

JOHNSON/BURGEE'S CRYSTAL CATHEDRAL: EMBODIMENT OF LIGHT AND NATURE
DULUTH PUBLIC LIBRARY, BY GUNNAR BIRKERTS
THREE HOUSES: THE ARCHITECT AS CLIENT
BUILDING TYPES STUDY: THE FIRST AGA KHAN AWARDS FOR ARCHITECTURE
FULL CONTENTS ON PAGES 10 AND 11

ARCHITECTURAL RECORD

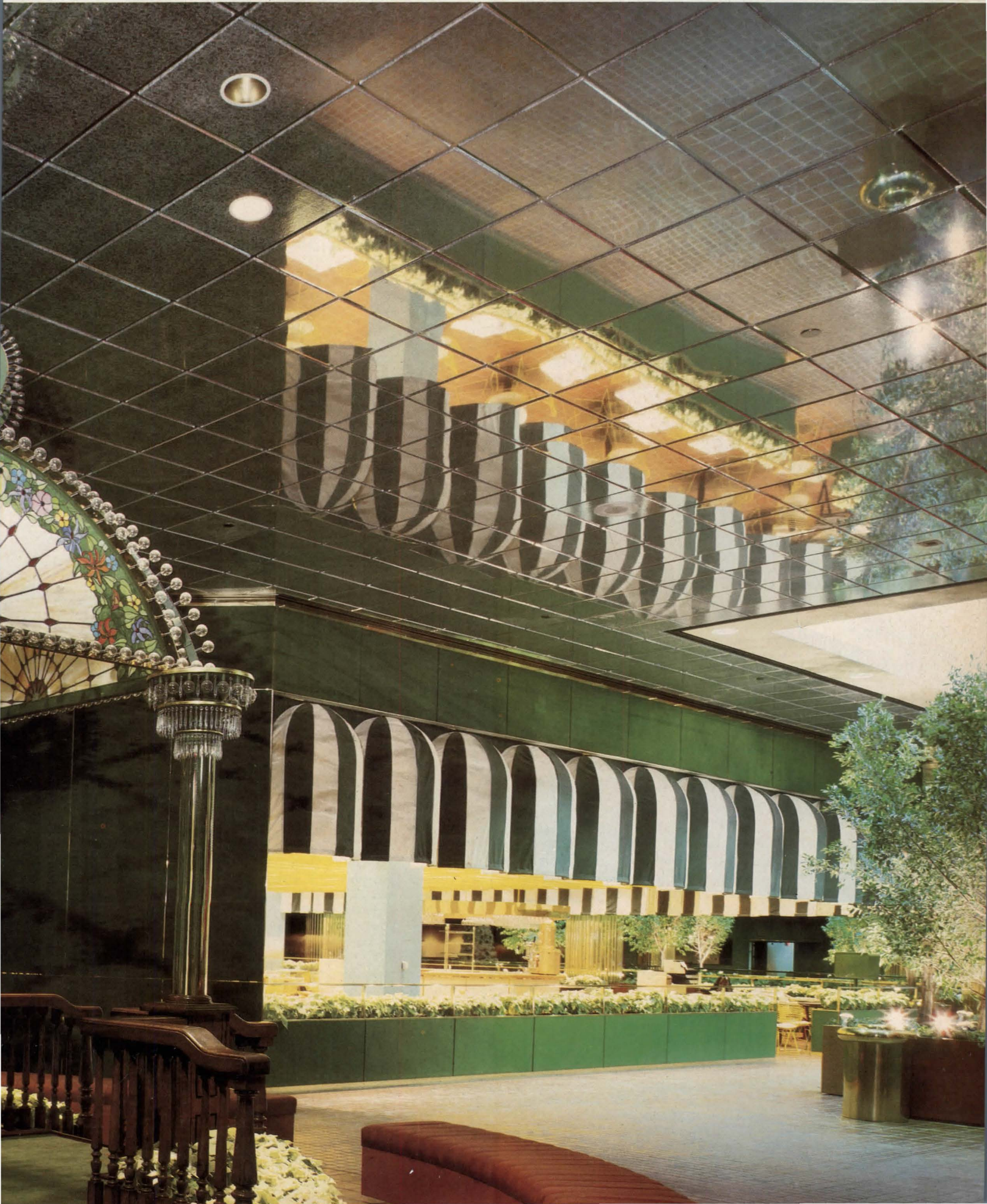
NOVEMBER 1980

11

A MCGRAW-HILL PUBLICATION \$5.50 PER COPY



's Park Place Casino Hotel, Atlantic City, N.J.; Architects – Skidmore, Owings and Merrill, N.Y.C.; Interior Design Consultants – Yates and Silverman, N.Y.C.; Ceiling Contractor – William J. Scully Acoustics Corp., N.Y.C.



Letters to the editor

Bravo to Hugh Newell Jacobsen for his letter in your August 1980 issue [page 4]. Too bad the author of the letter following Mr. Jacobsen's hadn't had the opportunity to read it before penning his own. Bravo, too, for your reply to that letter.

I, as many do, view the *Record Houses* issue as the highlight of the year. I thoroughly enjoy studying the published submissions, and comparing the development of an architect's works by reviewing previously published houses from past issues. So give me more Richard Meier, Edward Larrabee Barnes, Hugh Newell Jacobsen, Charles Moore and Arthur Erickson. I eagerly await a view of their latest creations.

There is still plenty of room for the William Bruders, Jefferson Rileys and the many more like them out there. Who knows which of these new fresh architects each year will become the next regular?

In any case, we'll all be rewarded and inspired in our own way by next year's submissions.

*Thom Dahlgren
John Victor Frega Associates, Ltd.
Architects-Planners
Chicago*

The July 1980 issue of your esteemed publication contains a very handsomely illustrated article on the Arizona Biltmore Hotel [pages 116-121], written by Charles K. Gandee. To set the record straight, Frank Lloyd Wright himself, in a letter dated June 2, 1930, mailed from Taliesin and signed by his own hand, states beyond question that "Albert McArthur is the architect of that building—all attempts to take the credit for that performance from him are gratuitous and beside the mark." Your own publication for July 1929 [page 19 *et seq.*] lists Mr. McArthur as the architect of this remarkable structure.

As for the recent additions to the Biltmore complex, there is no question that the Taliesin Team, under the direction of John Rattenbury, has had full responsibility for that. Whether Mr. Wright would approve of what has been done during the past seven years is open to question, but the additions to the hotel are in the original spirit of that structure, and it continues to be an outstanding addition to the Arizona scene. However, Mr. Wright himself disclaimed responsibility for the architectural concept, and the credit must go to Albert Chase McArthur.

*John I. Yellott
Department of Planning
College of Architecture
Arizona State University
Tempe*

With regard to your article on a new housing type in response to changing family concepts (RECORD, September 1980, pages 98-101), I feel Susana Torre is on to something very interesting. Current family concepts come as a result of many complex societal forces. Shifts in values, demographic phenomena, economic woes, the energy crisis, as well as major technological innovations—all effect changes in our society. Perhaps these new family concepts are the embryos of a new society that redefines the family and community structure in order to respond more effectively to these societal forces.

Innovative urban residential planning and architecture integrating recent technological advances can help create more workable community environments. In addition to Miss Torre's analysis of changing family concepts, I would suggest a more general reassessment that emphasizes an appropriate community scale based on a coherent and workable ecological and economic structure. Such an analysis, I think, should emphasize the need for a more self-sustaining renewable, rather than exhaustible, energy source. Furthermore, the application of several experimental technologies in building systems and materials and in network telecommunications systems portend many innovative community cooperatives that could revitalize the community environment. For example, network communications systems now in the experimental stages interconnect individual community members with each other and with national and local merchants and institutions. Such systems could significantly reduce energy consumption by selective substitution of communications for transportation, while greatly increasing intercommunication, services and marketing possibilities for the community.

*Peter J. Forella, Architect
Washington, D. C.*

Correction

The chairman of Oklahoma City's Myriad Gardens Authority is Dean McGee, not Magee, as misspelled on page 77, RECORD, mid-August 1980.

Calendar

NOVEMBER

5 "Housing Rehab/Energy Conservation," a full-day conference focusing on the practical details and critical issues in energy-efficient housing rehabilitation. Sponsored by the Tri-State Regional Planning Commission and the Connecticut Department of

Housing; New Haven, Conn. Contact: John Miller, Housing Rehabilitation Institute, 203/787-8372.

6-7 2nd Annual Meeting of the Building Seismic Safety Council, Memphis, Tenn. Theme: Mitigation of earthquake hazards through voluntary action. Contact: BSSC, 1015 15th St., Suite 700, Washington, D.C. 20005.

9-12 65th International Hotel/Motel & Restaurant Show, at the New York Coliseum. Contact: George Little Management Inc. at 212/986-4700.

11-28 Exhibit of designs and plans for the new Australian seat of government in Canberra by Mitchell/Giurgola Architects. The Architectural League, Madison Ave. at 51st St., 11 AM to 5 PM from Monday through Friday.

15 The annual meeting of the Society of Commercial Archeology at the offices of Venturi, Rauch and Scott Brown, 4236 Main St., Philadelphia, Pa. 19127. Contact: Steven Izenour at 215/487-0400.

15 Opening of exhibition, "The Search for Alexander," at the National Gallery of Art in Washington, D.C. A major exhibition of rare Greek antiquities dating back to the 4th century BC. Sponsored by Time Inc. with the Greek government's Commission on "The Search for Alexander the Great." Contact: Michael Luftman, Time Inc. at 212/841-2515.

17-18 Conference/work session, "How to Get Downtown Organized," sponsored by the Downtown Research & Development Center; at the Warwick Hotel in New York City. Contact: Mary Dalessandro, coordinator, Downtown Research & Development Center, 270 Madison Ave., New York, N.Y. 10016.

19-20 Short course entitled "Thermal Design of Solar Processes," sponsored by the American Society of Mechanical Engineers Solar Energy Division. Presented in conjunction with the 1980 ASME Winter Annual Meeting in Chicago. Contact: ASME, United Engineering Center, 345 E. 47th St., New York, N.Y. 10017.

Through November 24 Exhibition of architectural travel sketches from the 1920s by Roger Bailey, FAIA, at the Philippe Bonnafont Gallery, 478 Green St., San Francisco, Calif. 94133.

Through December 1 "Celluloid Cathedrals," color photographs by John Margolies of movie theaters in the U.S.; on display at The Lobby, 369 Lexington Ave. at 41st St., New York City.

Through December 1 Entries in the American Plywood Association/Professional Builder Plywood Design Awards program must be postmarked by December 1. Contact: Plywood Design Awards, P. O. Box 11700, Tacoma, Wash. 98411.

ARCHITECTURAL RECORD (Combined with AMERICAN ARCHITECT, ARCHITECTURE and WESTERN ARCHITECT AND ENGINEER) (USPS 132-650)

November 1980, Vol. 168, No. 7. Title® reg. in U.S. Patent Office, copyright© 1980 by McGraw-Hill, Inc. All rights reserved. Copyright not claimed on front cover and editorial four-color separations. Indexed in Reader's Guide to Periodical Literature, Art Index, Applied Science and Technology Index, Engineering Index, and The Architectural Index.

Quotations on reprints of articles available. Every possible effort will be made to return material submitted for possible publication (if accompanied by stamped, addressed envelope), but the editors and the corporation will not be responsible for loss or damage.

EXECUTIVE, EDITORIAL, CIRCULATION AND ADVERTISING OFFICES: 1221 Avenue of the Americas, New York, N.Y. 10020.

OFFICERS OF MCGRAW-HILL PUBLICATIONS COMPANY: president: Paul F. McPherson; executive vice presidents: James E. Boddorf, Gene W. Simpson; group vice president: Thomas H. King; senior vice president-editorial: Ralph R. Schulz; vice presidents: Kemp Anderson, systems development; Stephen C. Croft, manufacturing; Robert B. Doll, circulation; James E. Hackett, controller; William H. Hammond, communications; Eric B. Herr, planning and development; John W. Patten, sales; Edward E. Schirmer, international.

CORPORATION OFFICERS: Harold W. McGraw, president, chief executive officer and chairman of the board; Robert N. Landes, senior vice president and secretary; Ralph J. Webb, treasurer.

ASSOCIATED SERVICES/McGraw-Hill Information Systems Co.: Sweet's Catalog Files (General Building, Engineering, Industrial Construction and Renovation, Light Residential Construction, Interiors), Dodge Building Cost Services, Dodge Reports and Bulletins, Dodge/SCAN Microfilm Systems, Dodge Management Control Service, Dodge Construction Statistics, Dodge regional construction newspapers (Chicago, Denver, Los Angeles, San Francisco).

SUBSCRIPTIONS: Subscriptions solicited only from architects and engineers. Position, firm connection, and type of firm must be indicated on subscription orders. Please allow 4-12 weeks for shipment. Subscription rates for U.S., U.S. Possessions: \$23.00 for architects, engineers and others in the field served; all others \$33.00. In Canada: \$25.00 for architects, engineers and others in the field served; all others \$35.00. In all other countries: \$49.00 for architects and engineers; all others \$55.00. Domestic and Canadian single copy price: \$5.50 except the mid-May issue which is \$5.95. Foreign single copy price: \$7.00. "Publisher reserves the right to accept/reject any subscription." GUARANTEE: Publisher agrees to refund that part of subscription price applying to unfulfilled part of subscription if service is unsatisfactory.

CHANGE OF ADDRESS: Forward changes of address or service letters to Fulfillment Manager, Group A, ARCHITECTURAL RECORD, P.O. Box 430, Hightstown, NJ 08520. Provide both old and new address, including zip code; if possible attach issue address label.

PUBLICATION OFFICE: 1221 Avenue of the Americas, New York, New York, 10020. ARCHITECTURAL RECORD (USPS 132-650) published monthly except May, August and October when semi-monthly, by McGraw-Hill, Inc. Controlled circulation postage paid at Strasburg, Virginia.

POSTMASTER: PLEASE SEND FORM 3579 to Fulfillment Manager, ARCHITECTURAL RECORD, P.O. Box 430, Hightstown, NJ 08520.

THIS ISSUE is published in national and separate editions. Additional pages or separate editions numbered or allowed for as follows: Western Section 32-1 through 32-4.





a must for malls

Gail

Unglazed Brickplate

Ceramic tile floors and walkways are used in virtually all shopping malls in the U.S. And Gail Unglazed Brickplate has been used far more often for a combination of reasons:

Slip-Resistant—Gail Unglazed Brickplate has an abrasive surface which helps prevent accidents; **Longer-wearing**—Gail Unglazed Brickplate outlasts others because the

vitrified clay body withstands foot-traffic from millions of shoppers; **Economical Maintenance**—non-absorbent body resists acids, oils, chemicals, and other abuses... cleans quickly without heavy scouring or waxing; **Frost-proof**—patterns and colors can be coordinated, indoors and outdoors; **Widest Selection**—a myriad of natural,

earthtone colors and sizes (2½ x 10, 4 x 8, 5 x 10, 8 x 8). For more than 85 years, Gail Brickplate has proven itself all over the world under the most severe conditions. For additional information or the name of your local distributor contact one of our four regional sales offices.

Gail Ceramics

1481 North Main Street
Orange, California 92667
Phone: (714) 997-9383

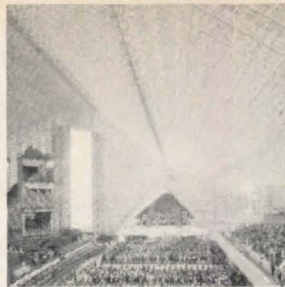
1201 Douglas Avenue
Redwood City, California 94063
Phone: (415) 365-6212

6265 McDonough Drive
Norcross, Georgia 30093
Phone: (404) 448-8304

388 Pompton Avenue
Cedar Grove, New Jersey 07009
Phone: (201) 239-7117

Shown above: 1. Greenwood Park, Indianapolis, Ind. Over 93,000 Sq. ft. of Gail Unglazed Brickplate installed; Architects: Charles Kober Associates; Developers: Melvin Simon Associates, Inc. 2. The Meadows Shopping Mall, Las Vegas, Nevada; Over 45,000 sq. ft. of Unglazed Brickplate (English Red and Leather) specified for floors by architects, Charles Kober Associates; General Contractor: Ernest W. Hahn, Inc. 3. Lougheed Mall, Vancouver, B.C., Canada Architects: Dirrassar, James & Jorgensen; Developers: Trizec Corp., Ltd. 4. Woodland Hills Mall, Tulsa, Oklahoma Architect: Charles A. Kober Associates; Developer: Dayton-Hudson Properties. Gail Unglazed Brickplate on floor surfaces. 5. Capitol Mall, Olympia, Washington; Architects: John Graham & Co., Seattle; Developers/General Contractors: Ernest W. Hahn, Inc., El Segundo, California.





Cover: Crystal Cathedral
Garden Grove, California
Architects: Johnson/Burgee
Photographer: Gordon Schenck

EDITOR

WALTER F. WAGNER, JR., AIA

EXECUTIVE EDITOR

MILDRED F. SCHMERTZ, FAIA

SENIOR EDITORS

HERBERT L. SMITH, JR., AIA, Administration

ROBERT E. FISCHER

ASSOCIATE EDITORS

GRACE M. ANDERSON

DOUGLAS BRENNER

CHARLES K. GANDEE

BARCLAY F. GORDON

CHARLES K. HOYT, AIA

JANET NAIRN

ROGER YEE

PRODUCTION EDITOR

ANNETTE K. NETBURN

DESIGN

ALEX H. STILLANO, Director

ALBERTO BUCCHIANERI, Senior associate

ANNA-MARIA EGGER, Associate

MURIEL CUTTRELL, Illustration

J. DYCK FLEDDERUS, Illustration

JAN WHITE, Consultant

EDITORIAL CONSULTANTS

EDWARD LARRABEE BARNES, FAIA

JONATHAN BARNETT, AIA, Urban design

GEORGE A. CHRISTIE, JR., Economics

ERNEST MICKEL, Hon. AIA, Washington

PAUL RUDOLPH, FAIA

Foreign architecture

L'Architecture d'Aujourd'hui, Paris

McGRAW-HILL WORLD NEWS

MICHAEL J. JOHNSON, Director

9 domestic and 10

international news bureaus:

Bonn, Brussels, Buenos Aires,

London, Milan, Moscow, Paris,

Singapore, Tokyo, Toronto.

SALES MANAGER

MICHAEL J. MRVICA

CIRCULATION DIRECTOR

RICHARD H. DI VECCHIO

BUSINESS MANAGER

JOSEPH R. WUNK

MARKETING SERVICES MANAGER

CAMILLE H. PADULA

ASSISTANT TO PUBLISHER

ELIZABETH HAYMAN

PUBLISHER

PAUL B. BEATTY

THE RECORD REPORTS

13 Editorial

On evolution and interiors:
a 16th issue of RECORD

4 Letters/calendar

33 News in brief

35 News reports

San Francisco's Ferry Building will undergo a \$50-million restoration. The AIA adopts an energy education program for architects. Professional liability insurance premiums are on the decline. Congress approves funds for improvements to urban waterfront areas. The GSA will spend \$4.2 billion to construct 172 Federal office buildings over the next four years.

39 Buildings in the news

The Chicago chapter of the AIA presents six Distinguished Building Awards.



J.A. McAlonen III

40 Architects for Portland's Fountain Plaza redevelopment will be Zimmer Gunsul Frasca Partnership.

43 Required reading

*Chicago Tribune Tower Competition/
Late Entries*

by Stanley Tigerman
introduction by Stuart E. Cohen,
reviewed by Christine Matheu.

ARCHITECTURAL BUSINESS

**57 Dodge-Sweet's Construction Outlook:
A wobbly recovery**

Provided that the Federal Reserve allows 1980's high-interest rates to recede, the emergence from recession shown by housing construction during the past summer is likely to gain further momentum in 1981, leading a partial—if tentative—reversal of this year's steep decline in nonresidential construction, as well.

FEATURES

77 Johnson/Burgee Crystal Cathedral
Embodiment of light and nature
 The new church for the Reverend Dr. Robert Schuller in Garden Grove, California, is both an inspiring and an inspired structure. Further, it is more than a vehicle for Schuller's pastorate—at once a religious edifice and a spectacular TV "studio." In truth, the building is extraordinary architecture—a building that reaches out to people and that people reach out to, a fair litmus test for any serious piece of architecture.

86 Birkerts' library for Duluth
 Recalling the form of long cargo boats on the Great Lakes, the new Duluth Public Library, designed by Gunnar Birkerts and Associates, carries out the architect's nautical metaphor with prow and steel hull.



©Timothy Hursley/B. Korab, Ltd.

92 Three architects' houses:
 92 Renato Severino
 Greenwich, Connecticut

96 Morton Hoppenfeld
 Albuquerque, New Mexico

00 Tod Williams
 Sagaponack, New York

BUILDING TYPES STUDY 552

104 The 1980 winners in the first Aga Khan Award for Architecture
 This award, established in 1978, was designed to encourage Muslim leaders and their architects, both Western and Muslim, to begin to pay attention to Muslim beliefs, ways of life and building traditions and allow these forces to help shape the new environments in which a 1,800-year-old religious culture will persist. The fifteen winners are included in this study. They have been sorted into the seven following categories as determined by the master jury.

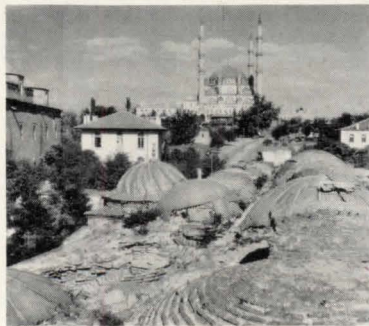
106 Search for architectural innovation
 Projects from Mecca and Kuwait

110 Social premises for future architectural development
 Self-help efforts in Indonesia

112 Search for appropriate building systems
 A low-technology labor-intensive structural method developed in Senegal

114 Search for consistency with historical context
 A headquarters building for a cultural institution in Turkey, a hotel in India, and a house on the Turkish coast

118 Restoration
 Ancient buildings conserved in Turkey, Iran and Qatar



Holuk Dogaribey

122 Search for contemporary use of traditional language
 Housing in Morocco, a private house in Egypt and a medical center in Mali

124 Search for preservation of traditional heritage
 A village in Tunisia conserves its vernacular architecture

ARCHITECTURAL ENGINEERING

82 Crystal Cathedral:
The engineering details
 How the space frame works and how the building is ventilated naturally.

128 Office literature

135 Product reports

165 Classified advertising

170 Architectural Record Book Shop

178 Advertising index

181 Reader service inquiry card

NEXT MONTH IN RECORD

Building Types Study:
Federal Buildings Overseas

America's new embassies and consular buildings overseas will have a new look that will reflect Washington's revised image of its role and presence overseas. By and large they will be good buildings, for they come out of a Federal program that once again insists on quality.

Laminated Architectural Glass.

It brings nature in and keeps burglars out.



Designing a home for clients who want to be in touch with their natural surroundings calls for extensive use of glass. Unfortunately, most glazings also add a serious security risk, particularly in remote rural areas or in downtown urban renovation sites. In fact, twenty percent of all forced break-ins are the result of glass breakage.

With laminated architectural glass, there's a solution to the problem. Unlike ordinary glass, which shatters easily on impact, laminated glass is a formidable barrier. Even heavy attacks by brick, crowbar or pickax result in only localized fractures and limited penetration.

Of course, no construction of any kind will stop a sustained attack. But since most burglaries are

committed by non-professionals who don't persist for more than a few minutes, laminated glass will usually provide sufficient delay to successfully thwart the attempt.

Laminated glass is constructed of two or more sheets of glass permanently bonded together with a plastic interlayer.

Monsanto manufactures the Saflex® polyvinyl butyral plastic interlayers most often used by leading producers of laminated security glass.

To find out more about how laminated architectural glass can fit into your residential designs, write: Monsanto Plastics and Resins Company, Department 804, 800 North Lindbergh Boulevard, St. Louis, Missouri 63166.

Circle 7 on inquiry card

SAFLEX

PLASTIC INTERLAYER BY **Monsanto**

Monsanto

Saflex® is a registered trademark of Monsanto Company

On evolution and interiors: a 16th issue of RECORD

I've talked many times on these pages about evolutionary change—in architecture and in magazines. All of us journalists are tempted (and sometimes accused) of announcing (and sometimes attempting to create) revolution: "Modern architecture is dead and post-Modernism is the future"; "Systems building is the only salvation [remember that one?];" "Construction managers threaten architect's role [remember *that* one];" "Man bites dog."

What's happening now continues to seem to me to be evolutionary, the kind of constant change that marks our lives—and the life of any profession or business. There clearly is under way a trend toward pluralism in design—more is good than we used to think was good. And that's good. Energy conservation is clearly having a strong effect on architects and engineers—and the shape of buildings. Rehabilitation and re-use—which were hot new ideas ten years ago—are now mainstays of architects' work; and clearly perceived by the public and by public officials as a force for rebuilding our cities.

In anticipation of, or in reaction to, these changes, RECORD has evolved. In recent years, we introduced the Architectural Business section to help readers understand and compete with the "construction manager threat." As the profession's concerns over professional liability simply multiplied, we asked the brilliant and thoughtful attorney/architect Arthur Kornblut to write our Legal Perspectives page. To strengthen the link between our architect and engineer readers, we added to our monthly architectural-engineering coverage the mid-August *Engineering for Architecture* issue to explore on a broader basis the cutting edge of engineering as it impacts design.

Perhaps the most exciting evolution of recent years has been the growing involvement of architects in interior design—not just the design of their own buildings (that's been going on for a long time), but the performance of interior design commissions for tenant office interiors, restaurants, department stores, shops, showrooms, apartments, museums, and so on and on.

Our most recent (1978) research on "Interior Design Activity of Architectural Record Subscribers" showed that almost all (but 4 per cent) of the respondent firms "sometimes" or "always" designed the interiors of the buildings they plan, that over 80 per cent are involved in the interior design of remodeling/re-use projects within the firm, and that over one-quarter have a full-time interior

department within the firm. The move is clearly on for more and more architects to be more and more involved. . . .

And thus RECORD is becoming more and more involved. Ten years ago, in the January 1970 issue, we introduced *Record Interiors* "to recognize outstanding interiors designed by architects." In a 26-page article, we published (among others) a temple by Richard Foster, offices by Harry Wolf, a showroom by Victor Lundy, an industrial plant by ISD (then a division of Perkins & Will)—and a bar in Washington by Hugh Newell Jacobsen, which as I recall failed shortly (surely not for lack of drinkers in our Capital, and *surely* not because it wasn't an elegant place).

The *Record Interiors* program, for which we invite submissions, has grown over the years—until we now study for publication well over 300 projects each year. Our coverage of interiors in issues through the years has also grown, and last year we published such an article almost every month.

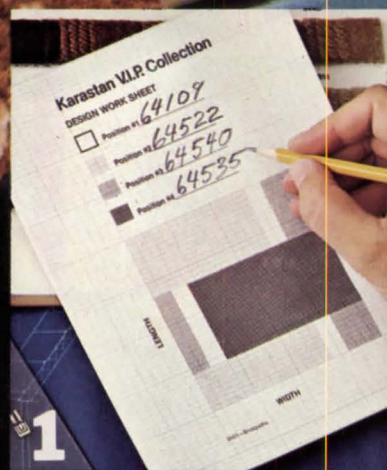
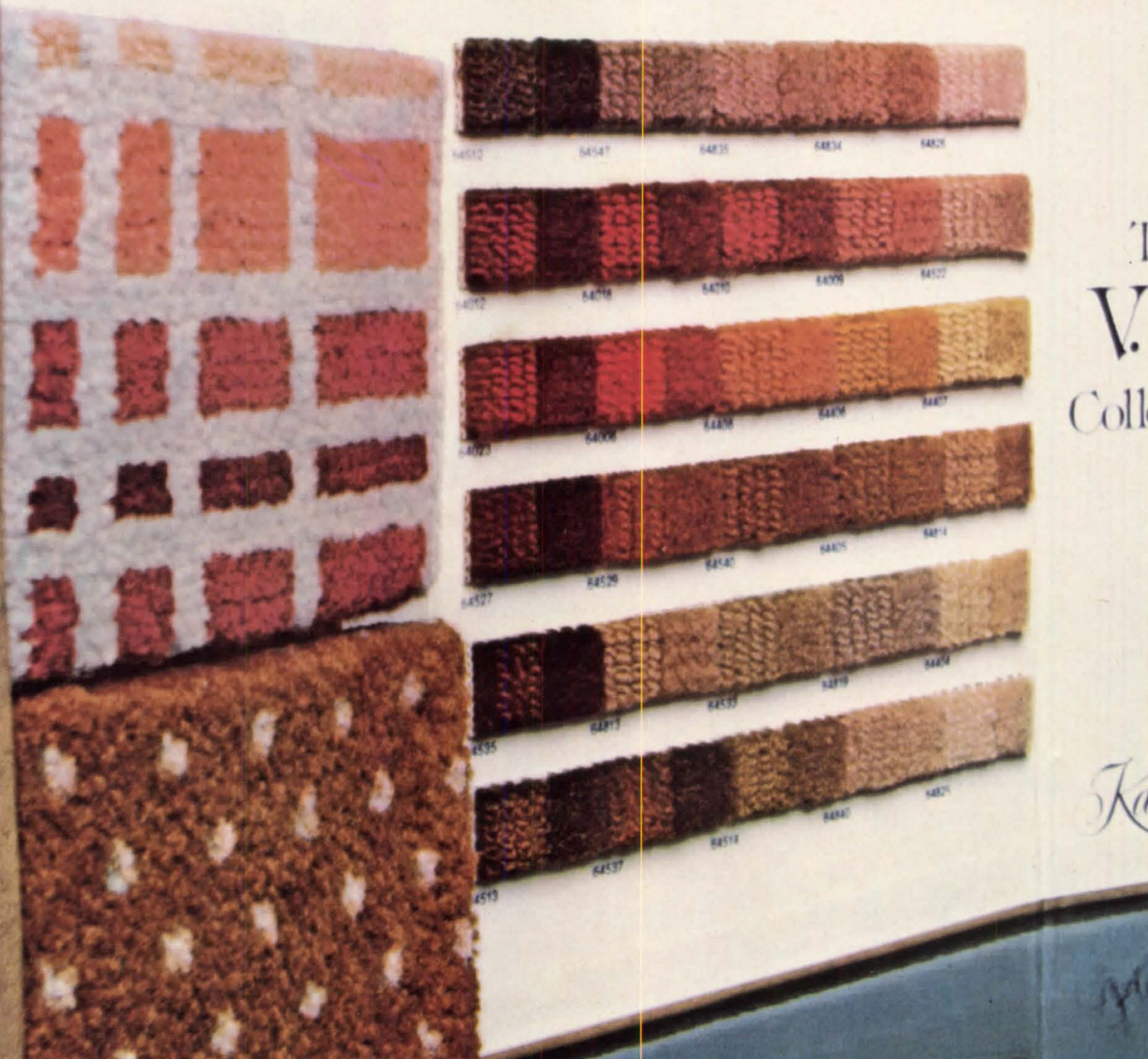
And thus, we think, the time is right to expand our interior-design coverage still further—and in mid-February we will publish a regular issue entitled *Record Interiors*—our 16th issue each year.

It will include as its major feature an enlargement of the *Record Interiors* program—and I'm encouraged by the early material we've looked over that it will be the best collection of work yet. We also intend to publish the results of a Round Table to which we have invited as panelists architects and interior designers, and, to keep us all honest, representatives of major clients. The working title is "Architects and Interior Designers: Conflict, Cooperation, and Design Quality." Some of the questions we hope to address: Are there certain kinds of interior design commissions more suitable for architects than for interior designers—and vice versa? Do designs by interior designers "look different" from designs by architects—for example, is it true that interior designers use a wider palette of materials? Does the boom in restoration and recycling suggest any changing relationships between architecture and interior design? Perhaps more broadly: What do interior designers know that architects don't know? And vice versa? And practically: Is it true that interior design is more profitable?

At any rate, we think that the time is right. And we hope the issue—again, watch for mid-February—will be both fascinating and useful to you.

—Walter F. Wagner Jr.

BREAKT



1 Fill in the Design Work Sheet.



2 We deliver your sample promptly.

Nominations for the 25th R.S. Reynolds Memorial Award will be accepted until November 24. The award is given annually for the design of "a permanent, significant work of architecture, in the creation of which aluminum has been an important contributing factor." To be considered for the award, an architect must notify the AIA (responsible for administering the award), or be nominated—preference will be given to work completed during the three years prior to January 1, 1981. The R.S. Reynolds Award confers a \$25,000 honorarium and an original aluminum sculpture. For nomination forms and further information contact: R.S. Reynolds Memorial Award, American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C. 20006.

The University of Texas at Austin has announced plans to establish the O'Neil Ford Chair in Architecture, named after Texas architect O'Neil Ford. It will be the University's first academic chair in architecture.

August contracts for new construction totaled \$15.1 billion, a gain of 6 per cent over the year-ago amount. Although construction activity has been recovering steadily since the recession's low was reached in May, August was the first month in 1980 when contracting for new projects actually exceeded the comparable 1979 value. Nonresidential building, at \$4.3 billion, slipped 2 per cent below last year's amount for the month, while residential building showed further improvement, as the month's \$5.9 billion of contracting recovered to within 17 per cent of the year-ago total. August's over-all gain is attributable to the \$4.9 billion nonbuilding construction value—a 76 per cent gain over last year's August figure.

An exhibition entitled "Central Park: Original Drawings" will be at New York's Cooper-Hewitt Museum until February 1. The exhibition will include 50 drawings by Olmsted, Vaux, and their associates, from a collection of 1400 drawings on permanent loan to Columbia University's Avery Library. The drawings in the Cooper-Hewitt show date from the late 1850s through the early 1880s, and range from full-scale working drawings—construction details for artisans and plans for structures—to watercolor presentation drawings.

The 1981 Rotch Competition is accepting applications until January 12, for two traveling scholarships. The Rotch Scholar will receive a \$12,000 stipend for eight months' foreign travel and the Second Rotch Scholar will receive \$6,500 for four months' foreign travel. Applicants must be citizens of the U.S., under 35 years of age on March 10 of the year of the competition; must have a degree from an accredited school of architecture plus one year of professional experience in an architecture office in Massachusetts; or, have received a degree from an accredited Massachusetts school of architecture with at least one year of professional experience. For information and further eligibility requirements contact: Norman C. Fletcher, Secretary, Rotch Traveling Scholarship, 46 Brattle Street, Cambridge, Massachusetts 02138.

The second issue in the American architecture commemorative stamp series was introduced by the U.S. Postal Service on October 9, at the annual convention of the National Trust for Historic Preservation in New York City. The 1980 issue portrays the original building (1895) of the Smithsonian Institution, Washington, D.C. designed by James Renwick; Boston's Trinity Church (1877) by Henry Hobson Richardson; Philadelphia's Pennsylvania Academy of Fine Arts (1876) by Frank Furness; and Lyndhurst (1838) at Tarrytown, N.Y., by Alexander Jackson Davis. The stamps were designed by Walter D. Richards of New Canaan, Connecticut.

ASHRAE is organizing a competition "to foster the efficient use of energy in new and existing buildings. . ." The objective is to discover and publicize the most innovative, tested, and effective designs in the field. A total of nine awards will be given, with first, second, and third prizes in the following categories: Institutional/Commercial New Construction; Institutional/Commercial Existing Structures; and Industrial. Projects must be in successful operation for at least one year at the time of entry, and all entries must be submitted by an ASHRAE member who has been actively involved in the project. For further information contact: Andrew T. Boggs, Executive Vice President, ASHRAE, 345 East 47 St., New York, New York 10017.

Women In Design International is holding its first design competition to recognize the work and achievement of outstanding women in all fields of design, including architecture, planning, landscape architecture, and interior design. The panel of jurors will include, among others, architects Angela Danadjieva and Margo Grant. For further information contact: Call for Entries, WID International, Rebecca Covalt, 530 Howard Street, San Francisco, California 94105 (415/285-9106).

A competition to design a memorial to the veterans of the Vietnam War is open to American architects, sculptors, landscape architects, and artists. The memorial is "to be a symbol for national unity and reconciliation after the controversy of the Vietnam War." The site is a two-acre park in Washington's Constitution Gardens, directly northeast of the Lincoln Memorial. In addition to a cash award, the winner will be retained as a design consultant through completion of the structure. Architect Paul D. Spreiregen, FAIA, is serving as professional advisor and the competition will follow AIA guidelines. For further information contact: Vietnam Veteran Memorial Fund, Design Competition, Suite 806, 1730 M Street, N.W., Washington, D.C. 20036.

All-Steel 8000 Series Systems Furniture not only offers you the freedom to design a totally new open plan office... it also offers panels and componentry which combine with existing office furniture. If you have an investment in conventional furniture to consider, such a combination could make real economic sense today.

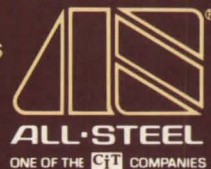
It will continue to make sense in the future, too, as offices grow and change. Because 8000 Series is a furniture based system that remains compatible with either traditional

Freedom Of Choice

The Unique
Advantage
with All-Steel's
Furniture Based
System

or open office plans. So, the freedom of choice you get when you choose All-Steel today is something you never really lose.

Learn more about All-Steel 8000 Series Systems Furniture. Call Wayne Wilkins at 312/859-2600, or write for our new brochure: All-Steel Inc., Aurora, Illinois 60507.



Circle 25 on inquiry card



San Francisco restores Ferry Building for \$50 million

San Francisco's historic Ferry Building will undergo a complete restoration and redevelopment that will convert the 1898 structure (originally designed by McKim, Mead and White-trained architect A. Page Brown) into an international business center by 1982. When completed, the complex will house office, commercial, and retail space, along with the proposed San Francisco History Museum that is tentatively slated to occupy the converted clock tower and a portion of the building.

According to Charles H. Lundquist, president of Continental Development Corporation (the project developer), "the result will be a 24-hour, seven-day-a-week world trade, shopping, dining, entertainment, and cultural complex."

The adjacent Agriculture Building on the south—to be restored on the exterior and rebuilt on the interior—will provide office and retail space. Plaza areas behind the Agriculture Building will be redeveloped, as well as the plaza area to the south of the building. The latter will be linked to the new open waterfront promenade now under construction. Rear portions of the Ferry Building will

become a continuation of the pedestrian promenade.

A second level will be added to Pier One (near left in photo) to be used for interim parking and future office and retail space. A plaza to the north of the Ferry Building will act as a connector platform area between the Ferry Building and Pier One. To be developed into a plaza and arcade for indoor/outdoor use, it is expected to provide a "major public amenity that will tie the entire complex together."

The project is viewed as a key-stone in the massive program to open up San Francisco's northeast waterfront to the public, under the jurisdiction of the San Francisco Port Commission.

The Ferry Building complex project will carry neither expense nor risk to San Francisco taxpayers, since Continental Development Corporation will provide all financing in return for 65-year leasehold rights.

The developers will be held to strict esthetic, and environmental

guidelines for the construction: one of the chief guidelines will be based on an exhaustive historical study by Charles Hall Page and Associates on replenishing the "historic integrity" of the Ferry Buildings' major facades.

I.M. Pei & Partners will serve as masterplanning and design architects. Gensler and Associates will be associated architects.

The project is expected to cost over \$50 million, with \$40 million in redevelopment expense and \$10 million in tenant improvements.



\$100 million in Federal funds for urban waterfront areas

The Coastal Zone Management Act was approved by Congress just before the election recess. The new legislation guarantees \$20 million a year for five years in Federal funds for cities to use in improving their waterfront areas. According to the legislation, the funds are intended for grants to urban areas—for waterfront parks and boardwalks—and the program is to be administered by the Commerce Department's Office of Coastal Zone Management. The agency's over-all program is authorized to spend \$161 million a year for the next four years, with a third of that amount earmarked for the 25 states that qualify.

In addition to the waterfront program, another new initiative this year will be grants to areas adversely affected by energy development, such as coal ports or ocean thermal energy conversion.—*William Hickman, World News, Washington.*

President Carter signs housing authorization bill

Congress has approved, and the President has signed, a huge housing authorization bill which substantially modifies many of the programs of the Department of Housing and Urban Development (HUD). The bill authorizes \$3.81 billion for the Community Development Block Grant Program,

\$675 million for the Urban Development Block Grant Program, and \$144 million in 3 per cent loans for the Rehabilitation Direct Loan Program.

A new rental subsidy program for 40,000 moderate-income families—as proposed by the House of Representatives—was dropped from the bill. Senators argued against creating the new program because it would subsidize some families with earnings as high as \$40,000 per year.

A major policy change requires that the biggest housing subsidy program—the Section 8 program which is provided an additional \$1 billion in contracting authority—must spread its funds equally between existing housing and new construction.

A greatly-expanded subsidy program for lower-income home buyers was enacted under Section 235, but administration budget authorities contend the program must undergo appropriations actions before the supposedly available \$135 million can be committed.

An amendment to the Urban Development Action Grant Program sets a time limit for clearance by the Heritage Conservation and Recreation Service of the Interior Department—this provision was sought by developers with projects affecting historic buildings or neighborhoods.

The final bill adopted a time schedule for the Building Energy Performance Standards (BEPS) that satisfies everyone in the construction industry except for the AIA. It extends the deadline for implementing BEPS to

April 1, 1983: the AIA wanted immediate implementation.

Interim BEPS regulations are to be published by August 1, 1981, with the proposed standards to be tested over a 12-month period in various regions of the country. Implementation of the program will be kept under HUD's wing for the time being, not transferred to the Department of Energy as some legislators wanted.—*William Hickman, World News, Washington.*

Insurance premiums decline for A/E professional liability

For the first time in more than a decade, professional liability insurance premiums appear to be going down. The AIA and the American Consulting Engineers Council (ACEC)—which together represent most construction design professionals—still consider the premium costs too high and are seeking legislative relief to ease the burden. But surveys commissioned by the two organizations suggest that premium costs may have peaked, at least temporarily.

One particular survey, conducted of ACEC members, shows the average firm paying 2.6 per cent of its 1980 gross billings for insurance premiums, as opposed to last year's figure of 2.9 per cent. The same survey shows that the number of firms choosing not to buy insurance coverage will decline this year from 17 per cent to 15 per cent.

The National Society of Professional Engineers (NSPE) is telling its members that there will be no further rate increases this year, and that amounts are likely to decline for firms with billings of less than \$100,000.

Although there has been a noticeable reduction in the number of claims filed, and many of the claims are frivolous, even frivolous claims are expensive. They cause firms to spend countless hours of unproductive time in preparing legal defenses while slipping into higher risk categories without regard to the legitimacy of the claim.

The AIA and ACEC reaction is to seek approval of a tax device for architects and engineers permitting the establishment of a professional liability trust for the tax-free accumulation of income that could be used to pay professional liability claims and associated expenses. As Congress was ending its pre-election session, the organizations were lobbying hard to have such a provision attached to "Christmas tree" tax legislation. Although the tactic failed, the two groups plan to make another effort in this month's post-election session, and, if the current efforts fail, again in the new Congress.

Under the proposed legislation, the amount of the deduction permitted would be determined by the severity of a firm's liability insurance problem. Those unable to obtain \$1 million in coverage at a premium cost of 2 per cent or less would be permit-

continued on page 37



Solar system.

Here's an easy way to solve one of the major causes of premature roof failure—moisture in the membrane.

It's the Johns-Manville FP-10 One-Way™ Roof Vent. This solar operated venting unit is designed to release moisture-laden air from the membrane. And to prevent its re-entry.

The vent works simply. And automatically. When the sun's heat causes trapped moisture-laden air in the roof to expand, the vent's one-way valve opens, releasing the moisture. When the roof cools, the valve closes, sealing damp air out.

The valve also keeps out snow and wind-driven rain as well as water, even if submerged.

The FP-10 Vent is ideal for roofs where internal moisture may enter the system because of a faulty vapor retarder or lack of one.

It's easily and quickly installed on both new and existing roofs. And is eligible for coverage under the J-M Guaranteed Roof Program.

For more information, consult Sweet's. Or contact Dave Lucy, Johns-Manville, Ken-Caryl Ranch, Denver, Colo. 80217, (303)979-1000.

**For single-source
built-up roofing systems.**



Johns-Manville

Circle 26 on inquiry card

continued from page 35

ted to deduct the lesser of 5 per cent of the year's gross receipts from services of \$100,000. All other firms would be permitted to deduct the lesser of 2 per cent of the year's gross receipts from services of \$25,000.

Two-thirds of the firms surveyed in a consultant's report commissioned by the AIA and ACEC say they would make use of this tax device; most say they would do so for supplementing their existing coverage. A breakdown shows 58 per cent of the firms intending to take advantage of the trust to raise their deductible amount, another 19 per cent would raise their policy limit, 12 per cent would lower policy limits, and 11 per cent would discontinue commercial coverage.

According to AIA president Charles E. Schwing, FAIA, the legislation is "urgently needed" and is "of prime importance to the entire design profession."

A major insurance company, writing coverage for architects and engineers, supports the bill. J. Spring Duvall, president of Victor O. Schinnerer & Company of Washington, (which insures 6,000 firms), says design professionals have "unique and very complex exposure" to claims for personal injury, property damage, and intangible financial loss. Mr. Duvall contrasts this with other professionals—such as doctors, whose exposure almost entirely involves personal injury, or attorneys, whose liability usually encompasses intangible financial loss.

Whatever the case, the liability insurance burden falls most heavily

on the smallest firms: those with fewer than five employees pay an average of 3.38 per cent of their gross billings in premium costs, while the largest firms with more than 500 employees pay an average of only 1.43 per cent of gross billings.—William Hickman, *World News, Washington*.

AIA will develop energy education program

At its fall meeting in Halifax, Nova Scotia, the Board of Directors of the AIA voted to accept a 2½-year Energy Professional Development Program for architects.

AIA President Charles Schwing appointed a 7-member task force, chaired by Don Burr, who will be the 1981 chairman of the AIA Energy Committee, to develop the format for a comprehensive educational program to reach the maximum number of AIA members.

The objectives of the program are:

- The development of AIA member skills and knowledge so that architects become leaders in the energy field.
- The integration of energy-conscious design into the design process.
- The encouragement of a public and client perception of architects as leaders in the energy conservation field.

The program consists of three "levels." Level one will be developed for AIA component chapter meetings in several forms including live and/or

audiovisual presentations. Printed material will describe the range of energy issues defined by the task force. Various formats will be developed which will be suitable for 30- to 90-minute programs. Level two will be presented in two workshops, one in the area of technical analysis and the other in design. Level three will be presented in two two-day workshops which will investigate those areas of technical analysis and design covered in level two. (The unique feature of this level will be to apply techniques developed in level two on actual building projects.) Technical analysis will include overview and case studies using actual application techniques. Design at this level will include energy economics, regulation and government programs, energy-conscious design, and building operation and control.

The AIA Research Corporation will be contracted to develop content for the program (based on the content outline defined by the AIA task force) in consultation with education consultants and technical specialists in the energy field.

GSA prepares for onslaught of office construction

The General Services Administration (GSA) has tentative plans for spending up to \$4.2 billion over the next four fiscal years on 172 Federal office buildings. Legislation now pending in Congress, gives the GSA authority to go to the U.S. Treasury for construction loans and orders it to lessen its

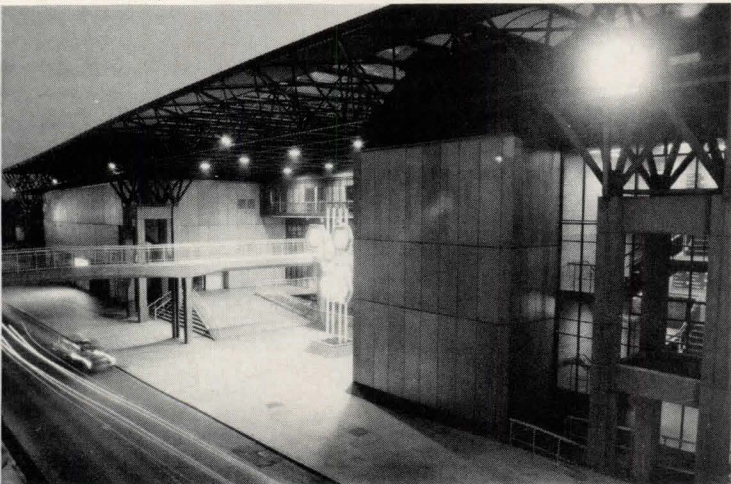
dependence on leased space for government workers—the result will be a dramatic acceleration of Federal office building construction.

The four-year program, outlined in a GSA internal planning document, represents only a fraction of the over-all program: the GSA is operating under the assumption that full implementation of legislation—known as S. 2080 or the Moynihan Bill—will force it to spend between \$20 billion and \$30 billion over the next two decades on Federal office building construction.

During Congress's pre-election recess, the staffs of the House and Senate Public Works Committee were meeting to work out a compromise on differing versions of the bill. If they can come close to an agreement, the lawmakers will be asked to ratify the pact and approve the conference report. Meanwhile, the GSA is tooling up to handle the anticipated increase in its workload. It is in the process of hiring a management consultant to offer advice on how the GSA Public Buildings Service Headquarters staff can reorganize itself to manage the program. This will not be easy, as the agency has been operating on a \$30-million new construction budget in recent years and lacks the staff and organizational structure for the larger program.

