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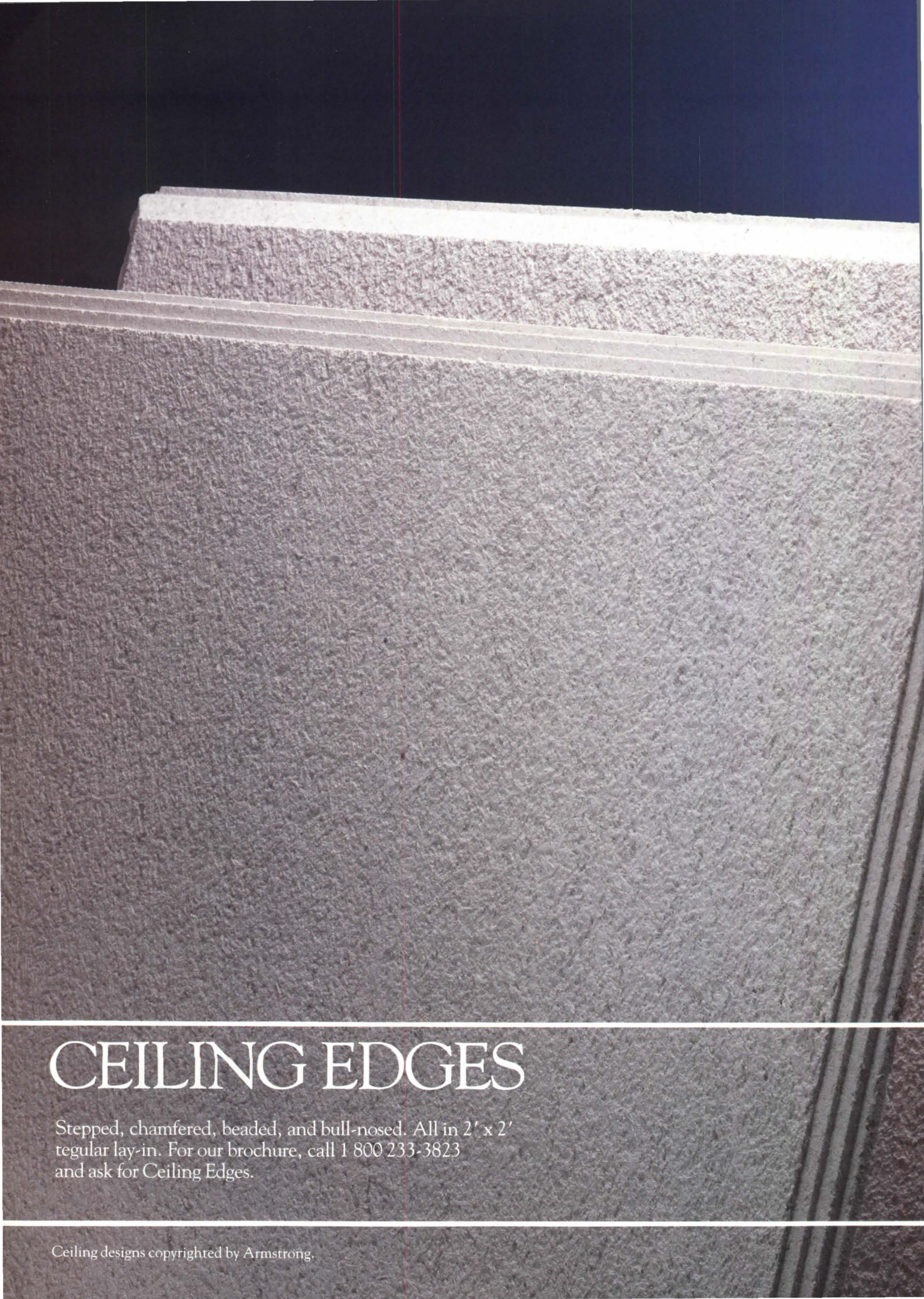

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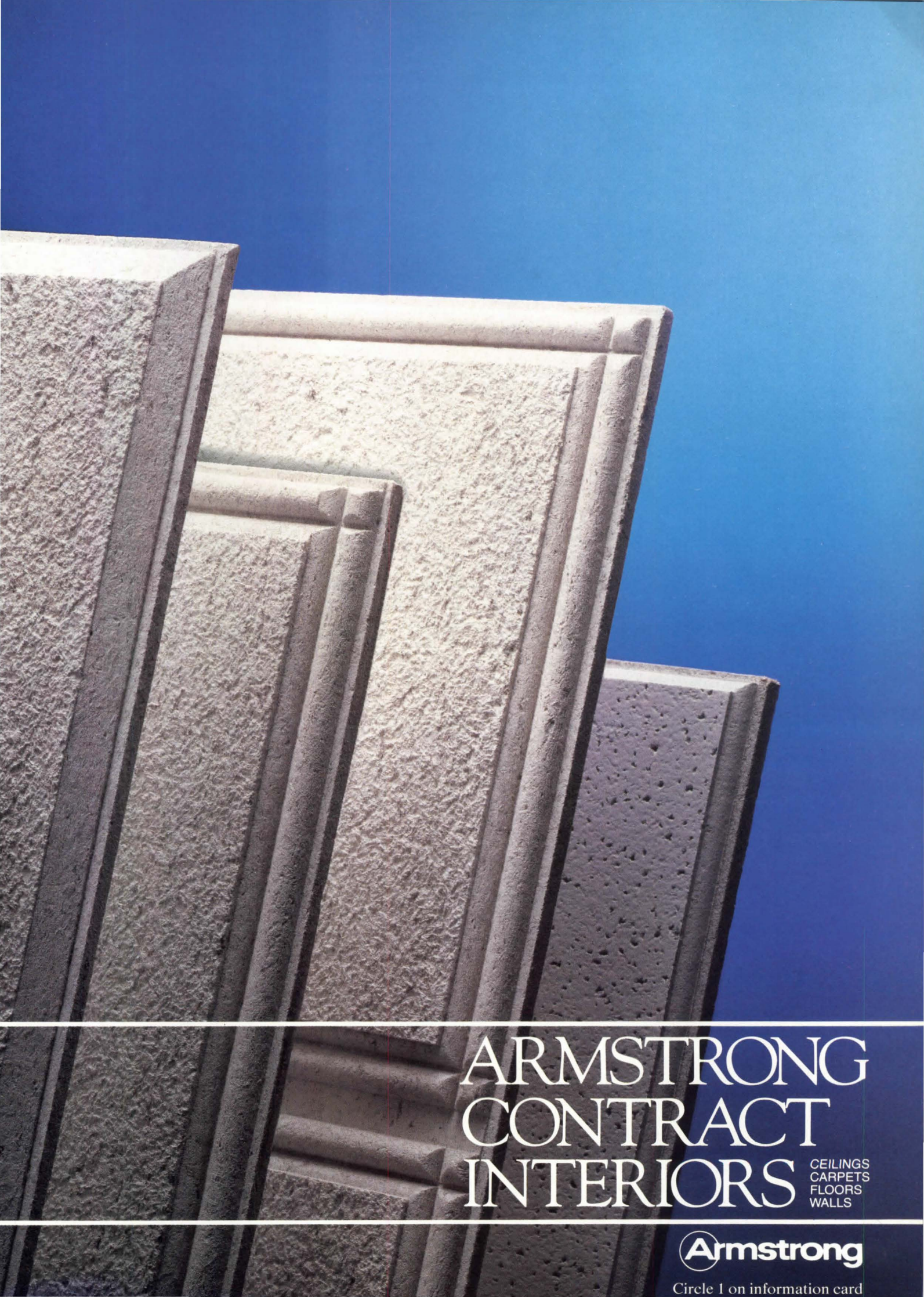


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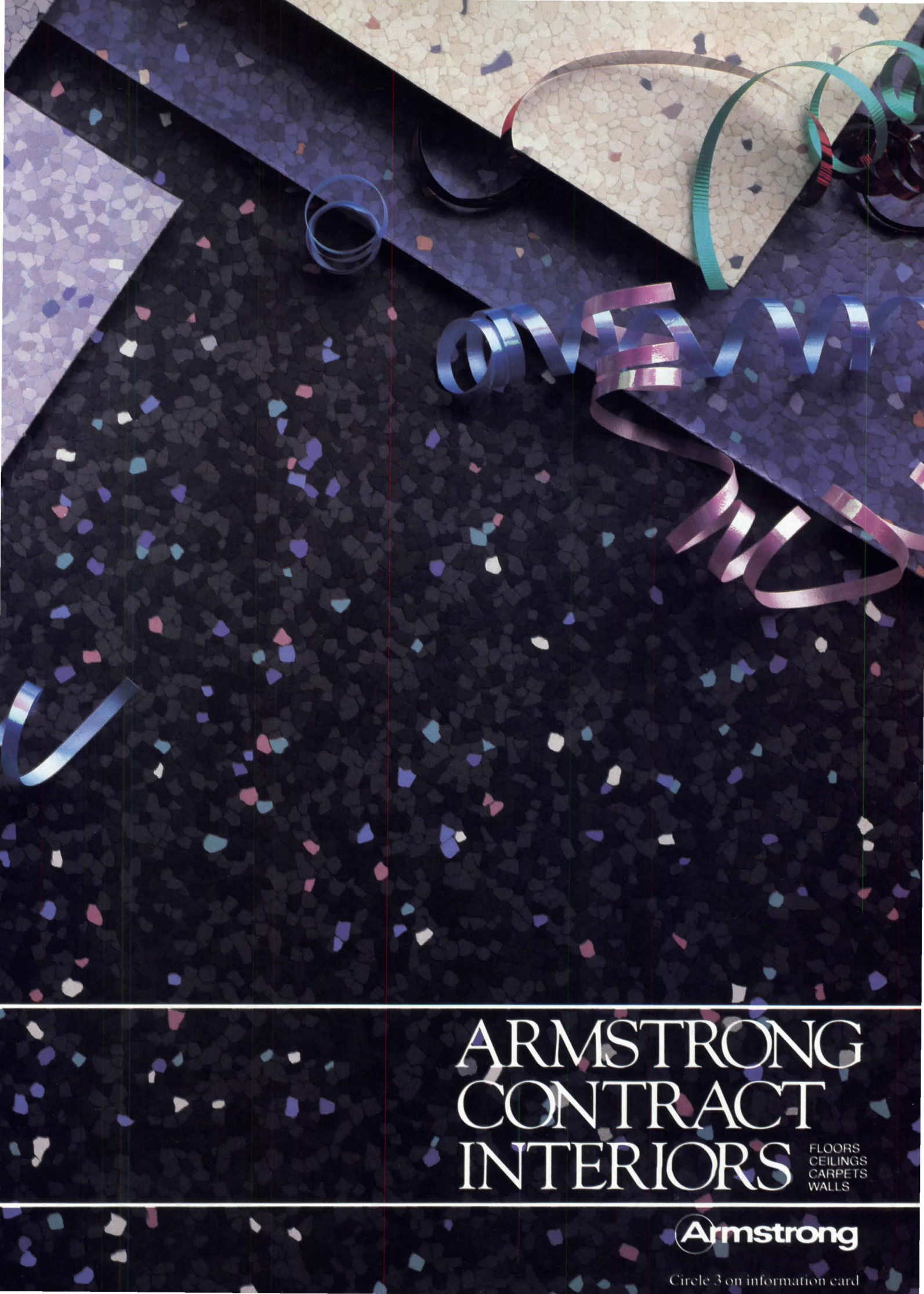

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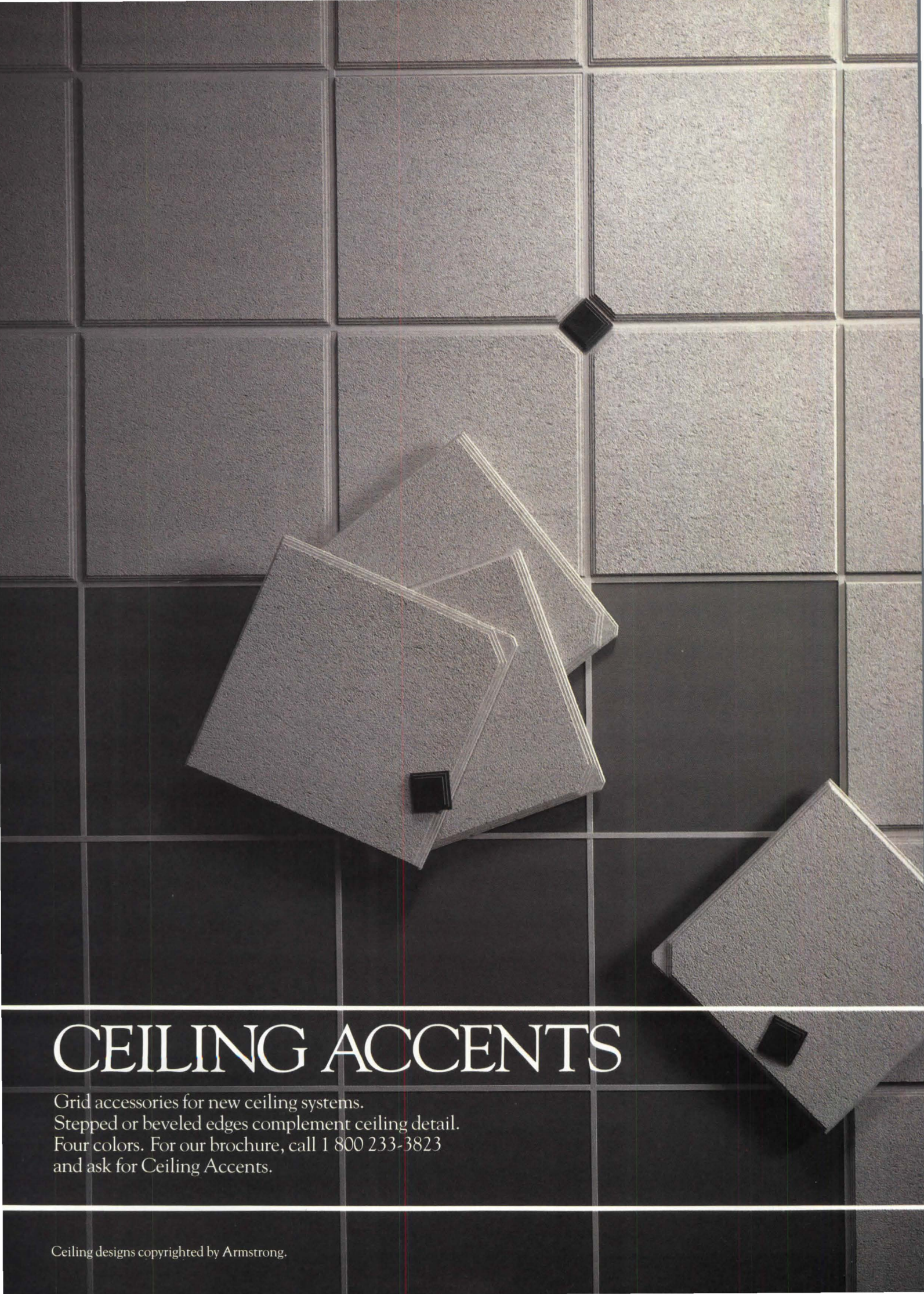
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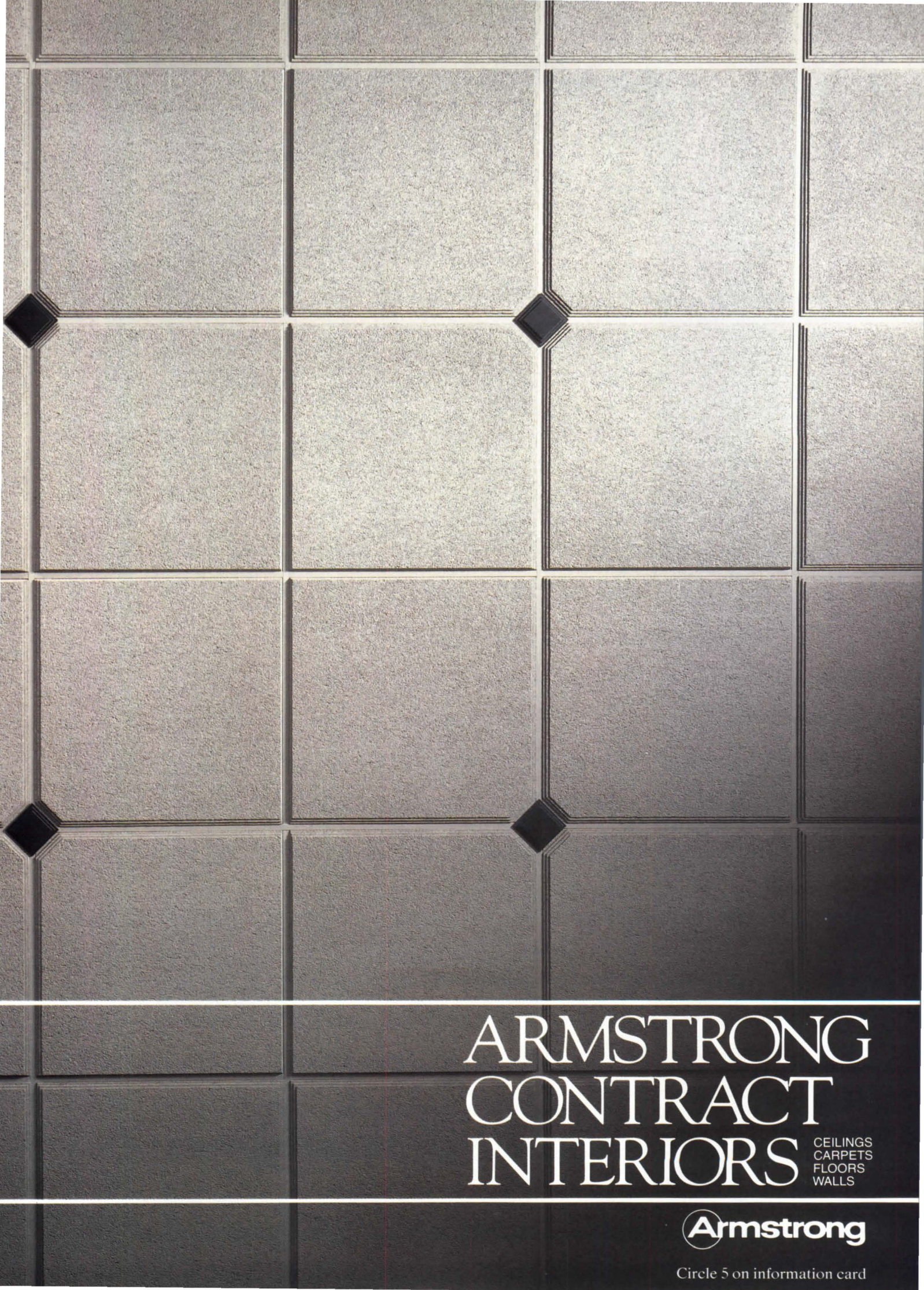

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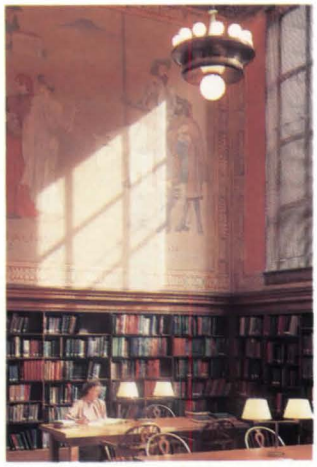

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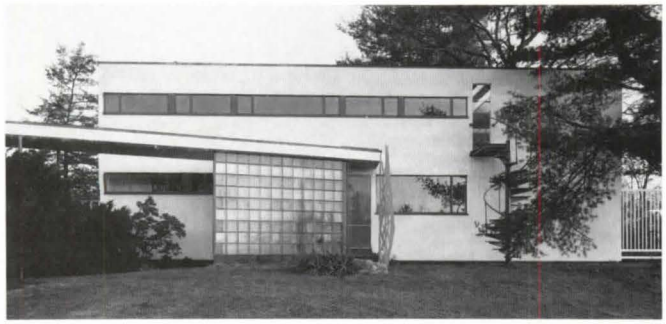

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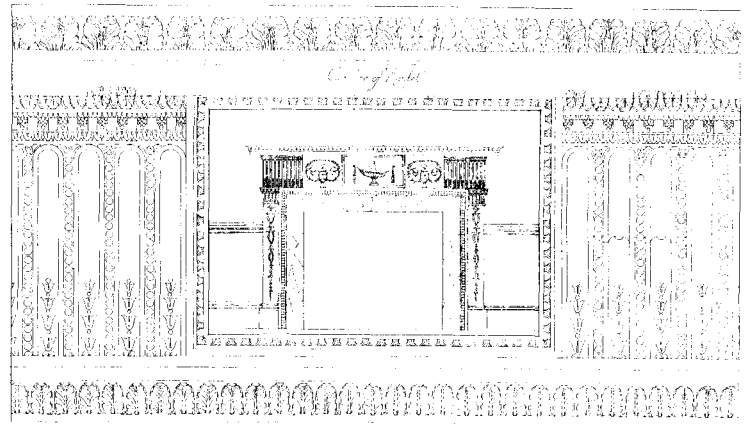
Cover
Daniel Burnham's Union Station, Washington, D.C. (see page 68). Photograph © Carol M. Highsmith.



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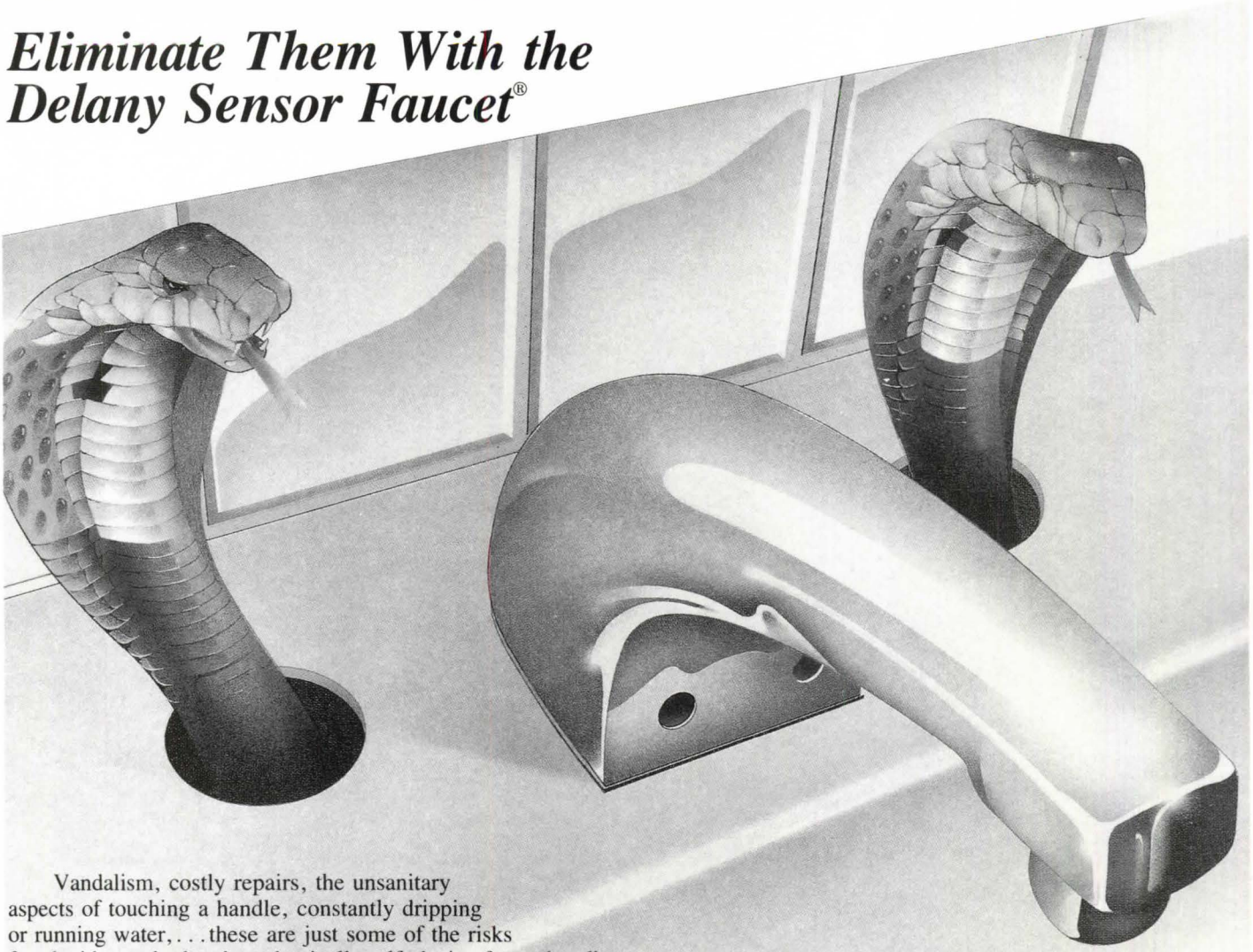

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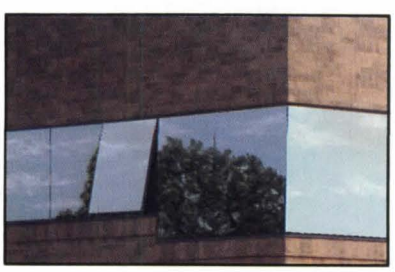

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EVENTS

Nov. 29-Dec. 1: Energy conference entitled "Affordable Comfort III," Pittsburgh. Contact: Affordable Comfort Conference, ACTION-Housing Inc., 2 Gateway Center, Pittsburgh, Pa. 15222.
Dec. 2-3: AIA Architects in Education Committee Open Meeting, Seattle. Contact: Karol Kaiser at Institute headquarters, (202) 626-7356.
Dec. 4-7: World Congress III and Exposition, Asbestos Abatement Council of the Association of the Wall and Ceiling Industries, Washington, D.C. Contact: Denise M. McGiffin, Asbestos Abatement Council of AWCI, 1600 Cameron St., Alexandria, Va. 22314.
Dec. 6: AIA Professional Development Workshop on Managing Others, San Francisco. Contact: Brenda J. Henderson at Institute headquarters, (202) 626-7353.
Dec. 6-8: AEC Expo Show and Conference, New York City. Contact: Susan Werlinich, Expoconsul International Inc., 3 Independence Way, Princeton, N.J. 08540.
Dec. 7: Seminar on Indoor Air Quality in Commercial Buildings, Providence, R.I. Contact: Jim Kirby, Energy Management Council, P.O. Box 541, Brattleboro, Vt. 05301.
Dec. 7-9: Interiors Conference and Exposition for Historic Buildings, Philadelphia. Contact: Charles Fisher, Interiors Conference, P.O. Box 27080, Washington, D.C. 20038.

LETTERS

Design Competition Jury Suggestions: I recently had the dubious pleasure of attending a design competition awards banquet during which the audience listened to three of the jurors crow and beat their drums for almost three hours. The comments and criticisms were nonsensical gibberish, having no founding in reasonable thought or good design practice. Meanwhile, the fourth (and the most qualified) juror had little opportunity to speak.

The sponsoring chapter also lost out on the perfect opportunity to involve the public and to elicit the public's opinions with a "people's choice award." That turned out to be an "architects' choice award."

In light of this, I offer the following suggestions for future design competitions.
- A jury should be balanced and large enough (at least eight to 10) to have a meaningful interchange and avoid stacking in a particular direction.
- Avoid selecting jurors with caustic personalities or lacking in maturity.
- Jurors selected must be from truly different points of view and design genre, but with the ability to recognize quality design and a successful problem solution *in any design genre.*
- Jurors should represent a wide variety of backgrounds beyond architecture, including: developers and other clients; public members with some design/artistic affinity (i.e., from arts and civic beautification committees); related professionals, such as interior designers, planners, artists.
- Allow a reasonable length of time for jury review, with a minimum of two days, and well in advance of the presentations.
- Give the jury specific guidelines and directions, with the committee there to support that direction and avoid conflicts.
- Structure the competition to allow like projects to compete against like projects.
- Structure the awards such that the best and next best in each category are selected and *recognized as such.* Only honorable mentions should be optional (except for the lack of entries).
- Above all, make the judging an enjoyable and professionally rewarding experience for the jurors—not a test of wills and a pulpit for vengeance.

With regard to "people's choice awards," I suggest the following:
- Arrange for a well-traveled public space for an extended exhibition of the entries, at least a week in advance of the awards presentations, with wide public notice of the display and voting.
- Organize a system for actual *public* voting for awards, under the same categories as named above.
- The staff and/or committee and/or an accounting firm (many CPAs will volunteer their time) should compile the results and display these awards *during* the banquet.
- Both awards should remain on display at the same public place for at least one week afterwards, with public notification of same. *Thomas J. Trischler, AIA*
Orange, Calif.

Congratulations on a superb September issue. On page 122, Stanley Hallet, former Fulbright lecturer at the University of Kabul, says, regarding the architecture of Afghanistan, "There appear to be no new building problems. . . . People need the same thing today they have always needed—privacy and community, rest and activity, shelter and a sense of place." Prof. Hallet should be congratulated for having expressed, in less than 25 words, what should be the basic purpose of architecture everywhere. *Kenneth C. Black, FAIA*
East Lansing, Mich.

Schools and the Profession: The August issue focusing on professional education at Yale, McGill, University of Houston, University of Wisconsin-Milwaukee, and Georgia Tech was another excellent response in reporting the diverse, dynamic, and exciting opportunities that are being taught in our schools of architecture.

We in active practice have long been critical of our colleagues in professional education who have assumed the mantle to commence the teaching and preparation for the future of architecture and our profession. We have taken too much for granted, and, while we have rushed forward with our duties to business, personnel, liabilities, contracts, management, marketing, etc., etc., it is the professional educator, faced with the immense challenges and barriers of administrative bureaucracy, who continues to keep alive the inspiration to create design, construct, draw, and communicate to propel the student into a commitment to produce better architecture.

Granted, with the variety of schools available, the student has a difficult choice to make; but from what I have read and explored in ARCHITECTURE and other articles, the schools are responding to the needs of the profession—not the present, but the future.

I believe it is time that we in practice should stop, look, and listen and become more aware of what is occurring in our schools of architecture. We should also accept our professional responsibility to encourage the continuation of learning and exploring the inner depths of architecture with the graduates who commence their practice in our offices. If we do not share this challenge with our colleagues in education, then who will? It is the vital link that will assure our profession a future.

Thank you for your sustained reporting on schools of architecture. Give us more.
John A. Busby, FAIA
Atlanta

University of Houston: We appreciate contributing editor David Dillon's in-depth look at the architecture program at the University of Houston and the critical view of its progress [Aug., page 62]. But I would like to clear up a couple of misconceptions.

The university does have a variety of dormitories available for our students, with approximately 10 percent of the students living on campus. Although there are no dorms set aside exclusively for architecture students, the students enrolled in both the undergraduate and graduate architecture programs can live in campus housing, if they wish.

The reference to a lack of National Merit scholars also requires some clarification. The University of Houston ranks among the top 25 schools in the nation for enrolling merit scholars. I understand that Mr. Dillon was referring to the number enrolled in architecture at the current time; however, the implication that the university does *not* attract this level of student is incorrect. We have brought in between 55 and 60 new merit scholars each year for the past three years. *Wendy Adair*
Office of University Relations
University of Houston

Clarification: Mimbres Inc. of Santa Fe, N.M., was architect of record for Riverside School in Sunland Park, N.M., featured on page 78 of the August issue. The sole general contractor for this school was Wooten Construction Co.

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Cities

Festival Marketplaces Facing Hard Times in Small Cities

As a gloriously renovated Union Station opened in late September as a festival marketplace in Washington, D.C. (see page 68), similar projects in some cities around the country were not living up to initial and often unrealistic retail expections. Although some of the developments are not the financial successes hoped for, city officials maintain that festival marketplaces played major roles in the revitalization of downtown areas.

Of downtown festival marketplaces, James Dausch, development director for the Rouse Co., said, "Five years ago they were considered pure gold; now they are fool's gold. Neither of those extreme assumptions is correct."

The phenomenon started 12 years ago when developer James Rouse and architect Benjamin Thompson & Associates transformed Boston's historic Faneuil Hall-Quincy Market to a bazaar of late-20th-century Americana. The combination of pushcarts, colorful kiosks, food stands, restaurants, and specialty retail shops drew hordes of people who spent millions of dollars infusing life into a long-neglected area adjacent to the city's waterfront. Within a few years this seemingly magical formula was being applied in cities from Baltimore to St. Louis to New Orleans.

Many of the later festival marketplaces in smaller cities around the country were developed by Enterprise Development Co., an affiliate of the charitable Enterprise Foundation established when Rouse left his development company in 1981 to work full-time to improve housing and living conditions for the urban poor.

The festival marketplaces developed by EDC in some of these "second-tier" cities now are having financial difficulties. Three projects—Sixth Street Market in Richmond, Portside in Toledo, Ohio, and Waterside Pavilion in Flint, Mich.—recently have severed ties with EDC and have brought in new management companies.

Richmond's Sixth Street Market was still operating at a loss three years after it opened in 1985. Robert E. Olson, executive director of Richmond Renaissance, the quasi-public group that helped launch the development, said that, although the market did not generate the traffic and sales volume that EDC had predicted, it was a tremendous boost for downtown development.

Unlike the successful projects in the larger cities of Boston and Baltimore, Richmond's marketplace is not located near a body of water. Market research had looked at all the demographics, but, Olson observed, "It's hard to objectively measure the 'magic' of the water." Olson likened the construction of the marketplace in Richmond to a heart transplant still in the early stages. "There had to be experimentation to see how the concept could be stretched and compressed," he said.

The new management company, Virginia-based Goodman Segar Hogan, plans to change the approach to Richmond's 65,000-square-foot marketplace to a more traditional retail center that will cater to downtown workers and suburban shoppers. Kim Hamel, the new director of mall management, said, "Leasing in any environment is market driven—dictating the type of retail it needs and the type of retail it wants."

Another festival marketplace that ran into financial problems was Flint's Waterside Pavilion, which last July was taken over by the city's Downtown Development Authority. According to Gary Bates of the development authority, Waterside opened in July 1984 to about 90 percent occupancy and by July 1987 had fallen to approximately 60 percent, where it has remained.

A variety of factors played a role in the high failure rate of many of the early stores in all of the festival markets, including the largely successful projects in Boston and Baltimore. According to Hamel, the original idea was to encourage small entrepreneurial retail outlets rather than established and traditional shops. "Many of the original shops were undercapitalized, and the owners were inexperienced," he said. "High risks often result in high failure."

Bates, like officials in every city that hosts a marketplace, emphasizes the catalytic role the Flint facility has played in the revitalization of the downtown area. Yet Bates said that the direction and approach of the market is changing. "When Waterside opened we had marketing researchers from the East Coast, Dallas, Colorado, and California. Maybe a local person could have done a better job. In retrospect, I think that is symbolic of the problem," said Bates.

Cities that have invested in festival marketplaces believe that they cannot allow

continued on page 23

Right, Portside marketplace in Toledo, by The Collaborative Inc., during one of its many city-sponsored special events.

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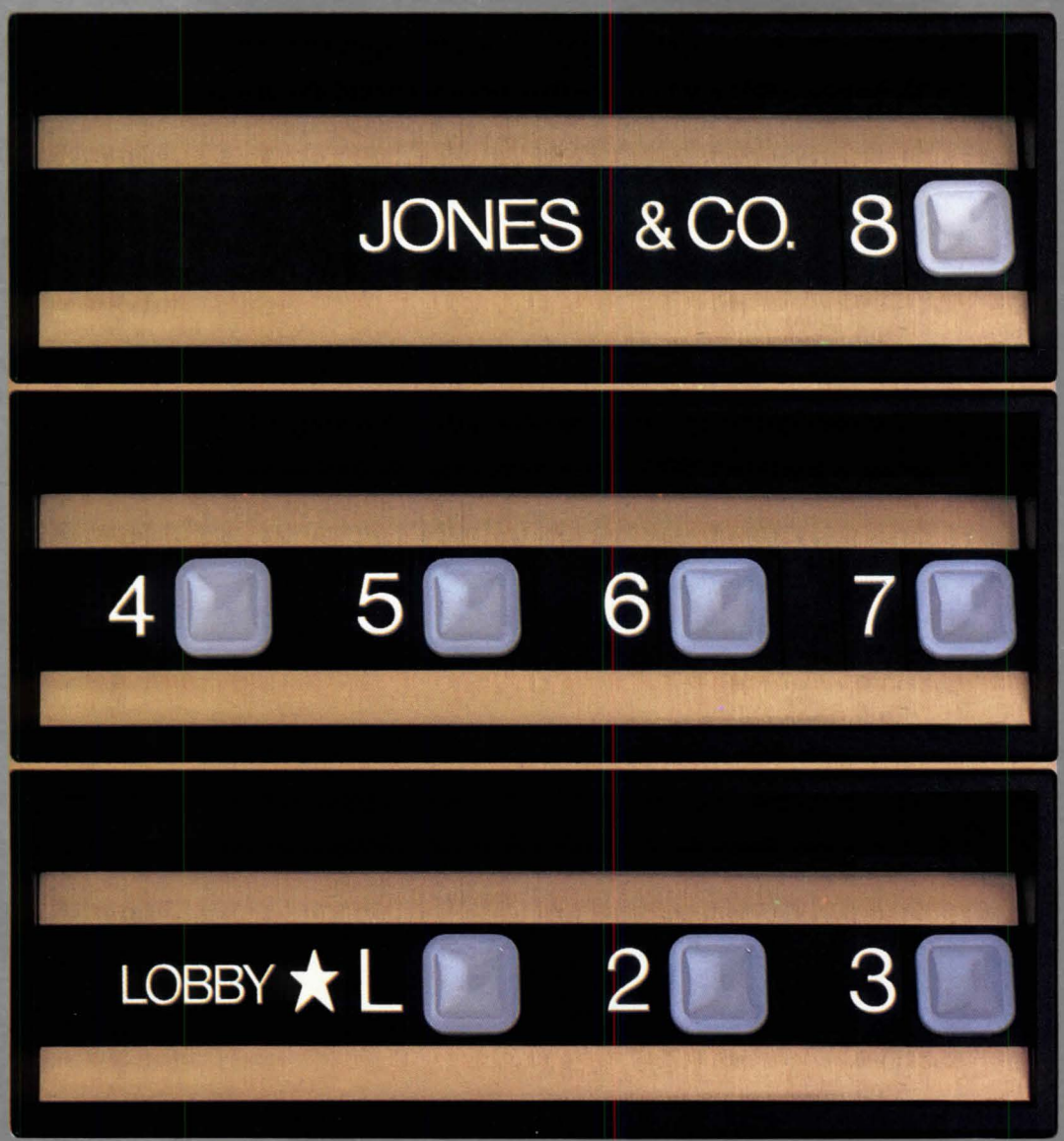

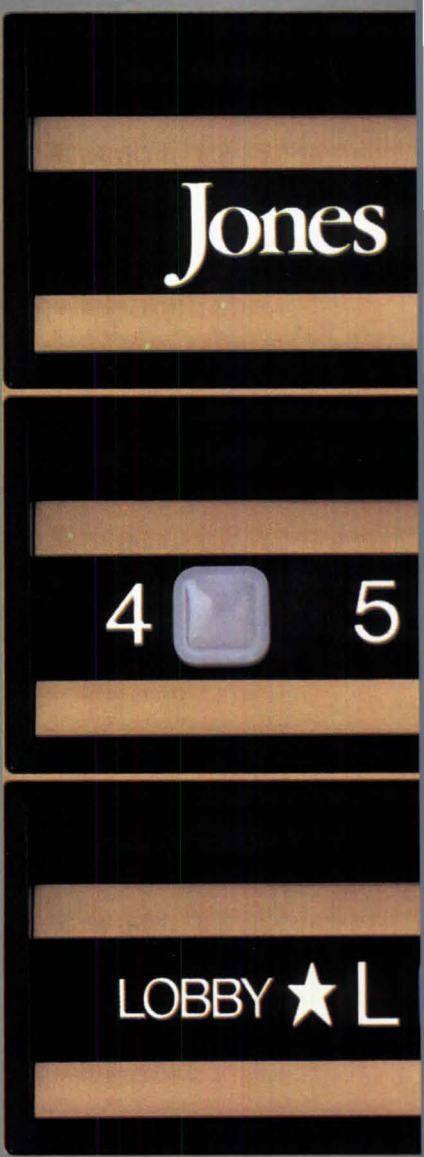

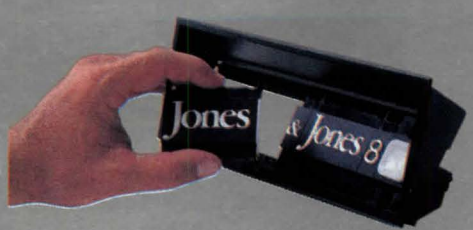

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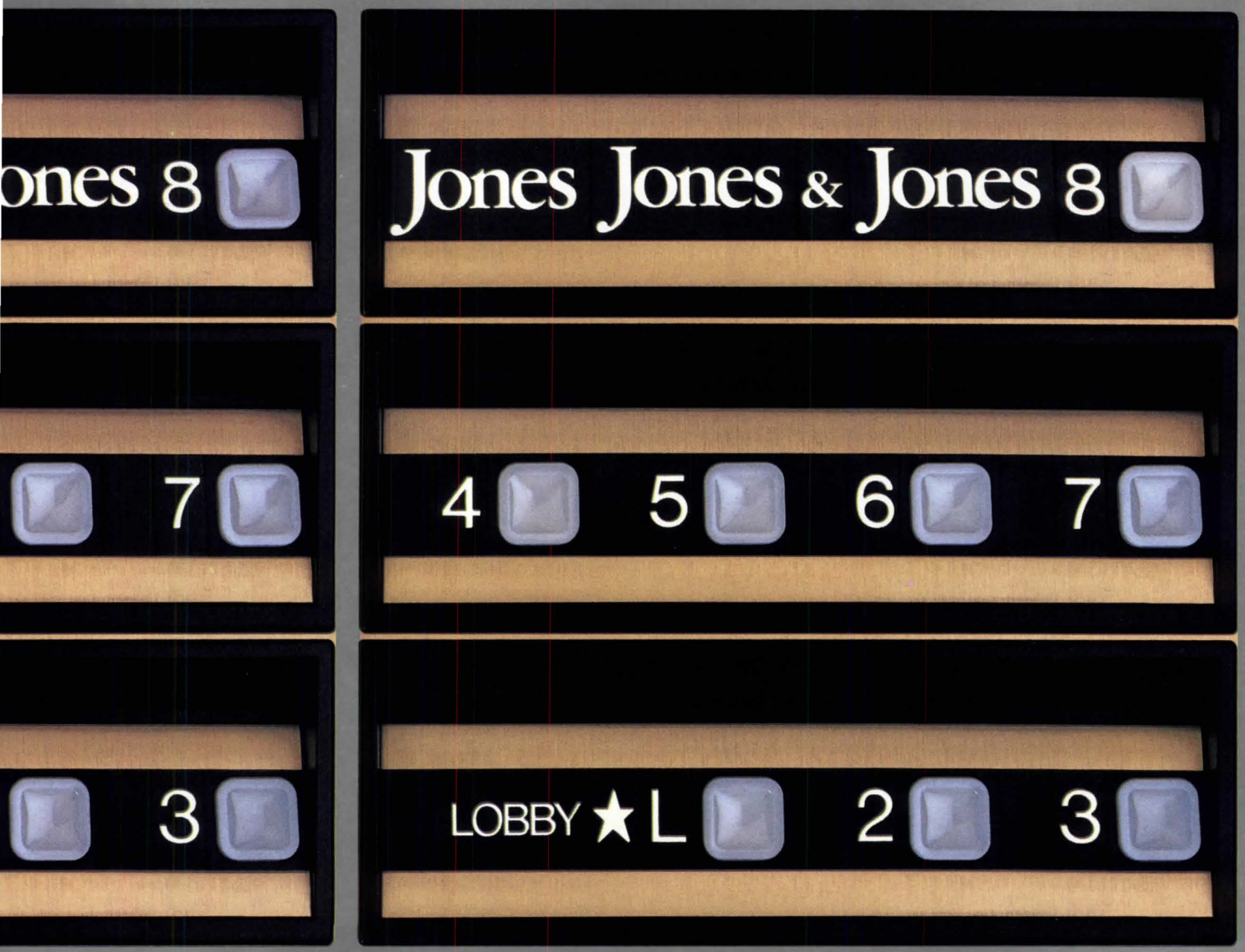

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Cities *from page 19*
the projects to go under. Portside in Toledo recently has instigated an aggressive marketing campaign by its new private property management company. The city also sponsors festivals and special events in the waterfront park adjacent the project.

Richard Nachazel, executive director of the city's tourist and travel department, said, "Portside is now an integral part of Toledo, and we will do whatever we have to to keep it."

EDC currently manages five festival marketplaces. Jacque Carter, general manager of McCamly Place, praised EDC and the marketplace for helping revitalize downtown Battle Creek, Mich., a city of 56,000. Carter also cited an average occupancy rate of close to 90 percent since the development opened in April 1985. Waterside Market in Norfolk, Va., is another EDC development that is becoming more financially successful.

In most cities, the festival markets have been subsidized by public funds. In the *Nation's Cities Weekly,* Neal R. Peirce reported that HUD records show that 12 festival marketplace projects have received more than $110 million in UDAG money, including $20.4 million for South Street Seaport in New York City and $10 million each for St. Louis's Union Station and Atlanta's new Underground, which is now under construction. These 12 projects also received $168 million in local funds.

Riverwalk in New Orleans is a festival marketplace that also has experienced financial difficulties. Although New Orleans has all the necessary ingredients—history, water, a sense of place—the development opened in 1986 when the city was rebounding from the financially disasterous World's Fair and the near-collapse of its oil and gas industries.

The inherent problems of the festival marketplace were recognized years ago. Writing in this magazine in 1981, Robert Campbell, AIA, called Faneuil Hall "a quick fix, an upper of urbanity that lifts your blood sugar and then lets you down, leaving you thirsting for more. Of course it isn't a real city. We have to make that for ourselves."—Lynn Nesmith

Studies Say Subsidized Housing Doesn't Lower Property Values

Does subsidized housing lower adjacent property values? The common wisdom that it does—and the ostensible basis last summer for resistance to court-ordered subsidized housing in Yonkers, N.Y.—is refuted in a new compendium of 15 local research reports from around the country. The research encompasses five decades beginning in 1938 and includes "all known and readily available material on this subject," says the sponsor, the California Department of Housing and Community Development.

The state sponsored the investigation, says the report, because "many California cities find it difficult to promote and encourage low- and moderate-income housing opportunities for their citizens. Resistance often comes from local citizens themselves, who fear that the development of low- and moderate-income housing or the inclusion of affordable units in market-rate developments will in some way lower the esthetic and, more importantly, the economic value of their properties." Of the 15 published papers, 11 dealt with the property value effects of subsidized housing, one weighed similar effects of group homes for people with mental or emotional disabilities, and three considered the effects of manufactured housing.

Fourteen of the papers concluded that there were no significant negative property value effects. Some, in fact, reported positive effects after locating subsidized units in a neighborhood.

The sole exception described a situation in suburban Washington, D.C., in which selling prices were compared in four town house clusters at varying distances from below-market-interest-rate housing complexes. This study in Fairfax County, Va., published in the *Journal of the Amer-*

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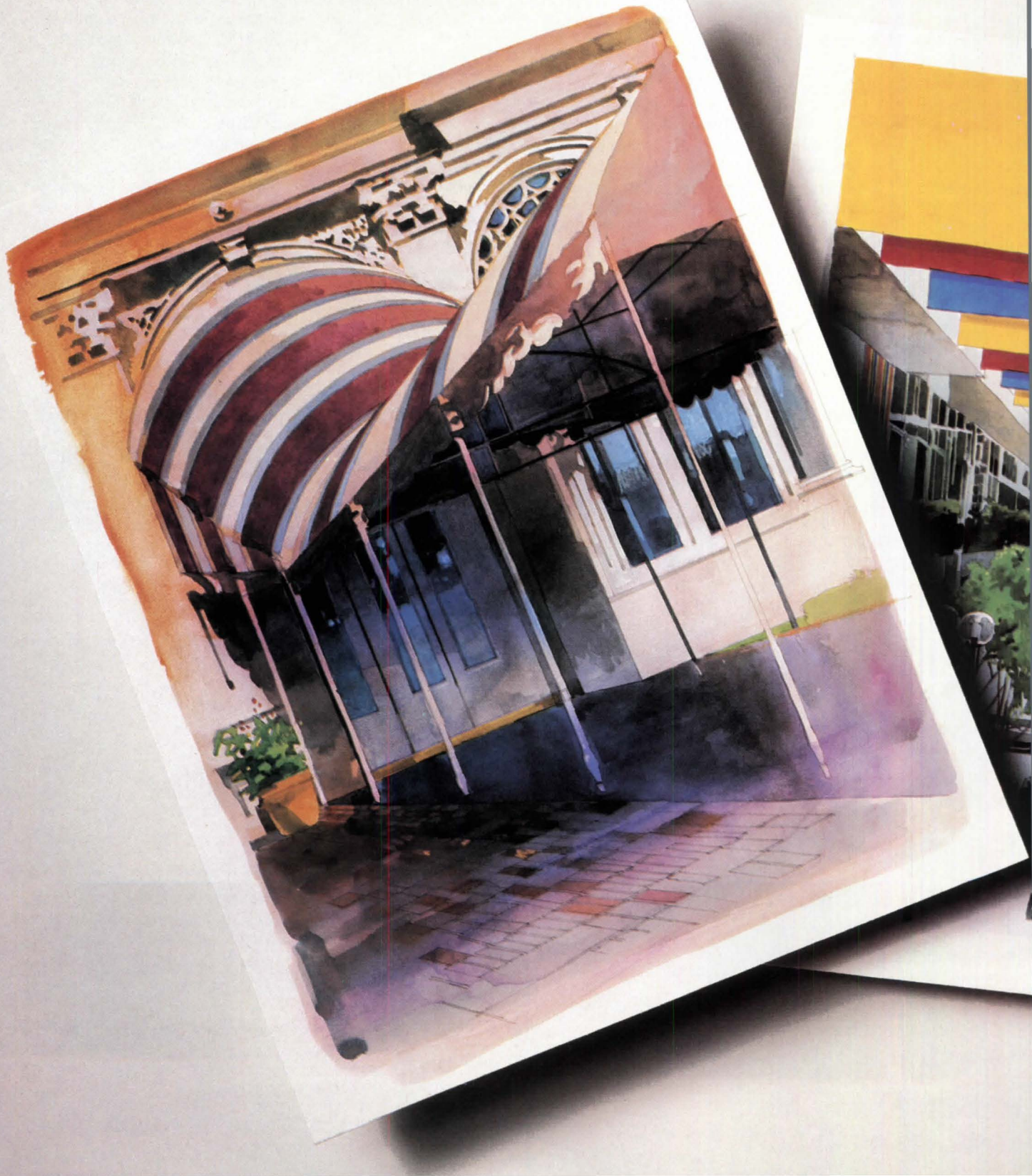

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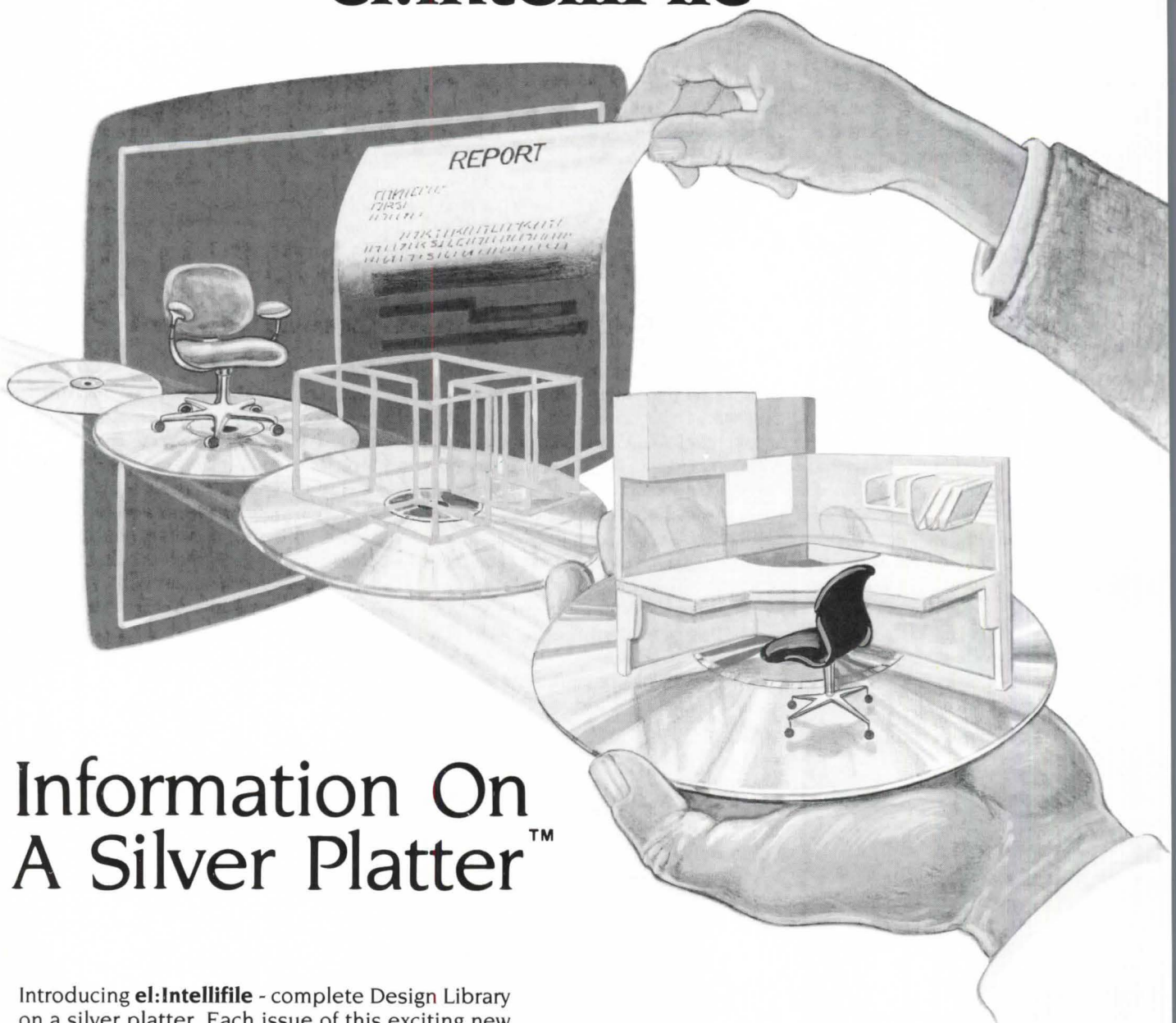

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Cities *from page 23*
ican Real Estate and Urban Economics Association, found that the average value of all units increased over time (the study period was 1972-1980) but that prices rose higher for units farther from the subsidized housing.

However, a similar study in the same county obtained different results. This study, supported by a grant from the Northern Virginia Board of Realtors, compared property value movement during 1975-1979 around four complexes with subsidized units and found that houses near three of the four projects actually gained in value on a yearly basis relative to control houses farther away from each of the projects. The presence of the fourth subsidized project did not decrease proximate property values but apparently slowed value increases.

The earliest analysis in the California compendium covers the period 1938-1960 in St. Louis. Eight public housing sites were arranged into three neighborhoods that were compared with three control neighborhoods as similar as possible but without public housing. No difference in property value increases was found in two of the three test neighborhoods, while the third test neighborhood exhibited a slight increase in property value appreciation.

The most comprehensive study, conducted by the Center for Urban Policy at Loyola University in Chicago, analyzed impacts of four types of public subsidy and four specific subsidized housing sites in Chicago and surrounding Cook County. A statistical analysis of all census tracts in the city and county led to the conclusion that other factors, particularly median family income, are much more important in explaining the level of property values than is subsidized housing. The study concluded further that the overall impacts are neither positive nor negative, and when public or subsidized housing did show up as a predictor of property values the impacts were negligible. A site analysis of three suburban projects found no significant impacts on property values, and a similar analysis in Chicago found that rehabilitation of a project under the federal Section 8 program had a positive effect on property values.

The study involving housing for people with mental and emotional disabilities tracked placement of nine group homes in single-family neighborhoods in and around Shreveport and Bossier City, La. Using price levels, price increases, and length of time on the market as measures, the investigation, published in *Urban Studies,* found no significant price effects in high socioeconomic markets (except for possibly some lengthening of time houses stayed on the market) and some evidence of positive effects on property values in below-average socioeconomic areas where housing markets are weak.

Other studies synopsized in California's compendium were in Belmont, N.H.; Guilford County, N.C.; Marin County, San Jose, and San Fernando Valley, Calif.; Jefferson County, Colo.; Portland, Ore.; New York City; and Memphis, Tenn. Entitled "The Effects of Subsidized and Affordable Housing on Property Values: A Survey of Research" (Publication #105), the 46-page paper is available free of charge from the Department of Housing and Community Development, Publication Office, 921 10th St., Room 102, Sacramento, Calif. 95814-2774.—Allen Freeman

The Institute

Vision 2000 Conference Focuses On Architects' Community Roles

"It's not too late to deal with the future," said David Pearce Synder, "but if one waits without action, one is waiting for catastrophe to effect change." Snyder's admonition came at the conclusion of a two-day conference sponsored by AIA to try to avoid just such a scenario—at least in architecture. And the single most important message that came out of the conference was that architects must become more involved in community action.

More than 300 architects, educators, social scientists, journalists, and other professionals gathered in suburban Washington, D.C., charged with the ambitious goal of "assessing and ultimately shaping" architecture and architectural practice in the next century, as part of AIA's multiyear Vision 2000 program (see Sept., page 27).

Speakers addressed the general assembly on such topics as technological innovation, creating livable cities, changing human values, and global economic realities; but most of the program was devoted to small workshop discussions. The participants listed 14 national issues they considered most important for architecture:

- computer-aided design and engineering, which are becoming common to all industries;
- rising public support for preserving America's architectural heritage;
- rising public standards of professional responsibility—and liability;
- growing use of sophisticated computer systems and models, promoting greater client sophistication;
- public support for stronger environmental protection measures;

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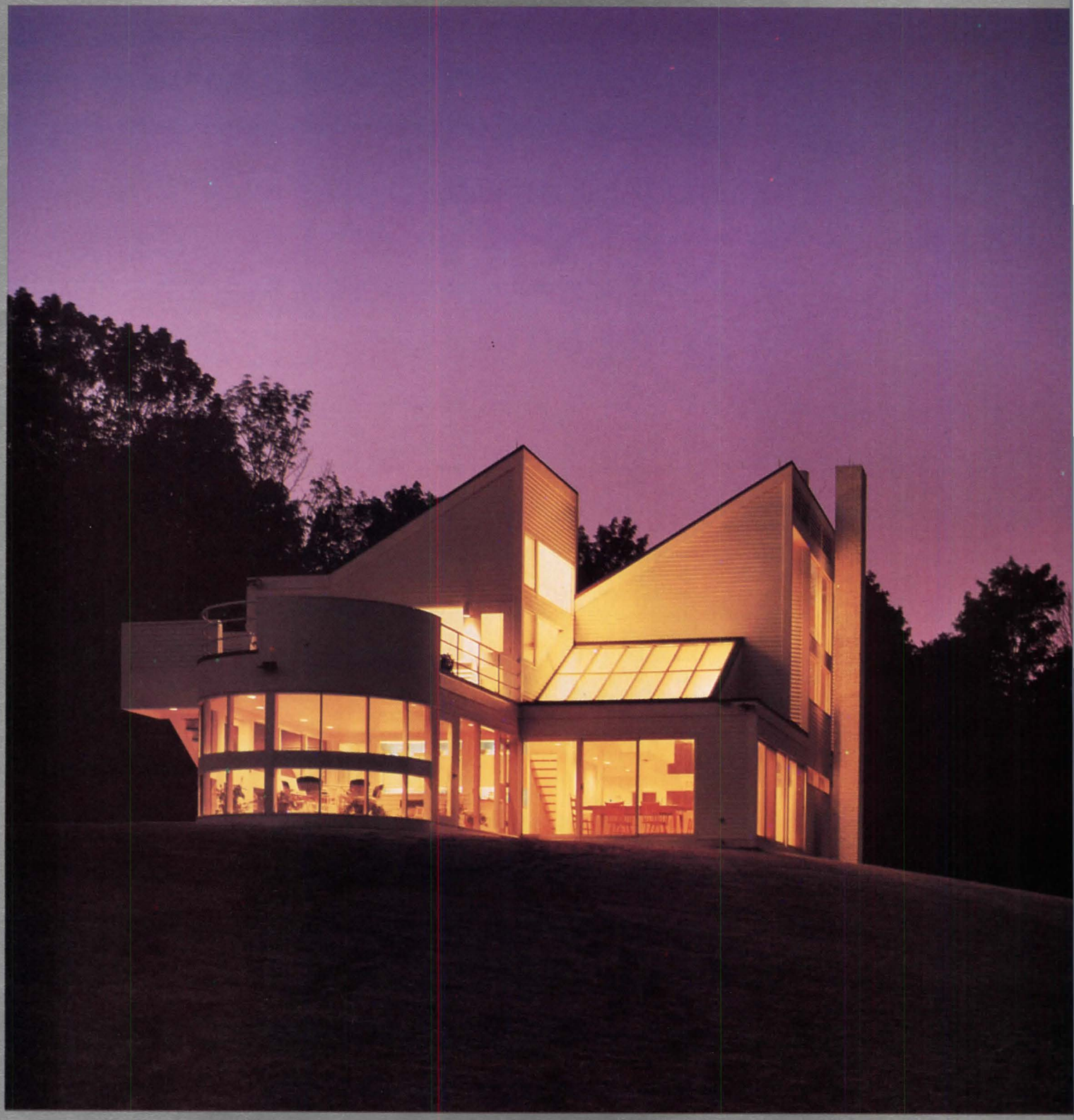

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The Institute *from page 27*

- public support for more worker and consumer protection, including quality of the indoor environment;
- a growing U.S. underclass, with more than 10 percent of Americans unable to afford adequate housing or health care;
- adoption of improved energy efficiency as a long-term national priority;
- the urbanization of U.S. suburbs;
- more than three-quarters of married couples with both partners working full-time;
- growing metropolitan traffic congestion, which is expected to cause a national transportation crisis;
- worker retraining and new workplace technologies fostering a boom in adult education;
- voter approval of new government programs for low-cost housing, urban renewal, and infrastructure replacement;
- U.S. population and commercial production continuing to migrate from high-cost center cities to lower-cost exurban and rural areas;

The conference participants also made lists of 10 essential "conventional" and "innovative" roles, functions, and services architects should consider for the future. The two lists were similar in their emphasis on community service through involvement in such activities as public design review and pro bono service; research and development relating to architectural design; and a stronger partnership between education and practice.

Speaking on the changing roles and responsibilities of the profession, author and educator Daniel Boorstin said that architects have a special obligation to society and to the future because their "prophecies are embodied in stone." Boorstin also said that a society that will benefit in the future must be "receptive and hospitable to the unexpected."

Social scientist and Harvard professor Daniel Bell explored the effects of transportation, energy, and communication on America's "social geography." According to Bell, markets are no longer places; now they are "amorphous entities." Citing an example, Bell said, "The Rotterdam spot oil market was situated where it was because Rotterdam was a major seaport for oil tankers. Now, markets are networks, and the Rotterdam spot oil market is nowhere and everywhere at once."

On the challenge of creating livable cities, Anthony Downs of the Brookings Institution in Washington, D.C., warned that the "greatest drawback of democracies is their difficulty bearing short-run costs to attain long-run benefits." He also called this country's traffic congestion "an inescapable result of the population's pursuit of three cherished goals: low-density housing, a wide choice of where to live and work, and driving private cars for all trips."

Amitai Etzioni, author of *The Moral Dimension,* called for a "social movement to re-energize values" and reform the economic system, reduce corruption, and restore social commitment. For an America that is no longer competitive, Etzioni proposed two options: return to the 19th-century priority of production over consumption or learn to live with our economic misery.

America's diminishing economic power was also the topic for Pat Choate, policy analyst at TRW Inc., who warned that, "if we're rigid and unwilling to give up our moral arrogance, we are guaranteed to be dominated by foreign firms." According to Choate, in 1982 the United States was the world's largest creditor nation; now it is the world's largest debtor nation. He also observed three dangerous national trends: "economic tunnel vision, political gridlock, and a low sense of ethics."

