

AWARD-WINNING



**The Bold Look I[™] ceiling. New from Armstrong.
The look of prestigious, heavy-textured tile.
The convenience of lay-in panels.**



Like our Second Look® I and Second Look II ceilings—shown below at far right and center, respectively—Bold Look I brings a whole new look to the overhead world.

It's a look we've artfully designed for both beauty and economy. Because what we've done is to use standard 2' x 4' lay-in panels with an exposed grid in a way that disguises the 2' x 4' repeat. The grid is slightly recessed, blending with score marks which divide the panel into surface squares the size of ceiling tile. What results is an acoustical ceiling that gives you a rich look without a rich price tag.

In the case of Bold Look I, each

handsome rough-textured 24" x 48" panel is scored in both directions with one-inch-wide routings that divide the surface into eight tilelike sections. Second Look I, with its smoother surface, is also divided to simulate 12" x 12" tile, while Second Look II provides the broader look of a 24" x 24" tegular-edge panel.

So what you end up with is a ceiling that combines the beautiful efficiency of a tilelike look with the cost efficiency of an exposed-grid system—a combination you can't beat for good looks or good sense. To learn more, write Armstrong, Dept. 8BNAJ, Lancaster, Pa. 17604.



Bold Look I



Second Look II



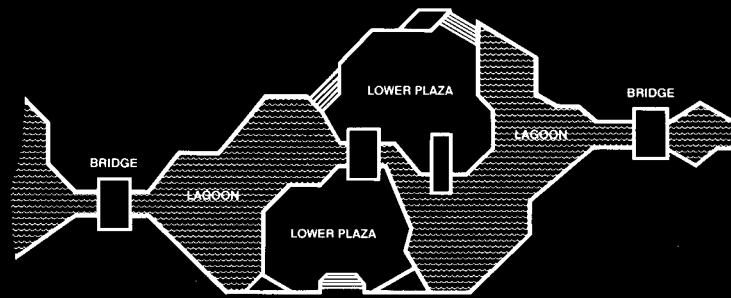
Second Look I



FROM THE  INDOOR WORLD® OF

Armstrong

Circle 47 on information card



Red cedar makes a shopping plaza a welcome neighbor.



St. Mark's Shopping Plaza, Stockton, California. Architect: Al Saroyan, Jr. and Neil G. Rains, Architecture. Inc.

Compatibility with surrounding residential areas was one of the architect's key considerations in planning this distinctive shopping plaza. Richly textured red cedar shakes provided a beautiful—and practical—solution.

"Red cedar shakes were extensively used for roofing and sidewalls in order to lend unity and harmonize with the community's residential scale.

"The light material weight of the shakes permitted economies in the framework of the roof system. And, by letting the shakes weather naturally, the cost of initial painting was eliminated and minimum maintenance was assured!"

Another practical consideration: Red cedar's superior insulative quality works to combat today's higher cost of heating and air conditioning.

For information on "How to Specify," write us at Suite 275, 515-116th Avenue N.E., Bellevue, WA 98004. (In Canada: 1055 West Hastings Street, Vancouver, B.C. V6E 2H1)

These labels under the bandstick of red cedar shingle and shake bundles are your guarantee of Bureau-graded quality. Insist on them.



Insulative ("R") values of roofing products shown below. Source: ASHRAE Handbook and California Energy Design Manual.

Cedar Shakes (Heavy)	1.69
Cedar Shakes (Medium)	1.15
Cedar Shingles	.87
Built-Up Roofing, Slag	.78
Asphalt Shingles	.44
Built-Up Roofing, Smooth	.33
Asbestos Cement Shingles	.21
Slate	.05

Red Cedar Shingle & Handsplit Shake Bureau

Circle 48 on information card

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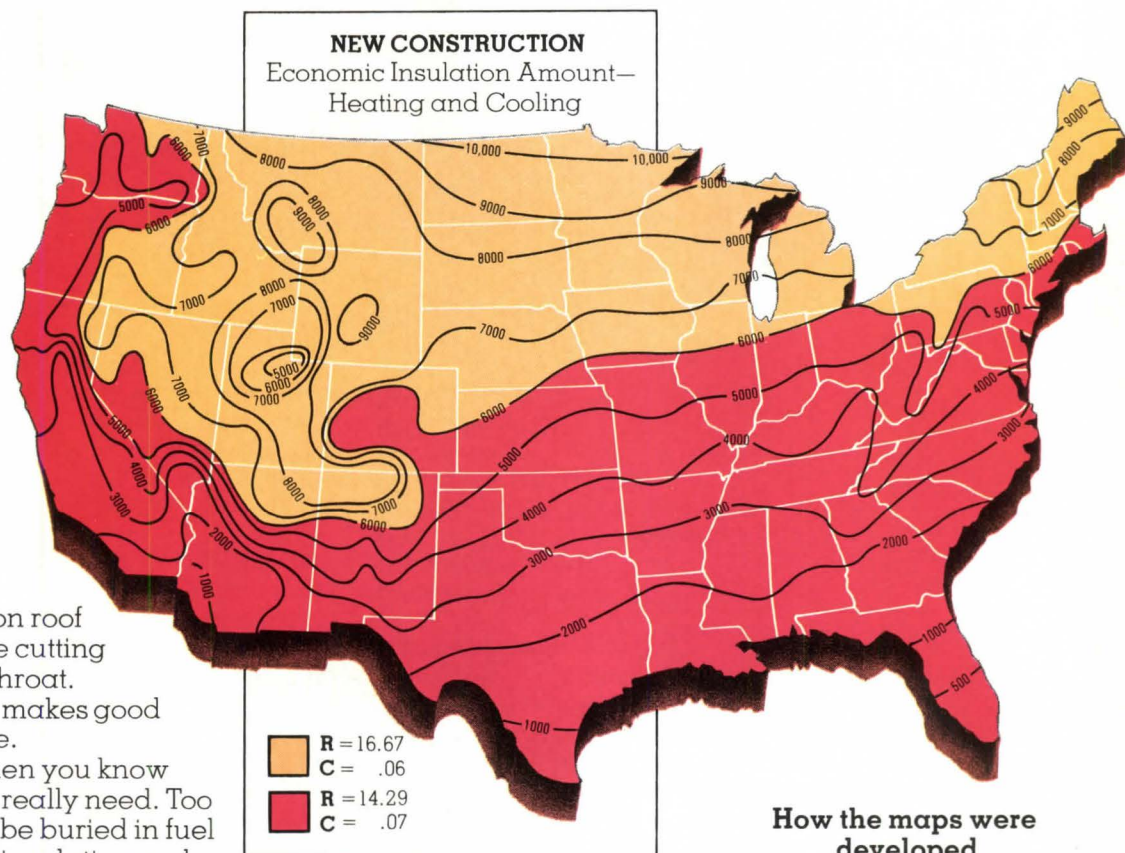
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Donald Canty, Editor; **Suzy Thomas**, Art Director; **Carole Palmer**, Associate Art Director; **Nory Miller**, Assistant Editor; **Mary E. Osman**, Senior Editor, Departments; **Andrea O. Dean**, Senior Editor, Articles; **Allen Freeman**, Managing Editor; **Nora Richter**, Editorial Assistant; **Michael J. Hanley**, Publisher; **Michael M. Wood**, National Sales Director; **George L. Dant**, Production and Business Manager; **Gladys McIntosh**, Circulation Manager; **Lisa Moore**, Administrative Assistant; **Richard H. Freeman**, General Manager.

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How saving money on roof insulation is a quick way to go broke



Cutting down on roof insulation is like cutting your financial throat. Roof insulation makes good economic sense.

But only when you know how much you really need. Too little and you'll be buried in fuel cost. Too much insulation and it'll seem like forever before you recover the cost.

Here's a not too farfetched example to show you what we mean: A million-square-foot (1,000,000) plant with a minimum amount of roof insulation "R" 2.77 ("C"—0.36) in the northern part of the country with 7,000 degree-days and 500 cooling hours. It can cost you \$129,700 per year to heat and cool.

Assuming a 5% annual inflation in fuel costs, seven years from now the same building will conservatively cost you a whopping \$208,250 to heat and cool per year.

But there's more to come. The original equipment cost

for heating and cooling our not so farfetched example could run as high as \$1,900,000. How's that for a quick way to go broke!

How to avoid going broke

Take a hard look at these two "Economic Insulation" maps. Using 7,000 degree-days, 500 cooling hours and 80°F temp. difference. The map for a new roof recommends an "R" of 16.67 ("C" of .06). Translated into energy costs a year, that's only \$25,000 to heat and cool this building. A savings of \$104,700 the first year and a possible reduction in equipment cost of \$1,500,000.

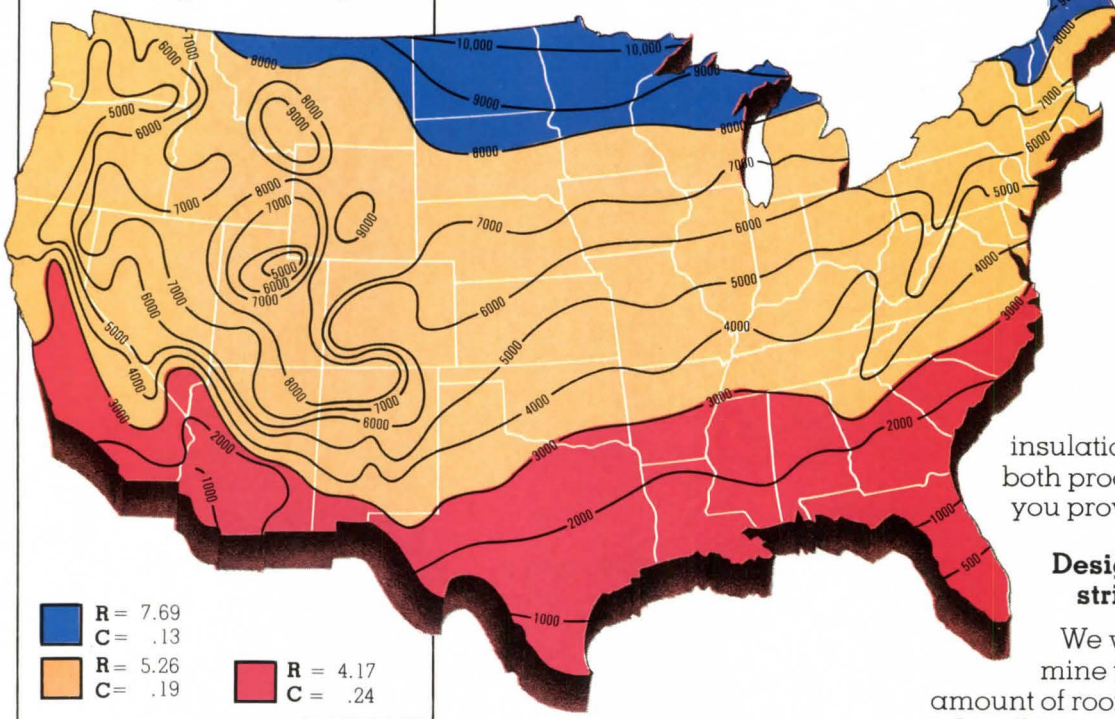
How the maps were developed

Owens-Corning has taken twenty years of energy management experience and put it into a computer.

We used a metal-deck commercial or industrial building, with gas heat and electric cooling, as our base. We did thorough calculations for degree zones throughout the country. Then we factored in a 15-year building life. A 5% annual fuel inflation estimate. We put corporate income taxes at 48%. Electric costs at \$0.03/kwh, \$1.80/M cu. ft. (1 million btu) for gas. Equipment costs were pegged at \$1000/ton—cooling. \$35/1 M btu—heating. Plus 5% equipment maintenance cost. Roof resist-

RE-ROOFING

Economic Insulation Amount—
Heating and Cooling



ance: 1.50—summer, 1.11—
winter. Insulation ¾" fiber glass.

For equipment design an
80°F temp. diff. and deck ETD of
62°F were used. Allowed for 10%
roof insulation cost adjustment
and 75% heating system efficien-
cy. The maps are the result.

If you're designing a new
roof or replacing an old one,
you can tell at a glance the
economic amount of insulation
you should be using for your
project. Pure and simple.

Talk to our computer about your special requirements

Our "economic insulation"
maps should cover most
of new roofing and re-roofing
projects. If your roof is a spe-
cial case, you can talk to our
EMS 3 computer by using a
touchtone telephone or com-
puter terminal. Give EMS 3 the
basic information about your
project and EMS 3 will tell
you the economic insulation
amount based on your input. It
will also give your projected
first-year heating and cooling
savings, equipment savings
on new construction, and
added insulation cost. We'll
send you full details so you

can call EMS 3 about your spe-
cial requirements.

Ask us about our roof insulation

We've got Fiberglas* Roof
Insulation and Fiberglas
Urethane Roof Insulation (FURI).
Depending on your design and

Fiberglas Roof Insulation Thermal Values

"R"	"C"	Nominal Thickness
9.09	.11	2-1/4"
7.69	.13	1-7/8"
6.67	.15	1-5/8"
5.26	.19	1-5/16"
4.17	.24	1-1/16"
3.70	.27	15/16"
2.78	.36	3/4"

FURI Insulation Thermal Values

"R"	"C"	Nominal Thickness
20.00	.05	3-3/4"
16.67	.06	3-3/16"
14.29	.07	2-5/8"
12.50	.08	2-3/8"
11.11	.09	2"
10.00	.10	1-13/16"
9.09	.11	1-11/16"

insulation requirements,
both products will give
you proven performance.

Design help with no strings attached

We will help you deter-
mine the economic
amount of roof insulation. EMS 3
is hardly a salesman. It's there
to help owners, engineers and
architects obtain energy-
efficient roofs.

Of course we want to sell
you our insulation. We believe
if we help you find the eco-
nomic amount of roof insula-
tion you'll probably come to us
for the right insulation for
your roof.

What you should do now

Planning a new building or
replacing an old roof? Incorpo-
rate the "economic insulation"
amount from the maps into
your specifications. If you're
not directly involved in specifi-
cations, pass them along to the
person who is. If there is any-
thing that you don't understand
about insulation, call your local
Owens-Corning representative.
That phone call might keep you
from going broke.

Want more information on
our roof "economic insulation"
amount maps, or how to talk to
our computer, drop us a line.
Write to A.K. Meeks, Owens-
Corning Fiberglas Corporation,
Fiberglas Tower, Toledo,
Ohio 43659.

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EVENTS

Nov. 29-Dec. 1: Design/Build Conference, Stouffer's Denver Inn, Denver. Contact: Al Branson, Associated General Contractors of America, 1957 E St. N.W., Washington, D.C. 20006.

Dec. 1: Nominations postmark deadline, R. S. Reynolds award for architecture. Contact: Maria Murray, AIA Headquarters, (202) 785-7390.

Dec. 1: Applications deadline, scholarships for four-year construction or civil engineering degrees. Contact: AGC Education and Research Foundation, 1957 E St. N.W., Washington, D.C. 20006.

Dec. 4-6: Seminar on Developing and Controlling an Energy Management Program, Chicago. (Repeat seminar: April 23-25, Los Angeles.) Contact: New York University Conference Center, 360 Lexington Ave., New York, N.Y. 10017.

Dec. 4-8: Course on Solar Energy for Buildings, Hartford Graduate Center, Hartford, Conn.

Dec. 5-7: Western Design Engineering Conference, Convention Center, Anaheim, Calif. Contact: Banner & Greif, 369 Lexington Ave., New York, N.Y. 10017.

Dec. 6-7: Lightning Protection Engineering Seminar, Holiday Inn Downtown, Houston. Contact: Lightning Protection Institute, 48 N. Ayer St., Harvard, Ill. 60033.

Dec. 6-8: Workshop on Life-Cycle Cost Application, Anaheim, Calif., sponsored by AIA and American Consulting Engineers Council. Contact: ACEC, 1155 15th St. N.W., Washington, D.C. 20005.

Dec. 10-12: Design Engineering Show and Conference, East, John B. Hynes Auditorium, Boston. Contact: Banner & Greif, 369 Lexington Ave., New York, N.Y. 10017.

Dec. 10-15: American Society of Mechanical Engineers winter annual meeting, San Francisco Hilton Hotel, San Francisco. Contact: ASME, 345 E. 47th St., New York, N.Y. 10017.

Dec. 11-12: Course on Construction Law, Hartford Graduate Center, Hartford, Conn.

Dec. 15: Call for papers, papers deadline, for International Conference on Wind Engineering to be held July 8-13, Co-sponsored by AIA. Contact: J. E. Cermak, Department of Civil Engineering, Colorado State University, Fort Collins, Colo. 80523.

Dec. 15: Call for papers, abstracts due, for National Conference on Noise Control Engineering, to be held on April 30-May 2. Contact: J. W. Sullivan, Ray W. Herrick Laboratories, Purdue University, West Lafayette, Ind. 47907.

Dec. 15: Call for papers, abstracts deadline, for Jungian Perspectives on Creativity and the Unconscious Conference, to

be held June 2-4. Contact: Donald W. Fritz, President, Jungian Studies, Inc., 208 S. Main St., Oxford, Ohio 45056.

Dec. 19-20: Plant Energy Conservation Seminar, New York City. (Repeat seminars: Feb. 22-23, Atlanta; April 23-24, Chicago; June 21-22, Los Angeles.) Contact: Association of Energy Engineers, 464 Armour Circle N.E., Atlanta, Ga. 30324.

Jan. 8: Call for papers, abstracts deadline, for National Conference on Earthquake Engineering, to be held Aug. 22-24, co-sponsored by AIA. Contact: Earthquake Engineering Conference, Department of Civil Engineering, Stanford University, Stanford, Calif. 94305.

Jan. 11-13: AIA Grassroots North, Hyatt Regency Hotel, Washington, D.C.

Jan. 15: Applications deadline, predoctoral and postdoctoral fellowships for research in Venice, Italy. Contact: Gladys Kriebel Delmas Foundation, 40 Wall St., New York, N.Y. 10005.

Jan. 18-20: AIA Grassroots South, Royal Sonesta, Hotel, New Orleans.

Jan. 20-23: National Association of Home Builders convention and exposition, Las Vegas. Contact: NAHB, 15th & M Sts. N.W., Washington, D.C. 20005.

Jan. 22-24: AIA Grassroots West, Biltmore Hotel, Los Angeles.

Jan. 26-29: International Encounters on Architecture and Planning, Palais de Beaulieu, Lausanne, Switzerland. Contact: FACT '79, CP 248, 60 avenue d'Ouchy, 1006 Lausanne, Switzerland.

Feb. 8: Entries deadline, Reynolds aluminum prize for architectural students. Contact: Maria Murray, AIA Headquarters, (202) 785-7390.

June 3-7: AIA convention, Kansas City, Mo.

LETTERS

Designed Space Evaluation: In reference to the article by Clare Cooper Marcus entitled "Evaluation: A Tale of Two Spaces" in the August issue (p. 34): Articles relative to evaluating designed spaces have appeared in the past in a somewhat sporadic but "fashionable" manner in various architectural magazines, Sunday newspapers, etc. Currently, they are becoming quite numerous in such publications.

Past and present, they have usually represented a single subjective viewpoint effort made from a surface cosmetic bias with the subjective pronouncements usually controlled by the current fashionable architectural theory (or architect) with all the attendant shapes, misshapes, etc. Such personal critiques have probably contributed excessively to many of the ongoing problems of the design environment as it relates to human needs and response experiences.

Work by Clare Cooper Marcus in the

field of designed space evaluation is an unusual exception. One of her earlier efforts (coauthored with Phyllis Hackett), "Analysis of the Design Process at Two Moderate-Income Housing Developments," is a classic in its own right and should be required reading for anyone in architecture, particularly architectural students. [Working Paper, No. 80, June 1968, Center for Planning and Development Research, University of California.] Although "A Tale of Two Spaces" borders precariously on comparing an apple with an orange, the article represents a quality model for evaluating designed environments from varied humanistic needs and viewpoints. *Arthur K. Olsen, AIA Salt Lake City*

I very much enjoyed "Tale of Two Spaces" in the August issue. It would be good to see more of this type of usage evaluation by sensitive nonarchitects.

Speaking as an architect-turned-sculptor, however, I feel that Clare Cooper Marcus is remiss in not crediting the artist of the "yellow sculpture" which she admired enough to claim that it alone saved the Federal Reserve Bank Plaza. It is the work of fellow architect-turned-sculptor Charles Perry.

T. Merrill Prentice Jr., FAIA New York, N.Y.

'Inside AIA': The mid-August directory issue is beautiful. Beginning with the cover—very nice—and going on with such readable explanations of all parts of AIA, and more nice graphics and illustrations, I don't see how any member can continue to say, "What does AIA do for me?" or, "Isn't AIA just an old men's drinking club?" or "How can I have any influence on that big organization?" If they do say such typical things, we'll have an answer. It's impressive.

Sarah P. Harkness, AIA Institute Vice President Cambridge, Mass.

The mid-August issue (pp. 147-148) lists publications available from the National Fire Protection Association. We appreciate this publicity, but there is one major error. The publications cited, as well as the miscellaneous publications on fire safety in buildings, are *not* free. Our material carries a wide range of prices. In no way should there be any implication of distribution on a no-charge basis, except for our catalog of publications, which will be sent upon request.

Peter Force Assistant Director Marketing and Advertising NFPA, Boston

The Journal welcomes reader comment, not just on its content, but on any matters of concern to the profession. Ed.

YOUR FIRST SOLAR JOB.

Your Sunworks representative can make you expert very quickly.

It can be lonely, that first solar job. For in addition to energy, the sun radiates a whole new set of variables for the architect and engineer — collector tilts and orientation, row spacings, storage sizing, life-cycle costing. Definitely not your typical HVAC spec.

Fortunately, Sunworks is not a typical solar equipment manufacturer, and a telephone call can give you access to a fund of knowledge accumulated since the early days of practical solar application.

Tap our extensive experience

Sunworks was established by an internationally recognized authority on solar energy, and structured to emphasize research, engineering, and technical service. Our solar experts have extensive product design and application experience.



They can apply a unique store of empirical solar data representing almost three decades of research. Sunworks has supplied solar equipment for air conditioning, domestic water and space heating of schools, offices, hospitals, industrial plants, single and multi-family housing. Based on total collector square footage awarded,



Sunworks is the leading solar collector supplier to HUD and DOE demonstration projects.

Computer simulations

To help you achieve optimum design efficiency, Sunworks offers computer programs that simulate the performance of our Solelector® solar energy collector.

Utilizing 30 years of weather data, hour-by-hour analyses are employed to compute thermal efficiency for different locations, collector tilts, orientations, flow rates, transfer fluids, and other design variables.

Simulations are based on either the Sunworks Sunsym™ computer program, one of the most sophisticated available, or on programs using the traditional F Chart procedure.

Return on investment

The economics of any system are critical. Sunworks can provide a comprehensive economic analysis of your project based on the installed cost of the system. (Worth remembering: We believe the Solelector solar energy collector offers the lowest cost/BTU/ft² installed in the industry.)

Design consultation

Our architectural and engineering staff has years of experience in solar design analysis. Sunworks staff would be happy to assist in developing your system.

The Sunworks representative

The Sunworks rep is an experienced HVAC professional trained in solar technology by Sunworks. He is technically-oriented and particularly responsive to the needs of architects and engineers for specific data readily applicable to the job at hand.



The Sunworks representative is your key to the services and unequalled experience of Sunworks. He will be happy to assist in preparation of government solar demonstration grant forms. He can also refer you to a nearby Sunworks installation for your inspection.

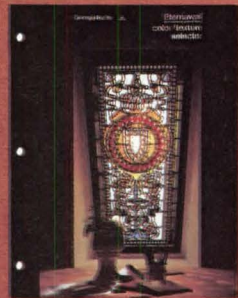
For more information on Sunworks and its complete line of solar energy equipment, write Sunworks, P.O. Box 1004, New Haven, CT 06508. Call Sweet's Buylines (800) 255-6880 for the name of the Sunworks representative nearest you.

SUNWORKS

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No laminating.
No painting.
No papering.
No repainting.
No repapering.

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Our easy to use, easy to maintain vinyl-covered gypsum board. Use it in offices, hospitals, hotels, motels and schools. In high traffic areas or in wall systems



to meet fire resistance ratings. As a demountable partition or permanent wall. For complete specifications, send for our Eternawall color texture selector by writing to: Georgia-Pacific, 900 S.W. Fifth Ave., Portland, Or. 97204.

Georgia-Pacific



Government

Procurement Code Draft Stresses Competence

The American Bar Association's coordinating committee on a model procurement code for state and local governments has issued a draft which recommends that in the negotiation of contracts for A/E services the selection should be on the basis of demonstrated competence and qualification, and at fair and reasonable prices. The code prescribes that a selection committee be formed to ensure that consideration is given only to qualified firms.

An earlier draft had contained an alternative which included price as a selection factor (see April, p. 14). The deletion of this alternative in the most recent draft resulted from opposition by AIA and other professional societies at the national, state and local levels. In the commentary on the code, however, there is alternative language which states that the procurement officer in negotiations "shall take into account, in the following order of importance, the professional competence of offerors, the technical merits of offers and the price for which the services are to be rendered."

Final recommendations by ABA are not expected until after its convention early in 1979. Meanwhile, AIA's department of government affairs advises Institute components "to proceed with caution since the draft is still subject to change. Contact AIA's component affairs department if action is being taken by your state or locality."

The ABA project, funded by the Justice Department's law enforcement assistance

administration, was initiated in 1975. Several jurisdictions, including the Commonwealth of Kentucky and the city of Knoxville, Tenn., have been used as pilots in the ABA project and have passed procurement codes based on the Brooks law approach to the selection of A/Es based on competence. Nebraska is among the more recent states to pass such an A/E selection law. In Wisconsin, a requirement for competitive bidding for A/E services on state projects was removed. A total of nine states has enacted "Brooks law" legislation and four have passed selection board procedures.

Meanwhile, the Committee on Federal Procurement of Architect-Engineer Services, of which AIA is a member, has formed a task force to assess the effects on competitive bidding of the Supreme Court's decision that the National Society of Professional Engineers, as a private group, may not bar priced bidding in its ethical code (see Oct., p. 8; July, p. 92).

In the wake of the Supreme Court decision, Environmental Protection Agency's attorneys have deleted reference to the Brooks law procedure in the guidelines for construction grants. EPA says, however, that the change is in compliance with "the letter of the law" and does not rule out the Brooks law approach. Recently, the Military Construction Appropriations Act for fiscal year 1979 calls for a "test" of fee competition in A/E selection by one of the military services.

The Justice Department is increasingly

letting its opposition to the Brooks law procedures be known. For example, the deputy attorney general for antitrust is reported to have told audiences that the ruling on NSPE requires a re-examination of the Brooks law, the Supreme Court having caused doubt about the legality of barring competitive bids for engineering services.

GSA's Selection Performance Given a Clean Bill of Health

"Even in an agency which is alleged to be rife with favoritism, perhaps corruption, there has been no charge of favoritism, corruption or illegality in the procurement of professional A/E services," said Burt Talcott, executive vice president of the American Consulting Engineers Council. The reason for the clean record in procurement of A/E services, said Talcott, is that procedures for selection are based on qualification rather than price competition. A/E selection is insulated from fraud, he said, resulting in the "highest quality of design at reasonable cost."

In letters to appropriate government committees and agencies, Talcott reviewed the system of A/E procurement. "Following allegations early in the 1970s that A/E selection was not free from political manipulation, a GSA task group was formed to study and make recommendations to improve A/E procurement by GSA." Now, independent regional selection panels evaluate and rank competing firms based on qualification for the job. "Any deviation from the order of ranking must be explained in writing by the administrator," Talcott said. Moreover, application forms have been improved. "This GSA system of selection on the basis of qualifications has stood up under the most severe test and most difficult environment," Talcott said. Low bid procurement, he said, "is the easiest to manipulate and is subject to favoritism, even corruption."

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GSA Adopts Selection Process, Picks Team for St. Louis Job

Jay Solomon, GSA administrator, and Lester A. Fettig, procurement chief of the Office of Management and Budget, have signed a "memorandum of understanding" under which GSA has agreed that the agency will use the level-three process for A/E work on all federal projects that cost more than \$25 million.

Under level three, A/E design teams are invited to apply for the project. From these, three finalists are chosen to prepare preliminary designs and are paid for their work. One team is finally chosen and employed to carry out the project. The procedure was first used in choosing designers for the restoration of the old post office in Washington, D.C. (see March, p. 42; May '77, p. 8; July '77, p. 48) and next for the St. Louis post office (see Oct. '77, p. 20).

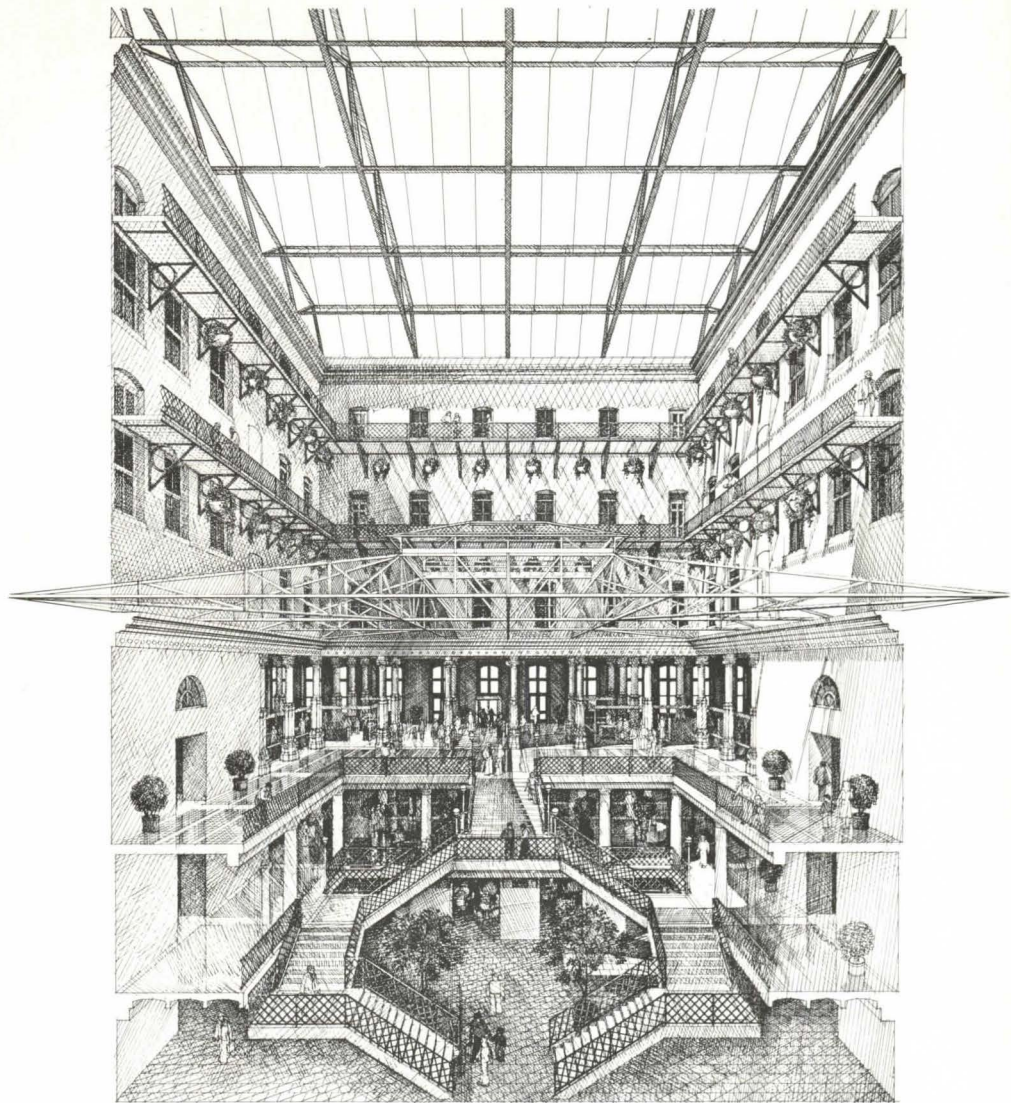
The joint venture of Patty Berkebile Nelson Associates and Harry Weese & Associates has been chosen to renovate the St. Louis post office. The winning design will restore ornamental work and historic detail of A. B. Mullet's 105-year-old Second Empire structure, including cleaning and repairing the exterior and restoring the bottle glass floor on the first level. Interior finishes will be selected in consideration of the original materials and colors. Open landscaping will be used in much of the office space, where ceilings are 16 feet high (sketch at right).

The four-story building has a central staircase and atrium, and the team proposes to replace existing skylight glass (between the second and third levels) with large sheets of wire glass. The light well above the skylight would be glazed above the fourth level, employing reflective glass for energy savings.

In accordance with the 1976 Public Buildings Cooperative Use Act calling for mixed uses, the atrium space would be used for public purposes: an area "full of life" with dancing, dining and shops. The basement and first floor would provide 24,000 square feet (of the building's 120,000 usable square feet) for public activities. The second floor would house large government offices; one of the third floor courtrooms would be restored. The fourth floor has smaller offices, and a space museum would be placed beneath the dome. Catwalks, built off the upper floors in the light well space, would give federal employees circulation space with views of the lower levels of the building.

The \$15 million project is expected to house 24 federal offices and approximately 650 employees. Construction is to begin in '79, with the opening set for '81.

The proposals of the two other finalists



also called for preservation of the building's ornamental work, cast-iron cornices, steel window shutters and other historic detail. Each of the three finalists was paid \$39,000, and the proposals remain the property of GSA.

The team of Eugene J. Mackey & Associates and Anderson Notter Finegold Associates proposed restaurants, food shops, a landscaped dining area, fountain and specialty shops in the basement, and restaurants, shops and a post office annex on the first floor. A new skylight would be placed in the atrium off Locust Street. In the main lobby off Olive Street, the skylight would be removed and a glass elevator would soar from the first floor to the dome. Mezzanines were proposed above the second and third floors to provide 90,000 square feet of government office space. The grand offices and corridor on the second floor would be restored, as would both two-story courtrooms entered on the third floor.

The team of William B. Ittner, Inc., and Kaplan-McLaughlin proposed a 15,000-square-foot public mall on the first floor. This would extend the width of the building between Locust and Olive Streets. The skylight would be exposed

over the mall area which would be surrounded by a French-style cafe, a gift shop, a fast-food restaurant, an ice cream parlor, a post office facility and other shops. The basement would be converted into space for two restaurants, shops and a sunken cocktail lounge. Between the basement and first floor would be an activity platform.

Fourth Federal Design Assembly Suggests Some Better Ways

About 800 architects, building administrators, graphic designers and federal workers recently gathered at the Pension Building in Washington, D.C., for the fourth Federal Design Assembly. Co-sponsored by the National Endowment for the Arts and GSA, the conference highlighted examples of improved federal design and offered suggestions for ways to achieve better design.

The assembly concluded with a speech by Joan Mondale assessing the gains made in the quality of design in government and showing how these advances contribute to the U.S. quality of life.

Government continued on page 14

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In addition to the formal discussions, three architects—Stanley Tigerman, FAIA, Susana Torre and the team of Moore, Ruble, Yudell—had been chosen to design lounges with furniture available from the GSA catalog and “using imagination and illustrating good design.”

More recently, the scene of the assembly—the Pension Building—was the subject of testimony by David O. Meeker Jr., FAIA, executive vice president of the Institute. He testified on behalf of AIA before the House subcommittee on public buildings and grounds, saying that the Institute supports legislation that would make the structure into a national museum of the building arts (see May, p. 10). Meeker said that it was appropriate that the federal government play an important role in such a repository of knowledge for the building arts.

Expansion of Dulles Begins; Airport Still Not on Register

A two-year, \$7 million project to expand Dulles International Airport, located near Washington, D.C., started in September. The expansion, planned by Hellmuth, Obata & Kassabaum, will extend the Eero Saarinen-designed airport 50 feet toward the field and the full length of the catenary structure (see Feb., p. 14, and Dec. '77, p. 8).

The east loading gates are now closed, and passengers arriving during the peak hours of 4 P.M. and 9 P.M. are transferred to a temporary building under the terminal's tower. The east gates will be closed for about a year until work is completed on that section of the extension. At that time, the 12 west gates will be closed. In about two years, when both ends of the structure are finished, the temporary arrival gates will be torn down and both ends of the federally operated facility will resume use.

Despite consistent efforts of AIA and other organizations to have Dulles put on the National Register of Historic Places, this has not yet been done. Changes in the airport were approved by the Department of Transportation and the National Capital Planning Commission; and, at the request of Transportation Secretary Brock Adams, a review of the extension was made by the Commission of Fine Arts, as well as by the Virginia Historic Landmarks Commission.

A spokesman at the National Register reports that, at the request of the Secretary of the Interior, Dulles was declared eligible for landmark status on March 10, despite the fact that the structure is not yet 50 years old. At this writing, however, the National Register has not yet received the nomination from the Virginia Historic Landmarks Commission.

New Liability Relief Sought

Strong support for federal legislation that would allow architects and engineers to establish tax-exempt reserve funds to help meet escalating liability costs has been voiced by AIA, the American Consulting Engineers Council, the National Society of Professional Engineers and the American Society of Civil Engineers.

Bills permitting this form of limited self insurance for professionals and for product manufacturers are before both the House and the Senate and have been supported by AIA and other professional societies. Other bills extend the tax deduction for liability reserve accounts only to manufacturers.

In recent testimony before the House subcommittee on miscellaneous revenue measures of the ways and means committee, Robert C. Broshar, FAIA, an Institute board member who serves on the liability committee, presented a prepared statement by AIA and the three engineers' organizations. Broshar said that all the organizations support HR 7711 and “strongly urge the inclusion of design professionals within the coverage of the legislation. . . .”

The statement includes a chilling recitation of the “critical” liability issues faced by the design professional. It says in part:

“During the 1960s, professional liability insurance for building designers generally cost less than 1 percent of a firm's gross receipts. Because of its manageable cost and ready availability, purchased insurance became widely accepted by architects, engineers and their clients. In the '70s, however, insurance premiums for this coverage began to skyrocket, with annual increases of 100 percent or more not uncommon. Actual increases, of course, vary by firm and state, but nationally the average annual premium increases have raised the cost of insurance 557 percent over the past eight years. Liability coverage now represents an average of 3 to 10 percent of a design firm's gross receipts. For many A/Es, insurance coverage is now the largest single cost item after payroll. What is more, purchased insurance is generally a fixed cost for construction designers, while the construction industry is highly cyclical.

