AIA JOURNAL

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Northern Federal Building, St. Paul, Minnesota. Owner: Yorktown Investment

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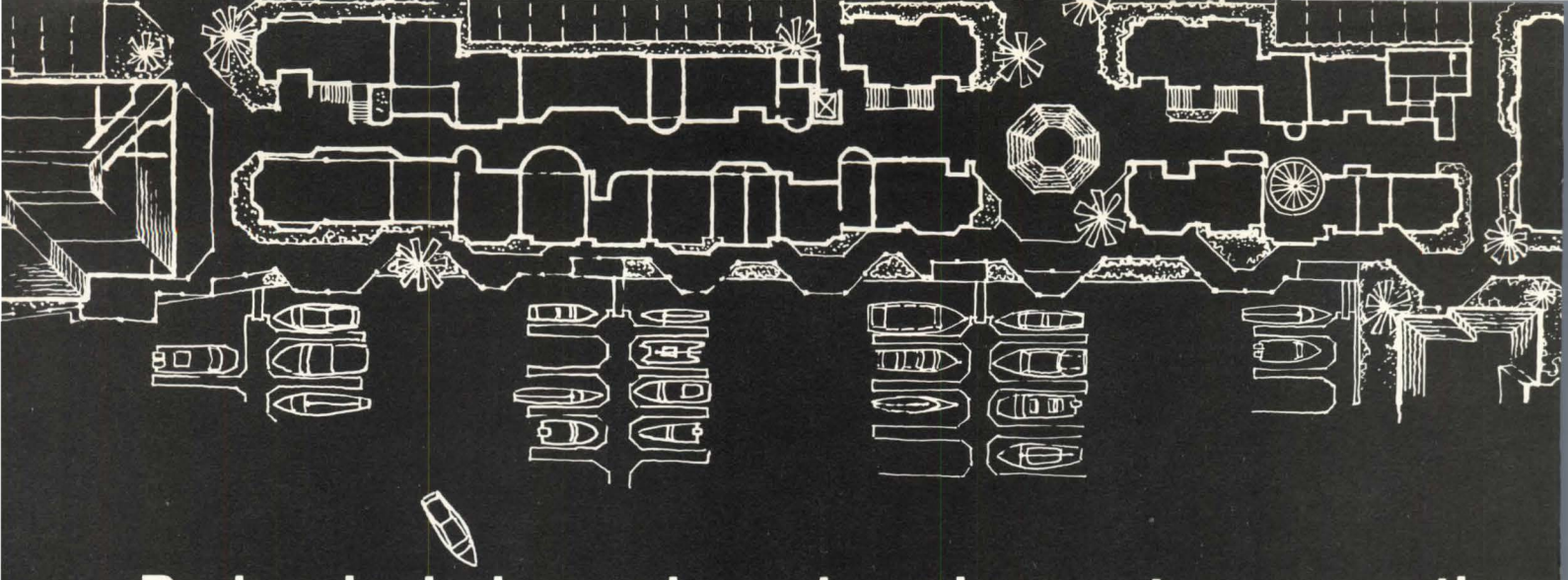

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AIA JOURNAL

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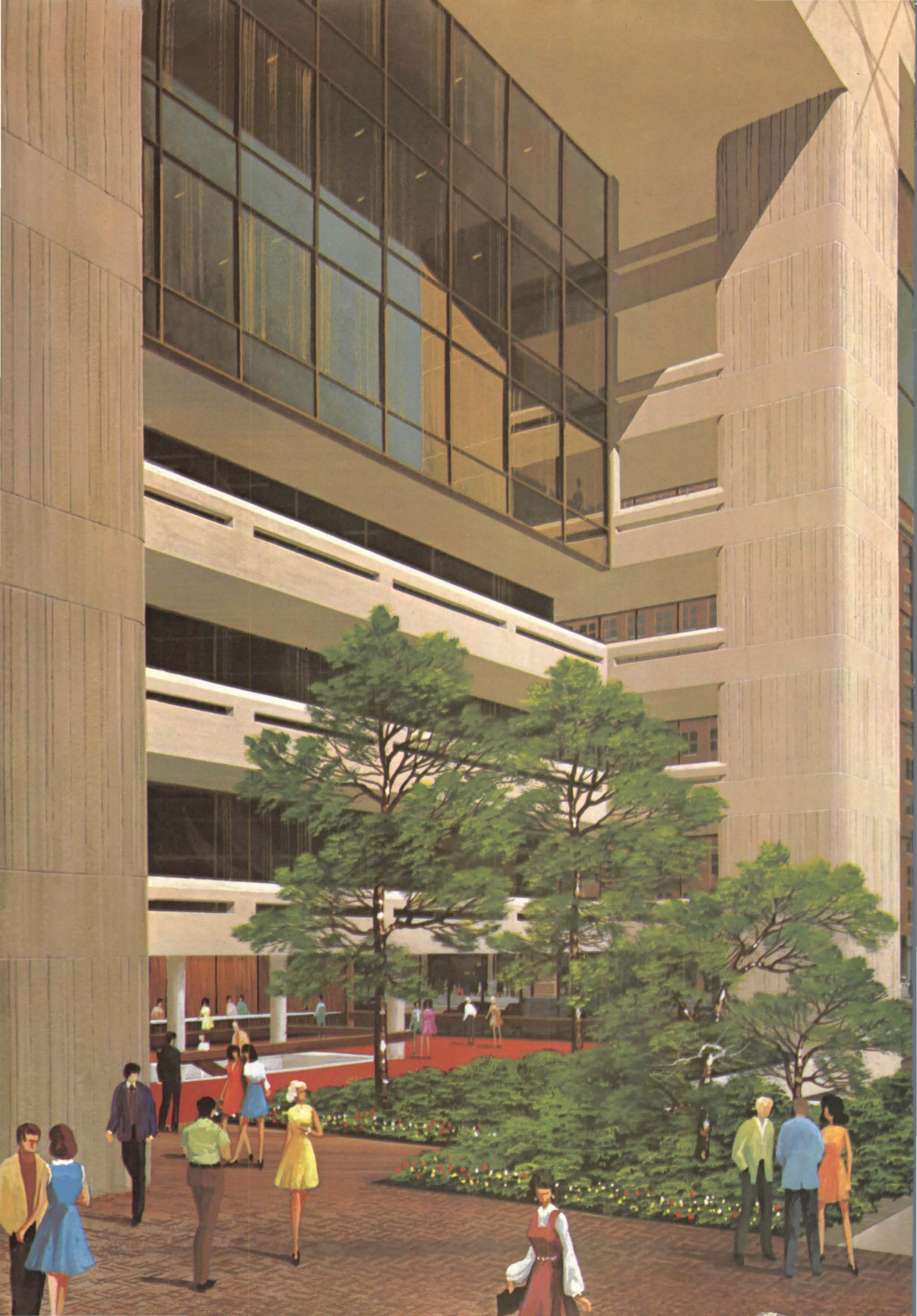
BPA



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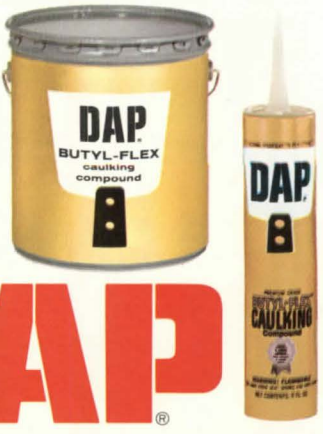

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AIA, Building Trades Call For Public Works Programs, Aid to Housing

Representatives of AIA and of AFL-CIO's building and construction trades department met in Bel Harbour, Fla., in February to discuss mutual concerns about the depressed construction industry and to draw up a plan aimed at helping to revive the nation's economy.

Robert A. Georgine, president of the building trades group, and William Marshall Jr., FAIA, president of the Institute, agreed to a broad combined effort between the two groups to implement a seven-point program which urges the immediate investment of public funds to stimulate public and private construction in local communities. Both near- and long-term benefits would result, said the officials.

The joint statement issued by the two groups follows:

"It is time to take positive, creative action to revive our economic system: not only to rebuild our economy, but to rebuild as well the human environments of our towns and cities.

"We now have the opportunity to make wiser investments of public expenditures to stimulate both public and private construction in communities throughout America. In the near term, this will mean jobs and a boost for the economy of communities everywhere. In the longer term, it will result in permanent improvements to the physical environment, to the direct benefit of all our citizens.

"This is the spirit that now draws together our organizations . . . in a common effort.

"We believe that the key to the nation's economic prosperity rests with the construction industry in which we work together as architects and craftsmen. Time after time, it has been demonstrated that a healthy construction industry is vital to a healthy nation. While no segment of our economy has suffered more from the current economic crisis, we are confident that the construction industry can and must lead the nation out of the recession and, at the same time, bring lasting public improvements to communities in every part of the country.

"To accomplish this, however, will require strong action and leadership from the Administration and the Congress. The AIA and the building trades therefore make this joint appeal to the President, every member of Congress and every state and local government official. We urge that the following actions be taken at once:

"1. Funds currently impounded by the Administration should be released immediately to construct facilities for health care, education, airports, mass transit, recreation, prisons, government offices and neighborhood centers: to provide needed community planning, and make improvements to community environments.

"2. Special emphasis should be placed on reviving and strengthening the nation's housing industry to provide decent homes for families with low and moderate incomes.

"3. A broad new national public works program should be initiated to improve the living environments of local communities.

"4. General revenue sharing funds and community development block grants should be used by state and local governments for direct construction activities in local communities.

"5. Federal monetary policies should be revised to increase the availability of mortgage funds to the construction industry.

"6. Tax incentives should be immediately provided to owners of new and existing buildings to design and redesign their structures to make them more energy efficient.

"7. Similar incentives should be provided for the renovation and remodeling of existing unused or underused buildings to enable their adaptation for new or additional purposes, thus conserving energy and resources.

"We view the prompt implementation of these programs as a vital first step, not only for the immediate economic relief of the industry and the nation, but as a lasting contribution to improving the quality of our national life."

Two Congressmen Included in Diverse List of New Honorary Members

Honorary membership in the AIA is extended to persons outside the architectural profession in recognition of their distinguished contributions to architecture and allied arts and sciences.

Newly elected to honorary membership are:

• Rep Thomas Ludlow Ashley (D.-Ohio) one of the sponsors of the Housing and Community Development Act of 1974, and an "aggressive and innovative supporter of urban growth and development legislation and housing policy."

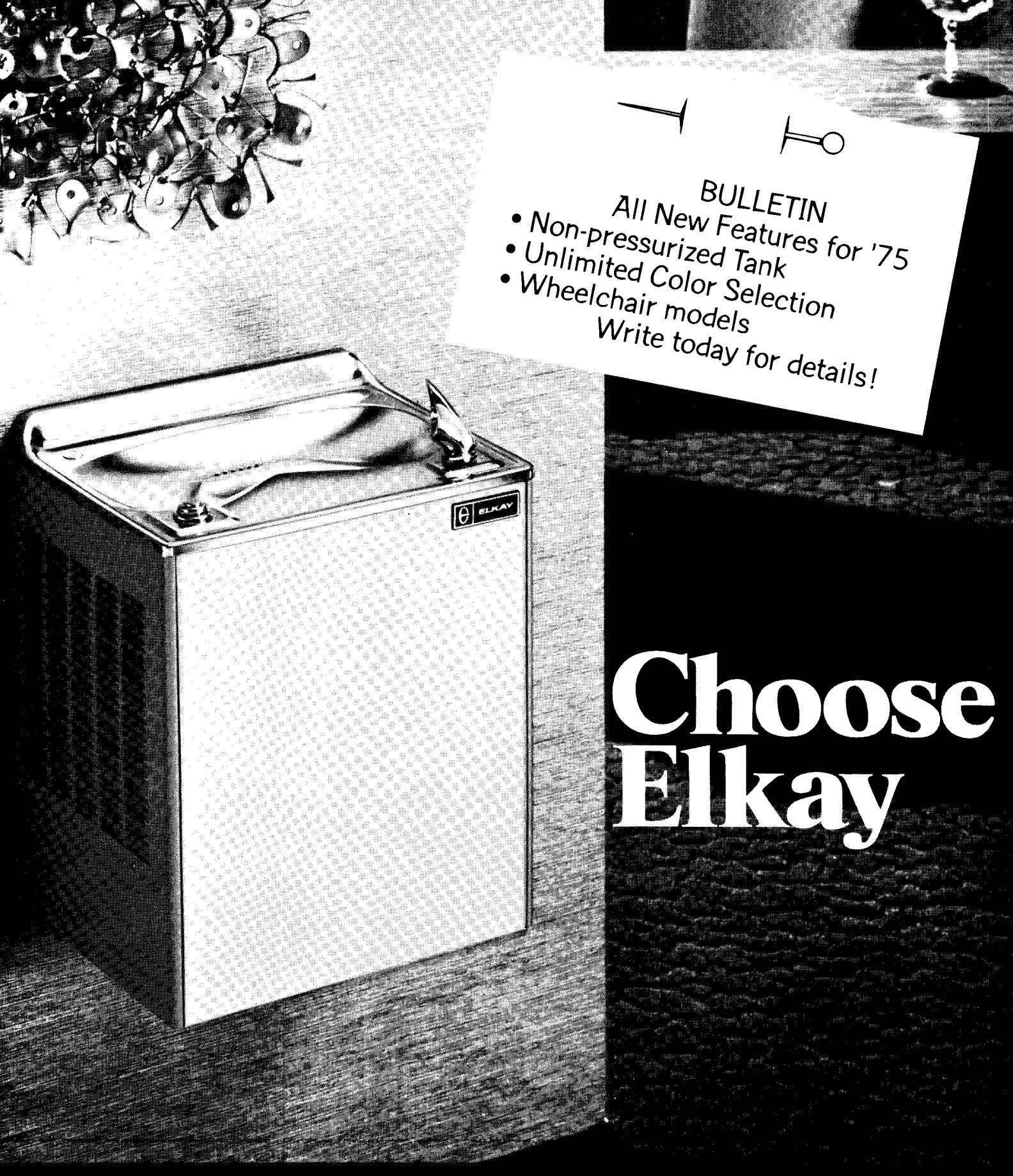
• Augustus Baxter, executive director of the Architects' Workshop of Philadelphia since 1968, who played an important role in the establishment of some 60 community design centers.

•James Biddle, president of the National Trust for Historic Preservation since 1967, and an ardent defender of this nation's architectural heritage.

• Rep. Jack Brooks (D.-Tex.), author of Public Law 95-582 which requires federal agencies to select A/Es on the basis of qualification and competence, subject to fair and reasonable negotiated fees, who "has been unyielding in his support of competitive negotiation in the selection of design professionals for public projects."

• J. Carter Brown, director of the National Gallery of Art in Washington, D.C. chairman of the Commission of Fine Arts and a trustee of the American Federation of Arts, the National Trust for Historic Preservation, the John F. Kennedy Center for the Performing Arts, the Institute of Fine Arts of New York University and the American Academy in Rome.

• Marvin B. Durning, Seattle attorney and a specialist in environmental law, who has represented citizens' groups in major environmental controversies for more than a decade. He was the first chairman of the Seattle design committee, established to ensure good design in public projects, and has directed major legislative study of the problems of metropolitan areas in the state of Washington.



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• Philip Hammer, chairman of the board of Hammer, Siler, George Associates, economic consultants of Washington, D.C., Atlanta and Denver. He has been personally involved in studies of more than 120 cities and metropolitan areas in the U.S., Canada and Europe, and has served as president of the American Society of Planning Officials and as chairman of the National Capital Planning Commission, of which he is still a member.

• Peter Kory, director of commercial development for the New York State Urban Development Corp., where he has been involved in a broad range of commercial developments. Trained as an architect, he was formerly director of urban development for Cincinnati.

• Robert B. Pease, executive director since 1968 of the Allegheny Conference on Community Development, a citizen's group that has sparked the Pittsburgh Renaissance since the '40s. He was formerly chief executive officer of the Urban Redevelopment Authority of Pittsburgh.

• Bernard Weissbourd, president of Metropolitan Structures, who has helped change Chicago's skyline. His firm is responsible for two major urban developments: Nun's Island, near downtown Montreal, and Illinois Center, a billion-dollar complex in downtown Chicago.

Edward Kemper Award Goes to F. Carter Williams

F. Carter Williams, FAIA, of Raleigh, N.C., first chairman of the AIA national inquiry committee which was organized in 1974 to investigate charges of professional misconduct, has been selected to receive AIA's Edward C. Kemper award for 1975.

Long concerned with professional ethics and judiciary matters, Williams has served as chairman of the judiciary committee of the North Carolina chapter/AIA, as chairman of the regional judiciary committee for the South Atlantic region and as a member of the AIA task force which is studying and revising the Standards of Ethical Practice.

He has been active in chapter affairs, having held virtually every elective office in the North Carolina chapter. While acting as co-chairman of the legal affairs committee, he worked successfully for amendments and improvements to the state's Architectural Practice Act; as a member of the North Carolina Board of Architects, he composed and administered a variety of professional registration examinations.

Named in honor of the late executive director of the AIA, the Kemper award is given annually for "significant contributions to the Institute and to the profession of architecture."

Shown here is a solar energy collector on top of the 56-story Citicorp Center, now under construction in New York City (Hugh Stubbins & Associates, Inc., with Emery Roth & Sons). If a Massachusetts Institute of Technology research team finds the design feasible, a flat-plate collector mounted on the south-facing sloping roof would operate a dehumidifier in an airconditioning unit.

Peter Blake, Jane Jacobs Voted Critics' Awards

The AIA architecture critics' medal "recognizes a distinguished career devoted to architectural journalism." Winner of the 1975 medal is Peter Blake, FAIA, currently editor of *Architecture Plus* and contributing editor to *New York Magazine*. From 1950 to 1972, when he became editor of *Architecture Plus*, he was on the staff of *Architectural Forum*, first as associate editor and then as managing editor; he became editor of the magazine in 1964.

Blake was cited by the jury on Institute honors for his "worldwide view, perceptive eye . . . keen mind and sense of humor. . . ." The jury said that Blake's "broad range and unflinching integrity constantly remind us that we live in a real world with real, as well as theoretical, standards."

He is the author of several books, including *God's Own Junkyard* (Holt, Rinehart & Winston, 1964) and has served as visiting critic and lecturer at many universities. As a practicing architect, he has been in partnership with James Baker in New York City since 1964.

Jane Jacobs, author of *The Death and Life of Great American Cities* (Random House, 1961), is the winner of the architecture critics' citation for 1975, given in recognition of a single distinguished work in the field of architectural criticism.

In making the award, the AIA jury on Institute honors said that the book's publication identified her as "one of the earliest liberal opponents of such generally accepted liberal programs as urban renewal and city planning."

Mrs. Jacobs, who served on President Johnson's task force on natural beauty and on New York City Mayor John Lindsay's task force on housing, is also the author of *The Economy of Cities*, published in 1969.

The above awards will be made at the AIA's convention, to be held in Atlanta on May 18-22. At the same time, Yukio Futagawa, editor and publisher of *Global Architecture*, a series of nearly 40 books documenting major works of contemporary architecture, will receive the architectural photography medal for 1975.

The Japanese architectural photographer is cited by the AIA for "his technical skill with the camera" which "create for the viewer a heightened sense of reality that is almost the equal of being there."

Construction Industry Council Established

The National Construction Industry Council was established recently by representatives of 30 national organizations in the construction industry. Representing AIA at the organizational meeting were Carl L. Bradley, FAIA, vice president of the Institute; Hilliard T. Smith Jr., FAIA, Institute secretary, and Edward Petrazio, AIA, administrator of the department of professional practice. Approval for AIA's representation on the council, which aims to be "a single voice for the construction industry," was granted at a recent meeting of the executive committee.

The purpose of the new council is "to provide effective liaison between the member associations in order to achieve greater overall efficiency in the construction industry; to provide a means for consultation in matters of mutual interest between the members and with the U.S. government . . . and to provide a means for issuing joint policy statements to the public. . . ." Charles Yoder of the American Society of Civil Engineers has been elected as the council's first chairman.

In the summer of 1974, Saul Horowitz, president of the Associated General Contractors of America, called together representatives from construction industry organizations and urged the establishment

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of a national council. Carl Bradley represented the AIA at this initial meeting and served on an ad hoc study committee which drafted the council's bylaws.

The council has agreed to consider at a future meeting a proposal for the establishment of a federal office of construction.

Fair Housing Code for AIA Chapters, Firms

In response to a request by the Department of Housing and Urban Development and upon the recommendation of the AIA housing committee and commission on environment and design, the AIA board of directors has approved an AIA chapter code on fair housing. The board encourages chapters and members to adopt the code and display it in their offices. A printed certificate, suitable for framing, is available without charge from Michael B. Barker, administrator, AIA department of environment and design.

The code's first precept reads: "In accordance with the policy on national growth of The American Institute of Architects, and recognizing its role in the housing delivery system, this chapter vigorously supports strict compliance with the federal housing laws and local civil rights acts to afford each citizen equal opportunity in housing."

The code declares that "architects of this chapter and their associates shall render professional services in a manner that will actively support human rights and will not knowingly undertake housing projects which deny the human rights of any segment of society because of sex, creed, race or national origin. . . ." It states that every American family is entitled "to a decent house and a suitable living environment. We recognize that the nation is falling far short of this noble goal. It is only through the leadership of all those in the housing industry, including the architects of this AIA chapter, that this objective can be achieved."

There is also another version of the code—identical in content and appearance—except that the word "firm" is substituted for the word "chapter" where applicable.

Architectural Glass Subject Of Consumer Standard

The first national safety standard to be developed under Section 7 of the Consumer Product Safety Act concerns architectural glazing materials. Culminating six months of effort, the Consumer Safety Glazing Committee has presented to the U.S. Consumer Product Safety Commission its proposal for a federal safety standard for architectural glazing materials used in such products as entrance or exit doors, bathtub and shower doors and enclosures, glazing panels and sliding doors.

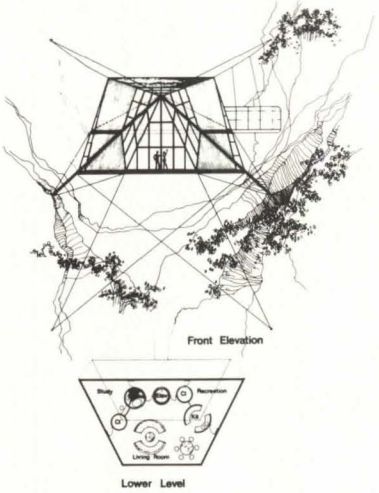
The committee, an independent cooperative organization, is made up of leading manufacturers, labor and public interest groups and trade associations. Its proposed standard must now go through a review process by the commission and the public before its implementation on a national scale.

The proposed safety standard is designed "to provide consumers throughout the nation with uniform protection against unreasonable risks of injury from architectural glass-related injuries," says W. Jeff Keirns, CSGC chairman. The standard will apply to glazing materials used for both new and replacement purposes.

Patent Granted for System Of Hillside Construction

Richard W. Snibbe, FAIA, of New York City has been granted a patent by the U.S. Patent and Trademark Office for a structural system that would permit dwelling units to be built economically on what is now considered to be unusable terrain.

The patent embraces a suspended structural system of steel cables and pipe secured to a mountainside by rock anchors



at six points, creating two levels of living space. Snibbe suggests using the system for satellite towns such as a village for the 1980 Olympic Games at Lake Placid, N.Y., to house some 60,000 people in 18,000 dwelling units. The structures would be removable, with "minimum permanent defacement of the terrain."

Snibbe says that "the master plan envisions an essentially automobile-free transportation system with cable cars that convert to commuter trains serving as the prime transit mode." Only one major road would be built through each town, and automobiles would be stored under the town itself. Cable car stations would hold community facilities.

The system has been analyzed by Lev Zetlin Associates, New York City-based structural engineers, and the firm reports that the procedure "can withstand erosion hurricanes and earthquakes." Snibbe, who reports that a prototype house is planned for an Adirondacks site, says, "The pluses would be breathtaking views, the freedom from dependence on the automobile and moderate prices."

UIA Announces Awards, Theme for 1975 Congress

The theme of the 12th world congress of the International Union of Architects, to be held in Madrid on May 5-10, is "Architectural Creativity-Ideation + Technology." Among the scheduled speakers are José Luis Sert, FAIA; Paul Rudolph, FAIA; Felix Candela, Hon. FAIA, of Mexico, and Oscar Niemeyer, Hon. FAIA, of Brazil.

The UIA will present the following awards at the congress:

- The Sir Patrick Abercrombie prize to Russian architects I.B. Orlov and N.I. Simonov for the town planning and construction projects in the towns of Navoi and Chevtchenko.
- The Auguste Perret prize to Canadian architect Arthur Charles Erickson and his firm for recent architectural projects (honorable mention to engineer Joaquim Cardoso of Brazil for his collaboration with architects over 30 years, especially in the creation of Brasilia).
- The Jean Tschumi prize to Reyner Banham of England for his activities as a teacher, historian and architectural and city planning critic.

New AIA Staff Members

J.R. Kirkland has been appointed deputy director of the department of Institute and component affairs. He earned a doctorate in American history at the University of North Carolina and has combined his academic interests with a political career. A former professor at Cornell University and American University, he has served as assistant to Congressman Charles Weltner (D.-Ga.) and research director for the Democratic National Committee. More recently, he was executive director of the Democratic party in Georgia.

Raymond E. Charity Jr., a graduate in architecture from the Hampton Institute and formerly a member of the planning staff of the department of city planning and community development in Newport News, Va., has been named director of education programs for AIA.

Another new staff member is Connie Neuman, appointed as director of state government affairs. She was previously associated with the office of Senator Alan Cranston, where she worked in the areas of education and civil service. She was graduated from Marquette University.

continued on page 17

IMPORTANT ANNOUNCEMENT

The January issue of The AIA JOURNAL contained an advertisement purportedly signed by "Board of Directors, 1970-1975, American Society of Interior Designers," a supposed trade association. As the result of inquiries received from its readers, the JOURNAL has investigated but has been unable to identify the person or persons responsible for submitting this advertisement, which appeared inadvertently. It has been established from the official records of the United States Patent Office and the Library of Congress that statements set forth in the advertisement as factual are in reality false.

It therefore appears that both the AIA JOURNAL and the actual American Society of Interior Designers, 730 Fifth Avenue, New York, New York 10019 (a professional society formed by the consolidation of the American Institute of Interior Designers and the National Society of Interior Designers) have been imposed upon by the person or persons unknown who submitted the copy for publication.

This statement is being published with the concurrence of Norman De Haan, AIA, President of The American Society of Interior Designers, whose office is at the above address.

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Circle 10 on information card

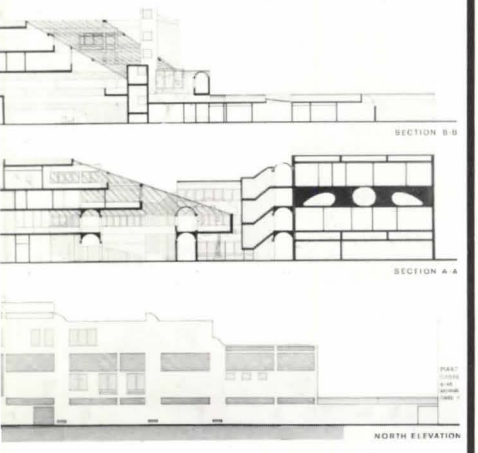
oing On from page 10

Andrea O. Dean, recently associate edi-
r of *The Art Scene Magazine,* has been
ppointed associate editor of the AIA
OURNAL. Formerly, she worked on a
umber of periodicals, including *Women's*
ork, Washingtonian Magazine and the
C Gazette. She is the author of a book
out museum trusteeship, written for the
merican Associations of Museums.

Prize Given Neighborhood Health Center Design

he 1974 Hirons Prize, sponsored jointly
the National Institute of Architectural
ducation and the New York chapter/
IA's hospitals and health committee, has
en awarded to four persons for the de-
gn of a neighborhood health center. The
nual competition is limited to persons
orking in the architectural field who are
t students and are under 35 years of
e.

First prize of $1,500 went to Martin
operman of Little Neck, N.Y., and sec-
d prize of $500 was awarded to Michael
oleman of Groton, Conn. Because the
o top winners changed the scale of
awings from the program requirements



order to present their solutions more
equately, the NIAE board of trustees
cided to award parallel first and second
izes to H. Preston Crum of New York
ty and James Charnisky of Boston.

The "balanced jury of architects, cli-
t groups, regulatory agencies, hospital
ministration, facilities research and pub-
benefit corporations" commended the
ection of a neighborhood health center
the subject of this year's program.
Medical care in the U.S. is in a state of
ange," the jury said. "The neighborhood
nily care center can be a setting for pri-
ıry care, a force for preventive medi-
e and, as an affiliate to community and
gional hospitals in the area, a direct re-
onse to this change. It is intended to
ate closely to the needs and desires of
community it serves through physical
e and scale and through scope of serv-
."

Economic Incentives Highlight NAHB Statement

The National Association of Home Builders, in its 1975 policy statement, recommends a variety of new economic incentives to achieve a minimum goal of 1.8 million housing starts this year.

