
AIA JOURNAL

The Armstrong Commercial Corlon® Flooring System. A new concept that's been proved in use for over 20 years.

Today, all across the nation, many millions of square yards of Armstrong Vinyl Corlon are performing beautifully. And many of these installations have been in place for over 20 years. That's just one reason Armstrong .090″ gauge sheet Vinyl Corlon is one of the most widely

specified commercial floors. Another is the system that makes it work.

It looks monolithic.

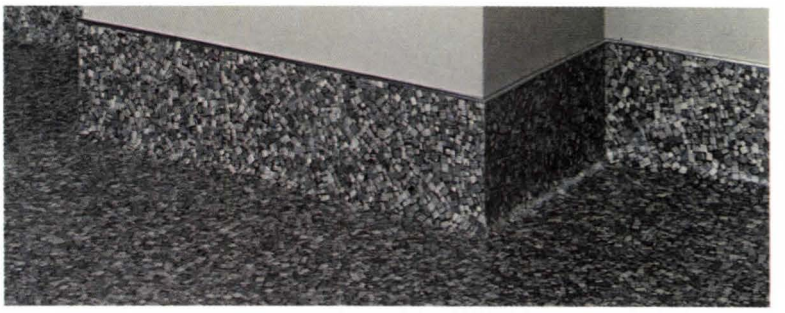
Corlon comes in 6′-wide rolls up to 90′ long. You get a monolithic look because there are few seams. For example, you'll have about 93% fewer seams with Vinyl Corlon than with the same area of 12″ x 12″ tile.

Epoxy-bonded seams.

An exclusive Armstrong epoxy adhesive chemically bonds the seams without heat or special tools. They won't come apart. And they won't trap dirt and moisture.

Wide range of colors and designs.

Armstrong Vinyl Corlon comes in five distinctive chip patterns and 32 colors ranging from bright and modern to neutral and natural.

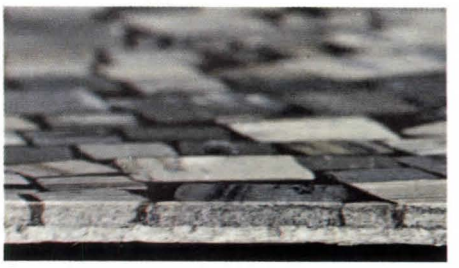


Coving where dirt can't hide.

Flash-coving makes it simple to create a gentle radius where floor meets wall, eliminating the sharp corner where dirt can hide.

The pattern lasts and lasts.

Armstrong Vinyl Corlons are inlaid materials. Because the pattern and color go all the way through to the backing, they won't wear off like printed products. And because the inlaid construction is smooth and dense, spills wipe right up. Simple regular maintenance keeps the floor looking like new. These resilient floors meet the flame-spread and smoke-developed requirements of the most widely recognized building codes and regulations.

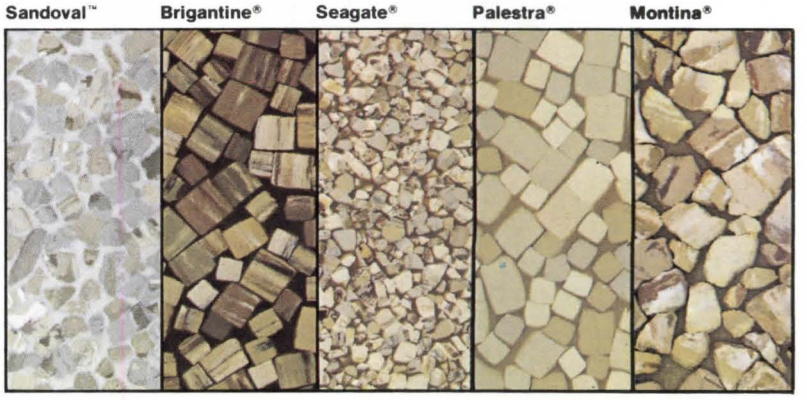


Vinyl Corlon floors can be installed with a perimeter bonding system developed by Armstrong. In most cases, you can install them right over an old floor and eliminate a lot of work and expense.

The Armstrong Vinyl Corlon Commercial Flooring System. Specify it, and you'll get one beautiful long-lasting floor. For more information, write Dept. 1BFAJ, Lancaster, PA 17604.

FROM THE INDOOR WORLD® OF Armstrong

Sandoval™ Brigantine® Seagate® Palestra® Montina®



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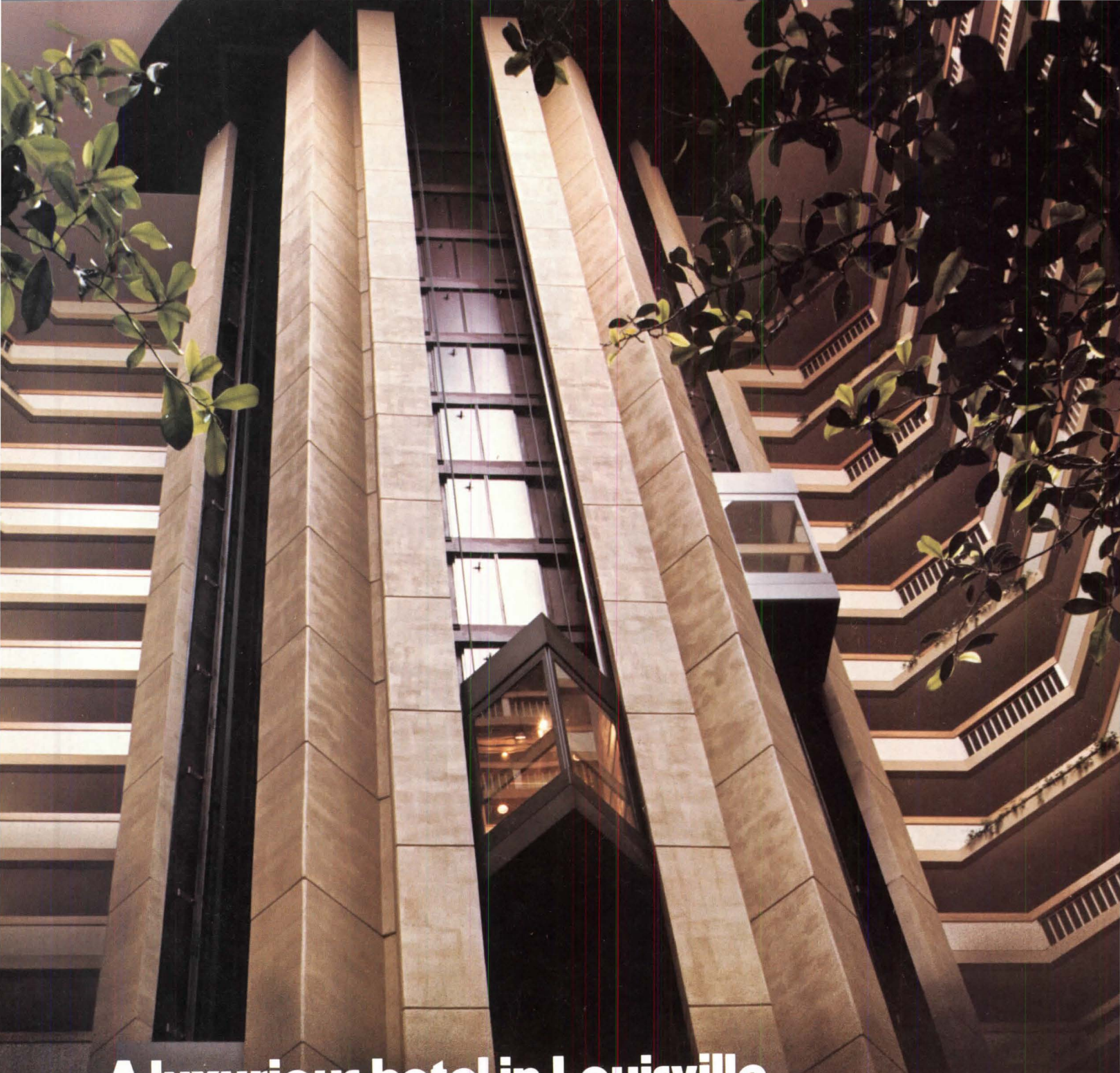


A luxurious hotel in Louisville.
ELEVATORS BY DOVER

The 393-room Hyatt Regency Louisville on River City Mall includes the Hyatt hallmark—a soaring atrium-lobby *filled* with greenery and excitement. The three glass-back, scenic Dover Elevators enable guests to enjoy a breathtaking view while moving smoothly through this 17-story space. Four other Dover Elevators carry passengers and freight between levels of this busy convention-center hotel. For more information on Dover Elevators, write Dover Corporation, Elevator Division, Dept. 673, P.O. Box 2177, Memphis, Tennessee 38101.

Hyatt Regency Louisville, Louisville, Kentucky

Owner: LHR Partnership
Architect: Welton Becket Associates
Contractor: J.A. Jones Construction Co.
Elevators sold and installed by
Dover Elevator Company, Louisville.

DOVER®

The elevator innovators.

CONTENTS

Cover: Photograph by Balthazar Korab of Eero Saarinen's TWA Terminal at Kennedy Airport, New York City (see page 36).

The AIA JOURNAL, publication number: ISSN0001-1479, official magazine of The American Institute of Architects, is published 14 times yearly at 1735 New York Ave. N.W., Washington, D.C. 20006. **Subscriptions:** for those who are, by title, architects, architectural employees and to those in architectural education (faculty, schools and students), and to libraries, building construction trade associations and building products manufacturers: base rate $24 a year in the U.S., its possessions and Canada. For all others: $30 a year in the U.S., its possessions and Canada. All others outside the U.S., its possessions and Canada: $40 a year. Single copies, $3 each. Publisher reserves the right to refuse unqualified subscriptions. For subscriptions: write Circulation Department; for change of address: send Circulation Department both old and new addresses; allow eight weeks. Quotations on reprints of articles available. Microfilm copies available from University Microfilm, 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Referenced in *The Architectural Index, Architectural Periodicals Index, Art Index, Avery Index to Architectural Periodicals.* Second class postage paid at Washington, D.C., and additional mailing offices.

VOL. 70, NO. 13.

Exposed steel wall system provides economy and energy efficiency in new Chicago schools.

The new 357,000 sq. ft. Olive-Harvey College in southeast Chicago was designed to provide 8,500 full-time students with programs covering the arts, sciences and technical areas of learning.

The building's 30-foot by 30-foot bay steel framed structural system provides good quality spaces for students and faculty functions.

The building's enclosure of insulated painted ¼ in. thick carbon steel plate with 1″ thick insulated glass on a 5-foot module, was designed in 10-foot wide full height 46-foot 6-inch sections for rapid erection and early close-in of the building.

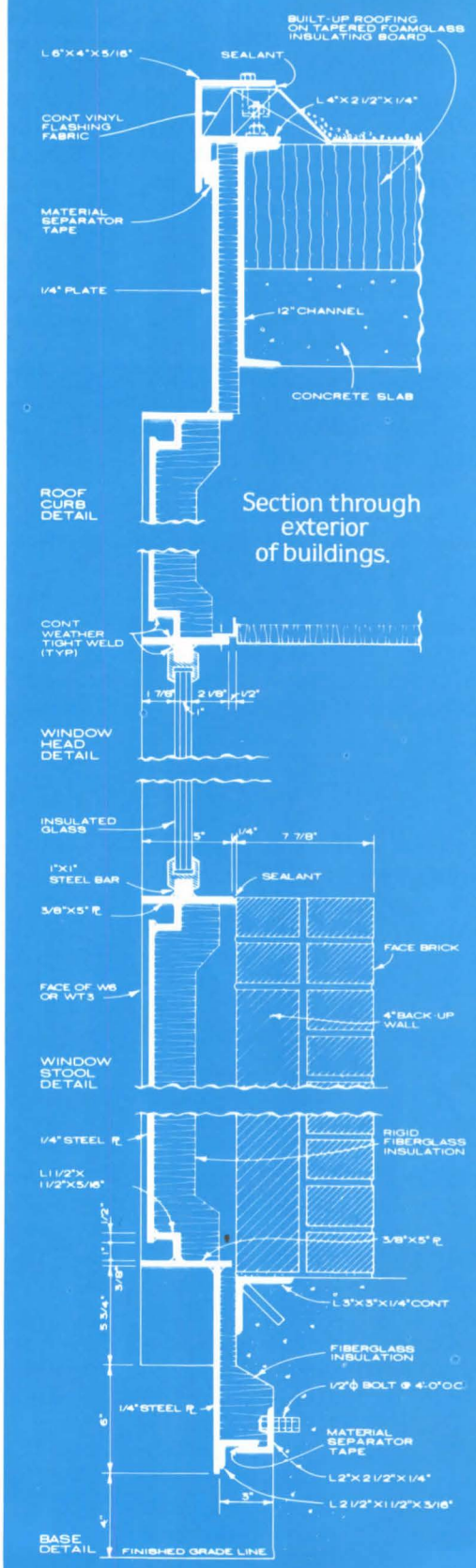
This enclosure is not only an effective barrier to the high noise levels caused by the heavy auto and truck traffic from the adjoining streets and expressway but also complies with energy conservation design requirements. Of the 59,150 square feet of exterior wall surfaces only 35% is glass.

The new Olive-Harvey College is a successful example of the design flexibility and practical economy of using structural steel on the inside and a painted, easily maintained, exposed light-weight steel skin on the outside. The Richard J. Daley College building in southwest Chicago duplicates this structure and exposed steel wall system.

To find out more about these buildings, and for information regarding the many applications for structural steel, contact a USS Construction Representative through your nearest U.S. Steel Sales Office. Or write for a copy of the USS Exposed Steel Design Data Sheet C.5/5a to United States Steel, P.O. Box 86, (C1497), Pittsburgh, PA 15230.

USS United States Steel

TRADEMARK



Owner: Public Building Commission of Chicago, Chicago, Illinois

Operator: Board of Community College District No. 508, Chicago, Illinois

Architect/Engineer: Dubin, Dubin, Black & Moutoussamy, C.F. Murphy Associates—A Joint Venture—Chicago, Illinois

Construction Manager: DDBM Inc., Chicago, Illinois

Curtain Wall Fabricator/Erector: Chicago Ornamental Iron Co., Melrose Park, Illinois

Structural Steel Fabricator/Erector: Wendnagel and Company, Inc., Chicago, Illinois

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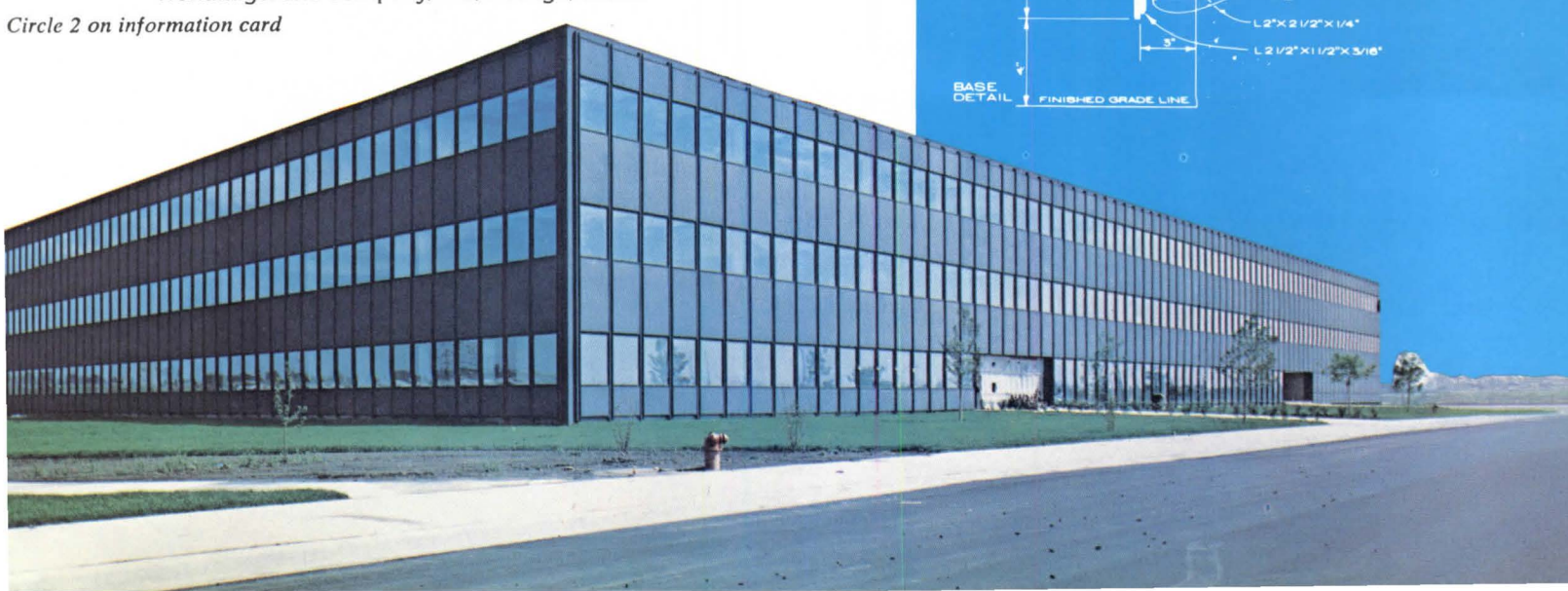


EVENTS

Nov. 23-24: Defense Construction Mobilization Conference, Fort McNair, Washington, D.C. Contact: Col. Robert M. Gogal, Office of the Assistant Secretary of Defense (MRA&L) IC, Room 3C762, Pentagon, Washington, D.C. 20301.
Nov. 30-Dec. 1: Passive Solar Workshop, San Francisco. Contact: Passive Solar Associates, P.O. Box 6023, Santa Fe, N.M. 87501.
Nov. 30-Dec. 1: Construction Management seminar, Washington, D.C. (Repeat seminars Jan. 14-15, Orlando, Fla.; Feb. 25-26, Phoenix, Ariz.; Mar. 22-23, Pittsburgh; Mar. 29-30, Houston.) Contact: Battelle Seminars and Studies Program, 4000 N.E. 41st St., Seattle, Wash. 98105.
Nov. 30-Dec. 4: Residential Energy Auditing course, University of Wisconsin, Madison.
Dec. 1: Quality Management in a Design Practice seminar, Denver. (Repeat seminars Dec. 2, Seattle; Dec. 4, Los Angeles; Dec. 7, Minneapolis; Dec. 8, Boston; Dec. 10, Houston; Dec. 11, Atlanta.) Contact: Don Thompson, Don Thompson Associates, 3247 Embry Hills Drive, Atlanta, Ga. 30341.
Dec. 5: Course on Earth Sheltered Housing & Passive Solar Systems, Jordan College, Cedar Springs, Mich.
Dec. 5-12: Caribbean Solar Tour, sponsored by Jordan College, Cedar Springs, Mich.
Dec. 7-9: Lighting World International exposition and conference, New York City. Contact: Robert A. Weissman, Exhibit Manager, National Expositions Co., Inc., 14 W. 40th St., New York, N.Y. 10018.
Dec. 8-11: Conference of Thermal Insulation, Materials and Systems for Energy Conservation in the '80s, Clearwater Beach, Fla. Contact: Marjorie C. Matthews, Oak Ridge National Laboratory, P.O. Box X, Oak Ridge, Tenn. 37830.
Dec. 9-10: Life-Cycle Costing workshop, University of Wisconsin, Madison.
Dec. 9-10: Professional Marketing Workshop, Los Angeles. (Repeat workshops Feb. 4-5, Washington, D.C.; Mar. 25-26, Oklahoma City; April 29-30, Atlanta; June 3-4, Chicago.) Contact: PMW Registrar, BIDS, Inc., Operations Center, P.O. Box 3344, Springfield, Ill. 62708.
Dec. 10-11: Construction Cost Estimating and Bidding seminar, Towson, Md. Contact: Center for Management Development, College of Business and Management, University of Maryland, College Park, Md. 20742.
Dec. 11-13: ACSA/CSBA Joint Annual Conference, San Francisco. Contact: Jacquie Howell, Conference Executive, ACSA Foundation for Educational Administration, 1575 Old Bayshore Highway, Burlingame, Calif. 94010.
Dec. 12: Harvard Architectural Review Forum, "Urban Monument," Cambridge, Mass. Contact: Paul Bentel, The Harvard Architecture Review, Gund Hall, 48 Quincy St., Cambridge, Mass. 02138.
June 6-10: AIA National Convention, Honolulu, Hawaii.

LETTERS

Registration and Exclusiveness: In recent issues of the JOURNAL, letters have expressed some well developed concepts as to why the National Council of Architectural Registration Boards should not require an individual to have only a professional degree in architecture from an accredited school for certification. Beyond the philosophical reasons, there is a very practical reason that should suggest that our profession tread very lightly on this subject.

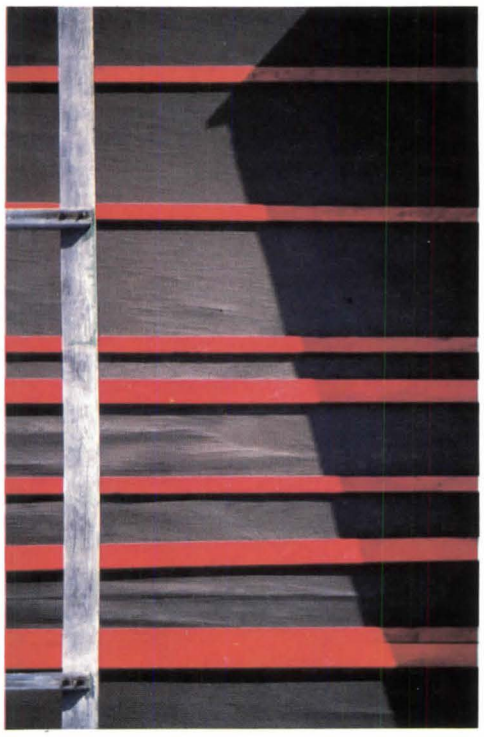
We are in danger, in many sections of this country, of loosing uniform registration for architects. For several years arguments have been made that "registration" has in fact restrained trade or competition more than it has protected public health and safety. If we apply such restrictive rules for registration so as to make architecture an exclusive organization, it would add fuel to this fire.

There is no question that registration is an important element toward maintaining basic standards of professional practice, but let those rules encourage competency and responsibility. Let us remember that registration is intended to maintain minimum standards and only motivation and inspiration with basic skills will produce excellence. At a time when the community desperately needs more highly competent and motivated architectural leaders, let us not be accused of making the profession inaccessible to hundreds of young aspirants.

We, as a profession, have and will continue to face challenges to our professional standards on many fronts. If we can truly demonstrate that the rules and standards do significantly maintain the competency and integrity of our profession, then we will win those confrontations. However, if we can't, we may truly face suspension of registration in many jurisdictions. *J. Michael Lloyd, AIA*
Farmington, Conn.

Photo Contest: I must compliment you and your jury for the photo contest awards but . . . on page 56, award of merit, detail of the Golden Gate Bridge, by John W. Moore Jr., the jury says, "The bolts almost seem to be in motion . . . a small scale demonstration of engineering discipline."

Could that august body have been confused by the difference between bolts and rivets? *F. Xavier McGeady, AIA, P.E.*
Severna Park, Md.



Congratulations on your presentation of the 1981 photo contest winners.

I especially liked Kassel Slobodien's photo on page 50.

Gordon E. Landreth, AIA
Corpus Christi, Tex.

Kassel S. Slobodien, AIA, writes: I felt I was in good company when the awards leaned so heavily toward the "art form" style. Compliments to the editors!

I was dismayed to see that my photo was *printed on its side.* A printer's error, no doubt. The shadows appear as though it was taken in a rocket to the moon—with the sun below.

(Above, the photo as intended—*Ed.)*

Energy efficiency research: In the news segment of the August 1981 AIA Journal, is a story titled "Building Industry Said Unable to Shoulder Energy Research" (page 20). We at ARCO Chemical agree with much of what is said.

The article, however, leads the reader to believe that the private sector is not actively participating in research for improved energy efficiency in buildings.

On the contrary, ARCO Chemical Co. and Drexel University, with funding from other private companies, have established the Center for Insulation Technology in Philadelphia. This ambitious program brings bright, eager young minds, seasoned professionals and research dollars and experience together in a unique venture. Compared to Uncle Sam's former efforts, our scope is dwarfed, yet, as in many things, quality, not scale, may be preferable.

At ARCO, Drexel et al. we're doing our share. *Frank X. O'Connor*
Residential and Spec. Applications Specialist
ARCO Chemical Co.

"You don't have to be the biggest to be insured by the best."

"Shand, Morahan?"

"Shand, Morahan."

It's the growing consensus of the leading architectural and engineering firms in the land: the E&O program available through Shand, Morahan & Company is about the best coverage you can have, at a most competitive premium rate. That's why so many of the ENR top 500 design and construction firms are choosing our insurance.

But your firm doesn't have to be among the biggest to enjoy the best in Architects and Engineers Professional Liability insurance. Shand, Morahan also extends its uniformly excellent claims-made program and unmatched standard of service to more and more medium and smaller-sized firms as well. These firms enjoy the same experience and attention that only the nation's foremost source for professional liability insurance can provide.

If your present Architects and Engineers Liability policy or premium might benefit from an analysis and comparision with ours, we welcome your insurance broker's inquiry. Whether you're among the biggest, or just want the best.

Shand, Morahan & Company, Inc.

One American Plaza, Evanston IL 60201

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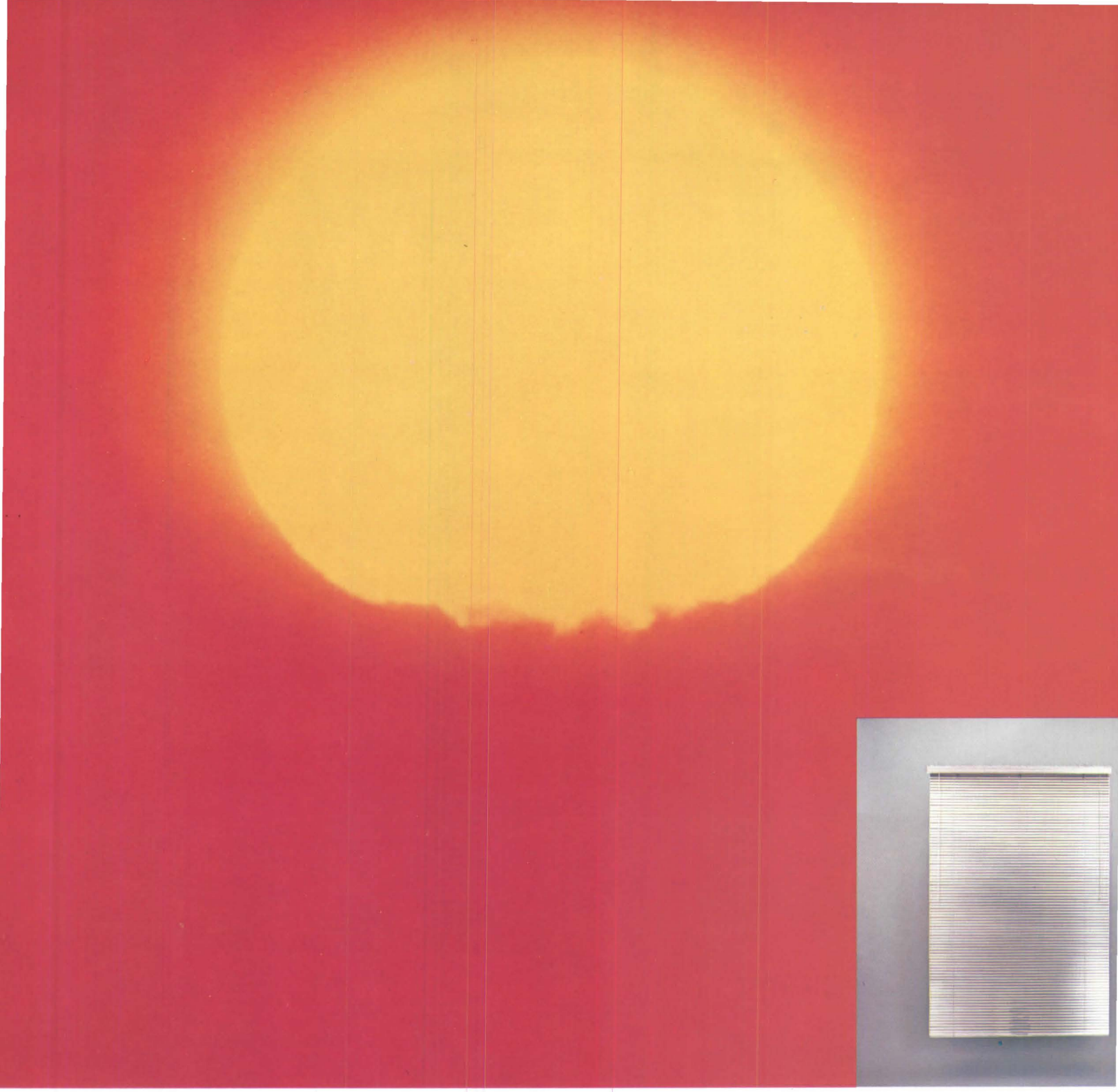


Cryotherm Treated blinds reduce solar heat gain by 55% (12% more effective than conventional blinds).

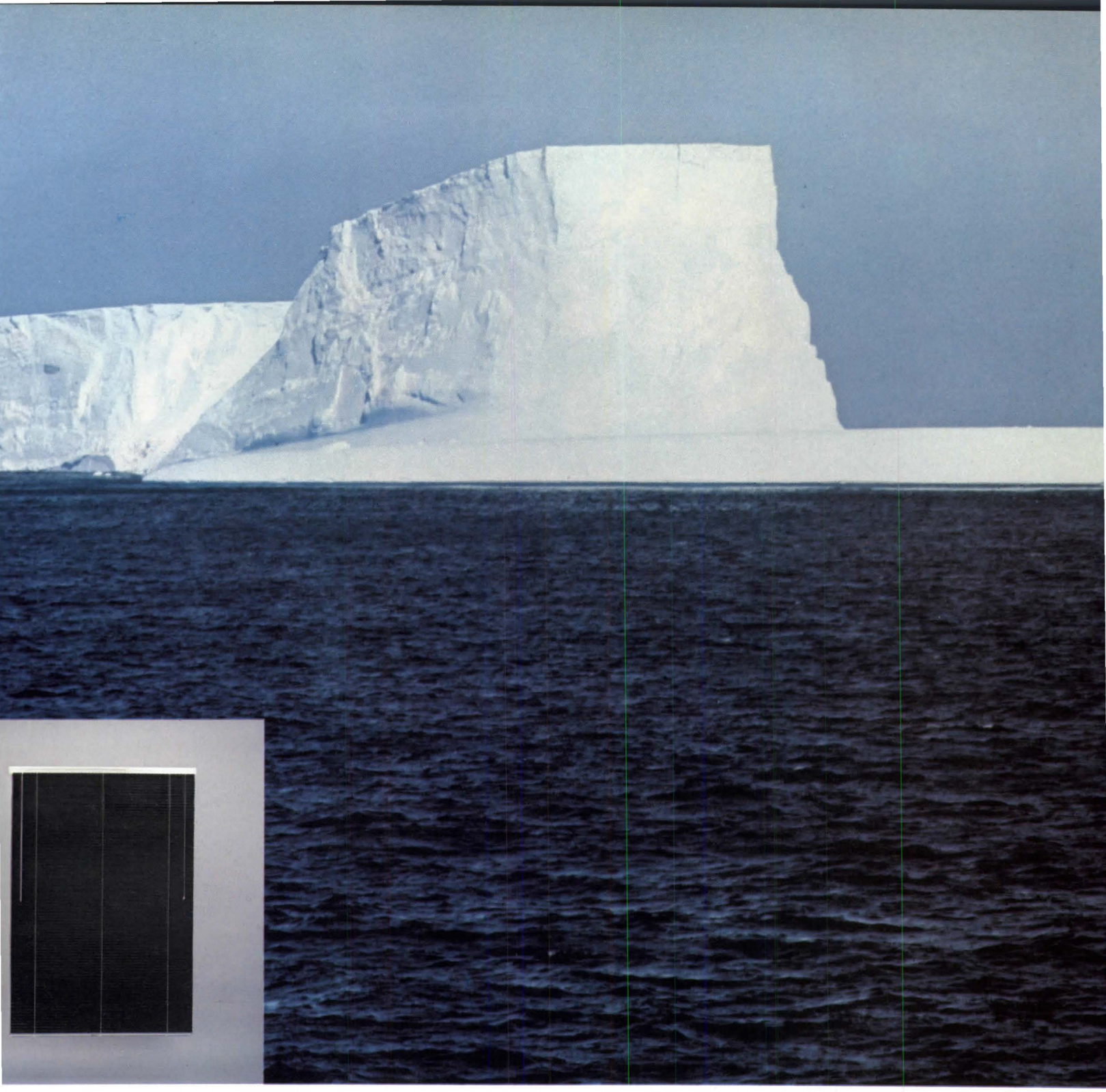
You've always known that window blinds are energy efficient. They keep out undesirable solar radiation in the summer, let in and retain valuable solar radiation in the winter, while diffusing sunlight to provide glare-free illumination all year.

And now there's something new in blinds. The Cryotherm Treated Riviera™ Blind by Levolor. An innovation in window treatments that makes blinds more energy-efficient than they've ever been before.

Cryotherm is a mirror-like metallic finish that is more than just beautiful. Its sleek surface promotes direct reflection of the entire solar energy spectrum—including infrared heat—and allows individually adjustable heat control with glare-free comfort. A definite asset in today's glass-faced buildings.

Exactly how effective is this new treatment in reducing heat gain? We asked the Stevens Institute of Technology to find out. Their find-

Detailed information about the use of these blinds in both summer and winter environments is available. Please write: Levolor Lorentzen, Inc., 1280 Wall Street West, Lyndhurst, New Jersey, 07071



ings in the accompanying chart reveal that the Cryotherm Treated blind reduced solar heat gain 12% more effectively than white blinds. Even more when the treated blind is compared to darker blinds.

But Cryotherm is only one side of the story. These blinds reverse to a dark, heat absorbing color on the other side, reducing energy costs in winter, too.

Heat loads and energy savings

Finish of blind	Total heat loads (Btu/hr.)	% Savings
No blind (clear glass)	16,086	Base
White finish blind in closed position (clear glass)	8,176*	49%
Cryotherm Treated† blind in closed position (clear glass)	7,282*	55%

Chart represents data for a typical summer day (August 21) for south-facing windows on a building located at 40° N latitude. Temperatures are 95° F outside and 75° F inside at 12 noon.

*The 894 Btu difference represents a 12% savings.

†No. 89 Brite.

CRYOTHERM™ TREATED LEVOLOR® BLINDS.

Circle 4 on information card

Mutschler cabinetry. For clients who insist the best things in life are a necessity.

Mutschler has the thoroughly proven ability to meet an architect's most imaginative design requirements. In fact, over half of all Mutschler cabinetry is custom designed specifically to an architect's specifications. Mutschler's carefully crafted and engineered cabinetry can meet any room's requirements.

For 88 years, Mutschler has anticipated storage needs — and then met those needs with imaginative solutions. Because what cabinets accomplish counts as much as appearance. Today, Mutschler storage features — many of them exclusive — represent cabinetry's highest standards in usefulness and practicality.

The people who make Mutschler cabinetry in the small town of Nappanee, Indiana, have steadfastly held out against the assembly line philosophy. Craftsmen who care, the best materials, design ingenuity — these are Mutschler's secrets.

For detailed information about the versatility of Mutschler cabinetry and our special Architect Direct Sales program, please contact:

Ron Ringenberg
Mutschler
302 S. Madison St.
Nappanee, Indiana 46550
219/773-3111

Mutschler's new Spectra design in a kitchen by Charles Mount.

Mutschler

In cabinetry it's Mutschler, and it always will be.

Mutschler Cabinetry and Bruce Hardwood Floors are Triangle Pacific companies.

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OUR HANDICAPPED RECESS GIVES NON-HANDICAPPED ACCESS.

Specifying a handicapped drinking fountain for a narrow corridor can be a bit challenging. The more the protrusion, the narrower the corridor. At Haws, we believe that drinking fountains should compliment good architecture. So we designed our model HWCT6. For the handicapped, a wall recess permits complete access. For the non-handicapped, an uninterrupted corridor permits normal access.

Bringing refreshments to **all** people may not be the easiest way to manufacture drinking fountains. But at Haws, we think it's the only way. For complete information contact:

Haws Drinking Faucet Company
P.O. Box 1999, Berkeley, CA 94701
Phone 415/525-5801 — TELEX 33-6358

Haws®

Circle 7 on information card

Energy

Most States Adopt Codes Using Component Performance Model

The California Energy Commission recently adopted stringent energy standards for new housing that allow either a prescriptive or a performance approach. The adoption of this code reinforces California's position as one out of only five states whose energy code is not totally based on the American Society of Heating, Refrigerating and Air-Conditioning Engineers standard 90-75.

States are required to develop and carry out an energy conservation plan under the federal Energy Policy and Conservation Act of 1975. The act requires implementation of several energy conservation strategies, including mandatory lighting efficiency standards and insulation requirements for new and renovated buildings. Only two states, Alaska and Louisiana, do not have energy codes. Besides California, Arizona and Pennsylvania are the most recent states to adopt energy codes.

The ASHRAE 90-75 code is basically a component performance standard in which the building components, such as the envelope, lighting system and HVAC system, must meet certain levels of efficiency. Section 10 of the ASHRAE standard does allow a total building performance approach, but the process is extremely complicated. The National Conference of States on Building Codes and Standards, Inc., estimated in 1980 that only 2 percent of the designs submitted in states that use ASHRAE 90-75 as the basis for their energy code use the total building performance approach. This compares to a rate of 33 percent in North Carolina where the code mandates the use of the total performance approach for all buildings over 15,000 square feet in size.