Technology

New Sets of Guidelines Issued on Seismic Design Considerations

The Building Seismic Safety Council (BSSC) recently made available three new sets of design guidelines entitled *Seismic Considerations for Elementary and Secondary Schools, Seismic Considerations for Health Care Facilities,* and *Seismic Considerations for Hotels and Motels.* The books, prepared by BSSC under contract to the Federal Emergency Management Agency, are the first of a set of five building-type-specific guidelines that also will include office buildings and apartment buildings.

The books emphasize the importance of lessons learned in recent earthquakes. For instance, the 1985 earthquake in Mexico City gave evidence that there are four typical problems in the building configuration of many motels that contribute to seismic damage: juxtaposition of solid and glazed walls; location and materials used for atria, interior courtyards, and lobbies; the placement of off-center circulation cores for more efficient guest traffic; and the size and shape of wings used to house and distribute guest rooms. The authors also report that nonredundancy of structural systems has been found to be a contributor to seismic damage in hotels and motels: particularly, failure to use a large amount of the interior wall as part of a redundant system; use of a limited number of columns (with too great a span) in

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QUALITY ROOFS BY DESIGN

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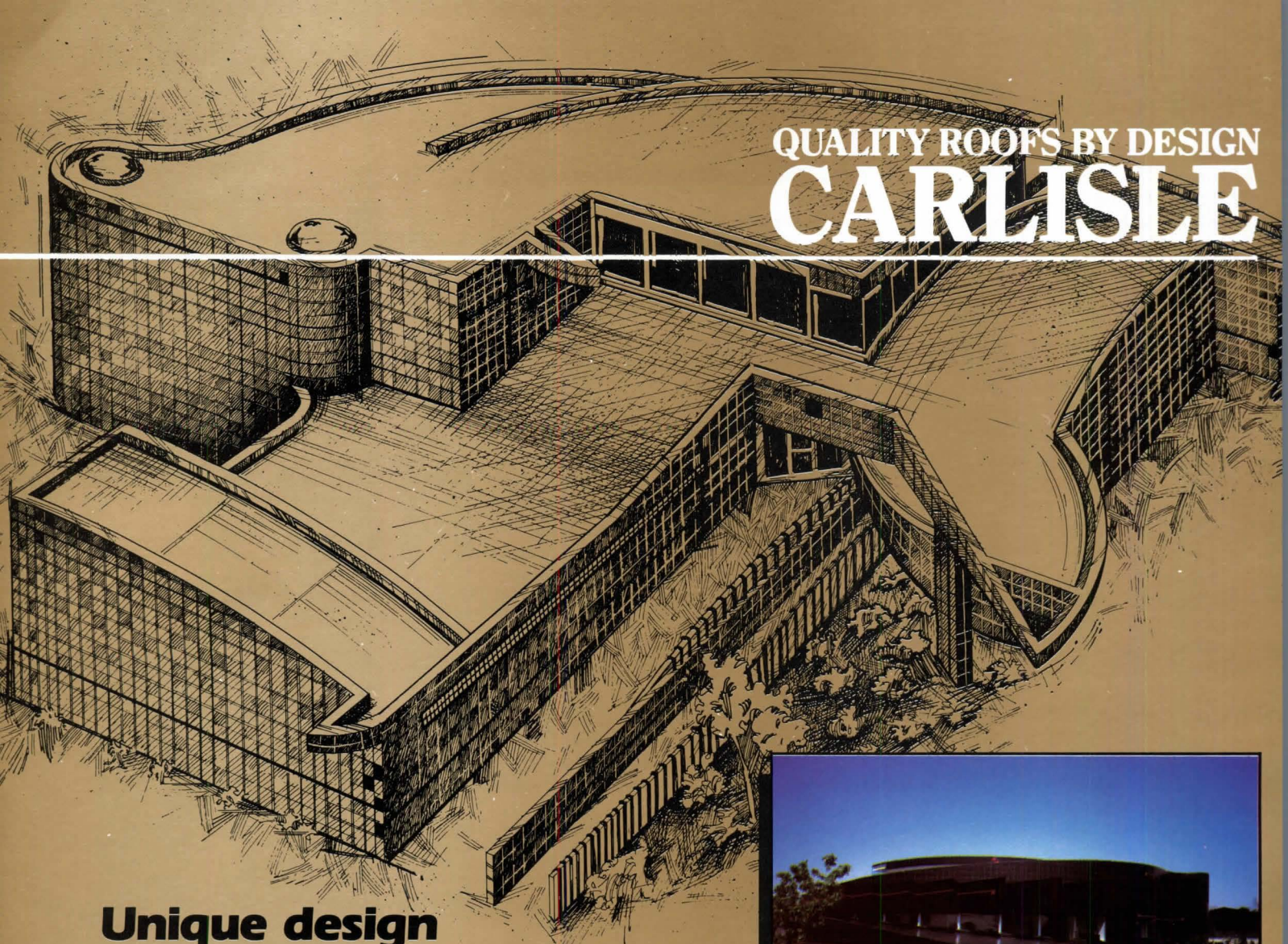

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Concluded Brodak, "The Carlisle 'Design A' system is the only roof I know that could perform well under such design considerations. It was the perfect solution. Its fully-adhered roofing system allowed us to go wherever the roof went." Carlisle's roofing membranes include the standard EPDM and a new polyester reinforced EPDM. Both are available in designer colors–basic black Sure-Seal® or the innovative white-on-black Brite-Ply™.

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Technology *from page 29*
large open areas; discontinuity of framing system uniformity because of the location of large spans; and placement of openings uniformly in interior and exterior shear walls, causing large forces to be concentrated in weak elements.

In *Health Care Facilities,* the authors state that analysis of hospitals suffering varied amounts of damage in the 1971 earthquake in San Fernando, Calif., provides a wealth of information for seismic mitigation in hospitals. For instance, a common design element of health care facilities is some form of re-entrant corner, popular to maximize the number of windowed rooms for patients. Re-entrant corners appear in plans of L, T, U, H, and cruciform shapes. Typical problems of these plans are internal courtyards that can cause torsional effects at their interior corners, narrow wings that also cause torsional effects and stress concentrations at the corners, and the placement of a tall nursing-floor structure above a broad-base building.

An additional cause of seismic damage in many health care facilities is use of a "soft," or open, ground-floor level, which results in a great stress concentration at the second floor connections.

Health Care Facilities also emphasizes the importance of protecting key functional areas in addition to the patient spaces within a hospital. Hallways and corridors that are primary means of egress need to be designed to be safe from falling ceilings and light fixtures and from broken glass, and free of obstructions, including stored items. Diagnostic, treatment, and laboratory areas should protect heavy equipment, and hazardous chemicals should be stored to prevent containers from falling off shelves. Medications in pharmacies need to be protected from breakage or upset.

School buildings may carry the added responsibility of functioning as a community shelter in the event of an earthquake, and, as the authors state: ". . . if the school building is not functional, it becomes another disaster-related liability rather than an asset."

Elementary and Secondary Schools points out that many of the form and configuration problems common in hospital designs are the same ones found in school designs. Many of these problems arise from re-entrant corners and unbalanced, asymmetrical massing. However, of particular concern in school design is the importance of stairwells as the major means of egress. Even stair designs that have carefully addressed fire egress may act as diagonal bracing between floors and can suffer racking induced by interstory drift, causing collapse. Furthermore, because stairs normally are anchored to floors, their unyielding stiffness can take the brunt of the building force.

Nonstructural hazards also are of particular concern in school design. For instance, libraries and information resource centers have the potential hazard of flying books during an earthquake. This, coupled with the normally controlled exit requirements of libraries, demands a clear, unblockable means of egress to allow users to escape. Damage and injuries in libraries can be lessened if the stacks are adequately anchored to prevent overturning.

Each of the three volumes contains a chapter on seismic considerations (specific to the occupancy type) to be used by the building's decision makers, including owners, developers, and regulatory officials. In addition to discussing the economics of seismic design, it specifies life safety, property damage, and performance requirements in nontechnical terms and provides a checklist of possible seismic hazards to look for in existing buildings.

The BSSC is an independent agency established in 1979 under the auspices of the National Institute of Building Sciences. Its purpose is to promote public safety by providing a national forum to foster improved seismic safety provisions for use by the building community in the planning, design, construction, regulation, and utilization of buildings. BSSC is not empowered to set or promulgate standards concerning seismic safety, but rather advocates the use of its guidelines by standards-making bodies.

The three new books are part of a series (called "the yellow books") that includes design guidelines, code and standards information, technical reports, and conference proceedings, designed for a variety of audiences. Two of particular interest to architects are the *National Earthquakes Hazards Reduction Program (NEHRP) Recommended Provisions for the Development of Seismic Regulations for New Buildings* (1985) and the *Action Plan for the Abatement of Seismic Hazards to New and Existing Lifelines* (1987). For information on ordering any of the books in the series, contact the Building Seismic Safety Council, 1015 15th St. N.W., Washington, D.C. 20005, (202) 347-5710.

—M. Stephanie Stubbs

EPA Recommends Strict Radon Testing Policies

Based on new data collected by the Environmental Protection Agency, the federal government has recommended that all detached houses, row houses, and apartments on a second floor or lower be inspected for radon, a naturally occurring, colorless, odorless gas that some experts now suspect causes as many as 20,000 deaths from lung cancer each year.

According to a New York *Times* report, at a Sept. 12 news conference Dr. Vernon J. Houk, an assistant surgeon general with the Public Health Service, and EPA administrator Lee M. Thomas stated that, if radon levels exceed recommended EPA

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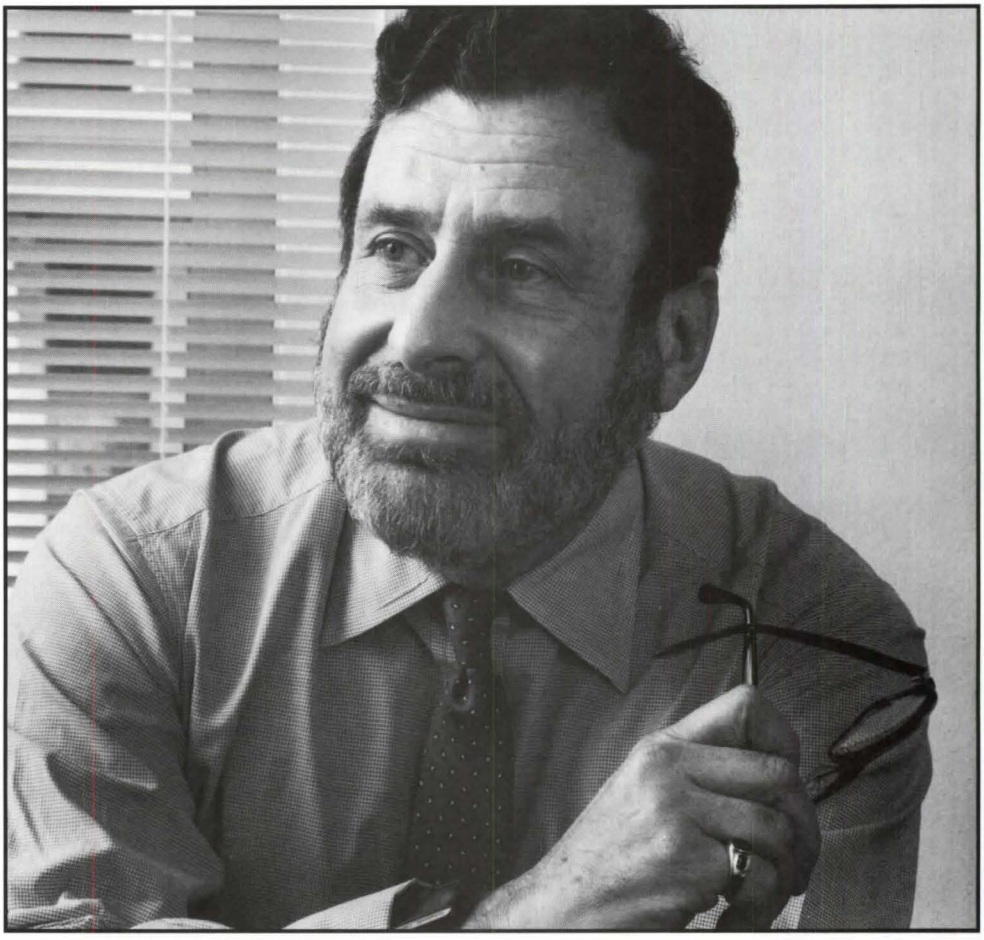
"None of us studied architecture expecting to be defendants in a lawsuit. Most architects are creative people—they may or may not be businessmen, although the better they are in business the better it is—but few expected to be defendants in this changing profession. It's something that has affected me personally, and, I expect, the growth of many architectural firms. It's caused me concerns, maybe burned me out, in spite of the fact that we've won every one of our suits.

In the middle '70s to the early '80s, I felt insurance was the biggest problem architects faced—that and litigation. And it's a continuing problem, no question about it. But I think that today DPIC Companies is with us for our entire future. Although we had only had two other insurers in 69 years, we really moved away from our previous insurer without any hesitation. DPIC was the first insurer that ever discussed loss prevention. And they were the first insurer that ever gave a damn about how we practiced architecture. That makes us very comfortable. Because, really, they are the most important partner in this firm. They provide us with the assurance we need to know they are going to be there. They assist us in undertaking contracts and procedures necessary to try to keep out of trouble in this litigious world. They provide us with legal counsel when there's a problem brewing. In fact, we took advantage of their Early Warning program just this week.

I feel very good about them."



Martin David Dubin

Dave Dubin is a principal in Dubin, Dubin and Moutoussamy, a 75-year-old architectural firm based in Chicago. He is past president of both the Chicago and Illinois AIA. We value our relationship with his firm and thank him for his willingness to talk to you about us.

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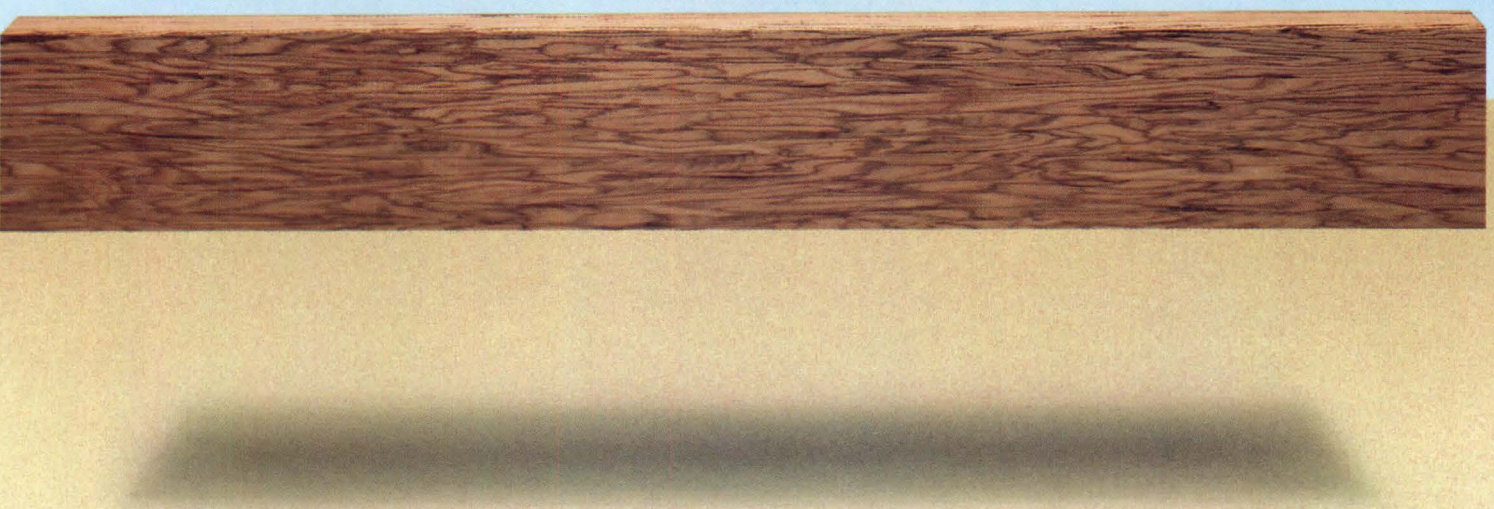

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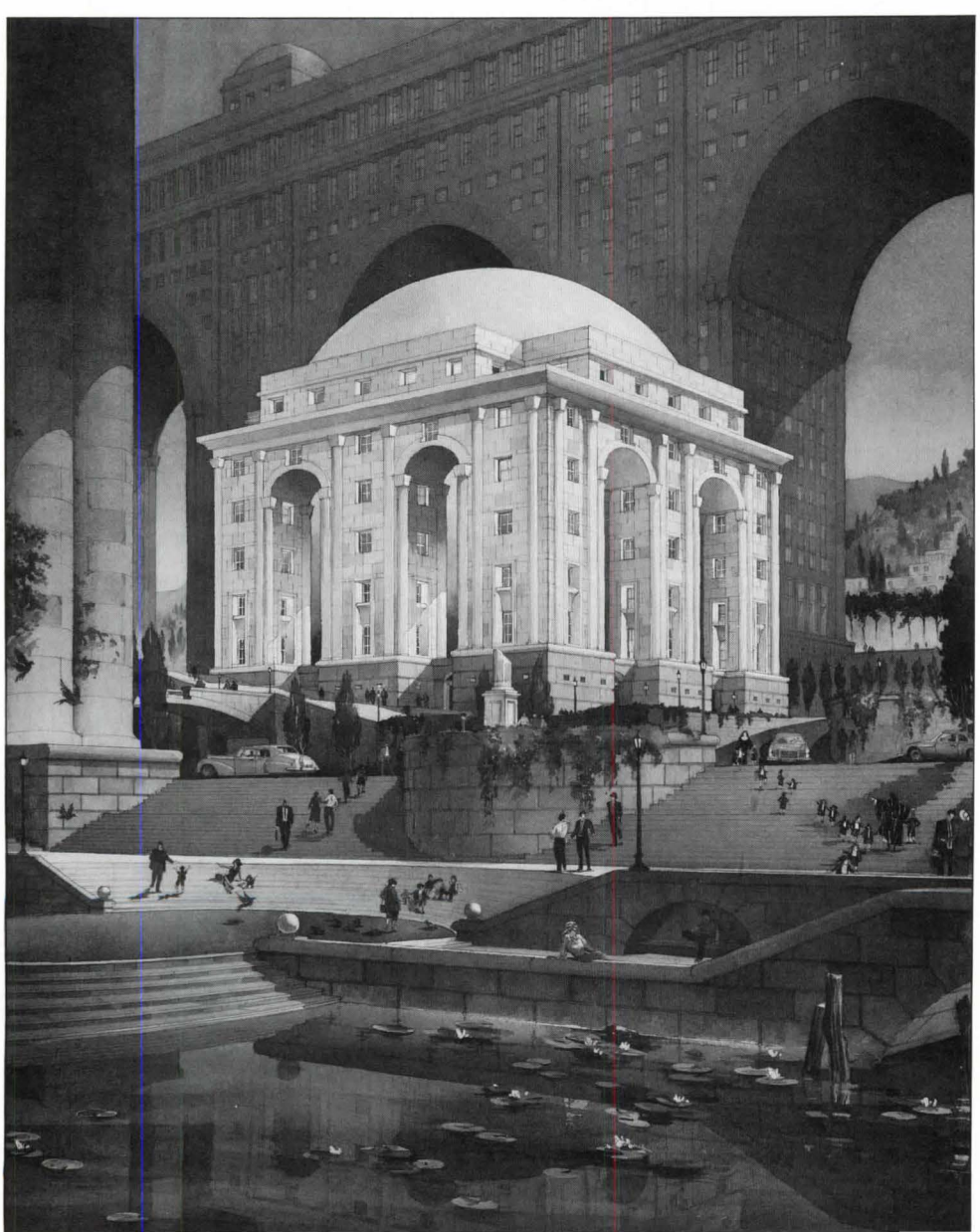
Technology *from page 31*
guidelines, immediate action should be taken to lower the amount of radon that is permitted to enter the dwelling unit. They also said they believed radon testing should be mandatory whenever a house changes occupants.

The advisory was issued based on a survey taken in 11,000 houses in Arizona, Indiana, Massachusetts, Minnesota, Missouri, North Dakota, and Pennsylvania. The survey indicated that nearly one out of every three dwelling units tested had a radon level high enough to be considered a health hazard—a level that exceeds the current protection standards for uranium miners and, according to the EPA, poses a cancer risk equivalent to smoking a pack of cigarettes a day for people spending 75 percent of their time in the home. The newest study reinforces a similar study conducted in 10 states last year and also implies that the radon problem in this country is more widespread geographically than was formerly thought.

Methods for reducing radon levels in an existing dwelling unit include traditional methods for improving ventilation and for sealing cracks in basements. Testing for radon levels can be performed with commercially available devices or by specialized contractors. State offices of the EPA can provide lists of companies that test and renovate.—M. Stephanie Stubbs

Awards

The American Society of Architectural Perspectivists has selected the winners in its third annual national competitive exhibition. The highest honor, the Hugh Ferriss memorial prize, was presented to architect and perspectivist Thomas Schaller for his watercolor representation of an Italian cultural center of his own design (below). Jurors for the competition, which had more than 500 submissions, were Charles Bassett, FAIA, of San Francisco; University of Minnesota dean emeritus Ralph Rapson, FAIA; and Los Angeles perspectivist Barry Zauss. *News continued on page 38*



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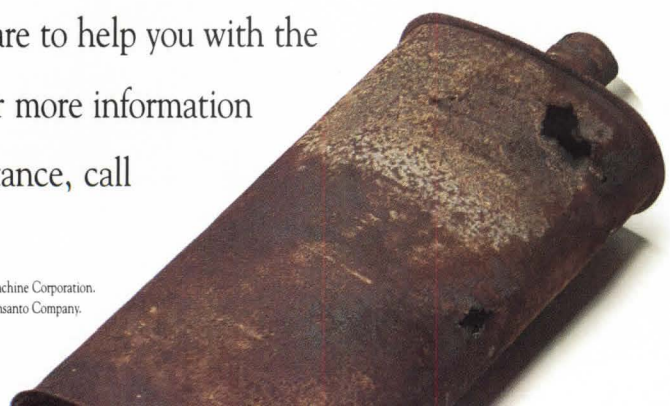

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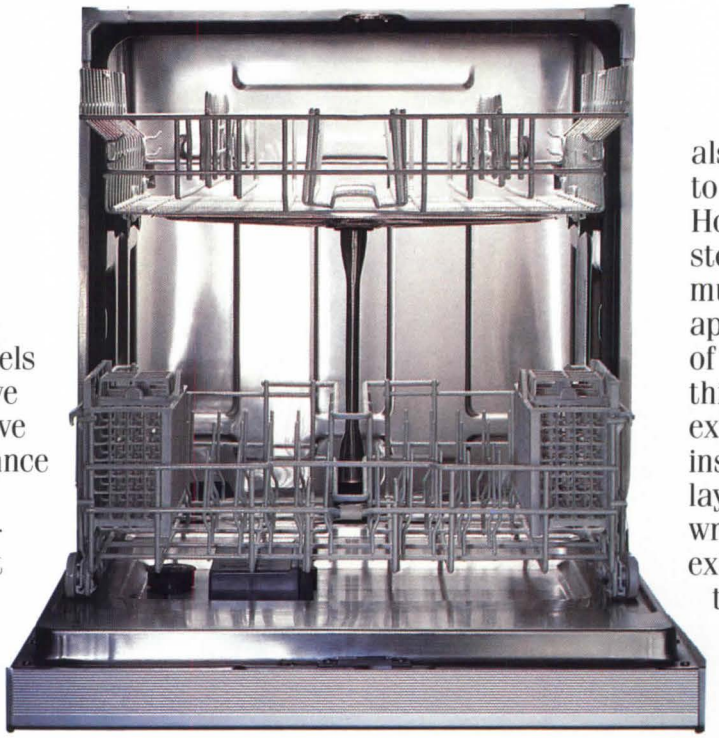

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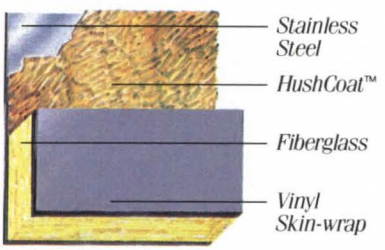

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IFRAA Honors Twelve Projects for Design Excellence

The Interfaith Forum on Religion, Art, and Architecture has chosen 12 religious buildings for its annual design awards; these include restoration and preservation projects and new buildings in the United States and abroad. The jury included John H. Jelliffe, FAIA; Henry G. Meier, FAIA; Charles Sappenfield, FAIA; the Rev. Harold R. Watkins; and the Rev. George D. Blackwell Jr.

IFRAA gave honor awards for two buildings. The Baha'i temple (see Sept. '87, page 72) in suburban Delhi, India, by Fariburz Sahba of Vancouver, British Columbia, was cited by the jury as "an extraordinary feat of design, construction, and appropriateness of expression of both the Baha'i faith and the context of India." St. Elizabeth Seton Catholic Church in Indianapolis, by the St. Paul, Minn., firm Rafferty Rafferty Mikutowski & Associates Inc., was honored for its "context, site design, form and materials expression, circulation, and designed furnishings."

There were seven merit awards:

- St. Michael's Church in Orland Park, Ill., by Paul Straka & Associates Architects Inc. of Northfield, Minn.
- SS. Peter and Paul Cathedral in Indianapolis, by SMSQ Architects Inc. of Northfield, Minn.
- Grace Episcopal Church in Chicago, by Booth/Hansen & Associates of Chicago.
- Holy Name Friary in suburban Washington, D.C., by Frank Schlesinger, FAIA, of Washington, D.C.
- Nativity of Christ Greek Orthodox Church in Novato, Calif., by Reid & Tarics Associates Inc.
- Shiga Sacred Garden near Kyoto, Japan, by Minoru Yamasaki Associates of Troy, Mich.
- Fairfax Unitarian Church in Fairfax, Va., by Lawrence Cook Associates of Falls Church, Va.

Citations were awarded to St. Francis Episcopal Church in Great Falls, Va., by the Kerns Group Architects of Washington, D.C.; First Lutheran Church in West Barnstable (Cape Cod), Mass., by Herman Hassinger Architects of Moorestown, N.J.; Italian Cemetery Mausoleum in Colma, Calif., by Robert K. Overstreet, AIA, of Corte Madera, Calif.; and the Sea Ranch Chapel in Sea Ranch, Calif., by Dumaran Construction Inc.

Deaths

Thomas B. Muths Jr., FAIA: Leader in Preservation

Thomas B. Muths, FAIA, was a Washington, D.C., architect who specialized in historic preservation. He served on the President's Advisory Council on Historic Preservation from 1976 to 1984 and was a member of the advisory committee of the National Trust for Historic Preservation from 1973 to 1979.

A native of Mobile, Ala., Muths graduated from the University of Washington. In 1968, he founded a firm in Jackson Hole, Wyo., and practiced there until 1984, when he moved to Washington, D.C., and became vice president of the firm Mariani & Associates.

Muths was also active in AIA, serving on the national board of directors from 1979 to 1983. He was chairman of the Institute's national committee on historic resources and also served as president of the Wyoming Chapter. He died in October at the age of 56.

C. Ray Smith, Writer and Editor

C. Ray Smith, FAIA, was a prolific writer on architecture and interior design for almost 30 years. Born in Birmingham, Ala., he graduated from Kenyon College in Gambier, Ohio, and attended the Royal Academy of Dramatic Arts in London. He served on the editorial staff of *Progressive Architecture* from 1961 to 1971 and later was editor of *Interiors*. In recent years he was editor of *Oculus*, the publication of the New York City Chapter/AIA.

Smith wrote several books including *Supermannerism: New Attitudes in Post-Modern Architecture* and *Interior Design in 20th-Century America: A History*. In keeping with his interest in design and the dramatic arts, he edited *Theater Crafts* magazine and was active with the U.S. Institute of Theater Technology. He died in August at the age of 59.

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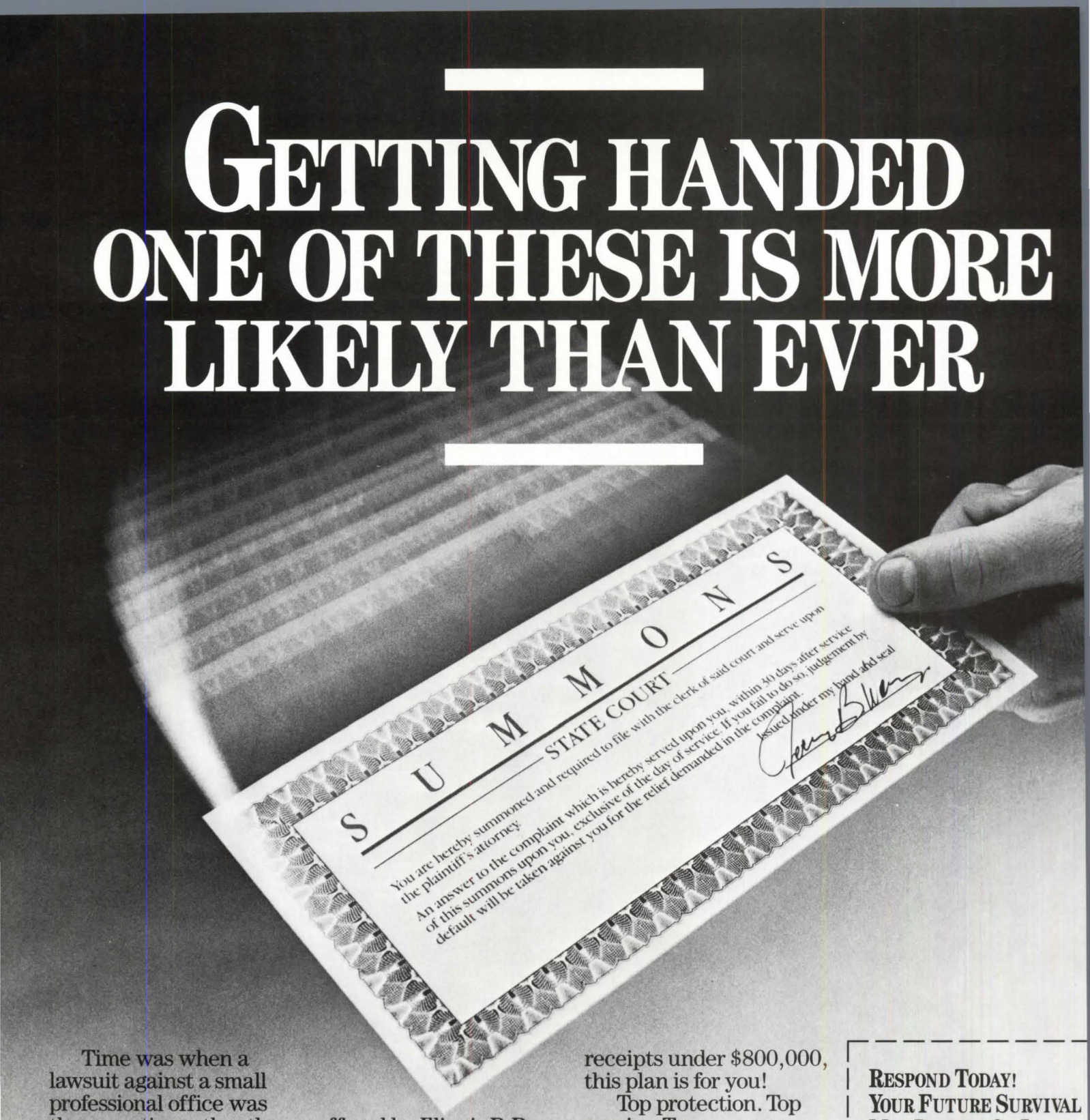

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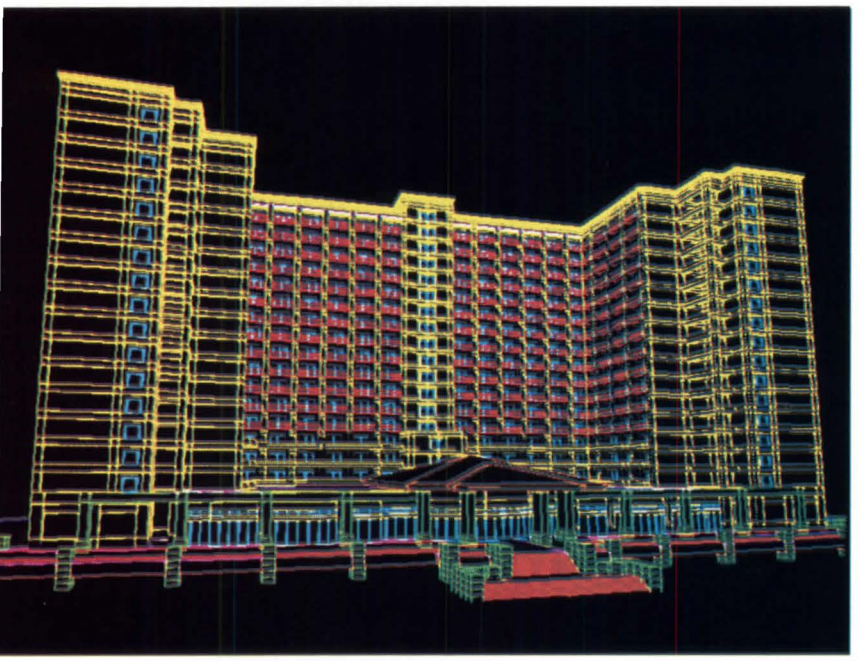

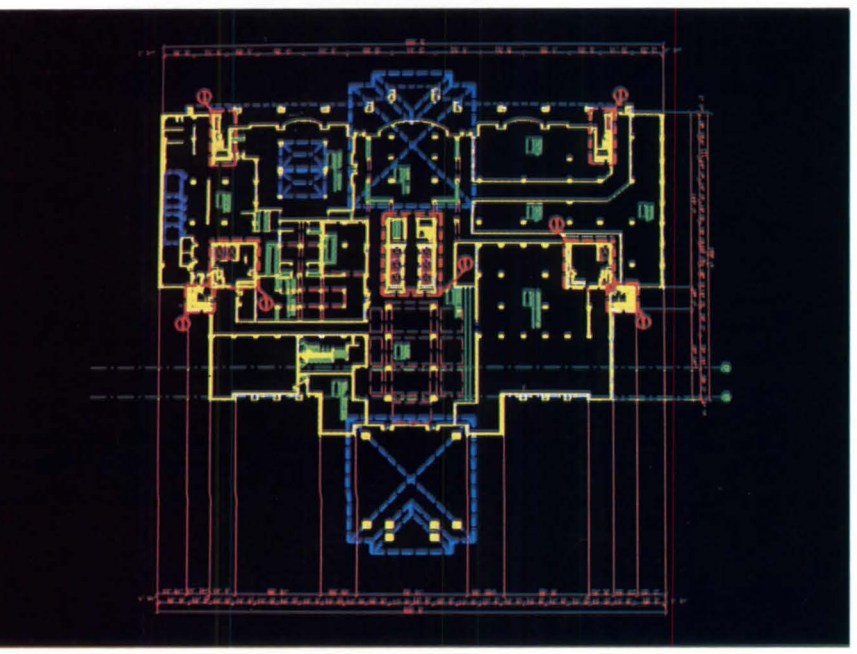

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INTERGRAPH

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Melton "Mel" Ferris, Hon. AIA, was executive director of the California Council/AIA for more than 20 years. He had graduated from the University of California and worked as a reporter for the San Francisco *Chronicle* and the San Jose *Mercury-News.*

Named administrator of the California Council/AIA in 1959, Ferris helped establish the council's insurance program and was one of the founders of the national Council of Architectural Component Executives. A longtime resident of Marin County, he was active in local conservation and preservation issues. He died Sept. 5 in New Zealand, where he had been living since his retirement. He was 72.

Berlin Harding Pless, AIA, a principal of the Atlanta firm Beckett, Pless & Associates, received his architecture degree from Georgia Institute of Technology. During the 1960s his firm, then Godwin & Beckett, was superintending architect of Washington Cathedral in Washington, D.C. The firm also designed buildings for the Georgia Power Co., the Coca-Cola Co. headquarters, the Episcopal Cathedral of St. Philip in Atlanta, and other churches, schools, and colleges. Pless died in August.

Richard Ridley worked in the Washington D.C., office of Skidmore, Owings & Merrill before founding his own firm in 1975, Richard Ridley & Associates, which he headed until his death in October at age 49. His projects included the conversion of the historic Argyle House to condominiums in Washington, D.C., the City Art Gallery in Raleigh, N.C., and the renovation of a textile mill to a high-tech industrial facility in Winsted, Conn.

A native of Antioch, Calif., Ridley received a degree in architecture from the University of California, Berkeley, and a master's degree in urban planning from Harvard. In 1986 he was a Loeb Fellow and taught at MIT. Ridley also taught architecture at Howard University and wrote frequently for the Home section of the Washington *Post.*

Raphael S. Soriano aligned himself with the Internationalist masters Richard Neutra and Rudolph Schindler. Born in an ancient Sephardic Jewish community on the Greek island of Rhodes, he emigrated to Los Angeles in 1924. A decade later, he graduated from the University of Southern California architecture school. In his first commission, the Lipetz house of 1939, he created one of the well known glass-enclosed spaces of the period, a 15x31-foot music room curved at one end. Another important work was his Hallowell Nursery and Garden Center in San Francisco, built in 1941-42. Soriano became known for combining esthetics with technology, especially in low-cost, prefabricated, steel and aluminum buildings. He was 83 when he died in July at his home in Claremont, Calif.

George R. Thomas, FAIA, retired professor at the University of New Hampshire, taught architectural drawing, graphics, and painting and developed courses in drawing, painting, and art history for non-architecture students.

Thomas was born in Portsmouth, Va., but resided in Durham, N.H., for most of his life. He joined the UNH faculty in 1930 after receiving his architecture degree from Carnegie Technical Institute. During the Depression, he directed artists painting building murals at UNH under the Works Progress Administration. Thomas was one of eight founding members of the New Hampshire Chapter/AIA. He died in August at 81.

BRIEFS

Urban Design Call for Entries

The Rudy Bruner Award for excellence in the urban environment, a biennial competition for outstanding urban places, announces its call for entries. The first Rudy Bruner Award was given to Seattle's Pike Place Market in 1987. The deadline for entry in the next competition is Dec. 1. Contact: Janet Carter, Rudy Bruner Award, Bruner Foundation, 244 Fifth Ave., New York, N.Y. 10001.

Briefs continued on page 46

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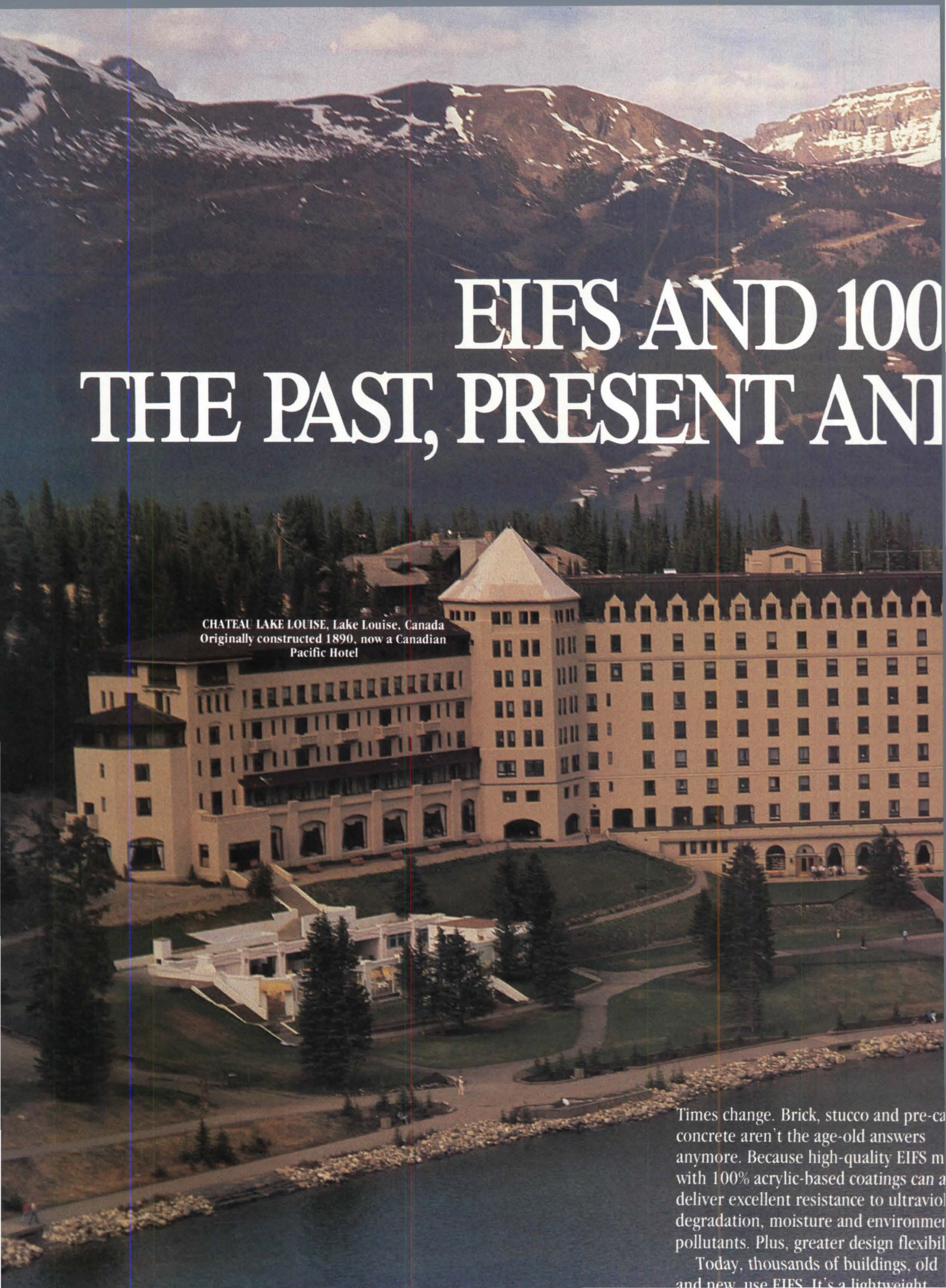

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Architectural Precast Awards
The Architectural Precast Association has honored three projects with its award of merit and has given one other project special mention. The awards are for excellence in design and manufacturing of architectural precast concrete elements. The winning projects are: Park Plaza Condominium, Wilmington, Del., by the Salkin Group Inc.; Carter Presidential Library, Atlanta, by Jova, Daniels & Busby Architects; Third National Bank headquarters, Nashville, by Kohn Pedersen Fox Associates; and Federal Street Restoration, Boston, by Jung/Brannen Associates (special mention).

Affordable Housing Competition
A competition for imaginative concepts for affordable housing in Connecticut is open to architects, landscape architects, developers, and students. Prizes totaling $10,000 will include a $2,500 first prize, $1,500 second prize, $1,000 third prize, and $5,000 in other prizes. The entry deadline is Nov. 15; the entry fee is $50. Contact: "Fairfield 2000" Affordable Housing Competition, 500 Summer St., Stamford, Conn. 06906.

Egyptian Library Competition
A competition for a new library at the University of Alexandria, Egypt, is being held by the Egyptian government in association with the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and the United Nations Development Programme (PNUD). The one-phase competition is open to all architects. Prizes totaling $200,000 will include a $60,000 first prize, $35,000 second prize, $25,000 third prize, and $80,000 in other prizes. The registration fee is $150; entry deadline is Nov. 30. Contact: UIA General Secretariat, 51, rue Raynouard, 75016 Paris, France, Telex: 614855 F.

Glass Design Competition
The National Glass Association announces its competition for unique use of glass in a nonbuilding application (for example, fountain, design panel, tavern, bar, aquarium, etc.). Projects must be completed between Jan. 1, 1983, and Dec. 31, 1988. Entries must be submitted by Dec. 15. Contact: NGA, Awards for Excellence Competition, 8200 Greensboro Dr., Suite 302, McLean, Va. 22102.

Innovations in Housing Competition
Entries are being accepted for a competition for outstanding residential design, sponsored by *Better Homes and Gardens, Builder,* and *Progressive Architecture* magazines, the American Plywood Association, and the American Wood Council. The competition calls for entrants to design a move-up house with a flexible floor plan in 2,200 square feet or less. The house must incorporate wood products and systems and be economical to build. Houses built or under construction between Feb. 1, 1988, and Feb. 1, 1989, are eligible. There will be a $5,000 first prize and five $1,000 citations of merit. Entries must be received by Feb. 6. For more information contact: Innovations in Housing, P.O. Box 11700, Tacoma, Wash. 98411.

NEA Fellowship
Myron Goldsmith, professor of architecture at Illinois Institute of Technology and a retired partner of Skidmore, Owings & Merrill, has been awarded a distinguished designer fellowship by the National Endowment for the Arts. The fellowship, according to NEA, is given for "extraordinary contribution to design over a lifetime."

AIA Student Officers
The American Institute of Architecture Students has elected Matthew W. Gilbertson, a student at the University of Minnesota, and Irene Dumas Tyson, a recent graduate of Mississippi State University, as president and vice president for 1988-89.

International City Design Competition
The University of Wisconsin-Milwaukee school of architecture and urban planning is sponsoring an international city design

continued on page 50

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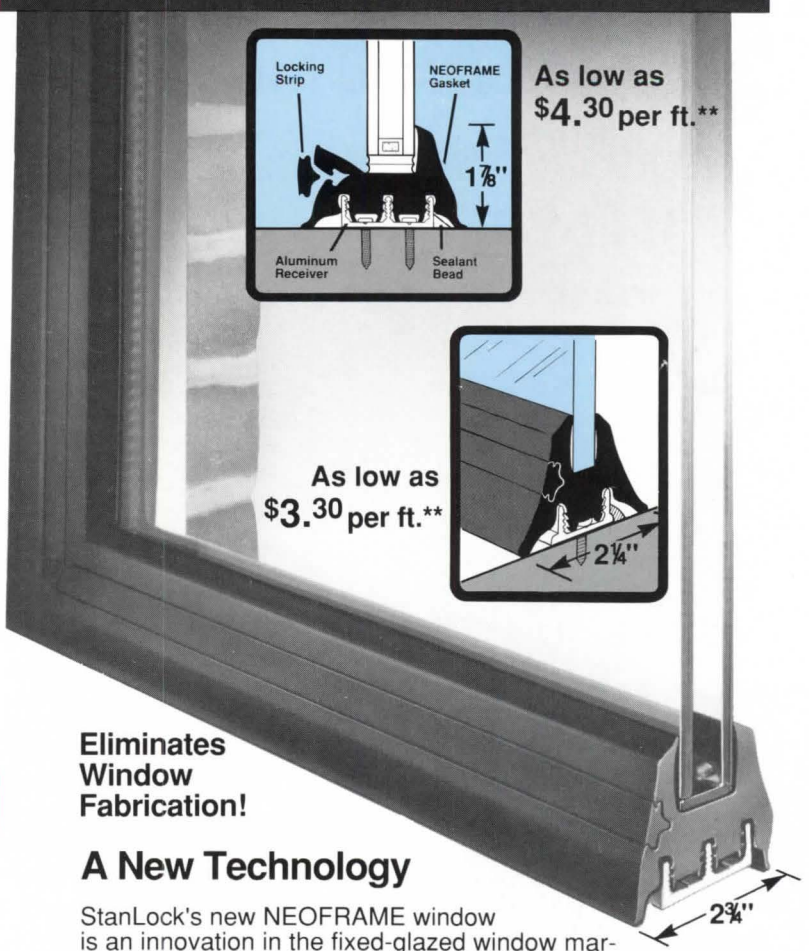

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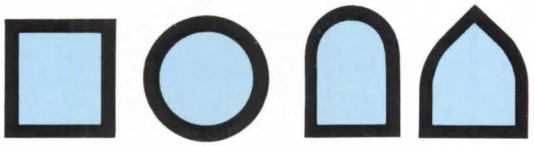

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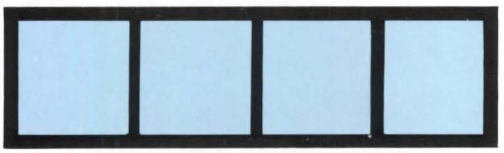

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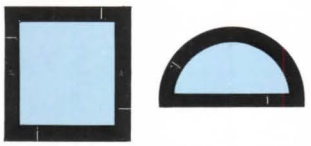

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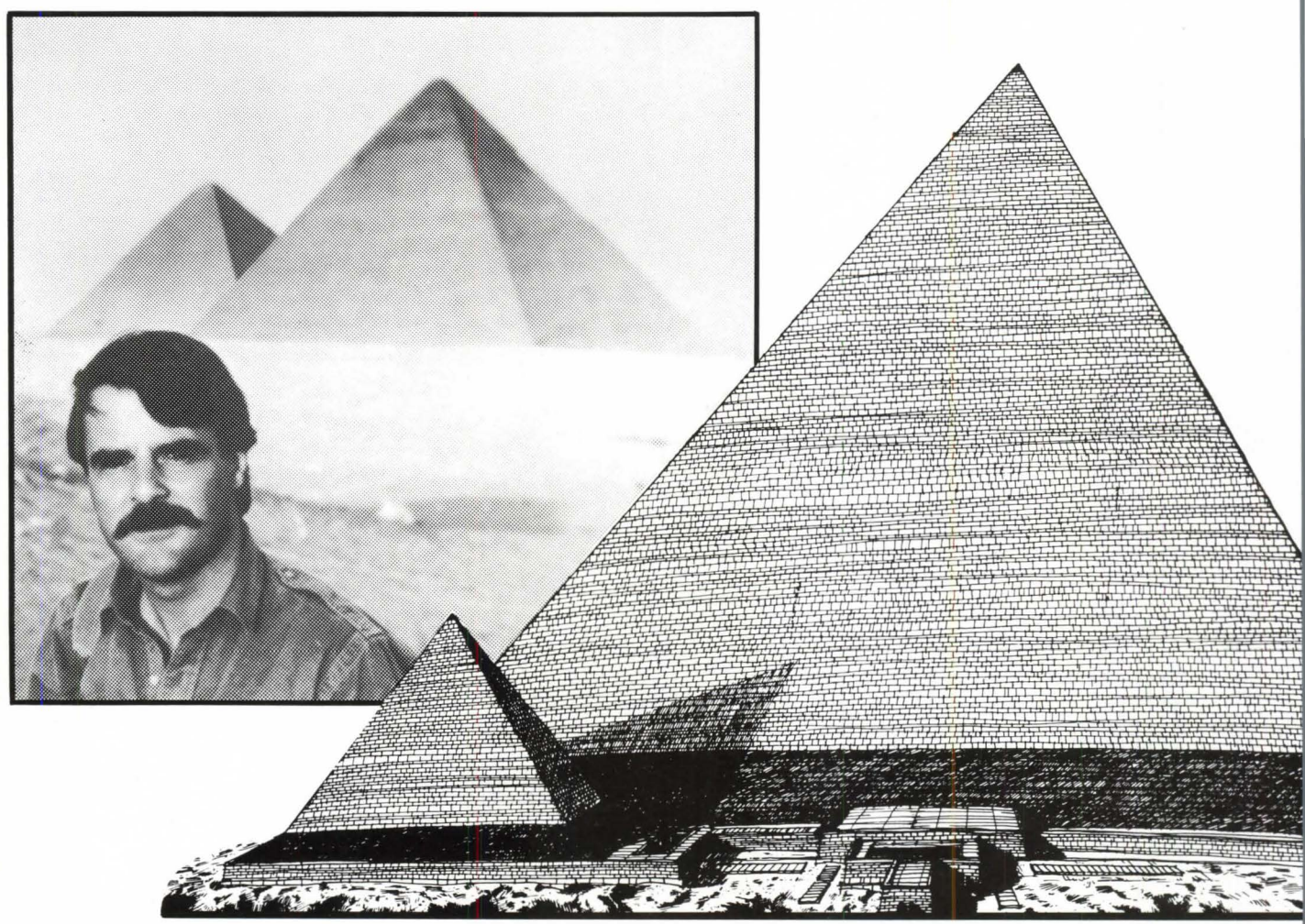

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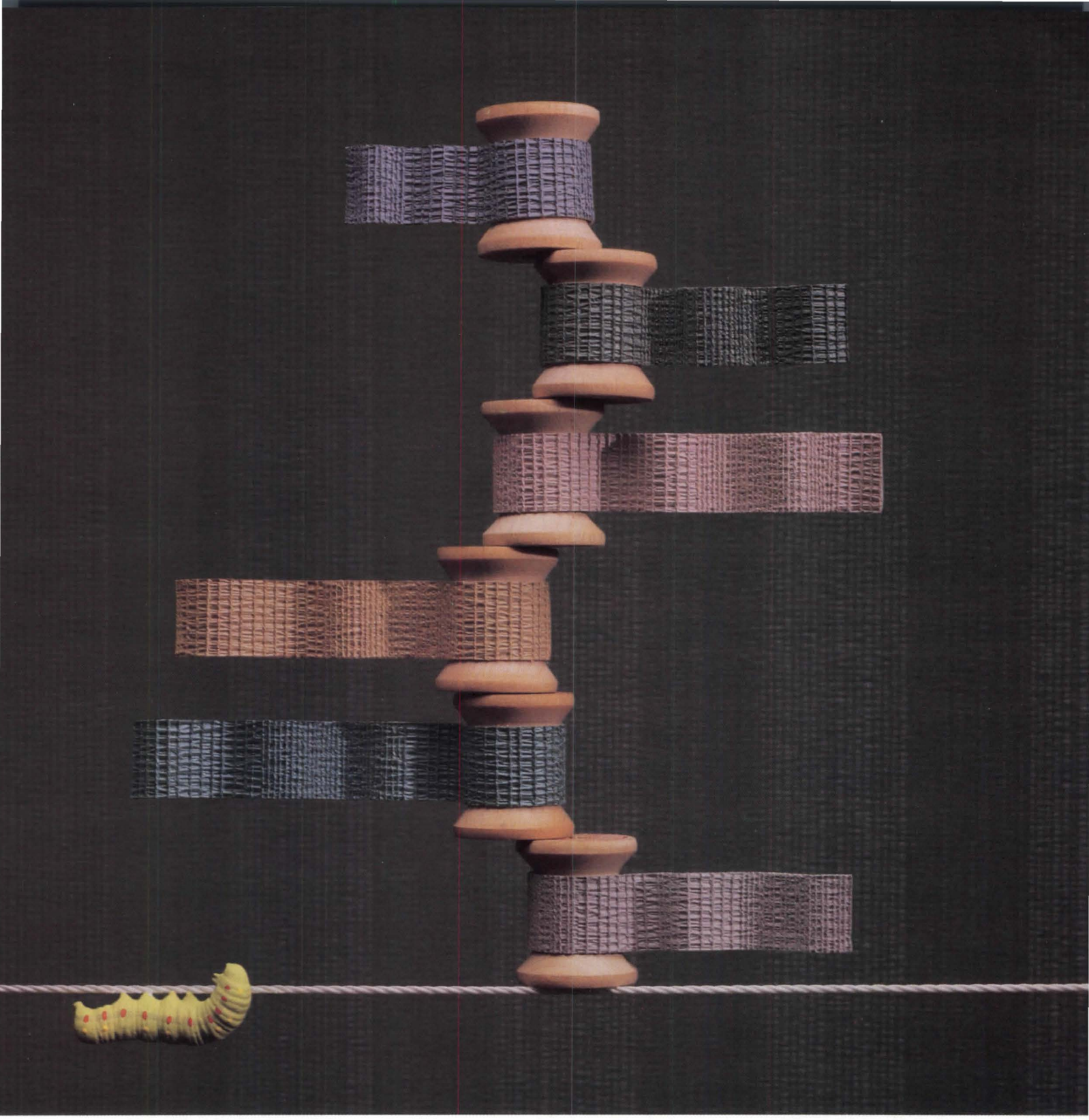

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Briefs *from page 46*
competition with "the future of the industrial city" as its theme and Milwaukee as the prototype. Cash prizes totaling $125,000 will be awarded. The registration fee is $75, and the deadline is Nov. 30. Contact: ICDC, School of Architecture and Urban Planning, University of Wisconsin-Milwaukee, P.O. Box 413, Milwaukee, Wis. 53201.

New NCARB President
George B. Terrien, founder and principal of Terrien Architects, Portland, Me., has been installed as president for 1988-1989 of the National Council of Architectural Registration Boards.

Cornell Students Honored
Six landscape architecture students at Cornell University received awards from the American Society of Landscape Architects' New York Upstate Chapter for their "outstanding academic achievement in the study of landscape architecture and skills shown in their landscape architectural design work." The honorees are Amy A. Nettleton, Freeville, N.Y.; Christine M. Cleveland, Lansing, N.Y.; Thomas P. Conley, Bloomington, Ill.; Gregory P. Cloos, Rochester, N.Y.; Christopher Siefert, Fairfield, Conn.; and Sharon Gombas, Ithaca, N.Y.

SOM Traveling Fellowship Awards
The Skidmore, Owings & Merrill Foundation has announced the winners of the 1988 architectural traveling fellowships for travel and study: $25,000 to Alex Krieger, Harvard University; $9,000 to Brian Andrews, Princeton University; $9,000 to William Callahan, University of Illinois at Chicago; $12,000 to Denise Dumais, Princeton University; $8,000 to Julie Evans, University of Illinois at Chicago; $8,000 to Timothy Love, Harvard University; $8,000 to Michael Baushke, Virginia Polytechnic Institute and State University.

Max Abramovitz Honored
Max Abramovitz, FAIA, has been awarded the University of Illinois at Urbana-Champaign's medal in architecture for lifetime service and achievement by an alumnus of the school of architecture.

Rotch Traveling Scholarship
Applications are being accepted for the 1989 Rotch Traveling Scholarship. A stipend of $16,000 is awarded to the winner of the two-stage design competition for eight months of travel, with an additional $1,500 upon completion of a report to be added to the scholarship's archives. Deadline is Jan. 2. Contact: Hugh Shepley, FAIA, Rotch Traveling Scholarship, 40 Broad St., Boston, Mass. 02109.

UCLA American Culture Fellowships
UCLA's Institute of American Culture is offering postdoctoral fellowships to support study of Afro-Americans, Asian Americans, Chicanos, or American Indians. The stipends of $20,000 to $25,000 per year can be used to supplement sabbatical salaries. The deadline for applications is Dec. 31. Contact: Norris C. Hundley, Institute of American Cultures, UCLA, Los Angeles, Calif. 90024.

Loeb Fellowship
The Loeb Fellowship in Advanced Environmental Studies at the Harvard graduate school of design is seeking nominations of professionals in design and design-related fields for the 1989-90 academic year. A one-year independent study program, the Loeb Fellowship is awarded annually to up to 12 midcareer professionals who have demonstrated leadership in the planning and design fields in both the private and public sectors. Loeb fellows have included architects, landscape architects, urban planners, journalists, community advocates, and other professionals. The deadline for nominations is Nov. 15, and the deadline for final applications is Jan. 20. Contact: Karin Gil, Loeb Fellowship Program, Harvard University Graduate School of Design, 48 Quincy St., Cambridge, Mass. 02138. □

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Neglected Legacy of An Industrial Past

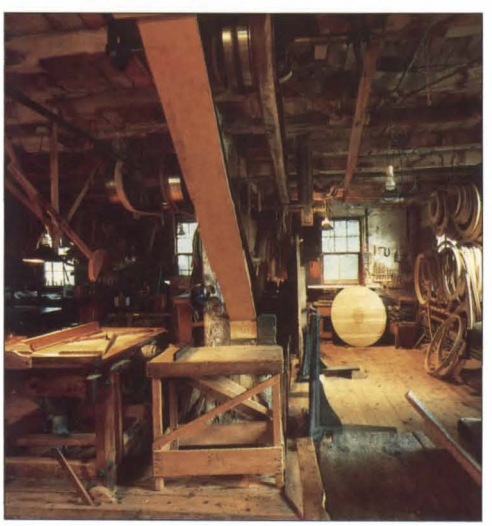
Mills and Factories of New England. Photographs by Serge Hambourg, essays by Noel Perrin and Kenneth Breisch. (Harry N. Abrams, $29.95.)

Although you rarely will find them on a Christmas card, the brick mill and factory are as much a fixture of the New England landscape as the white steepled church and the town green. A few are still fulfilling the use for which they were designed—manufacture. Many exist abandoned and on a steady march to ruin, or have found new lives as office buildings, shops, or condominiums.

Few communities would fight to save an old factory, as they might an old church or fine house. Yet it was the factory that often made the church and the house possible—that drew young workers, many of them women from failed farms, to new communities that prospered in the din of noise and dust that was the factory. In New England, "there has been a symbiosis between the pastoral and the mechanical," writes Noel Perrin. The fields and the factories coexisted. "The early farmers produced and marketed handmade nails in their spare time: They were metalworkers as well as shepherds of flocks."

New England became the textile manufacturing capital of 19th-century America. Historian Kenneth Breisch points out that the cool, damp climate was perfect for spinning cotton into thread, which grew stronger when exposed to humidity. The first mechanized textile mill began operation in 1790 in Rhode Island, and by the end of the 19th century New England mills were producing half the woolen and all

continued on page 58



Two mills still in operation: top, Pejepscot paper mill in Topsham, Me.; above, Schwamb mill in Arlington, Mass.

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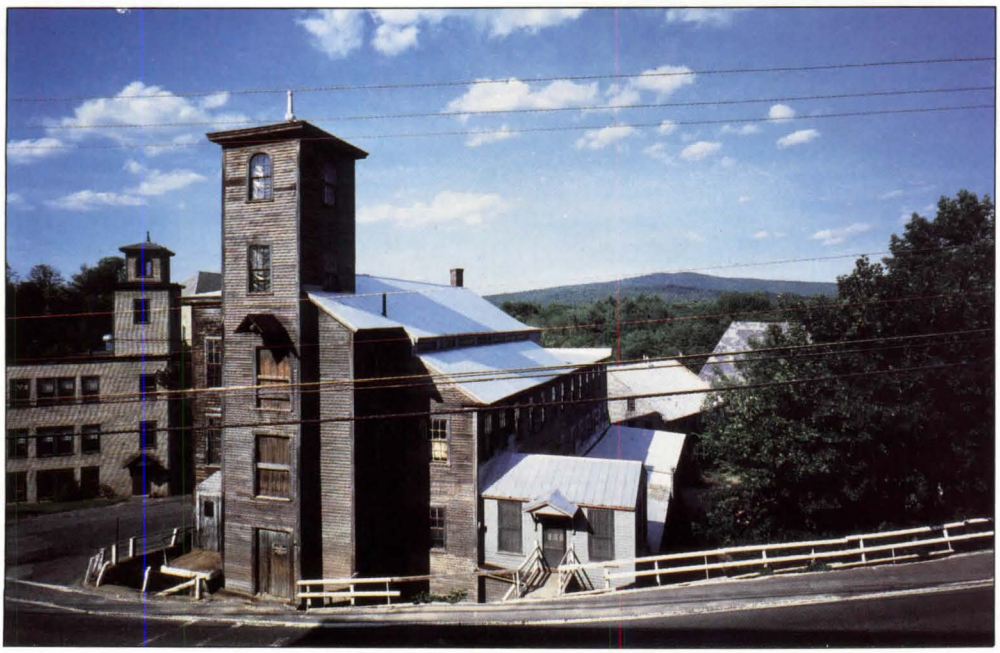

© Serge Hambourg

Above, Marcy Mill in Hillsboro, N.H., a typical mid-sized New England textile mill contructed in 1828.

Books *from page 55*
but a fifth of the cotton goods in the United States.

The mills were designed for maximum efficiency—long buildings with lots of windows (which were usually nailed shut to maintain humidity) and a tower housing vertical circulation of goods and workers. Fire was a constant danger, so the mills were built of brick or stone, and their wooden guts were of oversized wood columns and beams and layers of thick flooring—all of it slow to burn. The building form was adapted to the manufacture of a host of goods—brass works in Connecticut, paper in Massachusetts and Maine, machine works in Rhode Island.