NAHB also calls for the establishment of a national housing policy review board —independent of the Department of Housing and Urban Development—which would report directly to Congress and would be charged with "making realistic assessments of housing goals that are annually achievable, and recommend the policies and actions . . . to meet the goals." The board would be given "authority and funding necessary to accomplish its purpose."

NAHB also declares that a "pervasive problem for the housing industry is the issue of growth versus no growth. . . . On the national level, the housing industry has had to cope with excessive and, many times, too many stringent regulations and rules and interpretations issued through the passage of legislation such as the National Environmental Policy Act, the Clean Air Act and the Water Pollution Control Act."

The policy statement contends that NAHB "is deeply concerned with efforts being made to enact a national land use policy that might further deny housing opportunities for Americans at all income levels, their right of mobility and their freedom of choice." NAHB says that "any national land use policy must contain an explicit specific housing element . . . ."

NAHB declares that it will "continue to fight no growth policies in all their manifestations—including exclusionary and discriminatory zoning; limitations on approval to develop land or to build; needless delay in providing essential community services and facilities, and any and all other forms of limiting the attainment of housing goals and excluding certain economic, racial or ethnic groups."

Union Sues to Overturn Licensing Examination

The San Francisco-based Organization of Architectural & Engineering Employees (an affiliate of the United Brotherhood of Carpenters & Joiners of America) has initiated a lawsuit in California to have the state's revamped examination for architectural registration overthrown.

OAE charges, according to the *Daily Pacific Builder,* that the State Board of Architectural Examiners "invoked inappropriate emergency powers in implementing the examination changeover," first used in June 1973. OAE is also suing for a re-

continued on page 61

Results.

Let's Invest In Conservation Of Energy Instead of Waste

This is the basic plea of a new report by AIA's energy steering committee, entitled "A Nation of Energy Efficient Buildings by 1990." The report, published late last month, makes a significant contribution to the current national discussion of energy and economic policies. For it proposes a strategy that could, at once, save energy and money—and help ease the worsening capital crunch.

The first premise of the report is drawn from earlier studies by the committee's predecessor, AIA's energy conservation task force (Leo A. Daly, FAIA, chaired both). These studies documented potential energy savings averaging 30 percent through refitting existing buildings and 60 percent in new buildings. "Subsequent analyses," the new committee report says, "have tended to reinforce the conservative nature of these estimates."

Even savings of this magnitude, the report points out, mean that "by making the nation's buildings energy efficient we could, within 20 years, save as much energy each year as the projected 1990 production capacity of any of the prime energy systems: domestic oil, nuclear energy, domestic and imported natural gas and coal."

Thus if, as the committee proposes, all of the nation's buildings were made energy efficient by 1990, the savings in all forms of energy would amount to the equivalent of 12.5 million barrels of petroleum per day. If not, this becomes the sum total of energy waste in buildings.

The report estimates the gross capital requirements for facilities to produce this much energy at $415 billion in current dollars. In addition, it estimates that consumers will lay out between $892 billion and $1,499 billion, depending on the rate of inflation and other factors, to buy this amount of energy. This is the cost of waste.

Making both existing and new buildings energy efficient would virtually eliminate the need for the $415 billion investment outright. And it would convert the savings to consumers into the capital required for the energy efficiency program. The report estimates this requirement to be $1,460 billion at the highest, slightly less than the total consumer savings.

Still, on the face of the estimates, the gross capital required to make buildings energy efficient is far higher than that required to produce the wasted energy, $1,460 billion vs. $415

billion. However, says the report, "this is not the case. The average time required to recoup the $415 billion invested in traditional energy systems would be 30 years. Because of the savings generated by the energy efficiency strategy, the comparable recovery period would be approximately 15 years. This would permit utilization of the same capital twice within the same period." The report backs this contention with a complicated series of "scenarios" of investment and return year by year between now and 1990, each based on the "recycling" of consumer savings in energy costs into investment capital to achieve further energy efficiency in buildings.

Each of the scenarios shows investment in energy efficiency declining and repayments from energy savings increasing as these years go on. This fact takes on added importance in light of the report's prediction of a deepening capital shortage in this same period, with a "capital crisis" joining the energy crisis sometime in the 1980s.

The report goes on to point out that the energy efficiency strategy "is realizable with a minimum of dislocation within the present energy systems because it is complementary to the problem of how to resolve a projected shortage of supply." Moreover, the strategy "employs capital in the more consumer-oriented part of the building industry and will result in a needed stimulating effect on a depressed sector of the economy. This effect will be more equally distributed geographically than would be the case in construction of large centralized energy systems."

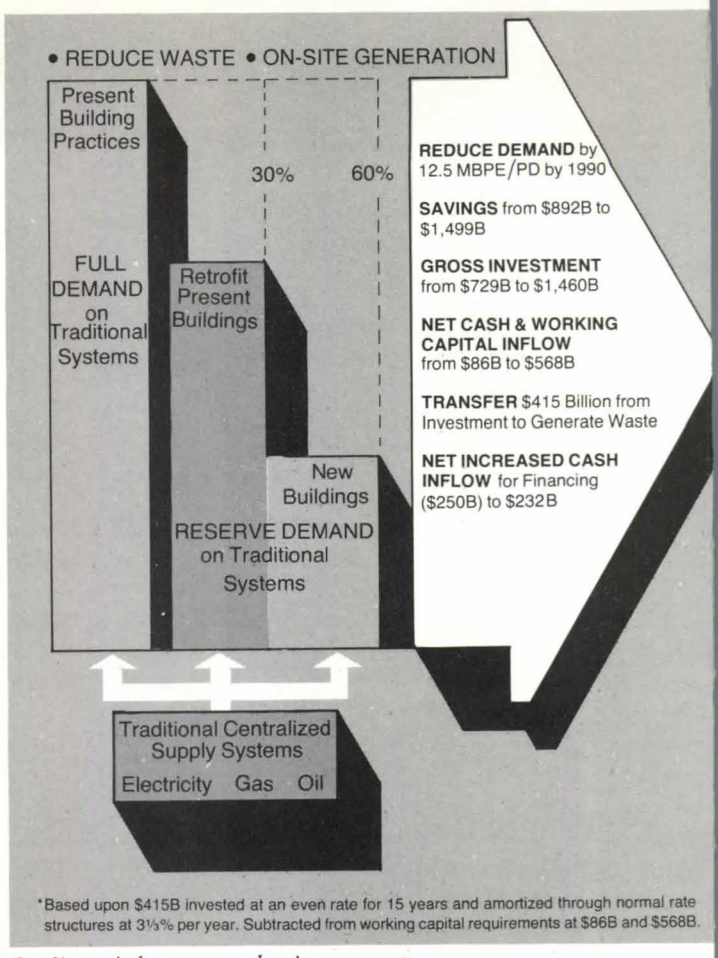
To achieve its goal of energy efficiency for all U.S. buildings by 1990, the report prescribes 1) reduction of waste through modified design and construction techniques and through more efficient environmental control systems; and 2) reduction of demand upon fossil-based fuels and centralized supply systems through on-site generation from nature's current income accounts—principally solar and wind.

These would be accomplished through offering building owners and clients "integrated energy packages" of equipment and services. The report suggests that the purveyor of these packages be large-scale energy system utilities.

The utilities would send in interdisciplinary "system design and evaluation teams" to see to the energy efficiency of existing and new buildings, then install whatever equipment was deemed necessary. This would be done without charge to the buildings' owners.

The utilities, however, would retain ownership of the equipment (and would maintain it). The savings in energy costs would be split three ways: 10 percent to the building owner in reduced energy bills; a share of the utility based on a fixed percentage of return on its investment in the package; and the remainder to replenish the capital pool to invest in other packages. Here is where the conversion of consumer savings to capital occurs.

Once the cost of a package had been fully paid back into the pool, the building owner would assume ownership of the equipment—and would have his energy bills further reduced to reflect 100 percent of the savings.



Outline of the reports basic concepts.

Such an approach, the report points out, would overcome building owners' frequent reluctance to make front-end investments in energy conservation despite the promise of decreased operating costs. Moreover, since the utilities' returns would be tied to the savings achieved, there would be a built-in incentive to getting the most efficiency for the buck.

The report suggests that if existing energy utilities are not interested in playing the roles outlined above, other entities could be created. It also raises the possibility of the federal government's launching the effort through establishment of a revolving fund to provide initial capital. Otherwise, it sketches a mainly regulatory role for government.

Among the fringe benefits claimed for the report's approach is an increase in the capacity of architects and engineers for energy efficient design. (The utilities "design and evaluation teams" would be comprised of independent professionals, although the report does not indicate how they would relate to the owners' own designers in the case of new construction.) Also, a national effort such as the report proposes would stimulate technological innovation and aggregate a huge market for energy-saving products and equipment.

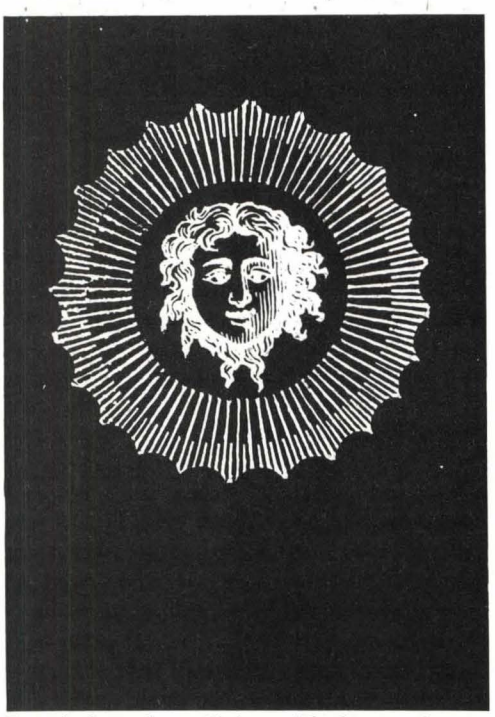
Altogether, it is an ambitious and complex proposal. Its impact will depend on how convincing policymakers find its economics, and will derive less from details of implementation than its basic message. For that message goes to the heart of the current great (if confusing) debate over energy and economic policy.

At the heart of the debate is a remarkably simple question: Will we, as a nation, go on spending more and more to consume more and more resources until both capital and the resources themselves run out? Or will we adjust our way of life (and building) to our (and the world's) means?

Facing these questions takes courage on the part of ourselves and our leaders. The ultimate value of the energy report may be in dramatizing and documenting, in the area of building, the literally unsupportable cost of waste. *Donald Canty*

New Concepts for Residential Use Of Solar Energy

Clint Page



People have been living with the sun forever, and one would think that by now we know just about everything we need to know about heating and cooling houses with solar energy. The truth is, we do. Yet it seems to have taken an energy crisis and an act of Congress—specifically the Solar Heating and Cooling Demonstration Act of 1974—to prompt widespread research and development of this most basic of energy sources—an effort that will no doubt tell us what we already know.

Don't misunderstand: The confirmation of existing knowledge is just as important as the discovery of new but unconfirmed facts. And along with that confirmation comes the organization of what we already know—the process of putting it into some form that everyone can use. What is really vital about both of these results of research is that they take something like solar energy out of the fringe areas of our thinking and put it squarely in the mainstream; solar energy becomes "real," believable and practical, not something for eccentrics and freaks. And in the case of solar energy, it is about time that happened.

Mr. Page is a freelance writer specializing in architectural and engineering topics.

What has happened so far is that the Department of Housing and Urban Development and the National Bureau of Standards responded to the Solar Heating and Cooling Demonstration Act by setting their own research program in motion. NBS drew up a set of interim performance criteria, HUD started looking into the possibilities of including solar energy systems in housing; together with the AIA Research Corporation, they launched a grant program to develop housing design concepts incorporating solar energy. The Research Corporation in turn subcontracted with eight architectural firms and two schools of architecture (some 350 firms and 30 schools sent in preliminary proposals). The eventual result will be a document for use by HUD and other government agencies, as well as by researchers, designers, builders and home owners. The eight firms, for the record, are Community Design Associates, Cos Cob, Conn.; Donald Watson, AIA, Guilford, Conn.; Giffels Associates, Detroit; Joint Venture, Denver; MASSDESIGN, Cambridge, Mass.; RTL, Inc., Paramount, Calif.; The Architects, Taos, of Taos, N.M., and Total Environmental Action, Harrisville, N.H. The two schools are the school of architecture and environmental studies of the University of Detroit and the college of architecture of Arizona State University.

Certainly the results of the grant program run by the AIA Research Corporation and HUD indicate that solar energy is entering the mainstream of our design thinking. The clearest evidence is perhaps the intricate report from Giffels Associates (nothing arcane about them) that describes a rational and systematic way of balancing the variables that influence the design of solar heated or cooled dwellings.

And in a variety of ways, the other reports (four of them are summarized and shown on the following seven pages) that received grants from AIA/RC also retrieve solar energy from the avant garde. MASSDESIGN focused on the typical builder's house in New England. RTL, Inc. looked at mobile homes: How much more in the mainstream could they be? Donald Watson, AIA, did an extensive comparison of forms and solar energy re-

quirements to find out what limitations solar requirements put on the architect's ability to create forms. Another report, prepared by Joint Venture and Friends of Denver, investigated the potential in specific combinations of forms and solar equipment.

As everyone knows by now, solar energy systems fall into two basic categories, passive and active. Passive, or inherent, systems depend on a sizable amount of mass to store and reradiate the heat; active systems collect and store the heat in liquid or gas (usually water or air), which is used to move the heat throughout the system. Efficiencies vary, practicality varies—but each type has its uses and advantages, which the reports do a good job of outlining. Some of the researchers considered rather complicated systems, which in some cases make up for their less than efficient performance by doing something extra, like producing electricity. It is from the combined efficiencies—or inefficiencies—of a variety of pairings of systems and building forms (with the attendant variables of design, construction, siting and orientation) that conclusions about the possibilities of designing housing for use of solar energy must come.

The safest conclusion that can be drawn from all of these reports is that the inclusion of solar heating and cooling equipment still leaves enough design freedom to satisfy all but the most aggressively independent architects, and that crowd would probably rise to the occasion by creating new forms anyway. Granted, there are some givens that will have to be accommodated. Flat plate collectors will require a specific amount of roof or wall area that must face south, unless some sort of movable collector is used. Passive or inherent systems will require massive south facing walls to collect and store heat; warm water systems will require a sizable reservoir somewhere for heat storage. Some types of collectors, those that do not need to be attached directly to the dwelling will have less of an influence on design, of course, but they may present other problems in site design. Also affecting design for solar energy is the amount of collector area required, which depends on the local climate and the amount of reliance on solar energy desired; the more the house is going to rely on solar energy, the greater the effect the collector will have on the final form, a fact quite clearly pointed out in the report assembled by Donald Watson. But for the most part it appears that the inclusion of solar energy equipment probably won't threaten anybody's sense of what a house should look like—Cape Cod or free-form, single family or apartment. Which suggests that the house-buying public, as well as the design professions, can have what they want.

One of the things the house-buying public wants these days is reduced utility bills, and all the reports indicate that solar heating can indeed save money by reducing the amount of fossil fuel or electricity that must be purchased. Whether the money saved is worth the cost of saving it is another consideration: Solar energy equipment, built-in or added-on, will increase the first cost of a house—on that everybody agrees.

The cost of a conventional solar heating system can run around $10,000 today, and given the wide range of climates the U.S. offers, the average dependence on solar heating may only be around 50 percent of the heating load. Everybody also agrees on the overall importance of reducing our reliance on fossil fuels and electricity, however, so in the long run the initial costs of using solar energy become less important than the reduced energy use, particularly as conventional energy costs continue to rise. The amount of energy and money saved will depend on such variables as climate, the type of solar equipment used, the site and orientation of the house or apartment building, and the design and construction—once again, things we have known for a long time. The overall agreement, though, is that solar energy can reduce fuel consumption and energy costs, and that the more carefully the dwelling is designed and built, the more efficient its use of all sorts of energy will be.

The process of designing for solar energy has also been given a fair amount of thought in all the reports. The researchers all appear to view it as an interdependent process involving factors of local climate, human comfort, the design and construction of dwellings and the efficiency and practicality of available solar equipment. And the message is clear: It is possible to design a house using solar energy that will be acceptable to designer and user alike—in short, one that can be sold and used.

Naturally, none of this can happen without some sort of standards for performance. Many of the reports in the AIA/R grant project included a review of the interim performance criteria developed by the National Bureau of Standards as part of the recently launched solar energy project. Reactions to the criteria are mixed: They meet some objectives, fall short of others, judging from the reviews. Some basic questions go unanswered. It isn't clear to some reviewers whether the criteria are to be advisory or mandatory, whether they would apply to all housing or just that sponsored by the government, whether they recognize that experimental systems don't have to be as long-lived as commercially developed systems.

There also seems to be some thought that the criteria are vague and ill-defined, and that they overlook some important points, among them the potential of radically new solar systems as opposed to standard ones, and the present high costs of solar systems and their potentially higher costs in the future. The criteria were also criticized for not considering the overall merit of a solar system, focusing instead on components rather than the system as a whole, or even more importantly, the system and house together.

The interim performance criteria do accomplish some things. They will serve to make everyone—designers, manufacturers and those who will evaluate systems and projects—more aware of the performance factors that must be taken into account in the design and construction of solar heated housing, although they are not entirely comprehensive. They also establish a basis for judging performance although they might be more specific, and they do provide a foundation for further research and refinement.

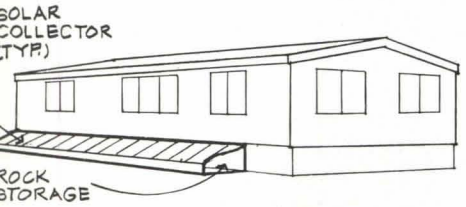
What it begins to look like is not so much that solar energy is an idea whose time has come, but that it is an idea whose time came long ago; it's us who have finally come to it. □

Bringing solar energy to mobile homes through adding on equipment.

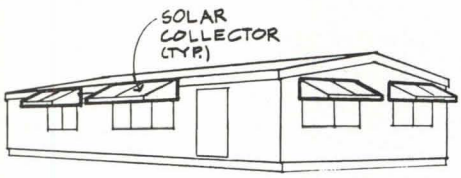
Add-on rather than build-in is the recommendation of a study of the application of solar energy systems to mobile homes by RTL, Inc., of Paramount, Calif. Their reasoning goes like this: The space limitations imposed by the need for economy, the dimensions imposed by highway regulations, the lightness and flexibility required for transportability, the wide range of climate conditions to be encountered in any one factory's marketing area, the standardization needed for mass production plus the workspace and labor constraints of mobile home factories all conspire to make in-factory installation of solar equipment impractical.

So while RTL did design a prototype solar mobile home, it concentrated on solar equipment that can be added on after manufacture, including carports and porch covers bearing solar collectors, wall panels and berm systems. While this equipment can be added to individual units, rigidities of mobile home park layouts led RTL to propose carports or trellises for clusters of four or five units, or centralized systems serving entire mobile home parks or planned unit developments.

RTL designed a total system using readily available Sunsource collector panels that would serve a 50-space mobile home park. The system is sized and cost estimates are given for the complete installation. Another part of the RTL output is a computer program that can evaluate changes in the variables affecting solar energy requirements; it can be used by manufacturers of mobile homes to study the effect of solar equipment on their units.

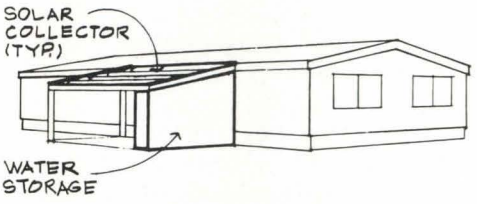


BERM SYSTEM

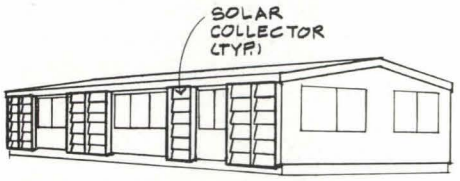


WINDOW AWNING

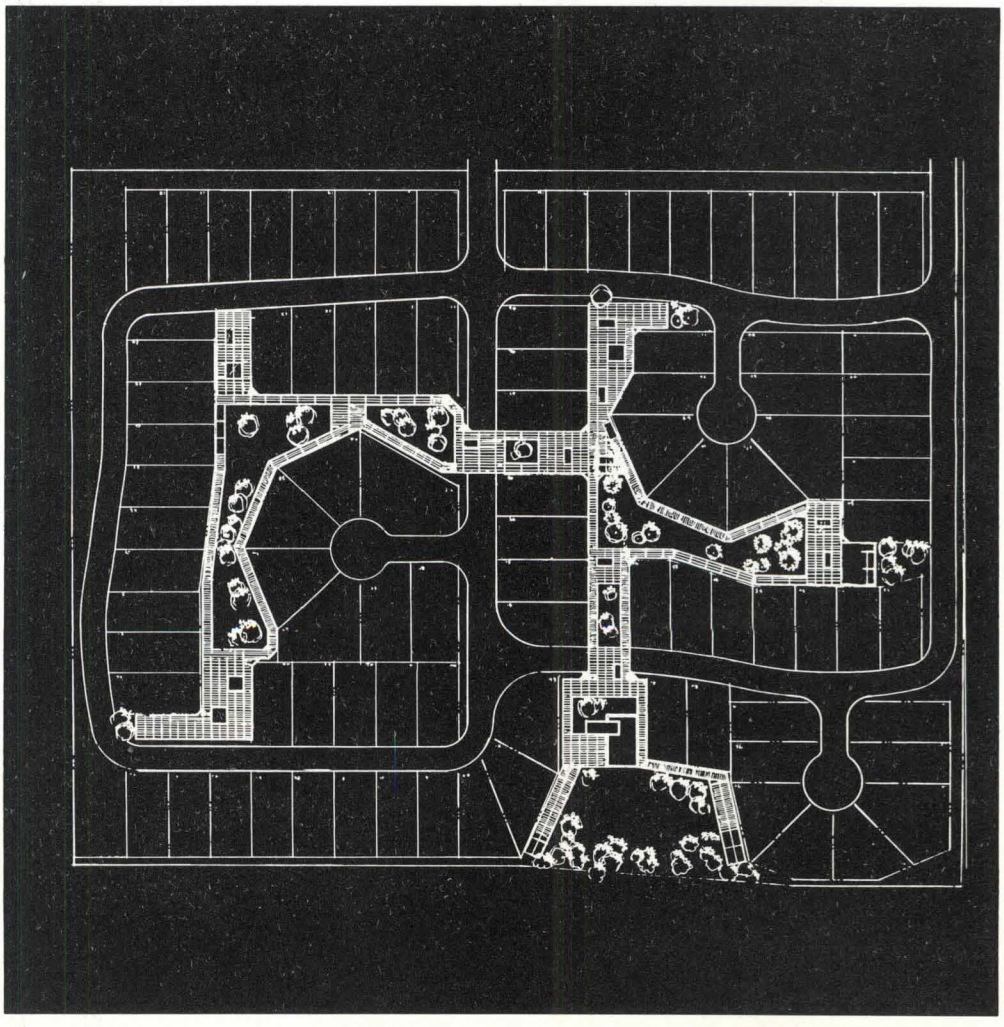
CARPORT



STORAGE TANK & PORCH COVER



SIDE WALL PANELS

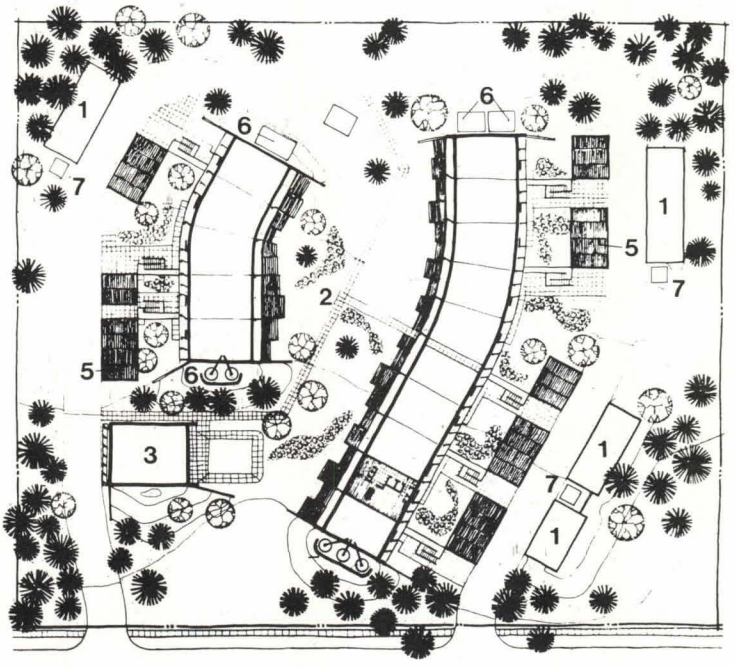


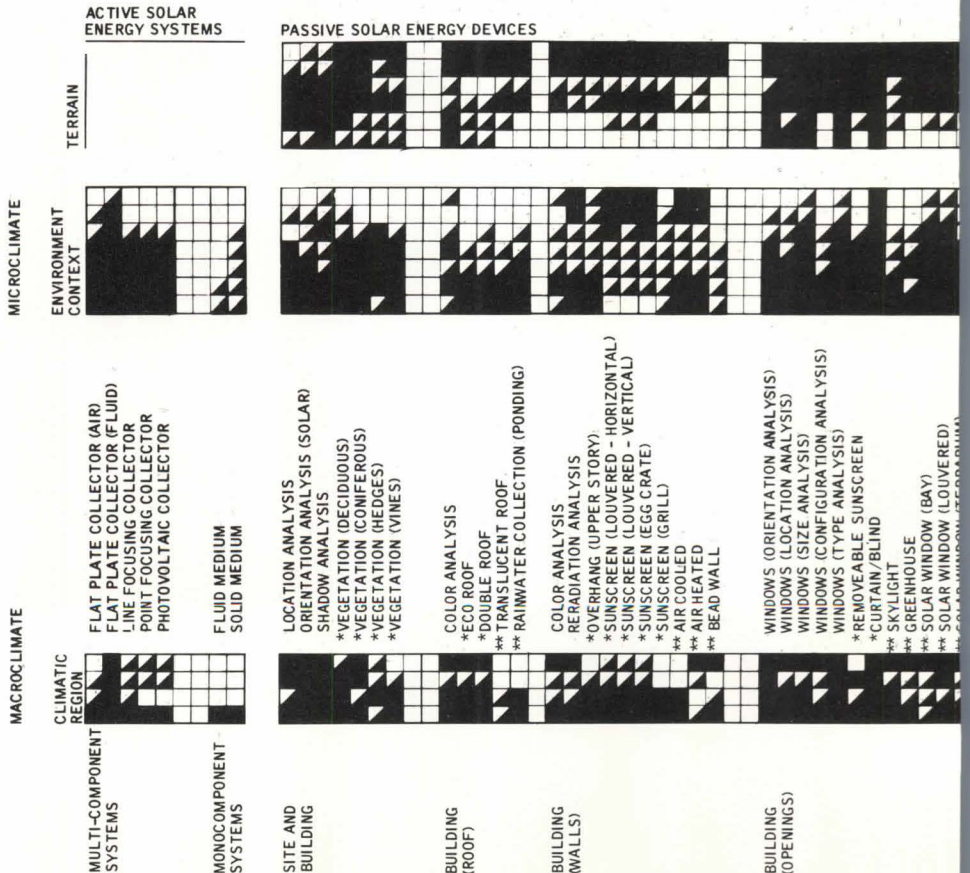
Weighing applicability of solar systems to various climate zones.

