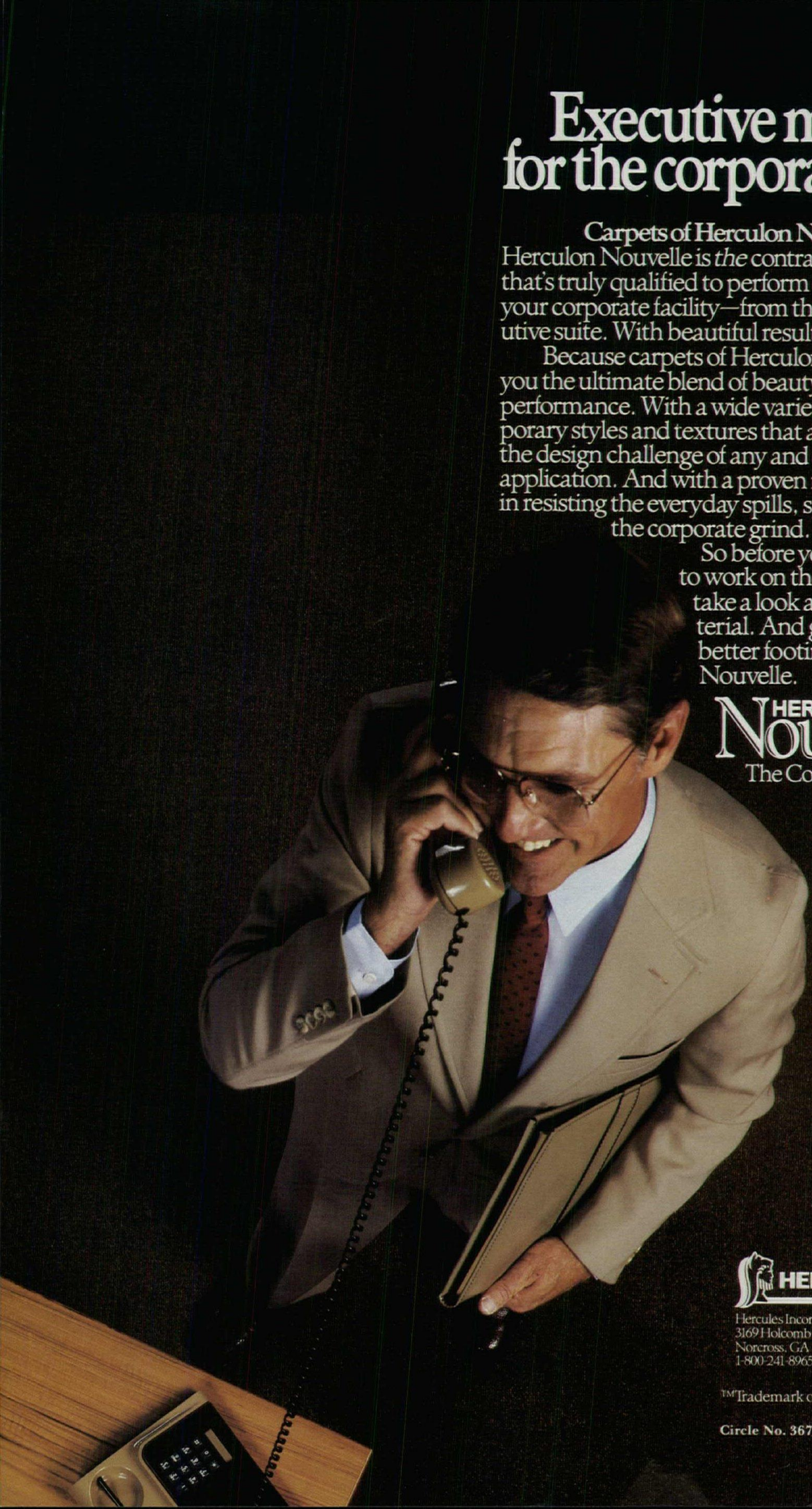

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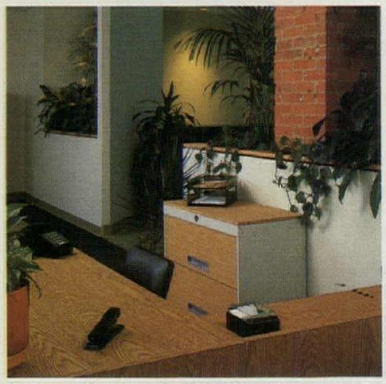

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The National Endowment for the Arts, Design Arts Program, and the City of Escondido, California (approx. 30 miles northeast of San Diego) are jointly sponsoring a competition to provide an urban design plan for Escondido's proposed $52 million Civic Center. The Center will contain multiple governmental functions, and the North San Diego County's primary cultural facilities. The winner of this open two-stage competition will be awarded the opportunity to negotiate a contract to provide immediate architectural services for the first element of the Civic Center—the estimated $8 million City Hall Building which is funded and scheduled to begin construction in 1985.

Registration deadline is June 30, 1984.

For additional information and registration forms write to: William H. Liskamm, FAIA, Competition Advisor, Escondido Civic Center Urban Design Competition, City Hall, 100 Valley Blvd., Escondido, CA 92025, or phone Competition Secretary (619) 741-4631.

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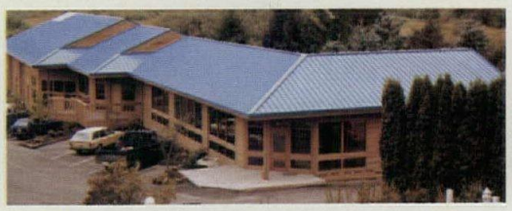

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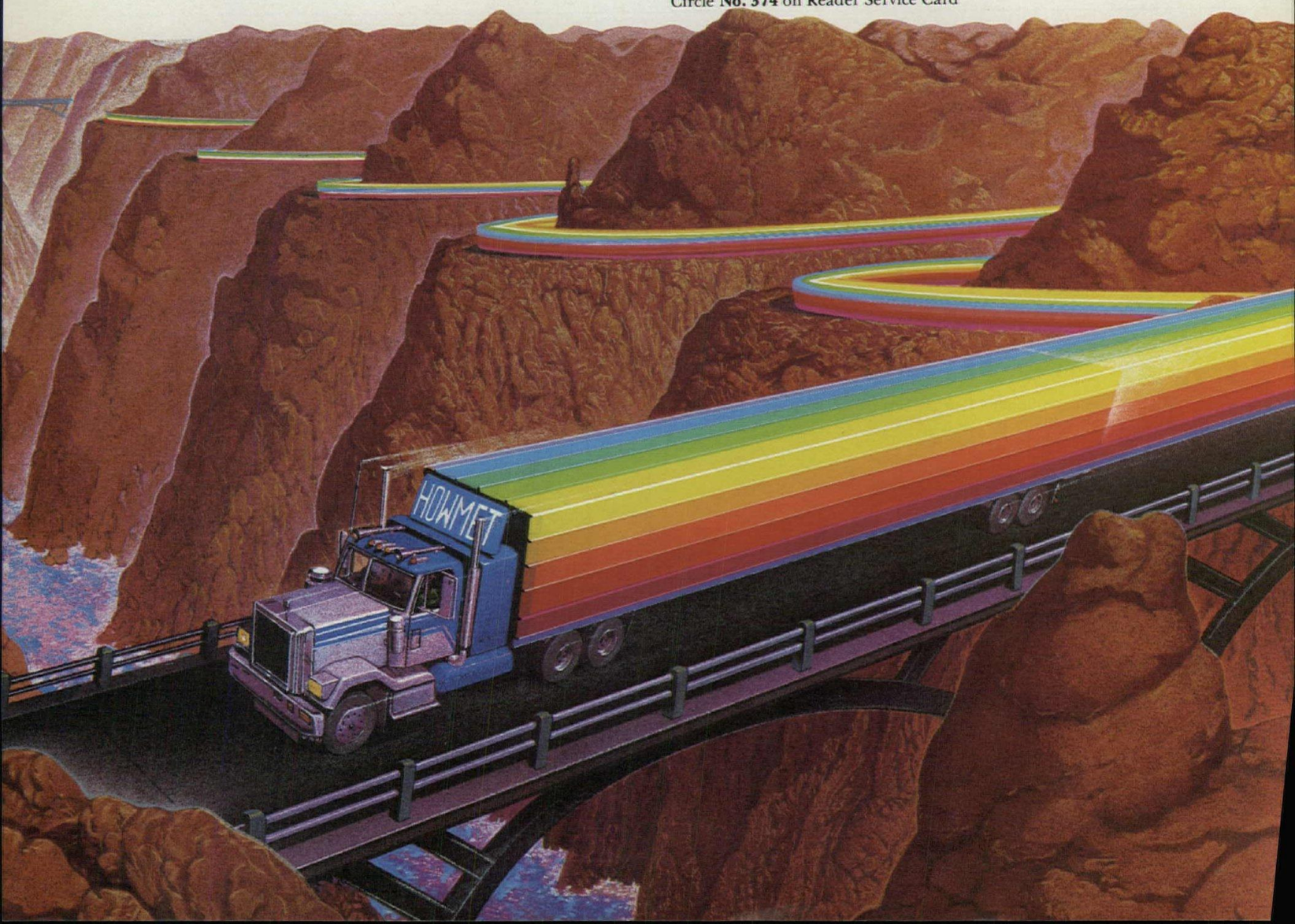

P/A Job mart

Situations Open

Architect of the Capitol

The State of Texas is seeking a qualified architect to direct the restoration of the State Capitol Building in Austin. Must have an architectural degree (or its equivalent in experience), registration, eight years professional experience with four years experience in historic preservation, and must have taken a lead role in at least one major preservation project. The Architect of the Capitol will be responsible for selection of a staff and curator, as well as research and documentation, preparation of plans and specifications, policy development, and budget and personnel management. Send resume to Karen Johnson, Office of the Governor, P.O. Box 12428, Capitol Station, Austin, Texas 78711.

The State of Texas is an equal opportunity employer.

Architectural faculty position opening. A tenure track position in the Architectural/Engineering Technology Programs at SUNY at Alfred is anticipated September 1, 1984. The program is heavy in building methods and the applicant should have good, practical experience. A masters degree in Architecture or Architectural Engineering and the ability to become licensed within a reasonable time are required. The residential campus has a student enrollment of 4000, and is located in a rural setting of rolling hills with excellent fishing and hunting available. Apply with resume and three professional references by May 31, 1984 to: Ronald S. Nichols, P.E., Chairman, Civil Engineering Technology, State University of New York Agricultural College, Alfred, NY 14802. An Affirmative Action/Equal Opportunity Employer.

Assistant Director, Architecture: The University of Alabama in Birmingham, a rapidly developing, comprehensive, urban medical and educational complex spanning 70 blocks of the city's southside is currently inviting applications for Assistant Director, Architecture and Engineering. Degree in Architecture and five years relevant experience required. Must be eligible for registration in Alabama. UAB offers an outstanding benefits package. Salary for this position will be commensurate with qualifications. Individuals interested in this challenging opportunity are invited to send resumes to: UAB Employment Division, G001 BB, University Station, Birmingham, Alabama 35294. AA/EOE.

Auburn University's Department of Architecture is seeking applicants for nine-month, faculty positions beginning Fall 1984. The Department offers degrees in architecture, interior design, landscape architecture and community planning. The Department anticipates openings in the areas of design, history and theory, computer applications, and professional management. 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, Alabama 36849. Auburn University is an Equal Opportunity Affirmative Action Employer.