The new legislation will also create the office of supervising architect, make the Commissioner of Public Buildings a statutory office, and will demand higher quality architecture.—William Hickman, *World News, Washington*.

Gordon Railton & Co. photos



British firm receives Eurostructpress Award for recreation facility

The Eurostructpress Award is sponsored annually by 10 European journals and is considered one of Europe's top awards for architecture. This year, after receiving submissions from 8 countries, an international jury of architects, engineers, and members of the construction industry, presented the award to Gillinson Barnett and Partners of Great Britain.

The award was presented in

Paris by M. Maurice Herzog, former French Minister for Youth and Sport, to Randell Wynne-Jones, a senior partner of Gillinson Barnett and Partners, for the \$11-million Recreation and Leisure Centre in Sunderland, England.

The project began in 1970, when Gillinson Barnett and Partners was asked to prepare a sociological, financial, and commercial feasibility study

for the Recreation Centre. The firm was subsequently commissioned to design the facility, which includes an ice rink, a free-shape pool with wave machine, saunas, club rooms, and restaurant and banquet facilities.

The roof of the structure was fabricated at ground level and then raised on its own columns to its final position. During the design stage, calculations for the roof design were

made by the NASA Space Agency computer, with signals transmitted by satellite.

Mr. Wynne-Jones was the partner-in-charge of the project from its inception.

Gillinson Barnett and Partners is well-known for leisure and recreation buildings, and the firm participated in the 1978 Commonwealth Games at Edmonton, Canada.



The first safety bubbler.

Now help prevent accidental mouth injuries...with Elkay's exclusive Flexi-Guard.™ Soft and pliable, it "gives" when struck. Then returns immediately to its original form.

Flexi-Guard's extremely tough. It won't tear or lose shape. Abrasion-resistant. Meets U.L. requirements. Perfect for all public locations.

Elkay's the only place you'll find Flexi-Guard. And you'll find it standard on every Elkay.

**Elkay innovation.
Reflected in everything we do.**

ELKAY[®]

FOR MORE WATER COOLER INFORMATION, PLEASE WRITE ELKAY MANUFACTURING CO., 2222 CAMDEN COURT, OAK BROOK, IL 60521.

The Chicago Chapter of the AIA presents six Distinguished Building Awards

The Chicago Chapter of the AIA presented its 1980 Distinguished Building Awards on November 4 at the Art Institute of Chicago. From the 82 entries, six projects were chosen. The jury also presented a Twenty-Five Year Award to Mies van der Rohe's Town Hall at Illinois Institute of Technology. The jury included: Lee Copeland, FAIA, Director of the Graduate School of Fine Arts at the University of Pennsylvania; Harry C. Felt, FAIA, Charlotte, North Carolina; James Wood, Director of the Art Institute of Chicago; and Myron Goldsmith, FAIA, Chicago. The winning projects, and the jury's comments follow.

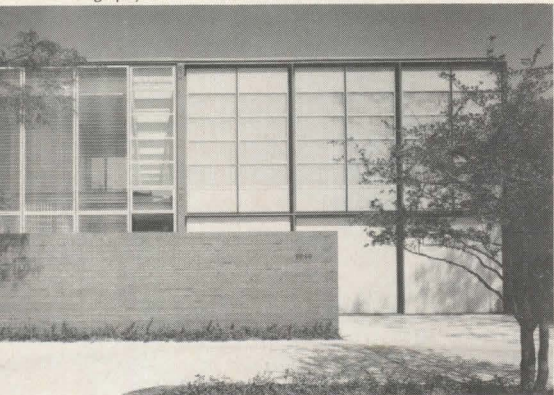
Howard N. Kaplan



Honor Award, Tri-State Center. Architects: Hammond Beeby and Babka. "This building accepts all the precepts of urban speculative office buildings, manipulating and reworking them in a special way to produce an image without uncloyingly pastoral cuteness too often found in this building type. . . . In the line of structural expression—with the bearing wall

facades rounding the corner to the non-structural ends, it provides a brief insight into the potential for future architectural expression, as does the manipulation of that singularly suburban element—the portecochère, brought here to a new definition. In the opinion of one juror, 'Until suburban development is outlawed, this project gives a significant suggestion for the future.' "

Karant Photography Inc.

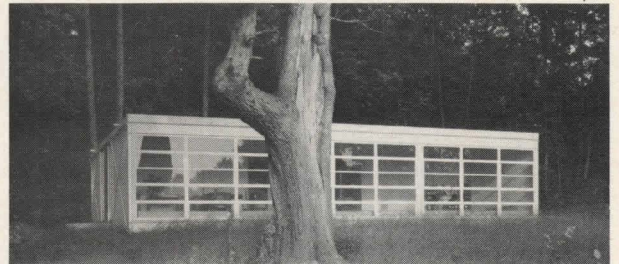


Honor Award, Steel and Glass House. Architects: Krueck & Nishida Architects. "This house is a real gem; every part of it is equally reinforcing to produce a greater meaning and resonance to the other elements. Technology, materials, color and color are, on the surface, simple but, in the end, complex. They fit beautifully together with an over-all sense of the house as a whole. As a design, it is a one-of-a-kind product. There is a consistent-

cy in the execution of intent on behalf of the architects. The high level of craftsmanship and the fabrication and erection of the building remain as part of one's experience. These are architects who have a sensitivity toward painting and sculpture; they are dealing with color, the painterly effects and exploration of the house as sculpture. There is a sophisticated appreciation and interpretation of history."



Honor Award, Xerox Center. Architects: C. F. Murphy Associates, Inc. "This building establishes a subtle, comfortable and intimate relationship with the street and the pedestrian. Rather than creating a barrier, the structure facilitates movement of pedestrians around the corner and along the sides of the building and to its entrances. The entries are almost sensuous; the inside lobbies and bank spaces are exciting and dynamic rather than static. The spaces invite movement and interest. The exterior wall has been rigorously done, as variations of a single repetitive architectural element. By continuing the curtain wall at the ground floor, the concept is emphasized and produces a strong result."



Howard N. Kaplan

Distinguished Building Award, Fultz Residence. Architects: Hammond Beeby and Babka. "The jury admired the relationship to site, the scale and the two architectural masses in a very delicate balance to the wooded and the agricultural area. As a closure element, the grid of glass induces the psychological feeling of containment. The scale is delicately handled, and the building is

very systematic and rational, organized in a very logical way that creates a human iconography. The statement is a balance between the rationality and the whiteness of the forms and their relation to the trees and the forest. The house is very much an 'edge,' through its positioning on the site, which is set slightly into the forest, thereby reinforcing the feeling of border."

Honor Award (Restoration), Carson, Pirie Scott & Co. Original architect: Louis H. Sullivan, restoration architect: John Vinci. "One modern problem to be resolved was the introduction of revolving doors. . . . The replacement of the curved glass elements in the rotunda was executed with care. It is admirable that the restoration architect refrained from a personal design expression and subordinated his ego to scholarship. The jury applauds the client as the genesis of this effort to make whole the architectural legacy of this part of Adler & Sullivan's architecture."



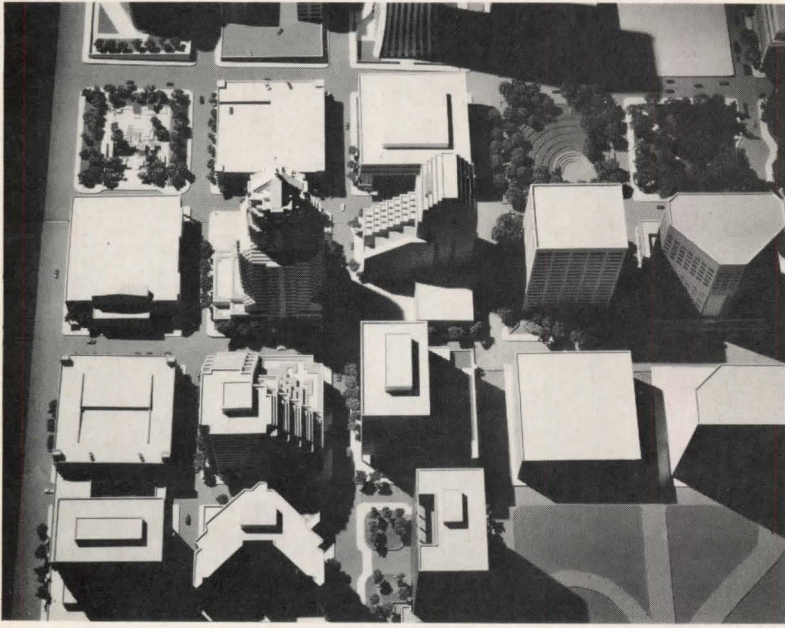
Bob Thall



Bob Thall

Honor Award (Restoration), Trading Room, Chicago Stock Exchange Building, the Art Institute of Chicago. Original architects: Adler and Sullivan, restoration architect: John Vinci, Lawrence Kenny. "The Art Institute has given a room to Chicago. The jury applauds this major commitment by the donor and the Art Institute in making this restoration possible. . . . one can see the room's original decoration and colors in the context of the space as it existed, rather than as fragments of an art preserved piecemeal."

The changing face of Portland, Oregon: Zimmer Gunsul Frasca Partners awarded Fountain



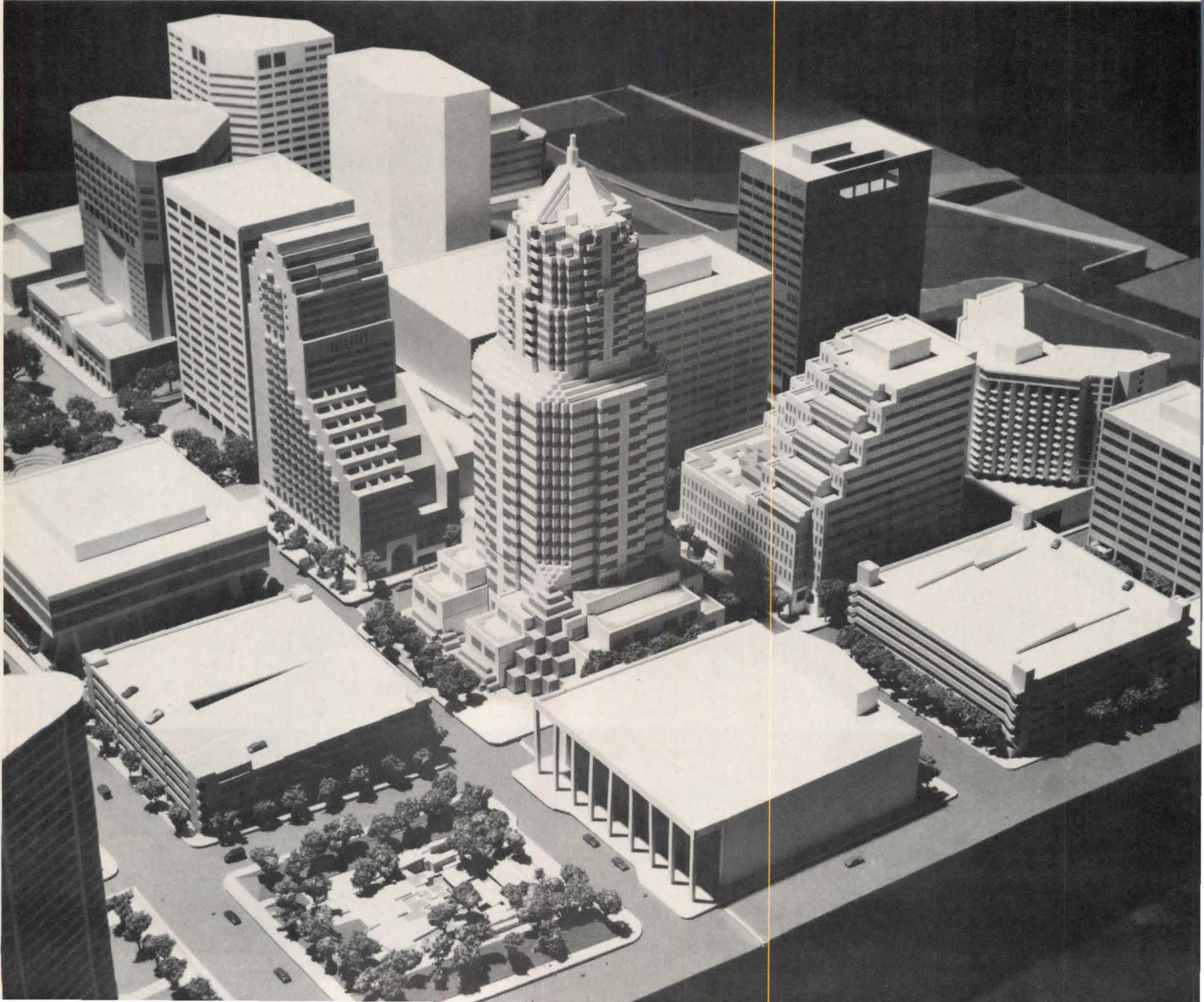
Last winter, the Portland Development Commission issued a public offering for 1½ blocks of downtown Portland. Seven proposals were received, and the project, known as Fountain Plaza, was awarded to developers Olympia and York Equity Corp., in joint venture with KOIN-TV and parent company Lee Enterprises. Architects for the winning proposal are Zimmer Gunsul Frasca Partnership of Portland.

Olympia and York had the incontestable advantage of being able to include an extra block in their proposal by joining with KOIN-TV, who had an existing building on an adjacent block that they were willing to assimilate into the public offering parcel. KOIN will be retained as a tenant in the now

2½ block proposal, but move to a new building off the street. According to developers, the inclusion of the additional site "improves the opportunity to create an ideal pedestrian environment... by consolidating street loading, we gain a necessary area to allow efficient underground parking as well as below-grade pedestrian connections between three sites."

The most striking of the proposed three buildings is the KOIN Center, the new headquarters for KOIN-TV. This will be a multi-use facility with 15 levels above grade, 15 floors of office space, 50 condominiums on the top 10 floors, commercial, retail, and c

Photocraft Inc./J.A. McAlonen III photos



za redevelopment project . . .

ex space along the street. KOIN's old building will be replaced by the Terrace Office Plaza, a 15-level office building with an atrium and retail space at street-level. A 285-room Four Seasons Hotel will sit adjacent to KOIN Center, and will include 23 residential units on the top six floors of the 17-level building.

The Fountain Plaza project follows the much-publicized Pioneer Courthouse Square competition (RECORD, August 1980) won by an interdisciplinary team headed by Willard K. Martin, and the Great Public Service Building competition (RECORD, August 1980) won by Michael Graves.

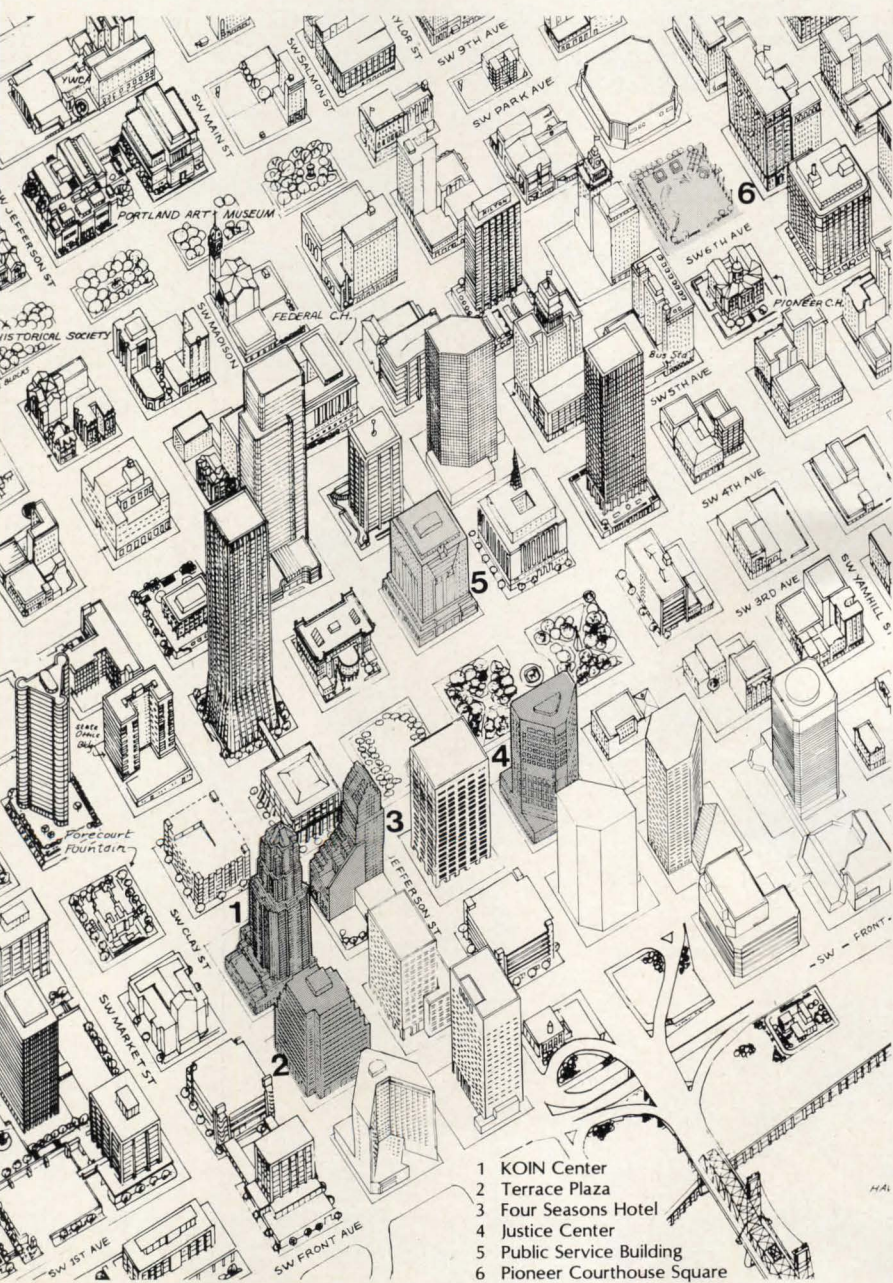
RECORD asked Robert Frasca, partner in the firm of Zim-

mer Gunsul Frasca, to present a design statement for the three buildings.

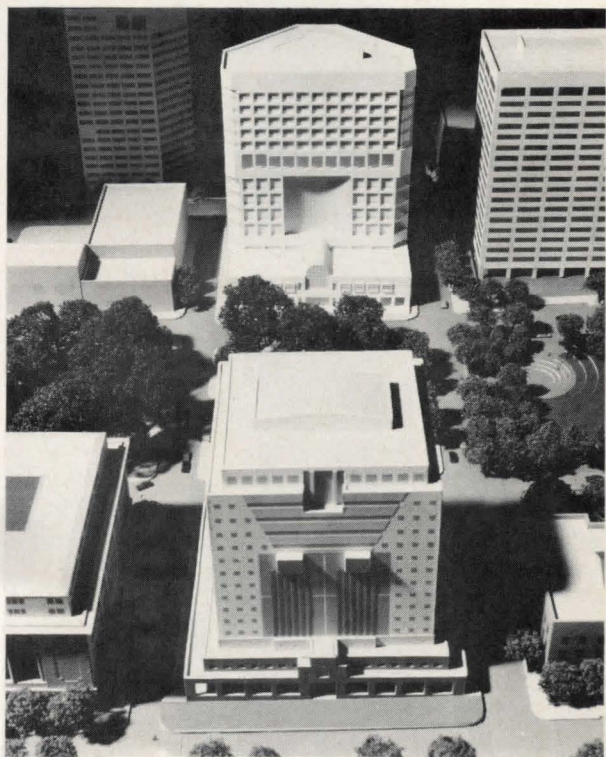
"The forms (or architecture) were derived from the program, the neighbors, the streets and the sun. The KOIN building wanted to be small at the Forecourt Fountain but 'big' behind that, and the scale of the elements reflects that. The footprint of apartments on top of the KOIN tower wanted to be smaller than the office floors below, which in turn wanted to be smaller than the 'street hugging' retail/activity area. The vertical articulation (which is as old as civilization) is a fallout of the program. To my knowledge, every time an architect has dealt with this transition of mass from top to bottom, it was

handled in a similar way. The pointed top is a device which will hang the apartment portion of the structure so that we can have microwave equipment and antenna. It also looks good. If the architecture is unique, it is in part because the program is unique.

"It's a return to some old homilies: trying to bring back some beauty with a capital B that the box could never provide no matter how slick it became. The materials we'll use are old friends—brick, natural stones, terra cotta, blended from block to block in similar shades, different tones, with threads of continuity between the blocks to define a relationship at a detail level but to dismiss the notion of a 'complex' or 'project.'"



- 1 KOIN Center
- 2 Terrace Plaza
- 3 Four Seasons Hotel
- 4 Justice Center
- 5 Public Service Building
- 6 Pioneer Courthouse Square



. . . and the city's new \$50-million Justice Center

A block away from the Fountain Plaza project—and across the park from Michael Graves's Portland Public Service Building—Zimmer Gunsul Frasca Partners has designed a new 480,000-sq.-ft. Justice Center, now under construction. The 16-story, \$50-million facility will house courtrooms, administrative offices, and police facilities in addition to a detention center for 430 inmates (non-sentenced offenders). The Justice Center will replace an outdated detention

center that is being destroyed by a new freeway.

According to Robert Frasca: "The tower is a precast concrete grid which accommodates the diverse fenestrations which the program demands. . . . The concave mirror-glass 'dish' on the park side opens up the dining and multipurpose rooms on the prisoners' housing floors."

An arcade along the park will have restaurants and outdoor seating. The glass vault identifies the main entrance.

**Haworth
takes the open
office out of
the dark ages.
With TriAmbientTM
Lighting.**

Improper light distribution, caused by inflexible ceiling fixtures, is a common lighting problem. But TriAmbient Lighting combines Panel-Mounted Fluorescent, Panel-Mounted H.I.D. (High Intensity Discharge) and Free-Standing H.I.D. lights along with task lights for optimum quality and economy. And TriCircuit ERA-1[®] powered panels allow completely internal electrical connections. TriAmbient Lighting. Part of the complete UniGroup[®] open office system from Haworth.



Send for the "UniGroup Lighting Package." Write Haworth, Inc., Holland, Michigan 49423.

HAWORTH[®]

Circle 28 on inquiry card



Architecture as media event

CHICAGO TRIBUNE TOWER COMPETITION AND LATE ENTRIES, by Stanley Tigerman, introduction by Stuart E. Cohen; Rizzoli New York, \$30.

Reviewed by Christine Matheu

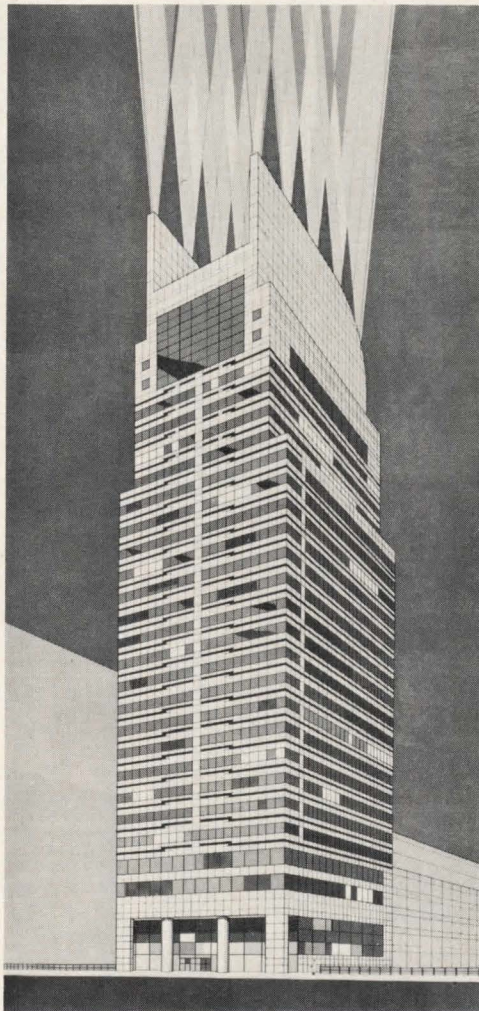
Artists reacted in the early 1960s against the arid scholasticism of Abstract Expressionism by bringing art back to earth, bringing it back to the people, by making super-realistic paintings. Warhol, Rosenquist, Rauschenberg, Johns, and friends emerged, followed in the 1970s by Close, Goings, Estes, Katz, and others. The public loved the palatable new art and the movement's charismatic personalities; the museums took advantage of the interest and collected extra revenue from it.

What is happening these days to architecture is not unlike what happened to art. The recent, somewhat mannered, reaction to the cloistered position in which the Modernists put architecture is causing a reaction among architects and the general public. This decade we are seeing architecture in what has been the traditional bastion of painting and sculpture, the private gallery; first through artists using architectural themes, such as Mary Miss's and Alice Aycock's use of "dwelling" as an iconographic form, and more recently through Michael Graves's drawings shown this fall at the Max Protetch Gallery, and *Architecture II: Houses for Sale* at the Leo Castelli Gallery, in which drawings, plans for construction, and estimated costs were displayed for the purpose of selling buildings by well-known architects.

Usurping the cultural position that art held in the '60s and '70s, architecture is emerging as this decade's new media event. The personalities we now see on the covers of *Esquire* and *Time* are gurus like I.M. Pei and Philip Johnson. Each week brings a new headline, one of the latest being the televised opening of Johnson's Crystal Cathedral for the Rev. Robert Schuller: architecture, personality, and religion rolled into one big publicity package.

Of more durable importance are events such as the opening of the Cooper-Hewitt Museum during this past decade, the first time the Federal government has supported a national museum of architecture and design. More recently, the Committee for the Venice Biennale recognized the need for architecture to have a separate exhibition and catalog,

Christine Matheu is an architect with Venturi, Rauch & Scott Brown and currently teaches architecture at the University of Pennsylvania. Ms. Matheu was co-designer of the Philadelphia installation of *Palladio in America* and curator for *Two Centuries and Beyond*.



"Late Entry" by Frederic Schwartz of Philadelphia.

partly because of the new architectural vision emerging from the re-examination of architectural history. And early this summer the Museum of Contemporary Art in Chicago first hosted the traveling exhibition entitled *Chicago Tribune Tower Competition/Late Entries*, organized by Stanley Tigerman, Stuart E. Cohen, and Rhona Hoffman.

Chicago Tribune Tower Competition/Late Entries is a re-event of the Chicago Tribune Competition of 1922. The organizers have abbreviated the original competition requirements in order to maximize presentation graphics for a flashy, colorful exhibit, and Rizzoli International has published a catalog to accompany the exhibition. The current exhibition organizers felt that the competition "to erect the most beautiful and distinctive office building in the world" was a perfectly appropriate vehicle for discussing not only what went on in 1922, but, more importantly, what is happening now. Subsequent events have made it seem as though in 1922 architecture was poised between the worlds of the nineteenth and twentieth centuries. The revival

competition purports to point to the 1980s as another moment between two worlds.

The title of the show—*Late Entries*—is rich in the kinds of associations which architects seem to love these days. Claes Oldenbergs's sculpture, which eventually found its way to Philadelphia, had as its original title *Late Submission to the Chicago Tribune Architectural Competition of 1922: Clothspin*, and Eliel Saarinen's runner-up project, a "late entry" of 1922, was considered the most beautiful solution at the time. In some ways, however, the exhibition catalog should have been entitled *Tribune Tower Competition, Volume I* and *Tribune Tower Exhibition, Volume II*, for the biggest question raised by the event, as George Baird points out in his catalog essay, is that it is important to distinguish between what is a competition and what is not. The 1922 version had all the requirements of a serious competition—a full array of drawings was required so that there was a complete picture of each project submitted, and a golden carrot was dangled before the entrants' eyes—\$100,000 in prizes and the opportunity to build the world's most beautiful skyscraper. The re-enactment, on the other hand, had as its sole requirement a large color perspective, and all the entrants reaped the same reward for their labor—the glory of having their project travel in an exhibition, be published, and reviewed.

Further distinctions must be made. The original competition was open to anyone who wanted to enter, while the later event was invitational. The original entries were rendered in black and white; the recent entries—while printed in black and white—were actually rendered in color. What has resulted is perhaps not what was expected by the exhibition's organizers, as Stuart Cohen points out in the catalog's introduction. By limiting this new competition's drawings to a single perspective, the only drawing we have today from the original competition, the organizers were effectively asking the entrants to drag out their own dusty copies of the 1922 competition and look at those entries rather than start fresh with the original rules of the competition. Also, by requesting a formal statement from each of these new entrants, the organizers should have expected that the entrants would use this opportunity for verbiage as a crutch for the metaphorical and esoteric statements which abound in *Late Entries*. The format of the new competition made original architectural thought difficult and acted as a catalyst for ironic and witty statements. Instead there is a continuum of commentary on the 1922 event: the competitors are reviewed by the

continued on page 45



New from
Masonite Corporation...

GEORGETOWN COLONIST

PREFINISHED

Now there's a six-panel, hardboard door facing that is factory prefinished in a warm, rich, wood-like tone. This puts an end to on-site finishing, resulting in faster installation.

Identical in styling to our highly popular, original Colonist® door facing, the new Georgetown Colonist faithfully duplicates the classic architectural styling and craftsmanship of colonial American stile and rail doors. Cove and bead, grain and joint details are all sharp, clear and authentic. Its finely embossed surface creates the look, the feel, and the textured appeal of a real wood door.

And this facing makes a much better door than the panelled wood doors of old (or even of today). Better, because the new Georgetown Colonist is die-formed from a single length of durable hardboard that's 50% denser than ordinary wood for strength and stability. Better, because there are no joints between the panels, stiles, moldings and rails that can separate through years of use. Better, because Georgetown Colonist is priced at about half the cost of pine and other wood doors.

For the names of quality door manufacturers using new Georgetown Colonist, write: Masonite Corporation, 29 North Wacker Drive, Chicago, Illinois 60606.

Masonite and Colonist are registered trademarks of the Masonite Corporation.



MASONITE

"late entries" who are reviewed by catalog essayists finally to be reviewed by reviewers. The original competition was a means to an end—to build a building; here the majority of entries are self-conscious references to the 1922 competition.

Chicago Tribune Tower Competition/Late Entries is made up of two soft covered volumes, the first of which is the almost entirely unabridged edition of the original volume as printed in 1922. Stanley Tigerman wrote *Volume Two* with an Introduction by Stuart E. Cohen and critical essays by George Baird, Juan Pablo Bonta, Charles Jencks, Vincent Scully and Norris Kelly Smith. There is a reproduction of each "late entry" with a short profile of each participant and a description by each of his/her project.

The physical artifacts of the 1922 Chicago Tribune Competition were the winning building by John Mead Howells and Raymond Hood, and the subsequent catalog of entries. We now have as a result of this new competition just a catalog of "late entries." There are plenty of reasons why one should own this two-volume set in this time of "referentiality"; every entry from the original competition has been reprinted for those who want, but cannot find, a copy of the original catalog at an affordable price, and there are as well all the benefits of seeing what the new wave of primarily young architects are thinking. There are, however, some problems which go along with not only the nature of a revival in general, but in particular with the reprint of an old catalog and an appendix of new ideas and opinion. Because of the rise in production costs, it is not easy to find an inexpensive hardbound book anymore; this is unfortunate because holding the heavier, hardbound, burrap-covered volume of the original competition somehow conveys the solemnity and importance of the formidable event it documents. The reprint, although well-produced and containing just about everything from the old book, is flimsy by comparison. The pages are more tightly packed with information, the pictures and general format are smaller, the paper neither as shiny nor as thick. Furthermore, the original shape of the book was rectilinear, tall, like a skyscraper, while the new shape is a bit too contemporary in its quarishness.

A catalog documents and preserves forever an event like an exhibition. There is danger, however, in treating architecture as a media event, as the majority of essayists point out. Vincent Scully seems so disappointed in the preoccupation with graphics over other architectural considerations that he states: "The old one [the 1922 competition] made everyone realize that their present was great. The present one suggests that our past was better." Juan Pablo Bonta and Charles Jencks simply view the exhibition as a barometer of our architectural concerns, and that the competition is important for that reason. While Bonta passes off the competition entries as mere graphic stunts not to be taken too seriously as architecture, Jencks

continued on page 50

Stop fires in seconds...safely. With DuPont Halon 1301.



1. Flammable liquid ignited. Halon 1301 cylinders discharged.



2. Fire totally extinguished in four seconds.

The fire protection system you specify in critical areas of buildings must react instantly to save lives and property. And no gaseous fire extinguishant works faster and more safely than Halon 1301. For example, in the demonstration above, Halon 1301 extinguished a flammable liquid (n-heptane) fire in just 4 seconds.

DuPont Halon 1301, at levels recommended for extinguishing most fires, won't harm people. It's safe to breathe at recommended extinguishing concentrations. When mixed with air (generally 5-7%), Halon 1301 renders the protected area fire-free.

Halon 1301 is noncorrosive, nonconductive—and clean. The odorless, colorless vapor leaves no residue to damage equipment, documents—whatever it protects.

Specify fast, safe DuPont Halon 1301 extinguishant. Tell us your specific hazard and application. Take advantage of our experience by writing for our Halon 1301 literature kit: DuPont Company, Room 38087E, Wilmington, DE 19898.

Halon 1301 fire extinguishant

Circle 30 on inquiry card



FOCUS

2



The ergonomic solution to space planning.

Showrooms:
Chicago
312/644-8144

Philadelphia
609/467-1423

New York
212/753-6161

Dallas
214/242-8592

Los Angeles
213/854-1882

kimball®

KIMBALL OFFICE FURNITURE CO.

A Division of Kimball International, Inc.
1549 Royal Street • Jasper, Indiana 47546



A steel-framed pedestrian bridge (above) connects the free-standing elevator tower to the garage, ground, and third levels. The concave facade (left) emphasizes the entrance and preserves as much of the landscape as possible.

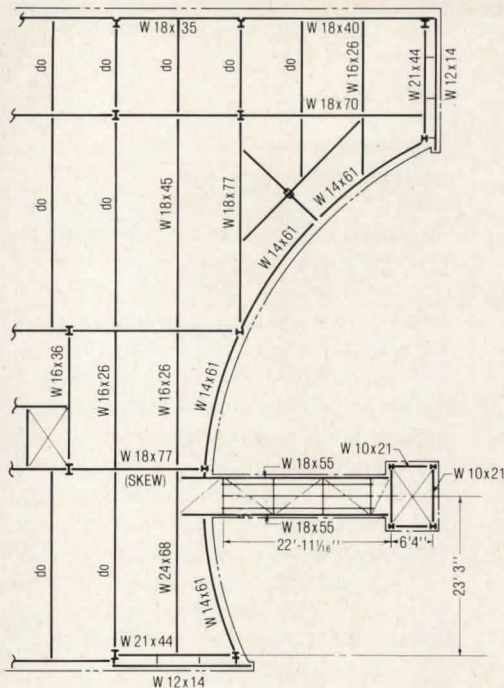
In the final evaluation made by the construction manager, Louis Lee, Inc., structural steel proved to be the least expensive framing method. The engineers explained, "Steel framing proved to be more efficient because we were able to minimize the construction depth of the floors by using shallower beam depths."

The structural system

The structural system consists of a roof and the three steel-framed floors. The design is based on a nine-foot module. A ramped, underground garage provides parking for 60 cars.

The floor system is composed of a 2½-in. concrete topping poured on a 2-in.-deep composite steel floor deck, supported on structural steel filler beams. Lateral loads are resisted by X-bracing provided in the elevator shaft walls and in the stair walls of the building.

Two types of torsional considerations are involved. First, the



Framing plan for the third floor and pedestrian bridge to the elevator. The contractor reported, "Time was a key factor. We saved two to three months by selecting steel framing in lieu of concrete."



Intersection of the pedestrian bridge and the third level.

exterior face of the stone cladding on the north, west, and south faces is 2 ft. 3 in. outside of the column centerlines. Second, the curved edge beams at the east face are subjected to torsional loading.

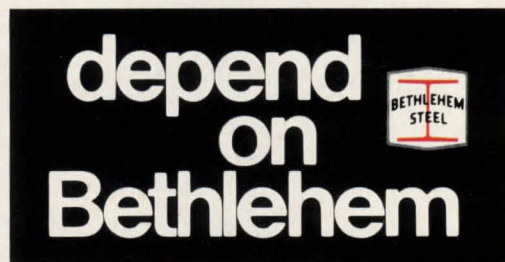
On the curved face, the curved edge beams are restrained from excessive rotation by the use of additional supports. The spans of the curved beams are limited to 21 ft.

The stone cladding, interrupted by a glass panel at each level, is supported by a continuous lintel, hung from the floor above by hanger angles spaced at a maximum of 4 ft.

Preliminary framing analysis available

Let us help you determine the most economical steel frame for your next building. Our District Office Sales Engineer and Home Office Buildings Group can provide you with a detailed budget cost study on the total framing system package. There's no fee or obligation involved.

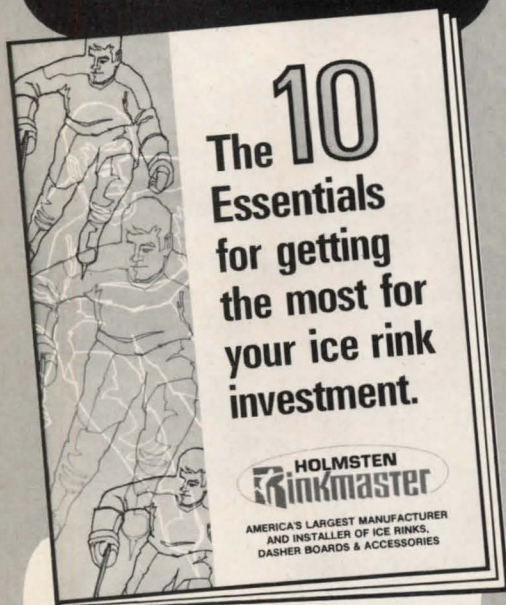
Our Sales Engineer will be happy to give you more details on



this program or on any of the other technical services we offer. You can get in touch with him through the Bethlehem Sales Office nearest you. Bethlehem Steel Corporation, Bethlehem, PA 18016.

- Give us a call:
- Atlanta (404) 394-7777
 - Baltimore (301) 685-5700
 - Boston (617) 267-2111
 - Buffalo (716) 856-2400
 - Chicago (312) 861-1700
 - Cincinnati (513) 984-4615
 - Cleveland (216) 696-1881
 - Detroit (313) 336-5500
 - Houston (713) 659-8060
 - Los Angeles (213) 726-0611
 - Milwaukee (414) 272-0835
 - New York (212) 688-5522
 - W. Orange, N.J. (201) 736-9770
 - Philadelphia (215) 561-1100
 - Pittsburgh (412) 281-5900
 - St. Louis (314) 726-4500
 - San Francisco (415) 465-6290
 - Seattle (206) 938-6800
- Ask for Sales Engineer

ICE RINK ANSWERS



FREE FROM AMERICA'S LARGEST MANUFACTURER & INSTALLER OF ICE RINKS

For your free copy, just write or call. This 16 page guide contains essential ice rink information for the architect.

Whether planning a new ice rink... or just thinking about it... or modernizing an existing facility... this guide will help you. It tells how to get the most energy efficient ice rink ever developed at a very competitive cost.

SERVICES PROVIDED TO ARCHITECTS:

1. Typical ice rink plans, specifications, options.
2. Accurate preliminary cost estimate for budget protection.
3. Customized plans and specifications for your project.
4. Total BONDED ice rink responsibility, including refrigeration, installation, concrete rink floor, subsoil heating, waste heat recovery, dasher boards, nets, scoreboards, etc.

ARCHITECTS DO BETTER WITH HOLMSTEN

HOLMSTEN
ICE RINKS, INC.



2301 Como Ave., St. Paul, MN 55108

612 646 8625

defends the exhibition as a media event that is characteristic of our times.

Clearly Tigerman's essay, by virtue of its location, preceding the photos of the entries, is meant to take precedence over those of Bonta, Baird, Jencks, Scully and Smith. It is he who sets the tone for the book as a whole, and his strident call to arms, "On the basis of the work in this exhibition, I challenge the Neo-Rationalists and Neo-Platonists to defend their line that historical referentiality is evil"—although perhaps appropriate for this an election year—seems dogmatically out of character with the rather timid offerings of the late entries. Nearly a third, by this reviewer's count, could be considered Neo-Rationalist and Neo-Platonist in their nature. Despite his commendable efforts to make distinctions among the projects based on an *ad hoc* taxonomy, there seem to be fewer real differences than he so optimistically uncovers.

The catalog essays which review the "late entries," constituting by their sheer number a "competition of essayists," are arranged alphabetically, so as to diminish the importance of any single one at the expense of the others. While all the critics caution against making too much of the comparison between 1922 and 1980, none can fully resist the temptation to do so. This is the major strength of *Late Entries*... proof of the continued validity, particularly in relation to skyscraper design, of the challenge of the original Tower Competition. Each essayist brings to the proceedings all his usual biases and preoccupations; no surprises here. But architects, being individualists, have subjective views on architecture, and there is merit in viewing the *Chicago Tribune Tower Competition/Late Entries* through the various lenses provided by Baird, Bonta, Jencks, Scully and Smith. Charles Jencks, popular prophet of Post-Modernism, sees the architectural struggle of today clarified by this exhibition; there are good guys and there are bad guys, and the good guys, the Post-Modern Classicists, are winning at last. The other essayists take a less sanguine view. Their predominant tone is surprise: surprise that such a good idea could turn so sour. Each has his individual favorite however. George Baird feels that a few submissions manifest instances of "synthetic potential": the projects of Tod Williams and Billie Tsien, Frederic Schwartz, Thomas Beeby, Giuliano Fiorenzoli and Herwin Romney. If Bonta had his way he would award first prize to Helmut Jahn, whose air-rights skyscraper is an image of breathtaking beauty in Bonta's eyes; second prize to Walter Netsch, whose project is "complex geometry folded in space"; and third prize to Cynthia Weese's entry which, in Bonta's mind, in its use of setbacks, is the only one that "might have changed the course of skyscraper design, had it been submitted in 1922."

The *Chicago Tribune Tower Competition/Late Entries* is, as Stanley Tigerman suggests, an exercise in "esthetic speculation." These are not buildings, but pictures of ideas, and as such deserve consideration during a confusing period in architectural practice.



Duluth Public Library Duluth — Port City of Minnesota. Gunnar Birkerts & Associates: Architect

Alpana Aluminum Products, Inc. is proud to have had the opportunity to be a part of this New Expression of Contemporary Architecture. Mr Birkerts design of curved sloping walls & slender lines are a bold departure from the surrounding architecture of Duluth, a contrast adding a pleasant note on the shores of Lake Superior.

Alpana's Custom Thermal barrier windows met the challenge provided by the unique conditions of this functional building. The one inch glass is contained in the slender window members that follows the curved and sloping walls. The aluminum required a Kynar painted finish on the exterior and a different interior finish. Features easily accomplished only with Alpana's thermal barrier construction. For more information call or write us.



ALPANA
ALUMINUM
PRODUCTS
INC.

MINNEAPOLIS, MN 55441 • (612) 559-1555

Circle 36 on inquiry card

Dodge/Sweet's Construction Outlook: A wobbly recovery

Inside every recession, there's a recovery trying to get out. The recovery from the 1980 recession surprised everyone with its early appearance this summer, but in this case early does not mean the same as strong, or even sustainable. Most often, the path to recovery is paved with easy credit and extra Federal spending. However, because of inflation's tenacity, the route to recovery from the 1980 recession is an obstacle course of monetary and fiscal restraint.

This has been one of those years when too much of what has happened in construction markets can be explained by what has happened in credit markets. Three distinct periods are easily identified.

Period 1: February through May

After more than a year of frustration in trying to break inflation's grip, the Federal Reserve went all out, boosting its discount rate to an all-time high and following up with credit controls. Interest rates soared and the Dodge Index came tumbling down as construction led the rest of the economy into recession. From a strong 190 in January, this leading indicator of construction and building materials demand fell to 125 by May. This drop of one-third in only four months was much steeper than at any time during the 1974/75 recession. In fact, it was without precedent.

Period 2: June to September

Building wasn't the only victim of 1980's monetary overkill. When the whole economy responded with a sharp 9 per cent decline in real GNP during the second quarter, the Fed backed off. With interest rates retreating during the summer, the Dodge Index—paced by a rebound in housing starts—staged a three-month recovery. By August, construction activity was pretty much back to where it was at the start of the year.

Period 3: September to ??

By September it was clear that the economy was recovering from its monetary shock treatment. But it was also clear that inflation was still rampant, and the money supply was expanding by leaps and bounds. This was enough to convince our central bankers that it was time to tighten up again.

On September 25th, the raising of the discount rate from 10 to 11 per cent sanctioned increases in other key interest rates. By early October, the prime was back up to 14 per cent. Mortgage money, which at 12½ per cent in the summer had supported a recovery

of homebuilding, was now approaching 14 per cent and threatening a replay of last spring's collapse of the housing market.

As 1980's final quarter began, period three had arrived, and it was looking uncomfortably like period one. Where it will lead is the subject of the rest of this *Outlook*.

THE ECONOMIC ENVIRONMENT

The most recent boost of interest rates already threatens to set back housing, where a good part of the economy's recovery to date is concentrated. Fiscal restraint is beginning to bite in some areas, now that the 1981 budget is in effect. It is even possible that much of the third quarter's surprising recovery will turn out to be little more than a temporary reaction to the lifting of the credit controls that so greatly intensified the second quarter's decline. Meanwhile, inflation continues at a core rate of 9 per cent or worse.

Under these circumstances, prospects for the economy's continued recovery are limited to a few unattractive alternatives: stagflation (not unlike the aftermath of the 1975 recession); the double-dip (recession/recovery/recession—the result of too much monetary restraint too soon); or the hockey stick (a low-angle recovery following last spring's sharp decline). Without much else to choose from, the hockey stick seems to be the best that can be expected for 1981. However, until interest rates recede, the risk of the double-dip cannot be ignored.

More than anything else, monetary policy will govern the progress of the economy's recovery through the next few critical months. Caught between an inflation rate that won't retreat and an equally irrepressible demand for money, the position of the Governors of the Federal Reserve is not exactly enviable. Nevertheless, the Fed must bear the responsibility for risking double-dip recession by its latest move to restraint.

Because it is not possible to issue a forecast of construction for 1981 without making some assumptions about all-important interest rates, the key assumption is that rates will recede from their recent surge before the end of 1980. The sluggishness of the economy's recovery is not likely to support the

present rate structure for long. Nor is Mr. Volcker likely to risk double-dipping by still further restraint. Despite the growth of the money supply, the Fed's position is less supportive today with inflation at 10 per cent than it was last winter at 17 per cent. It is expected that interest rates will retreat soon enough to avoid a second recession, but not soon enough to avoid a temporary setback of the credit-sensitive housing market.

Fiscal policy for most of 1981 is now in the hands of Congress. The realities of budgeting for the coming year dictate a hefty tax cut to offset the repressive effects of a large jump in Social Security taxes along with "bracket creep" on income taxes. Restraint on non-military spending (urban programs and construction) is inevitable as an anti-inflation gesture. In contrast to the \$6 billion Local Public Works program devised to stimulate the economy's recovery from the 1975 recession, budgetary restraint will be exerted in 1981 on public works, along with aid to distressed communities and state revenue-sharing.

Implications for construction

If demand were the only consideration, it would be reasonable to anticipate a vigorous recovery of construction next year. The all-too-familiar demography of the situation has already demonstrated (in 1977 and 1978) that annual housing need exceeds 2 million units on a continuing basis. If the pent-up demand resulting from 1980's huge shortfall is also taken into account, the pressure of demand on the shelter market is enormous right now. Nonresidential building, too, is poised for a strong recovery. Unlike the previous cycle, when the boom of the early 1970s left commercial building markets seriously overbuilt, the nonresidential building expansion of the late 1970s was more orderly, ending well short of overbuilding. With these basics of demand in good order, recovery of construction will proceed in 1981 as fast—but only as fast—as external economic, financial, and political limitations permit. Unfortunately, the austerity that will permeate the 1981 economy will not make an encouraging environment for construction.

RESIDENTIAL BUILDING

The recovery of homebuilding, which required nothing more than a retreat of the spring run-up of mortgage rates, was clearly

continued on page 59

Wait till you see the sensation that Italian styling creates when it's built by American-Standard.

If you thought the French styling of Ellisse generated excitement, look for even more dramatic results from our newest product grouping.

It marks the dawn of a new era for the entire industry, by combining the sought-after styling of Italy with the quality that's made us the international leader.



 **AMERICAN-STANDARD**
European elegance built to your standards.

Circle 43 on inquiry card

established by mid-1980. However, by late September the durability of this recovery was in question. Strong credit demands from the Federal government, business, and state/local governments collided with tightening monetary policy. Already-rising mortgage rates crept still higher, discouraging many home buyers.

Five years ago, in the fall of 1975, similar forces buffeted that housing recovery. The housing market survived those shocks and, starting from just about the same low base as 1980's, produced housing starts of a bit more than 1.5 million in 1976 and 2.0 million in 1977. Encouraging as this may be, there have been more than enough changes in the housing market between then and now to question the relevance of the experience of the middle 1970s as a guide to the early 1980s.