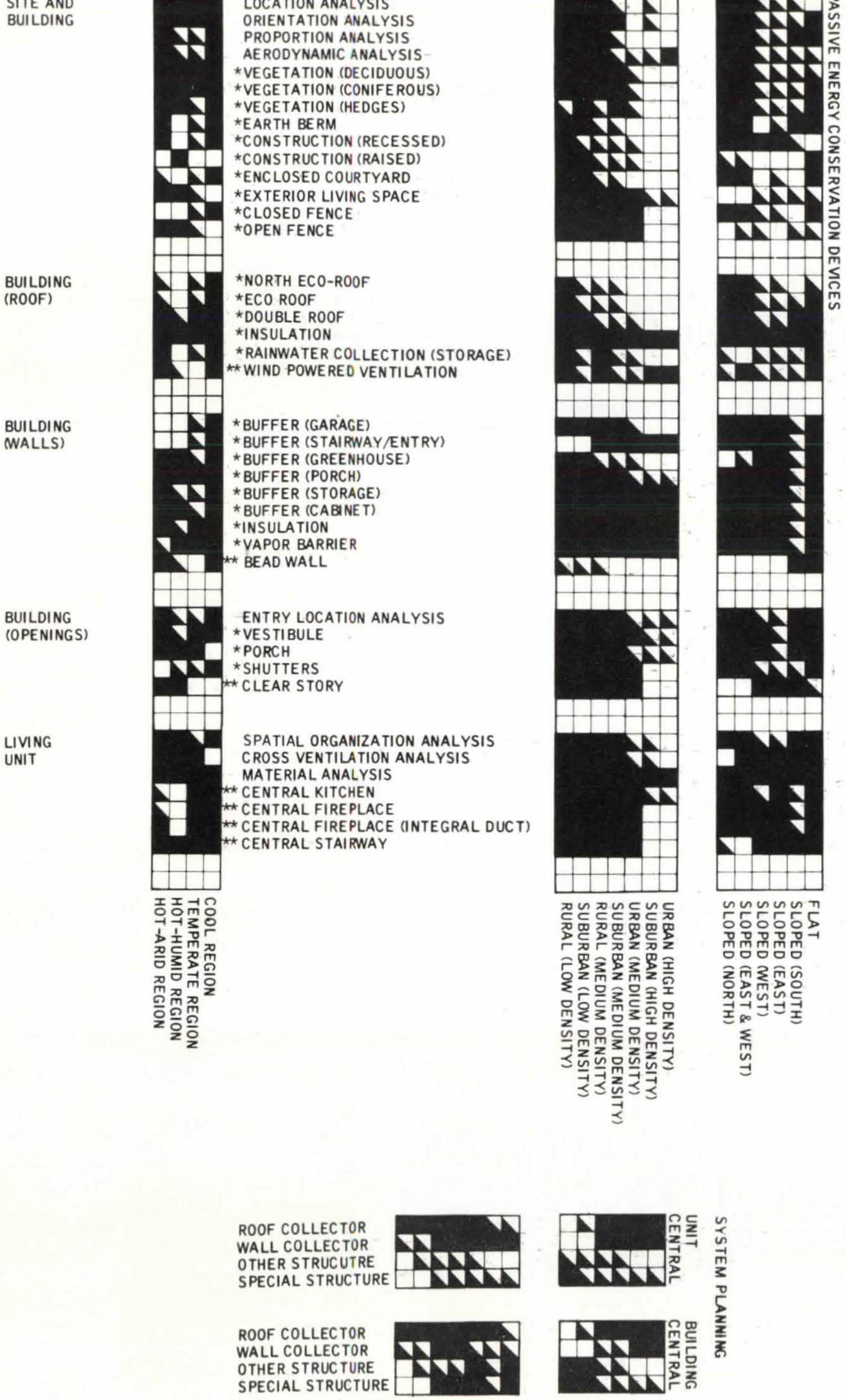
A methodology for energy-conscious design is the heart of the report from Giffels Associates, Inc., of Detroit. To the conventional design methodology based on human factors and cost/construction criteria, the Giffels team added the further considerations of energy conservation criteria and alternative energy use. To achieve totally energy-conscious design, they reasoned, requires a chain of three essentials: Architecture consistent with the climate conditions is essential to reduce the energy required for human comfort; reducing the energy requirements is essential to reducing the cost of solar energy systems; reducing the cost of solar energy systems is essential to establishing their applicability.

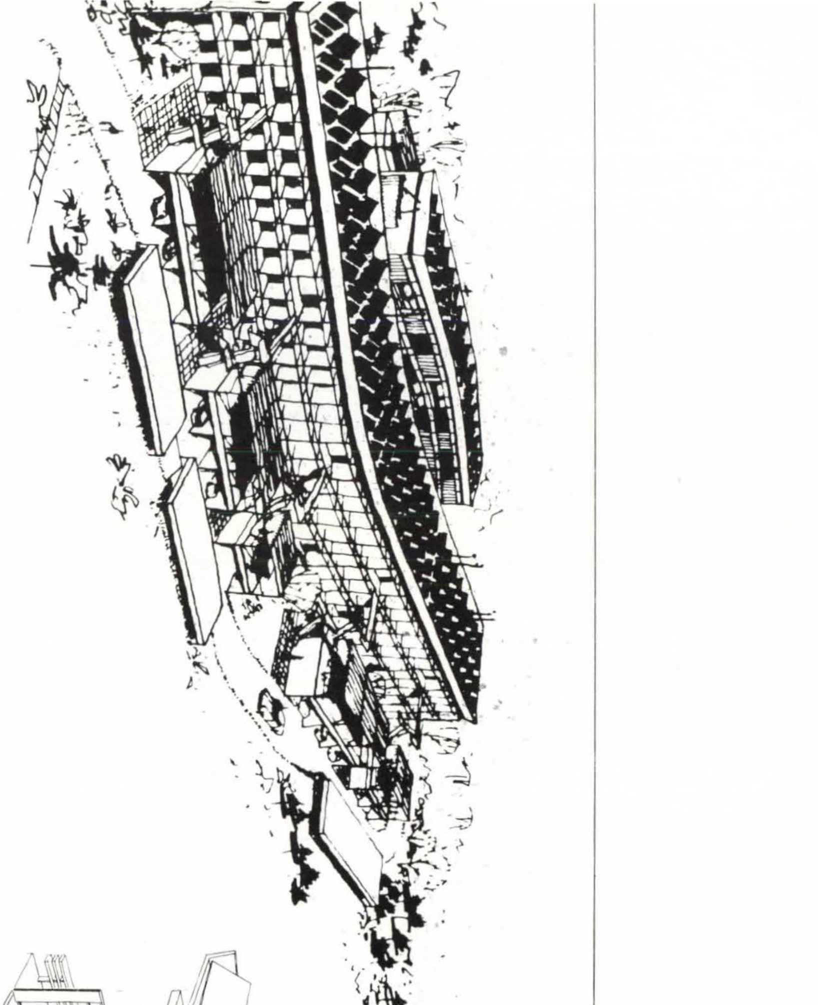
From that point the researchers went on to develop what they termed a "systemic" for solar energy and housing. This "systemic" is a visual and organizational tool, they point out, not a checklist, CPM chart or anything absolute. Within the systemic are three subsystemics dealing with user criteria, environmental items and energy criteria. Built into their study is another visual and organizational tool —a matrix for system and device applications. This approximates the degree of applicability of each system or device within a range of micro- and macroclimatic situations.

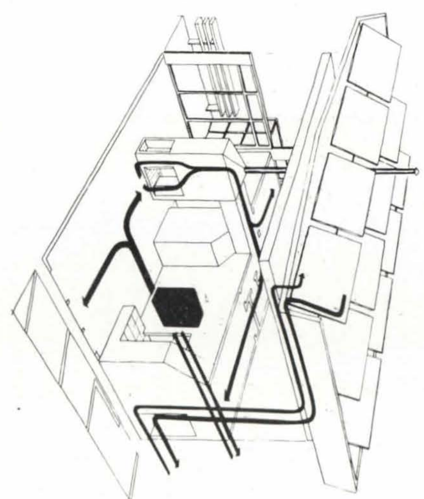
Using the methodology they had set up, the Giffels team went on to develop design concepts which they then applied to four climate zones: cool, temperate, hot humid and hot arid. For each climate zone they provided a design concept for building, a climatic analysis, a design analysis, a description of the buildings; a design concept and description for the living unit, and a design concept and description of the solar energy system.






SITE AND
BUILDING
LOCATION ANALYSIS
ORIENTATION ANALYSIS
PROPORTION ANALYSIS
AERODYNAMIC ANALYSIS
*VEGETATION (DECIDUOUS)
*VEGETATION (CONIFEROUS)
*VEGETATION (HEDGES)
*EARTH BERM
*CONSTRUCTION (RECESSED)
*CONSTRUCTION (RAISED)
*ENCLOSED COURTYARD
*EXTERIOR LIVING SPACE
*CLOSED FENCE
*OPEN FENCE
BUILDING
(ROOF)
*NORTH ECO-ROOF
*ECO ROOF
*DOUBLE ROOF
*INSULATION
*RAINWATER COLLECTION (STORAGE)
**WIND POWERED VENTILATION
BUILDING
(WALLS)
*BUFFER (GARAGE)
*BUFFER (STAIRWAY/ENTRY)
*BUFFER (GREENHOUSE)
*BUFFER (PORCH)
*BUFFER (STORAGE)
*BUFFER (CABINET)
*INSULATION
*VAPOR BARRIER
** BEAD WALL
BUILDING
(OPENINGS)
ENTRY LOCATION ANALYSIS
*VESTIBULE
*PORCH
*SHUTTERS
** CLEAR STORY
LIVING
UNIT
SPATIAL ORGANIZATION ANALYSIS
CROSS VENTILATION ANALYSIS
MATERIAL ANALYSIS
** CENTRAL KITCHEN
** CENTRAL FIREPLACE
** CENTRAL FIREPLACE (INTEGRAL DUCT)
** CENTRAL STAIRWAY
COOL REGION
TEMPERATE REGION
HOT-HUMID REGION
HOT-ARID REGION
URBAN (HIGH DENSITY)
SUBURBAN (HIGH DENSITY)
URBAN (MEDIUM DENSITY)
SUBURBAN (MEDIUM DENSITY)
RURAL (MEDIUM DENSITY)
SUBURBAN (LOW DENSITY)
RURAL (LOW DENSITY)
FLAT
SLOPED (SOUTH)
SLOPED (EAST)
SLOPED (WEST)
SLOPED (EAST & WEST)
SLOPED (NORTH)
ASSIVE ENERGY CONSERVATION DEVICES
SYSTEM PLANNING
ROOF COLLECTOR
WALL COLLECTOR
OTHER STRUCUTRE
SPECIAL STRUCTURE
UNIT
CENTRAL
ROOF COLLECTOR
WALL COLLECTOR
OTHER STRUCTURE
SPECIAL STRUCTURE
BUILDING
CENTRAL



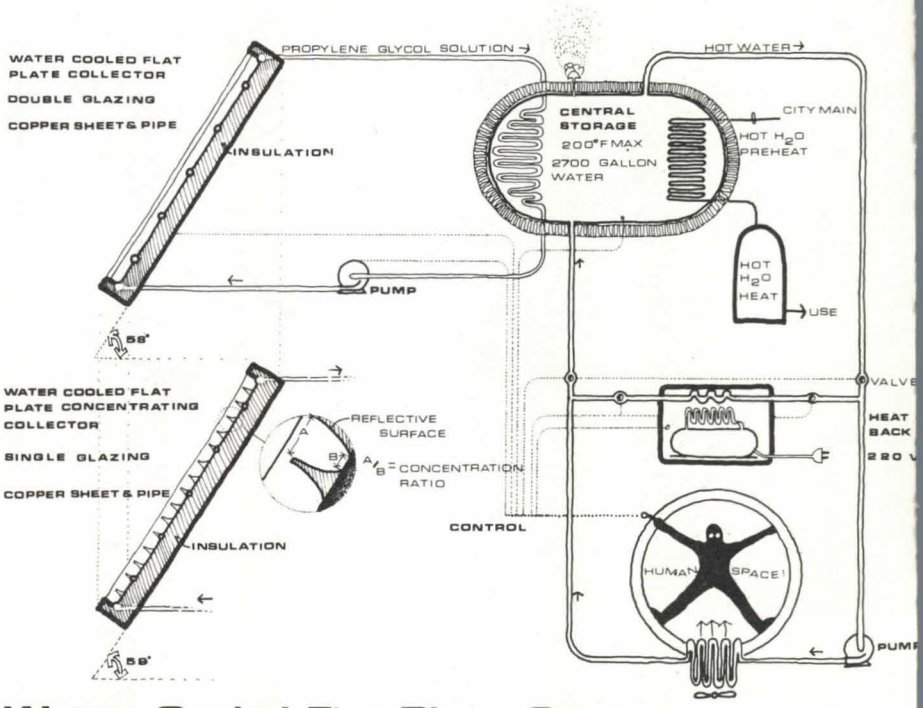


Relating solar systems to building forms, with a leavening of whimsy.

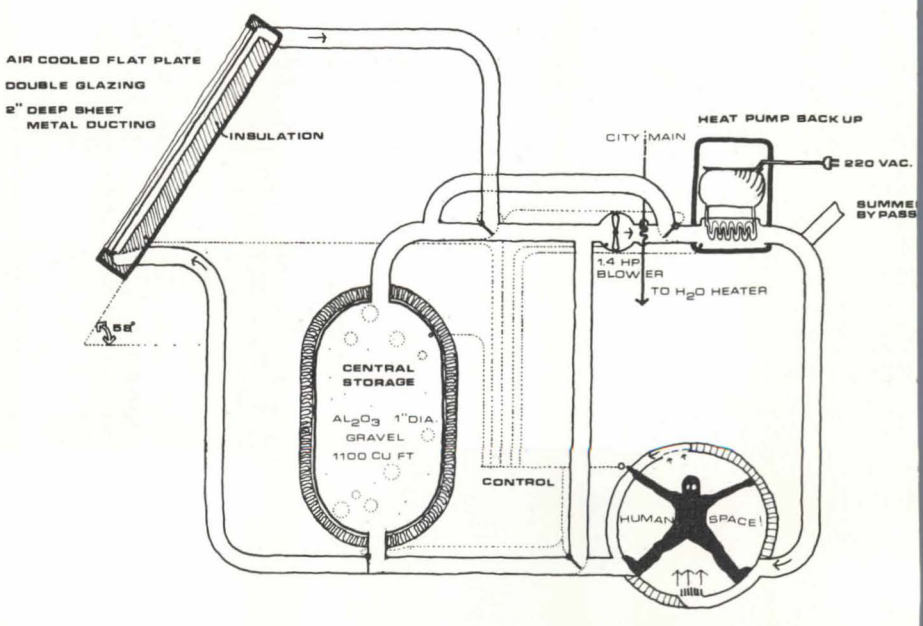
The graphics are fun, whimsical and at times almost too cute to be believed; the same goes for the writing. But behind all that—behind the crabs, the sea snake, the snail and the Rocky Mountain oyster, as the research team labelled its four housing schemes—behind all that there is a serious attempt to relate housing forms and solar energy design. What else but just such a combination of whimsy and serious thought would you expect from an outfit that calls itself Joint Venture and Friends (Architects, Environmentalists and Visionaries).

Joint Venture and Friends ended up with the conclusions that with solar energy there are as many freedoms available to designers as with conventionally heated buildings. They certainly set out to prove it with their choices of housing forms and solar energy equipment. There was the crabs scheme—fragmented groups of 10 buildings of 10 dwelling units each; the sea snake—a linear structure of 100 dwelling units; the snail, a large curved structure of about the same number of units, and the R.M. oyster—a 100-unit domed structure. With these they paired a variety of solar systems. The crabs scheme got a flat plate solar system, combining the least energy conserving building form with the least efficient heat transfer system (water or air); the sea snake was paired with a concentrating flat plate, or CPC system, putting a high energy conserving form together with the most efficient flat plate system; the snail got the most efficient collector system, a spherical SRTA system; and the Rocky Mountain oyster, the form offering the highest rate of energy conservation, got the least efficient and perhaps the most complicated system, a photovoltaic system that through a process roughly approximating magic produces electricity as well as heat.

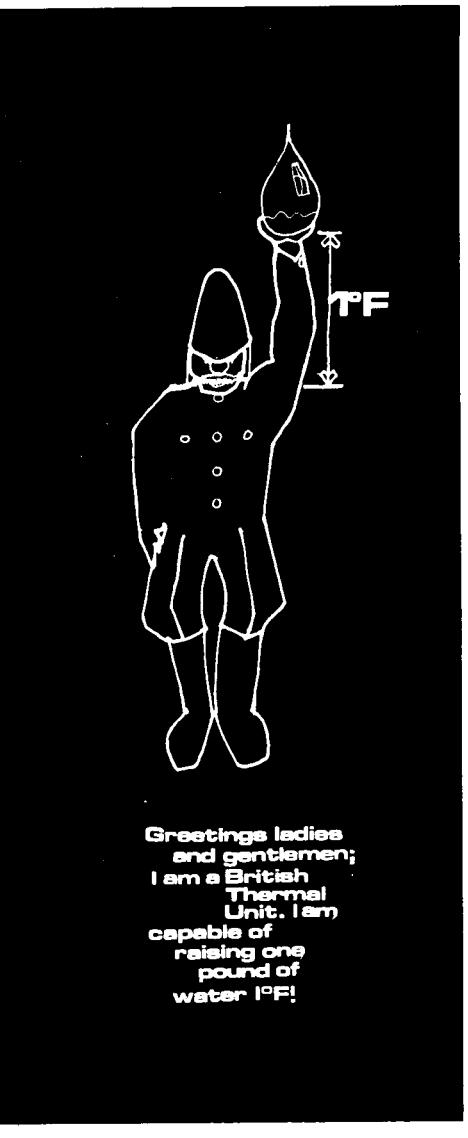
Conclusions? Early in their report these high energy researchers pointed out that there was no perfect solution. They end the report with the idea that each of their schemes—crabs, sea snake, snail and oyster—has its merits; they can all be realized, marketed and used. The trouble is that their self-described seafood platter is almost too much to swallow. Which is too bad, because it's all fresh and healthful.

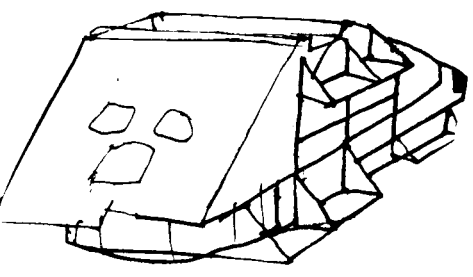


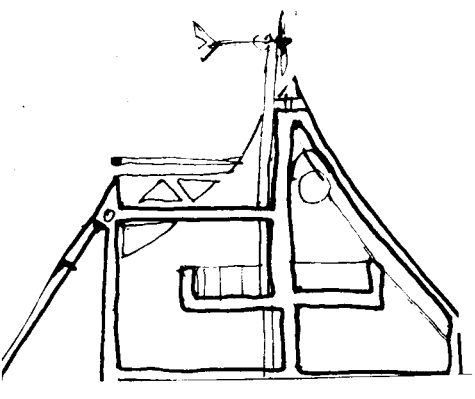
Water Cooled Flat Plate System BY JOINT VENTURE

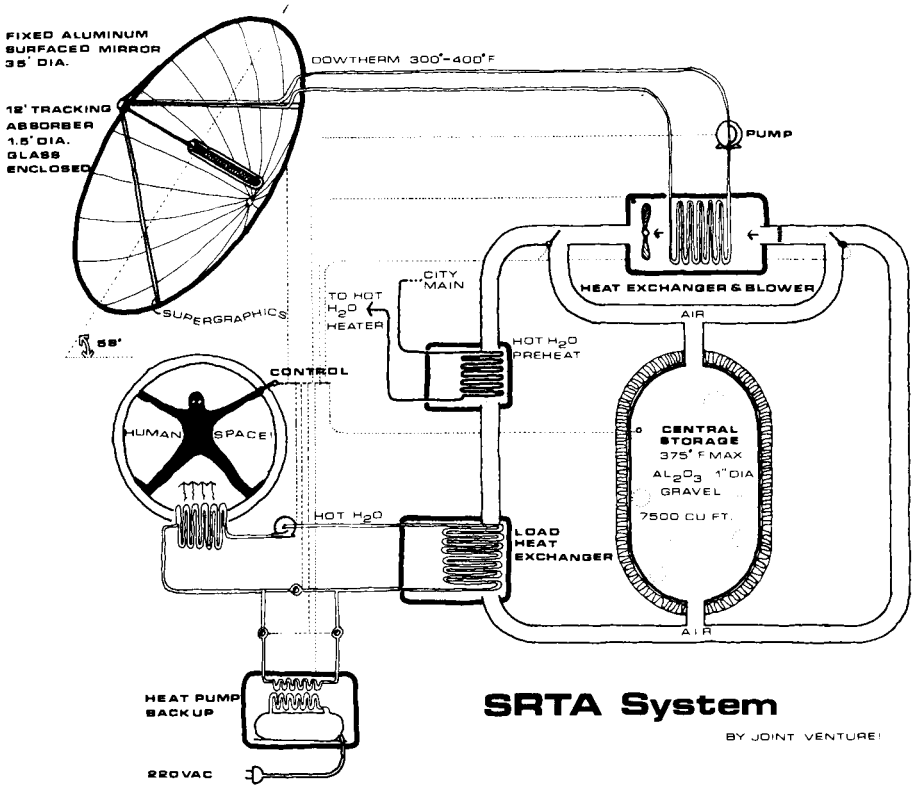


Air Cooled Flat Plate System



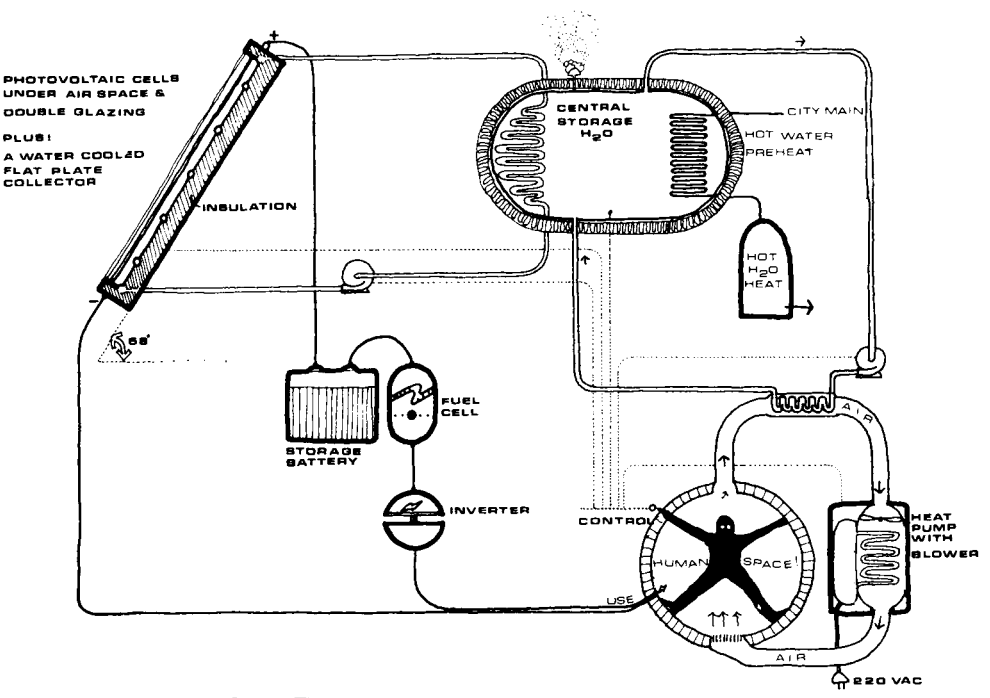






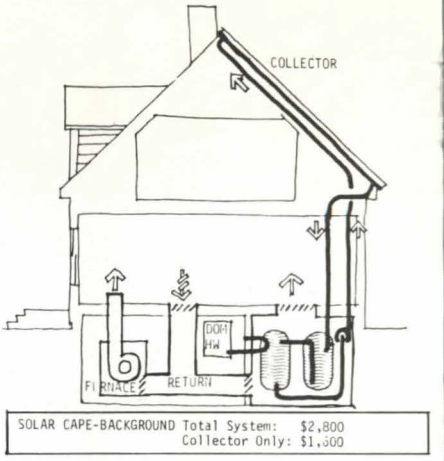
SRTA System

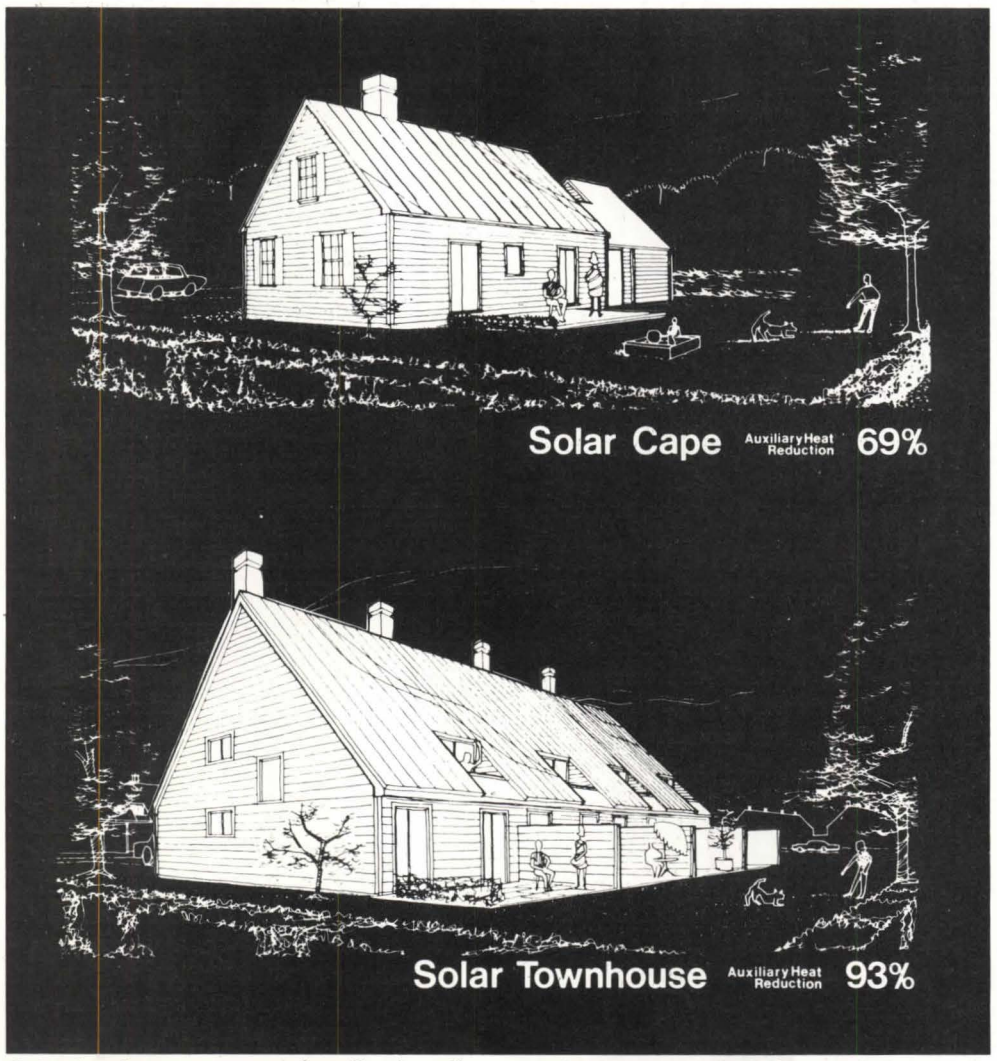
BY JOINT VENTURE!

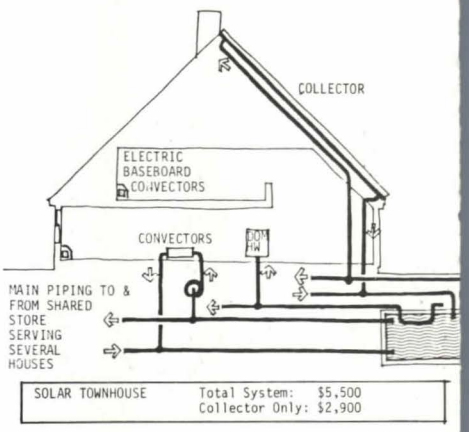


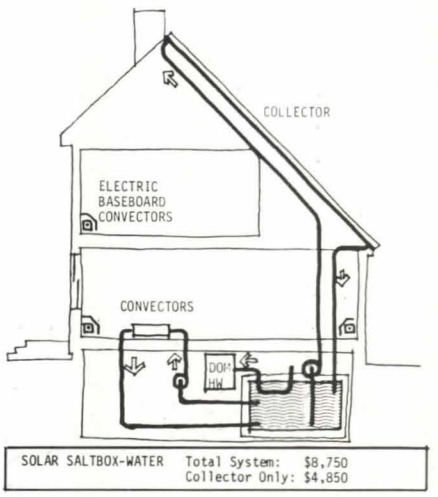
Photovoltaic System

Adapting the merchant builder's saltbox for solar heating.









Solar heating systems can handle virtually all the space heating requirements of the typical builder's house in New England, reducing the amount of fuel used for domestic hot water by 80 percent, according to the study by MASSDESIGN of Cambridge, Mass. What's more, the study makes it clear that solar heating systems can be built into selected conventional houses without changing their appearance or their utility.

The MASSDESIGN report looked at three solar heating systems—forced circulation warm water, forced circulation warm air (both with inclined or vertical collectors and basement heat storage) and an "inherent" or "passive" system in which a massive south wall collects, stores and radiates heat. Nine different house configurations were studied; they varied according to the amount and type of insulation and glazing, basement, heat conserving improvements and solar equipment.

For the study, MASSDESIGN assigned alternative heat loss characteristics to the variations of each prototype, then tested them against a year's worth of Boston area weather (with the aid of a computer). Costs estimates were based on current New England construction prices and 20- to 25-year amortization at current interest rates. From these estimates, MASSDESIGN could estimate the amount and cost of conventional (or auxiliary) fuel saved, giving an idea of the most efficient combination of components.

The cost of solar heating, they concluded, will probably exceed that of fossil fuel heating, at least at present. Improvements in solar systems and rising fuel prices could change that, perhaps in the next five years. MASSDESIGN also concluded that it is not reasonable to design solar heating systems for more than 90 to 95 percent solar heating in New England because of the number of periods during the year with four or five consecutive days of cold, sunless weather.

The basic solar house heating system can also reduce the amount of fuel used to heat domestic hot water during the summer at little extra cost, the report says, though full solar heating of domestic hot water isn't feasible. That's because it is hard to collect and maintain water at temperatures above 150° F. throughout the year. □

Exploring the Potential Of Research as a Market For Architects' Expertise

ames Bailey

s this same author reported last month, IA's recent economic charrette pro-uced a long list of potential nonbuilding arkets for architects.

