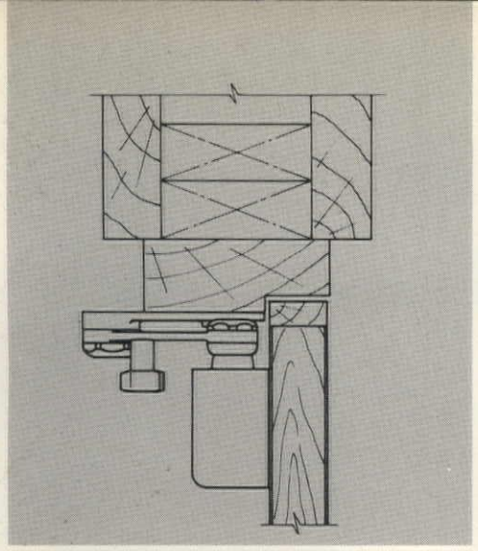
AIA JOURNAL



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COMMENT AND OPINION

Some Parting Thoughts: Since February will be the last issue of the AIA JOURNAL to carry my name on the masthead, I would like to reflect a few moments on what has transpired in the more than 11 years that I have been associated with the publication. When I became editor in July 1965, the editorial page carried a statement which I feel is still pertinent in regard to what we have tried to achieve during the period that I have been at the helm. To repeat one paragraph:

"It should be said that over the years there has been a lot of soul-searching about the audience and purpose of the magazine. Now the search has led to a single central editorial purpose—that of serving architects and, through them, serving architecture. There is a small but hardy band of nonarchitect subscribers who read the JOURNAL because they *want* to know about architecture. However, over 85 percent [currently 95.3 percent] of the circulation is now among US architects, most of them in active practice, who read the JOURNAL because they *must* know about architecture."

And that has been our major thrust ever since: to make the publication a real working tool for the practicing architect. I think that one AIA member summed it up nicely when she pointed out, "The JOURNAL looks *behind* the facade of buildings." Of course, so much has happened within the profession that we carry articles on subjects today that were unheard of or received scant attention 11 years ago. Just to name a few: the architect as developer, life-cycle costing, computer-based financial management, fast-track, construction management, barrier-free architecture, recycling, land use policy. It has been our intent to keep our readers abreast of these issues, and the response seems to indicate that we have been doing something right.

I want to take this opportunity to thank all of our readers who have often burned the midnight oil to meet a deadline for a manuscript, who have cooperated in our editing pursuits, who have graciously accepted rejection notices and who, in countless other ways, have supported our efforts. I also want to thank the members of the Institute's professional staff who have been helpful as consultants and reviewers. Finally, I am most grateful to my wonderful editorial associates who have served me beyond the call of duty.

In closing, all I can say is that I wish the AIA JOURNAL and its staff, including my successor, Donald J. Canty, continued success. *Robert E. Koehler*

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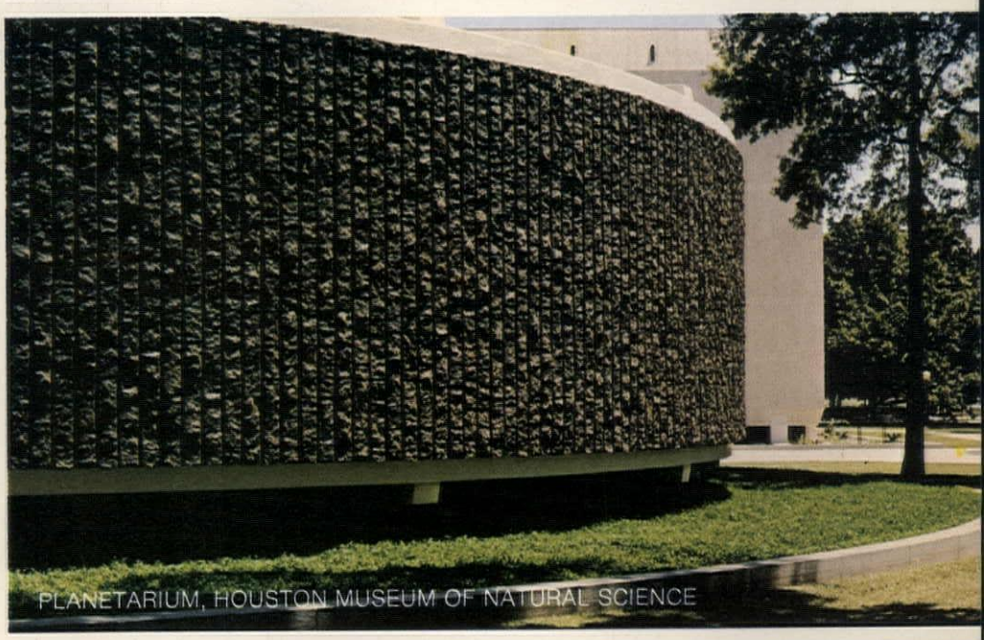

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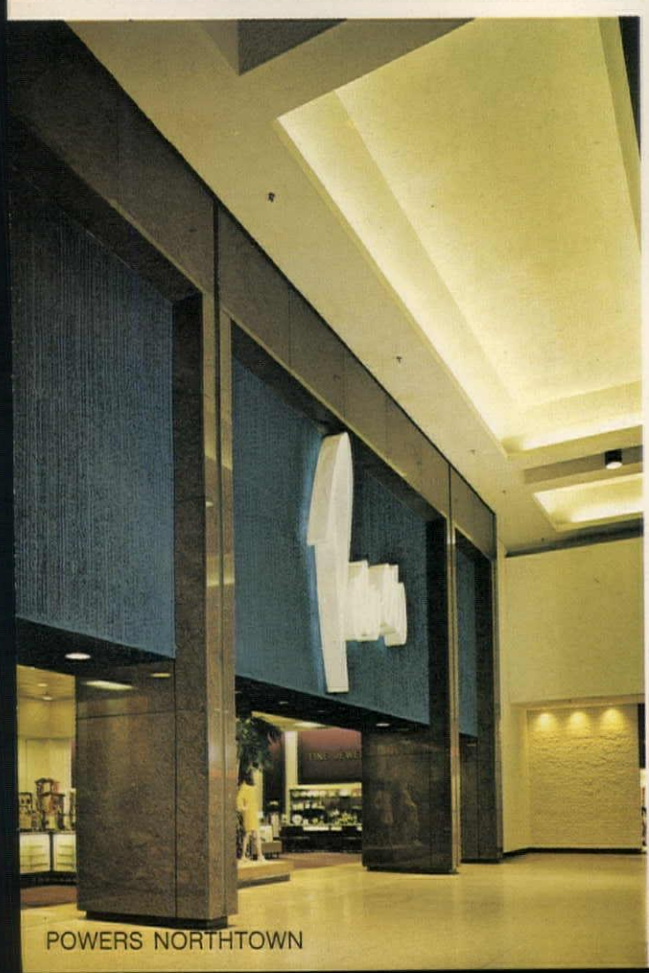

POWERS NORTHTOWN

GREENACRE PARK

GOING ON

Rogers Installed as AIA President; 50th Leader to Assume This Role

"This is an occasion of mingled pleasure, nostalgia and relief," said S. Scott Ferebee Jr., FAIA, when he relinquished the presidency of the AIA to his successor, Archibald C. Rogers, FAIA, on December 7. William L. Slayton, Hon. AIA, executive vice president of the Institute, quoted Mrs. Ferebee as having said that it was a red letter day for the Ferebee family: It was one of the few times in a year that the family had had dinner together.

Rogers assumed his new responsibilities as AIA leader at a dinner held at the Octagon Building. The honored guests included four past Institute presidents: Robert L. Durham, FAIA (1967-68); Morris Ketchum Jr., FAIA (1965-66); J. Roy Carroll Jr., FAIA (1963-64); and Leon Chatelain Jr., FAIA (1956-58).

William Marshall Jr., FAIA, the incoming first vice president and president elect of the AIA, expressed appreciation to the officers and directors whose terms of office ended. He paid special tribute to Fay DeAvignon, who has served two terms as president of the Associated Student Chapters/AIA. Marshall then introduced the new officers and directors who have been elected to serve in 1974 (*see* p. 4 for a complete listing and p. 16 for a statement by the new president).

Marshall conveyed the AIA's appreciation for the leadership of Ferebee, presenting him with an inscribed silver tray, the Board's traditional gift to outgoing presidents. Slayton conferred upon Ferebee an Institute citation for his "exceptional service."

Upon the investment of Rogers as the AIA's 50th leader, Ferebee said, "It is my hope that the number 50 will prove a significant omen and that your administration will prove to be truly a golden year for The American Institute of Architects."

After his investment, Rogers introduced the Right Reverend Bennett J. Sims, Episcopal Bishop of Atlanta, who gave the major address of the evening. He was serving as rector of the Church of the Redeemer in Baltimore at the time the parish retained Pietro Belluschi, FAIA, and the firm then known as Rogers, Taliaferro & Lamb to design its new church building. Rogers said that his "enormously rich and stimulating" association with Bishop Sims started then. "Because excellent architecture is the result of dedicated collaboration between good architects and good clients," Rogers had asked the Bishop to be present at his installation as AIA president and to "share some of his thoughts about architecture in the service of God and man."

During ceremonies at the Octagon Building, Rogers is invested as AIA president.

Another highlight of the occasion was the presentation by Hector Mestre, Hon. FAIA, of Mexico, of honorary memberships in the Mexican Society of Architects to Ferebee and Slayton.

The evening was also the occasion of the official dismissal of members of the AIA National Policy Task Force, which had functioned since 1971 with Rogers as its chairman. Ferebee called the work of the task force "one of the proudest achievements of the AIA's 116-year history." To commemorate the event and to express the gratitude of the AIA to members of the task force, each was presented with a special AIA citation, signed by Ferebee. He praised the document produced by the task force, calling it a "unifying principle for Institute programs."

Archibald C. Rogers, FAIA, becomes the Institute's 50th president; past AIA president Robert F. Hastings, FAIA, is dead.

Robert F. Hastings, Former Institute President, Dies in Detroit December 21

On the day after his 59th birthday, Robert F. Hastings, FAIA, died suddenly on the way to his office. He was chairman of the board of Smith, Hinchman & Grylls, the firm he joined upon his graduation from the University of Wisconsin in 1937. He served as AIA president in 1970-71, and was a past president of the Detroit Chapter AIA. Numerous national and state level AIA committees benefited from his participation.

The Luckman Family Reacquires Firm; Will Also Form Development Company

In 1968 the Ogden Corporation acquired the architectural firm of Charles Luckman Associates.

Recently Luckman and his son, James Luckman, AIA, entered into a contract with Ogden by which the Luckman family reacquired CLA. Luckman commented that "the reacquisition contract also makes provision for the establishment of a Luckman-owned real estate development company."

Ralph E. Ablon, Ogden chairman, stated that "changes in the development field had led Ogden to conclude that it no longer has a need for an architectural capability" and that Ogden would concentrate future efforts in the areas of water transportation, metals and food products and service. CLA "will continue to be available to perform architectural services" on Ogden projects. Charles Luckman, AIA, entered into a contract with Ogden as a member of its board of directors.

The AIA Development Team Conference Planned for February in New Orleans

A conference to explore new approaches to development building for expanded practice opportunities and better design control will be held at the New Orleans Marriott Hotel on February 8-9.

Tailored for architects with either extensive or limited experience in project development, the Development Team Conference will feature concurrent small-group workshops. The conference offers two days of intensive interaction with suc-

continued on page 15

going on from page 8
cessful development, economic and real estate consultants, tax and legal counsel, mortgage bankers and architect/developers on strategies and techniques of project development. For registration forms and information, call Robert Class, conference director, at 202-787-7300.

Restoration of Centennial Masterpiece To Celebrate Nation's Bicentennial

Among the projects to help celebrate this nation's bicentennial will be the restored Pennsylvania Academy of Fine Arts' building in Philadelphia. The original

Opened in 1876, Pennsylvania Academy of Fine Arts is one of the oldest buildings in America specifically designed as a museum and school.

structure, built between 1871 and 1876, has come to be regarded by critics as a masterpiece of Victorian architecture.

A competition for the design of the building was won in 1871 by Frank H. Furness and George W. Hewitt. Hewitt

left the firm of Furness & Hewitt before the building's completion, and over the years the structure has been referred to as the Furness Building. The structure was finished in time for the crowds that came to Philadelphia for the Centennial Exposition to marvel at its architectural richness. As a result, the reputation of Furness was firmly established.

The academy's board of directors has spent three years of preliminary study which has resulted in a plan of restoration that "has received international acclaim and approval." Responsibility for restoration work has been assigned to the architectural firm of Day & Zimmerman.

The board of directors has announced that elements of restoration will include climate control, lighting, security systems, storage vaults, administrative offices, increased public areas, roof repairs and restoration of the decorative features that have been damaged by time and weather in the intervening years. The board has initiated a fund drive for the $7.4 million restoration project.

Two California Plans, a Californian Honored by Professional Organization

The American Institute of Planners gives meritorious program awards annually to one to five planning processes which have unusual significance for the planning profession. This year's honors go to the San Francisco Urban Design Plan and the Los Angeles County Mental Health Plan. San Francisco's plan (which was featured in the April AIA JOURNAL) was praised by the AIP for "its significant innovation in control of heighth and bulk of building to preserve the natural scenic amenities" and for its "wide acceptance by and the involvement of the citizens" in its development.

The Los Angeles Mental Health Plan, commented the AIP, "has alerted administrative and clinical personnel to the need for and desirability of planning for future services, and it has led to the increasing ability of all personnel involved to plan in terms of very specific mental health needs for the community and communities rather than in broad and general terms."

The AIP presented its distinguished service award to William L. C. Wheaton, dean of the College of Environmental Design, University of California at Berkeley. He was acclaimed as a "leader in the formulation of planning theory and practice through his notable contributions" in education, public service, professional practice and services.

The Institute, for the first time, now has an archivist/historian; a new librarian is appointed.

The AIA Appoints Archivist, Historian; Assistant Librarian Becomes Librarian

George E. Pettengill, Hon. AIA, became the AIA's first professional librarian in 1951. Over the intervening years, he has worked to make the library an efficiently organized source of information for AIA members and architectural scholars.

Pettengill was recently named librarian emeritus of the Institute and in the future will act as historian and archivist of the AIA. He has been staff executive for the Committee on Architectural Design Competitions for more than 15 years and will continue his duties in this area. Among the other projects which will engage his attention will be bringing the history titled *The A.I.A.'s First Hundred Years* up to date. The book, authored by the late Henry H. Saylor, was published in 1957.

Pettengill is a graduate of Bowdoin College and the Columbia University School of Library Service. Before coming to the AIA, he worked at the New York Public Library; the Reading, Pa., Public Library; and the Franklin Institute in

continued on page 65

THE INSTITUTE

Three broad and synthesizing principles will buttress Rogers' goals as AIA president. The focus will be on institutional renewal.

Archibald C. Rogers, FAIA
President

Mission Possible: The program and budget for this year focus upon institutional renewal. The Future of the Institute Task Force is the spearhead of this focus. Its chairman is Harold L. Adams, AIA. S. Scott Ferebee Jr., FAIA, immediate past president, has agreed to serve as a member of this task force.

The task force's assignment is difficult. It is the nature of institutions to resist change and, thereby, to avoid the poignant problems of self-renewal.

I recall some years ago discussing the future of another institution—the church—at a meeting with a number of parish priests representing varying denominations and nationalities.

Their question: "What is the role of the church today?"

My answer: "What it has always been. As the most venerable of all our institutions, save perhaps the family, the church is expected to man the barricades in defense of tradition. As an evangelical institution, it is expected to lead the forces of change in their charge upon these barricades. As a godly institution, it offers to its members an escape hatch to serenity through which they may avoid the raucous clash between change and tradition."

Mission impossible? Not necessarily so.

All institutions share these seemingly conflicting roles to some degree, including the AIA as an organization in service to the broader institution of architecture.

The AIA must, first, protect the traditional roots of architecture—roots that have survived some seven millennia of wrenching changes in the long tide of civilization. Second, the AIA must early identify these changes and judge their relative impact upon the broader architectural institution. It must then adapt to them, as a lissome willow-in-the-wind beneath which its members shelter. Finally, the AIA must provide the spiritual nourishment of professional interchange and enhancement for its members all over the country.

These three roles become one if we apply to our institutional renewal the design principles which we espouse as architects.

These principles can perhaps best be summarized as a three-layer synthesis.

These layers are stated sequentially but seem often to occur simultaneously.

Synthesis I: The Well-Solved Problem. This requires, first, a deep understanding of the problem and then the design of a matrix for evaluating the cost and benefits of the solution—a matrix that is capable of measuring environmental and social factors external to the problem to be solved—and, finally, the imagining of the broadest possible spectrum of alternative solutions from which to select, by comparative evaluation against this matrix, the optimum solution. Synthesis I is applicable to the design of the AIA's future as it is applicable also to the architectural design which the AIA nurtures.

Synthesis II: Its "Fit" to the User. This technical solution then requires adaptation to the subtle, nonphysical requirements of those who shelter within the resulting architecture; of those who will be also touched by it externally. Architecture is one of the humanities. Its role is always to harness technological, political and economic forces within a person-oriented synthesis. Again, this reconciliation between these forces within the AIA and its members is imperative.

Synthesis III: Time and Eternity. Architecture is an art. The role of art, in my opinion, is precisely to reconcile time with eternity as their conflicting forces impinge upon the person.

This, then, is the final synthesis: to release from the well-solved problem, in harmony with its sheltering society, the latent art form which lies at the core, and at the terminus, of the design process; an art form to nourish the spirit of contemporary man as it nourished the spirit of primitive societies.

And this, too, is a charge laid upon the AIA. If architecture is an art, then the architect is, *au fond,* an artist. If the AIA is really to serve its architect (artist) members, it, too, must be "artistic" in all that it does and says.

This year sees the start of a difficult, but "possible," mission—an exercise in institutional self-renewal that could be a most timely model for other contemporary institutions as they, too, address the need to change in our troubled circumstances. □

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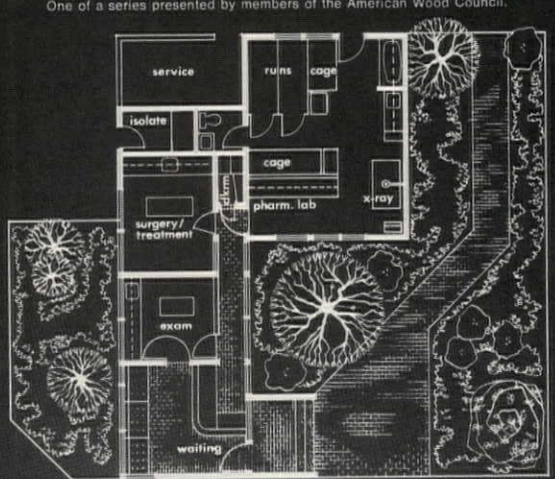

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AIA JOURNAL

John K. Bowersox

THE NEW AGE OF BUILDING

That significant changes are occurring in the construction industry has been apparent for some time—changes in technology, management or simply in the way we do business. Equally apparent, moreover, is that these changes are here to stay. The quiet revolution of the '60s is gathering steam in the '70s. Buzz words first introduced a decade ago are gaining wider currency; words such as building systems or systems building or construction management, fast-track and value analysis have not only come into the vernacular but into practice in a growing number of old-line design firms.

Gone for the most part is the knee-jerk reaction experienced when these catch-phrases were first introduced among the members of the traditional disciplines—gone because careful analysis has revealed that they are not radical departures from normal design and business practice but adaptations of procedures or technology that have existed for some time.

Several important factors have come out of the introspective review of our industry

Saving is the order of the day within the construction industry. Ways to reduce the use of materials, time and energy are sought. American ingenuity is at full play; the possibilities are exciting.

ALUMINUM
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CONCRETE
STONE
BRICK
GLASS

brought about by this new age of building. First, the owner or ultimate user has become much more knowledgeable and involved in the construction process in the past 10 years. As a result, he has become much more demanding. He requires high performance and, above all, speed. He wants his building yesterday—with tomorrow's technology.

Second, our industry and nation are rapidly realizing that our resources are not inexhaustible. New ways must be found to provide the necessary land, materials, energy and capital to maintain orderly growth. It boils down to the fact that our industrial society can do almost anything it sets its mind to, but it can no longer do everything at the same time.

A recent Delphi study just released by the Producers' Council attempts to foresee some additional changes we can expect in the years ahead. Thirty-two well-qualified construction observers participated in this study and came up with some highly interesting findings:

• During the balance of the '70s, these experts predict, the energy shortage will force radically new designs of our buildings. Multifamily living units will markedly increase during this period, and a number of

No less exciting is what already is at hand for architects to use, and in this issue the JOURNAL gives an overview of what is offered from some of the main producers at this time.

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new cities like Reston or Columbia will be built. Security will be an increasing concern and school design will be more flexible, allowing for expansion and diversity.

• In the '80s, these experts forecast, modular construction and larger building components will be much more in evidence on the building scene. "Plug-in" mechanical and utility systems will be the order of the day.

• And by 1990, new building materials, light as magnesium but strong as steel, will further alter methods of construction. Wireless transmission of energy and solar energy collectors will be used; plumbing and mechanical systems will change dramatically.

These are but a few possibilities that point to an exciting and challenging future. Whatever that future may hold, one thing is certain: The building industry will become increasingly complex. More and more we must rely on the interaction and expertise of *all* of the members of the building team. Through this means alone can the intricate timing and orderly implementation so necessary to respond to today's needs and to meet tomorrow's goals be accomplished.□

Mr. Bowersox is executive vice president of the Producers' Council, Inc., in Washington, D.C.

What's Going On with Aluminum

R. H. Barton

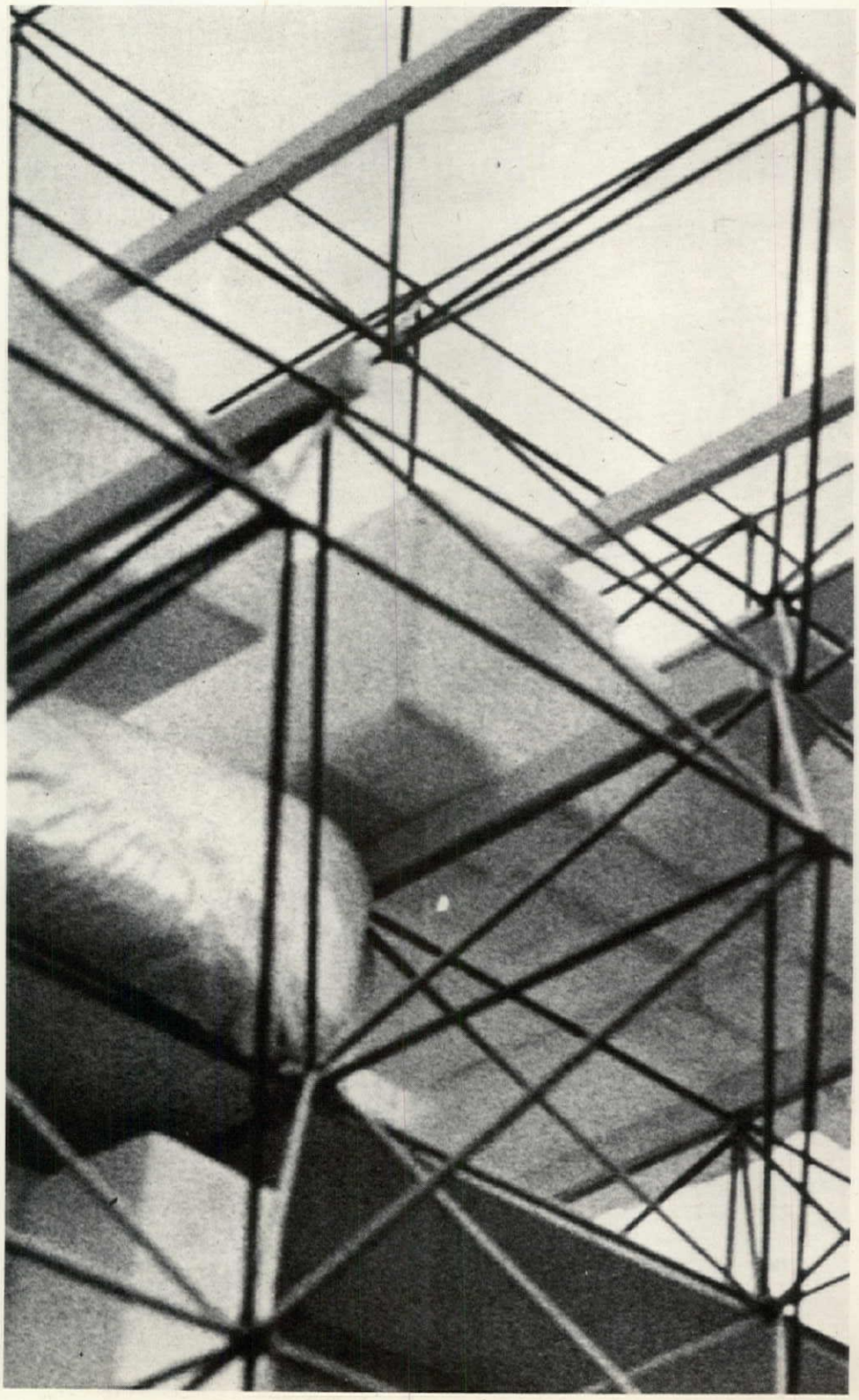
The energy crisis will challenge the ingenuity of American industry, but it ultimately may lead to vastly expanded demand for aluminum. The energy saving characteristics of the metal—its light weight, durability, conductance, reflectivity, and recyclability—will increase its usage in present applications and as a basic material where products are being redesigned to reduce energy consumption in their use.