“As significant as these premium increases have been, it is vitally important for this subcommittee to understand that they are but a part of the total liability cost problem faced by our members. Professional liability policies for A/Es are written with a deductible amount of first (investigation and defense) costs chargeable to the insured, that is, *applied to each*

claim. As premiums have escalated, many A/E firms have raised this deductible limit as the only way of controlling their costs. The deductible amounts now usually approach, equal or exceed the annual premiums. This means that a design firm that does have one or more claims lodged against it in a single year can end up paying twice or three times the amount of the premium, even if none of the claims is successful. In addition to these cash expenses, the A/E firm must absorb the intangible costs of uncompensated professional time spent in investigation and defense preparation. Informed estimates indicate that a design professional spends three hours for every hour an attorney spends in preparing to defend against a claim. Since an architect or engineer, as any professional, essentially sells his or her time, this can be a significant loss. And finally, unlike manufacturing concerns, A/Es must *personally* stand behind their losses and are not shielded by the limited liability of the corporate form.

“The importance of these uninsured first costs of liability paid by the designer over and above the premium is highlighted by two factual circumstances. First, the majority of claims against A/Es are relatively small property damage claims. From 1960 to 1976, 95.1 percent of the claims for which we have statistics did not exceed the deductible limits of policy coverage by more than \$25,000. The average claim exceeded the deductible by \$16,751 in 1976. But this average deductible amount is now between \$15,000 and \$20,000. This indicates that the design professions are currently satisfying a substantial portion of the costs of liability out of pocket, even with insurance.

“Second, the frequency of claims is increasing at the rate of 20 percent per year, so that now, 29.6 percent of insured A/E firms in our data base were sued in 1976. We simply live in a society that is ever more prone to litigation. In this connection, it should be pointed out that liability coverage for A/Es is written on a ‘claims made’ basis. This means the insurance does not cover claims brought after policy lapses based on acts or omissions committed during the term of the policy. So A/Es must maintain insurance, even after retirement or dissolution, for at least the length of the state's statute of limitations, if there is one.

“All of this can be brought into sharper focus if put into the context of a hypothetical example: Let us assume a typical architectural or engineering firm of eight people carries \$150,000 of insurance with

Legislation continued on page 17

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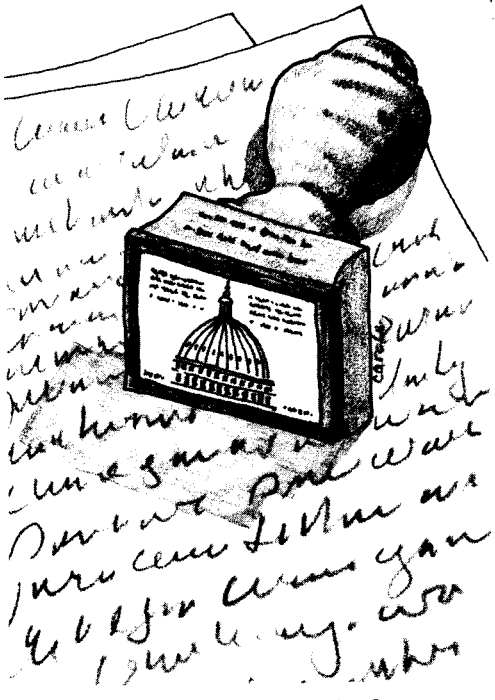
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a \$10,000 deductible limit. The firm may be paying \$8,000 to \$12,000 per year in premiums for this, indicating roughly \$200,000 in gross yearly receipts. Now assume that a dispute arises over a project involving responsibility for a construction delay and a claim is filed. In the same year, a tenant in an apartment house that the firm designed five years earlier sues for damage due to water leakage in one of the apartments. The firm is now potentially facing \$20,000 in direct, out-of-pocket expenses, after paying about \$10,000 in premiums . . . before any finding of fault is made. In this all too typical example, 15 percent of the firm's gross receipts can be consumed or at least encumbered by professional liability just as cost of doing business that year, the majority of it borne by the firm itself despite insurance. And it cannot be overemphasized that this is 15 percent of *gross receipts* before payroll, rent, utilities, taxes, other insurance, etc.

"To appreciate the effects of this recent crippling, financial burden, it is important to recognize that the construction design profession is preponderantly one of small businesses. Among architects who belong to AIA, 80 percent work in offices of nine or fewer people. If we assume that there are about 10,000 full-time architectural and engineering firms in the country, more than 95 percent of all these firms qualify as small businesses under the Small Business Administration's definition of that category.

"Given this industry configuration, the impact of escalating liability costs is readily apparent. The increase in a firm's liability insurance premium often means the difference between laying off personnel and hiring new staff. A single claim

can preclude expansion or the acquisition of more sophisticated design technologies, if not require a staff reduction.

"The high cost of insurance has created a substantial barrier to the formation and expansion of new, small firms. The federal government and many states and local governments require liability insurance as a precondition to even qualify for a commission. And many, if not most, private clients require it as a contract condition. Therefore, because of the size of current professional liability insurance costs, a beginning architectural or engineering firm must be substantially capitalized before it can even compete for many commissions. . . .

"We believe the ability to establish liability loss reserve accounts would be almost wholly used to cover exposure to first costs under insurance deductible limits. Because of the preponderantly small business nature of the profession and the high cost of the structures being designed, very, very few firms would or could attempt to totally self-insure. Virtually all architects and engineers who would elect to create a reserve account would do so in conjunction with purchased insurance to cover catastrophic losses. In fact, total self insurance to the level of industry standards would be impossible under [proposed legislation], since that bill limits accumulation in a reserve account to a maximum of 15 percent of yearly gross receipts, whereas most A/E's carry insurance far above that percentage.

"Design professionals are currently, in effect, self-insuring to an extent because of the limited nature of commercial insurance available. Existing tax law allows a deduction for purchased insurance premiums and actual uncompensated liability losses incurred. [The proposed new legislation] would simply allow a commensurate deduction for a reserve account to meet the same costs of doing business, but on a manageable, more predictable basis. With a liability loss reserve account, an A/E firm could slowly build up a reserve to cover its exposure to the first costs of claims.

"As the account grows, the firm could raise the deductible limit on its purchased insurance, thereby reducing, or at least stabilizing, premiums. The growth of the reserve would depend on the lack of claims, so these accounts would encourage and reward good performance much more than the current situation.

"For new, small firms or sole practitioners just beginning, the ability to establish a reserve account would allow them to immediately set aside funds and gain some liability protection without having to wait until they can afford purchased insurance. And when a new practice does buy commercial coverage, a growing re-

serve account could help the firm get it cheaper. In this respect, should the subcommittee include designers in this bill, we would hope that some language could be included in the report indicating the intent that amounts in these reserve accounts be considered on a par with commercial coverage in satisfying federal and, it is hoped, state requirements for liability coverage in procurements. . . ."

Design/Planning Aid Backed For Community-Based Groups

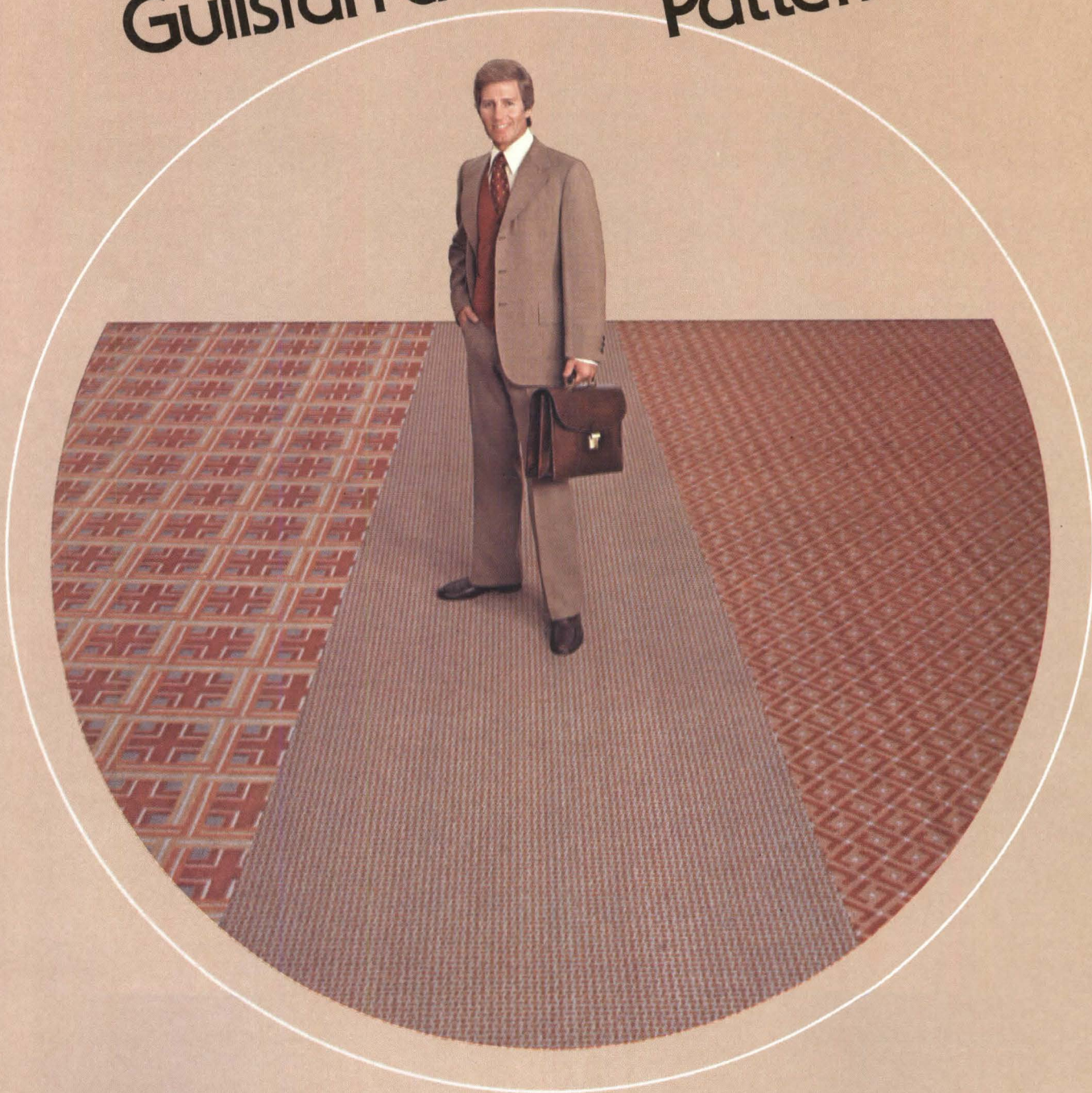
AIA supports the retention of Section 226 on design and planning assistance in the Economic Opportunities Act. Retained in the Senate measure (S 2090), the section would authorize the community service administration to make grants for design and planning assistance to community-based organizations. The advent of a federal urban policy which emphasizes neighborhood development and other programs that help shape the neighborhood environment make it mandatory to retain the section, said Elmer E. Botsai, FAIA, president of the Institute, in a letter to members of the conference committee now considering the overall act.

If neighborhood groups are to have a meaningful voice in their development, Botsai said, "it is vitally important that technical planning and design assistance be specifically authorized rather than merely allowed within a block grant." City agencies, he said, "are loath to provide the technical assistance necessary for neighborhoods to put forward alternative community-oriented development plans when those alternatives by their very nature differ from municipal planning agency proposals." Botsai pointed to the 80 community design centers in the nation which, he said, "are hindered by lack of proper funding." Reauthorization of funds, he said, would permit the CDCs to concentrate on their primary goal of service to the community.

Funds for Pennsylvania Avenue

Last-minute legislation by the 95th Congress extends for five years the life of the Pennsylvania Avenue Development Corporation. The bill authorizes \$140 million for the renovation of the ceremonial avenue in Washington, D.C. A day earlier, the House had blocked the extension measure because of amendments. The Senate put the authorization onto a bill for a park project in Louisiana, which the House quickly approved. The action permits the PADC to ask for Congress for supplemental funds in 1979 to expedite work on a plaza near the Willard Hotel (see Oct., p. 20), soon to be refurbished. *News continued on page 22*

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Jack Lenor Larson believes in pattern for both fashion and function. This world famous designer feels pattern can weave a magic all its own, transforming the drab into the dramatic. And he proves it, for Gulistan, with his new Cavalcade Collection, carrying the revolutionary concepts in his highly successful Systemic Collection one step further. Here, Intertwine is the coordinator, smoothly accomplishing the transition from bold, handsome "Parquet" to striking "Medallion." Maze is the third richly colored pattern and all three work off the ten stunning colors of more basic "Intertwine." A full range of coordinated solids complete the picture. The dense cut pile construction of these fabrics absorbs sound better than conventional level-loops so lush elegance can be added to any installation. Public areas, offices, corridors . . . all . . . can be treated with vitality and diversity with this new system of interior landscaping.

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Bits and Pieces of Carter Package

President Carter's urban policy had a mixed showing in the 95th Congress: Many of the minor pieces were approved, but four of the five major bills were not enacted.

M. Carl Holman, president of the National Urban Coalition, had correctly predicted the outcome when he said, "I imagine what we are going to get is \$15 million here and \$10 million there."

Cited as reasons for the mixed response were a crowded legislative agenda, delays in drafting the bills, disagreements over critical aspects of the legislation, increased wariness of more federal spending and an uneven lobbying effort by the White House.

The President's urban policy, announced in March, (*see* May, p. 35), is essentially a set of 10 minipolicies combining old and new initiatives. The objectives range from coordinating federal urban programs to implementing a "new partnership" between the federal and state governments to supporting voluntary groups in neighborhood revitalization. The strategy calls for a combination of job and tax incentives, grants, loans and public works efforts, all directed to revitalizing the inner cities.

At the heart of the urban policy are a national development bank, state incentive grants, "soft" public works, supplementary fiscal assistance and tax proposals. The first four did not pass.

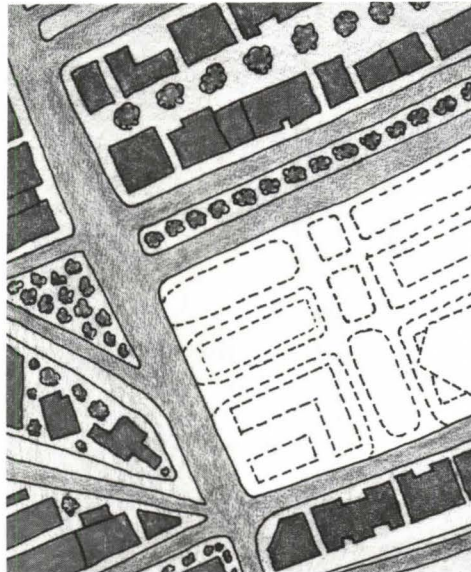
The national development bank, tabled by both the Senate and House banking committees, would have provided \$8 billion in loan guarantees, \$3.8 billion in interest rate subsidies and \$1.65 billion in grants during a three-year period to help local development authorities attract private businesses to both urban and rural "distressed" areas.

The state incentive grants bill was also stalled in Senate and House committees. It would have provided \$200 million in grants to states to encourage urban planning and redirection of state programs toward urban areas. Some of the critics of this bill questioned whether such financial incentives would have any impact, for the \$200 million would have been divided among 10 to 15 states.

The Administration's public works bill called for \$3 billion—\$1 billion each in fiscal 1979, 1980, 1981—for "soft" public works projects: renovation and maintenance of public parks, government offices and schools. About 50 to 80 percent of the cost of each project would have been spent for labor and half of the 50,000 jobs created would have been earmarked for low-income, low-skill unem-

ployed persons. A House subcommittee attached a \$7.1 billion local public works proposal to the bill which the President vetoed (the House sustained the veto).

The fiscal assistance act was saved briefly when the Senate passed a pared-down, tightly targeted continuation of the antirecession fiscal assistance bill. But the Senate's version was never considered by the House. The Administration had called for \$1.04 billion in fiscal '79 and another \$1 billion in fiscal '80 for "distressed"



cities. The Senate's bill would have provided \$450 million a year for two years.

One of the urban policy's tax proposals passed by Congress calls for tax credits for employers hiring workers under the Comprehensive Education and Training Act (CETA) program: \$3,500 per youth the first year and \$1,500 the second year. Also, Congress reauthorized the CETA bill providing \$11 billion for an estimated 660,000 jobs targeted to economically disadvantaged persons. Another tax proposal passed provides a 10 percent investment tax credit to private companies locating or expanding in distressed areas, or rehabilitating industrial or commercial buildings.

Congress adopted Carter's initiatives piecemeal, turning minor portions into major tenants of enacted legislation. The minor bills adopted include more funding for existing programs and some new directions.

Community development corporations will receive an extra \$20 million, and HUD's 312 housing rehabilitation program will receive an extra \$120 million. An additional \$150 million will go to the Social Security Act's social service projects such as meals for the elderly.

To develop and preserve the artistic, cultural and historic resources of cities,

\$5 million in fiscal year '79 and \$10 million in '80 has been approved for the development of the livable cities program to be administered by HUD and the National Endowment for the Arts. HUD will also manage the neighborhood self-help fund which contains \$15 million for local rehabilitation groups. Other new programs include \$40 million for the development of an urban volunteer corps; \$10 million for a neighborhood crime prevention program; \$50 million for inner city health clinics (added to the community health services budget); \$25 million for air quality planning grants under the direction of the Environmental Protection Agency; \$150 million in fiscal year '79 and \$725 million over the next five years for the urban parks program to revitalize parks, and \$200 million for a Department of Transportation program to build urban transit facilities and malls.

In light of Congress's disinclination to act on some of the major urban policy proposals, the Administration may try to accomplish some of the urban policy objectives through existing programs. In particular, the goals of the national development bank and state incentive grants may be pursued through expanded funding and adjustments to existing HUD and Economic Development Administration programs.

In addition, President Carter signed into law four executive actions, announced in his urban policy:

- directing the administrator of GSA to first consider urban locations when acquiring federal office and facility space;
- requiring federal agencies to buy more goods and services from areas of the country that have a high unemployment rate;
- creating an interagency-coordinating council—composed of White House and federal agency officials—which will coordinate the development and implementation of urban and regional policy;
- ordering federal agencies to prepare urban and community impact analyses of major policy initiatives that may adversely affect cities.

HUD \$31.9 Billion Appropriation Is \$2.2 Billion above Last Year's

Congress appropriated \$31.9 billion for HUD for fiscal year '79. More than \$33 billion was requested by the Administration. HUD's fiscal year '78 appropriation was \$29.7 billion.

The appropriation includes \$26.9 billion for housing programs, \$4.5 billion for community planning and development, \$85 million for the flood insurance administration; \$9 million for housing counseling; \$57.5 million for policy research and development and \$524 million for management and administration.

News continued on page 26



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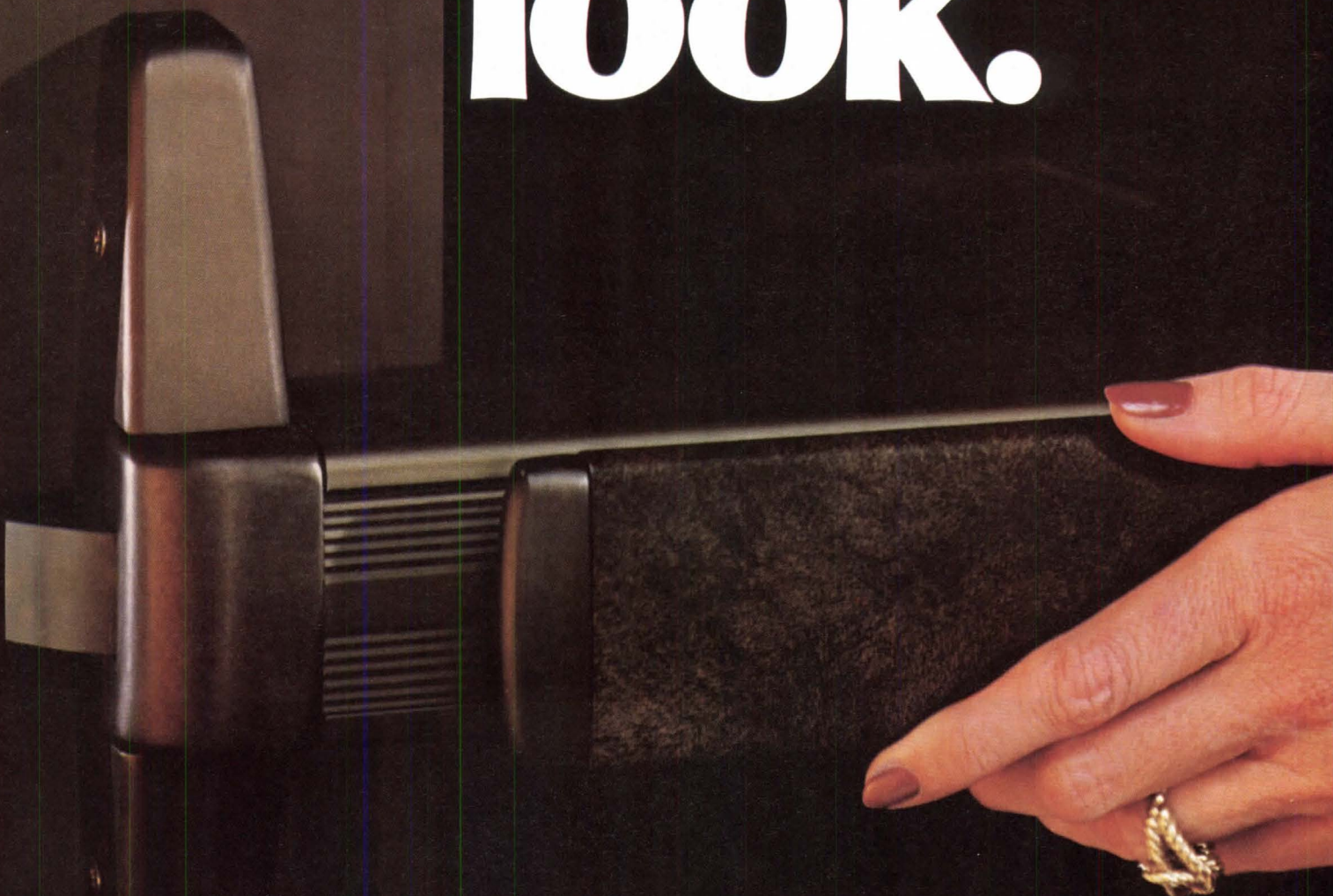
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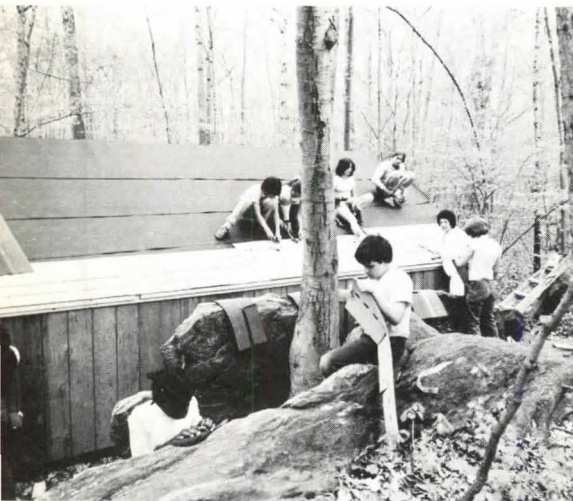
Circle 59 on information card

An Early Crack at Architecture

"Like piper pipers of architecture, Allan and Barbara Anderson have left a trail of projects built and designed by children all across White Plains, N.Y.," says the magazine *American School and University* (July 1978). Not only do the schools get low-cost construction, including the eager and free labor of children in the fourth through the sixth grades and some materials given by local businesses, but architecture is the integrating discipline in the curriculum, unifying the children's study of mathematics, science, art, composition and social studies.

In an interim report on the program, funded in the first two years by the National Endowment for the Arts, the New York Foundation for the Arts and the Council for the Arts in Westchester County, as well as by the school district on a matching grant basis, Allan S. Anderson, AIA, says: "In the course of planning, designing and building, the children have

ington Elementary School, 160 children are building a playground, having made site maps and considering things that would affect the design, such as orientation, topography, drainage patterns, noise, views, microclimate, access and circulation and shadow patterns of buildings and trees. When it was time to design, after dealing with the problems of making the playground vandalproof, economical, adventuresome, easy to maintain and build



Allan S. Anderson, AIA



learned to make and use graphs, to measure and map and to do scale drawings. They have found out how their community thinks and what goes on there. They have experienced the process of taking an idea from concept to reality."

So successful is the architect-in-residence program that the school district is "picking up the entire bill for it in this third year. In these days of educational program and facilities decline, I am quite pleased about that," Allan Anderson says. This success has been recognized as well by the New York State Association of Architects which last month gave the Andersons, the schools where they have worked and the school district as a whole a "special achievement award."

At the Rosedale Elementary School in White Plains, 70 children designed and built a new school lobby, a classroom quiet area, a sculpture garden and an overnight shelter. At the George Wash-

and child-scaled and -oriented, the children learned how to make simple working drawings. Meanwhile, they had visited other playgrounds, sketched them and written compositions about them.

At Woodlands High School in Hartsdale, N.Y., a high school mechanical drawing class has designed a student center in a new part of the school for which the Andersons were the architects. In a districtwide selection of talented students of all ages, the young "architects" have designed a minipark for older people, which has been funded by the federal government.

The Andersons, partners in a nine-person architectural firm in Rye, N.Y., became involved in the program in 1976. They meet with the children on the average of once a week for three hours at each school. Following the student sessions, they meet with the teachers involved and draw up a lesson plan for the next meeting.

Allan Anderson says, "The program follows the same basic steps that a practicing architect should follow: an analysis phase, a design phase and a construction phase. In-service programs along the way also help the teachers learn the disciplines involved as they do much of the work,

since a major reason for the program is to leave new skills with the faculty."

He says that teaching architecture is one thing, but putting tools into small hands is another. He teaches the children respect for the tools and, except for a splinter or so, there have been no accidents. Adult volunteer supervisors may have a part in this happy report. And vandalism has been reduced because the children now believe they have a real stake in their school environment. He points to another plus: "Needs of the children are taken into account; too often, children are ignored and not heard in the process of building their own environments."

From time to time, the entire staff of Allan & Barbara Anderson is involved in the program, "for the experience," Allan Anderson says. He adds that teaching in the architect-in-residence program "becomes a wonderful opportunity to learn firsthand (the hard way) about designing good teaching environments."

And what do the students and teachers think of the program? "The program reaches the whole child," one teacher says. Another comments that the program "provides a self-discipline and learning of the need to persevere despite considerable frustration." One student says, "It was fun seeing we could do things if we only took the time to try." And another child says, "I've learned a lot but I've had a lot of fun."

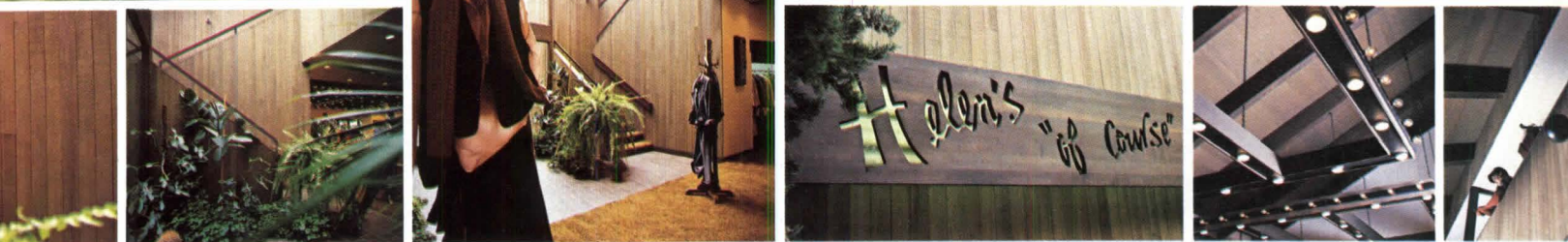
Detroit Chapter Design Contest For Students Is Going Statewide

After 12 years of success, the Detroit chapter/AIA's annual architectural design contest for city-area high school students in art and architectural and mechanical drafting classes will go statewide. Tom Wikle, AIA state contest chairman for the Michigan Society of Architects, says architects who have seen the results of previous contests displayed at the Michigan State Fair and at the summer MSA conference have been so impressed "with the substantial quality of student drawings that they have asked for a statewide competition using the same projects and rules."

Consequently, the eight AIA chapters in Michigan now have the option to sponsor their own contests locally, judge the results and send the winners of projects to MSA for a chance at a \$1,000 scholarship award to be made in late April. Prizes to be awarded in the Detroit-area contest are \$1,000, \$500 and \$250 for first, second and third place scholarships. Detroit winners are eligible for the MSA award.

The contest this year is for the design of a community fitness center to serve a city of 100,000 to 150,000 people. To

Education continued on page 30



"I wanted to create a sophisticated, inviting setting for a high fashion shop. I used Western Wood."

WILLIAM L. FLETCHER, FAIA

Helen's, of Course! in Beaverton, Oregon, sells women's fashions. When the building was being planned, the owner, *Helen Gell*, stressed that she wanted a "warm feeling." And the building had to be "responsive to the surrounding neighborhood," a residential district. After weighing the variables, architect William L. Fletcher decided that one building material met almost all the structural and visual requirements — Western Wood.

Western Wood has a natural warmth and charm that other building materials don't have. And it blends, beautifully, into any surroundings. What's more, Western Wood doesn't distract from window merchandise. It actually highlights garments. Helen's, of Course! sells in-fashion garments. It seems only fitting that Helen's is housed in a building made with material that's never out of fashion. Western Wood.

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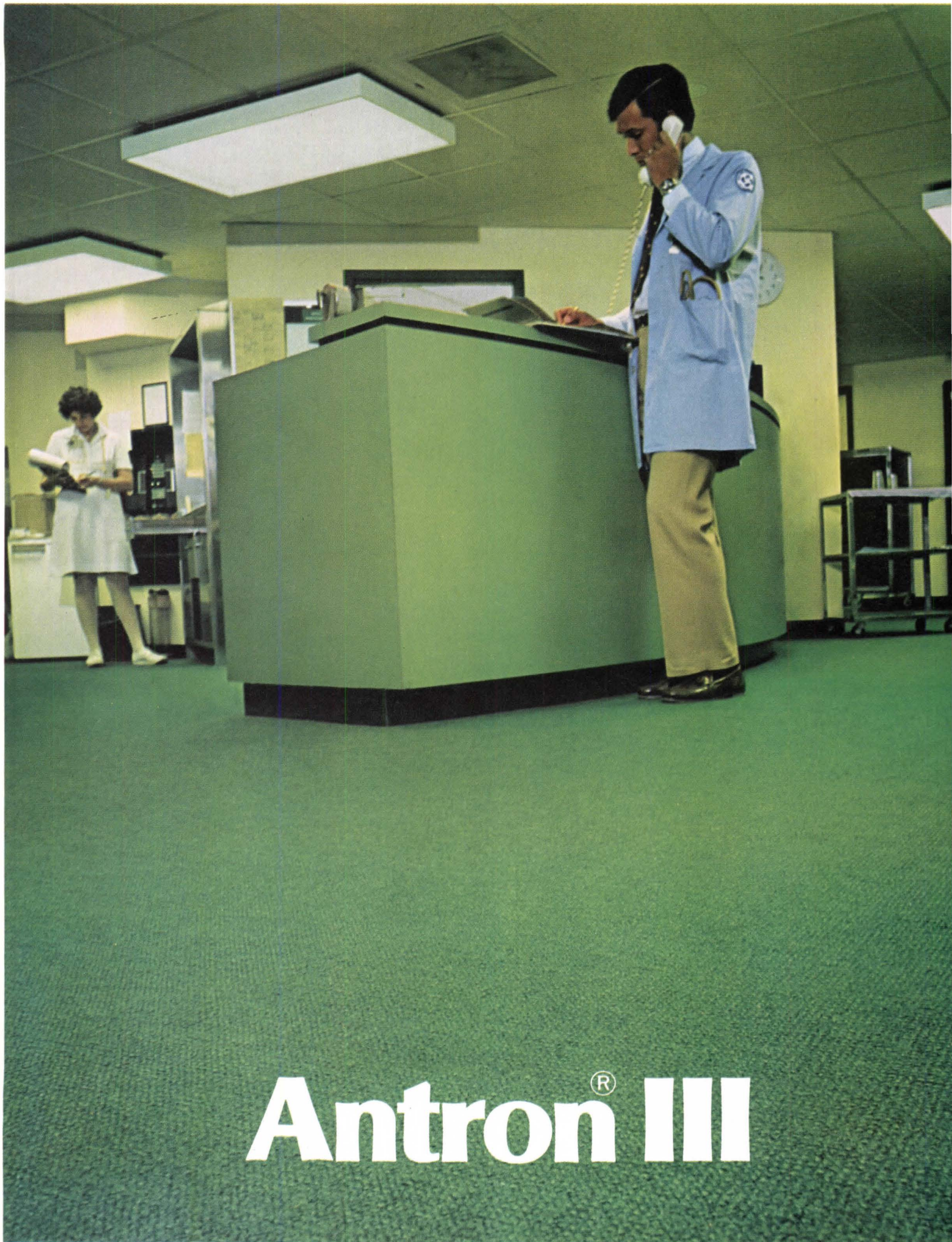
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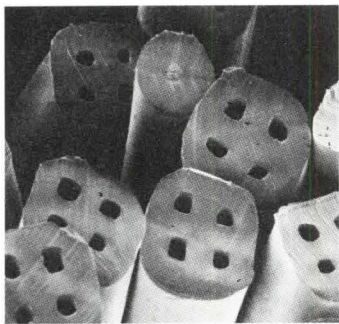


Prentice Pavilion, Northwestern Memorial Hospital.

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structure of this fiber in the 250X electron micrograph shown below. The smooth exterior shape minimizes soil entrapment to facilitate cleaning.

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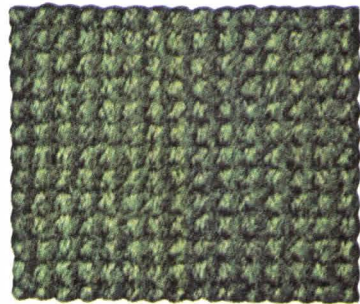
Magnification of 250X of "Antron" III nylon showing hollow filaments and round, anti-static filament.

sive Du Pont tests confirm that "Antron" III maintains effective static control even after 3 million traffics, repeated vacuuming and regular shampooing.

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MAN LIFE
MADE MADE
FIBERS BETTER

Education from page 26

help local contest entrants, the Detroit chapter/AIA sponsored a design seminar at the Lawrence Institute of Technology early this month. Potential high school contestants are invited to get in touch with local AIA chapters for contest rules.

A Taste of Architectural School For Teenagers Before College

High school juniors and seniors with B averages or better who are considering architecture as a career now have a chance to test their potential in a special pre-college program offered by Lawrence

Energy

Design Concern Rise Documented

A survey of 1,000 mechanical engineering and 1,000 architectural offices by the Glen Oaks Research & Statistical Services of Glen Oaks, N.Y., indicates that 85.4 percent of the architects surveyed and 78.1 percent of the engineers are placing greater emphasis upon energy conservation in their projects than they did as recently as three to five years ago. The survey also reveals, surprisingly perhaps, that architects now rely more upon such techniques as insulation than they do upon design considerations—wall and roof systems, window and door openings, space use, building orientation, passive solar systems, etc.

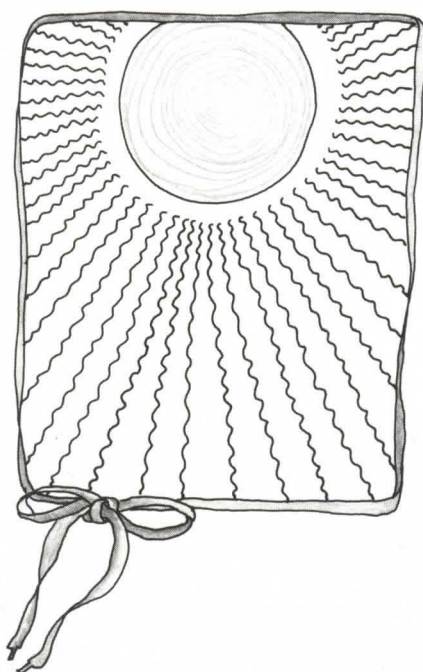
The survey, reported in *Topstory*, the Sweet's Division of the McGraw-Hill Information System Co.'s newsletter to marketing executives, reveals that 95 percent of the architects surveyed gave top priority to insulation, with second place going to special glazed and insulated glass. The engineers gave top place to heating systems (87.2 percent).

After insulation and special glass, the architects paid most attention in energy conservation to: heating systems (82.8 percent), cooling systems (75.9 percent), lighting (62.1 percent), building siting (61.2 percent), hot water systems (45.9 percent) and electrical systems (34.2 percent). Among the areas of lesser interest to architects are: building design concepts, protective landscaping, roof overhangs, shading, ventilation, weatherstripping and heat recovery systems.

A total of 27.1 percent of the architects and 36 percent of the engineers reported that solar energy systems are a factor in anywhere from 1 percent to 10 percent of their current projects. In retrofitting, 24.5 percent of the architects and 49.7 percent of the engineers said that they are currently involved in the renovation or remodeling of projects for energy conservation.

Institute of Technology's school of architecture, Southfield, Mich. The program, which began in September and will continue through January, permits the young students to examine their capabilities and interests before launching into a full program of college study.

Three courses are offered on Saturdays, and the student may participate in one or all three. A three-hour morning course in visual communications is designed to develop basic skills in the techniques of architectural drafting and sketching. Another three-hour course in the afternoons is on basic design. A 45-minute seminar surveys the theory and history of art and architecture.



A survey by Sweet's five years ago showed that only 69 percent of the architects "were placing more emphasis on energy conservation in their designs and that 22.4 percent were not considering energy at all." The study by the Glen Oaks team shows that only 0.6 percent of the architects fall into the "not at all" category.

Congress Passes Greatly Altered Version of President's Package

After an all-night session and a flurry of last-minute debate, the 95th Congress finally passed an energy bill. It had taken 18 months of political compromise to come up with the extensively revised version of President Carter's proposals for a national energy policy.

Shortly before the final session of Congress, a dramatic 207 to 206 House vote

had put five energy bills into one package to assure passage of the total legislation. Congress had already changed, restricted or eliminated many of the Administration's proposals, such as taxes on oil at the well-head and mandatory utility rate reform.