In the California residential code the total building performance approach establishes energy budgets (based on research undertaken for the federal Department of Energy's proposed building energy performance standards) for 16 climatic zones. To evaluate a building's performance two computer programs can be used, DOE-II and Cal-Pass.

In addition, the commission is developing a point system for simplified budget calculations that will rank the energy savings of various design, material and efficiency features. Positive points will be given for passive solar components. This point system is also designed to help consumers measure the energy efficiency of housing products.

The California Energy Commission believes that, mostly through the prescriptive approach, the use of passive solar designs will increase in the near future. This part of the energy code provides three "packages" for energy-conserving houses. The first calls for passive solar designs with 40 percent of the window area facing more or less south (plus or minus 22 and one-half degrees), leaving one-half of the concrete slab floor exposed (although it can be covered by tile or linoleum), low R-value insulation in the ceilings and the walls and in some climate zones optional shading devices. These energy measures are expected to add $500 to $4,000 to the cost of a new house, the commission says.

John Chandley of the commission expects that the market response to the new standards will go generally in the direction of this passive solar package. Once builders "begin to appreciate the competitiveness of passive solar design, the building industry will move more and more toward using these less costly construction techniques," Chandley says.

The second package incorporates a more traditional design approach that requires on the average R-30 roof and R-19 wall insulative values, although the values depend on the climatic zone. This approach is expected to add $1,000 to $5,000 to the cost of a new house, says the commission. The third package calls for the use of a solar hot water heater and allows lower insulative and glazing values. This system will cost between $2,800 and $6,000, says the commission, but the homeowner can take advantage of a 55 percent energy conservation tax credit. The models used in the development of these packages was a 1,384 square foot house, but Chandley says they can be applied to any size house.

In most areas of the state, the commission expects that the owner of a new house will achieve net savings in five to ten years. And the commission says, the standards will cut in half the energy used by the heating, cooling and hot water systems. The standards will go into effect after a design manual and the point system have been available for at least six months or by July 1, 1982, whichever comes later.

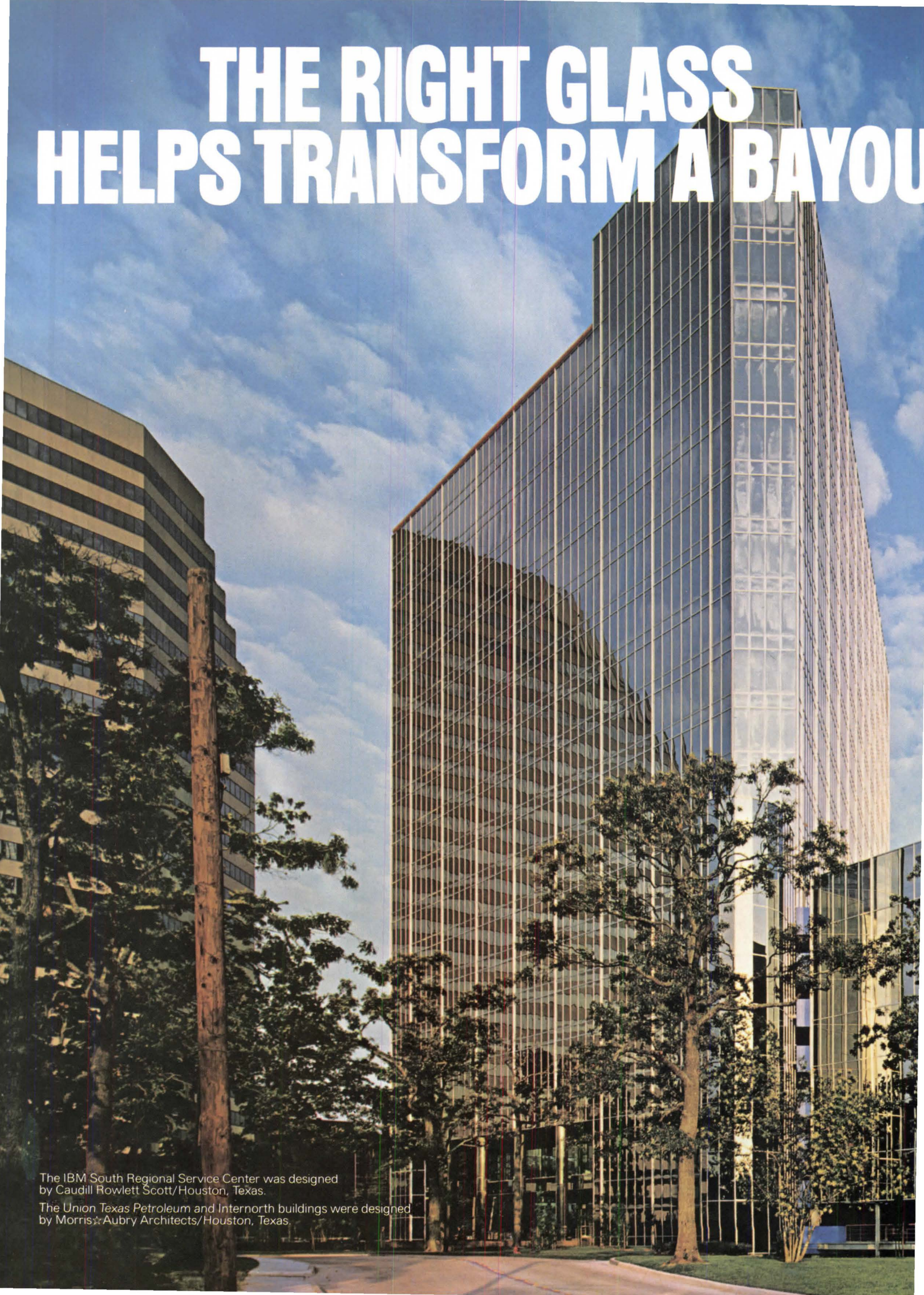
The only other state that offers a point system in its residential energy code is Florida. Points are calculated for the energy used for heating, cooling and domestic hot water. Penalty points are given for high energy consuming features and credit points for the use of nondepletable energy sources. A similar approach is provided for highrise residential buildings.

The Florida energy code, as well as the North Carolina code and the California nonresidential code, include component performance criteria based on ASHRAE 90-75, but also allow a total building performance approach. For nonresidential buildings in Florida, the annual energy use of a building design is calculated by estimating the energy consumed by nine specific building elements. This sum is compared to maximum allowable design energy budgets of thousands of BTUs per square foot per year. There are 12 building classifications and nine climatic zones.

The California code for new nonresidential buildings establishes budgets of maximum allowable energy consumption

continued on page 16

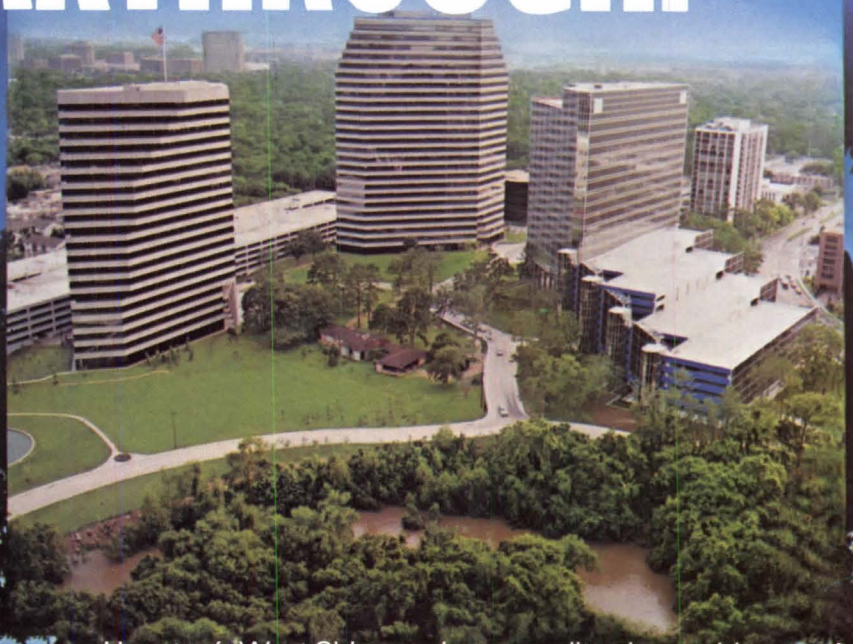
THE RIGHT GLASS HELPS TRANSFORM A BAYOU



The IBM South Regional Service Center was designed by Caudill Rowlett Scott/Houston, Texas.

The Union Texas Petroleum and Internorth buildings were designed by Morris☆Aubry Architects/Houston, Texas.

INTO A BREAKTHROUGH.



Houston's West Side now boasts a glittering architectural landmark in the midst of a once-bleak bayou landscape.

At the heart of the 28-acre complex is an imposing group of three new office buildings bound by a graceful visual harmony.

The right glass strikes the keynote. Tying the complex together are the silver tones of two different high-performance glass products from PPG.

A spectacular, jewel-like curtain wall of PPG Solarcool® Gray reflective glass lets the new IBM Southern Regional Service Center mirror its setting on all three sides. Even the three-section garage enhances the parklike atmosphere, since it's clad in the same reflective spandrel glass.

And the insulating qualities of the glass work beautifully—and economically—with IBM's state-of-the-art, computer-directed climate control system.

To the east and west of IBM's triangle rise the stately three-stepped towers of the Union Texas Petroleum Building and its near twin, the Internorth Building. Both are wrapped in ribbons of Twindow® units of PPG Solarban® 550-20 (2) clear glass.

It was chosen not only to sustain a striking overall aesthetic effect but also because energy load studies showed its insulating powers to be most effective in reducing thermal load and providing comfort in sunlit exposures.

That kind of flexibility is typical of the problem-solving potential of PPG's tremendous variety of beautiful, energy-efficient glass products.

With such a broad spectrum of colors, reflective surfaces and performance capabilities, PPG has the right glass for the project you're working on now.

To find it, just check Sweet's 8.26/Pp. And write to PPG Industries, Inc., One Gateway Center, Pittsburgh, PA 15222.

We can help turn your latest brainstorms into breakthroughs.

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Circle 8 on information card

Energy *from page 13*
per year in terms of thousands of BTUs per gross square foot of conditioned floor area. There are 15 categories of buildings and 15 climatic zones.

The North Carolina code sets budgets for peak hour building energy performance for buildings over 15,000 gross square feet. The code establishes maximum allowable simultaneous loads in terms of BTUs per gross square foot. There are seven categories of buildings and four climatic zones.

In Kansas the state energy code is administered by utility companies and new buildings must comply with the standard to be connected to the utility service. The code requires that the total heat loss of the building not exceed 35 BTUs per hour per square foot of floor area, establishes a minimum efficiency level for airconditioning equipment and incorporates the lighting energy criteria of ASHRAE 90-75.

The Wisconsin nonresidential energy code varies from ASHRAE 90-75 in that it specifies a thermal performance value of the entire exterior envelope instead of separate overall thermal transmittance values for exterior walls and roofs. Thermal transmittance values are expressed in BTUs per hour per square foot of above-grade exterior envelope and represent maximum allowable design heat loss, excluding infiltration and ventilation. Thermal performance values vary with the number of stories of the building.

Of the other states, 12 have adopted ASHRAE 90-75 as their energy code, while others have adopted codes based on the 90-75 standard, such as the Model Code for Energy Conservation in New Building Construction (MCEC, 15 states) and the model energy codes of Building Officials and Code Administrators International (BOCA, three states), International Conference of Building Officials (ICBO, three states) and Southern Building Code Congress International (SBCCI, two states). Thirteen states have developed their own codes using ASHRAE 90-75 as a technical basis or adaptations of one of the model codes.

States have often significantly modified ASHRAE 90-75 and the model codes by:

- amending the lighting energy criteria to make it less difficult to enforce;
- providing additional prescriptive approaches for one- and two-family houses;
- upgrading requirements for thermal envelopes, especially exterior walls, to be more stringent;
- providing ways to consider the effect of thermal mass in the building envelope;
- requiring vapor barriers in residential construction;
- updating requirements for the efficiencies of HVAC system equipment and water heater equipment;
- limiting over-sizing of HVAC systems;
- revising systems analysis requirements to be either more specific or less specific relative to the comparison between a standard design and an alternative design.

Senate Urged to End Funding For Conservation Services

AIA and 10 other organizations have urged the Senate to eliminate funding for the residential conservation service program, which they called "federally subsidized competition to small businessmen who wish to provide energy audit and energy conservation services."

The residential conservation service program requires that large natural gas and electric utilities offer consumers onsite energy audits and related conservation services. The commercial and apartment conservation service program requires that utilities provide simplified energy audits for their customers.

At this writing the Senate has not recommended funding for the commercial and apartment conservation service, although $7 million has been appropriated for the residential conservation service program (RCS). An amendment offered by Sen. Robert Dole (R.-Kan.) would eliminate funding for the RSC program and redirect those funds to state and local programs.

In arguing against the RCS program the 11 organizations pointed to estimates by the Department of Energy that "at most only 7 percent of the eligible customers will participate." DOE also estimates that the cost for implementation will be $4.9 billion and because of the statutorily imposed limitations on what utilities may charge for RCS audits, "all customers on the utilities system will have their rates raised." The 11 organizations also pointed to a recent Oak Ridge National Laboratories study that suggests low- and fixed-income people are less likely to participate in the RCS program and that it will be actually subsidizing the audits of middle- and upper-income people.

The organizations also argued that the program discourages small businesses from providing solar and energy conservation services. "At a time when high energy prices, tax incentives and state and local energy policies are creating a flourishing market, the RCS program is mandating that public utilities perform rate payer subsidized services in competition with independent small businesses," the letter states.

Joining AIA are the Air Conditioning Contractors of America, American Consulting Engineers Council, American Gas Association, Mechanical Contractors Association of America, National Association of Home Builders, National Association of Plumbing/Heating/Cooling Contractors, Washington Gas Light Co., ENSEARCH Corporation and Columbia Gas Distribution Companies.

In a separate letter AIA President R. Randall Vosbeck, FAIA, called for the elimination of the commercial and apartment conservation service, as well as the RCS, to "provide a greater incentive for many more small businesses to provide energy conservation services, without the burden of federally imposed competition."

Design Professionals Promote Cooperative Energy Programs

The Interprofessional Council on Environmental Design at its September board meeting called for cooperation between architects, engineers, landscape architects and planners for the advancement of energy-conscious design, along with the teaching of energy-conscious design principles and development of supporting research.

The ICED board adopted statements provided by its energy conservation issues committee, which had previously decided that energy-conscious design was a common goal of all ICED member organizations—AIA, American Consulting Engineers Council, American Planning Association, American Society of Consulting Engineers, American Society of Consulting Planners, American Society of Landscape Architects and National Society of Professional Engineers.

On the need for professional cooperation in energy-conscious design of buildings, the board agreed that in the future "there will be a need for well-balanced teams of professional people properly educated and qualified to handle the many different problems of energy-conscious design for the total physical environment." ICED board members agreed to be a "framework" for the "voluntary development of interdisciplinary trust and understanding."

On professional education, the board agreed to support cooperative educational

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Energy *from page 16*
programs among member societies, such as AIA's "Energy in Architecture" program. Cooperative efforts should also include sponsorship of seminars and workshops; self-study programs; resource data books; collection of operation data for existing buildings; recommendation of necessary capital and operating energy conservation measures to make buildings more efficient, the board agreed.

On the need for energy research, the board adopted a statement saying that such research "will benefit the design professionals and the public through increased awareness of their individual responsibilities and the interdependent nature of their activities, and will foster more effective cooperation in the process of designing, operating and retrofitting the built environment." Research should be geared, said ICED, toward a better understanding of the knowledge necessary for energy-efficient planning, design and operation of communities and buildings; identification of what relevant knowledge is available, along with translation of this knowledge into useful design information, and a study of areas where needed knowledge is insufficient or nonexistent.

Institute

Board Gives Energy Program Top Priority Through 1983

The Institute's "Energy in Architecture" program will receive top priority through 1983, AIA's board of directors agreed at its August meeting in Charleston, S.C.

The program was first approved by the board in May 1980 to help architects "understand and practice energy-conscious design as naturally as they concern themselves with good design itself," said the Institute's energy committee, which developed the program. AIA board members and staff are now actively promoting the program with the goal that more than 8,000 AIA members will participate by the end of 1983.

The program is designed to teach participants how they can substantially reduce energy consumption in buildings through careful design based on knowledge of energy principles and analyses of alternative strategies. It is divided into three levels of increasing proficiency.

Level one, titled Energy in Design: An Overview, is a very basic program to help individuals acquire a broad awareness and appreciation of energy-conscious design. The major text for the seminar is *Energy in Architecture.* There is a $7 fee ($9.95 for nonmembers) that covers the cost of the book.

The level two workshop, Energy in Design: Techniques, is a two-day, 14-hour workshop focusing on fundamentals, techniques and options needed to incorporate energy considerations into the design process. The cost is $150.

There are two level three workshops. The first, Energy in Design: Process, concentrates on the application of design techniques. With the assistance of an instructor, a workbook and regional case studies, participants select appropriate techniques for the design process and evaluate the results. The problems are keyed to specific climatic regions. The second level three workshop, Energy in Design: Practice, allows the participants to solve an actual design problem keyed to a specific climatic region. Both are two-day, 14-hour sessions, and each costs $275.

In all there will be 44 workshops in 1981. AIA's goal is to present as many as 250 sessions by the time the program ends.

In other action, the board approved "in concept" a management reorganization of the Institute. The executive committee will approve details of the reorganization, subject to final review and ratification by the board in December.

Basically, the plan calls for restructuring AIA and its subsidiary corporations: AIA Foundation, AIA Research Corporation, AIA Corporation and Production Systems for Architects and Engineers, Inc. The proposed reorganization calls for consolidating them into three entities: AIA, AIA Foundation and AIA Service Corporation. AIA Foundation would include the current foundation merged with AIA Research Corporation; AIA Service Corporation would include the income producing activities of AIA, such as PSAE, the AIA JOURNAL, publications, fulfillment and marketing, and AIA would include the professional membership functions of the Institute.

Reasons given for the reorganization are: the achievement of Institute-wide objectives; an increased effectiveness of membership services; a better delineation of member dues; a more effective management of income producing activities through the creation of three-year business plans; five-year strategic plans; the broadening of AIA Foundation's base and its endowment campaign; the creation of greater unity of purpose, and the allowance of greater flexibility to meet new opportunities and constraints.

The board also elected John Naisbitt as the Institute's public director for 1982-83. Naisbitt has been publisher since 1973 of *The Trend Report,* a quarterly summary of emerging trends in the U.S. A resident of Washington, D.C., he has served as senior vice president of the research firm Yankelovich, Skelly & White, as chairman of the board of the Center for Policy Process, and chairman and president of the Urban Research Corporation. He is currently a director of the CRS group and of the Corporation for Enterprise Development.

Naisbitt has had both governmental and business experience. He served on the White House staff as special assistant to Lyndon Johnson, was special assistant to former Health, Education and Welfare Secretary John W. Gardner and was assistant to former U.S. Commissioner of Education Francis Keppel. He also served as an executive with IBM and Eastman Kodak Co.

Among other actions, the board also did the following:

- Reaffirmed a 1977 policy stating that neither architects, engineers nor contractors should take action in connection with the licensing or other laws that would have the effect of reserving to themselves construction management markets;
- Approved the 1982 dues at the same level as 1981 and approved the discontinuation of the $10 contribution to the legal defense fund;
- Approved the creation of a six-member task force to initiate development of a life safety program in 1982;
- Tabled until December the approval of a supplemental booklet to AIA's "Hand-

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The AIA Energy in Design workshops scheduled for December and January are:

Dec. 3-4: Practice workshop, Wichita, Kan.
Dec. 4-5: Techniques workshop, Milwaukee.
Dec. 4-5: Practice workshop, Phoenix and Houston.
Dec. 11-12: Techniques workshop, Boise, Idaho.
Jan. 7-8: Practice workshop, Detroit.
Jan. 21-22: Process workshop, Arlington, Tex.
Jan. 22-23: Process workshop, Washington, D.C.
Jan. 29-30: Process workshop, Providence, R.I., and Birmingham, Ala.

For more information contact Brenda Henderson at Institute headquarters (202) 626-7353.

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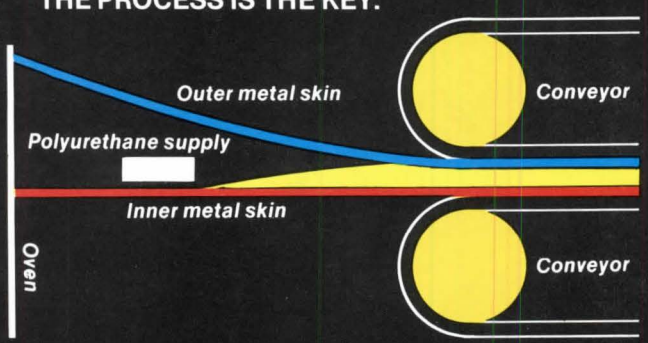

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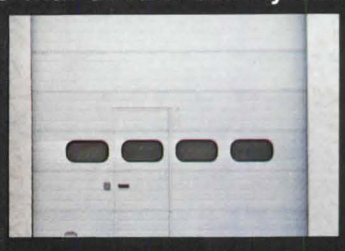

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Institute *from page 18*
book of Architectural Design Competitions" that would discuss guidelines for competitions sponsored by developers;
- Accepted the recommendation of the architects liability committee to continue commendation of the CNA/Schinnerer liability insurance program;
- Approved revision of AIA document A201, "General Conditions of the Contract for Construction";
- Approved for sale AIA documents A511/CM, "Guide for Supplementary Conditions, Construction Management edition"; A512, "Addition to Guide for Supplementary Conditions"; A571, "Guide for Interiors Supplementary Conditions," and M101, "Glossary of Construction Industry Terms";
- Authorized the Directions '80s task force to study proposed statements of philosophy and purpose, suggest amendments while retaining the existing statements of objects as found in AIA's bylaws.

Cities

Pennsylvania Avenue Projects Changed; Post Office to Open

Plans have changed for two key elements in the redevelopment of Washington's Pennsylvania Avenue: the Willard Hotel renovation and new housing. Meanwhile, first occupancy of the rejuvenated old post office building, another Pennsylvania Avenue landmark, is scheduled for next spring, two years behind original estimates.

The Willard project has a new lead developer, Oliver T. Carr, and a somewhat altered program, but Hardy Holzman Pfeiffer Associates remains the architect. The original developer, Stuart Golding, stays as a partner in the venture after almost three years of unsuccessful attempts to secure financing. Golding was chosen over Carr and other developers in December 1978.

The new program for the 80-year-old hotel and an adjacent tract fronting the avenue reduces planned hotel rooms from 600 to 350 and adds 225,000 square feet of office space, a mix of uses that Carr insists is necessary to ensure financial success. The main architectural feature of Hardy Holzman Pfeiffer's original proposal—an infill building with setbacks in the Beaux-Arts, mansard-roofed style of the hotel—remains, Carr told the board of the Pennsylvania Avenue Development Corporation (PADC) last month. "We are aware of the sensitivity" of the design, he said. "Modifications will not change the esthetics."

Carr's firm has been active in recent development of Washington's retail core just north of Pennsylvania Avenue. He has pledged to arrange financing by next month and to have the project completed by early 1984.

PADC, a federal agency in charge of renewing the avenue between the Capitol and White House, has received an economic report prepared by Hammer Siler George Associates and the PADC staff recommending revision in plans for the housing sector in its jurisdiction. The agency's 1974 proposal called for construction, east of the FBI building, of 1,500 housing units, including 250 for low- and moderate-income families, along with 475,000 square feet of office space and 325,000 square feet of retail development.

The newly recommended mix more than triples office space allowances and drops plans for the 250 units for low- and moderate-income families. "Given current market conditions, the PADC eastern sector is not a competitive site for rental housing," states the report, which concludes that the area remains competitive for highrise and midrise condominium buildings of high-priced efficiencies and one-bedroom apartments.

James Gibson, a PADC board member and Washington's city planner, concurs with the economic assessment in the housing report. He says rising land costs in the area and the continuing reduction of federal assistance for housing subsidies make it unlikely that private housing developers will locate in the PADC area.

Asked if the District of Columbia would use its federal housing assistance funds (Section 8) in the area, Gibson said he doubted that the local housing finance agency would consider it a priority in view of the need for assistance in other neighborhoods.

The Office of Management and Budget has deferred authorization of $30.4 million in federal funds for land acquisition and planning for new housing in the PADC area until the PADC commits itself to a new housing plan. The PADC board is expected to adopt a plan following hearings on the recent report.

Three blocks east of the Willard, office space renovation is complete in much of the turn-of-the-century old post office building. And GSA has recently chosen Benjamin Thompson & Associates, designer of Baltimore's Harborplace, and Evans & Thompson, developer of the Arcade in Providence, R.I., to turn the first three floors of the 10-story building into a commercial mall of approximately 50,000 square feet. (Evans & Thompson was chosen over the Rouse Co., developer of Harborplace and Boston's Faneuil Hall Marketplace, both designed by Thompson.)

The third part of the mixed use plan, development of its tower into a tourist facility, is in the design stage, with repair of the tower foundations a priority. After office occupancy next spring, the mall is to open in summer 1983 and the tower late that year.

In the resurrection of such a neglected old building, one might expect delays. In this case, they stemmed from underestimating the repair job, reluctance by GSA

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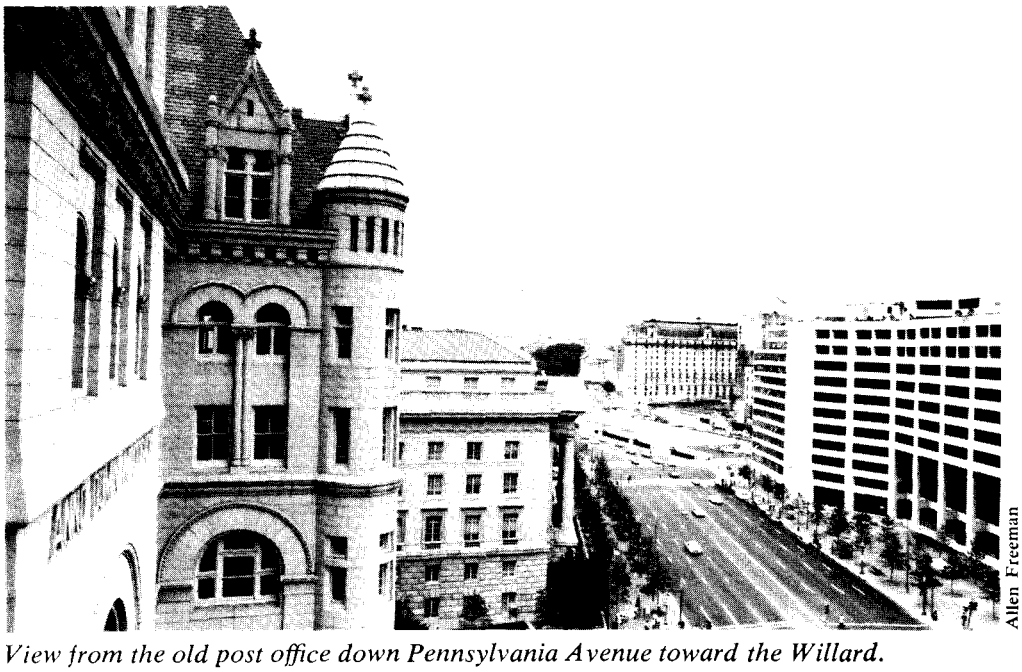


Allen Freeman

View from the old post office down Pennsylvania Avenue toward the Willard.

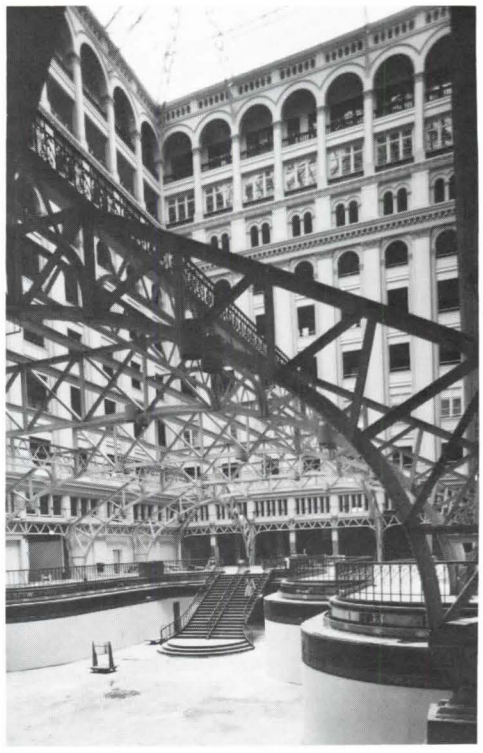
Institute *from page 21*

to seek additional funds, an enlargement of the program and one costly error.

The building was in sad shape 10 years ago and was all but torn down. GSA had declared it surplus and had received a competitive demolition bid of $400,000. The consensus was that the large gray pile with Romanesque tower and turrets and skewed site placement was an unwelcome interruption of the '20s and '30s neoclassical Federal Triangle buildings on the south side of Pennsylvania Avenue. Postal functions had long since been moved elsewhere, leaving the mail sorting floor in its central cortile unused. A low, inner roof designed for temperature control blocked the view of the office corridors that ring the 196-foot-high atrium, the skylight was covered over, the offices were dimly lit and grimy and there were no takers among federal agencies for locating there, despite the prime downtown location.

The wreckers were staved off by a single vote in a Senate subcommittee. Meanwhile, a group called Don't Tear It Down mounted a preservation campaign and *Washington Post* critic Wolf Von Eckardt wrote about its hidden esthetics and development possibilities. Arthur Cotton Moore, FAIA, and Nancy Hanks of the National Endowment for the Arts, among others, also worked to save the building.

Finally, GSA, in an about face, decided



Allen Freeman

to turn it into one of GSA's first mixed use structures and to make its renovation the test of an innovative A/E selection procedure based on a competition of ideas. From 85 initial proposals, three finalists were chosen and invited to submit detailed plans, for which they were compensated. Arthur Moore's firm, teamed with McGaughy, Marshall & McMillan, Stewart Daniel Hoban/Associates and Associated Space Design, won the competition in spring 1977.

Their design approach is a mixture of a little historical restoration (for a small cluster of offices that were once the postmaster's) and a lot of adaptive use. Most offices have been converted to open landscaping, and the lower levels are being radically changed. Most obvious are the cut-away cortile floor and removal of the inner roof, which exposes the courtyard full height up to a new skylight glazed on three of its four gables in solar glass (above). The north gable is clear for a view of the tower.

Early in the renovation, plans were abandoned to set movable solar thermal louvers just inside the skylight. This was because the load capacity of the skylight structure was indeterminable, but if that had not proved prohibitive, the payback cost factor probably would have, according to Jim Stewart of GSA.

Other problems involving cost surfaced after the job got underway. Inflation was insufficiently accounted for in the estimates, and plaster and roof damage was more extensive than originally estimated. Moore says delays resulted from reluctance on the part of GSA brass to seek more funds. But one problem resulted from an unfortunate mistake. One of the arguments of those who had wanted to

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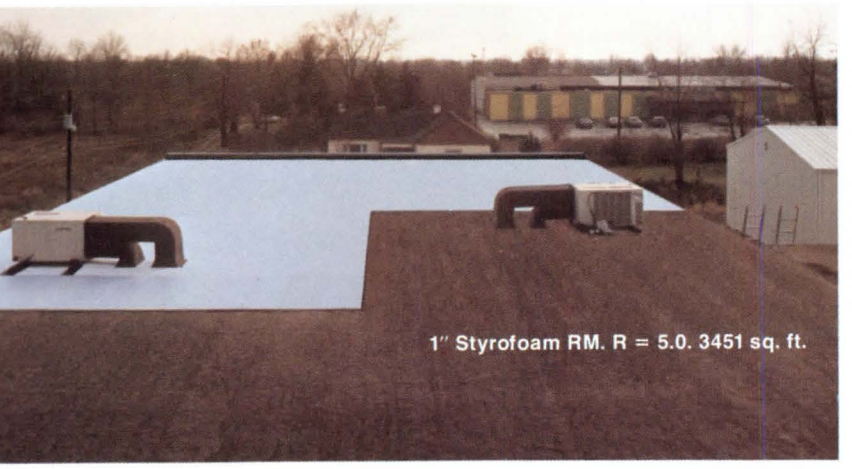

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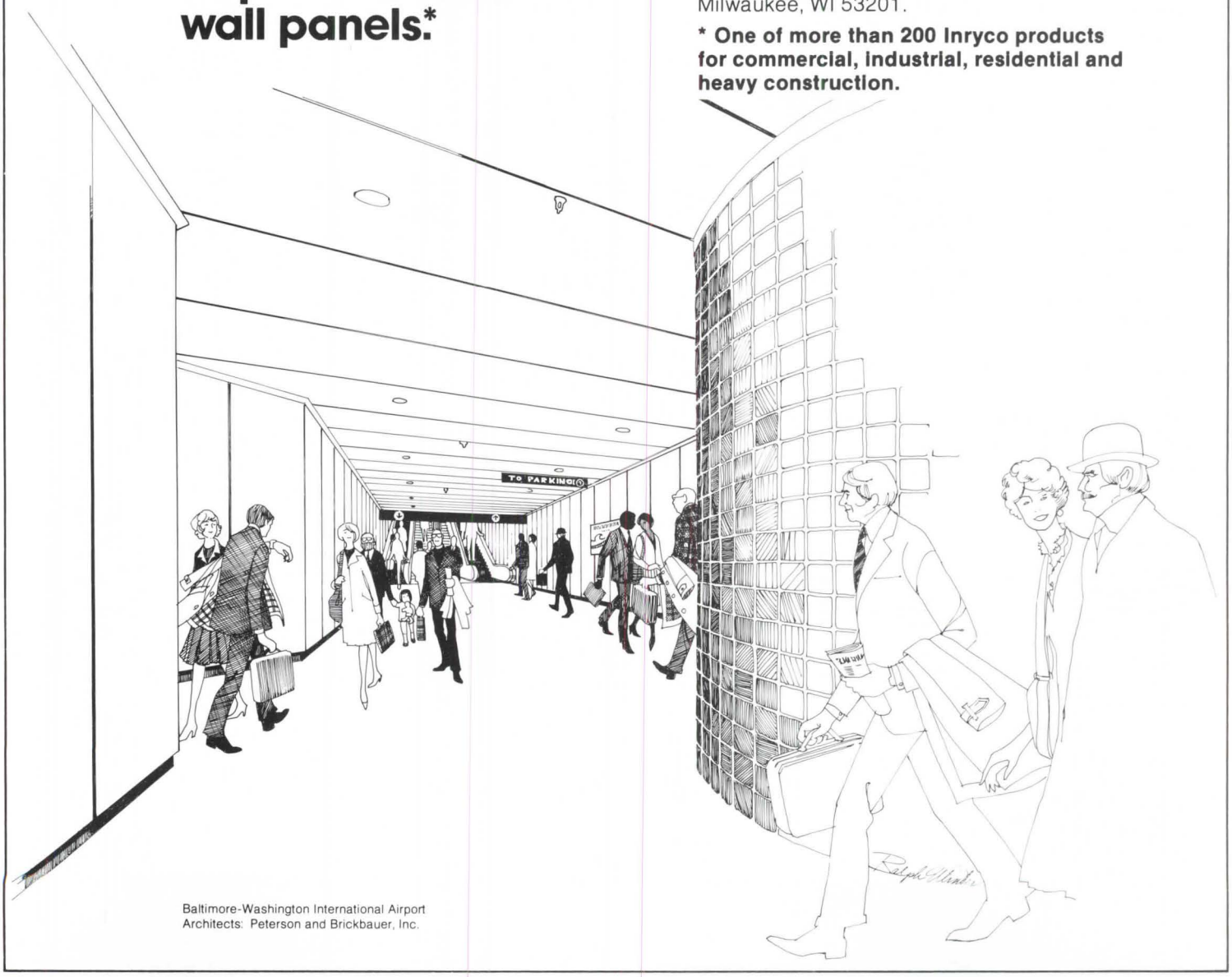

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Cities *from page 22*

tear down the building was that its wood foundations, particularly under the tower, were most likely rotten.

This opinion was premised on the belief that the area's high water table had dropped during subway excavation nearby and that the 80-year-old piles had dried out. To find out if this were so, a hole was dug at the foot of the tower, and, although the piles were found to be in good condition, the hole was left open, the water dried out and the foundations began to deteriorate. Repairs, involving a complicated procedure to reinforcement, will cost a minimum of $595,000.

Another complication involving the tower resulted from a bicentennial gift from Great Britain—a set of change ringing bells identical to those in Westminster Abbey.

In order to function properly such bells require a relatively rigid structure, so a sway test was devised, which the tower flunked if the bells were to be placed in the arcade at the top. The solution is to position the bells lower in the tower, with an observation elevator running up the tower facade inside the cortile.

Development of the tower, which could rival the Washington Monument as a popular way to view the city, is seen as important to the success of the food and retail concessions at its base, and these combined attractions are considered vital to draw Washington tourists from the Mall into the Pennsylvania Avenue corridor and beyond into downtown's retail sector.

In other plans for Pennsylvania Avenue, GSA has announced a proposal to develop the last remaining parcels in the Federal Triangle, which were left vacant in the '30s when funds ran out. One of these adjoining lots was to be the site of a "great plaza" in the plans drawn up early in the century.