City of Charleston—Preservation Architect: Administers Board of Architectural Review; reviews plans with architects and developers for rehabilitation and new construction; develops guidelines for new construction and renovation. Masters degree in Architecture preferred or related field and 2 years experience. Submit resume to: Personnel Director, P.O. Box 304, Charleston, SC 29402.

Coordinator—Architecture & Design—Battery Park City Authority. Monitor all design related issues for all projects being planned or developed for site. Architecture, Landscape Architecture, Urban Design or Planning degree plus 1–2 years experience preferred. Send resume and telephone number to 40 West Street, New York, NY 10016.

Designer/Detailer—for custom decorative lighting manufacturer. Person must be able to draw free hand. Experience desired but not required. Factory/offices located in Queens, New York. Reply Box 1361-430, *Progressive Architecture*.

Designer/Draftsman: Design oriented, small architectural office located in the Virgin Islands has position open for a graduate with a minimum of 2 years experience. Send resume, salary history and non-returnable examples of design and working drawings to: Frank Blaydon, AIA, 5 Company St., Christiansted, St. Croix, U.S. Virgin Islands 00820. Salary commensurate with experience/abilities.

Director of Interior Design—Midwest architectural and Interior Design firm with nationwide practice invites applications from persons with capability to lead/manage programming, space planning, interior design detailing. Responsibilities include planning, organizing and controlling of interior design functions and personnel and marketing. Qualifications include a college degree in architecture and/or interior design, a minimum of ten years experience and expertise in interior design for institutional, corporate and commercial clients. Qualified candidates are invited to forward their resume with salary history in complete confidence to: John M. Dierdorf AIA, BDMD Inc., 124 S. Meridian Street, Indianapolis, IN 46225. An Equal Opportunity Employer.

Faculty Vacancy: Architectural Engineering—Pennsylvania State University, University Park, Pa. Tenure track opening, Asst. Prof. level, primary duties—teach materials and methods of construction, working drawings and residential and light commercial construction to students in architecture and architectural engineering. Requires master's degree in architecture or architectural engineering. Architectural registration, 3–5 years office experience. Experience in computer graphics a desirable plus. Closing date—June 1, 1984 or until position is filled. Send curriculum vitae to Mr. J.S. Futrick, Admin. Aide, Dept. of Arch. Eng., Box D, 104 Engineering A, University Park, Pa. 16802. PSU is an Affirmative Action/Equal Opportunity Employer.

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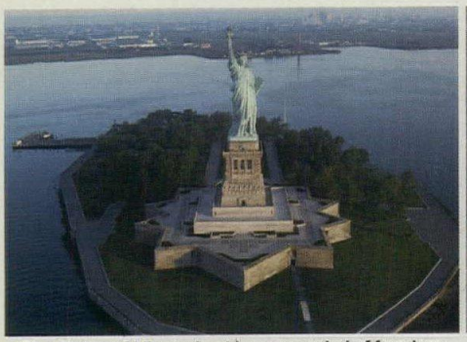
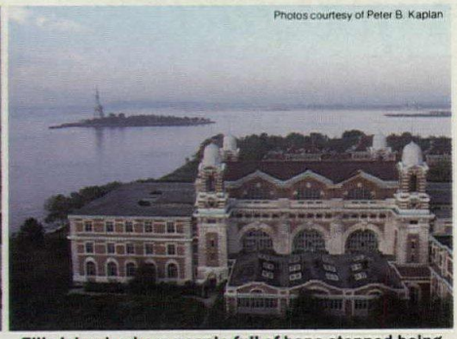
EOE/M/F/H

[*Job mart continued on page 288*]



The Statue of Liberty, best known symbol of freedom in the world, is every American's to cherish.

A century of fatigue and corrosion has weakened the Statue's frame, eaten holes in the copper skin.



Photos courtesy of Peter B. Kaplan

Ellis Island, where people full of hope stopped being foreigners and started being Americans.

For nearly a hundred years, the Statue of Liberty has stood on the edge of the New World, America's most powerful symbol of freedom and hope. Today the ravages of almost a century of weather and salt air have left their marks. Corrosion has eaten away at the iron framework. New holes continue to appear in the copper sheets that form the exterior.

Less than a mile away, on Ellis Island where the ancestors of nearly half of all Americans first stepped onto American soil, the Great Hall of the Immigration Center is a hollow ruin. Rooms are vandalized, passageways overgrown with vegetation, walls crumbling in decay.

Inspiring plans have been developed to restore the Statue. On Ellis Island, a permanent museum will be established devoted to the history of the island itself and celebrating America's immigrants on both coasts; the diversity of their ethnic origins, the magnitude of their contributions to our nation. But unless restoration is begun now, these two landmarks in our nation's heritage could be closed at the very time America is celebrating their hundredth anniversaries. Sections of the Statue have already been declared unsafe and closed to visitors. The 230 million dollars needed to carry out the work is needed now.

All of the money must come from private donations; the federal government is not raising the funds. This is consistent with the Statue's origins. The French people paid for its creation themselves. And America's businesses spearheaded the public contributions that were needed for its construction and for the pedestal.

The torch of liberty is everyone's to cherish. Could we hold up our heads as Americans if we allowed the time to come when she can no longer hold up hers?

A copy of the last financial report filed with the Department of State may be obtained by writing to: New York State, Department of State, Office of Charities Regulation, Albany, New York 12231, or the Statue of Liberty-Ellis Island Foundation, 101 Park Avenue, 12th Floor, New York, N.Y. 10178.

Opportunities for Corporate Sponsorship and Employee Participation

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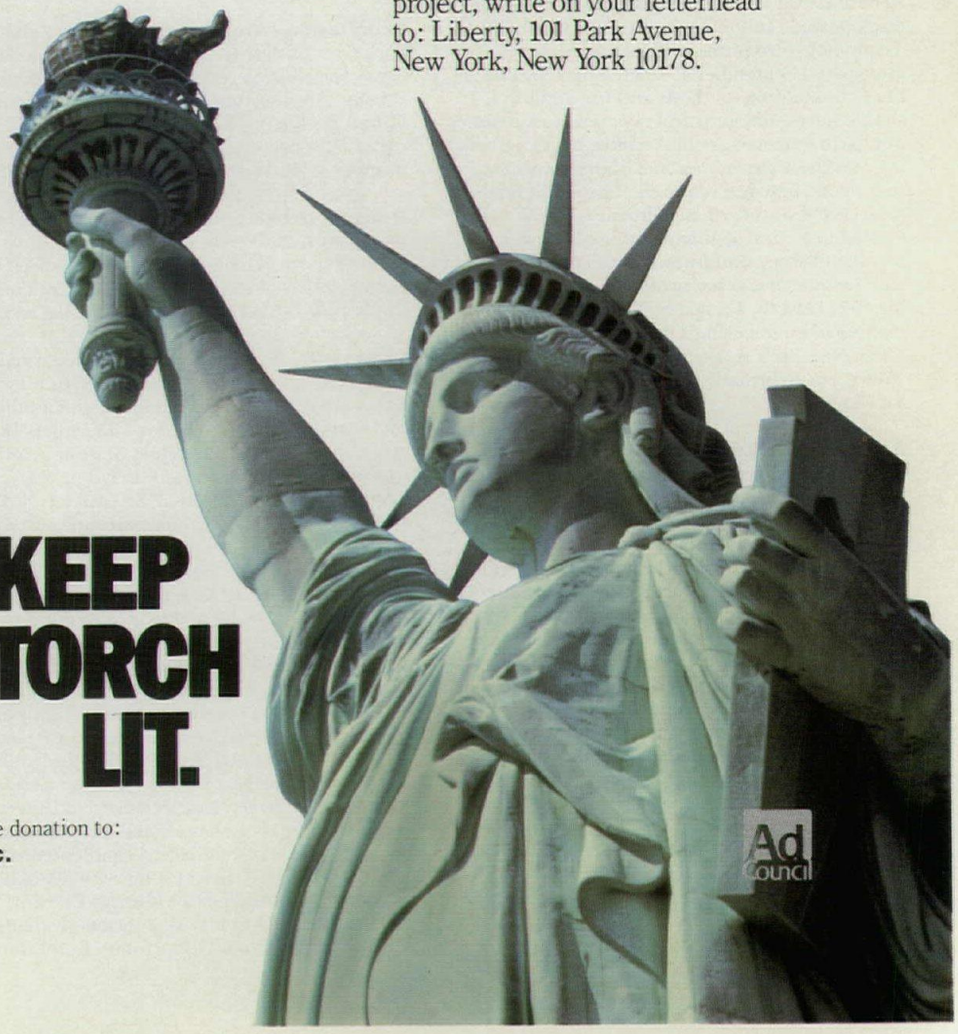
Initial response from corporations to the centennial fund-raising campaign is well under way. Companies such as Chateau Ste. Michelle Winery, Coca-Cola, Kellogg's, Stroh's, U.S. Tobacco, Oscar-Mayer, Kodak, USA Today, Nestle and The Chrysler-Plymouth and Dodge Dealers are already behind the project. To learn more about the advantages of corporate sponsorship and how to set up employee fund-raising programs during the nationwide promotions surrounding the restoration project, write on your letterhead to: Liberty, 101 Park Avenue, New York, New York 10178.



KEEP THE TORCH LIT.

Save these monuments. Send your personal tax deductible donation to:
The Statue of Liberty-Ellis Island Foundation, Inc.
P.O. Box 1986, New York, N.Y. 10018

Ad Council

On May 18, 1982, President Ronald Reagan announced the formation of the Statue of Liberty-Ellis Island Centennial Commission and appointed Lee A. Iacocca chairman of the 20-member unit.

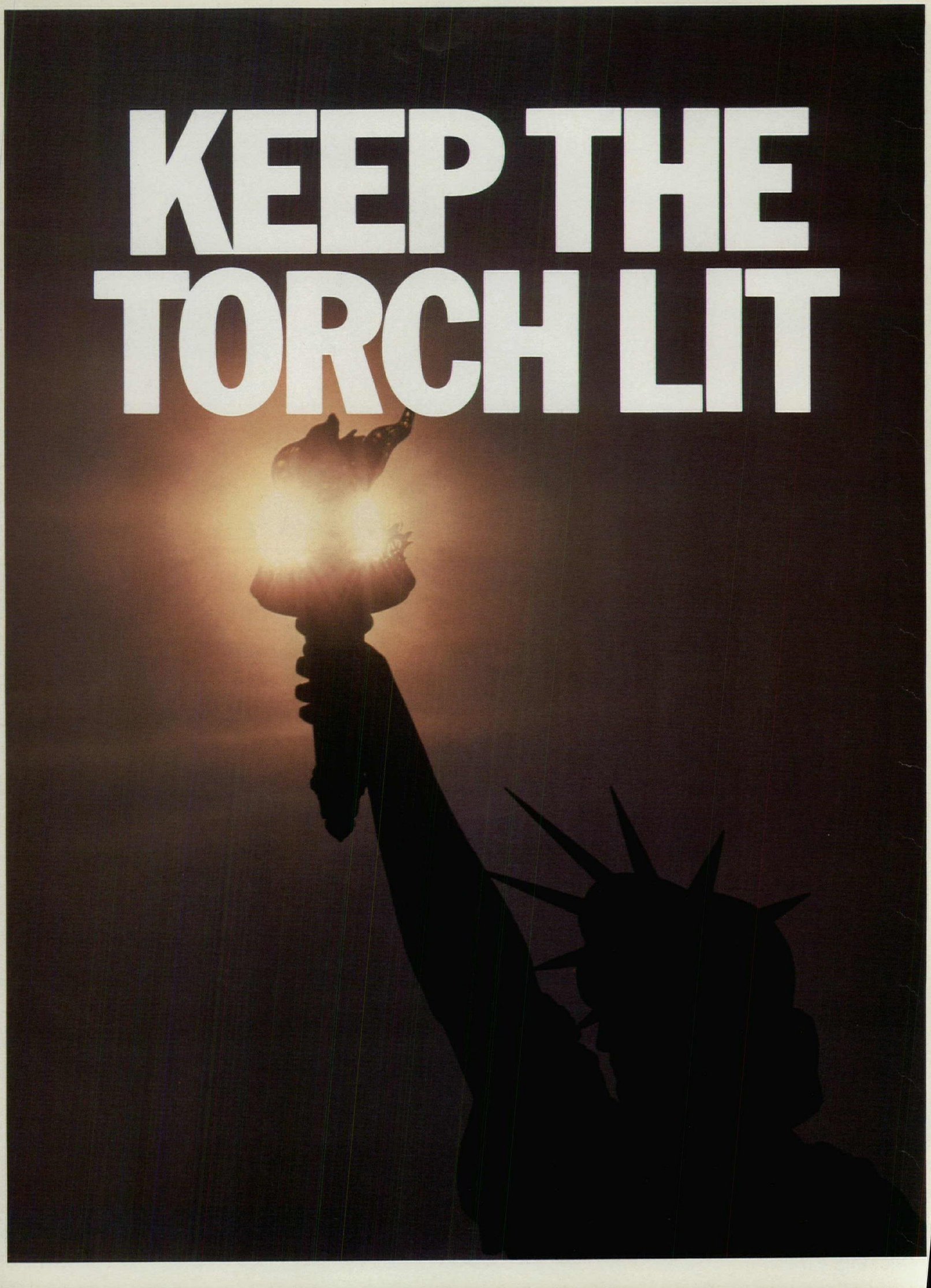
"The torch of liberty is in danger of going out."

