Views

Museum as monument
I enjoyed your in-depth article on "Museum as monument" in the March 1975 issue of P/A. It gives architects a chance to evaluate the work not just as form—although, inevitably, the form is the heaviest component.
Geoffrey Freeman, partner
The ELS Design Group
New York

I read your "Museum as monument" and think it is a wonderful job. It is tactful and very well organized. But most impressive is the general intelligence. The photo by Dixon on the cover is wonderful too. You mention Jack Anderson and Ada Louise Huxtable vis-a-vis the Hirshhorn Museum. Nice people. But have you thought what Tom Wolfe might say about it? Venturi's comment about the Hirshhorn would be interesting; let's hope he notices it.
Alan Mather
Detroit

I want to thank you for your fine article on the Hirshhorn Museum in the March issue. It has renewed my respect for architectural journalism (which I feel has almost ceased to exist.) I especially appreciate the reference to the Guggenheim—the comparison between it and the Hirshhorn is bound to horrify the most self-satisfied.
Harris Stone
New Haven

"Appropriate" is the only adequate apology for the Hirshhorn Museum. In fact it is embarrassingly apropos for a world view we need to outgrow.

It is also sadly appropriate that Nat Owings and friends will be responsible for the Mall redesign, and other architectural commissions in Official Washington. If the Hirshhorn represents the prevalent urban design philosophy at SOM, what can we anticipate for the future?

Harvey's version of Hirshhorn (P/A Mar. 1975, p. 43)

Maybe some good will come from this blunder if the architects will treat it as a cautionary tale about "giving the client what he wants."
Douglas P. Harvey, Architect
Houston, Tex.

Weathering criticism
The article and photograph of my sculpture "5 in 1" (Mar. 1975 P/A) recently erected in New York's new Police Plaza is appreciated, but the headline "Dedicated but not desired" is more than misleading.

Happily this monumental work has just won first prize in the Design in
[continued on page 11]

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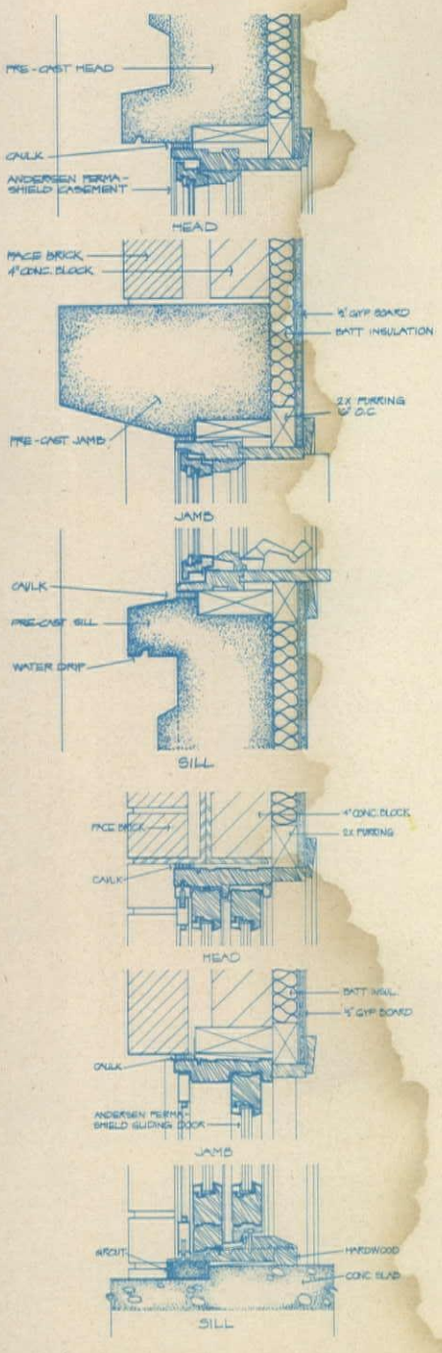

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Views continued from page 7

Steel Awards of the American Iron and Steel Institute and, as a letter from Sidney Frigand, press secretary to Mayor Beame, points out, the "work is an asset to the world of art as well as a great contribution in making our city more beautiful."

The use of weathering steel is difficult for public acceptance, especially during the six months it took to erect this 75,000 pound sculpture. The passersby at that time were critical of the rusting steel, but now it is another six months later, and the steel is taking on a more uniform color and with this uniformity, a greater acceptability.
Tony Rosenthal
New York, N.Y.

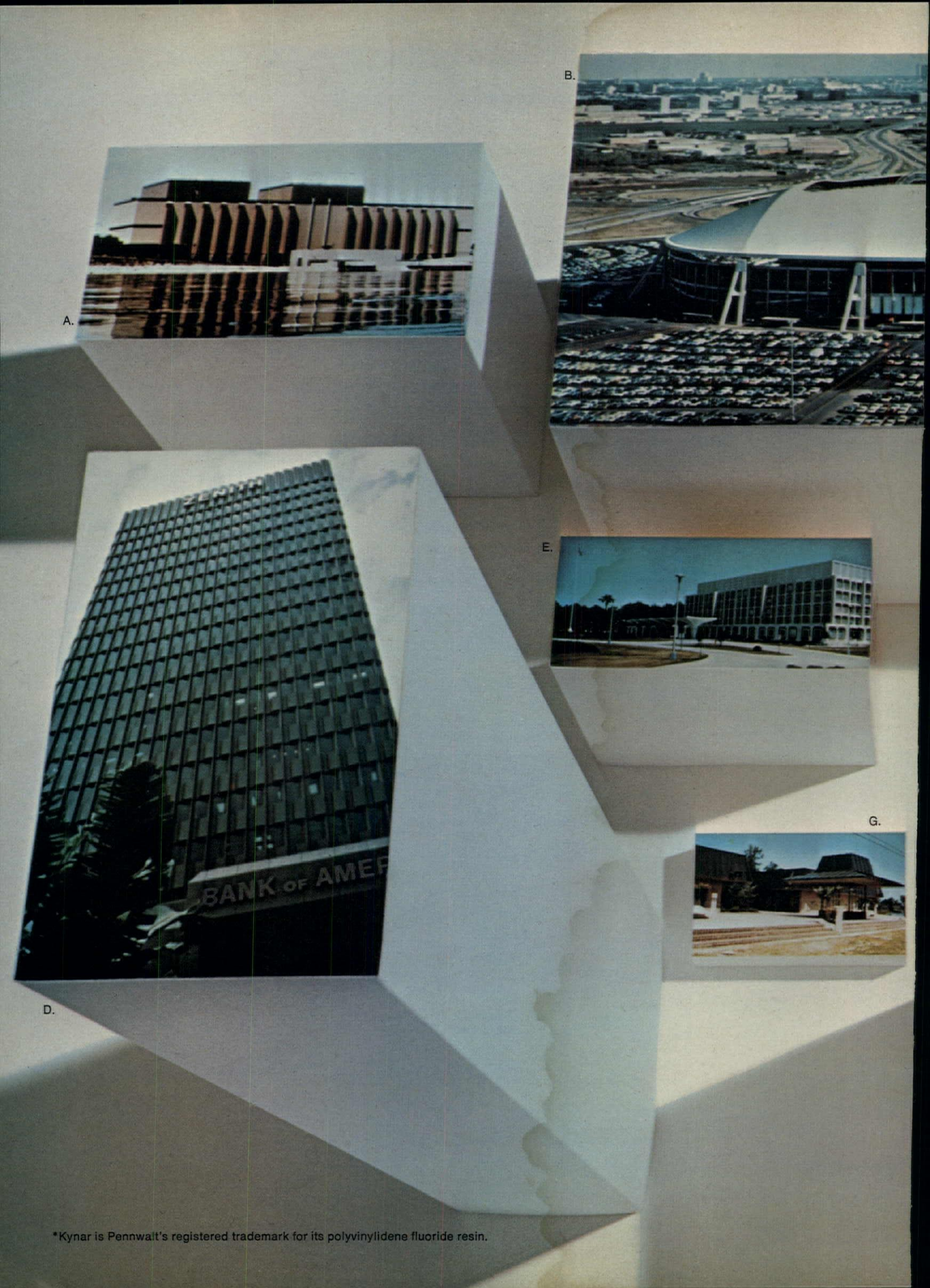
Credit due

It's of no great importance, but the 1950–51 Good Design exhibition installation attributed to me in your March issue ("The art of high art," p.62) was in fact the work of Charles and Ray Eames, and of Edgar Kaufmann, Jr., who directed the project.
Arthur Drexler, director
Architecture and Design
The Museum of Modern Art, New York

In the February 1975 issue of *Progressive Architecture*, the News Report section contained a brief article on the AIA Research Corporation grants for solar energy. In the article you credited Community Design Associates, Cos Cob, Conn. as being one of the recipients of these grants, whereas in actuality, the holder of this grant is Continuum Team, formerly The CODA Team, of Westport Conn. The team members involved in this project are: Edward Hicks, Edward Hicks & Associates, Chief Architectural Designer and Project Coordinator; Bruce Peruo, Enertect and Macro-Energy Physicist; Richard Shepard, Natural Heat Engineering Company, Engineering and Design Development; Brent Porter, Pratt Institute, Documentation Coordinator; Eric Wormser, Wormser Scientific Corporation, Optical Physicist.

We would appreciate your correction of this error and the listing of proper credits in a future issue.
Edward Hicks
AIA/RC Solar Energy Project
Continuum Team
Westport, Conn.
[The information in the news story came from the AIA, and apparently was unclear in the submission itself. We thank Mr. Hicks for clarifying the credits for all of us.—Ed.]

In the article "Art of high art" (Mar. 1975 P/A) Sharon Lee Ryder makes mention that the tent exhibition structure displayed at the Museum of Modern Art was designed by Frei Otto. With all due respects to the progenitor, the structure was in fact designed by students from Washington University in St. Louis, of which I was one.
Dennis A. Bolazina, Architect
St. Louis, Mo.
[The structure was designed by the university students under the direction of Professor Lawrence Medlin with Otto's blessing—Editors.]
[continued on page 114]



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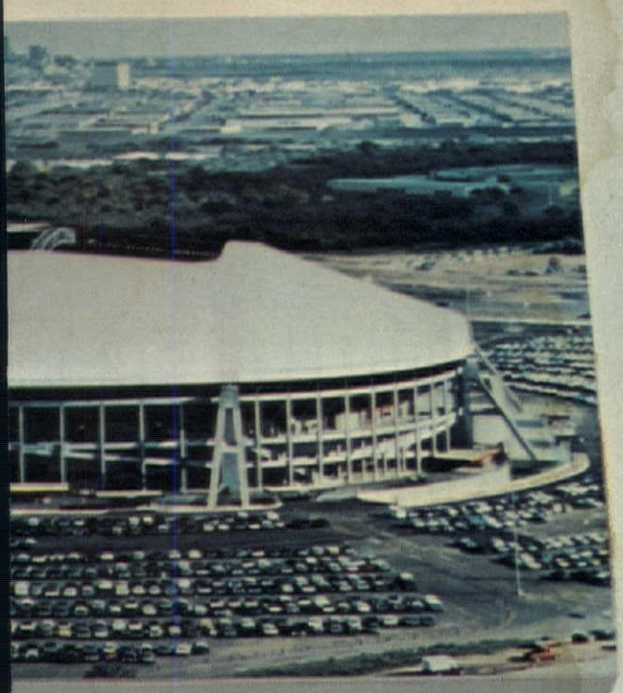

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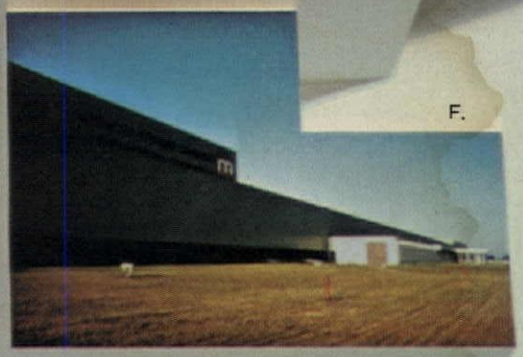

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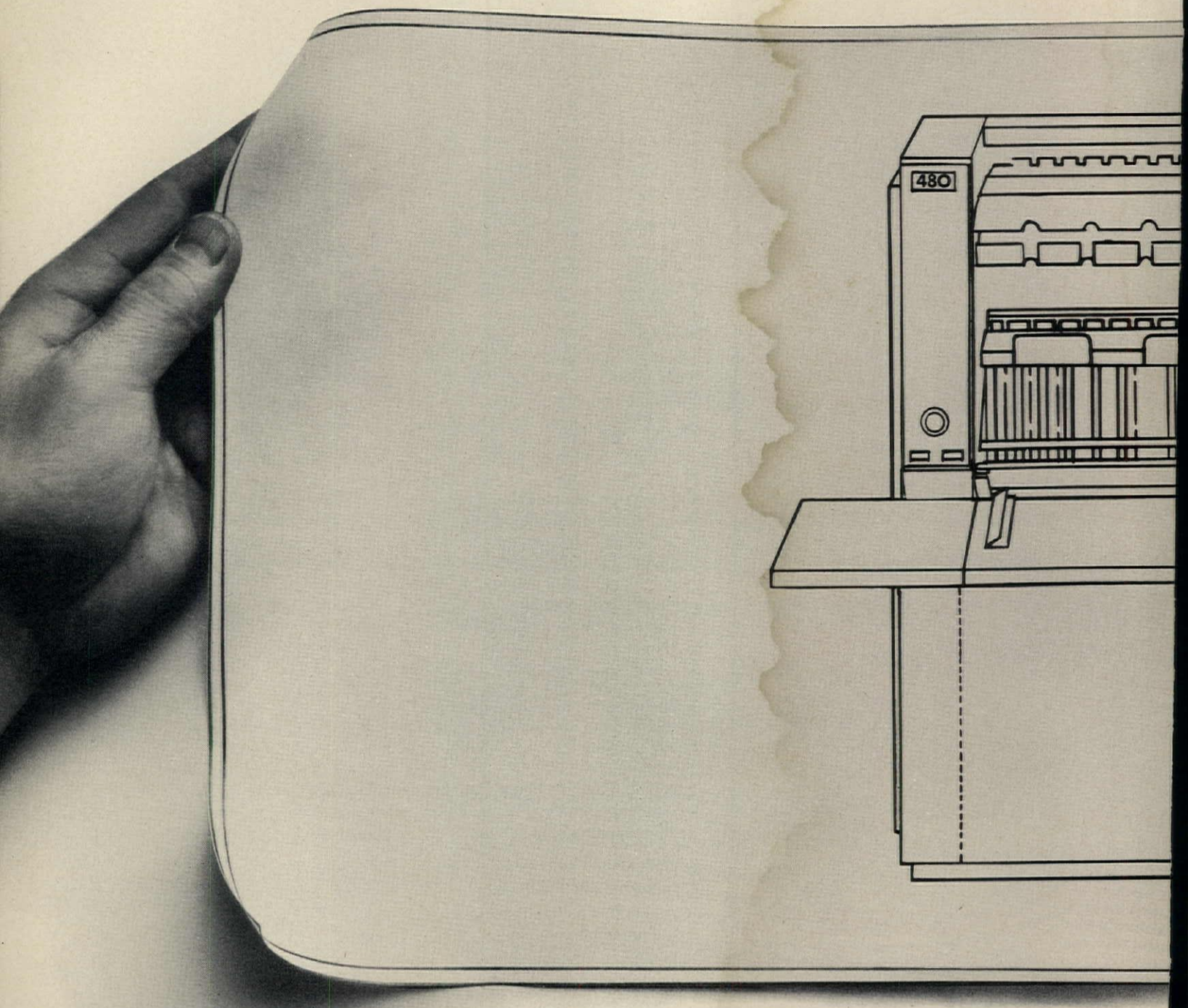

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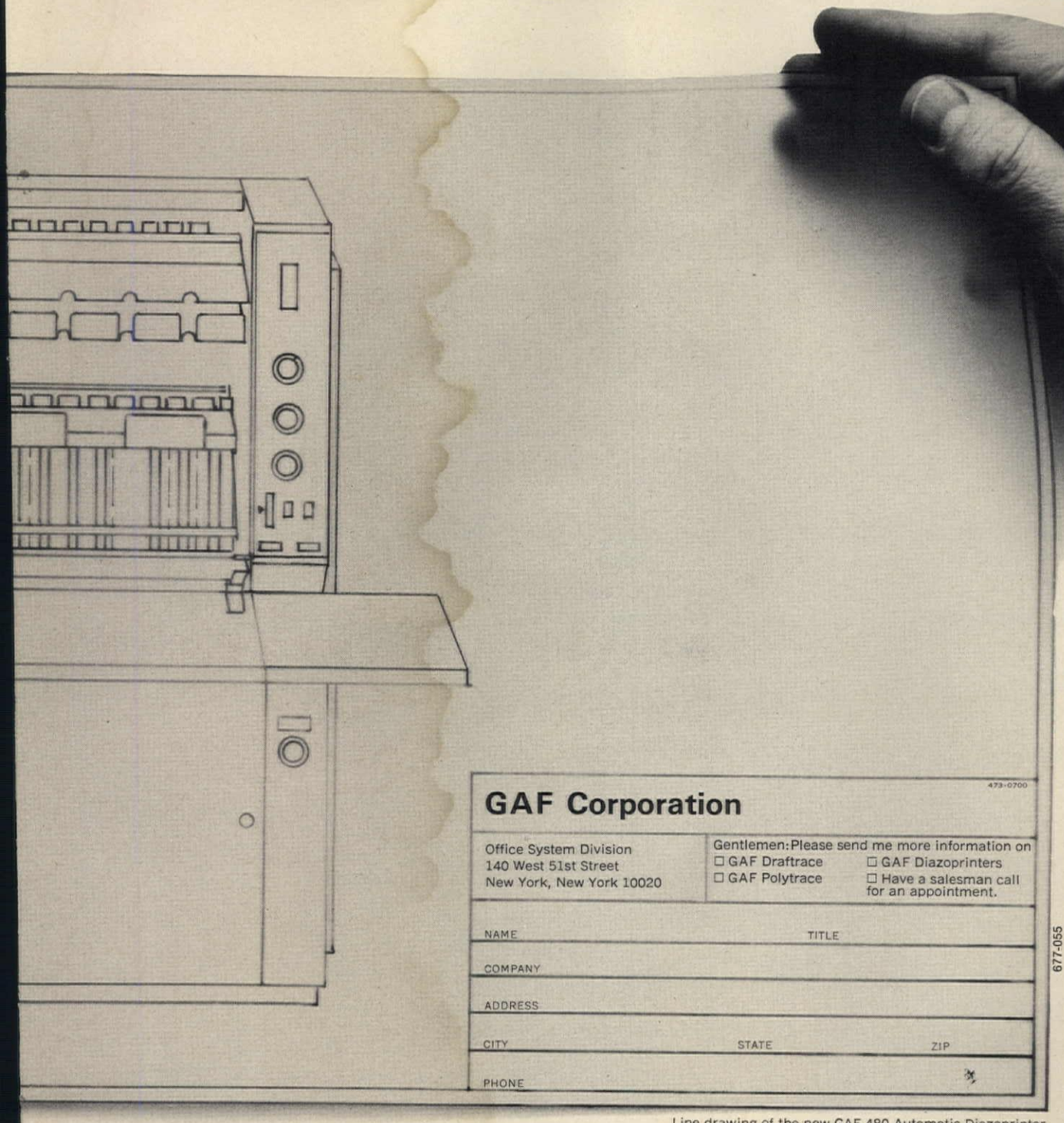

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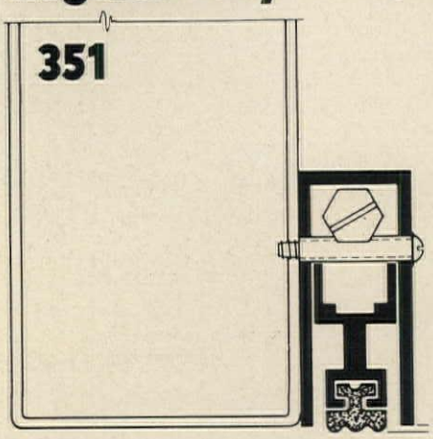

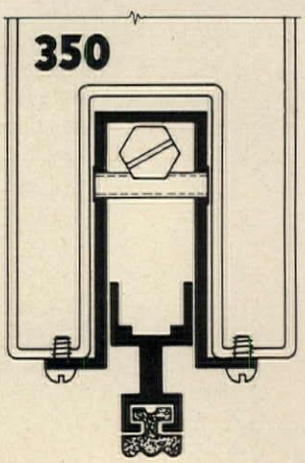

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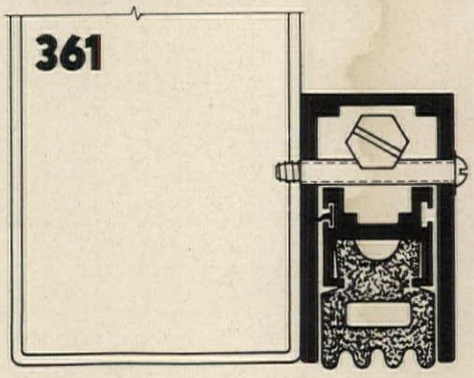

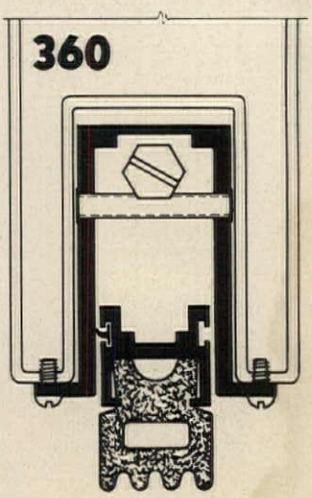

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Imagination in finishes

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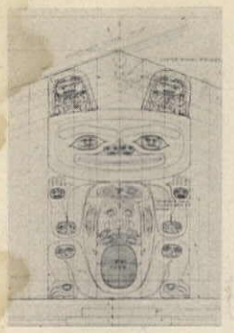
News report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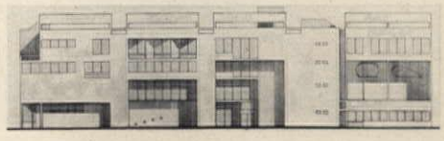
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Annual awards for design excellence

Alaska has joined the chapters of the American Institute of Architects and other concerns which annually honor distinguished buildings with design awards. The AIA's Alaska Chapter presented five awards in its first Honor Awards program; four prizes went to projects completed during recent years, and the fifth went to the reconstruction of Chief Shake's Community House (1) in Wrangell, a structure built in 1938 by the U.S. Forest Service. Reconstruction was under the direction of architect **Linn Forrest Sr.**

The Chicago Chapter of the AIA presented one Honor Award in its 1974 Distinguished Buildings and Service Awards Program. The award went to **Harry Weese & Associates** for Lake Village East (2). The chapter presented six Distinguished Building Awards and two citations.

The Connecticut Society of Architects gave nine awards, two of which went to projects entered in the new classification of rehabilitation and additions. The two prizes in this category were presented to **Stein, Sapack & Ames,** of Waterbury for the American Savings & Loan Association (3), created from an abandoned gasoline station in Waterbury, and to **Roth & Moore, Architects,** of New Haven for the new addition to the Oak Lane Country Club in Woodbridge.

The Minnesota Society of Architects gave two Honor Awards and seven Merit Awards in its 18th annual Awards presentation. In addition to being given to the architect, awards also were presented to the client "for possessing the elements necessary for the realization of the building." Honor Award recipients were Minneapolis architects **Miller Hanson Westerbeck, Inc.,** and Washington, D.C. developer **Charles B. Coyer** for renovation of the Butler Square Building, Minneapolis (P/A July, 1974, p. 36) and to the **Architectural Alliance of Minneapolis** and **HAW, Inc.,** for the Valley Square Professional Building (4), Golden Valley.

The New York State Association of Architects presented six Certificates of Merit and gave 12 Honorable Mentions in its annual program. The six merit awards went to **Davis, Brody & Associates** for a biology/psychology building, State University of New York, Binghamton; **Glass & Glass** and **Conklin & Rossant** for the Cadman Towers, Brooklyn; **Gwathmey-Siegel** for the Cohn Residence, Amagansett; **Jacobs & Associates** for the Cast-Iron Building, New York City; **Di Donato, Renaldo Associates** for the Erie Basin Marina (5), Buffalo; and **Feibes & Schmitt** for the Police Facilities Building, Schenectady.

The Gold Medal was awarded to the Philadelphia firm of **Mitchell/Giurgola** in the 1974 Annual Awards of the Philadelphia Chapter, AIA. The award was given for the Columbus East High School (6), Columbus, Ind. The Silver Award was received by **Baker Rothschild Horn Blyth** for Wister II Housing, Germantown. Six citations for excellence were awarded.

The San Diego Chapter of the AIA presented Awards of Honor to Simpson & Gerber, Inc. of La Jolla for the Seven Lamps office building (7), La Jolla, and to **Sander & Thomas/ Frank L. Hope & Associates,** a San Diego joint venture for the Naval Underseas Research and Development Center. In addition, six Awards of Merit were presented.

The New York City Chapter of the AIA, together with the National Institute for Architectural Education awarded the first prize in its annual Hirons Prize competition to **Martin Cooperman** of Little Neck, N.Y., for his neighborhood health center (8), and second prize to **Michael Coleman** of Groton, Conn. Parallel cash awards were presented to

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H. Preston Crum, New York, and **James Charnisky,** Boston, Mass., who exactly conformed to the tight scale requirements of the competition (as the first and second prize winners did not). The competition is open to professionals under age 35.

First Honor Awards in the Biennial Awards Program for Architectural Achievement sponsored by the Naval Facilities Engineering Command and the American Institute of Architects were given to **Barrett Daffin & Figg,** Tallahassee, for the Whiting Field Naval Air Station's theater, Milton, Fla.; to **Ferendino/Grafton/Spillis/Candela,** Coral Gables, for the Atlantic Oceanographic and Meteorological Laboratories (9), Virginia Key, Miami; and to **Lyles, Bissett, Carlisle & Wolff,** Columbia, S.C., for the Charleston Naval Hospital. Five Awards of Merit were presented.

The Prestressed Concrete Institute Awards Program gave 19 Awards, without differentiation, to three housing schemes, including the Crown Center Hotel (10) by **Harry Weese & Associates,** a research center, library, medical building, two office buildings, a parking structure, a public building, one stadium, two schools, and six bridges. The awards are for both design excellence and engineering.

Resources Council, Inc., a national association of interior furnishing manufacturers, presented six Jury Awards and one Jury Honorable Mention at its Fourth Annual Product Design Awards program. Guests attending the presentation also voted on submissions, and 14 Popular Awards were selected. Among Jury Awards was a wallpaper design (11: "Clouds" by David Nordahl).

Cyberneticist to give AIA keynote speech

Heinz Von Foester, retired director of the Biological Computer Laboratory, University of Illinois, Urbana, will give the keynote talk at the convention of the American Institute of Architects May 19 in Atlanta. "Spaces for the Species" is this year's convention topic; four workshops will be devoted to the theme: a consideration of the impact of design decisions on human behavior.

Von Foester, a cyberneticist with a wide range of interests, has a special concern for the physics of perception and has written a book on music and the computer. He also will take part in the May 22 wrap-up session which includes a discussion of how well architects can identify user responses to the environment.

Heinz Von Foester

One-to-one interviews with representatives from 18 federal agencies will be a day-long program on Tuesday, May 20, called "How to get a Federal Contract." Interviews are scheduled by appointment. The first and second sessions of both the theme workshop series and the marketplace workshops on architectural practice will be held at 2:30 p.m. and 4:15 p.m. respectively on May 20. The President's reception and the host chapter party will be held concurrently that evening at 6:30 at the Arts Center (by Toombs Amisano & Wells and Stevens & Wilkinson) and at the recently completed Colony Square (by Jova/Daniels/Busby).

The two closing theme and marketplace workshops will be held Wednesday, May 21, at 2:30 p.m. and 4 p.m. Each of the four theme workshops will focus on a collaborative project between an architect and a social scientist.

Wednesday night at the Regency Hotel (Edwards & Portman, 1967) the AIA Research Corp. will hold a seminar on earthquakes.

Thursday, May 22 at 2:30 p.m., a special workshop on "The Construction Market Outlook for 1975–76" will be held. Post convention tours will be conducted all day Friday, May 23.

ASC/AIA agenda for convention week

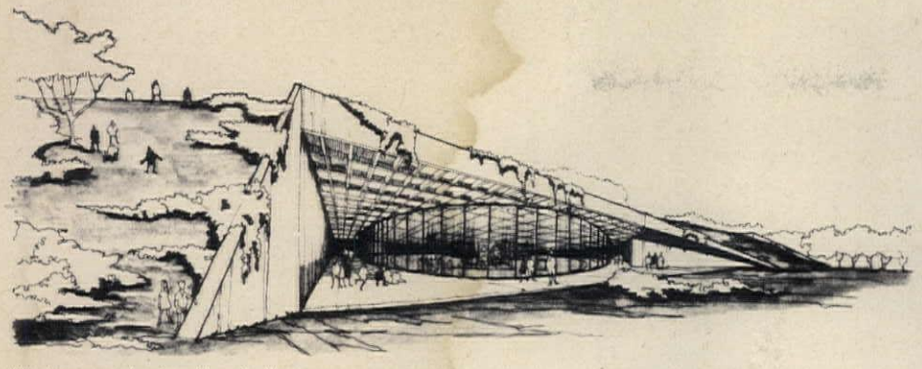
The Association of Student Chapters of the American Institute of Architects will meet May 17–18, the week-end prior to the AIA convention, in Toccoa, Ga., about 100 miles northeast of Atlanta. Roundtrip transportation will be provided from Atlanta at Georgia Tech to the meeting at the Georgia Baptist Assembly building.

Speakers at the student gathering will be authors Robert Goodman (*After the Planners*) and John Friedmann (*Retracking America*) and Patrick Quinn, dean of architecture at Rensselaer Polytechnic Institute. Further information is available from the ASC/AIA Convention Committee, School of Architecture, Georgia Institute of Technology, Atlanta, Ga. 30332.

School heated for ½¢ per sq ft

Under ideal conditions, that is. The "Terraset" design for an elementary school in Reston, Va., by Davis, Smith & Carter, is an underground scheme that takes advantage of thermal mass in shielding the interiors from outdoor extremes. This way, simple body heat of the occupants and heat from lights, plus the use of solar collectors to assist the mechanical systems, will heat the school for a half-cent per sq ft—a 98.8 percent saving over the average 49 cents per sq ft electric heat in the Fairfax County schools.

The architects maintain that the solar heating system can be applied not only to underground buildings but also to



Underground school heated by sun

Photo: Gordon Schenck

Pews give Opry House a country touch

above grade structures with similar energy savings. Initial mechanical equipment costs also are reduced up to $100,000 in the "Terraset" school.

Plagued concert hall to start from scratch

The acoustically troubled concert hall of Lincoln Center, the Avery Fisher Hall, will be completely gutted a year from now and rebuilt in time for the 1976 concert season. The firm of Johnson & Burgee, New York, and acoustician Cyril Harris, a professor at Columbia University, have the multi-million dollar commission.

Originally the hall, which opened in 1962, was designed by Max Abramovitz of Harrison & Abramovitz with Leo Beranek, a pioneer in modern acoustical design, as consultant. Unsatisfied with the sound achieved, administrators hired German consultant Heinrich Keilholz, and extensive remodeling was undertaken. Still the sound, while improved, was not at a desirable level of excellence. Critics complained of lack of bass tones; musicians couldn't adequately hear each other on stage. Several visiting orchestras returned to Carnegie Hall for their New York engagements.

With the hiring of Dr. Harris, a more traditional solution to acoustical design is being sought. The professor has a well-established record of success: most recently, the new hall for the Minnesota Orchestra (P/A Feb. 1975, p. 50). Other halls on which Dr. Harris has collaborated include the Metropolitan Opera House, Lincoln Center; the Kennedy Center, Washington, D.C.; and the Krannert Performing Arts Center, Urbana, Ill.

Grand Ole Opry is a grand old TV studio

The 45,000-sq-ft Grand Ole Opry House by Welton Becket & Associates lays claim as the world's largest television and radio broadcasting studio. Acoustical consultants Purcell & Noppe & Associates, Inc., of Chatsworth, Calif., and theater/studio consultants George T. Howard & Associates of Hollywood collaborated to make the hall, which opened a year ago near Nashville, Tenn., one of the most technologically advanced, while keeping a raise-the-rafters tradition.

Although the seats are pews, to resemble the old Ryman Auditorium, they are upholstered to absorb sound as if physically occupied by a person. A 20-channel mixer amplifier console can control the house sound without affecting the sound for broadcast. Acoustics were studied with a model and the use of optical tracing techniques employing a laser beam as the source element.

UAW: retrofitting for energy conservation

The northern Michigan resort of the United Auto Workers, designed by Stronorov & Haws five years ago, will undergo a "retrofitting" to save energy and to demonstrate energy-saving techniques to the more than 600 union members who vacation there every two weeks. The Research and Design Institute of Providence, R.I. (see p. 68, this issue), has been selected to adapt the copper-roofed structure to a year-round system of heating both water and interior space. In addition, REDE has been commissioned by UAW's Leonard Woodcock to install the Darrieus rotor shown on this month's cover, to harness wind power for the production of electricity, and they will conduct an energy consumption sur-

Photo: Sandor Acs

Philharmonic Hall as opened in 1962

Photo: Bob Serating

After its second alteration . . .

Photo: Bob Serating

After third, and last, improvements

UAW vacation resort

vey of the complex.

The resort is named the Walter and May Reuther Family Education Center after the late Walter Reuther, who along with architect Oskar Stonorov was killed in 1970 in an airplane crash while on an inspection trip.

In memory of the late Giulia Ponti

A telegram came Mar. 18 from Gio Ponti in Milan: "Our dear Giulia is no longer with us." The Pontis and their apartment on Via Dezza became familiar and dear to me beginning in 1956 when I first started traveling to Italy—to write often on the machined arts or handcrafts which Italy produced with such gusto in the 1950s. Gio designed in every medium from metal to cellophane to ceramic.

Obituaries rarely are written about the wife of an architect unless she is an active participant in the design; and offensive as it is to one's feminism to say they also serve (in Milton's sense), that was what Giulia Ponti did. The very nature of the profession of architecture makes husbands and wives more and more one and divisible. But among the one and indivisible were the Pontis, and like all the long married, their indivisibility had the effect of sharply defining their identities as it increased the shorthand of their loyalties. Superfluous to be explicit.

My most vivid memory of Giulia concerned a time when she was explicit. When a Ponti show opened at UCLA, I sat beside her as Gio lectured. She caught my hand anxiously, and whenever Gio hesitated a moment over an English word her fingers became a vise around mine, and in a loud stage whisper she pronounced the English word he must have been seeking. She was there beside me but her spirit was there with Gio. [Esther McCoy]

Sullivan ornament displayed in Lovejoy Library. Photomural by Richard Nickel.

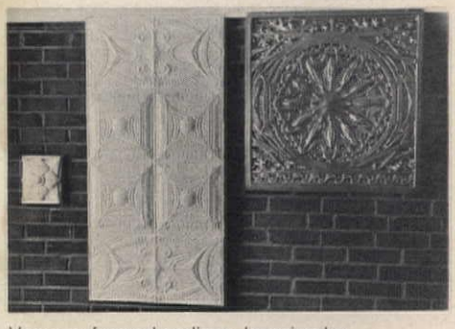
Sullivan ornament may travel in plastic

Southern Illinois University is experimenting with ways to reproduce items in its collection of Louis Sullivan ornament, and one method which holds promise is that of vacuum-forming. This process, which takes several hours, has the advantage of producing a durable, lightweight replica suitable for traveling. The expense of shipping and insuring the originals would be almost prohibitive, said John Celuch, acting curator of the collection, who hopes eventually to organize an exhibit of about 20 pieces.

The idea of applying the vacuum-forming process to reproduction of the ornament came a year ago when sculptor Ike Hay was holding a vacuum-forming workshop at the university. While other mediums and methods of reproduction are being explored, such as traditional plaster and a new plastic foam, vacuum-forming appears to be the easiest, though it also has limitations.

SIU, located on a new campus at Edwardsville designed by Hellmuth Obata & Kassabaum of St. Louis, bought the Sullivan collection in 1965 from photographer Richard Nickel. Nickel died in 1972, while photographing the demolished ruins of Sullivan's Stock Exchange in Chicago. The collection includes a range of types and materials—friezes, cornices, and hardware, stone, terra cotta, sheet metal, and glass, for example. It is especially noted, said Celuch, for a concentration of early Sullivan ornament from the 1880s and 1890s.

Photos: John Celuch



Vacuum-formed replicas, hanging by push pins, of (from left) ornament; pressed metal ceiling; star pod.

A portion of the collection is permanently installed at the Lovejoy Memorial Library on campus; some pieces are on display out of doors; and others are in storage, accessible to students and scholars. The university has applied for a National Endowment grant to complete installation of the works in various campus buildings but particularly in a general classroom building scheduled to open this fall. The Architects Collaborative, Cambridge, Mass., designed this building which has a three-story interior "street" well-suited for displaying the Sullivan works. Enlarged photographs of the Sullivan buildings as they existed also would be hung to illustrate the relationship of ornament to the structures.

AIA presents nine honor awards

Nine buildings from 600 entries have been cited for 1975 Honor Awards by the American Institute of Architects. They are the Hanselmann Residence, [continued on page 28]

Many new roofs waste a lot of energy. Here's how to cut that loss by 50 percent- without spending an extra dime.

It may sound amazing, but you can do it.

The only thing you have to do is specify thicker 2¼-inch Fiberglas* roof insulation instead of the thinner 15/16th-inch size.

This dramatically reduces heat loss through your roof. And it actually brings the total cost of your building *down!*

The reason: the improved thermal performance of your roof enables you to get along with less elaborate, *less expensive* heating and cooling equipment.

In general, every dollar you spend on thicker 2¼-inch roof insulation vs. 15/16th-inch size cuts up to *two* dollars off original equipment costs. So you come out considerably *ahead.*

On a suburban office building in northern climates, for example, thicker roof insulation could save as much as $27,000 in equipment costs for every 60,000 square feet of roof.

And, of course, the thicker Fiberglas roof insulation goes on slashing the loss of fuel energy through the roof of your building by 50 percent—and the fuel *bills* by roughly 10 percent—year after year.

The exact savings vary according to climate zone, the size and type of roof deck, "U" improvement, and the added cost of the thicker insulation.

We've worked up all the figures and charts in a handy booklet called "Roof Insulation Systems." For your free copy, write to: V. F. Meeks, Architectural Products Division, Owens-Corning Fiberglas Corporation, Fiberglas Tower, Toledo, Ohio 43659.

More details: See our section in Sweets Catalog, Roof Insulation Systems 7.15/Ow, or contact your Owens-Corning representative.

*Reg. T.M. O.-C. F.

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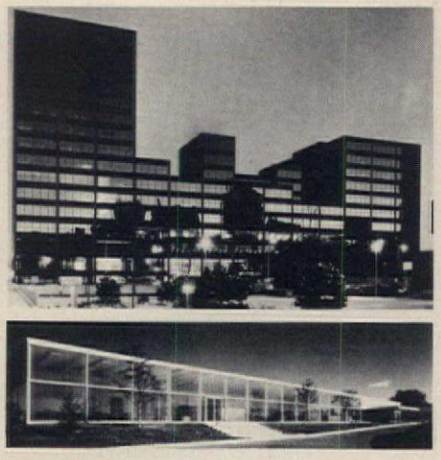
News report continued from page 24

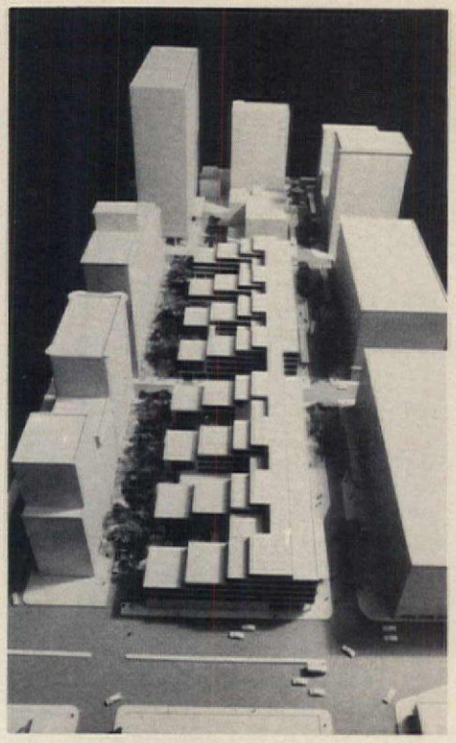


Park Central (top), Denver.
The Republic (above), Columbus.