First, the changes for the better. Hard as it is to believe, some things have improved over the past five years.

■ Demand. In terms of sheer numbers, the current rate of net new-household formation has reached a record annual rate of 1.65 million. By conservative estimates, some 75,000 more households are now forming each year than in the mid-1970s. There's also been a qualitative change. The number of households whose heads are in the age bracket 35-44 is now growing faster than ever before. This means a shift in the mix of housing demand from multifamily toward single-family ownership.

■ Supply. Inventories of both multifamily and single-family units are low. In contrast to the overbuilt apartment/condominium market

that followed the mid-1970s shakeout, today's multifamily vacancy rate is only 5 per cent. The stock of one-family homes for sale was all but depleted during the first half of 1980 and is currently smaller than at any time since early 1976.

■ Housing finance. Several recent innovations have made the residential market more effective in attracting and holding mortgage funds. Sales of mortgage-backed securities, which were just gaining acceptance by institutional investors in 1974/75, have become a huge market (\$100 billion in GNMA securities alone), successfully drawing sizable sums from life insurance companies and pension funds into home mortgages. The surge in mortgage-backed securities sustained mortgage credit during the summer of 1980, sparking the upturn in housing starts even under conditions of weak savings flows through traditional passbook channels.

Money-market certificates, whose rates are competitively established by Treasury Bills, zoomed from nothing before mid-1978 to one-third of the thrift industry's current \$625 billion in deposits. During the worst of the late 1979/early 1980 monetary squeeze, thrift institutions aggressively issued these certificates in order to hold their deposits. Disintermediation—the outflow of funds which plagued the thrifts during the summer of 1974 and crimped their mortgage lending for months afterward—was avoided.

Together, the combination of pent-up demand, a tight housing supply, and considerably improved mortgage market operations suggests an even more vigorous housing

recovery in 1981 than in 1976.

Unfortunately, inflation could impose formidable limits on this expansion, since it will negatively impact housing twice—in the form of higher building costs and higher credit costs. This is paramount among the changes for the worst from five years ago.

■ Credit costs. Circumstances have shifted the nature of the financing problem from availability to the cost of credit. Institutional purchasers of mortgage-backed securities require long-term yields that cover the core rate of inflation (9 to 10 per cent) and provide a real return of 3 to 4 per cent. Thrift institutions will have to charge similar rates. Treasury Bill rates, and in turn, the cost of money-market certificates, will remain high, putting a floor under mortgage rates. Unpleasant as the prospect may be, mortgage rates are likely to hover in the low double-digit area throughout 1981.

■ Affordability. Housing has been one of the leading sources of inflation for the past few years. Cost per square foot for single-family homes has risen at an annual rate of 10½ per cent since 1975 (compared with 8 per cent annually during the prior five years). Multifamily building, with an annual inflation rate averaging 9½ per cent during the past five years, is hardly much different.

With the typical new one-family house now selling for \$65,000 (versus \$43,000 in 1975), home ownership is increasingly a "trickle-down" affair. Most new homes are bought by previous owners who trade up on the basis of accumulated equity gains.

continued on page 61

1981 National Estimates

Dodge Construction Potentials

Nonresidential Buildings

	1979 Actual	1980 Pre-liminary*	1981 Forecast	Percent Change 1981/80
Contract Value (millions of dollars)				
Office Buildings	\$11,194	\$11,800	\$11,700	- 1
Stores & Other Commercial	13,021	11,150	11,700	+ 5
Manufacturing Buildings	7,280	7,050	6,800	- 4
Total Commercial & Manufacturing	\$31,495	\$30,000	\$30,200	+ 1
Educational	\$ 6,298	\$ 6,900	\$ 7,550	+ 9
Hospital & Health	4,790	5,050	5,250	+ 4
Other Nonresidential Buildings	7,076	7,000	7,600	+ 9
Total Institutional & Other	\$18,164	\$18,950	\$20,400	+ 8
Total Nonresidential Buildings	\$49,659	\$48,950	\$50,600	+ 3

Floor Area

	1979 Actual	1980 Pre-liminary*	1981 Forecast	Percent Change 1981/80
(millions of square feet)				
Office Buildings	234	220	200	- 9
Stores & Other Commercial	579	445	425	- 4
Manufacturing Buildings	237	195	175	-10
Total Commercial & Manufacturing	1,050	860	800	- 7
Educational	101	98	97	- 1
Hospital & Health	58	55	53	- 4
Other Nonresidential Buildings	160	143	145	+ 1
Total Institutional & Other	319	296	295	-
Total Nonresidential Buildings	1,369	1,156	1,095	- 5

*Eight months actual; four months estimated.

Residential Buildings

	1979 Actual	1980 Pre-liminary*	1981 Forecast	Percent Change 1981/80
Contract Value (millions of dollars)				
One-Family Houses	\$54,520	\$40,425	\$61,800	+53
Multifamily Housing	17,430	16,500	21,200	+28
Nonhousekeeping Residential	2,736	2,975	3,000	+ 1
Total Residential Buildings	\$74,686	\$59,900	\$86,000	+44

Floor Area

	1979 Actual	1980 Pre-liminary*	1981 Forecast	Percent Change 1981/80
(millions of square feet)				
One-Family Houses	1,859	1,260	1,760	+40
Multifamily Housing	616	500	585	+17
Nonhousekeeping Residential	56	55	50	- 9
Total Residential Buildings	2,531	1,815	2,395	+32

Dwelling Units

	1979 Actual	1980 Pre-liminary*	1981 Forecast	Percent Change 1981/80
(thousands of units)**				
One-Family Houses	1,169	800	1,100	+38
Multifamily Housing	599	475	550	+16
Total Housekeeping Residential	1,768	1,275	1,650	+29

Nonbuilding Construction

	1979 Actual	1980 Pre-liminary*	1981 Forecast	Percent Change 1981/80
Contract Value (millions of dollars)				
Highways & Bridges	\$13,842	\$11,500	\$12,500	+ 9
Utilities	13,117	5,000	10,500	++
Sewer & Water	7,704	7,550	8,300	+10
Other Nonbuilding Construction	7,370	7,500	8,100	+ 8
Total Nonbuilding Construction	\$42,033	\$31,550	\$39,400	+25

All Construction

	1979 Actual	1980 Pre-liminary*	1981 Forecast	Percent Change 1981/80
Contract Value (millions of dollars)				
Total Construction	\$166,378	\$140,400	\$176,000	+25
Dodge Index (1972 = 100)	183	154	194	

*Eight months actual; four months estimated.
**F. W. Dodge basis.

CRITERIA: ULTIMATE PERFORMANCE

TCS

Architects have become increasingly aware that a metal roof can become a welcome departure from the commonplace and an important aspect of contemporary expression.

When that departure is created by TCS, terne-coated stainless steel, as exemplified by the beautiful, new headquarters of Square D Company in Palatine, Illinois, this exciting new material permits the visually significant roof to become an important basic component of design.

TCS is unique among roofing materials. It has inherent adaptability to form and function, is maintenance free, and weathers to a predictable, warm gray. May we send you substantiating evidence?

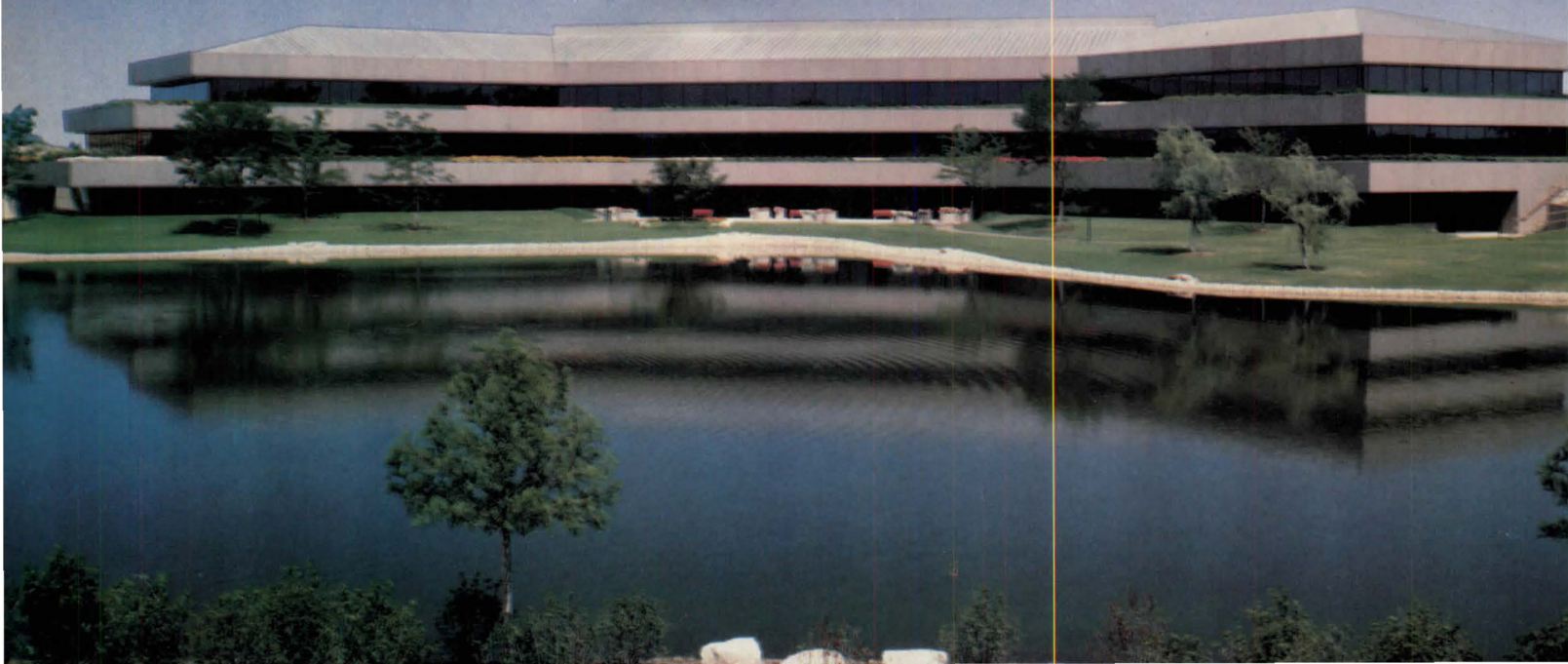
Call us toll-free 800-624-6906

FOLLANSBEE

FOLLANSBEE STEEL CORPORATION
FOLLANSBEE, WEST VIRGINIA

Headquarters Building, Square D Company, Palatine, Illinois
Architects: Loebel, Schlossman & Hackl, Chicago, Illinois
Roofer: E. W. Olson, Chicago, Illinois

Circle 44 on inquiry card



time buyers often find themselves limited to the lower end of the existing home market. Once they become owners, however, they soon become prospects for new homes. The virtual assurance of capital appreciation, continues to be more of an incentive to buy than rising cost is a deterrent.

On balance, the pressures of demand are expected to outweigh the pressures of inflation in 1981's housing market, leading to a stronger recovery than in 1976. A total of 1.65 million housing starts is within reach. But in order to achieve it, the recent flare-up in mortgage rates must subside before the spring building season begins.

Once the Federal Reserve brings the monetary aggregates within its targets, the historic recovery that 1981 promises should leave sufficient funds available for quarterly improvement in homebuilding. To sustain expansion, however, homebuyers will have to accept mortgages at 12½ to 13 percent. Reaching a total of 1.6 to 1.7 million housing starts in 1981 amounts to not much of a challenge, considering the ongoing need for at least 2 million units per year. The test will come in 1982 and 1983, when the housing industry should again be operating at full capacity.

The housing mix

The interplay of demographics, credit availability, and credit cost will yield a mix of homebuilding in 1981 that is heavily tilted toward one-family units, but not as much as it

could be. The stark fact that persons born in 1950 are now 30 means that a growing number of young families are in the market for one-family homes. However, at 1981 prices and interest rates, not every family that intends to purchase a new home will be able to realize that goal. Alternatives to new houses—apartments, condos, existing one-family homes, manufactured (mobile) homes, conversions, rehabbed units—will serve the needs of many families, especially the newest entrants into the marketplace. Condominiums, with their advantages of value appreciation and tax deductions, are the most viable alternative to conventional one-family ownership for this segment of the housing market, as well as for the empty-nesters at the other end of the age spectrum.

In 1981, the biggest gain in housing starts will be in one-family units, the part of the residential market that bore the heaviest impact of 1980's credit restraint. Subject to revision (when a future monetary policy is revealed), next year's total of 1,650,000 housing starts is most likely to consist of 1,100,000 singles, 180,000 condominiums and 370,000 apartment units.

NONRESIDENTIAL BUILDING

The fact that homebuilding is already several months into recovery is a hopeful sign for the lagging nonresidential building market, because these two building cycles rarely go their separate ways for long. Even if housing's upswing is briefly interrupted by adverse

credit developments, the decline in contracting for nonresidential building is expected to cease by the end of 1980—provided the economy itself doesn't suffer a relapse.

The trough of the nonresidential building cycle usually remains flat for two or three quarters before the next expansion begins. A period of stability typically occurs at both peaks and troughs of the nonresidential cycle as, one-by-one, the various submarkets that make up total nonresidential building reverse themselves. If, as expected, this reversal sequence begins early in 1981, it should result in a rising rate of total nonresidential contracting during the second half of the year.

The "basics" needed to support the next expansion of commercial and industrial building (once it begins) are more favorable today than they were immediately following the 1975 recession. Store and shopping center construction will benefit from an extended period of unusually strong housing demand. What's more, the same demographic forces that are fostering great expectations in the housing industry are also supporting record growth of the white-collar labor force, otherwise known as the people who occupy office buildings. And some of the new approaches to coping with the energy and productivity crises of the 1970s—the synfuel development program and the national commitment to reindustrialization—could mean as much for industrial building in the 1980s as the Local Public Works Act meant for highways and

continued on page 63

1981 Regional Estimates
Dodge Construction Potentials

Northeast		Connecticut, District of Columbia, Delaware, Massachusetts, Maryland, Maine, New Hampshire, New Jersey, New York, Eastern Pennsylvania, Rhode Island, Virginia, Vermont			
		1979 Actual	1980 Preliminary*	1981 Forecast	Percent Change 1981/80
Contract Value (millions of dollars)	Nonresidential Buildings				
	Commercial & Manufacturing	\$ 5,257	\$ 5,300	\$ 5,525	+ 4
	Institutional & Other	3,608	3,850	4,200	+ 9
	Total	\$ 8,865	\$ 9,150	\$ 9,725	+ 6
	Residential Buildings				
	One-Family Houses	\$ 7,155	\$ 5,375	\$ 8,325	+55
	Multifamily Housing	2,677	2,775	3,600	+30
	Nonhousekeeping Residential	789	600	625	+ 4
	Total	\$10,621	\$ 8,750	\$12,550	+43
	Nonbuilding Construction				
Highways & Bridges	\$ 2,122	\$ 2,200	\$ 2,350	+ 7	
Utilities	415	275	1,250	++	
Other Nonbuilding Construction	3,123	3,875	3,975	+ 3	
Total	\$ 5,660	\$ 6,350	\$ 7,575	+19	
Total Construction	\$25,146	\$24,250	\$29,850	+23	

Midwest		Northern Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, North Dakota, Ohio, Western Pennsylvania, South Dakota, Wisconsin, West Virginia			
		1979 Actual	1980 Preliminary*	1981 Forecast	Percent Change 1981/80
Contract Value (millions of dollars)	Nonresidential Buildings				
	Commercial & Manufacturing	\$ 7,533	\$ 6,325	\$ 6,150	- 3
	Institutional & Other	4,466	4,600	4,950	+ 8
	Total	\$11,999	\$10,925	\$11,100	+ 2
	Residential Buildings				
	One-Family Houses	\$11,103	\$ 6,925	\$10,975	+58
	Multifamily Housing	3,398	2,725	3,650	+34
	Nonhousekeeping Residential	539	450	425	- 6
	Total	\$15,040	\$10,100	\$15,050	+49
	Nonbuilding Construction				
Highways & Bridges	\$ 3,947	\$ 3,100	\$ 3,300	+ 6	
Utilities	1,443	375	2,725	++	
Other Nonbuilding Construction	3,713	3,400	3,700	+ 9	
Total	\$ 9,103	\$ 6,875	\$ 9,725	+41	
Total Construction	\$36,142	\$27,900	\$35,875	+29	

*Eight months actual; four months estimated.

South		Alabama, Arkansas, Florida, Georgia, Southern Illinois, Kansas, Louisiana, Mississippi, Missouri, North Carolina, Nebraska, Oklahoma, South Carolina, Tennessee, Texas			
		1979 Actual	1980 Preliminary*	1981 Forecast	Percent Change 1981/80
Contract Value (millions of dollars)	Nonresidential Buildings				
	Commercial & Manufacturing	\$10,442	\$10,075	\$10,125	—
	Institutional & Other	6,363	6,425	6,775	+ 5
	Total	\$16,805	\$16,500	\$16,900	+ 2
	Residential Buildings				
	One-Family Houses	\$20,847	\$16,875	\$24,900	+48
	Multifamily Housing	6,234	6,350	7,700	+21
	Nonhousekeeping Residential	749	1,125	1,150	+ 2
	Total	\$27,830	\$24,350	\$33,750	+39
	Nonbuilding Construction				
Highways & Bridges	\$ 5,241	\$ 4,250	\$ 4,600	+ 8	
Utilities	11,015	2,350	4,000	+70	
Other Nonbuilding Construction	5,233	4,800	5,075	+ 6	
Total	\$21,489	\$11,400	\$13,675	+20	
Total Construction	\$66,124	\$52,250	\$64,325	+23	

West		Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming			
		1979 Actual	1980 Preliminary*	1981 Forecast	Percent Change 1981/80
Contract Value (millions of dollars)	Nonresidential Buildings				
	Commercial & Manufacturing	\$ 8,263	\$ 8,300	\$ 8,400	+ 1
	Institutional & Other	3,727	4,075	4,475	+10
	Total	\$11,990	\$12,375	\$12,875	+ 4
	Residential Buildings				
	One-Family Houses	\$15,415	\$11,250	\$17,600	+56
	Multifamily Housing	5,121	4,650	6,250	+34
	Nonhousekeeping Residential	659	800	800	—
	Total	\$21,195	\$16,700	\$24,650	+48
	Nonbuilding Construction				
Highways & Bridges	\$ 2,532	\$ 1,950	\$ 2,250	+15	
Utilities	244	2,000	2,525	+26	
Other Nonbuilding Construction	3,005	2,975	3,650	+23	
Total	\$ 5,781	\$ 6,925	\$ 8,425	+22	
Total Construction	\$38,966	\$36,000	\$45,950	+28	

*Eight months actual; four months estimated.



The elevators were running before the building was finished.

Delivered on time. Installed on time. Operating ahead of time. That's the story of the 22-elevator installation at Clinical Science Center of the University of Wisconsin-Madison, one of the most ambitious building projects ever in the state of Wisconsin.

The huge building complex on a 45-acre site houses four major components of the University of Wisconsin Center for Health Sciences—Hospital and Clinics, Medical School's Clinical Departments, School of Nursing and Wisconsin Clinical Cancer Center. On a typical day 6000 patients, staff, students and visitors use the building, and enjoy quiet, efficient inter-floor transit on Dover Elevators.

Dover wants to be on your team by providing on-time elevator installations. Dover Corporation, Elevator Division, Dept. 669, P.O. Box 2177, Memphis, Tenn. 38101.

Clinical Science Center,
University of Wisconsin-Madison
Architects:
Phase 1: Hellmuth, Obata and Kassabaum,
St. Louis
Phase 2: Flad and Associates, Madison
and Milwaukee, Wis.; Gainesville, Fla.
General Contractor:
Findorff-Hutter, "Joint Venture," Madison.
Dover Elevators installed by:
Northwestern Elevator Co., Milwaukee.

DOVER[®]
**The elevator
expeditors.**

sewers in the late 1970s.

One limitation of these basic supports of the nonresidential building market is that they are more long-term than immediate in their impact. Before their potential can be tapped, the first order of business is to take up the slack left by the recession of 1980.

Commercial and industrial building

■ **Retail building.** The past two years' experience has piled up still more evidence of the strong bond between housing and retail building. Once again, the two-quarter lead-lag relationship prevailed, as housing's peak in 1978-III (at 2.1 million units) was followed by a peak in store/shopping center contracting in 1979-I (at a rate of 300 million square feet). Each market, in its turn, eased off its peak, then fell sharply. Peak-to-trough declines—50 per cent for housing and 40 per cent for stores—suggest that the retail building cycle is close to bottoming out. Once housing's recovery is securely re-established, it is reasonable to expect that residential activity will spawn a recovery of retail building. Past performance would put the upturn of store/shopping center contracting in 1981's second quarter, if not before.

The subsequent expansion of retail building through the balance of 1981 will be subject to the same financial limitations endured by housing. If credit conditions can support the start of 1.65 million housing units in 1981, then they will also support up to 190 million square feet of retail building. Next year's recovery of retail building is expected to generate a demand for 180 million square feet of warehouse space. Contracting for commercial garages and service stations in 1981 is estimated at 55 million square feet.

■ **Office buildings.** Easily the best survivor of the recession, office building hardly slowed its blistering pace in 1980. Contracting for offices is heading for a total of 220 million square feet this year, down only 6 per cent from 1979's record volume. This total is double the volume of office space provided in the previous recession year, an indication of the major structural change that has taken place in this market in only half a decade. A sizable backlog of demand will sustain the office building boom for at least another year.

■ **Manufacturing buildings.** The expansion of industrial building normally begins when manufacturers' operating rates approach 85 per cent. Because this critical rate is currently hovering around 75 per cent, recovery of industrial building is several quarters away.

The 1981 recovery pattern of industrial building must reflect the following assumptions: while tax incentives for "reindustrialization" will accelerate the recovery of capital spending, the emphasis on productivity will initially stimulate investment in *equipment* rather than *buildings*; the restructuring of the auto industry will also tilt heavily toward investment in *technology* as opposed to *construction*; and although the synfuel program will launch at least one huge facility in 1981, it will not involve a significant amount of square footage of enclosed structure.

Beyond these special situations, the generally sluggish 1981 economy will *not* provide the environment for either an early—or strong—recovery of industrial building.

Institutional building

Obstacles to public financing during 1980 exaggerated the sagging trend already apparent in institutional building. Together, soaring interest rates and budgetary restraint further sunk every category in this group, but none so much as public administration buildings. The current year's total of all contracting for institutional building fell to an estimated 296 million square feet—the lowest volume in more than 25 years.

Subject to similar conditions in 1981, the institutional building market will be further handicapped by the suspended return to the states of \$2.3 billion in Federal revenue that would normally be due them under the Federal revenue-sharing program. The prospect: little gain in institutional building next year. The greater likelihood: another decline.

A FRAGILE RECOVERY

The construction industry is emerging from its 1980 recession under much different circumstances from those it faced following the 1975 recession. This time around recovery begins with inflation at 10 per cent, not 6 per cent. Mortgage rates are averaging 13 per cent, not 9 per cent. The thrust of government economic policy is restrictive, not stimulative. This partial list of differences is enough to illustrate the fragile nature of the current recovery.

Rising interest rates pose the single greatest threat to sustained recovery in the months immediately ahead. Housing, of course, is the building market that is most sensitive to changes in credit conditions. But its problems are not isolated—nor can they be quarantined. A healthy housing market is, in fact, essential to the recovery of many kinds of commercial and institutional building. Office and industrial construction, which need the support of general economic expansion, cannot thrive in a credit-induced "double dip."

Despite the fact that the housing market is already on the brink of reversal, a further rise in interest rates could set back the recovery of the *entire* construction industry—not just housing. Skeptics need only review the sequence that followed last winter's overdose of credit policy. If the process of cyclical expansion of construction markets that began in the summer of 1980 is to survive and grow through 1981, it is essential that the Federal Reserve show more self-restraint in the application of monetary restraint.

Unfortunately, housing and credit are already on another collision course. It is probably too late to avoid a temporary stalling of the housing market during the final quarter of 1980. However, if interest rates are permitted to recede by year's-end, the 1981 housing total can still reach into the 1.6- to 1.7-million-unit range for the year as a whole.

Highlights of the outlook for *total* construction contracting in 1981:

■ Following a pause in 1980's fourth quarter,

the recovery will regain its momentum early in 1981.

■ Next year's gain will be concentrated heavily in housing; nonresidential building's recovery will be delayed until the second half and won't show strength until 1982.

■ Total construction contract value will increase by 25 per cent to \$176 billion.

■ Although this will be one of the largest annual gains in the past 30 years, it is not all it seems to be, because it represents only partial recovery from 1980's steep decline, and at least 10 of the 25 percentage points of gain will be just more inflation.

Despite these qualifications, the recovery from 1980's construction recession is on its wobbly way. In the remaining commentary, which is based on portions of *The Next Five Years*,* some thoughts are offered about where this incipient expansion will lead.

The next five years

While the previous section of this report has addressed the prospect of cyclical recovery from the recession of 1980, emphasis now shifts to a subject that lies beyond the cycle: growth. For at least the last 15 years, the construction market has borne the label "slow grow." The harsh facts: Between the cyclical peaks of 1965 and 1969, *real* growth in new construction averaged only 2 per cent annually; from then to the next peak (1973), growth was still only a grudging 2 per cent; and between the peaks of 1973 and 1978, there was no growth at all. This pattern is due for a change for the better in the 1980s. The extent of this change will depend on how the economic problems of the new decade—especially inflation—are resolved, if at all.

The 1980s are a demographic milestone. This is the decade in which all the people born during the fertile 1950s turn 30—their collective birthdays heralding profound implications for the construction industry and its suppliers. The 1960s offered a preview of what lies ahead, as this bulge in the population pyramid passed through the educational system. The impact on school construction, though temporary, was unforgettable. The main event, which is only now beginning, will affect construction markets in a much broader way—as this same group's needs for housing, shopping facilities, offices, factories, recreational facilities, and a wide variety of other forms of social capital are expressed.

Five-year potential

The potential for new construction that will evolve naturally from the demographics of the next five years is easily the largest that the industry has ever experienced. Shelter requirements arising from record rates of household formation, along with replacement and relocation needs, will exceed 2.5 million units annually through most of the decade ahead. And because a significant part of the demand for nonresidential construction is eventually derived from the same forces that

*An economic analysis of national and regional construction markets, 1981-1985, by the McGraw-Hill Information Systems Company Economics Department (June 1980).

continued on page 65

Project: Cafeteria, Educational Testing Service, Princeton, New Jersey
Architect: CUH2A Architecture, Engineering, Planning, Princeton
Lighting: Lite Duct by Peerless, one of the 13 Longlite systems.

Here cast corners and crossings combine with the fixtures to create a polished architectural element. Lite Duct comes in seven different diameters and configurations, in lengths up to 24', in any finish, and adapts to virtually any optical task.



You get more out of a long space if you light it with long fixtures. It's easier, it's cleaner, and, as this ceiling demonstrates so spectacularly, it opens up a whole new world of design. For a catalog of a thousand different Longlite options, write to 747 Bancroft Way, Berkeley CA 94710.

ONGLITE
BY PEERLESS
(510) 845-2760

generate shelter needs, the potential for non-residential construction in the 1980s is overshadowed by this prospective housing boom. It's simple enough to develop estimates of the construction potentials of the 1980s by focusing exclusively on the demand variables. But as eye-popping as these numbers are, they are suspect under Murphy's Law, as well as the law that governs supply and demand: Things *do* go wrong (take 1980 as the latest example). There is a *supply* side to economics.

Potential is *never* fully realized. During the final half of the 1970s, a period when the housing industry reached full capacity operation in only two of five years, approximately two-thirds of the potential need for shelter was met through the production of new homes and apartments. Some of that period's shelter requirement was satisfied by alternatives to new housing—mobile homes and conversions or rehabilitation of existing structures. And some needs simply went unmet, deferred and thus becoming part of the shelter-satisfaction for the early 1980s. In nonresidential building markets, where alternatives to new construction are not as readily available as they are for housing, a higher proportion of potential is normally realized. Even so, between 1976 and 1980, a period that was blighted by severe inflation and recession, only about 70 per cent of nonresidential building potential was actually realized.

The volume of new construction that will be initiated during the next five years will depend partly on the size of the potential and partly on the extent to which circumstances permit that potential to be realized. Demographic data have long indicated that the potential for all kinds of new construction will reach a new high in the five years ahead. However, this period is also unusual, in that it puts a formidable array of obstacles in the path of the potential it offers.

Old problems in a new setting

The Cycle. Realizing all the potential of a five-year period like the one coming up would demand that the building industry operate at, or near, full capacity *all the time*. If this challenge were adopted, the first hurdles to clear would be the lingering recession of 1980 and the less-than-robust recovery that will follow in 1981.

During the first year of the next five, housing output will be, at best, some 400,000 units short of what is needed. Nonresidential building, which normally lags behind housing, will remain depressed through most of 1981, making its recovery late in the year. Pitting performance against potential, the next five years will be getting off to a poor start.

Capacity limits. A weak start wouldn't matter so much if 1981's shortfall could be made up in some future year. There are, however, limits to the cyclical flexibility of the building business.

Homebuilding, for example, has recently (1977-78) demonstrated a capacity limit in the range of 2.0 to 2.1 million units per year. In the 1980s, the market could absorb this volume—and more, every year. If the full poten-

tial of the period is to be achieved, it means that for every lean year like 1981, when only 1.6 to 1.7 million units are built, there must be a year when homebuilders produce 2.5 million units. Not only is that volume unattainable, but it would be a waste of resources for this highly cyclical industry to provide enough capacity to meet such extreme peaks. Mobile homes, conversions, and rehabilitation of existing units are more desirable alternatives and they too will flourish in the 1980s.

■ **Energy.** Cartel-priced oil has had a devastating effect on the cost of building products in recent years. Because many building products use petroleum derivatives as raw materials, or require large quantities of energy for their manufacture, building-material prices which reflect these costs have been the source of most of the inflation in construction ever since the 1974 "crisis."

Energy performance standards (BPES) will influence the design and construction of most buildings in the 1980s. Although such standards may result in higher-cost construction, the higher *initial* investment in creating energy-efficient structures is recovered over the long run, as a "trade-off" against lower operating expenses.

The ever-rising cost of energy cannot be avoided, but it should be no more of a limiting factor to building in the early 1980s than it was in the late 1970s. Energy-conscious design can shift some of the inescapable cost from the consumption of oil to the consumption of building products.

■ **Inflation.** Of all the constraints that will limit the realization of the potential for the construction industry in the 1980s inflation is the most threatening by far. As building costs continue to soar, averaging 11 per cent over the next five years, some marginal projects will be cancelled while others are scaled down. Rehabilitation of existing structures, especially housing, will be encouraged as an alternative to new construction.

However, it is not these direct effects of building costs themselves, but rather the indirect consequences of continued double-digit inflation throughout the economy at large that are the greatest threat to construction markets. Until inflation is finally ratcheted down generally—a process that will take half a dozen years—monetary and fiscal restraint will remain the way of economic life.

The eighties . . . unfulfilled expectations

The next five years will begin with the construction industry in the early stages of recovery from one of its periodic slumps. 1981 will remain something of a transition year—one in which gains in residential building are partially offset by lagging nonresidential building. Before the end of 1981, however, nonresidential building will also be making its recovery, clearing the way for an even larger gain in total construction contracting in 1982. By 1983, the construction industry is expected to be operating at (or very near) full capacity once again. The total amount of new construction that is likely to be contracted during the five-year period 1981-85 will reach an all-time high. Analysis of 20 key residential

The Outlook

Nonbuilding Construction Contract Value

Seasonally adjusted annual rates, \$ in billions

Year/Quarter	Total	Public Works	Utilities	
1980	I	\$35.0	\$33.0	\$ 2.0
	II	26.3	24.8	1.5
	III	37.0	24.0	13.0
	IV	27.9	24.4	3.5
1981	I	36.4	28.4	8.0
	II	39.9	27.9	12.0
	III	41.0	29.0	12.0
	IV	40.5	30.5	10.0

10/80

Residential Building Contract Value

Seasonally adjusted annual rates, \$ in billions

Year/Quarter	Total	One-Family	Multi-Family*	
1980	I	\$60.2	\$39.5	\$20.7
	II	48.1	30.8	17.3
	III	66.3	46.0	20.3
	IV	65.0	45.5	19.5
1981	I	70.8	49.6	21.2
	II	84.5	60.7	23.8
	III	90.8	65.3	25.5
	IV	97.9	71.6	26.3

10/80 *Includes Nonhousekeeping Residential

Nonresidential Building Contract Value

Seasonally adjusted annual rates, \$ in billions

Year/Quarter	Total	Commercial/Industrial	Institutional and Other	
1980	I	53.9	\$35.0	\$18.9
	II	47.0	28.5	18.5
	III	48.6	29.4	19.2
	IV	46.3	27.2	19.1
1981	I	46.7	27.1	19.6
	II	49.5	29.3	20.2
	III	51.8	31.2	20.6
	IV	54.4	33.2	21.2

10/80

and nonresidential construction markets indicates that the total physical volume of work started will exceed that of the past five years by 5 to 10 per cent.

Considering the potential for growth in the early 1980s, a real gain of 5 to 10 per cent must be regarded as less than optimum. Ironically, the period that provides the best potential for construction also offers some of the worst conditions for realizing it. The constraints of cycle, capacity, energy—and most especially, monetary/fiscal restraint—will bear heavily in the years immediately ahead. As a consequence, conditions in the early 1980s will not permit the same degree of realization of this potential as in previous periods. Even within these limits, however, there is room for growth—simply because the potential is so great.

In *dollar* terms, the outlook for construction contracting over the next five years takes on a strikingly different, but perhaps deceiving, appearance. If construction cost continues to inflate at 11 per cent annually, as is likely, it will add up to a five-year cost increase of between 65 and 70 per cent. This translates into a 75 per cent rise in the contract value of the moderately larger volume of work to be done. For whatever these dollars will be worth, they amount to a spectacular \$1.3 trillion of construction over the next five years—more than the cumulative total of construction contracted in the entire decade of the 1970s.

We're still looking for ten architects who have a job we can be proud of...

"I've gotten some encouraging phone calls from architects who've seen our first ads in the July and September numbers of *Architectural Record* — showing our work at Ed Barnes' Burlington Cathedral (*Record*, January 1979). So let me tell you our story again: Up here in Vermont I own a quarry full of good quality slate. About 60 of us work here — eight in the mill, 30 in the quarry, four in the office, others driving trucks and doing maintenance. Paul McClure, who's in the picture with me, has been splitting slate for us since December 1955 — and has never taken that cigar out of his mouth. Just so no one can say he has a sit-down job, every Saturday he climbs the cables over the quarry to oil the carriages. My name is Bill Markcrow, and I spend most of my time on the telephone doing the selling. We cut and hand-split and sell about a million square feet a year of stock slate. That gives us a good profit. But . . .



Which would you rather do? Work on slate for do-it-yourselfers to buy in a lumberyard, or help restore a grand old building?

"Everybody around the quarry takes pride in custom jobs — like our part in the restoration of Faneuil Hall Marketplace in Boston,



which was featured in the December 1977 issue of *Architectural Record*. We provided about 750 squares of roofing for the North and South Buildings. At the risk of bragging, we put a lot of personal effort into

ensuring that the new slate matched the 150-year-old slate as closely as we could possibly manage; and deliveries were made conscientiously on time. I believe everyone associated with the project was perfectly pleased with our performance as a quarry.

We could handle about ten custom jobs like this a year. We've got the slate and the skills for a job we'll all be proud of.

"Our slate is all unfading color, and we've got mottled, purple, greens, and reds. I've just been to China again and we'll soon receive some extraordinary slate in most unusual creams and blacks. If you're considering slate for a job you're designing, don't worry about the budget until you've talked to me. I'll make a good price for any job like Barnes' cathedral or Faneuil Hall. Call me at 802-265-4933."

—Bill Markcrow

**VERMONT
STRUCTURAL
SLATE
COMPANY** FAIR HAVEN, VERMONT 05743

The Best-Laid Plans Start with Wiley Book

SIMPLIFIED BUILDING DESIGN FOR WIND AND EARTHQUAKE FORCES

James Ambrose & Dimitry Vergun, both of University of Southern California. Here is an explanation of the basic nature of wind and earthquake forces on buildings... with the typical solutions utilized for simple buildings in present practice.

(0 471 05013-X) 1980 142 pp. \$24.00

MANAGING ARCHITECTURAL AND ENGINEERING PRACTICE

Weld Coxe, *The Coxe Group, Inc.*

In this book, you'll discover such invaluable aids as: descriptions of the "passages" in the evolution of a design firm; a whole section devoted to legal forms of organization, valuation of established firms, and formats of transferring ownership; and much more.

(0 471 08203-1) 1980 177 pp. \$18.95

AIA METRIC BUILDING AND CONSTRUCTION GUIDE

Edited by Susan Braybrooke for *The American Institute of Architects*

You won't find a more practical primer of essential, reliable information on the International System of Measurement (SI) as it applies to building construction—examining metric conventions for architecture and engineering drawings, precise anthropometric implications of metrication for building codes and standards, and specific recommendations for dimensional coordination in building.

(0 471 03812-1) 1980 154 pp. \$19.50 Cloth
(0 471 03813-X) 1980 154 pp. \$14.50 Paper

ARCHITECTURE AND INTERIOR DESIGN

Volume 1: A Basic History Through the Seventeenth Century

Volume 2: Europe and America from the Colonial Period to Today

Victoria Kloss Ball

These two volumes represent a concise chronology (geographical and topical) history of architecture and relates to interior design—including 16 pages of beautiful color photographs and many illustrations of significant historic buildings and their furnishings.

Vol. 1: (0 471 05162-4) 1980 464 pp. \$45.00

(0 471 08719-X) 1980 464 pp. \$27.50 Paper

Vol. 2: (0 471 05161-6) 1980 approx. 464 pp. \$45.00

(0 471 08722-X) 1980 approx. 464 pp. \$27.50 Paper

2-Vol. Set: (0 471 08721-1) \$80.00 Cloth

(0 471 08720-3) \$50.00 Paper

ARCHITECTURAL HANDBOOK: Environmental Analysis, Architectural Programming, Design and Technology, and Construction

Alfred M. Kemper

The first book of its kind to incorporate the complete range of architectural activities involved in building design.

(0 471 02697-2) 1979 591 pp. \$43.50

SIMPLIFIED DESIGN OF STRUCTURAL WOOD, 3rd Ed.

The late Harry Parker, M.S. Prepared by Harold D. Hauf, M.S.

This new edition explains, in a simplified manner, methods commonly used in determining timber sizes.

(0 471 66630-0) 1979 269 pp. \$19.50

MEANING AND BEHAVIOUR IN THE BUILT ENVIRONMENT

Edited by Geoffrey Broadbent, Richard Bunt, & Tomas Llorens. Provides a select number of key contributions dealing with the problem of meaning in the built environment.

(0 471 27708-8) Nov. 1980 approx. 336 pp. \$50.00 (tent.)

Order through your bookstore or write to John Storjov, Dept. 7296 TO ORDER BY PHONE call toll free 800-526-5368. In New Jersey, call collect (201) 797-7809. Prices subject to change without notice. 1-7296



WILEY-INTERSCIENCE
a division of John Wiley & Sons, Inc.
605 Third Avenue
New York, N.Y. 10158
In Canada: 22 Worcester Road,
Rexdale, Ontario

Gordon Schenck



The Crystal Cathedral: Embodiment of light and nature

Johnson/Burgee's new church for the Reverend Dr. Robert Schuller in Garden Grove, California, is both an inspiring and an inspired structure. But it is more than just a vehicle for Schuller's pastorate—at once a religious edifice and a spectacular TV "studio." In truth, the building is extraordinary architecture: with its magic of light and structure, it is a building that reaches out to people and that people reach out to—a fair litmus test for any serious piece of architecture.

—Robert E. Fischer

CRYSTAL CATHEDRAL



Robert E. Fischer photos



The Reverend Dr. Robert Harold Schuller, world-renowned pastor of the Garden Grove Memorial Church (35 freeway miles southeast of Los Angeles International Airport and a stone's throw from Disneyland in Anaheim), got what he was looking for, and more, in the Crystal Cathedral designed for him by Philip Johnson and John Burgee.

It's an even more beautiful building than the photographs show. It's a beautifully crafted building. One approaching on foot has his interest aroused by the chameleon-like shell. And then, the funnel-like porticos prepare one for the surprise and emotional impact of the vast interior. Philip Johnson, at a recent meeting of 2,000 California architects/designers, described the interior best: "It's a room with little corners; it's a room where you can cuddle, and yet it's a room that feels as big as the Colosseum if you need that kind of space."

Having started his ministry 25 years ago at a drive-in theater in Garden Grove, and having preached under the open sky for six years, Dr. Schuller had a predilection for a building essentially with no walls or roof. "When you've worshipped in a drive-in as long as I have," he says, "you'll come to the conclusion that a roof that comes between your eyeball and the infinity of space limits your capacity for creative imagination."

So Johnson/Burgee mustered their courage and their design skills, and gave the pastor what he really wanted—a glass tent, but a glass tent of meaningful and breathtaking scale.

His first requirement, Schuller says, was for a disarming environment—one offering tranquility. "Tranquility," he avers, "is conditioning for creative communication, because only a relaxed mind can listen and think."

Now famous from his television broadcasts, and as minister to a local congregation of 10,000, Dr. Schuller had more in mind than an anonymous enclosure.

He issued this charge to the architects: "You've got to come up with a design that will be so sensational, so striking, that when sophisticated, refined, cultured people see it, they will say, 'That has to be built. The human family must never be deprived of the joy of seeing it.'"

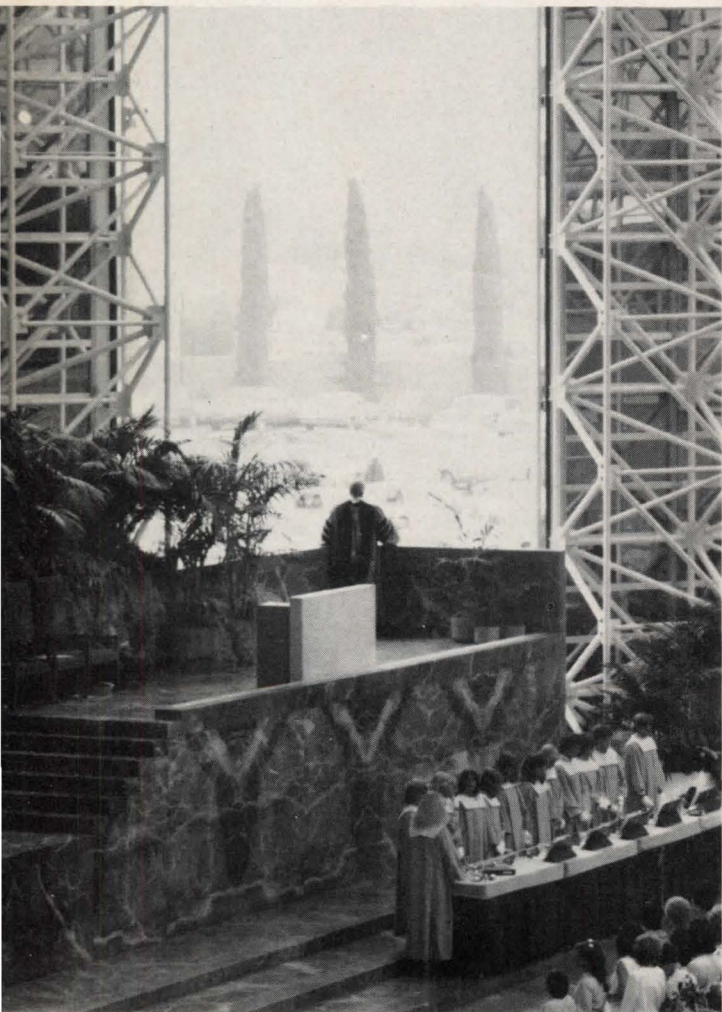
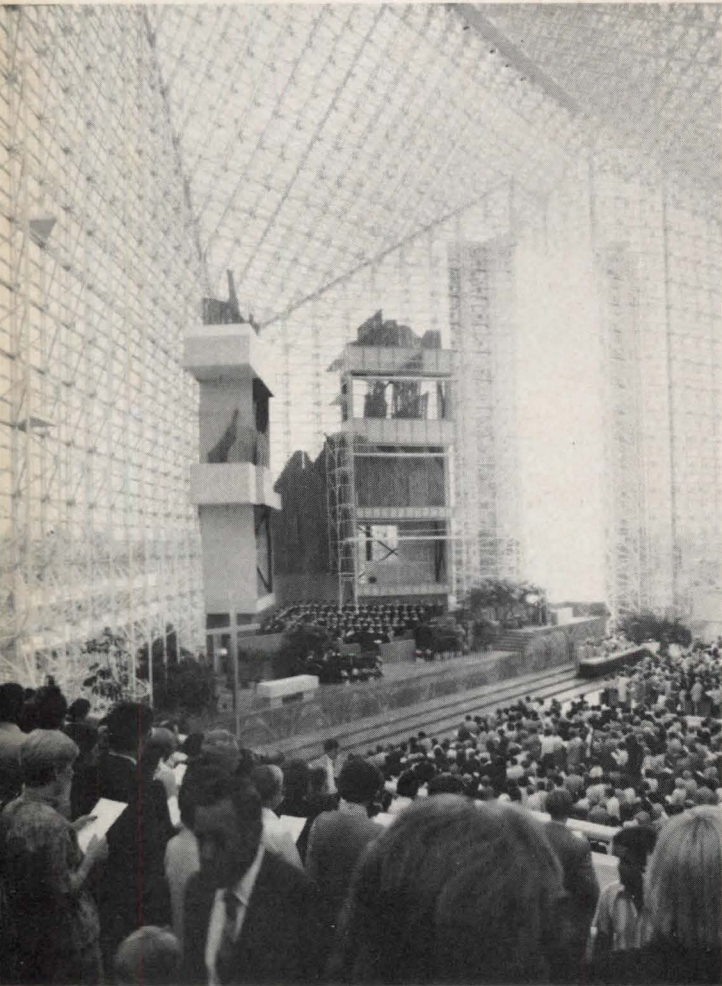
During the visit of the 2,000

Gordon Schenck photos





The Crystal Cathedral has many different visual aspects, depending upon direction of one's view, orientation of the building, reflections of adjacent buildings and surrounding landscape, sky conditions, and time of day. The multiplanar views present dynamic panoramas to the public's eye and the camera lens—resulting from the combination of angled roof and wall planes, tapered roof lines, a clerestory at the apex and a triangular appendage for the 90-ft-high hangar doors, and, finally, the stepping of the operable windows used for ventilation.



California architects, Schuller volunteered, "Some critics said it never should have been built. I can tell you (since this is a secular meeting) that I've gone through hell to try to build it, and primarily from the religious community or the extremely secular community. I have not received a single congratulatory telegram from any major religious leader!"

The "more" that Dr. Schuller got is a skillfully sculptured space outside and in. It is unmistakably an ecclesiastical edifice on the exterior.

And the "more" is the solace the building offers to anyone. A young man with the contractor said, "When things get pretty tough, I just sit quietly in an upper seat in the balcony, and the experience consoles me."

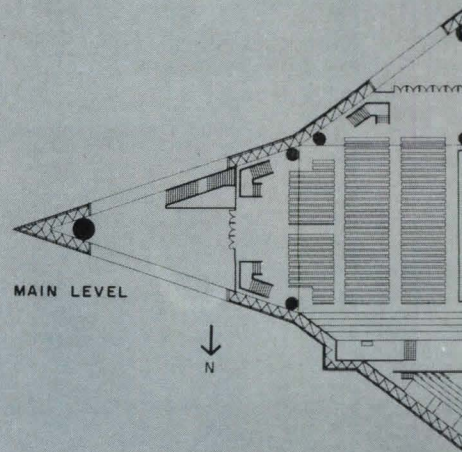
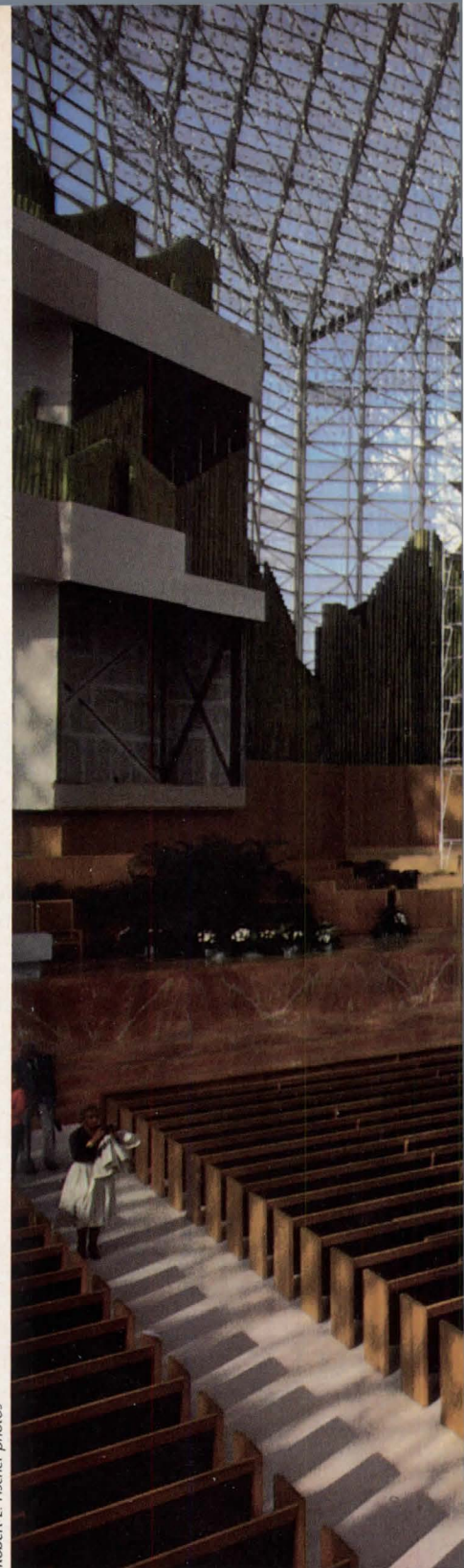
Inside, the Crystal Cathedral achieves both the grandeur and the intimacy that Philip Johnson saw in his mind's eye. And what he saw was a modern version of the structural tracery of Sainte Chapelle in Paris, where the enclosure is principally glass, and the structure seems to disappear. The structure *is* there in the Crystal Cathedral, performing both as support and as space definition. But it does not intimidate. "We brought the columns in, but you can see through," points out John Burgee.