Serge Hambourg's haunting, magnificently reproduced photographs depict the mills and factories in settings both picturesque and grimy. The stillness of many of the pictures speaks of the role these buildings, once alive with noise and commerce, now play as repositories of our industrial history.—Michael J. Crosbie

The Architect's Guide to Computer-Aided Design. Mark Lauden Crosley. (John Wiley & Sons, $37.45.)

Mark Lauden Crosley's discussions of computer-aided architecture range from the fundamentals of the computer to glimpses of its potential applications, all in a comprehensible, well illustrated style. Anyone involved with or merely interested in CADD will find this book a valuable resource.

Those who have not yet ventured into computerized architecture, as well as those who are beginning the search for a proper system, will find the first section most helpful. Here Crosley discusses the computer and how it functions, without unnecessary technical detail. He does, however, provide enough definitions to enable a neophyte to both ask the proper questions and understand the answers.

For those who have some experience with CADD, the second part of Crosley's book will provide additional techniques, shortcuts, and advice. He thoroughly covers current techniques of data management such as layering and symbols, as well as concepts such as drawing with objects rather than lines. He discusses the problems one might expect to encounter and suggests how to avoid them. In fact, close examination of the numerous illustrations shows, though unintentionally I'm sure, many of the glitches that currently plague CADD—for example, dimension and leader lines, which would not be tolerated in hand drawing.

In the final section, Crosley presents his vision of the potential of computer-aided architecture, which is exciting and yet ominous. He discusses systems that allow the creation of plans from which elevations and sections "grow" automatically. I fear that the profession may come to depend too heavily on the computer to solve problems, particularly as the current video generation reaches maturity.

The concept of "sketching" on a computer will inevitably lead to many differing opinions about whether future generations of architects will need to learn to draw at all. The idea that computers will make the solving of an architectural problem so easy that the client could actually sit down and do it without the architect will worry some, especially in view of the fact that there is already a do-it-yourself design program available for home computers, costing about $20, which advertises that there is no need for an architect.

Crosley has presented an organized overview of an architectural tool that is both complicated and confusing.

—Richard L. King, AIA

Mr. King is a practicing architect with Centerbrook Architects and Planners in Essex, Conn.

Manhattan Manners: Architecture and Style, 1850-1900. M. Christine Boyer. (Rizzoli, $30.)

M. Christine Boyer here continues the original line of thinking that was notable in her earlier *Dreaming the Rational City,* and equally concentrates on urban design and planning. Real estate—spelled m-o-n-e-y—dictated the 1811-to-eternity Manhattan gridiron plan. By 1850 the city had begun to accommodate itself to the directionless anonymity of the plan. Functional districts emerged dedicated to warehousing, entertainment, retailing, manufacturing, fashion, residential, and other uses, and these provided the city's architectural themes.

Urban landmarks, churches, monuments, parks, and a few surviving boulevards (like Broadway) provided additional accents. It was from these, in spite of the grid, that the architects took their cues and the city took its form. Most of this was in place before 1850. The north side of Washington Square was built by the 1830s. Union Square, with its fountain celebrating the completion of the Croton aqueduct in 1842, and many of its surrounding mansions, also were there.

Boyer hits her stride with the description of "Ladies Mile" (Broadway from 14th to 23rd streets) that "simply appeared" as the luxury trade pushed northward. In this restless change, Boyer finds the period's architectural tempo. Department stores succeeded shops, hotels appeared, churches, theaters, concert halls and places of entertainment, art studios, and showrooms emerged in profusion. Horse cars and the omnibus heralded the steam railroad and its stations. So far, so good. But it was the tall building that killed Ladies Mile, forcing its traditional luxury and fashion activities north and east to fresh locations. Sic transit gloria mundi.

—Frederick Gutheim, Hon. AIA

Mr. Gutheim is an author, teacher, and critic in Washington, D.C., and a frequent contributor to this magazine.

Architecture and Women: A Bibliography. Lamia Doumato. (Garland, $40.)

This book compiles primary and secondary writings on 127 women architects, landscape architects, designers, architectural historians, architecture critics and writers, and others in fields related to architecture. There are also lists of other bibliographies, monographs, theses, and exhibition catalogues pertaining to women in architecture.

A cursory look through the book reveals a few errors—one of them a whopper: Jaquelin Taylor Robertson will be surprised to find himself in the company of Denise Scott Brown and Ada Louise Huxtable. A few prominent names in the field have inexplicably been left out, such as Catharine Beecher, Dolores Hayden, Elizabeth Plater-Zyberk, and Adele

Naude Santas. *Books continued on page 60*

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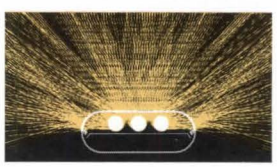

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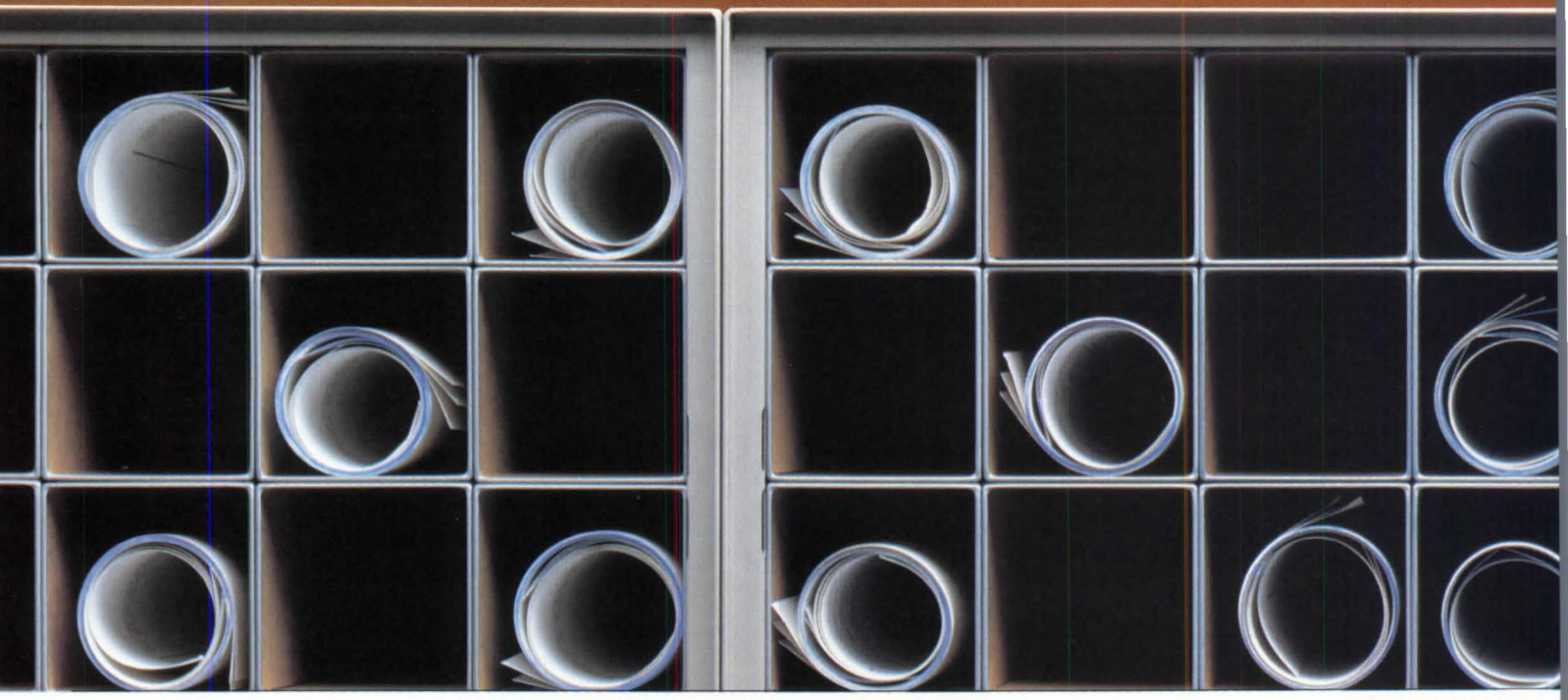


Design Thinking. Peter G. Rowe. (MIT, $25.)

One approaches a book titled *Design Thinking* with a mix of trepidation and anticipation. Trepidation because of the string, lengthy by now, of such books that have presented to us overly mechanistic explanations of how we architects design. Anticipation because one holds out hope that there might yet be a description of designing that will elicit from us the reaction "Yes! *That's* what I do!"

Peter Rowe is well aware of the shortcomings of previous design explanations, and his sympathy with and understanding of the mind of the designer show all through his book, especially in such ringingly apt concepts as "enabling prejudices," "bounded rationality," and "satisficing"—that conditional acceptance of a partial solution that doesn't quite satisfy but yet will suffice to let us make progress on other aspects of the design. In such concepts there is the feel of "I've been there," but is there that large sense of "That's what I do"?

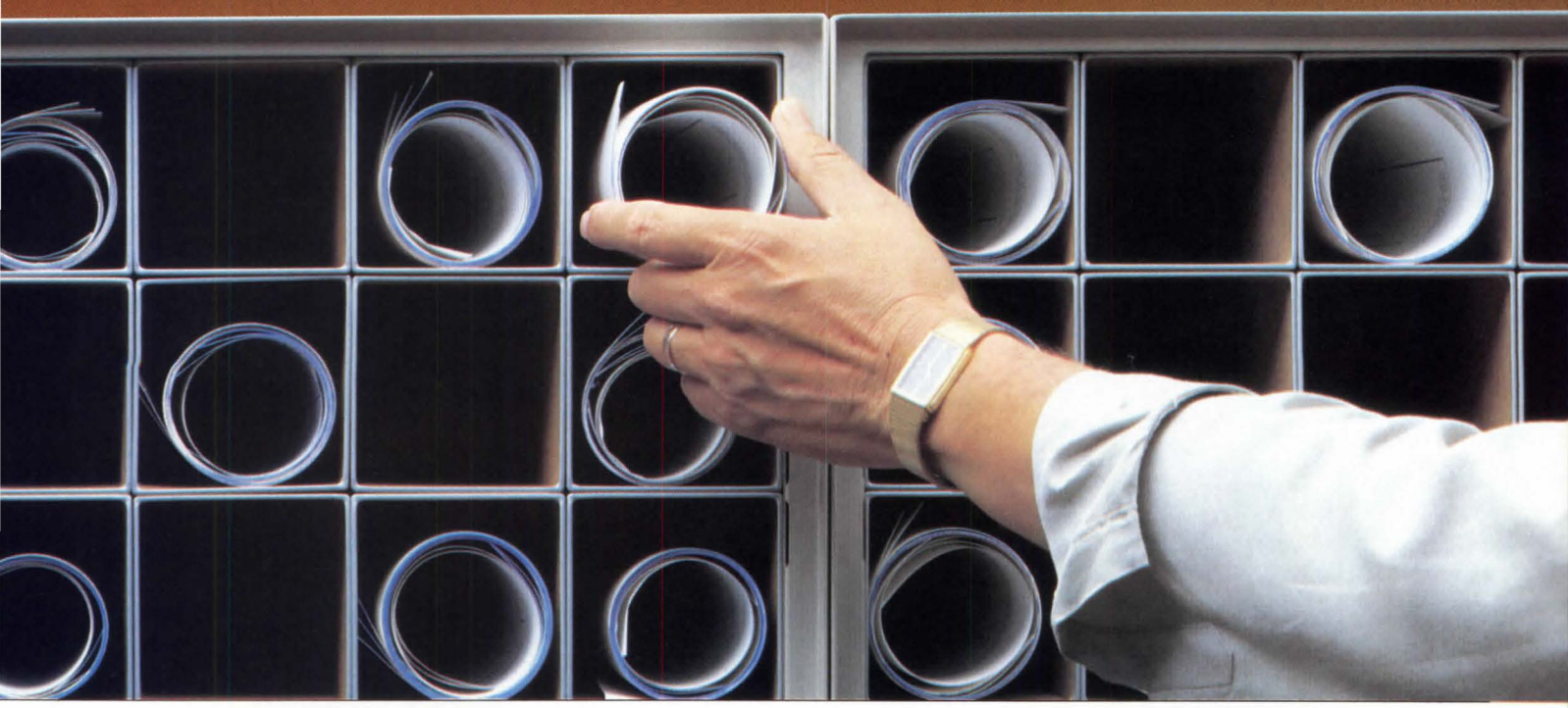
Rowe opens his book with three anonymous case studies of recent designs, explicating for us the differing thought processes each of the architects went through. His analysis convinces us that the process is at least potentially characterizable, and he quickly presents us with an account of attempts at such characterization, a progression of gradually less mechanistic models, ending with the model that Rowe will work from—the "problem space," an apt visual analogue in which the path toward resolution moves not directly across the problem space but can double back, restart, zigzag among partial resolutions, even begin from different edges (the parts to the whole or the whole to the parts). One can almost imagine a video in which an unfocused design (perhaps on a yellow background) moves from point to point, the image either rearranging itself or coming into sharper focus. The image is so compelling that one wishes Rowe had pushed the idea further for us.

But Rowe has other purposes for this net of resolution points. He wants us to consider what drives that evolving image from point to point. Why does the design take *this* branch of development and not those others? Here is Rowe's central insight: it is a sense of "what it ought to be" that switches the development onto a particular course of paths.

As a method of revealing the content of such "normative positions," as he terms the arrival of what ought to be, Rowe offers a taxonomy of aspects. We can look, for instance, at the orientation of such positions, their conception of a critical stance and an overarching purpose. As an example of orientation, a normative position would favor certain architectural devices, Eisenman's shifted grids. The recurrence of such devices, used in preferred ways, constitutes a look, a style, which Rowe terms the "production" of a normative position. Using these aspects, Rowe then presents us with an analysis of the normative positions—the "what it ought to be"—of several contemporary architects, among them Moore, Venturi, and Eisenman. After a series of equations in formal logic (which I will not purport to understand), Rowe discusses some the commonalities and conflicts among these particular normative positions and among others commonly held today, and he concludes that the several differing positions spring from large "realms of inquiry"—essentially, views of the world and design's role within the world.

In Rowe's account of the design process of architects we miss a sense of grounded rightness—how we know when a design "clicks." It is not, precisely, that "Eureka!" sense of having unquestionably found it, because "it" can in no way be proven. But yet we believe in "it." The concept of "satisficing" doesn't come near this feeling of absolute conviction. All of us know about this-will-do design: that's the sketch you hand on to the production staff only because you know that if you stew over it any longer a deadline will not be met. It never clicked, but it will do.

Yet we also know another species of



and the concept that satisfies the client's program seems almost to draw for us a logical structure, and then the structure and the spaces fairly announce to our eye an equally logical mechanical concept. Each part of the design falls into place with an ease that amazes, and for every additional aspect we consider—access, sun, landscaping—the solution appears to be already in the diagram. It is through such designs that we test what conviction feels like. It is, in fact, only through such experiences that we are able at all to calibrate the scale that measures the distance between "It's right" and "It will do" and "It won't do at all."

I would like to read, someday, an analysis of design that takes as its starting point not how we do what we do but why we even believe we are able to do what we do. Somewhere in that analysis would be, I believe, the key to how architects really think and feel.—William Hubbard, AIA

Mr. Hubbard teaches at MIT's department of architecture, where he has recently formulated a new introductory course in design for arts and sciences undergraduates majoring in architecture.

Facility Management Systems. Jeffrey M. Hamer. (Van Nostrand Reinhold, $34.95.)

Facilities management is the latest market opportunity touted to architects by consultants. The demand for facilities management—in-house or consulted—is apparent, if by no other evidence than the formation in 1980 of the International Facility Management Association, which had more than 4,000 members by last year, Hamer notes. That demand, coupled with the fact that advances in computer hardware and software make automated facilities management affordable and practical, makes facilities management look pretty tempting. "If you're already into computers," the argument goes, "you're already storing all the data a facility manager needs. You're halfway to being a facility manager yourself."

That's nice for a pep talk, but not too helpful for principals faced with making a real decision about delving into a new but competitive market that is already being dominated by some of the larger A/E firms. This book is helpful to architects interested in this new field, even though it is written for building owners.

First, just what is facilities management? It is "the process of planning, implementing, maintaining, and accounting for appropriate physical spaces and services for an organization, while simultaneously seeking to reduce the associated total cost," Hamer offers. In fact, definition of the emerging expertise is this book's strong point.

Hamer emphasizes repeatedly that automation is only a small part of facilities management, one that follows procedures, staff, and training. All the same, techniques for automating the management process dominate the text—probably because automation is where things are changing.

The book begins with a discussion of the tools (including automated tools) and subsystems (facility design is one of six implementation subsystems) and includes an enumeration of the costs-to-paybacks factors one might use to decide whether a project needs such a structured approach to management of the physical plant. The costs and paybacks chapter includes cost-benefit formulas. A section on data management itemizes types of information to collect and sample methods of collection and storage. A chapter on space allocation and planning offers a few projection strategies and enumerates considerations in space allocation, but only enough to tell readers what they don't know.

One is not going to be prepared to provide facilities management services upon completion of this book if he or she couldn't before starting. But someone involved in space planning or client development at a moderate level will most likely benefit from the carefully organized approach presented by an experienced manager. And a novice will finish the book knowing what the discipline entails in enough detail to immediately engage a facilities manager in meaningful discussion. With as complex a field as this one, that alone is an accomplishment.

—Douglas E. Gordon

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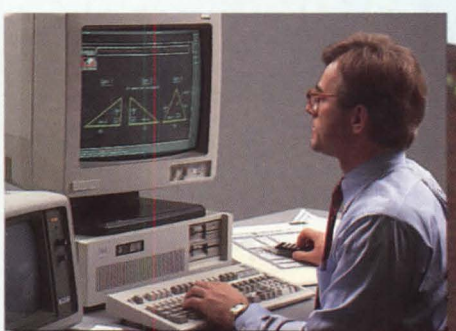

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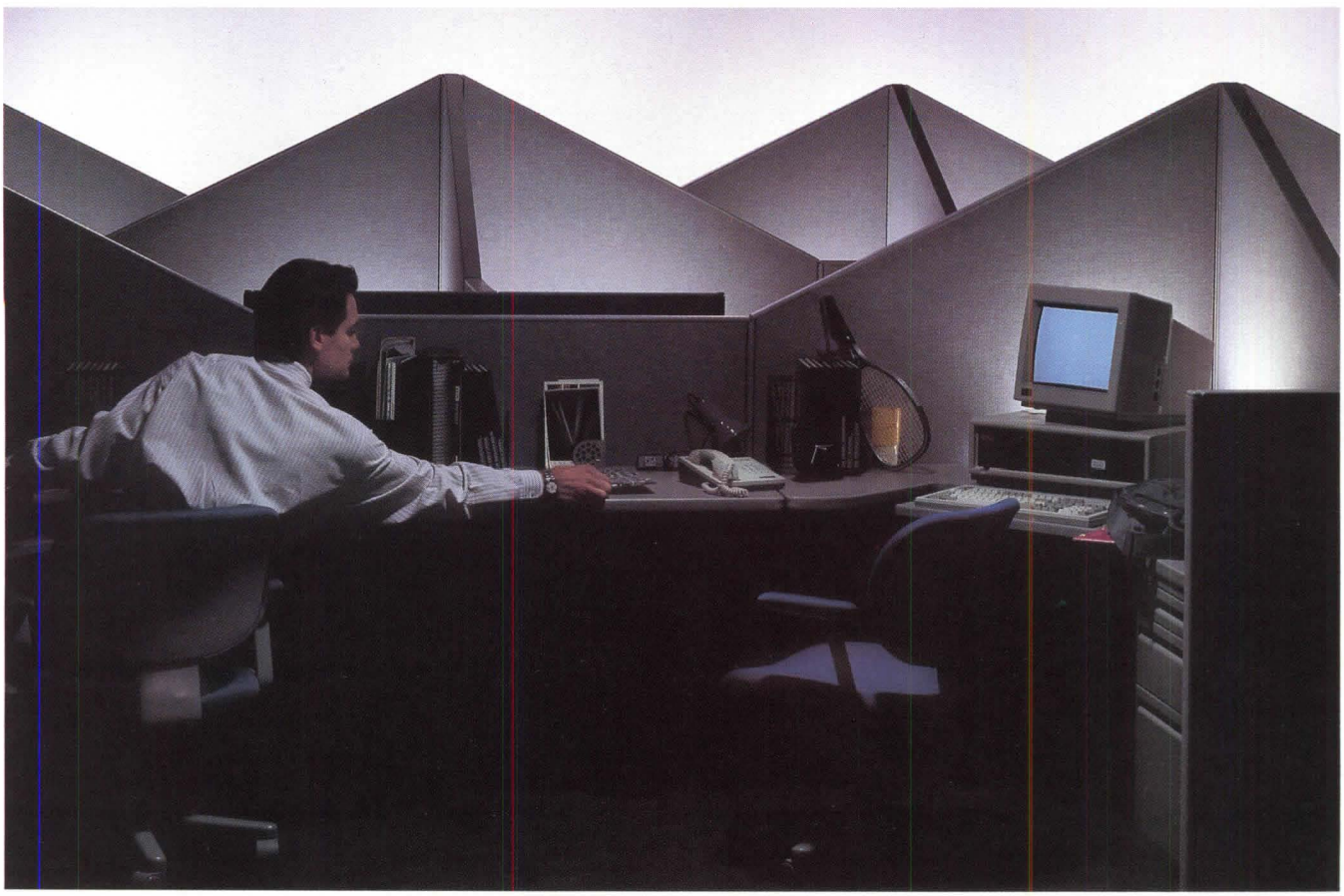

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We deal this month, as we do most Novembers, with historic preservation and its handmaidens renovation, restoration, and adaptive use. Each year there is more to choose from as the involvement and sophistication of architects in dealing with these matters increase. We believe this year's content illustrates the wide range of approaches being taken to old buildings and, in some cases, their relation to new. And there were many other good things left on the cutting-room floor because of space limitations.

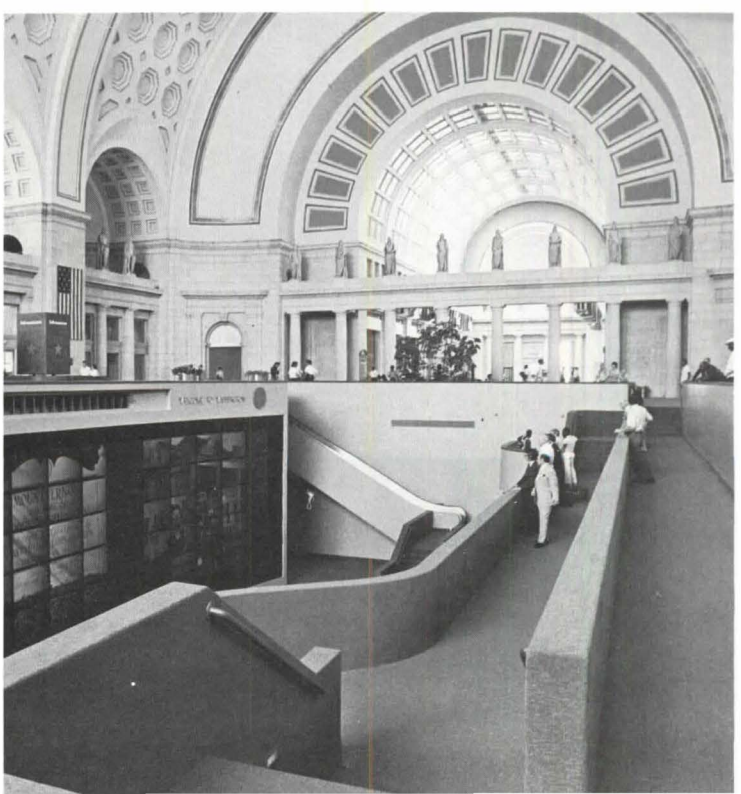
The lead article, on Washington's previously brutalized Union Station, underscores the point about sophistication. We weren't there when it originally opened, but we can't believe that its great hall ever shone more radiantly.

Unfortunately, one aspect of the project makes a less positive point about the difficulty in adding new elements to such a great space. At its center an information booth and train board have been allowed to grow into a bulky wooden cylinder, festooned with dubious pseudo Victoriana. This odd object sticks in your eye from almost any vantage point. Worse yet, atop is an open restaurant, raised to obtrusive prominence.

Fortunately, this unhappy construction should be demountable. At the very least the restaurant should be lopped off. Optimally everything but an information booth and the train board, both quite appropriate in this location, should be removed.—*D.C.*

The Rebirth Of a Magnificent Monument

Washington's Union Station restoration.
By Douglas E. Gordon and M. Stephanie Stubbs



Union Station, a revered landmark for generations of Washington, D.C., residents and visitors alike, will round out its 81st year with a new purpose in life. After years of neglect, Union Station is back in the limelight with all the grandeur and promise that is its birthright. In addition to regaining its rightful position as a restored train station and gateway to the nation's capital, it now houses more than 100 new retail shops and promises to be the keystone to reclamation of that section of Washington.

Union Station was conceived at the turn of the century to provide a "union" terminal facility, consolidating the functions of two railroad stations and tracks that crossed 28 city streets, often causing unsafe travel conditions. Designed by Daniel H. Burnham and completed in 1907, Union Station held inaugural crowds of 100,000 and was, at 760 feet long and 344 feet wide, the largest train station in the world. Burnham, in classic Beaux-Arts style, modeled the building after the Diocletian Baths, achieving its massive form with masonry-covered steel frame clad with white Vermont granite. In its heyday, Union Station employed more than 5,000 people and contained within its abundant square footage a hospital, mortuary, butcher, baker, police station, swimming pool, bowling alley, and basketball court.

Union Station's history, however, is not all glorious. It was suffering economically from a steady decline in railroad use that had begun in the early 1950s when, in 1964, it was declared a historic landmark to protect it from any possibility of demolition. In 1968, Congress voted to convert the building to a national visitors center, as part of the nation's bicentennial celebration. But the well intentioned center was not well received. An exhibit space too big for its few displays—mostly Depression-era photographs of Americans at work and play—the centerpiece of the visitors center was a 120x50-foot sunken court that soon became known in the local press as "the pit." The decline in rail travel siphoned off travelers, and the train station proved too far out of the way to become a tourist attraction itself.

The cost of converting and maintaining the unpopular visitors center quickly passed $45 million. In 1980, Congress authorized the Department of the Interior to spend $11 million to make emergency structural repairs and install a new roof. When one-third of the new roof was in place, heavy rains severely damaged a large portion of the unprotected ceiling, causing large chunks of the plaster to fall. The plumbing, too, fell into worsening disrepair until, finally, the center was deemed unsafe and closed. Train travelers' travails also increased as passengers were shunted around the west portico, through a rat maze of plywood tunnels, and down into a makeshift station. This, coupled with frequent delays as Amtrak repaired its Northeast Corridor tracks, brought railroad travel to and from Washington to its nadir.

Congress had another big problem on its hands by the end of 1977, with a proposed 4,000-car parking garage turning into a 1,700-car garage at twice the proposed price and involving a major lawsuit; the Washington *Post* ran editorials deriding the handling of the project, and there was even talk of special-interest boondoggling. Demolition, as tempting as it may have seemed, was

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Above, the restored head house on opening day. Opposite page, the ill-fated 'pit' of the visitors center before the restoration.

tion Act" in 1981, providing funding for restoration of the building as a railroad terminal and authorizing private commercial development, effectively cutting the project in two: historic restoration for the main hall and adaptive use for the retail and train operations areas. By encouraging private development, the federal government could withdraw from financial and operational responsibilities for the project.

The intricate restoration began in 1983, when Congress established the nonprofit Union Station Redevelopment Corp. (USRC) to oversee the work by private interests. USRC's architect is Harry Weese & Associates, and its construction manager is the Gilbane Building Co. of Landover, Md., with Sherman R. Smoot Co. of Columbus, Ohio, as a joint venture. Weese's responsibilities were to restore the exterior and significant interior spaces, mechanical systems, and features; to renovate the remainder of the building as shell space for the developer's uses; to design new Amtrak facilities; and to advise USRC regarding the effect of the developer's proposals on the historic structure.

On the new development side of the project, Union Station Venture Ltd. (USVL) was selected through a request-for-proposal competition. USVL, a private corporation, comprises Equity Associates Inc.; LaSalle Partners Ltd., Chicago; Williams Jackson Ewing Inc. (WJE), Baltimore; and Benjamin Thompson & Associates Inc. (BTA), Boston, as limited partner and architect for the retail space. The contractor is the Dick Corp., Pittsburgh.

USVL's proposal encompassed the overall redevelopment and adaptive use concept and plan, including circulation, public areas, and the retail plan for all spaces adjacent to the Amtrak corridor. Given limited space for a viable marketplace, BTA found space not immediately obvious for nine movie theaters and a food court on the lower level, shops by way of a new mezzanine in the main concourse, and small-group congregation in various nooks throughout the building.

"Roughly speaking, Weese and its team had responsibility for the primary restoration, while BTA and its team had responsibility for enhancing the areas of secondary restoration, but the line is finely drawn," says civil engineer William Duvall, Gilbane/Smoot's project manager. "Perhaps this is a testament to the smooth interface of the teams' work. The building process, thankfully, did not take as long as settling the paperwork—the project went from ground-breaking to grand opening in two years."

The interweaving of the restoration work and new construction was made more difficult by the fact that USRC, the owner during construction, and USVL, in effect the developer and owner after completion, were drawing from the same fixed budget. This meant that the sometimes conflicting viewpoints on what constitutes proper renovation of a historic building were exacerbated by negotiation over budget allocation between restoration and enhancement.

While Weese was concerned with restoring the visual impact of the station, BTA was striving to bring back the ambience of Burnham's original design. Union Station "was a bustling hub for thousands of citizens enjoying the adventure of travel in an

Above, main facade with Columbus Circle in foreground. Opposite, removable fountain and kiosk 'enhancements' in the head house.

urban setting, replete with services, sociability, and small pleasures attending the ritual of arrival and departure," says Benjamin Thompson, FAIA. "In any plan for preservation and re-use, a central task is to bring people back to Union Station in large numbers—numbers sufficient not only for economic support but for the revival of its ambience."

That being the intention behind the USVL development plan, BTA was able to get USRC approval on some major departures from the original design, such as a double-level central kiosk with a concierge/hospitality desk (providing information, convenience commodities, light dining, elevated views, and a "visual landmark") and two fountains (unattached to the floor, as required by Interior Department restoration guidelines) placed in the main space being historically restored.

On a first walk through the newly opened complex, the logic of BTA's plan and its sequence of spaces reveal immediately the new Union Station's purpose—it is once again foremost a train station, with clear pedestrian circulation paths, equally suited to an all-aboard sprint or a mosey to and from the trains. To appreciate, however, the intricate details that have been considerately designed and crafted into all the spaces, one must make numerous visits. The entryway announces the space inside by way of three 50-foot arches, patterned by Burnham after the Triumphal Arches of Rome to create a formal gateway to the city. Flanked symmetrically on both sides by a series of arched openings that complete the entry facade's loggia, the main arches are topped by 18-foot-tall, 25-ton statues personifying fire, electricity, agriculture, mechanics, freedom, and imagination.

One enters the building proper through the main hall, known in railroad parlance as the "head house." With its 96-foot-high, hexagon-coffered, barrel-vault ceiling, the head house is the image most people remember from Union Station's good old days. It measures 200 feet wide by 640 feet long, and its heart is the centrally located main hall, flanked symmetrically by the east and west halls. Once filled with mahogany benches, the main hall now is home for the double-level kiosk.

Restaurants now fill the main hall's corner spaces and the 2,140-square-foot Presidential reception room, which originally was appointed with silk-covered walls, parquet floors, electrified chandeliers, mahogany furniture, and the obligatory red carpet for visiting dignitaries.

The head house and its adjacent spaces also are the best showcase for Weese's meticulous restoration plan. Where Italian immigrants provided most of the labor for the original construction, teams of specialty consultants and skilled workers (often 400 on site at one time) re-created the grandeur of the enormous space down to the smallest details. Even with the most sophisticated preservation techniques, restoration proved to be a labor-intensive operation because of both the restrictions of the space and the nature of the work. Six-foot-wide doors prohibited driving a crane inside the building, so most materials had to be hand carried, slowing assembly. *Detail* restoration by hand included the 22-carat gold leaf in the coffers of the vaulted ceiling, which was applied in 0.00125-inch-thick sheets by workers standing on scaffolding nearly 100 feet in the air. Plaster replacements for damaged or missing ceiling coffers were cast on site.

Also renewed are the 36 plaster-cast Roman legionnaires (originally intended to be nude, though Victorian modesty required strategically placed shields), who stand guard over the head house.

Lighting was another carefully crafted detail. The architects took great pains to recapture the original flow and washes of light to the head house. The windows, adorned with cast iron grillwork, and the bronze light fixtures also were restored.

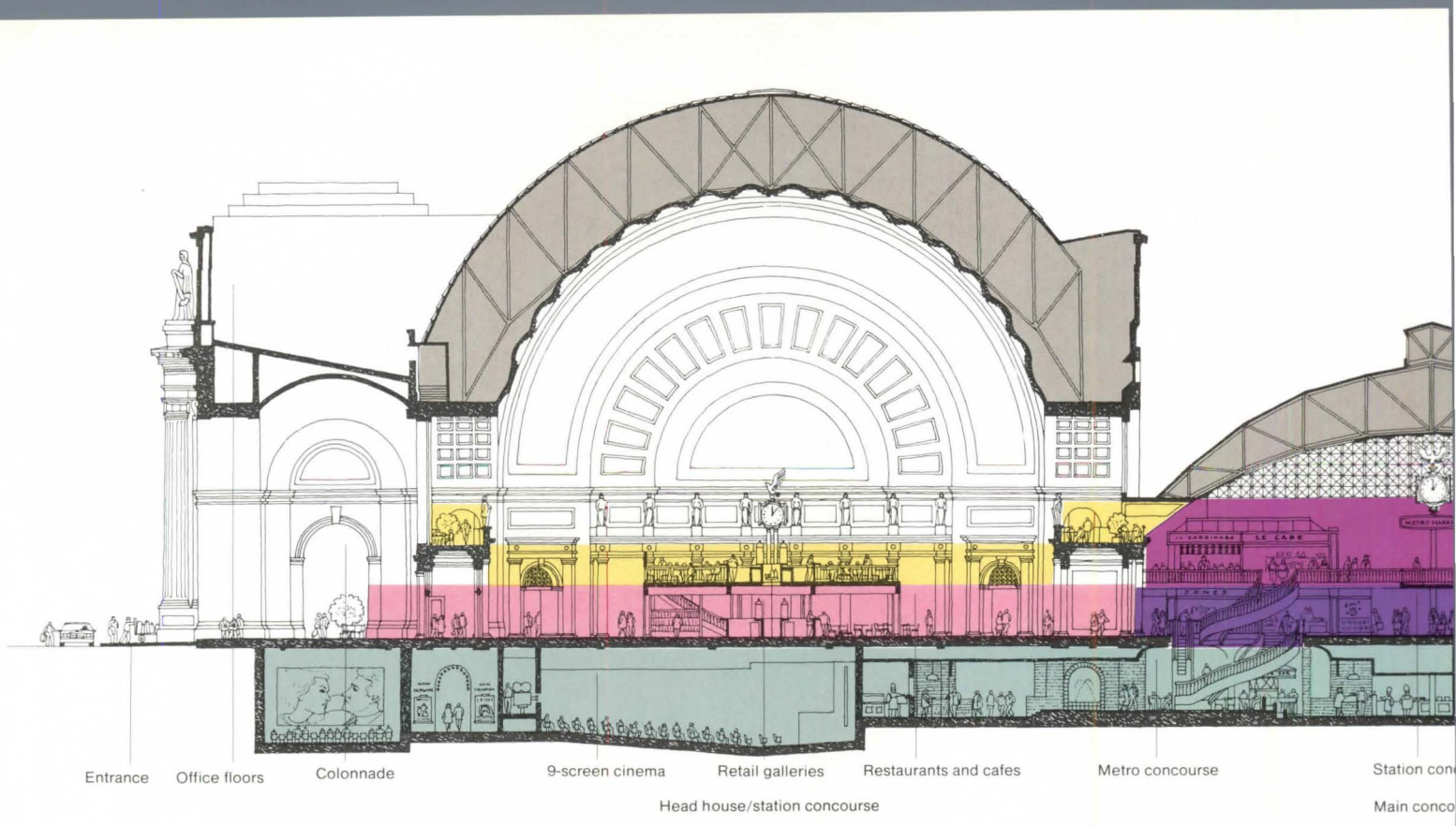
The huge expanse of softly polished marble floor in the head house—24-inch white tiles inset with six-inch red corner dots—now reflects light throughout the space as it did originally. The original floor had been replaced in 1951 with one of terrazzo, which had been carpeted in the mid-'70s. The replacement red marble comes from Vermont, as did the original. The white marble with gray highlights is no longer available in this country, however, so replacement stone was imported from Greece.

The west and east halls, now housing gallery-type shops and restaurants, once again reveal the importance of the tranverse axis in Burnham's original design. The 3,400-square-foot east hall, the station's former main dining room seating 1,000, had columns constructed of scagliola (faux marble of finely ground gypsum mixed with glue and colors) halfway up their shafts. The columns in their renaissance look as good as new and complement the restored hand-painted oil-on-canvas stencil murals that adorn the walls in this space. Layers of paint covering both the columns and the murals were removed during restoration.

Burnham gave plaster a major role in his design to achieve rich, classical detailing at minimal cost. Barianos Historic Restoration Inc., the Washington-based firm for the city's Willard Hotel restoration as well as for Union Station, honored Burnham's legacy with superbly replicated edge moldings, cornices, and medallions screeded and molded on site. The art in Barianos's craft blossomed in the restored Presidential Suite (now the dining room of the Rattlesnake Club restaurant). Plaster panels in the reception room have been painted and daubed to simulate leather wall coverings. In the adjacent Presidential sitting rooms, plaster walls were painted freehand to simulate matched wood paneling, including simulated door sills with mitered joints.

Beyond the interior arches of the head house is the street level of the main concourse, where the serious shopping space begins. Originally an open train shed, this space became overscaled and empty with disuse and was closed in the 1970s. Now, the retail space runs the 600-foot length of the building under the vaulted ceiling about half as tall and more gently arched than that of the main hall. Grillwork-covered windows at the ends of the building further extend the already broad vistas of the space, which is unbroken horizontally and divided in half vertically by the new addition of a second-floor mezzanine accessible by curved "grand stairs" clad in 2½-inch-thick red marble and by escalators at the far ends.

Photographs © Carol M. Highsmith



As the head house is Weese's main masterpiece, so is the two-level shopping and restaurant hall BTA's, echoing earlier successes of the festival markets in Boston, Baltimore, and elsewhere. Called the "main concourse" on the street level and the "shopping concourse" on the upper level, the retail space demonstrates the skillful blending of major architectural restoration with new economic raison d'etre that marks successful adaptive use. More casual than the main hall, it is nonetheless visually commanding in its own right. Old plays with and against new—the white marble floor of the main hall flows into gray in the main concourse and on the upper level. Balconied walkways present plenty of opportunities for sight lines between the two levels, as well as views into the head house. Longitudinal glass sections in the ceiling were replaced with historically accurate wire glass, and fan-shaped recesses near the top of the south wall were opened to make interior windows that look across the head house toward the Capitol. Recessed fixtures strategically placed behind storefront roofs backlight the coffered ceiling at night.

The storefronts on the mezzanine level are carefully designed to underwhelm the grand space. Their sloped-glazing roofs slant from the nine-foot, 10-inch entryways up five feet to the painted steel demising frames, behind which is a bulkhead wall (not visible from the floor) that conceals the mechanical equipment for the stores. It appears as though the glass pours down to the frame, gracefully bridging the height gap from the "street level" to the soaring ceilings of the existing concourse.

BTA's project manager, Philip N. Loheed, AIA, describes the design intent of station's new elements: "The demising frames, railing designs, stairs, and so forth are intended to have a character compatible with the fact that the space was originally a train shed—the painted steel is related to the notion of substantive material that one would expect to find in a train station. But beyond that, the character of the space also intends to achieve a certain sense of finish and historic detailing that is compatible with the work that Burnham did. The key phrase is 'sensitive neutrality.'

"There are basically two schools of thought on restoration work. The Department of Interior's view is that whatever you add to a historic building should obviously be new and different from the historic fabric. The corollary to that view is that you preserve the historic fabric in an almost archeological manner—you don't rewrite history. The Historic Preservation Review Board, on the other hand, holds the theory that new elements should be 'closely compatible' with the historic fabric—they don't mind design attitude on this project is closer to Interior's argument."

The storefronts vary in appearance and materials, but virtually all conform to the criterion of 85 percent tranparency, achieving what Loheed terms a "crystalline" feeling. In addition to glazing percentage requirements, BTA developed an extensive set of tenant design criteria for architectural, electrical, plumbing, and mechanical elements.

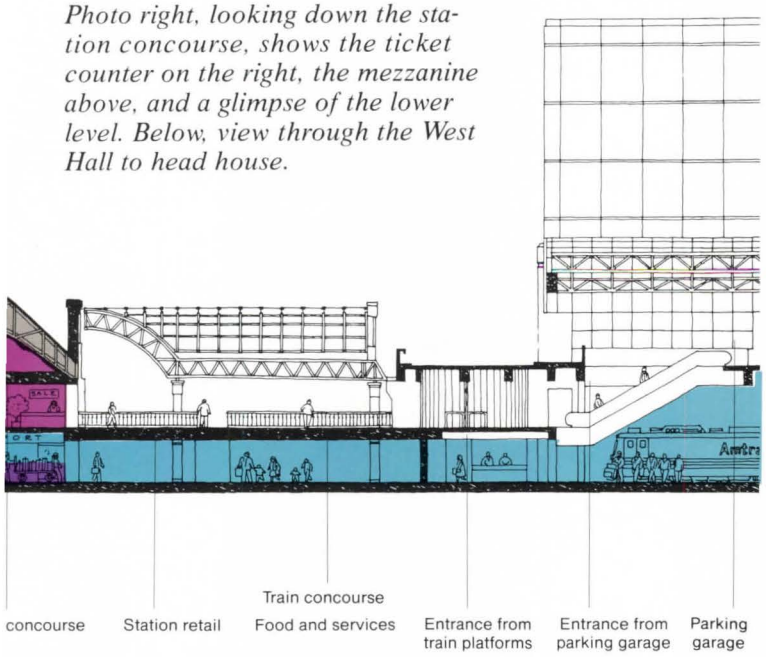
"There were several instances in which we negotiated designs on a tenant-by-tenant basis, especially for the major restaurants," says Loheed. "The tenant, who is required to work with a registered architect, often begins by bringing a preliminary sketch to WJE's landlord coordinators. Two formal submissions then are required—a schematic design and working drawings. BTA works as a sort of design consultant. We start with the formal criteria and, if necessary, hold a series of design conferences with the tenant, negotiating until we get a design that works to our satisfaction and theirs." BTA also designed the interiors for some key retail spaces and the fixtures and furnishings for the east hall gallery shops.

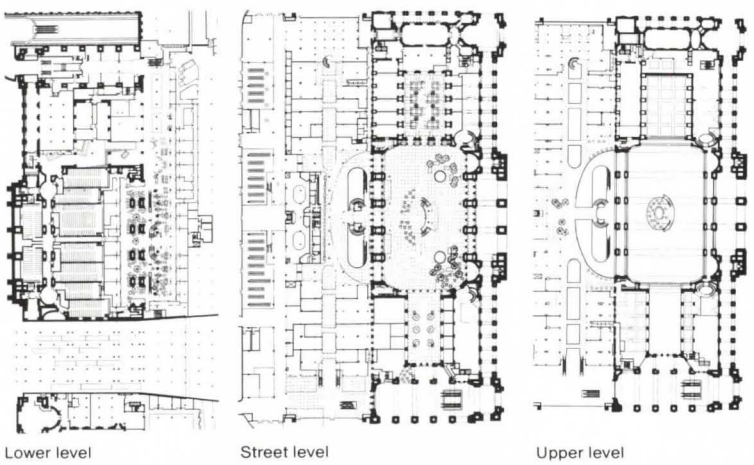
The marketing strategy of the Union Station retail space, in keeping with BTA's experience in similar projects, includes more than 100 stores and five major restaurants, with no large department store to serve as an anchor. Evidently, the strategy works. A month before the grand opening, LaSalle Partners had a 90 percent commitment to lease. "We like to have local stores," says Jonathan F. Bortz, a LaSalle vice president. "Because they're often slow to lease, we held space for them."

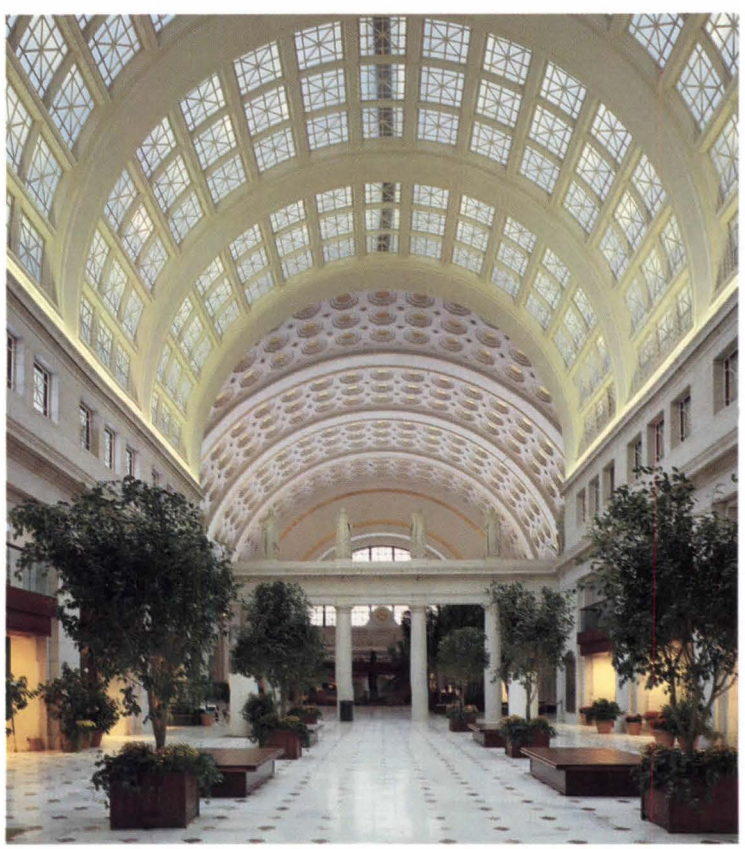
The visitor moves sequentially from the restored hall through the adapted retail space, past the 20 ticket counters arranged in airline-ticket servicing style, to the newly built train concourse—a contemporary, skylighted and barrel-vaulted design linking the historic station buildings to the now completed garage. (The five-level garage for 80 buses and 1,300 cars looms behind the station with its hulkish, square-jawed mass, a permanent reminder of the former visitors center.)

What is now the new train concourse was an open courtyard. Although hidden from street view, its massing and materials are complementary to and respectful of the station. Passengers entering the front of the station (where taxicabs rule the labyrinthine semicircle of Columbus Plaza) gain access to the train concourse through the main concourse, passing below the shopping mezzanine. Two other main access paths are down a glass-covered arcade from the parking garage and up through the lower level from the subway station that is adjacent to Union Station on

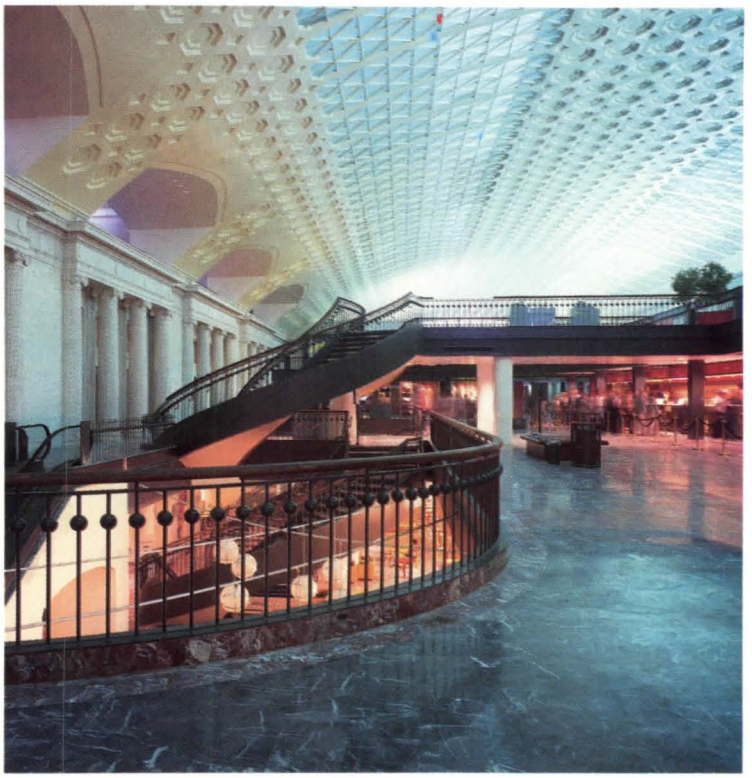
Photo right, looking down the station concourse, shows the ticket counter on the right, the mezzanine above, and a glimpse of the lower level. Below, view through the West Hall to head house.







Photographs © Carol M. Highsmith



of Amtrak passenger facilities and public space. Amtrak also occupies 100,000 square feet of office space on the upper floors of the main building, with interiors by the Washington firm of Vlastimil Koubek, AIA.

The lower level of the station adds another dimension or two to the visitor's shopping opportunities. Open to the public for the first time, this level—called the Metro concourse because of its direct connection to the Metro subway station—is similar to a number of successful commercial tie-ins to subway stations around Washington. The hallway adjoining the subway houses a bank and other service facilities, while the main space is filled with convenience shops and eclectic food vendors, all designed to appeal to commuters on the way to work, on lunch break, or on the way home. The entrance from the subway to the lower level was achieved by removal of the middle existing escalator from a set of three that connected the subway station to the Union Station carriage porch one level up.

Once a warren of offices, storage space, and a holding area for immigrants, the lower level originally had little of the ornamentation found just above on the ground level, although Burnham did propose a Turkish bath that was never built. The metamorphosis into a public space required dropping the floor three feet to make space overhead for mechanicals. This was a minor problem, because the massive, corbeled masonry piers go down 20 feet into the ground beneath the lower level. Enhancing the appearance was a matter of encasing columns in concrete (mostly to align column edges), roughing out storefronts for finishing by tenants, and reshaping passageways with plaster on expanded-metal lath and sheetrock on steel studs to emulate the stone arches and imitation vaulting one floor up. Clean white tile punctuated with vibrantly colored and fanciful depictions of fruits, vegetables, chickens, etc., allow no mistaking what purpose the food court serves.

Additionally, the Metro concourse houses nine movie theaters—2,000 seats in 38,000 square feet—with a popcorn concession open to passersby. The theaters, tucked into the farthest reaches of the station's lower level, are a BTA-"found" and -designed space. They also were at the forefront in terms of engineering considerations. A tunnel bringing trains under the station's east side could have caused obtrusive vibration in the theater immediately adjacent. To isolate the theater from the tunnel, structural engineer Tippetts-Abbott-McCarthy-Stratton (TAMS) floated a reinforced concrete slab on a 2x2-foot grid of 1¼-inch-thick neoprene pads covered with clip-joined plywood and sheet cork.

"Isolating the slab was only one of the challenges for TAMS,"

says Duvall. "The existing columns had to be strengthened to accommodate loads from the new mezzanine level, and the engineers also had to design a cantilevered system of beams so that columns could be realigned to allow clear views in the theaters." (The workload on the engineers was lightened somewhat by the good structural condition of the existing building and by the fact that most of the 58 different roofs had been repaired, under the auspices of the Department of the Interior, by the time the project was under way. Over the main waiting room, a new roof of plywood sheathing topped with terne-coated stainless steel was installed, and the vault of the concourse was reroofed with an elastomeric membrane. Glass clerestories in the concourse monitor were replaced with corrugated glass fiber panels.)

Altogether, Union Station comprises some 607,000 square feet sited on 12.5 acres and carries a price tag of approximately $150 million. About $110 million, for the restoration of the historic building and construction of the train concourse and parking garage, is provided by Amtrak and by public funding. Union Station Venture and the retail tenants are kicking in about $40 million for construction and improvements in the retail amenities. The effective owner of the building is the U.S. Department of Transportation; however, the federal government has no responsibility for maintaining the building. Amtrak areas are managed through leasing agreements with the Terminal Realty Baltimore Co. and the Terminal Realty Penn Co., an affiliate of the Penn Central Corp. The other spaces are managed by USVL under a master lease from USRC.

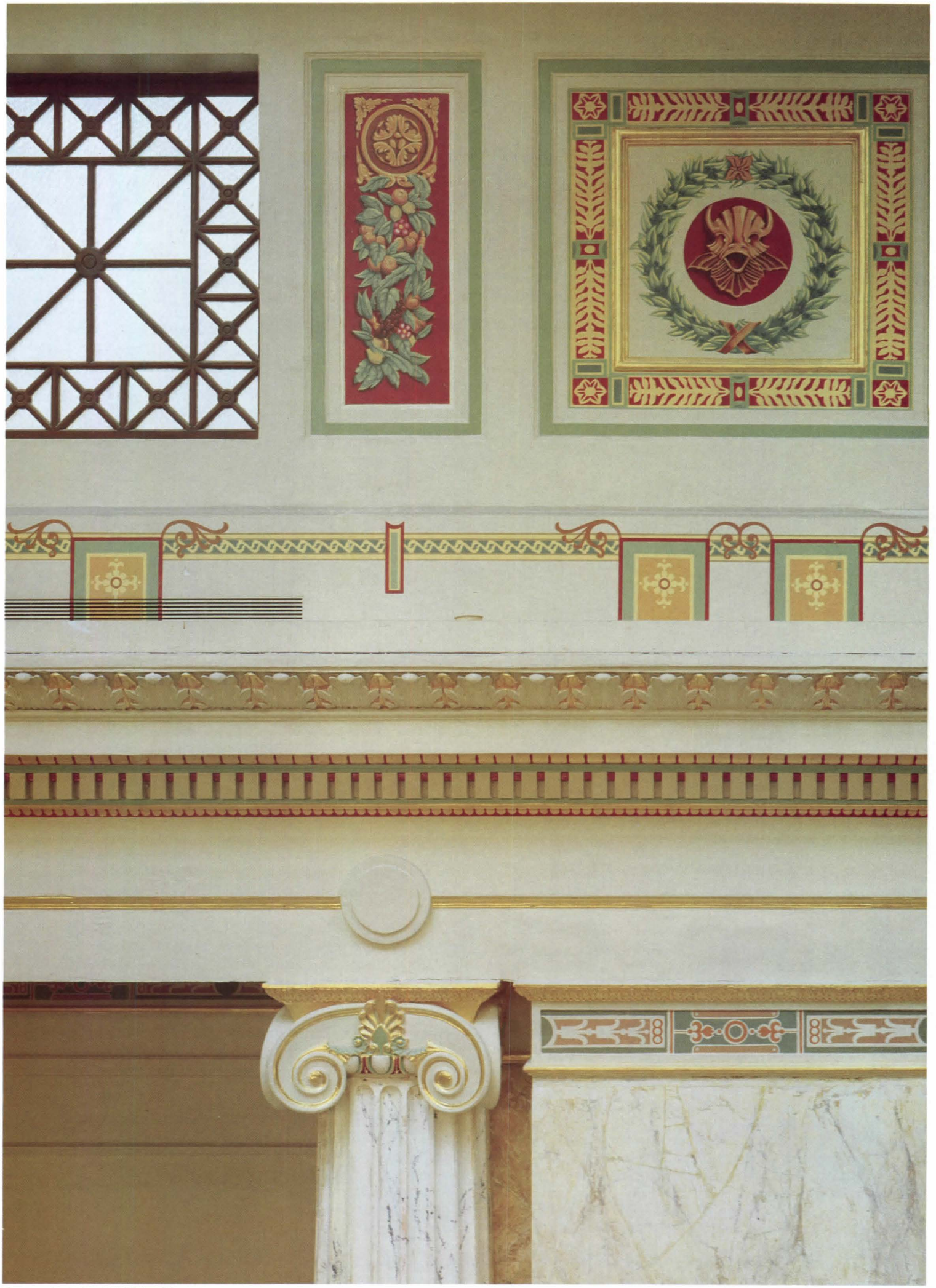
"From an economic perspective, I think the most exciting part of this project is that it is a very substantial public/private partnership," says Jonathan Bortz of LaSalle. "Obviously, from the private sector's side, our interest is in saving the building and making it a part of the social and cultural environment of Washington. But, of course, we're also in it to make money—and we

Restored East Hall, above, with movable display cases for boutique merchandise, doubles as a banquet hall. Right, details in East Hall include hand-painted murals and scagliola columns.

tor will participate in 50 percent of the success of the project, because of the lease that provides for participation in cash flow of the project payable to the government as rent. So, the more successful we are, the more successful economically the public sector will be."

Union Station is expected to draw 15 million to 20 million area residents and visitors annually, and already sprouts of neighborhood rebirth can be seen in the surrounding area. Bortz says, "There is a program for the post office [another Burnham building just across the street, west of the station] being finalized that would redevelop that property into 750,000 square feet of office space, and there is a spec office building one block from the garage for which space is already being leased. Behind the post office, there are plans for an office for the Council of Governments and other office buildings. On the east side of the station, the Architect of the Capitol is seeking final approvals from all the agencies involved for a 600,000-square-foot federal office building. The site directly adjacent to the station on the east side, owned by CSX, currently is planned to develop something on the order of 1 million square feet. We expect this trend to continue to accelerate."

Keith Kelly, president of USRC, sums up the team's feelings toward the project: "We are well pleased with the efforts of all involved to create a workable train station and a showpiece that Washington can be proud of. I think Mr. Burnham would be proud—proud of the way his building has held up, and proud of the way it has been restored. We were thrilled to have the challenge of re-creating one of his greatest works. I think we all have lived up to that challenge, but the proof of the pudding



Photographs © Carol M. Highsmith

Heritage

The Diner Was There; It's The Large Building That's New

Photographs © David Todd

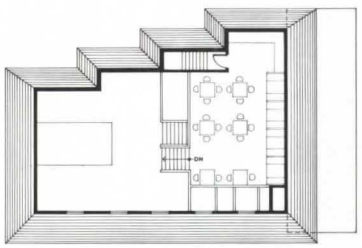
Larry's Diner was a landmark on the Post Road in Fairfield, Conn., from the day in 1927 that it arrived at the railroad station on its own wheels. The steel-frame building with its wooden barrel-vault roof was wheeled into place on a Fairfield street corner and opened for business, wheels still on. In the 1950s it was moved a block and the wheels disappeared, and in 1986 it was moved again to make way for a new office building designed by Mark P. Finlay Architects of Fairfield. Finlay and his client offered the diner to the Smithsonian Institution, which declined, and it was put up for sale under the condition that the buyer keep the diner in Fairfield, restore it, operate it as a diner, and retain the name.

Developer Ross Proctor, who had restored another diner, the Elm City, in New Haven a few years earlier, bought Larry's and asked Finlay to expand it into a new restaurant/night spot. One of the few available sites near the Post Road was a block from where the diner originally had stood and right across the street from the Fairfield train station. The diner couldn't have found a more congenial spot. The train station suggested to Finlay an architectural strategy for expanding the diner and an appropriate response to nearby turn-of-the-century wood-frame houses. The glossy painted diner now appears to be parked in front of a classic railroad station, with its red clapboards, green roofs, and bracketed awnings.

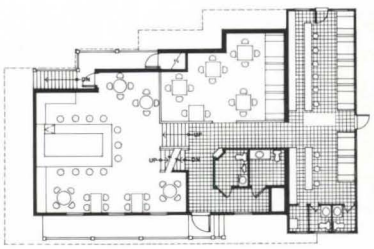
After 60 years of service, Larry's Diner was short on charm but had plenty of grime. "It was a real greasy spoon, Coke-Pepsi' kind of place," recalls Finlay. The mahogany-trimmed interior was basically intact, although the floor was nearly rotted through, and what couldn't be saved at least suggested what should replace it. The original metal ceiling was painted, and the wood strips cleaned and refinished. The arched windows were fitted with new stained glass, and the stainless steel hoods refurbished. The original upholstered benches had seen better days (before they were covered with Naugahyde), so new mahogany benches replaced them. The stainless steel stools, salvaged from a New Jersey diner of the same period, were blackened with age and so were ground clean, polished, and painted. From the marble-topped counter, which originally ran the length of the diner, Finlay removed a section to gain access to the addition and added a little sparkle at the corners in the form of illuminated glass block.

The new tile work is a slightly larger design than the original, and that's to prepare you for the larger scale of the rest of Larry's, which is a remarkable contrast to the tight little railroad car that leads to it. The restaurant is a triple deck of space, with a small dining room directly behind the diner, a large room with freestanding bar a half-flight up, and another dining room another half-flight up. The space balloons up under a stepped, pressed-tin ceiling and is crowned by a cupola. —Michael J. Crosbie

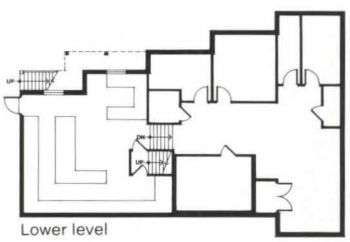
Top, sexagenarian diner sits beside its new addition, which



Upper level



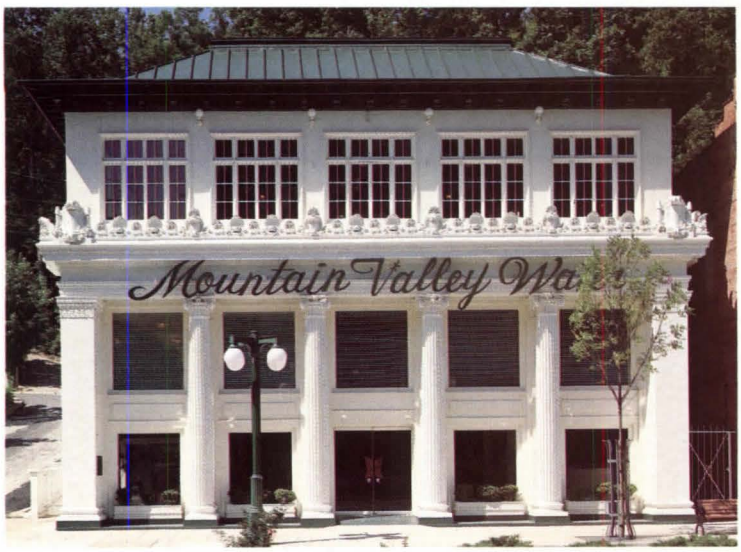
First floor



Lower level

Above right, diner's renewed interior with mahogany benches and trim, salvaged stools, and new tile work. A cut through the counter leads to addition, right, with free-standing bar and reproduction of diner's original neon sign.

A Company Comes Home to Splendidly Restored Quarters



At the turn of the century, Hot Springs, Ark., was a world-class resort. People from all over the country flocked there to take the natural hot springs mineral baths and to drink the water, which was said to cure various ills such as rheumatoid arthritis and bursitis. Gambling abounded, and the town became a popular playground for gangsters. But the town began a rapid decline in 1967 when illegal gambling casinos were shut down by Gov. Winthrop Rockefeller. Now the renovation of and addition to the Mountain Valley Water building signals the revitalization of this town of 37,000 and heralds the return of the nation's oldest water-bottling plant to its roots. In 1966 the Mountain Valley Spring Co.'s headquarters had moved from its original location in Hot Springs to New Jersey after a change in ownership, but the 1987 acquisition of the company by Sammons Enterprises of Dallas has brought it home again.

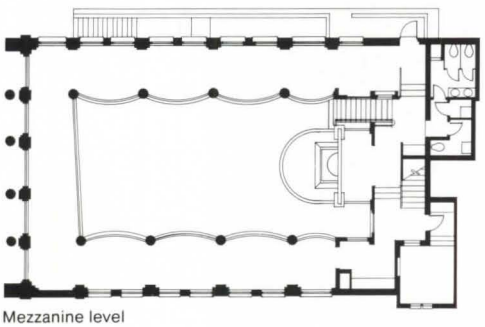
After years of neglect and sporadic cosmetic surgery, buildings in this quaint town are now starting to receive the restorative attention they deserve. The catalyst of this development is a 1910 white brick classic revival building of superb street-front proportions. This seems appropriate in a town that has made its living primarily through its water, for the building is regarded by the renovation architects, Bob Kempkes and Anthony Taylor, both of Hot Springs, as a temple to mineral water, situated as it is over a still-operating spring. The architects say they persuaded Mountain Valley Spring to restore the building, something the company was not sure it was willing to do. The building had harbored the company since its founding merger with DeSoto Mineral Springs in the late 1920s, and the architects suggested

ing, located within a national historic district, is distinguished by two square brick corner columns that bookend four fluted Ionic terra-cotta columns. Their cornice is surmounted by a row of elaborate, high-relief, cast acroteria with elegant cartouches at each end. Five bay windows on each of the three levels face the street.