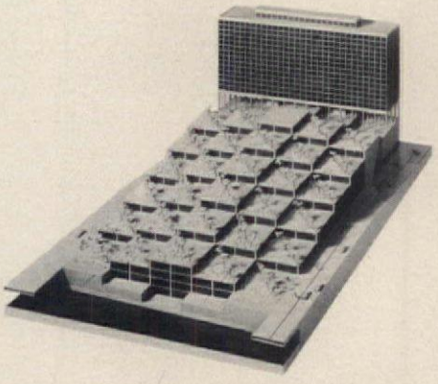
Ft. Wayne, Ind., (P/A March 1972 p. 76) recognized for its variety and "distinctively elegant" architectural elements, designed by Michael Graves of Princeton, N.J.; the I.D.S. Center, Minneapolis, Minn., which won for its "reflective ambience" and achievement as a true city center, designed by Philip Johnson and John Burgee, New York; the Kimbell Art Museum, Fort Worth, Tex., by the late Louis I. Kahn of Philadelphia, Pa., distinguished for its form and rhythmic quality.

The Columbus East High School, Columbus, Ind., "the most mannered building of those selected," designed by Mitchell/Giurgola Associates, Philadelphia; Park Central, a mixed-use urban renewal complex, Denver, Colo., by Muchow Associates, Denver, noted for its consistent detail and architectural character; the Herbert F. Johnson Museum of Art, Ithaca, N.Y., by I.M. Pei & Partners, New York, which impressed the jury with the way in which the building related to the site; 88 Pine Street, New York, by I.M. Pei & Partners, a white coated aluminum office tower of "classical purity"; Cedar Square West, Minneapolis, an urban housing complex by Ralph Rapson & Associates, Minneapolis, cited for attaining the "long-sought goal" of housing for mixed income groups; and The Republic, Columbus, Ind., a "showplace" for a newspaper plant by Skidmore, Owings & Merrill, Chicago, Illinois.

Jury: Richard Meier, chairman; John Desmond, Gertrude Kerbis, Donald F. Olsen, and Alfred Price, a student.



Loop College model by SCB & Assoc.



Model by Stanley Tigerman & Associates

High-rise version by Mies office.

New school not the 'Chicago School'

The Capital Development Board of Illinois has announced Solomon, Cordwell, Buenz & Associates, Chicago, as architect for the new Loop College building on a site in the south Loop area. This announcement has been the source of some antagonism since Loop College, one of seven colleges operated by the city of Chicago, had already picked a site and an architect.

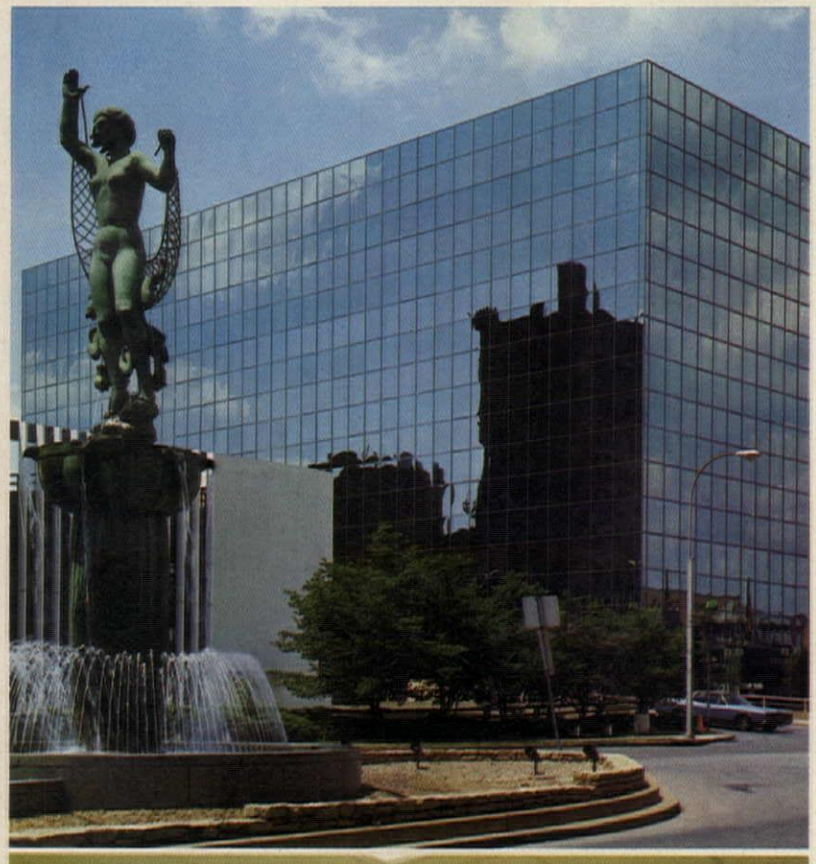
In August 1971, Loop College purchased a site in the north Loop area at the northwest corner of Lake St. and Wabash Ave., near its present location, and commissioned the Office of Mies van der Rohe to design a building for the 29,000-sq-ft parcel. Since the State of Illinois will provide three-quarters of the funding for the college, the project came under the jurisdiction of the Capital Development Board at the time of its formation by legislative act in 1972.

One of the Capital Development Board's criteria for judging public investments is its potential for revitalizing adjacent areas, a determinant that weighed against the single function high-rise building commissioned for the Lake-Wabash site. In June 1974, alternate site proposals were solicited by open invitation and of those received, the Capital Development Board selected five of the proposals to be prepared as detailed feasibility studies. Significantly, of those chosen, three involved adaptive reuse, an idea whose time may come even in Chicago. Included was a proposal for the threatened Marquette Building (P/A Oct. 1974, p. 21) prepared by the Landmarks Preservation Service—a private organization, and the architectural firm of Holabird & Root. From the studies, two sites and designs were selected for further consideration—one at the south end of downtown State St. and the other a site along the north bank of the Chicago River.

The South State St. location covering two blocks between Jackson Blvd. and Congress St. is the site for two proposed five-story, stepped-section buildings designed by Solomon, Cordwell, Buenz & Associates. Development at this location would serve as an anchor and terminus to the State St. mall which is scheduled to be completed in early 1976.

[continued on page 32]

WE SHOWED THEM IN MISSOURI.



Executive Plaza, Kansas City, Missouri. Owner: Tower Properties Co.
Architectural Firm: Hellmuth, Obata & Kassabaum, Inc.
Mechanical Engineers: Herman Blum Consulting Engineers, Inc.

INSULATION YOU CAN SEE THROUGH, FROM LOF.

They liked what they saw because it not only looked beautiful, but it saved energy and money, too.

$79,067 SAVED IN INITIAL A/C HEATING COSTS.

In fact, by choosing LOF high-performance Vari-Tran® in Thermopane® units over single-pane bronze tinted ¼" glass, Kansas City's Executive Plaza owners saved $79,067 in initial heating and air conditioning costs. The extra cost of this high-performance glass was more than recovered in energy-dollar savings (life cycle costing).

PEAK LOAD REQUIREMENTS REDUCED.

When compared to tinted glass with medium drapes, this LOF high-performance glass (with no drapes) reduced peak cooling load requirements by almost a million BTUH. It also reduced peak heating load requirements by over one and one-half million BTUH.

But Vari-Tran did more than just make Executive Plaza figures look impressive. It gave building tenants a comfortable working environment. And it showed Kansas City just how beautiful an energy-saving building can be.

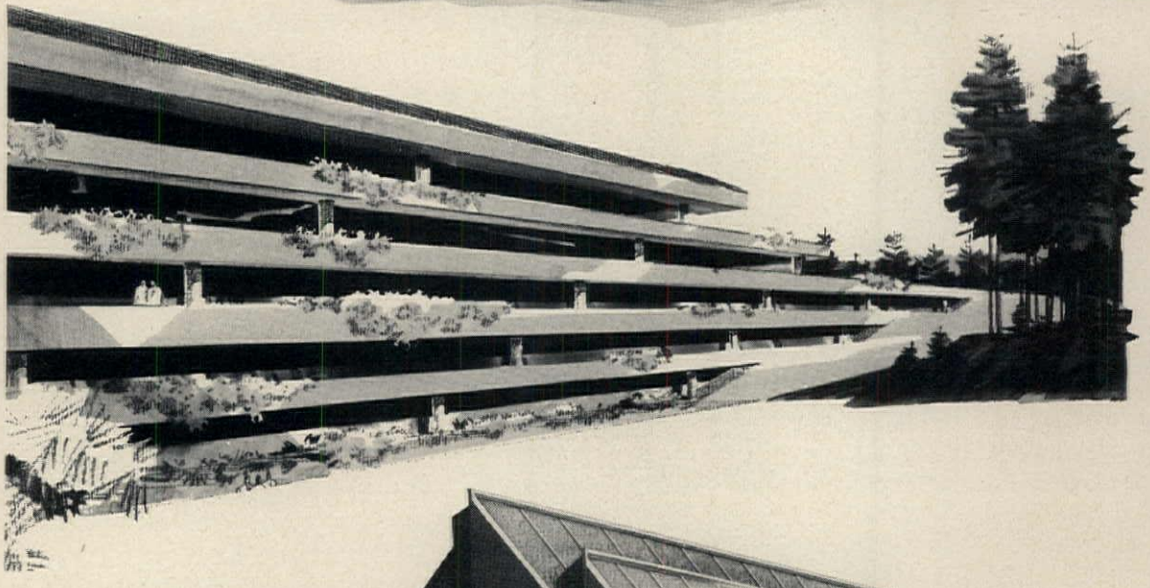
LOF CAN HELP YOU.

After all, LOF has been bringing you glass for storm sash for over 40 years, Thermopane insulating units for over 30 years, and Vari-Tran coating since the mid-'60s.

If you want to save energy dollars with the right glass, one of our highly qualified architectural representatives will be glad to help you. Or you can write Libbey-Owens-Ford Company, 811 Madison Avenue, Toledo, Ohio 43695.

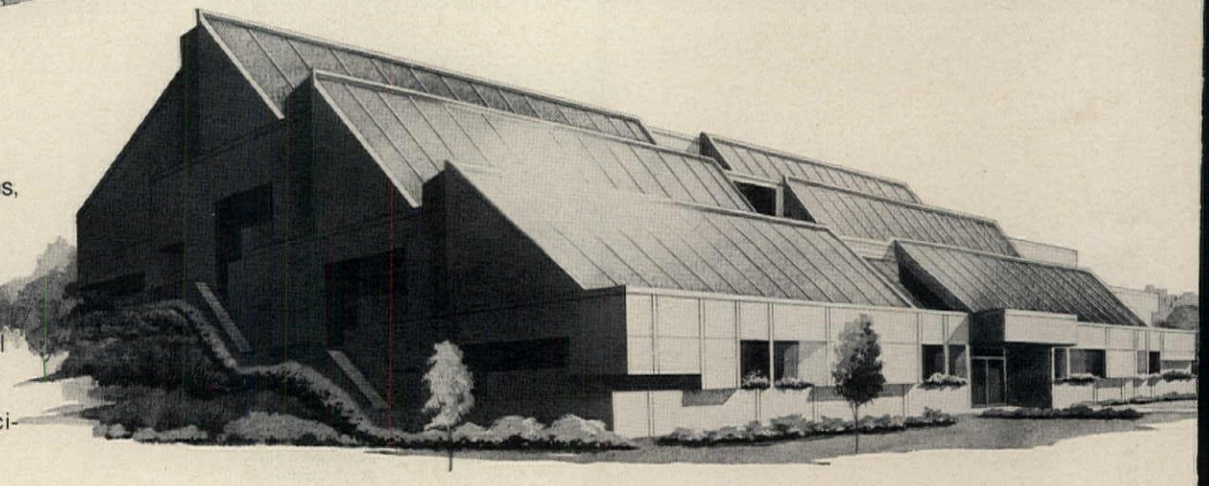
LOF

1972 winners: Mercy Hospital II, Coon Rapids, Minn., designed by S.C. Smiley Assoc., Minneapolis. Not shown: Westinghouse Nuclear Center, Monroeville, Pa., designed by Deeter Ritchey Sippel Associates, Pittsburgh. And the Energy Center, Mount Sinai Medical Center, Miami Beach, designed by The Smith Korach, Hayet, Haynie Partnership, Miami, Florida.



1973 winners: Weyerhaeuser World Headquarters Building, Tacoma, designed by Skidmore, Owings & Merrill, San Francisco. Not shown: General Electric River Works Program, Lynn, Mass., designed by GE's Lynn, Mass., Construction and Engineering Section. And the Boca Raton Community Hospital designed by The Smith, Korach, Hayet, Haynie Partnership, Miami, Florida.

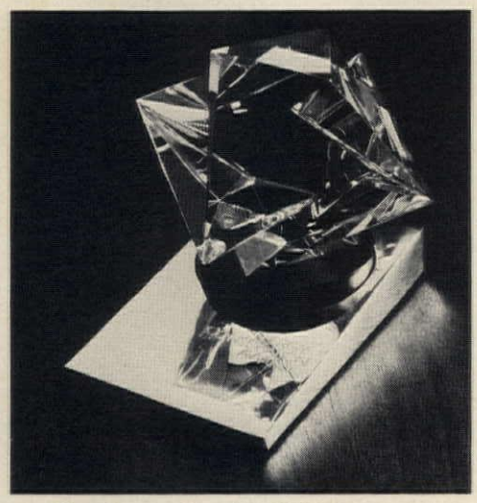
1974 winners: Desert Research Institute, University of Nevada Systems, Boulder City, Nevada, designed by Jack Miller & Associates, Las Vegas, in association with Arthur D. Little, Inc., Cambridge, Mass. Not shown: Federal Building, Saginaw, Mich., designed by Smith, Hinchman & Grylls Associates Inc., Detroit.



These buildings use 33% to 98% less of our nation's energy than conventional structures. Have you designed a building that saves fuel? See Award Program details on next page.

*T.M. Reg. O.-C F.

Announcing the 4th annual Owens-Corning Energy Conservation Awards Program.



The Owens-Corning 1975 Energy Conservation Award. "Triangles," a Steuben Crystal sculpture that captures and reflects light from multiple triangular planes.

Show our Awards Jury a building design that doesn't waste energy—and you could receive one of the Energy Conservation Awards Owens-Corning will present for 1975.

The Awards Jury will be looking for three things: Creativity. Originality. And most important of all—designs that save energy.

Too many of our buildings waste fuel and contribute to environmental pollution.

By continuing the Energy Conservation Awards Program we initiated in 1972, Owens-Corning hopes to stimulate even more ways to conserve energy. It also lets us recognize—and honor—the architects and engineers who do the best job of designing buildings and mechanical systems that help conserve our nation's energy.

Who can enter

Any registered architect or professional engineer practicing in the U.S. is eligible. As an individual. Or in a team. But to qualify, your entry must be a commissioned building project—in the design process, under construction, or a completed structure.

Although Fiberglas* products are an excellent way to conserve energy, their use is not an entry requirement.

Four entry categories

Winners will be selected from four design categories.

Institutional—schools and hospitals, for example.

Commercial—office buildings, shopping centers, retail stores, and similar structures.

Industrial—including manufacturing plants, research centers, warehouses.

Governmental—post offices, administrative buildings, and military structures, to name a few.

The Awards

Winning architects and/or engineers will receive the Steuben Crystal sculpture at left. Owners or clients will receive other Steuben Crystal awards.

The Awards Jury for 1975

Outstanding professionals in architecture and engineering will serve as the Awards Jury to select the winners.

Send for entry details now.

Completed entries must be submitted by August 31, 1975. Winners will be selected and notified in early September.

For a brochure giving complete details, write X. Z. Meeks, Owens-Corning Fiberglas Corporation, Architectural Products Division, Fiberglas Tower, Toledo, Ohio 43659.

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News report continued from page 28

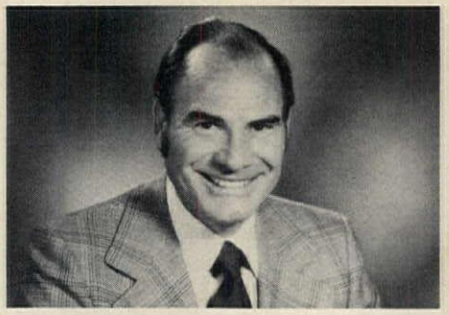
The river front location between Clark and Dearborn Sts. was proposed by Stanley Tigerman & Associates, who designed a terraced building stepping down in height toward the river combined with private residential and commercial development at the north end of the river site.

Political issues aside, these two schemes seem to indicate that the thinking of both builders and architects in Chicago may be changing. While comparison of these schemes to that of the Office of Mies van der Rohe is unfair (the Mies office was commissioned to do a high-rise building with a specific program developed for a specific site) it is none the less significant that the two schemes preferred by the Capital Development Board are low rise. They both are buildings that essentially fill their sites rather than exist free-standing, and they provide actual pedestrian amenities other than token or ceremonial plazas. The Solomon, Cordwell, Buenz scheme proposes landscaped courtyards connecting the college with the State St. mall, and Tigerman's design has a commercial galleria and landscaped roof terraces. Further, the two schemes suggest building forms with strong urban design relationships to projects slated for implementation—the State St. mall, and the eventual development of the river's edge as a pedestrian promenade and as the location of mixed use buildings to include housing. [Stuart Cohen]

IPC president elected chairman of ABP

Thomas L. Dempsey, president of Industrial Publishing Company, Cleveland, and chairman of IPC/Reinhold Publishing Co., publisher of *Progressive Architecture,* was elected chairman of the board of the American Business Press, the association of specialized business magazines. ABP members publish more than 500 magazines and represent the major publishing houses.

Dempsey joined IPC, one of the nation's leading business magazine publishers, in 1957. He was elected a vice president in 1964, executive vice president in 1968, and president in 1969. He has been chairman of Reinhold since it became an IPC subsidiary last year and is also a director of IPC's parent, Pittway Corporation.



Thomas L. Dempsey

IPC has expanded rapidly in recent years to provide a wide range of communications services. In addition to its 18 monthly business magazines, IPC produces references and directories, direct- response mailers, trade shows in three specialized fields and offers separate research, mailing list, and mail-marketing facilities.

Dempsey previously served ABP as first vice-chairman. He is a former director of Business Publications Audit of Circulations and a longtime member of Business/Professional Advertising Association, American Welding Society, Traffic Clubs International, and many other technical/industrial associations.

Richardson, by Sir Hubert von Herkomer

H.H. Richardson exhibit on view

An exhibition of presentation drawings and sketches by Henry Hobson Richardson, 1838–1886, is on view through June 22 at the Renwick Gallery, Washington, D.C. The show also includes photographs of Richardson himself, his staff, and his Brookline, Mass., studio from which came some of his most notable designs. Organized by the Department of Printing and Graphic Arts, Houghton Library, Harvard University, and the Boston firm of Shepley, Bulfinch, Richardson & Abbott, the exhibit contains more than 250 items and an illustrated catalog.

Wright's Oak Park home and studio

Wright's Studio Home open to the public

In 1889 with a loan from his employer, Louis Sullivan, the 22-year-old Frank Lloyd Wright built himself a small "shingle style" house in Oak Park, Ill., at 428 Forest Ave. In 1895 the young Wright, busy at making architecture and raising a family, added to the original house an office and studio for his architectural practice and a playroom for his six children. Today the house is unique for it spans many generations of Wright's work. In addition, Wright remodeled portions of the house for a later owner in the 1950s.

After years of private ownership the Oak Park dwelling was purchased for $168,000 by the Oak Park Development Corporation and the Frank Lloyd Wright Home and Studio Foundation, a local preservationist group formed to buy and operate the building. While 100 percent interim financing was provided by local banks for the sale, the Foundation is presently working to raise $106,500, its half of a matching grant from the National Trust for Historic Preservation, to pay for the home.

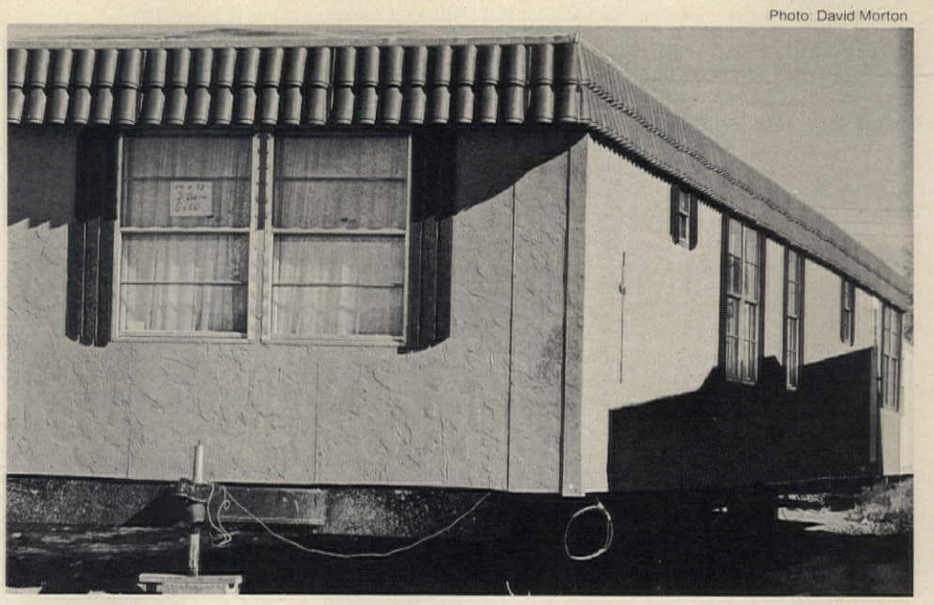
June 3 is the Foundation's deadline for collecting these funds, and the major fund-raising push will be a special tour of Wright's buildings in Oak Park on May 24. In addition to the Studio Home and Unity Temple, the tour will include eight houses, many never before open to the public—among them the Winslow (1893), Cheney (1904), and Gale (1909) houses.

Immediate plans call for roof repairs and new wiring, but the foundation intends eventually to restore the entire building. It is their hope to have the Studio Home function as an architectural tour center for Oak Park and as a Prairie School of Architecture resource study center. [Stuart Cohen]

[News continued on page 37]

Report from Santa Fe

Photo: David Morton



Veneration of old culture produces interesting ironies: an "adobe" mobile home.

Santa Fe is the holy city of the Southwest. Set in a peerless landscape, it enshrines the cultures of the Indian pueblo, the Spanish-Colonial period, and the ranch. So layered is this publicized image about Santa Fe that it is hard to understand its meaning in the real life of the people there.

Its role of regional shrine began in the 1920s when Santa Fe was colonized by artists and writers. Over the years their numbers have increased, but the most significant addition is the growing retirement community. Today with a population of 40,000 the economy is based on wealth accumulated elsewhere and enjoyed in Santa Fe.

Along with physical growth, Santa Fe's aura has expanded, projecting the idea that life is increasingly better there. One observer who disagrees is historian and social geographer J.B. Jackson whose years of writing and teaching have created a new way of interpreting the American landscape as perpetually modified by social usage.

Speaking of the Southwest, which he first visited as a boy and where he has lived since 1938, Jackson said, "When I first came here it was still primitive and pastoral. The villages were alive. People thought it a wonderful way of life. People now are still under the same illusion. But I've seen this country deteriorate physically and socially. First the Depression; then war and urban migrations to California; then a harsh, post-war return. Villages that were maintained in the 1920s are in disrepair; the land is all overgrazed. It's a wretched place, socially speaking. So I've lost a great deal of enthusiasm for the non-technical world. It's just not working."

Among the residents of Santa Fe his is a minority opinion. Veneration for the non-technical culture of old Santa Fe, much of which is perceived architecturally, has produced some interesting ironies. A design control ordinance for the historic core of the city has been in effect since 1957. Concerned citizenry would have new buildings everywhere conform to it. The ordinance cites as models the old Santa Fe style which includes Pueblo, Pueblo-Spanish, Spanish-Indian, and Territorial styles; and the new Santa Fe style is intended to harmonize by the use of similar materials, scale, color, and general detail to give a dominant effect of adobe construction. The ordinance has been accused of promoting façadism and ignoring the three-dimensional quality of the city. Moreover, adobe is so expensive now that most recent buildings are stuccoed over wood stud or concrete block.

Photo: Sally Woodbridge

J.B. (Brink) Jackson

Since efforts to build non-adobe, prefabricated housing for the native, low-income population are viewed as attacks on regional culture, little is done to prevent the indigenous population, whose forefathers produced the culture so staunchly defended, from leaving the squalid urban settlements and villages for something more up-to-date—like a mobile home. Their departure leaves the well-to-do retirement community to be served by a boutique culture where it is easy to buy crafts but hard to buy service. Jackson regards this as tragic for both sides since the Spanish-Americans love Santa Fe as the French love Paris.

There is an increasing awareness of the link between social well-fare and the preservation of buildings and places, but will solutions come in time to revitalize the countryside, to produce the jobs, roads, schools, and other institutions that maintain culture?

Jackson sees a ray of hope shining through the black cloud of second-home development that threatens to cover the central Rio Grande Valley. Much of it has been fraudulant and badly organized, but he sees improvement in more responsible design and planning. More importantly, it is a valid way of continuing the tradition of living in small communities in a beautiful landscape while broadening the economic base of the region.

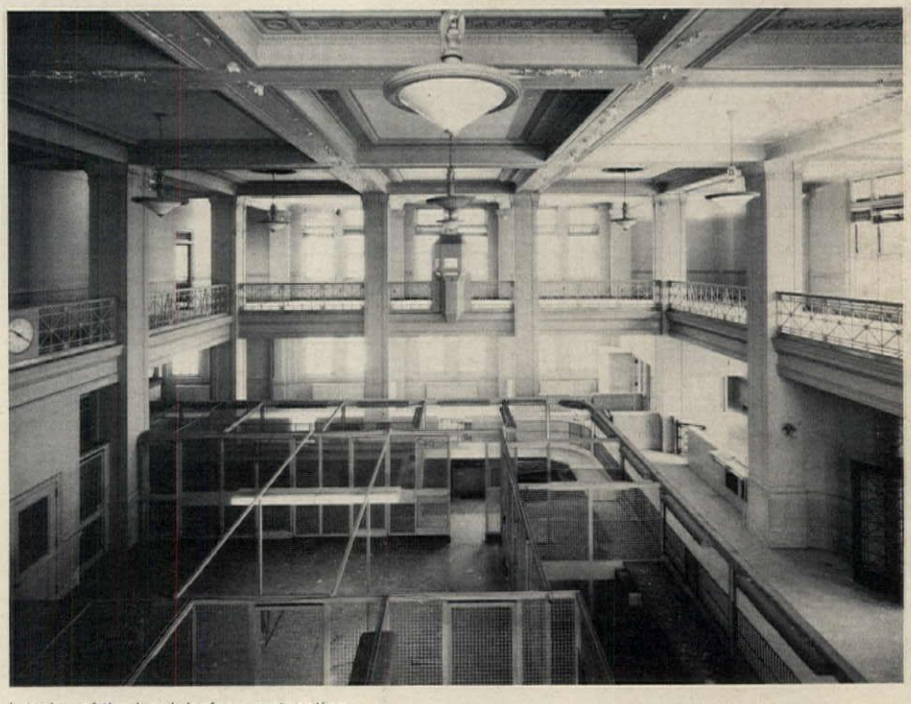
When visiting friends exclaim in horror over the littering of the landscape with trailers he simply replies, "Well, I'm so nearsighted they look like the Bauhaus to me." [Sally Woodbridge]

Report from Houston

Photos: Rick Gardner

Houston's Federal Reserve of Dallas.

Remodeled interior provides offices for the Crispin Company.



Interior of the bank before restoration.

An event unusual for Houston: rather than the wholesale replacement of another piece of the city's past, a neglected building is enjoying new life. This new life was given by the decision of the Crispin Company, engaged in world trade, to move its headquarters into an abandoned building.

Crispin's choice was an old branch of the Federal Reserve Bank of Dallas built in the CBD in 1922 on the advent of Houston's oil boom days. The terracotta and limestone-faced classical structure had served as a maximum security facility open only to commercial banks. Activities centered around a teller's cage area on the main floor, overlooked by armored turrets on the mezzanine. Although vacant since 1958, the building had been built so soundly that the program of two floors for the Crispin Company and a third floor for leasing could be readily provided without substantial rehabilitation.

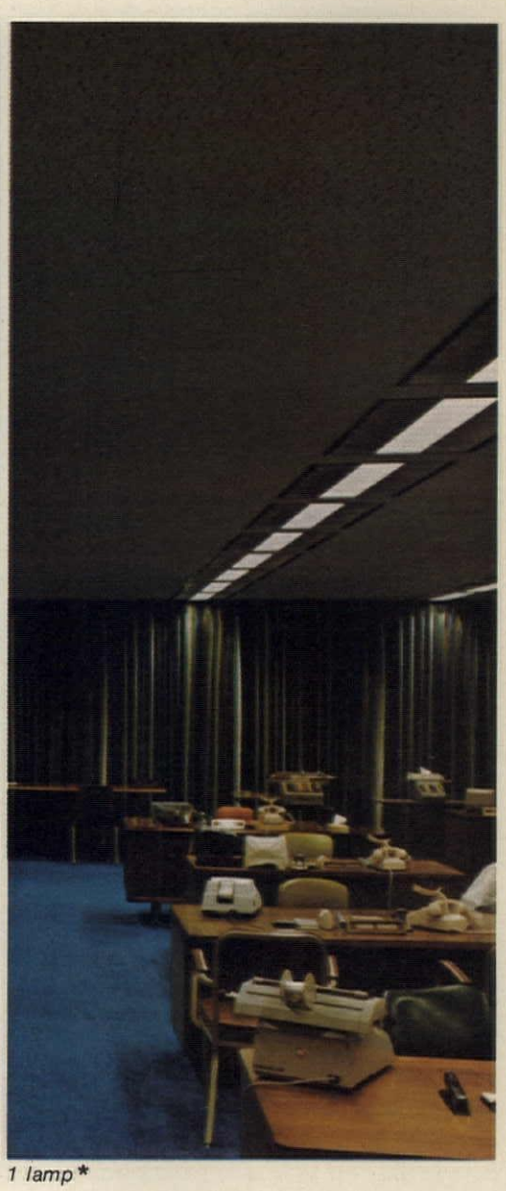
Architect Howard Barnstone chose a direction of minimal interference with the existing context. Plaster classical mouldings adorning the main interior space were retained, even as they bore a patina of old paint and gold leaf. New space planning was accomplished by the discreet use of mullionless glass for office partitions, plus salvaged marble for new areas designed to blend with original decor.

In renovation of the building's exterior, the original name was left incised on the front, while bronze glass in thin dark mullions was added to achieve the dark poché that Beaux-Arts designers actually wanted for their window openings. Barnstone also designed in references to the building's past by maintaining the edge line of the original teller's cage in the floor pattern of the new reception area. Basement facilities were developed for clerical use, and include the illusion of expanded space, gained through occasional mirrored partitions and soffits. The existing context also provided for off-beat events, such as the old bank vault's renovation into a conference room. Barnstone's restrained attitude about positive aspects of a former generation's creation amply demonstrates that there is a viable future for the past.
[Peter Papademetriou]
[News continued on page 41]

Cut energy drain with PARABOLUME 3-level lighting

3 lamps

2 lamps



*1 lamp**

Parabolume fixtures allow you to reduce energy use significantly and still retain the integrity of your lighting design.

No special fixtures are required . . . just our 2' x 4' three-light Parabolume accomplished the lighting levels illustrated above.

No special ballasts. Standard 40 watt with center lamps tandem wired.

And no fancy or expensive wiring. Only a separate switched circuit.

Best of all, the esthetic results are an intentional part of your interior design. You can achieve the desired illumination without random lamp removals or afterthought "turn offs."

Lighting levels may be changed for different jobs, for different natural ambients, to differentiate spaces, or simply to save precious energy whenever possible. But whatever selection is made will be within the framework of your lighting system design, and your clients will enjoy the low brightness environment of Parabolume lighting.

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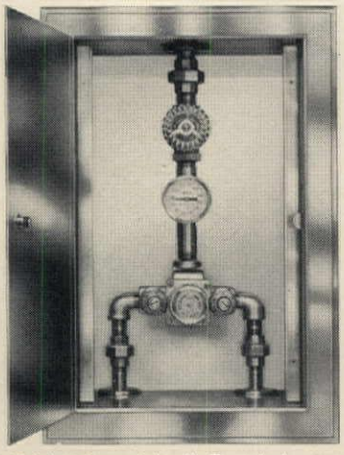

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News report continued from page 38

Personalities

Personalities

Sir Nikolaus Pevsner has been awarded the Thomas Jefferson Memorial Foundation Medal in Architecture at the University of Virginia.

C. Ian Jackson has been named executive director of the Canadian Participation Secretariat for Habitat: United Nations Conference on Human Settlements to be held in Vancouver, June 1976.

George C. Frost, partner in Rist-Frost Associates, consulting engineers of Glens Falls, N.Y., has been elected to serve as the 1975 chairman of the National Architect/Engineer Liaison Commission.

Calendar

Mar. 21–Jun. 22. Richardson exhibit, Renwick Gallery, Washington D.C.

May 17–18. ASC/AIA National Convention, Georgia Baptist Assembly, Toccoa, Ga.

May 18–22. Convention of the American Institute of Architects, Atlanta, Ga.

May 24. Fund-raising tour of Frank Lloyd Wright buildings, Oak Park, Il.

Sept. 1 Submissions accepted now through Sept. 1 for Hirons Prize competition, open to architectural designers (not students) under 35. First prize, $1500; second, $500. Write National Institute for Architectural Education, 20 W. 40th St., New York, N.Y. 10018.

June 9–13. Plastics Show of Canada, Exhibition Park, Toronto.

June 15–20. International Design Conference in Aspen, Colo.

June 18–20. Seventh annual congress on interior environment (NEOCON), Merchandise Mart, Chicago.

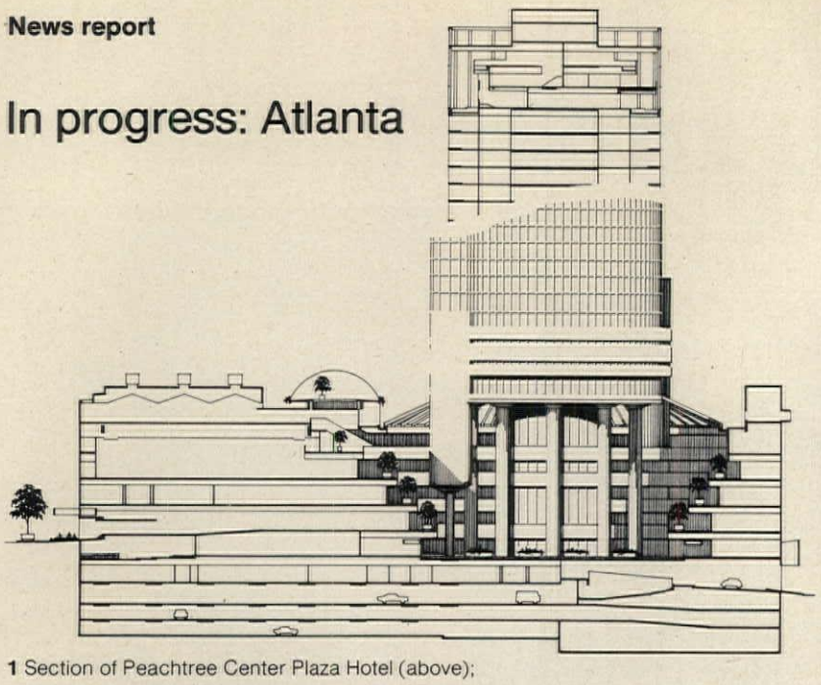
June 23–25. Nineteenth annual convention and exhibit of The Construction Specifications Institute, The Rivergate, New Orleans.

June 23–July 4. Workshop on theory, history, and practice of public celebration, MIT, Boston.

July 7. Deadline for entries in the Red Cedar Shingle & Handsplit Shake Bureau/AIA Architectural Awards Program, Seattle, Wash.

July 7–9. Third International Conference of the Design Methods Group, Berkeley, Calif.

In progress: Atlanta



1 Section of Peachtree Center Plaza Hotel (above); under construction (right); photomontage of Peachtree Center skyline with model of the 70-story hotel (below).

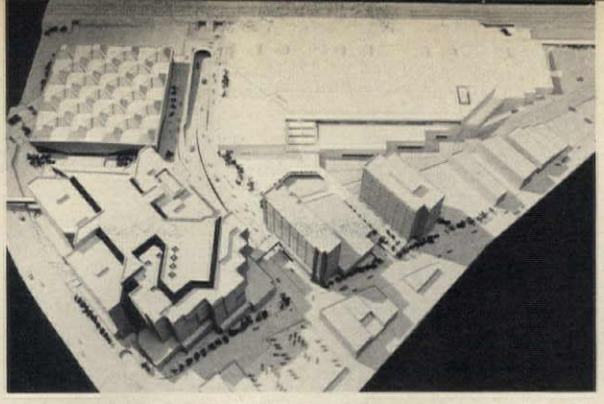
1 World's tallest hotel—John Portman & Associates in Atlanta is architect and developer for a 70-story, 1200-room hotel in downtown Atlanta, the Peachtree Center Plaza Hotel. The cylindrical building, tallest in the Southeast, will have one exterior express elevator that will serve the three-story, revolving cocktail lounge and restaurant on the top—in addition to centrally located elevators. Glazing will be reflective glass. The building will be linked through a two-story arcade to Peachtree Center a block away.

2 Longest escalator—The $65 million Omni International, a 14-story office, retail, and entertainment megastructure near downtown Atlanta, is ready for occupancy. The interior court will enclose 11 million cu ft, across which an escalator, the world's longest, will span from ground to the eighth floor. The complex will include a 500-room hotel, multi-media puppet theater, six cinemas, and an indoor ice skating rink. Thompson, Ventulett & Stainback of Atlanta was architect for Omni International as well as for the Omni next door, a sports arena, and the nearby World Congress Center just beginning construction.

3 Flatiron Building—Virtually guaranteed is the preservation of a 77-year-old Atlanta landmark, the Flatiron Building, done in 1897 by Bradford Gilbert of Chicago. Atlanta interior designer Wayne Covington is handling the $1 million, a-la-20s renovation, complete with awnings and polished mahogany. At one point the Flatiron (model for a larger and more famous New York City namesake by D.H. Burnham & Co.) was slated to see the headache ball to make way for a high rise, but a disquieting real estate market spared the structure. Hamilton Bank & Trust Company, the new owners, instigated the renovation, scheduled to take two years.