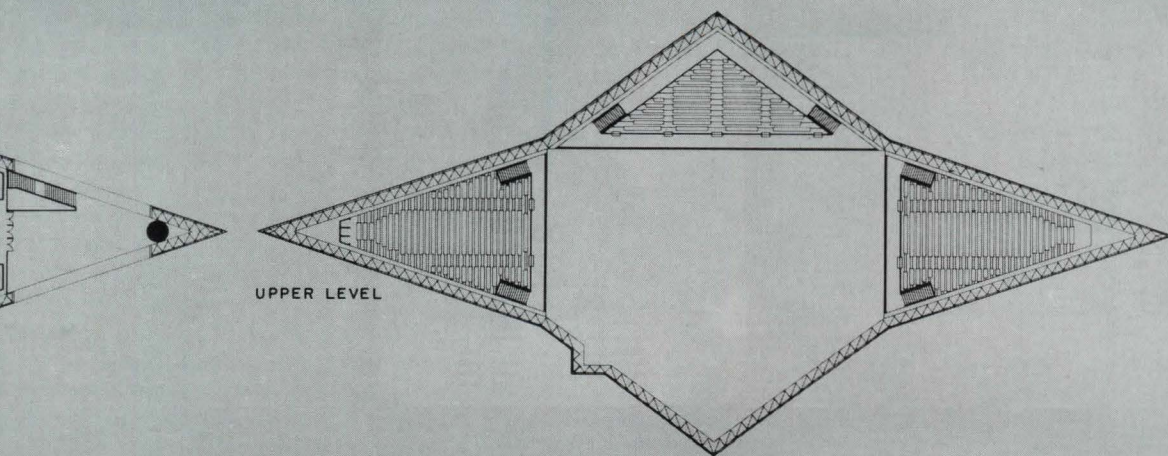
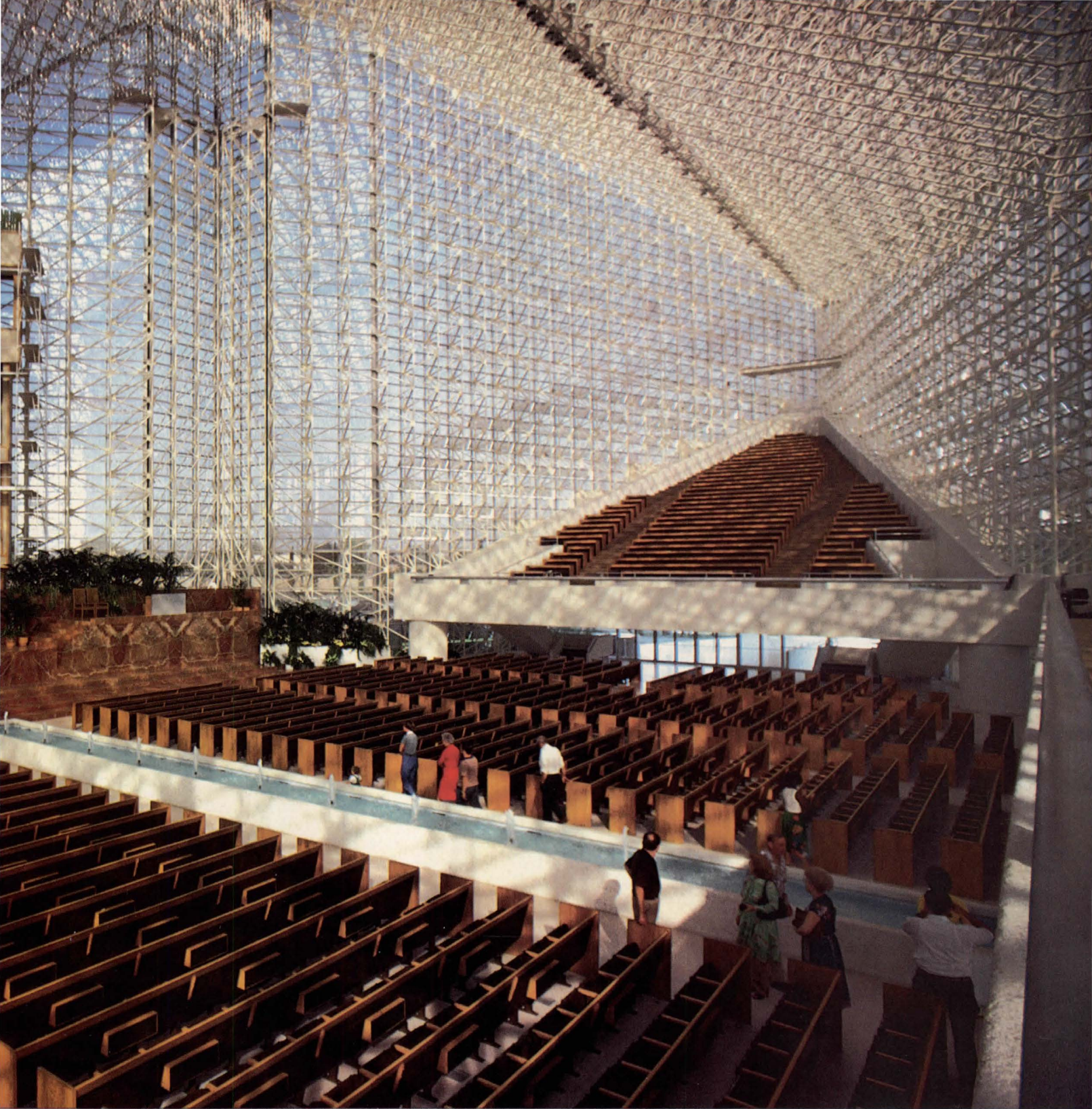
The impression is helped by the space trusses being painted white, by the pipes generally being no larger than 3 inches in diameter, and by the architects' insistence that the structure be comprised of pipes rather than steel angles, and that there be no cross-bracing members perpendicular to the inner chords that would interrupt the visual flow of structure.

The architects achieved grandeur partly through sheer dimension: the building is 415 ft long, 207 ft wide, and 128 ft high at the apex. They achieved intimacy by manipulating scale. The "pinched" diamond plan (a four-pointed star) divides seating into four discrete areas; 1,778 seats on the main floor, 403 seats each in the east and west balconies, and 306 seats in the south balcony. The shape, says Burgee, derived from the desire to pull everyone in as close as possible, resulting in a shortened nave and tapered transepts.

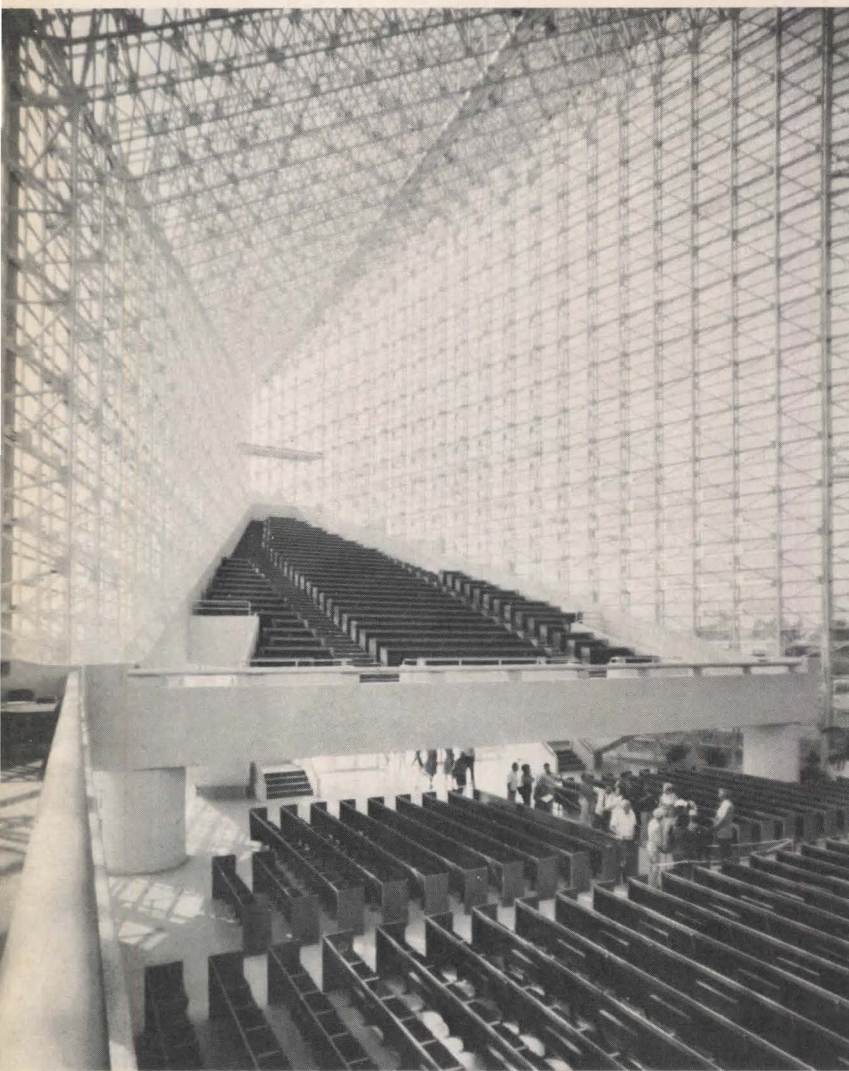
Scale manipulation also involved sloping the balconies

Robert E. Fischer photos

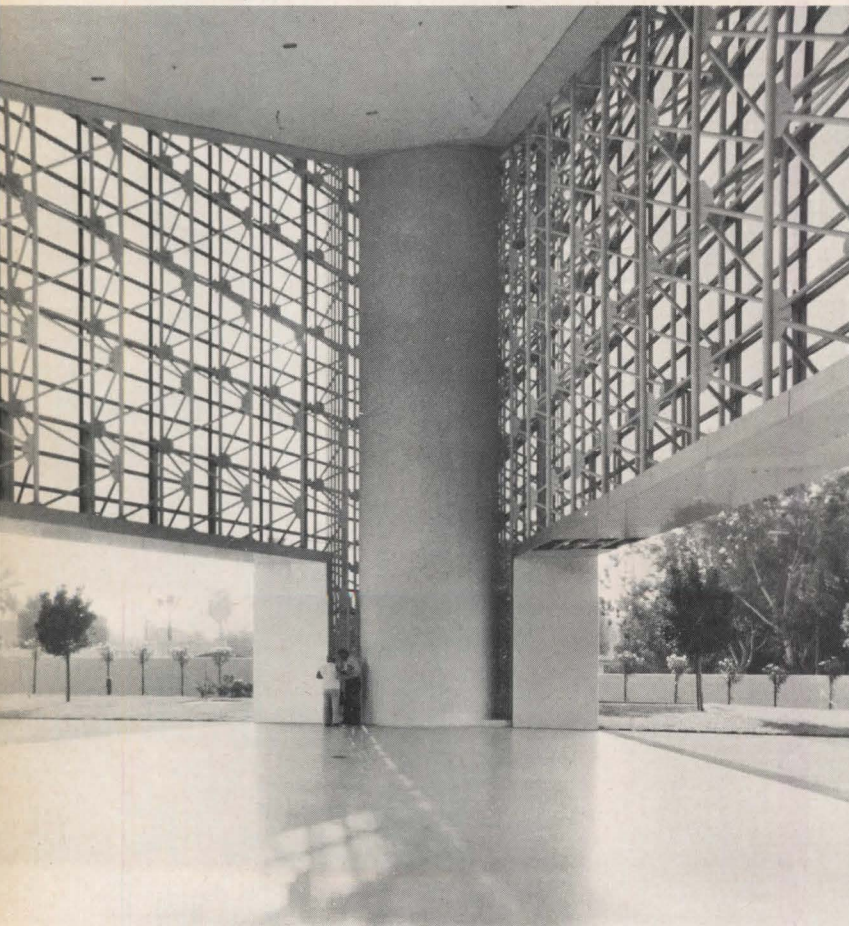




Whether the day is overcast or sunny, no matter: the overcast sky bathes the interior with what has been described as a pearly light. On a clear fall afternoon, the sun draws out the rich, deep colors of the Rosso Alicante marble, and turns the delicate filigreed structure a creamy white. In spite of the building's 415-ft length and 128-ft height, its planes create intimate spaces. The drama begins when Dr. Schuller intones, "This is the day God has made . . ." and the 90-ft doors open for his welcome to the automobile congregation.



Robert E. Fischer photos



down close to the main floor—the underside of the front balcony girders is only 7½ feet above the floor.

It is clear that the structure is very much in the service of the architects' goals for the building. The shape of the building, says Johnson, could have been a plain box with a flat top and plain side walls, using a universal type of framing system. "But what we feel is important is what we have done with structure, not what structure has done to us."

"We let the structure all hang out," say Johnson and Burgee, "but it is not high-tech. It's not an aircraft hangar in which you expect to see a dirigible . . . a hangar has no molding, no scale. The Crystal Cathedral is beyond high-tech. Or maybe it's high-tech for moral purposes."

Because of the nature of the space-truss system, the connections are mostly gusset plates, but in locations of high stresses and complicated framing geometries, 157 castings were used. The castings were so difficult to comprehend visually that steel detailer George Kent, consultant to the structural engineers, made mockups using a rubber ball and cardboard mailing tubes.

In a building of this scale, the gusset plates are not distracting, but merge visually into the space-frame network. The architects worried about potentially distracting elements, so took great care in locating ladders, catwalks and ceiling lighting fixtures, which all are above the lower chord of the space trusses.

The structure is a series of space trusses having a predominantly one-directional load-carrying capacity. The reason is that while the top chords of the triangular-cross-section trusses are braced horizontally, the bottom chords are continuous only in the direction perpendicular to the longitudinal axis of the church. The plan geometry of the trussed walls, however, says Severud's project engineer John Muller, enables them to act as shear walls, which, combined with a horizontal load connection to the balconies, creates an extremely stiff structural system.

The balconies are formed by triangular stepped concrete slabs spanning between intermediate beams and edge beams. The edge beams for all balconies, plus the intermediate beams in the

east and west balconies, were post-tensioned.

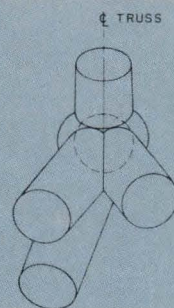
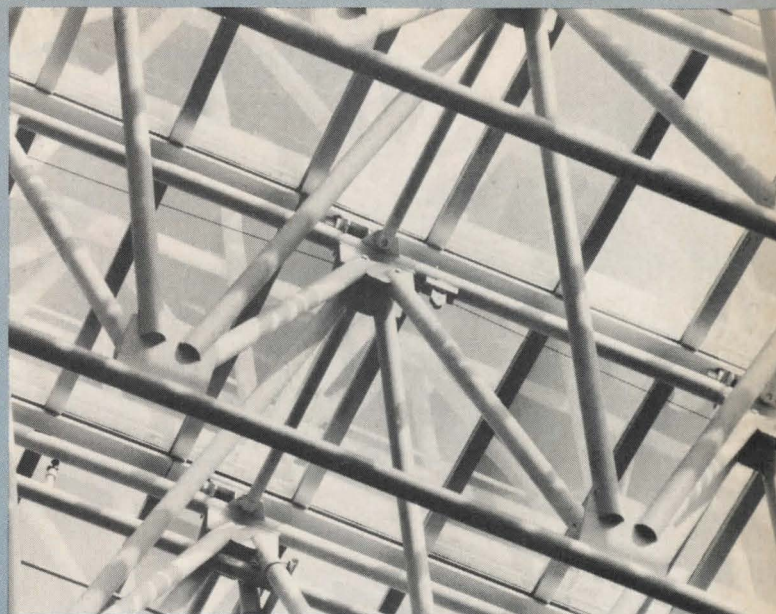
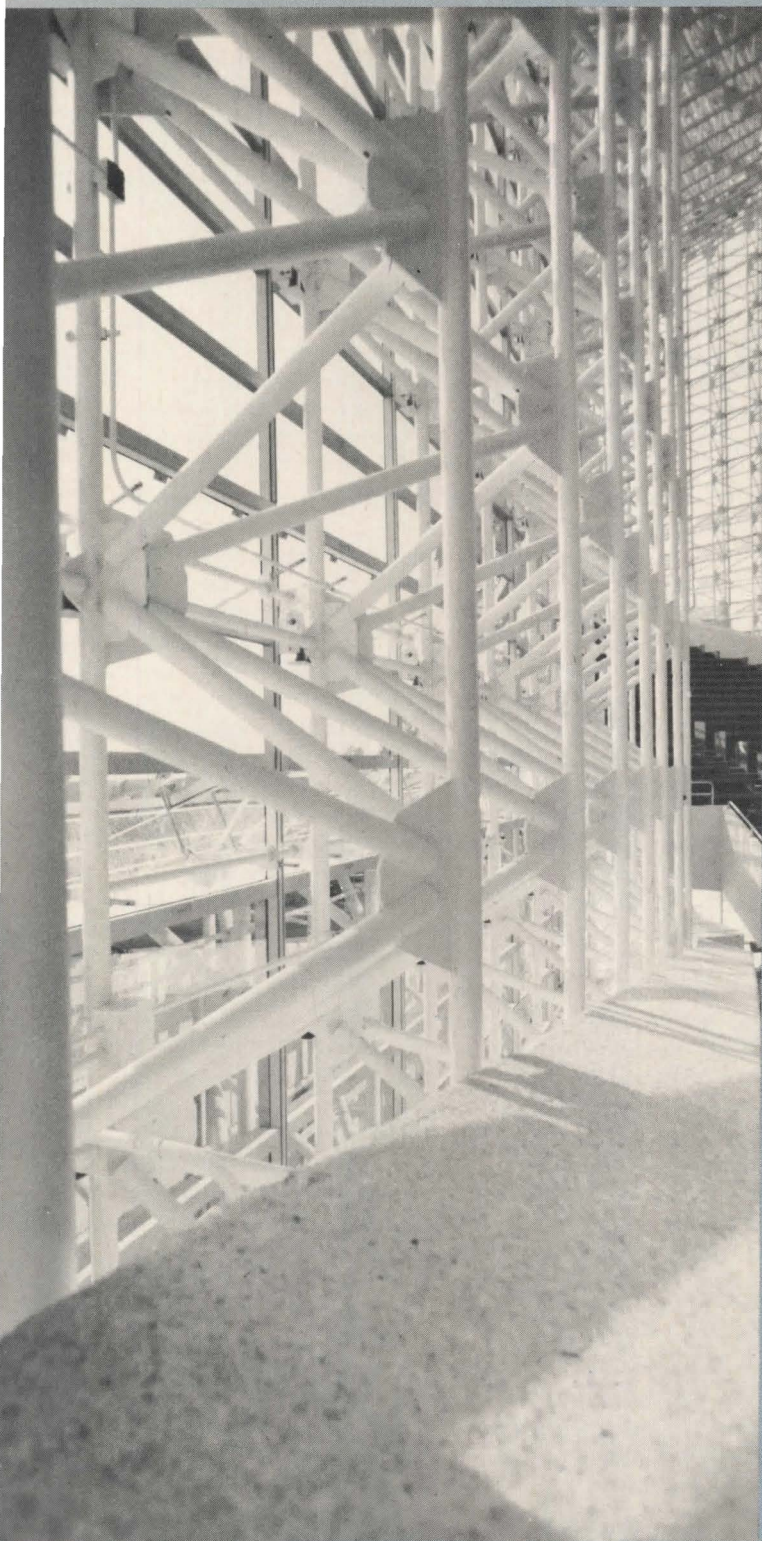
The foundation walls enclose the lower level, provide the fixed base for the space trusses and distribute the lateral load of wind and seismic forces.

The building was designed for seismic loads in accordance with the 1976 Uniform Building Code. The static seismic loading was determined by a dynamic response spectrum analysis, and by a time-history analysis for the most probable and most credible earthquakes derived for the site according to Hans Karl Bandel, formerly with the structural consultants. Further, because of the relative stiffness of the walls in contrast to the slenderness and long spans of the roof, an analysis was made for vertical as well as for horizontal seismic forces.

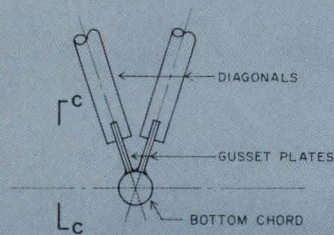
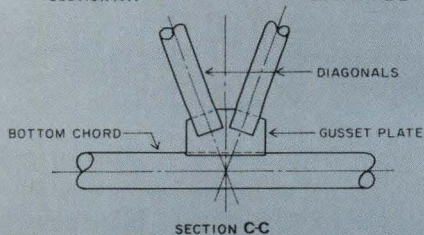
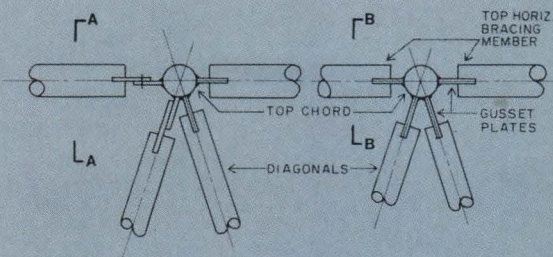
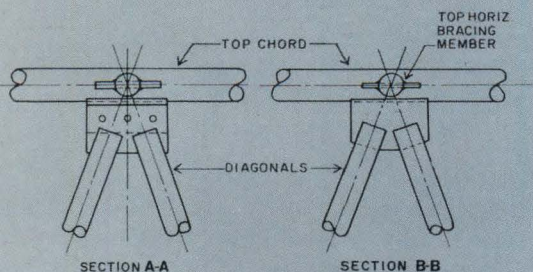
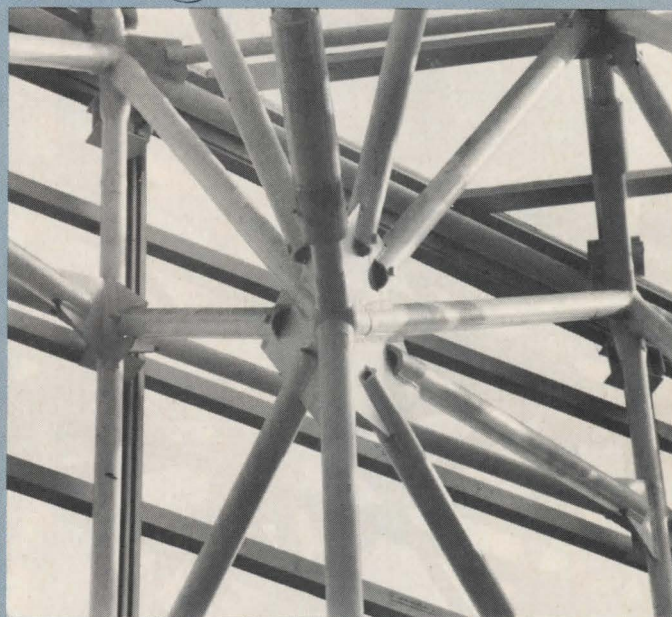
The structure also presented technical problems to the architects: how to solve the mechanics of the 90-ft-high doors, one 15-ft wide and the other 11, that Dr. Schuller can open or close using a garage-door operator. "It dawned on me," says John Burgee, "that the only place I'd seen something like that was Cape Canaveral. Two phone calls later I had a fellow who said it not only was possible, but easy. It uses a motor no larger than the one on your washing machine."

As one could easily surmise, the mechanical engineer and the acoustics consultant had their share of challenges. It was decided from the start that the sanctuary would not be air-conditioned, but rather cooled with cross ventilation and stack action via operable windows, numbering over 550 lights, in the wall and at the peak of the roof in a clerestory—and of course, via the hangar doors. "We never dreamed it would work as well as it did," says mechanical engineer Marvin Mass enthusiastically. The building can be precooled at night, and reports are that even during the recent heat wave people were a great deal more comfortable inside the church than outdoors—not too surprising since the glass has only eight percent light transmission, 10 percent total solar transmission.

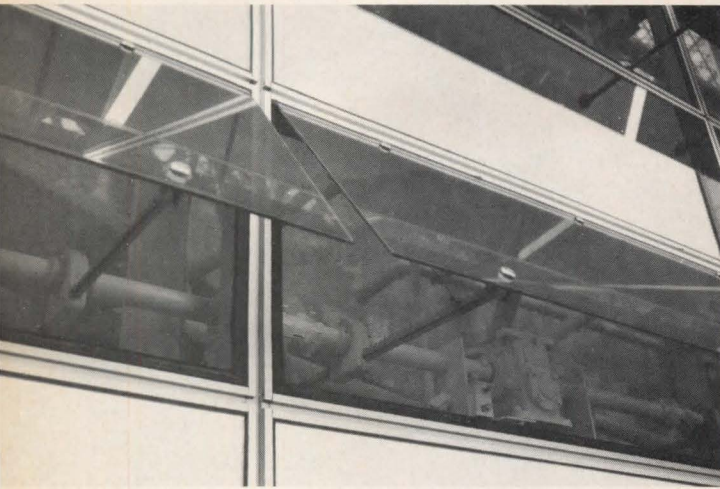
The windows are opened and closed by manual switch from a console, but the engineers have an ongoing monitoring program by which they hope to determine optimum patterns



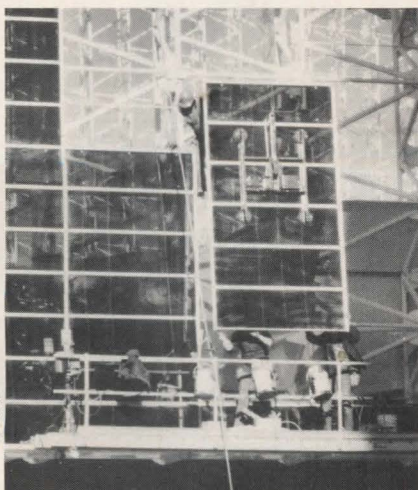
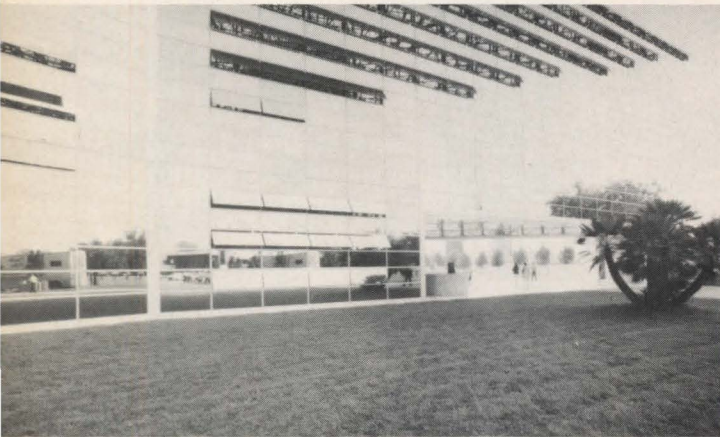
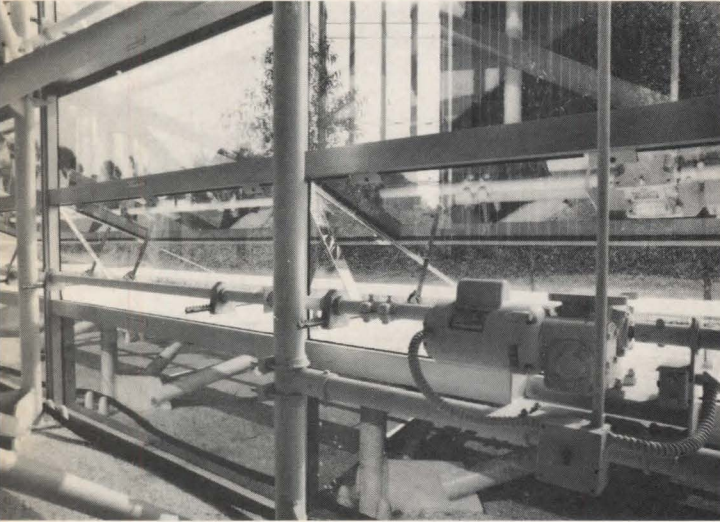
Typically, the pipe-truss members are connected by welding slotted ends to gusset plates. Where roof and walls meet, gusset plates had to be supplemented with castings because of the complex geometry of chords and diagonals and high stresses. Some connections in the corners have as many as 11 pipes (below).



The roof and walls comprise continuous space trusses formed by pipe members generally ranging from 2 in. (horizontal bracing) to 2½ in. (diagonals) to 3 in. (chords and diagonals). At locations of high stresses, such as the knees where roof and walls meet, some pipes are nearly 5 in. The bottom (or inner) chords are continuous in one direction only, perpendicular to the long axis of the church. Balcony slabs span between intermediate beams and edge beams, which are supported by circular columns. Walls are braced by balcony edges.



Robert E. Fischer photos



James Caccavo

openings for different weather conditions.

The number of openings, low at the main level and in staggered rows above the balconies, was pretty much determined by "gut feeling," says Mass's partner Ava Tinfo. "It's a good deal like a greenhouse."

Warm-air heating takes the chill off during cool mornings and evenings. Since the large concrete columns are hollow to diminish earthquake load, they conveniently provide space for ducts which deliver air to the balcony floors.

Since the building was to be a "cathedral," it has "cathedral" sound. Because of the volume of the building and the absence of any visible sound-absorptive treatment ("We wanted to respect the architecture of the building," said acoustics consultant, David Klepper), the reverberation time is between 3 and 4 seconds at mid-frequency range. Electronic reinforcement for speakers and for soloists is provided by inconspicuous, flat loudspeakers mounted on the backs of pews, one loudspeaker for every three or four people. A complex digital delay system lets the amplified sound and direct sound be heard simultaneously.

What is the sound really like? The present electronic organ shakes one's backbone. With speech, some echo is heard but, as Klepper points out, the mind associates lots of reverberation with large heights. Choir and audience singing the standard Protestant hymns sound less distinct than one is accustomed to in smaller churches. Speech and solo singing sound as if they are coming from an "invisible" amplification system. "Gabielli and Charpentier should be marvelous," Klepper predicts.

The consultant for the pipe organ, which is being built in Italy by Fratelli-Ruffati and will be installed by spring, was the late Virgil Fox. The green bamboo tubes merely suggest the organ-to-come and will be replaced by a main organ of 173 ranks in the choir loft. There also will be an antiphonal organ of 43 ranks in the south balcony, a three-rank trumpet organ in the west balcony, and a four-rank trumpet organ in the east balcony.

Because the building is a glass tent, the architects did not want a lot of heavy frames inter-

rupting the glass planes, so all of the 10,661 lights of glass are flush-glazed with low-modulus silicone sealant. The operable windows are frameless—an idea the architects got, says Burgee, from seeing windows on a Chevy van—and are made watertight with neoprene gaskets. The multiple-light glazed frames fit together tongue-and-groove, with weatherproofing by gaskets.

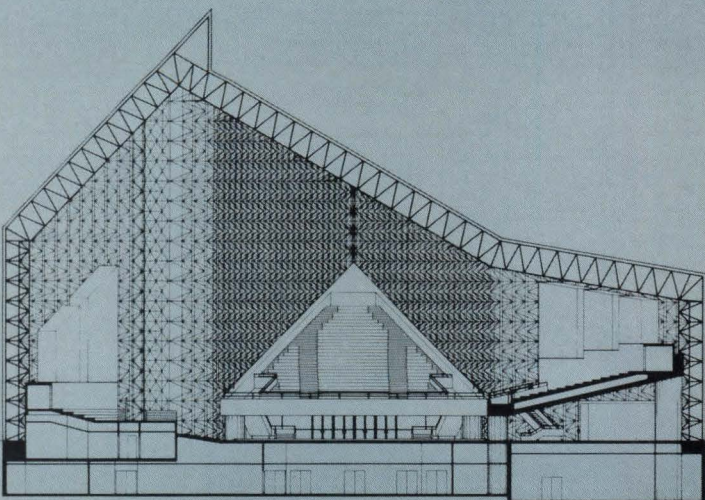
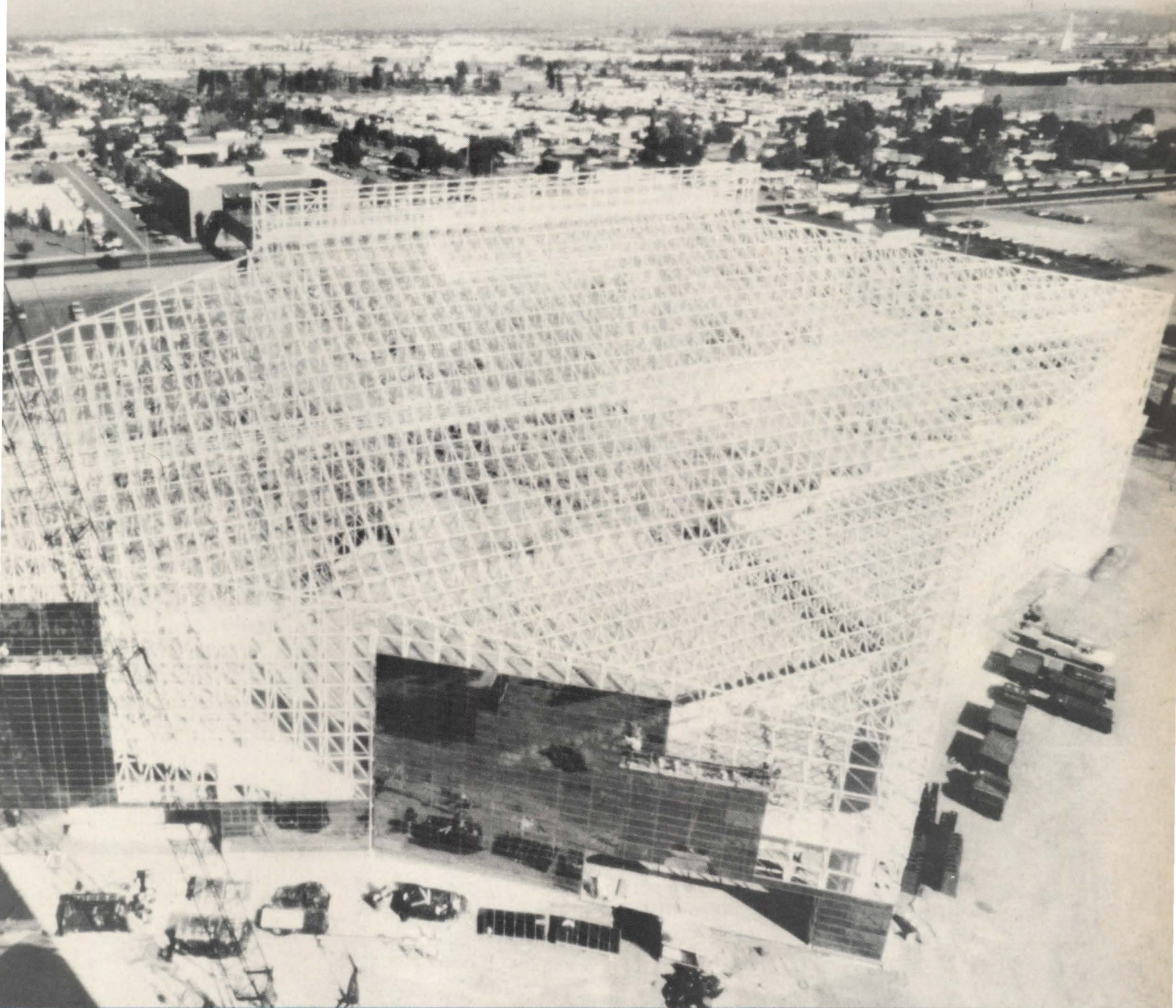
The biggest design problem of the curtain wall was how to attach it to the framing, according to Cupples, the fabricator. The glass framing had to be in absolute position, and the anchors had to facilitate this—the clips by which the frames attach to the tubular structure called for six-way adjustment. The total curtain wall was designed for seismic shock, including vertical forces. The frames for the glass can move like scales on a fish, in the words of one engineer. Vertical glass probably will be cleaned with a high-pressure hose from a cherry picker says curtain-wall consultant Eugene Tofflemire.

Philip Johnson, and Schuller himself were not always sure the Crystal Cathedral would be built. But practically all the money is in the bank for the \$18 million the building cost—raised entirely from contributions.

Said Philip Johnson to the 2,000 architects, "As architects, as creators of the world around us, we have the duty to create buildings like this. . . . Some may say 'That's not architecture, that's just fantasy architecture.' Darn right it's fantasy architecture; it's the only kind worth building. Which one of you wouldn't rather sit down and design your fantasy and have it built, than any other single thing you wanted?"

THE CRYSTAL CATHEDRAL, Garden Grove, California. Owner: Garden Grove Community Church. Architects: Johnson/Burgee Architects. Field architect and civil engineer: Albert C. Martin. Engineers: Severud-Perrone-Szegezdy-Sturm (structural); Cosentini Associates (mechanical/electrical). Consultants: Klepper-Marshall-King Associates, Ltd. (acoustics); Eugene Tofflemire (curtain wall); Claude R. Engle (lighting); Rolf Jensen (life-safety systems). Joint-venture builder: C.L. Peck, Contractor; Morse/Diesel, Inc.; and Koll Co. Structural steel fabricator: Pittsburgh-Des Moines Steel Co.

James Caccavo



All glass is reflective with a silver-colored coating to reject the sun's heat. Light transmission is 8 per cent, yet, at noon on a hazy fall day, the illumination can be 400-500 footcandles. Roof glass is tempered, while wall glass is annealed, except for the frameless operable windows, for which the glass is tempered. Approximately half the glass is $\frac{1}{4}$ in. and the other half $\frac{3}{8}$ in., randomly dispersed throughout the walls and roof. Reason was to avoid acoustical resonance that could cause some musical notes to "disappear" through a phenomenon

known to acousticians as "coincidence dip." The difference in thickness results in a pleasing variegated pattern on the outside where glass reflects the sky. The glass was installed in factory-fabricated panels of six lights. The 2- by 5-ft or 2- by 6-ft lights are flush-mounted with silicone structural sealant. Neoprene gaskets maintain the water-tightness of the frames, which fit tongue-and-groove fashion. The operating windows, the only source for comfort cooling in the sanctuary, are opened and closed by rack-and-pinion operators.

BIRKERTS' LIBRARY FOR DULUTH

Recalling the form of the long cargo boats on Lake Superior at the bottom of the bluff on which it floats, the steel-hulled Duluth Public Library heads toward downtown.

The words *motion* and *mobility* recur persistently when architect Gunnar Birkerts describes the design of the newly opened Duluth Public Library. The building sits on a long, narrow site only a scant block from some railroad tracks that serve the Lake Superior port, and Birkerts confesses to an early fantasy about the library:

"There was talk that these tracks along the lake shore would be abandoned, and I was attracted by the thought that maybe a library for a linear city like Duluth—it's 15 miles long and about five blocks wide—should not be a static one but should move where the demand is, where the people are. I was intrigued by the thought that the abandoned tracks and the right of way could be used to move a structure at a certain schedule through the city, and that people at different geographical positions on the axis could have access to the library. Everyone, once a week, could have the library near the front door."

Charming though the notion was, Birkerts had of course to abandon it. He nevertheless retained the image of motion.

Birkerts believes that an architect's generation of form is largely intuitive, drawing on a lifetime's accumulation of remembered visual images as they mesh with the physical necessities of a given job. Here, height restrictions and the librarians' space requirements demanded a zero-lot-line building on the skinny oblong site. And if Birkerts' own memory, fastening on the idea of movement, had not cast up the image of an ore carrier, he had only to lift his eyes to the giant boats on the surface of the lake.

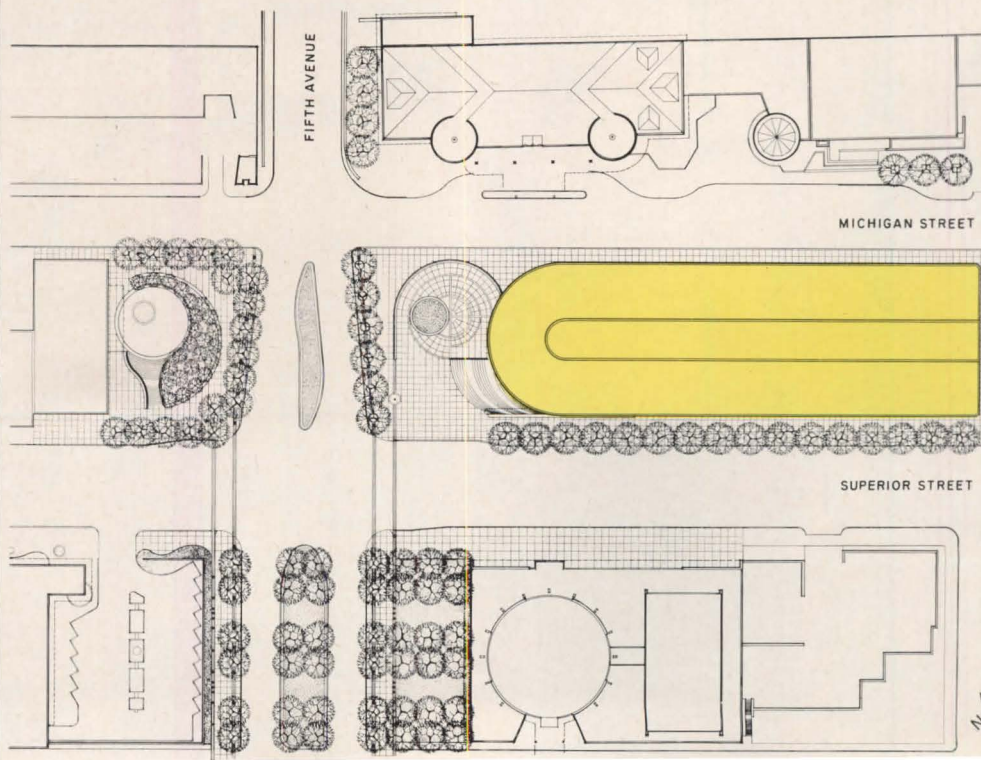
Though the design appears up to the minute, the library was in fact designed some ten years ago. What's more, the project suffered both financial and environmental vicissitudes during that decade.

On-again off-again state funding first held the project up, but then in 1976 the Federal government, fighting pockets of recession and unemployment through the Economic Development Administration, issued community block grants to localities that could get public works projects out to bid within 90 days. Duluth's library project, after



Asked why the yellow circle was painted on the soffit of the library's forward overhang, Birkerts answers, "The sun!" The architect thinks of Duluth as a "gray" city, not only reminded by the gray slate covering the roof of the Depot across the street from the library, but also by the weather, which is often cold, overcast and foggy, as in the photograph below, taken from behind the pierced iron marquee on the Depot. In the long winter months, the architect feels, dwellers on the shores of Lake Superior need a

visual remembrance of the bright summer. The building, which is 330 feet long, purposely emulates the form of a lake steamer, stretching its curved prow toward downtown. Its floating quality is reinforced by its stepped cantilevers and inward-sloping windows and by the long overhang above the Michigan Street sidewalk (below right). On the upper plaza in front of the library (top), a semicircular railing overlooking the lower plaza echoes the curve of the large column supporting the prow and housing fire stairs.





fyng this condition, qualified for a \$5-million grant, supplemented by \$700,000 from the city and more than \$1 million from private donations.

EDA had a further major condition beyond the 90-day deadline, however: although the design had originally called for a steel structure to support metal panels, the government insisted on a concrete structure as labor-intensive, thus fulfilling the grant's aim to provide local jobs.

Meanwhile, the city had decided to restore its Depot, across the street from the library, as a cultural center. That project's supporters objected to the protrusion of the library's curvilinear "prow" over the sidewalk, where it would obscure the Depot's view up the new Fifth Avenue Mall. (The mall, designed as another project by the Birkerts office, extends northward from the Depot to the Civic Center designed by Daniel Burnham, who planned the city of Duluth.)

The final design accommodates both these conditions without alteration of either the boat metaphor or the building form. The structural redesign did sacrifice what had promised to be a dramatic cantilever forward of the semicircular support beneath the prow, but Birkerts shows no discernible regret for the loss, and indeed the slender ordered pilotis hamper the impression of weightless movement not at all—a 16-foot cantilever stretching nearly 300 feet along the side of the library floats the building well above the sidewalk.

The building wall gains further apparent weightlessness by the gradation of color from paler to darker gray toward the top of the building. Birkerts, his mind still on shipping, thought of the building as a "dynamic container," and the skin of the building does in fact remind one of a steel hull. Though the skin appears in most light to be a single fabric pulled tight around the curved bow, in reality it is composed of flat panels, each 30 inches wide. The insulated panels, made of steel with a polyester enamel finish, had to fit against each other with extremely low tolerance as protection against the weather. Architect Arthur G. Thoma, who served as project coordinator for the city of Duluth, says that the strong wind sometimes blows rain horizontally off the lake, hitting the library broadside at starboard.

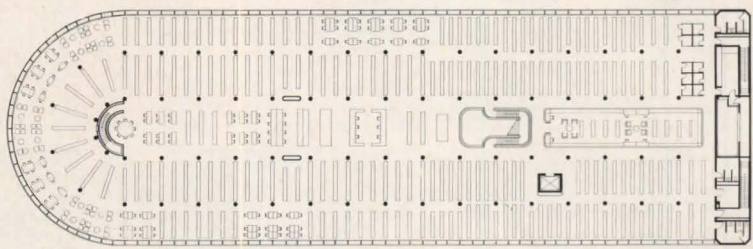
To comply with the cultural center's request for a view toward the city, the architect opened a vantage from the Depot up Fifth Avenue straightforwardly by pushing the library back 40 feet. Although this move necessitated narrowing the street at the back of the building, it had the happy effect of adding a street level plaza that augments the lower plaza beneath the prow. These spaces, lighted and furnished with a movie screen on the large semicircular column, are expected to become popular for outdoor cultural activities sponsored by the library itself, by the cultural center in the restored Depot, and by the Performing Arts Center next door to it.

Duluth, in addition to being a linear city, is a steep one in its narrow dimension, dug into the side of a high bluff, down the

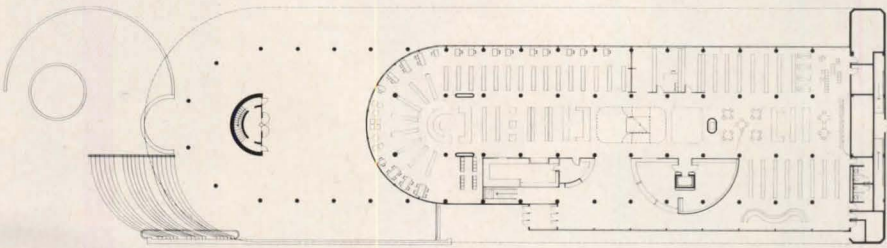


The interior light of the Duluth library carries on the nautical metaphor suggested by the exterior: daylight bouncing from the silver-colored exterior metal panels beneath the sloping windows to the tilted white metal panels over windows and tables (above) acquires something of a watery quality. More daylight bounces off the curved cantilevers and tie beams down the length of the corridor between the

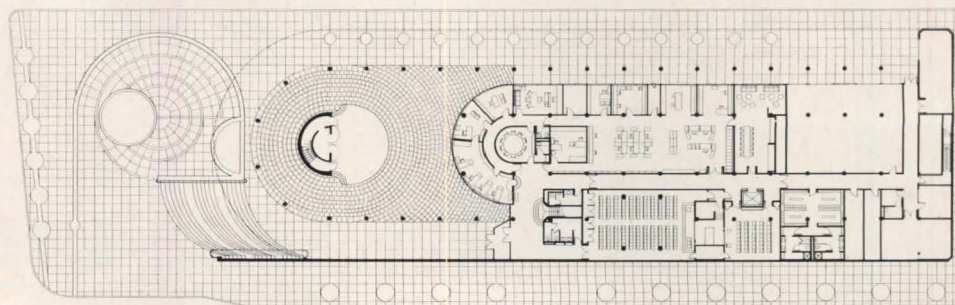
stacks (opposite); operable louvers on the vertical skylights control sunlight (section overleaf). The Birkerts office, which designed interior decor and much of the casework, used dark and light shades of magenta on the top floor, combining warmth, splendor and humor in the central space. Reading tables are arranged in intimate groupings around the prow and between stacks on the long walls.