As a brief review, the domestic aluminum industry increased shipments to record levels in 1973. Worldwide demand exceeds capacity, and most experts feel that this situation will continue for the near term. However, the United States industry, restrained by price control, continues to be plagued by low profit margins and the resulting inability to finance added capacity.

The aluminum industry in its operations accounts for approximately 1 percent of the nation's total energy consumption, primarily in the form of electricity. However, about half of this electricity comes from hydroelectric generation, a constantly renewable and nonhigh-polluting resource. The Aluminum Company of America, for instance, generates well over half of its electricity needs in company-owned facilities with the remainder coming from both public and private sources under long-term contracts.

Aluminum industry research has greatly increased the efficiency of the basic smelting process so that the most modern smelters operate with 50 percent less energy per pound than in the World War II era. Alcoa now is constructing a plant in Texas which will utilize this Alcoa Smelting Process, which was announced early last year. We expect the process to cut the electrical consumption by an additional 30 percent under today's most efficient smelter.

Aluminum will have a growing role in providing solutions to the energy shortage. Transportation and construction are the two primary areas where the light metal has especially attractive characteristics—



Mr. Barton is manager of Building and Construction Industry Sales, Aluminum Company of America, Pittsburgh.

A more efficient smelting process; proposed solar energy and storage systems; equipment to produce solar power; thermally insulated extrusions for windows—all add up to an optimistic view of what lies ahead.

not to mention the packaging industry which is the fastest growing market for a metal.

The long-term trend in the automotive industry will require large tonnages of aluminum as the auto makers seek to lighten cars to reduce fuel consumption. During the past year, the amount of aluminum in the average American car climbed from 80 to 87 pounds, the addition mostly in the form of trim, bumpers and heat exchangers. The development work now going on in Detroit and in the laboratories of the aluminum producers is aimed at additional uses, including such parts as hoods, doors and, ultimately, body panels.

In the rapidly growing commercial automotive market where weight reductions often can be directly translated into additional payload, light metal usage continues to grow in such areas as wheels, frame rails, bumpers, fuel tanks and all-aluminum cabs.

The building and construction industry, the largest single market for aluminum, continues to have growth potential in both its residential and commercial segments. Look, for example, at the booming sales of residential siding and rain-carrying equipment and the strong demand for aluminum storm windows and doors. The latter has significant potential for reducing home heating fuel consumption, as do aluminum insulation materials.

One of the most interesting projects involves solar energy collection and storage. Scientists now involved in a mass study have as a final goal the utilization of this power source. For our part, we have been looking into developing an aluminum apparatus to collect solar energy. Chemists have been working on selective coatings that absorb solar energy. We've even supplied some materials to companies experimenting with the concept of homes powered by solar energy.

The Architectural Aluminum Manufacturers Association (AAMA) has made great efforts to develop formal performance criteria for aluminum insulating windows as a part of the industry's program to provide energy-saving building materials. This standard rating system is still in the development stages, but it will become a reality. And when it does, it will

offer architects and builders an easy guide to selecting the aluminum window system to meet their specifications. What we are looking at is an effort on the part of the industry to offer a vital product that will contribute to energy savings in heating and airconditioning. We all know the role that windows play in this area, and aluminum manufacturers are continually looking for a better product. The research into producing a thermally insulated extrusion for this application looks very promising.

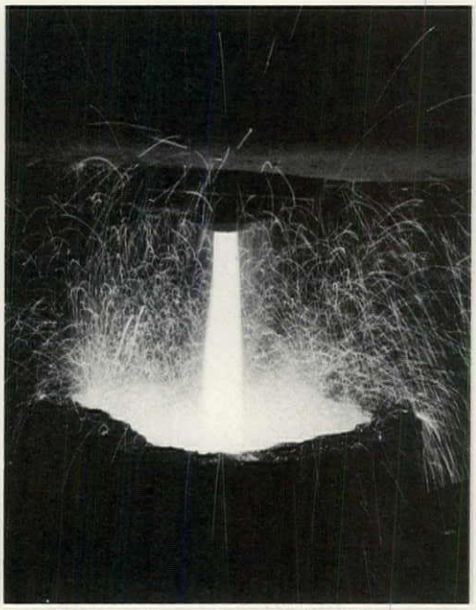
Looking at the overall picture, we need a national energy approach. No policy set down at a moment in time will serve all situations, but a rational well-devised systems approach will serve the nation indefinitely. It is indispensable to solving our energy problems. It implies and rests upon a total consideration of all factors—technological, economic, resources, environmental and social. Solutions will require a series of economic and environmental tradeoffs. The systems approach will require a mechanism for making decisions and a means for appraising the total impact of governmental action. There are no "energy" decisions without profound economic and environmental implications as well as major social impact in most cases.

We also need more emphasis on industrial processes. We need further successes such as the aluminum industry has had in technological innovations to reduce energy consumption. With energy such a crucial concern, perhaps a stimulant is required. Perhaps the United States should consider a tax credit for all dollars spent on research and development devoted to energy conservation and environmental protection. That type of incentive should ensure that every logical dollar is being invested in energy research.

I have no doubt that we will come to terms with the energy problem, and I see no reason why we should retreat to a poorer standard of living to do so. This nation has thrived on new technology and on ingenuity in applying it. The penalty of retreat would fall most heavily on those in our society who have yet to gather the full rewards of our prosperity. That would be neither right nor necessary. □

Methods in Steel That Speed Construction

Leslie A. Barron



With speed more than ever at a premium, steel construction is making constant progress in reducing building time. Some late developments are steel frames for residential and hotel use and steel decking; prefabricated, insulated interior steel panels; and prefabricated plumbing "trees" serving up to 10 bathrooms each.

Since its first application in 1967, staggered truss design has now been used for some 20 apartment houses, hotels, motels, dormitories and other types of building. In it most recent use, this framing system has resulted in new reductions in construction time and costs. The system was initially conceived and developed by a research team from the Departments of Architecture and Civil Engineering at the Massachusetts Institute of Technology, headed by Professor Robert Hansen, and sponsored by the United States Steel Corporation.

The design or architectural significance of this system, incidentally, is that the one-story-high trusses running from front to back in the building result in interior freedom from columns. The clear spaces on each floor are limited only by these trusses which alternate from floor to floor, so that all odd floors are identical, as are all even floors. These trusses have openings for corridors, doors and utilities. Each floor slab rests on top of one truss on one end and hangs from the bottom of the adjacent truss one story above. The system requires about 20 percent less steel than more conventional framing designs.

A system that incorporates the staggered truss technology and precast lateral support beams is Skipcon, which was developed by Skipcon Building Systems, Inc., a subsidiary of Shrenko Steel Corporation. It has the capacity to function immediately upon installation as both spandrel and exterior wall. Four apartment houses recently completed or now in the design stages in New Jersey have made use of this system, and each successive building has improved upon it.

Further, Skipcon uses advanced erection techniques which includes a single, special tower crane erected just outside the center front of the building. This has a boom operator, a telephone man in a control room at the top level of construction and one at ground level. An Australian development sometimes referred to as the kangaroo, this tower grows with the construction and takes up less space on the ground than regular cranes, helping to ease traffic congestion at the jobsite.

The Skipcon technique was first used in a 24-story apartment building in Hackensack, New Jersey, where the design resulted in substantial direct savings and also significant time savings. The 207,000-square-foot building, by Eugene A. DeMartin, AIA, has 197 apartments and cost $3.5 million, including appliances and carpeting throughout, but not including the land.

After completion of this building in early 1973, the system was used for a much larger project, the 29-story Briarcliff Manor apartment house in Cliffside Park, New Jersey, also by DeMartin. Each floor has nine 28-foot bays for a total area of 17,700 square feet; each floor was erected in only four days. A total of 100 working days will be required to top out the building.

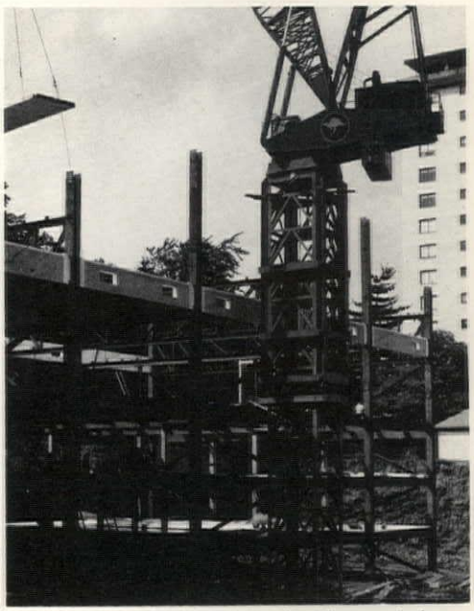
Now in the design stage by the same design firm are two additional apartment houses in New Jersey, one in Passaic and one in Newark. Construction time of these will be cut about 20 percent by eliminating end trusses and making compensating adjustments.

In brief, the Skipcon assembly technique starts with the tower crane placing exterior columns on the foundation. This is a relatively light foundation, easier and faster to lay since the entire structure is lighter in weight. Then come two floors of steel trusses in the staggered pattern. The outermost cast floor planks are then installed for lateral strength, and a few are arranged in the inner area as well. High-

Mr. Barron is vice president, Engineering, American Iron and Steel Institute.

New developments from the steel industry all aim to reduce construction time and cost. A prefabricated steel pipe plumbing system including water, waste and vent lines (below) has been patented by the Zien company. It can serve 10 bathrooms.

An advanced erection technique is used for the Skipcon Building System, which incorporates staggered trusses and precast lateral support beams: a single, special tower crane erected outside the center front of the structure, growing with construction, taking minimum space.



strength steels are conveniently used since the truss system resists major gravity and lateral loads directly; no additional support material is needed for drift control.

Precast spandrel walls are inserted between columns for lateral support. In the early assembly phase of each level, the spandrel wall and plank serve as a perimeter platform. The wall forms an immediate balcony rail that provides a safe working area and eliminates expensive temporary railing required by law.

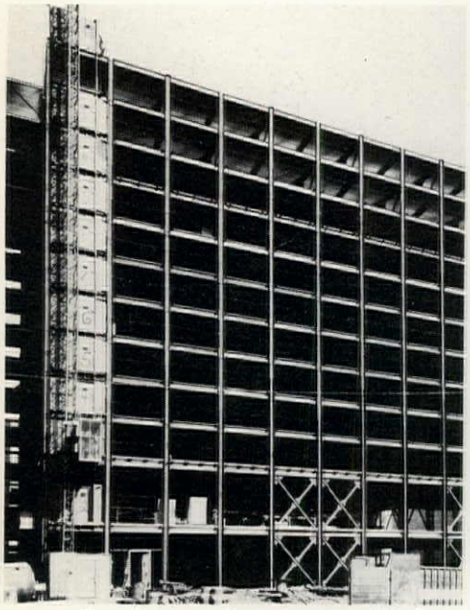
Pratt trusses with Vierendeel panels are placed in the central corridor; the remaining planks are installed to complete the floor. They are grounded top and bottom (since no concrete topping is necessary) and smoothed for later carpeting on the upper surface and painting on the under surface (or ceiling) below.

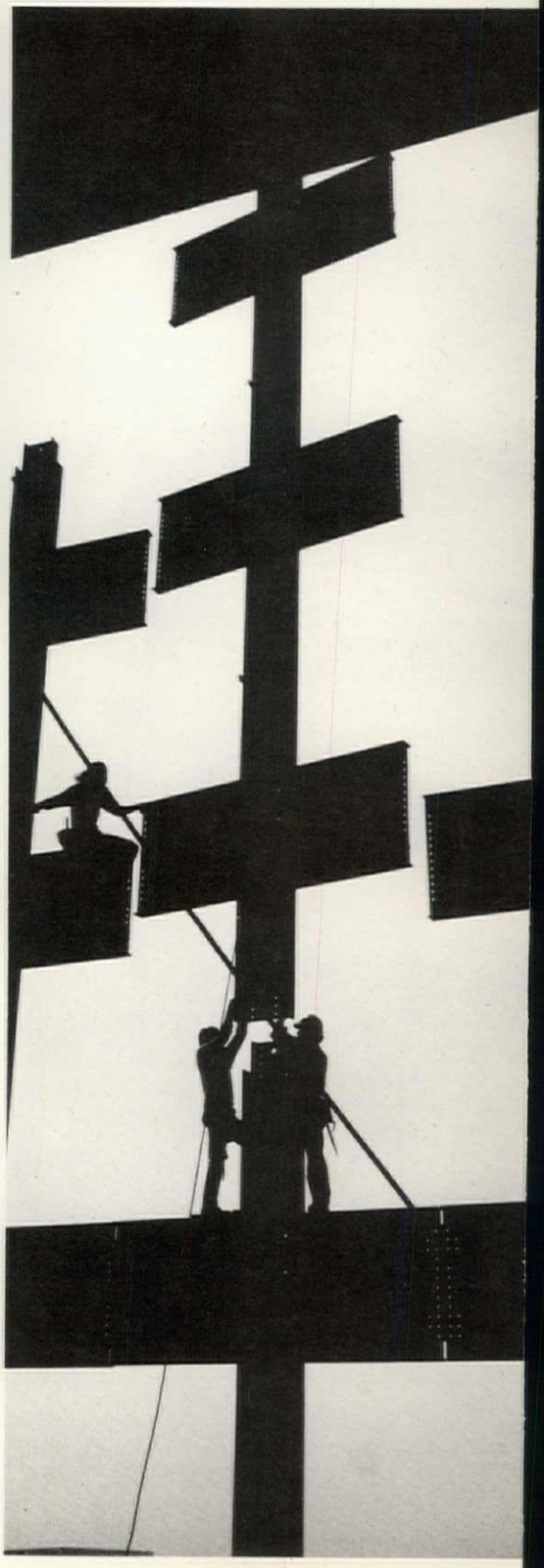
At this point, the level below is ready for the interior trades to begin work. This occurs when the structural frame is in place three levels above. Finally, precast column covers and any precast exterior wall panels, other than the spandrel walls, are applied to complete the basic frame. This assembly procedure is repeated floor by floor until the building is topped out.

The top surface does not require a concrete topping and is acceptable for installation of carpet and/or an underlayment for tile or wood parquet flooring. The bot-

The 12-story Ramada Inn in Beverly Hills, California (below) has framing completed after six weeks.

Prefabricated steel panels (below) consisting of exterior wall, insulation and interior wall may eliminate or reduce the need for horizontal support.





tom surface is smooth and acceptable for sprayed acoustical painting.

Arthur Hassler, president of Skipcon, believes that his system has taken approximately one-third less time than former construction methods. In the future, that time will be cut to one half.

Framing was completed in six weeks in the 12-story, 266-unit Ramada Inn in Beverly Hills, California. The architect, J. Stewart Stein, AIA, enjoyed almost complete design and layout flexibility. There are no interior columns on the truss-supported floors.

Columns were erected on opposite sides of the structure and connected across the building by one-story-high (8-foot, 6¼-inch) shop-fabricated trusses, 60 feet, 10 inches long. Steel decking was then installed to span and brace the trusses and to provide an immediate working platform for other trades. The deck served as a form and reinforcement for the concrete floor when it was poured. The 6¼-inch floor/ceiling sandwich helped minimize floor-to-floor height. As usual in staggered truss design, the floor system is supported alternately by the top chord of one truss and the bottom chord of the adjacent truss one level higher.

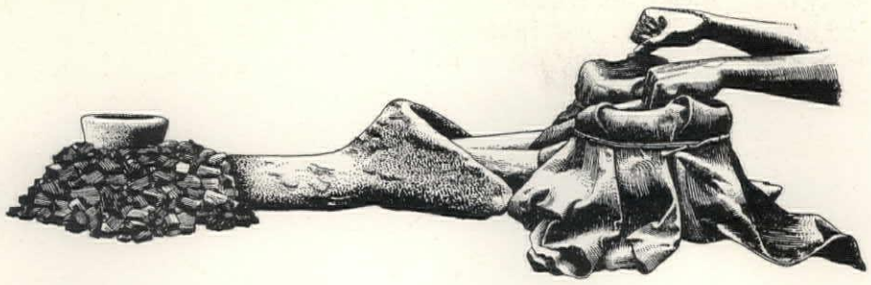
A central corridor was provided in the trusses by omitting a diagonal member from the central panel and reinforcing its horizontal chord members.

Net benefits to Ramada Inn Development Corporation because of this design: greater architectural flexibility, faster erection on a cramped jobsite, lower field labor costs, tighter budget controls and efficient fulfillment of Zone 3 seismic design requirements. Structural engineers were Kelly, Pittelko, Fritz & Forssen; the fabricator, Techni Builders, Inc.

At Treasure Island, Florida, an eight-story staggered truss frame was put up in 12 days. The architect was Edward W. Hanson, AIA. And the 14-story, 230-room Howard Johnson Motor Lodge in Clearwater, Florida, with parking decks on the second, third and fourth levels, was started last June and topped out in early October. The structure, by Gordon Johnson, AIA, will be ready this spring.

Prefabricated insulated steel panels are essentially three-in-one combinations of exterior wall, insulation and interior wall.

The architectural manager of the building products firm, H. H. Robertson Company, James W. Boyd, recently said: "Today, about 30 percent of the metal walls put up in this country are made of these prefabricated, three-part structures. Seventy percent are assembled at the jobsite from separate walls and insulation. Within a three-year period, we anticipate a reverse situation with up to 70 percent of all metal walls constructed from the steel prefabs."



Steel frames for residential and hotel use and steel decking are other innovations; research work now goes on from how to optimize fillet welds to major computer programs for planning and designing skyscrapers.

Many types of structures are excellent prospects for these panels: light industry plants, warehousing and distribution centers, schools and colleges, hospitals and suburban office buildings, airport terminals and hangars.

The panel components vary greatly. The outer ply, or exterior surface, is usually galvanized steel in thicknesses from 0.0276 to 0.0516 inches. Maintenance-free weathering steel and a porcelain-enameled finish on galvanized or aluminized steel are also available.

Surface profiles can either be flat or ribbed. Architects seem to prefer the flat surface where they have cubes to work with and can incorporate such design effects as bevels and chamfers. Conversely, deep-ribbed exteriors can produce an interesting variety of shadow highlights.

Three coating systems are possible to top the galvanized surface: fluor-carbon paint finish, a silicone-modified polyester paint, or a multilayered protected metal system (asbestos felt impregnated with a waterproof sealant and a modified polyester coating on the surface).

All of these prefabricated panels help speed construction because of their structural strength (two thicknesses of steel), which may eliminate or reduce the need for horizontal support. And the cost is less. These building units offer a per-square-foot construction price of $3 to $6 completely installed. Fastening is done with self-tapping stainless steel screws to structural supports, with fasteners completely concealed within the tongue-and-groove side joints.

A prefabricated steel pipe plumbing system, including water, waste and vent lines, has been developed and patented by the Zien Plumbing & Heating Company. It is a single plumbing tree that can serve as many as 10 bathrooms at a time, two each on five floors. So far this system is available only in the Midwest and West.

The plumbing trees are cut, threaded, assembled and strapped, and tested in a shop. They are stored until needed, then trucked to the jobsite and lowered into place by a crane. Size of the tree is restricted only by transportation limitations.

In the first year after development, which was in 1970, more than 3,000 installations were made in townhouses, condominiums, lowrise and apartment houses. The crowning achievement for this system was its use in a Milwaukee Ramada Inn by Sheppard, Legen, Aldrine, Ltd., a 200-room motor lodge completed in late 1973 six months ahead of schedule. Total construction time is reduced since no other work waits for the plumbing; the trees are made up ahead of time and possible on-site delays due to weather are eliminated.

The use of interstitial space for hospital construction can mean significant time savings. One of the nation's most modern children's hospitals and one that has incorporated all major construction innovations in its field is the $50 million addition to the National Medical Center in Washington, D.C. This, by the Leo A. Daly Company, is scheduled to be in operation in mid-1974. It incorporates the following: an all-structural steel frame; true interstitial construction, where hospital care levels are alternated with mechanical/utility levels; galvanized sheet steel decking on all floors, with a cellular system on the mechanical/utility levels for electrical supply and airconditioning.

The addition incorporates more than 500,000 square feet of usable space on the four above-ground levels. The same area is provided in the service level plus three levels below ground for vehicular traffic and parking.

The advantage of interstitial hospital construction, as far as speed is concerned, is that all mechanical and utility work can be done on separate floors at a separate time concurrent with work on the patient floors.

Another hospital points up these time savings in broader perspective: Greenpoint Medical and Mental Health Center in Brooklyn, New York, by Kallman & McKinnell. Here, interstitial design was employed partly because this enabled the architect to use phase bidding. Working drawings for each trade were completed in the same order as the construction sequence.

Mechanical and electrical bids did not go out until many months after the structural steel bids. Half of the mechanical

and electrical work went out in a lump sum contract, and this was for the fixed major pieces of equipment and the primary distribution systems such as cooling towers, boilers, air handling units, primary piping runs, etc. The other half of the mechanical and electrical bids went out on the basis of estimated quantities with the contractors supplying unit prices.

At one point two years ago, the structural steel would be approximately 50 percent erected, and no final architectural plans or mechanical layouts would have been issued to the contractors.

Such a scheduling method as used for Greenpoint is particularly useful for hospitals, which are notorious for the length of the planning-to-construction phase. By allowing construction to begin before the final layout, the architect estimates that he gained more than a year during which planning of Greenpoint continued as the structure was being erected.

Other developments underway that will help speed steel construction range from research work to optimize fillet welds all the way to major computer programs for planning and designing skyscrapers.

The steel industry, steel fabricators, contractors, construction companies and the architectural profession are all moving forward to reduce construction time and cost even further, while still achieving esthetic buildings. □

New Ground for Concrete in Housing

James M. Shilstone

As construction costs have escalated and labor and materials availability have diminished, many builders recognize that they must look to new construction opportunities. Like other building materials, concrete has increased in cost. On the other hand, the efficiencies of precasting yards and developments in techniques for cast-in-place concrete have created new and faster procedures, and concrete must now be examined with a new eye.

In the past, concrete has been used to a greater degree in large structures than in smaller dwellings or smaller commercial buildings. The foremost reason for this has probably been the difficulty encountered by builders of smaller projects in assembling the right crews and equipment to get the job done: cranes to lift the mix from the truck into place, forms to contain the concrete and vibrators to consolidate the mass. Further, builders of smaller projects have had trouble scheduling the use of the equipment for full efficiency to keep unit construction cost at a minimum.

For these reasons it has been natural for builders to resort to materials which could be readily handled by a few skilled workmen with semiskilled and unskilled assistants, frequently outside the union-scale workers who often control structural, vertically cast-in-place concrete.

Today, builders look to new, more sophisticated ideas to fill the gaps caused by shortages in labor and materials, and buyers are watching not only initial price but also life-cycle cost.

In order to accept the opportunities in concrete, the architect must first change his fundamental concept of the material. Many designers look upon concrete as a free-forming plastic material with immense possibilities for casting to fit any configuration and a minimum need for discipline. Unfortunately, discipline must be an overriding consideration for concrete if it is to be economically and properly used within relatively strict budgets.

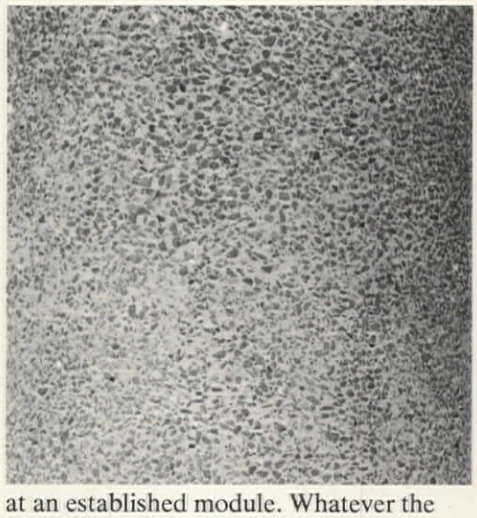
Concrete, both precast and cast-in-place, should be considered as a modular material whose modules can be designed with some degree of flexibility but used with discipline. The lumber industry has recognized the need for standard-dimension precut framing products. When someone wants framing lumber for other than standard dimensions, the cost of the frame is increased because special cuts must be made and material wasted. The same appreciation of standardization must be held for concrete so that the product is used at its best economic advantage. Changes in standard size destroy good economics.

