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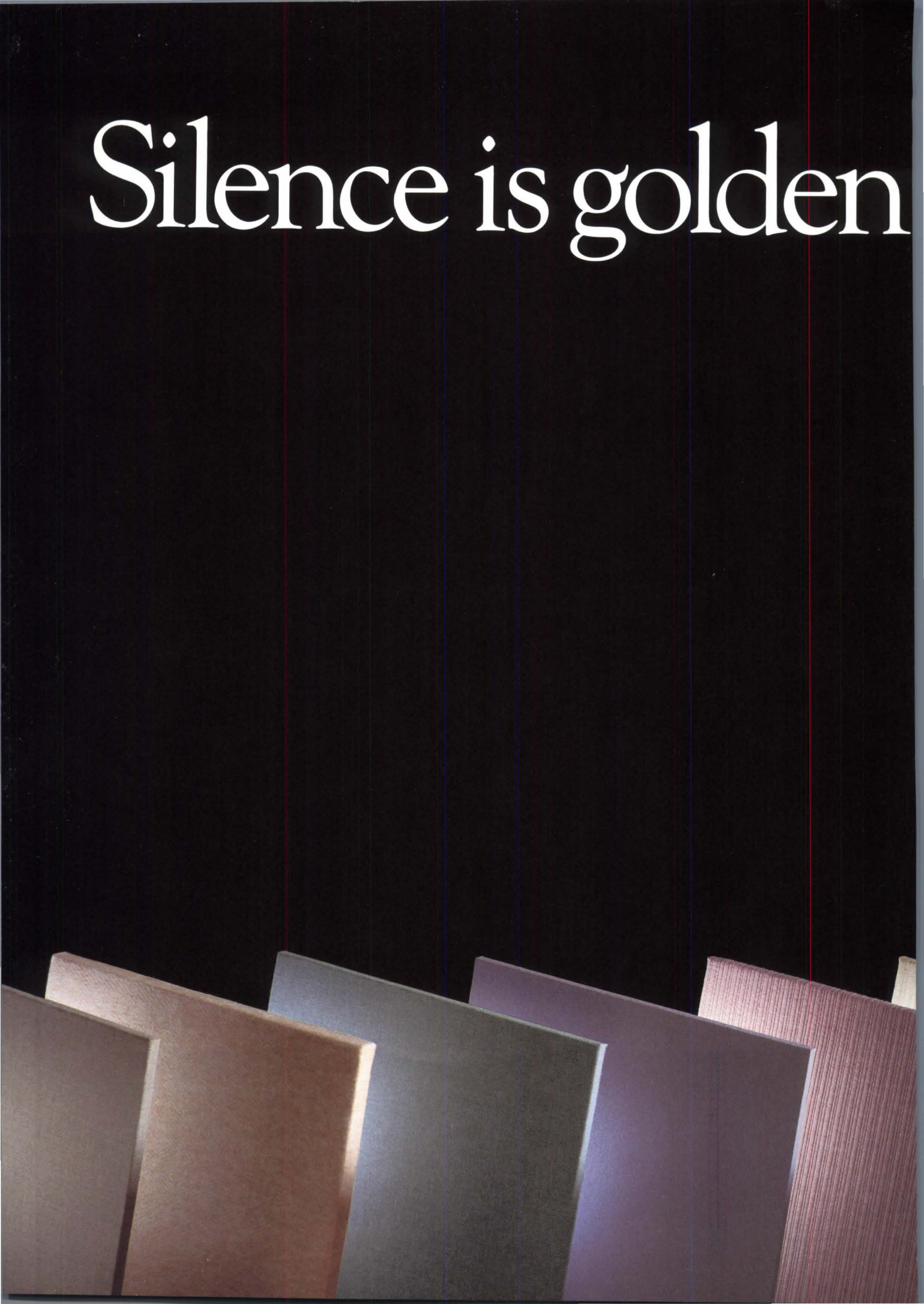

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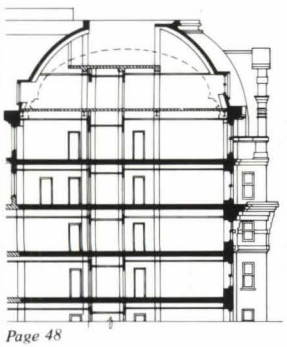

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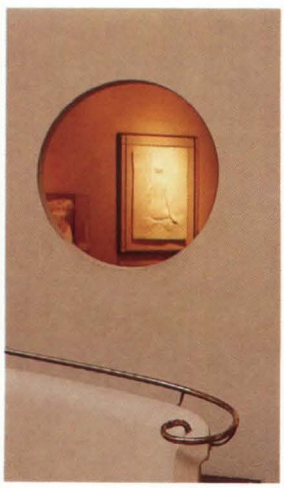

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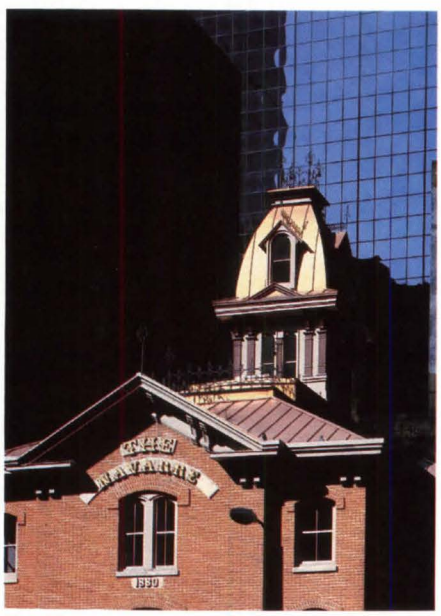

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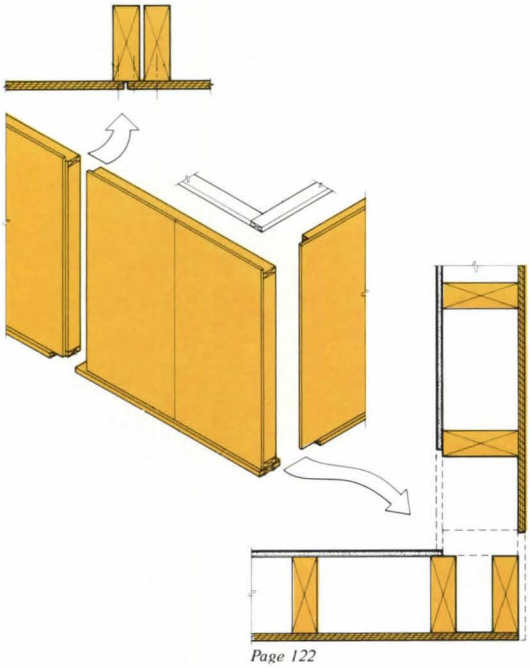

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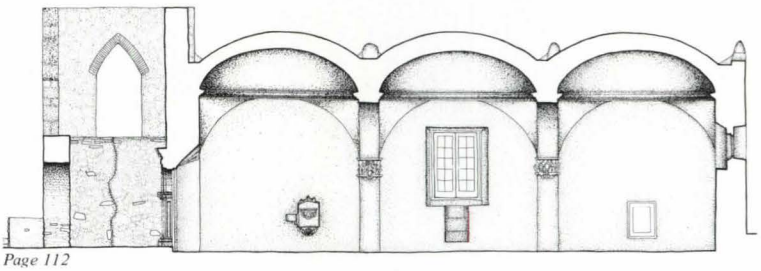

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Cover
Mies van der Rohe's 1930 Tugendhat house in Brno, Czechoslovakia, recently restored as a museum (see page 12). Photograph ©Pavel Stecha.

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EVENTS

Dec. 1-2: Seminar on Automatic Temperature Control, Tampa, Fla. Contact: Jack McClung, ASHRAE, 1791 Tullie Circle N.E., Atlanta, Ga. 30329.
Dec. 1-2: Course on Light and Color for Human Performance, Atlanta. Contact: Deidre Mercer, Department of Continuing Education, Georgia Institute of Technology, Atlanta, Ga. 30332.
Dec. 1-5: Course on the Application of Infra-Red Scanners to Detect Building Energy Losses and Roof Moisture, San Diego. Contact: Paul Grover, Infraspection Institute, Juniper Ridge, Box 2643, Shelburne, Vt. 05482.
Dec. 2-4: Conference on Rehabilitating Windows in Historic Buildings, Boston. Contact: The Window Conference, P.O. Box 27080, Central Station, Washington, D.C. 20038.
Dec. 3: Seminar on the Design of Concrete Parking Structures, Kansas City, Kan. Contact: American Concrete Institute, P.O. Box 19150, Detroit, Mich. 48219.
Dec. 3: Seminar on "People and Computers," Houston. Contact: INNOVA, 20 Greenway Plaza, Houston, Tex. 77046.
Dec. 4: Conference on Roofing Systems, Phoenix. Contact: Jan Thompson, National Roofing Contractors Association, 8600 Bryn Mawr Ave., Chicago, Ill. 60631
Dec. 4: Lecture entitled "The Frank Lloyd Wright I Knew," New York City. Contact: The Architects Designers Planners for Social Responsibility, 225 Lafayette St., New York, N.Y. 10012.
Dec. 4-5: Seminar on Roof Inspection, Diagnosis, and Repair, Charlotte, N.C. Contact: Roofing Industry Educational Institute, 7006 S. Alton Way, Suite B, Englewood, Colo. 80112.
Dec. 7-10: Seminar on Computer Graphic Arts and Design, New York City. Contact: Pratt Center for Computer Graphics in Design, 9 Skyline Drive, Hawthorne, N.Y. 10532.
Dec. 8-9: Course on Optimizing Cooling Tower Performance, San Francisco. Contact: Association of Energy Engineers, 4025 Pleasantdale Road, Suite 420, Atlanta, Ga. 30340.
Dec. 9: Seminar on INNOVA Office Systems, Houston. Contact: INNOVA, 20 Greenway Plaza, Houston, Tex. 77046.
Dec. 10: Conference on Roof Problem Analysis and Reroofing Options, Seattle. Contact: Jan Thompson, National Roofing Contractors Association, 8600 Bryn Mawr Ave., Chicago, Ill. 60631.
Dec. 11-12: Workshop on Improving Technical Writing Skills for Engineers, Scientists, and Technicians, Madison, Wis. Contact: Don Theobald, University of Wisconsin, Department of Engineering Professional Development, 432 N. Lake St., Madison, Wis. 53706.
Dec. 17-19: Conference on Microcomputer Graphics, New York City. Contact: Expoconsul International, 3 Independence Way, Princeton, N.J. 08540.

LETTERS

Performance Oriented Planning: Portland is alive and well. Editor in Chief Donald Canty's article [July, page 32] is greatly appreciated and a fitting testimonial to an architectural profession in Portland that is dedicated to quality urban design. Key to the success of Portland is that our planning is performance oriented—not prescriptive. Planning is the first step of creating development strategies, and the citizens of Portland are always a part of the planning process. If the article erred in any way, it was in the insinuation of on-going planning being done outside of established government bureaus. The basic process decision in Portland is not *if* the citizens will be involved, but *how* and *when.* This was true for the now largely implemented downtown plan and for the new central city plan to be unveiled in May 1987.

The central city plan will be the product of three years of citizen effort. The unique trust the city has in its citizens is not only be involved, but be responsible for the plan. We are not separated from the bureau of planning, but have our support staff established as a division of the bureau. The plan, when complete, will be a statement about the future direction of growth in Portland—a performance specification, not a prescriptive two-dimensional land use plan.

Key to the ability of Portland to implement the downtown plan and visualize the forthcoming central city plan is our commissioner form of government—one in which each of five commissioners has a portfolio of bureaus they are responsible for *and manage.* Commissioner Margaret Strachan currently has under her direction the central city plan, the bureau of planning, housing, and transportation (among others). It is her vision that has kept planning alive in Portland during the former administration that discounted the importance of planning.

Portland will continue to be a national model for development and progress that gets things done. We all hope the readers of your fine magazine will visit, provide us further critiques of our work, and build upon the lessons we have learned.

Donald J. Stastny, AIA
Chairman, Citizens Steering Committee
Central City Plan
Portland, Ore.

North Carolina: On behalf of the college of architecture's membership and alumni [University of North Carolina at Charlotte, Aug., page 42] I express our pleasure with being one of the subjects in this year's study of architectural schools. In the search for program improvement it is valuable to learn the observations of informed persons about what we are doing. The article by Contributing Editor Marguerite Villecco will be part of our continuous self assessment program. Overall, it was a well-balanced, perceptive essay. Fo purposes of factual accuracy only, I do wish to make several corrections.

UNCC did grow out of the co-educational (not woman's college) Charlotte Col lege, with Miss Bonnie Cone guiding it to become part of the UNC system in 1965. The college does have a structure for critical reflection and continues to work at strengthening its system of review as well as improving instruction. As with any design or search, our spirit of trying out new ideas, as noted in the article, does at times lead to dead ends. However, we would rather attempt new things that lead to improvement rather than no acting for fear of making a mistake. We shall continue our search for providing students with the opportunity for a holistic design and general education as well as to encourage students to achieve their individual potentials while acquiring common required skills and knowledge.

There is one minor but critical typographical error on page 45. We have a fifth year professional (not proposed) degree program, which has been accredited since 1979.

Recent conversations with parents of incoming students indicate some confusion in the acceptance ratio into our fifth year program, namely that we admitted only four or five out of 250. The admission process to both first and fifth years is rigorous, but it is not severe. For example, in the past three years we accepted 26 of our 50 four-year graduates who applied to the fifth year. Many of the other BA graduates in architecture chose to gain office experience prior to further study, pursued graduate education at other schools, decided to study in allied fields, or selected employment in construction or development.

I compliment ARCHITECTURE for its annual issue on architectural education.

Charles C. Hight, AIA, PE
Charlotte

New Orleans: As a New Orleans based architecture firm, we thoroughly enjoyed the article about New Orleans published in the July issue [page 48]. It was an up-beat and complementary tribute that the city, and especially the local architects, have long deserved and earned. All too often we turn the pages of architectural magazines to find that trendy and faddish commissions capture more than a fair share of the limelight. We applaud Contributing Editor Robert Ivy's recognition of architectural results achieved through honest-to-goodness teamwork.

We are disappointed at not having been identified as the architecture firm responsible for the unidentified restaurant pictured on page 52, but in spite of that, we are pleased to see a small part of our work included in ARCHITECTURE.

David M. Spicuzza, AIA
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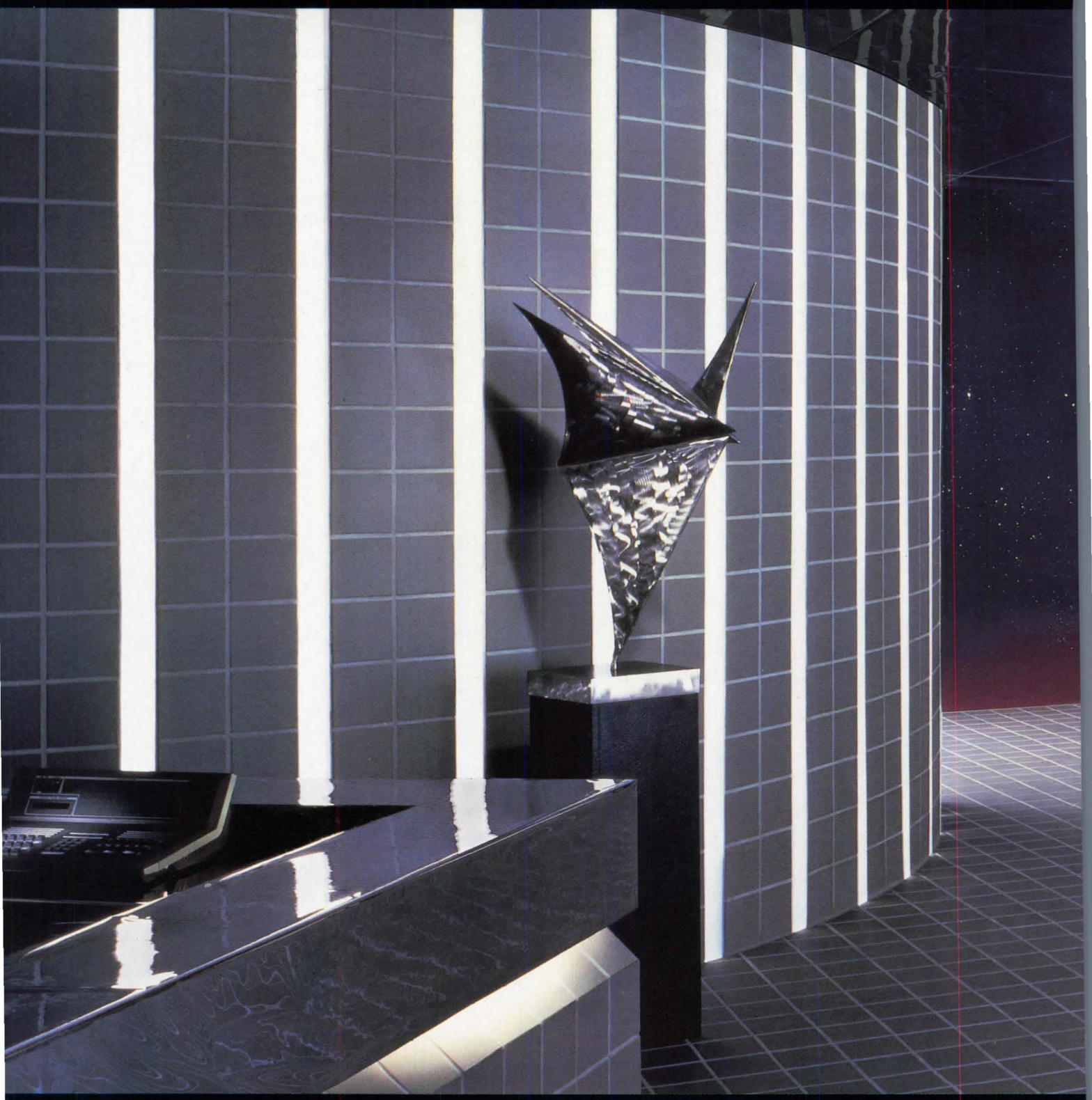

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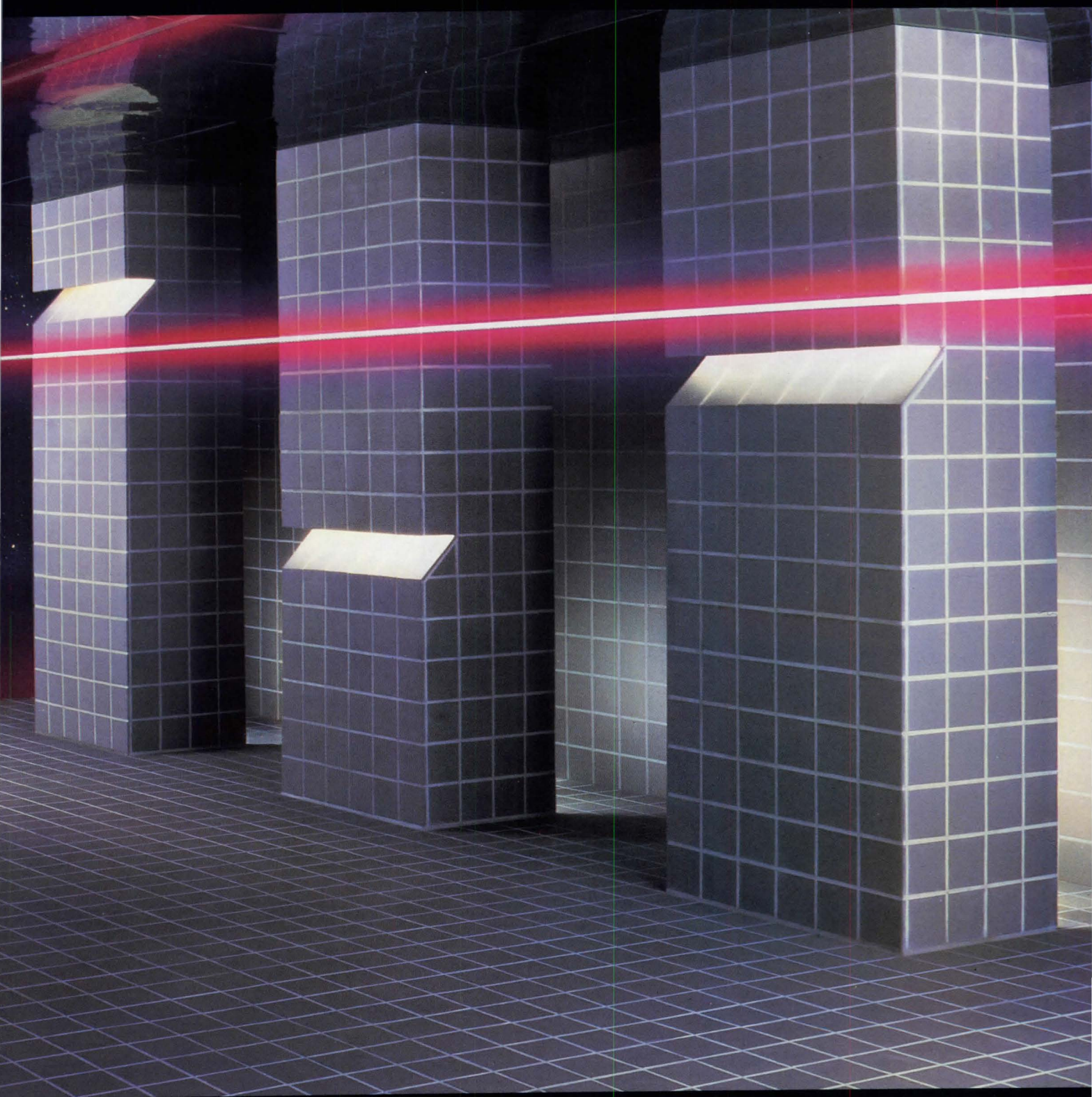

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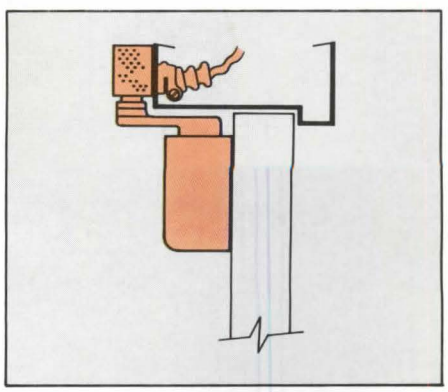

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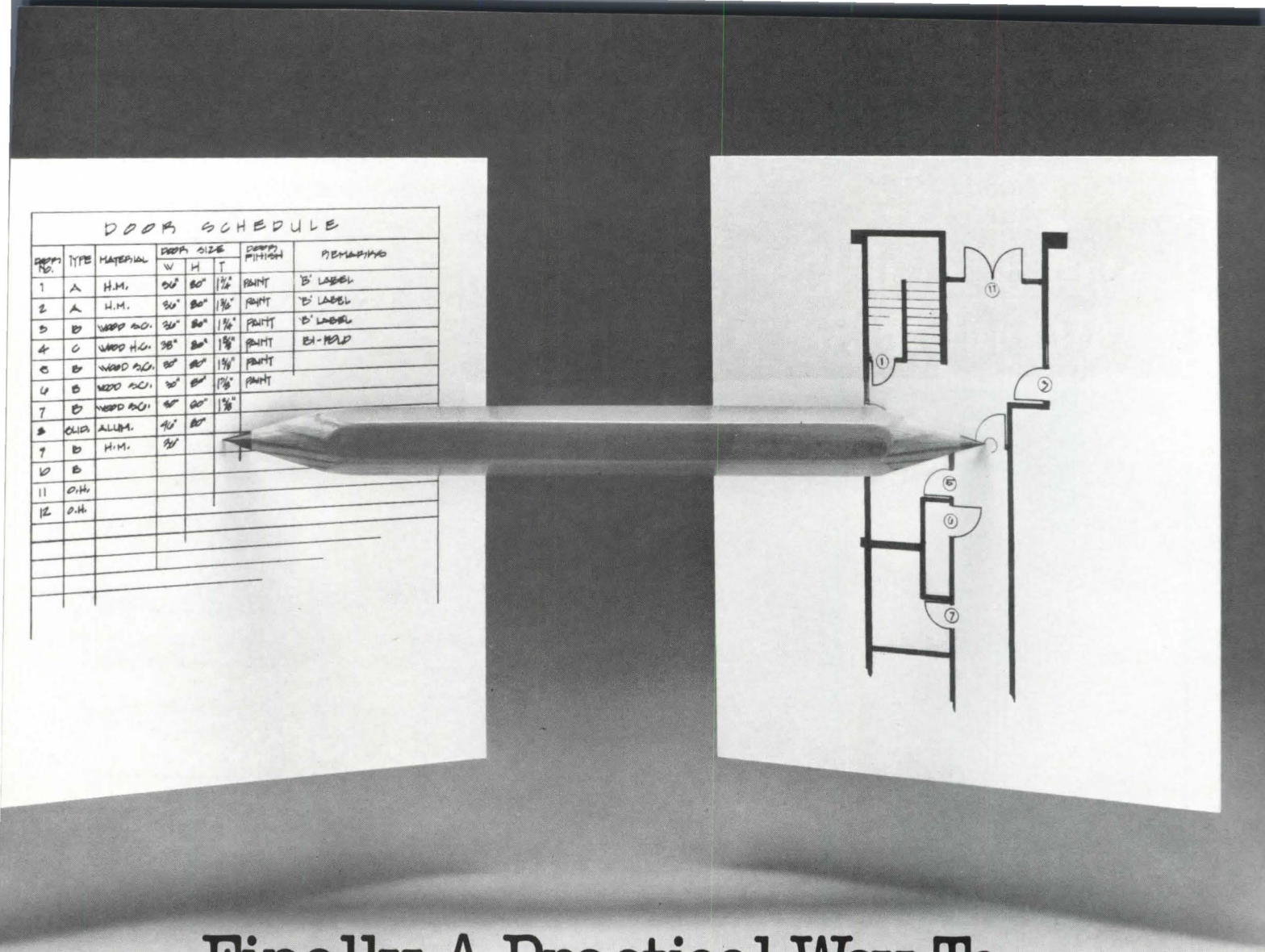

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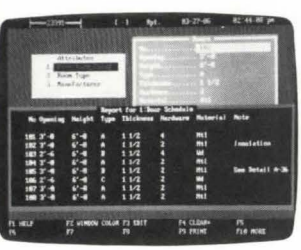

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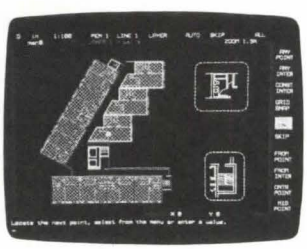

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Preservation

Miesian Revival: First Barcelona, Now Tugendhat Restored

Peter Lizon, AIA

Mies van der Rohe's Tugendhat house in Brno, Czechoslovakia, has been restored to the gleaming modernist jewel that it was when completed in 1930. Designed while Mies was working on the Barcelona pavilion (the subject of its own reconstruction, see Sept., page 12), the Tugendhat house took the pristine, abstracted spaces of the pavilion and activated them around a domestic program. The restored house is now used as a museum.

Fritz and Grete Tugendhat, Mies' clients for the house, met the architect in Berlin in 1927 and asked him to design a family house for them. Mies came to Brno in September 1928 to inspect the site. He discovered a south facing, steeply sloping lot with commanding views of the Spielberg castle and the old city beneath. He returned to his office in Berlin where he started designing the villa while continuing working on the Barcelona pavilion, which opened the next year.

The Tugendhats used the villa from 1930 until 1938, when they escaped the approaching Nazi occupation of Czechoslovakia and settled in Venezuela. The German Nazis occupied the house in March 1939, and one celebrated inhabitant of the villa during the war was Albert Messerschmidt, the German aircraft manufacturer.

After the war the property was nationalized and the house came into state ownership. A number of pleas were made by architects, private individuals, and institutions to save the decaying building from total destruction by various unsuitable adaptations. Finally, in 1963, the villa was granted a status of a national cultural monument. But the question of restoration to its original appearance had been repeatedly tabled at meetings of the national council of the City of Brno. In 1969 the motion of the "putting an end to the improper use of the villa" was passed, and a complete restoration of the building and its grounds was approved.

The connection between the Tugendhat house and the Barcelona pavilion seems obvious. Not only were they conceived at the same time and cross shaped chrome-plated columns used on both, but they were a continuation of the *de Stijl*-inspired project of Mies' brick country house from 1922.

Both the Barcelona pavilion and the villa Tugendhat were designed to evoke a feeling of endless space. The floor and roof—the horizontal white planes connected by the subtle and mirroring columns—provided a continuum of space divided from the exterior by floor to ceiling glass and doors. The free-standing partitions (mirroring polished stone) organized a flow of spaces and circulation. The furniture was strategically placed in a composition where the relationships of one piece of furniture to another, of one group to another, and of the groups to the partitions were carefully calculated.

The givens Mies faced for the Tugendhat house were the program and the steep sloping site. Accordingly, from the street the house looks like a single story of sober architecture, while a view from the garden reveals a three-story building with a terrace on the third floor and a monumental stair leading to the middle floor, which is expressed by a large horizontal expanse of glass.

Entry to the house is located in a void between the residential wings on the house's top floor. A travertine forecourt leads one to a curved milk-glass wall and a recessed entryway leading to a vestibule. From here a round staircase goes downward to the living space of the house. The travertine forecourt continues at the entrance floor through the void between the residential wing and the service wing. It connects to the terrace in the front of the bedrooms on the garden side and is opened to the southern view.

The top floor, where one enters, is divided into a larger residential wing to the east and a service wing to the west. The service wing contains a garage and a former chauffeur's residence. Today, it is the residence of a housekeeper. The residential wing, divided into two blocks of bedrooms parallel to the street, was used as the two bedrooms for the Tugendhat children, and a guest room in the other block as the individual bedrooms of the clients. Today, all of the bedrooms are used as guest rooms and are furnished with hotel-like furniture including television sets and under-the-counter refrigerators.

The middle floor, containing the living area of the house, is perceived as a single interior space and serves a variety of functions: reception and entry area, study/office and library, dining space defined by the semicircular partition of macassar ebony, and a sitting space defined by the polished gold onyx partition.

The cruciform columns with reflective chrome plated covers, on a grid of 5x4.6 meters, assist in the creation of a clear geometric order continuously revealing new, surprising views. On the east of the living space is located the winter garden, and on the west are the kitchen, pantry, servants' rooms, and storage. The north end is built into the hill. The south side of this great space offers views to the garden and farther to a castle and the city. The living space has its own forced air heating system. Two huge floor-to-ceiling windows (15 feet of sheer glass) can be lowered electrically onto the

ground. Another temperature control and comfort device included by Mies was the retractable canvas awnings to control the penetration of the solar heat into the living space.

The house has been restored with great care. The travertine paving shows clean joints, the white linoleum lies flat, the chrome of the columns is crisp and shining. What is missing, however, is the original furniture designed by Mies especially for the house. According to records, there were 49 pieces of furniture in the house when occupied by the Tugendhats. The house seems incomplete without them. There were not only Barcelona chairs and the MR chairs designed for the Barcelona pavilion, there were also the "Tugendhat pieces," such as the Tugendhat chairs, the Brno chairs, the "X" coffee table, and other furniture. One hopes these pieces will find their way to the house, whose sole function will be to serve as a museum.

The plans for restoration and the reconstruction supervision were executed by architects Kamil Fuchs (the son of the renowned Brno functionalist architect Bohuslav Fuchs) with Kutejova and Janecek of the Brno offices of the State Institute of Reconstruction of Historical Towns and Buildings. Grete Tugendhat and the architect Dirk Lohan, a longtime associate of Mies in Chicago, were consulted on the aspects of restoration plans.

—Peter Lizon, AIA

Dr. Lizon, an architect and professor of architecture at the University of Tennessee, has written on architecture of the socialist block countries.

News continued on page 16

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Religious Groups Wage Legal Battles over Preservation Law

In New York City, where many churches have been designated as historic landmarks, two congregations are actively fighting the restrictions of the preservation law. While St. Bartholomew's Episcopal Church on Park Avenue has waged a costly and highly publicized legal battle for more than six years to obtain permission to raze its community center and build a 47-story office tower, a church on Manhattan's Upper West Side has now petitioned the U.S. Supreme Court to rule on the constitutionality of preservation laws that curtail church activities and to exempt the church from the restrictions of landmark laws.

The United Methodist Church of St. Paul and St. Andrew, which filed the petition in early September, has asked the country's highest court to determine if the New York City Landmarks Preservation Commission is unconstitutionally interferring with the free exercise of religion.

The Church of St. Paul and St. Andrew, located at West End Avenue and 86th Street, was designated as an individual city landmark in 1982 after the church announced plans to raze its 1897 sanctuary and build a new smaller church and use part of its property to build an apartment building that would generate revenues for the church. The congregation has argued that the original building was too large to maintain and not worth renovation.

The church took the case directly to New York Supreme Court, which is the state's lowest court, soon after the New York Landmarks Preservation Commission made the designation rather than going through the administrative appeal process to determine if the church had entailed "undue economic hardship."

Ed Hart, attorney for the landmarks commission, said that the church, in effect, asked the court to rule on the issue of economic hardship. The commission has argued that it was inappropriate to put the economic hardship issue before the court. "It is much like a zoning situation where someone would first have to apply for a variance and have it denied before they could go into court," said Hart.

The case moved up through the New York state court system to the state's highest court of appeals, which ruled four to three that the case was a procedural issue and that the church should have first applied to the landmarks commission.

In its continuing fight, the church has asked the U.S. Supreme Court to determine if the landmarks commission is interfering with the constitutional guarantee of freedom of religion. In its petition before the highest court, the church questions the "discretionary authority of a government commission whose sole statutory standard for decisions is the preservation of buildings of historic and esthetic importance, a standard that excludes any consideration of the church's liberty to apply its property to its religious ends."

Hart said that it appears that the church is using this as a test case. "I think, in reality, the church is asking for religious buildings to be immune from the restrictions of landmark status," he said.

A ruling by the court in favor of St. Paul and St. Andrew would set a precedent at a time when battles between congregations and preservation groups are being waged throughout the country. In New York City, confrontations are particularly intense because of skyrocketing real estate values, which provide a strong financial incentive for both rich and poor churches. The Episcopal Diocese has determined that in New York City alone there are between 50 and 60 individual landmark buildings owned by Episcopal parishes, including St. Bartholomew's Church on Park Avenue at 50th Street.

But church leaders and members don't always agree on the importance of preserving historic religious buildings. The on-going battle over St. Bart's plan to demolish its 1928 community house and build a high rise office tower on its site has evoked strong reactions from both sides.

Twice within the past three years the landmark commission unanimously rejected requests by St. Bart's for "certificates of appropriateness" for design proposals for office towers. The commission in early 1986 rejected a third application that contended the church was facing an "extreme economic hardship."

Although the church's rector, the Rev. Thomas D. Bowers, has argued that the constitutional separation of church and state allows church officials to build a tower on its property regardless of landmark status, he said "a decision was made to exhaust all of our remedies" before taking the issue to the courts.

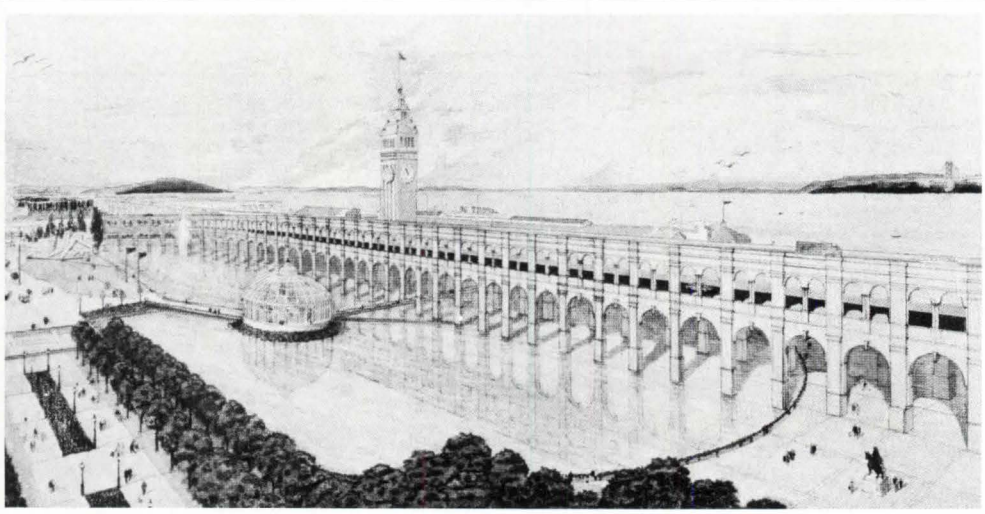
After the third rejection, St. Bart's sued in Federal District Court to obtain exemptions for the restrictions of the city's landmark laws. In July the appellate division of the state supreme court ruled that church leaders must put the issue to a vote before the entire congregation before continuing their legal battle.

In late September, the congregation voted 403 to 240 to "ratify, approve, and confirm" the vestry actions thus far and to authorize the church to continue funding the fight for a development scheme. (In 1981 the members voted 375 to 354 to pursue a development program.)

The Committee to Oppose the Sale of St. Bart's, a group of church members who oppose the tower, have charged that there were "irregularities" in the voting process and is suing in state court to void the election results.

Approximately $2 million has been spent by the church in promoting the scheme, while the opposition has spent more than $300,000 to try to save the community center.—Lynn Nesmith

News continued on page 20



Embarcadero Freeway Proposal. For more than a decade a battle over the fate of the Embarcadero freeway has been waged in San Francisco. Early last year the city's board of supervisors voted to demolish the 1.2-mile elevated highway, but this summer in a municipal election local citizens voted to keep the freeway intact. William A. Kendrick of the local firm Kendrick-Ritter-Spross Architects has proposed a scheme for revitalizing the elevated freeway and creating a link to the waterfront. Submitted to the San Francisco board of supervisors soon after the election, the proposal was reviewed by the board's planning, housing, and development committee and referred to the city planning staff for further study. The scheme includes a new facade for the freeway; new ramps at either end of the elevated structure to lift all through traffic off the Embarcadero; a large bay-water lagoon with an island with a conservatory; the renovation of the ferry building with shops, offices, and restaurants; an underground people-mover connecting the BART-MUNI station to the ferry building; and a landscaped park.

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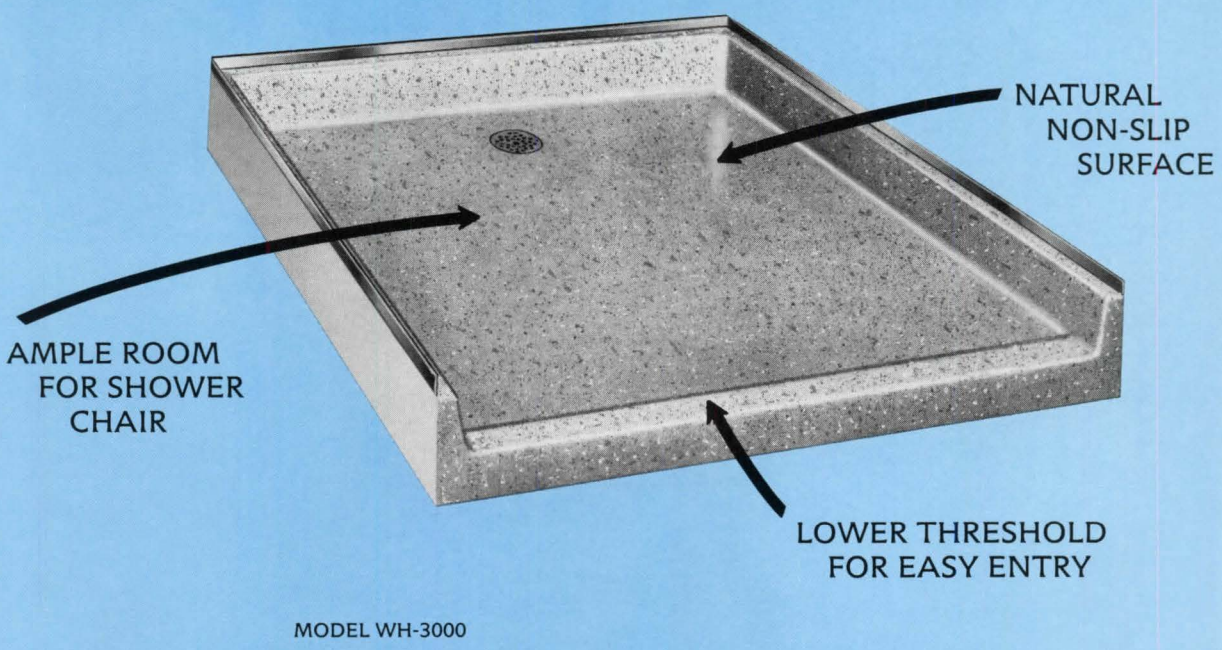

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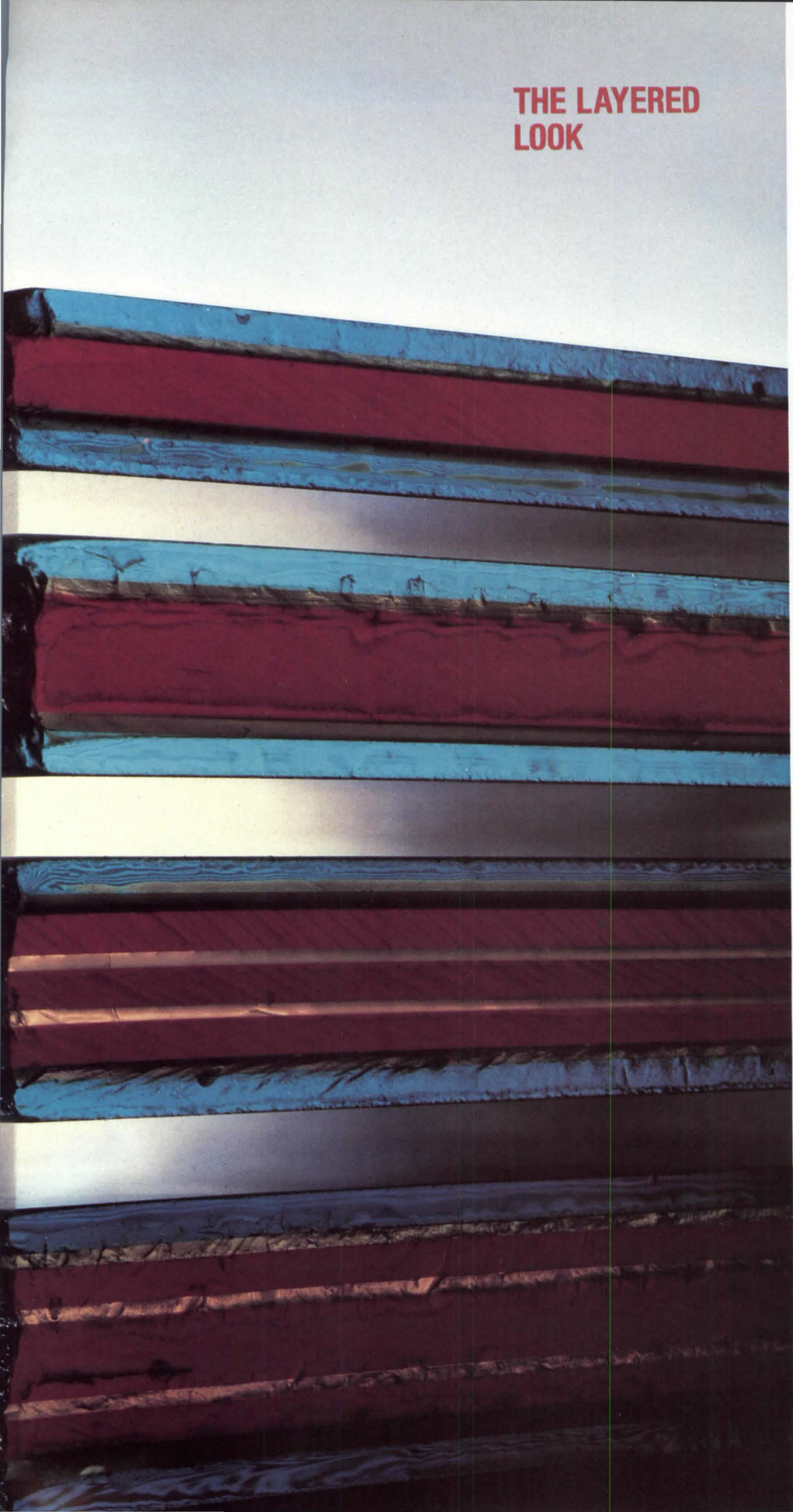

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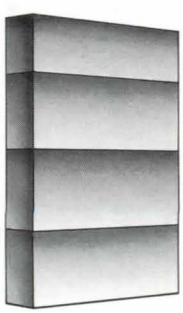

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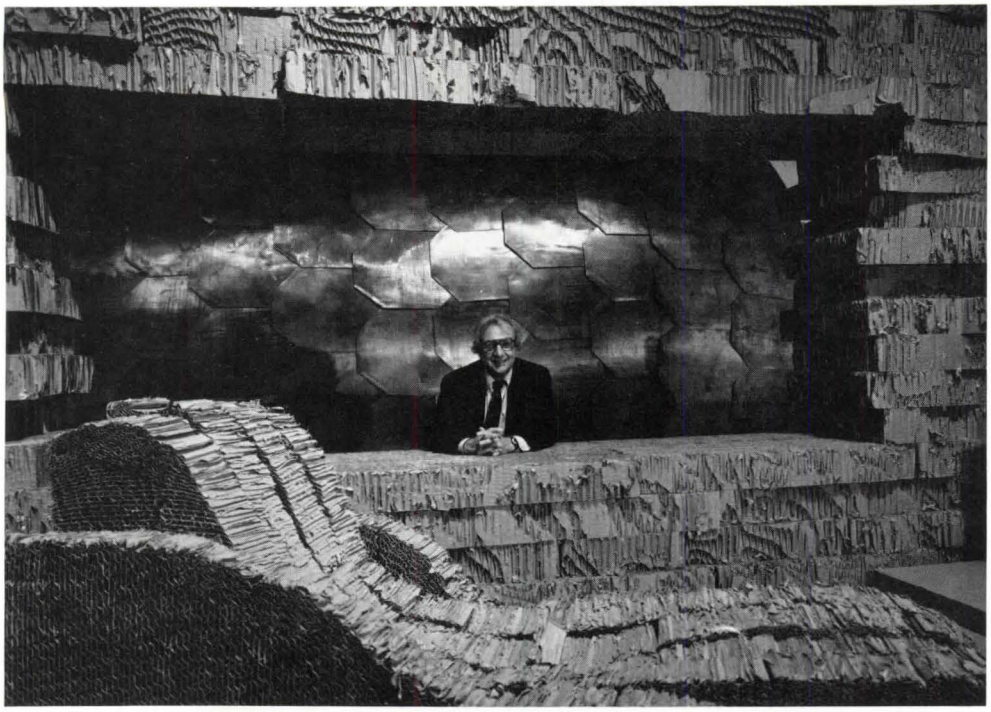
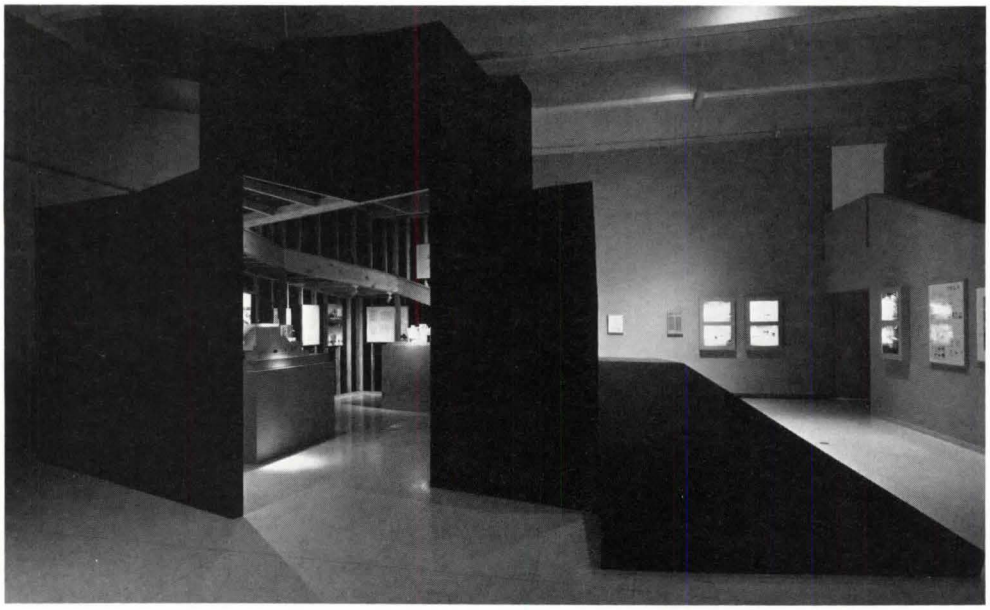




Exhibitions

Frank Gehry Exhibition at Walker: 'A Taste of the Real Thing'

The first major museum exhibition of Frank Gehry's work opened in late September at the Walker Art Center in Minneapolis. This show occupies two large galleries and includes nearly 250 drawings, models, and photographs, eight pieces of cardboard furniture, and eight sculptural objects, but the most noteworthy aspect of the undertaking is the installation itself. Designed by Gehry, it is dominated by five large, freestanding volumes, each of a different shape and sheathed in a different material, and a passageway of angled plywood columns. These constructions, representing materials and forms that are typical of Gehry's current work, overcome an almost universal limitation of architectural exhibitions, namely their inability to show the subject matter at full size, in actual materials, and as a spatial phenomenon.

Perhaps the show's most dramatic artifact, however, is not an architectural element but a self contained object that greets visitors in the museum lobby: a 23-foot-high glass fish sculpture that will later be permanently reinstalled in a public greenhouse-conservatory now under construction in downtown Minneapolis.

Although chain-link fencing and blacktop flooring are conspicuously absent from the Walker show, there are exposed studs and others of Gehry's usual unusual materials in abundance. One room, based on the Ron Davis house of 1972, is a thick-walled corrugated cardboard construction housing a selection of the architect's cardboard furniture. Convincing on its own terms, this ensemble can also be seen as a poker-faced transformation of a typical modern-art museum display of high-pedigree design products for upscale consumers.

Next to it, an immense minimalist fish with thick sheet-lead scales temporarily transforms visitors into Jonahs and Pinnochios while sheltering transluscent sculptural lamps assembled from broken plastic laminate that has been shaped into fish and coiled snakes. Just beyond, a colonnade of vigorously skewed plywood prisms, called trees but more closely resembling Samson's impromptu remodeling of the Temple, recalls the entrance of an office building under construction in Venice, Calif. Precisely wedged between steps and ceiling, this spatial and psychological tour-de-force leads viewers up a short flight of stairs to the architectural portion of the show.

There, photographs, models, and drawings of 39 built and unbuilt designs are exhibited within and between three highly differentiated constructions: an abstracted snake in the shape of a spiral ziggurat clad in dark, polished Finnish formwork plywood; a lens-shaped room sheathed in bright polished copper; and a rectilinear one finished in dull silvery-gray lead-coated copper. This trio represents Gehry's current practice of designing houses, and even some larger buildings, where each room is a separate and geometrically contrasting form.

The buildings displayed date back to 1962, when Gehry first began independent practice, but the emphasis is on the last decade, when the architect's originality has become most pronounced. Milestones such as his own house (see Mid-May '80, page 169), the Loyola Law School (May '85, page 202), and the Los Angeles Aerospace Museum are displayed in depth, as is the brilliant but sadly unbuilt Camp Good Times (designed in collaboration with Claes Oldenberg and Coosje van Bruggen), and the Winton guest house, now under construction in nearby Wayzata, which promises to be Gehry's most significant residential design since his own. It is this highly articulated project that is the formal source for some of the exhibit structures.

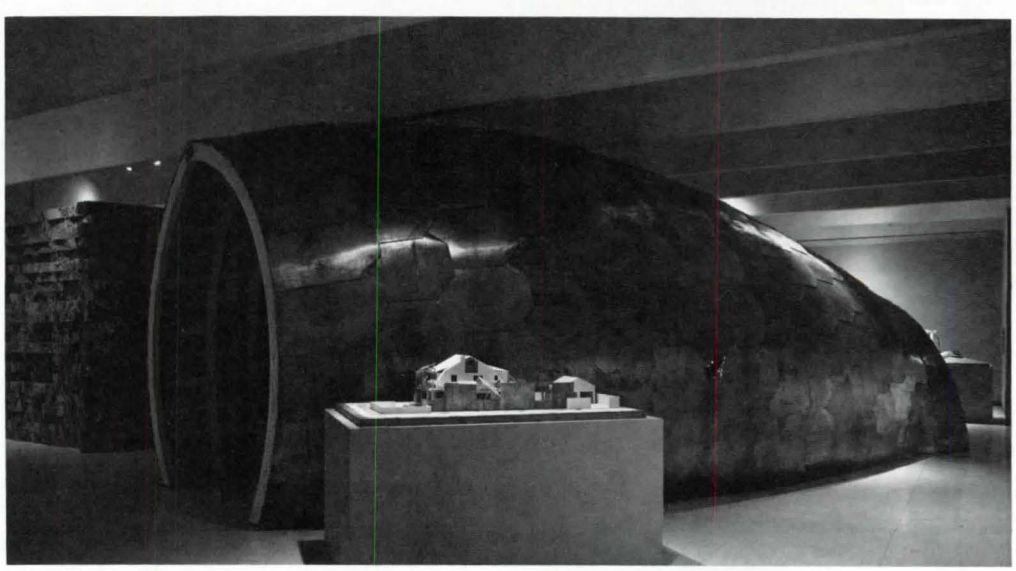
And, to a great degree, it is these large, walk-through models that are the essence of the Gehry show. They remind us that for all the prior attempts on the part of museums to reduce architecture to something easily exhibited in galleries, a taste of the real thing is far more potent and informative than even the best models and graphics.

Predictably, such an installation is more

costly than a conventional one, and it is to the great credit of organizer and curator Mildred Friedman, the Walker, and the show's many patrons (led by the Jay Chiat Foundation with other major support from the National Endowment for the Arts, Herman Miller, Inc., the Graham Foundation, Rouse Co. Foundation, and Gerard Junior Foundation) that Minneapolis has been able to accomplish what larger cities so far have not.

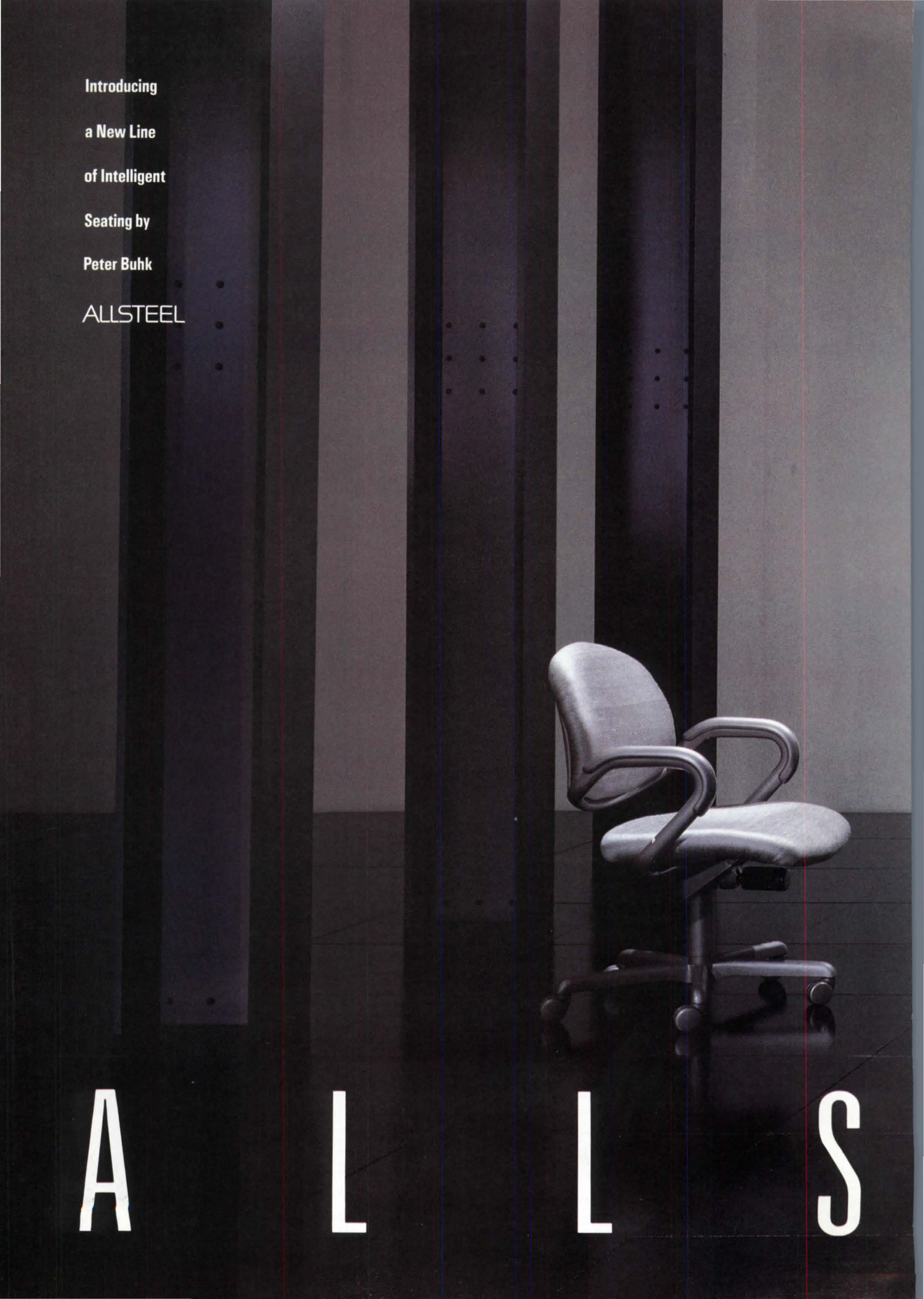
"The Architecture of Frank Gehry" will continue at the Walker Art Center through Nov. 16. It will then travel to the Contemporary Arts Museum in Houston, the Art Gallery at Harbourfront in Toronto, the High Museum in Atlanta, and wind up at the Museum of Contemporary Art in Los Angeles in early 1988. Additional sites are still under negotiation. The exhibit has also generated a 216-page catalog that stands as the most informative and graphically accomplished documentation of Gehry's work and career to date.

—JOHN PASTIER



Opposite page, top, Gehry outside cardboard house with corrugated chaise lounge in foreground; bottom, ziggurat of polished Finnish formwork plywood. This page, top, looking through lead fish with fish and snake lamps to passageway defined by angled plywood columns; above, model of Gehry's own house in front of fish clad with sheet-lead scales.

News continued on page 24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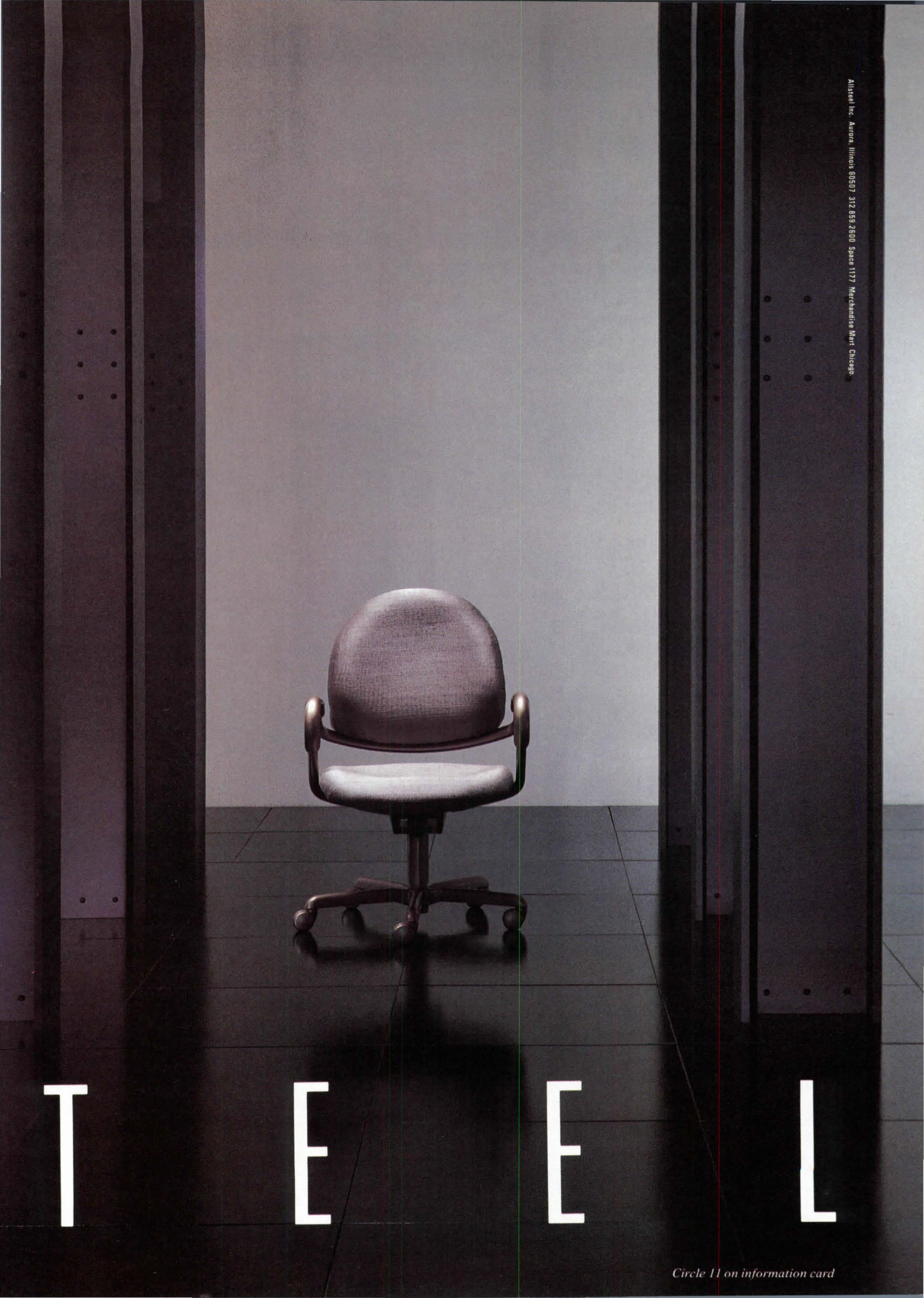
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Organizations Disagree on Professional Role Definitions

Efforts to define professional roles in design and construction have resulted in some basic disagreements between the professional associations representing architects and engineers.

Increasing concern over professional standards of care and related liability issues has prompted a serious attempt on the part of AIA, the American Society of Civil Engineers, the National Society of Professional Engineers, and the American Consulting Engineers Council to reach a consensus on the definition of responsibility among professions.

In March of this year, construction industry leaders took part in a roundtable discussion convened by ACEC entitled "Professional Responsibility in the Construction Industry." The roundtable, prompted by a Missouri administrative commission decision involving the Kansas City Hyatt Regency skywalk collapse, produced a twofold result: a list of recommendations and plans for a series of workshops to bring members of all four organizations up to date on professional responsibility.

AIA, however, strongly opposes two of the six recommendations—one that calls for the construction industry to reach a consensus on the roles and responsibilities of all parties in the construction practice, and another that condemns competitive bidding in both the public and private sectors.

Institute policymakers say that it is neither possible nor desirable to prescribe in great detail for all projects the specific roles and responsibilities that should be assumed by each member of the design team, because every building project is unique. Further, says James R. Franklin, AIA, group executive of the AIA professional services center, because the skills of individual architects and engineers vary greatly, the prime consultant for a particular project must assess what services and skills are needed and provide those skills directly or indirectly through consultants.

AIA's position is based partially on the report of its life safety design task group, which says that no list of roles and responsibilities would be comprehensive enough to protect the public interest on every project, and that any such list composed today would be inadequate to define tomorrow's responsibilities.

Franklin says AIA is also compelled to reject a Kansas City roundtable recommendation to condemn the practice of competitive bidding because it conflicts with AIA policy and violates AIA's 1972 consent decree with the U.S. Department of Justice. In the 1972 consent decree, AIA agreed not to adopt any type of standard prohibiting or limiting submission of price quotations for architectural services by its members.

In related action, the AIA life safety design report task group is developing "Toward a Standard of Care," a document meant to define the appropriate processes through which design professionals establish responsibility. The task group intends the document to apply to project needs more closely than the prescriptive list of activities or roles proposed from the Kansas City roundtable, Franklin says.