Some of the passed legislation's provisions:

- Tax credit for homeowners for insulation of 15 percent of the first \$2,000 invested or a maximum of \$300 per household, and a tax credit up to \$2,200 for the installation of solar equipment.
- An authorization of \$900 million over three years for energy conservation in schools and hospitals and local public buildings.
- A requirement that, generally, new utility and industrial plants be built to use some fuel other than oil or gas and that existing utilities convert to some other fuel than gas by 1990.
- Phased removal of federal price controls from new natural gas by 1985.
- An additional 10 percent investment tax credit for businesses for energy conservation equipment of certain kinds.
- A single 10 percent investment tax credit for businesses installing solar equipment.

Congressional Inaction Blamed For '78 Decline in Solar Firms

A dramatic 13 percent decline in the number of solar equipment manufacturers occurred in the past year, according to a survey conducted by the Solar Energy Research and Education Foundation. In 1977, there were 186 manufacturers and 162 in 1978.

Manufacturers attribute the decline to congressional inaction on federal solar tax credits, stalled in a conference committee for about a year, and to statements by White House and Department of Energy officials that confuse the consumer, says SEREF. More positively, however, the manufacturers point to an increase in the number of solar industries in California, giving the credit to that state's solar tax credits.

Solar Collectors To Be Installed Atop West Wing of White House

As "a signal . . . that the solar age is here," White House officials recently announced plans for solar-generated hot water in the west wing. Four banks of solar collectors (600 square feet) will be mounted on the west wing roof above the cabinet room adjacent to the oval office and will provide approximately 76 percent of the hot water needs of that wing.

The system will cost around \$24,000

Energy continued on page 84

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Circle 62 on information card

The way we teach masonry says a lot about the way we build with masonry.

Twenty-two years ago Gerrard Jenniges* was an apprentice mason—and a good one, good enough to win the National Apprentice Championship. Now, he's repaying the last generation of craftsmen—who taught him his skills—by teaching the next.

Jenniges is imparting his knowledge and experience to two young apprentices—David Sweitzer (left), his employer's son, and Paul Pfutzenreuter, son of the man who taught Jenniges his trade more than two decades ago.

The masonry industry makes craftsmen the way it makes buildings—one at a time, by hand, with skill, care and pride. It's those qualities that keep masonry the most economical of building materials, and have kept it competitive in an increasingly mechanized world.

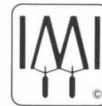
Jenniges sees the national energy crisis causing more and more architects, engineers, builders and owners to turn to masonry, which means an even brighter future for masonry craftsmen. "It's the best way you can build," he says. "My apprentices have years of steady work ahead of them." Jenniges adds: "There are so many different masonry materials to work with. Not just the hundreds of varieties and sizes of brick and concrete block, but stone, marble, ceramic tile, terrazzo, mosaics, and plaster. You have to work hard at this trade, but when you finish a building, you can turn around, look at it and say, 'I had a hand in that building and I'm proud of it.'

"In a way, that's how I'd like to feel about my apprentices years from now—that I had a hand in making them skilled craftsmen, and I'll be as proud of them as I am of any building I've worked on."

There are hundreds of reasons why your next building should be masonry. Among the best reasons are the masonry craftsmen themselves—people who devote their working lives to constructing good buildings, and are equally dedicated to making the next generation of masons even better than the present one.

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Circle 63 on information card

An Obituary

"It is a sad moment to have reached when we have to acknowledge the failure of the new towns. . . . The fact that must nevertheless be faced is that the new towns have failed on three separate counts: socially, economically and architecturally." So wrote J. M. Richards in *The Architectural Review* for July 1953.

A similarly sad moment came to HUD a quarter century later. Secretary Harris announced last month that the new towns program was dead.

The primary cause of death was economic: High front-end costs compounded by recession had driven seven HUD-assisted new communities into bankruptcy and left others faltering.

But the other parts of Richards' litany of failure apply as well to American new towns. Socially, they have been irrelevant at best. They have never achieved a degree of economic or racial integration much beyond that of conventional suburbs. Said a young college student after a month of living in Columbia, Md., where his campus was located, "Dad, that place is relentlessly middle class."

Architecturally, with a few exceptions such as the original Lake Anne Village in Reston, Va., the new towns have neither aspired to nor achieved excellence. There have been some notable examples of site planning, and generally the levels of respect for nature and protection of the pedestrian have been higher in the new towns than in most new suburban development. But their developers have been

largely content to build at a level of ambition that might be called marketplace modern.

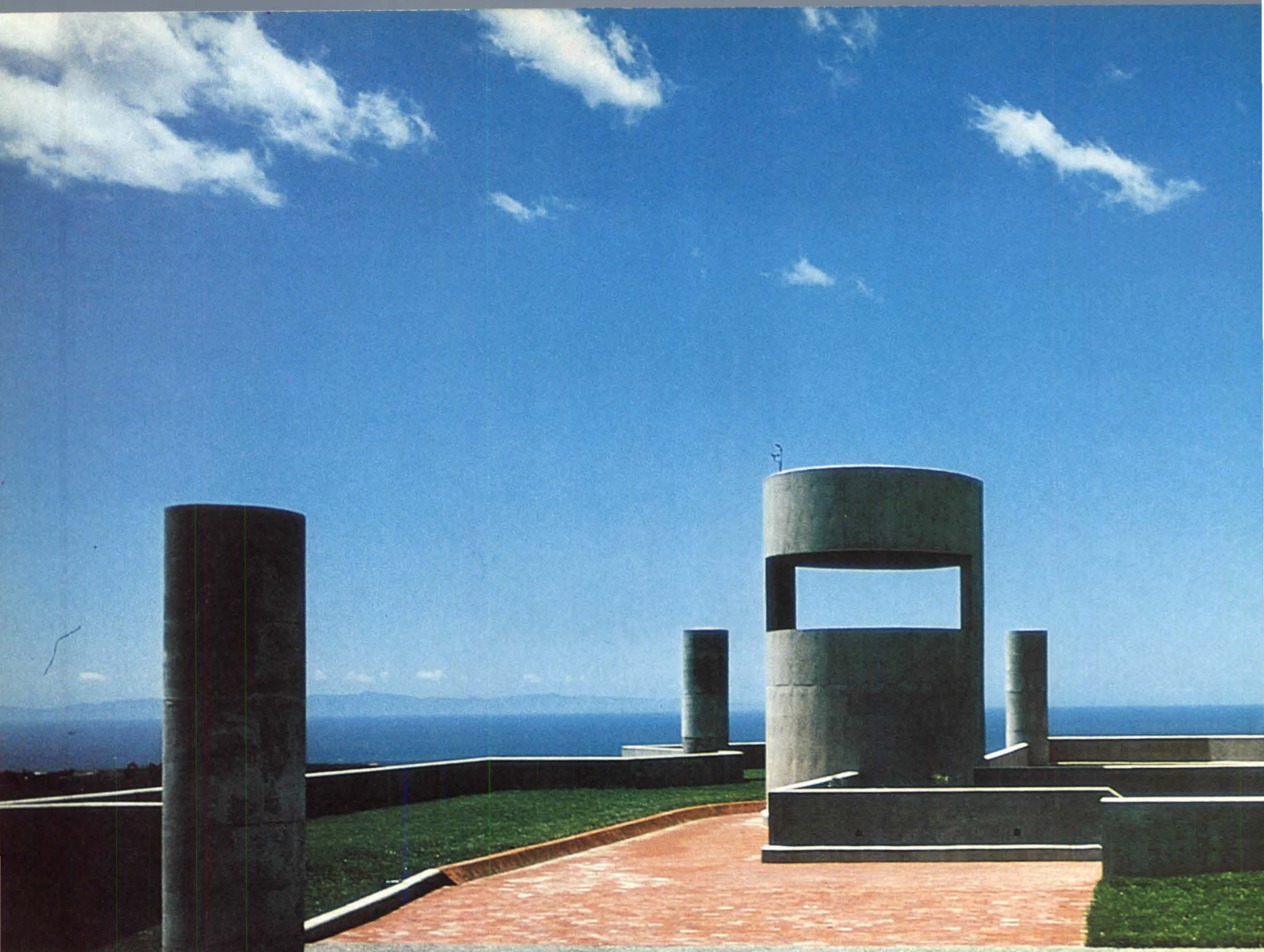
All of this is said more in sorrow than disdain. The American new towns movement, which considerably predated the HUD programs, was sound in its premises: that an alternative needed to be sought to the waste and scars of sprawl; that a better environment could be achieved through extension of planning and design concern to the scale of entire communities; that integration was more likely to succeed on turf that belonged to no particular groups from the outset.

The movement suffered initially from an excess of enthusiasm on the part of its participants and advocates, who tended to talk in terms of "the next America." This drew a predictable reaction from the urban academics, who made new towns an early target of their proclivity for smashing straw icons.

As the 1960s went on, an unfortunate schism developed between advocates of new towns and inner-city improvement. Neither side sufficiently saw or exploited the potential of new towns as a second front of opportunity for the inner-city poor.

Neither did HUD. The level of assistance it offered never approached the scale of the developers' front-end problems that was already apparent when its new towns programs were launched. Nor did HUD show much interest in pressing the developers to accept more than token numbers of *the poor and minorities*.

The ultimate failures of the American new towns movement were failures of public purpose—and of will. *D.C.*



The Underground Movement Widens

A look at six subsurface buildings along with some ideas and techniques. By Andrea O. Dean

Exploration of the potential of building underground, as recorded in our April issue, continues to widen and to attract both public and professional attention. The April article was picked up by newspapers across the country and was followed by stories in *Newsweek* and other national magazines.

It is not that the concept is a new one. In fact, it is as old as the hills in which underground buildings have nestled for centuries in Spain, Turkey, China and elsewhere. In America, Frank Lloyd Wright in 1950 built the Cabaret-Theater at Taliesin West into rather than upon the desert (overleaf). And in the mid-1960s, Philip Johnson, FAIA, went underground with the art gallery next to his glass house in New Canaan, Conn., and the less celebrated Geier house near Cincinnati (page 38).

What is new in its intensity is architectural concern for energy conservation (its rise is documented on page 30) and for the landscape. These are the prime factors, of course, that have motivated the proliferation of underground buildings, along with others such as protection against storm and fire, silence, security and low maintenance and operating costs.

On these and the following pages are four totally or partially

underground houses, including the one at right that is one of the few built expressions of the ideas of Malcolm Wells, perhaps underground architecture's most fervent prophet.

With mounting interest in subsurface architecture, especially houses, has come increased sophistication in design and construction methods. A first comprehensive "how to" book, *Earth Covered Housing Design*, was recently issued by the University of Minnesota and will be published for broader circulation in January by Van Nostrand Reinhold in New York City. Some of its major points are summarized beginning on page 44.

Also growing is the public's acceptance of underground architecture. For the simple act of experiencing a light, dry, cheerful-looking earth covered structure is usually enough to dispel unfounded fears and misconceptions. Our final article shows how different groups with whom architects work respond to the idea of putting a neighborhood school below ground before and after seeing a completed underground building.

It also points out how an architectural firm, now working on its second earth covered school, learned from the problems of its first experiment.



Jürgen Hilmer
*Left, the Alexander house by Roland Coate, AIA (see also cover and page 42).
Below and following pages, Malcolm Wells' 'Solaria' house.*



Bob Homan

Malcolm Wells and His Solaria

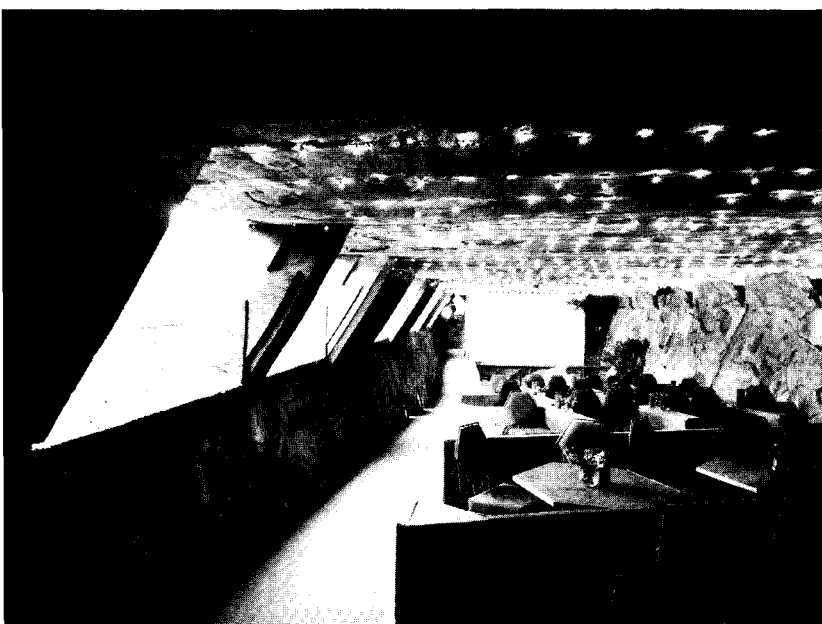
When architect Malcolm Wells visited Taliesin West in 1959, the very week of Frank Lloyd Wright's death, he found "that desert heat mysteriously avoided his open but earth-covered theater." But it would be five years before "the light bulb in my head finally blinked on," as Wells put it, to transform him from a successful, fairly conventional architect into a maverick and true believer, the standard bearer of today's movement to build into rather than atop the earth.

Wells struck his first blow in a 1964 *Progressive Architecture* article: "I spend a disproportionate amount of time wondering what an architect—in the America of 1964—can possibly do to set right the ills that plague us. . . . It really hurts me to be responsible for so much needless slaughter—to go on designing buildings, beautiful as I think they are, that crush acre after acre of precious life under their parking lots, their roadways, their floors. . . . We're racing—the wrong way—down the street of progress. . . . All aboveground facilities are plagued by water, by sizzling heat, by blizzards and by rain. . . . Down there, everything is quiet. There is no rain, no wind, no freezing water. . . . When we can say honestly and without arrogance that [our works] are as beautiful and appropriate as the humblest work of Nature, then we'll be building—and living—as we should."

The responses to this article, even the friendliest, accused Wells of escapism. "[Wells'] certainly is a reactionary concept, pessimistic, misdirected in imagination, and perhaps frightened by the uncontrollable breakthroughs that science appears to be making," wrote a well-known space planner.

Some so-called breakthroughs of science were, indeed, among the very things that prompted Wells' interest in underground architecture. His hometown of Cherry Hill, N.J., was trans-

Wright put his 1950 Cabaret-Theater partially underground because of the terrain and to give the building a low profile. Above right, Solaria.



formed in less than a generation from small town to "tinsel-town," a city with "two stinking rivers, traffic jams, shopping centers and asphalt," as Wells wrote in 1976. It dawned on him slowly, he says, that the real troublemakers were "people just like myself," architects who litter the land with buildings, "paving and waterproofing the earth's surface with so much concrete and asphalt that the amount of water denied access to the land exceeds the total U.S. water consumption." His conclusion: "Either physically improve the site or don't build. . . . There's no where to go but down."

Wells was a maverick from the start. Trained as a civil engineer, he never went to architectural school, but "fell into" a job with an architect, as he puts it. He soon opened his own small office, and the year he was registered, received a \$2 million commission from the Radio Corporation of America. Much of Wells' work until about 1964 consisted of houses reminiscent of F. L. Wright's. Says Wells, "I tried to emulate Wright by at first bringing roofs down low so that they would sweep into the land. But it was meaningless, schlock. The logical move was going into the earth. Then I made terrible mistakes; now I know everything. That is the story of my life."

He's not serious. His manner is to alternately mock himself and then speak in mock self-aggrandizing terms. His impassioned writings, his reputation (among people who don't know him) for being something of a hermit and eccentric—possibly a fanatic—are ill preparation for a meeting with Wells, who has abundant quiet charm and warmth, a wry sense of humor especially about himself. Question: "What do you think your effect has been?" Answer: "Guru of troglodytes, I've changed the world. Seriously? Not much. None. My reputation is built of froth upon froth."

When the big change came over Wells' life, former clients fell away and he couldn't sell an underground design for years. Wells therefore transformed himself into a proselytizer for the cause, building his office below grade as a showcase for underground architecture, giving lectures and writings articles for every magazine which would have him, such as: *Harper's*, *House Beautiful*, *Architectural Forum*, *Popular Science*, *Philadelphia*—and on and on. He wrote books and published them himself: *The Use of Earth Covered Buildings*, *Underground Designs*, *Energy Essays*. Wells is now laboring over a new book, *Gentle Architecture*, to be published next year by McGraw Hill.

The underground office he designed and completed in 1971 in Cherry Hill "is a tiny place on a tiny lot, wedged between a freeway and a sewer," he wrote in his slim book, *Underground Architecture*. "When I bought the property (for \$700!) all I could see were a few scabs of old asphalt on a patch of barren subsoil." Today, the site is grown over like a small jungle. "Now, when we tell our clients how to find choice building sites, we always urge them to pick the *worst* ones . . . to restore a bit of the trampled continent," says Wells. He would shepherd visitors through his office reciting mistakes: no insulation, improper waterproofing, not enough light, wrong exposure, no solar heating. Still, the fuel bills were miniscule, the house dry, light, firesafe and silent—despite the trucks thundering by on the six-lane highway outside.



Bob Homan

By choice, Wells has of late limited his practice to a two-person operation, himself and his wife—who keeps the book, keeps up with requests for his books and keeps the faith. Most of Wells' work today consists of consulting with owners and other architects, which he feels results in a far larger number of underground structures than he could produce providing full services himself. This explains, in part, why only three fully underground buildings can be attributed to him. Over a dozen of his designs—including a museum, a community center, a factory, a highway maintenance depot, schools—remain unbuilt for lack of a client.

In 1975, Wells completed "Solaria" (plural of solarium) in Indian Mills, N.J. All the house's major living areas are arranged on the south and have large windows, plus an array of solar collectors. Utility and other nonliving areas are along the north wall, where the raised roofline and small windows bring in additional light and provide cross circulation. The structure is heavy timber, with a wood planked roof; walls are concrete block. The roof is blanketed with two feet of earth and mulch. Wells insulated the roof, walls and floor edges with 2½-inch Styrofoam, and for waterproofing used ⅛-inch butyl rubber on the roof, with foundation coating on parged concrete block on the walls. At the end of their first winter in the house, the owners wrote, "We had endured the winter in comfort with temperatures of 65 to 70 degrees. We had spent \$60 to heat 2,400 square feet from September to April, which was \$740 less than the estimated cost. The amount of fossil fuel we used wouldn't show on any graph."

Wells is now building an underground house for his family in Brewster, Ma., where he is renting a summer cottage overlooking Upper Millpond. He left the asphalt of Cherry Hill intending

to rent only temporarily before moving on to a farm near Raven Rocks, Ohio, where the favorite of his underground designs is now under construction. The Raven Rocks complex, when completed, will house several families, plus small businesses, will be powered by wind and sun, have greenhouses and waterless toilets. But, southeastern Ohio proved too far from Wells' lecture circuit and Cape Cod is beautiful and hard to leave.

Beauty for Wells means nature, or what he calls "making wilderness values our guide," reclaiming the land to its virgin state. If we do this, he says, "we'd never need zoning laws or environmental commissions or perhaps even an AIA. Under such a system a gas station—or oil refinery—could adjoin a private home without causing the least disruption or offense."

A dreamer? Perhaps, but Wells has worked out what he considers a practical solution. Why not, he says, plug lightweight, inexpensive factory-made components into hillsides? In 1973, he wrote in *Education*, the magazine of the Association of Student Chapters/AIA: "We'll simply unplug the school components, send them to the recycling center, and slide the hospital parts—completely furnished—into the shell. Now that's what I call architecture. With a lot of luck, the plug-in parts may even some day in the not-too-distant future be solar powered, so well insulated they'll leak almost no heat in wintertime, they'll transform all our organic wastes into soil-enriching nutrients, they'll reuse all their water, and they'll free us from this architectural curse of building dead boxes upon living land. With even better luck we may someday learn to grow the great earth shells the way we grow crystals in a test tube. Imagine, huge, shimmering tetrahedrons growing 100-foot and 200-foot clear spans in the sides of hills! Talk about organic architecture. Ah, if only old Frank were still alive to show us the way!"

Johnson's 'Mound Architecture'

Back in 1965, Philip Johnson, FAIA, tucked the Geier house under a lakeside field in suburban Cincinnati for "romantic reasons," he says. At the time, a few buildings had already been lowered into the ground here and there, but only for security against nuclear attack, never for romantic reasons. Most were windowless, cavelike things, attractive perhaps to bats and rats, but antithetical to human notions of acceptable shelter in peacetime.

Johnson's Geier house, by contrast, was intended to be pleasing to the eye and comfortable to live in. "It was a beautiful field," the architect now recalls, "and I felt its connection with the water was so important that why not keep it just the way it was. The Geiers had ponies at that time, and they could graze on the roof. The dwelling affords complete privacy from the main road, and with the water coming onto the house as it does, you have the feeling of being on an island away from the world, although you're in the middle of suburbia. All that the Geiers can see looking out their windows is their own land rising on the other bank."

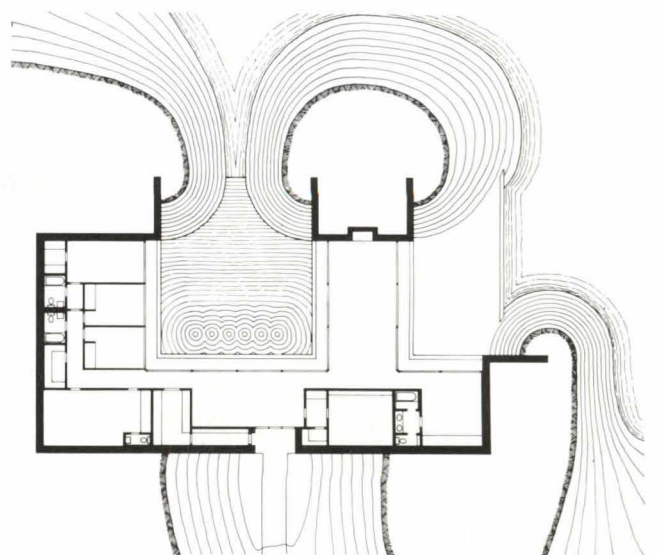
In typical wry fashion, Johnson told *Art in America* in 1966, "I have always been fascinated by mound architecture. . . . I love the cuddly feeling cellars give you." Most uncellar-like, all the major living spaces of the Geier house have very large windows with controlled views over the lake and outside terraces.

The exterior design is much in keeping with the underground art gallery Johnson designed for his New Canaan, Conn., estate at about the same time. From outdoors, all that is visible of the house are weathering steel cylinders on the roof that enclose exhausts and chimneys.

With its floor just six inches above the lake, the house has 15 inches of earth cover. Construction is reinforced concrete, six inches on the roof, 12 on the walls. Insulation and waterproofing? "Oh my goodness, yes," says Johnson, turning pixie. "Just like a boat." He used two inches of foamglass insulation on roof and walls. For waterproofing, there are five-ply built-up roofing walls and three-ply built-up waterproofing on the exteriors of the walls and floor. Most uncellar-like.



Photos by Ezra Stoller © ESTO





Two Hooded Eyes to the World

The Clark-Nelson house, designed by Michael McGuire of Stillwater, Minn., presents to the world nothing but two arched earth-framed glass openings, which echo in form the gently rolling countryside of River Falls, Wis.

It has, says McGuire, "the advantages of a traditional sod house" native to this part of America. But this modern incarnation has an arching steel culvert structural system, commonly used only for drainage ditches, road work and the like. The thin shell type construction was chosen because it can more economically support the weight of earth loads than can more usual, flat roof systems made of heavy wood or concrete.

The earth cover increases from a minimum of six inches at the top of the culvert. Insulation consists of two inches of polyurethane spray on the interior of the shells. Asphalt damp-proofing and bituthane and sheet plastic on the exterior provide waterproofing.

The two culverts are side by side, linked by an area housing laundry and mechanical systems, a plan that is very convenient for the two owners. Both are professors; both are away from home for long periods of time. The resident family is left with fairly private guest rooms in the other culvert. The house has been lived in now for six years and, according to McGuire, is "comfortable in winter and summer (without airconditioning). There is no sign of dampness or basement effect that one could expect during humid Wisconsin summers." In feeling it is light, cheerful, quiet.



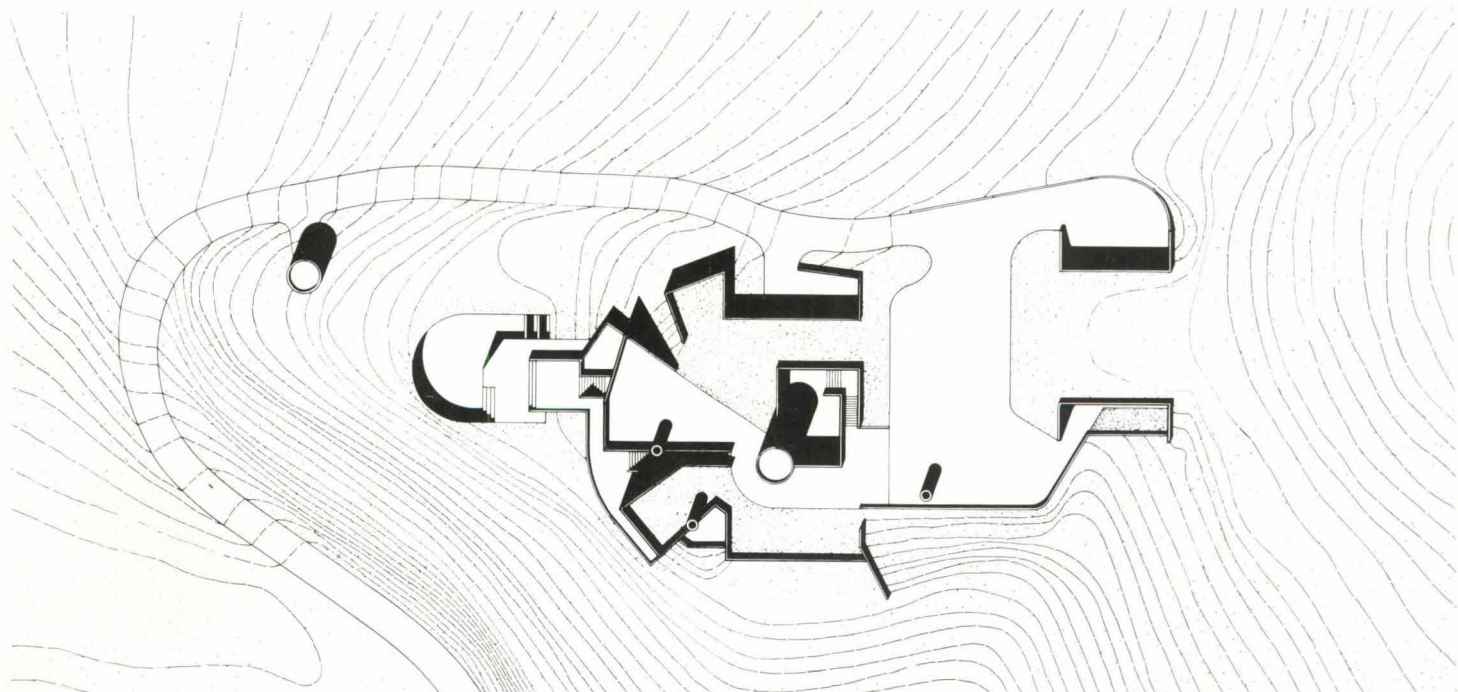
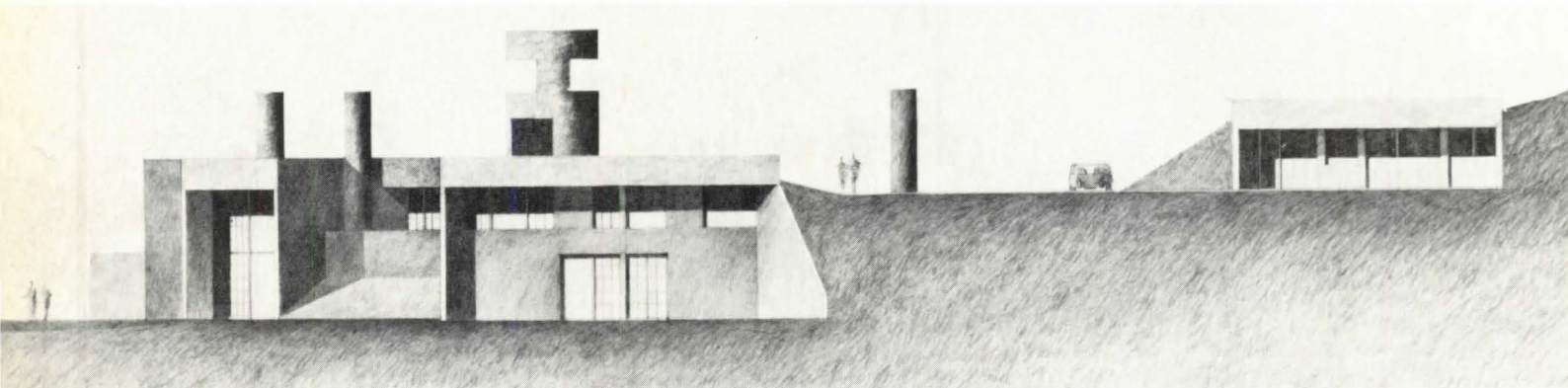
In the winter landscape especially, the Clark Nelson house is as unobtrusive as punctuation marks in a sentence. The downslope culvert arch contains living areas (left); bedrooms and a studio are in the upslope culvert.

House 'Poured' into a Hillside

By far the most elaborate of existing underground residences, the Alexander house in Montecito, Calif., nestles in a high ridge commanding a splendid view of the Pacific Ocean. It is really two houses, a big house and upslope from it a garage and guest cottage. The two levels of the main residence contain living and sleeping areas, plus studio, study and darkroom. One enters it from the plaza roof, which is partially paved with fireproof brick, partially planted with sod. From here a circular stairway, which connects all the major living areas and creates a gazebo-like lookout on the roof top, leads down into a lower courtyard. The house has windows on three of four sides, oriented to capture sun and views. To ensure privacy, a mound of earth was bermed up between the two dwellings, and exposures in the guest cottage face away from the big house.

The two dwellings were virtually scooped out of the hillside. Architect Roland Coate, AIA, thought in terms of "making a cast, a negative form into which the building can be poured," with the finished buildings recreating the ridge which was removed by the graders.

The program requirements called for protection from hot, dry summers, foggy winters and danger of fire—brush fires being a major hazard in the Santa Barbara hills. For fire safety, Coate used poured-in-place concrete throughout, rather than relying on "any elaborate sprinkler systems or diversion schemes which would require constant maintenance," as he puts it.





Photos by Jürgen Hilmer

Angular forms, such as the one above, project beyond the hillside to capture light and views. (The fatter cylinder is a stair-tower.) Across page top is the swimming pool and main residence from the west; the elevation shows the 'big house' and guest quarters from the south.

Underground Housing's First 'How to' Manual

Compiled at the University of Minnesota, it soon will be republished for broad circulation. A.O.D.

The first comprehensive manual on underground housing design was recently issued by the University of Minnesota, and will be published early next year by Van Nostrand Reinhold of New York City for broader circulation. *Earth Sheltered Housing Design* (see Sept., p. 80) is the work of the Underground Space Center in Minneapolis (Ray Sterling was "project coordinator"). The book gives concise and readable advice on site planning, programming, architectural design, energy use, structural design, insulation and waterproofing. It also discusses public issues relating to the design and construction of earth covered houses and presents a good sampling of dwellings that have been built for a variety of climates and conditions.

"It is important to clearly understand the impact of basic site considerations such as proper orientation as well as the location of vegetation on the site," begin the authors of *Earth Sheltered Housing Design*. The best of all possible sites, at least in northern climes, according to Sterling and coworkers, faces south and has a gentle slope. This allows all or most windows to be placed on the south side to capture the maximum amount of radiant energy from the sun. There should, of course, be vegetation, overhangs or shutters to reduce summer heat gain, and some vents or windows will be needed on the north side or top of the structure for natural cross ventilation. A south-facing site also protects against prevailing winter winds. A sloping one provides drainage for rooftop plantings and is more easily adaptable to a two-level design, which in most cases is more energy efficient—because more compact—than a single-story plan.

When placing an earth covered structure into an existing development of conventional houses, a larger than usual site may be required, because some designs "may require more manipulation of land forms on the site and the creation of earth berms around the house," say the authors. It may, for instance, be necessary to extend portions of the structure beyond existing setbacks if its spaces are arranged around an internal courtyard, a plan often requiring more area than a conventional house. For earth covered houses with windows on the south wall or periphery, a site should be chosen where views are not blocked by houses on adjacent property.

Particularly important in site selection are soil type and groundwater conditions. A high water table and certain types of soil that have poor bearing capacities, or a tendency to expand when wet, have the twin disadvantages of requiring more costly waterproofing and more complicated techniques. Sterling and coworkers suggest that even without doing a full-scale, costly site investigation, much can be learned about soil and water conditions from local realtors, city engineers and neighbors.

In their discussion of architectural design, the authors of *Earth Sheltered Housing Design* concern themselves mainly with such form-influencing factors as energy conservation, structural systems and the relationship of the house to the surface. They start with programming and begin by pointing to an obvious-seeming, but important, fact: You don't dig basements for underground houses; they're too costly and impractical. Machinery and appliances usually banished to basement spaces will need to be integrated with the living areas. And you will need a mechanical room. For though heating and cooling needs will be

much less than for a comparable above grade house, the equipment will still take space, and it will make just as much noise. The last is not an idle observation. Since earth sheltered houses all but eliminate noises from the outside world, appliances and mechanical systems will probably seem all the louder and require some form of damping. According to the authors, the mechanical equipment will require about 5.6 meters of space, an aisle for circulation another 2.3 meters, and space can be saved by combining mechanical and laundry areas in one room.

Additional space for equipment and storage must be provided if an active solar collection system is used. An ice airconditioning system, where water is frozen in winter and tapped for cooling in summer, will need a separate underground chamber near the house. On the other hand, spaces like garages and porches that require no heat can be put above ground, preferably not where they obstruct views.

Landscaping is an integral part of design in earth sheltered houses "since the house is really part of the surrounding landscape rather than simply placed on top of it," in the words of Sterling, et al. To underscore the importance of trees as windbreaks, they point to a Minnesota energy agency study which showed that an above grade residence with plants on three sides required only 40 percent as much fuel as a comparable house

Energy advantages of planted roofs and some pitfalls in indiscriminate use of skylights.

without any surrounding shrubs or trees. Plant growth on earth covered roofs is also vital for energy savings, because the reflective nature of grass and groundcovers helps reduce solar heat gain in summer. On hot days, a blacktop surface is warmer by 15 degrees Fahrenheit than the average air temperature, while grass remains 1 to 7 degrees cooler than the surrounding air.

There are three basic plan concepts for earth sheltered houses: the "elevational," "atrium" and "penetrational," as the authors call them. The elevational type plan concentrates all openings on one side of the structure, usually the south, leaving the other three sides buried. The idea here is to maximize earth cover around the house. The arrangement is similar to a typical apartment having one window wall with living areas ranged along the exposed elevation. One of the disadvantages is lack of natural cross circulation. Another is that there is a limit to the amount of space that can receive adequate natural lighting from one window wall. Skylights, windows penetrating the earth covering or a sloping roof may be needed to bring in more light. But all these additions are potential energy drains. Much heat can leak out, for example, if a typical flat or bubble type skylight is used. A directional, south-facing skylight, on the other hand, will reflect solar radiation into living spaces in winter and screen it out in summer, as the angle of the sun changes. Skylights, designed with operating windows, can also provide ventilation in summer. On winter nights they should be covered with an insulated shutter to lessen heat losses.

In the second type of plan, the “atrium,” spaces are arranged around a central courtyard, which brings in natural light and ventilation. But the plan is less compact than the elevational and often doesn’t allow easy circulation from one room to any other without going outdoors, a potentially chilling prospect in winter. A circulation path can, of course, be placed along the perimeter of the house, but it will be long and space consuming. Covering the atrium with plastic or glass can solve the problem and has the additional advantage of trapping radiant energy from the sun to warm rooms—windows must, of course, be kept open. But this arrangement can conflict with building codes requiring all habitable spaces to have openings directly to the outside; it may also be very costly, say the authors.

The third plan type, the “penetrational,” has windows punched through the earth cover at various points on the perimeter of the house. The effect is virtually the same as a compact above grade house with windows on all sides and circulation limited to the center of the structure. Of the three plans, the penetrational offers the best views, but usually at the expense of the best energy results, since puncturing the earth’s mass robs it of its thermal benefits. A few large windows will, however, siphon off less energy than many small ones and make construction less complicated and costly.

Turning now to structural systems for earth covered houses, Sterling and coworkers point out that since the structure will have to support heavier than normal roof loads, it will be a far more important design determinant than in conventional buildings. Using conventional roof systems—precast concrete planks, poured-in-place concrete slabs, wood and post systems—will result in flat or sloping roofs and generally rectangular plans. More unconventional systems—concrete for steel culvert shapes and geodesic domes—can support heavier loads more efficiently. But they can also substantially limit options for room layouts. “For example,” write the authors, “if a large culvert shape is used as a basic structure, window openings are primarily limited to the two ends and the space must be laid out with regard to the curved roof.” Possible alternative designs, they suggest, may include a shell shape large enough for two or more openings at either end.

“In designing an earth sheltered house,” they continue, “there are many details which must be carefully analyzed because of the unique conditions of placing a structure completely below grade. Many conventional construction details, for example, are not acceptable because they detract from the energy efficiency of the structure.” An example: The problem of losing heat by conduction through concrete is a major one, since the concrete acts like a wick through which heat bleeds out. A simple, but unhappy, solution is to eliminate such details as skylight wells and parapet walls. A better alternative is to provide a thermal break in the concrete, such as a layer of Styrofoam insulation which separates the interior and exterior structures and causes the two “to move and act separately,” as the authors put it. Still another solution is to use a separate structure and material for exterior parts. In their chapter on structural design, the authors go into much greater detail on structural elements, basic loads, soils, major structural components, application of structural systems, typical layouts and special problems and techniques than is appropriate here.

Saving energy is the name of the game in earth sheltered housing design. Two requirements, therefore, predominate: The first is that the structure be very compact, since the heat loss, and thus the energy use, of any building is a “function of the area of the surface through which the heat can escape.” Since a two-level house has far less exterior surface per square foot than the single level structure, it will be more energy efficient in winter. The reverse, though, is true in summer, since the surrounding earth is a major source of cooling. The more wall area, the cooler the house.

