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ELEVATORS BY DOVER

Letters from page 8

What resulted was an educational synergism. Masters and students explored new ideas as colleagues and equals; they differed and debated, evolved and tested theory, laughed and played together, and pursued diverse artistic directions. For the first eight years of its short life, the Bauhaus had no orthodoxy or rulebook. Demagoguery of any persuasion was firmly dispatched, but creative spurts, however outrageous, were not extinguished but rather fanned. In this laboratory of creative self-education, there was open-ended experimentation in search of new materials, forms and productive methods, energized by broad social idealism.

True, the Bauhaus didn't reform a society about to succumb to the Nazis. But its participants believed in goals beyond themselves, and left a considerable legacy we would do well to re-examine.

What I found behind the Iron Curtain in 1965 was a sad shadow of this "trimul-taneous" event—building, school and cultural movement. Bruised by the war and abused by antimodern communist occu-piers, "The Bauhaus" had survived 20 postwar years as a threatening if enig-matic symbol within the police state. Our guide, the city architect, was too embar-rassed to show the interiors, badly mutil-ated for trade school classes. Yet he and his party fathers were beginning to sniff the glory attached to this Bauhaus, so

renowned in the West, and to claim its origins in *their* territory. The move was on to restore the East German Bauhaus.

Fifteen years later, the East Germans appear to have done a remarkable restora-tion of the shell of an institution whose essence they do not, and will not, under-stand. Open-ended exploration and hu-manistic purpose, which was the core of the Bauhaus program until it was dis-torted and canonized by American style-setters of the 1930s and 1940s, has no place in the world of rigid state ideologies.

So be it—we can't change them. But what about ourselves? This fresh depic-tion of the "restored" school stirs a dis-concerting comparison with the state of our own educational system.

Students in schools everywhere (and in lectures, books and magazines) are be-ing taught that modernism is dead, the Bauhaus is bunk—indeed, that the Bauhaus is the Devil to be exorcised. And that the "shackling rules are off," eliminat-ing the need for discipline, conviction, or philosophy, because we are now free to seek novelty, to feed hedonism and to indulge in paper esthetics and revivalism.

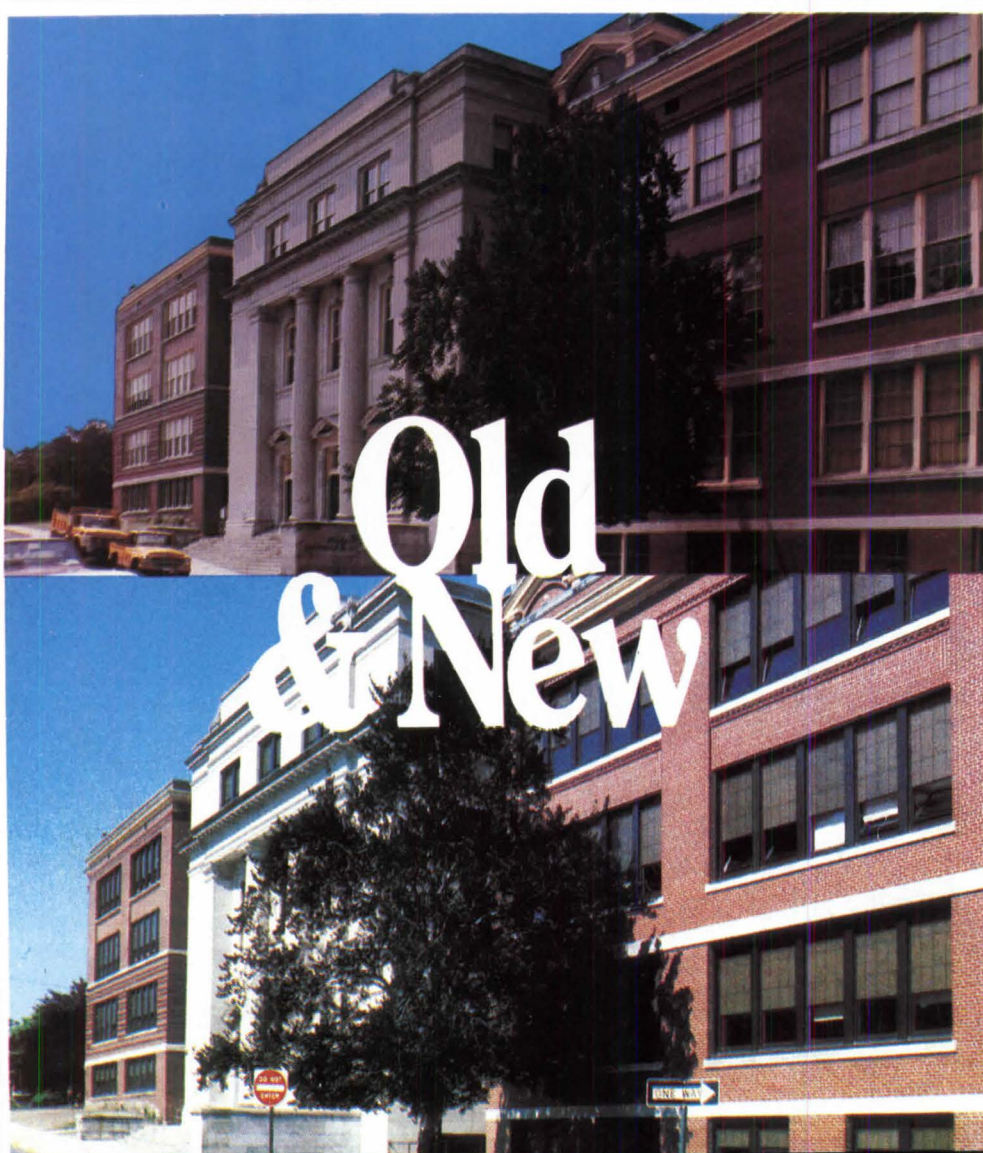
The Bauhaus is accused of ignoring history because it sought to replace the elitist, eclectic historicism of 19th century academic Beaux-Arts training. Yet Gro-pius wasted few words vilifying the past. He applied his energies to the future—to defining practical, pedagogical and ide-ological goals and to opening pathways for many others to reach them. His accusers, who would free themselves from the clutches of a "modernist" dogma many of them were instrumental in formulating, resort to blatant distortion of the last 80 years. Like teenagers seeking to achieve identity, they seem to be altering the evi-dence of their paternity.

Will today's students press beyond the propaganda to discover what really hap-pened between 1918 and 1933 in Ger-many when men and women struggled and starved for that nurturing antiacademic environment? Will they see in those Des-sau photographs any meaning beyond momentary chic? Unlike the East Ger-mans, our aspiring architects are free to search out new values and broader hu-manist connections by understanding our time and our past. But, *like* the restorers of the Bauhaus shell, they are surrounded by dogmas and personal cults that pro-pose stylistic answers rather than chal-lenging questions. Today's students, if they are too eager to be followers, may be rendered creatively impotent by an educa-tion defined by an artistic iron curtain.

Indeed, the restored Bauhaus appears so smart that we may see its styling revived while nothing of its meaning is under-stood.

Jane McC. Thompson
Cambridge, Mass.

Letters continued on page 16



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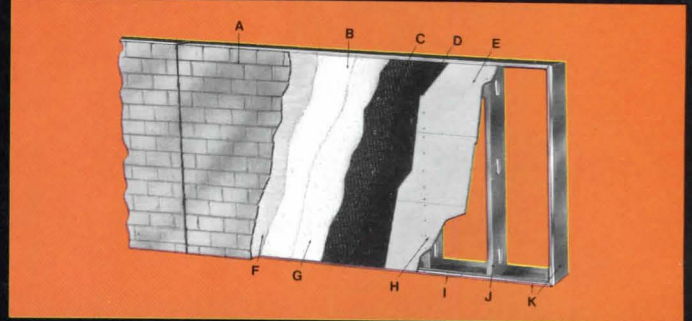
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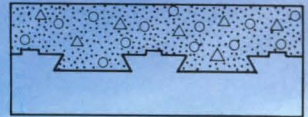
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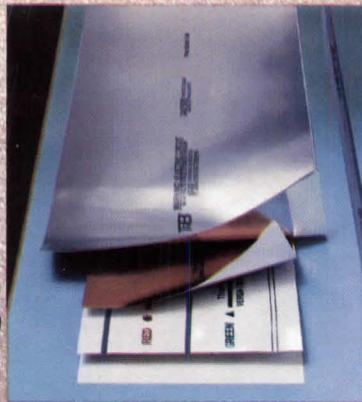
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Spectrum Building, Denver, Colorado. Architect: McOg Associates, Denver; General Contr.: Turner Construction.

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Letters from page 12

What's What in New York: We must correct a wrong impression made in the news account of the AIA convention (June, page 9). The Central New York Chapter/AIA and the New York State Association of Architects presented the roofing resolution that was passed at the convention. It was not the New York Chapter/AIA.

The Central New York Chapter was founded in 1887 only 20 years after the New York component and 30 years after the Institute. CNY/AIA is the second oldest component in New York State. It has parented two additional components (Rochester and Southern New York). It has also provided four state component presidents and one national president, George Bain Cummings (1955-56). The component services a 12-county area (approximately 10,000 square miles), with a population of more than a million people. The cities of Syracuse, Utica, Rome, Auburn and Watertown are within this area. Its 150 members and associates enjoy a rich heritage of culture, tradition and natural beauty.

The New York State Association of Architects, founded in 1931, is happily celebrating its 50th anniversary. The association is made up of 12 components and has offices in Albany. This organization serves the New York region as well, and helps provide two directors to the national board. The state organization serves all of New York State (approximately 49,000 square miles). It covers cities from Long Island to Buffalo, from the Pennsylvania to the Canadian borders. It is a true representative of all member architects from New York.

We are honored to be confused with our big city cousins, but we are proud of our area and our membership.

*Richard T. Lafferty, AIA
President, Central New York
Chapter/AIA*

Vietnam Memorial: I find the winning entry (Aug., page 47) entirely appropriate for its intended purpose. It is a simple and straightforward illustration of a massive cave-in.

*Antal Borsa, AIA
San Diego*

Your coverage of the Vietnam Veterans Memorial Design Competition, extensive in comparison with other publications, was very much appreciated. While extending sincere best wishes to the winner, I respectfully take issue with the jury and the sponsor based upon the following:

- The winning design does not address the topic of "reunification," stated in the program booklet as a primary reason for creation of the memorial in the first place.
- The Vietnam Veterans Memorial Foundation stated in the same publication that

it had "no preconceived ideas" pertaining to a design concept, when in fact it did, as evidenced by a column by James J. Kilpatrick appearing in the *Washington Star* of May 8, 1980, before the competition began. The foundation has reprinted the column for distribution in fund-raising literature, hence my knowledge of its existence. Kilpatrick states: "The sponsors do not envision anything very monumental. . . . The area would be serenely landscaped. A memorial wall would bear the names of the dead." Kilpatrick's column was perhaps of greater benefit to entrants who read it than was the program.

As a Vietnam veteran, I find it difficult to accept such an understatement as fitting tribute to the many (of whatever military or civilian organization, or student body, or that matter) who agonized, suffered or died for their beliefs during and after this struggle, whether or not the proposed monument is, in the words of Pietro Belluschi, ". . . profound. A monument for all time." In a larger sense, who died is of secondary importance in comparison with *why* they died, and whether or not future generations will be called upon to do the same for another equally senseless cause, therein lying the reason for erecting a monument. At a time in the history of our nation when reunification, re-examination and rededication are sorely needed, an edifice that celebrates death as an end in itself is a monumental disappointment.

*Lee E. Martin, AIA
Columbus, Ohio*

Women Architects: It is a pleasure to find women's names—many of them students—appearing more frequently in all of the architectural publications. We can look forward to women proving to be a visible force in the architecture of the '80s and '90s. How about a profile of some of the women who made it all possible and of the women actually out there practicing?

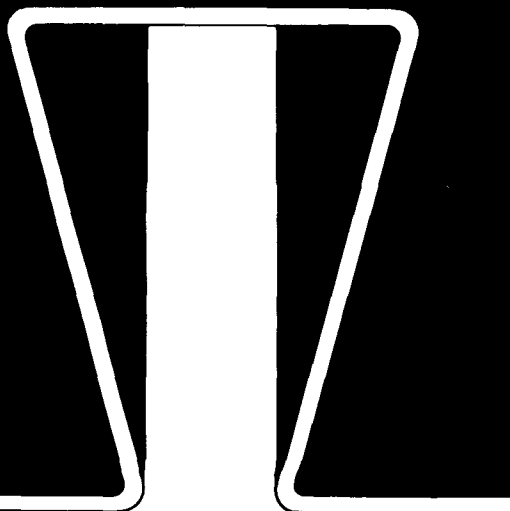
*Marlene Walli Shade
Charleston, S.C.*

Such an article is scheduled for the January 1982 issue.—*Ed.*

Editor's note: The Chinese ceiling design by the Chu, Chin & Ling Studio appears on the AIA JOURNAL's mid-August cover through the courtesy of the AIA Foundation Prints and Drawings Collection. Large prints and drawings, such as the Chinese designs, are transferred from the AIA Archives to the AIA Foundation for storage and proper preservation.

Peter Blake, quoted in our August tributes to Marcel Breuer, is a Fellow of the Institute.

Edgar B. Corr, Julia Craighill and Jeff Howard contributed to Vietnam Memorial Design Competition entry No. 3 on page 49 of the August issue.



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Government

Capitol Master Plan: Limits to Growth

In advocating a new master plan for the U.S. Capitol complex, Architect of the Capitol George M. White, FAIA, would utter, "We are long past the stage where we should be playing pin the tail on the donkey every time we need a new building." Last month, after five years of preparation, White presented such a plan to Congress.

The plan speaks of environmental capacity and limiting the monumentality and number of new buildings. It attempts to "humanize" the Capitol Hill area by adding lively plazas with shops and restaurants. And it attempts to eliminate excessive traffic, ease the transition from "monumental" architecture to the neighboring residential scale, correct disrupted vistas and alleviate the parking problem.

Creating a new master plan was first suggested by White in 1975 and approved by Congress that year. In August 1976 the results of a preliminary survey of existing conditions in the Capitol Hill area were presented to Congress and from that several options were presented in August 1977.

Whereas the preliminary plans looked at the Capitol Hill complex as a "space envelope" and envisioned as many as 50 more office buildings, the master plan is considerably scaled down. "There is a limit as to how many buildings and people can be in the area" to maintain its beauty, says White. This is one aspect of the plan that there should be a compelling reason to modify, White maintains.



Drawing by Thomas Todd

For the Capitol's east side, now a parking lot, the master plan provides for construction of an underground garage and an above-ground pedestrian plaza.

Currently the Capitol Hill complex houses some 20,000 employees and contains five House and Senate buildings, seven House and Senate annexes, the House and Senate garages, the Supreme Court building, the three Library of Congress buildings (plus the Capitol power plant and the botanic gardens) for a total of 9.7 million gross square feet of office space. The master plan places a 4.8 million gross square foot limit for new development and provides for three new Senate office buildings and 11 new House buildings of smaller scale. The maximum limit of employees envisioned is 38,000 on the area's 232.5 acres.

The hardest planning and design task was that of the House side or the south sector. The House of Representatives currently occupies three office buildings: Cannon (1908), Longworth (1933) and Rayburn (1963) and two house annexes. The sector is bordered on the south by railroad tracks and the Southwest Expressway. South Capitol Street comes under the expressway and enters the Capitol grounds.

From the beginning of the planning process the "importance of South Capitol Street as a major entry into the monu-

mental core area and also as an axial relationship to the Capitol itself was established," says Thomas A. Todd, FAIA, of Wallace, Roberts & Todd, consultants for the master plan. The planners realized that "the present expressway and railroad were not going to simply disappear and that they couldn't be designed out. We tried all kinds of schemes to try and re-route the tunnel under First Street so that we could get that railroad viaduct that cuts across South Capitol at the freeway out of the picture altogether, but the geometric gymnastics that you have to go through simply didn't make it feasible," Todd adds.

What the planners did was create what Todd calls a "triumphal arch" at the intersection of South Capitol, Canal and E streets, a vehicular traffic plaza framed by buildings with views down Canal Street to the Mall and down South Capitol Street to the Capitol. The gateway would be identified by piers supporting flags.

Moving north on South Capitol Street one would enter a second, smaller square entirely surrounded by buildings and enlivened by shops and restaurants on the buildings' lower levels, fountains and

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Government

<i>Capitol master plan</i>	(above)
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monial entrance plaza paved with granite Belgian block (the original 19th century material) and adorned by two fountains.

The master plan does not address the question of whether to restore or extend the west front of the Capitol, because White felt that should be a separate decision by Congress.

For the Supreme Court, White believes that eventually a judicial district should be created elsewhere in Washington, which would contain the Court and the administrative offices of the U.S. courts.

The immediate plan for the Court calls for locating additional offices in the nearby Methodist Christian Board of Social Concerns building and the Reserve Officers Association of the U.S. building, which would have to be acquired by Congress. There is also a need, suggests the plan, for consolidation of the administrative offices, which could be housed in the proposed building next to Union Station.

If the Supreme Court is ever moved, the plan suggests that the existing building become an extension of the Library of Congress for its scholarly research activities. The Methodist and Reserve Officers buildings would then be demolished for open space in accordance with the McMillan plan.

For the Library of Congress, parking facilities seem to be the major concern. The plan suggests the need to expand in the immediate future the use of car pooling, van pooling and public transit, and in the long term peripheral parking areas will be needed.

Of major concern to the planners was the relationship of the "monumental" buildings of the Capitol Hill complex to the surrounding residential neighborhood. "The archetype of not paying attention is the relationship between the Library of Congress' Madison building and the houses across the street," Todd says. He calls the building a "great marble slab with the most austere and dried up landscaping plan that one could conceive. . . . We talked a great deal about it [the relationship] in such fuzzy terms as soft edges versus hard edges and having buildings that 'acknowledge the hill' or that were

'humane' as opposed to monumental."

The plan therefore attempts to reduce the scale of new buildings, particularly those in the "transition zone," the Capitol Hill areas in close proximity to residential buildings, and to echo the form and color of the residential buildings, "so that by the time that you got to the end of the Capitol grounds, the quality of buildings would be almost residential," Todd says. The plan also calls for a program of street landscaping and facade restoration of the residential area to be taken "during the normal, gradual changes that will inevitably occur in the area."

The landscaping and traffic patterns of the area were also studied in depth. Basically the landscaping plan calls for the preservation and enhancement of significant historic landscapes. It also recommends restoring the axial linkages of buildings and open spaces, creating intimate open spaces and meeting places, creating coherence in the area as well as a "proper hierarchy" of open spaces and creating a "soft" interface between the Capitol grounds and the surrounding communities.

For transportation, the plan calls for closing of some streets for pedestrian movement, creating a "people-mover" system and removal of surface parking lots to be replaced by underground parking wherever possible.

Conscious of the fact that Congress could not conceivably implement the entire plan at one time, the planners offer a schedule suggesting an orderly fashion in which the entire plan could be realized. The construction of the underground parking and support space in the east plaza of the Capitol could be implemented at any time, the planner suggests.

"I hope that Congress accepts the plan in terms of the way it is meant," says Todd, "which is not that they next year have to appropriate umpteen billion dollars in order to carry out this plan. But that they look at it as a handbook, an indication to them about where they ought to be doing things and the manner in

Existing color scheme of townhouses flanking the Capitol grounds.

which they ought to be done if they have to do them."

The need for a master plan is evident, says Todd. "I think most of the additions that have been done, say after the Cannon and Russell office buildings, have been essentially uninspired, routine, prosaic and representative of a municipal properties frame of mind, where you fix things up and don't envision a whole concept."

Todd talks of the "FBI building syndrome, where people are not involved and everything is excluded but the automobile." The master plan instituted by White represents a reversal of that "kind of thinking," he says. "I think George feels, and I absolutely second him, that having that kind of thing happen on Capitol Hill, where it could happen very easily, would be a tragedy."

White emphasizes that the plan is not recommending "that anything be done now. But if Congress decides to build, this is how it should be done." The plan itself states that it "does not automatically imply the growth of the legislative branch of government, but consists of the harmonious adjustment of present needs and future projects to respect past heritage."

Todd explains that the planners attempted to define "what is the maximum expandability of the whole enterprise as an entity," by studying the time-distance relationship between Congressional offices and the floor, what is the maximum number of staff that a Congressman could supervise and still "be able to understand policy issues and so on.

"It's not like a city or some other kind of entity where you can predict growth," Todd says. "There is no basic programming element." What the planners established, says Todd, "is a series of rather fuzzy-edged and broad perimeters that led us to believe that the master plan about maximizes what the institute, the land and the physical conditions are capable of handling."

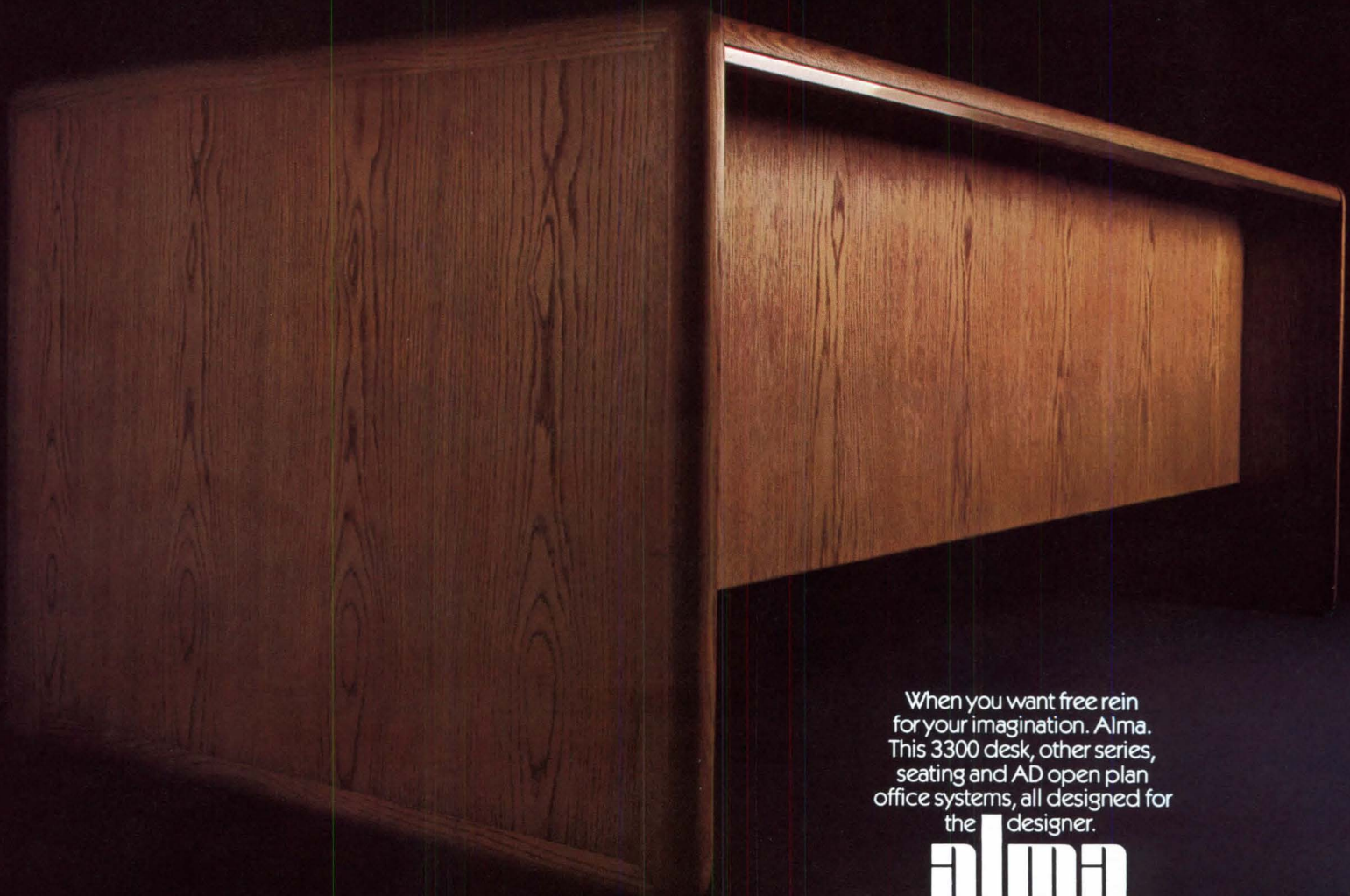
The master plan, therefore, as the report states, "is not intended to be an imposition of the existing fabric of buildings and landscape, rather it is the result

continued on page 24





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Government from page 22

of a search for a carefully defined relationship between the existing and the new, between the built and the natural.”

Involved in this “search” were White and members of his staff, Elliott Carroll, FAIA, and George C. Toop Jr., AIA, and consultants: Wallace Roberts & Todd (management planning, urban design and landscape design consultants), Mitchell/Guirgola (architecture), Frederick Gutheim, Hon. AIA (historic preservation), Hammer Siler George Associates (economics and social planning) and PRC Voorhees (transportation and parking).

Congress to Examine Extent Of Indoor Air Pollution

Congress and the Administration are beginning to grapple with legislation related to the problems of indoor air pollution. After several years of mounting evidence on the adverse health effects of indoor contaminants, an order to take a look at the problem has turned up in an Administration rewrite draft of the Clean Air Act.

Representative Toby Moffett’s hearings in the House subcommittee on the environment, energy and natural resources are expected to examine current knowledge of the problems and who should do what to remedy them. The Administration’s draft legislation would instruct the Environmental Protection Agency to report within two years on pollutant sources, strengths and health effects and the costs and benefits of various ways to clean indoor air.

The most recent and extensive documentation of the problem is a report by the National Academy of Sciences, which concludes that for some common indoor air contaminants, evidence points to sufficient human exposure to cause serious illness and premature death. The effects “extend from acute intoxication from carbon monoxide and formaldehyde to cancer that appears long after exposure to radon decay products and asbestos,” according to “Indoor Pollutants,” a book-length publication prepared for the Environmental Protection Agency.

Although the report connects pollutants to illnesses, it stops short of estimating the extent of the health effects. Knowledge of the extent of exposures and exposure relationships is inadequate, it says, and complicated by variations in effects. This is because cheap and reliable techniques for sampling and analyzing contaminants at very low concentrations have not been developed.

But the report deals at length with specific contaminants, including three of particular concern to architects and the building industry: radon, formaldehyde and asbestos.

Radioactivity is a natural phenomenon emitted from a variety of sources. As radon gas decays, it emits minute particles of uranium that in nature are dissipated into the environment. But in enclosed environments, radon and its offspring, emanating primarily from building materials, are trapped long enough to cause adverse health effects. The report says the greatest concentrations are found in building products that contain residues from industrial processes, such as concrete that incorporates phosphate slag.

The use of urea-formaldehyde foam as a thermal insulation material has increased the indoor levels of formaldehyde gas, which can be released into buildings when the insulation ingredients are improperly formulated or mixed. And particle board made from formaldehyde polymers can emit the gas continuously for months or even years, according to the report. Particular concentrations of formaldehyde are found in mobile homes, which are often more tightly constructed than conventional houses.

The spray application of asbestos, banned in most applications by EPA in 1978, remains an important indoor air contaminant. Uncontrolled removal of asbestos-sprayed surfaces during renovation is cited as a particular danger both for renovation workers and post-renovation building users.

New UDAG Rules Provide for Faster Historic Review

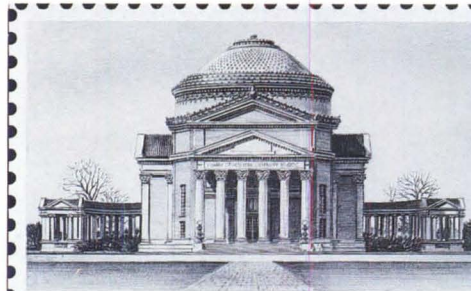
New regulations for the urban development action grant program call for a faster review of how the projects will affect historic properties and for greater public participation in the planning process.

Section 106 of the National Historic Preservation Act requires that the Advisory Council on Historic Preservation has the opportunity to comment on UDAG projects that will affect any properties listed in or eligible for the National Register of Historic Places. This is designed to assure that alternatives to avoid or mitigate adverse effects on such properties are adequately considered in the planning process. Under the new regulations, the Council will have only 90 days to conduct a review.

The new rule also calls for greater public participation in UDAG projects by persons living in neighborhoods affected by projects and by groups concerned with historic preservation.

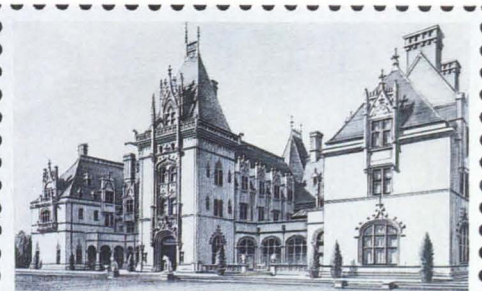
The new regulations also provide guidelines to assist applicants in the identification and location of national register properties and those that are eligible for inclusion in the register.

News continued on page 28



Stanford White 1853-1906 NYU Library New York

Architecture USA 18c



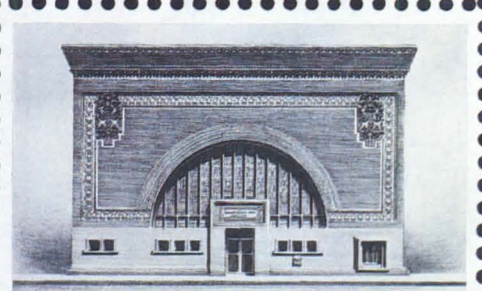
Richard Morris Hunt 1828-1895 Biltmore Asheville NC

Architecture USA 18c



Bernard Maybeck 1862-1957 Palace of Arts San Francisco

Architecture USA 18c



Louis Sullivan 1856-1924 Bank Owatonna Minn

Architecture USA 18c

Four new architectural stamps: The third round of U.S. postage stamps in the American architecture series features the New York University Library, New York City (Stanford White), the Biltmore House, Asheville, N.C. (Richard Morris Hunt), the Palace of Fine Arts, San Francisco (Bernard Maybeck) and a bank in Owatonna, Minn. (Louis Sullivan). The four commemorative stamps are the design of Walter D. Richards of New Canaan, Conn., who also designed the previous eight architectural stamps. The first day of issue ceremony was in Washington, D.C.

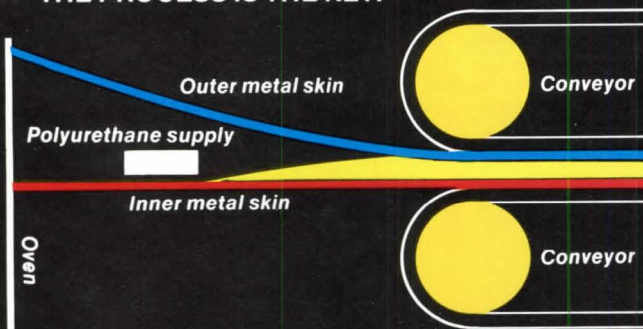
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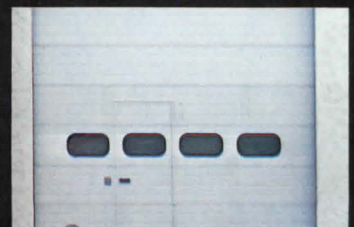
thane foam. This phase, as is the entire process, is monitored by television cameras to ensure even application with no air pockets and to check for any dirt or excess lubricants left from the roll former which would prevent uniform adhesion between foam and metal.

Strict quality control is an integral part of THERMACORE's™ process. Since the foam expands and becomes adhesive for only a matter of seconds, it must be in contact with the metal at this critical time before it hardens. Before each run of the line, the foam is mixed and lab-tested right in our own plant to ensure a density of 3.24 lb/ft³.

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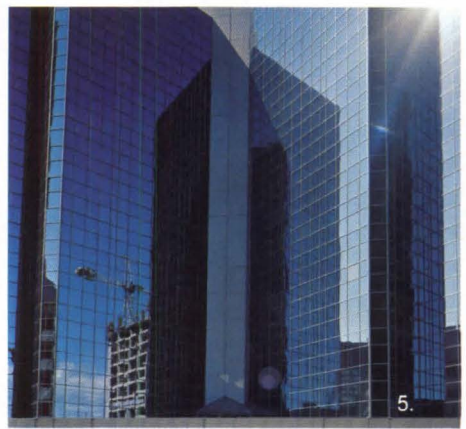
1. **Security Savings**
Glendale, Wisconsin
 CG-8 Gold Reflective Glass
 Owner – Security Savings
 Architect – Torke-Wirth-Pujara,
 Ltd.
 Glazing Contractor – Klein
 Dickert Milwaukee, Inc.

2. **Alpha Tower**
Dallas, Texas
 SS-8 Silver Reflective Glass
 Owner – McFaddin/Kendrick
 Architect – TMHI, Inc.
 Glazing Contractor – Haley-
 Greer, Inc.

3. **Corning Museum**
Corning, New York
 SS-0 Silver Reflective
 Pattern Glass
 Owner – Corning Glass Works
 Architect – Gunner Birkets
 and Associates
 Glazing Contractor – Kirschner
 & Sons

4. **Royal Trust Bank Tower**
West Palm Beach, Florida
 SG-10 Gold Reflective Glass
 Developer – Olympia & York
 Architect – Schwab & Twitty
 Architects, Inc.
 Glazing Contractor – Alumi-
 glass, Inc.

5. **Cadillac Fairview Towers**
Calgary, Alberta (Canada)
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 Architect – S. Zerafa & Chandl
 Kennedy Architectural Group
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Architect - Dan L. Rowland &
Associates, Inc.
Glazing Contractor - Cottrell
Glass Company

Settlement Reached in Lawsuit Involving 'Supplanting' Ethics

A settlement has been reached in the lawsuit involving, among other charges, AIA's formerly mandatory ethical standard limiting "supplanting." Under the settlement, the Institute will pay Aram H. Mardirosian, AIA, \$700,000 over the next two years; in turn, Mardirosian has dropped his suit in which he sought more than \$5 million in damages.

The suit arose from a controversy between Mardirosian and Seymour Auerbach, FAIA, both of Washington, D.C. Auerbach was the original architect for the conversion of Washington's Union Station into the National Visitors Center. Mardirosian was consultant to the National Park Service on the project and eventually replaced Auerbach as architect for the conversion.

Auerbach brought proceedings against Mardirosian before AIA's national judicial board, charging Mardirosian with violation of ethical standard nine of the Institute's then-mandatory standards of ethical practice. Standard nine stated: "An architect shall not attempt to obtain, offer to undertake or accept a commission for which the architect knows another legally qualified individual or firm has been selected or employed, until the architect has evidence that the selection, employment or agreement of the latter has been terminated and the architect gives the latter written or other equivalent notice that the architect is so doing."

Based on the evidence presented, the judicial board concluded that a violation had occurred. After an unsuccessful appeal to the AIA executive committee, a penalty of a one year suspension for violation of standard nine was imposed.

Mardirosian filed his suit against AIA and Auerbach in July 1977, claiming that he was innocent of the charges and that their conduct violated antitrust laws and damaged his personal and professional reputation. An important decision in the case came two years later, in June 1979. U.S. District Court Judge John Sirica ruled that the "supplanting" standard under which Mardirosian had been disciplined, "both on its face and as applied," was an "unreasonable restraint on competition" and a violation of the Sherman Antitrust Act. He based his decision largely on the Supreme Court's 1978 ruling that the National Society of Professional Engineers violated the antitrust laws in promulgating its ethical standard

prohibiting competitive bidding. In that case, the court said that the determination of whether an ethical rule violated the Sherman Act should be based solely upon its effect upon competition.

The ruling was made on a motion for a summary judgment on the question of the legality of the ethical standard, which was the first of six counts of Mardirosian's suit. The remaining claims of the complaint, including whether AIA was correct in its findings, and the issue of damages, were left to be decided at a jury trial. Under Sirica's decision, any antitrust damages awarded by the jury would have been trebled, and AIA would also have been liable for Mardirosian's attorneys' fees incurred in prosecuting the antitrust counts, in addition to actual and possible punitive damages on other counts. Soon after Sirica's ruling, the members of AIA's judicial board and executive committee were added to the suit as individuals and additional counts were added to the complaint.

The executive committee, in a July 1979 emergency session, decided on advice of counsel to defer action on appealing Sirica's decision until after the outcome of a trial, and formally suspended ethical rule 605 on supplanting, the almost identically worded successor to standard nine, enforcement of which had previously been suspended by the board.

(The ultimate disposition of the ethical standards was determined at the 1980 AIA convention in Cincinnati, when the entire code of ethics and professional conduct was voted out and the board was directed to replace it with a voluntary statement of ethical principles that would not be enforced by the Institute. The statement of principles was mailed to each member earlier this year.)

After further legal proceedings aimed at determining whether Mardirosian had been damaged by AIA's actions, and if so, the extent, the board of directors, at the urging of the court, agreed to pursue settlement discussions with Mardirosian to avoid the expense and uncertainty of a lengthy trial and appeal. Under the settlement reached Aug. 12 AIA will pay the \$700,000 in three installments, out of which Mardirosian will be responsible for his own attorneys' fees and costs; the Institute agreed to eliminate from its records the findings and conclusions of the judicial board and to reinstate Mardirosian as a

member in good standing throughout this time. In return Mardirosian has dismissed his claims against the Institute and all codefendants.

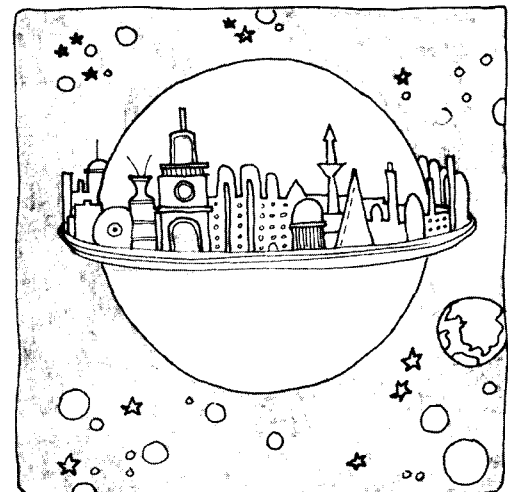
Also under settlement terms, AIA's payment is not an admission to Mardirosian's damage charges. AIA has additionally agreed to pay Auerbach \$60,000 in support of his legal defense.

Institute President R. Randall Vosbeck, FAIA, said that all parties believed they were acting in good faith in the positions they took, and that this settlement effectively wipes the slate clean. Vosbeck announced the settlement to Institute members in a letter in which he said insurance will cover some of the payment. AIA's legal defense fund has already covered the bulk of the litigation expenses, and Vosbeck said he would recommend to AIA's planning committee and board that the fund be discontinued, an action that would reduce individual member dues by \$10 a year.

Three Renowned Scientists To Address '82 Convention

At its annual convention next June in Hawaii, the Institute will celebrate its first 125 years with a look at the future: Three scientists will predict the state of society and the environment, and specifically the implications for architectural practice, during the next 5 to 25 years.

Speaking on space exploration will be B. Gentry Lee, aerospace manager at the Jet Propulsion Laboratory, Pasadena, Calif., and coproducer of Carl Sagan's PBS television series, "Cosmos." Lee is currently project engineer for Project



Galileo, an investigation of Jupiter and its moons scheduled for the middle years of this decade.

The future of man undersea, including underwater farming, will be discussed by explorer Joseph B. MacInnis, president of Undersea Research Ltd. in Toronto. He led seven scientific expeditions into the Arctic during 1970-75. Accomplishments

continued on page 32



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The Institute from page 28

during the expeditions included establishing the first polar dive station under the ice and leading the first team of diving scientists to the North Pole. MacInnis, author of *Underwater Man* and *Underwater Images* and host of a 15-part CBC television series, "The New Wave," makes a specialty of explaining the complexities of science to laymen.

