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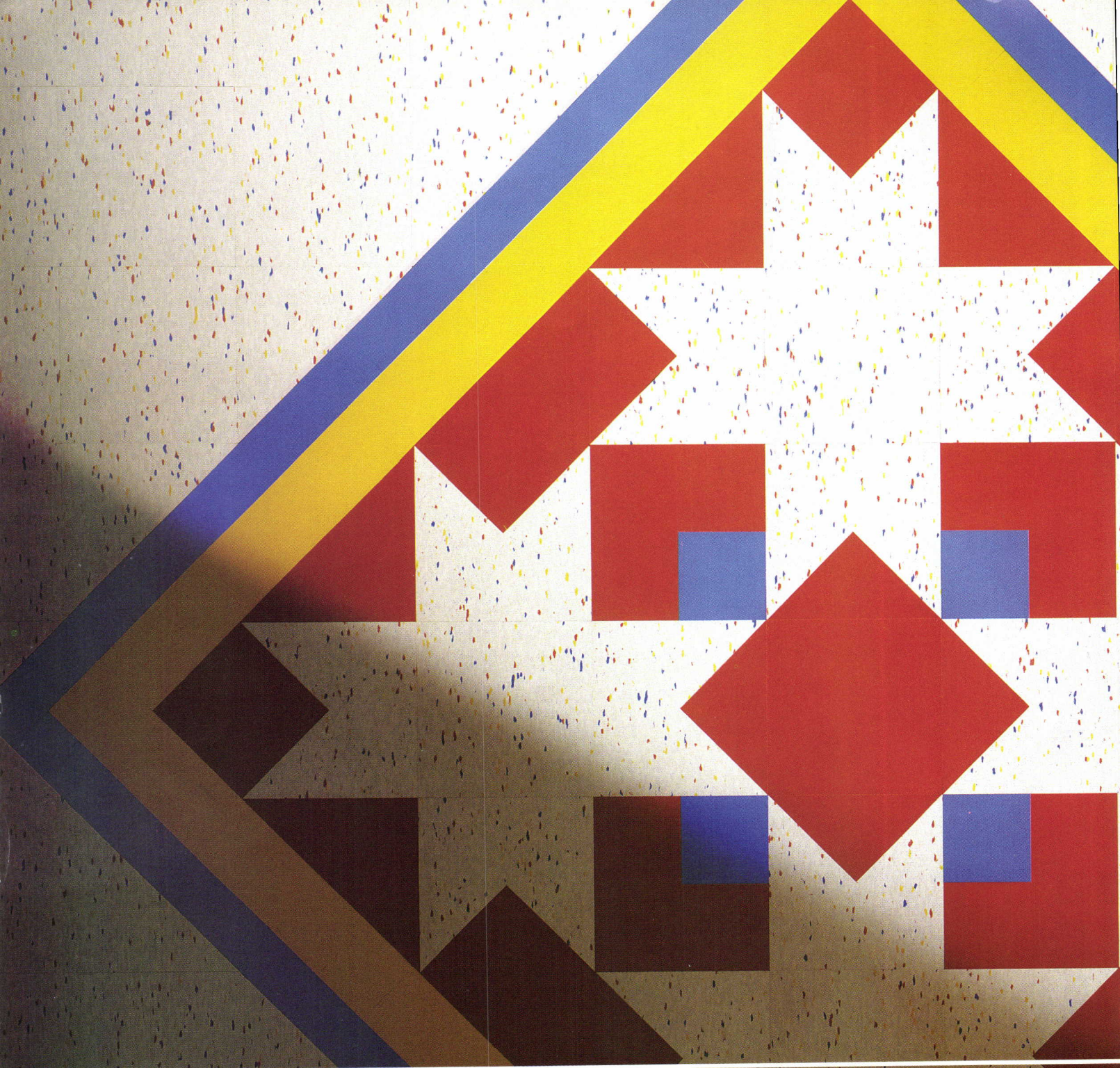
ARCHITECTURE

INCORPORATING ARCHITECTURAL TECHNOLOGY



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Environmental Priorities

IF PRESIDENT-ELECT BILL CLINTON AND VICE PRESIDENT-ELECT AL GORE have their way, improving our environment will become a national priority. And if newly inaugurated AIA President Susan Maxman has her way, architects will play a more visible role in shaping this country's green policies. Maxman, who attended last summer's Earth Summit in Rio de Janeiro, plans to further the institute's commitment to sustainable development by bringing the Rio initiatives home to architects at the 1993 AIA convention in Chicago. During the June event, design professionals from more than 80 countries will meet to discuss environmental awareness and practice. They will ultimately draft a mandate for environmental ethics and responsibility, to be called the Declaration of Interdependence.

This declaration is only one component of the institute's environment-related activities, now coordinated by the newly formed Center for the Environment. The center grew out of the two-year-old Committee on The Environment, whose *Environmental Resource Guide,* now a hefty, 375-page document, has impressed government agencies and architects alike. The AIA not only continues to broaden the scope of the guide and its sponsoring 850-member committee, but is now expanding its reach to organizations outside the profession. Working with federal agencies, scientists, foundations, and 30 allied design and construction associations, the AIA is formulating guidelines, policies, and ultimately, legislation to promote sustainable development.

In collaboration with the Environmental Protection Agency, which underwrote a major section of the *Environmental Resource Guide,* and the U.S. Department of Energy, the AIA is determining new methods for evaluating the energy- and resource-efficiency of construction products and materials.

To further promote sustainable architecture, the AIA is staging an international competition, cosponsored by the International Union of Architects, with $50,000 in prizes for architects who devise innovative solutions to the challenges of sustainable communities. And to educate architects about green opportunities, three EPA-cosponsored videoconferences in January, March, and April 1993 will address energy efficiency, healthy buildings, and urban ecology, respectively. Modeled after the AIA's successful series on the Americans with Disabilities Act, the videoconferences will be hosted by Earth Day founder Denis Hayes and broadcast via satellite to 100 locations around the country.

Maxman adds that the AIA is committed to proving that environmentalism is sound business. "We're trying to dispel the myth of jobs versus owls," she explains. "There is real economic opportunity in environmental responsibility. Architects need to be better equipped to take advantage of it." With its new initiatives, the AIA leadership is providing the information and resources for designing sustainable environments. It is up to architects to heed Maxman's call and apply these tools to everyday practice, before it's too late. ■

—DEBORAH K. DIETSCH

Power of the pen

I must confess to a very irregular schedule of magazine reading. In late October, I went cover-to-cover through your August 1992 issue and learned, to my great satisfaction, that the "National Park Service has withdrawn its plans to demolish 12 historic buildings on Ellis Island" (Details, page 24). I am convinced that your impassioned editorial protesting those plans (Editor's Page, March 1992, page 15) played a major role in the collapse of the plot to tear down the structures. My thankful congratulations.

Jules G. Horton
New York, New York

Absence of beauty

What has our profession become when awards are given to structures that look like binoculars (Awards, October 1992, page 38)? It is unbelievable that people will spend money on such outlandish statements. Do architects think such works enhance our profession's image? Do they think the public applauds strange, ponderous, or ugly buildings?

Architecture was once defined as the mother of the arts, but art seems to no longer be an ingredient, and instead the only objective is to be different. Harmony has been replaced by jarring incongruity, as if inspiration is now found in a visit to Toys "R" Us. Conscientious concern for beauty was the quality that once separated architects from engineers. It is unfortunate that the schools of architecture have lost sight of that element. If professors can't teach it, what can be expected of the students?

I am not naive to the notion that eye-catching objects are valuable tools for sales promotion. But why not instead rely on well-designed signs hanging from well-designed buildings? That's the environment in which such statements belong.

R. H. Brogniez
Marble Falls, Texas

More on metric

Learning to think metric is very easy when considering a project at full scale ("Moving to Metric," September 1992, page 117). But preparing drawings can be cumbersome at best, especially when using conventional metric drafting scales.

We have experienced monumental difficulties when tradesmen try scaling a 1:50 ratio metric scale floor plan drawing with a 1/4-inch American Standard scale. Even our trusted surveyor could not make the transition to a metric-ratio site plan from the conventional 1 inch equals 50 feet scale.

In the studio, when we review records drawn in American Standard scale, we have to rely on one or more systems of dimensional conversion. And this added mental step can lead to errors of translation.

More than a decade ago, we stumbled onto an easy and cheap way to skip back and forth between the two scaling systems. All the conventional American Standard scales used for preparing drawings also happen to use proportional ratios. Typical metric drafting scales use ratios such as 1:10, 1:20, etc. and the scale itself is just slightly longer than a 12-inch American scale. So once we figured out how to use a 1:60 metric scale in draw-

ings made with a 1 inch equals 50 feet American Standard engineering scale, all we needed were metric scales at American Standard ratios. We could find no manufacturer who carries them, so we made our own. For our scales, we used heavy paper strips with American Standard units on one side, metric units on the other. The paper scales didn't hold up to constant use, so we made a master and had a couple of hundred printed. Now, with a knife, glue, and a little time, we can make a new scale for a total cost of 2 cents.

Gerald Estes, AIA
Green Oaks, Illinois

Correction

The energy and daylighting consultants for the Boulder Public Library (October 1992, pages 46-53) were Architectural Energy Corporation (AEC) and LightForms, both of Boulder, Colorado. Michael J. Holtz of AEC served as principal-in-charge, Steven E. Ternoey of LightForms was the daylighting designer, and Peter C. Jacobs of AEC provided computer energy analysis.

December 1-14: "The Double Dream: House and Home," exhibit sponsored by UCLA. On display in the Perloff Hall Gallery. Contact: (310) 825-7858.

December 30: Submission deadline for the Rudy Bruner Award for excellence in the urban environment. Contact: The Bruner Foundation, (212) 334-9844.

January 8: CTDA Spectrum 93, Ceramic Tile & Stone Competition. Contact: CTDA, (708) 655-3270.

January 11: Entry deadline for the Brick in Architecture Awards Program, cosponsored by American Institute of Architects and the Brick Institute of America. Contact: AIA Awards Program, (202) 626-7390, or Brick Institute of America, (703) 620-0010.

January 14: Building Connections: Linking Economy and Ecology for New Prosperity, video teleconference sponsored by the AIA. Contact: (800) 365-2724.

January 23-26: AIA's annual Grassroots leadership training conference in Washington, D.C. Contact: Kim Christensen, (202) 626-7378.

January 26: AIA's Accent on Architecture, at the National Building Museum in Washington, D.C. Contact: Melissa Houghton, (202) 626-7514.

February 17-19: The Interiors Conference for Historic Buildings, sponsored by the National Park Service. Contact: Sharon Parks, (202) 343-9570.

February 19-22: The National Association of Home Builders Annual Convention in Las Vegas, Nevada. Contact: (202) 822-0200.

February 26: Deadline for the Easy Access Housing Design Awards Program, sponsored by the Easter Seal Society and Century 21. Contact: Pradeep Dalal, (202) 785-5912.

March 3-6: Building Solutions, a conference on energy efficiency. Contact: Christine Van Hooft, (617) 482-7186.

March 8-12: The 14th International Making Cities Livable Conference. Contact: Suzanne H. Crowhurst Lennard, (408) 626-9080; fax: (408) 634-5126.

March 17-19: WestWeek '93, sponsored by Pacific Design Center. Contact: PDC, (310) 657-0800.

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RANDY CROXTON, AIA
Croxton Collaborative Architects, New York City

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March 4, 1-5 p.m. EST	*Healthy Buildings and Materials*
April 22, 1-5 p.m. EDT	*Land, Resources, and the Urban Ecology*

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Selection of Awards	*May 15, 1993*

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AIA EPA

NEWS

Alexander Jackson Davis and Soviet Avant-Garde Exhibitions • Courthouse Conference

Chicago's Auditorium Theatre Lobby Restored

BANKROLLED BY PROFITS FROM TOURING shows, the main entrance to Adler & Sullivan's Auditorium Theatre in Chicago has been restored, reprising its original role as a warm-up act for the grand spaces and intricate decoration of the 104-year-old theater.

The restoration by Booth/Hansen & Associates is a major component of $1 million worth of improvements completed for the October 17 opening of the hit play *Miss Saigon*. New back-stage equipment has pleased thespians, but the public at large has also benefited: the restoration heals a wound inflicted upon one of Chicago's most significant buildings.

In 1955, traffic engineers jammed a city sidewalk through the south side of the Auditorium Building to accommodate the widening of Congress Parkway. Several rooms, including a spacious theater lobby, were halved to make way for a sidewalk arcade.

Now, the lobby has been visually reunited, with new chandeliers, a coffered ceiling, and marquees brightening its once-drab sidewalk arcade. Inside, whole sections of the theater have been repainted a lively rose-peach color that once graced the lobby and was discovered during the restoration process.

The Auditorium was a major forerunner of contemporary multipurpose structures. A hotel and offices were supposed to subsidize opera performances in its 4,200-seat theater. But financial difficulties struck the theater after the Chicago Opera Company left it for another downtown house in 1928. The Auditorium was purchased in 1946 by its present owner, Roosevelt University.

When the building was pierced by the sidewalk, the northern side of the theater lobby, housing ticket booths, was left intact. But the southern side was hollowed out to make way for the sidewalk arcade. Two grand columns were encased in plaster. So were ceiling decorations that may have been designed by Frank Lloyd Wright, then Adler & Sullivan's chief draftsman.

In recent years, the box-office success of touring shows such as *Phantom of the Opera* has set the stage for an ambitious return to Adler & Sullivan's original vision. To accomplish that, Booth/Hansen had to create the appearance of a single room in the divided lobby. The architects placed a glass wall between the two main columns, which are painted to resemble genuine marble. They also designed chandeliers and ceiling decorations for the arcade that resemble their interior counterparts.

PHOTOS BY TIMOTHY HURSLEY

Booth/Hansen reinvigorated Adler & Sullivan's 1888 Auditorium Theatre by inserting fan-shaped steel ornaments and lights into three stone arches at the entrance (top), and adding new chandeliers in the lobby (above).

Three arches that mark the theater entrance received new glass marquees and fan-shaped steel ornaments. To catch the eye of the passing driver, signs advertising *Miss Saigon* were hung from ill-proportioned posts along the street, the lone awkward note in a restoration that brings new harmony to a Chicago treasure.

—BLAIR KAMIN

Blair Kamin is the architecture critic of the Chicago Tribune.

AIA Inaugurates First Woman President

AIA UPDATE SUSAN MAXMAN OFFICIALLY became the AIA's 69th president on December 5, during a ceremony at Washington's National Building Museum. In her acceptance speech, Maxman implored architects to heighten their commitment to the environment. "The dilemma between sustainability and growth," Maxman believes, "is embodied in the role of the architect. We are uniquely prepared to protect the earth's natural resources." Since her participation at the Earth Summit in Rio de Janeiro last June (ARCHITECTURE, August 1992, pages 81-82), Maxman has preached that sustainability is as much an attitude as it is a science. "There are many small decisions architects can make that reflect environmental sensitivity," the Philadelphia architect maintains, pointing to her firm's design of an animal shelter that will rely upon natural lighting, advanced HVAC systems, and insulated glass to save $40,000 per year in energy costs.

PHOTOS COURTESY OF THE AIA

Susan Maxman

Included in Maxman's environmental agenda is a plea for urban revitalization. "We cannot solve one crisis without solving both," she argues. The AIA is currently drafting a legislative proposal that would direct federal aid to cities for community planning initiatives, sound urban design, and improved infrastructure.

Maxman reasons that broadening public perception of the architect's role will require changes within the profession. To start, she advocates increasing the number of women and minority architects. "Because architects will be designing fewer new buildings in the next century," Maxman argues, "the profession has to start developing a new set of values."

—K.S.