Second, there should be as much earth cover as possible, since “a building having a large thermal mass within the insulation can store a large amount of energy, so that during the day solar energy entering the south windows can be stored within the structure’s thermal mass and the temperature will rise slightly and slowly throughout the day,” to quote the authors, and fall only slightly and slowly at night. In addition, the earth’s mass will protect the building from expansion and contraction and freeze/thaw damage. Berming the earth around the outside walls is only minimally less energy effective than actually submerging a building in the earth.

The roof of an earth sheltered house is the worst potential offender in terms of energy losses. In fact, in severe climates winter heat loss through the roof can exceed 50 percent of the total heat losses through the building, since the thermal conductivity of soil is approximately 25 times greater than modern insulating materials. That’s why a thick earth cover is crucial. Also, the more earth cover on the roof, the deeper will be the entire structure, thus moving it into a new and more energy effective environment. Adequate earth cover is also needed to provide good drainage and room for plant root systems to grow.

“The limiting factor here,” write the authors, “is the physical structure required to support such a roof. As the weight of the soil increases, the cost of such a structure quickly escalates beyond the benefits accrued from the additional mass. This can result in the interior spaces being subdivided into smaller areas due to the shorter spans required for high loading factors. Therefore, it is usually preferable to increase the R-value of the roof by adding insulation rather than soil once the load limit of the lighter supporting structure has been reached.”

On vertical surfaces, the greatest energy losses are, of course, through windows, doors and walls. “During the winter months, a north-facing window will lose an average of 20 times the amount of heat as an equivalently sized section of wall on a subgrade dwelling,” write the authors of *Earth Sheltered Housing Design*. Even with double glazing and insulated drapery, an east-or-west facing window will lose 10 times the amount of heat as the same area of earth sheltered wall. A negative side effect of wall openings is that they diminish the effectiveness of the earth cover in their immediate area by bringing outside surface conditions right up to the wall. The trick is to let in enough light without losing too much energy.

Some form of insulation will be needed to lessen heat loss through walls. The most common approach has been to place

Insulation: Too much of it can isolate an underground dwelling from the surrounding thermal mass.

insulation over the entire exterior wall, a plausible seeming arrangement, until you realize it isolates the building from the surrounding thermal mass. Usually only the upper half of the wall needs to be insulated, according to Sterling, et al. As proof, they cite a study done of two underground houses. An identical amount of insulation was applied to the wall of each, with identical capital costs. On the first, two inches of polystyrene was put over the entire wall and on the second, four inches of insulation was placed over only the top half of the wall. At the end of a three-year period, the latter showed a 10 percent improvement in summer cooling, though a 5 percent increase in winter heat losses.

There are two additional alternatives for insulating walls. The first is to extend the roof insulation past the wall before dropping a vertical section of insulation parallel to the wall with soil backfilled between it and the wall surface. This creates an in-

continued on page 82



Two Communities Build Subsurface Schools

They were convinced to do so partly by the success of close-at-hand precedents. A.O.D.

The way in which individuals and groups with whom architects work typically respond to the idea of an earth covered structure is illustrated by reactions to two underground schools—one (completed in 1977) in the fairly affluent new town of Reston, Va.; the other (now under construction) in a predominantly poor and Mexican-American neighborhood in Fort Worth, Tex.

The Fort Worth community overwhelmingly approved putting the Washington Heights elementary school underground, but not before the architects, Parker Croston Associates of Fort Worth, did a lot of persuading and convincing. The advantages of burying the school were many: The site is only 3.74 acres, while a normal site for an elementary school is closer to 10, according to Mervin Croston, AIA. The site is at the end of one of the busiest airfields in the country. Deafening noise. It wouldn't be heard underground. In the middle of the site stood an auditorium and gymnasium which the residents wanted to preserve; building underground would allow them to do so. Then too, of course, a subsurface structure would reduce energy use, maintenance and operating costs.

Croston explains that at the first community meeting, everyone nodded yes, but few understood the concept, as was evident from questions: "Did you say this school would be under the ground?" "If it's underground, what's on top?" At the second meeting, Croston and colleagues talked about the documented advantages of the underground Abo school in Artesia, N.M.,

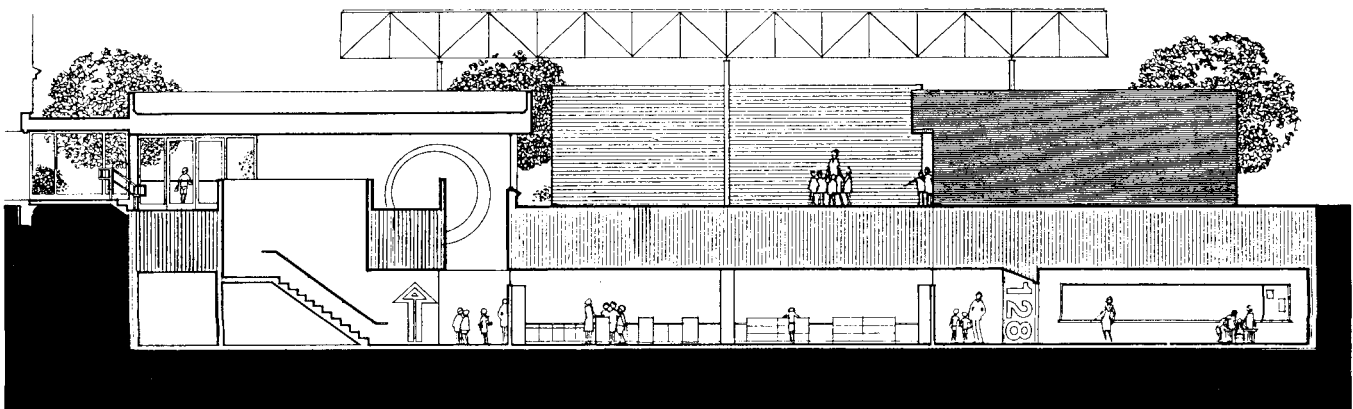
Terraset pupils (facing page) in front of their underground school in Reston, Va. Below, a section of the Washington Heights Elementary School in Fort Worth, Tex.

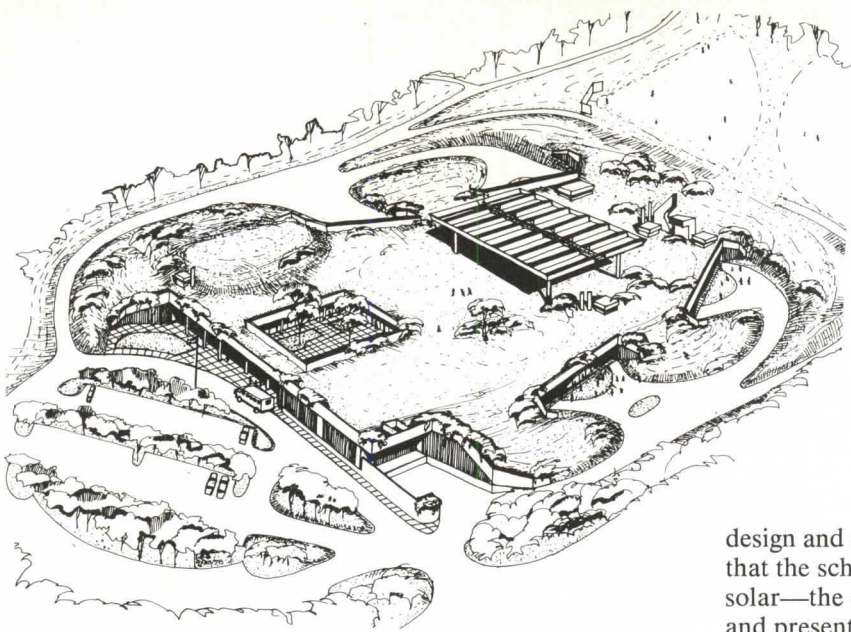
and the nearby school in Lake Worth. The Lake Worth school, too, is in the flight path of an Air Force station, and it's quiet inside, and really quite pleasant, says Croston, despite having no windows. "And they haven't had to paint the school in 12 or 15 years. We brought up other successful examples." The most convincing one perhaps is the newly opened underground Fort Worth library, also designed by Parker Croston. "The fact that the city would put its library underground meant to these neighborhood people that below grade buildings can't be second class," says Croston. "That kind of thinking by community people made all the difference."

In Reston, Va., architects Davis, Smith & Carter had no such living example to help them convert an initially skeptical community to underground construction. But in February of 1977, the Terraset school was completed, with a below grade courtyard sheltered by solar collectors. On one side of the courtyard are offices, and opposite is a "multipurpose hall." The main teaching area consists of four round learning centers (with windows), grouped around a smaller, skylit circular "media center."

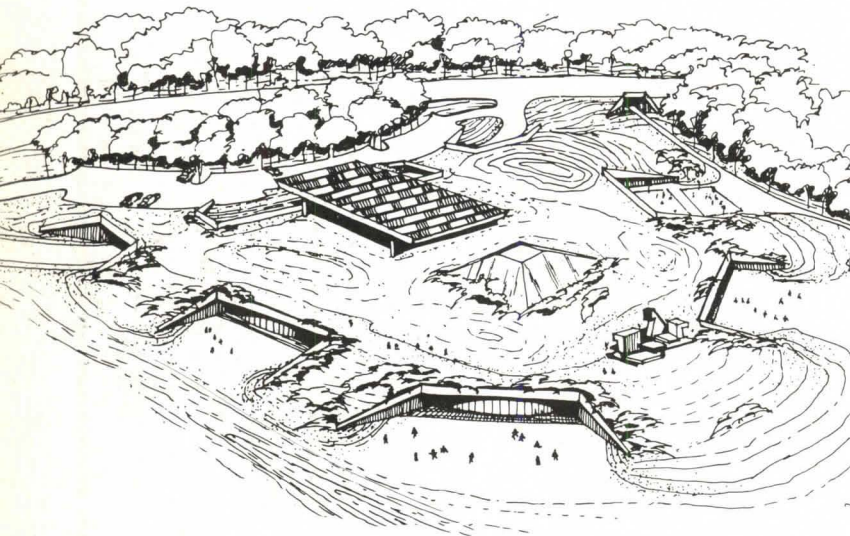
Terraset's almost immediate success prompted the Fairfax, Va., county school board to ask the architects to design at the new community of Burke Centre a "Mark II model," in the words of Douglas Carter, AIA, who shepherded Terraset through completion.

The user response, says Carter, has been "super positive." The school has, apparently, been blessed with an enlightened principal who was able to select her own staff from numerous applicants. The teachers use the school as a working tool for





The Burke Centre school (above) is still in design stages; Terraset (below and across page) was completed in 1977.



Initially, Reston was skeptical about Terraset.

instructing children about energy conservation and solar power. As for the kids, "They've become blasé about the constant camera crews and photographers that come wandering through," says Carter. They've designed their own logo and Terraset sweatshirts.

The Terraset school has attracted far more attention than the architects or the school were prepared for. There has been so much traffic from interested groups in the U.S. and abroad that Davis, Smith & Carter has been commissioned to design a Terraset visitors' center to take pressure off the school itself.

But during the design and construction of the school, the architects had to persuade a local design review committee, the community, the school board, a state review agency and prospective users that a below grade school would neither scar children's psyches nor cripple their learning abilities.

The first group Carter and his colleagues had to convince was the client—the school board's design and construction department. "Their initial reaction," he says, "was more than a little skeptical, cautious. They were afraid of costs and negative community reactions." The architects prepared cost estimates that showed construction would be competitive with a comparable conventional structure. Since the Terraset concept met the

design and construction department's two principal criteria—that the school be energy efficient and adaptable to the use of solar—the department told the architects to take their chances and present the idea to the community.

"Based on that," says Carter, "we built a model for community presentations. We felt this was the only way we could convince people we weren't going to bury their kids." He adds, that, at the beginning of the planning process, he and his colleagues talked about "a buried school," nomenclature which in itself evoked unpleasant images. So they cast about for a more positive-sounding description, and came up with "a terraset school."

The initial community response, says Carter, was what you might expect: "How are you going to keep that cold, damp basement floor warm? What are you going to do about the mildew that builds up in this basement over the summer months?" There were the usual jokes about giving the kids miners' hats for school; there were fears "that an underground building just cannot be very conducive to an attractive learning environment. You might term them nameless fears," says Carter, "because it was to a certain extent a fear of the unknown."

Carter says he and his colleagues were able to dispel many of these fears by showing perspectives of the interior of the building, and just by answering questions and talking, "explaining that this was just an above grade building with a layer of earth on top of it." Of great help in mustering support for the Terraset concept was the fact that it received very favorable local press coverage, and "in the end," says Carter, "the design and construction department felt comfortable in reporting to the school board that the community response was positive."

School board members were much easier to convince than the community since their main concern was whether the underground concept would be practical and inexpensive, according to Carter. They gave their approval based on the assurance that it wasn't going to cost more than a conventional school, and they adopted the name Terraset.

The next hurdle was the state education authority, which had to pass on detail finishes and approve the structure "as a good educational environment," in Carter's words. "Their reaction was very negative to say the least," he says. The principal objection was, apparently, to the open plan of the school. "One of the energy conserving items we'd come up with," explains Carter, "was the fact that a circle will enclose the same area as a square or rectangle with a much smaller peripheral surface area. Obviously, the smaller you can make your wall surface, the less energy you're going to lose through it. That was the origin of our circular learning centers, and the state education authority thought we were nuts." Nor did they think the underground concept was appropriate for a school. They also created a problem for the architects by insisting that there be 70 foot-candles of light over every desk, forcing Davis, Smith & Carter to use a conventional lighting system of 2x4-foot fixtures. A waste, with all that natural light.

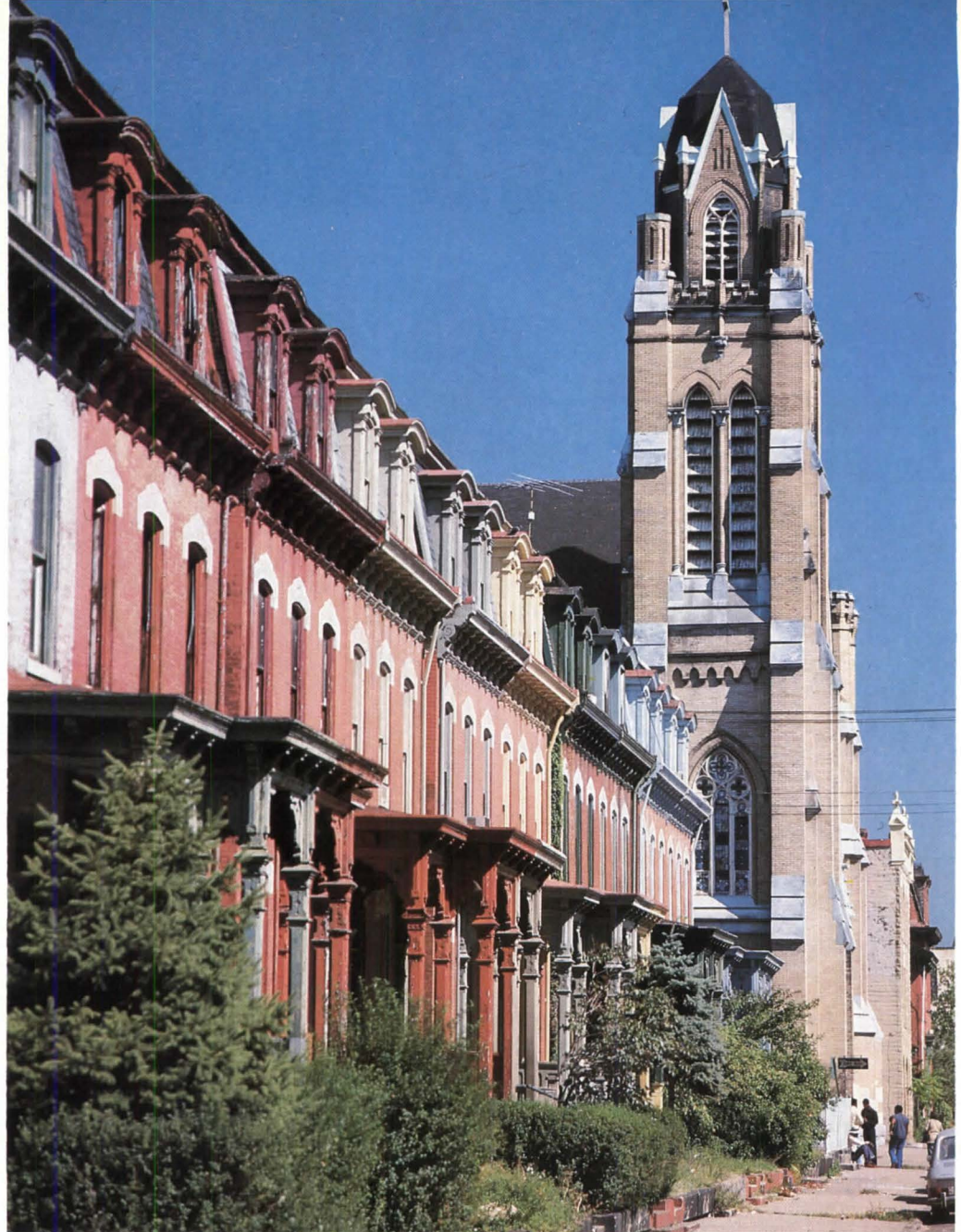
Next, the architects had to deal with local building officials,

the people charged with enforcement of building codes and their ramifications. They too were skeptical. Many raised eyebrows, according to Carter. But they appreciated the building's energy advantages, an appreciation heightened, once again, by good press coverage. But! There were lots of "buts" and "however's," the most troublesome ones coming from the fire marshal. "We couldn't convince him that we were really building an above grade structure with an earth covering over it," recalls Carter. "So, he applied the Building Officials and Code Administrators' code for basement construction, which meant, among other things, that every 150 feet around the perimeter there had to be a means of egress." The fire marshal also objected to the two, wide, concrete pedestrian paths the architects had designed over the depressed bus dropoff to give the feeling of a buried building. Says Carter, "The fire marshal was concerned that if there were a line of five, six, even eight buses down in that bus loop and we had these wide pedestrian linkages across the top, we were in effect creating a tunnel. If one of the buses caught fire, the marshal argued, there would no way for the flames to go but straight up. One bus after another would catch fire, flames would be forced into the courtyard, break the glass and fire would enter the school. We ended up with two 16-foot wide pedestrian links." Still another result of fire marshal directives are 12-foot wide fire lanes down both sides of the building. "So, now we've got this mound of earth surrounded by asphalt, rather than a continuously sloping hillside, as was planned," says Carter.

The Burke Centre school, which Davis, Smith & Carter was asked to design as a result of Terraset's success, is "basically a site adapt of Terraset," according to Carter. The interior plans are virtually identical. "Burke Centre is different mainly in the sense that we turned the entire building around," says Carter. Where the rear of Terraset falls off to ball fields over the top of the mechanical room, at Burke Centre, the ball fields run right over the top of the school. "A more meaningful use of the site," says Carter. Where at Terraset, the bus loop is depressed, at Burke Centre it will be on grade. This, as a response to the site and to "get away from the fire marshal dictating the design quite as much," according to Carter. The front of the new building will look more like a conventional, one-story, above grade building, though it will be obvious that the earth folds up over the top.

The most important differences between Burke Centre and Terraset consist of a refinement and simplification of the mechanical systems. At Terraset, a resident engineer is needed to "babysit the system"—Carter's words. The conventional power system has pneumatic controls, while the solar system has electronic. At Burke Centre, both systems will have electronic controls, which will be hooked up to a microprocessor so that there can be remote monitoring and adjustments to the system. Also, the whole system at Burke Centre is designed for easy plug-in retrofitting, while at Terraset, says Carter, "we had to do a lot of juggling with the conventional system before we got it all interfaced properly." □





Photos by Joseph A. Rosen

Pittsburgh's Innovative Renovation Record

It has been marked by concern for the impact on residents. By Nora Richter



Across the country, deteriorating inner-city neighborhoods have become speculators' gold mines. Structures can be bought cheaply, renovated and sold at inflated prices. The renovations may be good for the cities, but they can be devastating for individuals who have made the neighborhoods their homes. As rents and property taxes rise, the original residents—usually low-to-moderate-income people, many of them elderly—are often forced to move. They become "urban nomads."

Perhaps the prime example of rehabilitation without dislocation is in Pittsburgh, where the Pittsburgh Historic Landmarks Foundation (PHLF) has led the preservation movement since 1964. Three inner-city neighborhoods—Mexican War Streets, Manchester and Birmingham—have been or are being renovated without severe displacement.

It all began in 1964. As Arthur Ziegler, now head of the PHLF, recalls, he and Jamie Van Trump—a 69-year-old architectural historian, a member of the PHLF board, a man often referred to as "Father Pittsburgh"—were walking down Liverpool Street in Manchester, a ghetto scheduled for demolition.

Infuriated that this neighborhood of Victorian houses would soon be torn down for urban renewal, the two men organized the foundation and dedicated it to renovation *without* dislocation.

"As the old and familiar facades crashed down to the thunderous beat of the headache balls," recounts Ziegler, "there developed an awareness among a few that the shape of the future lay not entirely in the destruction of the past; that in certain areas of this historic city, which dates back to 1758, there were individual structures and even whole neighborhoods worth preserving, and that if these were allowed ultimately to vanish, they would take with them Pittsburgh's living memory of itself."

Ziegler, now 40, was then an English professor at Carnegie-Mellon University. Called a genius by some, he has proved to be a revolutionary in neighborhood preservation. He wrote in 1969: "Urban renewal annihilates neighborhoods, creates vast empty spaces that lie unused in the hearts of our cities while the poor cry for housing and the cities cry for taxes and then ultimately sell the land to developers who turn their profit, naturally, by serving the more well-to-do. The poor are shunted off the faceless 'projects' that lack even the amenities of their former ghetto neighborhoods. Yet, they are expected to rest comfortably—and quietly—in these institutionalized dwelling units. . . . Accompanying these tragic results is the loss of the older buildings of our cities, often including structures of historic architectural merit."

After the preservation movement gained momentum, Ziegler protested against the dislocation of the original residents. "The preservationists," he complained, "hit upon a highly successful technique: Buy property, 'P.R.' the area and market it to the people with the means to restore it. . . . But their methods have been almost universally the same: Move the poor out so affluent whites will move in and undertake restoration."

The PHLF's first neighborhood project, the rehabilitation of the Mexican War Streets, was also the nation's first renovation without dislocation project. Built between 1848 and 1890, with streets named Buena Vista, Monterey, Resaca, Palo Alto, etc., the neighborhood lies on Pittsburgh's north side and contains a number of Greek revival, Italianate, French Second Empire and Queen Anne houses. When the foundation's renovation plan was initiated in 1966, there was a mixture of residents: black, white; young, old; poor to middle-income. Some rented, some owned houses. But the neighborhood was deteriorating and residents were beginning to sell out to "slum lords." The area was designated for demolition on Pittsburgh's "Renaissance" master plan of the '50s and '60s.

To finance the rehabilitation project, the PHLF set up a revolving fund with \$100,000 from the Scaife Foundation. (At its high point, the revolving fund contained \$500,000, including money from other sources such as the Richard King Mellon Foundation, the Hillman Foundation, the A. W. Mellon Education and Charitable Trust and the Pittsburgh Foundation.) PHLF's first moves were to buy a large house in squalid condition and to establish its own renovation team. After 14 months and \$53,000, PHLF rented the first apartments to young professionals, because "they would bring to the area a deep commitment to participate in this urban experiment," Ziegler says. PHLF wanted this renovation to reveal the organization's commitment to the neighborhood and spur other residents to restore their own homes.

PHLF next acquired smaller properties which it restored and rented at subsidized rates to low- and moderate-income tenants. The strategy was set. Through the federal leased housing program, the foundation buys more derelict houses, restores them and rents them to the Pittsburgh housing authority at a rate that returns the investment in 12 to 15 years. The authority, in turn, sublets to low-income families at reduced rents. And, because the tenant's initial five-year leases are signed before work begins, PHLF is able to obtain mortgage funds. As one of Ziegler's colleagues said, "Ziegler is especially ingenious in using PHLF's comparatively modest financial resources as leverage for obtain-

ing matching funds, grants and loans from a variety of public sources."

During the Mexican War Streets project, emphasis was placed on residents and their needs. At first, the foundation held informal neighborhood gatherings to which all residents and property owners were invited. Later, the Mexican War Streets Neighborhood Association was formed and operated independently of the foundation, so the residents would "work on their own behalf and not look to us as the omnipresent problem-solver and benefactor," Ziegler says. "Creating a new sense of neighborhood with restoration as the common denominator is, from one perspective, our most significant accomplishment," Ziegler adds.

Today the neighborhood is renovated, save only a few structures. "Not a single homeowner has left the area since 1967, except for an emergency," Ziegler boasts. "There are a few residents who would like to see a change in the neighborhood, who would like to see their property values escalate." But, on the whole, he says, most residents remain committed to staying in the neighborhood and "keeping the neighborhood as it is."

PHLF owns 25 out of the 400 properties, with almost all of them rented to low-to-moderate-income tenants. About 50 new homeowners have moved into the area, buying property from absentee landlords and restoring the buildings. About \$350,000 has been spent by the foundation, and every \$1 spent has been matched by \$6 of members' or old-time residents' money. "We have saved taxpayers \$30-40 million through our investment," Ziegler says. "And more important, we have saved a neighborhood. To us, this is true urban renewal."

The second neighborhood PHLF planned for rehabilitation was Birmingham, established in 1812 on the south side of Pittsburgh across the Monongahela River. Irish and German immigrants first settled there and then moved "up the hills." The neighborhood is now a relatively stable, working class area, pre-

Victorian row houses (across page, above) and rehab work in progress (across page, below) in Manchester. Resident on front steps of his Mexican War Streets home (below).



Avoiding the dislocation rampant in other cities.

dominantly Polish and Lithuanian. Although never a slum, the neighborhood was showing signs of decay by 1965 when PHLF first began studying it. "Alarmed by the initial blight and the vast amount of ill-conceived remodeling that sacrificed architectural integrity," in Ziegler's words, the foundation developed the Birmingham self-help community restoration program in conjunction with the south side chamber of commerce and the south side community council. The goal of the program was to restore the 19-block commercial center with its Victorian buildings.

To launch the project, the foundation purchased and restored two small, typical commercial structures. Six percent loans were provided for residents to follow suit. Since 1965, about one dozen storefronts have been fully or partially restored, dozens of houses have been painted and a private organization, the Birmingham Corporation, has been formed to restore commercial property. On one particularly blighted block, the foundation acquired five houses and restored them for low-income families. Dislocation was not a great problem in this neighborhood since the ethnic population was stable, but the low interest loans helped residents help themselves. As one of Ziegler's colleagues said, "Restoration has become part of the language."

In the future, the PHLF and the Birmingham Corporation hope to link the south side to Station Square, the renovated Pittsburgh & Lake Erie railroad station that is now an office, shopping and entertainment complex. Station Square stands directly across the Monongahela from Pittsburgh's Golden Triangle business district.

Ziegler hopes that Birmingham, too, will "inspire other cities to utilize private, neighborhood initiative to implement an efficient, economical renewal process without relocation of residents and businesses."

The project that involves most of Ziegler's time now is the renovation of Manchester, where Ziegler and Van Trump first saw the potential of neighborhood renovation. Here, the PHLF has joined with Pittsburgh's Urban Redevelopment Authority (URA) for what it calls "the first urban renewal program in the U.S. to be based upon historic preservation for poor people."

Manchester, developed between 1870 and 1900, is a district which once housed well-to-do merchants and professionals. Gertrude Stein was born here and at one point the neighborhood was an enclave for artists. Later, it became predominantly Jewish and then a German neighborhood. By 1964, the population was largely black. A superhighway had separated the residential section from the commercial. Although Ziegler eyed the neighborhood for renovation back in the mid-'60s, it wasn't until 13 years later that any work began.

"At first, the citizens had to be convinced that they had a chance to keep their neighborhood intact if they worked together as a cohesive community and had a genuine desire for self-improvement," he says. Then too, the city government had to be convinced that renovation would be more beneficial than the planned demolition.

Between 1964 and '69, Ziegler and the PHLF spent a great deal of time working with the residents of Manchester educating them about historic preservation and what it would mean for their community. "At the first neighborhood gathering, the residents favored it wholeheartedly," Ziegler says, but it took about four years before the city would declare itself for preservation. Finally, in 1971, the URA abandoned its demolition plans.

But the program was halted in the early '70s when President Nixon suspended the federal 312 loan program. Manchester suffered bad damages during the four-year interim. "Up to 150 houses were demolished and a number were replaced with suburban-type houses noncompatible with the old structures," Ziegler says.

When the 312 program was reinstated, the foundation carried out a "marketing effort" to get the Manchester program back on

its feet. First, a dinner was held by the citizens committee for about 800 residents of Manchester, 50 of whom signed up to buy houses that week. Next, a brochure was mailed to the residents explaining the program. Radio, television, magazine and newspaper advertising was the final step. With the help of the marketing scheme, 105 houses were sold, 72 to existing renters. This spring, only 90 houses remained unsold.

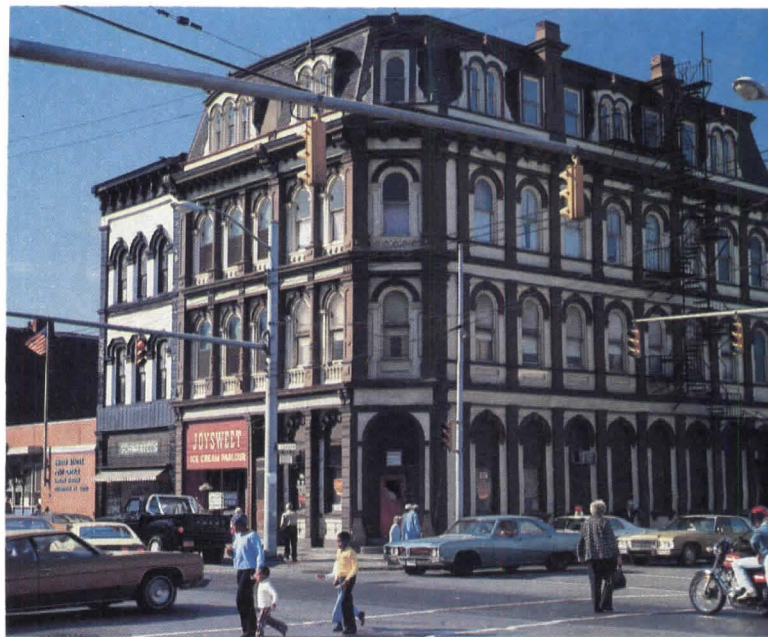
The strategy to keep residents in Manchester combines government aid, PHLF's efforts and residents' money. The URA will pay one-tenth of the appraised market value of the property and restore the exteriors, which the owner must maintain for 20 years. In addition, the interiors of the houses must be brought up to Manchester renewal standards for plumbing, wiring, etc. If necessary, both the federal 12 rehabilitation loan program and the outright grant program can provide funding. HUD has allocated more than \$28 million.

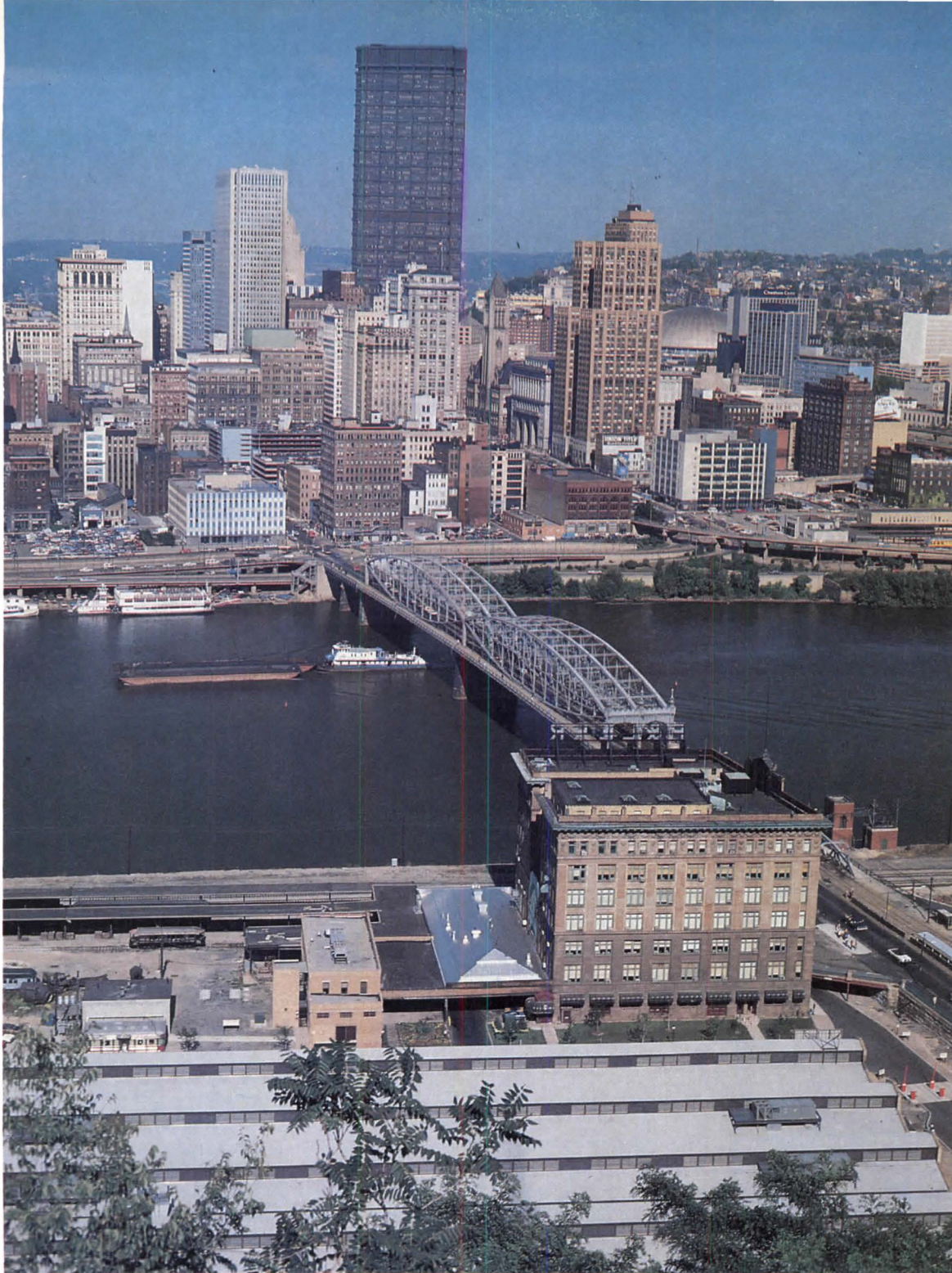
Homeowners can borrow up to \$27,000 per dwelling at an interest rate of 3 percent. Outright grants, ranging from \$50 to \$3,500 are available to property owners whose income is less than \$3,000 per year, who are on Social Security or whose monthly housing expenses equal or exceed 25 percent of their monthly income.

Although whites will move into Manchester, Ziegler feels strongly that this will not replace the present residents, "if the blacks support the program," he says. "They want it to happen because they recognize the need for middle-income residents, whatever their color and because they do not have to leave. Provision is made for everyone. . . . The restoration work should be completed within two years, especially if the paperwork process can be speeded up. The progress in one year is unbelievable." The paperwork processing by the URA has taken up to two years for one facade. Ziegler speaks of this with frustration and strongly supports more voluntary and resident involvement and less from government.

The example of Ziegler and the Pittsburgh History and Landmarks Foundation is one of the few success stories in rehabilitation without dislocation. The once neglected inner-city neighborhoods are now attractive to middle and upper class people due to the energy crisis, the convenience of living closer to work, the need for less living space (smaller families) and the desire to live closer to cultural events. Also, the 1947-'57 baby boom children are currently inflating the housing market. Last year

Restored store fronts on Carson Street, Birmingham (below), and renovated Pittsburgh & Lake Erie Railroad station across the Monongahela River from downtown Pittsburgh (right).





witnessed a record sale of 5.1 million new and used houses, many in inner-city neighborhoods. And some predict the demand will not drop until the 1990s. "I don't see anything wrong with bringing middle- and upper-income people into neighborhoods," says Karen Kollias, policy and program specialist in the HUD office of neighborhoods, voluntary associations and consumer protection, "but you have to meet the housing and credit needs of the people that are currently living there."

A recent National Urban Coalition report confirmed that the boom in urban revitalization is indeed causing severe economic and social disruption. Based on a two-year study of 65 neighborhoods in 44 cities, the report offers the first substantial documentation of the dislocation phenomenon, warns of "rising hostility and tension" between new and old residents and expresses a need for private and government assistance to the displaced. From 1969 on, the report says, rehabilitation work began to increase in urban areas. "And the problem is increasing faster than the remedies," HUD's Kollias says.

What can be done to control displacement? HUD Secretary Patricia Harris showed a commitment to neighborhood rehabilitation without displacement when she affirmed, "HUD is determined to protect the rights of those who want to remain in the city when they are threatened" by renovation. HUD has several programs which can be used to stimulate revitalization without displacement including:

- Section 312 rehabilitation loans for low- and moderate-income homeowners;
- Section 8 rental programs (new construction and substantial rehabilitation) for tenants who wish to continue renting in their neighborhoods;
- the urban homesteading program for low- or moderate-income people to buy houses at minimal cost and rehabilitate them;
- community development block grant funds for low- and moderate-income areas for property acquisition, rehabilitation, public improvements and subcontracting to neighborhood organizations;

continued on page 80



Community Design Centers in the '70s: A Status Report

'Pro bono architecture has established legitimacy'—and found new funding. By Andy Leon Harney

Efforts to rebuild the nation's cities after the 1960s riots resulted in the birth of a whole new set of institutions designed to provide services to the poor. Physicians set up free clinics, attorneys established *pro bono* law firms and architects created *pro bono* architecture and planning offices called community design centers (CDCs).

The design centers are a hybrid combination of architects, planners and community organizers producing everything from plans to rehabilitate single-family dwellings to surveys of entire neighborhood redevelopment options. They provide physical planning, architectural design and assist in community development planning (see Jan. '76, p. 38).

The nonprofit CDCs function as the once missing link between city planning agencies and the community. They help community groups articulate their needs and translate those needs into tangible design concepts with dollar signs attached. And their services are, by and large, free.

During the decade since the first were founded, the design centers were at first part of the so-called war on poverty and then, in the early '70s, the response to the decline of funding and interest in the cities. Today, they are part of the rebirth of concern for the welfare of urban America. But unlike a decade ago, the centers now seem to have credibility with their clients — the poor.