Physicist Gerard K. O'Neill of Princeton University will be the third member of AIA's scientific team. O'Neill, who works in the field of high-energy experimental particle physics, has also, since 1967, investigated the possibilities of research, manufacturing and human habitation in space. His book, *The High Frontier*, was published in 1978. Besides space colonization, O'Neill will discuss the potentials of new energy sources, computerization, automation and communications, which he describes as the most significant "drivers of change" over the next 25 years.

Lee, MacInnis and O'Neill are to give 50-minute presentations on three successive mornings, each to be followed by group discussions with architects and experts from fields related to their topics. Each discussion will be aimed at developing practical, "down-to-earth" applications. Running concurrently with the three speaker follow-up sessions will be professional development sessions focusing on cutting-edge issues, practice aids and management techniques.

The convention is scheduled for June 6-9 in Honolulu.

Bankruptcy Law, Insurance Addressed in New Document

The apparent conflicts between the contents of AIA documents on the one hand and new federal bankruptcy law and recent property insurance policies on the other (see Aug., page 20) are addressed in a new Institute document, A512.

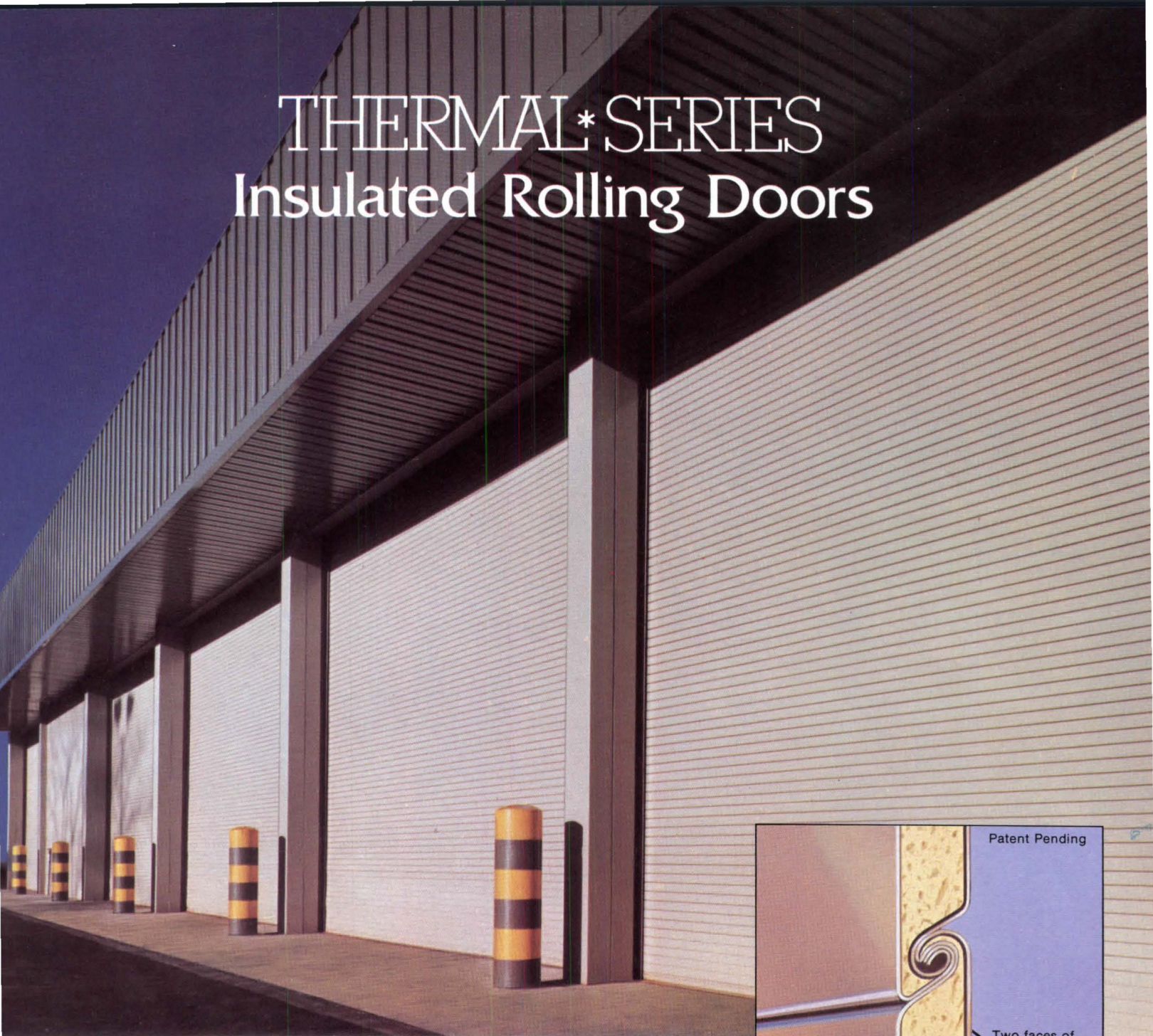
Designed for use with AIA documents A201, "General Conditions of the Contract for Construction," and A511, "Guide for Supplementary Conditions," A512 recommends changing certain provisions in the A201 document to conform with the federal bankruptcy act that became effective Oct. 1, 1979, and with changes now appearing in builder's risk policies.

The latest federal bankruptcy law voided termination-of-contract provisions contained in A201, and some builder's risk insurance policies override the waiver of rights provision of A511.

Document A512 is being distributed with each new order for A201 and A511 sent directly from AIA national headquarters.

The Institute continued on page 36

THERMAL* SERIES Insulated Rolling Doors



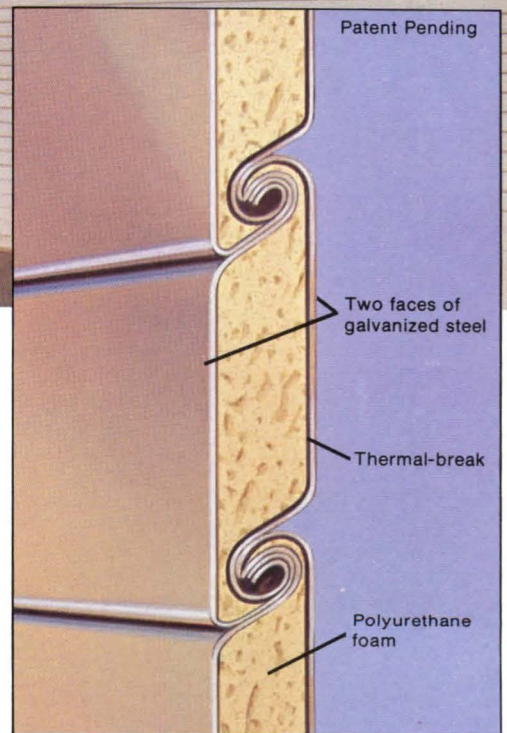
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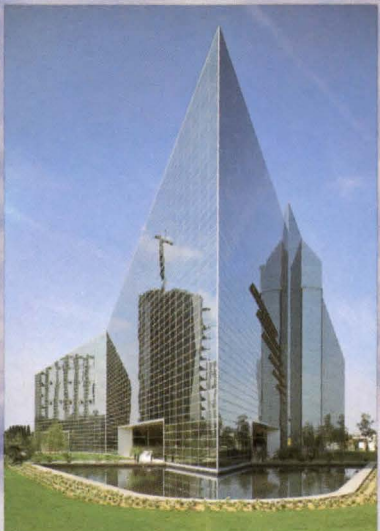
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The Crystal Cathedral's glass is much more than beautiful. Its mirror finish reflects southern California heat to help keep the

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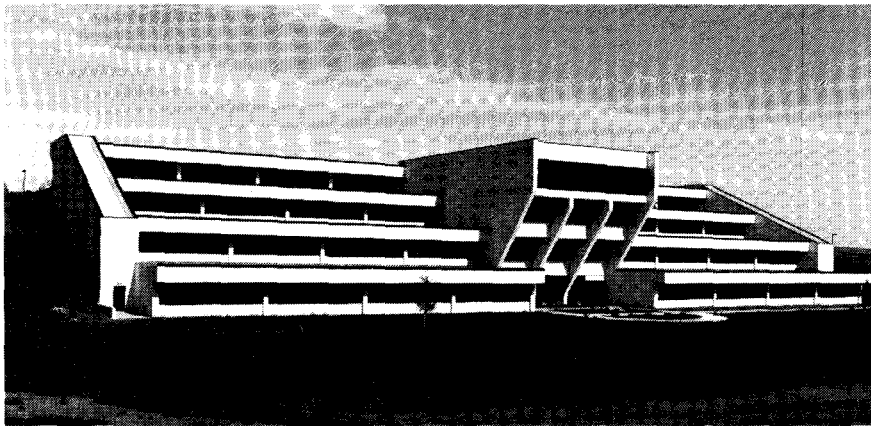
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The building's energy requirements are about one-half those of a comparably-sized conventional building. The designers nestled the building into a hillside, so that all but one story is shielded from chilling northwest winds. All four stories on the southeast elevation are warmed by winter sun passing through the windows. Higher-angled rays from the summer sun are blocked by overhangs.

This passive solar design, along with heat pumps, allows the accumulation of enough heat to make supplemental heating unnecessary — even at sustained low temperatures in the range of -4°F .

A prominent feature of the building is a center section that gets

progressively larger on the higher floors. This section contains executive offices and board room and space for elevators and stairwells.

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For information on Professional Membership Program, write to Director of Marketing.

The Institute from page 32

Environmental Education Guide Offered on Subscription Basis

AIA has just published *The Sourcebook*, an expansible teachers' reference of resources relating to both the built and natural environments. An elaborately illustrated catalog for grade school and high school educators, it is designed to be updated annually through a subscription service.

One section of *The Sourcebook* analyzes seven environmental education programs considered exemplary by a panel of architects and educators. Another section describes in detail 29 resources—books, series of books and activity cards—to use in classrooms. Included are critical evaluations by users of the materials. A third section is a bibliography with 36 citations of background reading materials for teachers and students. Finally comes a list



of people currently involved in environmental education who can offer assistance to teachers.

The Sourcebook is available for \$25 from AIA Publications Marketing/Sales at AIA headquarters. The subscription service, which will provide packets of additional description and current data, costs \$10 a year.

Design Competitions Handbook

A guide to conducting "well-run" architectural design competitions, the "Handbook of Architectural Design Competitions," has recently been published by AIA.

Prepared by an AIA competitions task group and funded in part by a grant from the National Endowment for the Arts, the handbook provides a brief overview of selecting an architect through a design competition. It describes the roles and responsibilities of the competition sponsor, the professional adviser, jurors and competitors. Time planning and cost estimate guides are included.

Also among the topics discussed are the following:

- types of competitions, such as project,

continued on page 40

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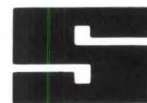
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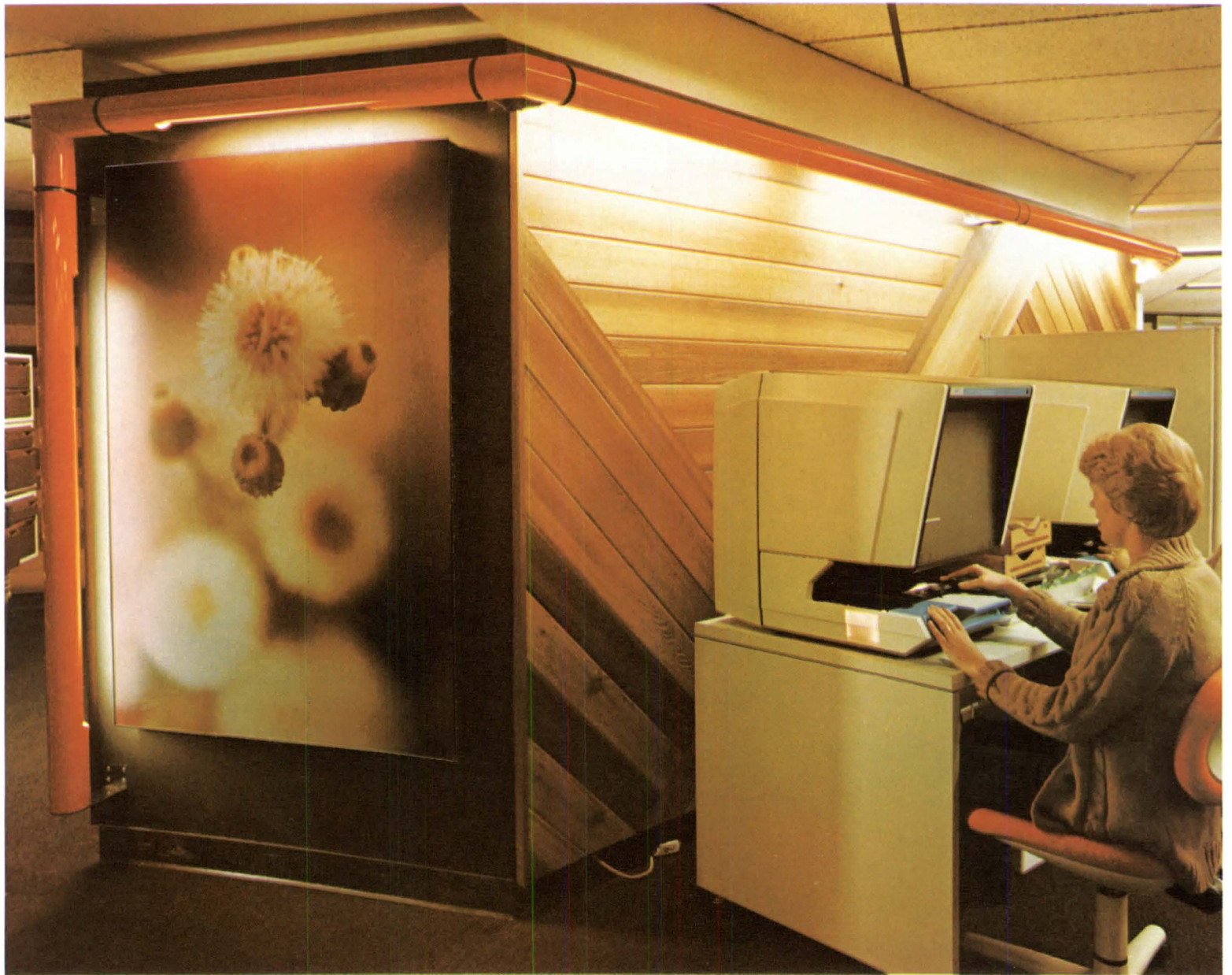


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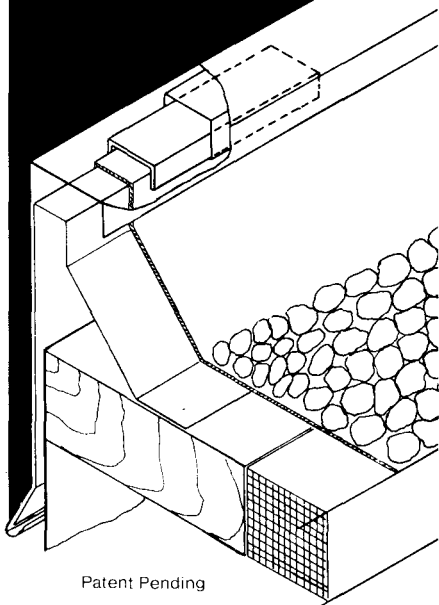
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The Institute from page 36

idea, open, limited, invited, student, one-stage, two-stage, product, prototype, developer/architect;

- conditions that make a design competition appropriate, among them projects that allow a wide degree of design exploration, that are on important or unusual sites or that will have a great and beneficial influence on subsequent design work;
- inappropriate situations for a design competition, such as for projects to be built on short schedules, for which a sponsor is unwilling to establish a qualified jury, for which an adequate development budget is not available and for projects lacking adequate professional advisers.

According to the handbook, "well-run design competitions require a conscientious sponsor, a competent professional adviser, a thorough and carefully written program, complete graphic and other illustrative material, fair and precise competition rules, clearly stated submission requirements, a realistic schedule, a qualified jury, appropriate prizes and arrangements for publicizing the winning design." AIA's participation in design competitions

Practice

Study of NCARB Examination Calls for Ongoing Evaluation

The National Council of Architectural Registration Board's examination is "reasonably related to the knowledges required in practicing architecture to protect the public health, safety and welfare," concluded a two-year in-depth study conducted by NCARB.

The validation study also concluded that the examination should be improved in content and method to result in greater benefits to public health, safety and welfare; that implementation of improvements should begin immediately, and that "it is essential" that a program be established for continual evaluation and improvement of the examination.

The NCARB "resolution five" steering committee was formed two years ago to "define the knowledge, skills, abilities and functions necessary for minimum competence for the practice of architecture in the U.S. and to apply these findings to an evaluation of the current examinations, internship standards, education standards and practice standards." In 1980 the NCARB board agreed to narrow the scope of the study to concentrate solely on the examination process.

To begin their formidable task, the steering committee first familiarized them-

is "advisory and informational," the handbook says.

For copies of the guide or for advice on competitions contact: Design and Environment Programs, AIA headquarters, (202) 626-7362.

Library Awards Cancelled

The 1982 library awards program, sponsored by AIA and the American Library Association, has been postponed until 1983 in an effort to reduce costs.

As for other awards programs, entry application forms for the Institute's honor awards program were to be postmarked by Oct. 2 with the deadline for submissions Nov. 9. Institute honors (AIA medals) must be postmarked Oct. 16. Postmark deadlines for other '82 programs are: Oct. 16 for Homes for Better Living (with submissions due Feb. 12); Nov. 23 for the R.S. Reynolds memorial award (submissions due Jan. 25), and Feb. 11 for the Reynolds Aluminum prize for architecture students.

For more information contact Maria Murray, Hon. AIA, at Institute headquarters (202) 626-7390.

selves with the state of the art of testing, or psychometrics. The committee found that there is not a consensus among psychometricians on how best to measure most of the skills required for the practice of architecture.

"A major method is multiple choice," the steering committee reported. "And yet, while this method is considered to be inappropriate in many cases, surprisingly little is known about alternative methods for measuring skills and the ability to apply them."

The committee also found that the "job analysis/exam validation" process used in the testing field did not lend itself well to the analysis and validation of licensing of a profession such as architecture. "One reason," said the report, "is that an architect may perform a particular service infrequently, yet that service is very important in order to protect the public health, safety and welfare."

As the realization grew that the processes, techniques and methods available in the testing world for analysis and validation could only be useful in their broadest sense, the committee set out to develop its own evaluation method. With

continued on page 106



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SHOWCASE

The Girl Scout Council of the St. Croix Valley in St. Paul, Minnesota is housed in this unusual contemporary structure. Designed "with and for the environment," it features solar heating, a wind turbine generator,

compost waste system and interior foliage designed to provide humidity and

oxygen. Moorwood Semi-Transparent Stain and Wood Preservative provided the perfect finish for this ecology-minded project.

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In warmer Charlotte, North Carolina, "solar belts" using alternating panels of aluminum and PPG clear glass gird Equitable Life's clean-cut regional headquarters. "A slick, brilliant use of glass in a simple but innovatively planned building," said the AIA jury.

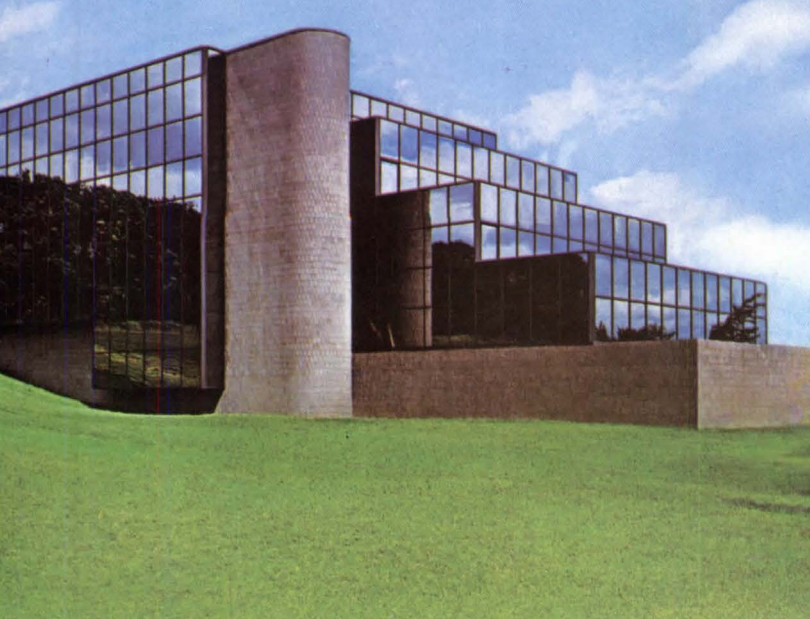
The panels combine with a low-velocity fan system to capture and channel hot or cool air to where it's needed most, summer or winter. So energy costs are held down dramatically.

And even in the forward-looking architectural environment of Columbus, Indiana, the high drama created by PPG's reflective Solarban Bronze glass helps set Bell of Indiana's switching station apart.

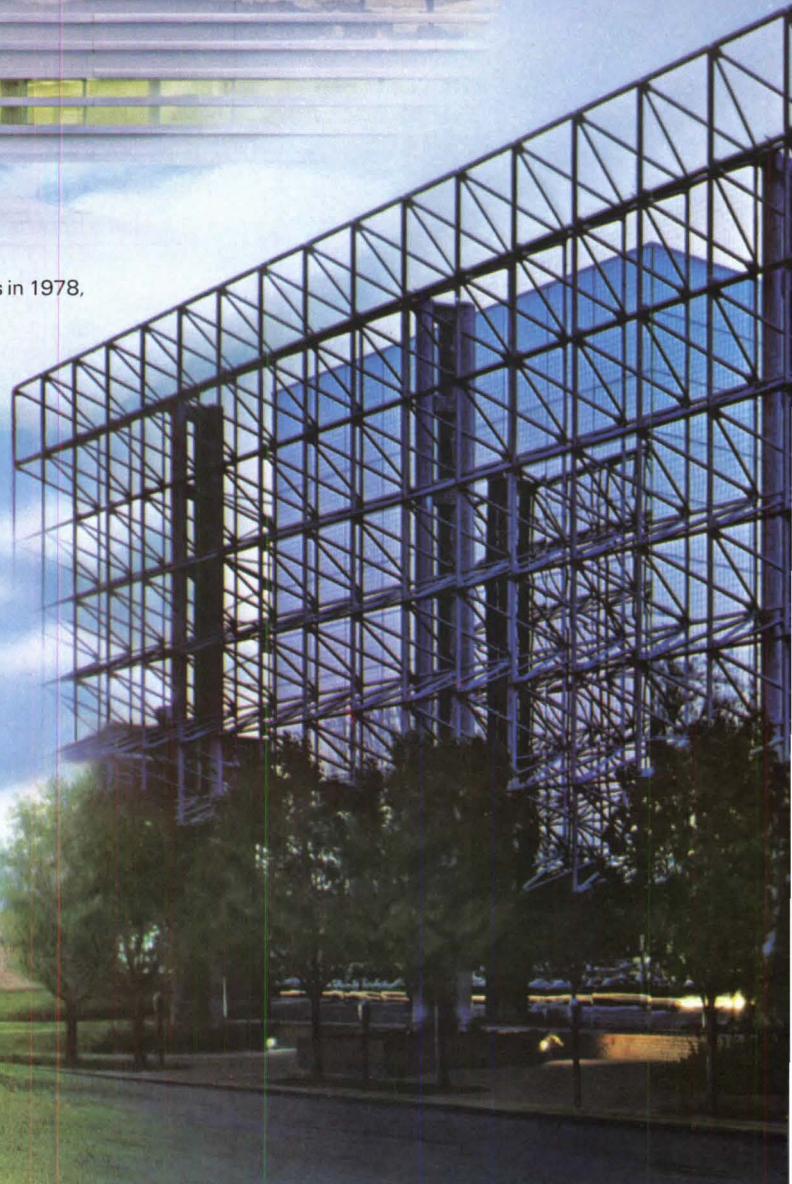
The original building is hidden behind a handsome structural silicone curtain wall system. And the new addition sparkles with a combination of opaque and transparent



Winner, 1980 national AIA Honor Award plus two regional AIA Merit Awards in 1978, Equitable Life's regional headquarters in Charlotte, North Carolina, was designed by Wolf Associates, Charlotte.



Winner, 1978 AIA Component Award, Minnesota Society of Architects, Gelco Corporation's headquarters in Eden Prairie was designed by Parker-Klein Associates, Minneapolis.



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Winner, AIA Honor Award in 1980,
Bell of Indiana's Columbus Switching Station
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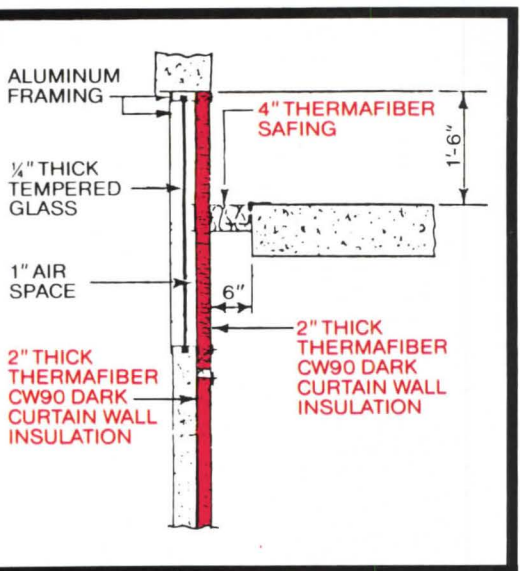
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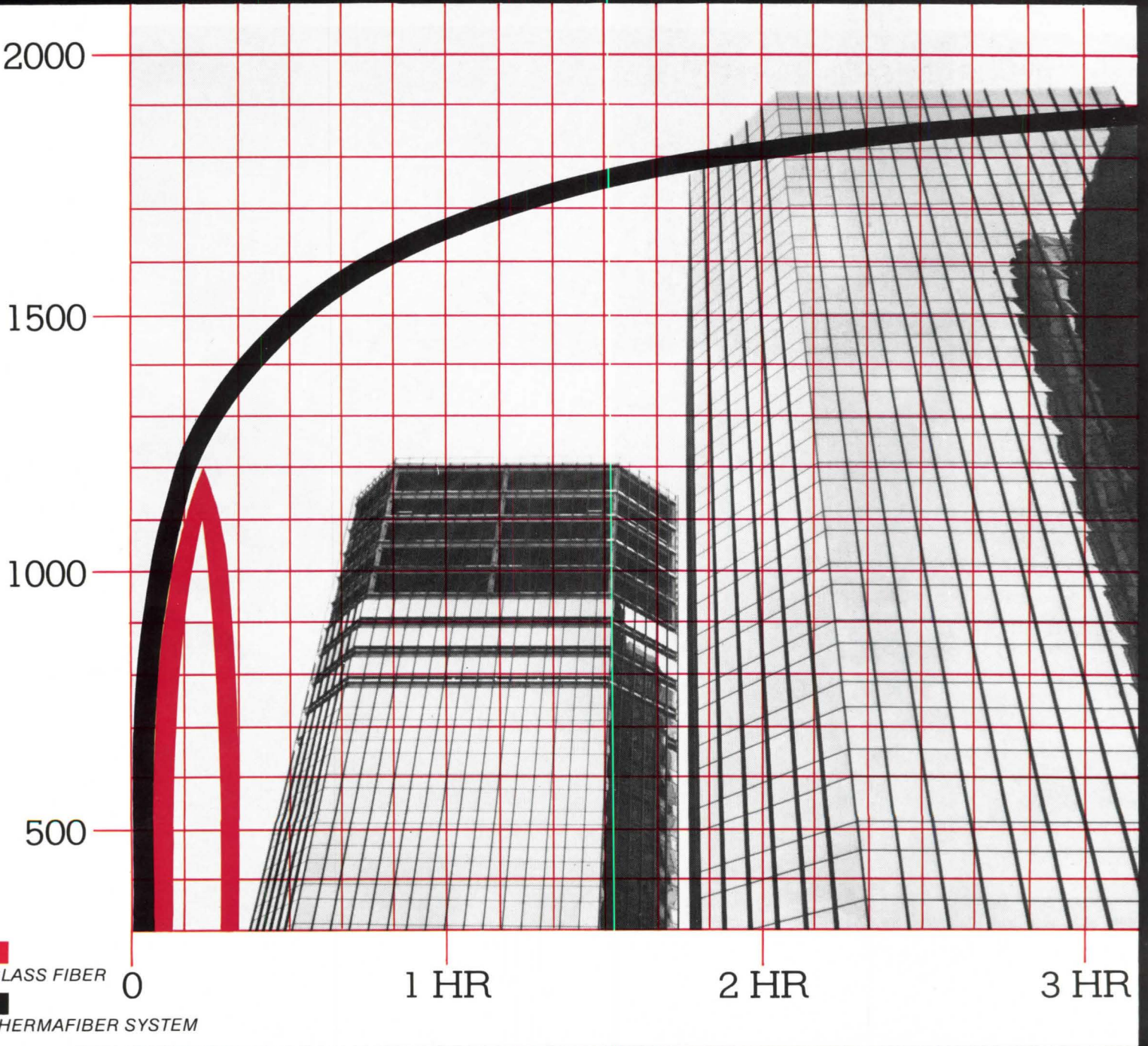
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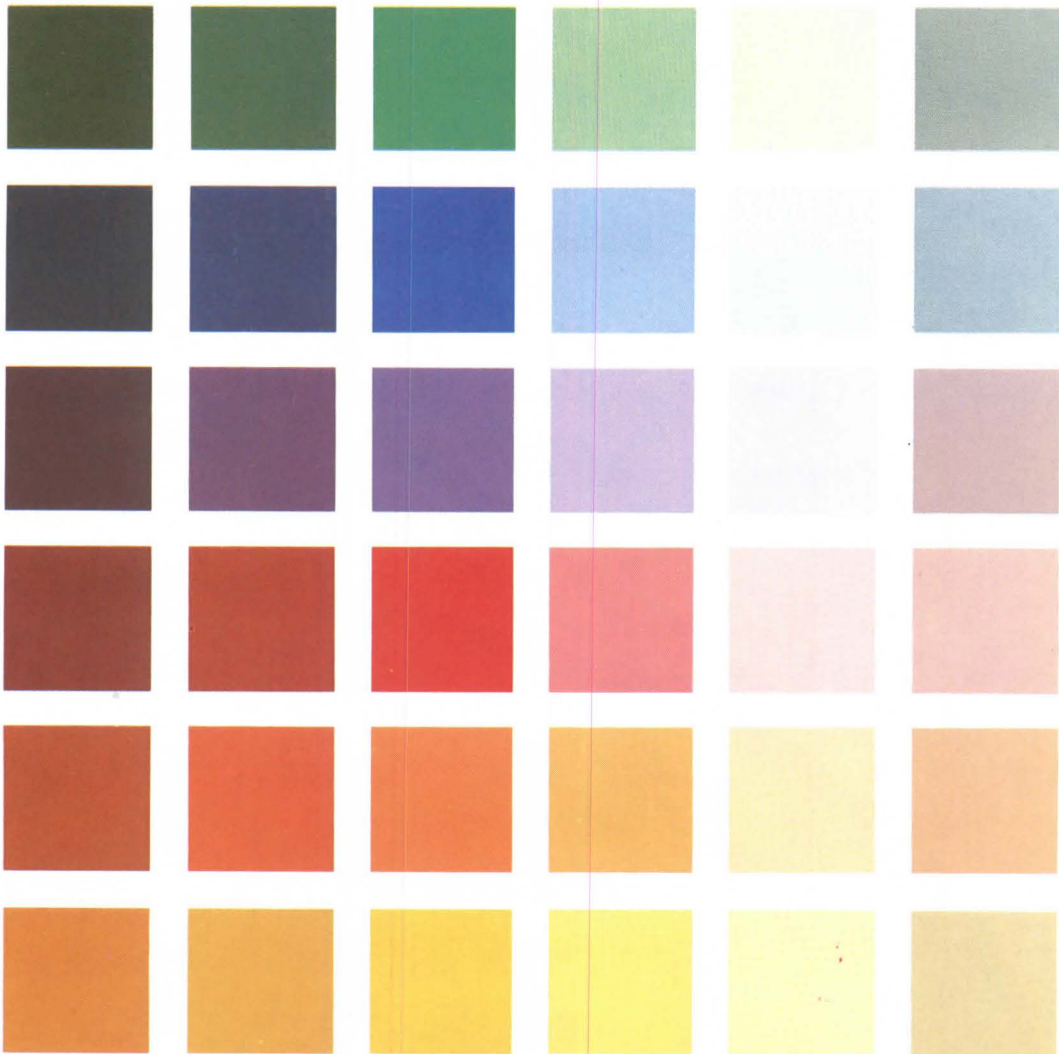
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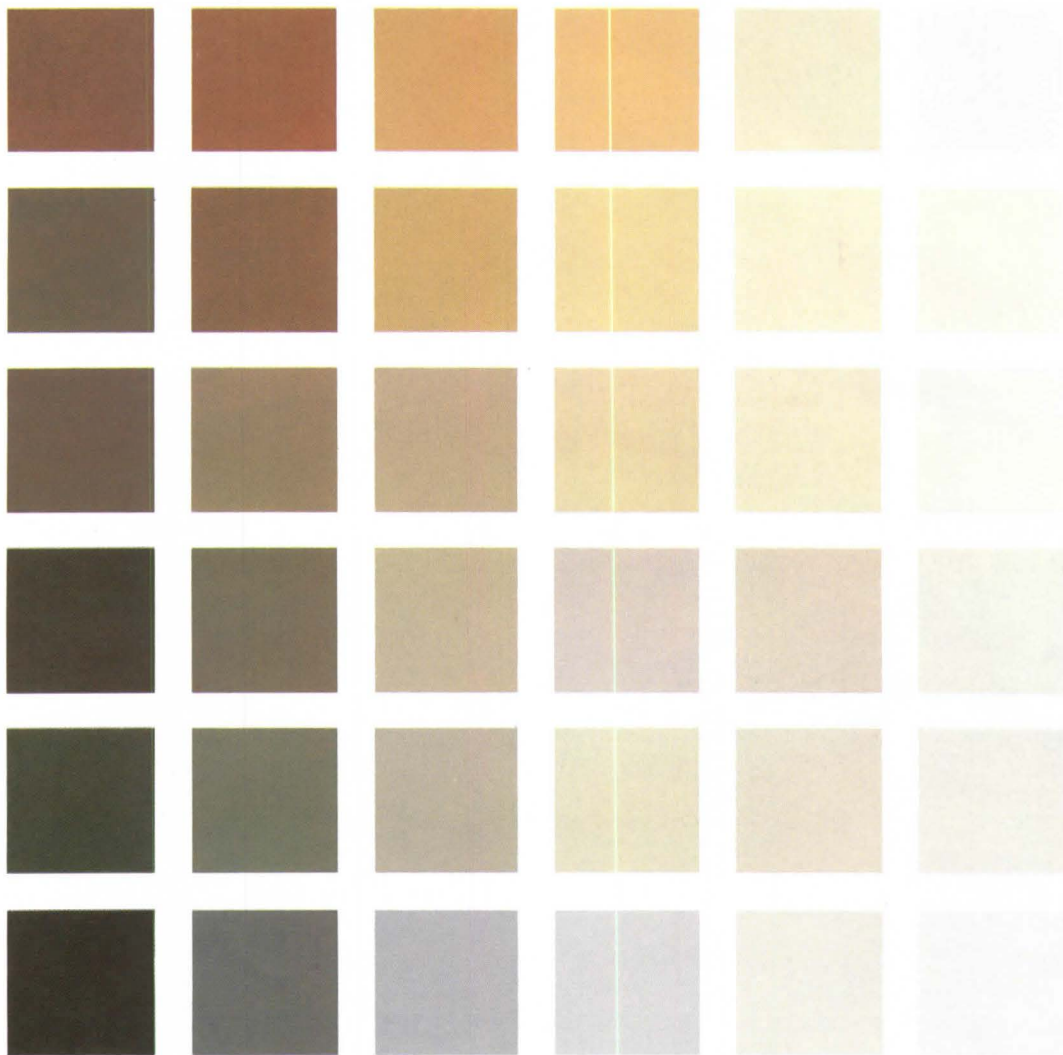
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Circle 76



Photos by Kottal

Design for harmony

The Pillsbury Company's new Research and Development addition is the first phase of the master plan to expand and renovate its Minneapolis R&D Facilities. Working together, architect and client developed a design that would be compatible both for new structures and for the renovation of existing ones.

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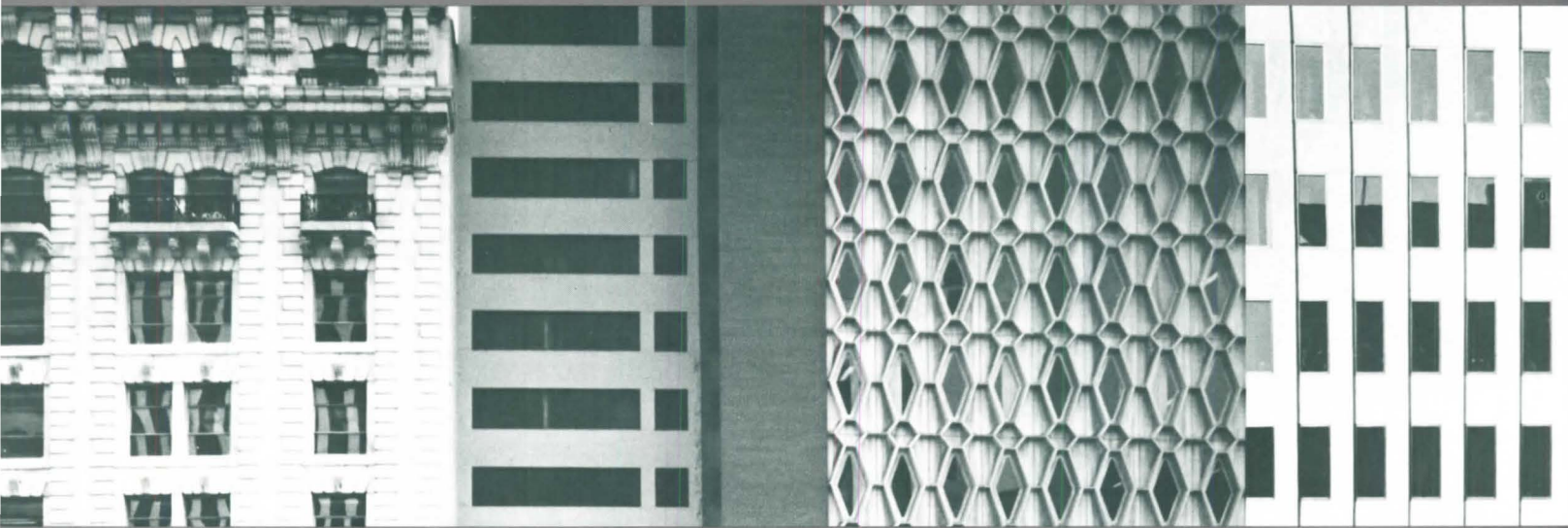
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AIA JOURNAL

**Buildings,
like bodies,
have skin...**



In both cases it is multi-purpose. James Marston Fitch, writing of the building-body analogy in *American Architecture: The Environmental Forces That Shape It*, explains that “the wall cannot be thought of as a simple barrier but must rather be visualized as a permeable filter, capable of embodying, modifying or rejecting forces which play upon it.”

Thus the building envelope, which did presumably begin as “a simple barrier” of protection against enemies and climate, soon developed additional features—slots in the wall for vision, openings for the escape of smoke and the collection of water, flaps of animal hide that opened or closed doorways to meet changing conditions. These primitive precedents have recognizable counterparts in buildings even today.

There has been a parallel revolution in the relationship between skin and structure. At most stages of architectural history building skin has necessarily served as structure also. At times, such inventions as the flying buttress have allowed a partial separation of the two. In the idealized work of Mies, skin was structure made eloquent. At present, skin may be integral with structure, within it or outside it, exhibiting effects as different from one another as the snail is different from the bat.