GSA proposes two huge buildings for 9,000 government workers in 1.725 million square feet of offices. The plan would devote 70,000 additional square feet to retail and exhibit space. One of the buildings would flank the avenue at a corner of the recently completed Western Plaza near the Willard.

Harry Weese & Associates is GSA's planning consultant for the Federal Triangle. Jim Stewart of GSA says the agency looked at "six or seven ideas" for the property. Asked about the percentage of nonoffice use in the proposal, Stewart says space in nearby buildings may be converted to mixed use. Architects have not been chosen and the Washington arts and planning agencies have not approved the concept, but GSA plans to seek funds for at least a portion of the massive project in the fiscal 1984 budget.

Conferees Decry Budget Cuts For the Arts and Cities

Some 400 artists, arts administrators, planners, developers, preservationists, politicians and architects gathered in Pittsburgh during the first week of October for "The Arts Edge," a national conference designed to emphasize "the competitive edge" that arts and cultural facilities bring to urban revitalization. As it turned out, however, the prime topic was the Reagan Administration's proposed budget cuts both in the arts and in federal aid to cities.

Slated for debate at the conference were four types of cultural developments: single facilities, cultural districts, artists' spaces and "urban animation" schemes designed to rekindle activity in downtown areas. Each topic was broached in plenary session and debated at length in follow-up workshops from three different viewpoints: planning and financing, design and use and management and promotion.

Circumstances conspired to lift planning and financing issues to the fore in almost every discussion at the four-day conference, which was sponsored by the National Endowment for the Arts, the American Council for the Arts and a Washington-based nonprofit group called Partners for Livable Places.

The gathering was a swan song of sorts for NEA Chairman Livingston Biddle,

continued on page 29

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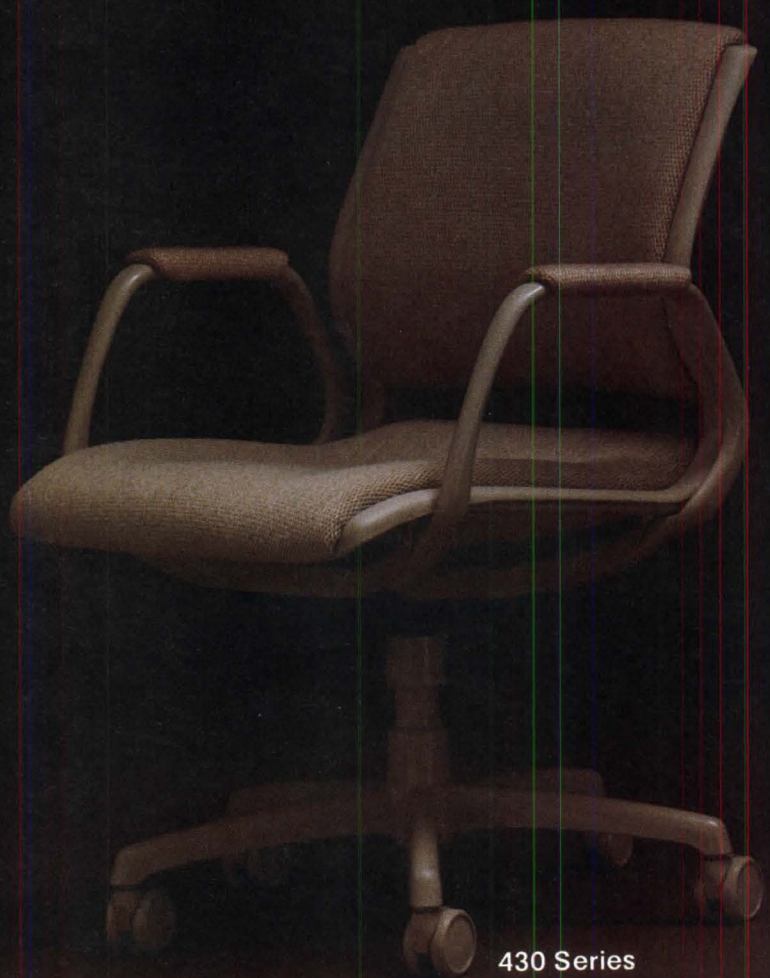

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Cities *from page 25*
who is succeeded this month by Reagan White House aide Frank Hodsell. Hodsell's reputation as a budget-slasher was much discussed in the halls of the now-in-renovation William Penn Hotel, site of the conference.

David Roderick, chairman of U.S. Steel, was one of the conference "hosts," and in his opening remarks he lauded the Reagan Administration's pro-business stance. He said the proposed 25 percent in NEA funding "may prove salutary rather than debilitating. When an institution or program relies too heavily on one source of financing, it makes itself unnecessarily vulnerable." Corporations, he said, should make up some of the reduced federal support for the arts, but not all of it. "To substitute a corporation for a federal agency is not an improvement," he said. "Any shortfall must come from the private sector *and* the public-at-large, as well as from more economical and efficient operations."

Keynote speaker Edward M. Kresky, a member of the New York State Council on the Arts and vice chairman of New York's Municipal Assistance Corporation, echoed Roderick's tone. "Surely," he said, "if the arts movement in the United States is as strong and vigorous as we all proudly say it is, if it contributes so much to the enrichment of American life as we claim it does, and if it is so important and contributes so much to our urban economy, then surely it can withstand a $40 million haircut given to it by Mr. Stockman and his friends."

The conferees, cultural facility movers and shakers of nearly every major city in the nation, responded to such remarks with surprisingly little rancor, spending little time at the follow-up workshops in criticism of Reaganomics. Instead, they plotted strategies for forging public-private sector funding partnerships and gave rapt attention to such speakers as Richard C. D. Fleming and James Cloar, whose successful downtown business coalitions have given new life and new fiscal resources to cultural efforts in Denver and Dallas, respectively.

The "artists' perspective" was brought to the conference by violinist Itzhak Perlman, actor/activist Theodore Bikel, dancer Bella Lewitzky, jazz pianist Billy Taylor, Utah Symphony conductor Maurice Abravanel and folksinger Peter Seeger. It was Bikel who made headlines in Pittsburgh's newspapers the next day. He launched a broadside against federal budget cuts and insufficient corporate support for the arts and called the $40 million haircut to which keynote speaker Kresky had referred "something only a woolly mammoth could sustain."

Perlman launched a major blast on

continued on page 31

"I swear by MASTERSPEC 2"

says Harry Schmautz, AIA, Architect & Engineer.

The other day Harry Schmautz, AIA, Partner in the 8 person general practice firm of Brinkman & Lenon, Architects & Engineers, Kalispell, Montana was talking about **MASTERSPEC 2.** His firm subscribes to both the BASIC and SHORT LANGUAGE VERSIONS. Here are some of the things he said that might be of interest to you.

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Cities *from page 29*
accessibility for the handicapped in cultural facilities. "An architect's bread and butter are stairs," he told the conference. "Add a sweeping staircase and everything looks great. Ramps just haven't gotten popular yet." Perlman described inaccessible halls from Amsterdam, where he will no longer play, to New York, where, he said, a temporary wheelchair lift has been installed backstage at Carnegie Hall. "I'm not blaming architects for not taking responsibility," Perlman told reporters during the conference. "But they should in the future." *Kevin W. Green*

News/Practice

ASC/AIA Continues to Withhold Support of Intern Program

The Association of Student Chapters/AIA has notified AIA's board of directors that it is continuing to withhold its support of the intern-architect development program, IDP, calling it inflexible and unrealistic. In response, the IDP Coordinating Committee told the AIA board that it believes the program "is workable, does address the realities of internship, is sufficiently flexible and does not place an undue burden on today's interns or their employing firms and organizations."

At issue is the IDP Coordinating Committee's "fine-tuning" of the program (which was approved by the AIA board last March) and specifically the use of the value unit system in recording and assessing internship activity. The "fine-tuning" resulted from extensive evaluations of the program by both AIA and the National Council of Architectural Registration Boards and is to provide a "more effective and accountable level of operation," in the words of the committee. The IDP Coordinating Committee's voting members consist of representatives from NCARB, AIA and the Associated Collegiate Schools of Architecture. An ASC/AIA representative sits on the committee as an observer.

Basically the IDP calls for training in 14 areas of professional knowledge and activity prior to licensing. Twenty-four states have endorsed the IDP program. Mississippi is the only state to now require the IDP as a prerequisite to registration; Arkansas will require it in 1982, Texas in 1983, Tennessee in 1984.

The value unit system was created by NCARB to record internship activity, provide more complete verification of training for state registration boards and ensure that the interns receive a comprehensive exposure to skills and knowledges needed for the practice of architecture. Under the system interns spend a pre-

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Practice *from page 31*

scribed amount of time on the 14 specific training areas of professional knowledge and activity. One value unit equals approximately eight hours of work, and a specific number of value units is established for each task (for example, 30 units are required for site and environmental analysis). In its "fine-tuning" of the program the IDP Coordinating Committee reduced the value unit requirements from 720 to 700, reduced the exposure requirements in seven out of the 14 training areas and increased the amount of "elective" activity by 63 percent.

ASC/AIA is "vehemently opposed" to the value unit system in its present form. It "will not accept the premise that all interns and all students are the same and should therefore all be put through the same mold before being allowed to sit for the registration exam," former ASC/AIA President Richard Martini wrote to AIA President R. Randall Vosbeck, FAIA. "We also have little confidence in a program that is totally quantitative and believes that quality will ultimately come out of the demand for X number of hours of any given subject. After all, does eight hours of construction drawings in a 300-person firm in Chicago necessarily equal eight hours of construction drawings in a two-person firm in Texas?"

ASC/AIA also maintains that it is impossible to complete the program in less than three years and three months, a conclusion drawn from a 1979 NCARB survey of interns in the IDP. (Most state architectural registration boards require that a candidate for the NCARB examination have three years of experience and a degree from an accredited university.) To complete the program in that time "requires the intern to follow the IDP guidelines *to the letter* without any deviation," Martini wrote. "This means that an intern works on site and environmental analysis no more than 20 days during his/her internship, otherwise the time to complete the program will be further drawn out. This value unit system allows the intern zero electives and no flexibility."

The AIA IDP evaluation task force had recommended in December '80 the elimination of the value unit system as internship requirements for registration, a point ASC/AIA emphasizes in its argument. The task force found that "the specific value unit exposure requirements in each of the 14 IDP training areas and the related activities category, as now promulgated by NCARB [720 units], are imposing an additional and unrealistic burden on those seeking architectural registration in those states that have adopted those requirements as mandatory."

The task force recommended the use of durational requirements and a "flexible instrument" to record an intern's experience. This system would relate to a firm's own timekeeping system and use as units hours, days, weeks, biweeks or months. ASC/AIA supports a system in which the intern's experience is shaped by the individual using the task force's recommendation as a guideline.

The task force's recommendation was based on an analysis of the time required to fulfill the total 720 value unit requirement, prepared by Bernard B. Rothschild, FAIA, which concludes that it is not possible for intern-architects to complete that requirement in three years, given realistic time constraints within most architectural firms. "An intern-architect might achieve the 720 value units in three years by the use of supplementary education; however, this makes participation in supplementary education mandatory or makes the minimum durational requirement extend something beyond three years," the task force said.

The task force also points to the results of a survey of IDP participants, conducted by the NCARB IDP assessment committee, which indicated that 75 percent of the intern-architects surveyed felt that there were either too many training areas, too much time required in each area and/or insufficient flexibility in the value unit system.

The lack of a pilot test on the effective-

continued on page 84

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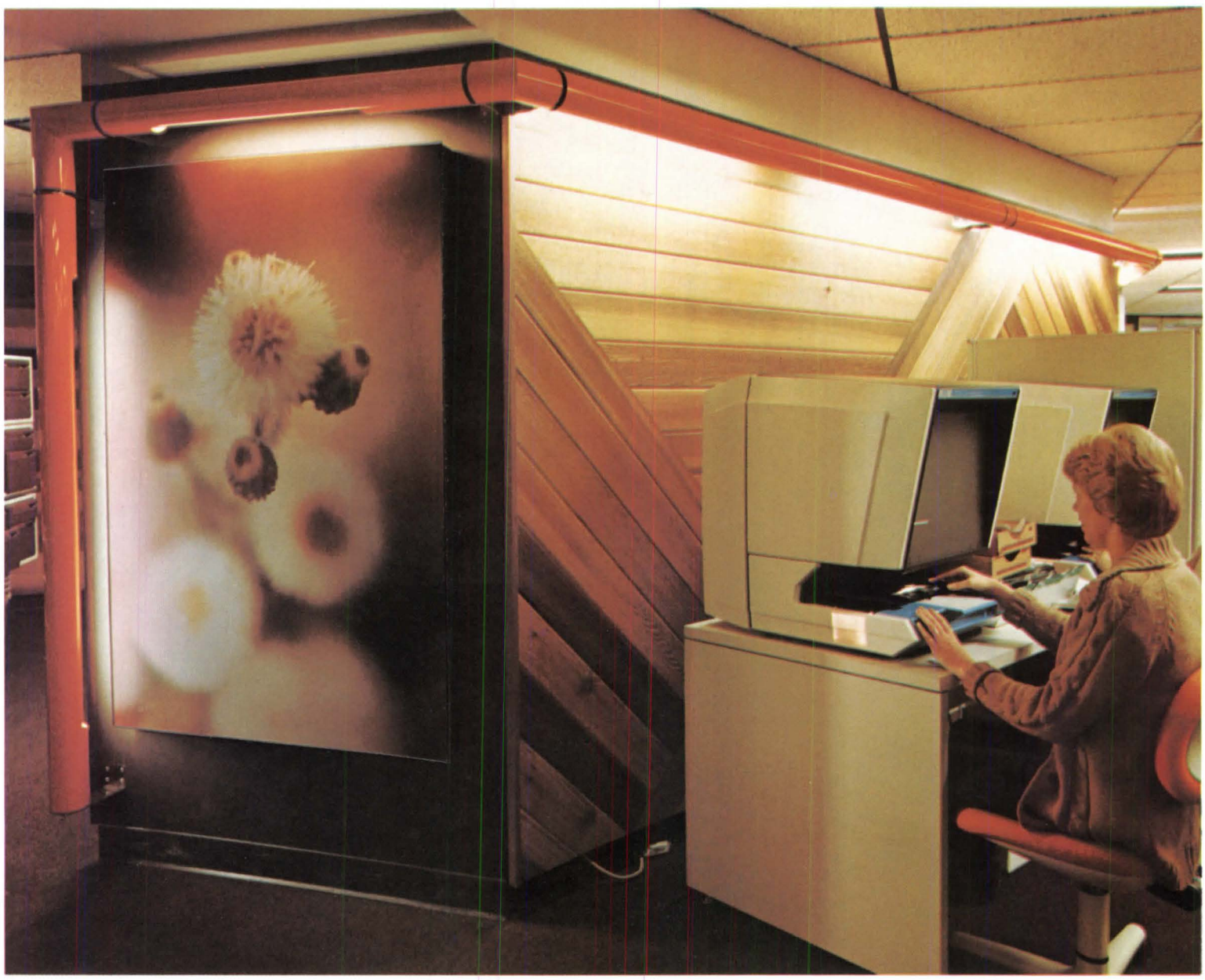

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Circle 23 on information card

Welcome!

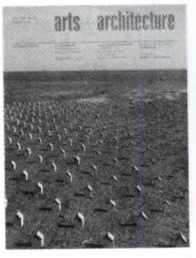
Say we to the spate of new architectural periodicals springing up around the country all of a sudden.

New York City alone now has four high-style tabloids on architecture and related design matters: *Skyline,* not new but revivified and refocused; *Express* (by the former editor of *Skyline*), *Metropolis* and *The Livable City.*

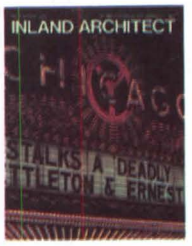
In California, *Archetype* has been joined by the new version of *Arts and Architecture,* the most influential regional force of the '40s through '60s, back after a 14 year hiatus.

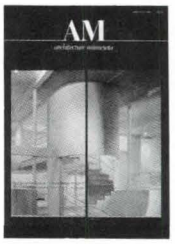
There is now an annual *Chicago Architectural Review* along with the strongly resurgent *Inland Architect* in the windy city.

AIA components are producing sturdy regional magazines in Texas, California and elsewhere, and the *Minnesota Architect* has blossomed into the colorful and widely circulated *AM.*



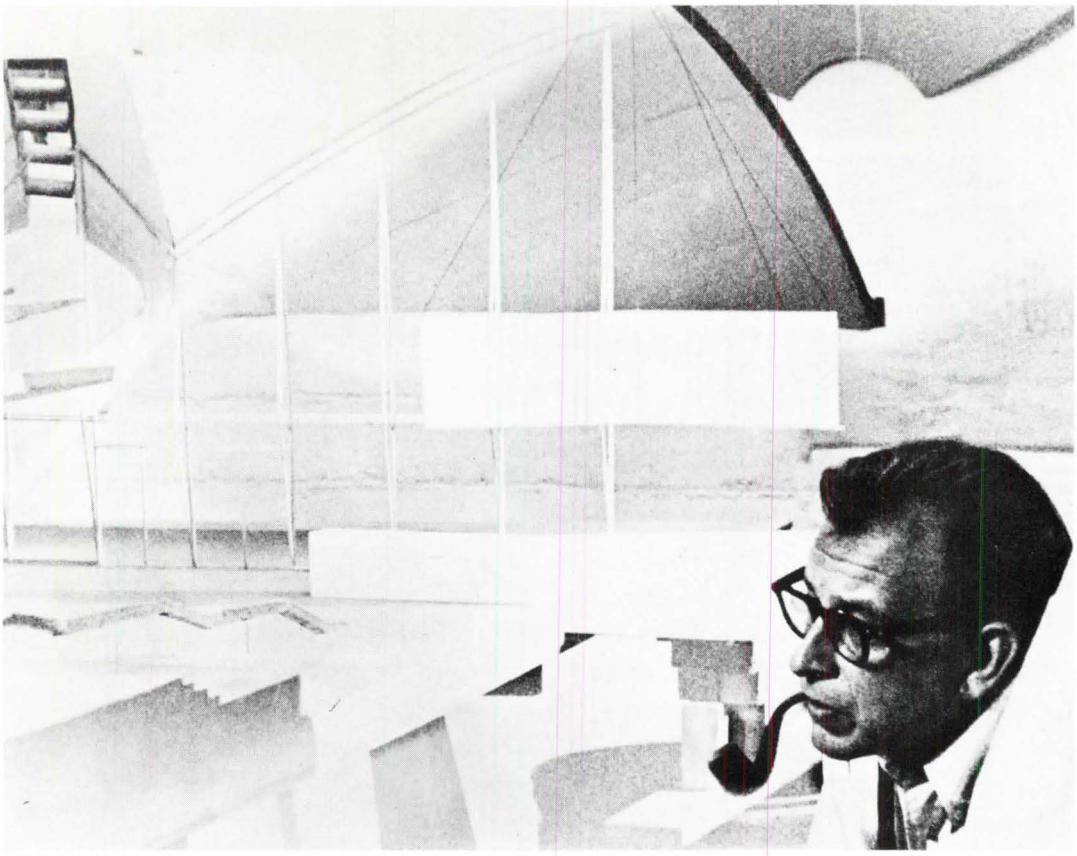
The phenomenon of this proliferation is welcome for several reasons. To begin with, it is an undeniable symptom of increased interest in architecture and architectural ideas, and should itself feed further increase.





It is especially salutary that many of the publications mentioned above go to laymen as well as architects; in fact, some are directed exclusively at laymen.

Finally, the phenomenon both recognizes and encourages regional traditions and tendencies, thus stimulating the architecture of particularity. *D.C.*

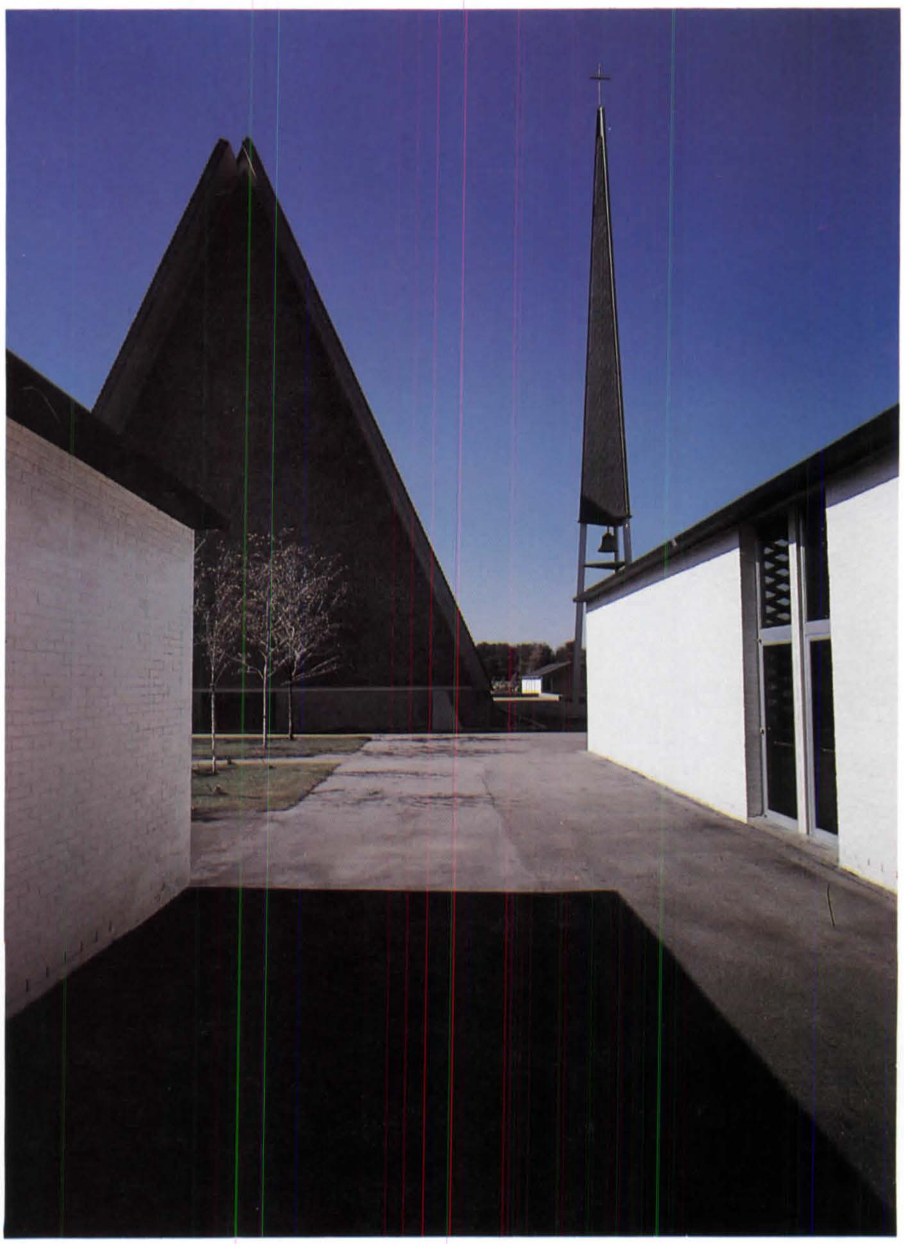


Eero Saarinen In Perspective

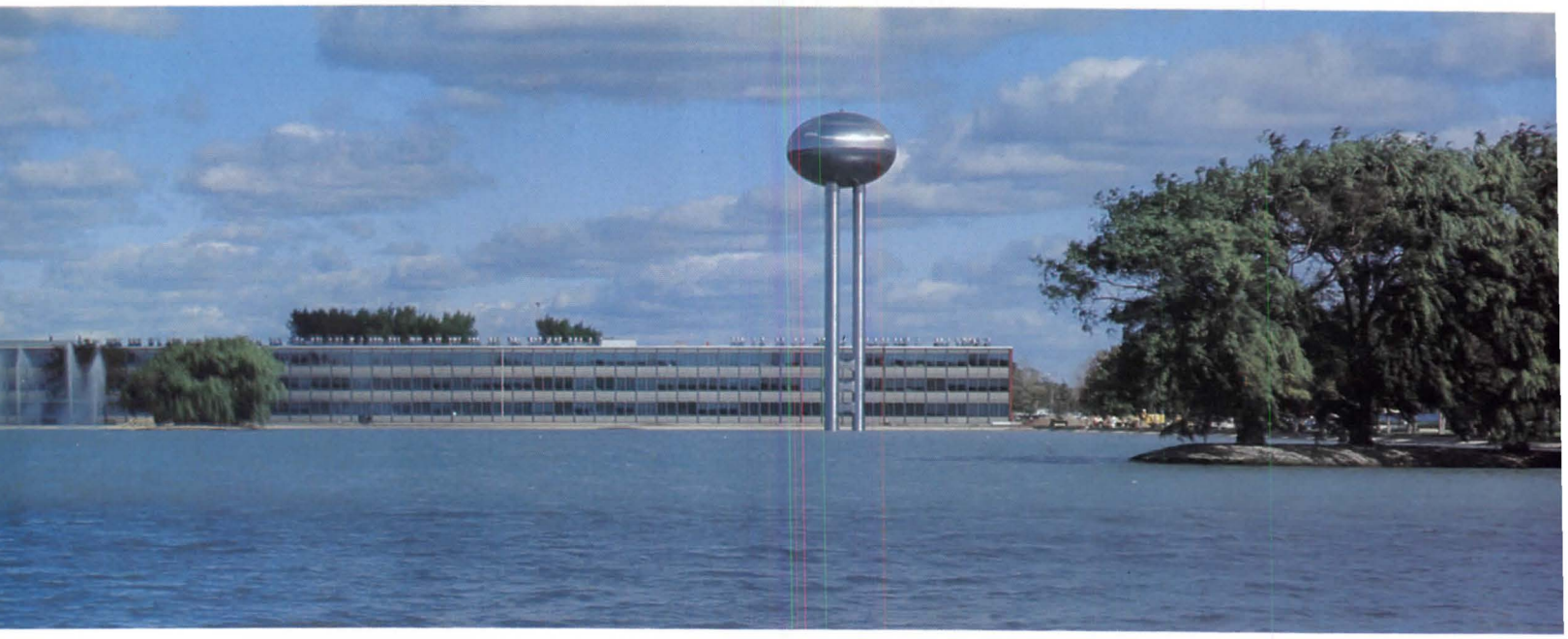
A generation after his loss, a discussion of his work and influence. By Andrea O. Dean

Photographs by Balthazar Korab

Much of Eero's youth revolved around Cranbrook, designed by Eliel (1927-43). Above, Eero with TWA terminal model; at right, his St. Louis arch.



Photographs by Balthazar Korab



During his lifetime, Eero Saarinen absorbed more punishment from critics than any other prominent architect of his generation. At a time when consistency of style and stylistic development were expected, Saarinen's unpredictability and bold diversity annoyed, even angered, many of his contemporaries. His General Motors Technical Center in Detroit (1956) was a vast Miesian ensemble dubbed "the industrial Versailles" by *Architectural Forum,* while Concordia Senior College, Fort Wayne, Ind., (1958) was, in contrast, a modest, almost vernacular-looking complex. Kresge Auditorium at MIT (1955), a domed, concrete structure, was very sculptural, as was the adjacent chapel, a brick cylinder with arches of varying sizes; the U.S. chancellery building, London (1959), would today be called contextual. The Ingalls hockey rink at Yale (1959), the TWA building at JFK airport (1962) and Dulles (1962) were highly expressive, exuberant buildings, while the CBS tower in New York City (1964) was a dark and brooding minimalist statement. Saarinen's work, wrote Vincent Scully in 1969, "embodied a good deal that was wrong with American architecture in the mid-'50s: exhibitionism, structural pretension, self-defeating urbanistic arrogance."

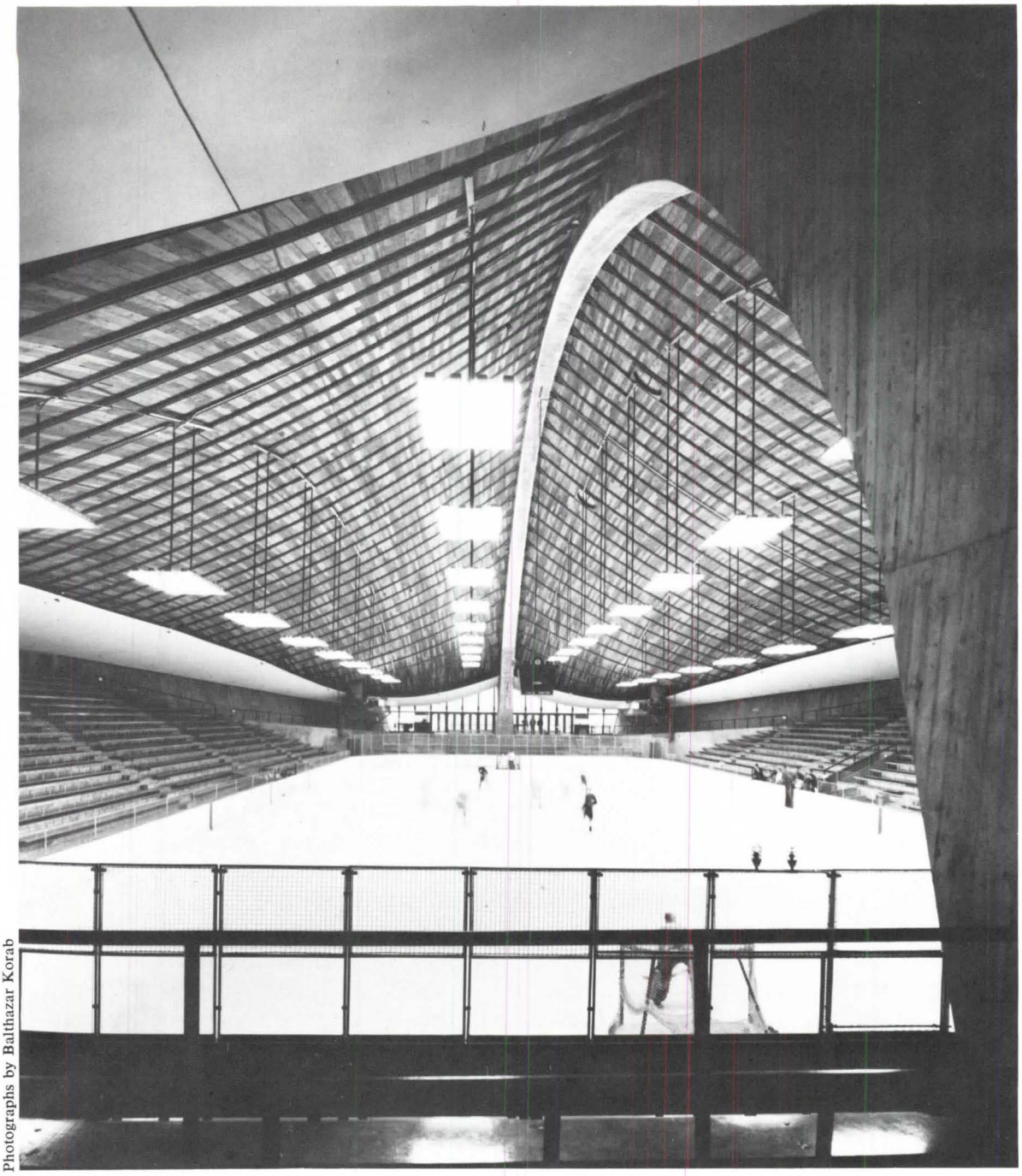
It is 20 years now since Saarinen died of a brain tumor at the age of 51, "struck down just as he reached the staircase," as Walter McQuade wrote in memorium. Since Saarinen's death, there has been an odd silence on the subject of his life, work and influence. It seems time, then, to record some opinions of critics, historians and architects who knew Saarinen well.

No other architect in memory has had as distinguished and varied a succession as Saarinen. As heirs to the office, the firm of Kevin Roche John Dinkeloo & Associates has faithfully added to the legacy it inherited by designing some of the nation's most innovative and spectacular buildings. In addition, an astonishing number of today's most prominent and influential architects spent time under Saarinen's tutelage and later developed in highly individual ways. Among them are Cesar Pelli, Charles Bassett, Gunnar Birkerts, Paul Kennon, Robert Burley, Warren Platner, Anthony Lumsden, Robert Venturi. How account for what has been called "the Saarinen spawn?"

Though a relentless achiever, Saarinen was, perhaps, better able than other famous architects to tolerate and even encourage a succession because he himself was a successor, on the one hand to his famous architect father, Eliel Saarinen, on the other, to the first generation of modern architecture's pioneers. Historian David De Long, who is organizing an extensive exhibit on Saarinen for 1983, points out that in the 1950s "when young architects looked around for innovative designers to work for they saw Mies and Wright, who were very old, rather fixed in their ways and dealing with vocabularies that didn't seem to point toward a new future. Eero Saarinen's seemed the most exciting office." Louis Kahn hadn't yet surfaced as a charismatic innovator, the large architectural firms were just beginning to emerge and, like Skidmore, most stood for a specific approach. The Saarinen office with its large, exciting commissions was, therefore, most appealing to young architects. As Gunnar Birkerts recalls, "As soon as I saw the work—Drake College, the Tech Center—I came under the spell."

Saarinen was clearly blessed with an exceptionally sensitive nose for people. And as Irwin Miller, his client for the Irwin Union Trust Co. in Columbus, Ind., (1955), says, "Saarinen appreciated brilliance in oth-

Across page, Concordia Senior College, Fort Wayne, Ind.; above, GM Technical Center, Warren, Mich.



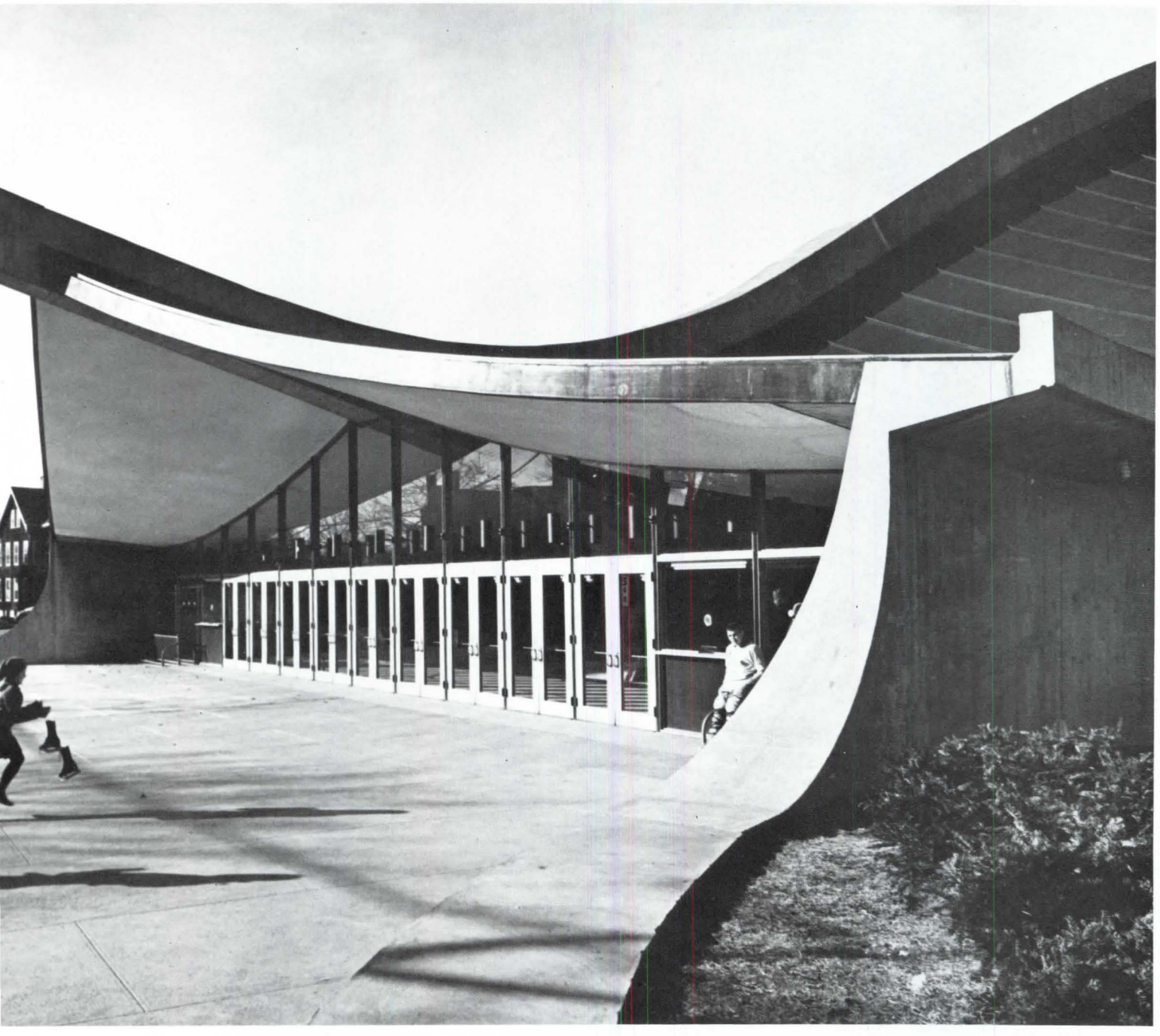
Photographs by Balthazar Korab

A continuous search for new solutions.

ers whether or not it followed his own ways." For one thing, he was supremely self confident. As McQuade has observed, "Most famous architects act a lofty role, but Eero Saarinen was too direct for that. All his pride —and there was plenty of it—went into his buildings." His total commitment to his profession explains, in part, the strong impression he left on people who worked for him. Roche remembers that "He talked of nothing but architecture; it was his whole life." And there "was much more to Saarinen than met the eye," in the opinion of architect and critic Peter Blake. "Eero's strength of character," according to Philip Johnson, "was simply beyond belief."