THIRD FLOOR



SECOND FLOOR



FIRST FLOOR



The new library thus appears to have three stories along Michigan Avenue, only two along Superior Street up the hill. The building's floors, further, expand in volume as the building rises, so that the top floor becomes the largest and the most traditionally serious library space, housing nonfiction, reference, the computerized catalog and quiet tables for reading and study. This floor also accommodates a collection of regional historical material in the North Shore Room and government documents (the library has for years been an official government depository).

Birkerts owns to a long-standing love affair with interior daylight, for its own sake as well as for its modeling of volume and texture. And while he welcomes the assistance to readers' visual acuity and the possible energy savings, these considerations are secondary to his appreciation.

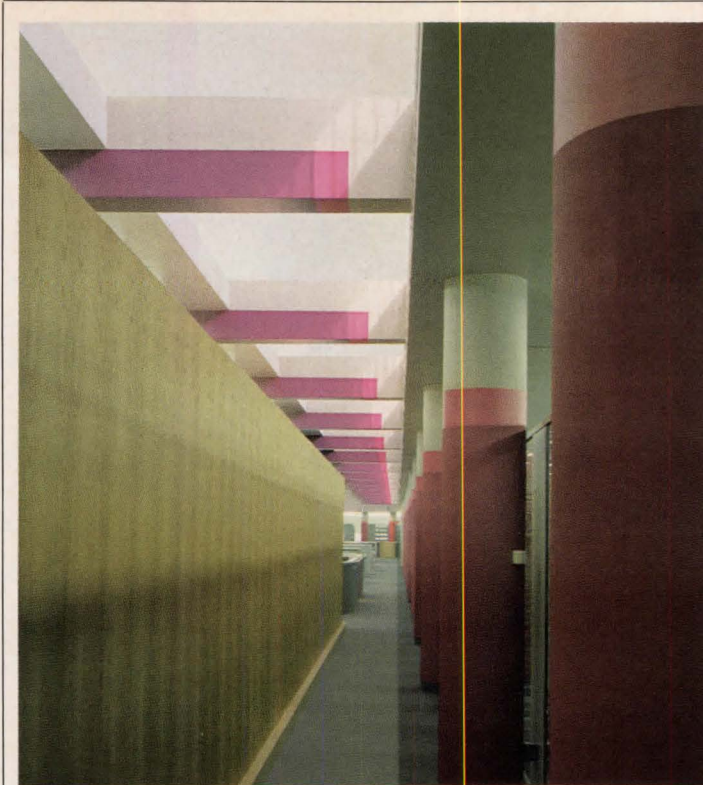
From his experience and contemplation of the nature of daylight, Birkerts draws the rule that for effective interior use it must come from two directions and it must be diffuse. At the Duluth library, light entering the vertical skylights on either side of the monitor above the third floor is diffused by the curved surface of cantilevers supporting the penthouse roof and by the exposed beams that tie the slabs on either side of the 26-foot-wide central corridor that extends the length of the floor (see section this page). Light around the sides of the space is diffused upward through the windows by pebbly "silver" metal panels outside, and downward by light-colored sloping metal panels above the windows on the inside.

The library's main entrance is from Superior Street to the building's second floor, which is likely to be its busiest since it houses the fiction collection, current periodicals and the children's room, as well as a "media services" section for film, slides and phonograph records—not to mention puppet shows. (The puppet theater has its backstage in the office of the children's librarian, at her suggestion and to the astonishment of the architect. Chief librarian Janet Schroeder observes that children's librarians, like kindergarten teachers, seem impervious to any discomforts incurred in the service of their young charges.)

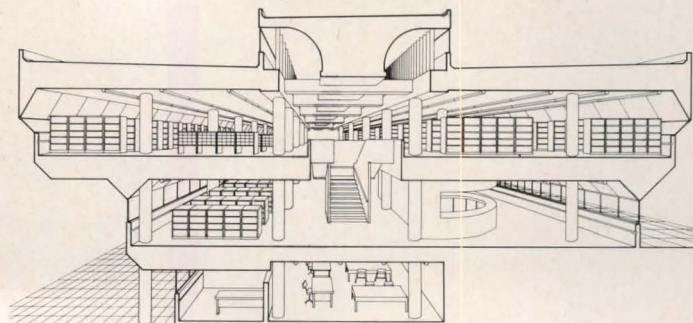
The lowest floor, bounded on one side by a retaining wall, houses staff offices and work space, conference room, a cafeteria, and maintenance areas. Two meeting rooms, accessible from the lower plaza, can be opened to the public in the evenings.

—Grace M. Anderson

DULUTH PUBLIC LIBRARY, Minnesota. Owner: *City of Duluth*. Architect: *Gunnar Birkerts and Associates—Gunars Ejups, Charles Fleckenstein, John Hilberry, Paul Chu Lin*. Interior design: *Gunnar Birkerts and Associates—Barbara J. Bos*. Supervisory architects: *Damberg & Peck*. Engineers: *Robert Darvas Associates P.C.* (structural); *Hoyem-Basso Associates Inc.* (mechanical/electrical). Landscape architects: *Gunnar Birkerts and Associates*. Library consultant: *Robert H. Rohlf*. Cost consultants: *Hodges-Jage of Minnesota*. General contractor:



On the library's entrance floor, which houses popular periodicals and fiction, the addition of seagreen enlivens the magenta color scheme. Multicolored pillows piled on the bench around the staircase (opposite) accommodate lounging children. At the top of the stair, a wood partition (top and opposite), veneered with book-matched red oak, sets off the North Shore Room, which houses a special collection of books and documents dealing with regional history.



Not just another
white box:
Renato Severino
Greenwich, Connecticut

A white stucco right triangle is not an obvious choice for a house on a hilltop in stately Greenwich with views of Long Island Sound. It is a choice that bears some examination.

The triangular shape developed from passive solar energy considerations being given pre-eminence in the design process: the heavily-glazed main roof facade—the hypotenuse of the triangle—faces south at a 45-degree angle for optimum sun infiltration; the north elevation is sheer, perpendicular, with only narrow strips of windows. It is an especially straightforward, logical parti, inviting comparison to a traditional New England saltbox.

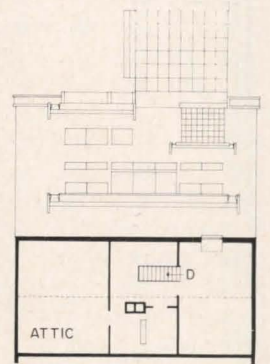
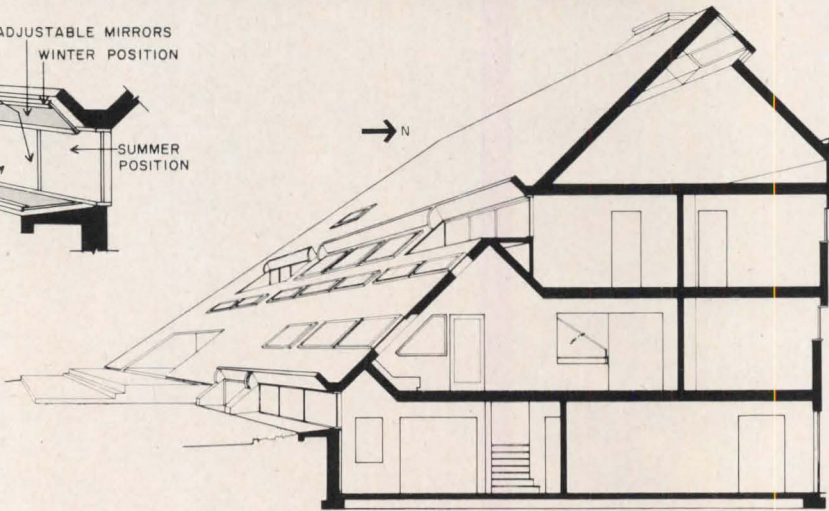
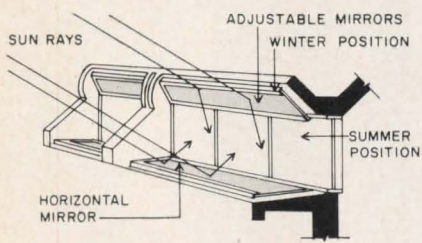
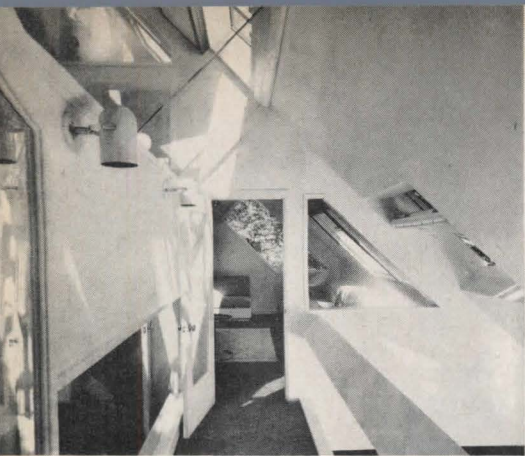
The more curious question is why the execution of the triangular form—especially the east and west elevations—has been honed to the point of austerity. This raises the topical issues of aesthetic preference and of a building's appropriateness to its context. Architect Renato Severino wanted the house to have a geometric precision that would give it "intensity." And for Severino, intensity translates into a strict articulation of form, best left unmitigated by softened edges. The choice of white stucco accentuates and purifies the geometry of the form.

This house raises two questions: whether the accommodation of solar energy is a sufficient premise on which to base a design, and whether an architecture of intensity is appropriate in the context of a traditional neighborhood. Both questions seem especially well-timed, and it is a measure of Renato Severino's conviction that he chose his own house as a forum for his investigations. —C.K.G.

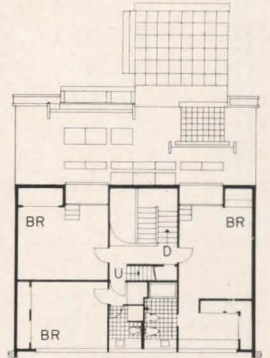
SEVERINO RESIDENCE, Greenwich, Connecticut. Architect: Renato Severino, Architects & Planners—principal-in-charge: Renato Severino; assistant: Michael Kreindler.



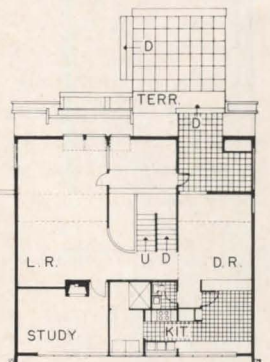
Norman McGrath photos



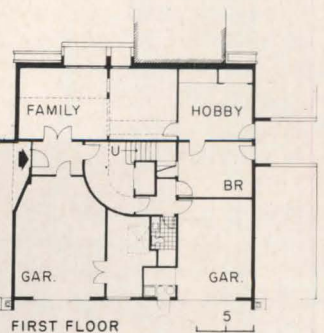
FOURTH FLOOR



THIRD FLOOR



SECOND FLOOR



FIRST FLOOR





The interior of the house presents a duality between the openness of the public spaces—with much emphasis on the play of light and the framing of unconventional views—and the simple, almost common rooms on the

north side of the house. Architect Severino considers the triangular form of the house especially logical because it invites natural convection, drawing heat up to the attic where in the winter thermostatically-controlled

fans recirculate warm air back through the house once it reaches 70 degrees, and where in the summer heat is discharged through vents in the roof. The intention was to design a house that would allow for 30 per

cent of the total energy requirements to be met by a combination of solar collectors and a natural passive system that uses operable "roof windows" with adjustable mirrors to control heat reception year round.



Although there is a gas-fired warm air system used as a backup, passive techniques keep the house comfortable most of the year. Two exhaust fans and an evaporative cooler help

roof-mounted solar panels supply domestic hot water year around. The corrugated metal roofing serves to reflect the sun and, like the stucco-covered adobe block, is characteristic



Much more than just
a vernacular flourish:
Morton Hoppenfeld
Albuquerque, New Mexico

The sheer delight of this Albuquerque house by architect Morton Hoppenfeld is apparent in almost every photo. The house is a small-lot solution to typical problems of privacy where free-standing, six-foot-high adobe walls serve as screens and where every square foot of the site is put to service. The well fed pond, for instance, provides not only an anomalous beauty but serves as a device for moderating the micro-climate in a flat, semi-arid district where noondays can be murderously hot but nights cool even in summer.

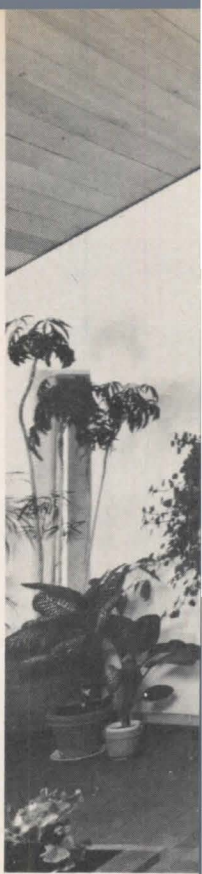
The south end of the Hoppenfeld house is thrown open like a green house to trap the winter sun and hold its heat in thick masonry floors and walls. To guard against summer overload, these glass sections are covered by a latticework of wood strips that, together with newly-planted cottonwood trees (photo below right) will make a filtered canopy. The rest of the plan, with the exception of the master bath, offers few surprises. Major spaces are pivoted around a kitchen that is clearly a focus of family activity.

What is most extraordinary about the Hoppenfeld house—and the feature that most sharply distinguishes it from others in this group—is the free use the architect has made of unusual, unexpected and sometimes idiosyncratic details (see photos next page). They are more than an assertion of personal values. These column capitals and eccentric bits of ironwork give the design a tactile richness that can be felt in every space and a sense of fun that is pervasive and absolutely beguiling. —*B.F.G.*

HOPPENFELD RESIDENCE, Albuquerque, New Mexico. Architect: *Morton Hoppenfeld*. Construction manager: *Ron Romero*.

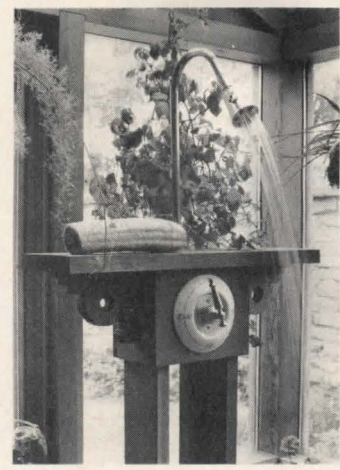
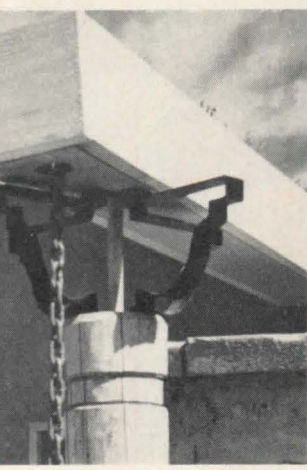
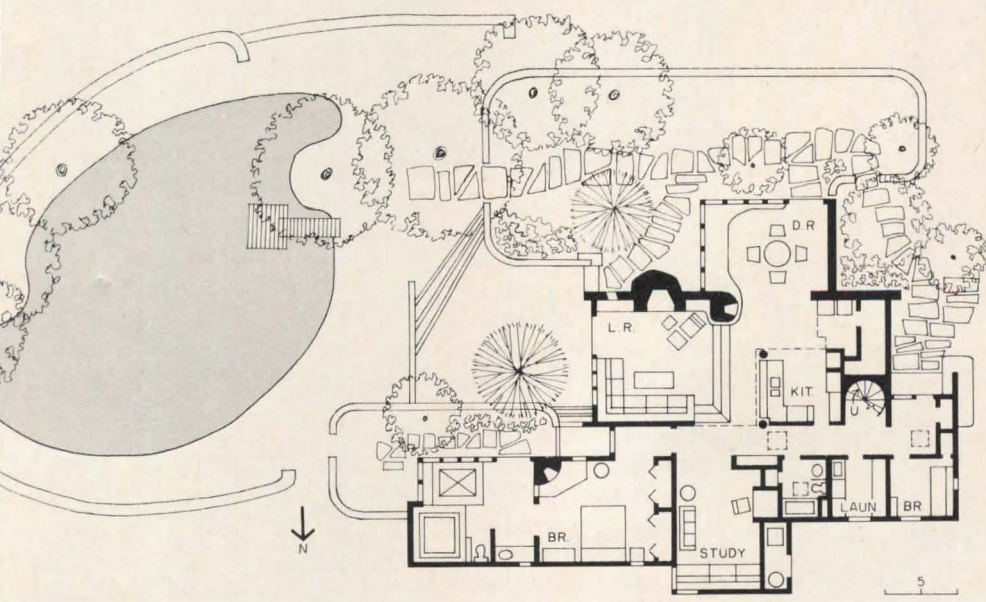
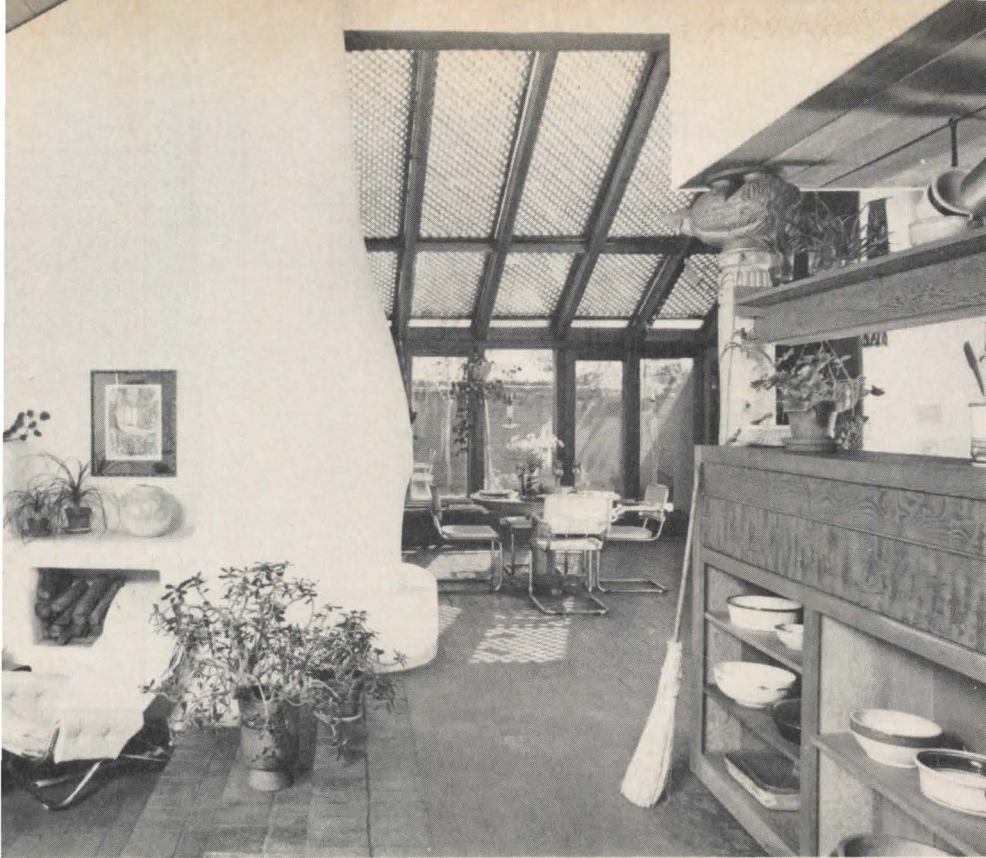


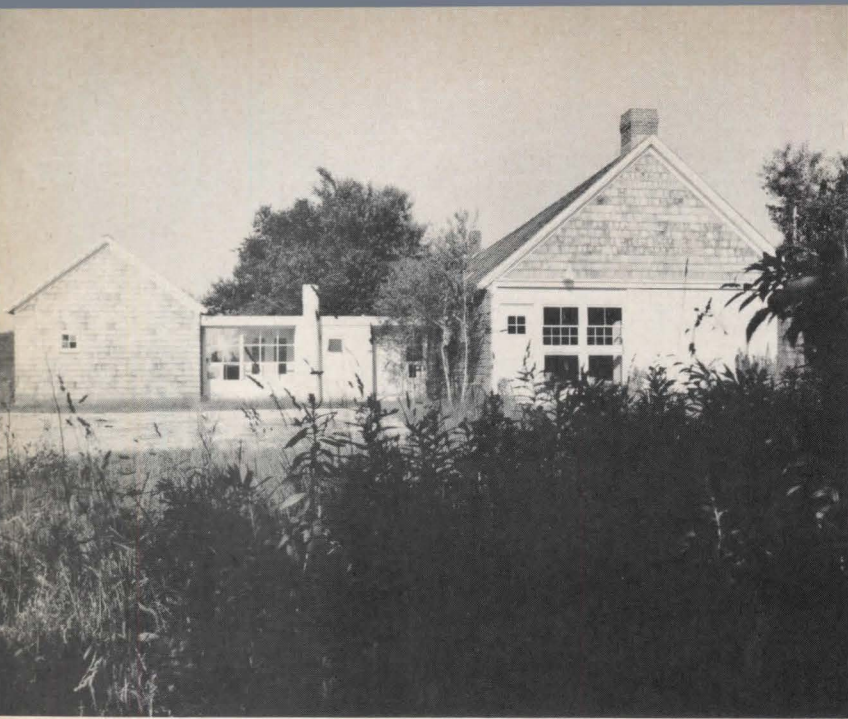
Glen Allison photos



Unusual column caps and fixture details (photos right) enrich the already lively interiors. *Latticework* applied over the greenhouse sections (photos above right) filters the sun-

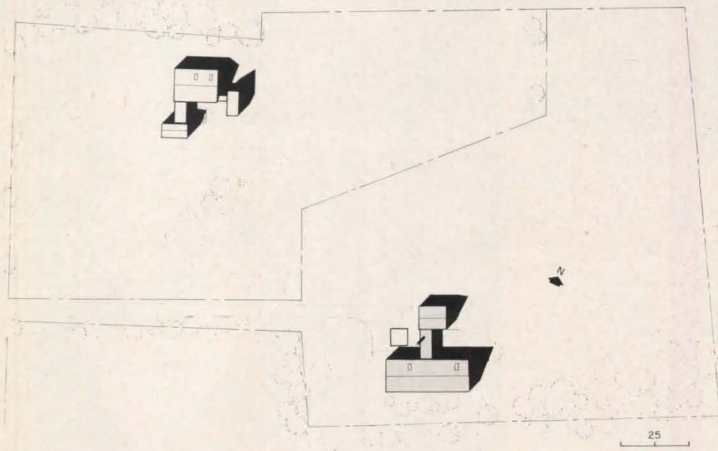
and master bath. Douglas fir and stucco on plaster applied both inside and outside, create strong visual contrasts, contrasts that are heightened by planting and agreeable color





It takes two barns
to make a house:
Tod Williams
Sagaponack, New York

A ramshackle potato barn on eastern Long Island is something short of an important architectural legacy. But Tod Williams saw in this humble artifact more than the picturesque remnant of a lost rural landscape: he saw both the form and the structure of the barn as "possessing an inherent integrity worth preserving and defining as an element" within a larger composition.



The larger composition was to be an assemblage of readily discernible parts that would include a second barn (moved to the site from a nearby farm), a simple corridor between the two barns, and various service modules and partitions to make the spaces function as a house. Williams believes that the success of the project hinged on his ability to express and articulate the divisibility of these components. And looking at the house, one has the uncanny sensation that objects were individually dropped into place and could be effortlessly separated again. This system is reinforced diagrammatically—everything old is unadorned wood, and everything new is painted white.

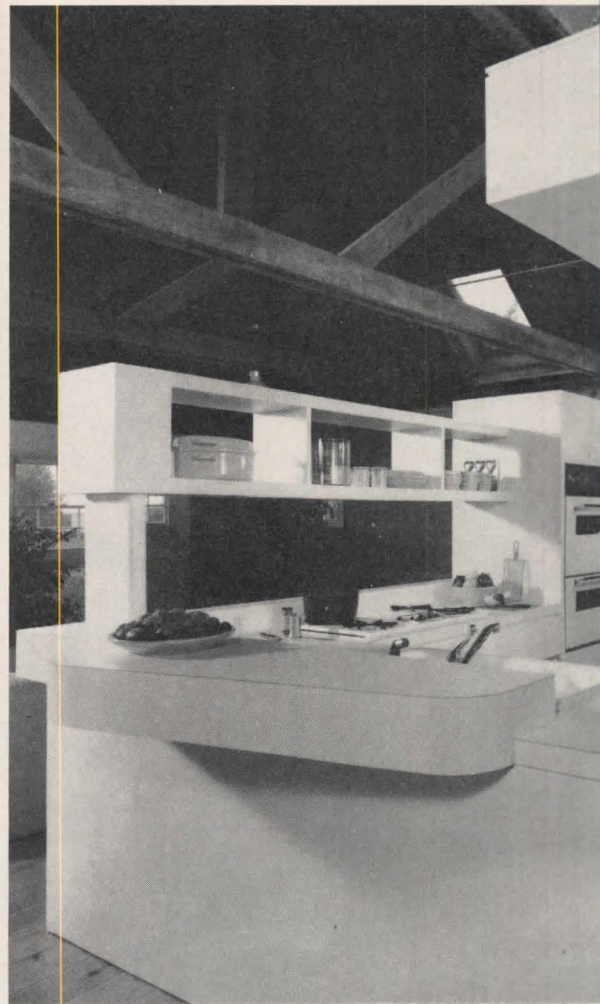
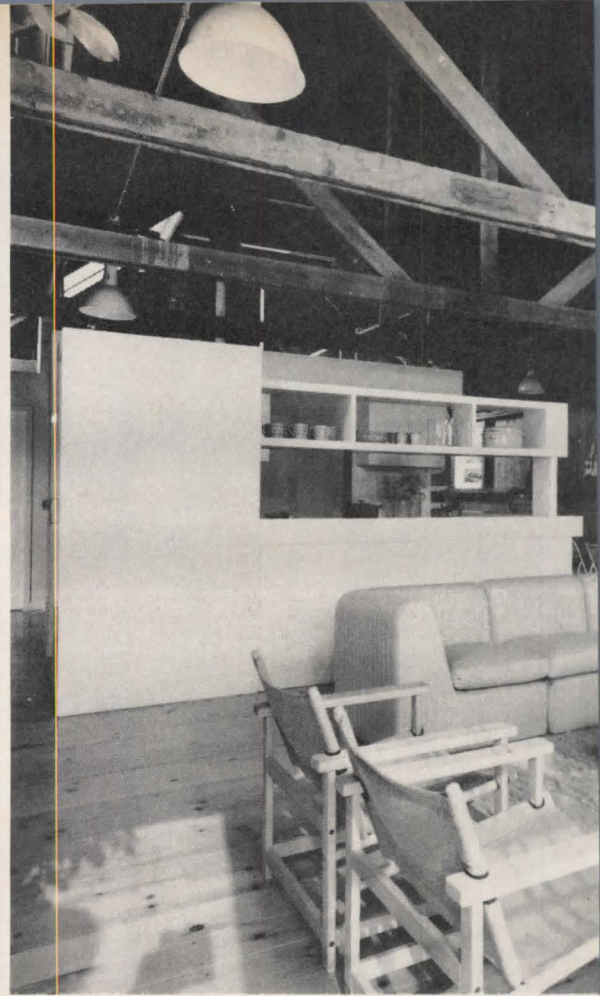
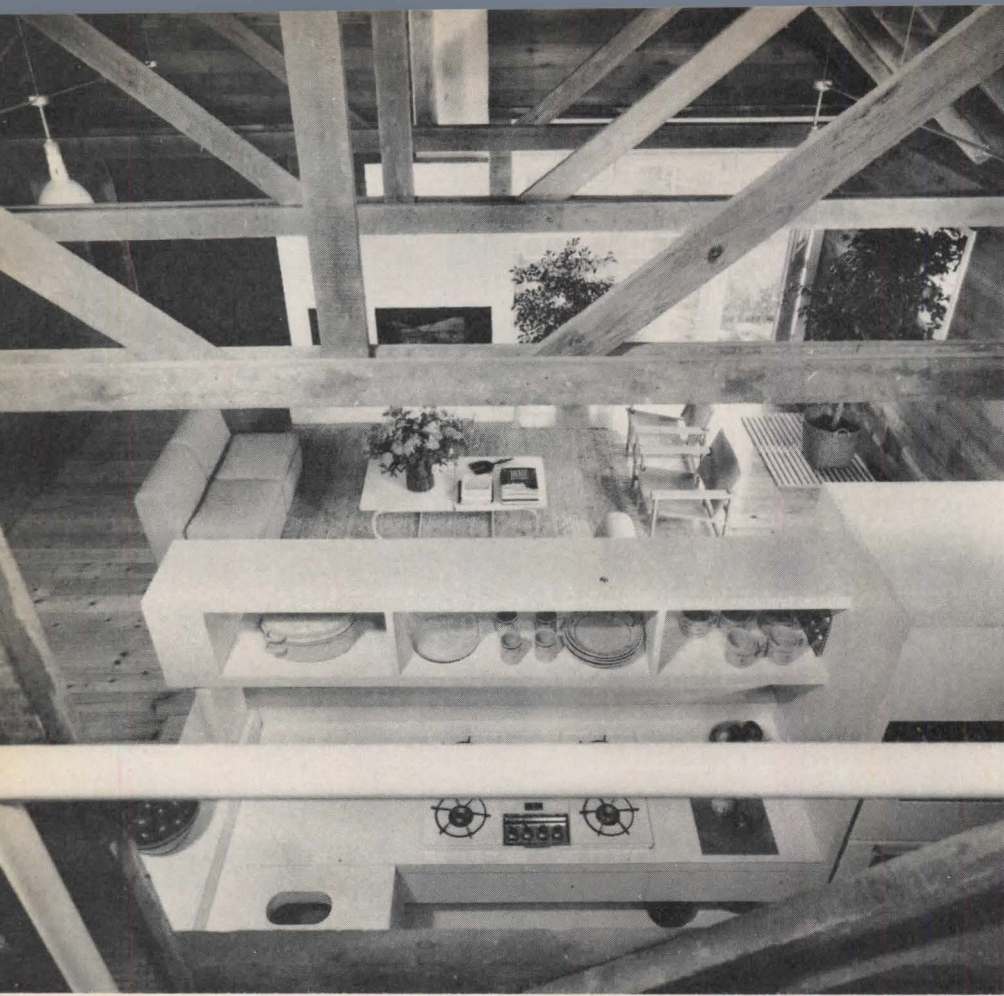
The juxtaposition of the crisp white additions and the weathered wood of the barns creates a visual tension which contrasts both the separateness and the relationship of the parts—the barns become more barn-like against the icy white plastic laminate of the bathrooms and kitchen, and the rigid sym-





After assembling the two-barn house (photo above) for himself, Williams repeated the process across the field with a three-barn house (see site plan) that he intended to sell. At first glance, the two houses appear to be

twins and their resemblance is intriguing enough to make closer inspection irresistible. But rather than being diminished by comparison, the similarities serve to give each house a more articulate sense of autonomy.



Rather than insulate the roof from the underside, Williams opted to cover the old roof with stiff foam and then rebuild a duplicate roof on top. The advantage of this more expensive

old barn was unaltered. Insulating the walls was handled in the same way where the shingles were decayed; where the shingles were still good, the insulation was put inside and cov-

metry of the modules and partitions becomes even more sculptural when played against the pockmarked wood beams. The unaltered simplicity of the barn form and the distinct clarity of the new construction are, for Williams, legitimate forms of preservation and intervention; especially appropriate because the delineation between old and new must be underscored if the integrity of the barn and the purity of the new construction are to be left intact.

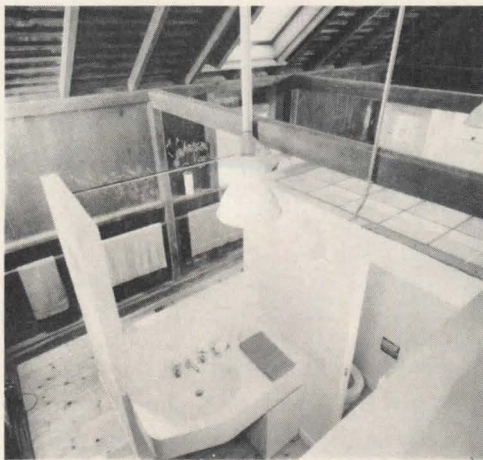
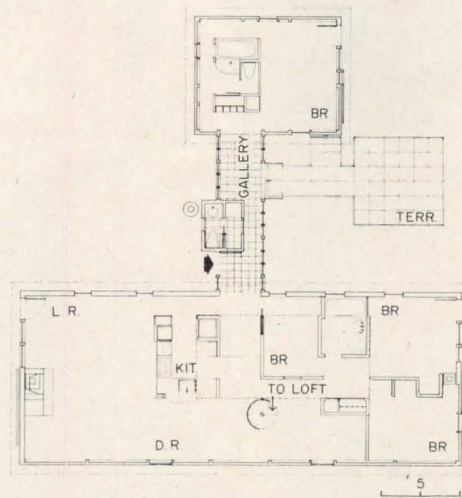
The flat-roofed corridor that connects the two barns serves to articulate each as separate while joining them as one. This heavily glazed, almost transparent link is bisected by a concrete cylinder that serves pragmatically as a flue for the underground furnace, and symbolically as a column to signal the primary entrance.

The original barn doors have been left on their tracks and are still operable: the void they create when open is taken up by a door and double-hung windows with a variety of mullions intended to relate to the various scales of the buildings. During the winter, the barn doors can be closed for added insulation.

This barn/house structure begins with the premise that new is new and old is old, and the line that separates the two is to be rigorously respected. With the exception of skylights and replacement windows, the old barns have been left alone. For Williams, the other, untenable option was to make the composition a contrived and "sentimental" commingling of intrinsically disparate elements that would be compromised if their distinctiveness were blurred. And for this architect, the resultant ambiguity would be a loss of significance.

Tod Williams is not the first architect to recognize the domestic potential of a barn. But what distinguishes this project is that the qualities that make a barn appealing have not only survived, but been enhanced by renovation. —C.K.G.

WILLIAMS RESIDENCE, Sagaponack, New York. Architects: *Tod Williams & Associates*—principal-in-charge: *Tod Williams*; assistant, *Billie Tsien*. Contractor: *ELP Construction*.



The 1980 winners in the first



“Because we are so numerous, live in so many parts of the world, speak such different languages and are of such different racial and cultural origins, I am profoundly convinced that there is no such thing as one type of Muslim environment or one type of Muslim building. Each region of the Islamic world must create its own architectural solutions, but just as we are all enjoined to help the needy, the sick and the poor, so I think we must all assist in a challenging but fundamentally important task. We must demand from our respective national decision makers, our architects, our planners and our landscape architects an environment in which we can live, work and practice the precepts of our faith harmoniously and to the fullest” —the Aga Khan

Aga Khan Award for Architecture

The first Aga Khan Award for Architecture has been grandly conceived, generously funded and imaginatively and meticulously executed. There has never been anything like it in the world of architectural prizes and commendations. Since the Award was founded in March 1978, an entire architectural culture, over 1,400-years-old, has been intensively studied by late twentieth century minds engaged with the fundamental question: Does any of it make any sense for today, and if so, how? The search is of particular interest to Western architects who are or will be more and more engaged in extensive projects throughout the Islamic world. During the past three years, the Award sponsored seminars in France, Turkey, Indonesia, Morocco and Jordan to help set criteria for making judgments. Thirty countries were visited by the Award staff to help find the best projects completed between 1950 and 1977, and many were revisited by specially qualified technical teams sent to assess the leading contenders among the 250 projects nominated. Fifteen projects from twelve countries finally made it through the rigorous screening process to share half a million dollars in prizes. At the Award ceremony last October 23rd in the Gardens of Shalamar, Lahore, Pakistan, 55 persons including architects, clients, government agents, preservationists, carpenters and masons received individual commendation and 17 agencies, both public and private, were also honored. Additionally, Hassan Fathy, the 86-year-old Egyptian architect famous for championing indigenous building, received special commendation and \$100,000. Most winners were Muslims from Islamic countries. Leading U.S. and European architectural and planning firms which have been working in the Middle East for two decades were conspicuously absent from the winners' circle. This fact by itself may make the Award program seem to be an exclusively Islamic event. All the fundamental problems which the Award addresses, however, are shared by the rest of the world. The solutions honored are transitional, experimental and part of a search, and as such are similar to approaches being tried everywhere. Such efforts deserve commendation and prizes. We should all be encouraged by the architectural news from Lahore. —Mildred F. Schmertz

As you turn the following pages to study the Award-winning architecture in the Islamic world, don't expect to see the megastructures you have been hearing about or are working on—airports, new cities in the desert, universities in regions until now inhabited only by Bedouin, large hospitals, high-rise office buildings and hotels, major public buildings, huge mosques, industrial parks, factories and so on. The projects selected for prizes by the master jury of the first Aga Khan Award for Architecture tell an unexpected story.

For example, the awards to a poor urban settlement and to a rural religious school in Indonesia (pages 110-111) remind us that the Muslim world is as poor as it is rich. The tanks of a water supply system in Kuwait (pages 108-109) have received an award because they are beautiful and spirited landmarks but also because they celebrate the water system itself, water for the poor being in short supply in much of the developing world. The technologically sophisticated conference center

and hotel near Mecca (page 107) received as much praise from the jury for its quotations from local vernacular architecture and its encouragement of handicraft traditions as it did for Frei Otto's structural acrobatics.

Labor intensive low-technologies are affirmed by the award given to a small agricultural center in Nianing, Senegal, which developed a versatile system of concrete block walls and cement barrel vaults by which it is constructing its own buildings.

The remaining awards teach yet other lessons: First, the design or restoration of a building must respect its context, particularly if the latter is both beautiful and historical; second, great traditional monuments must be preserved and restored; third, vernacular forms and building methods can be taught again and successfully used, even today; and finally, efforts should be made to preserve the urban fabric and way of life of older Islamic villages and towns. The message of the Award is plain and urgent. The Muslim countries are being asked to respect and

conserve the built world they have made and to renew their traditional skills. Small and old is beautiful.

But big and new is happening. Although one might think that the Award jury made an indirect negative comment on such work by ignoring it, this was not so. Consideration of the vast projects that have been underway for years in Islamic countries, particularly in the Middle East, was precluded by the ground rules established by the Aga Khan and his steering committee in consultation with the Award's first convenor, Dr. Renata Holod, specialist in Islamic architecture and urban history in the History of Art Department, at the University of Pennsylvania, who helped conceive and direct the program.

First they determined that the Award nominations would be made not by institutions but by individuals—Muslim architects, planners, socio-economists and other intellectuals within each country. Dr. Holod and the Award's present convenor, Pakistan architect and planner Hasan-Uddin Khan, visited thirty

countries to select these people (150 in all), gain their support and visit the projects they recommended. This decision assured that the work to be considered would represent what the local Muslims like, an important criterion to begin with. Because of their pride in the achievements of their own people, the Muslim nominators in the majority of cases nominated projects designed by Muslims. This at the outset placed the big work, designed abroad, out of consideration.

Further, the larger projects designed by Muslims and nominated by other Muslims, were inspired by the best current work being built in the West. Unfortunately, while similar to, they were not as good as the projects they imitated. Such projects, therefore, did not get past the first screening and were not reviewed by the master jury.

The second fundamental decision that shaped the results, long before the jury was even selected, was to consider only projects completed and in use since January 1950 and before January 1977. To get a major project, such as a large hospital or university building, constructed takes about eight years or longer in most Islamic countries. Delays are caused by shortages of labor and materials and difficult and extended contract negotiations. The Architects Collaborative, for example, began work on Baghdad University twenty years ago, but most of the construction now in place was finished in the last five years. They now have 122 buildings under construction for the University alone, and 34 of these will be finished by the end of this year. Over a long period, The Architects Collaborative have designed other large projects in Iraq as well as in Saudi Arabia, Abu Dhabi and Kuwait. Other U.S. and European firms are equally or even more active.

Since it is work at this scale which is having the most impact upon Islamic environments, it is now in the process of evaluation by the Aga Khan Award for Architecture. More of it will have been completed long enough to be considered for the next Award in 1983. A start was made at the most recent seminar held last May in Amman, Jordan, at which both Western and Muslim architects and planners presented and discussed projects so large as to be significant interventions for better or worse in the patterns of Islamic life. The decision to defer the consideration of such projects until they are more complete was, I believe, the correct one. To look back, instead, upon the building traditions of centuries, to search for their meanings and to affirm their continuing value for the future was certainly the way to begin. —M.E.S.

Members of the steering committee are:

Nader Ardalan, architect and planner; Garr Campbell, landscape architect and planning consultant to the Aga Khan Foundation, who works in several Muslim countries; Sir Hugh Casson, architect and president of the Royal Academy of Arts in Great Britain; Charles Correa, who practices in Bombay and is one of the leading architects in India; Hassan Fathy, the world-renowned Egyptian architect, author of *Housing for the Poor* and champion of indigenous and Islamic architecture; Professor Oleg Grabar, chairman of the Department of Fine Arts at Harvard University and a specialist in Islamic Art and Architecture; Professor Dogan Kuban, architect and architectural historian, director of the Institute of History of Architecture and Restoration at Istanbul Technical University; and Professor William Porter, architect, planner and dean of the School of Architecture and Planning at the Massachusetts Institute of Technology.

Members of the master jury are: Professor Titus Burckhardt, Swiss philosopher, Muslim and architectural historian; Sherban Cantacuzino, architect, secretary of the British Royal Fine Art Commission, author, and, until recently, executive editor of *The Architectural Review*; Giancarlo De Carlo, Italian architect, director of the International Laboratory of Architecture and Urban Design at Urbino and professor at the Institute of Architecture and Urbanism, University of Venice; Dr. Mahbub ul Haq, economist and director of Policy Planning and Program Development for the World Bank in Washington, D.C., and author of the classic text *The Poverty Curtain*; Muzharul Islam, architect in private practice and president of the Institute of Architects in Bangladesh; Professor Aptullah Kuran, chairman of the Department of Humanities at Bogazici University, Istanbul, author and architect with a practice in Ankara; Dr. Mona A. Serageldin, Egyptian architect and planning consultant practicing in Cambridge, Massachusetts, an expert in demographic analysis and programming with special experience in low-cost housing in the Middle East; Dr. Soedjatmoko, Indonesian sociologist and historian, and former Ambassador to the United States, who is now advisor on social and cultural affairs to the National Development Planning Agency in Jakarta; Kenzo Tange, Japanese architect and planner and Professor Emeritus of Architecture and Urban Design at Tokyo University.

The Muslims, like their counterparts in the West, hope that architectural innovation can in some ways help solve a variety of social and economic problems. Muslim culture, as the master jury pointed out in its formal statement, "is slowly emerging from a long period of subjugation and neglect in which it had virtually lost its identity, its self-confidence, its very language—which after all, is what relevant architecture does and should express. The present is a period of transition—a period when traditional heritage is being rediscovered; when new experiments are being made to combine modern technology with cultural continuity in both richer and poorer countries; and where there is an urgent search for socially responsive forms of architecture for the poor majority." The category "architectural innovation" is one of seven devised by the jury to define the areas of transition, experiment and search in the architecture of Muslim societies.

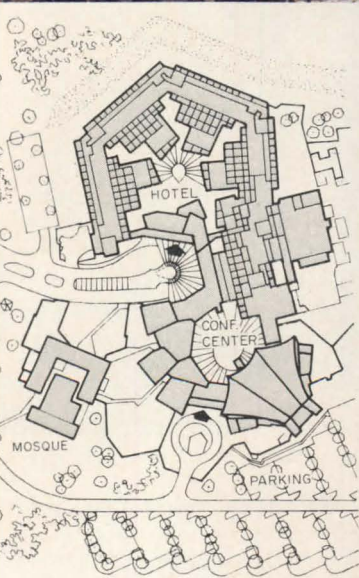
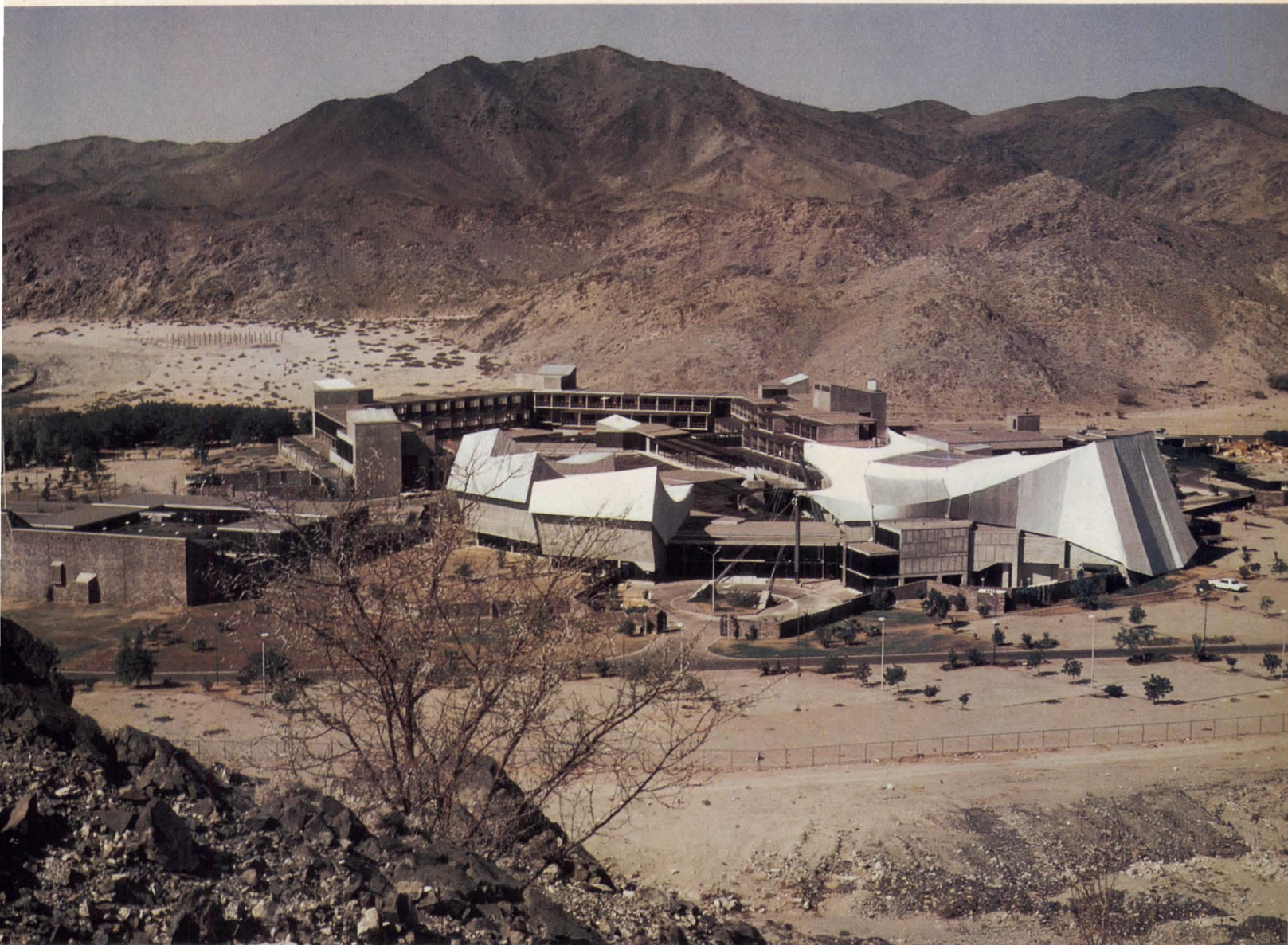
Of the two projects commended for their search for architectural innovation, the Islamic Conference Center and Hotel on the road to Mecca (opposite page) appears to combine successfully the advanced structural techniques of Frei Otto with a revival of local artistic traditions which had become almost extinct. These simple details and finishes contrast effectively with the elegance of the structural engineering.

On the other hand, the Kuwait Water Towers (pages 108-109) have been interpreted in part as an innovative response to the needs of the poor, who suffer the most in the developing world from inadequate water supply. The towers are integral to Kuwait City's new piped water distribution system. Before this facility was developed, water from two large seawater distillation plants was transported to consumers by tankers. The new system of water towers, by providing adequate capacity for storage, provides a constant supply of fresh water. The towers represent a vital element in the everyday life of Kuwait. They stand as a symbol of architectural and technological innovation and also represent the rise of economic power. The most visually important of the tower clusters, known as the Kuwait Tower, is an important landmark which has become a national attraction.