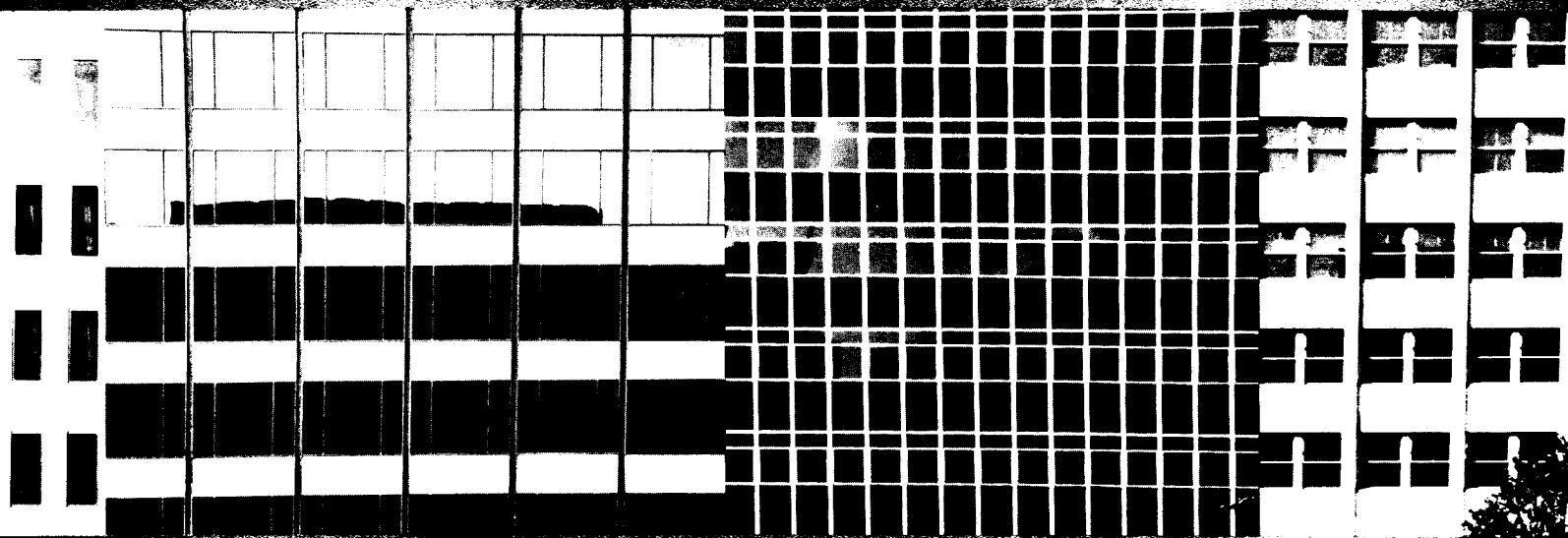
But the building-body analogy has a limit. As primitive man became civilized, his building skins developed characteristics less like his own skin than like its man-made supplement, clothing. Having been tailored to a growing diversity of functional needs, clothes and buildings alike became symbolic of those functions. They began to tell first of their owners' occupations, then of their affluence, their pretensions, their characters and their tastes. Fashion was born.

There are elements of fashion in building skins (pri-

mary colors are out; mauve and dusty rose are in) that are as superficial as the latest hemline style, but other elements are essential to architecture. Fashion is a principal indicator of history: We date a building by its skin. By skins we also read architectural intentions. The earliest works of the modern movement sought a skin radically different from the elaborate facades of the past. “But the underlying premise of buildings in the International Style”, Peter Blake has written in *Form Follows Fiasco*, “—the premise of sheerness, flatness, smoothness, unornamented plainness—remains, to this day, an impossible dream.”

So the search was in vain, and soon there were defections even among the archmodernists. When Gropius and Breuer came to the U.S. in 1937, they brought along the new European vocabulary of asymmetrical abstract geometry, but their first houses here abandoned the Bauhaus surfaces of white stucco and incorporated instead the New England vernacular of wood siding. When Aalto, after some orthodox white buildings in Finland, built his first U.S. work, MIT's Baker House dormitory, in 1948, he sheathed it in the roughest possible brickwork. And Le Corbusier, in the pebbled surfaces of his 1955 Ronchamp chapel and the crude masonry of his 1956 Jaoul houses, dramatized modernism's new acceptance of skin texture.

As modern architecture matured, the building skin became a major focus of attention. A variety of skin types became acceptable: the taut glass skin of Bushaft's Lever House, the modulations of Breuer's later concrete works, the bush-hammered ribs of Paul Rudolph's concrete, even the decorative screens of Edward Durrell Stone. These effects were often the major ends of the design process, and often it seemed the more



...in downtown Hartford, the remains of the rebuilding revolution of building skins in the commercial vernacular.

...the better. Certainly, the new glass
... instead in our buildings. The new
... createdly varied, and the new
... of the moment, the new glass
... have to look, and the new
... the new sandstone, the new
... when, too, and the new
... glass colors, the new
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... considered, the new
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... Arthur Drexler
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blocks. And a few individual effects, such as Richard
Meier's white porcelain enamel panels, continue to pur-
sue modernism's elusive ideal.

But perhaps the most important trend is that we have
come to expect our buildings to be communicative.
Eduardo Souto de Moura, in one of the many discussions that
shaped this issue, discussed skin treatments of the re-
cent past to nonobjective painting. Rather than "here
is a blue rectangle," the architect was saying "here is a
concrete plane."

That no longer suffices. We like now for building
skins to communicate about their content, or
about their context, or about glass buildings do in
detail of other construction, and as many recent glass
buildings do by relating to neighboring cornice lines,
penetration or materiality, or even, at times, about their
historical precedents.

We have also come to look for building skins that
are communicative about the impact of energy con-
servations, but there has been less progress in this
direction than expected a few years ago. It may still be
too early even for that, because of all the energy
programs that have been implemented, and the
fact that building skins are still changing
so fast that the quality of the skin in the sun
is not yet a widely understood or even
discussed criterion. It may not be obvious yet,
but it is not obvious yet.

And on the following pages we visually examine
some of the properties of building skins of architecture re-
cent and not so recent. — *Wesley Abercrombie* 111

Glass has been an accessory of building skin since its invention, and, at least as early as 19th century greenhouses and, most prominently, Paxton's 1851 Crystal Palace, it has served as a complete building envelope. Bruno Taut's Cologne pavilion of 1914 was an early conscious exploitation of the material's esthetic properties, as were Mies' skyscraper studies of 1919 and 1921. Since then, glass and glass-like plastics have become indispensable parts of our architecture.

Here are transparent skins in a few of their many guises: (1) Smith Hinchman & Grylls' own Detroit office, once a conventional masonry structure, bowed to fashion several years ago and was restyled with a new glass skin, in this case given an intriguing "quilted" look by its exposed hardware.

Mies, of course, was a master in the handling of glass, always conscious of its reflective as well as its transparent possibilities. Chicago's Federal Center (2), based on Mies' 1959 master plan, was finished in 1973 by his associates in collaboration with A. E. Epstein & Sons, C. F. Murphy Associates and Schmidt, Gardner & Erickson.

Glass as a component in metal-framed curtain walls is shown in (3) the Essex Wire building, Dearborn, Mich., by Rossen & Newman. A glass wall in Atlanta (4) mirrors the precast concrete surfaces of John Portman's Peachtree Center. And glow from interior lighting is demonstrated by the concrete and glass grille-work of St. John's Abbey church, Collegeville, Minn., by Marcel Breuer & Associates (5).

For Expo '67 in Montreal, Buckminster Fuller devised a transparent dome precociously responsive to light and heat transmission by the individual and automatic adjustment of myriad small shading devices (6).



Balthazar Korab

1

A Gallery of Architectural Dermatology



Hedrich-Blessing

5

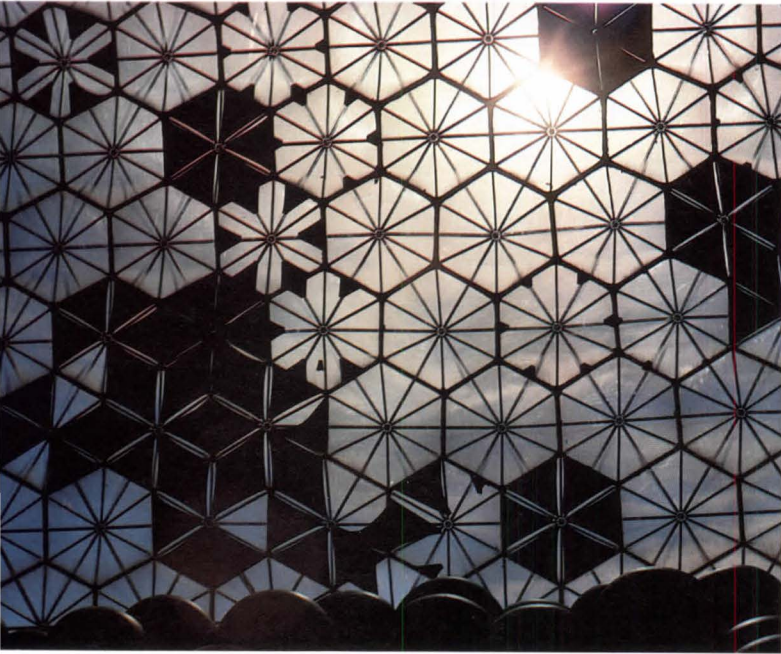


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Hedrich-Blessing

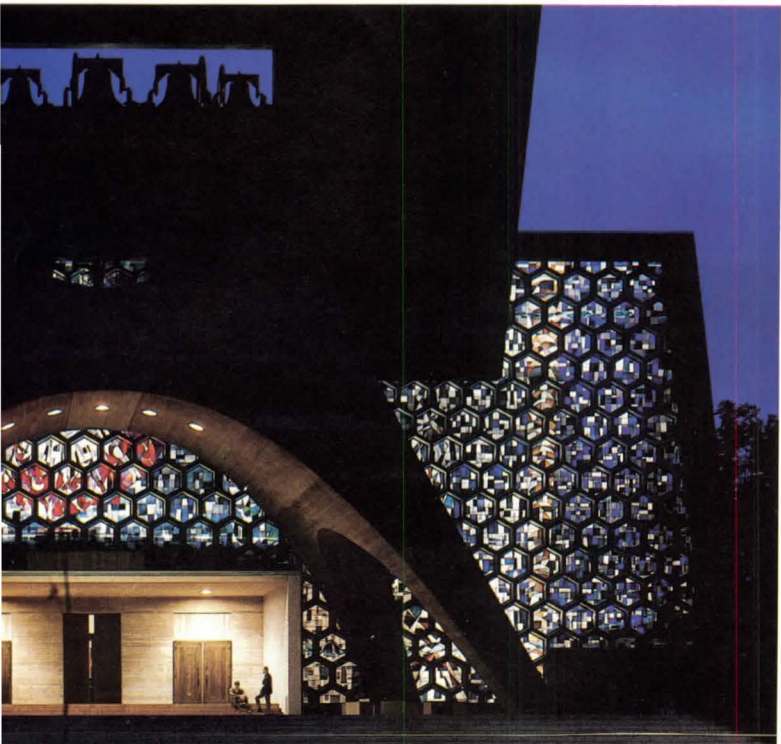
Balthazar Korab

3



6

Arlee Monson



Tim Street-Porter

4



Among opaque materials, the current fashion for sheen is accompanied by an enduring passion for texture. Louis Kahn's 1978 Yale Center for British Art (1) was sheathed in pewter-like steel, unmistakably metallic yet distinctive and reserved in its degree of reflectivity. A more typical metal skin encloses the Trailer Life Publishing Co. offices, Agoura, Calif., by Lomax-Mills Associates (2), seen here in the company of an even shinier Airstream trailer. From one of Florence's Renaissance palazzi (3),

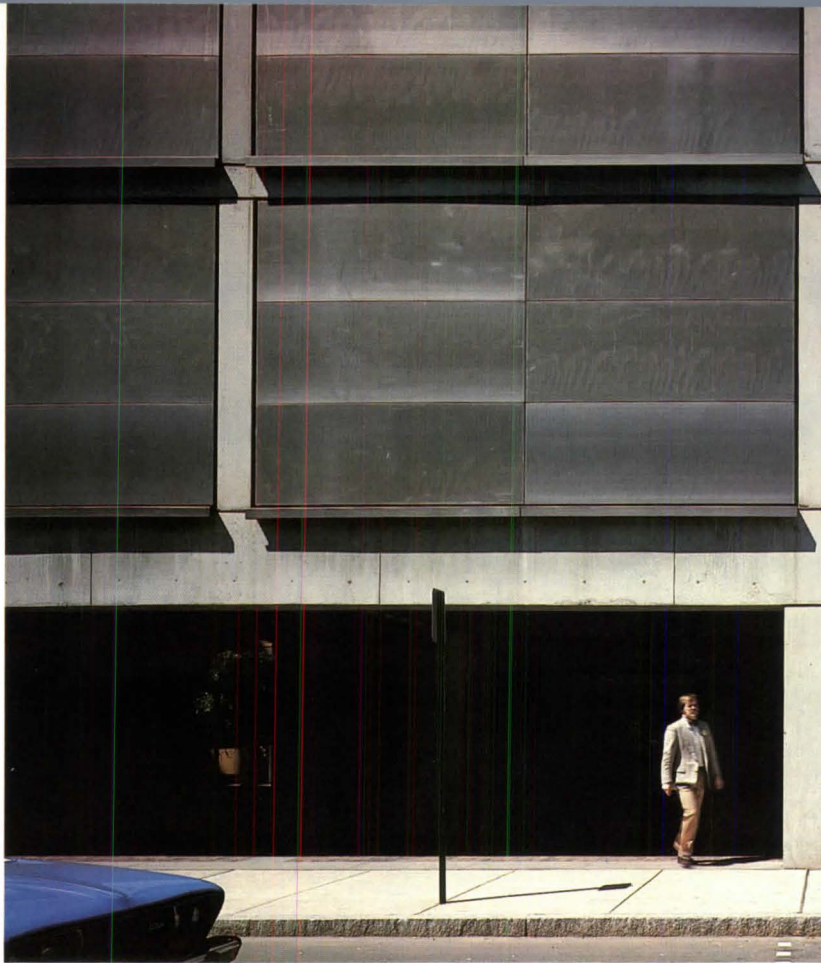
a solidly traditional example of rustication. Richard Meier's Bronx Developmental Center (4) had a modular aluminum facing of exemplary finesse, whereas in the Ennis house of Los Angeles, as in his other California works, Frank Lloyd Wright capitalized on the pattern-making potential of concrete block (5).

Wright's taste in texture, pattern and other matters can be traced in some aspects of the work of his protégé Bruce Goff, whose building skins are the subject of a separate article in this issue, and Goff's influence, in turn, can be seen in the work of his former student Herb Greene. Greene's highly idiosyncratic "prairie house" for himself (6) was built in 1961 in Norman, Okla.

An increasing number of structures are very nearly all skin, namely tents and other constructions of fabric. Shown here (7) is the Pier Six Pavilion in Baltimore's Inner Harbor by Todd Dalland. A free-wheeling combination of roughly hewn stone, vermiculated stone and occasional patches of smooth ashlar textures in Frank Furness' 1892 Mt. Sinai chapel, Philadelphia (8).

Cervin Robinson

1

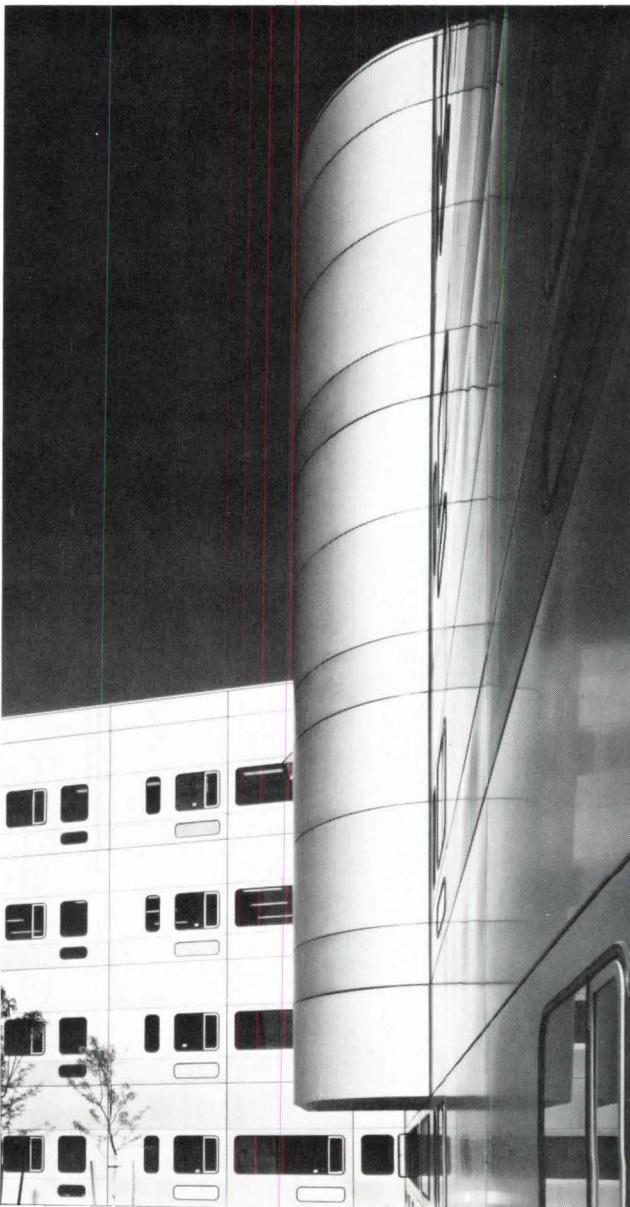


Tim Street-Porter

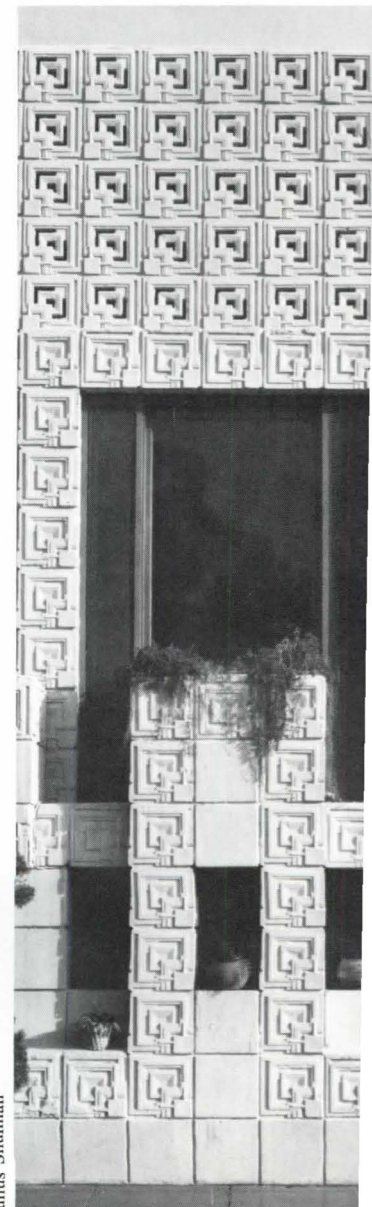
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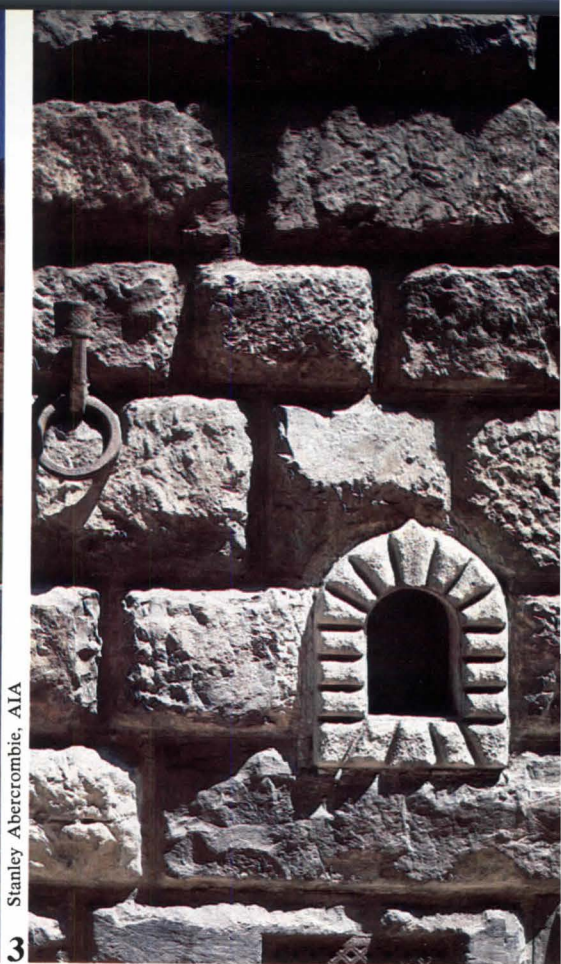


Zra Stoller © ESTO

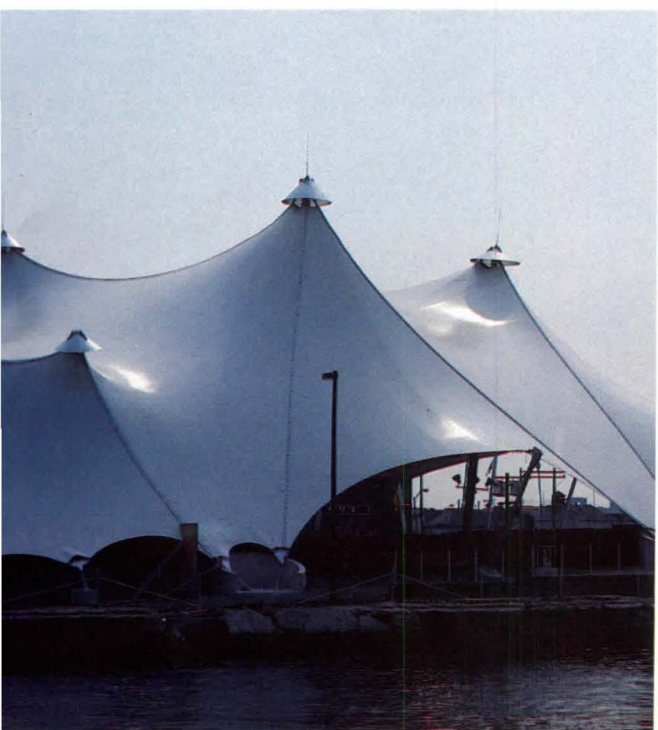
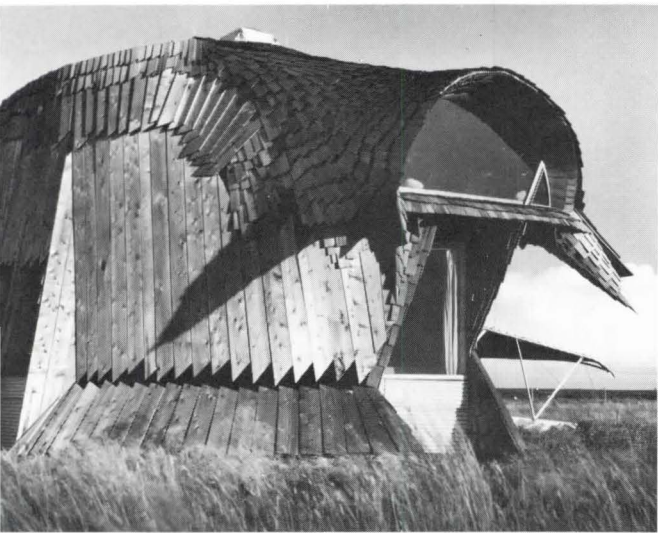


Julius Shulman





3 Stanley Abercrombie, AIA

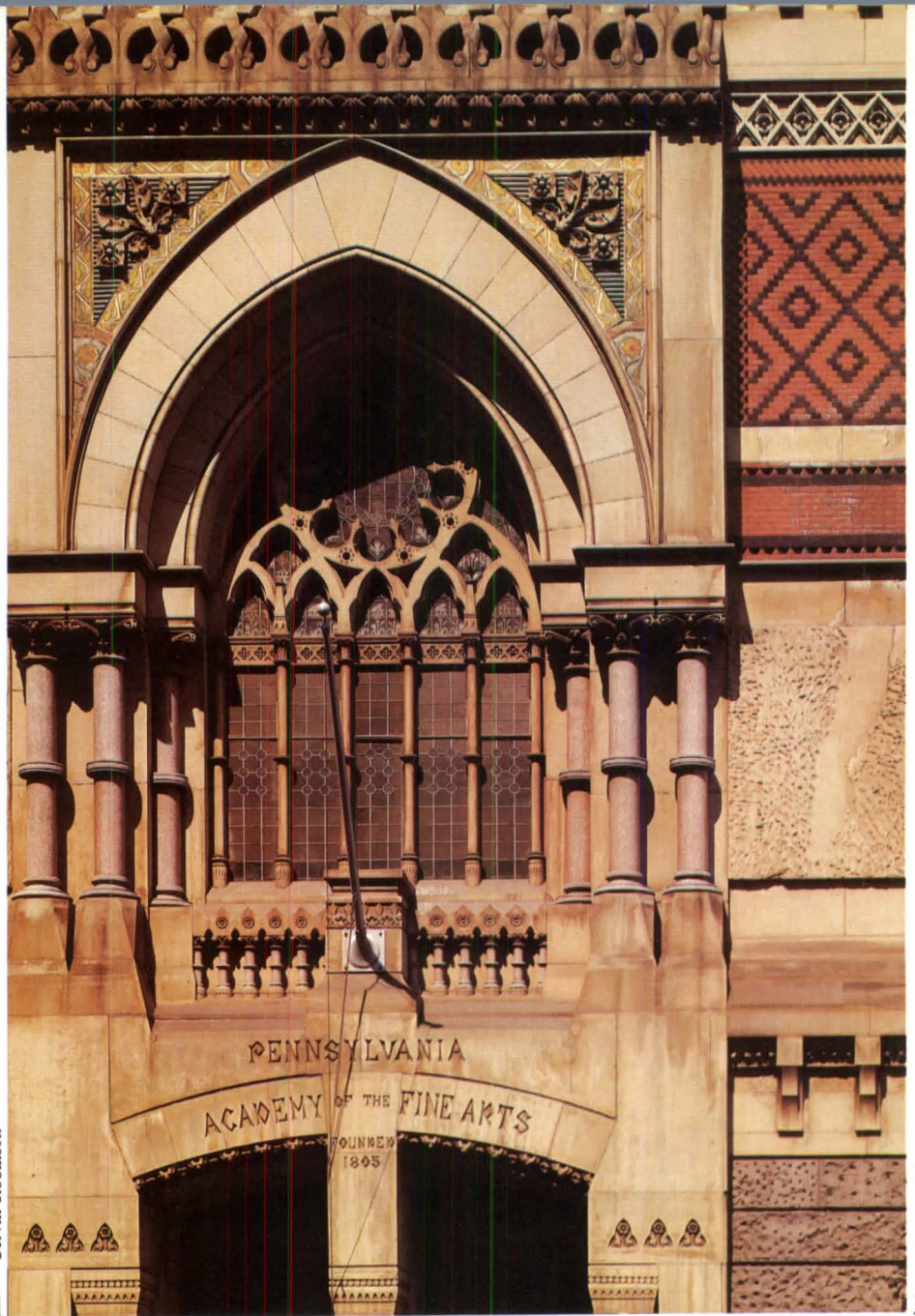


8 Cervin Robinson

Building skins have traditionally served as canvasses for the application of color and decoration. Furness' 1873 Pennsylvania Academy of the Fine Arts, Philadelphia, (1) is a flamboyant example. The illusion of such decorative richness can even be applied to existing buildings, as in artist Richard Haas' transformation by paint of an apartment building on North LaSalle Street, Chicago (2), seen here while the work of creating the illusion of bay windows was in progress. Vernacular building, of course, has often been shameless in its use of decoration, as at Tony's Cabaret, Superior, Wis. (3).

Color is not only decorative but is also a code referring to building uses at McCue Boone Tomsick's IBM Santa Teresa Laboratory, San Jose, Calif., (4) a 1978 honor award winner. And color emphasizes a building owner's business in the case of The Valspar Paint Co. building, Minneapolis (5). Peter Busa was the artist.

Even computer language can serve as appropriate decoration. At the entrance to the Spit Brook Engineering Facility, Nashua, N. H., (6) by Cambridge Seven Associates, graphic designer Ivan Chermayeff of Chermayeff & Geismar has designed a wall that says, in seven bit code, "digital software engineering." S.A.

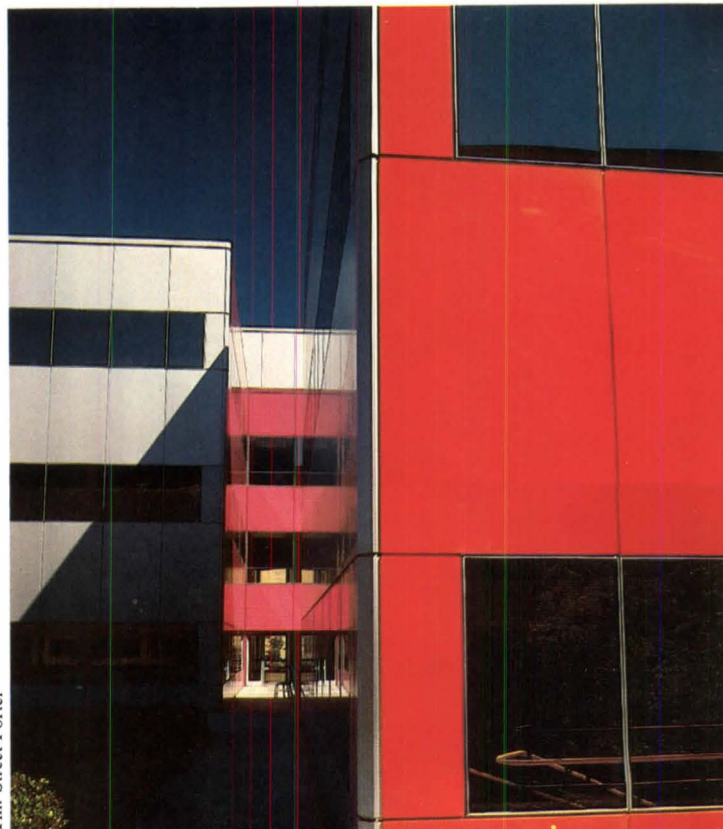


Cervin Robinson

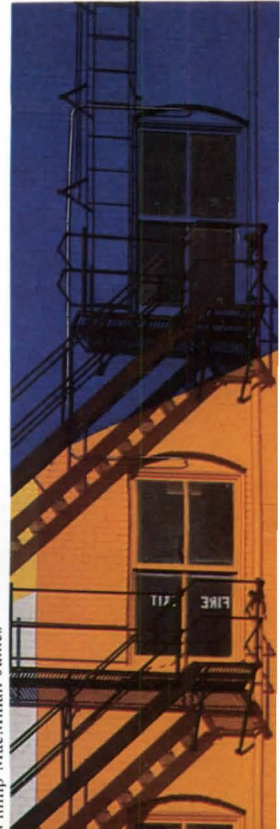
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Tim Street-Porter



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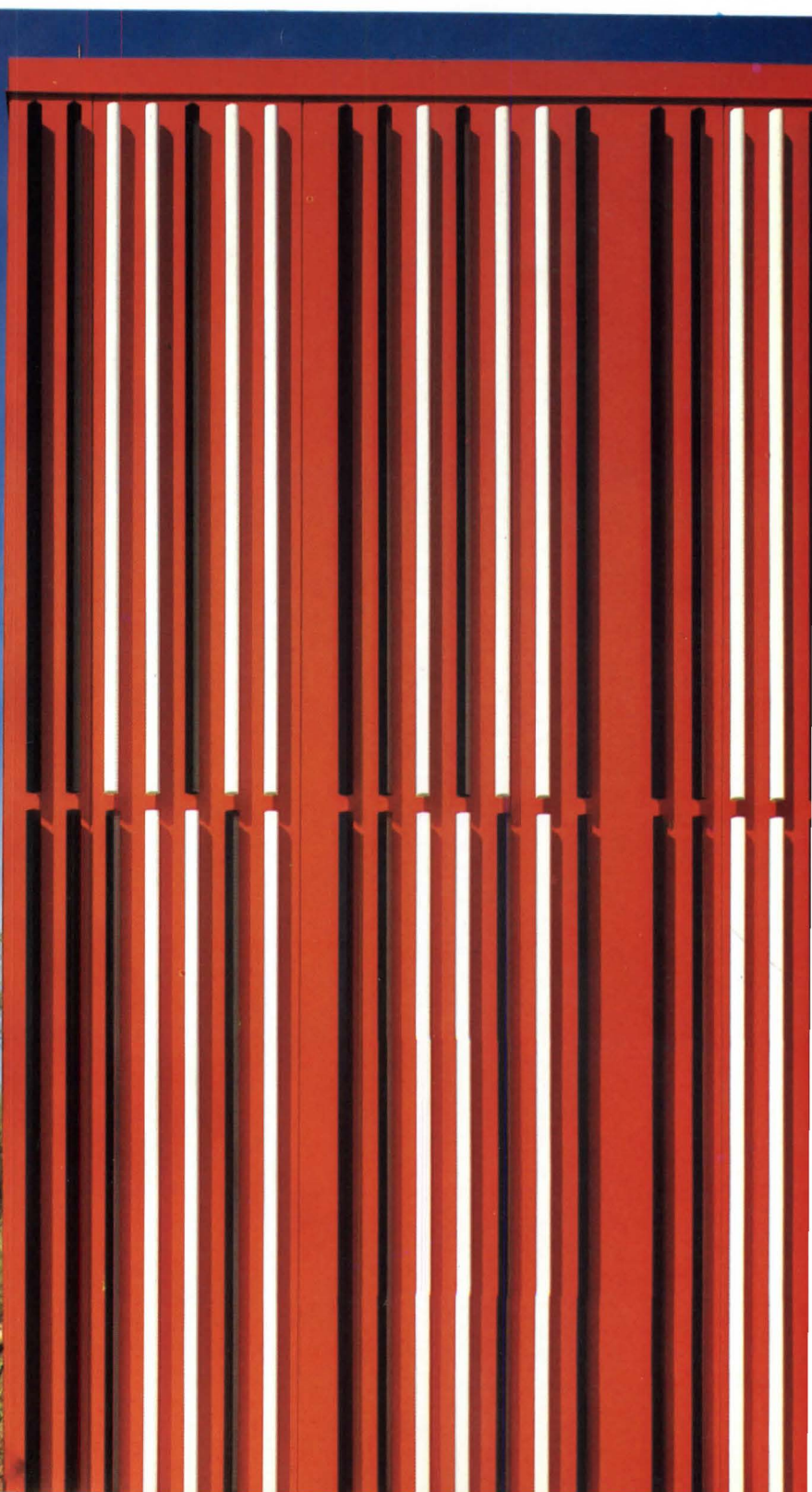


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Steve Rosenthal



Skinnovation

A roundup of research and development in materials and components. By Marguerite N. Villecco

Subtle surprises await architects as new skin materials and components emerge from the current research and development process. The surprises, however, may be less in the products themselves than in their implications for design.

An informal survey of manufacturers, government agencies and industry associations yields few radical concepts (the proprietary advantage such concepts offer is closely guarded). But the new products and areas of inquiry do offer refinements promising more diverse application, greater ease of manufacture and installation, and improved safety, energy and cost performance. And, in some cases, these refinements make feasible design strategies not heretofore possible.

A clear example of such material development is in the area of energy performance, a priority of much of the research. Skin products that offer much greater control of thermal and illumination conditions may make building form differentiation less of a mandate. Architects wishing to isolate form decisions from energy criteria will have greater technical freedom and justification; high-performance materials can assume new responsibility for energy conservation. The implication of greater design choice is that energy performance becomes more clearly an architectural decision, with the esthetic discipline less clearly defined than before.

Other innovations may also challenge some conventional wisdom. The conviction among many architects that industrialization of the building industry is a failed relic of the 1960s is one example. The total industrialization of individual buildings is no longer the issue, but much of the research strives for greater economies in production and installation and in most cases this translates to the greater industrialization. Supported in part by greater acceptance of life-cycle costing, industrialization is a cost-effective mechanism for improved quality, putting more of the investment in materials and design and less in labor. Skin assemblies that

emerge from the factory replete with exterior and interior finishes and an insulation core also allow greater material economies; the sandwich panel design can improve both energy and structural efficiency by minimizing redundancy in design and optimizing the use of exterior materials such as aluminum, steel, concrete and masonry. The design integration of skin components with structural and other building systems is also becoming more refined.

The current disillusionment with the formal purity or sterility of the modern movement has not escaped the product industry. Innovations in coatings and materials seek to provide greater esthetic choice. New coatings offer a wider range of colors than before, including bright and glossy finishes, as well as increased longevity through greater resistance to pollution, natural corrosion (including acid rain) and other environmental stress. New skin components also strive to increase an architect's sculptural options. The renewed interest in the articulated facade, for energy as well as stylistic reasons, is being met with skin materials that can be curved, shaped and textured for solar control, historical allusion or contextual compatibility. For those architects eager for diversity, the lag time between design scholarship and product development is closing.

But not all innovations are in response to architects' wishes and desires, or even those of the marketplace. In some cases, innovations come from technological discovery in other fields that lead and inspire our perceptions and capabilities.

Material research at the National Aeronautics and Space Agency (NASA) is rarely concerned with the terrestrial conditions of buildings; its design requirements are far more severe, its cost tolerances higher and its uses more specialized. Yet NASA researchers pioneered selective surfaces, which control the emission or reradiation of heat from absorber surfaces; reflective mirror films for glazing; flat conductor cable that permits elimination of ducts; cellulose insulation made by chemically treating shredded newspapers; new lightweight fire-resistant materials, photovoltaic and other solar applications.

Recent research has led to new forms of thermal insulation, such as the tiles to provide thermal protection to the space

shuttle upon re-entry. The tiles, which led some to call the spacecraft the "flying brickyard," are a low-density, high-purity silica fiber insulator made rigid by ceramic bonding; they are used to mitigate surface temperatures up to 2300 degrees Fahrenheit. With the exception of some industrial conditions, buildings are not concerned with such thermal extremes, but the extremely lightweight material, in varying sizes and thicknesses, is already suggesting new products, such as metal sandwich panels, that may be adapted for building use. The material dissipates heat so effectively that you can heat it with a blow torch and instantly pick it up with your bare fingers.

Current research on low-toxic, fire-resistant materials for airplane interiors and glazing may also yield new concepts for buildings. Surveys over the past decade have shown that for a variety of aircraft, the post-crash fire has accounted for most aircraft fire deaths, by a factor of 10 or more. NASA is currently testing new interior panel systems under a variety of conditions. Standard panels have proven lethal, with a high vapor-production rate for low char-yield materials for decorative surfaces and face sheets. Alternatives, such as phenolic resin panels, are promising much better performance, containing a fire of much greater severity for three to five times as long as standard epoxy panels without significant toxic gas production.

Phenolic resins are being developed further and will be used in the new generation of commercial aircraft, such as the Boeing 757 and 767, in a composite panel configuration with a crushed core that combines light weight and the ability to be intricately contoured. Such research has also included development of new glazing systems. The current acrylate windows shrink and drop out, allowing the fire to penetrate. NASA is now working on a new high-char-yield epoxy trimethoxyboroxine transparent polymer system that resists burning for up to 10 minutes, versus one minute for the current system. The new system will be used as a secondary, inner window.