"Restoration of the Statue of Liberty and Ellis Island is of vital concern to all Americans. The loss of these two landmarks in America's heritage would be a tragedy. But our allowing it to happen would signify an even greater loss in our national spirit.

"That's why I'm delighted that Lee Iacocca has taken on the job of Chairman of the Centennial Commission. His parents were among the 17 million who passed through the Immigration Center and went on to help build our country. Their determination to take responsibility for their own destiny is a heritage all Americans should be proud to keep alive today.

"I know Lee and his commission will do a tremendous job. The initial response to their appeal to business leaders and the public has been wonderful. Now it's time for every American to join in."

Ronald Reagan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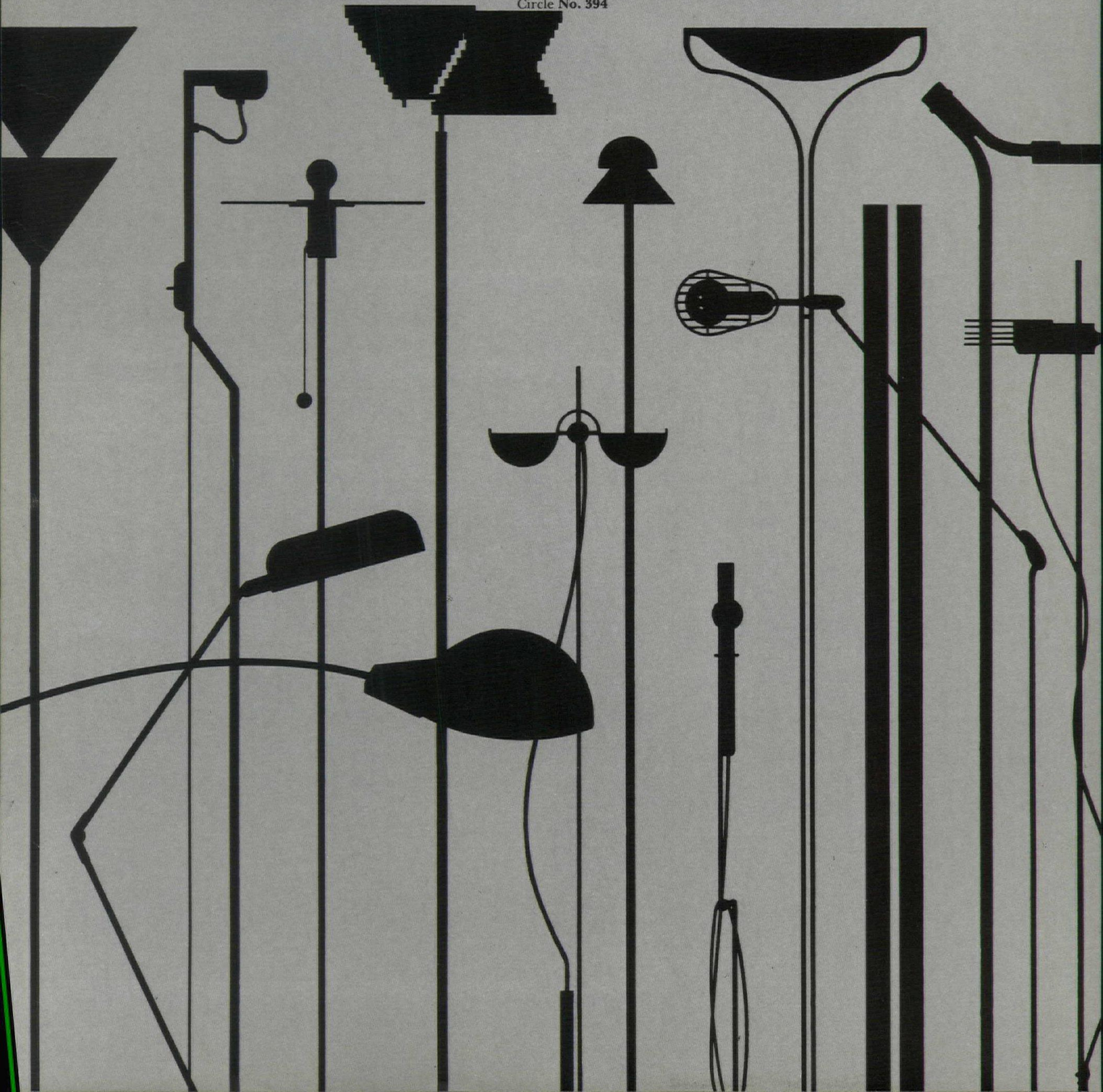
TORCH LIT



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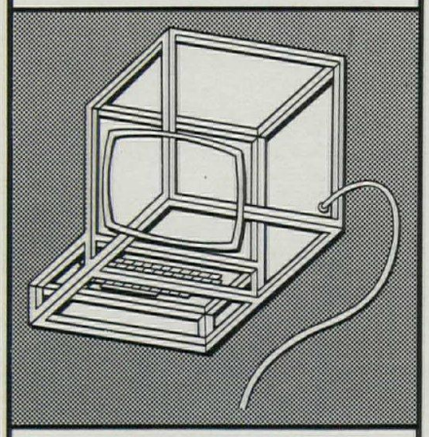

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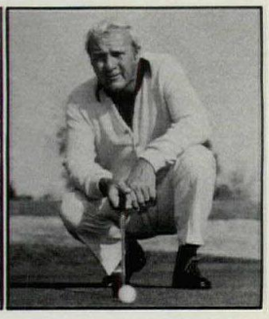

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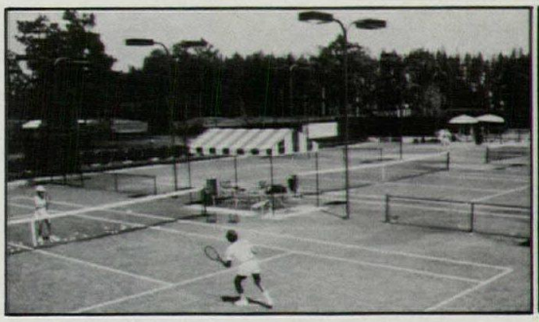

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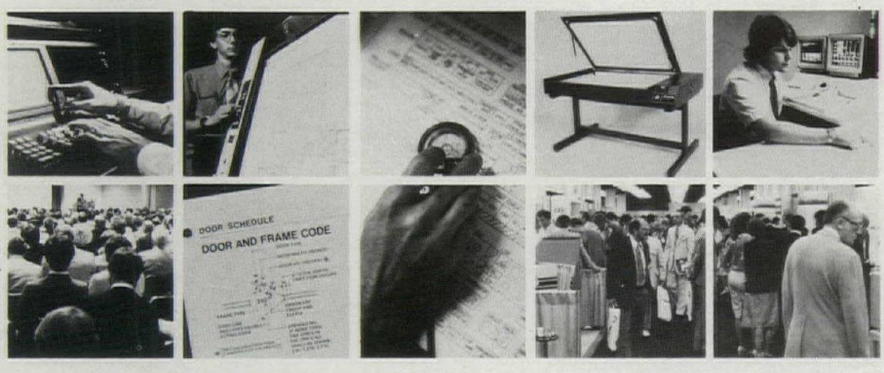

June 4-7, 1984 Baltimore Convention Center

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The 650 booth exhibit is open Tuesday and Wednesday, June 5-6 from 10 a.m. to 7 p.m. and Thursday, June 7 from 10 a.m. to 3 p.m.

Attendees must be 21 or older.

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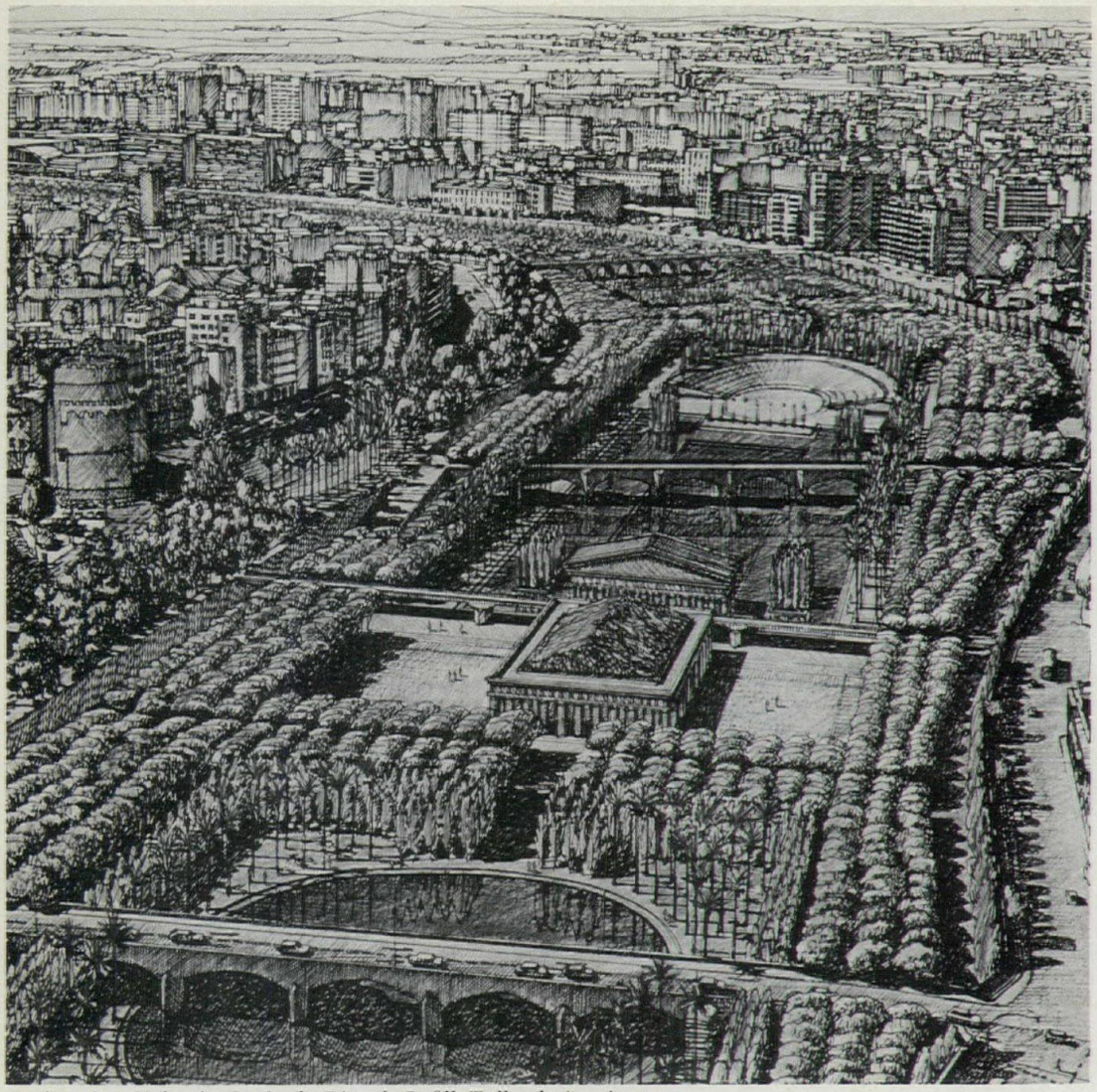
P/A in June: Buildings/Parks



Park project, Valencia, Spain, by Ricardo Bofill, Taller de Arquitectura.