DETAILS

Venturi, Scott Brown and Associates and **Anderson/Schwartz Architects** have been selected to design the 150,000-square-foot Whitehall Ferry Terminal for New York's Staten Island Ferry. **Cesar Pelli & Associates** of New Haven won a competition to design a 14-acre mixed-use development in downtown Kuala Lumpur, Malaysia. **Thomas Hanrahan Victoria Meyers, Architects** of Manhattan won a design competition for the AIA New York Chapter's new headquarters. Hugh Hardy of **Hardy Holzman Pfeiffer** is designing a master plan for the Mount, a 46-acre estate in Lenox, Massachusetts, originally built by Edith Wharton. **Tarantino Architect** of Millstone, New Jersey, has been selected to restore Louis Kahn's Trenton Bathhouse. **Blair Kamin,** an ARCHITECTURE contributor, has been named architecture critic of the *Chicago Tribune.* **Paul Schell** has been appointed dean of the University of Washington's School of Architecture in Seattle. **John Ames Steffian** has been appointed Chair of the Division of Architecture and Design at the Rhode Island School of Design. The Irvine, California, office of **LPA** has been commissioned to design a 60,000-square-foot library to be used by the City of Orange and Rancho Santiago Community College. **C.W. Fentress J.H. Bradburn and Associates** of Denver won a competition to design the $20 million National Cowboy Hall of Fame in Oklahoma City, Oklahoma. **Terence Riley** has been appointed director of the department of architecture and design at New York's Museum of Modern Art. **Skidmore, Owings & Merrill** of New York has won a competition to design a 500,000-square-foot, mixed-use development at Checkpoint Charlie in Berlin. Dallas-based **Phillip Shepherd Architects** was selected to design a $1 billion mixed-use complex on 20 acres in the heart of St. Petersburg, Russia. **Fujikawa Johnson and Associates** of Chicago received a General Services Administration Citation Award for the firm's design of the 27-story Ralph H. Metcalfe Federal Building. **Kallman, McKinnell and Wood** of Boston was selected to design a new library for the University of Kentucky in Lexington.

Davis Retrospective at the Metropolitan

MORE THAN 150 YEARS BEFORE MICHAEL Graves, Antoine Predock, and Robert A.M. Stern created a fantasy America at Euro Disney, 19th-century architect Alexander Jackson Davis designed a fantasy Europe along America's eastern shore. A Tuscan Revival villa, Norman Romanesque gatehouse, and Italianate palazzo by Davis were romantic reminders of old Europe, and enormously persuasive models for a young America in search of cultural identity. Honoring the centennial of Davis's death, New York's Metropolitan Museum of Art has organized an excellent exhibition of more than 110 lithographs, pencil sketches, and watercolors of proposed residences as well as furniture executed from Davis's designs. "Alexander Jackson Davis (1803-1892), American Architect" remains on view through January 24, 1993.

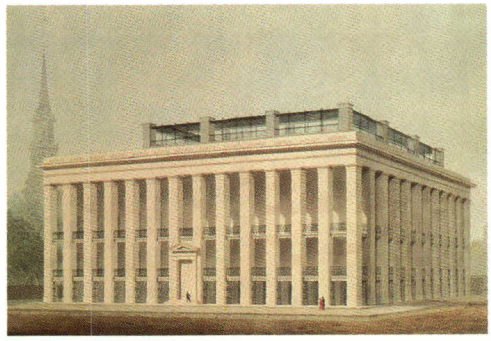
The exhibition, a retrospective of Davis's work, emphasizes city and country houses, religious buildings, and civic buildings, and chronicles the architect's innovation. In the early 1830s, Davis and his partner, Ithiel Town, launched a fashion for Greek Revival doorways that lasted for decades. The first truly picturesque Gothic Revival villa in America, Maryland's Glen Ellen, was the work of Davis, Town, and Robert Gilmore in the early 1830s, and Davis designed the first cottages with bracketed eaves around 1840.

Davis's books and drawings were perhaps more influential than his buildings. *Rural Residences* (1838), which he illustrated with hand-colored lithographs of his own designs, was the first American country house pattern book. Davis also teamed up with landscape architect and theorist Andrew Jackson Downing to produce books like *Cottage Residences* (1842), which married Davis's alluring imagery to Downing's compelling text.

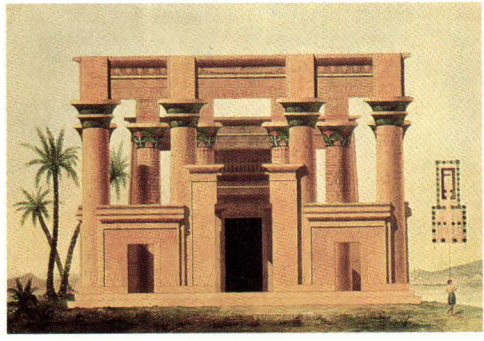
Davis, who never visited Europe, was self-taught. He acquired his knowledge of architecture from books and prints, as illustrated in the exhibition. "This distance," according to curators Amelia Peck and Jane B. Davies, "gave him the freedom to create a new American architecture, which, though based on Old World models, was attuned to the dramatic American landscape and the less formal ways of the American people."

Sadly, most of Davis's work has been demolished. Lyndhurst, the architect's high-Gothic Revival house in Tarrytown, New York, is his most spectacular survivor, and a lively testament to the fact that historicist, scenographic architecture is not a new phenomenon.

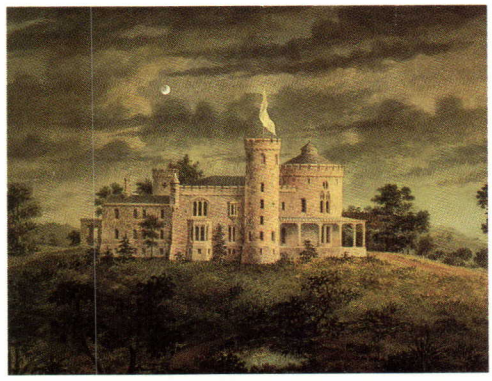
—DONALD ALBRECHT



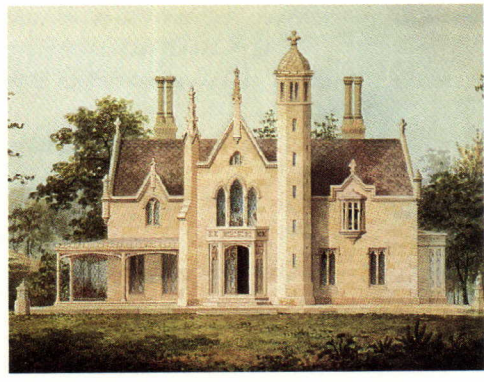
Astor Hotel, New York City (circa 1830)



Study of the Temple of Erment (circa 1830)



Ericstan, Tarrytown, New York (1855-59)



Kenwood, Albany, New York (1842)

Hadid Designs Guggenheim's Soviet Exhibition

LONDON ARCHITECT ZAHA HADID CONfronts Frank Lloyd Wright, Charles Gwathmey, and the Soviet avant-garde in her installation design for "The Great Utopia: The Russian and Soviet Avant-Garde, 1915-1932." This massive exhibition, on view at the Solomon R. Guggenheim Museum in New York through December 15, fills Wright's original building and Gwathmey Siegel's new tower galleries with more than 800 paintings, photographs, posters, graphics, theater designs, and porcelains, as well as architectural models and drawings. Explaining the Russian avant-garde's influence on her own neo-Constructivist career, Hadid points out, "Their ideas were never tested; their experiments became my starting point."

Hadid's exhibition design succeeds best when directly engaging Wright's great rotunda, a notoriously difficult gallery for displays of any kind. Her freestanding display cases and platforms beautifully modulate the sweeping surge of Wright's ramp. Angled, sloped, and tapered, they slice through Wrightian space, throwing off a presence and muscularity that vie with their legendary surroundings. Hadid's never-realized coup de theatre, her corkscrew interpretation of Vladimir Tatlin's spiraling "Monument to the Third International," would have risen within Wright's soaring atrium.

For mounting photographs, architectural drawings, and posters, Hadid created new walls that seem to float free of Wright's building. "This idea of liberation from gravity is not because you are flying around in the air," Hadid explains, "but because you are freed from confining laws and conventions, and can make a fundamentally new kind of space." Her display systems are simple and pragmatic in line with the avant-garde's utilitarian creed. Photographs are grouped, much like the rows of industrial machines and workers that the images celebrate.

Hadid designed two, bright red, angular walls at the base of Wright's ramp, which launch the exhibition with a revolutionary bang. These walls flank an opening overlooking an adjunct gallery, and they are centered on a view of Kazimir Malevich's painting, "Red Square." The symmetry here is too pat and contrived, but Hadid's jagged geometry and intense coloring electrify Wright's smooth, pale walls. Unfortunately, the gallery's dull and muddy lighting design mutes the power of Hadid's theatrics.

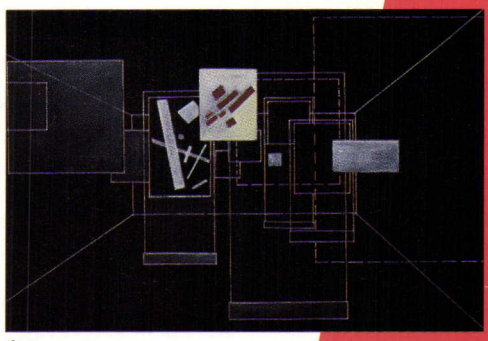
The shape of these red walls clues the museumgoer to the prominent role played by angles in the esthetics of the Russian and Soviet avant-garde. The movement's diagonals dared to break out of the traditional Cartesian grid of verticals and horizontals, and angular shapes and lines roamed freely across canvases, teapots, and buildings. Bold, angled orientations dramatize Soviet architecture, the building blocks of a new revolutionary society, in posters and photographs.

Unfortunately Hadid's anglephilia sometimes results in kitsch, like the set of gratuitous, Constructivist-style vitrines in Wright's small rotunda, or the gimmicky display of circles, stripes, and squares decorating one of Gwathmey Siegel's new galleries. In the same gallery, Hadid cantilevers paintings off walls in limp imitation of some of the most famous Russian avant-garde exhibitions.

Nevertheless, Hadid's installation at the Guggenheim marks a pivotal point in her career: Introduced to the Russian avant-garde by professors at London's Architectural Association in the mid-1970s, Hadid has continued the avant-garde tradition with her abstract paintings and a group of small-scale projects. But now, Hadid is moving into larger realms. Her soon-to-be-completed fire station for the furniture company Vitra in Germany and her proposal for a group of glass towers in Dusseldorf will expand her utopian horizons. "We can't carry on as cake decorators and do these nostalgic buildings that have an intense degree of cuteness," Hadid proclaims with resolutely avant-garde fervor. "We have to take on the task of investigating Modernism."

—DONALD ALBRECHT

Donald Albrecht is a New York-based curator.



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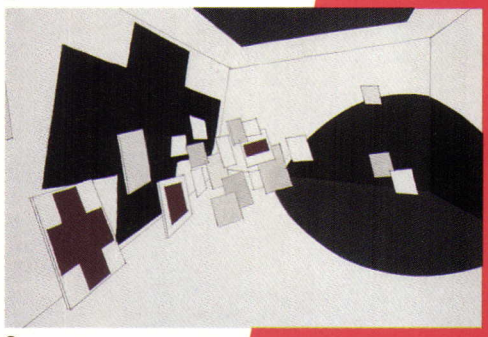

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THE OFFICE OF ZAHA HADID

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DAVID HEALD

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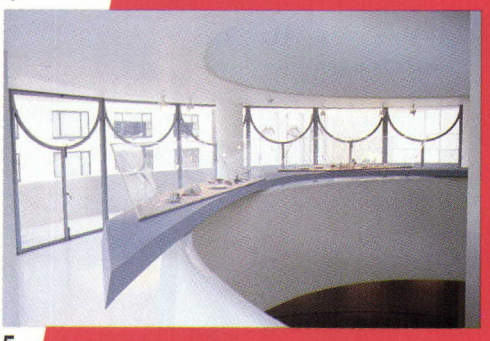
THE SOLOMAN R. GUGGENHEIM MUSEUM



5

DAVID HEALD

Zaha Hadid's exhibition design includes: drawing for the Black Room (1), a gallery in the Gwathmey Siegel addition devoted to Moscow's historic "5x5" exhibition, which took place in 1921 and included canvases by Alexandre Rodchenko; dynamic proposal for a painting gallery (2) and its realization (3); the architect's angled mounting surfaces and casework (4); slanted shelves and neo-Constructivist vitrines that Hadid added to Wright's small rotunda (5).

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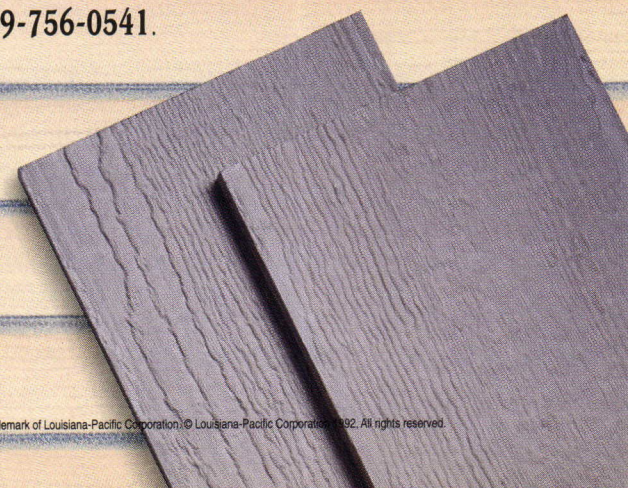

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International Conference Explores Courthouse Design

IN RESPONSE TO A LITIGATION EXPLOSION that is straining this country's courts, the federal judiciary has embarked on the largest courthouse construction program in our nation's history—more than 50 major new courthouses are scheduled to be completed by 1997. In addition, state governments are also expanding existing facilities and building new courthouses. Addressing the implications of this building boom, more than 580 architects, judges, court administrators, and government bureaucrats gathered in Washington, D.C., in mid-October for the first international courthouse design conference. Sponsored by the AIA Committee on Architecture for Justice, the U.S. Federal Courts, and the National Center for State Courts, the conference opened with a keynote speech by William H. Rehnquist, chief justice of the United States Supreme Court. Acknowledging that courthouses symbolize our democratic ideals, Rehnquist challenged participants to "rethink our notion of the halls in which justice is administered . . . to be creative in your joint effort to build the future systems of justice the coming years will require."

The chief justice's charge was repeated during the next three days in sessions that addressed such topics as design, security, technology, preservation, ADA requirements, and project financing. Many sessions brought together architects, judges, educators, and court administrators. Addressing design trends, the Honorable Douglas P. Woodlock, U.S. District Court of Massachusetts, moderated a discussion on the symbolic importance of the courthouse. Panelists Carl Lounsbury, architectural historian of the Colonial Williamsburg Foundation, Professor C. William Westfall of the University of Virginia, and Boston architect Andrea Leers presented diverse views on style and traditional iconography in contemporary courthouse design.

In conjunction with the conference, the National Center for State Courts, a professional association for state judges and administrators, mounted a retrospective exhibition on contemporary courthouse design. —L.N.