Most of the NASA developments require modification for commercial use to lower the cost and to adapt the concepts and materials to a more modest set of design conditions. But this process is familiar. Past NASA research has included

Ms. Villecco is a frequent contributor and consultant to the Journal. She played a key role in the conceptual shaping of this issue. (She wants it known that she had nothing to do with the above headline, however.) She was assisted in gathering information for this article by Associate Editor Nora Richter Greer.

mylar, the aluminized plastic film now sold commercially in the form of "space blankets," coatings, home and commercial wall coverings and drapery liners. Heat shield coatings for re-entry vehicles are now sold as fire insulation for commercial and highrise buildings. Sound insulation compounds are sold in liquid or panel form and used in hotels, industrial plants and hospitals.

NASA's need for nonflammable clothing and structures led to development of a beta fiber yarn and, ultimately, Teflon-coated fabric, which was then adapted for use in permanent fabric structures. Since 1974, fabric structures using the composite material have provided a dazzling array of new architectural forms, ranging from the U.S. pavilion at Expo '70 in Osaka to the new Haj Terminal airport in Saudi Arabia. Originally introduced in shapes derived from simple conical structures that could be readily analyzed to determine the stresses contained within the fabric, such structures now explore a full range of curvilinear forms. By 1980, over \$200 million of construction had involved this composite material.

Exploration of forms has been accompanied by refinements in the materials. The composite fabrics originally had a light transmission factor of 6 to 12 percent; some now achieve translucency sufficient to provide 800 foot candles of natural illumination, simulating an outdoor environment for both plants and people.

Fabric structures have also provided an arena for research into the concept of dynamic building skins. In the mid-1970s, Sean Wellesley-Miller and Day Charoudi, then of MIT, explored the concept of a "cloud gel" membrane that would respond to changing solar conditions by changing its degree of transparency. Such research continues today.

Others, also using a biological analogy for dynamic response, have experimented with air-controlled systems that could regulate the flow of sunlight into a building. In 1967, the German scientist Nicholas Laing developed an air-controlled membrane system that used transparent and reflective surfacing to control sunlight. His proposal called for inflatable tubes containing reflective inserts. By manipulating the relative positions of the reflective position of the reflective strip to lie parallel or perpendicular to the outer skin, the system would either reflect solar radiation into or out of the building. In 1976, a "solar cell" system of three membranes was included in a feasibility study for GSA. In this system, the upper and middle membranes have high solar transmissivity and very low black body radiation. The upper and middle membranes are each coated on opposite sides with a reflective coating. Air is used to push the middle membrane against the upper

one, which reflects solar radiation, or against the lower one, which allows solar radiation to pass diagonally through the membrane and into the building.

More recently, as part of a 1978 roof competition for GSA, a bioclimatic membrane was proposed by a team organized by Susan Gill, of ABRI, Inc. It sought to refine the membrane concept in several ways, by simplifying the air control system and the transformation process while maintaining structural stability and by increasing transmissivity. For the last, the team sought and found a material in which the fiber reinforcement is woven into a skin and sandwiched between transmissive layers instead of the more conventional composite fabric with the fibers diffused throughout. The team found the fabric through du Pont, which had developed it in 1972 and set it aside for want of practical use.

More recently, Jose Prada, working with ABRI, Inc., has refined the bioclimatic membrane into a product called Solarion, which further simplifies fabrica-

Seeking ways that buildings can respond dynamically to changing conditions for the sake of energy conservation.

tion and assembly, deals with the double curvature of a membrane system and provides more sophisticated control as a filter between the exterior climate and the interior microclimate of a fabric structure. The new ABRI membrane system consists of large modular air-inflated sections comprised of three layers. The top and middle layers are designed so that when they are pushed together by controlled air flow, the exterior surface becomes reflective. The bottom layer is transparent and when the middle membrane is pushed against the lower one, sunlight is able to filter through and into the building. The specific design of the system is still proprietary and is being refined under a contract to the Department of Energy.

These explorations into the processes, as well as the forms, of biological transformation are an area of energy conscious design that can lead to dynamic building response to dynamic phenomena. Other inquiries into dynamic skin performance are also in progress.

The U.S. Department of Energy is sponsoring a number of research projects to develop new materials and systems for passive solar design. These projects focus on such issues as lightweight thermal storage, phase-change thermal storage materials for masonry construction, radiative cooling materials, water walls, reflective transparent glazing insulation and insulating moveable curtain walls.

The National Association of Home Builders/Research Foundation is conducting research for DOE on thermal storage for lightweight structures, with a particular concern for homebuilders. Its study distinguishes between materials with high specific heat and those that take advantage of phase-changing, or heat-of-fusion, materials. Masonry is a traditional way to introduce thermal storage. Water has four times the specific heat of masonry, so such concepts as water walls, drumwalls, tube walls and others that integrate the water and masonry have been developed. However, the thermal storage capacity of water is low and therefore the volume and weight must be substantial. Further, NAHB/RF notes that 89 percent of single-family houses use frame exterior wall construction, with block construction accounting for 1 percent, load-bearing brick 1 percent and all else 1 percent. The study therefore looks to phase-changing materials for more applicable systems, but concludes that these systems are not yet broadly marketable for builders.

Phase-changing materials have great energy density and operate with low temperature differentials. Experimental units have stored and delivered up to five times more energy than water and 25 times more than rock beds of equal mass, operating under identical conditions. All materials have a characteristic heat of fusion: Water, for example, has a specific heat of 1 BTU per pound per Fahrenheit and a heat of fusion of 144 BTUs per pound. Water used for heat storage can therefore store 144 times as much energy at its melting point than at any other temperature in either its solid or liquid state. Research has been underway for years to develop materials that freeze at more convenient temperatures than water. The requirements are that the materials offer phase-change potential at desired temperatures; that they be safe and meet applicable standards, and that they perform reliably over a reasonable life-cycle, with easy replacement. This implies that the storage system should operate in the range of 40 to 150 degrees Fahrenheit; that storage should be nontoxic, at ambient temperatures and not support combustion. It should perform at least 10 years reliably and failures should not injure the building, its contents or inhabitants. Inorganic salt hydrates have, so far, looked most promising. NAHB/RF, however, concludes that existing packages rarely perform as expected and that more research is required on temperature demand and cycles in houses, on system performance and the materials and components of the systems.

Another DOE sponsored project is specifically on phase-change thermal storage materials in masonry construction. The contractor is the Institute for Energy

Conversion and the purpose of the research is to design, fabricate and test a thermal storage wall in which the cavities of standard concrete blocks are filled with pouches of phase-changing materials. This would increase the storage capacity of each block from 100 to more than 800 BTUs. The project is also looking to minimize material, production and installation costs, while improving durability, performance and appearance. The storage packages have been produced by vacuum forming to fit the contours of the block openings. Unplasticized PVC is used for the pouches and an overwrap of mylar has reduced water vapor loss to near zero. Testing continues.

Radiative cooling materials are being researched by the Energy Materials Research Co. for DOE. The purpose of this research is to develop improved materials for radiative cooling systems, which are based on the spectral radiance of the atmosphere and rely on selective coatings. The project seeks to develop materials that emit radiation only in the eight to 13 micron level over a black body and absorb in the same wave length. It uses glazing, similar to a solar collector, but here one wants to trap a cool air layer for radiative cooling. The material requirements are different because the glazing for cooling purposes must be transparent to eight to 13 micron radiation, while a solar collector glazing should absorb infrared radiation to prevent heat loss. Polyethylene has proved most suitable, but is subject to ultraviolet degradation and lasts only one year when exposed to outdoor conditions.

This project has been exploring both selective surface and glazing improvements, seeking a 5- to 10-year lifespan, \$2 per square foot life-cycle cost and market acceptability. The technical objectives have already been largely met. Silicon oxynitride is being used for the selective emitter and additives to the transparent glazing promise to increase its outdoor life. Zinc oxide is used for the reflective glazing pigment, with nickel chelates to extend its lifetime; this has achieved a reflectance of 60 percent under specified conditions, with the goal at 90 percent. The firm is optimistic that cost and durability goals are being met and is preparing for full-scale testing.

Another DOE-sponsored project underway with the Southwall Corporation is concerned with developing reflective transparent glazing insulation. Several techniques for high-performance (low U-value) glazing exist, including multiple-pane systems, low-emissivity coated glass, low-emissivity coated film and gas filling. An alternative is the use of multiple-pane, high-transmission glazing, which depends on increased solar gain to offset heat losses in a passive design. The joint DOE-

Southwall project, called Superglass, is developing double insulating units containing Heat Mirror transparent insulation stretched midway between the panes. Superglass is indistinguishable from conventional double glazing and can be routinely manufactured. Early problems with wrinkling were solved by using an epoxy adhesive to lock the film to the spacer assembly and there has been no sign of coating degradation. The product, says Southwall, offers superior performance in emissivity, transmission and color neutrality at a lower cost than other high-performance glazing and is suitable for use in sealed insulating glass. A related Heat Mirror project offers promise that the benefits can be extended to other applications as well.

The Ames Laboratory of DOE is working on a system called Transwall, which combines the storage features of a mass Trombe wall with visual transparency. A Transwall is a modular thermal storage wall that has visual characteristics similar to tinted glass. The storage is a water system that reduces the weight and space requirements of a concrete system by factors of four and two respectively. Designed for on-site assembly in new or retrofitted buildings, the system works by absorbing a large fraction of sunlight on absorber plates incorporated into the glass models that comprise the wall structure. Heat is stored in the water and released to the interior when interior temperatures fall below that of the storage

'Recent changes in architectural values . . . have been incorporated into product development.'

during the heating season. In summer, the thermal mass of the system mitigates interior temperature swings.

The status of the Transwall work is that full-scale tests are in progress and comparisons with Trombe walls and direct gain systems will be quantified. Thermal modeling includes the use of a Heat Mirror coating on the outer glass surface to minimize radiative heat loss, which performs slightly better than moveable insulation and doesn't involve daily operation. The visual clarity of the water is also being examined; solutions are being developed for such phenomena as air bubbles, algae, suspended mineral precipitates and evaporation. Thermal, optical and operating tests continue.

Additional work for DOE includes a variety of investigations for daylight, as well as thermal, purposes at Lawrence Berkeley Laboratories and others. LBL is looking at such materials as the coatings used on digital watches, which can be

applied to glazing and change from reflective to transparent; another project is looking at a solid transparent material with an R-8 insulating value, which has fair transparency and was developed for the radiation detectors on escalators. Steve Selkowitz, of LBL, predicts that in five to 10 years advanced coatings for glass and plastic will change automatically, used alone or in conjunction with mechanical energy management systems—blinds, shading systems (inside or between panes) and improved system integration. Selkowitz also sees such improvements in glass and plastic performance that the sleek glass building can endure the need for energy conservation. The result may be a building that yields little information about its energy performance except for close-up, where coatings that change properties, air flow systems and variable glazing systems may be more evident.

The private sector is, of course, also engaged in skin research and development, although more circumspect in talking about it lest a competitive edge be lost. New products coming into the marketplace make it clear that recent changes in architectural values and performance criteria have been incorporated into product development; new challenges for architects translate into new market opportunities for manufacturers. The degree of sustained research, however, is harder to determine. The building industry has long been recognized as a fragmented and decentralized agglomeration of individual entrepreneurs and research has frequently been edged out by more adamant priorities.

In our conversations with various producers, we found few with clear research agendas or visions that they wanted to share; they were far more comfortable talking about a new product line. Here follows a summary of some of the research issues that were discussed to illustrate the range and nature of potential innovation.

In many cases, ideas are refinements of older ones, which is not surprising for it allows a company to leverage the resources it already possesses. In other cases, the companies saw themselves as delivery mechanisms for known materials, such as granite or marble, and innovation was principally to improve their own efficiency, with some emphasis on coatings, finishes and more lightweight applications. In the examples that follow, references to a particular innovation are not an endorsement or recommendation, nor is there any attempt to be comprehensive.

Metal product manufacturers are looking to more and brighter colors and glossier finishes, with more interest in the use of stainless steel and greater efficiency in the process of porcelainized enamel. Inorganic porcelain enamel fin-

ishes offer improvements in longevity, better color retention and reduced costs, while improving environmental resistance. A number of substrates are used for the insulating core, with more emphasis on fire-resistant urethane and on some of the newer composite materials. The overall design of metal sandwich panels is being closely re-examined to improve their energy performance and reduce weight and to achieve greater integration of their components and their relationship to building structure and design.

There is research into improving the flexibility of metal panels, including vertical, horizontal, bonding between windows and more variety and innovation in shapes. Concerns about building integration and overall system performance have led to increased industrialization of the sandwich panels. A new stressed-skin steel panel, for example, has pre-cut openings for windows that are frameless, with the glass supported by h-shaped neoprene structural gaskets pressed onto the edges of the window openings.

Some aluminum sandwich panel manufacturers are looking to respond to passive solar design criteria and to take greater advantage of daylighting opportunities. New developments include thermal breaks, integrating glass areas as passive solar systems within the panels, exploration of air spaces within the panel and their energy implications and an overall engineering examination of whole-system performance. There has also been research in anodized finishes, improving manufacturing and materials technology and in taking advantage of life-cycle costs to improve initial quality for long-term savings.

Concrete product manufacturers are concentrating on fabrication and erection techniques, moldability and textures. Composite materials to increase strength and decrease weight continue to be important areas of research. Concrete wall panels are becoming increasingly thin skinned, some with alkali-resistant glass fibers instead of conventional steel reinforcement. There is also research into improved resin exterior coatings, more permanent facing and a broader range of esthetic options. Masonry product manufacturers are similarly moving toward more industrialized wall systems, including brick, core and interior finishes and, in an effort to reduce weight and ease fabrication, more hollow brick assemblies.

The ceramic tile manufacturers seem heartened by recent architectural trends, citing the material's role in history, its classicism and distinctive appearance. The growth and development area is in facade uses and there is research to reduce the cost and complexity of installation. One manufacturer has developed a ceramic tile wall panel that can be in-

stalled similarly to glass, with a regular window frame or lock strip neoprene gasket. While lightweight, the new system requires no back support, but may be adhered directly onto metal studs. Research goals were grounded in improvement of current product lines.

The Porcelain Enamel Institute reports trends toward increased use of the banding panels without windows to improve energy performance. The metal preparation processes are being streamlined and electrophoresis and powder coatings introduced to improve the continuity of surface coatings. Reducing the firing temperatures is allowing use of a better, thinner gauge of metal and maintenance of a smooth texture with fewer distortions.

Some of the glass research and development is now yielding products with greatly improved performance as a skin material. When the energy crisis first hit, glass facades took much of the brunt as energy conservation and the elimination

Hard-hit by the energy crisis, the glass industry responded with research.

of glass became widely equated. In some cases, laws were passed to limit glass in buildings to 10 percent of wall surfaces, and glass was labeled an uncontrolled source of heat loss. For the past five years and on into the foreseeable future, the glass manufacturers have been concentrating much of their research on improving the energy performance of glass, with the result that the glass building may again be acceptable in a newly energy-conscious design vocabulary. But the buildings will be newly differentiated, with different kinds of glass in different climates, on different orientations and at different elevations.

Renewed enthusiasm for daylighting has also been a boon to the glass companies and the visual/thermal tradeoffs a particular challenge. The new products demonstrate research into controlled heat loss and heat gain, sophisticated coatings and better understanding of visual quality. One manufacturer was particularly clear on current priorities: "The glass buzzword for the '70s was shading coefficient; for the '80s, its emissivity."

Recent developments have included myriad combinations of multiple glazing systems, insulating techniques, sealing systems and coatings. Reflective coatings have been and continue to be a major development area. Pyrolytic coatings, vacuum deposited coatings, sputtered and wet chemical coatings are already commercially available, offering a diverse applicability, shading coefficients and reflectances. Plastic films are a recent innovation to decrease weight and increase

solar transmittance. Window products using the film are only now coming onto the market, but there is a substantial amount of research continuing. The films increase the insulation capacity of windows and reduce penetration of ultraviolet light, without compromising the solar gain potential. New efforts are also being made to incorporate solar control devices into windows, which has been more common in Europe. Controlled air-flow window assemblies are also being introduced, where the air space in the window becomes an extension of the mechanical system. Chemical research into dynamic glazing systems is becoming more important.

The companies differentiate between the energy performance of residential and commercial buildings and developing product and marketing strategies appropriate to each. One company is developing low-emittance coatings with high transmission and low long-wave radiation. For commercial markets, it is looking to block the heat because of high internal loads and relying on reflective coatings.

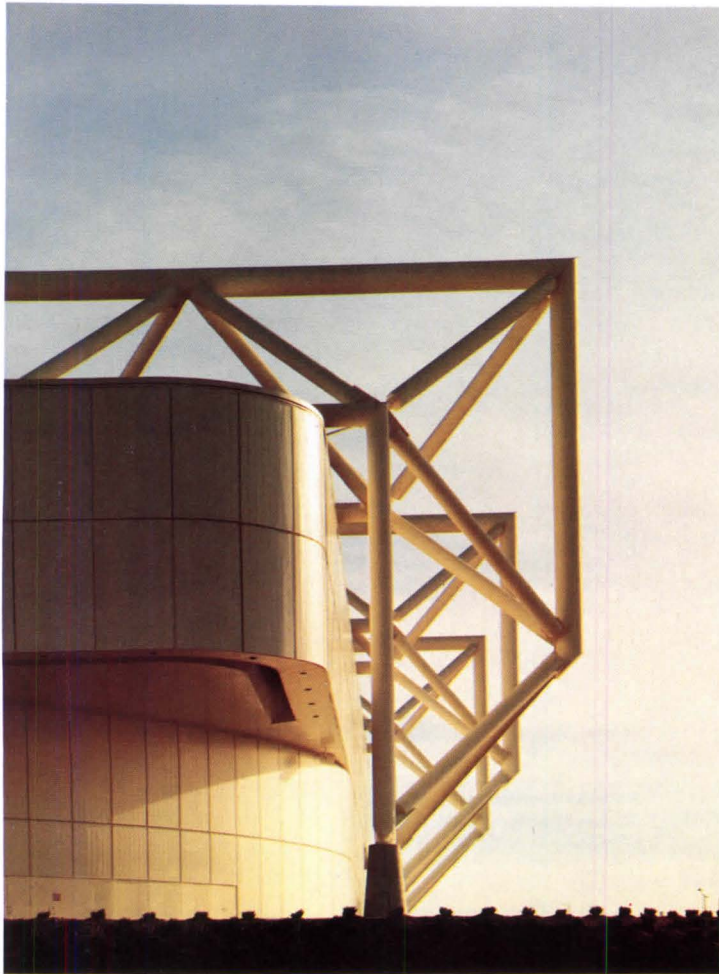
The use of glass spandrels with built-in thermal controls is anticipated, and there will be a trend toward more variety in color, including bright and pastel colors. The sensitivity to energy concerns also includes new product development for use in atriums and other non-vertical applications. One manufacturer is researching a variety of sloped glazing uses, looking for architects to use more geometric variety in building design.

The manufacturers of skyroof systems have similar expectations. One is concentrating on passive solar performance, integrating both daylight and thermal performance criteria. Currently, it has a panel with a U-value of .13 to 4, but is looking to development of one with a U-value of .10 by the end of 1982. Its design explorations also include increased long-span applications, with clear aluminum spans to 140 feet, again in response to increased architectural demands for formal diversity as well as energy performance.

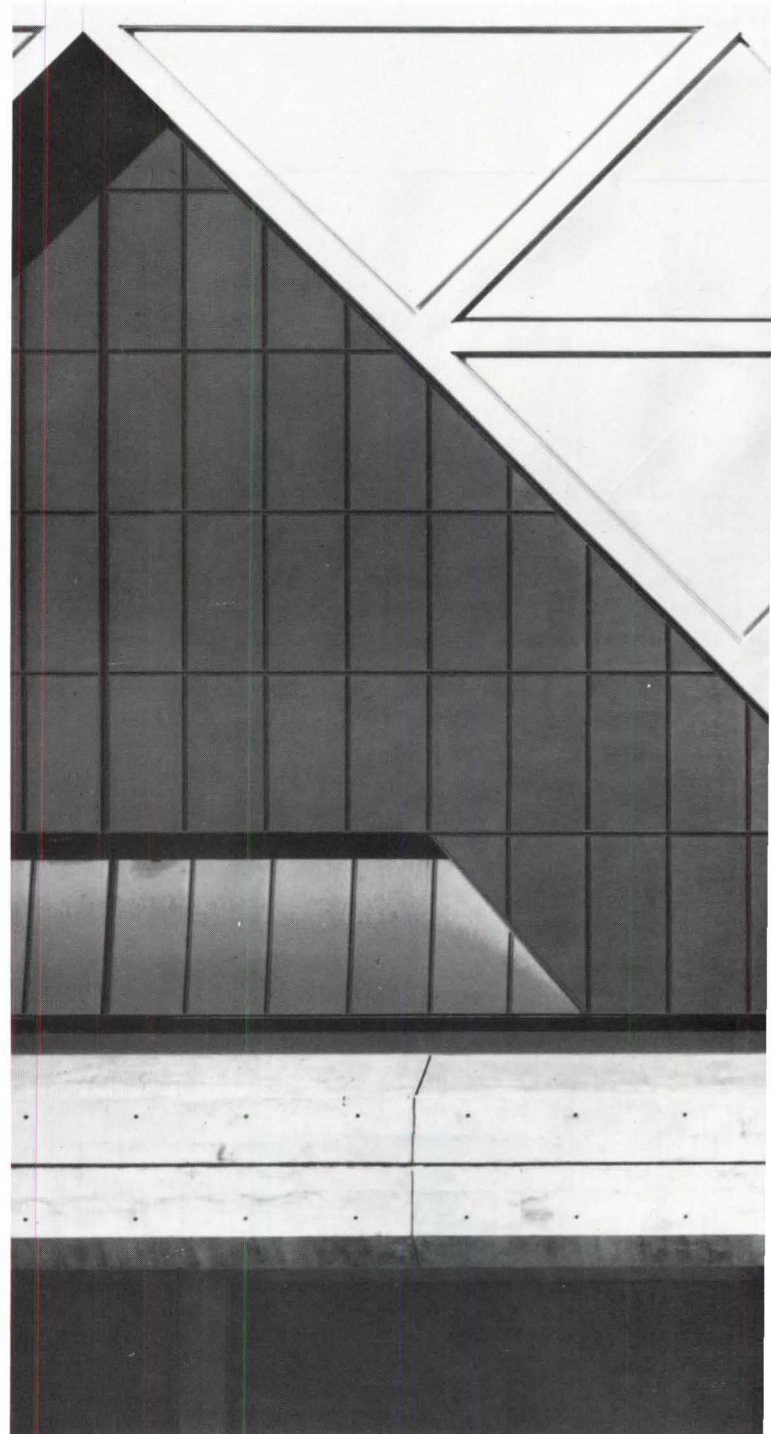
The informal survey of manufacturers is interesting in some broad respects. The glass industry was the hardest hit by the energy crisis and the changes in design criteria that followed. It is also the industry that seems to have the clearest research agenda and the greatest array of new products on the market, or under development, that are clear results of recent research. It speaks to the nature of much of private sector research in being a clear and effective response to a crisis that seemed to change the previous roles of success. But it leaves open the question about the building industry's ability and interest to sustain a commitment to long-term research with less obvious applications in the immediate future. □

The Changing Skins of Helmut Jahn

Miesian fundamentals followed by 'a little fantasy.' By S.A.



Helmut Jahn is a prodigious talent and, as chief designer of his firm, Murphy/Jahn (which, until last March, had long been known as C. F. Murphy Associates, Inc.), he has manifested his talent in many ways—in overall building compositions, in relating new work to built contexts, in playful experiments with natural light and in general matters of polish, wit and sheer bravado. He showed in his early work—as behoves a Chicago architect and I.I.T. graduate—admirable devotion to Miesian ideals. Although his devoutness has recently been tempered with some more worldly interests, the Miesian respect for fundamental order underlies all his work, even the latest and most apparently capricious. He feels now that much current work has “little fan-

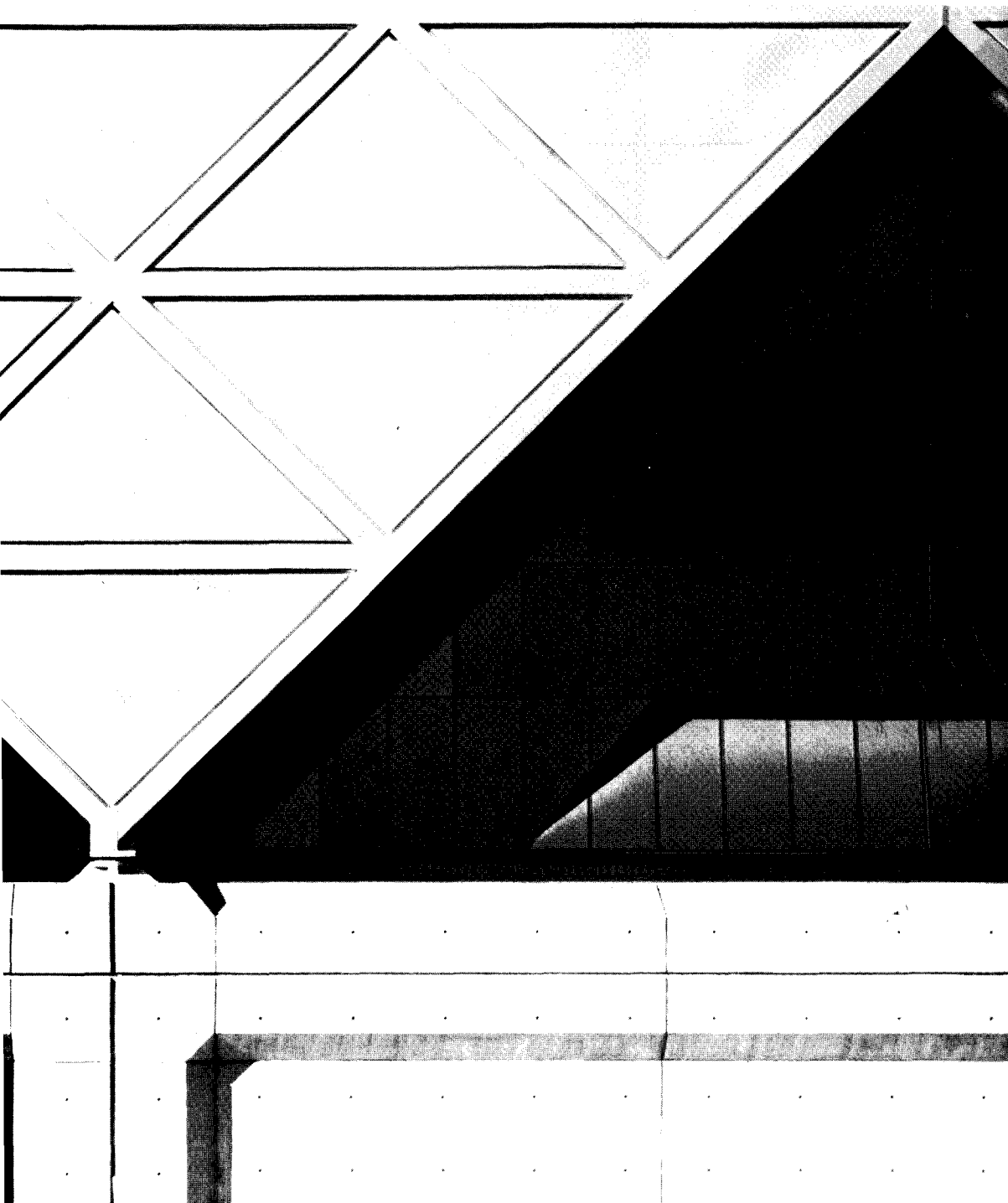


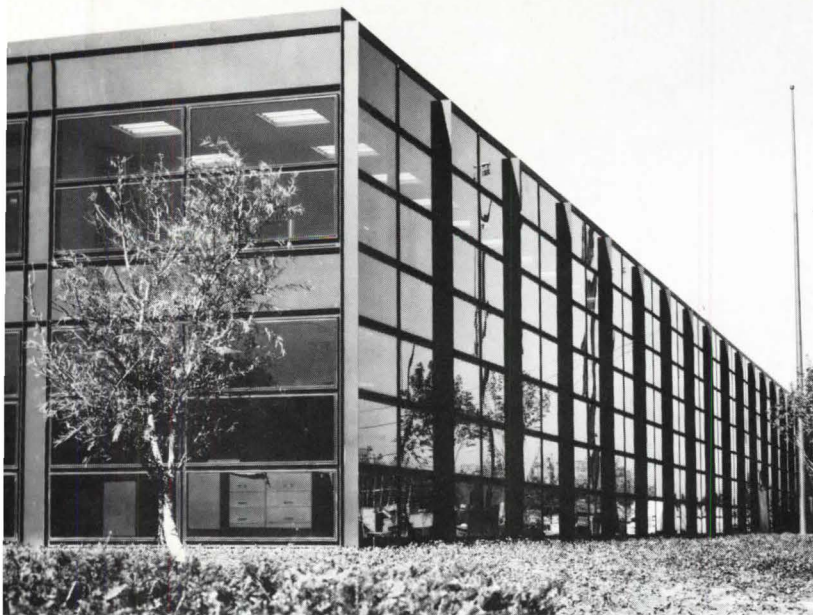
tasy, little excitement," and he is happy if his own work is "a reaction against stale architecture devoid of those attributes." Yet he is still a believer: His new work is "not an attack against Mies," he insists, "but against some of his followers." And throughout his development there has been a key interest in the building envelope, an interest enriched by, not at all in conflict with, the Miesian interest in structure. "As I achieve more distance from my work," Jahn says, "I see more and more that interest in building skin has been a primary motivation."

It is an interest that has been both continuous and greatly varied, and the play between structure and skin is one aspect of its variety. The 1974 Kemper Arena in Kansas City (Jahn's first

AIA Honor Award; he was 34 when the building was finished) was a rephrasing of Mies' Crown Hall, but with its over-the-roof structure more lyrical, less epic, and with the skin of the enclosure suspended inside the structure contrastingly taut, monolithic and opaque. Whatever its structural or constructional faults may have been, Kemper was based on a strong design concept, a very special solution for a special column-free space. More typical of Jahn's work of a few years ago were skins that

Two Murphy/Jahn buildings in Kansas City: left, the 1974 Kemper Arena, now rebuilt after a 1979 roof failure; below, a steel-paneled truss of the 1976 Bartle exhibition hall.





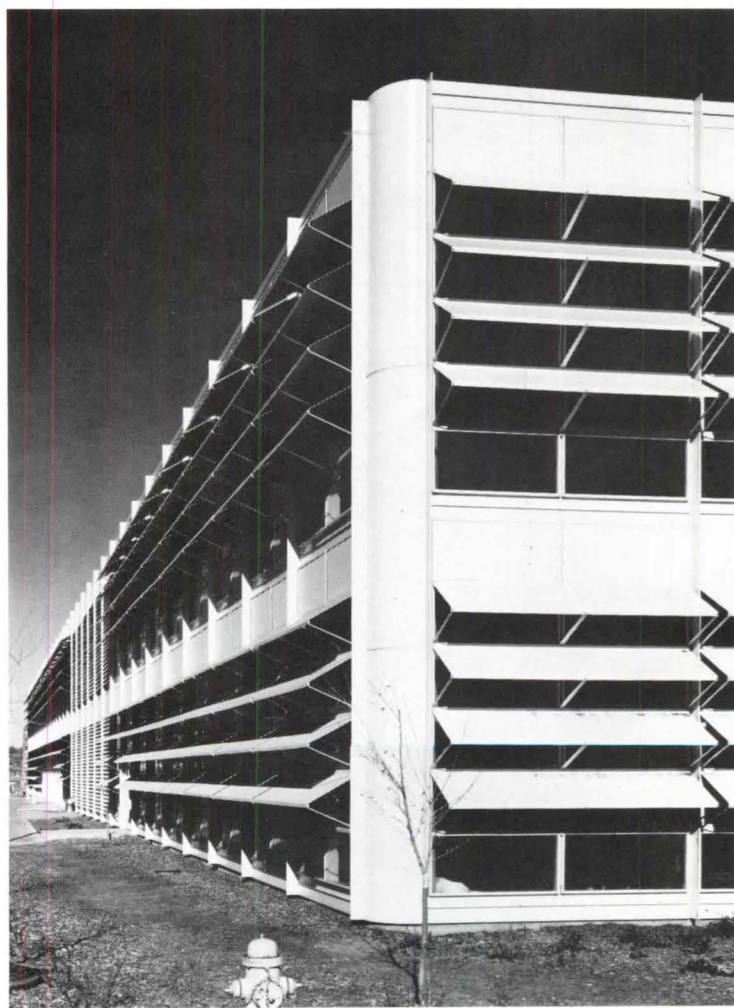
From structural expression to metaphor.

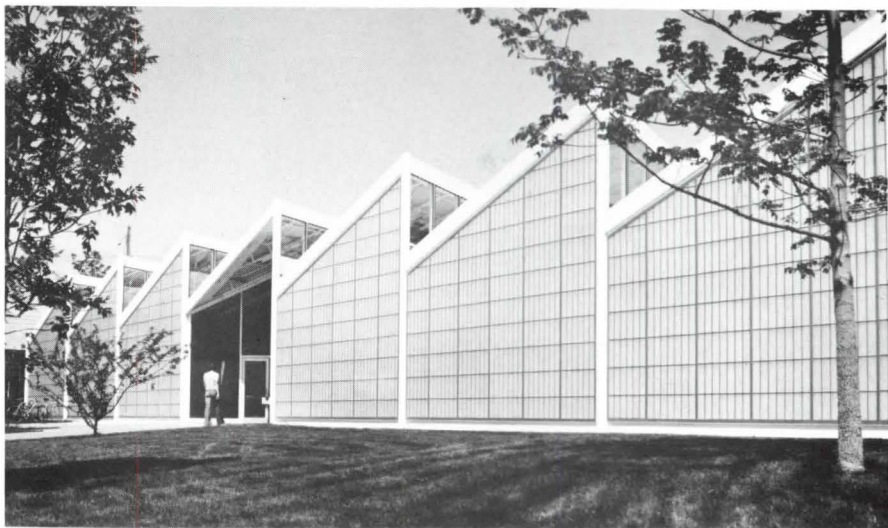
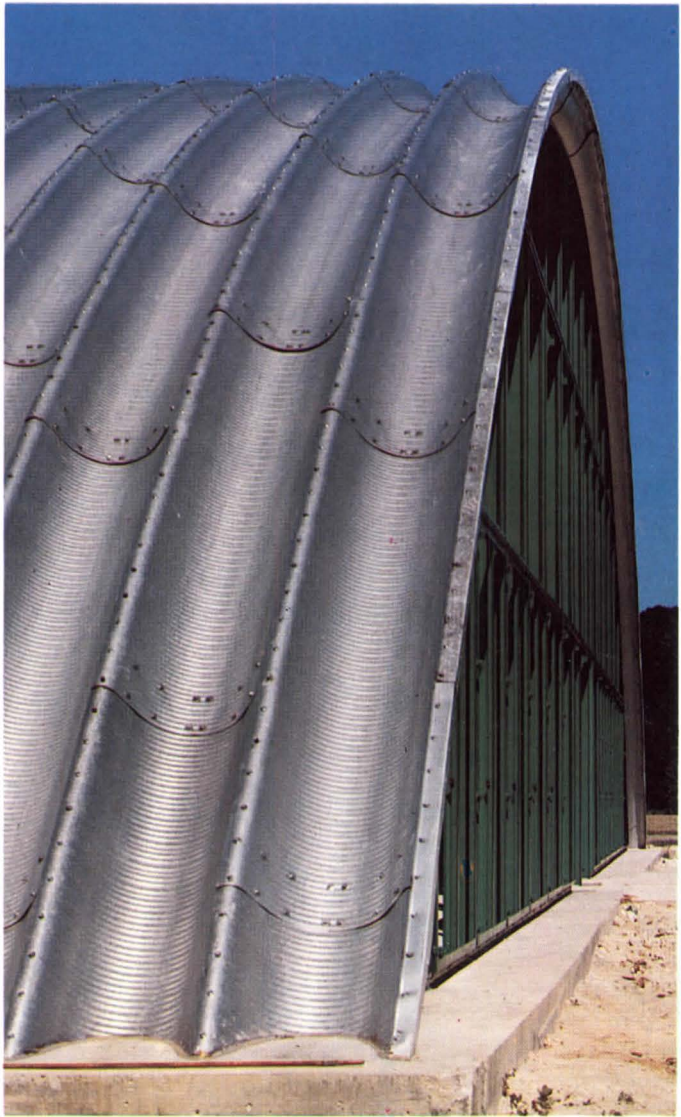
speak directly of the less specialized structural systems behind them. Typical of his more recent designs are skins that, in addition, speak metaphorically of building content and purpose. It is a development that has been a personal one ("I shy away from being a standard-bearer," Jahn says. "It is not my purpose to convince."); nevertheless, it is a development consonant with much recent reconsideration of the proper role of architecture and, because of that consonance, instructive about the present state of the art and how we came to it.

In the Fourth District Courts Building, Maywood, Ill., completed in 1976, the skin is a direct statement of structure, the use of a sprinkler system having obviated fireproofing and allowed exposure of the steel frame. On short sides of the building, glass serves as an infill between members of this frame, showing the building's 50-foot bays and 20-foot exterior cantilevers. The cantilevered edges are wrapped by a skin of one-quarter-inch single pane solar-bronze glass, the spandrel panels being made also of glass held two inches in front of rigid insulation. The result is thus expressive of both the cantilevered bays and of the building's possible longitudinal extension. Also finished in 1976, the John Marshall Courts Building in Richmond is based on a 40-foot-square structural bay. Lacking the directionality of the Maywood structure, the building is appropriately given a more neutral skin, held a bit away from the column lines, its curved corners emphasizing its function as exterior wrapping.

Two other Jahn buildings finished about the same time have more complex skins. Kansas City's H. Roe Bartle exhibition hall (by C. F. Murphy in joint venture with Seligson Associates, Horner & Blessing, and Howard Needles Tammen Bergendoff, and the scene of AIA's 1979 convention) flaunts a muscular skin of triangular truss members infilled with insulated steel panels; below the truss is hung a recessed surface of porcelain enamel sandwich panels. The surface complexity of the Auraria library in Denver, however, derives not from structure but from sun control. Exterior sunshades protect the building's south and

Above, the structure of the Fourth District Courts building, Maywood, Ill., 1976, is explained by changes in the building skin as it turns a corner. Top right, a simpler statement for the John Marshall building, Richmond, 1976. Right, sunshading dominates the skin of the Auraria library, Denver, 1976. Across page, some later Jahn skin treatments: top, Rust-Oleum headquarters, Vernon Hills, Ill., 1978; left, La Lumiere gymnasium, La Porte, Ind., 1978; middle right, the Michigan City, Ind., library, 1977; bottom right, St. Mary's multipurpose facility, 1978.