AIA President John A. Busby, FAIA, sums up the situation in the closing paragraph of a letter to ASCE President Robert D. Bay: "This does not mean to separate [AIA] from any on-going debate within the design professions and the public we serve. However, because of the concerns I have raised, AIA cannot participate in any workshops inconsistent with those concerns and the policies supporting them. . . . As you so eloquently stated, 'The public trust is anchored to the performance of all who supply services or materials to a project.' These are words with which the AIA fully agrees and it enthusiastically supports."

The four one-day workshops, sponsored by ACEC, NSPE, and ASCE, are scheduled for Dec. 8 in San Francisco, Dec. 1[0] in Chicago, Jan. 26, 1987, in Boston, and Feb. 9 in Atlanta. The workshops will draw on the Kansas City roundtable participants and their experience, according to ASCE President Robert D. Bay. Bay declined to comment on AIA's refusal to cosponsor the workshops.—Douglas E. Gordon

Conference Addresses Design, Technology, and Research

The three most talked-about challenges facing America's construction industry—expanding computer applications, transferring the knowledge of building scientists into the hands of practitioners, and housing the homeless—are actually problems of global scope. This was perhaps the most significant lesson of the 10th triennial meeting of the International Congress of Building Research, Studies, and Documentation (which is known by its French acronym, CIB) held last month in Washington, D.C.

The Congress, held in the United States for the first time, assembled leaders of public and private building research organizations from around the world, as well as hundreds of architects and engineers, for four days of presentations.

More than 500 papers were accepted by the congress for publication in the 10-volume proceedings of the event; these volumes represent a compendium of virtually every significant advance in construction technology made during the last three years. Of the papers accepted, approximately 140 were presented in concurrent sessions for each of the three subthemes. *continued on page 28*

Carter Presidential Library Dedicated: Located in a 30-acre, park-like setting near downtown Atlanta, the 130,000-square-foot library and research center was a joint design by Jova/Daniels/Busby of Atlanta and Lawton/Umemura/Yamamoto of Honolulu. The complex comprises four connected cylindrical pavilions, which surround a 2.5-acre lake and a Japanese garden. The main entrance to the facility is through a series of landscaped courtyards. Three smaller pavilions on the northern end of the semicircular complex house the Carter research center of Emory University, including Carter's suite of offices, a 300-seat conference center, offices for visiting scholars, and a reception area. The museum and library are located in a larger, three-story circular wing on the opposite end of the complex. Exterior materials are granite, precast concrete, and glass. Granite detailing punctuates the interior spaces.

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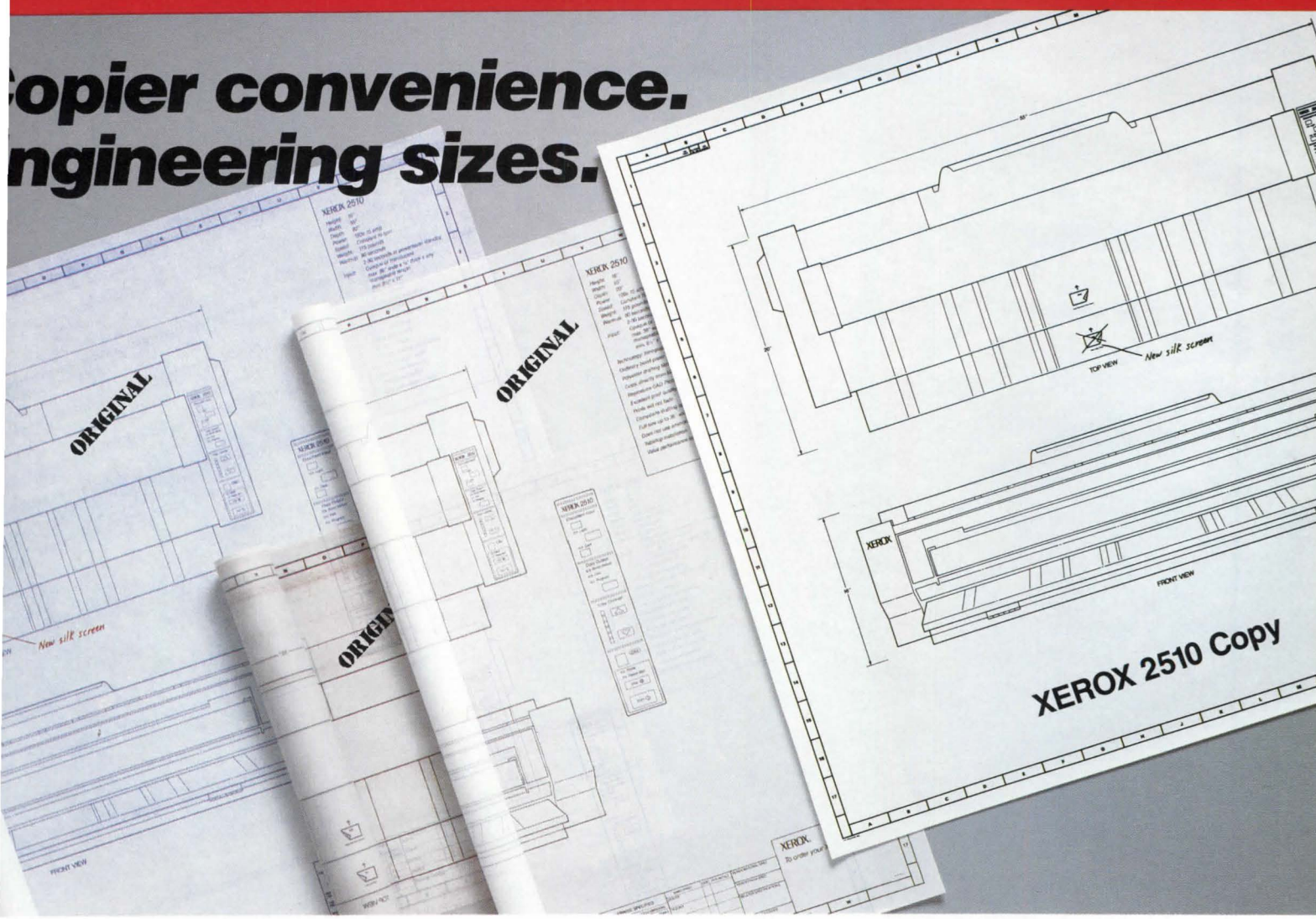

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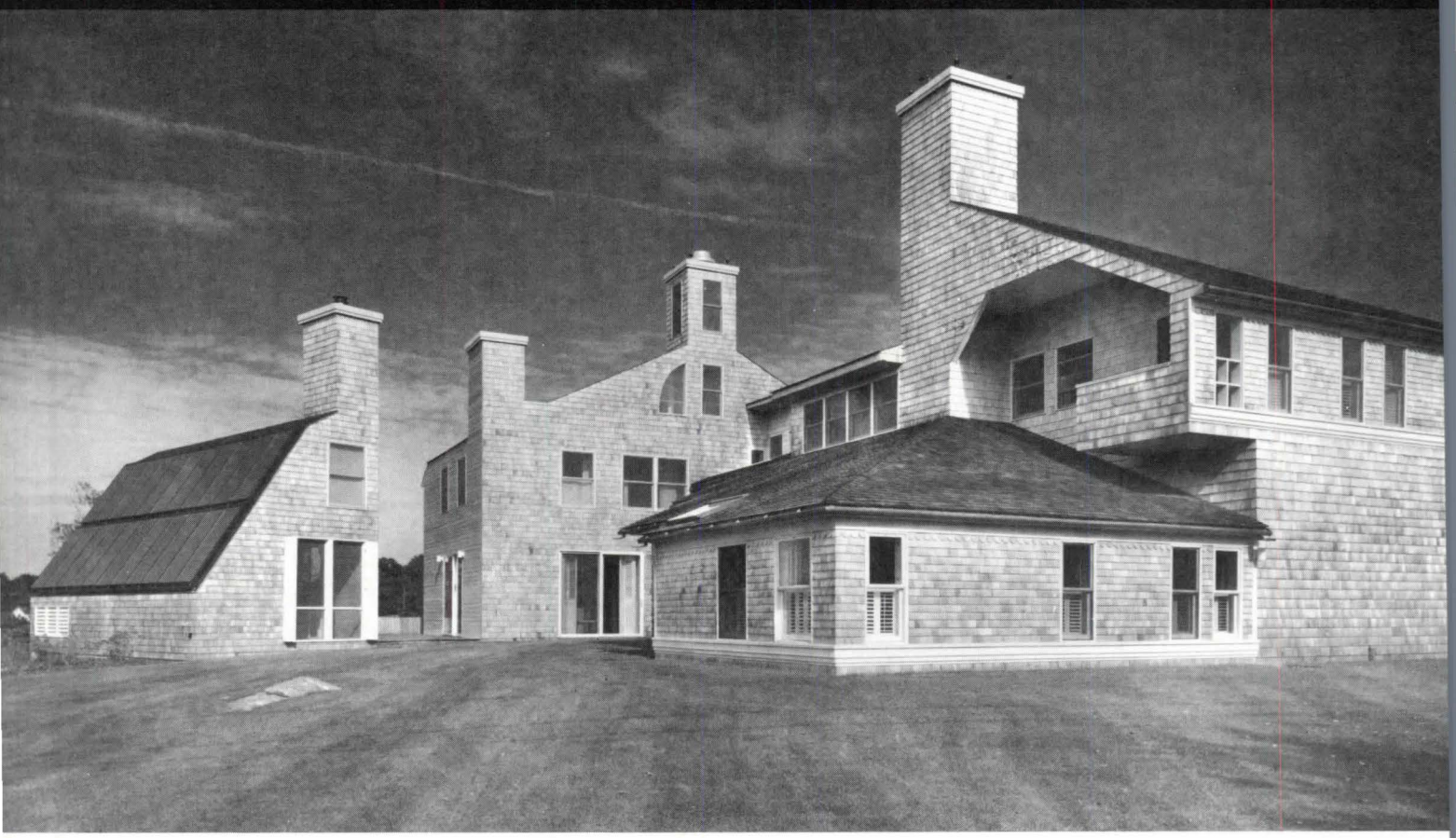

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Practice *from page 24*

The first subtheme, building technology for the computer age, went far beyond the expected dose of CADD discussions; the most promising papers dealt with rudimentary expert systems and ways computers can be used to analyze design, structural, and mechanical requirements. Nevertheless, as John Eberhard, FAIA, of the National Academy of Science's Building Research Board characterized the state of the art in his subtheme wrap-up remarks, computers are still being used in conventional ways. "What we see are computers being used to imitate older technologies and ways of practicing, much as the first automobiles looked like horse-drawn carriages." Eberhard said.

The second subtheme, housing the homeless, focused on the manifestations of this problem in developing countries, where a population saturation in rural areas has led to vast numbers of people migrating to cities that lack the infrastructure to absorb them. Though a few papers dealt with specific low-cost construction methods, most discussion revolved around the larger social, political, and economic issues that lie at the root of the problem.

More cooperation and less competition was the rule in subtheme three, titled translating research into practice. This session contained the best "meat" for American architects, and many of the papers presented will appear over time in the technology and practice pages of ARCHITECTURE. Encompassed in subtheme three were new methods for performing structural calculations, performance assessments for a number of new construction materials, a wide variety of lessons-learned presentations based on the results of diagnostic and forensic studies, and discussion of ways to enhance communication and coordination between the many parties that work together to produce buildings.

The congress is traditionally held in the hometown of the CIB president, who has been Dr. Richard Wright, director of the National Bureau of Standards' Center for Building Technology. The next congress, in 1989, will be held in Paris. Copies of the proceedings of this year's event are available for $150 from Noel J. Raufaste, Center for Building Technology, National Bureau of Standards, Gaithersburg, Md.

—MITCHELL B. ROUD

ASHRAE Invites Comments On Energy Standard 90

The American Society of Heating, Refrigerating and Airconditioning Engineers announced a second public review period for draft Standard 90.1P "Energy Efficient Design of Non-Residential Buildings and New High-Rise Residential Buildings." The first public review, held last year, yielded over 4,000 comments, resulting in a substantially altered second draft. The standard is offered for public review from Sept. 15 to Dec. 15.

Standard 90, first issued in 1975, forms the basis of building energy codes in all 50 states. It sets the minimum requirements for the design of new buildings so they will be constructed in a manner that minimizes the use of energy without constraining building function. The new draft of the standard includes design requirements for the exterior envelope and for systems and equipment for heating, ventilation, airconditioning, service water heating, electricity, lighting, and energy management.

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AAMA Sets Skylight Standard

The American Architectural Manufacturers Association's new Voluntary Specification for Skylights, AAMA 1600-85, creates the first uniform performance specification standards for skylights. Based on ASTM tests for air and water infiltration, the standard includes specifications for framing materials such as aluminum, vinyl, and wood.

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News continued on page 30

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Foundations

Leon Krier Named First Director of SOM Foundation Research Institute

Leon Krier, a forthright critic of the modern world, and Bruce Graham, FAIA, who as head of the Chicago office of Skidmore, Owings & Merrill has done much to build that world, are names not often linked. But in September in Chicago they got together in the living room of Frank Lloyd Wright's Charnley house to announce Krier's appointment as the first director of the SOM Foundation Institute. Krier will serve three years, moving to Chicago in August 1987 to take over the new body, described as "an institute for research on architecture in urbanism."

Krier said he hopes to use the new institute "to bring together people who are profoundly dissatisfied with conditions today, who are extremely critical of the global problems of the environment." He cited the worldwide loss of rain forests and atmospheric decay as problems that can't be separated from those of architecture. Such long-term ecological issues, he said, should be "the primordial basis" for judging the merit of architectural designs.

"Environmental planning in this century has always been short term," Krier said. "But the long term effects are the only test of design, or of broader philosophic ideas. We must either make major decisions now or head for absolute environmental disaster. We need an academy of the environment—an authoritative body that can say what architecture and urbanism mean in our time."

Krier plans to establish a research studio of young scholars in the institute. A symposium of world experts, its membership changing gradually over time, would meet there three times a year to debate basic issues. Eventually, the studio would produce a handbook, a primer of architecture and planning that Krier called "an upgraded *Reader's Digest* for mayors and all who deal with environmental issues." The handbook's prescriptions would be tested in model solutions for specific site and cities.

Asked whether he felt any incompatibility with Graham or SOM, Krier replied that he respects SOM's "professionalism" and that he thought the firm's work was changing. He said he wished to come to the United States from his current location in London because of this country's influence. "Even America's enemies imitate America," he said.

Krier noted that a problem in architecture today is that there is so much disagreement, "it's as if there were five or six professions instead of one—modernists, classicists, postmoderns, and so on." Comparing this situation to that of the American colonies after the Revolution, he said: "People with different convictions must meet and find a constitutional basis on which they can work, as the founding fathers did. We must find what is so basic that we can all agree on it."

The institute will be located in the Charnley house, designed by Wright in 1890 while he was still in the office of Adler & Sullivan. Now in disrepair, the house is to be restored to its original state, a major effort that will require the removal of one wing.—Robert Campbell, AIA

News continued on page 3

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The Arts

Restoring An Early Trompe l'oeil

Nantucket's Old South Church hides a secret self behind its austere, white facade. Inside, its walls and ceiling are covered with *trompe l'oeil* moldings, paneling, floral medallions, columns, and grapevines, in rich, creamy shades of cool and warm grays. Among the earliest *trompe l'oeil* work in America, they were executed by Swiss artist Carl Wendte (who is credited with introducing the style here) as the finishing touch to an 1843-44 remodeling of the 1809 whaling-era church.

The paintings have just been restored to their original condition and color scheme by conservator Darla M. Olson. When Olson began restoring it in May 1984, Wendte's work was disintegrating. The original two layers, done in distemper, a weak, water-based paint, had failed within 40 years in Nantucket's moist climate. Three layers of oil paint, incompatible with the substrate, applied in 1886 and 1936 in attempts to repair it, had exacerbated the peeling and obscured the true colors in the Old South Church. In addition, engineering errors from 1843-44 had caused major plaster problems. Olson found that the placement of the lathe in the dome had prevented the plaster from forming keys, threatening collapse of the ceiling. She and her assistants reattached it by squirting acrylic adhesive behind the plaster through holes drilled every 18 inches.

In many areas, the paintings were beyond salvage and had to be scraped to the plaster and recreated. To do this, they photographed each area, traced the design on acetate, and transferred it to paper to make a pattern. "It could take a week to make a working pattern for one area," says Olson. They then scraped through the layers, recording colors and making changes on the patterns as they encountered them.—Julia Lichtblau

Ms. Lichtblau is a freelance writer in New York City.

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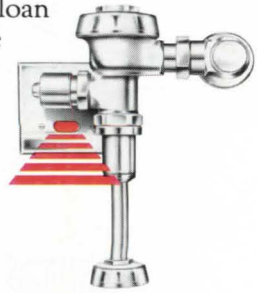

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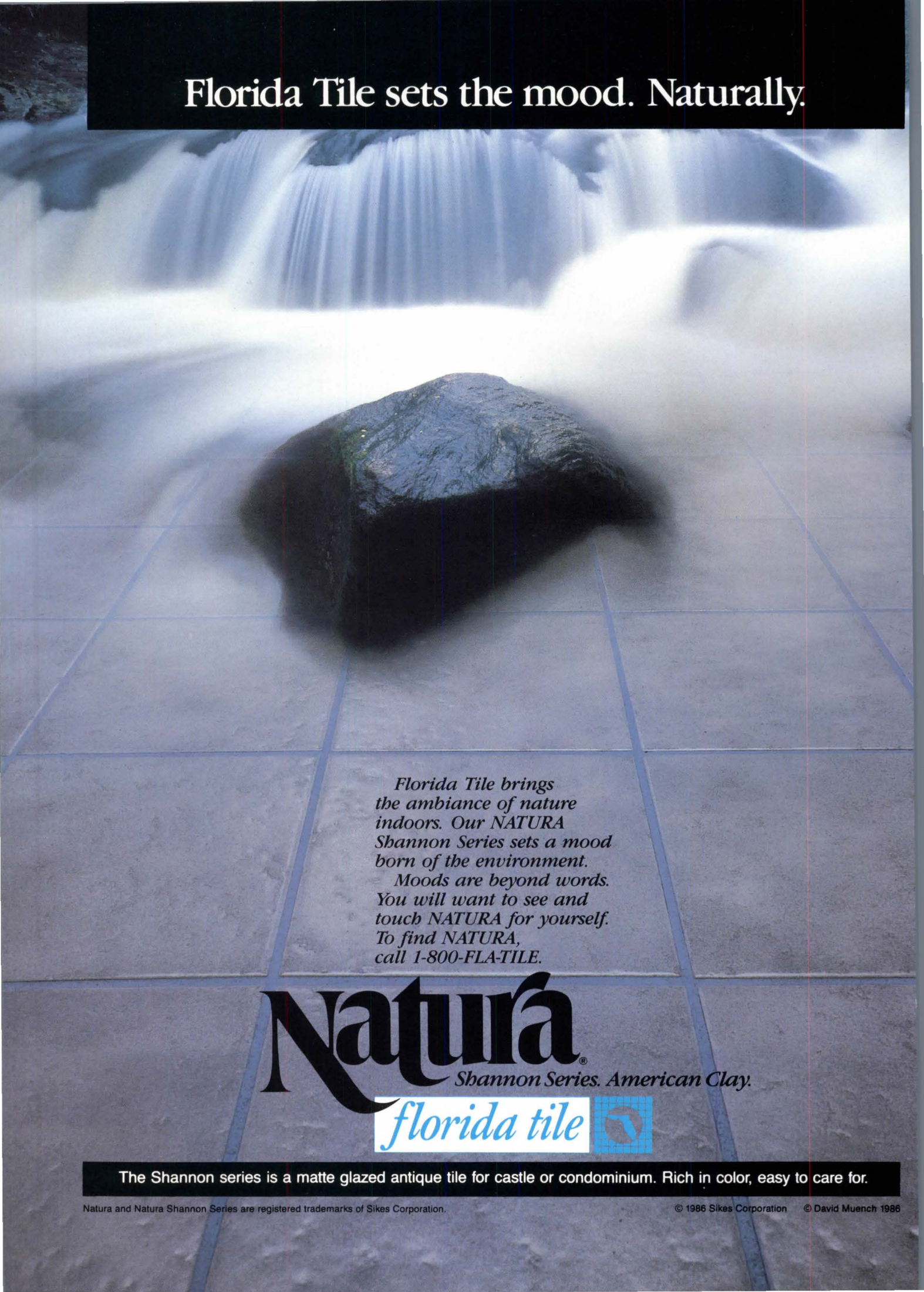

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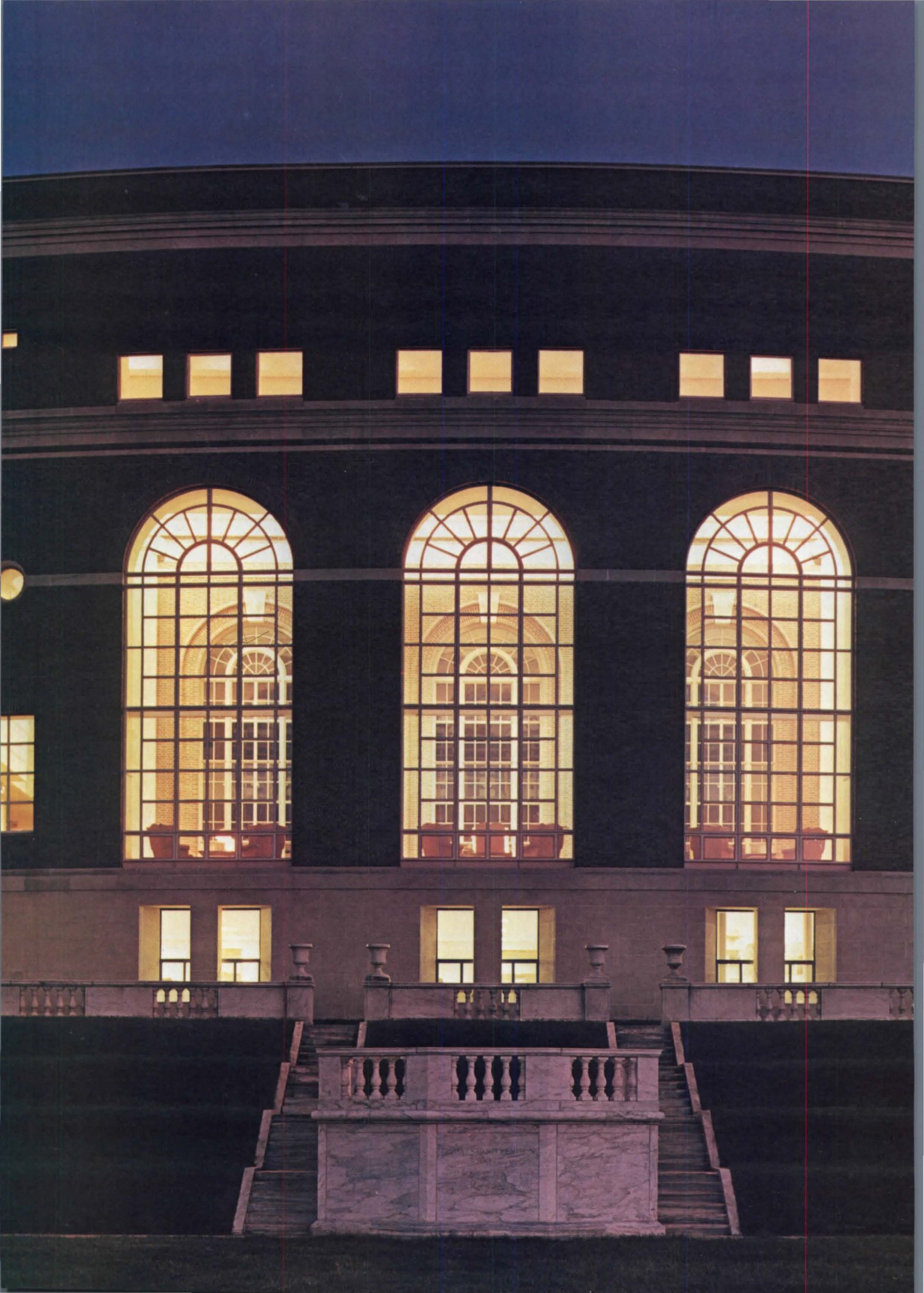
"Old buildings and agreeable surroundings are a familiar background for people in our towns and cities, a sheet anchor in a rapidly changing world," said architect-planner Alfred A. Wood of English Heritage on a recent Washington visit. "Conservation should not be seen as a specialized and slightly self-indulgent activity promoted by people frightened by the thought of progress, but rather as an essential tool of development."

The wise and witty Mr. Wood was stating the theme of this issue. It is about maintaining the presence of the past in the present. That involves preserving, restoring, and/or adapting old buildings; designing new ones that respect their elder neighbors and the continuity of history; weaving old and new together in an urban fabric of variety and richness.

These concerns have been steadily growing as objects of architectural attention. A case could be made, in fact, that in recent years they have come to constitute the profession's prime challenge. *D.C.*



A Noble Building Grows a Second Skin

Addition to McKim, Mead & White's Olin Library at Wesleyan University.
By Michael J. Crosbie

dditions to college buildings, particularly libraries (which seem a constant state of expansion) tend to take the form of an tirely new limb, connected to the old by a joint that distinishes parent from progeny. A new addition to the Olin Memoal Library at Wesleyan University in Middletown, Conn., owever, is more epidermis than appendage. Designed by Perry, ean, Rogers & Partners, Boston, this addition to McKim, Mead White's 1928 library appears as a new layer of the building's in, wrapping around the old and preserving it as part of a ithe and light-filled interior.

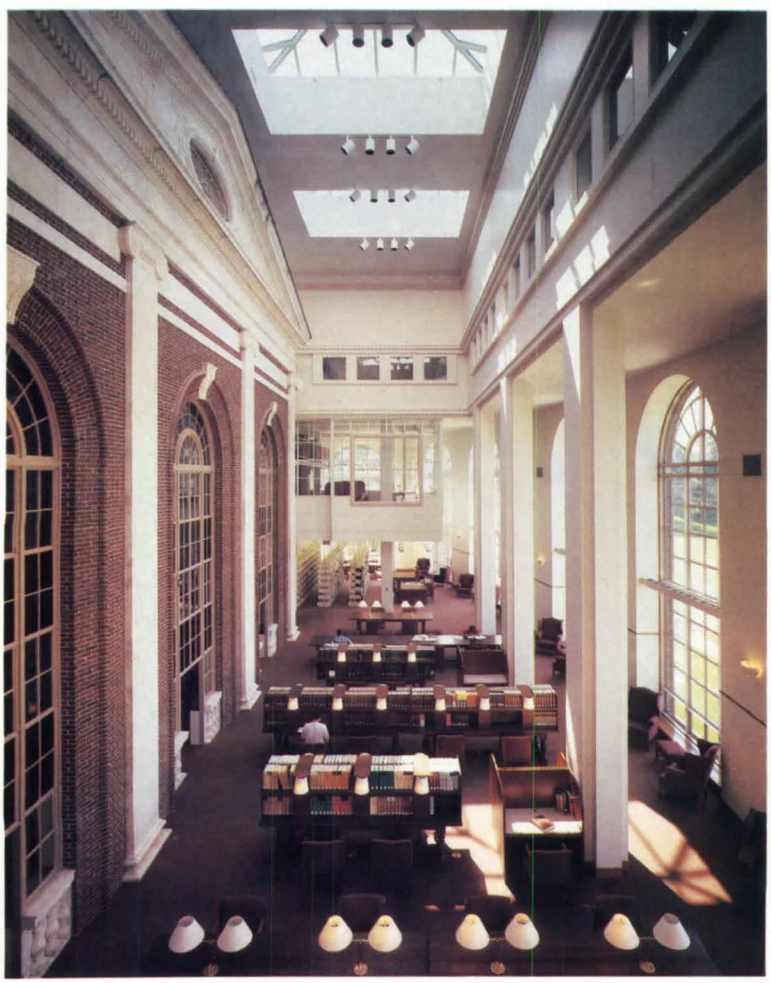
The project began in 1980 with the library bursting at its seams he stately lobby, now refurbished, had been filled with book acks). The library's client committee wrote a program calling r a 60,000-square-foot addition to Olin, which had been xpanded in 1939 on its north side to form a squat T in plan. he addition would more than double the 50,000-square-foot brary, and, with buildings flanking it east and west and an athtic field to the north, squeezing an addition of that size onto e site seemed impossible. Steven M. Foote, principal-in-charge f the project, explains that in subsequent meetings with the ommittee it was determined at by renovating the existing brary for more efficient use, e addition could be cut to),000 square feet. The probm was to find 10,000 unenumbered square feet for the eference index room, its acks, the card catalogue, and ome offices. Underground chemes extending out in front f Olin were studied, but their elow grade location was inonvenient. Finally, it was ound that by wrapping space round the library's north wing, e requisite functions could be ccommodated on the first oor without the addition enroaching upon its neighbors.

The renovation and addition as carried out with the library use (a hectic undertaking at was less so during the sumers, but likened by Wesyan's board chairman to rying to raise chickens on 91"). Nearly every function in e old library found a new ome, with the addition acounting for new reading pace, offices, and stacks. hroughout the old building, ooms and their accouterments ere spruced up and wide hallways narrowed by the addition of 88 new honors study carrels.

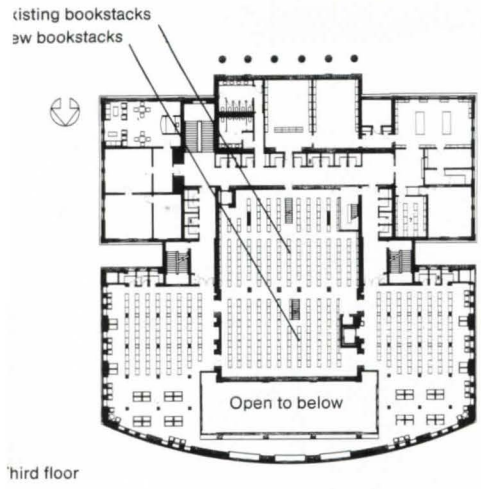
One immediate and stunning result of the addition was the liberation of the lobby, which now greets visitors with its rejuvenated mahogany and cherry paneling and brass trimmings. The circulation pattern in the old building was T-shaped: traffic ran between east and west reading rooms and into the stacks to the north. Now the circulation route is a loop that follows the periphery of the old library's exterior wall. From the lobby, one moves down wide and somewhat dark corridors, illuminated only by built-in lighting in new bookshelves. This low key passage is the perfect foil to the new reference index and reading room (below), which soars to the building's full height. The south wall is Olin's former north elevation, which was cleaned and its original sash retained, with new openings made for access to the stacks. This neo-Georgian, Harvard brick, limestone, and marble facade dominates the space like a huge architectural artifact—a proudly displayed piece of referential material, bathed in natural light from above and illuminated at night.

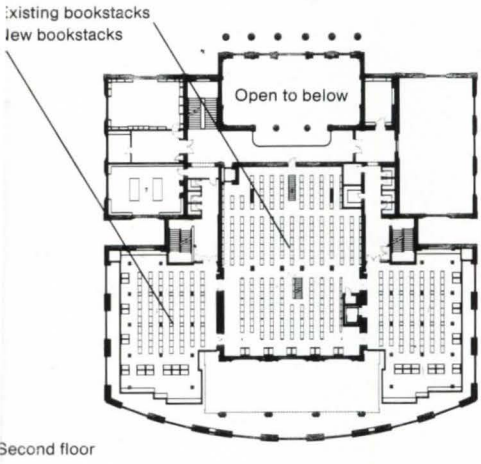
The northern wall of the index room describes a gentle curve, which pulls one around this space filled with restored library tables, new lamps modeled on old fixtures, new reference desks built to the architect's design, and comfortable wing chairs. The curved wall is punctured by tall arched windows that align with the old facade's fenestration. At either end of the room, seemingly hanging in space, are enclosed second-floor reading areas fully glazed to offer excellent views of the big reading room below but to maintain acoustical privacy. These self-contained spaces do not touch the addition's outer wall, allowing the arched windows on the east and west elevations to be read in their full height. For those who want a little more enclosure and privacy, the third floor has reading spaces that encircle the index room via a bridge that extends along the north wall. Found on this level are square windows that frame views of the old facade, allowing close inspection of its carved details.

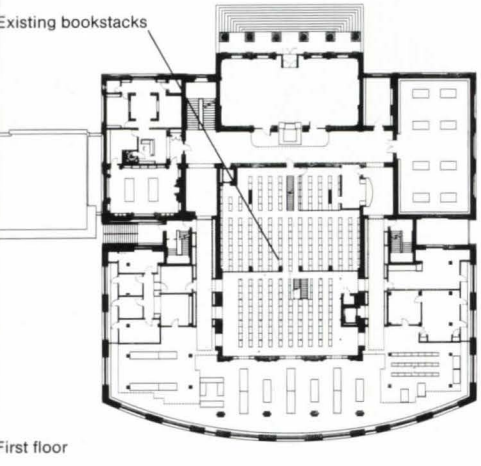
All of these spaces have ample light and lend to the index and reading room a variety of scale. For example, the second floor reading areas are

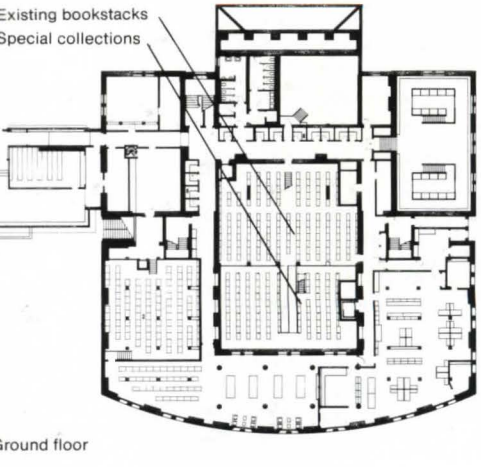


Above, reading room with old facade, seen from exterior, left.

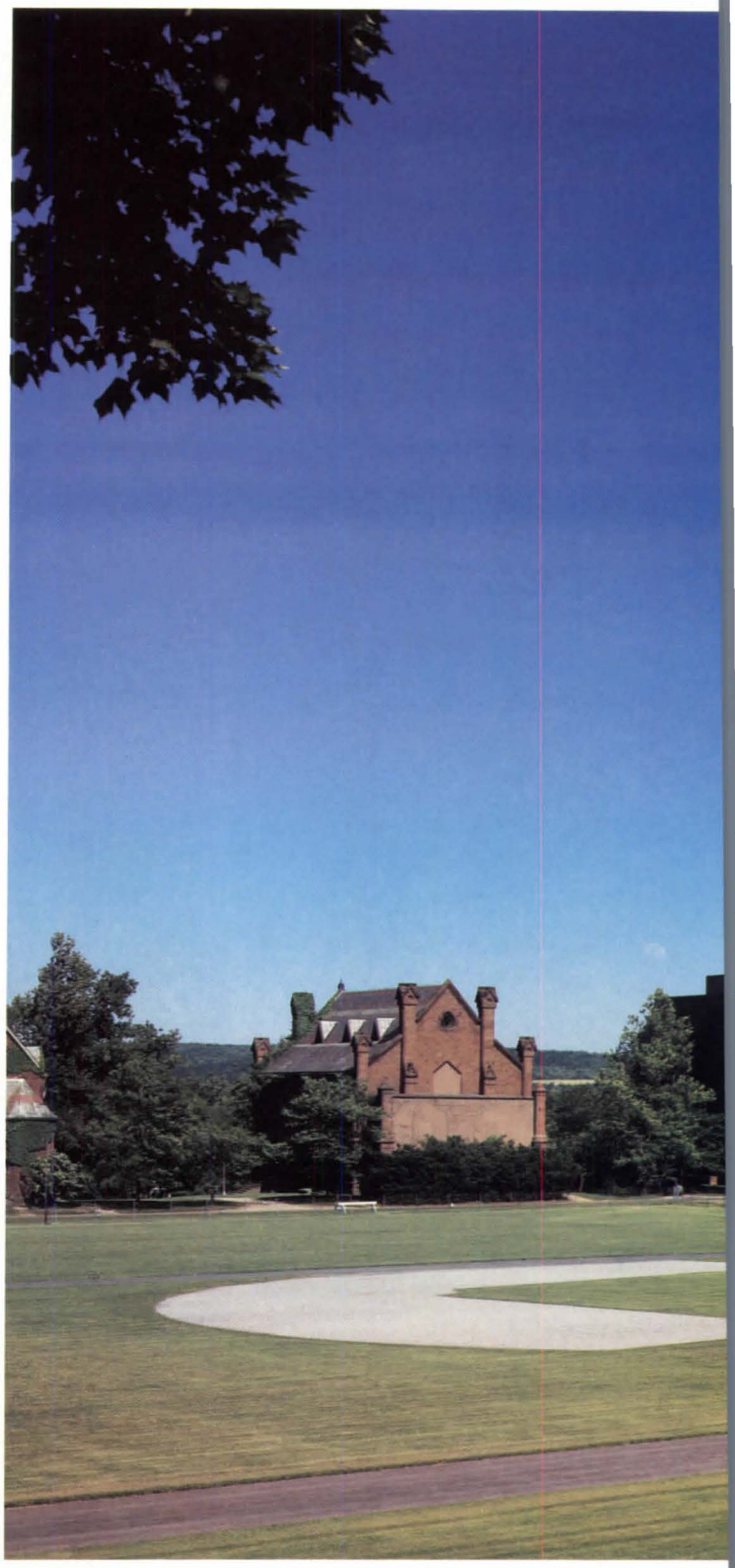








Across page, reading room in the index and reference library has ample, nonglare light from its northern exposure. Wing chairs along north wall are especially popular for reading or, in a small number of cases, sleeping. Old north facade is now an interior wall into which entrances have been made (at right in photo) to book stacks. Right, square windows in third floor reading areas frame views of preserved north facade's marble entablature and pediment. Below, addition's tall arched windows provide natural light and exterior views for glazed second floor reading areas. Bottom, refurbished lobby of original McKim, Mead & White library now has new cherry reception desk sympathetic to original woodwork.



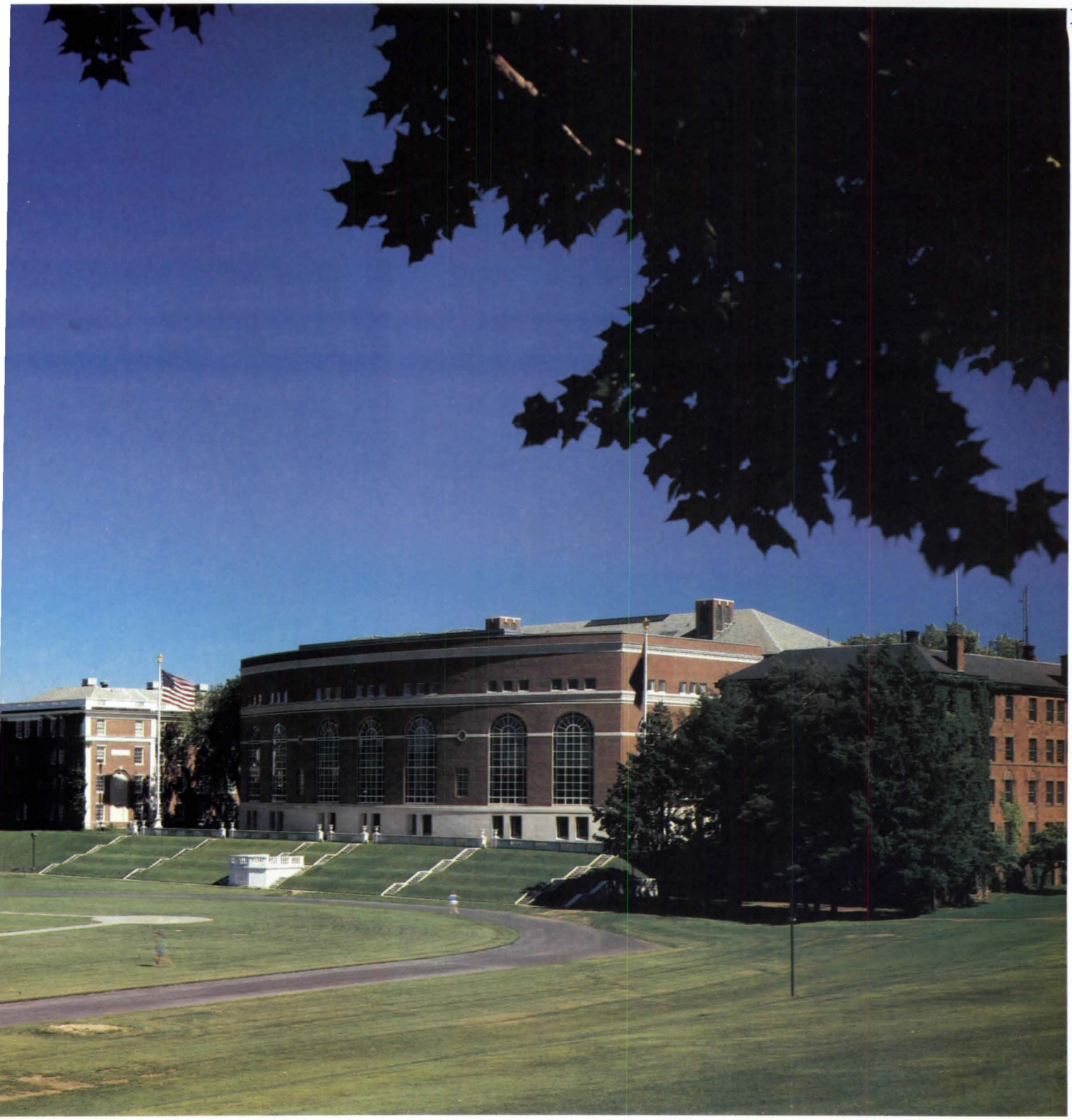
Left, front of original library, with addition visible on side elevation, distinguished by three arched windows. Above and right, addition's curved south elevation as it faces athletic field.

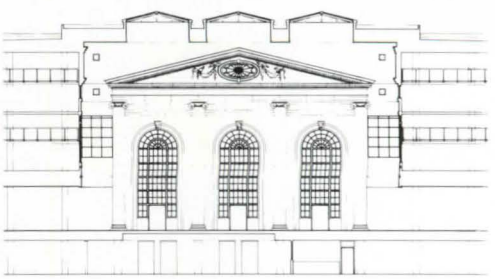
glazed in different patterns, the largest elements being four-paned square windows framed in buff to relate to the brick and carpet colors. Foote imagines these elements as huge framed portraits that might be found in a baronial hall.

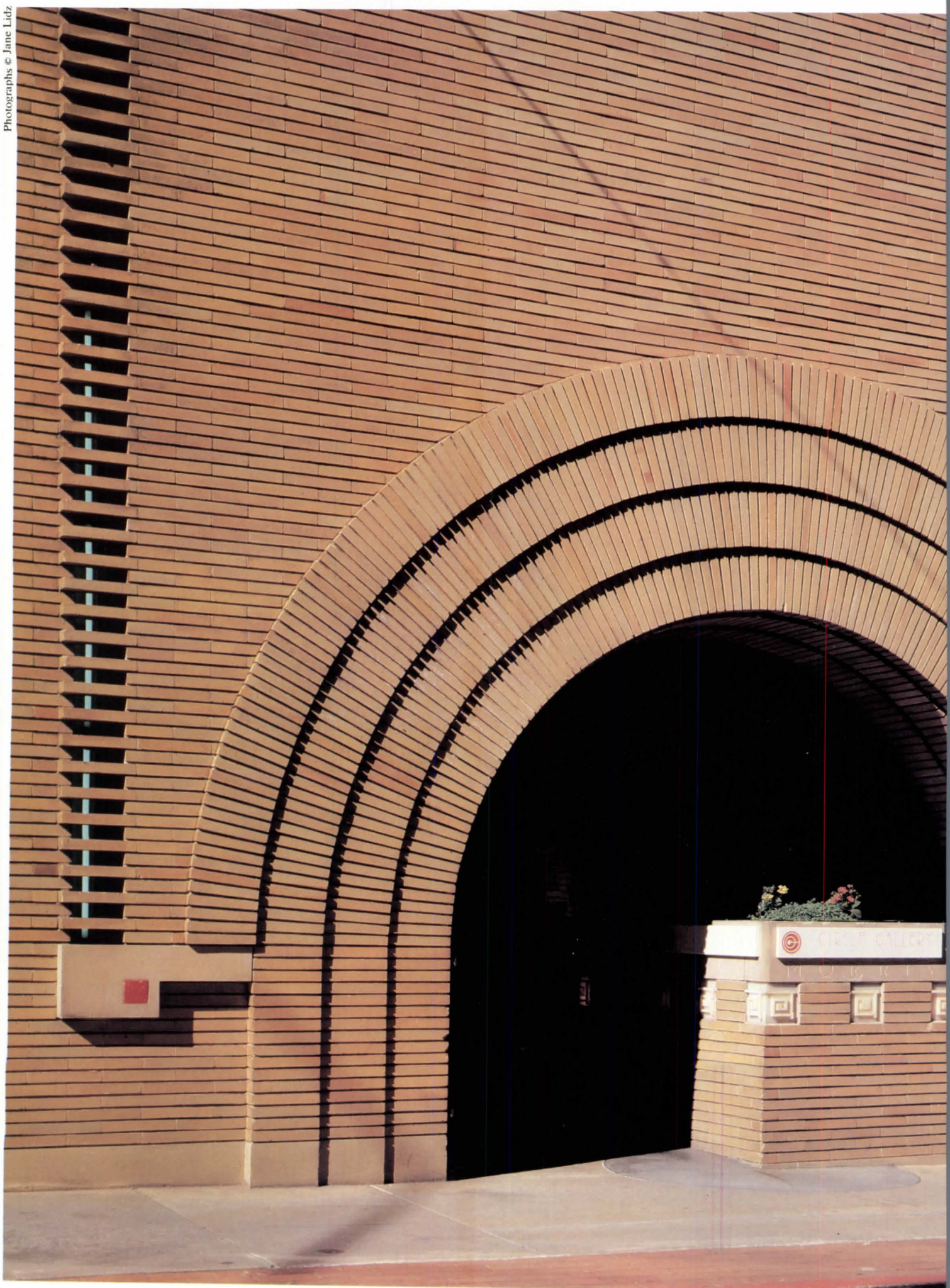
In contrast to its dynamic interior, the addition's exterior is a model of restraint, which is perfectly appropriate for the role it plays on Wesleyan's campus. Foote points out that unlike most, this campus has as its center a large athletic field, which is defined on its south and east sides by a modulated line of buildings, to the north by athletic facilities, and to the west by a gentle hill. The buildings to the south and east—Olin's neighbors and among them some of Wesleyan's oldest buildings—determined the addition's exterior. Its north wall is curved in deference to its flanking buildings, whose narrow ends face the field, as do the older brownstone buildings to the east. Curving the facade and pulling it back allows the flanking buildings to come forward and also encourages the eye to move quickly over the facade, which is absent of vertical trim stone that would mitigate its horizontal reading.

The addition's north face also had a tradition to live up to. Olin's old facade was the backdrop for nearly 50 years of commencements, which take place on the field at the foot of the library, and thus part of the collective memory of Wesleyan alumni as they left the university. The school's trustees wanted the old facade retained in some way, and at one point the architects considered wrapping the addition with a glazed wall. The brick facade, however, is more in keeping with the surrounding architecture and is a dignified stage set for the ritual of comencement, its large windows presenting a view of old Olin preserved inside. □

Photographs © Steve Rosenthal







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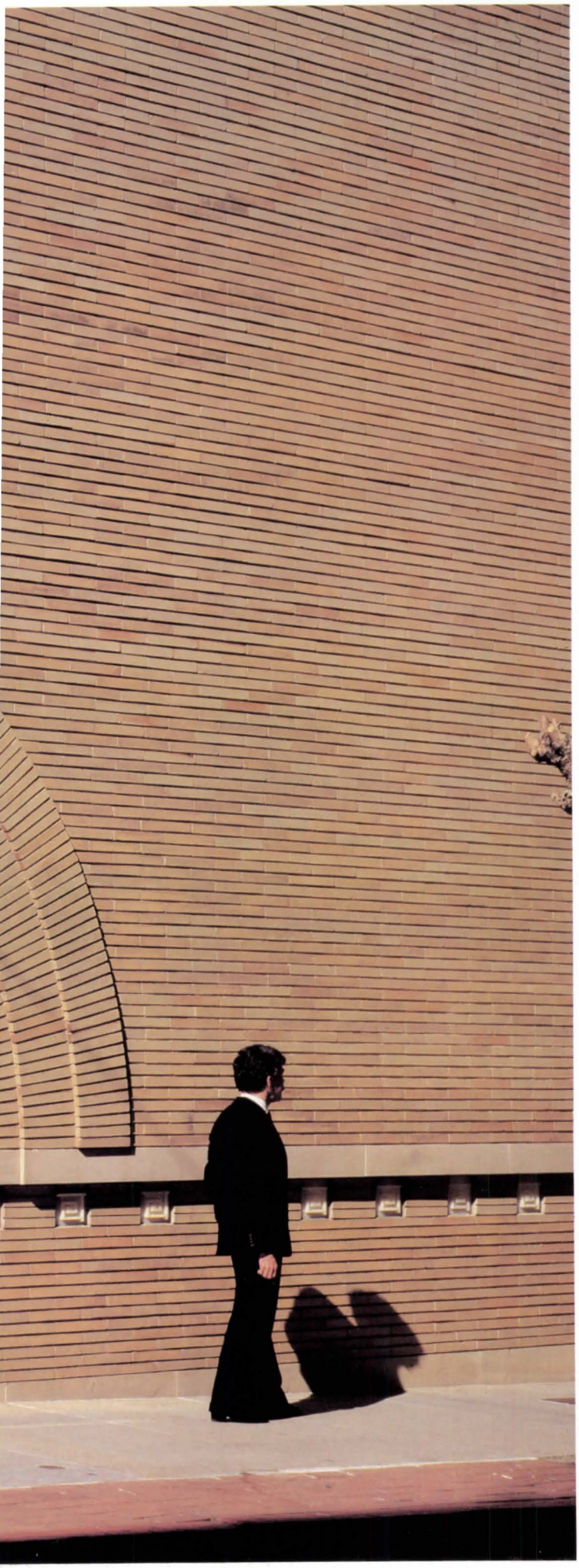
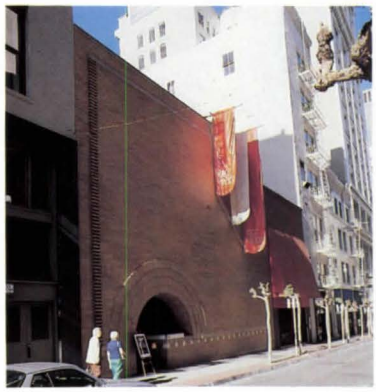


Masterpiece Put To Suitable Use

Frank Lloyd Wright's V.C. Morris Shop becomes a gallery. By Michael J. Crosbie

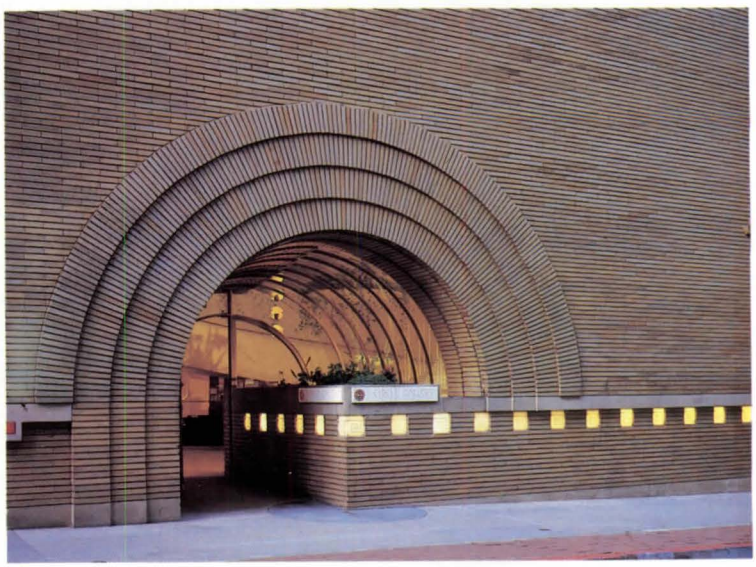


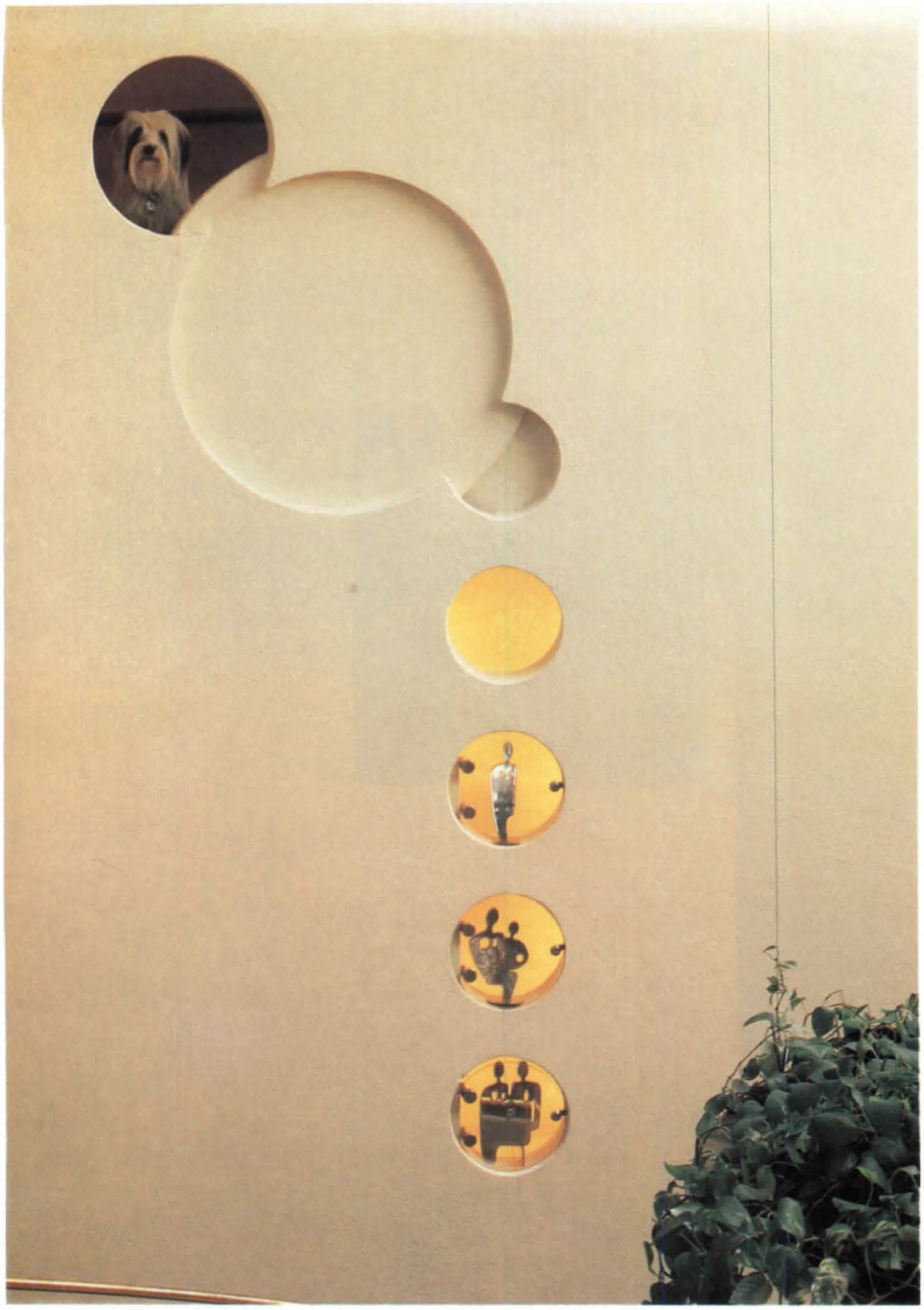
Frank Lloyd Wright's 1948 V.C. Morris gift shop in San Francisco has been renovated into an art gallery, restored with care by a former apprentice, Michel Marx, AIA, of Berkeley. The gift shop created a sensation when it opened, with crowds virtually closing narrow Maiden Lane, where it is found just off Union Square. Behind its mysterious, buff-colored Roman brick wall, through a cavelike entrance, the gift shop swirled like brandy in a glass, transporting patrons up a graceful, brass-railed ramp to walnut cabinets filled with fine gifts. Twenty-five feet above the sand-colored concrete floor, a translucent screen of acrylic bubbles sifted a mixture of natural and artificial light. This circle in a square was so popular that the Morrises at times grew a little tired of giving architectural tours to visitors who had no intention of buying anything.

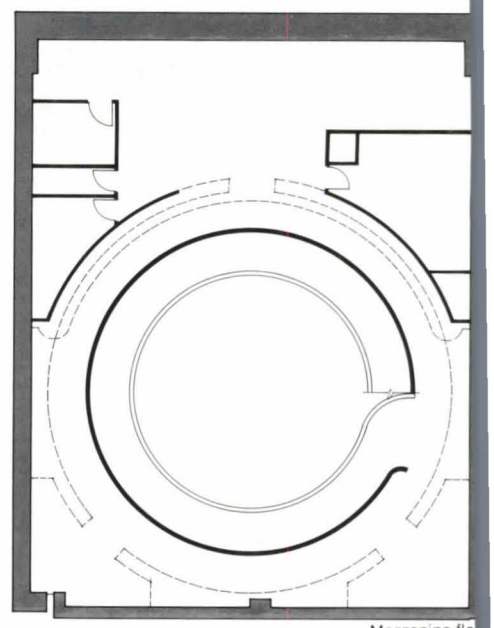
For a decade prior to its renovation, the gift shop was the home of Helga Howie's dress boutique, during which time it underwent some deplorable changes. The walnut cabinets were dismantled and dress racks and fitting rooms installed. The original light-colored walls were painted somber tones and the concrete floor covered with red carpeting. Partitions were constructed, and arched doorways cut into walls. Howie's lease finally expired, and the Circle Gallery saw the store as the perfect container for its wares.

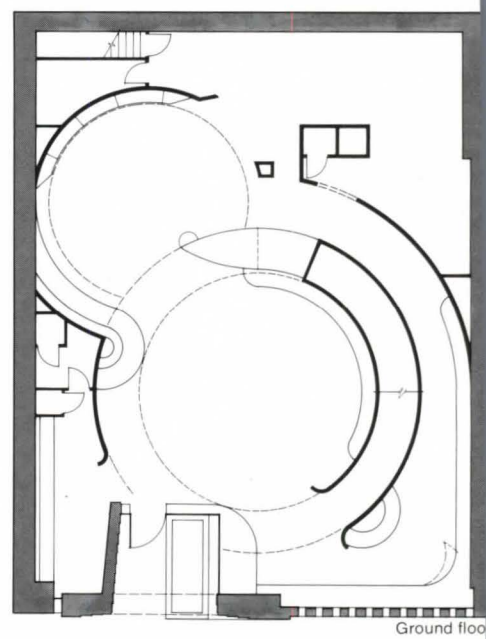
As luck would have it, a relative of one of the gallery's owners was an architect who works for Marx. When Ron Shattil, AIA,

Left and below, former Morris gift shop's powerful, arched entrance during day and at dusk offers peek into interior. Above, new banners on facade highlight building's new use as gallery.









Right, views of gallery from second floor and midramp show how well suited building is for exhibiting artwork. Above, punctures in ramp wall display small sculptures and photographer's dog, Annie.

learned of his family's intention of restoring the gift shop, he knew his employer was the perfect candidate for the job. Marx was at Taliesin when the gift shop was being designed, and in fact recalls working on a model of it. His charge was to bring the building back to as close to original as its new use accommodated.

Marx didn't have to look far for documentation. The plans for the building were found in its basement, along with a lot of the original furniture. After scraping through several layers of paint, Marx and Shattil determined the original color of the walls was a sandy beige. Some walls have been covered with low-pile carpeting of a similar color on which to hang artwork.

The red carpeting was removed and the concrete floor cleaned and its cracks repaired. The threadbare carpeting on the ramp and second floor was replaced with new carpeting of grayish brown—not its original color, but complementary. The walnut cabinets were refinished and a few of their knobs (lost over the years to souvenir hounds) replaced. The light screen, which had become dingy, was cleaned, and several new lenses installed. New balcony lighting, compatible with the original fixtures, now throws more light on the paintings.

The biggest change in the building's renovation has occurred outside. Wright's enigmatic facade, intended to entice passersby with a wee glimpse through the arch of the interior, apparently is too subtle. Gallery visitors, including people from Circle's Chicago home office, often couldn't find it. This spring, after approval by San Francisco's historic buildings design committee, orange and white banners designed by the renovation architect were hung perpendicular to the billboard facade. The mounting brackets for the banners are hooked and installed on the inside of the parapet wall so as to not mar the brick. Another change, this one at street level, is the addition of two unobtrusive Circle Gallery signs of white plastic, installed at the corners of the entrance's planter. The signs' orange characters are similar to the carved letters of the original Morris signifier, still visible in the planter's capstone under the new sign.

The renovated gallery continues to draw its share of architects from around the world who, according to the Circle's director, Karen Anderson, are pleasantly surprised by its new use. Anderson finds the design perfectly suited for a gallery, and the building is a popular spot for cocktail parties. In fact, one might say that the Circle Gallery fulfills the building's original role as a prototype for the Guggenheim Museum, designed at the same time. Wright, no doubt, would approve. □

Photographs © Carol Highsmith

Grande Dame Makes a Comeback

The restoration and augmentation of Washington's Willard Hotel.
By Nora Richter Greer

Perhaps no single site in the nation better symbolizes changing attitudes toward urban revitalization than the western end of Pennsylvania Avenue as it approaches the Treasury building next to the White House. In the early 1960s, a Presidential commission on the avenue's revival recommended creating a huge paved square at the western terminus of this stretch, necessitating the demolition of a group of buildings including the historic and locally beloved Willard Hotel. Today, a refurbished and augmented Willard presides regally over this block.

Located on the site of a series of Willard hotels dating back to 1816, the Beaux-Arts Willard opened in 1901. Designed by Henry Janeway Hardenbergh (who also designed New York City's Plaza Hotel), the Willard boasts an ornate facade topped by an exaggerated mansard-roofed penthouse and a rounded cupola at its most prominent corner. The eclectic Willard quickly became the Washington hotel preferred by the rich and famous.

By the 1960s, the hotel and the majority of the surrounding buildings were deteriorating rapidly as the center of the downtown drifted to the northwest. In July 1968, the Willard officially closed its doors, the final death blow being damage suffered in the riots that erupted after the assassination of Martin Luther King Jr. Most of the original furniture and architectural trim were auctioned off. At this point, the owner wanted to demolish and replace the hotel with an office building. Only a small group protested the proposed demolition.