Architect and historian Robert A.M. Stern ventures that Saarinen's followers "each exemplified an aspect of Saarinen's very eclectic personality and outlook. Roche developed the notion of the architectural organization, the big scale project, the experiment with new materials, the possibilities of the technological age. Then you have Pelli and Birkerts, who pushed the expression of technology in a kind of pictorial way, glittering, even glitsy, but done with great panache and adapting the ideas of technology to the marketplace with integrity. And there is Venturi, who represents the symbolically expressive, metaphorical side of Saarinen. The wonderful thing about Saarinen was his ability to combine all these things and move them from building to building with a responsive attitude."

Most characteristic and unique, especially during the very doctrinaire postwar period of architectural history, was Eero Saarinen's continuous search for new solutions. This attitude became known as using "the style for the job." As Johnson puts it, "Eero was the leader of the movement toward more individual archi-



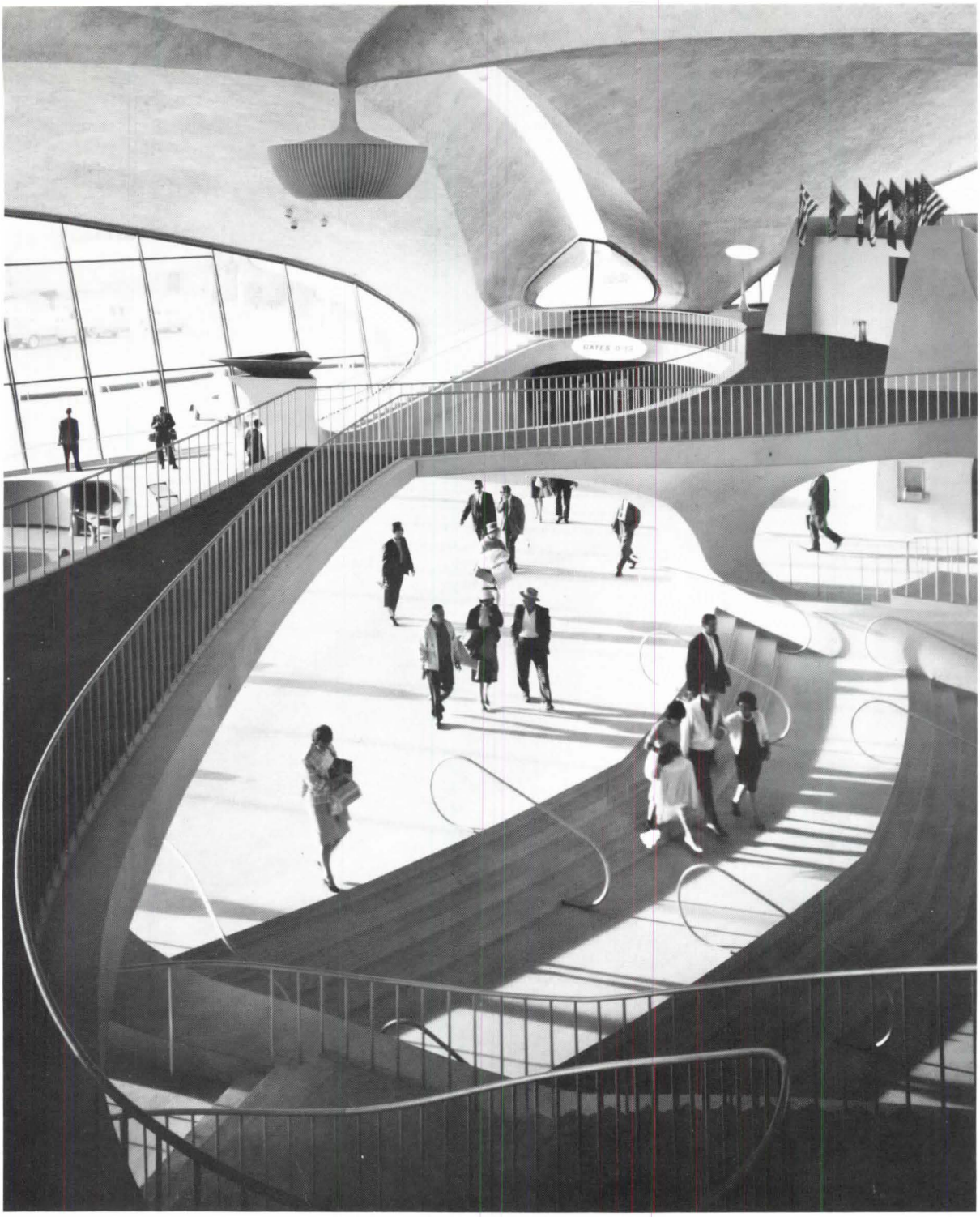
tecture and away from the stamped out International Style of his time. With him, it took the guise of making the style for the job. He believed very much in starting over again in each job, every day, practically. This led him into paths as far apart as the expressionist bird (TWA) and the Holmdel mirror building (Bell Laboratories, 1962), which is just a box for a factory. He was an extreme pragmatist. He wasn't a guru like Kahn, who stumbled along using long words or asking, 'What does an arch want to be?' "

Irwin Miller compares Saarinen to Christopher Wren, "a problem solver who never bothered with styles or schools." The contemporary architect most like Saarinen, thinks Miller, is Kevin Roche, "because by his own nature he's also a problem solver and not a person who works in a style. While the outward appearances are different, the fundamental approach is very, very similar." Like Saarinen, Roche treats each project as a unique case, never repeats a solution or approaches a building as a container in which objects must be fitted.

According to Roche, Saarinen searched for "the style for the job" in the spirit of industrial designers Norman Bel Geddes and Henry Dreyfuss, who looked to the machine for design solutions. "Paul Rudolph, Yama, Ed Stone and others," says Roche, "who were searching for new forms of expression, arrived at largely decorative solutions. Eero was using the device of function to produce form, which was really a reversion to the very earliest manifestoes of modern architecture. But it produced a certain kind of sculptural exuberance, because of Eero's interest in sculpture."

How form literally followed function for Saarinen is best illustrated at Dulles Airport, which, it is agreed,

Ingalls Skating Rink (1956-58) at Yale University swells upward on the spine of a giant parabolic arch.

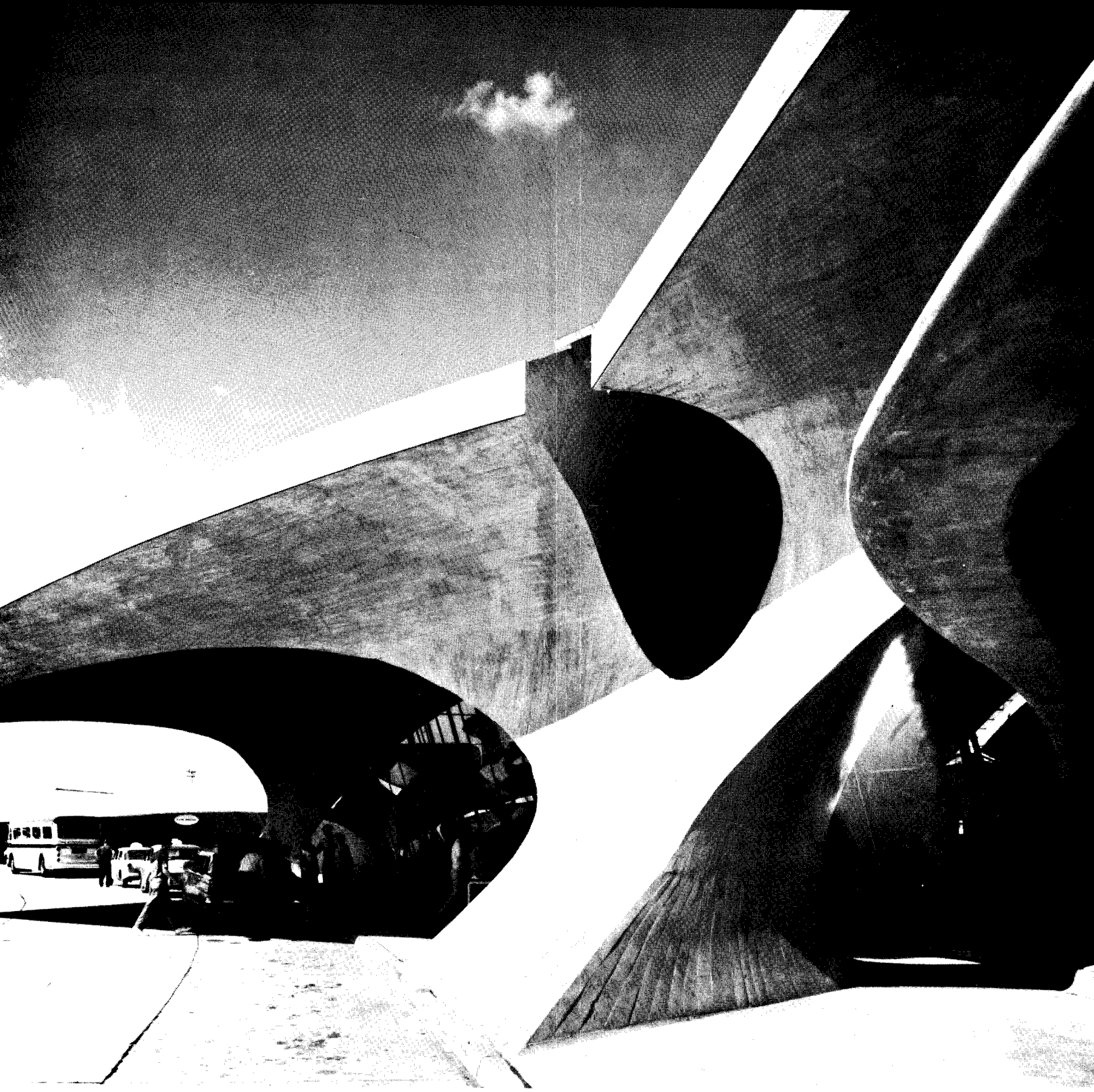


Photographs by Ezra Stoller © ESTO

A very broad definition of architecture.

was also his greatest. The conciseness of the terminal emerged from the system of mobile lounges invented by Saarinen to minimize taxiing for planes and walking for people. Critic Peter Papademetriou, who is at work on a book about Saarinen, found that "when Eero Saarinen was fairly young, his father's firm did a proposal for a restaurant called 'Serving Suzie.' It had a mobile lounge concept. The customers sat down, and this Joe Colombo thing made its way to their tables." Papademetriou regards Dulles as "an all inclusive environmental gesture, a great gateway for arrival and departure." With the lounges, he says, "Saarinen cut off a piece of the building and put it on wheels, giving away part of his territory, but thereby being able to claim more. He was saying that the architect can design a larger environment of which the building is just a piece. I think that's a tremendous contribution."

Saarinen, himself, defined architecture very broadly, "as the total of man's man-made physical surroundings." Roche believes that "if you were to call anybody an architect in the complete sense of the word, which includes being an artist, an intellectual, a socially conscious person, an inventor, a sculptor, a planner, a visionary who is nevertheless totally responsible to his clients, it would be Eero. Sure he had failings. He took chances, and making mistakes was not anything that bothered him; he regarded that as part of the price to be paid for taking the chance. He made errors because he



Saarinen's most harshly criticized building, TWA.

did things for which there was no precedent." Blake feels that another reason for Saarinen's mistakes was "that Eero often showed really bad taste. If you look at TWA, as a piece of sculpture, it is about as sophisticated as a certain kind of modernistic Danish modern stainless steel flatware."

On a more positive note, Blake believes that "most impressive was Eero's interest in and use of new technologies—and of technologies in other fields." Harry Weese remembers that Saarinen "was very influenced by the designers that surrounded the auto industry, their techniques, how they mocked up things, the nuts and bolts and all that." Saarinen's chief for production, the late John Dinkeloo, was responsible for the first use in buildings of cor-ten steel, neoprene gaskets and reflective glass. Says De Long, "I think Saarinen believed that for an architect to ignore the technological achievements of his own time was tantamount to turning his back on the most dramatic art of the future. Giedion's whole theory of the evolution of modern architecture, of course, depended on new materials, and most architects took that very seriously." Miller adds that "while his father was a craftsman, Eero was fascinated by the possibilities of new techniques and materials and the possibility they had for liberating the architect."

Saarinen's successful attempt to free architecture from the dogmas and constraints of his time made him a transitional figure, possibly a revolutionary one. Pelli

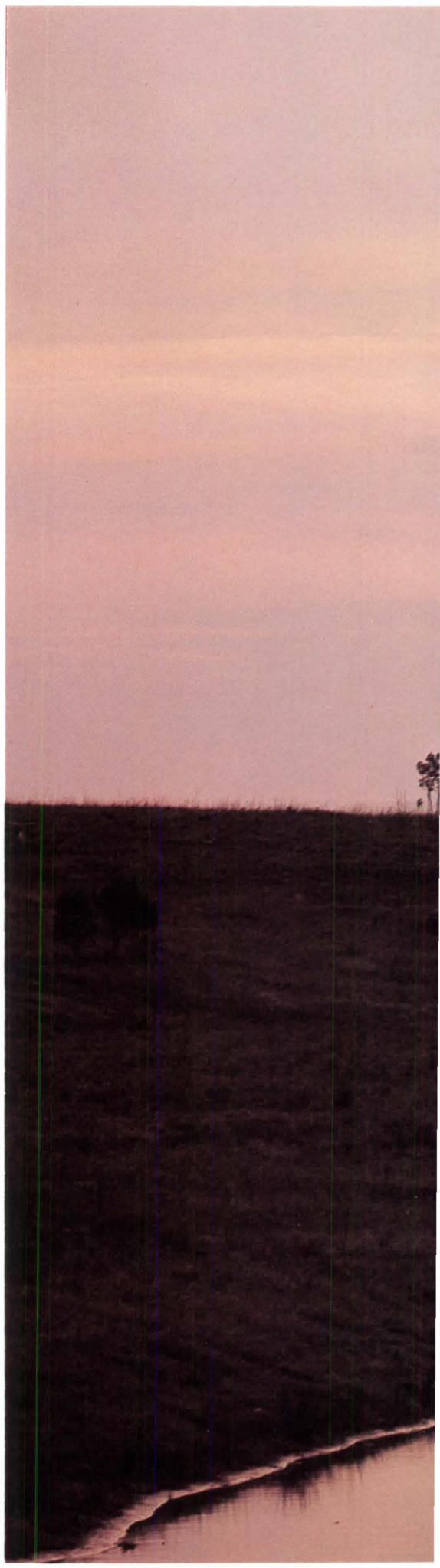
Enlarging the alphabet beyond A and B.

notes that "to free oneself from the canons of the International Style today seems quite easy and natural; at the time it seemed inconceivable. And Eero concerned himself with issues that were not being addressed by the International Style, such as the need for architecture to communicate, express things other than its own structure." Roche believes Saarinen had "broken the mold long before Bob Venturi by freeing architect's minds from the rigid patterns."

Both his upbringing and training would have predisposed Saarinen against accepting the strictures of the International Style. The effect of his Finnish origin—Saarinen was 12 when his family moved to America—is, as De Long says, "hard to pin down, except that the Finns tended to reject standard sorts of images and had a fascination for materials, especially natural materials." Also, the younger Saarinen grew up at Cranbrook, which as Papademetriou says, "was a situation outside the dogmas of the modern movement, in many ways. (Eero, of course, also chose Yale with its Beaux-Arts education for his architectural training.) Eliel Saarinen's Cranbrook had a Beaux-Arts plan, and my feeling is that Eliel gave form there to his urban theories, which combine Beaux-Arts and medieval schemes. At Cranbrook you get these great axes organizing public space in an intricate, picturesque composition of small spaces. If you look at Eero's site plans, you see modern buildings laid out according to Beaux-Arts compositional principles." Saarinen's personal history and predilections came together, says Papademetriou, "to create a feeling on Eero's part that the language of architecture was very complex and not the package that the International Style represented. As he said himself, he wanted to enlarge the alphabet beyond A and B."

The very diversity of Saarinen's architectural vocabulary and the fact that each of his buildings looks different "appears very relevant today," says Venturi. "In those days, that was not the acknowledged way to behave if you were to be a great architect; you could distinguish a great architect by his originality and consistency of vocabulary. Today, diversity is in the air in all fields."

Was Saarinen, then, a precursor of postmodernism? There are sharp differences of opinion, especially since postmodernism has different meanings for different people. Roche dismisses Saarinen's relation to postmodernism as "just nonsense, because while Eero was very aware of the history of architecture, he would not



Balthazar Korab

Most highly praised among Saarinen's designs is Dulles International Airport, Chantilly, Va., completed by Kevin Roche John Dinkeloo & Associates in 1962.

Reinventing the wheel with each project.

have used historical forms—at least not at that time. He was, I think, very fundamentally a modern architect, a part of the postwar brave new world drive, which was going to produce an all new environment based on technology." At least in principle, Pelli agrees: "I think Eero would have been totally uninterested in the issues of postmodernism. But, then, I think postmodernism has already blown away. It doesn't mean anything. It talks about history and context, but so did many others, including, of course, Eero. Look at Corbu's books; they are full of historical references, and someone like Aalto, who is a great hero of the modern movement, doesn't fit any of the supposed dogmas of the modern movement. Eero borrowed things from history, but always absorbed and transformed them, while for most today the borrowings remain undigested. Lutheran College in Concordia is reminiscent of a Nordic village, but there is nothing literal about it. The same is true of the colleges at Yale. What I believe and Eero believed is that issues such as decoration, which was abundant in Frank Lloyd Wright's work, were not separate from the mainstream of modern development, though they were separate from the most dogmatic core of the CIAM and Bauhaus disciples."

In Scully's opinion, Saarinen's tendency to reinvent the wheel with every new project, his emphasis on new structural techniques and abstraction placed him squarely in the modernist camp. He sees Concordia and the Yale colleges as contextual, not vernacular. "If Saarinen had been still more contextual," says Scully, "the buildings would have worked a lot better." Even Venturi denies Saarinen's connection with postmodernism, because "postmodernism is based on an attitude that admits symbolism in a very explicit way. I don't think Eero was so much involved in symbolism as expressionism. Dulles and TWA weren't reminding you of anything specific; they weren't looking like something else."

Robert Stern, on the other hand, believes: "Saarinen's way was to make a building devoted to flight look something like a bird. He also tried to reinvent the classical mood through technology, as at Dulles. He tried to make tall buildings seem more abstract and more like monuments, like graveyard stelae almost, as at CBS. You could say that he was a precursor of postmodernism. He had a broad view of context as both physical and symbolic—what the culture would expect a building to look like."

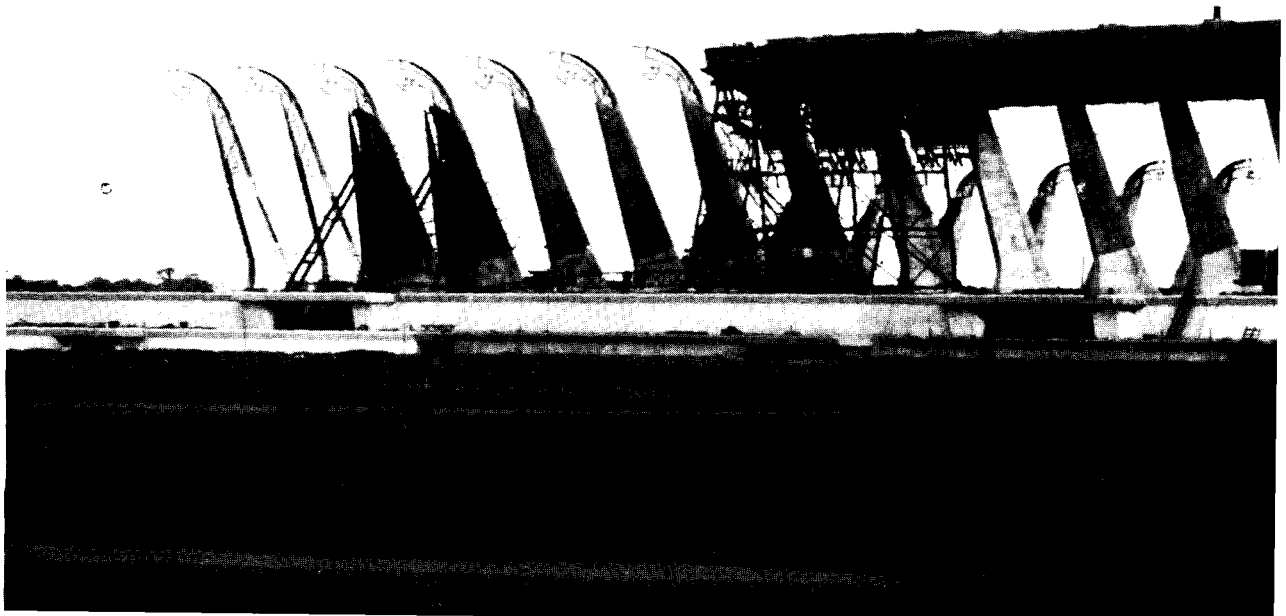
Johnson, with usual levity, sums up the topic, saying, "Eero was a proto-postmodernist as was I, though we had entirely different approaches. But don't forget, postmodernism doesn't exist. It broke the mold of the modern strictures, but what happened afterwards can be called by anybody's name."

When he died, Saarinen was about the age of the architects Johnson still calls "the kids." And had he lived, Saarinen would today be younger than Johnson. It is, of course, impossible to know what path his career might have followed or how his work might have matured. But it's an intriguing question.

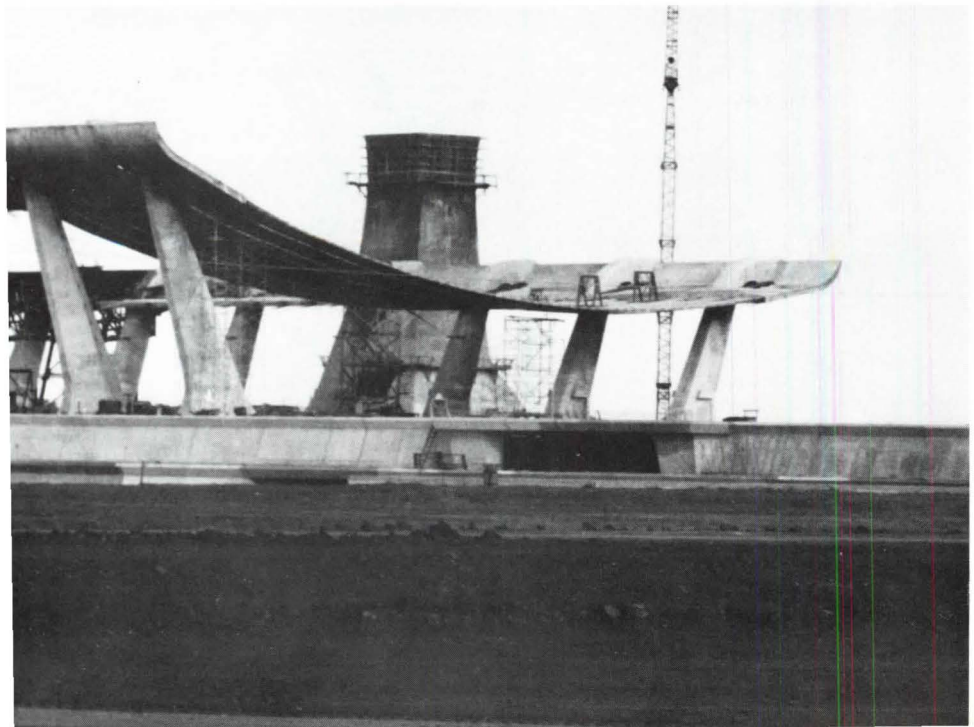
Gunnar Birkerts ventures that "for a while Eero would probably have gone just about where Kevin went, because they were very close and Kevin was influencing Eero toward the end. But later, maybe he would have worked more like Cesar or myself. He would certainly

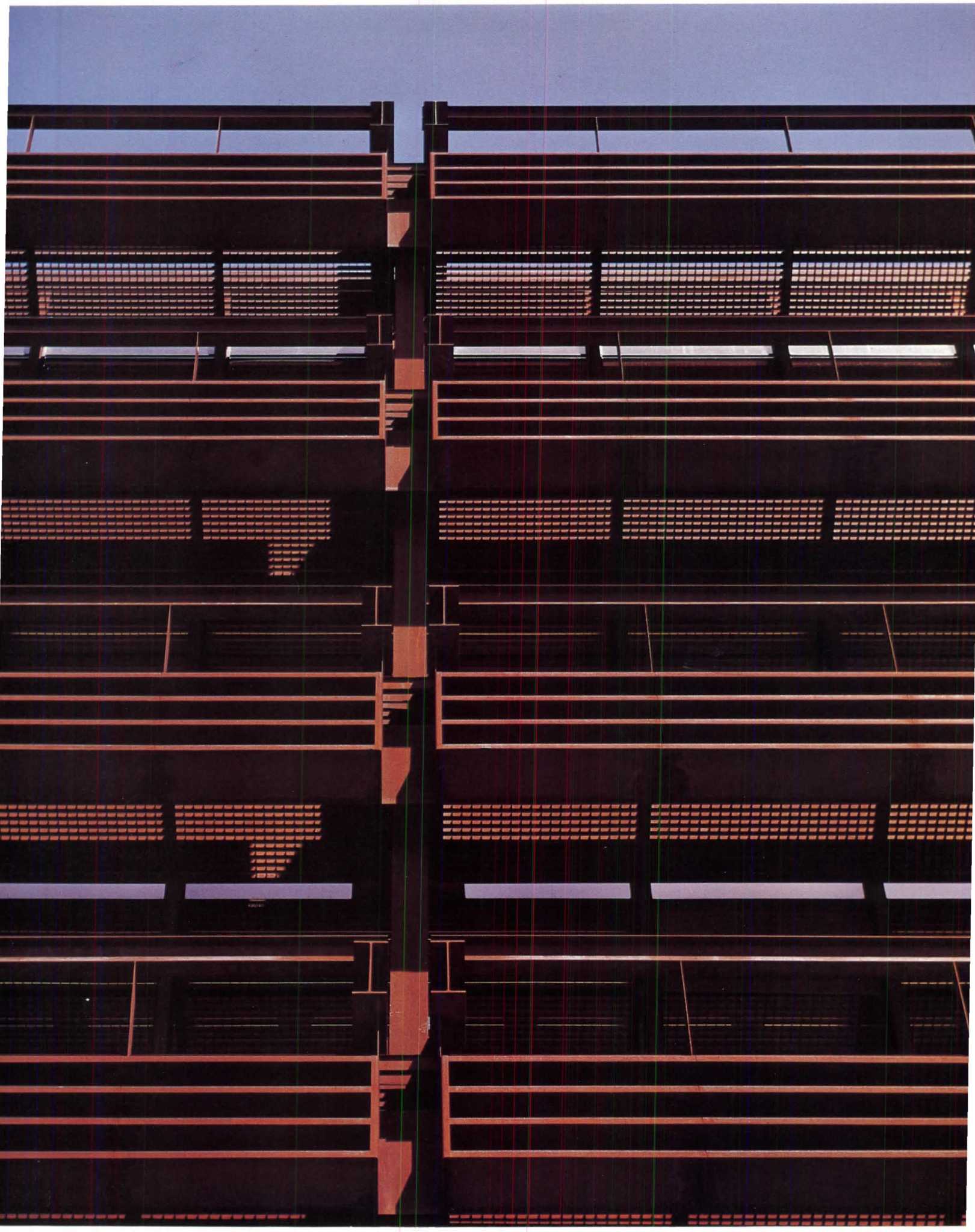
Dulles' forward tilting roof is supported by two rows of sloping concrete 'trees,' as Saarinen called them.

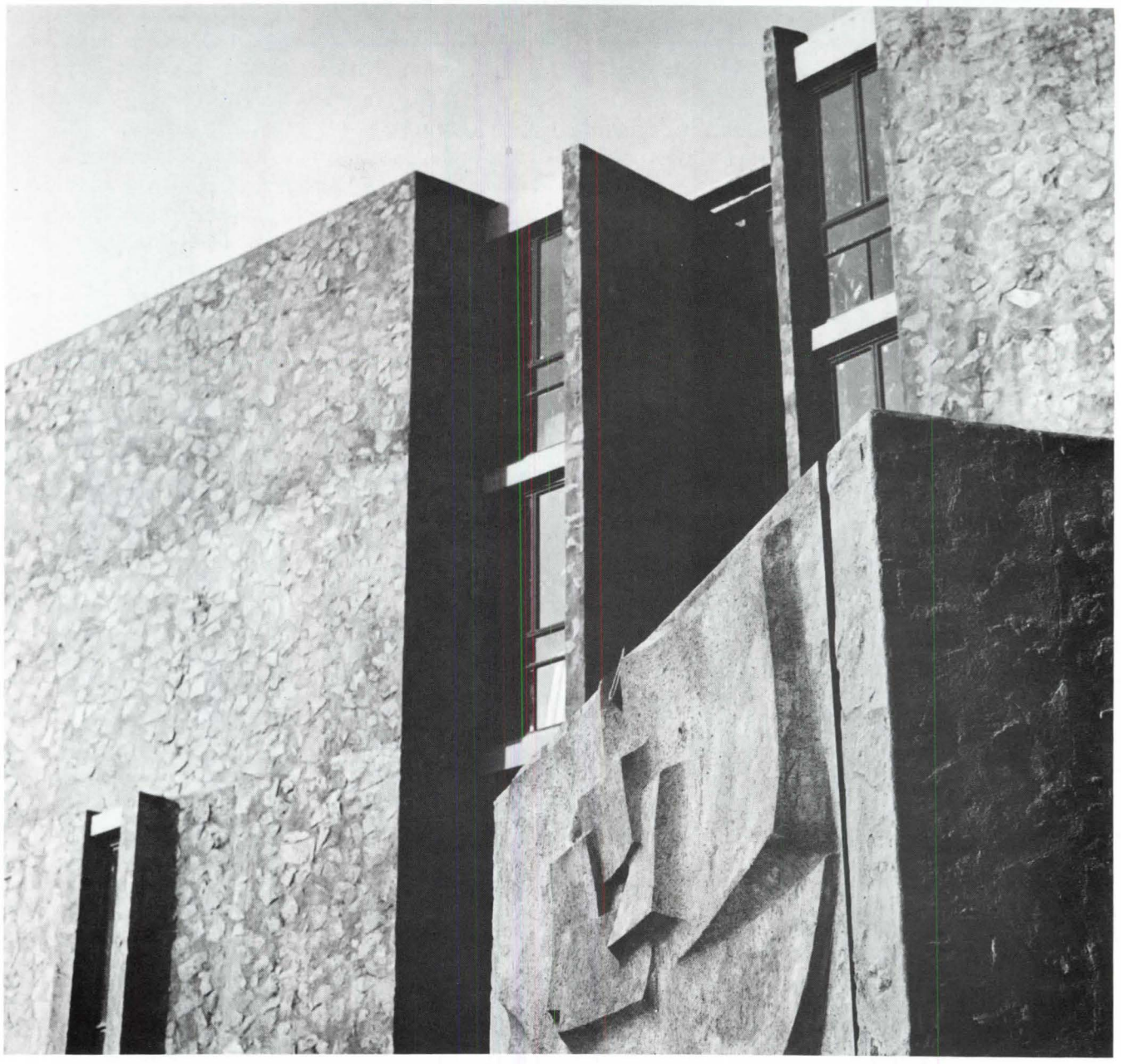
Richard Knight



Evelyn Hofer







Photographs by Balthazar Korab

'Just getting into stride when he died.'

be trying new things." Papademetriou's guess is that "because Saarinen was a man of the 20th century, a modern architect, I don't think you'd find him doing shingle style vignettes. He would still be an important architect. His work would always be changing. He'd be more at home with Emilio Ambasz than Bob Stern. He'd still have a faith in technology. He'd probably be wearing a throwaway Seiko watch with a calculator on it, just so he could run figures by real fast. And I think he would be doing buildings in a direction not unlike Kevin's."

Kevin Roche? He says, "I think his career would have continued much the same way it had been going, which is to say that he would have produced fairly remarkable buildings. He was just getting into stride when he died. He died before all his major buildings except General Motors were finished. I don't see that he would have readily fallen into any of the current movements. He probably would have spawned several movements himself. I don't see him as a hardline traditionalist or a late-coming postmodernist, though he might have dabbled in new things. He had a broad acceptance of other people and what they were doing and was all for anything that would broaden the vision of architects."

In De Long's opinion, Saarinen's last building showed a cohesive clarity, and he was beginning to really "understand materials and expression in a way that he'd been working for. He was moving from a fascination with particularization to an interest in universal sources of expression and prototypes. He was gaining extreme confidence." According to Scully, meanwhile, very few of the people who were inventive in that late modern phase "have come through. I think maybe the premise was all wrong. Precisely because they were still involved in the mythology of modern architecture, which hated most of what existed in the world, for that reason they were damned. I don't know how Saarinen would have

Two studies in texture: across page, Deere & Co. headquarters; above, Morse and Stiles Colleges, Yale.

'He would have influenced everybody.'

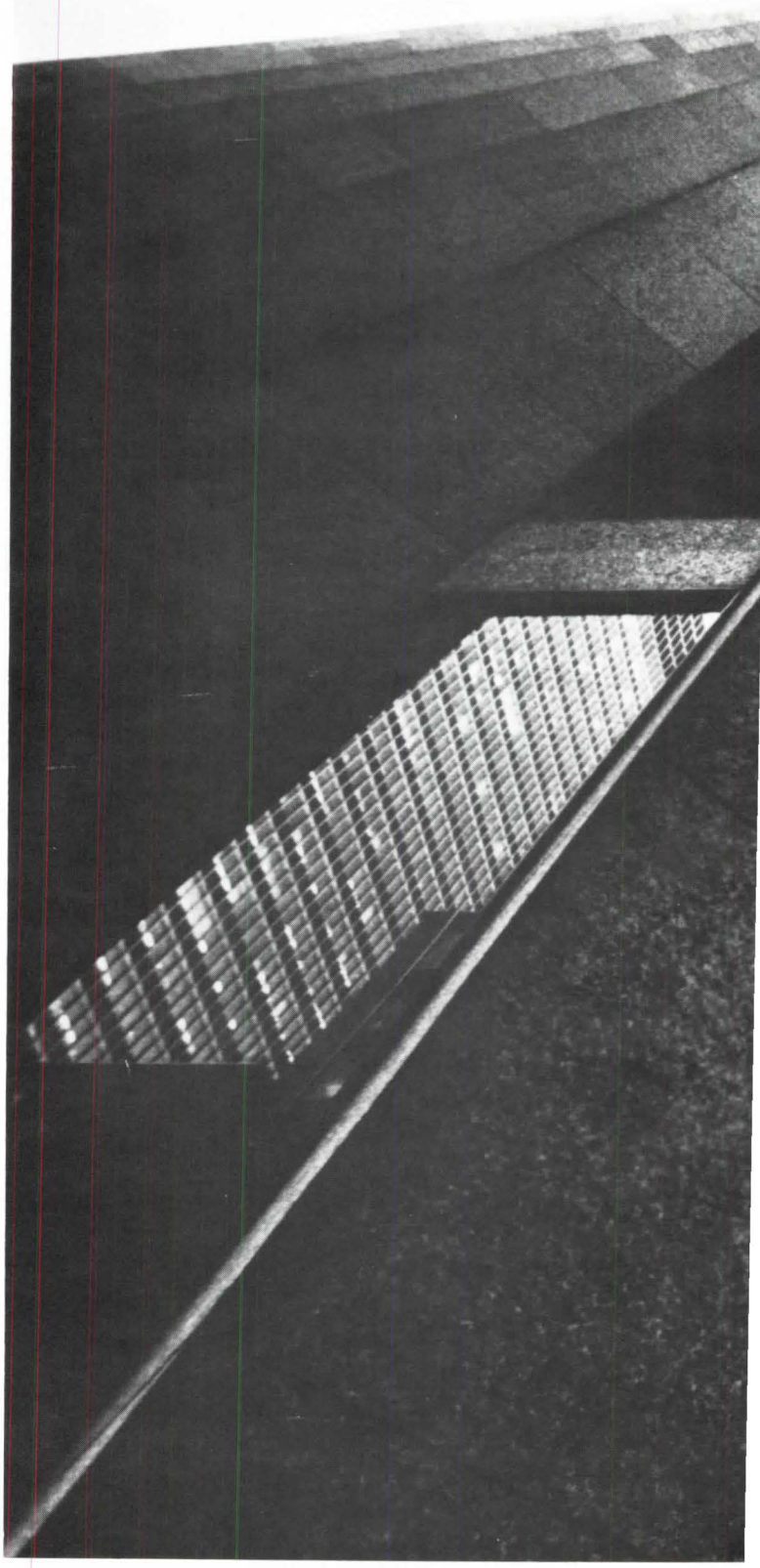
gotten around that. He was an eclectic, in terms of the style for the job. Maybe that would have enriched itself."

In Blake's view, "Saarinen, like Philip Johnson, was always very aware of what is going to be happening next, what people would be exploring next. And he was very anxious to be there first. When people were talking about shell concrete structures, he was trying to get there first with the Kresge Auditorium. When people were talking about contextual architecture, he was doing the Yale colleges, and he got there first. He was very much aware of what was in the wind. He was enormously competitive, enormously competitive. But what he actually would be doing is totally unpredictable."