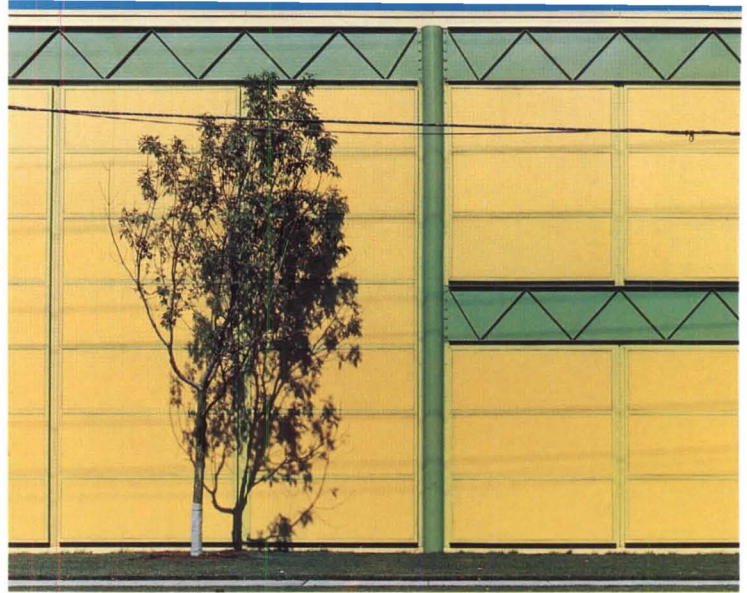
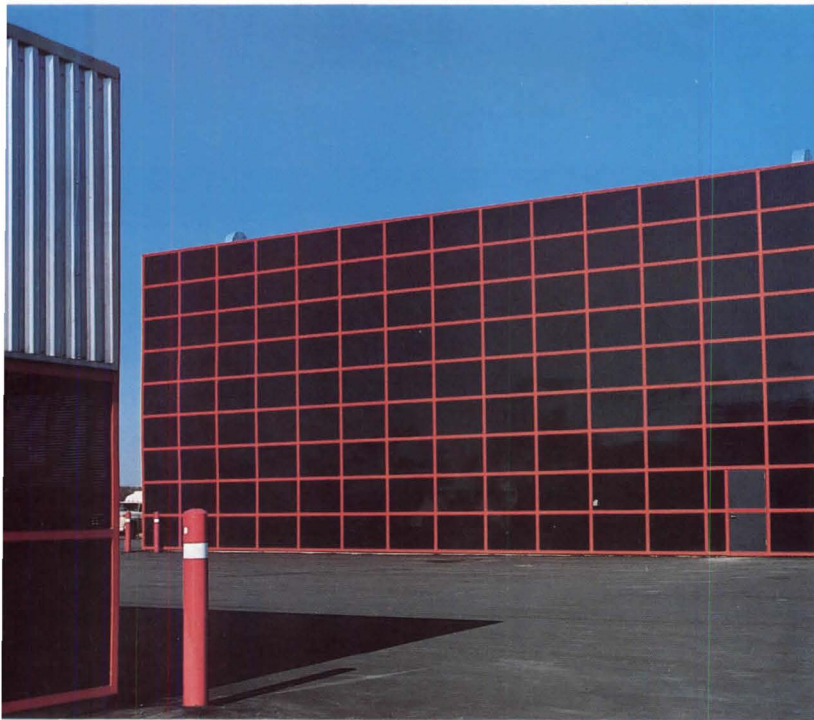


west exposures, and all sides are enclosed with a combination of fixed glass, operating sash and aluminum panels. The effect is that of a kit of interchangeable parts, but a more varied, free-wheeling one than the equally modular but more prim facade of the John Marshall building.

The Michigan City, Ind., library and St. Mary's multipurpose facility, Notre Dame, Ind. (an AIA Honor Award winner in 1979), introduce a lighter, more playful treatment. Exposed structural members are wrapped in—and largely visible through—skins that juxtapose clear glass and insulated fiberglass. In

both buildings, the translucent and transparent surfaces are continued overhead as roof areas or clerestories. Although in the case of St. Mary's the skin discloses the building's long spans, in the manner of Jahn's earlier work, the skin here has begun to do more—still *informed* by structure, it has a new liveliness and variety that are obviously derived from other interests.

But, alas, our neat story of progress from structural expression to metaphor is interrupted and complicated by a number of Jahn designs that seem quite independent of the developing pattern. One of these, the 1978 La Lumiere gymnasium in La Porte,



Recent designs are complex and expressive.

Ind., is bold and direct, its wall/roof/structure/skin a simple vault of bolted preformed metal, with glass walls filling the ends of the 110-foot spans. And Rust-Oleum's Vernon Hills, Ill., headquarters, another work of 1978, even seems to be a return to the quiet, uncomplicated elegance of the John Marshall Courts Building, although there are some new subtleties here: variations where solid panels (and the floors behind them) are omitted, but with the modular framing system continuing without interruption.

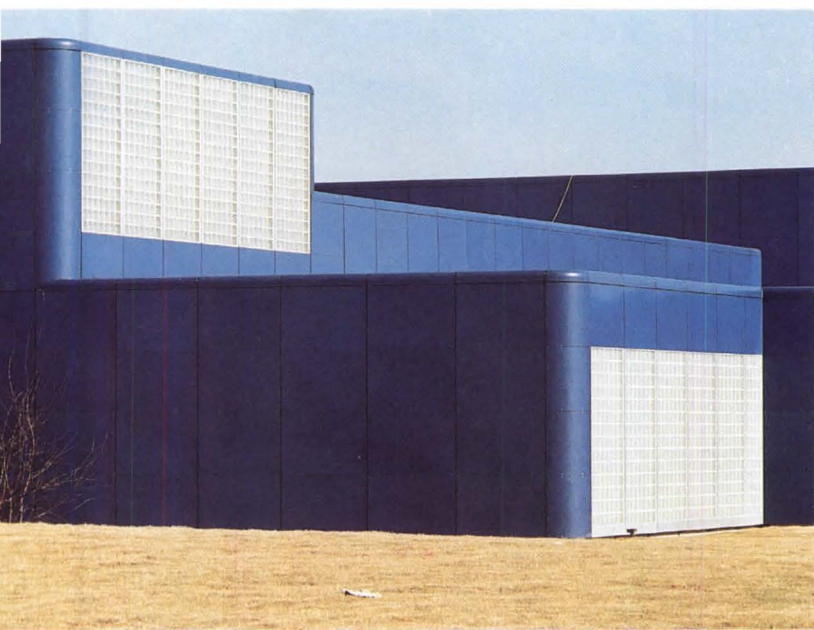
Because of a suppression of other elements and a general opacity of the skin, such modular framing becomes even more dominant in the Bolingbrook district headquarters of the Commonwealth Edison Co. A red and black scheme (the colors of Commonwealth Edison signage) emphasizes the building's graphic quality, the black panels being sometimes metal, sometimes dark tinted glass.

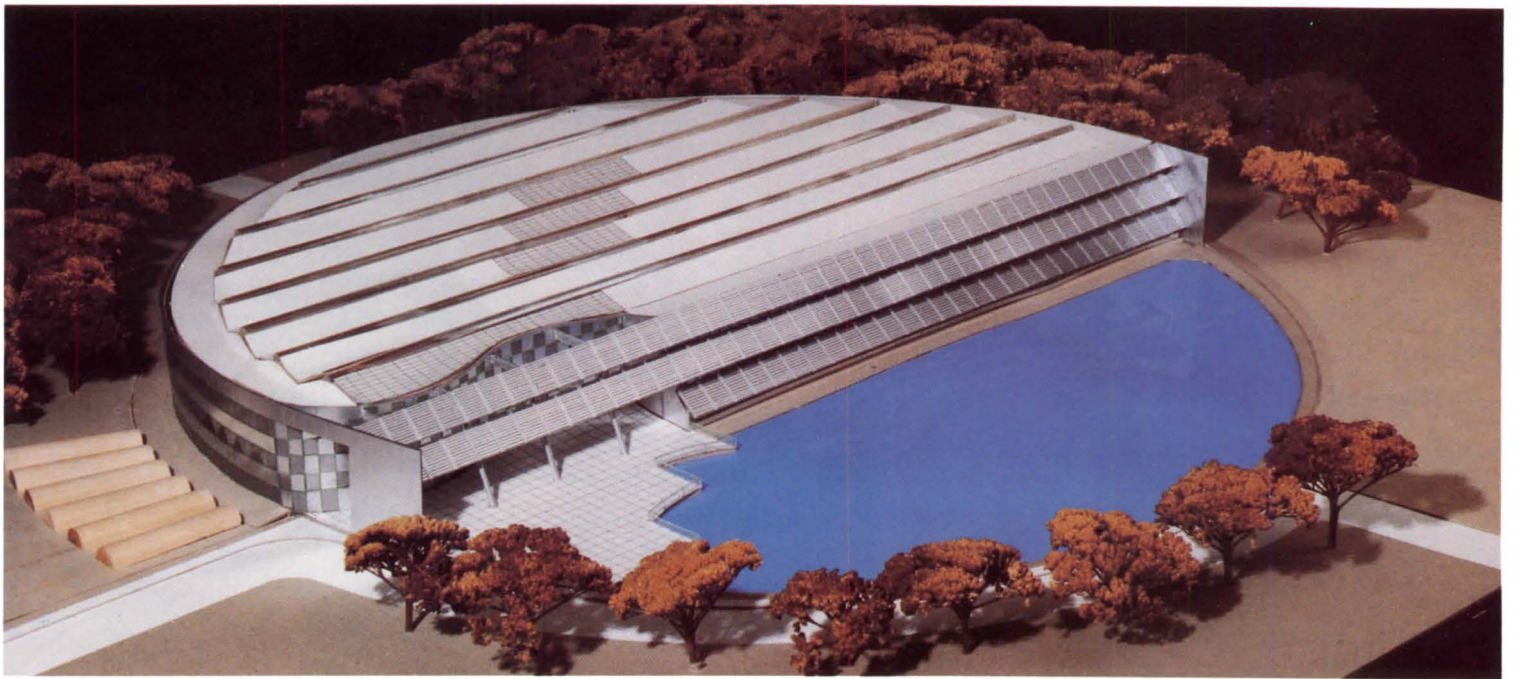
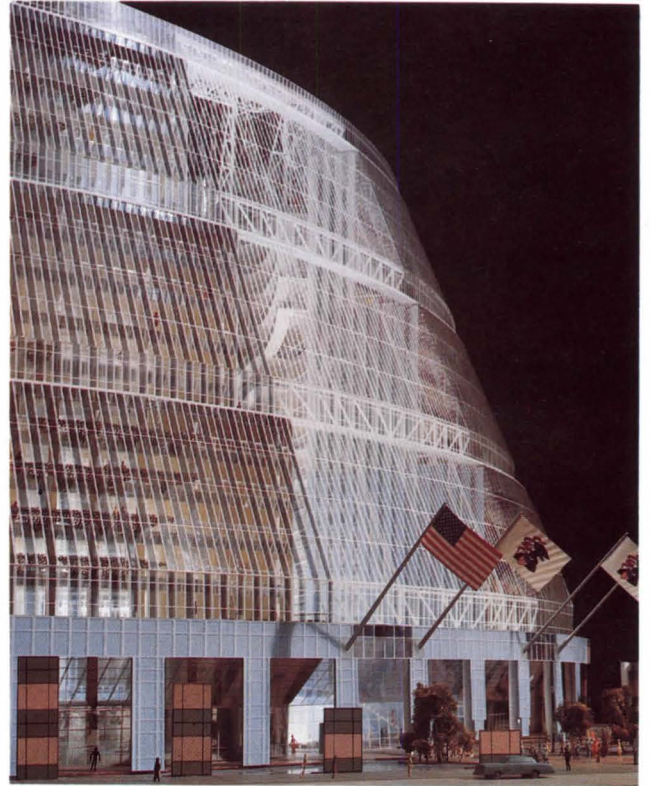
It is in the 1980 De La Garza career center, a vocational training school in East Chicago, Ind., that Jahn's use of color really blossoms. It is a purposeful, no-holds-barred assemblage of yellow steel panels, dark green aluminum structure, lime green mullions and muntins, orange doors and blue mechanical equipment. But this color is doing more than just being colorful: It is skin communicating not only about building form but also about building content, its dominant yellow, with the addition of other bright colors, making a clear reference to the big road machines, tractors and other industrial artifacts that De La Garza students are taught to operate and repair.

Jahn's recently completed U.S. Post Office for Oakbrook, Ill., and his Chicago Area Two police headquarters, now nearing completion, continue this trend, the police building uniformed in regulation dark blue, and the post office, in the shapes as well as in the colors of its ceramic tile envelope, being clearly generated from the image of mailboxes and postal service graphics. Here, clearly, there is—in Jahn's words—"an element beyond technical pragmatism."

To excerpt these designs from a large and diverse body of work is to imply that Jahn's developing use of metaphor has been obsessively singleminded; the whole picture is rather more diverse. Many recent works, such as Chicago's Xerox tower shown in our last annual review of new American architecture (mid-May) have skins that are skillful and striking, their character reinforcing that of the building form, their glass areas responsive to orientation, but hardly laden with references or messages. And Jahn's very latest work, such as the Argonne National

Recent Jahn skins have shown increasing use of color and symbolism. Left, top to bottom, Commonwealth Edison district headquarters, Bolingbrook, Ill., 1980; Area Two police headquarters, Chicago, nearing completion; U.S. Post Office, Oak Brook, Ill., 1980. Directly above, De La Garza Career Center, East Chicago, Ind., 1980.



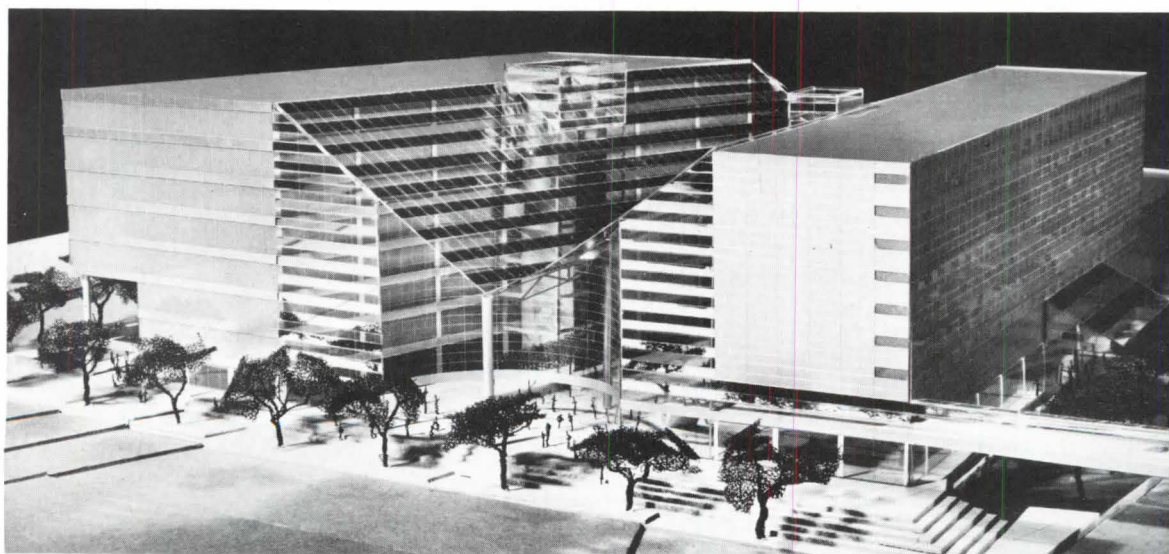


Laboratories, the First Bank Center in South Bend and the State of Illinois Center, all now under construction, display an unprecedentedly painterly attitude toward building skin, manipulating variations in color, spacing, transparency and reflectivity. Jahn, of course, is well aware that building envelopes are not simply art works or means of expression but building elements intimately and necessarily related to their contents, especially to their mechanical systems and energy concerns. (Jahn prefers the phrase "resource consciousness.")

Nevertheless, within practical limits and with some exceptions Jahn's work does show a progression toward effects that are increasingly varied, complex, expressive and, to be blunt, fun. It is a progression Jahn is making in the company of other design frontiersmen, each of them moving in a slightly different direction. Robert A. M. Stern, for one example, has written recently (in *Contemporary Architects*, St. Martin's Press, 1980) about his own progression—and he might have been writing about some of Jahn's work, as well—that "facades are not diapha-

The 1980 Xerox tower, Chicago, top left, has a skin designed to emphasize the building's form. Jahn buildings now under construction promise more fanciful skins: top right, the State of Illinois Center; above, program support facility at Argonne National Laboratories.

nous veils. . . . They are mediators between buildings as 'real' constructs and those illusions, allusions and perceptions necessary to put buildings in closer contact with their social, cultural, historical and physical milieu." Jahn seems to be thinking of the same goal (if not in the same kind of prose) when he says that buildings, tall buildings particularly, have an obligation to "establish urban symbolism." It is a goal obviously susceptible of many interpretations, and perhaps the most reassuring aspect of Jahn's own progression toward it is that unyielding backbone of Miesian discipline we know he brings as equipment. Perhaps the most exciting thing about his progression, though, is this: No one can say where it will lead. □



Also under construction now is Jahn's First Bank Center in South Bend, Ind., seen here in model form and in a progress photo. Its elaborate form is reinforced by the skin's horizontal banding, changing from opaque to transparent with varying degrees of reflectivity.



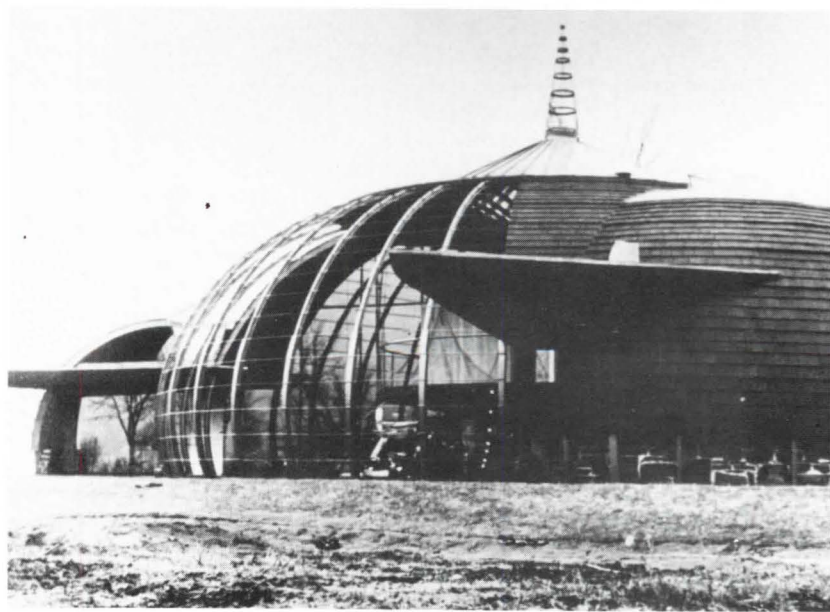
The Idiosyncratic Skins of Bruce Goff

Underneath it all, 'belief in esthetic integrity.' Text and photos by Jeffrey Cook, AIA

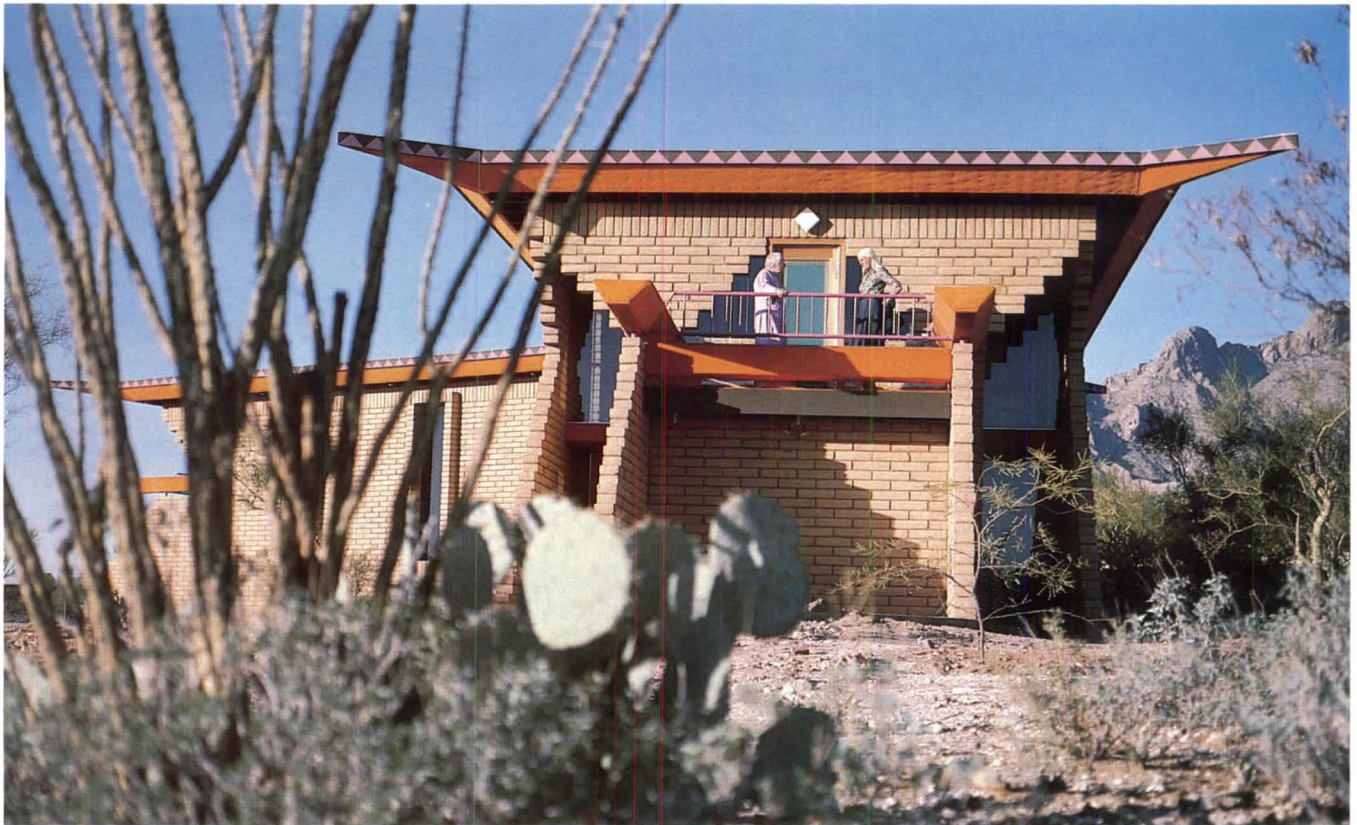
While many current architects struggle ubiquitously with elegant condom sheaths of seamless Alucobond or the planar textures of diagonal redwood siding, Bruce Goff has fantasized for over half a century with enclosures assembled from the world's fullest array of materials. Goff does not "skin" a building; he grows an enclosure.

With Goff one gets a serendipitous barrage of compound images in which the building materials are not obvious. His is an alchemy of Woolworth ashtrays, fishnets, outdoor carpeting, anthracite coal, oozing mortar joints, recycled boiler pipes, disposable pie plates, cellophane, stencil paint, turkey insemination tubes, sequins, fish scale shingles, spray can paint, stainless steel biplane braces, paper doilies and gold leaf—none of which has much place in a Sweets catalog. But in addition to the rejected oil well pipes, fallen trees, floating saucers and uncovered bedrock are the lumber, stucco, studs, anodized aluminum and open web joists of more ordinary building materials. They are often unnoticeable in the inseparable concordance of his design. The fact that it is an eclectic mix of recycled cast-offs from an industrial world, fused with an unorthodox use of more conventional building materials, is moot. It is their orchestrated tactile synthesis that counts.

Mr. Cook, author of *The Architecture of Bruce Goff* (1978), teaches architecture at Arizona State University.



Walls of Redeemer Lutheran Sunday school in Bartlesville, Okla., top, are native limestone studded with glass fragments. Masonry walls of the Ford house in Aurora, Ill., are enveloped in a structure wrapped in cedar shingles and screening (above).



Enclosures that combine humor and craft.

Goff seldom uses materials straight or spare. Even plate glass is often decorated with surface collage or adjacent tactile contrast or deliberate reflections of nearby architectural features. He heightens and intensifies material qualities by juxtaposed construction or assembly enrichment. The resultant enlivened and encrusted enclosures sometimes seem geological, sometimes seem jeweled. Sometimes materials are polarized by the revealing treatment of their edges. Sometimes there is a surface development and unfolding of abstracted repetitive ornamentation that derives from a geometric base and whose exemplars are Wright and Sullivan. More frequently Goff derives esthetic depth from a more organic exploration of material fiber and crystal by the detailing of assembled parts. The fish scale and diamond shingle patterns of several houses immediately come to mind—their curvacious stretched diaphragms or folded planes wrinkled with 19th century edges also simultaneously describe in miniature the plan rhythm of the whole building scheme.

Goff's favorite materials enhancement is the decoration of plate glass doors and windows with repetitive designs by directly gluing glass mosaics, sequins and other materials on them in repetitive geometric designs. Their colored multiscaled collages overlay views both into and out of spaces. The combination of architectural pattern and more distant view binds enclosure to space while underlining the delicacy and richness of the enclosure.

Stone walls peppered with marbles, vertical mission tile walls, alternating colored and projecting masonry courses and mosaic tile features are other surface-sensitive treatments whose variant liveliness and polychromatic patterns come from a certain humor as well as craft in assembling construction.

To call Goff's enclosures "walls" is perhaps as erroneous as to call them "skins." For Goff, the skin is more than a skirt between roof and ground to keep out the rain. It is not only the most visible part of any building, it is the essence of his architecture. On examination Goff's walls are primarily vertical, have structural stability and control light, views and ventilation with an original style each time.

Goff's walls not only keep the weather out with ever chang-

ing style, but also with environmental discrimination. Most of his buildings were designed in that other era of cheap fossil fuels and therefore had no programmatic or ethic mandate for energy efficiency. Nevertheless, one of his major houses was designed and is known as a "solar house." The 1947 Ledbetter house in Norman, Okla., had a large glass south wall protected by a calculated overhang. However, the solar aperture was articulated by a sawtooth plan with the southeast facing planes solid and decorated with punctured diamonds of heavy glass ashtrays; hidden hinged shutters provided summertime ventilation. There are other examples of sensitive solar orientation and environmental discrimination based on climate, but that has never been an obsession. Response to views or need for privacy could easily take priority.

Goff has always avoided double hung windows. Typically the ventilation function is separated from windows and is served by screened openings with shutters. Thus, the window could be a continuous piece of unbroken glass whose shape is not restricted to conventional rectangular sizes. Most important, it is always polished quarter-inch plate or heavier. For Goff the optical clarity of vision and the brilliant undistorted reflections of polished plate are critically important to architectural contrast and tactile relief. Hidden reglets or discreet stops avoid the conventional framing details of glass and reinforce its crystalline appearance.

Goff's windows usually provide strongly framed views to garden or distant scenes while preserving the privacy of the interior. Goff also uses another window type not for view but for daylighting purposes. Placed under the roof or around the turn of a wall, it articulates the weather enclosure without destroying it. Natural light enters from a variety of levels and directions, sometimes from sources unseen, to multiply the effects of bilat-

Top left, the Barby II house in Tucson, Ariz., with slump block walls exposed inside and out. Top center, the Nicol house, Kansas City, Mo., its serrated facade composed of plate glass triangles and chevron wood shingles. Top right, the Pi Lambda Phi fraternity house, Oklahoma University, Norman, built in 1955 on a minimal budget with walls of corrugated aluminum painted in contrasting colors to add depth. Right, model house, Lake Village, Tyler, Tex. The bright door is a typical Goff touch.



eral lighting. They soften the interior, enhancing character and privacy while intimately attaching the interior mood to the natural world beyond. This provides a sense of universe whose pursuit of inside/outside relationships is much softer than the planar solid/void articulation of more conventional architectural design.

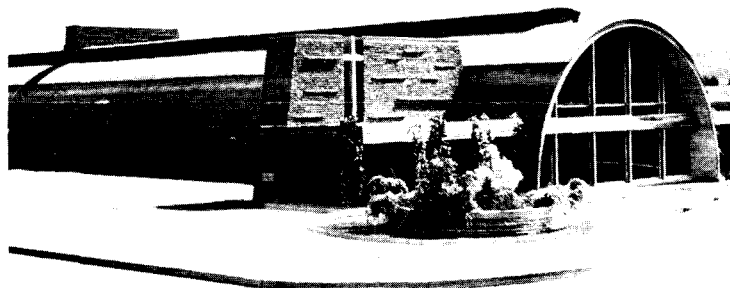
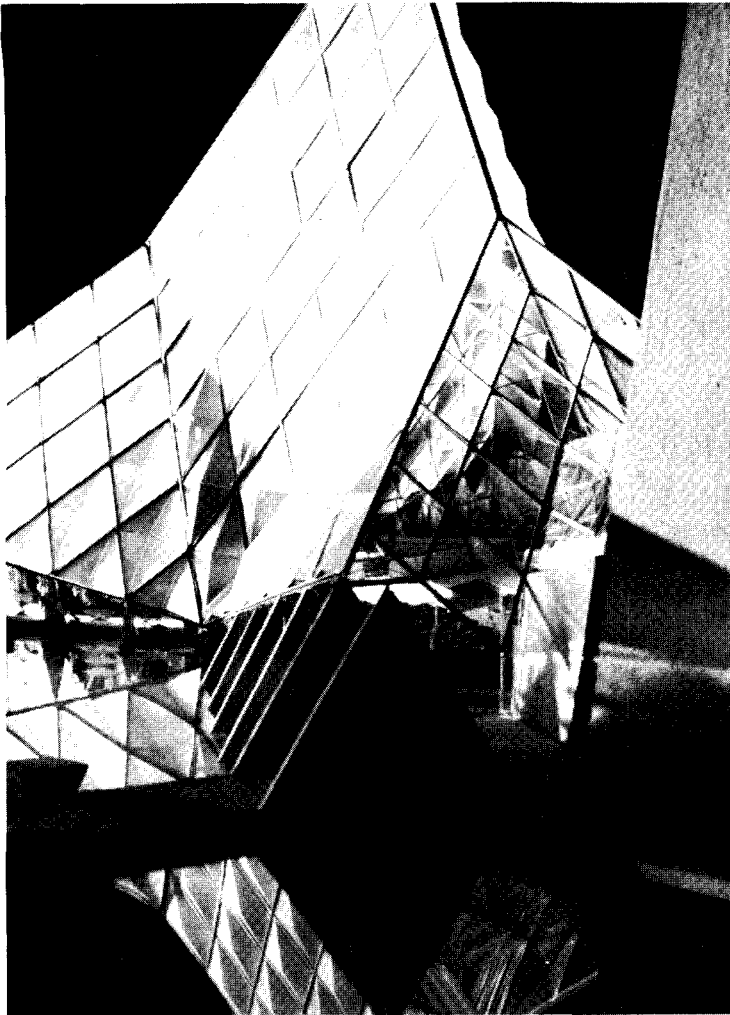
In spite of the worldly quality and materials of his walls, Goff aspires to an organic quality of innate belonging. While he recognizes our "world village," and constantly chafes at the restrictions of all current materials, he searches to free architecture from the handcrafted methods of his own works. For Goff "indigenous" means more than local or native, which for him are often superficial and sentimental. Rather he seeks to empower client preferences by material combinations that create new and personal esthetic synergies.

Virtually all of Goff's buildings are private houses in remote locations and for quiet and often retiring clients. Inaccessible, experienced only by photographs, Goff's designs are a curious and divergent counter to the American skin catalog of self-conscious architectural cloaks. Goff has managed to defy the successive waves of monocultural styles that most architects ride. With mostly modest budgets, and with all the rest of the restraints that other architects experience, Goff's pluralistic quest within the contemporary cultural milieu proves that the artistic potentials of 20th century building are continuously realizable.

Goff has avoided building design as a surreal image of materialistic efficiency by concentrating on the particularities of each building program. Refinement for Goff is not in the micro-detailing of materials, at which he is somewhat accomplished. Rather, refinement comes in the depth of esthetic perceptions and their translation into realized wholes with the new palettes of materials appropriate to each commission. Thus, just as Goff's designs fit no materials catalog, so his architecture fits no conventional stylistic or philosophic label.

Goff's divergence from the norms of American architectural practice are conceptual. Since he did not go to architecture school he was not taught some standard design process or esthetic expression that the rest of us have been educated to believe is the true way. Goff's self-discovered belief that site and client must be generators of an architectural originality is an





Inventive form and scintillation of surface.

approach often labeled "organic." For him, the organic is a tradition of architectural determinism based on the most artistic resolution of context. To that degree it is neither esthetic anarchy nor free art. But with Goff the creative plurality of context has been explored the most extensively.

Goff's architectural odyssey in America has had little convergence, either with himself or with anyone else. At only one point in the dynamics of the century's architecture has the design of loner Bruce Goff crossed the path of current convention. His 1945 Seabee Chapel at Camp Parks in California was seen in the Quonset advertisements as well as serious architectural articles of the late 1940s. It was a time of interest in innovative form-giving structure that was soon eclipsed by the steel and concrete trabeations of Mies and others. That experience came for Goff after several years during World War II of trying to be inventive with the stock military materials to be found in remote bases in Alaska. Previously Goff had the benefit of four years as chief designer of the Libbey-Owens-Ford glass company office that produced glass remodeling proposals for the entire country. There his experience with industrial materials such as Vitrolite

gave him a confidence and facility in the techniques of detailing that has continued to mature.

Goff's dedication to architecture as a "creative art" is what all architects say they are doing. With Goff the differences are not only visible, they are renewed with every building. Each design is a fresh prototype. His claim of interest in the "continuous present" is a restless quest much more evident in the spatial and surface exuberance of his elevations than in the geometric regularity or studied irregularity of his plans. But obviously Goff's enclosures do not come from "elevating" or extruding his plans.

The integrity of Goff's designs challenge analytical dissection. His belief in the organic wholeness and rightness of composition appear well founded in the results, which display a finality of resolution. Both Goff and his modest band of devotees would disbelieve the value of examining "skin" as a separable architectural entity. They are separate from those theorists and practitioners who view the physics of building design as skeletons (frames) with hung envelopes (skins) and support services (mechanical equipment). Nevertheless the examining eye would discover that clarity of structural expression is an elementary part of Goff's architecture. Yet somehow the impact of the whole, the fascination of inventive form and the scintillation of surface richness typically distract structural detectives.

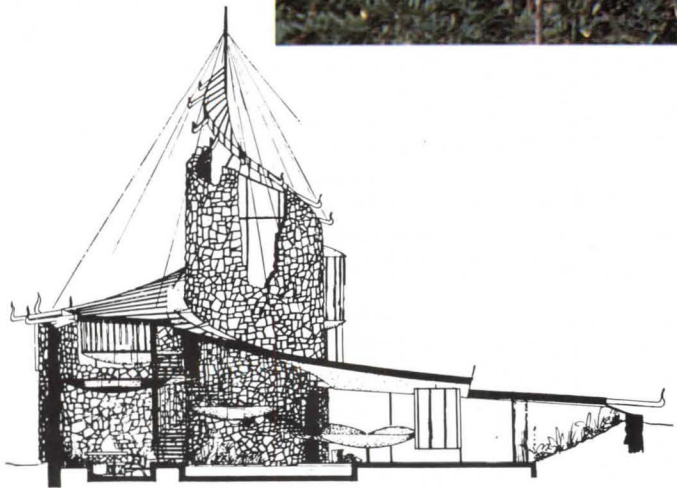
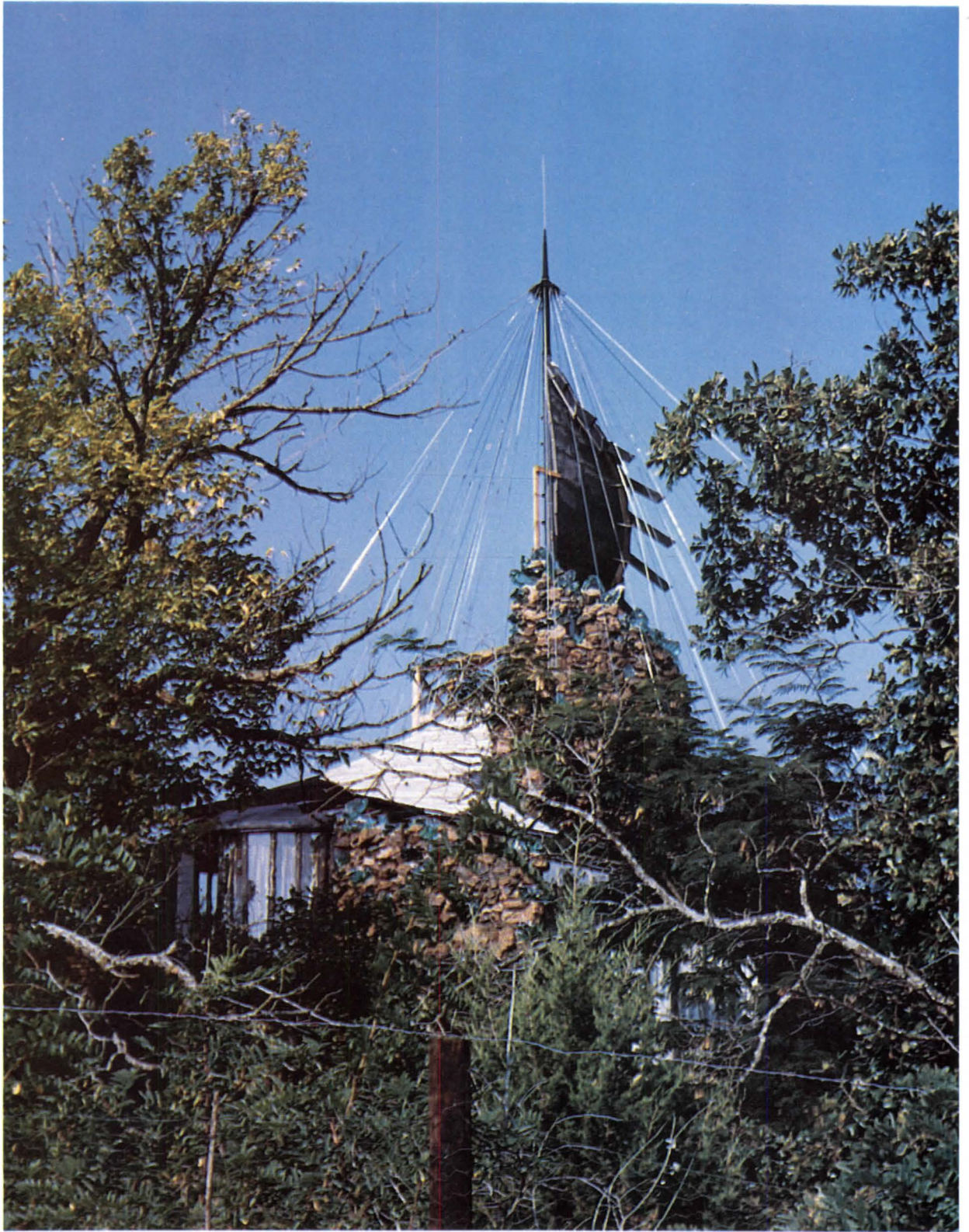
By looking only at exterior skins this essay and its illustrations violate the "organic" tenet under which Goff and a certain sector of the architectural profession continue to practice. They are inseparable from the total. For some, the response of the exterior surfaces is derived from the natural world—from thermal responses to the local climate or from materials derived from the context of regional resources both material and cultural. For Goff the context of design is the whole world of a spirited esthetic imagination, not just the soil of the earth. The goal is the infusion of some new dream, the habitation of some deliberate beauty.

Middle class tastes, current trends and banker esthetics defy Goff, almost as much as they perpetually hypnotize the current architectural community. Those conventional perceptions and mirrored facades he perceives at best as diagrammatic and borrowed. Since his own unfettered designs are achieved without drugs or drink and with only the plainest food, his belief in esthetic integrity requires neither trend sets nor other institutional endorsement. In a century of corporate clients and tastes, Goff is a free spirit whose individuality is a holdout either from or for another era.

Among the few buildings of Goff that suggest a skin structure is his 1949 unbuilt Crystal Chapel. Its folded stainless steel grid structure was to sit on pink Oklahoma granite triangles set in pools of water. Its translucent insulated glazing of quarter-inch pink colored tempered glass would have a gemlike glass-on-glass treatment sealed between. The northeast planes would remain clear to allow the spire to be viewed from inside. The lively depth of Goff's proposed glowing wall with structural sparkle behind can be compared with Philip Johnson's Crystal Cathedral of more than a quarter-century later. That is also based on a triangulated industrial enclosure. Johnson's structural space frame is whitened and his glass is a single layer of uniform tint of 8 percent transparency; it is a shaded blanket that sits flat on the ground, in contrast to Goff's unbuilt jewels.

Goff's originality has few precedents and attempts no associations. Although he attempts abstract visions, many viewers enjoy literary assumptions suggested by characterful exterior design. Thus, Goff's facility with a wood frame house, the Frank Cole house at Park Ridge, Ill., of 1935 earned it the title of "a cubistic lightning splitter" from a local carpenter.