The cutting edge of architectural design will be explored in the June P/A, through an examination of four completed buildings that are both bold and sensitive:

Eric Moss's "Petal House" in Los Angeles applies the flourishing Constructivist/Collagist idiom of that city with rare imagination in a remarkably workable, appropriate residence.

Michael Graves's new public library at San Juan Capistrano, California, the winning scheme in an invited competition, is assembled out of graceful turrets, arcades, and patios that complement its picturesque setting.

Mitchell/Giurgola's alterations to the Union Theological Seminary in New York show how visibly Modern insertions can complement a Gothic complex.

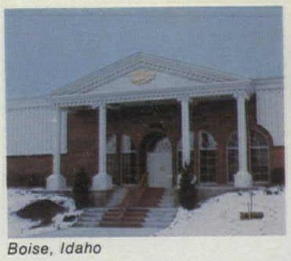
Moore Grover Harper's Lenz Winery in rural Long Island shows how wood structures of vernacular character can produce an environment of relaxed elegance.

Park design projects by the Bofill studio in Barcelona recapture the grandeur and public spirit of the great urban parks of earlier centuries.

Ergonomic design of a new furniture system for the automated office will be the focus of an interview with an eminent industrial designer.

Rounding out the issue will be the lively P/A News Report, the Practice department, the Editorial page, a selection of the latest Products and Literature, and a critical review of recent Books.

P/A in July will include a feature section on government-sponsored housing, examining the current constraints in the U.S. and illustrating several new projects where architecture triumphs over them. A related Technics article will cover the special technologies and procedures in the expanded field of Third World housing.



Boise, Idaho

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Pacific Palisades

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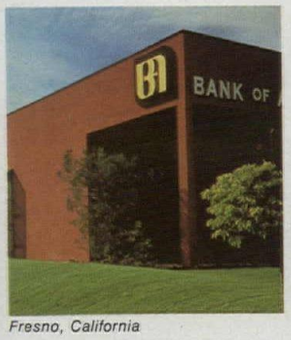

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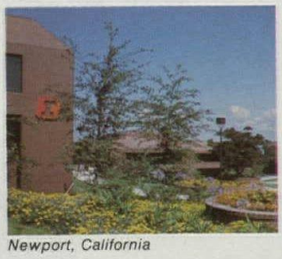
Denver, Colorado

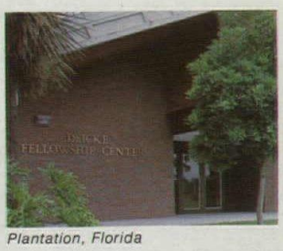


Newport, California

Universal City, California

New York City, New York

Oahu, Hawaii



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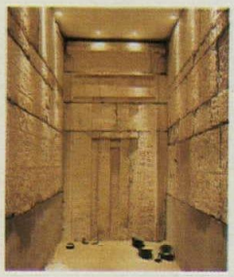

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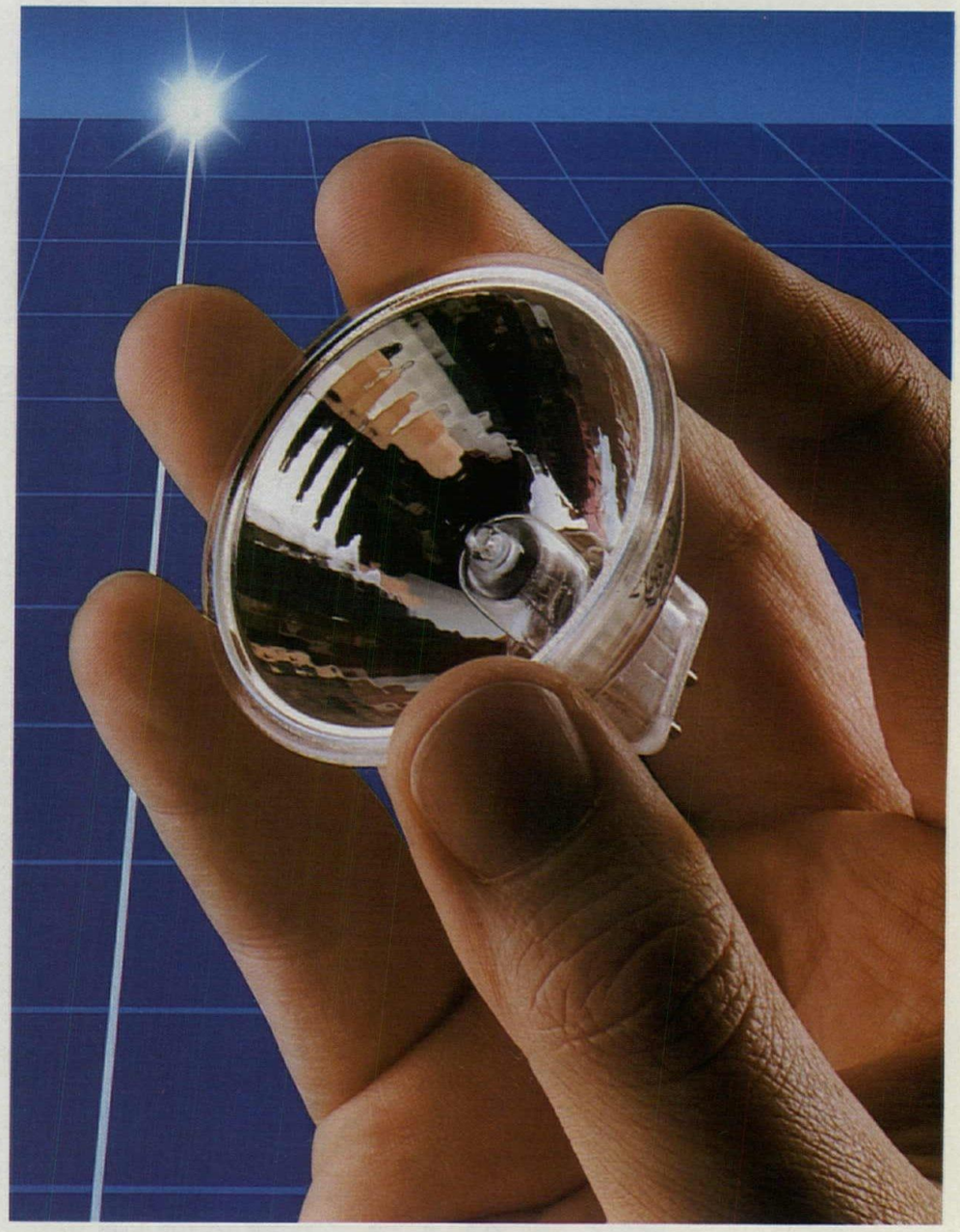

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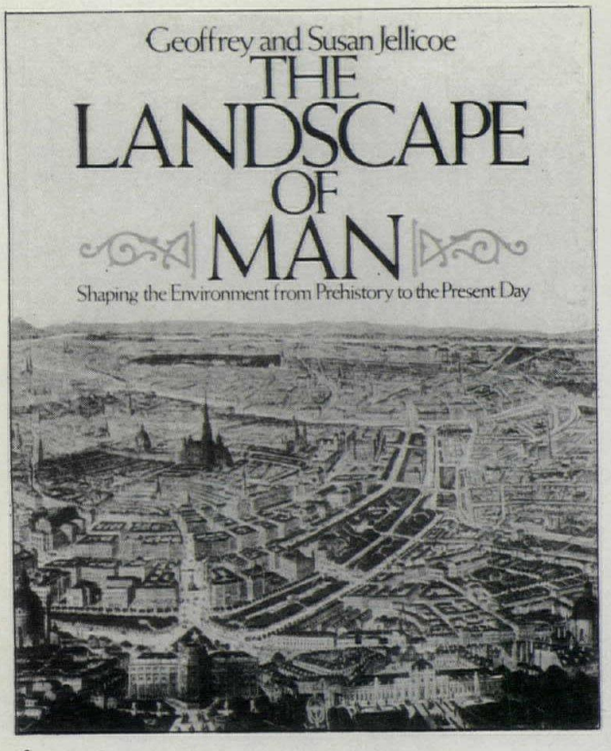

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1 The Landscape of Man

By Geoffrey and Susan Jellicoe
383 pp., illus....$19.95
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For twenty-six different cultures the authors summarize the social and intellectual background, describing how it was expressed in terms of landscape. The history of landscape architecture and the progress of landscape design are thoroughly and intelligently discussed. History, philosophy and religion are consulted in order to explain fully "the landscape of man".
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2 Mitchell's Movement Control in the Fabric of Buildings

by Philip Rainger
216 pp., illus.... $46.50

Guidance is given on the design and constructional precautions which can be taken to prevent movements. These precautions are treated under the headings of the prevention and methods of accommodating these in the structure allowing free movement to take place.
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3 Structural Systems

By Henry J. Cowan and Forrest Wilson
256 pp., illus.... $16.95

This is a comprehensive guide to preliminary structural design using a minimum of mathematics and numerous illustrations to describe structural forms and their mathematics. It has a strong emphasis on graphic presentation and is an instant-access reference to structural design. Full consideration is given to the internal and external forces that a building must withstand, and the interaction of structural and environmental design.
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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,
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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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By Gideon S. Golany, Ph.D.
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This book explains the energy-saving advantages that earth enveloped shelters offer for heating or cooling, weather-proofing, comfort, benefits of lower land and maintenance cost, durability, privacy and maintenance safeguards against noise, strong wind, and pollution. It discusses all types of potential land uses belowground.
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7 Design and Planning of Swimming Pools

By John Dawes,
276 pp., illus.... $52.50

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.
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8 Architectural Rendering: The Techniques of Contemporary Presentation

By Albert O. Halse, 326 pp.,
illus., 2nd edition, 1972 ... $59.50

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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9 Cities For People

By Ronald Wiedenhoeft
224 pp., illus.... $24.95

This book is a thoughtful analysis of the dehumanization of cities and the urban blight that results. It demonstrates how we can reverse this trend, making cities more responsive to human needs and improving their economic viability. It offers a number of economically sound steps that have proven effective in revitalizing cities all over the world.
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NEW