Clermont County Courthouse by NBBJ-Roth

Arizona State Courts Building by Howard Needles Tammen & Bergendoff

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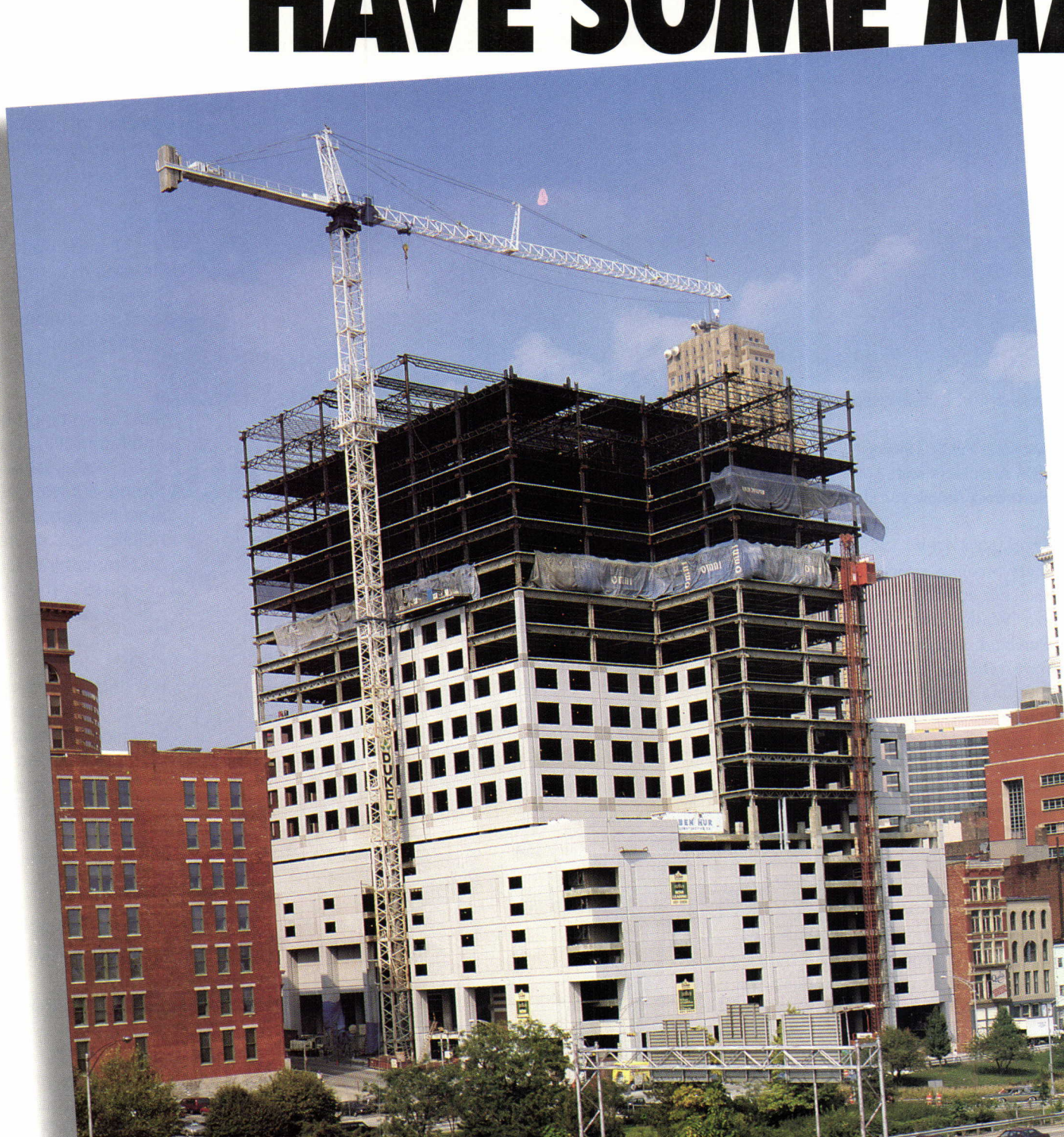


Twenty-six story, 312 Elm Building, Cincinna

ARCHITECTURE

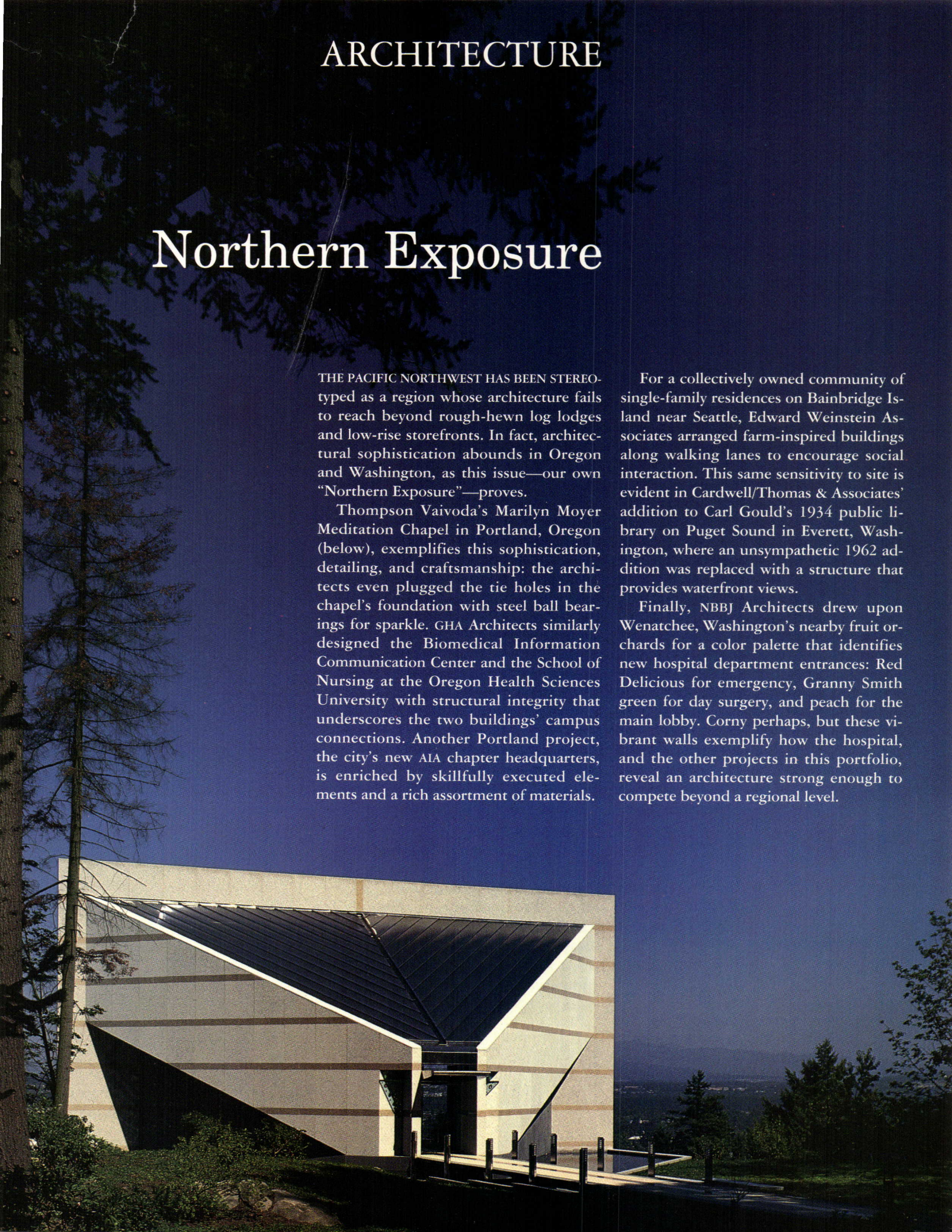
Northern Exposure

THE PACIFIC NORTHWEST HAS BEEN STEREOtyped as a region whose architecture fails to reach beyond rough-hewn log lodges and low-rise storefronts. In fact, architectural sophistication abounds in Oregon and Washington, as this issue—our own "Northern Exposure"—proves.

Thompson Vaivoda's Marilyn Moyer Meditation Chapel in Portland, Oregon (below), exemplifies this sophistication, detailing, and craftsmanship: the architects even plugged the tie holes in the chapel's foundation with steel ball bearings for sparkle. GHA Architects similarly designed the Biomedical Information Communication Center and the School of Nursing at the Oregon Health Sciences University with structural integrity that underscores the two buildings' campus connections. Another Portland project, the city's new AIA chapter headquarters, is enriched by skillfully executed elements and a rich assortment of materials.

For a collectively owned community of single-family residences on Bainbridge Island near Seattle, Edward Weinstein Associates arranged farm-inspired buildings along walking lanes to encourage social interaction. This same sensitivity to site is evident in Cardwell/Thomas & Associates' addition to Carl Gould's 1934 public library on Puget Sound in Everett, Washington, where an unsympathetic 1962 addition was replaced with a structure that provides waterfront views.

Finally, NBBJ Architects drew upon Wenatchee, Washington's nearby fruit orchards for a color palette that identifies new hospital department entrances: Red Delicious for emergency, Granny Smith green for day surgery, and peach for the main lobby. Corny perhaps, but these vibrant walls exemplify how the hospital, and the other projects in this portfolio, reveal an architecture strong enough to compete beyond a regional level.



Marilyn Moyer Meditation Chapel
Portland, Oregon
Thompson Vaivoda & Associates, Architects

Spiritual Viewpoint

Moyer Chapel, located within the Grotto in Portland, is visible from many vantage points. Its curved glass facade, which appears to be supported by a large cross (above), can be seen from the client's house, across the Columbia River. The entrance (facing page), located at focal point of building's quarter-circle plan, is sliced from the intersection of three sloping planes: two granite-covered walls and steel standing seam roof.

A POWERFUL MAN WHOSE WEALTH HAS been amassed in the world of commerce builds a family chapel at his city's most prominent Catholic shrine. This is not Renaissance Italy, but late-20th-century Portland, Oregon, where Thomas Moyer, a developer who made his fortune in movie theaters, built a chapel in memory of his wife, who died in 1988. It seems less than coincidental that the Grotto, the Catholic sanctuary that is home to the chapel, is staffed by the Order of the Servants of Mary. The order was founded in 1233 in Florence, Italy, a city where powerful families of commercial wealth have long commissioned works of art and architecture for the church, with examples as famous as Michelangelo's Medici Chapel.

In Portland, however, Moyer wanted not a church, but a place for contemplation, reflection, and meditation for all denominations in this 62-acre sanctuary dedicated to the Virgin Mary, a place to which his wife had devoted much of her life. Thompson Vaivoda chose to interpret this brief by creating a form that imitates a holy figure lifting arms toward the sky. Citing Hugh Stubbins and Associates' 1977 St. Peter's Church at Citicorp in Manhattan as precedent, the architects created a sculptural structure of great presence.

The 1,500-square-foot chapel is perched on the edge of an exposed, 130-foot-high basalt cliff surrounded by dense foliage, at a high point in the sanctuary's grounds. A granite-lined path on axis with the chapel appears to float above a shallow pool, symbolizing the separation of the temporal from the spiritual world.

The building, a quarter circle in plan, is entered at the circle's implied center. The interior is dominated by a 28-foot-high curved glass wall and a compelling view of the Columbia River Valley and the Cascade Range. Although a large, concrete cross appears to uphold this glass wall, the cross is actually supported by a deep beam cantilevered from

the building foundation at the edge of the cliff.

The precast concrete cross, theatrically lit with neon, and the glazed wall's framing, which recalls a proscenium arch, refer to the client's career in movie theaters. Other details are more abstract, but equally carefully considered. The custom-built glazing system for the curved wall has glass mullions; dichroic glass lanterns near the door, designed by local glass artist Tim O'Neill, refract sunlight into colored ellipses on the walls. Hidden glazed panels above pools of water reflect patterns onto the ceiling of the interior, while the angled walls inset with glass bars transmit daylight. Along the concrete foundation, stainless steel ball bearings, placed in the tieholes, add sparkle.

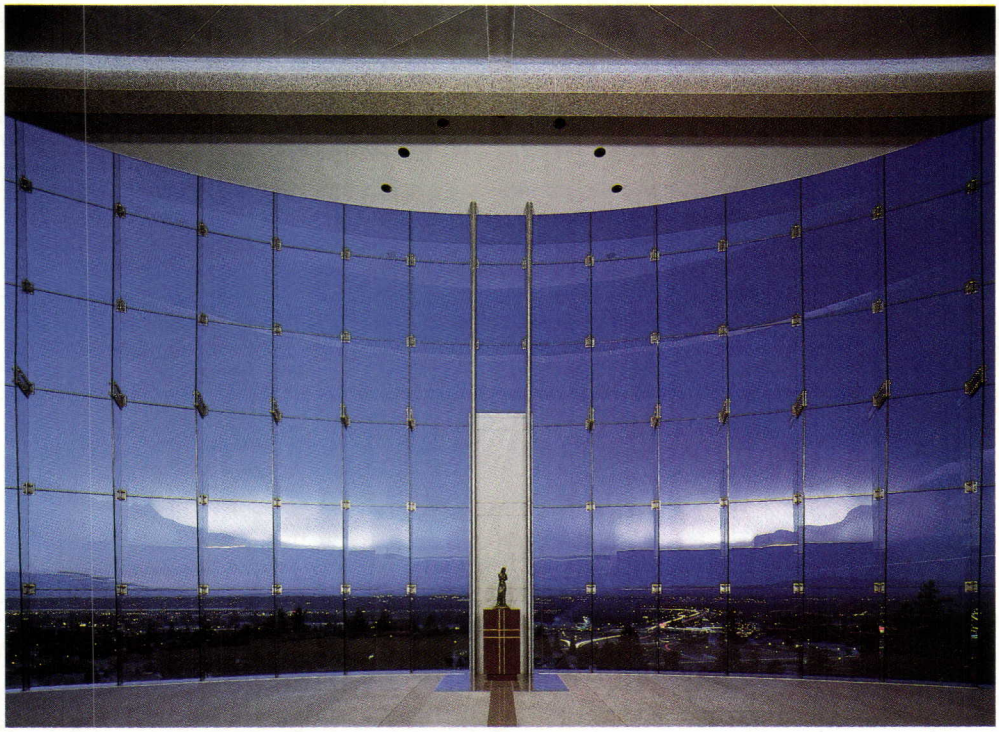
Several of these features seem like Modernist contraventions of traditional ecclesiastical architecture. The usually solid apse is glazed, while the cross, typically a glazed incision, is a solid. "Stained" glass transmits unexpected colors not inside the building, but onto its exterior surface. A more didactic Modernist might have left a gap between the cross and the cliff to reveal that the cross does not support the building, but actually hangs from it, but this apparent slip reveals Thompson Vaivoda's real concerns.

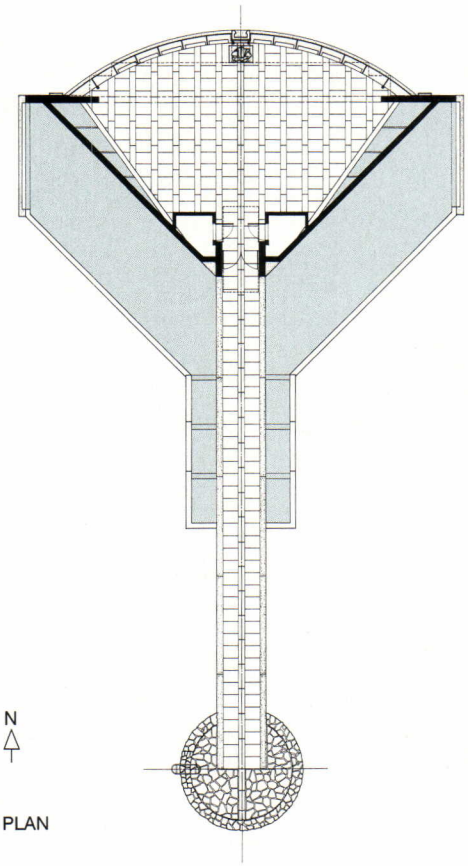
The architects are not interested in a display of structural purity, but sculptural form and the spatial experience of that form, enlivened by careful attention to detail. They have created the sensation not of looking at a view, but of being in a panorama. The entry sequence, which controls the experience of that view, contributes to the strong, emotive qualities of this small building.

The success of the Marilyn Moyer Meditation Chapel is partly a result of the collaboration between architect, client, and sanctuary director, all of whom contributed to the site selection for the chapel. Like the sanctuary's grotto, the chapel's relationship to the natural basalt cliff recalls Edmund Burke's famous 1756 treatise on the sublime and the beautiful. Burke attacked the Classical orders as the canonical standard of beauty, and wrote of the esthetic emotions aroused by sublimity, a quality associated with the great displays of nature. By extending the natural force of its site into the experience of the building itself, Moyer Chapel makes it clear that a traditional building vocabulary is not needed to provoke either spiritual associations or architectural power. ■

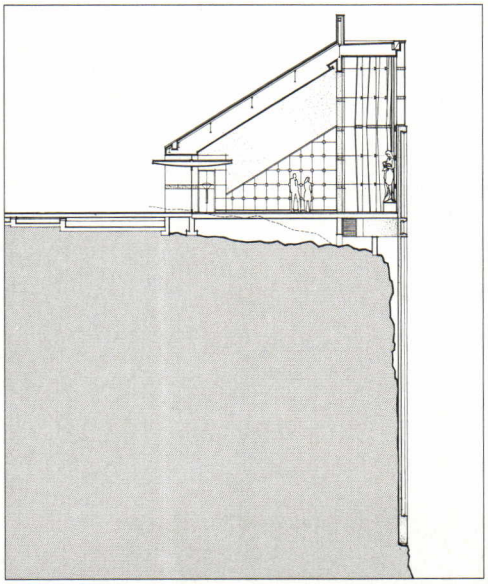
—JUDITH SHEINE

Judith Sheine is a Los Angeles-based architect.