At their best, CDCs have become design and planning advocates for low-income community groups. They are intimately involved in rehabilitation efforts at the neighborhood level. They see themselves as a force promoting public awareness of the essential role of architectural and planning services for the poor, a force which, they claim, drums up business for their colleagues in private practice. They also serve as a kind of informal apprenticeship program for young architects, planners, designers and community organizers associated with VISTA or some of the CDC-based university programs. At worst, they are builders of dreams that will remain on paper for want of funding.

There are some 50 to 80 different community design centers around the country. There is no definitive count and they have only recently begun to organize as a group, forming the Com-

munity Design Centers Directors Association, (see June, p. 16) which has an official membership of only 35 CDCs at the moment.

Through the years, they have had to find funding from a wide range of sources—donations, private foundation grants, local government and federal government grants and contracts. Manpower from VISTA and the CETA (Comprehensive Employment and Training Act) programs have made an essential difference in many centers' ability to function at all. Today, according to the head of the directors association, Toni Harris-Gaskin, (executive director of the Architects' Community Design Center in Newark, N.J.) the majority of the operating CDCs around the country get their support from VISTA, CETA, private foundation and corporate grants and, increasingly, through HUD's community development block grant program.

An entire section of the block grant program regulations is devoted to eligible planning and urban environmental design costs. The thrust of HUD's regulations is to allow recipients of block grants to contract with nonprofit entities organized to promote and undertake community development design and planning activities on a not-for-profit basis. The goals of the block grant program and those of most community design centers appear to be at one with each other. Yet the marriage of local governmental entities (the recipients of the grants) has not been altogether harmonious. The enterprising design centers which have negotiated contracts with local governments view the support with alternating bursts of enthusiasm and disdain. For many architects associated with a bureaucracy, it is their first intimate contact with a bureaucracy and the experience has left its scars. Most model cities and urban renewal program support was in the form of grants for specific projects. Foundation and local AIA chapter support only required annual reports, or occasional informal summaries of work undertaken. CDC directors receiving block grant funding or other local government support complain bitterly that the reporting requirements, combined with the slowness of payments, are a great burden. Increasingly, they have learned, like the community groups they work with, that they must learn how to operate within the system, to use their political skills to achieve desired results.

One of the stalwarts of the CDC movement is Augustus

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Baxter, director of the Philadelphia Architects' Workshop and recipient of one of the largest block grants awarded any CDC to date—\$215,000 for the current fiscal year. In 1971, Baxter wrote a primer on founding a design center. When he came to a discussion of funding sources, he cautioned centers to avoid drinking from the federal trough. "I have to write a new primer today," says Baxter. "Foundation money is all dried up—we can stay alive with block grant funds. . . . The hard thing is to hold onto our values and standards. It's been difficult learning that the bureaucracy takes time—it tries to run you. We have had to learn how to retain our independence and, believe me, it's not always easy."

Experience with block grants is spotty. The program is barely four years old and many communities are still working on monies awarded several years ago. More than a dozen centers have block grant contracts with municipal agencies. If Congress revises its stance on CETA and focuses on primarily unskilled workers, the design centers may be even more dependent on block grant funds for survival in the future.

The nature of block grant support and the restrictions on the use of the funds vary as much as does the operation of each community design center. In Baltimore, for example, the Neighborhood Design Center relies almost exclusively on volunteer architectural assistance and uses the \$18,500 block grant contract to pay the salary of the director, the rent and phone bills. In addition, the center has three CETA staff people—a graduate architect, a graduate in design and a secretary/receptionist. In Chicago, the Architectural Assistance Center receives block grant funds through two different local agencies—the department of human services and the department of planning, city and community development. Each source has different requirements for reporting and different restrictions on the use of the funds. Other support comes through CETA workers adding up to a total budget of \$133,600.

While the sizes of staffs and budgets differ, the centers restrict their work to those who cannot afford to pay. Some take walk-ins and help individual homeowners; others limit their work to helping community organizations in poverty areas.

Few centers take projects into the working drawings phase or get involved in supervising construction. Lack of sufficient funds for necessary liability insurance and a desire to avoid conflict with members of the for-profit architectural community who might be threatened are the two reasons the centers limit their activities. As an informal apprenticeship program, the design centers do not tie young graduate architects to the drawing board sketching toilet details. Instead, they give them solid grounding in articulating client needs, working with the community and developing workable and, it is hoped, fundable designs.

To better understand how community design centers operate, particularly those involved in community rehabilitation work through CD block grants, let's look at a few centers.

Philadelphia's Architects' Workshop is the granddaddy of most community design centers. Workshop director Augustus Baxter's approach to community design advocacy has served as a role model for most design centers around the country. (The original CDC prototype, ARCH—Architects Renewal Committee for Harlem—folded several years ago.)

The city's office of housing and community development disburses \$1.3 million in community development block grant funds to community organizations—many of which, says that agency's director, John Gallery, have their own design capability. Of that \$1.3 million, the design center receives \$215,000—an amount believed to be the largest single contract in the country with any community design center.

The Architects' Workshop operates on a sophisticated level with regard to community development block grant funding. Instead of concentrating on current "neighborhood strategy areas," the city relies heavily on the center's preliminary studies and analyses of potential target areas to make decisions on

future projects. "Much of the information developed by the Architects' Workshop is folded into our applications for future funding to HUD," says city official Gallery.

The center has been around long enough so that many of the people it works with in city hall are alumni of the workshop—making communication with various city agencies much easier than in other cities. In 10 years, the design center has handled some 2,000 different projects, currently averaging around 190 projects yearly.

In addition to planning services, the workshop provides individuals with a rendering, preliminary sketches and write-ups of rehab jobs, including cost estimates for code violations of residences owned by low-income people. The group rarely gets involved with working drawings. If a project is funded, the work is then available to a practicing for-profit architect.

Unlike most centers, Baxter does not use any VISTA workers, relying instead on more trained CETA employees and even architectural and planning students from the University of Pennsylvania. The staff numbers about 23 people, including two registered architects.

The main thrust of the organization is to work with community groups. Once a design is articulated through a series of meetings between citizens and the architects, the workshop helps the group locate funding—often a time-consuming and frustrating process. The experience in Philadelphia has been that despite the frustrations, community groups and the design center have learned to work with the bureaucracy in ways that were impossible a decade ago.

"In 10 years a lot of things have changed," reflects Baxter. "The architectural profession has changed—they're working on conversions of buildings these days instead of commissions. And community organizations are more sophisticated—they know how to use tools—to use federal programs. They know how to read and write proposals. And most of all," concludes Baxter, "they've learned how to wait because they have seen things do work—that dreams can become realities."

The Chicago Architectural Assistance Center is a late bloomer in the history of community design centers. It was founded in 1974 by George Sample, AIA, formerly of Skidmore Owings & Merrill, and several other architects. It emerged, says Sample, the director, "primarily as a result of the riots. It just took longer to happen here than in most places." The center began in association with the Chicago Legal Assistance Foundation, which still provides it with about one-third of all its referrals. The center provides extensive housing rehabilitation services. Referrals from a number of city agencies are the result of code violations. Sample estimates that close to a third of its work comes from code problems. The city's community organizations provide the final third of the center's referrals, with a handful of walk-ins off the street.

Under the city's financial assistance program for low-income homeowners, the city's department of planning, city and community development refers low-income homeowners whose properties are in violation of the building code to the center to analyze their buildings and draw up a thorough "work write-up" along with drawings for contracts to bid on the rehabilitation jobs. Many buildings are three-unit flats which must be converted to two units. The write-ups are an important part of the job. They are so detailed that they must specify how long each crack is and how much should be patched, in addition to more technical specifications. The write-up is necessary because many of the small contractors bidding on the job may not be able to read architectural drawings well enough to develop a comprehensive bid. Of the work done under this program, Sample estimates that perhaps only 25 percent involves real design work. The rest is fairly straightforward renovation detail work.

Does director Sample feel that the individual architectural assistance provided through this program builds community understanding of the role of the architect? "No," he says. "I

think our community work is far more visible in that respect. When Minnie Jones comes to us with a piece of paper from the city's inspection task force, she usually says, 'They tell me I need an ar-chi-tect—I understand you're an architect, so draw me a blueprint so I can get my house fixed.'

An example of the kind of visible community work done by Sample and his staff of eight is a study done for a community group called "tranquility." The study examined a "minizone" or target development neighborhood and listed alternative redevelopment strategies for the residents of the community to explore. The city's department of human services paid for the study through a one-stop housing service center, "Rehab," founded and spun off by the Chicago CDC. The illustrations included here are taken from that study.

The center's experience with city agencies appears to be an exercise in black and white (no pun intended). It receives block grant money from the department of human services as well as the department of planning, city and community development. The rehabilitation work done for the city's planning department is satisfying, Sample says; "Compared to other government agencies, these people are fantastic. It's very straightforward." The work done for the department of human services sounds like a futile paper pushing exercise in which the design work is incidental to the process.

"The red tape is unbelievable. Every building we work on has to be approved by the group [Rehab] we started as a one-stop housing center, then they send it to the human services people; they approve it, send it back to Rehab and then they send it back to us.

"It takes forever," says an exasperated Sample.

The problem pinpointed by Sample is one that continually cropped up in discussions with other CDC directors: It pays to have friends in the right places—friends who believe in what the design centers are doing and understand what they do. Without it, says the head of the Louisville design center, you might as well throw in the towel.

Louisville's Community Design Center director/architect, Ronald W. Gascoyne, shares both the vision of what a design center can do for a community along with the frustrations expressed by George Sample and other directors interviewed. Initially, the Louisville group had project contracts under community development block grant funding for planning and technical assistance totaling \$35,000. Most recently, however, a proposal for an extension of the same kind of contract was rejected in favor of a personal service contract, which, in Louisville's experience, has been an exercise in frustration. The smooth communication of the Philadelphia group's working relations with the city is absent in Louisville, where the community development cabinet approves all work undertaken by the center.

"Except for assignment," says Gascoyne, "the cabinet has no control of the quality, type or procedure with regard to the assistance the design center provides its clients. We encourage maximum participation by our clients and much commitment on their part—a time-consuming, and hence costly process. The projects proposed by the design center for approval have tended to be parochial, zany or widely distributed throughout the target areas, which is an anathema to the cabinet's evolving direction toward 'comprehensive demonstration projects.'" The architect/director's frustration is in not being able to attack the problems as he sees necessary. His point is echoed by Augustus Baxter in Philadelphia, who maintains that one of the hardest things is to retain the independence of the center, not a tool of the city agencies who support it.

In spite of the friction between some city officials and the Louisville CDC, meaningful things have been accomplished. The CDC has been responsible for the rehabilitation of a number of single-family residences; planned the reuse of a residence as offices and exhibition facilities for an advocacy group; developed plans for the adaptive use of a national historic landmark, an

old pumping station, for the use of an art advocacy organization; analyzed and developed design criteria and schemes to inhibit deterioration of a retail/residential neighborhood into a commercial strip, and made a comprehensive study of the reuse of alleyways to better serve the community and its residents.

While there is frustration with the procedures required under its current contract with the city, Gascoyne's group recognizes the significance of block grant funding for both nonprofit groups and private architects. "There are opportunities for private architects to make proposals through the block grant program," says Gascoyne. "I have found an almost universal indifference to the \$16 million worth of architectural and urban design projects which will be undertaken here next year. . . . People just aren't aware of the opportunities this program offers."

Plan/Build, Inc., in Syracuse, is one of the most ambitious community design centers in the country. Like most CDCs, it works with community organizations and low-income individual homeowners. What is ambitious about the group is its plans to set up a housing rehabilitation corporation to buy, rehabilitate and resell homes to low-income people.

Richard Paccone, architect and executive director of the organization, feels that the biggest single contribution made by the nine-year-old group is to stress the importance of homeownership in contributing to the stability of the city. Toward that end, the group has become a force against city demolition of houses, has worked closely with community groups to help develop plans for both residential and commercial redevelopment and is currently working with the city department of community development staff and private developers to draft an urban development action grant application for new housing and business development.

"Politically, we're in a good position," says Paccone. "I don't mean to be cocky. We remain an independent architectural agency. We do bite the hand that feeds us over issues . . . there is friction, but it's working. We have, I believe, been influential in the way the city's community development department operates."

In more specific terms, the group has a CD contract to assist families to qualify for loans and grants for rehabilitation of their homes. They develop design concepts and drawings to supplement the city's abilities to serve its clients. Unlike other design centers, the group works with families to help train them to perform rehabilitation tasks that would otherwise bring the cost of the job beyond their ability to pay, even with government help. A major effort by Plan/Build is in the area of training people to use sweat equity. Toward that end, it has helped shape the city's homesteading program for the poor and has been involved in applicant selection.

It is almost with a sense of urgency that Paccone describes plans for the group's nonprofit housing rehabilitation corporation. Plan/Build, Inc., with the help of a few investors, hopes to buy up those houses that no one else is willing to work on. Using the expertise of a CETA rehabilitation specialist and others on his staff, Paccone plans to attack code violations, repair them and sell the units to low-income neighborhood people who will be trained to complete the renovation work themselves.

The group anticipates some resistance to this latest effort, but its commitment to helping poor people own their own homes seems to outweigh any reservations it might have about making the leap from a design and planning agency to a developer.

It's clear that community block grant funding provides a new key to the survival of many community design centers. It's also clear that, after a decade, the centers no longer exist as a kind of guilt-ridden response to the riots which stimulated their creation. This new breed of *pro bono* architecture has established its legitimacy—to the community groups and individuals it serves, to the architectural community of which it is a part and to the municipal agencies and federal programs which support its operation. □



The Arch: An Appreciation

By George McCue

The tall blond graduate student in economics from Amsterdam tilted her head far back to focus her Japanese camera on the towering, shimmering symbol of the American West done by a Finnish architect. She moved to another position to catch an almost blinding highlight that flashed from near the stainless steel summit. Then she took a picture of two companions, with the base of the monument as background. Then she walked close to the mirror-like surface, and looked at it intently. Then she gave it a light pat, and stroked it with her open hand.

If there were a choreography for something like "Afternoon at the Gateway Arch," these would be its opening passages. Of the 3.5 million persons from most parts of the world who visit

Saarinen's vision: 'enduring for a thousand years.'

Eero Saarinen's monument at St. Louis every year, few seem able to walk past its gleaming triangular bases without administering what the arch's custodians call The Touch.

"I like to try to see how structures are put together, and I looked at the Eiffel Tower for a long time. But I'll have to ask somebody about the gateway arch, because it's all under that beautiful skin." This was a building contractor from San Diego. He took the pictures; he patted the beautiful skin and stroked the finely crafted welded seams, and finally he rapped it with a knuckle. He was rapping a quarter inch of stainless steel plate, enclosing three feet of concrete lined with three-eighths inch of structural steel plate, all tied together with a thick lattice of rods and bolts. Men almost always test the arch with their knuckles, and they always seem pleased, even surprised, at its solidity.

The Touch may be partly a ritual gesture of respect (and, after long association, of affection), but it seems that this contact sometimes may be made to confirm that the arch is really there, a substantial, dependable vision that Saarinen confidently asserted could endure for a thousand years, and not like a rain-bow that can be verified by the eyes but never by the fingertips.

The gateway arch has its moments of ephemerality, despite all that structural thickness, and despite its being 630 feet tall and 630 feet between the points where the legs spring from the ground and soar skyward to be joined high above the city. In the river mist of early morning the arch appears to have become partly dissolved overnight, and its upper structure fades in and out of the gray atmosphere. With an overcast there is no shiny finish. The polished steel takes on the character of the ambient light, so a dull day makes the arch as impassive as a piece of neglected pewter, although its form can make a forceful dark silhouette when the ceiling lifts. On a bright day there is another condition that gives cause for wonder whether the arch is really permanent. On the side hit by the sun, the surface becomes crinkly, like reused kitchen foil. The thick, hard stainless steel ripples under the stresses of expansion and contraction as one huge surface warms up, while the two shaded sides remain cool. It was this pushing and pulling of the structure by solar action that made it necessary, during construction, to make the transit measurements at night.

The vision had a long, difficult gestation. It has been 43 years since the riverfront blocks of the original village of St. Louis were designated a national historic site by President Franklin D. Roosevelt. In its entirety, this is the Jefferson National Expansion Memorial, and from the outset the intention was to have a monumental image as its dominant feature.

In the somewhat monumental language of its inception, the project was conceived to provide "an appropriate national

memorial to those persons who made possible the territorial expansion of the United States, including President Thomas Jefferson and his aides, Livingston and Monroe, who negotiated the Louisiana Purchase, the great explorers, Lewis and Clark, and the hardy hunters, trappers, frontiersmen, pioneers and others who contributed to such expansion."

The two-stage design competition, with 172 first-stage entries and five finalists, was concluded 30 years ago, on Feb. 17, 1948, with the award to Saarinen by unanimous vote on the first ballot. The jury's evaluation of the design was that "it tends to have the inevitable quality of a right solution. . . . The memorial structure is of that high order which will rank it among the nation's greatest monuments."

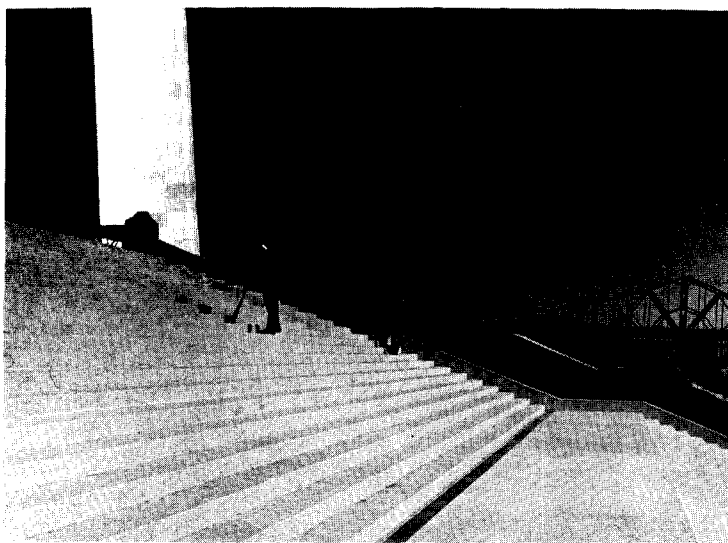
Thirteen years remained to Saarinen, in which to refine his scheme. In those years he did all the other 27 commissions that constitute the major body of his work. Ten of these were yet to be completed when he died on Sept. 1, 1961, at the age of 51. At that time excavation for the gateway arch foundations was still in progress. The arch, said Aline Saarinen at topping-out ceremonies in 1965, "was the climax of my husband's career—the thing that meant most to him."

Saarinen was 37 when he won the St. Louis competition. Most of his previous work had been in collaboration with his noted father, Eliel Saarinen, and his own record of independent architecture consisted of the Music Tent at Aspen, Colo., and two experimental projects—a community center and an "unfolding" house—developed as models. But he was seasoned in large conceptions, and fully equal to the challenges that the St. Louis project presented in the scale of the area to be designed, and the magnitude of its exceedingly troublesome physical obstacles, chief of which was an elevated double railroad track from the 1880s on a scaley structure 25 feet high along Wharf Street, just inside the east line of the memorial area. A single track lay, and still does, in the middle of Wharf Street, city property.

The contestants were conducted to the quicksands with the bleached bones of 25 or more riverfront design proposals put forth since the 1890s. St. Louis has a historic urge to prove that it has not really turned its back on the river that gave it life. After Eads Bridge was completed in 1874, making the city a railroad center and accelerating the steamboat's demise, the business core began moving away from the levee. The buildings were continued in service as warehouses for furs, feathers and wool, with a scattering of goulash restaurants, bars and other picturesque low-pressure enterprises. All these buildings dated from about the same period, the years soon after the great fire of 1849 burned out everything in the old town area except the 1834 Old Cathedral and the Manuel Lisa Warehouse, a two-story stone building of 1818, last survivor of the early village. Much of the rebuilding availed itself of the new technology of iron-front construction.

As this area declined, plans proliferated for endowing it with profitable new life. There were projects calling for business and residential towers, and for sports arenas, railroad terminals, airplane landing strips, continuous warehousing for the length of the area with rooftop parking all the way, and for vast neo-classic and Beaux-Arts promenade compositions of fountains, museums, statuary and river overlooks. All these attempted to combine revenue-producing function and civic art. The white-city evocations inspired by the world fairs of 1893 and 1904 wistfully ignored the harsh reality of the coal smoke that poured from switch engines, industrial plants and house chimneys, often darkening the city until midmorning, encrusting the noblest buildings with grime and sending residents to the suburbs. With all their variety of forms and uses, they had one thing in com-

Mr. McCue, Hon. AIA, was for 19 years art and urban design critic of the St. Louis *Post-Dispatch*. He has lived in that city off and on for a total of 40 years, and he followed closely the construction of the arch.



Photos by Joshua Freiwald



A ride to the top of an 'awesome slippery slide.'

mon—the stumble over the elevated tracks. The pervasive treatment was to wall in the tracks with arcaded masonry up to a promenade deck at the same level as Third Street, with ramps to the levee.

Some of these efforts and their frustrations were still in the public memory at the time of the competition, and any misgivings about the possibilities of still another go at the riverfront were reasonable. But this time the circumstances were much more productive.

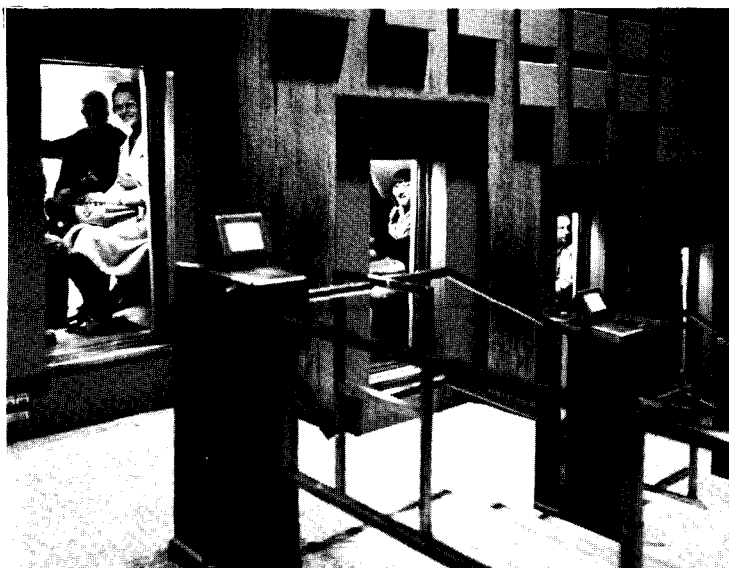
The park service assigned Charles E. Peterson to record and evaluate some 400 buildings to be removed, and to supervise the preservation of artifacts for an architectural museum. He employed John Albury Bryan, a St. Louis architect, who thus became the pioneer historian of the city's architectural legacy. By 1941, all but the Old Cathedral and the Lisa Warehouse were gone, with the relics piled in a temporary building near the cathedral.

Then came World War II and the Korean war, and some 20 years in which the emptied ground became downtown's biggest parking lot. The city's prompt participation cost it two decades of real estate taxes, and put numerous displaced concerns out of business.

To keep the project alive, the memorial association sponsored the design competition with \$75,000 in prizes, and it had the good fortune to enlist George Howe as professional adviser. On the jury, chaired by William W. Wurster, were S. Herbert Hare, Fiske Kimball, Richard Neutra, Roland A. Wank, and St. Louisans Louis LaBeaume and Charles Nagel Jr. The first stage was intended to elicit "qualities of imagination, vision, power of analysis and practical ingenuity" in five designers, who then would prepare finished submissions.

Saarinen's first-stage perspective showed a four-sided arch close to the levee, with sculptures and murals in an arcade running parallel with the arch and extending beyond the bases. On the East St. Louis side of the river, today still a wasteland of railroad tracks, highway ramps and vacant ground, he drew a landscaped area with stadium, playing fields and boat basins. (Designs for areas outside the memorial tract were excluded by the park service from the second stage.) Howe's program had suggested that the architects associate themselves with painters and sculptors. In his final report he wrote that this was a mistake because of the difficulty of judging plan and ornament simultaneously. He recommended independent competitions for "the two sister arts."

Saarinen's associates were J. Henderson Barr, associate designer; Dan Kiley, landscape architect; Alexander Hayden Girard, painter, and Lily Swann Saarinen (his first wife), sculptor.



In his second-stage design, Saarinen made the arch an equilateral triangle in section, with an exquisitely refined taper as it rose in an inverted catenary form. He kept it near the levee, within a few feet of the strip from which the elevated tracks were to be removed. The arch's north leg was placed north of the Lisa Warehouse, which was to serve as entrance to an underground loading platform for the arch elevator. A river overlook housing a railroad museum was at the northeast corner of the site, and a second overlook with river museum at the southeast corner, both with restaurants. A museum for the architectural relics was at the southwest corner, and near the wooded north end were a frontier village reconstruction, a tea pavilion and a campfire theater—the latter standard in national parks. Kiley's landscaping covered most of the area with trees, and provided a gentle upward slope from the levee, to extend beneath the arch, past the sculpture arcade and to the future expressway at Third Street.

The track relocation became a stone-wall controversy involving the railroads, the city and government agencies, and it almost killed the project. It was resolved in 1957, after the St. Louis Chapter/AIA, then headed by Eugene Mackey, prepared a questionnaire and survey directed at bringing the issues into focus. This was turned over to Mayor Raymond R. Tucker, an engineer, who achieved, with editorial pressure by the *Post-Dispatch* and *Globe-Democrat*—a compromise solution: The tracks were moved inland a few feet, to pass through cuts and tunnels concealed in a hillside. The slope to the river was destroyed, and the topography reversed to place the arch on an embankment to be built high above the levee, with the slope now gently downward toward Third Street and precipitous at the levee. The new track route crossed the rear of the Lisa Warehouse, which had been painstakingly restored, so it was torn down. The few rocks identifiable as original to its walls were marked and piled in the Old Courthouse basement, for the day when the warehouse might be reconstructed somewhere—a fractional residue for a remote possibility. The new bridge and its highway approaches at Poplar Street, the site's south boundary, took from the memorial 15 acres that had included the architecture and river museums, the south overlook and the larger of two parking lots.

With some of the crucial "givens" of the program a shambles, Saarinen reworked his entire concept. The arch was moved west, to about the site of the sculpture arcade but high above it on the new embankment, for which he designed monumental steps. Instead of a small underground space for elevator loading, he

Boarding one of eight capsules in each foot of the arch (left), one rides to the top (below) and looks out slit windows at the new construction of St. Louis on one side, East St. Louis on the other.





carved out a subterranean visitor center for the entire distance between the legs, to include a pair of small theaters, with entrance by inward-sloping ramps.

Only the two river overlooks remained from the competition scheme's surface features. The sculpture arcade, museums, restaurants, village, tea garden and campfire theater: all abandoned. But the new position made the arch more prominent, and reinforced its axial relationship with the Old Courthouse and a mall to be extended westward on the same axis. Pedestrian bridges over Memorial Highway are due in two years. The strengthened association with downtown was at the sacrifice of association with the river—the old turned back again—which now cannot be seen from the base of the arch or from anywhere in the memorial site but the edge of the embankment.

The most serious loss was the architectural museum and many of the relics gathered for it. Bryan telephoned a summons to this writer one morning to hurry to the museum warehouse. He said that he had been given a few weeks to dispose of the collection to properly qualified museums and schools, because the warehouse was in a fill area for dirt excavated for a depressed section of Memorial Highway—a short, economical haul and a contribution to the embankment. We toured the dimly lighted, crowded collection—an Aladdin's cave of columns, capitals, moldings, sculpture, keystones, quantities of iron pieces from imposing facades, doors and so on. "How the hell am I ever going to get all this into good hands?" Bryan was quivering with rage, almost in tears. The Smithsonian took the choicest elevator cage, with red plush benches, and some other things; several universities picked up the more portable bits of old St. Louis. Some were moved to the Old Courthouse. But the time was too short for disposition of large, unwieldy fragments of old buildings, and when the deadline came, the remaining artifacts vanished under the highway dirt. Recently, in excavation for a reflecting basin, a lifesize stone torso, male, with a cluster of grapes, was turned up—a Dionysian fragment, evidently, that had become archeology.

The arch rose steadily during three years and four months, with spectacular precision. Like Eads Bridge, it was a unique structural invention. MacDonald Construction Co. was the prime contractor for the entire development, including track relocation. The steel was prefabricated in sections 12 feet high

and erected by Pittsburgh-Des Moines Steel Co.

With Saarinen partner John Dinkeloo in charge of engineering, the great structure was rooted in bedrock, and the form that looks so slender from a distance is 54 feet from corner to corner of its three sides. For the first 300 feet of rise, the legs were weighted with concrete, poured between the outer stainless steel and the structural steel lining, three feet thick at the base and tapering to one foot. It is post-tensioned with 252 bars, 1 and a quarter inches in diameter, loaded to 71 tons by hydraulic jacks. Some 170 bars extend to the top of the concrete mass, and the others were terminated and stressed at intervals during the pour. Additional compression on the concrete is provided by thousands of lateral bolts, tightened by hand. For the rest of its height, the structure is stiffened by crossbracing within the steel walls, which taper to 7 and a half inches thickness at the top. In each leg, there is a service stairway and a train of eight capsules, each capsule seating five visitors knee-to-knee in a semicircle. At the summit, they walk up a short distance to rows of slit windows. There is one more step in altitude, for access to the red aircraft warning light, serviced by climbing out through a hatch and standing on top of the world's most awesome man-made slippery slide.

The entrance ramps, open to the sky, are efficient catch basins for rain. Five drain channels cross each ramp, but one cloud-burst overloaded the drains, with some water buildup outside the glass entrance doors. The drains were enlarged by Ted Renison, who came to the project in 1961 as a Saarinen engineer, and remained with park service.

Saarinen's concept had not included a facility for interpretation of the history of the westward expansion. In 1960, when construction was about to begin, George B. Hartzog Jr., then the National Park Service superintendent at St. Louis, arranged for Saarinen to add space for a museum in the underground area. This roughed-in cavern, 290x150 feet, 20 feet from dirt floor to concrete ceiling supported by a grid of 40 columns on 30-foot centers, was closed for 10 years.

Then Hartzog, having advanced to director of the National Park Service, selected Aram Mardirosian and his Potomac Group to design and finish the museum, in collaboration with contract manager Frank Phillips, an NPS veteran who directed construction, installation of exhibits and quality control. The



The arch as a delicate orientation point (above). Below, the framed Old Courthouse; across page, the Old Cathedral, gracefully arched Eads Bridge, the Mississippi and East St. Louis.



Savoring unexpected glimpses from far and near.

museum, ranked by the park service as its biggest and best, was opened in 1976.

A few pieces of sculpture related to the expansion theme are in the museum, and it is hard to see the loss of the surface arcade as anything but a benefit, like absence of the tea house and campfire theater. As Aline Saarinen said at the topping out, "You can't use sculpture in the ordinary sense because of the vast scale. My husband loved the Old Courthouse, a building of great authority and beauty and conceived it as part of his design. The Old Courthouse is sculpture in relation to the arch."

After Saarinen's death, his partners, Joseph N. Lacy and John Dinkeloo, and chief designer Kevin Roche, supervised completion of the arch as Saarinen Associates, now Kevin Roche-John Dinkeloo & Associates. The grounds are being finished, with extensive plantings of trees and shrubs, and two 2.5-acre free-form reflecting basins, by Harland Bartholomew & Associates. The Old Courthouse, which was at first absent-mindedly marked for replacement by an office building, was saved through desperate effort by Peterson and Bryan to have it transferred to the park service and included in the memorial area. It is being rehabilitated.

There is abundant evidence that the gateway arch has grown in the national consciousness as a pre-eminent symbol and memorable image, for which the sacrifices were well spent. For those of the St. Louis region it stands as a resplendent vision, visible for more than 30 miles from Illinois hilltops and highways. On the Missouri side, more hilly terrain limits the viewing distance to 15 miles or so on clear days, when it is revealed by a sudden flashing of the sun from the summit curve. Within the city, the experience of discovering and rediscovering the arch is varied considerably by one's location. It dominates the skyline from several expressway approaches, but drops from view at closer range when tall buildings intervene. Then, across the roof of a warehouse, or at the end of a row of alleys, or high above industrial chimneys, suddenly there it is. The unexpectedness of these far-and-near glimpses is the most exciting part of the viewing experience for those who live with the arch, and who can savor its endless variety from day to day. There was a time when floodlighting was considered. Thankfully, this idea was left swinging slowly in the wind. The response of the gleaming finish to the light that bathes it is one of the special delights at night, when stray colors from downtown sources race along its crisp edges or tint parts of its surface. Sometimes a towboat searchlight will strike a blaze near its base. And under a full moon it glows with an unearthly luminosity that is worth the trip from anywhere to see. The towering form reads distinctly from a passing plane, and its gateway symbolism becomes even more far-reaching from such a height.

The arch contributed to a renewed sense of civic identity that seemed dissipated after removal of the wondrously visionary Louisiana Purchase Exposition, produced with prodigious effort in Forest Park so long ago. Its economic effects are more measurable, in the revival of downtown investment and a new stir of street life, especially along the levee and in Laclede's Landing, the nine-block remnant of the city's first street pattern, cobblestones and all, immediately north of the memorial. Its sturdy warehouses, similar to those demolished, are found to be readily adaptable to restaurants, offices, studios, galleries and apartments.

"The impact of the gateway arch has been enormous," said Edward A. Ruesing, executive director of Downtown St. Louis, Inc. "One has to recall that in the '50s the project had many detractors who thought parking was the highest and best use of the cleared blocks. What was seen by some as a nonutilitarian monument is the main reason for millions of dollars in downtown improvements, and for St. Louis's need for the 2,000 new hotel rooms it has gained since 1975. This would not have come about without the arch momentum, which has made tourism a growth industry here." □



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Built-Up Roofing Systems Performance Comparison							
System	Thermal Shock Factor NBS Minimum** Criteria-100°F	Tensile Strength NBS Minimum-200 lb/in at 0°F	Char/Rot	Wicking	Absorbs Moisture	Lays Flat	Needs Glazing
3 Perma Ply-R	570°F	277 lb/in	No	No	No	Yes	No
4 Perma Ply-R	528°F	372 lb/in	No	No	No	Yes	No
3 Perma Ply No. 11	275°F	171 lb/in	No	No	No	Yes	No
3 fiber glass Felt Brand C	146°F	141 lb/in	No	No	No	Yes	No
4 fiber glass Felt Brand C	149°F	202 lb/in	No	No	No	Yes	No
3 fiber glass Felt Brand D	140°F	148 lb/in	No	No	No	Yes	No
4 fiber glass Felt Brand D	184°F	197 lb/in	No	No	No	Yes	No
Base Sheet & 3 No. 15 Organic Felt	231°F	302 lb/in	Yes	Yes	Yes	No	Yes
Base Sheet & 2 No. 30 Organic Felt	212°F	277 lb/in	Yes	Yes	Yes	No	Yes
Base Sheet & 3 No. 15 Asbestos Felt	89°F	165 lb/in	Yes	Yes	Yes	No	Yes
4 No. 15 Pitch Felt	202°F	311 lb/in	Yes	Yes	Yes	No	Yes

other systems to Perma Ply-R, see the Performance Comparison Chart above. Perma Ply-R outperforms the field in thermal shock performance.

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*T.M. O. C.F. Corp. **Preliminary Performance Criteria for Bituminous Membrane Roofing was introduced by the National Bureau of Standards in November, 1974.

BOOKS

The Computer as a Tool That Is 'Here to Stay'

Computer-Aided Architectural Design. William J. Mitchell. New York: Petrolcelli/Charter, 1977. 571 pp. \$29.95.

In 20 years, the computer has gone from a monster to a midget in size and cost and from midget to monster in its pervasiveness and giant in its capabilities. Think what the next 20 years will bring! Make no mistake about it: The computer is here to stay, and it will play a large part in how we provide architectural services. What we have to do is learn about it, how to leash it and how to make it work for us.

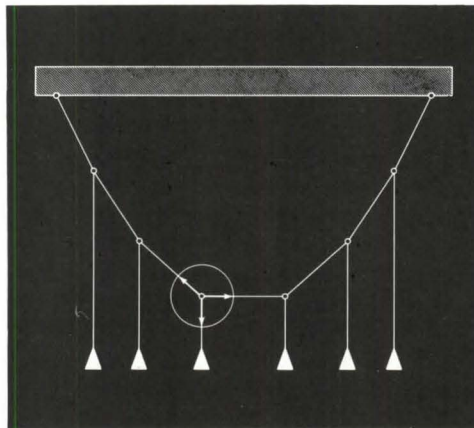
Of all the authors writing about it, William Mitchell comes the closest by far to helping the ordinary person understand the computer and how it may assist in architecture. Despite occasional lapses into the world of academe, the jargon of the computernik and the predilections of his Australian background, Mitchell (who has taught at Yale, the University of California at Los Angeles and Cambridge) brings clarity to a complex subject, and mostly in good American English. His knowledge goes well beyond the computer into the worlds of architectural practice and architectural research as well as writing. For example, he served as conference planning chairman and editor of the voluminous proceedings of the 1972 Environmental Design Research Association conference (EDRA 3) held in Los Angeles.

The structure of *Computer-Aided Architectural Design* is logical in organization, and the meat is of prime quality to match the solid bones. The contents are aptly described on the book's jacket flap. Part 1, "Fundamental Concepts," introduces computers and their capabilities, discusses the theoretical foundations of computer-aided architectural design and describes how computer-aided design techniques can be employed in practice. Part 2, "Data Bases," discusses methods of encoding and storing building and site description data in computer memory. Part 3, "Interfaces," deals with communication between user and machine. Part 4, "Problem-Solving," discusses numerous

computer-oriented techniques for solving practical problems. The illustrations both illuminate the text and provide helpful ideas to the practitioner, while the reading lists and extensive bibliography provide a plethora of additional references. The index is sometimes useful.

This reviewer's attention was particularly drawn to the chapter on feasibility analysis and (architectural) programming because of a current task in overseeing completion of a forthcoming book on facility programming. This chapter contains considerable detail on computer techniques useful for problem structuring and data analysis in the problem-starting phase of a project, while the following chapter on automated spatial synthesis is complementary in probing the problem-solving phase.

Most minicomputers and desktop equipment today are concerned with the automation of numbers and words. Com-



Analogue modeling technique employed by Antoni Gaudi for design of vaulting.

putation and word-processing are emphasized. But for many architects, being what they are, the chapters on (computer) graphics will hold much interest. Graphics applications have been more expensive and less used in architecture, but their use in the future may equal or even outstrip the mere crunching of words and numbers.