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by Klaus Herdeg
125pp., illus. ... $22.50

Deals with Gropius's pervasive influence from the late 1930s to the early 1950s as head of the Harvard Graduate School of Design. Criticism of the school and the curriculum under Gropius and his formal analysis of the work of its most illustrious graduates. Shows that they have all failed to move beyond Gropius's indoctrination and the Bauhaus legacy.
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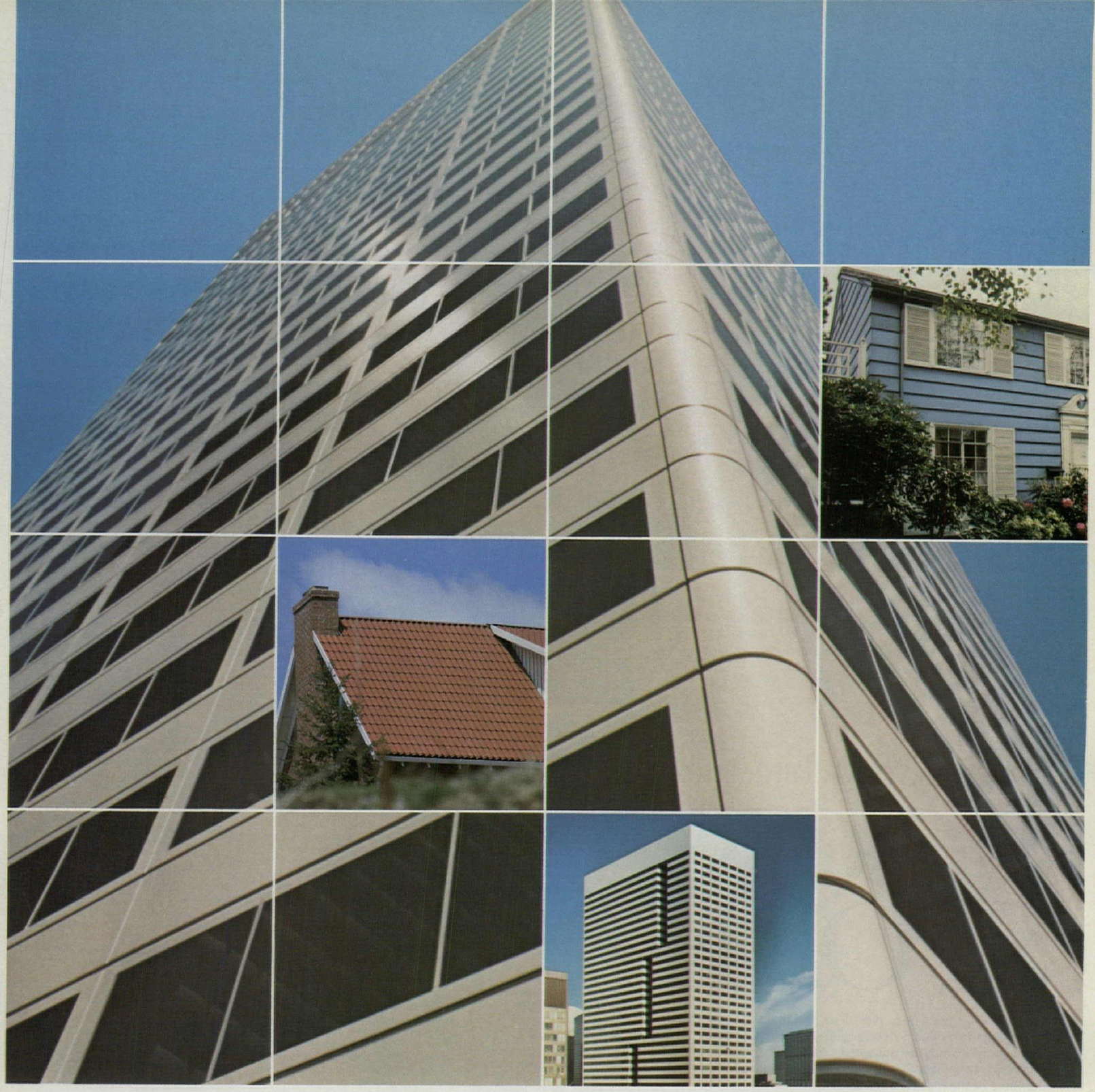

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Sigma III CAD workstation offers 16/32 bit microprocessor, up to 400 megabyte disk storage, high-speed cartridge tape for backup and archiving, and high-resolution color or black-and-white displays. Displays have tilt, swivel, and horizontal positions, with touch-menu/keyboard or graphics tablet input. Architectural software includes floor plans, elevations and sections, site plans, 3-D extrusion and fold-up, HVAC/electrical/plumbing, and Details +® for architectural details. Sigma Design, Inc.
Circle 523 on reader service card

Viewpoint™ facility design and management system is based on a Digital Equipment Corporation minicomputer, graphic and data terminals, a printer/plotter, and storage devices. There are software programs to aid designers in creating work environments and in identifying tasks and determining equipment needed. Programs for the facility manager help to analyze, plan, and control space. Two graphic tools are IDD™, an aid in the creation of building and interior plans, and DDD™, an aid to planning and analyzing space, featuring a 3-D modeling program. Core.
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Electronic scanning device digitizes drawings in a matter of seconds. It produces high-quality raster images that can be edited with Formtek's drawing system software. The scanner is integrated with Form:Sketch, freehand sketching package, and Form:Draw, design and drafting package. Images can be plotted, modified, sketched over, highlighted, or converted into more detailed drawings. Formative Technologies, Inc.
Circle 525 on reader service card

CADPLAN™ computer-aided design system, which operates on the IBM Personal Computer, decreases the amount of time required to complete two-dimensional designs such as office floor plan layout, placement of equipment and furniture, and design of mechanical systems. Editing options are: copy, move, rotate, delete, and undo. Viewing options include the ability to pan, zoom in, or zoom out. Features are described in a six-page brochure. Personal CAD Systems, Inc.
Circle 526 on reader service card

The Total Facilities Management System consists of an alphanumeric CRT and keyboard, digitizer tablet, color 19-inch CRT and keyboard, computer with 512K bytes of memory, a color printer/plotter, and a report printer. Functions include programming immediate space requirements, estimating future requirements, tracking space utilization, preparing computer-generated building stack diagrams, and creating and updating block type floor plans. Interior Facilities Associates, Inc.
Circle 527 on reader service card

Project Time Management System for architectural and engineering firms includes project costing, accounts receivable, billing, accounts payable, payroll, and general ledger. It has management reporting capabilities, and forms can be retrieved on a daily, monthly, year-to-date, or project-to-date basis. The program runs on Digital PDP-11 and VAX hardware. Alpine Datasystems.
Circle 528 on reader service card

A^2CE accounting control software for architectural and engineering firms, stores, accesses, and provides data for job costing, payroll, accounts payable, general ledger, and accounts receivable. It is available for use on Wang 2200, IBM PC/XT, Wang P.C., HP-150, or Digital Rainbow. With single-entry accounting, the information is entered once and immediately posted to all related accounts and job records. ECOM Associates.
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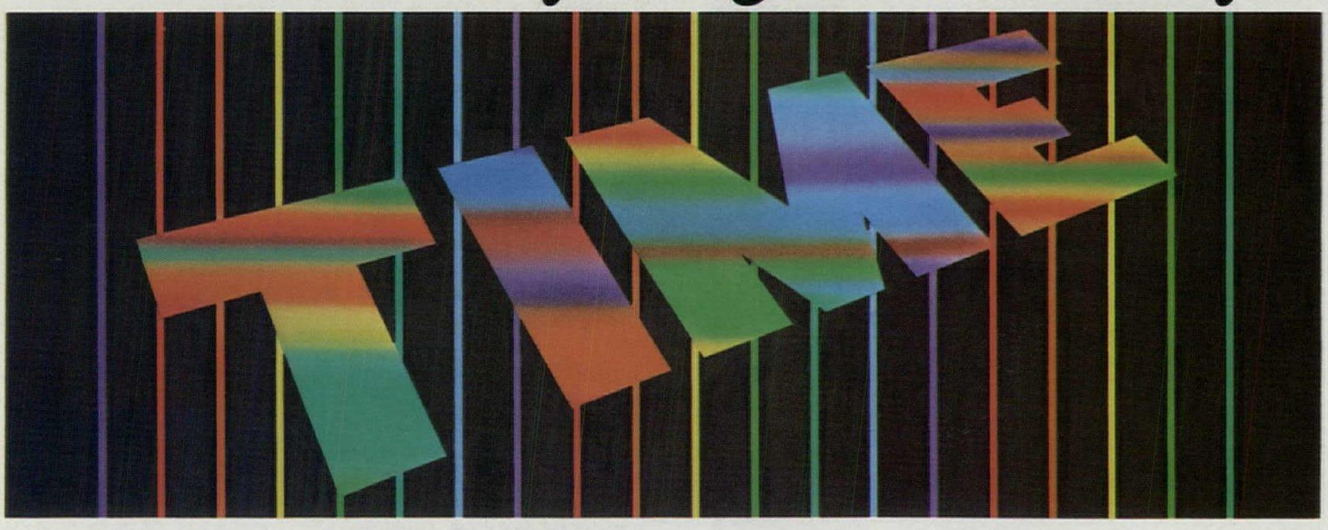

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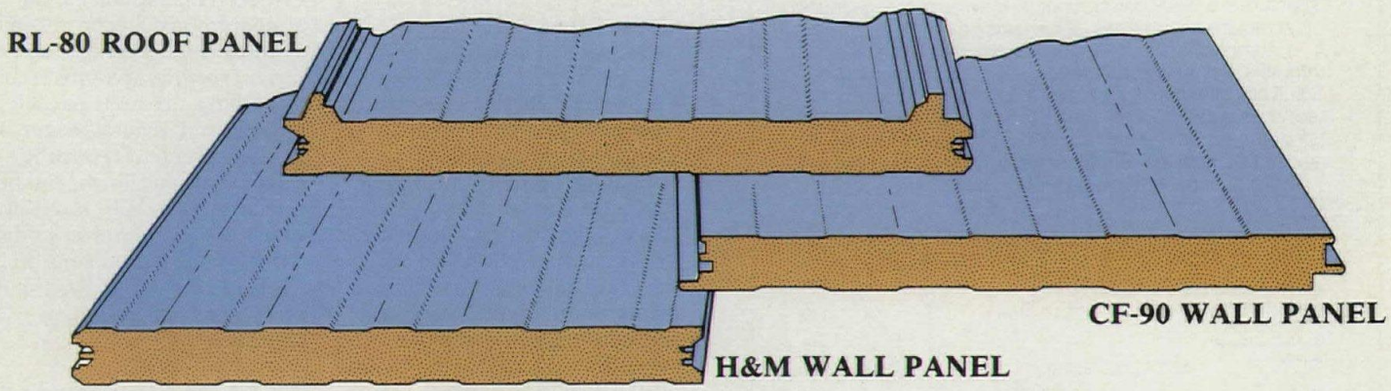
Insulated Building Products, Inc. has a Sandwich Panel System that turns this enemy into a valuable ally



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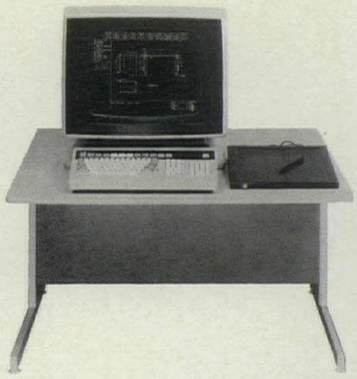