PLAN



SOUTH-NORTH SECTION

A 28-foot-high curved glass wall reveals a panoramic view of Columbia River Valley and Cascade Range (above). Inside, cross (section) is sheathed in Carrara marble. Wall framing glass curve (facing page) is covered in polished granite; floor is finished in flamed granite with polished granite insets.

MARILYN MOYER MEDITATION CHAPEL
PORTLAND, OREGON

ARCHITECTS: Thompson Vaivoda & Associates, Architects, Portland, Oregon—Robert Thompson, Edward Vaivoda, Jr. (partners); Kurt Schultz (project architect)
LANDSCAPE ARCHITECT: Murase Associates
ENGINEERS: KPFF Consulting Engineers (structural/civil); Glumac & Associates (mechanical); Baisley McNees & Associates (electrical)
CONSULTANTS: CS Acoustical Engineer (acoustics)
GENERAL CONTRACTOR: Hoffman Construction Co.
COST: Withheld at owner's request
PHOTOGRAPHER: Strode Eckert Photographics

Portland AIA Chapter Offices
Portland, Oregon
Fine Young Constructivists


New Chapter

Curved wall (preceding spread and facing page) separates gallery and conference area from offices (plan, facing page). Garage doors fitted with glass panels (above) retract above a perforated, wood-paneled ceiling, creating open spaces. Above a circular conference table, the architects exposed the steel ceiling structure to support a floating translucent glass plane (right). In the rear meeting room, they designed a glass table and maple-clad audiovisual equipment storage wall (facing page, top right). In the office adjacent to a restored bank vault, slate flooring is accented with black tiles to echo structural system (following spread, right).

WITH 765 MEMBERS AND A GROWING CONstituency, the Portland, Oregon, chapter of the American Institute of Architects is one of the national organization's most successful components. In 1984, the group established an intern development program that has served as a prototype for the AIA. The chapter also sponsors an effective client-referral system, and recently joined forces with the Bonneville Power Company to establish an awards program for energy efficient design.

This fall, the Portland chapter opened a new, 3,400-square-foot headquarters that is as innovative as the group's programs. The project began two years ago, when, in need of additional space, the chapter took the opportunity to expand its mission from administrative outpost to public forum, including a gallery and meeting rooms for allied organizations. "Our goals were to create a resource center for the design and construction industry, and provide a catalyst for improved communication among allied professionals and craftspeople," explains AIA Chapter President Alan J. Beard, a principal of GBD Architects.

The chapter's search for a stronger presence in downtown Portland led the organization to the Henry Building, a glazed terracotta and brick structure completed in 1909. Fortuitously, the Portland Development Commission, a nonprofit agency charged with creating housing downtown, was looking for a ground-floor tenant for the building, which was recently renovated into a mixed-use project that includes an SRO hotel. Adds Beard, "We were happy to support this kind of development downtown."

Next came the task of selecting an architect to design the new AIA headquarters. Rather than sponsor a competition or name a single firm, the chapter organized its members to oversee various aspects of the job. Beard, Chapter Executive Saundra Wark, and BOOR/A Principal Dennis O'Toole formed an executive committee to procure donated materials and labor. The committee invited several young architects from Portland's leading firms to form a volunteer design team. Jeffrey Lamb, a BOOR/A associate principal, headed the team, dubbed the Fine Young Constructivists. He was joined by Kevin Johnson and Michael Gregg of BOOR/A, Michael Dowd of GBD Architects, and Sharron Duggan of the Zimmer Gunsul Frasca Partnership.

The executive committee gave the team plenty of leeway. Lamb had recently returned from a three-month sojourn to study the work of Carlo Scarpa, and he acknowledges the Italian master as a source of inspiration. The design team developed a highly articulated presence for the AIA within the confines of the 3,400-square-foot space, originally a bank and recently a Japanese restaurant.

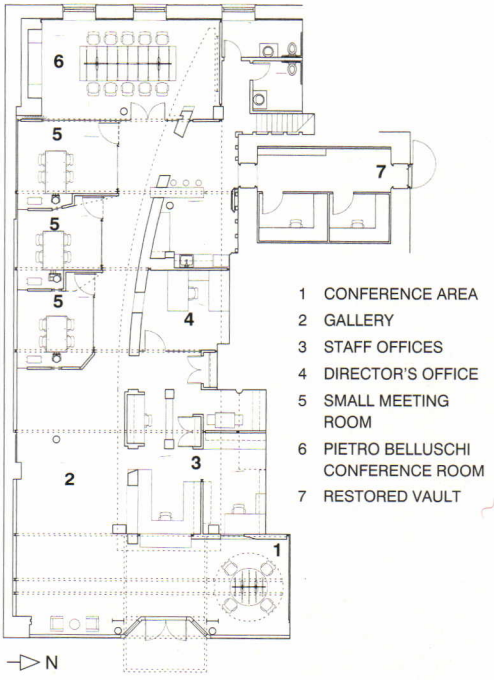
To encourage a visual interplay between the street and interior functions, the design team set a round conference table under a floating, translucent circle within the eastern storefront bay. They reserved the western storefront for the chapter's gallery, which features changing exhibitions of artists as well as

architects. Within the space's original, unadorned shell, the design team inserted an exposed steel structural frame that rises along the walls and runs along the ceiling. Dark walnut stripes in the maple floor echo the structural frame, and stainless steel inlays accentuate freestanding walls and doorways. Against this new, rigorous structure, the architects inserted sculptural planes of wood, steel, glass, and granite, establishing a mix of hard and soft surfaces, contours and curves.

To separate public areas and private offices, the architects inserted a muscular, splayed wall finished in textured plaster that emphasizes the north-south circulation axis. Containing randomly arranged, rectilinear niches for displaying models and drawings, this 70-foot-long wall terminates at a large conference room. Accentuating the arc of the wall, the architects staggered three small conference rooms and outfitted each with a custom glass and steel table suspended from exposed ceiling beams.

If "God is in the details," as Mies maintained, this small office space is a virtual deity—a crafted sensibility rooted in highly articulated surfaces and connections. But just as important as its esthetic is the new office's testament to the collaborative process. Reaching beyond a single practice, the chapter has created a design effect that embraces architects, craftspeople, artists, and tradespeople, expressing the many talents of Portland's design and construction industry. ■

—LYNN NESMITH



GROUND FLOOR PLAN

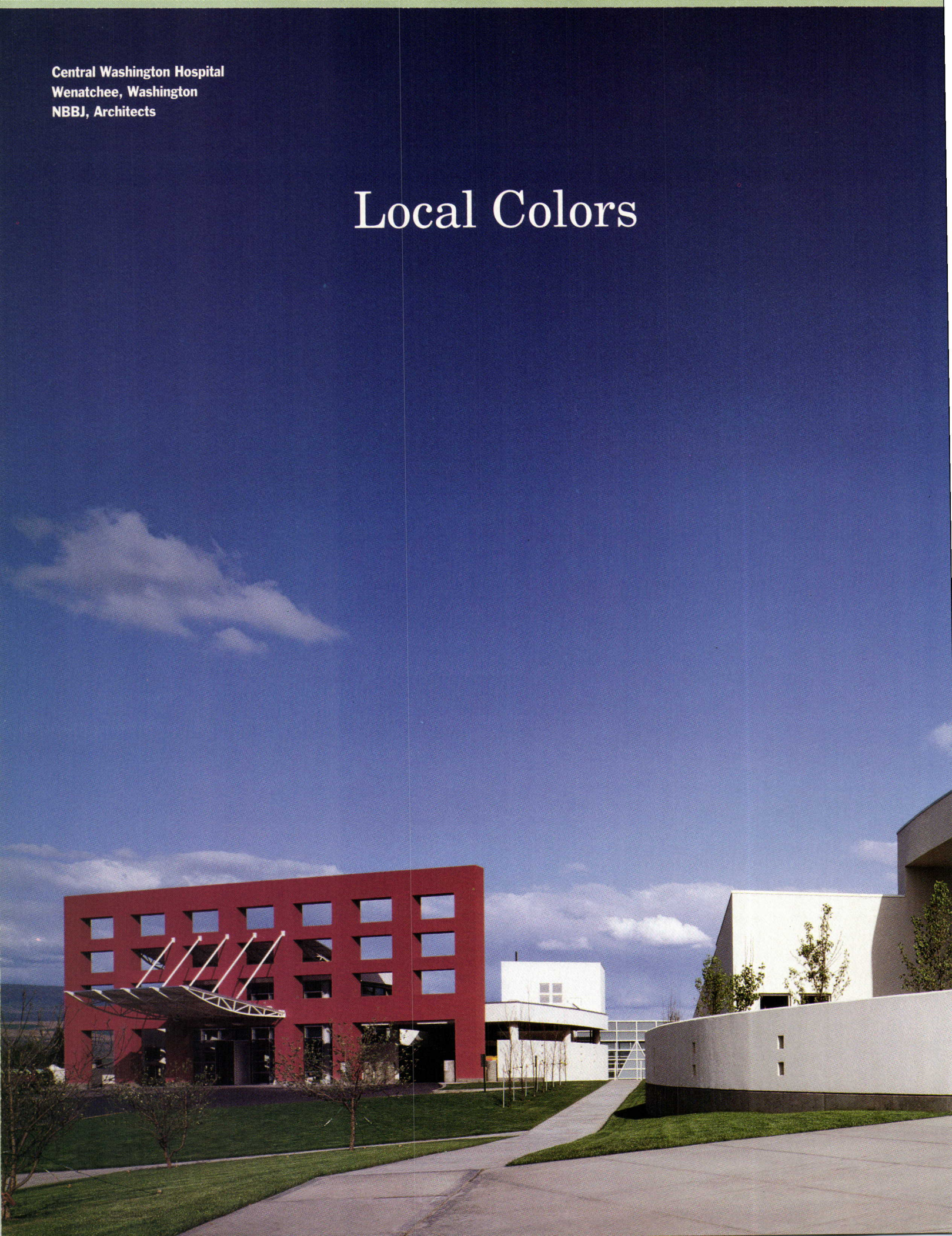
PORTLAND AIA CHAPTER OFFICES
PORTLAND, OREGON

ARCHITECTS: Fine Young Constructivists—Alan J. Beard of GBD Architects and Dennis O'Toole of BOOR/A (principals-in-charge); Kevin Johnson of BOOR/A (project manager/job captain); Jeffrey Lamb of BOOR/A (chief designer); Michael Dowd of GBD Architects, Michael Gregg of BOOR/A and Sharron Duggan of Zimmer Gunsul Frasca Partnership (designers); Ray Totten, Barrentine Bates Lee (specification writer)
ENGINEERS: KPFF (structural); Carson Bekooy Gulick Kohn (mechanical/electrical)
CONSULTANTS: Dave Emery/Lightrix, C.E. Marquardt Lighting Design (lighting); Design Partnership (graphics); Tom Freedman, Beth Yoe, Bruce Hoheb, John Emmerling (artists)
GENERAL CONTRACTORS: McCormack Pacific; Western Construction Services; Hoffman Construction; A.C. Schommer & Sons; Joe Hughes Construction; Reimers & Jolivette; Koll Construction; Brockamp and Jaeger
COST: $100/square foot
PHOTOGRAPHER: Michael Mathers


COLUMBIA RIVER

Central Washington Hospital
Wenatchee, Washington
NBBJ, Architects

Local Colors



Hospital additions (above) form pinwheel plan, beginning with 1964 facility (far left) to 1978 and 1983 expansions, to new wings (above). Red screen wall announces emergency wing, linked by glass bridge (facing page). Apple-green wall (left) marks new day surgery unit.

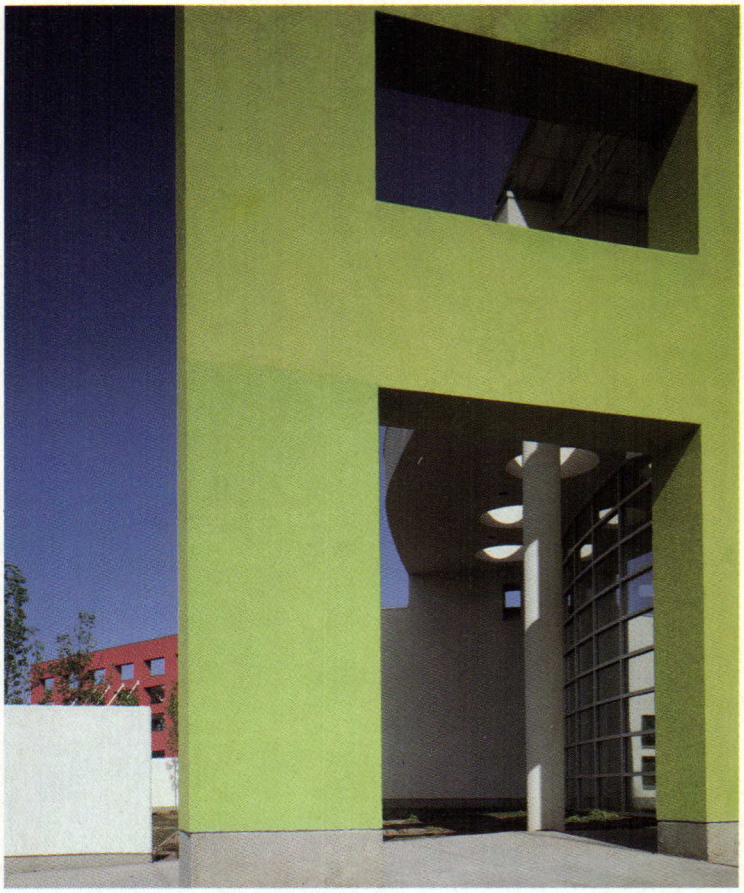
Peach-colored wall (below) announces hospital's name and unites two earlier additions along southern edge of the complex. Custom-designed, suspended steel trusses support translucent fiberglass canopy over drop-off area (below); similar trusses support shelter over 8-foot gap between screen walls and lobbies (facing page, top left). Day surgery roof overhang (facing page, top right and bottom) provides shade, while punched, round openings allow sunlight to penetrate garden. Walls of clear, aluminum-framed glass form three sides of 18-foot-high lobbies of new wings (facing page, bottom), and rectangular openings in stucco entry walls frame rocky outcroppings of surrounding hills.