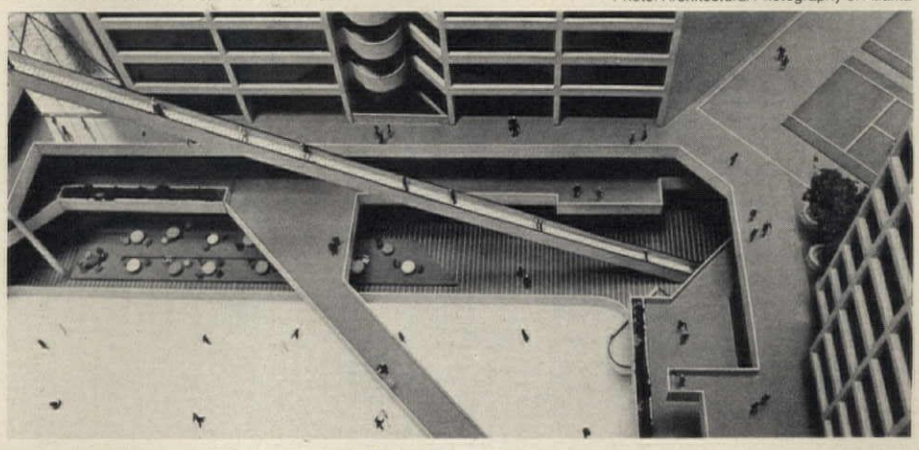
4 Urban Life Center—The first phase in the $20 million, federally sponsored Urban Life Center at Georgia State University in downtown Atlanta has been occupied for more than a year. The center is one of only four designated by the government throughout the country and was designed by Finch Alexander Barnes Rothschild & Paschal (FABRAP) of Atlanta. It forms a major addition to the growing campus located between the commercial district and the state capitol complex, soon to be expanded.

5 Capitol Hill master plan—Jova/Daniels/Busby of Atlanta were architects of a design team headed by urban planners Eric Hill Associates for a master plan of the Georgia Capitol. The first phase calling for two office towers over a proposed rapid transit station has received funding for design, to be done by Aeck Associates of Atlanta. Phase two will be the construction of three medium-rise office buildings; six office structures including three high-rise towers and a stepped back legislative office building behind the Capitol will make up phase three. An integral part of the plan is linkage of the Hill to other parts of the city and to the nearby university by pedestrian walks separated from traffic. Lowered streets, already under construction, and galleria connectors also are planned.



Site, over rail yards, of TVS buildings

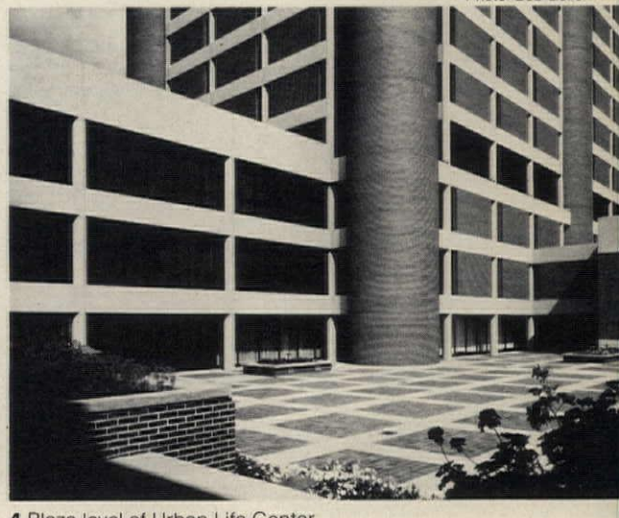
Photo: Architectural Photography of Atlanta



2 Eight-story free spanning escalator in Omni International

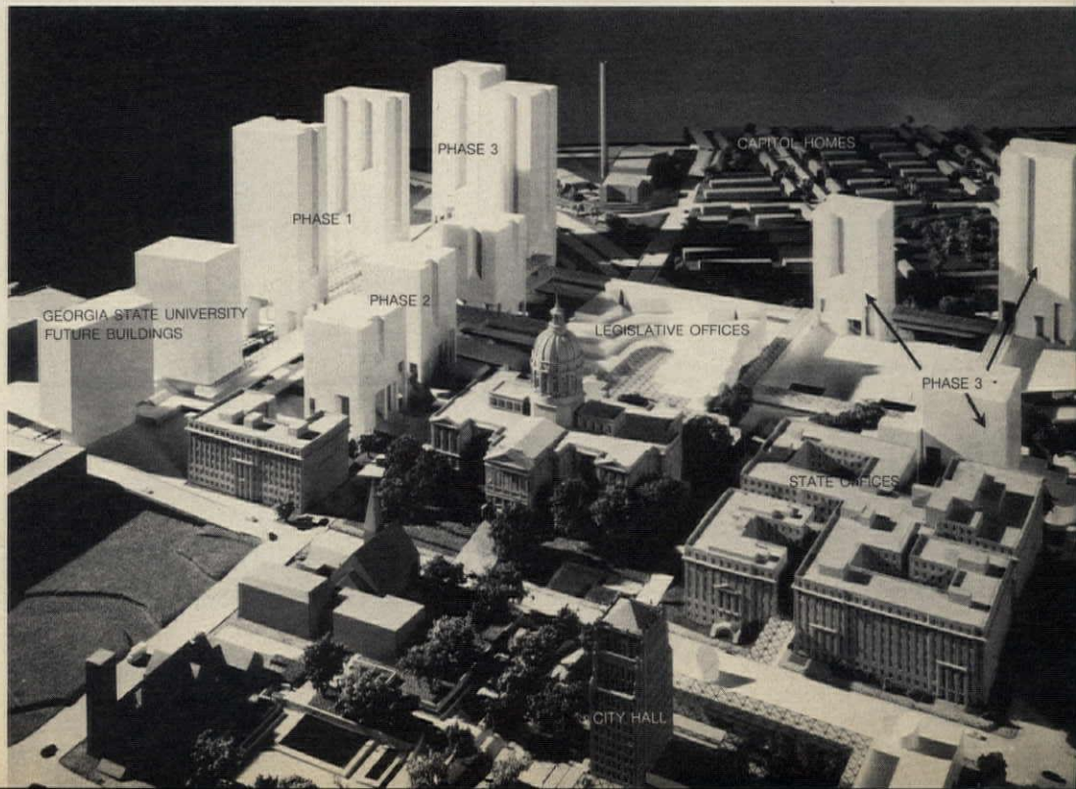
Photo: Bob Geller

3 Ready for renovation



4 Plaza level of Urban Life Center

5 Georgia State Capitol master plan



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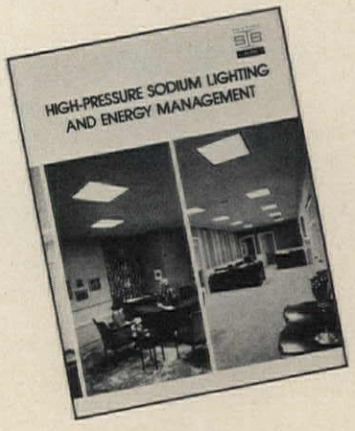

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Energy imperatives

May 1975

You've been hearing about energy from every quarter. You haven't heard the end of it yet, and you won't in your lifetime. *Energy efficiency* is going to rank right up there with *commodity, firmness,* and *delight* when it comes to judging architecture—or architects.

We were not always blessed with so many ways to waste energy. To keep buildings cool, Frank Lloyd Wright and some of his contemporaries relied on wide overhangs and through ventilation; LeCorbusier adopted the *brise soleil.* In the 1950s, architects all over America were devising ways to light classrooms with clerestories. Then we were all bought off with cheap energy.

By the 1960s, we had electrical appliances for everything and the air conditioning to dispel the heat they generated. We could have May all year in any interior, and high noon lighting around the clock. The few architects who worried about power consumption had economics pitted against them. Energy conservation usually called for higher first costs—for extra insulation, reflective glass, more intricate lighting controls, heat retrieval systems. Energy-saving measures with no apparent cost—such as proper orientation—were okay, but the profit statement and the tax structure favored a skimp-now-pay-later approach. Now, at last, the energy-conscious architect or engineer may find the accountant on his side. And the new economic imperatives are likely to be backed up with incentives and regulations from government.

The technology that made energy-wasting buildings possible can now make energy-conserving ones a reality. You'll find the latest word on technical means at the architects disposal in this issue.

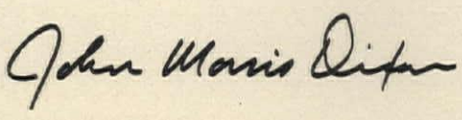
The impact on architectural design? It's going to be harder to justify turrets, cantilevered appendages, transparent enclosures, or sprawling one-story structures, One prototype for the future may be the compact, featureless block of the shopping center department store.

You can get the energy virtues of bulky buildings without accepting all the curses. There can be a focal interior court, as in Portman's hotels or in the hospital featured in this issue. And you can make the outside of a thick-skinned box interesting. Brunelleschi and Bramante did it; Sullivan and McKim did it; when Venturi advocated the "decorated shed" solution back in the 1960s, he spoke mainly of construction savings, but that's a timely objective, too.

Building design and technology are not our only means for controlling energy use. Heating and cooling of buildings represent, in fact, less than one quarter of our total energy demand. In the area of transportation (which accounts for roughly another quarter) voracious fuel demands can be checked only by more compact settlement patterns and a finer grained mix of land uses. We can't expect much immediate help here from a government preoccupied with bailing out auto-makers and home-builders, but in the long run the ecology bloc will make a strong comeback and help to promote energy-sound planning.

We can also reconsider our living habits. There are alternatives to air conditioning (opening your collar, closing up shop early, nurturing shade trees, moving out of Houston), even alternatives to central heating. (On a snowy night in Japan, a hot bath, a quilted kimono, and a pot of hot coals can mean comfort.) And in the past year, most of us have found that we don't need 100 footcandles to find our way down a corridor.

Back in the days of abundant energy, P/A questioned the way we were squandering it, as part of an issue on the linked subjects of resources and pollution ("Life Support Systems for a Dying Planet," Oct. 1971). Since the oil embargo of 1973, other publications of all kinds have taken up the energy cause. This issue of P/A, then, is not meant to be a revelation. But a lot is happening now on the energy front, from advanced gadgetry to sensible interior planning. It's time for an energy update.

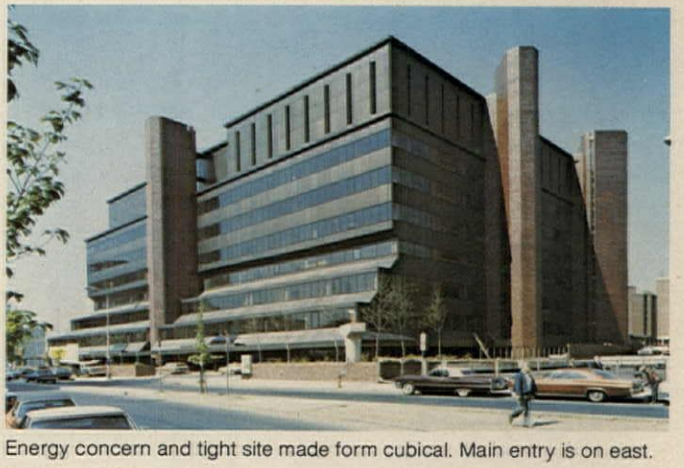


Children's Hospital of Philadelphia

Chopping energy costs

In the Children's Hospital of Philadelphia, known as CHOP, by Harbeson Hough Livingston & Larson, and William A. Amenta, significant energy savings are achieved through reuse of normally rejected heat.

Outdoor playdecks on south side (above) shield huge inner atrium (right).



Energy concern and tight site made form cubical. Main entry is on east.

There is a saying going around Philadelphia that the city now has a hospital that looks like a hotel and a hotel that looks like a hospital. The two buildings are across the street from each other, next to the University of Pennsylvania campus. The hotel is a white, somewhat antiseptic concrete horizontal slab that reminds one of early modern European sanatoriums. The hospital, on the other hand, is faced in warm, mahogany-toned glazed brick with bronze-tinted aluminum and glass. Inside, a huge, one-million-cu-ft glass-topped atrium rises through 8 above-grade levels of the 11-story structure. On ground level, the atrium acts as the main "lobby" of the building. Here, play, waiting, and dining areas are provided amidst a veritable forest of fig trees. A bank, snack bar, auditorium, and gift shop—all available to the public—and a gymnasium, dining rooms, administrative offices, and patient lobbies encircle the space. As the atrium rises through the building, it is surrounded by open, balcony-type corridors on each level that are the main circulation paths to the patient rooms; they are also the major orienting device of the building. There are even glass-enclosed elevators rising through lower levels of the space. All of this probably sounds more like what we have come to expect from a John Portman hotel than what we might imagine for a hospital, but all of it does make a great deal of sense, both socially and economically.

Planning for the new hospital began 15 years ago, long before the energy problem had become a crisis. But even then, those responsible for the facility realized that heating and cooling a one-million-sq-ft building as complicated and specialized as this could be astronomically high. This explains the building's somewhat bulky shape, the huge inner atrium, and the stepped-back outdoor balconies on the south side.

An energy-saving system

Because the energy costs of running a building of this size and complexity on a round-the-clock basis could be very high it was decided that the form of the structure should be that which is the most efficient in terms of its surface-to-volume ratio. Unless an architect can justify a spherical form, a cube presents the least exterior surface in relation to the volume of the interior. And, the larger the cube, the more efficient the ratio becomes. Consequently, the hospital took a shape that was closest, practically, to that of a cube. This meant that perimeter heat gains and losses could be held to a minimum, but it also meant that spaces deep within the building, where there is a heat build-up from equipment, lighting, and people, would require air-conditioning even during the winter. This internally generated heat, however, as well as heat from the sun, could be reused, rather than

Million cu ft atrium is main orienting device in million sq ft hospital.

Corridors, dental, and play areas (above and below) encircle rising court.

rejected as is customary, both summer and winter.

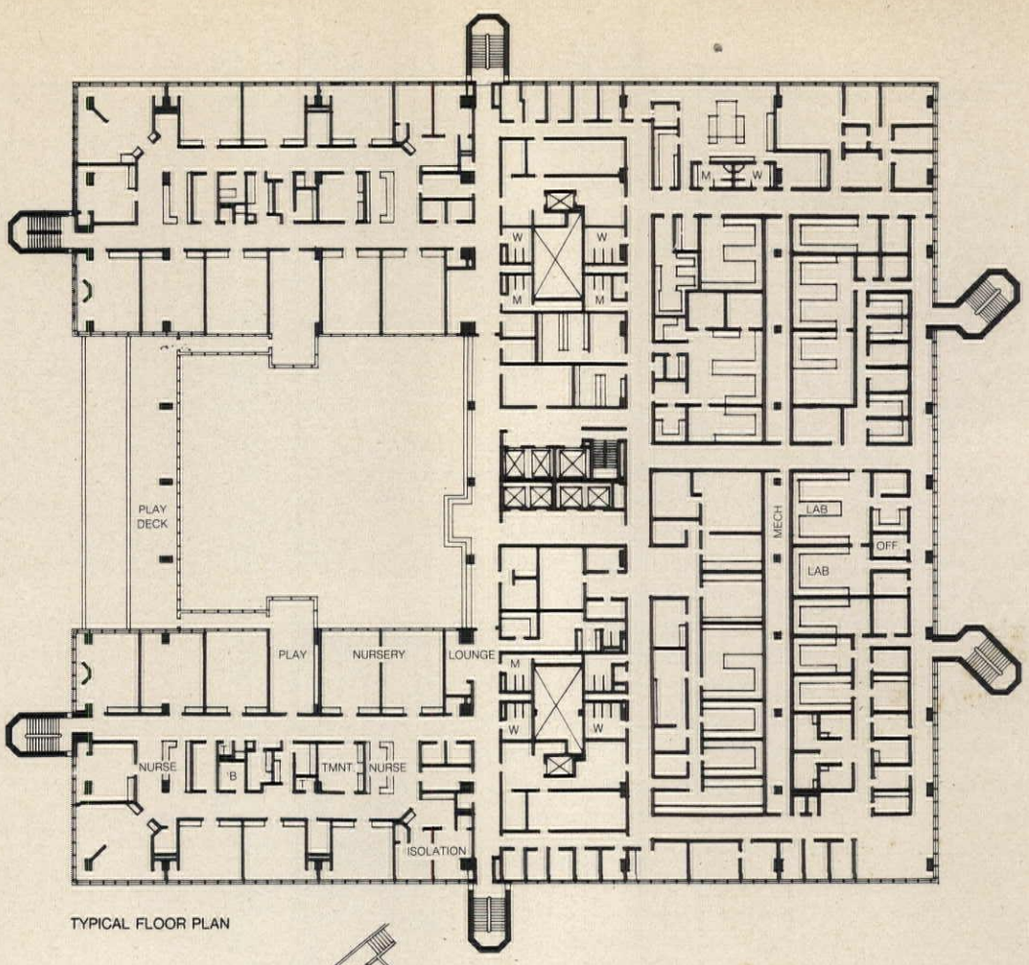
In winter, when the refrigeration machines operate at a 1200-ton capacity, the heat they would otherwise reject is redirected to the perimeter of the building to offset the heat loss that occurs there. No additional, purchased steam or energy is required for environmental heating as long as the outside temperature does not fall below 29 F. This pays off handsomely in Philadelphia, where the winter temperature averages a moderate 40 F. Throughout the entire year, this normally rejected heat is used to heat domestic hot water and to temper air. In the summer, if the outside temperature drops, some areas of the building may not require air as cold as that emanating from the ducts. In addition, different areas of the hospital, such as operating rooms, research departments, patient rooms, private offices, animal-research areas, etc., require different temperatures because of their different functions. Consequently, the building is designed so that all areas are permitted individual temperature control, and this control is achieved through reheating, with the normally rejected heat, the air at any terminal outlet. The idea of reheating previously refrigerated air may sound peculiar, but the system has certain distinct advantages. First of all, it is a reheat system with a free heat source. Second, the system allows air volume to remain constant while permitting any variation in temperature in any area within the building. Third, and most important, it is estimated that the savings in operating costs through this all-air constant volume terminal reheat system (it cuts fuel bills $55,000 annually) will pay for the initial cost of the equipment in the first five to six years. Fifth, all of this is accomplished with standard components that are readily available to anyone wishing to make use of them.

Courtyard is actually part of energy system

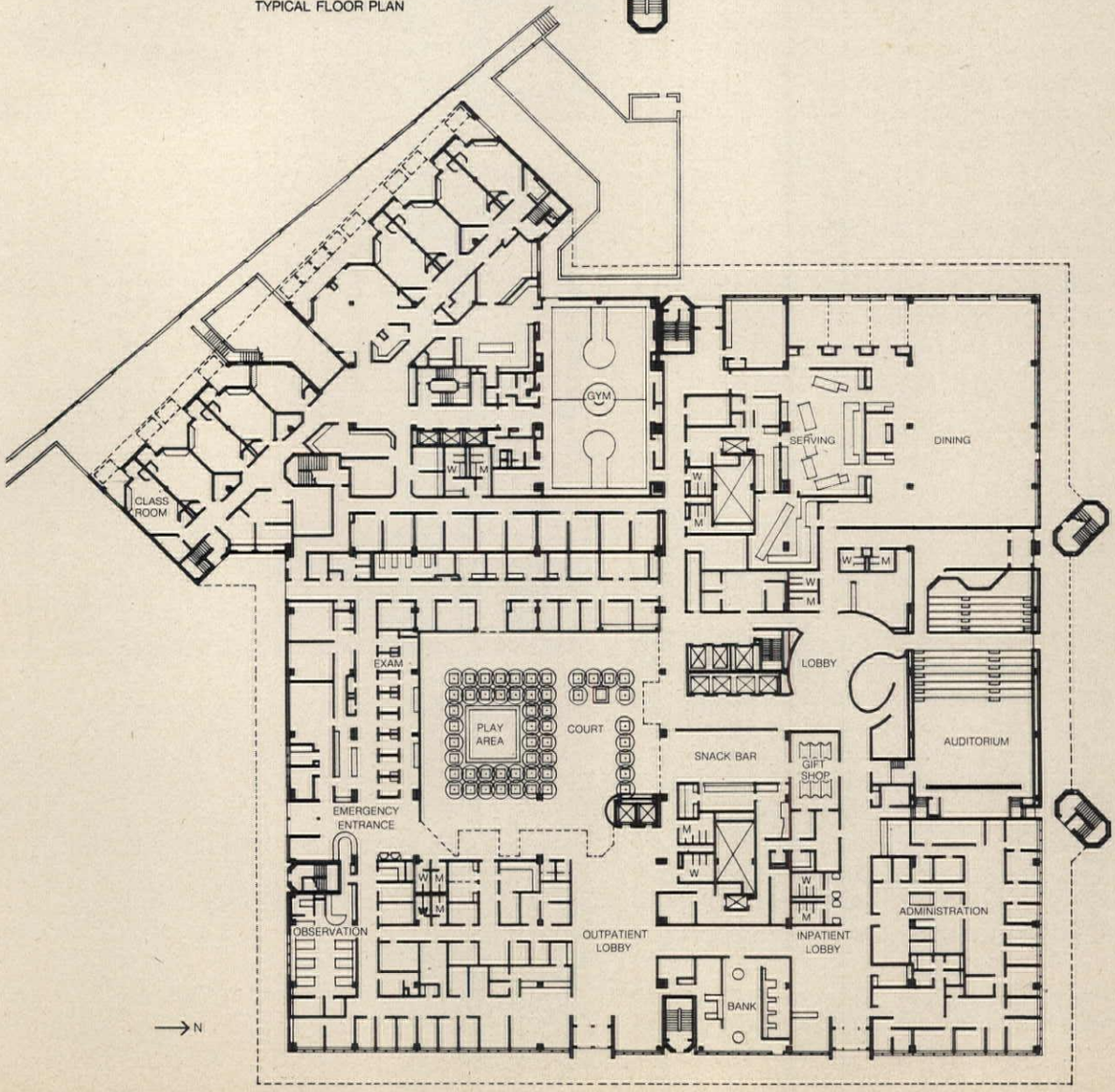
The courtyard greatly enhances the system's efficiency. The ground floor space, which is actually the third level of the building, is air conditioned with temperature and humidity appropriate for the many trees and plants that fill the area. From the second floor through the eighth, the courtyard is used as a return air plenum. Return air is discharged through slots in the floors of the corridor-balconies that surround the interior of the court on six of these levels, thus eliminating the need for large vertical duct runs to the air handling units on top of the building. This resulted in a saving of over $100,000 in duct construction.

While the courtyard is set into the building, it is exposed to the exterior on its south side and, of course, through its truss-supported glazed roof. The concrete outdoor playdecks on the south side of the courtyard act as a large venetian blind in a fixed position. They are calibrated to sun angles to provide maximum intervention in summer to reduce heat and glare from direct rays, and to present minimal obstacles to warmth and illumination from the sun in the winter. Although the roof of the courtyard is of clear glass, it is designed as a series of parallel, saw-tooth forms angled to reflect summer sun (reflective mirror glass was

Atrium cafe (top, far left) gift shop and bank (top right) are open to public. Waiting areas and bedrooms (right) are child-scaled and colorful.



TYPICAL FLOOR PLAN

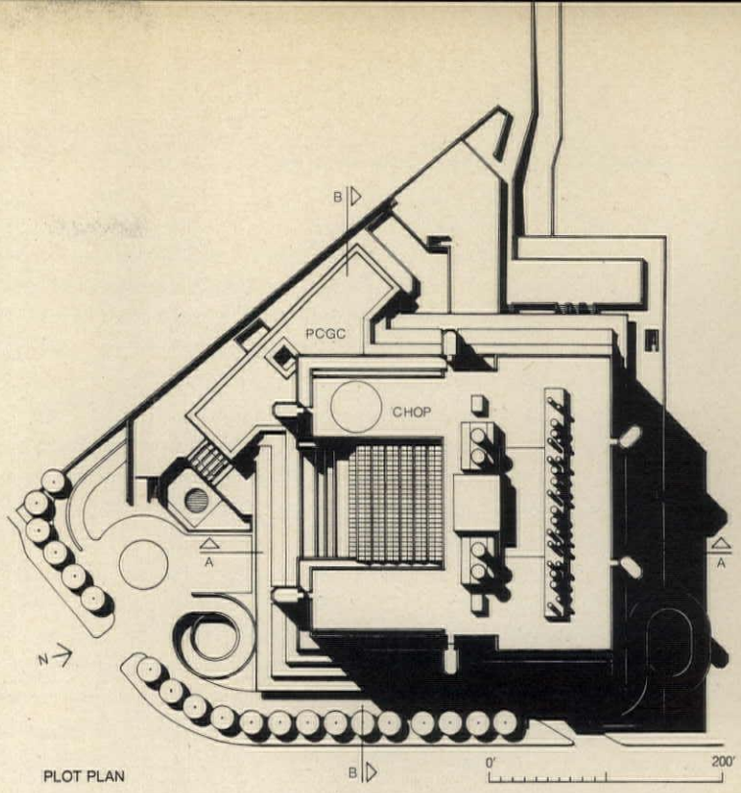


GROUND FLOOR PLAN

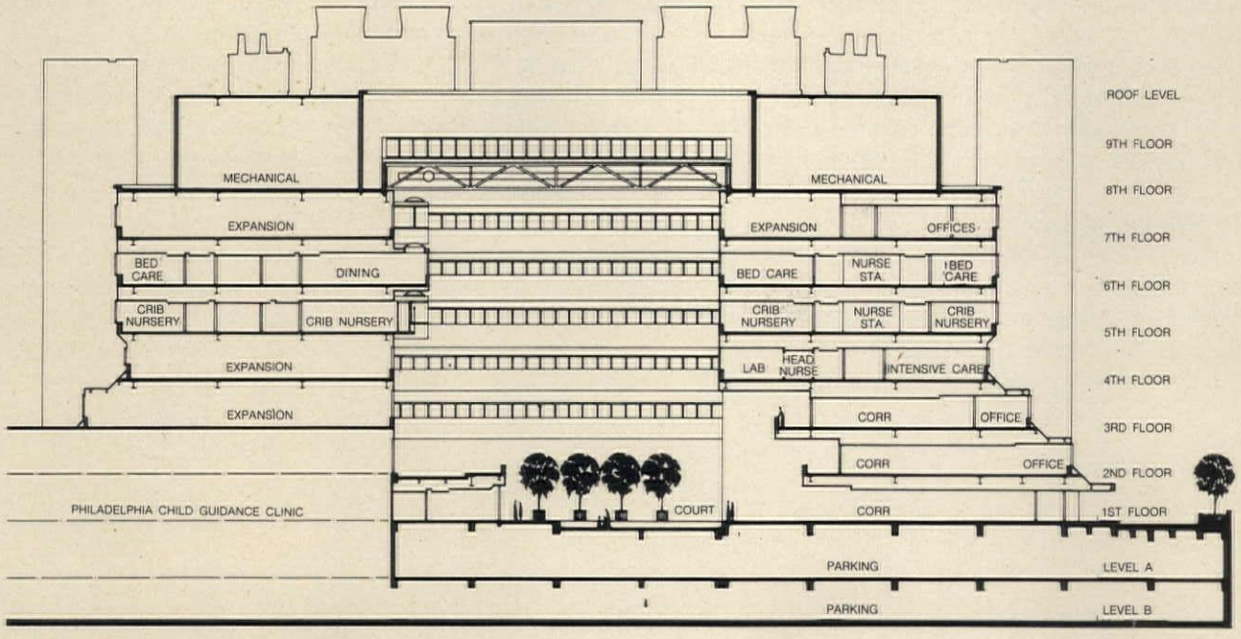
not used as calculations indicated that it would not reduce heat gain enough to offset cost; tinted glass would have defeated the purpose). In winter, the roof has little effect as a solar reflector due to the low angle of the sun. The highest percentage of solar heat gain then comes through the specially angled south balconies.

Ability to change

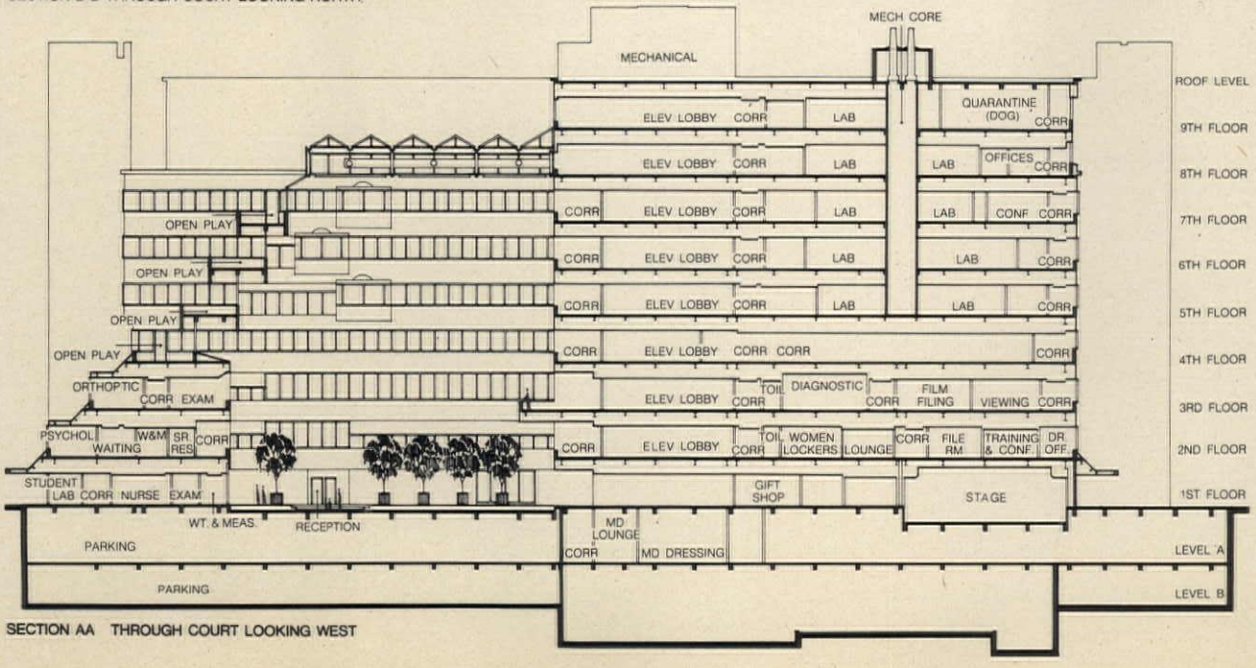
In a hospital of this size, changes are always contemplated, so the building has been structured to respond to change. The bay size of 24′x48′, the use of a welded steel structural system easily adaptable to change, as well as the floor-to-floor height of 13′-4″, give the building an overall three-dimensional grid that ensures maximum flexibility. While the in-patient capacity of 259 beds is not expected to change significantly, it was important to provide for flexibility in areas related to out-patients (130,000 a year) and their



PLOT PLAN



SECTION B B THROUGH COURT LOOKING NORTH



SECTION AA THROUGH COURT LOOKING WEST

supporting services. In addition, because the hospital is a major teaching and research facility, flexibility was also important for areas related to those functions. In the long term, it is envisaged that compartmentalizations and even departmentalizations will change their character.

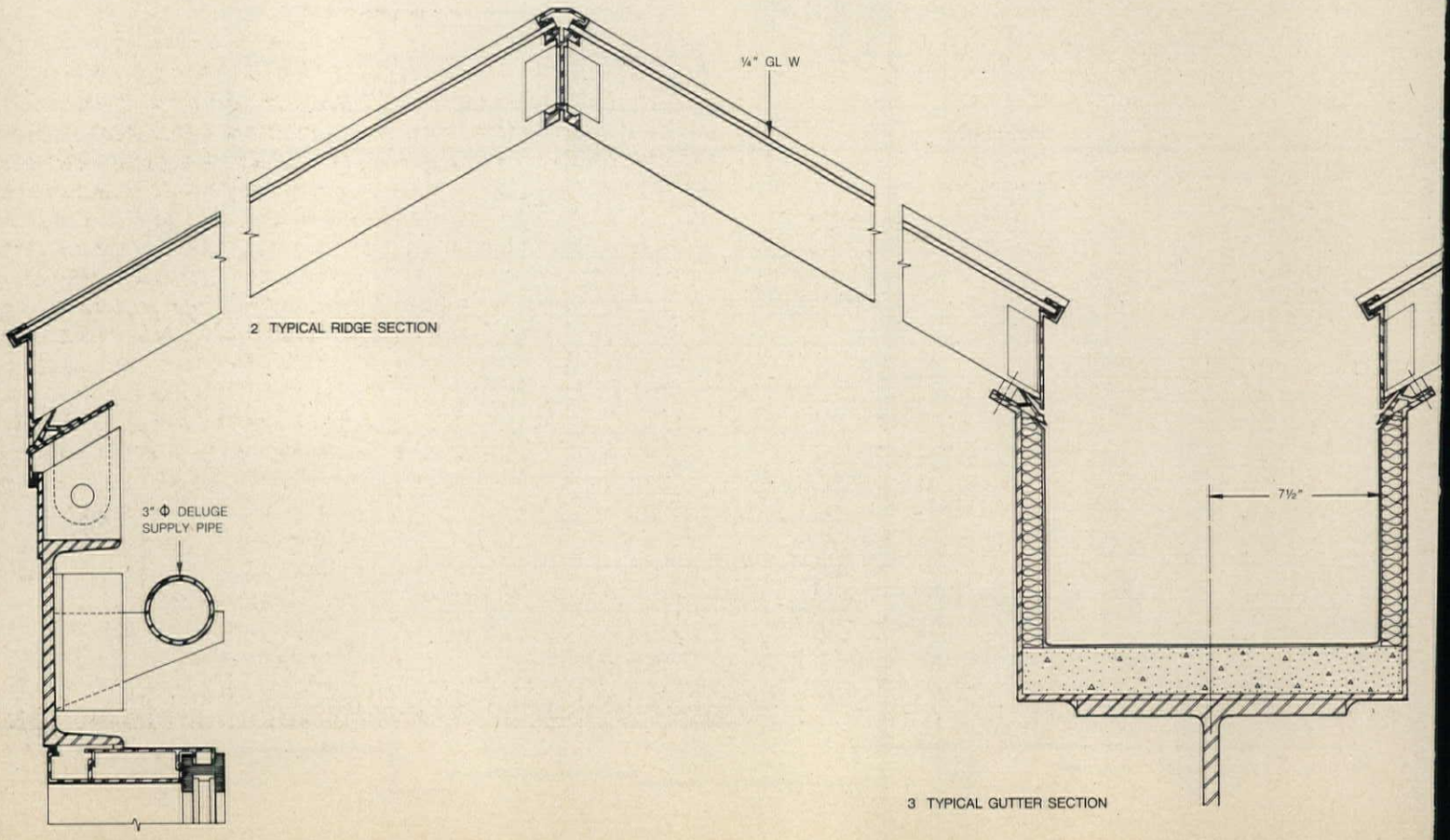
Because laboratory areas will expand or contract in accordance with the shifting focus of clinical and laboratory research, even the complex mechanical systems that serve them have been planned with maximum adaptability and flexibility since these systems, perhaps more than structural elements, are just the ones that can quickly render a hospital facility such as this obsolete. Consequently, the unusual mechanical corridor that runs from east to west through the north end of the building with research and clinical laboratories backed up to it on both sides, has been designed to facilitate expected future changes. The advantage of this vertical system over the more usual horizontal interstitial floor system is that it allows the laboratories, as they are arranged and rearranged within their modular system, simply to plug into the back wall for supplies of electricity, water, air, and rare gases, and for drainage of waste products. No awkward work has to be done through the ceiling; if repairs are needed, a workman simply walks into the mechanical corridor at any level to correct them.

The oldest is now the newest.

Children's Hospital of Philadelphia is the oldest childrens' hospital in the country. Since its founding in 1855 it has moved four times to increase and improve its services as a primary care facility for community children and as a highly specialized referral center for complex and life-threatening disorders of children who come from all over the nation and the world. (The recent successful operation on the Siamese twins from the Dominican Republic was performed at the hospital during the first week it opened.

In the new hospital, the entire environment is predicated on the concept that children are not adults in miniature, and that their environment must be adapted to the complex needs of the child in such a way as to minimize trauma and make the child and his parents feel comfortable. As the photographs show, interiors are designed for the child's pleasure and reassurance; abundant play facilities are provided, furniture is designed to child scale, specialized safety features protect the child from self-injury, and even the ceiling heights are scaled to approximate those a child is accustomed to at home. A hospital such as this, however, costs considerably more both in construction and in operation than an adult facility. Additional space is required for the child to ambulate and to play, for his parents to remain with him, for teaching and observation purposes, and for parent education and counseling. Many heavily staffed, small nursing units are required because the average child is acutely ill, and 55 percent are under two years of age.

The operating costs will not go down; in fact, they will probably increase as the years pass. Energy costs will, in all probability, not go down over the years either. But at least in Children's Hospital, due to particularly intelligent early planning and to a design that anyone planning a hospital should consider very carefully, the energy costs will not increase as quickly as they surely will in almost all other new (and old) buildings. Our oldest children's hospital is now the newest. In more ways than one. [David Morton]



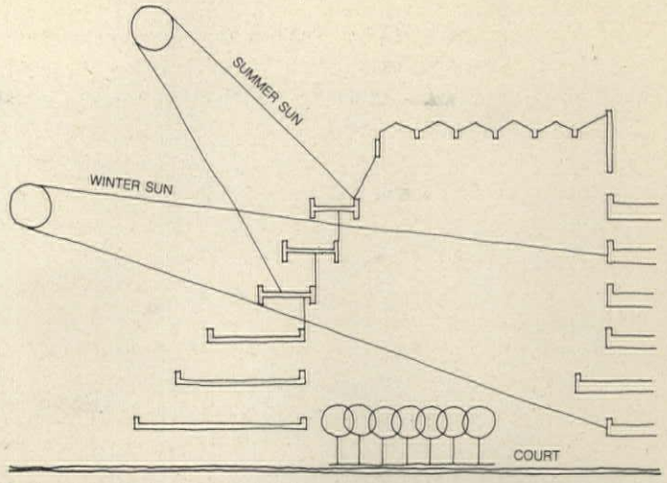
2 TYPICAL RIDGE SECTION

1 HEAD SECTION (PLAYDECK WDW)

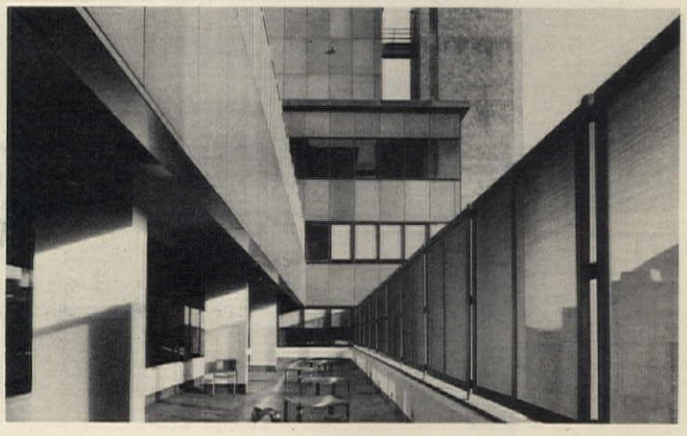
3 TYPICAL GUTTER SECTION

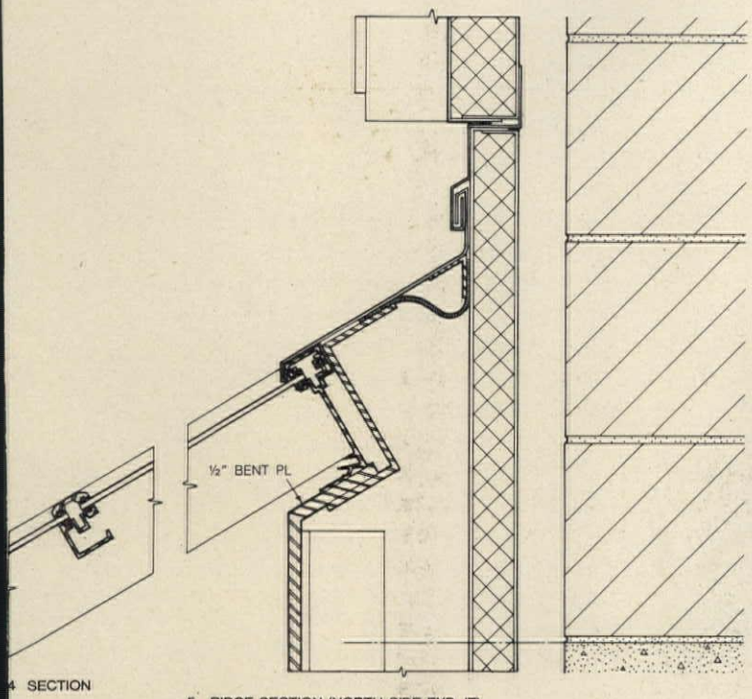
Data

Project: Children's Hospital of Philadelphia, Philadelphia, Pa.
Architects: Harbeson Hough Livingston & Larson, and William A. Amenta, associated architects; William J. H. Hough, Jr., partner in charge; Barry Eiswerth, design architect.
Program: a one-million-sq-ft children's hospital facility with 259 beds, capable of handling 130,000 out-patient visits per year. It is also a major center for teaching and research, and a major referral center for chronically ill children, 55 percent of whom are under two years of age. A new Child Guidance Clinic, designed by Bruce Porter Arneill, is appended to one corner of Children's Hospital.
Site: 4.5-acre site located between the medical center of the University of Pennsylvania and Philadelphia General Hospital. Architects were involved in site selection, which had some influence on size and shape of the compact building.
Structural system: welded structural steel frame on 24′ x 48′ grid; steel used for economy and for ease of change in future.
Mechanical system: an all-air constant-volume terminal-reheat system requires the purchase of no additional energy for environmental heating until outside temperature falls below 29°F, 5000 tons of refrigeration used in summer, 1200 in winter.
Major materials: exterior clad in insulated aluminum panels. Windows are double-glazed with exterior sheet of solar bronze. Exterior masonry is 8″ x 8″ silo tile. Foundation is reinforced concrete; structure is welded steel frame; walls of steel frame backup; floors and roof of metal deck and reinforced concrete; ceilings of acoustical tile and metal pan; roof surfacing of built-up roofing, marble chip slag; partitions of metal studs and plaster Rocklath.
Consultants: Dan Kiley, landscape; Harbeson Hough Livingston & Larson and William A. Amenta, interior design; Leonard Weger Associates, Inc., mechanical; A. W. Lookup Co., structural; Eugene Rosenfeld & Associates, hospital consultant; David A. Mintz, lighting.
Client: The Children's Hospital of Philadelphia.
Costs: $62,659,058; $69.60 per sq ft.
Photography: Harris/Davis, Inc.