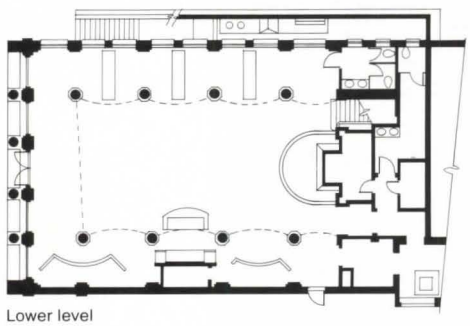
In restoring the front, it was decided early on that, because of a tight budget and out of respect for the building's original exterior, much would be left as it was wherever possible, leaving the architects to concentrate on cleaning and redoing only as necessary. The architects, finding the facade of glazed brick in such disrepair that it had to be replaced, repainted the front in three subtle shades of white. The acroteria had seriously spalled and were painstakingly restored, and much of the terra-cotta was broken and had to be patched or replaced. The roof of galvanized tin is original. It has an overhang for guttering all the way around the building. A local tin shop was able to replace the original guttering where needed.

The jaunty, incongruous Mountain Valley Water sign of enameled stainless steel, placed above the doors in the late 1940s or early 1950s, required only a new paint job. The sign's having hung above the doors for more than 30 years seemed reason enough to the architects to let it remain, and the decision appears to be the right one. Remodeling in the 1960s resulted in more incongruities, including double glass doors with amoeba-shaped pulls and unsegmented second-floor and ground-floor aluminum windows. (The third floor retains original glazing with mullions.) The architects say they like the existing windows and doors, which

Facing page, clockwise from top: mezzanine of Tuscan columns and bowed, cherry wood railings surrounds two-story lobby space; refurbished, handpainted globe of stained glass adorns third-floor office lobby that originally housed a dance hall; restored, white brick, streetside facade. Right, third-floor executive office.



Mezzanine level



Lower level

visitors into the ground-floor exhibits. The focus remains on water, not on the architecture.

In the two-story lobby, dominated by large, evenly spaced Tuscan columns, the architects pulled off vinyl tiles to reveal one-inch hexagonal tiles set in concrete. Because of the difficulty chipping out the tile, only in places where cracks were especially bad was tile replaced, such as along obvious settlement lines. Showing the age of the floor retains something of the building's character. Refinished cherry wood railings gently bow out from either side of the columns on the second level.

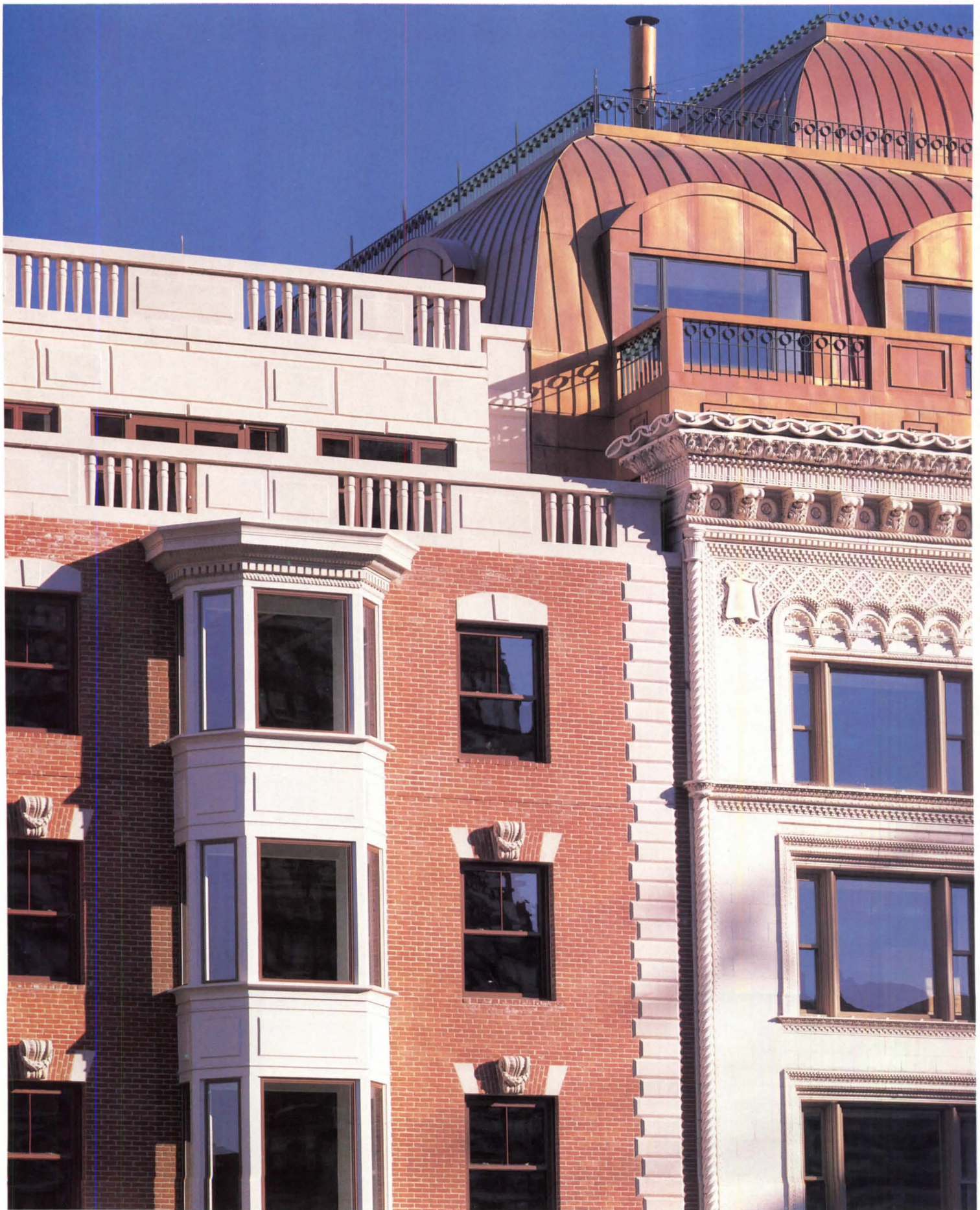
Ringing the first floor are rather lackluster exhibits about the company, the surrounding area geology, and the building. Fortunately, these displays are temporary, and the architects are working on plans to bring the exhibits to life. The best exhibit is a hydroponic garden in which plants receive sunlight, air cooled in the building's cellar, and nutrients from water from the spring underneath the building. Called the DeSoto for the building's original name, the spring also heats and cools the rear addition. A cascading waterfall, designed by Kempkes and Taylor and faced with glazed brick salvaged from the front, is the lobby's focus. The architects liked the many water images they found throughout the Hot Springs area, and they wanted people to hear trickling water as soon as they walked into the building.

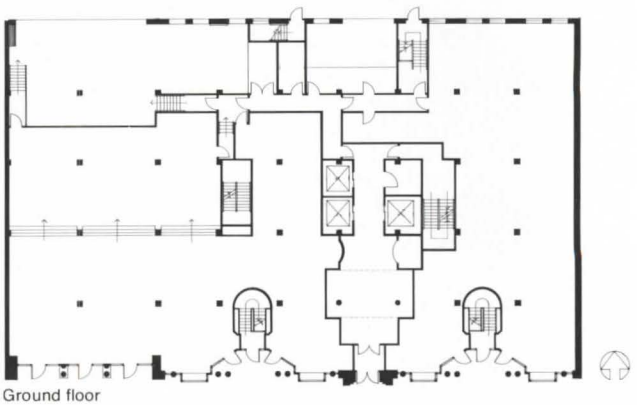
The company's administrative offices on the second floor mezzanine are arranged in a nine-foot-wide swath of open-landscape office space. (Although workers feared a lack of privacy, there have been few complaints since the low partitions were installed.)

A rooftop dance pavilion was enclosed as a third floor in 1921 to become a luxury dance hall with an Oriental motif. More recently, the third floor was closed off, boarded up, and used as a mechanical equipment room. Now it contains executive offices. Original pagoda lanterns and chandeliers and a stained glass globe more than three feet across were carefully refurbished. The globe, suspended over the center of the floor, contains several hundred pieces of glass depicting dancing nymphs with handpainted faces. Original ceiling stencils in seasonal Oriental images were restored, as were the maple flooring and wooden latticework in period decorative style. The architects organized the offices so that everyone on the floor can see the globe.

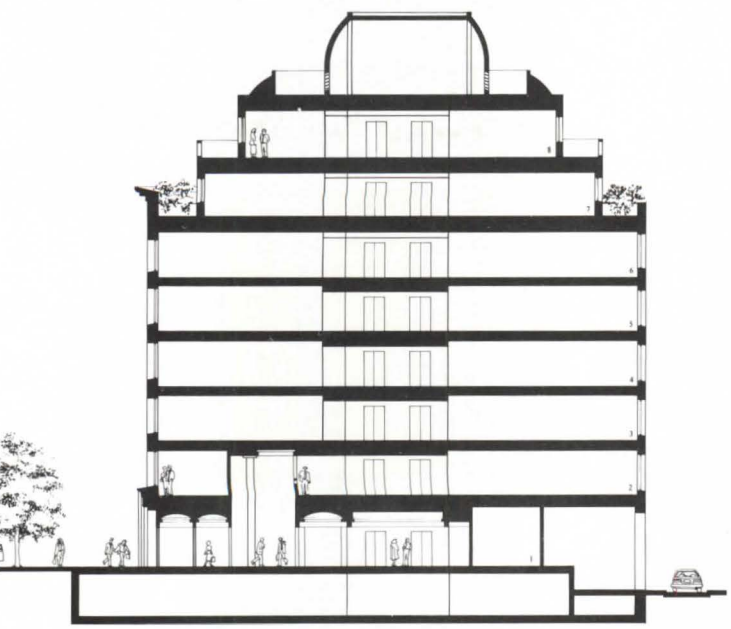
The architects extended the third floor in a rear addition that looks as if it might always have been there; they kept the original walls and created more space from a former parking level above one part of the building. Directly underneath the addition is a crawl space housing the heating and cooling equipment and ductwork. With this addition, the architects were able to concentrate more craft on the new part of the building, designing light fixtures, tables, and cabinetry. The conference room contains built-in cabinets and a custom-designed conference table made of Arkansas walnut with leather inserts. The president's office faces a small, courtyard-styled patio decorated with native plantings. The decision for a garden off the president's office was made after the area behind the rear addition was deemed too small to expand into a parking area. Since there was already a parking lot next door, this was not a problem. A retaining wall behind the building sets up the private space, which overlooks a national park. The executive vice president's and president's offices are furnished in period antiques; the president's also contains lantern-style ceiling fixtures. —Amy Gray Light

Greenhouse-like Penthouse Built Atop a Boston Building





Ground floor



A new two-story penthouse stands atop an older building with something of the bulbous grace of a Victorian greenhouse in this outstanding renovation in Boston's Back Bay. The penthouse echoes the curvy, tiered shape of such a greenhouse—Decimus Burton's conservatory for the Royal Botanic Gardens at Kew, England, perhaps—and its copper skin is light, crisp, and reflective like those Victorian glass skins. When the copper turns green, the likeness to a greenhouse or winter garden will increase.

The penthouse is the most striking element in a complicated recycling. Two old buildings plus the penthouse have been combined into a single new office building, known as the Grant Hoffman Building after its developers.

The larger of the old buildings is the one that supports the penthouse. Its very handsome white terra-cotta facade, designed by architect Clinton J. Warren in 1903, is the only known example of Chicago-style office fenestration in all of Boston. The problem for today's architect—Richard Bertman of CBT/Childs Bertman Tseckares & Casendino—was to add floor space without disturbing Warren's facade. Working with the preservation mavens of the Boston Landmarks Commission and the Back Bay Architectural Commission, Bertman chose to leave the terra-cotta facade alone and self-contained and to create something very different above it—with enough setback so that, from the sidewalk, the new penthouse is invisible.

Behind the terra-cotta, which was restored, everything was gutted and rebuilt. To complicate matters, a three-story, brick-fronted building next door—on the left as you face the facades—was demolished and replaced by a new seven-story building, which at its interior is simply an extension of the floor plates of the terra-cotta building but on the exterior is separately expressed. There's a special twist here: the facade at the first three floors of the new brick building replicates the facade of the one they tore down. Got it? In Boston, history matters.

The rest of the brick building's facade is Bertman's sympathetic invention, as are the shopfronts of the terra-cotta building. And there is a fine new lobby that serves the entire complex.

—Robert Campbell, AIA

This page, 'after' (top) and 'before' photographs show that the renovation architect added a two-floor penthouse to the building with the terra-cotta facade. The brick-fronted building to its left seems to have gained three full-site floors plus a set-back penthouse, but in fact this is all-new construction.

An Addition of Character to The Chicago Historical Society

The Chicago Historical Society's requirements for an addition were straightforward: 50,000 square feet of underground space for storage. The solution by the Chicago architecture firm of Holabird & Root meets those storage requirements and much more: the architect created a totally new and dynamic image that invites passersby in, dramatically celebrates the colorful history of the city, and satisfies the needs of the Historical Society's staff.

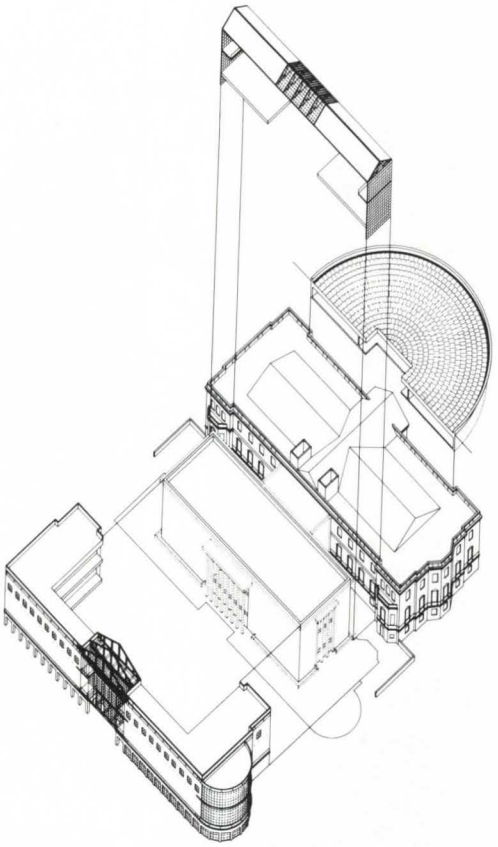
The headquarters is a 1931 Georgian revival, 105,219-square-foot brick building facing Lincoln Park. In 1971 a 53,875-square-foot addition was built behind the original building facing west onto Clark Street. Designed by Alfred Shaw & Associates, this classical revival addition had a mausoleumlike limestone facade that turned all but the most unintimidated visitors away. A corridor awkwardly linked the old and new. In the opinion of Holabird & Root, the 1971 addition failed miserably to meet the Historical Society's need for a public posture and had to be changed or eliminated. The task was complicated by the building's location on city parkland. Any addition would be severely limited in size and site.

Under the direction of Holabird & Root's Gerald Horn, FAIA, the fortresslike 1971 section was completely hidden by a new, U-shaped, bricked addition. Contained within it are the much-needed spaces for staff offices as well as a new public corridor. To bring unity back to the complex, the new building gently echoes the original in materials and vertical bandings.

The new Clark Street facade welcomes visitors under an arcade with display windows on its northern half and encourages gift shop browsers through display windows on its southern half. Between is a beckoning main entrance, built of steel trusses with a peaked steel pediment. Festive banners hanging from the trusses announce special events.

The most intriguing part of the addition is a three-story, glassed-in prow that faces south to North Avenue and becomes a dramatic end piece where Clark Street northbound jogs to the west. Outside and inside, the prow is a dramatic celebration of light with a two-story public restaurant next to the museum store and a staff lounge on the third floor.

To tie the wraparound addition elegantly to the 1931 building, atria were added on each side of the connection, which then was opened to the atria. Inside, the brick exterior walls of the 1931 building remain exposed. This newly created three-story space can contain life-size exhibitions such as "The Chicago Street: 1865-2000," a full-life display of Chicago then and now showing the evolution of paving, streetlights, entertainment (an old neon movie marquee), and vehicles. (Oversized displays can now be brought in through a 10x14-foot opening in the north wall; before, parts of walls had to be dismantled.) Steel trusses,



Above, axonometric of 1931 building on right, 1971 wing in middle, and additions—a U-shaped buiding, an atrium insert, and a semicircular plaza and underground storage. Facing page, the new Clark Street facade envelopes the 1971 wing. Top, the prow's interior; center, the new entrance at night; above, the lobby's main staircase as seen from the second floor.

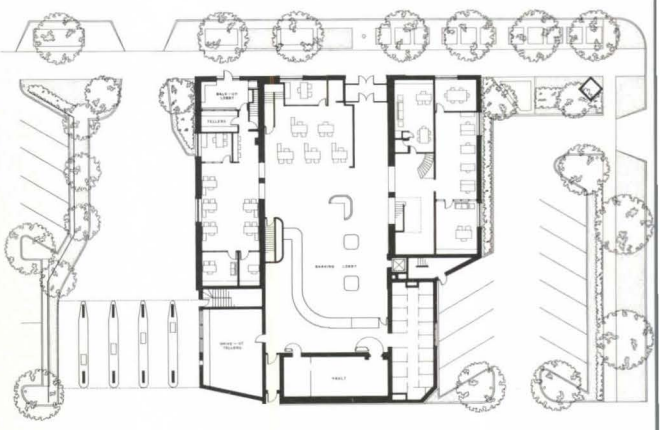
echoing those of the main entrance, tie the new atria together above the connection.

Just beyond the entrance to the 1931 building (which now is used only for special functions) a semicircular granite plaza was created. It is a weatherproof top to 15,000 square feet of new underground storage space, but it also doubles as a plaza for special events, with views of Lake Michigan and a statue of Abraham Lincoln, the park's namesake. Additional storage space was formed by inserting a mezzanine floor between the third story and roof of the 1971 building.

The wraparound addition increased the complex's square footage by 37,064, including new office space for the museum's curatorial staff. Formerly crammed into exhibition space and hallways, staff members now have adequate offices and laboratories throughout the complex, including state-of-the-art costume and paper conservation laboratories.

Most delightful, though, is the generous natural light that, where appropriate, floods the new interior. The three-story, glass and steel-trussed entrance admits abundant light into the main lobby, a tremendous three-story room with a grand stair rising from west to east. This stair works to establish the east-west axis that terminates in the grand stair of the 1931 building. The north and south walls are tic-tac-toe display cases, with each square designed for a separate exhibit.—Nora Richter Greer

Imparting Suitability to a Bank In the Town Wright Made Famous



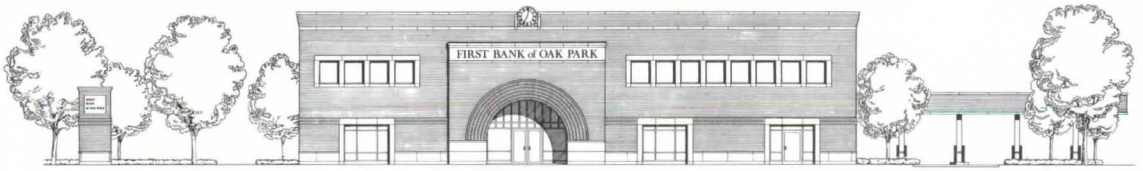
Left, three storefronts were transformed into a cohesive whole, with an arched entrance as the focus. It stands where the former entrance did, although the facade was granite and glass, below. A new brick and limestone wall, right, hides the former facades of granite and glass and masonry.

The Chicago suburb of Oak Park is known internationally as an enclave of Frank Lloyd Wright architecture. Yet in close proximity are dreary commercial strips of 1920s vintage, made all the more mundane by noncontextual additions from later years. Now, however, a new stylistic precedent has been set for the strips—an architecture that borrows forms and images from the past, that entwines old buildings together behind a new facade, and that challenges others to respond in like elegance.

Since the 1960s the Oak Park Bank had occupied a 50-foot-wide building fronted by four- to eight-inch granite. On each side of the bank were 25-foot-long masonry storefronts, which the bank had acquired. The Chicago architecture firm of Nagle, Hartray & Associates was hired to tie these buildings together into a cohesive, 20,000-square-foot bank facility. For the new facility, firm principals James L. Nagle, FAIA, and Dirk W. Danker, AIA, borrowed from the esthetic of such Chicago School architects as Purcell & Elmslie and Louis Sullivan, an appropriate choice for a design-conscious town.

Basically, a new masonry wall was wrapped around three of the four exposed sides of the abutting buildings. The fourth, a masonry wall that overlooks an alley, was mended and painted. This wraparound immediately tied the exterior together. Difficulties in connecting the brick to the granite were solved by sinking below the sidewalk line six-inch-wide concrete blocks upon which the new brick exterior wall was set.

The entrance remained where it was on the granite facade but, in the new design, became a graceful, 12-foot-tall archway. The entrance was further accentuated by setting the arch within



a slightly raised masonry block, outlined at top and bottom with limestone. The front and side facades are punctured with bands of windows set on the second floor over pairs of windows on the first level. The banding on the second floor gives the bank a distinctive character and was accomplished by laying steel strips vertically above and below the windowpanes. The numbers of windows in each strip are purposely varied, as are the numbers of paired windows below the strips.

Tying the entire facade together are a footing of limestone, a subtle strip of two bricks set vertically end to end that runs along the upper edge of the first-floor windows, and a corbel outlined by limestone in which layers of brick are progressively pushed forward as they rise. A decorative clock sits directly above the arch at corbel height. Since the bank is bounded by parking lots and a drive-in on the two sides, its future as an unattached building is secure.

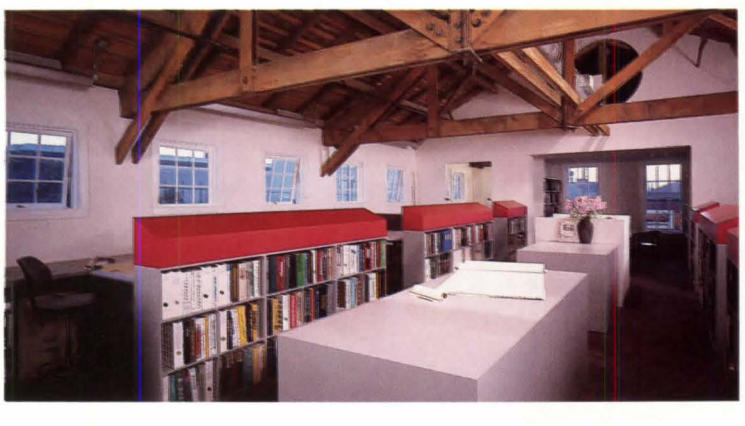
Inside the arched entrance is the main banking room with its teller stations. A vault runs along the back wall. To either side offices run the length of the building. On the second floor are the bank executives' offices. To reflect the openness of this community bank, private offices are glassed in; this also allows natural light to penetrate deep into the interiors. The interior spaces were formed by punching openings in the two-foot masonry bearing walls, a process that in some spots called for internal structural work.

Inside and out the bank has been successfully transformed from a set of disparate parts to a cohesive, welcoming whole.

—Nora Richter Greer

A Combination of Old and New Recalls a History of 'False Fronts'

Steve Proehl



Jane Lidz

Jane Lidz

Top, the Iron Works, elevated freeway, and downtown Oakland beyond. Left, Dommer Associates' offices within the complex.

The Oakland Iron Works retail and office complex, by Don Dommer Associates, is a distinctly original example of where the historical preservation instinct can lead.

A 300-foot-long block of buildings near the Oakland, Calif., waterfront, dating from the 1880s to the 1920s, had grown up to house the Oakland Iron Works, one of the city's more prosperous industrial enterprises during those years. After a final spurt of productivity during World War II, the company shut down in 1955 and, like much of the once-booming area around it, fell into decay. This half-abandoned ex-industrial district was lost between the elevated freeway that cut it off from downtown Oakland (which has its own problems) and the city's still-unrealized dream of a thriving waterfront restaurant and tourist precinct called Jack London Square.

The block of buildings was purchased by a major retail developer in 1975, who got its key building listed on the National Register of Historic Places. With tax credits thus assured, he began work transforming the buildings into new shops and offices. Unfortunately, in the process, the facade of one of the old buildings was destroyed. After that, tax credits for all but the original landmark building were withdrawn.

Frustrated by this development and by the controls imposed by genuine historic preservation, the owner decided to demolish all but the big north-corner foundry. But the architect managed to persuade him to rebuild the streetfront south of this one remaining authentically old structure.

The result is unlikely to fool anyone, since the four pretend-old buildings are obviously new constructions in which 19th-century industrial recollections (gable ends, wood siding, steel and painted fashionable colors. But then, such "false fronts," rising flush from the sidewalk line, are part of the very tradition this "Old Oakland" row is trying to recall.

The one genuine piece of the complex, a 100x100-foot, triple end-gable set of sheds at the north end, has been impeccably restored on the exterior (a sliding metal door was left on its tracks alongside the reglazed entry bay) and on the inside has been stripped to reveal the handsome original roof trusses and framing. Lighting is industrial; ducts and piping are exposed. The second-floor office spaces (25,000 square feet)—new floors, old roofs—are continuous behind the facades and are full of wonderful surprises. The rear wall of the entire complex is faced in corrugated metal and painted gray, with one inset balcony per building unit looking over the parking lot.

So far, most of the ground-floor space (30,000 square feet) has been taken by discount furniture outlets, like similar popular stores on adjacent streets. Folding futons and stacking lawn chairs are a far cry from the marine boilers and custom-made mining machinery that once filled these walls. But anything that will help keep Oakland commercially alive between the Interstate and the Inner Harbor is welcome. Even more welcome is Don Dommer's part-real, part-fantasy salvage job on a piece of history in a city that, unlike its past-obsessed neighbor across the bay, often seems to forget it ever had one.—David Littlejohn

Mr. Littlejohn is a professor of journalism at the University of

Elegance Returned to an Opera House in a Tiny Town

Sandwich, Ill., is a farming community of 5,000 people located 60 miles southwest of Chicago. The town was incorporated in 1860. By 1878 Sandwich had built a rather elaborate City Hall and Opera House. The first floor has continuously served as the center of government, but the once-popular Opera House on the second floor fell onto hard times and was abandoned by the late 1930s. During the 1950s the neglected theater was used as a firing range for the city's police department.

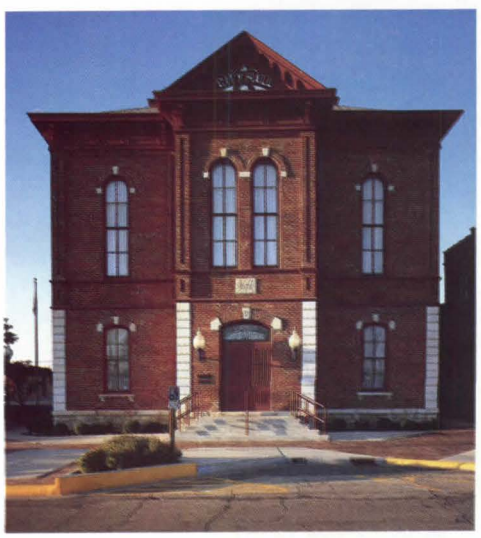
Now, after a 50-year hiatus, the Sandwich Opera House has reopened to rave reviews. Returned to its turn-of-the-century form, the 305-seat hall is the centerpiece of a $1.7 million restoration and addition by Dixon Associates of St. Charles, Ill.

The architects incorporated sophisticated acoustic and lighting systems within the historic fabric of the space and discreetly tucked a new elevator under the original balcony. They also replicated a walnut staircase that had been removed during an unsympathetic remodeling in the 1950s. Wall and ceiling stencil patterns and the original palette reflect the appearance of the theater in the 1890s. Existing 12-foot-high, cast iron columns with Corinthian capitals are restored; a five-foot-wide chandelier in the main hall and matching foyer chandeliers are new.

The 2,300-square-foot addition, which steps back along the rear of the original, houses a new community center, theater workshop, and support spaces for the Opera House. The architect matched the original brick and limestone and continued the metal cornice and roofline details.

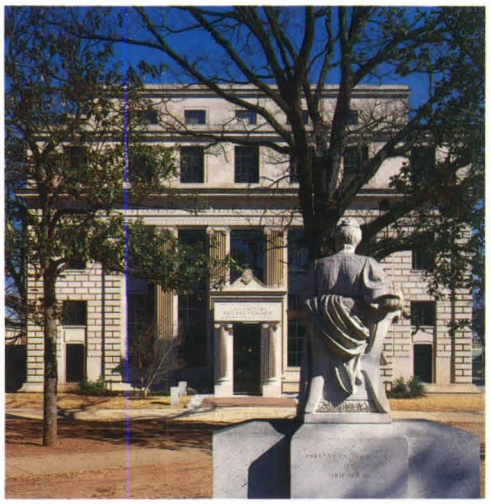
Michael Dixon, AIA, says that early in the project the citizens of Sandwich became "infected with a degree of curiosity about old buildings, the way in which they were built, and how they were used." The City Hall is now a symbol of civic pride and, not surprisingly, has served as a catalyst for downtown revitalization.—Lynn Nesmith

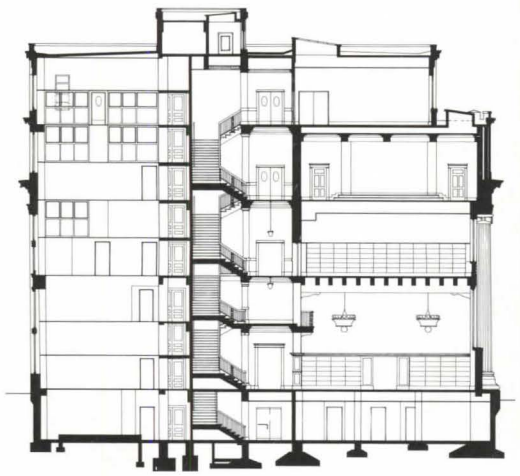
Top left, balcony railing matches restored original columns. Below, new stage and restored proscenium. Left, main entrance.

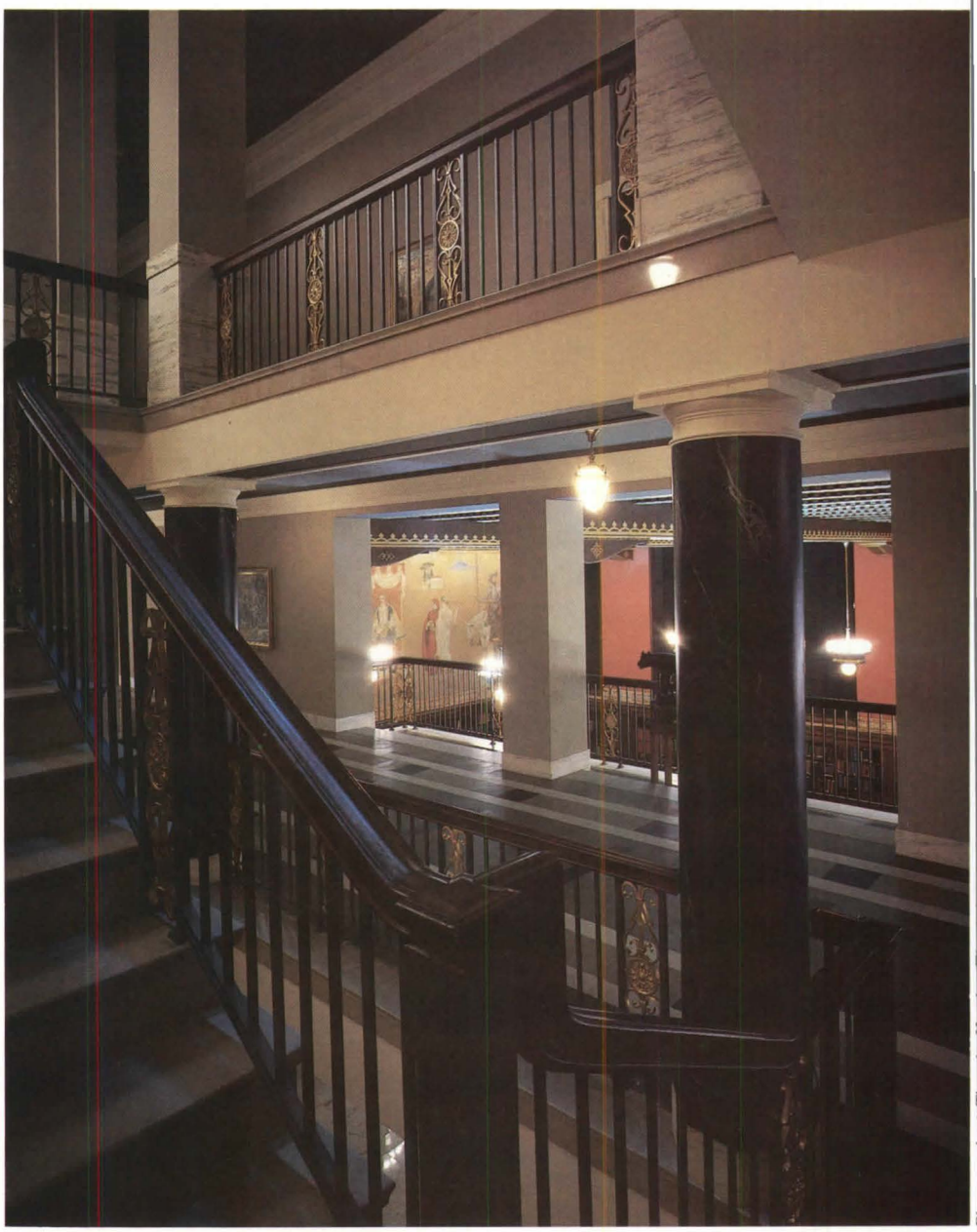


Michael A. Dixon

A Library Reorganized and Restored to Its Original Glory





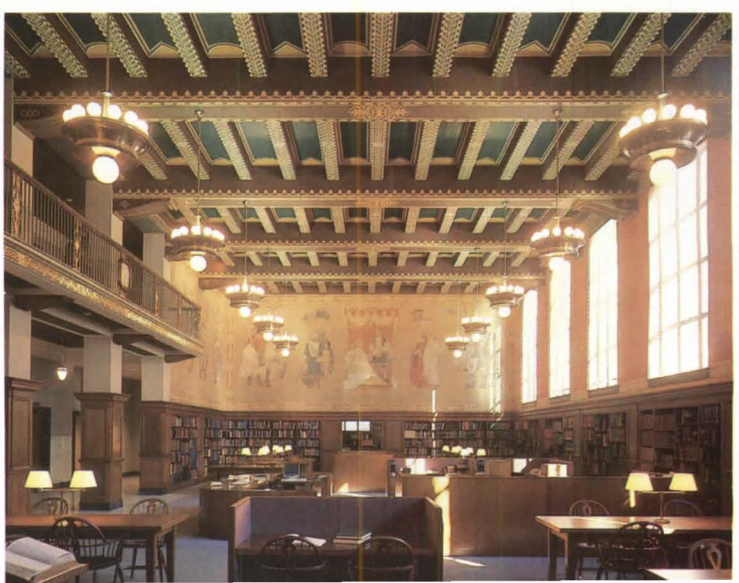


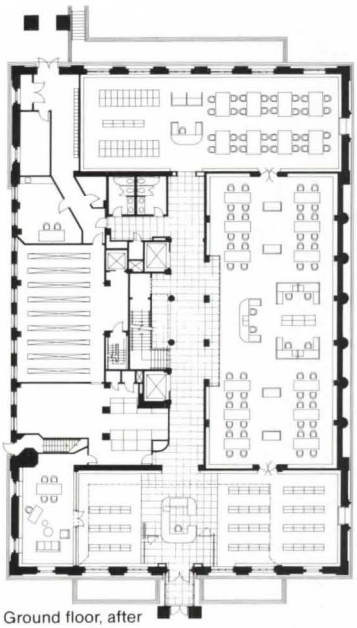
Birmingham's former central library of 1927 has been renovated and given new life as the Linn-Henley Research Library. A harmonious neoclassical temple bordering a downtown park, its interior spaces are warm and rich; two reading rooms glow with charming, storybooklike murals by Ezra Winter (the artist of the huge, ethereal "Quest for the Fountain of Eternal Youth" in the Radio City Music Hall lobby).

Despite these considerable endearing qualities, the original design, by Miller & Martin of Birmingham, offered room for improvement by Kidd/Plosser/Sprague, renovation architect.

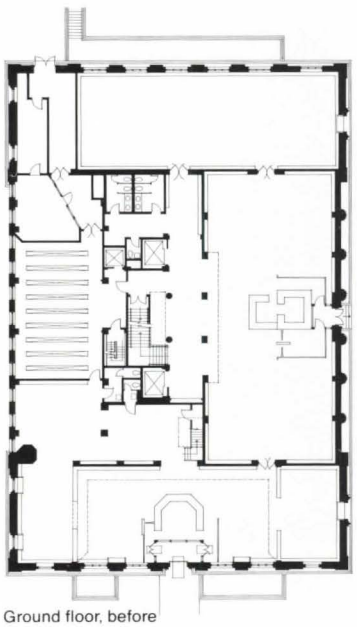
For instance, entrances were timid little things, out of character with the building. And the front door opened directly off the street through an interior vestibule that protruded into the main room. By the time you passed the circulation desk, you had traversed the room and were almost into the core. From there, you could easly get lost in the six floors of rooms and 10 levels of stacks.

There had been clumsy alterations, too. Airconditioning installers had ripped away half of the decorative ceiling brackets in the main room when hanging exposed ductwork; electricians





Ground floor, after



Ground floor, before

Facing page, the new entrance, stair at mezzanine, and full view of main reading room. Above, main room and corridor.

wiring along walls and bookshelves. Dingy and confusing is the way Richard W. Sprague, AIA, design principal for the restoration, remembers the library from his childhood.

In 1984 a new, 150,000-square-foot central library (by Morris Architects with Kidd/Plosser/Sprague as associate) was completed on the block to the east, which led to renovation of the 90,000-square-foot old building and its rebirth as the Linn-Henley Research Library. It houses the city's noncirculating historical collections and archives and is linked to the new building by a pedestrian bridge across 21st Street.

From the limestone exterior the restoration architects erased without a trace the south-facing main entrance on Park Place. This proved to be a minor loss to the colonnaded longer elevation since the door had seemed an afterthought. They reoriented the building to the west side facing the park, enlarging a previous entrance by borrowing from what was there—the new pediment is a big brother of the original—and pulling the door eight feet in front of the building to make an exterior vestibule.

A new program freed Sprague and company to clear interior clutter and replan circulation. You now enter through the former children's library, smaller of the two muralled rooms, on a new long axis through the building. Halfway down, the spine opens up to the large reading room, now, appropriately, a quiet place for research and contemplation. Perimeter paneling and murals are restored; pendant lights are new, a free interpretation of '20s lighting designs. (Early photographs show ornate, broad-rimmed torchiers worthy of a 1920s funeral parlor, longsince gone.) The delicate gold-on-green patterns on the beamed ceiling duplicate original handpainted stenciling, but in fact they are printed on custom wallpaper derived from the stenciling.

Although the large room is the restoration showcase, the rest of the library was renovated with respect. The original architects lavished far less in materials and detailing on the upper floors, so it seems quite all right to find a new meeting room on the third floor that is little different from those in scores of upscale hotels. You also find rooms without assigned uses—growing space—and that seems an appropriately commodious circumstance for this venerable building with a hard-use history.

—Allen Freeman

Creating 'a Whole New Building' Solely with Paint

Photographs © Douglas Kahn

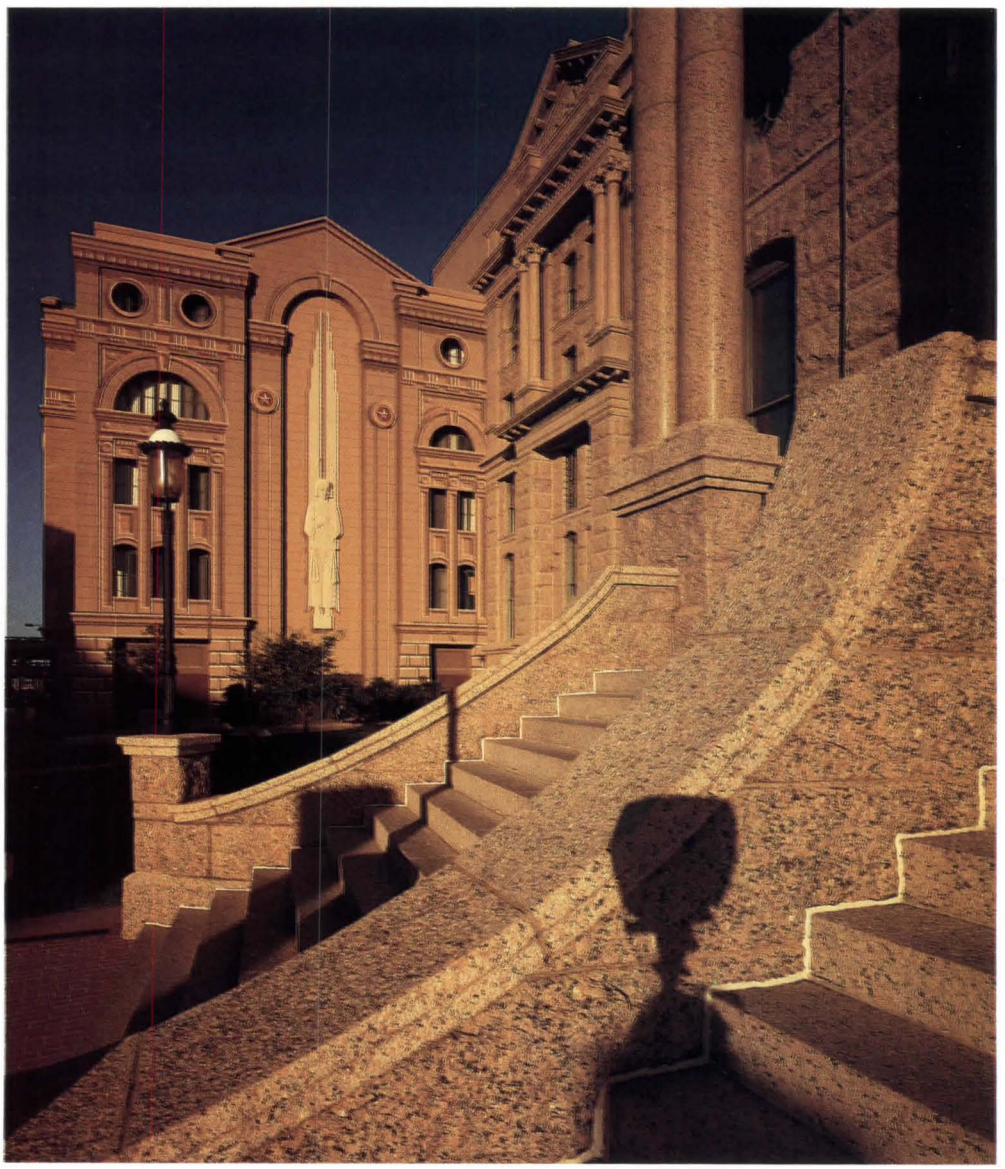
If wishing could make it so, the Tarrant County Civil Courts building in Fort Worth would have disappeared years ago. A befinned behemoth of the 1950s, it suggested everything from a swamp cooler to an accordion, but never a civic monument. Around Fort Worth it was known as the "refrigerator" and generally considered the worst architectural accident ever to have happened downtown.

But instead of imploding it, the local Sid Richardson Foundation commissioned *trompe l'oeil* muralist Richard Haas to paint it out. The $1.5 million project is the most ambitious and technically demanding Haas has undertaken, involving not merely painting a series of flat walls but creating a whole new building with windows, doors, advancing and receding planes, and the appearance of three-dimensional solidity. Haas's mandate was to accomplish all of this without changing the interiors of the existing structure, a warren of courtrooms, judges' chambers, and clerks offices, and a potential mine field politically. "To alter a building without touching it is a unique challenge," Haas says.

He finally decided to move the mechanically operable sunscreens (which worked for a few months when the building first opened and then quit forever) and wrap the shell in a floating skin of synthetic stucco panels. George C.T. Woo & Partners architectural terms, dividing the design into modules determining where the window and door openings should go and also how the system should be attached to the walls of the original building. The stucco panels, suspended two feet out from the original walls on a steel framework, became the canvas on which Haas and his associates, American Illusion Inc., painted columns, arches, medallions, and other architectural details reminiscent of the adjacent 1895 Renaissance revival courthouse, designed by Gunn & Curtiss of Kansas City, Mo.

Haas's intention was not to copy the old courthouse as much as to bring the Civil Courts building closer to it in feeling. Except for the red granite base and the slender angels of justice on the facade—both parts of the original structure—all the architectural details are products of his imagination, including the half-round columns at the main entrances and the rusticated stone bases on the corners. By sculpting the facade and finishing off the peaks of the roof, Haas avoided creating a sullen floating box that would have been as oppressive as the original building. The renovated version has a strong urban presence along the street, even if the columns and stone bases echo when you rap them.

From a distance the illusion is considerably more convincing, as the noisy collisions of forms and materials resolve into a harmonious architectural composition. The Civil Courts building



Above, the Civil Courts building before the makeover; left, the same building transformed. Towering behind is one of Paul Rudolph's twin, dark glass City Center buildings. Right, white bas-relief is real, part of the original facade; this view is from steps of 1895 courthouse.

disappear at the stroke of a brush and firmness, commodity, and delight appear as if by magic. But if the Civil Courts building is now more deferential to its historic neighbor, Haas never lets us forget that it is also an illusion, a gigantic drop unfurled on the north end of Main Street. Sometimes the painted shadows and the real shadows correspond almost perfectly, while at other times they go in opposite directions. The painted windows in the stucco panels line up with the real windows of the building behind, adding depth to the facade but also making us wonder momentarily what is real and what is fake.

The value of this ambiguity is that it invites us in, making us examine forms and details more closely than we otherwise might. Discovering that all the horizontal joints on the Civil Courts building are fake and the vertical ones real reminds us not to take any design for granted. The Civil Courts building is Haas's third project in downtown Fort Worth, all for businessman and philanthropist Sid Bass, whose family *is* the Sid Richardson Foundation.

In 1985 Haas painted six period storefronts in Bass's Sundance Square, as well as a large mural commemorating the Chisolm Trail Drive on the wall of a nearby book and video store. These comparatively straightforward, two-dimensional "scenes" were generally applauded as engaging commemorations of Fort Worth's frontier past, as well as effective camouflage for otherwise drab commercial facades. The Civil Courts project is far more complex, and public reaction has been mixed. Some residents have complained that Haas's materials are insufficiently durable and dignified for a hall of justice, that they mock the activities taking place within. Preservationists have cried "facadectomy" and complained that Haas has erased an important piece of Fort Worth's architectural history, however maligned and unpopular that piece may have been.

Haas says that he anticipated many of the objections before he took the job and chose to dismiss them. "I'm not insensitive to '50s architecture, but frankly the courts building didn't deserve the careful consideration that was given it," he says. "It was only economic circumstances that prevented the architects from wiping out the original courthouse and extending their building across the entire site. It is hard to be very sympathetic to that kind of thinking."

Whatever the philosophical objections, Haas's re-creation of the Civil Courts building has appreciably softened the architectural chaos of one key block of downtown Fort Worth, and at a fraction the cost of renovation or new construction. Even people who loathe the project have found merit in the economic argument. "Those old louvers were aluminum, and the county retained salvage rights," noted one county clerk. "We could get $20,000 for them."—David Dillon

Viollet-le-Duc's Legacy of Controversy

After more than a century his approach to restoration is vigorously debated.
By Elena Marcheso Moreno

Architect, artist, archeologist, Eugène-Emmanuel Viollet-le-Duc (1814-1879) was a master of historic preservation and a founder of the restoration movement as it is known today. Yet, more than one hundred years after his death, controversy still surrounds the architect, as it did in his lifetime; there still exists a dichotomy in opinion about his work.

Although he had critics, he was generally considered the foremost authority on historic preservation in 19th-century France, while at the same time his teachings on architectural theory were denounced by his contemporaries. Today his work is often cited as a precursor to modern architecture, and the 20th century's view of his contributions in restoring landmarks that would otherwise have decayed is mostly appreciative. But preservationists look askance at the liberties he took with Europe's monuments.

Among the French medieval architectural treasures Viollet-le-Duc restored are Notre-Dame of Paris, the Church of the Madeleine at Vézelay, the Abbey Church of St. Denis, the Château of Pierrefonds, the medieval city of Carcassonne, and the Palace of the Popes at Avignon.

Viollet-le-Duc's philosophy of restoration was to formulate his own interpretation of the medieval Gothic structures he analyzed. He felt that reason should dictate architectural form and that form should result from function, regardless of the phase of civilization. He went so far as to write in an article, "Restoration: the word and the thing are modern. To restore an edifice is not to reconstruct it; it is to re-establish it in a complete condition which may never have existed at any given moment." In fact, he was often charged with restoring Gothic buildings that had been altered through the ages, with little guidance as to their original configuration. His solution was to unify the whole in his own rationalization of Gothic architecture without being bound by the initial design, retaining features from some periods but not others, or incorporating what he felt should have been there. It is for this approach that he has been most condemned.

But his critics should not be so harsh, says Ann Van Devanter Townsend, president of the Trust for Museum Exhibitions, which organized the only exhibit of the restoration architect's work ever to appear in the United States. His drawings have been ranked among the most beautiful architectural renderings of all time. (The exhibit of 135 watercolors and drawings is ending a U.S. tour at the National Building Museum in Washington, D.C., and the illustrations accompanying this article are from its catalogue.)

"For Viollet-le-Duc the matter was less simple, as it always is for the pathfinder, the pioneer," Townsend says. "His charge was medieval restoration appropriate to his time and its technology, and he believed in employing imagination where examples and documentation were scant. For precise architectural scholars armed with more than a century of evolving, constantly refined knowledge and technology, Viollet-le-Duc is perceived as having taken undue liberties with the purity of his architectural heritage. Yet his work provided the essential and invaluable foundation."

Viollet-le-Duc was born in Paris to a family of culture, very much involved in the arts. He decided at an early age to become an architect and at his father's suggestion traveled through France and later Italy, studying and drawing medieval monuments. He was an independent young man, opposing the traditional course of education that architects of his time followed as being both much too lengthy and insufficiently technical. He shunned the to study as an apprentice with the architect Huve and later with Leclère. In addition to design, he learned every aspect of construction and became a master tradesman of many crafts.

Early in his career, Viollet-le-Duc was designated inspector general of historic monuments as France began to conserve its architectural treasures, many of which had been destroyed in the French Revolution. Few architects of his time had the inclination or the resources to tackle restoration of medieval buildings. There were no standard solutions because the problems had not yet been defined or even much contemplated. Notwithstanding the interpretive liberties he took, without him many of these jewels of history would have decayed to rubble.

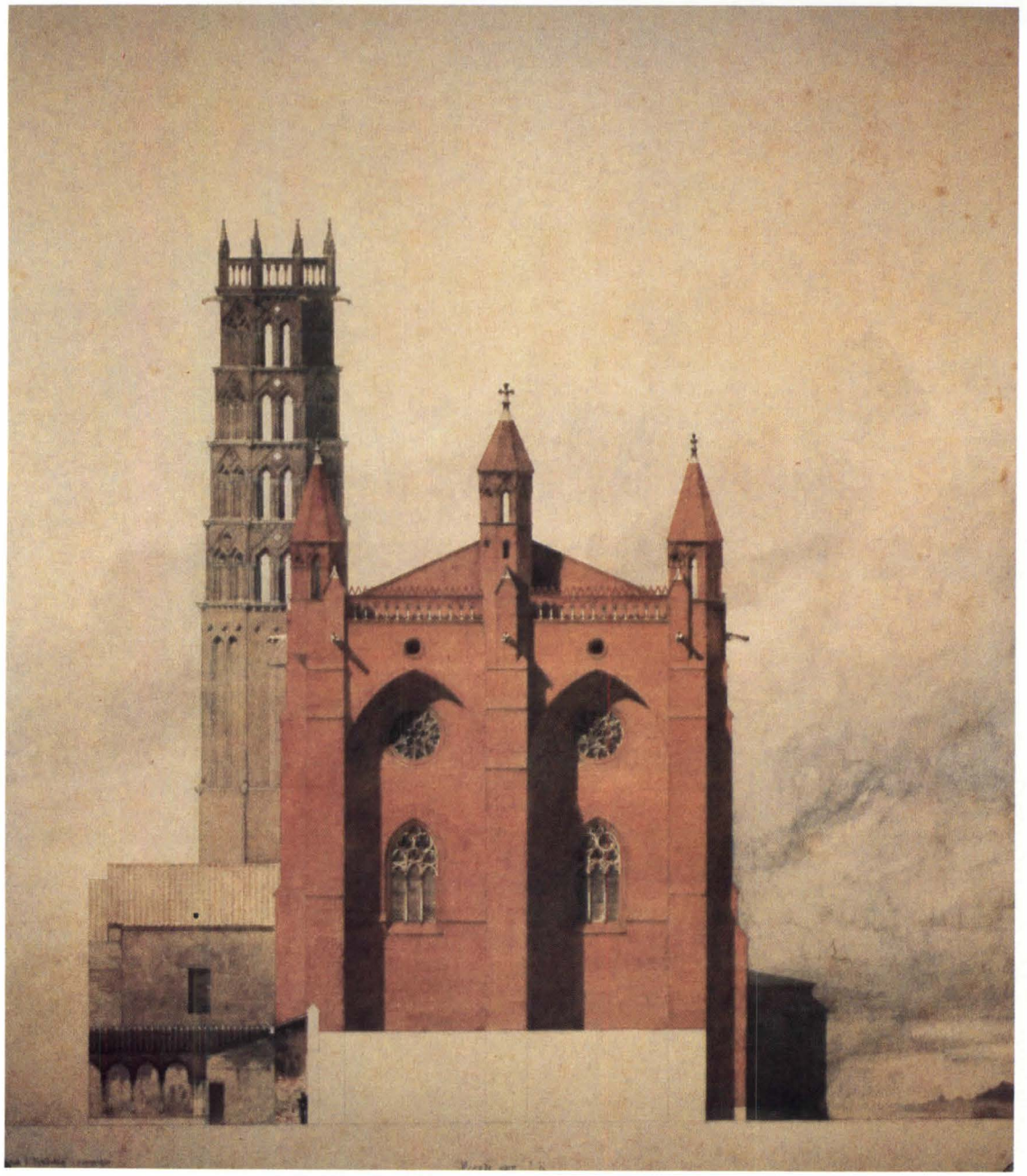
In Viollet-le-Duc's Victorian era, there was a movement to restore Gothic architecture to its former esteem as the one true style for buildings of all classes. This movement was never completely embraced by 19th-century architects steeped in the tradition of classicism. Their main concession to Gothic revival was in the design of religious buildings. But the restoration architect adopted the style wholeheartedly, at least those aspects of it that he found to be "rational."

"One of Viollet-le-Duc's real contributions to historic restoration was his attention not only to the appearance of a building, but to its structure," wrote Bruno Foucart, a French authority on the architect. Viollet-le-Duc believed, according to Foucart, that everything was a function of structure—the organ loft, the pinnacle, the gable—that there were no forms in Gothic art that were founded on free fantasy, and nowhere is this better seen than in his restoration of Notre-Dame of Paris.

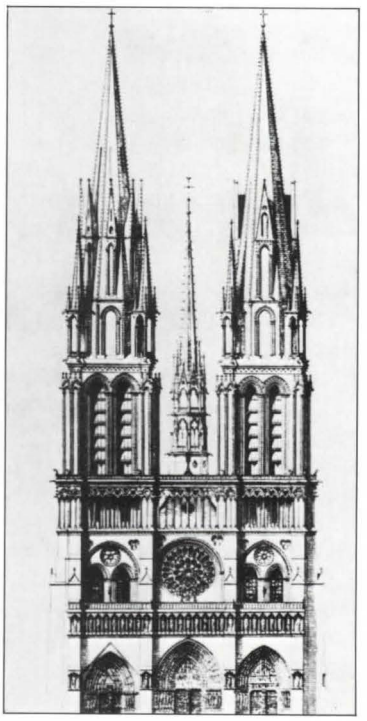
Soon after the 1831 publication of Victor Hugo's novel *Notre-Dame de Paris,* restoration of the cathedral became a national cause. The monument had been severely disfigured during the Revolution and was no longer being maintained. In conjunction with J.B.A. Lassus, Viollet-le-Duc won a competition in 1845 to renovate the cathedral, and it was this project that brought him fame. In their proposal, the two architects said that successive additions would be respected and that the damaged elements of the cathedral were to be replaced by identical ones, even if this would repeat a defective arrangement. But Viollet-le-Duc was never really comfortable with this decision.

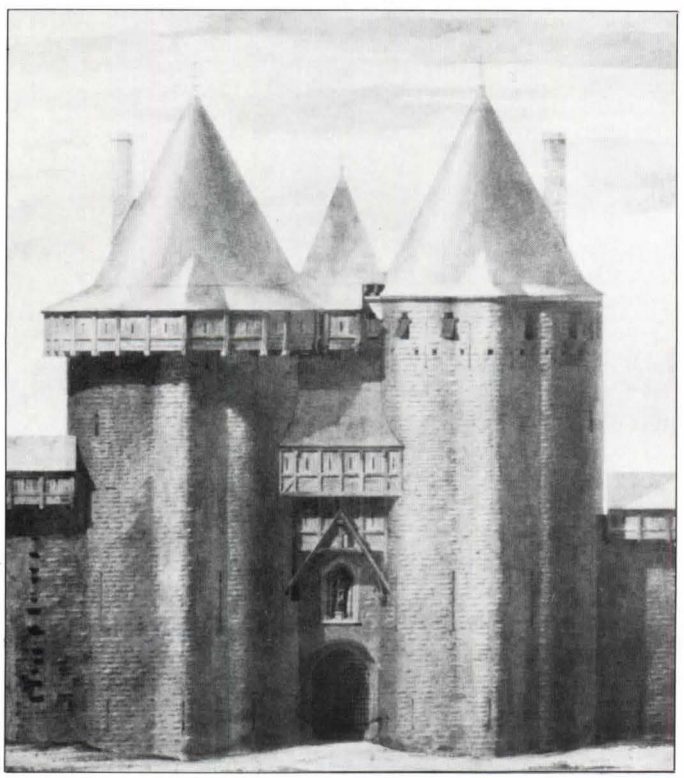
The idea of placing two spires above the towers of Notre-Dame was discarded because the spires had never existed, but after Lassus's death Viollet-le-Duc did reconstruct a spire above the transept crossing. "The spire of Notre-Dame is without doubt one of the architect's greatest successes, one essential to the monument," said Foucart. On the elevation of one part of the structure, the architect elected to return to the four original floor levels of the 12th century, replacing the existing five of the 13th century, once again opposing the approach Lassus would have followed. The result was to greatly modify the cathedral's inner spaces. It was impossible to replicate the exterior sculpture and supporting columns, so they were copied from statues on other monuments, based on the architect's drawings. But they appear to be what they are—19th-century sculpture, not medieval. Likewise, for the interior Viollet-le-Duc designed many small statues.

Viollet-le-Duc believed deeeply in the emotional power of architecture—he compared it to music. Music, the cathedral of Notre-Dame, and architecture were all intermingled for him, almost into one medium. In his writings, he recalled being taken as a little boy by his nurse to the old cathedral. It was quite dark inside, but the sun was shining through the great rose window of the south transept. Then, suddenly, music from the organ filled

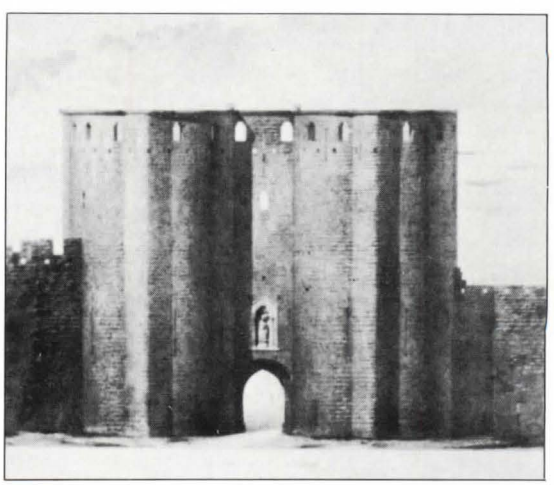


Left, the architect's restoration plans for the Jacobian church in Toulouse were faithfully completed in the 1970s, while plans were under way to de-restore another of his projects in the same city. Below, an idealized Notre-Dame of Paris. The two spires above the towers were never realized.





Left, the outer elevation of the two towers of the Narbonne Gate of the outer wall of Carcassonne, a fortified village constructed during the Middle Ages. Below, its prerestoration condition. Carcassonne is one of the most controversial of Viollet-le-Duc's restoration projects.



the music. It seemed to him that the different lights in the window created the sounds of varying depth and intensity. This capacity for architecture to become alive with sound has been touched on by very few, said the English architect Sir John Summerson, but it is, for most of us, a verifiable phenomenon.

Carcassonne, a fortified city of the Middle Ages, is Viollet-le-Duc's most controversial restoration. The architect approached its conservation from archeological and historical perspectives, determining that the city had been built over different periods and intending to preserve the character of each. But his chronological study has been severely criticized. When he encountered a section of the wall or a tower that had obviously been altered, he drew attention to the differences. When the town was nominated for inclusion in a list of the world's greatest treasures, it was proposed that it be classed within the 19th century, so pervasive was that century's influence upon its architecture.

The Synodal Hall at Sens is one of Viollet-le-Duc's most characteristic restorations. The work of the archeologist to find traces of the original structure is evident, but so is Viollet-le-Duc's bold and presumptuous technique of restoration, which, said Foucart, "may be pure invention, but seems ideally true. In this structure of relatively limited volume, erected in a single burst of effort and representing in all its parts a perfect unity of style, Viollet-le-Duc carried his rationale to its conclusion: its tangible embodiment is perfect."

Viollet-le-Duc's intention was to restore the interior volumes and outer elevations, which had been modified, and return the building to a unity he believed was originally intended. He replaced the upper chamber, which he suspected had been vaulted, with six new vaults having intersecting ribs. His assumptions have been disputed, but, as his restoration permanently changed the building fabric, there is little evidence left to determine the argument.

While Viollet-le-Duc was restoring historic monuments and being considered, kindly or not, the champion of Gothic revival, he was also putting forth unique ideas for contemporary architecture that were to serve as the basis upon which many architects later built their principles, among them Louis Sullivan and Frank Lloyd Wright. Viollet-le-Duc's lecture series *Entretiens sur l'Architecture* and his encyclopedic *Dictionnaire de l'Architecture Française du XIe au XVIe siècle,* published in 10 volumes, provided a theoretical foundation for ideas in the modern movement. In France his concepts, such as the use of iron structurally to replace stone, were vehemently opposed. Appointed to lecture at the Ecole des Beaux-Arts, he stressed structure, functionalism, and the adoption of modern materials for architectural applications. But he was shouted down and largely ignored. Today he is seen as a man of vision, and, within the constraints of his Victorian culture, he was a rare example of the rational architect rather than the romantic.

"Great celebrities make for great misunderstandings. Viollet-le-Duc was without a doubt the most popular architect of the 19th century," said Foucart, but he, like Le Corbusier after him, aroused and continues to arouse controversy.

Viollet-le-Duc wrote that "between the academic oligarchy on the one hand and the anarchy resulting from the entire absence of method on the other, architects know not where to seek what everybody is calling for—an art characteristic of our time." Contrary to the French, however, a few architects in the United States were to find truth in his theories.