Gordon Bunshaft, who worked with Saarinen at Lincoln Center, believes "CBS was an indication that Saarinen was going to be a more disciplined architect and get away from the plastic period, which to me wasn't very great except for Dulles. I think he would

Stanley Abercrombie, AIA

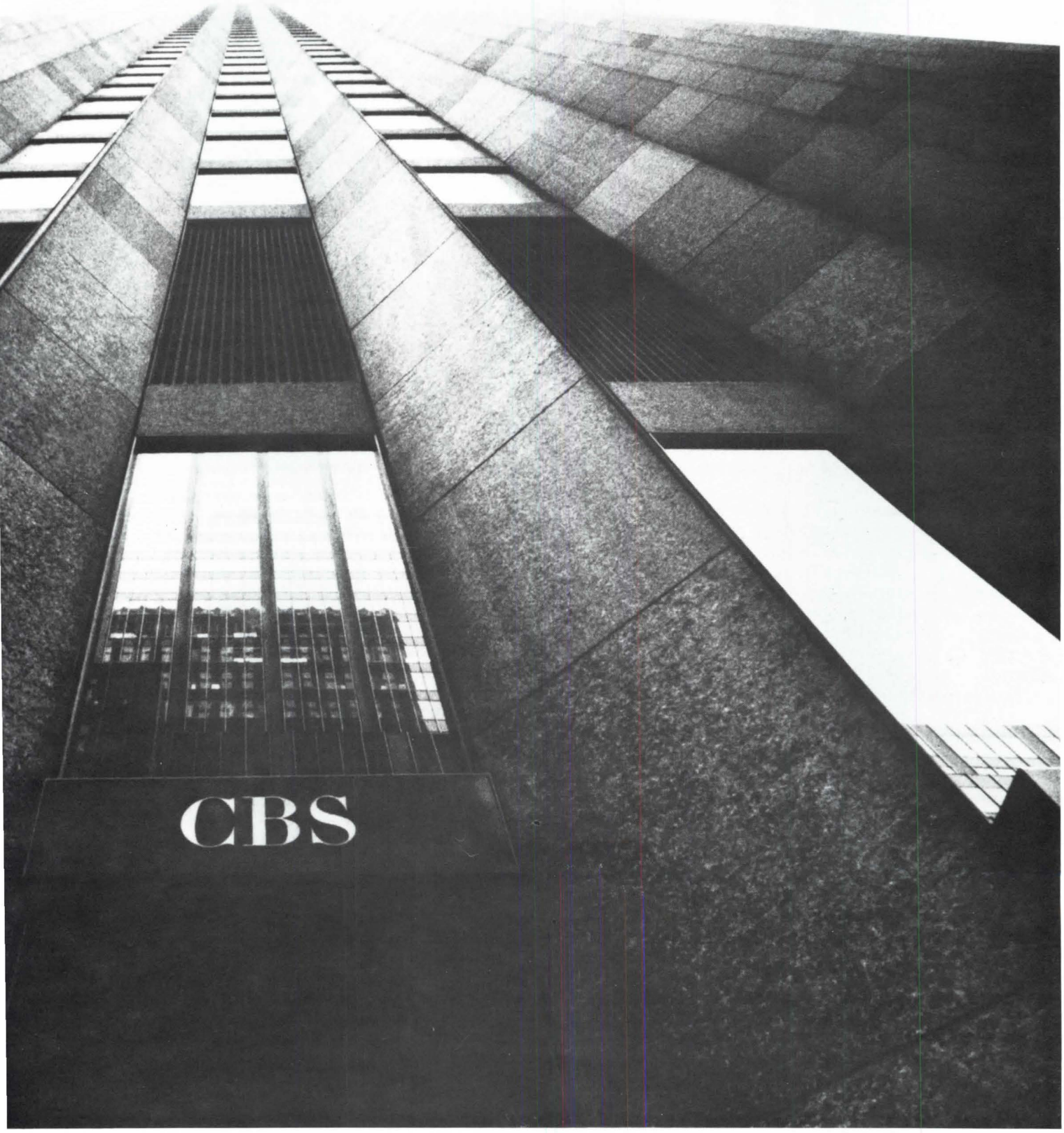
CBS headquarters, Saarinen's last work.



have developed into a very important architect." Harry Weese says, to the contrary, that Saarinen belonged with Corbusier and Aalto "who were able to free-hand things and weren't caught with a grid. I think Eero would have gotten more and more into the free line. I think he would have been an antidote to Philip Johnson. I can't tell you what he would be doing, but it would be very gutsy, structural and sculptural. It's only a pity he couldn't have hung around a lot longer. I think he would be telling Philip a thing or two."

Catch, Mr. Johnson. "Eero was altogether unpredictable," he says. "He would have influenced everybody, all of us."

And Scully, who was not among Eero Saarinen's admirers during the architect's lifetime, concludes, "A man's life should be seen in its shape. His shape was to die at that time. In a way, it's really wonderful to have 10 years of activity like that, absolutely pure, like a kind of Achilles and then you're gone so clean. But, I wish he was still around so I could apologize." □



A Primer on Postoccupancy Evaluation

Uses and techniques of an increasingly valued tool. By Craig M. Zimring and Janet E. Reizenstein

The idea that buildings should accommodate the needs of the people who use them is not a new one in architecture. What is relatively new, and increasingly accepted, is the practice of using systematic methods to find out exactly what makes designed environments work well for their users. Interviews, surveys, observations and other methods are being used to explore users' responses to a wide range of buildings. The practice is known as postoccupancy evaluation (POE).

Postoccupancy evaluations, as they have evolved to date, focus primarily on the impacts of designs on users. This is not to imply that evaluations of other aspects of design are not critically important: esthetics, energy performance, maintenance and the workings of structural, electrical and mechanical systems. Some evaluations take a multidisciplinary approach. However, the ways buildings work for people are less well understood than some of the other aspects and need special attention.

Postoccupancy evaluations have two major purposes: immediate feedback for a given project and development of information for future designs. POEs give feedback to designers, managers and users about how designs function in relation to users' needs and suggest how buildings might be improved.

Without systematic behavioral evaluation, designers must rely primarily on occasional comments from the client to know if the design "worked." Certain kinds of feedback may get back to them in the form of recognition by fellow designers (publication or awards) or problem reports, but evaluations offer a way to ensure that the architect receives feedback from users, as well as clients, identifying how some design features work well and others work less well.

POEs also contribute to the body of knowledge architects have about the social impacts of design. As design sociologist John Zeisel has pointed out, evaluations can make the design process cyclical so that the predesign programming for each new project benefits from knowledge of previous related projects. The alternative approach is a linear one—each project starting from scratch, without benefit of systematic learning.

Interest and activity in the field of postoccupancy evaluations are growing rapidly. One of the world's largest building clients, the U.S. General Services Administration, has routinely performed comprehensive postoccupancy evaluations since 1976. These evaluations use teams that include a senior architect, mechanical engineer, electrical engineer and psychologist and focus on a broad range of issues, including behavior, energy and cost effectiveness. According to team psychologist Ron Reinsel, one of the most significant outcomes of this process has been a change in the way GSA deals with architects. Because the evaluations also examine the programming process and compare the program to the completed building, the evaluations have helped GSA develop a more straightforward programming process, one with which both architects and client are more pleased.

Mr. Zimring is an environmental psychologist on the faculty of the college of architecture, Georgia Institute of Technology, is coauthor of *Environmental Design Evaluation* and has performed postoccupancy evaluations for government and private clients. **Ms. Reizenstein** is an environmental sociologist working on the design of the University of Michigan Replacement Hospital. She is a board member of the Environmental Design Research Association and an associate editor of *Environment & Behavior.*

An increasing number of private clients, and architects themselves, are commissioning or conducting POEs, and they are getting growing recognition in the literature of the profession. This magazine's evaluation series has many of the characteristics of POEs, and several POEs have won *Progressive Architecture* applied research awards. The journal *Environment and Behavior* recently devoted an entire issue to POEs and seeks examples for publication on a regular basis. A recommendation for wider use of evaluations even appeared in the ill-fated Moynihan bill attempting to change the charter of the U.S. public buildings service.

The reason for the increasing acceptance of POEs is simple: With better information about how some of the many assumptions and decisions made during the design process actually turn out, designers are finding they can produce better designs. However, there are other reasons why designers are using evaluations. It is exciting to find out how your design works, to see that your intuition was dead-on or that the extra care that was put into the design made users pleased and enthusiastic.

Postoccupancy evaluations can be understood more clearly if we compare them to something familiar: architectural criticism. In some ways POEs and criticism are very similar, in other ways very different. Both evaluations and criticism look at the historical context of a building and try to place it in the history of architecture. Both look at circumstances leading to the building being built the way it was, and may look at similar issues such as circulation, image or appropriateness for the local context. There are, however, some fundamental differences between criticism and POEs. Neither is inherently "good" or "bad," though there are good and bad examples of each. They come from different traditions and serve different purposes. Criticism is by its nature subjective; it is the building seen from the critic's viewpoint. Evaluations use systematic methods of investigation to gain a valid picture of the *users'* views of the building.

Traditional architectural criticism has, as its main focus, esthetics—the quality of the design and its place in the history of artistic ideas and concepts. POEs consider esthetics as one of many design elements affecting users.

A fundamental difference between criticism and evaluations is the process by which conclusions are reached. The critic may visit the site, examine photographs and/or look at other buildings by the same designer; the methods depend on the individual approach of the critic. The results of this examination may yield artistically valid insights about the work itself, describe a historical milieu in which the design was conceived and identify significant flaws in the execution. By contrast POEs use relatively standard and tested procedures of investigation to ensure that the information is not biased.

In *Environmental Design Evaluation* (Plenum, 1978), Arnold Friedmann, Craig Zimring and Ervin Zube describe a multistep process for doing an evaluation. They suggest that the problem must first be described in terms of five elements: the users, the building itself, the social-historical context, the design process and the neighborhood. They stress that the users are not merely the people who work or live in the setting; they may be passersby or other people affected by the building. A description of the building includes such typical architectural considerations as

size, cost and materials as well as a description of other qualities important to users—for instance, the amount of auditory and visual privacy provided. The social-historical context is a description of the broad forces that influenced the building design. Examples are societal pressures to create an energy-efficient structure or the increasing demand for housing for the elderly. This description is closely tied to the design process. POEs generally describe who made decisions and help understand the various participants' roles in creating the final design (client, users, designers, bankers, etc.). Finally, POEs consider the neighborhood, focusing on how well the building fits in its physical context and on how the building is affected by its surroundings. The neighborhood is examined from an esthetic viewpoint to assess the fit between building and surroundings as well as from a social viewpoint: how the building affects neighborhood pride and self-image.

Once the five elements of a postoccupancy evaluation are described, the evaluators define and give priority to issues the client, users, designers and they (the evaluators) are interested in. These could include: lighting, color, use of space and privacy. The chosen issues serve as the focus of the evaluation.

Next, the evaluators select and refine techniques to gather information. The test of effective data-gathering techniques is whether they provide good quality information at a reasonable cost. In evaluations, "good quality" means that the methods are sensitive enough to capture important problems, and that they provide a valid and reliable picture of the users' reactions—not the views of the evaluator. In addition, the research must be structured so that it can be generalized appropriately; if the POE is intended to provide input into a subsequent design, then it must study issues common to both design projects.

After the data-gathering techniques are refined and pretested, these must be used in a way that does not bias the results: Interviewers must not ask leading questions or only pick people who will give positive responses, and so on.

Finally, after data have been collected and processed, they must be analyzed, a step that represents another difference between criticism and POEs. Criticism seldom uses numerical or statistical analysis, but rather relies on personal and historical frameworks for understanding a designed environment. A POE generally combines quantitative analyses of data (such as survey responses or counts of where people spend their time) with qualitative analyses of interviews and photographs to arrive at a picture of user attitudes and behaviors.

Talking to many designers and performing a number of POEs ourselves has revealed some common themes about the benefits architects are deriving from them. These benefits can be grouped into three general categories: ways evaluations have provided information to aid creativity and design development, ways they have enhanced and clarified programming and ways they have lengthened and solidified the designer-client relationship.

John Gibson, AIA, of Bohlen, Meyer, Gibson in Indianapolis has pointed out that one effect of information is to foster design creativity: "The more information you have, the more creative you can be. If you're lacking information, you tend to zero in on one to two aspects of the project, but these may be the wrong things to emphasize."

The output of POEs can be design guidelines of varying degrees of specificity for various building elements or types, or it can be performance criteria, which state a desired end result but do not specify design solutions. Evaluations can also yield organizing concepts that help to focus creativity in designs. One such principle that has served as a central theme in design of publicly assisted housing is that of the residents' control over their physical environment.

Not all POEs are devoted to testing overall concepts or at producing general guidelines. Many focus on assessing the adequacy of particular design elements such as signage or lighting. These studies may be very useful in helping to fine-tune the building to correct problems; a client may be very pleased if the designer comes back to modify the signage or alter the lighting system. However, narrowly focused studies may not be as easily applied to new projects as are conceptually focused studies. The requirements for materials and design of every building are unique; specific results may not apply to a new design as well as can more general concepts.

POEs can be used to evaluate the program as well as the design. Frequently they will trace a malfunction of a building back to a false assumption in the programming process.

Evaluations have also helped convince clients to adopt design alternatives they might not have otherwise considered. For example, Ewing Miller, FAIA, senior partner in Archonics Design Partnership, Indianapolis, was asked to design new dormitories at Indiana State University, which, like many other universities, had been building highrise dorms. Armed with evaluations showing that students preferred lowrises, Miller and his associates convinced the university to build three-and-four-story walk-up apartments. Miller recalls, "The research findings turned around the dean of students and the governing board." He notes, with satisfaction, that "although several years later they could not fill the highrise dorms, and these had to be converted to other uses, the walk-up apartments have always been popular."

POEs may also help establish the cause of design or function problems. When Hugh Stubbins & Associates of Cambridge, Mass., designed a headquarters building for a large U.S. corporation, the building was generally well received, but there were many complaints about temperature control. An evaluation helped pinpoint the source of the problem: poor installation of the HVAC system. This was corrected, and a major irritant was removed—one that had been blamed on the architects by many of the users.

This points up the special benefits that can accrue from evaluating buildings more than once, over time, or even on a continuing basis. Doing so can keep designers and managers informed about the fit between the building and the users throughout its life, and identify not just problems, but the need to change it to meet changing circumstances.

POEs can also help extend and enhance the client-designer relationship. Charles Albansee, AIA, a partner with Brooks & Associates, Tucson, commissioned a POE in conjunction with the firm's work at the Reid Park Zoo in Tucson. The research team found that exhibits in the central core of the zoo were not being visited. Careful analysis suggested that the circulation system was partially at fault. The visual dominance of the walkways in the outer part of the zoo prevented people from seeing and using the narrower circulation paths in the zoo's central core. In addition, the animals liked to spend the day in the coolest part of their display—a problem, since this was the dry moat surrounding the exhibit and out of the visitors' sight. Says Albanese, "Although it wasn't part of our scope of work, we were interested in why several exhibits weren't working well. The parks and recreation department was apparently impressed by our analysis: They asked us to redesign a number of exhibits, greatly expanding our contract. The client had more confidence in us because of how much we knew about their exhibits from the research and review of the literature, even though we hadn't done zoos before."

Once the decision has been made to conduct a POE, a variety of individuals or groups is available to do the research: The architectural firm may do its own research, the architect or client may hire an individual consultant or professional organization or an academic group may initiate and perform the evaluation. Each of these options has advantages and disadvantages.

Architectural firms that carry out their own evaluations,

although still relatively rare, are quite enthusiastic about the process. The Stubbins firm is an example. It has been conducting POEs since 1976 to "assess buildings' performance as measured against the original programs, acquaint the designer with the opinions and attitudes of the client-user and provide the designer with feedback that can be useful for the design of similar facilities." According to Michael Kraus, AIA, senior associate in the firm, it tries to evaluate all its buildings, but is most likely to evaluate a special or unusual project. Almost 30 have been evaluated to date. Kraus and his colleagues spend up to three days collecting information by talking to users, surveying them or both. The evaluations focus on people who maintain, operate and use the buildings. Findings are disseminated in-house and usually to the client.

Another architectural firm conducting POEs is CRS, Houston, which routinely includes them as part of its standard services. It has a highly interactive design process, one that involves users during predesign, design and evaluation. Depending on the situation, CRS may use interviews, questionnaires or both in doing POEs. It finds that the session when it provides evaluation results to the users is particularly exciting and helpful to architects and users alike.

Architects who want to collect information about how buildings work for people need to carefully consider a number of issues. First, the ultimate goal of a POE is to provide useful, high quality information. Although the professional and personal judgments of the evaluator may enrich an evaluation, they must be clearly separated from a factual view of users' reactions to the building. Several issues affect the quality of the information: The people who are chosen to be observed or interviewed must be representative of the actual users of the building, they should be chosen in a way that allows all viewpoints to be represented (such as by choosing every tenth person in the corporate phone directory) and there must be enough people involved to get a fair view of users' reactions. This last may require scores or hundreds of people, depending on the situation.

Techniques need to be chosen that accurately assess the important issues in an evaluation. Because any single data-gathering technique has limitations, evaluators usually select several to balance the strengths and weaknesses of each one. Some techniques commonly used in POEs include: observation, in which users' activities are recorded directly on a floor plan of the setting or with some other recording scheme; interviews with tenants, managers, workers, or passersby; photographic survey: analysis of documents, such as correspondence between the client and designer, or sales records of retail properties and looking at physical evidence of use. Evaluation methods are described more fully in a new book, *Inquiry by Design,* by John Zeisel (Brooks/Cole, 1981).

In addition to the procedural issues to consider when conducting their own POEs, there are other potential concerns when architectural firms undertake research of this sort, one being the vested interest a firm may have in evaluating its own design. Even the well-intentioned architect/researcher will have specific expectations about his or her own design and this bias may unconsciously affect the evaluation. In addition, many firms simply don't have the money to support services beyond those paid for directly by the client, even if these improve the firm's overall designs. One alternative is to convince the client to pay for evaluations (using AIA documents B-161 and B-162). Although still rare, this is becoming more frequent as evaluations are better accepted. Another alternative is to hire architects with research training. A few schools of architecture, including Georgia Tech and the University of Wisconsin-Milwaukee, offer concentrations in environment-behavior research. Graduates of these programs are likely to have a working knowledge of the literature and methodologies of postoccupancy evaluation.

Rather than doing an evaluation itself, the design firm may wish to hire a consultant. The advantages over in-house evaluations are that good consultants will have been trained specifically in evaluations and know appropriate data-gathering techniques and data analysis and interpretation procedures. Consultants are also likely to be aware of other evaluations of the given building type. And, because they aren't evaluating their own design, less bias is likely to result.

However, some problems may occur when working with a consultant. It is sometimes difficult for the designer to express to a consultant exactly what information is needed. Traditionally, researchers have been trained to be oriented to the written word, rather than to the visual mode familiar to architects. And many researchers come from a background where time schedules are different from those used in architectural practice. One solution to these problems is to seek out consultants experienced in working with designers. As evaluations become more common, an increasing number of consultants is becoming knowledgeable about the time and money constraints of design firms —and more and more consultants speak the designers' language.

Several organizations have members experienced in design evaluation. The Environmental Design Research Association based in Washington, D.C., has more than 900 members, including designers, researchers and clients. Some of these researchers are in academia, some are fulltime consultants and many do teaching, research and consulting. The Architectural Research Centers Consortium is an organization of schools of architecture with research programs. It also can direct designers to experienced evaluators.

Clients also may commission POEs, and from the designer's standpoint, there are some clear advantages when the client does so. Clients generally have greater resources than design firms, so evaluations may be more detailed. Also, if the evaluation results in innovative but costly suggestions, the client may be more willing to accept them if it paid for the evaluation. For example, an evaluation of pretrial detention centers (described on page 57) discovered that the motel-like furnishings were well-received, but that more recreation space was needed. As a result, the bureau of prisons, which commissioned the evaluation, is considering enhancing rooftop recreation facilities at future centers.

Most evaluations haven't been initiated by the designer in private practice. Rather, they have been initiated and performed by an academic group and carried out for a variety of reasons: interest in a particular building or building type, interest in a particular psychological or social process such as crowding, interest in developing evaluation methods or simply as a class exercise.

From the perspective of the architect in practice, academic-initiated research has both advantages and problems. It is advantageous because university professors may volunteer their time and because many are competent in performing evaluations: They use rigorous methodology and are knowledgeable about related research. From the designer's viewpoint, a disadvantage may be the fact that many academic evaluations use technical language and specialized concepts intended for the evaluator's peers rather than for the practitioner.

POEs not only benefit their sponsors or those involved with the buildings under study, they contribute to a rich and growing storehouse of information on the social impacts of design. Architects can mine this information and come up with better designs —with designs that respond to user needs in addition to the myriad of other factors involved in any building project.

On the following pages are examples of POEs on some prominent, and not so prominent, buildings—summarizing the techniques used and the lessons learned.

Postoccupancy Evaluation: A Set of Six Case Histories

1. Since the 1930s growing numbers of Americans have been accommodated in subsidized housing, and, although many experts have attacked its effectiveness, it has only been recently that evaluators have begun to ask residents how *they* feel. Between 1972 and 1977, Guido Francescato, Sue Weidemann, James Anderson and Richard Chenoweth studied residents' satisfaction with HUD-assisted housing at 37 sites primarily in the East, Midwest and Southeast.

The housing developments ranged in size from 44 units to 1,124 units and most were clusters of lowrise buildings, although some midrise and highrise developments were included. The developments ranged in age from new buildings to those 30 years old or more, and represented a considerable variety of architectural quality, from unadorned boxes on asphalt parking lots to pleasant and well-designed projects on carefully landscaped sites.

The evaluators used several data-gathering techniques to assess the relationship of housing design to resident satisfaction with the housing projects. At each site they sent out questionnaires to residents, with a total of 1,907 being returned; recorded how and where residents spent their time over a two-day period; analyzed the management records to ascertain the background of the residents; photographed the sites and buildings, and examined the architectural drawings and other documents related to each project.

The research found that "a blend of factors is responsible for creating a satisfactory living environment, not a single aspect." The researchers identified a number of factors that contributed to satisfaction, such as user control over the physical environment, privacy, maintenance and satisfaction with management. However, the three best predictors of resident satisfaction with their living environment were satisfaction with other residents, perceived economic value of living in the housing development and pleasant appearance.

The developments that were rated highest on appearance represented a range of styles: traditional and contemporary, lowrise and highrise. Developments that looked institutional in their fenestration, facades and entrances were rated low; developments that had individualized forms and looked cared-for were highly rated. Contrary to some commonly held views, highrise housing, when appropriately designed and managed, was not inherently unsatisfactory and was actually rated higher than lowrise housing on privacy and security. Overall, as one resident said of his development: "I'd rather live in a single-family house, but this place is pretty nice."

2. Modular Laboratories For Instructional Use

Can the design and management of a college building affect the quality of the education that goes on inside it? Kellogg Community College thought so. The college commissioned Facility Management Institute (a division of Herman Miller Research) to design interiors for a 60,000-square-foot, four-story science/health technologies building on their Battle Creek, Mich., campus. The evaluation of the completed building, designed by Sarvis Associates and opened in 1980, was conducted during 18 months using objectives set out in the building's original concept documents. These objectives included adaptable space configurations, more efficient use of faculty time and improved student interest.

The evaluators held open-ended interviews with instructors, students and administrators, observed and recorded lab activities for four weeks, monitored spatial behavior and analyzed enrollment and other records.

Plagued by existing science buildings that were overcrowded, obsolete and full of huge quantities of uninventoried supplies, the college wanted a building that would be able to adjust as curricula and enrollments change. The new building incorporated modular laboratory and office furnishings, mixing all functions (classrooms, labs, study areas, project rooms, offices) in the same expanse of open interior space. Spatial and acoustic separation of functions was maximized, but different kinds of spaces could be expanded, moved or removed in hours or days. So far, there have been scores of minor changes and several major changes, including an enlargement of a dozen faculty offices and two classrooms. Numerous superfluous features such as extra storage units have been moved.

"Coming from a conventional setting, we couldn't imagine much more than translating what we already had into new furniture," says one user. "We had to live here before we saw the possibilities. I think we're now entering the period when the flexibility is going to start paying off." The evaluators found evidence to support this. After an initial flurry of rearrangements, followed by a quiet period, the change rate is climbing. A reception area, for example, has been put to use as an

Lab materials are delivered daily to students in individual trays (above). Instructor has desk in lab itself (below).

Photographs courtesy of the Facility Management Institute

audiovisual materials center.

College administrators wanted a building whose materials were so well organized and managed that both faculty and students would have more time to interact. Previously it was not uncommon to spend a quarter of an hour rummaging through drawers and cabinets at the beginning of lab periods, and labs often ran late because of this. The new building uses a materials management department modeled on hospital systems to deliver materials to the labs each day. A work sampling evaluation showed that the amount of interaction between students and instructors doubled in the new building. This was partly because of the materials management system but also, unexpectedly, because instructors became able to spend more time in the labs. A mobile "office" table in the lab areas allows them to do work and class preparation in the labs instead of elsewhere.

The administrators also hoped that a modern, elegant building for science courses, replacing outdated buildings, would improve student interest. Evaluators followed enrollment figures, number of science majors, science books withdrawn from the library and numbers of students finishing science courses. All these indicators rose after occupancy. The new building looks "newer than the labs I'll be working in someday," said one student, who added, "I think the snazzy building gives us a credibility edge in the eyes of recruiters." While such reactions are to be expected in most new buildings, the college hopes to keep enrollment figures high by selectively replacing worn furnishing modules.

Evaluations, conducted by the college, are to continue after this year. The college plans to keep watching in-lab activity patterns and to use evaluations to guide reorganizations of flexible environment and materials management systems.

The Facility Management Institute and Kellogg College both have learned lessons about the implementations of innovative systems, one of which is that nothing works quite as predicted. For example, one large lab area is largely unused, due to unexpected scheduling problems. Others, particularly study spaces, are often very heavily used.

Says one of the project designers:

"The flexible furnishings are bailing us out of a few planning oversights such as too small classrooms and too many student project rooms. They're also allowing implementation of things that never occurred to anybody—like the audiovisual control center. We're glad to have the opportunity to follow up on good as well as bad predictions."

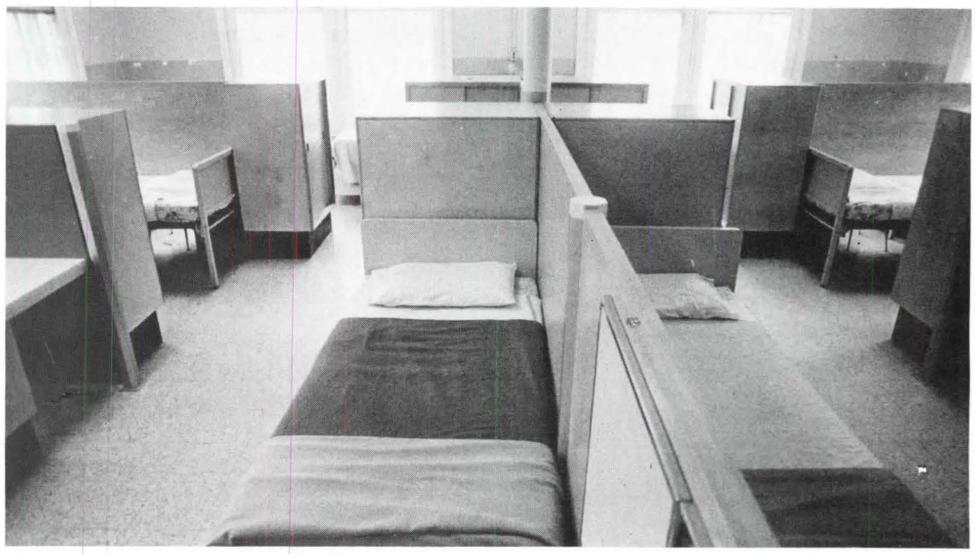
3. Renovated Facility For the Retarded

For decades, hundreds of thousands of mentally retarded people have been housed in large state institutions—austere, sparse facilities primarily intended as warehouses for people with mental handicaps. Residents have had little privacy and few amenities; they often sleep in open dorm rooms with 25 to 50 other people. In the last 10 years, increased activism by parents and concern by the federal government have brought reforms; the worst institutions are closing and most others are being renovated to meet federal standards for crowding and safety. Until recently it was unclear whether mentally retarded people prefer to live in single rooms or dorms, or in fact whether people with very low mental abilities respond at all to environmental design.

The Effects of the Living Environment on the Mentally Retarded Project was a three-year postoccupancy evaluation of court-ordered renovations at Belchertown State School in western Massachusetts. At the outset of the evaluation, most of the mentally retarded residents were housed in two-story brick dormitories. Somewhat resembling college buildings on the outside, the interiors of the buildings were noisy, smelly and sparsely furnished. Each building had six 30x40-foot spaces: Three served as sleeping wards, one was a day hall and two were dining hall/multipurpose rooms.

Because of a class action suit on behalf of the residents, the institution was provided $2.6 million in state funds to renovate 14 buildings. After hurried design development by Bradley Associates and some conflicts between the administration and the parents' association, the renovations took three forms: a one-and-two person bedroom design, with rooms arranged along a double-loaded corridor resembling a college dormitory in a newer building, and two designs that were placed in the 30x40 spaces in the older dorm buildings. One consisted of shoulder-height modular units, each with a bed, dresser and desk, and the other placed eight-foot-tall sheet-rock partitions in a suite configuration with three- or four-person bedrooms.

The evaluation studied the residents and direct-care staff before and after the renovations, recording where they spent their time and what they did. Data gathering techniques included structured and



Photographs by Alyce Kaprow

Belchertown school sleeping ward before renovation (right) and after (above right).

unstructured interviews with staff, having a researcher work as a staff member, observing and recording the activities of staff members and residents and measuring sound and acoustics. The observers coded the activities of staff and residents directly onto computer sheets. During the three-year evaluation period, more than 300,000 observations were collected.

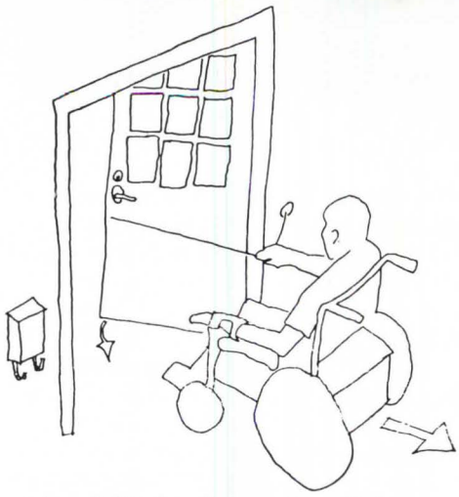
The designers and administrators predicted that all of the design schemes would have some positive impacts on residents and staff and that the suite design would be the most positive because it clustered residents. To their surprise, the double-loaded corridor design was the most positive. While living in this design, residents were more alert and less withdrawn, talked more and fought less. The corridor design was more institutional in appearance than the suite design but had an important advantage: Private and semi-private rooms and the corridor serving only a few people gave the residents control over their lives. They could protect their own space and be alone when they needed to be. Even these residents—who had average IQs of 20—responded to the opportunity to control their lives.

4. Apartment Complex For the Disabled

Creative Living, Inc., a small apartment complex for the severely disabled in Columbus, Ohio, was evaluated in 1976, two years after occupancy. The evaluation was part of a project sponsored by the National Endowment for the Arts and four federal agencies (including HUD, the developer of this housing) and managed by the AIA Research Corporation. Two major goals were to learn about designing supportive living environments for severely disabled people and to communicate this information to design professionals, community groups and HUD.

Residents of this complex are quadriplegics: people with paralysis of all four extremities. Quadriplegia, of course, renders individuals physically dependent; most quadriplegics use electric wheelchairs. Less obvious, but perhaps more devastating, can be the resulting psychological dependence. For this reason, this physical environment (and its relation to the total service delivery system of staff, services and environment) was analyzed with regard to the degree to which it enabled residents to accomplish various tasks of daily life without assistance.

Creative Living, Inc., was completed under HUD's section 236 assisted housing program. It provided 10,000 square feet of living space in five double occupancy and 13 single occupancy units. The complex was built in a hollow square plan, facing inward onto a landscaped



courtyard. Each unit contains a living area, kitchen, bedroom and bath.

Three researchers spent four days collecting data. They interviewed, observed and photographed 17 of the 18 residents in their daily activities. Staff, personal service attendants and members of the board of trustees were also interviewed.

One part of the evaluation dealt with design features, describing required physical capabilities, rationale for the particular design decision, analysis of the design as it was used by residents and recommendations for adaptation or change. For example, one design feature evaluated positively was the overhang that covers the entire sidewalk and protects residents in bad weather from exposure that can cause them serious health problems. In contrast, the front doors of the individual apartments were down-rated. Cost limitations prohibited automatic doors, which is unfortunate because most residents can neither operate the locks nor reach the handles to pull the doors closed. Many had ropes or light chains attached to the doors so that they can pull them shut.

5. Two Innovative Detention Centers

After it built two innovative jails ("pretrial detention centers") in New York City and Chicago, the U.S. Bureau of Prisons commissioned postoccupancy evaluations to look at the effectiveness of the buildings in providing secure, humane detention facilities. Three design goals were privacy, noninstitutional design resulting in decreased vandalism and decentralized functional units.

The Chicago Correctional Center by Harry Weese & Partners is a 25-story, triangular building with six functional units. Each basic functional unit has a split-level design, occupying two floors of the building. The central space is a general purpose room containing dining, ping-pong and pool tables and a small kitchenette. Bedrooms surround this space and are located a half-level up or down from it in four triangular wings of 11 rooms each.

The New York correctional center by Gruzen & Partners is an 11-story building with two irregularly shaped units per floor, connected by several sets of doors. Units are split-level, with rooms a half level up or down from a central general purpose space. The general purpose area is 1,800 square feet and contains dining tables, telephone, ping-pong and pool tables and a full kitchen area. Bedrooms are located in six eight-room tiers.

Data came from questionnaires, interviews and observation. In the Chicago facility, 126 inmates and 74 staff members completed questionnaires; in New York, surveys were filled out by 111 inmates and 13 officers. Observations iden-

Chicago Correctional Center has cells organized around common spaces (right).

tified what behavior took place, when and where it occurred and how many people were involved. This resulted in about 12,000 observations in the Chicago facility and 20,000 observations in the New York jail.

Most inmates in single rooms spontaneously mentioned privacy as the best single feature in the environment. However, despite reported satisfaction with privacy, these inmates occasionally did things to increase visual isolation, such as placing paper over window slots of bedroom doors. Inmates in dormitory units were not happy with the amount of privacy they had. They complained that there were no places to escape from the sight of other residents except toilet stalls. In one of the facilities, inmates occasionally hung blankets between bunks in order to gain some privacy.

The research showed that noninstitutional design—including bright colors, windows without bars, the sense of light and air and varied textures—was noticed and appreciated by inmates. Said one, "If the state place was like this, they'd have less problems, 'cause people act better when they're in a nice place." Supporting this view was the low incidence of vandalism and graffiti.

The decentralized functional unit system was intended to provide flexibility for management and to keep needed facilities near inmates. Since this meant that inmates might remain in the unit for days, weeks or months at a time, monotony and boredom were mentioned as problems. As one inmate said, "This place may look nice, but how would you like to be locked in a Holiday Inn for three months?"

6. Modern Monument With a Troubled Past

How is it that a building praised by most architects and critics can be greeted with antipathy by many of its users? The turbulent history of the design and 18-year occupancy of Paul Rudolph's Yale Art and Architecture building is being recounted in a forthcoming book by C. Ray Smith, AIA.

Behind the burly facades of vertically ribbed exposed concrete Rudolph provided a complex system of interior spaces. In section, the building centered on a large drafting room stacked over a main hall, around which overlapping platforms and interlocking vertical spaces were arrayed in pinwheel fashion. Many interior walls were finished in exposed concrete, and a good portion of these wore the corduroy pattern of the exterior. The architect sought and achieved a multilevel interior of flowing "spatial experiences," and in doing so set a rather inflexible program for the sculpted spaces.

Smith has interviewed Rudolph extensively and has attempted to talk with everyone who participated in the planning, design, construction and renovation of the building. In addition to Smith's analysis of the design process, the book will include a postoccupancy evaluation survey of all 17 years of alumni. Forty-one percent (approximately 675) of the alumni returned the questionnaire.

The evaluation surveys the building's principal users, art and architecture students, about their reactions to some of the controversial issues surrounding the building, including the 1969 fire that destroyed the three upper floors; the million-dollar rebuilding program on which Rudolph was never consulted, and the medical finding that the exposed asbestos ceilings were carcinogenic, resulting in their replacement.

More specifically, the questionnaire asked alumni about both financial and esthetic issues. Different functional areas such as drafting, painting and photography spaces were evaluated for such issues as convenience of access to the workplace, lighting, heating, privacy, noise, ceiling height and amount of square footage assigned. A number of esthetic issues were addressed, including spatial atmosphere, spatial variety, esthetics of the structural system, integration of heating system elements and the consistency of the total design.

Says Smith, "No other building has had so dramatic a first 20 years. In contrast to the anticipation of the design of the building as an architectural second coming, for some people who have worked in it, it calls forth such seething rage and vehemence as perhaps no work of architecture before or since." Smith believes that one of the most important lessons to be learned from the history of the Yale building is the difference between how visitors and critics may evaluate design and how it is evaluated by the people who use it every day. □

The original interior arrangment of the Yale Art and Architecture building.