CADMAX-M entry-level 2-D CAD/CAM system consists of a minicomputer, a small workstation with separate display, keyboard and tablet assemblies, 10M byte disk, and a floppy disk for archival storage. It uses the same basic software as the more powerful CADMAX-II. The single-action command system permits the user to perform a function quickly and simply. Both systems can be mixed in a network that allows operators to share data and output devices in the network. Vector Automation, Inc.
Circle 515 on reader service card

The Architectural and Engineering Applications System combines the total project design and management process from concept through documents to long-term management of the finished facility. The package is divided into four parts: 3-D architectural model, architectural production drawings, space planning/facility management, and engineering production drawings. Each part is described and illustrated in a 12-page color brochure. Intergraph Corp.
Circle 516 on reader service card

The CalComp Architectural Production Package software produces architectural drawings from an index system for building components. This data base includes both a graphic depiction of the component and a description of size and other data. A code number identifies each component according to type, size, and other criteria, including angle of view from which it should be drawn. It can be interfaced with Report Writer software to produce a bill of materials and with Architectural Costing Package to generate detailed cost estimates. California Computer Products, Inc.
Circle 517 on reader service card

Integrated Software System includes project management software, word processing, and computer-aided design for two-dimensional drafting. Project management includes Timecard to assign payroll to specific projects; Consultant transactions to cover the cost of outside services being supplied to the client; and Vendor transactions for applying vendor charges. The system is described in a 48-page brochure that includes samples of the reports that can be generated. Keystone Project Management Systems.
Circle 518 on reader service card

Business Power™ System designed for the architectural and engineering office includes a microcomputer, a printer, and a hard disk or series of floppy disks, depending on program selection. The integrated project management/financial accounting package includes billing, payroll management, accounts payable, and general ledger. Other programs are Project cost accounting, Income property analysis, and Preliminary cost estimating. GBC, Office Automation Systems.
Circle 519 on reader service card

Computer-based Financial Management System (CFMS®) for design professionals, developed in conjunction with the AIA, offers applications such as payroll, project cost accounting and budgeting, labor distribution, accounts payable, accounts receivable, general ledger, financial statements, automated billing, and work-load forecasting. It is offered for timesharing, service center, or stand-alone systems. Harper and Shuman, Inc.
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Architectural Engineering Master Accounting System software package is a complete accounting, job costing, and payroll package that is now available for microcomputers. The system tracks costs through the life of a project. Invoices can be generated automatically, and reports are available on the screen or in printouts. The five modules are job costing, payroll, accounts receivable, accounts payable, and general ledger. It will run on the IBM Personal Computer, Wang Professional Computer, and the Victor 9000. Data-Basics, Inc.
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Borden decorative finishes let you truly create an interior environment. The widest choice of laminates and vinyl wallcoverings in the industry also lets you totally coordinate an interior, from floor to ceiling, wall to wall. Specify economical, durable Borden Type I, Type II fabric-backed or K-6 LT vinyl film laminates for demountable partitions and landscape wall system surfacing. Then unify your concept with matching Guard® vinyl wallcoverings on load-bearing walls and support columns; Borden vinyl K-2 laminates on other interior surfaces like enclosures, fascia, trim moldings.

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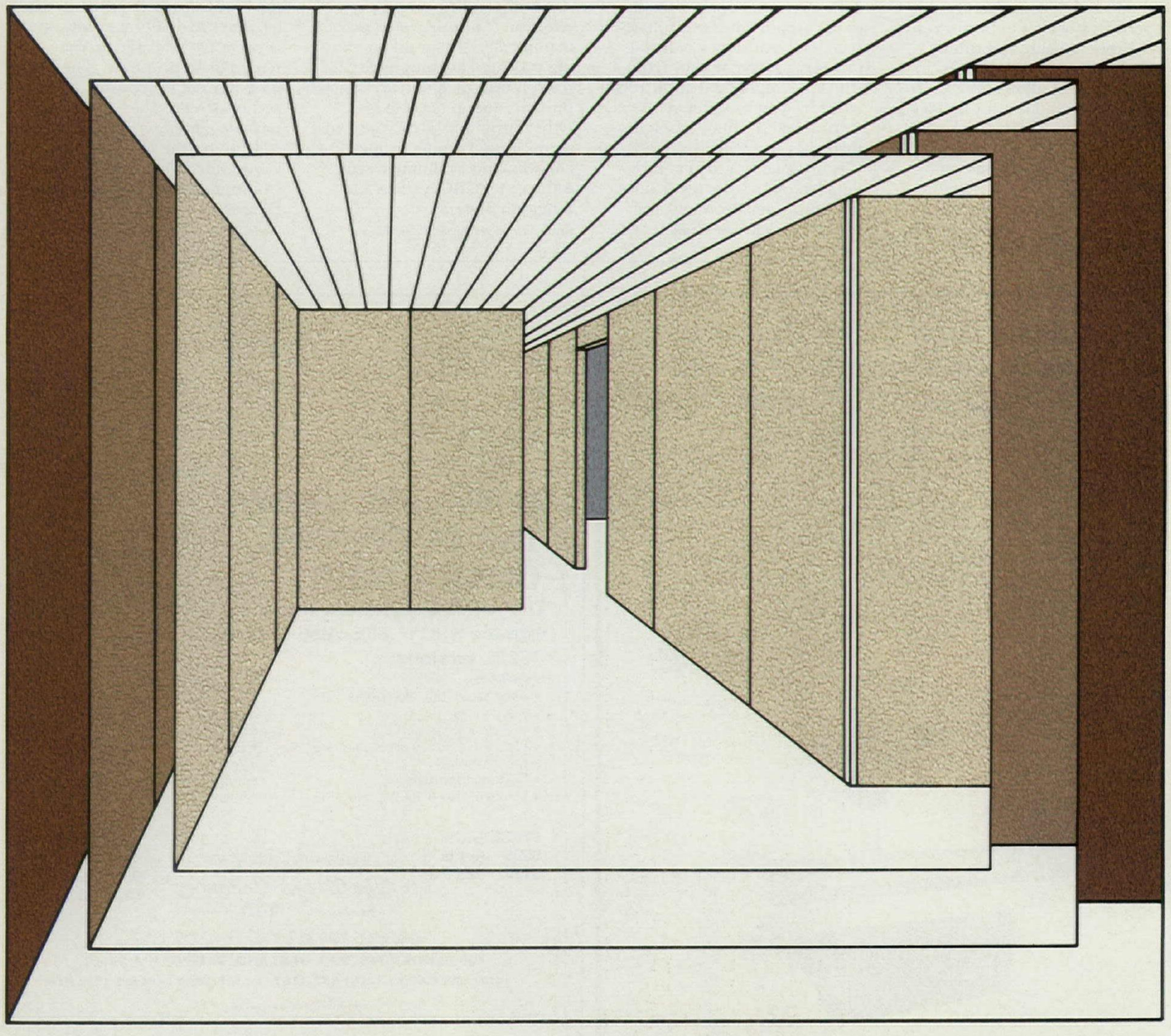

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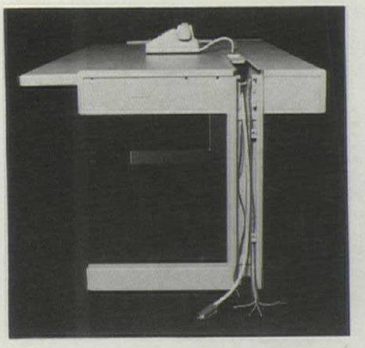

Ergodata® EDP work stations are adaptable to worker needs and changing tasks. Height and angle of work surfaces can be changed without removing items on the top. Stations can be assembled to accommodate one worker or arranged to be shared by as many as four. The system, its ergonomic design, wire management for power and communications, and accessories are described in a 40-page color brochure. Precision Mfg., Inc.
Circle 502 on reader service card

Ultronic 9000 computer furniture additions are a mobile pedestal, a printer stand, keyboard shelf, and manuscript holder. The 18-inch pedestal will fit beneath a machine-height work surface; the 24-inch pedestal will fit beneath a desk. The upper drawer is lockable. The printer table accommodates both bottom- and rear-fed printers with paper fed from optional shelf or from a portable cart. The keyboard shelf mounts beneath any Steelcase worksurface and stores underneath, out of sight. Steelcase.
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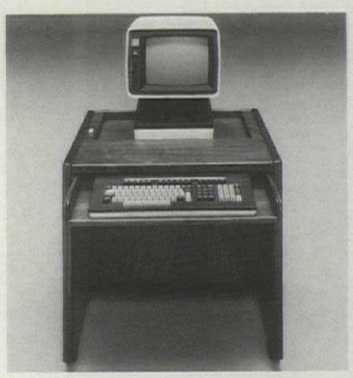

The Powered Mobile Support Unit for a computer, part of the WCF system, has a motorized platform that can raise or lower the video display up to six inches. The keyboard disappears into the cabinet when not in use and has an optional lock for security. The unit is available in oak or walnut veneers and hardwoods in several finishes. Executive Office Concepts.
Circle 504 on reader service card

Computer furniture, CRT and typewriter tables, office machine stands, library furniture, mobile equipment tables, and video furniture are covered in a 32-page catalog. New products featured are an adjustable universal TV wall-ceiling mount and adjustable microcomputer table. Detailed specifications are included for each item. Bretford Manufacturing, Inc.
Circle 505 on reader service card

Calma-Draft Architecture and Calma-Draft Facilities Layout are used with Dimension III core system software for architecture, engineering, and construction applications. They can be used by architects and facilities planners with no previous computer experience, since on-screen menus lead the user through the system. The architecture package is used for the design and drafting of plans, sections, elevations, and details. The facilities layout package is used for planning, remodeling, and management of commercial and industrial facilities. Calma Company.
Circle 506 on reader service card

MiCAD computer-aided design and drafting system includes a 16-bit computer, software, digitizer pad, and C/D-size plotter. The NEC APC color graphics computer has 256K of RAM, expandable to 768K. It has a detachable keyboard with numeric key pad and a math processor. The Houston Instruments plotter handles bond, film, or vellum paper in C and D sizes. Micro-Installations, Inc.
Circle 507 on reader service card

Architectural Interactive Design System (AIDS) software, written for the VAX 32-bit general-purpose computer, is a drafting and design graphics aid for architects, engineers, and others in the design and construction industry. It has a starting library of 2000 symbols and details. It allows scaled architectural drawings to be produced 3 to 5 times faster than by hand, and nonscaled drawings 40 to 50 times faster, according to the company. ARCAD.
Circle 508 on reader service card

General Drafting System (GDS), a two-dimensional computer drafting system, is used for layouts and space planning, architectural design, structural details, engineering systems, general schematics, tax mapping, and utility mapping. It features a central data base, extensive symbol library, automatic measurement, compact drawing storage, and total data security. It interfaces with Building Design System (BDS) to produce full-detail, two-dimensional finished architectural drawings. MCAUTO®, McDonnell Douglas Automation Co.
Circle 509 on reader service card

Designwright™ computer system, specifically for interior designers and architectural professionals, consists of hardware, software, and computing services necessary to determine clients' individual needs. The basic word-processing and accounting system can be expanded to include computer-aided design and drafting. ASID Computer Services, Inc.
Circle 510 on reader service card

The Advanced Graphics Workstation (AGW) is a full-function, 32-bit CAD/CAM system capable of local area networking and distributed processing. Since each station has its own computer, there is no reliance on a host computer, yet the AGW network users can share data and programs. As the system grows, however, it can be linked to a corporate network by connecting to a host computer. The system is described in a six-page brochure that shows a workstation and diagrams of the way that operators can share information. Auto-trol Technology Corp.
Circle 511 on reader service card

Summadraft™ S-series computer-aided design/drafting system is compatible with currently available Summadraft software. It features the Data General MicroEclipse Engine capable of supporting up to 512K bytes of main memory. S-series styles include a single-user workstation, a single graphics workstation with one nongraphics workstation, and a dual workstation for two graphics users. Summagraphics Corp.
Circle 512 on reader service card

IBM XT/PC™ 68000® advanced 32-bit workstation with graphics is easy to learn and easy to service. The system, its features, software support, and hardware specifications are provided in a 10-page folder. Specifications and description are included for the SX-II Penplotter/Digitizer that produces D or E-size drafting quality color or wet ink plots on Mylar or paper at high speed. Summit CAD Corp.
Circle 513 on reader service card

CADD Buyer's Guide, an annual report, lists major turnkey suppliers of computer design/drafting systems sold in the U.S. and Canada for architectural, engineering, interior, and facilities management applications. Appearing in the March issue of A/E Systems Report, the guide lists vendors, addresses, telephone numbers, hardware and software descriptions, applications available, and pricing. The guide is available to nonsubscribers to the monthly reports for $10 from A/E Systems Report, P.O. Box 11316, Newington, Conn. 06111.