This is the first of a series of articles xploring some of these markets, one by ne. ED.

has its pitfalls, and it's a highly com-titive field, but research can be a re-arding pursuit, financially and otherwise, r architects.

"Research" in this context does not ean the traditional studies that archi-cts conduct, usually charging them ainst overhead, in the course of design-g buildings. It means investigations, car-ed out for a fee, that usually lead to in-eased knowledge (such as what causes ople to fall down stairs) or to new ap-ications of knowledge (such as an oustically better partition).

Very few architects—probably less an 1 percent of the profession—are do-g these kinds of contract research. Why? or one reason, says Ben H. Evans, AIA, the Building Research Institute, "Ar-itects simply don't realize that their ckground eminently suits them to do search."

If they did realize it, and if they ac-ely cultivated research work, architects uld probably capture a greater share of e billions of dollars that are consumed research each year in the U.S. In 1974, vernment and the private sector spent estimated $32.1 billion on research d development, and the construction in-stry spent "somewhere between $300 illion and $750 million," according to on Conway, AIA, Institute director of search programs.

What do the research funders spend eir money on that's within the realm of chitects' expertise? Private industry, ys Conway, spends about half of its tal research dollar (some $13.1 billion 1974) on improving its products and e other half on developing new prod-ts. Most of this research is done in-house, but occasionally industry will use outside consultants, including architects.

But the largest area of research opportunity for architects, says Conway, lies in the projects funded by federal, state and local governments, which amounted to some $17 billion in 1974. Government agencies buy a great deal of research that architects are capable of performing, including feasibility studies, programming, building systems development and studies to solve particular problems, such as how to design-stable foundations for structures built on the flood plains of rivers.

Government agencies (as well as many universities, foundations and nonprofit research organizations) spend a large share of their money on more "pure" research —the kind that studies and observes phenomena rather than tackling a specific problem. Most architects, says Robert Wehrli, AIA, chief of the National Bureau of Standards' architectural research section, don't understand this kind of research. "The architect is interested in 'what ought to be,' he says. "The scientific researcher is interested in 'what is.' "

There are many opportunities for architects in "pure" research, especially environmental research, but Wehrli believes that many of them are going to have to "change their attitudes and approach" if they want to do it. "One of the main things required," says Wehrli, "is a sense of curiosity without knowing what the answer is. The scientific researcher has to postpone what he thinks and let the situation tell him what's going on in the world. This is very difficult for architects because they are paid to know the answers."

On the other hand, Wehrli believes that "too much research is done for the benefit of researchers" and that too few research findings are applied to real-life situations. "Architects," he says, "have an important role to play in taking scientific findings and converting them to applications."

A similar view is expressed by John P. Eberhard, AIA, president of the AIA Research Corporation. "The kind of research we're doing is complex problem solving," Eberhard says. "Architects have been trained to become complex problem solvers against all kinds of restraints. Unlike the typical research community, they can produce results."

But first, of course, architects have to get research projects. That can be a long and tortuous process, but it can pay off. One firm that has made it pay off for the past seven years is Stone, Marraccini & Patterson of San Francisco. According to George A. Agron, AIA, SMP's senior vice president, the firm's income from research has averaged $250,000 a year since it "really started seriously" in the field in 1968. Today, SMP has a research staff of 15, including an anthropologist, a systems analyst, a psychologist, a nurse and a research librarian.

The architect who wants to make it in research, says Agron, has to have a lot of curiosity, has to be systematic and analytical and has to be able to work on a team —sometimes a wildly disparate team. He or she also has to be able to write and present ideas with clarity and to know how to collect and analyze information. "Beyond that," says Agron, "he should be a free soul."

Among SMP's major research projects have been five for the Veterans Administration. Three of them involved the development of building systems for VA hospitals and are now being implemented. The fourth was a study to integrate hospital design with transportation systems within the framework of building systems. And the fifth was a study to improve life safety and hospital performance in earthquake regions.

Another architect whose firm has successfully done research for a long time is Lawrence R. Good, AIA, of Lawrence, Kans. "We got started 15 years ago with a state agency in the mental health field," says Lawrence. "We studied the functions and operations of mental hospitals. We started in a small way and expanded by putting together a team." The work with the state agency led to a five-year study of hospitals and mental health facilities for the National Institutes of Mental Health, among other research contracts.

"If an architect is interested in research, and makes that interest known, there are opportunities," says Lawrence. "If an architect puts out the effort to develop con-

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tacts and assembles an interdisciplinary team, he can get research grants."

One of the least likely ways to get a research grant (or contract) is, as John Eberhard states it, "to put together answers and then go around looking for a problem to solve." He cites as an example of this an architect who develops a new prestressed concrete I beam and then tries to get a research contract for which he already has a solution.

"That's the first big mistake," says Eberhard. "The second is to assume you know what a government agency's problems are and tell it you're going to solve them. I get a lot of letters saying 'HUD should be working on this problem, why don't you get me a grant?' Sometimes you can get one that way, but it's a hundred-to-one shot."

Most government agencies and research foundations are "mission-oriented," Don Conway points out. "The Department of Housing and Urban Development, has a mandate from Congress to accomplish certain things. It buys research to help it carry out that mandate. The buyer is calling the projects."

How does an architect find out what projects they are calling? For those funded by federal agencies, the best place to start is in the pages of *Commerce Business Daily,* which contains notices of all "Request for Proposals" (RFP) for research projects issued by agencies of the federal government. (Subscriptions to *Commerce Business Daily* cost $63.50 a year, plus $56.80 for airmail, and can be ordered from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.)

A research RFP describes the project that the agency wants done, the kind of expertise required to carry it out and usually the estimated cost. The proposal that is being requested is a written document describing how the prospective contractor intends to go about giving the agency what it wants, who will do the work, what their qualifications are and how much the contractor will charge for these services. The agency will study all of the proposals and decide who is most likely to do the best job for a reasonable amount of money.

An architect can get a quick course in research simply by reading a typical RFP. It will give an indication of the kinds of teams that have to be put together, the approach that has to be taken and the results that are expected.

But completing an RFP and sending it in cold may not be the best way to break into the research field. First of all, it can be time-consuming and costly. Second, it can be way off base unless someone who works on the proposal (which should be produced by the same team that would perform the research) has firsthand knowledge of how federal agencies operate.

"You should expose yourself to the potential sponsors of research projects and have them explain to you what their problems are," says Eberhard. (He is speaking not only of federal research sponsors, but corporations, foundations and other government agencies.) "Sit down with them. Get publications from them. Get to know somebody in the institution who can present its problems to you.

"You don't have to come to Washington," says Eberhard. "Less and less of the research money is in Washington because of block grants and other developments. This opens up enormous opportunities with state and local governments. They've got research money to spend without the staffs to help them spend it. Architects should talk to local, state and county governments. Many of them don't even know how to define their problems, much less solve them."

But Washington is still a fertile field to cultivate. Among the research offices lodged in virtually every agency of the federal government are two whose programs dovetail closely with the more immediate interests of architects.

One is the community design research program of HUD—the only program in that agency that funds research on physical design and planning. The mission of the program, according to Charles A. Gueli, AIA, its director, is to increase understanding of the "physical, social and psychological impact of the built environment on man."

Within that context, the program funds a broad range of research, covering subjects as diverse as "Site Design Needs for the Elderly and Handicapped" and "Solar Energy Residential Design and Site Planning Guidelines." For fiscal year 1976 (beginning July 1), the program will emphasize research into the impact that design decisions and building regulations have on the users of spaces and buildings, as well as the development of improved housing codes, standards and guidelines. It will also, in the words of the program description, fund research on "design performance standards for alternatives to highrise construction related to varying urban densities."

The second program is the National Endowment for the Arts' architectural and environmental arts grants. This program, like those of other federal agencies, covers certain missions, but it has a more free-swinging approach to the projects it funds within its grant categories. Among the missions now being considered for fiscal 1976 are projects to broaden public awareness of design and public participation in the resolution of design issues, to assist planning for the conservation of historic structures and districts, and to help practicing designers engage in special independent projects.

There is one major hooker: The endowment's grants cannot be awarded to firms, only to individuals "of exceptional talent," universities, state and local governments and nonprofit, tax-exempt organizations. The grants are limited to $10,000 for individuals and $50,000 for organizations, which must put up matching funds at least equal to the amount of the grant.

For the individual architect who has a research or demonstration idea and wants to get it funded, the endowment probably offers the best prospect in the federal government. Another prospect is the National Science Foundation, which spends upwards of $200 million a year on research, most of it for projects proposed by outsiders. But NSF is an extremely tough nut for architects to crack, primarily because it doesn't often consider architectural research scientific enough to meet its standards. It has funded only a couple of dozen architecturally related research projects over the

continued on page 6

A Conversation with the 1975 Convention Keynoter, Dr. Heinz Von Foerster

ancy Thomson Hallmark

IA's 1975 convention, to be held May -22 in Atlanta on the theme "Spaces r the Species," promises an unusually de range of experiences for those at- nding. The marketplace of new ideas s been expanded to more than 30 indi- dual sessions, many dealing with the onomic crisis. The products exhibit has en titled a "showcase of design ideas" d organized into 11 sections around ch subjects as energy conservation and st control. The theme sessions, some volving direct participation by attend- s, will focus on the interaction between vironments and their users. Keynote eaker will be scientist Heinz Von Foers- r. While a scientist might seem an un- ual choice for this role, he is an unusual ientist whose ideas are directly relevant the spirit of the inquiry suggested by e convention theme. ED.

einz Von Foerster made headlines some ars ago when he predicted the extinc- on of the human race on November , 2026—not from starvation but by ing squashed to death. Why so soon? Ve discovered," he said, "that the popu- ion curve of a cooperative species like an was not, as had been thought, an ex- nential curve but rather a hyperbolic rve which, in our case, will approach finity on November 13, 2026—give or ke a few years in either direction. I se- cted November 13, of course, because is my birthday."

The doomsday prediction inspired an isode in cartoonist Walt Kelly's "Pogo," distinction to which Von Foerster refers th amusement and some pride. He re- lls mentioning to a government official at, although one of his university col- agues had received the Nobel prize in ysics, he still had not appeared in Pogo," and notes that the official was itably impressed.

Asked what he wants to say to archi- cts, Von Foerster replies characteristic- y with a counter question, "But what the architects want to talk about with e?"

Then, proceeding to answer both my question and his own, the Viennese-born professor says, "My principal concern at the moment is the problem of what is going on in a dialogue."

For a convention whose theme is the dialogue between the built environment and human behavior, the choice of Von Foerster as principal speaker seems particularly apt. A physicist by training, he is a specialist in the physics of perception and his work in the field of cybernetics is internationally known. Until his recent retirement, he was a professor in the departments of electrical engineering and biophysics at the University of Illinois, and also served as director of the university's biological computer laboratory. The titles of his publications run to seven pages of typescript, and his impressive scientific credentials include two Guggenheim fellowships.

For Von Foerster, however, the distinction between "the two cultures"—science, and the arts and humanities—is an artificial one. "I am associated with the scientific domain," he says, "but I can stand on two legs. I can speak artistically about scientific things; I can speak scientifically about artistic things. My language will take on the flavor of the dialogue which the other person is creating with me by his interests and by his response to what I am saying."

Von Foerster views his straddling of the two domains as his "point of resonance" with architects. "Architecture acknowledges the inseparability of the artistic and scientific universes, their perceptions and perspectives.

"The architect must be artist, physicist, engineer. It would be impossible for him to stay in any one of those worlds and still do what he does. The distinction between artistic and scientific 'disciplines' only comes when you are in academia. There is really no such thing as an 'interdisciplinary approach': it is a *non*disciplinary approach. Forget about the disciplines; just *do* the thing!"

"Do you see your coming into a dialogue with architects at the convention as part of your nondisciplinary aproach?" I ask.

"Oh, absolutely. A professional convention is often a place where people come to talk to themselves. But when you get a strange fish into that pond, you break the interlock of self-talk. If everybody agrees, then no one says a thing! The most important thing is to be controversial, to say things that people don't know so that they become surprised or angry—that would be the perfect thing—and then the dialogue can begin.

"This is the function I see for myself in Atlanta, to be like but different. The surfaces must be matched; otherwise dialogue would be impossible. But then what follows must be completely strange."

"So in order to 'match the surfaces' you may have to make some agreements about communication beforehand?"

"Oh they emerge, they emerge. You can't have it beforehand. This is why a dialogue is not what is defined in a dictionary, that is 'an exchange of ideas, a transmission of information.' You can't transmit information, you can't exchange ideas. People are always referring to information and ideas as commodities, as objects. It is as though ideas were like patterns to be duplicated; you make a little stamp and it comes out as a commodity. This is clearly nonsense."

"Why do you say that?"

"I believe," answers Von Foerster, "that there is a rapid and fundamental change going on in the way in which we look at things; a loss of faith in what was called 'objectivity.' It is perhaps more than a loss of faith in objectivity; it is seeing that belief in what is called objectivity is one of the major sources of irresponsible behavior. In claiming that there is such a thing as objectivity, what one supports is a refusal to be responsible for one's acts.

"The moment that there is so-called 'objective truth' to something, it is no longer uttered by anybody. It is not you who utters something; what you are saying is the objective truth, and you can't be made responsible for that. You are only an instrument of describing it.

"I'll give you my formulation of objectivity. Objectivity is a state of affairs in which the properties of the observer shall not enter the description of his observations.

"If you say, '*I* see something,' then it is a reference to your very properties of see-

s. Hallmark is a writer of news articles d features for the AIA.

ing. But if you say, '*One* sees something,' then it is surmised that *if* someone were able to see, he would see that thing. If one takes seriously the rule that the properties of the observer shall not enter the description of what is observed, then probably nothing can be observed. It is the properties of the observer that make observations possible; therefore any description that can be made of anything *will* and *must* contain the properties of the observer."

"Still we do talk about dialogue. If ideas are not being transmitted, then what is going on in a dialogue?"

"For a dialogue to take place," replies Von Foerster, "two partners must attempt to generate an environment in which each can be creative. And when creativity is induced or provided for by the whole situation, then each partner can invent ideas which he *thinks* are the ones being transmitted. Whether the idea was indicated by the other partner can never be found, and whether they really mean the same thing is absolutely impossible to establish. Thus a dialogue is a process in which the partners mutually generate their creativity."

"How does this relate to architecture?"

"I believe," says Von Foerster, "that architecture should see itself as a dialogical thing. It is not a commodity to be delivered; it is a catalyst for letting dialogue be created. That means that architectural spaces should constantly allow for the stimulation of creativity in the people moving within them. Otherwise architecture produces commodities, objects, instead of inviting process.

"If the architect is thinking in terms of commodities, then he is not aware of his responsibility for what is being done. He has refused to take responsibility for what goes on in the building when he is no longer there. Yet the architect *is* always in the building, because his decisions continue to influence the interactions that go on among the building's users."

"Is it then the architect's responsibility to decide what kinds of interactions should occur within a given space? Doesn't a design decision determine how people react in a particular place?"

"The ideal thing, of course, would be to allow people to make the choices about how *they* want to be. That means that the architect should make as few choices as possible and, instead, invite them to make the choices."

"But once you dig a hole or put up a wall, you have already made some choices."

"Of course. Still I would present to you an ethical imperative for the last quarter of the 20th century and that is that anything which is done should increase, not decrease the number of choices available. And to enrich the number of choices you need something that stimulates, something that invites invention."

"It seems as though you are asking for an architecture without constraints to choices."

"Yes," he answers. "And this creates a paradox, which is really one of the most fruitful ways of getting something. Paradox cannot be resolved in the plane in which it is presented; it forces you to get out into another dimension, in this case into a new realm of choice. If a constraint is set up in order to increase the number of choices, then it is not a constraint in the narrow sense but rather in the paradoxical sense that says, 'You can't but you must!'

"Any utterance presents some kind of constraint. But it can also suggest some inventiveness, some possible choices, like a seed. A raindrop cannot form unless there is a piece of dust. You need something on which something else can develop, a nucleation. And the person or the gesture that makes such a nucleation possible carries a tremendous responsibility. You might nucleate in a very dangerous direction, reducing the possibilities for choice. So the way in which you make the initiating gesture must be looked at with greatest care, as in any creation."

"We seem to be talking about the responsibility of the architect."

"Absolutely. This comes as soon as the fallacy of objectivity is removed. If you have objectivity, you don't have to be responsible at all because you are only doing things as they are anyway. But if things are not objective, if they are to be created, then the responsibility falls on the creator."

"I see what you mean, but where does the responsibility end? Won't people say, 'Once the architect puts a wall in place, it's there?' "

"Certainly. Therefore he should watch it when he puts the wall in place. He should really watch it. And he should be asking himself questions in the process. Once the architect starts asking himself questions, he will tend to respond, and if he tends to be responsive, then he becomes aware of responsibilities. In this way he sets up both an internal dialogue and a dialogue with somebody else.

"Yet the conception some architects have of themselves is counterproductive t this activity. Take, for instance, the famous notion of a 'strong statement.' Statements are not conducive to dialogue. If you make a statement, you want to have the other person completely silenced. Therefore I think that making strong state ments should not be part of the architectural game. This is not, at the moment, what is really needed in this world. What is needed is to initiate perception among people who have been blinded, who cannot say what they want because the whole of our cultural apparatus has squashed th perception of needs and desires."

"Then it is the job of the architect to ask questions?"

"Exactly. Questions that cannot be answered with unique answers, that cannot be interpreted in a single way. If you do this, you are creating yourself in a dialogi situation and allowing the other to becom creative in the same spirit.

"If you make statements, you don't make a dialogue; you stop a dialogue. Yo may make a pronunciamento: 'Here I am the great XYZ!' And the other will say, 'Thank you very much, I knew that.' You have said nothing.

"People seem to think that if they scream very loudly they can be heard. Bu that turns out not to be the case. You are only heard when you can be answered."

"One last question. Does the kind of thing we have been discussing have any implications for the economic crisis now facing the architectural profession?"

Von Foerster thinks for a moment, the smiles. "But awareness is applicable in *an* situation. When you are in danger, you do not shrink the pupils of your eyes; you widen them!" □

The Board Acts on The Role of Women In Architecture

The AIA board has voted to launch a four-year affirmative action plan "for the integration of women as full participants in the architectural profession."

The board's action, taken at its meeting early this month in New Orleans, followed recommendations of the women in architecture task force and submission of the task force's report on the status of women in the profession.

The task force will draft the affirmative action plan for submission to the board in December. At its New Orleans meeting, the board also adopted the following policy statement:

"The American Institute of Architects affirms that the architectural profession and the AIA are entirely and equally open to women and men.

"The AIA affirms that societal prejudices and the traditional views of the role of women are not justification for perpetuation of discriminatory treatment of women.

"The AIA shall make a determined effort to integrate women as full participants in the profession. To attain this goal the AIA shall take affirmative action during the next four year period to:

- "Increase the public's awareness of the contribution of women architects in the design of the built environment;
- "Increase the percentage enrollment of women in all undergraduate and graduate architectural programs;
- "Promote employment policies and practices which will assure women equal access to employment opportunity;
- "Increase the membership of women architects in the AIA;
- "Insure active participation by women members in the activities of the AIA at all organizational levels.

"Any practices by AIA members which are found to deny women equal participation in the profession will be in violation of the Standards of Ethical Practice and policy of The American Institute of Architects."

The portrait of the typical woman architect that emerges from the task force's report is that of a 39-year-old woman who is outnumbered by males in her profession more than 95 to one, and who suffers pervasive discrimination solely on account of her sex. (Women make up only 1.25 percent of all registered architects and 3.7 percent of architects nationwide.)

True to commonly-held notions about career women in general, the woman architect is more likely than her male counterpart to be unmarried (54 percent of women architect respondents were married compared to 89 percent of men). She is also more likely to be childless (44 percent of women respondents had children compared to 88 percent of men).

Much like her male colleague, the female architect chose architecture as her first preference among possible occupations. She chose it at approximately the same age as he did (18), and like him elected it as a result of a process of self-evaluation.

The task force report found that despite initial similarities between men and women architects, their career paths begin diverging sharply very early on as a direct result of discrimination against women.

For example, even after identifying their primary interest in architecture, more women than men reported having majored in fields other than architecture as undergraduates, a fact the task force interpreted as a sign that women feel more serious doubts about succeeding as architects. Further, although they seldom result in higher incomes, graduate degrees in architecture were obtained by almost twice as many women as men, which the task force viewed as an attempt by women to bolster a shaky sense of self-confidence.

By far the most significant difference separating men from women in the architectural profession is the size of their respective salaries. The mean full-time annual salary for women is $14,500 as opposed to $24,300 for men. Yet almost half of the women surveyed reported that they rely only on their salaries for financial support.

The gap separating men and women architects in terms of their earning power is matched by a comparable discrepancy in the status and influence of their positions within the firm. Only one-quarter of women responding to the survey, as compared to 64 percent of men, were principals or partners. Also, only 31 percent of women, as compared to 70 percent men

architects, benefit from some form of profit-sharing.

In fact, says the report, discrimination affects almost all aspects of the careers of women architects, placing them at a disadvantage in being hired, receiving internships, being promoted and obtaining other signs of professional recognition.

The probable reactions of women to such treatment are not hard to fathom. "Frequent disappointments and frustration," said a typical respondent, "cause eventual apathy and reluctance to continue fighting the issue. I have been sidetracked into less interesting (to me) related fields due to need for employment and adequate pay." Or another: "Anger and regret may be stimulating to others, but to me they are paralyzing."

One reason for such anger and regret is that in their careers women are penalized, according to the report, for being married and especially for having children. Men and women architects taking time off from their principal places of work are viewed very differently. The report found that "men who take time off to teach, for example, are encouraged by their employers. Women who take time off to care for children risk losing their jobs."

In the same vein, one of the reasons most frequently given by employers for not hiring women to begin with is that their work may be interrupted by eventual pregnancy or child-raising. Yet, the report found that the average total time away from their careers for women architects was a maximum of two years (compared to one year for men), and that there was less than one chance in four that it was caused by children. "This is certainly not a persuasive argument for discriminating hiring practices," says the report.

Another significant form of discrimination against women cited by the task force report is prejudicial licensing practices. Architectual registration boards in some states do not accept any form of part-time work as applying towards eligibility, which is one of the reasons the majority of women surveyed were not NCARB certificate holders.

The "sponsor-protégé" system of advancement is cited as another major obstacle to the promotion of women. Outmoded views on women's limitations frequently prevent the "sponsor" or person in power—almost invariably a man—from designating a woman as his "protégé" or successor. "Discrimination has been the most damaging to me in terms of ultimate goals rather than intermediate ones," says a typical respondent, commenting on the effects of the "sponsor-protege" system. "[I] became aware of the impossibility of becoming a partner in a large firm. It caused me to alter my professional plans. . . ."

Turning to the general issue of underrepresentation of women in architecture, the report found that "the opening up of the architectural profession to women . . . lags behind many other traditionally male fields."

The commonly held impression that there has been a dramatic rise in the number of women studying architecture is not substantiated by the task force, which notes that only a modest, albeit steady, increase has occurred and that it is limited to a few select schools.

The report suggests that many women are deterred from entering the field merely by "knowledge of existing discrimination against women in the profession."

It blames outmoded traditional views about "women's work" and "women's place" in society both for discouraging women from entering the field and for the prejudicial treatment they receive once in it. In recent years, of course, federal, state and local laws have made it illegal to discriminate against any individual because of sex.

For its part, the AIA has included in its Standards of Ethical Practice, Standard 2, which reads: "An architect . . . shall not discriminate against any employee or applicant because of sex, race, creed, or national origin."

To date, no charges for violation of this portion of the standard have been filed, which the task force thinks is because "the statement is very general and there are no interpretations of the board of directors as to which practices are discriminatory."

"Few women," the task force continues, "are aware of the AIA grievance procedures. In addition, women in the profession generally do not believe they can get fair treatment by the AIA." As one woma AIA member put it, "I have felt not only underrepresented but discriminated against by those in power in the AIA. Many do so subtly."

The report provides substantial evidence that women feel alienated from AIA. According to a 1973 survey of AIA membership, only 222, or 1 percent, wer women.

In conversations with women architect across the U.S., the task force members learned that women applying for membe ship in AIA "were often told they were not welcome and/or advised to join the WAL [Women's Architectural League]."

"Even in areas where such practices do not exist," said the report, "women architects are usually assigned to commit tees which deal with subjects assumed to be more to the 'taste and abilities' of women. They are seldom assigned to con mittees on codes, regulations, awards, nominations, structure, etc."

The largest number of non-AIA wome respondents (29 percent) claimed that they were not eligible for membership, which would indicate that many were either unfamiliar with associate membership categories, or considered them of dubious value. Other reasons for not belonging to AIA given by significantly hig percentages of women surveyed were the high "cost of membership, disagreement with policies, and that AIA membership was not useful to them."

The full report of the task force will be distributed at the 1975 convention and to all AIA components. In addition, the task force has prepared a "guide to lawful employment practice," designed to assist "employers in the discharge of their obligations and employees in securing their rights."

While the task force will continue to take a leadership role, it emphasized to the board that "the responsibility for taking affirmative action for equal emplo ment opportunity cannot be assigned to a particular group, but should be shared by all those within the AIA structure whose activities or charges effect the employme practices of the membership."

Andrea O. Dec

How AIA Acquired Its First Woman Member, Mrs. Louise Bethune

eorge E. Pettengill, Hon. AIA

e first!—so meaningful and yet it is ore often than not impossible to say ars afterwards precisely who or what irst. For instance, Mrs. Louise Bethune s been called the first professional oman architect in the country. Whether e was or not is difficult to prove, but we n assert without much trepidation that e was the first woman member of the A, elected an associate in 1888.

Still earlier, in 1885, she had been cted a member of the Western Associan of Architects, probably the first oman ever elected to an architectural ciety of more than local import. This curred in St. Louis, at the second conntion of this new society, which had en organized just the year before. Perps a transcript of what happened, as it peared in the *Inland Architect* of Noember 1885, may be worth repeating:

"At the afternoon session.

e President called the meeting to order d said: There is a bit of unfinished busiss before we can proceed. All the memrs recommended by the directors for mission were voted in except one, and thing was done on that subject.

r. Burnham: That was with reference a lady.

e President: Now, I will ask if the comttee are prepared to recommend that rty in all respects except the fact that is a lady.

r. Sullivan: Yes, sir.

e President: What shall be done with s question?

r. Burnham, of the Board of Directors: ay I say that what the board desires is be instructed upon the principle of adtting women as members of this assotion. That is the thing. If this decision given to us to admit women, we will ke the recommendation. We would like decision, now, of the convention, as to ether it desires to admit women as mbers of the association. We want the -Laws interpreted.

member: I would like to know what opinion of the Board of Directors is.

r. Burnham: We are all agreed; we are y much in favor of it.

Mr. Cochrane: Then I would recommend that the secretary cast the ballot for the lady.

A member: Is the lady practicing?

The President: Yes, sir.

Mr. Cochrane: Let the secretary cast the ballot as he did for the others.

The motion was seconded.

Mr. Sullivan: What we desired was a vote of instructions as to the admission of women as a general thing.

A member: It seems to me that if you carry the motion as made by Mr. Cochrane that it will suggest a precedent for future consideration. If the lady is practicing architecture, and is in good standing, there is no reason why she should not be one of us.

The President: The motion is made and seconded that this lady applicant be admitted to membership. All in favor of this will say aye.

Motion was adopted.

The President: Mrs. Louisa Bethune is the applicant. Her husband was an applicant but withdrew. She has done work by herself, and been very successful. She is unanimously elected a member."

Although Louise Blanchard had hoped to attend the newly-opened architectural school at Cornell University, she was offered a job as a draftsman at the age of 20 and decided to get her training in the office. There she met her future husband, and after a five-year apprenticeship, opened an office with him in 1881, their marriage occurring a few months later. A new partner was admitted in 1890, and although Mrs. Bethune did not remain active too long after that, the firm name continued as Bethune, Bethune & Fuchs until her death in 1913.

She believed in equal pay for equal service, and she did not believe that women architects should specialize in dwelling house architecture—the firm did all kinds of work.

And what of her reaction to the honor accorded her in St. Louis? This has recently come to light in a letter written to John M. Root after her acceptance by the Western Association of Architects.

"Dear Sir.

"Your kind note of congratulations has just followed a similar one from Mr. Illsley. My sincere thanks are certainly due to you and thro (sic) you to all members of your society for the cordiality of the welcome you have accorded me, and also for the extreme delicacy and adroitness with which the nomination and election were managed.

"I am particularly sensible of the kindness the association has rendered me, and the honor it has done itself in preserving my admission from any taint of ridicule or notoriety. If the society's new member is no great acquisition, its new measure's certainly creditable and progressive. . . .

"Don't trouble to acknowledge this unduly long and unbusinesslike letter. My excuse is a stormy afternoon and consequent unlimited time. . . .