Robin Middleton, a professor of art history at Columbia University, says that broader understanding of Viollet-le-Duc's ideas began to take root in the minds of his American admirers. Frank Furness of Philadelphia was perhaps the first American to interpret his theories with vigor, says Middleton, followed by John Wellborn Root. Viollet-le-Duc became a vital source of intellectual inspiration to a generation of American architects. Sullivan recommended the Frenchman's writing to his students, and later, Wright, the greatest of his disciples (who had delved into those writings even before contact with Sullivan), noted, "I thought *Raisonnée* was the only sensible book on architecture in the world. I later obtained copies for my sons. This book alone enabled us to keep our faith in architecture, in spite of architects."

"He left no doubt that he considered the ideas of Viollet-le-Duc as the spur to his own glory," says Middleton. "With Wright as intermediary, the teachings of Viollet-le-Duc penetrated all of American architectural thought."

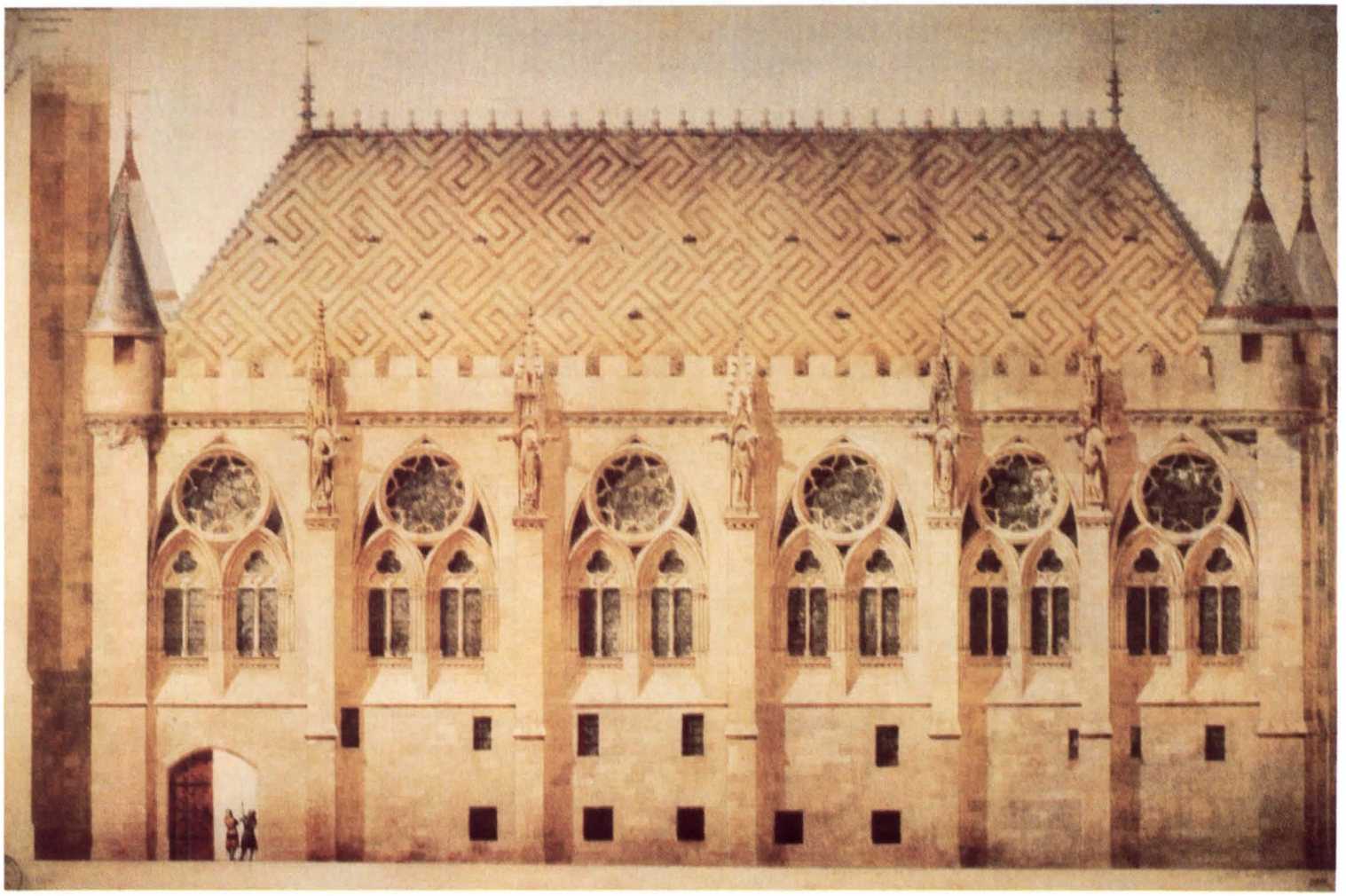
"Viollet-le-Duc was one of the most brilliant architects of the 19th century, but his name is not exactly a household word, or even recognized by many American architects," says Roger Moss, executive director of the Athenaeum of Philadephia and a professor at the graduate school of fine arts at the University of Pennsylvania. His restorations, though, are still being criticized unfairly, says Moss. Any restoration is at best an approximation, but in the 20th century the process has evolved to the point that it is easier to get close to some sense of the reality of the original building. But, in fact, says Moss, the approach today is not too different from Viollet-le-Duc's—it is an idealization of time and a perception of the past that never actually existed.

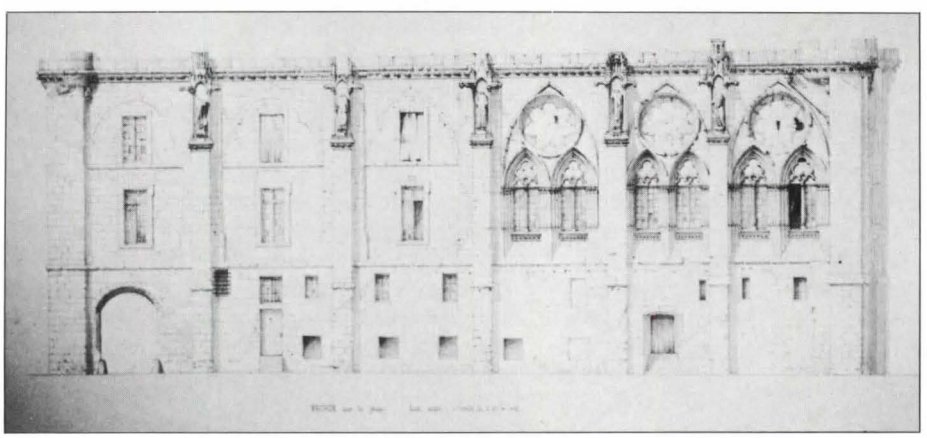
Today American architects familiar with Viollet-le-Duc's work are still not of one opinion. He is a paradox, not all good or all bad, says James Marston Fitch, Hon. AIA, an architectural historian with Beyer Blinder Belle. Viollet-le-Duc did destroy some aspects of history, says Fitch, but that is a problem of any archeological search. It is never possible to work on an ancient artifact without damaging some of it in the process. "Today we are more conscious of this danger, and we document much more carefully. But we have developments in testing available that Viollet-le-Duc could not benefit from." It is because of the Frenchman that today architects will look at an old building to find its golden moment, its apex in time, and then restore it to that, contends Fitch.

Viollet-le-Duc's writings on architecture were astonishing, says Fitch, but still he was a prisoner of his time. He was fascinated with the potentials of metal, and he anticipated skeletal structure but with a Victorian architect's approach. His connections would be balls and sockets but never would be bolted.

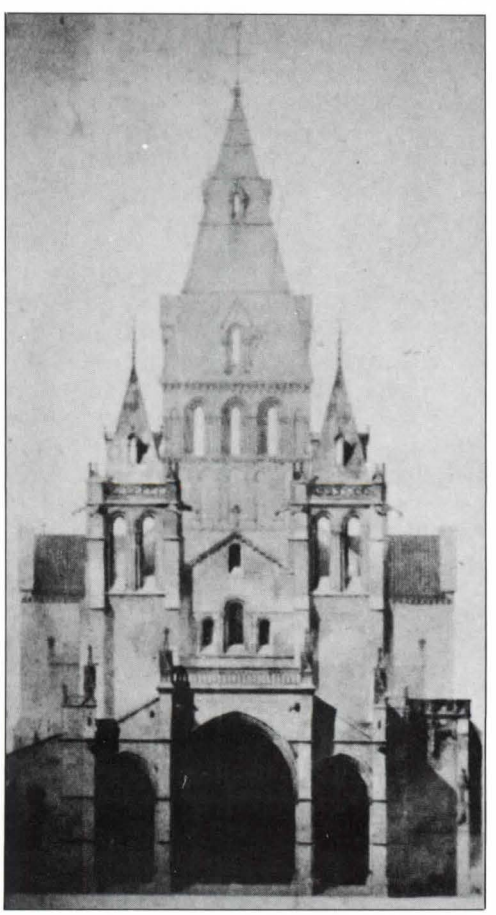
"Because Viollet-le-Duc was so caught up in how things should have been, he had no ability to distinguish what might have been," says George Hartman, FAIA. He was a gifted artist and architect, and what he did always looked better than what was there before, but his work usually amounted to a demolition project. His example is almost a warning to take care, says Hartman.

He has had enormous impact in the United States on building restoration, but Hartman sees that changing now. Still, Hartman takes issue with the guidelines issued by the Department of the Interior for historic restoration, which he feels lean too heavily on Viollet-le-Duc's philosophy. It is really dangerous to have a notion of how things should be done, says Hartman. "I believe Viollet-le-Duc did not realize what he was doing, didn't really mean to do what he did, or realize how wrong he was in those restorations. He just did them so well and so convincingly that he fooled himself." □

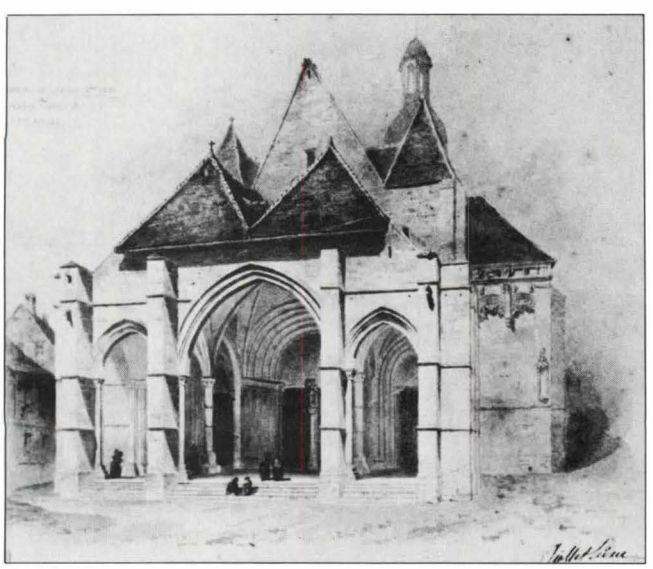




Above, the restored courtyard-side elevation of the Synodal Hall at Sens. Left, its pre-restoration condition.



The perspective on the right shows the pre-restoration state of the west-facade porch of the Church of Notre Dame at Beaune. The watercolor on the far right shows the church's west elevation in its restored condition.



Restoring a Modern Milestone

It required use of some unfamiliar techniques.
By Michael J. Crosbie

Photographs by J. David Bohl

A milestone in modernism, Walter Gropius's house in Lincoln, Mass., was completed a half-century ago this autumn and has recently been the object of an extensive and painstaking restoration by the Society for the Preservation of New England Antiquities. SPNEA acquired the house in 1983 after the death of Gropius's wife, Ise, and opened it to the public.

Gropius arrived in the United States from Germany (by way of London) in 1937 to accept a professorship at Harvard's graduate school of design. Harvard offered the Gropius family a Beacon Hill town house, an idea the Bauhaus founder immediately vetoed. The family stayed in a New England farmhouse while Gropius, in collaboration with Marcel Breuer, designed a house for himself. Unable to obtain a mortgage to build his house, Gropius found a benefactor in Mrs. James Starrow, who provided land and a loan. The site was a three-and-a-half-acre apple orchard in Lincoln, a 20-minute drive from Cambridge.

The house was completed on the day of the great hurricane of 1938, which swept through New England on Sept. 21. As the story goes, Gropius's new neighbors were so impressed that this odd house, which appeared from the road as a flimsy billboard, withstood the storm that they promptly showed up on the architect's doorstep for a tour. The house remained a point of curiosity in the neighborhood and a setting for visits from Gropius's colleagues and students. In partnership with Breuer, Gropius designed three other houses on nearby sites, creating a modernist enclave of sorts.

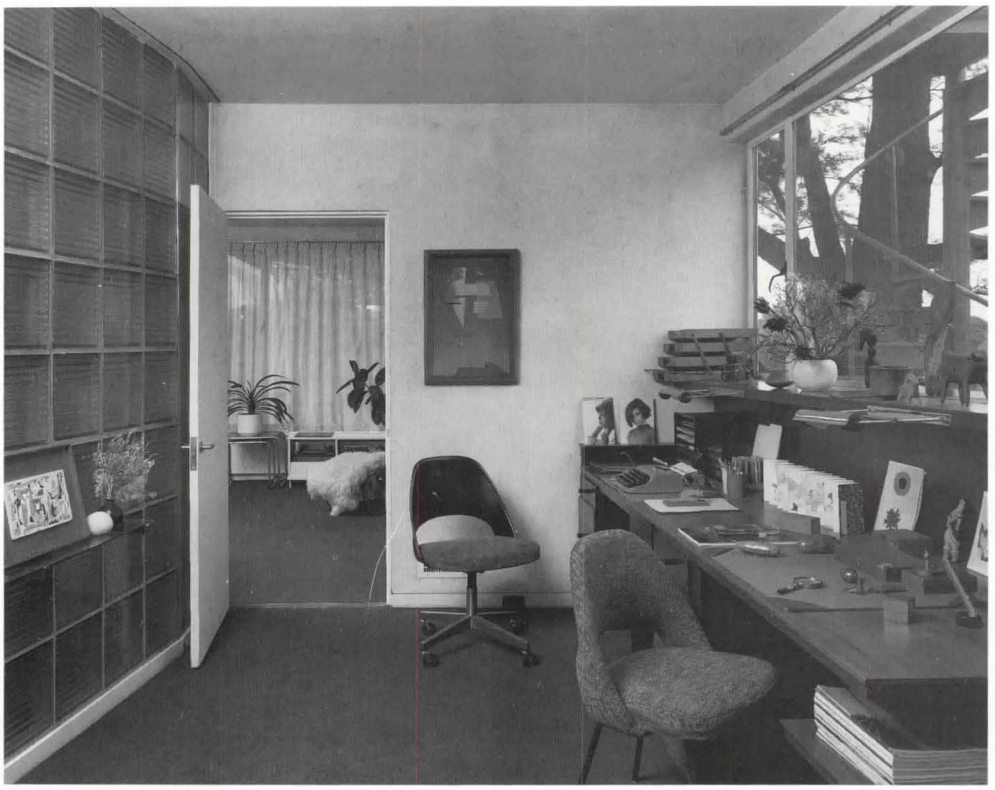
The architect's house is one of the most striking examples of Gropius's fascination with and embracement of mass-produced industrial materials as the stuff of architecture. Throughout the house one finds such off-the-shelf items as laboratory countertops in the kitchen, theater wall sconces for illumination, and commercial-grade coatracks in the foyer; there is plastic everywhere. One of the few items specially made for the house is the black metal railing that snakes up the main staircase. The exterior spiral staircase, leading with theatrical flair to a roof terrace, allowed the Gropiuses' daughter, Ati, private entrance, although she had to pass directly in front of her father's study.

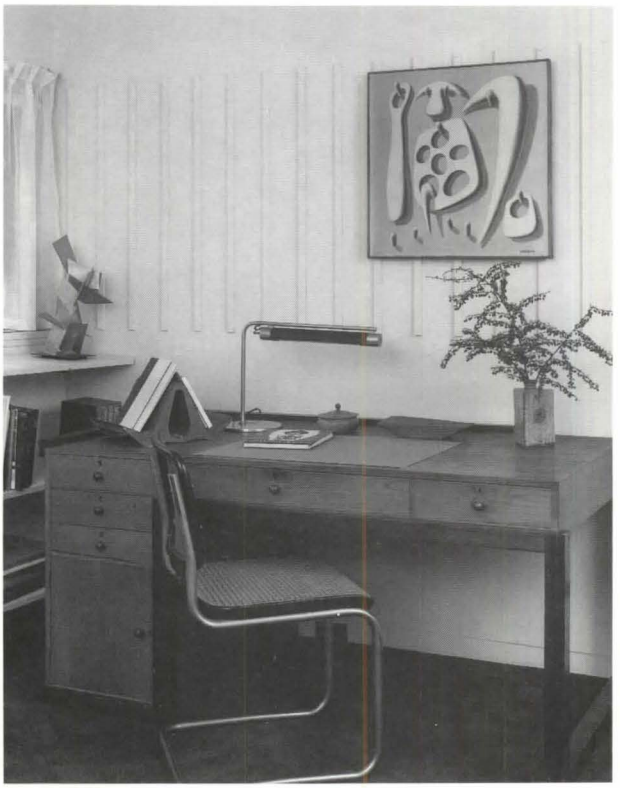
Less obvious is Gropius's keen absorption and interpretation of New England farmhouse vernacular architecture. The plan itself is based on the center hall colonial house, with entry hall and staircase in the middle, kitchen and pantry at the hall's end, living and dining areas off the hallway, and corner bedrooms on the second floor, all opening onto a second-story hall. Vernacular materials are found in the house's fieldstone base, white-painted tongue-and-groove siding (applied vertically), and gray trim. In the foyer is clapboard siding, also applied vertically.

The challenge to the conservators was to restore a not-so-old house to a date in the recent past. The house is restored to its 1967 appearance, just as its designer would have best remembered it before his death in 1969. The choice of 1967 was also based on the furnishings available. Peter Gittleman of SPNEA explains that restoring the house to an earlier period would have been nearly impossible because most of the furniture from before the 1960s was gone. The Gropiuses kept a cellar well stocked with furniture they had brought from Germany. "When something got old and shabby looking, the Gropiuses would simply drag it out to the curb, the garbage man would take it away, and they'd go into the basement to pick something else out, or go to Knoll or Design Research and buy new furniture," says Gittleman. "We had no choice because all the furniture from the '30s, '40s, and '50s and been chucked out with the trash. The '60s was the period from which we had the most objects to do an accurate restoration." There was also a wealth of family snapshots from this period to aid the conservators in replicating the interior decor.

While SPNEA conservators had plenty of experience in restoring and preserving houses 200 years old or more, a 50-year-old house embodying the tenets of modern architecture presented

Above, Gropius house as it faces the apple orchard. Long canopy reaches out to the driveway from the front door. Facing page, above, study with specially built desk that allowed Walter and Ise to work side by side. Spiral stair to roof deck is visible through window. Right, dining area with view into living room

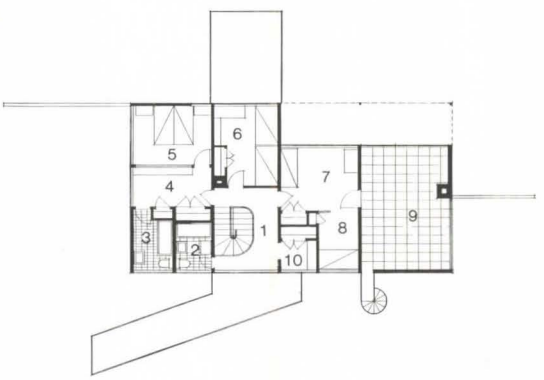




Photographs by J. David Bohl

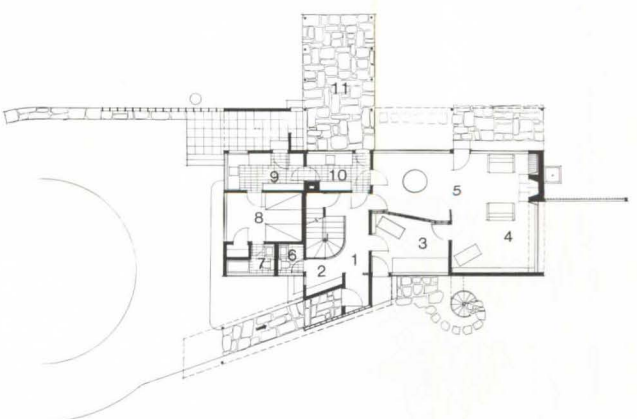
unfamiliar materials and techniques of restoration. "We were starting from scratch," says Gittleman. "We often look to what other conservators are doing, but no one had restored a modern house before." Fifty-year-old plastics had dried out and begun to crack, thin machine-cut veneers bubbled through exposure to dampness, laminated materials proceeded to delaminate. The cork floor in the foyer was crumbling, having been rotary sanded in the '70s and sealed with polyurethane. The conservators took what Gittleman calls a "drastic step" and ripped the cork floor out to replace it with new material from the original manufacturer, which had Gropius's order still on file. Subtle paint colors, such as a pink wall on the roof deck, were duplicated by the local paint store that had mixed the original batch.

By far most helpful to SPNEA in this restoration (again, in contrast to colonial properties) was the opportunity to consult the only surviving occupant of the house in matters of detail. After the furniture and furnishing arrangements had been duplicated by conservators from photographs, Ati Gropius Johansen, who had briefed the conservators on her parents' design philosophy and life style, surveyed the interiors and set to work fine-tuning. She placed her father's glasses where he had always left them on his desk. A piece of sculpture in the study was returned to its rightful place upstairs, at Gropius's bedside. "When she walked into the living room, she said it was completely wrong," recalls Gittleman. "She started moving chairs, opened the fireplace screen—she said her parents never had the screen closed—rearranged the branches in the fireplace, pushed the sofa back, shoved the books against the wall, pulled tables out, moved this and that. What we ended up with was the most accurate restoration that SPNEA has ever had." □



Second floor

1 Hall
2 Bath
3 Bath
4 Dressing room
5 Master bedroom
6 Guest room
7 Child's room
8 Bed alcove
9 Roof deck
10 Sewing room



First floor

1 Entrance hall
2 Coats
3 Study
5 Dining room
6 Toilet
7 Maid's bath
9 Kitchen
10 Pantry
11 Screened porch

Above left, master bedroom. Glass wall separating sleeping area from dressing area allowed Gropius to open windows on cold nights (he preferred chilly temperatures for sleeping) without cooling the rest of the house. Above right, desk in Ati's room is an early Bauhaus piece. Facing page, main stair and foyer have new cork flooring. Front door is right of glass block wall.

Paul Rudolph on Yale's A&A

His first interview on his most famous work. By Michael J. Crosbie

No postwar building has had quite the same ability to infuriate and infatuate those who have come within its vicinity. Since its dedication on a crisp November morning in 1963, Paul Rudolph's Art & Architecture building at Yale has drawn a generation of praise and condemnation. For some it has served as the catalyst to pursue the discipline of architecture. For others it remains an obstacle in that very pursuit, a building haunted by gremlins bent on driving out its would-be architects and artists via leaky roofs, crumbling concrete, too little daylight. Within seven stories, its 36 different levels are a mystical revelation in the art of space making, prompting Joseph Esherick's remark that you couldn't go to the men's room without having a spatial experience.

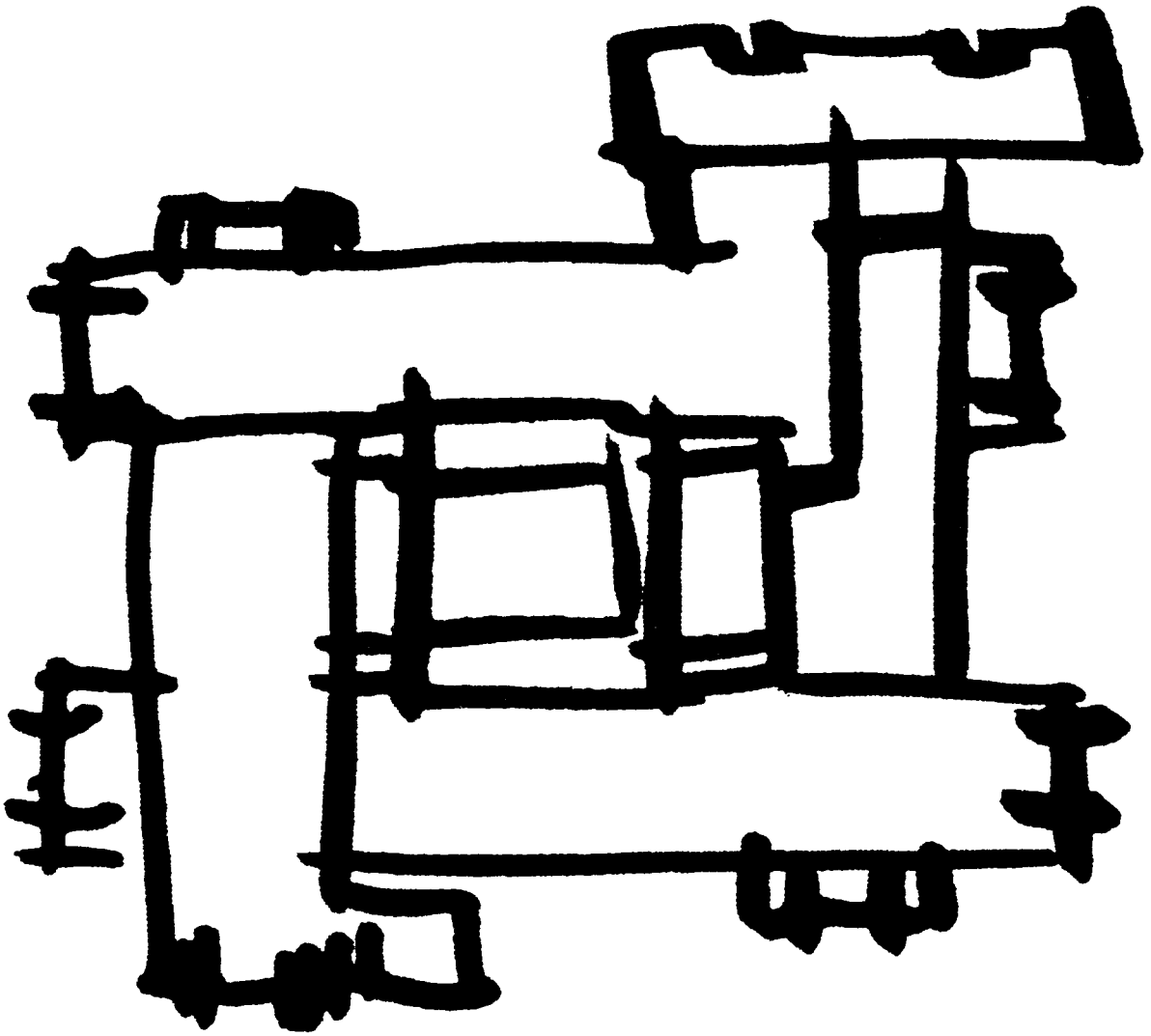
The building today is only marginally as Rudolph intended it to be. A devastating fire in June of 1969 (the cause of which was suspected but never conclusively proven to be arson) gutted the fourth and fifth floors and provided the occasion to make the building over. Double-story spaces were divided into single stories, space use and allocation were changed, open spaces were subdivided, fluorescent lighting replaced incandescent, and hung ceilings appeared. Members of the art school have been the building's most outspoken critics. Rather than settle for the basement quarters provided them, sculptors moved to another building.

The hushed solemnity of Ezra Stoller's photographs made 25 years ago has given way to a building seemingly in the midst of ruin, thanks in good measure to Yale's "cost-cutting" deferred maintenance program of the 1970s and early '80s, which allowed many campus buildings to deteriorate. Yale's president, Benno Schmidt, has dedicated several million dollars to refurbishing the university's physical plant, giving some (including architecture's dean, Thomas Beeby, AIA, who sits on the university's buildings and grounds committee) hope that the A&A building will soon enjoy a rejuvenation of sorts and perhaps, within the next decade, an addition to the north to alleviate an overstuffed library and too little classroom and administration space.

And yet, in spite of the stalactites forming on the seventh-floor ceiling, a ventilating system long overdue for a cleaning, the abrasive exposed aggregate walls that former Yale president Kingman Brewster complained gave him a "cement sore"—in spite of all this and more, the building's stock is rising with students. A 25th-anniversary exhibit of Rudolph's drawings of the building now open at the school (and continuing through Nov. 18) was organized and displayed by architecture students. In the undertow of student complaints about the building's shortcomings, you can feel their appreciation for a work of architecture that has survived an avalanche of misfortune—still vigorous enough, 25 years later, to antagonize and enthrall.

Rudolph began designing the A&A building in 1958, when he was 40—a relatively young age for an architect to design a building of this stature. In the interview that follows, the architect discusses his most controversial creation for the first time since its completion.

Below, the building in context, with roof of Center for British Art at lower left. Facing page, Rudolph's conceptual sketch.



Crosbie: When was the last time you visited the A&A building?

Rudolph: I think in October of last year. I lectured at Yale.

Crosbie: I understand that at the Yale lecture you said that you didn't want to talk about the building.

Rudolph: I almost never talk about it. It's a very painful subject for me. I talk quite freely about many of my buildings when asked, but I *never* talk about this building. It's partially because I don't think I can look very objectively at it.

Crosbie: What's your attitude about the building now, 25 years later?

Rudolph: It's a little mixed.

Crosbie: How mixed?

Rudolph: Obviously buildings have a life of their own. This one has had a rather unusual life, I suppose. It talkes its toll, in terms of one's attitude about it.

Crosbie: What were your first impressions, given the site and the program? Were you involved with writing the program?

Rudolph: Well, for the department of architecture, certainly. I had definite ideas about the program. In terms of the department of art, it wasn't true. That isn't to say that everything they thought should be included is there.

Crosbie: What were some of the concerns of the Yale representatives about how the design was evolving?

Rudolph: The Yale Corporation thought the very first proposal was the most awful thing they'd ever seen. Maybe they were right. I guess it's fair to say that there were a lot of people interested in the design at that point. There were a lot of people who had a lot of looks.

Crosbie: What were your thoughts about how the building would serve as a model, pedagogically?

Rudolph: To start with the architects, I thought it was important that first-year architecture students be very aware of what their elders, the older students, were thinking and doing. To that end, the drafting rooms were a multileveled affair, so you couldn't help but see and be quite aware of what other people were doing. You looked down.

I also thought, perhaps quite mistakenly, that the jury system would be of some interest to other than architecture students. To that end I suggested that the jury be in the middle of the [second-floor] exhibition space, and that people could come and listen if they wanted. I believe that you learn about things in mysterious ways, and that the chance encounter can be as important as the formal lecture. I quite mistakenly thought the department of art might be interested in the discussions on the second floor, not just the architects. But that, perhaps, is too public a position, even for architects. Too much like throwing people into the lions' den—too much exhibitionism, if you will. So far as I know, the second floor is not used in that way at all. It's used primarily as a gallery.

Crosbie: Although a similar thing happens on the sixth and seventh floors. The architecture students call the center where juries are held "the pit." What they like most about it is the casualness one can have about moving in and out of that space while a jury is going on, and sitting on the other side of the divider, being able to hear what's going on while you're at your board.

Rudolph: I suppose it's a question of privacy or intimacy, and the idea that if you really want to listen to what's going on at the jury, if you make an effort, you're welcome, but if it's just thrust at you it's no good. It's a question of a degree of privacy. I had considered that and thought, yes, the second floor isn't the most intimate space in the world. I thought that a sunken area or a defined area in a larger space, between the two columns, lent a certain degree of interaction. But the idea of a lot of curious outsiders, not aware of the peculiarities of people making an effort of talking about architecture—that's much more private an affair than I ever thought it was. There's a lot of lip service given to a lot of concepts that don't pan out.

Do the painters and sculptors ever come up to the sixth floor

to listen to a jury? I doubt it. Maybe that's the way it should be.

Crosbie: Beyond just the functional requirements of the spaces themselves, how does the building itself, as an object, work pedagogically?

Rudolph: I don't think of it as an object. I think of it as participating in urbanism. It's freestanding, but it was always intended to grow toward the north. Yale at the time didn't own the two buildings to the north, and it was perfectly clear that the building wasn't really large enough the day it opened.

The building is intended to be read from the New Haven Green, and the building certainly is intended to turn the corner; and therefore the configuration, at least from the outside, is an effort to turn the corner. The fact that a wall aligns with Lou Kahn's building [the 1953 addition to the Yale Art Gallery across the street] is an intention to embrace his building, with an invisible plane connecting to other points of the building across the street. I don't think you'd ever build a building in this configuration if it weren't for the fact that it's at a corner, and that Kahn's building is immediately across the street. There was a filling station on the [A&A] site, so everyone was at least happy to get rid of the filling station.

Crosbie: Did you do plans for the addition?

Rudolph: There were doodles. The elevator core was placed on the north edge to encourage an addition, and the courtyards in back to be centrally ringed.

Crosbie: Once the students are inside, though, how is the building something they could look at and learn from?

Rudolph: This is complicated, from my viewpoint. I was the chairman of the department of architecture, a post which then and now I was never too sure was something I really wanted to do. I'm interested very much in the theory of architecture, but I regard that as different from the teaching of architecture. I had taught in various schools as a guest, so it was not that I was new to the academic world. I was a gadfly, it was all great fun, and I'm sure I learned much more than the students. But, for very complicated reasons, I found myself responsible for a school of architecture. To this day I think of myself as a very bad teacher, as opposed to a critic or a theoretician.

I say this because I think for certain students my attitude was okay, but for others it was not, in spite of the fact that I felt there should be something for everyone—the good students as well as the not-so-talented ones. I think I was much better for the good students or the talented students than with the less talented students. But the mark of a good teacher is that he really cares equally about everybody. And try as I might, the truth of the matter is that's not within me.

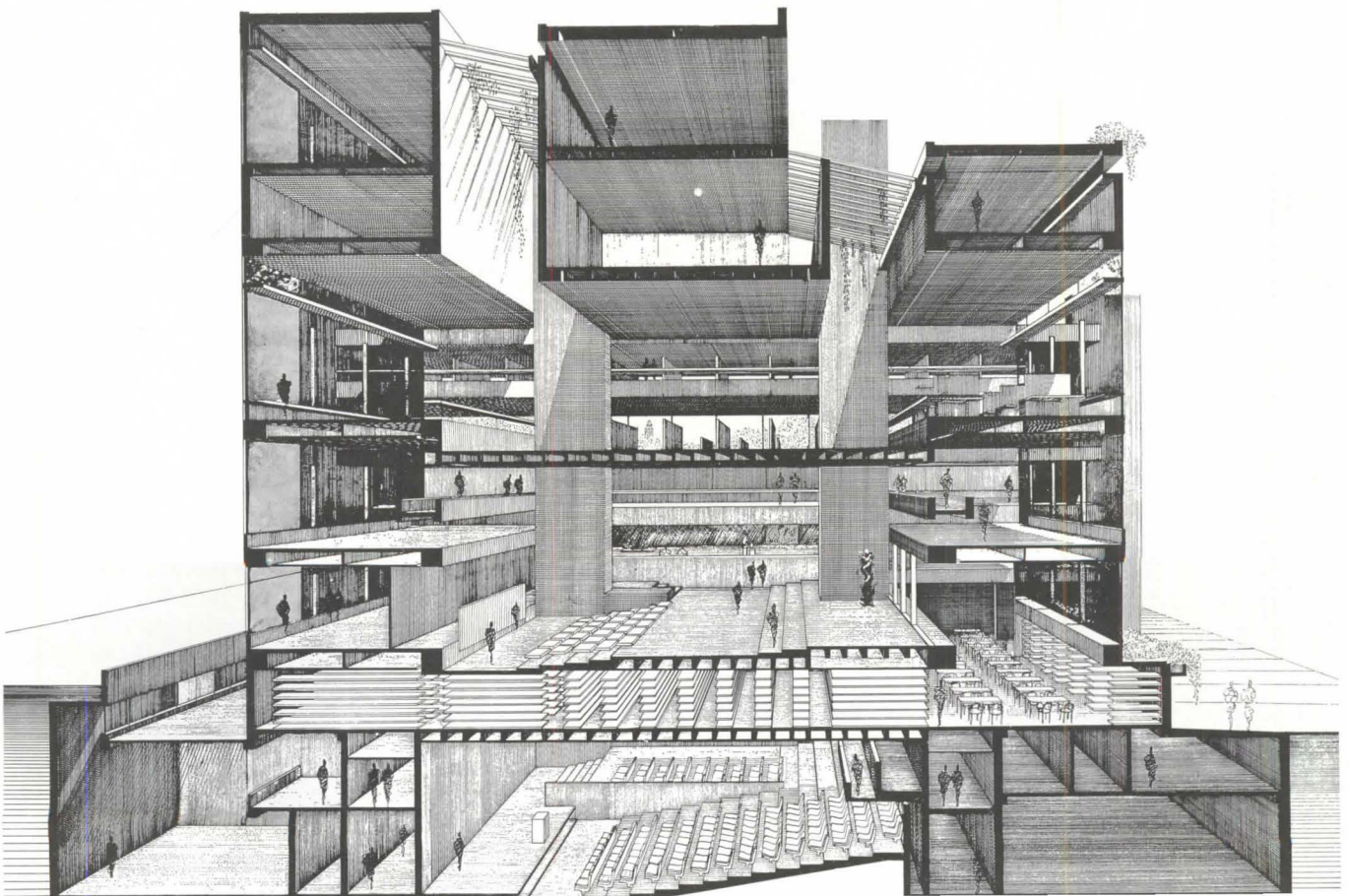
At the same time, it seemed to me that [as a teacher] I should never ever talk about myself as an architect, and indeed I didn't. I never talked about what I was doing. I tried to talk in terms of principle, and to this day I think that's very important—the differentiation between an architect and a teacher or a theoretician or a critic is the difference between night and day.

As a teacher or critic, it seems very important to me to be as objective as possible and to talk only in terms of principle, never how I myself, as an architect, would try to carry something out. I really learned that from Gropius. All of us have our biases, and no matter how much we'd like to get rid of those, we can't totally. But it's the job of a teacher, I believe, to look objectively at something—not how he would do it, but to talk in terms of principles. Because I think principles don't really change. How you carry them out changes and the problems change, but not the principles.

But as an architect, I become a different person. I become very passionate, I suppose is the best word. I did and still do, and I can't tell you why but certain things make an itch and I . . . well, the attitudes are different. I know that really well, and for the eight years I was at Yale I tried to be two different people, and finally I could not tolerate that any longer, so I left.

Now, the contradiction to that is the fact that I indeed was the architect of the A&A building. I assure you that many times I thought then and still think that maybe I was the last person in the world to undertake such an assignment. It muddies the waters in terms of putting aside one's prejudices.

But, at the same time, I think people learn from buildings, not just the buildings that they're in, but any building, good,



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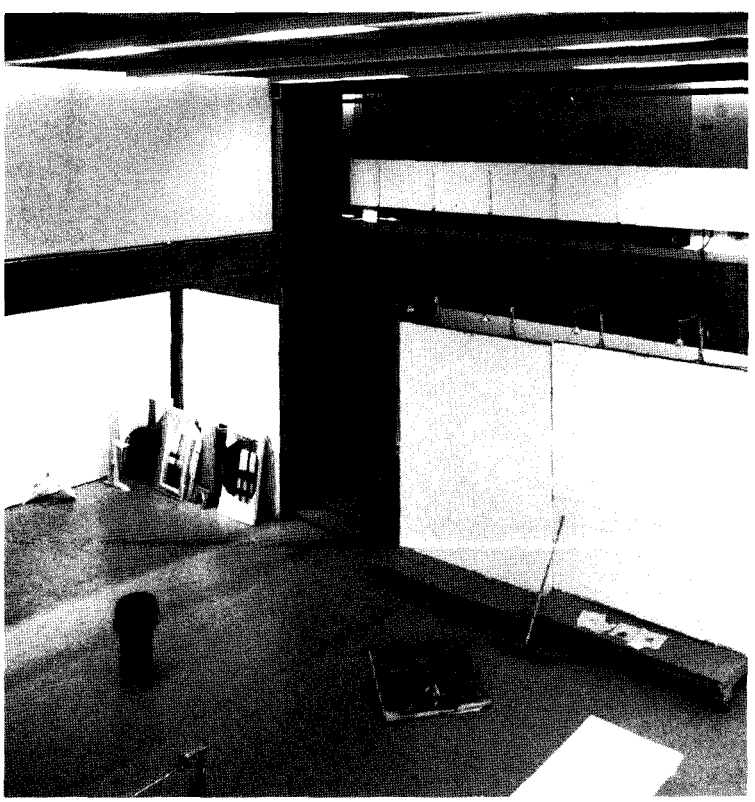

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Left, Rudolph's section reveals only some of the building's complexities. On this page, two views of the same space, the third-floor studio originally for architecture (top), a room that extended through the building from front to back and was daylighted by two light wells. Now walled in and closed to daylighting (bottom), it is used by the art school.

bad, or indifferent. They learn positive things and negative things. So I thought that a building to house the people it was intended to house should be a work of architecture in as true a sense as I could make it.

Now having said all that, as a would-be, sometime educator, I truly think there have to be things that students can fall back on—not formulas, but principles. It's not that you follow someone else's articulation of principles necessarily, but at least you know if you want to go in the opposite direction. There has to be a sounding board, there has to be a guidepost. That is the intention of the building. Whether or not it works that way is another matter. To me, you see, it doesn't matter whether people like something or dislike it. The fact that they encounter this thing is important.

Crosbie: Do you think that the fact that this building is still generating love and hatred simultaneously is a real measure of its success in the way you've described it?

Rudolph: The fact that there are those who have strong opinions about it, negative as well as positive, is okay. It's a part of it. Maybe the degree of this is, for me personally, a little difficult to understand, sometimes. If I can look at it objectively, I would say that's the purpose which it's intended to serve.

Crosbie: How did the building go up, under construction? It must have been a real challenge to the people who built it.

Rudolph: Charles Solomon, who was the executive vice president of Macomber Construction, built the building. And the building would not have been built as it was intended had it not been for Solomon. He was very creative and understood a great, great deal, and was most helpful. Macomber at that time was building many of Yale's buildings. The building was done on a negotiated contract basis—it was not put out for bids—and this gave me the opportunity to consult with Charles.

I suppose that, just purely technically, the treatment of the exterior concrete would not have been developed if it had not

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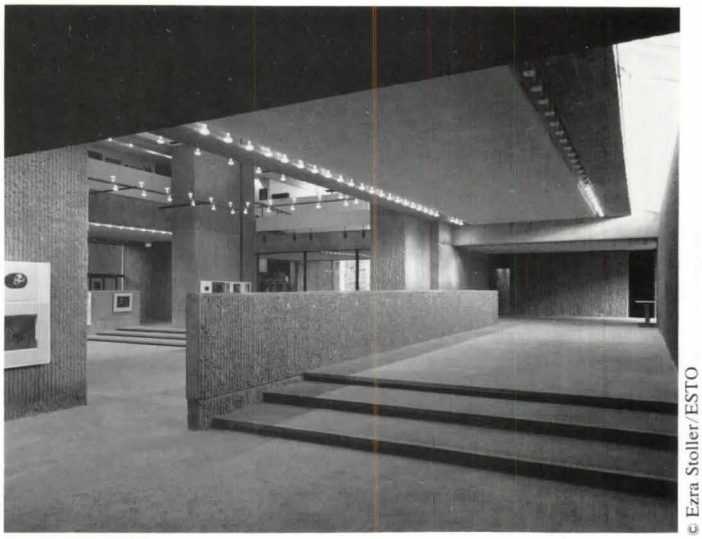

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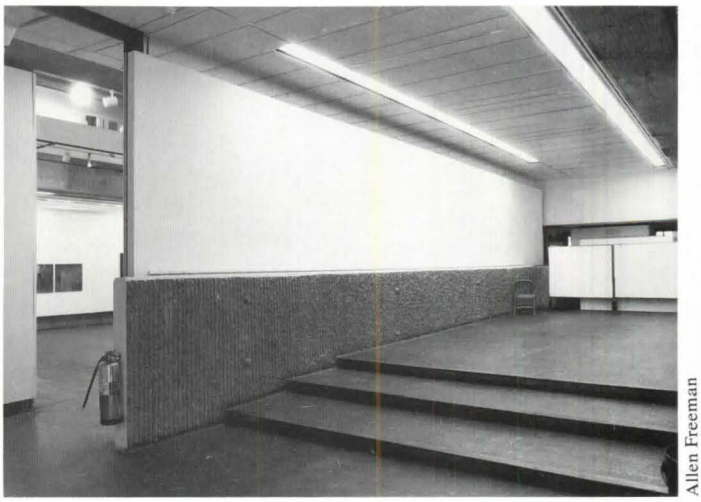

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been for Macomber. They made many samples. The notion of the concrete and how it should be handled derives from how concrete weathers. My notion was that if you got to the inner guts of the concrete, the aggregate and its color, and exposed that, and then made channels for the staining to occur, that it would weather much better. It has to do with the density of concrete. Of course that led to what is there, and that, I suppose, is the most unique part of the building process. I did several other buildings using the same technique, and for various reasons I stopped. It had to do with expense, although I subsequently devised a concrete block which is different but has the same characteristics for the same reasons—the weatherability.

Crosbie: The forms were ribbed inside; how was the aggregate brought to the surface?

Rudolph: The form was removed and the ribs sometimes pulled a lot of the cement off, and the rest was knocked off with a hammer, by hand.

Crosbie: Did the builders find the building engaging?

Rudolph: My experience is that at first builders and artisans say, "What is this, that's not the way to do it, the architect's making a big mistake, we're not going to do it that way, we're going to do it our way." But once they get the hang of it their attitude changes. I always know that when they start bringing their wives and girlfriends to the work site on Sundays after hours to see what's going on, the tide has turned. That isn't to say everybody likes it. But workmen will respond to innovations if they understand why the innovation is done. That's an important part of being an architect.

Crosbie: What other innovations or ideas were you experimenting with, technically or materially?

Rudolph: I'm fascinated with the idea that a building may be structurally very well thought out, and then the mechanical engineering comes along and it's superimposed on it, and there's

The structure was combined vertically with channels for mechanical systems, but not horizontally. It had to do with height. I didn't think from an urbanistic viewpoint that the building should be much higher than the surrounding buildings. The horizontal passage of air in concrete channels tended to make the building considerably higher, so I abandoned it.

Crosbie: What did you learn by doing this building? How has it touched you in the way it's evolved over the past 25 years?

Rudolph: I don't know how to answer that. I regard it to this day as an expression of many things that I think as an architect, not as a sometime teacher, although that too, in a strange kind of way.

I suppose this might sound like sheer obstinacy, but if I were to do it again, in detail I would certainly modify certain things. But in principle, I'm not sure that I'd modify it a lot. In fact I'm quite sure that I would not. I'm sure this probably sounds like, "Oh God, he hasn't learned anything." Architects cannot look truly objectively at what they've done, and 25 years later I find myself being still too close. A building for people as well as for architects is one of the most emotional affairs you can imagine. I think all of us know that, yet we talk about the tangible things and deal by and large with what is ostensibly very tangible. But the net result is a highly emotional affair, for its users, the commentators, and for the architect. And that can't change.

Crosbie: So how do you see the building now and how has it changed you?

Rudolph: The two things that I believe to be the weakest points in 20th-century architecture are the fact that we cannot make cities—not cohesive cities or even one building next to another—and that we don't understand very well what I call the psychology of space, both interior and exterior. Now this building addresses both of those. I believe its strongest point in fact is

Facing page, library in early photo (top left) and today (bottom left) shows boarded-over glass wall. Gallery (top right) has been partitioned (bottom right) and relighted. Right, the entrance.

By that I mean it does have a silhouette, a configuration in relation to the street, and a scale in relationship to the adjacent buildings. Not the immediate adjacent buildings, but this neck of the woods in general. Those formal relationships are there. I'm talking about it essentially from the outside. I think that its character, without at all copying details from earlier buildings, blends in terms of its color, scale, texture, its placement, its dimensions, its profile. It's a building that seems to belong. I believe that the A&A building demonstrates that you don't have to pick up details from a Gothic building nearby to make it sympathetic.

Now the appropriateness of space inside is a mixed bag. I regret very much for instance my inability to get natural light into the second floor as it was intended. But the fire laws and so forth made that difficult, although I think that if I pursued it a bit further I could have managed it. But I didn't, and the importance of natural light, and artificial light as far as that goes, becomes an integral part of the psychology of space. And the variety of space being simultaneously intimate and grand, sophisticated and simple—I think you find those characteristics in the A&A building, and subsequently I feel that I've carried many of those things much further. After all, this was an early building for me.

Crosbie: What do you see as its shortcomings?

Rudolph: Obviously it's too small. I did not anticipate—I'm not sure that anyone anticipated—that the painters for instance would want to make very large paintings. It's hard to remember that far back, but it was just about the time that large, conceptually conceived easel paintings came into being. People really wanted to make large paintings, and obviously the building did not take that into consideration. The size of the painting studios would have to be much larger.

The floor, I think, was wrong. It's exposed aggregate, and I would not do that again. While I liked the idea of that use of concrete, the maintenance of that was next to impossible. It was the wrong choice.

Crosbie: Of the changes that have occurred to the building over the years, what do you think has been the most damaging?

Rudolph: The lighting. Well, no, I should say first of all, the divisions of the major space, which happened to be the architectural drafting room [on the fourth and fifth floors]. That is subdivided and it's used in an entirely different way. While that's the nature of buildings, that they are used in different ways, it seems particularly damaging to me that because . . . well, I guess it's fairly clear that that was a major part of that building.

Crosbie: How do you react to the fact that the building now seems to be enjoying appreciation among current students?

Rudolph: Buildings have lives of their own. Buildings are like people, they're sometimes honest or sometimes not so honest. Attitudes change. The fact is that the building is in another cycle, opinions oscillate, and it matters little to me whether it's up or down. It's the nature of the beast. It brings up the question, of course, of whether the students set the building on fire. I don't know. It's what everybody's pleased to say.

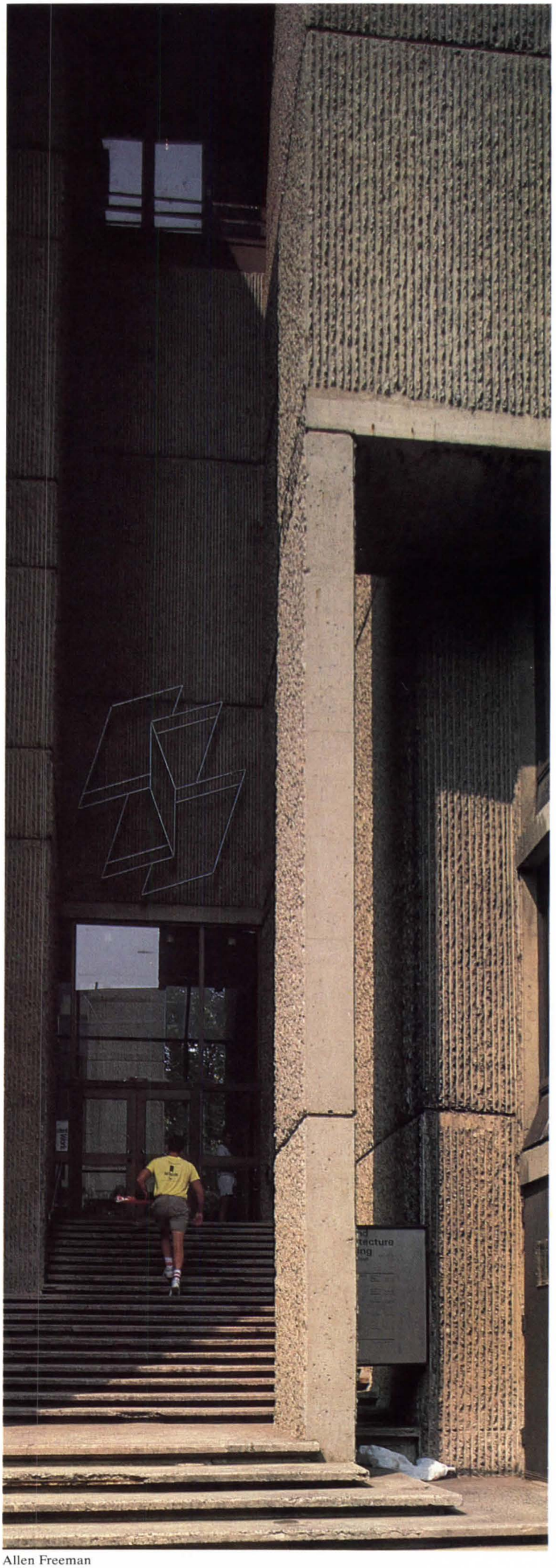
Crosbie: What do you believe?

Rudolph: I don't really know. I talked to the fire marshal.

Crosbie: Were you satisfied with his report that it wasn't arson?

Rudolph: I don't know if that's true. I don't know. But I would prefer to think that it was not the students of architecture. All of us can deal in wishful thinking. It would be wrong of me to say that I'm not touched by the idea that students of architecture set the building on fire. But I'm also touched by the fact that they make a model of the building and they want to have an exhibition. Of course it touches me. I'm pleased that the building touches people, and part of that is that people's opinions oscillate about it. That's okay. The worst fate from my viewpoint would be indifference.

I've never worked on a building that affected me as much as that one does. I'd like to think that, in spite of everything, it says something about the nature of architecture. □



Allen Freeman

Women in Architecture: Changes Over Time

By Nora Richter Greer

Women's status in the profession of architecture has improved markedly in recent years. Yet many would argue that women still do not have parity with men, that discrimination and stereotyping still exist, and that, although some new avenues have been opened, it is still difficult to achieve equal pay, equal responsibilities, equal recognition, equal opportunity. In an effort to better understand women's place in the profession—past, present, and future—we interviewed women from different regions of the country, in different roles in the profession, and of a range of ages.

It wasn't until the years surrounding World War II that women began to enter the architecture profession in more than minuscule numbers. That first wave of female architects would experience work situations in which overt discrimination was the norm.

A Pacific Northwest architect who graduated in 1941 found her first job with the Bonneville (Idaho) Power Administration. "They had a huge drafting room, and I was the first woman they hired. They put me right in the middle, with all these eyes watching me. I'm sure that was calculated." While acknowledging the real opportunities for female architects during the war, she also mentions experiences such as "looking for a job and being told 'we can't have a woman in the office because you can't take the language.' "

Another architect of this generation, who now heads a small firm in the Midwest, recalls that her first job could have been with a prominent Chicago firm. "But they said that I could only work in their interiors department, which was in a small, isolated room. They couldn't have me in the much larger drafting room because it was a distraction to my male colleagues. Obviously, I didn't take that job. But it was extremely hard to get a job then and advance within the firm."

From the late 1940s into the '50s and even the '60s, a common recollection is the sense of always being alone. What seemed most necessary for a young woman determined to become an architect was just that: an incredibly strong determination.

"I was in the fourth grade when I found out what architects did," says one woman now in her 50s. "I came home and announced I was going to be an architect and my father laughed. But I never gave up. I got to junior high school and wrote my paper about how I was going to be an architect, and the teacher said to me, 'I don't want to see you hurt, but they won't let you be an architect.' And I said, 'Nobody can give me a good reason why I can't do it.' When I got to high school and the war was on, they had special drafting classes for senior girls. There was a desperate need for drafting help. But when I got to the university, I had a three-hour lecture from the dean about how I was depriving some deserving G.I. of his rightful place and how I was wasting the state's money because I would only get married and have children and it would all be down the drain."

The determination of these early women in architecture has seen them through disappointments and worse. Two years out of architecture school, a 1952 graduate applied to work overseas with the U.S. government. "They said no women overseas, period. When I asked why, the government representative said, 'It's much too dangerous. Besides, you'd have to work with men.' "

A Southwestern architect in her 50s talks of "two kinds of discrimination. The first is overt and involves the recognition of a woman as a threatening being. I can deal with that. I can make friends with a mason who starts out telling me that I couldn't

crimination, is what's really destructive to a practice. This is the school board talking behind your back and not inviting you to talk to them. This is the subcontractor coming into the contractor's office during bidding and saying, 'This is crazy, what does that female think she's doing?' . . . I have to make a tougher set of bidding documents to be sure someone hasn't assumed that I don't know what I am doing."

Some 35 years ago, a newly registered architect applied for a job with the Chicago Park District. "After I was tested and extensively interviewed, they hired me as the most qualified. The job turned out to be the chief architect for the park district, a great opportunity. But within three months I was blacklisted. They said I was coming in late, that I was slovenly, both of which weren't true. The park district was so appalled at having a woman in their organization that they resorted to all kinds of disgusting behavior."

We don't hear very much these days of what went on in the '50s, when one woman was told by a design critic, "You'd have put everyone's time to better use if you had stayed at home and warmed your husband's bed." Today, women help each other to avoid courses where the professor has a reputation for treating women students badly. And together women are learning to deal with the mixed messages of such old sayings as, "Your drawings are lovely and they even match your outfit," or, "I would never expect such a strong project from a woman who looks like you," or even, "You'll be good designing kitchens."

Outrageous behavior is not all in the distant past. The principal of a prestigious firm headquartered in Chicago recalls: "I was in a surveying course and was holding a pin while my teammates were taking their turns at the transit. My professor came up to me and said, 'That's all you women are good for.' "

One woman who attended an Ivy League graduate school of architecture in the mid-1960s remembers the work of her studio being judged by a prominent architect. "He refused to crit my work because I was a woman, the only woman in that studio. He walked right by me. I asked my professor, 'Hey, how about me?' And my professor said, 'You know he is not going to do it.' . . . That they would invite someone, knowing this, and go through the farce of having me pin up my work . . . the more I asked, the more appalling it became. I've told this to a number of people and they've said, 'You are out of your mind. It couldn't have happened.' But it did."

"In the mid-1970s, people didn't dare to say, 'We don't hire women,' the way they did in the mid-1960s," says a West Coast architect. "They'd find other excuses. I was always told I was either underqualified or overqualified for the job. Once I was told they wouldn't have a position for another two months, even though they were advertising an opening at that very moment."

In recent years, getting paid less than men has been the worst aspect of discrimination for many women. "You start that way and it's cumulative," says one architect on the West Coast. Says a woman practicing in the Northwest, "I've never been paid the same as men doing the same kind of work. But it wasn't until the women's movement came along that I felt I had a right to expect equal pay."

To facilitate the advancement of women and minorities in all occupations, federal, state, and local governments initiated affirmative action programs, calling for businesses not dominated by white males to participate in a specific percentage of govern-

moment of affirmative action programs," says a Boston architect. "We were actually sought after for a proposal. It was our first public project. It gave us the opportunity to show that we could do a good job and it gave us credibility for future projects."

"There has been a lot of growth in women-owned firms here because of affirmative action. It has been good for all women in construction," says a Chicago architect.

But affirmative action has had a mixed reception. Sometimes a government gives only lip service to its affirmative action program and does not take seriously the firms that want to be considered for contracts. Sometimes, too, the abuse has been on the other side, with firms declaring minority status when in fact they don't qualify. The atmosphere in the United States today is decidedly against affirmative action in the awarding of public contracts for architecture, and many women don't notice any effects of affirmative action.

"I think I'm the only woman-owned architecture firm in the state," says one Southwestern architect, "but I have not yet seen a public job come my way."

"There's no affirmative action in this country," says another architect. "I thought I had two government jobs. But on one they cut the fee in half and made it impossible to do the job, and on the other they underplayed the position."

"We have never been selected for a job on the basis of our being a woman-owned firm," says an architect in North Carolina. "We've never even been interviewed for state work. To satisfy the guidelines, they can just get your proposal—they don't even have to be interested in hiring a minority- or woman-owned business."

Beginning in the 1970s, a number of local groups for women in architecture were founded, with the purpose of exploring and mitigating the problems of female architects. Such groups also provided a forum for moral support, which at that time was severely lacking. These groups continue to make an impact.

"I went to Chicago Women in Architecture in 1978 and asked their help in organizing a show of women architects," says a principal of a Chicago-based firm. "It was a very important event, a landmark event for a lot of women in Chicago, because women weren't used to thinking of themselves as architects, as important to the process. . . . It was very interesting to watch people congratulating each other, realizing they were part of the process."

But it is possible that interest in such groups is on the wane. What seem more appealing to women architects in the late 1980s are broader organizations, such as CREW (Commercial Real Estate Women) in Baltimore and elsewhere. A clear trend now is a women's network that crosses many professional boundaries.

"The Alliance of Women in Architecture is now in a lame-duck situation," says one of its founders. "It did a great deal for women. It was a process, I think. As an organization, I don't think it really holds together now. Maybe it will be useful again when the students now graduating from school begin to come up against a wall. They are very much like my generation in that they don't know what discrimination is. But if they hit a wall, at least they'll have an organization they may be able to use. . . . The walls are still there. I just closed my office. I am appalled at how little we have actually accomplished within the field."

"Women architects need to be more active in all kinds of groups that make policy, in the business world and in government," says an architect who is an elected member of her city council. "The chamber of commerce, for example, rarely has a woman on the board of directors, or if it does, she's just one out of maybe 15 people."

In virtually every major American city, women have emerged as leaders in the profession. With a sigh of relief these principals, partners, and top associates tell you that the worst is over in the struggle to gain equal status with men—that there are now few instances of outrageous mistreatment, of not being taken seriously, of not being given suitable work or proper compensation. But in another breath these women caution their younger female colleagues not to forget the past lest the gains slip away. The old warriors also ask, "Have the changes gone far enough for women architects? Or should we continue to push the boundaries further? Can we make the architecture profession more responsive both to females and males?" The answers are still to come.

In the late 1980s women want to be considered architects rather than "women architects," but they also want to claim the special qualities they may have because of their sex. "I see as much difference between individuals as I do by gender," says Chicago architect Diane Legge Lohan, AIA, the first woman partner of Skidmore, Owings & Merrill. "Yet women do deal with other people differently from men. We tend to be facilitators. We accommodate. We try to resolve a conflict before there's a confrontation. In order to succeed, though," she admits, "women have learned from men when to be tough, confrontational, stubborn."

"The best architect is one who can combine both roles as they are viewed today—the female supporting role, which involves details, getting things done, and the male initiating role, which involves an overview rather than details," says Miami architect Elizabeth Plater-Zyberk, AIA.

One of the traits perceived by some as growing out of their experience as women is the desire for an architect-client relationship that emphasizes the satisfaction of the people using the building. "We don't just style things the way most men do. We're much more honest about solving problems for our clients," suggests a Southwestern architect.

"Men tend to think, 'I've designed this and, damn it, I'm not changing it,' " says another, the principal of her own firm. "But I encourage a lot of criticism because that improves the work."

The vitality and commitment of women in architecture is apparent at every turn. Margaret McCurry, AIA, now a principal of Tigerman McCurry Fugman in Chicago, entered the profession "through the back door." A Vassar graduate with a B.A. in art history, she got her first job with Quaker Oats as a package designer. Her first job in architecture was with Skidmore, Owings & Merrill as an interior designer. She formed her own interior design firm in 1977 and in 1982 took the architectural registration exam. Her work now involves "more straight architecture than interiors," and, like many women, she wants to be better recognized for the quality of the work she does. She was a Loeb Fellow at Harvard in 1987, studying design theory and history. "I'm trying to make myself as good an architect as I'm capable of being," she says.

Roberta Washington, an architect in New York City, left a firm that specialized in health care facilities in order to open her own firm in Harlem. "I like my work now," she says. "I like projects

that are a benefit to some segment of the population rather than just a personal gratification to me." While Washington renovates brownstones in Harlem as her bread-and-butter work, she also designs housing for the homeless, for recovered alcoholics, for former drug addicts and their children, and for others who have trouble finding adequate housing. She wants "to be known as a good architect, not a good female architect, not a good black architect."

Cindy Harden, director of the Pratt Architecture Collaborative in New York City, works on similar projects. Harden, who studied social work as well as architecture, strongly believes that "as architects we can improve the environment for lower-income and disadvantaged people." The extreme poverty that Harden sees is atypical for a career woman in her mid-30s. One of Harden's projects was the renovation of a large single-room-occupancy hotel on the Upper West Side. "There were a lot of squatters there," Harden said. "The place was a disaster, the conditions just unspeakable. One woman had lived in the same room for 20 years and had all her belongings in huge piles. I asked her what she would like for her room, something that had never happened to her before. Mostly she had been told to leave."