Outdoor playdecks (above) let winter, but not summer, sun into courtyard.

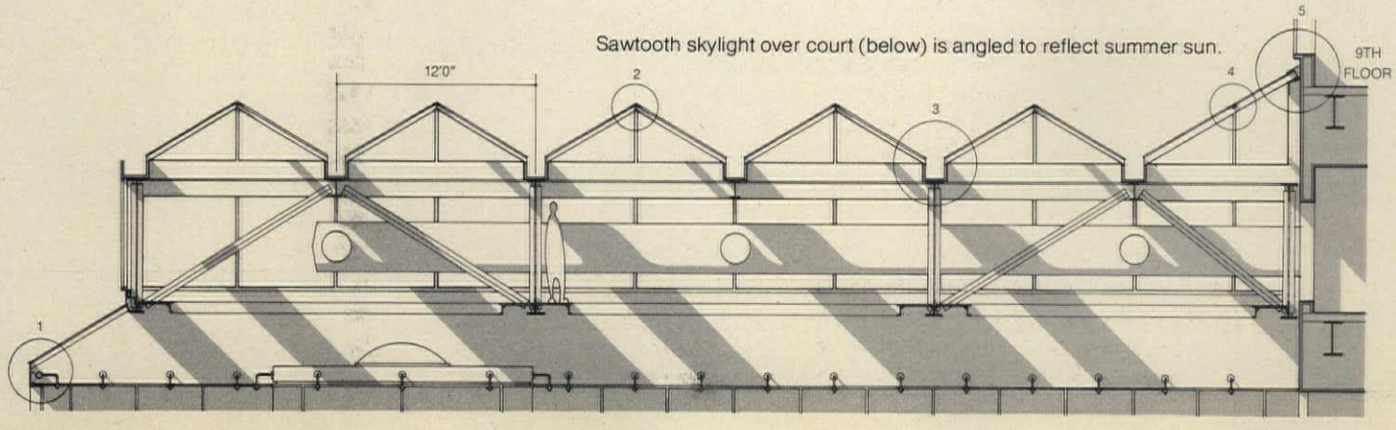




4 SECTION

5 RIDGE SECTION (NORTH SIDE EXP JT)

Sawtooth skylight over court (below) is angled to reflect summer sun.



SKYLIGHT SECTION (FACING WEST)

Brother, can you spare a dyne?

Architects, engineers, and clients fattened buildings on hefty BTU losses when energy was cheap and plentiful. P/A asks government, business, and the building industry how much this has changed since October 1973.

They come running up to your electrocar as traffic eases slowly out of Jane Jacobs Shopping Mall. You groan, but there they are. An attractive couple in neat sports clothes, clutching a small recharging battery. Here we go again, you think.

"Please," the man begins. "Could you spare us a minute's recharge? It's all we ask."

"We lost all our energy credits last month," the woman adds, "when our friends turned on all the appliances at our housewarming party. We tried to explain this to the children, but they're too young to understand. Johnny and Mary, come here."

All four are standing there now, cradling illegal appli-

ances in their arms. They've got you. "Okay," you sigh, "one minute only." You punch a code on the electrocar console, and a recharge terminal door slides open on the right fender.

"Oh, thank you sir!" the man exclaims as he swiftly and expertly connects his battery.

As you drive away, the pathetic little family is fleeing a policeman who has spotted their illegal appliances.

We still have nine years to 1984. In the 1950s America washed its hands of World War II and sat down at the table to eat. The American consumer, big business, all levels of government, the institutions, and the professions began a feast unparalleled in history. More materials and energy were gobbled up in these past two and one-half decades than many an underdeveloped nation has consumed in its historic lifetime. Does any American architect or engineer need reminders that his buildings help make the U.S. Number One energy consumer of the world? How does six percent of the world's population feel about devouring more than one-third of the world's energy consumed each year? What have we learned from October 1973, when the "energy crisis" began?

This is not a time for bitterness. Though the extent of our problems is not uniformly measured everywhere, almost everyone from President Ford on recognizes an enlarging gap between our demands on the environment and the earth's willingness to supply them. How to bridge the gap has become the gnawing preoccupation of our society. Architects and engineers are among the anxious pilgrims seeking the energy Grail.

Which grail?

Confusion over energy reigns in the building industry. Who is preaching the true faith? Architects have perhaps unfairly accepted the major onus of blame for designing buildings that "leak like a sieve." Historic hindsight reminds us that an entire nation cultivated a taste for cheap energy and cheap materials. As Leo A. Daly, principal in one of the na-

tion's largest architecture firms and chairman of the American Institute of Architect's Energy Steering Committee, says, "Not long ago, it was patriotic to consume energy, because, after all, we were contributing to the Gross National Product and that is important enough."

Sweet's Division of McGraw-Hill informally surveyed 58 major U.S. architecture offices and found, to nobody's surprise, that serious building products re-evaluations in the drafting room were striving for greater energy efficiency and physical longevity. Life cycle costing, the lonely crusade of architects like Richard G. Stein of New York, is now orthodox thinking. At long last.

Our greatest energy problem seems to be the absence of a political consensus to cope with it. Competing doctrines range from President Ford's Project Independence to Doomsday. Because of the power and prestige of the Presidential office, Project Independence and its offspring loom large over all other proposals. It says to architects and engineers: put more insulation and less glass in your buildings, but keep those calculations steady—there's plenty of fossil and nuclear energy in American soil, and we're going to extract it.

There *is* plenty of fuel left in our soil. Even the recent dissenting report, *Mineral Resources and the Environment,* prepared by the National Research Council for the National Academy of Sciences, concedes this. "World resources of coal are large relative to current energy requirements," it comments. "Resources appear adequate for hundreds of years even at considerably expanded rates of production . . . the principal deposits being in China, The U.S.S.R., and the United States."

However, the Ford Administration's plans for that remaining treasure trove are equally staggering: 200 new nuclear plants, 250 new coal mines, 150 new coal-fired plants, 30 new oil refineries, and 20 new synthetic fuel plants (to convert coal to synthetic oil and gas) by 1985. There are reasons to question this goal. Economics is always associated with energy problems, and so it is here. Technology and politics are implicated too, as we survey energy sources.

Nuclear energy: still behaves like a beloved but tempestuous diva. Its operation, fail-safe reliability, and by-products are considered unreliable in the minds of enough environmentalists and state legislators to block "nuke" powerplant construction. A whopping capital cost of $600 per kilowatt of nuclear generating capacity (versus $300 per kilowatt of fossil fuel equivalent) is clearly dulling its sex appeal, because long amortization periods and poor yields for utility investments makes them hard to negotiate in mortgage money markets.

Congressman Mike McCormick (D.—Wash.), a nuclear advocate, may vow "Anybody who stands in the way of cheap, clean, environmentally acceptable energy production is going to have to answer to the voters in his district." Whether the public or the utilities will identify nuclear energy this way remains to be seen. Utilities have postponed or cancelled "nukes" by the dozens, and nuclear supporters call 1975 the "year of decision."

Coal must heed new environmental restrictions. Over Ford's objections, Congress again passed a strip mining bill to ensure orderly extraction of coal in ravaged states like West Virginia and in virgin states in the West. Carl E. Bagge, President of the National Coal Association, has voiced dismay. The bill requires strip mine operators to return land approved for strip mining to approximate contours and conditions after mining, and bills operators for reclamation of the millions of acres already strip-mined.

However, with revisions of the Clean Air Act, there should be vast new supplies of what may include high-sulphur coal soon available. The utilities, stung by petroleum price increases, can hardly wait. Says John H.K. Shannahan, President of the Electric Energy Association, "The substitution of coal, in any of its several forms, for gas and oil must be made wherever it is possible to do so, even if it takes more coal to do the job and even if end-use efficiencies are somewhat lower." Just how this might shortchange the future is uncertain.

Oil is plentiful for the rich; held captive on our shores by environmentalists; or a phantom beneath us whose real size will dismay us when we find it. It depends on whom you ask. The National Academy of Sciences report states that "Undiscovered recoverable resources of oil and natural gas, onshore and offshore, in the United States and Alaska, are considerably smaller than indicated by figures currently accepted within government circles . . ." That is, world petroleum supplies may run out in 50 years, U.S., Arabs, and all.

What about 30 new oil refineries? As the late Aristotle Onassis discovered last year in Durham, New Hampshire, few citizens here want oil so badly they would plant refineries in their bedrooms to get it. The oil companies will most likely expand existing facilities instead, as they have realistically done before.

Will the U.S. win the much vaunted independence from imported oil? Argues Alan G. Kirk, Assistant Administrator for Enforcement and General Counsel for the U.S. Environmental Protection Agency, "Of all the oil consumed in the United States, approximately 17 percent originated from the Arab countries. I find this heavy reliance on imported oil to be a national abomination." To which Edwin L. Dale, Capitol Critic for the *New York Times* rejoins, "We are vulnerable in other things too, such as chrome and nickel and several other materials. Vulnerability is a fact of life. The Japanese and the French are trying to live with it. Why can't we?" America must decide how much peace of mind it can afford.

Synthetic fuels are barely simmering on back burners. The Canadian government and the provinces of Ontario and Alberta recently committed $1.4 billion to assist a private consortium in developing a new energy source, oil-bearing tar sands in Athabasca. For want of $1.1 billion, the American Natural Gas Service Company of Detroit simultaneously postponed plans for a coal gasification plant in Beulah, N.D. Fearful of world oil price cutting, American industry will do little work in costly synthetic production without getting a floor price on oil. Washington must decide the next move. Meanwhile, oil shale extraction still faces technical, environmental, and financial problems.

Solar, wind, tidal, and geothermal energies could sud-

denly gain public sympathy if the environmental costs of fossil and nuclear exploitation become unbearably high. The cost of using self-renewing natural forces is itself quite high now, even where research and development have been continuing for years. Geothermal energy is plagued by technical problems, and there is only one operating geothermal powerplant in the U.S., near San Francisco. Some wind energy enthusiasts claim their hardware could be readied for tying into the nation's power grid in a number of years. However, only relatively small units exist.

Equally enthusiastic solar energy proponents point to such imposing statistics as two days of solar radiation on the earth equalling the world's total fossil fuel reserves. Unfortunately, much development must precede mass marketing of total solar energy systems. In the words of the National Academy of Sciences report, "All in all, the low concentration of energy from the sun, the tides, and from the earth's interior makes them unattractive at present as large scale energy sources compared with fossil fuels."

The plot thickens

So we may not get all the energy we want. Should architects heave themselves out of their crystal towers in a dramatic farewell to high BTU/sq ft/yr design? Mankind shivered when the Club of Rome's *The Limits to Growth,* 1972 by Dr. Dennis L. Meadows and the MIT Project Team predicted mankind strangling in the curves of exponential growth around the year 2000. This linear extrapolation of past trends casts us as helpless victims of our own habits.

Dr. Jerome B. Weisner, President of Massachusetts Institute of Technology, disputes this conclusion. "I believe," he wrote for the International Business Machine's *Think,* July/August 1974, "that there is at least some evidence to warrant the view that modern man can learn to modify his behavior fast enough to avoid the catastrophic disasters that some see ahead." As if to second Weisner's opinion, architects and engineers have risen to the occasion.

The professional designer has chosen to do what he can do best: increase energy efficiency in design. The American Institute of Architects, American Society of Heating, Refrigerating, and Air Conditioning Engineers, and individual architects have drawn up both predictable and startling responses to mounting energy bills. Eagerly observing the A/Es and in some instances putting forth their own proposals are an alphabetical galaxy of government agencies. Included: the Federal Energy Administration (FEA), General Services Administration (GSA), Energy Research and Development Administration (ERDA, the new super agency that has assumed research and development functions once assigned to the Atomic Energy Commission, National Science Foundation, Dept. of the Interior, and Environmental Protection Agency in six divisions: fossil energy, nuclear energy, environment and safety, conservation, solar, geothermal, and advanced energy systems, and national security), Housing and Urban Development (HUD), and Office of Technology Assessment (OTA, the congressional agency to judge technical programs Congress must consider).

National emphasis in energy related research is slanted towards increasing energy supplies. Martin M. Glesk of Arthur D. Little, Cambridge, Mass. challenges this. Considering the probable benefits of energy conservation and efficiency measures, he feels the research budget should be split at least 50-50 between increasing supply and conserving it. Glesk says, "I seriously doubt that a residential/commercial saving of anything near 25 percent will be achieved without strong government action in the form of regulations and legislation to ensure compliance."

Undramatic and evangelistic though energy conservation is, substantial savings can be achieved by cutting the energy appetite of America's buildings. Some 34 percent of the nation's energy consumption heats, cools, and supplies domestic hot water for our homes (20 percent) and commercial buildings (14 percent). In effect, we have a latent source of additional energy supplies locked in existing buildings. Architects like Leo A. Daly have appeared before the Federal Power Commission to demonstrate this.

Daly is no radical environmentalist. Yet he told the FPC that in 20 years, energy conservation in new and existing buildings could save as much energy as the projected 1990 production capacity of any prime fossil or nuclear energy system—the equivalent of 12.5 million bbl of oil per day. This isn't very flattering to the energy efficiencies of existing buildings. Milton M. Duke, Assistant Commissioner of New York State's Division of Housing and Community Renewal, says they waste 30 to 50 percent of their energy.

Setting the engineering house in order, ASHRAE's Standards Committee is preparing a final draft of its Proposed Standard 90P, Design and Evaluation Criteria for Energy Conservation in New Buildings. Prompted by California, New York, and other member states, the National Conference of States on Building Codes and Standards asked the National Bureau of Standards to prepare a reference standard, Draft Design and Evaluation Criteria for Energy Conservation in Buildings, for use in state and local building codes. This draft became the basis for ASHRAE deliberations on 90P. Early drafts of 90P have not won universal acclaim. Some critics insist more stringency is needed. However, 90P provides much needed performance oriented criteria. Adherence to its logic will move the nation towards new buildings with high thermal resistance and low air leakage from their exterior envelopes, and improved mechanical and electrical systems inside.

The sincerest form of flattery

ASHRAE's 90P has even attracted the attention of the Ford Administration. Using 90P, HUD Minimal Property Standards for thermal insulation, research contracts with NBS, HUD, and private organizations, and consultations with the building industry, the FEA is developing what will become a National Energy Conservation Design Standard covering thermal efficiency in virtually all new construction, through performance criteria. It could dramatically affect architectural design methodology.

Since Uncle Sam is a major mortgage subsidizer and a big client too, there are plenty of carrots and sticks behind the FEA proposed standard. Recalcitrant state and local governments may find their FDIC or FSLIC insured savings and loan institutions enjoined from issuing construction

loans in the disputing municipality. Government building plans in the same place could be postponed.

Like 90P, the FEA standard is not predicated on radical new technologies. Says Roger Sant, Assistant Administrator for Energy Conservation and Environment, FEA, "We're anticipating design with off-the-shelf materials and techniques." Owners of existing buildings will also be encouraged to comply. They may be offered a 12 percent tax credit in commercial structures or a 15 percent tax credit up to a maximum of $1000 in residential structures for thermal upgrading.

One of the nation's biggest landlords with 10,000 buildings under its control is also getting involved. The GSA is very specific about the energy performance it expects from its assorted physical plants around the nation. GSA Energy Conservation Guidelines for New and Existing Buildings set binding energy budgets of 55,000 BTU/sq ft/yr for new GSA buildings and 75,000 BTU/sq ft/yr for remodeled existing GSA buildings. They provide design recommendations for such aspects as: lighting, power distribution, HVAC, solid waste disposal, and elevator and escalator operations. Arthur F. Sampson, GSA Administrator, believes 20 to 30 percent energy savings could be achieved in remodeling GSA buildings according to the Guideline.

Does this give you a headache?

Fred Dubin, President of Dubin-Mindell-Bloome Associates, Engineers, New York, dreams of a conceptual picture, generated by computer, to show how a building uses energy, given applicable variables like climatic conditions, standard or generic materials, building type, color, mass, or mode of operation. This statistical concept would be associated and weighed with factors stored in regional computer data banks to give designers explicit design recommendations and tradeoffs for their particular buildings. Standard A/E fees would cover the computer service.

"We need more than a piecemeal approach," says Dubin, whose firm has been active in energy conservation studies for government and private organizations. "The thermal design of a wall is not just in U-factors, but in total mass. There are complex tradeoffs among building massing, floor area, and perimeter. We could coordinate the work of writing these programs in regional centers, bringing together professional societies, industry, government, and universities. Only this way could there be an energy/economic/societal/political model of how America uses energy in buildings. It would be costly. It would also be worth money to get fast, pragmatic answers." Dubin admits that programming costs could run into tens of millions of dollars. He feels the cost could only be underwritten by the federal government.

Now that the noisy clashes of the 1960s between the design profession and social activists are history (in retrospect seem sadly misguided), Dubin's inclusion of societal factors in energy standards may sound uncomfortably worn. However, one of the most important questions about energy use is seldom recognized by designers: standards of human comfort. "Clients are not very sophisticated about this," Dubin says. "We must offer them choices in the simplest terms. Do you intend to smoke? How cold can it be? What about drafts?"

He quickly adds that the real question is more complex. Comfort standards need careful re-examination and comparison with physiological needs. Dr. Paul L. Miller, Professor in the Mechanical Engineering Dept., Kansas State University, a center of HVAC research, agrees. "There is no hard ADPI data (Air Diffusion Performance Index is the percentage of occupied space which is comfortable to a majority of occupants) on standards of comfort," he says. "Present standards vary, and many sex-age differences in comfort studies are ill-defined. Some findings have even been contradictory."

Despite provocative papers by Houghton and Yaglou (1923, 1938), Nelson and Stewart (1938), and Miller and the late noted Dr. Ralph G. Nevins of Pierce Laboratory, Yale University (1964), more work remains to be accomplished. The prospects are still difficult. Draft and room temperatures, air movement patterns and velocity, and exposure of different parts of the body to draft are only some of many critical factors. Miller and other researchers like Dr. P.O. Fanger of the Technical University of Denmark are continually exchanging test results, which will someday greatly benefit architects.

Wasting energy on macroeconomics?

The most visionary and perhaps most politically radical response to energy problems comes from the AIA. In a two-part report, *Energy and the Built Environment* (Part One: *A Gap in Current Strategies,* Part Two: *A Nation of Energy Efficient Buildings by 1990*) the Institute's Energy Steering Committee clarified the meaning of energy conservation in buildings; proposed a shift from "capital account" energy (exhaustible fossil and nuclear fuels) to "current income" energy (self-renewing natural forces); and with this shift from off-site to on-site energy generation, a shift in ownership and operation of building operational and nonoperational energy system components (insulation, HVAC mechanicals, and so forth) from building owners to utility companies (albeit different from those we know today). How this would encourage utilities to increase efficiency without the sort of front end costs that already drive angry consumers to state public service commissions is not clear. Not to mention inevitable raw energy price changes, which utilities must try to pass through to finished energy rates.

Quite simply, building owners and occupants live far more intimately with their energy systems than Ma Bell customers live with their telephones. Who would arbitrate disputed energy costs of this complexity? Who gets the prized depreciations that building owners include in shelters of cash flow? Who decides to upgrade aging but serviceable equipment? Wolf Von Eckardt, Architecture Critic for the *Washington Post,* urges the Institute to "Stop wasting energy on 'macroeconomics' and tell us how to fix that light switch in San Antonio." His criticism may be a bit blunt, but he has a point. The AIA proposal could gain from greater specificity.

Getting down to earth, architects are drawing up numerous useful guides to energy conservation in building design

and remodeling which touch on all aspects of architecture and engineering. Some of these recipes are finding their way into print. Others are prepared for office use only. Typical of the latter is a solar exposure study by the office of Albert C. Martin and Associates, Los Angeles. In simple tables and easy to follow graphic diagrams, the firm's designers can quickly apply solar exposure studies to specific project sites. Considering what Dubin hopes to accomplish someday, this is only a beginning.

Manufacturers could significantly aid the designers in energy-conserving design. "Good choices among available hardware can really improve energy performance," Dubin notes. "Manufacturers have always taken the lead in promoting greater use of their products. They refrain from taking a similar lead in proposing new ones. They feel it's the professional's responsibility." If this is so, designers themselves must continue to demand more efficient and durable hardware, as well as better performance data (that is, normal and seasonal operation as well as peak). Dubin and others believe this will happen.

Frank Lloyd Wright walks at midnight

Has anyone seen the Natural House? By native genius or whatever term mankind chooses to compliment itself, man's cultures invested centuries in the regional design of structures. A dash of special ingredients, a lot of common sense, and voilà! Why is there so little reference to regional principles today?

Although Frank Lloyd Wright was not always thinking about heating, cooling, ventilating, or insulating what he called a Natural House or Organic House, American settlers bargained for a serviceable peace with the continent's diverse climates. Recent work by American architects and scholars shows we haven't completely forgotten those Vitruvian lessons. It can still be done.

Ralph Knowles of the University of Southern California has documented the deliberate solar exposure design incorporated in the habitations of American Indians of the West and Southwest, in a recent study entitled *Energy and Form* (1974). Malcolm Wells, architect, Cherry Hills, N.J. continues to design underground structures noted for their low environmental profile (P/A, June 1974, pp. 59–63, 112, 113). The office of Wallace, McHarg, Roberts & Todd, architects and planners, Philadelphia, demonstrates the meaning of total environmental design (P/A, June 1974, pp. 88–97).

Designers may be their own best source of comfort in an "energy crisis." The *Architectural Review* editorial of February 1975 suggests why. "When things go wrong in a highly developed technocracy," it said, "top level decision making becomes impossibly difficult. . . . It is better that we learn to make as many decisions as possible for ourselves: the changeover from the habits of 'cheap fuel' to the habits of 'expensive fuel' has to be made by us before it can be confirmed by government."

Maybe this is just a bad dream. We are barricaded in the electrical closet. Outside, Adam Smith's Invisible Hand batters at the door with a mean pair of wire cutters. Can you hear it? Are you awake? [Roger Yee]

Photo: David Morton

Sunstrokers and windbaggers

Clean, inexhaustible, and free: few energy sources are as tantalizing as sun and wind. Can they be harnessed? P/A identifies hardware that architects can specify today.

Fable of Sun and Wind
Sun and Wind were disputing, as usual.
"See that man walking to work?" blustered Wind. "Can you part him from his overcoat?"
"A matter of no consequence, my Son," Sun replied. "So elementary that I shall not attempt it."
"Or cannot," Wind suggested. "Watch me!" He proceeded to unleash a withering gale. The man only wrapped himself tighter. Before long, Wind's store of solar energy (absorbed by air, land, ocean, and water vapor) was depleted. A weary Wind whispered, "I am exhausted."
Sun beamed intensely on the man. In a matter of minutes this confused and perspiring individual removed his overcoat. Wind regained enough solar energy to implore, "Father, teach me your secret!"

Generator of planets, instigator of winds, patron of photosynthesis: the sun sets the ecological cycle in motion. The above children's tale instinctively recognizes the sun's primacy as original and principal source of life-giving energies. And yet, mercurial as the wind is, its awesome presence is implacable on land, sea, or air. As prosperous and hungry nations together eye the dwindling stocks of fossil fuel once thought inseparable from technological and social change, solar and wind energies assume a new and messianic importance. In this brief review, P/A identifies some of the devices available today to tap the energy of sun and wind for architecture.

Shopping for solar and wind energy hardware in 1975 is not as risky as bidding on yearlings whose only promise is their pedigree. But the resemblances are unsettling. Despite long, arduous centuries of solar and wind energy research in domestic hot water heating, space heating and cooling, and direct energy conversion to steam or electricity by a small unheralded fraternity of scientists, engineers, architects, and tinkers.

The research for lower level technological applications is nearly complete now. Syska & Hennessy, Engineers, New York, believe that even as we await those light fantastic schemes, "Solar energy should be utilized for practical applications, such as space heating, which do not depend on any technological breakthrough and are a 'here and now' proposition." This concurs with the opinion of Fred Dubin, President of Dubin-Mindell-Bloome Associates, Engineers, New York, who says, "There is reliable equipment for solar hot water and space heating now. It will become competitive if prices and supplies of energy remain tight."

Few technologists can resist this Aladdin's Lamp: a theoretical solar collector the size of Lake Erie could meet annual U.S. energy needs with one day's sunlight. Alas, adequate *development* for the simplest solar heating systems needs years of additional manhours. Says Sheldon H. Butt, Director of Market Research and Planning for Brass, Olin Corporation and President of the Solar Energy Industries Association, "Although solar energy could make a significant and important contribution to total energy requirements in 1985, the magnitude of the contribution would still be small compared with the total 'new' energy requirements. Increasingly greater contributions can be made by solar energy in subsequent years."

Prototype solar structures have proliferated across the land. According to a University of Colorado survey, some 200 solar-heated houses are completed, under construction, or in planning now. Of these, nearly two dozen are solar demonstration experimental houses. There are many windmills, wind turbines, and wind generators besides.

It is one thing to prove a concept, quite another to prove a product, however. Of dozens of the estimated 100 or more solar equipment makers interviewed by P/A, those who would inspire confidence in their ability to mass market, service, and guarantee their products are fewer than would be hoped for at this time. With growing corporate efforts and government funding, a predicted $1.3 billion solar industry in 1985 (by Dr. Peter E. Glaser, Vice President of Arthur D. Little, Inc., Cambridge, Mass.) will sound increasingly plausible.

For the moment, anyone who was first in his office to own a pocket calculator should understand the solar hardware predicament. Materials are costly, output is slow, and often solar energy components by various manufacturers must be custom crafted into complete solar energy systems

Two archangels of sun and wind. At right a wind generator from France. Below an experimental solar energy system at Grover Cleveland Jr. High School in Dorchester, Mass.

at very high premiums. Residential solar installations contemplated by architects and builders for the affluent $60,000 to $70,000 and up market may require $2000 to $4000 or more each—in a reluctant mortgage market.

Haven't we met before?

There is really nothing new under the sun or wind. Archimedes, legendary Greek mathematician and engineer, is said to have aimed a battery of solar focusing mirrors on the sails of the Roman fleet beseiging his Syracuse in 212 B.C. and set them afire. Windmills and sailing ships date from antiquity. History first records an irrigation windmill in 7th Century A.D. in oil rich Persia (Iran).

The history of Western science and technology from the 17th Century thereafter includes numerous solar energy experiments. There have been brilliant moments. Athanasius Kircher concentrated sunlight with fine mirrors to ignite a woodpile in the 17th Century. Nicholas de Saussure created a 320 F solar oven which trapped solar energy with black paint and coated glass plates in the following century. Augustin Mouchot and Abel Pifre developed a solar steam engine to power a printing press for the Parisian newspaper *Le Soleil* in the 19th Century. In our time, Bell Telephone scientists fashioned a photovoltaic generator of silicon photocells.

Americans are prominent in the Solar Energy Society, the international professional organization of solar scientists and technicians. And American solar studies are nearly two centuries old, thanks to individuals such as: John Ericsson, inventor, Frank Shuman, engineer, J.A. Harrington, mine owner, Dr. Charles Greeley Abbot, scientist at the Smithsonian Institution, Dr. Robert Goddard, the rocket pioneer, Dr. Maria Telkes, thermal storage expert at the University of Delaware, and Dr. George O.G. Löf, director of the solar laboratory at Colorado State University.

Energy from the wind for human work has been courted as assiduously if not as dramatically for centuries. In 1105, a permit was granted for windmill construction in France. When Sir Francis Beaufort, British Navy hydrographer, drew up his scale of wind strength in 1805, a reliable estimation of wind velocity became possible. Wind power was a major source of power for settlers of 19th Century America. In fact, American windmills achieved such admirable efficiency and endurance that they were (and still are) exported around the world.

Not so long ago, small but handsome commercial and residential markets for solar and wind energy devices flourished in America. Solar energy water heaters were mass marketed between the turn of the century and the 1930s in California and Florida. Tens of thousands of these rooftop "black body" flat plate collectors, whose properly maintained components supplied enough hot water for domestic needs, were sold until about 1950. Similar devices for solar powered water heating, cooking, and distilling appeared in countries such as Australia, France, Israel, and Japan.

Wind generators sold by the Jacobs Wind Electric Company of Minneapolis delivered a minimum of 400 to 500 kilowatt hours per month. $75 million worth of them were sold from 1928 to 1957. At a larger scale, Central Vermont Public Service Corporation and Palmer C. Putnam, engi-

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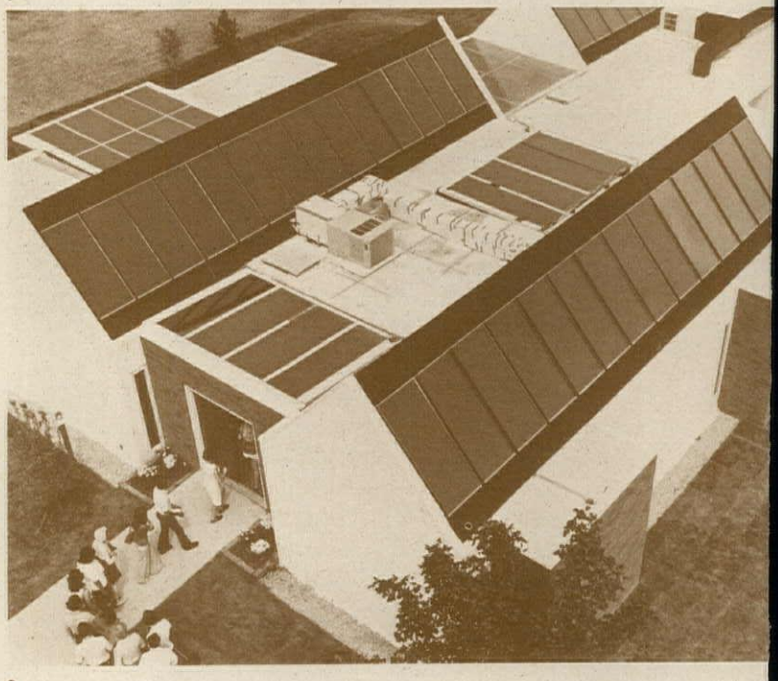

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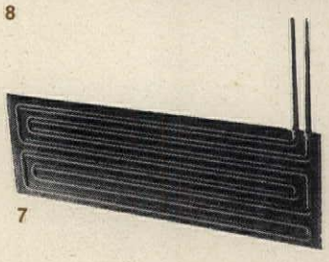

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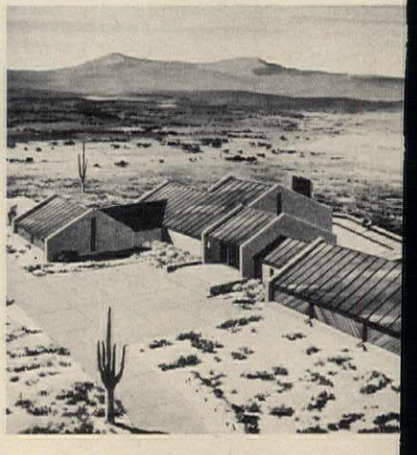

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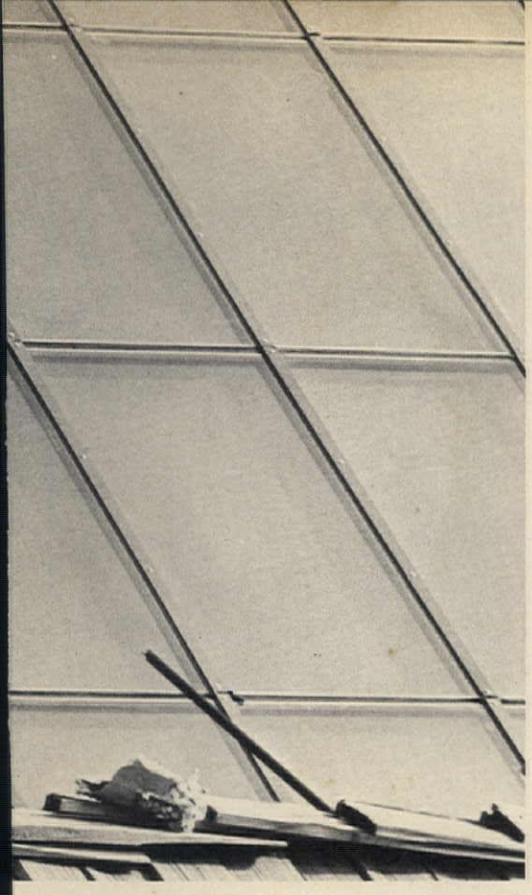

Solar and wind energy hardware: a random list. The following manufacturers and distributors, a fraction of the 100 or so involved today, supplied product information to P/A on solar and wind energy hardware for immediate sale. No endorsement by P/A is implied in this list. Product inquiries should be addressed to producers.

1 Solar energy heating system. Complete solar forced air system for residential or commercial heating. Flat plate collector, pebble thermal storage bin, thermostat control, ductwork elements, air-to-water heat exchanger and preheat storage tank. HVAC dealers will market for Solaron Corp., 4850 Olive St., Denver, Colo. 80022.

2 Glazing for solar collectors. "Tedlar" PVF film type 400BG20TR transmits about 92 percent total incident solar energy. Can be heated, shrink wrapped, adhesive bonded. Du Pont Company, Inc., Wilmington, Dela. 19898.

3 Sunlight control coatings. "Varishade," on glass or plastic, shades when dry, is almost transparent when wet to reduce temperature maintenance costs. Solar Sunstill, Inc., Setauket, N.Y. 11733.

4 Solar pool heating. Hydrosyphon heat collector of Du Pont "Hypalon" raises pool water 2F to 8F. Water pumped to collector, gravity fed to pool. Burke Industries, Recreational Products Div., 2250 So. 10th St., San Jose, Calif. 95112.

5 Solar flat plate collector. Domestic hot water heater amenable to space heating system using indirect heat exchange. Copper pipes, aluminum heat exchange fins. Energy Systems, Inc., 634 Crest Drive, El Cajon, Calif. 92021.

6 Solar flat plate collector. Based on laminated copper panel building system. Revere Copper and Brass, Inc., P.O. Box 151, Rome, N.Y. 13440.

7 Thermal transfer bonded metal sheet. Copper or aluminum roll bonded sheet has expanded heat transfer fluid cavities. Designed for commercial heating/cooling equipment. Could be adapted to solar flat plate collector design. Olin Corp., Brass Group, 460 Park Ave., N.Y. 10022.

8 Solar flat plate collector. Double glazed, fluid-circulating aluminum plate collector for residential, commercial, and institutional domestic hot water and space heating. PPG Industries, Inc., One Gateway Center, Pittsburgh, Penn. 15222.

9 Photovoltaic generator. Solar photovoltaic generator modular array, typically used to power offshore navigation instrumentation platforms. Solar Power Corp., 186 Forbes Rd., Braintree, Mass. 02184.