Louise Bethune"

In any event, it was less than three years later that she applied for admission to the AIA and was admitted April 4, 1888. Her letters of application have not survived but copies of those to her indicate that she submitted documentation on the following projects: P. Hoffman's millinery house; police station no. 2; school no. 4; dwellings for Wm. Mitchell, Spencer Helleg, H.G. Brooks; residence for A.J. Meyer, and a frame house for Geo. Waterman.

In a speech in 1891 on "Women and Architecture", Mrs. Bethune said:

"The professions of medicine and law were far advanced before the much needed and highly appreciated physician and lawyer appeared. Women have entered the architectural profession at a much earlier stage of its existence even before it has received legislative recognition. They meet no serious opposition from the profession nor the public. Neither are they warmly welcomed. They minister to no special needs of women, and receive no special favors from them. . . .

"The great architectural societies of the country, the American Institute and its state and city Chapters are all open to them upon proof of qualification. Thank, with me, the noble hearted men whose far-seeing polity and kindly nature has laid this stepping-stone."

Never since the admission of Louise Bethune has the AIA been without a woman's name on its rolls. □

r. Pettengill is AIA archivist and rarian emeritus.

A New Approach To Pennsylvania Avenue's Renewal

Sometime in April, Congress will either accept or reject a new plan for the renewal of Pennsylvania Avenue between the Capitol and the White House. It is the third plan for the avenue produced in little more than a decade, and it differs from its predecessors in at least two significant ways.

The first is that it has teeth, having been drafted by a Congressionally-created nonprofit corporation with the power to carry out much of what the plan proposes. The second major difference is that the new plan pays more than lip service to the fact that Washington is a city as well as a capital.

The two earlier plans, published in 1964 and 1969, had called for a massive rebuilding of the cluttered and partially decaying north side of the avenue and the opening of a sweeping vista from the Capitol to the Treasury Building softened by rows of trees lining tiered sidewalks. Both plans included a vast "national square" in front of the Treasury Building, which as initially conceived would have required the razing of the Willard and Washington Hotels and the National Press Building. The square was designed as a fitting culmination of the "grand axis of the nation."

The older plans also called for a monolithic series of new buildings along the north side of the avenue, set back 50 feet to provide room for three rows of trees and meeting the street with ground-level arcades.

The sweep of the proposals in the earlier plans was matched by their prose. "The spirit of the plan is contemporary," said the 1969 version. "It seizes and employs the very forces of technology, growth and change that have threatened the destruction of so many large cities. . . . In the great tradition of city planning that Washington has always expressed, the rebuilding of Pennsylvania Avenue should

A ceremonial way between the White House and Capitol, Pennsylvania Avenue also is the place where the federal precinct and the city of Washington meet most directly. The plan area is the avenue's north side (left in photo), which now faces the federal triangle with a motley collection of mainly commercial buildings.

find a place in the nation's heart as a fittin tribute to its national aspiration. It is an achievement to fill the nation with pride. The opportunity of today . . . is to realize a great conception which embraces so much of what the city and the national government desire, and to do so with a dispatch which rivals the imagination and style of the plan itself."

By the time the Pennsylvania Avenue Development Corporation took over in 1973, a changed view of what the avenue should be had begun to emerge.

The fledgling corporation reflected this in its stated planning goals. Among other things, it said, the plan should: reinforce the symbolic link between the White House and the Capitol; make the avenue function "as a bridge, not as a barrier" between the monuments, museums and federal buildings to the south and the city downtown commercial area to the north; turn the avenue into an "attractive and pleasant place for residents and visitors alike" with "comfortable places to stroll, rest, sit and talk, eat and shop"; provide a mixture of commercial and cultural activities that will attract a wide variety of people and stimulate streetlife, and bring people back to the avenue.

What evolved from this kind of outlook is a plan that, while respecting the nature of the avenue as the nation's ceremonial street, is less a sweeping vision than a set of block-by-block prescriptions for blending new development with existing buildings of enduring economic or architectural value.

Among the old buildings to be saved, if possible, are the previously threatened Washington and Willard Hotels. Preservation of the mannered, beaux arts Willard, in particular, has become something of a local cause célèbre, and while its future remains clouded, at least it will not be a casualty of the plan.

The four blocks next to the hotels are

The 1969 plan called for a huge "national square" in front of the Treasury Building which blocks the avenue's procession to the White House. It would have lined the avenue's north side with massive new buildings set back to widen the shaft of space between the square and the Capitol

esignated for a variety of uses—offices, ıops, restaurants, theatres and open ɔaces, intertwining old and new buildings romising a variegated texture for the orth side of the avenue. The combination f old and new breaks up the setback line, vith the older buildings jutting out and ny new buildings pushed back behind ɔws of trees.

Between 9th and 10th Streets is the new BI headquarters, an immense, overscaled nd bland concrete building which was uilt in conformance with the older plans nd looks starkly out of place in the con-ext of the new proposals. Ironically, the ne place where the building deviated from he previous criteria is that it does not have rcades, which might have humanized it omewhat. They were eliminated because . Edgar Hoover feared they might pose afety problems for female FBI employees.

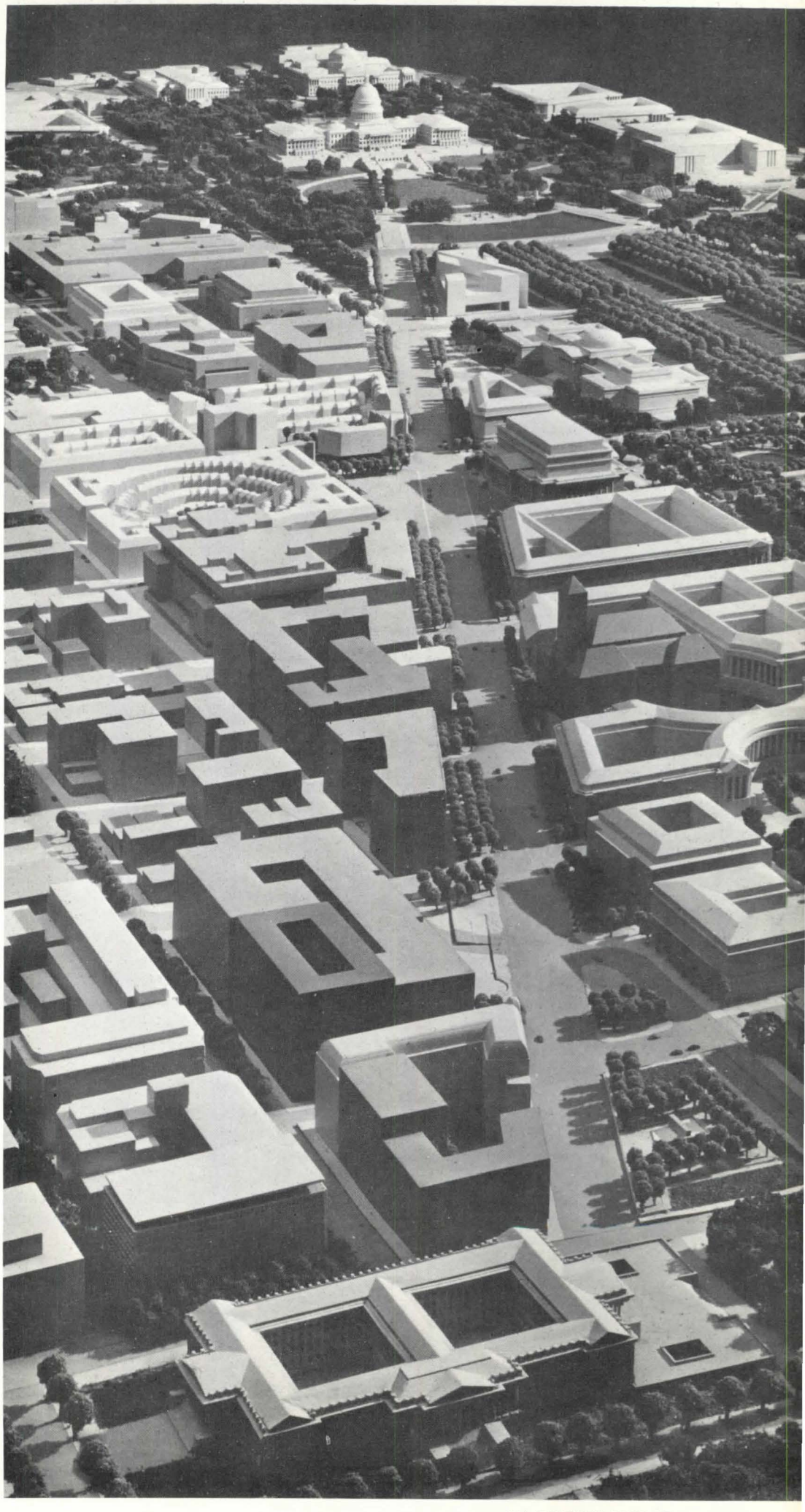
Next to the FBI building is the most lramatic element of the new plan: 1,500 ınits of housing in a four block superblock ut through the middle by 8th Street. De-igned by Hugh Newell Jacobsen, FAIA, he housing is in an inward-turning com-ɔound with the exterior devoted to arcaded etail space on the ground floor and offices ınd parking above that. Inside would be he housing arranged in two-to-four story iers. Also within the superblock would be he Woodrow Wilson International Center or Scholars.

"There's real merit to the housing de-ign," said Katharine B. Gresham, a Penn-ylvania Avenue Development Program ɔlanner. "How do you live next to the BI building and still be human in scale?"

"Getting residential development is ɔaramount for a revitalized downtown," aid Robert Gray, planning director of Downtown Progress, a civic-business orga-ıization dedicated to the renewal of the ɔommercial core area which abuts the PADC's territory. "If there is a key, it is

continued on page 45

n the new plan the square is eliminated ınd new buildings are interspersed with ɔld on the north side. The plan's most triking element, a housing compound, is he coliseumlike structure just beyond the nassive FBI Building at the avenue's ıpproximate midpoint.



Barrier-Free Architecture: 'Yesterday's Special Design Becomes Tomorrow's Standard'

"It is clear to the practicing architect that barrier-free design is no longer a special solution to an isolated problem. It is going to be a requirement of an increasing number of architectural commissions for both publicly and privately owned buildings," says Edward H. Noakes, AIA, chairman of the AIA barrier-free policy task force.

The task force calls this a "quiet revolution in which yesterday's special design becomes tomorrow's standard." The "revolution" is being carried forward by handicapped citizens who are using both lawsuits and lobbying to claim successfully their right of access to all elements of the built environment.

This assessment is backed up by a book published this month titled *Into the Mainstream: A Syllabus for a Barrier-Free Environment,* prepared by Stephen A. Kliment, AIA, for the Institute, under a grant from the Rehabilitation Services Administration, Department of Health, Education and Welfare. (A copy will be sent to each AIA component; a limited number of single copies are available without charge from the AIA department of design and international relations.)

The book—intended for both "seasoned workers" and those who are new to the issues of barrier-free architecture—contains a major section on what has happened in recent years in the passage of local, state and federal legislation to make buildings accessible to the handicapped. A 1973 pamphlet prepared by the President's Committee on Employment of the Handicapped, titled "A Survey of State Laws to Remove Barriers," indicated that nearly every state in the union had statutes on architectural barriers. Now all do.

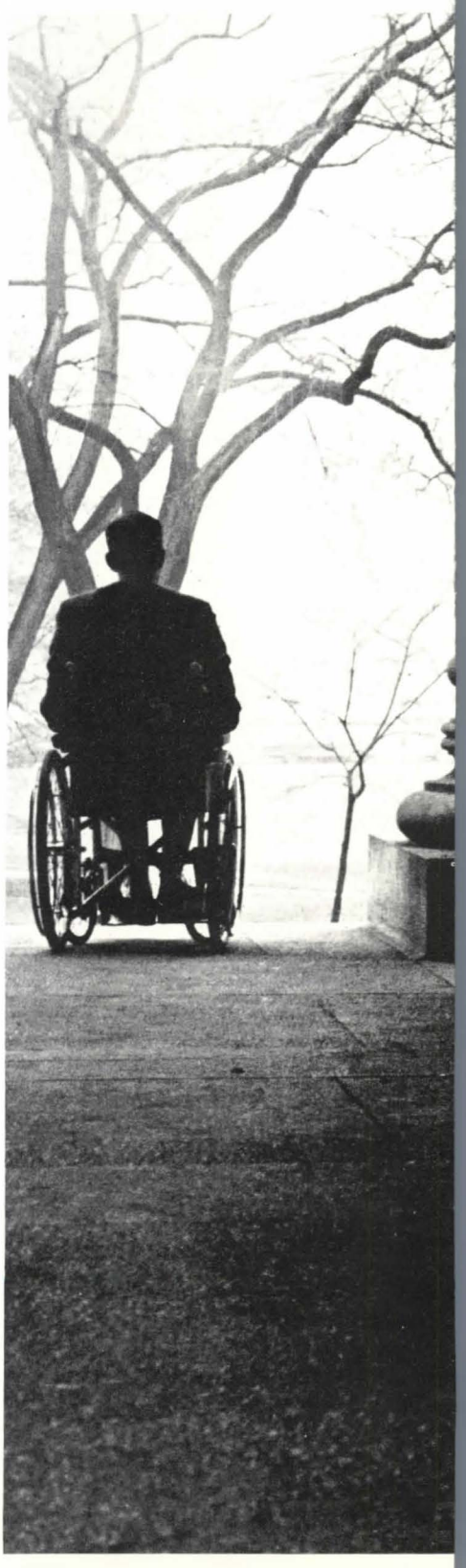
The federal Architectural Barriers Act of 1968 (PL90-480), in which AIA's initial task force on barrier-free architecture played a leading role, stated that "any building constructed in whole or in part with federal funds must be accessible to and usable by the handicapped." This legislation was buttressed by PL93-112, the Rehabilitation Act of 1973 (amended in 1974 by PL93-516).

The 1973 law established the Architectural and Transportation Barriers Compliance Board, giving the board the power to "conduct investigations, hold public hearings and issue such orders as it deems necessary to insure compliance." Its authority was strengthened by the 1974 amendment.

This legislation also requires that "qualified handicapped applicants be actively recruited, considered and employed" under any contract with the federal government over $2,500. The provision not only applies to initial employment of the handicapped, but also to job assignments, promotions, training, transfers, etc.

Kliment points out that "the handicapped are being thought of more and more as a classification of citizens whose *civil rights* are being abridged by the presence of barriers." He cites a precedent-setting lawsuit in which a disabled attorney brought action against Cuyahoga County in Ohio. The lawyer was unable to enter several county buildings without assistance, and he filed suit for a judgment on right of access. The county buildings were not new and thus were not covered by the Ohio barrier statute. The action was based, therefore, on *rights* guaranteed by the U.S. Constitution and the state of Ohio. The lawsuit ended when county commissioners agreed to eliminate the barriers.

"The prospects for a barrier-free architecture are brighter than they have been in decades," Kliment writes. "Barriers are being attacked on many fronts. . . . The entire philosophy behind the barrier-free movement is gradually shifting to the view that handicapped individuals must be able to live as wide and rich a life as any other citizen, with total freedom of choice as to where they wish to work, play, study and live; and that no man-made negligence must be allowed to prevent this. . . .



The photos at right and on page 44 are from a widely reprinted 1969 JOURNAL *article on barrier-free design. Photographer Ron Jones accompanied a handicapped veteran on a tour of the monuments of Washington, D.C., to determine their accessibility or lack thereof.*

ıere is still room for progress, though, pecially at the local level where citizen titudes and lukewarm or uninformed forcement of codes dilute the legal eakthroughs already attained."

Rita McGaughey, coordinator of edu-tion and training for the National Easter al Society for Crippled Children and dults, is also concerned about the "luke-arm or uninformed enforcement of odes." She says, "The cooperative efforts AIA, President's Committee and Easter als stimulated the first public education rogram in the area of a barrier-free chitecture during the 1960s, which re-lted in the passage of some landmark ws for the handicapped. Now—moving ws into action—requires even greater forts."

There have been many difficulties in the nforcement of federal legislation. This oint was underscored by a survey of 34 derally financed structures, built in the ate of Iowa since 1968, that was con-ıcted by the Iowa chapter/AIA, in co-peration with the state Easter Seal Society nd the Governor's Committee on Em-oyment for the Handicapped. The survey owed that not one of the buildings met l the federal government's own andards.

The Iowa project, a model of its kind r other states and communities, was raised on the floor of the Senate, and the apter received the President's commit-e's achievement award.

The impact of the survey was high-ghted when the Senate subcommittee on ging subsequently ordered the General ccounting Office to ascertain whether e federal government was complying ith the Architectural Barrier Act of 968. GAO submitted an interim report st November, which shows that a "sub-antial number of federal buildings violate ıe 1968 law," reports the January issue *Building Design & Construction.*

"The still tightly guarded report," says e magazine, "found federal buildings cking in such areas as proper height of ater fountains, special parking areas for ıe handicapped and raised lettering on oors and entrances to aid the blind." The agazine predicts that there'll be some red faces in Washington" if public hearings are held by the House and Senate committees.

In this time of economic difficulties, it is logical to ask what it costs to eliminate barriers. Kliment cites a study performed by McGaughan & Johnson, Washington, D.C., architects, retained in 1967 by the National League of Cities to survey three buildings where access by the public was required. It was found that "in none of these three buildings would the estimated cost of deleting barriers at the initial design stages have exceeded one-tenth of 1 percent of construction costs."

There are two avenues open to attack architectural barriers, says Kliment. The first is to make a determination of the expected use to which the building will be put. "Clearly, an apartment building for the elderly must have all its facilities barrier-free. An infantry barracks need not."

The second approach is "adaptable design." Here, "an entire building is designed so any or all of it can, if necessary, be made accessible—by adding or subtracting design elements. For example, a toilet is so sized and laid out that it can be adapted for side access or transfer. . . . This concept allows barrier-free provisions to be placed where and when they are needed."

And what about products? Can they also be barrier-free? Kliment writes, "Most products—door handles, water fountains, television and appliance controls, even packaging—are based on criteria developed for so-called 'normal' groups. . . . By pushing for development of design criteria and standards that will accommodate most classes of handicapped persons, you will end up with a far more universal product. For example, a door handle that requires downward pressure instead of a twisting motion will help not only those with loss of hand function but all able-bodied people, especially those with loads."

Kliment gives many practical suggestions to community groups and AIA components about how to organize to eliminate architectural barriers, citing sources from which assistance may be obtained.

"One of the strongest and most ripple-producing projects" that a community can undertake, he says, is a community building survey. Such a survey as conducted by the Iowa chapter/AIA focuses the community's attention on the problem; creates interest in barrier-free construction; provides a service to the handicapped; helps introduce volunteers to the problems of the handicapped, and draws attention of public officials to cases of noncompliance with laws and regulations.

The AIA barrier-free policy task force continues to work for the development of barrier-free design principles. It was instrumental in the establishment, in 1974, of the National Center for a Barrier-Free Environment, incorporated as a coalition of major groups active in promoting barrier-free architecture.

The task force was also the leader in the draft of a national policy for barrier-free architecture, which has now been endorsed by more than a hundred organizations in addition to AIA. The policy states:

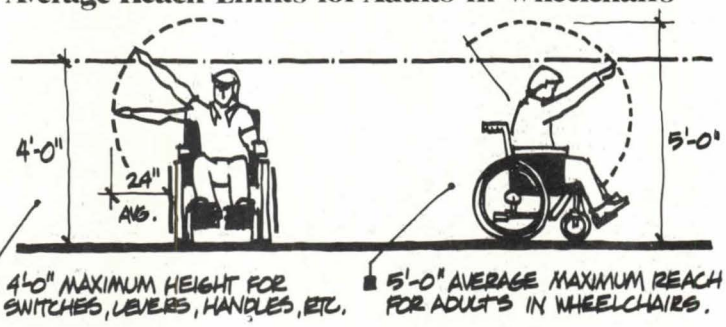
"In the U.S. today, it is estimated that one out of 10 persons has limited mobility due to a temporary or a permanent physical handicap. Improved medical techniques which provide some mobility where it was not possible in the past, and an expanding population of older persons, is increasing this number every year. Yet, in general, the physical environment of our nation's communities continues to be designed to accommodate the able-bodied, thereby perpetuating the isolation and dependence of disabled persons. To break this pattern requires national commitment.

"Therefore, it shall be national policy to recognize the inherent rights of all citizens, regardless of their physical disability, to the full development of their economic, social and personal potential, through the free use of the man-made environment.

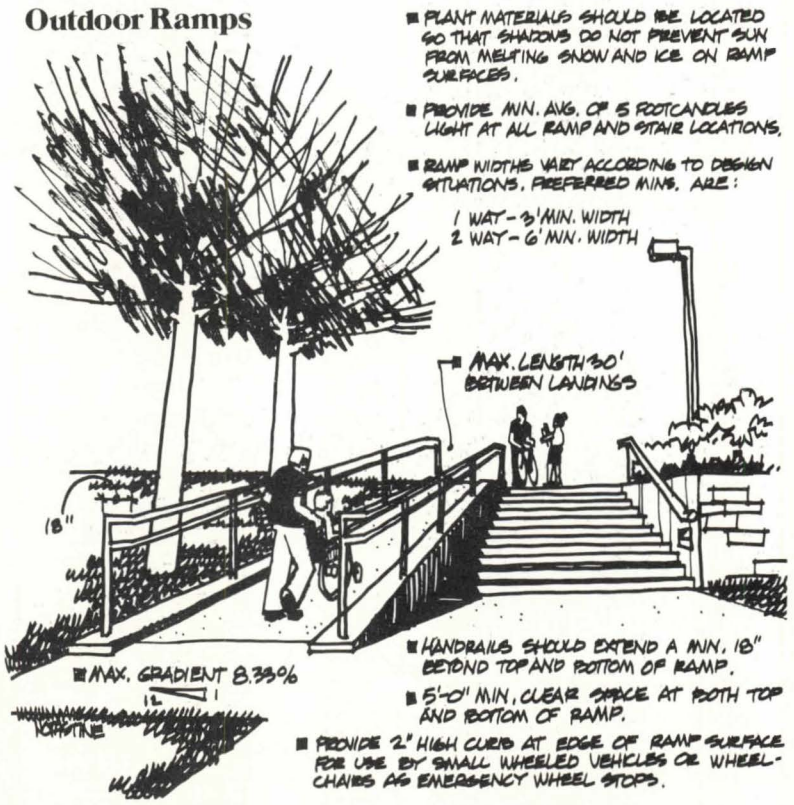
"The adoption and implementation of this policy requires the mobilization of the resources of the private and public sectors to integrate handicapped persons into their communities." *Mary E. Osman*

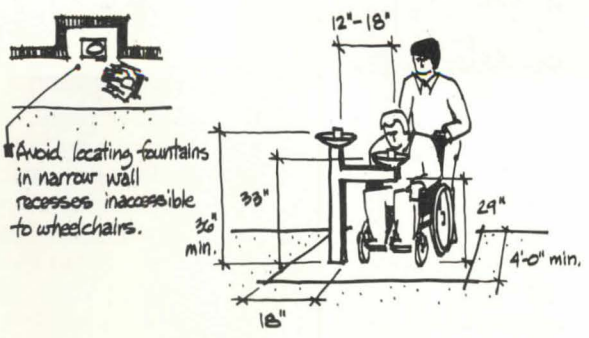
Barriers can face the handicapped in the outdoor environment as well as in buildings. These sketches are from a new book, "Barrier-Free Site Design," prepared by the American Society of Landscape Architects under a HUD grant. Graphic design, illustrations and editing by Johnson & Dee, urban designers and landscape architects, Avon, Conn. Christopher Nothstine and Richard Dee of the firm did the sketches.

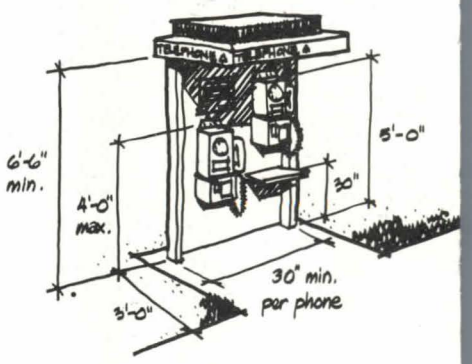
Average Reach Limits for Adults in Wheelchairs



Outdoor Ramps







Outdoor Telephones

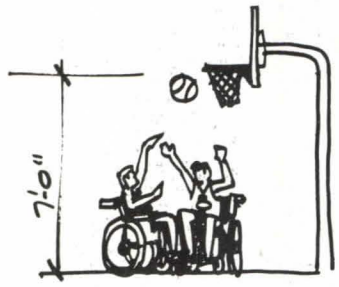
- All groups of telephones should have at least one lower height telephone for use by the handicapped and children.
- Phones for the handicapped should be no higher than 4'-0" at the coin slots. Provisions for braille instructions, volume controls on headsets, and push button dials are helpful for many handicapped individuals.
- Provide adequate lighting on the underside of overhang for nighttime use.
- Package rests are a helpful convenience to all people.

Drinking Fountains

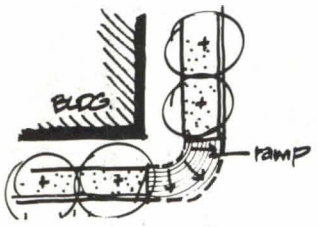
- Hand operated knobs or buttons and foot pedals are difficult for many handicapped people to operate. Hand levers are preferred.
- Provide a minimum 29" vertical clearance below fountain nozzle to allow wheelchairs leg room for access.
- Nozzle heights should be approximately 33" for wheelchairs and children and 36" to 39" for adults.
- A minimum 18" wide paved area around outdoor fountains avoids both mud and puddles.

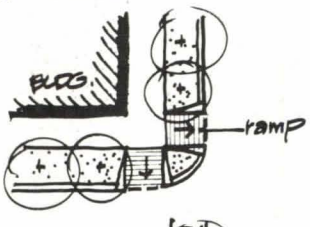
A Checklist of Accessibility Design Factors

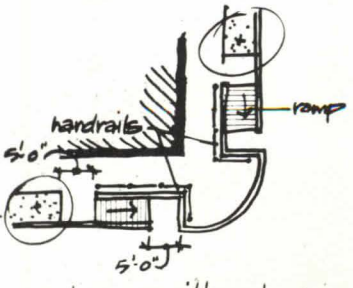
Basketball Hoops



■ basketball hoops lowered to 7'-0" from standard 10'-0" ht. allow those in wheelchairs and young children to enjoy the game.







■ wherever possible, curb ramps should occur as a natural extension of the alignment of the walkway.

Curb Ramps

The checklist below was developed by the Iowa chapter/AIA for use in community surveys to determine if public buildings are accessible to and usable by the handicapped. It is also useful for the architect who wants to check a design project to see if he can answer "yes" to the questions, thus helping make a barrier-free environment a reality.

Parking Lots.

1. Are accessible spaces approximate to the facility?

a) Are they identified as reserved for use by individuals with physical disabilities?

2. Are there parking spaces open on one side, allowing room (12 feet minimum width) for individuals in wheelchairs or on braces and crutches to get in or out onto a level surface?

3. Is it unnecessary for individuals in wheelchairs or those using braces and crutches to wheel or walk behind parked cars?

4. Is distribution of spaces for use by the disabled in accordance with the frequency and persistency of parking needs?

Walks

1. Are public walks at least 48 inches wide? Is the gradient not greater than 5 percent?

2. Are walks of a continuing common surface not interrupted by steps or abrupt changes in level?

3. Wherever they cross other walks, driveways or parking lots, do walks blend to a common level?

4. Do walks have a level platform at the top of which is (a) at least 5x5 feet if a door swings out onto the platform or toward the walk, or (b) 3x5 feet if door does not swing onto the platform?

5. Does the platform extend at least 1 foot beyond each side of the doorway?

Ramps.

1. Do ramps have a slope no greater than 1 foot rise in 12 feet?

2. Do ramps have handrails on at least one side?

a) Are they 32 inches in height measured from the surfaces of the ramp?

b) Are the surfaces smooth?

c) Do they extend 1 foot beyond the top and bottom of the ramp?

3. Do ramps have a surface that is nonslip?

a) Do platforms comply with questions 4 and 5 under "Walks?"

4. Do ramps have at least 6 feet of straight clearance at the bottom?

5. Do ramps have level platforms at 30-foot intervals for purposes of rest and safety, and wherever they turn?

Entrances/Exits.

1. Is at least one primary entrance to each building usable by individuals in wheelchairs? (It is preferable that all or most entrances and exits should be accessible to, and usable by, individuals in wheelchairs or who have physical disability.)

2. Is at least one entrance usable by individuals in wheelchairs on a level that would make the elevators accessible?

Doors and Doorways.

1. Do doors have a clear opening of no less than 32 inches when open?

a) Are they operable by a single effort? (Note: Two-leaf doors are not usable by those with disabilities unless they operate by single effort, or unless one of the two leaves meets the 32-inch width.)

2. Are the doors operable with pressure or strength which could reasonably be expected from disabled persons?

3. Is the floor on the inside and outside of each doorway level for a distance of 5 feet from the door in the direction of the door swings?

a) Does it extend 1 foot beyond each side of the door?

4. Are sharp inclines and abrupt changes in level avoided at doorsills?

5. Do door closers allow the use of doors by physically disabled persons?

Stairs and Steps.