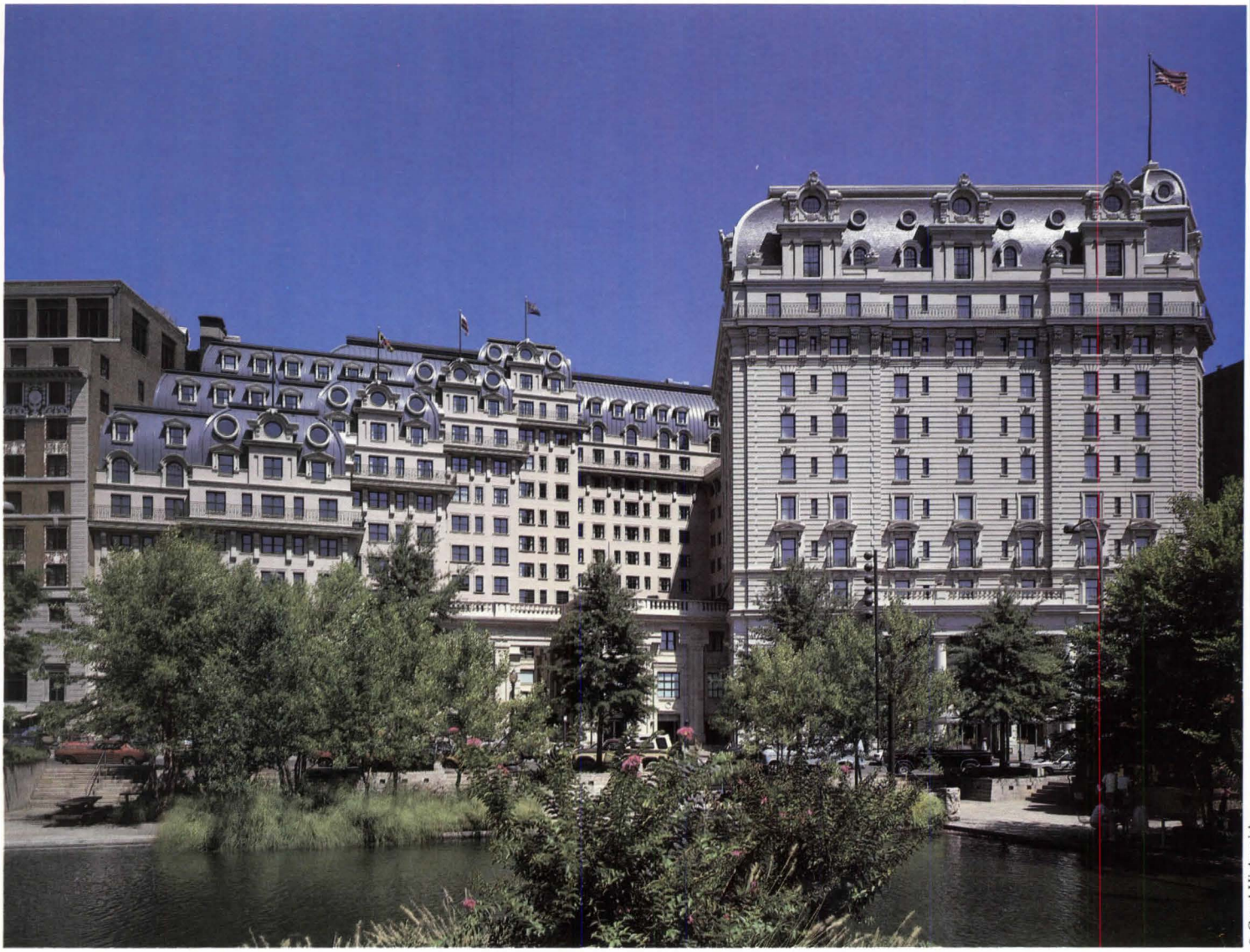
But with the growth of the preservation movement in Washington in the '70s came louder pleas for the Willard's renovation. In 1977, the original government plans changed significantly when the Pennsylvania Avenue Development Corporation, the successor of that '60s Presidential commission, bought the Willard for $8 million. Within a year, PADC held a design/development competition for the renovation of the Willard as a deluxe hotel and the mixed use of the adjacent site to the west. Nine architect/developer teams participated, with the winning proposal submitted by the New York City architecture firm of Hardy Holzman Pfeiffer, developer Stuart Golding, and Fairmont Hotels. Over time the architect and developer of the project would change, but the original design concept, although modified, would stay the same.

In the winning design Malcolm Holzman, FAIA, created an addition to the Willard that graciously pays respect to that original French Second Empire building by echoing its cornices, turrets, porticos, and corners in four segments that gently step up and back as they step closer to the original building. This creates between the Willard and the addition an open air plaza that rises and links Pennsylvania Avenue with F Street to the north through an arcade. This scheme allows the original building to remain the focal point of the site and the addition to become a backdrop, albeit a spirited one. It is hard to imagine a more appropriate addition to this building at this site.

Holzman's scheme called for 600 hotel rooms and a retail arcade of 40 boutiques and restaurants. It was to open in 1982. However, due to high interest rates and the fact that lenders still regarded development in the old downtown as a major risk, Golding was unable to finance the project, and in 1981 its development was turned over to the Oliver T. Carr Co. PADC still required that five historic rooms in the Willard be renovated to their turn-of-the-century elegance; to PADC's credit, it also mandated that the basic elements of the HHP design be kept.

Later, Carr successfully argued that the project was only feasible if the number of hotel rooms was pared down to around

Above, Hardenbergh's 1901 Willard runs the length of 14th Street on a spur of Pennsylvania Avenue (bottom of photo). Its addition sits to the west. Left, the newly created plaza with fountains cuts diagonally through the new and the old.



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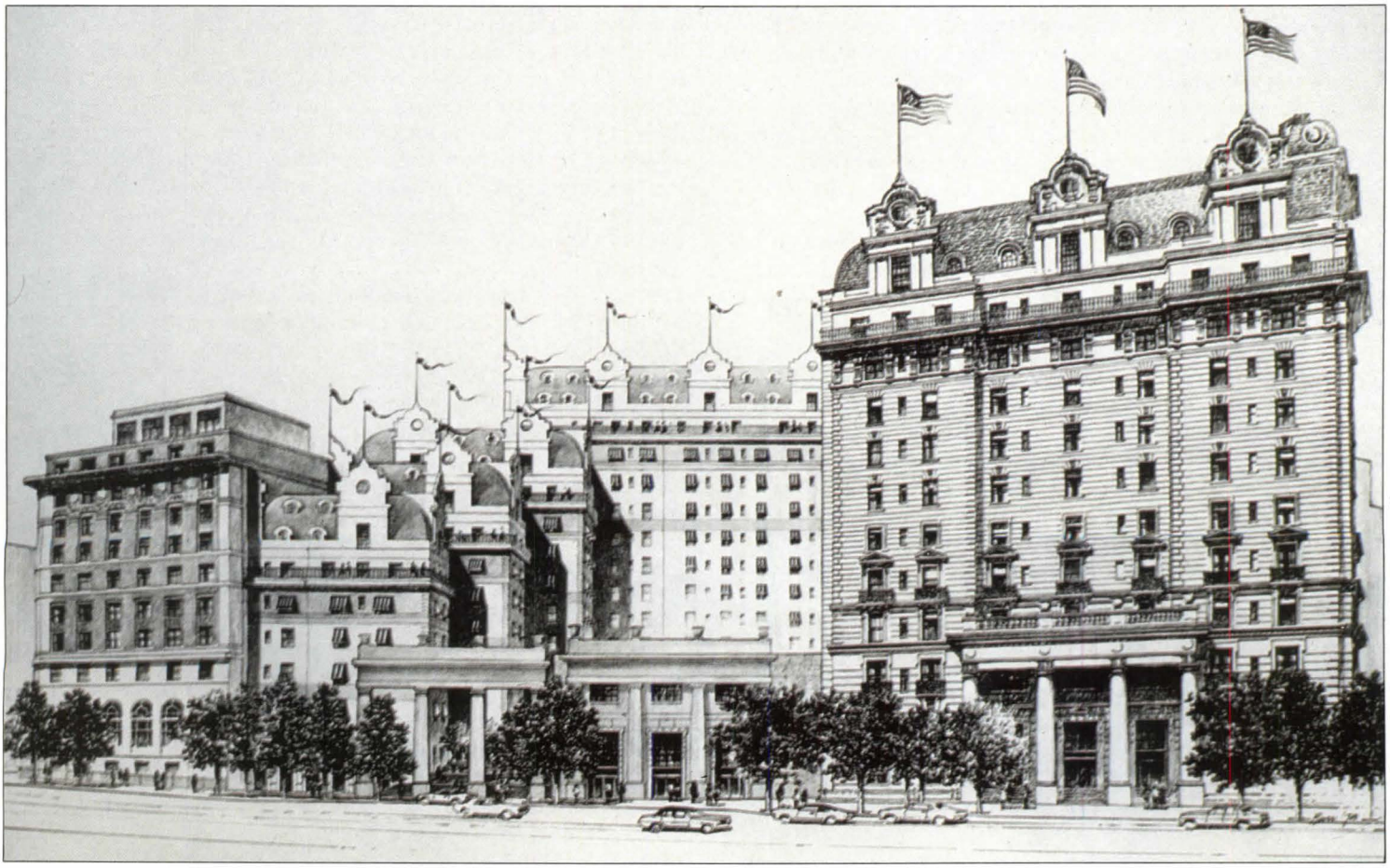


Courtesy of Pennsylvania Avenue Development Corp.

00 and that the addition be enlarged to provide 218,600 square eet of office space. This change significantly affected the massing of the HHP-conceived addition and marked the time when HHP nd Carr became disenchanted with each other. As a consequence the Washington firm of Vlastimil Koubek, AIA, took over the architectural duties, and the Inter-Continental hotel chain replaced Fairmont.

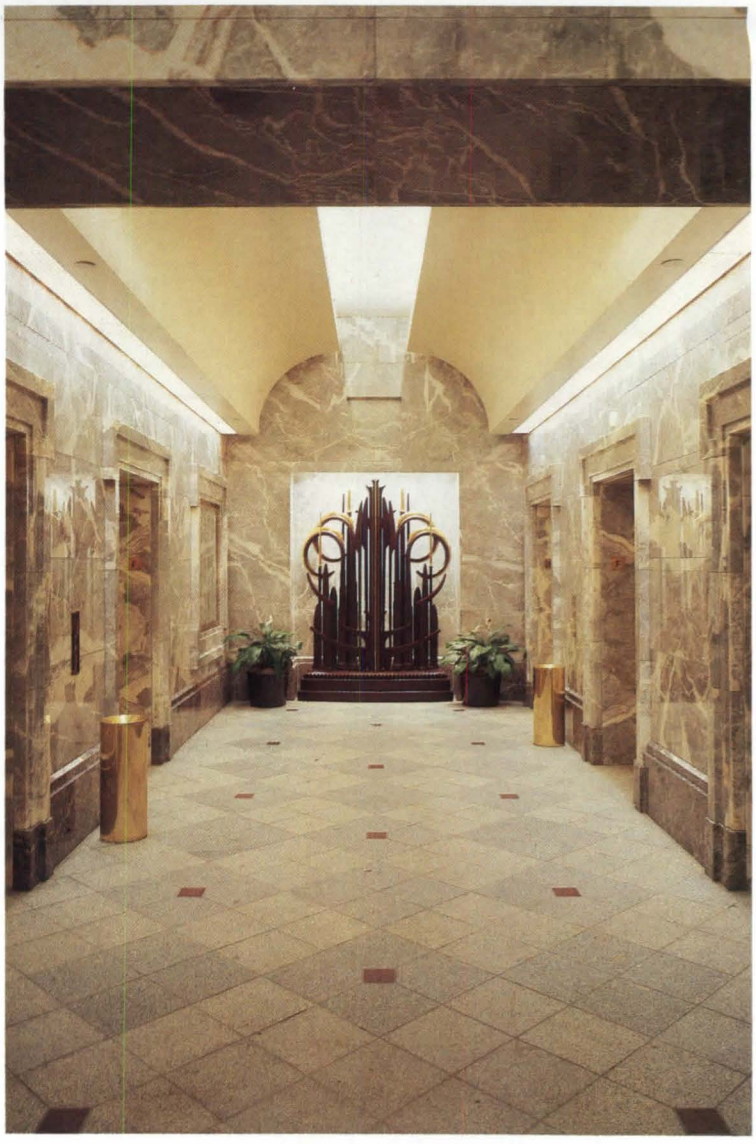
Perhaps the greatest effect of the change in architects was on he detailing of the addition. It picks up some of the Willard's letails but in drastically oversimplified form. The giant bull's-eye windows seem a bit too large, the window treatment a bit oo plain, the skin a bit too stark. The Willard is Indiana limestone up to the fourth story and brick and terra-cotta above that. The new is a matte-glazed brick that lacks the original's subtle horizontal banding and window decoration.

Overall, though, Koubek admirably handled the difficult task of enlargening the new segments while achieving the symmetry and rhythms suggested in the HHP proposal. The outdoor plaza with its multi-levels, its fountains, and its granite paving in black, russet, and red is attractive, articulated, urban; when the bulk of the shops and restaurants open it will surely become a lively place as shoppers meander through the arcade linking F Street to Pennsylvania Avenue. Within the arcade the entrance to the offices is marked by a somewhat overly lavish marble portico. The Pennsylvania Avenue entrance to the plaza is much more restrained. Here the Willard's three-story, limestone portico jogs slightly back into the plaza, first as the framing of store fronts and then as an open entryway. This gesture works to establish the addition's southern edge while simultaneously announcing the open space within.

By the time restoration work on the Willard had begun, the once ornate interior had been reduced to rubble. The scagliola-covered columns and mosaic floors were eaten away, the plaster walls, wood finishes, and coffered ceilings had warped and rotted as the result of a leaky roof. The '60s auction and scavangers had emptied the building of most of its decorative details. Only the original structural drawings could be located, so months of research and investigation had to be undertaken to recreate the interiors (see accompanying article). In the end, 34 different types of marble were used in the restoration, over 700,000 square feet of mosaic had to be restored by artisans, the polished mahogany front desk was totally recreated from photographs, up to 18 layers of old paint were scraped off and the original colors matched using an electron microscope, the scagliola on the columns was replaced or repaired, and much of the elaborate plaster work was remolded.

Now, entering the lobby from Pennyslvania Avenue is a step back into the turn-of-the century. First noticed are the lobby's exuberant colors. Sarah Lee of Tom Lee Ltd. in New York City, the Willard's interior design firm, says her biggest challenge was "taking those ghastly colors of the period and making them beautiful. . . . It was a difficult period in decor, with yellows not a clear yellow, with greens frequently a burnt-spinach shade, and reds the color of dried blood."

It takes a while for the modern eye to adjust. However, when the afternoon sun shines through the tall windows overlooking Pennsylvania Avenue there is a soft, warm glow in the lobby that makes it a gentler place and allows more attention to be directed toward the room's historic details—elegant chandeliers, the impressive Corinthian columns, the elaborate plasterwork, the state seals painted on the ceiling. A short walk down Peacock Alley, the formal promenade between the lobby and the F Street entrance where ladies once showed off the newest fashions and celebrities greeted fans (see Contents, page 2), is the somewhat somber Willard Room (the main dining room) with its dark, rich colors and its half oak/half oak-looking plaster walls. Next door the Crystal Room (now a banquet room) has a sharply contrasting celestrial quality with its shimmering glass chandeliers and soft yellows and pale greens. Completing the historical tour is the F Street lobby, which, compared to the rest of these areas, is a quiet, light space—almost a relief for a modern-day visitor, and tucked in the front corner is the



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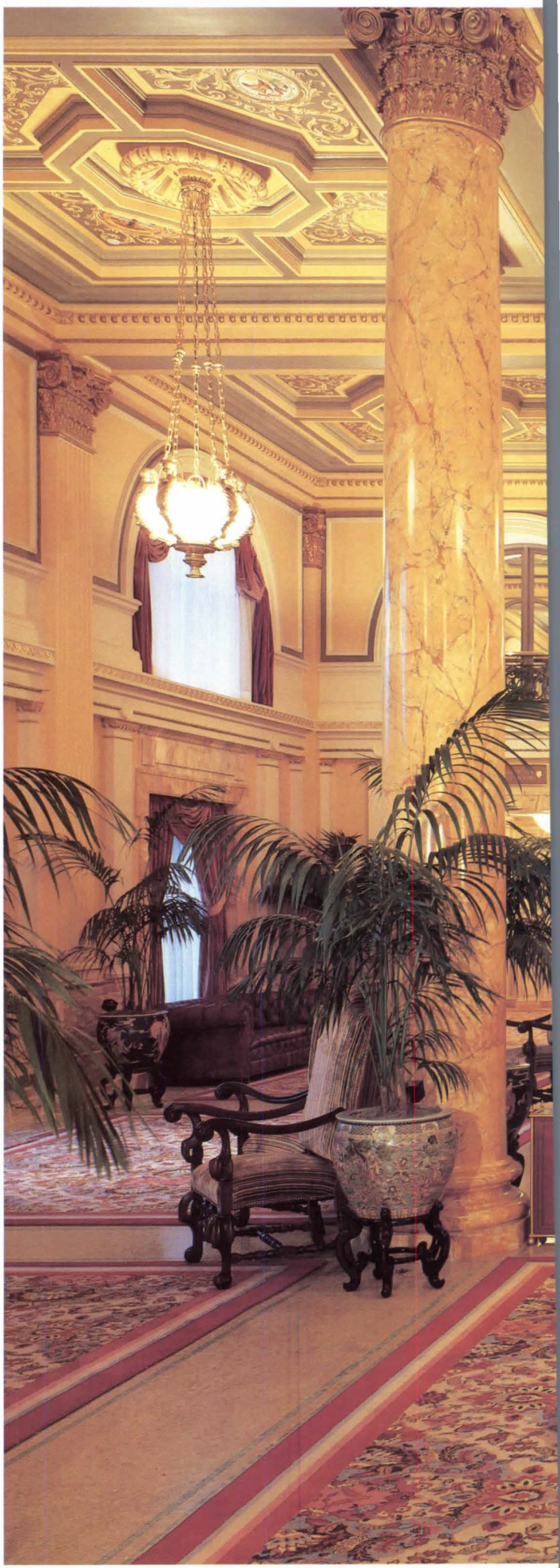
Above, the new office lobby with William Paley sculpture, marble clad walls, and granite floor. Across page bottom, Hardy Holzman Pfeiffer's design for the addition, the winning entry in a design development competition sponsored by the Pennsylvania Avenue Development Corporation. When the project's architect changed, the addition's massing, scale, details, and amenities would also change, but the basic design concept remained the same. Across page, top, the Willard as seen from Pershing Park.

Round Robin Bar, with its appropriately round, black marble topped drinking counter and forest green walls.

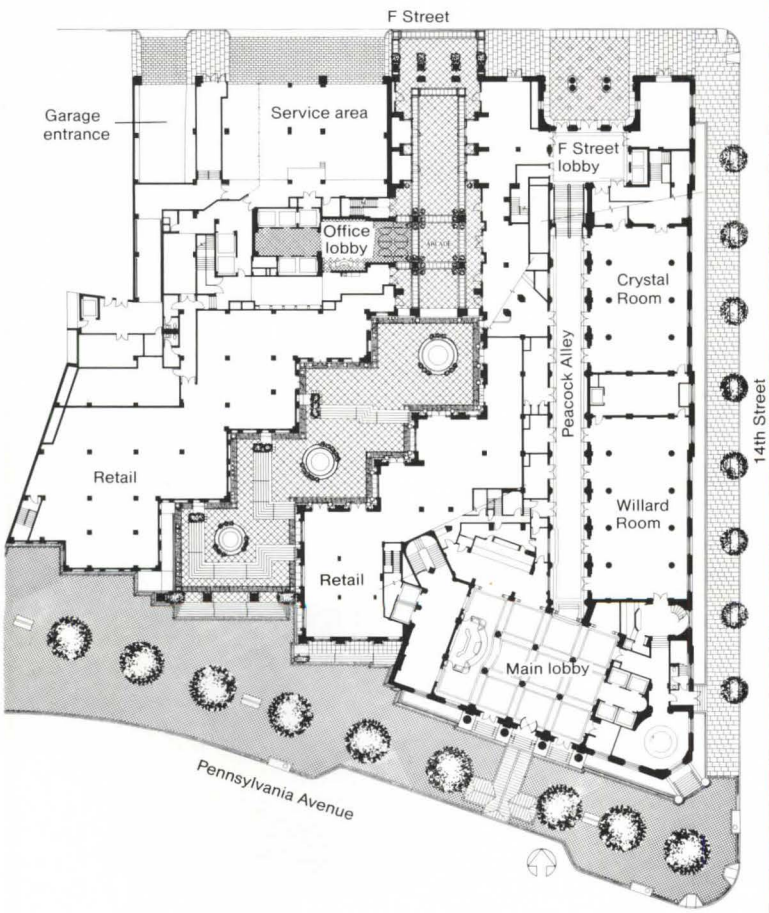
Supposedly one of the most brilliant places in the old Willard was its two-story ballroom that ran the length of 14th Street between F Street and Pennsylvania Avenue on what was then the two-story top floor. Fire and other building codes would not allow for an economically feasible use of this space as a ballroom, so that portion of the hotel was remade into two floors of hotel suites, and the windows were changed back to their original size and shape (they had been enlarged in the '20s to allow for greater views of the city). A new ballroom and various sized conference rooms were placed on the lower level, partially under the hotel's lobby and partially under the boutiques facing the new plaza.

With the renovation of the Willard and its sensitive addition and other improvements to the area (most notably the rerouting of Pennsylvania Avenue that placed a be-fountained, terraced, landscaped plaza between the Willard and heavy traffic) a rather quiet, elegant enclave has been created just a block from the White House. And once again what used to be called the "crown jewel" of Pennsylvania Avenue is shining. The Willard is now a place to remember an era long past and to encounter a new age that, with a delightful sense of humor, honors the old.

Photographs © Carol Highsmith



Five historic areas of the Willard were restored to their turn-of-the-century appearance, including the main lobby, right, its large Corinthian columns and rebuilt mahogany main desk and the Willard Room, above, with its oak and oak-looking walls.




CONCIERGE

"The real challenge of the Willard restoration was research," says Charles Stover, director of specifications and contract documents for Vlastimil Koubek Architects. "We had to figure out what was really there in the first place and find out where to get replacement parts."

Four researchers spent about a month tearing through what was essentially the ruin of the hotel. The team uncovered marble that had been painted over and varnished, identified species types used in woodwork, pieced together ornamental plaster, and stripped down walls to identify the original paint colors. Simultaneously, the architects culled through a vast number of photographs taken at various times throughout the Willard's history; these revealed much about original ornamentation, metal grillwork, and furnishings that had long since disappeared.

When the architects had a fairly good sense of what the Willard once looked like, the task began putting it all back together. Chipped and broken marble had to be patched with new, and since quarries no longer produce the same colors, penetrating stains were used to match the new and old marbles more closely. Columns made of scagliola, a kind of faux-marble plaster work with embedded color, had to be patched as well; contractors prefabricated new pieces based on formulas for various colors Stover found in a 1937 copy of a plastering handbook.

Thousands of new marble tiles were purchased to match those in the mosaic floor, 30 percent of which had been destroyed. Though the original floor was laid tile by tile, the repaired sections were assembled on a paper backing, then glued down. The repaired areas are noticeable, but only if you really look for them.

Ornamental plaster was recast, then wired into place. Wood was stripped and wood species matched, then various stains and varnishes were used on both the old and new woods, since the old wood, however many times it was bleached, could never be freed from the oils and resins of half-a-century of coating.

Since no hardware of any kind remained and few of the old photographs showed what the original hardware looked like, Stover found a 1910 Yale and Towne hardware catalog and looked through it until he found something he liked. Then he drew sketches from the drawings in the catalog and took them to a custom brass manufacturer in New York City, who cast plates and handles that worked with new mortise locks.

"Integrating new mechanical systems well can make or break a project like this," Stover says, referring not only to the placement of HVAC registers and electrical outlets but also to the location of horizontal pathways for routing cables, pipes, and ducts. The renovation called for installation of a new variable-air volume HVAC system, sprinklers, piping, and an upgraded electrical system.

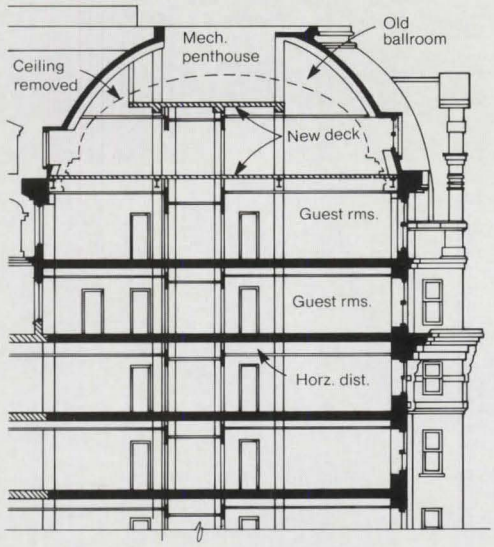
The original architecture helped out a bit, since there was a variety of grilles and coves where registers could be concealed. In Peacock Alley, where there weren't any opportunities to discretely hide the registers (there's a low ceiling and no grillwork, so the occupant really sees everything) Koubek installed no registers at all. Air simply is forced through the corridor in a steady stream, with intakes at one end and exhausts at the other.

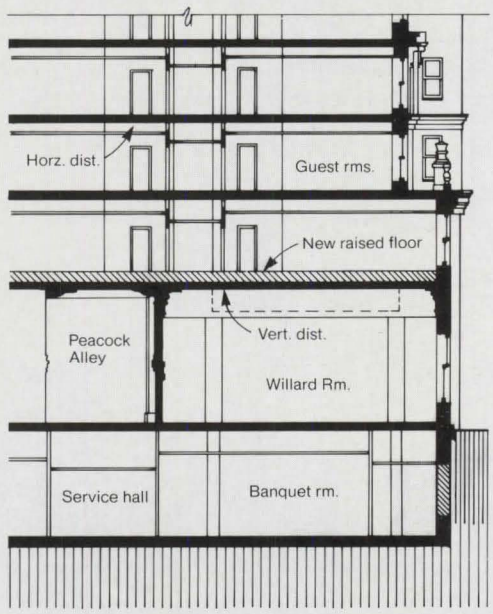
Distributing services horizontally throughout the building was another matter. On the guest room floors, hung ceilings enabled services to be channeled freely. This solution wasn't possible on the main level, since the original ceiling is an integral part of the architecture. To solve the problem, the Koubek firm decided to create a new deck for the second floor, two feet above the original flat arch clay tile floor. This created an interstitial service distribution zone, which permitted services to feed downward through punctures in the original ceiling.

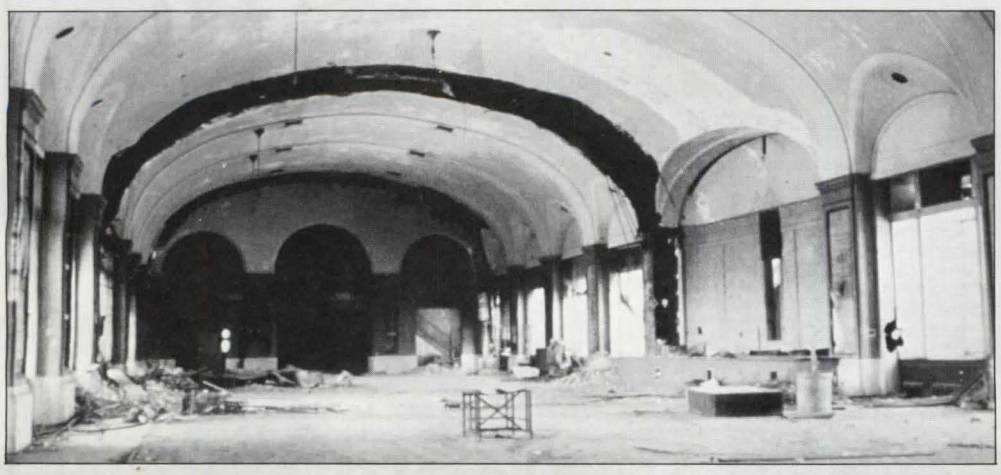
The most significant structural modification made to the Willard involved the reframing of the ballroom level, originally located on the top floor of the hotel. The old ballroom, below, measured 175x60 feet, with a 27-foot ceiling, dimensions no longer useful for most hotel affairs. A new ballroom was built on the lower level, underneath the lobby, and the old ballroom was converted into two floors of guest rooms.

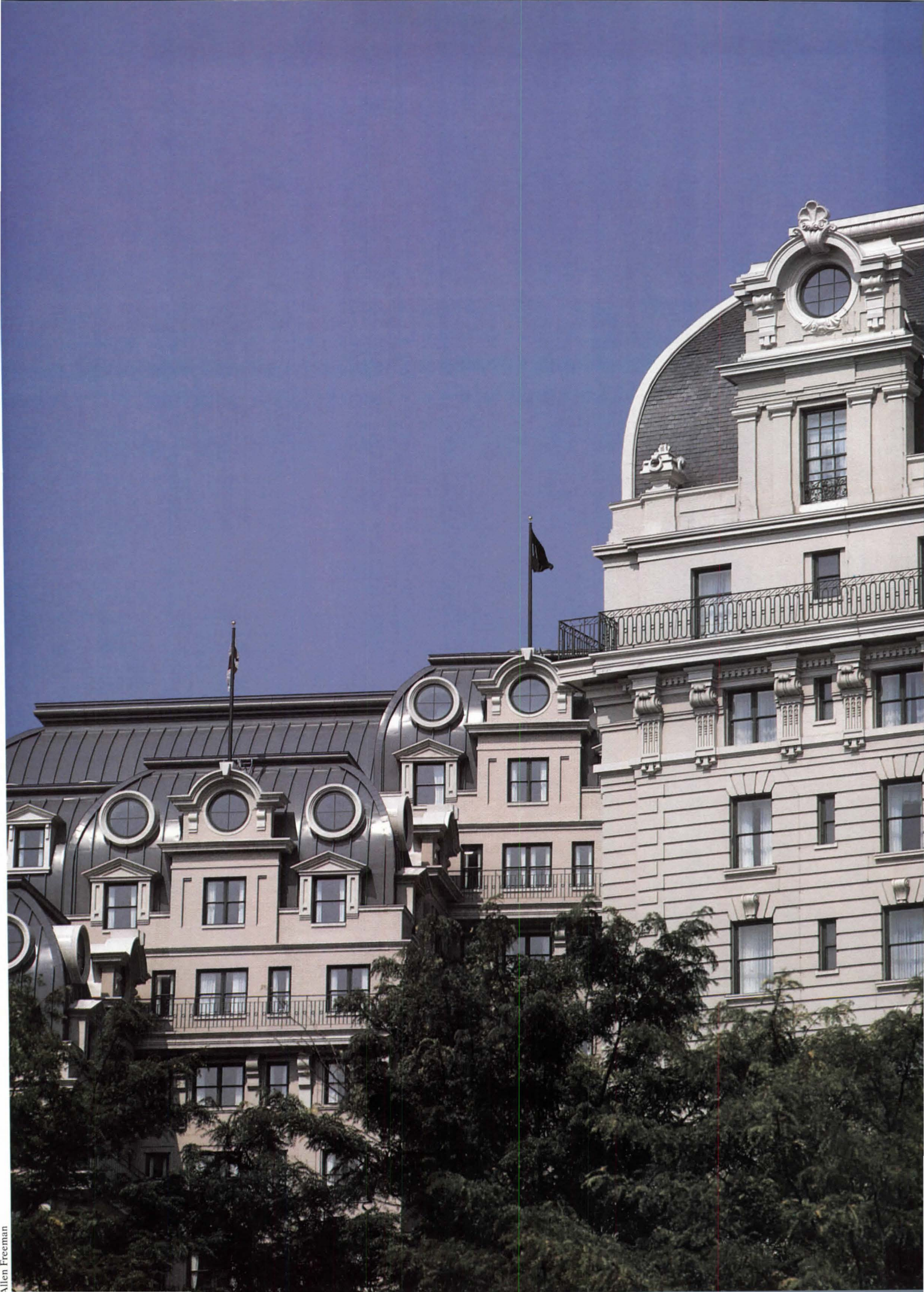
The original arched trusses that framed out the ceiling of the ballroom cut deeply into the upper parts of the space, which would have cost precious floor area on the top level (below). The contractor phased installation of a new framing system, then removed the old trusses, to create a square post and lintel frame that worked better for the plan of guest rooms.

—Mitchell B. Rouda









Allen Freeman

Contextualism Continues Strong In the Capital

A new crop of works that show deference to tradition. By Andrea Oppenheimer Dean

Washington has long been viewed as the symbol and sump of our national aspirations and failings. In the 19th century Charles Dickens called it "the city of magnificent intentions," of "spacious avenues that begin in nothing and lead nowhere." It was in those days little more than a raggedy old Southern style town. A few months ago, the *New Republic* characterized the capital city as "decadent and sybaritic . . . like Rome in decline."

Haynes Johnson of the Washington *Post,* a voice of reason as usual, countered, "However pompously the political capital takes itself, and new marks of self-infatuation are being set in certain circles, splendid things have been happening to the city itself." Among these he listed the reopening of the Willard Hotel, the restoration of gracious 19th century buildings on and near Pennsylvania Avenue, and new buildings "being constructed with an eye to modesty and charm."

High time, too!

The historicizing tendency in Washington's architecture, which has gained momentum especially in the last couple of years, was to be expected given the city's history and the attitudes of the design firms doing the most interesting work: Hartman-Cox Architects, Skidmore, Owings & Merrill/Washington, Shalom Baranes Associates, and David Schwarz/Architectural Services.

These architects share a refreshing sense of deference—without intimidation—toward the city's architectural traditions, even its pretensions. They also have in common a Victorian-like tendency to combine traditional elements into new combinations. In talking about their intentions they downplay the architectural "statement" and dwell on the need for buildings to be "appropriate" (Schwarz) and "handsome" (David Childs, FAIA, SOM). The overall attitude is summed up by Warren Cox, FAIA, when he says, "Once you start looking at and working on these good Washington buildings by Cret, Goodhue, et al., you realize there's a richness, interest in detail, and caring about how things work together that makes the average elderly graduate of the GSD look like he's doing spec houses. I'm tired of drywall and a bunch of wood hand rails and Formica."

Among the new works are buildings that go beyond the facadism we described two years ago (Nov. '84, page 62); one enfolds several old buildings, instead of just using them as false fronts, while another incorporates only fragments of the original. The new works include rooftop add-ons, in the Parisian tradition, and seek to complement rather than mimic the old. Though none of the architects involved sees a "Washington style" coming out of their collective work, each acknowledges Washington's peculiar history as a primary design influence.

From World War II until at least the mid-'70s, the District of Columbia went through what Cox calls "a dark age." His partner, George Hartman, FAIA, adds that "the current run of work wouldn't have happened if we hadn't had 25 years of some very famous architects doing very bad work here." Marcel Breuer, Edward Durrell Stone, and Gordon Bunshaft, FAIA, are the first three that come to mind. As Ada Louise Huxtable, Hon. AIA, then of the New York *Times,* wrote upon completion of Bunshaft's Hirshhorn Museum in 1974: "It is hard to know whether Washington does something to architects or architects do something to Washington. Perfectly respectable practitioners fall on their faces with alarming regularity, unstrung by the Capital's overblown scale and frequently overwrought grandeur."

Some of the grandeur is of surprisingly recent vintage. John Russell Pope's classicist National Gallery of Art was completed in 1941 and his Jefferson Memorial in 1943 when most of the architectural world had given up Beaux-Arts niceties in quest of a brave new world à la Gropius or Le Corbusier. As Childs says, "The tradition here is traditionalism." The 1930s Federal Triangle, for instance, is not only the largest built Beaux-Arts project in the world, but was unequivocably rear guard.

It all started, of course, with the original L'Enfant plan of 1791. With its radiating plan of broad avenues and vistas and large city blocks, the city was conceived in the image not of a new nation but of the old world—specifically of Paris—and in revising the plan after the Chicago Exposition of 1893, Daniel Burnham turned Washington into the building ground for classicism in America.

Washington's European feel is further reinforced by an 11-story height limit, which, along with wide streets, conspires to make buildings visible in their entirety from the ground—unlike the skyscrapers of Manhattan or Chicago with their narrow, canyon-like sites. This partially explains why Washington buildings traditionally have been articulated in Beaux-Arts fashion with a base, middle, and top, and given vertical emphases to offset their horizontality and bulkiness. As Cox says, "Nobody ever found a better way to modulate this stuff than monumental classicism, whether you do it literally or abstractly."

Childs adds, "This city has such a strong, relentless character, a real context. The influence of living and working here seeps into your heart."

Also absorbed now by architects working in Washington are the capital city's strong preservation laws, which, uniquely, have jurisdiction over entire historic districts, including their new buildings, and require extensive review from federal and local agencies. Almost eight years old, these laws have now been accepted by developers as "part of the planning process rather than an outrageous imposition," according to Robert Peck, president of the D.C. Preservation League. Tania Beauchamp of the D.C. Historic Review Board adds that "preservationists are going from confrontation to negotiation and becoming more selective and confident that some new work can match the old in quality."

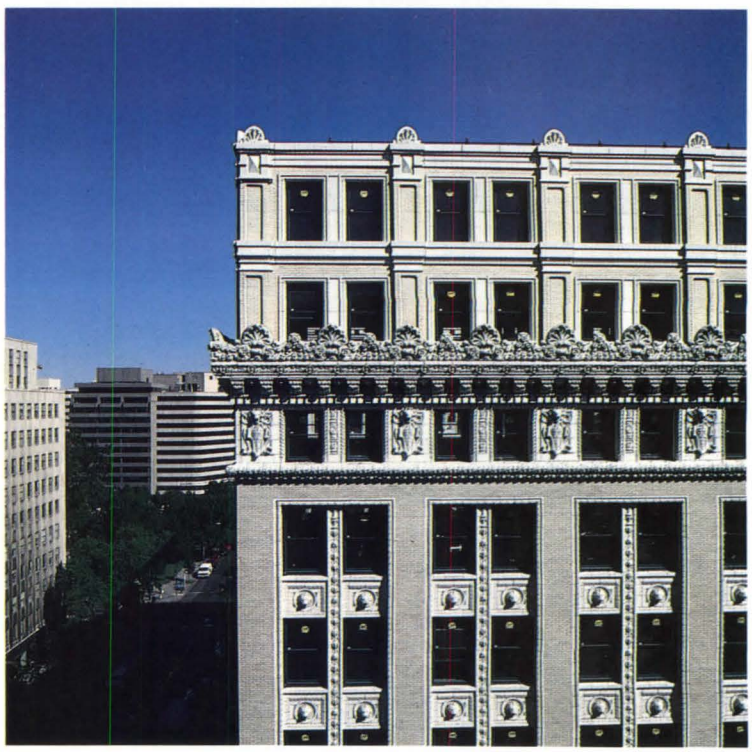
Also contributing to improved design quality is a recent surfeit of office space, which has prompted developers to choose not only more distinguished but distinctive architecture; the transformation of a sizable segment of previous transients into a permanent population invested psychologically and otherwise in the city; and the new nationwide taste for nostalgia and old-timey buildings.

As recently as three years ago, facadism usually resulted in making historic buildings look like caricatures of themselves, as at Hellmuth, Obata & Kassabaum's 1983 Red Lion Row with its file of slicked up old town house fronts mounted on a huge, ungainly modern building. As Peck says, "Red Lion Row was a lesson. Now when we negotiate we also want to have a say about what goes behind, on top of, or next to what gets saved."

Among the most visible examples of the new facadism are Shalom Baranes' additions. Baranes' rooftop and infill add-ons are collages that often mix-and-match several styles. His primary concerns, he says, are "proportioning systems, patterns, a general order that transcends style and sheds new light on the existing landmark." He attempts, in fact, to improve the look of some historic buildings.

At the Beaux-Arts Bond building (above), on a corner site in the old financial district at 14th Street and New York Avenue, Baranes added three stories and two identical "bookend" infill buildings. The new takes cues from the rhythm and fenestration of the old but is less three-dimensional, includes modern, flat, and large glazed areas, plus corner gable shapes, paired columns, and extruded bays that have little or no precedent in the old. Though a welcome addition to the downtown, the updated Bond building is a friendly-looking hodgepodge.

Daniel Burnham's Southern Building at 15th and H streets (right), again in the old financial district, was apparently meant to have two additional stories, which the developer decided to do without when he ran out of money. Almost three quarters of a century later, Baranes added a two-story penthouse in consultation with Graham Anderson Probst & White (Burnham's successor firm). Low-key and less ornate than the original, the addition above Burnham's three-foot projecting cornice doesn't clash with the old but looks like a benign afterthought, especially since it rises above the roofs of adjoining buildings.



David Schwarz' Penn Theater building on Capitol Hill has three distinctly different faces. Below, on Pennsylvania Avenue, its offices have a neo-deco face; right, its courtyard is International Style; and below right, its residential portion on 7th Street is Victoriana. Across page: top, Schwarz' Griffin building; below, SOM's new office building at 2000 K Street.

Allen Freeman

While Baranes mingles elements from different styles, David Schwarz mixes whole facades from different eras in the same building, as at his new Penn Theater building (above) on Capitol Hill. Its main elevation on Pennsylvania Avenue houses office space, is neo-art deco, and includes fragments of the original art deco movie house that it replaces; its residential portion on Seventh Street has a Capitol Hill red brick town-housey facade; and linking these elevations is a courtyard marked by a startling, white stucco International Style screen that forms the rear facade of the condominium. Neighborhood critics fault the deco side for its "too strong" blue color. Though the building is more emphatic than the gray theater formerly on the site and prompts associations to old-time bath houses with its blue tiles and deco detailing—its color isn't too strong in this neighborhood of small, commercial buldings with their bright accents.

Overall, Schwarz's strength as a designer is in adept massing and scale. He has broken down the massing of the Seventh Street facade to give the feel of nearby Victorian-style town houses, and on Pennsylvania Avenue has carved a setback on either side of the entrance and terminated the setbacks with a projecting wing topped by a simple parapet. The multilevel courtyard, which covers parking, is a vacant expanse and will remain so unless a hoped-for restaurant can be lured.

Schwarz's knack with massing and scale is seen again at the Griffin (opposite page, top), a brick neo-Victorian corner condominium at the edge of Foggy Bottom (26th and K streets). Like the Penn Theater building, its style defers to that of the neighborhood. At nine stories, its north, K Street elevation is, by Washington standards, high rise, while its west facade steps down twice and is articulated into bays to meet 26th Street town houses. Schwarz has given the building a base, middle, and top by slightly varying the brick color and wrapping a light-colored, overly heavy contrasting band of molding over the lower two floors and under the top two. Despite the punched-out massing, columned entrance, sandstone lintels, and the like, the Griffin is "modern," says Schwarz, pointing to the curtain wall beneath the old-timey-looking west wall and the single paned glazing.

Richard Giegengack, AIA, of SOM says that in time "these buildings will become more modern again, be stylized and sort of streamlined." But for SOM that time is not yet, as evidenced by its newest building, with its turrets, metal roofs, banded facades, and extruded lintels (right). Because it is in the heart of K Street (at the corner of 20th)—a strip of '60s and '70s boxes—SOM tried to give the building the sense of history that the area sorely lacks. As Childs says, "It is reminiscent not of its neighbors, because they're bad buildings, but its neighbors that used to be." The problem here, he continues, "is the Parisian one of making the long, continuous block interesting and handsome." The building's elements and detailing are, unhappily, oversized and overbearing. But in concept, especially, 2000 K Street illustrates a theme that links all recent Washington historicist work. Says Childs, "There is a sense of freedom and seriousness about the use of traditional devices, columns, arches, turrets, and other elaborations of the corner, silhouette, and roofline. Those things are being joyously received by architects in Washington."

The salubrious effect on the city is apparent and will be underscored, we hope, by a closer look at two complex and distinguished buildings by Hartman-Cox on the pages that follow. □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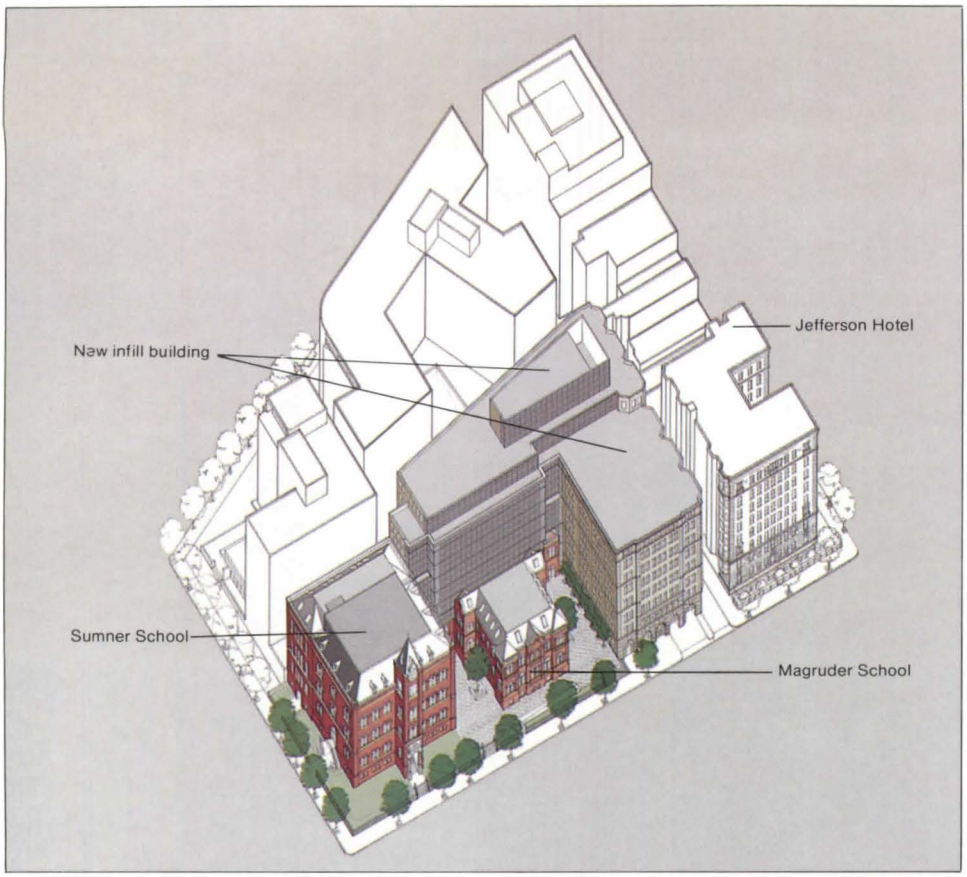
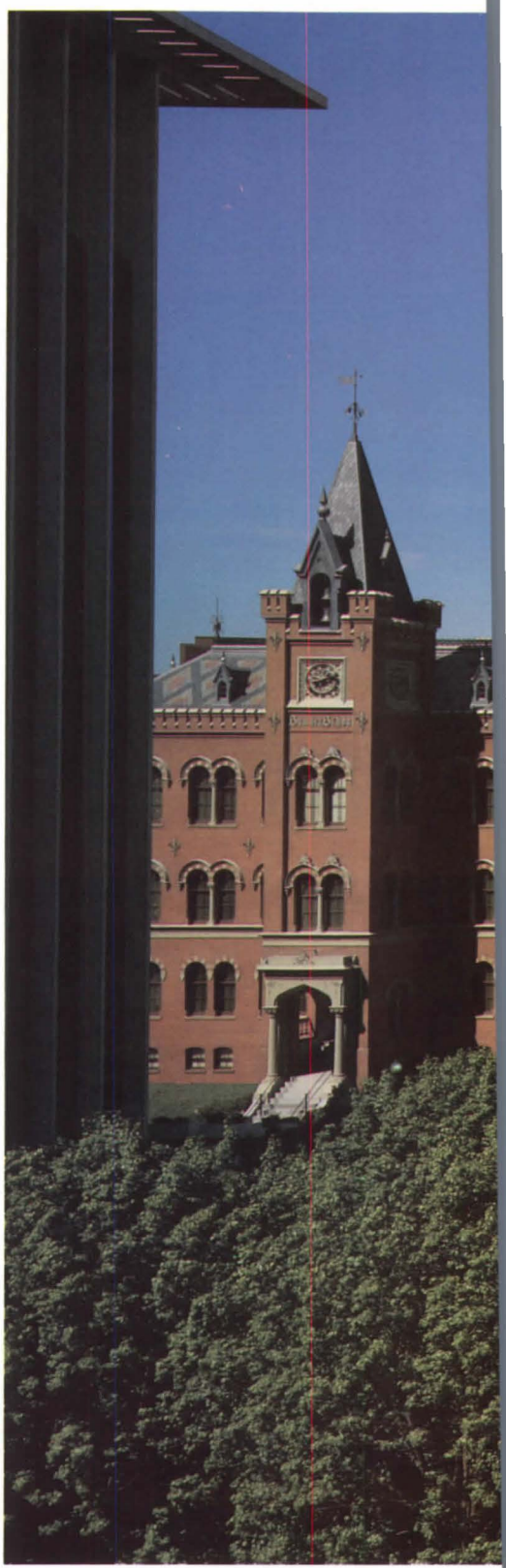




Two Old Schools Woven Into an Office Complex

Sumner Center in downtown Washington.
By Andrea Oppenheimer Dean

Photographs © Peter Aaron/ESTO

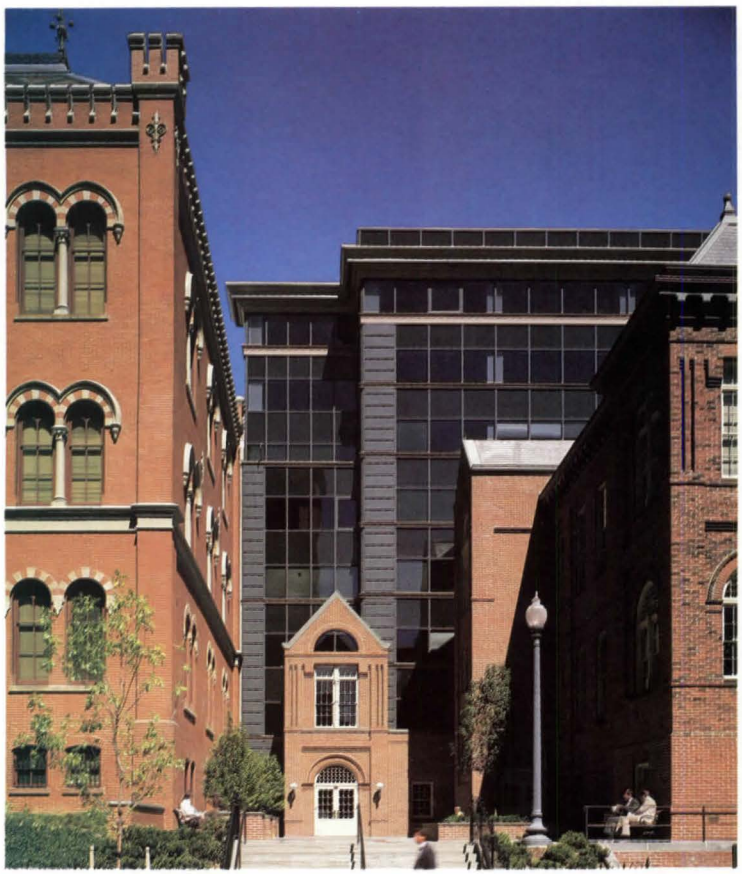
Today, the 1600 block of M Street N.W. forms a little cityscape of its own embodying contemporary notions of what a city should be. There is a variety of buildings of different types, times, sizes, styles, and levels of distinction. The old have been restored, the new accommodate them, and the landscaping acts as a weave to stitch the buildings together, and is inviting besides.

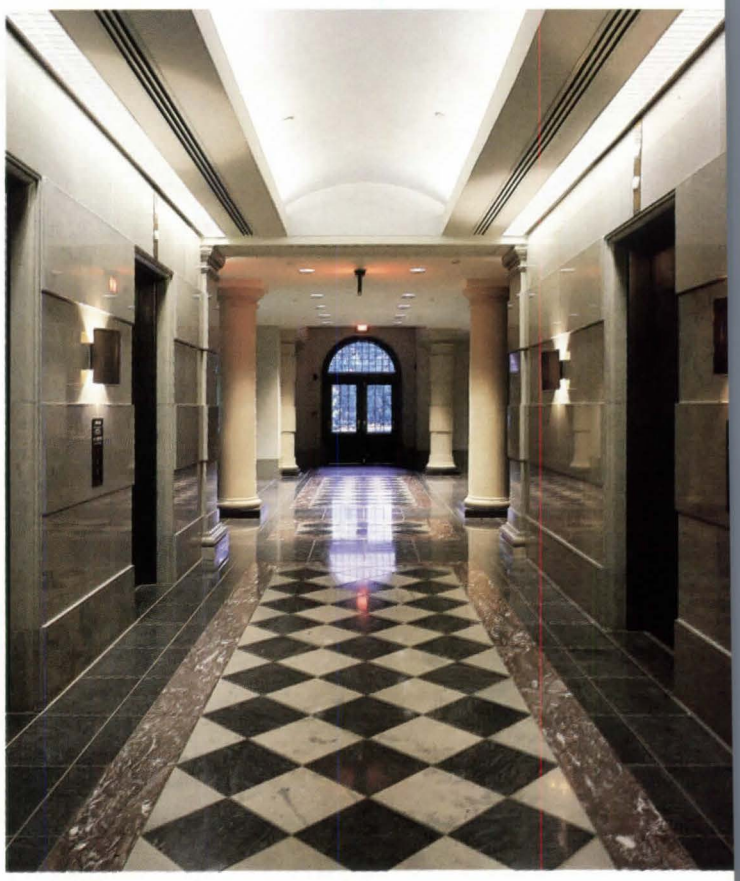
The surest way to distinguish the old from the new is in remembering what was on the site before Hartman-Cox Architects (with Navy, Marshall, Gorden) transformed it. At the corner of 17th and M stood the 1872 Charles Sumner School by Adolph Cluss. Named for a leading abolitionist, it served for many decades as cradle and cornerstone for the education of blacks in the District of Columbia. By the time it was placed on the National Register of Historic Places in 1978, the abandoned school was a pestiferous old wreck, its tower missing, roof collapsing, and

Above, the Sumner ensemble from the recent National Geographic addition: from left, Sumner School, Magruder School, and L-shaped infill, with dark and light facades, that wraps behind Magruder. Far left, the same elevations from the corner of 17th and M showing matching extension to the rear of Sumner.

Gothicized windows mostly broken. Just east of Sumner was the slightly less aged, far less damaged and distinguished, red brick Magruder School. The 1923 Beaux-Arts Jefferson Hotel on the corner of 16th, formed the site's eastern boundary.

Hartman-Cox's competition-winning scheme for the D.C. Board of Education built upon the relationship of these three ancients and located the bulk of the new behind and to the sides of the old schools. The Sumner was restored by RTKL and The Ehrenkrantz Group, while Hartman-Cox added a two-bay exten-





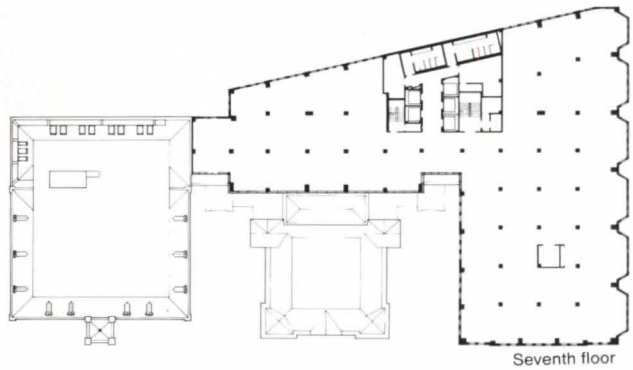
Above, new entry to office building appended to Magruder looks purposely thin; above right, sedate lobby to offices. Opposite, light-filled atrium, whose detailing is taken from all four buildings, links Magruder with office buildings behind and beside it.

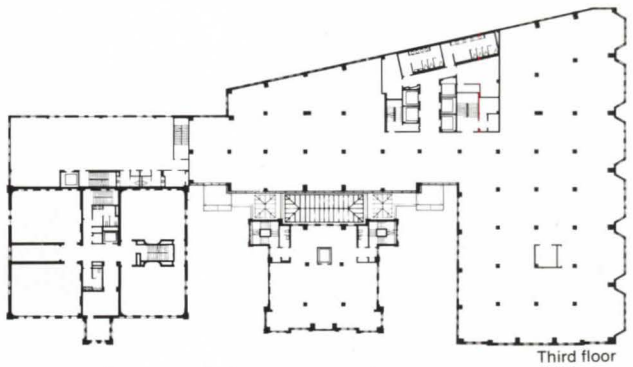
sion to it on 17th Street closely matching the original. Linking Sumner to Magruder and the Jefferson Hotel is a nine-story office building, which forms an irregular L framing the Magruder School. One of the office building's legs runs parallel to the Jefferson across an alley from it and duplicates the Jefferson's height, tan-gray color, and materials. The other leg of gray mirror creates a backdrop for Magruder. The Magruder School, meanwhile, was completely dismantled (after its rear had been lopped off) and reassembled a few feet farther west than its original resting place to become the centerpiece of the complex. Back on either side of Magruder, the architects added two little peaked wings, entries to the office building that mimic the original school and serve as a foil for courtyards to either side of Magruder that further weave the project together.

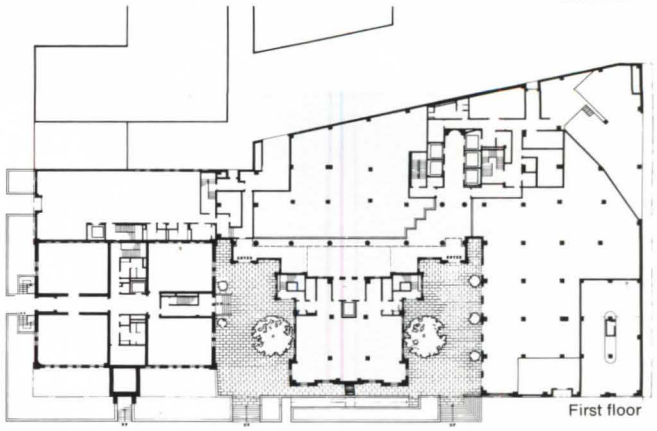
One of the results of moving Magruder School a few feet was to center it and its little courtyards on the landscaped setback entry to Skidmore, Owings & Merrill/Washington's recent ziggurat addition to Edward Durell Stone's National Geographic headquarters across the street. The counterpart created by the two projects makes this block a model of recent Washington design.

The Sumner complex is beautifully scaled and tempered. One can find fault with it: The gray-black curtain wall behind Magruder with its quoins and coursing and cornices is neither *fish nor fowl*; Magruder's new entries look like paper-thin false fronts, which they are; the awkward-looking bays appended to the alley facade of the stone-clad office building do echo those on the Jefferson next door, but make for an ugly, if little seen, elevation; and the four-story atrium joining Magruder with the office building behind it tries to incorporate pieces from almost all the exterior elements but ends up a mishmash.

More important, however, the complex "keeps the scale of the street," as partner-in-charge Warren Cox, FAIA, puts it. And, he says, it embodies two lessons for building in cities, especially Washington, namely that "part of the statement is that there shouldn't be a statement—especially in tight urban spaces—and that you can hardly make things too small." □







Intricate Composition Of Stepped Facades

The 1001 Pennsylvania Ave. office building. By Andrea Oppenheimer Dean

Situated on the "nation's main street" just across from the Federal Triangle, 1001 Pennsylvania Avenue is the most prominent, complicated, and thoughtful single example of the new Washington buildings. A very large (795,000-square-foot) office building with retail on the lower levels, it is directly opposite the Romanesque Old Post Office and the monumental Internal Revenue Service building (part of the Federal Triangle), while the Beaux-Arts former Evening Star building faces it from the other side of 11th Street on Pennsylvania. By comparison, its neighbor across 10th Street, the strident and muscle-bound giant FBI building, underscores the restrained good taste, freshness, and sense of agility that Hartman-Cox (with Smith, Segreti, Tepper) managed to confer on 1001 Pennsylvania despite its size.

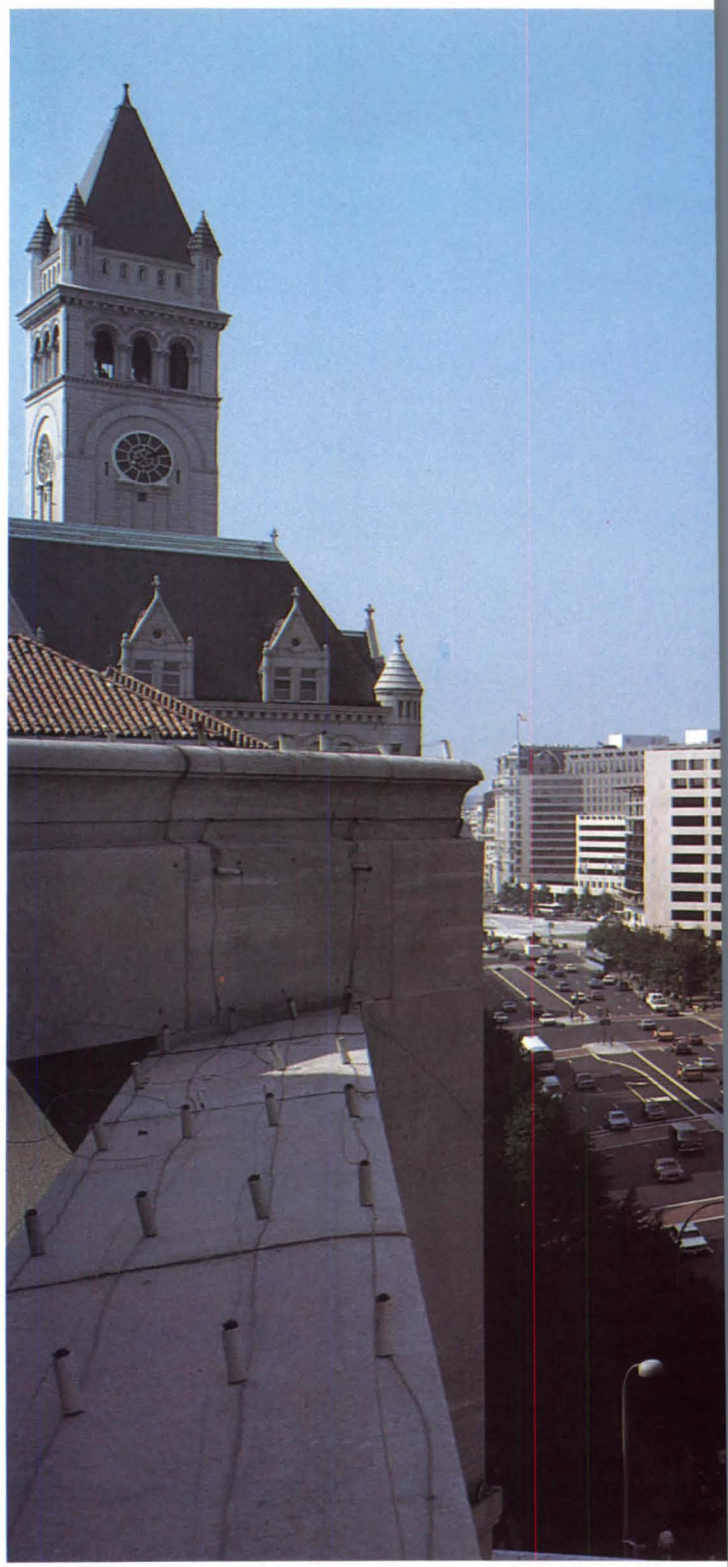
Though the firm does have its recognizable signatures, its buildings are varied in style and conception. The reason, says George Hartman, FAIA, is that "part of responsible urbanism is to have stuff look like what it is, where it is, and when it is. You need very different solutions for different sites and problems."

The main problems posed by 1001 were to relate to the best of its context, as well as the neighboring commercial downtown; to disguise the building's bulk; and to preserve four small, brick, turn-of-the-century buildings on 11th Street, plus the stately 1909 U.S. Storage building on 10th Street, with its paired six-story arches.

Hartman and his colleagues began by analyzing and applying the rhythm of the Federal Triangle—horizontal buildings with vertical emphases. They picked up the major cornice lines, composed their building of vertical elements that could rise 15 stories on the avenue (on which the height limit has been raised to 160 feet to encourage development), and stepped it down on the three lesser streets to relate to existing buildings. They employed the "Washington solution" of preserving old buildings (or just their facades) on the site and showing them off with a set-back new building, but gave "facadism" a new twist by making the restored antiques look embedded in the new, rather than using the new as a backdrop. And they masked the building's size by layering it and stepping the tiers back as they rise.

The first, fully inflected tier of limestone enfolds the old building on the site; a second, higher and simpler layer of brick and textured limestone steps back 20 feet, as does the innermost one, which is also the highest, most plainly detailed, and flattest of the three. The upward progression is underscored also by variations in fenestration including two-bay storefronts at street level and double-hung sash of different sizes and depths.

All four facades are different. On the three streets, but not on the avenue, the rooflines of all three layers bump up and down to visually underline the inset refurbished facades and create a lively play between old and new. The most reserved, and least inspired elevation, is the one on the avenue where each layer is capped by a flat—not stepped—roofline. The 10th Street elevation is symmetrical, stepping down from each wing to frame the old U.S. Storage building at the middle of the block. The asymmetrical 11th Street elevation steps down to show a somewhat too broad expanse of the second and especially bland third layer to meet a small, brick, former turn-of-the-century palazzo on the corner, where the building's energetic rhythm is resumed to create the E Street elevation.

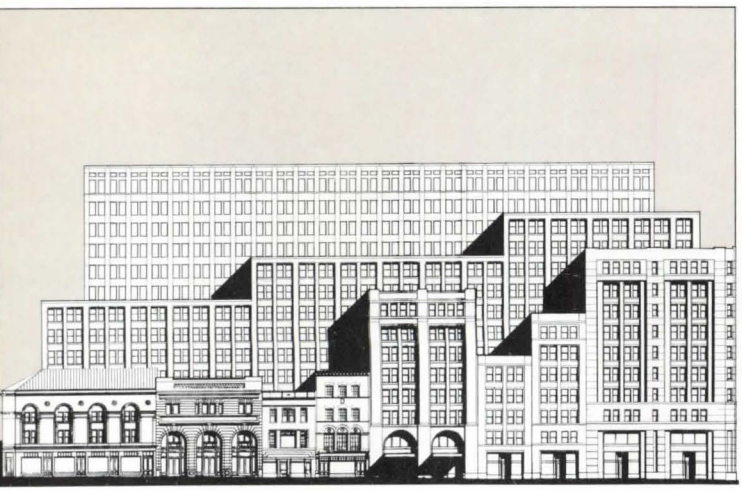


Above, Pennsylvania Avenue elevation and 10th Street facade with embedded 1909 building, seen also far right. Right, unfinished N Street elevation embedding smaller buildings.