The use of architectural precast concrete panels in small buildings will be a reasonable solution when the precaster can, on a production-line basis, cast modular panels to standard dimensions. Length is not a great problem since precast pieces can be cut to desired lengths or stops inserted at typical lengths.

Precast pieces will, in the future, be bought from the shelf much as one buys a piece of mahogany paneling. Any number of textures can be achieved for the exterior face using inherent concrete qualities or applied coatings.

A smooth, as-cast surface is one of the most difficult finishes to achieve. The best economics and results will be found with textured as-cast products which may be shipped by the precaster without further treatment. If local aggregates can be attractively exposed, this, too, may be reasonably economical.

The use of precast concrete dictates certain constraints to finish selection. Obviously, there will be joints between panels at an established module. Whatever the finish, it must accommodate the repetition of a caulked joint. The apparent ideal would be a vertical linear effect of such detail that the joint-line would be interpreted as a natural part of the total rather than a separate contradicting entity. A variable exposed aggregate texture such as that frequently used for large commercial building is another possibility.



The dimensions of the precast piece will be limited by the most economical lifting equipment available in any given area. In most cases this will probably be a four-wheel tractor with a front-end lifting device. While module length may vary, width will most likely be constant for residential construction. Thickness will be related to the proposed casting and stripping techniques. This will be in the range of 4 to 5 inches, but with prestress members this could be reduced. Selection of an appropriate module for housing is important; to facilitate variations special pieces could be cast for one-third and half modules.

The connection between precast pieces preferably will be through bolts to eliminate the need for specially qualified welders, though welded connections could be provided as an option. Standard commercial building caulking procedures will be used at all joints. Windows may be framed with a variety of solutions. The load-bearing concrete panels could be finished on the exterior. Interior face of panels should be furred to provide space for installation of conduits and insulation.

Mr. Shilstone is president of Architectural Concrete Consultants, a division of General Portland Inc., in Dallas.

There are ways to speed up concrete construction, ways to keep cost down. The greatest problem, manufacturers agree, lies in the architects' reluctance to work within the system. Minor changes are in reality costly, major adjustments.

The Arverne project in Far Rockaway, New York (left), by Carl Koch & Associates, Inc., combines on-site and off-site precast panels and takes advantage of extensive repetition for quicker construction, best economics.

Conventional cast-in-place concrete will probably find its greatest economics in lower cost housing. Standard forms have been developed for casting of exterior walls and roofs. A system which was developed in Latin America and now is finding its way into the United States uses forms that are rolled from house slab to house slab. A house can be enclosed and roofed in 72 hours. Conduits can be cast in the walls as desired and opening can be provided with ease.

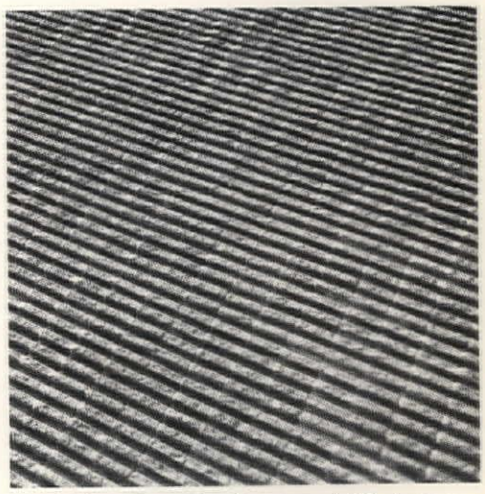
Form liners can be attached to the standard forms to impart texture to the cast concrete. The final surface should be an applied coating. In some areas where economical, attractive cements are available, the coating may be eliminated and the inherent characteristics of the as-cast concrete expressed. Wing walls and other treatments will relieve the visual repetitive impact of the standard box.

A product now being developed within the concrete industry may aid the acceptance of this type of cast-in-place system: a reliable foamed concrete. This would have a manyfold and advantageous impact upon this cast-in-place system.

First, due to the fluidity of the mix, there will be no need for vibration of the concrete; it will seek its own levels within the forms. Second, it has been proved that as weight per cubic foot of foamed concrete is reduced, the insulation value is increased. Therefore, using the minimum acceptable weight per cubic foot for the load conditions imposed, desirable insulating characteristics can become part of the concrete.

A proper balance between strength of concrete, hardness of surface and insulating value can be developed along with thermal-type glass to provide an effectively enclosed living environment. This will markedly decrease energy demand, conserving our resources and reducing operating costs.

Concrete can now be sprayed, following the principles of "shotcrete" spraying of mortar on a relatively low volume basis. The recently developed spraying system by American Conspray involves the erection of only one single-form form face which may be the exterior with textured form liners or even the interior



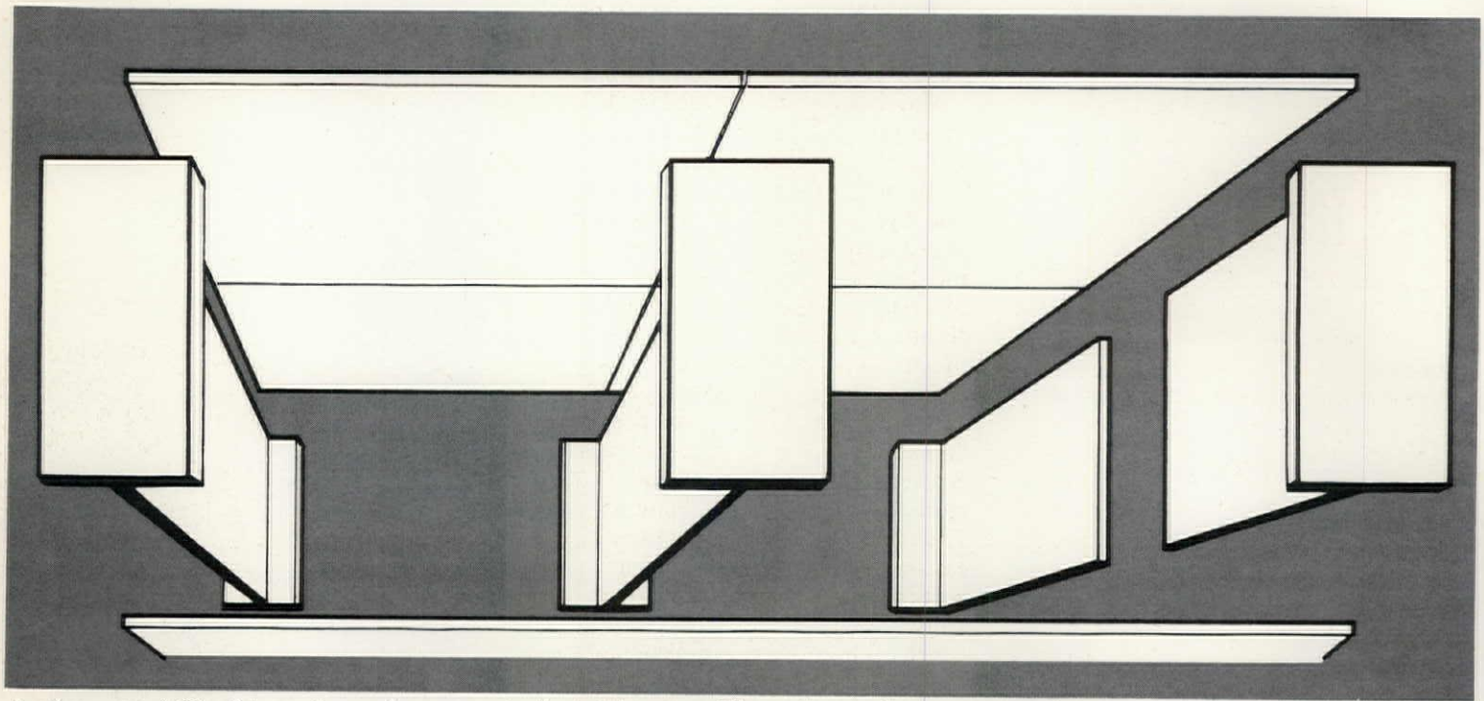
insulation. Spraying for an outside texture will probably be the most widely used method. Openings for windows and doors can be created for any location; radiuses and other shapes will be limited only by the forming system. The reinforcing metal will be erected and one form placed. Zero slump concrete will be sprayed through the nozzle to cast the wall. Finishers will then stick the sprayed surface to the desired place. Since forms may be removed after about 1½ hours, a full set will not be required.

The concrete quality is outstanding due to the low ratio of water to cement. There is no need for consolidation equipment, so a great deal of labor is saved. With the advent of the fibrous reinforcement, the thickness of the concrete wall which will take the full load of the structure can be reduced considerably.

Not only the walls but also the roof can be sprayed. Finishes can be achieved through the inherent characteristics of the concrete plus its formed shape, or by coating. The spray can develop a stucco-type texture or even an exposed aggregate finish. Insulation can be applied by current techniques, such as furring, to provide cavities for insulation and conduits. Insulation can be embedded in the concrete.

Though this may be more costly than conventional wood framing methods, the reduction in time of construction will be significant. Specialty subcontractors should be able to perform the work in an efficient, systematic manner. With a pro-

The Lacrete System (below) consists of two elements: a vertically cast T-panel for walls and a 4-inch solid flat slab for structural floors. The T, a stable element, eliminates the need for shoring wall panels. One man can erect approximately 650 square feet per day.



duction rate of 60 cubic yards per day per nozzle (2 per pump), the exterior of three houses may be sprayed in one day.

When it comes to precast systems, the results of Operation Breakthrough point out that many of them are not reasonable because a centralized marketplace does not exist in this country such as in Europe. This nation demands versatility and the ability of the small as well as the large operator to become part of the construction scene.

Unfortunately, a number of precast systems have encountered financial difficulty because large investments were required for new plants which, once in production, did not find an ample market.

There are several systems producers providing units in the Northeast. The population concentration in this area with resulting high housing demand makes mass production of standardized pieces reasonable.

When discussing the economic advantage of the systems, manufacturers agree that the greatest problem is the architect's reluctance to work within the system. They appreciate the desires of the architects to create distinctive design but point out that what would seem to be minor changes are in reality major adjustments to the total system. These changes have an impact similar to that of an attempt to change the configuration of a windshield for a certain model of car. Nothing will fit.

There are cases such as the 1,100-unit Arverne project by Carl Koch at Far Rockaway, New York, by Corbetta Construction Company, Inc., where a combination of on-site and off-site precasting produced the best economics. Where there is extensive repetition, practically anything is possible. These advantages are not similarly possible for repetition in terms of several hundred.

The key is application of the systems available to the maximum discipline. It is much as Lincoln logs in childhood development: The same units can be used many ways once one accepts the standards of the unit.

Large capital investments for plants are not necessary for all precast concrete systems. Concrete Products, Inc., in Baton Rouge, Louisiana, probably has one of the simplest methods for off-site cast units. Called the Lacrete System, it consists of two elements: a vertically cast T-shape piece for walls and a 4-inch solid flat slab for structural floors. The latter may be extended to form balconies.

The T-panel, being a stable element, eliminates the need for shoring wall panels, thereby minimizing erection time and, with it, cost. It is estimated that 650 square feet of floor space per day can be erected per man on the crew. This compares with 115 to 130 square feet in many other systems.

Flexibility is another advantage. All three dimensions may be varied: length, width and height. Wall thickness may be altered to compensate for varying loads from lowrise to highrise structures. Floors and ceilings are ready for final finishes. No wet materials are required after the first floor slab is complete. And, finally, no scaffolding is required.

In the casting operation, vibrators are attached to the forms for the T-shaped panels. On the side opposite the vibrators, an enclosure is provided for steam curing to allow the earliest possible stripping of the forms. Concrete can be placed within the form on a continuous basis. The time lapse from start to placement to moving to the next casting is as low as two minutes. With the proper forms, the casting operation can be accomplished on-site as well as off-site. The casting speed seems to dictate that the most efficient process is off-site so that units can

The Conspray System (below) involves spraying of concrete bearing walls 3.5 inches thin. Thermal and acoustical insulation can be designed into structures. Exterior and interior walls and roofs can be sprayed with different textures, even exposed aggregate finish. Forms can come off after 1½ hours.

be stockpiled in advance, thus assuring an uninterrupted construction process.

During a recent Concrete for Housing seminar sponsored by the American Concrete Institute and the National Association of Home Builders, precast construction systems were divided into three categories: flat panels, modular subunits and major modular units. Structural engineers James Cagley, Norman Scott and Vincent DeSimone each overviewed one of the three systems. (Copies of their papers are available from the ACI and provide interesting analyses of the various systems.)

Flat panels can be fabricated both off- or on-site. With detailed planning and repetition of shape and size, site precasting can be highly effective. Medium rise apartment buildings have been constructed by techniques pioneered by Challenge Development Company of Redwood City, California. Even before the first floor slab is cast, flat panel casting can commence around the periphery of the structure. Provision is made in each panel for conduits, lifting devices, blockouts for nonshrink grout mortar connections and all other details necessary to complete the building. Bond breakers are applied between castings, and the stacks range as high as 12 to 15 panels.

A truly production-line operation can be set up for the panel casting to build, in effect, the superstructure while the contractor is still working on the slab. Finally, with all panels fabricated, cranes are brought to the jobsite, and the building can be erected at the rate of almost a floor per day. There is little lost motion; completion time is minimal.

Among the more effective modular subunits used in concrete systems construction are those developed in Switzerland by engineer Fritz Stuckey. The manufacturer is Elcon AG. The concept provides for the fabrication of U-shaped members. The vertical units can be walls or columns at the corners of the slab. The versatility of the system will allow for varying the sizes of rooms by changing the arrangement of the pieces. In many cases involving housing, the modular subunits are brought to the site completely equipped with built-in furnishings and sanitary facilities. The system has even been effectively used for single-family homes.

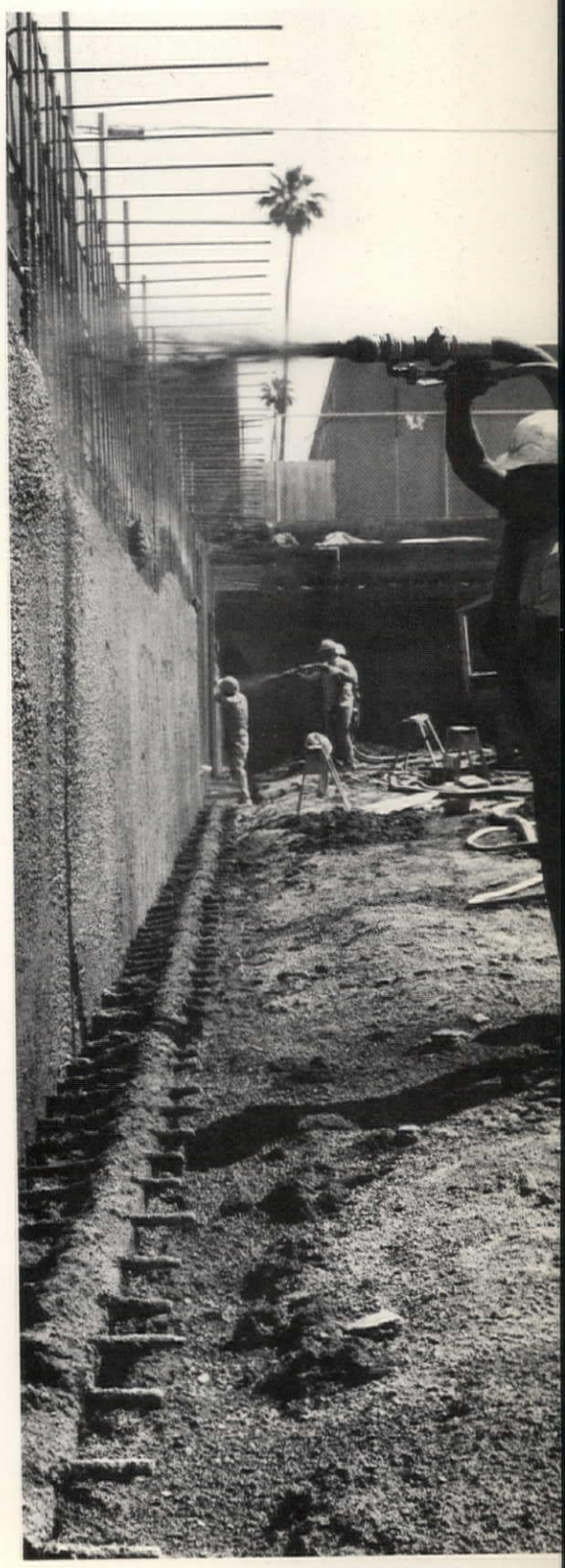
Major modular units used in this country and currently available were pioneered by Zachry in San Antonio, Texas, and Shelly in New Jersey. These systems provide, by various methods, completely enclosed units which can be fully furnished and decorated prior to erection. These are concrete boxes which can be hauled long distances, even by rail, and be installed effectively and economically.

During the Concrete for Housing seminar, DeSimone discussed the possibility of thin-shell concrete members which do not, regardless of height, require loading more than their individual unit weights. The structural integrity would be through cast-in-place columns and beams to support the pods. He also offered the possibility of prefabricated pods of this nature which could serve as cargo containers for export. Upon removing the cargo, the container could serve as housing in underdeveloped parts of the world.

Naturally, there are combinations of these three basic systems. One very effectively used both in Operation Breakthrough and in private applications is that of the FTS Dillon Company of Akron, Ohio. This functions around a stacked series of wet cores which are major components and probably come from a central factory. Other portions of the structure could be on- or off-site cast slabs.

Stuckey recently pointed out that he looks to developments in concrete for housing to come not from the big organizations but from the smaller producers. The best details will probably come about as a result of evolution and will not be a preconceived concept for which an industry is willing to spend $5 million for a plant without knowledge of public acceptance.

Although it is in multifamily housing that the modular concrete unit will fully demonstrate all its advantages, it will become more and more prominent in single-family dwellings. Concrete offers a multitude of opportunities for the imaginative architect. However, to use the material most effectively, discipline is essential. Without it, costs will soar. □



Stones for Architectural Uses

Charles H. Behre Jr.

The architect who plans to use stone, whether in interiors or exteriors and whether in paneling, roofing, flooring or paving, faces some critical choices. The major factors and dangers in suitability and use fall under two broad but overlapping headings: strength properties and esthetic qualities.

Certain types of stone or rock, for example, tend to have internal, unsuspected planes of weaknesses along which straining or atmospheric attack may produce cracking or discoloration after the stone is laid. Therefore, the architect must exercise great care, whether he selects the stone himself or relies upon a contractor. In the latter case, the contract should include certain guarantees so that damage suits arising from defective stone or improper use do not fall upon the architect or his insurance company but are transferred to the quarry operator, the stone contractor or the stone mason where they properly belong.

Much stone is sold under a popular name or under a name applied by the stone company, which is confusing because the name does not necessarily imply any specific technical or scientific qualities. This is true of many of the so-called "granites," "slates" and "marbles," although many other stones are quite properly given these names. For example, such a term as "bluestone" means a granite-like fairly homogeneous, massive rock in the Maryland area; a quite different layered rock in New York State and Pennsylvania; and an almost flaky, slate-like stone in the District of Columbia. In each of these instances, the character of the stone and its proper use are unique and not interchangeable with those of the other types, despite their identical names. Two stones with the same trade name may be suited to wholly contrasting uses. The name alone is not sufficient, and both a stone's strength properties and the esthetic considerations merit careful review by the architect or by a knowledgeable geologist.

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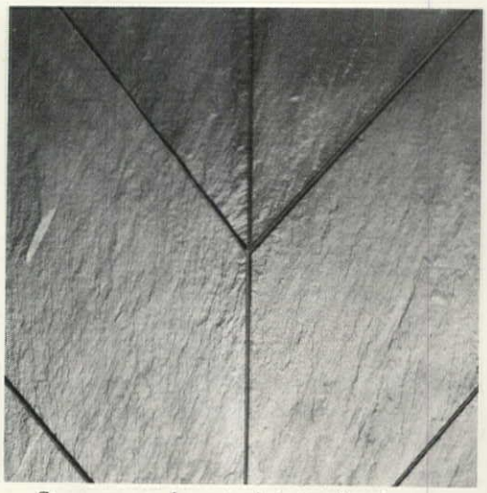
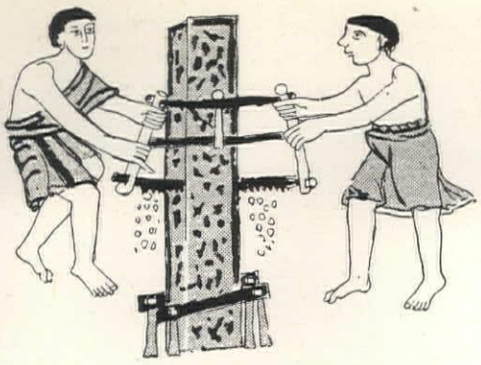


Stone or rock materials tend to be preserved in their original character below that level in the ground where openings are saturated with water. Above that level, however, which is frequently called the "ground water table," the stone can be attacked by air or by water that is seeping downward toward the ground water table and may carry humic or carbonic acids or other solvent substances derived from soil or atmosphere. In descending, this water may change the rock from its original color or strength. This near-surface alteration of the original stone may vary considerably.

This applies to the material's strength as well as to other characteristics. Thus a sedimentary rock such as sandstone, which consists of sand grains cemented by lime carbonate, will commonly retain that cement below the ground water table. By contrast, such cement above the water table may have been dissolved by downward percolating water, weakening the rock to a greater or lesser extent.

Before accepting a specific kind of stone for use in foundations or pavements that are to be subjected to heavy traffic, the architect should request representative samples. These should be examined carefully for possible planes of weaknesses. Sedimentary rock, i.e., rock originally formed by accumulation and deposition in the sea or other water bodies or on dry land as in dunes, usually shows a banding caused by settling in more or less regular layers or beds. The "bedding planes" between such layers are generally



Critical choices face the architect who plans to use stone in either exteriors or interiors. Strength properties and esthetic qualities are major considerations in this material's suitability and use.

surfaces along which the stone can be split. Yet, they are not necessarily planes of weakness if the stone is laid in floors or pavements with the bedding parallel to the floor. On the other hand, if the block is set on edge, with the bedding planes vertical, these may become planes of weakness.

In outdoor pavements exposed to freezing weather, water from rain or snow may gradually penetrate along such planes, expand and wedge thin beds apart, thus contributing to failure of the stone by "frost heaving" or "spalling." If this appears to be a possibility, perhaps the best procedure is to consult a knowledgeable specialist on stone or obtain the advice of a rock testing laboratory to determine the suitability of the material in question for the particular proposed use.

Like other structural materials, stone can be tested for porosity and for compressive and tensile strength. The services and tests of the American Society for Testing and Materials (1916 Race St., Philadelphia, Pa. 19103) are recommended. Density and hardness also may be important. The former is significant because the stone may have to bear the weight of the structure, although this is not usually critical; the latter because of the stone's necessary resistance to wear or to abrasion if used on polished paneling where the polish may be destroyed.

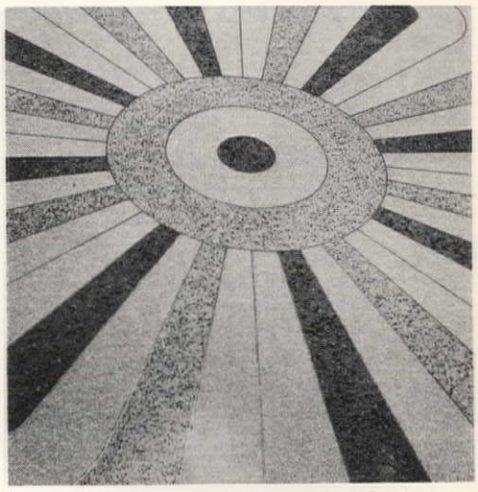
Rock formed by successive beds of sediment may differ in composition from bed to bed. Where the layers are flat-lying, a vertically deepening quarry in descending may pass into stronger or weaker stone. In folded sedimentary rocks, a horizontally extended quarry operation may enter weaker or stronger stone or, in fact, entirely different stone.