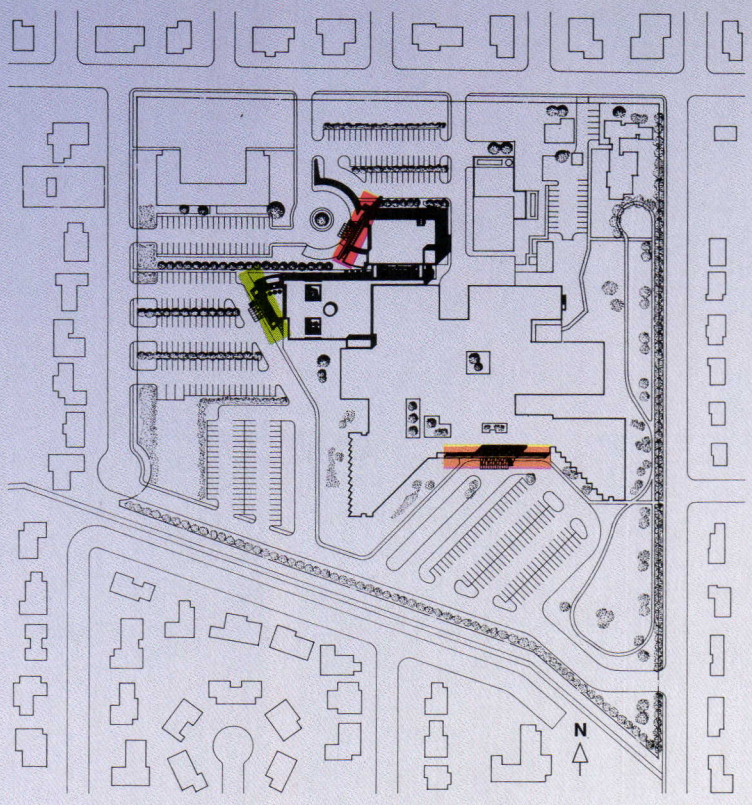
THE CENTRAL WASHINGTON HOSPITAL, serving the apple-belt community of Wenatchee, is a place where patients arrive for treatment wearing cowboy hats. This maverick spirit is captured in a bold new design by NBBJ of Seattle, a firm that has added new wings to the hospital since 1978. Since its completion in 1964, the locally designed institution had evolved to form a rambling, 200,000-square-foot complex with an obscure entrance. NBBJ's latest assignment was to enhance the main entrance, expand the emergency room, add a day surgery center, and establish a sophisticated identity for a major hospital serving a four-county area.

The designer in charge of this assignment is NBBJ Senior Associate Rick Zieve, a dyed-in-the-wool Westerner who grew up in Colorado and Utah, and who worked for 11 years for CRSS in Houston. Zieve appreciates Wenatchee's arid, treeless, high desert terrain, and sought to site NBBJ's additions with a strong presence against the Cascades' eastern foothills. His scheme focuses on three, 34-foot-high, stucco "screen walls" that clearly mark the entrances to the hospital's main lobby and its two new additions. Colored to match the fruit grown in irrigated orchards along the nearby Columbia River Valley, the billboardlike grids are rendered in Granny Smith green, Red Delicious, and peach, and they give the randomly organized hospital both unity and a recognizable architectural symbol. Juxtaposed against the surrounding landscape, the vibrant walls' rectilinear openings frame the jagged rock outcroppings like dramatic Western paintings.

NBBJ Principal James Brinkley's 1987 master plan determined the location of the new wings at the hospital's northwest corner. The emergency area juts due north, connected to the hospital by two bridges that span a 25-by-68-foot courtyard. Day surgery points west, and is organized around two square interior courtyards. Capitalizing on the site's rugged scenery, the architects positioned both wings' entrances and screen walls to address two nearby pinnacles, favorite Wenatchee landmarks. These angled entrances, backed by rectangular additions, create wedge-shaped spaces for the two wings' lobbies, where Zieve took full advantage of the dramatic scenery with floor-to-ceiling window walls that drench the waiting areas in sunlight.

"I discovered this hot, dry climate and a big stucco hospital, and it seemed very odd





Screen walls color-code entrances to rambling hospital (site plan, left). Square windows create rhythm along surgery wing (below). Ambulance port (facing page, behind red wall) is screened from lobby by stucco walls. Fiberglass canopy (facing page) provides shelter at drop-off area.

Everett Public Library
Everett, Washington
Cardwell/Thomas & Associates Architects

Depression Modern

DESPITE ITS EUROPEAN REFERENCES, CARL Gould's 1934 Everett Public Library was designed to be quintessentially American, as befit the Everett of its day. Reflecting brick and terra-cotta detailing reminiscent of the work of Dutch architect H. P. Berlage, the 19,000-square-foot building was considered quite modern for a Depression-era sawmill town at the edge of Puget Sound. The library's rear windows addressed Everett's working waterfront and the Olympic Mountains beyond, but its entrance faced a downtown that, despite the rest of the nation's troubled economy, was thriving thanks to the new technology of a fledgling paper industry. Incorporating paintings and prints purchased by the federal Public Works of Art Project, the new library dominated cultural life in a changing community.

Today, the renovation of the 1934 building and a new, 35,000-square-foot addition create a similarly felicitous match with the Everett of the 1990s, a Boeing stronghold that is about to become a U.S. Naval home port. As in the 1930s, the town is bucking the nation's recessionary trend by embracing new economic resources, and the library addition accommodates both contemporary works of art and state-of-the-art technology. Architects Cardwell/Thomas of Seattle and The Dykeman Architects of Everett began the $6.2 million project by demolishing a 10,000-square-foot 1962 addition that had obliterated the Gould library's waterfront views, and replaced it with a two-story volume. They restored the original library as a frontispiece, and created a grand, vaulted reading room that recaptures Puget Sound vistas.

Carl Gould's 1934 library (top left) has been restored, including both south- and east-facing entrances (left). New wing, rendered in brick and slate (left and center) extends to the west with a copper-roofed, barrel-vaulted reading room (facing page).

The original building's L-shaped footprint was expanded to a rectangle with the 1962 addition, which blocked the building's secondary, south-facing entrance. Cardwell/Thomas restored the southern entrance and inserted a larger rectangular volume, west and south of the original building, into the L's right angle. Visitors now pass through the original, east-facing entrance into the 1934 lobby, where murals, repoussé sculptures, and dark oak wainscoting have been skillfully revived. Into the original structure, the architects tucked staff offices, archives, and a gallery of local history—including the office furniture of the late Senator "Scoop" Jackson, who lived up the street.

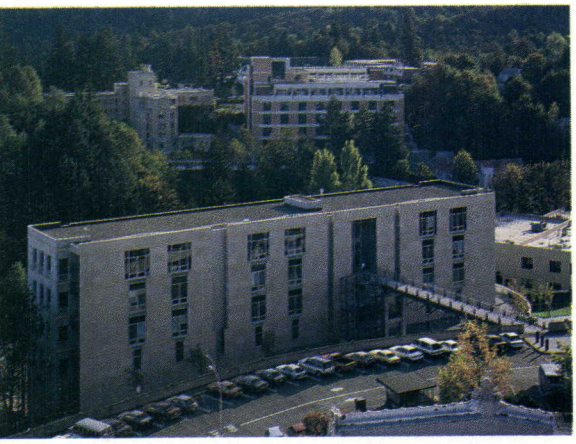
Although Cardwell/Thomas's restoration of the 1934 interior is commendable, the architectural centerpiece of the library has clearly shifted to its steel-reinforced masonry addition. Breaking free of the small, dark spaces of Gould's library is a barrel-vaulted reading room that truly exhilarates. The long, narrow, 38-foot-high space is flanked by north- and south-facing clerestories and culminates in a window on the waterfront, resulting in a lofty room that requires little artificial light, even on the foggiest days. Custom-designed steel bowstring trusses atop graduated steel pipe columns support the roof. Cardwell/Thomas's structural honesty is also evident in the second floor reference area, where clerestories and inverted trusses echo the vocabulary of the reading room.

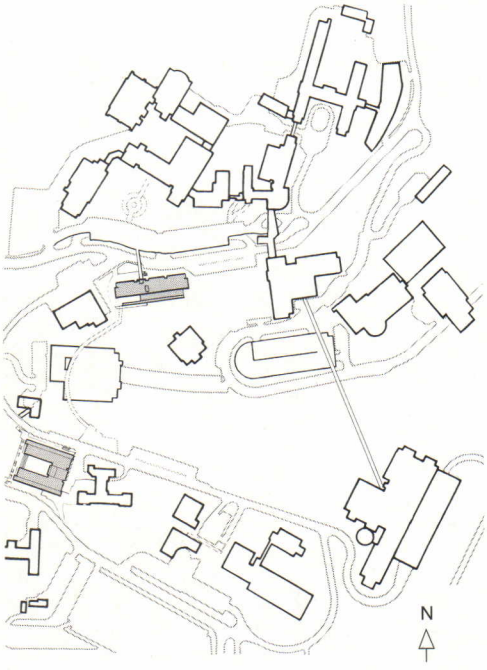
The architects' most important achievement is remarkably similar to what Gould accomplished almost 60 years ago: they created a simple, easy-to-follow plan and provided a new cultural center for Everett. The original building, deftly restored, will be reviewed for the National Register of Historic Places, but it is Cardwell/Thomas's new architecture that truly underscores the process of learning inherent to a library. ■

—HEIDI LANDECKER

Biomedical Information Communication Center
School of Nursing
Oregon Health Sciences University
Portland, Oregon
GHA Architects

Campus Order





Biomedical Information Communication Center (in photo foreground, above, and top of site plan), an electronic medical library, is sited on the edge of a canyon with a south-facing, concrete and glass frame (facing page). The School of Nursing (background, above) is located across the canyon to the south (plan), on a site outlined in GHA's 1988 campus plan.

INTENDED AS AN ACROPOLIS OF HEALING, the Oregon Health Sciences University (OHSU) was originally designed as a Classical enclave atop the wooded hills above downtown Portland. The institution's early-20th-century buildings, designed by local architect Ellis F. Lawrence, remain campus landmarks, but they are now overshadowed by a motley assortment of modern hospitals, clinics, laboratories, and other academic buildings. In recent years, OHSU has attempted to regain cohesiveness on its 116-acre campus, known to the local community as "Pill Hill."

A major contributor to this change is GHA Architects, a Portland firm responsible for a pair of new structures that play a significant role in uniting the campus and elevating its architectural character. The 79,000-square-foot Biomedical Information Communication Center (BICC), a computer-oriented medical library, and the 92,000-square-foot School of Nursing are not attention-seeking designs, but quiet, site-sensitive buildings rooted in an elegant structural logic.

In presenting GHA's scheme for the communication center to the university's review board, Principal Thomas Hacker recommended that the institution rethink its campus plan. He suggested siting the BICC and new nursing school as anchors across a canyon that divides the university's densely built northern hilltop from the clinics and other buildings at its southern end. He proposed constructing a parking garage and student center within the canyon, and spanning the garage with a pedestrian walkway that would link the new communication center with the nursing school. Not only was GHA's plan adopted by the university's board of governors, but the firm was subsequently awarded the commission for the nursing school in 1988.

Hacker designed the BICC to further these campus connections. From the center's front door, the architect extended a steel-truss-supported pedestrian bridge over a road to the main campus quadrangle, and clad the front, north-facing elevation in limestone to harmonize with the light-colored, Lawrence-designed campus buildings nearby.

GHA's design for the School of Nursing to the south is similarly site-sensitive, but more introspective than the BICC. Rather than create a linear sequence of spaces, Hacker focused the classrooms and offices around a central courtyard that stresses the new autonomy of the school and encourages social interaction between faculty and students. Like the BICC, the nursing school's tile and concrete volumes are articulated to complement adjacent buildings, including a tuberculosis hospital designed by Lawrence in 1939, and recently renovated to house campus services.

Both of GHA's buildings at OHSU clearly exhibit the influence of the architects' mentor, Louis Kahn. Hacker and partner Richard Garfield studied under Kahn at the University of Pennsylvania in the 1960s and worked in his office on such projects as the Kimbell Art Museum. In the 1970s and early 1980s, Hacker and Garfield were chiefly involved in teaching at the University of Oregon; they formed their partnership in 1982, winning a competition for the Arizona Historical Society in 1985. Although the firm has since designed several museums, including the critically acclaimed High Design Museum in Bend (1988), the buildings at OHSU represent their most significant completed projects to date.

"If you look at our work, each building is different from another," maintains Hacker. "But they all attempt to take cues from the place they're in. This is what gives the work its strength." The BICC and School of Nursing also derive strength from their finely tailored, structural integrity, which sets them apart from the current fashion for fragmented designs. GHA's buildings at OHSU not only offer a sign of health within their university setting, but within contemporary architectural design.

—DEBORAH K. DIETSCH

Biomedical Information Communication Center

AS ONE OF FIVE SITES IN THE U.S. FOR THE National Library of Medicine's new electronic network, the Biomedical Information Communication Center (BICC) at Oregon Health Sciences University provides students and faculty, as well as healthcare professionals throughout the Northwest, with the latest bulletins on medical treatments and procedures. The BICC is the first such center to be built from the ground up, prompting GHA Principal Thomas Hacker to carefully consider the implications of how information is electronically communicated, both within the structure and via satellite to other locations. "No one really knew what this building should be," Hacker explains. "So we designed it to change with developments in the field." The need for flexibility within this computer-dominated building led the architects to separate its 242-foot-long concrete structure into linear functional zones that allow for future expansion and adaptation.

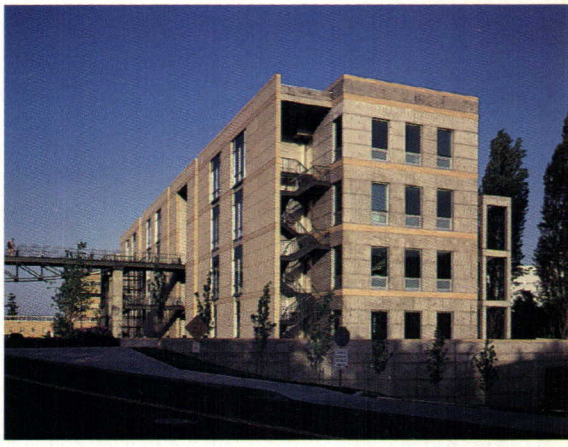
This potential for growth is most clearly expressed by the exposed concrete framework on the southern edge of the building, which borders a wooded canyon. Open to nature, its modular, 10-by-20-foot grid is both engaged and disengaged from the building mass, suggesting room for future infill. The eastern bays on the third and fourth floors, for example, are faced in glass block to provide the main reading room with appropriately diffused light, while on lower levels, the latticework supports terraces, staircases, and walkways, offering contact with the outdoors.

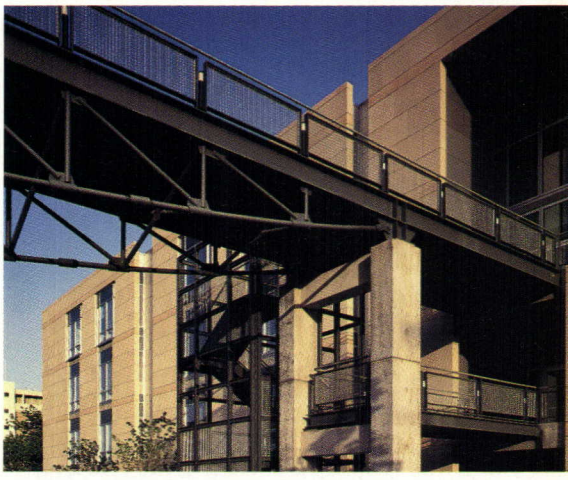
The center's north side, which faces the campus, is also separated from the main building mass, but it expresses a denser, more appropriately formal statement than the rear. Hacker applied a veneer of Spanish limestone, banded in Kasota stone, as a sympathetic gesture to Ellis Lawrence's main library and Mackenzie Hall across the quadrangle. But he also makes it clear that this stone is only skin deep. Punctuated by graduated openings and 2-foot-deep, aluminum-covered recesses that indicate the location of mechanical stacks, the front facade abruptly terminates at the ends of the building, exposing a pair of fire stairs inserted at the corners and poured-in-place concrete walls that enclose the central bays of the east and west elevations.

The communication center is connected to OHSU's main quadrangle by a muscular, steel-supported pedestrian bridge, and to the southern campus by a new concrete walkway. Emerging from a large portal placed off-center in the formal front facade, the bridge spans the main campus road and leads to the research buildings clustered on OHSU's northern heights. Beyond the portal, the main lobby on the third floor leads to elevators and the principal staircase, a service core that separates the public areas to the east from private offices to the west.

Hacker established this core and its flanking, east-west zone as a 36-by-20-foot-wide structural datum, against which he layered a band of offices along the front perimeter and public areas within the concrete frame at the rear. Within the building's central bays, he extended a double-height reading/reference room on the third floor, and placed stacks and computer training and conference rooms below.

While the program of this building clearly focuses on electronic communications, Hacker eschewed mechanistic imagery in favor of simple, well-proportioned spaces and a clear circulation system that ties the building to the surrounding campus. As a prototype for computer-based learning, the new communication center skillfully accommodates the growing field of medical "infomatics" within the quiet dignity of a library. —D.K.D.