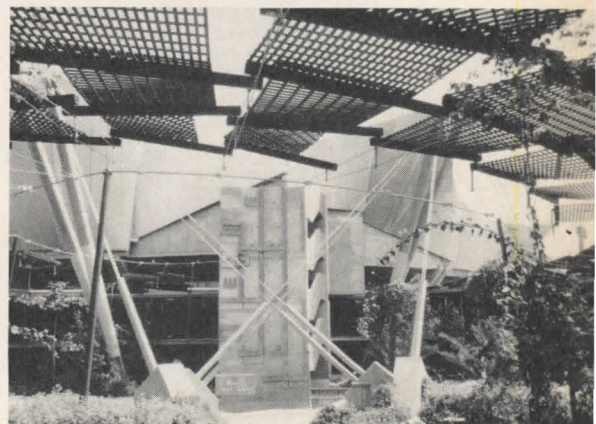
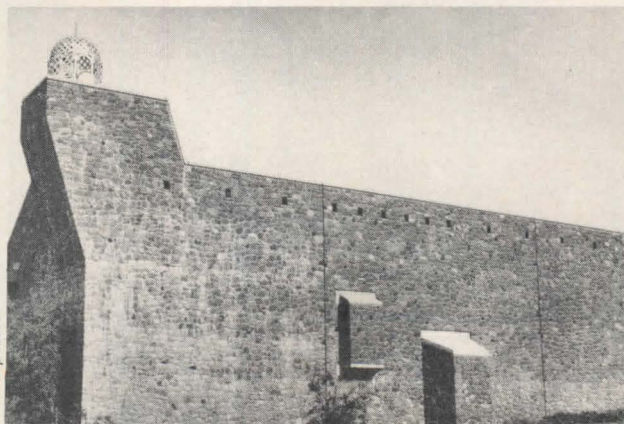
In the words of the jury: "These towers present a challenge to the accepted architectural drabness of most public utilities and stand as an invitation to evolve even better ways of assimilating new technology into existing traditions."

At the awards ceremony in Lahore, the monetary awards for "architectural innovation" were distributed as follows: For the Hotel and Conference Center, Mecca—\$12,000 to architects Rolf Gutbrod and Frei Otto; for the Kuwait Water Towers—\$12,000 to Rolf Gutbrod and Frei Otto.

Search for architectural innovation



Al-Hariri photos



The Islamic Conference Center and Hotel in Mecca, Saudi Arabia, was cited by the master jury as "a significant attempt to combine modern technology and functional forms in the context of Islamic culture. Its distance from indigenous models does not invalidate the considerable effort made toward a new kind of architecture which avoids existing conventions. This project is a noteworthy example of the difficulties inherent in finding an architectural synthesis of

form, functions, materials and Islamic values, and represents a step in the search for an appropriate architectural language." The conference center and 170-room hotel were completed in 1974 and occupied in 1975. Because of its proximity to the Holy City and in deference to the beauty of the surrounding hills, the architects designed a low and unobtrusive building. They have handled natural lighting and ventilation according to local custom—including shading areas

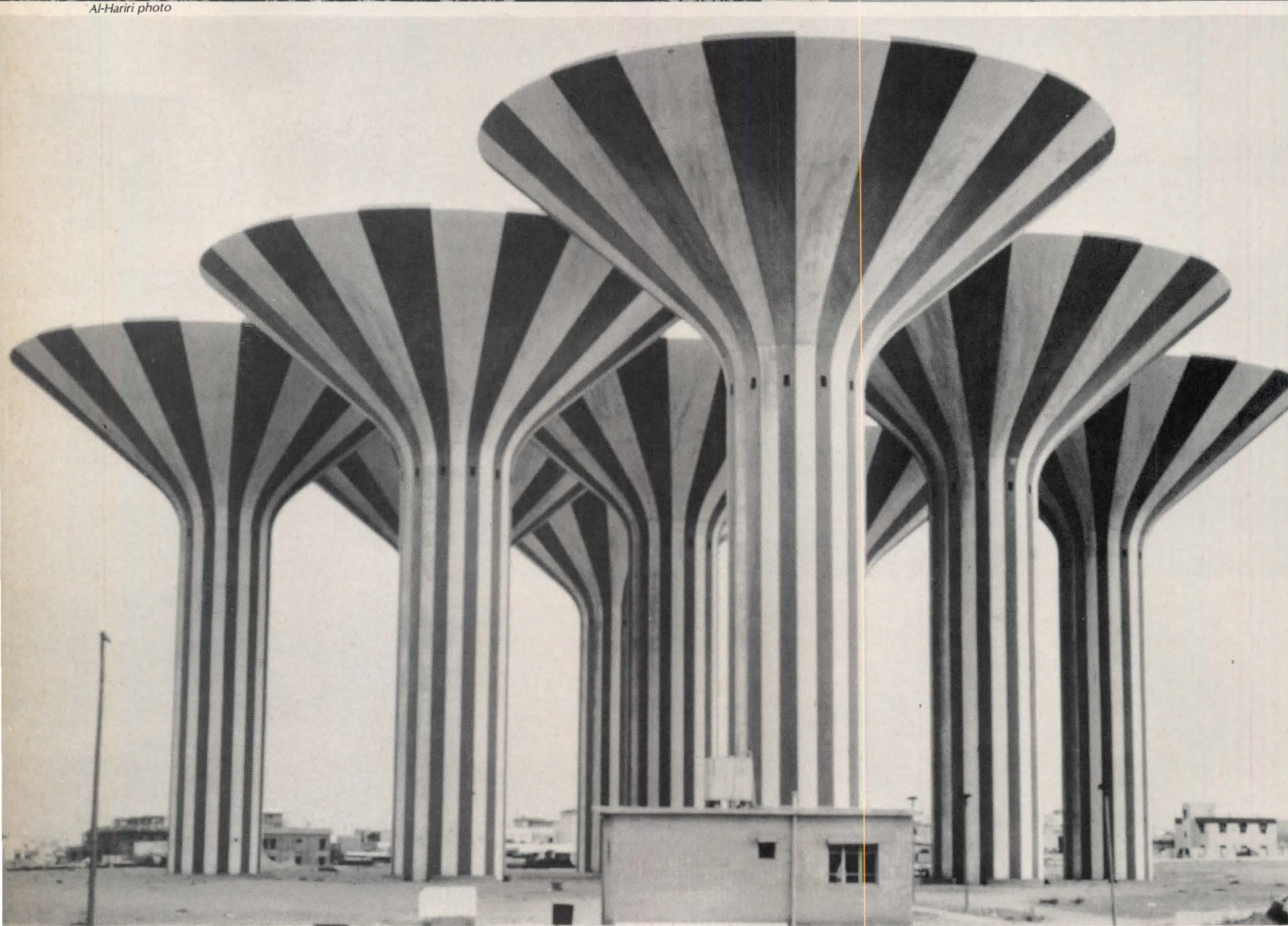
with wooden lattices (above right). The mosque (above left) recalls traditional mosque forms in the region (left). Except for the hotel wing and mosque, however, the structural system is quite sophisticated, consisting of tent-like roofs suspended from steel masts. Certificates of commendation have been awarded to the architect, Rolf Gutbrod; designer, Frei Otto; and client, the Kingdom of Saudi Arabia/Ministry of Finance and National Economy.



Search for architectural innovation



Al-Hariri photo

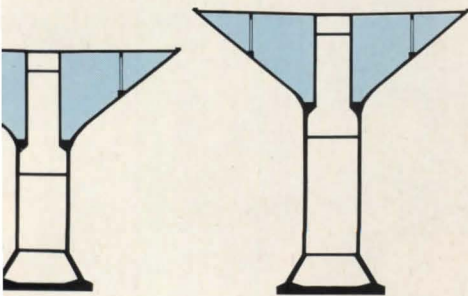
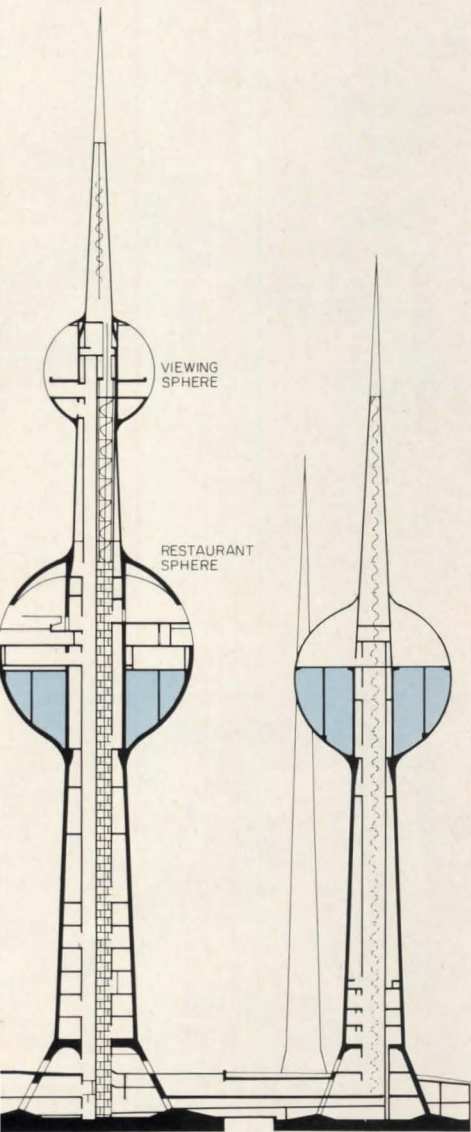


Kuwait Water Towers, in Kuwait City, Kuwait, were commended by the jury "for a bold attempt to integrate modern technology, esthetic values, functional needs and social facilities in a public utility." The 33 towers, completed in 1976, with a combined storage capacity of nearly 27 million gallons, are the most visible aspect of the water distribution and storage system of Kuwait City. Distribution and service zones required the

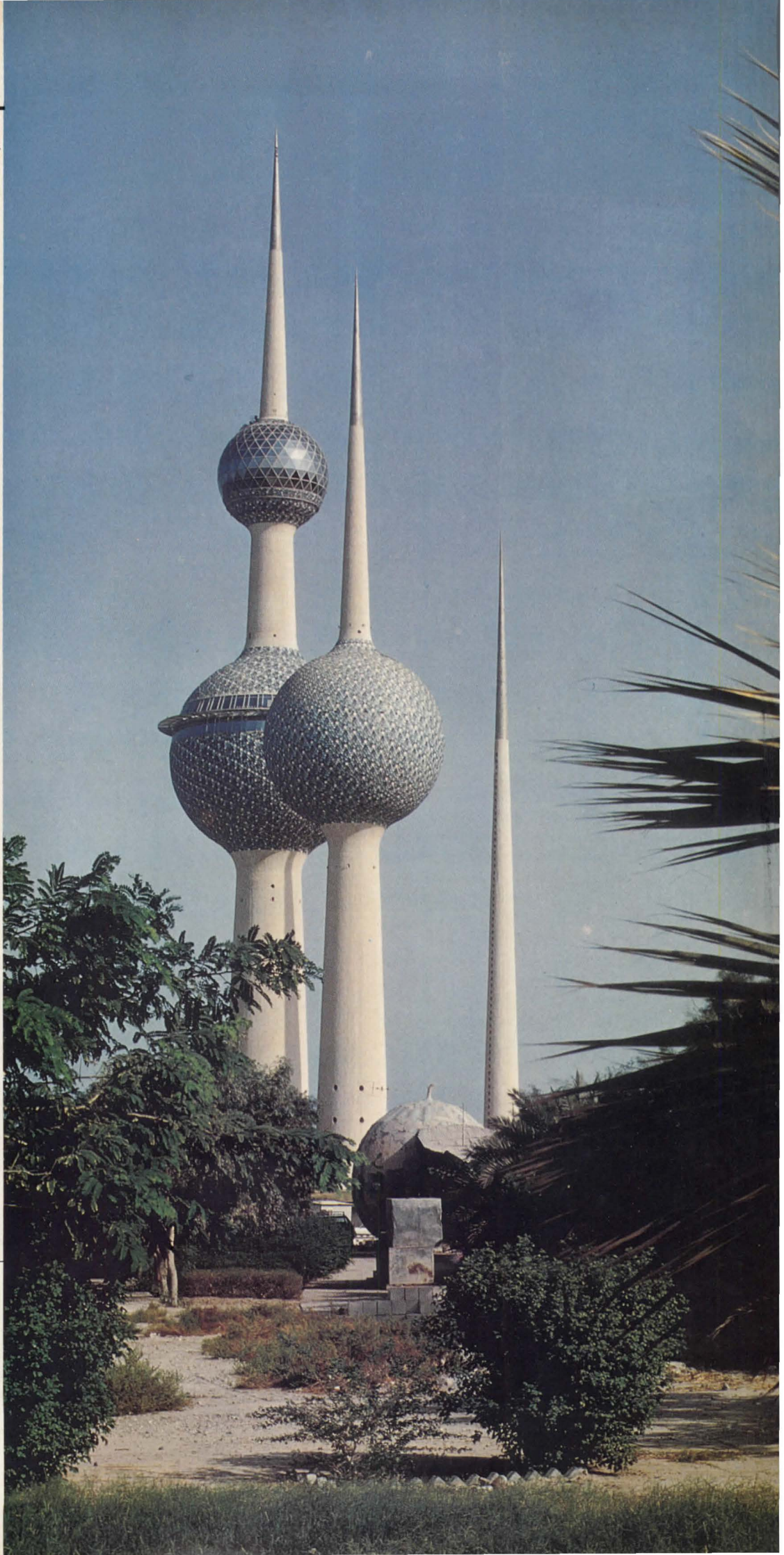
various locations. This included the need for locating 2.5 million gallons at the northern part of the central city, near the shore of the Arabian Gulf. At the wish of H.H. Sheikh Jaber Al Ahmed, this tower group (photos top, left and right, and opposite page) was given special attention because of the prominence of its location in the middle of a promontory in the Kuwait Bay and its visibility from his palace compound. The main

crete column approximately 607 feet high and supports two spheres. The largest sphere, 246 feet high, contains a restaurant, banquet hall, indoor garden and a cafeteria. The lower half of this sphere is a reservoir with a water capacity of just over 2 million gallons. The smaller sphere above it is approximately 394 feet high, and houses a revolving observatory with a cafe. The second tower of the group, not accessible to the public,

Except for glazed areas, the spheres of both towers are surfaced with steel plates enameled in bright colors, inspired by mosaic-surfaced Islamic domes. The third structure holds no water, but serves to complete the composition. It is a concrete needle equipped with floodlights that illuminate the other two towers. All the other towers in the system are mushroom shaped. Each grouping is treated as an orientation landmark for



placed. The groups are distinguished from each other by variations in height, painted patterns and colors. Each set of towers will eventually be surrounded by a public park. Singled out by the jury for commendations were the client, H.H. Sheikh Jaber Al Ahmed; acting client, the Ministry of Electricity and Water; VBB Consulting Engineers; Sune Lindstrom, Joe Lindstrom, Stig Egnell, architects; Bjorn & Bjorn Design; Malene Bjorn, architect; Union Engineering, contractors.



Social premises for future architectural development

The master jury took careful note of the urgent needs of poor Muslims in the developing world. In their formal statement the jurors asserted that Islamic architecture must evolve to meet these needs. They called for a search for appropriate forms of low-cost housing, because housing shortages have become a crisis in many Muslim societies. In the jury's words: "No responsible architect can ever afford to ignore the socio-economic environment in his legitimate pursuit of excellence of design, nor is it necessary to sacrifice architectural excellence in finding socially responsive solutions to the difficult problems of these societies." The master jury, therefore, established the award category "Social premises for future architectural development."

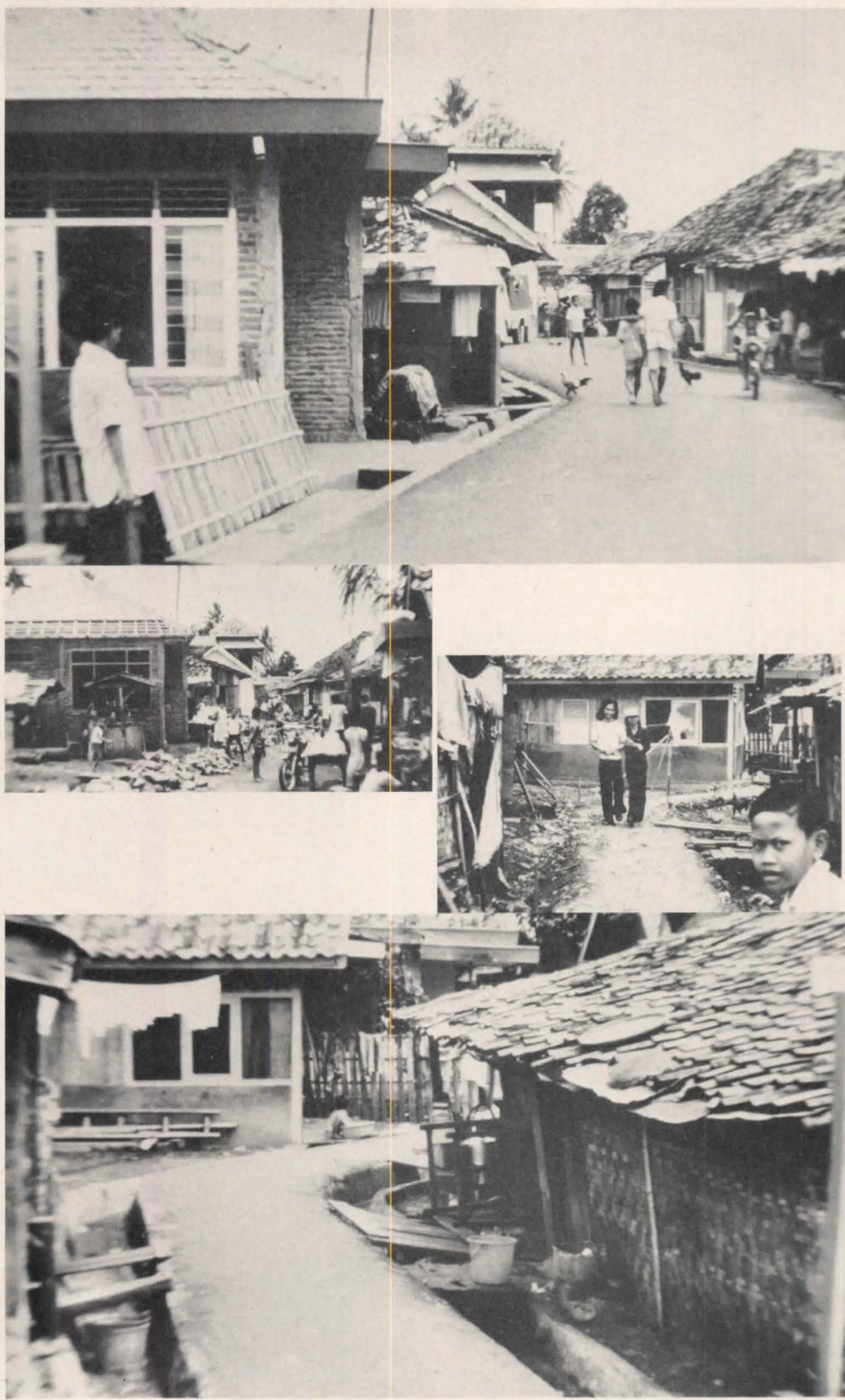
The aim of the government-assisted self-help community planning program in the award-winning Jakarta Kampung (right), in addition to the obvious one of improving the living environment and the quality of life of Jakarta's poor, is to expand the productive capacity of the residents so that they may be more effective in increasing their incomes and participating in their country's development.

The large numbers of rural poor who are coming in increasing numbers to Jakarta migrate there because of the poverty of their rural villages, an outgrowth of the growing impoverishment of the rural economy. The award-winning Pondok Pesantren Pabelan in Central Java, Indonesia (opposite page), is a rural co-educational boarding school, which trains young people to assist the rural communities in reversing their decline. The awards jury, therefore, gave an award to the urban kampung in recognition of its efforts to improve the lot of urbanizing rural people, while on the other hand acknowledging the countermeasures of a Muslim religious community to make rural life viable and prosperous once again.

In its third award category, "Search for appropriate building systems," the jury once again acknowledges the problems of the Muslim poor by commending the Agricultural Training Center in Nianing, Senegal, (pages 112-113) for developing a low-cost, low-technology building system which it has used to construct its own buildings.

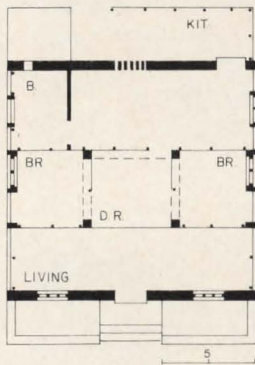
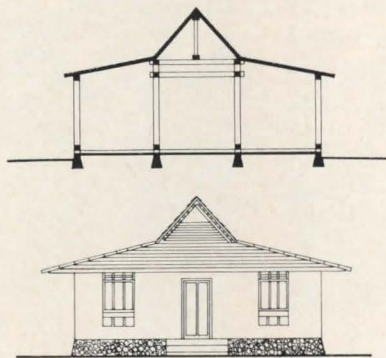
The prize money in the categories "Social premises for future architectural development" and "Search for appropriate building systems" was awarded as follows:

For the Kampung Improvement Program, Jakarta, Indonesia—\$40,000 to the K.I.P. Technical Unit; for the Pesantren Pondok, Central Java—\$88,000 to the Pesantren and the LP3ES; for the Agricultural Center, Nianing, Senegal—\$88,000 to the Center, UNESCO/BREDA, CARITAS and to the



The Kampung Improvement Program in Jakarta, Indonesia, ongoing from 1974, received a citation because in the words of the jury it "has improved living conditions, helped to integrate the informal sector with the city economy and encouraged individual initiative in the improvement of housing. The Jakarta municipal government made a bold decision to upgrade existing Kampung (squatter settlements) throughout the city by

the infrastructure. The upgrading of individual settlements has its limitations, as communities cannot solve on their own problems that are city-wide. Despite these shortcomings, the validity of the approach cannot be denied." Shown above are street and drainage systems before and after improvement. Commended are the K.I.P. technical unit and its chief, Mr. Darrundono; H.E. Pik Mulyadi, Vice-Governor of Jakarta, and "the

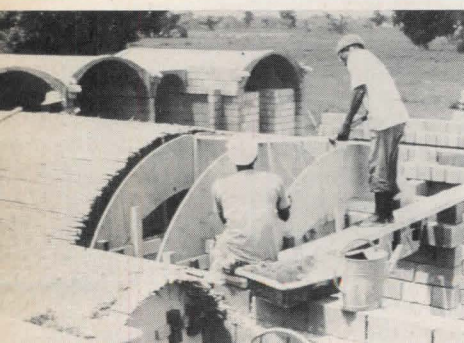
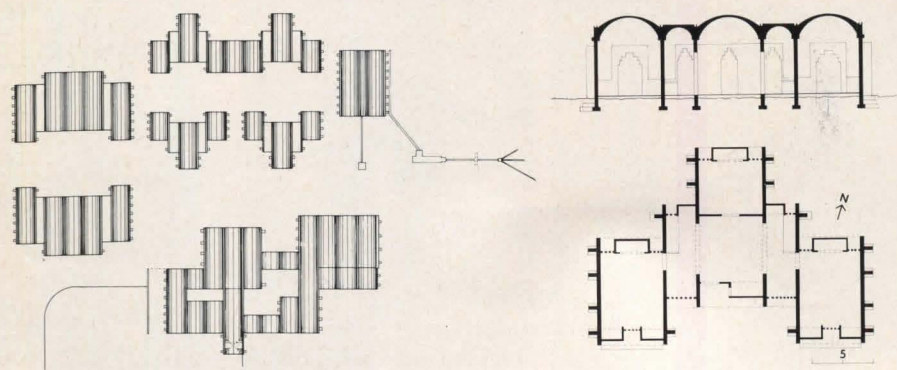
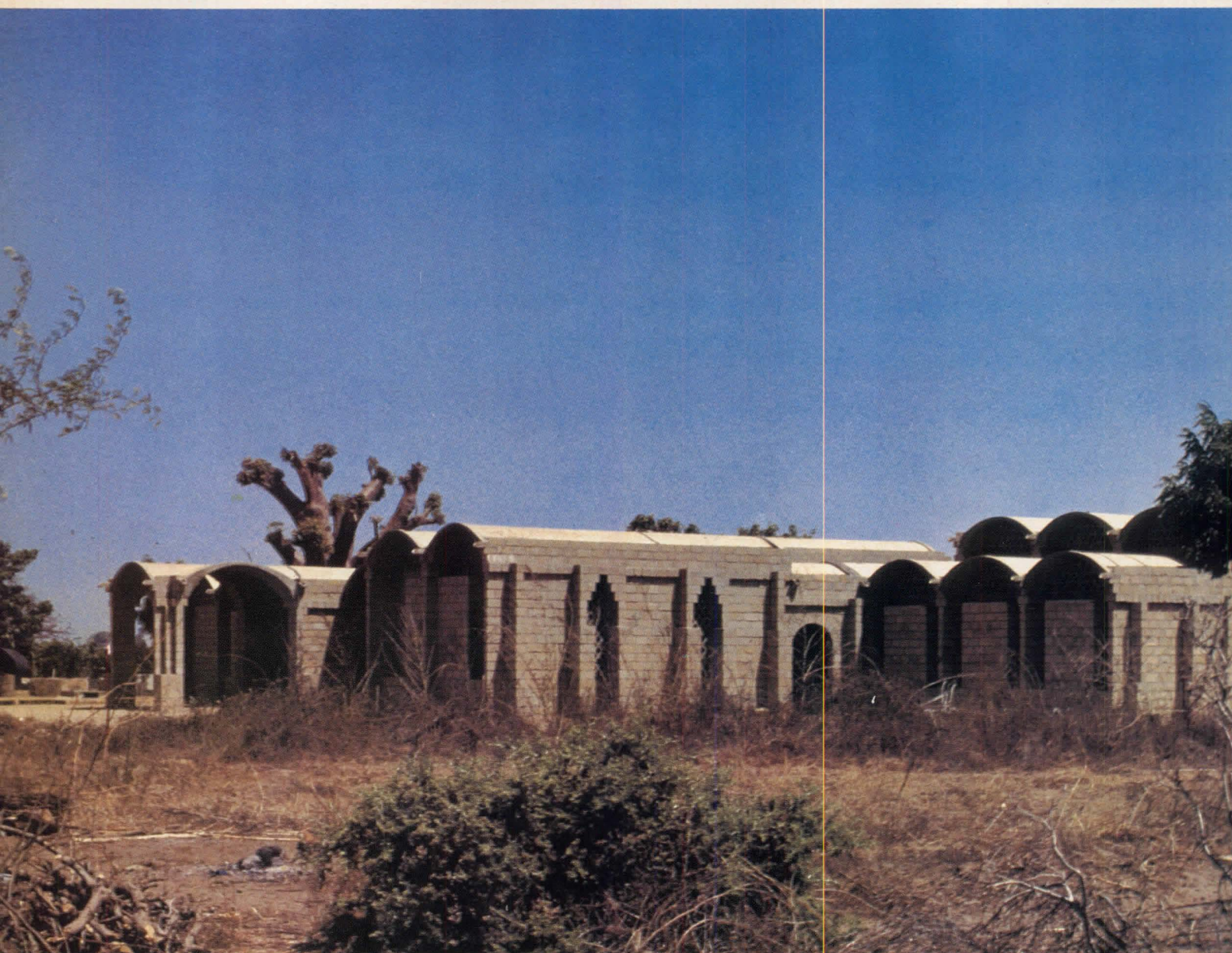


The Pondok Pesantren Pabelan in Central Java, Indonesia, is a rural social institution ongoing since 1965. It was cited by the jury because it "holds the promise of attaining a fuller architectural expression, discernible in the organization of spaces and levels in the landscape, the use of local resources, materials and technologies, and the attempt at integrating rural tradition with modern elements. This institution presents an interesting example of a traditional

Islamic educational establishment which evolved into a rural community development scheme, based on largely self-financed cooperative initiatives. It provides instruction in general educational and practical skills, motivating students to be self-reliant. It has established mutually reinforcing relationships with the community in which it is located, offering agricultural and medical services and training in building construction. This institution is capable of evolving an indigenous

architectural expression responsive to modern rural needs." Older, upgraded and new structures are included in the photos above. The house, which is shown in plan and section above, is one of several domestic prototypes. Commended are Kyai Haman Djafar, head of the Pesantren; Habib Chirzin, deputy of the Pesantren; Amin Arraihani and Fanani, planner/designers; LP3ES and Abdurrahman Wahid, consultants; and the People of the Pesantren.

Search for appropriate building systems



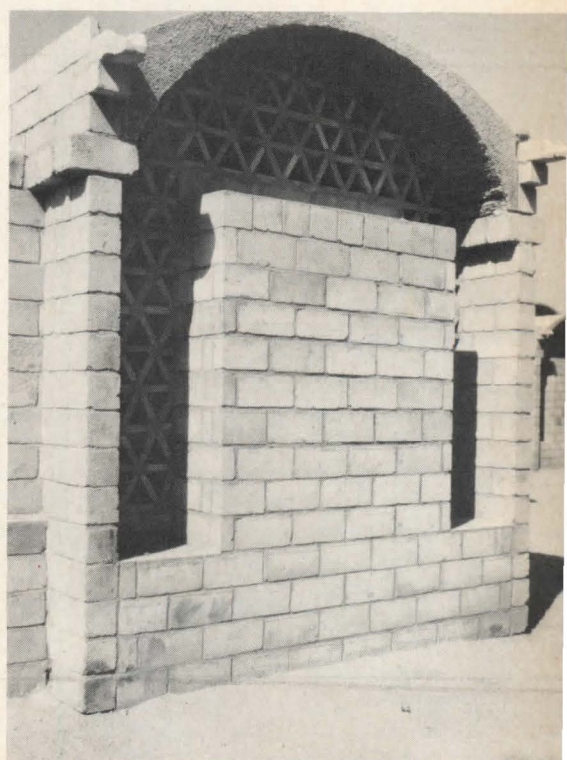
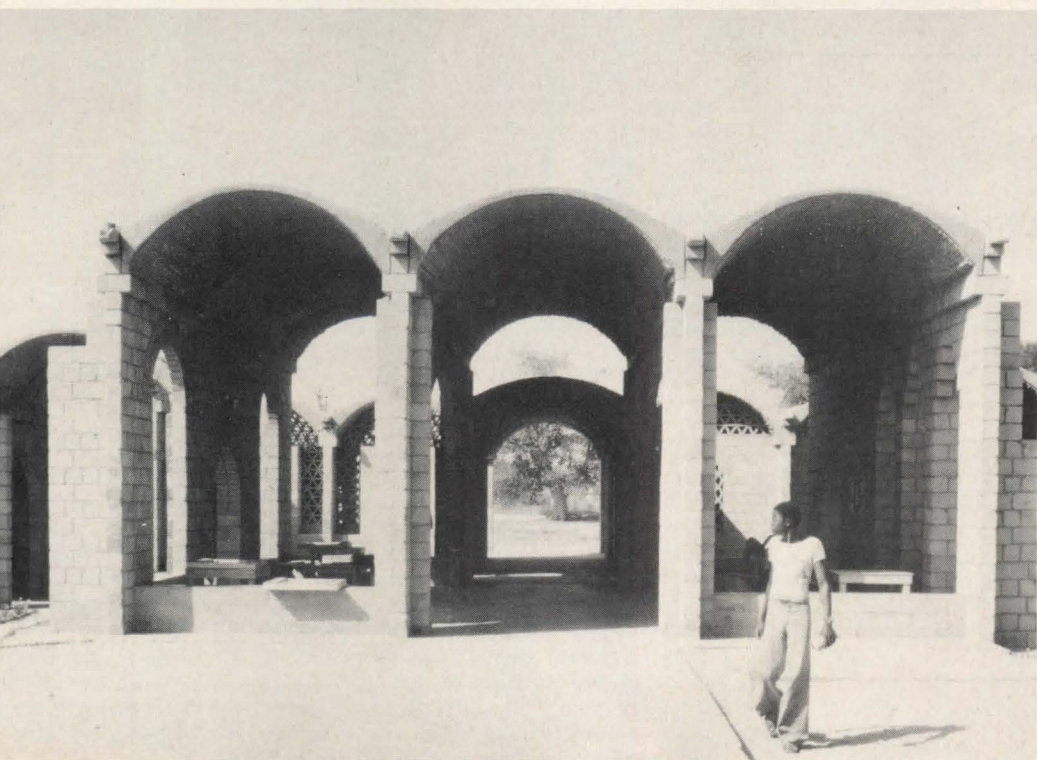
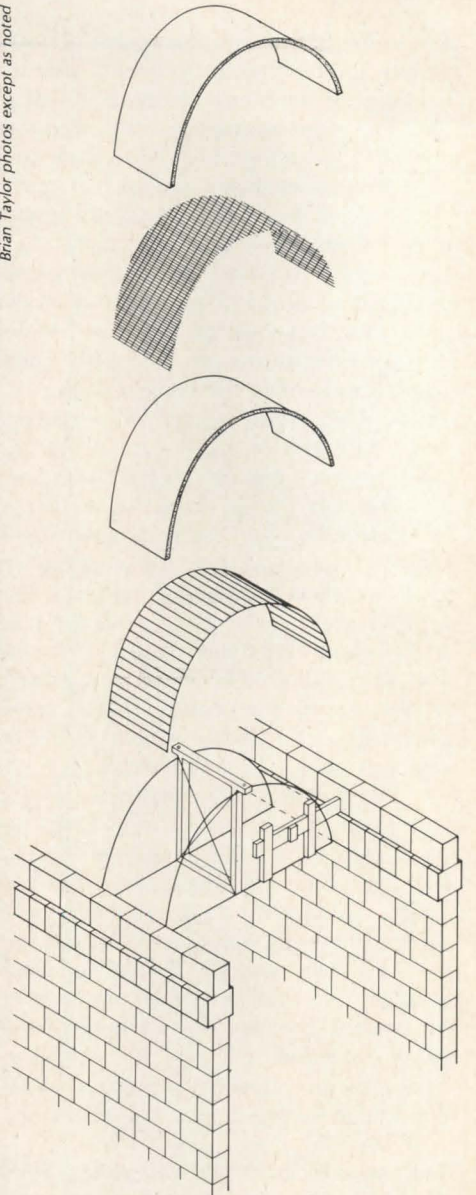
The Agricultural Training Center in Nianning, Senegal, completed in 1977, is a prototypical series of buildings based upon a relatively simple structural system of solid load bearing sand and cement block walls, parallel to one another and supporting short-span barrel vaults. The vaults, whose thickness at the crown is only a little over 1½ inches, were formed using three layers of cement mortar stabilized with wire mesh at the top of the

and the diagram (opposite page) indicate, rounded plywood struts were used to support the shuttering of millet matting. The walls are either pierced by large arches (photo above) or solid with buttresses to counteract the horizontal thrust of the vault. The jury commended the Ministry of Education as client; Frere Picard of CARITAS, the sponsor; UNESCO/BREDA and its architects—Kamal El Jack, Pierre Bussat, Oswald

phorus Posma and Paul de Walick and the master mason, D'lallo. In the jury's words, these men developed "a complete architectural language whose forms, sober and beautiful at the same time, correspond to its social ambiance. A labor intensive building system has been used here to revitalize masonry construction by training a local craftsman who in turn has trained others. It has thus provided a model for a number of different



Brian Taylor photos except as noted



Search for consistency with historical context

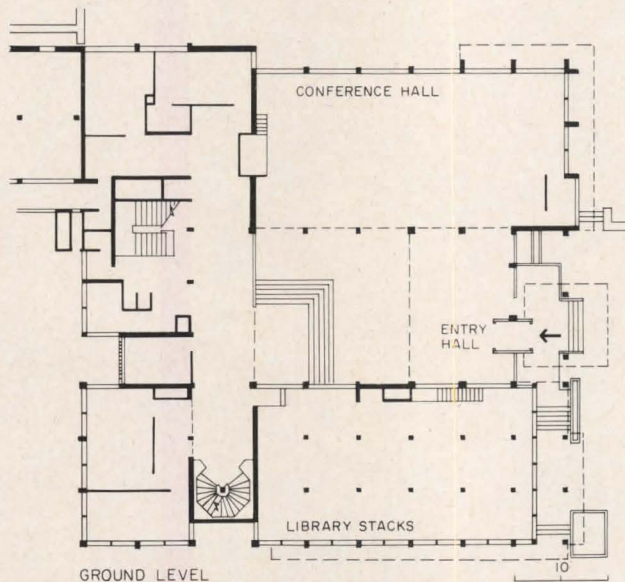
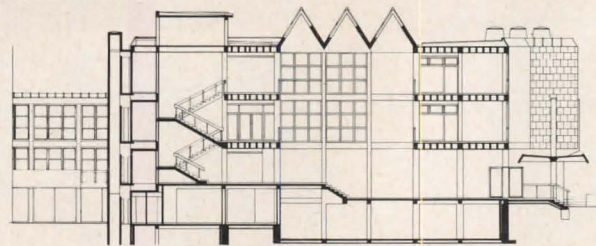
Ten of the fifteen awards emphasized the beauty and continuing usefulness of Muslim building traditions. Under the heading "Search for consistency with historical context" are three buildings which acknowledge built history in ways that significantly affect their form. The design of the Turkish Historical Society in Ankara, Turkey (right), is based upon the formal organization around courtyards of traditional Ottoman buildings. The Hotel Mughal in Agra, India (opposite page), has been constructed within the context of the Taj Mahal. The Ahmet Ertegun House (pages 116-117) is one of a collection of historically important old Turkish houses.

The jury made three awards in a category which they simply labeled "Restoration." Of these, only the work on the great monuments of Isfahan are pure restoration (page 119). The Caravanserai in Edirne (page 118) was partially restored and recycled into a hotel (unsuccessfully). A fine turn-of-the-century palace compound in Doha, Qatar (pages 120-121), was transformed into a museum.

Three awards were made for projects which directly use vernacular building systems and forms: The houses in Agadir, Morocco (page 124), the summer house at Agamy, Egypt (page 125), and the Medical Center in Mopti, Mali (pages 122-123).

The final category, "Search for preservation of traditional heritage," goes beyond the consideration of the vernacular of individual buildings and neighborhoods to embrace the entire village of Sidi Bou Said in Tunisia (pages 126-127).

The awards in these categories were divided as follows: For the Turkish Historical Society building, Ankara, Turkey—\$12,000 to the architect, Turgut Cansever; for the Hotel Mughal, Agra, India—\$12,000 to the architectural firm ARCOP; for the Ahmet Ertegun house, Bodrum, Turkey—\$15,000 to the architect, Turgut Cansever and the carpenter, Cemil Ormanlar; for the Rustem Pasha Caravanserai, Edirne, Turkey—\$12,000 to the Department of Pious Foundations; for the restoration of Ali Qapu, et al., Isfahan, Iran—\$24,000, divided equally between NOCHMI and IsMEO; for the National Museum, Doha, Qatar—\$12,000 to the architects, Michael Rice and Company; for the Medical Center, Mopti, Mali—\$38,000 divided among the architect, Andre Raveau, the sponsor, Fond Européen du Développement, and the client, Assistance Médicale de Mali; for the Courtyard Houses, Agadir, Morocco—\$12,000 to the architect, Jean-Francois Zevaco; for a Private Summer House, Agamy, Egypt—\$35,000 divided among the architect, Abdel Wahed El-Wakil, the master mason, plasterer and carpenter; for Sidi Bou Said Village, Tunisia, Tunisia—\$88,000 to the



M. Pehlivanoglu photos

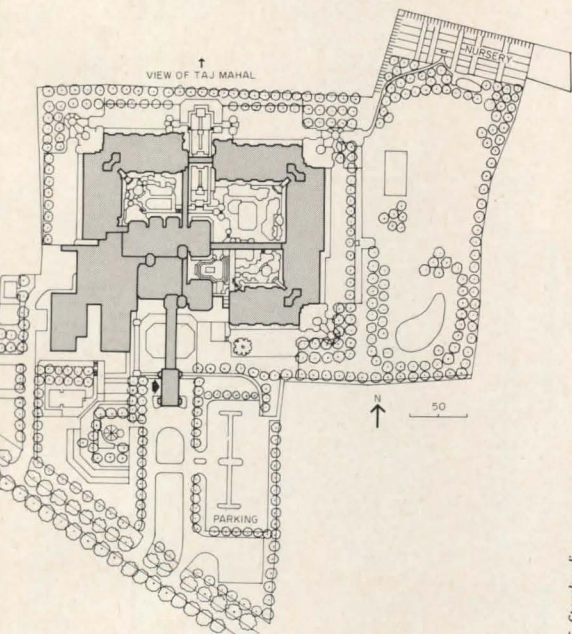


The Turkish Historical Society building in Ankara, Turkey, completed in 1966, was cited by the jury for "combining modern building technology with traditional ideas and principles. The central atrium around which the major functions are grouped reflects the inward character of traditional Ottoman buildings, while the Islamic principle of unity is used as an ordering device in determining the proportions of the parts to the whole. Re-

that has characterized building in Ankara since the 1930s, this building is an example of what can be learned from tradition." The interior photo, plan and section show the skylighted central court behind the entry hall. The facade (above right) is carefully proportioned and detailed. Certificates of commendation go to the client, Ulug Igdemir, director of the Turkish Historical Society; Turgut Cansever, architect, and Urtur Yener,



D. Sareen photo



F. Stambouli

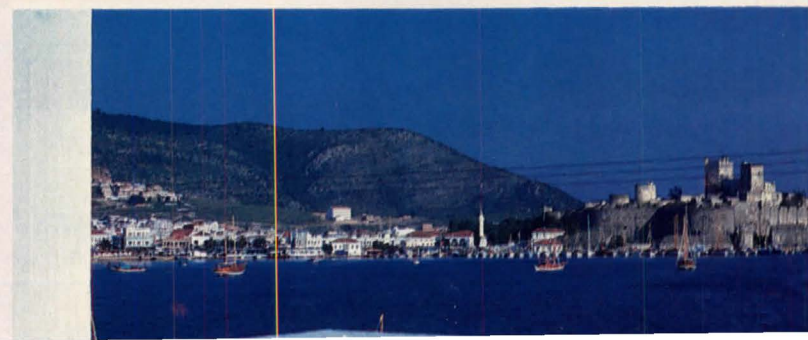
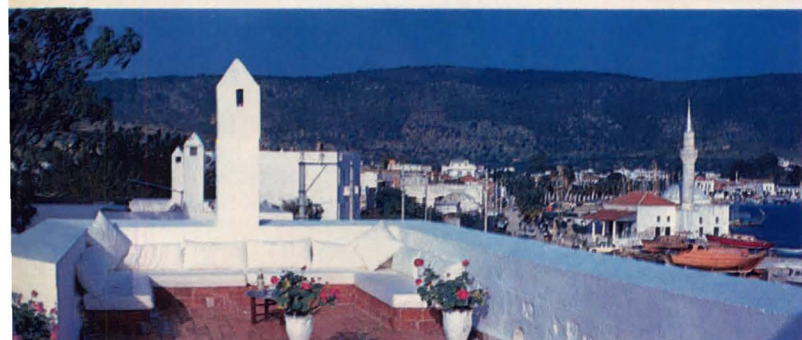
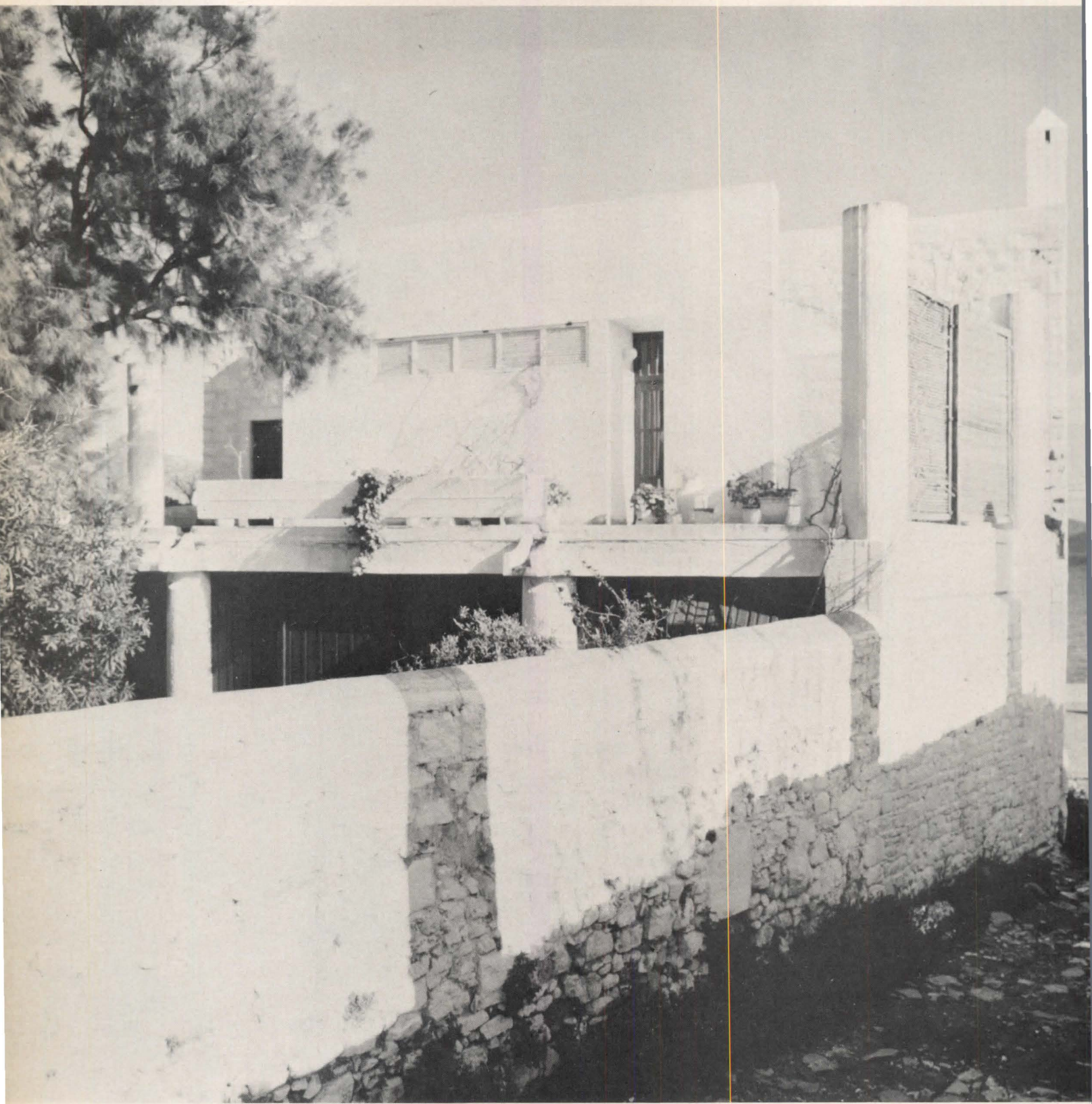


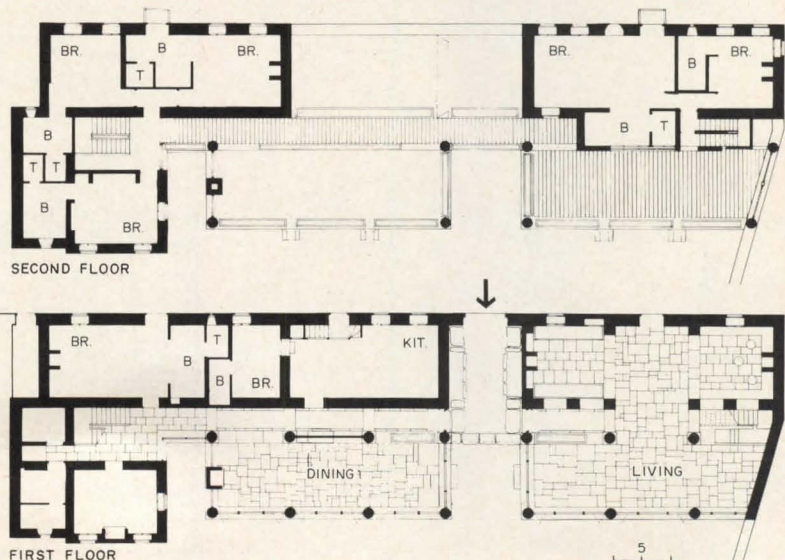
The Hotel Mughal in Agra, India, is a 200-room, five-star hotel, planned around garden courts and fountains. Completed and occupied in 1976, it has been designed to accommodate visitors to the Taj Mahal and Fatehpur Sikri. The jury found that it "expresses the culture and rich architectural tradition of the region with an entirely contemporary vocabulary of forms derived from functional needs. Its design and construction make full use of the available regional materials

and technology, the abundant labor force, and traditional crafts, for a creativity which is free from so-called Muslim architectural symbols." The hotel has been placed on axis with the Taj Mahal, which can be seen on the skyline in the photo above. Red sandstone, the building block of Fatehpur Sikri, has been used extensively in the hotel gardens, and white marble, from the same quarries that served the Taj, is used in the public areas. All materials and fabrics are

Indian, as can be seen in the photograph of a typical guest room (top left). The jury singled out for commendation the client, A.N. Haksar, chairman of the India Tobacco Company, the Canadian architectural firm ARCOP Associates and the architects and designers of the ARCOP team: Romesh Khosla, Ray Affleck, Ranjit Sabikhi and Ajoy Choudhury, as well as the landscape architect Ravindra Bhan and interior designers Kiran Gujral and Anil Verma.