In contrast with sedimentary rock, some stone is essentially homogeneous, a fact that should be realized by the architect. This applies particularly to igneous rocks, those which have cooled from the molten state such as granites, "trap rock," basalts and the like. For the most part, tests on samples of one block of such rocks will serve for the rock as a whole, whereas the bedded, sedimentary rocks may vary in strength, weight and other characteristics from bed to bed.

Another complication regarding the strength and other properties of certain stone is due to the fact that long ago, while still in the ground, the stone was affected by the kinds of earth stresses that produce earthquakes or the folding of rocks into mountain chains. Although such metamorphism may cause changes in the mineral arrangement or crystalline character to enhance or reduce the esthetic appeal of the rock, it also may develop a tendency to split into thin sheets or slabs, as is the case with true slate. A good example of these effects is illustrated by the change of a lime mud (perhaps originally accumulated on the sea bottom and thus occasionally showing patterns of sea shells or other fossils) by its compaction, cementation and hardening into firm limestone, and then further into a rock composed of coarse crystals whose surfaces may reflect the light. This last rock is now a "marble."

The folding of the rocks may be so close that a small block of a rock shows the bedding as a series of zig-zags, adding a pattern that is attractive in paneling. Despite the folding, the rock may not be weakened at all by the process.

Such stresses are likely to produce still other internal effects. They may induce visible, inconspicuous or merely incipient fractures (geologists call them "joints") which tend to be in parallel systems of patterns. If parallel and widely spaced enough, these simplify quarrying and preparation into usable blocks or slabs. If they are too close together—say, only a few inches apart—they may be planes of weakness that may reduce the value of the stone.



Such joints usually can be recognized by the careful observer, but the architect should defer to the opinion of a competent adviser to be assured of the absence of joints in a given rock or a certain quarry or even in a specific block of stone intended for use as a decorative panel. Microscopic study may become necessary before a decision can be reached regarding the stone's acceptability.

The three features of building stone that most affect their selection by architects for esthetic reasons are color, pattern and texture.

Color possibilities range from white (as in Carrara marbles) through various shades from light gray to black; from a very light lemon or sand color to deep chocolate brown; from various shades of pink through a variety of reds, extending from a dull crimson through brick red to dull purple; from yellowish green to deep gray/green and leaf green; and from light grayish blue to inky bluish black, although true blues are rare.

To obtain an accurate picture of these colors, it is recommended that the architect use a color chart such as the *Rock Color Chart,* published by the Geological Society of America (Boulder, Colo. 80302). Using the chart, the architect can select the desired color and then turn to someone familiar with rock types for advice as to where the stone of the desired color and other acceptable characteristics

Like other structural materials, stone can be tested for porosity and strength. The designer should consult an expert before he commits himself with finality to the use of a given stone.

The selection of building stone for its esthetic qualities is guided by three primary considerations: color, pattern and texture.

may be obtained. The local state geological survey or a consulting geologist may help. Another dependable source is the Building Stone Institute (420 Lexington Ave., New York, N.Y. 10017). One of the institute's functions is to aid architects.

The stability of color selected should be assured by careful inquiry. The presence of certain minerals is objectionable because of their tendency to oxidize and produce a brown smear or stain. Such discoloring is chiefly from iron compounds. Normal atmospheric conditions over relatively long periods of time are apt to produce such staining, and the effects may be accelerated unintentionaly by washing with certain cleaning solutions.

The position of a given stone with respect to the water table may be significant in its effect on the color of the stone. Above the water table, the shade may change, usually grading downward to the original color of the stone. The most permanent colors, broadly speaking, are buff, yellowish and reddish brown because they indicate that the iron in the stone is well oxidized.

Such colors, however, may give way to grays or whites as the fresh stone is encountered below the water table. The "permanence" of color, as well as lack of disintegration after quarrying, is much longer and greater in most sandstones than in granites. In turn, granitic rock retains its color and strength better than marble. Limestones are generally the least stable, but certain "brownstone" sandstones are reported to have the shortest life. Of course, successive layers of sedimentary rock may well vary in color as they do in strength.

Not uncommonly, the colors of stone surfaces result from the juxtaposition of two kinds of minerals. For example, a pink to gray granite is caused by varying proportions of pinkish potash feldspar, one or two white minerals (quartz and soda feldspar) and one or more black minerals such as amphiboles or micas. A very beautiful light to dark bluish gray rock related to granite is laurvikite, originally imported from the Scandinavian countries. It consists of many differently oriented crystals of a feldspar whose reflecting crystal surfaces sparkle. Many marbles, if not too highly polished, reflect light in much the same way.

ROCKS CLASSIFIED ACCORDING TO QUALITIES AFFECTING USE

CLASS	TEXTURE	COLOR	PARTINGS
Shale	Very fine granite	Gray, black, red to brown	Parallel to beds or layers
Sandstone	Granular, showing sand grains, cemented together	Very light buff to light chocolate brown or brick red; may tarnish to brown	Bedding planes; also fractures transverse to beds
Limestone	Fine to crystalline; may have fossils	White, light gray to light buff	Parallel to beds; also fractures across beds
Marble	Finely granular to very coarsely crystalline showing flat-sided crystals	Highly varied: snow white to black; also blue-gray and light to dark olive green; also pinkish	Usually not along beds but may have irregular fractures
Granite (light igneous rock)	Usually coarsely crystalline; crystals may be varicolored; may be fine grained	Almost white to pink-and-white or gray-and-white	Not necessarily any regular parting but fractures irregularly
Dark igneous rock	Usually coarsely crystalline if quarried but may be fine grained	Gray, dark olive green to black; Laurvikite is beautifully crystalline	Not necessarily any regular parting but may fracture irregularly
Lavas	Fine grained; may have pores locally	Varies: pink, purple, black; if usable, rarely almost white	Not necessarily any regular parting, as a rule, but some have parallel fractures
Quartzite	Dense, almost glassy ideally	Variable: white, buff, red, brown	Usually no special parting
Slate	Finely crystalline; flat crystals give slaty fracture	Grayish-green, brick red or dark brown, usually gray; may be banded	Splits along slate surface, often crossing color bands
Gneiss	Crystalline, like granite, often with glassy bands (veins)	Usually gray with some pink, white or light gray bands	No special parting; tends to break along banding

Patterns are highly varied too. Some result from either rounded pebbles or angular fragments embedded in the matrix of the rock. Others are caused by veins—fissure fillings—in many cases contrasting in color which cross the body of the rock in regular or irregular patterns. Slabs of such stone may be carefully sawed to expose the veins and laid in panels on walls or pillars to make contrasting patterns. The desired beautifying effects are only rarely accompanied by any adverse change in the structural integrity of the material.

There is also a wide range of textures. Some are simply coarsely fragmented blocks cemented with a color contrasting mineral; others are finely textured, in many cases consisting of grains of what was formerly sand, now held together through interstitial deposition of white silica or lime carbonate. There are also the finely or coarsely crystalline marbles and granites as well as very fine crystalline rock which has a tendency to break parallel to the beds. The texture in slate is fine and almost silken with closely parallel parting or "cleavage." The crystalline nature of the stone, the fineness of the grains and the hardness of minerals composing it are features that determine whether or not the stone will take and retain the high polish desired in most decorative panels.

Care must be taken to avoid incipient

Stone, one of the oldest of building materials, is both trustworthy and esthetically pleasing, provided care is exercised in its selection, use and maintenance.

HARDNESS	SPECIAL FEATURES	CHIEF USES
Very soft		Rarely used
Fairly hard if well cemented	Ripple marks; oblique color bands ("cross bedding")	General; walls; building; flagstone
Fairly soft; steel easily scratches	May show fossils	All building uses
Slightly harder than limestone	May show veins of different colors or angular rock pieces or fossils	May be used for building stone but usually in decorative panels
Harder than limestone and marble; keeps cut shape well	May be banded with pink, white or gray streaks and veins	Building stone, but also in paneling if attractively colored
About like granite; retains cut shape well	May be banded with lighter and darker gray bands and veins	Building stone but also used in panels if nicely banded or crystalline
About as strong as granite; if light colored, usually softer	Note rare porosity	Good foundation and building stone; not decorative
Very hard if well cemented, as usually the case	Very resistant to weather and impact	Excellent for building but hard to "shape"
Softer than granite or quartzite; scratches easily	Some slates have color-fading with age	Roofing; blackboards; paving
About like granite	Banding is decorative; some bands very weak, however	Used for buildings; also may be decorative if banded

fractures in the stone during quarrying. Where possible, the stone should be examined for such fractures and rejected before being set. Most stone can be sawed to specific dimensions after large blocks have been quarried. It can be honed or polished after quarrying to suit the use for which it is intended. Great care should be exercised with any cleansing fluid in the cleaning of flagstones and paving, especially for outdoor use. Ordinary rock salt and other salt compounds may crystallize in hidden openings and induce spalling.

Some paving stones are cut or split so that the flat surface transects the bedding planes. This is true of much slate, for example, and the effect is attractive, giving many of the slabs a banded appearance. Unfortunately, some of the bands, especially if high in carbon, may wear faster than the rest of the stone. Marble, limestone, ophicalcite and travertine all contain lime carbonate. If acid solutions are used to clean these rocks, the polished surfaces may become etched or pitted.

The length of time between quarrying and placement of the stone affects its strength and its esthetic properties. If the stone was quarried within a year or two of its architectural use, certain detrimental factors such as frost heaving may not have had much chance to operate. On the other hand, any partially or wholly concealed partings or fractures will probably have become visible after exposure for a year or more to the atmosphere, and blocks containing them can be recognized and rejected. It takes time for the stone to reach its normal long-term color, and surfaces of blocks quarried and exposed to the weather for a year or more before emplacement are much more likely to have attained the color or shade that will be retained during long exposure.

It is a wise precaution for the architect, if he possibly can, to see the quarry in operation as well as the stockpile from which the proposed stone is to be taken. He should certainly know how recently the stone was quarried. If the architect cannot make an examination himself, he should have a disinterested but competent observer look at the quarry and the stockpile before he commits himself to the stone under consideration.

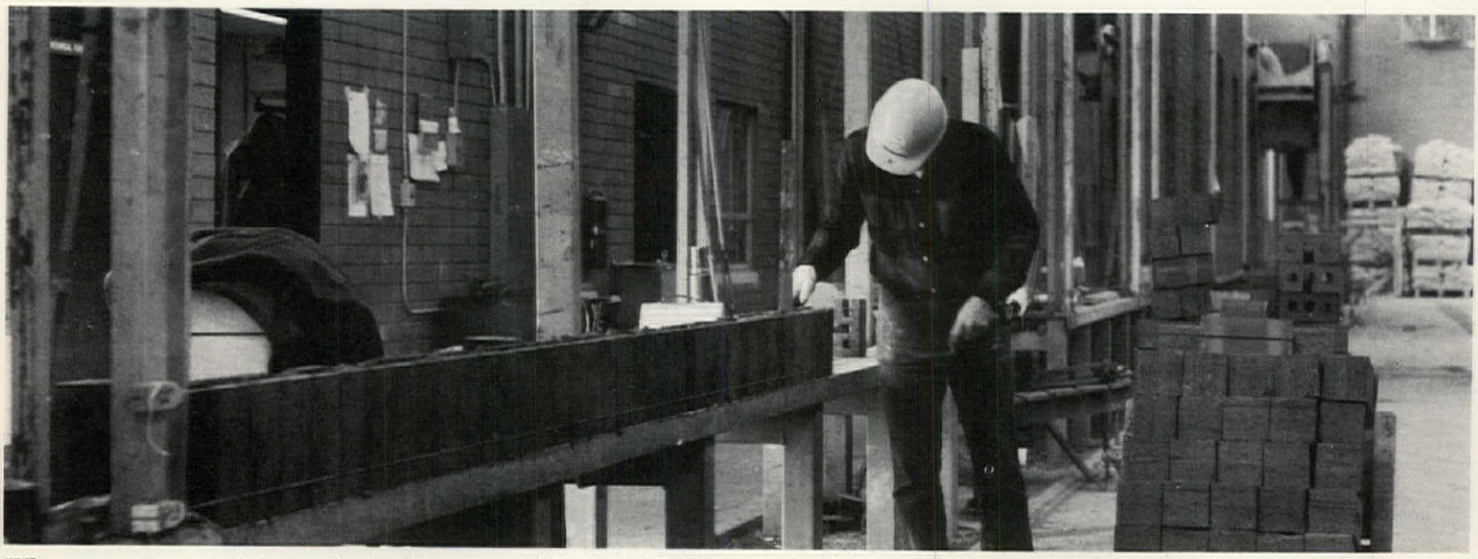
A few general statements may be useful:

- Strength and resistance to the impact of expected atmospheric conditions obviously should be considered if the stone is to be used outdoors where high porosity and the internal fractures previously described may accentuate deletrious weathering.
- Granite-like rocks are generally strong and impervious; limestones and marbles are usually weaker; sandstones, if more porous, are more inclined to spalling by water and frost.
- For pavements and courtyards the flooring must obviously be a hard stone, resistant to abrasion. Much sandstone made up of the hard mineral quartz, especially if well cemented, is suited to this use. Moreover, it is easily split or sawed into flat slabs parallel to the bedding. Much the same is true of slate which readily breaks along its cleavage, although the graphitic bands that cross the cleavage wear out selectively in some slates.
- Limestones and marbles, however attractive, are softer than the slates and sandstones.
- Granite-like stone will not provide a flat surface without expensive special treatment.

It is not possible to generalize briefly about the esthetic use of stone in interior walls, ceilings and panels. The choices of color, pattern and response to polishing are numerous and varied. □

Now, for Masonry Precast Panels

Neal English



Why masonry panels? Increasingly, this question is being asked by a growing number of persons in the construction industry. As long as they can remember, and centuries before, it has been the custom to lay one brick, block or stone upon another and directly into the wall. Architects designed buildings that way, and mason contractors and craftsmen did the work as specified.

Now, however, it is common to see masonry panels as large as 25x9 feet and 4 inches thick being hoisted onto highrise buildings. Some have been made in well-equipped, modern masonry panel plants; others have been produced in all-weather enclosures on so-called launch pads at the job site. Some are skin-type panels just one brick thick; others are composite, loadbearing walls of brick and block bonded by grout-filled collar joints and horizontal wire reinforcing.

What has created this recent surge of interest in masonry panels? Are they more economical? Do they have better quality? Does the system assure faster construction? What is the labor union's attitude concerning panelization?

These are questions repeatedly asked of the International Masonry Institute. IMI is the industry's labor-management trust fund which disseminates information on a wide variety of masonry topics to architects, engineers, owners, investors, builders, developers and others. But there seems to be no single answer to the question, "Why masonry panels?"

Some architects like to have panels made with the bricks laid in stack bond. Then they turn the panels 90 degrees for installation in the wall, creating a dramatic effect with bricks in soldier course. Some design panelized hollow-brick columns of brick or block. Reinforcing cages are installed and concrete poured in the columns. Others have arches panelized upside down; when the mortar is set the arches are turned right-side-up, thus having eliminated the need for angle irons. Some architects create striking patterns or surface variations in the panels.

In designing the first masonry panel system building in Kansas City, Missouri, which was recently completed, the architectural and engineering firm of Ralph F. Oberlechner Associates had competitive cost as a deciding factor. On this basis, the firm selected brick for the nine-story medical office building. The owner, Bryan Development Co., wanted speedy erection to save on construction loan interest and to get earlier financial return from occupancy of the 120,000-square-foot steel-frame structure.

For the 11-story, 103,000-square-foot Monocacy Manor apartments, a turnkey project for senior citizens in Bethlehem, Pennsylvania, and that area's first highrise masonry panel building, time was a deciding factor. According to project designer Jim Wilcoxson, an associate of the architectural firm of Wallace & Watson, conventional laid-in-place masonry was more economical, but the time-line difference in getting the building enclosed more than offset this financial difference.

In Southfield, Michigan, however, for a 14-story office building designed by Nathan Levine & Associates for the Dayton-Hudson Corporation, conventional mortar was used to construct composite brick and block walls on site. The triangular corner panels weigh as much as 18,000 pounds each. The structure topped out in seven months with an estimated four month's saving in construction time.

William Lefkofsky & Associates, consulting structural engineers, designed the wall-bearing panels for the structure. Mason Contractor, Vetovitz Masonry Systems, used seven to eight days to structurally frame each floor. All panels were made on launch pads at the site, where bricklayers belonging to the Bricklayers, Masons & Plasterers International Union (BM&PIU) worked under cover in all types of weather. As panels were needed, the canvas, all-weather tentlike enclosure was lifted by crane and set aside and then returned to its original position as production continued.

The Vetovitz Masonry System incorporates use of automatic mortar spreaders, operated by union bricklayers, and other devices that make more efficient use

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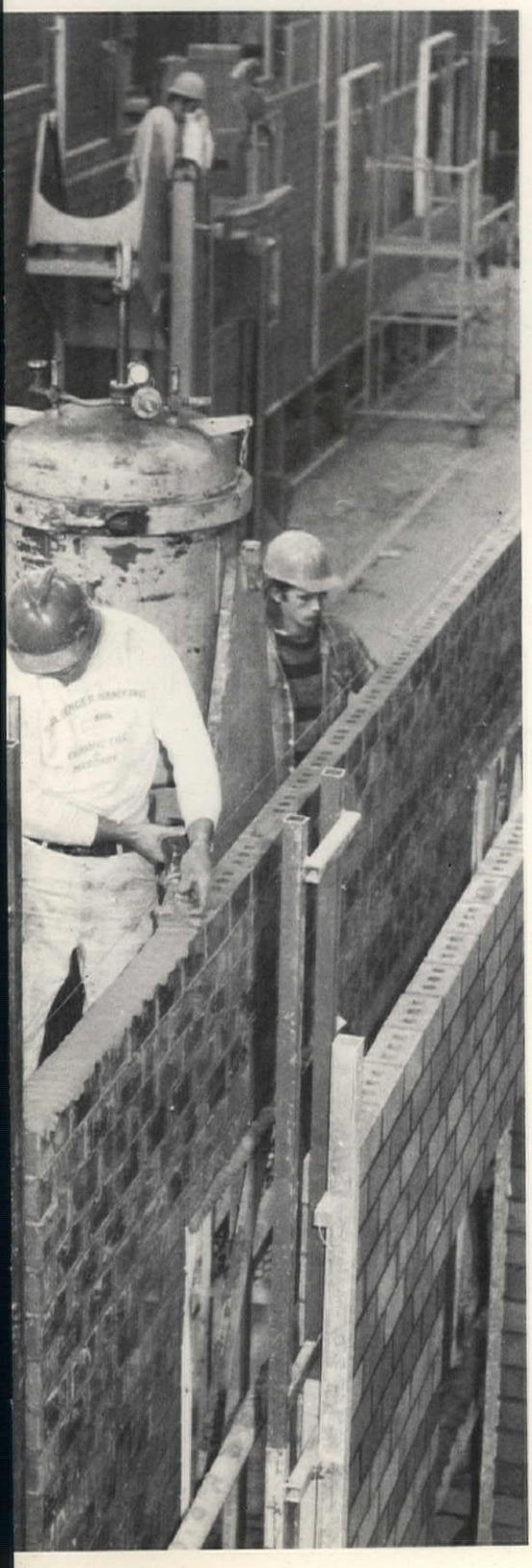
The term "prefabricated" is now part of the masonry lingo, brought there by brick or block panel systems made on or off site. At far left, a union bricklayer forms panel at the Masonry Systems of Pennsylvania plant. Panels grow in assembly line production on a year-round basis.

Masonry panels made in St. Louis are trucked for use on a medical office building in Kansas City, below. Panels at left on truck are culled brick spread with epoxy, then sprinkled with marble chips. They are used above and below window openings.



of manpower. The Vetovitz crew erected exterior panels and the four corner panels for each floor in 16 hours.

Most masonry panel system structures in the United States, however, are being constructed with panels made in plants and trucked to the site. This was the case in the Kansas City medical building and with Monocacy apartments as well.

For the Kansas City job, 660 panels, with a combined weight of 4½ million pounds, were transported 250 miles on a specially equipped truck from the Masonry Systems of Missouri plant in St. Louis. These brick panels were 12 feet high, 13 feet, 8 inches wide and 4 inches thick, average weight 6,700 pounds.

The Monocacy panels were made in the plant of Masonry Systems of Pennsylvania in Nazareth. The 551 panels were trucked 15 miles. Most of them were 25 feet wide; some were grill-work panels for a pedestrian bridge and others were designed with two angles and an airconditioner sleeve for use under the bay windows of the highrise. Kolbjorn Saether of Chicago was structural engineer for the rigid steel frame, moment connection structure. The Bethlehem Housing Authority is the owner.

The Missouri and Pennsylvania plants are two of a number of franchises of Masonry Systems of Colorado, a pioneer in the field in North America.

By agreement with the BM&PIU, the mason contractors who run the panel plants employ union bricklayers on a year-round basis to work in their automated plants. Union bricklayers also installed the panels at the Bethlehem and Kansas City job sites.

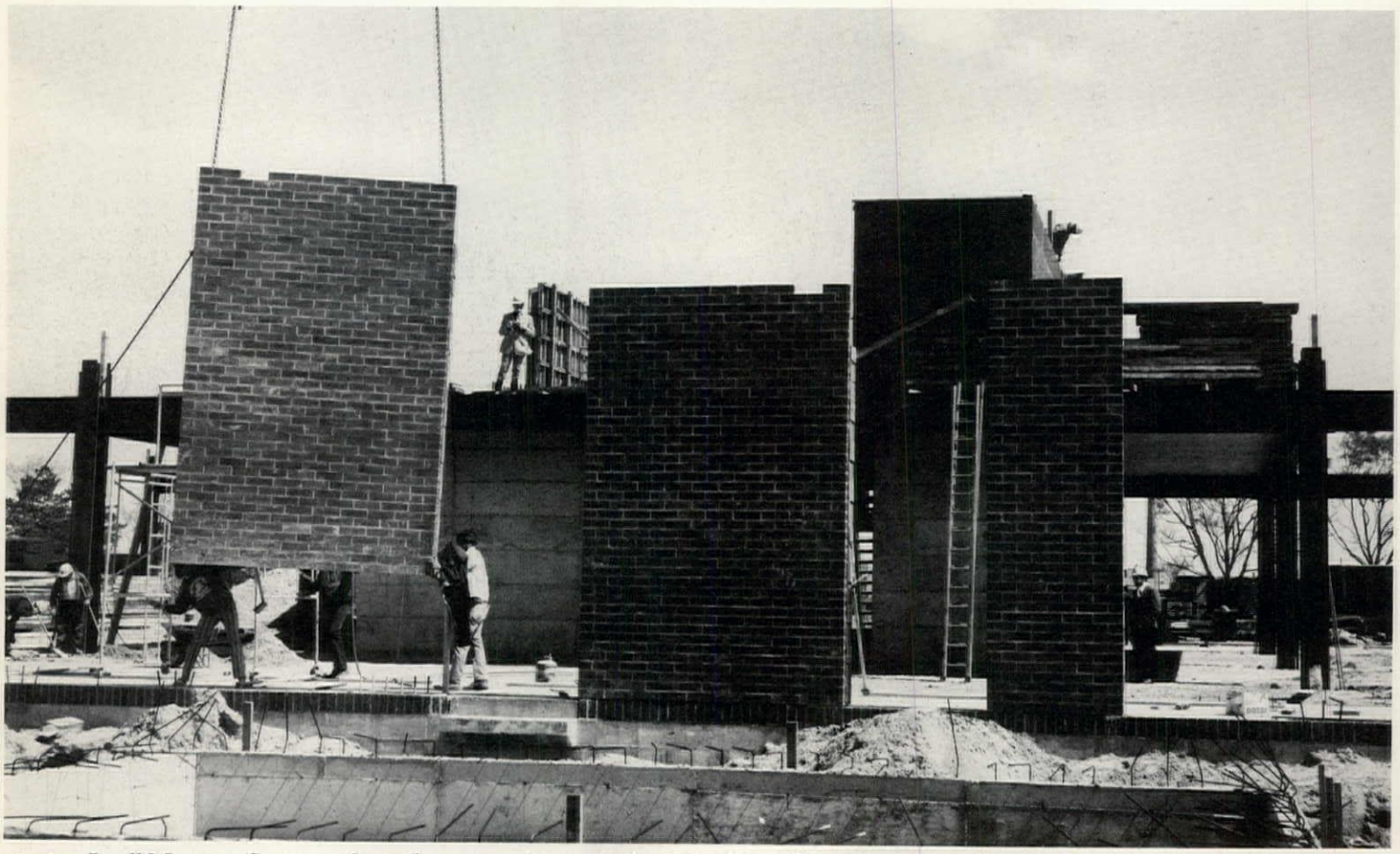
Working in the Masonry System plant on an assembly line not too unlike those of any other automated plant, the union bricklayers lay the bricks or blocks into the panels by hand. IMI has found that no system to date has been developed to do this function more economically or with greater skill or craftsmanship.