Such entertaining interpretations tell at once of the charged whole images of Goff's designs where structure and skin have the presence of one, regardless of the facts. Sleek skins may encourage clean, sensible design. Idiosyncratic building is seldom such architecture. □



Across page top, the unbuilt Crystal Chapel and below it the Seabee Chapel at Camp Parks, both Goff designs of the 1940s. Above, the Bavinger house in Norman, whose spiraling mast and cables are the most published image of Goff. Less notice has gone to the way its rugged walls of rocks gathered from surrounding fields merge with the undisciplined landscape.

The Sophisticated Skins of Cesar Pelli

'They have ceased to talk only about themselves.' By John Pastier

While the emergence of postmodernism has added undeniable variety to architecture, it has also muddied the waters. The clarity, concern for building technique and fidelity to materials that were central tenets of the modern movement seem to have little value to designers fascinated by older stylistic devices. Instead, the postmodernists—few of whom admit to the validity of that expression or their participation in such a movement—have placed greater value on formalism, axuality, symmetry and artfully composed facades. Classical motifs have been revived with a vengeance, and the moldings, capitals, pilasters and vaults of the Beaux-Arts are now lovingly crafted in sheetrock and plywood, painted in the dusty colors so popular with the Victorians. More often than not this is an architectural celebration of the mixed metaphor, meant as an improvement over modernism's indifference to allusion. Although its aims of richness, eclectic freedom, symbolic meaning and historic reference are all laudable in the abstract, the concrete products of the postmodern sensibility tend to be caricatures of old architecture or disingenuously superficial essays.

Superficial: literally on the surface, figuratively skin deep. In a delicious irony, the reformers have taken a modern standby—the lightweight, nonstructural wall—and turned it into a weathertight stageset. The dull but honest modernist skin has been shed and replaced by a new model that is perhaps not as dull and certainly not as honest.

Of course, there was no law requiring honesty in the enclosures of modern buildings. Mies van der Rohe's famous habit of using a structural metal member as a nonstructural symbol for the real framework of a building proves that complexity and contradiction were not first discovered in Philadelphia. Nor was there any building code provision mandating dullness. Tight economics and the Spartan palette of modernism made it difficult to design skins well, but there have always been a few architects of sufficient ability to conquer those limitations.

Cesar Pelli, who earned his place in that small group long ago, would not even agree that those factors were limiting. He says, "I am interested in skins because that is the way we build in our time. Real masonry—stone used to support the weight of a building—is beautiful, but we can no longer afford to build that way. Walls have been freed of their structural function, but there is still a temptation to mimic masonry. There's nothing

wrong with that—whether one's skins express themselves as lightweight membranes or seem solid and massive is not a litmus test between good and bad architecture. Still, design solutions are usually better when they are consistent with the way they are built."

Although Pelli has never been a dogmatist, the tone of these observations is somewhat more ecumenical than those he might have expressed 10 or 15 years ago, when glass skins occupied more of his design attention. At that time he was beginning an independent career after eight years in Eero Saarinen's office. Perhaps visible would be a better word than independent, since Pelli was not in business for himself but was in charge of design first at Daniel Mann Johnson & Mendenhall and then at Gruen Associates, two large, commercially oriented firms in Los Angeles. There, unlike at Saarinen's, the clients rarely had generous budgets and for the most part were not interested in architectural monuments. Efficiency of form and construction were paramount, and although Pelli developed several inventive floor plans based upon circulation spines, those demands for economy plus short design schedules left the curtain wall as the most promising element of design expression.

In the early buildings—those done for DMJM—he collaborated with Anthony Lumsden, a colleague from the Saarinen days for whom Pelli created a position as associate design director. Lumsden had worked on the Bell Telephone laboratories in Holmdel, N.J. This was the first mirror-glass building anywhere, and the material was actually developed for Saarinen to permit walls and ceilings entirely of glass without the usual thermal consequences. At that point, therefore, Pelli and Lumsden were alumni of the architectural practice responsible for the most advanced skin of its time. In 1966, they designed three quite different buildings of lightweight skin, and a fourth that had, by contrast, all the weight that the others had successfully shed.

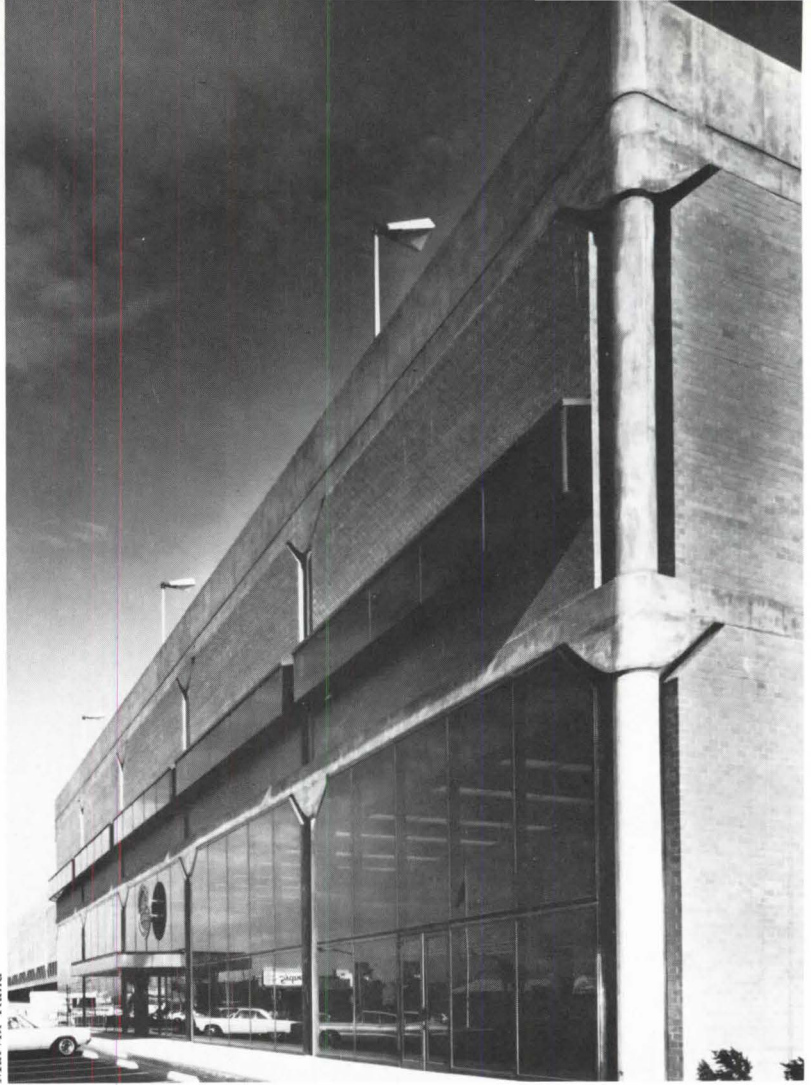
The Teledyne laboratory building (right) had an 800-foot-long glass corridor running along the front, capped by a narrow metal fascia. The glass was mirrored, and since the lab sat in an empty field, the spine had three angled projections that allowed it to reflect part of itself. This is a wonderfully literal example of a self-referential quality that Pelli now ascribes to his early skins. In those days, it was an adventure simply to build a real skin, and those buildings' glassy exteriors seemed content in the mere act of displaying themselves: Pelli today states that "obviousness was their most important design quality."

Mr. Pastier, a frequent contributor, is a teacher and writer in Austin, Tex., and author of *Cesar Pelli* (1980).





Marvin Rand



Early experiments with lightweight cladding.

The second of the group, the federal building in Lawndale, Calif., was also clad in reflective glass and also set in a suburban location where there was little to reflect. Like Teledyne's, its skin is articulated so that the building can reflect itself in some places, but that is not its main design objective. There, the goal was to express the idea of a unified continuous membrane wrapping the structure. That hope was too ambitious for its time, and the available technology and the designers' skills in breaking new ground each fell short of the goal. Both the faceted curves and the combination of mirrored windows and aluminum spandrels lack the smooth continuity needed to support the idea of a single skin.

A third fared better in that regard: In the Century City Medical Plaza, dark gray glass was used for spandrels and windows alike, held together by a mullion system that projected outward less than half an inch and thus allowed the glass to read more as a sheer plane. Since the glass was not mirrored, reflections could occur only at sharp angles to the walls, and under those conditions conventionally protruding mullions would have masked much of the reflected images. Pelli considers the Century City building a breakthrough in the genre because it had the most glass and least framing possible at the time, and on a limited budget to boot. Unfortunately, it was not otherwise as distinguished. Wrapped around a simple prismatic tower of stocky proportions, the dark membrane could not overcome the building's essential banality of form. The idea was more fully realized a few years later at Gruen Associates when Pelli used essentially the same cladding, albeit in dark brown, on a taller and more elegantly shaped tower for the Toronto Dominion Bank in Vancouver, British Columbia.

The other 1966 design was not a true skin but rather a masonry, glass and metal infill for an exposed concrete frame. The structural system for the Worldway Postal Center had been spe-

cified by the client, and Pelli and Lumsden, in a brief afternoon's work, decided to display that framework and to slice the flared column capitals at the perimeter. The result was the opposite of the other claddings, revealing structure rather than veneering it, expressing weight and solidity rather than thinness and lightness and embodying the esthetics of opacity and shadow rather than those of transparency and reflection. The lightweight skins of that year were experiments and as such exciting yet clearly imperfect. The infill wall, although not structural, nevertheless partook of a tested masonry tradition and capitalized on its strengths without breaking new ground.

COMSAT laboratories was Pelli's last major skin building for DMJM. Designed in 1967, it combined spines akin to Teledyne's with an aluminum-and-glass enclosure evolved from that of the Lawndale federal building. Considerably more sophisticated than either of those designs, it was the first time that complicated planning requirements, an advanced wall system and fully realized three-dimensional form were combined and resolved in an executed Pelli building. It marked his transition from a designer of single-issue responses to one demonstrably capable of synthesizing full solutions.

A year later, he had left DMJM for Gruen Associates, and Lumsden had moved into his former role there. After the Toronto Dominion Bank, Pelli's second major design for his new firm was the 1969 San Bernardino City Hall. It was shaped very much like the federal building except that the skin turned corners by means of a 45-degree chamfer rather than a series of facets. Its skin was dark brown glass, and in an act of daring it wrapped around under a deep projection to form a glistening ceiling over a protected entrance loggia. This is another building

Examples of Cesar Pelli's early absorption with skin issues: Top left, Toronto Dominion Bank; above, Worldway Postal Center; top right, San Bernardino City Hall; near right, the Lawndale federal building; far right, the COMSAT laboratories.

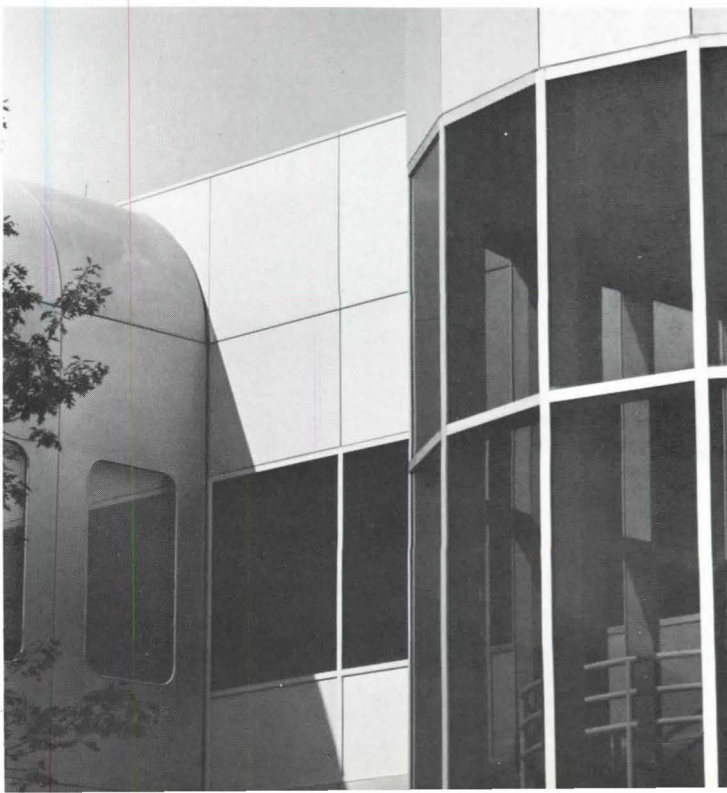
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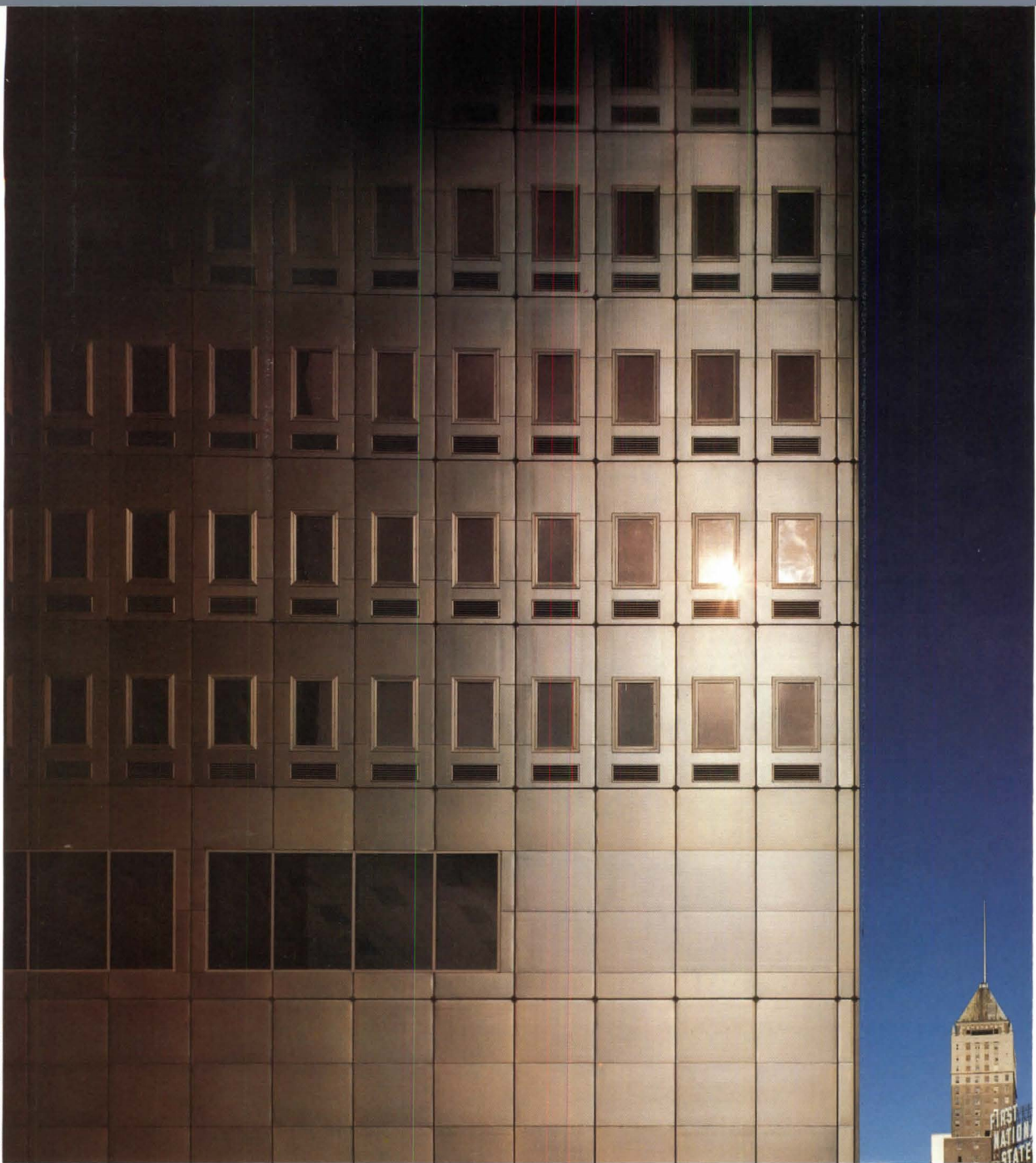
John Pastier



Stephen Hill



Nathaniel Lieberman



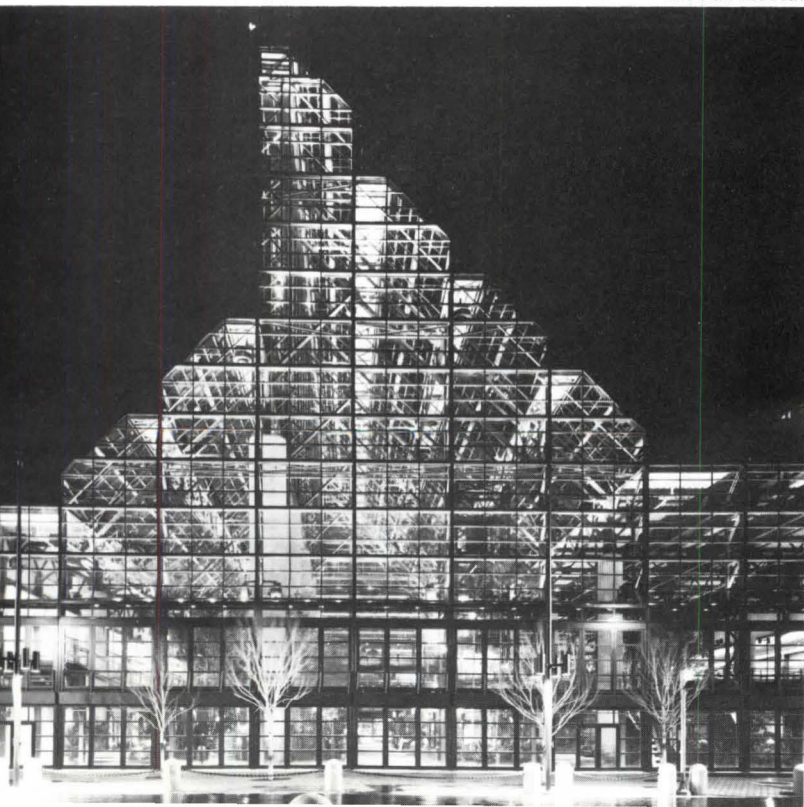
Norman McGrath

Moving from subtlety to bravura to delicacy.

that Pelli regards as a personal milestone because of the consistency of its detailing, the completeness of its wrapping and its expression of “the joy of its skin.”

The design of the Western Electric building in Newark dates from the same year, and here there are no subtle disappointments: It is a straightforward case of the designer’s role being essentially confined to the skin, with building form dictated by economics and client needs. The skin is unusual for Pelli in that it is a deliberate aggregation of discrete panels rather than an attempt to approach the ideal of a single seamless membrane. The floor-height modules contain either very large windows, smaller windows with vents below or are solid aluminum. The joints between these panels are visibly gasketed, and the system clearly implies an interchangeability of elements. As a whole, the building is not sufficiently varied to demonstrate the richness of pattern possible with such a system, and unfortunately Pelli did not follow up on the kit-of-parts strategy in any later commissions.

By 1970, Cesar Pelli’s reputation had advanced to the point where he was nominated for membership to an exclusive club: He was given a commission for a major public building in Columbus, Ind. The assignment was a downtown shopping center and an enclosed public gathering space fronting on the main





Julius Shulman



Balthazar Korab



John Pastier

street. Once again he used a glass skin, but this time with mixed results.

The next year witnessed the design of an extraordinarily subtle enclosure system for a speculative office building in downtown Oakland. The Wells Fargo building—and its later sibling, the Clorox tower—exhibited a twofold awareness of the strong California sun as an illuminator of form and as a radiator of heat. To reinforce the first quality, an indented spandrel was devised to produce distinct shadow lines analogous to those cast by masonry cornices and moldings, while still permitting the glass window bands to create reflections without obstruction. To moderate the second, the proportion of glass to spandrel varied with orientation: Window areas were largest on north walls, reduced on east and west walls and smallest on the south sides of each building. These manipulations of surface and material also gave the structures a variety and scale not possible with standard undifferentiated skins.

But in the same year of 1971, Pelli designed a far from subtle Los Angeles building that did much more for his reputation than all the refinements demonstrated in Oakland. The Pacific Design Center was a building so bold and deftly blatant that it provoked amazement and even outrage in a city that is usually blissfully unaware of its public environment. Immense, oddly shaped, totally confident, shiny and bright blue, it insisted on being noticed. The ploy worked so well that it even gained a

nickname: the Blue Whale. In this design, a basically windowless building program permitted the intense color and reflective properties that only opacity could produce. Pelli had earlier used deep colors on the tiled exteriors of two windowless suburban department stores, but its impact there did not approach that of a 530-foot-long structure of unconventional shape rising above a low carpet of small homes in West Hollywood.

The pendulum swung back to understatement and refined detailing in 1972 with the design of the U.S. embassy at Tokyo. Once again, the floor plan and structure were largely determined by the client. Pelli allowed the bones of the building to be visible at its end and entrance loggia, but otherwise he wrapped the frame in a banded skin of thin scored concrete and operable mirrored windows. Executed with stunning skill by Japanese builders, the gridded membrane takes on some of the apparent lightness of shoji screens. In its palpable delicacy, it occupies a unique place among his executed buildings.

In 1975, Pelli designed an all-glass building for Niagara Falls. He does not categorize its enclosure system as a true skin, but it comes close enough to merit some discussion. The Winter Garden is a large greenhouse and public space that will eventu-

Top left, the Western Electric building in Newark; top center, the Tokyo embassy; top right, the Clorox tower in Oakland; above, the Pacific Design Center; far left, the Niagara Winter Garden.



Towers clad in geometric polychrome curtains.

ally become the centerpiece of a shopping mall. It is an essay on transparency and even permeability since many of its window sections are operable. Although its busy structural system and notched, sheared profile are intentionally stronger design statements than its cladding, the glass walls and roof nevertheless play an essential role in the ensemble. Here is Pelli's most lavish application of glass, but also the one where that material is the most self-effacing.

In 1976, Pelli entered a distinctly new phase of his career by moving from Los Angeles to become dean of architecture at Yale, and, soon after, to enter a truly independent practice. The change of setting and the freedom of working for himself brought about marked changes in his work that were further reinforced by a relaxation of design attitudes within the profession at large. An independent thinker but not an intellectual loner, he believes that "there is great energy in the ideas that are common to your own time. There are certain things each period searches out, and those are the areas where you can do the most." In his case, this did not mean a sudden conversion to postmodern styling, but rather an increased concern with context, a greater playfulness and an increasing preference for compound and hybrid forms rather than pure ones.



Pelli's first independent commission, designed from 1977 onwards and now under construction, was a major expansion of the Museum of Modern Art and a new, income-producing condominium tower adjoining the institution. The enlarged street facade of the museum extends the original 1939 work of Edward Durell Stone and Philip Goodwin, but the tower has provoked objections due to its size (again, a client requirement) its mid-block location and its glassiness. The skin is an astonishingly elaborate combination of roughly a dozen colors—Pelli, understandably, could not recall offhand whether the number was 11 or 13—all in shades of gray that range from a near-white, through charcoal to an almost-blue that will seem stronger in color as it reflects the sky. An irregular grid of black mullions binds the composition together, and in its frank tribute to Mondrian the skin is both an example of historical reference and a symbol of the adjoining museum's purpose. Since some of the panels can be opened, the freely designed skin pattern will be even more varied in use, and further complexity will be introduced by the opening and closing of draperies inside.

Here is a polar opposite to Pelli's other blue glass building, the Pacific Design Center. In its assertiveness of hue, simplicity and horizontality, the Blue Whale is very much in keeping with the spirit of Los Angeles, while the MOMA tower's verticality, explicit cultural reference and delight in drawing distinctions between a dozen shades of gray all speak to the preoccupations of America's metropolis.

In Houston, twin towers with similarly intricate skins are nearing completion. Their mullions are principally dark brown in tone, but a substantial proportion are white and frame a light-colored glass band that corresponds to the space between floor height and the ceiling below. The glass tones are all warm, and include bronze-tinted vision panels and operating windows, brown column covers, an opaque salmon-to-rose shade enclosing the balance of habitable spaces and the previously described milky strip that runs at floor level. The skin is therefore rigorously color-coded to indicate what occurs behind it: livable space, vertical structure or horizontal structure and mechanical space. About a third of the way up, the floor plan of each 44-story tower shifts from one having eight units per floor to one having four larger units within the same area. The skin pattern also shifts to reflect this internal change, with six floors devoted to a pair of intermediate configurations to effect a smooth transition. The uppermost floors are two-story-tall, octagonal penthouse units capped by pyramid-like roofs.



The first two major works of Pelli's independent practice: Above left, the twin Houston towers; and above, a detail of their "color-coded" skin. Left, the nearly completed MOMA tower, and left above, a detail of its Mondrianesque skin.



J. Baird

Kenneth Champlin

Further departures in a rigorous evolution.

The skins have proven controversial primarily because of their color, which could be considered postmodern shades of red and brown, but which is often thought of as pink by people who don't find it to their taste. The heterogeneity of the skin is difficult to judge at this point, since it will become even more complicated by the trappings of occupancy, just as with the MOMA tower. Some strengths have emerged clearly, however: The colors resonate nicely in the warm light of dawn and sunset, and the towers' diagonal alignment allows one building to be reflected in the other throughout most of the day. Both the Four Leaf towers and the MOMA tower skins are Pelli's most masterful exercises in the genre and, like so many design advances, are likely to open up new possibilities to other practitioners. An era of polychrome curtain walls may soon be dawning.

Compared to these *tours-de-force*, the Cleveland clinic is as conservative a cladding as a Brooks Brothers gray pinstripe suit. Setting aside such comparisons, however, it is an unflamboyantly lively building. Long elegant bands of granite and mirror glass run one to three tiers deep and slide past each other on the clinic's front facade. A puzzle-like interlocking pattern effects a transition between the thin strip windows of its examining rooms and the more generous glass expanses of circulation and waiting areas. Applied to a wide symmetrical mass with stepped-back sides, this wall treatment will quite possibly be illustrated in Charles Jencks's next slightly revised and slightly more expensive edition of *Postmodern Classicism*. But despite its faintly historical air, the clinic's skin is clearly descended from that of the Tokyo embassy and is also similar to a somewhat earlier office tower design that Pelli prepared for the Bunker Hill redevelopment competition in Los Angeles.

Pelli's most recent and largest project also makes use of a masonry and glass enclosure system. But, just as the magnitude of Battery Park City's six million square feet of floorspace overshadows anything he has done before, the mastery shown in its graded and layered cladding seems of a higher order than any of his earlier composite skins. Sited next to the monumentally banal twin 110-story towers of the World Trade Center, this planned building group will occupy a physically and symbolically sensitive position in the urban design of lower Manhattan. It seeks to

re-establish the fine-grained pattern of building volume and form that was so rudely interrupted by the WTC, and attempts a more sensitive scale and more sophisticated design approach than has been achieved by nearby buildings of the past generation.

The design developed so far promises to do all those things, and do them brilliantly. The four major towers, rising between 33 and 50 stories, are sheathed in mirror glass set in a grid of granite. Like the older prewar skyscrapers they step back as they rise, and like so many of them they end in distinctively shaped tops: one in a dome, and others in truncated zigzags, mansards and truncated pyramids. And, like a handful of earlier skyscrapers scattered throughout the country, they become lighter in tone as they ascend. The older structures achieved their effect by a careful mixture of several colors of bricks blended together in different proportions at different floor levels. Pelli's buildings do so by changing the proportions of light glass and dark granite in four clearcut zones.

The lowest three floors constitute a heavy arcaded base where the granite predominates. From there to the ninth floor, the granite grid bands are six feet wide and the windows take up only four feet of each 10-foot horizontal module. From the 10th to about the 25th floor, the proportion is four feet of stone to six of glass, and above that it is two of stone to eight of glass. At the very top of each tower, just beneath the shaped caps, there is a single story of mirrored glass alone, held in place by the thinnest of metal frames. The height of each transition was chosen to correspond to that of typical building forms in earlier periods of lower Manhattan's development.

Pelli says that these "buildings are trying to be very good citizens. In my earliest designs, the focus was on the nature of skin itself. Now my skins reflect broader concerns, and they have ceased to talk only about themselves."

This has been a long and rigorous evolution, one that most architects find difficult to achieve in an entire professional lifetime. At 55, Cesar Pelli can still be considered young by the standards of what is notoriously an old man's profession. (Philip Johnson amiably calls him one of "the kids.") Battery Park City may later prove to have been the pinnacle of his accomplishment, in which case his place as one of America's leading 20th century architects would be assured. But perhaps this project will prove to be merely another step in his professional development, as were his best designs of the '60s and '70s. Naturally, such speculation about creative change is futile. As Pelli himself says, "If I knew where I was going, I would already be there." □

Above, the conservatively clad Cleveland clinic. Above right, Battery Park City, and right, two of its variegated towers.



BOOKS

The 'Ladies' Lovely Child' Of the 1893 Chicago Fair



Courtesy of the M.I.T. Historical Collections

The Fair Women. Jeanne Madeline Weimann. (Academy, 360 N. Michigan Ave., Chicago, Ill. 60601, \$29.95 hardbound, \$14.95 paperbound.)

In *The Book of the Fair*, a contemporary report on the World's Columbian Exposition of 1893 at Chicago, Hubert Howe Bancroft emphasized its artistic, material and moral instruction, "so brilliant and yet so transitory." Transitory, certainly, yet it was significant in its effect on American architecture, fixing its white classicism on public buildings all over the country and on the public's taste for at least 40 years. Then came "modernism," with its total scorn of the classic and of surface decoration, reigning for almost another half century. Now, once more, Chicago's '93 exposition has kindled the interest of architects and architectural

historians, and Jeanne Madeline Weimann has given us a new look at it through the lens of the women's movement.

The Woman's Building is the central focus of this exhaustive and exhausting compendium. There seemingly was endless infighting of opposing groups and individuals about the very existence of a women's building. The steely manipulative powers of Bertha Palmer, who beat out contenders for the presidential position, and the unfeeling attitude of most of the officials toward the contributing women architects, sculptors and painters were enough to give the architect who won the competition a nervous breakdown. They did. Sophia Hayden, first woman graduate of the four-year architecture course at the Massachusetts Institute of Technology and winner of the exposition competition open only to women architects, had never constructed a building. She had taught mechanical drawing during the year since her graduation, in preparation for carrying out her plan of entering the profession of architecture. Only 21 years old, she entirely lacked experience with construction and with the demands for modification after acceptance of her original design.

The main feature of the plan was an exhibition hall 65x120 feet, with small exhibition rooms grouped around it and wings at either end for large exhibition rooms. Three stories provided varying sizes of spaces for exhibitions and for assembly use. Roof gardens surrounded by

Sophia Hayden, left, was the architect of the Woman's Building, World's Columbian Exposition, Chicago, 1893, shown below before the scaffolding was removed.

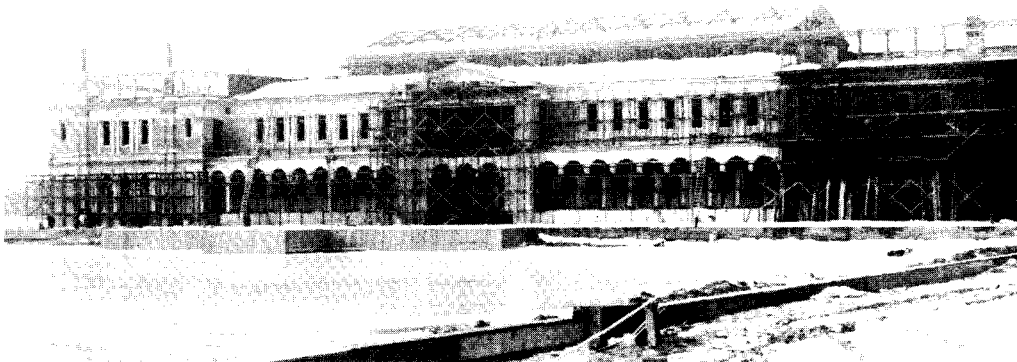
an open screen of small columns and caryatids were surmounted by a light entablature. Her use of the orders followed the accepted classical or Italian renaissance style. The exterior of the structure "evolved quite naturally from the interior conditions," according to Hayden. It was one of the 12 major buildings of the fair.

Daniel Burnham, chief of construction, suggested that Sophia Hayden open a firm in Chicago where "she could soon be at the head of a lucrative business," but Hayden withdrew to Massachusetts, miserable that Palmer was insisting on modifications and commissioning other women to do the interior design, the sculpture and the ornamentation of the building. Called "the Ladies' Lovely Child" by Bertha Palmer, the building won an award for "delicacy of style, artistic taste and geniality and elegance of the entry hall." In 1895, Sophia Hayden married an artist, William Bennett, and was lost to history, although she lived until 1953, when her obituary failed to mention that she had been an architect.

Not a book to read through at one sitting, *The Fair Women* continues for more than 400 pages after completing the story of the construction of the Woman's Building, the part of the book of most interest to architects. The exhibitions to take place in the building were as hotly contested as was its planning. There is no doubt that the Woman's Building was a major attraction for the 27.5 million people who visited the exposition.

Jeanne Madeline Weimann has turned up many fascinating characters ordinarily omitted from history, and her account makes a worthwhile contribution. She has

continued on page 86





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brought architect Sophia Hayden and sculptor Alice Rideout into her spotlight, even though they both disappear almost immediately from our view. It is to be expected that some errors and omissions could be noted, such as Weimann's apparent ignorance of the YWCA's Women's Building designed by Julia Morgan for the Panama Pacific International Exposition in San Francisco in 1915 (v. page 598). On the whole, Weimann has given us a reference work that brings the '93 exposition to life just now when it is again being recognized as an impressive achievement, for its architecture as well as for its introduction of the Ferris wheel. *Sara Holmes Boutelle, Founder/Director of the Julia Morgan Association and author of Julia Morgan, Architect, to be published in 1982, Santa Cruz, Calif.*

Prehistoric Architecture in the Eastern United States. William N. Morgan. (MIT Press, \$25.)

Architect William Morgan has produced an intriguing study of prehistoric architecture east of the Mississippi River. Drawing on work of 19th and 20th century anthropologists and archeologists, Morgan synthesizes what is now known about the sites he investigates in order to "infer the existence of an intrinsic meaning [in the structures] without actually knowing the nature of that meaning." That is, by comparative visual and formal analysis, he attempts to overcome the absence of concrete data about the builders of these structures and their use and meaning.

An introductory overview of his methods and intentions and a summary of the principal architectural qualities that one finds in prehistoric American architecture—enclosure, mass, ascent through space, shaped elements and the arrangement of structures around plazas—precedes descriptive analyses of 82 sites built between 2200 B.C. and 1500 A.D. Morgan divides these sites into three periods. The first, lasting from 2200 B.C. to 1000 B.C., encompasses the architecture of migrating hunters and gatherers, whose principal monuments consist of enclosures of debris and earth, defining and characterizing a central space. In period two (500 B.C. to 200 A.D.), the widespread use of ceramics, the introduction of agriculture and a growing ceremonial focus complemented the construction of large geometrical earthwork enclosures, often connected by processional avenues, and conical burial mounds containing complex log tombs. This is normally referred to by anthropologists as the Hopewellian culture. The third period, which coincides with the anthropologists' Mississippian era, covers the years 800 A.D. to 1500 A.D. Now, agricultural and ceramic pro-

duction are highly developed. Rectangular wall-trench houses with wattle-and-daub walls and thatched roofs were associated with the truncated pyramidal mounds, ascending in terraces, that survive in many parts of the Eastern U.S. These were often part of large ensembles grouped around plazas and enclosed by defensive palisades. The larger number of period three structures surviving allows Morgan to discern geographical distinctions among sites.

Morgan's effort is a frankly experimental one. His work is closer to architectural history than to anthropology, but it fits easily into neither category. He works with fragmentary data that are not yet fully understood by anthropologists. The sites that he treats are at best heavily altered, and in several cases were completely destroyed in the 19th century. Thus, the careful drawings that he presents are reconstructions, based on painstaking analysis of the available data. Morgan's intention is not merely to summarize others' conclusions, but to make an original contribution to the interpretation of the architecture of prehistoric America by offering comparative observations based on the intrinsic formal qualities that he perceives in the sites. This is augmented by a discussion of similar principles that can be found in excavated objects and decorative patterns. In addition, analyses of comparable sites from other cultures of Western Europe, Asia, Mesoamerica and Anglo-America are included as a way of emphasizing the contrasts and similarities in the formal principles evident in prehistoric American building.

The book has its limitations. For one thing, the title is misleading. As a result of Morgan's own professional bias (he is interested in contemporary earthen construction) and of the greater rate of survival of earthworks, disproportionate atten-

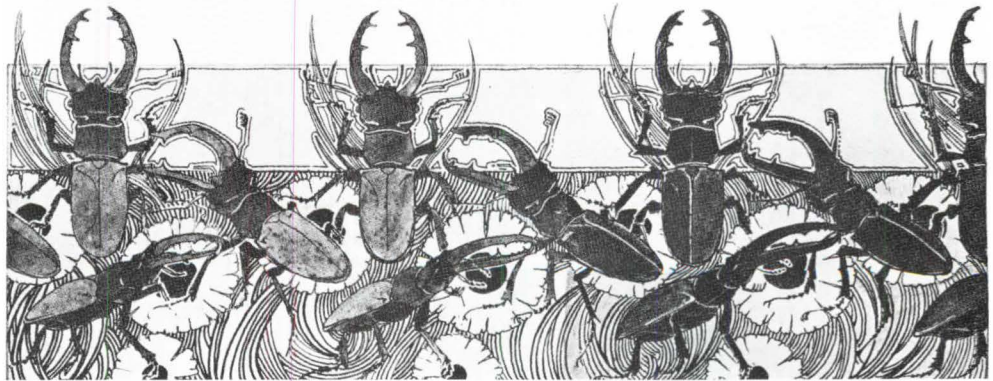
tion is paid to these enormous structures. This introduces other implicit biases. The large earthworks were primarily ceremonial structures, and thus there is little here about domestic architecture. Furthermore, many Eastern peoples did not build earthen structures, and whole groups and regions of Eastern U.S. are thus passed over.

There are also theoretical difficulties inherent in the kind of approach Morgan takes. His expressed intention is "intuitively [to] perceive essential tendencies at different places and times." But "tendencies" of this sort are cultural values, not physiological instincts, and the ability to perceive them is also learned. Thus to operate "intuitively" is merely to avoid questioning the relevance of one's own point of view to that of people living in the distant past. The meanings that Morgan perceives are not "intrinsic" as he claims (following Erwin Panofsky), but ones that an architect is trained to find. Nevertheless, Morgan is in other respects so careful and so frank about his assumptions and procedures that he avoids the most dangerous aspects of his point of view.

The text could have been better organized. The three periods are defined in essentially the same fashion in the introduction to the book, in the introductions to the three sections and in the conclusion. Other points are repeated as well. The sense of repetition is heightened by the catalog-like structure, which often renders it difficult to make the very comparisons that Morgan intends. Finally, the conclusion is choppy and stilted, reading like a manuscript archeological field report rather than a finished book intended for general consumption.

None of these faults is crippling. Morgan has written an important, original book. Several of his comparative devices

continued on page 88



The Art Nouveau Style Book of Alphonse Mucha. Edited by David M. H. Kern. (Dover, \$7.95.) Reproduced in this book are all 72 plates from *Documents décoratifs* (1901), a portfolio of Alphonse Mucha's art nouveau designs for posters, jewelry, wallpaper, stained glass, furniture, human figures and botanical studies (photo above). Mucha (1860-1939) was a famed practitioner of the graphic arts, often imitated but seldom equaled. He has been called the "high priest" of the art nouveau movement.