1. Do steps avoid abrupt nosing?

2. Do stairs have handrails 32 inches high as measured from the tread at the face of the riser?

3. Do stairs have at least one handrail that extends at least 18 inches beyond the top and bottom step?

4. Do steps have risers 7 inches or less?

Floors.

1. Do floors have a nonslip surface?

2. Are floors on each story at a common level or connected by a ramp?

Rest Rooms.
1. Is there an appropriate number of toilet rooms for each sex?
a) Are they accessible to physically handicapped persons?
b) Are they usable by physically handicapped persons?
2. Do toilet rooms have turning space 60x60 inches to allow traffic of individuals in wheelchairs?
3. Do toilet rooms have at least one toilet stall that:
a) is three feet wide?
b) is at least 4 feet by 8 inches (preferably 5 feet) deep?
c) has a door that is 32 inches wide and swings out?
d) has grab bars on each side, 33 inches high and parallel to the floor, 1½ inches in diameter, with 1½ inches clearance between rail and wall, fastened securely to the wall at the ends and center?
e) has a width of at least 48 inches between the wall and the front of the stall entrance?
f) has water closet with seat 20 inches from the floor?
4. Do toilet rooms have lavatories with narrow aprons, which when mounted at standard height are usable by individuals in wheelchairs?
5. Are drain pipes and hot water pipes covered or insulated?
6. Are some mirrors and shelves at a height as low as possible and no higher than 40 inches above the floor?
7. Do toilet rooms for men have wall-mounted urinals with the opening of the basin 19 inches from the floor, or have floor-mounted urinals that are level with the main floor of the toilet room?
8. Do toilet rooms have towel racks mounted no higher than 40 inches from the floor?
a) Are towel dispensers mounted no higher than 40 inches from floor?
b) Are other dispensers mounted no higher than 40 inches from floor?
c) Are disposal units mounted no higher than 40 inches from floor?
9. Are racks, dispensers and disposal units located to the side of the lavatory rather than directly above?

Water Fountains.
1. Is there an appropriate number of water fountains?
a) Are they accessible to physically handicapped people?
b) Are they usable by the handicapped?
2. Do water fountains or coolers have up-front spouts and controls?
3. Are they hand-operated?
4. If coolers are wall-mounted, are they hand-operated, with basins 36 inches or less from the floor?
5. If there are floor-mounted fountains, are spouts no higher than 30 inches?
6. Are the fountains accessible to people in wheelchairs?

Public Telephones.
1. Is there an appropriate number of public telephones accessible to physically handicapped persons?
2. Is height of dial from floor 48 inches or less?
3. Is coin slot located 48 inches or less from the floor?
4. Are there telephones equipped for persons with hearing disabilities? Are they identified as such?

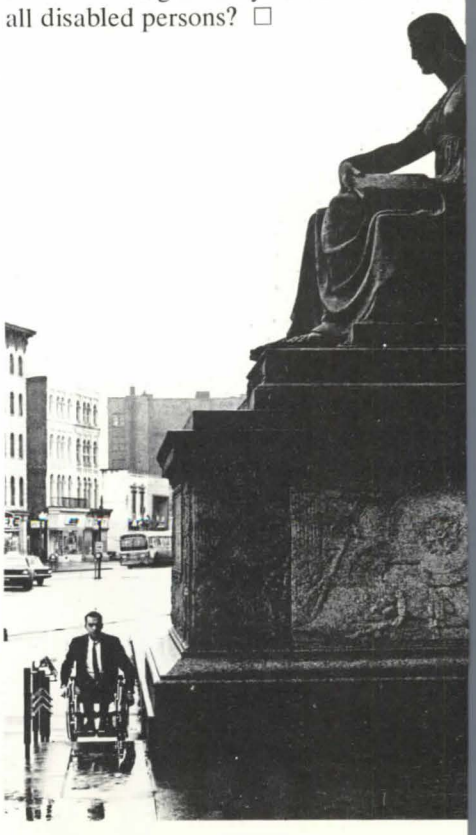
Elevators.
1. If more than a one-story building, are elevators available to the handicapped?
a) Are they usable by the physically handicapped?
2. Are all of the controls 48 inches or less from the floor?
3. Are the buttons labeled with raised (or indented) letters beside them?
4. Are they easy to push or touch-sensitive?
5. Is the cab at least 5x5 feet?

Controls.
1. Are switches and controls for light, heat, ventilation, windows, draperies, fire alarms and all similar controls of frequent or essential use within reach of individuals in wheelchairs?

Identification.
1. Are raised (or recessed) letters or numbers used to identify rooms or offices?
2. Is identification placed on the wall, to the right or left of the door?
a) Are they at a height between 4 feet by 6 inches and 5 feet by 6 inches, measured from the floor?
3. Are doors not intended for normal use, which might prove dangerous if a blind person were to exit or enter by them made quickly identifiable to the touch by knurling the door handle or knob?

Warning Signals.
1. Are audible warning signals accompanied by simultaneous visual signals for the benefit of those with hearing or sight disabilities?

Hazards.
1. When manholes or access panels are open and in use, or when an open excavation exists on a site, when it is approximate to normal pedestrian traffic, are barriers placed on all open sides at least 8 feet from the hazard, and warning devices installed?
2. Are there no low-hanging door closers that remain within the opening of a doorway, or that protrude hazardously into regular corridors or traffic ways?
3. Are there no low-hanging signs, ceiling lights, fixtures or similar objects that protrude into regular corridors or traffic ways? (A minimum height of 7 feet measured from floor is recommended.)
4. Is lighting on ramps adequate?
5. Are exit signs easily identifiable to all disabled persons? □



enn. Ave. from page 39

rong residential development. I like the lea of mixed uses and an interior pedes-ian area, and the design looks nice."

Not everyone is as enthusiastic about ıe housing design—some have termed it ı "urban fortress"—but there seems to be eneral agreement that round-the-clock esidents are the key to reviving the ave-ue. "The housing is brilliant," said District f Columbia planner John Fondersmith, even though I'm not sure the design works uite right." And, said John Wiebenson, local architect and planner who for years as a devoted critic of planning for Penn-lvania Avenue: "Washington is a city f neighborhoods, but Pennsylvania Ave-ue is nobody's neighborhood, except aybe the street sweepers who work it." he housing, said Wiebenson, is of crucial nportance—"the more, the better."

The housing development may be the ey to success, but the plan as a whole is a nique reflection of how urban planning as changed over the past few years.

"Everyone believed back in the early 0s that the sky was the limit, that big rban renewal projects were the way to et things done," said PADC director ohn Woodbridge, FAIA, who has been a rincipal author of all three plans for the venue, the first two while with Skidmore, wings & Merrill. " We believed that you ıould just sweep the area clean and start ith a fresh new project. But so many rojects fell short of public expectations ıat planners and architects started to be ulled between two strong demands—the aditional city beautiful idea of designing city with strong visual qualities and the ommunity voice saying "to hell with all ıat—get out on the streets and save verything you can."

The shift in planning thought from city eautiful to living city certainly had its npact on the plan. But things in Wash-ıgton had changed, too. For years, plan-ing decisions about the city had been ıade by a federally-oriented National apital Planning Commission made up of eople from all over the country. By the me the Pennsylvania Avenue Develop-ıent Corporation began work, the District f Columbia had an Office of Planning nd Management to act as an advocate for local planning considerations. And the law which created the development corporation provided a strong review role for both the District of Columbia and the U.S. Department of the Interior and also required public hearings.

One result of this was that the District Office of Planning and Management published its own "think piece" on Pennsylvania Avenue. Entitled "The Great Historic American Avenue," this document set the mood and established the framework for much of the thinking which was ultimately incorporated in the plan.

Previous plans for the avenue, the draft said, "depicted a grand scale of development with emphasis on new monumental buildings and wide plazas. They were conceived in the spirit that nothing was too good for Pennsylvania Avenue. . . . However, in the last decade our ideas about cities, what they should be and who they should serve, have begun to change. Perhaps we have been mellowed or matured by experience. We are no longer content to accept monumental buildings as the answer to our needs. We want to create urbane and livable cities—cities for people. We want our cities to be a mixture of the old and the new—to preserve our heritage while building for the future."

Said planner Fondersmith, "We became aware of the great opportunities that were there which we hadn't really seen before, opportunities to tie together things that are special and unique to Washington."

The District's position paper said, "The new Pennsylvania Avenue should be more than just a backdrop for great parades and celebrations, important as they are. Pennsylvania Avenue should be a living, special place, providing a unique atmosphere and experience for residents and visitors every day of the year. We believe the avenue should offer a panorama of the American experience, a place where we can relate to our heritage, learn new facts about our city and country and have a good time in an inspiring and educational setting."

This kind of thinking was echoed by citizens and civic leaders in the course of public hearings. Public thinking about the plan was fairly consistent, with two main themes: Save the good, old buildings and bring new life to the avenue.

How well the plan works is dependent upon a number of factors, and one of these is the kind of mix of activities—theaters, bars, restaurants, shops—chosen to lure people to Pennsylvania Avenue. To Fondersmith this is crucial. "There's no place in the country that has the opportunity to pack that kind of life into a mile," he said.

Woodbridge agrees that providing that kind of diversity is essential but cautions that the PADC "won't be able to control it absolutely." One idea the corporation is toying with is leasing the ground floor retail space itself and then subletting to shopkeepers and restauranteurs. This kind of control would ensure a commercial mix and would enable vital but less profitable stores to come into what is surely to be a fairly high-rent district.

Right now, however, there is a more pivotal issue in implementing the plan—whether Congress will approve it, and, beyond that, whether Congress will fund it. Woodbridge said he is "cautiously optimistic" about funding, in part because the development plan is a good pump-priming project in a time when new construction is desperately needed to budge the economy. The economics of the plan hinge on a fairly substantial federal investment—more than $130 million in appropriated funds and more than $92 million in bonds—which would generate an even more substantial private investment—$250 million—and more than $11 million annually in real estate revenues. The public money would be used for land acquisition, business relocation, parks and open space, public improvements and renovation and historic preservation.

How much money is appropriated now of course depends upon the mood of a new and unpredictable Congress. "It's hard to tell at this point," said Woodbridge. "It's clear that the plan has some old friends on the Hill and not really any old enemies."

And this is true of its citizen constituency too. There are still points of difference—over traffic solutions, business relocation plans and the working out of details—but most of the plan's old citizen enemies have become new friends and those citizens who were once lukewarm have become enthusiastic.

Beth Dunlop

The Use of Computers Instead of Drawings In Building Design

In the sequence of illustrations starting at right, graphic displays on the computer are employed in the study and development of a design for a simple summer cabin.

Charles M. Eastman

Drawings are an integral part of architectural practice. They are the principal medium for design problem-solving and coordination and for communication with client and contractor. They also have important uses to others associated with building, including financiers, building code inspectors and construction material suppliers. Drawings are used in a facility's operation—in planning maintenance, renovation and the assignment of space.

The primary use of drawings in building is to depict the spatial composition of materials and spaces. Ancillary information regarding materials and spaces can be provided through notes and tables appended to the drawings. In this light, drawings have no intrinsic value in architecture, but are only the most useful existing device for the representation of building spatial information in a form convenient for decision making.

Physical models have been the only practical alternative to drawings. Models, like drawings, incorporate spatial information in an easily interpreted form. Biographers of Antonio Gaudi point out that he designed and directed construction almost exclusively from models. Most large architectural projects today include the construction of a model; its use is primarily for promotion, not decision making.

A comparison of drawings with models shows that both have advantages. A model can represent all three dimensions of a composition directly, while a drawing can represent only two unambiguously. Thus it takes two drawings to represent the information provided by a single model. A user is required to integrate both drawings in his mind to derive their three-dimensional implications. In some cases, a model is easier to update (one change versus two), but more often, the cost of changing lines in a drawing is less than changing the shapes of parts in a model. Models also allow direct observation of spatial conflicts, while drawings do not. The portability and reproducibility of drawings, plus their ease of updating, probably accounts for their prevalence in architectural practice. In fields where spatial conflicts are critical, as in ships and refineries, models are often used.

Both models and drawings have weaknesses. Most analyses require numerical information and, at present, it must be manually read from a drawing or model. Data preparation is the major cost of most engineering analyses. Similarly, a major task in cost estimating and contracting is the derivation of material quantities from the spatial representation provided by the architect. Another weakness of both models and drawings is their scalar accuracy. Both must rely on multiple copies at different scales to show all the spatial relations—for example, between the placement of a window on a wall and the detailed joining. The multiple copies add greatly to the expense of design changes.

The *ideal* representation of a building for architectural design emerges from these comparisons. It would combine the positive aspects of both drawings and models and eliminate their common weaknesses. It would incorporate three-dimensional information in an easy-to-read format and would require any change to be made only once for its full effects to be revealed. It would accept changes easily and provide automatic checking for spatial conflicts. It would be portable and reproducible and would facilitate numerical analyses. A single description would be sufficient to allow measurements at any scale.

Conceptual design of a building description system: Past work in computer graphics has resulted in impressive capabilities for depicting the shapes of simple objects in visually realistic terms. (*See,* for example, "Computer Displays," Ivan Sutherland, *Scientific American,* June 1970). A building, however, is more than a simple shape. Other work has developed automated drafting techniques that provide for the copying and formating of drawings that have been described to the computer. ("The ARK 2 System," C. Stewart and K. Lee, *Progressive Architecture,* July 1971.) The resulting series of templates fails, however, to provide for any checking or automatic updating of three-dimensional information.

A building *can* be conceived, though, a a collection of three-dimensional element arranged in space. Elements might includ 2x4s, reinforcing bars, precast panels or a room. A detailed building representatio might be provided by a computer, if it could store descriptions of a very large number of different elements arranged in space. Designing would consist of interactively defining elements, according to their shape and other properties, and arranging them, much as one would a balsa wood model.

If element shapes were defined and arranged in three dimensions, a given arrangement would allow a wide range of perspective views (closeups of details and from inside the structure), using compute graphic display methods. In addition, orthographic views of 3-D shapes can be generated by computer; procedures to cut a section through a shape would not be difficult to develop. It should be possible, then, to derive sections, plans, isometrics or perspectives from the same description of elements and produce them on an automated plotter. High quality drawings, wit dimensioning, cross-hatching and appropriate symbols, should be achievable.

Approached this way, the range of drawings available would be infinite. If a consultant or contractor wanted any particular drawing, it could be generated on demand. Any change of arrangement would have to be made only once for all future drawings to be updated. All drawings derived from the same arrangement of elements would automatically be consistent. The representation would be truly three-dimensional.

With the building description in a machine-readable form, any type of quantitative analysis could be coupled directly to the description. All data preparation fo analyses could be automated. Reports for cost estimating or material quantities could be easily generated also. A compute description is inherently far more accurat than a model or drawing. One description at the finest level of detail would be sufficient to allow generation of the whole range of drawings needed to analyze or construct a building. Thus it seems possible that a computer-based building representation, consisting of the description

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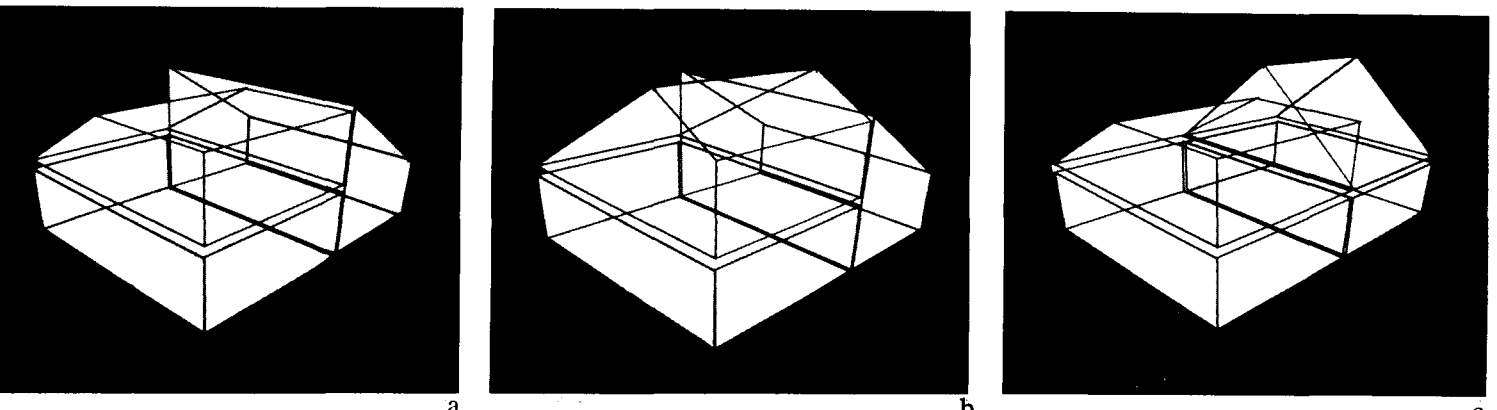


a large number of elements and their rrangement, could approach the ideal ilding representation.

Although representing a building in all details within a computer may be an tractive concept, practical application quires the resolution of a number of chnical issues. It requires the develop- ent of programs that are capable of al- wing the description of a very large mber of elements—on the order of ndreds of thousands. It requires data anagement techniques that would allow st accessing and manipulating of element scriptions and their locations. It requires techniques for displaying and drawing parts of the building model at different scales and levels of detail. It requires methods for interfacing the description with various analyses programs. Most important, it requires that such a description system be implementable on widely available hardware and that it be inexpensive and easy to operate.

An important precedent exists for such a building description. In Europe, several of the industrialized building methods have associated computer-aided design systems, allowing quick composition and analysis of buildings from their catalog of parts. What is proposed here can be viewed as a generalization of these efforts, allowing composition of custom-designed as well as standard parts and with much more general analytic, drawing and display capabilities.

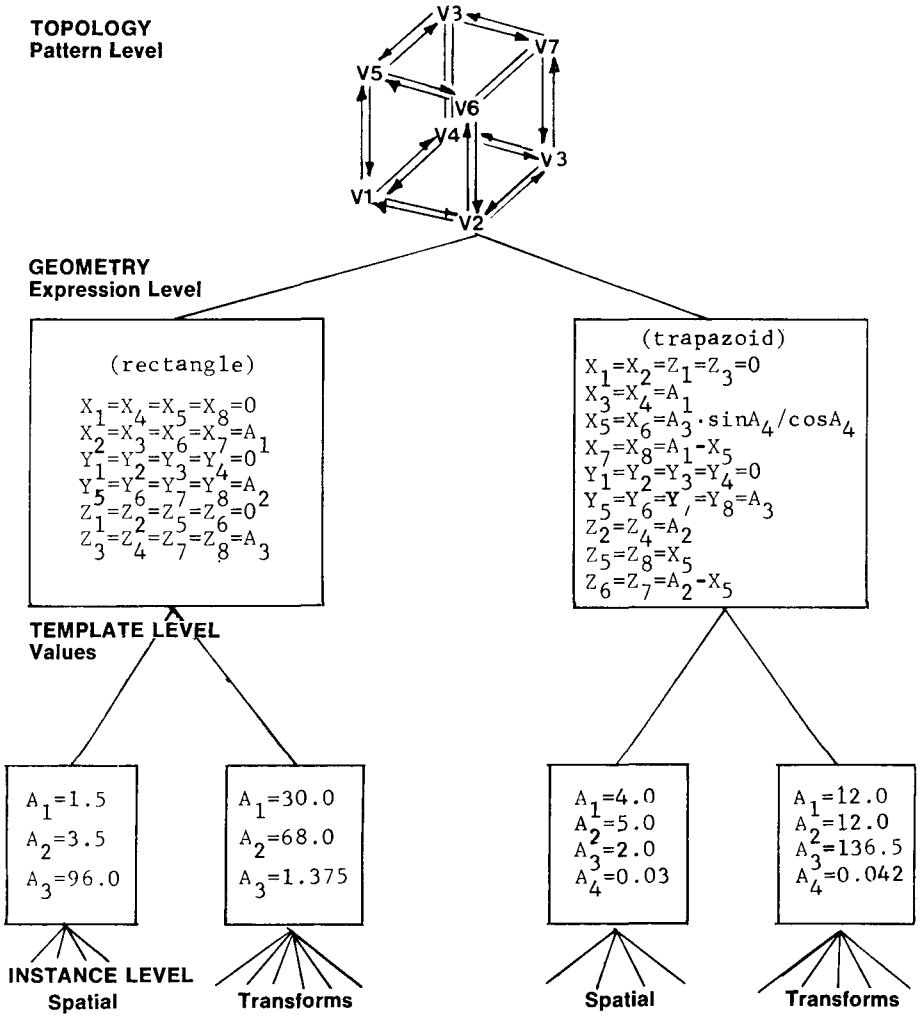
The C-MU Building Description System: A team (Joseph Lividini, David Fisher, Gil Lafue, Douglas Stoker, Richard Blum, Max Henrion and the author) associated with the advanced building studies program at Carnegie-Mellon University has been involved in the development and implementation of a Building Description System (BDS), based on the above principles. Support for the research has been provided by the National Science Foundation. Portions of the system are now running.

The concepts behind BDS are general and can be implemented in a variety of ways. At some future time, we anticipate that computer manufacturers and software houses will offer a variety of building description systems, with varying features and sophistication. Our own implementation, then, is only indicative of what could become available later.

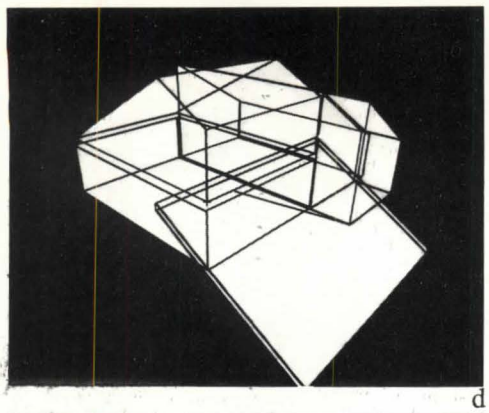
Element descriptions: Because elements are the basic units of information within BDS, a large effort has been devoted to their appropriate representation. The most obvious type of element is a building component. But designers manipulate other spatial entities, particularly *spaces*. In addition, they sometimes utilize imaginary spatial entities, such as activity areas. The BDS element description is general enough to depict all these types.

Basically, an element is made up of three kinds of descriptions: a shape, a list of properties and a location. A shape is treated within BDS as a polyhedron, a planar-faced form, all of whose edges are straight lines. A shape may have holes, valleys or other type of irregularity. Furthermore, all polyhedra in BDS are closed, i.e., every edge is adjacent to two faces.

The shape of an element is defined in two types of descriptions: a topology and a geometry. The topology defines the relationship between vertices, edges and faces. A topology has no dimension and can be thought of as a special form of directed graph (*See* Figure 1). The geo-



gure 1: *The four hierarchical levels within the BDS data base. The shapes picted are an 8-foot 2x4, a door, a rubber motor mount and a concrete column.*



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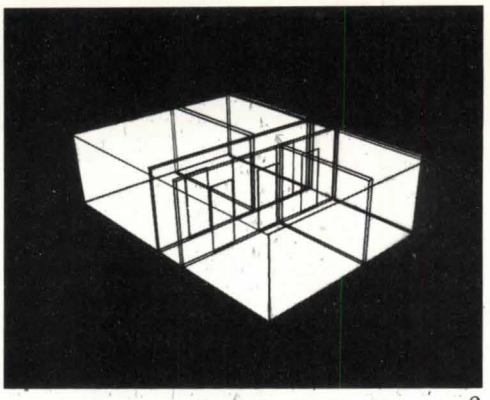

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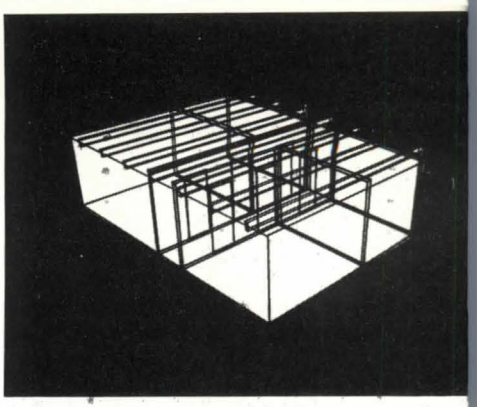


metry is defined by a set of vertex coordinates. They give dimension and proportion to a topology. Together, they provide a complete shape description. An important property of our shape description is that the intersection of lines or surfaces with a shape is easily detected. Thus spatial conflicts may be easily identified. Volume and other properties of a shape also may be quickly computed.

An element is assumed to occur one or more times in a building project. Thus copies are defined simply by providing multiple locations. A location consists of three cartesian coordinates and three angles. Coordinates may be defined relative to the building as a whole or to some already located element. In most cases, only one or two coordinates are needed to specify a location.

The information used to describe a shape is organized hierarchically in a tree structure. One topology may be associated with several different geometries. Each topology-geometry pair defines a shape and any number of locations can be associated with a shape. It is this hierarchy that is shown in Figure 1.

In BDS, properties describe all nonshape aspects of an element. A property is an attribute name and its value, where the value may be numerical or alphabetic. Alphabetic values can incorporate text of arbitrary length. The name-value pairs have intrinsic meaning only for analytic programs. Thus, beyond the requirements for analysis, the designer may store any type of property with shape. Examples might be cost, color, manufacturer, function, maximum bending moment or the element's specification. Attribute values may be stored separately for each element or collectively, by having each element refer to a common attribute value. With this facility, all elements of a particular type can be treated together; elements coming from the same supplier or with the same finish may be listed. Alternatively, if every element is assigned a specification then the allocation of specifications to elements can be listed and evaluated.

An efficiency resulting from the separation of topologies and geometries is that one topology may be used to depict a large number of shapes. For example, all WF steel members have a single topology, all pipes another. All square, rectangular and trapezoidal shapes have the same topology. Figure 1 shows one utilization of a common topology. If the reader jumps ahead, it may be noticed that the building description shown in the Figures above utilizes only two topologies—for rectangles and pipes.

A shape description is useful to the degree that it is general and, also, to the degree that shapes are easily defined and manipulated. Currently, shape topologies are defined by using a set of operations that build legal topological shapes. Soon we expect to be able to enter topologies directly by sketching on an electronic digitizer tablet.

The coordinates describing the geometry of most shapes are large in number, and we have devised a way to simplify their entry for all regular shapes. Instead of requiring X, Y and Z values for every vertex, a set of expressions is associated with each geometry that allows the minimum number of critical dimensions to be converted into coordinate values. Thus a rectangle requires three values (as shown in Figure 2); a pipe, three numbers (length, diameter, thickness) and a steel WF member, only five. Eventually, we expect the sizes of standard elements to be

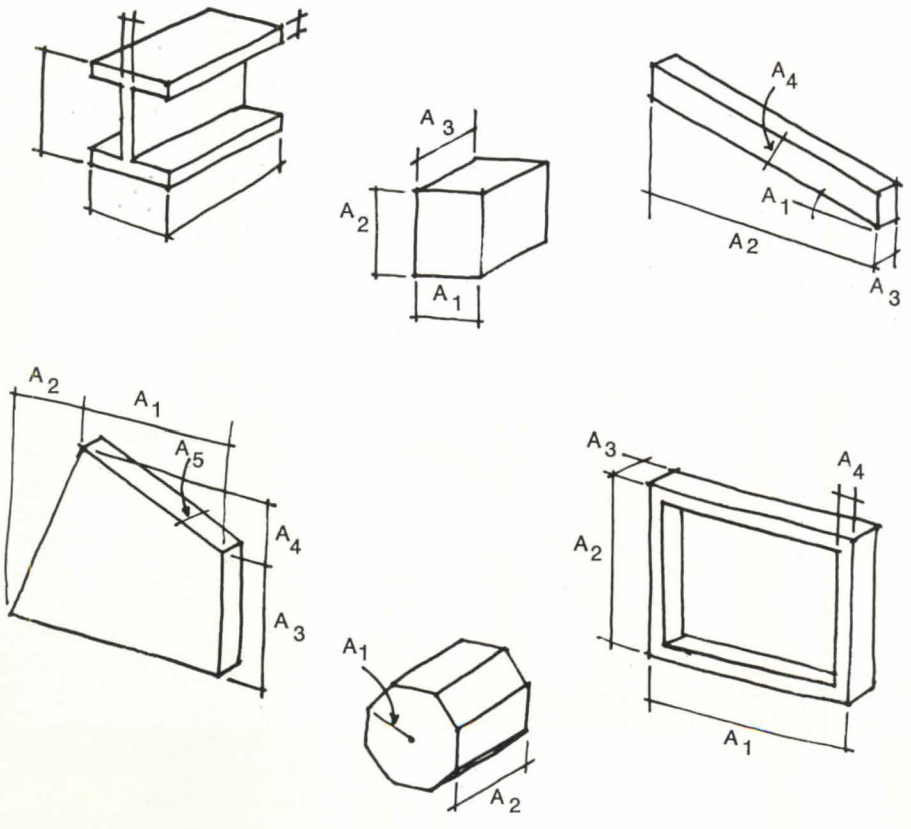
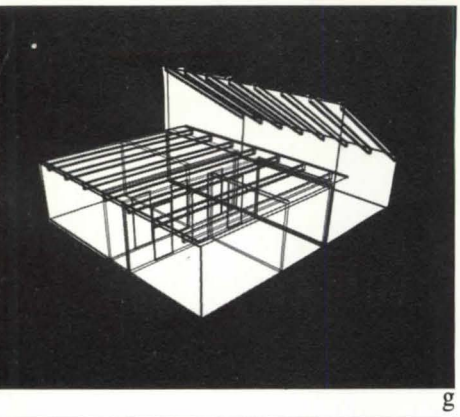


Figure 2: *Some of the topologies and expressions currently being utilized in BDS. The user may define new ones whenever needed.*



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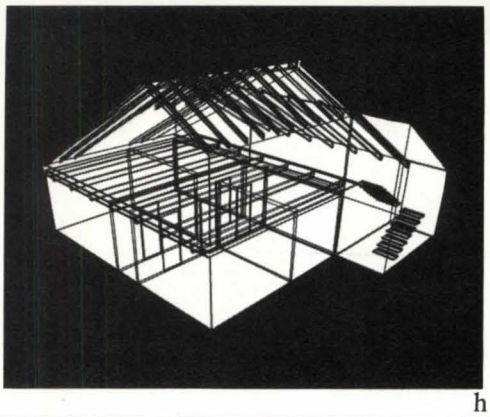

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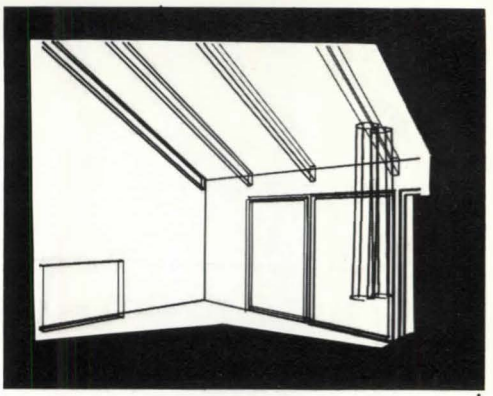

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ored within the computer in an easily cessed form; the user need only ask for "WF14122."