In these climatically controlled, automated masonry panel plants, other aspects of bricklaying are quite different. Power equipment delivers the masonry materials to the scaffolds. The union bricklayers use such devices as mechanized mortar spreaders. Scaffolds rise beside the panels at the bricklayers' pace so that the craftsmen are always in the most comfortable and productive positions to lay the bricks or blocks. Under these conditions quality control, including cleaning, is simpler to maintain than, say, when laying overhand in adverse weather high up on a structure.

When panels are completed, overhead cranes shuttle them to a curing area at the far end of the plant. Later, they are moved into the yard for storage until trucked to the job site. An average of seven days is required for a panel to set sufficiently before it can be transported.

The bricklayers use machine-mixed

Kansas City bricklayer of the BM&PIU welds panel to the structure, right. Union sees the system as challenge to the trade. Below, composite wall bearing panels of brick and concrete block installed on an office building in Michigan. They were made in an all-weather enclosure on site.



mortar. In all Masonry Systems plants the mortar contains the additive Sarabond to provide higher compressive and tensile strength. This also leaves the panels with greater resistance to water penetration, thus improving their weatherability.

The mortar is prepared in a minilab in the panel plant. Exact proportions are adhered to, and repeated cube and prism tests are undertaken. An outside testing agent also periodically checks to assure that the strength of the mortar—and the resulting wall panels—meet requirements.

Despite the fact that a couple of panels, while being lifted on the Monocacy job, were caught in an unexpected gust of wind and damaged, Wilcoxson is enthusiastic about masonry panels. The Monocacy project was enclosed in five to six weeks, compared with 12 to 14 weeks using conventional methods.

What is the position of the BM&PIU in regard to the masonry panel system? BM&PIU President Thomas F. Murphy sees it as a challenge to the trade, as a new opportunity to employ the skills of masonry craftsmen. He favors the idea of bricklayers being employed in panel plants providing that the working conditions and pay scale are right, and notes that this type of arrangement gives men more employment throughout the year.

When it comes to performance type standards for this new development in the masonry industry, the Brick Institute of America, which represents a number of brick manufacturers, is now working on one. The BIA standard will define acceptable tolerances for masonry panels of varying dimensions and serve as a guide for the construction industry. Panels are now acceptable for a wide variety of construction ranging from screen fences to warehouse walls to exterior walls using concrete blocks, customized concrete masonry, or split block for exterior and interior walls of highrise apartments and office buildings.

Owens-Corning Fiberglas has a new product on the market, BlocBond, which is troweled on the exterior surface of dry stacked block, whether for in-the-wall or panelization purposes. Another innovative method was used in Tampa, Florida, where brick panels were made on site and then tipped at a 30-degree sloping position to make a striking exterior wall for a section of the Tampa International Airport. In Austin, Texas, a 27-story college dormitory has a skin of 3-inch brick panels each weighing 5,600 pounds, fabricated in the basement of the dormitory. Near Loveland, Colorado, the 1.7-mile Eisenhower Tunnel, taking Interstate 70 through the Continental Divide, has 2,140 glazed tile panels.

As is true with all building products and systems, the technology of masonry is influenced by the construction marketplace. The masonry panel is one answer to the economic and psychological factors that exist in that marketplace today. □

Status Report on Safety Glazing

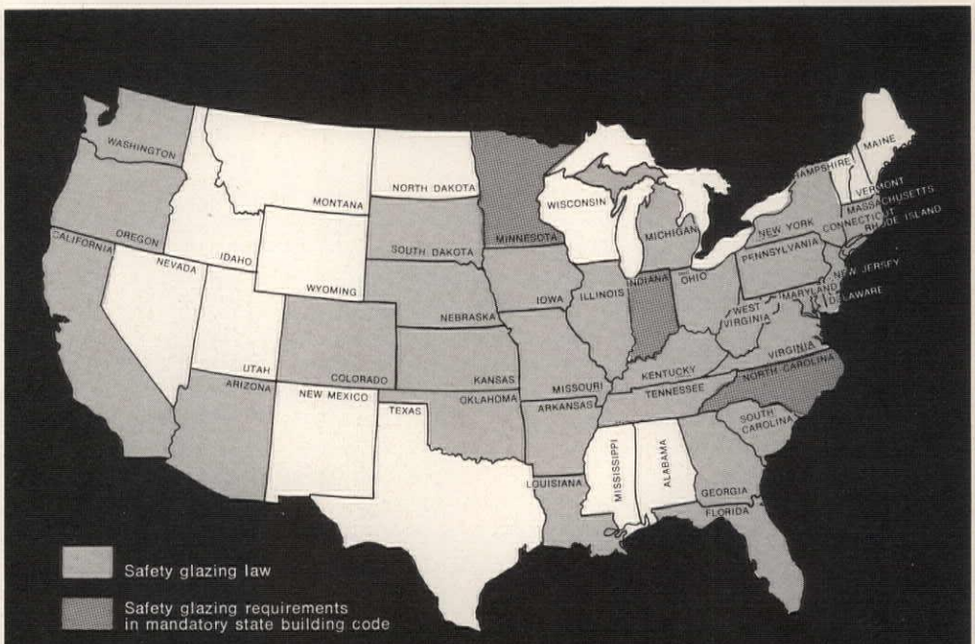
M. N. Zeolla

We are so concerned about large-scale problems of the environment that we tend to overlook some less dramatic, but equally vital, ones. Ironically, some of them can be solved very easily by our personal decisions and actions.

One such problem is living, working, shopping and playing in surroundings that contain hidden hazards; and, surely, a safe environment is at least as important as a clean environment. Among the most prominent hazards we face each day—often without being aware of it—is the potential danger of accidentally walking or falling against and breaking through ordinary annealed glass in doors and panels.

This situation was first brought to light in 1960-61 by the National Safety Council as reports of injuries involving ordinary annealed glass in sliding glass doors were being received with increasing frequency. As a result, the council established a national study group to investigate the problem and recommend solutions. Under the sponsorship of this study group, and with the direction of the US Public Health Service, investigative surveys were conducted to determine the causative factors, the agents involved, and the magnitude and severity of the matter.

Analyses of injury data from these and continued studies conducted by the US Public Health Service, from testimony presented before the National Commission on Product Safety [1] in January 1969, and from the National Electronic Injury Surveillance System [2] now under the Consumer Product Safety Commission [3] show that about 250,000 persons are injured each year from accidental impacts against and breaking through ordinary annealed glass in certain glazed structural elements in residential, commercial and public buildings. This represents at least one injury every two minutes, or one person out of every 1,000 subjected to the cut-



STATES THAT HAVE ENACTED SAFETY GLAZING LAWS

State	Bill Number	Effective Date
Arizona	House 2161	July 1, 1974
Arkansas	Senate 34	Jan. 1, 1974
California	Assembly 399;	Nov. 29, 1970
	amended by Senate 601	Nov. 29, 1971
Colorado	House 1110	July 1, 1971
Connecticut	Act No. 182	Jan. 1, 1974
Delaware	Senate 23	Jan. 1, 1972
Florida	House 214;	July 1, 1969
	amended by Senate 417	July 1, 1970
Georgia	House 412	July 1, 1970
Hawaii	House 379	May 28, 1971
Illinois	Senate 101	Jan. 1, 1973
Kentucky	House 353	Jan. 1, 1971
Louisiana	Senate 460	Jan. 1, 1973
Maryland	House 7	July 1, 1973
Massachusetts	Senate 1401	Jan. 1, 1973
Michigan	House 5740	July 1, 1973
New Jersey	Assembly 496	Mar. 28, 1972
New York	Assembly 1456 and Senate 9580	July 1, 1973
Ohio	House 9	Jan. 1, 1973
Oklahoma	House 1350	Jan. 1, 1972
Oregon	House 1771 and State Health Department regulations	July 1, 1970
Pennsylvania	Senate 29	Jan. 1, 1972
Rhode Island	House 5030	July 8, 1973
South Carolina	House 1433	Jan. 1, 1974
South Dakota	Senate 53	July 1, 1974
Tennessee	Senate 178	Jan. 1, 1972
Virginia	Senate 656	Jan. 1, 1974
Washington	House 137	Jan. 1, 1974
West Virginia	House 504	July 1, 1971

1. Created by Congress through Public Law 90-146 in 1968, it submitted its final report to the President and Congress in June 1970.

2. AIA JOURNAL, *Nov. 1971, p. 60.*

3. Established by Congress through Public Law 92-573 on Oct. 27, 1972.

Tempering is a heat treating process which results in a product three to five times stronger than regular annealed glass. While it is breakable, its safe break pattern — small particles or cubes about the thickness of the glass, left — minimizes the chances of severe injury, as compared to that of raw untempered glass, below.

ting and piercing injuries that maim, disfigure and even kill. From these and continuing studies, the following five important facts have been revealed:

1. The accidents occurred not when people were alert but when they were preoccupied, distracted or accidentally fell and thus delivered bodily impact to the glazing material.

2. The glazing material in question was ordinary annealed glass.

3. The annealed glass was glazed in certain structural elements of residential, commercial or public buildings that were so located within these structures that they presented obstacles or barriers in the pathway intended for and used by those in going into, through and out of the buildings.

4. In about 75 percent of the cases, the direction of travel was from indoors to the outdoors, from an area of relatively low illumination to one of greater brightness. With such lighting circumstances, the glazing material, for all practical purposes, becomes invisible.

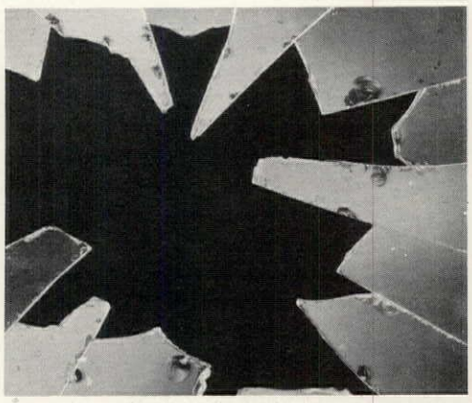
5. Over 50 percent of these accidental injuries were inflicted on children under 15 years of age.

The glazed structural elements centrally involved are:

- commercial and residential entrance and exit doors and the immediately flat, fixed or operable panels or sidelights
- storm or combination doors
- sliding glass door units, including the fixed glazed panels which are part of such units
- bathtub enclosures

Use of ordinary annealed glass in such structural elements presents an unreasonable hazard to the consumer and the general public.

In the Final Report of the National Commission on Product Safety, a definition of "unreasonable hazard" is presented this way: ". . . preventable risk is not reasonable a) when consumers do not know that it exists; or b) when, though aware of it, consumers are unable to estimate its frequency and severity; or c) when consumers do not know how to cope with it, and hence are likely to incur harm unnecessarily; or d) when risk is unnecessary in . . . that it could be reduced or eliminated at a cost in money or in the performance of the product that the consumers would willingly incur if they know the facts and were given the choice." (Available from the US Government Printing Office.)



Glass, depending upon the force applied, can break on impact. Strictly from a product viewpoint, there are several things that can be done to increase the impact resistance of glass: 1) increase the thickness; 2) decrease the size; 3) strengthen the glass by thermal or chemical means.

However, if the objective is to reduce the chance of serious personal injury, there is only one choice: the use of a safety glazing material—tempered, wire or laminated glass, or rigid safety plastic —in the defined structural elements as recommended by the study group. The solution is available, but unless it is widely applied not only will the problem continue to remain unsolved but also with time it will become increasingly more critical.

The domestic glass and glazing industry, together with the door producers, in the early 1960s accepted the recommendations of the study group as a challenge and an opportunity to demonstrate that cooperatively they could find the means to overcome the situation.

From 1963-68, through the efforts of concerned groups in these industries, minimum but upgraded requirements for safety glazing were adopted by these national model building codes: the Basic Building Code, the Uniform Building Code and the Southern Standard Building Code, and the One and Two Family Dwelling Code.

In 1970 the National Commission on Product Safety, as a result of its investigations and the testimony presented at its hearings on the glass safety problem, placed the facts regarding both the problem and the solution on public record in its final report to the President and the Congress.

The Federal Housing Administration, in 1969, revised its Minimum Property Standards for one- and two-family and multifamily dwellings to provide for the use of safety glazing materials in doors and panels in housing built with FHA-insured financing.

The next effort was directed to the building codes of those states with mandatory ones. Safety glazing requirements were adopted and included by six of the seven states reported to be in that category: Cailfornia, Connecticut, Indiana, Minnesota, North Carolina and Ohio.* Wisconsin, the seventh, is currently revising its code.

In 1964, under the sponsorship of the National Safety Council, the American National Standards Institute established the Z-97 Committee. Its work resulted in the development of the ANSI Standard Z-97.1, "Performance Specifications and Methods of Test for Safety Glazing Materials Used in Buildings." Initially approved in December 1966, it was revised in 1972. This standard, which defines an acceptable safety glazing material, is nationally recognized and is referenced in all updated building codes, FHA Minimum Property Standards and safety glazing statutes.

Another milestone was the development of the Safety Glazing Certification

Mr. Zeolla, who recently retired as market manager of residential construction for PPG Industries' Glass Division, helped organize and was first chairman of the Consumer Safety Glazing Committee. A resident of New Kensington, Pennsylvania, he was the 1973 winner of the National Safety Council Home Conference distinguished service award.

**Building Codes: Report of Advisory Commission on Intergovernmental Relations.*

State laws require safety glazing as new or replacement material in hazardous locations. Safety glazing materials include tempered, laminated and wire glass and rigid safety plastics.

Council's certification program for such materials.

Despite these efforts and accomplishments, the needless accidental injuries involving ordinary annealed glass in the defined structural elements continued to occur in increasing numbers. It became apparent that the minimum requirements in the FHA Minimum Property Standards and in building codes would not solve the problems for several reasons:

1. Exclusions are included that will permit the use of annealed glass instead of a safety glazing material on the basis of glass size and/or the use of push bars or other visual barriers.
2. Application of the requirements is generally limited to new construction.
3. Requirements are not applied to "do-it-yourself" type of construction.
4. Inspection for compliance is not always adequate or complete.
5. Requirements are not applicable to retail sales, replacement glazing and remodeling that do not require building permits.

In late 1968, the Consumer Safety Glazing Committee, composed of concerned industry, government, labor and safety groups, was formed to exert a cooperative and united effort to provide the consumer and the general public greater safety with glazing materials in the defined structural elements.

Upgrading safety glazing requirements in model, state and local building codes was an important step. However, enactment of meaningful legislation at the state level nationwide appeared to be the fastest and most effective method to make certain that the consumer and the general public would be provided greater safety with glass.

Such legislation would complement and reinforce upgraded glazing requirements in state and local building codes and would aid in their enforcement. More importantly, it would encourage and assist the involved industries, trades and professions in their self-regulating efforts to specify, provide and install only safety glazing materials in the defined structural elements.

To accelerate nationwide enactment of such legislation and to ensure reasonably consistent and uniform requirements, a model safety glazing bill was drafted by the Consumer Safety Glazing Committee for action by state legislatures. Since 1968, such a safety glazing bill has been introduced in the legislatures of 46 states. Also, in 1972, the model bill received approval and support from the Council of State Governments, recommending enactment by state legislatures.

Through June 1973, criminal statutes, geared to the provisions in the model safety glazing bill, have been approved by the legislatures of 28 states. Together with the safety glazing provisions in the building codes of Indiana, Minnesota and North Carolina, these statutes provide for safety glazing benefits to more than 80 percent of the United States population encompassed by these 31 states.

The Consumer Product Safety Commission became effective in May 1973 when four of the five required commissioners were appointed and took office with Richard Simpson as chairman. This most important agency has been charged with the responsibility and provided with the authority and machinery, including civil and criminal penalties, to "protect the public against unreasonable risk of injury associated with consumer products."

In September 1973, the commission issued a comprehensive "priority list" of 369 products or product categories which "appear to pose the greatest threat of injury to the American public." The position of a product or product category on this list is based on an adjusted frequency/severity index. Architectural glass (windows and glass walls/panels and doors) is in the No. 10 spot.

In late June of 1972, the Consumer Safety Glazing Committee petitioned the commission to commence a proceeding for the issuance of a Consumer Product Safety Rule for the use of safety glazing materials in specified structural elements in residential, commercial and public buildings. The proposed safety rule which was submitted is patterned after the provisions in the model safety glazing bill. The Consumer Safety Glazing Committee's petition was approved by the CPSC on November 1, 1972, and proceedings will be initiated soon. □

A Uniform System for Working Drawings

Task Force #1
Committee on Office Practice

Construction documents—drawings and specifications—delineate the form of construction and the standards of performance required for a building project. The documents are a guide to bidders, informing them of requirements in order to estimate the work involved. They form a part of the contract between owner and constructor, describing and limiting legal and technical responsibility. They also are the fabrication and installation guide.

The use of the word "guide" is deliberate. The quantities of material and labor effort are not usually explicitly indicated in American construction documents. Each bidder "takes off" quantities on a basis peculiar to his operation.

The construction documents are of utmost importance to the building process, but they bear the same relationships to the architect/engineer's actual services that the physician's prescription and the lawyer's brief do to their professional services. Producing the documents—communicating design decisions—generally requires approximately twice as much real time and money as the design process —the professional services—itself.

Methods for documenting design decisions and then communicating them to a constructor are still largely traditional: Drawings are produced by hand. Some few minor labor saving techniques may be used, but it basically requires simple manhours to develop working drawings.

Skilled drafting labor is in short supply and is expensive; time is always critical; and the fee structure does not presently recognize the economic parameters within which the professional must operate. It is mandatory that the architect/engineer produce the construction documents efficiently and with a minimum of waste motion if he is to perform his paramount services of research, analysis and design.

Construction documents must communicate correct, complete, concise and coordinated information. The appropriate method of communication, graphic and/or verbal, and the amount of information needed to produce the desired results vary with the nature of the end product required and construction industry technology. Whatever the extent of information required, however, professionals should communicate in a language that is consistent and uniform: a common language.

The effort of Task Force #1 has been to develop standards based on the "most common practice," or the obviously "correct" way. The task force members are agreed, however, that there presently is no one method, no one format, which is obviously the "best." The task force found that often within the same large office there were differences in documentation techniques from project to project, in spite of similarity in scope and building type. Even where office standards were established, there was a tendency to disregard such standards in favor of individually invented abbreviations and material designations.

The task force believes that there is a need for a uniform system for working drawings and recommends that a start be made by the profession now. That beginning can be, by agreement and usage, the adoption of certain minimal standards for 1) abbreviations; 2) material designations; 3) graphic symbols; 4) schedule formats; and 5) drawing sheet sizes.

Abbreviations: Principles agreed upon for use on architectural working drawings:

1. Abbreviations should be easily recognizable (self-reading).
2. Abbreviations, not otherwise formed, should be combinable.
3. Periods should not be used as punctuation.
4. Words of four or less letters, with few exceptions, should not be abbreviated.
5. Abbreviation of a single word should have no more than five letters.
6. Commonly used words and abbreviations should not be included, for example, inch, foot, department, government, street, etc.
7. Each abbreviation should usually have but one meaning; where duplication is unavoidable, the context in use should make the meaning clear.
8. Abbreviations of specification-controlled terms should be largely excluded from this list and should be standardized through MASTERSPEC. (A listing of such terms and their abbreviations will be published separately.)
9. Abbreviations should be avoided wherever possible. *continued on page 45*

Note that this list is assembled with the *complete words in alphabetical order* to permit the architect to select the words that he wishes to abbreviate. On *drawings*, the abbreviations should be listed in alphabetical order so that the user of the drawings can easily locate the "definition" that he seeks.

ARCHITECTURAL WORKING DRAWING ABBREVIATIONS

SYMBOLS used as abbreviations:

∠	angle
℄	centerline
⊂	channel
d	penny
⊥	perpendicular
PL	plate
ϕ	round

ABBREVIATIONS:

ABV	above
AFF	above finished floor
ASC	above suspended ceiling
ACC	access
ACFL	access floor
AP	access panel
AC	acoustical
ACPL	acoustical plaster
ACT	acoustical tile
ACR	acrylic plastic
ADD	addendum
ADH	adhesive
ADJ	adjacent
ADJT	adjustable
AGG	aggregate
A/C	air conditioning
ALT	alternate
AL	aluminum
ANC	anchor, anchorage
AB	anchor bolt
ANOD	anodized
APX	approximate
ARCH	architect (ural)
AD	area drain
ASB	asbestos
ASPH	asphalt
AT	asphalt tile
AUTO	automatic
BP	back plaster (ed)
BSMT	basement
BRG	bearing
BPL	bearing plate
BJT	bed joint
BM	bench mark
BEL	below
BET	between
BVL	beveled
BIT	bituminous
BLK	block
BLKG	blocking
BD	board
BS	both sides

Who would want his doctor to spend more time in writing a prescription than in diagnosis? Analogous to this situation is that the production of construction documents generally requires twice as much time and money as the design process.

What's needed is for professionals to communicate in a language that is both consistent and uniform. It is time to adopt a uniform system of working drawings.

BW	both ways
BOT	bottom
BRK	brick
BRZ	bronze
BLDG	building
BUR	built up roofing
BBD	bulletin board
CAB	cabinet
CAD	cadmium
CPT	carpet (ed)
CSMT	casement
CI	cast iron
CIPC	cast-in-place concrete
CST	cast stone
CB	catch basin
CK	calk (ing) caulk (ing)
CLG	ceiling
CHT	ceiling height
CEM	cement
PCPL	cement plaster (portland)
CM	centimeter(s)
CER	ceramic
CT	ceramic tile
CMT	ceramic mosaic (tile)
CHBD	chalkboard
CHAM	chamfer
CR	chromium (plated)
CIR	circle
CIRC	circumference
CLR	clear (ance)
CLS	closure
COL	column
COMB	combination
COMPT	compartment
COMPO	composition (composite)
COMP	compress (ed), (ion), (ible)
CONC	concrete
CMU	concrete masonry unit
CX	connection
CONST	construction
CONT	continuous or continue
CONTR	contract (or)
CLL	contract limit line
CJT	control joint
CPR	copper
CG	corner guard
CORR	corrugated
CTR	counter
CFL	counterflashing
CS	countersink
CTSK	countersunk screw
CRS	course (s)
CRG	cross grain
CFT	cubic foot
CYD	cubic yard
DPR	damper
DP	dampproofing
DL	dead load
DEM	demolish, demolition
DMT	demountable
DEP	depressed
DTL	detail
DIAG	diagonal
DIAM	diameter
DIM	dimension
DPR	dispenser
DIV	division
DR	door
DA	doubleacting
DH	double hung
DTA	dovetail anchor
DTS	dovetail anchor slot
DS	downspout
D	drain
DRB	drainboard
DT	drain tile
DWR	drawer
DWG	drawing
DF	drinking fountain
DW	dumbwaiter
EF	each face
E	east
ELEC	electric (al)
EP	electrical panelboard
EWC	electric water cooler
EL	elevation
ELEV	elevator
EMER	emergency
ENC	enclose (ure)
EQ	equal
EQP	equipment
ESC	escalator
EST	estimate
EXCA	excavate
EXH	exhaust
EXG	existing
EXMP	expanded metal plate
EB	expansion bolt
EXP	exposed
EXT	exterior
EXS	extra strong
FB	face brick
FOC	face of concrete
FOF	face of finish
FOM	face of masonry
FOS	face of studs
FF	factory finish
FAS	fasten, fastener
FN	fence
FBD	fiberboard
FGL	fiberglass
FIN	finish (ed)
FFE	finished floor elevation
FFL	finished floor line
FA	fire alarm
FBRK	fire brick
FE	fire extinguisher
FEC	fire extinguisher cabinet
FHS	fire hose station
FPL	fireplace
FP	fireproof
FRC	fire-resistant coating
FRT	fire-retardant
FLG	flashing
FHMS	flathead machine screw
FHWS	flathead wood screw
FLX	flexible
FLR	floor (ing)
FLCO	floor cleanout
FD	floor drain
FPL	floor plate
FLUR	fluorescent
FJT	flush joint
FTG	footing
FRG	forged
FND	foundation
FR	frame (d), (ing)
FRA	fresh air
FS	full size
FBO	furnished by others
FUR	furred (ing)
FUT	future
GA	gage, gauge
GV	galvanized
GI	galvanized iron
GP	galvanized pipe
GSS	galvanized steel sheet
GKT	gasket (ed)
GC	general contract (or)
GL	glass, glazing
GLB	glass block
GLF	glass fiber
GCMU	glazed concrete masonry units
GST	glazed structural tile
GB	grab bar
GD	grade, grading
GRN	granite
GVL	gravel
GF	ground face
GT	grout
GPDW	gypsum dry wall
GPL	gypsum lath
GPPL	gypsum plaster
GPT	gypsum tile
HH	handhole
HBD	hardboard
HDW	hardware
HWD	hardwood
HJT	head joint
HDR	header
HTG	heating
HVAC	heating/ventilating/air conditioning
HD	heavy duty
HT	height
HX	hexagonal
HES	high early-strength cement
HC	hollow core
HM	hollow metal
HK	hook (s)
HOR	horizontal
HB	hose bibb
HWH	hot water heater
INCIN	incinerator
INCL	include (d), (ing)
ID	inside diameter
INS	insulate (d), (ion)
INSC	insulating concrete
INSF	insulating fill
INT	interior
ILK	interlock
INTM	intermediate
INV	invert

After review and analysis of practices in firms all across the country, the AIA Committee on Office Practice recommends minimal standards for abbreviations, material designations, graphic symbols, schedule formats and drawing sheet sizes.