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—the section on comparable sites, the frequent references in the discussions of individual sites to famous European monuments constructed at the same time and the term “prehistoric United States” itself—are effective in keeping the comparative perspective in view and in forcing the reader to consider these structures in the context of Western traditions. These monuments are more than mere antiquities, and this book should engage anyone with an interest in architecture of any sort. *Dell Upton, Richmond, Va.*

Preservation Comes of Age: From Williamsburg to the National Trust, 1926-1949.

Charles B. Hosmer Jr. (University Press of Virginia, two volumes, \$37.50.)

It will be said that Charles Hosmer here continues his earlier history of the preservation movement, *Presence of the Past*. Rather less than 300 pages were there required to cover 70 years. Here, more than 1,000 pages of text deal with 23 years. It is a case of the telescope and the microscope. While great scholarship and literary effort have gone into this presentation, the easy sweep and generalization of the earlier volume have been lost. We have instead an apparatus of case studies, geographically distinct areas, blow-by-blow narratives. There is fascination, to be sure, with the minutiae. Many of the personalities acquire a stature and significance (and many of these, like William G. Perry or Charles E. Peterson) will gratify and inspire architect readers. But the result is a work for the scholar rather than the general reader. If you have any doubt, look at those 4,511 footnotes.

And yet, if you are a preservationist of any description—a restoration architect, a member of a preservation or historic district commission, a worker for the Historic American Buildings Survey—you are going to have to read these volumes. The work is well divided to make reading easier, but don't try to take it in one gulp. The 225 illustrations also help, but many of them are portraits of preservation personalities. Most of all, as you read, you will find yourself getting older, adding years to your life, from the beginning rather than for the future. Hosmer tells his story like the great legend tellers. He extracts the wisdom from the historical events. Read about Wakefield, George Washington's birthplace, and ask yourself if it could ever happen again. How did John D. Rockefeller build that terrific commitment to colonial Williamsburg that led him ultimately to invest \$40 million there? What could a businessman like Henry Ford see in the mass of artifacts he assembled at Greenfield Village? These are the things that were happening in the period Hosmer writes about, and they are unlikely to happen today.

The great theme that Hosmer pursues is the rise of professionalism, and the evolution of a preservation establishment, with its trained, experienced personnel and its well-established principles. Three sources are explored. The National Park Service—history-minded, oriented to major national themes, concerned with federally owned land and exercising many specific powers like those over archeological sites, dating back to 1903; Williamsburg, Va.—committed to research, strongly preoccupied with restoration architecture (more precisely to Perry, Shaw and Hepburn), devoted to “interpretation” of its many-sided values; and the American Institute of Architects—active in fighting preservation battles, especially at the grass roots, originator of such programs as the Historic American Buildings Survey and strong supporter of the efforts of many individual architects who were then almost alone in this field. But the evolution of a cadre of professionals is traced in many individual biographical sketches and, when you are through reading, you will feel that you knew many of them.

A lot has happened since 1949, as the National Trust for Historic Preservation cannot resist in pointing out in an institutional afterword. But one shudders to think of its history being written at the same scale as these two volumes. Come to think of it, have we lost those “giants in the earth” whom Hosmer writes about in the professionalism he describes? It would be hard today to find a person of the stature of Tom Vint in the nooks and crannies of the preservation bureaucracy. *Frederick Gutheim, Hon. AIA, Washington, D.C.*

The Potential of Earth-Sheltered and Underground Space. Edited by T. Lance Holthusen. (Pergamon Press, \$48.)

Earth Sheltering: The Form of Energy and the Energy of Form. Edward R. Frenette, AIA; edited by T. Lance Holthusen. (Pergamon Press, \$35 hardbound, \$18 paperbound.)

In June of this year in Kansas City, Mo., there was an unprecedented conference of experts in underground construction. The first of the two books noted above is the official proceedings of the conference, sponsored by the American Underground Space Association.

Why Kansas City? Few realize that there are more than 27 million square feet of mined-out underground space in the Kansas City area. Millions of additional square feet are being created each year. This space is used for storing frozen foods (more than a pound for each person in the U.S., or one-tenth total U.S. capacity), manufacturing delicate electronic and optical equipment (the moon-shot optics, for example), general storage, a foreign trade zone, general light manufacturing

and offices. All this energy efficient, dry, vibration free, secure space represents the secondary use of limestone mines, some of which are virtually under downtown Kansas City. The economic success of the secondary use is rapidly overtaking the importance of the primary mining function. This huge amount of underground space and its extensive and diverse use was the ideal setting for the Underground Space Conference and Exposition.

The proceedings, like the conference, have been divided into four major subject areas: (1) public policy; (2) earth-sheltered buildings; (3) urban planning for underground space uses, and (4) deep-mined space. Of the 42 papers, 36 were from the U.S., while six were from abroad, including Finland, Germany, Israel, the Peoples Republic of China, Great Britain and Switzerland.

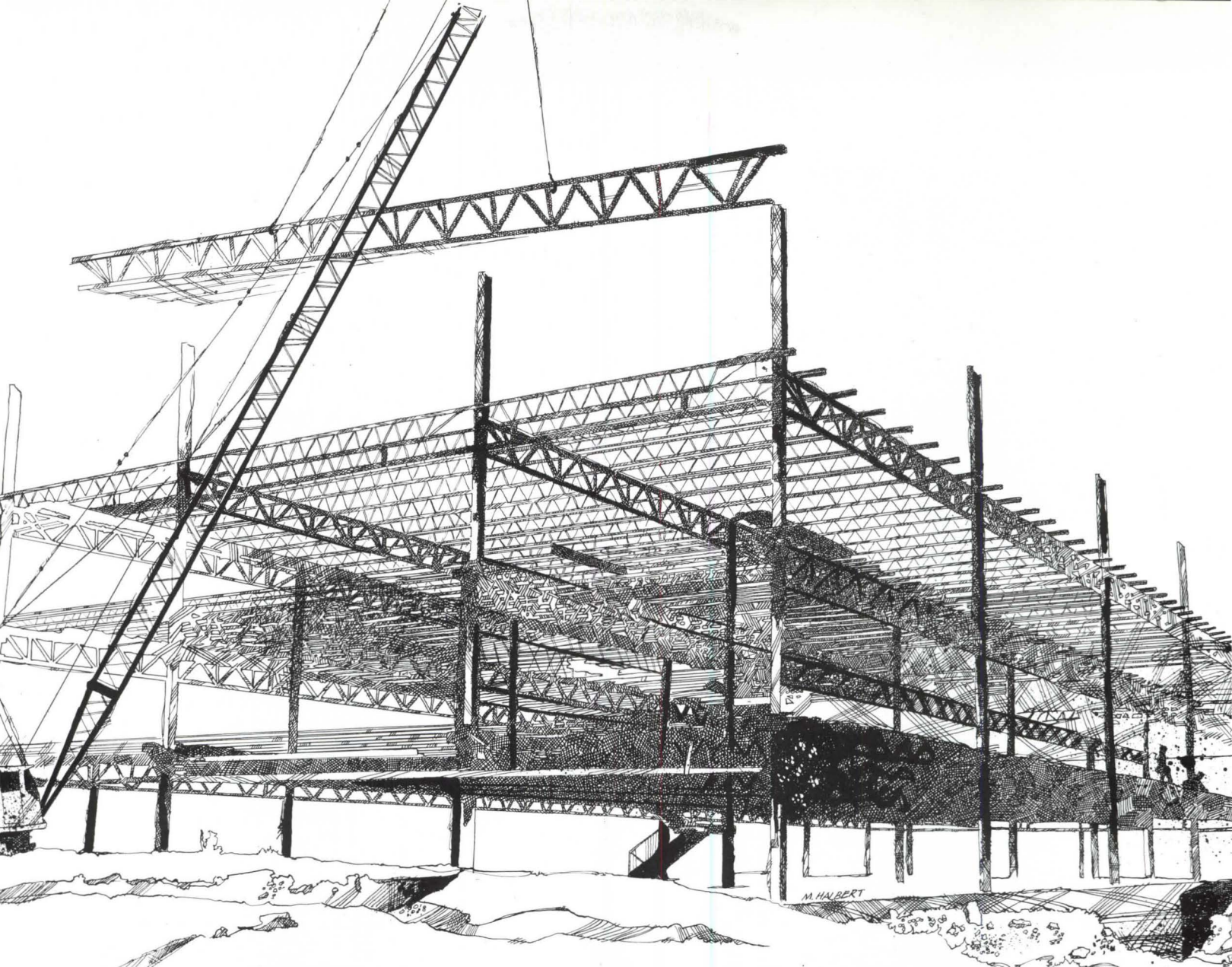
The public policy sessions featured presentations of the broad implications of earth sheltering in conserving energy and achieving the “sustainable society.” A paper by AIA's President R. Randall Vosbeck, FAIA, titled “Womb or Tomb? The Designer's Role in the Energy Crisis” is among the best. Two other important ideas were covered in the public policy session: an examination of underground public transportation in the U.S. and civil defense against foreign attack and natural disaster. Four papers on these subjects are included in the proceedings.

The conference session on earth-sheltered buildings was the best attended, covering such subjects as architectural design innovations, hot and cold climate design, heat transfer research, commercial construction, energy performance case studies and structural systems. Twenty-two papers on these subjects are presented.

The urban planning session includes seven papers covering the role of the real estate developer in the future of underground development; mixed use, multi-level projects; planned residential development, and interior environmental effects of earth sheltering. The final section, made up of seven papers, covers deep-mined space, i.e., tunnels, petroleum storage and utility systems. Questions of design, construction contracts, risk insurance, national policies, construction technology, labor and motivation to go sub-surface are examined.

As earth-sheltered construction becomes more accepted and widely used for many purposes (especially environmental concerns and saving energy, which are uses that often come first to the minds of architects), those in the field will look back to this conference as a milestone in the development of earth sheltering. These proceedings should not be overlooked by anyone who has an interest in earth-sheltered architecture.

continued on page 92



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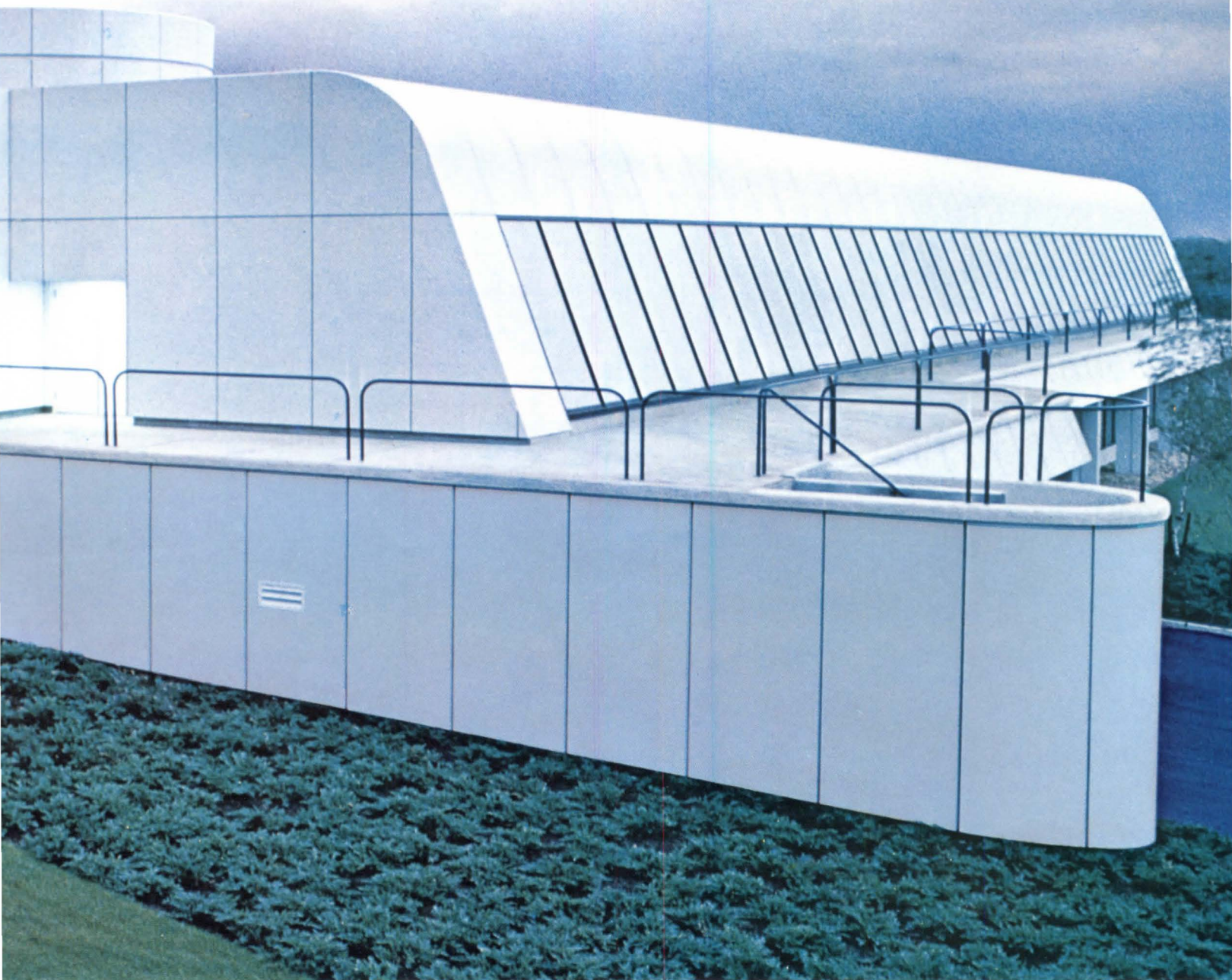
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Where can you find examples of earth-sheltered architecture by Gunnar Birkerts & Associates, Bentz/Thompson & Associates, Perkins & Will, Hellmuth, Obata & Kassabaum and Ralph Rapson & Associates? Answer: in *Earth Sheltering: The Form of Energy and the Energy of Form*. The work of these architects and some 45 others appears in this book, which contains the best entries in the 1981 design awards program on earth-sheltered buildings sponsored by the American Underground Space Association.

Entries were solicited from students and professionals in four categories: Single-family residential, multifamily residential, nonresidential and research. The program attempted to reduce the burden on participants by emphasizing that the projects (other than student work) should be real projects for real clients thereby not requiring original design work purely for the entry.

The jury, chaired by Edward Allen, AIA, reported that its members looked first of all for architectural excellence and then for the manner in which the earth sheltering was handled.

Professional adviser for the competition was Edward R. Frenette, AIA, whose essay on design philosophy serves as the preface to the book.

Both books may be ordered from American Underground Space Association, c/o TLH Associates, Inc., Suite 900, Minnesota Building, St. Paul, Minn. 55101. *Michael B. Barker, AICP, Administrator of the Department of Design at AIA Headquarters and a director of the American Underground Space Association.*

Of Building: Roger North's Writings on Architecture. Edited by Howard Colvin and John Newman. (New York City: Clarendon Press, Oxford University Press, \$49.)

Roger North (1653-1734) was by profession a lawyer, and he had little influence on his contemporaries as either a theorist or a practitioner of architecture. Howard Colvin tells us in the introduction to this book that North's architectural writings were probably unknown outside his family circle. His executed buildings, with the exception of the Temple Gate in London, "long supposed to be the work of Wren," received little attention. And yet his writings on architecture are now compared with such pioneering works as Wotton's *Elements of Architecture*, Gerbier's *Counsel and Advice to All Builders* and Pratt's *Architecture*. All these 17th century treatises give advice on the design of gentlemen's houses. "Wotton's prose is elegant, Gerbier's pretentious, Pratt's practical and straightforward," Colvin says. "Informal and conversational in

style, North's book is by far the most readable of them all: Indeed, it is hardly going too far to claim it as the most entertaining treatise on its subject in the English language."

North read the architectural textbooks of his day and learned the principles of architecture. He applied them in the remodeling of Rougham Hall in Norfolk, his large country house. In his treatise, North refers often to Rougham, but the references serve to explain and illustrate broader architectural principles. Colvin says that the treatise, which touches on a variety of topics, is much more than an architectural amateur's record. It is also a commentary on 17th century architecture "by a man endowed with unusual intelligence and literary ability."

Architecture to North (using his own spelling and punctuation) was "a sober entertainment, and doth not impeach but defend health. Other pleasures which are less despised, as wine, weomen, gaming, &c. have a sting, which this hath not. And it is also an exercise of the mind, as well as of the body, and a pratique of manage and conduct greatly usefull in all civil life. For what habits ought to be imprest with more efficacy than those of providing materialls, foreseeing occasions, snatching opportunities, waylaying prises, and making bargaines?"

North's style is further demonstrated

in his directions for the design of a laundry: "Laundry is an office wholly of weomen; and the men, however officious to aid their sweethearts, should not be allowed to frequent there, because all they doe, is not so much in advance, as the impertinent conversation hinders the business of the family."

Livable Streets. Donald Appleyard. (University of California Press, \$25.)

Since the 1920s, when city planning, zoning and subdivision regulations became a responsibility of local governments, planning commissions and their staffs have been struggling (usually with meager results) to create "livable streets" for residential development. With the exception of strip commercial areas, heavy traffic has been the major impediment to livable streets. Residential streets that were once pleasant enclaves with light indigenous traffic can suddenly become a major thoroughfare as development either intensifies or occurs on adjacent land. Add to this the almost casual disregard for neighborhood planning concepts by local legislative bodies because of great pressure from speculative land developers to approve the expedient, and the problem of livable streets becomes one of the real challenges facing urban designers.

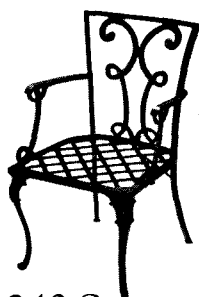
Now that urban growth has been slowed by the general malaise of the U.S.

economy there is a growing interest in making existing cities and their infrastructure more habitable. The idea of exploiting one area and moving on to another is less attractive than it was in the day of cheap energy and booming land development. Further, the massive federal housing programs, urban renewal projects, water and sewer grants and transportation programs that fueled rapid urban growth seem to be drawing to a close. Changes in public priorities seem to reflect an increasing consensus that something should be done to make existing neighborhoods more livable. After all, everyone lives on a street somewhere. Hence, Appleyard's book is timely.

Appleyard describes the purpose of this book as the exploration of what it is like to live on streets with different kinds of traffic and the searching for ways to make streets more safe and livable. My initial scanning of the book led me to the premature conclusion that I probably would be critical because it was so dominated by design school type research in places such as San Francisco and Oakland and Berkeley, Calif. Even though I know these places and like to read about them, my initial reaction was that others would not. After carefully reading the book, I have concluded quite the opposite. In order to truly understand the

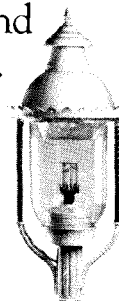
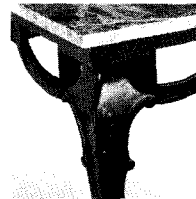
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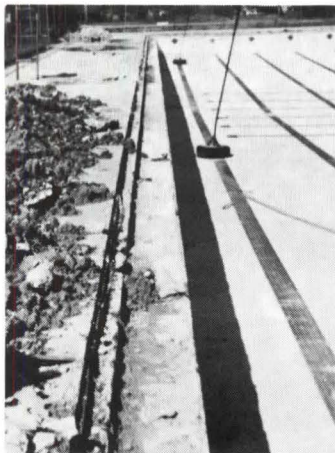
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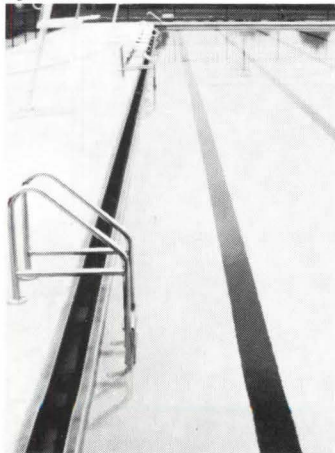
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problems of livable streets, it is necessary to wade through the research development that Appleyard presents in this book, which, incidentally, is presented very well, with photographs, diagrams and other illustrations.

The focus of the book is on the residential street and neighborhood. The basic question addressed is how to control traffic in such a way that noise, dust, vibration, fumes and physical danger can be avoided, and where in their place can be found quiet, tranquility, play areas, barrier-free circulation, a sense of community and a felt and real sense of safety and security. If these are your concerns, this book is for you. If you are concerned about transportation planning and management, or urban and regional planning, you may find the book too specific for your needs.

The book is divided into three parts, the first of which describes the San Francisco research and has a particularly interesting section on groups that are particularly vulnerable to heavy traffic. The second part, on early street battles, examines the environmental area concepts first enunciated by Colin Buchanan in his book *Traffic in Towns* (1963). This section looks at traffic management in six towns. The final section, on livable streets and protected neighborhoods, deals with citizen participation, the politics of the street, street management and traffic control devices and systems.

This is an important book that should be on the shelf, and, it is hoped, frequently in the hands of architects, urban designers, city planners and public officials who are concerned with making residential streets more livable. *Michael B. Barker, AICP, Administrator, Department of Design, AIA Headquarters*

Practical Guide to Mobile Homes. Editors of *Hudson Home Magazine*. (Van Nostrand Reinhold, \$12.95.)

Sunken tubs, picture windows, wet bars, skylighted high ceilings, French doors, fireplaces, walk-in closets, recreational areas large enough to hold pool tables. All these amenities, and more, once thought to be impossible in a so-called mobile home, are portrayed in this book. One mobile home in Irvine, Calif., whose interior was designed by an unnamed architect, has a dining room with parquet floors and a family/living area big enough to accommodate a fireplace, an organ and a second dining area. There's even a solar mobile home described, independent of city utilities and the use of fossil fuels, whose building and furnishings, exclusive of labor, came to about \$20,000.

The book describes and illustrates

continued on page 96

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ways to customize, decorate and landscape mobile homes. It outlines the advantages of mobile home living, how to shop for and finance a mobile home, what to take into consideration in siting. It gives a selection of floor plans to make the most of space and to meet the life style of the inhabitants. There is a directory of what accessories may be added and where to buy them, including such things as anchoring devices and siding. There is also a list of mobile home manufacturers and mobile home associations.

As the editors comment, mobile home is a misnomer—only about 2 percent are ever moved once they reach the site. A more accurate term would be, they say, “factory-assembled manufactured hous-

ing.” Whatever they are called, the outlook for the mobile home industry “is much better than for most residential construction,” say the editors. They estimate that about 300,000 mobile homes were sold in 1980 and more than a million resold. More than 10 million people live in mobile homes, “and this number increases every year.”

Directions in Managing Construction: A Critical Look at Present and Future Industry Practices, Problems and Policies.

Donald S. Barrie. (Wiley, \$34.95.)

Sixteen “policy level spokesmen” have joined Donald S. Barrie, vice president of Kaiser Engineers, Inc., in the preparation of this book whose intent is “to provide policy level guidance and to stimulate

thought to concerned construction managers, superintendents, engineers, craftsmen, functional specialists and other special interest groups at all organizational levels.” There are three major parts to the book, the first of which focuses on change in the construction industry, discussing such topics as management concepts and growing management problems. The second part is devoted to the construction industry’s segments, such as housing and residential construction, industrial construction and material and equipment suppliers. The final section concerns special interest groups and other factors affecting the construction industry. Among the topics discussed are labor unions, legal and contractual considerations, governmental regulations and ethnic minorities and women. A final chapter discusses the future. In an essay by Barrie, it is pointed out that the construction industry today is “divided with substantial internal turmoil.” The hope for the future is “management performance.”

McGraw-Hill’s National Electrical Code Handbook.

17th edition, Edited by Joseph F. McPartland. (McGraw-Hill, \$24.50.)

Based on the current 1981 National Electrical Code, developed by the American National Standards Institute’s national electrical code committee and sponsored by the National Fire Protection Association, this handbook provides detailed guidance in the use of the code. It gives full coverage to additions to and modifications of the rules as reflected in the ’81 code. The reader is informed that the ’81 code contains “completely new articles on equipment never covered by the code before,” among them being messenger supported wiring systems, conductor cable for wiring on concrete slabs under carpet squares and electroplating. The handbook refers as well to the current code’s “radically new regulations and changes in old regulations covering everyday electrical details. . . .” Useful for the electrical installer and designer, the handbook examines, among an array of other topics, equipment grounding, wiring methods, electrical installations in health care facilities and modular ceiling wiring. The book is copiously illustrated with photographs and drawings.

Earthquake Protection of Essential Building Equipment: Design, Engineering, Installation.

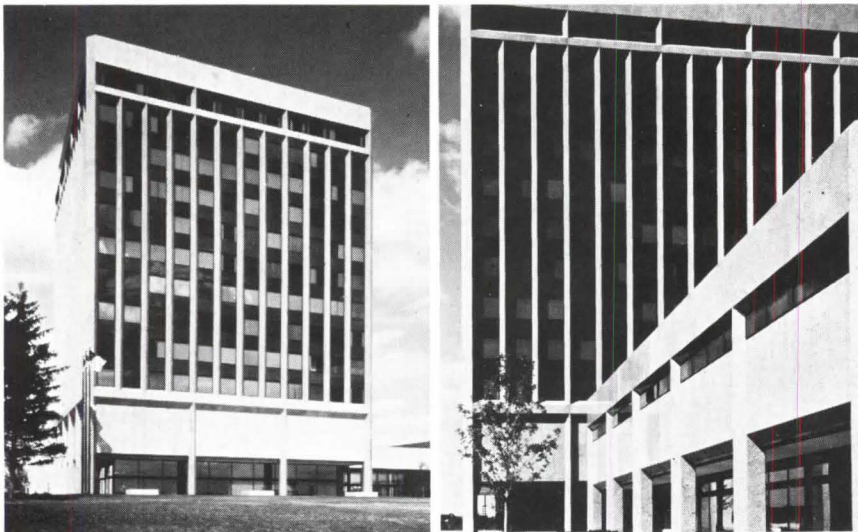
Gary L. McGavin. (Wiley, \$35.)

If a hospital, for example, is structurally intact after an earthquake, it isn’t of much use as a critical facility if vital equipment is rendered inoperable. Current building codes, says McGavin, address both structural systems and some nonstructural elements, but the majority of

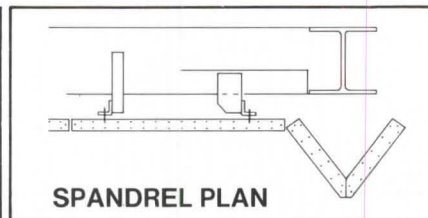
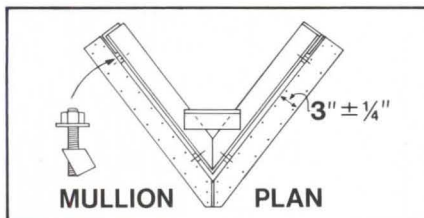
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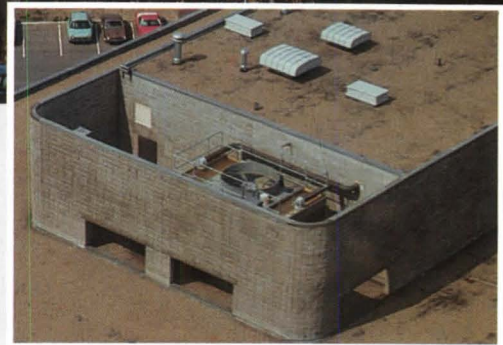
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equipment items "are virtually ignored." Using the systems approach, he provides a plan for the classification and qualification of individual pieces of equipment, using methods that are appropriate for each piece's requirements and characteristics. He relates such major systems as data processing, elevator, emergency power supply and air handling to the individual piece of equipment within each system, suggesting its seismic category, appropriate seismic specification and seismic qualification. The information for the various types of equipment is referenced to diagrammatic installation details.

The book is highly recommended to any architect who designs in earthquake prone areas. McGavin, a member of the Earthquake Research Institute, an associate member of AIA and project designer for the Riverdale, Calif., architectural and planning firm of Ruhnman-Evans-Ruhnman Associates, comments that the book's comprehensive seismic qualification program "is geared to reduce the potential for damage to all building equipment whether it is for a hospital, library, refinery, school or other building." He says that the approaches suggested in the book are not new, having been used by such critical facilities as nuclear power plants for more than a

decade. "The technology exists," he says, "to attain a relatively high level of confidence with respect to survivability of equipment after a severe earthquake and is only waiting to be employed." This book points the way toward ensuring the operability of any structure following an earthquake.

Gone from Texas: Our Lost Architectural Heritage.

Willard B. Robinson. (Texas A&M University Press, \$29.95.) This handsome and interesting book's introduction says that over a century ago the legendary inscription "G.T.T." appeared on vacant houses of the Southern states, testifying to the fact that the owners had "Gone to Texas." Now, however, many of the buildings erected by the Texas pioneers are "G.F.T."—*Gone from Texas*. This book, in a way, is an obituary of these houses, churches, institutional and governmental structures. It is more than that, however, because Robinson writes thoughtfully of Texas's cultural history as he traces the state's architectural development from Indian and Hispanic buildings on down to the 20th century. The 250 photographs and drawings complement the text. Carefully researched by the author, who is professor of architecture at Texas Tech University, the book is one to fill a Texan with pride. It is also one to

make that same Texan rather shamed that countless beautiful buildings of historic significance have been destroyed.

The book contains an architectural glossary and a lengthy bibliography. Despite Robinson's accounting of so much that is lost, he is hopeful, saying that "there yet remains a rich heritage. . . . With care, representations of the diverse aspects of this heritage may be preserved, and posterity may retain some examples of every aspect of the architectural legacy that is being created today."

Monograph of the Work of McKim, Mead & White, 1879-1915.

Student's edition. (Architectural Book Publishing Co., \$10.95.) A part of the "Classical America Series in Art and Architecture," this book is a reissue of a 1925 publication. It contains plans, elevations and details of McKim, Mead & White's major projects. It also has an introduction by Allan Greenberg and biographical notes of the firm's principals by Michael George. Greenberg calls for a re-evaluation of the firm's work in light of the "reassessment of architecture and architectural history which is now underway." No other large office before or since the time of McKim, Mead & White has equalled the quality of the firm's work, Greenberg says. □

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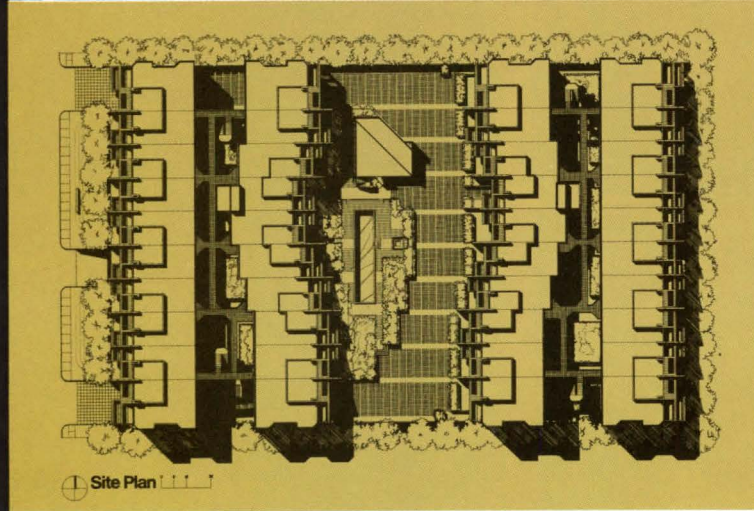
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Soaring land prices are forcing architects and developers to seek creative solutions to hold down project costs. Sandy/Babcock & Associates, architects for Augusta Court Condominiums, chose a unique midrise concept instead of conventional 2 and 3 story wood frame construction. Local building codes restrict conventional wood frame construction to 3 stories. Inryco's steel stud and joist framing system was selected as an economical alternative in achieving the desired density of 65 units per acre.

Augusta Court consists of 152 units in four 4 story buildings over a subterranean parking garage. Each building pair is connected by an open steel bridge, providing access to units through open courts. This creative solution provides security, openness and 40 additional units.

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Inryco offers unmatched counsel and design assistance on steel frame construction. See our data in Sweet's General Building or Light Construction Files — or write for catalogs 37-1 and 37-2. Then contact us for an appraisal of its suitability for your projects: Milcor Division; INRYCO, Inc.; Dept. K-4127; P.O. Box 393; Milwaukee, WI 53201. (TLX 26683 INRYCO A WMIL)

Project: Augusta Court Condominiums, Houston, Texas
Owner: A joint venture of David Mitchell Companies and Mac-Carey Properties, Inc., Houston
Developer: David Mitchell Companies, Houston
Architects: Sandy/Babcock & Associates, San Francisco; project architect, Steven House AIA
Structural Engineer: M. Hourani & Associates, Houston
General Contractor: Urban Construction Company, Houston
Framing Contractor: Marek Brothers Company, Houston



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Furnishings

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objects of design. S.A.*

A table lamp design by Ettore Sottsass (1) is shaded by black metal plate, its legs and handle of red metal tubing. It takes a 60 watt bulb and is available from Stilnovo of Milan. Lawrence Peabody has designed a new lounge series for Helikon, including chairs, two-seat, three-seat and four-seat sofas. Shown here (2) with a cane back and walnut edge, it is also available with an upholstered back, with other wood edgings, and covered in either fabric or leather.





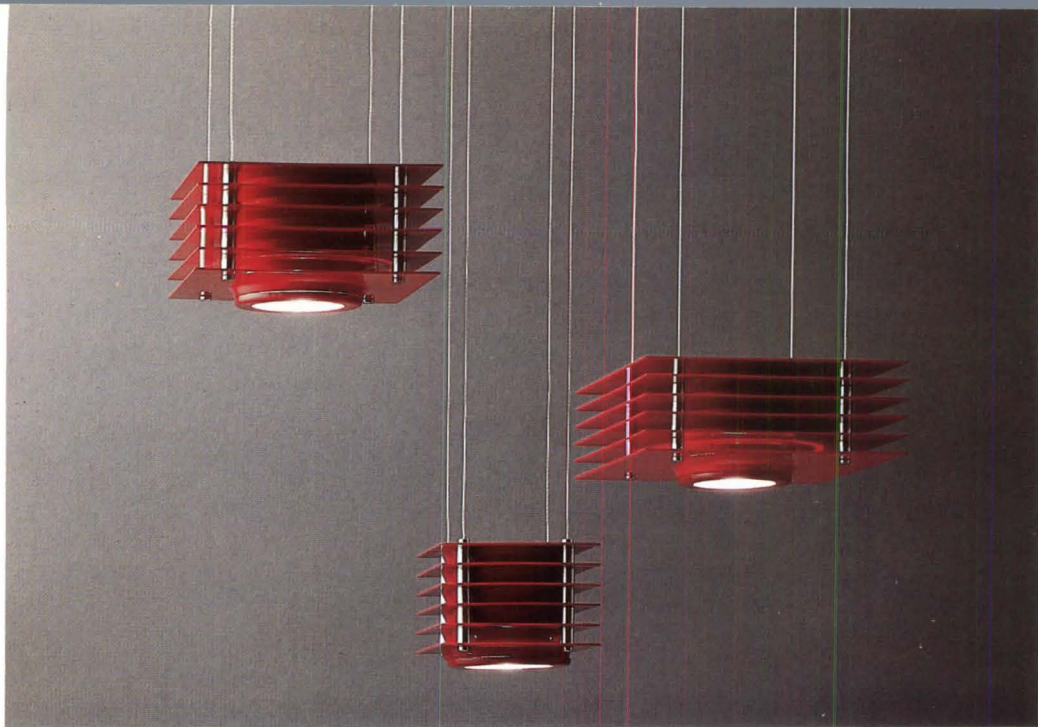
3

Hans Wegner designed his greatly admired China chair in 1944. Now, 37 years later, he has designed a dining table to match (3). It is made of the same hand-carved cherry as the chair, and its top extends from circular to oval shape. Both chair and table are now available through ICF. Industrial designer Niels Diffrient has applied his mastery of ergonomic data to the design of the new Helena chair line for Sunar. Available in executive, guest (4) and workstation versions, with or without arms, with sled bases or five-legged bases, the Helena is, according to Diffrient, "a chair that will let you sit badly and still perform correctly and gracefully." Thonet's Interlock Stack chair by Warren Snodgrass (5) combines stacking convenience, rare in a cantilevered design, with upholstered comfort.