Ezra Stoller © ESTO

All photographs by the author

Stylistic Dogma vs. Seismic Resistance

The contribution of modernist tenets to an Algerian disaster. By Marcy Li Wang

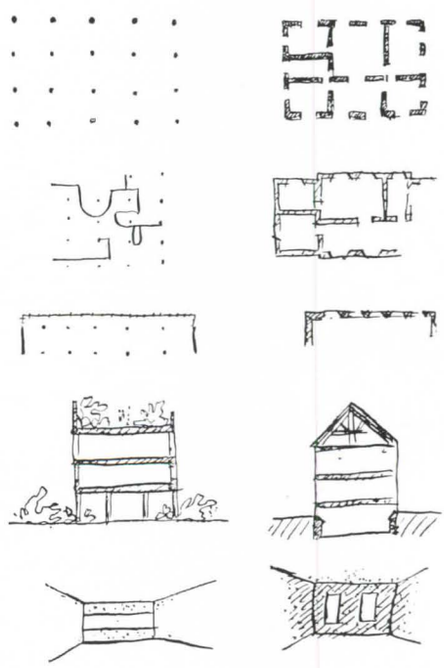
As one of its principal prophets, Le Corbusier dogmatically spelled out the requisite physical elements of modern architecture that he felt were necessary to ensure its proper execution.

Almost every architect educated in the Western world is familiar with the "five points of a new architecture" that Le Corbusier published in his *Ouevres Completes:*

1. Pilotis (or first story columns to free the ground);
2. A free plan (free of the systematic restrictions of bearing walls);
3. A free facade (an external skin such as a curtain wall that is independent of the structure holding the building up);
4. Roof terraces (which are encouraged to be constructed with sand covered by thick cement slabs laid with staggered joints, seeded with grass);
5. Strip windows (horizontal lengths of fenstration that could occur as uninterrupted bands).

While "the five points" have set generations of architectural hearts beating faster, they have more sinister overtones for structural engineers and other seismic specialists who would recognize pilotis as "soft stories" that have been the failing point of dozens of modern buildings in earthquakes all over the world. They know that the free plan is the generator of highly asymmetric plans that result in excessive torsion during earthquakes.

Ms. Wang is an assistant professor of architecture at the University of California in Berkeley. She adapted this article from a paper being presented at a workshop on architecture and seismic issues sponsored by the National Science Foundation this month in Peking, China.



Above, Le Corbusier's illustration of his five points contrasting his approach with the conventional. Top, a clinic in El Asnam, Algeria, whose Corbusian pilotis failed during disastrous 1980 earthquake.

European imports and seismic unconcern.

The free facade may pose complicated motion and interaction between the structure and nonstructural elements. Roof terraces involve an absurdly heavy load of thick concrete, sand and soil. Strip windows effectively destroy the resistance of shear walls, or create short columns that are highly susceptible to shear failures.

Yet the "five points" have had profound impact on the look of modern buildings around the world. The cause of Le Corbusier's strong influence in Europe and colonial French North Africa is obvious; his indelible mark on the rest of the world may be due to the directness with which he defined his elements of modern architecture in his prolific and passionate writings, and also due to the fact that he worked primarily in reinforced concrete, which is still the most accessible modern material in much of the world. It is by chance that many of these elements of Le Corbusier's invention are antithetical to principles of good seismic resistance when explicitly applied to buildings in earthquake zones.

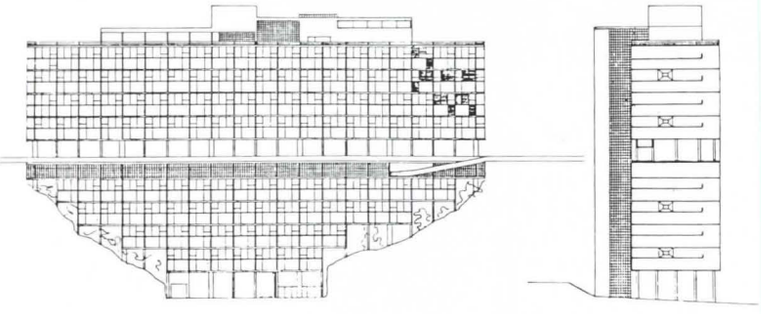
Of course, a relationship between architectural styles and seismic resistance is not unique to the modern era. The follies of insisting upon heavy masonry styles in 19th century California, for example, are easy to see in light of the great 1906 San Francisco earthquake, in which massive stone buildings that escaped the ravages of the ensuing fire collapsed into heaps of rubble. Three major factors are important to the seismic resistance of a building: earthquake engineering and technology, materials and workmanship and architectural concepts. Even in modern Japan and the U.S. where technology, materials and workmanship are the most advanced in the world, highly engineered buildings have failed mainly due to architectural concepts. Here in the U.S., the famous failures of the Olive View Hospital in San Fernando (1971) and the Imperial County Services Building in El Centro (1979) are two examples of architecturally aggravated failures. These cases illustrate an undue reliance upon engineering to make buildings hold up in earthquakes that is modern architecture's Achilles' heel in a seismic design.

In third world countries where technology, materials and workmanship are especially inadequate, the architectural concepts even more frequently determine the fate of a building. Devastation of large portions of cities, including the more modern sectors, and grim mortality rates in places such as Caracas, Venezuela, Managua, Nicaragua, and El Asnam, Algeria, which have recently suffered major earthquakes, are partially the product of modernist architectural expressions used contrary to sound seismic resistance principles and exacerbated by deficient workmanship or materials so common to developing nations.

Algeria's French colonial past (1848-1962) makes this country a particularly notable example of a seismic region into which modern architecture was boldly injected by the Europeans irrespective of the North African setting. In the capital city of Algiers, for example, the ancient Casbah is surrounded by 19th and 20th century buildings that are architecturally reminiscent of French Mediterranean styles.

Through much of the French colonial era, the problem of seismic resistance was not high on the list of problems that the French found most worrisome about building in Algeria and the other North African territories. The March 1936 issue of *L'Architecture d'Aujourd'hui,* which was devoted to the subject of French architecture in North Africa, summarizes the concerns that Europeans had about building in that part of the world. In relation to Algeria, the major problems cited were the differences in cultural, esthetic and sanitation standards that Europeans and Algerians were accustomed to in their housing. The French were especially disturbed by the lack of adequate sanitation facilities in Algerian households, to which the Europeans attributed a high mortality rate among the native Algerians. For their own housing and more prestigious public buildings, the French would import architecturally current styles from their homeland, usually modifying them for climatic and insect conditions. In the case of both European and indigenous buildings, the threat of earthquakes was hardly mentioned.

The same issue of *L'Architecture d'Aujourd'hui* contains



Vernacular buildings of unreinforced masonry, left above, were devastated in both El Asnam earthquakes. The huge concrete Ain Nasr market at top didn't fare that much better. Above, Le Corbusier's proposal for a multiuse building in Algiers.

town plans proposed by Le Corbusier for Algiers and Nemours. Although the proposals must have appeared quite radical and futuristic at the time and although those specific plans were never implemented, the sketches of the buildings that Le Corbusier envisioned in his plan are startlingly similar to buildings that the French were to erect in Algiers two decades later. One illustration in the issue shows Le Corbusier's design for an enormous housing and transportation structure of reinforced concrete, with pilotis at both ground and occasional intermediate levels. Such buildings, with their "structural discontinuities" and "soft stories," are extremely common in Algiers and constitute one of the more frightening seismic hazards that the city could realize in the case of a major earthquake.

Such an earthquake struck during the French occupation of Algeria on Sept. 9, 1954, in the town of Orleansville (now known by its Arab name, "El Asnam"), 150 miles west of Algiers. In this 6.7 Richter magnitude shock, most of the town was destroyed and 1,300 people were killed. This event abruptly awakened the French to the enormous earthquake hazard, and they immediately began the reconstruction of El Asnam (on the same site) with intentions of making it much more earthquake resistant.

In the June 1955 issue of *L'Architecture d'Aujourd'hui* the cause of the great devastation in this earthquake was attributed to the bad quality of construction in old, traditional, masonry architecture that was often neither reinforced nor tied. Steel frame construction was encouraged for the area, but the expense of steel there precluded its widespread use, and the traditional masonry buildings were largely replaced by concrete frame structures.

Typical construction from the French period of building after the 1954 earthquake consisted of two-way reinforced concrete frames with modules of three meters (about 10 feet). The floors were hollow precast concrete elements with a topping of reinforced concrete four to five centimeters thick. Interior as well as exterior walls were mostly built of hollow precast concrete infill, usually with pilotis on the ground floor. The French also devised and applied a rudimentary earthquake engineering code for building in Algeria.

After the French were expelled in the 1962 revolution that gave Algeria independence, the Algerians assumed the task of keeping up with the enormous housing and other construction needs there. While the general mood of the country at that emotional time was to do away with vestiges of their French colonial past, many aspects of French culture were so entwined with the Arab, Berber and other Algerian influences that it was difficult to segregate and evict them.

It was easy enough to symbolically change street names from French to Arabic and to disregard the French seismic code for construction. Much more difficult to eradicate was the dominance of Corbusian forms, the only modern architecture that the Algerians were familiar with. Thus, the use of a concrete frame with masonry infill and ground story pilotis was a French tradition that the Algerians automatically continued, very probably without any architectural convictions about what they were building. The Algerian buildings also began to assume more elaborate ornamentation, which was quite "un-modern" and probably derived from the individual designers' notions of

A rebuilt city all but wiped out again.

Arabic historic allusion (their "postmodernism?"). Usually this addition of ornament, whether applied or in the complication of architectural forms, only aggravated the seismic problems.

On Oct. 10, 1980, a series of major shocks, the largest of 7.2 Richter magnitude, originated on the same fault of the 1954 earthquake. In small, very rural villages close to the earthquake epicenter, innumerable people died in the predictable collapse of traditional, unreinforced, stone and adobe buildings. At El Asnam, which had been almost completely reconstructed only 20 years earlier, 80 percent of the structures were destroyed. This time most were modern, reinforced concrete buildings.

The buildings of El Asnam prior to the 1980 earthquake could be roughly divided into three categories: those few buildings that withstood the 1954 quake and were strengthened; buildings constructed by the French, and buildings put up by the Algerians after independence. Not surprisingly, many of the buildings in the first category did not survive this second large earthquake. The modern buildings of categories two and three, on the whole, behaved worse than the more traditional buildings of category one, which were generally constructed of massive unreinforced masonry walls with heavy tile roofs.

In several cases, modern buildings suffered complete pancake failures; structural failure was immediate and resulted in the heavy floor and roof slabs of concrete stacked up one on top of the other. Hundreds of people perished as a result of such failures. In most of them, collapse was so complete that there was no way to determine exactly what the buildings had looked like or how they failed.

The most awesome structural failure in terms of the size of the building, the extent of failure and lives lost was that of the Ain Nasr Market, a huge block 100 meters square of three and four stories with shops and restaurants on the ground floor and housing on the upper levels. This whole complex, built by the French after the 1954 earthquake, collapsed except for one corner that remained precariously standing. It was from this small fraction of the structure that investigating engineers determined the main causes of the devastating failure. General characteristics of the building can be seen from photographs of the remaining corner: Enormously heavy slabs of concrete, exceptionally thick concrete nonbearing partitions, were supported by relatively spindly ground-story pilotis.

The specific mechanism of failure can be seen in the way the slabs were beginning to fail in the portion of the building left standing. The inner columns were apparently weaker than the columns on the perimeter of the building and failed first, followed by the inward pancaking of slabs and inevitable failure of the rest of the columns. Deaths in this complex alone exceeded a thousand.

A new medical clinic, almost completed but not yet occupied at the time of the earthquake, was an example of a modern building with Algerian ornamentation. The building was elevated on pilotis, more for the functional purpose of accommodating a garage on the ground story than as a conscious application of the modern trademark. Adjacent to the clinic was a building identical to it except for the lack of ground story columns. The clinic collapsed; its twin, without pilotis, did not.

A major Algerian construction project that partially collapsed was a cultural center built of concrete frame and masonry infill. Its two buildings had heavy and ornamental "Algerian" facades cantilevered from thin modernist concrete frames.

Not far from downtown El Asnam was a new housing project

Above, fragments of the cultural center facade. Housing at top right, all but destroyed, resembled Le Corbusier design (sketch).

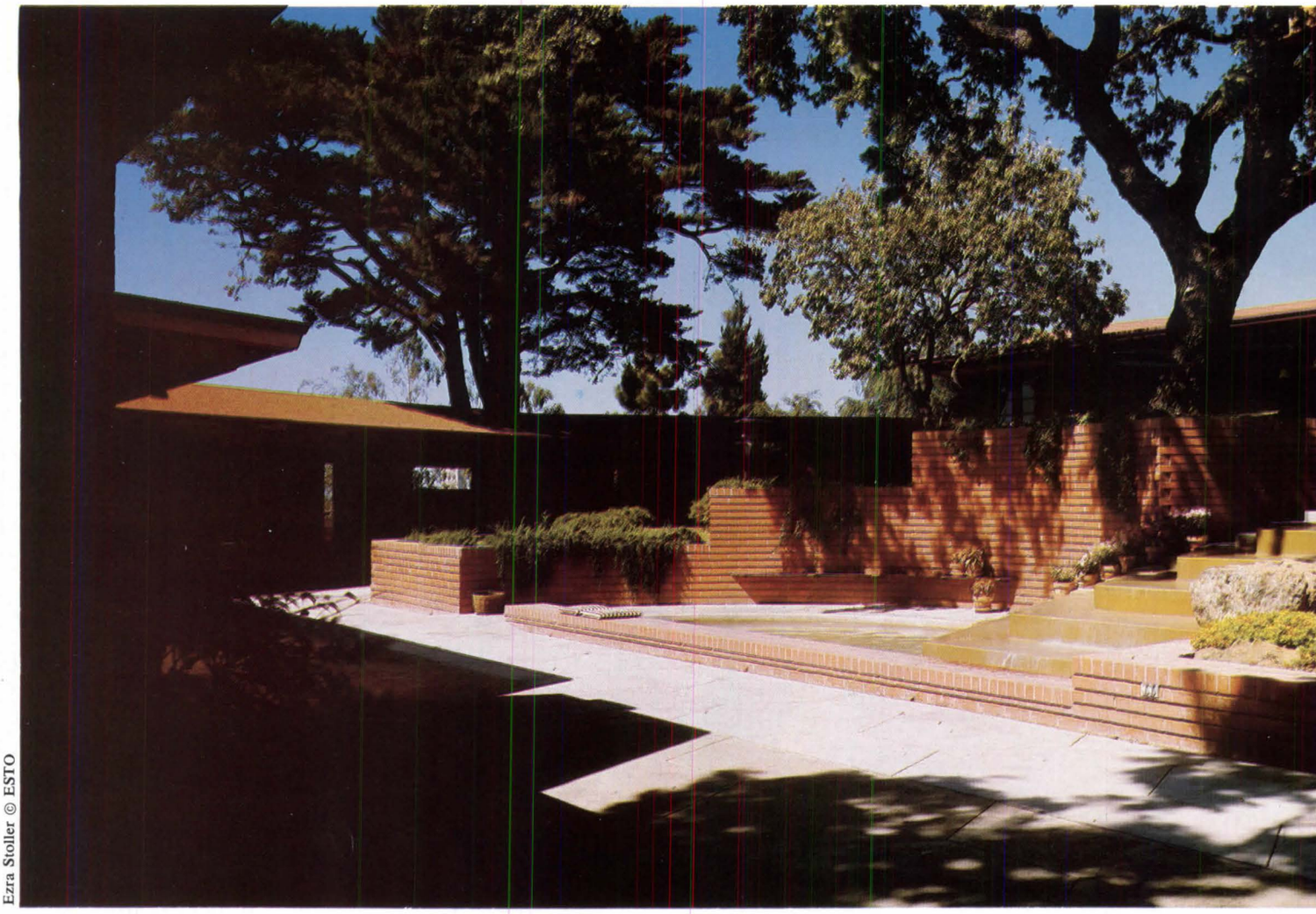
bearing a remarkable resemblance to "peasant farmer" housing sketches that Le Corbusier published in the '20s. There, dozens of two-story housing units elevated on pilotis were completely destroyed as a result of the failure of the pilotis. Fortunately, no one was living in these units yet.

During investigation of the disaster, it was not uncommon to discover in the rubble that, in addition to unusually thick and heavy concrete or masonry wall loads, the heavy roof slabs were further loaded with large quantities of sand designed for protection from the summer heat. This is an example of how accommodating one environmental condition can aggravate another.

A. U.S. earthquake investigative team (of which the author was a member) concluded: "The collapse of these buildings did not occur because they were not engineered structures, or because attempts were made to economize the use of structural materials. The collapse occurred due to the fact that the buildings were not architecturally designed and engineered for the effects of strong earthquake ground motions."

Prior to the 1980 El Asnam earthquake the Algerian government had commissioned a group of Stanford University engineers to write an earthquake building code for Algeria based upon historic seismicity. Subsequent to the earthquake, a code of Algerian regulations has been produced that emphasizes restricting the types of concrete construction allowed, since design practice, material quality and construction methods just cannot provide the required performance. All concrete systems must be braced by continuous, 100 percent seismic load resisting shear walls in place of the Corbusian frames that have been in such common use.

The radical limitation on building techniques is not extreme considering that El Asnam was destroyed twice in a little over two decades, and that one contributing factor was the emphasis of style over safety. □



Ezra Stoller © ESTO

Clients'-Eye View of a Wright Classic

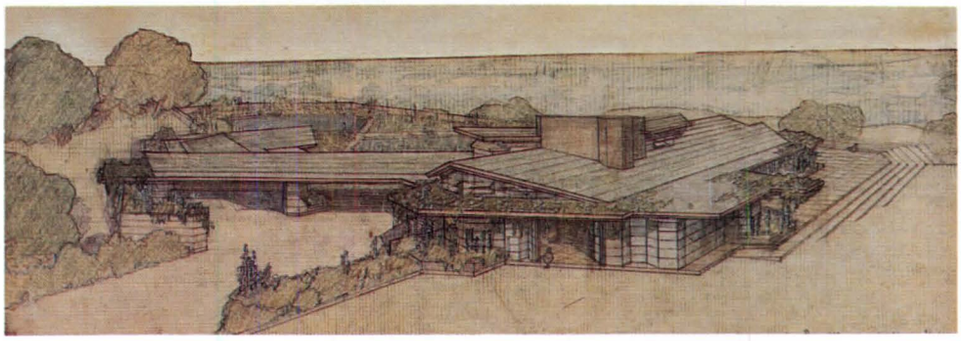
The Hannas write about their 'honeycomb house' at Stanford. By Donald Canty

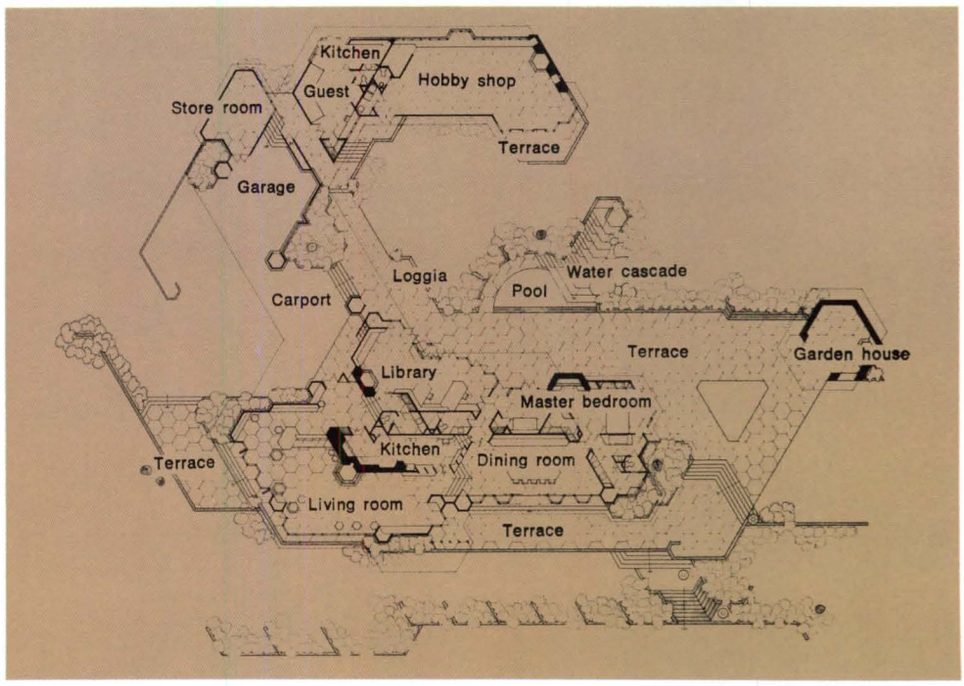
Frank Lloyd Wright had no more devoted clients than Paul and Jean Hanna, for whom he designed the "honeycomb house" on the Stanford University campus. In the years 1930-1980 they saved virtually every item concerning him and/or the house, eventually depositing these unique archives in the university library. Now they have written a book, *Frank Lloyd Wright's Hanna House: The Clients' Report,* being published this month by MIT Press and the Architectural History Foundation. It is a charming and unusual narrative of a time, a place and a relationship. It might have been called "Paul and Jean Hanna's Frank Lloyd Wright."

"We met in college as freshmen and fell in love," the Hannas begin. "During the four years of courtship and two years of engagement, we dreamed about a home of our own. From the time we were married in 1926, we kept folders containing architectural ideas. At first we were able to visualize only one room at a time. Gradually we began to think in terms of the whole house. We discovered the Bauhaus movement and read everything we could find on German architecture. Mostly we were confused. We could not formulate or express a basic philosophy of architecture.

"We were teaching at Columbia University when, in 1930, we came upon newspaper reports of the Kahn Lectures by Frank Lloyd Wright at Princeton. We secured the published volume of lectures and sat up all night reading and rereading *Modern Architecture* aloud to each other. Certain adages in that volume expressed for us a philosophy of home and of living that moved us deeply:

- 'Principle is the safe precedent.
- The working of a principle is the only safe tradition.
- An organic form grows its structure out of conditions as a plant grows out of soil. Both unfold similarly from within.
- Form is organic only when it is natural to materials and natural to function.
- An inner-life principle is a gift to every seed. An inner-life is also necessary for every idea of a good building.
- Simplicity and style are both consequences, never causes.
- Specific purpose is the qualifying aim of all creation.
- From the ground up is good sense for building. Beware of from the top down.
- Form is made by function but qualified by use. Therefore, form changes with changing conditions. The last analysis is never made.
- All forms stand prophetic, beautiful and forever in so far as they were in themselves truth embodied. They become ugly and useless only when forced to seem and be what they are not and cannot be.
- Creation never imitates. Creation assimilates.' "





Above, the house seems a natural outcropping of its site. Above right, a Wright rendering and the famous honeycomb plan.

The next day the Hannas wrote Wright a "fan letter," to which he replied with an invitation to visit Taliesin. They accepted and during the visit recalled Wright speaking casually of his hope "someday to abandon boxlike, right-angle corners and to design and build with the more flexible hexagonal forms of the bees' honeycomb." Before leaving they asked if Wright would someday design a house for them.

"Four years and three children later," as the Hannas put it, Paul was invited to join the Stanford faculty. They made two phone calls: one accepting the appointment and the other asking Wright to begin thinking about a house for them in California. On the way West they stopped again at Taliesin and spent three days evolving a set of requirements with Wright. It included:

- "Land on the brow of a hill, with view and drainage, large enough for gardening, playing and privacy;
- A house nestling into the contours of the hill;
- A house enclosing enough space for a variety of human activities without crowding three young children and the parents;
- A house warm and dry in inclement weather, but thrown open to the breezes of terrace and garden when desired;
- Walls of glass so that we could always be visually conscious of sunrise or sunset, the fog banks rolling over the hills or trees and grass in the fields;
- A house so equipped that electricity, natural gas and labor-saving devices would do the drudgery, leaving time and strength for the more creative aspects of life. We wished to be free of tending the furnace, regulating room temperatures, washing dishes, carrying out garbage;
- Furnishings that carried out the simple, unified pattern of the house as a whole; little decoration as such; only the honest use of materials;
- A house accommodating art objects that had special meaning for us and reminded us of great events, great people or great experiences;
- A house sheltering indoors up to 30 guests at dinner parties, up to 100 guests for musical evenings, receptions, cocktails, or teas, overnight guests or relatives, seminar groups of students or colleagues;
- A house with terraces and gardens that would accommodate up to 200 guests for informal functions, sunning or relaxing in sunshine or shade and children's activities, such as roller-skating, games, dancing;
- A house that could be remodeled easily as changing family composition and function required. . . .

"In late 1935 Mr. Wright began to design our house; in a matter of weeks a perspective sketch arrived. With eagerness and anxiety we unrolled the drawing; we found a rendition of a magnificent two-story house! No accompanying explanation! What to do? Jean was recovering from a fall down a flight of stairs, and Paul was adamant: only a one-story house would do.

"Nothing in our archives throws light on why Mr. Wright sent us a drawing of a two-story house. He had not yet seen Stanford nor had we sent him any suggestions on site or design. Possibly this sketch was meant to show us another example of his work. We realized that in some matters the clients' preferences take precedence, so we returned the sketch. We hoped Mr. Wright would understand. He did."

Photographs by Ezra Stoller © ESTO

Getting accustomed to hexagons.

The Hannas then began negotiating with Stanford for a site on the campus. The Wrights visited them in their rented home and looked at three of the possible sites. Their story continues:

"After the Wrights' visit a new set of floor plans arrived. Another shock! The designs appeared to be exercises in geometric patterning. During the March visit at Palo Alto, Mr. Wright talked about his hexagonal concept, but our memories do not retrieve any details of these discussions. We recall that we were fascinated at the time but not prepared to comprehend the complex and unconventional geometric grid. Mr. Wright's accompanying letter urged us to study the plans carefully and in depth:

April 2, 1936

'The sketches, rather completely worked out, left Palo Alto today.

'I imagine they will be something of a shock, but perhaps not. They will probably explain themselves, but I should mention that the laboratory kitchen is sunlit from above as are the bathrooms and entry toilet.

'The [exterior] accordion walls are shown partly moveable but all could be moveable. There is so much glass surface that the tracery of wood crossing the glass makes only a delicate screen wall—leaving tremendous visibility.

'I hope the unusual shape of the rooms won't disturb you because in reality they would be more quiet than rectangular ones and you would scarcely be aware of any irregularity.

'The furniture works into the scheme naturally enough.

The angular interior spaces change constantly in volume (one of the tallest is the tiny kitchen) and are flooded with light.

'You have contrasting low and high ceilings in every room.

'While the plan is spacious and spreads itself, it is not unduly extravagant, I think.

'There is a small cellar for heater and storage under the kitchen, entry and study connecting with the chimney and an outside stairway. The plumbing is well blocked together.

'There is no back door—only a bypass for convenience. The 'back door' has gone with the 'upstairs.'

'You will see, I think, a very direct pattern for simple living in the dining and working arrangement as related to living room and play space and terraces and garden. There is only a screen for the garage. And the garage floor and forecourt are colored gravel to be raked occasionally.

'The house itself is built upon prepared ground—precast hexagonal-unit tiles laid down on concrete and the house erected on the intersection lines.

'The outside walls are only two and three-fourths inches thick of redwood insulated with aluminum foil. The walls inside, just the same, and the ceiling all wood, also worked out on unit lines. Such walls would not burn and the house would be comparatively vermin proof. No termites could work.

'I hope you will both like it as much as I do when you become familiar with its somewhat unusual proportions.

'It is so much more practical—I believe—than the conventional house that you will find little comparison.

'You will see in the plans the *thought* that is *architecture* modern or old.' "

The Hannas "bombarded" Wright with requests for changes, and meanwhile Stanford allotted them the hilltop site they wanted.

They were working with Wright on the basis of a five para-

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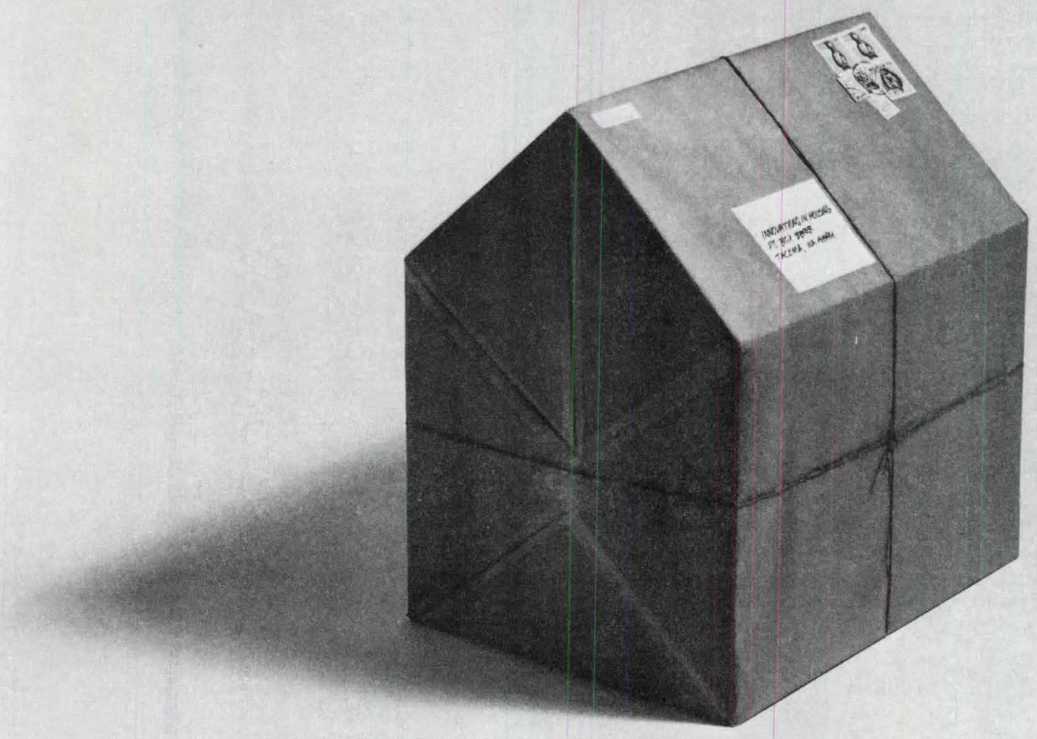

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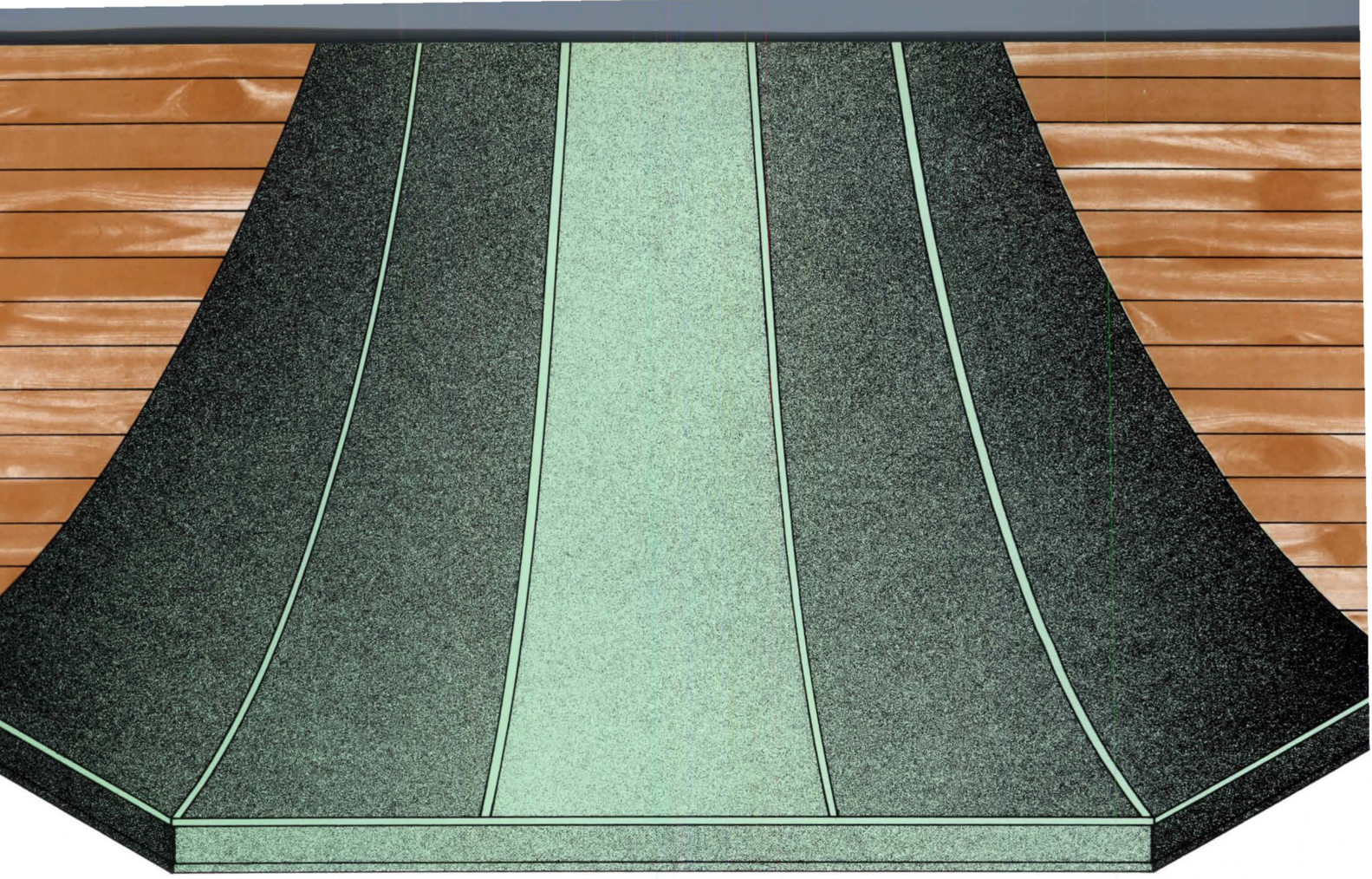

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BOOKS

Survey of U.S. Architecture Lacking a Sense of History

American Architecture, 1607-1976. Marcus Whiffen and Frederick Koeper. (MIT Press, $30.)

To write a survey of American architectural history is to invite criticism. No individual can command the expertise to treat every aspect of several centuries' building in a way that will satisfy specialists, and every reader will find favorite buildings, favorite architects and favorite subjects slighted or omitted altogether. In history and literature, this problem is often alleviated by the use of multiple authors, a solution that is rare in architectural history, but one that has been attempted in this book. Marcus Whiffen is responsible for the years before 1860, while Frederick Koeper recounts developments since then. The temporal division is not an ideal one, since the break that the Civil War marks in politics is less apparent in 19th century architecture. Generally speaking, however, the apportionment of responsibilities works well. The problem of coverage can also be dismissed. The authors, Koeper in particular, have made good use of the scholarship of the last 30 years in incorporating architects and movements that in other surveys would be dismissed or mentioned only in passing. Noteworthy is the treatment of the early 20th century eclectic styles and the discussion of architecture since 1945, which is unusually clear and extensive for a work of this type. Also, a serious effort has been made by both authors to include buildings other than the hackneyed examples that appear in nearly every survey of American architecture.

The book has other merits. The photographs are beautifully reproduced, even if the choice is unadventurous and there are too few of them. The number of plans is greater than in most surveys, though Koeper's section is less well supplied with them than is Whiffen's. And the authors recognize that readers will want to visit the buildings mentioned and have indicated in the index which ones no longer exist. (There is at least one error: Upjohn's Church of the Holy Communion has not been demolished.)

While the scope and production of the book are admirable, the treatment of the material raises serious questions. One is compelled to ask who the prospective reader is, and how the book is intended to be used. Presumably, most readers of a survey book are architectural neophytes who have either a casual interest in architectural history, or an assignment in a formal academic course. Casual readers will find the book difficult to use. There is little explanation of terms or basic concepts of architectural history and criticism either in the text or in a glossary.

A glaring example is in the discussion of Godefroy's Unitarian Church in Baltimore, which, the reader is told, embodies the architect's "regard for character, or *caratère,* as defined by the 18th century French theorists," without further explanation. Names of styles punctuate the chapters, but in most cases it would be difficult for the uninitiated to form a working definition of them that could be applied to buildings encountered on the street. In chapter 12, "The Elimination of the Box," for instance, the stick style is characterized by its "diagonal and cross bracing, whose patterns enlivened the sides of suburban villas." True enough, but such bracing also appeared commonly on houses that many would assign to the Queen Anne style, and it continued to be used well into the 20th century in half-timbered revival buildings. Similarly, the Queen Anne style is said in the same chapter to employ living halls and (in another place) assorted textures of materials and picturesque roof lines. Again, true enough, but not very helpful. The real problem lies in the insistence on applying discrete stylistic labels to a period where such labels had less visual than ideological and promotional significance,

continued on page 73

The End of the Road. Photographs and text by John Margolies; edited by C. Ray Smith. (Viking Press and Penguin Books, $22.95 hardbound, $12.95 paperbound.) Published in collaboration with the Hudson River Museum, host of an exhibition under the same title that opened in July 1981, this book contains 130 full-color photographs of motels, eating and drinking places, gas stations and various roadside attractions. Margolies calls them "splendid, wonderful folk architecture . . . inventive and original." He contends that such so-called architecture "is not blight and ugliness and bad taste. It proves that what we are really best at is being tacky and commercial." Both attributes are revealed in the Campus Drive-In Theatre in San Diego, shown above. Margolies makes a plea to save these roadside buildings by a reassessment of historic preservation standards. Even so, many of the structures will crumble away, he says, and we had better give them a "long, lasting look" now.