Deftly proportioned and detailed throughout, 1001 holds a surprise within in the form of a splendid octagonal, domed, central lobby that picks up themes from most of the exterior elements and is accessible from all four sides through arched passageways. These public spaces are illuminated to create an almost ethereal feeling.

1001 stands as proof of Hartman's contention that the building type best suited to furthering the goals of urbanism is the office building, because it is the most flexible. He feels it should be used to make "the city a more interesting place by incorporating the maximum amount of richness and variety." □

Allen Freeman



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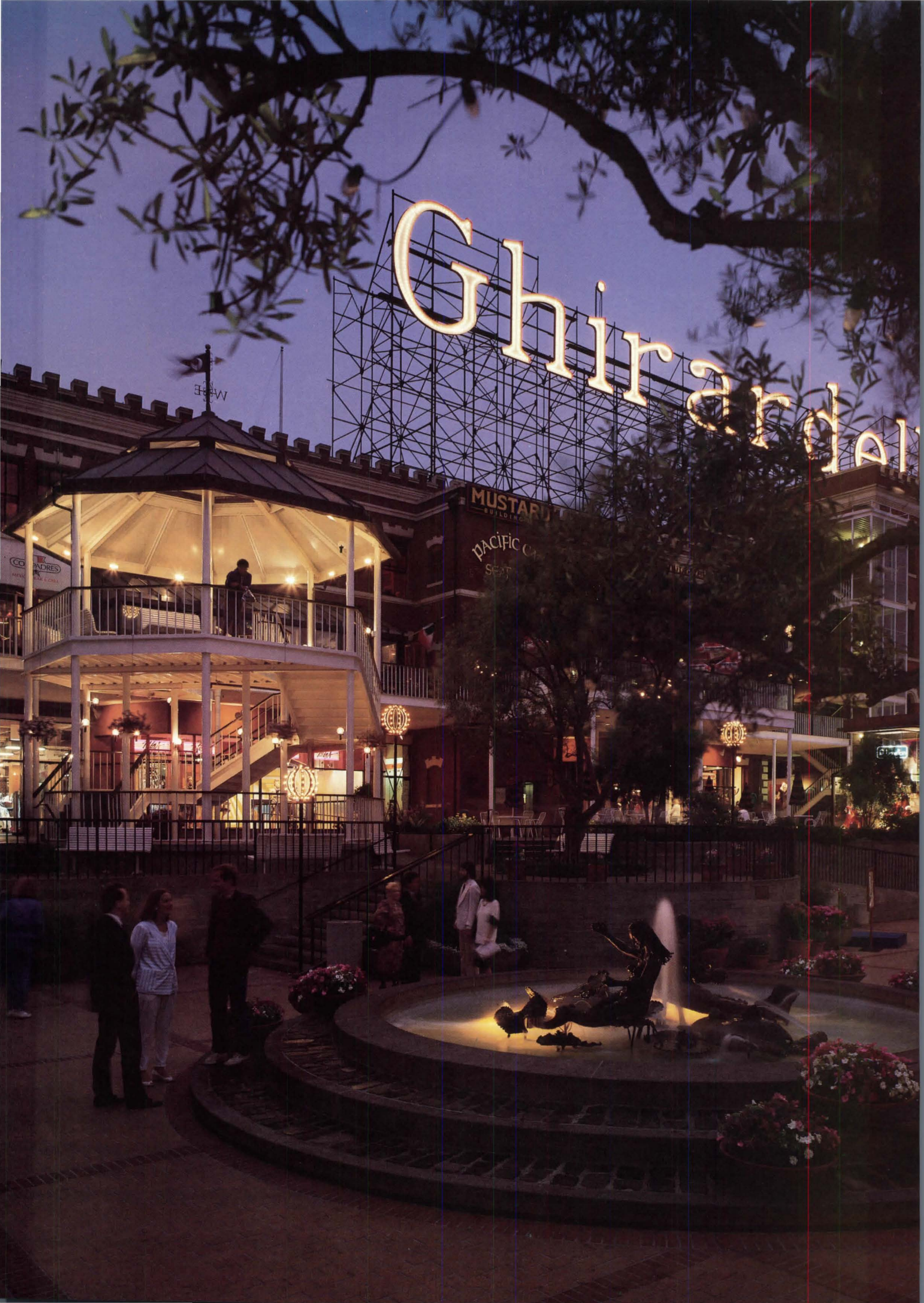
Ghirardelli
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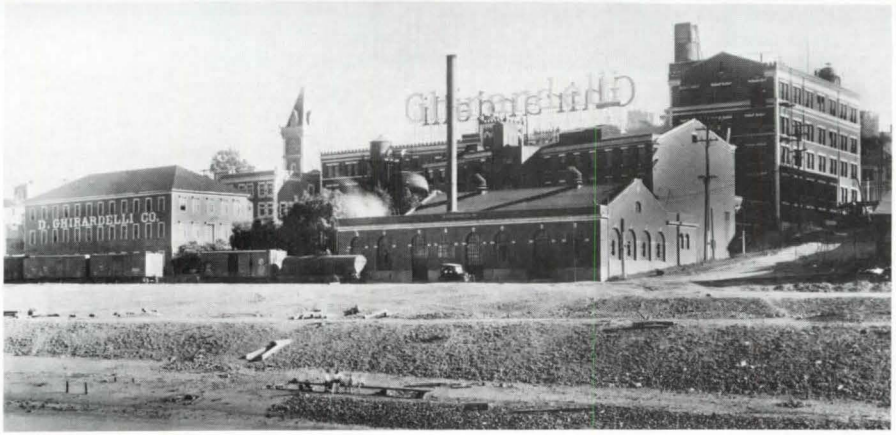


Allen Freeman

'Fine Tuning' A Landmark of Adaptive Use

Ghirardelli Square gets a respectful renovation. By Allen Freeman

Twenty-one years after it opened, Ghirardelli Square still holds a favored spot in the hearts of San Franciscans. It is a link with the city's recent past—before neighborhood shopping areas became trendy and the financial district became a skyscraper canyon—and with the more distant past when the scent of chocolate from the Ghirardelli chocolate factory wafted up the swank slopes of Russian Hill.

Conceived and built in the early 1960s, Ghirardelli Square was America's first urban adaptive use "specialty retail center." Now it is the first of its kind to be extensively renovated. In a continuing project, Benjamin Thompson & Associates is addressing a range of problems including circulation, visibility of shops, tenant mix, and graphics. As Thompson puts it, Ghirardelli Square had become "old-fashioned" by 1983, when his firm began evaluating it.

To a first-time visitor, which I was this summer, Ghirardelli Square seems a curious blend of premodern factory and office buildings woven together with 1960s-style brick, glass, and concrete. With about 90 stores and restaurants on eight levels and 300 parking spaces tucked underneath, it occupies a full block at the end of a commercial strip along San Francisco's north waterfront. The bay view is magnificent, and the location seems prime; near the Union Street cable car terminus and close to, but removed from, the tourist jumble of Fisherman's Wharf.

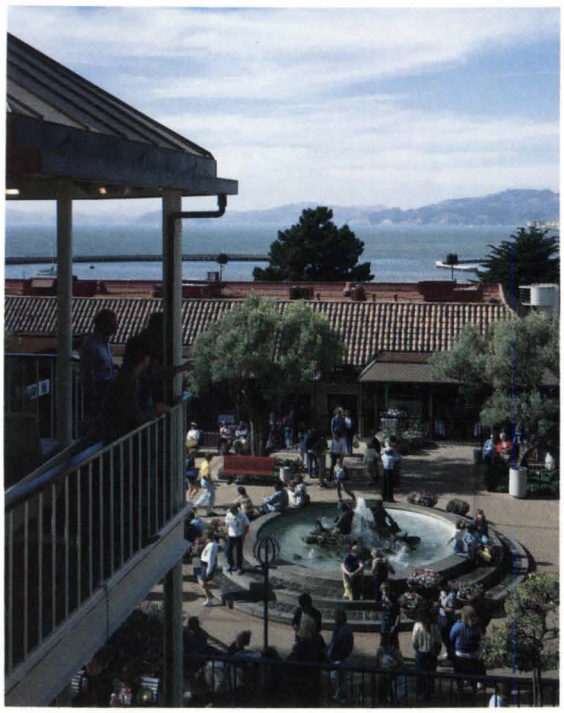
In plan, it is a double doughnut of 10 buildings encircling a pair of open plazas. Built on a slope, its four signature castellated buildings form a solid row along North Point Street on the higher ground and support a 150-foot-long, 15-foot-high "Ghirardelli" sign in lighted letters that face the bay. A chateau-style, gingerbread, four-story clock tower punctuates one end of the row. The lower edge along Beach Street is less lively: two buildings, one of '60s vintage with a strip of high, glassy bays above a punched-in arcade, and the other an industrial building from Ghirardelli's more distant past. Prominent in one of the interior paved courts is a circular fountain with sculpted metal mermaids and frogs, one of the city's top tourist destinations.

For the first half of this century, the block's internal space was a landscaped park for chocolate factory workers to use at lunch hour. The Ghirardelli family, makers of chocolate in San Francisco since 1849, had bought the block in 1893. To an 1862 wool mill that predates the city street grid and doesn't align with it, and a wooden building called the box factory (now demolished)—the Ghirardellis added the buildings along North Point Street. As architect they chose William Mooser, who later designed the Santa Barbara County Courthouse. Last to be built, in 1916, was the clock tower that housed administrative offices.

Twenty-five years ago a macaroni company bought out Ghirardelli, moved the chocolate manufacturing operations to San Leandro south of Oakland, and put the San Francisco block on the market. At the time, two modernist apartment buildings

Opposite, the fountain plaza against Ghiradelli Square's row of early-1900s buildings by William Mooser. This page, top: a 1920s view of the chocolate factory at the foot of Russian Hill from the northwest corner. Stepping up the slope are the 1915 power house, the 1860s wool mill, and the 1911 Chocolate Building. Wood frame building behind boxcars was torn down in the early 1960s when the square was built. Above, complex today from the northeast.

Right, Ruth Asawa's mermaid sculpture on the midlevel fountain plaza. Behind it, the big, new, six-sided 'bandstand' staircase designed by Benjamin Thompson & Associates to draw people to restaurants and shops on the upper levels of the old buildings. Its form is similar to a '60s addition at the northeast corner of the complex. Below, the view from the bandstand's top includes a panorama of the bay. Building with angled red roof and cluttered flat roof is a '60s addition named for William Wurster. Note new paving—a warm, orangey brick—in contrast to original gray paving in photograph at bottom taken in 1985.



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Michael J. Crosbie

were rising immediately to its west—an ominous precedent because they obstruct views of the bay from Russian Hill and, if replicated, would obliterate the topographical contours that give the city its character. Eventually, outrage over these twin high rises spurred a zoning height limit all along the city waterfront. But before that protection was enacted, William Matson Roth, grandson of the Matson lines founder and one-time president of the city planning and urban renewal association, bought the factory, having no specific use in mind but knowing that no public benefit would derive from tearing it down.

Roth retained Wurster, Bernardi & Emmons to study the former factory's possible uses, and with Lawrence Halprin and John Matthias they produced the design that was built. Ghirardelli Square was constructed in two phases, with the chocolate company continuing some operations on the western half of the block while the eastern side was developed. The first phase opened in 1965; the second in 1967.

In the years that followed, Ghirardelli Square proved to be a trendsetter. Together with Joseph Esherick's Cannery two blocks away, a different type of industrial building converted to similar use and opened in 1968, Ghirardelli set off a wave of urban renovations across the country. One measure of their numbers was AIA's creation of a separate category with its own jury for adaptive use honor awards 10 years after Ghirardelli received a 1966 merit award. For the next eight years, the Institute gave 42 "extended use" awards, almost half of the total for these years.

It is forerunner of Boston's Faniel Hall Marketplace, Baltimore's Harbor Place, New York's South Street Seaport, and like

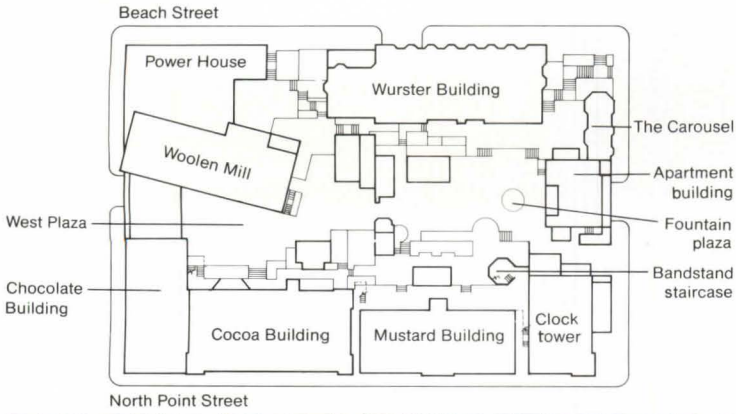
Allen Freeman

evelopments that have brought people back into central cit-es. As Charles Moore, FAIA—who in 1965 praised Ghirardelli n an *Architecural Form* article—points out today, it came about t "the turning point when it seemed downtowns had died and verybody was lost in grim and disgusting shopping malls. With Ghirardelli Square, people began to think that public environ-nent could in some way reach out and touch people."

Despite its influence on architecture and urban development, o one considered Ghirardelli a model of efficient retailing. Com-non wisdom calls for high visibility of shopfronts on no more nan three levels, with at least two anchor stores. Anchorless, Ghirardelli was more like a maze spread over eight levels, with o single level reaching all the buildings, with dead ends, and nops along single loaded corridors. "There is high adventure even *finding* some of the upper floor enterprises," Moore wrote in 1965. He also noted that the square seemed to be "filled with San Franciscans and not tourists."

But Ghirardelli Square's heyday was a decade ago; by the early '80s, profits were waning, its paved surfaces were wearing, and the '60s infill seemed dated. Its remoteness was now working against it as more convenient, upscale developments like Embarcadero Center and trendy neighborhoods with their own fashionable restaurants competed for the same trade. At the same time, areas like North Beach were becoming choked with shops, mostly for tourists, for whom the novelty of adapted old buildings was wearing off.

Roth sold Ghirardelli in 1982, the year that the entire complex, including the Wurster additions, was placed on the National



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Top photo, glass shed roofed addition and brightened shopfront just inside the east entrance. The little addition alone reportedly generates $750,000 in business yearly. Above, the west plaza: Use of neon signs (just behind people in photo) is new to the square; Cocoa Building sign (top left) is one of a series designed by Thompson for the major buildings. Directory sign (right) is also new. Opposite, Thompson's stair and Mooser's tower.

Register of Historic Places. The new co-owners, an insurance company and a real estate developer, hired the Edward Plant Co. of San Francisco to manage and improve it, and, on Roth's advice, Plant engaged Benjamin Thompson & Associates of Cambridge, Mass., and Lanier, Sherrill & Morrison of San Francisco. As a former owner of Design Research stores, Thompson had been an early Ghirardelli Square tenant; coincidentally, he served on the honor awards jury in 1966 when Ghirardelli was cited. Albert Lanier, principal of the associated firm, had advised Roth through the years. Their stated goals were to clarify all circulation; make shops and restaurants more visible and accessible; increase local patronage while welcoming tourists as a "secondary market segment"; and boost outdoor cafe seating and use of public spaces. Though all exterior changes had to be approved by the local landmarks board, Lanier says the board was "much more forgiving on the newer structures than on the old ones."

Most of Thompson/Lanier's exterior modifications are in place. By far the most prominent and controversial is a "bandstand" staircase (close to Ruth Asawa's circular fountain) intended to entice people to the upper reaches. Traffic studies had shown that only about one in ten visitors found their way up from the fountain plaza. Donn Emmons, FAIA, of the original design team generally endorses Thompson's changes but calls the stair "too big, too bulky, insufficiently used, and detrimental to the central space." In partial defense of the stair, Thompson says it hasn't been landscaped properly—flowers, greenery, and benches are to surround the base. I find it unobjectionable.

Two less noticeable changes at the fountain plaza are short flights of stairs down to the large restaurant building and a chamfer on a concrete planter that makes stairs leading up from the plaza more visible. A Plant Co. spokesman says the latter change alone cost $17,000.

Elsewhere, large signs have been added, each with a distinctive logo and colors to identify the major buildings. The signs—like the bright new awnings, glassy bow storefronts, and brick paving replacing concrete—decidedly enliven the complex by making it more visually stimulating. Other changes are designed to be unobtrusive, including a new shop at the top of the staircase at the square's northeast corner, originally a pair of rest rooms badly misplaced in a prominent location. Thompson et al. enlarged the space by replicating a pair of brick arches directly in front of an original pair and covering the space with a copper shed roof similar to those elsewhere in the square. The profit-generating change is almost invisible.

The renovation of Ghiradelli Square is being done as fine tuning—new paving here, different tenants there, clearer graphics everywhere. Dozens of changes great and small, none of which would make much difference by itself, apparently are making a difference for the owners. According to Plant Co. figures, sales of $28 million in 1982 are projected to pass $40 million this year. Over the same period, gross income is up 50 percent and net operating income nearly 60 percent.

Understandably, some San Franciscans are unimpressed with this kind of success. Lawrence Halprin of the original design team thinks, "They have Rouseified the place. It is changed from a real place to a yuppified cheese and wine place. It has become a formula." Another longtime observer, community planning consultant Jim Burns, says, "Change applied by formulas used elsewhere that refer only to the ledger book will probably not continue to nourish the square as we've known it."

That may be. But to me, the changes so far were merited on practical and/or esthetic grounds. Whether Ghirardelli Square appeals to avant-garde yuppies or old-garde San Franciscans, the important issue is continued respect for and use of the chocolate factory buildings. In response to the Rouseification charge, I asked Plant Co. managing director William Anderson Barnes what would have happened if Ghirardelli Square had not been extensively renovated. "Our fear was that signs of middle age, if not corrected, would have meant additional declines in business."

All of which is a reminder of architecture's fragile position—even landmark architecture—in the purgatory between commerce and art. □

Allen Freeman

Heritage

Richardson Library Returned To Its Original Luster

Henry Hobson Richardson's Austin Hall at Harvard law school, completed in 1883, is one of the oldest law school buildings in the country and is listed on the National Register of Historic Places. Despite this pedigree, it did not age gracefully. At more than a century old, the building's exterior was marred by grime and deterioration, while the inside had undergone a series of renovations (the most extensive and damaging done in the mid '50s) that had preserved little of the building's original character.

Goody, Clancy & Associates of Boston (aided by preservation consultant Ann Beha Associates, Boston) has restored Austin's exterior luster while reviving its interior to a point that is compatible with its contemporary use.

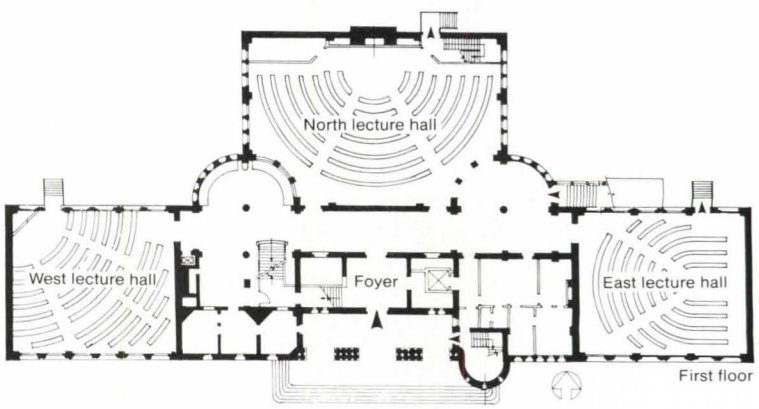
It is on the exterior that this $1.1 million restoration project receives its highest marks. The guiding principle in cleaning the masonry was to not over-clean it. Project manager Ralph H. Tolbert, AIA, explains that there is danger of bleaching and streaking the material in an effort to remove every bit of dirt, as evidenced in another of Richardson's local buildings, Trin-

ity Church. Austin Hall's great Ohio sandstone arches on its south side had, in fact, been sandblasted 10 years earlier, causing permanent loss of much of their intricate detail.

A wall at the building's northwest corner, shaded by trees, was selected to test a dozen cleaning procedures based on research into the geologic properties of Austin's granite, sandstone, and bluestone. Three weeks of testing determined that the best method would be to wash the stone with a hydrochloric acid and detergent solution rinsed with high-pressure water. For delicate carvings, sculpture conservators were employed to clean the stone with tools not unlike dental instruments. Mortar joints on the building's north, east, and west sides were repointed where necessary, while the entire south elevation was repointed. The result is stonework that again glows with color and depth but shows a faint patina of age.

Investigation by consultant Sara Chase of the Society for the Preservation of New England Antiquities of the black-painted window woodwork revealed that the original colors were deep red for the sash and buff for the frame—colors that complement the masonry. These were restored, while the woodwork was patched and repaired and new storm windows installed inside.

Spatially, the building comprises a four-story core with story-



Across page, below and above, before and after views of Austin Hall's south elevation, vibrant after cleaning and repointing, with decorative patterns over entrance now enlivening facade. Above, main hall, looking toward east lecture hall, is illuminated with new chandeliers and black track lighting fixtures. Plan shows new orientation of east lecture hall, similar to original scheme, in contrast to west lecture hall, yet to be restored.

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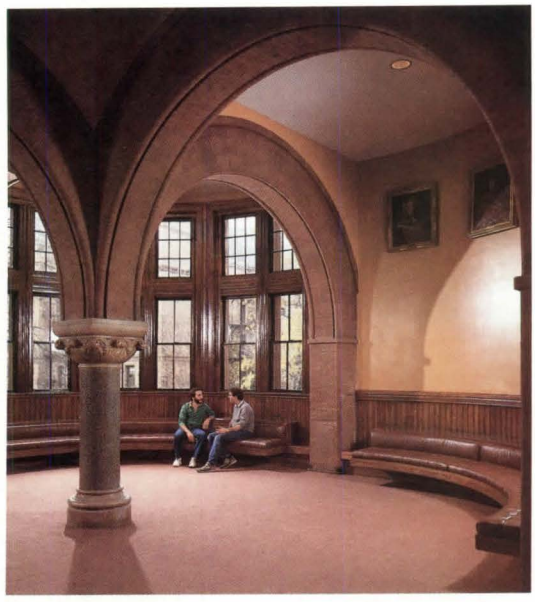

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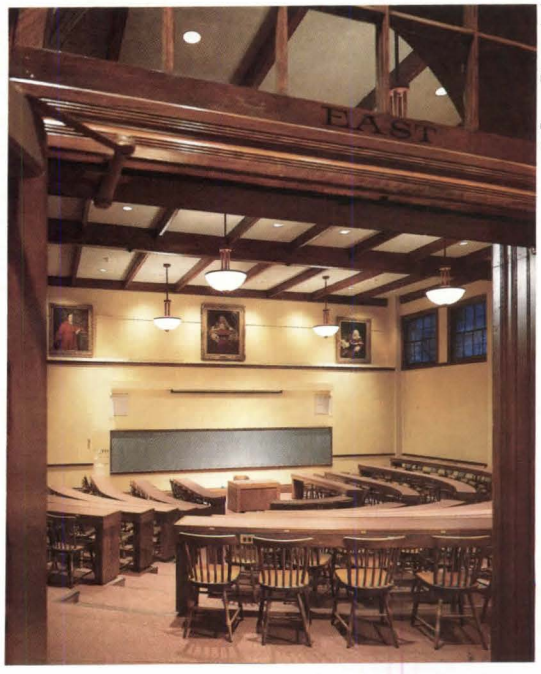

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and-a-half lecture hall wings to the east and west. The first floor is devoted to three lecture halls and some small offices, while the upper floors are occupied by more offices, a court room, and miscellaneous storage. Receiving the most use is the first floor, which is the building's most public. Restoration of the interior was limited to this floor, and at that not to its original condition. Austin, after all, is a working school building, not a museum, and its restoration reflects this fact. "The concern was to return to the strong and consistent use of materials that existed in the original design," explains John Clancy, FAIA, "adapting where necessary for modern uses." Thus, the north lecture hall has refurbished desk tops but with new, hollow legs to accommodate wiring for computer terminals. The east lecture hall, whose seating orientation was changed in the 1950s to a diagonal, has been restored to its original east orientation.

A sitting alcove to the west, never part of Richardson's design, is now appointed with comfortable seats. New carpeting throughout is keyed to the brick arches (which were cleaned). New wainscoting fashioned to the original design was installed where it had been removed. Interior colors were originally dark, later very light. The new color scheme is a middle ground of rich ochre, capturing the woodwork's highlights.

At their most inventive the restoration architects designed sympathetic additions—such as new pendant lights that replace banks of fluorescent tubes, and the lobby floor, which had been installed with terrazzo over the original wood. The design of the new tile floor is based on Austin's decorative masonry patterns and the lobbies of other Richardson buildings.

This restoration is by no means complete. The west lecture hall is still entombed in crumbling acoustical panels and cracked rubber tile, while the other three floors haven't been touched. And the building's disintegrating front steps suggest a textbook example of a lawsuit's progenitor.—Michael J. Crosbie

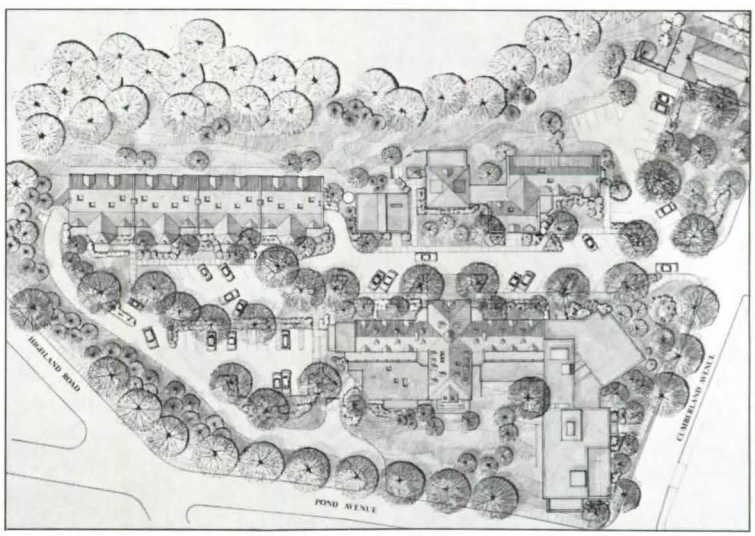
Top left, lobby with new tile floor patterned on Austin's decorative stonework over south entrance. Seven-paneled doors in foreground are new. Top, newly appointed seating area in west alcove with integrated oak furnishings. Above, refurbished east lecture hall with new oak desks, which are wired to accommodate future computer terminals.

Hospital Made into Apartments Flanked by Historicist 'Houses'

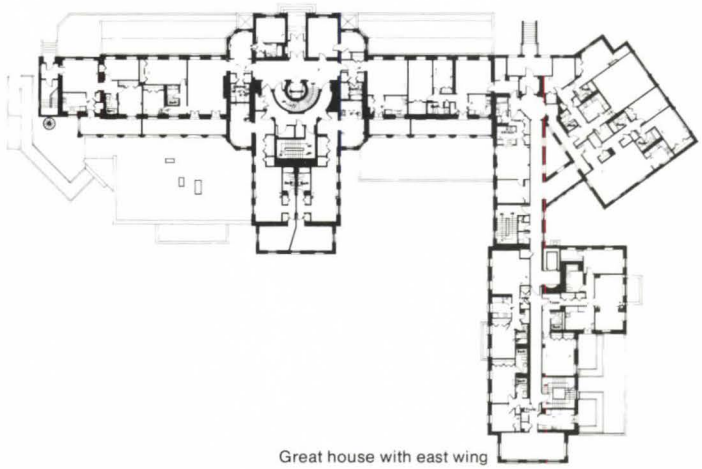
Nothing is more amazing to a citizen of the late 20th century than the humanity and architectural delight of the hospitals our forebears built in the last century. Airy and spacious, with views out to lawns and trees, with handsome details that express a sense of dignity and public importance but preserve a residential scale, they possess a humanity that must have been taken for granted in the days before our hospitals became huge factories for processing the sick.

The Free Hospital for Women in Brookline, Mass., part of greater Boston, is such a building. Shaw & Hunnewell, the architects, were not "hospital specialists" but were rather a firm known for gracious Boston town houses, for the picturesque Wellesley Town Hall, and for the original Fannie Farmer Cooking School. Their Free Hospital opened in 1895 in a landscape setting designed by the firm of Frederick Law Olmsted, just across the street from what is now called Olmsted Park—a link in Olmsted's Emerald Necklace, the chain of parks that the great landscape architect threaded through Boston in the latter decades of the 19th century.

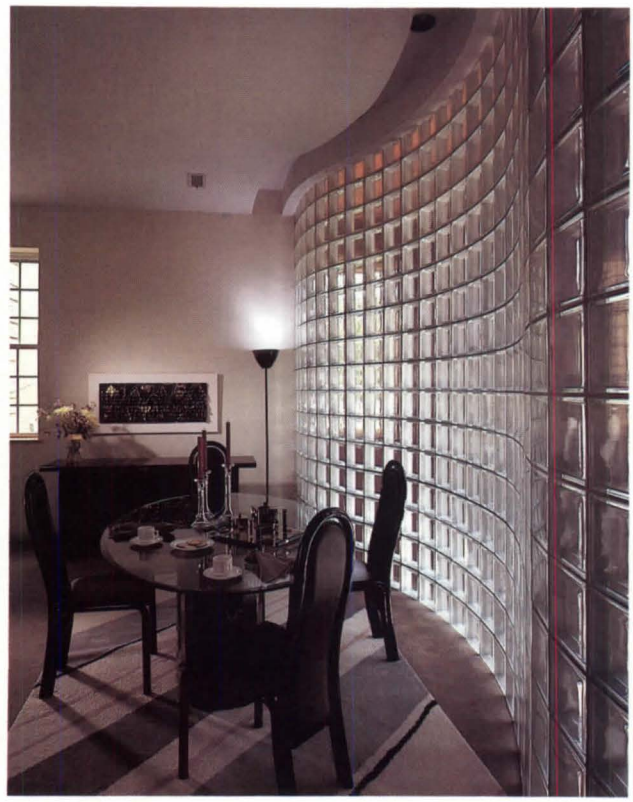
The Free Hospital abandoned its buildings some years ago, and they became derelict. Now this fine combination of archi-



Top, main building of former hospital complex (site plan above) renovated into 70 rental apartment units in landscaped setting.



Great house with east wing



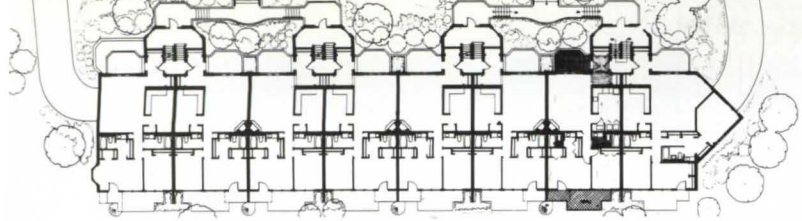
tecture and site has been restored and enlarged as a residential complex called the Park.

The architects for the Park, the Boston firm of CBT/Childs Bertman Tseckares & Casendino Inc., have ingeniously tucked 70 rental apartments, of all sizes, shapes, and heights, into the old hospital buildings. An additional 16 new condominiums have also been built in a style that makes them look like a row of eight Victorian town houses. Walking through the site, you don't notice at first which buildings are the new ones and which are the old, so well has the character of this lovely place been preserved.

The original hospital is made of pale orange-yellow brick, with a rusticated base of granite and trim of limestone. It heaps up in an profusion of arches and gables that give it the character of a great, self-indulgent country mansion. Besides the work of Shaw & Hunnewell, other buildings were added as the hospital grew. CBT has found ways of inserting apartments into nearly all of them, including even the boiler plant. As a result, crazy, out-of-scale details survive from the former hospital into the new apartments, giving a special interest. A dark-stained wood truss, for instance, once needed to span a large refectory, now inexplicably crosses beneath a living room ceiling like a messenger from another universe. Stained-glass windows, carefully restored, appear in improbable places. As always in recycled architecture, the success is greatest where the new wine doesn't quite fit the old bottle, where there are tensions, gaps, ironies between the co-existing past and present.

Where they have built from scratch, in the new condos, the architects have gone to great lengths not to look too contemporary, yet at the same time have avoided self-conscious historic allusions. They've simply built Victorian vernacular, looking to the houses of the neighborhood for models. The crowded site dictated that the condos must have underground parking, and the need to give the resulting garage an efficient plan provides a strong discipline, forcing the condos into a single firm row. The obvious decision to repeat the hospital's yellow brick is another discipline.

Within those constraints, the row burgeons with animation—stoops, terraces, and porches, upper walls that are covered in shingle stained a weatherbeaten green, and roofs that are hipped



Across page, interior in new and remodeled units have dynamic lighting and preserved details. Above, new buildings containing 36 condominium units are carefully composed Victorian.

and gabled like those of the hospital. Windows can be round, half-round, double- or triple-hung. Entry doors have traditional sidelights and blank fanlights. A darker tone of brick is used to create rustication and string courses. Old-fashioned streetlights stand near the entries.

The result is as picturesque a cluster of dwellings as any Victorian might desire, but one quite free of artiness. Stylistically, the houses give the sense of Queen Anne turning into classical revival, but there's no attempt at either literalism on the one hand or jokey, ironic "quotation" on the other. The architects have simply taken a cluster of conventional architectural ideograms that say "house" to any American and deployed them in a relaxed but well-composed way. What looks like a house actually consists of terraces concealing the parking, a flat above these, and a duplex on top, but the sense of a single house remains very strong. The result doesn't have the surprise and freshness of truly distinguished architecture, perhaps, but its low-key, familiar charm succeeds in appealing to a very broad range of sensibilities.

There have been a few losses in the recycling. The most serious is that too much of the landscape has had to be given over to the usual asphalt parking lots, despite the underground garage. Except for porches, no dwelling has any significant private outdoor space. And the interiors of the duplex condos are perhaps a little too dramatic for their size, spatially fractured by zigs and zags: An angled fireplace, a spiral stair, a mezzanine overlook, and a scatter of skylights all impinge on the smallish living-dining area, making it restless and hard to furnish. It's a jazzy modernist space inside a traditional shell. A generous attic storeroom, however, provides an almost unheard-of amenity in today's world.

These new buildings at the Park, like much other recent work around the country, are an example of vernacular style that bridges the once-enormous gap between what architects like and what ordinary people like. To rephrase the words of Venturi, they are handsome and ordinary.—Robert Campbell, AIA

Building with a Checkered Past Renovated as a Museum

Just across the street from downtown Denver's most venerable landmark, the Brown Palace Hotel, is a charming little building that, in the words of its restoration architects, "has echoed with the sounds of schoolgirls and prostitutes, politicians and gamblers, hymns and jazz."

Built in 1880 as the Joseph Brinker Collegiate Institute where young ladies were taught "customary Christian virtues," the building subsequently lost its virtue and became a celebrated gambling hall and bawdy house. Legend has it that an underground tunnel linked it to the Brown Palace in those days.

In 1983 the by then deserted and gutted building was acquired by William Foxley, a cattleman with a marvelous collection of art on Western themes. He engaged architects C. W. Fentress & Associates and John Prosser to make it a Western Art Museum.

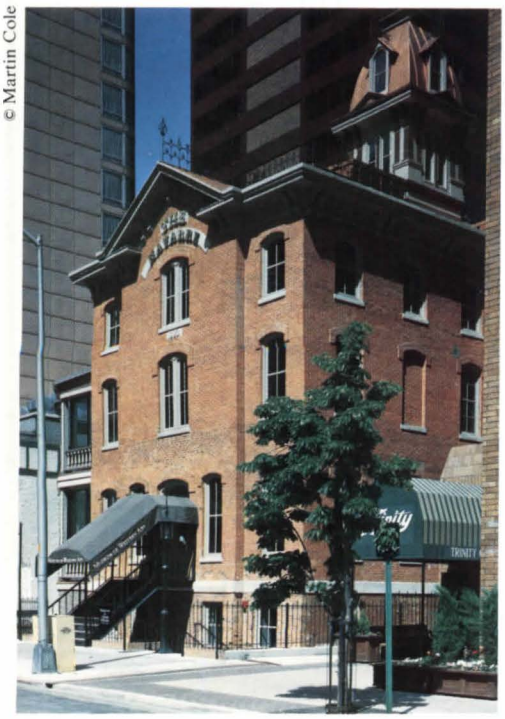
The museum has 24,000 square feet of space on three levels joined vertically by a glazed stair tower bringing light from the cupola above. The small spaces in front of the stair tower have retained their windows and Victorian character; the actual gallery spaces behind it are coolly contemporary, the only natural light coming down from the cupola.

Visitors are advised to start their tour on the third floor, peruse the paintings on perimeter walls, then proceed downward via the stair tower and repeat the experience on the floor below. The third floor is a hollow rectangle, a central opening giving views of the second-floor gallery and, in particular, a spectacular set of bronzes at its center. The first floor has a large gallery for traveling exhibits. The ceiling of this gallery is a vault that pushes up beneath the second level sculpture platform.

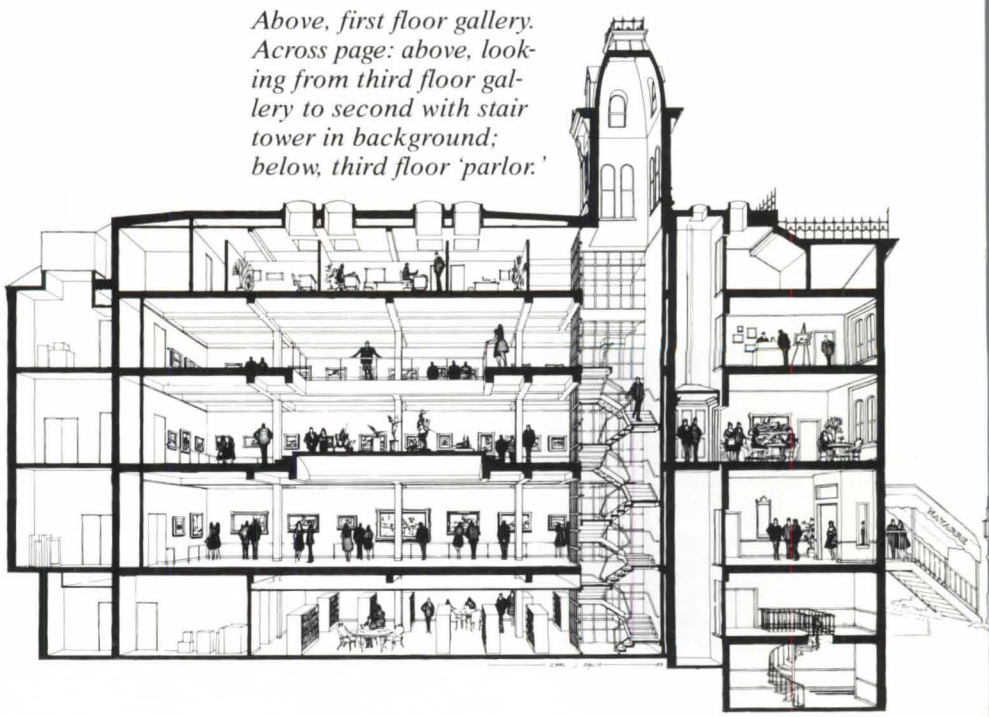
Ceilings throughout are relatively low, precluding installation of a dropped ceiling to hide mechanical and other paraphernalia. It is hidden instead in a two-foot void between the original exterior walls and new interior walls. This room-within-a-room approach allowed structural members to become welcome visual punctuation, and the void provides a buffer between temperature and humidity levels inside and out. Gallery lighting is by low-voltage floods and spots on a thoroughly adjustable three-circuit track system.

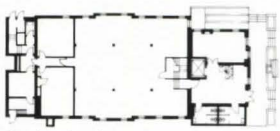
In all, the atmosphere is muted and relaxing, the circulation effortless, and the museum a very pleasant experience indeed.

—Donald Canty, Hon. AIA

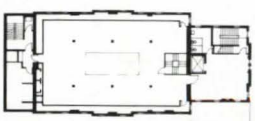


Above, first floor gallery. Across page: above, looking from third floor gallery to second with stair tower in background; below, third floor 'parlor.'

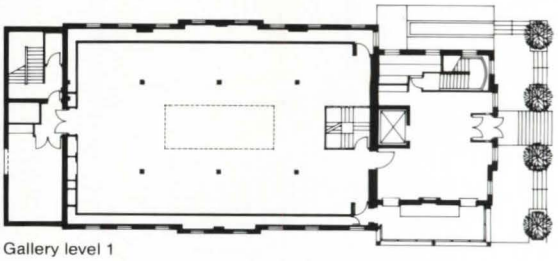




Garden level



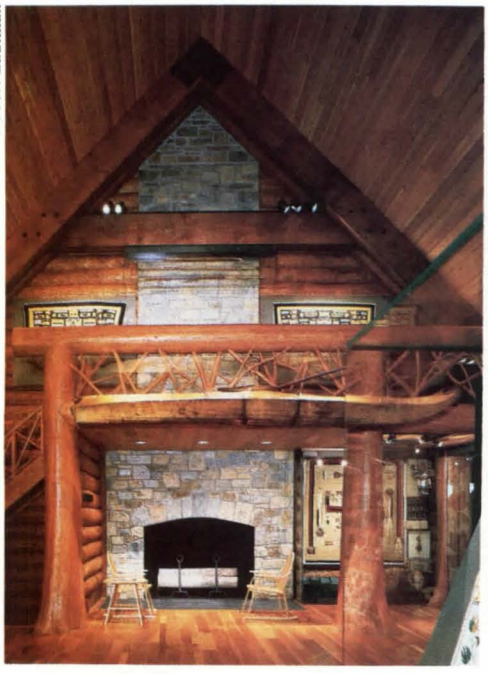
Gallery level 3



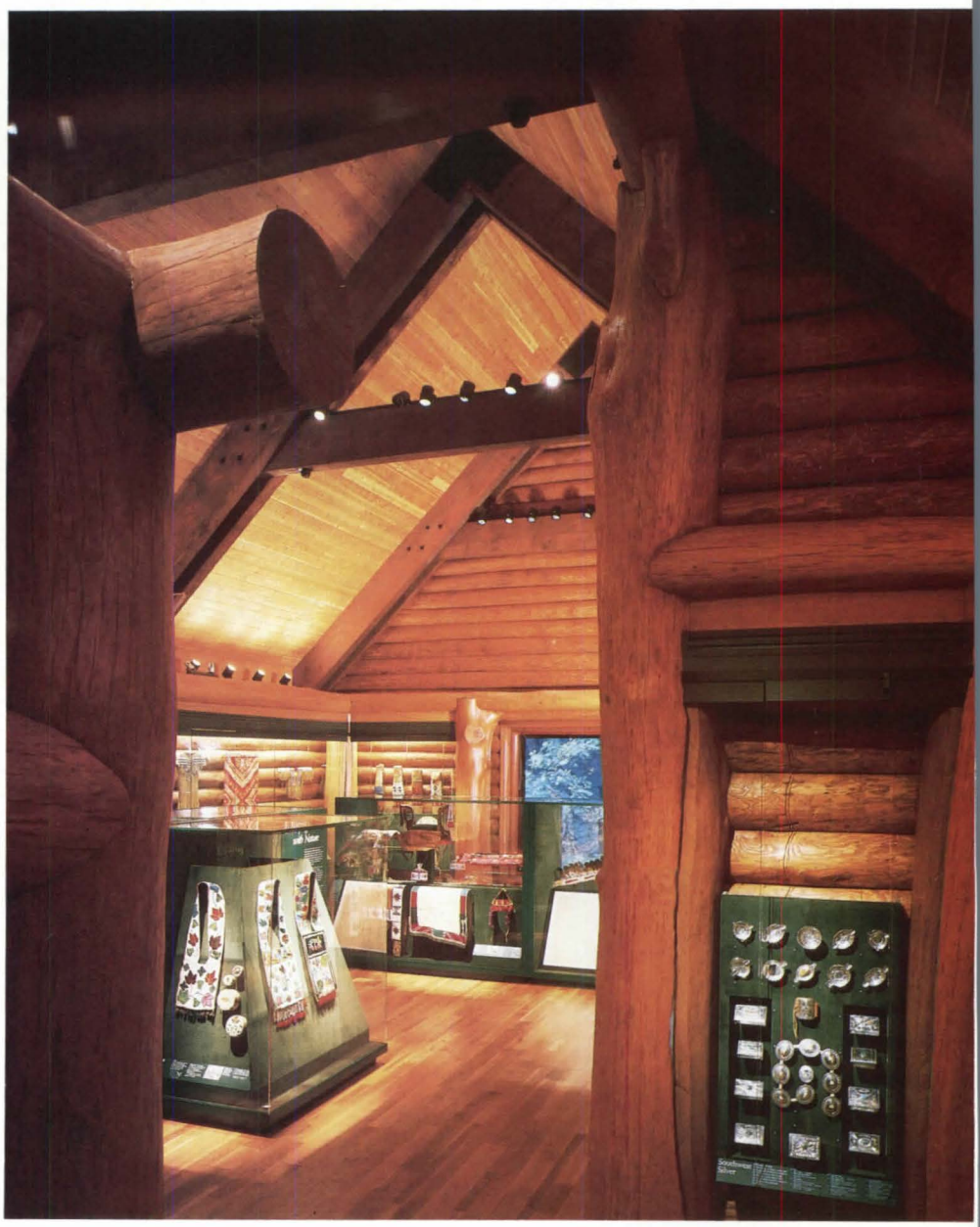
Gallery level 1

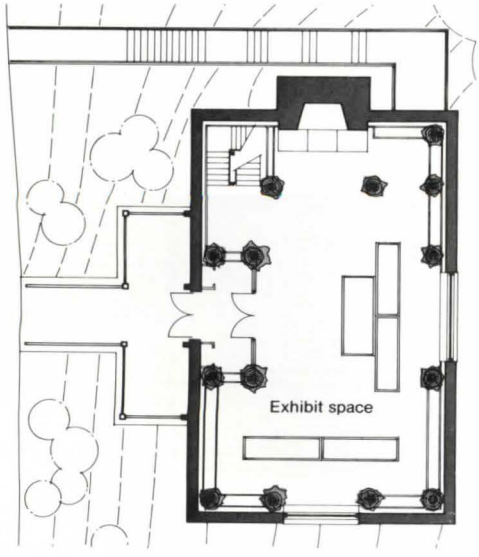
Adirondack Origins Recalled In Museum of Indian Art

James Oesch



Robert Lautman





Tucked within the wooded slope of Hillwood, the 25-acre, Washington, D.C., estate of the late Marjorie Merriweather Post, is a small museum by the firm of O'Neil & Manion Architects for the display of the Post Indian artifact collection.

The museum is designed in a rustic style reminiscent of Post's upstate New York camp, Topridge, where the collection was originally displayed. Sara O'Neil-Manion, AIA, said that she drew from the Adirondack tradition without creating "a dead ringer for Topridge."

To avoid conflict of style and scale with Hillwood's 40-room neo-Georgian mansion and red brick auxiliary buildings that house Post's large collection of 19th century Russian and French decorative art, the architect placed the museum away from the main complex of buildings.

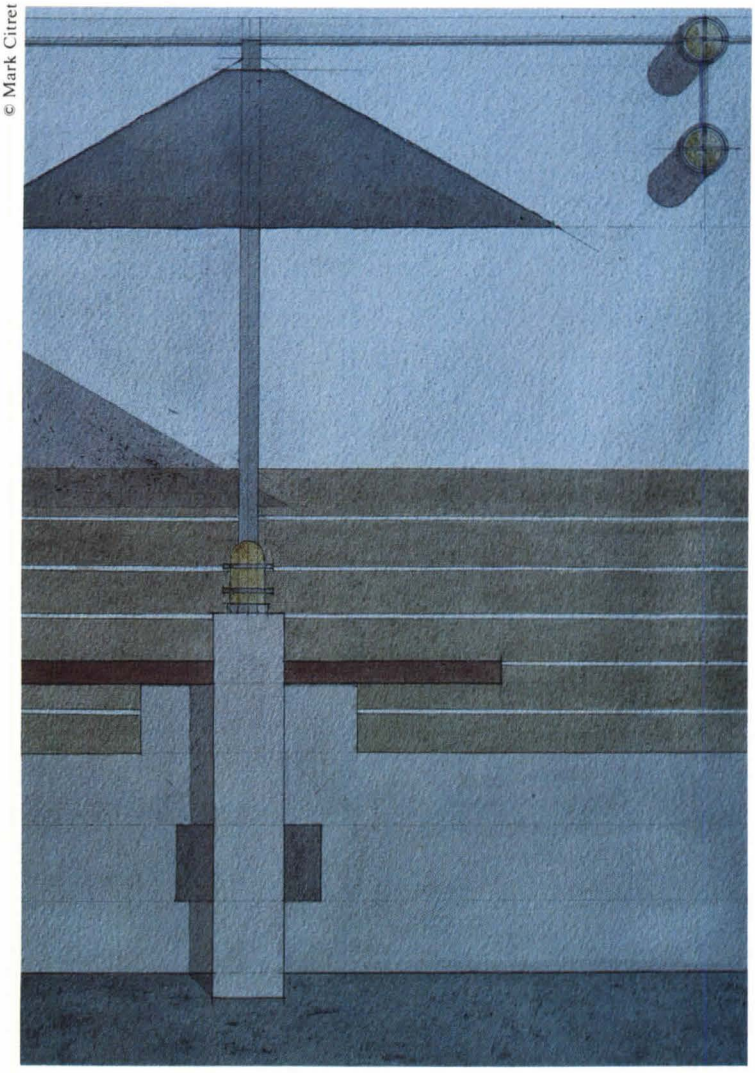
The exhibition area of the 3,000-square-foot building is a single soaring space dominated by rough sawn heavy roof timbers and columns of white oak tree trunks that appear to be growing up through the floor. The 14 trunks support a 300-square-foot loft while they frame the entrance and two rectangular windows. The walls are split hemlock logs, and entwined branches form the balcony railing and define the doorway.

Above, trees frame central door. Opposite page, top, exterior of the museum has bark-edged cedar siding and hand split roof shakes; far left, chairs are grouped around the stone hearth; left, large windows provide views out to the surrounding forest.

The collection is on long-term loan from the Smithsonian Institution, which sets strict guidelines for levels of ultraviolet light and humidity and temperature control. Glass display cases are set directly into the trees, and mechanical and fire protection systems are concealed behind the cases and soffit banding logs.

—Lynn Nesmith

Cafe Delicately Appended to Muscular Wurster Hall



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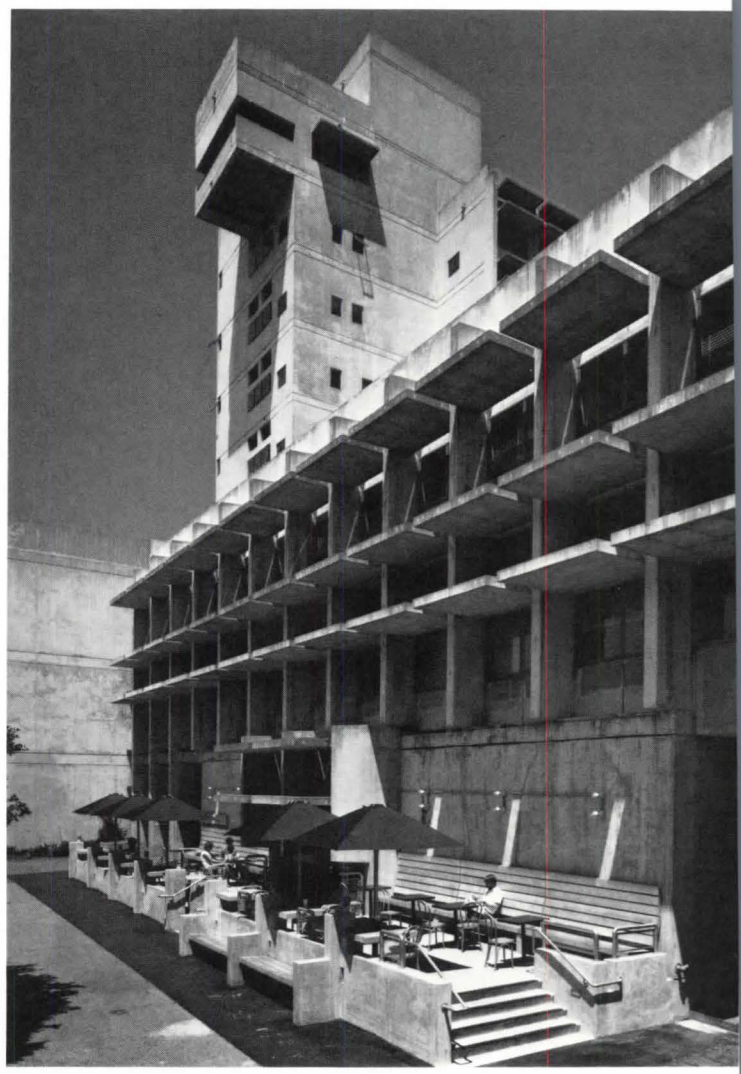

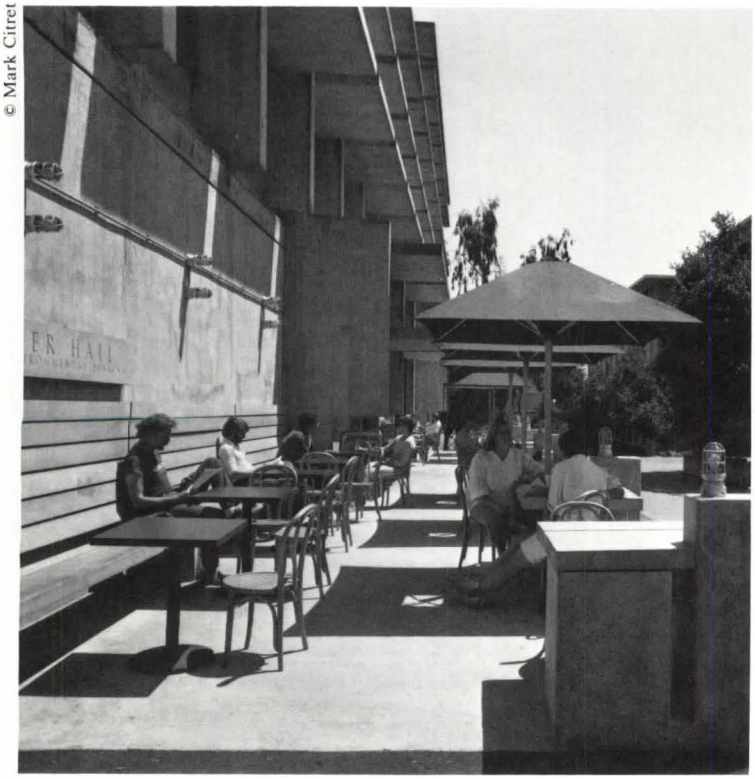

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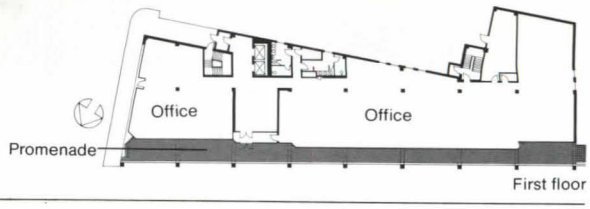
Wurster hall, home of the University of California at Berkeley's college of environmental design, defies indifference. People either hate it or love it for its mountainous scale, raw materials, and muscular form. In designing a cafe for 22-year-old Wurster, Berkeley architect Richard Fernau, AIA (a CED alumnus who also teaches there), warmed to the building's not-so-obvious links with the Bay Area's built heritage. "It's Wurster's toughness that I came to appreciate," says Fernau. "Where this toughness escapes the oppressive and succeeds best in transmitting certain bay region attitudes is in the industrial materials, the simple detailing, and in its peculiar manipulations of scale."

Inside there are high-tech features such as industrial lighting and exposed ducts for this chessboard eatery cum gallery. But it is outside that Wurster's full force was to be reckoned with, and here the cafe incorporates wonderful, soft-edged material translations—thick, cantilevered wood tables; square, green umbrellas; pipe railings; and high-back, bleached wood benches—of Wurster's vocabulary. Placed on a podium, it's a comfortable transition between Wurster and Berkeley's lush, green campus. "We wanted to avoid putting a bow tie on a bulldog," says Fernau. "A cafe is too small a thing to tangle with 10 stories of concrete." This addition meets Wurster on its own terms and displays the same inventive interpretation of context that has come to mark the best of Bay Area architecture.—M.J.C.

Above left, watercolor study of outdoor cafe's details by Fernau's partner, Laura Hartman, and as built, left and above.

Office Building Changes as it Takes Cues from Dual Contexts



© Steve Rosenthal

When you first see this new office building on Congress Street in Boston's warehouse district, it impresses you as a finely detailed, sleek steel and glass structure of Miesian reverie. But become more familiar with its neighborhood and you find this design to be not another placeless glass box but an industrially inspired container that takes all its cues from the context.

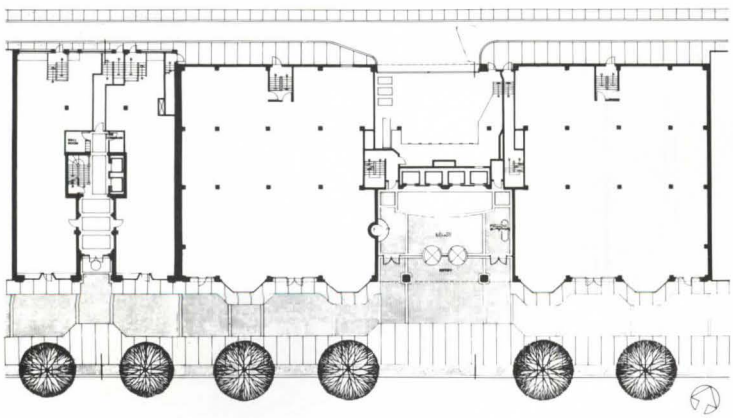
James Alexander, AIA, of Notter Finegold & Alexander, Boston, says that he has always admired the Congress Street Bridge that spans the Fort Point Channel. The distinctive feature of this lift-span bridge is an enormous block of concrete held in a rust covered steel cage that serves to counterweight the raising of the roadway. This modern day triumphal arch has the bare-bones beauty of unselfconsciously designed engineering, and Alexander found it the perfect inspiration for the channel side of his building. The other three sides are clad in brick as they face warehouses. The architect imagines the channel side as what one might find if the brick wrapper were peeled off. The thin struts that cross the facade are an expression of the building's bracing, while its color, with green-tinted glass and darker spandrel panels, relates to the cast of the channel's water. The precast concrete pile base suggests the bridge's pylons.

The wood deck that extends along the channel side allows access to a small lobby, offers spectacular views of the city, and provides a pedestrian connection between the Congress and Summer street bridges.—M.J.C.

Michael J. Crosbie

Above, building from across channel and, right, view of its deck.

Large Building Deftly Inserted Into a Sensitive Neighborhood



nserting a quarter-million-square-foot office building into the elicate (and jealously protected) fabric of Boston's Back Bay s a job to blanch the bravest architect. But at 399 Boylston treet, CBT/Childs Bertman Tseckares & Casendino Inc., has erformed the miracle, shaping a building whose bulk is nearly nvisible to the pedestrians promenading past it in a streetscape t helps to enliven.

Few neighborhoods in the U.S. can be as difficult to build in is the Back Bay—never mind for an outsize building like this, ut for any building at all. Since the middle 1960s, when the eighborhood first defeated a proposal by the mayor to permit igh rise construction on the neighborhood's corner sites, the itizens of the Back Bay have been sophisticated enemies of isruption and change. Partly thanks to their vigilance, the Back Bay's historic architecture has remained intact in the last 20 ears during which the neighborhood has undergone an apothe- sis, transforming itself from a drab quarter of cheap rooms in eteriorating buildings (the owner-occupancy rate at one point ell below 1 per cent) into a yuppied heaven of condos, bou- iques, and sidewalk cafes. Despite the displacement of students nd transients that accompanied the change, and despite the illy displays of competitive consumption that confront the eye ow, one can't regret the revolution. The Back Bay has again ecome a great urban neighborhood, filled with public life in a setting of humane architecture.

Into this vital context the vast new building slips almost unnoticed. It is actually two buildings. One is Warren Chambers, an outstandingly handsome eight-story brick and marble structure built in 1896 as doctors' offices. The other is 399 Boylston, an all-new 13-story office building with shops at the ground floor. Originally, the developer proposed to demolish Warren Chambers. But the Back Bay Architectural Commission—the agency that administers the design controls for the historic district—rejected that idea, refusing permission to build until it had succeeded in negotiating an agreement in which Warren Chambers was fully renovated as part of the new project. Federal preservation tax credits on the old building helped make the agreement possible.

The result is emphatically not a case of facadism. Warren Chambers, meticulously restored with much refurbishing of bronze and marble, retains its full volume and presence as a separate building. Facadism, oddly enough, is a term better applied to the new building, where a thin limestone and brick front appears to have been slipped like a mask in front of a taller dark glass modernist box. The flatness of the masonry detailing supports the illusion of a false front, which is especially strong near the building's top where two Palladian stage flats project upward into space, silhouetted against the sky-reflecting curtain wall behind them. Postmodern to its core, 399 Boylston achieves the success of honest fakery: You can perceive the insubstantiality of the facade and at the same time enjoy the appropriateness of its scale, rhythm, and materials.

One certainly might wish 399 to be smaller. In a way, the task of the architect has been to disguise an obtrusion too big for its site. But the disguise has been carried out so well that the result works. The new building is as handsome as the average of the older ones on the block, and its larger, more flexible floors are far better suited to the economy of today.

The building has a base, a middle, and a hat, or rather two hats. Alternating bays and flat brick panels pick up the town house rhythm of the neighborhood. Windows either are punched through the brick like those of Warren Chambers next door or else are bays recalling those of the typical Back Bay houses. Limestone trim keeps the proportion of stone to brick to glass close to the ratios in older buildings. A delicate shadow line, like a penciled accent on a drawing, passes above each window, signifying, with minimal means, an attitude of care and craftsmanship.

These are buildings a pedestrian can interact with. There are no blank walls, no vacuous plazas or pompous lobbies. The lobbies exist and are attractive, but they are small; most of the street facade is filled by shops with doors you can open and walk through into stores you can enjoy (if perhaps, in the case of $400 shoes, by way of fantasy).

If 399 is a fancy front pasted onto a simple loftlike interior, so, in fact, was the typical Victorian street building. Such buildings express an awareness of the dignity and importance of the public realm, the need to confront it in full dress. Like them, 399 is an example of architectural good manners.

—Robert Campbell, AIA

Left and below, new building's brick and limestone facade abuts refurbished Warren Chambers building and hides glass top from street; below right, lobby is dominated by floating mezzanine.

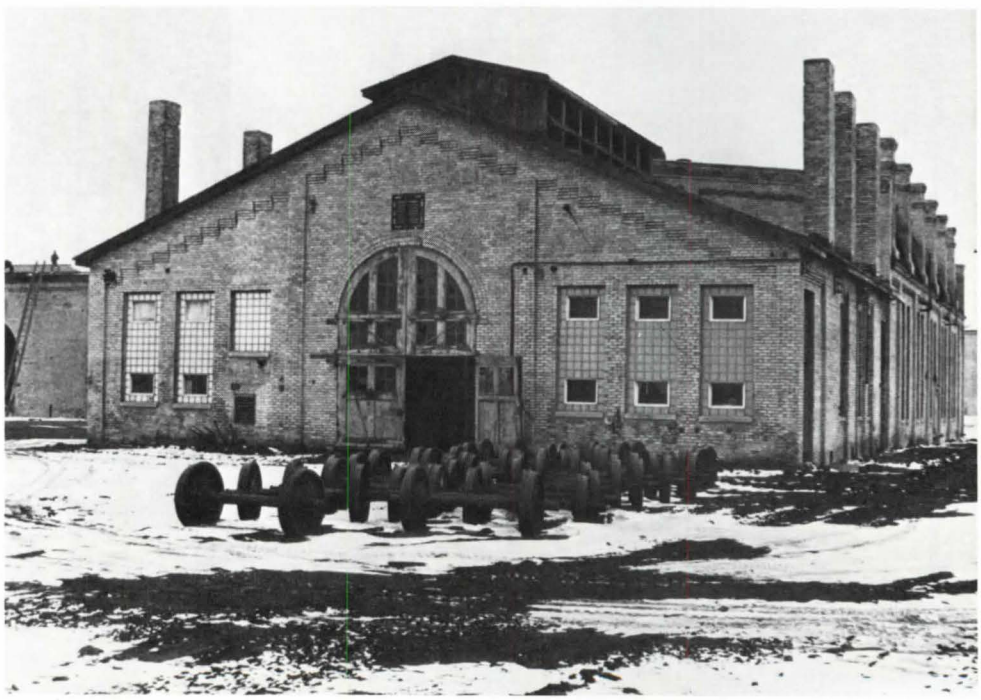
© Steve Rosenthal

Sturdy Blacksmith Shop Becomes a Children's Museum

Photographs by Burt Levy

The Children's Museum opened in late 1981 on the first floor of a multistory Minneapolis warehouse under renovation as a mixed use project. Two years later the museum had outgrown its 6,300-square-foot space and began looking for a new home.