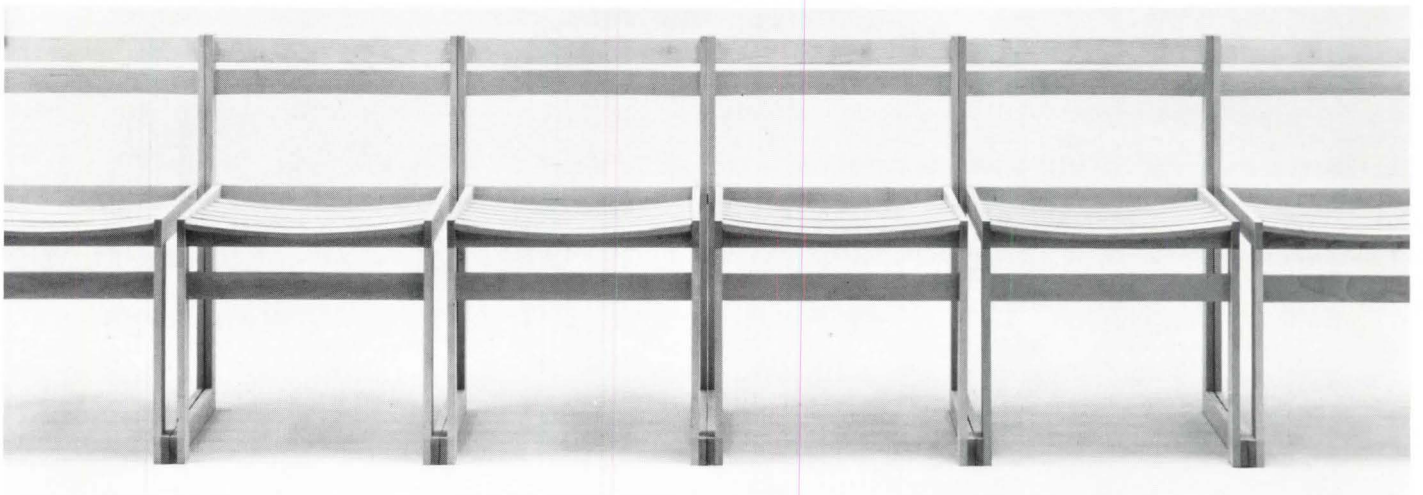
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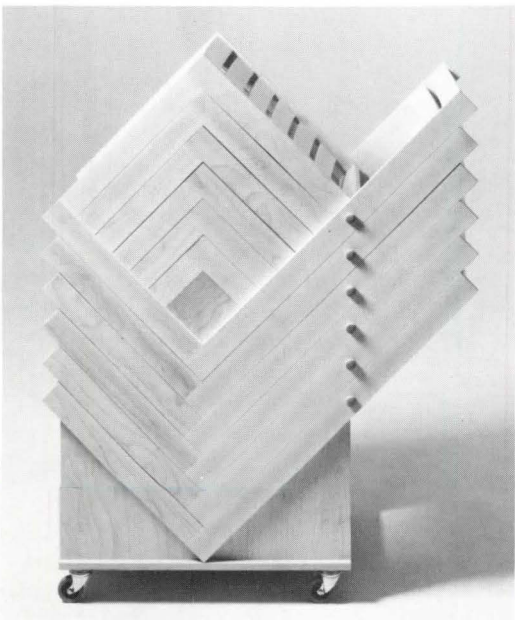


1



Louis Schnakenburg

2

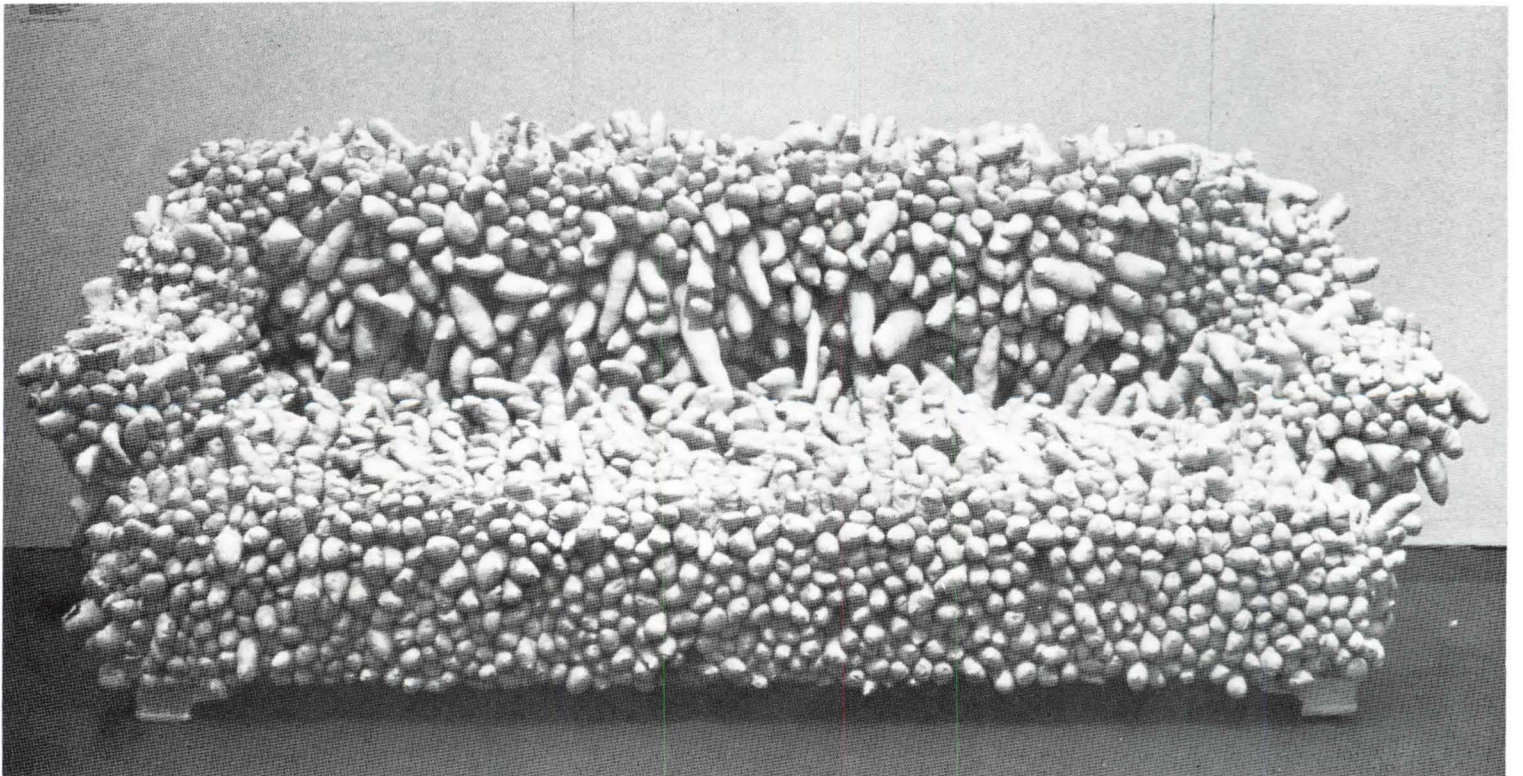
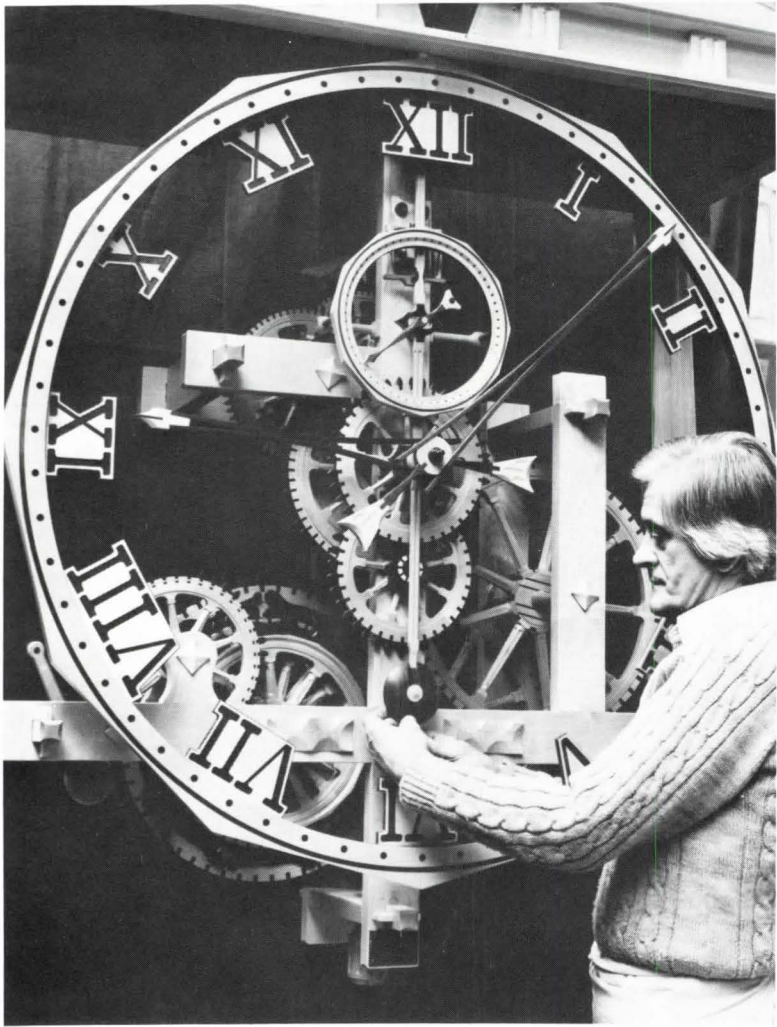


Louis Schnakenburg

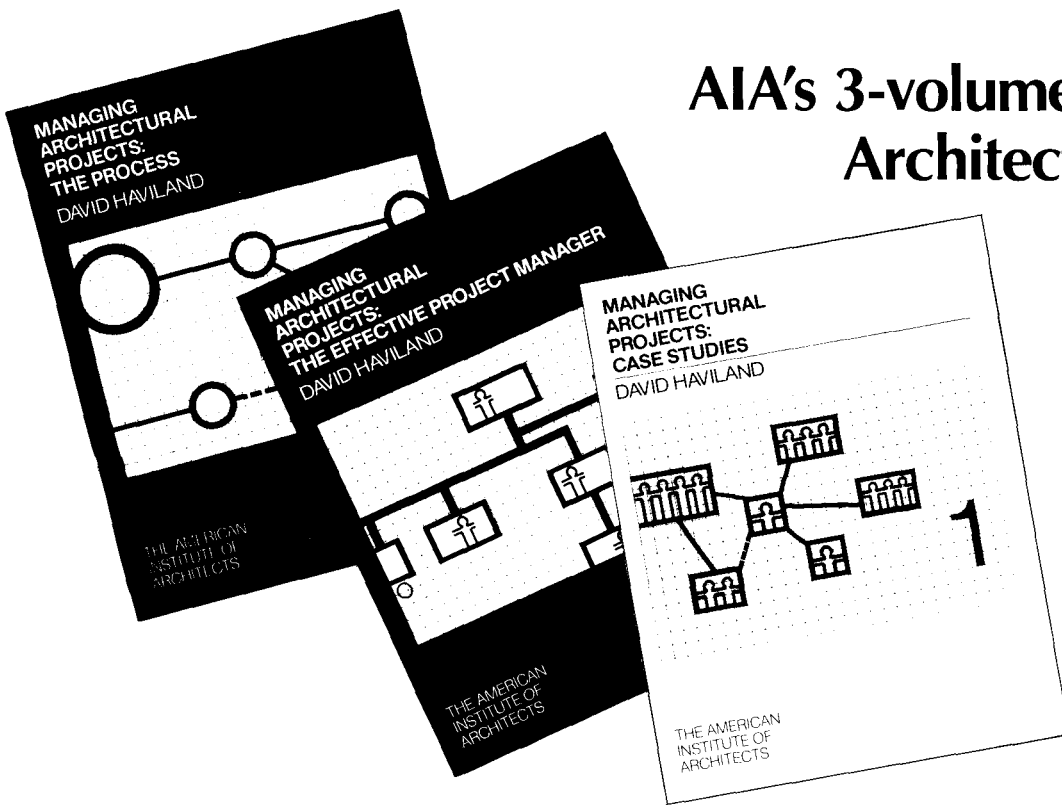
Another lighting design by Ettore Sottsass is the Hikary hanging lamp from Skipper, Milan (1). It takes a halogen bulb, comes in three sizes and several colors. The transformer is in a ceiling mounted box; lamp height is adjustable. The Stabelstol chair (2) designed by Copenhagen architect Roald Steen Hansen is made in either oak or ash. Designed so that they can be either ganged together or stacked, the chairs are handsome either way.

The idea that the office workstation of the future will have to accommodate display terminals and other electronic equipment has become commonplace. Yet most manufacturers' systems simply leave it all sitting around on work surfaces. American Seating has taken the simple but welcome step forward of housing a display terminal behind a snap-off vertical panel, thus putting it at eye level and freeing the work surface for other uses (3). Shown also is one model of American Seating's extensive BioChair line.

British craftsman Ron Woodford specializes in custom-designed clocks, perhaps unique in being made entirely of wood (4). Dial sizes from 3 feet to 20 feet in diameter are possible, and there are 20 types of hardwood to choose from. Woodford produces a maximum of eight clocks a year, distributed by Barrex Ltd., Oadby, Leicestershire. From the exhibition (and accompanying book) of *The Art Fabric: Mainstream* organized by Mildred Constantine and Jack Lenor Larsen for the American Federation of Arts is Yayoi Kusama's "Couch and Canvas" (5), a couch frame to which hundreds of stuffed cloth packages have been stitched. Won't you sit down? □



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Practice from page 40

the help of McManis Associates, a Washington, D.C., consulting firm, the committee decided to determine how the practice of architecture was perceived by architects and users of architectural services. Architects were surveyed by letter, users by panel.

For the survey of architects, the committee began with the 164 services listed in the AIA document, B-162, "Scope of Designated Services" and added 142 knowledges, skills and abilities. A test survey went to 192 NCARB board members; 32 percent responded. Then a revised survey was sent to 12,000 U.S. architects; 3,833 responded.

Forty users, divided into two panels, discussed the role of the architect in building and site analysis, building design,

preparing construction documents and building construction and post-construction services.

From the survey and panel data the committee and McManis Associates identified 38 services, 29 areas of knowledge and 14 skills necessary to establish the level of ability needed to protect the public health, safety and welfare in the practice of architecture.

After identification of requirements, the next step was assessment of the NCARB examinations. McManis Associates was selected to evaluate the content of previously administered examinations, while National Evaluation Systems, Inc., an Amherst, Mass., consulting firm, was selected for the assessment of testing methodologies. The examinations assessed included the qualifying tests used

in 1979-80; the professional examination, part A, used in 1978, 1979 and 1980, and the professional exam, part B, used in 1979 and 1980.

In the evaluation of how the examinations related to the necessary areas of knowledge, McManis found the following:

- The qualifying test measures a candidate's retention of factual information in slightly over one-third of the areas identified.
- The multiple-choice portion of the professional examination provides coverage of 21 of the 29 areas of knowledge identified.
- Coverage of the four areas of knowledge that are not well handled in the qualifying test are not adequately covered in the professional examination.
- The design test requires the application of 21 of the 29 important areas of knowledge, but places primary emphasis on 12 of these 21. Six of the areas are not needed in producing a solution in the design test.
- Four of the areas are not addressed in any of the three examinations, and two others are not given the level of emphasis they should receive.

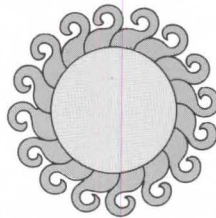
Regarding the services, McManis Associates found:

- The qualifying test is focused almost entirely on two broad categories of architectural services—building design and construction—and on four specific areas within these two categories: structural considerations, specifications, selection and layout of building systems and electrical considerations.
- The professional examination, part B, includes questions that are presented within the context of all seven broad categories of architectural services and gives attention to at least five of these categories.
- In the professional examination, part B, almost one-third of the 38 most important individual architectural services are the subject of at least 15 multiple-choice questions. Although the examination's coverage of services is broad, it is still insufficient to adequately evaluate the candidate's understanding of them.
- The design test concentrates on two categories of architectural services: site design and building design.

Regarding skills it was found that:

- The qualifying test only calls for application of reading communication skills.
- The multiple-choice professional examination, part B, provides a test of the candidate's reading comprehension, analytical, perceptual and research skills.
- The design test requires candidates to demonstrate reading comprehension, analytic/perceptual, conceptual/artistic and graphic communication skills.
- The important architectural skills not required in any of the three examinations

continued on page 110



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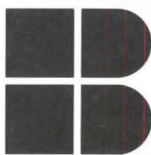
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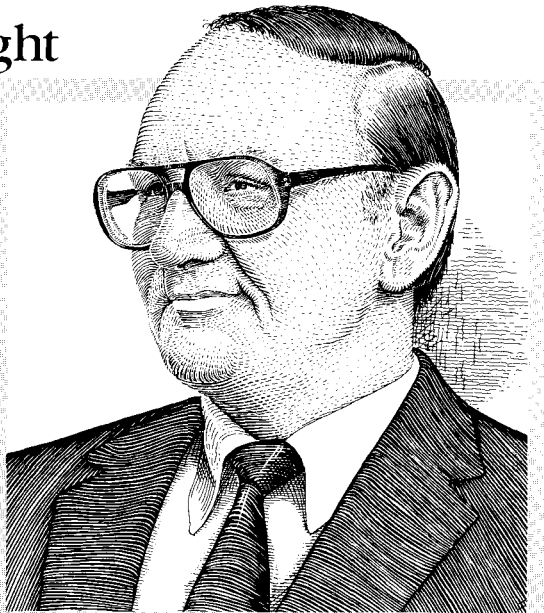
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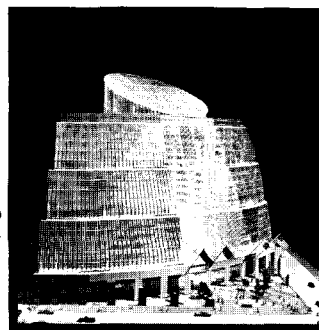
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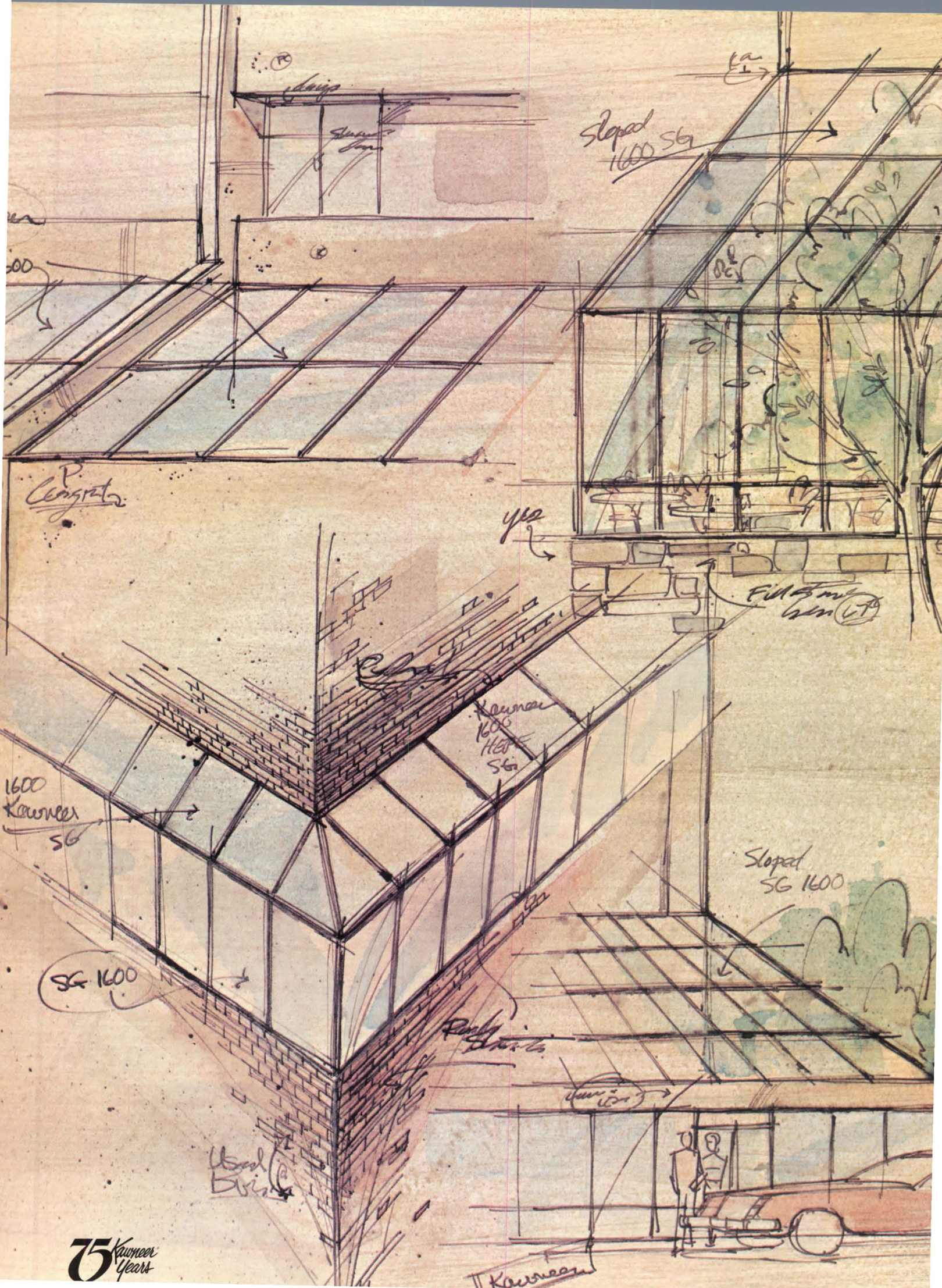
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Roof

Support
Beam

Sloped
1600 SG

East
→

1000

P.
Concrete

400
→

Filled with
glass

Kawneer
1600
HERT
SG

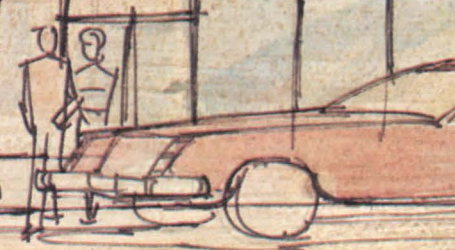
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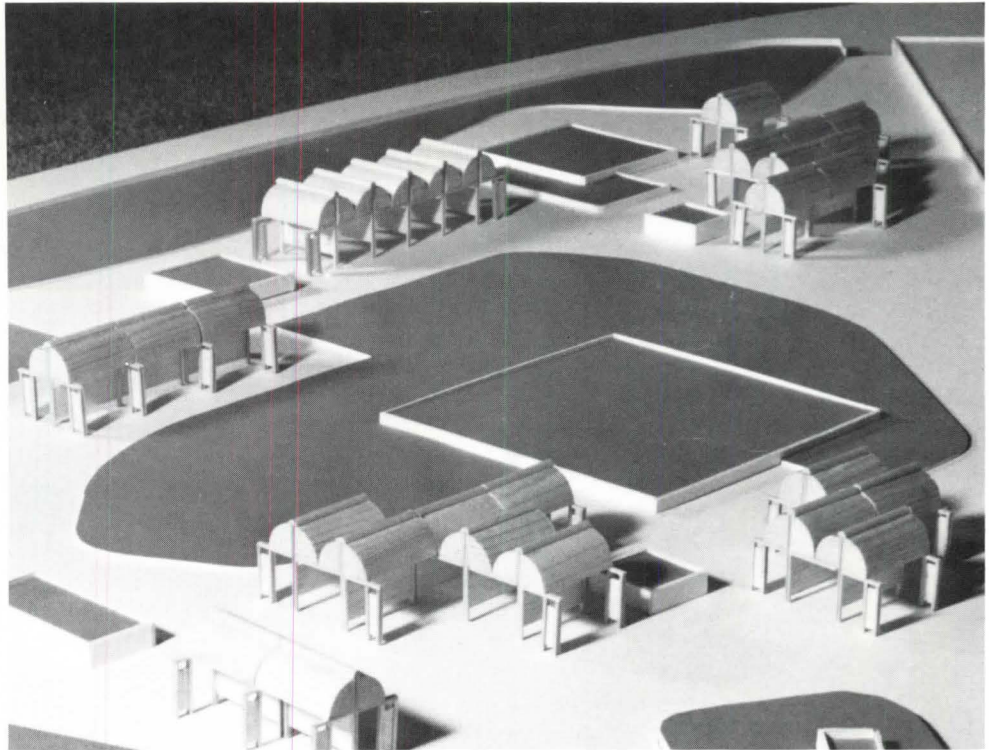
Kawneer
The designer's element

Practice from page 106

are management/coordinating and oral communication.

In the methodology assessment, National Evaluation Systems identified seven testing methods as most relevant to the practice of architecture: multiple-choice items (types A and K), design problems, written simulation, simulated identification, written identification, oral assessment and short answer. Of the seven methods, one is presently incorporated in the NCARB examination process—multiple-choice types A and K. Type K was not recommended by National Evaluation Systems. (This type of question has a series of options and asks the examinee to choose which two seem to be the best.) It is noted, however, that NCARB examination question writers over the years have made a concerted effort to reduce that kind of question.

National Evaluation Systems concluded that a multiple-choice examination can adequately test a number of services, knowledges and skills. However, other methods are more appropriate to testing for some of the services, it said. The findings also indicate that the design problem is an effective method for measuring architectural skills. It was suggested that NCARB should develop and thoroughly pre-test examinations that use the other methods. □



Exhibition design competition winner: The winner of the Three Rivers Art Festival Design Competition for a portable display environment to exhibit two-dimensional artwork is Michael Tych of the Atlanta, Ga., firm Nichols, Carter, Seay, Grant. Tych's design calls for modules with barrel-shaped canvas roofs protecting canvas-covered panels, which are grouped in various configurations. The jury said it was the entry "most respectful of the artwork being exhibited." Jury members included Ivan Chermayeff, Ulrich Franzen, FAIA, and Robert B. Pease. The competition was sponsored by the Carnegie Institute.

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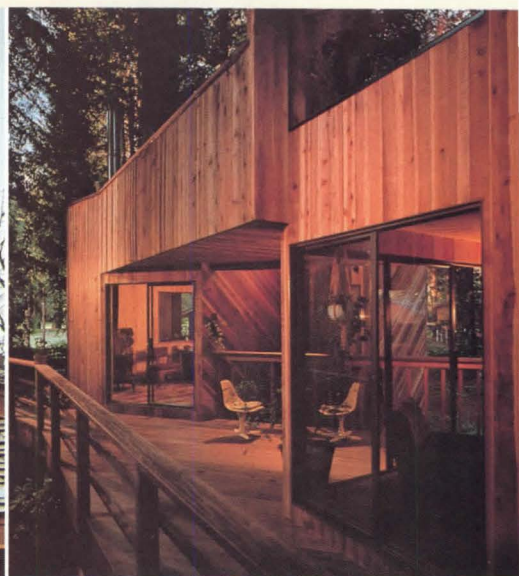
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DEATHS

Leonard L. Hunter, FAIA: Mr. Hunter served as assistant commissioner of design and construction, GSA's public buildings service, for 32 years before retiring in 1970. He also worked with John Carl Warnecke & Associates and was the architect and construction supervisor of the Field Headquarters Compound in Luxor, Egypt, for the Oriental Institute of the University of Chicago. He died on August 27.

Albert Speer: The son and grandson of architects, Mr. Speer received a degree in engineering from the Technical University of Berlin. In 1931, at the age of 26, while in private architectural practice, he was attracted to the personality of Adolf Hitler. Although he never joined the Nazi party, he served for the next 11 years as the Fuehrer's architect and confidant. In 1942, Hitler placed the 37-year-old in charge of the entire German economy, which he put on a full-scale war footing.

Among Mr. Speer's designs for Hitler were the 400,000-seat Nuremberg Stadium and a series of government buildings in Berlin, including a great assembly hall modeled on the Parthenon. The hall, a particular obsession of the Fuehrer, was to be centered on a dome 462 feet in diameter and containing 16 times the vol-

ume of St. Peter's in Rome. It was never built. In January 1938, Hitler gave Mr. Speer less than a year to design and construct a new chancellery (palace) as the official residence. The entire job was completed 48 hours before the deadline, and Hitler was delighted with the results, which included a gallery twice as long as the Hall of Mirrors at Versailles. Mr. Speer also designed spectacular lighting effects for the Nuremberg party rally.

Mr. Speer was the only defendant at the Nuremberg war crime trials who admitted war guilt, in his case the use of slave labor. He served 20 years in Spandau prison in Berlin, writing on scraps of paper smuggled out of the prison by friendly guards. The notes written there were turned into two books, *Inside the Third Reich* (1969), which sold more than a million copies in the U.S. alone, and *Spandau: The Secret Diaries* (1975).

Historian H. R. Trevor-Roper called Albert Speer a moral neuter during the Nazi years, saying that he combined the ability to perform hard work with an indifference to the purposes or consequence of the work at hand. In his later years, Mr. Speer denounced Hitler and Nazi goals and maintained that he never knew that Hitler actually undertook the extermination of European Jewry.

Mr. Speer, who lived in Heidelberg, died Sept. 1 while visiting London.

M. J. Bochnik, Plymouth, Pa.
Romolo Bottelli Jr., Avon-by-the-Sea, N.J.
Stanley Brown, Dallas
Albert M. Davis, Cuernavaca, Morelos, Mexico
Joseph T. Fraser Jr., FAIA, Philadelphia
Robert P. Greife, Boca Raton, Fla.
A. Levy, Philadelphia
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J. B. Wooley, Binghamton, N.Y.

BRIEFS

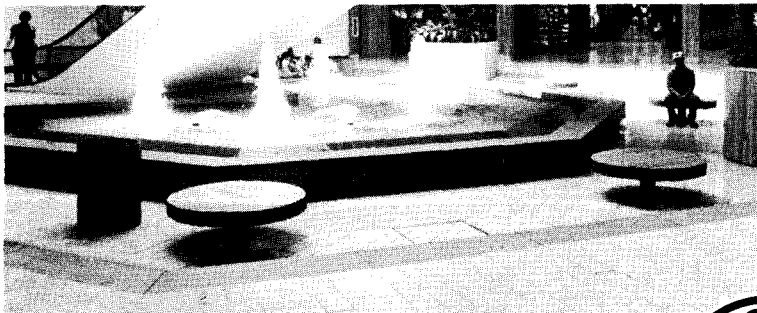
A furniture design competition has been announced for designs "that perform two or more functions, either single pieces or furniture systems." The competition is co-sponsored by Mitchell Wolfson Jr., Cassina of Milan, Air Florida and Arango, Inc. For information contact: Arango Design Competition, The Metropolitan Museum & Art Center, 1212 Anastasia Ave., Coral Gables, Fla. 33134.

Passive solar energy materials and components research and development projects will be solicited by the Department
continued on page 116

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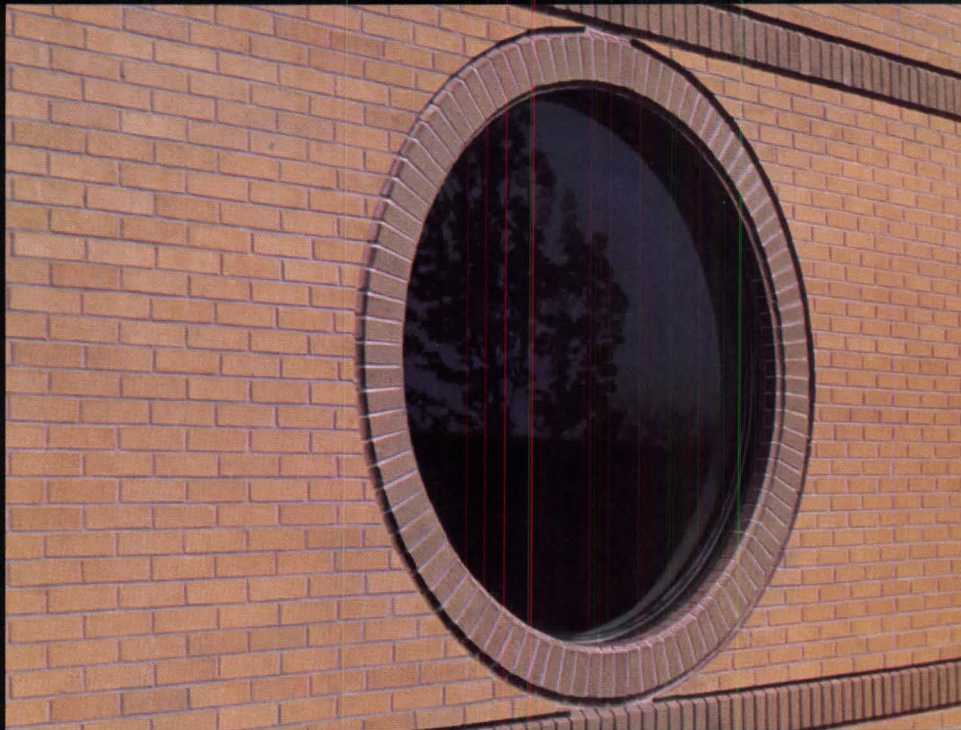
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It all adds up to an original building design which is beautifully suited to its function and location—based on brick.

For more information about the Ward Building, and about other innovative design applications of brick, write for a free copy of "Brick in Architecture," Vol. 36, #5, from the Brick Institute of America, 1750 Old Meadow Road, McLean, Virginia 22102.



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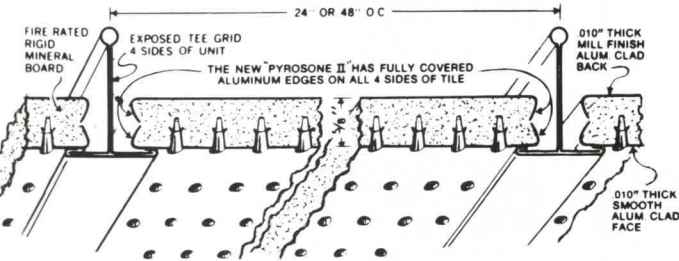
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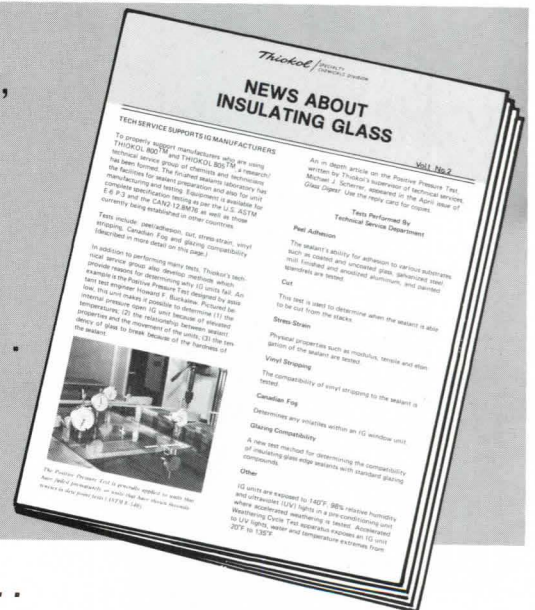
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of Energy on or about Nov. 1. Possible areas of study include light and heat rejection and collection, heat storage, humidity control and daylighting. To be placed on the announcement mailing list, write: PSEMC/Carl Ahlberg, U.S. Department of Energy, 98 S. Cass Ave., Argonne, Ill. 60439.

M. David Lee, AIA, has been appointed to the design arts policy panel of the National Endowment for the Arts.

Creative street furniture designs are being sought for a national awards program. Cash awards will total more than \$4,500, and winning designs will be illustrated in a catalog and exhibited in several museums. Deadline for receipt of drawings and designs is Dec. 31. For information and entry forms, contact Prof. Harold Malt, Program Adviser, Center for Design Planning, P.O. Box 8484, University Station, Miami, Fla. 33124.

Nine Loeb fellowships for 1981-82 have been awarded by Harvard University's graduate school of design. The recipients are architects Stephen J. Carter, AIA, Dayton, Ohio, Kenneth E. Kruckenmeyer of Boston, Paul S. Oles, AIA, of Newton, Mass., David S. Slovic of Philadelphia and N. Scott Smith of Cambridge, Mass.;

landscape architects Michael Curran, Gunnison National Forest, Colorado, and Robert W. Ross Jr., Washington, D.C.; economist Michael L. Horst of San Francisco, and Mary C. Means of the National Trust for Historic Preservation, Washington, D.C. Loeb fellowships enable professionals concerned with the built environment to study at Harvard on a part-time basis while continuing to work.

Suburbs, an exhibition of original drawings, building and site plans, literature, contemporary models and photographs, will be held at the Cooper-Hewitt Museum, New York City, Nov. 10 through Jan. 24. Robert A. M. Stern, AIA, is guest curator.

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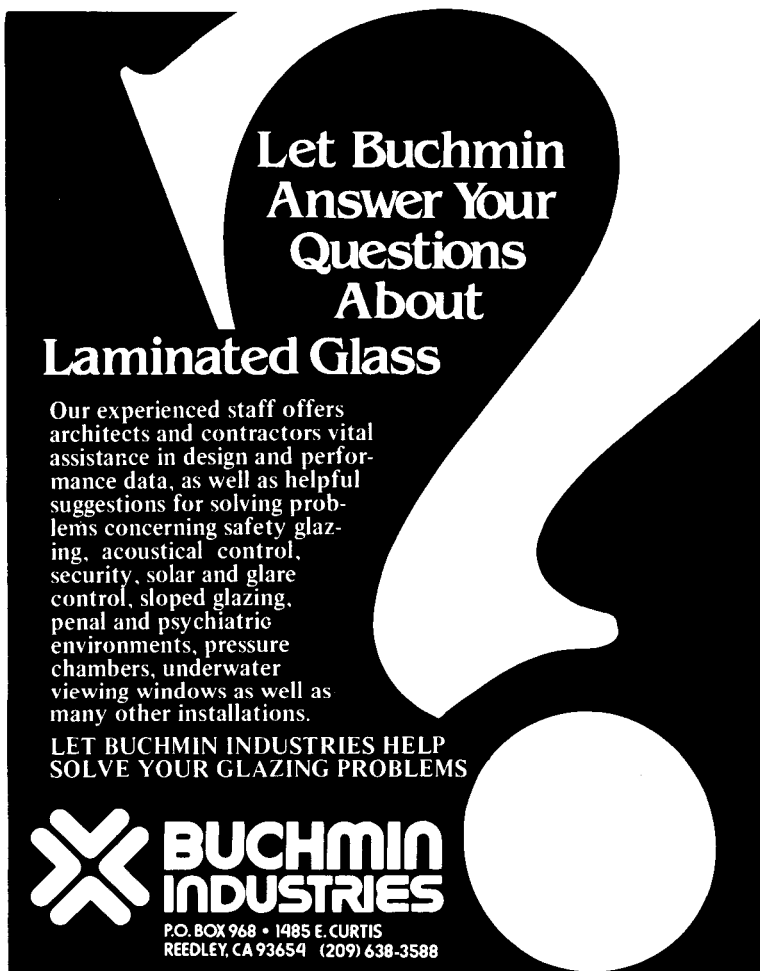
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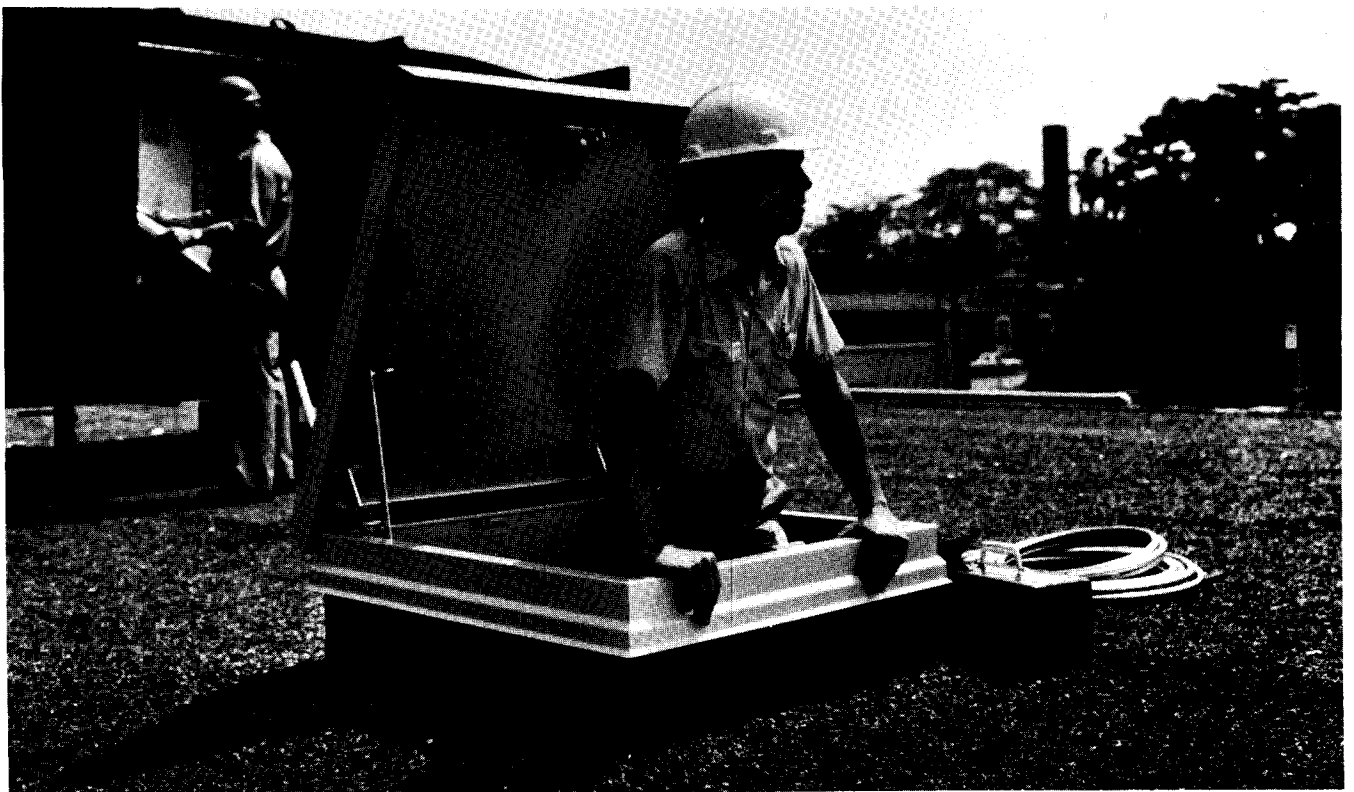
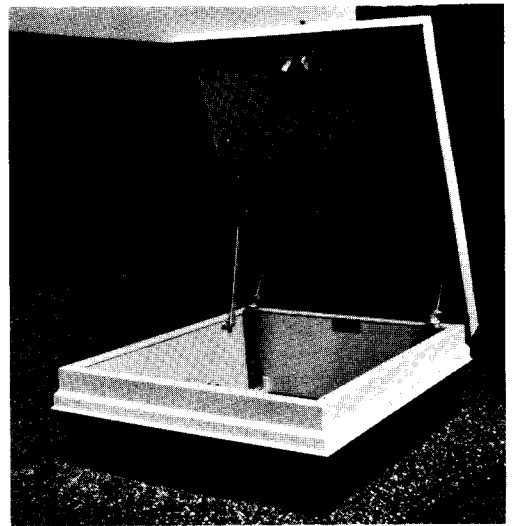
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