Steel-trussed pedestrian bridge (facing page and top right) leads from main campus to outdoor staircase (right, second from bottom) and BICC lobby. Front facade (facing page) is pulled away from building mass, exposing corner staircases (right, second from top). Rear elevation (right) features terrace and exposed concrete framework.

School of Nursing

UNTIL THIS YEAR, THE SCHOOL OF NURSING never had its own building at Oregon Health Sciences University; classrooms and faculty offices were housed in facilities scattered over the hilly campus. So when the university decided to construct a new building for the school in 1988, nursing administration and faculty, which had doubled since 1978, asked GHA Architects to create a strong identity that would announce the presence of nursing on the campus. "The roots of nursing are in nature," explains Dean Carol Lindeman. "We wanted to see that reflected in this building." GHA Partner Thomas Hacker, whose wife is a nurse, was sympathetic to Lindeman's point of view, seeking to capture a sense of nature through light-filled, interconnected spaces. "Architecture and nursing are similar," the 51-year-old architect maintains. "Buildings play a fundamental role in our physical and social health." Achieving this rapport proved difficult, however, given the nursing school's steeply sloped, north-facing site in the southwestern corner of the campus.

To accommodate a changing curriculum and create an introspective character, Hacker separated the school into a pair of classroom-office wings arranged around a central courtyard. At the eastern edge of the courtyard, he connected the two wings with a service tower that houses shared public functions, including a library and conference rooms. Although the plan of the nursing school is symmetrical and its paired volumes identically rendered in structural clay tile and concrete, this mirrored order is not immediately perceived, due to the orientation of the building. The classroom-office wings are terraced, with their 167-foot-long, north and south sides parallel to the slope and the street, shielding the school's open, light-filled heart from view.

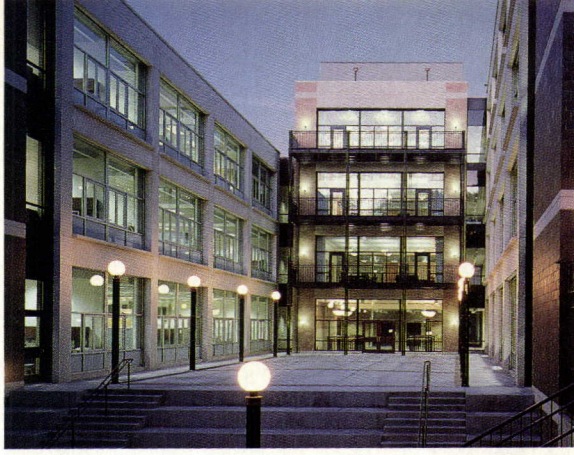
The designer underscored an autonomous identity for the school through a rigorously rational structure. He articulated the north- and south-facing perimeter offices as light-colored layers, accented with precast concrete moldings, over the darker, higher volumes indicating the offices' supporting structural and functional roles. This banded effect breaks down the school's massing and complements the variegated brick of the adjacent building, a former WPA tuberculosis hospital, which now houses OHSU's campus services.

The heart of the school, a serene, 46-by-94-foot courtyard, fulfills Lindeman's desire for daylight and views of wooded surroundings. "Light is the reflection of life, the goal of nursing," she explains. The east end of the outdoor space is terminated by glass-faced public rooms, shielded from the afternoon sun by a steel filigree of grills and balconies, and the flanking classroom wings are punctuated by large, aluminum-framed windows to maximize precious daylight. As an outdoor meeting room, the courtyard also achieves the sense of community sought by the school.

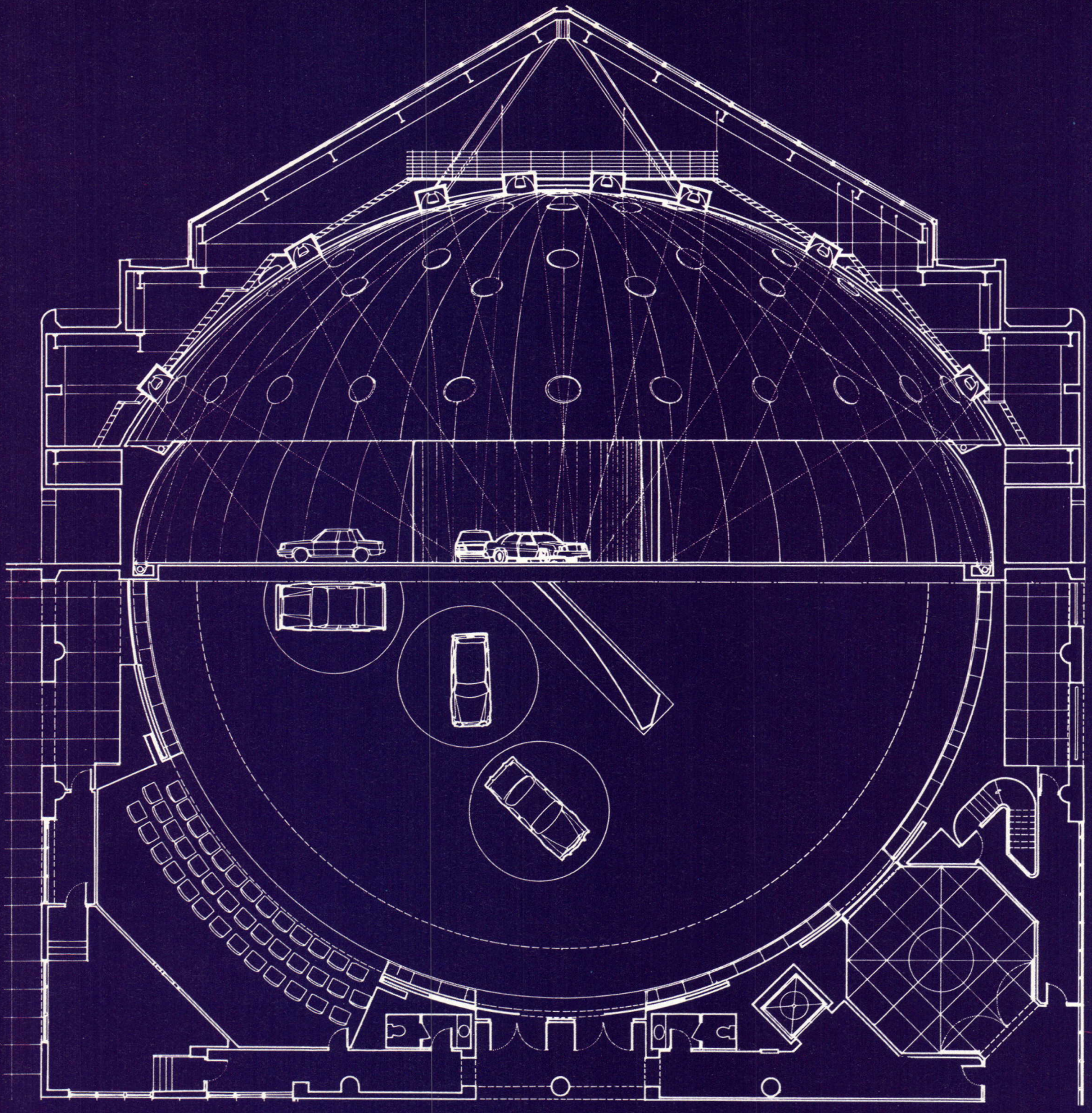
Inside the building, Hacker further encouraged social gatherings by designing an open stair tower, albeit dimly lit, with generous landings. In the public spaces, such as conference rooms, library, and classrooms, he incorporated doors and balconies that open to the outdoor space, and on the top floor, he included terraces with campus views. Even the hallways, lined with wooden lockers, storage cabinets, and window benches, are designed to encourage casual meetings.

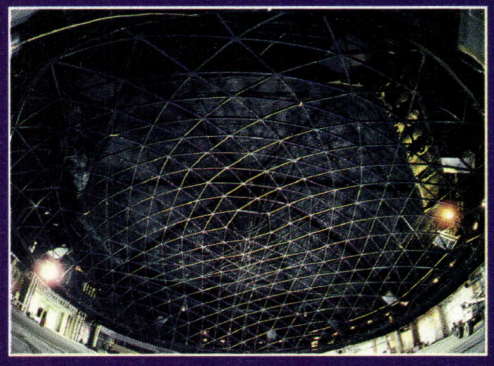
In contrast to the linearity of the BICC, GHA's School of Nursing is a centrally focused complex. As such, its terraced tile and concrete volumes are closely allied to the work of Louis Kahn, whose programmatic resolve seems to echo throughout the school's corridors. Nursing, as Hacker points out, is an underpaid field, but at OHSU, its noble goals are reinforced by GHA's life-affirming setting. ■

—D.K.D.



Public rooms facing courtyard are screened by balconies and grills fashioned from standard steel sections (facing page and top right). North and south perimeter offices (right, second from top) are expressed as light-colored layers that sympathize with neighboring Lawrence building (right, second from bottom) and bracket building mass (right).





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Geodesic structure

Chrysler's styling dome is composed of two elements: .090-inch-thick aluminum panels that define its concave surface, and a lightweight geodesic structure (1) of 60/61T6 aluminum alloy, typically used in aerospace applications. The aluminum panels are attached to the structure (3), which also supports lighting equipment, sprinkler pipes, and a catwalk that pivots at the dome's top, allowing service access. A joint venture of 3-D Structures of Avondale, Pennsylvania, and Starnet Structures of West Babylon, New York, completed the dome's design and engineering.

A geodesic dome was selected primarily because its geometry could incorporate hexagonal panels, which lowered production costs. "A conventional dome divided with latitudinal and longitudinal lines would have required 80 different panel types," notes 3D Structures' Joseph D. Clinton, who worked with Buckminster Fuller on geodesics in the 1960s. "A geodesic required no more than 13." Rectilinear panels also have continuous seams, while hexagonal panels have shorter, multidirectional seams that are more difficult to see.

Unlike most Omnimax screens, the Chrysler dome's 841 panels, ranging in size from 20.9 to 16.1 square feet, are butted rather than lapped, fastened at their corners to circular aluminum hubs that extend from the geodesic structure (2). The hubs are adjustable, allowing panels to be perfectly flush with one another. The cove contains 457 panels ranging from 12.75 to 11.3 square feet. Panels are appropriately finished with a powdered coat similar to automotive paint.

similarly covered with insulation The result is a virtually echo-free chamber.

Replicating daylight

"THE LIGHTING IN THE DOME WAS CRITICAL," notes Stefan R. Graf of IlluminArt Lighting Consultants in Ypsilanti, Michigan, "because decisions about auto design, form, and color—both inside and outside the car—are made here. This is where it all starts."

Graf designed a scheme programmable by computer that permits great flexibility in light quality, quantity, color, and pattern. Each fixture is located behind a 14-inch-wide retractable perforated aluminum disk. The fixtures were located by first determining where cars would be best positioned on the styling dome floor. The floor can hold up to 21 cars, which can be spotlighted with 85 fixtures in the dome. Six lights are trained on each of the three turntables; four lights are directed to a spot in front of the turntables; four locations behind the turntables are each lit with six lights; 13 locations along the back wall are illuminated with three lights each. This arrangement provides sufficient lighting for every car on the floor, although the system is flexible enough to permit all 85 lights to be trained on one automobile.

The lamps consist of a 5600 Kelvin metal halide type, with a color rendering index (CRI) of 90. As sunlight has a CRI of 100, the dome's lamps offer virtual daylight color perception. Similar lights are employed in the motion picture and entertainment industry, explains Graf. The beam of light can be rotated 360 degrees via a motorized mirror in the fixture. Beam size can also be adjusted, along with beam edge, which can be hard or soft. Red and blue dichroic filters color the light for special effects, while star, leaf, wave, and dot patterns can be added to simulate outdoor shade conditions.

To illuminate the dome and cove walls evenly, simulating ambient daylight, Graf specified a combination of compact fluorescents, metal halide, and filtered quartz lamps to provide a CRI of 85. These lamps are located in the floor in front of the cove walls and at the top of the cove walls, just below the dome's spring line. Light angles for even illumination of the dome's surface were engineered by professor Mojtaba Navvab at the University of Michigan's architecture, planning, and research laboratory.

The compact fluorescent lamps are angled to illuminate the dome's lower region, while the metal halide and quartz lamps are angled to light the upper region and the dome's center. "Quartz and metal halide are directional lights," notes Graf, "which means that we can direct them to a spot we want to illuminate. We achieved even lighting across the dome's surface using a combination of lamps, instead of just one type." And because metal halide lamps require four minutes to reach full illumination, the quartz and compact fluorescent lamps, which illuminate instantly, are timed to dim at the same rate as the metal halides, ensuring light consistency.

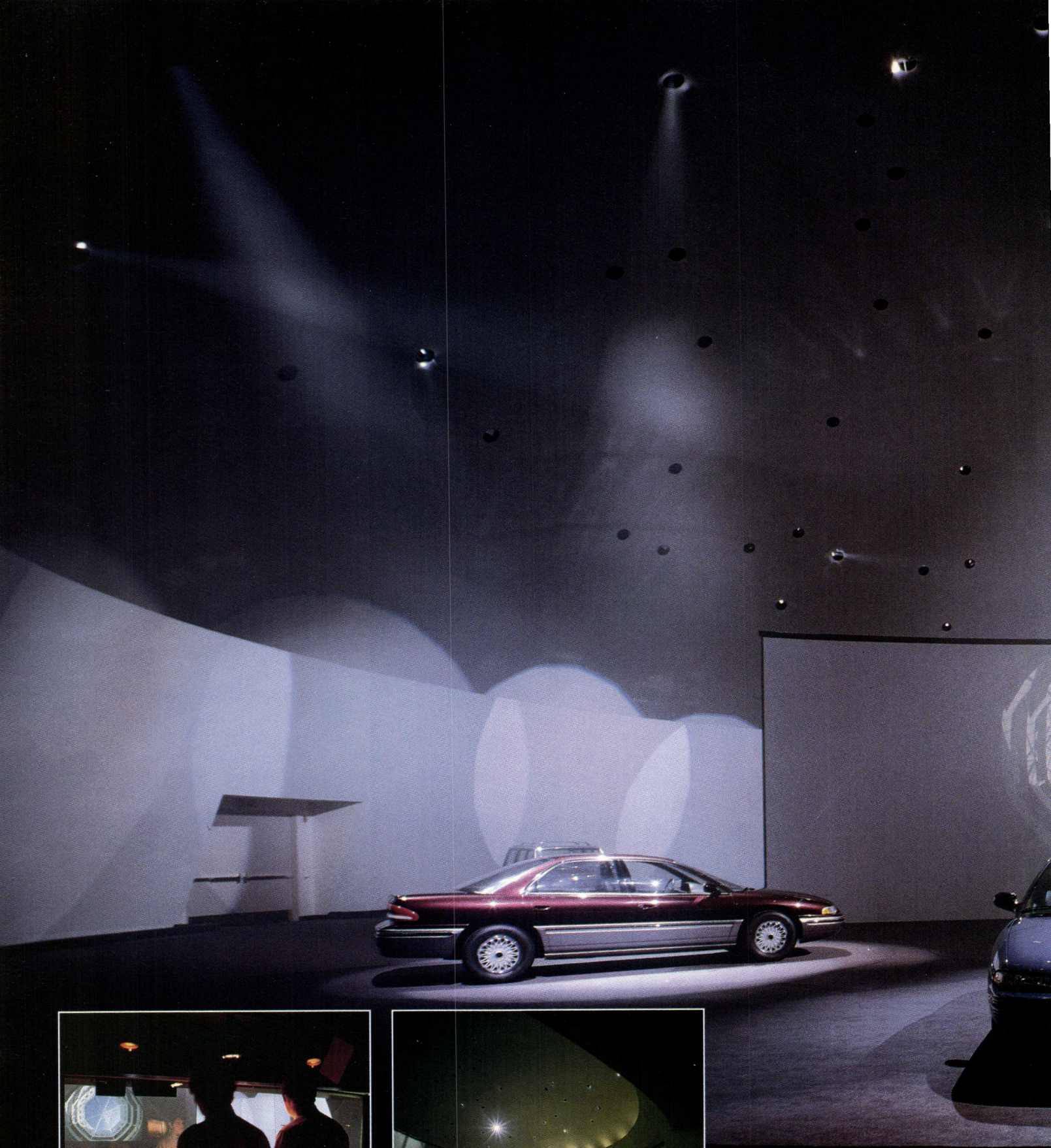
Future applications

WHILE KNOCK-OFFS OF CHRYSLER'S SPECIALized chamber are not likely to be built as backyard projects, the dome's lighting and acoustics are already affecting other design-conscious companies and organizations. "Chrysler's competition is very interested in the dome, because they have similar facilities for car design," notes Boggess, and Chrysler has even allowed the competition to visit. CRSS has other automotive company clients, and while no new styling domes are as yet on the boards, "we've gained a lot of knowledge and experience that can be applied to future projects," Boggess maintains.