The IBM Fastdraft system, described in an eight-page color brochure, consists of a graphics processing unit, one or two graphics workstations, a display terminal console, a large format color plotter for D or E-size drawings, and software. The light pen and graphics display unit are used like a drafting pencil and drafting board to create drawings, which can be stored on diskettes for later use or revision and reproduced on the plotter. The system can produce two-dimensional and isometric drawings. International Business Machines Corp.
Circle 514 on reader service card

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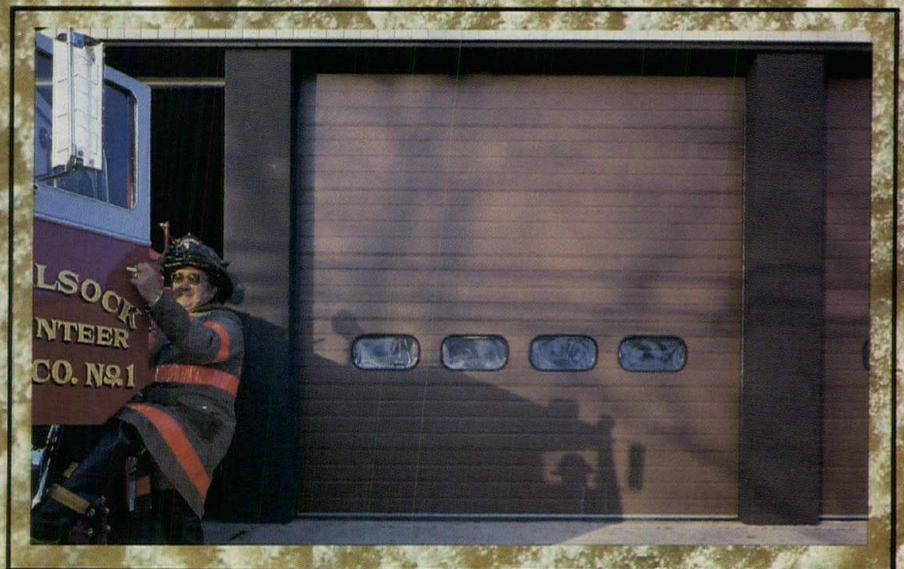

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Manufactured by Insoport Industries, Inc., 3200 Reach Road, Williamsport, Pennsylvania 17701

*Approximate energy savings can be calculated for your facility upon request.

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BAS-X512 building automation system, available as stand-alone unit or with CRT, will control a single building or manage facilities around the country by means of the telephone. It uses the existing electrical system to automate energy control functions. Its time-of-day control provides year-round advance programming, such as changes from standard to daylight saving time, leap year, holidays, vacation periods, and long weekends. It can be programmed to shut down an entire building at a command from the keyboard or over telephone lines. Powerline Communications, Inc.
Circle 255 on reader service card

Tracer™ computerized HVAC control system integrates hardware, controls, and software to provide building control and increased energy savings. The software can manage up to eight rooftops and provides: equipment off/on scheduling; duty cycling; automatic override if temperatures fall outside preset levels; anticipation of electrical demand peaks; start/stop for most efficient operation based on indoor and outdoor temperatures; automatic conversion to nighttime temperature setting. The Trane Company.
Circle 256 on reader service card

Autocrat microprocessor-based controller uses existing AC wiring for remote control of electrical devices. Applications include energy management, facilities management, lighting control, and process control. It is compatible with most computers, terminals, and energy management controllers. It can operate as a stand-alone processor, as a computer-controlled interface, or under telephone modem control. BI-COMM Systems.
Circle 257 on reader service card

CPM Micro/8000 HVAC controller can provide control of a single zone, variable air volume, multizones, central systems, unit ventilators, boilers, and chillers. It is compatible with most pneumatic, electric, electronic, and industrial control devices and is easily installed. The system, its capabilities and expansion possibilities are explained in a 12-page brochure. Barber-Colman Company, Environmental Controls Div.
Circle 258 on reader service card

The Facilitator™ Package combines off-the-shelf hardware components, the miniMax 800® communication link, which reduces wiring costs, and a software program. The program allows the user to customize control and monitoring strategies such as energy management, HVAC control, lighting control, equipment monitoring, equipment control, security, fire, and life-safety features. Conversational prompting guides the operator through the proper sequence to use the system. American Multiplex Systems, Inc.
Circle 259 on reader service card

Modular EDP Support Units have been added to the Marcatré open plan furniture system designed by architect Mario Bellini. Components include video display terminal tables, printer tables, and computer-sharing linking segments for two, three, or four desks. The units are available in oak veneers or gray, white, or beige laminates that match other Marcatré furniture. Atelier International.
Circle 260 on reader service card

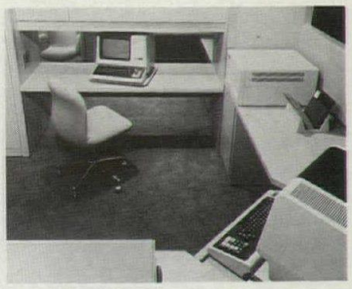
Universal Data Stations, designed to accommodate computer systems, have a working height that adjusts from 23 to 33 inches in one-inch increments. The top shelf adjusts horizontally to provide individual screen-viewing angles. Options include privacy panels, book-rack, and bottom shelf. Finishes are oak woodgrain pattern with putty enamel frame finish, or walnut woodgrain with black enamel. Virco Mfg. Corporation.
Circle 261 on reader service card

Touch-Stat™ antistatic table-top mats dissipate static to protect computer terminals, word processors, and other electronic data processing equipment from damage by static discharge. Made of tough, flexible, electronically conductive PVC and a snap-on grounding cord, the mat drains static away when the operator simply touches it before contacting the terminal. United Technical Products, Inc.
Circle 262 on reader service card

Computer support components available for System 2PLUS open-plan office are a two-tiered printer stand with paper fed through a slot; paper management clip-on trays that mount diagonally on horizontal rails; and 16-inch-deep EDP storage shelves in a choice of widths and finishes. Panel Concepts, Inc.
Circle 495 on reader service card

Electronic work station assembled from components of the 8000 Series panel system has cantilevered work surfaces to support electronic equipment. Keyboards can be set into a well or placed on a retractable keyboard drawer. Storage space is provided by panel-mounted shelves and cabinets. Wiring is concealed in dual raceways that provide power at work surface height and floor level. The 600 Series operator chairs of ergonomic design with posture controls provide comfortable seating. All-Steel, Inc.
Circle 496 on reader service card

PC WorkCenter Unit for the IBM personal computer uses vertical space for all computer components and related equipment. It has a roll-out keyboard shelf, locking tambour door to secure contents, and media file with lockable door. Heights are 50 or 63 inches, widths 24 or 30 inches. The WorkCenter has a master on/off switch with circuit breaker, locking rear panel for ventilation, and locking casters. Wright Line, Inc.
Circle 497 on reader service card



Advent III open office system accommodates the rapidly changing technology of the electronic office. The double-wall construction provides flexibility by creating a virtually unobstructed raceway to manage present and future wiring needs. Integrated task-oriented furniture components adapt to changing requirements while maintaining the system style. Harvey Probber, Inc.
Circle 498 on reader service card

Terminal tables added to Information Management Station series consist of three models. Each has two surfaces with a height adjustment of nine inches and horizontal four-inch pull-outs. The 24-inch table has a pedestal base with casters and optional tilt feature. The 36-inch and 48-inch tables have a 15-degree tilt adjustment and black metal column bases that serve as wire managers. Howe Furniture Corp.
Circle 499 on reader service card

Emtech™ electronic furniture brochure illustrates the three product categories in the system: work surface-freestanding tables in several sizes, with optional extension wings; ergonomic seating with gas cylinder adjustment in styles to match job function; and storage cabinets for filing computer media and printouts. Each category is described and shown with options. GF Furniture Systems.
Circle 500 on reader service card

Electronic work station modules combine to accommodate specific functions. The components are described and illustrated in an eight-page color catalog. Work surfaces, media storage, wire management, and accessories are included. Cole Business Furniture, Div. of Litton Industries.
Circle 501 on reader service card

P/A Products and literature

Products and literature this month are related to computer use for building management, computer-aided design, project management, and furniture for the electronic office.

Computerized energy management systems are available for buildings from 10,000 square feet to multibuilding complexes. The JC/85/40 shown controls and monitors boilers, fans, pumps, air handlers, lights, chillers, and other building equipment for energy efficient use. It can include fire management and security systems, as well as maintenance management. Johnson Controls, Inc.
Circle 243 on reader service card

The 2616 Energy Controller™ provides automated energy management for small to medium-sized buildings. Heating/air-conditioning controls include duty cycling, time-of-day scheduling, electrical demand limiting, stop time optimization, and night temperature setback/start-up. It has an optional remote communications module to communicate directly or over telephone lines to printers and computers. Battery backup protects memory for up to 48 hours. Robertshaw Controls Company, Uni-Line Division.
Circle 244 on reader service card

A design analysis service, originally for energy management programs, assists architects in making an energy-use analysis of a design's options in lighting, HVAC, site orientation, and construction materials. Applied to more than 1200 existing buildings, it produced average energy-use reductions exceeding 30 percent. The computer takes into account the impact of individual factors that influence energy consumption. Viron Corp.
Circle 245 on reader service card

System 600, with distributed digital control, manages building energy-consuming equipment, such as heating, lights, and air conditioning. Also available with the system are security protection, and fire management that provides early warning of fire or smoke, notifies occupants and the fire department, and operates the building's ventilating system. A maintenance management option computerizes work scheduling, work order processing, inventory control, and materials billing. MCC Powers, Mark Controls Corp.
Circle 246 on reader service card

Paesar PRF control system for fluorescent lighting saves up to 50 percent of fluorescent lighting energy costs, according to the manufacturer. A lighting energy adjuster reduces excess light levels; daylight compensator uses available daylight; interior lighting compensator decreases excess energy used by new lamps; time-of-day scheduler programs lighting levels 24 hours a day; and peak demand reducer avoids peak demand utility penalties. Lutron.
Circle 247 on reader service card