Across the Mississippi River, in St. Paul, Winsor/Faricy Architects was engaged in the renovation for adaptive use of a complex of seven buildings known as the Como Yards. Newly named to the National Register of Historic Places, the complex had been built as a major terminal by the Northern Pacific Railroad in the 1880s, when St. Paul was the gateway to the Northwest. The 100-year-old complex was being converted into a multipurpose development that would eventually include specialty shops, apartments and condominiums, sports facilities, a clinic, and both



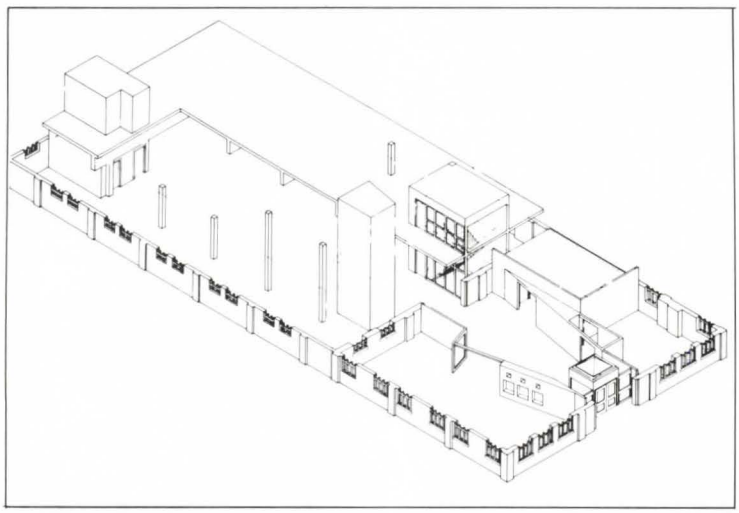
Above and left, before and after views of the 1917 segment. Top, the restored original with its procession of Queen Anne chimneys.

commercial and light industrial uses. Winsor/Faricy's Jim Cox, AIA, project designer for the complex, was determined to retain the historic character of each of the seven buildings and to incorporate the railroad theme wherever possible. One requirement was to find the right "fit" of user to each building.

The Children's Museum was a propitious match for the Northern Pacific's former blacksmith shop. Once the accumulated baggage of years of abandonment was cleared away, the building's battered old architectural bones were rather handsome. The original portion, completed in 1885, featured a mansard roof and 12 Queen Anne-style chimneys (one above each former smith's station). A 1917 addition, while less distinguished, had a usable light monitor on its shed roof.

The window proportions, once elegant, had been altered during a postwar renovation, and the multipaned windows filled in with glass block. The windows were replaced with triple-glazed windows with small panes suggestive of the originals. Further investigation of the building's original specifications revealed that the roof had been fabricated of metal sheeting. A new roof, heavily insulated with urethane foam to meet the requirements of Minnesota's energy code, is made of sheet metal panels. Window trim has been painted a rusty red to match them.

For the building's interior architecture, the museum selected



Below, exposed building systems are teaching tools; bottom left, miniature cityscape; bottom right, station and locomotive recall building's past. Opposite, scissor trusses over meeting room.

Meyer, Scherer & Rockcastle, the firm that designed its original space. MS&R was familiar with the museum's participatory philosophy and program and worked in collaboration with its exhibition designer, Dean Wilson.

An important part of the program was the need for more usable floor space than the existing 9,255 square feet in the new shell. A 3,000-square-foot basement was carved out and two more levels added. The second and third levels are supported by a heavy timber superstructure that rests on new basement walls placed inside the original exterior foundation. The solution doubles the existing space in the building.

Entering the museum at what was the one-story addition to the original building, the visitor comes into a tall, one-story space with a shed roof and functional light monitor. The exposed mechanical ducts and low-hanging industrial light fixtures are suspended beneath the metal roof trusses. Low, painted partitions have been constructed in this entry area, directing visitors toward the exhibits. The low walls accentuate the height of the roof but are also scaled to the height of small visitors.

On one side, the partitions reveal the museum store; on the other, they hide restrooms and a visitors' waiting room. MS&R's color palette is an appealing assortment of Lik-em-aid colors, warm marigolds and peaches, that bring out similar tones in the brick walls. A centrally placed ticket booth is located between brick walls that mark the division between the original building and its 1917 addition. Once past it, visitors are free to explore two floors of exhibits.

On the first level, these comprise a miniature townscape. Children can operate a gantry crane, deposit money in a bank, watch themselves forecast the weather at a miniature television station, play with Legos, walk on crutches in a clinic, or climb aboard Main Street's "awarebus." Upstairs, the museum's mezzanine level includes holograms, computer games, and a British castle, complete with throne. Lines are long.

The new facility, winner of a recent Minnesota Society/AIA honor award, is frequently bustling: Attendance has tripled since the move, and the museum may soon have to take advantage of the planned expansion space. But even on a busy day, it retains a kind of quiet dignity befitting to a century-old structure. As the Minnesota jury noted, "It's possible to get a sense of the building before it was remodeled." —JOANNA BAYMILLER

Ms. Baymiller is deputy director for planning and development at the Minnesota Museum of Art, St. Paul.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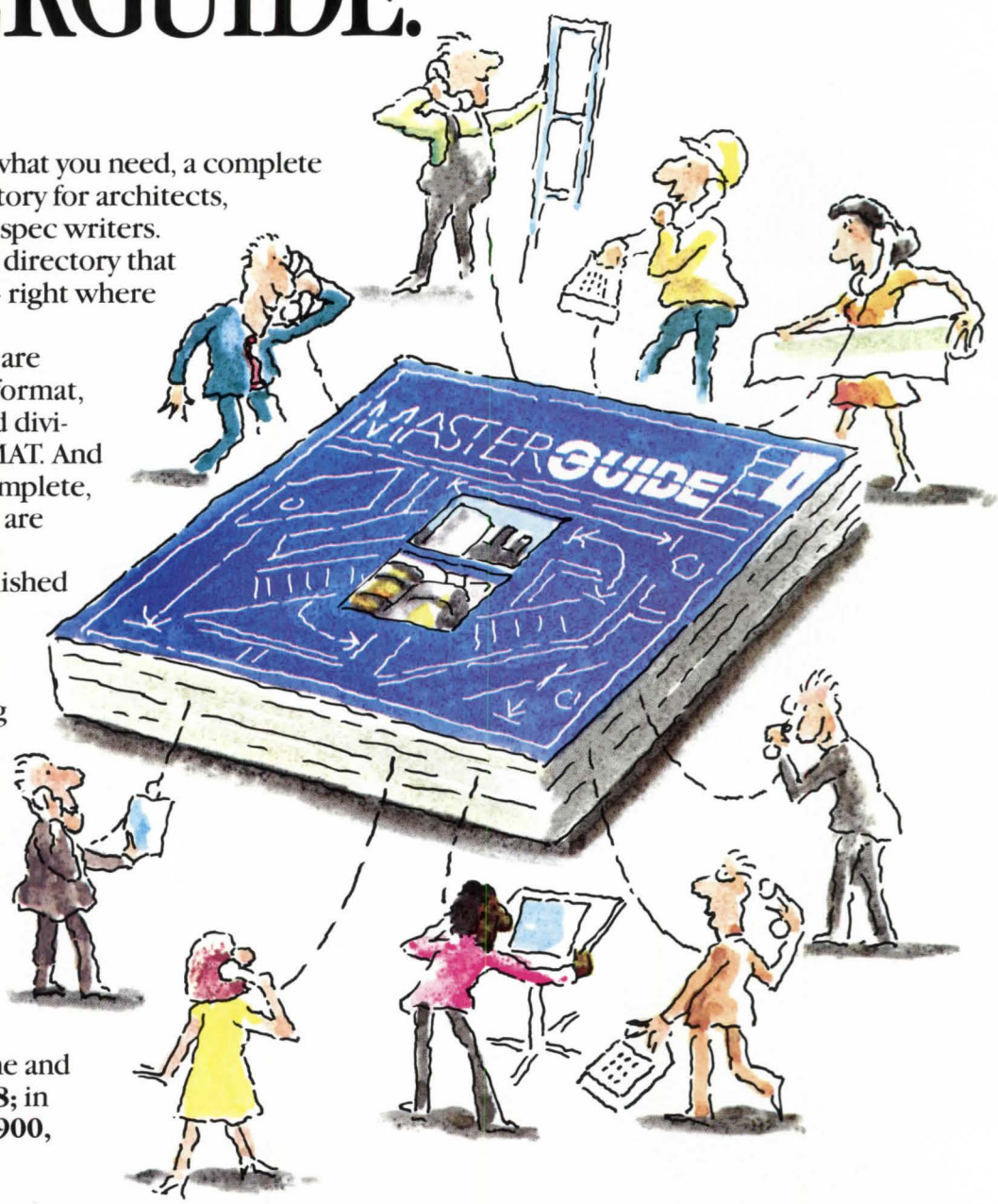

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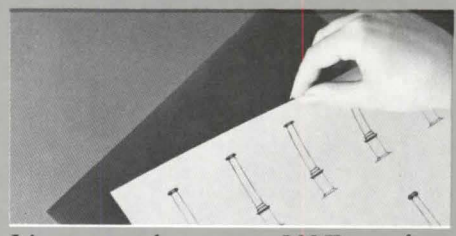

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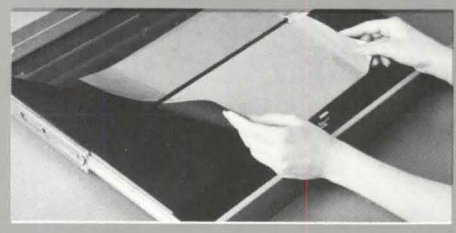

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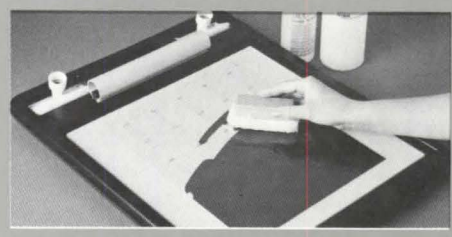

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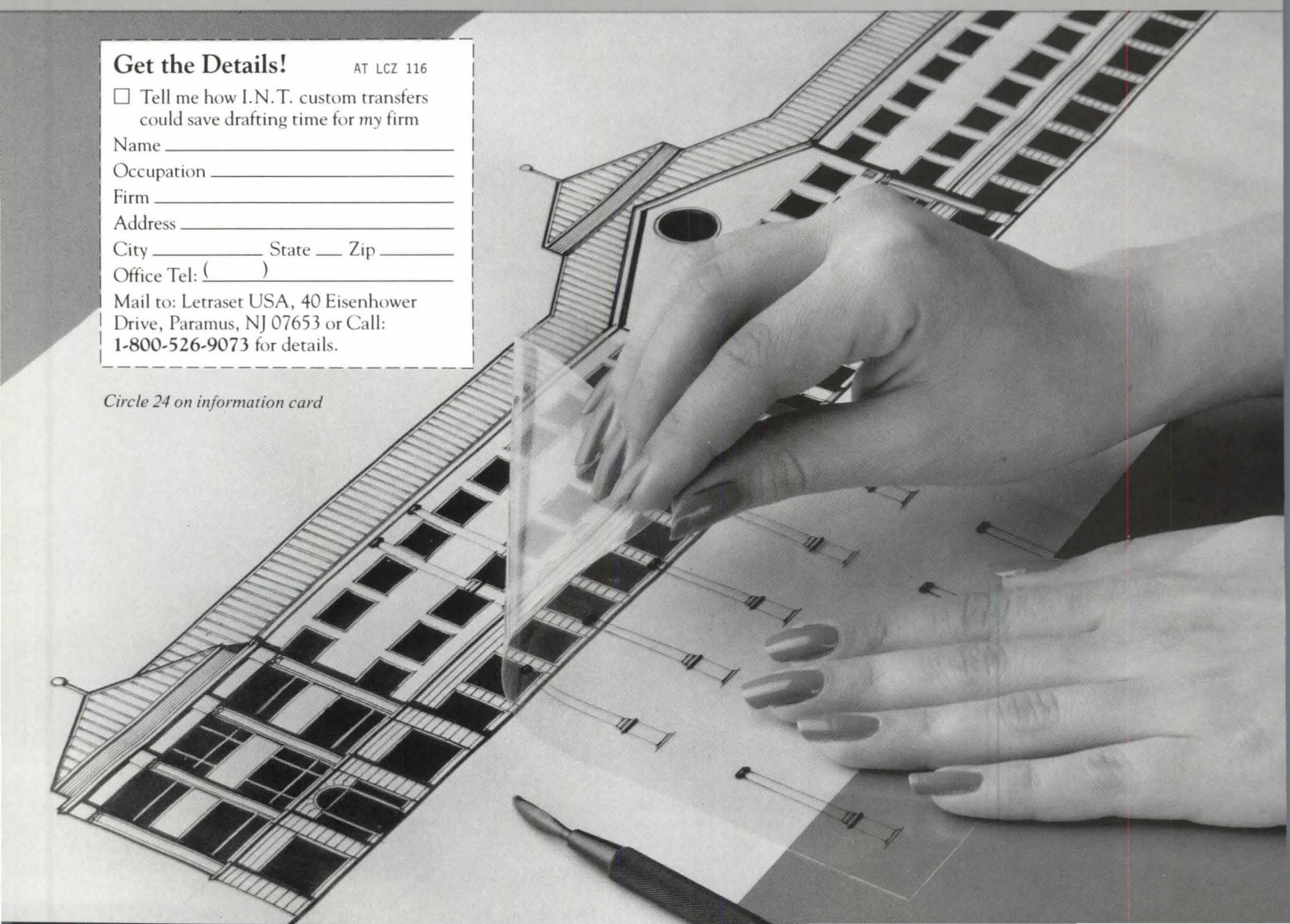

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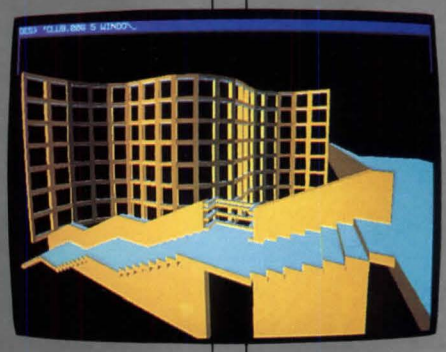

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Technology & Practice

Rehabilitating, restoring, and renovating older buildings are fast approaching 50 percent of our nation's architectural caseload. According to the National Remodeler's Council, construction associated with existing buildings (of all types) totaled $80 billion in 1985; this compares with a dollar volume for new nonresidential construction built that year of $85 billion.

This coming of age of the rehab market has brought with it a body of knowledge many times more sophisticated than that discussed five years ago. Sciences have emerged for diagnosing the needs of older buildings and mapping out therapies, for restoring virtually every construction material, for financing projects, even for making good money as an architect specializing in the field. All of these sciences are a part of this month's Technology and Practice section.

Hugh Miller, AIA, of the National Park Service starts off the package by laying out a mind set for working with older buildings; Miller instructs us to use all of our senses (page 96). Editors Douglas Gordon and Stephanie Stubbs present a collection of solutions to some of the most widely confronted rehabilitation challenges, based on the wisdom of a dozen architects from across the country (page 100). Two articles discuss the business of rehabilitation. One, by marketing specialist Jonelle Lawhorn, tells us how a number of architects developed their reputations as specialists (page 116). The other, by Bruce Kriviskey of the Institute staff, explains design requirements for receiving federal investment tax credits for historic preservation (page 114).

In one of four essays on working with specific materials (page 108), Elmer Botsai, FAIA, reminds us that—for all this science—building rehabilitation remains very much an art. As such, rehabilitation work requires skills and intuition gained best through experience. That's why Botsai asked me to tell readers his piece is something of an elixir. Botsai speaks for all of the writers this month, I feel, when he says his piece is built on a bit of knowledge, a dab of experience, and a whiff of mysticism.—Mitchell B. Rouda

A Health Maintenance Program For Older Buildings

Diagnosis, prognosis, and therapy to keep them well.
By Hugh C. Miller, AIA

A building should have a complete "physical" before any significant changes are made: before restoration, to differentiate original material from later accretions; before rehabilitation, to determine what parts need modification and what can be used intact; before stabilizing a historic building, to record the condition that will be the basis for the repair and maintenance program; and as part of any ongoing building maintenance program.

When we give an old building a physical, we follow the steps of the medical diagnostician: analysis of symptoms; testing and monitoring to develop a prognosis; and prescribing and administering a remedy, the effects of which are carefully observed. We must distinguish normal from abnormal states. In diagnostic evidence, symptoms, which are reported by the building user, and signs, which are objective and measurable evidence of abnormality, must be analyzed to determine the actual disease. (Too often the symptom is treated rather than the cause.)

It even seems possible that in the future we will be able to develop computer "expert" data bases for building disorders like those currently used to help diagnose human disorders. For now, however, building diagnosticians must rely on their own mental model based on experience and expectations of how symptoms and disorders correlate in buildings.

The six senses of building diagnostics

The first stage of building diagnostics is sensuous. It involves all five senses, enhanced by a sixth: intuition. Sight is the most important, since the symptoms of decay are often visible, even to the casual observer. Musty smells indicate dangerous levels of moisture. The feel of frass (insect excrement) can indicate infestation by wood-boring beetles and help identify the species. Tactile sensing of surface textures can indicate subsurface distortions. The sound a member makes when knocked tells if it is solid. With a stethoscope, one can hear carpenter ants or carpenter bees chewing inside a piece of timber. Taste can reveal the presence of salts. (A caution—many toxic substances form crystals on surfaces. Be very careful about tasting!) Intuition enables the experienced diagnostician to put observations and experience together to sense what is wrong in a building, especially when the causes are not obvious.

The diagnostic walk-through is based on the empirical/intuitive approach. It is a house call in the truest sense of the term. The evaluator walks around and through a building, assessing it in terms of health, safety, energy consumption, comfort, and the needs of its owners and managers. He or she differentiates between the effects of environmental conditions, such as location, climate, soils, and geology; the interforces of structural conditions, such as materials, design, and workmanship; and the forces of natural science, such as biology, chemistry, physics, and human impact.

I usually start by evaluating the roof, since it is the hat of the building. Have with you plans and elevations or photographs of the area where you are working so you can make notations. Get on the roof if possible. If not, work from the ground, adjacent buildings, or a cherry picker, using binoculars or a telephoto or zoom camera lens.

Since moisture is a major problem, the condition of roofing materials, particularly coatings, is very important. Look for signs of wear or failure. Examine the conditions of gravel-stops and of the edges and intersections of flashing. Pay particular attention to joint conditions, including the continuity of flashing and counterflashing. Check the coping and its joints on the parapets. Rust stains may mean deteriorating interior fastenings or anchors. Loose or missing mortar in masonry joints is a sign there are serious problems elsewhere.

Tar on the back of parapet walls indicates poor construction and maintenance practices. The tar bucket contractor is a villain in the war against moisture seepage. Tar can be good for emergencies, but it is only a bandage and eventually dries out and peels off. It is not an alternative to flashing, a continuous sheet membrane, or a well-made mechanical joint.

When surveying the roof, check its appendages—chimneys, stacks, cupolas, ornaments, and lightning rods. It is most important to understand how the roof system drains and where the gutters and rainwater conductors are located—internally and externally. This rainwear is essential to the well-being of the building. Water stains are the symptom of drainage failure, a problem that will turn into serious deterioration if neglected.

The next components to look at are the wall surfaces. Cracks, bellies, and sags may mean structural problems. The presence of moss or algae suggests excess moisture. Look for obvious deficiencies like missing or split rainwater conductors, broken or loose-fitting windows, spalling masonry, and joints in need of repointing. All are symptoms of imminent or active deterioration.

Many building failures occur where the wall meets the ground. Here, back slopes will allow water to accumulate against the wall. Rising damp can cause spalling or coving of masonry walls. Pay special attention to the way rainwater conductors terminate. What happens to water going below ground?

Hugh C. Miller, AIA, is chief historical architect for the National Park Service and a member of AIA's historic resources committee.

How does water flow from a splash on the ground? Vines, foundation plantings, and volunteer plants can make inspection difficult and cause damage to the wall or foundation. They may need to be removed.

If you can, observe the building during a heavy rain. This will show you how the drainage system, copings, cornices, and door hoods work and how water flows over and away from the building. Also look closely at such exposed appendages as roof ornaments, brackets, porches, colonnades, terraces, and steps. The connections between dissimilar materials like iron and copper, metal and masonry, wood and masonry, and so on, can be problematic and warrant scrutiny.

Finally, inspect the utility lines, the places they enter the building, and the site, including walks, curbs, and parking areas, for actual and potential deterioration.

When inspecting the interior, try to correlate what you observe there with exterior conditions. As before, work from the top down. Look for water stains and rot at the eaves, ridges, and other edges in the attic. If they are present, use a moisture meter or probe to determine whether there are active leaks and the extent of damage. Check for evidence of insects—slight holes and new frass from beetles or termite channels. Check for sags, bellies, or structural cracks. Note the presence of insulation, with or without a vapor barrier, and the extent of attic ventilation. Look under the insulation for electrical wiring and fixtures, paying special attention to potential fire hazards. Make note of equipment stored in each space.

In the main spaces of the building, use a level and plumb bob to detect structural changes, including deviation of walls and door frames from vertical. Roll a marble across the floor to test for excessive sloping. Test floors and stairways for stiffness by jumping. Structural cracks at wall intersections or around door frames can be caused by framing failures or settling of supporting members. Stairways that are pulling away from the wall may have failing stringers or fasteners.

When exterior cracks correlate directly with interior ones, suspect a rotting lintel or foundation problems. Water stains or spalling plaster on interior walls may result from a broken downspout, defective pointing, roof or plumbing leaks, or condensation. It is particularly important to look for moisture problems in kitchen, bathroom, and laundry room floors. If they have hard floor finishes, you may need to probe through the ceiling below with a moisture meter.

Moisture penetration is a common culprit causing sills, door bottoms, window frames, and mullions to rot or corrode. Pay close attention to the condition of weather stripping, caulking, and glazing materials. Defective glazing putty or compound makes a sash vulnerable to serious weather damage. Take note of the overall condition of finishes, fixtures, and equipment, but don't attach too much significance to deteriorating wallpaper or carpet unless it is clearly a symptom of an underlying problem.

The basement, where structural systems and utilities are often clearly exposed, is an excellent place to look for structural distress, distortion, cracks, signs of rot (particularly where wooden members are embedded in masonry), insect damage, and moisture conditions. Pay particular attention to the interior basement wall for structural cracking and wetness. Rising damp may cause masonry to spall at the floor line.

During inspection of utilities and infrastructure systems,

Foundation tests diagnose stability and settlement problems.

testing is usually necessary, though frequent observation of electrical panels, wiring, HVAC equipment, ducts, vents, water supply, and drainage systems can teach the observer something about their condition. A system that does not meet today's codes may not necessarily have to be replaced if it works. Nonetheless, be wary of additions to or modifications of these old systems, especially where electrical circuits have been added. Such casual retrofits often violate both building codes and common sense.

Before ending this preliminary evaluation, walk back through the building to look for symptoms or clues you may have missed. Remember, a building is a dynamic system. You must look both "up-down" and "down-up" before making an assessment. For example, water in the basement, which a building owner may attribute to a high water table, may come from something as simple as a hole in a gutter or as complicated as missing arch stones in a roof dormer that is the end of a crack originating in the foundation caused by a change in the soil's bearing capacity.

Quantitative analysis of buildings

Sometimes the cause of deterioration can be determined simply from the diagnostic walk-through, but often the signs are complex. If more data are needed, testing with instruments is usually required. These methods can be nonintrusive and nondestructive. Sometimes small samples, collected without disturbing the system, are necessary for testing. Intrusive testing (opening up walls), like exploratory surgery, is occasionally necessary but should be avoided if possible. Generally, destructive or load-testing methods are too drastic for an existing building.

The equipment required for several effective, nonintrusive methods is stock-in-trade for a building diagnostician but can be rented off-the-shelf from scientific equipment houses (listed in the Yellow Pages) or manufacturers and does not require specialized training to operate. The portable X-ray, for example, locates wood members, areas of deteriorated wood, fasteners, and utilities in a frame wall. It is also useful for finding evidence of alterations, such as windows that were covered up. For masonry, where the X-ray is not effective, ultrasonic methods locate fractures and changes in density by measuring changes in sound transmission rates. A pachometer can locate reinforcing steel in concrete or anchors in masonry. Strain gauges such as the Whitmore or the Demic gauge measure micromovement and can test for inherent stress at a given moment or measure its effects over time. Miniaturized television camera probes can be used to inspect drains or chimneys. Fiber-optic bore scopes, with or without cameras, enable the user to see inside cavities, pipes, and ducts. Infrared thermography, so useful for energy audits, can be used to locate wet areas and pinpoint leaks or locate overheating electrical equipment.

The federal acid rain program is adopting high-tech instruments to measure surface deterioration as well as rates of change of physical and chemical conditions of materials. Optical surface chemical analysis and laser measurement of microchange of the surface are now possible for specialized field use. Close-range photogrammetry combines paired, stereo images to make a three-dimensional image, like a stereoscope. These images can then be plotted topographically or analyzed in the plotter to find distortion or deterioration. This process is easily repeatable and is excellent for documenting change over time. In a common industrial surface analysis technique, pressure-sensitive tapes are applied to an immovable surface to obtain an impression that can be taken to a microscopy laboratory to reveal surface conditions precisely. Microwave analysis/ground penetrating radar is also being used experimentally to find voids in materials.

When signs of damage are obvious but causes remain unclear, intrusive testing may be necessary. It can involve extracting sample cores of material to determine density, strength, and moisture content. Wood cores, which may be less than ¼ inch in diameter, can be cultured in a prepared medium to determine if rot-forming fungi are present. Masonry or concrete cores can be subjected to a whole series of laboratory tests.

Long-term monitoring is another important aspect of building diagnostics. Unfortunately, many building owners are unwilling to invest the additional time (months or years) and money, even though in most cases they would get a more accurate and complete diagnosis, which in turn would produce a more effective and ultimately more economical treatment. Long-term structural monitoring devices can be simple glass or plastic calibrated plates that break or slide as a rack opens or closes, or plunger-type micrometers fixed across cracks that measure every movement of a building. Precision surveying equipment, laser leveling systems, or photogrammetric methods can also be used to measure distortion or movement in a structural member or system. These measurements must be repeated over time to analyze the change. Linear variable differential transducers, which can detect actual times and rates of movement, can make structural analysis much easier.

It is particularly important to monitor moisture over time. The sources are often elusive and cannot always be located at once. Sometimes, with complex moisture problems, there is no other way to be sure you have identified the cause than to fix what you think the problem is and monitor the drying or continual dampness over time. There are devices for measuring internal moisture content and surface condensation. A surface/air thermometer and hygrometer will tell you if condensation can occur after the dew point of the air is calculated. The electrical circuit on the mirror surface of a "damp check" instrument will tell if condensation is occurring. "DewTabs" fixed to a wall surface indicate condensation when the dye on the surface spells "dew." Electronic resistant-type moisture meters can measure moisture content in wood accurately (essential for determining whether the moisture level is hospitable to rot-forming fungi) and give relative readings of "dry," "moist," and "wet" for most other porous materials. They are also good for pinpointing the location leaks in water and drainage lines buried in a wall. Using a moisture meter may require drilling very small holes in masonry, sheathing, insulation, or roofing to probe below the surface.

Be aware of hydroscopic salts that attract moisture and are themselves wet though the subsurface is probably dry. They will cause the moisture meter to indicate a higher moisture content than is actually present. The problem can be avoided by using salt detectors in conjunction with the moisture meter or by using a chemical-reaction moisture testing kit that is not affected by salts (although the latter requires collecting a sizable amount of testing material). In either case, moisture tests should be repeated systematically and the results documented.

A coring cone test determines material density, structural strength, and the presence of moisture.

Building prognostics and maintenance

In restoration work as in health-care, diagnosis is not an end in itself. It must be linked to a prognosis for the future. A prognosis extends beyond a simple judgment of "good" or "bad" to state also whether the building fails to meet, meets, or exceeds standards. The third possibility is especially important where adaptive use is intended. An overbuilt structure may have the capacity for more intensive use, for example where exits exceed code requirements or column designs permit an additional story. It could also have negative implications, as in a case where repairs have overstiffened a member and induced new stresses.

Of course, prognosis is no more an end than diagnosis. We must decide whether it is necessary to intervene and, if so, what the therapy will be. Unfortunately, when an old building doesn't meet code or has other deficiencies, the automatic response of many architects, engineers, and contractors is to gut it. Contrary to rehabilitation doctrine, this option is probably the most expensive and, in the case of a historic building, insensitive one for continuing a building's life and usefulness. Building and code officials are beginning to accept that many old buildings actually perform very well even though they may not be up to the letter of the current code. Studies by the National Institute of Building Sciences show that many archaic building systems have inherent safety features and can function safely if their limitations are identified and accommodated. Sometimes, even in cases where there is damage, it may be better to do nothing but watch and monitor the structure, especially if decay is very slow. Perhaps we are moving into the "gerontology" of old buildings, rather than the "pathology."

I believe that buildings fail not because those who build and maintain them are ignorant but because those persons misapply or fail to apply what is known. Materials and systems are ignored until they become problems. The tendency to wait until disaster strikes makes us vulnerable to snake-oil peddlers with sure-fire cures, especially for wall-joint problems and leaks in masonry. But the natural process of entropy can be mitigated and controlled with continuous observation and maintenance.

What I am proposing is a health maintenance program for buildings. We buy maintenance contracts on typewriters and copy machines. Why not buildings? Building owners could receive comprehensive, timely information about their building's condition. That information could be fed back into the field to expand our collective knowledge. Repair costs would be lower; the benefits, substantial.

Who will perform this service? Who but architects? Instead of dropping their involvement (and financial interest) after construction, architects could be retained to monitor the building and keep it healthy. Thus, building diagnostics can also be a new area of service for the profession.

Old buildings tell us far more than "the old-timers sure did know how to build them" and "you can't get materials like that anymore." Historic buildings are invaluable as laboratories where we can discover how building design, construction, or maintenance succeeds and what fails over time and why. We can learn why old buildings survive by analyzing their systems. With systematic monitoring, we can project the rate of decay in time to prevent further damage. By documenting repairs and replacements, we can determine their effectiveness and the repercussions they may have on the rest of a structure. The lessons we can learn are not only important for preserving historic buildings, they can help us avoid making the same mistakes in new ones. □

The Mechanics of Building Rebirth

Solutions to frequently encountered rehabilitation problems
By Douglas E. Gordon and M. Stephanie Stubbs

Your client wants to rehabilitate rather than build anew, and the existing building is a programmatic dinosaur. The odds are that you will run into some unusual situations that require totally new solutions. After all— as the truism goes—every rehabilitation is unique. Still, some design challenges appear frequently enough that you can tap the experience of others to shape your own design strategy.

Finding the optimum path leading from an existing structure to a solution that fits the owner's program will likely involve assessing structural soundness; reconfiguring interior space to meet new needs; repairing or replacing existing materials; upgrading mechanical and electrical systems; bringing accessibility up to code; or any combination of these. We've asked a dozen architects specializing in rehabilitation to share some of their creative approaches to common rehabilitation design challenges.

Structural reconfiguration

A rehabilitation design team's first task is to survey the existing building, checking for soundness of structure. If the program calls for building reconfiguration, the effects of new loading or changes in beam and column placement add to the engineering considerations. Code or program requirements may necessitate isolated reinforcement of heavily loaded bays or additional structural members to carry the entire building load.

The turn-of-the-century Marquette Building illustrated in Figure 1 had a flat-tiled floor-arch structure, covered with a cinder floor, subfloor, and finish floor—a common construction method in its day. In the process of adding through-floor ductwork, the architect, Holabird & Root, removed the tile finish-floor, taking extra care selecting locations for floor penetrations so that the supporting arches would not be damaged. To maintain the integrity of the new slab, the architect specified concrete collars to reinforce penetrations larger than one foot in diameter.

As a replacement structure for the heavily loaded floor in a new computer room, the architect specified a new slab, topped with structural styrofoam and then concrete. The bay supporting the computer room was also isolated and structurally reinforced.

Another structural problem the architect encountered in this building evolved from an earlier rehabilitation of the first floor. When the city raised the level of the street 17 inches, the owner agreed to raise the interior floor level by topping the existing floor with lightweight fill. The fill successfully raised the floor level, but the load exceeded the floor's design capacity. To bring the load back within code, the succeeding rehabilitation replaced the fill with the same slab/structural-styrofoam/concrete-topping floor.

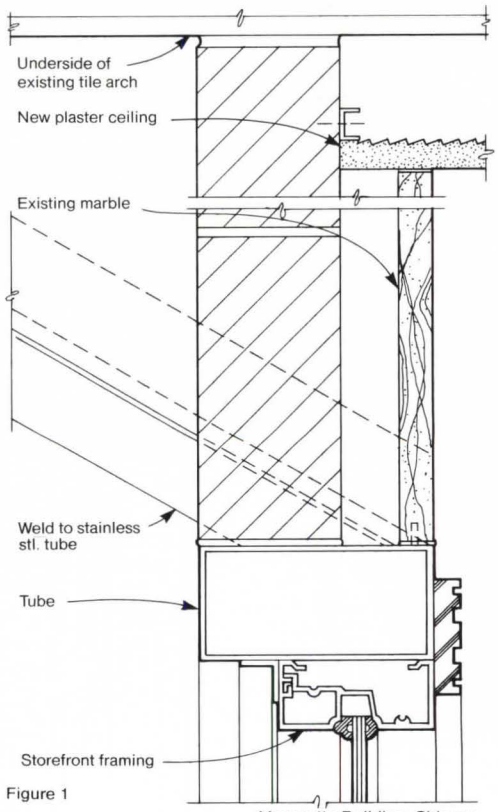
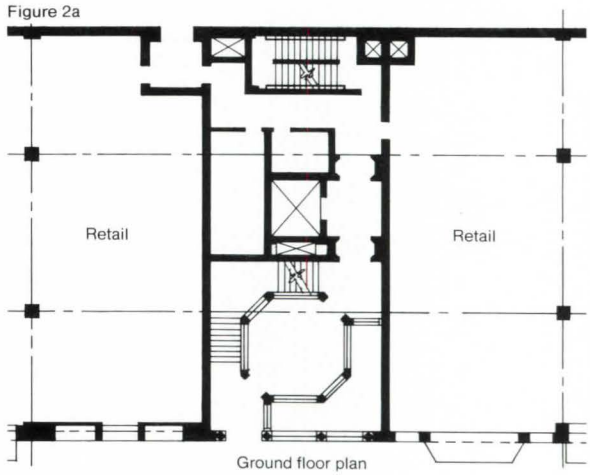


Figure 1
Marquette Building, Chicago

Floor-level alignment is a common problem, especially when combining a row of buildings into one project. In Figures 2a and 2b, the architect, Hartman-Cox, divided the six buildings in the Gallery Row project into two parts, the floor levels of which were a half story out of alignment. The building between the two parts was demolished to make way for an entryway containing a stair and elevator core. A glass facade clearly shows the stairway connecting the two levels, thus visually as well as physically integrating the building block. "Solving technical problems often yields the esthetic solution as well," principal-in-charge George E. Hartman, FAIA, says. He addressed the problem of elevator access by specifying a cab that opens on either side, depending on the level at which it stops.

Code requirements may also affect structural rehabilitation design, particularly in jurisdictions with strict seismic requirements, such as San Francisco. In the project in Figures 3a and 3b—a silverware factory made into architects' offices (see March '85, page 140)—the architect, MBT Associates, had to stiffen the structure in accordance with local regulations. The job required either bracing the existing, exposed framing—which rested on wood piles—or adding shear walls. Since bracing would have destroyed the interior appearance, according to principal-in-charge Frank Tomsick, FAIA, he chose shear walls. The existing wood piles extended 50 feet into the fill and had originally been placed without caps. The rehabilitation design placed new shotcrete shear walls on poured-concrete supports that also cap the existing wood piles. Reinforcement bars in all the structural pieces were threaded and tied together for lateral stability of the concrete shear walls.

Figure 2a

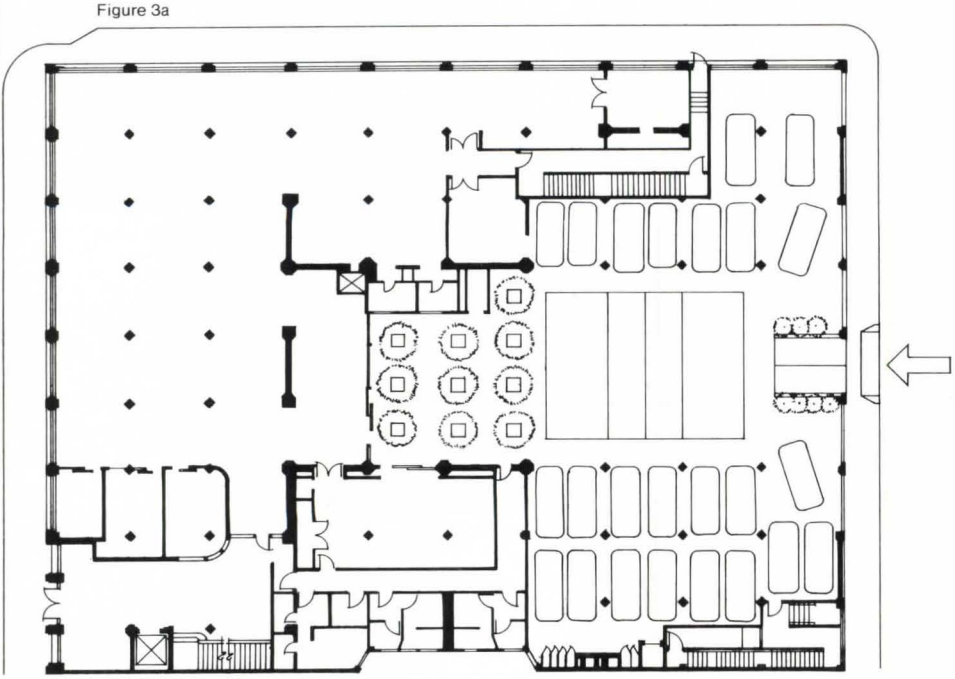


Ground floor plan

Figure 2b

Gallery Row, Washington, D.C.

Figure 3a



539 Bryant Street, San Francisco

Figure 3b
Shear wall elevation

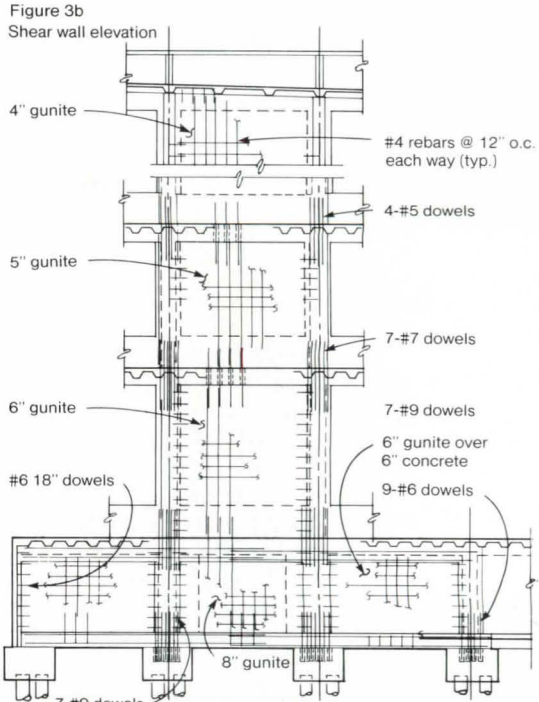
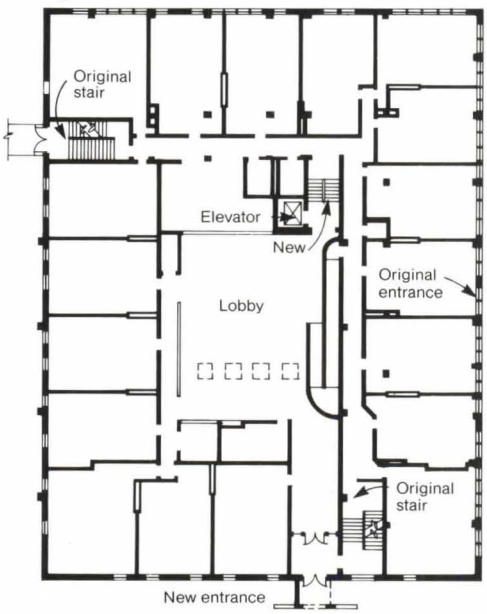


Figure 4a



Immanuel Manor, Kansas City, Mo.

Figure 4c

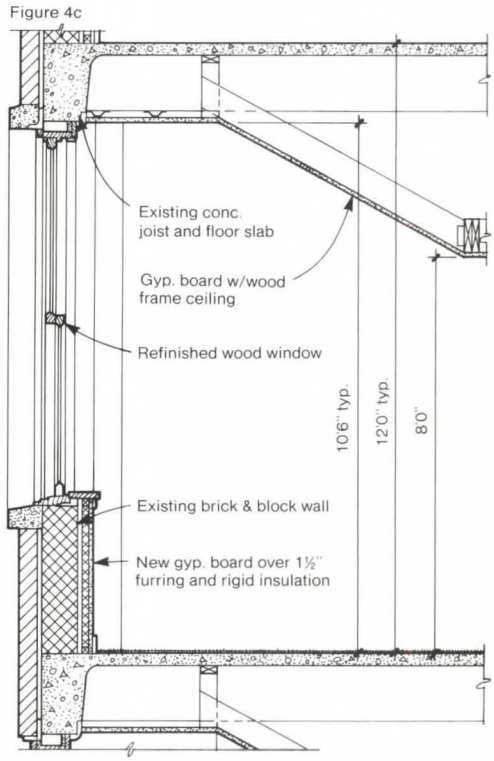
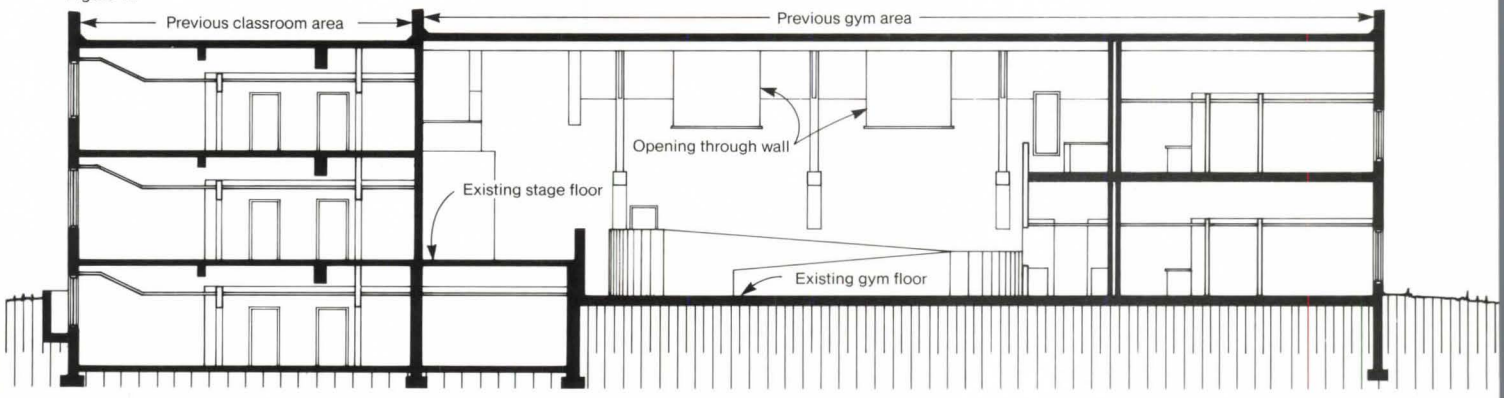


Figure 4b



Spatial reconfiguration

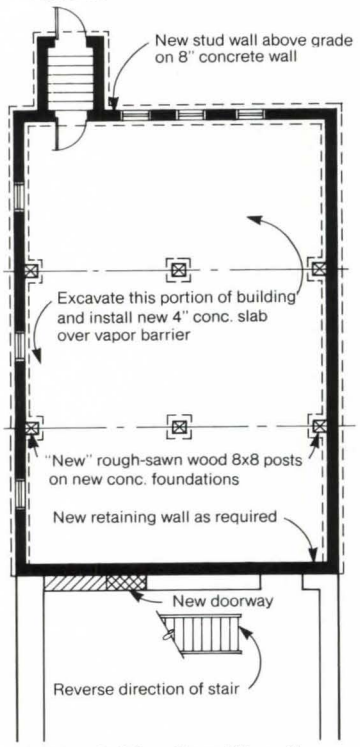
During redesign of an existing building interior for maximum efficiency, an easy trap to fall into is letting the existing building configuration limit the range of design possibilities.

The project in Figures 4a and 4b involved converting a two-story 1950s elementary school containing classrooms and a full-height gymnasium into apartments for the elderly. The sloped site allowed entrances at both levels, with the main entrance on the upper floor. The architect considered six different schemes for the renovation, including new units on top of the existing building and new wings on the sides. The final scheme Fred Truog, AIA, developed moved the main entrance to the lower level and placed apartments along two sides of the inside perimeter of the gymnasium on that level. A ramp allows wheelchair access to the second floor, which includes apartments all along the interior perimeter, leaving an open atrium in the center with a mezzanine over half of the lobby below. This arrangement maximizes exterior window area for the apartments and still provides sufficient lobby and congregation spaces. Truog divided existing classrooms into apartments using the HUD Minimum Property Standards as guidelines.

He also reconfigured space within individual apartments, which originally had 12-foot ceilings. Because the apartments are relatively small, the unusually high ceilings looked out of scale. The architect consequently developed sloped, wood-frame, gypsum board-covered ceilings, which descend in height from 12 feet (at the window to allow maximum light) to eight feet (Figure 4c).

In making the silverware factory into its offices, MBT reconfigured interior space to meet updated codes requiring parking space (Figure 3a). Adjacent exterior space for parking didn't exist, so MBT created it within the building. Glazing above the atrium in the U-shaped building was in disrepair, and re-enclosing the space in a way that would meet code requirements would have been unacceptably expensive, according to Tomsick. His solution began with removal of the atrium glazing (leaving the framing for visual interest). Then, by landscaping the courtyard and opening it to the street, Tomsick created both a pleasant interior greenspace and the required parking area for 26 cars.

Figure 5a



McMahon Building, Stowe Village, Vt.

Maximum use of site

Limited site area is a constraint in many rehabilitation projects, particularly in urban settings. Since a goal of many rehabilitations is increasing usable floor area, limited site area forces the architect to design additional space above or below the existing structure. Even when adjacent site space is available, a client's desire to maintain the original appearance as much as possible may add another design consideration.

Expansion of the historic building in Figures 5a and 5b was secondary to the restoration of the building. The wooden members under the existing building were rotted through, which meant the building had to be jacked up and the structure shored. Since the crawl space was accessible, the architect decided to dig out a cellar, which would increase the usable space of the building by 20 percent without affecting the external appearance of the building. The building was then lowered onto the original (permanently braced) dry stone foundation.

Finding space in which to fit HVAC equipment was another problem in the silverware factory made into MBT's offices (Figure 6). Originally built without airconditioning, the building had no interior space set aside for air-handling equipment and little outside area in its tight urban setting. The architect therefore had few choices for locating a new mechanical system. MBT roof-mounted the air-handling units and ran exterior ductwork along courtyard walls to accommodate the bulky equipment while minimizing the structural and visual impact of through-floor penetrations, says project principal Tomsick. Limited space on the street presented another problem during installation. Because cranes could not operate from the street to place the rooftop equipment, MBT Associates used a helicopter to lower units onto the roof.

Figure 5b

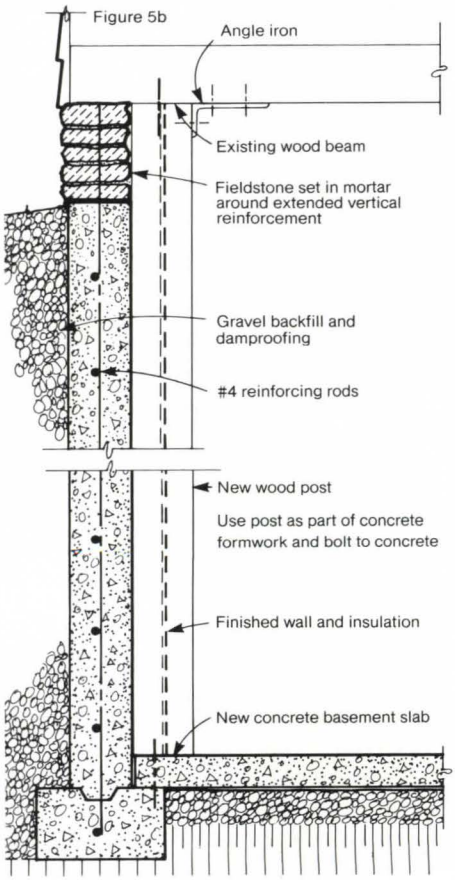
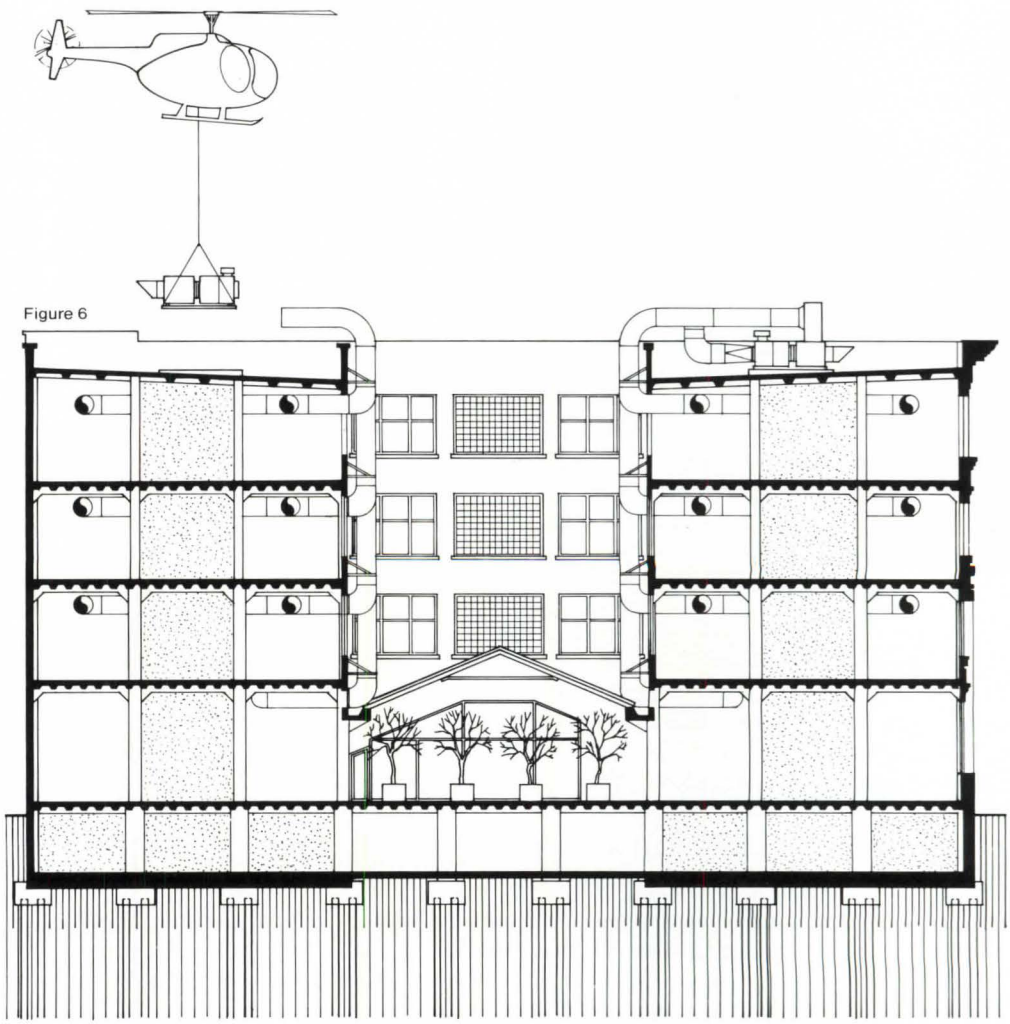
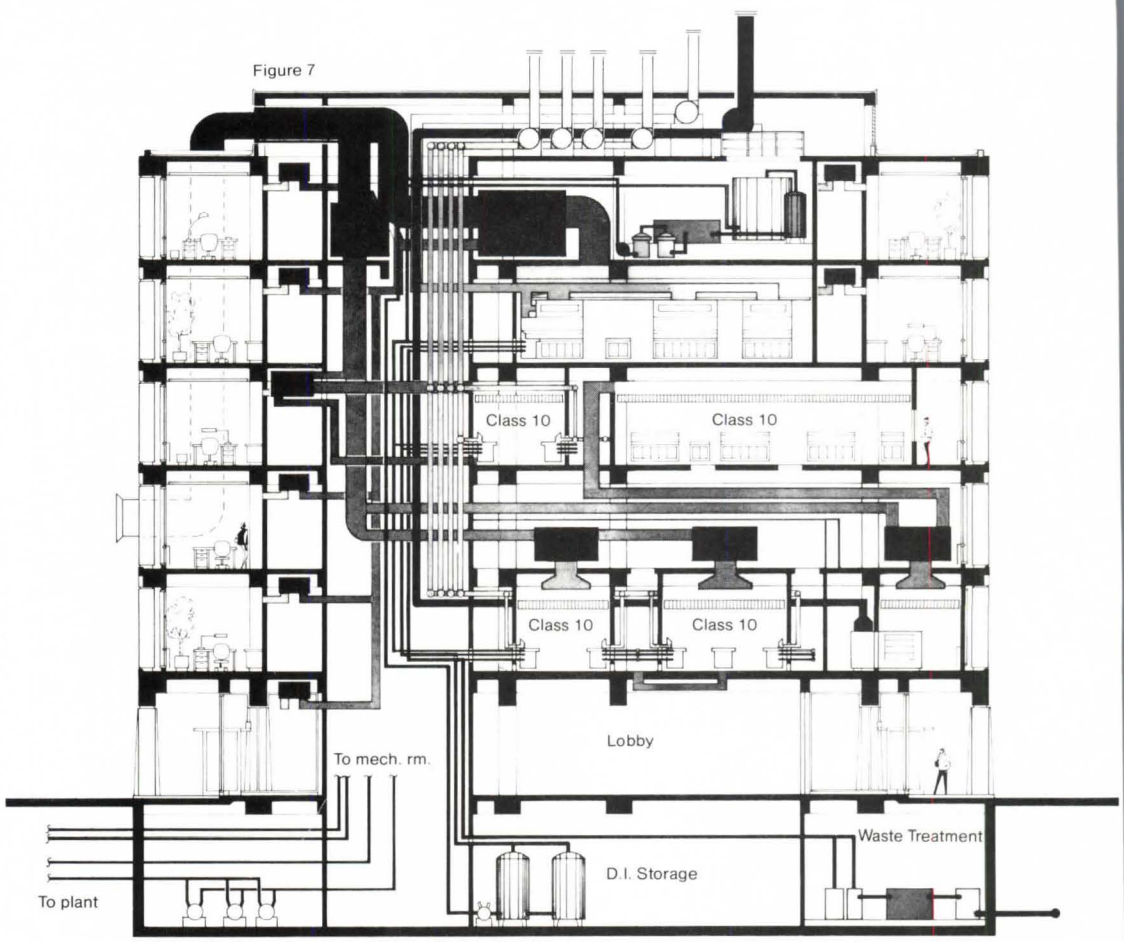


Figure 6



539 Bryant St., San Francisco

Figure 7



Building 39, Massachusetts Institute of Technology, Cambridge, Mass.

Mechanical equipment

Limited floor-to-ceiling height and limited or irregular floor area demand no small amount of creativity in fitting in new ducts and wires. Low energy consumption (though not the priority it was 10 years ago) and consumer demand for advanced electronics systems also influence mechanical system design strategy. Though not as common as office rehabilitations, laboratory and other high-tech facility rehabilitations represent particularly challenging mechanical situations.

The concrete structure in Figure 7, a building on the MIT campus, was rehabilitated to accommodate teaching laboratories and clean rooms, both of which impose strict mechanical requirements upon the space. Floor-to-ceiling heights are a mere 10 feet, 6 inches, and the clean rooms require 8 feet, 4 inches of clear space. Because the constrained height could not accommodate the air-handling systems in an enclosed ceiling, the architects designed pressurized open plenums in the labs. They also placed the laboratories and the heavy mechanical equipment on alternating floors. The interstitial mechanical floors act as return-air plenums, with air-handling equipment creating negative pressure that draws air into the mechanical areas from occupied spaces. (In the case of the fume hoods, exhaust ducts disperse fumes directly to the outside.)

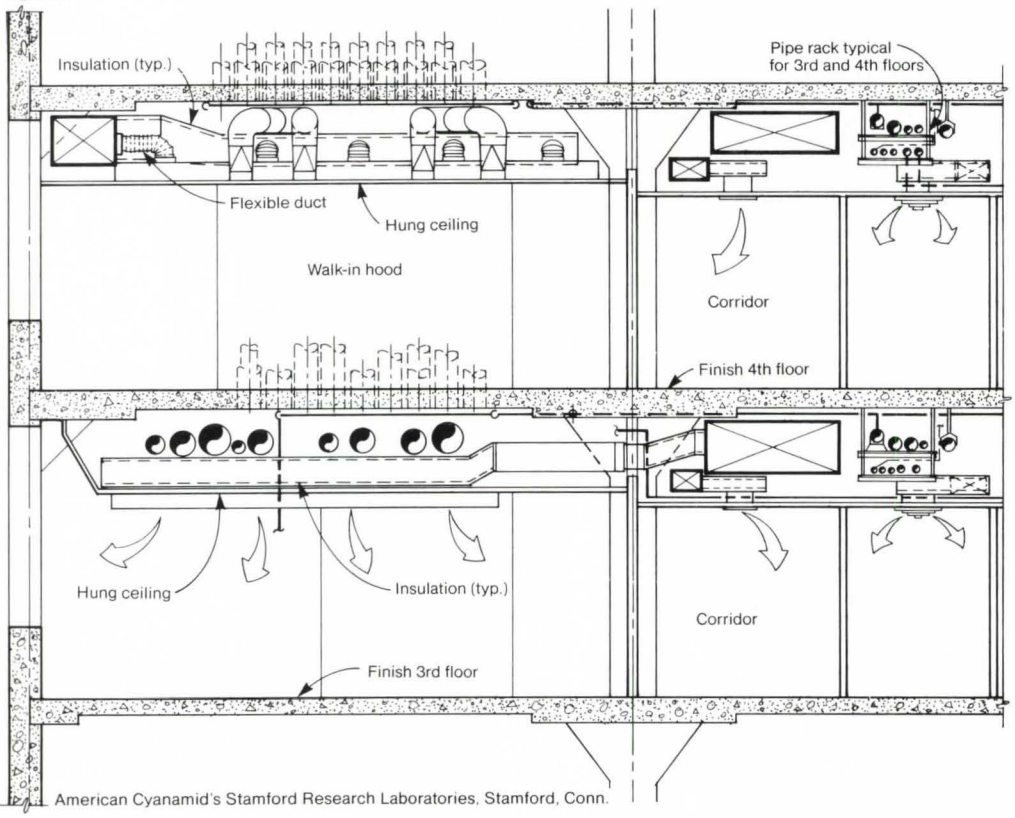
The demountable wall system on laboratory levels allows spatial flexibility. Since laboratory configurations may be altered at will, a custom lighting and electrical system was devised to offer comparable flexibility. The design specified demountable luminaires that hang from clips attached to the ceiling, allowing the lights to be easily relocated. The design also called for 480-volt electrical outlets in all cores, regardless of originally conceived need—again, for flexibility.

A design complication in the laboratory rehabilitation illustrated in Figure 8 was to update the facility while allowing research to continue. Haines Lundberg Waehler, the A/E firm for the project, divided the rehabilitation into four phases (to extend over 10 years), sacrificing speed of completion for the sake of the client's desire to stay in the building. The most extensive work was done on the laboratory floors. HLW provided new variable-air-volume air-handling units that connect with the fume-hood exhausts to maintain critical pressure relationships. The building—originally a silk mill—had ample floor-to-floor height to allow for a mechanical space above a hung ceiling and still maintain a 9-foot floor-to-ceiling height in laboratory areas.

Office space mechanical systems may be less complicated than lab systems, but they still present a unique set of design challenges. In the renovation of the Marquette Building, Holabird & Root placed major fan units on every third floor to minimize the amount of vertical ductwork necessary, thus increasing the overall energy efficiency of the air-handling system. The building is divided into two zones—north and south—to provide flexibility for users and to take into account the heat gain on the south side and cooler temperatures on the north side. The temperature differential is amplified by massive masonry walls, which vary in thickness from 18 to 24 inches. Perimeter fintube radiators (Figure 9) and a new electric boiler and fan system prompt lower energy rates from the utility company and help to keep the building clean, says project architect Walker C. Johnson, AIA. A computerized control/monitor system works in tandem with the mechanical components to provide energy savings that are 30 percent higher than predicted, Johnson says.

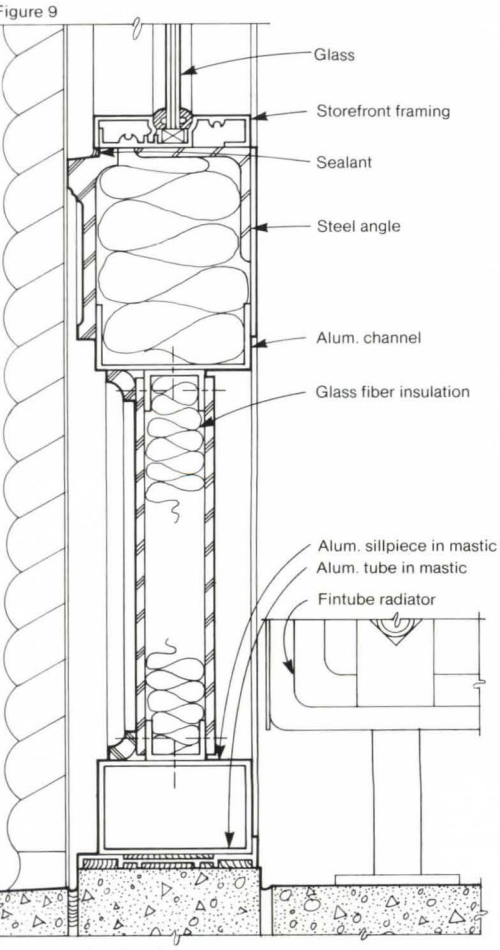
In addition to searching for innovative HVAC solutions, rehabilitation engineers and architects are seeking ways to rewire

Figure 8



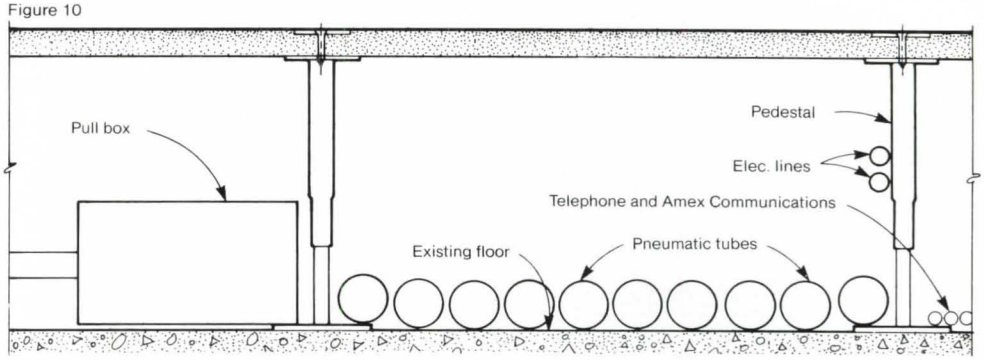
American Cyanamid's Stamford Research Laboratories, Stamford, Conn.