Concurrently with the development of e sketch input of topologies, we are plementing the automatic reading of e coordinates that define an element's ometery. The result will be that the sys- m will be able to directly interpret aced-in engineering drawings. Some of e shape descriptions now being stored e shown in Figure 2.

The reader may note a problem that we ickly encountered when first using the stem. A certain amount of variation may ist with each copy of essentially similar ements. A beam's length (and weight d cost) or its deflection may be unique en though its other properties are com- on with others. Originally, copies of an ement had to be identical. Modifications w underway will allow properties, in- uding some simple size parameters, to be sociated with either the general element scription, which we call a *template,* or th its copies. To some degree, then, ery element can be unique. This change ll facilitate, for example, the layout of ids on gable-end walls, which were oided in the examples presented later.

Operations: Describing and locating a ry large number of elements would be awesome task if some very efficient echanisms for definition and location ere not available. There are essentially ree methods now available for describ- g an element. A user may select an ele- ent from a directory of prestored parts, may use existing topologies and/or pressions to define a new part or he ay generate a new one from scratch by fining a topology, its coordinates and a t of attributes. Attributes may be modi- d or added to, as required by the user.

The locating of elements within a con- guration requires separate capabilities. ere the task is simplified by allowing ultiple copies to be quickly made of isting elements. Thus, after placing one am at a desired location, copies can be aced at given intervals. The copying cility allows for any translation and/or tation so that complex compositions of nilar elements can be quickly specified. ot only can single elements be copied, but also whole collections of them. Thus all the elements in a bay or a room may be copied in different locations with a few simple commands.

When properties or length of individual elements vary, they may be specified in two ways: by accurately defining them during the location process or by adjusting their length to make them longer than needed and trimming them, using space modification operations. Initially, the shape-modifying operation will include the capabilities to: 1) glue two adjacent or overlapping elements together, or 2) subtract one element from another (*see* Figure 3). In the first case, the attributes have to be respecified. These manipulation operations provide means for cutting holes and notches or otherwise altering shapes in context with other shapes. Temporary shapes may be specified for the purpose of shape modification, for example, for forming a concrete element or sizing a hole.

At any time during the build-up or modification of the building design, the user may ask for a display of any part of the design. He now does this by specifying the set of elements in which he is interested. Later, he will also have the option of defining the area of the building project that he wishes to view. He also must specify either a sightline (for perspective views) or a section line and whether elements behind the section plane are to be displayed (for plan, section or elevation). Only the perspective view is currently operational.

We have not yet begun to implement the interface between BDS and other application programs. The planned interface will allow interaction with any application program that is Fortran compatible. Initially, the output of an analysis will be on a printer. Later, we expect to allow analyses to enter data back into the data base, allowing BDS to analyze the stress in a beam or air flow in a duct, then to size them and provide other extended capabilities.

Designing with BDS: Some flavor of the interaction and output provided by these operations is indicated by the sequence of displays generated during the development of a design, as shown at the top of these pages. The design is for a summer cabin located on the West Coast. The figures depict various graphic displays provided by BDS.

Initially, three alternative roof types are considered for the building envelope, as shown in Figures a-c, page 47. One—b—is selected for further development. The overriding concept was for a two-level sleeping/service area with an attached two-story living space. A carport is on the right front. Figures e-h show the introduction of structural elements, and Figure e also shows some detail development of the sleeping area. Windows in the living area (Figure i) are added next. The site is in a redwood grove, and the view from the

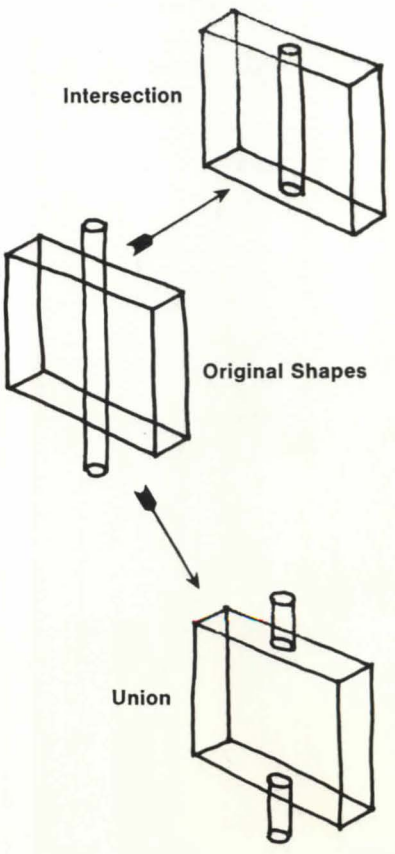
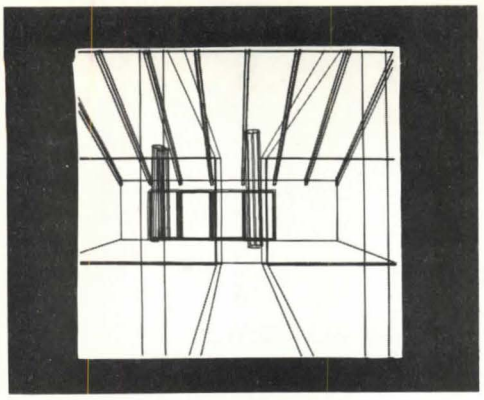
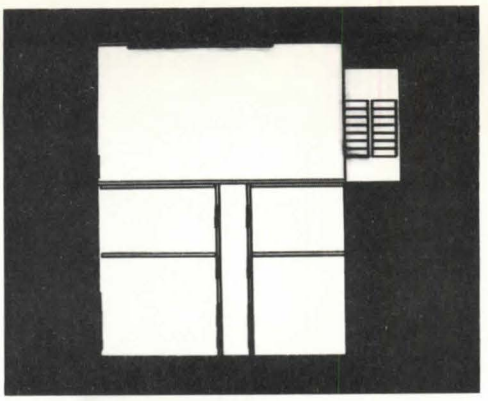
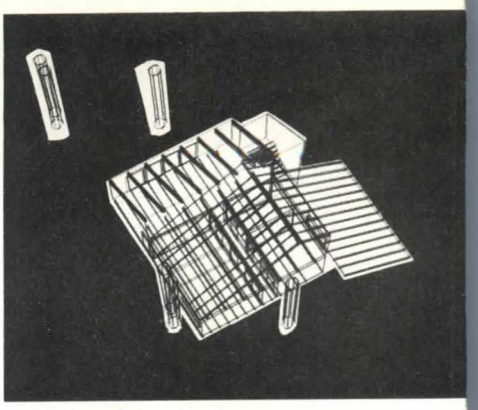


Figure 3: *The shape manipulation operators allow for the adding or subtracting of any shape.*







living and sleeping areas justify review. A plan and framing perspective are shown last.

Hardware: BDS was designed to operate on widely available and inexpensive computer equipment. Although time-sharing systems were a seriously considered alternative, we concluded that the most responsive performance per dollar could be provided using a minicomputer. BDS is designed to run on Digital Equipment PDP-11. The data base resides primarily on disc secondary storage. The amount of disc storage determines the size of data base BDS can hold. A 40-million character disc can hold about 500,000 elements, which was our target capability. More or less disc memory will vary the system's capability. The program accommodates a variety of graphic interaction, including a display tube, digitizer tablet and mechanical plotter.

With this size data base, significant attention has been given to the quick accessing and manipulating of large numbers of elements. Using the hardware described above, BDS is capable of manipulating 15 to 20 elements per second. (It requires a maximum of two disc accesses per element —one each for a topology and a geometry.) Given an area of interest within a building, BDS can find the elements occupying it in about a quarter second.

The future: It is much too early to assess the capabilities or limitations of BDS-type systems. Our own system has been operational only since December 1974. Major development work is still underway—for drawings, analysis and the refinement of man-machine interaction. Later, we plan a number of evaluation sessions with selected architects. Currently, Carnegie-Mellon students are trying the system out on class projects.

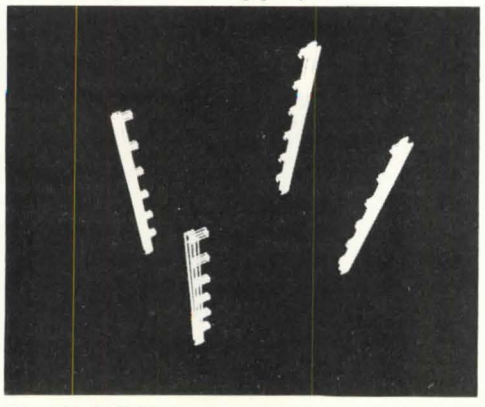
Even at this early date, however, there are certain implications. BDS supports a variety of approaches to design. A designer may start with a structural module, the spaces to be enclosed, the external envelope or other schema. Some psychologists believe that the external representation of information significantly affects the way in which we think about that information. Up to now, the representational alternatives in architecture were plans, sections, isometrics and models. Sessions using BDS make quite apparent the validity of the psychologists' assumption. The remote manipulation of elements in three dimensions is quite different from making multiple drawings of them in two dimensions. A different way of thinking about design is encouraged by BDS. My own reaction is that the new mental perspective that evolves with its use is both more realistic—when construction is considered —and more thorough. With an infinite number of perspective views available on the display, visual analysis is significantly enhanced, as the examples here indicate.

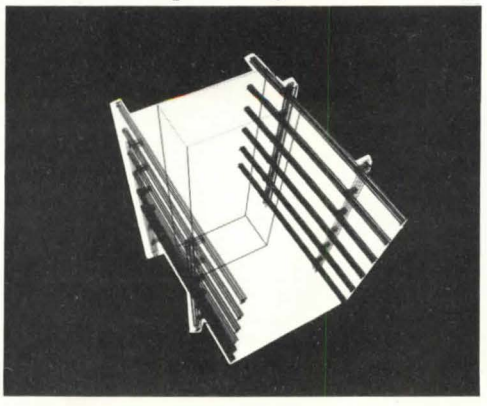
Significant refinement will be required before a BDS-type system can be used in a production environment. If and when that day arrives, its first use is most likely to be the recording of design decisions. Work will proceed according to current practice, but instead of producing finished drawings for recording the status of a design, sketch solutions will be entered directly to the computer. Upon demand, it will produce drawings in a variety of formats for design use, with the drawings forming the basis of future design refinements and contract documents. Thus BDS will act as design coordinator and analyzer, providing a single integrated data base for visual and quantitative analyses, for testing spatial conflicts and for drafting. Only much later after use in this limited mode allows BDS to become widely understood will any machine representation replace the drafting board.

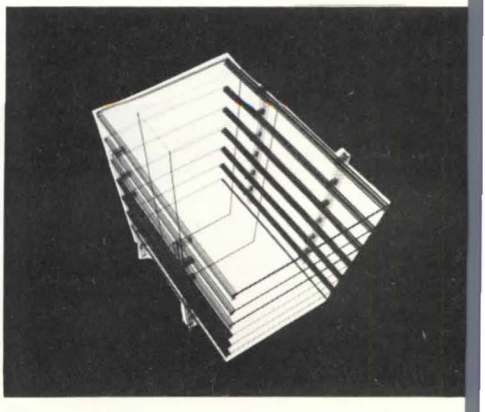
Full shape descriptions and specifications for an element can be stored within the computer—on tape or disc. BDS is designed to accommodate a catalog of such descriptions for standard elements in order to reduce the time spent on element definition. Initially, parts catalogs will have to be built up within each user's office. Quickly, however, one can anticipate architectural information bureaus expanding their services to include parts information in a machine-readable, compatible format—automating the interface between a design representation and what is now Sweets' catalogs. Later, one can conceive of a BDS supporting automated building code checking in city hall or the architect's office. Contractors of large projects may find this representation advantageous for scheduling and materials ordering.

As a research endeavor, BDS will become significant to the degree that its design responds to the projected user's need. Critical assessments are accordingly invited. □

Shown below are some displays—taken from a single, evolving building description—that resulted from work on a small office building project.







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For Everyone a Garden. Moshe Safdie. Cambridge, Mass.: MIT Press, 1974. Variously paged. $25.

If Moshe Safdie's prime objective was to create shelter, he would have called his new book *For Everyone a House*. But Safdie is an architect who knows what it means to be able to open windows in two directions and bring a breeze through a stuffy apartment. He understands what an expansive vista can do to a one-room unit, and he realizes how much a high-rise dweller appreciates a terrace for shaking out rugs, potting plants or getting sun. His objective is to create choice and to build opportunity into living spaces. It is not surprising, then, that he calls his book *For Everyone a Garden*.

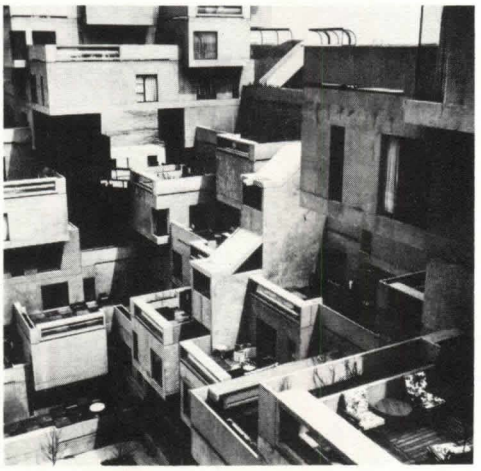
With enthusiasm, Safdie takes on the challenge of designing livable places. Habitat 67, at Expo in Montreal, was his first and best known work. Cantilevered concrete boxes stacked high into the air, Habitat is a complex array of shapes and shadows. At first, it seems to be more of a statement in pure geometry than a response to people's needs. Those needs, however, form the basis for Safdie's qualitative design program. He realizes the program through imaginative building systems.

At Habitat 67, for example, the program included providing each unit with multiple views, roof gardens, privacy and also individual identity. Traditional construction could not accommodate the program. A prefabrication system made it possible.

Safdie's first book, *Beyond Habitat* (MIT Press, 1970, *see* Apr. '71, p. 35), documents the day-by-day drama of how Habitat 67 happened. It is a personal saga of dauntless optimism. His new volume, with its bright, exuberant cover by Taal Safdie, shows the same spirit.

Since Habitat, Safdie has been a busy man. *For Everyone a Garden* updates the work at Montreal and presents a remarkable variety of new work, including habitats in Puerto Rico and Rochester. Baltimore has commissioned him to plan a new town, Coldspring. Israel requested a study on the feasibility of new housing systems. He adapts his modular units to each particular locale and client. Projects range from a student union at San Francisco State College and a rabbinical college in Jerusalem to resort condominiums at Saranac Lake, N.Y., and St. Thomas. Much of Safdie's success lies in his ability to sell ideas to a skeptical public. If he is to stimulate change, he needs a wide audience. Hopefully, numerous nonarchitects will discover him through the book. All who see what he has done and is now doing are certain to share his enthusiasm.

Change, however, is a slow process. Safdie's strongest statement has to do with industrialized building and that remains, as he asserts, a primitive business. At



a time when builders and architects are feeling some of the worst effects of an inflation, fanned by constantly rising construction costs, it is especially important to consider his plea for new ways to organize the production of buildings. Unfortunately, the necessary research and development is hardest to finance when money is tight; labor practices are hardest to change when unemployment is high.

Uncoordinated local planning also hinders innovation. Disparate building codes and ordinances complicate large-scale production of factory-built units. Montreal's fire code, for example, mandated five-inch concrete slabs and walls, while a three-and-one-half-inch thickness sufficed in Puerto Rico. It is almost as if Detroit had to manufacture cars customized to meet the special requirements of every city and town.

For Everyone a Garden is filled with illustrations. (The series of photographs of Habitat 67 under construction is excellent.) Projects are organized by theme. The type is widely spaced on square page with broad white borders. Still, it is difficult to use the book for reference. The time and place sequence is often vague, as is the status of planned or projected work and section numbers are a poor substitute for simple page numbers. Somehow, this elegant and even lavish format seems better suited to something which is finished, or someone who is looking back.

Safdie is still happening. His words are timely and most of his works are in progress. A more informal layout, possibly a loose-leaf or workbook format, might have been a good idea. Then Safdie could have kept everyone up to date with more new pages of good sense and ingenuity. *Jane Canter Loeffler, AIP Associate, Washington, D.C.*

Development on a Human Scale: Potentials for Ecologically Guided Growth in Northern New Mexico. Peter van Dresser. New York: Praeger, 1973. 116 pp. $10.
Landscapes for Humans: A Case Study of the Potentials for Ecologically Guided Development in an Uplands Region. Peter van Dresser. Albuquerque, N.M.: Biotechnic Press, 1972. 128 pp. $3.

Good things sometime come in small packages. *Development on a Human Scale* is a book modest in size and in price, large in print, undistinguished graphically and available with two different titles in three different bindings. Already in its second printing, it is written in simple, succinct language and is structured in a direct and logical way. It is first-class, and potentially a classic.

In 1970, Fred Richardson proclaimed "Workers of the world, disperse." In 1971, Wendell Berry published his "Think Little" essay; in 1972, Peter van Dresser's crisp biotechnic regional plan was first published, and in 1973, E. F. Schumacher's collection of essays was published under the title "Small Is Beautiful."

These are recent expositions of the organic decentralist planning tradition that includes such personalities as Prince Kropotkin, Gustave Landauer, Tolstoy, William Morris, Gandhi, Lewis Mumford, Alex Comfort, Paul Goodman and Murray Bookchin. It is a planning concept ou

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side the theoretical bases of progressive modern industrial society—that exploitive philosophy articulated in 1776 by Adam Smith as *The Wealth of Nations* and hustled through Marx, Engels and Keynes to today's precipitous fossil-fuel hiatus. Suddenly, the underground economists of decentralization look good!

Peter van Dresser mentions none of these distinguished colleagues of either persuasion. Rather, he proceeds in simple direct narrative to define his fourth world regional plan in ecological terms. It is the watershed basin of uplands in northern New Mexico—a natural province of climatic and geological integrity. Its Canadian-continental climate has had a long and rich succession of human habitation, including Indian, Spanish, Mexican and Anglo waves—all today culturally active in a lively demographic mix.

Van Dresser's sources and references are the hard, dry kind produced by successive governmental commissions and agencies, such as the Corps of Army Engineers. Already in 1926, the region "had been the subject of various reports and investigations for the past 40 years." His plan, then, has a direct statistical information base of almost 90 years. It has also had an incubation of 40 years in his personal participation in the life and action of the region. His statement of the problem is comprehensive, thorough and objective. His approach is a form of socioeconomic structuring, in which the open village is the ideal human settlement.

Van Dresser recognizes our "urban-industrial civilization in crisis." He believes that mass production and merchandising, capital-intensive mechanization and automation, and massive public and corporate investment have become unmanageable. It is implied that results also may be cruelly inhumane. He sees no human advantage to the larger Gross National Product. For him, development means profit, not happiness. He's the antithesis of *The Power Broker*. He proposes "undevelopment."

His proposal is expressed in "cause and effect" terms. Regional communities cannot "solve the problems" by out-migration, nor by importing big industry and its works. Livelihood in a region must ultimately be based on the long-term biotic and environmental resources of the land. The evolution of productive economy toward self-sufficiency could provide a high standard of living that would be real because it would be renewable. Economies of site and logical relationships would be maximized rather than economies of scale.

Van Dresser proposes a soft evolution, not a hard revolution. He would save his region from industrialization, avoiding Californication, by sliding into a post-industrial culture with the goals of a full complement of region-supplying primary industries; land- and skill-intensive agriculture and husbandry; deep functional involvement of the community in soil and biotic conservation, and enriched village-community economic, social and cultural life.

His thesis is a return to the land, with use patterns familiar to each of the four ethnic contributors to the region. Population concentrations would be in villages or small towns, in a settlement configuration that is historic. But the particulars of land use would have, hopefully, the advantages of scientific understanding and technical skills unavailable in the past. His thesis is balanced, fair and uncompromising and is highly critical of the value base of most planning decisions in this country.

The plan's only potential weakness is in application, for planning must be implemented to be successful. In this northern New Mexico province, there fortunately seems to exist a satisfying lifestyle and a respectful attitude of self-pride that would support such a regional schema.

Van Dresser does not tackle cities either culturally or conceptually. Although he uses Mumford's definitive "biotechnic" term, meaning ecological and technological balance, he does not enter the more ethereal realms of man's existence: that civilization is a product of cities, which is where Mumford began; nor that evolution tends toward a more complex flux of consciousness, which is where Soleri insists is our divine obligation.

Philosophically, van Dresser's low profile extends Mumford's position of the late '30s, expressed cinemagraphically in "The City." But van Dresser's healthy environment for a new age is not an East Coast greenbelt, with fast buses and cars on parkways to sunlit modern factories. It is a softer and slower vision, and in many more colors than the greening of a valley. The cultural capitals of Taos and Santa Fe, with their pedestrian intimacy and brown mud architecture, are larger prototypes of the biotechnic community. For some, these environments are too pretty, too sweet or too shabby, but they offer the human comforts of an "underdeveloped" region. Van Dresser does not aim at abstracting life. Though economics is his tool, he wants to extend the joys of firsthand reality, avoiding both romanticizing and sermonizing.

A similar modest-sized book, almost unknown today, was William Morris *News from Nowhere,* published in London in 1891. It was a postindustrial fantasy of depopulated England, where people have returned to the joys of handiwork and the land. It was subtitled "An Epoch of Rest." Van Dresser's *Landscape for Humans* is an 'epoch of resustenance.' It is a postindustrial reality of northern New Mexico, where existing village and small town economies and traditions are the potential base for restructuring a region. In a large sense, van Dresser's region is a prototype for much of our world. He uses the logical tools of reason, as a humanist, to formulate a regional plan that, in the last analysis, is based on the emotions of the human condition. His proposal for a biotechnic province in northern New Mexico, a place now of no small integrity in spite of its present underdevelopment, is then "news from somewhere." To the extent that this specific program is a case study of almost universal applicability—and possibly biological necessity—this is, indeed, "news from everywhere." *Jeffrey Cook, AIA*

Shop Fronts. Jacques Debaights; photos by Michel Nahmias. New York: Architectural Book Publishing Co., 1974. 192 pp. $36.

This book will give the American architect some idea about modern shop fronts in France, England, Denmark, Germany, Austria, Switzerland, Italy and Spain. There are many handsome photographs (some in color). The text in French, German and English spells out some principles about the methods and materials of shop front design as well as the all-important subject of lighting. There is descriptive information about each of the individual shop fronts portrayed, and in this part of the book the plans, diagrams and photos are as helpful as the text. There is also a brief section at the back of the book on shop signs.

A History of Architecture on the Disparative Method. Written and illustrated by Forrest Wilson. New York: Van Nostrand Reinhold, 1974. 80 pp. $3.95.

Learning can be mixed with humor, says Wilson, and he does just that in this small book that he dedicates to "lively young minds oppressed by dead scholarship." He hopes that "this bit of nonsense sprinkled with fearful puns, double entendres and the most shameless innuendos" will help the student "in restoring some degree of rational perspective to this area of his education."

Some quotes from the text—which is greatly lightened even more by drawings that are bound to bring forth chuckles—will give the book's flavor:

On prehistoric architecture: "Man's first shelters were constructed of the trees from which he descended. . . . This historic period coincided with the dog's domestication, which rendered tree-constructed dwellings damp and inhospitable. Man then occupied caves since they had the virtue of prefabrication and were devoid of canine kidney compulsion."

On ancient Egyptian dwellings: "The earliest Egyptian buildings were constructed of mud and reeds. The weight of the roof-framing members at the top of the wall caused the wall section to bow

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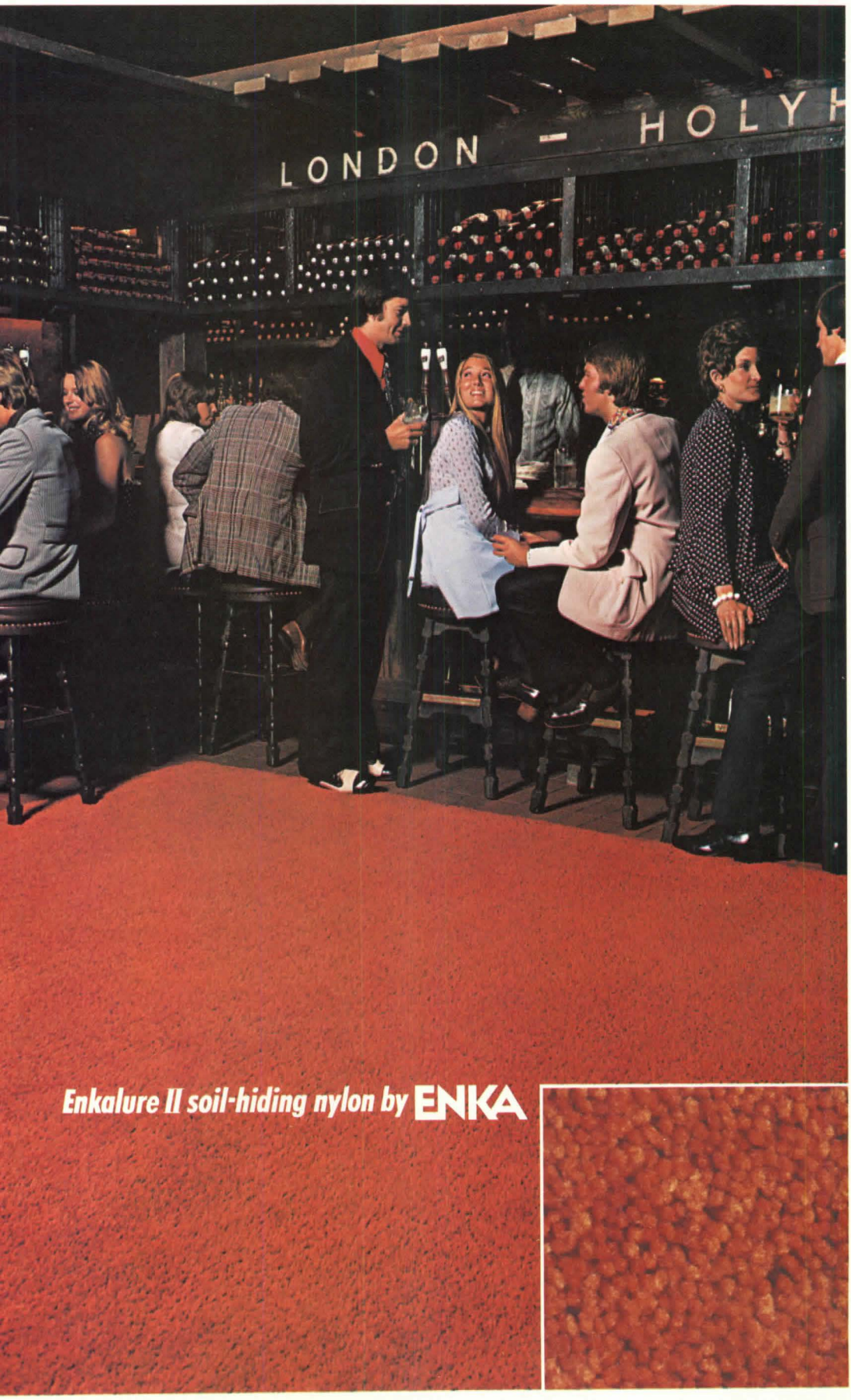

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out, a structural defect that was immortalized as a design feature by an alert architect in the famous Egyptian cove molding. While not remarkable in itself by contemporary standards, this is notable historically as the first instance where a client was persuaded that a structural miscalculation was in reality a design feature."