Mitchell candidly points out that while the process of technological development is continuously and rapidly expanding the realm of feasible applications, the techniques discussed in his book range from

those which have become clearly feasible in practice comparatively recently, while others are still only marginally practical or still in experimental stages. He also indicates that as hardware costs decrease, software costs increase because programs are still produced by hand! However, the practical economics of implementation indicate that labor is replaced by capital, but as the cost of skilled professional labor rises and automation becomes cheaper and more effective, less capital is able to substitute for more labor. Figure that one out.

In its role in architecture, the computer may store and retrieve data describing a design, automatically generate solutions to well-defined problems and test potential solutions. In doing so, it replaces or augments people skills and hand production methods. Some will welcome such changes, some won't. But the potentials of linking cheap computers in small offices to large data networks are intriguing to some as a way of competing with a trend toward bigger and multibranch architectural offices with great internal sophistication.

Drawing boards won't be immediately replaced by computer graphics terminals nor will the entire fragmented building process rally 'round the computer just yet. Discrete application programs will gradually replace manual design procedures in a nontraumatic way. Just as gradually, the professional roles of the designer of design systems and the data base manager will emerge, Mitchell believes, while the traditional patterns of the architect's consultants will change as the computer enables better coordination of the work. The conclusion one draws from Mitchell's book is that the architect will have better control of the programming and design process with the aid of the computer than is currently the case.

The book is written for clarity in reading and enhanced understanding. Each new term is defined as it is introduced. Every architect under the age of 85 should read it. But it's just like sailing a boat. You can read all you want about the fundamentals and the fine points, but a book won't teach you to sail. You have to

continued on page 70

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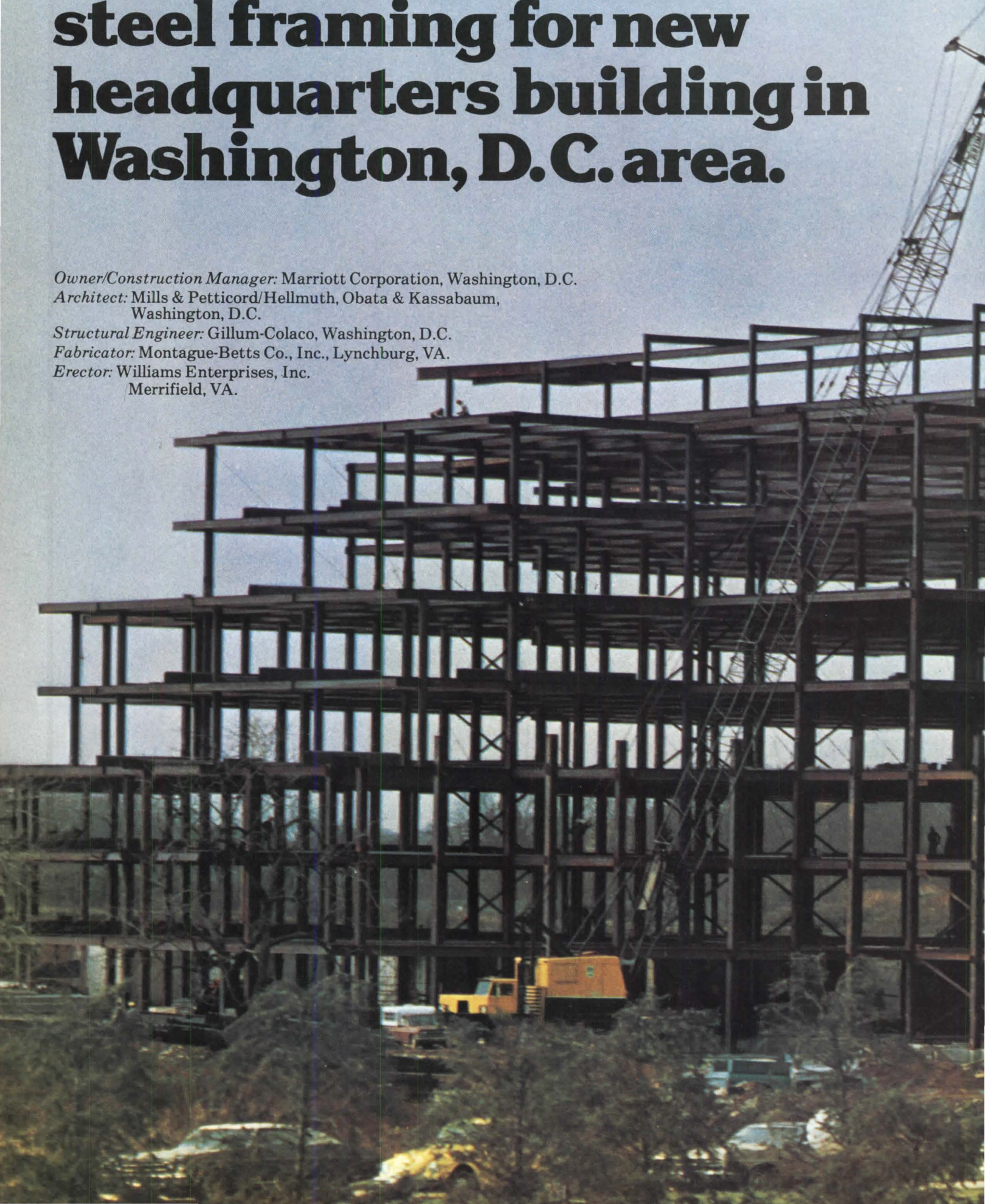
Owner/Construction Manager: Marriott Corporation, Washington, D.C.

Architect: Mills & Petticord/Hellmuth, Obata & Kassabaum, Washington, D.C.

Structural Engineer: Gillum-Colaco, Washington, D.C.

Fabricator: Montague-Betts Co., Inc., Lynchburg, VA.

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Books from page 66
 get in the boat and grab tiller and sheet. Then you have to sail it, despite a few dunkings. It's the same with computers. Robert Allan Class, AIA, Director of the Practice Division, Institute Headquarters

Hospitals: The Planning and Design Process. Owen B. Hardy and Lawrence P. Lammers, AIA. Germantown, Md.: Aspen Systems Corporation, 1977. 259 pp. \$29.75.

This is a timely and informative book about a process which, as the authors point out, has become much more complicated and in which a number of new types of professionals (such as construction managers) have established a footing. This is not another description of the

content of the various functions of a modern hospital, such as Hudenberg's *Planning the Community Hospital* (1967) or Allen and Karolyi's *Hospital Planning Handbook* (1976).

This book is supplementary to the books mentioned above and to Zeidler's remarkable account of the design considerations of one particular hospital (McMaster Health Science Center) in *Healing the Hospital* (1974).

Examples of designs illustrated suggest the authors' preference for the traditional approach of a nursing tower over a diagnostic and treatment podium which was made popular in the '50s and '60s by hospital consultant Gordon Friesen. This is not surprising from members of a firm of "functional planning consultants," who

were formerly with the Friesen organization. This background also shows up in the unqualified assertion that patients prefer the privacy of single rooms. Thompson and Fetter (*Health Services Research*, April 1969) show, however, that the response of patients in the lower socioeconomic groups is significantly different.

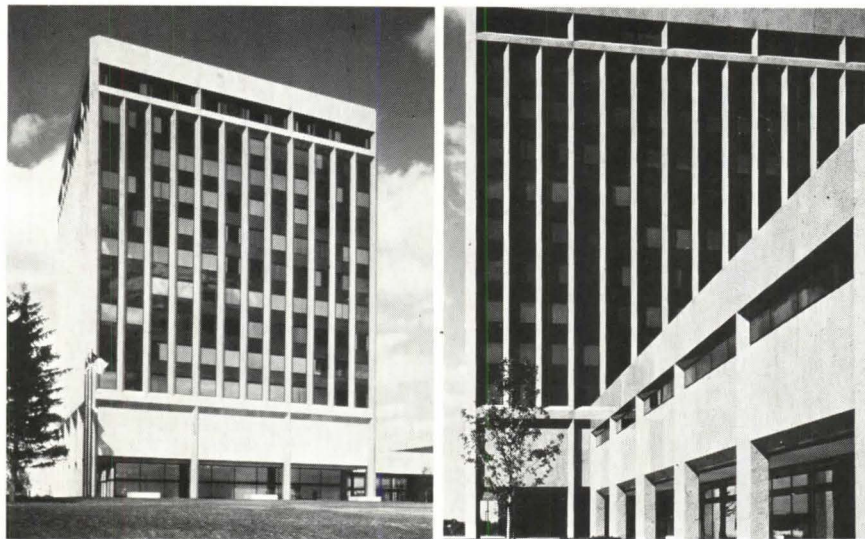
The most controversial feature of the book, which clearly shows the professional bias of the authors, is an unsubstantiated attack on functional planning, or programming, carried out by architectural firms. With such an arrangement, it is stated, "functional planning almost invariably has a secondary role which suffers when key internal decisions are made." This is hardly likely to be the case in firms with a health service planning and programming capability and people with a wide range of qualifications in fields such as medicine, nursing, public health and operations research, and where there is a commitment at the managerial level to this area of work. Indeed, the quality of health service planning and programming depends more upon the caliber of the individuals carrying out the work than on the setting in which they operate. The integrated firm should have the advantage of improved communication among programmers and designers; failures in this aspect of communication account for many functional errors in hospitals. "Functional planners" vary in range of services provided, e.g., some have the qualifications and expertise to produce schematic designs, in which case the architect becomes little more than a technician. This factor, which affects the argument, is not discussed, nor is this review the place to go into more detail on the valid advantages and disadvantages of these alternative approaches.

Throughout the book, "A/E firms" are referred to without any description of the different roles of architects and structural, mechanical or electrical engineers, or of the way in which these roles are interrelated. There is, however, no stated preference for combined architectural and engineering firms, nor are the pros and cons of this arrangement dealt with.

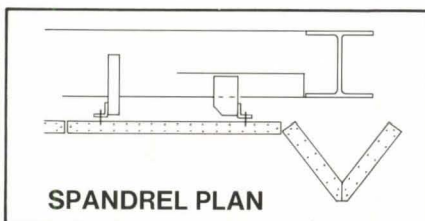
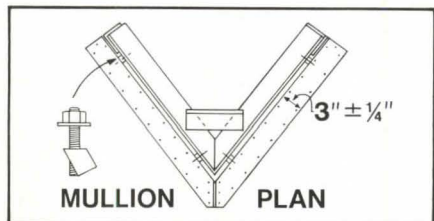
A good feature of the book is that "physical and functional evaluation" is discussed at an early stage, and a holistic approach is recommended. Although the reference here is primarily to evaluation of an institution's existing facilities, the principle can be extended to evaluation of recently completed health care buildings by those undertaking the programming and design of comparable new buildings. (Postoccupancy evaluation, however, is often advocated as the last link in the planning and construction chain of events, but is seldom undertaken properly for lack of motivation or resources.) *Books continued on page 72*

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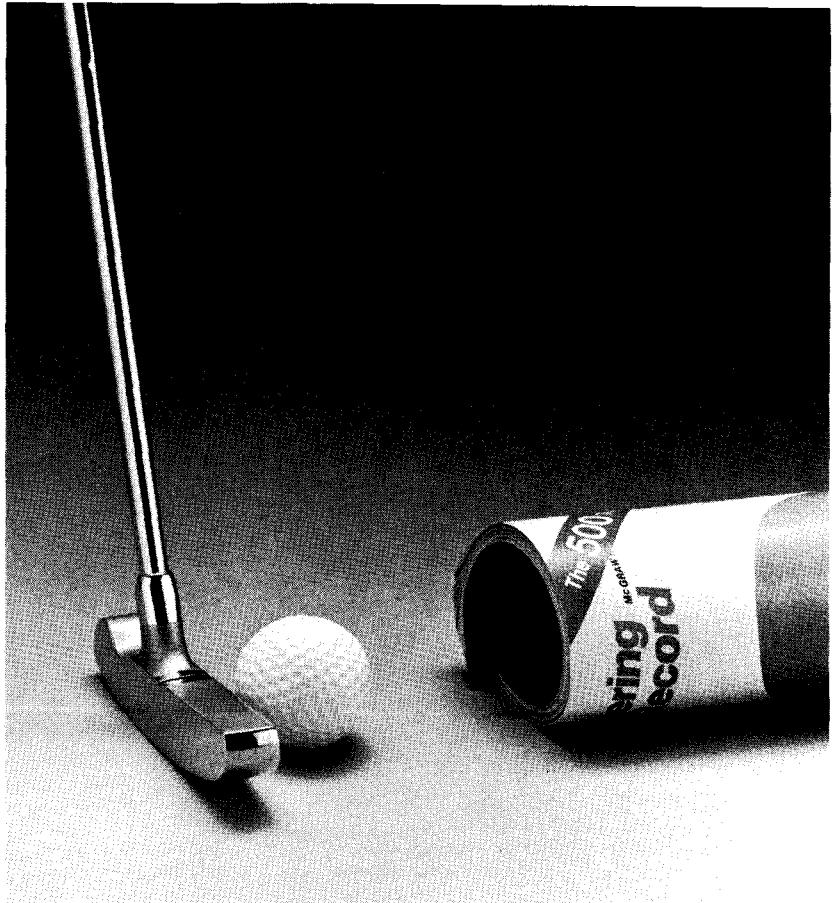
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*Engineering News-Record, May 18, 1978

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The vital need for adaptability is not stated where it belongs, under schematic design, but in a brief chapter on modernization and expansion. "Interstitial spaces" are referred to but not defined, and it is surprising to find only a passing reference to certificates of need. It is stated that "modern plants, efficiently designed, will exhibit a (net-to-gross) ratio in excess of 64.5 percent" (a surprising figure, seemingly precise, but nowhere explained). An entire chapter on this subject follows entitled "design efficiency: key to construction cost savings." While some of the means recommended to avoid excessive circulation space are sound, a recent hospital systems study has shown that this kind of slavish adherence to net-to-gross standards leads to overtight planning and reduced adaptability, and often to increased cost.

Apart from the foregoing criticisms, this book should provide useful guidance, especially to hospital administrators and boards without previous involvement in planning and construction. For example, the case for a "director of planning" on the hospital's staff is well made. The checklist of "activities of the professional planning and design team" (pp. 32-37) is helpful information, despite a few reservations. Unlike many books on subjects of this kind, it is well written and laid out and easy to read, with a minimum of jargon. Much of the material will be familiar to experienced hospital architects, but for most there is likely to be something new and worth reading. *Anthony Noakes, RIBA, Stone, Marraccini & Patterson, San Francisco, on leave from his post of superintending architect, Department of Health and Security, London*

Planning and Design for Perinatal and Pediatric Facilities. Editor: Carolyn M. Russell. Columbus, Ohio: Ross Laboratories, 1977. 100 pp. \$12.95.

Perinatal care occurs in the time from 26 weeks' gestation of a human being through the first 28 days of life. It was in the 1960s that special care units for the newborn were developed and by 1970 the roots had been formed for a new medical discipline called perinatology.

This book, prepared by a staff of experts in the planning and design of hundreds of perinatal centers throughout the country, presents the most current thinking on the design of perinatal divisions of hospitals. It is replete with information about functional programming, costs and the planning and design of such facilities. There are many illustrations and plans.

Information on the planning and design of pediatric facilities is given, and a recommended chapter for all architects is an insightful discussion of "children are not small adults." This chapter might also help the architect/parent with its ex-

cellent suggestions on how to minimize the anxiety of hospitalized children.

The book may be obtained from Ross Laboratories, 625 Cleveland Ave., Columbus, Ohio 43216.

The Toilet Papers. Sim Van der Ryn. Santa Barbara, Calif.: Capra Press, 1978. 124 pp. \$3.95.

There will be lots of superficial jokes about the cute title of this crusade against the ceramic crucible that symbolizes our present misplaced "solutions" for dealing with human "waste." Many architects, especially graduating students, have become fascinated with the disposition of man's biological excreta and the water-laden systems of its transport. But none has devoted the professional commitment with numerous experimental models and many built designs, together with the analysis of postoperative monitoring to verify performance, as has Sim Van der Ryn, who recently resigned as state architect of California. The significance of his concern is not just with the mechanics of such a common and universal issue, but with the ethics. Fundamentally, he is "concerned with how all of us can take more responsibility" for our own excreta.

"Easing thyself" is a timeless, and timely, worldwide human condition. But the 20th century panacea for mega-technical central sewerage "clean machine" systems is argued as a misplacement of resources. Both the nutrient contents of sewage and the value of pure water are lost. Flushing and forgetting only compounds a problem by moving it elsewhere: The megalomania of sanitary engineers multiplies the scale of the "solution" and its impact.

Van der Ryn writes most convincingly of the small composting privies of his own experience. Potentially, they are the fore-runners of a new century of sanitation practice. For while the U.S. continues to grope with energy budgeting as the pivot of a happy mechanical progress, many world statisticians identify clean water as the growing primary challenge for the earth's inhabitants. And just as the energy issue has been most convincingly addressed by homeowners/builders in non-urban situations, so have sanitary prototypes emerged in parallel locations and with similar balance of physical manifestation and ethical window. Both are based on an intimate appreciation of the natural world.

Thus, *The Toilet Papers* is a manifesto both about hardware and software. It is an uneven collection of writings based on a variety of earlier publications brought together here in a neat, easily read and nonacademic form. There are many illustrations of every type, including systems diagrams and "how-to-do-it" techniques. The contents are sometimes repetitious,

continued on page 74

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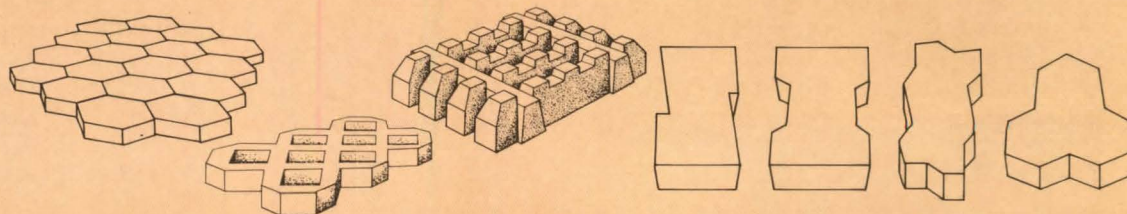
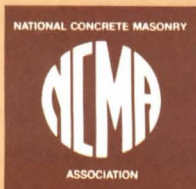


Parking area, Shopping Center, Baltimore, Maryland. Note that white units were installed to provide permanent parking space marking. Jewell Downing & Associates, Architects.

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but always sensible. Occasionally, solutions are presented before problems are defined. In particular, pathogens are not discussed until halfway through the book. Although there is an annotated bibliography, there is no index. And even the author occasionally slips back into the old thought pattern—such as the question on page 41, “why use one resource to destroy another?”

In reality, *The Toilet Papers* is based on the concept of the transformation of human “waste” and other resources, not in a religious belief in creation and destruction of materials. The biological appreciation of biological processes has seldom been a part of the architect’s process. But as social costs become an increasing

valuative criterion, “waste” will grow in importance as a creative part of valued systems.

Dry toilets and graywater systems for single-family units are thoroughly discussed and illustrated. As a systems component for reconsidering the ecological and autonomously directed dwelling, they are fundamental. Chapter seven, however, on “The Urban Sewer,” also discusses a prototypical community-scaled approach: The “solar aquacell system” is not only a sanitary treatment process, it is a beautiful biological experience that produces a bounty of new local jobs and harvests of fish, shrimp and lovely aquatic plants. Van der Ryn never defines the word “toilet,” but his neat little book adds to its meaning. *Jeffrey Cook, AIA*

Senior Center Design: An Architect’s Discussion of Facility Planning. Joe J. Jordan, FAIA. Washington, D.C.: National Council on the Aging, Inc., 1978. 104 pp. \$12.

Although this design manual for planning senior centers is directed principally to architects, it will also be of great help to all people involved in planning a community center for older people, including agency personnel and staff. Jordan, who is also the author of *Senior Center Facilities: An Architect’s Evaluation of Building Design Equipment and Furnishings* (National Council on Aging, 1975, \$8) and a contributor to this magazine (see Sept., 1977, p. 50), is an architect/gerontological planning consultant in Philadelphia. He brings to the subject of this book much experience in the planning of buildings for the elderly.

A senior center, he explains, is a new form of community center, providing a special place for older people “to spend leisure time in social, recreational and educational pursuits.” Unique in that they serve a single age group, senior centers can vary in sponsorship, size and activities. Jordan makes specific recommendations because “there are few built models to learn from,” he says. He gives sound advice on conceptual design considerations, the building space and systems and interiors. He includes as well various helpful check lists for cost estimate, lobby design, corridor design, elevators, rest rooms, lighting systems, furniture, etc. There is also an equipment roster and a list of references for further reading.

The address of the publisher, the National Council on the Aging, Inc., is 1828 L St. N.W., Washington, D.C. 20008.

The Cardiovascular Care Unit: A Guide for Planning and Operation. Glenn O. Turner, M.D. New York: Wiley, 1978. 512 pp.

This book is of great importance and significance. Heart disease is one of the leading causes of death in the U.S. Since the 1960s, coronary care units (CCUs) have been established in many community and regional hospitals. At this time, however, many of the features and philosophies related to these “traditional” CCUs have become obsolete.

Glenn Turner, M.D., author of this book, presents new thinking on the subject, describing in detail his experiences at St. John’s Hospital in Springfield, Mo., where he established a comprehensive cardiovascular care unit (CVCU)—in reality, a new system of care of patients with cardiovascular related diseases. He gives the reader as well a much broader view and understanding of cardiovascular disease as it relates to health and hospital facility planning.

Turner begins by pointing out the short-continued on page 76

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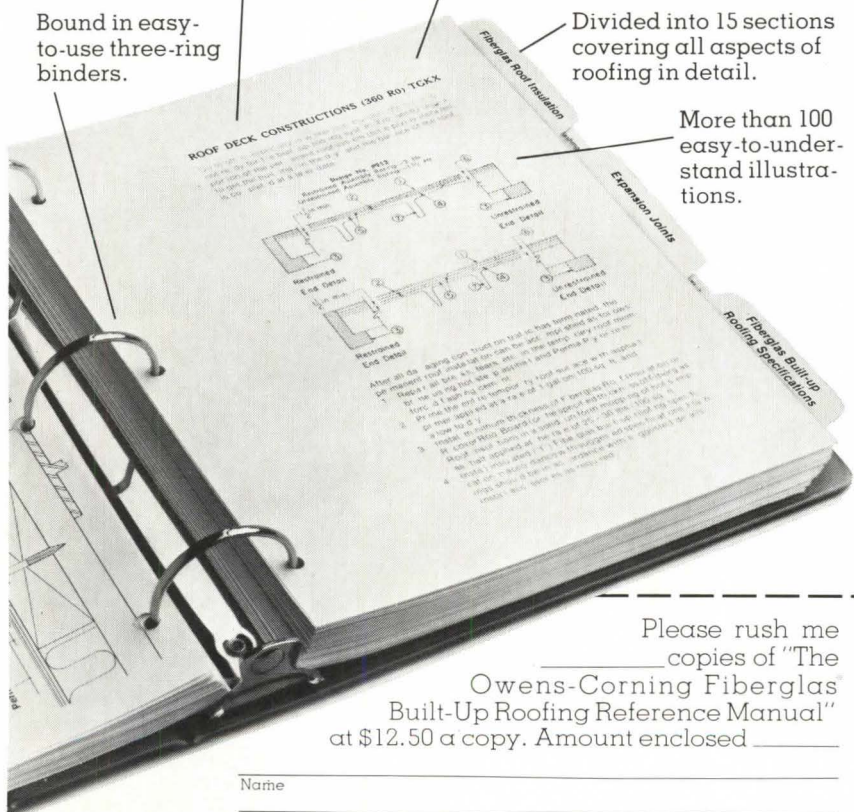
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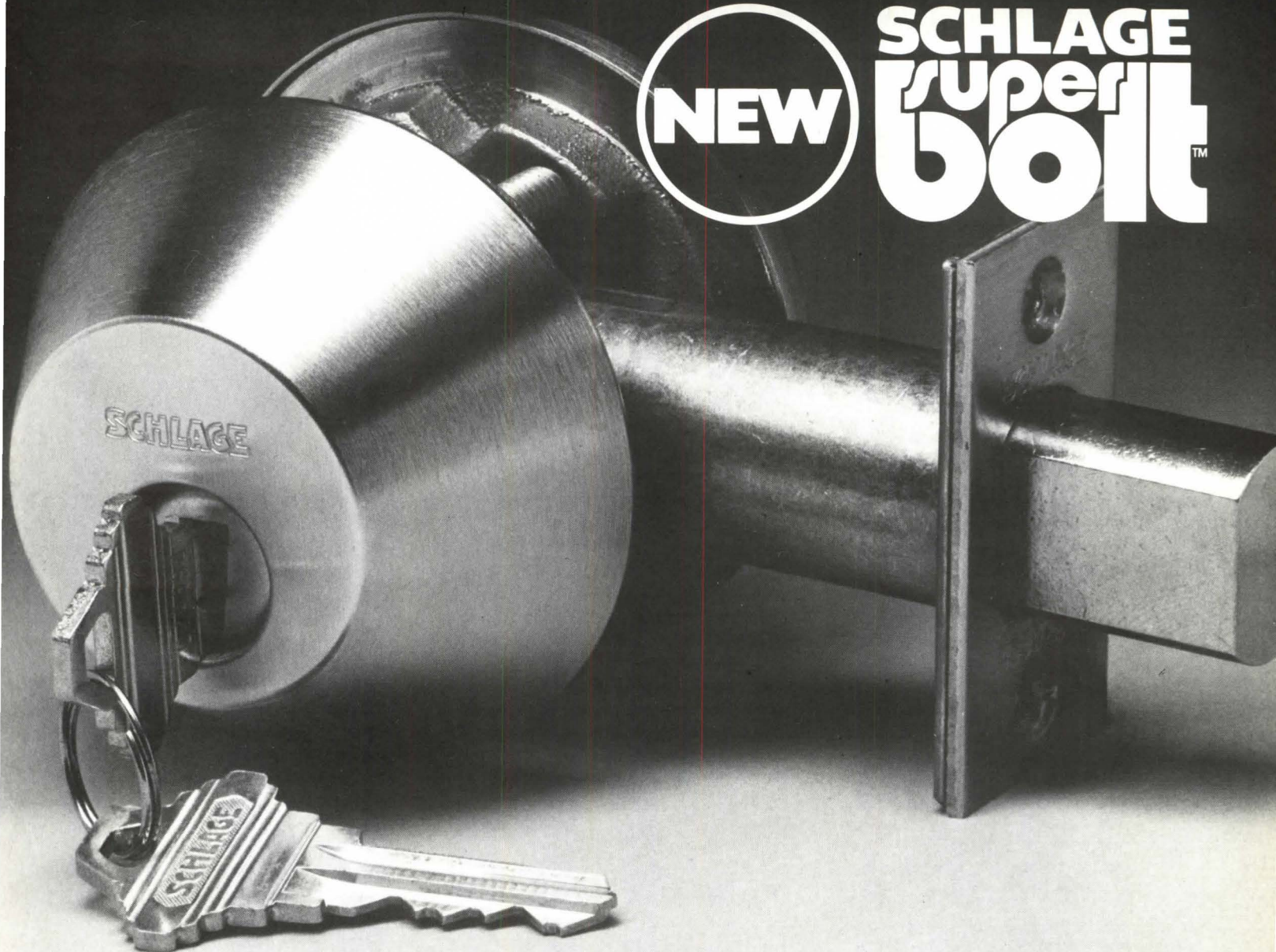


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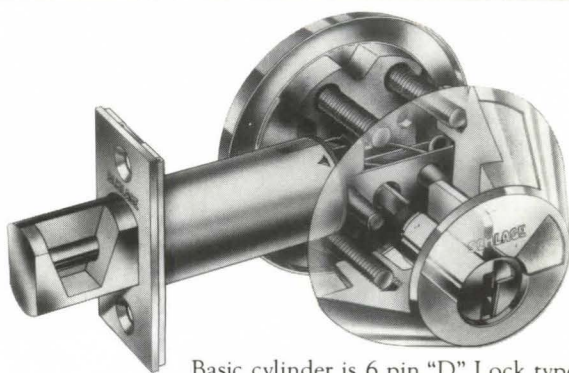
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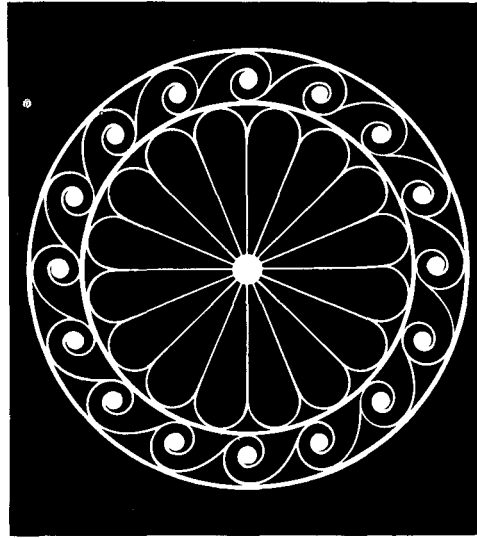
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comings of the traditional CCU. The second part (one-third) of the book is devoted to a description—down to the finest medical and architectural detail—of the CVCU he and his colleagues created at St. John's Hospital. Ample and clear photographs and plans are given. Also included are the special sections of the CVCU (intensive, intermediate, convalescent, auxiliary services, cardiovascular surgical services) and the specialized Springfield wall Turner has developed for improved patient care. There is also an impressive list of the broad range of cardiovascular disease related cases handled by the CVCU.

In part 3, the author provides specific guidelines for managing and staffing a CVCU. Part 4 discusses ways of speeding heart disease patients into the CVCU via public education, communications and bypassing the emergency room.

Turner has written a "why" and "how" book. It is of special importance to architects, engineers, interior designers, hospital administrators, physicians and nurses. This book will make a fundamental impact upon the design of community hospitals for years to come, because Turner has clearly shown how greatly needed is a much broader view of cardiovascular disease and how this view will influence hos-

pital and health facilities. In my opinion, Turner's renderings of the traditional CCU as obsolete is quite correct. I iterate that the book—well written and filled with photographs, plans, diagrams and charts—is an important contribution.
George J. Mann, AIA



Ornamental Ironwork: An Illustrated Guide to Its Design, History & Use in American Architecture. Susan and Michael Southworth; photographs by Charles C. Withers. Boston: David R.

Godine, 1978. 192 pp. \$20.

The art of fabricating objects of iron flourished in the 19th century in this country, the authors say. "Everything from kitchen equipment and cradles to farm machinery and civic fountains found expression in iron." Across the country, structures were adorned with iron doors, grilles, window guards, balconies, verandas and fences.

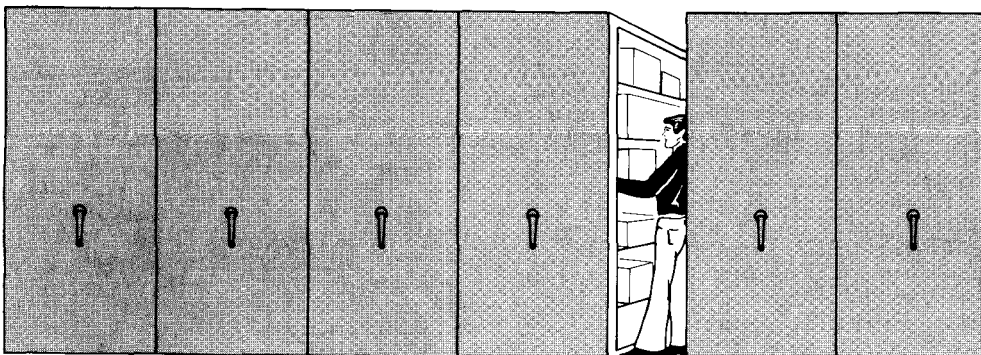
This beautiful book—replete with illustrative materials, including smashing photographs by Charles Withers—surveys ironwork in America, from old to contemporary. In addition to discussions of ironwork in architecture and techniques of ironwork, the book covers regional ironwork, concentrating on Boston, New York, Charleston, S.C., Savannah, Ga., New Orleans, San Francisco and other cities where variations in ironwork are apparent. The authors also provide information on 20th century American artists who work in iron and the visual and practical considerations of design. There are also a patternbook, a directory of ironmakers and notes.

The publisher claims this to be "the finest book ever published on the subject," and this may well be true. Its information will certainly be of great assistance to the architect responsible for the restoration of a historic structure. □

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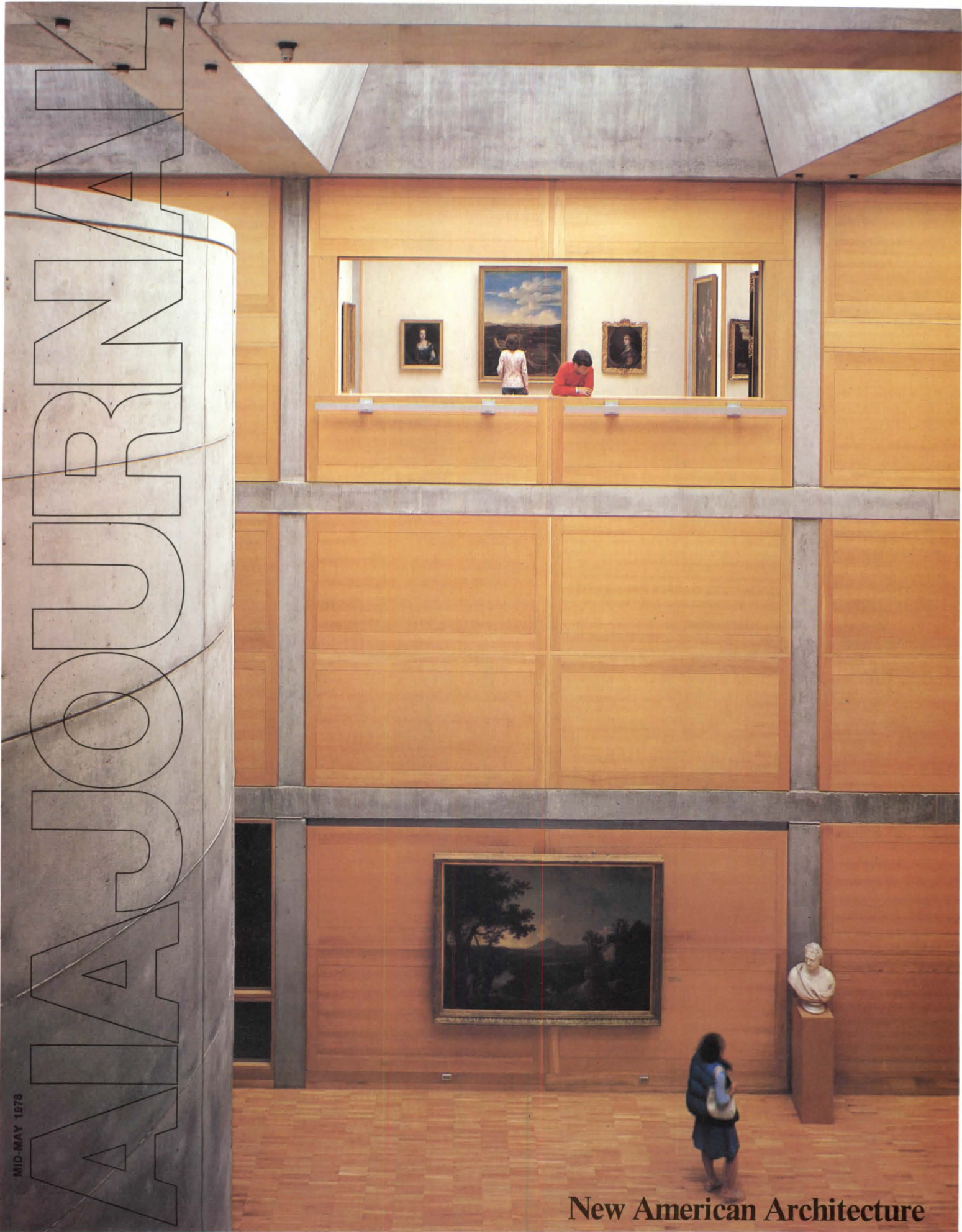
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Planning a New Architectural Practice

By Marie Kovacic

For a new architectural firm to succeed, design talent and architectural vision must be tempered with realistic planning and a sound business management foundation.

The first steps in setting up an architectural firm are deciding which method of organization will best serve one's situation and goals and engaging an attorney to help set up the firm. The three basic alternatives of organization are proprietorship, partnership or corporation. Proprietorship is the simplest form, giving one person complete control as well as complete legal responsibility. Partnership, the most common form chosen by architects, lets several people share both ownership and liability. The corporation, a relatively new option in several forms, is a separate legal, taxable entity, and under it the principals become employees eligible for employee benefits and possibly reduced liability.

The choice will be largely determined by whether the new firm will be a one person operation or larger. Small firms are the rule in today's architectural practice. A 1977 survey of AIA firms showed that a fifth were composed of one person, and more than half of four or fewer. If the firm is to be composed of more than one person, partners or principals should be chosen for their complementary skills to provide the greatest possible range of services without resorting to outside help.

The architect's choice should take into account several other factors as well. The long-range goals of the principals should be considered, including the type and size of projects desired and areas of specialization anticipated. The architect's age is a factor, for as a practicing architect grows older, it becomes increasingly apparent that less cash value can be obtained from a firm in which he is the main asset. Liability consequences are minimized through corporations, but maximized in proprietorships. A tax advantage may be gained through one form over another, depending on the number of principals

Ms. Kovacic, a writer and editor for AIA continuing education programs, was formerly on the professional practice staff.

and volume of work. AIA's *Current Techniques in Architectural Practice* includes a more thorough discussion of all these factors.

Before the firm can be established, sufficient financial resources must be amassed to assure that the firm can survive the first lean year. Initial capitalization is needed to set up the firm and sustain it during the nonincome period before projects can be completed and billed. *Current Techniques* suggests that a firm have a minimum of 25 to 30 percent of anticipated annual billings to operate comfortably. Initial capital can be obtained as investment from the firm's founders, and/or borrowed from banks or friends or family. Establishing a good relationship with a bank and a banker at this time is prudent, for they can provide valuable financial advice as well as money. Financial planning should include establishing a line of credit which can be used to cover the payroll and any unexpected needs that arise, and establishing a credit record for future loans by borrowing and paying back. The firm should start to accumulate assets, which include signed contracts as well as money in the bank.

Before the firm begins operation, a financial management system must be set up with help from an accountant to handle money effectively in a way that will complement the firm's objectives. The AIA's financial management system offers components such as the computer-based financial management service rendered rather than the traditional percentage-of-construction-cost basis.