Figure 9



Marquette Building, Chicago

Figure 10



American Stock Exchange Building, New York City

old buildings for new voice and communications systems. "Older buildings are emptying because of the common misconception that you can't retrofit services for modern voice and data communications systems," says Alan Abramson, president of Electronic Innovations Systems, a subsidiary of the engineering firm Syska & Hennessey.

In flat slab construction, where floors cannot be penetrated nor ceiling height changed, a common solution is to run wires down the columns and enclose the columns in gypsum board. Use of prewired systems allows placement of outlets in the furniture, with supplemental flat cables in open-plan space.

A poke-through floor system is another solution. In the American Stock Exchange rehabilitation by Swanke Hayden Connell (Figure 10), Syska & Hennessey used a raised floor system to compensate for lack of space needed for the mechanical core.

In another Syska & Hennessey project, thermostat placement posed a problem in the renovation of an open-plan office because of a space crunch. As an unusual but effective solution, the designer incorporated thermostats into individual telephones. The phone wire connects the thermostats to the controller, which in turn is connected to remote variable-air-volume boxes, serving the individual occupied spaces in the building.

Materials replacement

Materials replacement often entails the architect's choosing between replicating the original material, for purposes of authenticity and exact match, and replacing the material with a modern counterpart that may prove cheaper, easier to obtain, and more durable.

To repair or replace—that was the question in the two adjacent terra-cotta buildings in Figure 11, one built in 1900 and the other in 1909. MacDonald & Mack Partnership replaced with molded glass fiber the ornate, matt-glazed terra-cotta on the older building, which was heavily damaged by window-washing equipment. The glass fiber was manufactured to match the color of the original terra-cotta and then "dirtied up" with a mixture of dirt and oil specially formulated to match the aged appearance of the remainder of the building.

The architect found that the ornate ornamentation of the 1909 building was intact, while the plain, high-gloss terra-cotta blocks on the lowest two stories had cracked due to settlement and lack of expansion joints. Project architect Robert Mack, AIA, speculates that the "ornate decorations were made by the master craftsman, and the plainer blocks left to the apprentices."

Figure 12 Stanley D. Lindsey Office Building, Nashville

O. Baitz, Inc.

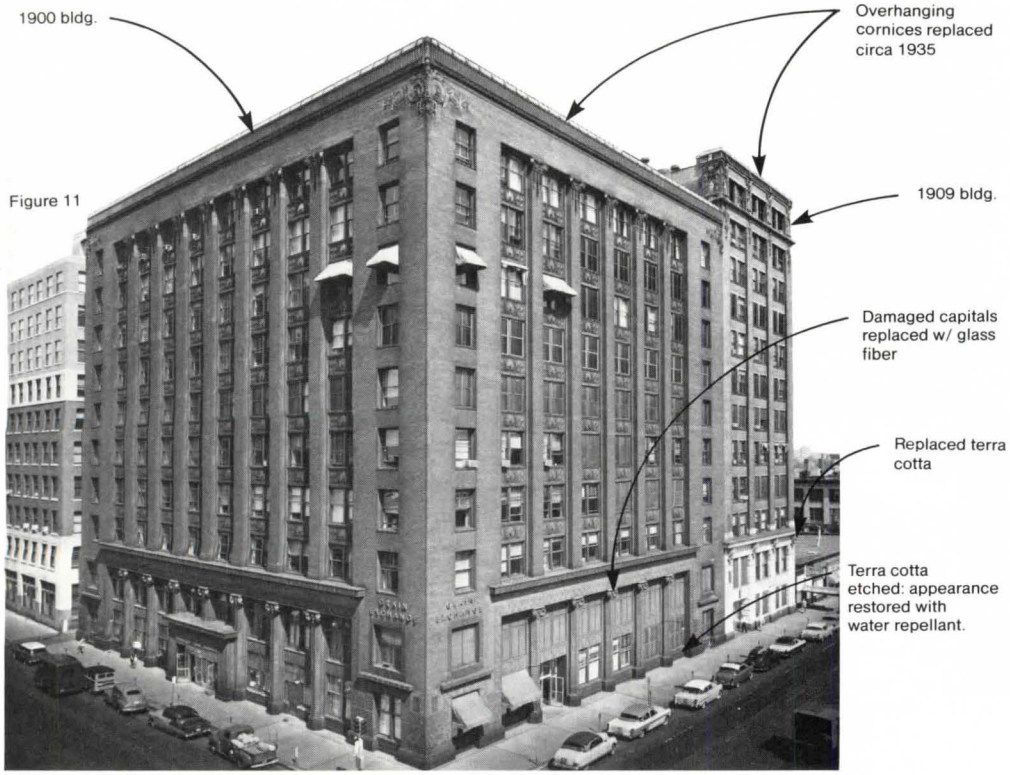
The architects specified that the blocks on this building be replaced with terra-cotta from California, which Mack pronounces a "perfect match." Acquisition of the original shop drawings simplified the task. The architects also redesigned the connection system to include stainless steel anchors (replacing the original cast-iron connectors), and control and expansion joints.

The rehabilitation of a former residence into office space in Figure 12 required that the architect respect the original exterior appearance. As well as rehabilitating the existing structure, principal-in-charge Richard Frank, FAIA, designed an addition he describes as a modern interpretation of the existing building's rustic lines. The addition is connected to the rear of the historic building with glass-panel walls that don't obstruct views of the back of the building.

In the restoration of the rear porch of the office building, Frank traded old material for new. The original wood porch was deteriorated beyond repair. The design team decided to replace it with a steel replica, which both retains the appearance of the old porch and achieves the fire rating prescribed by code. Visually, the porch is the only solid architectural element to touch the new addition, creating a bridge between the old and the new, Frank says.

The Marquette Building's ornate, cast-iron storefronts (Figure 13) had practically vanished piece by piece over nearly 75 years. Drawings of the original casting patterns allowed Holabird & Root to construct replicas of the storefronts, this time in cast aluminum. Sealant tape permits thermal breaks between the pieces of casting. The aluminum storefronts were then painted dark gray to match the original shade of the cast-iron pieces.

Figure 11



Grain Exchange Building, Minneapolis

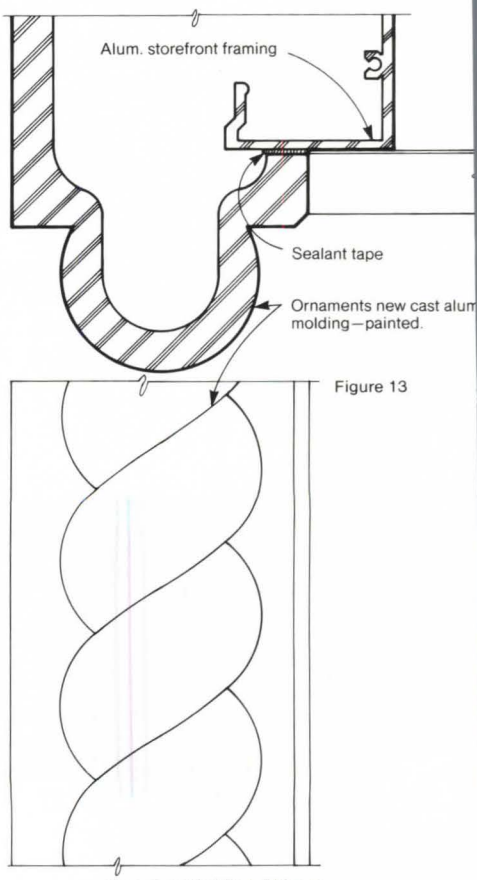
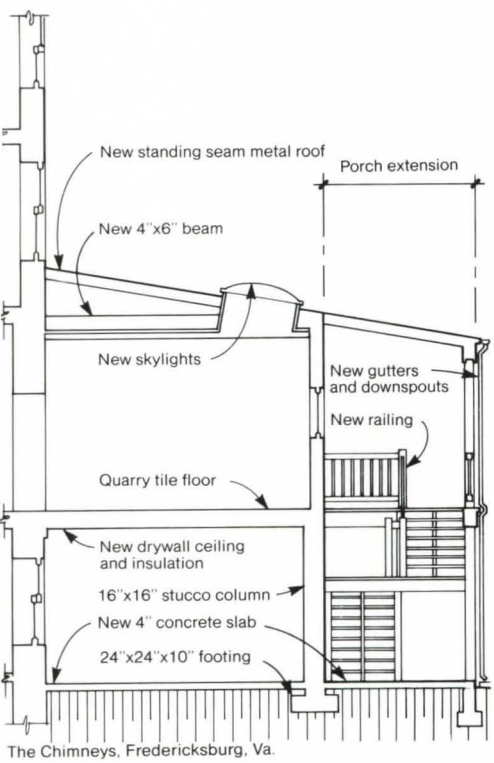


Figure 13

Marquette Building, Chicago

Figure 14



The Chimneys, Fredericksburg, Va.

Figure 15

709 Caroline Street, Fredericksburg, Va.

Accessibility requirements

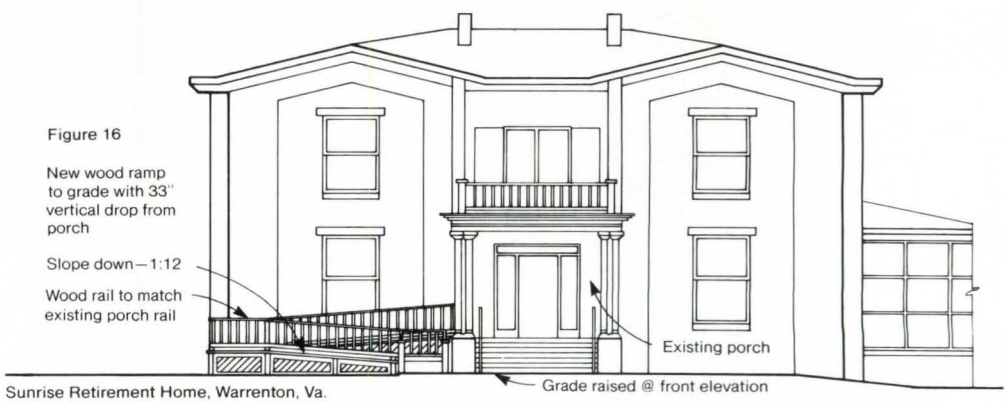
Requirements for accessibility are set by local codes. Accessibility refers both to fire egress and to accommodations for the elderly and handicapped, and presents a particular design challenge with historic restoration projects. The Department of the Interior guidelines recommend that rehabilitated buildings be accessible, yet remain as close to the original appearance as possible.

In the two projects in Figures 14 and 15, Henry J. Browne, AIA, solved the problem of fire egress with two variations on one theme: creating a rear exit where none existed before. Both projects were historic buildings and former residences, one being rehabilitated as a bed and breakfast inn and the other as a restaurant. Accessibility for The Chimneys (Figure 14) entailed addition of a new two-story porch and stair, and conversion of a second-floor window into an exit door. Gypsum board added to both sides of the existing wall adjacent to the porch increased the fire rating of the structure. In the project in Figure 15, the architect's design involved removing a nonhistoric porch addition, replacing it with a larger porch addition with stairs.

Building officials have some leeway with designated historic buildings (under the special historic buildings and districts section of the building code) to work with the architect struggling to meet code under the additional constraint of maintaining historic appearance. In this case, for instance, the official allowed use of intumescent paint to contribute to the firerating even though not specifically recognized by code, Browne says.

Access for the disabled presents another set of design challenges with respect to historic rehabilitation projects. By itself, adding a ramp to a building isn't a unique rehabilitation solution. In the project in Figure 16, however, project architect Mary Oehrlein, AIA, devised an elegant ramp solution both to provide handicapped accessibility and to adhere to criteria of the *Secretary of the Interior's Standards for Rehabilitation.* The guidelines recommend that accessibility ramps enter at the building front and tie into the original appearance. Another guideline for additions is that if the ramps are removed in the future the "essential form and integrity of the structure would be unimpaired." Oehrlein's solution was a 1:12 ramp attached to the front porch, which required removal of only one porch railing and widening of doors. □

Figure 16



Sunrise Retirement Home, Warrenton, Va.

Preserving Historic Materials

When a building's materials fall into disrepair, the architect faces a range of rehabilitation choices, from patching to replacement. The chemical composition, durability, availability, craftsmanship of work, and the physical condition of each material, as well as the environment in which it is located, all play a part in determining the best course of action.

First and foremost, material damage must be well-diagnosed. From fragile ornamentation to massive foundation supports, all materials require close scrutiny in situ to determine the best method of cleaning, repair, or restoration. Sometimes, this diagnosis involves more than straightforward observation and testing; intuition, subtle sensations that can't be quantified, even a sort of mysticism play a part in the analytical process.

The "Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings" (see p. 114) offer general performance parameters for rehabilitation. In order to supplement these guidelines with some hands-on knowledge, we asked four practicing architects with field experience in material restoration to delineate major points of advice they would pass on to practitioners beginning rehabilitation work. Though they are material-specific in orientation, all of the articles share a common theme—determining the proper course of rehabilitation action can be as much an art as it is a science.—M. Stephanie Stubbs

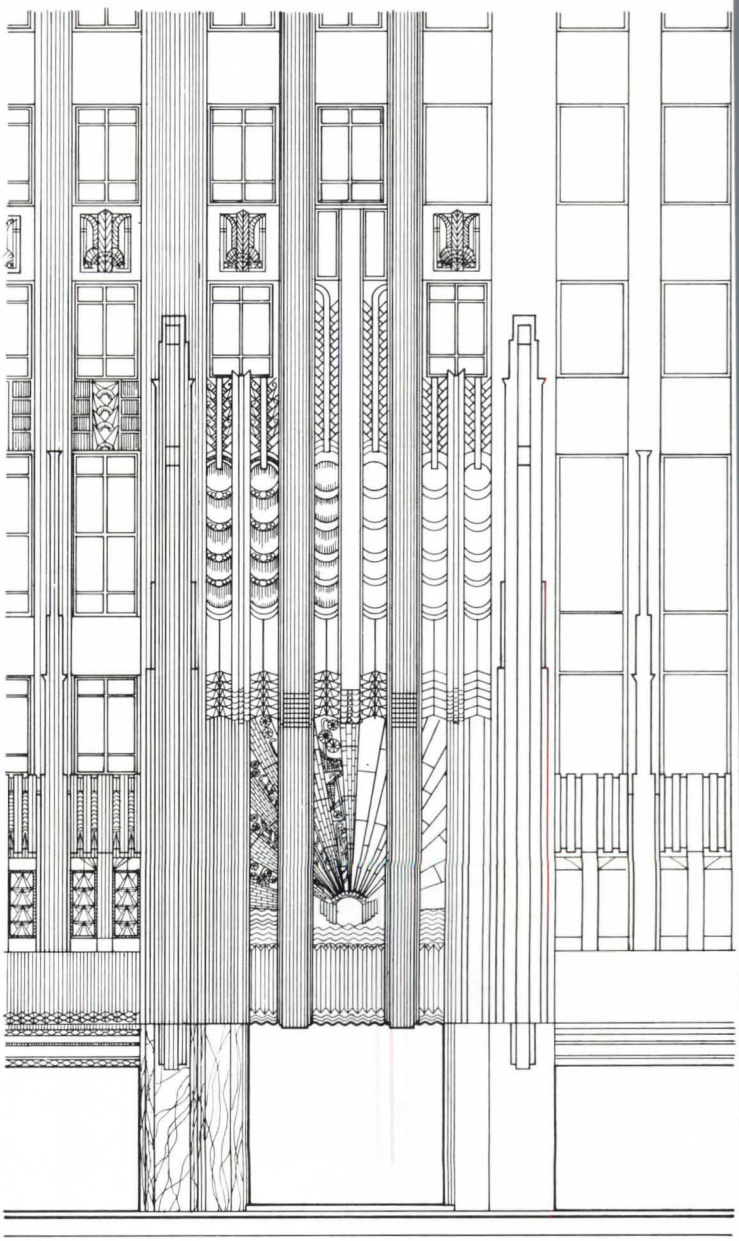
Ferrous Metals

By Valerie A. Sivinski

Ferrous metals are composed of iron and therefore are magnetic, noncombustible, and subject to rusting. Combining the iron with other elements changes the characteristics of the metal so it can meet a variety of needs. Wrought iron is nearly pure iron (less than .035 percent carbon). Its toughness, elasticity, and tensile strength are the result of incorporating threads of slag into the metal during its manufacture. Cast iron, on the other hand, has a high carbon content (2 to 4 percent) along with traces of other metals; this mix produces a hard, brittle metal that is strong in compression. Steel (.06 to 2 percent carbon) combines the tensile strength of wrought iron and the compressive strength of cast iron. The addition of other metals changes the properties of steel—chromium and nickel produces corrosion-resistant stainless steel, and the copper in Corten steel helps it to form a crust that protects against progressive corrosion.

All metals react with oxygen to form a surface layer of metallic oxide. This layer can protect the metal underneath from further reaction, or it can form a loose, disorganized structure that allows corrosion to continue to progressively deeper levels in the metal. The rust that forms on iron is not protective. Water accelerates rusting, but it need not be in the form of standing water. Humidities over 65 percent can condense on the cooler surface of the metal to provide sufficient water for a reaction. The salts and other chemicals deposited by pollution, rain, and sea water can aid the oxidation process or directly attack the metal. For this reason, iron is nearly always painted to provide a barrier against the corrosive agents in the atmosphere. For the same reason, hollow iron objects should never be filled with concrete since concrete retains moisture and contains corrosion-inducing salts.

Galvanic action can also be a factor in the deterioration of iron. When two different metals are in contact with each other



Valerie Sivinski, who holds a degree in building conservation from the University of York, England, is a practicing preservation architect in Washington, D.C.

and a solution that will carry an electric current, the "nobler" (more inert) metal will attract positive ions from the baser metal, causing the eventual destruction of the baser metal. Any metal can act as either a base or a noble metal, depending on the other metal it touches. Iron occupies a position fairly low in the galvanic series and is affected by tin, lead, copper, nickel, and their alloys.

Physical forces can also cause failure in a building element or in the bolts, rivets, or screws that connect the pieces. Abrasion by rubbing or weathering can decrease the thickness of the metal. Fatigue from the cyclical application of forces can overcome metal's inherent elasticity. A member can be overloaded through poor design, a change in occupancy, or a modification of the loading pattern. The casting process sometimes produces mechanical flaws, including air holes or cinders in the metal, rapid or uneven cooling, and asymmetrical pours. Although ferrous metals are noncombustible, they are not fireproof—they soften and lose strength at temperatures typical in fires.

Preservation and restoration techniques focus on cleaning, mechanical repair, and protective coating. To minimize rust damage, it is best to remove only the rust and any loose coatings. Securely attached paint can continue to protect the metal underneath. Of course, thick paint on an iron object sometimes obscures detailing, so architects may wish to remove it for esthetic reasons. On flat, unornamented surfaces, mechanical means, such as sandpaper, steel wool, wire brushes, and rotary strippers will probably perform best. Grit blasting (sand at less than 100 psi) is an effective, cost-efficient method of removing heavily encrusted paint from iron objects. Blasting is not without its drawbacks, however. Adjacent materials, neighboring buildings, landscaping, cars, passersby, and the operators of the equipment need to be protected, not only from the sand, but from the lead dust released from blasted paints. Blasting also removes caulking and putty; these need to be replaced.

Chemical paint removers are slow but effective. Phosphoric acid, oxalic acid, and sodium citrate are the preferred strippers. Hydrochloric acid should not be used because it leaves a corrosive chloride compound that is difficult to remove. All chemicals should be rinsed away thoroughly and the metal dried quickly with heat. No matter what cleaning method is used, the exposed metal must be primed immediately to prevent the reformation of rust.

Small defects can be filled with plumbing epoxy or auto body filler. Larger repairs can be made by welding in patches, splices, or reinforcement. Cast iron should be brazed or nickel-welded; wrought iron and steel can be welded with more conventional techniques. Alterations of existing structures should take into account that manufacturing processes up to this century did not reliably produce homogeneous metals; there may be weak spots in any structural member. Good preservation practice recommends that replacements be made "in kind." This advice may prove difficult for historic iron objects. Wrought iron is no longer being manufactured, and the replication of single pieces of cast iron may be expensive. Mild steel is regularly substituted for wrought iron and wood; glass fiber and aluminum have been used in place of missing cast-iron pieces. Check that earthquake and fire codes will allow such replacements.

Protecting metals against decay often requires modifying the environment by dehumidifying the surrounding air, applying corrosion inhibitors to the metal, or providing a low-voltage electric current to counteract the charges produced by rusting. Proper design could also eliminate water traps, establish effective drainage, or insulate the iron from nobler metals. In most cases, painting protects iron from water and air. Oil based primers of red lead, red iron oxide, zinc chromate, basic lead-silicochromate, or zinc dust are of utmost importance because they form the transition layer between the iron and the protective coating. The paint should be selected on the basis of the iron object's use, expected environment, exposure to corrosive materials, vulnerability to fire, and future maintenance program. Regular recoating should be scheduled every five years with annual inspections of the paint film.

Wood

By Elmer E. Botsai, FAIA

There are at least five guidelines to consider when working with older wood buildings.

1. Water, water, water. Though water is such a blessing to mankind, it is a curse to buildings, particularly wood buildings. Next to fire, water does more damage to wood than any other single action.

To understand the action of water on wood, it's important to consider that decay spores have been found in or on every piece of wood that's ever been tested. Fresh sticks taken directly from the mill's sawblades show decay spores. These spores do not die under normal conditions; they are simply dormant. As soon as the moisture content of the wood exceeds the fiber saturation point (approximately 25 to 28 percent), decay starts, and depending on temperature, humidity, and the variety of the wood, it proceeds at various, and sometimes rampant, speeds. Decay will stop if the wood is allowed to dry below the fiber saturation point, but as soon as that point is broached again, decay will continue as rampantly as before.

When wood decays to the point where it has lost merely 5 percent of its overall weight (an amount that field investigations cannot even detect), it already has lost 80 percent of its shock or impact resistance. This loss of strength has tremendous significance in earthquake regions.

In diagnosing the condition of wood in an older building, it's important to look both inside and out. Generally, it is the intersections in buildings that will first show the signs of problems, such as the joints between jambs and sills in doors or windows, roof valleys, gutter and eave connections, roof penetrations, parapets, and foundation sill plates. Look at joints between different materials; spot-check plaster cracks to ensure the membrane is not torn. If you find any such evidence, it should be

Elmer E. Botsai, FAIA, former president of the Institute, is dean of the University of Hawaii's school of architecture and an architectural pathologist practicing in Honolulu.

thoroughly investigated. Don't wishfully think it away. Water penetration usually won't vanish; it simply gets worse.

2. Building aroma. Using your sense of smell can help, though this sometimes means playing "witch doctor." Smells are great indicators of a building's health. Warm, humid, moldy, or sweet smells should be checked out, the same with any rank smells, even if only to find the old, dead cat. These smells often spell trouble. The dry, musty smell is usually OK and only points to disuse and the need for cleaning.

There is something almost mystical about this method of sensing a building's condition. I truly believe buildings try to talk to us, to tell us when they are in trouble. So listen to the building's creaks and groans, smell its perfume or body odor, taste its salt or sugar, and feel, feel, above all, feel. Lay your hands on it. Feel the vibrations, the warmth or cold.

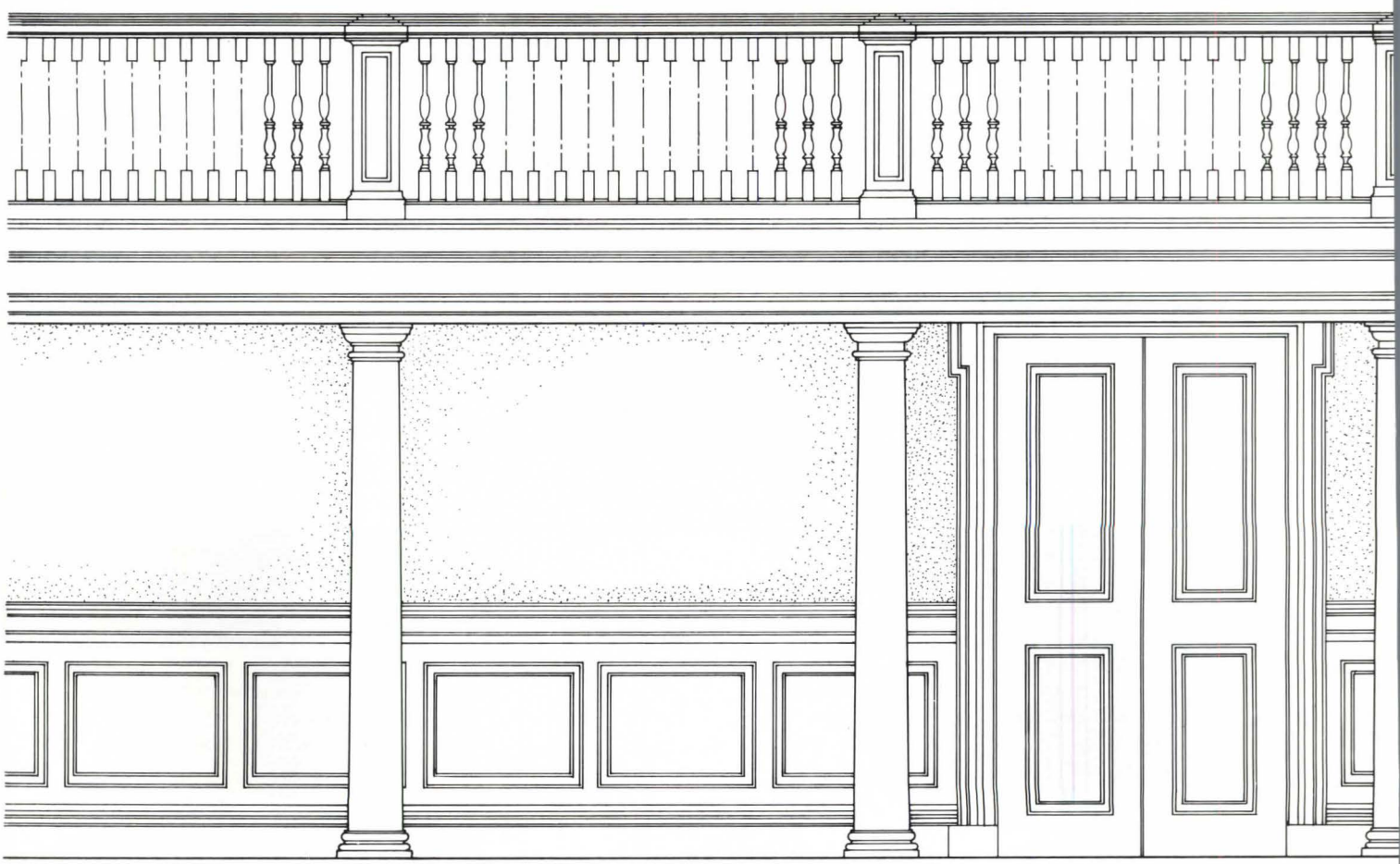
3. Energy sins. Frequent causes of trouble with older wood are energy modernizations. Older wooden buildings, like ourselves, need to breathe to stay healthy. Closing them up, foaming their cracks, and sealing their joints can cause condensation and decay, which all too often precipitates a disaster. If this kind of work has been done, look it over very carefully. And yes, try not to commit these sins in your own rehabilitation work.

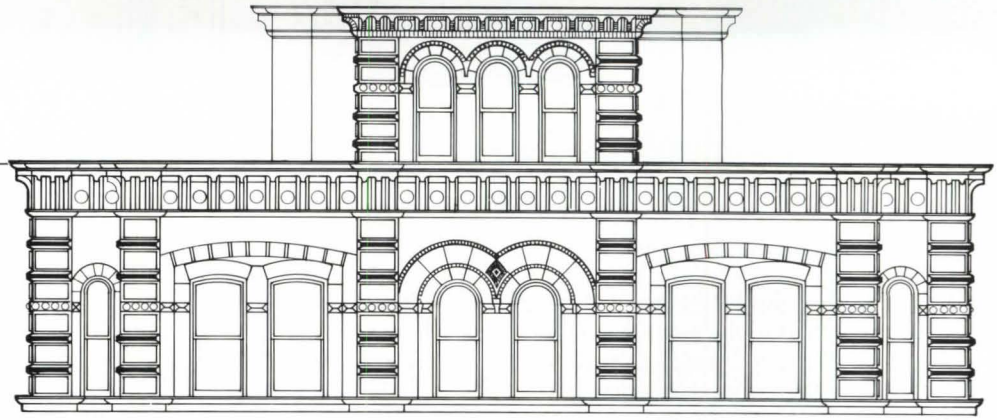
4. Structural distress or just old age. Signs of structural overload are not always cause for concern. Wooden buildings are much like people. When young, we both should be tall and straight, sharp-edged and steady. When older, we both sag, sway in the wind, and lean a bit.

What is the fine line between old age and structural distress? Wood has so much individuality that the design, when well done, is far more art than science. I care far less about psi and stress numbers; instead I look at how members are tied together and at structural redundancy—these are really critical in wood buildings. Sure, if you have a beam that is really sagging, check it out. You'll probably find it a bit undersized. But so what? A more important concern is how is it supported; if it is sitting on a good solid post, that's one thing, but if it's held by a couple of bolts, that's something else.

Look for cross-grain crushing at plates, particularly if you're working in heavy snow country. Look for continuous movements that are stressful. Look carefully at any veneer and how it is tied to the frame. Check carefully for degradation of metal connectors. In summary, look for signs of stability versus signs of excessive, continuous movement. For example, that crack in the foundation—is it merely a little shrinkage or perhaps a bit of differential settlement, both long gone, or are the edges fractured and crumbling and showing signs of continuous change? Your older building should be well-settled by now. If not—worry.

5. Design Philosophy. This brings up a final point of advice in working with older wooden buildings: Establish early on which elements of the building should be saved, and why, and then determine whether they can be saved. All too often, less experienced professionals go to great lengths and expense to save everything possible, even when much of it added little to the end product. Restoration strategies must revolve around a clear, philosophical design concept for the finished work.





Sandstone

By Shira Rosan, AIA

Sandstone is a sedimentary stone composed of mineral grains held together by natural cements. It has a layered structure, resulting from variations in the rate of deposit of the grains. Where layers come together, zones of weakness ("bedding planes") occur.

Differences in the composition of the grains and the cementing agents account for the differences between sandstones, which range from stones with a loose crumbly structure to others that are dense and uniform. The methods of quarrying, dressing, and use also affect the properties of the stone as a building material.

The problems in preserving sandstone spring from the same properties that made it popular. The relative softness of sandstone makes it workable but also permeable. The great enemy of sandstone is water, both because of water's own destructive properties and because of elements such as salt and various chemicals that water can carry into the stone.

Unfortunately, especially in urban centers in northern climates, the historical use of the softer sandstones is widespread and has intrinsic problems. Bad techniques used during original construction, as well as earlier attempts at repairs, can exacerbate the situation.

It is important to recognize that deteriorated sandstone cannot be "repaired" and that although a sandstone building can be restored, restoration will always be at some cost to the original stone. Therefore, it is recommended that preservationists considering restoration develop a tolerance for a certain level of weathering and dirt and choose restoration techniques with an eye toward stabilizing the building in its current state wherever possible rather than attempting to restore it to a pristine condition. Treatment choices must also consider the expected life of the building, the life and cost of the repair, and the level of maintenance that can be reasonably expected. For sandstone buildings that have escaped significant decay, diligent maintenance and carefully considered small repairs will go far toward preventing major problems.

The most common problems afflicting sandstone in older buildings are:

• *Weathering.* Damage from wind and water is marked by disintegration of the stone surface and appears as a softening or blurring of edges and loss of detail.

• *Blistering.* Bubbling and swelling of a thin layer of "skin" results from chemical action, especially pollution.

• *Cracking.* Fractures extending through the stone occur because of freeze-thaw cycles.

• *Exfoliation.* This is the separation of layers along bedding planes. Its causes include freeze-thaw cycles and stresses in the stone that result from settlement and rust-related expansion of embedded iron. At the face of the stone, exfoliation results in spalling and loss of stone. When exfoliation occurs within the stone ("blind exfoliation"), the result is a separation of layers but not necessarily an immediate loss of stone. Blind exfoliation can be detected by striking the stone with a rubber mallet; stone with this problem sounds hollow.

• *Detachment.* Breakage at any point in the stone occurs because of impact or stresses due to settlement.

The choice of treatment for any of these problems depends on the extent of the damaged stone and the condition of the remaining stone. Some of the choices:

• *Composite Patching.* The oldest of the treatment methods, composite patching is useful where loss of stone is not extensive and can be used to rebuild areas of detail. In this treatment method, many cement-sand layers are built up to replace the missing area. The damaged stone must be cut back as far as necessary until sound stone is reached; a composite patch will not adhere to damaged stone. The finish coat must be carefully matched to the existing stone in color and texture, although over time a repair will weather differently from the way original stone will. Composite patching works in cases of weathering, severe blistering, and exfoliation.

• *Mechanical Repair.* There are three mechanical repair techniques. Concealed repair (also called "Dutchman repair") involves the use of stainless steel or thermoplastic pins set in epoxy-filled holes in existing stone and replacement stone. Concealed repairs are used for cases of detachment; they can also be used when replacement stone is the original detached piece, or for newly carved stone. Through-surface repair (also called "stitching") uses staggered holes drilled through the face of the stone and filled with adhesive grout. Stainless steel or thermoplastic pins are inserted and countersunk; the remaining holes are filled with composite patching material. Through-surface repair is used in cases of blind exfoliation and of cracking where cracks are larger than ½ inch. Direct injection, the third mechanical treatment, refers to adhesive grout that is pressure-injected, usually with a 60-millimeter syringe, directly into stone. The crack surface is then sealed with non-oily clay to prevent leaks. Direct injection is used where cracking has occurred.

• *Chiseling.* With this technique, the damaged surface of the stone is cut back to sound stone, and the newly exposed stone surface is chiseled or honed to the desired pattern. Chiseling is used in cases of blistering, weathering, exfoliation, or detachment, but only where existing stone is deep enough to be cut back to sound stone and then worked and where detailing of the structure makes a new, shallower depth of stone appropriate.

• *Chemical Consolidation.* Consolidates in liquid form penetrate and replace deteriorated cementing agents within the stone. Although used with some success in Europe on sculpture and finely detailed carving, this technique remains experimental when applied to larger areas. If proved effective, this method will be useful for stabilizing weathered areas to prevent further deterioration (but not useful where exfoliation or cracking has occurred).

• *Total Replacement.* New stone can be matching stone from the original quarry (stone to match the brown sandstone used in the Eastern U.S. in the 19th century is virtually impossible to obtain), similar stone from another quarry, or recycled stone from another area of the building under repair or from another building via a stone yard (care must be taken that the replacement stone is sound and can be worked). Often no appropriate

Shira Rosan, AIA, is an associate with the Stein Partnership, a New York-based architecture firm specializing in restoration.

new stone is available; in that case another material can be substituted. Replacement of sandstone by brick, tile, or other nonstone material is usually unacceptable, as it changes the fundamental character of the building. Cast stone, which is essentially concrete cast with agents to color and texture the final product, can be used to replace large areas of damaged stone. Molds are taken of any remaining detail; plaster models are then made and worked to re-establish lost elements. Replacement is used in cases of severe weathering, exfoliation, or detachment; the technique should be seen as a last resort.

The New York Landmarks Conservancy and the Preservation League of New York State offer useful publications for additional reference. "The Maintenance and Repair of Architectural Sandstone" is available from the New York Landmarks Conservancy. Its address is 330 West 42nd St., New York, N.Y. 10036. "Property Owner's Guide to Maintenance and Repair of Stone" is available from the Preservation League of New York State. Its address is 307 Hamilton St., Albany, N.Y. 12210. Additional information is available from the U.S. Department of the Interior. Write to the Heritage Conservation and Recreation Service, Technical Preservation Services Division, Washington, D.C. 20243.

Limestone, Granite, and Marble

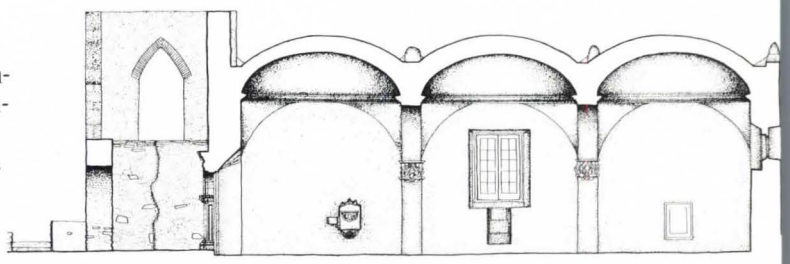
By Baird M. Smith, AIA

Restoration of natural stone begins at a seemingly obvious yet critical point—knowing with reasonable certainty that it is natural stone and what type it is. There are many look-alikes—such as terra-cotta, cast stone, and cast concrete—that can have exactly the same color and texture as natural stone.

Once the architect ascertains that the building material is indeed natural stone, the next step is to determine if the stone is a calcium carbonate material—a limestone or marble. Non-calcium carbonate stones, such as sandstone and granite, require different treatments for restoration, especially for chemical cleaning.

To determine a course for restoration, the architect must first assess the stone's physical condition and the degree of deterioration. Planning to carefully survey and inspect all building elements is essential, for some may require scaffolding or staging. Conditions frequently encountered include dirt, stains, and coatings; surface spalling and cracks; and loose or missing elements.

Heavy accumulations of dirt, stains, and algae commonly occur on older buildings, especially in urban settings. There is evidence that leaving this build-up of dirt in place may sometimes subject the building stones to future damage, but the overriding reason to clean a building is to improve its appearance.



Stones coated with paint, clear coatings, or heavy-bodied mastics or pargeting present more complex issues. First, it must be accepted that stones are porous and that some degree of moisture vapor migrates through the stone at all times. Heavy coatings block this free movement, and the result often turns out to be spalling and surface damage. Generally, coatings have short lifespans (5 to 10 years). If it looks like a coating should be removed, the following questions must be answered before work begins:

- Why did the architect place the coating there in the first place? Does it cover up a more serious problem? If the coating is left in place, does it create risks of future damage?
- If the coating can be removed, will the removal process (i.e., chemical, water, or physical) cause damage? Are there multiple coatings that may prove impractical or too costly to remove?
- Is the stone beneath in good enough condition or of good enough appearance to warrant the effort of removal?

If spalling is discovered, its severity must be assessed: Through how many years has the spalling occurred? What is the rate of loss? If spalling is less than ¼-inch deep, repairs may not be warranted.

Cracks or damage that result in loss of material usually suggest some failure in the structural system, such as foundation settlement, corrosion of metal anchorage, or overloading. Cracks represent symptoms of more serious problems, and a structural engineering assessment may be warranted. It is important to note that loose stones create a public safety issue.

Cleaning often proves difficult on the job site, and cleaning contractors generally demonstrate more interest in the final product (i.e., a very clean surface), than in the careful process of selective and gentle cleaning mandatory for historic building stone. The architect should administer cleaning tests during the design-development/contract-document phase of the project, and then specify the cleaning operation that has proven effective. The following are recommendations that address typical cleaning problems for limestone and marble (calcium carbonate materials), as well as granite:

- *Algae:* Apply a solution of trisodium phosphate (commercially available as Spic-N-Span). Remember, however, that if the environmental conditions of temperature and light that promote algae growth remain unchanged, in time the algae will return.
- *Dirt and Stains:* Calcium carbonate materials react with acidic cleaners such as hydrofluoric or hydrochloric acids, causing surface erosion. Select chemical cleaners specifically intended for limestone and marble. These will be nonacidic (basic) solutions, generally sodium hydroxide. Test programs determine the degree of effectiveness. Some stains or dirt may prove to be stubborn, and cleaning them may be less than effective. Compromises may be necessary when the best cleaning product available still leaves the limestone or marble somewhat splotchy. In such cases, further cleaning or use of stronger cleaning solu-

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tions only results in the loss of surface material and is definitely not recommended.

• *Paint Removal:* Paint-removal chemicals (sodium hydroxide or methyl methacrylate) often remove latex or alkyd paints effectively and do not react adversely with the stone. However, if they are not thoroughly rinsed from the stone, a whitish residue will remain. Reapply the chemical as often as necessary to remove multiple layers of paint. Lead- or milk-based paints may prove more difficult to remove. Be aware of environmental controls regarding the effluent and disposal of the paint residue. Heat guns or torches may scorch the surface of the stone and therefore are not appropriate.

When patching is required, many high-tech materials are available that can be used with older stones. However, most "off-the-shelf" patching materials, intended for use in very corrosive environments such as concrete storage tanks or on parking garage decks, prove too strong or too brittle for use on historic buildings. Basic stucco patches of lime/cement/sand mixtures are most effective, and the sand can be specially selected to match the color of the stone. A typical stiff patch mix consists of one part white portland cement to one part lime to six parts sand, and is usually troweled into place.

Patches greater than 3/4 inch in depth should have some form of mechanical anchorage, usually a stainless-steel dowel set into the base stone. A patch should never cross over a mortar joint, joining two stones together. Each stone must remain independent of its neighbor to allow for ordinary thermal expansion and contraction.

In more severe deterioration cases that call for replacement, the architect may encounter yet another problem—many building stones are no longer quarried, and finding replacement materials can be difficult. Once the architect does find suitable replacement materials, repairs on calcium carbonate stone can be made in the same way repairs on sandstone are made—by piece-in (a Dutchman) or by replacing an entire unit. Epoxy adhesives can aid in anchoring smaller pieces; otherwise, traditional mortars and stainless-steel dowels should be used for the replacements.

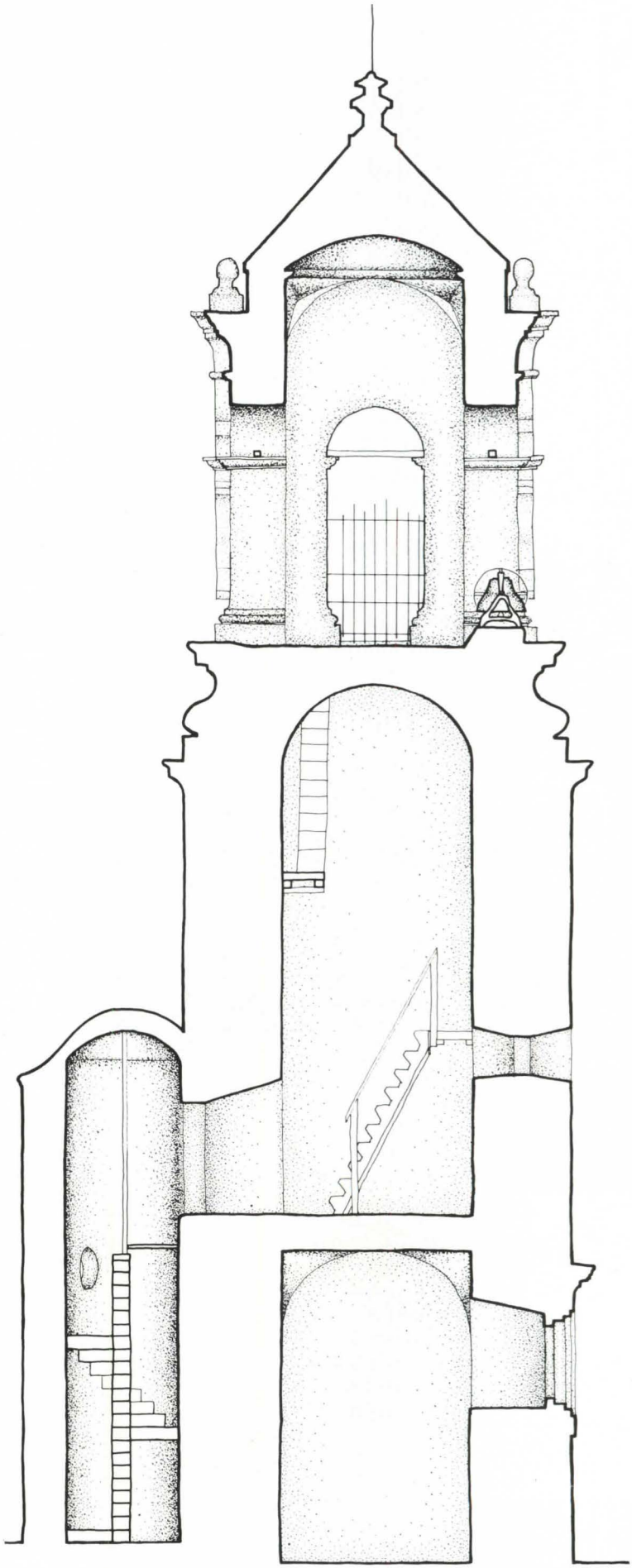
Traditional mortars have service lives that often exceed 100 years and therefore should never be cast aside in favor of sealants, which have a useful service life of about 20 years. Properly selected and placed mortar consistently outperforms sealants over time.

On the other hand, perhaps too much attention has been placed on repointing, and buildings are repointed without sufficient cause. A detailed investigation to determine if repointing is necessary should examine two major questions:

• Is the joint eroded to the point (usually in excess of ⅜ inch) at which water penetrates the wall system? Penetration can be confirmed by verification of damage to wall anchorage systems or water staining on interior surfaces.

• If the joint has not eroded, has the bond between the mortar and the stone unit failed, providing a horizontal crack that allows moisture penetration? This condition prevails in 19th-century stone-veneer buildings, in which the original mortar was often a strong portland cement mix.

If the decision is to repoint, the mortar selected should always be weaker than the base mortar, which typically means a lime-rich mix. A good starting point is a type O mix: one part white portland cement, two parts lime and nine parts sand. The color of the sand should closely match the color of the base mortar to assure that the pointing mortar will match. □



Federal Standards for Preservation

The Department of the Interior spells out design requirements for investment tax credits. By Bruce Kriviskey

The new tax reform act reduces the amount of investment tax credits (ITCs) allotted for rehabilitation of historic and other older commercial properties. Other than this reduction in credits, there has been little change to the law regarding review for rehabilitation credits established in the Tax Reform Act of 1976 and refashioned in the Economic Recovery Tax Act of 1981. The greatest ITC benefits—and the most demanding design review process—still apply to properties listed in the National Register of Historic Places.

Under the new tax act, the owner is entitled to a tax credit of 20 percent of the rehabilitation cost for certified historic structures and a 10 percent credit for rehabilitation of non-registered properties built before 1936. Being on the National Register does not automatically qualify a building for the 20 percent tax credit. To qualify, a historic rehabilitation project also must adhere to 10 standards set forth by the Department of Interior.

The review process is intended to ensure that the architectural significance of a building or its historic context is not compromised by insensitive alteration. For the ITCs, this process comprises a professional review by qualified architects within responsible state and federal agencies. At the local level, concerned and knowledgeable citizens (many of whom are architects) serving on historic preservation commissions or design review boards conduct the reviews.

To guide both the review and design processes at the state/federal level for preservation-tax-credit certification, the preservation assistance division of the National Park Service (housed within the U.S. Department of the Interior) developed a set of criteria known as the Secretary of Interior's Standards for Rehabilitation.

Initially, the National Park Service developed the standards to guide work on rehabilitation projects within its historic preservation fund grant-in-aid program. Federal agencies also used them to review rehabilitation proposals affecting properties listed on the National Register. When the Tax Reform Act of 1976 established the investment tax credits, the standards already existed, in one form or another. The standards define "rehabilitation" as the process of "returning a property to a state of utility, through repair or alteration, which makes possible an efficient contemporary use while preserving those portions and features of the property which are significant to its historic, architectural, and cultural values."

Specifically, the standards propose that the preservation of a building's historic architectural character rests on two assumptions: first, that its materials, craftsmanship, and features are unique; and, second, that these should not be removed, ruined, or replaced unnecessarily. To achieve these ends, the architect must first identify the particular materials and features that define the building's architectural significance. Next, the architect must assess the potential impact on these materials and features of the work deemed necessary to achieve project program goals.

Following are the Secretary of the Interior's Standards for Rehabilitation in their entirety:

1. Every reasonable effort shall be made to provide a compatible use for a property that requires minimal alteration of the building, structure, or site and its environment, or to use a property for its originally intended purpose.

2. The distinguishing original qualities or character of a building, structure, or site and its environment shall not be destroyed. The removal or alteration of any historic material or distinctive architectural features should be avoided when possible.

3. All buildings, structures, and sites shall be recognized as products of their own time. Alterations that have no historical basis and that seek to create an earlier appearance shall be discouraged.

4. Changes that may have taken place in the course of time are evidence of the history and development of a building, structure, or site and its environment. These changes have acquired significance in their own right, and this significance shall be recognized and respected.

5. Distinctive stylistic features or examples of skilled craftsmanship that characterize a building, structure, or site shall be treated with sensitivity.

6. Deteriorated architectural features shall be repaired rather than replaced, whenever possible. In the event replacement is necessary, the new material should match the material being replaced in composition, design, color, texture, and other visual qualities. Repair or replacement of missing architectural features should be based on accurate duplications of features, substantiated by historic, physical, or pictorial evidence rather than on conjectural designs or the availability of different architectural elements from other buildings or structures.

7. The surface cleaning of structures shall be undertaken with the gentlest means possible. Sandblasting and other cleaning methods that will damage the historic building materials should not be undertaken.

8. Every possible effort shall be made to protect and preserve archeological resources affected by or adjacent to any project.

9. Contemporary design for alterations and additions to existing properties shall not be discouraged when such alterations do not destroy significant historical, architectural, or cultural material, and such design is compatible with the size, scale, color, material, and character of the property, neighborhood, or environment.

10. Wherever possible, new additions or alterations to struc-

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tures shall be done in such a manner that if such additions or alterations were to be removed in the future, the essential form and integrity of the structure would be unimpaired.

The standards thus give the rules of the game and define parameters but don't spell out strategies or give design direction. Therefore, the National Park Service developed more detailed guidelines to supplement the standards and to provide general design and technical information. They are published together in the "Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings."

Not intended as universally applicable answers, the guidelines serve as suggestions to aid case-by-case decision making by the architect and other preservation professionals. The guidelines constitute advice on interpreting the Secretary of the Interior's Standards for Rehabilitation during the processes of preservation, protection, repair, and replacement as part of any building rehabilitation project.

Unlike the standards, the guidelines are not codified but are intended to assist the architect as suggested do's and don'ts, with side-by-side comparisons of recommended and not-recommended courses of action regarding the exterior, interior, environs, code compliance, and design of additions. Exterior materials and features covered are masonry, wood, metals, roofs, windows, entrances, and storefronts. Interior structural systems, interior finishes, and mechanical systems are also covered.

As an example, the guidelines make the recommendation to clean masonry only when necessary to halt deterioration or remove heavy soil and to hand-rake joints to avoid damaging the masonry. Conversely, the guidelines recommend against cleaning masonry that is only lightly soiled, since it would needlessly introduce chemicals or moisture into historic materials, and to avoid using power saws and hammers when removing deteriorated mortar from joints because of the high risk of damaging the masonry.

In general, the guidelines recommend that the architect do only what needs to be done to preserve a building's fabric and architectural character, and to not contrive any kind of historic appearance when accurate supporting documentation is unavailable.

Though the standards and guidelines function primarily to aid review of projects seeking historic rehabilitation certification, many local preservation review boards have also adopted them, in whole or in part, simply because they are one of the few comprehensive rehabilitation guides in print and are widely available. Over a thousand communities throughout the country have adopted local historic preservation ordinances that include a formalized design review board or official who measures compliance for local rehabilitation ordinances. Therefore, the architect must know the guidelines as they are written, and more importantly, how they are interpreted at the local and state/federal levels. This is where the standards and guidelines offer answers and directions and why they should be looked at not just as rules but as common sense indicators of good architectural practice when dealing with all existing older buildings.

To obtain a copy of the standards and guidelines, contact your local state historic preservation office or the preservation assistance division of the National Park Service. Or, get the book, *Respectful Rehabilitation: Answers To Your Questions About Old Buildings,* National Park Service, Preservation Press. Washington, D.C. (1982). The Preservation Press of the National Park Service also publishes a number of books and pamphlets on a wide variety of technical subjects. □

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Making Preservation a Specialization

Here's how seven firms built reputations that help win commissions.
By Jonelle M. Lawhorn

America's preservation movement, spawned some 20 years ago by a small, some say elitist, group and taken up as a battle cry by citizens in the streets, has come to mean a viable business for many architecture firms, both financially and philosophically.

The question of why—and how—architects have leapt into the fray hasn't a single, simple answer. Although they may seem the most likely standard bearers for the preservation battle, architectural historian James Marston Fitch, Hon. AIA, derides architects for their apparent lack of concern for the nation's built heritage.

"I think architects are just beginning to appreciate historical architecture. They've often been hostile toward older buildings, in some cases gleefully demolishing them to make way for new," Fitch says.

Yet, despite Fitch's indictment, many firms have long worked to preserve and adapt older buildings—and competition among them has grown stiffer. Those close to the preservation movement see architects as critical to the process.

"The architectural profession is very important to this effort," says Sally Oldham, vice president of the National Trust for Historic Preservation's office of programs and services in Washington, D.C. "There is a strong recognition among architects of the need to preserve our architectural heritage. Ten years ago, even five years ago, that would not have been true."

Oldham credits that interest in part to evolving architectural styles and a renewed interest in historical precedence, and to a noticeable cultural shift in America. People are concerned about their roots, their heritage," she says. "They're more interested in their cities, in keeping those places lively, exciting places to be. Developers looking to their next business move have picked up on this. They're hyping restoration projects, which feeds into people's interest in their heritage. And architects are simply finding it a good business to be in."

So, the bandwagon's rolling and the market's still hot. How to jump on? In a survey of seven preservation-oriented architecture firms across the country, responses were, in many cases, strikingly similar. Many firms fell into the preservation field early in their histories, as much by chance as by design. For others, renovation or restoration work was among the few projects they could land with their fledgling practices.

Charles Tseckares, FAIA, principal with CBT in Boston (examples of whose work are shown on pages 75 and 84), recalls that when the partners first opened their doors in 1966, they were, like most new firms, desperate for clients. The partners launched a concerted attack on one market area that was, at the time, languishing in the wake of urban renewal.

"The city of Boston was working on its urban renewal plan; all the major sites were already dedicated to specific developers—but not the historic areas," Tseckares recalls. "We studied that plan—we needed clients. We went out and analyzed the older buildings for their reuse potential and then tried to convince developers to take them on as projects. We sold it as historic preservation. 'There are some real beauties out there,' we told the developers. 'And once the market recognizes that, you'll be in the driver's seat, Mr. Developer.'"

The strategy worked. "At one point, our practice was 101 percent adaptive use," Tseckares says. "In the early to mid-1970s, the economy was pretty tough, with the interest rate on new construction up to 20 percent. Because of that, developers started to think seriously about adaptive use."

The firm's practice now consists of roughly 40 percent adaptive-use projects and 60 percent new construction, both in the commercial office, institutional, and multifamily housing markets. Gross annual billings last year were roughly $5.4 million, with $2 million of that in adaptive use.

Why the switch? "We're a larger firm now," Tseckares says. (The firm's staff has grown from 45 in 1980 to 85 today.) "We were beginning to get typecast. We had developed quite a reputation for adaptive-use work and decided we should downplay that somewhat and branch out."

For Hewitt/Daly/Isley of Seattle, preservation work was a natural pursuit, given the principals' philosophical commitment to historic buildings and the conservationist sentiment that characterizes the area. About 65 percent of the firm's work is in new construction, and the balance in preservation.

"Seattle has long been a forerunner in the preservation movement," explains principal Jim Daly, AIA. "We're behind in some things—they're still wearing their skirts short out here—but in other things, Seattle's way ahead. Preservation is a way of life here.

"Before we formed the partnership in 1975, I had my own practice set up in an area of Seattle known as Pioneer Square," he says. "The area was a whole jumble of very romantic, Romanesque revival-type buildings that were going through renewal. It was very inexpensive office space at the time, and I ended up working on some of those projects. From that point on, I've been personally very involved in preservation and restoration work, and that interest has carried over into the partnership. I've been involved with the National Trust board and served for two years as chairman.

"People around here are very sensitive to architectural preservation," Daly adds. "Any developer who wants to come in and trash an old building would most likely be shredded."

Jonelle M. Lawhorn is a public relations and marketing specialist for a Connecticut-based architecture firm not mentioned in this article.

Notter Finegold & Alexander of Boston (an example of whose work is on page 83) launched its practice in 1961, also taking advantage of the city's move toward urban renewal.

"Our interest in Boston has been a big factor in our involvement in preservation," says Maurice Finegold, AIA. "Our practice began at a time when Boston was looking at the renewal of its waterfront. With the assistance of the Redevelopment Authority, which shared our vision, we began to adapt the old waterfront buildings, the warehouses and so on. It took the guts and integrity of one of our founding partners, Tim Anderson, to get us into this market. [Anderson has since left the firm to start his own practice.] Tim renovated the old Prince Spaghetti warehouse down on the waterfront primarily because he thought it would be a great place to live.

"When we were doing that project, it was almost impossible to get financing. The bankers thought we were crazy, you know, 'There goes another crazy architect.' Now, of course, they're falling all over themselves to finance such projects."

The firm's practice is now a 50-50 mix of adaptive use and new construction. NF&A has about 70 employees; 50 in the Boston office, a dozen in its Washington, D.C., office, and another 10 in a New York City project office to manage the restoration project at Ellis Island, a joint venture with Beyer-Blinder-Belle of New York City.

At the Burley Partnership in Waitsfield, Vt., preservation work is an important component of the firm's business, both philosophically and economically. Like many other firms, the Burley Partnership was its own first client for architectural preservation.

"Our offices are located in a 1906 schoolhouse," says principal Jay White, AIA. "That was our first preservation job; we were able to get 3,000 square feet of space at a relatively low cost.

"The firm has continuously tried to encourage employees to gain whatever skills are necessary to keep us on top of what is happening in conservation. We encourage our staff to attend seminars and conferences on preservation and conservation techniques, and we volunteer our time to speak on the subject at conferences and symposia."

White, who recently attended a six-month international seminar on architectural conservation in Rome (he was one of three American architects invited to participate), plans to conduct several seminars and workshops to keep the profession apprised of new technologies and the public informed about the nature and importance of preservation.

The 10-member firm is just now, after some 20 years in business, developing a brochure.

"The new brochure is intended to help us expand our service area and enable us to be more selective," says principal Robert Burley, FAIA. "That's our way of increasing the quality of the projects we do."

"But I think the best marketing tool we have is to do the work that we have very well, and to put quality ahead of the profit margin," White says.

Charles Davis, AIA, of Esherick Homsey Dodge & Davis in San Francisco agrees.

"We have quite a track record doing this kind of work," Davis says. "There's a lot of experience we can show to a new client. We can point to examples of what we've done, define the problem, and show how we solved it."

Cicely Reynolds, EHD&D's director of marketing, says: "We go through the usual proposal process, and we do a lot of research on a project before we pursue it."

"We get shortlisted on about 90 percent of the projects we go after, but that's also a function of how much research we do before applying," says Peter Dodge, FAIA, one of EHD&D's principals. "That research is very important when you're going after a historic project. In order to get that job, in the midst of a lot of competition, it's extremely important that we find out as much as we can about the building—structurally, historically, and culturally. The more we know, the better success we have selling ourselves."

Past experience and personality

Keeping an edge in the preservation business seems as much a function of past experience as personality and skill in the interview process. Most of the architects feel their past experience is a real key to getting new projects. All firms interviewed say the bulk of their work comes in through word of mouth, referrals from past clients, or recommendations from local historic preservation agencies.

Each firm uses its own strategies as well for keeping up against the competition—which all say is fierce, much stronger now than five or six years ago.

At the Burley Partnership, for example, White says the partners will also keep their eyes open for buildings or groups of buildings that seem to have some potential for renovation. They'll call up the owner or developer and discuss the owner's plans for the building. If the owner is planning to improve the property, sell it, or demolish it, the principals will suggest that adaptive use be considered.

"We would recommend a feasibility study first, and then, based on that study, recommend that preservation or adaptive use be undertaken," says the firm's founder, Robert Burley, FAIA.

At CBT, Tseckares attends a lot of conferences on adaptive use, conferences directed at developers and other real estate professionals.

"We have a lot of experience with the Department of Interior's standards for rehabilitation and have gotten a lot of projects through the agency process," Tseckares says.

Past experience, of course, is all well and good—if you have it. But what if you haven't done a lick of work in the preservation field and want to break in?

When Peter de Bretteville, AIA, joined Stefanos Polyzoides four years ago to open de Bretteville and Polyzoides, a Los Angeles-based architecture firm, neither had substantial working experience in architectural preservation, although both had been practicing for some years.

But both partners were actively involved in a private conservationist group in the Pasadena area. That membership and a bent toward research gave them the credibility and the connections to win their first major preservation job.

"We didn't really think of that as a marketing strategy," de Bretteville says. "It's been more an outgrowth of our educational background and our commitment to and interest in older buildings."

What's the lure of the preservation market? Given that art and business aren't easily separated ideals in the architectural profession, the responses are understandably mixed.

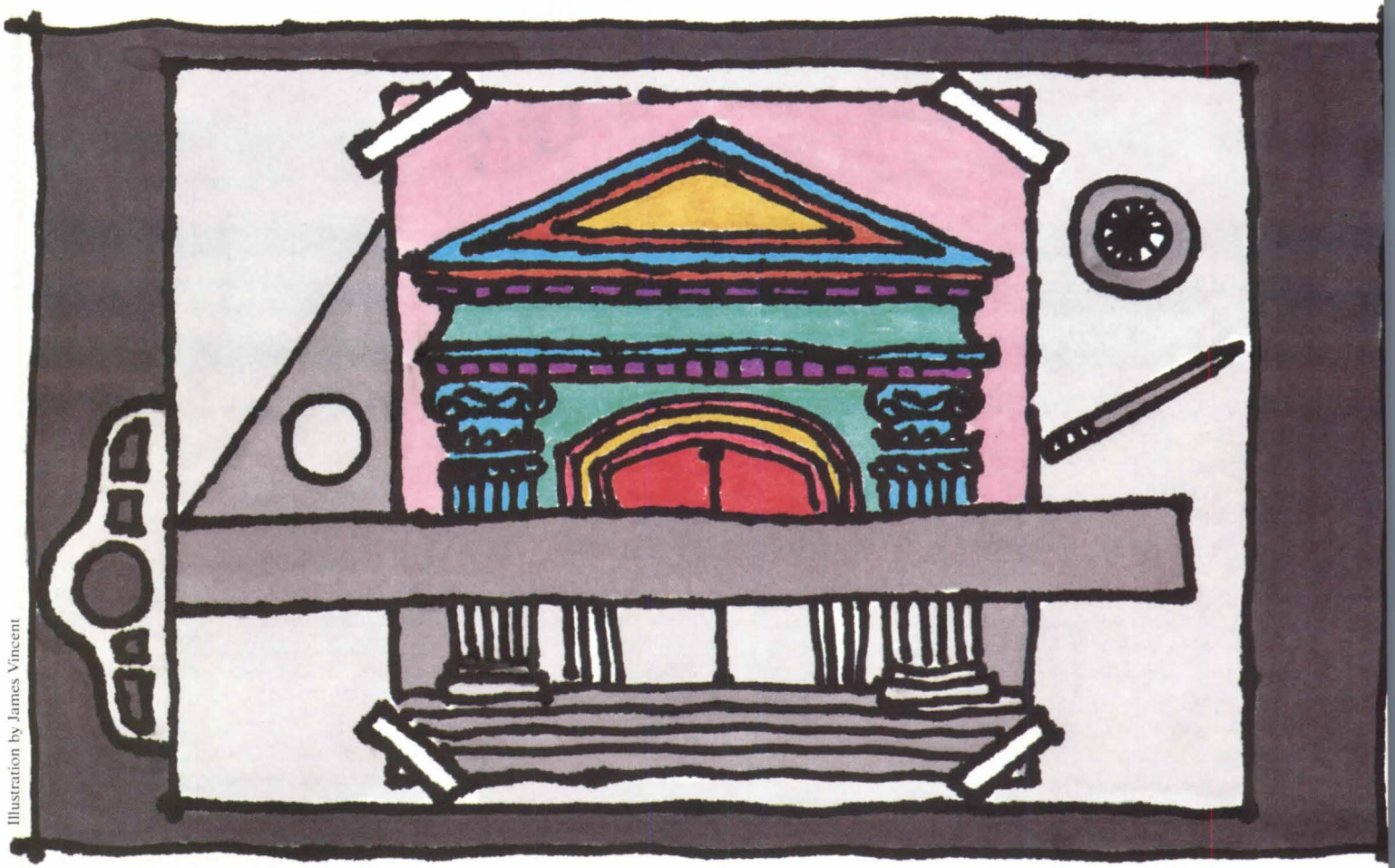

Illustration by James Vincent

"For someone getting into this business, there's a great satisfaction in doing this kind of work," says Maurice Finegold. "There's a certain amount of ego involved in knowing that you've taken something and made it better, or improved its value. And that's a lot different from someone who wants to build a new building."