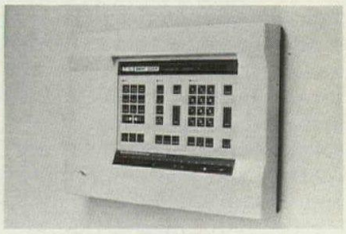
Excel direct digital control system uses microprocessor technology to control heating, ventilation, and air-conditioning systems. Software technology makes it possible to adjust the system from the operator's terminal. Programs are available to run HVAC installations, manage energy to reduce operating costs, and aid in the design of appropriate systems. Honeywell, Commercial Div.
Circle 248 on reader service card

CALPAS3 Building Energy Analysis program predicts heating and cooling energy use of houses and small commercial buildings. It uses a full-year hourly simulation to calculate energy performance. Included with the program are a user's manual, one-year user support, five weather files, a training class, and a newsletter. Berkeley Solar Group.
Circle 249 on reader service card

SavIt LifeStyle™ computer system for home and small business can save as much as 42 percent annually on heating and cooling costs. The computer is sensitive to ½-degree change in temperature and constantly monitors and adjusts to maintain a more comfortable temperature level. System protection features alert the user to change the filter and to service the air-conditioning or heating system. Other features include vacation mode and battery backup. It will control most gas, electric, or fuel oil heating and cooling systems. Electronic Systems International.
Circle 250 on reader service card

The 2120 Building Management System is cost-effective for small and medium-sized buildings. It is available with fire alarm, voice communications, energy management, and security capabilities. It monitors up to 1008 points with up to 504 control points. Simplex Time Recorder Co.
Circle 251 on reader service card

The Intelligent Relay is a microcomputer-based device for energy management and related fields. It uses a TMS 7000 microcomputer and software designed and developed by Texas Instruments. Features include six daytype programs, each programmed for up to six changes per day; three fixed holidays and up to five additional holidays; manual override of each load without altering program schedules; battery carry-over power for up to 24 hours of power loss; self-correcting leap year and daylight savings time changes. Budd Industries, Inc.
Circle 252 on reader service card



Smart Clocks energy management systems are microprocessor-based time clocks for users with monthly power bills of $800 to $5000. Standard features include 32-character English language display for user prompting; eight on/off or duty cycling entries per day per load; seven-day scheduling plus two holidays; 30 dates for holiday scheduling; A.M., P.M., or 24-hour format; staged restart after power failure. Microcontrol Systems, Inc.
Circle 253 on reader service card

Programmable Load Control design manual provides a system overview diagram and explains features of the system. The 22-page manual includes general descriptions and specifications for the system controller, optional auditor, programmer, optional telecommunications network, transceiver panels, switch input modules, breaker/control panels, and peripherals. General Electric Company, Wiring Devices Dept.
Circle 254 on reader service card

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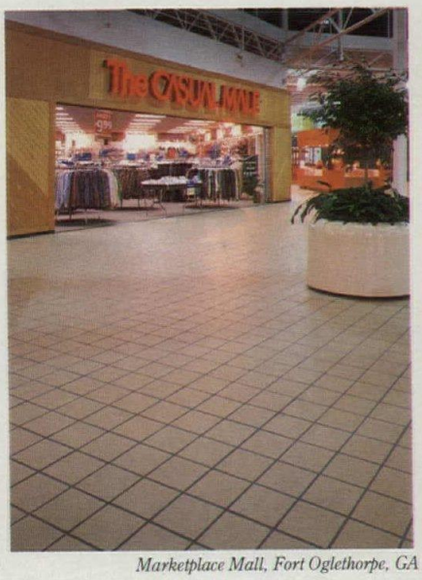

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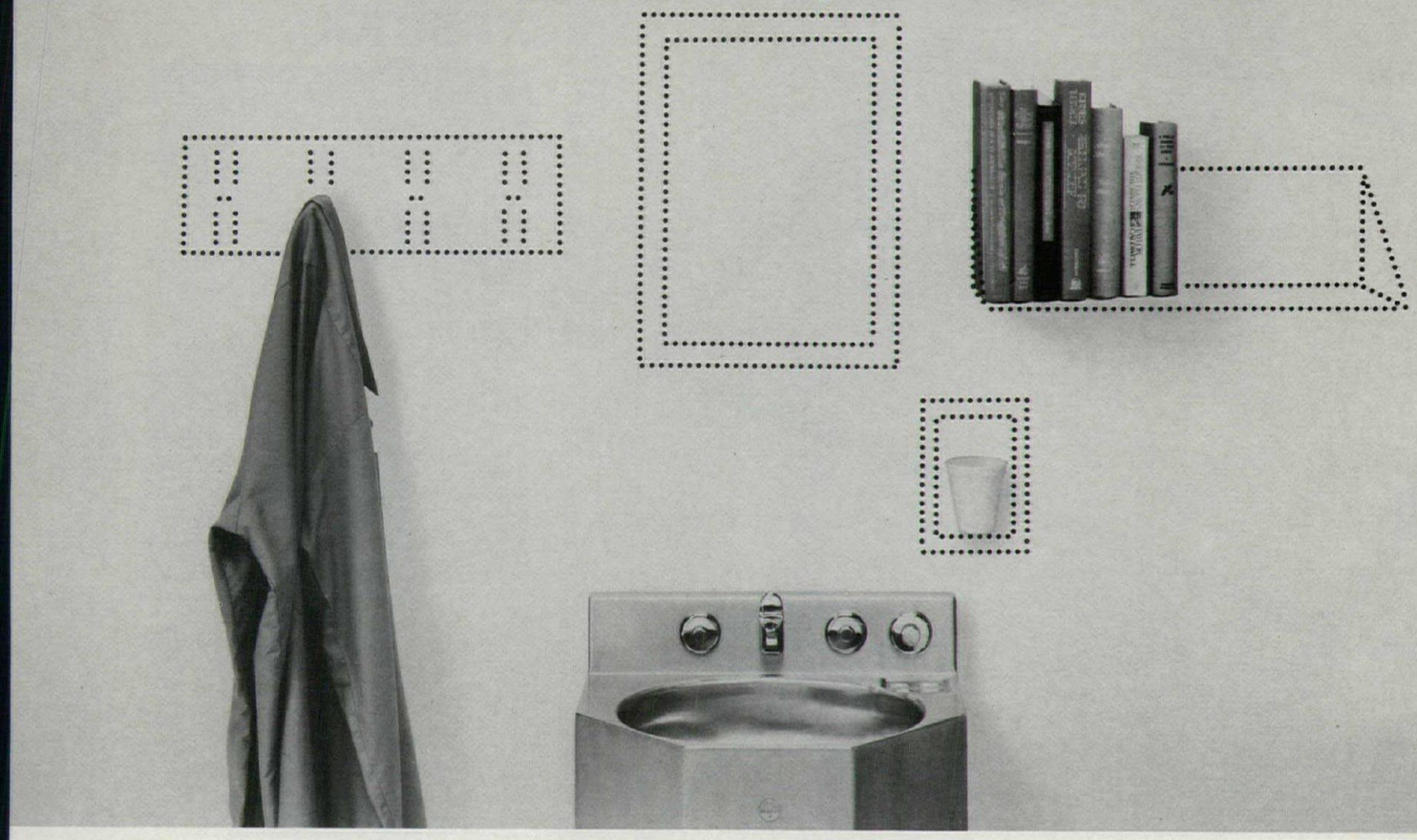

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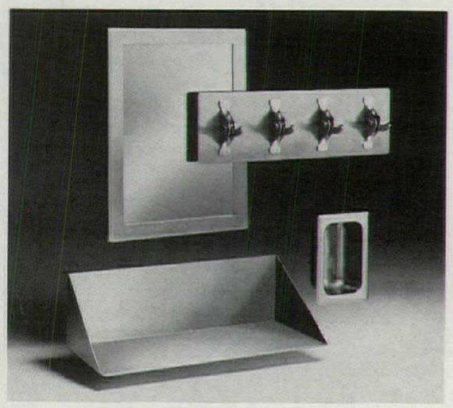

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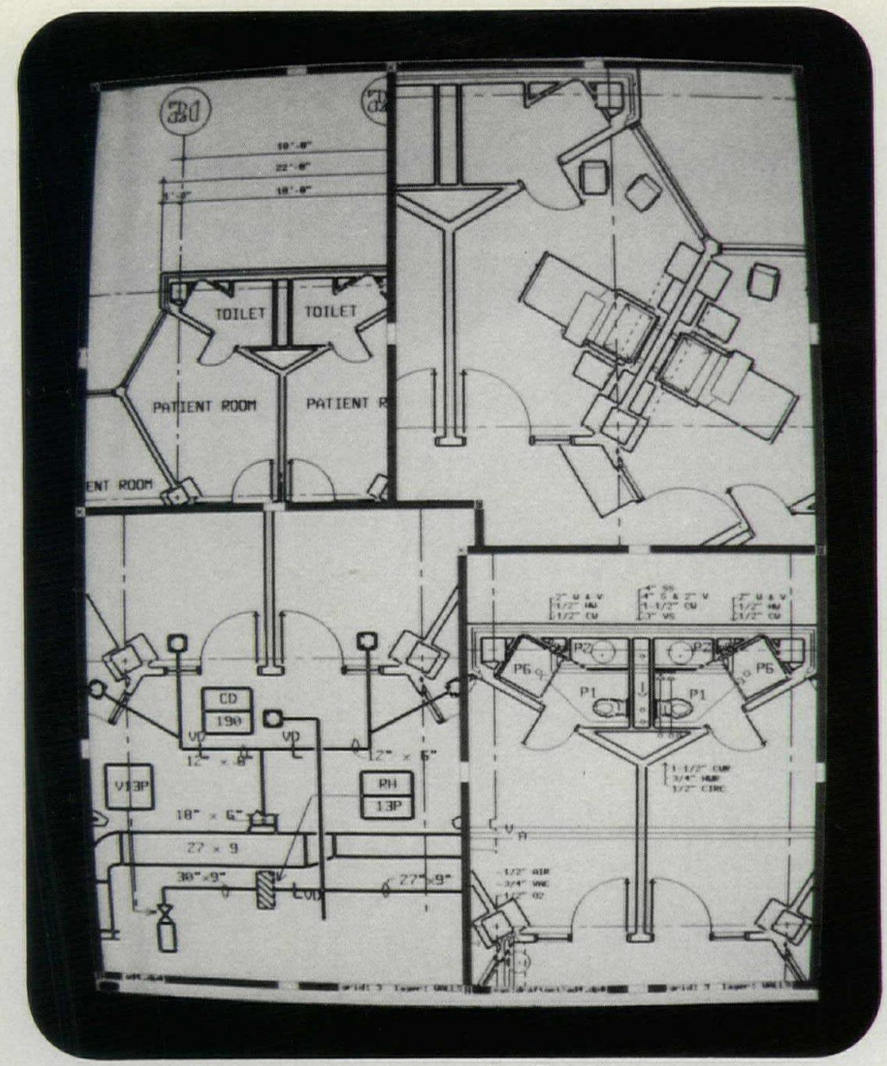

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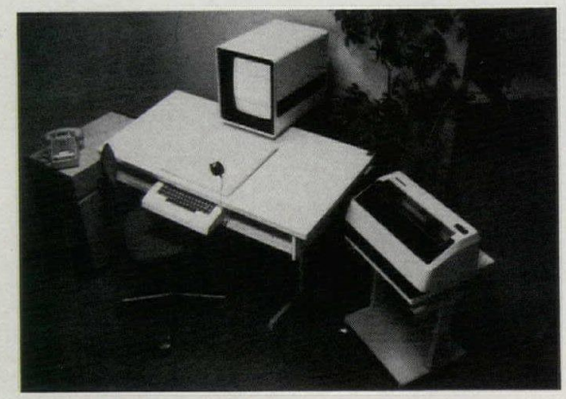

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