Where the architect establishes a practice depends on personal preference as well as basic market considerations. The locale must have demonstrated growth opportunities if the firm is to avoid stagnation. The practitioner should look specifically for sustained population growth, growth of nonagricultural employment and a healthy local building industry. The area in which the architect grew up or went to school can offer contacts that are valuable for gaining business. However, if such an area is in a no-growth or slow-growth period due to regulatory or economic considerations, no amount of contacts will foster a successful architectural firm.

Good surroundings contribute to a firm's credibility. Even a one-person firm should have office space, if only for meeting clients, because working out of one's home conveys an unsuccessful, not very professional impression. Office space should be chosen for appealing surroundings and accessibility for both clients and employees. There should be sufficient space for all functional requirements, including reception, management and production. However, investment in the office should be kept to a minimum to avoid ty-

ing up precious capital. The firm should endeavor to meet equipment needs adequately with the least possible initial investment by renting rather than buying.

Effective operation demands a variety of information resources. As in other fields, the amount of information on architecture is expanding exponentially, and sifting through the immense quantity to find pertinent data absorbs time. Consequently, the most frequently used data should be available in-house in an organized, easily accessible arrangement. Principals should know where to obtain infrequently used materials, making use of the closest architectural school library or the in-house library of another firm willing to share its resources and information services. A basic resource on products and materials is Sweet's yearly catalog, which qualified firms (chosen by the quality and quantity of their projects) can obtain free through application to Sweet's Division of McGraw-Hill Information Systems Co. Most important, the firm should set up an organized, easily accessible filing system to accommodate resources, office business and projects. Chapter 14 of *Current Techniques* enlarges on this issue.

Since there are many areas in which the principals of a new firm lack expertise, it is wise to seek outside counsel. Legal advice is needed to set up the firm and provide guidance in a variety of ensuing circumstances. Financial and insurance



advisers can help set up the necessary safeguards to protect the firm and keep it running smoothly. An accountant is invaluable in the firm's early months to help determine such matters as whether the firm would profit from using cash basis for tax purposes while maintaining accrual basis for internal information. Management consultants can help with firm organization and related matters.

Consultants are also valuable in expanding the range of services that a firm can offer. As a rule, the smaller the firm, the more important it becomes to anticipate varied needs and seek out consultants who will be willing and able to provide services that cannot be met in-house.

In most offices, personnel policies evolve in response to pressure rather than

according to plan. Whenever an office consisting of more than one person operates without a written statement of firm policies, problems typically arise in matters such as tardiness, paid time-off and unclear areas of responsibility. To avoid conflict, every firm should begin with its own written statement of personnel practices that clearly defines firm policy on such subjects as absence, illness, holidays, overtime, dress and office supplies. The policy should also establish a regular review of employee benefits and encourage strong communications to promote a smoothly functioning office, AIA's *Personnel Practices Handbook* offers a guide which architectural offices can use to develop an individualized office manual.

Since operating an office exposes the architect to every imaginable hazard, prudence demands an early analysis of all the risks and a recognition of what coverage is needed to protect the architect and the firm. There are four basic types of insurance which every firm should have: legal liability, including professional liability insurance; property damage; crime coverage, including bonding, and employee benefits, which include life insurance, disability protection, medical coverage and retirement benefits. A detailed examination of architects' specific insurance needs is contained in *Current Techniques*.

To minimize risks and misunderstandings in client relations, every agreement to provide service should be put into writing. Independent architects should know what kind of agreements are required for various contracts with clients, consultants and contractors/owners. Volume 2 of *Architect's Handbook of Professional Practice* is a handy reference to the easy-to-use AIA documents, with all of the standard forms of agreement.

The ultimate test of every firm is obtaining the type and amount of work to make the firm succeed. From the beginning, the architect should identify areas of interest and focus on selected markets. The firm's long-term plans should include identifiable goals that recognize the firm's capabilities and possibilities. In setting those goals, the architect should carefully consider how he wants the firm to develop: Is a large firm desired, or will a small staff be better suited to the firm's individualistic approach? What margin of profit is desired, and what timetable is there for achieving that profit? Are there specific design achievements and awards that are particularly important in the architect's aspirations? Each project that the firm undertakes should be a step forward in developing the firm's goals.

Generally, finding the first few clients is the most difficult step in establishing the firm. Effective marketing of a firm's services is a manifold process that requires

persistent effort and daily attention. As mentioned earlier, an architect's friends, family and former business associates can be excellent sources of business, serving as referrals as well. The architect should work to gradually increase visibility through membership in civic, religious and other social organizations.

Since personal contact rarely provides sufficient initial business, the architect must be prepared to be aggressive in marketing the firm. Realistic economic and geographical market research should be followed by a concentrated marketing effort. Business development aids such as brochures and slides of the firm's previous work can be persuasive marketing tools. Offering an unusually broad base of services such as construction management or design/build can be an excellent selling feature, but the architect must be sure that he has the necessary skills, know-how and any extra liability coverage that might be needed. Most important, clients are best won through the architect's communicating an effective approach to solve the client's problem rather than a recitation of qualifications.

Because a neophyte firm is eager to find work, there is a tendency to take any project that comes along. This dooms the firm to failure, or at best mediocrity. An architect must know when to turn down a project. A small firm will lose money on a project for which the bill for services rendered is less than \$1,000, and the only reason for accepting such a project is in the hope of gaining further work through that client or through a referral.

Once the architect lands a project, his most important marketing tool is good work. Surveys indicate that 60 to 80 percent of the dollar volume for a typical firm comes from satisfied clients and referrals. Strategy for ensuring project success should include communicating with the client regularly and encouraging client participation. Perhaps the most important business achievement in any project is to keep within the budget and keep the client informed if his demands cannot be met within the budget. The most critical step for continuing success is to go after a second project before the first project is completed, for that is the only way to provide a steady flow of work.

As the firm begins to take shape, there is one last step that is too often overlooked: the continuing education of the architect. The prevailing tendency is to become immersed in the day-to-day details of making the office function, but the architect needs to find time to maintain himself as a professional.

In the architectural firm, whether new or well established, success is a continuing effort, requiring a good balance of business sense, design ability and professional knowledge. □



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Rehabilitation from page 53

- innovative grants programs for local units of government to develop revitalization strategies that minimize or prevent displacement and create models for other cities;
- housing counseling services for neighborhood residents in low- and moderate-income housing;
- neighborhood development programs for low- and moderate-income neighborhoods to create alternatives to property ownership.

HUD established the office of neighborhood development, headed by Geno Baroni, to tackle the problem of neighborhood rehabilitation. Kollias, a member of Baroni's team, says that HUD has limited resources to promote renovation without displacement, but says they are "maximizing them." The office will be providing technical assistance to neighborhood organizations so "they can plan and create strategies which will minimize or prevent displacement." Gearing up for action, it is making an inventory of existing programs, will do some on-site training, some demonstration housing counseling and development of neighborhood base strategies. A grant has been awarded to the National Urban Coalition to develop some pilot housing counseling programs around the country.

One solution to the problem of displacement, Kollias says, is for city or neighborhood groups to "control the use and value of the properties for the people that live there at an early stage. Even in Cleveland and other cities like that where they consider their problem to be abandonment, deterioration and redlining, they still need to start talking about stabilization strategies for the people who live there."

She emphasizes the need for neighborhood organizations "in order to come across strongly enough to work with the city government. They also have to have a level of sophistication to deal with lending institutions and to obtain private investment that is affordable to the people in their neighborhood."

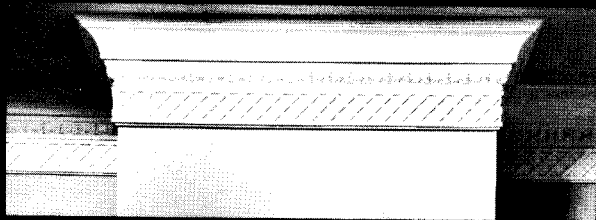
Solutions to the problems of dislocation vary from city to city. "What you could do in an inner-city neighborhood in St. Louis right now is completely different from what you could do if you were going to go into Adams Morgan in Washington, D.C.," Kollias adds. In St. Louis, rehabilitation is in the early stages and in Adams Morgan the price of property is already inflated.

Baltimore is another city which is engaged in efforts to rehabilitate without displacing people. Through its homesteading program, the city sells houses for \$1 to those willing to rehabilitate. The owner must bring the house up to habitable condition within six months. A loan program for rehabilitation offers 6 to 7 percent loans for 20 years, with funding from the sale of city bonds. And the city will take on mortgages in certain areas where private loans are not available. For small businessmen, the city makes fix-up loans to shop owners and then undertakes street and landscaping improvement. And the city extends relocation coverage to people who are displaced by private rehabilitation.

Meanwhile, Savannah's Landmark Rehabilitation Project, Inc., is leading rehabilitation efforts in the Victorian district aimed at preventing wholesale dislocation (*see* Feb., p. 51). That program uses some of the same techniques as the Pittsburgh Historic Landmarks Foundation: private grants, a revolving fund, HUD loans and its own rehabilitation efforts to encourage other residents. The group has just received a \$160,000 innovative grant, a new program of HUD. Then too, Seattle has just passed a reallocation of its block grant money to support an "antidisplacement" work plan. Clearly, there are neighborhoods and cities determined to prevent neighborhood residents from being dislocated by rehabilitation.

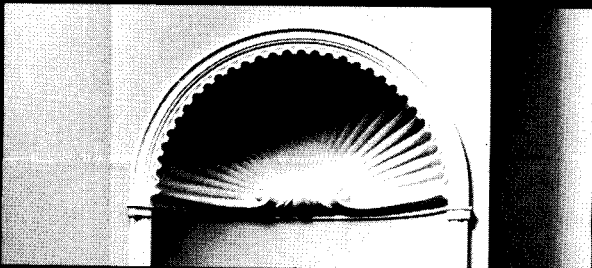
But the question for many cities remains: rehabilitation with or without dislocation? The consequences are evident. It's up to city officials and neighborhood organizations to take action or face the inevitable. □

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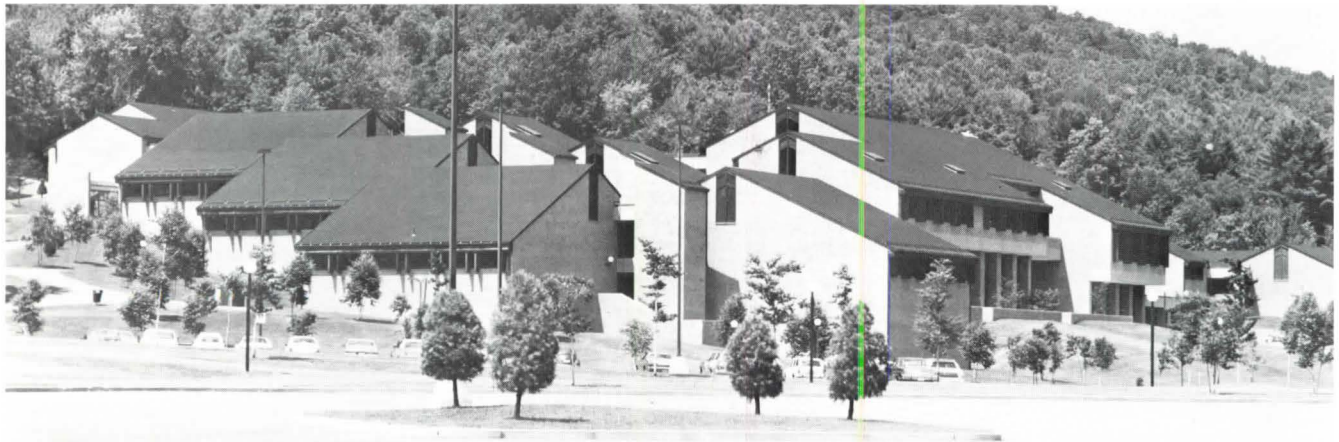
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Turning Theory into Practice Enables Greenfield Community College to Reduce Energy Consumption by Over 45%



The attractive educational "clusters" of Greenfield are achieved at the cost of more than 70,000 square feet gross exposed wall area.

Common sense approach to lighting & HVAC accounts for virtually all energy savings

Greenfield, Mass. There is a much used quote that says that, "A journey of a thousand miles begins with but a single step." Used or not, it was this philosophy that enabled Greenfield Community College here in Massachusetts to chip away, bit by bit, at an annual estimated 8,853,309 KwHr usage and reduce it in a period of four years to only 4,701,648 KwHr per year.

Founded in 1962, Greenfield Community College primarily serves the Franklin and Hampshire counties of Massachusetts. For its first 12 years, Greenfield was, in essence, "a college without a campus," being housed in an assortment of old buildings and reconverted factories that at its maximum totalled 100,000 square feet. In August, 1974, it moved into a modern 225,000 square foot structure on the west side of Greenfield and immediately faced a staggering annual energy bill estimated in excess of a quarter of a million dollars.

New Campus. As designed by the architect, Dales Sprankle of Sprankle, Lynd & Sprague, the building is actually a tiered multi-level structure comprised

of three modules divided into six faculty-student clusters. Intentionally avoiding the imposing grandeur and aloofness of a university, the structure accepts the "community" aspect of the college, giving the appearance of a village of cozy Swiss chalets. Architecturally scaled to its relationship with the area it serves, the building is set into a hillside on a beautiful tree-covered and rocky site. By stepping the five tiers up a 15% to 30% gradient slope, the building generally appears no more than two to three stories high at any point.

Of the six faculty-student clusters, three are in the South Academic Module and three are in the North Academic Module. The third, or "core" module houses the library, bookstore, TV studio and administrative offices. The groupings give priority to the educational purposes of the institution. Each academic module is composed of clusters of classes and faculty offices with interrelated activities. The modules are connected by open balconies which minimize wasted corridor space and give high visibility to the warm and natural "human" feeling achieved by the brick and wood interiors.

A different world. It was all the way back in 1964 that Dr. Lew Turner, President of Greenfield Community College, first discussed and agreed to the "cluster" concept with the architect.

The original specifications for the ultra-modern concrete-and-brick structure were established in 1967, but it wasn't until 1969 that, after hearing all proposals, the State Bureau of Building Construction in Boston gave its stamp of approval for the all-electric design. Construction was finally started in July 1971 and in August of 1974, Greenfield Community College moved into its new campus.

However, in the years since the original concept, the world had undergone a Middle East war and an oil embargo which tripled the price of imported oil. The nation was going through an agonizing reappraisal of its energy resources. These events, unforeseen and unexpected by virtually anyone, were not reflected in the totally climatized structure designed for 72°F year-round operation and boasting a gross exposed wall area in excess of 74,000 square feet.

Thus, a full year before the move, school administrators began looking critically at the anticipated energy consumption of their new "home." Mr. Charles Carter, Sr., Director of the Physical Plant, had already initiated energy conservation measures in the old existing buildings and personally took up the task of cutting back on the projected energy bill.

About 3000 combined day, evening and summer school students attend Greenfield Community College study-

Some of the best ideas were the simplest; like installing electric fans in the high ceiling of the lecture hall to direct warm air toward the floor.

ing subjects that range from humanities to computer science. Between musical presentations, plays, conferences, seminars, art shows, and a large night class enrollment that equals its daytime program, the school usually has some activity going on from 7 A.M. when classes begin to midnight seven days a week. With its library, bookstore, TV studio, locker rooms, lounges and cafeteria, Greenfield is essentially a headquarters away from home where every service the student may need from the time he enters the building until the time he leaves is available.

To keep the tuition down to \$150 for a full-time student per semester for Massachusetts residents, the college relies on State funding for about 80% of its budget. Massachusetts is not a state that takes its energy measures lightly. A Report on Energy Consumption must be filed with the Massachusetts Energy Policy Office once every month. This enables comparisons to be made easily and the effects of various energy conservation measures taken by the State can be evaluated.

Five steps forward, one step back. Some of the earliest conservation steps involved lighting policies. Outdoors, parking lot and sidewalk lighting was reduced by two-thirds. Indoors, manual override switches were installed at open areas previously operated under central control. The idea was to reduce lighting in areas which were not heavily utilized at all times such as hallways and lecture rooms. In little used halls, 150 watt incandescents were replaced with 75 watt units. Eventually, 300 of the 75 watt units were themselves replaced by a specially designed retro-fit fluorescent fixture which reduced power requirements by 60% and increased light output by 25%. In conjunction with the entire lighting reduction program, wherever the manual override switches had been installed, simple tags saying "Please Turn Off Lights" were posted by the switch.

"In the long run, we knew we could show the faculty and student body tangible benefits from our conservation program," Carter says. Funds saved from the Utility Account could eventually be used to improve the educational programming. "But we needed their



President of Greenfield, Dr. Lew Turner, gave education the top priority in okaying original "cluster" design concept in 1964.

total cooperation from the very first day in order to make this thing work." The means to achieve that cooperation was the administration's 100% commitment to an 8-hour response time for any complaint from a faculty or student member, no matter how insignificant.

Other steps in the lighting program included reducing classroom light to 60 foot candles (somewhat below levels recommended by the Illuminating Engineering Society), with 75 foot candles for offices and labs where paperwork and other detail tasks were performed. Relamping and fixture cleaning helped increase the light output from existing fixtures and permitted the installation of energy-saving lamps in many areas.

Some areas were naturally well-illuminated. Working with nature, photo cells were installed to take full advantage of ambient daylight, automatically turning on lights only when the particular site became too dark. After every conservation step was taken, the effects were carefully monitored to assure that no hardship on students or faculty resulted.

One such study revealed an increase in vandalism in the parking lot which was attributed to the lighting cutback. An analysis of the relative costs of hiring security guards versus returning to a 100% outdoor lighting policy indicated that it was cheaper to keep the lights on. The lights went back on in the parking lot in 1977.

Northeast climate. Located in northern Massachusetts, just south of the Vermont border, Greenfield Community College faces the harsh, cold winters and humid, windy summers typical of the New England terrain. The region's ambient temperatures played a substantial part in the HVAC conservation measures. For example, one of the

largest single energy saving measures involved the installation of outdoor thermostatic and clock controls on the chillers. The original design called for the chillers to pre-cool the building during the hot summer nights. However, these nighttime temperatures often fell into the low fifties. The new outdoor controls effectively lock out the chillers and pre-cool the building through fresh air intakes whenever the ambient temperatures fall below 67°F. Conversely, fresh air intake during winter months was reduced to the minimum (state law requires 25%) to utilize the pre-heated recirculated air as much as possible.

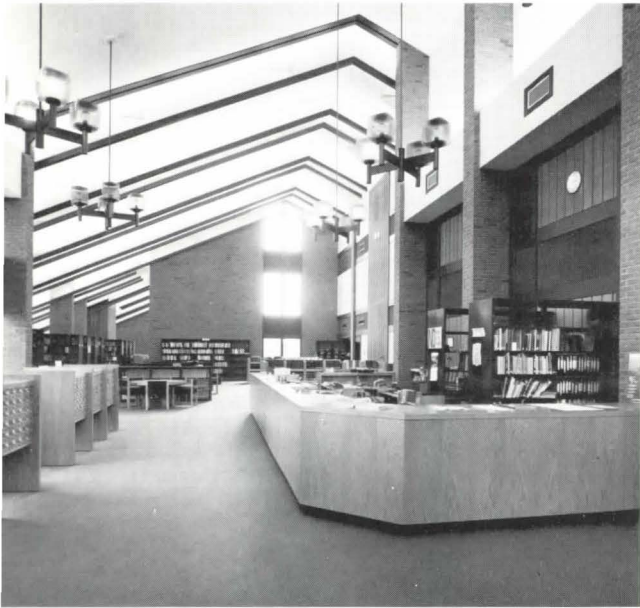
The winter months from November to March are, of course, heavy usage months for heating. In the Fall of 1976, controls were established through the Master Control Panel that enable the building to be heated entirely with the reheat coils, lights and sill heaters. The heavy drain on usage by the pre-heaters was completely eliminated.

Zones of occupation. The original architectural design of the college called for clusters according to function. For example the science labs form one grouping, liberal arts classes form a second grouping, administrative offices a third, and so on. These groupings provide natural zones of use during various times of the day. Analysis led to the establishment of eight separate systems, each individually thermostatically controlled depending on its level of occupancy at various times of the day and week. Winter operating temperatures in unoccupied zones were reduced to 60°F and occupied zones to 65°F.

To maintain tight control over all eight zones, the entire building feeds into a Honeywell Selectographic Master Control Panel. From this station, the status of all HVAC systems can be de-



Director of the Physical Plant, Charles Carter, began planning conservation program a year before building was occupied.



The high-ceiling library, like other areas opening to more than one tier, will have overhead fans to send warm air to lower levels.

etermined. The daily checkout of fans, pumps, heaters, supply air throughout the entire building is accomplished in minutes simply by pressing the right combination of buttons and checking the readout. A direct telephone hook-up to each mechanical room provides an audible double-check to catch trouble at its earliest stage.

Seeking out ideas. There's no telling where or when a new idea will come along, so the entire Greenfield maintenance staff stays alert to the possibility. While flipping through a magazine, a new solid-state thermostat that used platinum wire through a glass bulb caught one reader's eye. The device was discussed at one of the periodic meetings that Carter holds with the top maintenance personnel. Tests indicated that the unit would reduce the override and cycling of temperatures due to bi-metallic fatigue. The units are now on order.

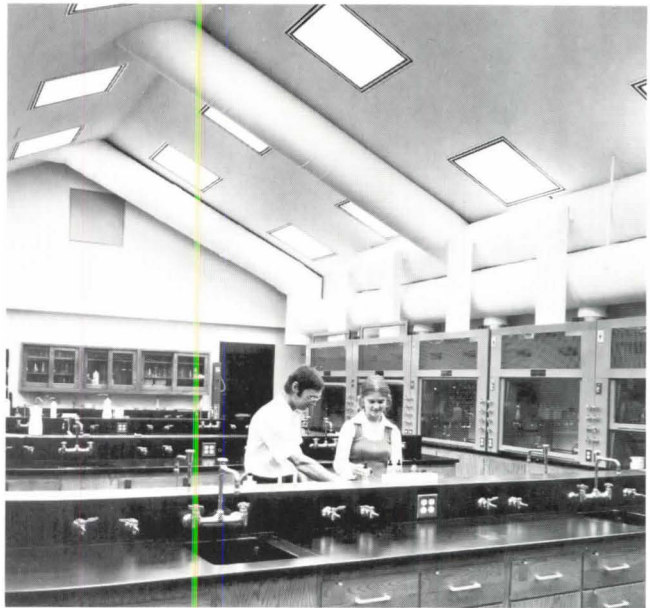
Another idea, one of the most cost-effective to date, was instituted as a result of an energy management training program which the Energy Management Services Department of Northeast Utilities sponsors, using courses provided by the Electrification Council of Edison Electric Institute. Carter serves as instructor for these courses, which bring together the operating engineers of major commercial and industrial plants in the area. The training sessions allow for an exchange of ideas, problems and possible solutions on how best to cut energy consumption. At one session, a student sitting in the rear suggested that the high ceiling of the lecture hall was acting as a natural plenum for containing hot air. By installing ceiling,

fans, the warm air could be directed to the floor, reducing the winter heating demand within the room and minimizing the temperature differential as well.

The theory was tested. Temperatures at various parts of the room were taken. The front (and lowest) end of the hall registered 60°F; the rear (uppermost) part of the hall registered 79°F. The temperature differential of 14° is typical of auditoriums and lecture halls which have very high ceilings. When the temperatures were taken again after installation of two ceiling fans in the lecture hall, the readings were 67°F at the low end and 69°F at the high end, a reduction of temperature differential of 12° from the front to the back of the hall, thereby achieving a far more stable and desirable condition.

Each ceiling fan cost approximately \$3/year to run. Virtually every area at Greenfield that opens to more than one tier can benefit from installation of the fans. One fan has already been tested in the library which opens to three levels over a dropped study area. The study area was rarely used in the winter because it was always cold. The ceiling fan circulates the warm air throughout the entire library including the study area which now boasts increased usage. Current plans call for an additional 15 fans strategically located throughout the library ceiling.

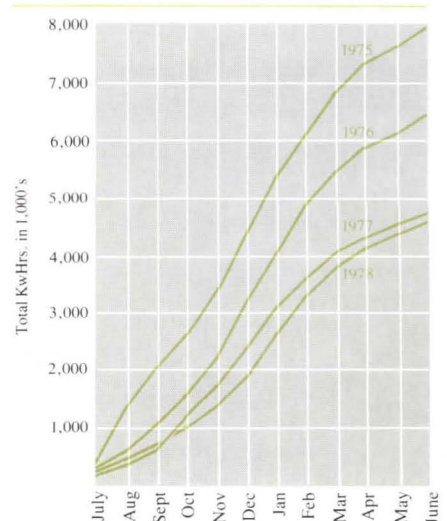
No detail too small. A wide range of other measures were adopted involving structural and architectural features. Twenty pair of exterior doors had succumbed to weathering problems by the summer of 1977 and were replaced. In addition, the floor-mounted door closers were closing too slowly. In this case,



All 21 laboratory fume hoods, which previously ran all day, now operate under Master Control Panel to reduce unauthorized use.

an "open-door" policy was also an energy-waster, so new door closers were installed.

The laboratory fume hoods (21 in all) which previously ran all day were placed under control of the Master Control Panel to reduce unauthorized use. Coordination between the Chemical Department and the Maintenance Department assures that they are run only when the fume hood station is actually in use. In addition, the supply air for the fume hoods was reduced, enabling the fans to operate in a more desirable portion of their efficiency curve and eliminating the requirement for heating aspirator air which would simply short circuit from intake to exhaust. A 450 Kw electric heater for supply air is turned on



Greenfield Community College Annual Cumulative Power Consumption in KwHrs for the fiscal years 1975 through 1978.

only between November and March since local ambient air is warm enough during the balance of the year.

A major energy-saving piece of equipment was added when a 10-ton air conditioner was installed in the computer center. This eliminated the need to operate one of the existing 300-ton chillers in the spring and fall solely for the purpose of cooling the computer room. The 10-ton unit handles the low load requirements during the two mid-seasons. Since the 300-ton unit also requires cooling water, pumps and blowers, the savings were more than just a switch from an inefficient portion of an operating curve to an efficient one. Operation of a lot of auxiliary equipment was eliminated as well. Although the figures include more than just the computer room modification, total chiller operational time was reduced from 1808 hours in 1974 to 539 hours in 1977.

In addition, smoke hatches and fume hatches were checked for leakage and sealed to eliminate heat loss in these areas. Fan coil heating units were turned off at 57 doorways. All water heaters were shut down during weekends, holidays and vacations.

High yield investment. Because virtually all work was performed by college maintenance personnel, total material costs were below \$25,000 over the entire four years of energy reduction policies. How were costs kept so low? "We took out a service contract the very first year," Carter revealed. "Every time a service man came, we had at least one, sometimes two of our own maintenance people looking over his shoulder. By the time the contract expired, we knew the workings of the control equipment about as well as they did." Once the service contract had done double-duty as a workshop training program, the Greenfield operating staff found little difficulty in any of the retro-fit modifications dictated by the conservation measures.

In return for the minimal investment, Greenfield Community College has proven that an all-electric facility, even in the Northeast, can achieve substantial reductions in energy use that stands as a model throughout the state. In fact, Greenfield is one of the few institutions that has not asked the State of Massachusetts for an increase in their Utility Account once in the past four years.

However, there are more tangible rewards than just glory and a pat on the back from the Massachusetts Energy Policy Office. In education, as elsewhere, budgets have never come under more critical scrutiny and money has never been more difficult to obtain from government sources. Without sufficient

funds in education, programs must be eliminated, teachers dropped, and in many cases, the quality of education can suffer. So when Greenfield had to let five people go during their "Bloody August" of 1975 due to insufficient funds, their resolve to cut costs was stiffened even further. Over the next twelve months, all individuals were brought back on staff as a direct result of the energy conservation program.

School officials estimate that every \$10,000 saved on the Utility Expense Account can go to one new teacher and additional programming. In 1974, Greenfield was funded \$200,000 for electrical costs. In Fiscal Year 1977, the budget figure was still \$200,000 but actual utility expenses came in at \$160,000 despite an increase of 10% in heating degree days over the previous year. That meant that approximately \$40,000 could be transferred to educational support accounts.



Chief of Plant Operations, Sterling Clarke, runs daily status check of all building utilities through this Master Control Panel.

Looking back over the past four years, Greenfield officials see nothing remarkable or extraordinary about their accomplishment. The measures taken to achieve a better than 45% reduction of energy consumption were neither unusual nor unique to their situation. They point to the cooperative atmosphere that made conservation a common goal of student, faculty and administration alike. They point to the high morale, skill and sense of responsibility of the maintenance personnel and the determination and drive of men like Charles Carter. They point to the ease of re-wiring electric equipment in retro-fit situations as compared to moving steam pipes. They point to the flexibility of

DESIGN SUMMARY

GENERAL DESCRIPTION:

Area: 225,000 sq ft
 Volume: 3,030,000 cu ft
 Number of Tiers: five
 Number of Rooms: 300 (approx)
 Types of Rooms: Classrooms, laboratories, library, cafeteria, full-food kitchen, mini-gymnasium, locker, lecture hall, music room, art studios, book store, computer center, administrative, faculty and staff offices, student and teacher lounges, storage

CONSTRUCTION DETAILS:

Glass: 1/4" bronze tint, single
 Exterior walls: Brick veneer, 3 1/2" fiberglass insulation, metal studs and sheet rock, some of poured concrete with brick veneer; U-factor: 0.075
 Roof and ceilings: Combination flat built-up roof and pitched roof with 2x3 stringers with 1 1/2" urethane, 3/4" plywood, 290 lb asbestos shingle; U-factor: 0.09
 Floors: All concrete; carpet, tile, slate, wood in cafeteria and gymnasium, and exposed
 Glass exposed wall area: 74,200 sq ft
 Glass area: 17,400 sq ft

ENVIRONMENTAL DESIGN CONDITIONS:

Heating:
 Heat loss Btuh: 10,800,000
 Normal degree days: 6,800
 Ventilation requirements: 22,600 cfm
 Design conditions: -10°F outdoors, 72°F indoors
Cooling:
 Heat gain Btuh: 9,850,000
 Ventilation requirements: 22,600 cfm
 Design conditions: 87°F dbt, 74°F wbt outdoors, 75°F, 50% rh indoors

LIGHTING:

Watts per sq ft: 2.4 average, interior
 Type: Fluorescent, incandescent highlights, mercury exterior lights

CONNECTED LOADS:

Heating:	3231 kw
Cooling (680 tons):	470 kw
Ventilation	320 kw
Interior lighting, main building	550 kw
Exterior lighting	50 kw
Elevators, cooking, misc	200 kw
Hot water	573 kw
Snow melting	290 kw
TOTAL	5684 kw

PERSONNEL:

Owner: Commonwealth of Massachusetts
 Architects: Sprankle, Lynd & Sprague, formerly Ernest J. Kump Associates
 Engineers: Yanow & Bauer
 General Contractor: Daniel O'Connell & Sons
 Electrical Contractor: Johnson Electric Company
 Mechanical Contractor: Holyoke Heating & Ventilating
 Utility: Western Massachusetts Electric, subsidiary of Northeast Utilities

individual room controls that an all-electric facility offers. But most of all, they say that what they have done, anyone can do. "Reductions of 55% in energy consumption aren't impossible", Carter says. "Come see us next year."

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Architectural Secretaries, 500 Strong

By Mary E. Osman

If other architectural practices are anything like his own, the whole place comes to a "screeching halt" when the secretary is away, said Elmer E. Botsai, FAIA, president of the Institute, at the 1978 AIA convention. Similar to medical and legal secretaries, architectural secretaries are also specialists who have duties that are distinct and particular to the profession of architecture.

An organization dedicated to the educational and professional development of architectural secretaries in the fulfillment of those specific responsibilities is the Architectural Secretaries Association, a nonprofit, nonunion, self-governing organization which has 27 chapters and more than 500 members.

In furthering its objectives of making its members an effective part of the design team, ASA at its convention in May approved the first level of a competency accrediting program. The certification program as now envisioned is proposed primarily as a means of personal development and as a checklist of objectives to be attained through the educational programs for the benefit of all support personnel. At the same time, ASA also plans the continued development of in-service training programs and the encouragement of curricula at the college level for the education of architectural secretaries.

The general aims of the organization are cited by Robert L. Durham, FAIA, a past president of the Institute: "Through training programs, seminars and office aids, ASA has shown its members how to take over greater responsibilities in the office, leaving the architect more time for design." Durham's words are buttressed by those of Joseph B. Reid, AIA, chief of production and senior associate at the Washington, D.C., office of John Carl Warnecke & Associates: "Our office has benefitted from the interchange of innovative ideas by ASA members which has resulted in more efficient operation of the office."

It was in 1969 that AIA's board first approved affiliation of AIA components with ASA when there was an interest on

the part of both. All current ASA chapters are sponsored by local AIA counterparts. Further approval was expressed by AIA's board in 1977 when a resolution was passed supporting the "goals and objectives" of ASA, commending it for its continuing education programs and encouraging AIA members "to investigate ASA membership for their employees."

AIA has been supportive in other ways. In 1970, a staff member at national headquarters was appointed to provide liaison with ASA, and for several years now, an ASA member has served on national office practice committees. Also since 1970, ASA has held its annual convention at the same time and place as AIA, and ASA members have participated in many AIA convention events. Robert V. M. Harrison, AIA, a principal in JHH & Partnership in Jackson, Miss., comments on the benefits of such collaboration, saying that the architectural secretary in his office through attendance at AIA conventions "has brought back to the firm an invaluable amount of knowledge that a small office such as ours would never be able to obtain through conventional educational methods."



On the local level, many AIA and ASA chapters enjoy a close relationship, sharing programs of mutual concern. For example, Marie Farrell, Hon. AIA, executive vice president of the Northern California chapter/AIA, says: "Efforts at fund raising activities to benefit ASA have always placed architects, architecture and AIA prominently in the activity. In addition to all the other physical and substan-

tive support ASA has given the AIA chapter, its members have been a source of referral for members who need guidance in administrative matters. They have been a communication link between employer and employee when job openings exist. In sum, any AIA component without an ASA is not making use of an extraordinary resource."

In fulfillment of its goal of improving office practice through the education and training of administrative personnel, ASA has compiled and published *The Architectural Secretaries Handbook*. Correlated with AIA's *Architect's Handbook of Professional Practice*, the ASA handbook is intended to guide administrative personnel in good practice procedures. The first supplement to the ASA handbook, "Architectural Secretary's Project Checklist" and additional reference material, was recently published.

ASA has also prepared a series of seminars on "An Overview of Office Practice," aimed at introducing architectural secretaries and recent architectural graduates to the administrative functions of architectural practice. A guidelines packet of materials was designed to make it possible for ASA chapters of any size to put on the program by calling on local architects, engineers, accountants, insurance executives and other professionals to provide the expertise in conducting the prescribed programs on the various phases of administrative management. Cosponsored by local AIA chapters, the seminars have been conducted nationwide.

The 12-week course was initiated in Seattle by the local ASA chapter, which acted with the national ASA education committee in developing the course which reviews such matters as accounting procedures, methods of compensation and contract documents. Courses on the specific subjects covered by the brief overview are in various stages of development. The first to be completed is entitled "Introduction to Basic Accounting and Reporting Systems for the Small Design Office."

According to the *Architectural Secretaries Handbook*, the well-trained secretary who takes pride in the job "is an asset in any office and plays a major role in the all-important liaison between the architect and his client." The architect who wants to spend more time on design problems and less on management details may want to investigate further the goals of ASA, an organization which has already accomplished so much with so few. Additional information may be obtained from Terry L. Peck, Institute headquarters. □

Earth Sheltered Housing from page 45

sulated cap which fits over the building, and by enclosing soil between the wall and the insulation it inexpensively increases the thermal mass, according to the book.

The second method is to extend the roof insulation past the building about 5.6 feet, which again increases the thermal mass around the wall without appreciably increasing the cost of insulation. It also creates a watershed which will help prevent moisture from accumulating around the building walls. Where soil conditions permit, this technique can, therefore, provide savings in construction by reducing waterproofing requirements. The greatest benefits of both of these insulation methods is for summertime cooling. Both are best suited for structures that have windows mainly along a single wall. They also share a common problem: If the insulation doesn't seal well and maintain its structural integrity for the life of the building, thermal short circuits may develop.

Installing insulation beneath the floor slab only isolates the concrete structure from the surrounding mass of earth. Not a good idea, according to Sterling's group. Footings along the exposed boundaries of the floor should, however, be insulated, to reduce the influence of outside weather conditions.

In almost all cases, insulation should be placed on the outside, not inside the structure. Sterling and coworkers list the following criteria for insulation materials:

- high compression strength to resist the lateral earth loads imposed by the backfill;
- high resistance to water and very low water absorption so that the R-value of the insulation is not reduced;
- high resistance to the various chemical properties of soils—therefore long lived;
- a good dimensional and R-value stability over a long period of time (approximately 20 years, minimum);

- tongue and groove configuration;
- low cost, current availability and ease of handling.

In their discussion of HVAC systems for earth covered houses, the authors advise that "the heat pump is 2.5 to 4.0 times more efficient than other forms of electrical heating. In addition, the heat pump automatically includes airconditioning and can be nicely coupled with various solar heating systems." The capital investment for active solar systems is lower for earth covered than conventional houses, since power needs are less and less storage space is required. The warming of hot water becomes the largest heating requirement in earth sheltered houses, which makes solar hot water systems pay off. The need for any cooling, say the authors, is questionable, but their book discusses both conventional and solar powered systems. It also details various methods of bringing fresh air into earth covered houses. "The simplest and probably the most economical method," they say, "is to provide a duct from the outside to the return air plenum. The fan will pull in fresh air automatically. A balancing damper should be installed in the duct to control the proper air volume. Exhaust to match the fresh air supply can be achieved through bathroom and kitchen exhaust fans."

Fear that earth sheltered residences will be damp and leaky is based on experience with unwaterproofed basements. The reasoning goes something like this: Basements are below ground; they are usually damp and leaky; below ground houses will therefore be damp and leaky. "Forming an opinion in this way is like looking at a barn and deciding houses shouldn't be built of wood above ground because the wind will blow right through," write Sterling, et al.