"It is a profitable market to be in," adds Jim Daly. "I love new construction too, but I do very much enjoy recycling our built environment. There's a very special pleasure in that."

"It's neither more nor less profitable than any other market," says Jay White. "We've always focused our work on the quality of the product. I can't say we're making a lot of money in preservation. We do preservation work because we think it offers the best solution to many of our clients' projects. And we will probably continue to pursue more of it. I came to the Burley Partnership primarily because of its national reputation in preservation work."

The worries and concerns of clients in the preservation market—whether they are developers, private owners, government agencies, or preservation groups—strike a taut balance *between* economics and history.

Finegold sums it up succinctly: "New clients have a certain amount of anxiety about a restoration project's potential for success. They worry about what the net usable or rentable space is going to be, latent conditions, how drawn out the municipal or historic review process is going to be, and just what all the contingent issues are going to be and how much it's going to cost. The experienced client has his eyes open. He's been through the process. Now, he's more excited about the building itself, about its esthetic potential."

And then there's that age-old knuckle-cruncher—At what point do or should architects sacrifice program for product? There's no hard and fast answer. But all the architects interviewed took a strong line on not sacrificing a building's historical integrity or altering its contextual qualities for the program. It's not quite "the client be damned," but more "let's swing him around to our side."

"Not every old building should be saved, and not every new building should be built," says Finegold. "You have to develop a sense of perspective about what's there. We try, in all of our projects, to be very persuasive in asking clients to get involved in the process, to try to discover together and develop together a program that respects the building and meets the client's needs. Sacrifices have to be made, of course, and it is a matter of economics. But I think we're able to come to a point of mutual satisfaction."

Davis of EHD&D puts it more bluntly: "We would always come down on the side of making sure we didn't brutalize the building. And most people who come to us are sensitive to that. Of course, there are developers with green eyeballs, but we just don't want to get involved in that. We try to manage the two together; it's a delicate balance between economics and esthetics. Yes, sometimes we do have to argue fairly strenuously to get our point across."

Business, economics, and ideology

As expected, fees vary widely from project to project. All the firms surveyed said fees were negotiated on a per-project basis, using hourly multipliers, lump sums, percentage of construction costs, or some combination of all three methods. Several firms said their fees were typically 2 percent to 3 percent higher for preservation work than for new construction. Others said their fee structure was the same across the board, although the allocation of those fees to each project phase tended to differ on

preservation, restoration, and adaptive-use assignments.

Explains Daly, "We skew our fees on preservation work. They tend to be 2 percent to 3 percent higher than for new construction—we need at least that much to do a competent job. But the way we break out that fee is different. We allow more of the fee for the construction phase, and architectural design service is heavier here than for new construction. Typically, we allow 20 percent of the fee for construction administration on new jobs; on preservation work, it's in the 25 percent bracket."

Fees are higher, for one, because of the unknown status of the building itself, Daly says.

"In new construction, you can test out your solutions on paper," he says. "In renovation, you have the patient sitting there, and you don't really know what you have until you open him up. Once design is under way, we're typically going back and checking and rechecking dimensions."

When billing hourly, most of the firms are in the range of three to three-and-a-half times hourly salary. When firms work on a percentage-of-construction basis, fees range between 8.5 percent and 15 percent, only slightly higher than those charged for new construction. The fee percentage varies based on project size, with smaller projects typically warranting the higher rate. Consulting services, especially structural, mechanical, and electrical engineering, are usually included as part of the fee, however it's negotiated.

"I think people would expect to pay more for design services related to working on older buildings. But often, construction costs come out lower, so while they may pay more to the architect, the overall cost may end up lower," says Robert Burley. "Both Jay [White] and I feel, though, that preservation should not be sold because it might be a cheaper or more economical way to do things, but should be sold because the building is worth something and because you can often end up with a better project."

The skills needed for architectural preservation work are both technical and philosophical—philosophical, everyone agreed, in that personal commitment and a special sense of respect for older buildings are essential.

"You need a wide-angle vision," says Finegold. "By that I mean someone who is really willing to look at what's there, to understand what's there, and be willing to work with that."

Design strength is essential, as is a strong understanding of past building technology and architectural intent. Only a few of the firms have architectural historians on staff, Beyer-Blinder-Belle being a notable exception with Fitch heading up its historical preservation department. About half the firms said they consistently hire historians as consultants on jobs; others feel it is the architect's responsibility to research and recognize a building's historic elements.

"When a project comes along, we put together the team that's needed," says Dodge. "As far as having a historian on staff, we are not large enough, for one, to support that. But more importantly, there are resources available to us for the information we need. We did a project for the University of California where all the information on the building was available there. We do have a librarian on staff who does an extraordinary amount of research as well."

Fitch sets two critical standards for approaching historic preservation projects:

"First, an architect must be literate historically, able to place a building in space and time. Any intelligent person can study architectural history. Secondly, a preservationist cannot play favorites; he has to work with what is there. Certainly, there are occasions when it is necessary to insert new fabric into a building, but it should read as new, not fake. It should be congruent, not competitive. If the architect finds that too restrictive, he should get out of the field."

Twelve to 14 of Beyer-Blinder-Belle's 130 employees work under Fitch on preservation projects. At CBT, about 35 of the firm's 85 employees work on preservation projects, although that group is not considered a formal department. Most firms, however, apply a unilateral approach, with everyone involved in everything. Staff are assigned to preservation projects based on the same premise used for any other project: experience, specific skills, interest, and work load.

Structural engineers headed the list of essential consultants, with mechanical/electrical engineers a close second.

"You need a good analytical structural engineer who is willing to work hard at understanding how the building technology of the time worked," says Finegold. "It is the most critical of the engineering sciences. In working on building interiors of special historical interest, your mechanical/electrical engineer is going to be very important. We try to work with consulting firms where the principals are going to be directly involved in the project. We believe it takes that level of involvement to make these projects work."

Other, more specialized, services include acoustic consultants, and paint and coatings experts.

The prognosis for the preservation business

Despite the furor and confusion over what effect the tax reform bill may have, the market prognosis is good.

At this writing, the tax reform bill establishes a two-tier tax incentive: a 10-percent tax credit for restoration/renovation of an older building, and a 20-percent credit for work on landmark buildings. The original credit allowed 15 percent for older buildings, 25 percent for landmark preservation, and 10 percent for equipment.

"I still think there is a big market out there," says Tseckares of CBT. "You have to be located properly, for one, though. It's still too early to speak on the impact of the tax reform. But I think the developers will still pursue the adaptive-use market. A few years ago, the tax incentives really encouraged developers. But now, the market has its own momentum; people out there like you and me really enjoy historic places. Even without these tax breaks, I think developers will still pursue that market."

"We may see an increase in activity next year [because of the tax reform bill], but there is a strong momentum going for historic preservation," says Sally Oldham of the National Trust. "But, although the tax incentive will decrease, [it's] still a significant incentive. There's been a tremendous difference from 10 years ago in the level of preservation work going on. Although the new tax plan isn't going to put real estate development in this area in as positive a light, it's not going to impede that [work]."

Caution prevails, however, against specialization in any one market area.

"I'm a little reluctant to advise anyone starting out, or established for that matter, to go exclusively into the preservation market," says Daly. "It's a tough row to hoe." □

What Do These Prestigious Buildings Have In Common?

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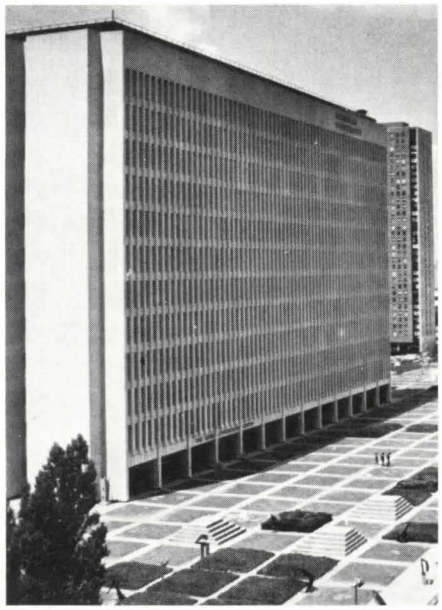
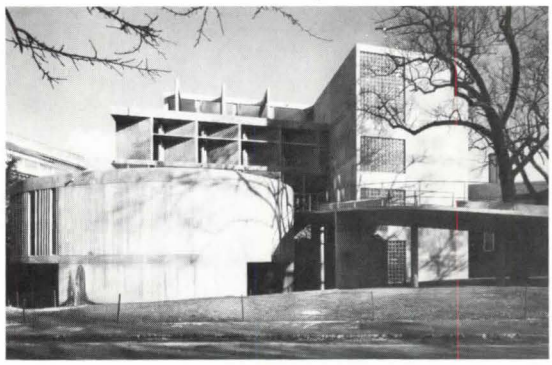


SEALED WITH POLYSULFIDE 1965

Lincoln Square of Fordham University
New York, NY
Architect: The Perkins & Will Partnership

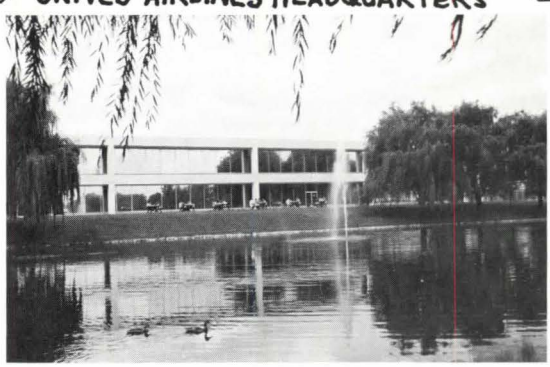
CARPENTER CENTER, HARVARD UNIV.



SEALED WITH POLYSULFIDE 1963

Carpenter Center For The Visual Arts
Harvard University
Cambridge, Massachusetts
Architect: Le Corbusier

UNITED AIRLINES HEADQUARTERS



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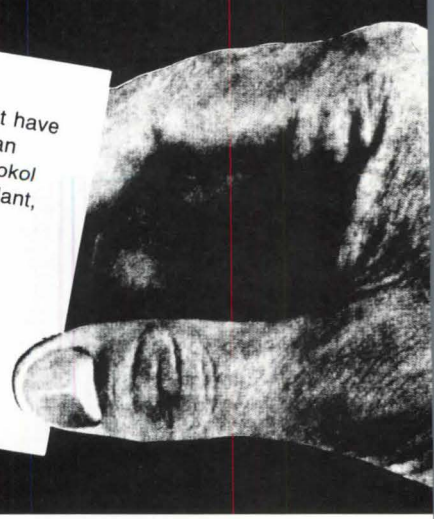

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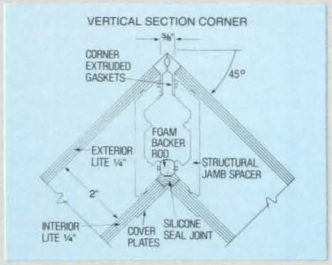

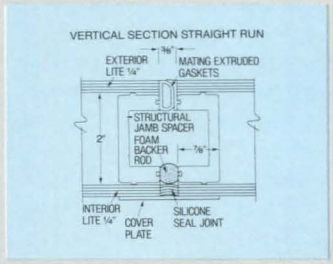

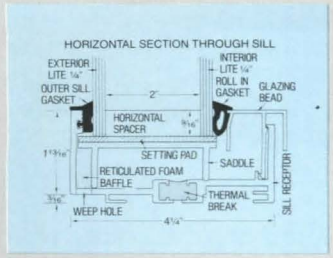

Building: Arthur Collins & William E. Fox Office Bldg., Stamford, CT

General Contractor: Frank Mercede & Sons, Inc., Stamford, CT

Architect: Bruce Campbell Graham Associates, Westport, CT

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Wood Foundations—Yes, But...

Pressure-preservative-treated wood has been gaining popularity as a foundation material in place of concrete or concrete-and-block foundations. Wood foundations now perform well enough to be accepted by federal agencies, mortgage lending institutions, and the model building codes.

The Wood Products Promotion Council (WPPC) claims that wood foundations are less expensive than traditional foundations.The group also points out that the same crew that erects the above-grade structural framing can fabricate and install a wood foundation; thus the need for a concrete crew is eliminated.

John Rose of the American Plywood Association (APA) cautions architects to check local code restrictions, however. Rose says that in areas where expansive soil conditions are common, local authorities have ruled against the use of wood for foundations, or at least insisted on certain limitations, often determined on a case-by-case basis. Alaska, for instance, requires concrete footings because of the expansive soils encountered there.

Just as with concrete or concrete and block, structural calculations for wood foundations must take into account the inward lateral pressure from the soil along with the normal downward forces from the roof and floor loads. The National Forest Products Association (NFoPA) says structural calculations must also be made for racking loads "whenever the differential height of backfill on the opposite sides of the structure exceeds two feet."

Wood basement floors must be designed to withstand "axial forces and bending moments resulting from lateral soil pressure at the base of the exterior foundation walls and live and dead floor loads while meeting code requirements for floor joist deflection, NFoPA says. WPPC members generally supply structural formulas with their literature.

Protection from water

Architects designing wood foundations should pay special attention to ensuring good drainage. It is essential to determine the soil type and its drainage characteristics either by using the Department of Agriculture's soil conservation maps of the site area or on the basis of a soil test performed by a qualified engineer. A ground surface slope away from the building of ½ inch per foot for at least six feet is recommended as a minimum.

Wood footings (Figure A), except where concrete footings are required, are a combination treated wood plate on a gravel or crushed-stone base, the bottom of which must be below the frost line to prevent heaving. The floor—whether concrete or wood—is laid on polyethylene film covering four to six inches of gravel. All basements (Figure B) should have a sump with a positive drain to the sewer or to daylight, which when combined with the under-floor gravel and gravel footing will handle the drainage of water from all sources, including those outside the footing. If a concrete footing is used, through-drains are required at intervals of six feet. Additional gravel backfill between the excavation and foundation wall can vary from one foot (when used above the footing in well-drained soils) to half the total backfill height (in poorly drained soils.)

The APA recommends 6-mil polyethylene film as a vapor barrier, but its installation requirements depend on the type of foundation and soil drainage. APA recommends lap joints of at least six inches and advises sealing them with an adhesive chosen for its ability to hold up under the temperature and moisture conditions of the particular site. Where the film would be exposed to damage above grade, the APA recommends providing a continous treated-plywood covering strip. Before installation, the strip should be caulked along its full length, then attached to the foundation wall with its top several inches above grade and its bottom at least nine inches below grade.

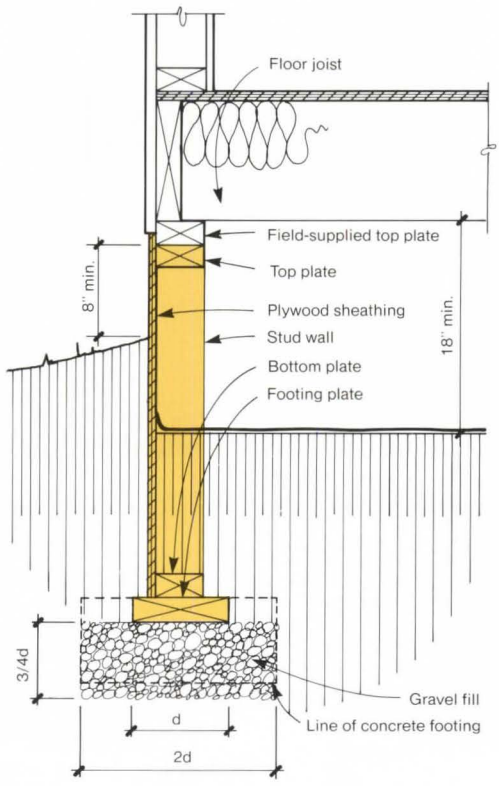
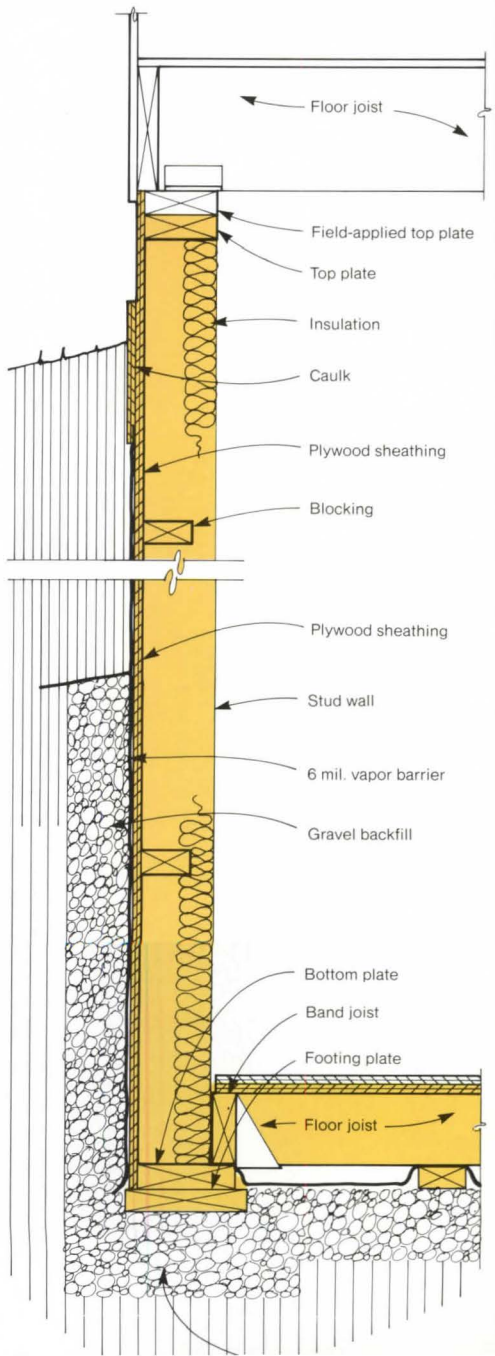


Figure A



Plan ahead to avoid cutting

Because the foundation is wood, there may be a temptation to cut out portions or drill holes in the studs for pipes, electrical conduit, or let-in bracing. The NFoPA insists that let-in bracing be avoided and that utilities be planned in advance to prevent cutting or drilling of the studs. If pipes must penetrate the foundation wall, a plywood backing board should be attached on the inside and caulking applied around the hole. On the outside, additional polyethylene film should be wrapped around the pipe. Since the wood treatment can corrode certain metals, precautions should be taken when pipes are selected and installed.

When specifying any metal fastening devices that will come in contact with the treated wood, it is important to consult the wood manufacturers' literature. The lumber and plywood preservative treatment recommended is either ammoniacal copper arsenate or chromated copper arsenate, both of which can be corrosive. Silicon bronze, copper, and some types of stainless steel are allowed above and below grade; but there are limitations on what kind of coatings must be used on steel nails and on whether the coatings can be used above or below grade.

Wood foundation panels (Figure C) are built in sections, each consisting of a footing plate, bottom plate, wood studs, plywood sheathing, and top plate. Proper planning at the design stage and taking advantage of the preassembled qualities of the system will simplify erection. Each panel is built with a lap joint (Figure D), created by offsetting the plywood sheathing, which fits into the recess produced by the offset plywood on the adjacent panel. A similar lap (Figure E) is also necessary at the corners. The lap joint produces a uniformly smooth vertical joint between panels and has the advantage of maintaining modular lengths of plywood.

For installation of a basement foundation wall, the lap joints should be caulked along their entire length to provide a waterproof joint between panels. Once the panels are in place facing one direction, the second top plate is installed so as to lap, at the corners, in the opposite direction. This plate doesn't need to be treated with a preservative. However, any lumber or plywood that is cut after its initial factory treatment will require additional treatment—either brushing the preservative on or soaking the piece in it.

Further information on wood foundations can be obtained from members of the Wood Products Council. They are listed below.—TIMOTHY B. MCDONALD

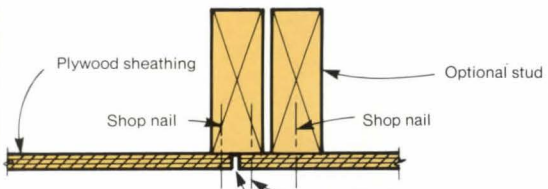


Figure D

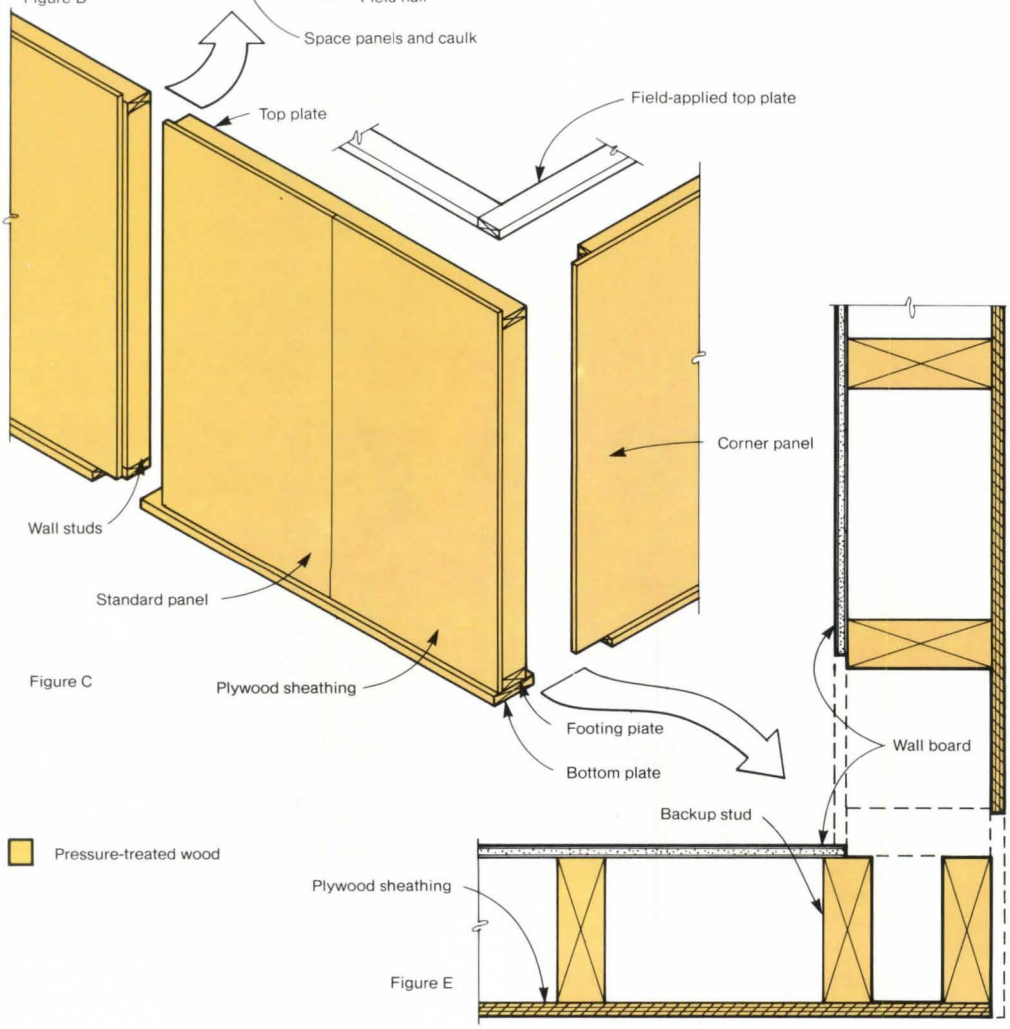


Figure C

Figure E

American Plywood Association
P.O. Box 11700
Tacoma, Wash. 98411
(206) 565-6600

American Wood Preservers Institute
1945 Gallows Road, Suite 405
Vienna, Va. 22180
(703) 893-4005

National Forest Products Association
1619 Massachusetts Ave. N.W.
Washington, D.C. 20036
(202) 463-2700

Society of American Wood Preservers, Inc.
1401 Wilson Blvd., Suite 205
Arlington, Va. 22209
(703) 237-0900

Southern Forest Products Association
P.O. Box 52468
New Orleans, La. 70152
(504) 443-4464

Western Wood Products Association
1500 Yeon Building
Portland, Ore. 97204
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Building: Expo '86 Theater, Vancouver, Canada Architects: Aitken Smith Carter Partners; The Wade Williams Partnership Roofing Cont

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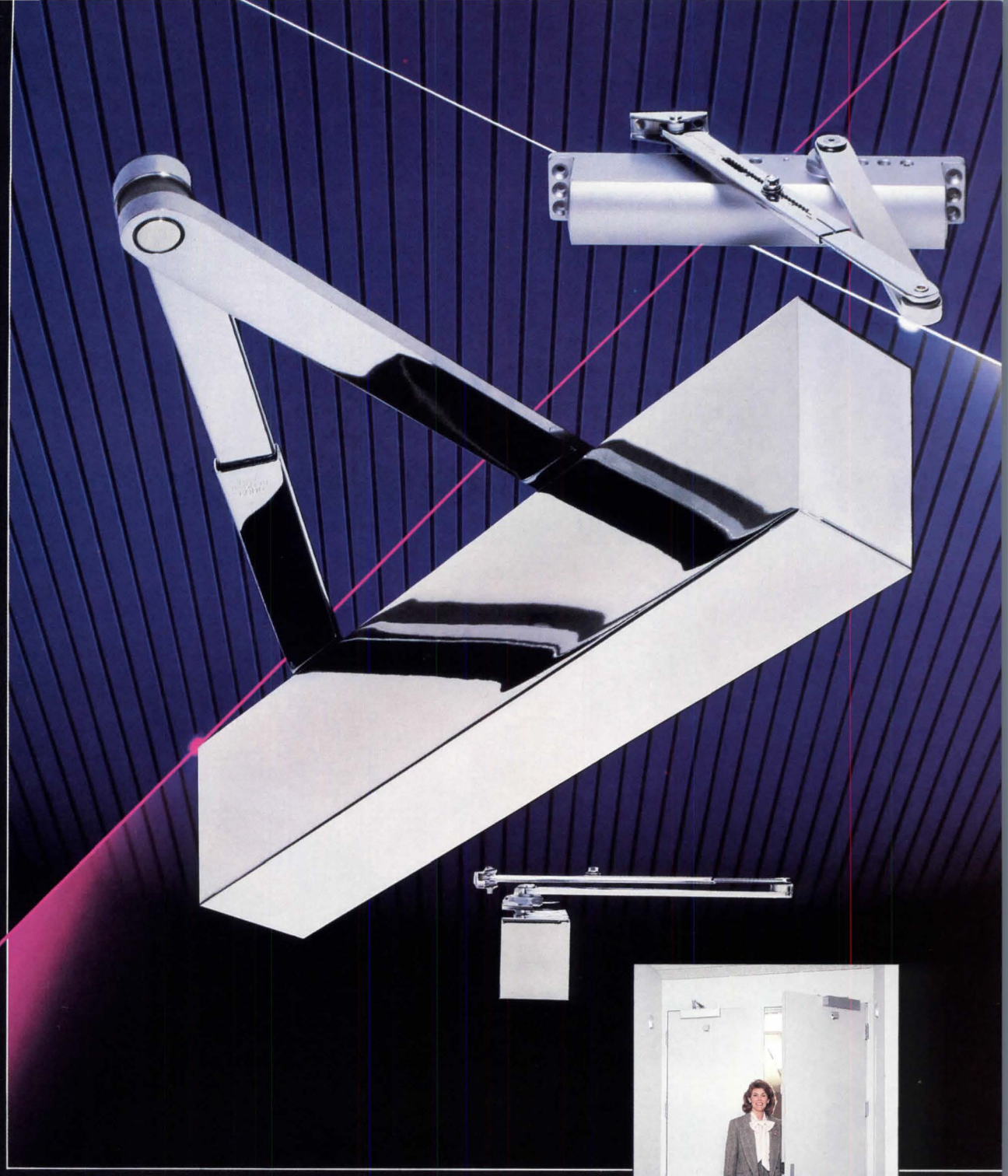

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Interiors

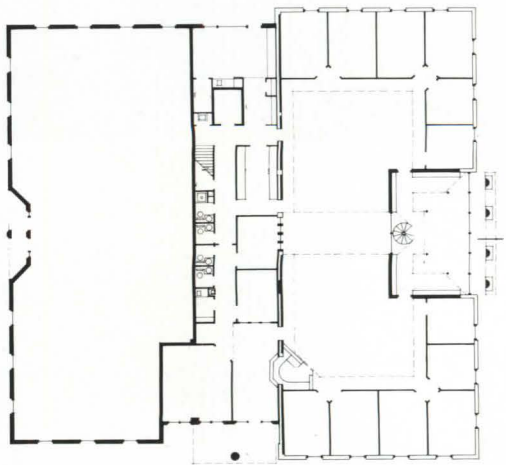
In renovating and expanding a drab, 1950s pseudo-colonial, highway office building for law offices in Moorestown, N.J., Herman Hassinger Architects of Moorestown created both exciting and reserved interiors to reflect the practice of law and its practitioners. Light & Space Design was interiors consultant.

The entrance lobby (below), a cool, deep gray with a hint of red, lends a dignified atmosphere to the office, whose major clients are banks and real estate firms. The skylit lobby's heavy cornice with its deep shadow lines gives this space a stature that belies its 250 square feet. On the lobby's west wall is a triptych window of stained and faceted glass by Philadelphia artist Charles Lawrence. The window admits natural light into a small, interior conference room next to the lobby.

The most exciting space in this renovation is devoted to the firm's law library (left). "Law libraries are always impressive with their walls of leather-bound books and spines of gold letters," says Hassinger, who wanted to display these repositories of the law. The library is viewed through a fully glazed wall that faces the highway. Indirect lighting, illuminating the bookshelves, remains on until midnight to showcase the library. Open railings and a spiral staircase allow this space to be as transparent as possible.

—Michael J. Crosbie

Fred Forbes



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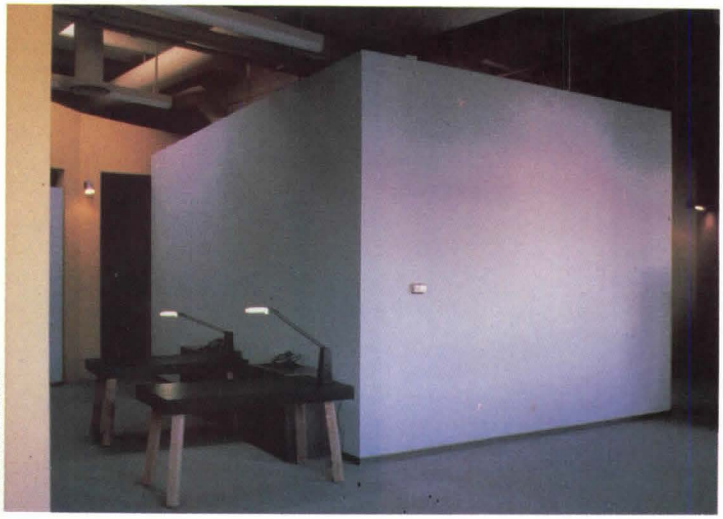

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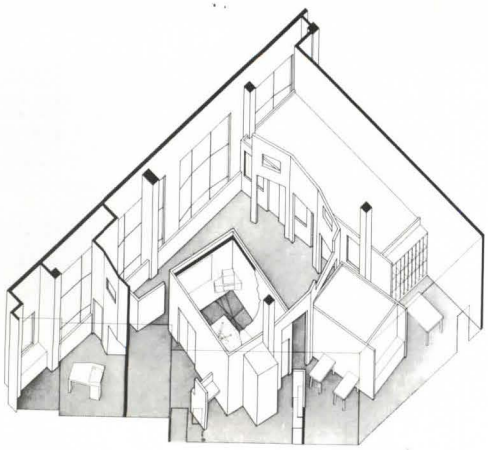


For the 35,000-square-foot Batey & Chan offices in the Wiltern Tower in Los Angeles, architect Schweitzer·Kellen deliberately designed an interior in sharp contrast to the exterior. The building is stylized art deco; the offices high-tech contemporary.

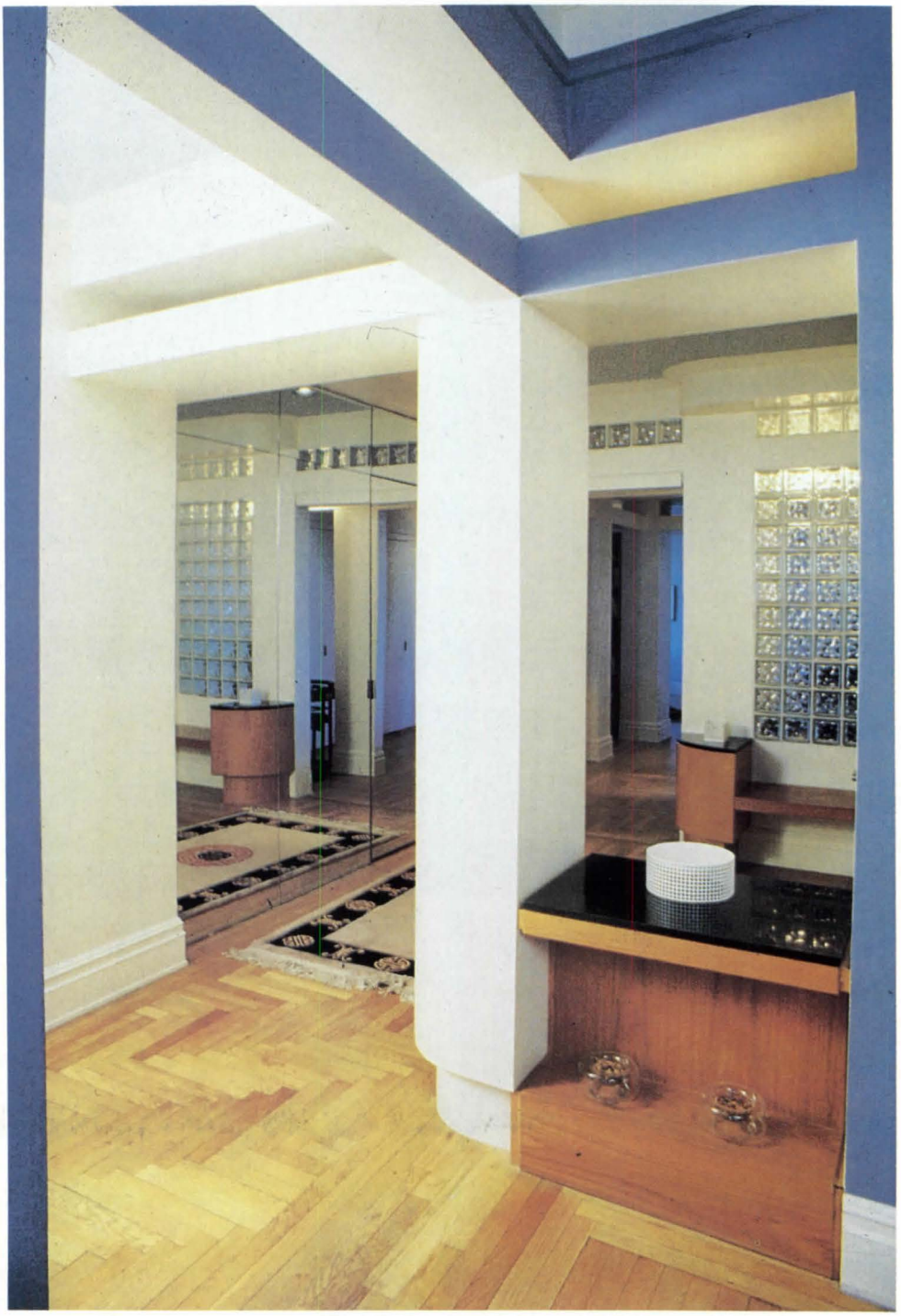
Typically, offices in the Wiltern have a dropped 10-foot ceiling; Schweitzer·Kellen instead wanted the full 18-foot height, which meant leaving the ceiling's ductwork exposed. Placed in this office space for 13 people are three rectangular boxes: one to house three offices, the second a conference room, and the third a single office. These boxes, as well as a curving screen wall and a few partitions, work to create distinct spaces within the larger open area. The three-office box is set alongside one party wall; next to this green box runs the yellow screen wall. The conference box is set roughly in the center of the office but is skewed to allow a more generous reception area than if the conference room were in more harmony with the existing walls. The smallest box is also turned, again an effort to achieve a more efficient division of open space.

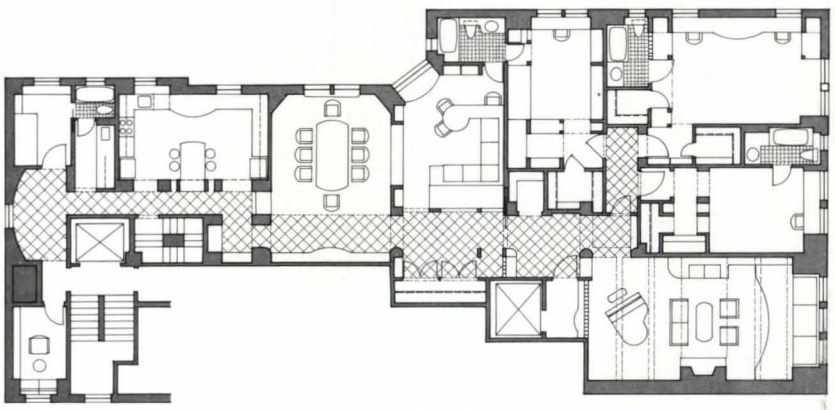
Much of the furniture was designed by Schweitzer·Kellen, and its architectonic quality adds another dimension to the space.—Nora Richter Greer

In the renovation of a New York City Park Avenue apartment, David Estreich & Associates turned a long dark corridor and a progression of small enclosed rooms into an airy, interconnected space.

Having gutted the entire apartment, the designers introduced as an organizing element a newly placed corridor, which is defined not by walled surfaces but by columns, soffits, and flying beams. This corridor jogs twice: at the front of the apartment to separate the master bedroom/bath from the more public spaces and at the rear to once again identify the more private spaces—the kitchen and bathroom/utility room. In the center of the apartment, the dining room is entirely open to the hallway and is connected by a large open frame to the study.

The more formal living room is marked by a curved platform at the window, complete with window seat and mirrors to the left and right of the seats that create the illusion of a full bay window. In front of the fireplace is a dropped soffit ceiling and a built-in love seat. At the entranceway is a small foyer faced with a wall of glass block. Wall and ceiling colors are off-white and blues; in the dining room and study the predominant materials are bleached oak and black leather—N.R.G.





© Dick Busher Photographics

For Atwater's, a restaurant filling the 30th floor of the 42-story U.S. Bancorp Tower in downtown Portland, Ore., ZGF Interiors (a division of Zimmer Gunsul Frasca Partnership) was limited by an ungracious 12½-foot ceiling height and windows designed for offices—horizontal strips of reflective glass with 30-inch sill heights.

Coffers and reverse-step ceilings (as above, in the lounge) make the most of low ceilings. To limit interior window reflections, the designers paneled walls in dark-toned bella rosa wood veneer and bathed them softly with wall washer lights. Pinpoint light sources are avoided: no sparkle lights or candles. And to enhance views of downtown and Mt. Hood, platforms put some sill heights at 18 inches.

Furnishings are eclectic with Far East flavors—Chinese Chippendale, wicker tables, Oriental rugs and artworks, plus contemporary art by Oregonians. Decidedly un-Oriental are six lacquer-finish columns in the foyer (right). A frieze of equestrian Greek figures, like terra-cotta decorations on ancient vases, encircles each. The black columns, with triple bands at their bases, are rich counterpoint to the beech hardwood floors and the walls with maple accent strips.—Allen Freeman

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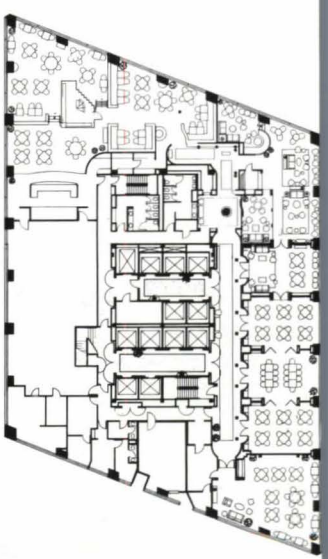
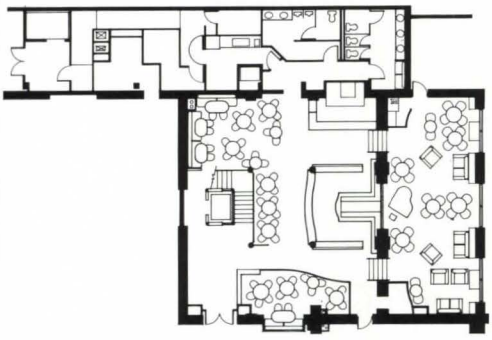
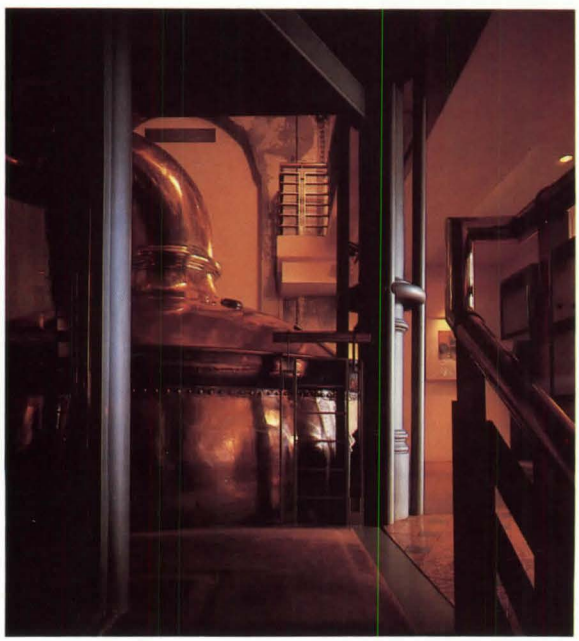




In trying to convey the future character of this restaurant now ensconced in a Denver brewery turned food and entertainment complex, architect Henry Beer of Communication Arts, Inc., told his client, Michael L. McCarty of the celebrated Michael's Restaurant in Santa Monica, Calif., during conception: "Just expect the unexpected—like a rattlesnake."

The name stuck and it is apt (if a bit smart-asp). Unexpected but not unwelcome in the 14,000-square-foot Rattlesnake Club are flaky, untreated walls (as at right in the main dining space), an elevator whose overrun required a skylight open not to the sky but into another restaurant on the floor above (photo below), and two giant brewing vats unmoved from their original places in the main brewing hall of the former Tivoli Brewery (below right). Some portion of the polished copper containers—positioned on either side of the main staircase—is visible on all three levels. Fabricated from the same polished copper are custom sconces, handrails, and a "beer manifold sculpture" as bar centerpiece. The four-tube artwork connects to a General Motors 671 supercharger as "a sculptural homage to the power of beer," says Beer. Also prominent are cast-iron columns and a system of shallow ceiling vaults.—A.F.



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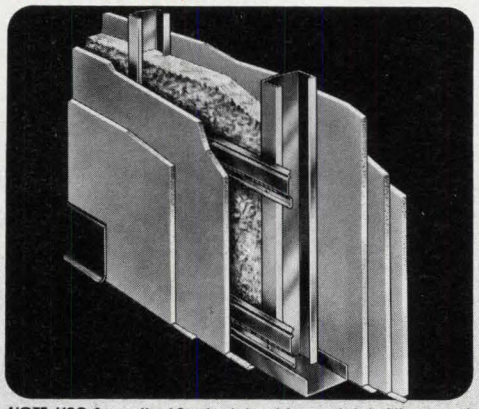

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BRIEFS

British Art Tours
The British Art Tours is sponsoring a series of 11-day tours of London, Bath, Norwich, and Scotland during 1987. Participants will visit major art galleries and private collections. For more information on the tour, contact the British Art Tours, 6119 Old Redwood Highway, Santa Rosa, Calif. 95401.

A/E Computer Software Program
The American Consulting Engineers Council has compiled a 12-category set of computer programs through the A/E software library. Each software list describes program functions, hardware requirements, vendor information, and prices. The 12-volume set can be ordered for $99 from the ACEC Publications Department, 1015 15th St. N.W., Suite 802, Washington, D.C. 20005

Call for Entries
The National Glass Association is seeking entries for an award for excellence in design with glass. Entries will be evaluated on the basis of originality and innovation in the use of glass as a building material and a solution to design problems. For more information, contact Barbara Engle, National Glass Association, 8200 Greensboro Drive, Suite 302, McLean, Va. 22102.

Brunner Grant Recipient
Thomas J. Schumacher, associate professor of architecture at the University of Maryland, is the recipient of the 1986 Arnold W. Brunner Grant of $12,000. Schumacher plans to research and write a book on Giuseppe Terragni and the culture of modern Italian architecture.

Design Competition Awards
Schwab & Twitty Architects, Inc., of West Palm Beach, Fla., received three AURORA awards in the design competition sponsored by the Southeast Builders Conference in the categories of "best residential development" and "best commercial project."

Arcosanti Construction Fellowships
A new fellowship program offers architecture students from any school in the U.S. a summer construction workshop at Paolo Soleri's Arcosanti project in Arizona. The intent of the program is to send one student from every school, funded by a $1,000 grant from the school and local architecture firms. Participants would be required to make a slide presentation at their respective schools following the fellowship summer. It would explain their experiences at Arcosanti. For more information, schools, firms, or students interested in the program should contact Ronald R. Morgan, Arcosanti Fellowship Director, 114½ West Fifth St., Charlotte, N.C. 28202, (704) 372-0116.

Rotch Traveling Scholarship Competition
Applications are being accepted for the 1987 Rotch traveling scholarship. Applicants must be a U.S. citizen, under 35 years old, and have a degree from an accredited school of architecture and at least one full year of professional experience in an architectural office in Massachusetts. Deadline for applications is Jan. 2, 1987. For more information, contact Norman C. Fletcher, Secretary, Rotch Traveling Scholarship, 46 Brattle St., Cambridge, Mass. 02138.

Applications Sought for Lighting Grants
The New York Section of the Illuminating Engineering Society of North America will be awarding grants of $1,500 and $500 to young professionals for creative thought and activity in the field of lighting. Applicants must be 35 years of age or younger and currently working or studying in the U.S., Canada, or Mexico. The deadline for applications is Jan. 31, 1987. For more information, contact the Lighting Research and Education Fund, Illuminating Engineering Society of North America, 345 East 47th St., New York, N.Y. 10017.

Paris Prize Winners
Eric A. Meub of Harvard University, Sui-Sheng Chang of the University of Illinois, Chicago, and Johannes Marinus Knoops of Pratt Institute, are the 1986 winners of the Paris prize in architecture sponsored by the National Institute for Architectural Education.

CREDITS

Olin Library Addition, Wesleyan University, Middletown, Conn. (page 38). *Architect: Perry, Dean, Rogers & Partners, Boston.* Principal in charge: Steven M. Foote, in collaboration with Charles F. Rogers II, Frederick K. Read, Janet Stegman, Martha Pilgreen, Bruce Hutt, and Richard Smith. Ceiling surfacing system: U.S. Gypsum. Interiors doors: Eastern Millwork. Floor surfacing: Lee's. Handrails: E&F Construction. Plumbing: American Standard. Washroom and bathroom accessories: American Standard. Water closets: American Standard. Stairs and treads: Pirelli. Wall surfacing: Kane-Gonic, U.S. Gypsum. Hardware: Sargent, Yale, Stanley. Paint and stain: PPG. Stationary partitions: U.S. Gypsum.Windows: Hope's Windows.

Willard Hotel and Office Building, Washington, D.C. (page 48.) *Architect: Vlastimil Koubek, AIA, Architect, Washington, D.C.* Ceiling surfacing system: Celotex Building Products, U.S. Gypsum. Doors: International Steel, Michaels Art Bronze, TSI, Acme, Mohawk, Weyerhaeuser, Blount, Algoma. Elevators: Westinghouse. Environmental control systems: Trane Equipment, Honeywell Controls. Floor surfacing: American Olean, Imola, Mameco, Azrock, Armstrong, Kentile, Hanover Precast, H. E. Fletcher Granite, Cold Springs Granite, Rock of Ages. Foundation: George Hyman Construction Co. Handrails: Custom Art Metals, Gichner Iron Works, J. Blum, Superior Iron Works. Roofing: Buckingham, Virginia Slate, Foremost Manufacturing. Waterproofing and sealants: Anti-Hydro, W. R. Grace, Sonneborn, Tremco. Plumbing: Sloan. Plumbing fittings and showerheads: Sanitary Dash, Speakman, Kohler, Moen, Symmons. Whirlpool: Kohler. Sprinklers: Central. Toilet stalls: Mills Metal Compartment, Custom. Tubs and lavatories: Kohler. Washroom and bathroom accessories: Bobrick, Baldwin, Keystone. Water closets: Kohler. Water fountains: Haws. Communication and intercom: American Amplifier. Computer room: IBM. Kitchen: Gill Company. Security and fire detection: Grinnell, Gamewell. Stairs: George Hyman Construction, Superior Iron Works, Wooster Products. Wall surfacing: Indiana Limestone, H. E. Fletcher Granite, Hanley Brick. Windows: Pella, Wausau. Hardware: Norton, Yale, McKinney, Schlage, Von Duprin, Rixson-Firemark, Ives, Baldwin, Builders Brass, National Guard, Period Brass. Paint and stain: Glidden, Sherwin Williams, Keim.

Sumner Square, Washington, D.C. (page 60). *Architect: Hartman-Cox Architects, Washington, D.C.* Ceiling surfacing system: Armstrong. Doors: Knipp + Co., Weyerhaeuser. Elevators: Dover, Cabs by Tyler. Environmental control system: Johnson Controls. Handrails: Custom Steel Fabricators. Lighting: Spring City, Lithonia Lighting. Waterproofing and sealants: Carlisle, Supradur. Security and fire detection: Gamewell Corp. Wall surfacing: Belden, Cushwa, Potomac Valley Brick, Alumiline. Skylights: Alumiline, Supersky. Hardware: LCN, Hager, Yale, Von Duprin. Partitions: U.S. Gypsum. Plumbing: Sloan Valve, Chicago Faucets. Sprinklers: Reliable. Toilet stalls: Mills. Lavatories: Kohler. Washroom and bathroom accessories: American Dispenser. Water closets: Kohler. Water fountains: Western Drinking Fountains.

Ghiradelli Square, San Francisco (page 66). *Renovation architect: Benjamin Thompson & Associates, Cambridge, Mass.* Principals: Benjamin Thompson, Jane Thompson. Senior associates: Ed Des Jardins. Project architects: John Shank, Hank Haff. Graphics: Nick Thompson. Contractor: Plant Builders, Inc. Management: Edward Plant Co. Architectural landmarks liaison: Lanier, Sherrill & Morrison. Exterior paving: Högenas, Higgins, H.C. Muddox. Exterior lighting: Ellipitar. Waterproofing: 3M Scotch Clad. Signage: Glen Raven Mills, Thomas Swan Co., K. Dawley. Exterior paint: Fuller O'Brien. Windows: Aluminum Storefront, Page Glass. *Credits continued on page 134*

Credits *from page 133*
Austin Hall/Harvard Law School, Cambridge, Mass. (page 72). *Architect: Goody, Clancy & Associates, Boston.* Ceiling surfacing system: Ocean Products. Doors: Medford Woodworks. Environmental control systems: MCC Products. Floor surfacing: Bigelow, Vermont Marble. Lighting: Lightolier, Wolfers. Waterproofing and sealants: Sika. Masonry restoration cleaner: Hydroclean. Sprinklers: Reliable. Water fountains: Oasis. Security and fire detection: Honeywell. Wall surfacing: Interior Acoustics, Guilford Fabrics. Windows: Devac. Hardware: LCN, Hager, Lloyd Matheson, Von Duprin, Rockwood, Ives, Reese, Glynn-Johnson. Paint and stain: Devoe, Moore.

The Park, Brookline, Mass. (page 75). *Architect: Childs Bertman Tseckares & Casendino, Boston.* Doors: Masonite. Environmental control systems: Climate Control. Floor surfacing: Armstrong, Charleston, Quarry Naturals, Hastings. Foundation: Trus Joists, Microlam. Lighting: Spring City. Waterproofing and sealants: Carlisle Adhered. Plumbing fittings and showered: Moen. Sprinklers: Allis-Chalmers, Victanlic, Viking. Tubs and lavatories: Crane. Washroom and bathroom accessories: Lawson. Water closets: Crane. Kitchen sink: Elkay. Communication and intercom: Housing Devices. Security and fire detection: American Alarm. Signage: Overhead Door. Stairs: Duvinage. Wall surfacing: Glen Gery. Windows: Wasco. Hardware: Arrow. Kitchen and laundry: H-K, Excel, Closet Maid. Security and fire detection: Larsen, Emhart. Windows: Marvin, Viking Storms. Skylights: Wasco.

Marquette Building, Chicago (pages 100, 105, 106, figures 1, 9, 13). *Architect: Holabird & Root, Architects Engineers Planners, Chicago.*

Gallery Row, Washington, D.C. (page 101, figures 2a, 2b). *Architect: Hartman-Cox, Architects, Washington, D.C.*

539 Bryant Street, San Francisco (pages 101, 103, figures 3a, 3b, 6). *Architect: MBT Associates, San Francisco.*

Immanuel Manor, Kansas City, Mo. (page 102, figures 4a, 4b, 4c). *Architect: Frederick S. Truog and Associates, Architects, Inc., Kansas City, Mo.*

McMahon Building, Stowe Village, Vt. (page 103, figures 5a, 5b). *Architect: Robert Burley Associates, Architects/Planners, Waitsfield, Vt.*

Building 39, Massachusetts Institute of Technology, Cambridge, Mass. (page 104, figure 7). *Architect: Symmes, Maini & McKee Associates, Inc., Cambridge, Mass.*

American Cyanamid's Stamford Research Laboratories, Stamford, Conn. (page 105, figure 8). *Architect: Haines Lundberg Waehler, Architects, Engineers, Planners, New York City.*

American Stock Exchange Building, New York City (page 105, figure 10). *Architect: Swanke Hayden Connell & Partners, New York City.* Mechanical Engineers: Syska & Hennessey, New York City.

Grain Exchange Building, Minneapolis (page 106, figure 11). *Architect: MacDonald and Mack Partnership, Minneapolis.*

Stanley D. Lindsey Office Building, Nashville (page 106, figure 12). *Architects: Preservation/Urban Design/Inc. Ann Arbor, Mich., and Earl Swensson Associates, Nashville.* Owner: Historic Partnerships, Nashville.

The Chimneys, Fredericksburg, Va. (page 107, figure 14). *Architect: Browne, Eichman, Dalgliesh, Galpin, Architects, Charlottesville, Va.* Owner: William Vacos.

709 Caroline Street, Fredericksburg, Va. (page 107, figure 15). *Architect: Browne, Eichman, Dalgliesh, Gilpin, Architects, Charlottesville, Va.* Owner: Catherine Lanier

Sunrise Retirement Home, Warrenton, Va. (page 107, figure 16). *Architect: Oehrlein & Associates, Washington, D.C.* □

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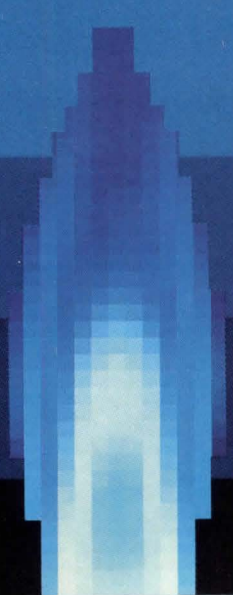

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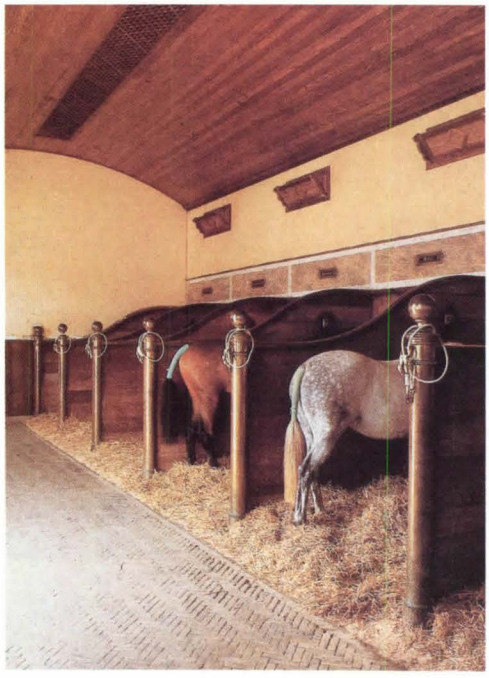
BOOKS

Whimsical Collection of Buildings for Animals

Beastly Buildings. Lucinda Lambton. (Atlantic Monthly Press. $19.95.)

Lucinda Lambton continues here the success scored in her earlier light-hearted *Temples of Convenience.* This survey of buildings for animals begins with horses, dogs, and the world of sport, and continues with farm animals, a lively excursion into beehives and bird cages, to a final climax with zoo buildings, pet cemeteries, and memorials. It is tongue-in-cheek all the way, but we are dealing here with the likes of Vanbrugh and Soane, Kent and Loudon, and other British architectural titans who are not to be trifled with. There will always be an England—of eccentrics and animal lovers—and Lambton sees to it that in this parade they do not fall over the boundary that separates them from the ridiculous.

The fun-and-games department of architecture is vast and deep. It includes the Gropius birthday parties at the Bauhaus, Al Bendiner's caricatures, Lutyens spinning his endless flow of sketches for the entertainment of those who could never be clients, and shafts of Osbert Lancaster's architectural wit—and now Lambton. In this array of Georgian stables, castellated cow houses, Norman dovecotes, dining rooms with dog niches, pinfolds, bear pits, and who knows what else, there is a feast for the eyes. Lambton, an architectural photographer, provides it. But we also discover that in the mid-17th century there



were 26,000 dovecotes in England from which 35 million privileged birds daily flew to ravage the crops. If you want to see this form of building at its best, visit the recently restored Royal Dairy at Windsor, "the prettiest, the most enchanting dairy in England, a glistening jewel of 19th century decoration." Or, perhaps, another recent restoration, Culzean, a National Trust of Scotland property, "alive with animal buildings," including a monkey house, a pheasantry, and a Gothic aviary.

But enough for a book that will keep you entertained and primed with anecdote and image while it stretches your idea of what architecture is.

—Frederick Gutheim, Hon. AIA

Above, Manderston stables, Berwickshire; below, blacksmith's forge, Northumberland; right, beehive niche, Gloucestershire.

Mr. Gutheim is a critic, teacher, and author in Washington, D.C.

Architecture from Prehistory to Post-Modernism. Marvin Trachtenberg and Isabelle Hyman. (Abrams, $45.)

The first thing that struck me as I browsed through this book was that in a time of space exploration, instant communication, and the probability of international annihilation, the title says, "HERE is the whole history of architecture." In fact, this is a history of the Western tradition only. Perhaps this says something about the usonian view of the world even though no small part of our population drives Japanese cars.

Reading bits and pieces, my second impression was that the authors had little, or perhaps no, field experience in archeology, and probably no training at all in the actual practice of architecture, which, perhaps, accounted for a lack of vitality—no strongly held theory as well as vagueness and generality where forceful demonstration was needed. How different, I thought, from such 19th century historians as Viollet-le-Duc, who was both architect and archeologist, and August Choisy, trained as an engineer and archeologist.

I presume that this book was designed for undergraduate courses in architectural history; from it the student would glean basic principles related to the built environment and the monuments that stud it; that a new book would not repeat what has been said before and would be based on new discoveries and insights. Otherwise, why publish, why add to the clutter?

Viollet-le-Duc asked and answered this question in the 1860s. Although considered a radical, he was asked to lecture on the history of architecture at the École des Beaux-Arts (for the record, he was hooted off the platform during the first

continued on page 138

Books *from page 137*
lecture for saying that Gothic and not Renaissance was the true expression of the French spirit), the result being his *Entrétiens sur l'architecture.* I condense and roughly translate from the introduction: ". . . Lectures on architecture must embrace a wide field; merely to present architectural forms without pointing out the causes by which their particularities were determined, the why of the various systems to which the forms are subordinated (such as climate, materials, tradition, technology) would be to present a sterile compilation of the numerous works we can easily procure from our public libraries. We must inquire into the reason for every architectural form, for each has a reason, point out the origin of the priniciples, and call attention to their relevance to the present day, for principles remain true. The arts never die, humanity remains the same, although customs, traditions, institutions, and technologies change."

Thus the view of a man who saw architecture as a basic social necessity and art, and that the main element in the environment made by man is to protect himself from nature's vagaries as well as to express his aspirations. One may well imagine Viollet's horror if he were to read in the introduction to the book under review: "Architecture commands our attention through history only as a visual art" or that the book centers on architecture "with a capital A" and that "by architecture is meant buildings in their three-dimensional form." (I can imagine Viollet snorting: "But your notion of building is two-dimensional.")

And surely it's true, such a formulation can only translate into picture postcard touristic views of sets without the viewer's knowing what the play is about. But what has happened and is happening on the streets of Chartres is not a play—those were, are, real people and the cathedral is not a painted canvas.

To grasp the reality of a building is not the same as understanding a painting seems clear since the functions are so different. That masterpieces have been created out of and art based on survival needs is a kind of miracle when purpose, structure, and esthetic appearance become not only one but a synergy. To explain what this miracle is calls for someone who has building in his bones.

Consider, for example, two instances in the description of Parthenon given by the authors: "Its design was strongly affected by Phidias's gold and ivory cult image of Athena. For this 40-foot colossus an immense cella was needed, over 60 feet in width. . . ." On optical refinements, the authors report: "Today, the predominant view is that they contribute to the visible grace and its vitality." If one compares such observations and the accompanying illustrations with those of Choisy in his 1895 *Histoire d'architecture* where his description of the Parthenon takes hardly more space, I think that my complaint becomes clear.

In Choisy the Parthenon comes alive in his text and small engravings. It is not a ruin blown up in some war, eroded by time and toxic fumes, its polychromy lost, its sculpture broken by iconoclasts or stolen by vandals. And so it is with other buildings, for Choisy tells us how the buildings were built, what they were made of, how they fitted the society, and on down to the differences between outdoor and indoor moldings, the placement and meaning of architectural sculpture, why exterior polychromy was needed under shadow-devouring sun.

The authors of this book would have been wise to have ended their book with Le Corbusier and Mies, but I suppose the publisher said, "Hey, bring it up to the minute." The result is a concluding chapter called "Second Modernism (Postmodernism)." In a book that provides a survey of architecture from prehistory on, it seems ill-advised to include a movement so ill defined, ill documented, and theoretically so shaky.

May I also mention the 72 pages of color photos that preface this book. They are uniformly of a technical excellence found in our best magazines, and surely will be copied as slides for lectures given on the "History of Architecture from Way Back Then Until Tomorrow." The authors should not be faulted if some will be shown upside down or backward. In addition to the quite good color reproductions, the book is put together in a commendable way. It weighs six pounds.

—Percival Goodman, FAIA

Mr. Goodman is a prolific author who taught at Columbia University's school of architecture. About five years ago he completed a condensation and translation of Auguste Choisy's 1895 work entitled Choisy's Rationale of Architecture: From Classic Greece to the End of the Italian Renaissance.

American Vernacular Design. Herbert Gottfried and Jan Jennings. (Van Nostrand Reinhold, $25.50.)

Vernacular architecture, enjoying a resurgence in recent design theories, is a broad and difficult subject to define and explain. Herbert Gottfried and Jan Jennings write about and illustrate vernacular exterior designs developed from 1870 through the 1940s as one means of presenting the ideas surrounding the industrial vernacular design of that period. This book, an illustrated and annotated handbook of vernacular designs, explains clearly and concisely in words and with beautiful, simple drawings the building designs that we see everyday, providing a starting point for interpretation.