Search for consistency with historical context





M. Pehlivanoglu photos

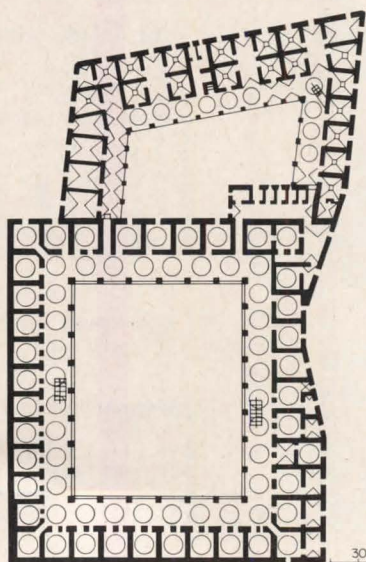
The Ahmet Ertegun House is located by the sea in Bodrum, Turkey, the ancient Halicarnassus. The town has a beautiful harbor, a splendid Crusader castle, and many traditional Turkish houses, of which the Ertegun house, originally two buildings joined by a gate, is one of the best. Although it follows fully the style and technology of the surrounding vernacular architecture, it is evident that it was originally built to standards higher than those of the ordinary houses nearby.

In 1973 it was converted to a contemporary summer residence with an addition at the rear which leaves the old structure totally independent. The jury gave a citation to this project for "demonstrating that old structures can be transformed into functional as well as beautiful environments without resorting to direct imitation. The different language in which the linear addition which joins the two houses at the back is conceived stands in harmony with the existing architec-

ture. This project is also significant for having encouraged the trend toward conservation in the Bodrum area." Commended were the client Ahmet Ertegun, his architect, Turgut Cansever, and the carpenter, Cemil Ormanlar. As the plans indicate, the portion of the building along the street has been retained in its original form. It has a single story at the center and two stories to either side. The old building is made of stone bearing walls with narrow windows, while

the new is constructed of round concrete columns with wood infill walls, doors and shutters, as can be seen in the view from the garden (above left) and of the second-story porch (opposite page top). The photo of the living area (top at right) shows the manner in which the space flows from the new wing to the old, past the new column and stairs to the street wall. The roof of the older structure has become a handsome terrace overlooking the harbor and castle.

Restoration

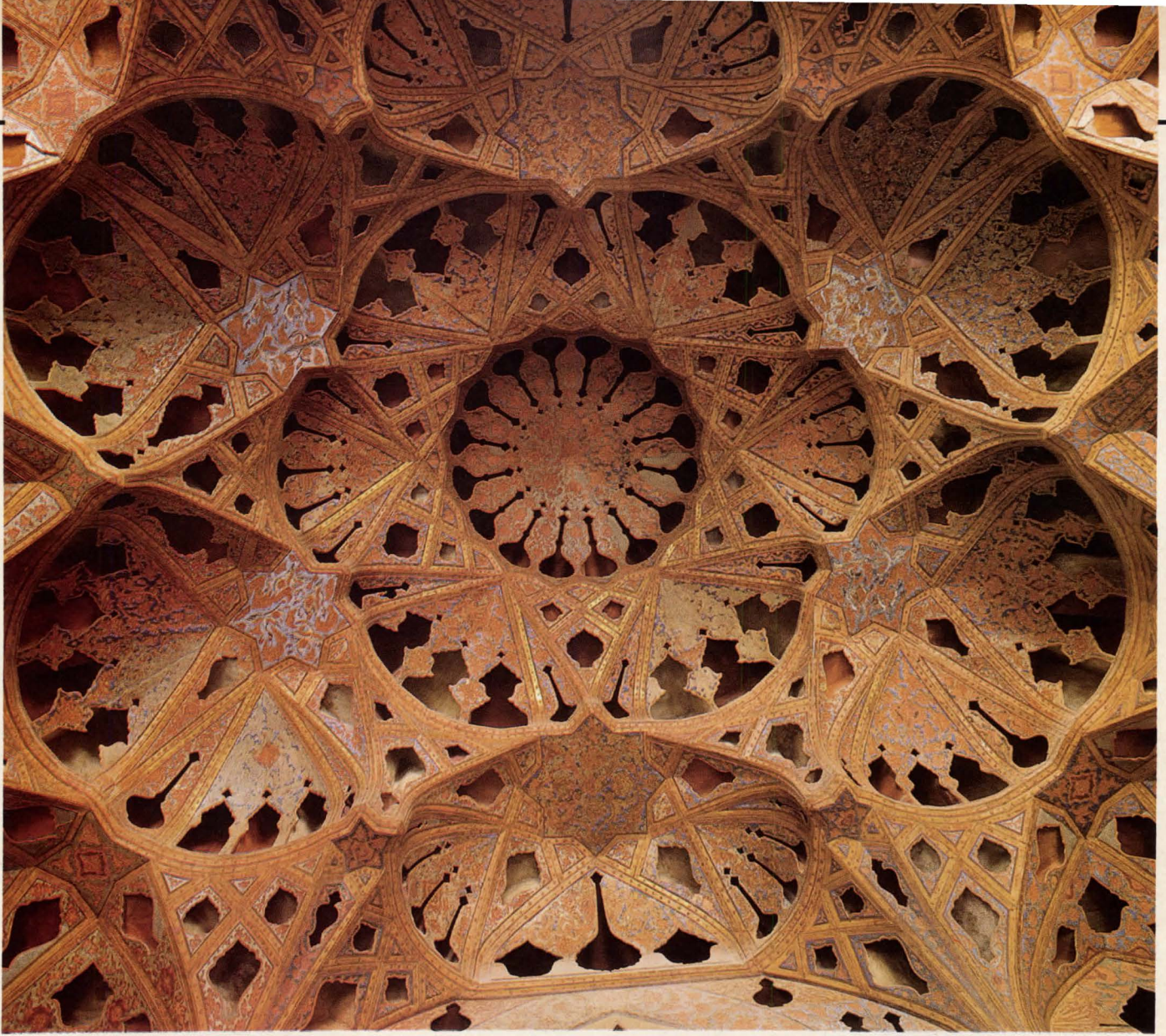


The Rustem Pasha Caravanserai in Edirne, Turkey, built in the 16th century by the great architect Sinan, was restored and converted into a 150-room hotel in 1972. The caravanserai (once a warehouse and overnight stop for camel caravans) is located in the historical center of the city, which is noted for its many old and beautiful Muslim buildings, most notably the Selimiye Camii, also designed by Sinan and his masterpiece. This mos-

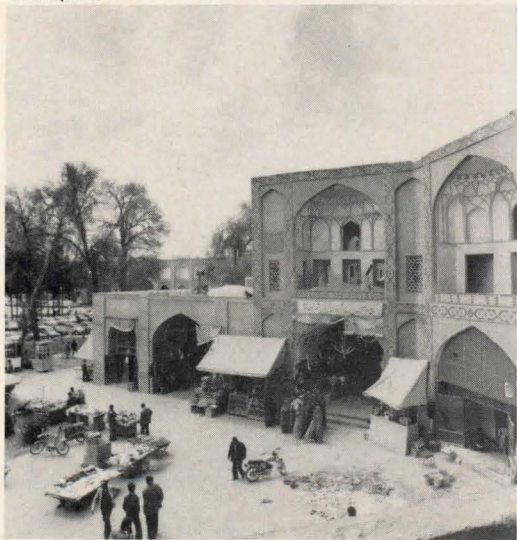
left) taken across the roof of the caravanserai before its domes were restored. In assessing the merits of this project, the jury was careful to separate the restoration aspect from the adaptive re-use effort. They believe that the restoration itself represents good standards of conception and performance. Unfortunately, however, the caravanserai has failed to attract visitors and indeed was barely in operation when the techni-

selected to give an award to the caravanserai in spite of its unsuccessful re-use. In their words: "While in its execution the work measures up to the established principles and techniques of restoration, the decision to convert the building to a modern hotel with its sophisticated services requires spatial and technical flexibility which a traditional building does not possess. Despite these shortcom-

historic monument is commendable and points to an important direction if there is to be a positive policy in architectural conservation." The restoration was initiated by a conservation agency based in Ankara known as the Department of Pious Foundations. The jury awarded certificates of commendation to Fikret Cuhadaroglu, director of the agency, and to Mehmet Ozturk, regional director. Ertan Cakirlar, architect for the resto-



K. Adle photos



The restoration of the Ali Qapu, Chehel Sutun and Hasht Behesht, great Safavid monuments of Isfahan, Iran, mostly completed in 1977, matters because of the importance of these buildings and gardens. In the words of the jury, this effort was commended "for the contribution which this restoration has made to the knowledge of Islamic planning, architecture and construction. The remarkable program, begun in 1964 and developed by the Italian Istituto

Medio ed Estremo Oriente (IsMEO) in collaboration with the National Organization for the Conservation of the Historical Monuments of Iran (NOCHMI), covers not only the restoration of these monuments with the surveys that necessarily precede such restoration, but also the publication of numerous volumes documenting this process. Of particular significance is the training of Iranian craftsmen and technicians and the setting up by NOCHMI of its own work force in

specialist skills. The program as a whole constitutes a model for other countries with similar conditions." The Ali Qapu is the main entrance to the palace complex in Isfahan. Its upper walls and vaults, of lacquered stucco and wood have been carefully restored (photo top). Its environs (photo left) are also being restored. Hasht Behesht (photo middle) was structurally strengthened with concrete links and supports and its ceilings and wall decorations restored.

As part of the extensive conservation and repair work on the Chehel Sutun (photo right) most of the great wooden columns of the large porch were removed from their bases, sawn in half and their central core hollowed out to receive and hide suitably shaped and sized steel rods. Certificates of commendation were awarded to the client, NOCHMI and its architect Bagher Shirazi; to IsMEO and its architect Eugenio Galdieri; and to the master craftsmen.

Restoration



The National Museum in Doha, Qatar, finished in 1975, was cited by the jury "for restoring and creating a national museum out of a group of buildings which is intimately linked with Qatar's history and traditions, and for being first in the field in that particular area of the Muslim world. In a period of rapid social and economic change, when the widespread and indiscriminate destruction of the architectural heritage has broken all

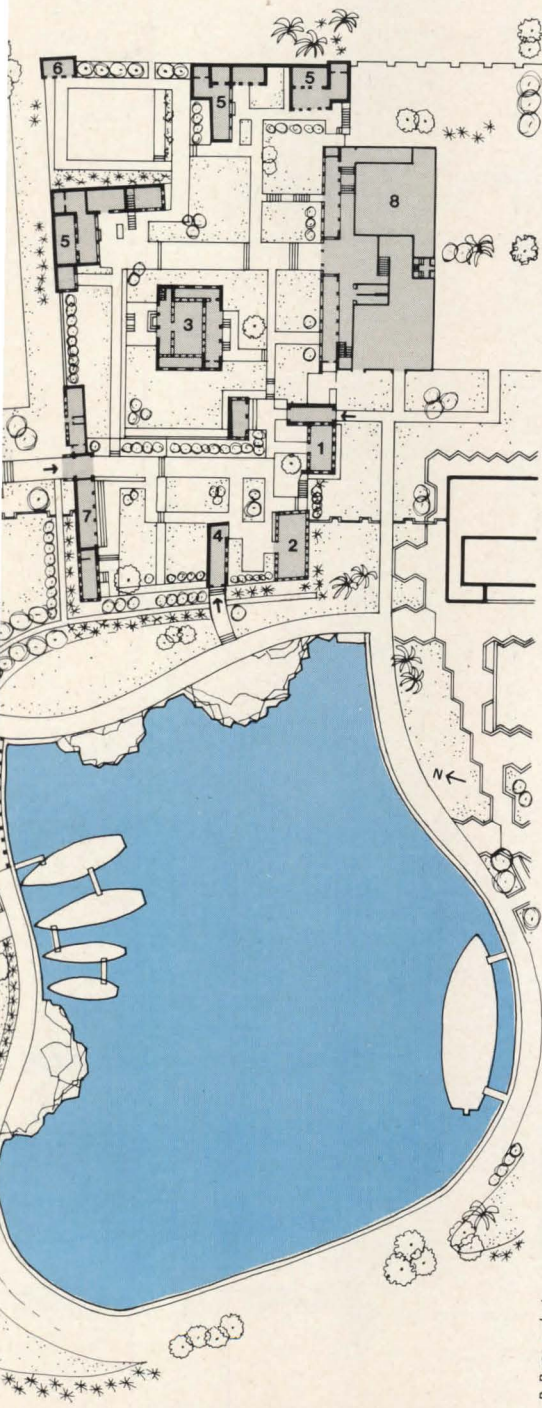
vation, enhancement and adaptation to a new public use of this important group is a noteworthy achievement. It is also an example to others, provided certain shortcomings in the restoration method are borne in mind." The shortcomings have largely to do with the substitution of reinforced concrete for the original and traditional materials—rubble masonry with gypsum mortar, plastered within and stuccoed without. The new con-

of Qatar's climate. The traditional materials are far more durable in these conditions and have the additional advantage that they don't need painting. There are four main components in the new museum, as can be seen in the site plan on the opposite page. It includes the old palace complex which has been restored, the new Museum of the State, and a marine museum and aquarium. The two-story arcaded structure at the

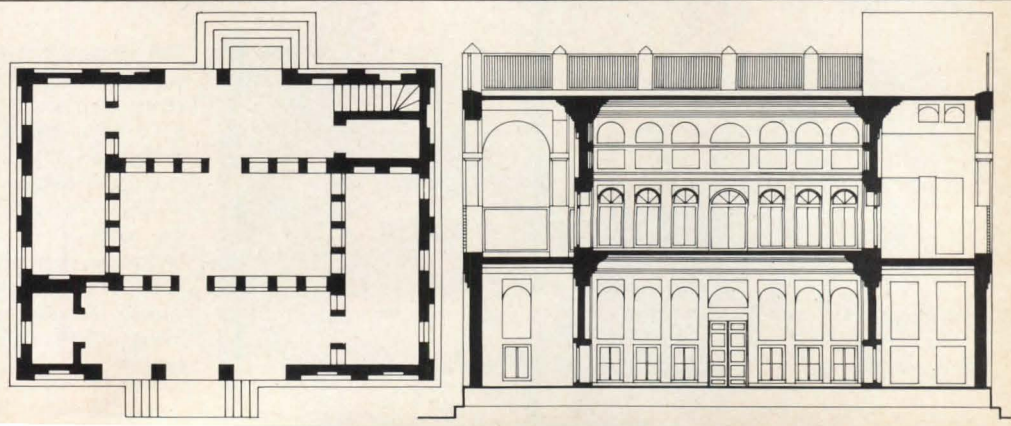
section opposite page and visible in the bottom and middle photos opposite) was built in 1918. The entire complex took shape in the early years of this century. Commended by the jury were the client, H.H. Sheikh Khalifa bin Hamed Al-Thani; the Minister of Information, H.E. Mr. Isa Ghanim Al Kawari; the planning and design firm of Michael Rice and Company; associate architect Anthony Irving; and specifically for the restoration, the

- 1 Public Apartments & north gatehouse
- 2 Little Majlis: Coffee Reception Hall
- 3 Inner Majlis
- 4 East Gate
- 5 Dwellings
- 6 Watchman
- 7 Sexton of Mosque
- 8 Museum

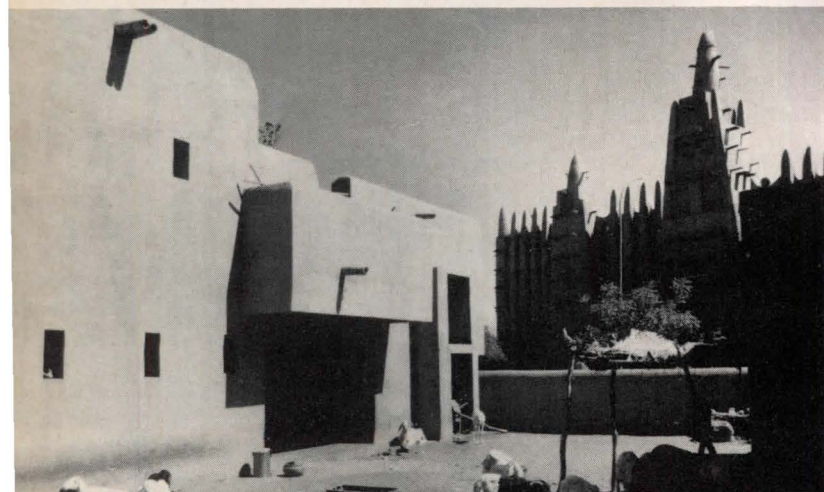
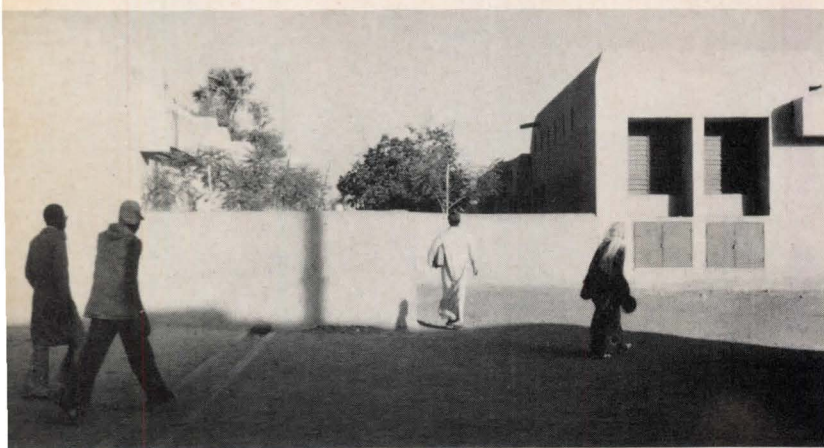
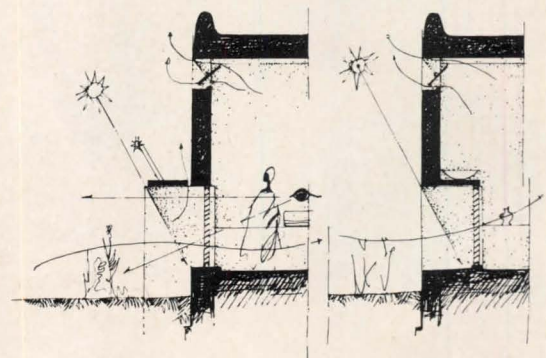
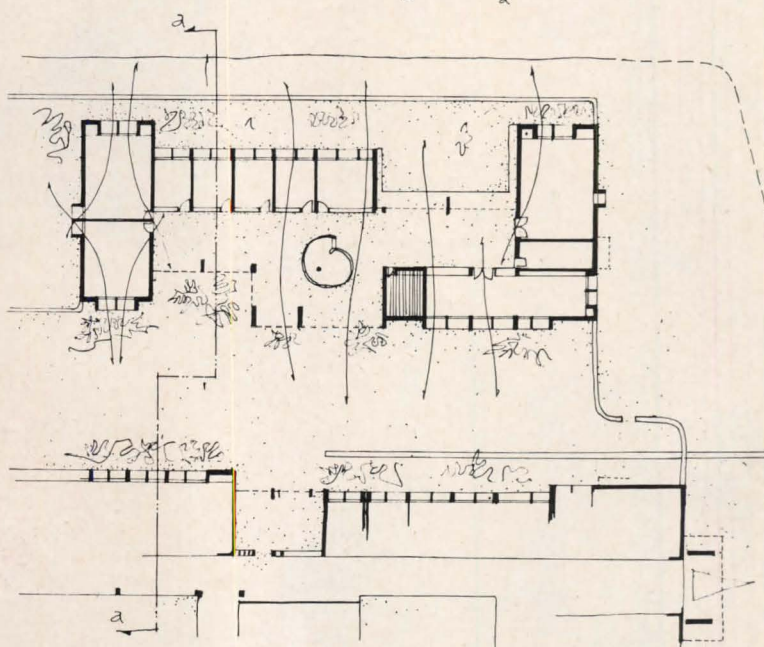
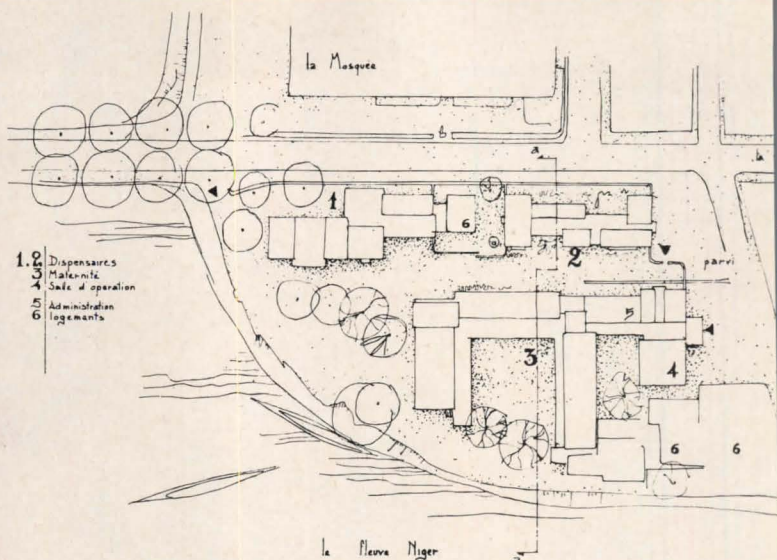
Najeh Abu Nab photo



P. Rogers photo

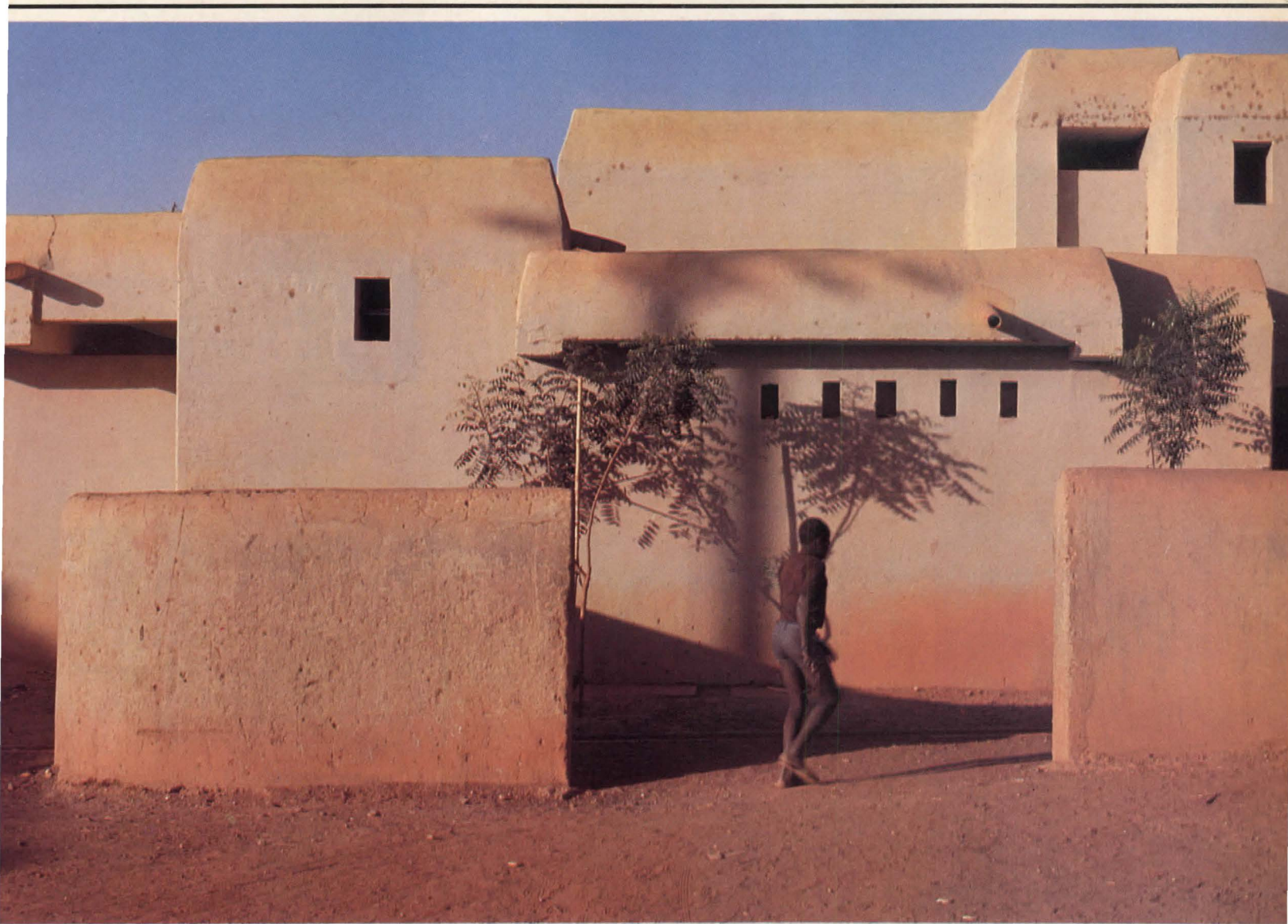


Search for contemporary use of traditional language

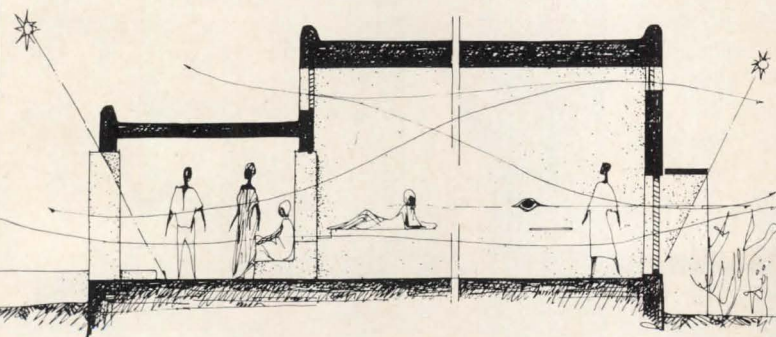


The Medical Center in Mopti, Mali, completed in 1976, is a maternity center and clinic located across from the Mopti Mosque (photo top left) along the River Niger. As the plans indicate, it includes two clinics, two wards, administrative offices, operating rooms, and staff lodging, all located along a pedestrian walkway. The architect, André Ravereau; the sponsor, Fond Européen du Développement, and the client, Assistance Médi-

the jury "for creating a medical complex which responds with great sympathy both to the local culture and to the sensitive surroundings. The design takes into account local traditions and practices, and makes effective use of local materials and techniques of construction. The imaginative relationship of public to private spaces within the complex is not only successful in use, but helps to integrate the buildings into the existing urban



Al-Hariri photos



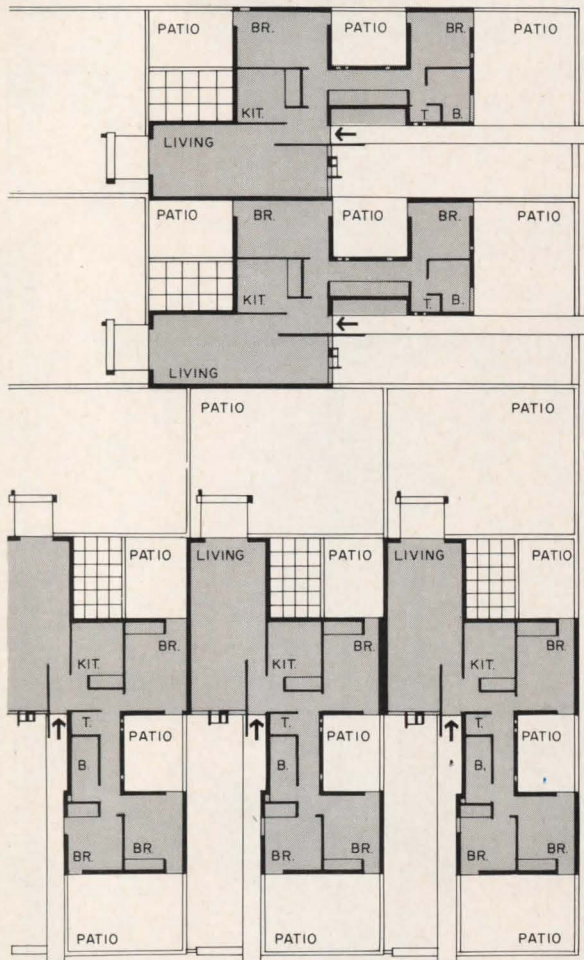
which encouraged the traditional custom of families cooking for patients while visiting them. Consequently there is no central kitchen. He also used the traditional local building techniques of mud brick construction using a natural dark clay. The walls and part of the roof structure are made of the local clay stabilized by adding a low percentage of cement. Most floors, walls and ceilings have been finished with a smooth cement coating. The wood doors and the

metal shutters for the windows were locally made. Much attention was given to natural ventilation and lighting. Ravereau wished to achieve a high level of thermal and lighting efficiency without relying on sophisticated systems. It was in this attempt, however, as the technical reviewer pointed out to the jury, that the project met with the least success. The principal criticism expressed by the resident doctor and by the personnel was that the shuttered window open-

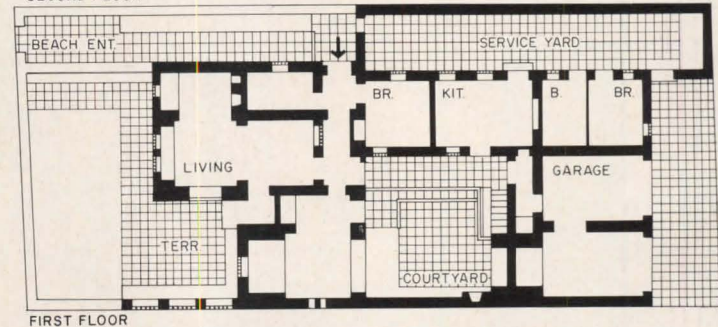
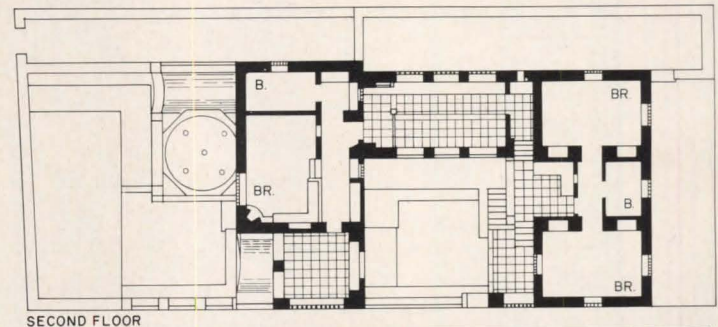
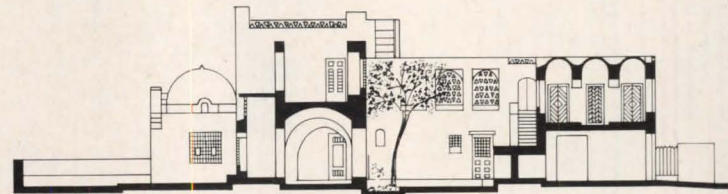
ings were too low and that, while the absence of glass clearly improved the natural ventilation, it allowed too much dust to come in during windy periods. While most public spaces are adequately lit and ventilated, some of the openings that are located at ceilings and roof lines have been closed by the users in order to reduce dust accumulation. It was also noted that the windows of the operating and delivery rooms have been glazed to control dust intake. As a result, an air

conditioning unit was added to provide greater comfort. As the electrical power in Mopti remains highly unreliable, the unit can seldom be used and the glazing and the shutters were totally removed from one of the windows and replaced with a homemade screen. In spite of such difficulties, however, the technical reviewer reports the project well accepted and understood. The Mopti project has become a prototype for new architectural solutions in Mali.

Search for contemporary use of traditional language



A. Goldenberg photo



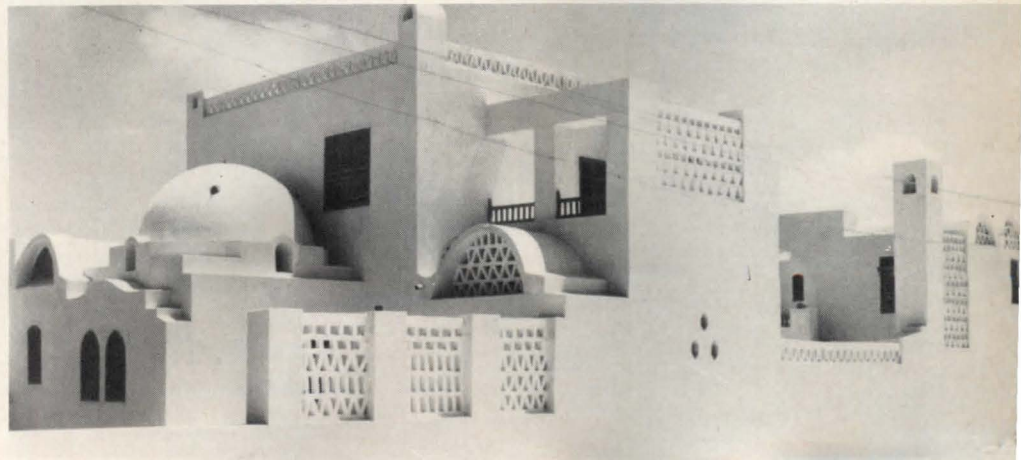
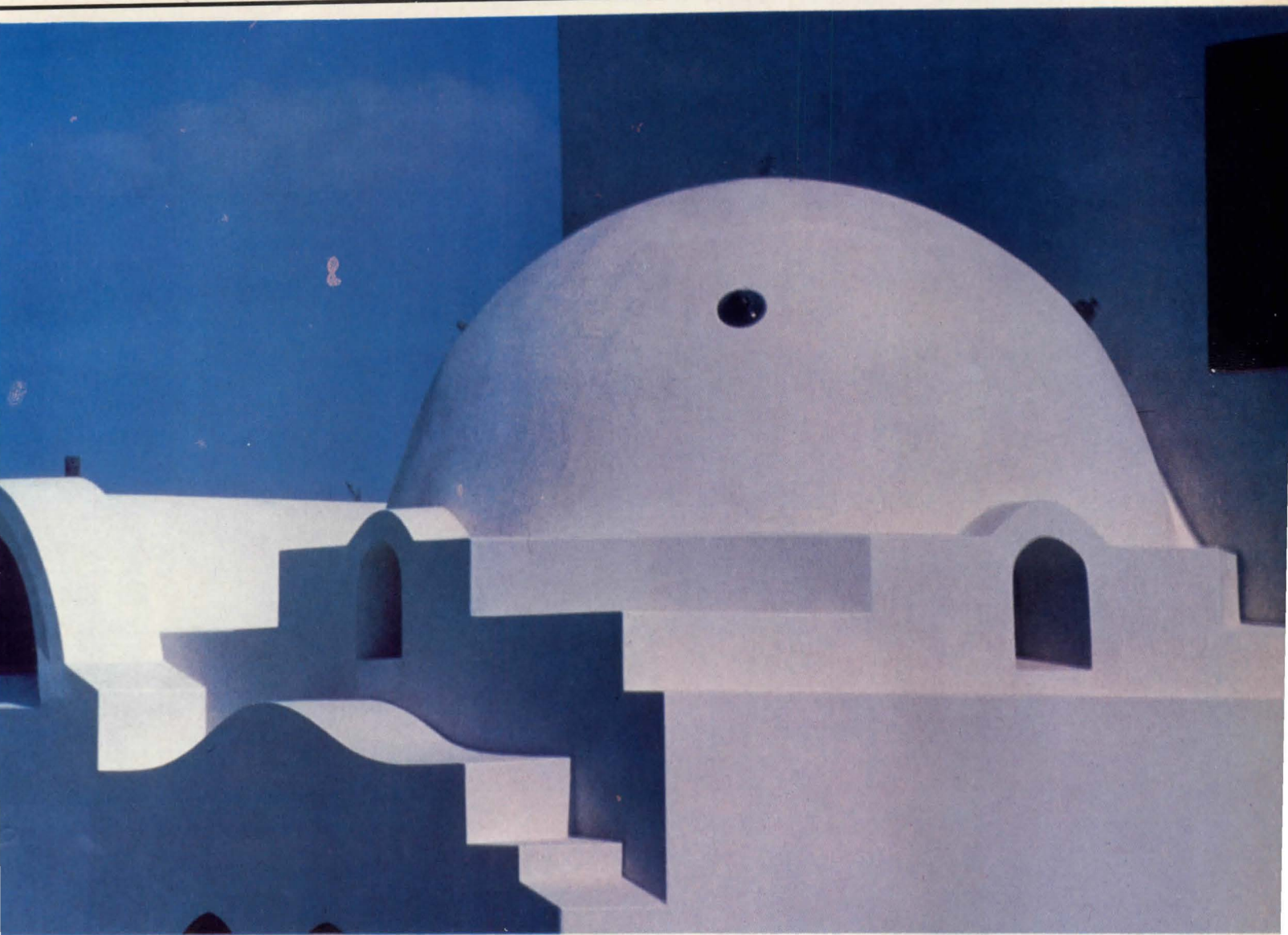
C. Avedissian photo



The Courtyard Houses in Agadir, Morocco, were completed in 1964 as part of a new urban center for the city which had been destroyed by an earthquake four years earlier. They consist of 17 units of single-story, middle-income housing in which each room opens upon two outside spaces, a garden or patio. They were economical to build, are easy to maintain and are suited to the lifestyle of an urbanized middle-income Mus-

award to this group of dwellings because they "respond in their plan form to climate and in a broader sense to the demands of privacy. The exploration and development of the courtyard form for urban housing points a way towards appropriate unassuming design solutions in the heterogenous character of contemporary Muslim cities." Certificates of commendation went to the architect, Jean-François Zevaco and the client,





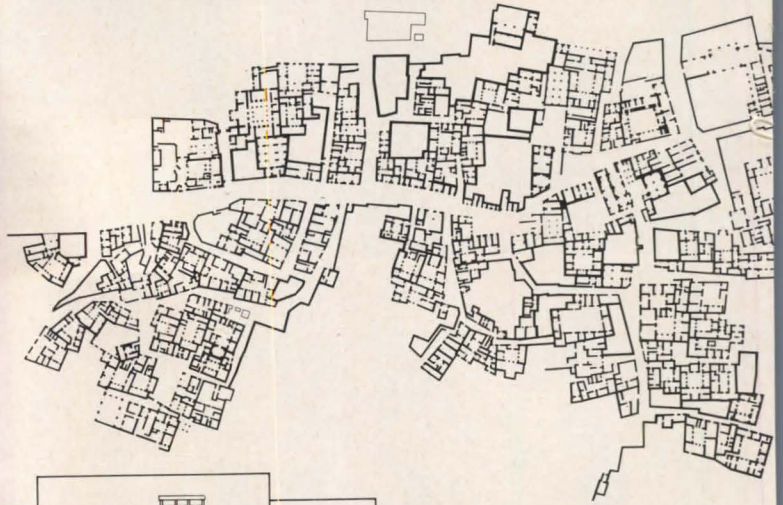
A private summer house in Agamy, Egypt, completed in 1975, received an award for its design and construction which, in the words of the jury, "represents a dedicated search for identity with traditional forms. The courtyard plan, the use of domes, vaults and arches, the articulation of space, and sensitive use of light combine to produce a house which fully satisfies contemporary needs. This imaginative handling of a traditional vocabulary is also enhanced by the

consistent use of traditional methods of construction and the careful attention to details and craftsmanship." The architect, photographed with the master mason as they celebrate the completion of one of the mud brick domes (left) has incorporated in the design of the house many features drawn from traditional Islamic (or Egyptian) archetypes. In addition to the courtyard and its fountain, the house has a loggia, a windcatch, alcoves (photo opposite page), ma-

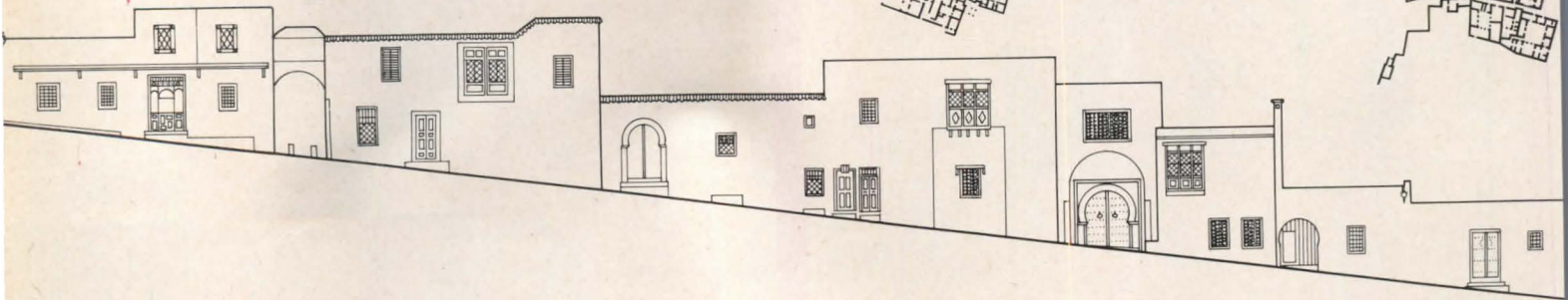
sonry benches and a belvedere. The construction technology was "low." Except for the master mason, plasterer and carpenter, who were skilled craftsmen, all labor was local (Bedouin) and unskilled. The vaults and arches were constructed by the "inclined arch" system without shuttering. The house works very well in the hot climate. The wall and roof structures give good insulation, sunlight is carefully filtered through the lattices, and the courtyard—which is in shade

throughout the day—draws fresh sea air down through the windcatch. The paving materials also play their part; the marble in the living areas is cool, and the Muqattam stone used outdoors gives a surface which can be walked on with bare feet even at the height of summer. Commended were the client, Esmad Ahmet Halawa; the architect, Abdel Wahed El-Wakil; the master mason, Aladdin Moustafa; the plasterer Mucallim Attiyah and the carpenter, Hassan El-Naggar.

Search for preservation of traditional heritage



A. Bennys photos



Sidi Bou Said Village in Tunis, Tunisia, has been the object of an ongoing conservation project since 1913. Located in the northern suburbs of Tunis, and built on a hill above a magnificent cliff and the Bay of Carthage, the natural beauty of the site contributes to the quality of the architecture. The town is a rich mixture of Mauresque and some Italianate elements organized around the main landmark, the mosque and tomb of

of the town itself is a subtle tangle of streets, many of which are cul-de-sacs. Once a summer resort village, it has become a year-round residential area of Tunis. The inhabitants are generally conscious of the quality of their environment and are eager to protect it. There is still much to be done. The big buses used for mass tourism have added to pollution and traffic congestion and are unsightly intrusions. The town still has some

houses which are no longer used and have fallen into ruin. Finally, the cliff is eroding. Its preservation will require a conservation approach at a grander scale than any yet conceived. The town received a citation from the jury "for the efforts over a long period of time by a community toward the conservation of their village. Based on true understanding of the architectural values of the village, legislation has been enacted controlling

lar circulation, and the sense of place has been kept. The character of the buildings, the relationship between activities and architectural forms, and the relationship between the built fabric and the surrounding nature have all been respected." Commended were the client, Mr. Baly, who is the Mayor of Sidi Bou Said; planner Mme. Sanda Popa of the Technical Bureau of the Municipality; and the conservator of the site, Abd EL-Aziz Ben-Archour.