Margaret D. Woodring, AIA, has been teaching since 1980 at the University of California, Berkeley, where she runs the international program that she developed. "Some of the most interesting work in my practice deals with development of low-income housing using the tax system as a basis of subsidies. . . . I'm a product of the '60s, more liberal and socially concerned than the norm today. And yet, because I spent the '70s in the realm of public finance, mostly in transportation, I feel that understanding finance and economics is critical before we make our next set of advances in social housing, transportation, urban recreation, child care, education—you name it. This position sometimes separates me from my '60s pals." Woodring wonders whether women architect-planners are more likely than men to play the role she finds herself in—doing "socially oriented building. . . . Is it because we are given fewer opportunities to compete favorably with our male counterparts in vying for the more lucrative projects? Or, because of our marginality in the profession—marginality in society?—are we more likely to use our professional training to increase the quality of life for people less fortunate than ourselves?"

Yet women are getting the kind of recognition that would have seemed unbelievable 20 and 30 years ago. Awards are only the smallest part of it. Judith Chafee, FAIA, educated at Yale and having worked for some of the best known architects in the East (Paul Rudolph, Walter Gropius, Eero Saarinen, and Edward Larrabee Barnes), returned to her native Arizona in 1970. A recent article in the Tucson *Citizen* said that Chafee is considered by some local architects to be "the best designer in Tucson."

An elected member of the Raleigh, N.C., city council, Norma DeCamp Burns, AIA, feels that she "represents the concerns of architects and others for a quality environment" in that rapidly expanding Southern city. She and others on the comprehensive planning committee have turned the city's planning document—originally considered "only a guide"—into an effective tool for regulating growth and ensuring quality development, she argues. And, too, Burns is adding her own quality architecture to the community: in 1985, the Chatham County social services building that she designed with her firm, Burnstudio Associates, was magazine's architecture critic Wolf von Eckardt, Hon. AIA.

Women are becoming visible as never before. Cynthia Weese, AIA, cofounder of the firm Weese Hickey Weese in Chicago, is now president of AIA's Chicago chapter. She has encouraged women architects in that city and elsewhere to seek broad exposure for their work. She believes there is slower acceptance of women entering the profession than of men. "In fact," she says, "this is not a great moment for women architects in terms of how their fellow professionals view them. There is a lot of skepticism. I hear my male colleagues talking about women architects in a slightly derogatory fashion."

Marie Laleyan, AIA, an architect from Bulgaria who opened her office in San Francisco in 1977 after serving as cochair of AIA's task force on women in 1975, is a commissioner of the state architectural licensing board in California, where there are more women architects than in any other state. "It's exhausting work," she says, "but it allows us to be in touch with the younger generation, to see who's going to inherit what we leave behind. It's very rejuvenating."

Women work in a variety of situations. Many are heads of their own firms; some have been for years. L. Jane Hastings, FAIA, started her firm in Seattle in 1959; she was the eighth woman to be licensed by the State of Washington and the third woman on the national board of AIA. She has been involved in education at all levels—teaching at the University of Washington and developing an architecture curriculum for elementary and secondary schools. In addition, she has been visibly active in l'Union Internationale des Femmes Architectes and quietly active in Seattle blowing the whistle on some questionable conduct in the public schools' capital improvement program.

Beverly A. Willis, FAIA, who came to architecture from the field of art and without a degree in architecture, has been licensed for 20 years and has served as president of the California Council of AIA. She once provoked controversy by saying she would not hire women; now her San Francisco firm, Willis & Associates Inc., is 75 percent women. She keeps the firm small, preferring to hire people as needed to supplement the staff. (In what may be a record, Willis and a crew of 28 designed and prepared all construction documents in nine months for a $110 million community in Hawaii.) Her work includes one of the earliest preservation projects in San Francisco—the award-winning No. 1980 Union St., done in 1963—and more recent major projects such as the $800 million Yerba Buena Gardens complex, for which Willis's group (led by Zeidler Roberts Partnership) was chosen over nine others.

Women are also partners in their own firms, with men or with other women. For Tannys Langdon, in her mid-30s, being recognized for her own talents as an architect is of great importance. "Authorship is a big problem in architecture. Famous architects have had the little woman back at the office designing for them, and those women are just a footnote in the pages of history," she says. After being a principal in the Chicago firm of Hammond, Beeby & Babka, she established Langdon Woodhouse, with David Woodhouse, a former employee of Booth Hansen

for substantial projects like the award-winning Conrad Sulzer Regional Library in Chicago for which she was codesigner with Thomas Beeby, AIA.

Some women work with their husbands. "Mom and Pop firms," according to Frances Halsband, FAIA, of R.K. Kliment & Frances Halsband, Architects, have developed from two principles: that the craft and the art of architecture are all-encompassing and all-consuming, and that they demand collaboration. The partnership of a husband and wife, Halsband finds, has remarkable design energy. "A partnership that contains more of the breadth of human experience and maintains the close working relationships of family life can serve as a model for the ideal creative environment," she says.

Increasingly, women are working in key administrative positions in public agencies and private corporations. In 1986 Judith Berke, AIA, became the first woman director of the Bureau of Space Design in New York City's Department of General Services. The city owns only 40 office buildings; Berke's bureau is responsible for designing and following through to construction whatever is needed for the several million square feet of office space the city rents each year. Her staff of 17 includes architects, engineers, and cost estimators. "We always have deadlines, pressures," she says. "Getting things through the bureaucracy is an art."

Another first for women is the job of chief architect of the Washington, D.C., public schools, held since 1986 by Jane Leoncavallo Hough, AIA. She has a staff of up to 20, an annual budget of $40 million, and an overall plant of 18 million square feet. Her office does primarily upgrading and converting—for instance, adding computer labs or new science facilities. But a new project, a pilot program in six schools, provides infant care to allow young mothers to stay in school. Another challenging project was the renovation of a building in which schools would teach renovation of buildings. "They never thought they'd have a woman in this job," Hough says. "I'm even hiring women now. The men requested it."

Lynda Simmons, a pioneer in building humane and affordable housing in New York City, has been president of the nonprofit Phipps Houses since 1982. Before that, as director of development, she created 1,610 apartments in the Bellevue South renewal area. Trained as an architect—she studied at Cooper Union at night—she decided to become a developer as a means of getting her ideas realized on design and social matters. She has insisted that kitchens have large windows and that laundry rooms be on the ground floor, within sight of "tot lots." Because she cares about her tenants and her buildings in a comprehensive way, she founded the Phipps Community Development Corp. to provide social services and engender a sense of community among Phipps tenants. One byproduct of that effort, Simmons says, is that they haven't had to paint the halls in 10 years. She knows of no other subsidized apartments where that is true.

Mary C. Means is a former vice president of the National Trust for Historic Preservation and former president of the AIA Foundation; she is now in private practice with Thomas & Means Associates, in Alexandria, Va. She anticipates seeing many more women with an architectural education in public policy and public interest positions. The chiefs of urban design, the parks commissioners, the mayors' assistants for community development will often be women, Means believes, who will work to set and administer a humane public policy that grows out of their traits as women—the qualities of nurturing, persuading, seeing holistically—those traits described by Carol Gilligan and others.

Women also are beginning to fill top academic positions. Rosaria Piomelli speaks candidly of her brief tenure as the first woman dean of the City College school of architecture in New York. "My being a woman was always a mixed blessing for the job," she says. "On the one hand there was attention bestowed on me. . . . On the other hand, this may have fostered discontent and resentment among my colleagues. I believe, though, that this attention was generated not only from my gender but also from the agenda I was implementing at the school."

Piomelli's last term as dean was the fall of 1982-83. Looking back, she says, "It is important that we not get so enamored of the title or the power as to accept costly compromises to maintain them. There must be no regret in letting go." Now, in addition to running her practice, Piomelli continues to teach at City College. One of her courses is an elective on ethics that encourages students to take responsibility for their architectural work, deciding what is right to build, where, and for whom.

Women architects are at the cutting edge of their profession, doing work that will probably not be part of conventional practice for many years to come. One such woman is Polly Welch, a Harvard graduate, an officer of the Environmental Design Research Association, and a partner in the new firm of Welch & Epp Associates in Arlington, Mass. She had worked in a traditional architecture firm but felt alienated from the profession. "The rewards for which we worked—'being in the magazines'—were not those I found satisfying." Now, in her own firm, she chooses not to offer traditional architectural services. "The services I am most interested in providing are research, programming, and evaluation. These are currently viewed as tangential to the design process, but I think they will all eventually be incorporated into design, as architects are held more accountable for the performance of their buildings over time."

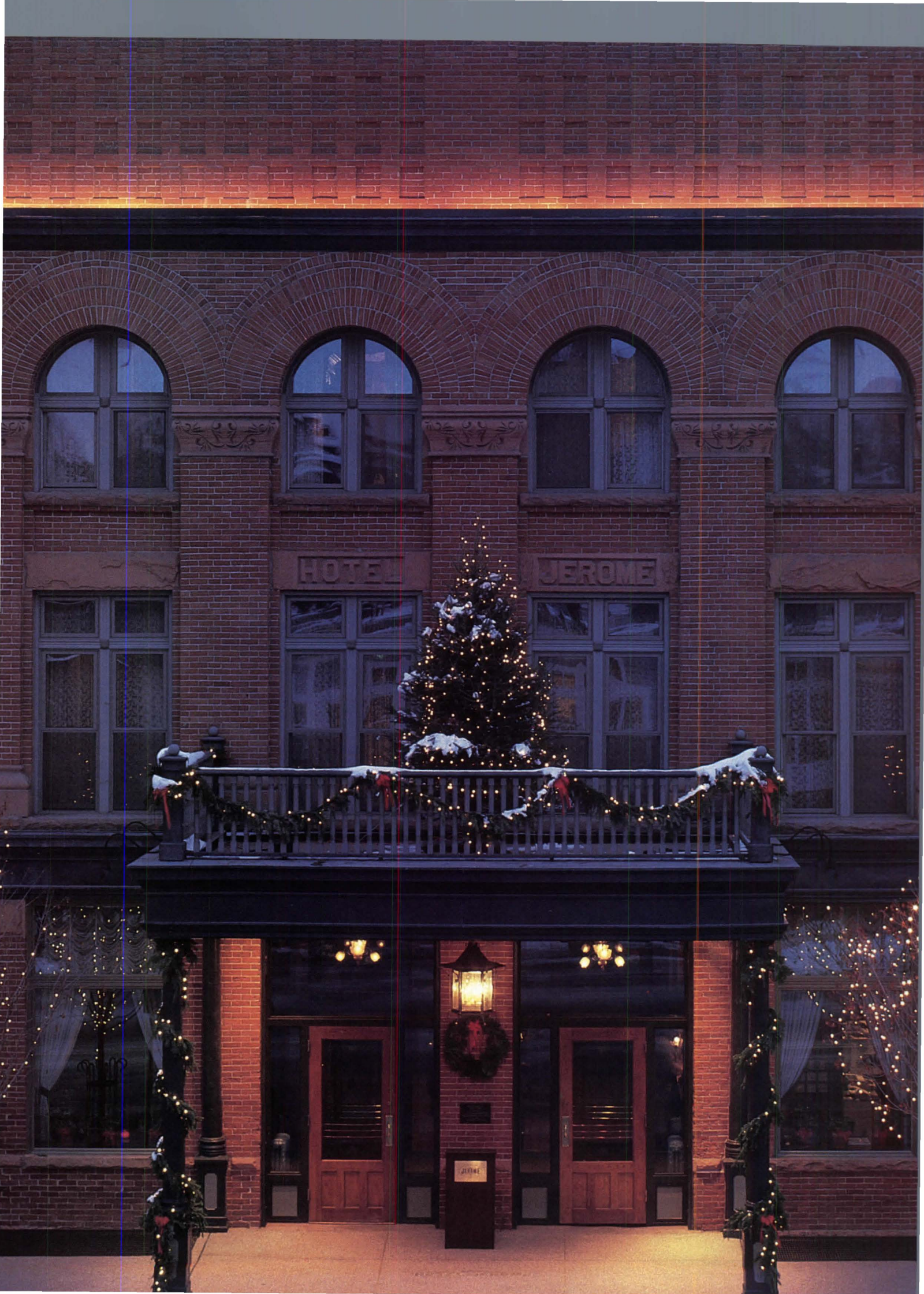
Welch views a building not as "an artifact, an object created at a moment in time" but as "the physical representation of an ongoing process," and she wonders whether that isn't "related to a gender difference." She finds that her approach to architecture fulfills her need "to nurture and facilitate growth."

Welch's partner, a planner, is a woman, and each works at home. This, too, may be a direction for the future, as electronic communications equipment allows people to connect without being in the same space every day. Interesting, too, is Welch's comment that many people view their practice "as less serious and less professional because we work at home. . . . I think it is particularly difficult for women to be taken seriously when they do not conform to conventional practices."

Women are looking ahead with hope, but not without concern. Marjorie Hoog of New York City says, "There's a backlash right now. Feminism is basically a dirty word. It's hard for us to admit that harmful sexist attitudes still prevail in our culture. These wrongs take a long time to right. The suffragettes thought they had won, too, you know."

But given the strength, talent, and creative energy of the women in architecture now, there is no doubt that their place in the profession is secure. □

Portions of this article will appear in Architecture: A Place for Women *(Washington, D.C.: Smithsonian Institution Press, 1989, Ellen Perry Berkeley, editor, and Matilda McQuaid, associate editor). Ms. Berkeley contributed to this article.*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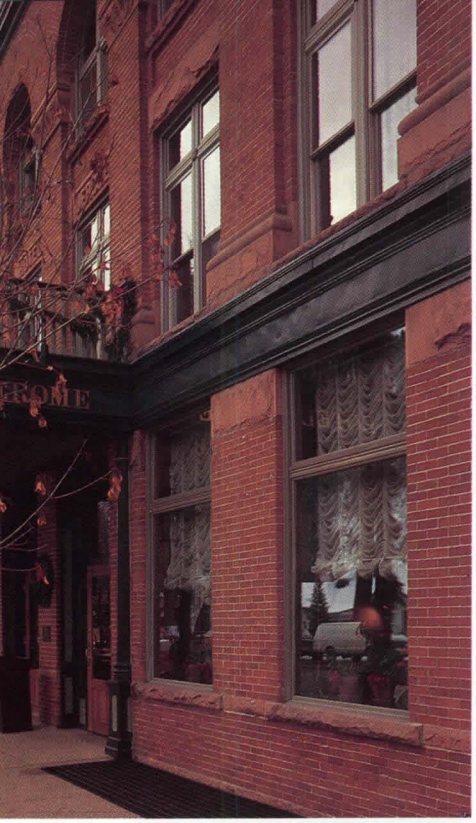

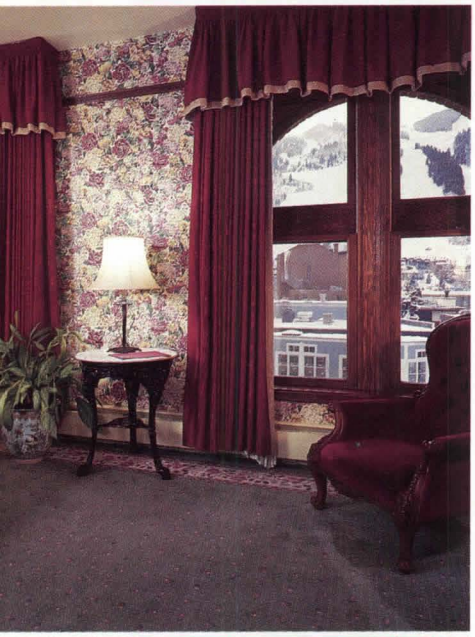

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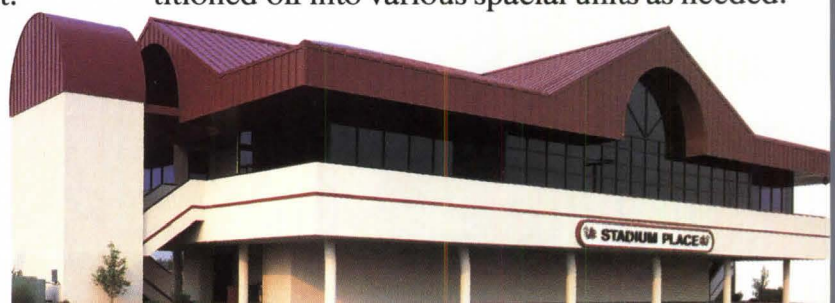

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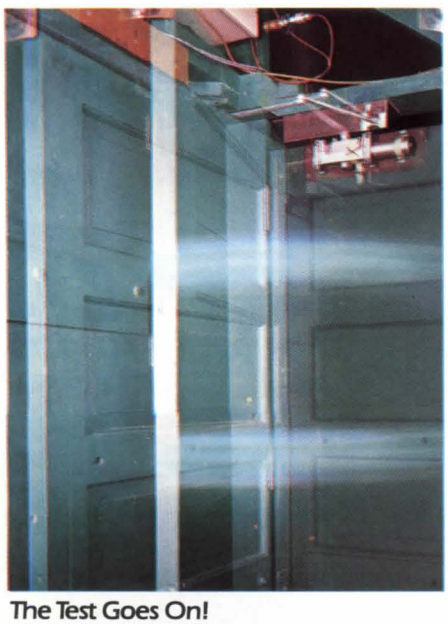

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Case History of a Capitol Restoration

As recounted by its architect, Charles W. Warterfield Jr., AIA

Just how much can one state capitol be expected to endure? In the 143 years since William Strickland laid the cornerstone of his master work in Nashville, the Tennessee Capitol has risen above an irate legislature, occupation and fortification by unsympathetic Union troops, the ravages of a smoke-polluted atmosphere, decades of neglect, and the vagaries of politics. In the 20th century, its magnificent setting has been diminished by the "progress" of urban renewal, the ascendancy of the automobile, and a public preference for easy pedestrian access over its 19th-century landscaping.

Aside from the widely recognized quality of its Greek revival architecture, the building seems a remarkable achievement considering the circumstances surrounding its conception and construction. In 1845, when the design was agreed upon, Tennessee was a frontier remote from skilled craftsmen and suppliers of the materials required for such an ambitious project. Thus, when Strickland moved to Nashville to superintend the design and construction, he had at his disposal a nearby source of limestone and a list of suppliers and fabricators of other materials in his native Philadelphia. Local prison labor was used, but the stonecutters and other skilled artisans came from Eastern cities. In 1859 the building was essentially complete, but its landscaping was not entirely in place until after the Civil War.

William LeFevor

The second-floor lobby space presents clearly the beauty and simplicity of the limestone walls in Strickland's design.

Tragically, none of Strickland's original drawings exist today, presumably having been discarded by Federal officers who occupied his former office during the war. Other documentation, however, describes the interesting relationship between Strickland and building committee chairman Samuel Dold Morgan, at whose insistence Strickland reluctantly agreed to add to his design the unique cupola based on the Choragic Monument of Lysicrates.

Strickland did not live to see the completion of the building, but on his death in 1854 he was honored by entombment within its massive limestone walls. The great dignity of his building has endured and prevailed; its continuous use as the seat of state government is a testament to his farsighted planning and knowledge of lasting construction. The building's commanding presence has been taken for granted, however, and its gradual deterioration went unnoticed until 1951, when the necessity of repair to the exterior was finally recognized.

In 1937, Gov. Gordon Browning had taken the first steps toward interior improvements with the renovation of the executive suites by Nashville architects Emmens H. Woolwine and John Howard Clark, whose eclectic work combined handsome Georgian woodwork with art deco chandeliers and ceilings. Restoration was not considered important at that time. Even when major "restoration and repair" of the exterior was undertaken in 1953, the theory, principles, and technology of historic restoration were only emerging.

Although the limestone exterior was largely removed and precisely replicated in this massive effort in the 1950s, many departures from original detailing and interior finishes further compromised the integrity of Strickland's design. Modern building systems were incorporated and the interior was refurbished, but the absence of commitment to precise restoration based on research and analysis gradually became evident. The 1950s "restoration," undertaken in an era when the value of historic buildings was barely recognized, was nonetheless a major step in the ultimate preservation of the Capitol. Architects for this project were Woolwine Harwood & Clark with Victor H. Stromquist of Nashville.

The importance of the building and the need for thorough restoration were clearly stated by Gov. Lamar Alexander when he appointed a State Capitol Commission in 1985 and charged it with responsibility for all future restoration of the Capitol. Because of the building's architectural value and statewide sentiment for its restoration, the commission members were drawn both from state agencies and from the private sector. The chairman was Amon Carter Evans of Columbia, Tenn., a private citizen known for his restoration work.

In the absence of historical documentation and guidelines for

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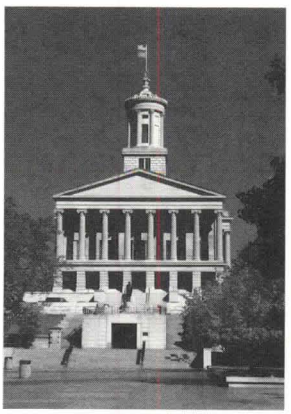
Mr. Warterfield, principal in charge of the Tennessee State Capitol restoration, was introduced to the building in 1937, when, as a boy of 11, he saw the work being done in the governor's office by his father's close friend, architect Emmons H. Woolwine. Seventeen years later, steeped in the tenets of modernism, he began his career as a draftsman with Woolwine Harwood & Clark, assigned to the position of chief draftsman for the first restoration of the Capitol. Mr. Warterfield has been responsible for numerous restorations including 27 buildings on the national register, historic district surveys for seven cities, and master planning studies for 63 historical commissions. He also is a member of AIA's committee on historic resources.

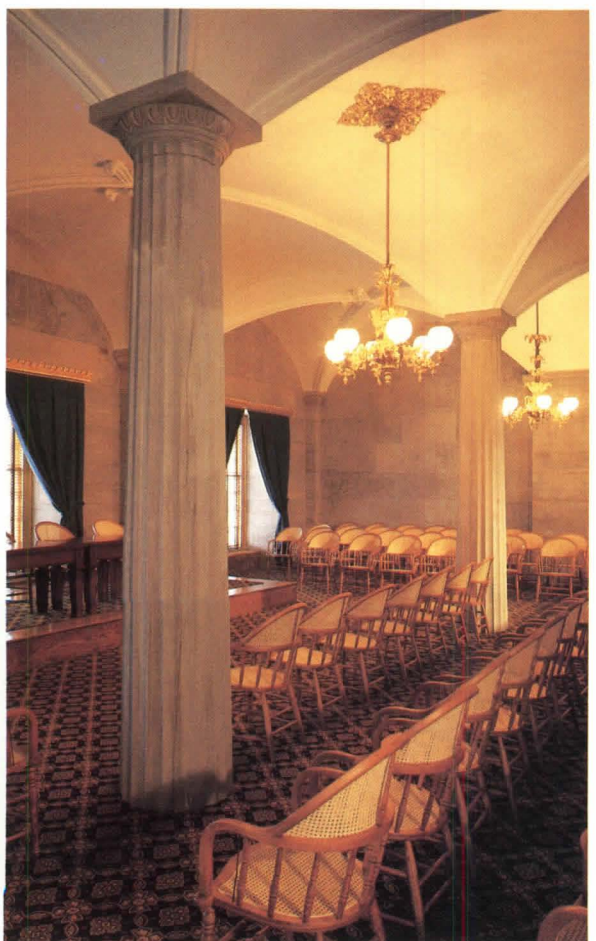
Charles Warterfield



Right, front elevation. Below, the Supreme Court chamber, before and after the most recent restoration.

Charles Warterfield

William LeFevor



future efforts, the group engaged Medel Mesick Cohen Waite Hall Architects of Albany, N.Y., to provide a historic structure report that included recommendations for phased restoration, anticipating that work would continue until 1996, the state's bicentennial. This firm was retained also to restore the Capitol Library as a pilot project during Gov. Alexander's term of office and as a demonstration of the value of authentic restoration. The dramatic result was an inspiration for the commission, which then adopted the historic structure report and firmly established restoration goals and quality standards to guide all the work. Basic premises underlying all planning include these: (1) The building will remain a working Capitol for the foreseeable future, and contemporary functional requirements will be provided for in such a manner as to be removable in the future. (2) Wherever possible, restoration should return the building to its original condition or appearance, including furniture and furnishings. (3) The original building fabric is to be left in place and undisturbed by the introduction of modern materials.

With an initial appropriation of $3 million, the state engaged two architecture firms—Warterfield Goodwin Associates and Hickerson Fowlkes Architects, both of Nashville. The architects' first task was to help the Capitol Commission determine areas to be restored, an effort complicated by the natural concerns of the building occupants—the governor, secretary of state, and other constitutional officers—who were concerned about the incompatibility of historic restoration with the traditional operation of their offices, not to mention the inconvenience of temporarily relocating the administration to another building. Further complications resulted from the necessity of completing all work between sessions of the legislature—a period of seven months.

Within the budget and time restraints, it was decided that the work should be limited to complete restoration of the major lobbies and halls; reclamation and restoration of the original State Supreme Court chamber; partial restoration of executive offices with emphasis on furniture, drapery, and carpeting; and total refurbishing of the crypt floor to accommodate the governor's support staff. Other required work included abatement of asbestos materials installed in the previous restoration, installation of fire suppression systems, and installation of massive new electronic data and communication systems. Additionally, the Capitol Commission planned to acquire and place period furniture wherever and whenever possible. Thus, the architects' charge was to authentically restore the building while incorporating every modern office system and to furnish it with a combination of antique and high-tech furniture—and to complete all this in seven months.

The importance of the contributions of the Tennessee State Museum and the Tennessee Historical Society cannot be overemphasized. Lois Riggins, director of the museum, and James Hoobler, then director of the historical society, were ex-officio members of the Capitol Commission, which depended heavily on their advice and opinions. The dozens of large portraits, sculpture, and other priceless artifacts that reside in the Capitol are owned by the museum, and, under Riggins's direction, their safety, removal, and reinstallation constituted a highly sensitive phase of the work. The museum staff also was instrumental in furniture acquisition, and all information recorded during the restoration became the museum's property. After completion of the project, Hoobler was appointed curator of the Capitol.

Obviously, all of the analytical and investigative techniques developed for restoration work in the three decades since the Capitol's first major restoration were to be employed, but logistical

planning and scheduling also were essential for the success of the planning and construction phases. Therefore, as part of their basic services, the architects provided a computer-generated schedule and a CPM plot defining the entire process. Every decision and activity of the Capitol Commission, state officials, building occupants, design team, consultants, and contractors was scheduled to meet the target move-in date of Dec. 15, 1987. Early restorationists might have viewed with skepticism the apparent dichotomy of sensitive analytical work and computerized planning in a major project, but such is the nature of restoration work in the late 20th century.

In contrast to the 1950s restoration, this careful planning and organization clearly indicated the need for research and analysis to proceed under early, separate contracts with the state. Moreover, because of the time constraints, results had to be available to the architects well in advance of issuing bid documents. Particularly sensitive areas were color analysis of the many painted plaster ceilings, stone cleaning procedures, and reproduction of the large gasoliers in the public areas. Based on the report of Biltmore, Campbell of Asheville, N.C., the firm responsible for the decorative ceiling painting in the library, the critically important ceiling painting was bid separately in advance of the general contract, and the work was awarded to Evergreene Studios, whose contract was eventually subbed to the general contractor. Only scant documentation exists of the original Cornelius and Baker gasoliers, but a design was developed by the architects under the assumption that the component parts were similar in character to those of other original ones in the building. Frank Boesel of the Milwaukee company Experi-Metals Inc. was identified as the only supplier capable of producing the three massive, 15-arm fixtures in the allotted time and to the specified high standards.

William LeFevor

The governor's reception room. Note restored stenciled ceiling.

Continued research under John Kiser, a consultant to the Capitol Commission, yielded exciting results. Architect Jim Thompson of Hickerson Fowlkes located three brass gasoliers from the 1850s, also made by Cornelius and Baker, which were used to replace those removed from the Supreme Court chamber when it was subdivided into office space in 1937. John Mesick discovered that Samuel A. Dornsife of Philadelphia had in his possession original 19th-century point papers, from which were designed carpet patterns closely matching those illustrated in early sketches and lithographs of the Capitol's interior. There was very little accurate documentation of the original ornamental plaster work, however, so the architects proceeded on the assumption that conjectural designs would have to suffice.

With such information at hand, contract documents were completed, the building vacated, and a contract awarded to the successful bidder, C.A. Gardner Construction Co. of Nashville. Asbestos abatement was quickly completed and the building turned over to the contractor on July 10, 1987. State architect Michael A. Fitts, in a preconstruction conference, impressed upon all members of the construction team the great importance of the work to be done, the inflexibility of the completion date, and the need for total cooperation among the many artists and artisans who would be working simultaneously under what were to be very congested and uncomfortable conditions. The management plan agreed upon by Fitts, the architects, engineers, and contractors included daily job meetings, biweekly scheduling conferences, and recognition that the work would include changes that would have to be made faster than state paperwork could flow. Every document would be hand delivered. Representatives of the state building commission, architects, engineers, the contractor, all subcontractors, and all suppliers convened for the scheduling conferences, which were deftly orchestrated by Davis Edwards of Construction Services Inc. of Atlanta, who translated the discussion directly to computerized progress charts.

With the work proceeding at such a pace, the architects were required to perform almost constant surveillance to ensure that

uncovered evidence of original or early fabric or design was carefully documented or preserved. Many discoveries influenced the final design. As expected, the removal of certain suspended ceilings installed in 1937 revealed original plaster medallions that provided patterns for new work as well as many stenciled motifs on concealed walls and ceilings. Mostly late-19th-century in character, these recalled early accounts of complaints from occupants that the original interior was "too severe and unadorned." Not satisfied with the previous report on original ceiling colors, Evergreene Studios continued to analyze them, finally uncovering the original warm palette and precise brush stroke technique that produced the elaborate *trompe l'oeil* ceilings that were so important in the original design.

Other than the ceilings and the 1937 millwork, which was left in place because of its beauty and quality of detail, the interior of the building is entirely native limestone. From the standpoint of exposure to weather, this fossilized stone with phosphate strata was not totally durable; thus, the major replacement of the exterior with Indiana oolitic limestone in the 1950s. On the interior, however, the limestone produced wall surfaces of great variety and interest, many of them 42 feet high. Nashville's formerly smoky atmosphere, early heating systems, and intense concentration of nicotine had virtually obscured their inherent beauty, and no serious effort had ever been made to clean them. Thus, when cleaning poultices were removed, an entirely "new" color resulted, bringing an unexpected brightness to the interior. Wasco Inc. of Nashville was responsible for the stone restoration.

As the work moved closer to completion, with ceilings painted, walls cleaned, chandeliers installed, and historic carpet handstitched in place, the intent of William Strickland's interior concept became increasingly clear: spaces of great nobility and monumental scale in a building of relatively modest size; spaces defined by severely plain stone surfaces that drastically contrast with the rich decorative features in brass, plaster, wood, and paint; and a color scheme of pure stone and richly toned ceilings.

On Dec. 15, 1987, Gov. Ned Ray McWherter, who had spent almost his entire first year of office in a temporary space, moved into the executive chambers precisely on schedule, with the other occupants immediately following. The legislature convened in January and the building was again in use as the seat of state government after only a passing interruption in its history as the United States' oldest building in continuous use as a state capitol. Future phases of its restoration will include the chambers of the Senate and the House of Representatives and as much of the site as is possible to restore. It is hoped that the beautiful lamp standards and statuary groups that originally graced all four of the approaches to the building will also be replaced. Cast by Wood & Perot of Philadelphia, they were an integral part of the original design. Their importance was not recognized in the earlier restoration of the 1950s, and so they were discarded.

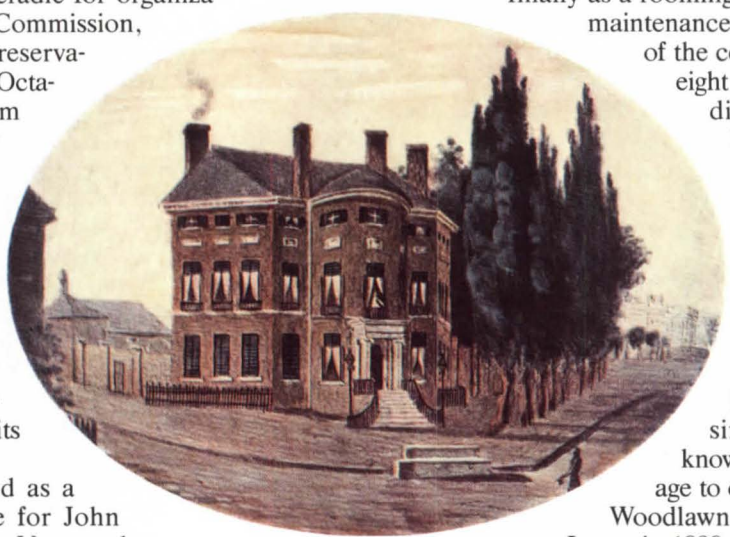
The restoration of this master work of a master architect was a challenging and humbling experience for the architects and all others involved. It is not necessary to visit William Strickland's tomb in the building's north portico—his powerful presence is almost tangible throughout the building. We see the Capitol today as he envisioned it but did not live to see. His respectful and admiring successors think he would be pleased. Much was learned in the restoration, but one item still remains Strickland's secret:

The Octagon: Cycles of Renewal

Its care is a never-ending task. By M. Stephanie Stubbs and Douglas E. Gordon

Only a handful of buildings can claim the architectural and historical significance of Washington's Octagon House, designed in 1798 by William Thornton, architect of the U.S. Capitol. Since that time, the Octagon has been a house of the wealthy, a house of the poor, a rented school and office, headquarters to AIA, and now a national historic landmark and museum of American culture.

Through all its varied roles, the Octagon has undergone physical changes to meet the needs of its occupants. Some changes have modernized its structure or function while others have restored its former grandeur. The alterations connote the continuum of effort by AIA to preserve the building and its heritage as a witness to history and cradle for organizations such as the U.S. Fine Arts Commission, the National Trust for Historic Preservation, and the national AIA. "The Octagon today is an architectural gem of a building, a living laboratory for historical research, and a focal point of educational and cultural programs for architects and laypersons alike," says Hugh Miller, FAIA, a preservation architect and Octagon committee member. "We must view the building in its broadest context—its past, its present functions, and the hopes we have for its future."



1830s watercolor, above, shows the Octagon the Tayloes knew.

Originally, the Octagon served as a winter season, "in town" house for John Tayloe III of Richmond County, Va., a tobacco planter, horse breeder, and one of the wealthiest men in the country at a time when there were many lots but few buildings in the newly founded capital city. Tayloe paid handsomely for his new home. At $35,000, the Octagon was two to three times as expensive as its grandest contemporaries built in the District.

The Octagon played its first major role in American history in 1814 to 1815, after much of Washington, including the White House, was burned by the British during the War of 1812. Spared because it was serving as the residence of the French ambassador at the time, the house thereafter became the residence of President James Madison and his wife, Dolley. The treaty that ended the war was signed at Ghent, Belgium, in December 1814, and the following February Madison signed it in the Octagon, most likely in his office, the second-floor circular room now known as the Treaty Room.

Remarkably, throughout its long life the Octagon's appearance has remained relatively constant. Tayloe himself made the one major structural change around 1820, when the building's flat roof was covered with a heavy truss-and-frame hip roof that was first shingled, then covered with terne, then shingled again. There is evidence that Tayloe preferred the look of the flat roof and enjoyed the views of the capital city, Georgetown, and Alexandria. (Dolley Madison is reported to have watched British troop movements from the Octagon, probably from the rooftop.) However, records of a lawsuit for nonpayment brought against Tayloe by the roofing contractor and records indicating that a great deal of oakum was added to caulk the original roof after it was first installed led J. Everette Fauber Jr., FAIA, to conclude in a 1976 report that the flat roof leaked badly from the outset and that Tayloe was forced to replace it with the hip roof, probably between 1817 and 1825.

Members of the Tayloe family lived in and cared for the Octagon until Mrs. Tayloe's death in 1855, at which time the family rented it out as a girls' school, then as a government office, and finally as a rooming house, apparently giving it less maintenance as time went by. Around the turn of the century, it was the dwelling place of eight to 10 families at once. Spaces were divided, doors added, fireplaces blocked off, and rooms filled with rubbish and covered with grime.

Some period photographs that show extensive damage to the Octagon have been used to support the assertion that the house was near ruin before AIA secured it. However, it is possible that the damage was inflicted by weather, not residents, since a severe storm in 1896 is known to have caused substantial damage to other old houses, including nearby Woodlawn Plantation.

It was in 1898 that the Octagon's fortune shifted toward the better. AIA looked to Washington, D.C., as neutral ground on which to bring together the factions representing architects across the nation. In that year, AIA rented the Octagon as a headquarters office (for $30 a month) and began repairs. It is testimony to the quality of construction and the Tayloes' commitment to maintaining the house that, despite its trash-laden appearence in 1898, AIA was able to move in almost immediately. Washington architect Glenn Brown, who later would become, in essence, the first AIA executive director, was elected Institute secretary in 1898 and pushed for AIA to purchase the Octagon outright. In 1902, with the help of Charles F. McKim and others, Brown succeeded in purchasing the Octagon from the Tayloe family. The story of its restoration and repair since that time can be told in four major phases.

Phase I: The new owner, 1902-1926

The extensive cleaning and repair undertaken by AIA at the turn of the century may well be considered the first step toward restoration of the Octagon. Although the term "adaptive use" was not yet in the architect's vocabulary, George McCue reported in "The Octagon—being an account of a famous Washington residence: its great years, decline and restoration" (American Institute of Architects Foundation, 1976): " . . . [T]his conception

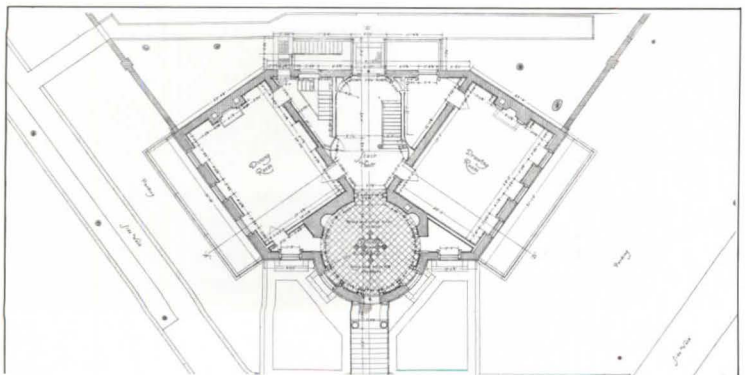
of keeping a landmark building in existence by restoring it to serve a new purpose consistent with its historic character was exactly what the AIA was working toward in a voluminous sequence of reports and resolutions. . . . It is unlikely that any preservation project ever had the attention or the participation of more architects." At 100 years of age, the Octagon was recognized for its value both as a place of historic events and as a fine example of newly independent America's building design, Federal architecture.

The Octagon's first years under AIA's tutelage brought those repairs necessary to adapt the building to office use, protect it from the natural effects of old age, and clean up layers of grime and peeling paint. Luckily, structural damage sustained in its 46 years as a rental property was slight. According to McCue, repairs around the turn of the century included adding new drains, repairing the shingled roof, relaying the garden wall on the 18th Street side of the building, and repointing brickwork on the cellar level. In the entrance lobby, old floor joists were removed, an eight-inch slab was poured, and the marble tiles were relaid. Missing tiles were replaced with similar tiles removed from the old Treasury Building. By 1926, radiators replaced the hot air system, electrical lighting replaced gaslights, and steel beams bolstered the sagging floor of the dining room.

Phase II: New headquarters, 1949-1956

A growing AIA staff crowded the Octagon in the 1930s, so a new staff office building was constructed behind the old, with a garden in between. The new building was completed in 1940, at a time when the federal government was in dire need of emergency wartime office space. Before AIA moved into its new headquarters, the building was pressed into federal service. During this time only emergency repairs were made to the Octagon; they included replacing, to a depth of four inches, crumbling Aquia Creek sandstone (in the basement wall and in the second-floor string course) with matched stone from Ohio and repairing the brick foundation of the stone steps. Finally, in late 1949, the AIA staff moved into its "new" headquarters. Only then could renovation of the Octagon begin in earnest.

Octagon restoration has always entailed dedicated sleuthing by historians as well as a modicum of guesswork. Although two preliminary studies for the building design exist and are now stored in the Thornton collection at the Library of Congress, its original plans have never been found. One of the major restoration efforts of the postwar period was the furnishing of the display rooms in a more authentic manner than had been done in the past.



Additionally, a 2½-inch deflection of the stairway at the second-floor level put the structural strength of the building under suspicion. It was found that the old floor joists, rather weak in their old age, were further stressed by workers cutting through them for the underfloor passage of pipes, electrical conduits, and gas lines. In 1954, the stairway was repaired by jacking its weight onto a cage of 8x8-inch upright timbers, removing the plaster soffit and original wood lath, and disengaging the wall stringers. A 10-inch steel beam supported by eight-inch channels embedded in the partition walls replaced the weakened 3x10-foot header joist. The stairway then was raised to its original position and refastened to the walls, with no damage to its skirting, balusters, or continuous handrail.

Weaknesses of the floor structure forced a major restoration decision—should the building be structurally restored as per its original wood substructure, or should it be reinforced with modern methods and materials, which would be easier, quicker, cheaper, and longer-lived? AIA decided the visible rooms were more important than the invisible structure, and therefore steel and concrete could be used for reinforcement, provided that the dimensions and appearances of the rooms remained unaltered. On the first floor, the dining room steel floor beams added in 1926 were reinforced with diagonal members.

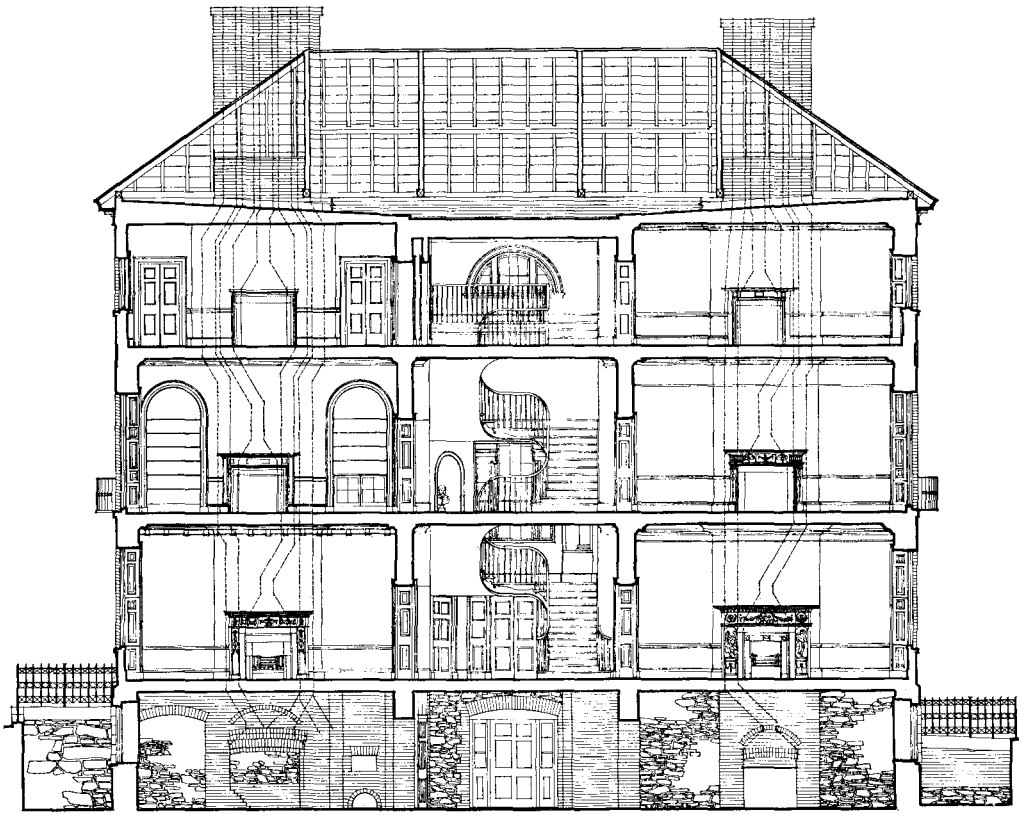
The second floor presented a greater problem—there was no way to reinforce it inconspicuously, so the floor structure had to be removed and rebuilt. The new floor was constructed of steel pans supported on heavy steel angles bolted to the walls, with wood sleepers bolted between the pans. A lightweight concrete topping was poured flush with the tops of the sleepers, and the flooring nailed to the sleepers. New plaster cornices and ceiling had to be recast, copied from existing pieces of the cornice that were carefully removed before the renovation. The only telltale clue left of this work is a hairline crack two feet below the ceiling where the old plaster meets the new.

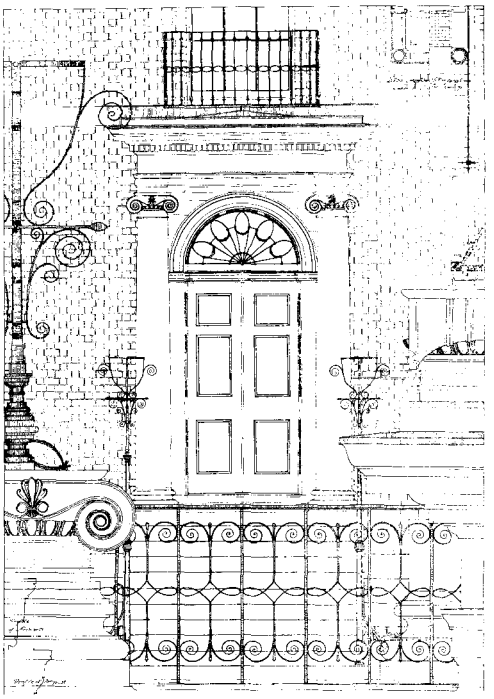
Phase III: The museum, 1968-1976

In 1968, AIA sold the Octagon to its nonprofit affiliate, the American Institute of Architects Foundation (now called the American Architectural Foundation), for about $1 million, raised by subscriptions. J. Everette Fauber Jr., FAIA, was the architect in charge of the next stage of restoration, which focused on basement rooms and fireplaces.The major structural problem at this time was the ceiling of the second-floor Treaty Room, which was showing signs of deflection. The third floor above it was needed for offices, but the entire third story was closed to public use because of fire code restrictions following a 1949 report that pointed out that a single stairwell served that level. Consequently, it was not considered for structural reinforcement, as was the second floor, when the building was being converted to a museum.

Reinforcing in 1968 for office use meant the floor at the third level had to be replaced. To that end, steel beams and heavy subflooring were put into place. The Treaty Room ceiling plaster then was cut away from the original cornice, which was left undisturbed while the rest of that room's ceiling, with the floor structure above it, was removed and replaced. Then the ceiling was replastered and rejoined to the cornice.

During this phase of work, there was talk of restoring the building's original flat roof. This action was rejected for historical and practical reasons: the roof pitch had been added during Tayloe's lifetime (the period to which the building was being restored), a





flat roof would probably prove as impractical as it was in the early 1800s when Tayloe put a pitch on it, and the attic space was needed to house new climate control equipment. Therefore, the roof kept its slope and was covered with fire-rated cypress shingles that closely resemble the first shingles found under the terne roof. Two large fan coil units were installed in the attic.

Donald Streeter completed a report in 1968 on the Octagon hardware that sheds some light on his research methods. Through reference to late-18th-century French and British encyclopedias and product catalogues, Streeter was able to identify pieces of a bell system used to summon servants, doorknobs original to the house, and the probable originality of spring-loaded door closers. By studying hardware fabrication techniques, such as use of rolled iron, hand-wrought screws, and brass of a particular light color, Streeter also established what among the existing hardware was in the house during the Tayloes' residence.

In 1970, the Octagon was ready to take on its role as a museum. In 1971, the 1940 administration building behind the Octagon was demolished, along with the former stable (which had been converted into the AIA library in 1954), for construction of the present headquarters building. In 1972, the Octagon was accredited by the American Association of Museums. The oldest architecture museum in the United States, it houses changing exhibits on architecture, decorative arts, and the history of Washington, many of which circulate to museums nationally. The Octagon, as a museum, gives researchers access to its collection of prints and drawings; it also sponsors lectures, publications, and educational programs.

The first-floor plan, opposite page, indicates the importance of the circular entrance hall. That plan, as well as the section facing the courtyard, above, and front door detail, right, are taken from a collection of drawings that form part of the 1914 study of the Octagon by Glenn Brown, FAIA.

Phase IV: Into the future

Although the Octagon has been occupied and operating fully since the early '70s, its maintenance, restoration, and preservation continue. Its function as a museum has played a determining role in the course of this work. "Because the Octagon is an accredited museum, its related functions are equally as important as the restoration," says Octagon director Nancy Davis. "This entails maintaining strict temperature and humidity standards to protect the exhibits—we can't go natural as they do at Mount Vernon. There also are security needs that must be met." To this end, in 1978 new mechanical systems were installed, as well as heating and cooling vents beneath each window.

The Octagon also continues to be an architectural laboratory for historic research. "The Octagon is a physical manifestation of American architectural history," says AIA archivist Tony Wrenn. "Because it has had only two owners, both interested in the preservation of the building as it was initially intended, it has been and is a reference source for colonial revivalists for such details as fireplaces and their mantels, cornice work, hardware, and interior finishes. For example, the Octagon's portico, window framing, balconies, and workmanship served as inspiration for Edward W. Donn Jr., who worked on the restoration of the Octagon early in his career. He used those familiar elements in his subsequent restorations of Woodlawn Plantation, Kenmore, and George Washington's birthplace, Wakefield."

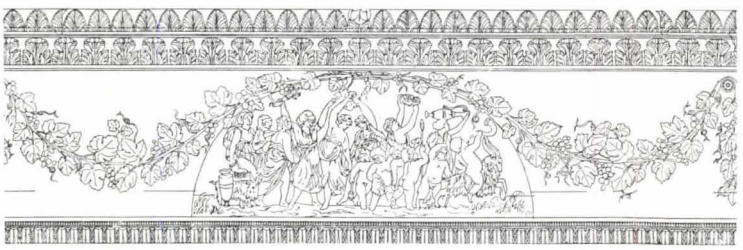
Another notable effort is a historic paint study conducted by Matthew Mosca in 1983, which subsequently has been used as a guideline for both interior and exterior work. Mosca's evaluation entailed his taking paint chips from various locations, exposing them to intense ultraviolet light to mitigate the effects of yellowing, and then examining them microscopically. Knowing what pigments were used in early-19th-century America and what

tests would determine the presence of those compounds, Mosca was able to re-create the vivid color scheme that faded paint and memory had kept hidden for more than a century.

The Octagon as living laboratory was the research topic for a team of graduate students from Columbia University during the summer of 1987. The students helped map the existing condition of the building's structural and decorative elements.

Another study, undertaken in 1982, did not have such favorable results. Assessing the feasibility of making the Octagon accessible to the handicapped by adding an elevator, the study concluded that there was no way to install an elevator without destroying the internal or external appearance of the building. Three options that were rejected were converting an existing dumbwaiter to a limited-occupancy elevator, replacing the servants' stair (which is externally visible from the back of the house) with an elevator, and adding an elevator housing to the exterior. As a compromise, a ramp has been installed in the back.

In recent developments, the Octagon has applied for a Getty grant for research, which would fund eight studies, mostly on the interior, including the wallpaper in the dining room and the doors. "By that time, just about all the research that can be done should be completed," Davis says.



In its role as a grand old building, the Octagon is at its most fragile and needs considerable care. According to Davis, the most important preservation issue now is protection of its exterior, specifically to function as a weather barrier protecting the interior from infiltration of the elements. "The top priorities now are the cornices and the windows," Davis says. "Bricks from the jack arches over the windows are visibly starting to slip."

Miller points out that preserving and maintaining the Octagon in all three of its roles requires continual care and commitment and constant decision making on many levels. All work on the historic building is overseen by the Octagon committee, which consists of an advisory committee, a building committee, a prints and drawings committee, a long-range planning committee, and a finance committee. Much of the money for the restoration work comes from AIA's College of Fellows and from private corporations, foundations, and individuals.

Quinn Evans/Architects are the restoration architects now, in charge of submitting restoration plans to the Octagon committee and responsible for all restoration work. The firm is the successor to Preservation Urban Design and was formed about five years ago by Michael L. Quinn, AIA, upon the retirement of his fellow partner in the previous restoration firm. The most recent Octagon restoration project, by Quinn/Evans, took place from September 1987 to March 1988. It called for window specialists Fabian & Sachs of Harwood, Md., to restore 10 window units in the curved, southwest-facing facade. Specific tasks included restoration of the wood frame and sash members (with primary emphasis on preservation of the original fabric); retention of the original glass and selected replacement of broken and inappropriate nonperiod glass with salvage glass; restoration and/or replication of historic window hardware and installation of locking hardware and weatherstripping; specification of UV light control at each window; and interior and exterior painting.

The project called for work simultaneously by the Edward W. Minte Co., the exterior paint and stripping contractor, to strip, prime, and paint 10 window frames, strip selected stone subsills and stone panels, and paint the cornices along the building's southwest facade.

The contractor and subcontractors worked with a detailed set of specifications prepared by Quinn/Evans, outlining materials, product industry standards, and step-by-step installation and execution standards for every component of the windows. The contractors also were required to take field notes daily, which are now part of the historic record. Additionally, the record contains a detailed weekly construction report with a daily log of work from the architect.The physical work began on Aug. 27, 1987, with the Minke Co. stripping a window with an electric heat gun. After a minor fire on the second day, it was determined that subsequently only chemical strippers would be used. Work proceeded relatively smoothly after the unfortunate start. One by one, each window element was painstakingly marked for replacement or reinstallation, and all elements that were removed were identified and labeled carefully.

By the end of March project funds were exhausted. Restoration glass and unused archive paint remain in storage, waiting for future efforts to get under way. There is still much work to be done on the Octagon. In June 1987, Quinn/Evans submitted a master plan for three to five years of restoration work.

Masonry repair and maintenance is one major concern for the future. Although the Octagon's brickwork is generally in fair condition, certain isolated repairs should be done. For instance, the structural deterioration at window heads, where bricks are slipping from the jack arches, requires immediate attention. Likewise, there is deterioration in isolated spots of the garden walls, and water penetration at the top of the garden walls appears to be accelerating localized deterioration at the coping brick and upper wall area, for which the architect advises immediate repair. Quinn/Evans further proposes a program of monitoring the masonry facades to help determine the direction that a future masonry restoration effort might take. The Aquia sandstone windowsills, however, require special attention, and the sill restoration work would be considered part of window restoration.

Quinn/Evans also reports that, despite the long history of repairs to the Octagon's 50 windows, they generally are in poor condition.The architect recommends that a comprehensive restoration be initiated as soon as possible because the deterioration is extensive enough to permit significant infiltration, making it difficult to control temperature, humidity, and soot and dust—all crucial in the building's role as a museum. Quinn/Evans therefore recommends that each window unit be completely restored "using methods that will guarantee conservation of all sound and repairable window fabric."

"The restoration of the Octagon should be ground-breaking work—we should be on the cutting edge of restoration. It is my opinion that we set the standard here, and we need to do a well done, accurate restoration," Davis says. Miller echoes her sentiment. "The Octagon is AIA's model for how one handles a museum-quality building," he says. "It's not a one-time exercise; it's a lifetime commitment. We should use the house to talk to architects and the public about the *process* of building design." □

Above, frieze detail of parlor fireplace, from 1914 Brown study.

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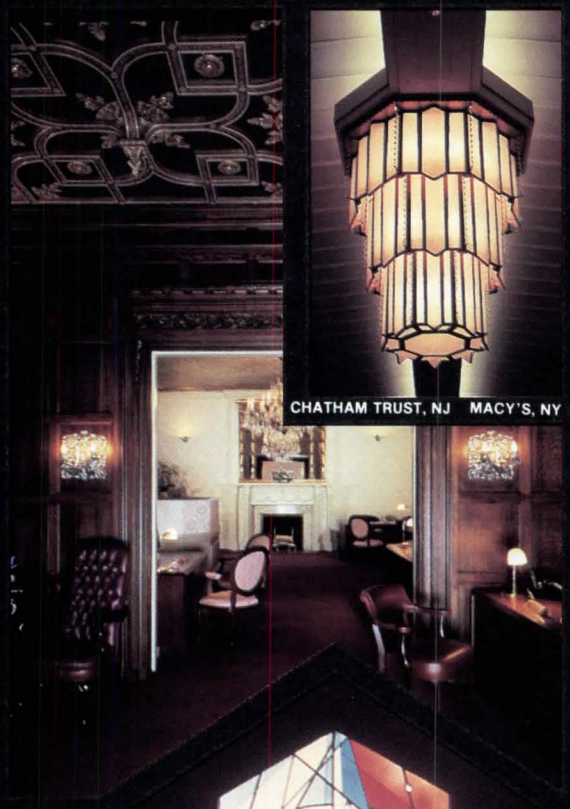

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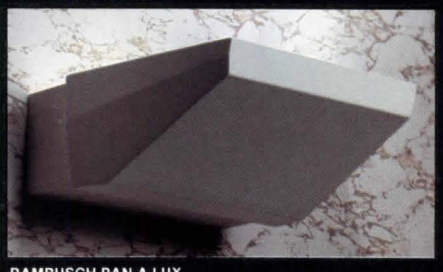

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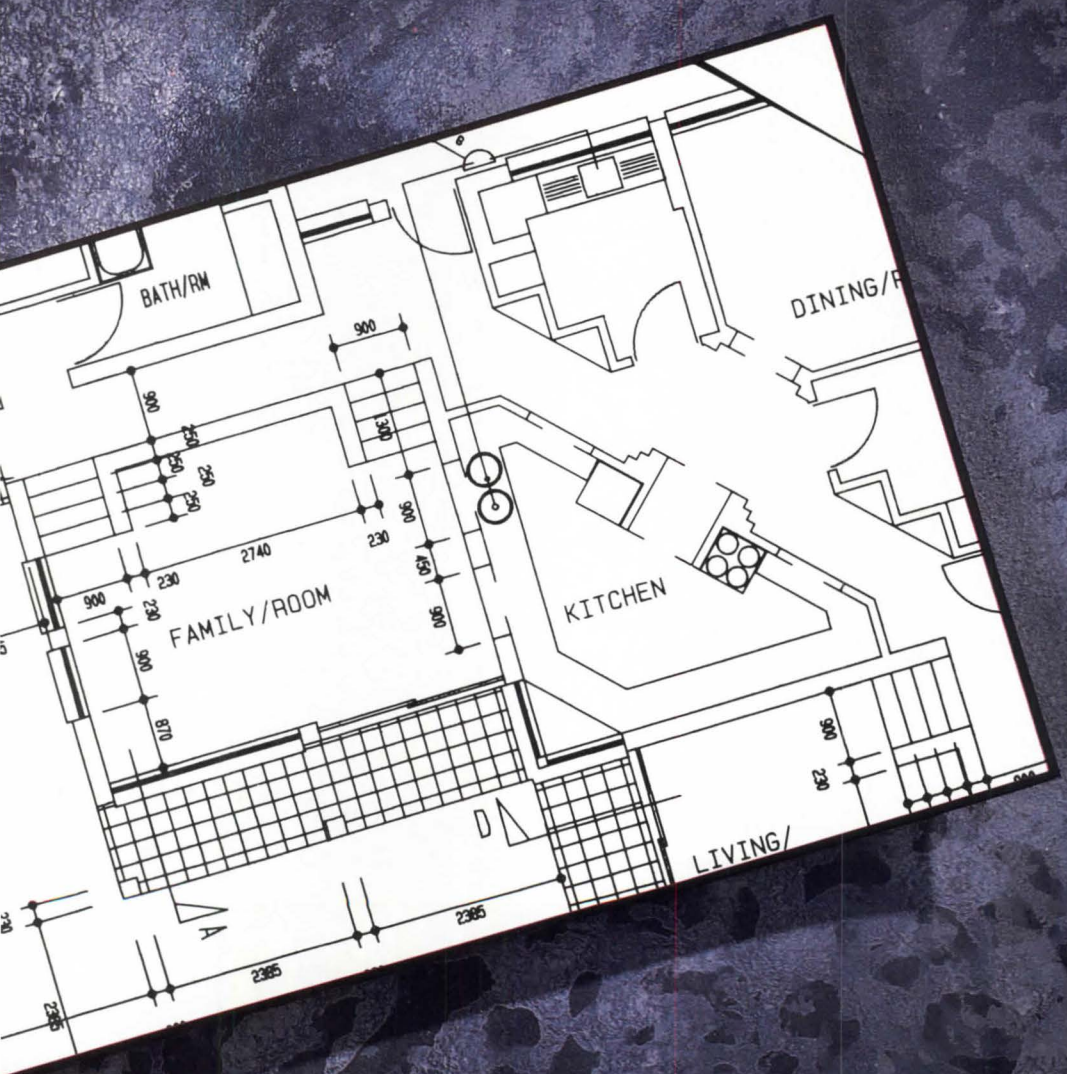

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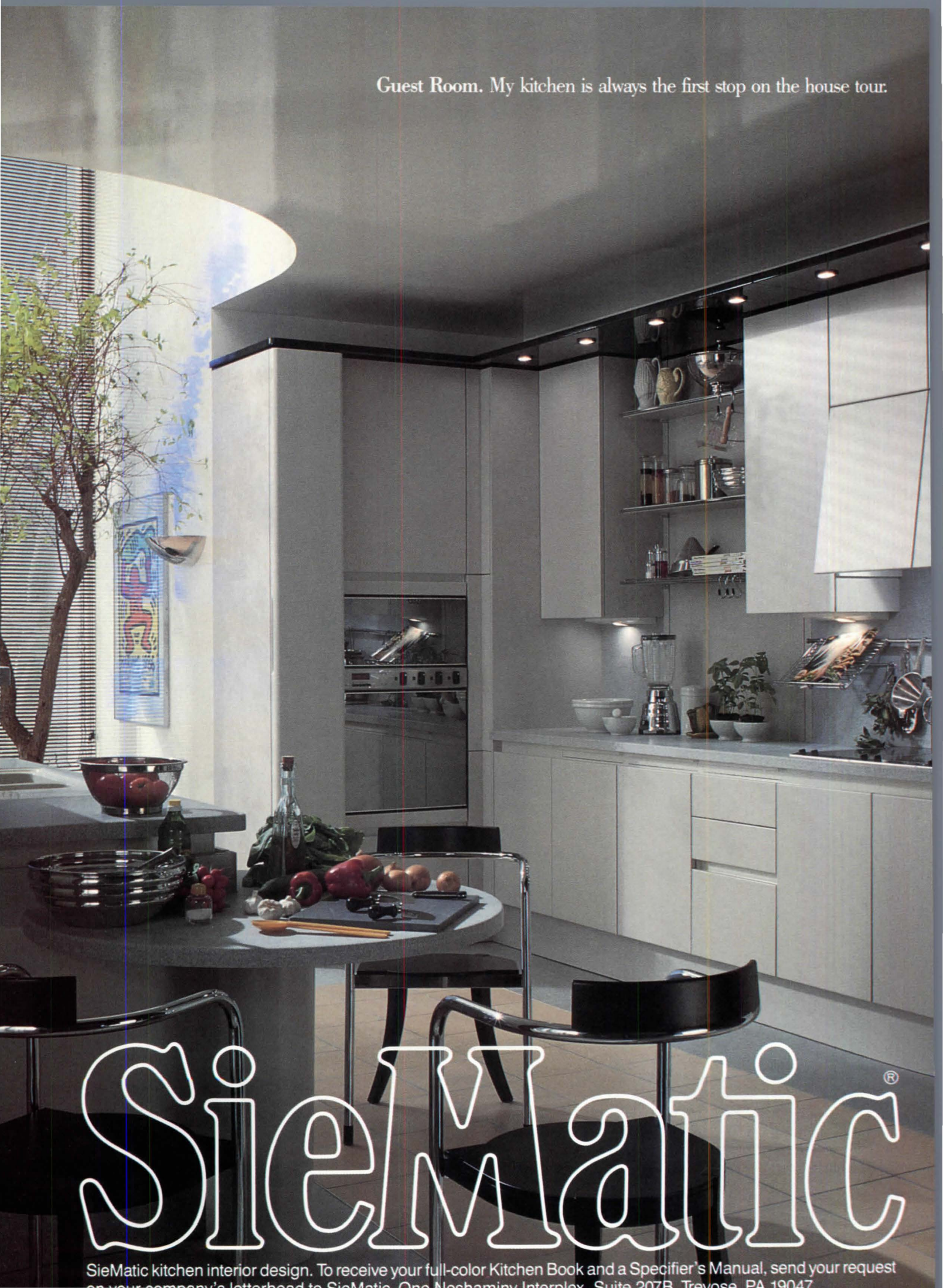
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Building Anew Within an Old Shell

An ingenious approach is taken to a Yale project.
By Michael J. Crosbie

Inserting a new building inside an old one is a common problem in rehabilitation work. Roth & Moore Architects employed an uncommon technique for this surgical procedure on a Yale University building, using its old structure to support the shell while a new interior rose.