The first step in assuring that an earth sheltered house will be watertight is to select a good site. Low areas and flood plains should be avoided. But where poor groundwater conditions exist an earth sheltered house with berms around it is in no greater danger of flooding than an above grade residence, and will be far less likely to sustain structural damage. An atrium design, on the other hand, is much more vulnerable, and even good drains, drainpipes and sump pumps won't be able to draw off large amounts of water in the courtyard. Even on higher ground, sites with gullies should be avoided. The best site slopes gently away from the house on all sides. Too rapid a slope will drain away too quickly to support rooftop vegetation; a flat surface will cause ponding water on the roof, which is dangerous, even if high quality waterproofing is used. The best slope is 1 to 5 percent, according to Sterling and coworkers.

The biggest water threat to an earth covered house whose foundation is above the normal water table comes from heavy rainfalls and spring thaws. The best protection is a site that slopes away from the house and properly compacted backfill that does not slip and trap water. Gutter systems around an exposed roof, together with horizontal leads that take the water from the roof well away from the house, will prevent additional water loads close to the underground walls.

Capillary action, which causes walls to draw moisture into themselves much as does a sponge, is responsible for most of the dampness problems which occur in everyday basements. It can be broken either by an impermeable barrier—waterproofing—or more effectively, by using an air gap or insulation material that is so open that moisture will not be drawn through it. The air gap system will not, however, provide any protection once there is more water in the ground than can be drained down the outside of the capillary break.

A final question: Isn't construction of earth sheltered housing more expensive than for above grade houses? The authors' answer is "no": "It appears that the cost of earth sheltered construction is quite comparable to good quality conventional above grade housing." In fact, they venture, "Once contractors have gained some experience with this type of construction and can confidently predict their own costs, the price is quite likely to go down." □

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Total number copies printed	37,454	37,858
Paid circulation		
Sales through dealers and carriers, street vendors and counter sales	None	None
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Free distribution by mail, carrier or other means	5,347	2,824
Total distribution	34,446	36,372
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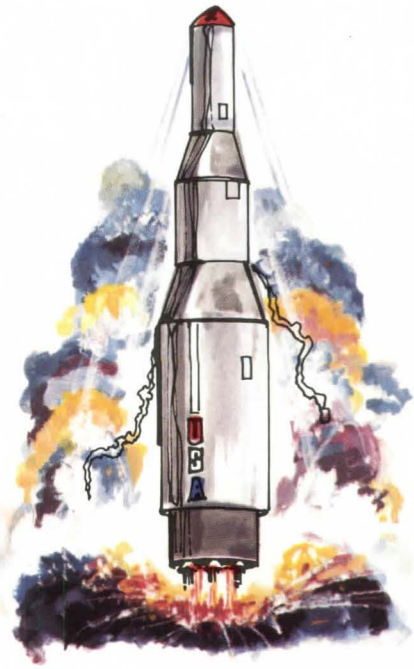
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Energy from page 30

to install and will bring annual fuel bill savings of about \$1,000. An 800-gallon water tank is planned for the basement. Most of the hot water in the west wing is used by the White House cafeteria. Officials acknowledge that economics alone don't dictate its installation, but the promotion of solar energy does.

With approval of the Commission of Fine Arts, the Department of Energy will handle the design and collector choice. The installation will be put out for competitive bidding in the near future.

There are no plans to extend solar energy applications to the residential portion of White House, said Omi Walden, assistant secretary of DOE, or to put solar collectors atop the flat roof of the Forrestal Building which houses DOE.

Continued Model Code Updating Is Funded by Energy Department

The Department of Energy recently signed a \$243,000 extension to an existing contract with the National Conference of States on Building Codes and Standards, Inc., to continue the support of energy conservation programs. The contract calls for the project team which developed the "Model Code for Energy Conservation in New Buildings" to continue to monitor

and update the code, taking into consideration experiences of the 17 states which have adopted the code in total or in part.

The contract also supplies additional funding for the development of new materials and for conducting training workshops. It provides funding as well for the development of an energy conservation code for existing buildings, a basis for this new code being the retrofit standard now in preparation by the American Society of Heating and Air-Conditioning Engineers' 100P committees. The contract authorizes educational and training materials for retrofit code.

HUD Signs Contracts to Develop Energy Performance Regulations

HUD has entered into two contracts to develop and implement workable regulations for energy performance standards for new buildings. The contracts are part of HUD's effort to assure a public voice in the development of regulatory programs, federal agencies being required by law to involve state and local officials in policies which have significant impact on their jurisdictions.

One of the one-year contracts, for \$135,000, is with the National League of Cities and the U.S. Conference of Mayors. A report will be prepared in which prob-

lems will be identified for the implementation of building energy performance standards within state and local jurisdictions. Also, research reports and guidance materials will be prepared and disseminated.

The contract for \$86,662 to the National Association of Counties Research Foundation provides for the development of an information program and guidance materials for the 3,101 counties across the nation.

The Institute

Design-Build

At AIA's 1978 convention, the delegates voted 3 to 1 to permit AIA members to engage in design-build and contracting activities for an experimental three-year period (see June, p. 8). The experiment would be monitored to ascertain its effects upon the membership and upon the profession. Members of the Institute task force to monitor the effects of the design-build/contracting activities for the three-year experimental period are Rex Whitaker Allen, FAIA, San Francisco; William Marshall Jr., FAIA, Norfolk, Va., and Chairman Herbert E. Duncan Jr., FAIA,

The Institute continued on page 86

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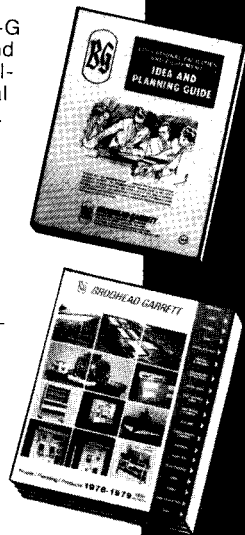
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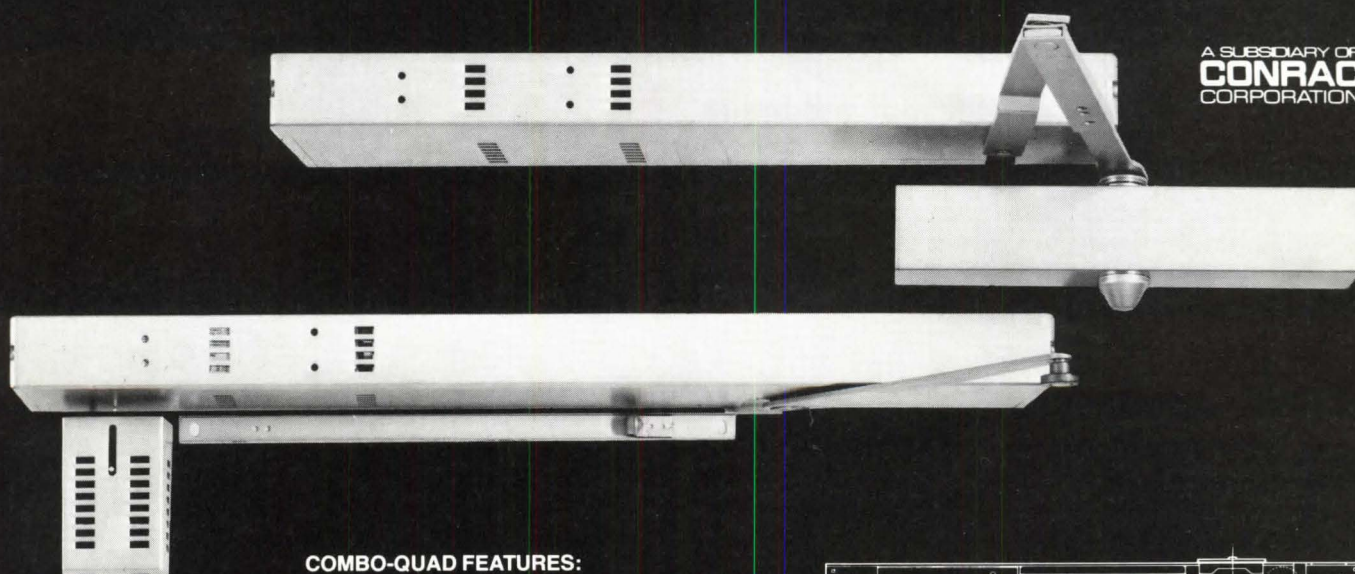
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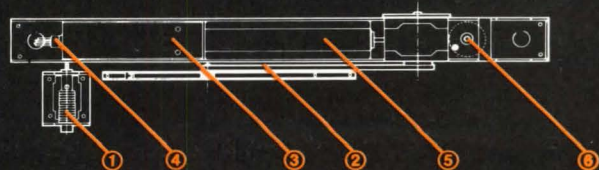
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The Institute from page 84
Kansas City, Mo.

During a recent exploratory session, the task force identified a wide range of areas for possible monitoring, including both ethical and practical issues. One of the areas, for example, was the monitoring of a possible shift in the public's perception of the role of the architect in society and increased architect involvement in specific building types. The task force said that a part of the monitoring effort might include the use of a simple reporting form at meetings of each AIA professional interest committee over the three years of the experiment.

Another of the broad areas of monitoring identified was changes in government interest in design-build/contracting and acceptance of the architect for single point responsibility on government projects. Still another monitoring task could involve liability, with observations made of changes in rates and sources of insurance for design-build/contracting and "potential changes in strict liability interpretations that could affect the profession and influence the 1981 recommendation."

In its first report to the fall board meeting, the monitoring task force stressed that activities should take advantage of existing AIA resources and that procedures should be kept as simple as possible. The task force said that "the cooperation of

many people will be required to evaluate this effort in a proper manner. The subject is worthy of such an effort because of the potential impact on all areas of Institute activity and professional practice by member firms." The task force will make reports to the board throughout the period of the experiment.

Completion Expected Next Month Of Headquarters Energy Retrofit

The AIA headquarters building in Washington, D.C., is being retrofitted for energy conservation under the supervision of the Atlanta firm of energy planners, architects and engineers, Sizemore/CRS. Substantial completion of the work is expected by Dec. 15. It is anticipated that the retrofitting will result in a 46 to 50 percent reduction in energy conservation, with costs recovered through reduced consumption in about two and a half years.

Lighting has been redesigned to reduce glare and to better illuminate each individual desk. Also, gray nonreflective film has been placed on south- and west-facing windows to eliminate sky glare.

Other energy saving techniques include:

- Reduction of total air requirements and rebalancing of air distribution.
- Weatherstripping on the ground floor.
- Reduction of hot water temperature.

- Control of relative humidity.
- Duty cycling of the fan coil system.
- Installation of optimum start control for the building.
- Reduction of residual load of the building when unoccupied.
- Installation of more selective light switches.
- Use of lower wattage fluorescent lamps as existing lamps burn out.
- Installation of carbon monoxide detection system in the garage.

Two Positions Currently Open In Education at Headquarters

AIA is seeking a director of continuing education programs and a director of environmental education programs—both positions in the department of education and professional development.

Candidates should hold a college degree and be able to demonstrate a high level of initiative and self-confidence and be able to communicate effectively both in writing and orally. Both positions are to be filled immediately. For further information contact James E. Ellison, AIA, administrator, department of education and professional development at Institute headquarters, or send résumé, list of references and salary requirements to Ellison. *News continued on page 88*



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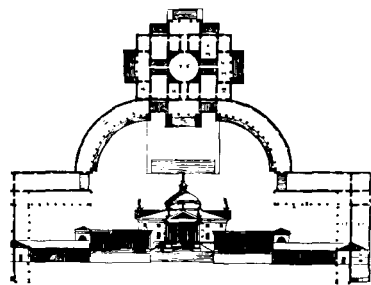
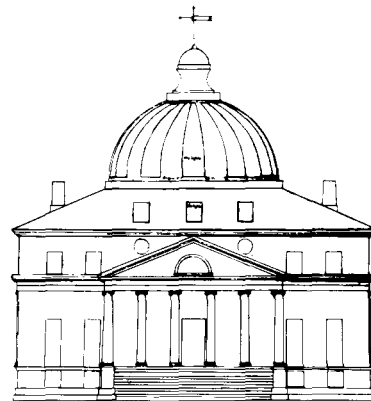
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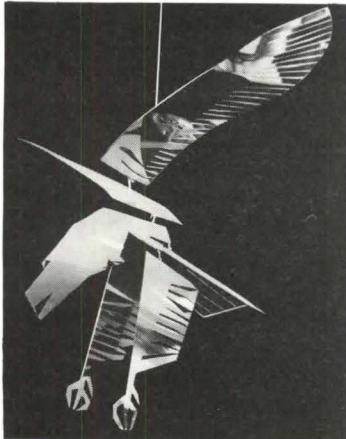
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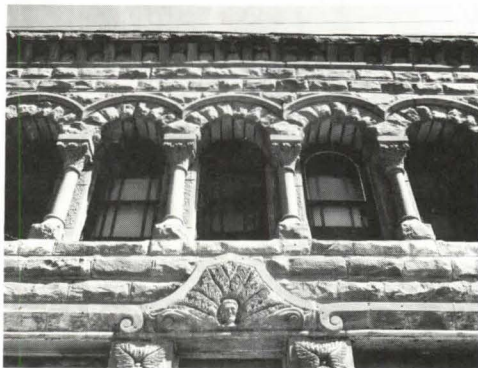
Preservation

Main Street Help

To prove that "preservation pays," the Midwest regional office of the National Trust for Historic Preservation is conducting a project to revitalize the main streets of three Midwestern towns: Galesburg, Ill., Hot Spring, S.D., and Madison, Ind. The National Trust contends that "revitalization based on preservation of existing fabric of the commercial core can result in measureable economic gains as well as in dramatic improvements in the quality of the visual environment."

"The American downtown is in trouble," said the National Trust. "The cumulative impact of suburban and commercial strip developments has shocked us into reconsidering the problems besieging downtowns everywhere." The Trust's involvement with the project began with a concern "for the preservation of downtown buildings" and expanded to include a concern "for the traditional role of main street in the life of a community."

In response to an overwhelming interest in commercial center revitalization in communities of all sizes in the Midwest, the Trust obtained \$300,000 from Bird &



James Ballard

Son, a national building supply manufacturer of East Walpole, Mass., and additional grants from the National Endowment for the Arts and the Bush Foundation, St. Paul, Minn.

According to the National Trust, revitalization must be based on sound economic strategies and physical improvements, and, therefore, the project emphasizes preliminary economic research and follow-up. Hoping to avoid historical "theme" or single time period main streets, the Trust is aiming to portray the "organic development of a community." "Successful commercial center revitalization requires careful thought and planning, time-consuming architectural, historical and economic research, coordination of effort, community involvement and an insistence on quality of rehabilitation and new construction design," said the Trust.

In the first year of the project, two teams of consultants, one focusing on economic issues and one on design issues,

analyzed each of the three towns and developed specific recommendations. A brief summary of the results follows.

Home of Knox College and the birthplace of Carl Sandburg, Galesburg (pop. 38,000) was once a lively commercial area comprised of brick buildings with classical revival and moderne facades. Once, five major railroad lines crossed in this Illinois town, but more recently, the downtown has lost several major department stores to competition from a nearby regional shopping mall.

The economic analysis by Shlaes & Co., Chicago, indicates a basic stability and recommends emphasizing the downtown as an alternative shopping center of specialty shops, services and restaurants. The design consultants, Preservation/Urban Design/Inc., Ann Arbor, Mich., suggested building improvements to aid the merchants and property owners in their rehabilitation efforts.

Hot Springs (pop. 5,000) is known as a vacation spot and contains a collection of Lakota sandstone buildings. It lies along the Fall River in the southern Black Hills of South Dakota near Mount Rushmore and a number of national and state parks. Development of nearby mining operations, a shopping mall and a prehistoric site necessitate comprehensive planning for the first time.

Shlaes & Co. recommends that Hot Springs could attract more tourists by upgrading its information center and visitor publications and consolidating retail shops to encourage pedestrian shopping. Preservation/Urban Design/Inc. suggests public improvements, especially on buf-



Tom Moriarity

fering the visual impact of a concrete floor control wall. It also recommends new emphasis on the entry points to the town and improving public parking areas.

Tourists are attracted to the federal and Greek revival residential neighborhoods and the Italianate brick commercial buildings that line the main street of Madison (pop. 3,600). The shift to rail traffic in the late 19th century ended this Indiana town's prosperity as an important Ohio River port, and now, the main street buildings are largely intact but vacant above the first floor (photo above).

While recent commercial development outside the downtown has drawn larger chain drugstores, discount department stores and fast food restaurants, down-

Preservation continued on page 90

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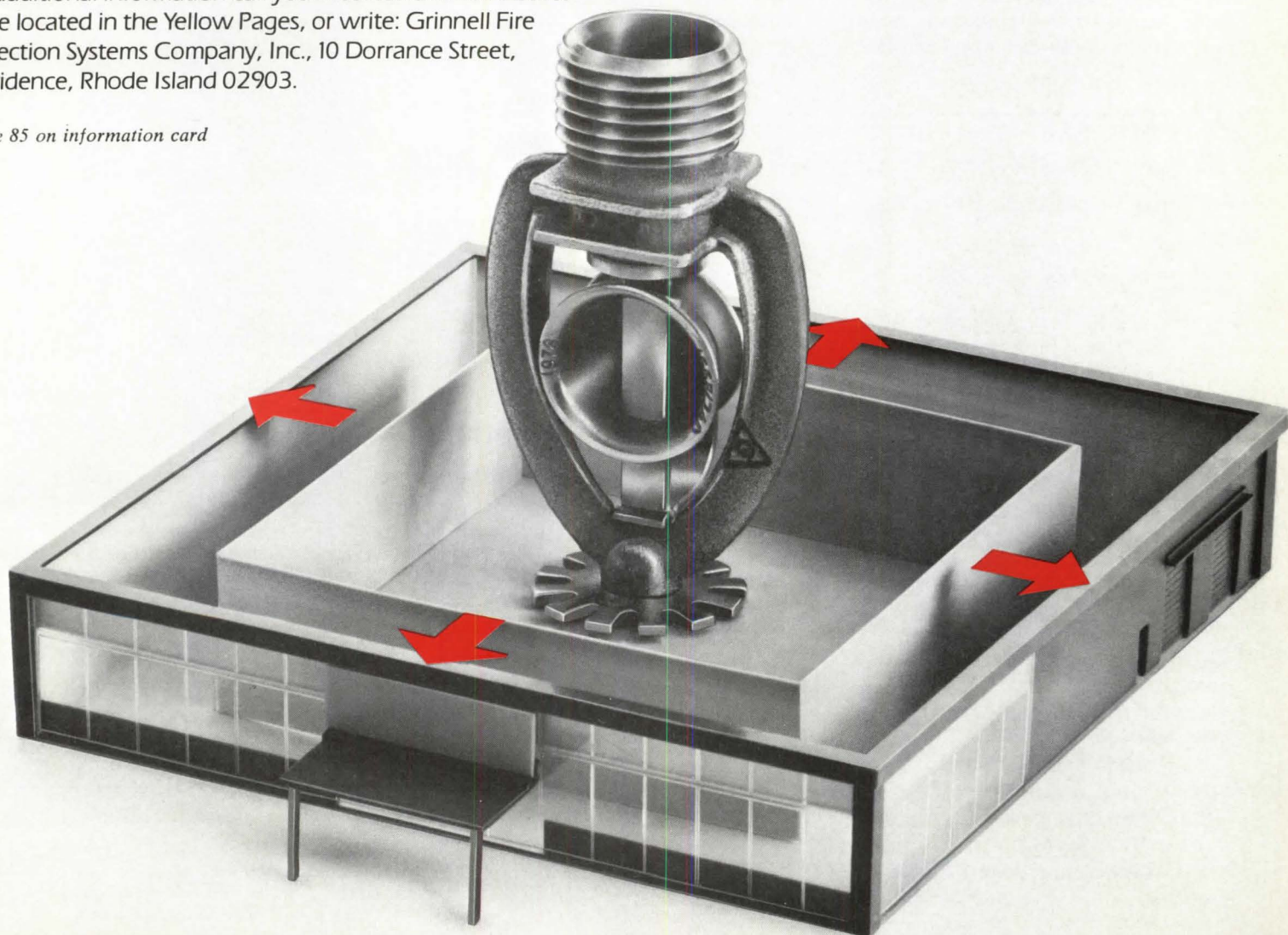
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Preservation from page 88

town Madison remains the center for service establishments, say Shlaes & Co. It is suggested that the town develop its market for specialty items with housing and office space to be located in the vacant upper stories. The design consultants, Miller, Wihry & Lee, Louisville, Ky., concentrated on public improvements, recommending landscaping to tie main street visually to the river. Individual building improvements are being designed by the project manager, a graduate architect.

The National Trust hired a project manager in each community to work for two more years to help synthesize the recommendations and to implement a coordinated program of private and public efforts. The rehabilitation will focus on enhancing the building facades and mounting well-designed signs.

Project managers are working with individual merchants and property owners to develop specific designs for their buildings, formulate cost estimates with the merchant/owner and a contractor, assist in finding financing (if necessary) and advise during construction. The project managers are also organizing communities for such actions as development of a feasible public improvements plan and locating sources of long-term financing for these improvements and will work with

merchants to encourage better merchandising, marketing and promotional practices and to fill existing vacancies with businesses need in the commercial area.

The local residents' response to the project in all three towns has been very positive, said Mary Means, of the National Trust. At first, she added, the townspeople of Galesburg didn't support the project due to a "poor self image" of their average American town. But since the Trust has found a project manager, the residents have shown a "2,000 percent change in attitude."

The National Trust is preparing a film, handbook, various information sheets and national conferences based on the three demonstration projects. The second National Main Street Revitalization Conference will be held in Columbus, Ohio, Dec. 6-8. For more information, contact: Main Street Project, National Trust for Historic Preservation, Midwest Regional Office, 407 S. Dearborn St., Suite 710, Chicago, Ill. 60605.

Exhibit on Reuse of Buildings Will Be Seen in 22 U.S. Cities

To call attention to the merits of adaptive use, the Smithsonian Institution is circulating an exhibition, "Building Reborn: New Uses, Old Places," to 22 cities in

three years. Organized by Dr. Barbaralee Diamonstein, a member of the New York City Landmarks Preservation Commission and the New York City Cultural Affairs Commission, the exhibition is based on Diamonstein's book of the same title (Harper & Row, 1978).

It opened at the Museum of Contemporary Art in Chicago in early October and will travel to the Museum of the City of New York; the Rhode Island School of Design, Providence; the Smithsonian's Renwick Gallery, Washington, D.C.; the Witte Memorial Museum, San Antonio, Tex.; the Museum of the City of New Orleans, and other locations. In each city, grass roots organizations combining the public and private sectors will focus on local recycling efforts and problems.

Diamonstein along with Congressman John Brademas, majority whip of the House of Representatives, hope that this tour will help efforts toward a national policy "for recycling architecturally and historically significant old buildings to make them living parts of communities. . . . a policy in which states and major cities would designate a commission for recycling significant buildings. Joan Mondale, wife of the U.S. vice president, says that recycling has become a "grass roots movement," making "great esthetic and economic sense."

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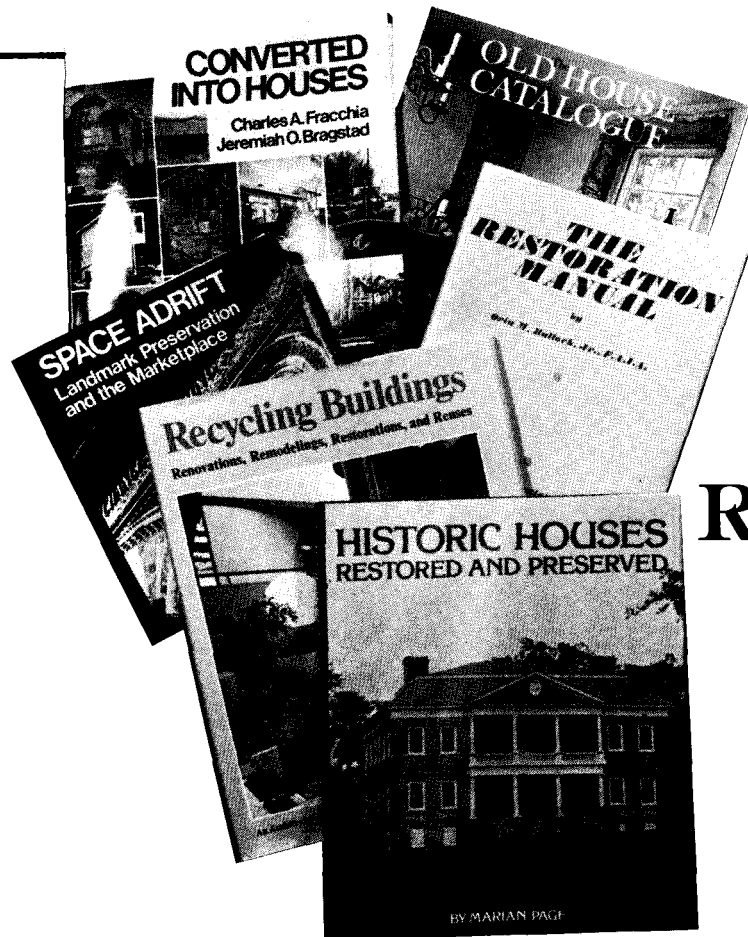
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Restored and Preserved

*Converted Into Houses (3-M228)

By Charles Fracchia and Jeremiah Bragstad. Serves as a guide book for creative recycling of non-residential buildings into houses. Over 30 dwellings—from other buildings, both in the U.S. and abroad, are discussed in lively text. Each dwelling shown as it was and as it is, accompanied by history of use and the process of conversion. Hard-cover, 96 pages, 216 color photographs (1976). \$15.00 Non-member, \$13.50 AIA member. Paperback (3-M228A) \$6.95 Non-member, \$6.15 AIA member

*The Old House Catalogue (3-M299)

Compiled by Lawrence Grow. Listed under one cover are 2,500 products, services, and suppliers for restoring, decorating, and furnishing period houses—from Early American to 1930s Modern. This much needed book ends the difficult chore of finding old materials and objects, or places that fashion reproductions. Softcover, 240 pages, 400 illustrations (1976). \$7.95 Non-member, \$7.15 AIA member

*The Restoration Manual (3-M115)

By Orin M. Bullock Jr. Invaluable reference on how to “read” older structures in order to preserve and reconstruct them in a manner compatible with their original design and construction. Hardcover, 181 pages (1966). \$13.95 Non-member, \$12.55 AIA member

*Historic Houses Restored and Preserved (3-M268)

By Marian Page. Behind-the-scenes view of the restoration of 19 Historic houses—representing four styles of architecture—their philosophies of preservation and priorities. Hardcover, 208 pages, 200 photographs (1976). \$25.00 Non-member, \$22.50 AIA member

*Denotes books published by organizations other than AIA; may not be in accord with AIA policy.

*Recycling Buildings: Renovations, Remodelings, Restorations, and Reuses (3-M265)

Edited by Elisabeth K. Thompson. This lavishly illustrated collection of the most successful examples of recycling buildings will appeal to ecologists, preservationists, and most of all to architects, who will find a wealth of imaginative and innovative design ideas in the rapidly expanding area of the profession. Hardcover, 224 pages, 282 photographs, 32 in full color (1976). \$22.50 Non-member, \$20.25 AIA member

*Space Adrift: Landmark Preservation and the Marketplace (3-M172)

By John Costonis. Presents “the Chicago Plan,” an ingenious approach for protecting landmark buildings. Involves government purchase of a landmark’s unused development potential, followed by sale of “development rights” to a developer who can then make new buildings larger and more profitable than zoning regulations normally permit. Hardcover, 207 pages, illustrated (1974). \$10.00 Non-member, \$9.00 AIA member

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Stephen W. Jacobs, Ithaca, N.Y.
Francis Keally, FAIA, New York City
John E. Wagstaff, Santa Cruz, Calif.
Willauer A. Osborne, FAIA, Captiva, Fla.

BRIEFS

Nomination forms for the 1979 R. S.

Reynolds memorial award must be postmarked no later than Dec. 1. An architect may nominate himself or be nominated by an individual or group. Forms are provided by AIA. AIA will send a data binder to the nominee for use in submitting photos, plans and descriptive materials. The binder, with identity concealed, must be returned to AIA postmarked no later than Jan. 2. The annual award is given for a significant work of architecture where aluminum is an important contributing factor. For information, contact Maria Murray at AIA headquarters, (202) 785-7390.

Successful examples of recreational facilities accessible to the handicapped are requested by the Heritage Conservation and

Recreation Service. The information will be incorporated into a working draft publication for use at a spring 1979 conference. Case studies may be sent to HCRS, Federal Building, Ann Arbor, Mich. 48107. The deadline is Dec. 1.

The cost of building health facilities in the U.S. during the first six months of 1978 amounted to \$2.5 billion, or the same as for the equivalent period in 1977, according to data released by the Bureau of the Census. The American Hospital Association contends that due to inflation hospital construction is actually decreasing.

Information on theaters designed by Thomas W. Lamb, John Ebersson and C. W. and George L. Rapp is sought by the research design studio, University of Wisconsin-Milwaukee. Contact: Joseph Valerio, School of Architecture and Urban Planning, University of Wisconsin-Milwaukee, Box 413, Milwaukee, Wis. 53201.

A bill providing loans to small businesses entering the energy conservation and solar energy fields has been signed by President Carter. Administered by the Small Business Administration, it authorizes a \$75 million loan fund. Firms eligible for loans are those that manufacture, sell or install energy conservation systems, as

well as architectural, engineering and consulting firms concentrating on energy conservation. Applicants for loans may contact their area SBA office.

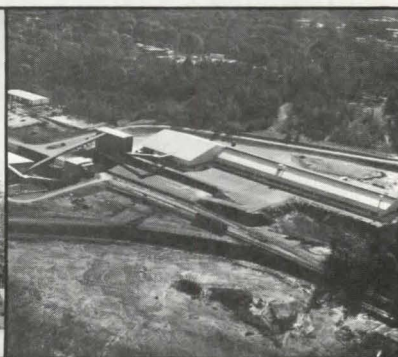
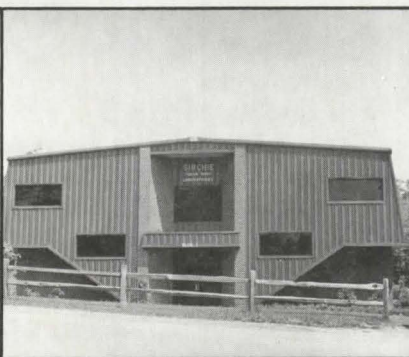
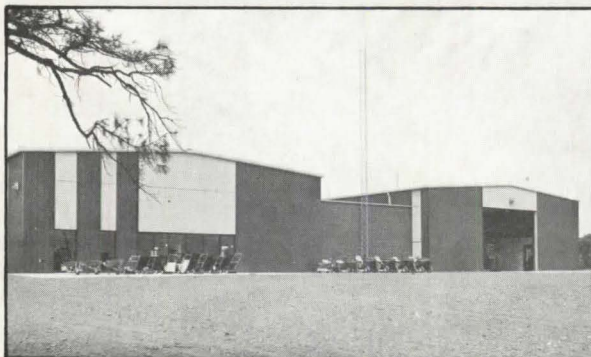
"Guidelines for the Employment of Women in the Construction Industry" is a publication aimed at helping construction firms meet Department of Labor regulations which require that 3.1 percent of the work force on federally funded projects be female. The target date is Mar. 31, 1979, with higher percentages required in 1980 and 1981. Order from the Mechanical Contractors Association of America, Inc., 5530 Wisconsin Ave. N.W., Washington, D.C. 20015.

"Who's Who in Landscape Contracting, 1978/79" is a membership roster of the Associated Landscape Contractors of America. Write on office letterhead for a copy to: ALCA, 1750 Old Meadow Road, McLean, Va. 22102.

Black and white photographs of compatible new architecture in older settings are sought by the National Trust for Historic Preservation for use in a book based on the proceedings of a conference on old and new architecture design relationships held in December 1977. Identify photographs by building's name, address, archi-
continued on page 94

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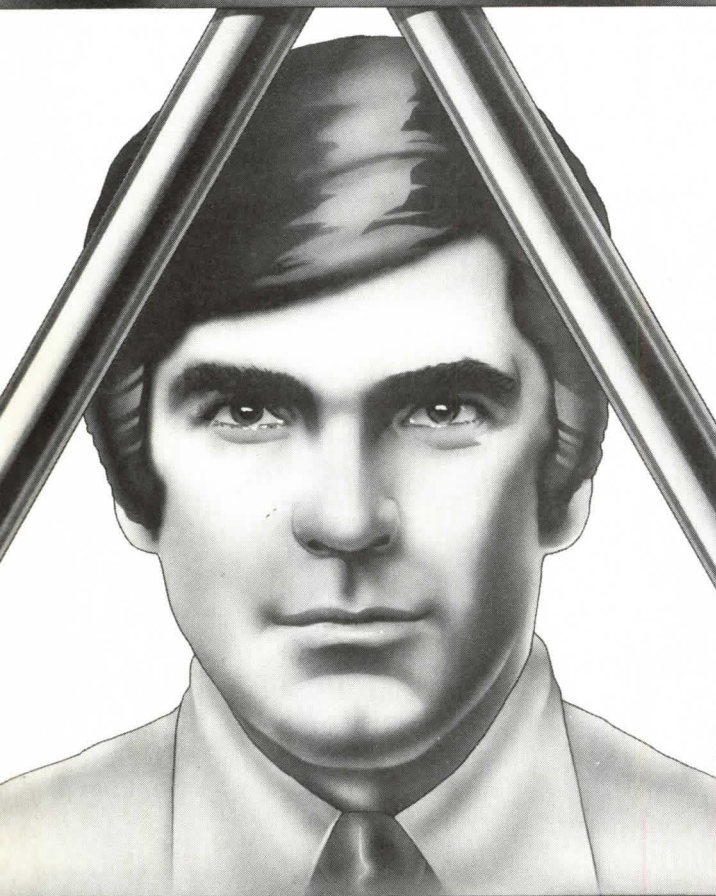
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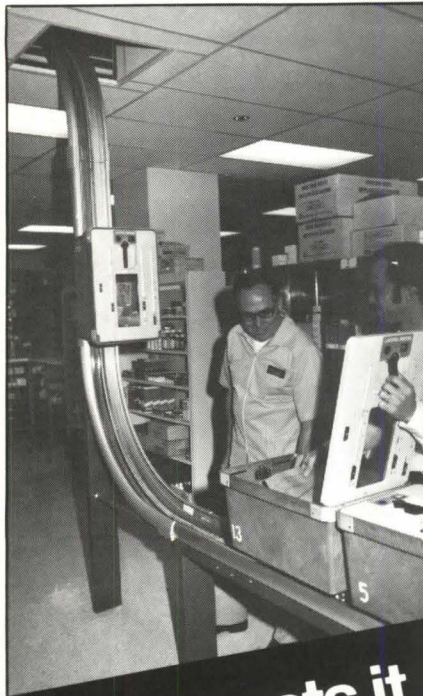
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tect, photographer's name, address and telephone number. Materials may be sent to: Michael S. Leventhal, NTHP, 740-748 Jackson Place N.W., Washington, D.C. 20006.

New executive director of the U.S. Metric Board is Malcom E. O'Hagan who has been serving as president of the American National Metric Council, a nonprofit organization which is coordinating metrification planning in the private sector.

"Building Underground for People: Eleven Selected Projects in the U.S." by Michael Barker, AIP, examines a sampling of underground projects. The 30-page report was presented by Barker to the International Tunnelling Association Working Groups on Subsurface Planning at their annual meeting in Tokyo in May. The report is available from AIA's publications fulfillment division for \$6 (#4M711).

Regional styles in fire station architecture is the subject of a book being prepared under a National Endowment for the Humanities grant. Information is requested on locations, descriptions and photographs. Send to Theresa Beyer and Rebecca Zunier, 1709 Foxhall Road N.W., Washington, D.C. 20007.

"Architects' Month" was celebrated in St. Louis in September. Mayor James Conway's official proclamation says in part: "Architects have planned, promoted and implemented 'quality of life' in St. Louis from the time of the World's Fair to the present. . . Architects have been in the forefront of energy conservation advocacy and are daily working in all facets of building design and construction to conserve energy."

"Bathroom Facilities Accommodating the Physically Disabled and the Aged" is the title of a study by students in the program of industrial design at the University of Michigan. It offers design alternatives to "frustrating barriers" for the aged and disabled in most bathrooms, both public and private. A copy may be obtained for \$2 from R. S. Meeks, Owens-Corning Fiberglas Corporation, Todelo, Ohio 43659. Checks should be made payable to Owens-Corning Fiberglas, sponsor and publisher of the study.

A five-year, \$100-million cooperative solar effort between the U.S. and Saudi Arabia is underway. The program, according to the Department of Energy, will emphasize both active and passive applications for solar cooling, solar desalination, solar-generated electricity for remote regions and solar thermal processes.

Under the agreement between the two countries, the Solar Energy Research Institute will act as operating agent and is currently preparing detailed documentation to help identify specific candidate projects.

George E. Kassabaum, FAIA, former president of the Institute, has been named "architect of the year" by the Missouri Council of Architects/AIA. Cited for "his outstanding achievements both professional and civic, as well as his extraordinary dedication to the development and promotion of the architectural profession," Kassabaum is principal in charge of project management responsibilities of Hellmuth, Obata & Kassabaum, Inc., with offices in St. Louis.

About 9,950 civilians died in 1977 as a result of fires in the U.S., reports the National Fire Protection Association. Of these deaths, 78 percent occurred in residential structures, including houses, apartments, hotels, motels and mobile homes. NFPA further estimates that 3,513,000 fires occurred nationwide in 1977, with property losses amounting to more than \$6 billion.

Frank Lloyd Wright's design in glass art, the "Tree of Life" window from the Darwin D. Martin residence in Buffalo, executed in 1904, has been given to the Milwaukee Art Center by the Frederick Layton Art League which was dissolved in 1977. The window, containing more than 750 pieces of clear and colored glass, is on temporary exhibition in the new acquisitions area of the center.

"An Exhibition of Color Photography: The Octagon and the Pension Building" will be on display at the Octagon, headquarters of the AIA Foundation, Washington, D.C., from Nov. 27 to Dec. 31. The photographs are by Charles Vincent McDonald, whose exhibition of color photography of the Woodrow Wilson house in the nation's capital was at the Octagon last year.

The New York Chapter/AIA has awarded its 1978 Le Brun traveling fellowship to Gary S. Flesher of McAlester, Okla. The \$5,000 fellowship is granted biennially for travel and the study of architecture outside the U.S.

Christopher William Bryant, who received a master's degree from the University of Virginia's school of architecture in May, has been awarded the William Van Alen architect fellowship by the National Institute for Architectural Education. The \$6,000 fellowship stipend permits him to travel and study abroad for about nine months. □

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