IPS	iron pipe size
JC	janitor's closet
JT	joint
JF	joint filler
J	joist
KCPL	Keene's cement plaster
KPL	kickplate
KIT	kitchen
KO	knockout
LBL	label
LAB	laboratory
LAD	ladder
LB	lag bolt
LAM	laminate (d)
LAV	lavatory
LH	left hand
L	length
LT	light
LC	light control
LP	lightproof
LW	lightweight
LWC	lightweight concrete
LMS	limestone
LTL	lintel
LL	live load
LVR	louver
LPT	low point
MB	machine bolt
MI	malleable iron
MH	manhole
MFR	manufacture (er)
MRB	marble
MAS	masonry
MO	masonry opening
MTL	material (s)
MAX	maximum
MECH	mechanic (al)
MC	medicine cabinet
MED	medium
MBR	member
MMB	membrane
MET	metal
MFD	metal floor decking
MTFR	metal furring
MRD	metal roof decking
MTHR	metal threshold
M	meter (s)
MM	millimeter (s)
MWK	millwork
MIN	minimum
MIR	mirror
MISC	miscellaneous
MOD	modular
MLD	molding, moulding
MR	mop receptor
MT	mount (ed), (ing)
MOV	movable
MULL	mullion
NL	nailable
NAT	natural
NI	nickel
NR	noise reduction
NRC	noise reduction coefficient
NOM	nominal
NMT	nonmetallic
N	north
NIC	not in contract
NTS	not to scale
OBS	obscure
OC	on center (s)
OP	opaque
OPG	opening
OJ	open-web joist
OPP	opposite
OPH	opposite hand
OPS	opposite surface
OD	outside diameter
OHMS	ovalhead machine screw
OHWS	ovalhead wood screw
OA	overall
OH	overhead
PNT	paint (ed)
PNL	panel
PB	panic bar
PTD	paper towel dispenser
PTR	paper towel receptor
PAR	parallel
PK	parking
PBD	particle board
PTN	partition
PV	pave (d), (ing)
PVMT	pavement
PED	pedestal
PERF	perforate (d)
PERI	perimeter
PLAS	plaster
PLAM	plastic laminate
PL	plate
PG	plate glass
PWD	plywood
PT	point
PVC	polyvinyl chloride
PE	porcelain enamel
PTC	post-tensioned concrete
PCF	pounds per cubic foot
PFL	pounds per lineal foot
PSF	pounds per square foot
PSI	pounds per square inch
PCC	precast concrete
PFB	prefabricate (d)
PFN	prefinished
PRF	preformed
PSC	prestressed concrete
PL	property line
QT	quarry tile
RBT	rabbet, rebate
RAD	radius
RL	rail (ing)
RWC	rainwater conductor
REF	reference
RFL	reflect (ed), (ive), (or)
REFR	refrigerator
REG	register
RE	reinforce (d), (ing)
RCP	reinforced concrete pipe
REM	remove
RES	resilient
RET	return
RA	return air
RVS	reverse (side)
REV	revision (s), revised
RH	right hand
ROW	right of way
R	riser
RVT	rivet
RD	roof drain
RFH	roof hatch
RFG	roofing
RM	room
RO	rough opening
RB	rubber base
RBT	rubber tile
RBL	rubble stone
SFGL	safety glass
SCH	schedule
SCN	screen
SNT	sealant
STG	seating
SEC	section
SSK	service sink
SHTH	sheathing
SHT	sheet
SG	sheet glass
SH	shelf, shelving
SHO	shore.(d), (ing)
SIM	similar
SKL	skylight
SL	sleeve
SC	solid core
SP	soundproof
S	south
SPC	spacer
SPK	speaker
SPL	special
SPEC	specification (s)
SQ	square
SST	stainless steel
STD	standard
STA	station
ST	steel
STO	storage
SD	storm drain
STR	structural
SCT	structural clay tile
SUS	suspended
SYM	symmetry (ical)
SYN	synthetic
SYS	system
TKBD	tackboard
TKS	tackstrip
TEL	telephone
TV	television
TC	terra cotta
TZ	terrazzo
THK	thick (ness)
THR	threshold
TPTN	toilet partition
TPD	toilet paper dispenser
TOL	tolerance
T&G	tongue and groove
TSL	top of slab
TST	top of steel

Many advantages will result from the use of a uniform system of working drawings. Not only will communications within the construction industry be improved, but it also won't cost as much to do business.

TW	top of wall
TB	towel bar
TR	transom
T	tread
TYP	typical
UC	undercut
UNF	unfinished
UR	urinal
VJ	v-joint (ed)
VB	vapor barrier
VAR	varnish
VNR	veneer
VRM	vermiculite
VERT	vertical
VG	vertical grain
VIN	vinyl
VAT	vinyl asbestos tile
VB	vinyl base
VF	vinyl fabric
VT	vinyl tile
WSCT	wainscot
WTW	wall to wall
WH	wall hung
WC	water closet
WP	waterproofing
WR	water repellent
WS	waterstop
WWF	welded wire fabric
W	west
WHB	wheel bumper
W	width, wide
WIN	window
WG	wired glass
WM	wire mesh
WO	without
WD	wood
WB	wood base
WPT	working point
WI	wrought iron

The task force members include Melvin Brecher, FAIA, chairman; T. Graham Bradley, AIA; Don D. Depew, AIA; Hansell P. Enloe, AIA; Quentin L. Reutershan, AIA; Marvin D. Suer, FAIA; and C. Herbert Wheeler Jr., AIA.

Task Force #1 of the Committee on Office Practice of The American Institute of Architects has for the past two years emulated other task forces and spent much of its time reviewing and analyzing practices within firms all across the country in an attempt to establish the basis for a uniform system for working drawings.

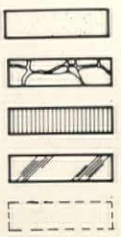
Material designations: The most commonly used materials are included and arranged in the order of the divisions of the *Uniform Construction Index*, and alphabetically within the divisions; for example, earth and porous fill are part of Division 2 with *earth* being the first material designation closest to the beginning of the alphabet.

The task force recognizes that regional differences exist in the use of some of the designations, but it strongly recommends that the indicated designations be accepted in the interest of uniformity of the language of the profession. Where materials are used which are in addition to those listed, they should be added to the list at the end of the group corresponding to the appropriate specification division. For example, a finishing material would be added to the end of the grouping of Division 9.

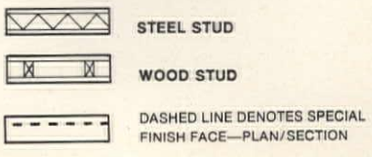
MATERIAL DESIGNATIONS

Plan/Section

Elevation



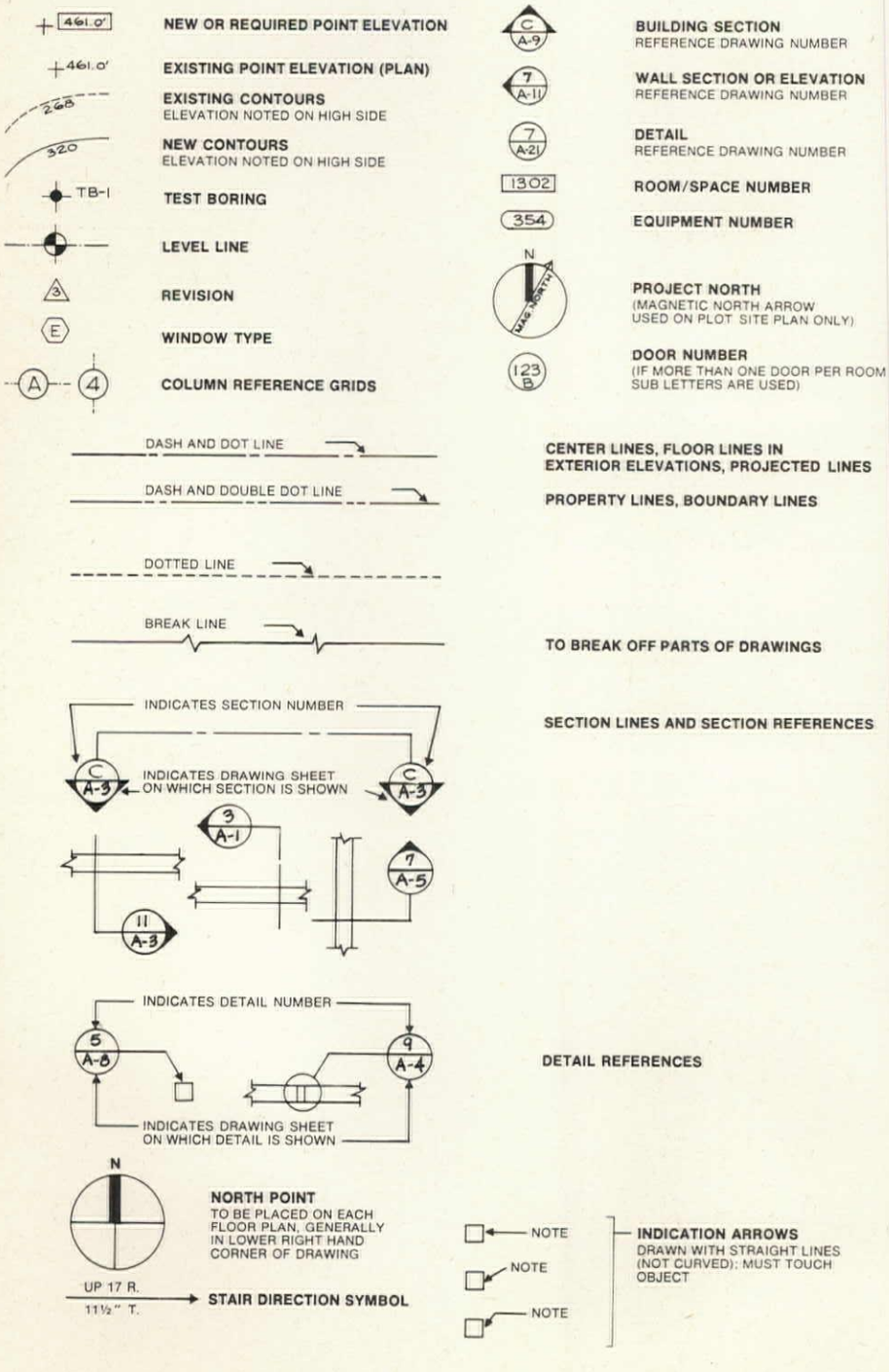
Special Indications



Architects are urged to put the recommended standards into practice. After they have been in use, an evaluation will be made.

Graphic symbols: The symbols shown are those which seem to be most common and acceptable, judged by the frequency of use by the architectural offices surveyed.

This list can and should be expanded by each office for those symbols generally included in its practice and not indicated here. Again, each professional is urged to accept the task force recommendation by adopting the use of these symbols.



Schedule formats: A "schedule" is a written or printed list or inventory often in tabular form. The two most commonly used schedules in architectural working drawings are those for room finishes and door openings. A room finish schedule (Exhibit A) located on the plan drawing, and including only the spaces covered on that plan, puts the needed information where it is most useful. When space requirements of either the drawing or project prohibit this location, then the use of a separate schedule drawing sheet is recommended.

A second method (Exhibit B), commonly in use for small projects, is a coded schedule within the room configuration on each plan. The legend for the code should be placed in the lower right hand corner of each drawing on which the code is used. For this method to be useful, plans must be drafted at large scale, and the projects should be rather simple.

A schedule of doors and frames should be located on a separate drawing sheet, where it is more important that the tabular information interface with the frame details and door elevations depicted by graphic details. The location of such graphic material adjacent to the text of the schedule is highly desirable. Door schedules located on plan would require the repetition of the graphic material on each plan, which is obviously an uneconomical use of time. Also, manual repetition increases the potential for error.

The task force recommends the use of the standard tabular schedule (Exhibit C) on a separate sheet which includes the referenced graphic details.

The recommended door opening numbering system is to number the doors with the same number as the room opened on, with an alphabetical subscript character for multiple openings to the same room. Typing of doors (in elevation) with alpha-numerical characters is the Steel Door Institute's standard and should be used for doors of any material.

The logic of the technique and standards recommended for room finish and door opening schedule formats can be applied to the scheduling of other building parts, for example, window openings, exterior panels, equipment, etc.

The five standards presented here are but a beginning. Subsequently, new standards will be added to the system and old ones improved.

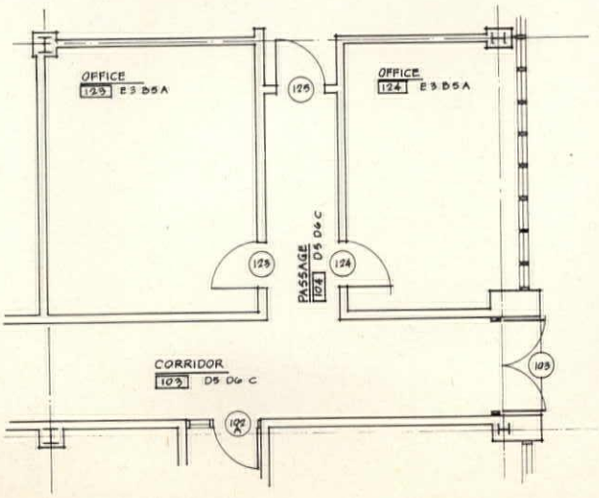
ROOM FINISHES — EXHIBIT A

ROOMS			FLOORS										BASES										WAINSCOTS							HT	WALLS										CEILINGS										MTG		SUSP HT	COLOR SCHEME	REMARKS
LOCATION	ROOM NO.	ROOM NAME	MATERIALS										MATERIALS										MATERIALS								MATERIALS										MATERIALS													
			CONCRETE	TERRAZZO	CERAMIC TILE	V.A.T.	CARPET					PAINTED	TERRAZZO	WOOD	CERAMIC TILE	VINYL					PAINTED	VINYL SHEET	CERAMIC TILE					PAINTED		CONC. UNIT MAS	PLASTER	KEENE'S CEMENT						PAINTED	CONCRETE	PLASTER	ACOUS. TILE A	ACOUS. TILE B	KEENE'S CEMENT					PAINTED	CONSTRUCTION	FURRED	SUSPENDED			
			1	2	3	4	5	6	7	8	9	P	1	2	3	4	5	6	7	8	9	P	1	2	3	4	5	6	P		1	2	3	4	5	6	7	8	9	P	1	2	3	4	5	6	7	8	9	P	C	F	S		
FIRST FLOOR	101	STORAGE				4										4															2									P	1									P	C			B	
	104	OFFICE				4										4															2									P		3										F			B	
	105	UNASSIGNED	1																			P									1										1										C			A	
	110	DAY CARE CENTER		2									1																		2									P			4								5	9'-0	C	
	115	NURSERY				4										4															2											3									5	8'-0	D	
	117	WOMEN'S TOILET			3																		2									3								P				5					P					E	
	118	JANITOR'S CLOSET	1																												1									P	1													F	
	119	MEN'S TOILET			3																		2									3								P				5					P					G	

Note: The numerical material designation takes precedence over the column location box.

ROOM FINISHES KEY — EXHIBIT B

① FLOORS		② BASES		③ WALLS		④ CEILINGS		⑤ CS	
A	CONCRETE	1		A	CONCRETE UNIT MASONRY	1		A	A
B	TERRAZZO	2	TERRAZZO	B	PLASTER	2	CONCRETE	B	B
C	CERAMIC TILE	3	WOOD	C	KEENE'S CEMENT	3	PLASTER	C	C
D	VINYL ASBESTOS TILE	4	CERAMIC TILE	D	5'-0 VINYL WSCT/PLASTER	4	FURRED ACOUS. TILE A	D	D
E	CARPET	5	VINYL	E	5'-4 CERAMIC TILE WSCT/PLASTER	5	SUSP. ACOUS. TILE A 9'-0	E	E
F		6		F		6		F	
G		7		G		7		G	
H		8		H		8		H	
J		9		J		9		J	

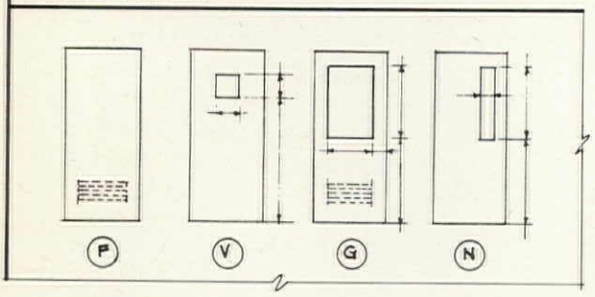


DOORS AND FRAMES

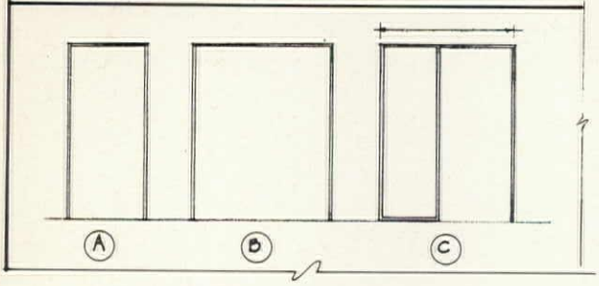
EXHIBIT C

LOCATION	DOOR NO.	DOOR								FRAME					FIRE RATING		HARDWARE		REMARKS
		SIZE			MAT	TYPE	GLASS	LOUVER		MAT	TYPE	DETAILS			LAB	CON	SET NO.	KEYSIDE ROOM NO.	
		W	H	T				W	H			JAMB	HEAD	SILL					
	101A	3-0	7-2	1¾	HM	N	¼ TEMP			AL	C	5/6	5	12			4	EXTERIOR	SIDE LITE ¼" TEMP. GLASS
	102A	3-0	7-2	1¾	HM	F		2-0	1-0	HM	A	1	1		B		6	107	
	102B	3-0	7-2	1¾	HM	F				HM	A	1/4	1		B		6	107	
	103A	2-10	7-2	1¾	HM	V	¼ WIRE			HM	A	2	2			B	21	107	
	104A	3-0	7-2	1¾	HM	F				HM	A	3	3		C		22	108	
	104B	6-0	7-2	1¾	HM	G	¼ WIRE			HM	B	7/8	9	12			16	EXTERIOR	PAIR

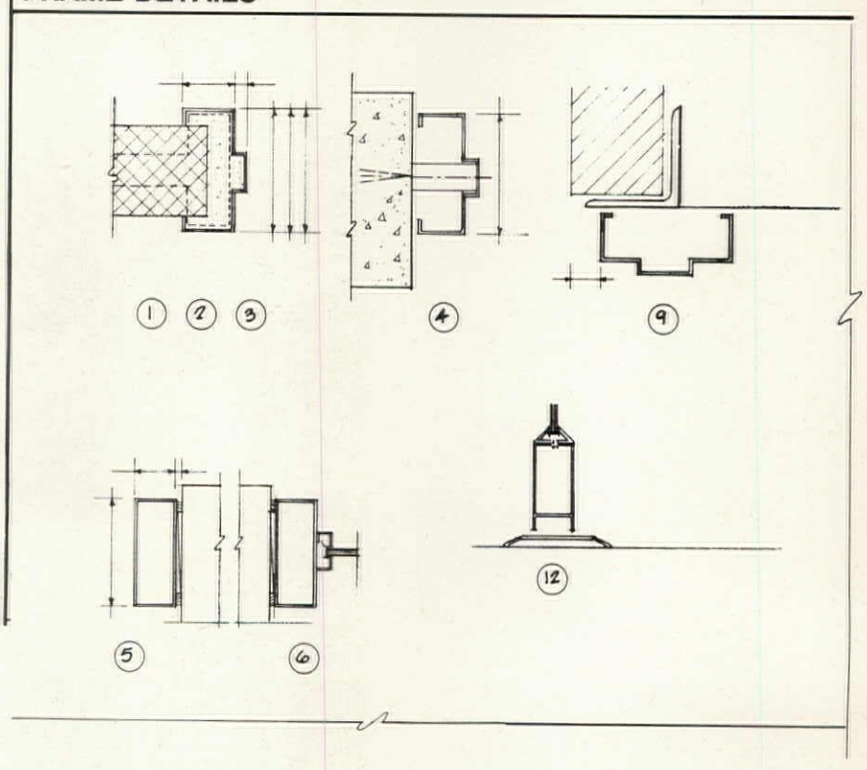
DOOR TYPES



FRAME TYPES



FRAME DETAILS



Standard drawing sizes: The task force in its survey and review of the profession found that established drawing sheet sizes have been influenced in most cases by the manufacturers of printing paper, printing equipment and storage cabinets. Most printing papers are manufactured in widths of 18, 24, 30, 36 and 42 inches. The "Scan" system viewing screen—a microfilm reader used by a large number of building contractors and material suppliers—is limited in its size and can only reproduce, at full size, a maximum sheet of 30x42 inches.

The advent and use of data storage banks for repetitive information and details, prepared on sheets of 8½x11-inch size and stored on microfilm cards or in other systems for paste-up drafting, makes it desirable that the main body of the drawing sheet accommodate a module of 8½x11 inches. An 8½x11- inch modular layout would help to improve layout time; folding into 8½x11-inch size would facilitate the storage and mailing of materials in standard size files and envelopes.

These considerations seem to override all others, and it is recommended by the task force that:

- Where possible, the main body of drawings be in 8½x11-inch modular sections. This would improve layout time, photo reproduction of standard details and storage of information.
- The maximum sheet size be limited to 30x42 inches within the drawing borders.
- All titles and major notes be located on the right hand side of the drawing starting at the bottom and working toward the top and/or starting at the right hand side and working toward the left hand side.

In Summary: The Committee on Office Practice foresees many advantages accruing to the profession from the use of a uniform system of working drawings, of which the five standards presented here are but a beginning. The *Uniform Construction Index* has proved the value of an industrywide standard for construction specifications.

Improvement of all forms of communication within the construction industry—the ultimate goal of these recommendations—will also improve professional practice, including the cost of doing business. The recommendations for nationwide standards are in no way complete or final. They should be modified and should grow based on experience and knowledge gained through usage. The present task force hopes that its efforts will be supplemented by those of future task forces.

Architects in practice are urged to put these recommended standards for working drawings into use. Test them with contractors, suppliers and clients. After they have been used and a fair evaluation can be made, the Committee on Office Practice would welcome comments and suggestions for the improvement of these standards. Subsequently, it will add new standards to the system. The help of all architects is needed to improve professional practice for everyone and to conserve energy in the production of construction documents in order to have energy to expend in designing. □

Room for Champions

Environmental Education: What is it? Why should anyone care? Who should be taught? Who should teach?

Stephen A. Kliment, AIA, and Marjorie Wintermute, AIA

The first obstacle which environmental education faces is its name. A nine-syllable title is more than any movement should have to bear. Other issues are:

1. What *is* environmental education?
2. Why should anyone care?
3. What can we do about environmental education; who should be doing it; and to whom should he do it?

Let us tackle these issues one by one. The length of the name we'll leave to the semanticists. To conserve space and energy, we will refer to it simply as EE.