A version of the Chrysler dome's acoustical perforated metal cladding has been incorporated into a 100-foot-diameter dome in the new Alabama Supreme Court building in Montgomery, according to Thomas Rose of Joiner Consulting Group. "Domes have always had acoustical problems because of the way they focus sound," explains Rose, "and the perforated aluminum is a creative solution." Unlike Omnimax screens, the dome's metal panels are butted rather than lapped, creating a monolithic screening surface that hides panel joints and fastenings. This technology could be adapted to Omnimax theaters in the future.

Lighting consultant Graf notes that the system used to replicate daylighting conditions could be applied to any product development and evaluation facility where true color rendering is essential, such as window glass or exterior paint manufacturing facilities, for example. The ability to control the dome's lighting quality and quantity by computer also has applications in retail environments where products can be presented under dramatic lighting conditions that constantly change. Graf points out that the dome's lamps are modeled on those used in night clubs, where fast-paced, specialized lighting effects are the primary means of creating atmosphere. ■

—MICHAEL J. CROSBIE



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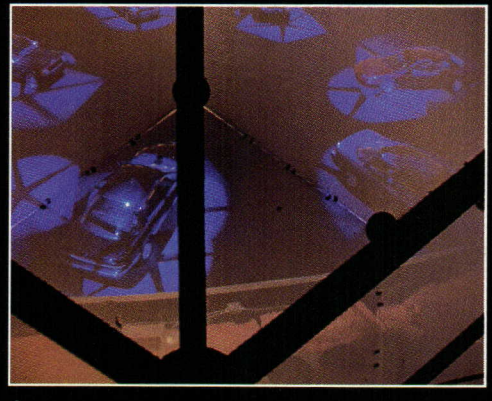
Dome is transformed with light into theatric space appropriate for press previews and board of directors' meetings. Eighty-five motorized lights are controlled by computer (1) in audiovisual center, located behind conference table (2) that overlooks styling dome floor. Dichroic filters change light color (3) for automotive model studies, with lower cove wall to simulate horizon line. Perforated hexagonal panels (4) and equipment are accessed by a rotating catwalk.

3



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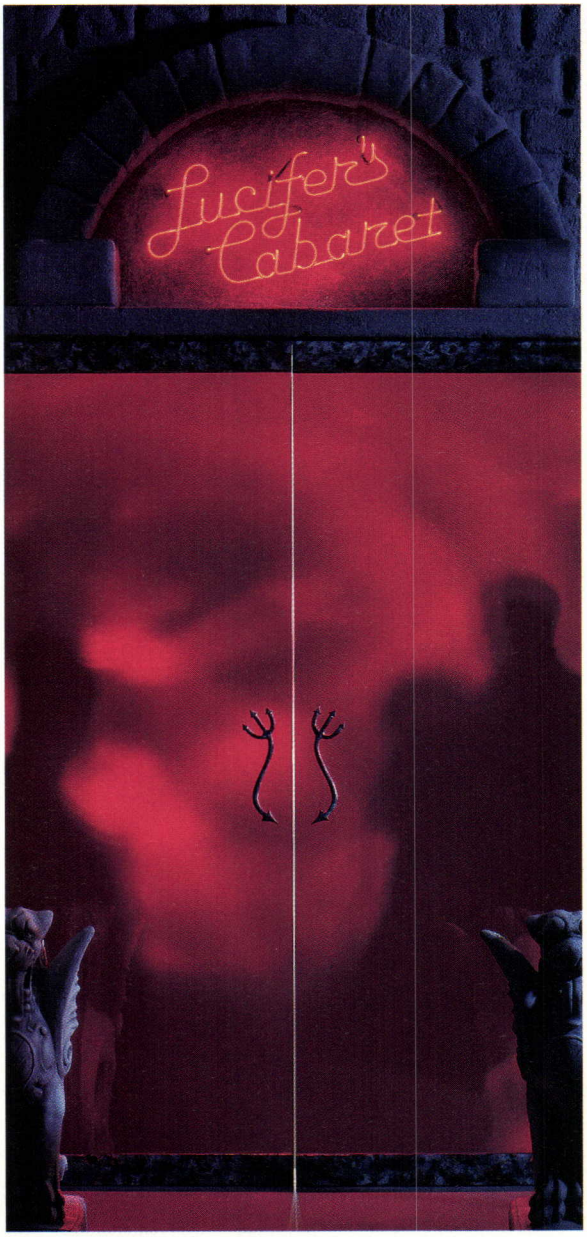

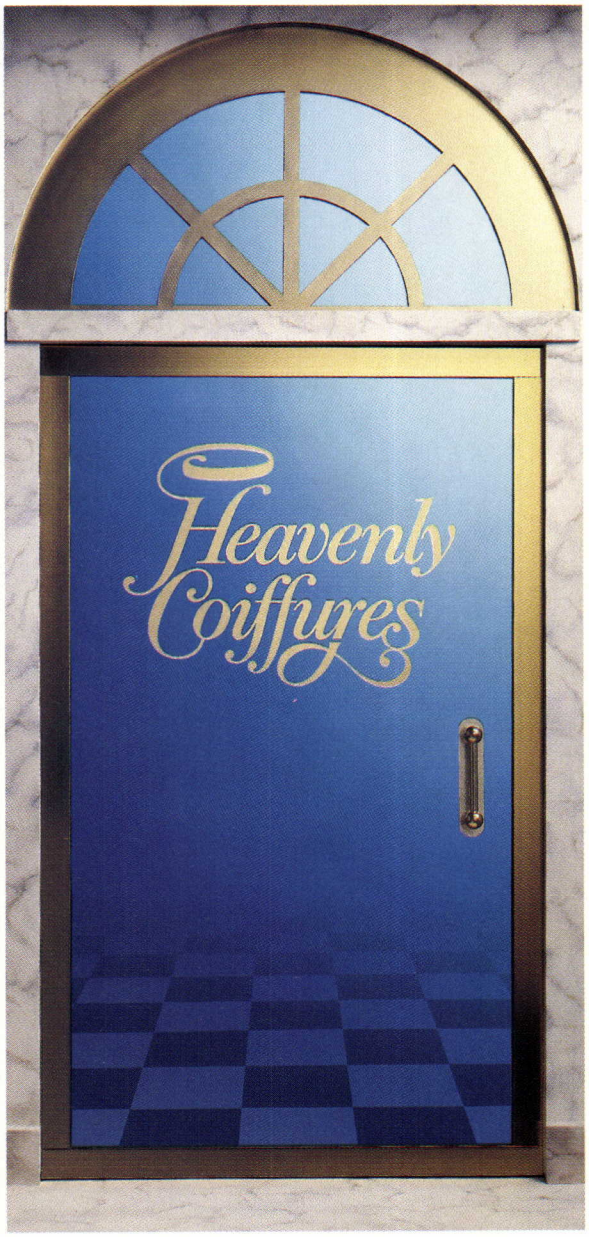

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Steel Reflections

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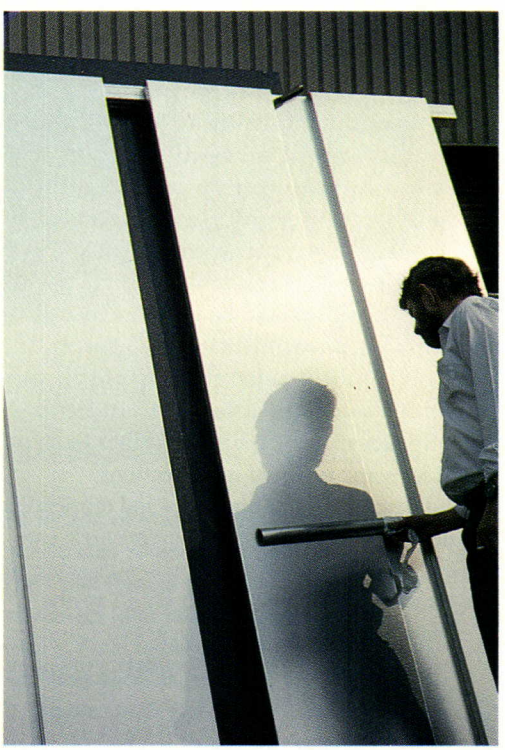
STAINLESS STEEL "HAS AN INNER GLOW," observes Cesar Pelli. "It absorbs light and radiates it back with a quality special to the place." Such site-specific reflectivity appeals to Pelli, who clad three of his most recent projects in the shiny metal despite the material's high cost and special fabrication requirements. Stainless steel can be between 10 and 15 percent more expensive than aluminum or painted metal, but its cost reflects the fact that stainless steel is more durable than other metals, and retains its beauty and corrosion-resistance with little care.

Although stainless steel is traditionally employed for interior ornament, Pelli's projects demonstrate the material's versatility as exterior cladding. When specified in large quantities for applications such as curtain walls, the right type of stainless steel must be selected for the demands of the environment, and careful attention must be paid to fabrication to ensure consistency.

Alloy types

STAINLESS STEEL GAINS ITS STRENGTH through alloying steel with chromium, nickel, manganese, and molybdenum. The material remains "stainless," or rust-resistant, because of a high content of chromium, which forms a transparent skin of chromium oxide that retards oxidation. Because stainless steel is relatively inert when used in combination with other metals such as aluminum, it also resists corrosion through galvanic action.

The most common alloy makeup for architectural stainless steel is 18 percent chromium and 8 percent nickel, commonly known as "18-8" grade or type 304. High corrosion resistance makes this grade of stainless steel, which Pelli chose for the Society Tower in Cleveland (page 89), a durable building mate-



Stainless steel curtain wall of Plaza Tower (top left) accentuates the structure's curved surface by reflecting light along vertical battens (top right). Sample panels (bottom left and right) assembled with moldings revealed rippling in sheet material, controlled by adjusting rollers during manufacture.

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Scanning Software

New computerized tools convert paper drawings to CADD.

AS NEW CONSTRUCTION SLOWS, THE PRESsure to renovate existing buildings increases, accompanied by the need to change original drawings. CADD vendors are responding to this growing demand by developing ways to convert paper documents into a digital format. Gone are the days when the only way to get an existing drawing into a CADD program was to tape it down to a digitizing tablet and laboriously, imprecisely, trace over each graphic element. New scanning hardware and software produce electronic images relatively painlessly, resulting in more efficient drawing storage and retrieval. However, getting the scanned images to be accurate and compatible with conventional CADD systems is difficult.

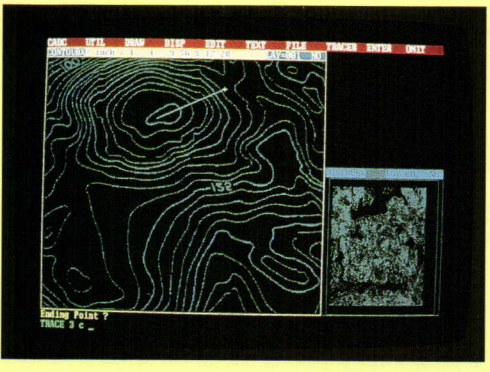
Scanners produce images in raster form, made up of rows of black and white (sometimes gray or colored) dots. This data can be stored electronically but, like fax images, has no "intelligence," or associated geometric and attribute information. Vector data, by contrast, consists of mathematically defined graphic components that are easily edited within CADD software. Converting images from raster to vector formats is an ongoing challenge. There are now several promising methods, each less than perfect, but each suitable for particular applications.

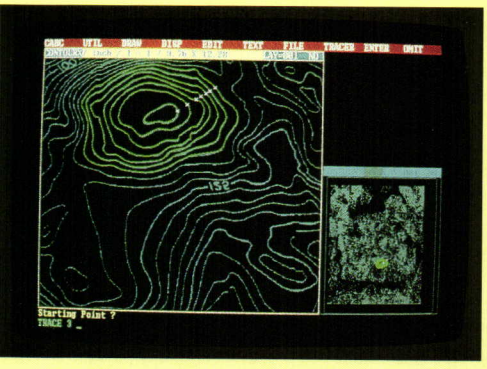
Choosing a scanning method

RICHARD STOVER, PUBLISHER OF *DOCUMENT Management Magazine*, in Scottsdale, Arizona, identifies four major approaches to dealing with scanned images. He explains that the choice of method depends in part on the nature of the drawing and how it will be used. One approach is to keep the image in raster format, most appropriate when only modest changes are required. Another is to retrace the drawings entirely into CADD. This approach is most suitable for the creation of complete 2D or 3D models that will require additional associated nongraphic information. The third approach is to partially convert raster to vector and produce a hybrid raster/vector drawing. This method is useful for remodeling projects in which only portions of the drawing need to be modified. The fourth approach is automatic "vectorization," in which the computer converts raster to vector without human assistance. Automatic techniques are gradually improving, but current software works best when limited to relatively simple images such as contour maps or technical illustrations.

Working with raster files

MOST SCANNER MANUFACTURERS PROVIDE limited software to edit the raw raster data that emerges from the scanning equipment. This software can clean up damaged or dirty drawings by identifying and removing random "speckles," straighten images that are out of square, and correct dimensional distortions caused by paper stretching. Such editing is useful for restoring drawings that are scheduled simply for reprinting or archiving. Most scanner software also compresses the files so they require less disk storage space, converting the images to any of several dozen available raster formats. Disadvantages of



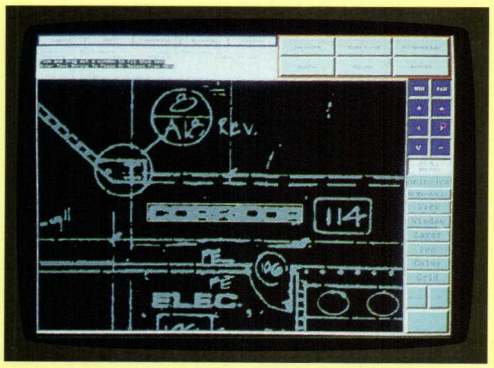


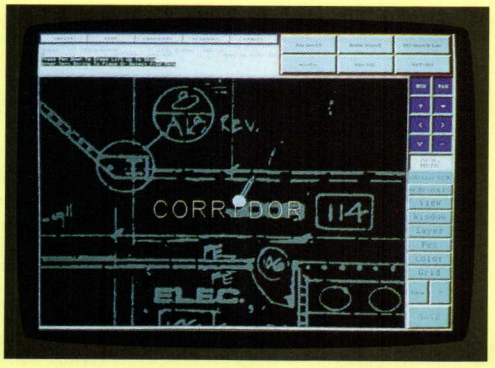
CADCore/Tracer

The multitrace feature of CADCore/Tracer from Information & Graphic Systems allows a user to identify a series of contours (left), which are then automatically traced and converted into their vector equivalent (below, left). The Tracer for AutoCad features interactive, semiautomatic conversions for orthogonal architectural and engineering drawings. Tracing rules can be adjusted to match the drawing's characteristics.

Cadscan

To replace a raster text segment in Isicad's Cadscan, the user boxes in the existing text (above right) and types the replacement. Cadscan automatically scales the new text to fit the space, and the operator erases the underlying raster image (right). Cadscan supports hybrid drawings, made up of both vector and raster images. Because attributes can be assigned to these images, they can be referenced in a nongraphic database.





keeping drawings in raster form are that, even in compressed form, they occupy a great deal of disk space, and only the relatively expensive electrostatic or laser plotters are practical for printing them.