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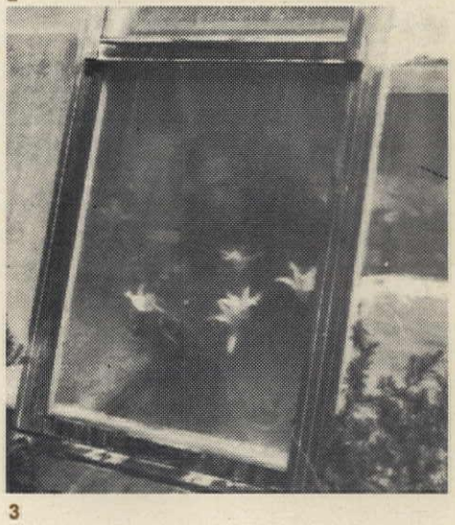

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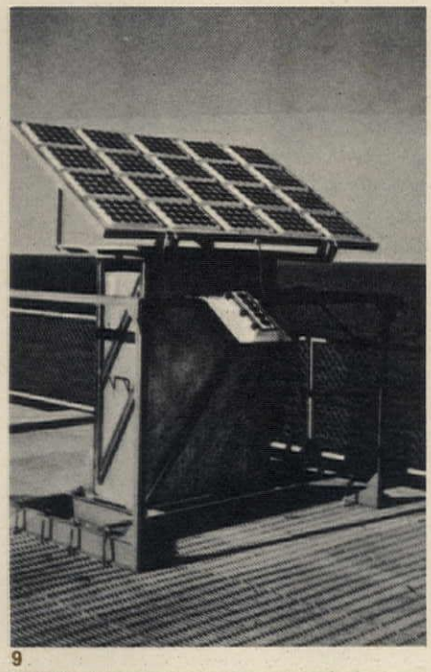

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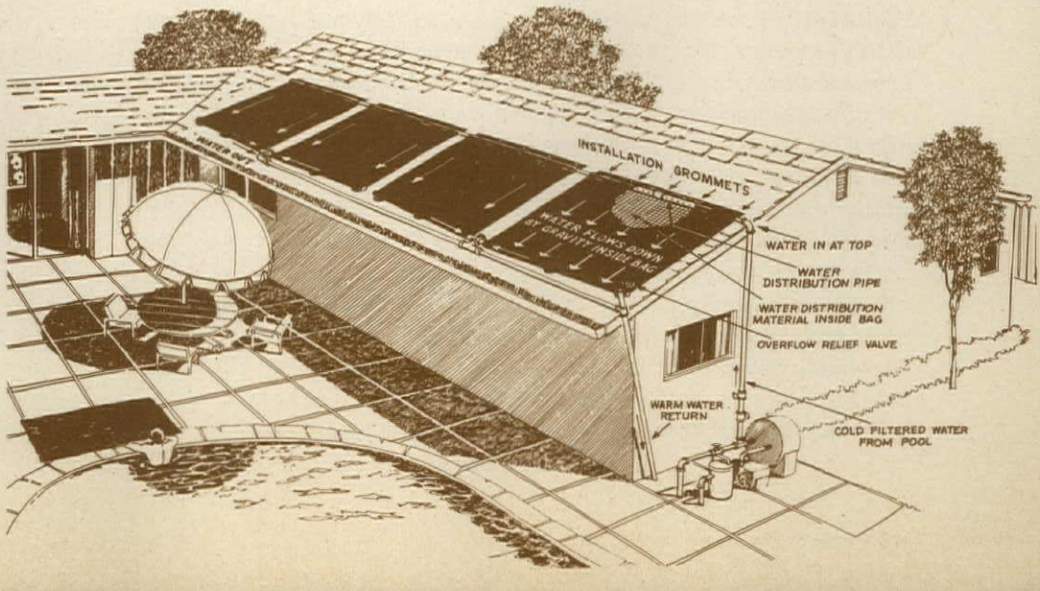

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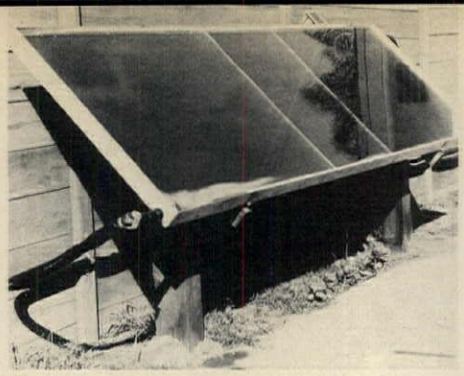

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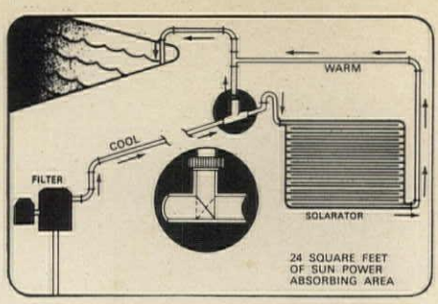

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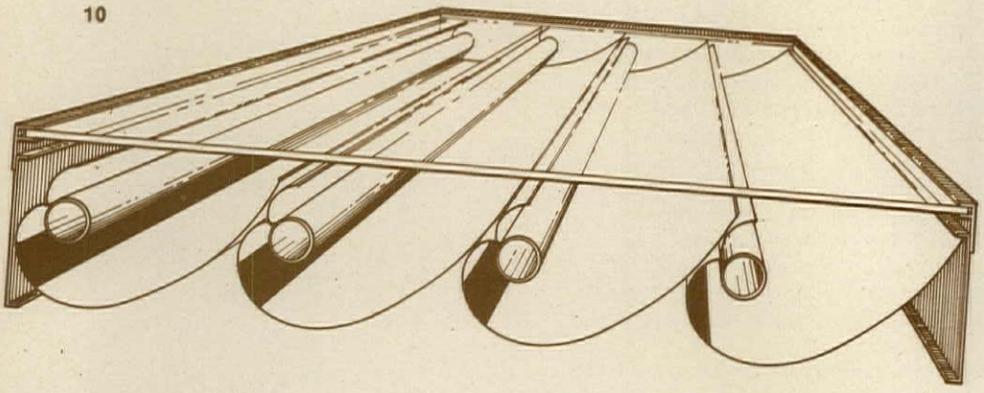

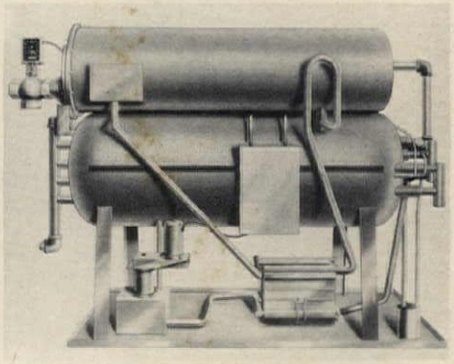

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neer, built an experimental 175-ft-diameter rotor and wind generating plant on Grandpa's Knob in the mountains of central Vermont to produce 1250 kw in 1945. American-made windmills for pumping water can still be purchased.

In Apollo's temple

You can't wait? Harnessing solar energy for architecture today is serious business. You will have to choose among six high technology solar energy conversion processes currently being studied, of which four hold much potential for architecture. There are also attractive and technologically simpler solar processes that architects and engineers are pursuing using much more modest outlays of capital.

Solar heating and cooling typically involve a first generation solar flat plate collector which absorbs solar radiation on a nonreflecting surface to heat a circulating medium (for processing by a standard HVAC system). The collector often consists of a blackened metal sheet above an insulated pad set in a single- or double-glazed box, covering about 10 to 50 sq ft per unit. It is usually mounted on a roof. Attached to the sheet is metal tubing through which water, possibly with an additive like antifreeze, passes, taking solar induced heat to a domestic hot water tank and a water heating and absorption refrigeration cooling system.

Or, the collector can handle an air medium, which may necessitate the inclusion of nonsolar cooling equipment. Or, much simpler than either of the above, is the thermosyphon solar collector, which circulates water through a large, sunlight-absorbing "plastic bag" on a building's roof. Water pumped up to the collector receives solar heat through the plastic skin and is then gravity fed to swimming pools and similar uses. Heat storage in solar heating and cooling systems is currently accomplished with rock bins, water tanks, or even the earth itself. A variety of flat plate collectors is now offered for architectural use.

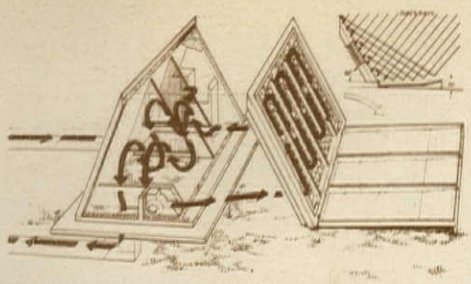
A second generation collector still too new for marketing is the evacuated cylinder collector. Within a glass enclosed vacuum, a metal absorber holds and transfers solar heat to a medium for HVAC systems processing. The cylinder collector operates at a considerably higher rate of efficiency than the flat plate collector.

Photovoltaic generators employ a semiconductor such as costly durable silicon or lower cost unstable cadmium sulfide in photocells to convert solar energy into electric current. The requirements of America's space program accelerated development of photovoltaic devices so that satellites could draw on the sun for electricity. The cost of current produced this way was appropriately astronomical—$100,000 per kw in space vs. $525-$825 in New York.

Until experiments in mass producing the preferred silicon as a fine ribbon or other easily manufacturable form bring down the finished cost of quality photocells, it is unlikely photovoltaics will be ready for architectural use. Researchers would like to have a demonstration photovoltaic generating plant in operation by 1985. Meanwhile, those of us who are not in space vehicles or remote outposts on earth like a lighthouse or weather station must wait. As must Glaser of Arthur D. Little. Glaser foresees a photovoltaic satellite solar power station beaming electricity in microwave form to earth receiving antennae for reconversion to electricity, from a synchronous orbit above earth.

Other high technology processes use solar energy indirectly: *oceanic thermal gradient conversion, bioconversion,* and *wind conversion* (discussed separately). Ocean thermal gradient conversion exploits the thermal storage capacity of solar heated water. Warm surface water enters a heat exchanger and boils propane at high pressure to drive a turbine. Propane vapor condenses on heat transfer to pumped cold deep water. Bioconversion is chemical conversion of biological matter by pyrolysis or other process to gas, oil, or solid fuel. The former concept has lain dormant almost a hundred years; the latter is being tested in pilot plants in many cities. Immediate application of either process in architecture seems improbable.

Low cost solar technology researchers like Harold Hay, Ralph Knowles, Steven Baer, and Day Charoudi have dem-



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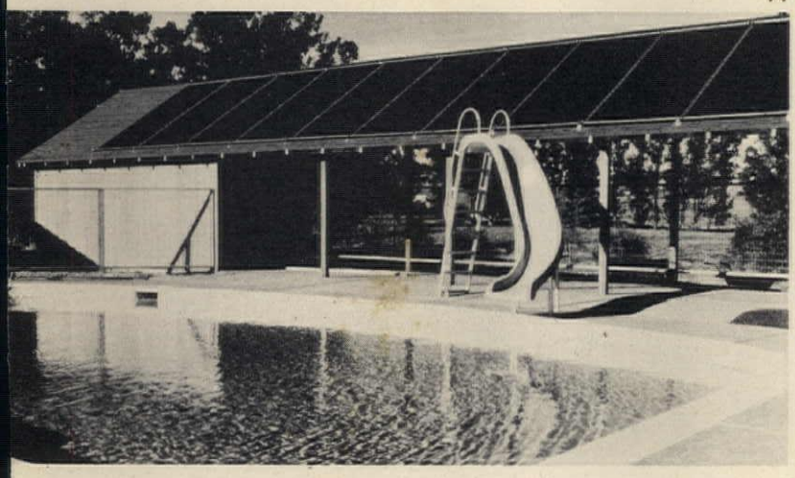

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onstrated that solar energy can be used with a lot of ingenuity and a minimum of technological paraphernalia. Perhaps simplest of these schemes is Hay's "movable insulation." Hay places foam-insulated shallow water basins ("ponds") on a flat rooftop to insulate the roof, heat the house in winter by exposing the ponds to sunlight and covering them at night, and cool the house in summer by exposing the ponds at night to evaporate and covering them during the day. Though large scale urban adaptations of these proposals are not always self-evident, much could be learned from their successes.

Wind song

Wind generator enthusiasts hesitate to attract hobbyists and casual tinkers for good reason. Wind generation of electricity is a highly technical and expensive project. Architects who intend to take it seriously must consider some critical issues. How much power is needed? What is the average wind velocity? How many days of less than effective wind must be anticipated by storage battery capacity? What grade of power will be provided by what kind of power invertor? Will a community object to a whistling, 50-ft-high generating tower?

Components for a wind energy system include tower, generator, storage battery, and invertor. Careful study must precede installation, and the results are by no means inconspicuous (towers have exceeded 60 ft in height). Total production capacity of a unit is limited: 6000 watts output is optimum for a 26 mph wind. Although long range plans could make low cost wind-generated electricity feasible for urban areas, current price tags for small residential units can run up to $20,000 as installed.

A handful of manufacturers in the U.S., Australia, Switzerland, and France build wind generators. A highly reliable windmill for pumping water is still produced on a regular basis by one U.S. manufacturer. Such small-scale activity could give way to a much bigger enterprise if the government took interest in wind power. Prof. William E. Hero-

10 Solar flat plate collector. Concentrates reflected sunlight onto absorber pipe containing medium via spiral and parabolic surfaces. Solergy, 150 Green St., San Francisco, Calif. 94111.

11 Solar flat plate collector. Collector of aluminum sheet with bonded copper tubing, insulation, and single or double glazing. For domestic hot water, pool heating, space heating. Sunwater Co., 1112 Pioneer Way, El Cajon, Calif. 92020.

12 Absorption refrigeration air conditioner. "Solaire" solar heated, water-powered AC uses lithium bromide absorption refrigeration process to chill water for space cooling. Various tonnages available. Arkla Industries Inc., 400 E. Capitol, Little Rock, Ark. 72203.

13 Solar furnace. Solar energy absorbed by air passing over aluminum cups in flat plate collector, transmitted to gravel thermal storage bin inside triangular collector housing or to residential interior. Electric blowers and electronic controls. Developed by International Solarthermics Corp. for marketing by others. Inquire Colle and McVoy, 1550 E. 78 St., Minneapolis, Minn. 55423.

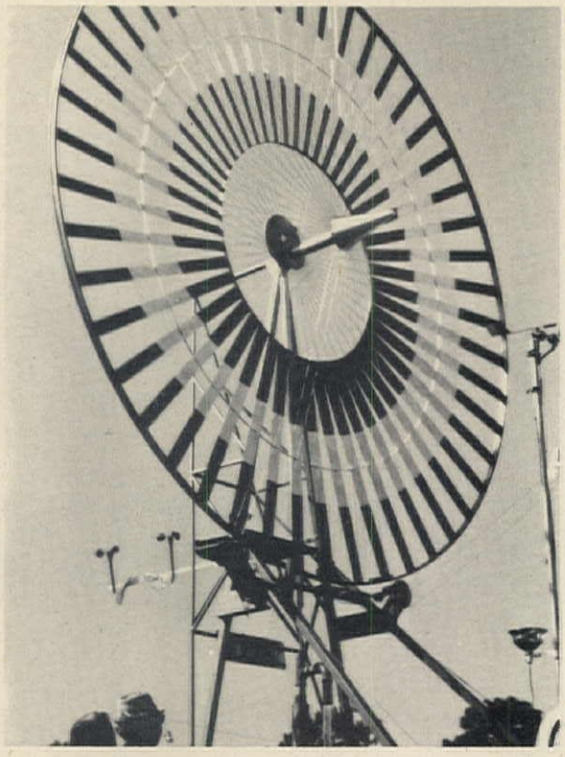
14 Solar pool heating. Standard pool pump feeds thin water film over entire interior of plastic flat plate collector. Automatic controls. Fafco, Inc., 138 Jefferson Drive, Menlo Park, Calif. 94025.

15 Solar flat plate collector. "Solarator" domestic hot water heater passes sunlight through PVC bladder to raise plate fluid temperature. Available through Environmental Energies, Inc., 21243 Grand River, Detroit, Mich. 48219, distributor of solar and wind energy products.

16 Wind generator. "Aerowatt" from France comes as 24w or 130w for 12v or 24v battery charging controls which also are available. Direct-drive brushless alternator AC generator. Through Pennwalt Corp., Automatic Power Div., P.O. Box 18738, Houston, Tex. 77023.

[Illustration on page 66]

Technics: Solar and wind energy



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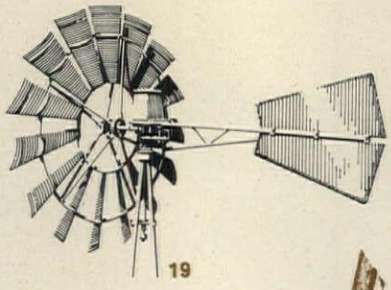

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17 Wind generators. Systems from various manufactors have capacity ranging from 50w to 12,000w. Plans for home made 500w generator also available. Through Environmental Energies, Inc., 21243 Grand River, Detroit, Mich. 48219.
18 Wind generator. "Wincharger" by Dyna Technology, Sioux City, Iowa is small 200w 12v unit. Available from Solar Wind, P.O. Box 7, East Holden, Maine 04429. Also: 45-page illustrated practical guide to wind power applications, "Electric Power from the Wind," by wind energy researcher Henry M. Clews, $2 at above address.
19 Windmill. "Annu-Oiled" steel windmill, steel tower, and fittings for pumping water, offered with optional pumps and cylinders. Dempster Industries Inc., P.O. Box 848, Beatrice, Neb. 68310.
20 Wind generator. Wind turbine is designed for high efficiency operation. Aluminum blades form 15 ft diameter wheel. Not available at press date, but soon expected. American Wind Turbine, P.O. Box 446, St. Cloud, Fla. 32769.
21 Solar flat plate collector. Fluid medium is heated in tubing on copper or selective surface in glazed and insulator collector. Sunworks, 669 Boston Post Rd., Guilford, Conn. 06437. Houses shown with Sunworks installations are by Charles W. Moore, architect (above), and Donald Watson, architect (below), both with Richard Riggio, builder.
22 Solar flat plate collector. Continuous welds control internal water flow for four passes of fluid medium. In carbon steel or stainless steel. Tranter, Inc., 735 E. Hazel St., Lansing, Mich. 48909.
23 Solar home plans. Harry H. Thomason, patent attorney and former refrigeration engineer, designed solar heated homes from 1950s to 1960s using flat plate collectors, water preheat drum, and stone insulated storage tank. Plans available from Edmund Scientific Co., 100 Edscorp Building, Barrington, N.J. 08007, which also offers solar water heaters, reflectors, cookers, and photocells, and wind generators and accessories.

Products not pictured here.
Solar domestic hot water heater, Hitachi America Ltd., 437 Madison Ave., New York, N.Y. 10022. Solar collector cover, Kalwall Corp., 1111 Candia Rd., Manchester, N.H. 03105. Australian "Dunlite," Swiss "Elektro," U.S. "Windco" wind generators and accessories, Enertech, P.O. Box 420, Norwich, Vt. 05055. Harold Hay movable insulation system for solar heating and cooling, Skytherm Processes and Engineering, 2424 Wilshire Blvd., Los Angeles, Calif. 90057. Solar water heater and other solar energy products, Sol-Therm Corp., 7 W. 14 St., New York, N.Y. 10011.

Companies currently in solar and/or wind energy research and development include: General Electric, Westinghouse, Reynolds Metal, Corning Glass Works, Honeywell, and Gulf + Western, to name a handful. It must be reiterated that this is neither an all-inclusive nor selective list. While HUD, NBS, and other government agencies draw up preliminary performance standards, architects must lean heavily on available resources. The U.S. Section, International Solar Energy Society, may serve as a useful starting point of inquiries. Current ISES President is Dr. George O.G. Löf, Director, Solar Energy Applications Laboratory, Colorado State University, Fort Collins, Colo. 80523.

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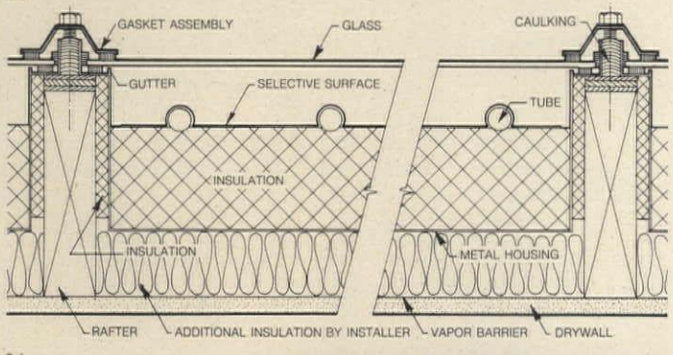

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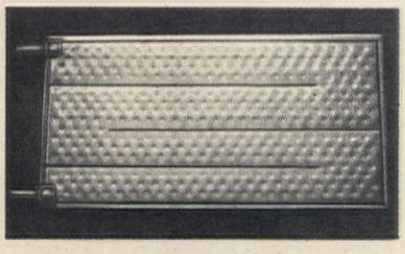

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nemus of the University of Massachusetts has testified before the Atomic Energy Commission (now defunct) that a wind generating system could be established for Long Island within two years of program start. A National Science Foundation study estimates that one fourth of the nation's energy could be supplied by wind generation by 2000.

Look before you reap

Uncle Sam has finally noticed that solar energy is literally pouring on the streets in a time of energy famine. To recover some of the equivalent of 1.0 kw/m² that saturates the earth on a sunny day, he is appropriating $50 million over five years for the Solar Energy Research and Cooling Demonstration Act and $1 billion over five years for the Solar Energy Research Development and Demonstration Act. This is not big money. However, solar researchers have worked with far less. It is rather the long-awaited official recognition by the newly created Energy Research and Development Administration (ERDA), which excites tinkers and major corporations alike.

But how well ERDA assumes former solar research activities of the National Science Foundation, National Aeronautics and Space Administration, and Housing and Urban Development remains to be seen. One pressing need will be to establish realistic goals and standards. In this regard, the publication of the HUD-sponsored, National Bureau of Standards document, "Interim Performance Critieria for Solar Heating and Combined Heating/Cooling Systems and Dwellings," is a welcome harbinger.

Questions about America's solar energy research program abound. Who will do the work? Will projects be farmed out to corporations, government agencies, or universities? Already controversy has arisen. Butt of the Solar Energy Industries Association has criticized the NSF practice of granting funds to academe for solar energy research, charging that universities are "too far removed from the realities of commercial application to be effective."

ERDA has asked the National Academy of Sciences and the National Academy of Engineering to report in August of the role and scope of a solar research institute. Whether it has multiple centers or a single location and where it is sited must also be decided. The report is eagerly awaited.

Meanwhile, individual states are creating financial incentives for solar energy hardware applications. Arizona taxpayers can amortize solar hardware costs over five years of state income tax payment. California's new long-range energy legislation gives consideration to solar energy research and development. Florida's new housing must prepare for solar-heated domestic hot water with appropriate plumbing. Indiana property owners may exempt up to $2000 of assessed valuation for commercial or residential property equipped with a solar heating or cooling system. Other states considering such legislation are Connecticut, Illinois, Massachusetts, Michigan, Minnesota, New Jersey, New York, North Dakota, Oregon, and Virginia.

Architects and engineers wishing to use solar and wind energy equipment must proceed diligently. Not all solar and wind products are worthy of architectural specifications. There are still fossil and nuclear fuel reserves untapped. We're perhaps a quarter century away from that day when, like Danaë, mother of Perseus, we could spread-eagle ourselves and let the sun shine in. [Roger Yee]

Energy conservation station, Providence

By all means

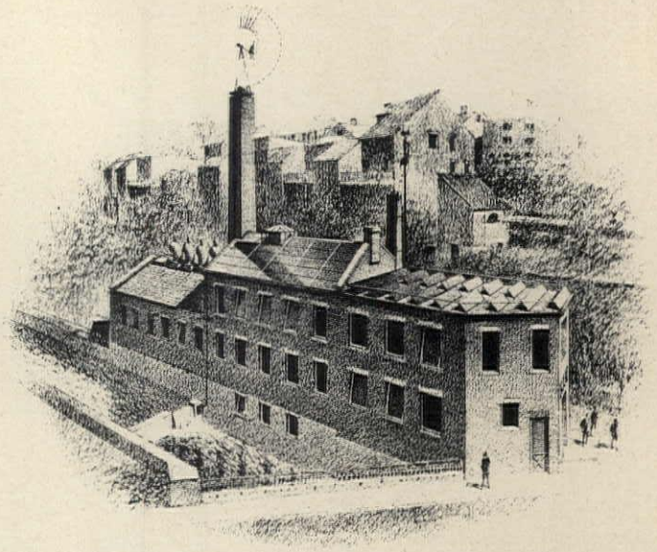
In their renovation, restoration, and retrofitting of a derelict foundry building, the Research and Design Institute evolves solutions to energy-related concerns.

It's almost as if the scenario were written for a play. Only the critics wouldn't buy it. It's too Pollyanna. If the program for an ideal project were written—and the conditions surrounding it were carefully contrived to produce the most interesting situations—how would it read? Research and Design Institute (REDE) of Providence has a pet project that would qualify.

First on nearly everybody's list, in 1975, would be an energy-conscious parti. Next current concern: reuse, restoration, and resource conservation, say with a historic old mill. Proper respect for, and advancement of, urban context would also be a natural component. Then, to get idealistic, wouldn't it be great to share the problem with students and manufacturers, and learn from/with them? And to get an interchange going between student (aspirations), producer (pragmatics) and architect (a balance)? Also, because there is probably a little romanticist in most of us, we are apt to be warmed—literally and figuratively—by the notion that nature is supplying comforts for which we've been used to paying dearly.

Well, that's it. That is what is happening in Providence. As in all good plays, a touch of pathos (funding, political and technical setbacks) has been included along the way. REDE, however, has persevered. A nonprofit institute working largely on contracts from various sources, REDE, under Executive Director Ron Beckman and Associate Director Howard Yarme, has become a model of the interdisciplinary work mode. The restoration and retrofitting of the Stillman White Brass Foundry is just the latest phase of the group's long involvement in ecological/environmental/sociological/design pursuits. This project is, however, the embodiment of these, and more, as the scenario suggests.

The Rhode Island Energy Conservation Station, as the Foundry will be known, is made up of the original building (1840s) and two subsequent additions (prior to 1869). Along the small Moshassuck River to the north were other industrial buildings of the period. To the south of the REDE project, a cleared area—destined to become Roger Williams National Memorial Park—stretches to the edge of downtown Providence. The future of the park proposal was uncertain when REDE began considering the Stillman White Foundry. "We were just naive enough," notes Beckman, "to believe it would happen, and we have now been assured that work will begin this summer."



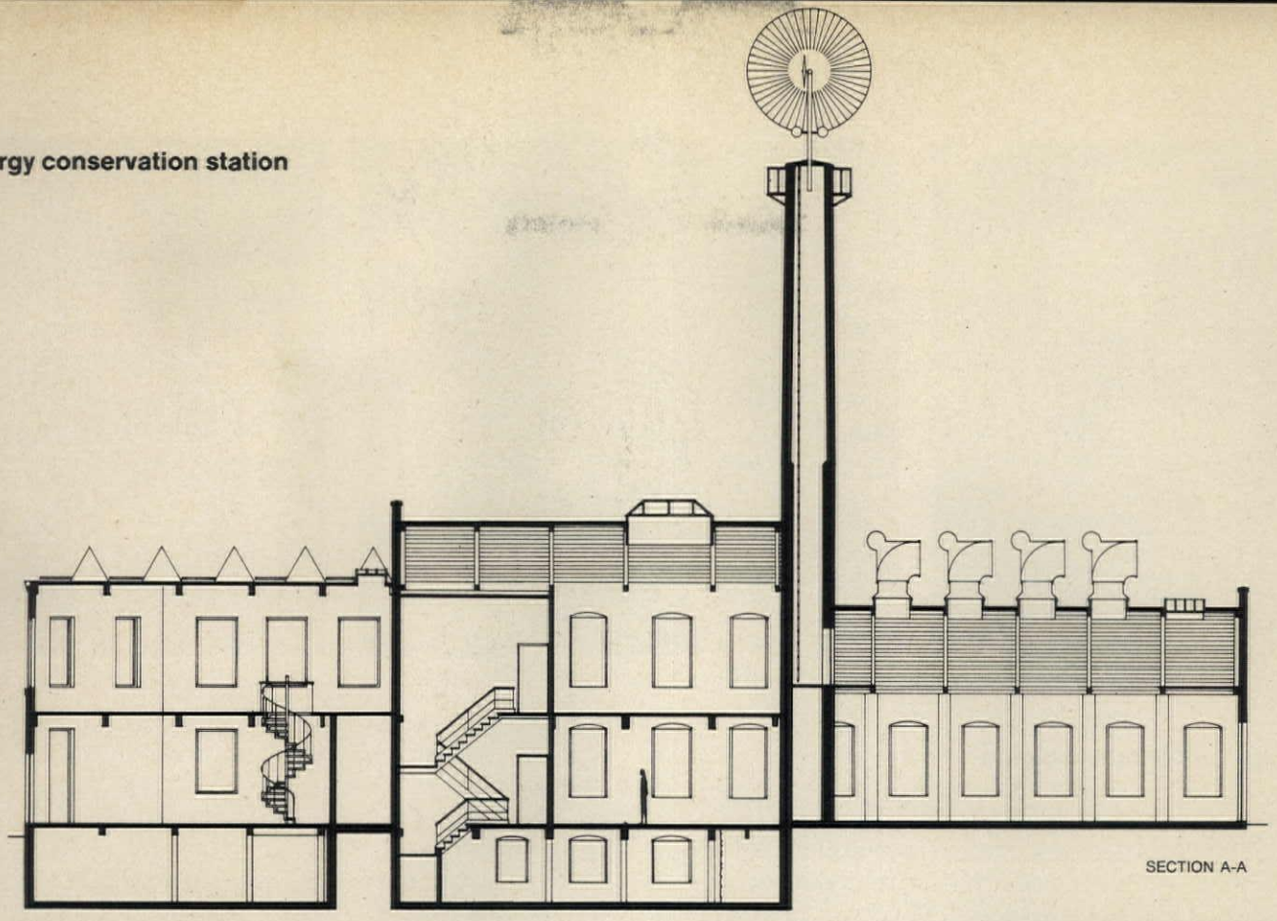
Drawing by Steve Oles of the retrofitted foundry. In April, the New England Regional Commission—a federally funded interstate planning agency directed by six governors—awarded REDE a $85,750 grant to further the retrofitting.

Seen from the park and downtown, the Foundry will be the focal point of the Moshassuck Square development, which is adjacent and beyond. (Moshassuck Square is a residential/commercial project which, through architect William Warner's dogged persistence, intermixes new housing and renovated old factory buildings.) Although developer George Macomber's residential units—designed by Warner—are finished, they are not yet an overwhelming financial success. Neither are the commercial spaces in the renovated buildings. But the area is only now reversing its downhill slide and, with Moshassuck Square, the Stillman White Foundry, and the national park, Providence will have erased a barrier of existing no-man's-land.

The Foundry and nearby remnants of industrial history had stood empty for years. Macomber and Warner's plan to revive the area was unpopular with *somebody* (protagonists of an in-town industrial park?), and an intriguing num-


REDE
ONE HOUR
SNOW ROUTE
TOW ZONE

Energy conservation station



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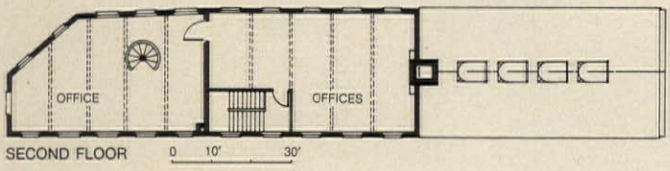

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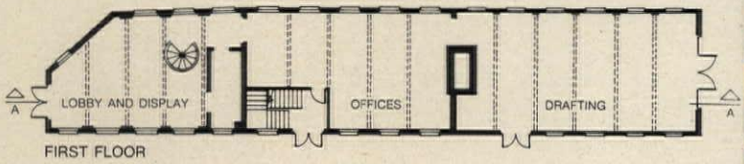

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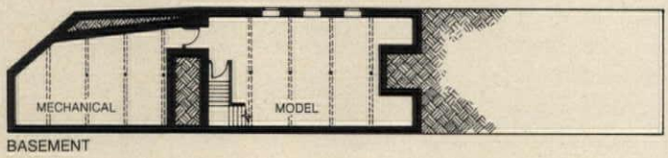

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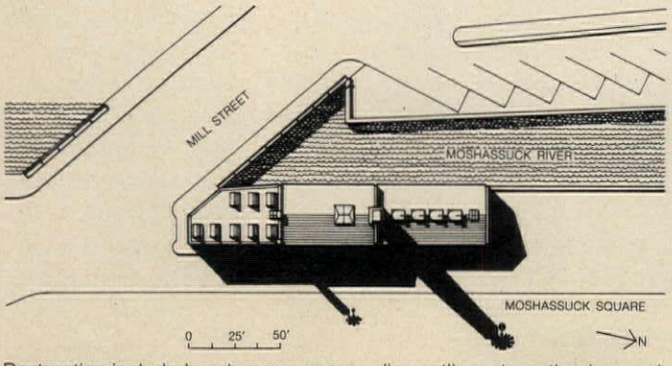
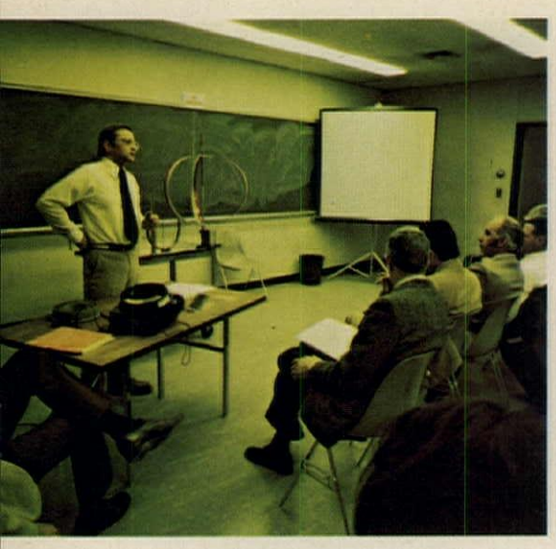
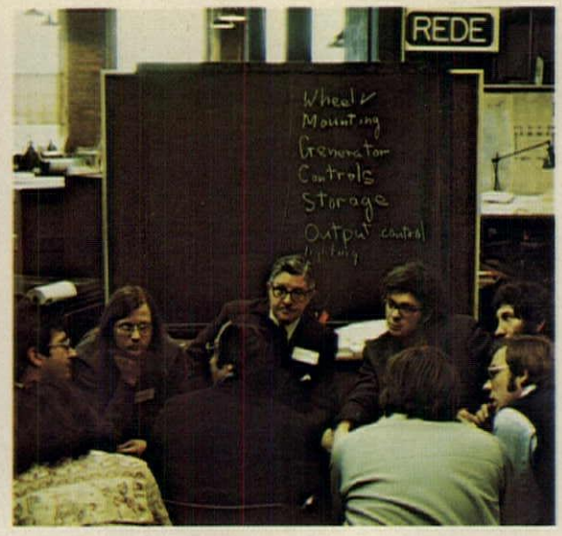


Restoration included such maneuvers as dismantling, strengthening, and rebuilding the existing chimney (opposite), and walls and roof (right).



Beckman describes rotor at Brown.



Work session at REDE offices.

Inflatable meeting enclosure in Foundry.

Energy conservation station

ber of fires had effectively crippled several of the old structures. What the flames had left, bulldozers were waiting, with bated breather caps, to level. REDE had joined Warner in the search for new owners, but their efforts were thwarted by the demolition of the venerable Eagle Mill in 1973 because it lacked tenants. One end wall of the Stillman White Foundry had already been reduced—"mistakenly"—to rubble before REDE's comptroller Eric Godfrey could organize a corporation to buy the building and halt its destruction. REDE decided that it would retrofit the facility, occupy it, and conduct energy conservation research.

The involvement principle

There is no prima donna in this production. In order to pull it off on REDE's admittedly limited resources, the cast grew to include numerous factions. Beginning with the Stillman White Associates—the corporation that saved the building—the roster expanded to include other preservationists, government backers, banks, a power company, and numerous manufacturers. Another important facet of the program has been its unique educational opportunities, a fact not overlooked by REDE, the Rhode Island School of Design (RISD), or Brown University. Since the fall of 1973, RISD and Brown students have played an active role in the project, gaining valuable experience, and school credit, through their contributions. The interaction of students, manufacturers, and REDE personnel has been encouraged through seminars organized by REDE; these experiences, Beckman notes, have been very rewarding and instructive to all of the participants. But more importantly, the sense of involvement that permeates the Foundry project is a sure sign that the process works.

Banking and industrial participation began early. As is often the case—fortunately—the banks saw the project as a good thing for the downtown, a catalyst for the surrounding Randall Square area. They, like the preservationists and the state, were in favor of anything that would stabilize the historic district's land values, and add strength to Providence. The electric company hopes that the facility will demonstrate the use of power generated during off-peak hours. And then came the manufacturers, drawn by REDE's alert that their products have a place in the big picture.

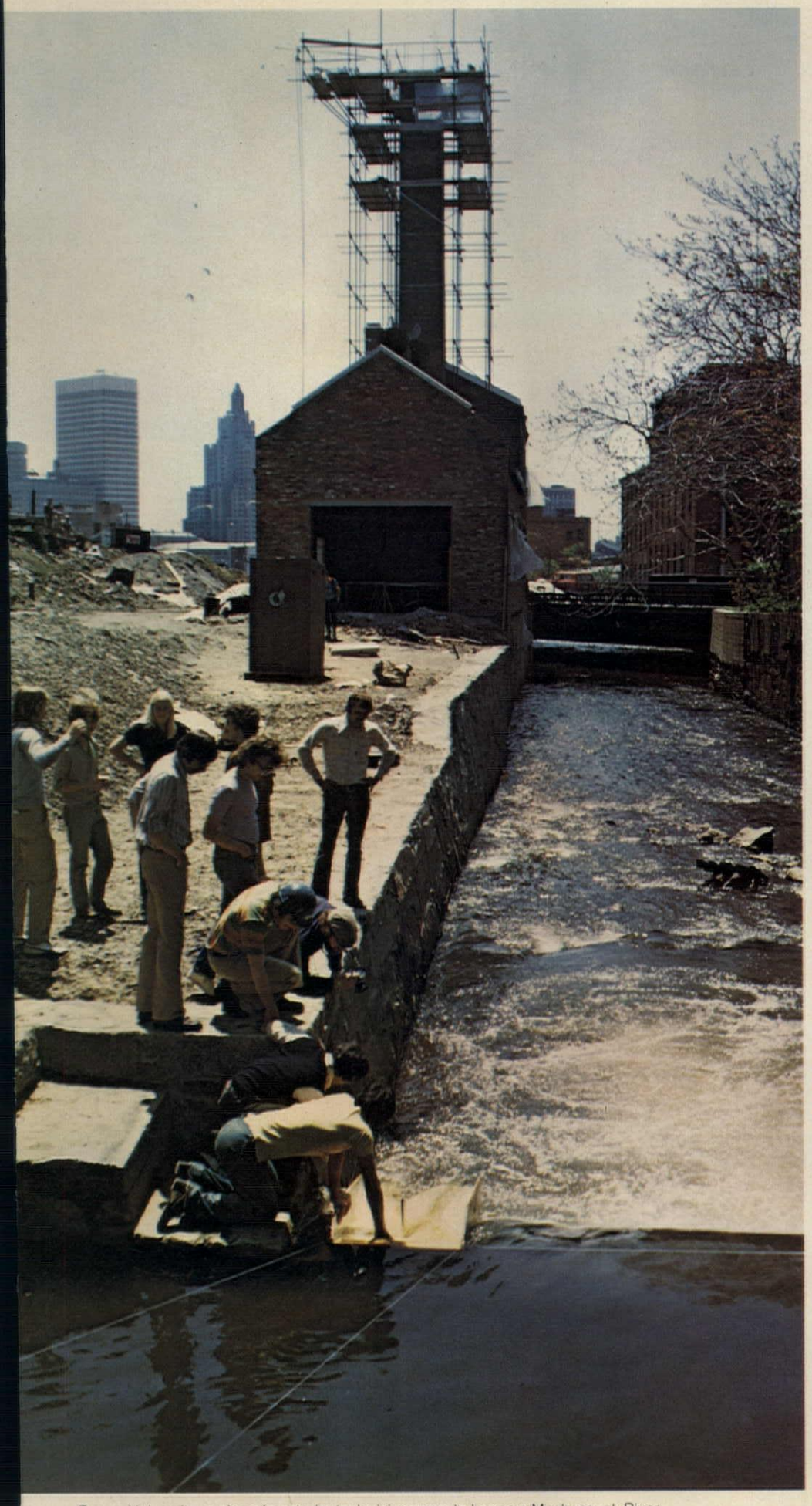
The work ethic

With the support of the U.S. Department of the Interior and The National Trust for Historic Preservation, the reconstruction process began. Further help came from The National Endowment for the Arts and the State of Rhode Island, through Governor Philip Noel's efforts.

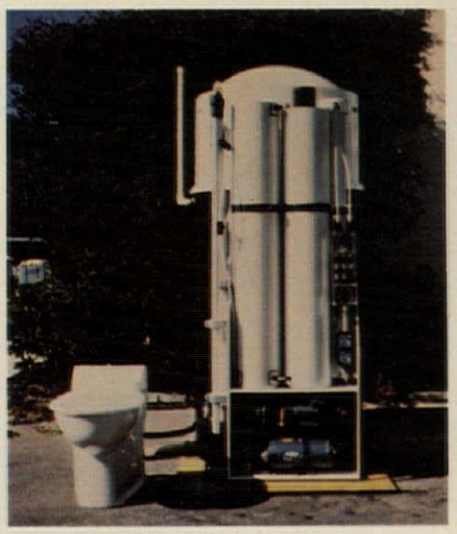
Structural assessments were first made by William Theon of LeMessurier Associates, and the findings indicated that the building was on the verge of collapse and would have to be rebuilt, from its innards outwards. Much of the masonry work also needed help. Partially because of age, but mainly to deposit necessary polyurethane insulation foam in the wall cavities, large sections of wall were rebuilt. New wood roof beams were slipped into position, and remaining wood surfaces were sandblasted clean.

Even the existing brick chimney stack was dismantled, strengthened, fitted with a full height internal ladder and reassembled, to serve as a base for a wind-driven power generator. Like a microcosm of the mill project generally, even the parts of the wind device will combine historic and relatively new technologies. At the heart of the assembly will be a Savonius rotor, a form of wind-harnessing hardware used by the ancient Persians to grind grain. Easily activated by light winds, the rotor will, at a certain speed, start a Darrieus wind rotor turning. The Darrieus is a vertical axis mechanism developed in this century (but little used until recently) for harnessing higher sustained winds. Thus old meets new, again.