The first section, entitled "Elements," is primarily a collection of individual elements extracted from the studied vernacular buildings. Looking through this section is like dissecting and viewing the exterior elements of a building under a microscope. The components are grouped in 14 categories of windows, roofs, chimneys, and other items. Along with annotated illustrations of each element, the authors present a brief description of each component's material, its performance, and function. It is the brief explanation of the element's order, design implication, and tradition, however, that gives these individual elements their vernacular character. For example, brick becomes a much stronger vernacular element once the brickwork patterns, brick courses, and textures are illustrated and explained. This section is somewhat incomplete—parapet

Illustration of shingle style elements.

details, the tar and gravel flat roof, the guard rail, and the balustrade details are not included or explored as part of vernacular design elements. Each of these components is an important and common form and detail for vernacular tradition that should be part of the building elements studied.

"Types," the second section, presents a series of building types using the explained "elements" in a total design. The building types are predominantly houses (cottages, bungalows, double and row houses), but small-scale commercial and church buildings are also included. Annotated illustrations and brief descriptive explanations of design implication and tradition appear in this section as well.

This section is a bit more ambitious in its attempt to reassemble vernacular elements and describe the overall patterns in a cohesive building design. The section is at once tremendously valuable and somewhat limited, especially with respect to the church building type; the authors provide only six examples. There is another limitation in that only the front elevations, delightful as they are, are shown with little connection to or indication of how these vernacular components appear as one goes around the building and into courtyards and gardens. In spite of these limitations, the reader gains a good sense of how these manufactured vernacular parts come together as a "cohesive and rational design," helping one to understand the traditional rules of American vernacular architecture.

continued on page 140

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Books *from page 138*

It has always been easier to show the vernacular than to define or describe what it is. The tight joining of the two sections is achieved through Jennings' careful freehand, single-line drawings. There are good visual, graphic, and annotated cross-references between the two sections. The drawings are mainly two-dimensional front views, with some axonometrics and plans to help clarify ideas.

This book is intended as a visual survey and reference guide that supplies information for further academic study. Despite limitations of vernacular origins and context, it is a good working handbook on American vernacular of the period. It proceeds clearly and logically from the simple single elements to the complex of a total design.

It will certainly be of interest to the practicing architect and to students of architecture and other related professionals given the recent importance of referrals to historical and vernacular components as design influences. It will also have a broad appeal to the casual architectural observer encouraging "visual literacy for vernacular environments."

—Bradford C. Grant

Mr. Grant, a practicing architect in the San Francisco Bay Area, teaches architecture at the University of California, Berkeley.

Design and Technology in Architecture. David Guise. (Wiley, $32.95.)

The publisher's advertising for this sizable paperback attempts to capture one's interest with this statement: "Turn functional building designs into works of art," suggesting a conception of design as alchemy—and completely missing the author's point. In his own scrupulously honest preface, professor David Guise admits that this is primarily a book for architecture and design students, expressing the hope that the case studies he presents "will prove a modest beginning." Although the book is directed to students, it is also more than a modest beginning and should interest many professionals.

Actually, it is an overview of what Guise calls "the hidden world of buildings." The text spans from some of the rudimentary, but here nearly oversimplified, fundamentals of building science that were a ladder we all climbed to sophisticated observations about the interplay between design goals and technological requirements. The book follows a logical path of technical information, culminating in examples of good architecture that are cleverly integrated. For the professional struggling in the daily thicket of technical detail, it is a reaffirmation that technology can be a positive contributor to beautiful and functional arcosystems.

The book has two parts, the first of which is an introduction to the basics of building essentially orthogonal systems, coupled with the most obvious parameters established in the interest of public safety. In sequence the issues of loads, materials, structural components, and system bracing are presented pleasantly and simply, a feat that is always welcomed by the beginning student. Three remarkable short chapters follow, dealing with mechanical equipment location, life safety, and codes and ordinances, bringing their intentions into focus well above the maelstrom of regulatory verbiage into which the designer must eventually descend. Here, too, the professional may benefit from a fresh vision, even while understanding that the code waters below swirl with complex currents and eddies.

Part two consists of 16 case studies of some of our more familiar "contemporary" architectural artifacts, half with steel frames and the remainder with concrete frames. Each was selected to illustrate a significant or unique effort in integrating building technologies with quality design, at least in the economical, functional, and visual senses.

Potential reader, know this: Virtually all of the examples are tall buildings whose goals are to provide modular workplaces for office or laboratory functions. High-rises require high technologies. The successful integration of building systems and esthetics under the twin taskmasters of efficiency and economy is a high challenge. Even so, it is difficult to be passioniate about some of the soberly rectangular buildings that inhabit this part of the book.

The shortest of the buildings, dwarfed by its 15 companions, is Louis Kahn's Yale Art Gallery. The next three are in the 8- to 12-story zone, with the rest moving up in irregular increments to be topped by the 64 stories of the U.S. Steel Building, towering triangularly over Pittsburgh. Chronologically, they begin with the Yale gallery (1953) and end at the Citicorp Center Tower (1978), whose facade Guise bravely describes as "another slick, tidily wrapped box." None of America's growing family of tall postmodern buildings has been included, so comparative questions about their internal advances find no answers here. Are the environmental control and structural systems in the more celebrated and controversial postmodern landmarks also integrated postmodernly in some "newly classical" way, or are they merely conventionally assembled and "premodern"?

For each case study, there is an introduction illuminating the building's essence and the design-technology interactions forged in the eliptical spiralling of the design process. Sometimes his revelations are reminders of masterly illusions or disclosures of rational departures from conventional wisdom. Some examples: Kahn's legerdemain in the Yale Art Gallery's ever-enchanting but deceptive tetrahedral joist systems, Mies' solution to the air intake needs of Seagram's lower zone, Pei's decision to run the primary beams in the longest dimension in the American Life Insurance Building in Wilmington, Del., the symbiotic secrets of the columns in Saarinen's CBS Tower, or the lovely logic of the technological layering in Lundquist & Stonehill's Hoffman-LaRoche Building in New Jersey.

Every case study includes at least one photo, typical floor plans, mechanical and structural plans and sections, with useful supplementary isometrics and details about some of them. It is in the mechanical drawings that the organic nature and potential of high technology is confirmed: tentacles squirming systematically into steel or concrete structural configurations designed either to absorb them or to coexist with them in separate planes. The case studies are eventually linked by a chart summarizing selected data, making it possible to compare the projects' dimensions, capacities, and efficiencies.

The student who persists in studying both the systems and the subtleties of the case studies will be wiser and should be inspired to give more attention to the technologies in design education studies. The professional, understanding the cat's cradle character of design decisions, probably will wish there were more information about the players, priorities, and parameters that brought these 16 buildings to their final forms. As the student will eventually learn, much of the pleasure of architectural design can come from creatively weaving together every segment of these multidimensional human and technological tapestries we call architecture.

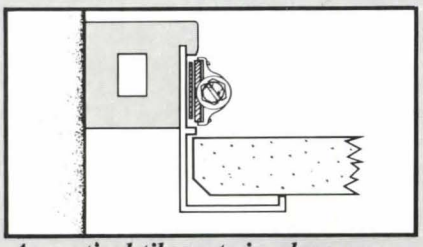
—Robert E. McConnell, FAIA

Mr. McConnell is professor of architecture and former dean of the college of architecture, University of Arizona, and teaches courses in design and technology.

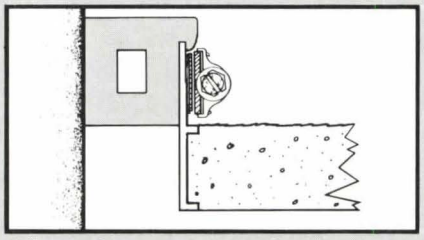
The Making of Modern London. Gavin Weightman and Steve Humphries. (Vol. 1, 1815-1914; vol. 2, 1914-1939. London: Sidgwick & Jackson, $11.95, paperbound—vol. 1; $19.95—vol. 2. Distributed in this country by Merrimack Publishers' Circle.)

For $218, you can fly from the East Coast to London and see the great Victorian city. Short of a tourist guide, these two volumes are a reliable introduction. Transportation is the key to the evolution and identity of the modern city. Metropolitan growth and housing are runners-up. Unless you mistakenly spend most of your time in the rapidly changing West End, along with the other tourists, what you see today is inevitably the past, the middle class, Victorian city. Weightman and Humphries wrote these volumes to accompany a television series, and they are correspondingly well illustrated and researched without too many surprises. The biggest difficulty is that too much has happened since 1939; what you read here is left at the level of historical understanding.—Frederick Gutheim, Hon. AIA

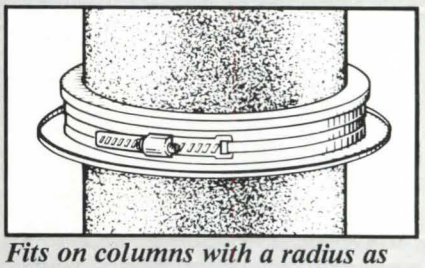
Fry Reglet's New Column Collar: You'll Find Us In Tight Circles.



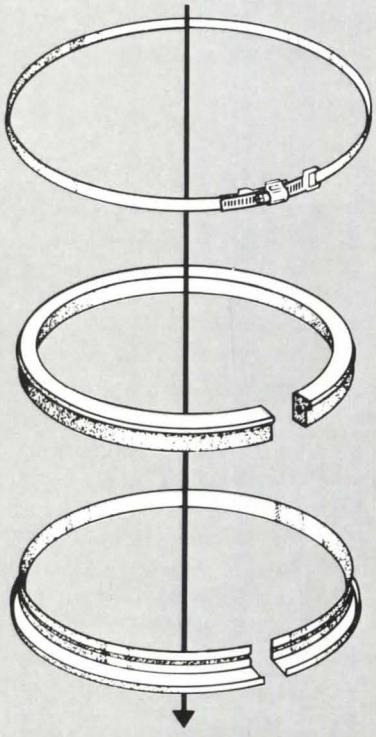
Acoustical tile rests in place on fitted aluminum angle.



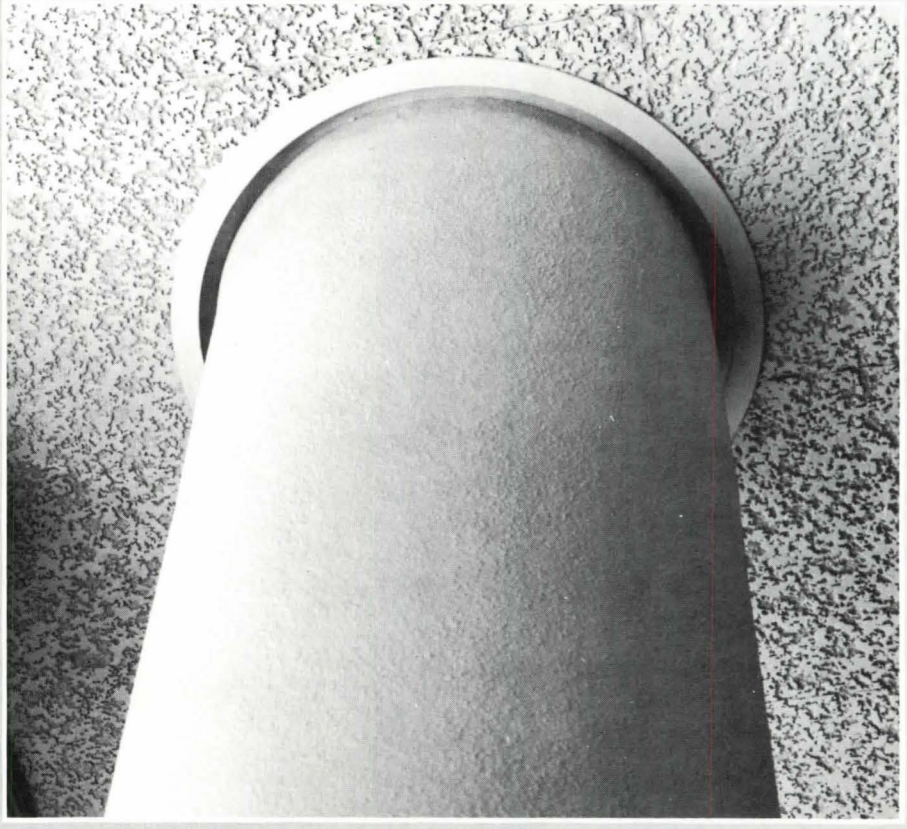
Plaster is screeded to aluminum reveal.



Fits on columns with a radius as small as six inches.



Two simple components secured by adjustable band.



Introducing Fry Reglet's new Column Collar — finally a workable molding which fits around small radius columns!

There exist today many well designed buildings with either crudely hand cut tiles fitted around a column or poorly joined plaster around a column. Accordingly, there is a demand by architects and builders for an economical molding which can be installed around columns to create a neat juncture for ceiling tile or plaster. Fry's new column collar does just that!

Fry's new Column Collar is a simple and inexpensive reveal molding for use around a column with a small radius. One part comprises a plastic spacer easily wrapped around the column; the other part comprises an extruded aluminum molding (of simple configuration) that is flexed or roll formed to the curvature of the column. The two parts interfit and are secured to the column by a band clamp.

Collars can be manufactured to fit around columns with radii as low as 6″. The aluminum molding is available painted (medium bronze, dark bronze, black and white) and clear or color anodized (medium and dark

When your needs call for a column collar that is easy to install, adjustable, and attractive, ask for the column collar that is found in tight circles. **Call Fry today.**

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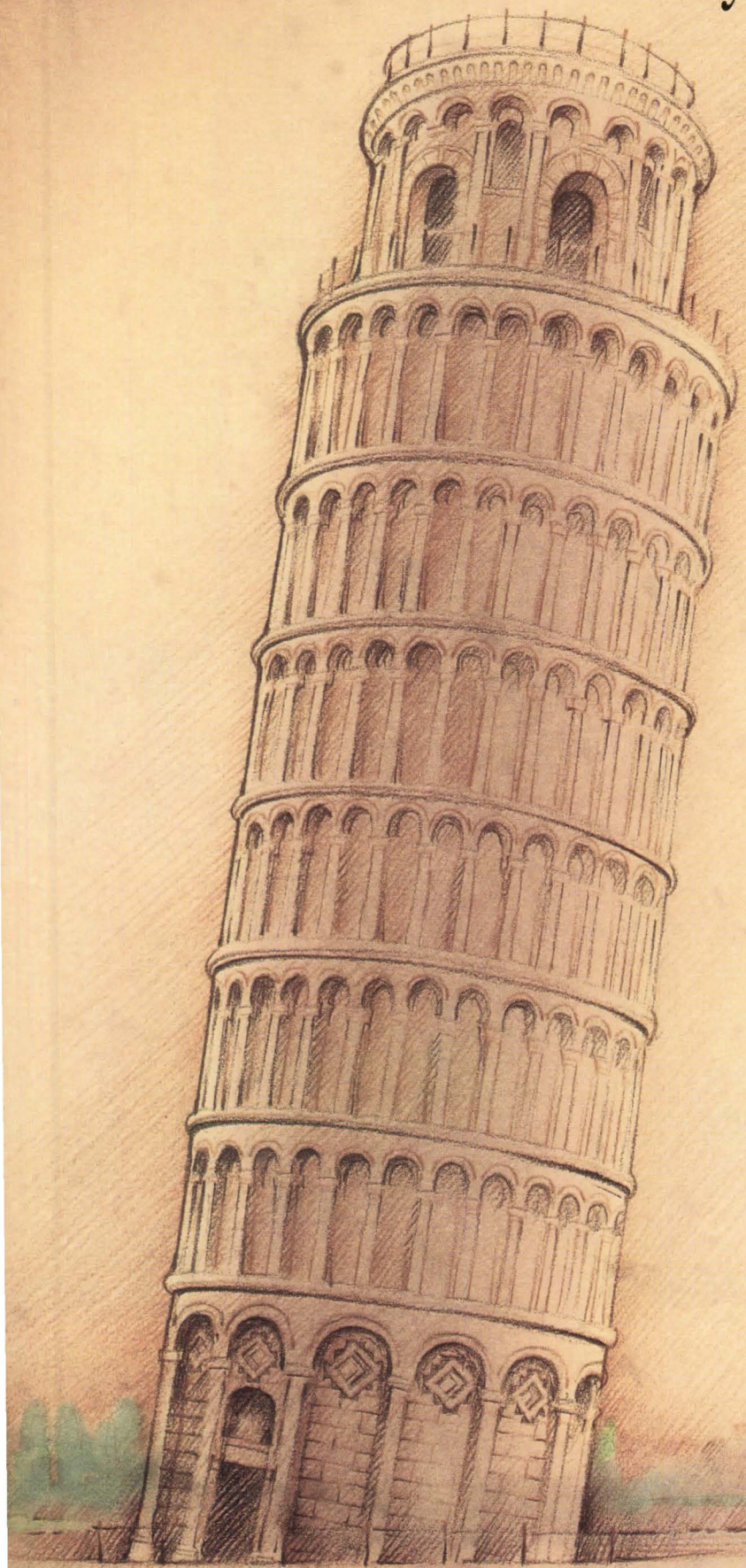

If you've been swayed to believe that glazed tile is a good choice for high traffic floors, you've been presented with a lop-sided view.

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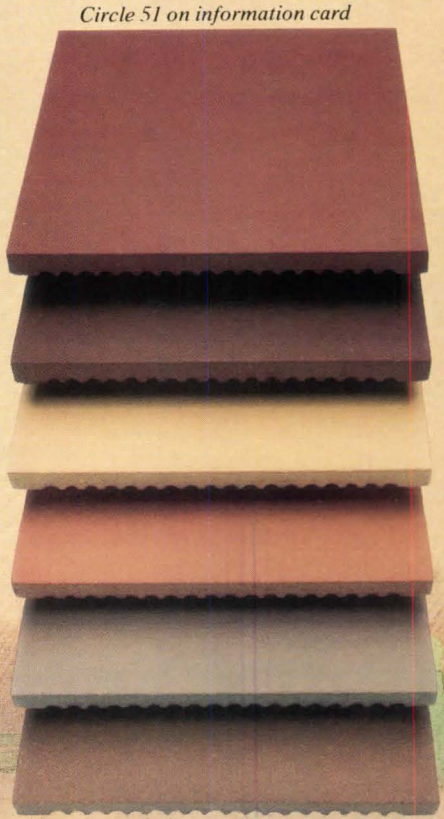
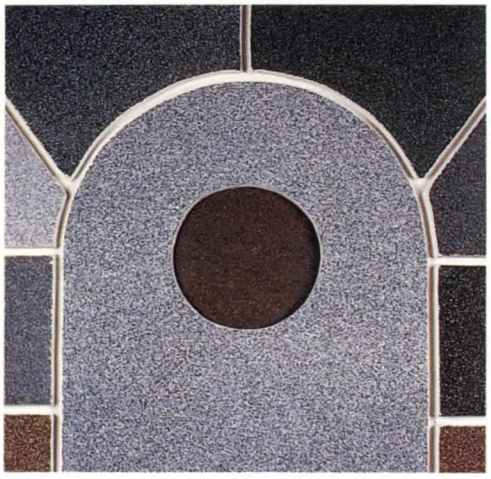


PRODUCTS

Composite Exterior Wall
The wall material below has an aggregate textured finish made from a marble chip composite that looks like real marble aggregate.

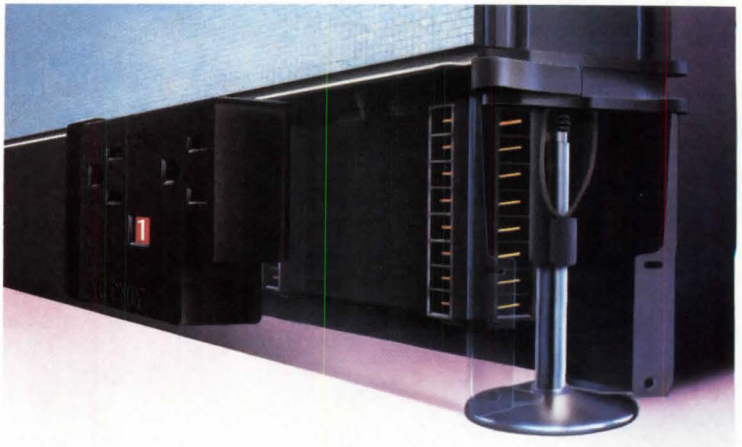
The water-repellent aggregate has a 100 percent acrylic polymer binder designed to resist mold and air pollution. The material is weatherproof and comes in solid and variegated colors to complement solid granite and marble.
Dryvit Systems
Circle 202 on information card



Space Frame
The structural steel space frame shown at right is available in any span length using the Space Deck or Nodus systems. The manufacturer fabricates additional steel support framing and will also detail and paint the structural steel to match the space frames. An engineering staff utilizes computer software for custom designs.
Haven Busch
Circle 203 on information card

Partition with Raceway
A 4-inch-high raceway from Haworth, right, accommodates up to eight 25-pair communication cables, a choice of three receptacles that show which circuit is in use, and "over-molded" power connectors that join the electrical system between panels. The connector surrounds each wire, providing double insulation for increased safety.
Haworth
Circle 201 on information card

—Amy Light



NEW AND NOTEWORTHY

Foam Penetration Sealant
Pensil 851 silicone-foam penetration sealant expands and cures in place at room temperature to form an elastomeric seal for floor and wall penetrations. GE reports that the sealant is fire-, smoke-, gas-, and water-resistant.

The silicone, applied in liquid form, foams into place. The manufacturer claims it is an effective sealant for conduits, cables, ductwork, and mechanical piping.
General Electric
Circle 206 on information card

Fluorescent Dimming Control
The Nova T-Star/Hi-Lume wallbox control enables operation of Lutron's Hi-Lume solid-state fluorescent dimming ballast without a remote dimmer panel. The same circuit may carry lamps of different lengths and wide-ranging light sources. The dimmer control operates up to 20 fixture packs (ballasts), with each pack able to control two lamps. At a normal room ambient noise level of 27 db, the user will find the system inaudible.
Lutron
Circle 208 on information card

"Kidfriendly" Play Surface
SafePlay playground surface (below), has a thick, safety tested shockpad constructed to absorb blows from falls and to remain soft and pliant even on the coldest days. Cam-Turf designs the surface to resist the wear of foot traffic, airborne pollution, and ultraviolet degradation, and to remain unaffected by water, rot, mold, mildew, and bacteria. SafePlay's plush, virtually stain-proof surface can't hide glass or sharp objects and cleans with a simple hosing off.
Cam-Turf
Circle 223 on information card

Ready-Mix Joint Compound
Gold Bond Lite is said to be 30 percent lighter than conventional ready-mix joint compounds. The manufacturer created the compound's lighter consistency to make application easier. Gold Bond Lite can serve as a sealant as well as for two-coat finishing of all fasteners and quarter beads.
Gold Bond Building Products
Circle 207 on information card

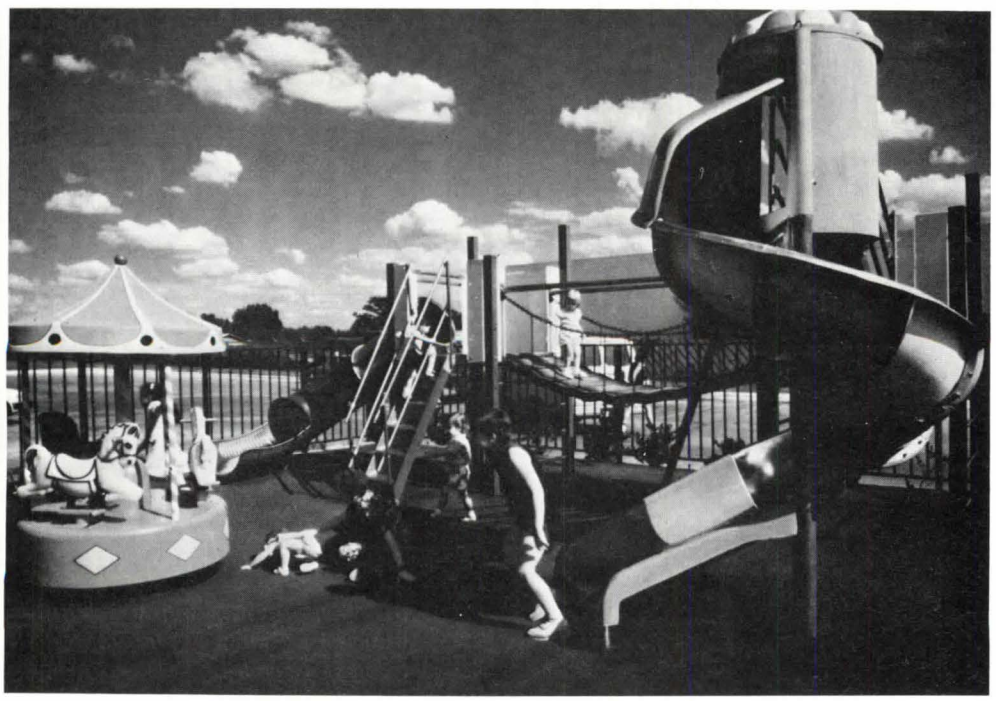
Wire Reinforcing Mesh
Hex-shaped stucco and plaster reinforcing wire mesh can serve as a backing for veneer and masonry, as reinforcement around shower and tub enclosures, and as a support of terrazzo flooring.

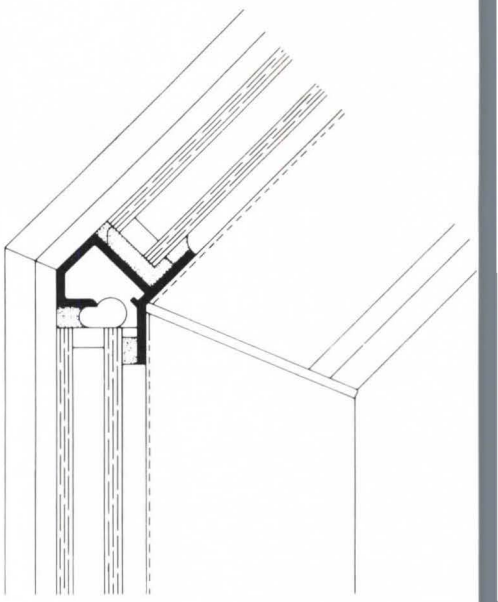
Keymesh, woven from galvanized, cold-drawn steel wire, reputes to maintain exceptional rust resistance in wet applications, as well as excellent fire ratings and shear values for load-bearing and non-load bearing fire-resistant construction over wood or metal framing.

Keymesh comes in 150-foot rolls of 1-inch mesh, 18 gauge; 1 ½-inch mesh, 17 gauge; and 1-inch mesh, 20 gauge.
Keystone Steel and Wire
Circle 211 on information card

Vinyl Cove Base
New vinyl cove base incorporates many of the design features of Roppe's rubber cove base, including a top lip design that fits snugly against the wall and a toe that hugs the floor. A ribbed back provides positive adhesion to the wall.

The .080-inch thick cove base comes in three sizes—2 ½-inch, 4-inch, and 6-inch—and 4-feet lengths, packaged 30 pieces to a carton. Available in white, almond, toffee, chocolate, brown, light gray, dark gray, and black, all coves feature a deluxe satin finish.
Roppe Rubber Corporation
Circle 220 on information card





Thin-Eave Slopewall System
New Vuline HP-1175 slopewall system (above), offers the esthetics of thin-line eaves for either ¼-inch or 1-inch glass, as well as thinner, butt-glazed eaves for ¼-inch and 1-inch glass. Components of this system come in stock lengths or can be custom fabricated. Vistawall designs and tests the system for high air and water performance.
Vistawall Architectural Products
Circle 221 on information card

Blinds for Arch-Top Windows
Levolor blinds for custom shaped arch-top windows come in more than 260 custom colors and may be fixed with tiltable slats. They are available with optional operating shades, which can be raised to the widest portion of the window. The head nail mounts directly to the inside of the jamb for easy installation, maximum light control, and privacy.
New Morning Windows
Circle 240 on information card

Fire-Resistant Wallcovering
Koroseal wallcovering detects the presence of heat and triggers an ionization-type smoke detector alarm before smoke or open flame appears.

When heated to approximately 300 degrees F, Early Warning Effect (EWE) wallcovering emits an odorless, colorless, harmless vapor that triggers an alarm in the presence of the ionization detectors. *Consumer Reports* magazine recently stated that these smoke detectors are the most popular type of detector on the market today.

In National Fire Protection Association tests, the 300-degrees trigger point falls below the ignition temperatures of most common room materials, including paper, cotton, polyethylene, and polyurethane foam.

EWE wallcovering outgasses when triggered by electrical outlet overloads, electrical fires in walls, fires started in other rooms, and in core service areas that gen-

continued on page 146

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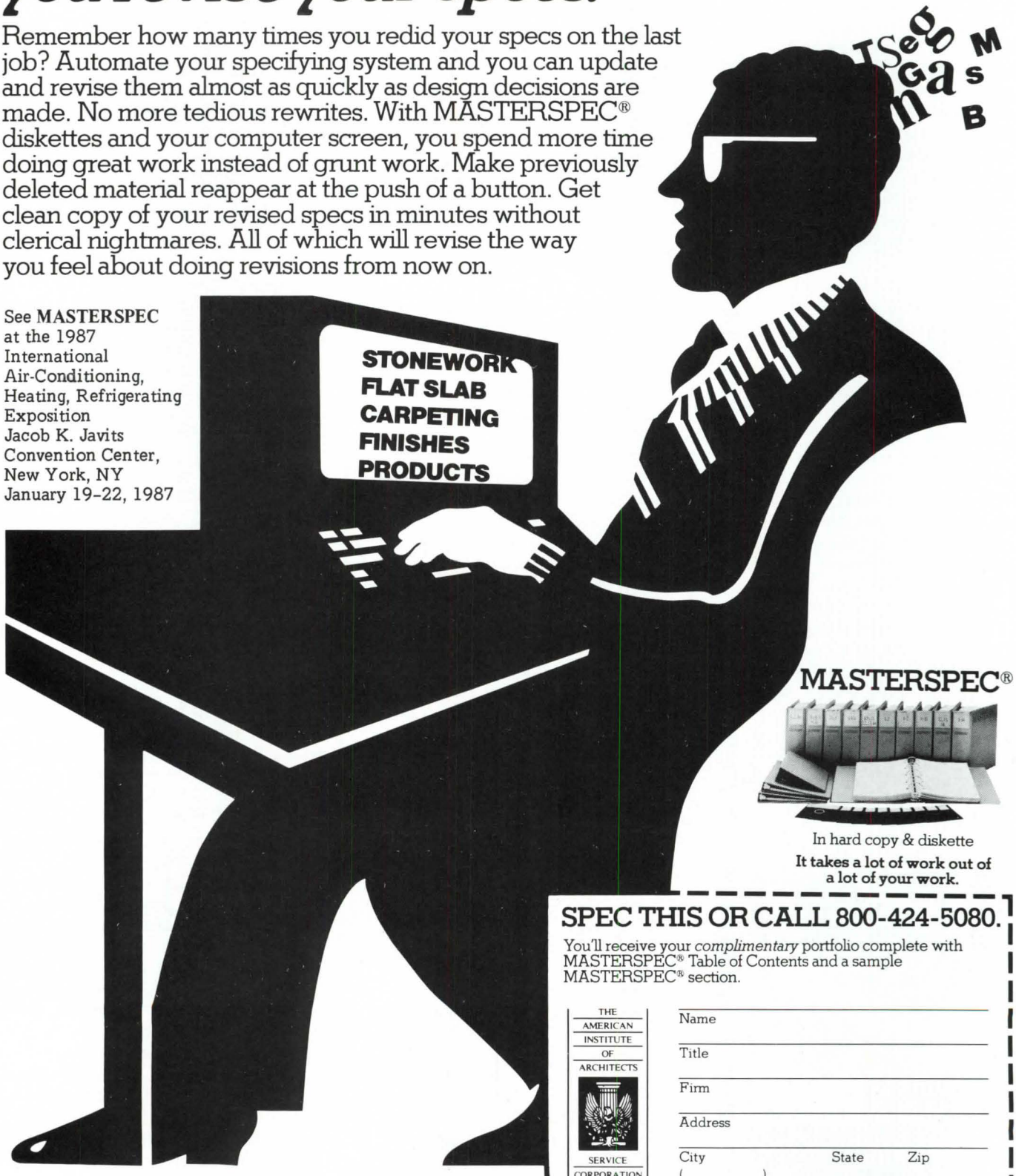

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Circle 53 on information card

erate heat in adjoining rooms or corridor walls.

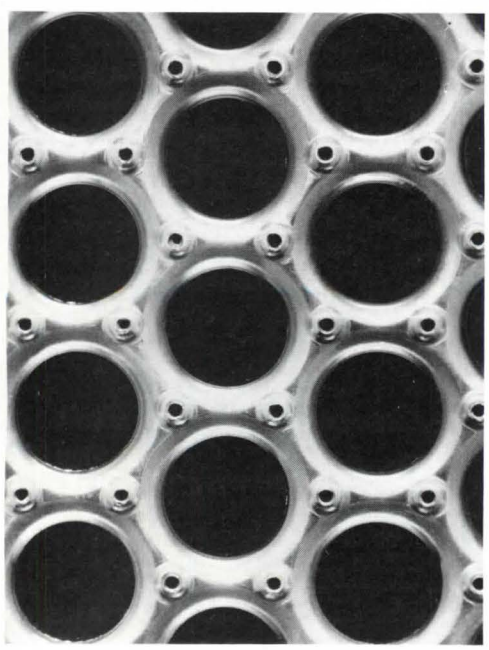
Incorporated into most of the manufacturer's standard wallcoverings, the EWE wallcovering, also designed for stain and fade resistance, comes in more than 2,000 colors and patterns.
B.F. Goodrich
Circle 204 on information card

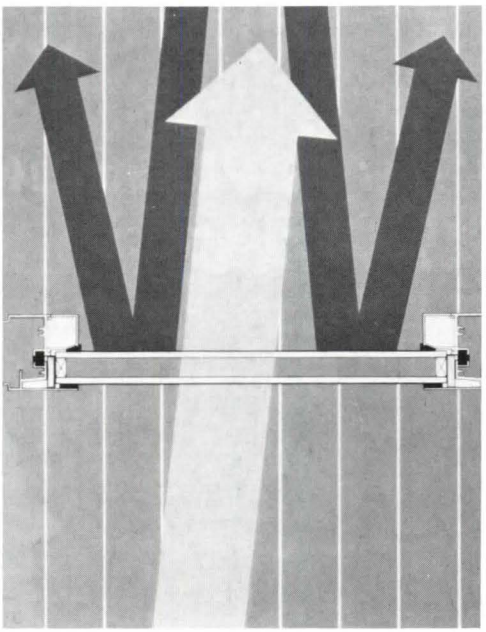
Free Emergency Lighting Brochure
An eight-page, full-color pamphlet describes an entire line of emergency-lighting models and includes product descriptions, standard features, and ordering information.

The models, each fully covered by a two-year warranty, include the following: 6-volt/8-watt, 6-volt and 12-volt emergency lights, 6-volt cylinder and square decorator lights, 6-volt T-bar lights, AC exit signs in red or green letter faces, self-powered 6-volt exit signs, fluorescent fixture power packs, NEMA 4x emergency lights, and exit signs.
Edwards
Circle 234 on information card

Safety Grating and Tread
Open-Grip (below), is a one-piece sheet metal grating whose applications include work platforms, mezzanines, catwalks, stair treads, and other open flooring applications. Morton Manufacturing Companies designed Open-Grip's self-cleaning debossed holes with no corners that could catch and hold mud or grease and no sharp points or projections that could cut skin, tear clothing, or stub toes. Raised buttons are said to provide a slip-resistant grip regardless of which direction the foot moves.

The user can cut or miter the heavy gauge steel grating without edge banding. A high strength-to-weight ratio minimizes support requirements.
Morton Manufacturing
Circle 214 on information card





Solar- and Heat-Reflective Glass
Low-emissivity glass (above), selectively reflects or transmits portions of the sun's radiant energy spectrum to improve glass-insulation performance. Acorn Products offers the glass in its complete line of DorWal sliding glass doors and windows, and thermal-barrier doors and windows.

E-Therm keeps in heat during the winter months and considerably blocks solar heat during the summer, thus reducing airconditioning and heating costs. The company claims the products also reduce ultraviolet damage to fabrics. The company's distributors offer windows and doors with E-Therm glass nationally.
Acorn Building Components
Circle 236 on information card

Three-Version Revolving Door
The Round Revolver revolving door operates manually, by power-assist mode, or completely automatically. The manually operated version features a frictionless drive speed control that doesn't begin to slow the door until the pedestrian has reached a maximum, pre-set rotation speed. The power-assist mode activates when the door is pushed, causing it to rotate at a pre-set speed controlled by the user. When the Revolver is set automatically, it rotates continuously or it can be activated by a microwave motion detector adjusted to detect pedestrians in front of the door. The user can preset the revolvers to revolve at 4 to 8 RPM; a "handicapped" button can slow the revolver to 2 RPM.

Additional safety devices include a torque-sensing circuit that limits the amount of force the door exerts on a user and a safety "stop" feature that stops the door and allows the user to reverse it. The Revolver automatically stops if something gets caught between the door and the drum. In the event of a power failure, the door operates as a conventional door. The Round Revolver has a curved glass drum and comes in aluminum, stainless-steel, and bronze finishes.
Horton Automatics
Circle 237 on information card

Desk Has Conferencing Option
A desk with a rounded end that supports a 6-inch-diameter cylinder creates conferencing space adjacent to desk work space. Conference End Top accommodates up to four seated individuals. The top comes in 72-inch and 90-inch lengths, with veneer options that include rift-cut white oak, mahogany, maple, and a full line of Spectra plastic laminate colors. The top complements other Gunlocke Panel System components.
Gunlocke
Circle 235 on information card

Software Manages Workstation Changes
A new computer software program that manages a Robertson Q-Floor/Taproute cellular floor electrical/communications system accommodates frequent workstation service change requests and demands for additional service during an office building's lifetime.

Because of the quantity of graphic and numeric data the programs contain, H.H. Robertson stores "Maproute" in its own VAX Series computer system. The program retains in memory a "diagram" of the entire cellular floor system of an office building as well as the original system installments. Having past and present usage patterns in memory helps the program project future system service requirements and suggests how these requirements can be made efficiently and economically.

The program allows every cable and wire to be tracked, and both written and graphic work orders are easily generated. A high-resolution, full-color visual display monitor can display any part of the system. The design can superimpose "templates" of desks, modular workstation systems, and office equipment over the cellular floor system to select locations for in-floor outlets.

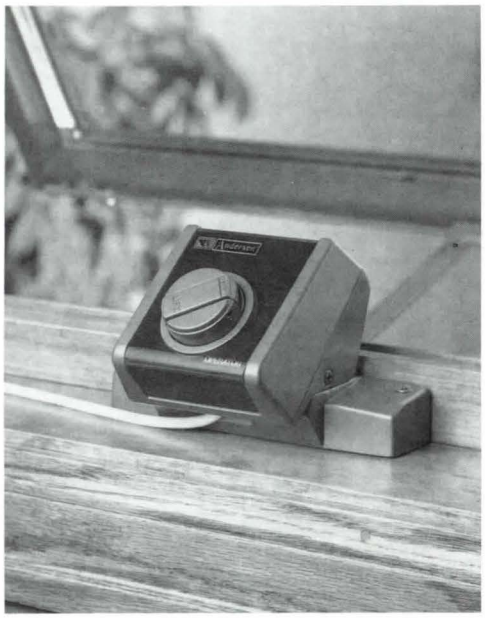
Maproute suggests the most direct route for putting down cables for electrical and communications services to in-floor outlets and shows all other possible cabling paths, highlighting on the screen any junctions where there may be insufficient capacity or other potential problems. The system can also evaluate a manually selected route. Once a route is selected, the user enters the data into the Maproute data base, updating the system.

Reports of available capacity—trench section by trench section or cell by cell—allow easy monitoring. The Maproute data base incorporates every workstation, along with the status of its power, voice and data service cables, and entire in-floor wiring modification, for future reference.
H.H. Robertson
Circle 205 on information card

Electric Window Opener
Andersen Windows now offers an electric window opener (below) with a rain sensor to automatically close windows. The starter package enables the user to operate one window sash; add-on accessories allow the user to operate up to four window sashes from one command center module.

The system fits all Andersen vented awning and roof windows manufactured in the last 20 years and some older model windows. Optional accessories include an add-on power operator package with awning bracket, a safety connector, rain sensor, power operator and command center extension cord, and a rain sensor with a 2-foot cord.

The UL-listed system contains a converter for changing from 120 VAC to 16 VDC.
Andersen
Circle 209 on information card



Coatings Manual
A 40-page mini-encyclopedia on the use of high-performance coatings serves as a guide for selecting the best coating systems for various surfaces and operating conditions. Special sections give practical information on project planning, surface preparation for steel and nonsteel substrates, coating application guidelines, inspection methods, and painting economics. The guide also provides performance features and product descriptions for DuPont high-performance acrylic, alkyd, epoxy, high temperature, polyurethane, zinc-rich, and volatile-organic-compound conforming coatings.
DuPont
Circle 212 on information card

Window Arch
Tru-Arch, a prefabricated arch guaranteed to produce a perfect arch for one-third the cost of a conventional arch, eliminates framing and drywalling applications associated with regular arch construction.

The preformed polyurethane arch comes with drywall paper permanently bonded to the surface to allow direct application of drywall taping compounds. Tru-Arch comes in various depths and widths, and can also be customized. Installation requires no special training.
Architectural Molding
Circle 222 on information card

Pressure-Treated Wood Brochure
Characteristics, Use and Specifications of Pressure-Treated Wood, an eight-page brochure, provides specifying information for all applications of pressure-treated wood and identifies contacts for technical information.
Western Wood Preservers Institute
Circle 213 on information card

Elastomeric Form Liner
A new concrete form liner that creates textured patterns in concrete provides relatively high reusability and good texture. Its cost falls between that of expensive elastomeric liners and inexpensive, low reuse plastic liners. The liner, produced in a wide variety of wood-look, stone, and fractured textures, comes in a standard size sheet measuring 4 x 10 feet.
Symons Corporation
Circle 216 on information card

Addition to Blind Line
The Riviera collection now includes a 1⅜-inch custom horizontal blind. The fuller cut European style features overlapping slats to provide maximum light control, energy efficiency, and privacy. Other available slat widths include ½-inch (micro), 1-inch (mini), and 2-inch. A color deck provides 55 available colors.
Levolor Lorentzen
Circle 219 on information card

Products continued on page 148

Products *from page 147*

Fire-Rated Vinyl-Bonded Wood

GenuWood is a vinyl-sheathed wood, made from wood veneer, that meets the flamespread rating of 75 as specified by ASTM Standard 75. PermaGrain designs the wood to provide exceptional durability and resistance to flame spread, stains and spills, and frequent use of disinfectants.

PermaGrain Products
Circle 238 on information card

Acoustical Brochure

An eight-page, full-color brochure describes in words, pictures, and technical data a broad range of acoustical products, including acoustical wall panels; scamp, satellite and centrallite sound masking systems; and acoustical enclosures for computer printers.

Insul-Art Acoustics
Circle 218 on information card

PRESERVATION

Stucco Replaces Plaster Coat

Pre-blended, water-resistant Marbilsil finish stucco replaces the finish coat in a two- or three-coat plaster system. WR Bonsal Company claims the stucco finish is clean, colorfast, and less expensive than job-mixed stucco and paint.

Applications for Marblesil include troweling or spraying over conventional scratch and brown coats, poured or placed concrete, brick, or stone. Factory-mixed colors come in natural white and 11 standard pastel shades.

WR Bonsal
Circle 199 on information card

Corrosion-Resistant Grout

Drehmann Paving and Floor Company claims their new grout for brick and tile is corrosion proof and withstands temperatures up to 380 degrees F. The grout, composed of Drehmann's grout powder and furan resin, is purported to form a shrink-proof bond that grips the sides of brick and underflooring. Formulated to withstand constant battering, the fast-curing grout also can serve as mortar.

Drehmann Paving and Flooring
Circle 198 on information card

Clear, Intumescent Coating

American Vamag Company offers Albert-DS-Clear "Class A" intumescent fire retardant coating for indoor use on wood, hardboard, cellulose board, plastics, and wood derivatives.

When exposed to 350 degrees F or more, the coating develops a rigid foam many times its dry thickness in volume. The foam contains non-combustible, non-toxic gases that provide a heat and fire barrier to protect the surface below.

Albert-DS-Clear has a flamespread rating of 5 and a 0 rating for both fuel contributed and smoke development ratings, according to tests conducted in accordance with ASTM E-84 (UL 723 and ULC-S-102).

American Vamag
Circle 197 on information card

Multipurpose Protective Coating

Miracoat coating, applied as a thin film, forms a flexible bond with concrete, metal, glass, rigid and foamed-in-place insulation, plastic, and ceramics.

The concrete-like surface resists impact, abrasion, weather erosion, and moisture. Because Miracoat does not act as a vapor barrier, the substrate does not trap moisture and vapor.

Miracoat comes only in off-white or cement gray. Color may be added with Miraco topcoats.

Miraco
Circle 196 on information card

Computerized Maintenance System

Intellvac, Inc., now manufactures a Modular, Automated Computerized Cleaning System (MACCS) for commercial, industrial, and institutional applications in both single- and multiple-story buildings. A network of pipes distribute system cleaning functions to programmable wall outlets throughout the building. Cleaning personnel activate the appropriate program for the housekeeping task to be performed. The system dispenses cleaning solutions, which are vacuumed away after each application. Selection modes include

continued on page 150

What made manual AEC drawing obsolete in Japan?

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Circle 40 on information card

Image courtesy of Ragan Design Group

Products *from page 148*
five different cleaning chemicals to be supplied, a range of vacuuming pressures, and hot and cold water. The system handles routine cleaning and emergency jobs. Options included special attachments and tools customized to each job.
Intellvac
Circle 195 on information card

Corrosion Resistant Coating
E.G. Smith Construction Products makes Duragard epoxy modified urethane coating for use on galvanized steel, aluminized steel, and aluminum. Users can bend, shape, crimp, and form components coated with Duragard.

The thick film coating resists corrosion from caustic chemical environments and comes in a wide range of colors designed to remain uniform and permit matching to building additions and extensions.
E.G. Smith Construction
Circle 193 on information card

Crystallizing Machine for Stone
The VMC Crystallization Machine strips, cleans, and screen grinds fine scratches on indoor marble, terrazzo, and some types of granite floors. By incorporating polishing compounds into the floor surface, crystallization causes a chemical transformation of the stone, resulting in a more mirror-like surface. The machine uses wire wool pads and two kinds of non-toxic, non-flammable, odorless chemicals. Users can walk on the floors immediately after treatment. Verona Marble Company does not recommend use of the machine for pitted, heavily scratched, or crushed marble.
Verona Marble
Circle 194 on information card

Reproduction Ceramic Tiles
Reproduction hand-printed and hand-painted ceramic tiles from Britain use colors, patterns, and glazes designed to evoke images of early nineteenth century tile. Tiles are available in a wide variety of standard patterns, and the Art Tile Company will also custom design orders. The designer can create large scale patterns and pictures with a series of tiles.

Completely flat surfaces allow the screen printing to extend out to the edges of the tiles. Prices range from $23 per square yard for plain colors to $113 per square yard for hand-crafted designs.
The Art Tile, Etruria Tile Works
Circle 192 on information card

Transparent Water Repellent
Aridsil water repellent coating protects and dampproofs brick, block, stucco, cement, plaster, and concrete surfaces while still allowing water vapor to escape.

Formulated from a silicone base in a hydrocarbon solvent, Aridsil minimizes efflorescence by sealing the surface and may also be used on interior surfaces to prevent dirt absorption. Aridsil also helps preserve masonry by minimizing damage due to freeze/thaw cycles.
Anti Hydro
Circle 191 on information card

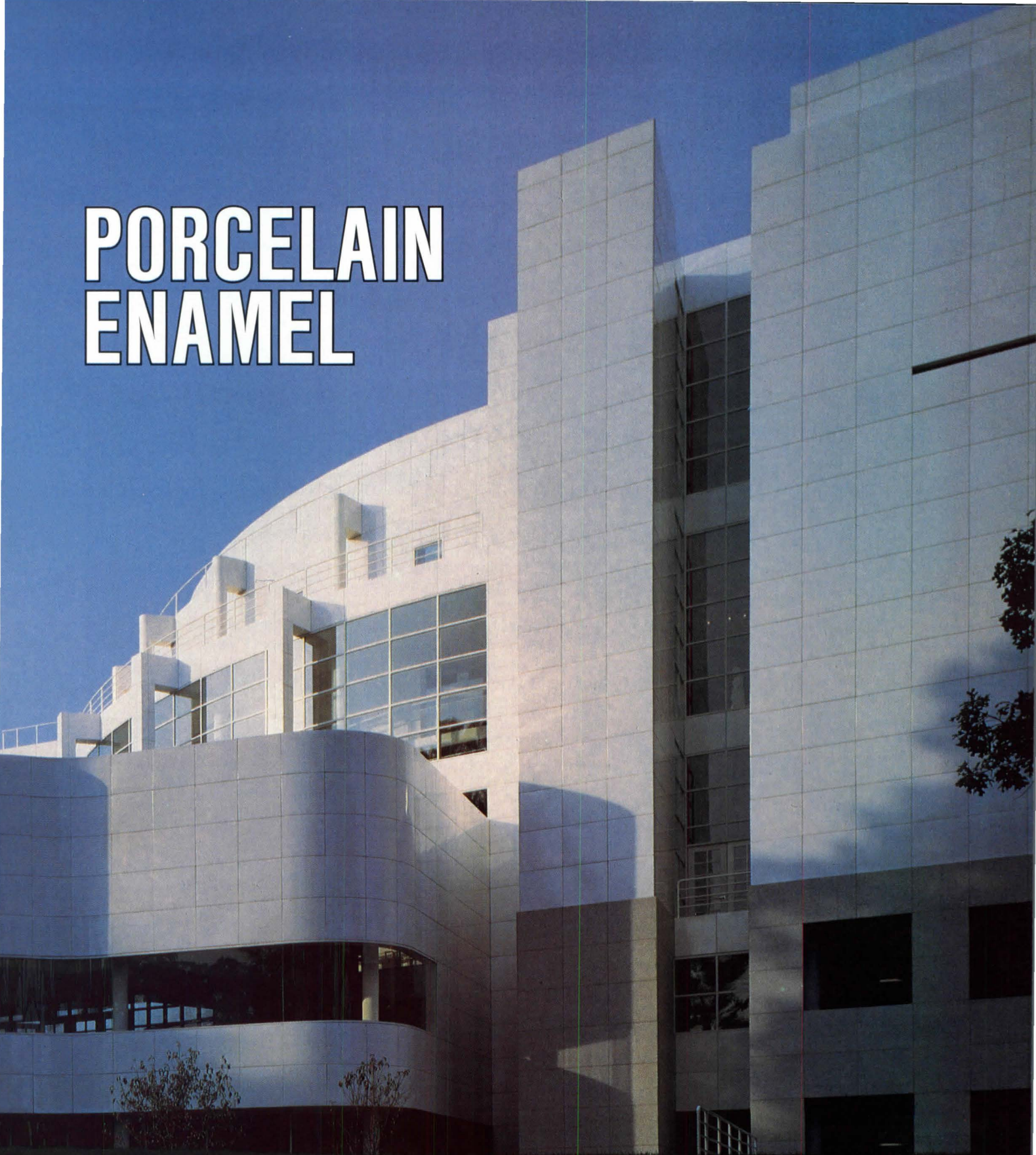
High-Performance Sealant
Silaprene All Weather Sealant's flexible ethylene propylene (EDPM) rubber base allows it to expand and contract to resist the effects of shock and other movement.

Uniroyal Plastics Company claims that Silaprene resists salt, sunlight, chemicals, ultraviolet rays, ozone, and weather and temperature extremes. It recommends Silaprene for use on wood, rubber, metal, concrete, brick, marble, glass fiber, plastic, and glass.

The user can field paint Silaprene to match its surroundings. Suggested uses include sealing panels, fascia, roof penetrations, cracks, ductwork, and exterior seams.
Uniroyal Plastics
Circle 190 on information card

Structural Adhesives
Lord Corporation introduces the Versilok HI 400 series, composed of two-component, modified acrylic structural adhesives specifically formulated to provide high impact and peel strengths. The three systems in the series offer a choice of cure times, varying from 3-minute to 40-minute handling strength times.

continued on page 152



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Circle 43 on information card

Products *from page 150*

The manufacturer claims the sealants, which are designed to bond metals and engineered plastics, provide excellent cold temperature strength and resistance to chemicals and weather. The series is designed to replace welding, brazing, riveting, and other mechanical fastening methods, especially in low-temperature environments subject to high-impact or high-peel loads.
Lord Industrial Adhesives
Circle 189 on information card

Cement-Based Floor Underlayment
Rexnord Chemical Products introduces Sonneborn Sonoflow, an indoor, cement-based, self-leveling underlayment designed to provide a durable floor surface. Sonoflow needs no troweling, can be pumped, and can be applied in thicknesses ranging from feather edge to two inches deep. It will accept foot traffic within two to three hours and features a compression strength of 4000 psi after a 28-day curing period.

Sonoflow will accept floor coverings such as ceramic tile, wood, or carpeting 24 hours after installation if the floor is maintained at 68 degrees F or above.
Rexnord Chemical Products
Circle 188 on information card

Water-Repellent Masonry Stain
Dymacryl masonry stains protect the surfaces of masonry against damage caused by water absorption. The manufacturer recommends Dymacryl for use on poured and precast concrete, exposed aggregate concrete, glass-fiber-reinforced concrete panels, common and face brick, stucco, natural stone, unglazed tile, and unglazed terra cotta.

Dymacryl masonry stains dampproof the substrate yet allow moisture to escape, preventing leakage that can damage interior surfaces and furnishings.

Dampney Company offers Dymacryl stains in clear, 10 standard colors, and custom shades.
Dampney
Circle 187 on information card

Masonry Protection
Thoro System Products offers a line of products that waterproof, maintain, and decorate concrete and masonry. Thorosheen, a 100 percent acrylic emulsion paint, forms a flexible film purported not to become brittle with age. Thorosheen comes in a variety of colors and is specially formulated to withstand outdoor exposure on concrete or masonry.

Thorocoat is a 100 percent acrylic, textured coating for interior and exterior surfaces of concrete and masonry. Thorocoat provides a sand-textured finish in a number of colors and is applicable by brush, roller, or spray.

Thoroglaze—a clear, semi-gloss acrylic sealer for horizontal concrete and masonry—seals with a non-yellowing film. The manufacturer recommends its use for sealing bushhammered concrete, exposed aggregate concrete, stucco, and concrete floors as protection against dirt build-up.
Thoro System Products
Circle 186 on information card

Acrylic Water-Resistant Sealants
The VIP 5000 Series sealants by VIP Enterprises have a 525 percent elongation factor for major patching, cracks, joint filling, and seaming. The 5000 series comprises one-component, internally plasticized, 100-percent acrylic sealants.

Approved by EPA and OSHA, the sealants are available in four grades: textured, brushable buttering grade (5100); smooth knife grade (5300); textured knife grade (5500); and caulking grade (5700) for use in standard guns.
VIP Enterprises
Circle 185 on information card

Elevating Work Platform
Access Engineering, U.S.A., Inc.'s Satellite Elevating Work Platform uses twin electric motors to drive a platform up and down a single mast. Capable of carrying a four-ton payload of people and material, the platform has a freestanding height of 32 feet and is capable of attaining heights of over 350 feet with standard attachments. The Satellite platform measures 40 feet long by 40 feet wide and may be extended to 50 feet.

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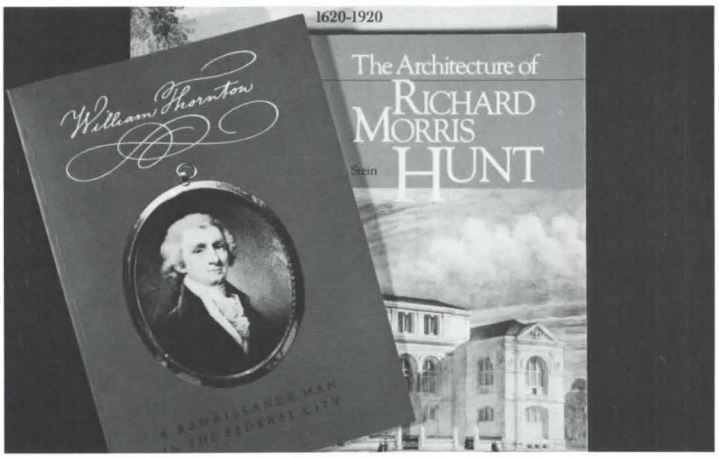

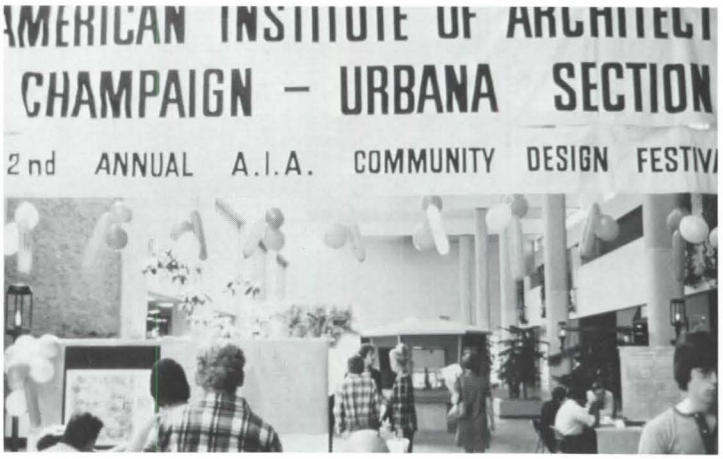

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Circle 46 on information card

Products *from page 152*

According to Access Engineering, the system is safer than swing stages and scaffolding and can increase worker productivity up to 50 percent. Enclosed by a steel mesh fence, the platform can be lowered at the rate of 24 feet per minute for resupply.

Each Satellite has a jib hoist built into its central tower to decrease dependence on cranes or cherry pickers.

Access Engineering is a U.S. subsidiary of Access Engineering Ltd., of Featherstone, England. The system has been used on over 100 sites in the U.S. and Canada.
Access Engineering U.S.A.
Circle 184 on information card

One-Coat Acrylic Wall Protection

Modac solvent-based acrylic coatings can last 10 years without replacement, according to the manufacturer, who claims that a single coat on smooth concrete or masonry can withstand 100-mph-wind-driven rain.

Modac has excellent color retention, allows vapor to escape, and coats over old surfaces, including chalked surfaces, with minimum preparation, states the manufacturer. Modac comes in 18 colors, including black and white.
Monsey Products
Circle 183 on information card

Anticorrosion Coating Outperforms Zinc

In caustic atmosphere tests, Stalgard-coated carbon steel corroded far less severely than both cadmium-plated and zinc-plated steel, Elco Industries reports.

Elco provides a full line of Stalgard-coated fasteners for metal, wood, siding, and roofing applications.
Elco Industries
Circle 182 on information card

Infrared Scanner Finds Roof Leaks

When roofs leak, the moisture-laden roofing material maintains a different temperature than its dry counterpart. Midwest Infrared Scanning Service (MISS) uses helicopter- or plane-mounted infrared scanners to locate subsurface wet areas that would otherwise go undetected without extensive destructive testing.

When compared with other nondestructive testing, such as capacitance grid surveying, the infrared scanning system proves more efficient at detecting small leaks, and quicker overall, claims MISS.

Beside detecting roof leaks, infrared scanning creates vivid graphic depictions (through false-color photography) of leak areas, which is a strong tool in persuading owners to agree to needed repairwork.

The infrared scanning technique also detects potential furnace burn-through points, excessive motor bearing friction problems, and insufficiently insulated wall or roof areas.
Midwest Infrared Scanning Service
Circle 181 on information card □

Circle 47 on information card

DataCAD 3.0

THE ARCHITECTS' CHOICE

Left to right: Mary E. Driscoll, Thomas R. Wyant, Jr., AIA, Richard S. Shank PC, AIA, W. Douglas Gilpin, Jr., AIA, Montie Breeden.

It has full-featured 2D. AUTOMATIC DIMENSIONING: DataCAD 3.0 creates a series of baseline or stringline dimensions automatically. ASSOCIATIVE DIMENSIONING: Stretch, move and edit a dimensioned object and within seconds the dimensions are re-calculated. COORDINATE GEOMETRY: It has a built-in COGO system. Enter metes and bounds or curve data for civil engineering and surveying applications.

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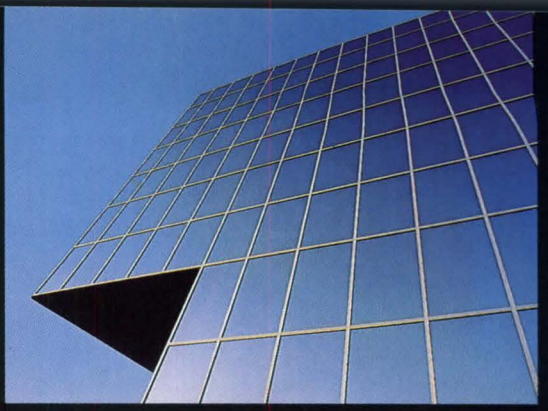

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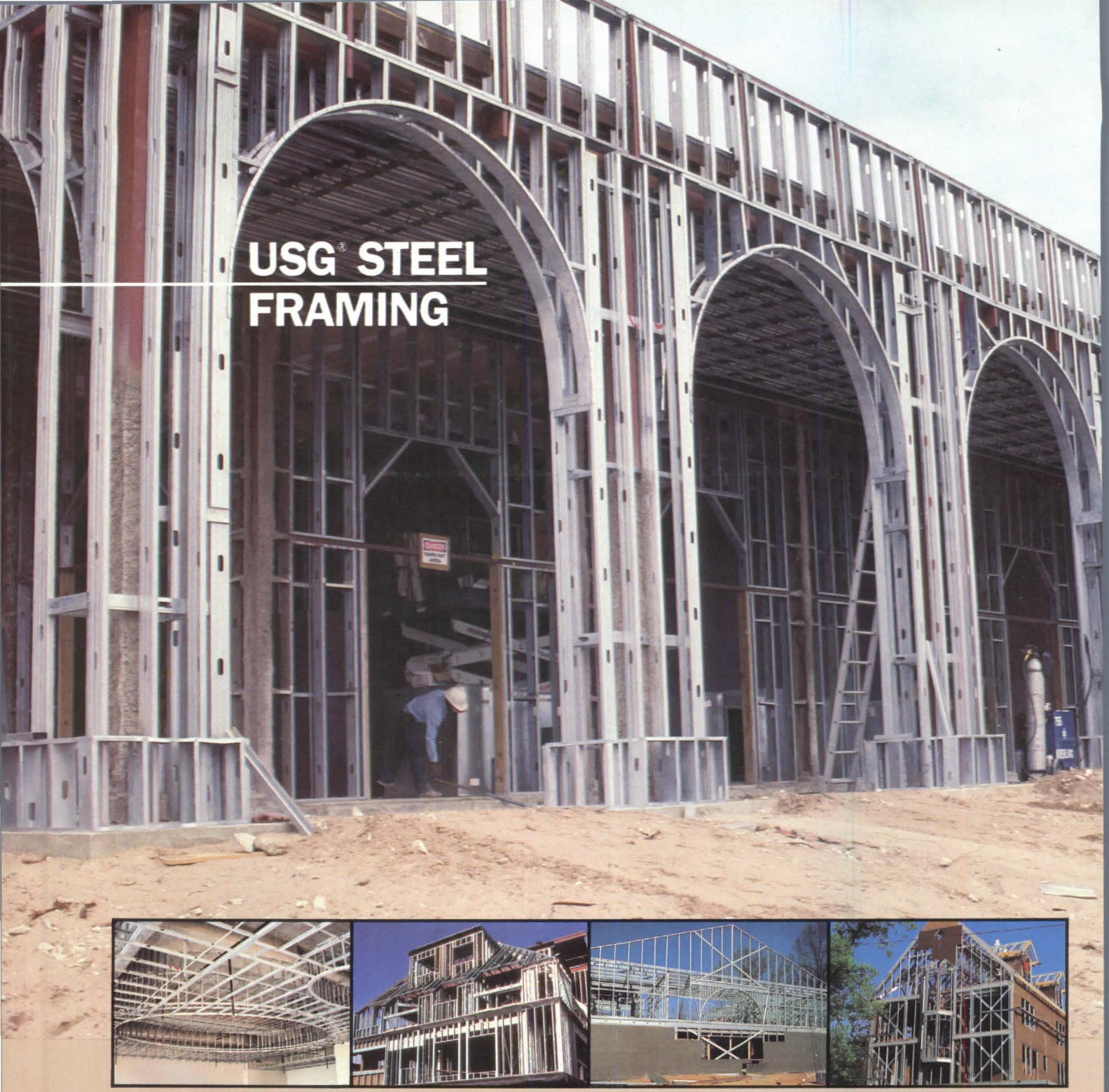

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