Watson Hall is the new home of the university's department of computer science. The building was designed by the New York firm Cady, Berg & See in the mid-1890s as a chemical laboratory. In 1923 it became an engineering mechanics laboratory. Later it served as a classroom building for engineering and ROTC, headquarters for an honor society, and studios and practice rooms for the music school. The four-story brick building was adjacent to two other decorative masonry buildings that were demolished to make way for Marcel Breuer's Becton Center for Engineering, completed in 1970. The laboratory building was slated for demolition along with its neighbors, but Breuer was persuaded by Vincent Scully, Hon. AIA, and Edward Larrabee Barnes, FAIA, to reduce the bulk of Becton and spare the laboratory building.

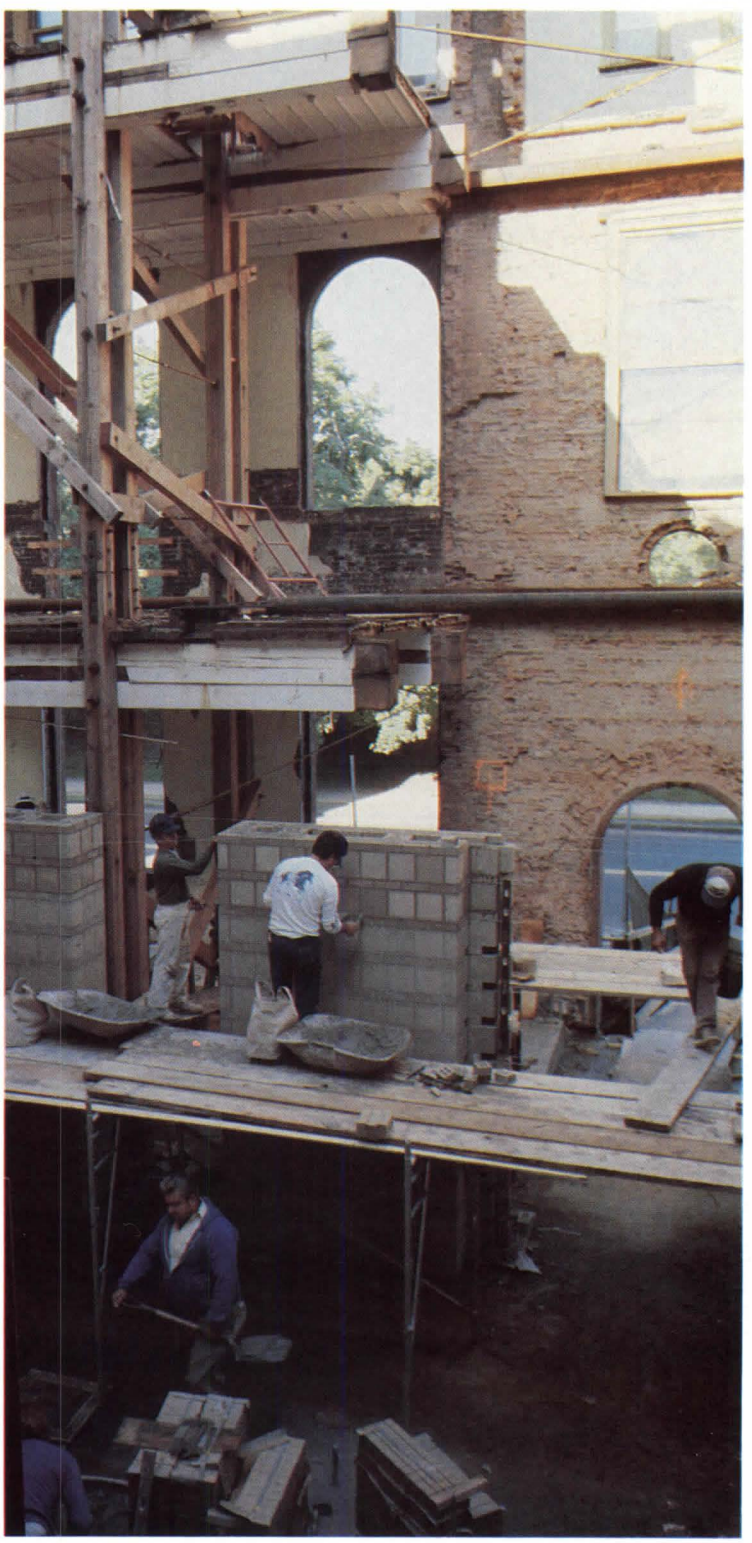
When it was chosen as an appropriate spot for the computer science department, the 35,000-square-foot building needed to be expanded by half its size, to more than 50,000 square feet, and the additional space had to come from within the existing envelope. Luckily, as Harold Roth, FAIA, points out, the building had generous floor-to-ceiling heights, which allowed the architects to insert six floors where there had been four. This meant that the building had to be completely gutted.

Gutting a building removes the lateral support that the floors provide to the exterior walls. The conventional solution is to brace the building from outside with elaborate steel frames and "a ton of connections between the frame and the facade, which can be damaging," observes William Moore, AIA. The steel frame is also costly, and is usually scrapped after construction.

Working with structural engineer Frank Zamecnik of Spiegel & Zamecnik, the architects developed a system that would use portions of the old structure and floors to provide lateral stability while the rest of the interior was removed. The new structural system would be built around the old system, the latter being removed as the new was constructed.

The building's skeleton held a surprise. Although the building was constructed all at once, two distinct structural systems supported it. The building's narrow end is streetside, and the building extends back into the site. The front half of the building was load-bearing masonry, and the other half timber-frame construction.

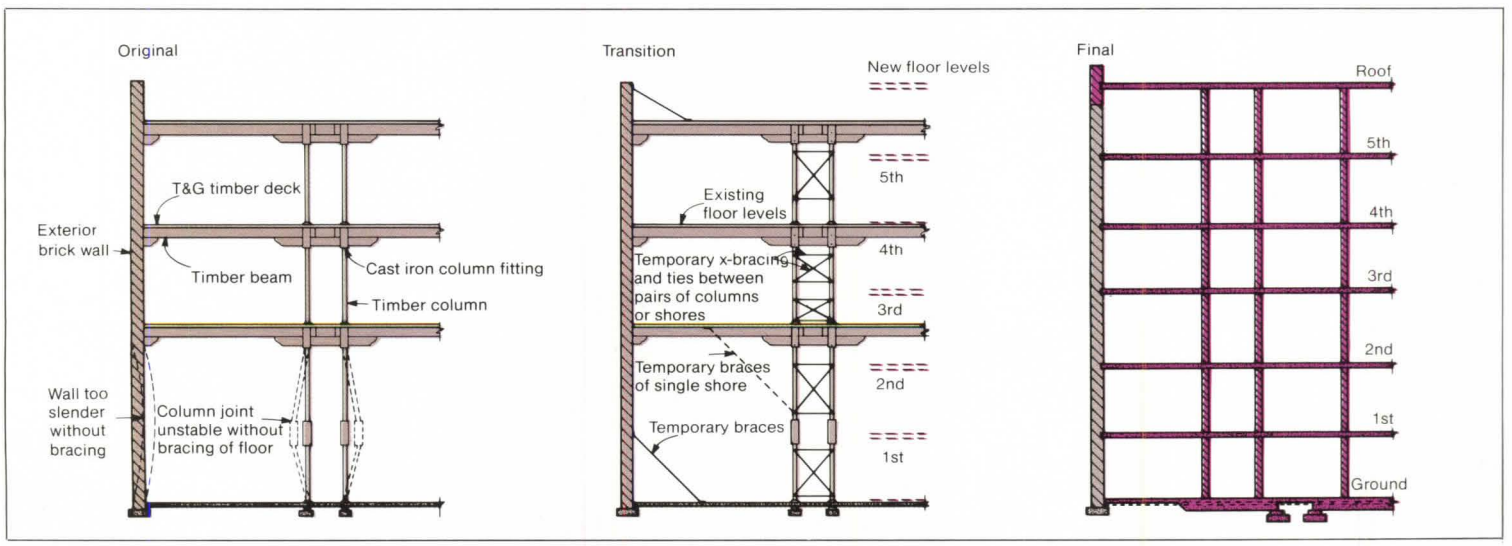
Thus, two procedures were employed. In the masonry half of the building, it was decided to retain corner portions of the four floors, which would provide sufficient lateral bracing to the front and side exterior walls. Pairs of timber shores were inserted through the four floors, straddling the beams. Additional shoring was added diagonally between the vertical members and the

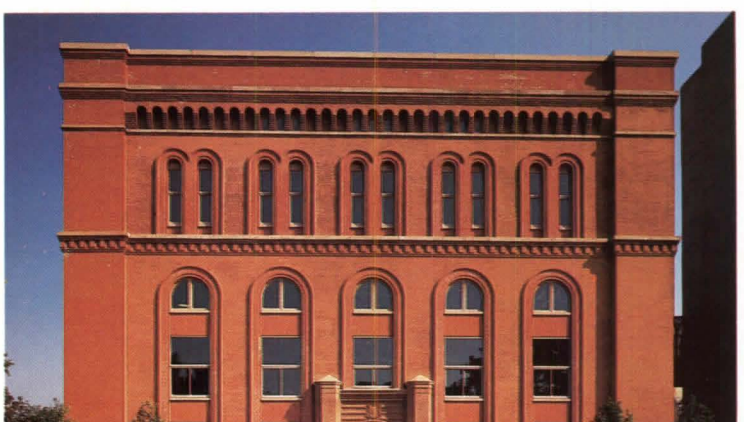


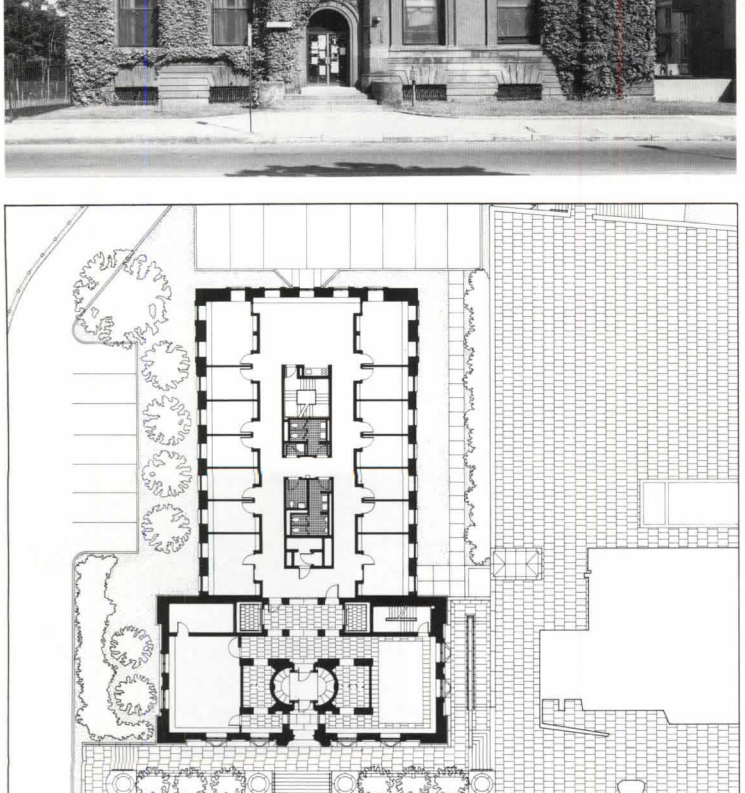
Right, workers construct a new masonry structure within the shell of the old building, with stabilizing structure above.

Michael J. Crosbie

Drawings directly below illustrate existing timber-frame structure and floor locations. Before (left) and after views of front facade show addition of pier and podium. Facing page, two-story lounge space.







floors, and a horizontal steel truss was placed along the building's front facade. This added support where new construction was taking place at the building's northwest corner.

Early photographs show the front facade to be asymmetrical. Roth theorizes that the building may have been designed to be symmetrical, but an existing building to the north at the time of construction caused an eight-foot re-entrant pier to be dropped from the design. A new pier was included in the expansion, built of load-bearing brick, just like the existing pier. Then the remaining floor sections were removed and along with them the masonry structure. The new concrete slab was poured between the floors and around the shoring, the old floor sections and shoring were removed, and the holes in the concrete slab were patched.

The building's timber-frame section had a rather unorthodox concoction of columns and beams. Pairs of timber columns were capped with cast iron fittings, hollow rectangles in section, which received the beams. The fittings were deep enough that beams could be spliced between two columns, the upper beams ending within the fittings and bearing on short, lower beams, which spanned between the columns. This allowed the structure to be concentrated at the building's center and also provided a chase

© Steve Rosenthal

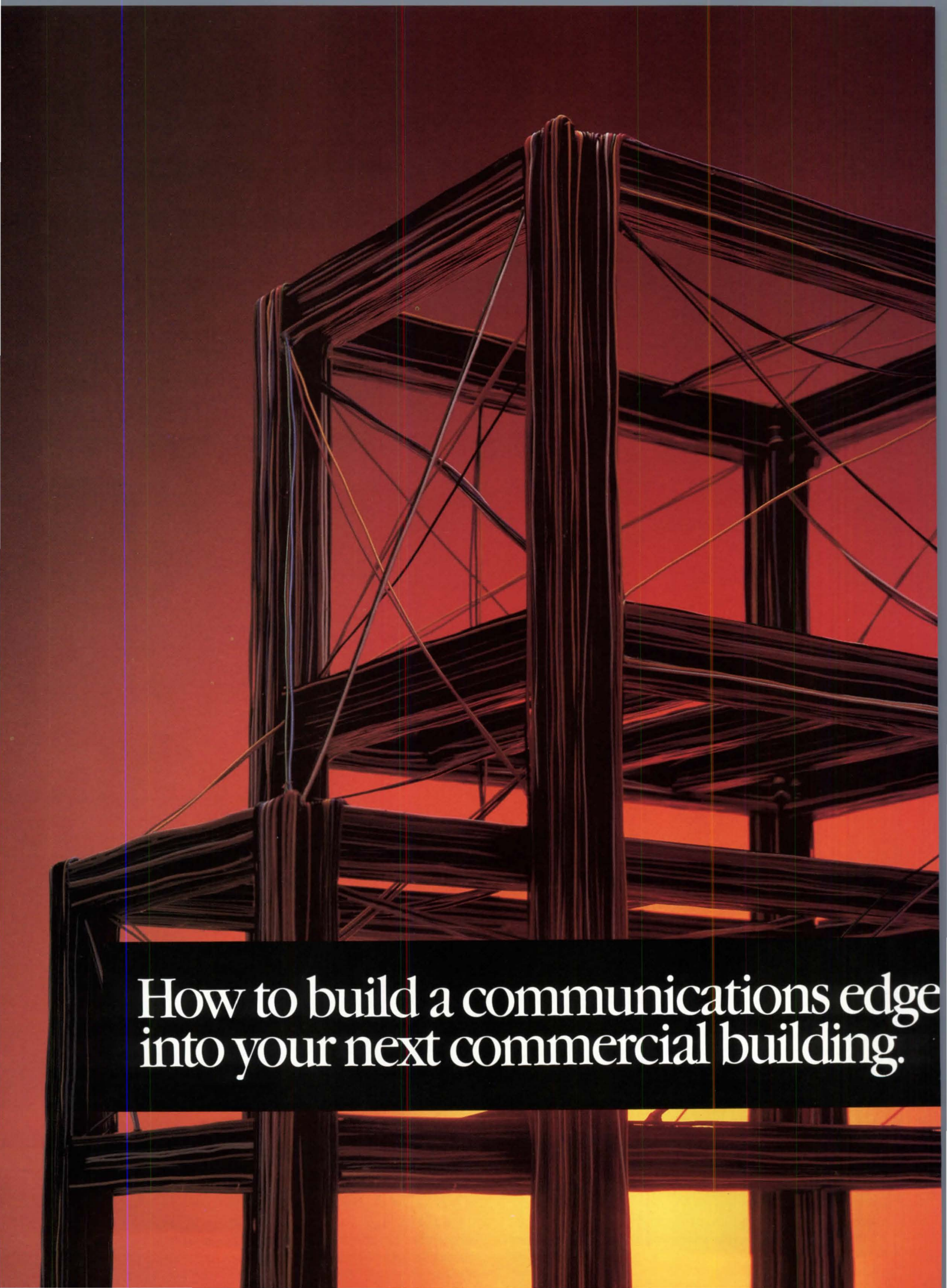
the paired columns that marched down the building's center were tied together with diagonal bracing, which was carefully placed so as not to occur where new concrete floor slabs would be poured. The columns thus were tied together to form unified bracing as sections of the old floor were removed and the new floors were inserted.

The basement level was excavated to provide more room, and the building's parapet was heightened to house another floor. Careful inspection of before and after photos reveals the new brick spandrels in the tall arched windows that indicate where the new floors are located. Masons worked amid old and new construction to raise the load-bearing brick walls that support the new interior. Moore says that the masons were routed back and forth from one corner of the building to another as old construction was removed to make way for their handiwork.

The building's exterior was cleaned and a bluestone podium designed for the front facade, which gives this building a base and ramped access. The podium also extends a walkway from Becton's arcade. Just inside the arched entrance, one discovers the materials of the new interior—slightly contrasting tones of buff-colored brick in a variation of English bond, with darker stretcher courses alternating with eight-inch-square brick courses. This arrangement allows glass block to interchange with square brick—a weaving of opaque and translucent walls that delivers much light and some views through the masonry interior. All corner brick is bull-nose, softening the interior's edges, and nearly all the lighting is indirect, further "lightening" the spaces.

The spaces are arranged with a clarity that derives from the building's overall configuration—a fat T-shape with the crossbar facing the street. The crossbar contains elevator lobbies, seminar and conference rooms, library areas, vending and mail rooms, and the building's most exciting spaces—two double-height lounges ringed with circulation space. These lounges become central to the casual exchange of information among colleagues who meet in the course of the day and sit down and talk. Computer scientists do some of their talking with chalk, so there are plenty of blackboards in the lounges to aid discussion.

The long leg of the T contains offices, which ring central cores of rest rooms and service spaces. Through the office hallways extend long fingers of mechanical hardware, stacked in diminishing size: air ducts on the bottom, computer-line raceway in the middle, and sprinkler pipe on top. The computer-line raceway has proved very popular with the building's occupants, who have no inhibitions about tearing into the wiring of a computer. □



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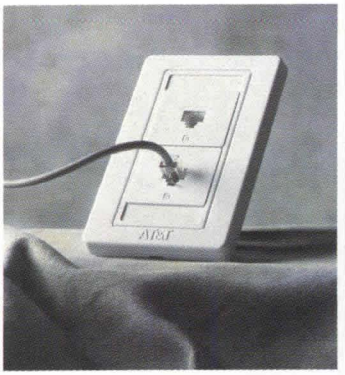

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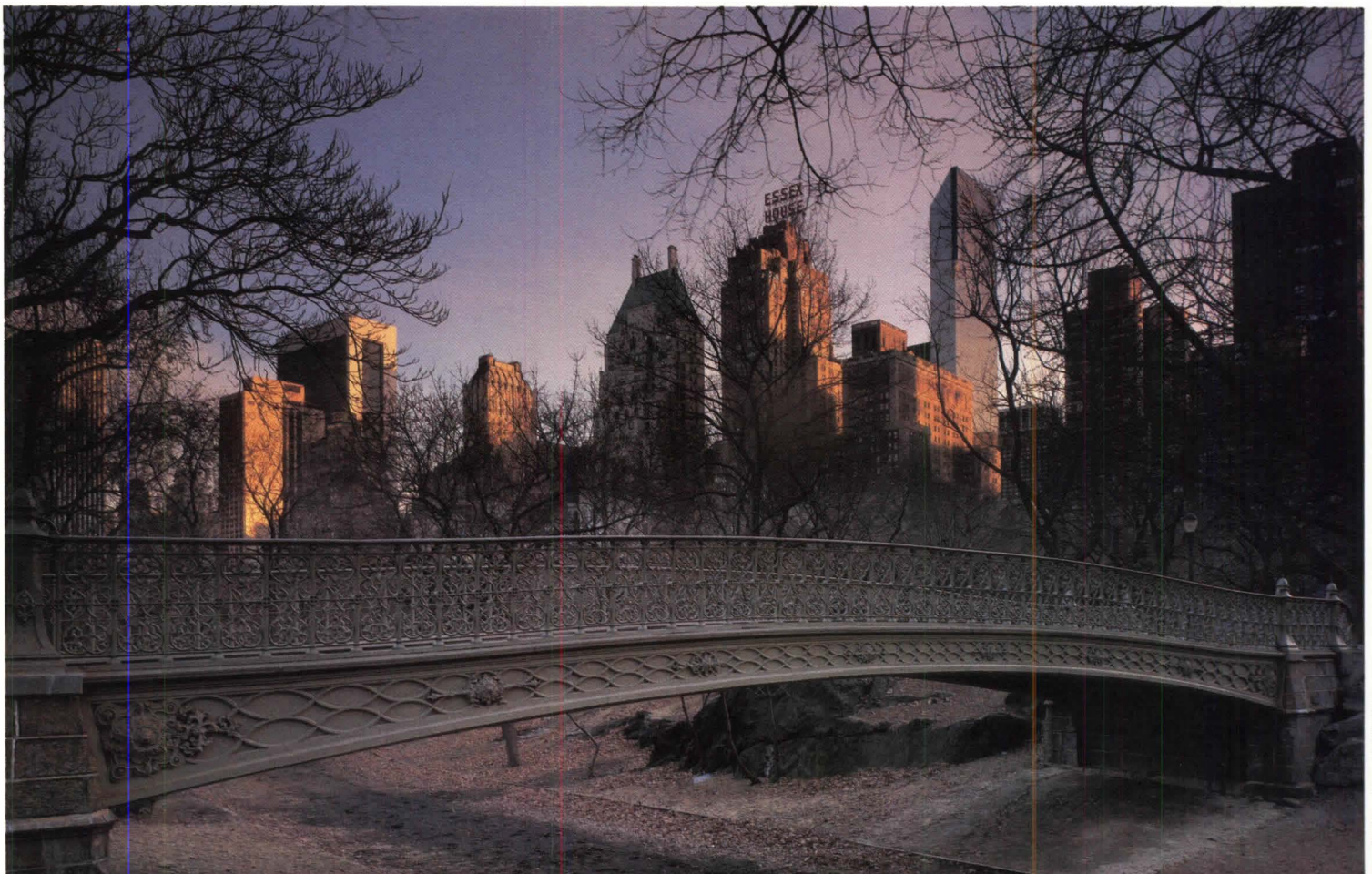
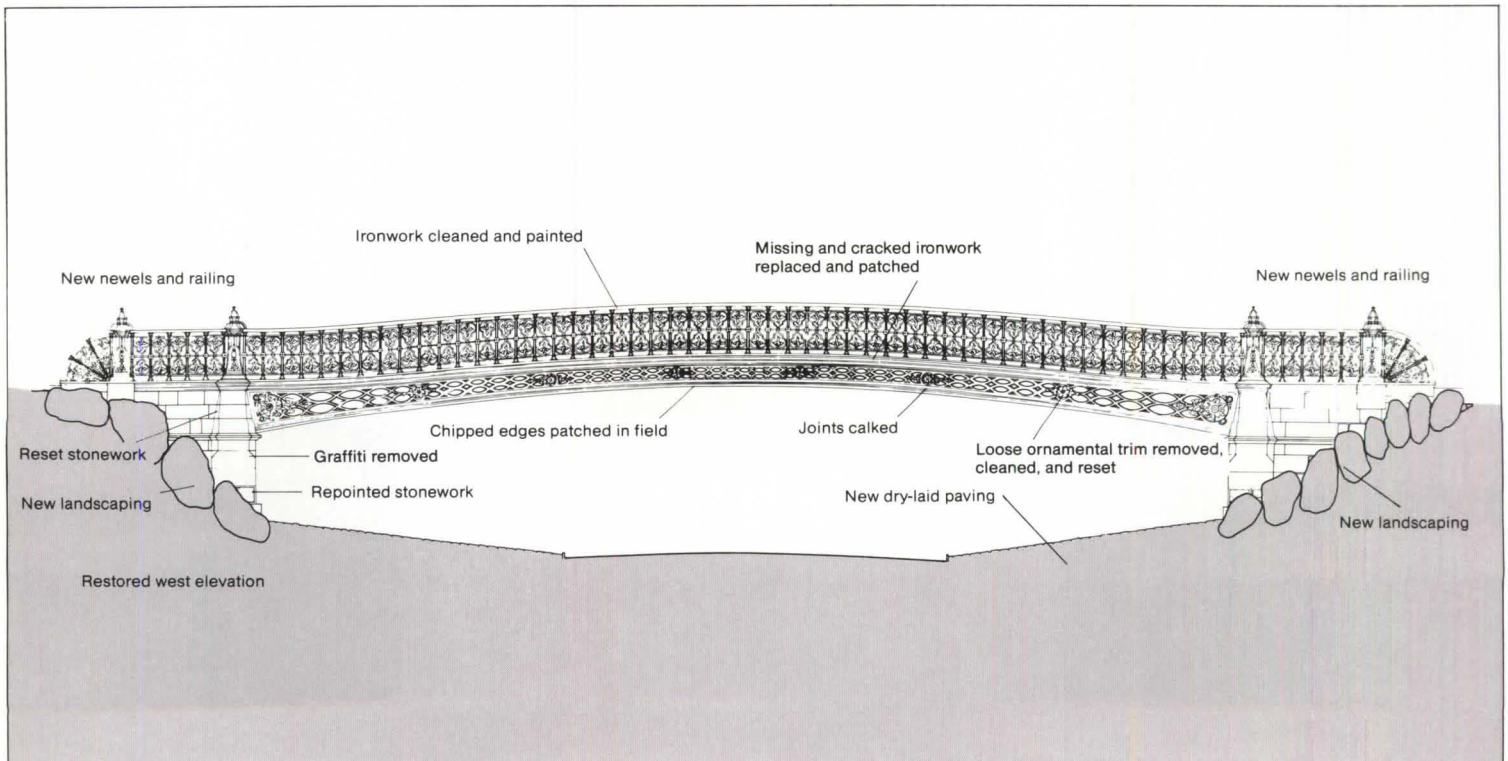
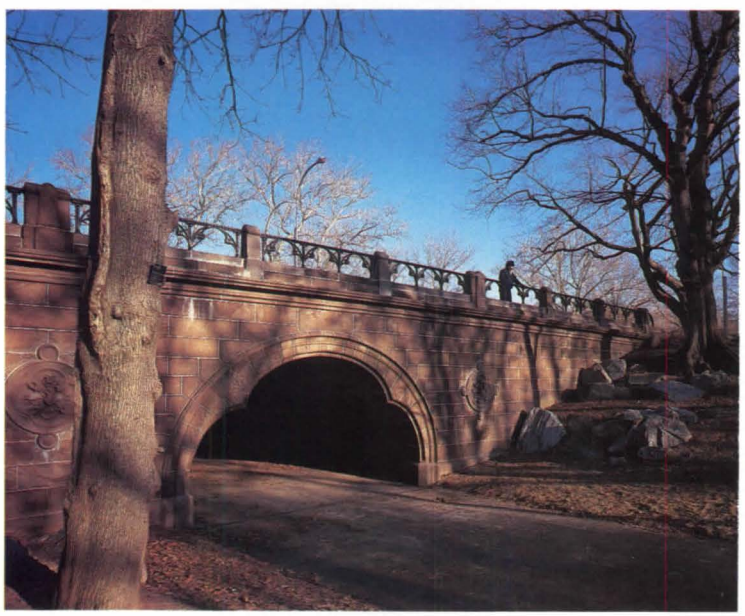


Photographs by Alan Schindler



Rebuilding the Bridges Of Central Park

By Allen Freeman



Fifty bridges and arches, each individually designed and most constructed between 1858 and 1868, enabled Frederick Law Olmsted and Calvert Vaux to weave their paths, drives, and bridle roads into a comprehensive, fluid system through Central Park. Exact authorship of these Ruskinesque structures is unknown, since architectural drawings were signed by both Vaux and Jacob Wrey Mould, the British architect responsible for much of the park's architectural ornamentation and polychromy.

Now, for the New York City Parks Department, Beyer Blinder Belle is restoring eight Central Park bridges. Their work on three—one of iron and two of masonry—is complete.

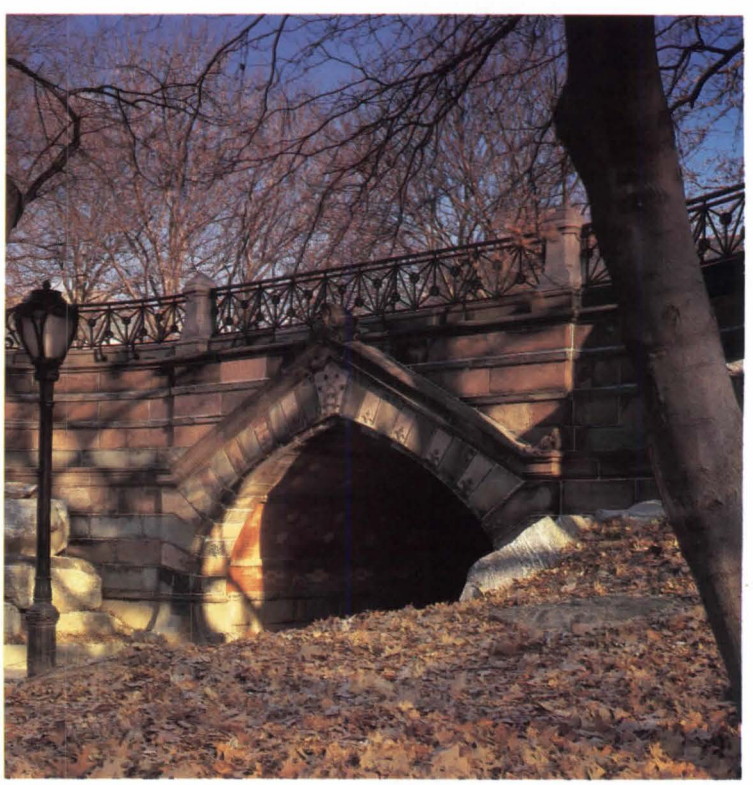
Pine Bank Arch (shown on the facing page), is an 82-foot-long pedestrian bridge over the bridal path near Columbus Circle. Severe rust damage, promoted by winter salting, was weakening the cast iron structural arch, rolled iron cambered purlins that supported the original wood decking, and metal rebars in the concrete decking (a latter addition). Also rusting were the decorative cast iron facia, balusters, newels, return railings, iron handrails, and iron gutter sections. All of these were removed. Once exposed, the structural arch was sandblasted and all corroded plates, flanges, and web stiffeners replaced.

Newels and railings were missing at the ends of the span. "Luckily, on this bridge we had one of every type of thing we needed," says architect John Stubbs of Beyer Blinder Belle.

In the case of Trefoil Arch (photo above), projecting quatrefoil ornaments in sandstone had "melted like sugar," says Stubbs. This little masonry bridge eight blocks south of the Metropolitan Museum of Art takes a footpath under East Drive. Original drawings for the arch were lost, so restoration architects had to rely on an 1880 stereopticon card found in Columbia University's Avery Library. The overall image is little over two inches across; the ornament image is the size of the head of a pin. This, enhanced and enlarged, was the basis from which the architects made shop drawings, artisans made a single mold, and workers made two cast stone replicas to match the sandstone's color and secured them with nonferris anchors.

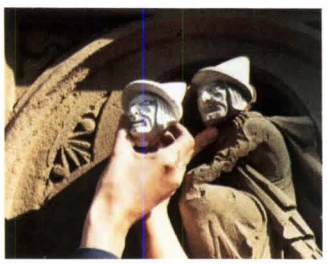
Like the Trefoil Arch, Graywacke Arch (below), behind the museum, was structurally sound but had extensive water damage that was literally washing away architectural character. From the roadbed above, water laden with salt for snow removal seeped down along the back sides of the bridge facades and then leeched through, washing out mortar joints and spalling and staining the sandstone, limestone, and brownstone walls. Drainage and soil erosion control have been fundamental parts of the project.

As Stubbs says, especially because these restorations are integral with landscaping, the parts are as interdependent as pieces of a Rubik's cube. □



'Curators for Future Restorers'

Applying the approach to a Central Park monument. By Forrest Wilson



If Eugène-Emmanuel Viollet-le-Duc had restored Central Park's Bethesda Terrace, there would be new gondolas on the lake, a four-star restaurant in the arcade, and formal dances held every Saturday night around a statue of Love in the middle of the fountain (see page 92).

But the philosophy of historic preservation has changed dramatically during the past century. Instead of Viollet-le-Duc making the terrace more like it was than it was, the Ezra Ehrenkrantz Group has preserved it as a memorial to a hundred years of hard use.

The Ehrenkrantz Group was commissioned in 1980 to study the deterioration of Bethesda Terrace. Later there was a public review, and contract documents were bid and signed. The work as it now stands was completed in 1986. The arcade ceiling remains to be completed.

If a building or monument is historically significant, the technology applied to its restoration should be as conservative as possible, says Kate Ottavino, restoration architect with the Ehrenkrantz Group. Any part of the structure lost is irreplaceable, in her view; today's restorers are "curators for future curators."

Reversibility is the key, she says. Others in the future should be able to undo what the restorer has done. Parts are removed and the original fabric replaced only to assure structural integrity and public safety.

Bethesda Terrace was part of the Central Park master plan won in competition by Frederick Law Olmsted and Calvert Vaux in April of 1858. The subsequent fate of the terrace parallels the prosperity and hard times of New York City. There were years of hard use. It became the site of a restaurant in the 1960s and then a center for the drug culture in the 1970s.

Ornamental stonework designed by the English architect Jacob Wrey Mould suffered the hardest wear over the years. The range of subjects that were translated into soft stone is immense: flowers, plants, birds, insects, and other animals are carved into the tracery panels of staircase landings, balustrades, and piers. The carvers gave little thought to drip moldings, water catchment, runoff, and the freeze/thaw cycle.

Vaux intended that bronze statues of Day, Night, Sunlight, Moonlight, Starlight, Twilight, the Seasons, the Ages of Man, Art, Science, the Mountain, the Valley, the River, and the Lake be included in the decorative panorama. Plans also called for a group of marble sculptures depicting Nature beneath the arcade and a marble figure of Love at the center of the fountain.

But the board of park commissioners decided instead to commission Emma Stebbins, the sister of the board's president, Henry G. Stebbins, to create a central bronze figure for the fountain. She sculpted an energetic biblical angel based on a story in the Bethesda, near the sheep market in Jerusalem, and troubled the water . . . whosoever then stepped in was made whole of whatsoever disease he had." The Angel of the Waters was cast in bronze and unveiled in May 1873. Thereafter the place was called Bethesda Terrace.

The stonework of the terrace is Nova Scotia or New Brunswick sandstone taken from 11 quarries. It is mustard olive in color, soft, and easily carved. A slightly harder, gray variant was used for capstones and finials.

Although the Victorian ornament—organic, fluid, and delicate—was carved when no one knew that one day acid-polluted air would wash the stone, artisans were aware of the danger of acid to stone and warned against its use, says Ottavino. The stone used for structure and embellishment of the terrace is soft and porous and does not weather well. It showed evidence of deterioration as early as 1890. As a result the areas of greatest sculptural interest have suffered the most damage.

The densest sandstone, bluestone, was used intelligently as a dampproof course. However, there were practical design inconsistencies: for example, the artisans left out dampproof courses at the bases of the arcade piers. This has resulted in severe disfigurement due to the wind tunnel effect of the arcade and its rapid evaporation of the rising damp, Ottavino says. Also in the arcade, the cavity wall construction permitted water penetrating from above to reach grade for drainage. However, no vents were provided for evaporation, so the piers were certain to deteriorate.

There were no drip molds on the elliptical balustrades used for the copings, nor were there any cut for the pier caps. As a result the fragile tracery panels and fine moldings of the panels have had water funneled over them to the point of dissolution.

The most durable of the materials used in the terrace's construction was granite, incorporated as the steps and landings of the stairways, paving, and the wall at the lake edge. These ele-

ments were all in good condition except for joints, setting beds, and foundations, some of which had washed away. Uneven or too thin setting beds caused a lot of cracked paving. The largest slabs of granite, measuring 10x19 feet, were on the stair landings. Righting these slabs during reconstruction was a heroic endeavor, Ottavino recalls.

Ventilation ducts for toilets installed early in the 20th century were concealed in two piers on the south edge of the upper terrace. The piers had been sawn into veneers and fit around the ducts. Birds' heads and finials were knocked off. Several large crested finials could be traced only in drawings and photographs. The originals and all other evidence of their presence had disappeared.

The south sides of the balustrade panels are the most deteriorated. This may be due in part to the north elevation being formed by the concave side of the elliptical arm and therefore being more protected, Ottavino observes. The deterioration of the south elevation may be due to its convex profiles and its proximity to the pathways. De-icing of the roadway and paths, combined with wicking action, carried salts into the stone.

The box girders of the bridge were designed for horse-drawn vehicles. Present-day traffic brings heavier loads and causes much more vibration. Originally the landscape surrounding the terrace was planted in the tradition of a Victorian showcase of exotic large-leafed and spiky plants. Great clumps of water lilies were planted in the fountain basin, and wide lawns covered the sloping grade.

In 1947, 24 pin oaks were planted on the slopes of the open landscape adjacent to the fountain, to commemorate the major naval battles of World War II. As the trees matured, their roots infiltrated the stonework, cracking the joints. The slopes eroded and dirt piled up the sides of the balustrades. Bethesda became a romantic ruin. Some of the oaks were removed (over the objections of a bird-watching lobby) and the slopes were replanted.

The restoration of Bethesda Terrace involved stabilization, conservation, and replacement in an increasingly radical treatment of the terrace fabric. Tests were made for honing and retooling. In honing, workers grind deteriorated stone off the surface, exposing the sound stone beneath. Removal was done by abrasion, using various grit pads and sandpaper mechanically or hand powered. Retooling was done by hand with hammer and chisel.

Cleaning tests were conducted over three years to evaluate chemical and mechanical cleaners and water rinsing methods. Where honing and tooling could not be used the consolidation of deteriorated stone surfaces was tested.

Consolidation is a procedure designed to increase the longevity of the building material by chemically replacing lost natural components of the stone. Silica is the binder of siliceous sandstone. When the silica is leached or percolated through the sandstone by polluted rain, it begins to crumble. A silane-based consolidator replaces lost silica. The stone will continue to weather, but the life of the original material will be extended. This is a surface treatment effective up to one inch in depth. The surface may be darkened but appear as new.

At Bethesda Terrace deteriorated material was removed and patches modeled to match the original profile. The patching material was designed to deteriorate before the original material. Like consolidation, patching will protect for a period of time.

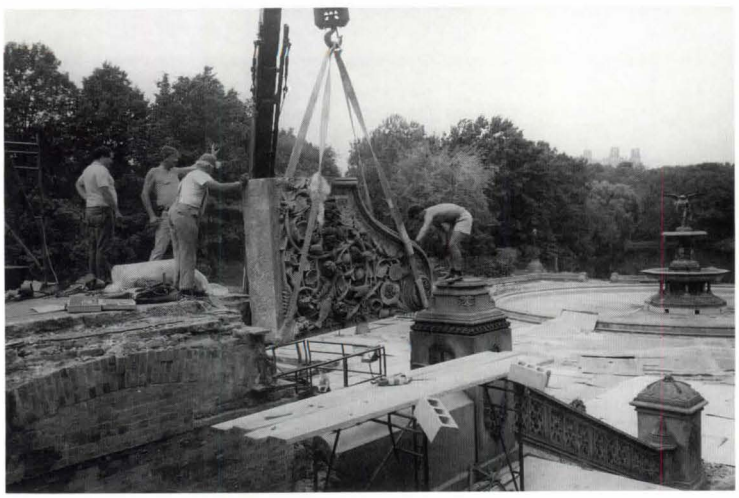
Replacement, the alternative so beloved of Viollet-le-Duc, was done very carefully at Bethesda Fountain. New pieces were carved and attached to the original with stainless steel pins.

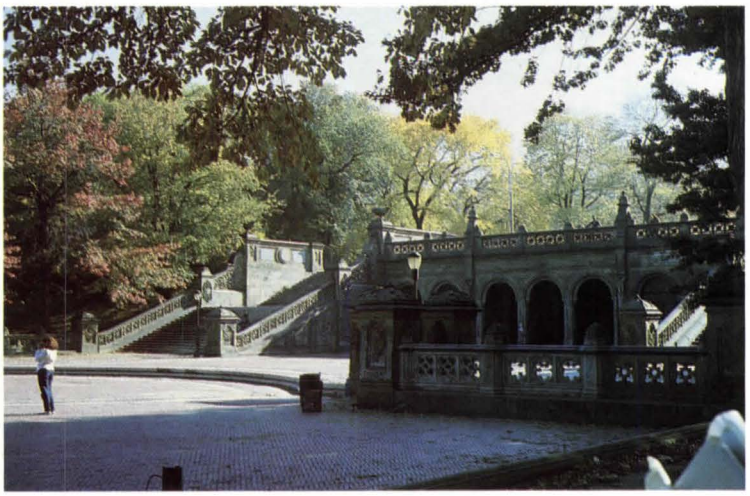
Replacement in kind is the guiding principle for restoring a work of historical significance, says Ottavino. The original material may have been of inferior quality, used incorrectly, or installed badly. The restorer's options are to remove the deteriorated element and replace it with one that is more durable or to veneer over it. Material that would be left in place in a private building is frequently sacrificed in public buildings because of the harder wear and possible danger to the public.

Despite the skill and careful work of today's preservation architects, the technology of stone preservation is still relatively crude, as was pointed out in 1982 by the National Academy of Sciences' committee for the conservation of stone monuments. The philosophy of "gently does it" is as much a sensible response to the present state of stone preservation technology as it is a reaction against Viollet-le-Duc's flamboyant interpretations.

The present curators of stone monuments are marking time for good reason. Research by the oil and aerospace industries has developed sophisticated analytical and preservation techniques that at present are too complex and expensive for use by preservationists. The transfer of this technology is a reasonable goal, the committee concluded. When the technology is ready Bethesda Terrace will be waiting. □

Facing page: far left, sandstone ornament gets a new head; left, bronze angel guards the fountain on the terrace. This page: below, workers replace upper portion of stone balustrade; right, one of the grand staircases viewed from the terrace level.





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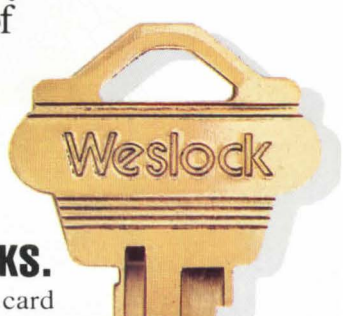

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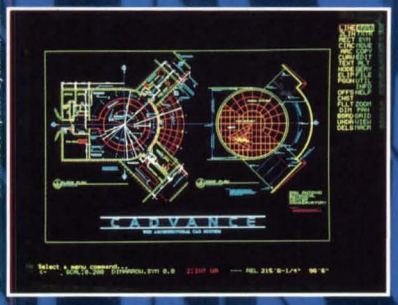

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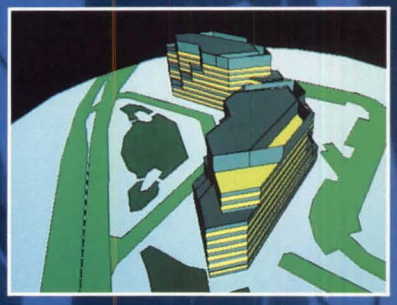

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PC-Based Operating Systems

New alternatives are becoming available. By Ken Sanders, AIA

Architects clearly are fond of low-cost PC-based CADD systems, but they often become frustrated by the inherent limitations of the PC's operating system, MS-DOS. Multitasking (the ability to run several programs simultaneously), high-speed networking (sharing files and resources between PCs), and support for larger memory and disks are sorely missed by many PC CADD users. All are features that users of workstation and minicomputer CADD systems have enjoyed for years.

These limitations exist despite the fact that Intel's 80386 central processing unit (CPU) chip finally has delivered to PCs a raw computing speed comparable to workstations and minicomputers. But the CPU chip is only a small component of a computer system. The most important difference today between PCs and more powerful workstations is not the hardware at all, but the operating system. A computer's operating system controls its basic user interface, memory management, communications, and disk and peripheral resources. Unfortunately, the MS-DOS operating system has not kept pace with the dramatic improvements in CPU performance, and it often fails to use fully the power of the hardware on which it runs. This is a particularly vexing problem within high-end PC-based CADD systems, where the mismatch between MS-DOS and the hardware is most exaggerated.

The 80386 chip of high-end PCs, for example, supports multitasking, but MS-DOS isn't equipped to take advantage of it. Although the chip can address (talk to) 4 trillion bytes of memory, MS-DOS knows how to address only 640,000 bytes. These and other limitations have constrained the ability of PC CADD developers to improve the functionality and sophistication of their software. In many ways, using an 80386-based CADD system equipped with MS-DOS is analogous to driving a race car stuck in second gear.

OS/2: The next generation

On April 2, 1987, IBM introduced its Personal System/2 product line and with it a new operating system known as OS/2, designed to eliminate many of the constraints of MS-DOS.

Like MS-DOS, OS/2 was developed by Microsoft Corp. and is licensed to IBM and other PC manufacturers. OS/2 Version 1.0 for IBM's PS/2 family began shipping in December 1987 and is available for some IBM-compatible PCs.

OS/2 introduces multitasking to the PC world and increases addressable memory to 16 million bytes. OS/2 also provides interprocess communication tools, which allow two programs running simultaneously to exchange data with each other. A key part of OS/2 Version 1.1, which has yet to be shipped, is the Presentation Manager, a graphic user interface providing a consistent front end to software applications, much like the Apple Macintosh. Users will still be able to run the vast majority of existing MS-DOS applications under the new operating system via a "compatibility box."

Ironically, OS/2 is an operating system designed for the Intel 80286 CPU chip, introduced back in 1982. Although the more powerful 80386 chip has been available for three years, OS/2 is tuned to run on PCs equipped with its older sibling.

The UNIX alternative

For firms that require more sophisticated applications and operating systems hardware, UNIX has provided an alternative to MS-DOS. In multitasking UNIX environments, users can plot one drawing and work on another at the same time, or run spreadsheet and word processor software simultaneously.

Most low-end UNIX workstations, such as Apollo Computer's DN3000 and DN4000 families or Sun Microsystem's recently introduced 386i, allow users to run both UNIX and MS-DOS applications at the same time. Moving to UNIX, like OS/2, does not necessarily mean abandoning popular MS-DOS programs.

Unlike MS-DOS and OS/2, UNIX is not constrained by an arbitrary limit of physical memory. UNIX was designed as a portable operating system and runs not only on 80286- and 80386-based PCs but also on workstations from Sun, Apollo, Hewlett Packard, DEC, Silicon Graphics, and Next. IBM supports a version for the RT, and Apple supports a version for the Macintosh II. A version of UNIX has been developed even for Cray supercomputers. From a development standpoint, software vendors enjoy UNIX because it simplifies the task of porting their software to different machines.

Unlike MS-DOS and OS/2, UNIX can be tuned for different hardware. As a result, while UNIX and OS/2 run about the same speed on older, 80286-based PCs, UNIX runs significantly faster than OS/2 on newer, 80386-based PCs. UNIX is able to take advantage of additional computing power; OS/2 cannot.

Despite its advantages in performance and flexibility, the relatively small number of low-cost UNIX software applications (compared with MS-DOS) has inhibited most architects from implementing UNIX in their offices. UNIX systems also have lacked third-party reseller channels so common in the PC world.

A handful of PC software developers are porting their software to UNIX platforms. Autocad and Versacad, for example, both run on Sun and Apollo workstations, although neither will support UNIX running of 80286 or 80386 PCs. Still, UNIX workstations that cannot also run MS-DOS applications do not yet provide a wide selection of affordable software.

UNIX was developed by AT&T programmers in the 1970s and originally was intended for internal use and not for public distribution. Designed as an efficient development environment for programmers, its command-driven user interface is terse and often cryptic. As a standard, it historically has lacked a graphic window system (allowing each software application to be displayed in its own window on the screen), networking and file-sharing

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protocols, and a standard user interface. Indeed, most UNIX vendors have developed proprietary enhancements to the basic UNIX operating system to provide these.

Fortunately, several standards have emerged in the UNIX world over the past year. X-Windows, developed at MIT, is the de facto window system in the UNIX world and is supported, or will be supported, by virtually all UNIX vendors. Sun Microsystem's Network File System (NFS) protocols also have emerged as a standard to assure connectivity and transparent file sharing across a network of workstations—in other words, providing each user access to all files on the network as if they were on the user's own machine. Sharing information between people and, therefore, between machines is a key requirement of architects, one that most PC-based CADD systems fail to meet. (Sneakernet—transporting files via floppy disk by human beings wearing sneakers—is still the most popular networking standard in the PC world.)

The remaining missing ingredient of UNIX is a standard graphic user interface of the kind provided by the OS/2 Presentation Manager and the Apple Macintosh. Last March, Sun and AT&T jointly announced the development of Open Look, a proposal for a standard UNIX user interface. Other alternatives include DEC's DECWindows and the Presentation Manager running on top of X-Windows. Whatever emerges as the standard, it will help UNIX by providing a consistent look and feel to applications and alleviating its reputation for unfriendliness.

One reason for the growing popularity of the UNIX operating system is its availability on a wide variety of computers. Although UNIX is owned by AT&T, the operating system is licensed to many third parties. The image of UNIX "openness," however, was clouded earlier this year by the alliance of AT&T and Sun Microsystems, the leading manufacturer of UNIX workstations. The relationship between the two firms, always good, grew closer when AT&T agreed to purchase up to 25 percent of Sun. AT&T also agreed to license Sun's SPARC CPU chip for use in its own computers and announced more restrictive UNIX licensing policies.

Many of Sun's competitors, most notably Apollo Computer and Hewlett Packard, have objected to this alliance, fearing that UNIX will be enhanced for the SPARC hardware and that Sun will be given an unfair early lead on implementing new versions of UNIX on its machines.

Partly as reaction to this partnership, seven computer manufacturers—including IBM, DEC, Hewlett Packard, and Apollo—formed the Open Software Foundation (OSF). Its stated purpose is to define a single standard to which all UNIX vendors would have equal access. Although the initial reaction of both AT&T and Sun to the formation of OSF was hostile, both sides since have adopted a more conciliatory tone. Standardization remains one of UNIX's biggest stumbling blocks to wider acceptance.

The Apple alternative

What about Apple Computer? The company's loyal enthusiasts would argue that the Macintosh and its Multifinder operating system is a legitimate alternative to UNIX and OS/2. Indeed, the graphic interface of the Macintosh has taught a lesson to the rest of the computer industry about the value and profitability of user friendliness.

Although it certainly compares favorably with both UNIX and OS/2 in terms of friendliness and graphics, Multifinder pales in comparison in terms of performance, functionality, and flexibility. Multifinder does not provide multitasking, despite Apple's claim to the contrary. Its operating system allows users to switch between applications, but only two can be running simultaneously—the active foreground task with which the user interacts, and a single, nongraphic background application, normally used for printing or plotting. When a user switches to a different application, the currently running application stops. This is not true of multitasking, which allows users to run various programs simultaneously.

Significantly, Apple must confront the same painful upgrade dilemma that IBM faced last year in its introduction of OS/2. When IBM and Microsoft unveiled OS/2, they acknowledged that the new operating system would run only on machines equipped with 80286 and 80386 processors and would not run on older PCs, PC XTs, and clones. The absence of a clear upgrade path for low-end PC users invited them to look not only at IBM's new PS/2 machines but also at other kinds of alternatives currently on the market.

Apple now faces this same challenge with the Macintosh. The original Mac, Mac 512, Mac Plus, and Mac SE simply will not be able to run future versions of Apple's Multifinder that compete with the functionality of OS/2 and UNIX. Moving forward with new operating systems will mean abandoning compatibility with more than 2 million Macintoshes. IBM already has taken that painful step. Apple has yet to do so, but it must in order to keep up with OS/2 and UNIX.

Life after MS-DOS

The lack of multitasking, transparent file sharing, larger memory, and a standard user interface in PC CADD environments has put up roadblocks for software developers and users. Architects frustrated by the limitations of MS-DOS should investigate OS/2 and UNIX CADD applications as they become available. After all, it is not the operating systems themselves that will directly benefit architects but rather the software systems that can use the operating systems' power.

Many architects in small offices may lack the need or desire for a powerful operating system like UNIX or OS/2. For them, MS-DOS is and will remain a viable operating system. Indeed, users of IBM PCs, PC XTs, and their compatibles, as well as buyers of IBM's PS/2 Models 25 and 30, have no choice. But for most CADD applications (which are among the most complex operations running on PCs today) a more robust operating system legitimately is required.

Users who don't need to squeeze performance out of their systems, but who desire a standard user interface and better software selection, should consider OS/2 and the Presentation Manager. UNIX, on the other hand, is a more portable, higher-performance operating system. Although still lacking a standard user interface, UNIX runs on a wider variety of machines and ultimately provides more flexibility and freedom of choice than OS/2.

Both operating systems require more memory, disk resources, and management overhead than MS-DOS. Architects with PC-based CADD systems will have to weigh the advantages of multitasking, increased memory, networking, and standard user interfaces versus their increased cost. In most cases, for architects seriously committed to office automation, the advantages will be well worth it. □

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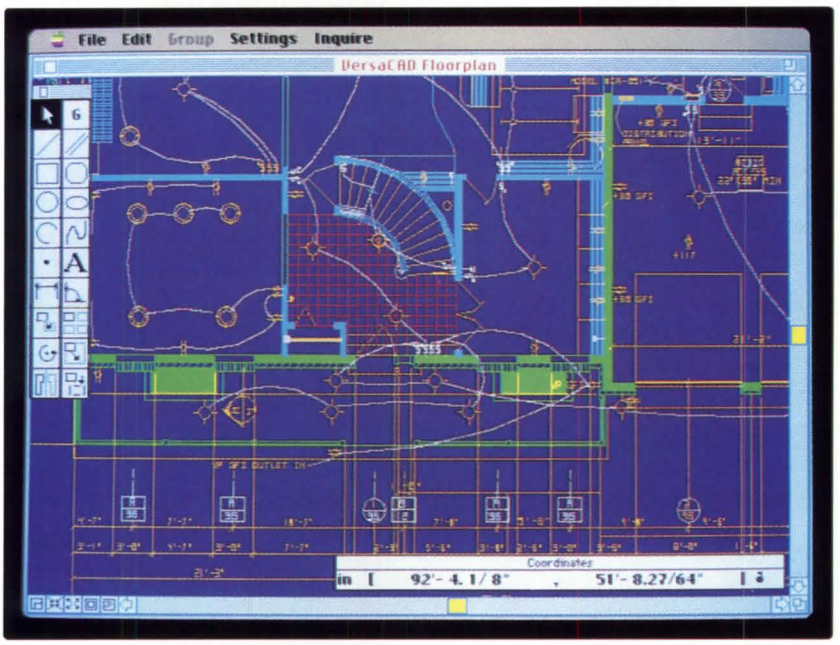

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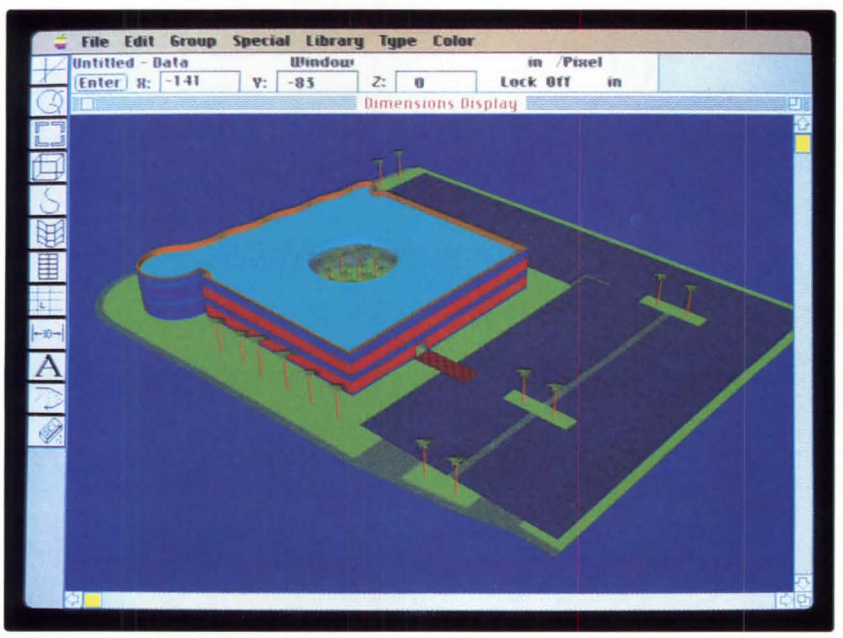

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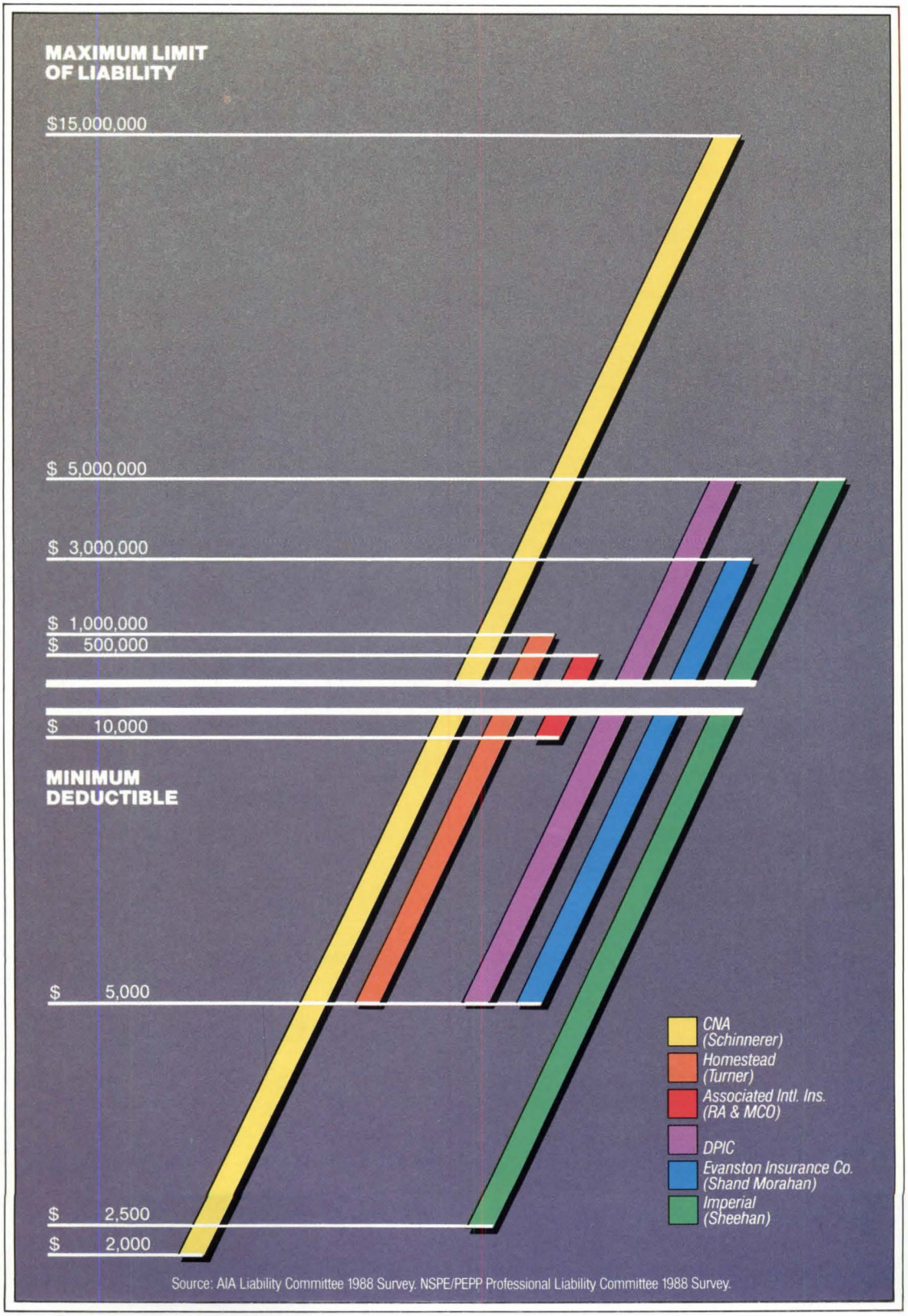

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Challenges of Cleaning Stone

The first thing any architect should know about the technically complex subject of cleaning stone is that architects without training in the field are well advised to consult a knowledgeable building conservator or preservation architect. Inappropriate cleaning can lead to serious stone deterioration.

Determining whether the stone to be treated is actually dirty or just weathered is of primary importance. If the stone is weathered, then a portion of the surface will have to be removed to make it look "like new." For instance, some light-colored, rough-surfaced granites take on a warmer, yellow to brown color after long exposure. The warmer tones are caused by oxidation of the iron minerals in the surface, and cleaning with the recommended fluoride-based solution may result in an unacceptable appearance.

If the stone is dirty, then determine whether the dirt and pollutants are harming the stone. Many attempts to make older buildings look new have only accelerated deterioration.

When stone is being cleaned, the material that bonds the grains together and its reaction to the method of cleaning is often more important than the mineral grains themselves. Once the bonding material is broken down—by washing, chemical treatment, air abrasion, or a combination of these—the stone will begin to disintegrate.

Sandstone consists primarily of quartz grains of moderate to small dimension (0.1 mm or less). It also may contain siliceous minerals—such as feldspar, clays, and micas—and small but appreciable amounts of carbonates, iron oxide, and other amorphous oxides such as silica and alumina.

Most sandstones are chemically neutral or very weakly acidic and therefore don't react with acid air pollutants, which tend to generate crusts on calcareous stone. But strong acid can leach out the minerals, thereby weakening the stone and affecting its color.

Because sandstone is porous, deposits tend to penetrate some distance below the surface and are difficult to remove. Generally the deposits consist of hydrocarbon combustion, fly ash, clay, soot, bird and other animal droppings, moss, and lichens. In order to reach the deposits it is often necessary to use a diluted detergent solution, allowing it to soak into the sandstone and then washing it off. If the stone is of good quality, stubborn deposits can be removed with a stiff bristle brush or high-pressure water or both.

Calcareous stone, including such stones as marble, travertine, calcareous sandstone, limestone, and tufa, is alkaline and tends to be slightly soluble in water and very porous. Liquid solutions penetrate into the interior through pores, channels, and minute intergranular crevices.

Polluted air may produce on calcareous stone a crust of gypsum (calcium sulfate dihydrate). Over time, dirt and soot become incorporated into the crust. The least destructive method of cleaning these stones is a soft mist of water for 24 hours or more, followed by a low-pressure wash.

Valerie Sivinski

This limestone building in Bath, England, shows the effects of plain water cleaning on years of accumulated soot and grime.

Efflorescent deposits result from salt-laden water passing through stone or adjacent masonry. As the water evaporates, it leaves the dissolved minerals. Alkali carbonates and sulfates are readily soluble in water. When dissolving away efflorescence, take care to prevent salts from soaking back into the stone. It's best to wipe the efflorescence away using no more water than necessary.

Efflorescence, while easy to clean, is not always a simple problem. If the source of the water or mineral infiltration is not found and corrected, the efflorescence will return and the cleaning will have to be repeated as additional deposits appear. Furthermore, efflorescence may well be an indication of stone decay. Some minerals cause certain types of stone to decay.

Calcium carbonate or calcium sulfate streaking is caused by water percolating through mortar, cement, or concrete. To remove this efflorescence, gel containing complexing (chelating) agents for calcium is applied to the streaked areas. The agents draw the calcium into the gel through molecular reactions. The gel must be removed before the chemical action penetrates the stone. Any residue can be removed with a fine abrasive pumice.

Granites and slates are composed of quartz, one or more of the feldspars, and micaceous minerals with or without plagioclase minerals. This composition makes the granites and slates relatively nonporous and nonreactive. They are hard and take a high polish.