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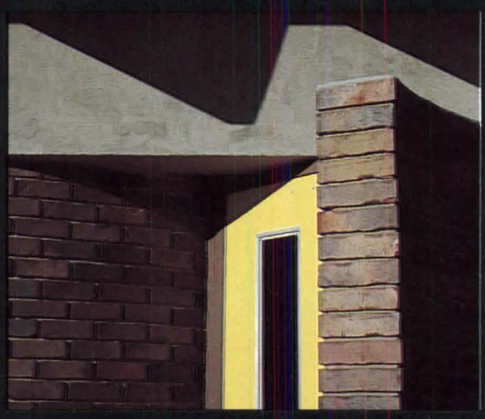

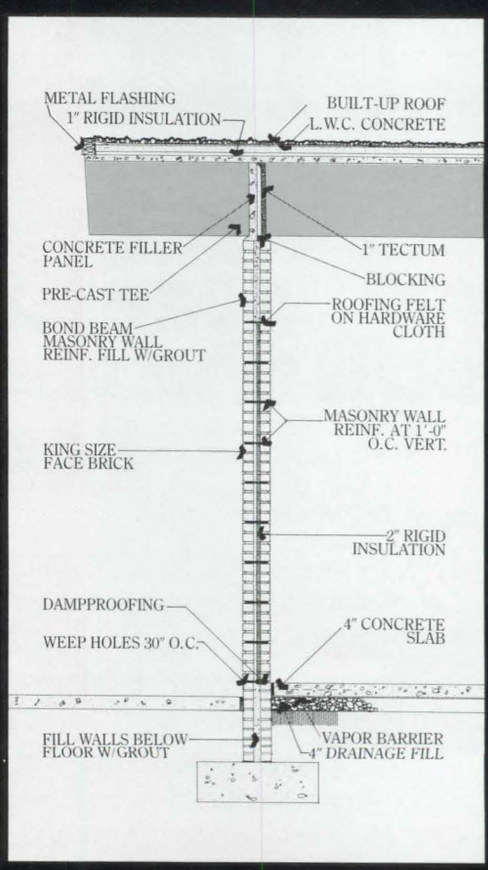

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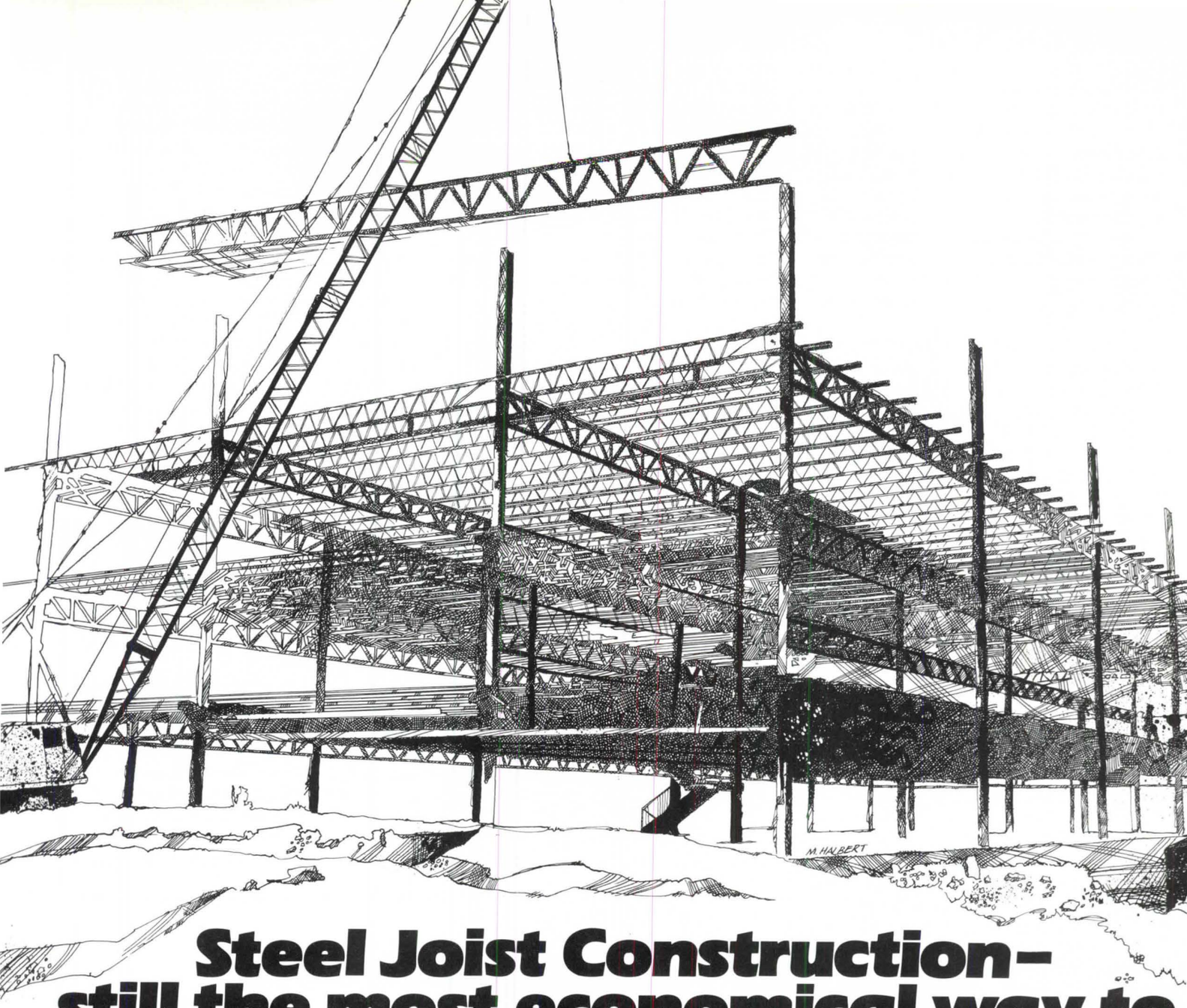

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Books *from page 70*
and in the questionable mixture of 19th century terms, like Queen Anne, with 20th century ones, like stick style. The difficulty is compounded by the fact that much of the interpretation of American architectural history has been taken over uncritically from standard monographs (in this case, Vincent Scully's *The Shingle Style and the Stick Style)* with little attempt to integrate it into a coherent overall interpretation.

To a student assigned to read the book in conjunction with academic training, it offers little that would not be standard fare in most lecture courses. If there is no information here that the student could not expect to hear in class, and not enough photographs to be useful for review, neither is there much interpretative material to help understand the structures. Few buildings receive more than a line or two of comment. Even where plans are illustrated, they are sometimes not mentioned in the text, and their analysis is always unsatisfactory.

A case in point is the passage on H. H. Richardson's Crane Library at Quincy, Mass. Koeper notes the simplicity of the facade when compared to the architect's earlier buildings, but neglects to mention the more picturesque character of the (original) rear elevation. He asserts that the five Richardson libraries are all similar in plan, when in fact they are similar in program, but very different in plan. He then characterizes the plan of the Quincy library offhandedly as being as "simple as that of a 17th century colonial house " But, as the illustrated plan shows, within the somewhat distorted rectangle the space is divided into three discrete areas, all treated differently, that serve to create a much more dynamic and complex visual experience than Koeper suggests.

As in the case with many architectural histories, *American Architecture* is not good history. (It is fitting that the word "history" is not used in the title.) There is no sense of context or of cause; only an architectural historian would claim that a building is "not of its age," as Whiffen does of the "Old Brick Church" (Newport Parish Church) in Virginia. In place of history, we are offered a series of "firsts" whose only causes seem to have been the whims of individual designers. This predilection often obscures the real significance of important buildings. Thus, the discussion of Latrobe's Bank of Pennsylvania consists of a citation of its priority in the use of a Greek order and of masonry vaulting, combined with a hasty description of its exterior massing that ignores the importance of the (illustrated) plan, and even of the plan's relationship to the exterior.

Not only is the sense of history deficient, the data are sloppily assembled, often outdated and frequently wrong. This is particularly true of Whiffen's section. To cite only Virginia examples, the date of Newport Parish Church is given as 1632, despite the fact that no student of the matter accepts this any longer. The wrong Green Spring is cited as Governor William Berkeley's house. The spire of St. Paul's Church in Richmond is treated as a 19th century entity when in fact it was drastically altered in 1939. Such errors may be attributed to carelessness. Others arise from more serious historiographical faults. The first sentence of the book cites a well-known description of Jamestown by Ralph Hamor that, with an accompanying description of Henrico town, has been commonly used by architectural historians to depict the architecture of Virginia's earliest settlements. However, equally accessible in the printed records of the colony are several accounts of the 1620s, including one signed by Hamor, that denounce these descriptions as falsehoods invented from political expediency.

Such an error, minor in itself in a survey book, epitomizes the all too common habit among architectural historians of relying on received wisdom and of using pithy quotes without regard for verification or context. One result, which Whiffen's section illustrates, is that few new insights have been contributed to a study of early American architecture in the last 50 years. Seventeenth century American architecture is still described as "medieval" (though that term is relied on here less than in most surveys), in the face of 30 years of English vernacular architectural studies and of such recent books as Abbott Lowell Cummings' *The Framed Houses of Massachusetts Bay* (which the authors cite) that have shown this characterization to be both inadequate and incorrect.

Considering *American Architecture* in the context of the many other recent American architectural surveys, I would say that the multivolume Pierson-Jordy *American Architects and Their Buildings* remains the best, with Leland Roth's *Concise History of American Architecture* the most satisfactory short treatment. *American Architecture, 1607-1976* is a distant third. *Dell Upton, Research Fellow, Winterthur Museum, Winterthur, Del.*

CM: The Construction Management Process. James J. Adrian. (Reston Publishing Co., $19.95.) **The Implementation of Project Management: The Professional's Handbook.** Edited by Linn C. Stuckenbruck. (Addison-Wesley Publishing Co., $24.95.)

CM: The Construction Management Process marks a drastic departure from most of the literature on construction management. Simply stated, it is a lucid, objective and comprehensive discussion of the entire CM process. While most of the literature on the subject deals with biases pro and con on this management

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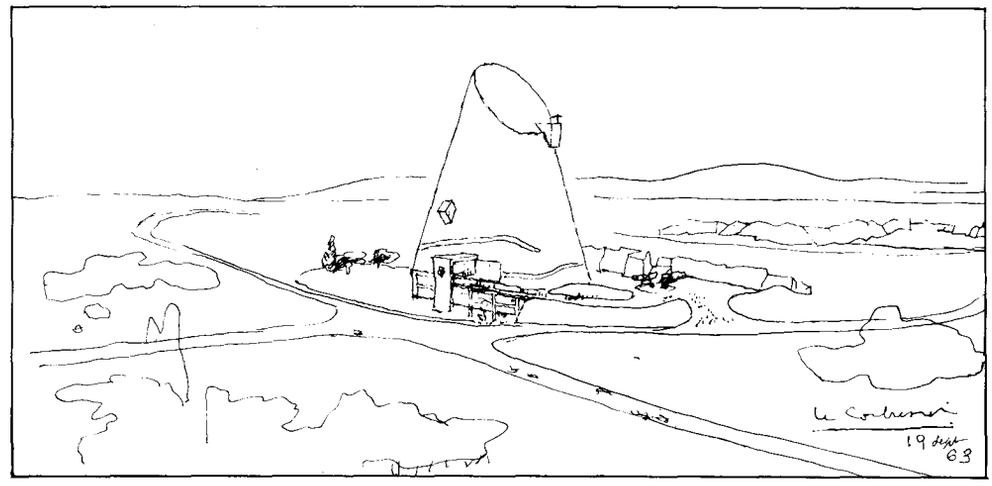

Le Corbusier's Firminy Church. Introduction by Anthony Eardley. (Institute for Architecture and Urban Studies and Rizzoli, $17.50.) Le Corbusier's sketch above, made in September 1963, is a site perspective for the architect's last realized building, the parish church of Saint-Pierre de Firminy-Vert in southern France. The book, which is the catalog for a 1981 exhibition mounted by the Institute for Architecture and Urban Studies, contains 120 drawings, Le Corbusier's handwritten notes and models for the project, commissioned in 1960 and still in process of completion. A perceptive essay by Anthony Eardley gives the story of the controversial church, whose cornerstone was laid in 1970. A decade later, Eardley writes, "the building stands some 30 feet out of the ground with about two-thirds of the concrete in place, almost 70 feet of its projected dome—incomplete, seemingly abandoned, more closely resembling the ruins of the Telesterion at Eleusis or the sixth century basicila of St. John at Ephesus than the new and gleaming contribution to the great white churches of France which its protagonists have so earnestly intended it to be."

Books *from page 73*
service, this book is highly objective, recognizes the subtle issues as well as the more straightforward topics and provides what could be a textbook on the subject.

The book is broken into parallel tracks dealing with questions of agency, who is responsible to whom, the benefits and disadvantages to the owner and the ensuing contractual relationships and the liability that stems from those contracts. Not overlooked are the tangible construction management questions such as scheduling, conceptual approaches to estimating and value engineering and the awarding of the project components.

The book will interest students and clients who wish to have a clear discussion on the subject, as well as practitioners who may be interested in moving into the construction management marketplace. The author's multifaceted background provides a distinct plus in this book, one of the better works on the subject.

The Implementation of Project Management deals with project management from a more general management perspective rather than from an architect's singular point of view. To this end the book succeeds admirably, clearly outlining the concepts of project management and further showing how to integrate those concepts into projects or organizations where needed.

The discussion on implementing project management in a potentially hostile environment (read: senior managers reluctant to change) and the frank evaluation of how much project management is enough are the most interesting chapters, dealing with areas that require the greatest sensitivity and speak to the essence of project management, evaluation and decision making.

The book is readable, the authors addressing well the component pieces of project management. Architects will find that the book is not directly pertinent to their practices, but any manager looking for a strong generalist discussion of project management will find the book useful. *William Hooper, AIA, Director, Practice Division, Institute Headquarters*

Solar Heating Systems: Analysis and Design with the Sun-Pulse Method. Gordon F. Tully. (McGraw-Hill, $23.95.)

The preface to this book presents an undoubted truth about the state of solar design: "Curiously lacking is a clear exposition of the principles which govern the behavior of these systems." Gordon Tully hopes that lessons applicable to all may be learned by considering in detail one particular system—a liquid flat plate collector. Avoiding an encyclopedic rush through all solar applications, he fondles each aspect of his chosen problem. He discourses not only on the standard element of solar theory, but also on those items that only a budget-scarred veteran knows. His asides on the reality of client decision making, for example, would probably be worth the price of the book for an apprentice architect.

Unfortunately, Tully's expertise muddles the structure of his book. He has not differentiated between that knowledge about solar heating systems common to all designers and that particular to his speciality. *Solar Heating Systems,* therefore, is too complex for the uninitiated and too simple for the expert.

It assumes from the first page a working knowledge of solar collector terminology, yet spends a later chapter explicating the fundamentals of heat transfer. It spends considerable space developing the admirable concept of a sun-pulse (the graph of energy delivered by the sun during a day), yet only briefly uses the idea. Consequently, the book will be most beneficially read by those seeking an architect's experience with flat plate systems design rather than by those needing exposition of system principles. *James E. Mitchell, AIA*

Books continued on page 76

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Books *from page 74*

Fragments from Greek and Roman Architecture: The Classical America Edition of Hector d'Espouy's Plates. Introductory notes by John Blatteau and Christine Sears. (Norton, $19.95 hardbound, $9.95 paperbound.)

Hector d'Espouy (1854-1928) was a professor at the Ecole des Beaux-Arts and a celebrated muralist. In 1905, his *Fragments d'architecture antique* was published in two volumes. As d'Espouy explained in the preface, here translated from the French into English by Henry Hope Reed, each student who won the Grand Prix de Rome and went to Rome to study was required to execute drawings based on fragments of ancient architecture. He chose a fragment, measured it and presented the restoration of its mutilated parts by means of a drawing. Some of the drawings were collected by d'Espouy and published in his *Fragments*. This edition in the Classical America Series in Art and Architecture is a distillation of d'Espouy's selection.

John Blatteau says in his introductory notes that the composition and technique of each drawing are worthy of study. "I cannot imagine the architect who has not looked with wonder and envy at these

drawings." Calling them "works of art in their own right," he says they "make an unrivaled corpus of ornament to be used and adapted by the architect and the artist. They serve as models, directly or indirectly. As classical ornament can be made use of again and again, the examples of Greek and Roman work herein are always at hand for comparison and provide a standard by which to measure contemporary efforts." To Blatteau's notes are added notes on the life of d'Espouy by Christine Sears.

Shown at left is a Corinthian capital and base from the Temple of Concord in Rome, restored by Honoré Daumet and the sculptor Jean-Baptiste Carpeaux. It reproduces one of the 127 plates in this handsome volume.

Lars Sonck, 1870-1956. Paula Kivinen, Pekka Korvenmaa and Asko Salokorpi. (Helsinski: Museum of Finnish Architecture, no price given.)

For most of us the Finnish architectural alphabet begins with Alvar Aalto and ends there. But before that illustrious figure, and since, there is an important collection of other architects who are now to be known in greater depth from monographs prepared by the Museum of Finnish Architecture, of which this is the first. Sonck was an excellent choice and especially interesting for Americans because of the impact that H. H. Richardson and other American architects had upon his work, and because of his contribution to the style of national architecture at the turn of the century that led on to Eliel Saarinen and others. This monograph is a

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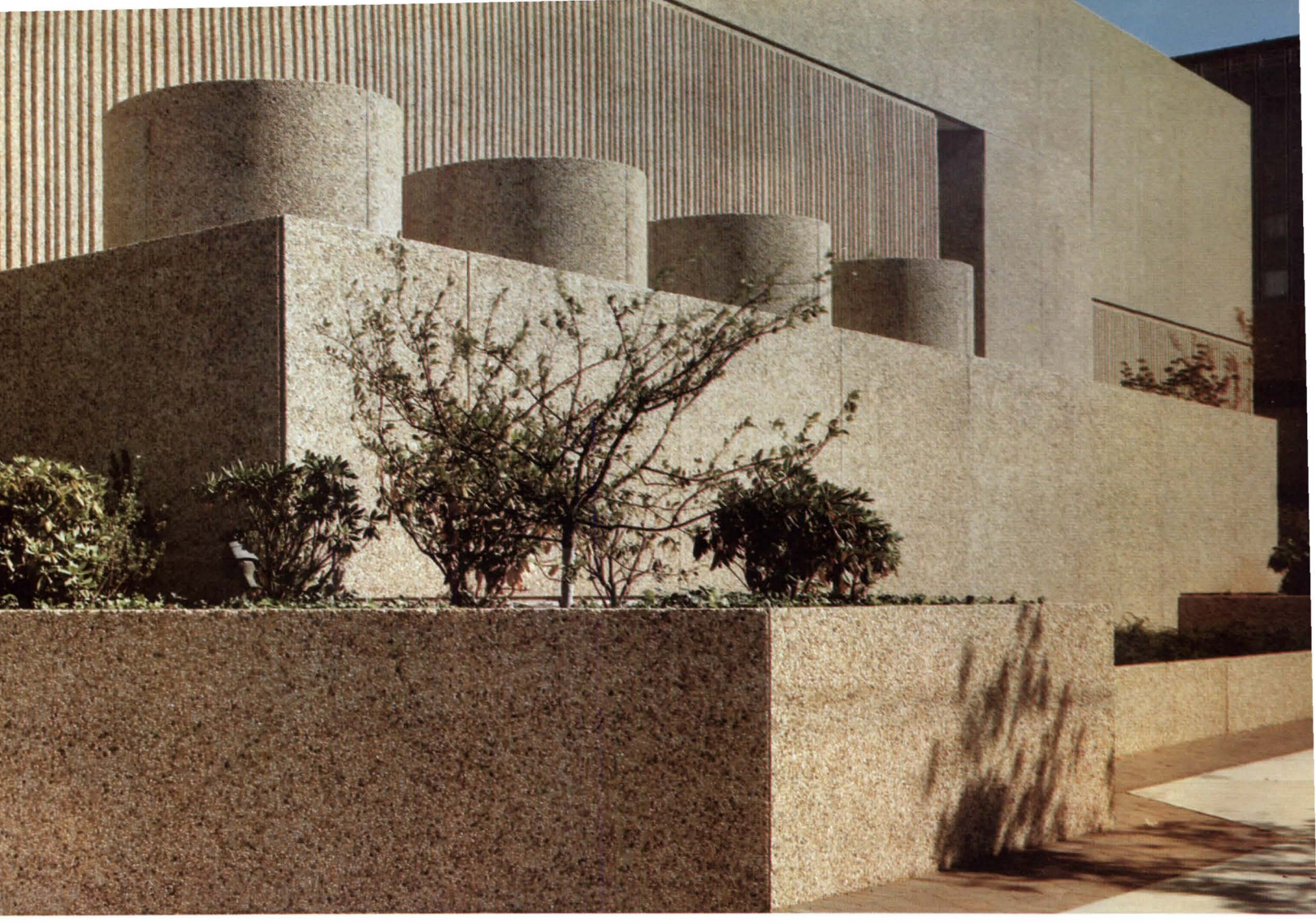

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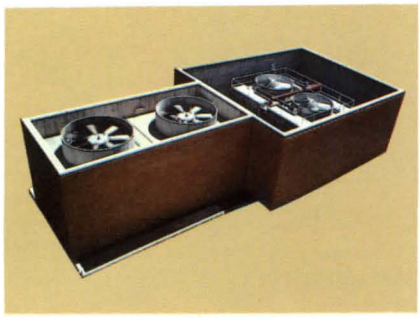

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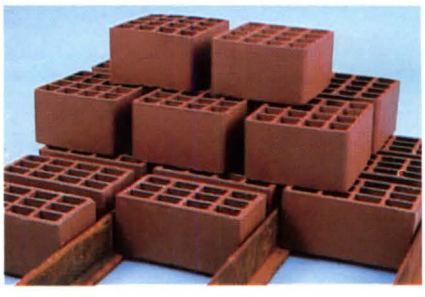

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Books *from page 76*

model of scholarship and presentation, with biographical details, an orderly presentation of Sonck's architectural work and a complete list of published writings. One only hopes that our new building museum in Washington, D.C., will produce something as valuable. *Frederick Gutheim, Hon. AIA, Washington, D.C.*

The Wind Power Book. Jack Park. (Palo Alto, Calif.: Cheshire Books; distributed by Van Nostrand Reinhold, $19.95 hardbound, $11.95 paperbound.)

This copiously illustrated book, written by a recognized authority who is president of the American Wind Energy Association, concerns small and medium-scale applications of wind power. Park describes as simply as possible the various wind power systems, wind energy resources, wind machine fundamentals, wind machine design and how to build a wind power system. He gives practical guidance to the innovator on just about everything regarding wind power. Although Park is enthusiastic, he tempers it all with a note of caution: "All the engineering know-how and the wisdom gleaned from experience just cannot make the wind blow." He himself has installed "idle monuments to the wind." But if the reader does have a windy site and wants a comprehensive and usable book on wind power, buy this one. A writer in the *Whole New Earth Catalog* says that the book "stands without competition and probably will have none for some time."

Housing for the Elderly: New Trends in Europe. Leon Goldenberg, AIA. (Garland STPM Press, $29.50.)

Goldenberg, an architect with Harry Weese & Associates, has written a useful survey of housing facilities for the elderly in Western Europe, having devoted a year of investigation to the subject. He finds a great variety in housing and services throughout Europe, attributing the reasons for this diversity to socioeconomic factors, differences in population and in political philosophy and level of urbanization. From Great Britain to the Scandinavian countries, to Belgium, France, West Germany, the Netherlands and Switzerland, even touching very briefly on Eastern Europe, Goldenberg describes current housing philosophy and practices and design trends in housing an elderly population. The text is complemented by many photographs, drawings and plans.

The book goes beyond being a survey, presenting the universal issues involved, the complications and conflicts in housing theory, the human conditions to consider in understanding the elderly and their needs, and design considerations to be taken into account. Goldenberg admonishes the architect to make "choice, flexibility and independence" the key words in designing housing for the elderly.

The Architecture and Design of Old Miami Beach. Laura Cerwinske. Photographs by David Kaminsky. (Rizzoli, $14.95.)

The recent destruction of Miami Beach's New Yorker, a hotel designed by Henry Hohausen in 1939 (see June '81, p. 18), caused consternation among preservationists who wanted to save the unusual structure, using it as a centerpiece in a complex of hotels rooms, apartments, shops and restaurants. The hotel is depicted as still standing in this exploration of Miami Beach's art deco district. The one square mile area, developed in the 1930s, contains more than 400 beautiful examples of the art deco style in architecture. Laura Cerwinske approaches her subject with verve—and respect. A design journalist who is a native of Miami, she explains the evolution of art deco and then devotes the remainder of the book to how it was adapted to a tropical climate, discussing the expression of art deco in facades, moldings and friezes, doorways, windows, hotels and apartment buildings, materials, lettering, interior details and murals. Each section, in clear and readable prose, is accompanied by photographic examples. A great deal of the credit for this successful insight into art deco is due to the stunning photographs by David Kaminsky, also a native Miamian and a freelance architectural photographer. His photographs, especially to be cherished if other architecture meets the fate of the New Yorker, are a delight and well worth the modest price of this paperback book.

Color Drawing: A Marker/Colored-Pencil Approach for Architects, Landscape Architects, Interior and Graphic Designers and Artists. Michael E. Doyle. (Van Nostrand Reinhold, $35.95.)

"Here is the golden rule: . . . With color you accentuate, you classify, you disentangle. . . . Always say to yourself: Drawings must be easy to read. Color will come to your rescue." This admonition by Le Corbusier cited in this handsome book is an apt one. The book's author believes that design drawings in black and white influence the finished architectural product, resulting in buildings that resemble the "bleak tones of unrendered paper probably left so during the design process. They speak not of decisions about color but of lack of them."

He advocates the use of markers and colored pencils, saying they are "ideal for use during the design process as well as for final renderings or persuasive

drawings." His many illustrations—all in color—testify to the effective use of felt markers and colored pencils as a design medium. He presents the fundamentals for the creation of color compositions, offering, as he says, "a framework, not a crutch."

Doyle meticulously and carefully gives his guidelines for drawing both exteriors and interiors, outlining tips and shortcuts in the production of the effects of light, shade and shadow, building materials and textures in color.

In a section on a "portfolio of materials," he demonstrates how commonly used materials can be drawn. For example, in a discussion on drawing wood, he tells how to apply the marker base, how to develop colors with pencils, how to add wood grain, color irregularities and stippling.

Doyle also explains the use of the three dimensions of color—hue, value and chroma, giving definitions and mixing basics, explaining how colors relate, discussing hue schemes and describing an approach to color composition. The book's final section concerns architectural color drawing, and Doyle presents an organized approach to planning and executing finished architectural color drawings from a line drawing in pencil to the finishing touches. The handsome examples show, he says, that "no mysterious talent" is required.

The appendices give a marker-brand cross reference chart, hue charts of AD markers and Prismacolor pencils according to the Munsell system of color notation, and a color wheel. There are also an annotated bibliography and a glossary.

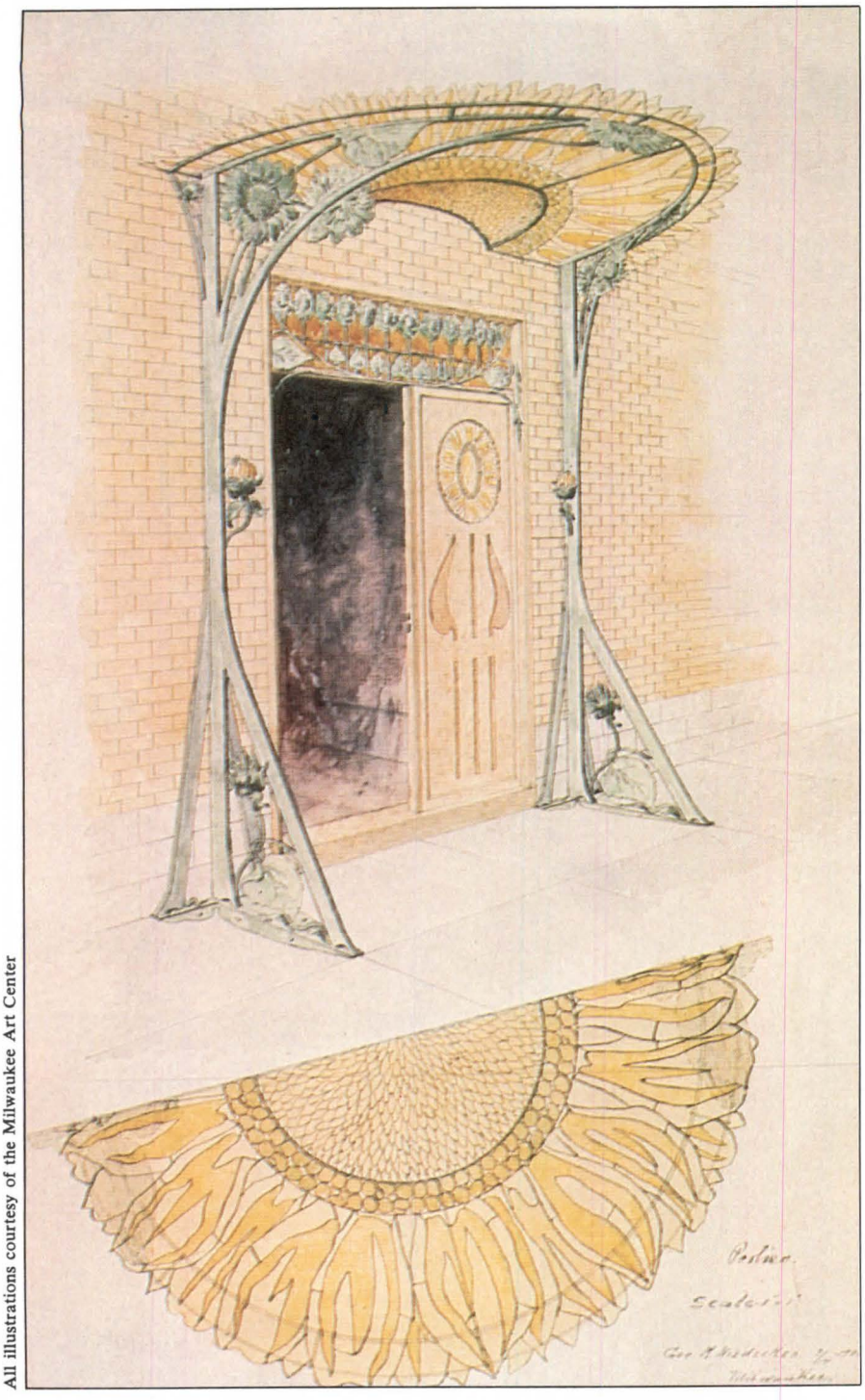
The book will surely be of tremendous help to architects in its approach to color drawing. "If design schools, students and professionals again start teaching and learning to respond, think and design competently in color, it will ultimately be reflected in a much more interesting and human built environment," Doyle says. For those who agree with him, the book is a must.

The Energy Resources Center Illustrated Guide to Home Retrofitting for Energy Savings. Paul A. Knight. (McGraw-Hill, $14.95.)

The words "illustrated guide" in the title of this book are certainly to the point. The book contains hundreds of step-by-step illustrations to show how to save energy in the home. Directed to the homeowner rather than to the architect, the guidebook explains in simple terms the retrofitting of windows, doors, insulation and holes/cracks. For each retrofit there is information on what the retrofit involves both in terms of materials and installation techniques. An introductory chapter paves the way, discussing heat loss, insulation, vapor barriers, condensation and caulks. The manual was written by the staff of the Energy Resources Center at the University of Illinois at Chicago Circle, with Paul A. Knight the principal author.

Entourage: A Tracing File for Architecture and Interior Design Drawing. Ernest Burden. (McGraw-Hill, $15.95.)

The 3,000 tracing drawings in this book include automobiles, trees, outdoor fixtures, boats, planes, human figures and layouts—all available for use without special permission of the author. Presented as a labor saver for designers and architects, the drawings, on easily removable sheets, help in filling in and completing surroundings depicted in architectural renderings. Previous books by Burden, an architect who conducts national workshops on visual marketing techniques, are *Architectural Delineation* and *Visual Presentation.* □



All illustrations courtesy of the Milwaukee Art Center

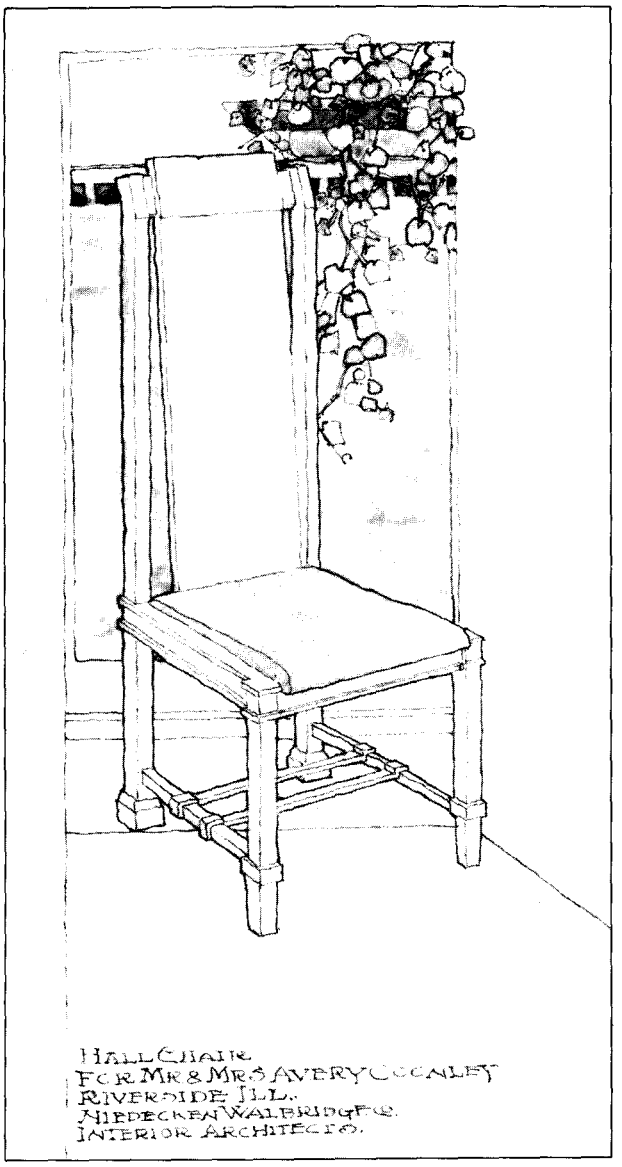
Furnishings

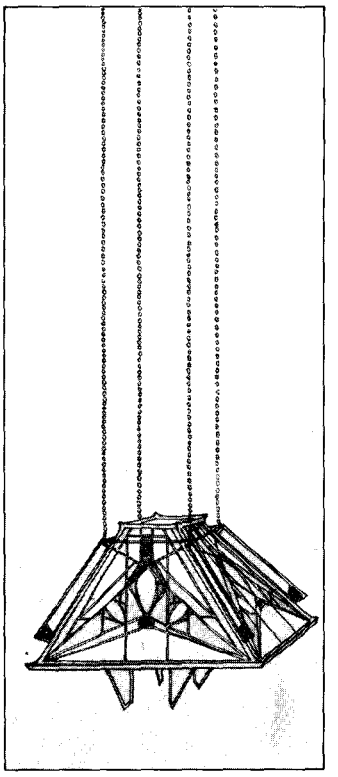
George Mann Niedecken, craftsman of the Prairie School. By Stanley Abercrombie, AIA

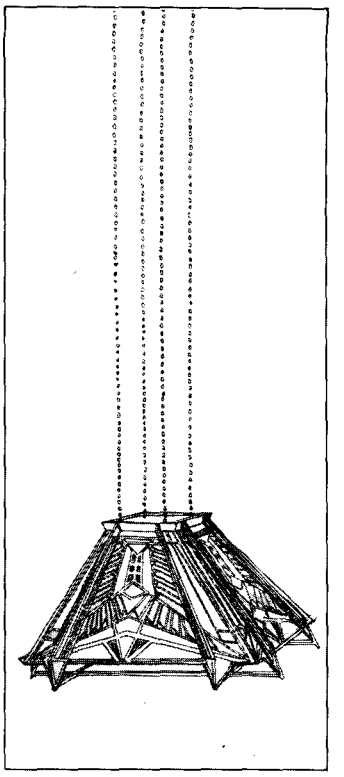
Rather than being our usual monthly sampling of current furniture designs and crafts, this issue's furnishings pages are focused on the work of a single designer, George Mann Niedecken (1878-1945). He is also the subject of a retrospective exhibition at the Milwaukee Art Museum Nov. 20 through Jan. 17, and we are grateful to that museum for the illustrations we show here.

Niedecken is best known as a collaborator of Frank Lloyd Wright. He worked on the Coonley, Robie, Tomek, Henry Allen and Martin houses and on other Wright commissions, in some cases merely supervising the execution of Wright designs, in some cases providing detailed working drawings and presentation renderings based on Wright's conceptual sketches, and in other cases originating designs for Wright's approval. His work was done through the agency of his firm, the Niedecken-Walbridge Co., founded in Milwaukee in 1907 with his brother-in-law John Walbridge, an enterprise that, according to David A. Hanks, "At the height of its business activity . . . employed 25 artisans." Whether or not Niedecken-Walbridge manufactured any of its own designs seems to be a matter of scholarly dispute. H. Allen Brooks, in his 1972 book *The Prairie School,* suggests it did; David A. Hanks, in *The Decorative Designs of Frank Lloyd Wright,* 1979, says it did not. In any case, Niedecken served Wright in much the same way as an interior designer might assist an architect today, even one with such definite opinions about interior details as Wright.