On Roman architecture: "The Romans used captured slaves for architects rather than waste the time of their engineers on building decoration. . . . Architects were

housed in slave pens, which explains the pensive nature of Roman architecture."

On modern architecture: "Architecture became everything and nothing. It expanded to include the 'entire environment' defined by Buckminster Fuller as everything outside oneself, which meant that we could forget all about it."

On America's environment: "Environmental ugliness is a direct measure of culture. Good design and good taste are financed and supported by a system capable of providing wealth that cannot be produced without environmental contamination. . . . God's own junkyard could only have occurred in an affluent society. Poor people have nothing to discard. There is no litter to be found on the backcountry roads of Africa, Mexico or South America. Cleanliness is next to poverty."

Playgrounds for Free: The Utilization of Used and Surplus Materials in Playground Construction. Paul Hogan. Cambridge, Mass.: MIT Press, 1974. 252 pp. $9.95.

Society's castoffs—such as cable reels, inner tubes, telephone poles, tires and concrete pipe—can be used to build playgrounds, as Hogan demonstrates so well. The book reflects his vast experience in Pennsylvania where he has worked for years in promoting the concept of "building playgrounds with people rather than for people," as Governor Milton J. Shapp expresses it in a letter of commendation about the book. Hogan has built more than 125 playgrounds in that state.

What he really aims at is stimulating people to build playgrounds for themselves. "For a playground to succeed," he writes, "its ultimate users must be its builders." And he includes children as well as adults.

The book is divided into three parts: The first section covers materials; the second discusses the use of the materials; the third illustrates both successful people-oriented playgrounds and unsuccessful maintenance-oriented ones. The playgrounds are various, ranging from a tire park in Tokyo to a nursery-school playground in Phoenixville, Pa.

Humanscale 1/2/3. Authors: Niels Diffrient, Alvin R. Tilley and Joan Bardagjy; designers: Henry Dreyfuss Associates. Cambridge, Mass.: MIT Press, 1974. $25.

This isn't a book in the usual meaning of the word. It's a portfolio that contains an explanatory booklet and three pictorial, color-coded, two-sided "selectors" equipped with rotary dials. The user can turn the dials to obtain more than 20,000 pieces of information about designing for the human body. The selectors concern sizes of people, seating considerations and requirements for the handicapped and elderly.

The tremendous amount of information on human engineering that is incorporated into the selectors has been compiled and organized by Henry Dreyfuss Associates over the past 30 years. Reflected is the research of many people, including anthropologists, psychologists, medical experts and human engineers. In brief, this ingenious, time-saving and effective tool will be of great assistance to architects, furniture designers and others who are concerned about the comfort and safety of human beings.

Land Use Planning Abstracts. New York: Environment Information Center, Inc., 1974. 499 pp. $50.

This is an invaluable one-volume guide to land use literature published since 1970 and is an essential reference work for researchers in the area of land use planning. The 2,300 abstracts included are of publications appearing in trade magazines, professional journals and lay publications, the aim being to present a variety of documents and articles "that would be balanced in terms of opinion, editorial treatment and depth of coverage." The result, as the publisher claims, is a "one-stop land use library."

In addition to the abstracts, there are lists of land use books and films, statistics, synopses of federal and state laws and a summary of recent land use planning trends.

EIC's service is made more valuable by virtue of the fact that nearly all the documents abstracted are available to users through EIC retrieval in hard copy or microfiche. EIC is located at 124 E. 39th St., New York, N.Y. 10016.

Infection Control in the Hospital. 3d edition. Chicago: American Hospital Association, 1974. 198 pp. $6.50.

There are many architectural considerations to take into account in the control of infection in hospitals, such as traffic patterns, materials handling, ventilation systems, handwashing facilities and carpets. Many advances have been made since this book's second edition, which was published in 1970. The new information is incorporated into this revision. There are entirely new chapters on hemodialysis units, carpeting, fogging and laminar airflow, and many chapters have been revised, particularly those on the newborn nursery, intensive care units, surgical suites and blood banks.

On Site/On Energy. Alison Sky, Michelle Stone, James Wines. New York: Site, Inc (distributed by Charles Scribner's Sons), 1974. 127 pp. $6.95.

The *On Site* publications are intended to bridge the gap between the environmental arts and architecture. This book is the artist's discovery of the energy crisis. There are major sections of the book devoted to resources, systems, mobility, habitat, synergy and iconology. Among the luminaries contributing to the volume

are James Wines, Rene Dubos, Lewis Mumford, Richard Stein and Percival Goodman. The book is a unique blend of the views of technicians, artists and social philosophers. The freshness of this combination makes the volume a highly readable treatise on the energy crisis. *Michael B. Barker, Administrator, AIA Department of Environment and Design*

rt Deco Architecture in New York, 920-1940. *Don Vlack.* New York: larper & Row, 1975. 179 pp. $15. **Sky-raper Style: Art Deco, New York.** Cer-in Robinson and Rosemarie Haag Blet-r. New York, Oxford University Press, 975. 88 pp., 115 plates. $20.

Art Deco architecture is being newly ppreciated if these two recent books on ie subject, a plethora of magazine arti-es and a number of exhibitions are indi-ators. Both books concentrate on New ork City because that metropolis is the te of the world's finest Art Deco archi-ecture. They both point out that there re many more examples than the well-nown Rockefeller Center—there are partments, hospitals, theaters, stores, arehouses, office buildings, whose in-eriors and exteriors are in the Art Deco tyle. Both books are handsomely and opiously illustrated, and make a contri-ution to the new interest in this phase of rchitectural history.

rchitectural Working Drawing Check ist I; Architectural Working Drawing heck List II; Architectural Rules of humb. Orinda, Calif.: Guidelines Pub-cations, 1974. 3 vols. $5.50 each.

The first in this series of handbooks sts over 1,500 items that go into work-ng drawings for commercial, institutional nd other heavy-frame building construc-tion. It provides for annotation to suit office standards and project requirements.

The second handbook contains over 1,500 items for residential and light-frame construction. The third booklet has about 150 rules for all phases of architectural practice, ranging from structural and mechanical elements to space planning areas. A section on office budgeting rounds out the rules of thumb.

The publications, not sold in book-stores, are available from Guidelines Pub-lications, P.O. Box 456, Orinda, Calif. 94563. The publisher assures architects that the books may be returned for full, unconditional refund if they're found not to be worthwhile.

Space, Style and Structure: Building in Northwest America. Thomas Vaughan, editor. Portland, Ore.: Oregon Historical Society, 1974. 2 vols. $27.50 hard bound, $22 paperbound.

A cooperative effort on the part of architects, planners, historians, landscape architects, engineers, photographers and research workers, this two-volume work is a praiseworthy history of a region's ar-chitecture. It begins with prehistory and continues through pioneer days and the railroad era to the age of the automobile. It covers cities and towns and buildings and gardens, interpreting the architecture in terms of the region's terrain, climate, ethnic influences and industry. Copiously illustrated, the books are attractive in format. But best of all are the perceptive essays, which are the contribution of a wide variety of authorities. The two-volume work is a bicentennial project.

Mind's Eye of Buckminster Fuller. Donald W. Robertson. New York: Vantage Press, 1974. 109 pp. $5.

This is a small book but one that will please the admirers of Buckminster Fuller. It supplies an added dimension in the quest to understand this man who has been called the "minister of progress from the 21st century."

Robertson was Fuller's patent lawyer for more than 25 years. It was to him that Fuller often poured out his thoughts, sometime forgetting both mealtime and bedtime. Fuller, says Robertson, was "born to test every preconceived notion, and to reject every 'can't do' of man." Robertson's purpose is to analyze the mind of Fuller through a study of his dis-coveries and inventions.

Throughout the book are anecdotes about Fuller and many quotations by him. Robertson says that "Fuller's mind, in-tuitively or through practice as the case may be, unerringly searches out the total of reality in terms of the dynamics of the universe. His mind's eye does not let him be foiled by his optic nerves."

LETTERS

Purpose of the Pyramid: It is regrettable that many architects do not know the purpose of the design of the Great Pyramid of Cheops (= Khufu). The article in the November issue titled "Supplementing History: The Environmental Impact of the Great Pyramid" is cleverly written, but it perpetuates the illusion that the pyramid was designed as a tomb.

On the contrary, it was designed as a multipurpose measuring device and also a temple of initiation for the priests/scientists. The evolution of the truncated mastaba into the smooth-sided pyramid was an evolution of the design of measuring devices (mastabas + obelisks at first). It is not surprising that some of the earlier forms became the tombs of the leaders recognized for their scientific accomplishments.

All architects should read—nay, *study*—Peter Tompkins' book *Secrets of the Great Pyramid*. Study also Tons Brunes' *The Secrets of Ancient Geometry* and Santillana and von Dechend's *Hamlet's Mill*. The history of early design is based on geometry, astrology and astronomy. What about the pyramid on the dollar bill—part of the seal of the U.S.A.? Our founders knew something of the real significance of the pyramid. To date, no mummy or treasure has been found in the Great Pyramid of Khufu. There was no motive to design such a gigantic structure as a tomb. There was every motive to design it for measuring and for initiation. Check the source of the word "pyramid!"

It means "fire within," indicating phenomenal power in the very *form* of the Great Pyramid. What the Egyptians built four or five thousand years ago was a remarkable scientific device.

Not only is the history of early design different from what most textbooks have told us, but also the new application of some rediscovered ancient wisdom may startle us tomorrow. *Dik Vrooman, FAIA*
College Station, Tex.

To: Chephren, Superintendent of the Works of the Pharoah, Prince of the Blood.
Re: Draft Environmental Impact Statement, Great Pyramid of Cheops.
Dear Lord Chephren:

We are returning herewith your copy of the above referenced statement (*see* Nov., p. 48) for revision and resubmission. Serious omissions have been noted in this statement and must be included before permission to proceed can be granted.

Under Article 1C, Functional Design, you have failed to note the additional function of this project as an astronomical observatory (*Secrets of the Great Pyramid,* Peter Tomkins), and such usage will undoubtedly have additional effects on regional seasonal plantings as well as future religious acceptance by the Copts.

Additionally, it is felt that the preservatory effects of this structure (*Psychic Discoveries Behind the Iron Curtain,* Shiela Ostrander and Lynn Schroeder) should be included under this heading.

It is also noted that the omission of Our Most Great and Beloved Messengers of Ra, possibly acting as prime contractors on this project (*Chariots of the Gods?* Erich von Daniken) and using construction methods not defined in Article IIIC, will have profound influence on your evaluation of IID, Public Participation, and IIID, Wastes & Pollution.

Inclusion of these factors in your revised statement will expedite examination and approval by this department.

Ciz Birhar
Assistant Director
Nile Estuary Region
Department of Delta Construction

ED. NOTE: The above was uncovered during recent excavations by Charles L. Witt, an architect from Lexington, Ky.

Speaking of the Movies: The two film reviews of "Earthquake" and "The Towering Inferno" in the January issue would have been more appropriately titled "Shake and Bake."

James Dowling, Director
AIA Codes and Regulations Center
Washington, D.C.

'Coping with the New Waves': In the November issue in his article titled "Coping with the New Waves of Aspiring Architects," Robert L. Bliss states that "one school (Oregon) has students in a 'holding pattern' for two years before their applications will be reviewed." That is false. It's not true now and never has been. Since this statement could be damaging to our admissions procedures, a correction of the statement is in order.

This is the actual situation concerning undergraduate admissions: Until three years ago, *all* applicants were accepted with no denials and no waiting. Three years ago, the demand exceeded our resources, so we accepted as many persons as we could on a first-come basis (these persons entered the program immediately with no waiting), and then placed the remaining applicants on a waiting list. All of these, and later waiting list students, were *guaranteed* acceptance to the architecture programs after a wait of one year or less. In no case have students been required to wait "before their applications will be reviewed." Many of these first "waiting list" applicants were able to begin our programs during their first year of waiting, and all of the remainder would begin by the end of their first year.

Two years ago, we repeated this procedure, but for the first time actually *denied* admission to many people who applied after the new waiting lists were filled. We accepted 197 students, placed 99 on waiting lists and denied 268. Again many of these waiting list students were able to begin our programs during their first year, and *all* of them were able to begin by the end of their first year.

Last year we accepted some applicants by "first-come" selection again, but we also initiated a personal selection procedure. We accepted 183 students, denied 407 and placed only 17 on a waiting list. All 17 were currently enrolled at the University of Oregon and were applying as major changes. Our best guess at this time is that all 17 of these persons will begin our program during *this,* their *first* year of waiting.

As is evident, we have nearly eliminated the "waiting list" situation, and in no case has a student been required to wait more than one year. In no case has a student been placed on a waiting list without his admission being fully guaranteed. *Mike Shellenbarger*
Assistant Department Head
Department of Architecture
School of Architecture and Allied Arts
University of Oregon
Eugene, Ore.

After reading the article by Bliss, I had the following question: Why doesn't our profession protect its greatest talents?

The plague of the profession of architecture is improper control and direction. Although our country has claimed to offer freedom of opportunity for our people, young and old, other professions have found in the past the necessity to control the quality and the need to set quotas for the general walfare of practitioners.

The writer of "Coping with the New Waves of Aspiring Architects" recognizes that there is the problem, but he seems to stress finding other channels of work for those who already have completed graduate work in architecture. Part of the real problem is to create the proper conditions in each state to allow those already registered practicing architects, who maintain their places of business, to obtain adequate work to sustain their practices yearly.

If an analysis is made of the statistics by Case & Co. and other references, we would find the following data: Assuming the figure of 35,000 registered architects in the U.S., divide that figure by 50 states, and there are approximately 700 registered architects per state (we know that the figure would vary with the size of the state). But 1,300 of the architects in this country are in some form of government service. Therefore, the average number of architects per state would be approximately 674. However, the Case survey indicated that about 6,600 architects (out

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of slightly over 10,000 returns to the questionnaire) maintained their own places of business. This would alter the figure of 674 to about 445 registered architects per state who maintain their own offices.

If our conditions were more ideal, assuming that each registered architect was actively engaged yearly at fees of $52,000 per year ($25 per hour), then $23,140,000 in fees would be needed to sustain the registered architects in practice in each state year. Each state, of course, would need to prorate its own figure for the actual number of registered architects in practice. Unless there is adequate volume of work in each state, it shows that foresight and the need to establish adequate controls to protect the greatest existing talent and ability are absolutely necessary.

Bliss has already stated that "the wastage in brains and talent is already at an intolerable level."

The answer to this problem is proper control, direction and a wider distribution of design work projects. On the public side, this can be programmed to assign several registered architects' firms when large public building projects are required instead of one or two firms who have been obtaining huge fees. It is believed that by doing this the welfare of our profession would be improved. The value of the trained practitioner comes first. The student situation should be properly controlled. *Sir George Stephen Lewis, AIA*
Boston

Is There a Doctor in the House?: I read with a sense of shock the article titled "Direct Mail as a Marketing Tool for Architects" in the November issue. But soon my sense (of shock) was diminished by a happening. It went like this.

I felt a pain in my side. My wife said, "Lie down and rest." I did. I don't know how the news spread, unless by extrasensory perception or mental telepathy. But the next day I received three brochures from surgeons. These brochures, monthly newsletters, were beautifully engraved and illustrated with photographs in color of surgical procedures performed on people who had had pains.

I was not sure what to do at this point: so I interviewed each of the brochure publishers. One recommended an appendectomy; another said that he would splice up a hernia for a consideration; and the third said he didn't know, but he would put me on the table and explore.

I still did not know; so I talked to an old friend who was, by happenstance, a doctor, and in whom I had confidence. He said, "George, you must quit smoking." I did (not quite true) and have lived happily ever after.

George P. Simonds, FAIA
Oakland, Calif.

EVENTS

Apr. 14-15: Symposium on the Urban Library of the Future, Boston. Contact: Johanne Duhl, Massachusetts Bureau of Library Extension, 648 Beacon St., Boston, Mass. 02115.
Apr. 18: Seminar on Quality Control in the Design Professional's Office, Detroit. Contact: Jack McKee, National Society of Professional Engineers, 2029 K St., N.W., Washington, D.C. 20006.
Apr. 24-26: World Leisure Environments symposium, Ball State University, Muncie, Ind.
Apr. 27-May 1: National Conference of States on Building Codes and Standards annual conference, Santa Fe Hilton Inn, Santa Fe, N.M. Contact: NCSBCS Secretariat, Center for Building Technology, National Bureau of Standards, Washington, D.C. 20234.
Apr. 28-30: Conference on Lighting for Museums and Art Galleries, General Electric Co., Nela Park, Cleveland. Contact: Lighting Institute, GE, Nela Park, Cleveland, Ohio 44112.
Apr. 30: Submissions deadline, Contractor of the Year award. Contact: National Association of Plumbing-Heating-Cooling Contractors, 1016 20th St. N.W., Washington, D.C. 20036.

May 1-3: Criticism and Architecture conference, University of Wisconsin-Milwaukee, Milwaukee.
May 4-7: International Council of Shopping Centers annual convention, Miami Beach. Contact: ICSC, 445 Park Ave., New York, N.Y. 10022.
May 5-6: Symposium on Corrosion, Pioneer Inn, Oshkosh, Wis. Contact: Paint Research Institute, 121 S. Broad St., Philadelphia, Pa. 19107.
May 5-9: World Congress on Crime Prevention, Holiday Inn South, Louisville, Ky. Contact: WCCP, 2100 Gardiner Lane, Louisville, Ky. 40205.
May 5-10: International Union of Architects Congress, Madrid. Contact: Maurice Payne, AIA, Institute Headquarters.
May 7-11: Scandinavian Furniture Fair, Bella Centret, Copenhagen, Denmark.
May 9-10: Technical session on Solar Energy and Energy Performance Building Codes, Madison Hilton Inn, Madison, Wis. Contact: Al Wilkins, 4717 Hammersley Road, Madison, Wis. 53711.
May 12-16: National Fire Protection Association annual meeting, Palmer House, Chicago. Contact: NFPA, 470 Atlantic Ave., Boston, Mass. 02210.
May 13-14: Conference on Underused Church Properties, Trinity Church, New York City. Contact: Cheswick Center, 17 Dunster St., Cambridge, Mass 02138.
May 18-22: AIA annual convention, Civic Center, Atlanta. (Reconvened session, Rio de Janeiro, May 23-June 7.)
May 19-20: National conference on land use, Marriott Hotel, Denver. Contact: Land Use Conference, 1321 Bannock St., Denver, Colo. 80204.
May 19-22: Course on Engineering for Extreme Winds and Tornadoes, Hilton Inn, Lubbock, Tex. Contact: Dr. J.R. McDonald, Box 4089, Texas Tech University, Lubbock, Texas 79409.
May 20-23: American Institute of Industrial Engineers annual conference, Sheraton-Park Hotel, Washington, D.C. Contact: AIIE, 25 Technology Park, Atlanta, Norcross, Ga. 30071.
May 23: Seminar on Quality Control, Great Falls, Mont. Contact: Jack McKee, NSPE.

GOING ON

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duction in the fees paid by applicants for the exam.

OAE requests a return to pre-1973 exams and objects to employer-supplied information that is given in confidence to the board. OAE argues that applicants have a right to review what is said about them. OAE complains as well about grading procedures, saying that the applicant has no opportunity "to substantiate whether or not the grade issued indeed belongs to him" or to use the materials in preparation for a re-examination.

The state board "explains that the recently changed California exam is patterned closely on a model test developed by the National Council of Architectural Registration Boards" and that "implementation of the newer procedures was accomplished through administrative channels with the board thoroughly publicizing its plans and giving all factions a chance to be heard."

Harvard Starts Program For High School Students

Twenty-four public high school students from schools in Boston and Brookline, Mass., are attending a 16-week, tuition-free program in architecture at the Harvard Graduate School of Design. The students will receive high school credits for the program. They attend the classes twice weekly for a period of two to three hours.

Lectures by instructors and visiting professionals, studio exercises in design, presentations of design projects, films, field trips and site visits are all part of the program. The purpose is to teach the students the basic theory of architecture.

The program is supported by a grant from the state department of education. The grant establishes the program in architecture as part of the state's efforts to bring together a racial mix of students in "unique educational programs." Charles MacMillan, project director for the department, says, "We are trying to address the issues of racial as well as social isolation by achieving a racial mix and an urban-suburban mix from communities in different parts of metropolitan Boston."

Satterlee Memorial Fund

A special fund has been established by the AIA Foundation to create a collection of books, slides and other documents on historic preservation and the architectural history of Washington, D.C. The collection is in memory of Nicholas Satterlee, FAIA, who was well known for his meticulous rehabilitation of historic landmarks (*see* Jan., p. 62).

The architect's own collection of books, reports and slides will form the nucleus of the collection, which will be housed in the AIA library. Memorial contributions will be used to purchase additions to the collection.

Tax-deductible contributions in memory of Nicholas Satterlee may be sent to the AIA Foundation, 1799 New York Ave. N.W., Washington, D.C. 20006. The foundation also requests information about books and other documents that would be appropriate in the memorial collection.

Deaths

Eugene Tucker Carlton, Richmond, Va.
Sumner E. Darling, Sarasota, Fla.
George L. Ekvall, Olympia, Wash.
Walter Hair, Hamilton, Ohio
Milo S. Holdstein, Cleveland
Whalen L. King, Clarksburg, W. Va.
George John Maguolo, St. Louis
A. F. Minkler, Binghampton, N.Y.
Louis A. Oliver, FAIA, Norfolk, Va.
Philip Partridge, Cincinnati
Howard A. Rosenwinkel, Chicago

Theodore Jan Pritchard, FAIA: Former head of the University of Idaho's art and architecture department and a consultant architect since his retirement from the university post in 1967, Pritchard was an active leader in AIA chapter affairs, having served as president of the Idaho chapter/AIA. He died on Dec. 7, 1974, at the age of 72. He also was a leader in many other academic and professional societies, including the Society for Architectural Historians and the Society of Architectural Bibliographers. He served on the National Council of Architectural Registration Boards, the Idaho State Board of Architectural Examiners and the AIA committee on awards and scholarships. He helped design a number of buildings in Moscow, Idaho, including the Eggan Youth Center, the Elks Golf Club, St. Augustine's Catholic Center and the Newman Center. Pritchard, a graduate of the University of Minnesota, earned his M.A. degree at Harvard University.

Darrell Boyd Harmon: A pioneer in architectural research, Harmon directed studies of more than 160,000 school children in order to demonstrate the effects of improper lighting, seating, decoration and arrangement of classrooms on their health and development. The principles he established were presented in the monograph *The Co-Ordinated Classroom* (American Seating Co., 1949), which is said to have influenced over $2.5 billion in school design and construction. He was cited by the AIA and the Producers' Council for this contribution.

Harmon, who died on Jan. 14 in Austin, Texas, after a long illness, was a consultant to many firms and institutions on human factors in design. He taught at universities and conducted seminars and conferences on design topics. An architect in Connecticut writes the AIA JOURNAL that Harmon believed that "architects were the most important people involved with human performance. As a result, he spent a large part of his life working with architects, building components manufacturers and environmentally oriented people in the medical professions. . . . After listening to Harmon, Richard Neutra wrote his well-known book *Survival Through Design.*"

Newslines

A catalog of guidebooks on the built environment is being prepared by urban planner John Fondersmith. His aim is to provide a source catalog with more sophisticated information on cities and towns than is generally available in commercial guidebooks. He requests that guidebooks be sent to him; or if that is not possible, he asks that he be supplied with complete bibliographical information and a brief description of the publication. His address: P.O. Box 186, Washington, D.C. 20044.

Physically handicapped children at the Rehabilitation Institute of Chicago are being helped by a freshmen architecture class at the University of Illinois at Chicago Circle. The students have designed and are building an indoor playground for the children. They have studied building codes and regulations and read extensively on child development theories in the preparation of the playground. Each of the 16 students submitted a design, and the RI staff chose two for development.

Pedro Aguirre, AIA, of Dallas, has been appointed by the Department of Housing and Urban Development to a 24-member ad hoc committee to plan a national fair housing conference and to develop a manual for fair housing organizations on how to apply for funds. Aguirre, the first Mexican-American in the history of Dallas to serve as a city councilman, is also on the board of the National Center for Housing Management in Washington, D.C.

Advanced solar and geothermal energy research has been shifted from the National Science Foundation to the Energy Research and Development Administration as part of the implementation of the Energy Reorganization Act of 1974. The transfer includes $37 million of solar energy projects and funds, $14.3 million of geothermal energy funds and $.43 million in program and development funds to maintain 47 positions at ERDA. Dr. Robert C. Seamans Jr. is administrator of ERDA, which is located temporarily at 1800 G St. N.W., Washington, D.C. 20550.

William W. Caudill, FAIA, chairman of the board of Caudill Rowlett Scott, Inc., in Houston, was a member of a five-man joint study team that visited Egypt recently to work with an Egyptian team on plans for advancing building technology. The team visit was sponsored by the Center for Building Technology, National Bureau of Standards. Another team member was James L. Haecker, AIA, industrial liaison officer, Center for Building Technology and Institute for Applied Technology, NBS.

The military family housing construction program has been appropriated $310 million by Congress for the fiscal year 1975. Included in the appropriation is $238.6 million for construction of new housing units; $1.85 million for trailer spaces; $60 million for improvements, and $9 million for minor construction.

Advocates for the Arts, the first national constituency of individuals engaged in economic, public and legal action for the arts, has issued the first number of its news quarterly titled *The Arts Advocate*. The periodical is available to those who support the national group with individual contributions of $15 or more. Tax-deductible contributions may be sent to Associated Councils of the Arts, 1564 Broadway, Suite 820, New York, N.Y. 10036.

The metric system of measurement is explained in a 20-minute audiovisual presentation available from the American Society of Civil Engineers (345 E. 47th St., New York, N.Y. 10017). Titled "SI (Metric) for Civil Engineers," it consists of 56 color slides, a cassette tape recording and a written script. The cost for purchase is $95 ($75 to society members), and the presentation can be rented for 10 days for preview purposes at $25, which can be applied to the purchase price.

E. Alfred Picardi, partner, Perkins & Will Washington, D.C., is the recipient of the American Institute of Steel Construction's 1975 T.R. Higgins lectureship award. The award recognizes the "most significant engineering paper on fabricated structural steel" published from Jan. 1969 to Jan. 1974. The paper titled "Structural System: Standard Oil of Indiana Building" was published in the Apr. '74 issue of the ASCE *Journal of the Structural Division*.

Theft and vandalism in the construction industry amounts to an estimated $100 million yearly, says the Associated General Contractors of America. AGC's crime prevention committee recently launched a program for AGC's 119 chapters that is designed to foil the thieves. Recommended procedures: centralized control over equipment and materials on the jobsite; circulation of information about stolen property to other contractors; company identification systems for all property; fenced-in equipment parks, security patrols, guard dogs and adequate lighting, and cooperation with law enforcement agencies.

The National Housing Conference has elected Leon N. Weiner, who heads a building firm in Wilmington, Del., as its president. Formed in 1931, NHC lobbies for better housing and community development. □

esearch from page 30

ast decade, and most of those went to niversities.

Aside from the federal government, here are a great many private foundations hat are willing to support good research roposals—though not usually those of rofit-making organizations. One way to egin finding out who they are and the inds of research they are willing to fund to call or visit the Foundation Center, national clearinghouse of information bout foundations that has offices in most ajor U.S. cities.

The architect's search for sources of re-arch funds is all part of what Conway alls "identifying opportunities." This is he first step architects have to take they want to get involved in research.

But it is a highly competitive field, Con-ay warns. "There are many knowledge-ble, highly competent people in research ho have an accurate grasp of the sources f opportunity, the methods and the kinds f people needed to do research, and who ave skills in managing research projects nd reliable information about costs. To he extent that an architectural firm oesn't have this information, it is at a ompetitive disadvantage."

To overcome this disadvantage, says onway, the architect has to build his wn capabilities to do research. "He has to et an understanding of the methodologi-al rigor—what's the right method for the ght topic. He has to learn how to get eliable data, how to design a research roject—a whole set of research skills."

Some of these skills the architectural rm can buy—either in the form of con-ultants or as additions to the staff. It an also acquire them by hooking into omeone else's research project, becoming art of a research team. Or it can develop he skills in-house by sending members f its staff off to universities.

Breaking into research is essentially a arketing task—a task that most prac-cing architects are basically equipped to andle. "It's very similar," says Conway, to what architects do to get conventional lients." It has different problems, differ-nt approaches and different goals, but he architect who wants to get into re-earch is standing on a solid foundation. □

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The Management of Time shows how to increase time productivity and avoid "wheel spinners." A cassette with assessment sheets. See Resourcenter #26.

Construction Management discusses the ins and outs of construction management. Details, logistics and advantages of CM approaches to projects. See Resourcenter #23.

Office, Partnership, Consultant and Architect Contracts provides practical guidelines for dealing with the legal problems inherent in architectural practice. SeeResourcenter #12.

Construction Contracts looks at the legal problems associated with the construction phase of architectural projects. See Resourcenter #13.

Transactional Analysis discusses principles for understanding human behavior. A cassette with diagrams. See Resourcenter #27.

*Jean-Jacques Servan-Schreiber, from "Is Management Really an Art?" by Henry M. Boettinger, Harvard Business Review, January-February 1975, 53:1, p. 55.

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