Soiling of granites, particularly polished granite, is usually superficial and easily removed with a stiff bristle brush and a detergent solution. For more resistant stains, a fluoride-based solution can be used. Fluoride solutions shouldn't be used on polished granite, however, since they will etch the surface. Even on rusticated or rough-textured surfaces, fluoride solutions require careful monitoring since they tend to attack mortar and cement, eroding them and impregnating them with soluble salts.

The common methods of cleaning stone may be divided into four categories: washing, chemical treatment, air abrasives, and steam and mechanical cleaning.

Washing. Washing is often the simplest and least destructive means of cleaning a stone surface. Low-pressure water spray is good for cleaning limestone and marble and can effectively clean sandstone when preceded by a thorough soaking with diluted detergent solution.

Simply a gentle spray of water for several hours can remove a good deal of dirt and grime. The water must be clean and free of metallic impurities, particularly iron and salts, which can migrate into the stone and cause subsequent decay. Low-pressure spray cleaning is the least expensive method of cleaning large stone surfaces, particularly limestone. The work should proceed from the top down. Any spraying should be regulated to prevent oversaturation of the stonework.

Oversaturation is best avoided, as it can cause problems in adjoining materials, for example, rot in floor and roof timbers or deterioration of plaster interiors. The quantity of water must be kept to a minimum also to reduce runoff, which should be channeled quickly away from the work area, possibly by means of temporary gutters and drains. Much of the dirt will be washed away simply by spraying, but it may be necessary to scrub heavier deposits off. In that case, workers using nonferrous, fine-bristle brushes should be careful not to overwork the stone.

Any time water is used on masonry, the work must be done in warm weather, months before there is danger of frost. Otherwise, water may penetrate the stone, freeze, and cause the stone to crack and spall.

High-pressure water cleaning can act like a putty knife scooping off dirt in a single pass. It has the added advantage of requiring less water over a prescribed area than the low-pressure method, and it is less likely to saturate the stone. The stone must be able to withstand the pressure, however. Adjacent areas, such as windows, also must be protected.

There is little agreement among companies specializing in cleaning as to pressure settings. Architects can minimize the potential of damage by specifying sample cleaning of test areas. Such tests will help determine whether moderate settings of 200 to 600 psi will be sufficient or whether higher pressures of 600 to 1,800 psi are necessary. Cleaning buildings using the higher pressures will require careful and constant supervision to avoid pitting or loosening of the stonework, which should be part of the specifications.

Don't mistake industrial cleaning for stone or masonry cleaning. Industrial cleaners use water pressures of up to 15,000 psi. That kind of pressure could do a great deal of damage to a stone building.

Chemicals. Chemicals are often added to water spray to hasten the removal of dirt, but this method carries the risk of considerable damage to the stonework. There are many chemical cleaners that promise to solve all your problems, and their claims are particularly confusing for an architect who doesn't regularly use cleansing chemicals.

Not having to use water saturation or air abrasion makes chemical cleaning attractive. But chemicals can leave a damaging residue. Also, it is difficult to get manufacturers, suppliers, or appliers to guarantee that all the residue will be removed once the stone is cleaned. Under the careful control and guidance of an expert, however, some chemicals can be used successfully with minimal damage.

Hydrofluoric acid, applied in a diluted form, has been useful in cleaning sandstone and unpolished granite. But if every trace of the acid isn't washed away, unsightly stains will appear. Hydrofluoric acid will also etch glass, marble, polished granite, and paving. Because it's a strong acid, workers must be protected from burns.

Tributyl tin oxide will effectively remove lichens and moss without damaging the stone. Although some lichens attack stone and others leave unsightly white patches, many lichens and mosses aren't as harmful to stone as once thought. The problems they cause are associated with the dirt and water they trap, keeping the stone damp when it otherwise would be dry.

Chemical soap diluted in white spirit will remove stubborn dirt from alabaster. But the cleaning must be done by an expert so as not to damage the alabaster.

Masons often use hydrochloric acid (muriatic acid) to remove cement splashes and lime encrustations. But the acid can cause serious damage unless it is thoroughly washed off. It is not wise to use either sulfuric acid or hydrochloric acid in general stone cleaning.

Poultices can be used in small areas where the problems are so difficult that normal cleaning would cause damage to the stone or the adjacent surfaces. A poultice is formed by mixing a cleaning agent with an inert substance (such as Fuller's earth or whiting) and plastering it onto stone to draw out the stain. The poultice typically is formulated to remove a specific stain from a specific type of stone.

Air abrasives. Because air abrasive techiques result in rapid and dramatic cleaning, they have been oversold for the

Thomas Jefferson Building, Washington, D.C.
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past two decades. Contractors were tempted to use higher pressures and coarser abrasives to achieve more dramatic effects, to the detriment of many buildings. As a result, abrasive cleaning has generally fallen into disrepute. However, using small units, low pressures, and fine abrasives, contractors can achieve good results with minimal damage to the stone. Small units and fine abrasives—such as air pencils and aluminum oxide—aren't practical over large surfaces but are useful in detail work and in combination with other cleaning methods.

A thorough specification includes the grit of the abrasive, the gun type, and the air pressure. It also requires that a sample section be cleaned as a reference for acceptible workmanship.

Once work has begun, regular spot checks of pressure will help ensure consistency. Pressures approaching 40 psi are at the upper limit, and in many cases lower pressures are recommended. A sensible time schedule is helpful for alleviating the contractor's temptation to hurry the work.

Dust from the abrasive and from the stone, particulary sandstone, is a constant problem. Adjacent materials, such as glass, brick, and terra-cotta, can be masked off to prevent damage. The dust often obscures the operator's vision, making consistency close to impossible. Scaffolds must be tightly enclosed to protect the public and the operator, who must also be supplied with protective equipment and clothing. Once the air abrasive work is completed, common good practice is to rinse the surface with clean water using a low-pressure water lance with a fan jet.

Steam and mechanical cleaning. A steam kettle was the traditional tool for removing layers of limewash from deeply recessed carving. But steam cleaning fell into disuse because it often left a residue of caustic soda and because simpler methods were developed. Today, steam is seldom used except as a support method.

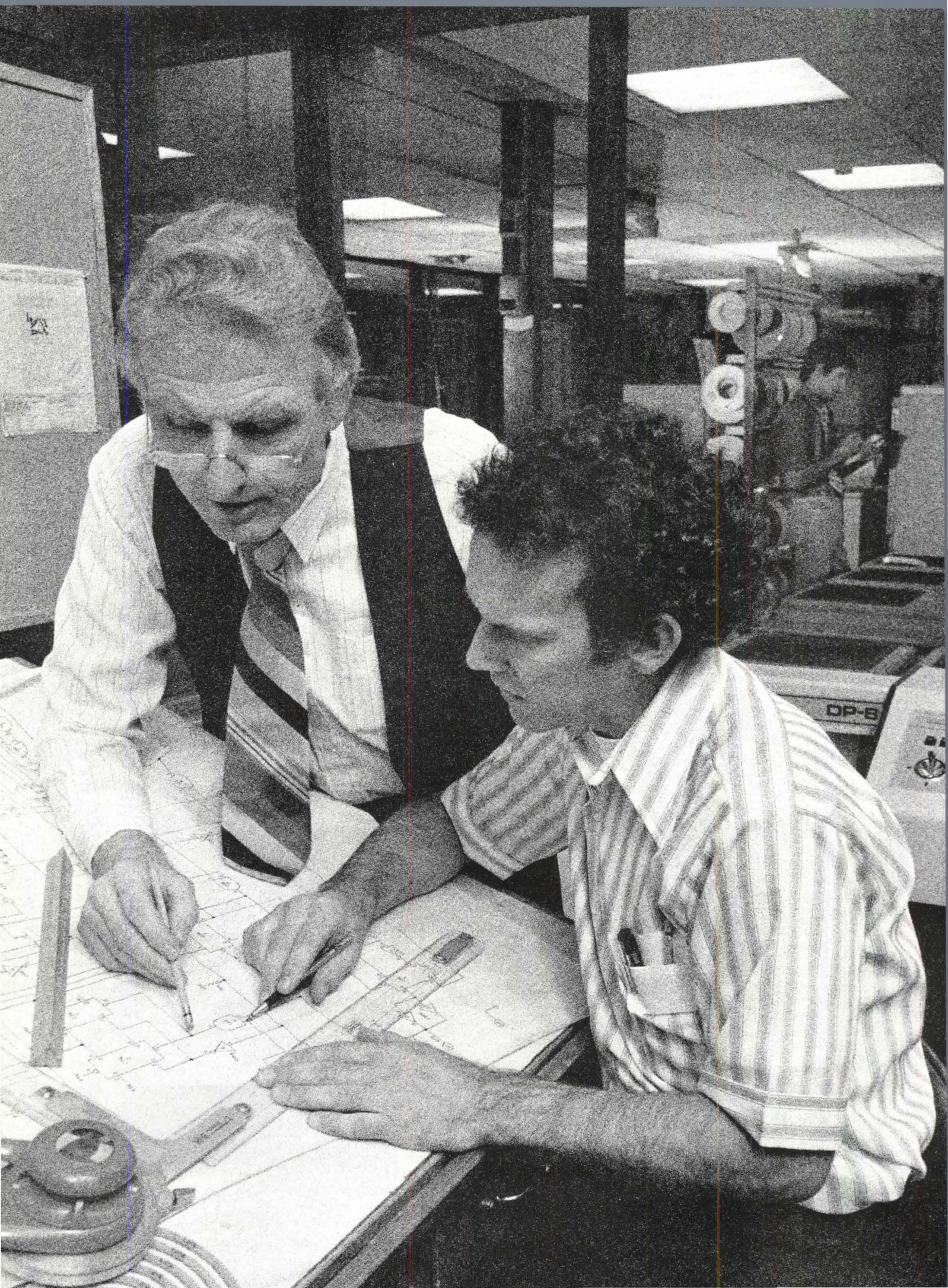
Most mechanical cleaning methods actually redress the stone, removing the top surface layer. Even mechanical cleaning using a flexible carborundum disc leaves scour marks that have to be finished by hand rubbing, thus removing even more of the stone's surface. Mechanical cleaning is a method used only as a last resort.

For smoother cleaning

- It is wise to undertake a complete survey of each stone surface, noting its type and condition. Is the stone's surface hard or crumbling? Is it polished or tooled? Has it been cleaned before? Note the stone's exposure and the delicacy of any carving, as well as how deeply the carvings are undercut. Look carefully at how the stones are joined. In what condition is the mortar? Also, record the surrounding surfaces and consider what kind of protection they will need. A photo survey is perhaps the best method for making a record of this kind.
- Because both wet and dry cleaning can interfere with other trades working nearby, and vice versa, the architect should help the contractor in coordinating the work. To this end, evaluate the time needed to complete each piece of work. For instance, if joints have to be repointed, allow time for the mortar to set before scheduling the cleaning. Good scheduling and coordination will minimize the number of unpleasant surprises.
- Coordination of work also is important to avoid impedance of public access and interference with services. Careful planning should be given to location of scaffolding and protection of adjacent areas.

—Timothy B. McDonald

Preservation architect Valerie Sivinski contributed to this article.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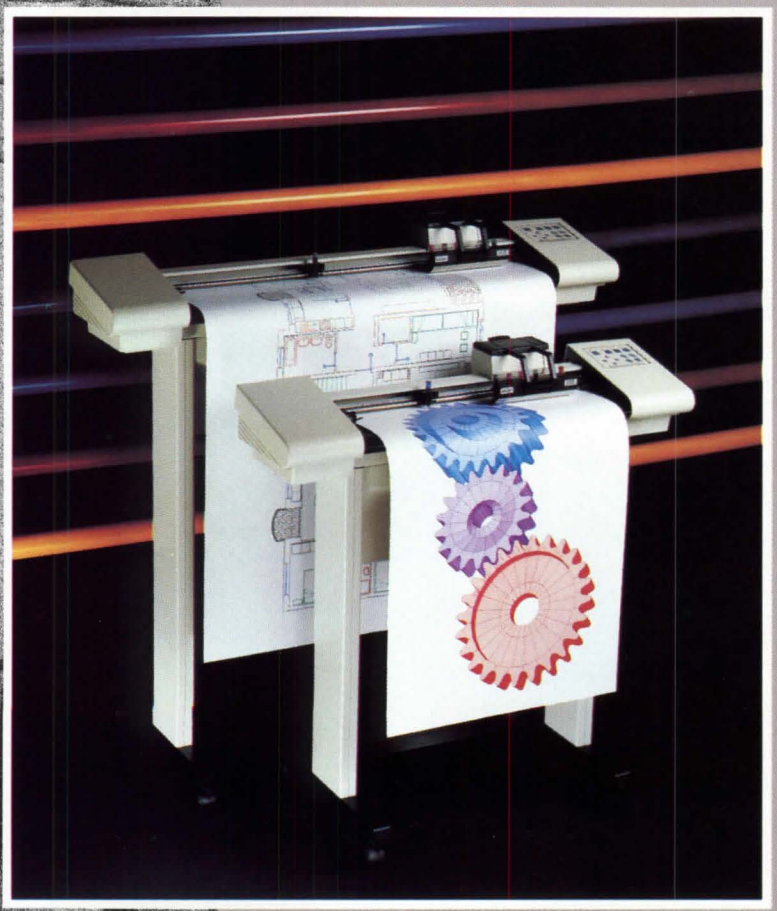

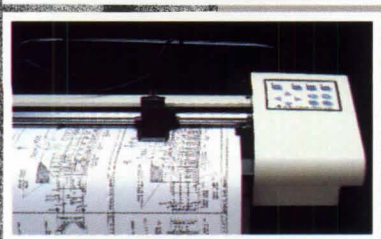

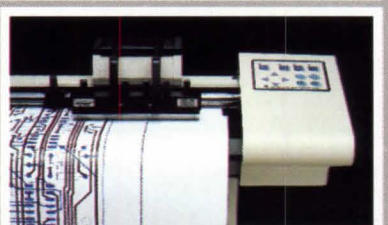

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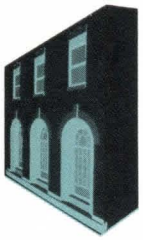

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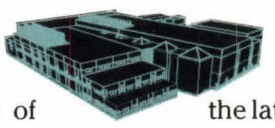

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Select Art Deco-inspired fountains of rich bronze; gracefully sculptured fountains of stainless steel; or the dramatic, thoroughly modern look of our innovative "hands-off" sensor-operated water coolers.

Find out more about how Haws can help you turn a neglected masterwork from the past into a handsome masterpiece for the future. Contact your Haws representative, see Sweets section 15455, or phone the Sweets BUYLINE.®

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Model 3352
Available in a choice of finishes, this striking fountain will lend an air of sophistication and classic beauty to any setting.

Model HWCF8RF
A smooth, uncluttered design ideal for renovated lobbies, hallways, and atriums.

Model HWDFS8
All-stainless steel construction means this cooler will provide years of reliable service and easy maintenance.

Model 1116
Designed in High Polish Bronze with a brown and cream swirl poly-marble receptor, this fountain will add warmth and charm to any restored interior.

Haws Drinking Faucet Company
P.O. Box 1999, Berkeley, CA 94701
415/525-5801, Telex: 336358
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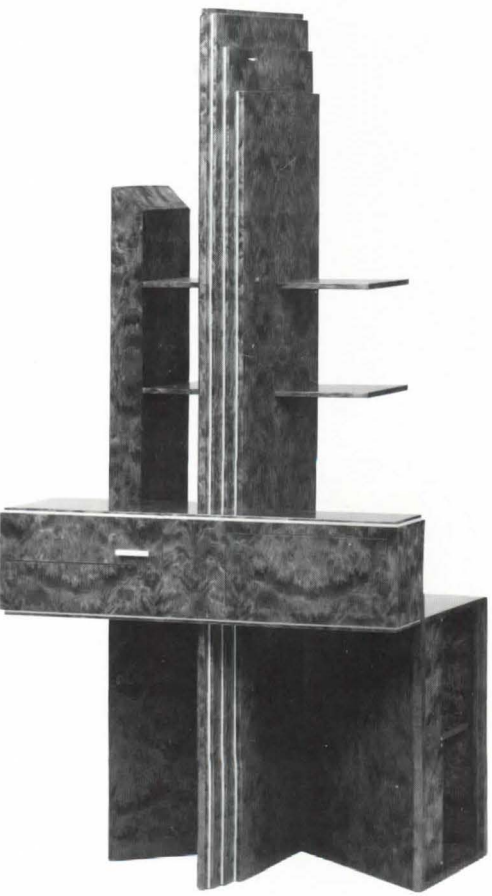
Model HCBF7HO
One of our exclusive "hands-off" sensor-operated electric water coolers, offering the ultimate in barrier-free convenience.

PRODUCTS

Verdigris Finish
Brass Smith Inc., a Denver-based innovator in decorative architectural metals and finishes, announces a new natural-weathered-look patina finish in the popular, greenish-blue verdigris for its line of decorative railings and fixtures.

The decorative railing finish (right) creates the look of aged copper. The company offers the verdigris finish on fittings, railings, and a variety of fixtures.
Brass Smith Inc.
Circle 400 on information card



Contemporary Secretaire
Inspired by Frank Lloyd Wright's Fallingwater and by 18th-century secretaire bookcases, designer Todd Granzow has fashioned his Secretaire (left) to follow the function, if not form, of the historical antecedents. The pronounced cantilever is balanced by a graceful vertical pier, and the rich earth tones of the piece invoke Wright's designs. The exterior is of mirror-image matching burled sequoia inlaid with white holly to resemble polished marble. A close-door angled bookcase on the right is countered by open bookshelves on the left side.

The interior of solid zebrawood lined in soft doeskin was built to resemble a Chinese box, with hidden compartments and secret doors. Even the doeskin writing surface is concealed when not in use. On the left, the case opens laterally to reveal the writing surface, and to the right a fall-front opens onto three burl drawers with tiny holly pulls that float in a space earmarked for documents. These are lined with zebrawood. The secretaire measures 43x28x80 inches.
Karl Mann Associates
Circle 401 on information card

Products *is written by Amy Gray Light*

Mission Style Lantern Beam Pendant
A solid brass Mission style chandelier (below) is available in seven finishes: antique, polished unlacquered or lacquered brass, brushed brass, polished copper, japanned copper, or polished nickel. The lantern shade is available in caramel, white, green, blue, or pink-colored art glass. The UL-listed fixture is six inches wide and 18 inches long. The company manufactures turn-of-the-century light fixtures, selling more than 100 styles of brass fixtures for commercial and residential building restoration, and remodeling projects.
Rejuvenation Lamp & Fixture Company
Circle 402 on information card


Lighting the way to tomorrow.
Today, windows are a bigger part of architectural design than ever before.
That's because design is a bigger part of windows.
Kawneer's window line includes both Thermal and Non-Thermal models.
Vertically and horizontally pivoted. Inswinging and outswinging casements. Projected, top-hinged, fixed and high performance windows. Kawneer has them all. To open design opportunities. To open minds.
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Kawneer windows. They let you look at your design in a whole different light.
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For full technical description, tracing details and specifications, contact your Kawneer representative or write to: Kawneer Company, Inc., Department C, Technology Park-Atlanta, 555 Guthridge Court, Norcross, GA 30092.

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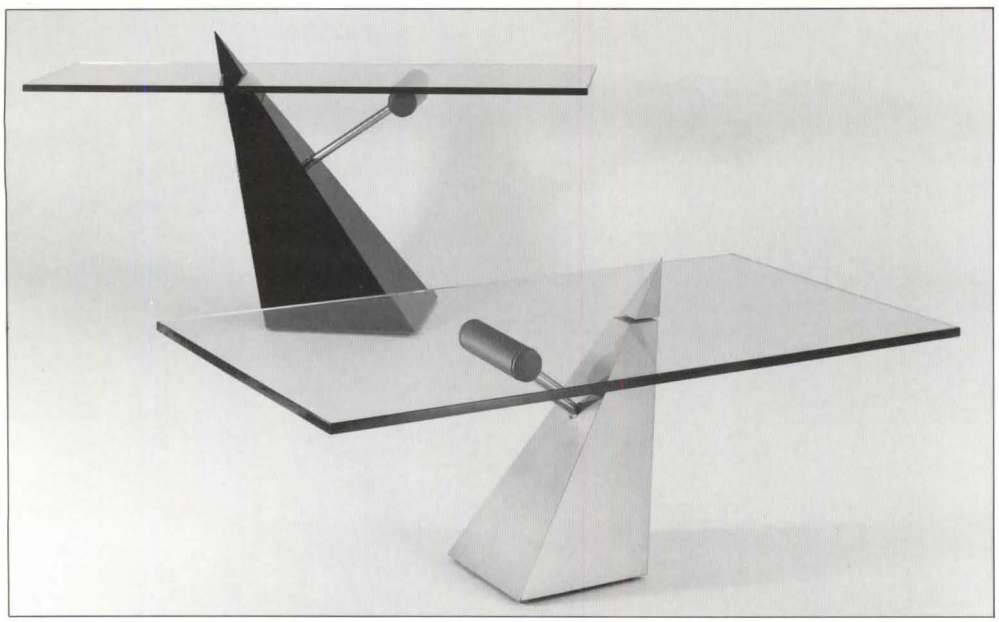


Geometric Table
Michael R. Burm, a Canadian architect, has won first prize in Directional Inc.'s design competition with a glass-topped Pyramid table (above), which mixes geometric forms in a sleek combination that gives it a futuristic look. A pyramid-shaped base pierces through a clear glass top to provide a cantilevered effect. The design is counterbalanced by a leather-covered cylinder, which extends from the base on a stainless steel arm.
Directional Inc.
Circle 403 on information card

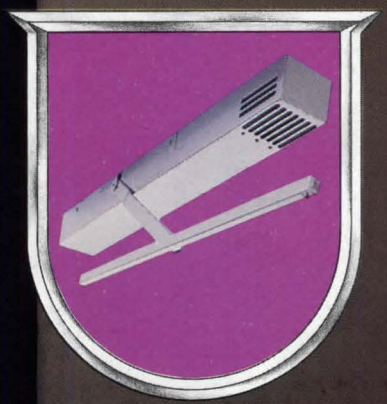
Radon-Detecting System
The Pico-Rad system for detecting radon in both air and water by the Packard Instrument Co. is designed for high-volume radon testing laboratories. The system includes detectors for measuring radon in air, a Tri-Carb 1900 CA liquid scintillation analyzer, specialized application software, a laboratory quality assurance program, and liquid scintillation cocktails for eluting and counting air and water samples. Processing of air and water samples requires only a one-step elution, followed by automatic counting and analysis. The Tri-Carb analyzer's sample changer allows unattended operation. Summary reports and letters are printed for individual customers on the test site. Disposable detectors need only 24 to 48 hours' exposure rather than the three to seven days required by other methods. The detectors are moisture independent, and no additional calibration curve calculations are required for automatic analysis. The method for air sampling has been tested to agree within 3 percent of the EPA values in proficiency tests.
Packard Instrument Company
Circle 404 on information card

Arris System and Compatible Case Goods
The Arris wood panel system, designed by Rich Tompson for the Alma Desk Co., consists of panel-mounted and freestanding components that support both private and open-landscape office space. The modular case goods supporting the system include work surfaces, pedestals, and vertical storage units. Features of the Arris system include "nonhanded" panel-to-panel connections. A steel channel that can be reconfigured later with the removal of only two screws per panel facilitates changes to the workstation. The system also features acoustically sound panels incorporating powerways, receivers, wire management, and lighting. Space for computers and additional equipment is accommodated. Work surfaces can be specified
continued on page 158

SMOK-CHEK

Bet your life on it

Rixson's Smok-Cheks provide patients an automatic defense in the event of a fire emergency. Combining a smoke detector with electromagnetic door controls, the Smok-Cheks hold the door open under normal conditions, but automatically close it in event of fire.



Rixson's Smok-Chek: efficient, reliable just when you need it most. From the pioneer and leader in smoke-actuated door control.

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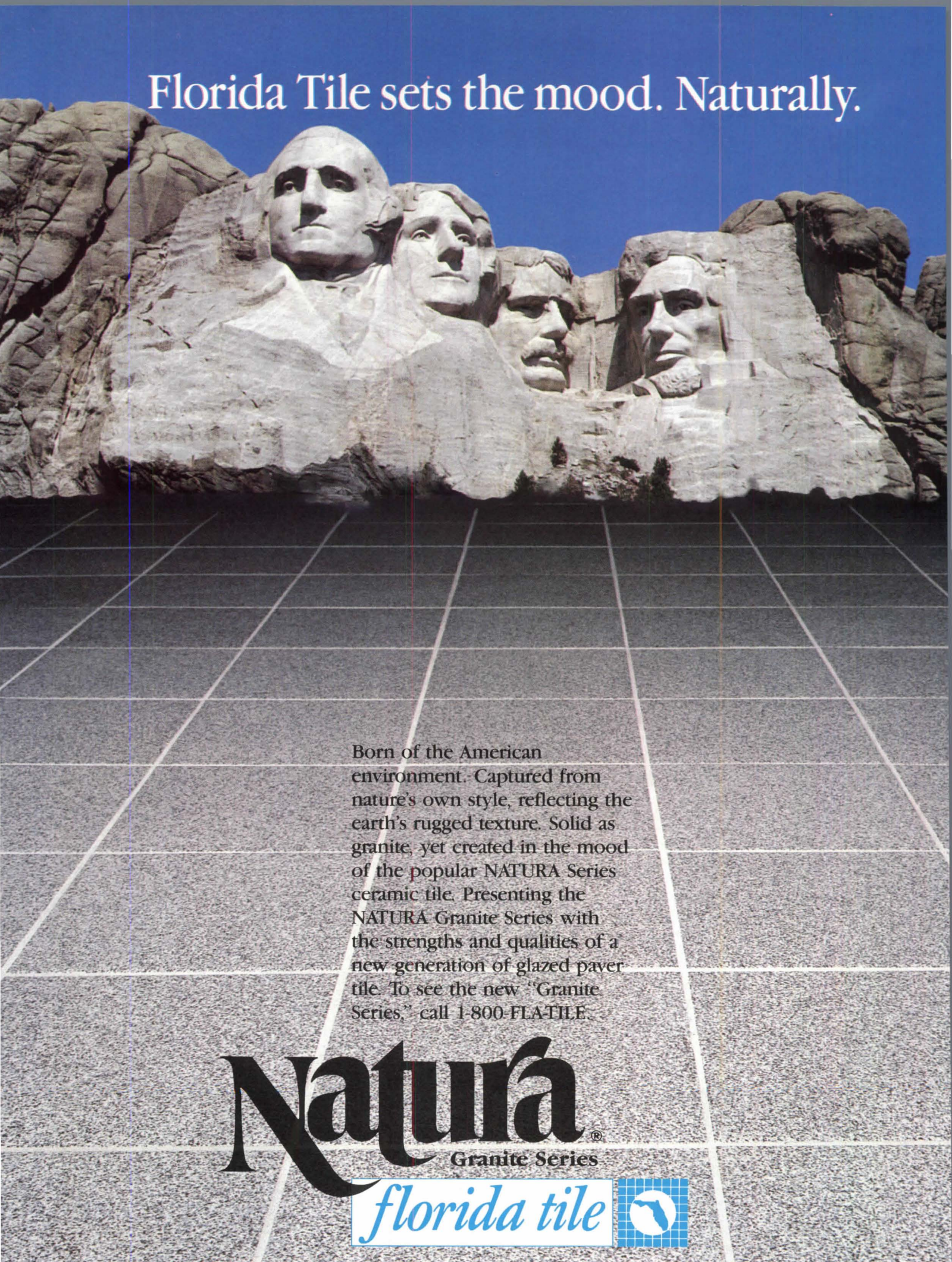
A Mark IV Industries Company

Circle 145 on information card



Circle 147 on information card

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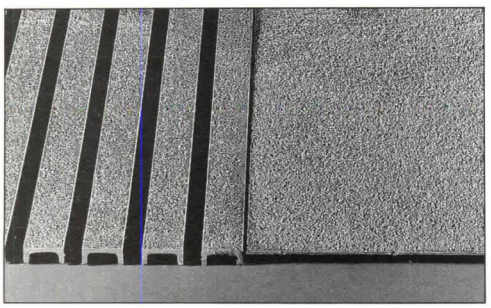
Products *from page 154*
with laminate tops contrasted by a solid wood edge detail. Wood veneer finishes include a light or medium oak, black walnut, mahogany on walnut, and medium mahogany. The Arris system is the winner of a 1986 Roscoe award.
The Alma Desk Company
Circle 405 on information card



Slip-Resistant Flooring
Mebac slip-resistant metal surfaces (above) have aluminum oxide grit particles bonded with molten metal to a metal substrate. This surface has a high coefficient of friction to provide traction when wet or coated with oil. The flooring is suggested wherever people walk or stand on metal, such as on ramps, work platforms, trench covers, vault covers, and bridge sidewalks. The UL-listed surface can be applied after metal fabrication, avoiding the chance of damage to the surface during the fabrication process.
IKG Industries
Circle 406 on information card

Glass Fiber Wall and Ceiling Panels
Glasbord glass fiber reinforced plastic panels are designed to resist stains, scratches, moisture, rot, rust, and mildew. The embossed surface panels are suggested for interior, high-traffic, high-use public areas. They are USDA-accepted and meet FDA requirements. A Fire-X model is also UL-classified and FM-approved, with a Class 1 fire rating. Both panels are fabricated to remain unaffected by temperature extremes. They require no painting and they come in eight colors, with custom colors available.
Kemlite Company
Circle 407 on information card

Door for Clean Room Applications
The Ultra Clean Sliding Door, Model 221, for clean rooms features noncorrosive, abrasion-resistant materials and an airtight seal. Constructed of seamless stainless steel panels, glass fiber, or ABS plastic, it has a view panel with flush glazing. Polyurethane air infiltration seals resist abrasion and outgassing and are attached to all four sides of the door panel to form a continuous seal with no exposed fasteners. An eight-inch, low-profile, self-supporting, industrial-duty header is designed to reduce header-to-ceiling height requirements and uses a heavy-duty ball-bearing track and wheel system. The door has electro/pneumatic operation, with the option for an explosion-proof system.
Horton Automatics
Circle 408 on information card

Cam Action Closer
The Dorma TS 93 Series door closer (above) has a cam and roller mechanism designed to make it easier to open doors than with closers with rack and pinion engineering. Other benefits include an adjustable back check and a hold-back capability. The TS 93 has a compact, narrow closer and track arm assembly.
Dorma Door Controls Inc.
Circle 409 on information card

Vehicle Turntable
A low-profile (four inches or less) vehicle turntable used for trucks and other vehicles to facilitate unloading and to position vehicles for front-first street entry is available from Hovair Systems Inc.

continued on page 160

the Renaissance Collection®

CHICAGO® FAUCETS

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Circle 155 on information card

Products *from page 158*

Made of fabricated steel, the structure's low-profile design and low ground-pressure requirements enable it to be installed on a mezzanine or on floors where it would be difficult to fit other types of turntables. The turntable is designed to float on a thin film of air. Such frictionless movement allows the turntable to be rotated by hand for loads up to 20 tons. Power-driven units are also available. Other applications for the product include jig rotation, parts assembly, rotation of theater stages, and revolving displays for merchandising.
Hovair Systems Inc.
Circle 410 on information card

Projection Screens

Artisan Series screens are available in five standard hand-rubbed hardwood finishes, four contemporary plastic laminates, and various custom finishes. Three Artisan case styles coordinate with rectilinear, radius, or traditional furnishings. The screens can be hung from the wall or ceiling and are either motorized or manually operated. They can also be formatted for audiovisual or large-screen video presentations.
Draper Shade & Screen Company
Circle 411 on information card

Wood Window

The City Lites series of wood windows, (above) offers etched glass patterns in combination cathedral and double 20-inch-wide

casement units. Several interior trim styles are available. Exterior trim comes in white, adobe, desert tan, or aluminum clad. Other series of window and door styles available are tilt and direct-set half-circle wood windows, hinged wood and hinged steel patio doors, and entrance doors and side lights. The etched glass is energy-efficient, insulated or triple-insulated glazing.
Weather Shield Manufacturing Inc.
Circle 412 on information card

Automatic Shut-off Gas Valve

A California state-approved and certified, earthquake-activated gas shut-off valve activates when triggered by the seismic shudders of an earthquake of 5.4 or higher on the Richter scale. Leaking gas lines are a leading cause of fires and explosions following an earthquake.

The valves are installed between a gas meter and the structure it services; they are constructed to withstand wide temperature fluctuations, the impact of falling debris, and uneven torque pressures. The valves are sensitive to the shocks of an earthquake but are designed not to become activated by the movement of trains or trucks. In case of a fire, the valves can be activated by a strong kick or solid jolt to shut off the gas line. Available with a lifetime warranty, the product is suggested for both commercial and residential applications.
QuakeMaster
Circle 413 on information card

Floor Design Kit

The Spec 1 flooring design kit has an array of one-inch-square vinyl chips in 29 colors and a special grid board and features strips ¼, ½, and one inch wide to help specifiers simulate a variety of floor covering color combinations and patterns.
Flexco Company
Circle 414 on information card

Products continued on page 162

To keep your roof from coming apart, go to pieces.

Corrosion-resistant fasteners. What goes down won't come up.

We'd like to assume something for a minute. You put a roof over your head so you can stay dry. And warm. (Or cool, for those of you in more tropical climates.)

Now, if a roof is going to do all this, it has to be put together with all the right pieces. In all the right places. By all the right people.

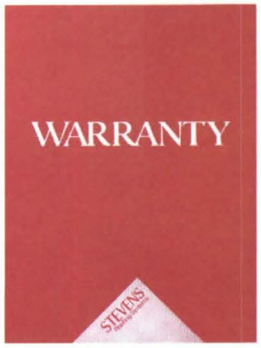
Introducing the Stevens Hi-Tuff Plus™ Total Roofing System.

Hi-Tuff Plus is a fully-integrated roofing system.

We started with the membrane itself. (45 mils of white scrim-reinforced Hypalon*.) We included the most popular insulations. (100% UL labeled.) The fasteners. (Stainless steel and ceramic coated.) And the roof-edge fascia. (In a variety of metals and colors.)

And that's not all, folks.

Once we got all the right pieces together, we made sure only the best applicators would be allowed to put them together. So we picked our most experienced contractors and made them authorized Hi-Tuff Plus applicators. They, in turn, make sure your roof meets our inspectors tough standards. For at least 15 years.



Our 15-year, 70 m.p.h. warranty covers all system components.

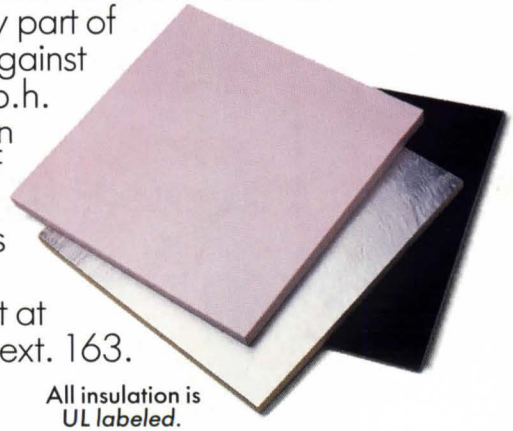
We'll back it into the 21st century.

O.K., so a 15-year warranty's nothing new in the roofing business. What is new is what it covers.

Our warranty doesn't just cover the membrane. It covers the insulation. The fasteners and plates. The adhesives. The fascia. And the workmanship. In short, every part of the system. Even against winds up to 70 m.p.h.

And if, within 15 years, your roof leaks, we'll fix it. Period. Our Sweets brochure can tell you more. Ask for it at 1-800-848-4400, ext. 163.

Our color-coordinated fascia has the edge in fighting high winds.



All insulation is UL *labeled*.

*Hypalon is a registered trademark of Du Pont.

Circle 161 on information card

Health Care Chair
Kinetics's patient chair (above) has a split-back detail to provide comfort to the user and ease of handling and cleaning, as well as a swing-away arm in combination with a cantilevered front for easier patient transfer. More than 20 different models are available, including a high- or low-back, split-back, fixed and swing arm, and sled base or four legs to the floor.
Kinetics Furniture Inc.
Circle 415 on information card

Window Control
An electronic remote control system from Velux-America features a compact keyboard the size of a conventional light switch panel that opens and closes the window, controls sunscreening accessories, and has an electronic rain sensor that automatically closes the window when rainfall occurs. The modular ES system can be linked with several other systems through an optional master keyboard with separate keyboards still available for individual windows. There is no limit to the number of ES systems that can be connected to a master control. This is useful in multiple-unit installations such as commercial offices. An optional rechargeable battery backup unit keeps the system in operation in the event of a power failure.
Velux-America Inc.
Circle 416 on informaton card

Facility Management System
A new facility management system (FMS) by Johnson Controls is geared toward mid-sized buildings that do not need the full support of the standard JC/FMS yet have special needs requiring a higher level of control than that provided by small-scale Digital Workstations. Johnson Controls suggests the company's Logical Option system for schools, hospital and health care facilities, retail complexes, and small office buildings.

The Logical Option system is designed to lower building operation costs by mon-

continued on page 164

HEWI

A comprehensive range:
Door Hardware, Railing Systems, Cabinet Hardware, Bathroom Accessories.
A range of high quality nylon items that allows versatility in combination and individuality of expression. Pleasant to the touch, wear resistant, colored throughout. All items are available in 13 colors.

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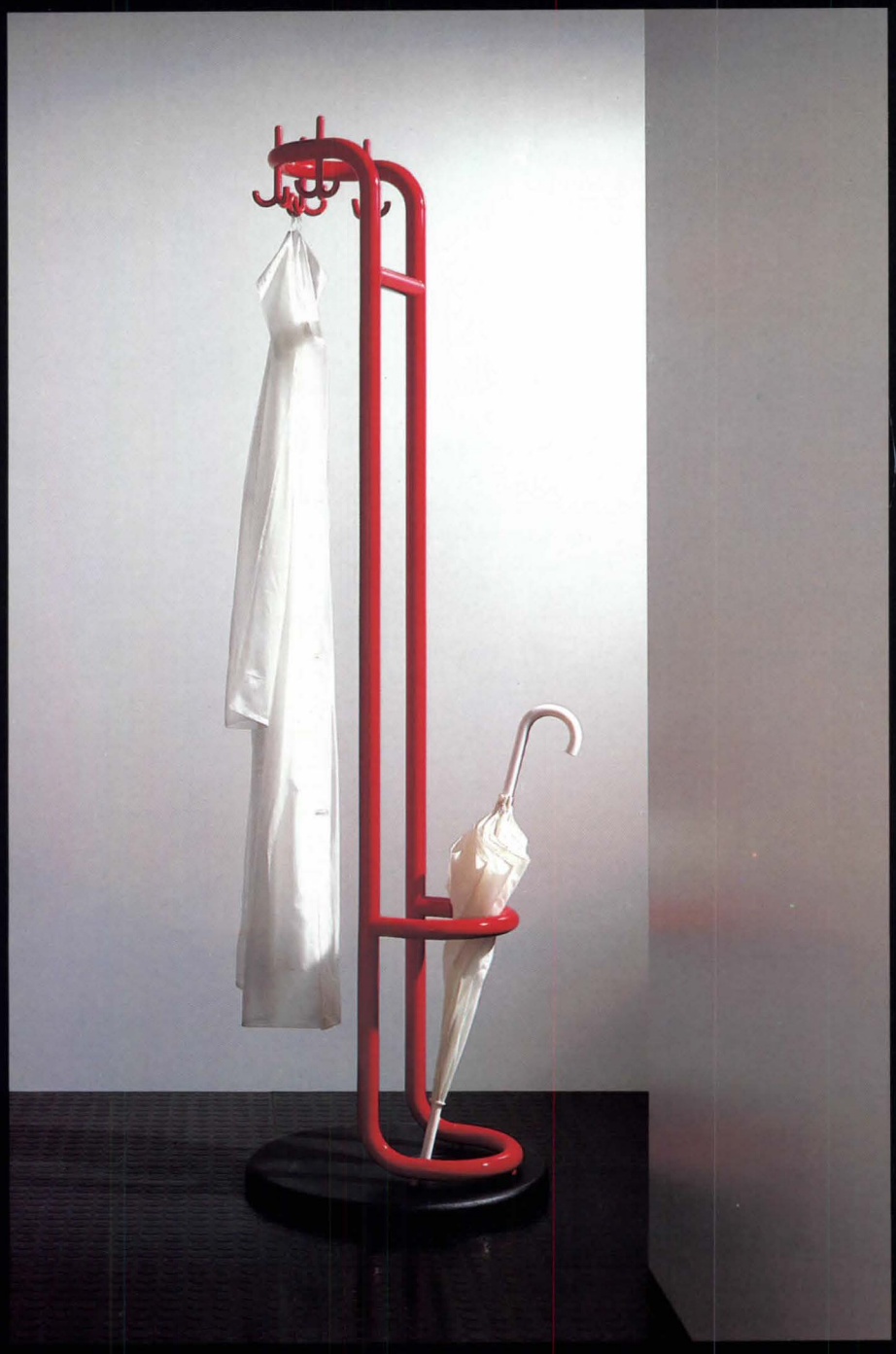
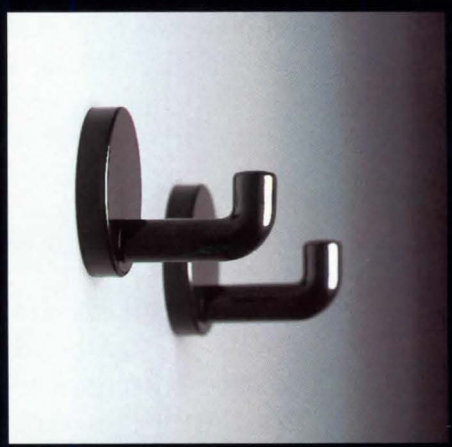
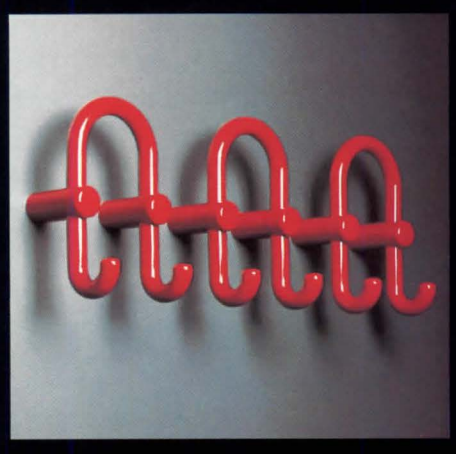


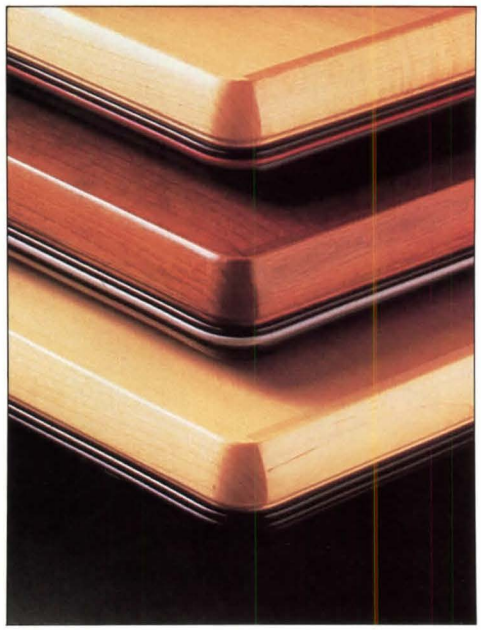




Circle 165 on information card

Products *from page 162*

itoring and controlling lights, boilers, chillers, and air handlers. Operating software further helps reduce overall hardware and software costs. Building control and management occurs through a communications link to networked Johnson Controls digital systems controllers (DSC) in the field. Because control capabilities are distributed to each component in the DSC network, functions continue even if the communications link between the program system and the DSC is broken.
Johnson Controls
Circle 417 on information card

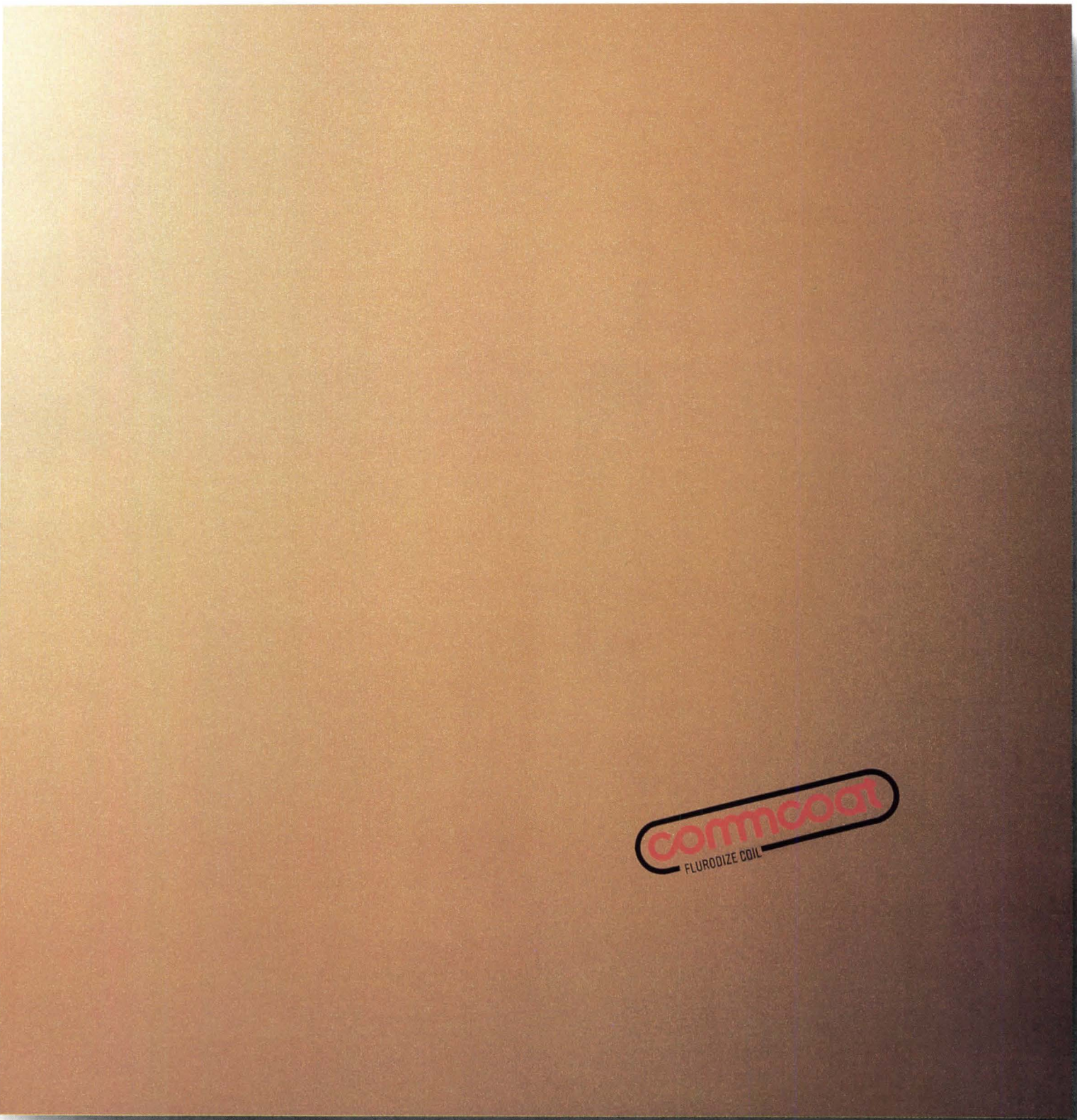


Modular Furniture
Estro, the newest in Gunlocke's series of Geva modular case goods for the office, features maple or cherry wood components that can be assembled, reconfigured, or enlarged to meet changing work-space requirements. Various components include work surfaces, modesty panels, vertical storage units, pedestals, and credenza assemblies. Enhancements to the line are wardrobes, storage units with shelves, lateral files, and bookcases. Various tables that can be used as conference tables or as desks are also available. An important detail to the line is an extruded edge (above) that is located on work surfaces and plinths. Made of black polyvinyl, the edging on work surfaces is accented with bead molding of jet black, scarlet, or shell gray.
The Gunlocke Company
Circle 418 on information card

Mortar and Joint System
The Mortar Mates S/G Color Pac system is a grouting, mortar color, and expansion joint system that contrasts or complements the color of mortar joint wall surfaces. Standard and custom-matched colors can be delivered. Each S/G Color Pac is packaged and controlled by volume and weight to color one bag of standard mortar. Tech-

continued on page 166

The new surface anodized can't match.



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The remarkable finish is made by bonding a Flurodize coating to our finest aluminum substrate, right in our rolling mill.

Commcoat looks a lot like anodized aluminum. Only better. And it comes in seven exciting colors. (Extrusions, too.)

For a price no higher than anodized.

But the difference is, Commcoat Flurodize Coil keeps on looking good year after year. With far less weathering, fading or staining than anodized.

Nor does its color vary from panel to panel. Or crack when sharply bent.

To get your hands on some, call any of these distributors: Petersen Aluminum Corporation, Wrisco Industries or Idéal Métal Inc. Laminated panels are produced by Alucobond Technologies.

Or call us at 1 (800) 556-1234, Ext. 174. In California, 1 (800) 441-2345, Ext. 174.

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Circle 169 on information card

Products *from page 164*
nical product information sheets are included with each kit.
The Burns & Russell Company
Circle 419 on information card

Geometrically Styled Lounge Furniture
The Eastside Lounge Collection by Sottsass Associati, part of the KnollStudio division product line, includes a lounge chair, setee, and sofa, as well as a complementary Central Park table.

The collection (below), designed in 1983, features combinations of geometric forms—squares, rectangles, triangles—designed to give the furniture a visually rectangular, architectural feel. Each upholstered piece can be covered with a mix of three different textiles or leathers. As textures and contrasting colors are mixed, the character of the furniture changes—from bright and contemporary to subdued and traditional.

Arm, seat, back, and head cushions on the chairs are of molded polyurethane foam in three different densities. The exposed frame is a brazed tubular steel structure in a high-gloss metallic gray finish with clear lacquer for protection.

The marble base of the table comes in dark earth red with deep green veins and patterns or in antique white with dense gray veins.
Knoll International Inc.
Circle 420 on information card

CREDITS

Union Station Redevelopment, Washington, D.C. (page 68). *Preservation architect (Union Station Redevelopment Corp.): Harry Weese & Associates. Architect and planner (Union Station Venture Inc.): Benjamin Thompson & Associates, Cambridge, Mass.* Principal: Benjamin Thompson, FAIA. Partner in charge: Phil Loheed, AIA. Senior associate: John Shank. Design associates: Diana Tracey, AIA; Fred Groff. Interior design: Tess Heder, Cammie Henderson, Weston Wright, Michael Dobler, Cyril Hunter, Bill Roe, Art Vento, Helena Korpela. Graphic illustration: Nick Thompson. Construction coordinator: Vern Patterson. USV construction manager: Essex Construction Corp. USV mechanical, plumbing,

continued on page 170

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Nothing Rates Like The Enkasonic® System For Sound Control Between Floors.

Enkasonic matting magically shuts off even romping, stomping impact noise.

That unique ability has been verified in the testing of numerous floor systems by the Ceramic Tile Institute.

A floor that floats on Enkasonic matting protects the people below from the noise of those above. **See Sweets 13081/BAS.**

Enkasonic exceeds both STC *and* IIC ratings of 50, whether with ceramic tile, wood, marble, vinyl, or carpeting.

It works like this: Your finished floor floats on a 3-dimensional geomatrix of nylon that creates a natural sound barrier of air. So unlike hard floor supports, Enkasonic doesn't transmit impact sound to the room below. And airborne sound is shut off, too.

So don't be misled by those who claim their floors are "sound rated." Just ask to see their IIC (impact) ratings.

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The Lightweight, Rigid, Bendable Composite Material.

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ALPOLIC is available in silver, light bronze, dar bronze, gold and black anodized and painted in range of colors

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Indoors and Outdoors, A-LOOK EX supplies the reflective beauty of a mirror. You can bend it, cut it and hang it. It's ideal for store fronts, eaves, entrance areas and signs as well as for any variety of indoor applications including spas, bathrooms and other areas subject to humidity. The fluoride resin surface of A-LOOK EX provides outstanding weatherability and resistance to humidity.

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Explore

The Octagon Museum's
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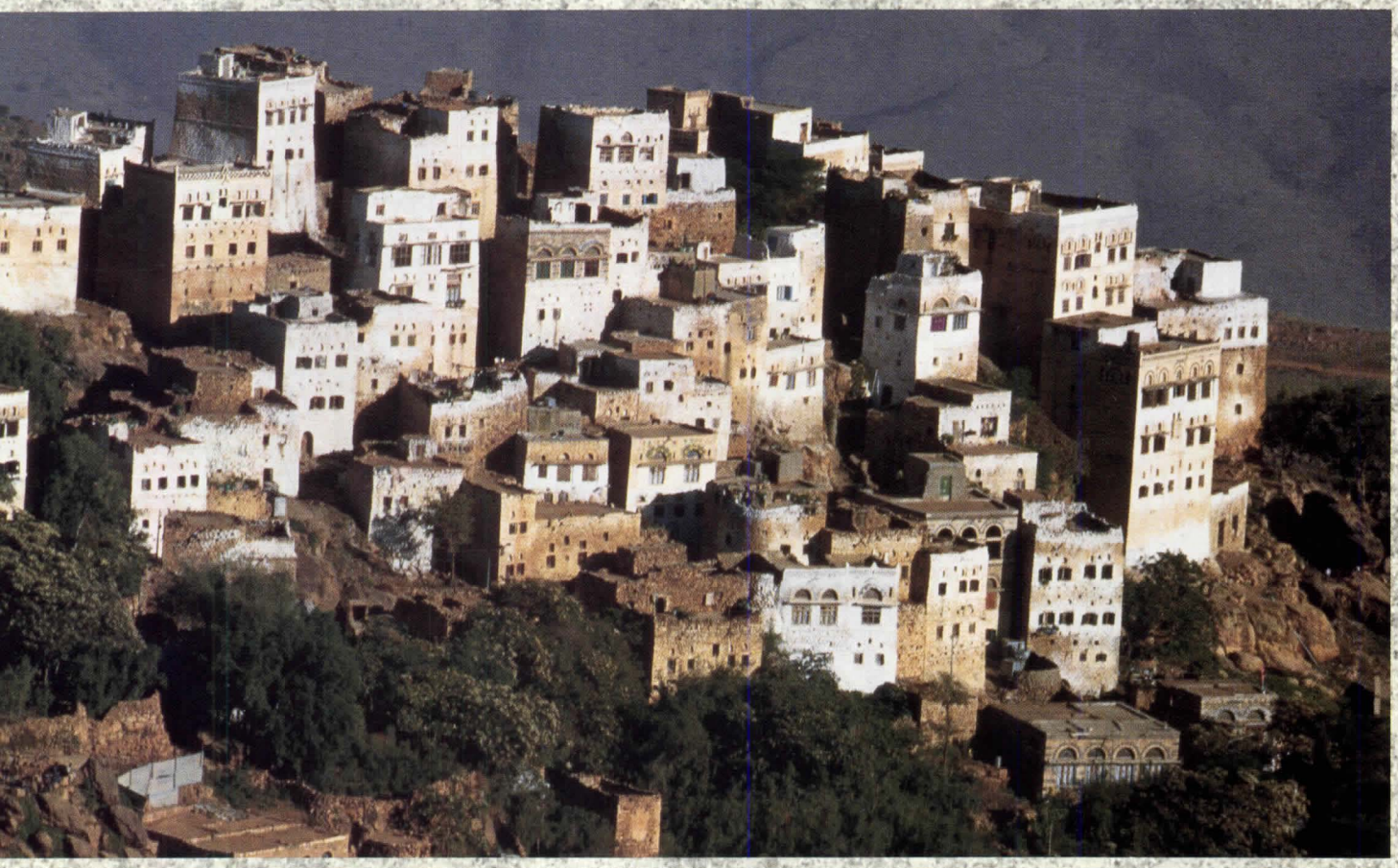

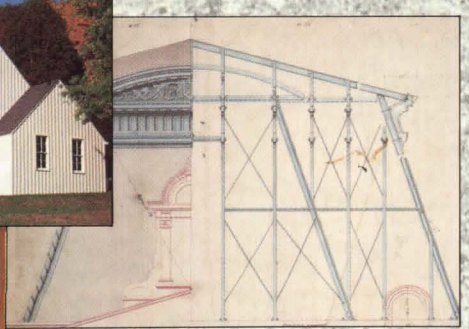

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Larry's Diner, Fairfield, Conn. (page 76). *Architect: Mark P. Finlay Architects Inc., Fairfield, Conn.* Principal in charge: Mark P. Finlay, AIA. Project architect: Rob J. DeVore. Project team: Jay L. Valade, Jeffrey C. Lesh. Interior design: Mark P. Finlay Architects Inc. Electrical and mechanical engineer: Regis Engineering. Structural engineer: DeStephano Associates. General contractor: Rizzitelli Construction.

Mountain Valley Spring Co. Corporate Headquarters, Hot Springs, Ark. (page 78). *Architect: Taylor Kempkes Architects, Hot Springs, Ark.* Principals in charge: Anthony Taylor, Bob Kempkes. Electrical, mechanical, and structural engineer: B&F Engineering. Landscape design: Delta Landscape. General contractors: Tony Usdrowski, Dennis Delaney. Interior design: Taylor/Kempkes Architects with Marilyn Rice and T. Epley.

Grant Hoffman Building, 745 Boylston St., Boston (page 80). *Architect: CBT Childs Bertman Tseckares & Casendino Inc., Boston.* Partner in charge: Richard J. Bertman, FAIA. Project manager: James McBain. Senior designer: Stan Fink, AIA. Job captain: Blair Caple, AIA. Construction administration: Edward Stokes. Drafters: Charles Bradley, W. Randolph Yerzyk. Electrical and mechanical engineer: Shooshanian Engineering Associates. Structural engineer: Souza, True & Partners Inc. General contractor: Perini Corp.

Chicago Historical Society Addition and Renovation, Chicago (page 82). *Architect: Holabird & Root, Chicago.* Partner in charge: John Holabird, FAIA. Design partner: Gerald Horn, FAIA. Project manager: Walker Johnson. Project architect: William Grosche. Project designers: Amy Degenhart, Brad Angelini. General contractor/construction manager: Pepper Construction Co.

First Bank of Oak Park, Oak Park, Ill. (page 84). *Architect: Nagle, Hartray & Associates Ltd., Chicago.* Principals in charge: James L. Nagle, FAIA; Dirk W. Danker, AIA. Job captain: Beth Alson. Interior design: Jeanne Hartnett & Associates. Landscaping: Thornapple Nurseries Inc. Structural engineer: Beer, Gorski & Graff. Masonry contractor: Ceisel Masonry Co. General contractors: Joseph Construction Co. (exterior), H.W. Todd Construction Co. (interior).

Sandwich City Hall and Opera House, Sandwich, Ill. (page 87). *Architect: Dixon Associates, St. Charles, Ill.* Principal in charge: Michael A. Dixon, AIA. General contractor: Irving Construction Co.

Exterior Renovation for Tarrant County Civil Courts Building, Fort Worth (page 90). *Architect: George C.T. Woo & Partners, Dallas.* Artist: Richard Haas. Structural engineer: Datum Structures Engineering Inc. General contractor: Ed A. Wilson Inc. Synthetic plaster contractor: Ray Boyd Construction Systems. Painting contractor: American Illusion Inc.

Tennessee State Capitol Restoration, Nashville (page 115). *Architects (joint venture): Warterfield Goodwin Associates Architects, Nashville; Hickerson Fowlkes Architects, Nashville.* General contractor: C.A. Gardner Construction Co. Restoration crafters: Evergreene Studios, Decorative Specialists Inc., Allen Kemper. Masonry restoration: Wasco Inc. Chandelier design/fabrication: Frank Boesel. Carpet design/specification: Henry Dornsife. Mural restoration: Ellen Kennedy. Ornamental plaster restoration: Liddle Bros.

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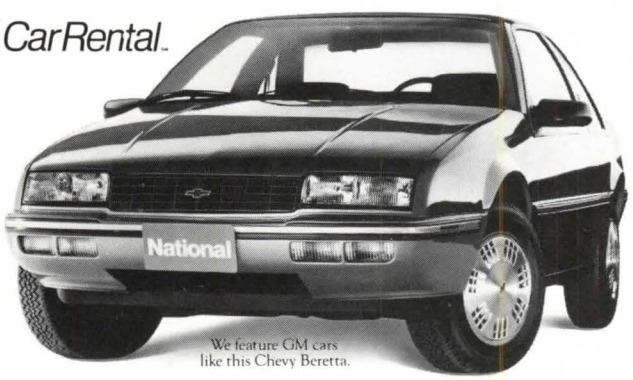

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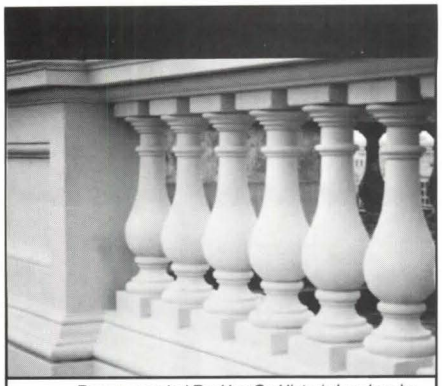

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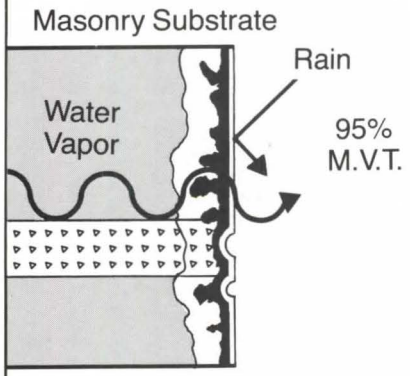

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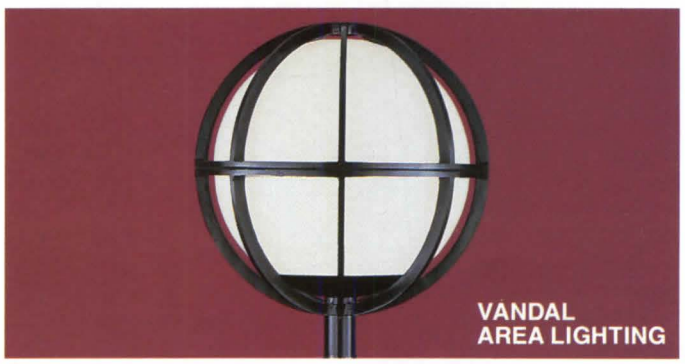

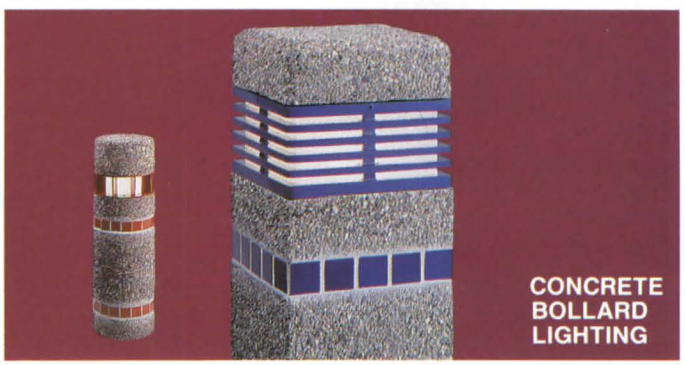

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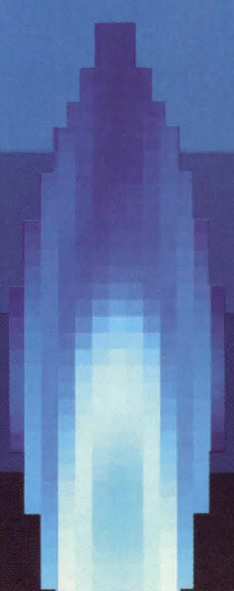

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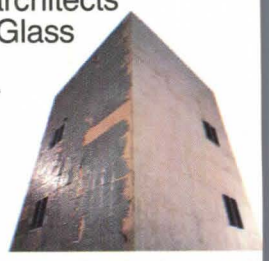

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