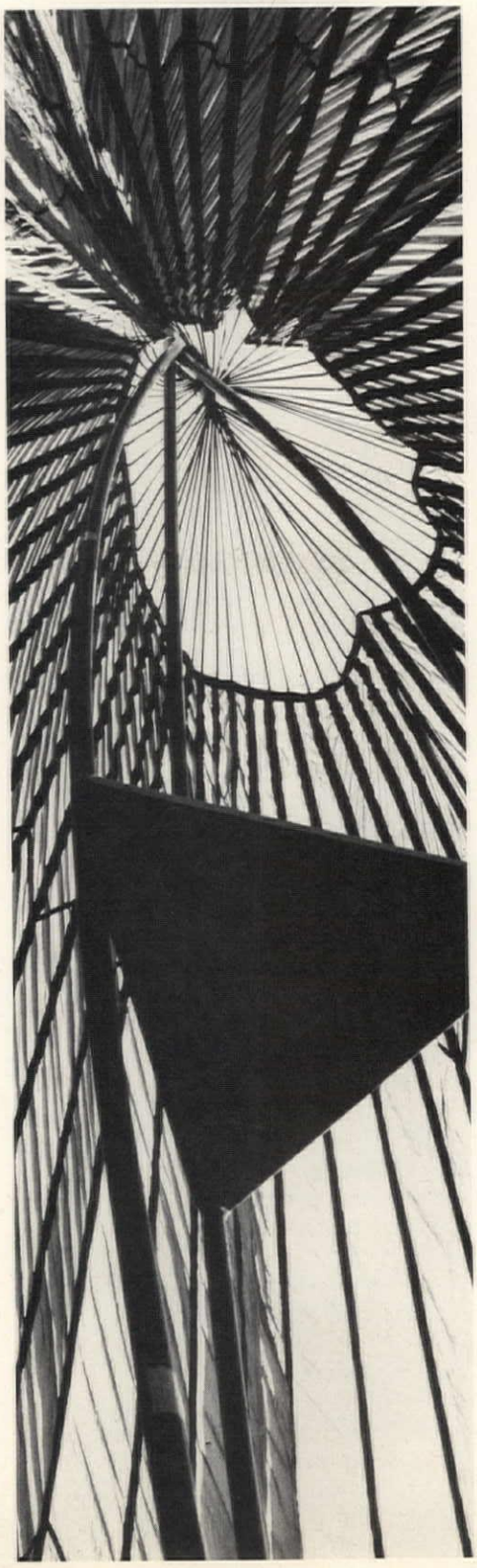
What EE is (and isn't) is tougher, if only because the word "environment" itself means different things to different people.

Much of the broad interest among civic groups, public officials and private industry has been in the natural environment: the quality of our air and our water; the need to balance conservation of natural resources with the nation's need for power and transportation routes; preservation of wildlife; noise control; pesticide control.

This combination of interests and focus has clearly shaped the face of the official control machinery and the spending of funds. The Environmental Protection Agency (EPA) has considerable clout and an annual budget of millions. What goes into that "other" kind of environment is today a pittance.

The "other" environment, as someone once wrote, is everything we see around us that we cannot blame on Mother Nature. It is the built, the man-made environment. The local post office with its benches and recruiting posters out front. The bus shelter, fountain, equestrian George Washington and courthouse square. The shopping center and parking. The drive-in theater and parking.

These are the two basic ways of *defining* the environment. *Educating* for it (especially the man-made variety, which is what the architect is trained to design) is one of the most critical issues we have to face. Architects have long felt and taken for granted that any virgin environment they touch will at once turn to environmental gold. History, by contrast, points out clearly that it is the buyer of the environment—king, bishop, tycoon or Mrs. O'Rourke of the fourth ward—who determines its quality by the choice of site, the decision to spend more (or less) money and, yes, the choice of architect.



EE, then, is the instilling of awareness in the buyer of the environment, making him discriminate against ugliness and eventually cause the problems to go away (*see* Table A for some typical definitions on what EE *is* and *isn't*.)

In a democracy, where every citizen has some say on how the physical environment is made, used, abused and finally disposed of, EE is clearly not a simple matter. Thus:

Question 1. Should the educational effort be aimed at adults, whose outlook is usually set in matters of esthetic appreciation and community concern?

Question 2. Should the main effort be aimed at youngsters, from elementary school through college?

The arguments for focusing the effort on youngsters are strong. By folding EE units into existing courses such as social studies, science and possibly arts, youngsters will recognize the built environment as a part of the whole world, not something to be seen in isolation or superimposed on an already established lifestyle. EE should be integrated, not separate new courses added to already overcrowded curricula.

Second, a child's mind is malleable. Impressions formed in those early years color everything that comes up later. The physical environment of the home, the visual character of the schoolhouse, and the route that connects the two nurture attitudes that last a lifetime.

Third, channeling EE programs through the schools allows the effort to advance via an existing organization: the nation's educational system. This country's teachers and school officials are informed as never before. They meet and exchange ideas and information at myriad

Mr. Kliment, a New York City-based architect and writer, also heads the Editorial and Graphics Division of Hagen Communications, Inc. **Ms. Wintermute** practices in Portland, Oregon. The two are chairman and vice chairlady, respectively, of the AIA Committee on Environmental Education.

Environmental education—EE—is the instilling of awareness in the buyer and user of the environment, making them discriminate between things pleasing and unpleasing.

seminars, workshops and conferences. A fat slice of the knowledge industry—the book and magazine publishers, the purveyors of audio-visual equipment and of films, slides and television programs—is geared to supplying teachers with ideas or with the wherewithal to put their own ideas to work.

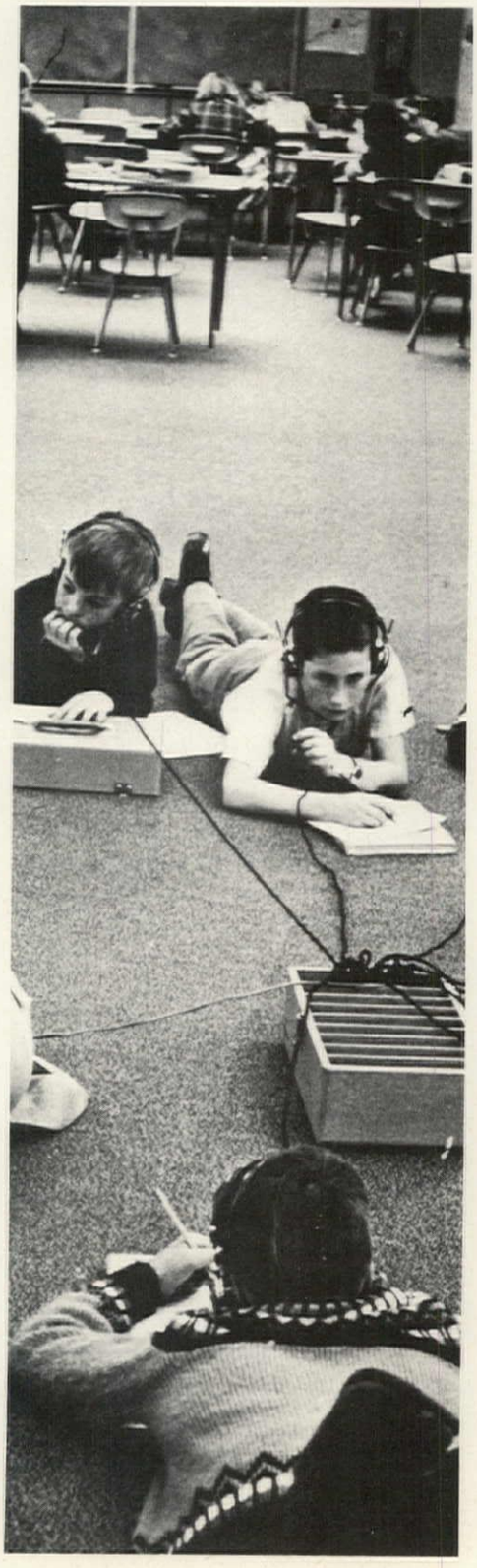
These, then, are the formal channels available for the EE of youngsters, at school. A different view, however, is held by some who feel youngsters are reached to greater effect in the home, using such teaching media as do-it-yourself EE kits, special TV programs, etc. that supplement what is done in the schools.

Whether EE's spearhead should be aimed not at young people but at adults is moot these days. Quite aside from inculcating fully formed adults with new attitudes to the physical environment, there is the more practical matter of usefully reaching those millions, in their offices, plants, farms, shops; etc.

Add to that the fact that adults need to set aside time to receive the message, and time to act on it. Also, unlike school teachers, there is no established group to transmit the message; architects, quite unfairly perhaps, might be suspect of creating work for themselves if they undertook the role of teachers. From a purely practical point of view, then, let alone for the sake of long-time effect, adults are not as good a point of attack as the young.

Why should anyone care? Robert Sommer, the psychologist and behavioral scientist, has written that "the environment affects most people just beyond the focus of awareness." What a good EE program does, as AIA's Dave Clarke has it, is to seize opportunities: You know you have scored when, say, you are with persons who admit to a conscious awareness of something in their surroundings which they were only unconsciously aware of before, and they are *conscious of the shift*.

Many groups and many individuals are active these days in bringing EE to young people. Some work under the aegis of boards of education, others, such as the US Forest Service and the National Endowment for the Arts, are government agencies, others still are supported by foundations. Professional associations



(both architects' and educators') labor in this vineyard, as do faculty at an occasional college of education and a scattering of manufacturing and publishing companies and firms, both profit and not-for-profit. Some associations have just formed a group known as the Alliance for Environmental Education, which The American Institute of Architects has been invited to join.

Is there a right way and a wrong way to make waves in reaching youngsters with the EE message? What happens when an EE program gets underway?

Alan Levy, AIA, president of the Philadelphia-based Group for Environmental Education, Inc., cites three steps. The first is to cause students to discover and see and question their immediate surroundings, to record physical patterns, needs and visible change in their schoolhouse and neighborhood. Even later, when programs get to more complex solving of problems, observation remains the basic tool.

(Science teachers have, for example, asked students to observe light and color comparisons in nature versus the built environment. Social studies teachers use mapping and interviewing to get pupils to discover the visible and the nonvisible parts of their surroundings.)

The second approach cited by Levy is centered around theoretical problem solving. A Philadelphia teacher a few years ago worked up a program she called "The Model City Laboratory." Three teams of students, working with Lego blocks, built, then changed, then rebuilt a whole city over one semester. Reading, mathematics, questioning, group dynamics all were brought into play.

This approach supplements direct observation and discovery without what Levy calls "the encumbrances of the complicated real world."

His third approach is to identify an actual problem and go about solving it. New neighborhood housing, recreation needs, a community center can be themes for a project that starts with definition of needs, identifies ways and means to proceed, and ends with design of a viable scheme (Table B shows typical activities).

C. Richard Hatch, another experienced

The reason why we should care is that EE is one of the most critical issues we face if we want to retrieve the environment before it makes an irretrievable dent in us all.

laborer in the EE vineyard, is, interestingly enough, a leading exponent of reaching kids not always through the educational establishment. Hatch ascribes great EE value to these alternative non-scholastic means: environmental guide maps that could be issued at gas stations (always assuming there's gas to reach all points on the maps!); EE program inserts for such TV programs as Sesame Street and Zoom; open-ended museum exhibits requiring young visitors to take an active part; summer activity books; comic books inserts; home-use parent/child man-made environment kits; even cereal box backs.

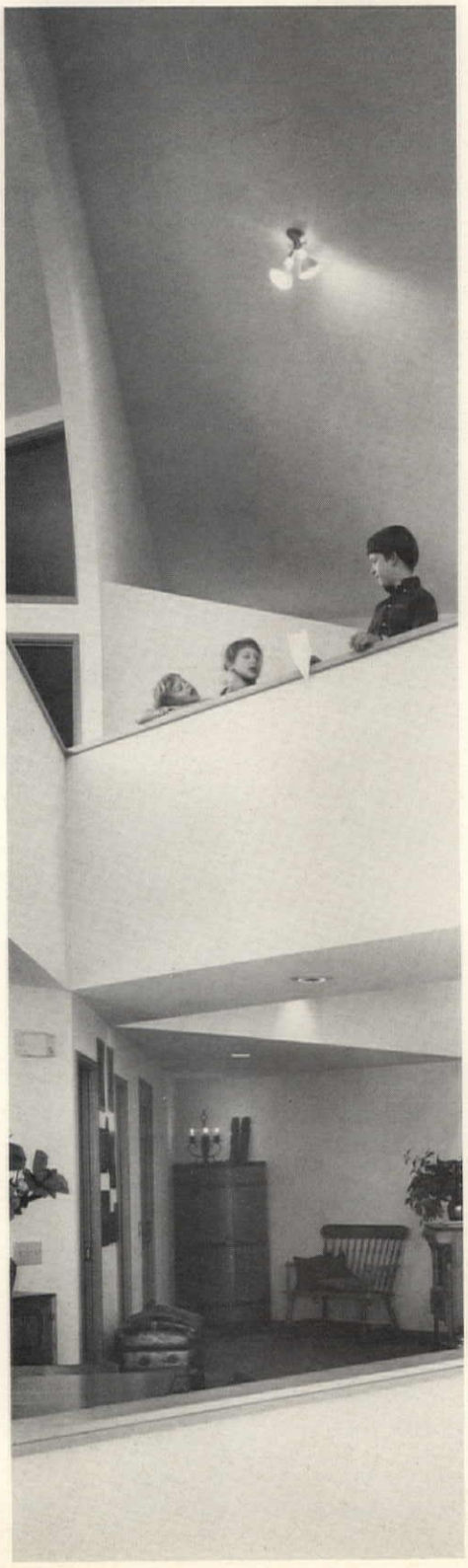
In a fine essay in Number 18/19 of *AS*, issued by the Associated Student Chapters of the AIA, Bruce Webb cautions architects not to reach for too large a role in EE in the public schools. And indeed this has been the experience of architects who feel strongly about the need to raise a new generation of "aware" clients.

It is too easy to assume that because a Rotary luncheon talk on the environment went over well, a similar lecture or series to a bright ninth grade class will have the same effect.

First of all, there are the purely administrative hurdles of, in a sense, bypassing an established teacher fraternity. Second, there is the matter of adapting the EE materials to the level of understanding of the class age. Third is the issue of integrating the materials into the overall school syllabus.

This rule is buttressed by the exceptions, such as the work of David R. Dibner, AIA, with 6th, 7th and 8th grade kids in New Jersey (Dibner does have the great asset of a wife who is a 6th grade art teacher). Still, all in all, architects are best off exploring other channels.

One such channel was developed successfully over the past two years via the so-called Stipends Program. Organized by the Association of Collegiate Schools of Architecture and supported by the National Endowment for the Arts, the Rockefeller Family Fund and the Johnson Foundation, the Stipends Program offers grants to architectural school faculty and graduate students to teach courses in environmental experience and education to



teachers in the public schools. Clarke is project director.

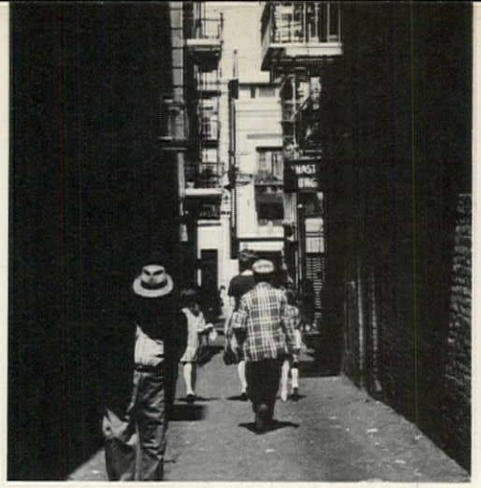
Typical of these $1,000 incentive grants given to some 30 such teams are:

- An in-service credit course in EE for Boston teachers. Included were field trips, guest speakers, office visits and environmental games.
- A similar program in St. Paul.
- Video-taping a discussion panel consisting of local (Lexington, Kentucky) politicians and other decision makers on the subject of cities and beaming the results over local educational TV.
- A regional program centered on Fargo, North Dakota, and including courses for teachers in four cities, design of a 10-week course for third graders, public lectures on local architectural history, a half-hour educational TV lesson for primary grades called "windows" and publication of a catalog of free EE materials.
- Video-taping of an environmental history show using marionettes, in Blacksburg, Virginia.
- Teaching a course sponsored by the Design Program in Elementary Education at New Haven's Teachers' Center Workshop.

Another important, but still rather undercultivated, channel for EE is the college of education, where the teachers are taught. Contacts by architects with deans and faculty have yielded wide interest but a rather sparse range of current EE programs. There is a nucleus of deans and faculty who are turned on by the need to work for a better built environment, but they are sometimes stymied (as in California) by state law that limits such colleges to accepting teacher candidates only in those majors that are commonly taught in the public schools.

Those colleges that do offer courses in EE to teacher candidates usually stress the natural or conservation rather than the built side of the topic. And so a group known as the National Association for Environmental Education is made up almost entirely of faculty with these interests; indeed, one of its leaders, Professor Clay Schoenfeld, typically teaches wildlife ecology at the University of Wisconsin at Madison. Clearly, effort is needed to turn this latent interest of the few into a more flourishing family of teaching programs

From a practical point of view, and also for long-time effect, the ultimate forum is the young, both in the homes and in the schools.



Architects have found, however, though with exceptions, that caution is best in trying to reach for too large a role in EE in the schools.

that include strong elements of the built environment.

Side by side with the colleges of education is the work of such professional teacher groups as the 16,000-member National Council for the Social Studies (NCSS), an affiliate of the huge National Education Association. A glance at the program of this past November's NCSS annual meeting in San Francisco disclosed a number of workshops for teachers on topics such as environmental value choices: urban and regional planning; ecology and human values; a program for high school students; land use, zoning and community values; a new approach to EE; and environmental ethic.

A good sign of progress is marked by the beginnings of a split in approach within the small army of environmental educators. The split is between those whom Webb labels the "touchy-feelies" (who are convinced that man is related to his physical environment in a very subjective way and that conversion is most likely to come about through personal encounters with this environment) and the "information freaks" (who think emotion is not enough and that you need all kinds of appropriate skills and pragmatic knowledge before anything useful can happen).

In any case, as Webb says: "Education must be directed at changing the person first, his attitudes and values, rather than at simply providing him with more information or helping him to attack a particular problem or situation."

What can we do about it? A model for cities everywhere in the nation is the way a city like Portland, Oregon, has successfully combined the two attitudes by means of a broad series of programs. Here's what has been accomplished over the past two to three years:

• An environmental education center has been set up, with space at Portland State University excitingly remodeled by a group of young designers from Skidmore, Owings & Merrill's Portland office. Using United States Office of Education funds, the Center has managed to maintain a self-learning center for people in the tri-county area of Portland (participatory exhibits are changed regularly); provide an atmosphere where teachers, youngsters and others become acquainted and exchange ideas; establish a collection of environmental educational materials and information for reading in the lounge area; maintain a file of federal, state and local environmental agencies, private businesses and organizations for referrals on specific environmental questions; serve as a consultant and coordinator in developing environmental proposals to private and government sources for the tricounty area; develop an environmental media center with portable video-tape cameras for use by teachers and students, community groups and individuals, business and industry.

• A conference on man's behavior and the built environment was held last summer. Using National Endowment for the Humanities money, it had teachers and other professionals take part in an exercise to experience and redesign a series of experimental spaces, using some of the principles of Sommer and Edward Hall for the initial design. The event was video-taped and has so far produced at least two pieces of afterglow: The Portland School District may give an in-service course—the kind teachers like to take because of the career credits involved—geared to applying the underlying research to the classroom; and a future series of conferences is planned for 1974 but in different communities, for comparison.

• In-service teacher workshops were held last year to develop awareness of "city edges" (riverfronts, oceanfronts, freeways, parks, rooftops), in line with the National Endowment for the Arts' current nationwide grant program. Architects were strongly connected with this Portland School District project.

• Tours of Portland are offered to students and adults. They are designed to show the city as "a sensuous experience and the product of social, economic and ecological factors." So far, 5,000 elementary school children have been on the tour, as have 500 high school students, as part of their urban studies programs. The tour also is a unit in several in-service teacher courses. It is now being expanded to include, in greater detail, comprehensive planning and development.

• To show to architects themselves some

of the principles of practical EE, a regular AIA chapter meeting had as its agenda sample tours for school children and an open house at the Environmental Education Center.

What lies ahead? By this year of 1974, the environmental education picture has begun to accumulate some quite sharp outlines. Above all is the need for each profession to do its own thing: teachers to teach, architects to purvey the professional know-how and experience.

This doesn't mean that architects must forego any initiative. On the contrary, it is the architect who, through enthusiasm and professional knowledge, is best at influencing educators at the various local, state and federal levels as well as officers of public granting agencies, private foundations and corporations.

A few architects and architecturally trained people have even gone one step further and have taken a personal hand in writing and publishing original teaching materials, or developing teaching packages for manufacture and distribution through commercial channels (*see* Table B and bibliography). But these efforts are aimed for use by teachers, and where they go directly to the home they have the benefit of input by commercial publishing houses and games manufacturers.

The AIA's Committee on Environmental Education is following the path of pragmatism in its own action program this year. It is writing a concise guide for teachers, which will try to point out how to develop a good course or program by using close-by resources plus his or her own ingenuity. Target date is spring. The committee is also assigning members to represent the man-made viewpoint on the boards of EE organizations that may not see EE in the same light.

For sometime later in the year, there are plans to convene a workshop or conference of interested EE people, and a program of merit awards for outstanding EE efforts is at a thinking stage. Finally, an EE traveling exhibit is planned for initial showing at AIA headquarters.

The various kinds of activity and approaches sketched out in this article are a good starting point for architects and educators. By looking at their own experience and insights and using such forums and channels as are available to them where they live, work or travel, each can begin to make a dent in retrieving a built environment before it makes an irretrievable dent in us all. □

Table A
WHAT EE IS NOT

An introduction to architectural design.
A book or clearly established body of material.
A self-contained course to be added to a school's curriculum.
Conservation management or nature study.

WHAT EE IS

Unstructured (usually) and structured (sometimes) discovery.
An educational process that deals with man's natural and man-made surroundings.
An effort to impart criteria for evaluating environments in which man works, plays.
An experience-based learning process that uses all resources at the school and surrounding community as an educational lab.
A learning process that begins at any age, but the earlier the better.
An activity directed at equipping individuals to be good and aware corporate, political and family leaders in the cause of good environment.
An activity directed to equipping society along the same lines as individuals in it.

Table B
A SAMPLING OF EE ACTIVITIES*

Older students

Inventory of the neighborhood according to given environmental principles. (Compare today's with that of 70 years ago. What should change? Be preserved? How does change happen? Identify further projects for class.)
Preparation of case studies analyzing specific changes (selection of a school site, construction of a highway). Social cost/benefit analyses.
Preparation of plans, models; outlining of budgets for transforming an undesirable urban environment; submittal of same to city government and media.

Younger students

Construction of dioramas of own neighborhood as it was in 1600, 1850, 1920, 1974.
Exhibits of student-made film or photos on spatial distribution of neighborhood activities and quality of services.
Investigation of effect on mood and behavior of spaces (in terms of dimensions, crowding, color, lighting, cleanliness and other factors).
Painting of a diagram (full size) of an average size student, showing dimensions in feet, inches. Comparison of this figure to size of door, height of ceiling, furniture, window sill. Why are some spaces (banks, churches) designed "larger than life?"
Calculation of the amount of waste each student produces per week, per year. What happens to it, when, how?

All students

Analysis of a historic building for the values it expresses: physical, social, economic.
Visiting of public service facilities and talk with users.
Exploration of schoolhouse and classroom as embodiment of EE in several variations:

- Make a chart of services to different rooms. Which get water, electricity, telephone, gas, intercom?
- Diagram a room's plumbing system.
- Find out what percentage of school grounds are used for movement, deliveries. Why? How would you change it?
- Explore how school building is zoned for different activities (language, other courses, gym, lunch, administration).

**Sources: Resource Center for Environmental Education, New York City; Memorandum from C. Richard Hatch; Group for Environmental Education, Inc., Philadelphia.*

With their enthusiasm and professional knowledge, architects can do most good by influencing teachers, public granting agencies, private foundations and corporations.

Bibliography*

Architecture and Interior Environment: A Book of Projects for Young Adults. Forrest Wilson. Cincinnati: Litton Educational Publishing, Inc. (300 Pike St., Cincinnati, Ohio 45202.) $6.95. Each page of this book has simple classroom building and construction ideas which use common items like straws and sugar cubes. The projects aren't just busy-work, though. They're aimed to give students better understanding of structural principles, scale and space.

Our Man-Made Environment. Group for Environmental Education (GEE!) Cambridge, Mass.: MIT Press. (28 Carleton St., Cambridge, Mass. 02142.) $4.95. This flexible workbook is geared for junior high but is adaptable for other ages. The exercises make up a comprehensive approach to personally understanding our immediate surroundings. A teacher's guide for the workbook is available directly from GEE! for $2. (1214 Arch St., Philadelphia, Pa. 19107.)