POWER DEMAND CONTROLLER / Two micro-processor-based power demand controllers are described in a *Dynapar* brochure. Both feature keyboard data entry, CRT display, and 72-hr power outage protection. ■ Dynapar Corp., Gurnee, Ill.

circle 400 on inquiry card

STRUCTURAL TILE / A six-page case history provides a detailed look at Atlanta's MARTA Hightower subway station, showing how structural facing tile was used to reduce noise levels and vandalism. ■ Stark Ceramics, Inc., Canton, Ohio.

circle 401 on inquiry card

PLAYGROUND EQUIPMENT / Color catalog on recreational, sports and educational products features the "Safety Seat Rock-A-Saw" for rehabilitative exercises. Push-and-pull shoulder and arm movement sets up a reciprocating motion for full torso and upper arm exercise by one or two children. ■ Thera-Play Products, Long Island City, N.Y.

circle 402 on inquiry card

WHITE PRINTERS / A revised color catalog includes product specifications, descriptions and prices for all models of *Diazit* whiteprint machines. Units range from basic printers through the "Executive III" production whiteprinter with speeds up to 45 ft/min. A complete selection of accessories is also covered. ■ Diazit Co., Inc., Youngsville, N.C.

circle 403 on inquiry card

METAL COATINGS / Pages from the *Kynar 500* Case Book illustrate outstanding architectural applications of the fluoropolymer-based coating system. A color brochure presents a variety of product applications, and answers frequently-asked questions about *Kynar 500* exterior coatings for aluminum, galvanized steel and aluminized steel building components. ■ Pennwalt Corp., Philadelphia.

circle 404 on inquiry card

WALL ACCESSORIES / A data sheet covers a line of accessories made to complement the "Natural Stone" line of *Sanspray* architectural panels. Items include matching batten and molding systems, as well as matching nails and screws, designed to save application time and improve the appearance of the paneled exterior. ■ Sanspray Corp., Santa Clara, Calif.

circle 405 on inquiry card

INSULATING SHEATHING / Brochure describes *ThermaTite Plus*, said to offer a high degree of construction flexibility: wood, hardboard, brick, aluminum and vinyl can be fastened to the wood frame construction through the sheathing. When used together with fiberglass insulation, it is an economical way to achieve higher R-value walls. ■ Johns-Manville Sales Corp., Denver.

circle 406 on inquiry card

COMMERCIAL INSULATION / Catalog sheet describes Thermal Acoustical batts, a lightweight

sound-absorbent fiberglass insulation specifically designed for installation above panels in suspended ceilings. Sized to fit 2- by 4-ft panels, the batts are simply laid in place for quick installation. ■ Johns-Manville Sales Corp., Denver.

circle 407 on inquiry card

FIBERGLASS INSULATION / A comprehensive, 12-page catalog features batts, blankets, and blowing wool insulation for thermal and acoustical control. Map shows latest R-value recommendations for ceilings, walls and floors. ■ Johns-Manville Sales Corp., Denver.

circle 408 on inquiry card

CONTRACT CARPETING / The most recent edition of "The Public Carpet with the Private Look" highlights this manufacturer's commercial carpet program and products. ■ Karastan Rug Mills, New York City.

circle 409 on inquiry card

KITCHEN/BATH FAUCETS / A pocket-size product guide includes photos and description of the *Aurora*, *Sceptre* and *Cascade* lines of single-control faucets, and six models of two-handle fittings. Coordinated bath accessories are also shown. ■ Bradley Corp., Menomonee Falls, Wisc.

circle 410 on inquiry card

CONSTRUCTION FASTENERS / Product brochure describes the *Parabond* capsule anchor, a two-part system composed of a threaded rod stud and a sealed glass capsule containing a resin mix and hardener. Driving the stud breaks the capsule, and the resulting chemical interaction forms a thick synthetic mortar which bonds stud to material. ■ Molly Div./Emhart, Temple, Pa.

circle 411 on inquiry card

SOUND CONTROL / Color brochure contains photos and diagrams to demonstrate how *Enka-sonic* composite matting meets strict code standards against noise and impact transmission in apartment interior floor and ceiling assemblies, including ceramic tile. ■ American Enka Co., New York City.

circle 412 on inquiry card

VERTICAL BLINDS / *Flexalum Verticals* provide light and temperature control as well as the warmth of drapery window treatments. A full color brochure shows various *Flexalum* materials such as pure wool panels in earth tones, natural linens, etc., in home and office settings. ■ Hunter Douglas Inc., Totowa, N.J.

circle 413 on inquiry card

UNDERGROUND PIPING / Brochure developed for insulation contractors describes three suggested protection system finishes for underground piping insulated with *Accotherm* and *Armalok* insulation. ■ Armstrong Cork Co., Industry Products Div., Lancaster, Pa.

circle 414 on inquiry card

ELEVATOR SAFETY / A battery-power unit, the *Aut-O-Safe* permits the safe arrival of hydraulic elevator passengers during a power outage. A booklet describes how emergency operation is activated within seconds of a power failure, bringing all elevators to the lowest landing at a normal rate of descent with the door-opening button operative. The compact *Aut-O-Safe* unit is mounted on the machine room wall to interface with the elevator controller. ■ Otis Elevator Co., Farmington, Conn.

circle 415 on inquiry card

DATA PROCESSING SEATING / An eight-page brochure describes how the new *ConCentrx* seating line can contribute to the comfort and productivity of people who spend long hours in their chairs. Adjustment features, human factors, construction and color options are explained; specifications for both the Operator and Manager's *ConCentrx* chair are given. ■ Steelcase Inc., Grand Rapids, Mich.

circle 416 on inquiry card

THERMAL ENTRANCES / Entrance systems with tested thermal values are available with *Insulclad 260* insulated aluminum glass doors. A product brochure describes the entrances, available with closers, locks, hinges, push-pulls and other hardware to meet a variety of applications. ■ Kawneer Architectural Products, Niles, Mich.

circle 417 on inquiry card

STRUCTURAL STEEL TUBING / A 240-page soft cover book, the "Manual of Cold Formed Welded Structural Steel Tubing" contains complete information about available sizes of square and rectangular tubing products. Design data includes column and beam load tables, and allowable stress tables for 46 ksi and 50 ksi yield strength steel tubing, column and beam connections, etc. ■ Welded Steel Tube Institute, Cleveland.

circle 418 on inquiry card

HPS CONVERTER / *Retro-Tek*, an incandescent replacement system, uses a twistlock outlet box cover-plate that allows installation of HID luminaires directly to standard four-in. outlet boxes. A product brochure describes how the replacement fixture is suspended from the cover-plate while the wiring is connected, then rotated and locked in place, completing the installation. ■ Hi-Tek, Lithonia Lighting, Conyers, Ga.

circle 419 on inquiry card

ENERGY CONSERVATION / Published by the DOE's Solar Energy Research Institute, "What your Community Can Do About Energy" is a 28-page booklet presenting a sampling of what communities across the country are doing in local energy supply planning. The booklet suggests ways for communities to get started, and tells where to go for additional information and assistance. ■ Solar Energy Research Institute, Golden, Colo.

circle 420 on inquiry card

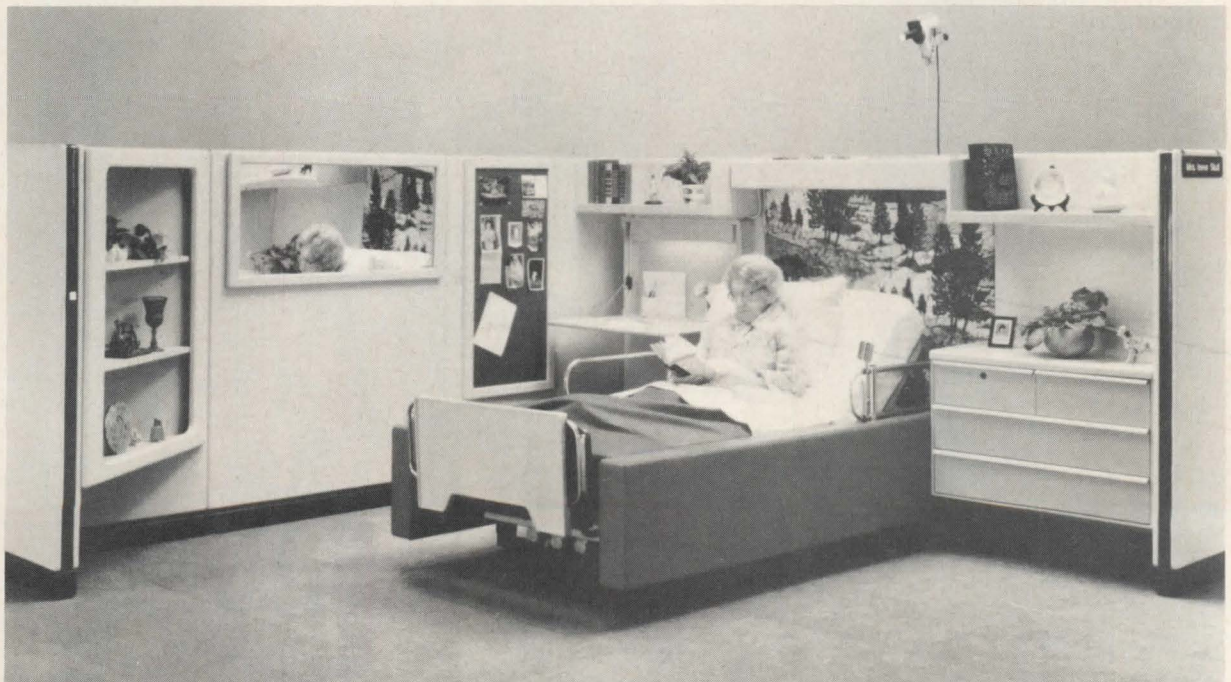
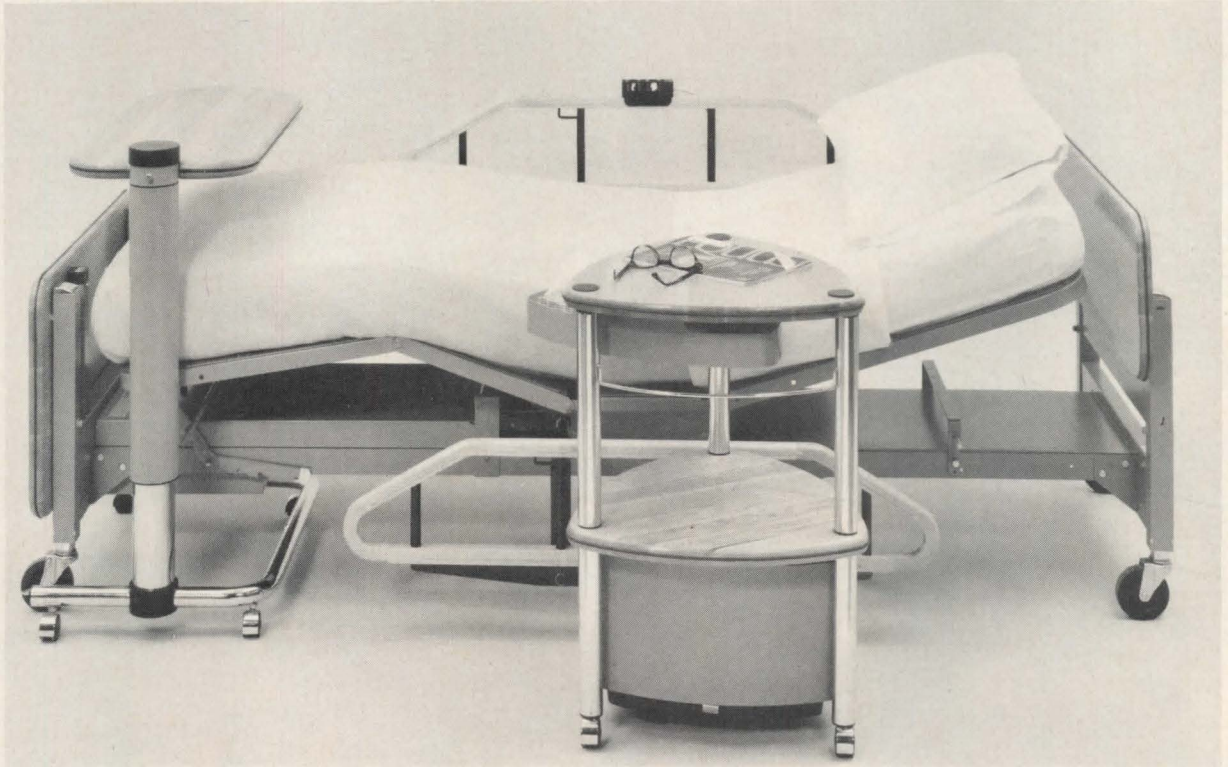
more information, circle item numbers on
 der Service Inquiry Card, pages 181-182

Designing patient furnishings that care

In our technological society, the elderly often do not work remarkably well for themselves. The problems soon become more acute, however, for those whose physical movements are limited by illness or age. There are too few attendants to give close personal care to those who seek it.

Russo and Sonder, hospital architects and industrial designers, have created the "41 System" bed, bedside cabinet and overbed table in an effort to improve the patient's ability to serve himself and the attendant's ability to reach him. While the system does not depart radically from standard health care furnishings, it represents some careful thinking by its designers. Surfaces are of solid oak where visible, rounded with protective edges. Controls are push buttons for easier reach and operation, electrically isolated from potential shock, and capable of fine adjustment. Storage is provided by pivoting drawers at different heights, which patients and attendants can open with simple arm movements; drawer liners are plastic trays removable for sterilization. Shapes and proportions are modeled to bring patient and furnishings as close together as possible while reducing overall dimensions—in what is all too often tight quarters. ■ G+W Healthcare.

circle 300 on inquiry card



Furnishings that foster self-maintenance

While the elderly are not always ill, their mobility is limited. The design of nursing home and health-related facilities should ideally supply the means whereby the elderly can conduct most of their daily activities unassisted. Joseph Melick, president of Design Research Services, Inc., professor of industrial design at Ohio State University, designed a "Geriatric Personal Furnishings System" as

an extension of the open plan office component system to make the nursing home environment easier to control. Basic components include bed bolsters with rails and overbed table, headboard panel, task/ambient light units, night stand storage unit and shelf

supported by two vertical panels joined to the headboard panel, and fold down desk and shelf, again supported by two vertical panels. More storage is offered by a triangular unit with tambour door for clothing or with open shelving for display, which fits

into the corner of two intersecting panels with mirror and tack board. The bolsters and hidden rails shield the patient from painful contact with the bed structure. The removable overbed table, resting on the telescoping rails, frees floor space and allows better at-

endant-patient positioning. Storage units and the desk upgrade nursing home standards while permitting the pursuit of a wide range of activities. ■ JG Furniture.

circle 301 on inquiry card
 more products on page 137

CROWD PLEASER.

**Moving people in style. Saving energy.
That's the Westinghouse Moduline 100® escalator.**

Pleasing big crowds is the specialty of the Park Place Casino Hotel in Atlantic City. And of the Westinghouse Moduline 100 escalator.

Customers were impressed with the dynamic looks of this "Stairway to the Stars" and its spectacular 90-foot glass balustrade.

Hotel managers liked its ability to move a lot of people quickly. Efficiently.

And the quick, trouble-free installation meant the

Bally Corporation, owner of this showplace, could open for business sooner. And win in the big race for new business in the "new Las Vegas."

But like building owners and operators all across America, Bally will also be pleased with the substantial energy savings these escalators provide.

Independent tests showed the Moduline 100 saved 30% over conventional escalators going up

and a whopping 59% going down with only five passengers. And with more people the savings were even greater.

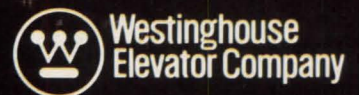
How does Westinghouse do it?

With a unique one-design concept. Modular units, each with a separate motor and drive, can be interconnected. So you can span a vertical rise to almost limitless height. Separate, parallel, criss-cross or even stacked arrangements are possible. And the compact design reduces the need for

massive machine rooms. Building space opens up. That's real design freedom!

To find out more about these people-pleasing people-movers write: Westinghouse Elevator Company, Dept. 802, 21 Bleeker Street, Millburn NJ 07041.

Circle 54 on inquiry card



**The technical leader
in people-moving systems.**





LABORATORY FURNITURE / A new product line, the *Flexalab* system of cabinets features individual units complete with integral countertop and casters. These mobile units work with a permanent wall mounted convenience rail, which provides for laboratory service requirements and holds a lockup strip matching those on the *Flexalab* furniture. Heights of the cabinets can be changed quickly without tools; standard widths are 16- and 31-in. Accessory corner and desk units are also available in the competitively-priced *Flexalab* line. ■ Curtin Matheson Scientific, Two Rivers, Wisc.

circle 302 on inquiry card

SHEET VINYL / Based on a hexagonal center motif, "St. Helena" sheet vinyl pattern has the appearance of inlaid parquet. Part of the "Grand" line of *Gafstar* sheet vinyl flooring products, "St. Helena" is offered in five colorways, ranging from almond to a dark red-brown shade, "Sunset." Competitively-priced vinyl comes in six- and 12-ft widths. ■ GAF Corp., New York City.

circle 303 on inquiry card

CUSTOM SCULPTURE / The large-scale metal sculpture pictured is an example of the custom work available to architects. Sculptures made of controlled-corrosion and stainless steel, aluminum and wood are offered for indoor and outdoor areas. Original designs are translated into submission drawings and scale models; installation is supervised by the manufacturer. ■ Devco, Fairfield, N.J.

circle 304 on inquiry card

RADIANT HEATING / A 500-Watt portable panel, the "Radiare" is said to provide safe, uniform heating with reduced energy costs. For use anywhere extra heat is needed, the panel warms a 10- by 15-ft area. Surface temperature reaches a safe-to-touch 150 to 190 deg without thermostat setting; an optional thermostat accessory has a lighted control box with a sensor that automatically controls panel operation. Self-contained "Radiare" units are UL-listed, and carry a five-year full warranty. ■ Radiant Warmth, Inc., Cleveland.

circle 305 on inquiry card

WRITING TABLE / Designed by the Scandinavian architect Jorgen Gammalgaard, this simple table has a frame of solid ash wood. Laminated ash is used for the smooth, resilient top. Both the table and matching chair are constructed without nails, using finger-joints to interlock the wood members. Additional furniture pieces by the same designer are offered for home and office in the "Triangle Series." ■ Dux Interiors, New York City.



circle 306 on inquiry card

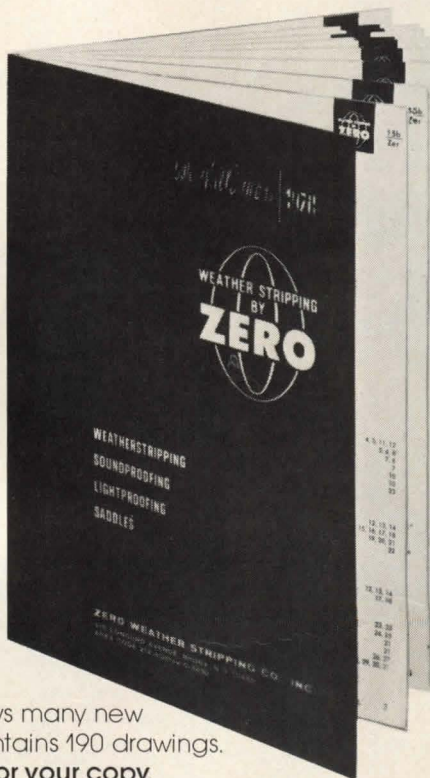
SLED-BASE CHAIRS / Curved sled bases in oak or walnut slide easily on any carpet; three *Domore* models provide guest or conference seating for a range of office settings. Full-back chairs with or without closed upholstered arms meet executive demands, while open-back, open-arm chairs are especially good in modular work areas. Lightly-scaled chairs are upholstered in leather or fabric, with finger-locked, curved frames. ■ IKD Corp., Elkhart, Ind.



circle 307 on inquiry card
more products on page 139

New edition now ready!

The most complete, authoritative guide for stripping: weather, sound and light—as well as thresholds.



Zero's latest catalog shows many new products; contains 190 drawings. Write today for your copy.



Zero Weather Stripping Co., Inc.

415 Concord Avenue, New York, N.Y. 10455 · (212) LU 5-3230

1924-1980...56 years of opening the door to progress.

Circle 55 on inquiry card

Columbia does it again!



P2 Parabolume...the low energy lighting for the 80's!

P2 Parabolume is the most practical innovation in parabolic fluorescent luminaires since Columbia Lighting introduced the original fifteen years ago. P2 Parabolume optimizes energy performance while maintaining the high visual comfort commensurate with good lighting practice. Specify P2 Parabolume...the most precise lighting device in today's recessed fluorescent market. Call your Columbia Agent or write us.

Columbia Operation
GTE Products Corporation
T.A. Box 2787/N. 3808 Sullivan
Spokane, WA 99220

GTE | **Specification
Lighting**

Circle 56 on inquiry card



GERMAN DESIGN / A sleek, European kitchen cabinet, these *Zeilodesign* units combine light oak wooden pulls with bamboo laminated casework. Many of these Allmilmo German-made kitchen cabinets are available in stock for two-week delivery. Interior functions include spin shelves, pull-out storage, bread cabinets, built-in spice racks and pop-out waste collector units. ■ Allmilmo Corp., Fairfield, N.J.

circle 308 on inquiry card

HYDRAULIC CEMENT / *Garonite* pourable grout sets in 10 minutes, and cures to 5000 psi in one hour, allowing quick service of installations from machinery to fences. The hydraulic cement expands as it sets, and will not loosen, shrink or crack under vibration, heat or cold. Final cure strength is said to be 10,000 psi. ■ Garon Products, Inc., Edison, N.J.

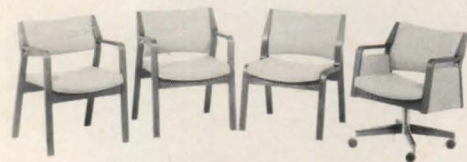


circle 309 on inquiry card

THEATRICAL EQUIPMENT / The "Model 41000" follow-spotlight is especially designed for throws in the range of 80- to 150-ft. The metal halide spot has a two element, variable focal length lens, controlled by a single lever. Features include a six-color boomerang; a fadeout system; horizontal masking control; and an hour meter. A 575-Watt metal halide bulb is included. ■ Strong Electric, Toledo.

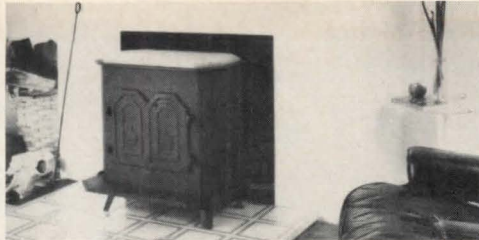


circle 310 on inquiry card



OFFICE SEATING / Extending the *Skagen* line of office furniture, these chairs feature laminated construction in oak or walnut, with slightly larger proportions for comfortable, long-term use. Additions include arm chairs, side chairs and executive swivel chairs, with either upholstered or cane seat and back. ■ R-Way Furniture Co., Sheboygan, Wis.

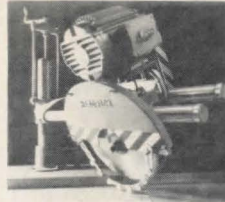
circle 311 on inquiry card



COMBINATION STOVE / The *Garrison* wood-burning stove combines the ambience of an open fire with the efficiency of an air-tight stove. With the doors open and the spark guard screen in place, the firelight can be enjoyed; when used as a heater, the stove burns up to 12 hours without reloading. ■ Garrison Stove Works, Inc. Claremont, N.H.

circle 312 on inquiry card

RADIAL SAW / A heavy-duty construction saw, the *Hanksaw* cuts materials such as wood, fiberglass, plastic, and ferrous/non-ferrous metals with reduced shock transmission and extended motor life. Accommodating up to 16-



in. diameter blades, the *Hanksaw* is designed for right- or left-hand set up to permit full length of cut in any mitre. The saw features a 7½ hp, three-phase, timing belt drive that permits a 6¼-in. deep cut with straight line accuracy over the maximum 22-in. cut length. The *Hanksaw* retails for under \$1,000. ■ Hendrick Mfg. Corp., Marblehead, Mass.

circle 313 on inquiry card
more products on page 145

passive solarglazing systems

- Sun-Lite® glass fiber reinforced polymer sheet for site-built systems — offers maximum economy.
- Sun-Lite® insulated solar glazing panels — are off the shelf and pre-engineered.
- Sunwall® job-engineered complete wall and skylight systems — for maximum performance.

Three use-proven products from an ever expanding group of solar energy collection/utilization products from the ...

Solar Components Division
KALWALL CORPORATION
P.O. Box 237, Manchester, NH 03105. Phone 603-668-8186

Circle 57 on inquiry card



There's a lot worth saving in this country.

Today more Americans who value the best of yesterday are working to extend the life of a special legacy.

Saving and using old buildings, warehouses, depots, ships, urban waterfront areas, neighborhoods and Main Streets is more than just a sentimental gesture. Economically it makes good sense to restore and revitalize quality structures. Preservation saves energy and materials at a time when our resources are limited.

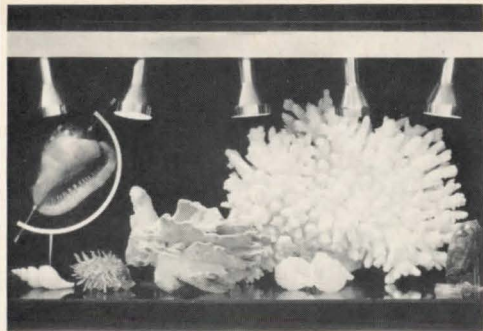
We can also appreciate the artistry and design of these many old structures, which are as much a part of our unique culture as the art and music we have given the world.

The National Trust for Historic Preservation—in cities, towns and neighborhoods—helping to keep our architectural heritage alive for us and for our children.

Help preserve what's worth saving in your community. Contact the National Trust, P.O. Box 2800, Washington, D.C. 20013.

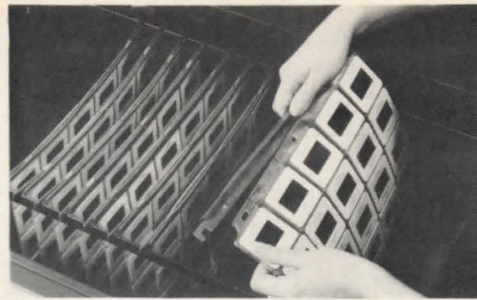

**National Trust for
Historic Preservation**
Preservation builds the nation





SHELF LIGHTING / Miniature spotlights snap onto an easily-installed power strip, equipped with a 12-ft cord and on-off switch. Three-, five-, and seven-light units may be used to accent displays, light cabinet interiors and work surfaces, etc. "Shelf Lights" come in polished aluminum, satin bronze, brass, and satin white finishes. ■ Halo Lighting Div., McGraw-Edison Co., Elk Grove Village, Ill.

circle 314 on inquiry card



SLIDE STORAGE / The "Snap-hinge" adapter converts pages and inserts of standard three-ring binders into hang-file units for storage of 35 mm transparencies and larger pictures in vinyl jackets. The plastic reinforcement has notched extensions for horizontal rods in file cabinets, and comes in three colors for file coding. ■ Bardes Products, Inc., Milwaukee.

circle 318 on inquiry card

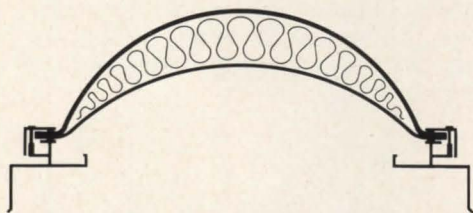
GRAPHICS FILING / The "Systems One" filing stand is designed to hold all types of sheet graphics and drawings within one rack for easy retrieval and replacement. The system is said to save floor space while providing increased storage for plans and drawings of all sizes. ■ The Huey Co., Franklin Park, Ill.

circle 319 on inquiry card



ELECTRIC STRETCHER / The *Amtrex* electric stretcher virtually eliminates the bending, pumping and lifting required of hospital personnel, while improving the patient's feeling of safety. The UL-listed stretcher assumes positions at the touch of a switch. ■ Ill Medical Systems, Hamilton Industries, Two Rivers, Wisc.

circle 315 on inquiry card



INSULATING SKYLIGHT / Shown here in a schematic drawing, the *SkyCraft* insulating-type plastic dome skylight is said to achieve a "U" insulating value of 0.19/1 hr sq ft F. With an "R" value of 5.4, the unit also reduces heat gain during summer weather. *SkyCraft* skylights are available in eight standard modular sizes. ■ API Mfg. Corp., San Francisco.

circle 316 on inquiry card

VINYL ROLLING SHUTTERS / Extruded from rigid *Geon* vinyl, the hollow horizontal slats of the Pease rolling-shutter store out-of-sight in an exterior housing. In warm weather, they can be lowered to block solar heat gain and improve air conditioner efficiency. In winter, the shutters help hold heat in the house, and insulate against the wind. The exterior shutters also provide acoustical insulation. ■ Pease Co., New Castle, Ind.

circle 317 on inquiry card

INDOOR/OUTDOOR MATTING / "Golf Spike"



matting is heavy-duty, all-weather compounded rubber, 3/16-in thick, designed to protect floors from golf spikes and ice skate blades. Matting is dimensionally stable; it lays flat and hugs the floor for safety. The non-directional pebble-textured mat can be cut easily into flooring or runners. ■ Boston Industrial Products, Div. American Bilrite, Inc., Cambridge, Mass.

circle 320 on inquiry card

ACOUSTIC PANELS / Optimum sight and sound



privacy within the open plan office are said to be afforded by these seven-ft-high, freestanding *Sho-Wall* panels. The flush-to-floor panels rest on neoprene-surface levelers, and connect at top and bottom by means of hand-tightened pinions. The seven-ft height provides standing privacy without interfering with overhead light or ventilation systems; three other heights are available. Panels have a NRC of 85; tackable surfaces include burlap, nylon plush and woven dacron. ■ The Brewster Corp., Old Saybrook, Conn.

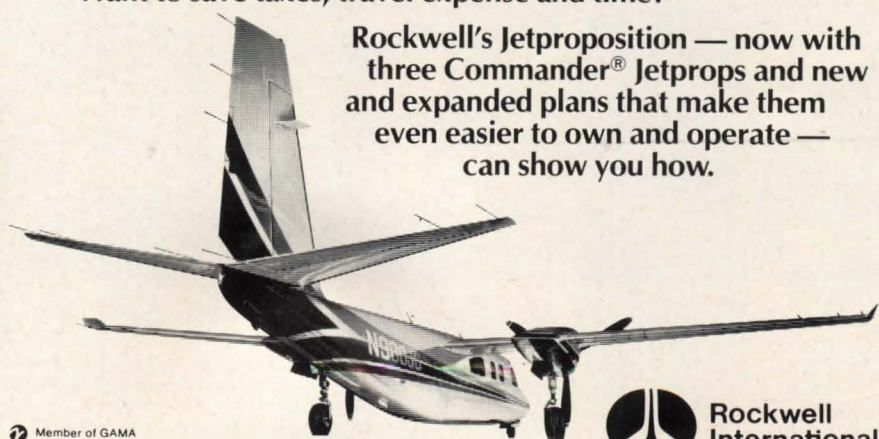
circle 321 on inquiry card

more products on page 147

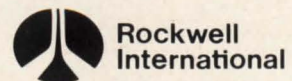
Write in for this write-off.

Want to save taxes, travel expense and time?

Rockwell's Jetproposition — now with three Commander® Jetprops and new and expanded plans that make them even easier to own and operate — can show you how.



Member of GAMA



... where science gets down to business

Name _____
 Title _____
 Company _____
 Street _____
 City _____ State _____
 Zip _____ Phone _____
 Present aircraft owned _____

For full information on the many advantages of owning your own Commander Jetprop, call 800/654-4483.* Or write: Dept. 25, Commander Jetprop Information Center, Rockwell International, 5001 N. Rockwell Avenue, Bethany, Oklahoma 73008. TWX 910-830-6870. AEROCOM.

*In Oklahoma, call collect: 405/789-5000, Ext. 228. AR 11

Circle 65 on inquiry card



The natural look of aluminum... works beautifully in Denver.

The Denver National Bank Plaza is a beautiful example of the use of Alcoa® architectural sheet in a major curtain-wall project. An office complex consisting of a 26-story tower and two adjacent buildings, it was designed to meet the Denver Urban Renewal Authority exterior facade specifications.

Alcoa supplied approximately 400,000 lbs of specially controlled 5005 alloy sheet to PPG Industries for fabrication and finishing of the spandrel panels. The pleasing natural aluminum finish is Alumilite 215, Alcoa 1 etched and anodized (AA-M10C22), providing a long lasting, corrosion resistant protective coating.

Bill Manning, PPG Branch Manager, sums up Alcoa's contribution to the project: "The Denver National Bank Plaza is typical of the quality and service we continually receive from Alcoa. From the supplying of high quality aluminum sheet to the furnishing of fine technical information and service, Alcoa plays an important part in our success in this field."

Let Alcoa help you on your next curtain-wall application. For more information, write Aluminum Company of America, 1012-L Alcoa Building, Pittsburgh PA 15219.

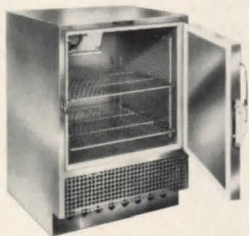
The Denver National Bank Plaza,
Denver, Colorado
Fabricator: PPG Industries, Inc.
Architect: Skidmore, Owings and Merrill
Contractor: N. G. Petry Construction Co.
Developer: N. G. Petry Construction Co.
Owner: L. C. Fulenwider, Inc.

We can't wait for tomorrow.

 **ALCOA**

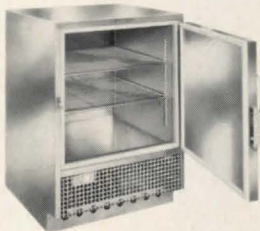
WE FIT IN

STAINLESS STEEL UNDER COUNTER LAB REFRIGERATORS AND FREEZERS



UC-5-BC refrigerator has a blower coil cooling system with automatic off-cycle defrosting and condensate evaporator in condensing unit compartment. Two adjustable stainless steel shelves are provided.

UC-5-F-BC freezer is equipped with automatic timer electric defrost. Capacity—5.4 cu. ft. (155 ltr.)

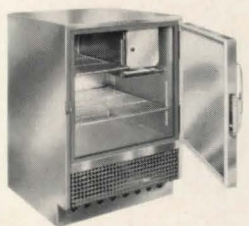


UC-5-CW* refrigerator with cold wall cooling system is equipped with push-button defrost, automatic reset and condensate evaporator. Capacity—5.4 cu. ft. (155 ltr.)

UC-5-F-CW* freezer is equipped with manual hot gas defrost. Capacity—4.6 cu. ft. (130 ltr.)

UC-5-CW-E refrigerator has the same interior features as the UC-5-CW but modified to make it *totally explosion-proof*. Capacity—4.9 cu. ft. (140 ltr.)

*With explosion proof interior only.



UC-5 features a two-tray ice cube cooling system with manual defrost and stainless steel defrost water tray. The cooler section has two adjustable stainless steel shelves. The entire UC-5 series features polyurethane insulated thin wall construction and air-tight neoprene thermo-break door seals. Capacity—5.4 cu. ft. (155 ltr.)

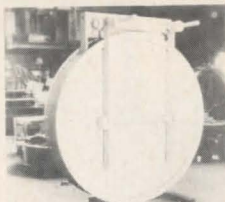
Jewett also manufactures a complete line of blood bank, biological, and pharmaceutical refrigerators and freezers as well as morgue refrigerators and autopsy equipment for world wide distribution through its sales and service organizations in over 100 countries.



Refer to Sweet's Catalog 11.20/Je for quick reference.

Circle 66 on inquiry card

EXPLOSION GATE /



The 84-in. explosion gate shown here is one of a variety of dampers manufactured for the steel industry, acid plants, heat recovery systems, pollution control, waste heat boilers, etc. This damper, situated at the end of a

super heater and boiler main flue, has a valve designed to relieve pressure build-up at 10-in. water column positive. Dampers can be custom built to meet various end-user specifications. ■ Frisch Div., Dayco Corp., Chicago.

circle 341 on inquiry card



RUGS/WALLHANGINGS / New standard designs have been added to the *Form III* line of handcrafted wool and nylon area rugs, wallhangings and carpeting. Pictured is Fritz Saal's "Saracen" pattern, a wide double Turkish floral border area rug. Custom designs, colors and sizes are also available for residential and commercial requirements. ■ Form III, North Vernon, Ind.

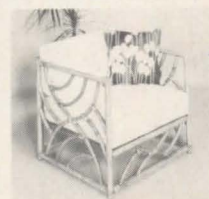
circle 342 on inquiry card



BUFFET SERVICE / Modular food service equipment rolls easily on recessed, locking wheels. "Decorator" series units are available in both wood-grain or white finish; optional panels can be changed to match or coordinate with restaurant decor. Buffet service units include a utility station and three- or four-well hot food server. ■ The Vollrath Co., Sheboygan, Wisc.

circle 343 on inquiry card

SMALL-SCALE RATTAN /

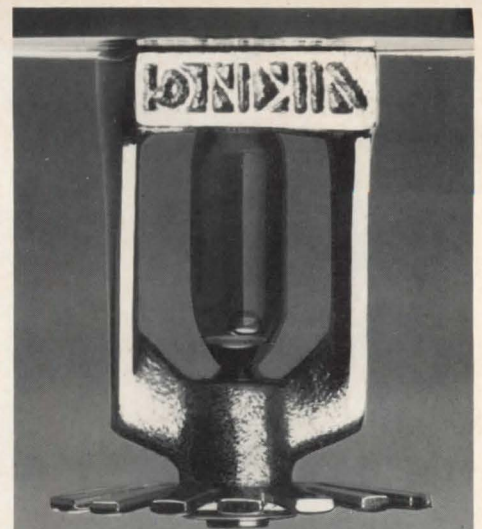


Furnishings in the 12-piece "Fanfare" collection feature rattan frames worked in an Oriental "cracked ice" pattern; units are sized for the smaller living areas found in contemporary homes and apartments. ■ Ficks

Reed Co., Cincinnati.

circle 344 on inquiry card

more products on page 149



THE SPRINKLER YOU CAN LOOK UP TO

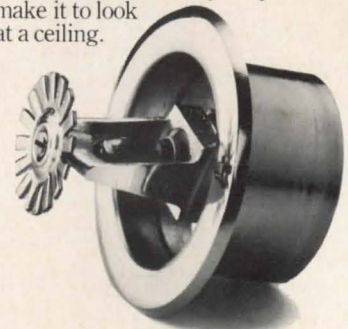
Most fire protection sprinklers aren't built with architects in mind, so they don't add much beauty to a ceiling.

That's why we've engineered our Decor® sprinkler line to be visually subtle, yet offer an attractive alternative to bulky solder-link or costly concealed sprinklers.

Decor® sprinklers are miniature sized and cleanly styled in satin or polished chrome; natural or polished brass. The glass bulbs are color coded for six temperature ratings.

Our new 2-piece adjustable recessed escutcheon allows Decor® sprinklers to be fitted prior to ceiling installation. This helps keep construction on schedule and provides for far lower installed costs than with competitive flush or concealed sprinklers.

Send for more detailed information on Decor® sprinklers and discover how easy they make it to look at a ceiling.



'see us in Sweet's 'E' file'



THE VIKING CORPORATION
210 N. INDUSTRIAL PARK ROAD
HASTINGS, MICH. U.S.A. 49058
TELEPHONE (616) 945-9501
CABLE-VIKING TELEX 22-6400

Circle 67 on inquiry card

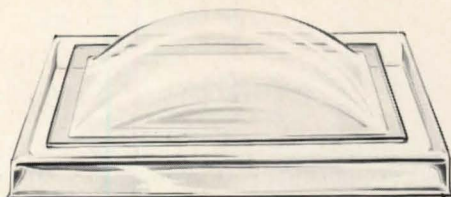
ULTRAWALL[®] movable partition predecorated vinyl elegance at the cost of painted drywall!

Compare! With ULTRAWALL[®] movable partitions, carpeting, ceilings, lighting, core and perimeter walls are all finished first... **before** ULTRAWALL partitions are quickly installed. There are no cut-up areas to work around—or taping and sanding to suit your schedule. Doors, frames, base, finish, and glazing are all handled by one contractor. This means move-in dates can be moved up for earlier occupancy and significant savings in financing—plus possible qualification for investment tax credit and accelerated depreciation advantages.

ULTRAWALL panels are 3/4" thick for that solid, permanent wall feeling. Completed partitions offer you a 1-hour fire rating, 40 to 60 STC rating, rich contemporary wall fashions and easy vinyl washability. With ULTRAWALL, why put up with dust, dirt and delays? ULTRAWALL is a costly fixed partition especially at relocation time. Call your U.S.G. representative. Or write to us at 100 Wacker Dr., Chicago, IL 60606, Dept. AR1180



UNITED STATES GYPSUM
BUILDING AMERICA



How to let light in without letting heat out.

Skylights formed from UVEX[®] Plastic Sheet can reduce costs by reducing the need for artificial lighting during daylight hours.

While the optical transparency of UVEX Sheet lets light in, its low thermal conductivity keeps heating and cooling losses low.

UVEX Sheet has excellent impact strength and outstanding resistance to weathering. And in many instances, skylights formed from UVEX Sheet can be flashed directly into the roof—eliminating the need for aluminum curbing or support.

For information and the name of the skylight manufacturer nearest you, contact Bill Seaman at Eastman Chemical Products, Inc., Plastics Products Division, Kingsport, Tennessee 37662.



Eastman Chemical Products, Inc., a subsidiary of Eastman Kodak Company, Kingsport, Tennessee. UVEX is Eastman's trademark for its plastic sheet. Eastman makes only the plastic sheet used in finished products and therefore makes no warranties with respect to such products.

UVEX[®]

Plastic Sheet

Circle 69 on inquiry card

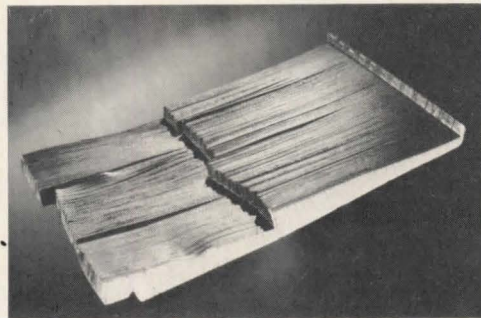
SOLAR SCREEN / KoolShade solar screens, designed to protect sun-exposed windows against solar heat gain, are said to block-out up to 85 per cent of the heat entering a building through glazed openings. The screens permit excellent outward visibility, while allowing ample diffused daylight to enter interiors for natural illumination. ■ KoolShade Corp., Solano Beach, Calif.



designed to protect sun-exposed windows against solar heat gain, are said to block-out up to 85 per cent of the heat entering a building through glazed openings. The screens permit excellent outward visibility, while allowing ample diffused daylight to enter interiors for natural illumination. ■ KoolShade Corp., Solano Beach, Calif.

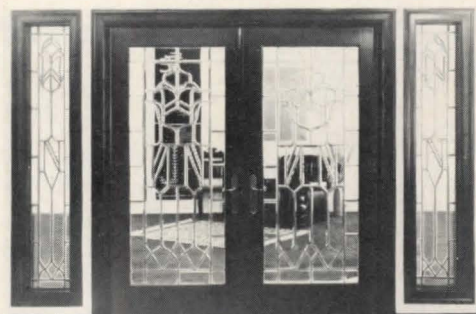
ample diffused daylight to enter interiors for natural illumination. ■ KoolShade Corp., Solano Beach, Calif.

circle 345 on inquiry card



FIRE-RESISTIVE SHINGLE / CeDurShake panels are made from glass-fiber reinforced polyester that simulates cedar; shingles are backed with a layer of polyurethane foam to provide an R-value of 5.2. CeDurShake roofs have passed burning brand, rain, and wind tests of over 100 mph; the Class A-rated panels qualify for energy-efficiency tax benefits. ■ The Upjohn Co., CPR Div., Kalamazoo, Mich.

circle 346 on inquiry card



BEVELED GLASS / The unusual door and side light installation shown here has individually bevelled clear glass hand-set in lead caming. Doors, windows, tables and architectural accents are made using a mass-production process said to substantially reduce time and costs. ■ Beveled Glass Industries, Los Angeles.

circle 347 on inquiry card

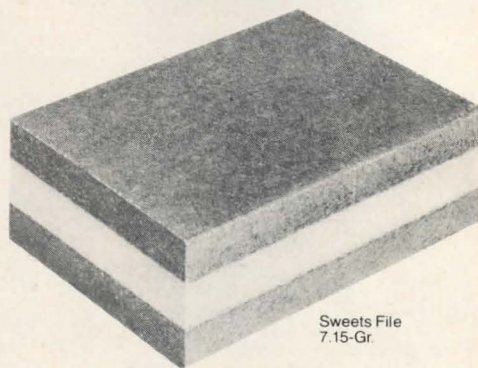
CRYSTAL CHANDELIER / Dramatic three-tiered fixtures in square and octagonal shapes demonstrate the custom-design potential of Italian Crystal architectural lighting elements. Each chandelier comprises several hundred individual components of hand-blown Serate crystal assembled on gold metal frames. ■ Venini, Ltd., New York City.



Dramatic three-tiered fixtures in square and octagonal shapes demonstrate the custom-design potential of Italian Crystal architectural lighting elements. Each chandelier comprises several hundred individual components of hand-blown Serate crystal assembled on gold metal frames. ■ Venini, Ltd., New York City.

circle 348 on inquiry card

Write today for free sample of one of world's best roof insulations:



Sweets File 7.15-Gr.

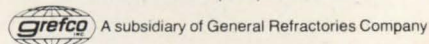
Permalite[®] Pk Plus[®] perlite/urethane/perlite 3-part composite roof insulation

Specify it when you want long-life insulation having a "C" value of .10 or better for industrial/commercial roofs.

•Permalite Pk Plus is a true sandwich board. The top and bottom perlite layers maintain the efficiency of the polyurethane core by protecting it from the effects of high rooftop temperature changes. The top perlite layer also protects the core from hot asphalt during membrane application. And both perlite layers contribute to the dimensional stability of the insulation panel and help dissipate both heat and moisture during application. SEND FOR FREE SAMPLE.

Permalite[®]

GREFCO, Inc. / Building Products Division
GENERAL OFFICE: 3450 Wilshire Blvd., Los Angeles, CA 90010
SALES OFFICE: 2905 Butterfield Road, Oak Brook, IL 60521 (312) 654-4500



Circle 70 on inquiry card

ARCHITECTURAL RECORD REPRINTS

Reprints of various Architectural Record articles available in a variety of formats and bindings. Custom designed covers and special layouts to suit every need. Art and Type services available on request.

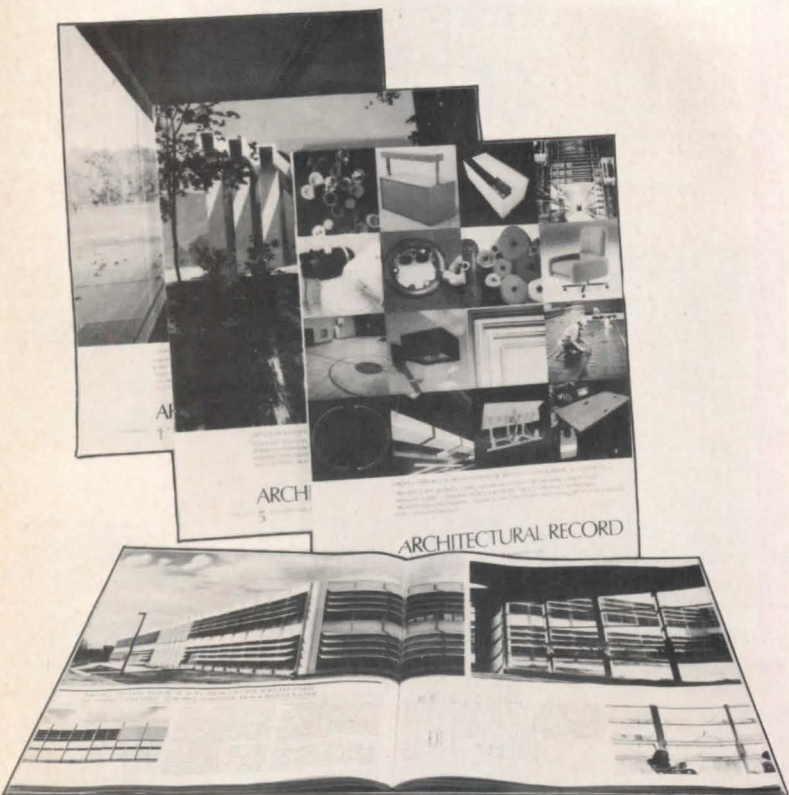
For a FREE inventory listing, price quotes and additional services call

609/448-1700

extension 5505

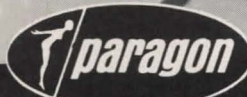
Address inquiries to:

ARCHITECTURAL RECORD REPRINT DEPARTMENT
PRINCETON ROAD
HIGHTSTOWN, N.J. 08520



When Designing New or Renovating Old Swimming Pools

Specify ParaFlyte Quality Deck Equipment



For Detailed Literature or Design Assistance Call:

KDI Paragon Inc.

Paulding St., Pleasantville, N.Y. 10570 • 914/769-6221 / See Us in Sweets Under 13.4b/KD

this publication is available in microform



Please send me additional information.

University Microfilms International

300 North Zeeb Road
Dept. P.R.
Ann Arbor, MI 48106
U.S.A.

18 Bedford Row
Dept. P.R.
London, WC1R 4EJ
England

Name _____
Institution _____
Street _____
City _____
State _____ Zip _____

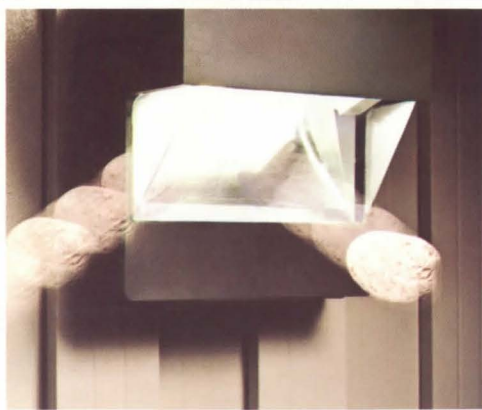
◆ Circle 71 on inquiry card

Uncommon strength. Incomparable control.



Crouse-Hinds wall-mounted WAL luminaires for small-area lighting.

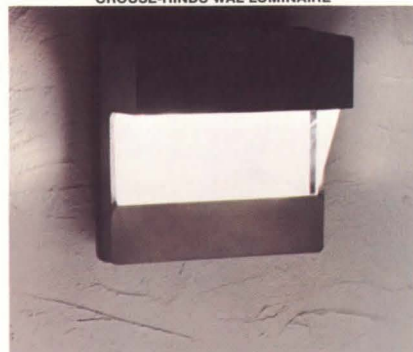
■ When you need a luminaire strong enough to stand up to both environmental and human abuse, specify Crouse-Hinds WAL. The WAL luminaire's base housing is made of rugged die-cast aluminum, finished in a dark-bronze thermoset acrylic enamel. Its sturdy one-piece polycarbonate front cover and lens is virtually vandal-resistant. No unsightly, inefficient shields or guards are required. A specially formulated finish applied to the inside of the front cover gives it a long-lasting dark-bronze appearance unaffected by outside elements. Naturally, the WAL is UL listed for wet outdoor locations.



VIRTUALLY VANDAL RESISTANT

■ When light is needed for walkways, entrances, courtyards or for building security, WAL luminaires provide controlled and efficient area illumination. A clear lens provides a soft, low-glare illumination level in front of the fixture and maximum light output on the sides. This allows you to increase spacing between fixtures. Or you can specify a special prismatic lens that provides a higher overall light distribution to the front and sides of the fixture.

CROUSE-HINDS WAL LUMINAIRE*



CONVENTIONAL WALL-MOUNTED LUMINAIRE*

■ WAL wall-mounted luminaires are designed to use energy-saving HID sources. Choose from 70-, 100- and 150-watt HPS lamps; 100- and 175-watt mercury vapor lamps; or 175-watt super metal halide lamps. A formed specular Alzak® aluminum reflector assures maximum utilization and performance.

The wall-hugging WAL luminaire won't detract from the clean design lines of any structure. With their low profile and matte surface, they look like an integral part of a building . . . not an afterthought.

Write for our new full-color selection guide.

Crouse-Hinds Company
Lighting Products Division
P.O. Box 4999
Syracuse, NY 13221

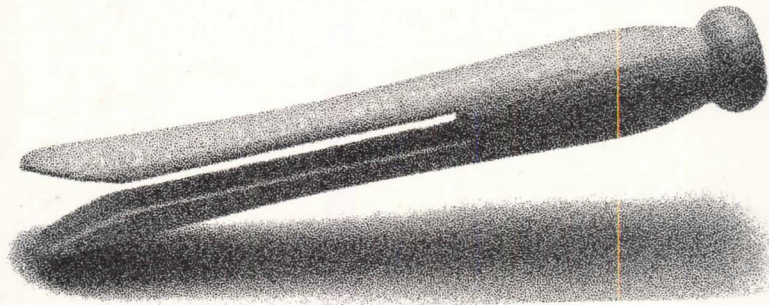
Or call (315) 477-8291



CROUSE-HINDS

* Photos taken under similar photographic conditions.

Sloan's Optima solves a problem not normally mentioned in polite company.



When the men's room is a little strong.

Sanitation is somewhat less than perfect if urinals go unflushed. Which can happen with manual or timed flushing. And disinfectants replace one odor with another.

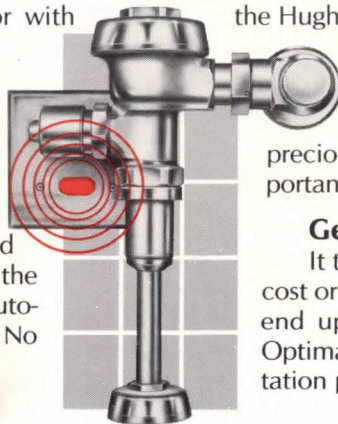
Sanitation is why Optima was invented.

The Sloan Optima™ Automatic Flushing System is *sensor-operated*. The sensor sends out an invisible, continuous beam of light. The user reflects the beam back into the scanner and arms the system. When the user steps away, the flush valve trips automatically. Sanitation's automatic, too, since flushing is on *demand* only. No more forgotten flushes.

Optimas work for big buildings (and little ones).

Optimas are on the job all around the country. For example, they help solve sanitation problems at the huge

Kemper Group headquarters in Long Grove, Illinois, where more than 2,000 employees work. Other Optima installations include the Oak Park (Illinois) Country Club and the Hugh Carter Engineering Company, San Diego.



Beyond sanitation, water savings.

Since Optimas flush only on demand, precious water is conserved. That's pretty important these days.

Get our new brochure.

It tells all about Optima Systems. There's no cost or obligation, of course. Just write. You may end up joining the ranks of those who find Optimas the clean-cut solution to tough sanitation problems.



SLOAN VALVE COMPANY

10500 SEYMOUR FRANKLIN PARK, IL 60131