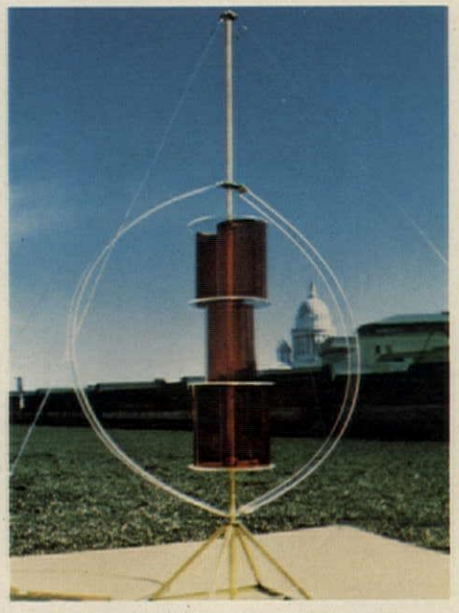
Also in the works is a small hydroelectric generator which will draw power from the Moshassuck River outside of REDE's windows. Although the "river" is actually a narrow canal, the head should produce at least a modest charge. Several other devices will also tap natural phenomena, extracting power or heat. Solar collectors of the liquid variety will trap heat and store it in a highly insulated tank in the Foundry's lower level. Banks of collectors made up of photovoltaic cells will eventually be mounted on the roof, converting solar energy directly into electricity. A multiple-battery storage facility, also on the lower level, will collect energy from all electric generation points.



Brown University engineering students devising ways to harness Moshassuck River.

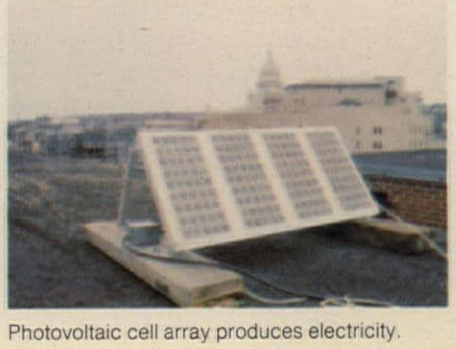


Recycling toilet.



Model of Savonius/Darrieus wind devices.

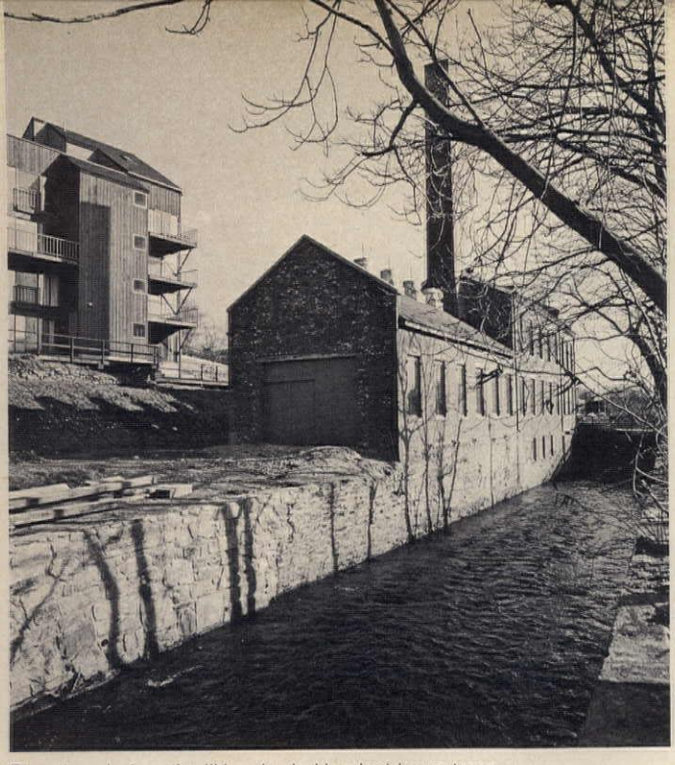
Flat plate thermal solar collector.



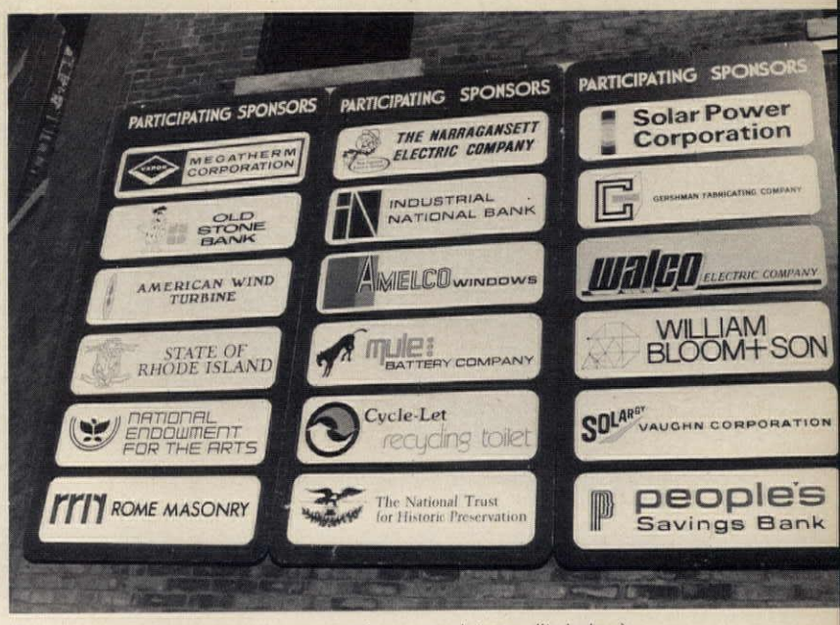
Photovoltaic cell array produces electricity.

Mill Street and Mohassuck Square façades after reglazing and rebuilding.

First floor interior, ready for finish work.



River façade (west) will be shaded by deciduous trees.



Commercial and institutional sponsors (see complete credits below).

Energy conservation station

Once this energy is collected, care in its use will be essential. The theme for REDE's operations at all levels has been scrutiny of each detail. That meant no effort would be spared to make each building element as efficient as possible in terms of energy conservation. Besides the urethane in the walls, the new windows were selected very carefully. To prevent temperature transfer through them, the double glazing is mounted in frames that are discontinuous from inside to outside. Sealed between the two pairs is a venetian blind, and the windows pivot, awning-style, to allow natural circulation and cleaning.

Since there was no choice about building orientation, REDE will plant deciduous trees along the Foundry's long sides, so that leaves will provide shade in hot weather, but not in winter. Roof insulation and an entry vestibule will also cut down on the amount of heat gain or loss. Wherever possible, manual equipment will replace electric within the offices, and lights will be individually controlled. (REDE replaced gang switches in their present quarters with pull chain sockets in July. Since that time, for an expenditure of $21.39, they have reduced their energy consumption average by a startling 51 percent.)

Still another conspicuous consumer, the standard bathroom, is being updated with a new solution in the REDE quarters. A recycling toilet, completely self-contained, promises an 80,000 gallon per year water savings over a conventional toilet. It is said to require only that its bioenzymatic system be drained and refilled each two years with 120 gallons of fresh water. Beckman loves to picture the prospect: "We're going to draw power from the polluted river to run a toilet that produces pure water without adding pollution!"

Elemental enjoyment

While recognizing that the conservation station/restored foundry/office will undergo continuous changes, due to its laboratory nature, REDE is emotionally involved with the project. As it changes, it will be doing exactly what its occupants expect to do—respond to new ways of using an abundance of natural elements—producing a more self-sufficient environment. It may take a while, but Beckman anxiously awaits the time when REDE staff members will be able to watch natural phenomena work for them to the exclusion of man-made sources. A romantic notion? Sure it is, and it won't happen tomorrow. But whether you believe in Christopher Columbus or Leif Ericson, neither could have gotten here, from there, without leaving shore. The production in Providence is launched, and the show's worth watching. [Jim Murphy]

Credits

Architects: Research and Design Institute (REDE), Providence.
Photography: REDE, except p. 74 and p. 75, top left, Norman McGrath.
Structural engineer: William Theon, LeMessurier Associates.
Because of the nonprofit nature of this project, REDE has listed the following organizations as participating sponsors for their donated or pledged assistance, both funds and products: Amelco Window Corp., windows and financial; American Wind Turbine Co., turbine and financial; William Bloom + Son, Inc., insulating wall panels; The Eppley Laboratory, Inc., solar radiation instruments; Gershman Fabricating Co., Darrieus Rotor; Industrial National Bank, financial; Kalwall Corp., solar collector cover; Leeds and Northrup Co., strip chart data recorder; Meehan Foundation, financial; Megatherm Corp., thermal water storage tank; Mule Battery Co., 50 storage batteries; Narragansett Electric Company, financial and services; National Endowment for the Arts, financial; National Trust for Historic Preservation, financial; Owens-Corning Fiberglas Corp., insulated air conduit and foam insulation; Old Stone Bank, financial; Peoples Savings Bank, financial; Rhode Island Development Council, financial; Rhode Island Historic Preservation Commission, financial; State of Rhode Island, financial; Rome Masonry, Inc., special masonry work; Solar Power Corp., photovoltaic cell array; Spectrolab division of Textron, photovoltaic clock; Taco, Inc., water pumps and heat exchangers; Texas Instruments, solar collector plates; Thetford Corp., recycling toilet; Vaughn Corp., heat pumps; Walco Electric Co., electric generating equipment.

Center for Applied Computer Research and Programming

Ultimately, a flower barge

LEGEND
1 Reception, **2** Loading Platform, **3** Storage, **4** Tape Archives, **5** Technical Preparation Area, **6** Computer Space, **7** Kitchen, **8** Cafeteria, **9** Dining/Meeting Rooms, **10** Audio Visual Presentation Rooms, **11** Power Plant, **12** Dry Dock, **13** Boat Dock, **14** Bathrooms.

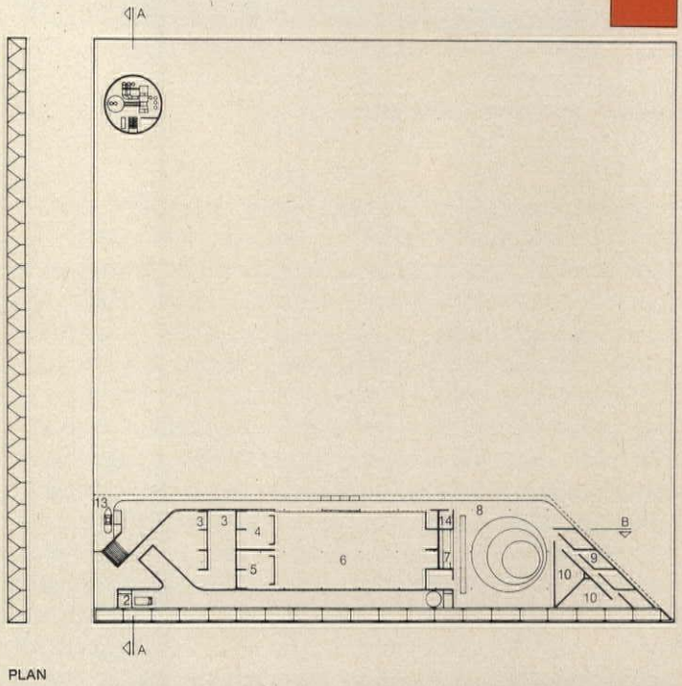
For a computer center designed by Emilio Ambasz, the power, and some for the community that is to be built around it, will come from the sun and wind.

The Center for Applied Computer Research and Programming will be the headquarters of a semi-public corporation that renders computer programming services to public agencies and private organizations. The headquarters building will be the first of a series of private and public office buildings to be developed on the grounds of the former Las Promesas ranch on the outskirts of Mexico City. Consequently, the building has been designed as a "site mark," establishing the development's prime point of reference and defining the southeast and southwest coordinates along which all future buildings will grow.

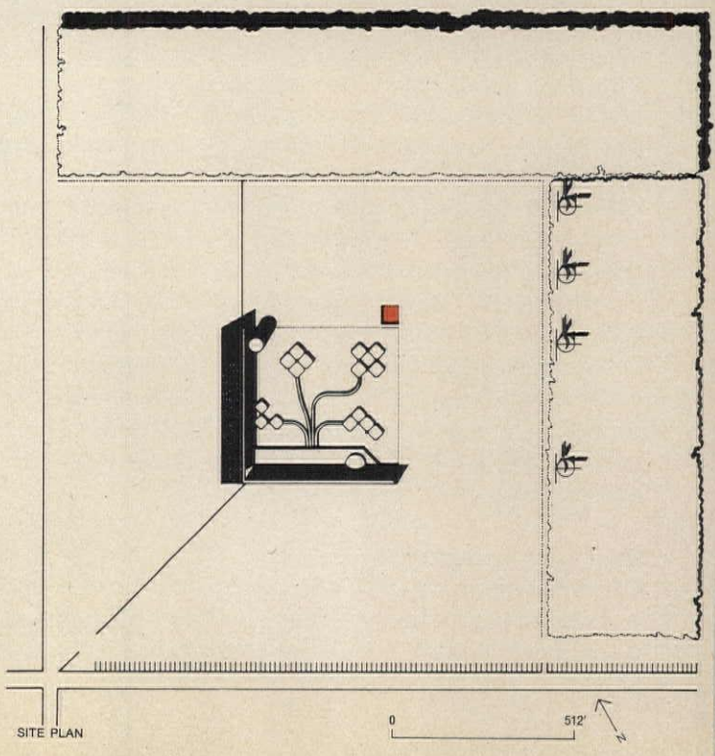
While approximately 160 people—mathematicians, economists, computer programmers, and supporting clerical staff—will use the center, the projects they work on will change, so the design program required work spaces capable of undergoing addition, subtraction, and reorganization according to the intrinsic requirements of the projects at hand, and the psychological needs for territorial identity of the different groups at work.

Because the Mexico City area is situated on a landfilled lagoon, the building's large water basin is designed to drain the soil and to solve foundation problems. By using the basin to satisfy the program requirement of flexibility and adaptability, the office workspaces have been designed as barges that float until positioned where needed. Once placed, a watertight compartment is filled, and the barge comes to rest on the basin floor (depth: 4 ft). When repositioning is required, the barges are refloated by pumping the water out of the compartments. Pedestrian/mechanical tubes connect barges, with their terminal units, to the main computer space. (Barges will be built in Mexico's shipyards, the country's sole fully industrialized building industry.

The two large walls that shield the building also define its entrance at their encounter. The inclined plane is designed as a solar energy-gathering surface for servicing the self-contained electric energy power plant. The electric energy, which is obtained through a heliovoltaic process and stored in batteries at the power plant, supplies power to the com-

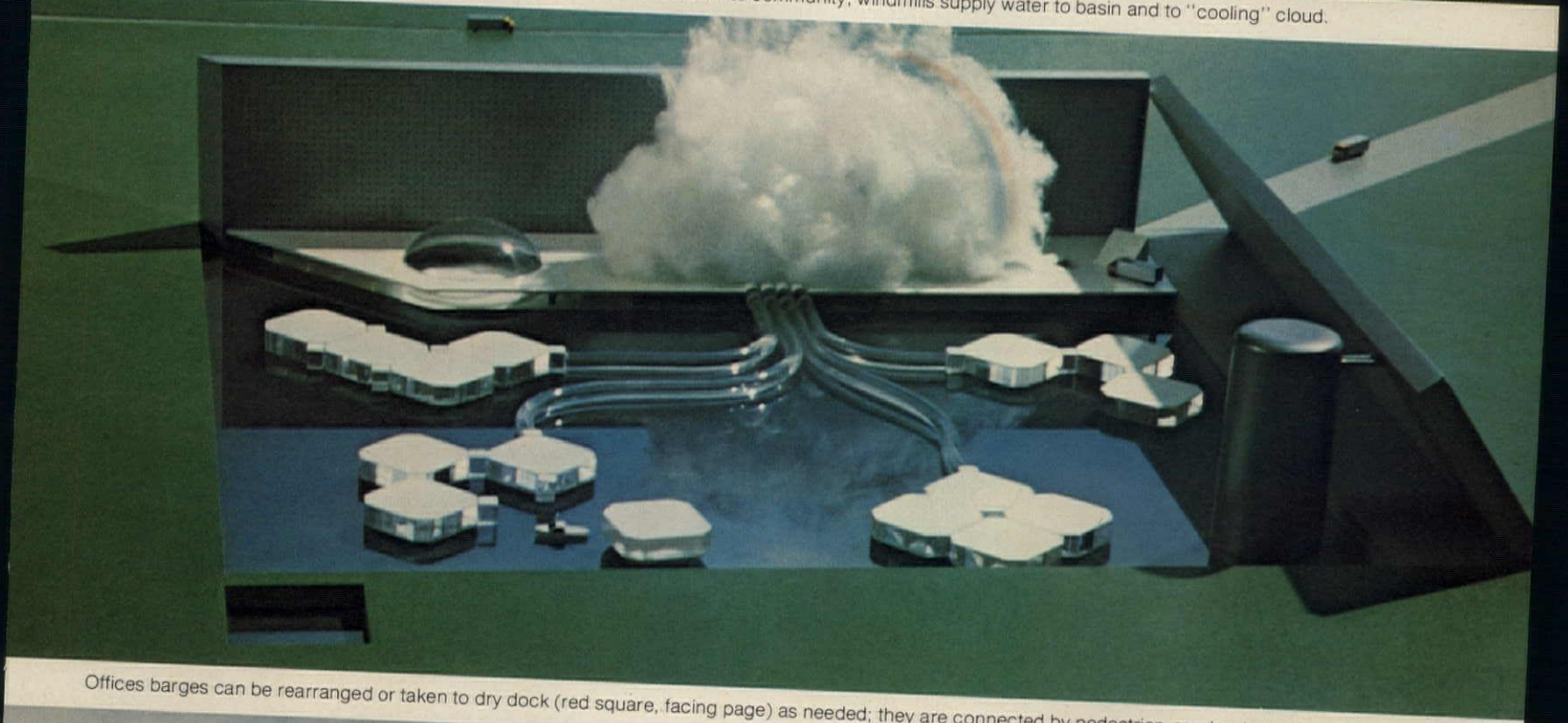


PLAN

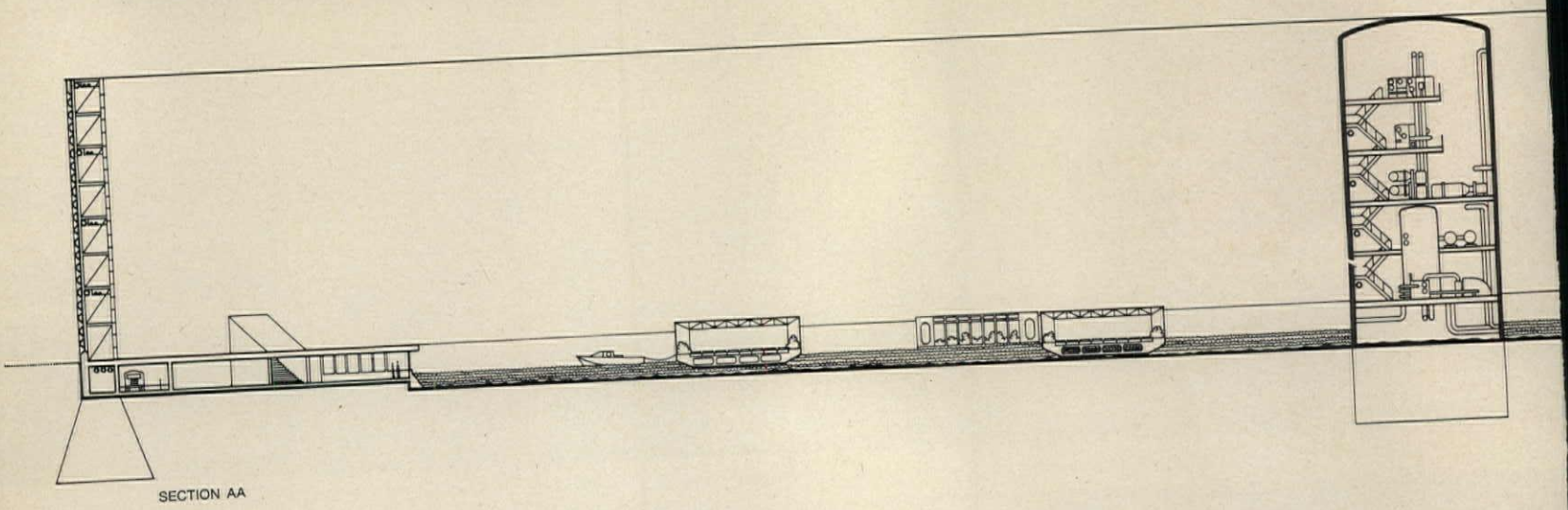


SITE PLAN

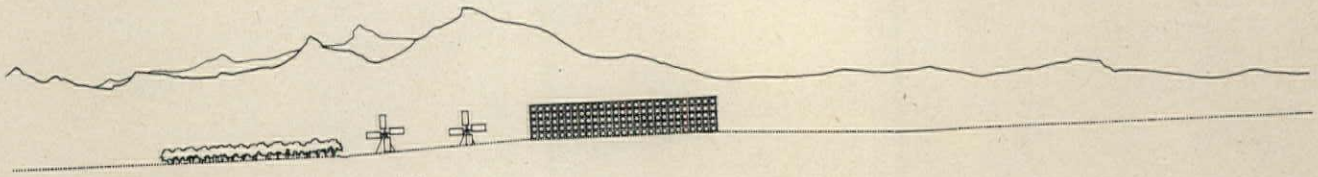
Solar energy-gathering wall supplies electric power to center and some to community; windmills supply water to basin and to "cooling" cloud.



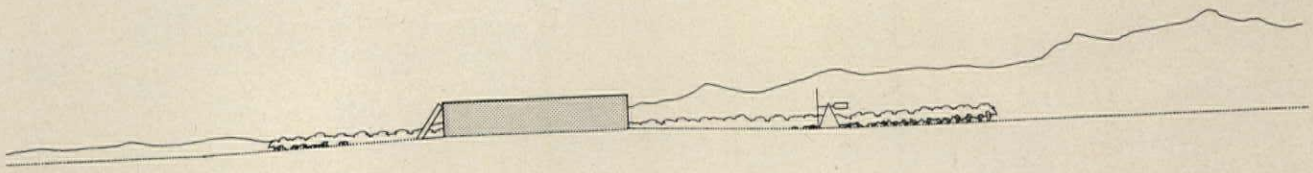
Offices barges can be rearranged or taken to dry dock (red square, facing page) as needed; they are connected by pedestrian-mechanical tubes.



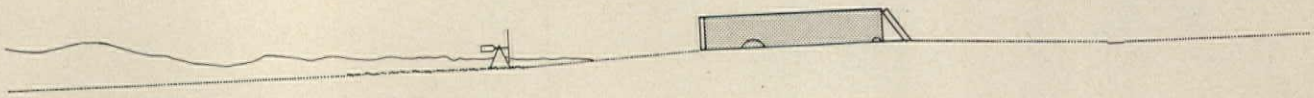
SECTION AA



SOUTHWEST ELEVATION



SOUTHEAST ELEVATION



NORTHWEST ELEVATION

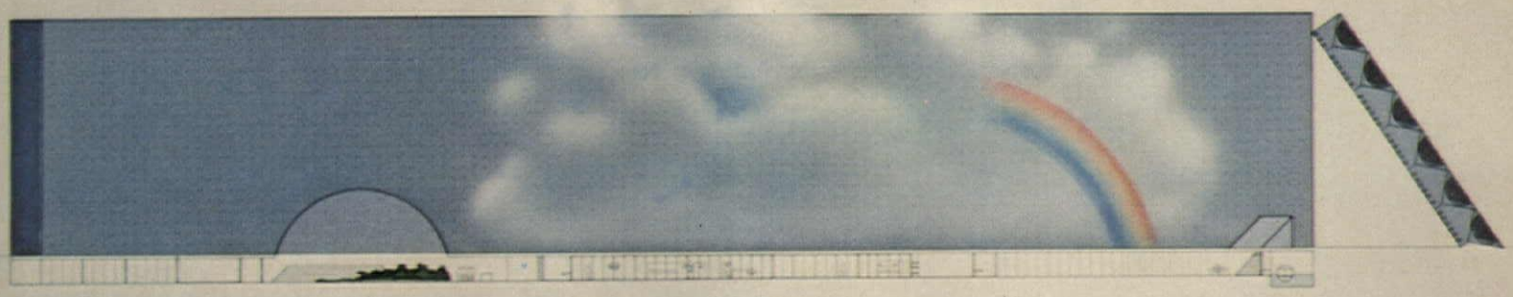
puter center, including its ventilation and air-conditioning, the development's communal services, and lighting. The vertical plane is to be a display board for representing visually the patterns of ongoing research projects, and for displaying building- or community-related messages.

The computer space, reception areas, storage, and cafeteria, which have direct views onto the water, are housed under a large platform. Hovering over this platform is a cloud, conceived as an architectural element, which serves to replenish the basin's evaporated water and to cool the building's exterior. This ever-changing mass of cold-water mist is generated by highly pressurized water as it is expelled through especially designed nozzles. (At present this process is used to cool open-air gatherings in the southern United States.) The cloud is fed with water pumped by windmills and stored in conical tanks that are traditionally used in the region as silos. This water is also used to satisfy all of the development's water needs and to irrigate its extensive plantings.

The clients understand the architect's basic premise that nobody should have to work. But if present circumstances so constrain us, at least it should be possible to do it from home. There is not, therefore, a real need for a large building, but for a relatively small installation to house the computer and receive messages. But the clients also feel they are not yet ready for such a radical arrangement. The building has been conceived, therefore, as comprising elements which may be progressively removed as courage grows and the need for physical space diminishes. Then, only the silent walls and a single barge turned into an island of flowers will remain. [Extracted from writings of Emilio Ambasz]

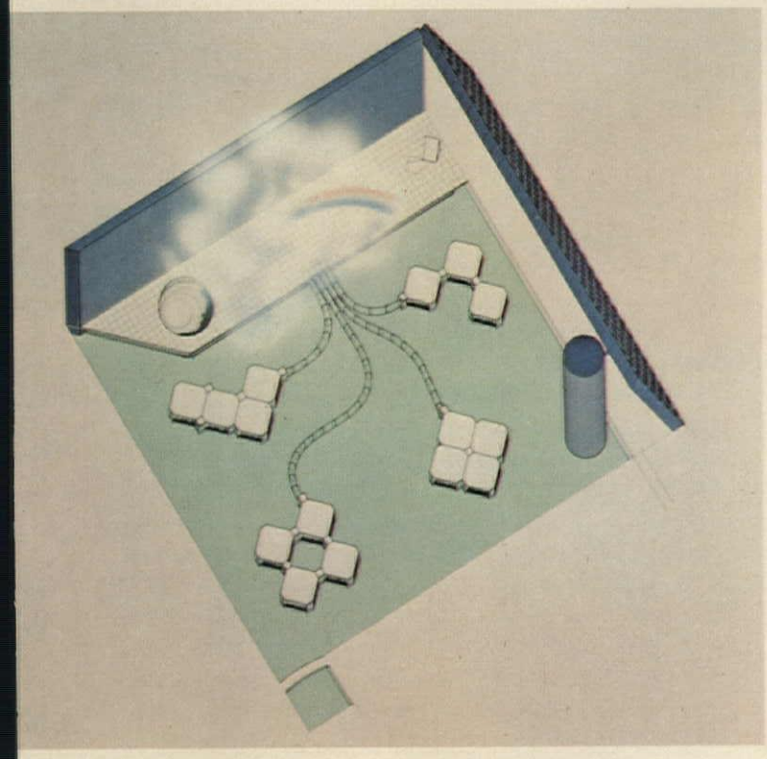
Data

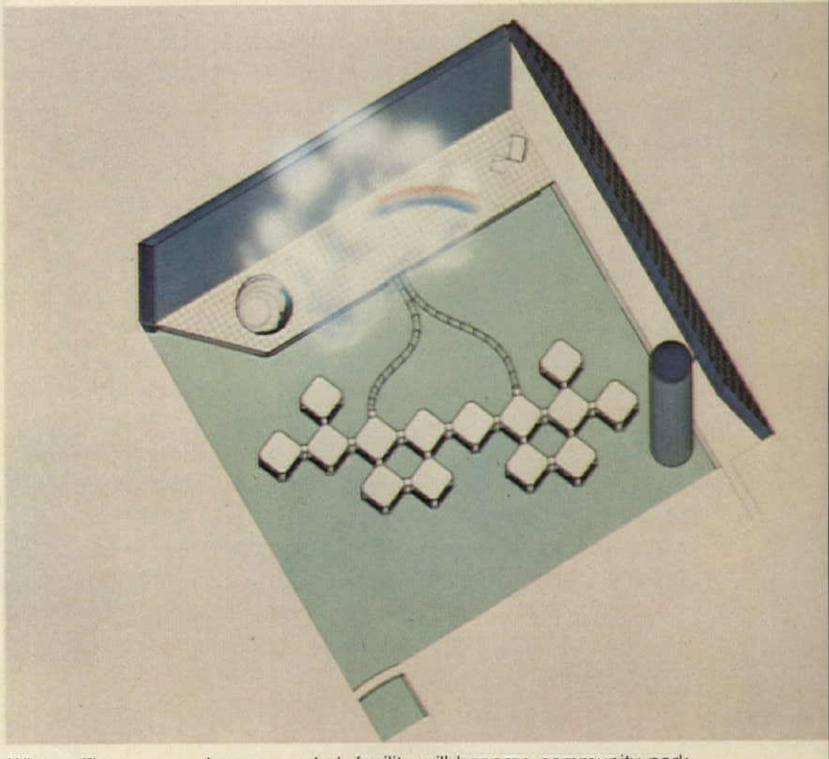
Project: Center for Applied Computer Research and Programming.
Architect: Emilio Ambasz.
Site: a former ranch on the land-filled langoon occupied by Mexico City and surroundings.
Photography: Louis Checkman.



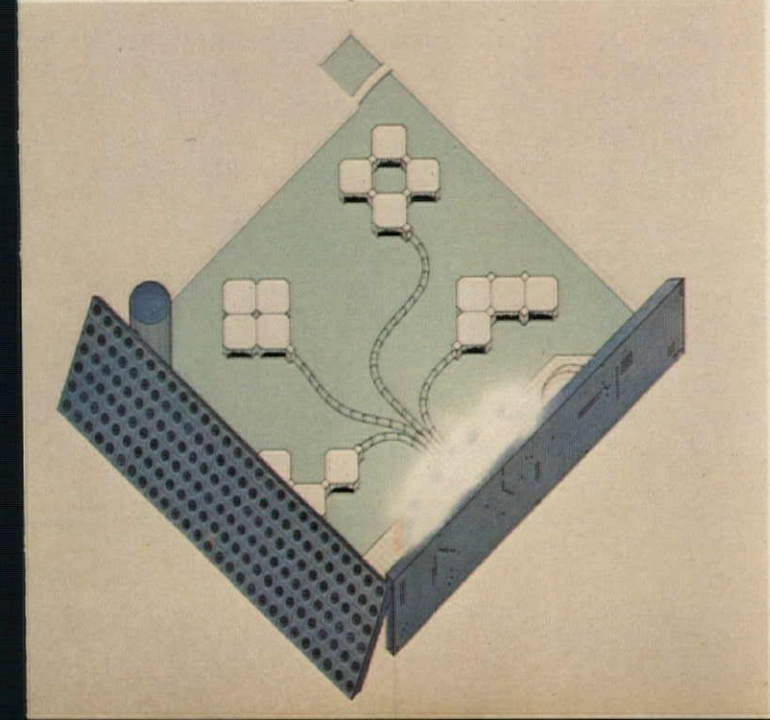
SECTION BB

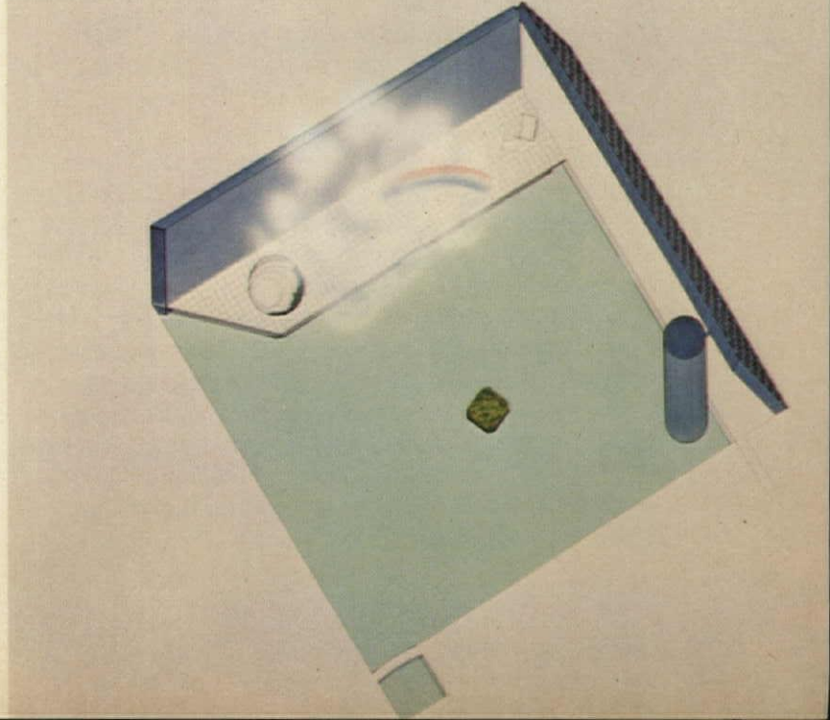
Section (above) and drawings (below) show entrance where two walls meet.





When offices are no longer needed, facility will become community park.





Waste not, watt not

In planning its new eastern headquarters, a major company saves a watt or two and, in the process, gains a place to work with a warm, relaxed ambience.

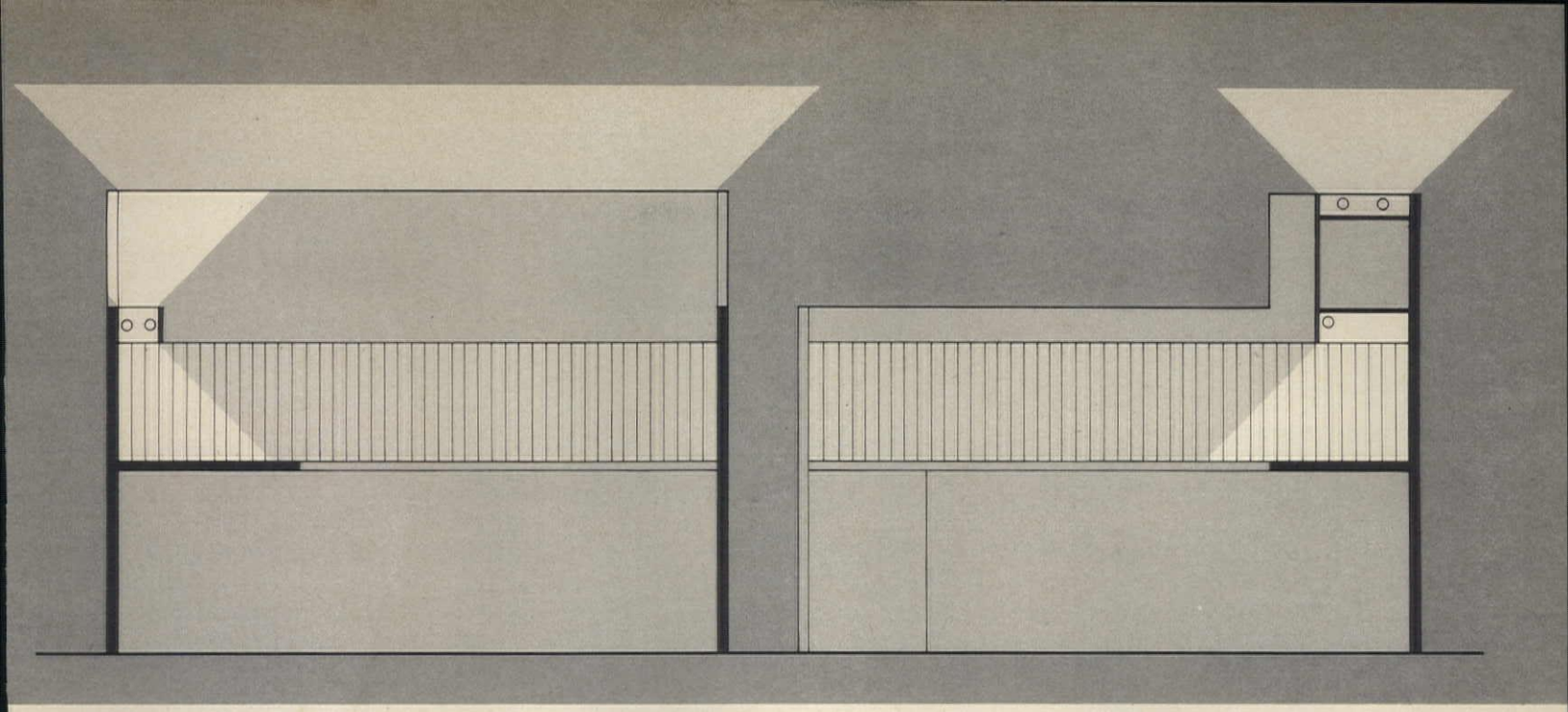
It is not unusual in the design process that the end results are not what anyone anticipated. Problems of budget, construction changes, or a myriad of other considerations often force a rethinking of objectives and solutions that may, in the end, produce something more significant and useful. Such was the case in the design of the Atlantic-Richfield (ARCO) offices in the new Center Square development in Philadelphia. ARCO has done something that very few companies, if any, have tried; it has reduced its electrical energy consumption 25 to 50 percent on its 22 floors of new offices, by eliminating general overhead lighting. Although ARCO has long been committed to using open planning in its offices, the question of lighting did not arise until the building, already under construction, went through a major design revision. The new scheme resulted in an awkward ceiling module for the lighting distribution required by the open plan. Interspace Design Associates of Philadelphia, the interior design team responsible for the 22 floors, was asked to study the lighting conditions and to make recommendations.

The overall task of space planning and design had begun sometime earlier with a complete investigation and analysis of available open plan furniture and its ability to meet the standards of function and flexibility required by ARCO (25 percent of its offices change every year). When it became apparent that some of the systems met only some of the requirements, the decision was made that Interspace would develop a new system to meet the flexibility demanded.

It seemed natural because of the difficulties encountered with the new ceiling grid that the lighting become an integral part of the new furniture system. But it was not a decision easily made, since there were few, if any, precedents against which to measure the non-general lighting requirements for a working situation. Sylvan Shemitz, who had developed a similar lighting concept for the Seagram and Sons' offices (P/A Sept. 1973 p. 90), was brought in as a lighting consultant to design and detail the lens and fixtures in coordination with Interspace's design development of the furniture system. To better understand the effect and to test, measure, and assess the lighting levels required, space was rented and a full scale mock-up of 6000 sq ft was constructed. Still skeptical about the viability of the proposed working conditions, even after the positive results of the mock-up, ARCO brought in 75 employees to use the space and be interviewed by Dr. Goodrich of the Environmental Research Group, a team already responsible for the programming of the ARCO spaces. The employees' overwhelming positive response was the confirmation ARCO needed to make the commitment to develop and use this new system on all 22 floors.