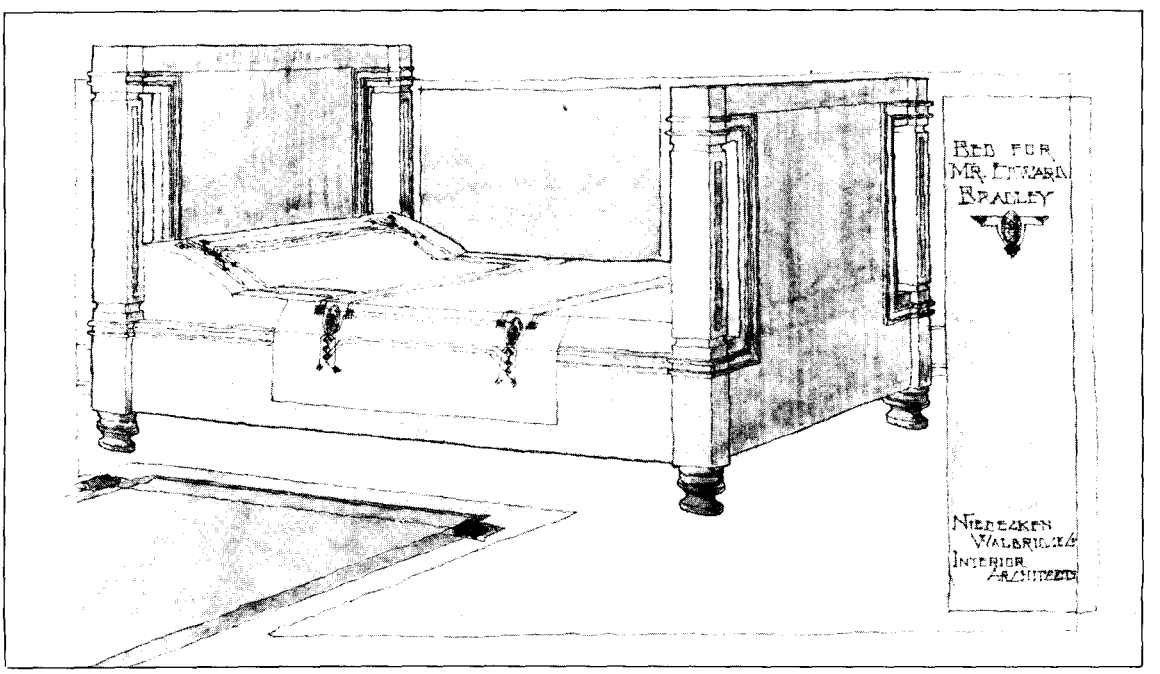
Niedecken also worked for others, of course, including Louis Sullivan, Purcell & Elmslie, Wright's friend Robert Spencer Jr.







Opposite page, left Niedecken's 1900 ink and watercolor sketch for a wrought iron and stained glass entrance portico. Opposite page, right, a sketch for a small wood side table; the pine bough and vase suggest the Japanese influence important to both Niedecken and Frank Lloyd Wright. Left, a hall chair for Wright's 1908 Coonley house. Above, hanging lamps for Wright's 1904 Susan Lawrence Dana house; the Niedecken sketch is based on Wright's own design, but Niedecken also furnished a dining room frieze for the same house. Below, a bed design for the Edward Bradley house.

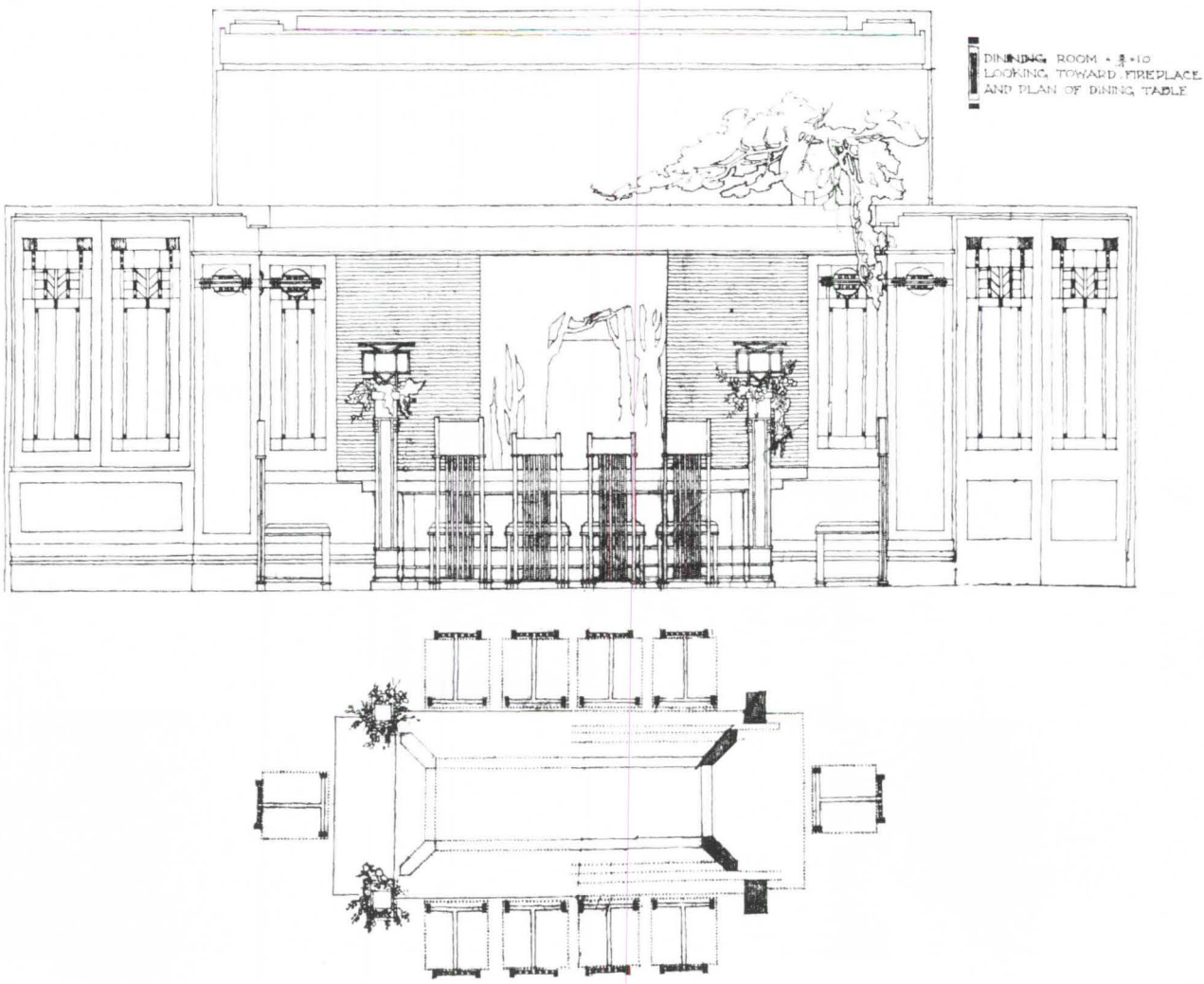


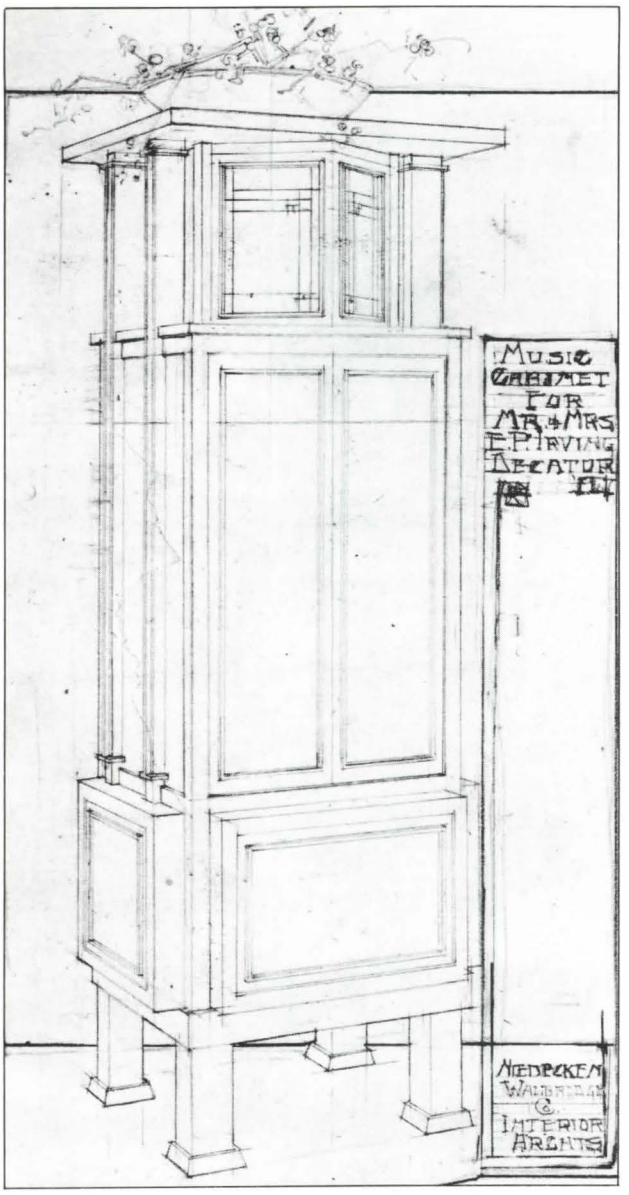
Courtesy of Mr. and Mrs. Robert L. Jacobson

of Spencer & Powers and William Drummond, who had once worked in Wright's studio in Oak Park. (The Spencer & Powers and Drummond firms shared office space with Walter Burley Griffin in the loft of Chicago's Steinway Hall; Wright and other architects also had offices in the building.)

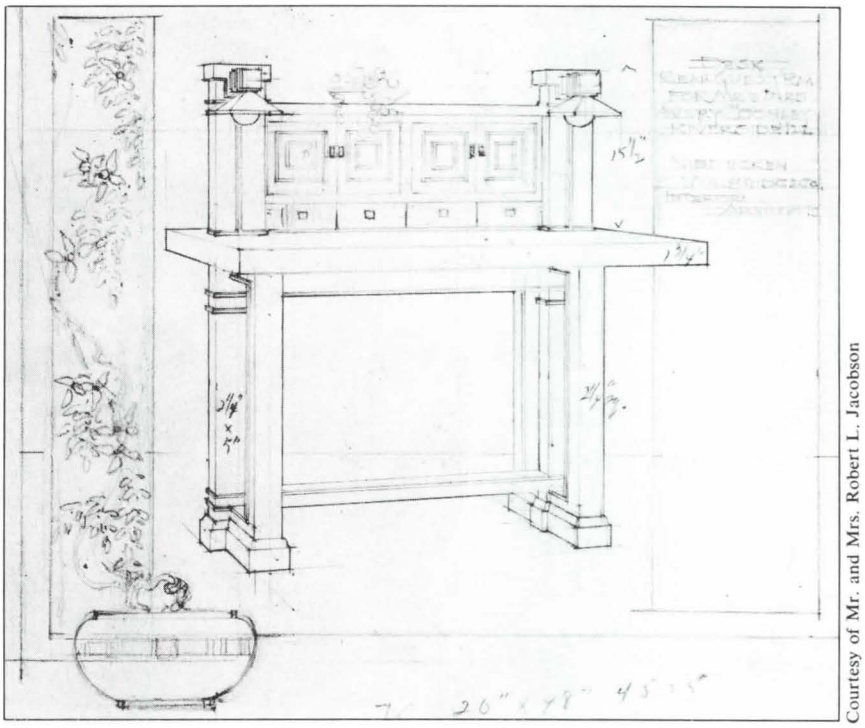
The Niedecken-Walbridge firm was concerned with much more than custom furniture design; it also designed fabrics, rugs, stained glass, wallpaper, hardware and decorative plaster. Niedecken himself, having studied in Paris at the École des Beaux-Arts in 1900 and also in the studio of the art nouveau artist Alphonse Mucha, was particularly proficient in mural painting, poster design and even advertising art. His graphic skill—and its resemblance to some of the presentation drawing techniques used by Wright (both men were collectors of Japanese prints)—is evident in the sketches shown here.

His most characteristic work shared the stylistic traits of Wright's work of the time and the work of other Prairie School architects (although he later did accept residential and commercial commissions in colonial, French provincial, Tudor and other revivalist styles), and he shared with them as well a strong belief in what Wright called the "organic" relationship between exterior and interior. Niedecken's work for Wright and other architects, ingratiating as it seems, was never meant to stand apart but to contribute to a larger whole. Implicit in such work are standards of humility, appropriateness and interprofessional cooperation that transcend style and time. □



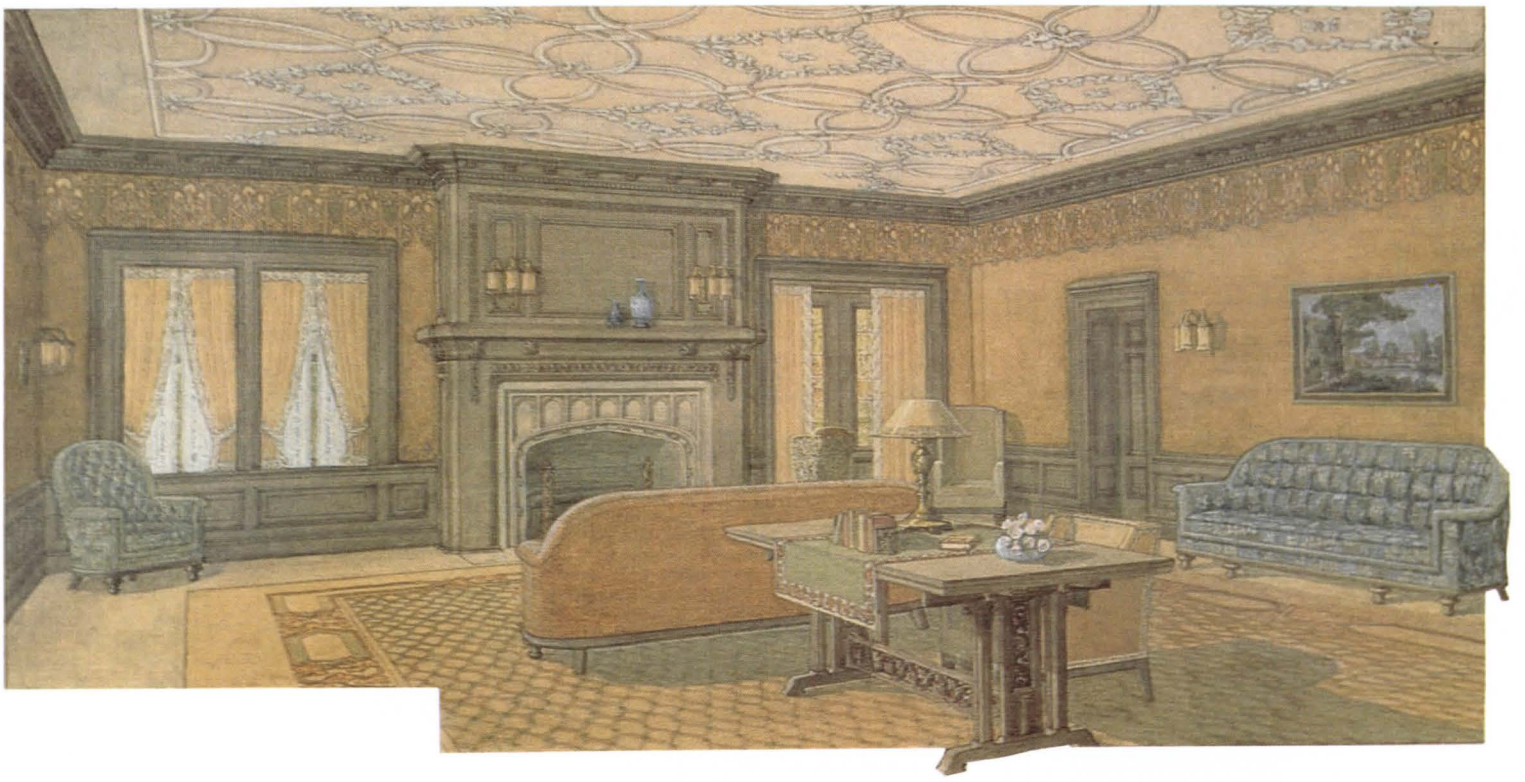


All illustrations courtesy of the Milwaukee Art Center



Courtesy of Mr. and Mrs. Robert L. Jacobson

Opposite page, top, a 1909 cabinet design rendered in watercolor with gold powder. Opposite page, below, a Niedecken section through the dining room of Wright's 1909 Robie house, with a plan view of the Wright-designed table and chairs. Niedecken's firm helped with several details of this room, including the rug design. Left, a music cabinet for Wright's 1910 Irving house, and, above, a guest room desk with cantilevered writing surface for his 1908 Coonley house. Below, an independent work by Niedecken, a living room scheme for the A. A. Schlesinger house, Milwaukee, 1912.



Practice *from page 32*
ness of the value unit system has been criticized by both the task force and ASC/AIA. Martini maintains that it is crucial that the system be tested in different geographic regions and working situations before state legislatures make the IDP mandatory for a registration candidate.

In response to ASC/AIA's allegations, the IDP Coordinating Committee emphasized that it spent "most of its time and effort" in analyzing the AIA task force's value unit recommendation, its supporting data and additional information not available to the task force regarding the actual performance of interns in the IDP.

The committee calls the current 700 value unit system "realistic." It also points to the Rothschild analysis and its conclusion that 702 value units can be acquired during a typical three-year employment period. And the task force says, "the most recent information on IDP intern-architects indicates that nearly all are completing the program within three years and with more than the total number of required value units."

The committee maintains that it does not "accept the premise that interns should be or ever could be 'put through the same mold'." It also emphasizes that it would have "little confidence in a totally 'quantitative' approach to measuring/evaluating/assessing internship experience and heartily agrees that different experiences in different settings differ as well in quality or value." The committee further maintains that the three-year durational system "relies on the simple accumulation of time without regard for the quality or value of the experience," whereas the value unit system "is designed expressly to provide a framework for the application of professional judgment by an IDP sponsor, together with an intern-architect, in assessing the value of all internship experiences."

The value unit system, the committee maintains, is more flexible than the durational system in that it "respects and rewards the reality that supervised training often occurs in increments longer than eight hour days, it encourages and recognizes approved supplementary education activities, it provides for one year of totally elective activity in practice-related areas, it grants full training credit in two categories for acceptable training not performed under the direct supervision of a registered architect and it recognizes the rich diversity of formal education and employment settings."

The committee emphasizes that the IDP program is continuously being re-evaluated and adjusted. In the near future the value unit system will be compared to the findings of the practice analysis conducted by NCARB on how its registration examination relates to architectural practice. The study concluded that the examination is "reasonably related to the knowledge required in practicing architecture to protect the public health, safety and welfare" (see Oct., p. 40). The committee will try to determine how the knowledge, skills, abilities and functions necessary for the practice of architecture as identified in the practice analysis relate to those required in the IDP program.

Robert Rosenfeld, NCARB's director of internship programs, believes that there is a very strong correlation between the IDP's training areas and the practice analysis, although he says some "minor" changes could occur. He also maintains that the interns completing IDP's training requirements are performing better on the NCARB examination. The passing rate for non-IDP candidates in the 1979 and '80 examinations was 55 to 56 percent. For IDP participants who had completed the requirements the passing rates were 80 percent in 1979 and 89 percent in 1980, Rosenfeld says.

Barriers Compliance Board Defers Action on Rules

The Architectural and Transportation Barriers Compliance Board voted in late September to delay for two months its decision on whether to rescind all or part of the "minimum guidelines" for accessibility standards for federal buildings, which were published last January. Enforcement of the rules has been extended until the December meeting.

The board also extended until Nov. 6 the period for public comment on the guidelines. Of the more than 12,000 comments received by September, most oppose recision of the rule. However, a letter from AIA Executive Vice President David O. Meeker Jr., FAIA, calls for the recision of the guidelines.

Meeker wrote that "in recognition of the need for regulatory reform and the federal budget constraints," AIA supports, as a substitute for the minimum guidelines, the efforts of the four standards setting agencies—HUD, GSA, the Department of Defense and the U.S. Postal Service—to develop a uniform federal accessibility standard based on the recently revised American National Standards Institute standard.

"We wish to point out that when ATBCB decided to promulgate its own minimum guidelines in January 1981," Meeker wrote, "the board ignored the recently revised ANSI accessibility standards, which had resulted from the cooperative efforts of over 55 organizations representing the handicapped and the building industry. While we acknowledge that even the current ANSI standard is not a complete document, we believe in

its values as the basis for the uniform federal standard."

The debate on the minimum guidelines has pitted the board's 11 representatives from federal agencies against 10 of the 11 public members. The federal agency representatives say they oppose the standards on grounds that compliance would be very costly. A GSA report has estimated that the rule's additional requirements would cost the federal government at least $800 million annually (see Aug., p. 19).

The public members, nine of whom are handicapped, are outspoken advocates of maximum accessibility for the handicapped. Board chairman Mason Rose V, a former pilot confined to a wheelchair since a training accident more than 15 years ago, has said, "My bottom line is the most access we can get for handicapped Americans and I don't care whose dollar or whose standard is involved."

The compliance board was established in 1968 by legislators who thought that the four federal agencies authorized to set accessibility standards had not made enough progress. Amendments made in 1978 to the Rehabilitation Act called for the board to "establish minimum guidelines and requirements for architectural specifications to be used in federally funded buildings and facilities nationally." These minimum guidelines would have to be met by the four standard setting federal agencies. The guidelines as published in January borrow heavily from the ANSI standards, yet are different in terms of technical requirements, format and scope. If the board rescinds the guidelines, the four standard setting agencies' guide would be the revised ANSI standard.

Meanwhile, the House has voted to fund the board through fiscal 1982, appropriating $2.07 million, compared to $2.3 million in '81. At this writing the Senate has not acted. And there are indications that the Reagan Administration would still like to see the board abolished.

DEATHS

Leslie V. Abbott Jr., Louisville, Ky.
Louis Kasoff, Montgomeryville, Pa.
Mellen C. Greeley, FAIA, Jacksonville, Fla.
Charles P. McCleskey, Mobile, Ala.
R. Bruce Miller, Oklahoma City, Okla.
Thomas Paul Steber, Mobile, Ala.

BRIEFS

Decorated window and door screens were made as early as 1861 of woven wire cloth painted or stamped with landscapes or advertising logos. The Baltimore Museum is seeking information about them, including references to their existence, use, location and painters. Contact Elaine Eff, Baltimore Museum of Art, Art Museum Drive, Baltimore, Md. 21218.

Architectural tours are being offered to Italy (Rome, Assisi, Florence, Venice, Milan) and Mexico (including Mexico City and the Yucatan) in January 1982. Contact Tim O'Connor, Boston Architectural Center, 320 Newbury St., Boston, Mass. 02115.

Two design awards programs have set December deadlines. The American Plywood Association/Professional Builder plywood design awards program honors "outstanding esthetic and structural applications" of softwood plywood on projects completed since Dec. 1, 1979. Submissions must be postmarked by Dec. 1. For more information contact, Plywood

continued on page 86

Briefs *from page 85*
Design Awards, P.O. Box 11700, Tacoma, Wash. 98411. The Consolidated Aluminum Corporation competition honors "the most creative" applications of Alucobond material, a lightweight composite of two aluminum sheets with a thermoplastic core, in three design categories: signage, trade show exhibits and commercial interiors. Entries must be received no later than Dec. 15. For information, contact Robert J. Hendricks, Consolidated Aluminum Corporation, P.O. Box 14448, St. Louis, Mo. 63178.

Materials and documentation on American vernacular architecture are being sought by the Los Angeles Craft and Folk Museum for an exhibition. Of interest are log cabins, Indian shelters, Spanish colonial buildings, earth mound houses, interior details, the California bungalow, architectural toys and Los Angeles eclectic structures. Contact Blaine Mallory, Craft and Folk Museum, 5814 Wilshire Boulevard, Los Angeles, Calif. 90036.

Amaro Taquechel, AIA, has been named "architect of the year" by the Latin Builders Association, Miami. Taquechel of Coral Gables is a native of Cuba commended for his community service.

PRODUCTS

Display System.
Modular components of stainless steel tubing are designed for exhibits in galleries, museums and convention centers. The system can be assembled and disassembled without tools or fasteners. Displays may be simple or complex structures of several levels. (Metrex Display System, Salt Lake City. Circle 190 on information card.)

Linear Ceiling Panels.
Aluminum ceiling panels snap onto metal carriers without tools to simplify access to wiring, ducts and piping. Optional features allow panels to be adapted to curved surfaces or combined with light fixtures and air diffusers. (Levolor Lorentzen, Inc., Lyndhurst, N.J. Circle 176 on information card.)

Energy Conservation Kit.
Linear Laboratories' kit, designed for energy conservation and plant maintenance procedures, utilizes portable infrared thermometers and radiometers to locate insulation defects, conduct energy audits and check bearing temperatures in motors and gears. (Linear Laboratories, Los Altos, Calif. Circle 167 on information card.)

Bell Towers.
The Verdin bell line consists of more than 50 steeple designs including Gothic, Trinity and modern in addition to custom built towers ranging in height from 18 to 90 feet. (I. T. Verdin Co., Cincinnati. Circle 192 on information card.)

Energy Monitor.
The temperatures of up to 200 different rooms within a building are monitored automatically by computer to provide printed information or data. The system is also programmed to signal an alarm if the temperature is below or above the predetermined limits. (Instrulab, Inc., Dayton, Ohio. Circle 189 on information card.)

Patio Door.
Steel Clad French Style Patio Door System features insulated glass, adjustable threshold, high density polyurethane core and a thermal break between metal door skins. (Duratherm Co., Downers Grove, Ill. Circle 173 on information card.)

Portable Drawing Board.
Four post plastic laminate drawing table folds to a four inch width. The adjustable board is available in three sizes and four colors. (Stacor Corporation, Newark. Circle 174 on information card.) □

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Paid circulation		
Sales through dealers and carriers, street vendors and counter sales	n/a	n/a
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Total paid circulation	41,801	42,230
Free distribution by mail, carrier or other means; samples, complimentary, and other free copies	3,137	3,123
Total distribution	44,938	45,353
Copies not distributed		
Office use, left-over, unaccounted, spoiled after printing	1,885	1,779
Returns from news agents	n/a	n/a
Total	46,823	47,132

I certify that the statements made by me above are correct and complete. (Signed) David S. Godfrey/General Manager.

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Wright *from page 67*
graph "memo of agreement" calling for phased payment of a 10 percent fee. Initially they said the cost of the house would have to be limited to $15,000, which they assumed would include the fee. At the point of preliminary sketches, Wright indicated that the cost of the house would be more like $18,000, definitely not including the fee. The exchange of suggestions and revisions continued and the house moved toward working drawings and specifications. Meanwhile:

"On a Sunday afternoon we were on our hillside lot with plot plan, floor plan, stakes, string and measuring tapes, busily laying out our house among trees.

"We were so engrossed in our project that we did not hear approaching footsteps. A voice startled us with, 'Young people, what are you doing?' We looked up to see Bailey Willis, world-famous geologist, looking disapprovingly at us and our equipment.

"We proudly showed him our plans. His reaction was dismaying. With an impatient wave of his hand he said, 'You can't build here; a minor earthquake fault runs right through this hill.'

" 'But Professor Willis,' we continued, 'the university has granted us this site on this hilltop and our architect is drawing up the working plans.'

" 'In that case,' said the professor, 'I suggest you inform your architect that there is a branch of the San Andreas fault running through this hill.' With that, Professor Willis continued his Sunday walk. Naturally we were distraught, and dispatched a telegram to Mr. Wright. We received this reply:
'I BUILT THE IMPERIAL HOTEL.' "

The design had to be approved by the university's comptroller, Almon Roth, and Mr. Wright came to Stanford to make the presentation.

"He arrived the evening before the scheduled appointment. At breakfast the next morning, he suggested that we walk through the inner and outer quads before the 10 o'clock appointment. Paul carried a large roll of blueprints and walked a step behind as Mr. Wright strolled meditatively through the quadrangles.

"It was clear that he was in a thoughtful mood. He would murmur, 'Magnificent. The hand of that master, Richardson. Nothing matches this architecture in quality on any campus that I know.' Paul was delighted.

"At 10 o'clock they walked into Mr. Roth's office, and introductions followed. Mr. Wright, in his most charming manner, said, 'Mr. Roth, I cannot tell you what an inspiration it is to stroll through the beautiful inner and outer quads of this campus. No university architecture can compare with what Richardson's associates gave you. It is truly a magnificent architecture.' He paused, then continued, 'But, Mr. Roth, I would like to take the person who has been responsible in the last decades for destroying the basic plans for the expansion of this campus and hang him from your tallest tree.'

"Paul watched in horror as Mr. Roth changed his expression from pleasure to anger. Paul, as shocked as Mr. Roth, decided that approval of the plans had suddenly died.

"But Paul glanced at Mr. Wright and was confused to note that his eyes were sparkling with humor. Then Mr. Wright said, 'Mr. Roth, I will tell you what to do. You give me the commission, and I will restore this campus just as Richardson would have approved.'

"With this Mr. Wright burst into a joyful laugh. Mr. Roth saw the humor of Mr. Wright's approach and joined in the laughter. He thrust his hand toward Mr. Wright and said, 'Mr. Wright, if Hanna wants you to design his house, I will approve your plans without even looking at them.' "

There follows a blow-by-blow account of the building of the house, and there were blows for both architect and client. Cost estimate rose to $25,000, then $50,000. In the end, however, the Hannas looked back on the process this way:

"Both of us, husband and wife, had worked along with the laborers and craftsmen on the job. We took part in every type of construction: We mixed concrete, laid brick, sawed redwood, screwed on battens, set plate glass, put on insulation, held pipe for plumbers, made light fixtures. We filled vertical joints in masonry, a job overlooked by bricklayers. The children aided in cleaning away waste materials and running errands. We worked ourselves into the house construction as a family.

"Mr. Wright gave us a home that left an imprint on the lives of our children. They know the subtle but true relations of form and purpose, of site and dwelling. For them, beauty is a way of living rather than 'pictures to hang on walls.' Our home is a natural gathering place for friends, and nothing can bring more happiness.

"The only test of a theory is the way in which it works. We can say that for us our house met the acid test of family life. The deep satisfaction of feeling that our dream had come true far exceeded the remembered difficulties and disappointments. We faced the future with optimism and a profound admiration for and gratitude to Frank Lloyd Wright."

Here is Mr. Wright's summary of the Hanna House, written in 1937 (in *Architectural Forum*):

"Dr. Paul Hanna of Stanford University has just moved into his house. . . . Here the thesis changes, not in content but in expression. Again we have a preliminary study of prefabrication—also made in humble native materials—principally redwood board partitions erected on a concrete mat cut into hexagonal tiles. Another experiment because I am convinced that a cross section of honeycomb has more fertility and flexibility where human movement is concerned than the square. The obtuse angle [120 degrees] is more suited to human 'to and fro' than the right angle. That flow and movement is in this design, a characteristic lending itself admirably to life, as life is to be lived in it. The hexagon has been conservatively treated—however, it is allowed to appear in plan only and in the furniture which literally rises from and befits the floor pattern of the concrete slab upon which the whole stands. . . . This model for prefabrication was built by hand, not employing shop methods for which the work was primarily designed. The result is necessarily more expensive than need be . . .

"But this thesis goes far enough to demonstrate the folly of imagining a true and beautiful house must employ synthetics or steel to be 'modern,' or go to the factory to be economical. Glass? Yes, the modern house must use glass liberally. . . .

"To me here is a new lead into a fascinating realm of form, although somewhat repressed on the side of dignity and repose, in this first expression of the idea. I find it easy to take a definite unit of any single geometric pattern and by modern technologies suited to the purpose, adjusted to human scale, evolve not only fresh appearances but vital contributions to a livelier domesticity. This house goes very far in conservation of space. I hope to demonstrate that no factory can take the house to itself but may itself go to the house. In the hands of one well-versed in the design of patterns for living it may come out continually refreshed by imagination—from within. . . .

"The new Reality of which I bespeak is in this house, with certain reservations needful at the moment. Appreciative clients not afraid they were going to be made ridiculous were essential to this experiment. Without such help as Paul Hanna and his wife, Jean, gave to this experiment with their lives, nothing could ever have really happened in this direction."

In late November, 1937, the Hannas moved into the house. The following spring they felt the interiors sufficiently completed to invite Wright to visit.

"As he stood in the living room and looked around, his first comment was 'Why, it's more beautiful than I had imagined; we have created a symphony here.' " □

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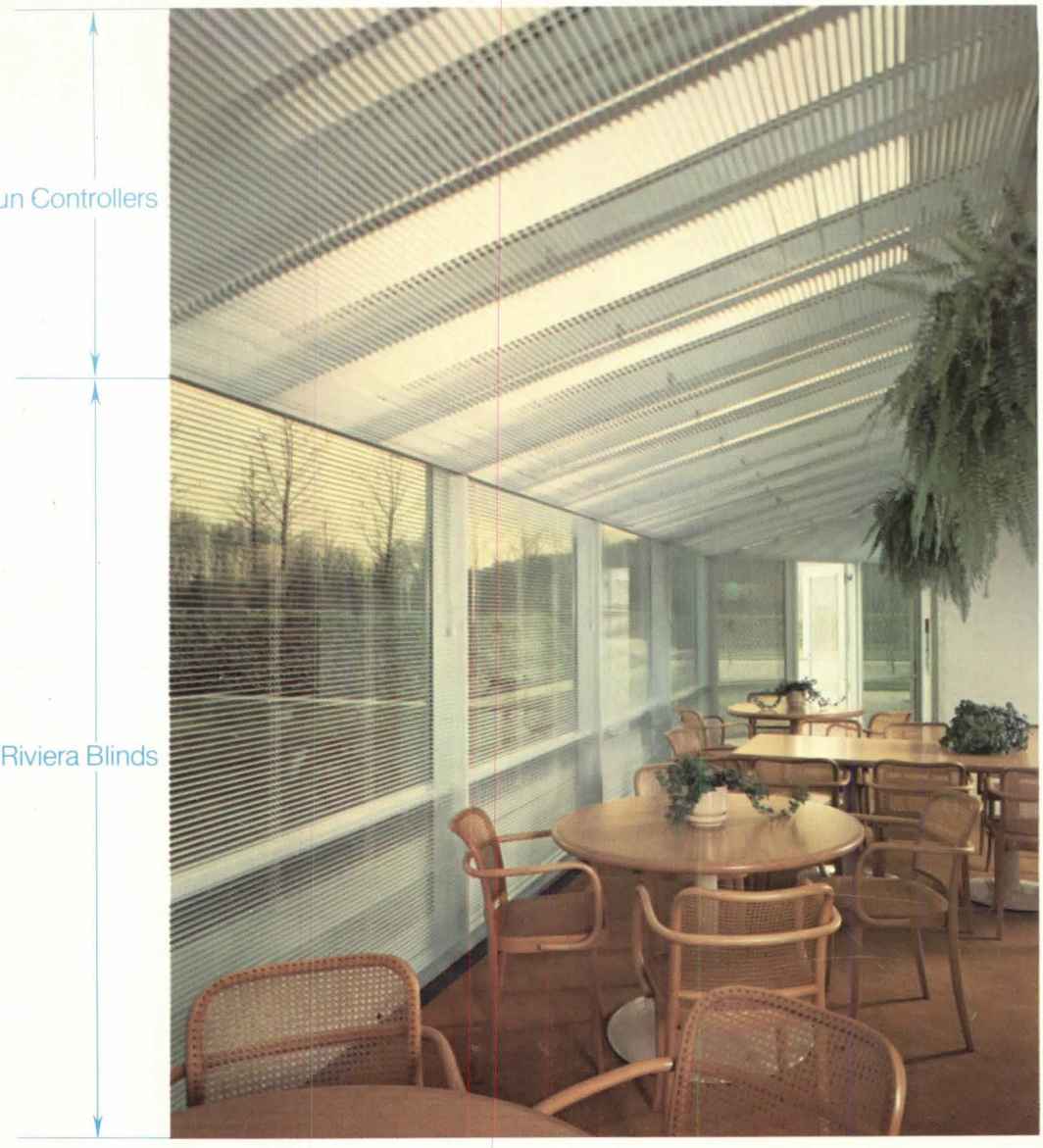

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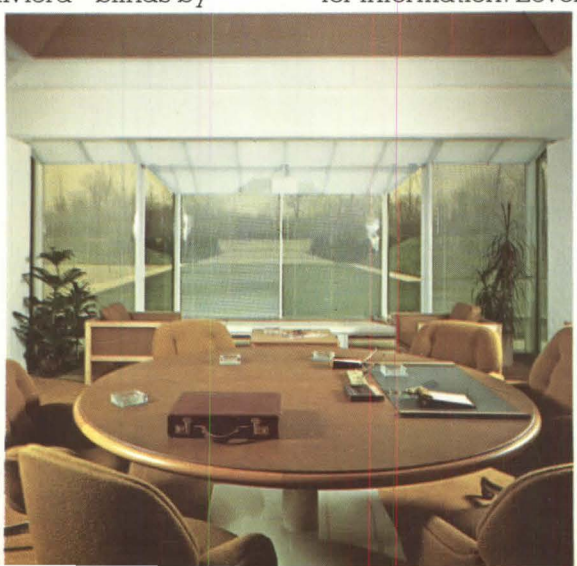

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