Increasingly, software developers are supplying raster editing tools that enable drawings to be changed within the raster format. Such editing is similar to that in popular "paint" programs. Raster editing is available in CAD Overlay ESP, CADCore/Tracer, Cadscan, Tracer, GTXRaster CAD Editor, I/RAS, NovaEdit, SGE, and Vectress.

Vectorization by tracing

RASTER EDITING IS LIMITED, HOWEVER, AND most architects prefer to work with a file that has been converted to vector form, so that it is compatible with conventional CADD software. One way to convert the image is through software that displays the raster image on the screen as an underlay within CADD. A drafter then "traces" over it, reproducing the drawing in a vector form that can be edited. This process is labor-intensive, but if the drawing is completely converted in this way, it can be as intelligent, as easily modified, and as accurate as if it had been drawn in CADD. And once a drawing is completely vectorized and the raster underlay discarded, the architect can print it with a low-cost pen plotter and store it on a relatively low-capacity disk drive.

William Glennie, an architecture professor at Rensselaer Polytechnic Institute in Troy, New York, works with CAD Overlay ESP from Image Systems. Glennie's students appreciate the automatic scaling afforded by CAD Overlay. "If you have a drawing of unknown scale," Glennie explains, "but you know the dimensions of one element, you can specify that distance and the software automatically scales the entire drawing." His students take advantage of this capability to convert drawings from one scale to another for building site models. The most recent version of CAD Overlay includes a raster object-identification feature that greatly improves the speed and accuracy of tracing over the drawing. Other programs that allow vectorization through tracing include CADCore/Tracer, Cadscan, Tracer, Envision It, GTX-Raster CAD, I/RAS, and NovaDraft. The Video Tracing Station from CAD Images allows the tracing of an on-screen video image without first scanning the drawing into raster format.

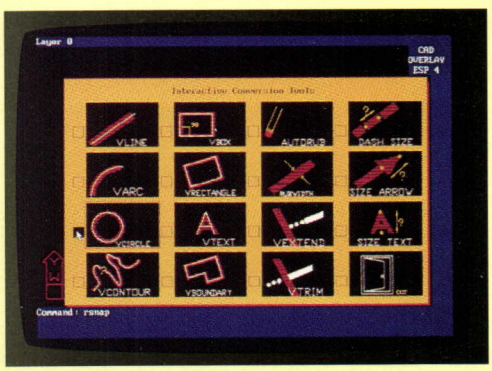
Hybrid drawing environments

MOST OF THESE SYSTEMS SUPPORT HYBRID drawing environments, in which raster and vector elements coexist, and both kinds of elements can be edited interchangeably. This capability is especially appropriate for remodeling work. A user can quickly trace over only those graphic elements to be modified, leaving the rest of the image in raster format. The vector elements can then be easily edited with ordinary CADD tools. But the output device must be able to handle the raster format, and hybrid drawings still have high disk storage requirements.

Architect R. Wayne Shannon is president of ComputerGraphics/Atlanta, a service bureau that specializes in scanning and converting architectural drawings. Shannon maintains that the feasibility of hybrid drawings depends on how much they will be modified. An Intergraph I/RAS user, Shannon says that for minor changes, it is faster and less expensive to retrace only selected portions of a drawing. Hybrid drawings that require only occasional modification can be incrementally vectorized over time. Shannon recommends, however, "Drawings that are modified frequently should be completely vectorized from the beginning."

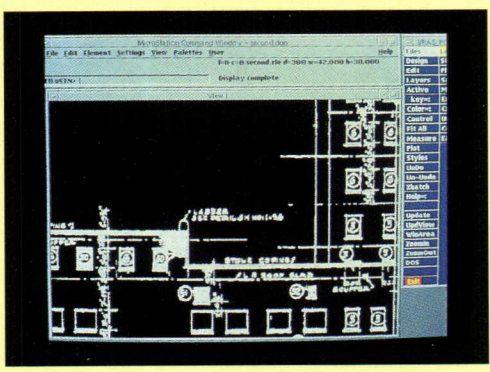
Automatic and interactive vectorization

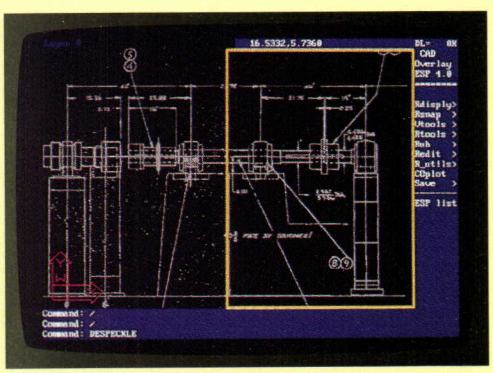
ALTHOUGH THE TERM "AUTOMATIC CONVERsion" is frequently heard in scanning circles, it is not now possible for a machine to completely and accurately interpret printed marks on an architectural working drawing. Automatic conversion means that the computer is programmed to "read" the dots of raster images and translate those patterns into vector equivalents. To illustrate the difficulty of truly automatic vectorization, Glennie explains, "your mind does a wonderful job of sorting out the different parts of a drawing. You're not confused by text or dimension lines running across a stairway, for example. But automatic vectorization programs



CAD Overlay ESP

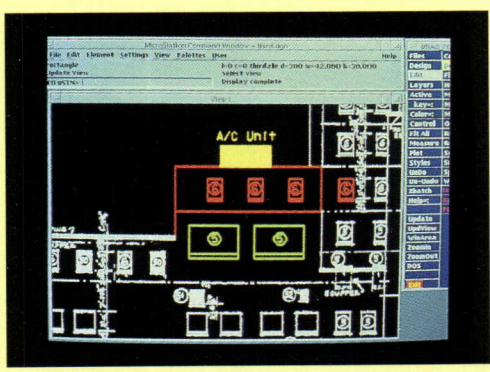
Interactive vectorization is possible with CAD Overlay ESP from Image Systems. A graphic menu displays a slate of tools (left) for replacing raster text, lines, arcs, and other geometric elements with their vector equivalents. Automatic speckle removal cleans up a scanned drawing (below, left) even before the user proceeds with further editing and vectorization. CAD Overlay ESP operates within AutoCad releases 11 and 12.





I/RAS

After scanning, an image (above right) is cleaned up in I/RAS from Intergraph with speckle removal and deskewing. The hybrid raster/vector environment facilitates selectively replacing parts of the drawing to indicate renovations (right), while leaving the rest of the raster image intact. This allows fast changes for minor renovations but requires a plotter that supports the raster format. I/RAS runs on both PCs and workstations.



are easily confused by that clutter."

Early attempts at pattern recognition software were disappointing. For example, a circle might be interpreted as thousands of short, straight-line segments, and the result would be difficult to edit and bulky to store. Newer pattern recognition software is more "intelligent," and a circle, for instance, can be recognized as a circle even if it overlaps other graphic objects. The software then redefines the raster circle in terms of radius and center-point location, making it simple to edit. Because completely automatic vectorization is unreliable, many software vendors have been concentrating on developing tools for "interactive vectorization." This means that the software and architect work together to convert a raster image to its vector equivalent. For example, the software may automatically trace along a raster contour line, converting it to vectors. When it meets an intersection, it will stop and ask the computer operator which way to proceed. Or the software may recognize raster circles but ask for the precise radius before converting it to its vector equivalent. CADCore/Tracer, CAD Overlay, Draftsman, GTXRaster CAD, I/RAS, and SRV feature such semiautomatic vectorization.

Richard Linn, the vice-president of Vectorex Corporation, a CADD conversion service bureau based in San Jose, California, claims that interactive vectorization has improved greatly in recent years because of smarter raster object identification. His firm uses GTX software, which combines automatic and interactive vectorization. "The computer does more of the up-front work for us," Linn says. "That frees us to do the skilled part requiring interpretation and judgment, such as layer and text assignments."

Neural networks

IN THE ONGOING ATTEMPT TO HELP COMputers recognize graphic patterns, promising results from the "neural network" branch of research have emerged. Although far from perfect, this approach seeks to solve pattern recognition problems by simulating how the human brain may learn. By "training" a neural network, researchers enable computers to recognize the inconsistent and often ambiguous marks in hand-lettering or drawing. A simplified diagram (below) demonstrates how neural networks can be trained to distinguish between "8" and "B." The possibility of those networks working on affordable hardware depends on lowering equipment prices coupled with continuing improvements in computation speed and memory size.

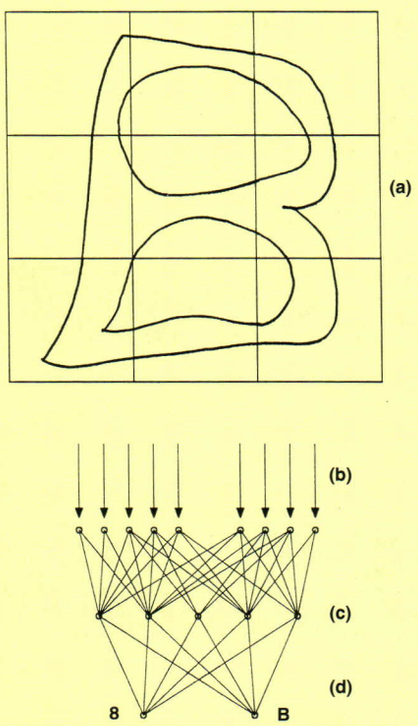
At the crossroads

THE JURY IS STILL OUT ABOUT HOW THIS technology will develop over the next five years. As high-speed, high-capacity optical storage devices drop rapidly in price, some experts believe the hybrid solution is the one most likely to survive in the long run. Others, like Linn, believe the role of raster images will increase. "Raster will continue to evolve as a productive tool," he predicts, "primarily because of the low cost of data capture and the improvement in compression techniques. As raster increases, vector will hold its own," Linn continues. "I believe they will coexist, each in their own applications, but I doubt how much hybrid raster/vector people will want to use." Many of these experts put faith in the future of neural networks to improve automatic vectorization. However, as Stover points out, neural network training procedures are not yet user-friendly.

Although computers may never be able to interpret drawings without some human intervention and verification, the technology for scanning and conversion is gradually relegating the tedious work to the machine, leaving only the most interesting subjective judgments for the experienced professional.

As technological sophistication grows, architects should not lose track of the heart and soul of the drawings intended to be preserved. "Our history is out there on paper documents," Shannon observes. "We once restored a set of 19th-century drawings from old, faded blueprints. Now we have captured it in vector form, and I hope it will never go away." If technology solves the problems of incompatibility over time and electronic media's fragility, such history, once doomed to disintegrate with the paper it's drawn on, could last forever. ■

—B.J. NOVITSKI



Neural Network Character Recognition

The "neural network" branch of research, as pursued by the GTX Corporation among others, has produced promising results in automatic conversion through pattern recognition. A simplified diagram (left) demonstrates how neural networks can be trained to distinguish between "8" and "B." The image of a character is divided into nine regions (a), each of which is entered (b) into the computer network (c). The network mathematically applies weighted factors and suggests an answer (d), which a human judges to be correct or incorrect. During repeated trials with many variations of 8s and Bs, the software adjusts the network's mathematical weights and eventually "learns" to identify the characters with a high reliability. The more sophisticated the weighting is, the more reliable the results will be. However, the more complex the neural network, the more computing power it requires.

Scanning Software Sources

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CADCore/Tracer
Information & Graphics Systems
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Cadscan
Isicad
(714) 533-8910

Draftsman, Tracer
Arbor Image
(313) 741-8700

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Envisions Solutions Technology
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GTX Corporation
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Neat file

ARCHITECTURE's "No Excuses After This" information exchange

Site Work *CSI Reference 02000*

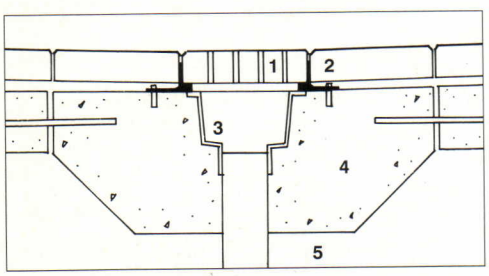
Exterior Stairs

Architects may be aware of the Americans with Disabilities Act's effect on building design, but may not know that ADA also governs site design outside the building, including exterior stairs. For our design of the walkways surrounding the Gateway sports complex in Cleveland, Ohio, for example, ADA required stair treads to be at least 11 inches deep, with a sloped nosing and riser at an angle not less than 60 degrees from horizontal. Under the new regulations, stone steps must be finished with slip-resistant surfaces, so we specified granite stairs with a flamed finish for the Gateway complex. Handrails must extend at least 12 inches beyond the top riser, and at least 12 inches plus the depth of one tread beyond the bottom riser, in order to comply with ADA regulations.

Alan Ward
Sasaki Associates
Watertown, Massachusetts

Paving Grates

Within a pattern of pavers, such as 1-foot-square concrete, stone, or tile units, a metal drainage grate always looks like an afterthought, and disrupts the uniformity of the paving. We've developed a way of using the paver itself as a grate by drilling holes through the paving unit and positioning a drain below it (detail, left). The drain is surrounded by a cast-in-place concrete ring collar with a welded steel angle frame near its top that can be adjusted to accommodate the individual paving unit's size and spacing.

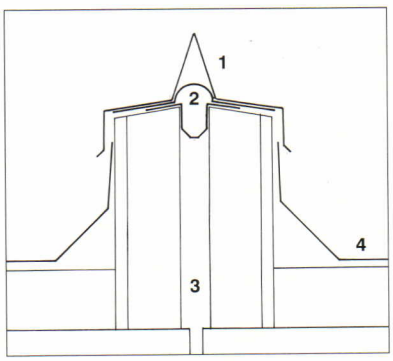


DRAIN SECTION

1 PERFORATED PAVER
2 ADJUSTABLE STEEL ANGLE
3 DRAIN
4 CAST-IN-PLACE CONCRETE COLLAR
5 AGGREGATE AND SUBGRADE

Barry Gazso
Johnson Johnson & Roy
Ann Arbor, Michigan

Metal Fabrications *CSI Reference 05500*



JOINT SECTION

1 GALVANIZED STEEL COVER
2 NEOPRENE WEATHER SEAL
3 EXPANSION JOINT
4 BUILT-UP FLAT ROOF

Metal Joint Covers

Horizontal expansion joints on flat roofs are not only exposed to a broad range of climatic conditions, but also to the abuses of maintenance. The joint's neoprene weather seal can be abraded by ladders or tools, or damaged by foot traffic. The best way to protect the seal is to cover the joint with a V-shaped metal plate, which allows objects to be moved over the joint without damaging the seal. The plate should be constructed of galvanized steel, which has a smaller coefficient of expansion than aluminum. The cover is not intended as a weather seal, and must be configured and attached to allow free movement of the joint assembly. The cover can be left with its natural finish or painted.

Paul Kiel, AIA
CRSS Architects
Houston, Texas

Alternative Metals

When architects select metal for ornamental or structural work, many think first of steel, which is inexpensive, easy to fabricate, and flexible. But steel is also heavy, corrodes easily, and is difficult to finish to a high quality. Advances in welding, cutting, and production technology now make other metals such as aluminum, bronze, brass, copper, zinc, nickel, and titanium alloys appropriate substitutes for steel. These lighter-weight materials are less likely to react with other building materials, can be naturally finished rather than painted, are easily machined, and can be completely recycled. In addition, most nonferrous metals can be worked with ordinary tools such as a bandsaw, a drill press, and a sanding machine, allowing work to be done outside steel fabrication shops, at lower cost.

Kimo Griggs, AIA
James Kimo S. Griggs Architects
Somerville, Massachusetts

Architects are encouraged to contribute their Neat ideas, including drawings, sketches, and photographs, for publication. Send the submissions to: NEAT *File, Michael J. Crosbie, 47 Grandview Terrace, Essex, Connecticut 06426, or by fax (202)828-0825.*