A performance spec was drawn up and sent out to various manufacturers for bids, leaving the details of hardware and joinery to be worked out by the manufacturer. Four different prototype work stations were developed—executive, middle management, secretarial, and clerical—each with individual, built-in fixtures for direct/indirect lighting. The fixtures, a high output fluorescent (800 milliamps) for indirect, 30-40 watts for direct, use a special plastic lens to diffuse the light and reduce reflections. Mounted at or below eye level to reduce glare, the lens projects light at a 35 degree angle to the left and right, the most desirable configuration for task lighting. An overall ambient light level of 75-85 footcandles is maintained. Although this standard is below the 100 footcandle minimum established by the Illuminating Engineering Society, the higher figure takes into account the shadows and veiling reflections produced by overhead lighting, a factor that can be eliminated in calculating the levels necessary when using a direct source.

The system consumes only 2.2 to 2.8 watts per sq ft compared to the 5.2 watts normally required for a traditional ceiling system. In addition to reduced wattage, the decrease in lamp heat has brought about a significant reduction in the air conditioning loads as well. A further benefit results from the reduction in the amount of duct space necessary. Because the extra depth needed for lighting fixtures can be eliminated, the accumulated amount of space saved could produce a whole extra floor for every 20 floors built, although this was not the case at ARCO since the floor-to-floor height had already been established.



The diagrams above show the distribution of lighting from the direct and indirect source.

Photo: Harris/Davis

Waste not, watt not

Photo: Barry Williams

Data

Project: Atlantic-Richfield Eastern Area Headquarters, Philadelphia, Pa.
Designer: Interspace Design Associates, Philadelphia; Herbert Kramer, officer in charge; James Dugan, R.A., project coordinator, Russell Weeks, R.A., architectural coordinator.
Client: The Atlantic-Richfield Company; David Allen, manager of corporate space planning; Benjamin Cubler, project manager.
Consultants: Sylvan Shemetz, lighting; Robert Hansen, Acoustical consultant; JG Furniture.

Partly due to ARCO's continued skepticism even after the mock-up proved viable, the light level in the actual space is somewhat higher than in the test area, and seems, even at 2.8 watts, overlit. As the photographs will show, the ceiling (developed especially for increased reflectivity) has bright spots and Benjamin Cubler, project manager for ARCO feels that the overall ambient light level could be even lower without interfering with the direct, task-oriented lighting. There were no major difficulties or setbacks encountered in carrying out the installation. While minor adjustments will no doubt continue, the people at ARCO seem pleased. The work environment has a relaxed, warm quality, something that can't be as easily measured as the dollars and cents savings in energy. [Sharon Lee Ryder]

Photo: Barry Williams

Photo: Harris/Davis

For areas without workstations, free standing chrome fixtures are used reflecting light off the ceiling.

Photo: Barry Williams

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An up-to-date list of reference works used to prepare this special energy issue of Progressive Architecture.

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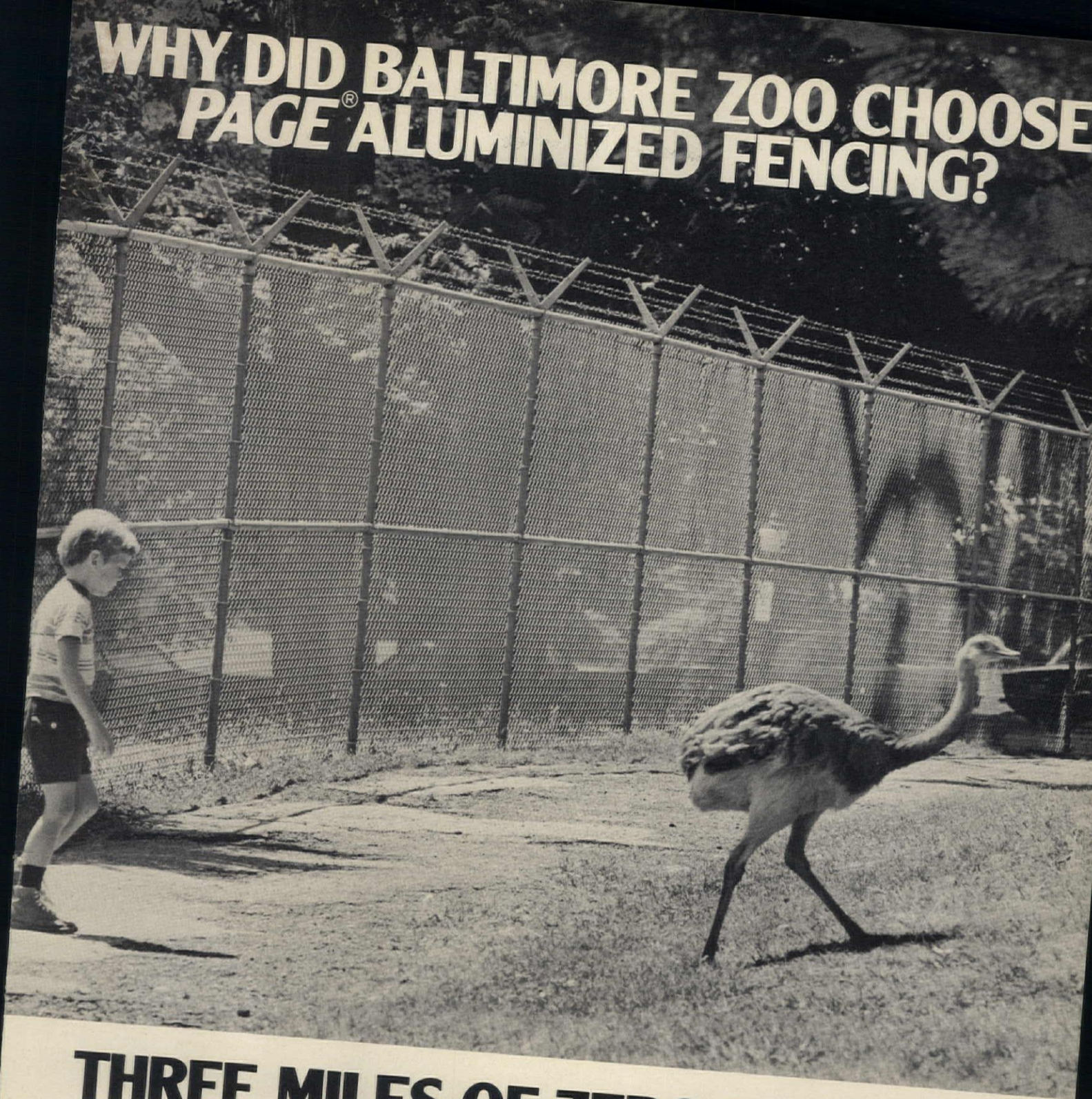

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Performance criteria for a walk on Mars

Harold J. Rosen, PE, FCSI

Our current approach to architectural specifications is often more contextual than planned in advance, more instinctive than scientific. Specifications can and should be more deliberate than they are now. The possible solution is performance spec writing.

You've been asked to set performance criteria for a walk on Mars. Is your methodology flexible enough to sustain you? Not using our current haphazard and unscientific approach. In order to more successfully evaluate and select materials, it is essential to structure a methodology that is designed by and for the architect and his engineer. To begin, it requires more proficient materials technologists who thoroughly understand basic materials. The complexities of today's materials, generated by chemistry and metallurgy technology, are beyond the range of most architects.

A tool that can be employed in a comprehensive way is the performance concept. If we utilize it as performance *specifications,* we can establish criteria such as investigation and assessment of new materials and products, development of new performance defined products in concert with manufacturers, and upgrading of existing products through feedback on field performance.

Performance is established in three steps. The first is determining the Requirement. (E.g., fire safety, strength, or durability.) The second is establishing the Criteria for the Requirement. (E.g., combustibility, flame spread, or hourly rate. The Criteria would be expressed in terms of limitations. For combustibility, "noncombustible." For flame spread, "not over 25." For hourly rate, "1½ hours.") The third is Testing of the Criteria. (E.g., ASTM E136 for combustibility. ASTM E84 for flame spread. ASTM E119 for hourly rate.) This could be expanded to encompass hundreds of criteria. The challenge will be to limit the number to essential criteria for any specific product.

A structured approach to evaluation/selection of materials and products is essential. A framework is emerging that may serve as the nucleus for a more sophisticated matrix. This will be filled by the input of materials experts.

The framework or format for assessment, evaluation, and selection consists of nine major performance aspects. They are listed here with some of their major requirements. In brief summary: 1 Strength and stability (wind loads, seismic loads, impact, indentation), 2 Fire safety (fire resistance, combustibility, fuel load, flame resistance), 3 Habitability (thermal properties, acoustic properties, water permeability), 4 Durability (resistance to wear, weathering, dimensional stability, adhesion of coatings), 5 Practicability (transport, storage, handling, field tolerances, connections), 6 Compatibility (jointing and fastening, coatings, galvanic interaction, differential expansion), 7 Maintenance (compatibility of coatings, indentation and puncture, chemical attack), 8 Code requirements (compliance), and Economics (installed costs, maintenance costs).

The nine major aspects of the framework and their requirements can be expanded as needed to investigate specific items of specification. Each requirement in turn can establish criteria and test method to check findings. Thus, this tool can develop new products by setting forth performance requirements and working with manufacturers to assure realistic criteria. It is a tool that can upgrade existing products too. Manufacturers may find it helpful in verifying and completing new and old product data sheets. A review of framework parameters can assure that significant requirements have been investigated and set forth.

Ideally the system will work best when the design professional is a materials technologist with broad insight in materials. However, professionals with lesser proficiency in materials will benefit as well. They will have a structured framework with comprehensive information on criteria and test methods. To make an intelligent evaluation or selection of materials and products, the specifier for that walk on Mars—or a building scheduled for erection starting today—will turn increasingly to performance specifications. □

Dover introduces the add-on elevator.

Designed with energy conservation in mind.

Here's the answer to the need for providing elevator service for two and three-story buildings that were designed without elevators or with too few elevators.

It also satisfies most requirements for providing vertical transportation for the handicapped in educational, institutional and other buildings.

The Dover IVO-15 Elevator can be installed in a stairwell or a shaftway erected at the end of a building corridor, usually at less cost than any other method of adding elevator service.

It requires no machinery penthouse or deep excavation and imposes no vertical load on the existing building walls.

The Oildraulic® power unit and control system is the finest in the elevator industry, providing smooth, quiet travel, accurate floor leveling, and dependable operation. Both motor and oil reservoir are sized for economy and energy conservation.

The IVO-15 can be used in new buildings too, of course. And for taller buildings, other Dover Oildraulic and Traction Elevator models are available to assure you of quality vertical transportation. For more information write Dover Corporation, Elevator Division, Dept. B, P. O. Box 2177, Memphis, Tenn. 38101.

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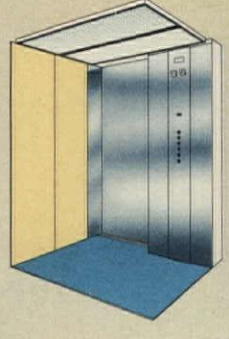


DOVER ELEVATORS

DOVER

Inside, there's the warmth and beauty of our traditional wood window.

For years, wood windows have been appreciated for their warmth. In appearance. And in their natural ability to provide good insulating properties. So when we developed the cladding system for our wood windows, we were very careful about leaving both of those qualities intact. Viewed from inside the building, all of the surfaces that were meant to be wood are still wood. The exterior aluminum skin is not visible anywhere on the inside of the window. And because the skin does not penetrate the frame or the sash (a), the insulating qualities of the wood are not disturbed.

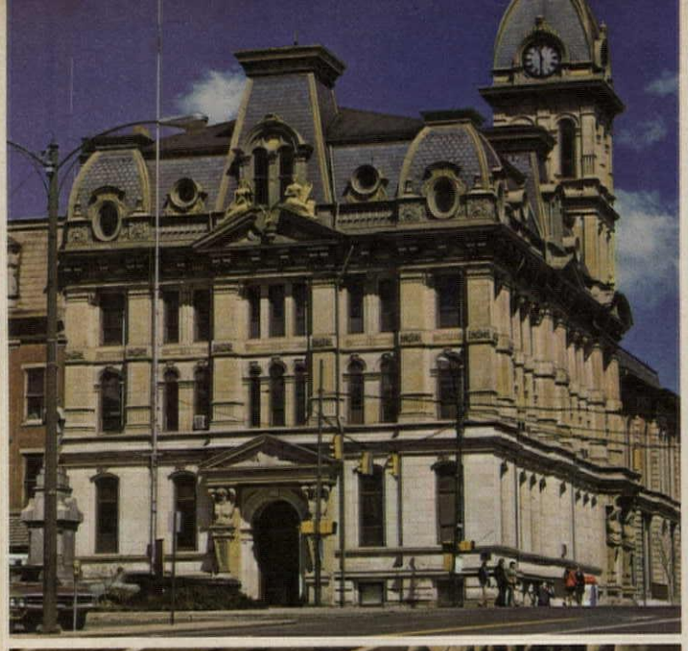
(a)

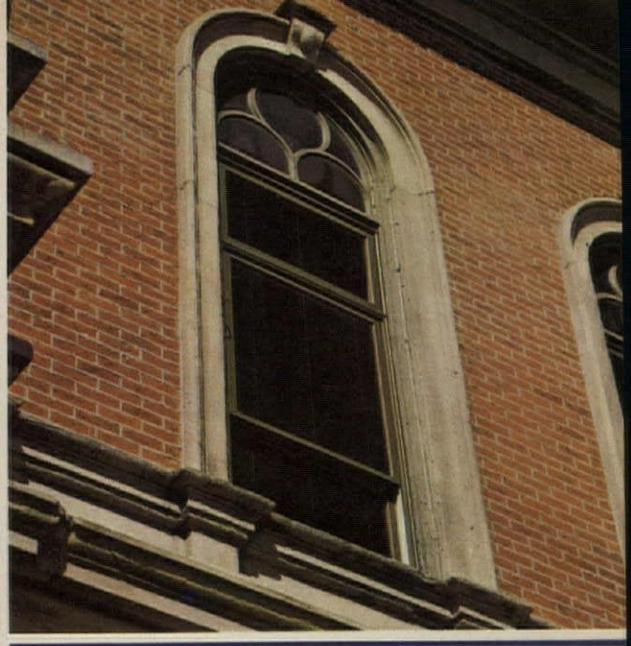
In between, a number of unique options for controlling the environment and associated costs.

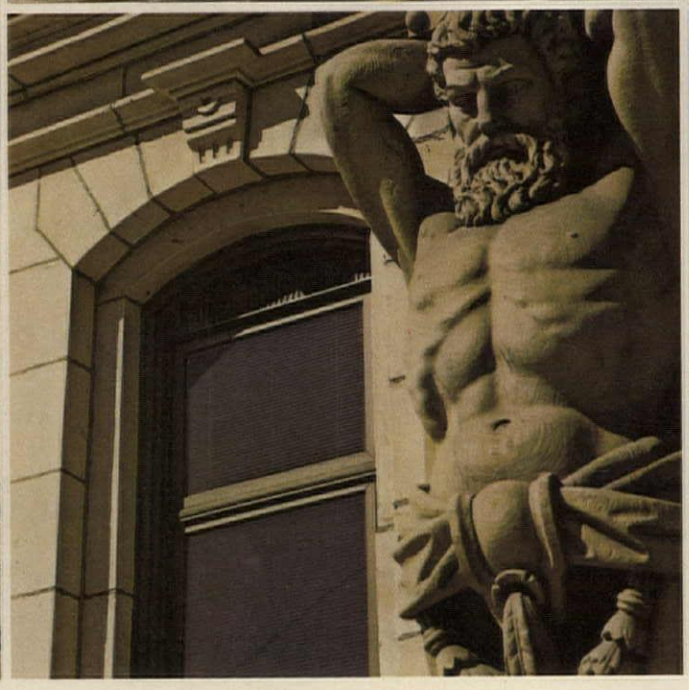
The removable inside storm panel in our optional Double Glazing System gives you a number of other valuable options. Like using our Slimshade® (b) to control sunlight, privacy and solar heat gain and loss. Housed between the panes, this fully adjustable blind remains virtually dust-free. The Double Glazing System also accommodates our snap-in muntins and privacy panels. But mere flexibility is not its only saving grace. The 13/16″ air space between the panes does a better job of insulating than ordinary welded insulating glass. And at a lower cost per window.

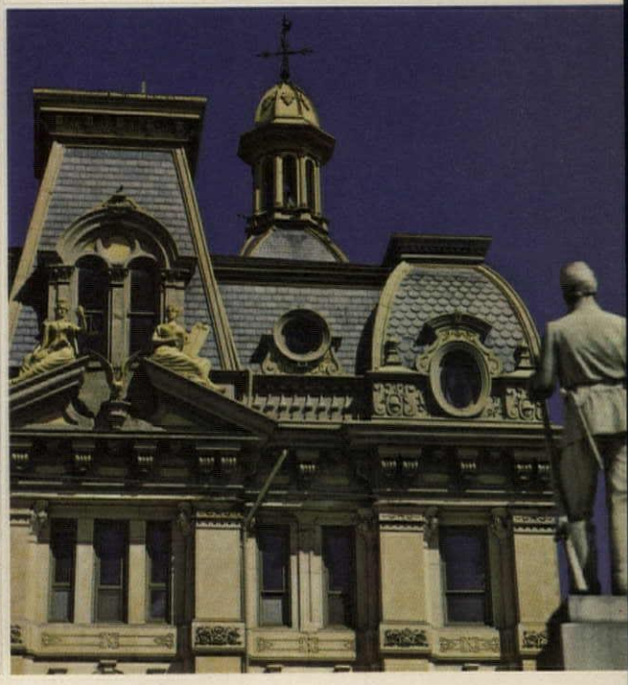
(b)

This Pella Clad window system combines modern convenience with traditional values, in the recently restored Wayne County Courthouse.









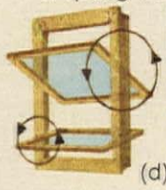
Outside, an acrylic coated aluminum finish that reduces maintenance without reducing your choice of colors.

In the Pella Clad window system, all exterior wood surfaces are sealed off from the weather and other atmospheric contaminants by an acrylic coated aluminum skin. An outside finish that has earned its reputation for durability. And one which is available on our Contemporary and Traditional Double-Hung, Casement, Awning, Fixed and Trapezoidal Windows, Pella Clad Frames, and Pella Sliding Glass Doors. In Dark Bronze, Dark Brown, White (c) and eight special colors. With sizes in each to accommodate a wide variety of design and building requirements.

(c)

Afterward, the ease and economy of washing the outside of a ventilating window from the inside.

Window cleaning is another maintenance factor which deserves consideration. And Pella Windows have something to offer in this area also. All of our ventilating units can be cleaned, easily, from the inside. The Pella Double-Hung Window has a spring-loaded, vinyl jamb liner which allows the sash to pivot fully. And because each sash pivots at its center point (d), the weight of the sash is counterbalanced. Which makes the job just that much easier. Reglazing can also be accomplished from the inside, along with sash removal. And the same thing is true of our casement and awning windows.



(d)

50TH YEAR

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First, it had to be tough enough to take 120 mph Colorado winds in stride.

And resilient enough to handle weather extremes from −30 to 120°F.

Foothills Fashion Mall, Fort Collins, Colorado

Architects: Flatlow-Moore-Bryan & Fairburn, Phoenix, Arizona

General Contractor: Ernest W. Hahn, Inc., Los Angeles, California

Installing Contractor: Colorado Partitions & Drywall Co., Fort Collins, Colorado

The panels had to be hinged for easy service, yet sealed tightly against weather, dust and insects.

And most important, they had to have superior diffusion and hiding power.

When architects Flatlow-Moore-Bryan & Fairburn designed the Foothills Fashion Mall in Fort Collins, Colorado, they turned to Wilson as the one company with enough savvy to solve such complex illuminated ceiling requirements.

Wilson's solution: an acrylic sandwich.

Wilson responded by designing and custom fabricating a special lighting louver inspired by aerospace sandwich structures.

Opal white acrylic sheet material was bonded to both sides of a half-inch thick white acrylic egg-crate louver.

The architects gave the new louver an exhaustive series of tests for durability, diffusion and hiding power.

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1975 National Convention American Institute of Architects Atlanta, GA, May 18–22

Theme: Space for the Species

Professional program highlights

Sunday, May 18		
	10am-4pm	Registration
	Noon	Alumni lunches, Reynolds lunch
Monday, May 19		
	9am-5pm	Registration
	10:30am	Opening ceremonies Keynote address: Heinz Von Foerster
	11:30am-2:30pm	Showcase of Design Ideas (see listing overleaf)
	3pm	Awards presentation
	6pm	Investiture of Fellows
Tuesday, May 19		
	9am	AIA business session
	10am-2:30pm	Showcase of Design Ideas (listing overleaf)
	2:30pm	Theme Workshop I: Cold Regions Research Collaboration Marketplace Workshops (see below)
	4:15pm	Theme Workshop II: Oxford Elderly Housing Project
Wednesday, May 21		
	9am-5pm	Registration open
	9am	Business session
	10am-2:30pm	Showcase of Design Ideas (see listing overleaf)
	2:30pm	Theme Workshop III: Milwaukee Dept. of City Development study Marketplace workshops (see below)
	4pm	Theme workshop IV: Columbia, Md., report American Plywood Association award
Thursday, May 22		
	9am	Balloting for Institute officers begins Theme wrap-up session
	10am-2:30pm	Showcase of Design Ideas (see listing overleaf)
	2:30pm	Marketplace workshops (see below)

Marketplace of New Ideas seminars and workshops

Tuesday, May 20		
	9:30am-5pm 2:30pm	How to get a federal contract Internship; Office brochures; Regional/Urban Design Assistance Teams; Joint ventures; Office production, profit and loss;
	4:15pm	Firm publicity; Corporate architects; Life cycle costing; Women in architecture; Fire-safe environment; Computerized financial management (for new users).
Wednesday, May 21		
	2:30pm	Energy conservation expertise; Masterspec updated; Improving earnings; Project costs; Planning for AIA effectiveness.
	4pm	Equal Employment Opportunity; Interview presentations; Adaptive re-use; Community Design Centers; Interior design; Computerized financial management (for existing users).
	8pm	Earthquake workshop.
Thursday, May 22		
	2:30pm	Construction market outlook; compensation for services; Architect as developer; Federal A–E selection; Design-build; New markets.

[Program continued overleaf]

Showcase of Design Ideas

Exhibitors	Booths
Addressograph Multigraph Corp., Bruning Div.	116, 117
Aluminum Company of America	80, 81
Amarlite/Anaconda Aluminum Company	63
American Olean Tile Company	127
Andersen Corporation	126
Art 3—Architectural Models	140
Bobrick Washroom Equipment, Inc.	5
W. R. Bonsal Company	98, 115
Carda Window Corporation	13, 14, 21, 22
Cold Spring Granite Company	110
Cushing & Company	109
Census Bureau	29
Dryvit System, Inc.	55, 60
Defense Civil Preparedness Agency	24
DeVac, Inc.	61
Dow Badische Company	64, 65
Eastman Kodak Company	100, 101, 102, 103
Electronic Flag Poles, Inc.	1
Eliason Easy Swing Door Division	45, 46
Factory Mutual System	2
F & D Wooden Signs	144
Federal Sign and Signal Corporation	143
The Feldman Company	41
Fixtures Manufacturing Corporation	20, 31
Follansbee Steel Corporation	7
Georgia Marble Company	83, 84
Gulistan Carpet Division	49, 50
Halsey Taylor Division	17, 18
HDW Houdaille	131
IDAC/Instant Data Access Control	119, 120
Jean Rosenthal Associates, Inc.	66
Johns-Manville	56, 57, 58, 59
Kaiser Aluminum	23, 32
Kawneer Company	9
Libbey-Owens-Ford Company	52, 53, 54
The Macton Corporation	8
McGraw-Hill Book Company	25, 26, 27
3M Company	12
Medusa Cement Company	28
Metalphoto Corporation	3
Metal Service Company, Inc.	135, 136
MM Systems Corporation	87
Modernfold, American Standard Co.	51
Moldcast Manufacturing Co.	111, 112
Monsanto Textiles Company	33, 34
National Asphalt Pavement Association	128
National Electrical Contractors Association	62
National Terrazzo & Mosaic Association Inc.	67
Pellerin Milnor Corporation	20
Pennwalt Corporation	90, 91
Permaloy Corporation	145
Plastic Binding, Inc.	99
PPG Industries	92, 93, 94
Puritan-Bennett Corporation	15, 16
Rapperswill Corporation	10
Red Cedar Shingle & Handsplit Shake Bureau	85
Resuscitation Laboratory	72, 73
Rinaldi and Associates, Limited	43
The Sanymetal Products Co., Inc.	4
Safelite Industries, Inc.	78, 79
Scott Plastics	141
The Shakertown Corporation	137
Stanley Hardware	19
Sterner Lighting Systems Inc.	146, 147
Symons Corporation	82
Vemco Corporation	107
Vecta Contract Company	37
Vermont Marble Company	95
VIP Waterproofing Systems	97
Wang Laboratories, Inc.	133, 134
Wood-Mosaic	6
Wood Industries, Limited	38
Xerox Corporation	104, 105, 106

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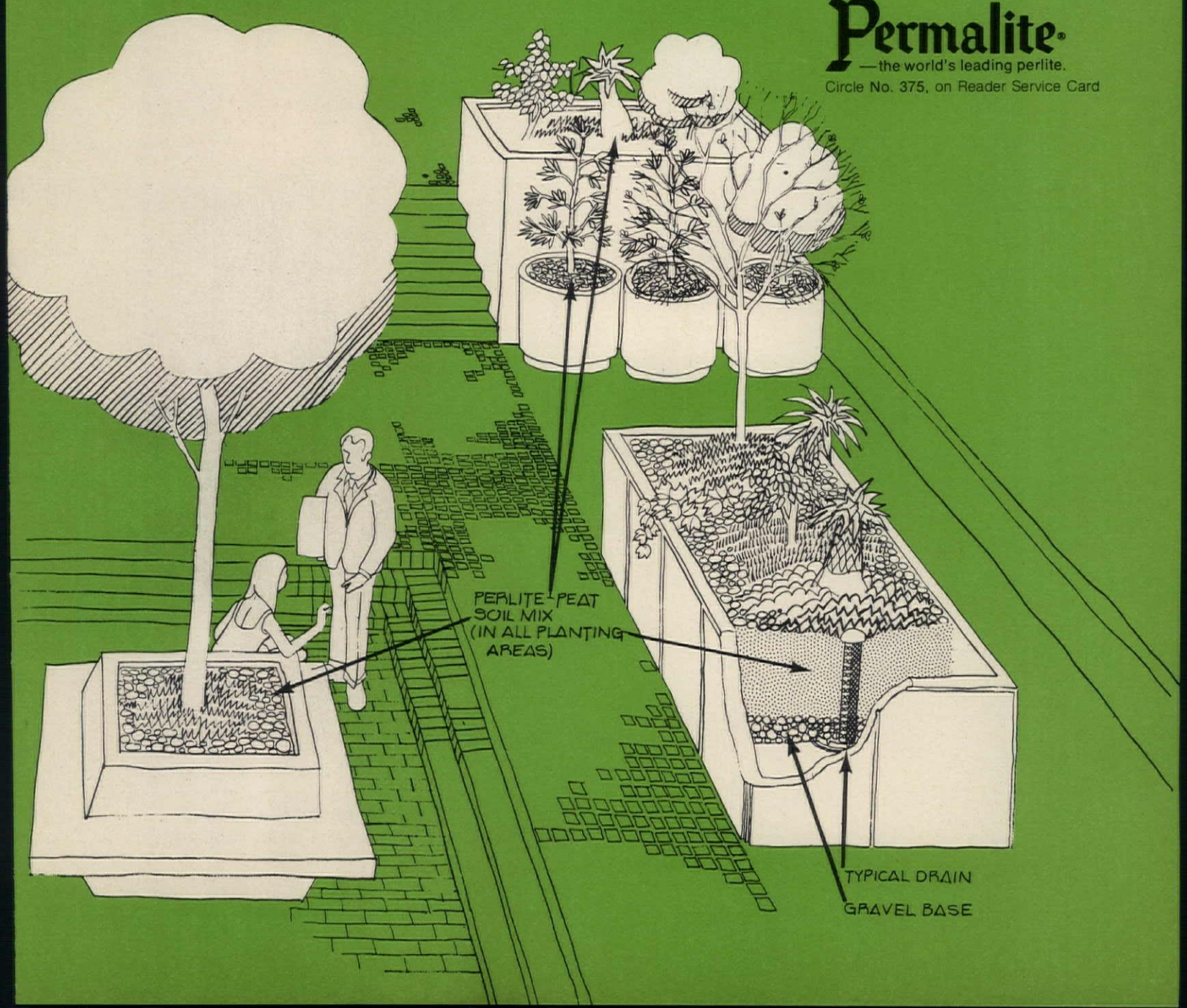

NONGLASS PANELS.

Left to right: Qasal, Facad, Glasweld. All panels shown are 4' x 8'.

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Practicing architecture in the U.S.S.R.

Bernard Tomson and Norman Coplan

Judge Tomson who recently visited the Soviet Union met with officials responsible for the planning and construction of building projects. His report indicates that the problems architects face are common to widely divergent types of societies.

"I met with Mr. Gennady Buldakov, Chief Architect of Leningrad and Chief of the Principal Department of Architecture and Planning of Leningrad. We were joined by Mr. Alexei D. Plushin, who is the head of State Architecture and Construction Control in Mr. Buldakov's department. There followed a very interesting and useful discussion, despite the difficulties attendant on the use of an interpreter.

"It would appear that every Soviet city has a master plan approved by the Council of Ministers of the U.S.S.R. There are provisions for green belts and zones and for areas zoned according to use. The master plan indicates what general projects would be acceptable in particular areas. City planning must accord with the master plan. Models of large projects were displayed on the walls of our conference room and were displayed in other areas in the building. Particular projects are planned and approved by the City Soviet. Perspectives, preliminaries and working drawings follow.

"Mr. Buldakov indicated that there has been considerable planning for apartment house construction. Parenthetically, it may be stated that this is obvious to every visitor. In each of the cities I visited, new apartment housing construction was evident everywhere. The size of each project was large, sometimes huge. The Soviets are particularly proud of the number of Soviet citizens that are reported as being relocated in these new apartments in large numbers each day, each week, and each month. Mr. Buldakov stated there was planning for industrial buildings which are being located outside the city proper.

"He stressed that particularly in the initial planning phase, the architect works with specialists in every related area. We seemed to agree that the architect was 'the captain of the ship.' Supervision is provided by the technical supervision control group, in this case, Mr. Plushin's agency, which has considerable power to control proper performance of the work. Among other powers that the agency has is the power to stop construction. It also has the power to award 'money damages,' a concept which at first blush would seem alien to a society where the state is the owner, the designer, and the contractor. This, however, becomes understandable when it is realized that as owner, the state is represented by one organization, planning by another body, and construction by a third.

"At the stage where in the U.S. the owner and contractor would enter into a contract for construction, the Soviet owner (the organization representing the state) enters into a contract with the construction agency (a state body). The contract in its purposes is quite similar to that to be found in other countries, including the U.S. It provides for the work to be done, the time of performance to the contracting agency (in *rubles*). There are premiums for successful and timely performance and penalties for late and inadequate or defective performance. The penalties and premiums are expressed in rubles, hence the reference previously made to 'money damages.' Although I have stated Mr. Plushin's department has the power to award premiums and impose penalties (and it seemed to me at one point it has final authority to do this), reference was made to the State Arbitration Commission which in some instances apparently would determine disputes between the construction agency, the principal architect and the owner agency.

"Mr. Buldakov and Mr. Plushin seemed well qualified for their important positions and duties. Mr. Plushin's educational background included graduation from the Leningrad Engineering and Construction Institute where he was prepared as an architect and construction engineer. It is also of interest to point out that the names of architects are constantly mentioned in the Soviet Union in connection with their work, whether the structures are 18th Century or modern. It appears obvious that the profession of architecture is held in high regard."

This column has had occasion to refer to the problems of architects in Mexico, England, Spain, Italy, Sweden, and Israel. Although they and the United States are capitalists societies and the U.S.S.R. is not, and although there are differences, undoubtedly major, between the way construction is planned and accomplished in the U.S.S.R., there are close parallels between the difficulties found in construction everywhere, including the U.S. and the U.S.S.R. □

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Energy services, literature and products

Professional and commercial aid in energy planning is offered from many sources; below, a partial list.

A departure from our regular "Products and literature" section, this month's focus will be on sources of information and services through which architects can design energy-effectiveness—so badly needed—into their next project. Through the help of the editors of two other IPC Reinhold and IPC publications—*Heating, Piping and Air Conditioning* and *Air Conditioning and Refrigeration Business*, P/A has assembled a list of leading businesses which stand ready to assist you in one facet or another of energy planning. It is not *the* definitive list. Nor does it attempt qualitative or quantitative ratings of the products/services available; due to the endless variables of problems to be solved, that analysis will have to be left with the reader and the listed companies, be they commercial, professional, or a combination. The salient points of each program, system, or products are listed, however.

For your convenience, we have provided a reader service card number for each item in the section, and inquiries will be forwarded to the appropriate firms. The companies involved have agreed to do their best to answer your questions, but in the interest of conserving *their* energies, P/A asks that your inquiries be serious ones.

The listings are in three categories:
1) Companies offering computer programs to assist in energy planning at the early design state.
2) Companies offering building control systems that monitor, and thereby conserve, energy.
3) Literature about products and services related to energy concerns.

Obviously, there is some overlap, since some companies are involved in more than one of the above. All are most effective at very early design phases, and operate to give an architect and his engineer guidelines to a more energy-efficient solution.

Computer programs

Companies offering computer programs have several things in common. All use as input hourly weather data from the Environmental Science Service Administration (U.S. Weather Bureau) or the National Climatic Center, based on accumulated records for a particular area. The number of available regional decks varies. All point out that the output of their programs, while very thorough and accurate, depends on the quality of input; most rest the responsibility on the design professional for that quality. Costs of these programs vary, however costs should be measured in terms of energy and dollars saved. One organization president suggests that, since the benefit accrues to the owner, he should bear the costs of the evaluations. All programs adhere to ASHRAE standards. Some of the organizations are:

American Gas Association—E-CUBE Program. Through Control Data, program accepts all sizes of computer, as long as it uses FORTRAN IV language and magnetic tapes. Projects estimated hourly, monthly, and annual energy requirements, using design point method to determine peak loading; analyzes equipment necessary to produce energy consumed; gives economic comparison to various energy systems. Access through 60 terminals.
Circle 201 on reader service card

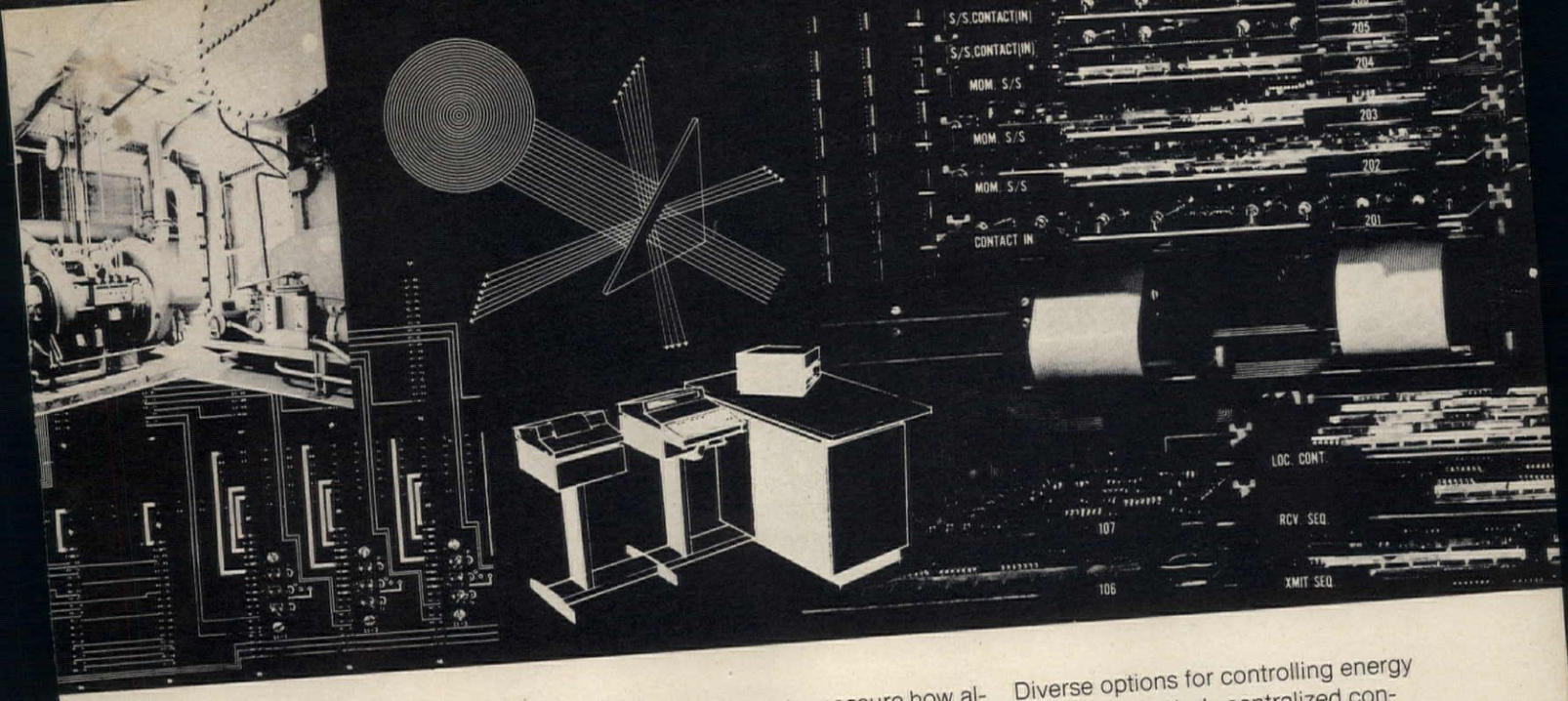
Edison Electric Institute—AXCESS Programs. Previously offered to investor-owned electric utilities, program access to architects and engineers on a broader basis will be available soon. Accepts hourly zone-by-zone loads derived from other programs or project engineer. Analyzes up to six separate alternate mechanical/electrical systems, and related energy supply costs; measures first cost differentials; computes maintenance and operating personnel costs. Finally, a separate program developed by Price Waterhouse and Co. produces financial analysis.
Circle 202 on reader service card

Envirodyne Energy Services—MACP programs. Working with Mellonics Information Center, Litton Systems, Inc., several MACP Programs of varying scope are offered. MACP–101 produces energy requirement calculations hour-by-hour; analyzes equipment selections for up to nine alternative systems; produces comparable utility billings, in dollars, and produces information that permits further study. MACP–301 is designed to do a complete analysis of financial implications of 101's findings. Also offered is MACP—201 and 202, for smaller scale buildings, using outside-computed heat gain and loss calculations.
Circle 203 on reader service card

Environmental Engineering Corporation. Offered either independent of the firm's engineering capabilities or in conjunction, EEC and its sister company, Computer Service, Inc., offer full line of computer services, including energy and load calculations. Programs written by computer-oriented design engineers can carry Projects from those calculations through evaluation of alternative design solutions to cost/benefit analyses and actual system design.
Circle 204 on reader service card

McDonnell Douglas Automation Company—MACE Program. The McDonnell Annual Consumption of Energy program—MACE—offers 1500 computers and data transmission devices in over 300 cities. The amount of detail and computer run time is flexible. At the option of the user, MACE can proceed from heating and cooling load circulations, through the choice of the most economical energy source and system, by way of building materials comparisons and annual-through-hourly period costs. Operating costs can then be developed if desired.
Circle 205 on reader service card

Mechanical Engineering Data Services, Inc.—MEDSI programs. Originated by Charles J.R. McClure and As-



sociates, Inc., MEDSI programs use United Computing Systems time sharing. Two simple coding forms and about 12 questions at a teletype make input easy. Unlike some programs, analysis uses model distribution throughout the building. Peak heating and cooling loads are calculated, and although all-hour data is not used for each run, a run time of 20 seconds and low cost per run make cost-effectiveness a feature. Models four systems, reheat, heat-cool-off, multizone or double duct, and variable volume. Another program, for internal source heat pumps, is also available.
Circle 206 on reader service card

Ross F. Meriwether and Associates, Inc. Although a two-program load calculation series is offered, most of this firm's work is with seven programs not intended to do design point load calculations, which would be supplied through the user. The programs, through University Computing Company (UCC), are: a data check; an energy requirement estimate; total coincident requirements; equipment energy consumption; monthly utility costs; and economic comparison of systems. Up to nine systems can be simulated, and financial predictions through cash flow are possible.
Circle 207 on reader service card

The Trane Company—TRACE program. Through McDonnell Douglas Automation (Mc Auto) TRACE operates by contract with users. Trane's 136 sales offices issue the contracts, initiating a program to measure how alternative systems effect cash flow and utility cost savings. Analyzing four alternatives and six possible combinations, the program embraces five phases: load, design, systems, equipment, and economics. Nine points are measured: energy type, equipment type, system type, amount of glass, type of glass, lighting intensity, orientation, amount of insulation, and amount of ventilation. The program now offers "one-day" TRACE.
Circle 208 on reader service card

Another program, not yet operational, is being evolved from a U.S. Postal Facilities model. NASA has been expanding the limited scope of the earlier effort, emphasizing the response factor technique. It will probably be run under contract with the University of Georgia, and should be operational about July.

Energy-monitoring controls

System for overseeing all factions of a building's operation controls all mechanical operations relating to comfort, lighting, routine and preventative maintenance, and, therefore, energy costs. Other concerns, such as building security and life safety are additional features of ECON IV. Starts up and shuts down equipment, monitors and regulates temperatures and pressures, and advises of energy-wasting mechanical efficiencies. Another division produces variable air volume systems for energy conservation. Barber-Colman Co.
Circle 209 on reader service card

Diverse options for controlling energy in buildings include centralized console on site time-shared external monitoring and control, and complete custom control system services. Delta 2000 console directs equipment on-off times for maximum economy, controls lighting, monitors electricity usage and forecasts demand peaks and automatically sheds low priority loads to avoid new peaks. Also surveys mechanical "problem signs," temperatures, alarm circuits, and access control. Building operation services system (BOSS) is a time-shared building control network linked to central computers via leased telephone lines. Other service arrangements are available, as are numerous individual control products. Honeywell.
Circle 210 on reader service card

System 570, a highly sophisticated monitoring, reporting, and controlling computer tool for building managers, is flexible in design, evolving with changing user requirements. It can take advantage of constant advances in building management methods without major revamping and funding. Ease of upward expansion as well as horizontal modularity of its foremost design considerations virtually eliminates penalties of obsolescence. The three basic series, the Series 100, Series 200, and Series 300, assure owners of matching a system to their needs. The smaller building owner is not "locked" into a system because all three Powers 570 systems employ identical and interchangeable field equipment, wiring
[continued on page 104]

Continued from page 103

methods, sensors and digital telemetry techniques—at a cost-per-function for any budget. The nature of all three System 570 series lends itself to comprehensive energy management and conservation, whether in heating, cooling, power demand limiting, or other requirements. Powers Regulator Co.
Circle 211 on reader service card

Energy conservation systems are provided, ranging from the simple load shedding device through total computerized building automation systems for complete optimization. The JC/80 system incorporates a computer designed and built for building automation and includes off-the-shelf software for programmed stop/start load shed and other energy conservation approaches. Individual devices include the N–9000 Enthalpy Logic Center, a prepackaged logic network designed to choose the most economical airstream for system cooling, and the C–7500 optimal start programmer which uses a cam to follow the start-time-versus-outdoor-temperature curve for a typical building. Johnson Controls.
Circle 212 on reader service card

Three comprehensive options, a digital management system (DMS 2400) and a matrix logic system (MLS 400), plus combinations of the two, offer virtually any degree of building control. Can direct all aspects of mechanical/electrical operation and also are capable of fire safety and security control. Modular components facilitate expansion and multi-unit to multi-building linkups. Computer automation analyzes loads, zone heat changes related to outside operating schedules, ways to avoid peak load rates, outside air intake based on conditions and occupancy, etc. Unit display option gives operating status of entire unit in clear terms, while simultaneously showing labeled schematic diagram of the unit. All models can include closed circuit tv. Backup central manual control in case of electronic failure. Complete line of individual control components and services is available. Robertshaw Controls Company.
Circle 213 on reader service card

System/7 Power Management System can be used to reduce the consumption of energy in a variety of businesses ranging from warehouses and shopping centers to manufacturing facilities and hotels. The amount of money saved by an industry using the System/7 depends on a number of factors, including the type of facility, climate, geographical area, wind direction, direct sunlight, etc. A variety of industries are already realizing savings of 10-20 percent and, in many cases, considerably more. One of the keys to IBM's power management is in both reducing the power consumed and the power demand peaks. When a business establishes the power demand levels within which it wants to stay, the System/7 becomes a 24-hour-a-day operator, monitoring and controlling energy-consuming equipment. Air-conditioning, heating, lighting and ventilation devices are examples of the kind of equipment the System/7 is most commonly used to regulate. Cutting back on energy-consuming fixtures is done without an inconvenience to employees or customers. IBM Corp.
Circle 214 on reader service card
[continued on page 106]

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Continued from page 106

Building envelope

Insulation performance of brick walls is explained in pamphlet *Walls to Save Energy,* which takes up thermal time lag as a factor too often overlooked in conventional U value calculations. All relevant factors are given for two dozen possible masonry wall sections. Brick Institute of America.
Circle 222 on reader service card

Cost and thermal performance for masonry walls is discussed in booklet *Walls to Save Dollars* addressed to both owners and design professionals. Other bulletins take up the subtle points of heat transfer calculations that seem to favor masonry over lighter building envelopes. International Masonry Institute.
Circle 223 on reader service card

Insulating skylights and translucent walls using Kalwall and Permakal systems are described in brochures covering specifications, details, thermal and light transmission factors for a variety of products described by the manufacturer as having "insulating properties many times greater than any other light transmitting material." Kalwall Corporation.
Circle 224 on reader service card

Glass

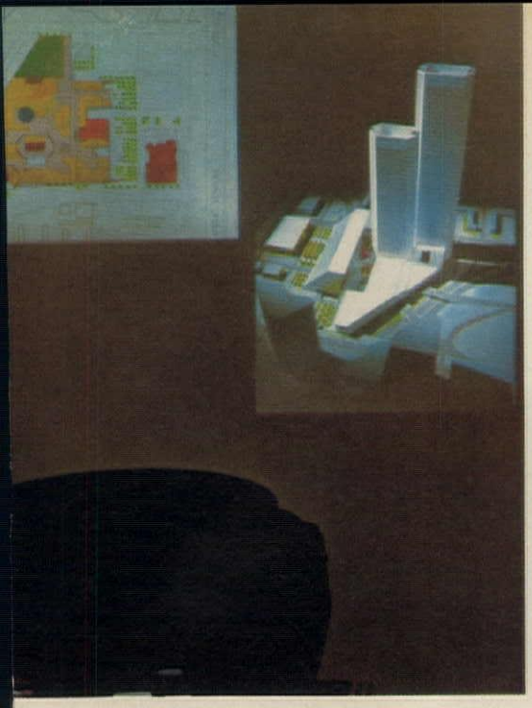
Energy saving glass. Gray or bronze tinted heat absorbing plate glass and Tru-Therm insulating glass are illustrated in four-color brochure. Given are guides to specifying and glazing and data charts. ASG Industries, Inc.
Circle 225 on reader service card

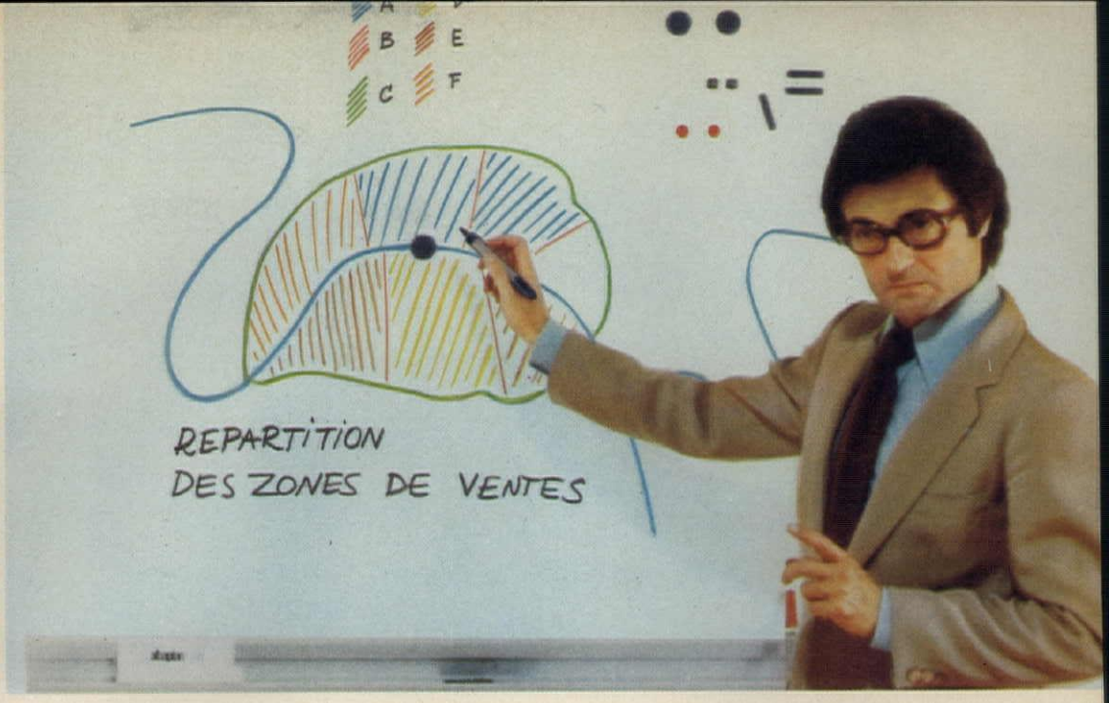
Guidelines to glass selection are provided in a booklet called "Energy-Effective Windows for Cost Savings and Conservation." It describes the performance and other characteristics of insulating, reflective, and reflective insulating glass units for windows and doors, discusses reflective glasses for the residential market and solar collectors. Charts indicate how selection of high-performance glass can help an architect design an energy-efficient building and retain the benefits of large vision areas. Discusses life-cycle costing, energy-cost, analysis, and building energy budgets. PPG Industries.
Circle 226 on reader service card

Environmental glass brochure from the architectural division of Shatterproof gives details on a wide variety of reflective and insulating glass, as well as glass for security and sound control. Shatterproof Glass Corp.
Circle 227 on reader service card

Glass and glazing catalog gives performance data on insulating and reflective glazing, Polarpane sun control units with internal venetian blinds, sound control units, and insulated spandrel panels. C-E Glass.
Circle 228 on reader service card

Glass for Construction booklet offers data on a wide range of L-O-F glass products, including reflective glass, Thermopane insulating glass, tempered glass, and combinations of the above, as well as insulated spandrel panels. The company is also offering
[continued on page 112]





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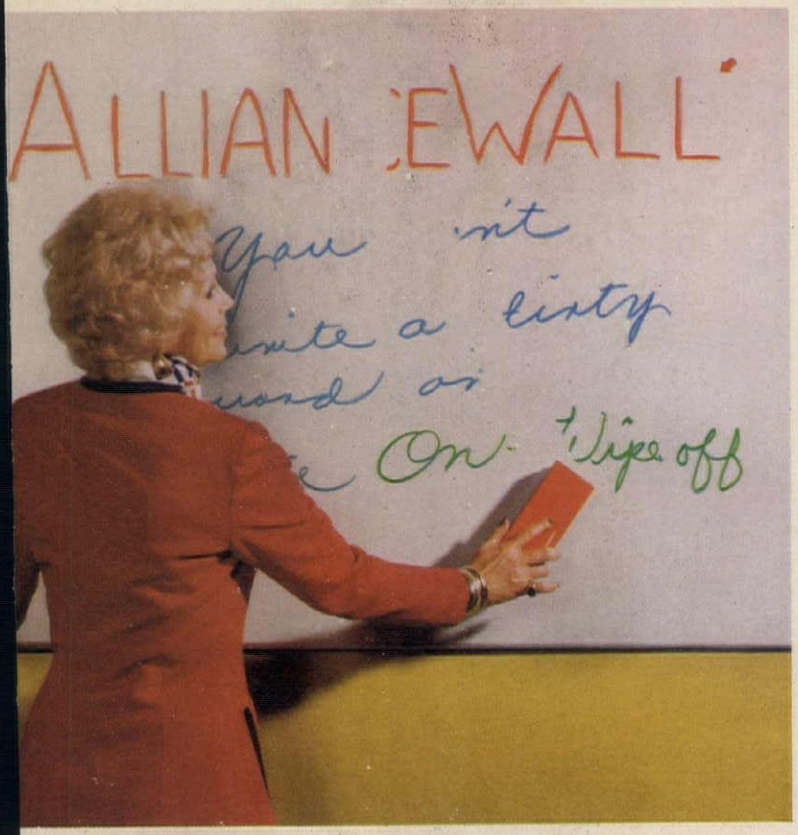

Specially treated porcelain-on-steel panels and dry marker pens are combined to create a completely dustless writing system. Writing dries instantly and can be erased with a dry cloth or felt eraser. Laminated to low-cost gypsum board, the Rite-On, Wipe-Off panels are fire-proof, inexpensive to install and maintenance free. Floor-to-ceiling length or framed panels come in 50 decorator colors. Lighter shades make excellent projection screens. Panels also double as bulletin boards when used with miniature magnets. Boards can be used with any partition system. No special lighting system is required. Writing surface is guaranteed for 50 years.

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BUILDING PRODUCTS

Products continued from page 108

(at $5 each) an updated version of its Sun Angle Calculator Kit. Libbey-Owens-Ford Company.
Circle 229 on reader service card

Replacement windows. Illustrated product sheet describes features and explains appearance, comfort, savings, and convenience possible with Model 505 unit. Window can be installed from inside of building with no structural alteration needed, and can reduce energy losses, states maker. Season-All Industries, Inc.
Circle 230 on reader service card

Windows. Prime/storm combination aluminum residential windows feature interior storm, exterior prime and screen sash, unitized by a frame with high performance vinyl thermal break. A large 2½ in. insulating air space between prime and storm sash, snap-on trim, tilting interior storm sash, and operating exterior prime sash are features. Literature is available from Capitol Products Corporation.
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Lighting

Lighting fixtures. A reflector system which makes it possible to transmit controlled light from source at distances in excess of 125 ft. Fixtures using the reflector design are available for 35w, 55w, 90w, and 180w Low Pressure Sodium lamps. Lamp emits no ultraviolet and is non-insect attracting. Literature is available. Sepco Lighting Div., Connecticut International Corp.
Circle 232 on reader service card

Versaglow luminaire. Designed for relighting using existing lighting circuits in surface- or pendant-mounted applications. Converting from incandescent or fluorescent fixtures to the 150 or 250 w Lucalox lamps reduces energy consumption, states maker. Brochure. General Electric Co.
Circle 233 on reader service card

Other

Powered attic space ventilators. Selecting the right unit by standards to certified performance ratings and ventilation rates can ease air conditioning load and save energy, according to literature available from the Home Ventilating Institute.
Circle 234 on reader service card

Steam generators. Eight-page publication discusses the fuel saving characteristics of steam generators, provides detailed technical and practical information pertaining to fuel consumption and fuel conservation. Presentation includes a description and schematic flow diagram of company's semi-closed system, includes a summary of potential fuel savings under normal operating conditions, efficiency comparison charts illustrate the factual data. Clayton Manufacturing Company.
Circle 235 on reader service card

Computerized start-up control monitors outside air temperature and wind velocity. Using this information it computes the optimum start-up time so that the building's normal "day" temperature is reached coincident with occupancy. N-R-G Saver 1 eliminates unnecessary heating during unoccupied night-time hours. Brochure. Powers Regulators Company.
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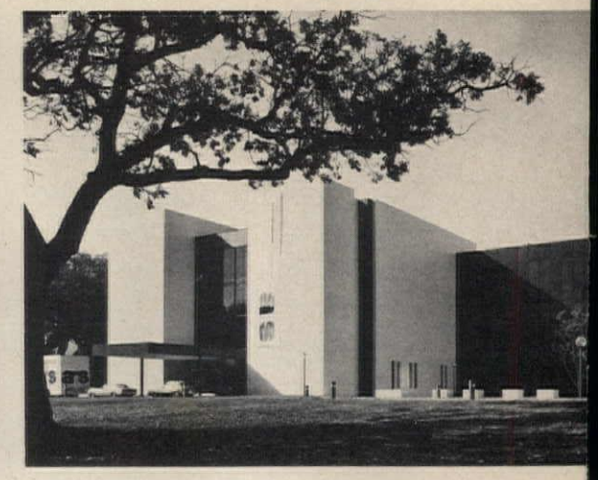
Bally

Views continued from page 11

Photos: Warren Reynolds

East wing corner and main entrance



Central space and west wing addition

The recent P/A article initialed by JMD on the new Sarah Scaife Gallery in Pittsburgh (Mar. 1975 P/A, p. 26) is about a project which involved a sizable addition to a turn-of-the-century Beaux-Arts building. The article in the same issue by Suzanne Stephens on the new Fine Arts Park in Minneapolis is about a project which involved, in part, a sizable addition to an early 20th-century Beaux-Arts building. There the similarity between the two articles ends.

JMD gives a concise summary of the building program and factual information about the specific architectural solution. Stephens on the other hand gives us a discursive collection of speculations about a design that might have been, and she also gives us airily condescending opinions about the buildings, about architectural preservation, and about the general competency of the project architects. She does not give any evidence of being aware of a very complicated building program for the entire complex of buildings which constitutes the Fine Arts Park. It actually called for far more than the mere devising of a picturesque arts village—whatever image of architectural forms that entails—which she inexplicably feels would have been the ideal design solution. Nor does she even allude to the exhaustive procedure followed by the Minneapolis Society of Fine Arts in selecting the project architects, Kenzo Tange of Tokyo and Parker Klein Associates of Minneapolis. In fact, the core of her negative reaction seems to be that these particular architects were bound to fail, or "miss" to use her word, because neither was, at the time of selection, as familiar with the sociological background of the project as another Minneapolis firm then apparently was. I think that the significant point is not who did *not* get the job, but rather the kind of architecture that was realized by the architects who did get the job.

As an architectural historian reasonably familiar with the project, I am exasperated in about equal measure by what Stephens says and by the manner in which she says it. For example, on general principle she castigates the architects for relocating the main entrance to the Minneapolis Institute of Arts at street level in the new east wing. That there were compelling reasons to do so is ignored. The new entrance is located significantly closer to the new parking ramp than the museum's old north entrance. Parking and the new entrance now serve both the new restaurant and the new children's theater as well as the older expanded museum, and both theater and restaurant are open at all kinds of odd hours that the museum is not. Actually there always was a street level entrance on that east side of the Institute, an unceremonial and unobtrusive side door which the public could and did use. Years ago, I, for one, began using it during the winter rather than stumble up and down the admittedly grand but often treacherous Beaux-Arts steps of the main north entrance. (As I write this on March 24, officially Spring, the blizzard visible from my study window is expected to deposit seven inches of new snow on our winter-weary area. In less extremely inclement weather, I would be happy to step directly from my car to shelter now available at that end of the trip.)

Stephens also says that the central open space between the major new buildings "performs no real function." Wrong again. In good weather, which we do have here sometimes, it will be used as an outdoor classroom and also as an outdoor staging area for various public events.

There is a great deal more that I object to in the article which on the whole strikes me as being relatively long on opinion and short on fact when it comes to analyzing the buildings. I recognize that this project, like all others, has controversial points as well as obvious good ones. Therefore I would like to suggest that someone else be sent here, after May and before November, to take another look at the buildings constituting the Fine Arts Park. A major project by a world-renowned architect working closely with a respected local firm surely deserves more objective critical treatment than this breezy dismissal by a would-be Ada Louise Huxtable.

Eileen Michels
St. Paul

Despite the allegation of breeziness, the article represents the distillation of a very complex sequence of events from programming to construction of a major building. The discussions of fast-tracking and space planning, for instance, clearly indicate the arduousness of the process.

All the facts in the world would not hide the fact that the complex is architecturally mediocre and urbanistically deadening. This conclusion is confirmed by two other P/A editors who have visited the site since I did (and I even saw it in good weather). As much as we admire Tange's previous work, we were disappointed with results here.

As for some particular points of Ms. Michel's letter, she misinterpreted my comment on the arts village. I was not advocating a village, but referring to the intention stated in publicity releases. I am glad that the empty "village" green will be used sometimes in good weather. As for the entrance, I think an entrance façade ought to have a workable entrance, bad weather entrances notwithstanding. I bet McKim, Mead & White think so too.
[Suzanne Stephens]

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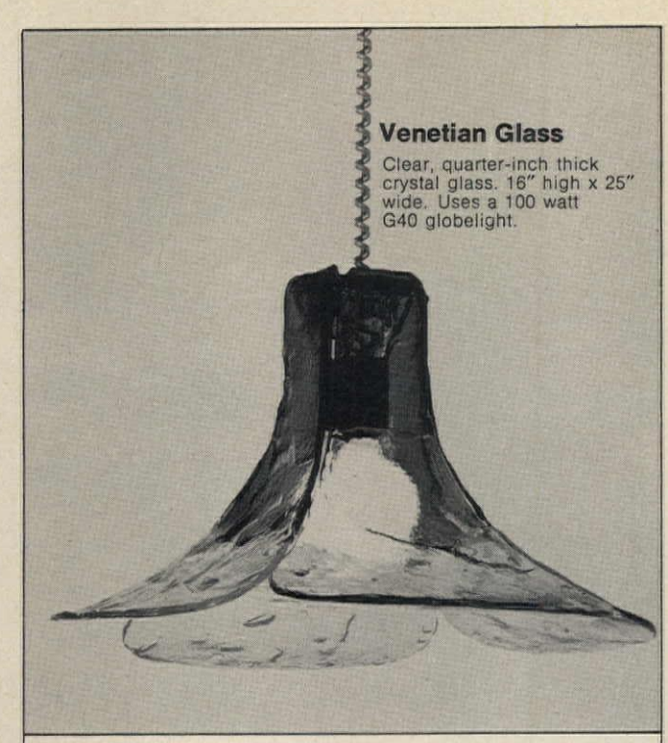

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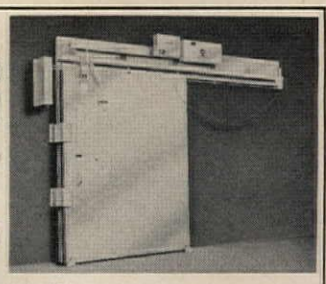

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Gruen's Vienna

Centers for the Urban Environment: Survival of the Cities *by Victor Gruen. New York, Van Nostrand Reinhold Company, 1973, illus., 266 pp., $24.95.*

Reviewed by Fran P. Hosken, an architect specializing in urban planning and development, and author of The Language of Cities *and* The Function of Cities.

There is little doubt in my mind that Victor Gruen is *the* man who deserves most of the credit for the development of the "Pedestrian Mall." To put it another way, he has contributed more than any other person to the enjoyment of millions of people in and of cities all over the world. For this he should have the thanks of all urbanists.

Beyond that he has forced all those who are actively concerned with cities, from mayors to planners, including bankers and businessmen, to re-assess the situation from quite a basic and human point of view. And Victor Gruen's long standing efforts, his persuasiveness, and above all his outstanding work all over the world, have born fruit. This is handsomely documented in his new book, *Centers for the Urban Environment,* published in 1973 just in time for Gruen's 70th birthday.

Gruen's international office is located in Vienna, the city where he was born and grew up. After retiring from his U.S. firm, Victor Gruen Associates, which he headed and successfully managed for many years and which continues to flourish in Los Angeles, Gruen has settled again in Vienna. This enables him to keep a watchful eye on the development of "his" city, which is going through the traumatic experience of building a subway after a history of nearly 2000 years, and to be close to his activities all over Europe.

Centers for the Urban Environment was prepared with the help of the Victor Gruen Foundation for Environment Planning, which Gruen created to be able to continue systematic research about inner city center and pedestrian mall development, and to support a host of activities including conferences, meetings, etc. In this book much of Gruen's pioneering work both as a thinker and doer—a rare combination—is documented, including many of his shopping centers in the U.S. Known as the father of the suburban shopping center and shopping mall development, Gruen in this book documents the history of this most successful form of "doing business by pleasing people" in which he took such a decisive part: always putting people first. As a comprehensive analysis of the modern shopping center by one of its principal creators, *Centers for the Urban Environment* deserves a special place.

The importance of Gruen's work, however, can only be measured in the reality of the cities to which Gruen has contributed so much. The book holds a wealth of information on urban centers of all kinds: the areas where people meet, work, shop, and find recreation in our contemporary environment. As social gathering places, these centers of and for urban living become enormously important. Their planning and design take on not only economic but indeed great social importance. The final chapter draws some conclusions from the rest of the book and presents some case studies of planning projects by way of illustrating a new approach, including plans of some new towns.

The City Center Plan of Vienna is shown in the book as one of the examples to document Gruen's approach to preserving historic center-cities by creating pedestrian areas and removing cars. Vienna furnishes an excellent example by its configuration. Today's business center is identical with the original historic city inside the medieval walls. The Ring, a broad tree-planted avenue, occupies the space where until 1848 huge fortifications protected the city proper. Victor Gruen's proposal to the city is to eliminate all private car traffic from this center, to make the main thoroughfares into pedestrian islands with cafes, planting, benches and all kinds of recreation. Large underground garages are planned under the surrounding Ring. Truck's will service shops through side streets, mostly at night.

A subway has been under construction in Vienna since the early 1970s and is due to be opened shortly with the first station in the center of the city. This will enable people to travel from the suburbs directly to the center of town. In addition, small passenger cars have been specially developed and built by Steyr, Daimler, Puch A.G., the Austrian car manufacturing and industrial firm. These vehicles, powered by liquid gas and entirely pollution free, are already being used on an experimental basis. They provide continuous service throughout the traffic-free city core.

This plan for Vienna, thoroughly illustrated and detailed, is the most far reaching proposal for the preservation of a historic city that Gruen has made.

The plan for Vienna is also the most important statement of Gruen's own development. I remember Gruen's first presentation of the Fort Worth Plan at the Harvard Graduate School of Design. In the plan, for the first time, all car traffic was diverted around the CBD, returning the streets to the people. At the time (in the mid-1940s) this truly innovative idea opened up a professional discussion which continues to the present day.

Gruen's ideas have enjoyed great economic success, that is, business has found his concepts highly profitable. His idea of the pedestrian shopping mall is now used all over the world. But, as Victor Gruen often states, the business leaders and politicians, unfortunately, are too timid and often implement plans only partially or piecemeal. The city of Vienna, instead of embracing Gruen's most innovative comprehensive plan, is settling for partial implementation. And as Gruen told me, that may well be the doom of its success. It was in the case of Fort Worth, as the city fathers learned, unfortunately, too late.

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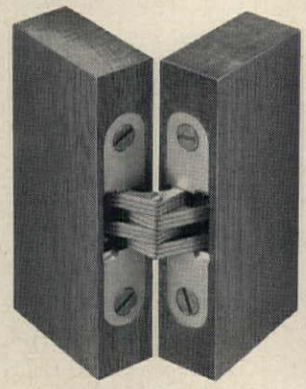
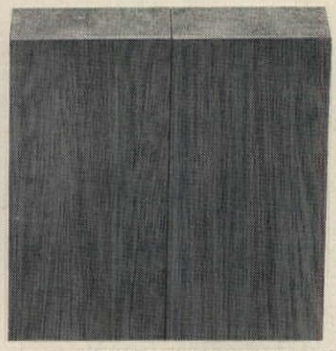


NOW YOU SEE IT



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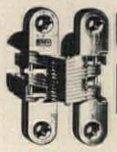

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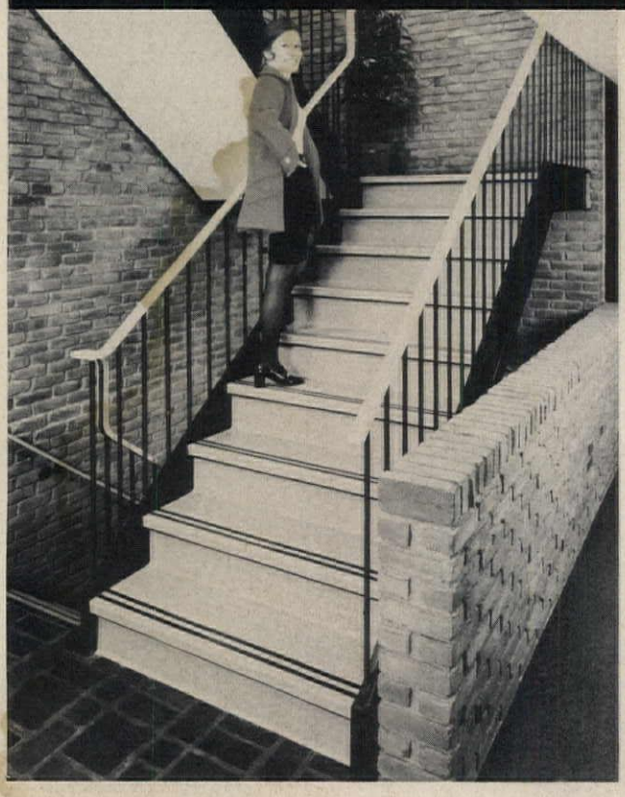
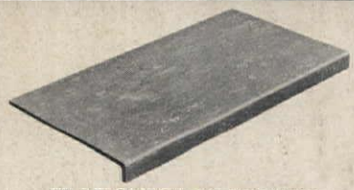
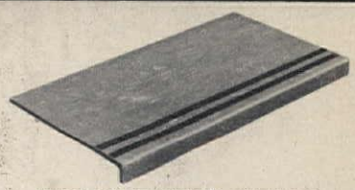




FLAT SURFACE TREADS – for typical interior stairs. Put more rubber in direct contact with shoe soles for more traction, better underfoot safety . . . with no cracks or crevices to hold dust or catch heels.



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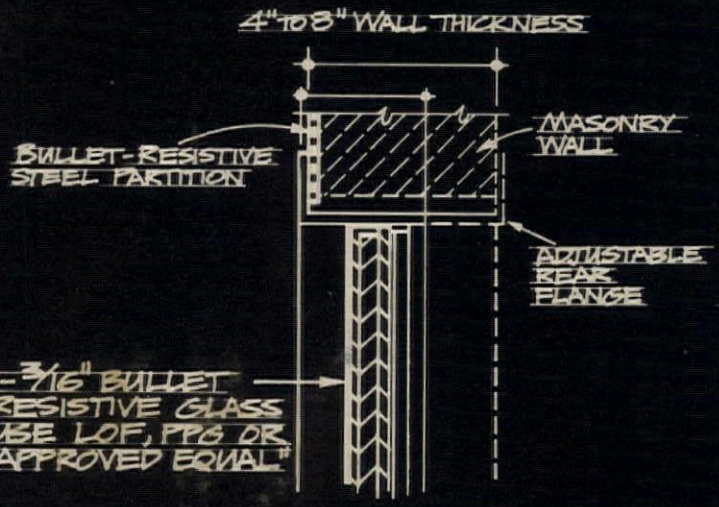

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Notices

Appointments

Bruce Johnson has been named a participating associate of Skidmore, Owings & Merrill, Portland, Ore.

Walter Padgalskas and **Emmanuel Aguilera** have joined Gin Wong Associates, Los Angeles, California, as project architects.

Ronald T. Cannamore has joined Ellerbe, Bloomington, Minn., as associate director of medical facilities architecture.

Hansen Lind Meyer, Iowa City, has appointed the following associates: **John Pattinson, James M. Cook, Brian P. Gutheinz, ASLA, Charles M. Engberg,** and **Dale Johnson.**

Edward R. Jones, Jr., AIA has been named vice president and general manager of the Los Angeles office of Charles Luckman Associates.

Jim Orzechowski was made a partner of Smith Carter Partners, Winnipeg, Manitoba, Canada.

David B. McBrayer has joined Dalton Dalton Little Newport, Cleveland, Ohio, as associate and transportation project manager.

Richard E. Hunter, RA has been named head of the architectural division of Boyd C. Wagner, Inc., Architects/Engineers, Reading, Pa.

Matthew L. Rue, AIA has joined Tatler Rue Associates, Architects, formerly Neubeck & Tatler, as principal. **William J. Metzger** has been named an associate of the Trenton, N.J. firm.

Constantin V. Micuda, AIA has been elected executive vice president, and **Charles A. Johnston** has been named vice president of O'Dell, Hewlett & Luckenbach, Inc., Birmingham, Michigan.

Richard Magee, AIA has joined Charles Kober Associates, Los Angeles, as an executive architect.

Alex Weinstein, AIA has been named a principal of Haines, Jones, Farrell, White & Gima, Honolulu, Hawaii.

Ben H. Jeanes, AIA has been made a partner in Kirk, Voich & Jeanes Architect-Engineer, Fort Worth, Tex.

[continued on page 130]

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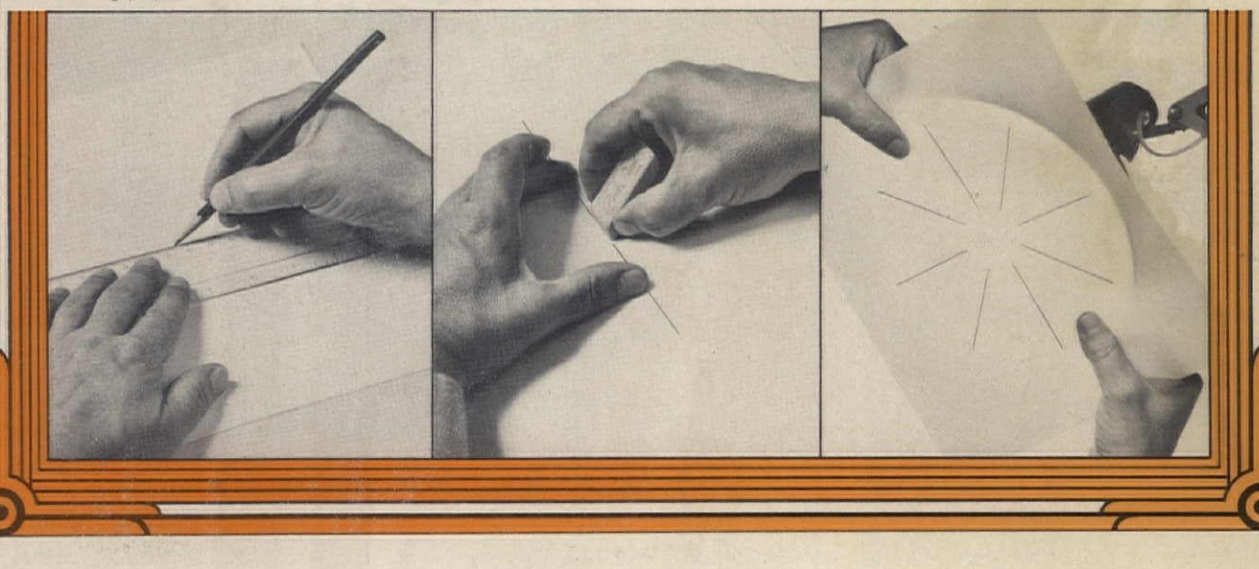


IF YOU'RE PLANNING A BUILDING, AMERICA'S ENERGY CRISIS JUST HAVE BECOME YOUR BIGGEST

3

Here's an actual case study of a proposed building:

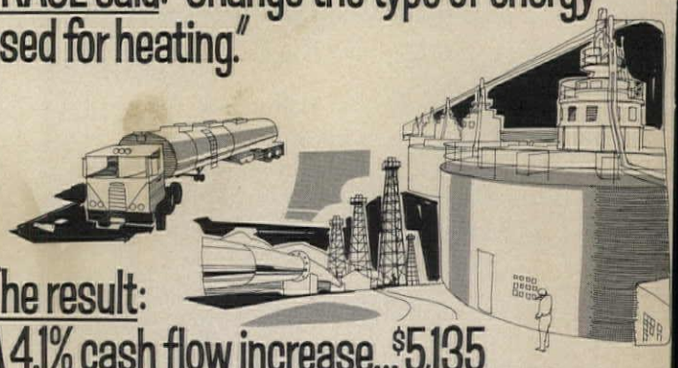
ORIGINAL DESIGN:

- 20 story building
- 300,000 sq. ft.
- 1st year cash flow - $125,675
- Gas and electric energy
- Absorption water chiller
- Double duct air conditioning system
- 50% Glass
- Insulated clear glass
- 4 watts/sq. ft. lighting intensity
- East/West primary exposures
- 3" Insulation
- 18 CFM/person ventilation

A TRACE analysis showed the effect the following alternatives have on cash flow*

*Cash flow values apply only to this study.

TRACE said: "Change the type of energy used for heating."



The result:
A 4.1% cash flow increase... $5,135

7

TRACE said: "Change from clear glass to reflective glass."

The result:
A 12.1% cash flow increase... $15,221

TRACE said: "Change the amount of glass from 50% to 20% and reduce energy cost."

The result:
A 13.5% cash flow increase... $16,932

11

TRACE said: "Increase insulation by 3" and reduce energy cost."

The result: A 2.7% cash flow increase... $3,395

TRACE said: "Decrease intake of outside air from 18 cfm/person to code... 7.5 cfm/person"

The result:
A 1.6% cash flow increase... $2,061

1

MAY PROBLEM...

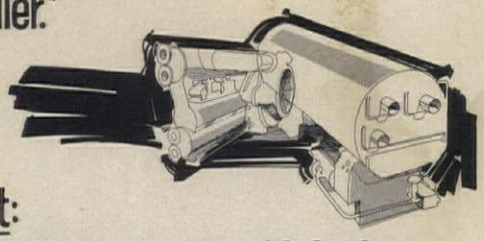
2

But there's a new computerized analysis program from Trane that can help you. It's called TRACE *...Trane Air Conditioning Economics.*

Before you design your next building TRACE can evaluate thousands of design variables that can effect energy consumption and building cash flow.

5

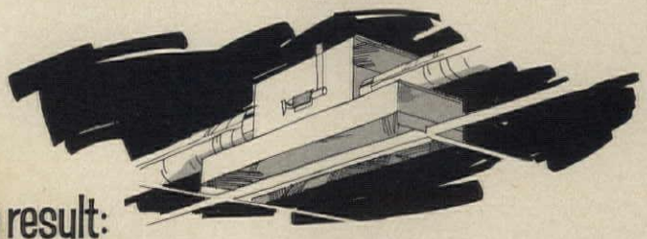
TRACE said: "In this case change from an absorption water chiller to a centrifugal water chiller."



The result:
A 1.9% cash flow increase... $2,343

6

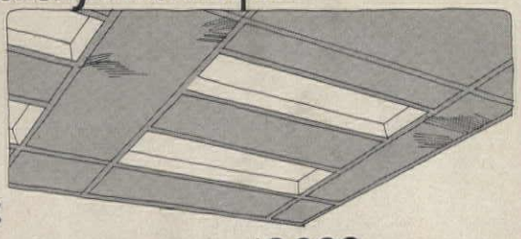
TRACE said: "Change from a double duct to a variable air volume system."



The result:
A 9.1% cash flow increase... $11,449

9

TRACE said: "Consider decreasing the lighting intensity 1 watt/sq.ft."



The result:
A 7.2% cash flow increase... $9,089

10

TRACE said: "Rotate the building by 90° to change solar exposure."

The result:
A 3.8% cash flow increase... $4,805

13

In this case study...

The total net increase in cash flow was $45,874 or an increase of 36.4%.

An annual utility cost savings of $63,354... Based on current rates.

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