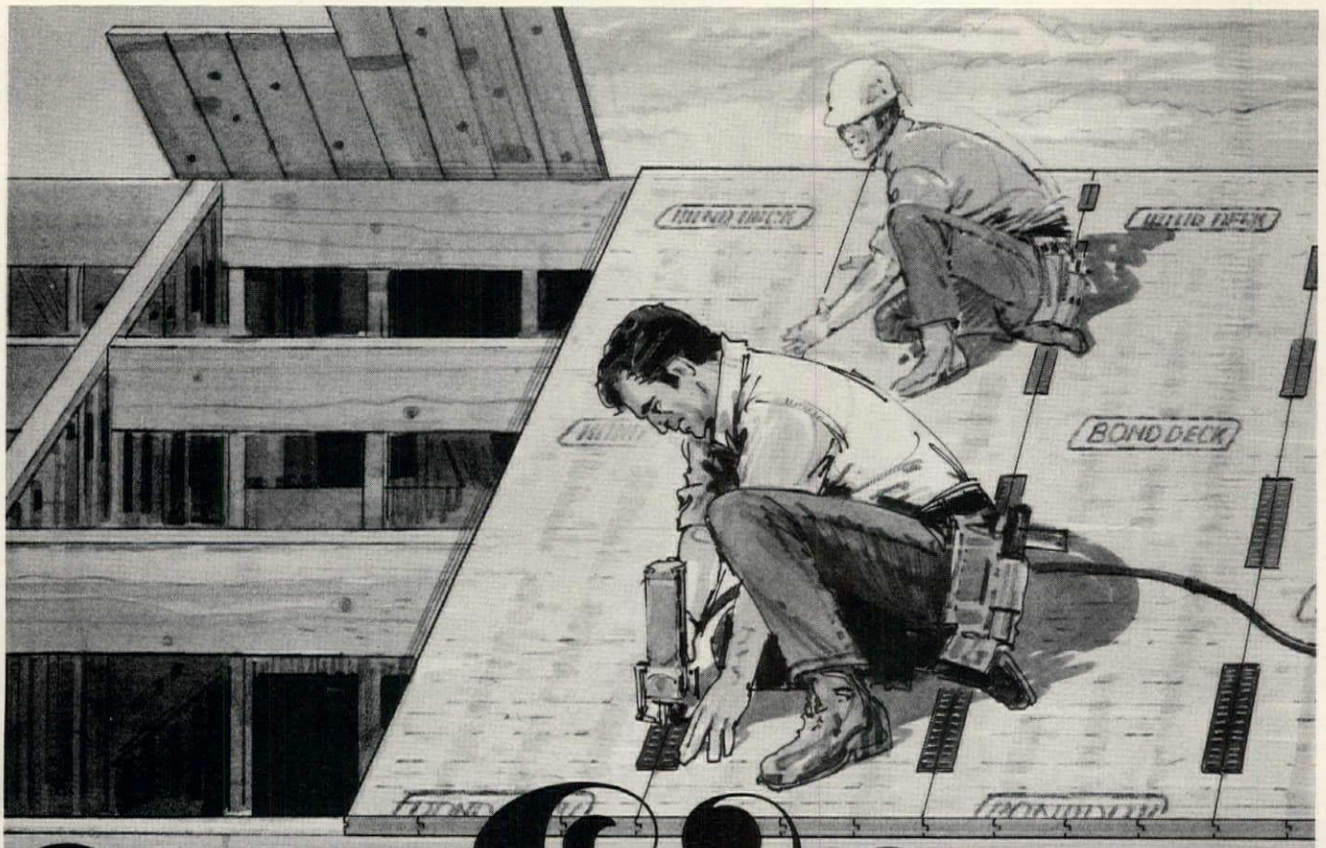
Our Man-Made Environment: A Collection of Experiences, Resources and Suggested Activities. GEE! $2. This 56-page book is filled with classroom ideas and handy reading lists for teachers, student browsing and reference.

The City Today and Tomorrow. $67.50. Developed by C. Richard Hatch. New York: Holt, Rinehart & Winston, Inc. A multimedia kit for intermediate and upper elementary grades. It is a 40-hour supplement to a school's social studies program, and teaches youngsters how to solve social and environmental problems in our larger cities.

The Process of Choice. Alan Levy and Stephen Geissbuhler. Cambridge, Mass.: MIT Press. $10. This package of five booklets (a total of 176 pages) continues the exploration begun in *Our Man-Made Environment* but with more emphasis on the different phases of the choice and change process.

Yellow Pages of Learning Resources. Edited by Richard Saul Wurman, AIA. Cambridge, Mass.: MIT Press. $1.95. The city is full of potential education. This guidebook helps students glean information directly from the people, places and process of any city, any town. The book has basic background on 70 categories and gives some leading questions.

*Assembled from various sources and evaluated by Paul Groth, member of the AIA Committee on Environmental Education. Additional resources, both printed and audio-visual, may be obtained in list form from the AIA Headquarters, 1735 New York Ave. N.W., Washington, D.C. 20006.



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Van B. Bruner Jr., AIA

As the year begins, we cannot help but look back over the past events that filled 1973.

Certain activities have played an important role within the profession of architecture. I especially remember the Grassroots circuit that I made last January and the Minority Disadvantaged Scholarship Program presentation. At that "point in time," most of the members of The American Institute of Architects attending the three meetings in different parts of the country were receptive and interested in the program.

Since then, I have had the opportunity to talk to many other members, and now a lot of them are asking questions which generally focus on "Why should I support the Minority Disadvantaged Scholarship?" Among the standard questions I am usually asked, and my answers, are these:

Question 1: We've got too many architects now. Why support an effort to add more?

Answer: If that's the case, let's cut out all scholarships. Why all of a sudden, when minorities are reaching their rightful place in this country, should we decide that we have too many architects?

Question 2: What are *they* trying to do now—take over the AIA?

Answer: No, I don't expect that we can. We have 24,000 members in the Institute, with minorities slightly exceeding 1 percent. The number of minorities in architectural schools is presently estimated at 4 to 5 percent. Both of these figures are well below national population averages. But like everything else, the number of minorities *interested* in being architects is much greater than those who become architects, which makes sense.

Question 3: I worked my way through school. Why don't the others help themselves?

Answer: Out there in society is a *valuable* human resource: the minority population. Many of its members (and I know this for a fact) have a great desire to be a useful part of this society, rather than having any urge to be against it or a burden on it. What's missing are adequate funds. That's what it's all about, brother. School costs have risen tremendously. Most scholarship applicants get no financial help from their families; in fact, the students should be helping their brothers and sisters.

A large number of the students have no source of moral support, and our program provides that too. We're helping kids get a start, helping them make it. As one of my little black brothers stated, "Just open the door—I'll get myself in."

I was given a boost as a little black boy with lots of dreams but no cash, and I know a lot of nonminorities who were in the same boat. I, in turn, am now assisting others. No, not everyone can help himself; no man is an island.

This country is presently looking to the minorities for support in many areas. Often, I am told, "If we just had *some* who were qualified." Today we have a chance to bring a miracle to someone who will become a viable human being, self-sufficient and self-giving, as a "qualified" professional.

Reflecting over the past months and evaluating the contributions for the scholarship program, I feel confident that the fund drive will be successful. However, this particular activity is a three-year effort, and the momentum must be continued in order that the financial goal of $600,000 can be achieved. To date, $67,000 has been contributed, the money being raised from architects and members of the Producers' Council, Inc. Pledges increase that figure to $107,000.

I also hope that the importance of the project has reached the state and local components where it will become a permanent part of their own programs.

If you haven't given as yet, I hope that I have been able to shed a little light on the darkness of your doubts. Remember, you could help to "just open the door." □

Mr. Bruner, who has been reelected to a second term as a vice president of the AIA, has his own architectural practice in Haddonfield, New Jersey.

BOOKS

Mexico is a land of contrasts, and its architecture reveals the country's characteristics. The design is "stunningly original."

Mexican Landscape Architecture from the Street and from Within. Rosina Greene Kirby. Tucson, Ariz.: University of Arizona Press, 1972. 167 pp. $27.50.

A magnificent book about a magnificent country: Mexico. It traces the origin of its landscape architecture from prehistoric times up to the contemporary scene with special emphasis on the work of one man, Luis Barragan.

Barragan was trained as an architect and an engineer, but he established landscape architecture as a profession in its own right in Mexico.

One of his most exciting achievements is the hidden convent at Tlapan which is described with photographs here. Every architect who visits Mexico should view this masterpiece; that is, if he can find it. It is definitely off the beaten tourist path, secreted behind a plain high wall in the suburb of Tlapan near Mexico City. The tranquil gardens recall the monastery patios of the 16th century but with a contemporary theme. Barragan has introduced his own vivid color scheme of lemon yellow, orange and gold and has given special attention to texture and form. His premise is that today's problems cannot be solved by yesterday's solutions. He has directed his efforts to dealing with landscape as a separate and specialized entity—the kinetic communion of man, earth and space.

It was Barragan who conceived the Pedregal Gardens adjacent to the University of Mexico. For years the lava beds were shunned by other land developers as unbuildable. Barragan transformed the volcanic terrain into a fantasy of luxurious contemporary homes cantilevered over purple-black rocks, blazing with red coral trees and tropical flora.

His newest planned subdivision, Las Arboledas, also retains the natural character of its surroundings. It introduces water gardens in the midst of deep woods with bridle paths and equestrian plazas. The architecture is bold—large, smooth planes of vivid color reflecting the shadows of the eucalyptus trees.

The author also illustrates and describes some of the works of other outstanding Mexican architects such as the cave house of Juan O'Gorman, the contemporary private home of Juan Sordo Madaleno, Mario Pani's Nonalco-Tlatelolco housing development and the famed Museum of Anthropology by Pedro Ramírez Vásquez.

In "The View from the Street" in Part 1, the author traces Mexico's prehispanic heritage from Aztec civilization, the Pyramids of the Sun and the Moon at Teotihuacan, to the great stone statues of Tula and the ruins of Monte Alban at Oaxaca. Unfortunately, she did not include the pyramids and temples at Chíchen Itza in Yucatan and the fascinating ruins of Palenque which are so reminiscent of Angkor Wat in Cambodia.

The book is filled with striking color photographs of plazas and parks, among

them Chapultepec Park and Alameda Park, both in Mexico City. Unlike parks in other parts of the world, the parks of Mexico are not vandal-plagued but are used and appreciated to the fullest by the local populace. Every day they are alive with balloon men, children, old people, lovers, philosophers and families seeking respite from the commotion of the city. The tranquility of the parks is enhanced by the ever-present component of water, its ubiquitous sound and motion appearing in pools, fountains and lakes. Sculpture plays an important role in the beauty of the parks as well as the myriad trees and plants of which Mexico boasts of over 20,000 different species.

In Part 2, "The View from Within," the author insists that the Aztecs, known throughout history as fierce warriors, were really "flower children." They not only named many things after flowers such as places, palaces, gardens and wars, but they built unique gardens such as the landscaped lagoon of Monctezuma at Iztapalapa. The garden villa incorporated the water of the surrounding lakes so that canoes could enter the heart of the garden.

Monctezuma's palace was starkly elegant, contrasting with the organic lavishness of the garden. Cortes described the palace as having "a beautiful terrace-garden with green arbors overhanging it, of which the marbles and tiles were of jasper, beautifully worked. It had 10 pools of water, in which were kept all the many and diverse breeds of waterfowl found in these parts."

Monctezuma also established the world's first tropical botanic garden, Huastepec, between 1440 and 1468. He not only imported the rarest and most exotic tropical plants from the far corners of his empire but also demanded that native gardeners from each locale accompany the plants and remain in Huastepec to tend them.

Long after the grandeur of the Aztecs, and after the conquest of Mexico by Spain, came the Mexican colonial period. One of the most significant elements of landscape architecture associated with this period was an idea brought from Spain by the conquerors: the patio. The Mexican colonial houses were all built around a central patio on to which all the rooms opened. The patio is still very much in vogue, and in the center is usually a fountain surrounded by potted plants. Tile is in abundance providing bright accents of color throughout the courtyard. While the Spanish patio is somber in its landscape, the Mexican patio abounds with color such as crimson bougainvillaea spilling over a rough textured wall, purple jacaranda trees, blood-orange poincianna, frangipani and morning glory.

Just as the patio is the focal point of the Mexican house, the plaza is the center of the town. Usually the plaza is flanked on one side by the church and on the other by municipal buildings. In the center is a small round kiosk which serves as a podium or bandstand. The ultimate function of the plaza is to bring together

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architecture and humanity. In 1967, a restoration movement began to refurbish all the old plazas in Mexico City, and now such beautiful plazas as the Plaza of San Fernando which was established in the 17th century by Franciscan missionaries can again be enjoyed.

The nature of the Mexican people has always been, since the time of the Aztecs, to place esthetic values above their own personal comfort or monetary gain. It is why they have developed such an unusual philosophy of achieving happiness.

An affinity between the old and the new is one of the remarkable facets of Mexican landscape architecture, yet contemporary Mexican design emerges as stunningly original. Its dominant characteristics are color, texture, form, scale, proportion and contrast. Mexico is a land of contrasts and extremes: good and bad, rich and poor, hot and cold, beautiful and ugly. The contrasts are evident in its contemporary architecture but in a different vein: rough planes against smooth, the constant interplay of light and shadow and the unique juxtaposition of muted serenity and blazing color.

This book reflects my own personal viewpoint of Mexico. There is so much beauty to behold that one tends to overlook the imperfections. *Peggy Cochrane Bowman, AIA*

Urban Planning—Illusion and Reality: A New Philosophy for Planned City Building. Jacob L. Crane. New York: Vantage Press, 1973. 169 pp. $5.

"While the statistical researchers and the planners plead with us to swallow their neat packages of predictions and programs, the instinctive, the irrational, the accidental, the unpredictable, the imaginative, the inspirational, the intuitive, the perverse—all together they seem to leave only narrow scope for long-view reasoned planning. My experience with life persuades me that understanding and judgment and wisdom and decision derive from strange intermixtures of the reasoned and unreasoned, in which the unreasoned often predominates."

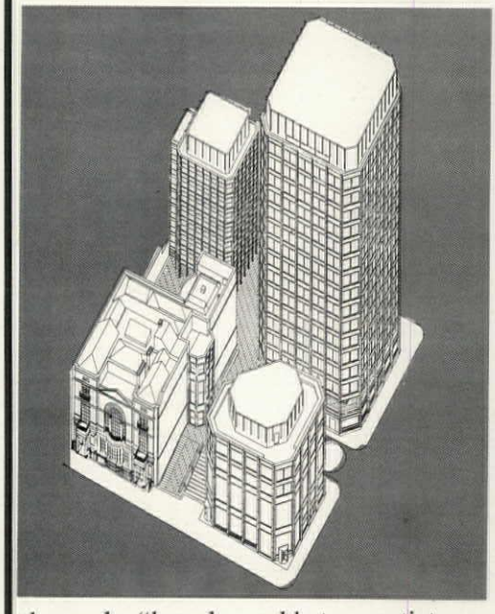
Crane has written a very personal view of the world verging upon philosophy and questioning the field of urban planning. He concludes: "In the principle of new towns I believe we can see the most likely hope for planned city building, short of a century or two of rebuilding at very great cost and very great grief and pain." This conclusion is remarkably close to the one reached by the AIA National Policy Task Force: the "growth unit" strategy for rebuilding America.

The book is short but not succinct. Among the chapter titles are "Cities Get Bigger and Worse," "Trial and Error by the Governments," "Illusion and Reality," "Toward Planned City Building," "To Humanize Our Cities."

Architects may wish to acquire this book if they would like to compare their professional philosophy with that of the author, who has had a half-century experience in the field of urban planning. *Michael B. Barker, Administrator, AIA Department of Environment and Design*

New British Architecture. Robert Maxwell. New York: Praeger, 1973. 199 pp. $25.

For architects who do not read British architectural magazines, this book is a good introductory summary of English buildings and critical thought as well. It is seemingly written for exactly this audience. I was familiar, for example, with only a few of the architects such as the establishment modern eclectic Sir Basil Spence and the much published new image-maker James Stirling. Most of the architects seem to operate between these two points of view. The emphasis is on



those who "have been able to negotiate some degree of freedom of expression with their clients" and have attempted "to extend the range of convention."

For the uninitiated, this book displays a new culture, similar to our own, but without the same emotional overlay. These buildings are not direct entries in the all-American contest. We can recognize the general influences but may not know what might have been published in England the year previous to any particular design. It can be an interesting experience. The buildings themselves can be seen rather than the slang-language of current "architecture."

The examples presented are those of the '60s. Maxwell discusses the change in point of view from the ethical '50s to the esthetical '60s. He characterizes the latter as a time of uncertain values following the recognition of the myth in functionalism. The myth is that a building can transmit only a message of functions without other symbolic content. The destruction of the myth came together with the willingness to recognize that different elements in society have differing needs and the realization of the importance of the client. These resulted, Maxwell says, in a self-conscious manipulation of forms. Such works gave rise to the descriptive labels: new eclecticism, new humanism, new empiricism and new brutalism.

Very few of the buildings in the book can be classified by what could be called new Victorianism. This term defines buildings made up of many different forms willfully put together without any overall imposed order such as provided by repetition or an expected composition. Stirling's buildings come close, except they do not appear willful but functional. This gives the apparently new but subconsciously symbolically old effect, which is so compelling in his work.

Maxwell convincingly concludes that the decade of change was inevitable. He says, "The cultural legacy is never complete." The approach is also in the English "tradition of the picturesque," which Maxwell quotes Nikolaus Pevsner as calling a "feeling-your-own-way theory" as opposed to a "rule-of-thumb" method.

Although Stirling's buildings may project the idea that they are the wave of the future, they and all of the structures in the book could essentially have been produced 50 years ago. Any one of them would have created a sensation at that time, however. The few architects who did design functional modern buildings 40 and 50 years ago did not continue to produce ever more useful ones. Many of the pioneers even lead in the later direction toward stylistics.

The buildings presented to us here cannot be judged adequately from a functioning point of view from illustrations. Each of them, however, seems to be effectively thought through on its own terms and shows the general freedom that was not available 50 years ago. Yet most, by being well designed for their own situations, are unobtrusive in spite of themselves and hence not really "significant" beyond their immediate contexts. This is as it should be, according to an increasing number of minds. Maxwell says that this is what the British have always expected of their buildings. Only recently, perhaps, have British architects had the urge to become editorially "significant." But they have been bested by the British architectural critics whose names and works are far better known.

A certain type of architect could once use his buildings as idea projections to establish a reputation through publications. The ideas had to be rare, however, and subject to popular resistance. Now, in a culture of relative acceptability, such ideas are either not available or would immediately become the latest fashion. Only stylistics or verbal theory seem to be available for such usage.

The critic, however, can take an extreme stance using architects' images as idea projections. Perhaps the critics will satisfy our needs for figureheads of great significance, and architects can concentrate on buildings. Maxwell unabashedly makes reference to varying degrees of paranoia of the "grand masters of the first generation of modern architects." This may well have been induced by their roles, which are not those of today. We have different problems.

For there really are no ultimates. If someone could define the requirements for a perfect building, a hundred architects of unquestioning self-confidence would each have a perfect building completed within the year. Ten thousand others would immediately follow their example. Instead of ultimates in buildings, architects and critics, there are brilliant noticeable exaggerations to which semiconscious symbolic values can be attached. They have irresistible communications value by their editorial success.

The collective problem is really how do we stay contented concentrating on making as many buildings and groupings as we can as good as we can. The British have something to tell us here. Although this book may highlight those players trying to play an American game, I think that it shows how really good they are at their own. *John Blanton, AIA*

A Computer Perspective. The Office of Charles & Ray Eames. Cambridge, Mass.: Harvard University Press, 1973. 174 pp. No price given.

History buffs with a little science and art in their souls will enjoy this latest production of the famous husband and wife Eames team. It is a triumph in communication. Billed as "a sequence of 20th century ideas, events and artifacts from

the history of the information machine," the book forever captures the essence of the Eames-designed exhibition at IBM's New York exhibit center. The book design is especially commendable for its 16-square matrix page format and its subtle use of color.

The bulk of the volume is concerned with the years between 1890 and 1950, decade by decade. A brief prologue looks at the 1833 design by Charles Babbage of an analytical engine and several other 19th century devices such as difference engines, arithmometers, tide predicators, ball and disc integrators, gyroscopes, automated looms and logic machines. Broken down into the three major categories of calculating machines, statistical machines and logical automata, the illustrations and brief text trace the gradual wedding of these diverse devices into today's sophisticated computers. Only two pages at the end are devoted to the 20 years from 1950 to 1970 after the computer had come of age.

The last decade of the 19th century was marked by a crisis in data processing because of the complex inventories required by the 1890 census. It was solved by Henry Hollerith's electric tabulating machine, a statistical one. In this same decade, William Burroughs' adding and listing machine and Dorr Felt's comptometer solved calculating problems, while Allan Marquand's first crude logic machine gave a glimpse of machines that feed on their own information.

And so it goes through the first five decades of the 20th century. The important contributions of dreamers and pragmatists are traced in this graphic study of the computer's origins. Hundreds of men and women added their

skills and ideas, among them the Sperrys, Vannevar Bush, Thomas Watson, et al.

Most of the devices illustrated were built and used, thus contributing to the buildup of knowledge leading to the computer. This even included robots patterned after human beings and animals. And then there were some devices that never made it, such as the bomb sight of the 1940s that was based on an automatic homing system that included pigeons.

A sentence from the introduction by Harvard's Bernard Cohen can sum up this review: "The task of making clear the historical forces that produced the modern computer has been elegantly accomplished in *A Computer Perspective.*"

Robert Allan Class, AIA, Director, AIA Technical Programs

Financial Planning in Ambulatory Health Programs. National Center for Health Services Research and Development. Prepared by Boston Consulting Group, Inc. Washington, D.C.: Department of Health, Education and Welfare, Public Health Service, Health Services and Mental Health Administration, 1973. 243 pp. No price given.

This manual is intended to help the planner in the early months of program development for the delivery of ambulatory health care before capital resources have been committed or policies have been formulated regarding the pricing and marketing of services. Its aim is "to avoid gross miscalculations that no amount of subsequent attention to cash management or operational efficiency can undo." The manual is not "an accounting text nor a discussion of cash management techniques."

The four chapters comprising the book are devoted to strategic planning; financial planning; obtaining external financing; and monitoring and controlling performance. There are a number of worksheets included which relate to the text, six appendices and a glossary of terms. There is also an annotated bibliography.

Dictionary of Architectural Science. Henry J. Cowan. New York: Wiley, 1973. 354 pp. $10.95.

The terms covered in this dictionary extend from "abacus" to "Z-tie." There are simple ones like "eaves" and the more complex such as "dynamic modulus of elasticity." Under "art of architecture," the user is referred to "science of architecture," which may say something for the profession today. Cowan, who is professor of architectural science, University of Sydney, Australia, writes that his dictionary "aims to be comprehensive within the field of architectural science proper, i.e., structures, materials, acoustics, lighting, thermal environment and building services." Most of the entries are terse and to the point. □

LETTERS

'More Than Just Building': The profession of architecture, as we all know, is more than just building. It is also educating. I am referring specifically to the article by David R. Dibner, AIA, titled "Opening Their Eyes to Architecture" in the October issue.

Congratulations, Mr. Editor, on a fine article and a round of applause to Dibner for taking time out of his busy schedule to help more people to better understand our profession and especially to help them become more visually oriented.

For the past several years, I have had the privilege of working with the local county schools in what we call "Career Day" or "The World of Work." I, too, share with Dibner the fun and enjoyment which one experiences while being with those young, enthusiastic and ever-questioning minds. It's just great!

James R. Meier, AIA
Springfield, Ohio

Miss Poly Metric: I read Robert Allan Class' article on the conversion to the metric system in the October issue. Why on earth was that dumb slogan and picture of the girl in the bikini included? Is this the only way that the AIA can think of to get architects interested in the metric system? If it is, why not include a picture of a luscious, scantily clad male for your women readers?

Iris Alex, AIA
New York City

If there is a poster of the "Think nothing but metric,"I would certainly like to get one for our office.

Harold T. Spitznagel, FAIA
Sioux Falls, S. D.

Thanks for the publication of "Miss Poly Metric." Please do it over again so that we of the bifocal group can see it across the drawing board.

William Lampton Gill, AIA
Jackson, Miss.

The article on metrication was interesting. Perhaps the highlight was the chart that features Miss Poly Metric. I would greatly appreciate further information about this healthy young lady.

Clement F. Wasleski Jr., AIA
Pleasantville, N.J.

I really must protest the metric maiden. With four or so architectural magazines coming into the house monthly, I have become accustomed to the eternal white-booted mini-skirted anachronism at the water cooler in the advertisements. But to find a metric girl-y in the editorial section was just too much. It takes very little feminist consciousness to deplore its playing card Rotarian lack of sophistication. Beyond that, if we need pinup approaches to lodge the metric system in this male-dominated profession, it's easy to understand the failures of modern architecture. Picture the male equivalent, Atlas, so pinioned to metric figures, and the ludicrousness of the whole approach penetrates.

Jane Holtz Kay
Architectural Critic, The Nation
Brookline, Mass.

Cementing International Relations: On a recent visit to Russia, my wife and I visited the offices of the USSR Union of Architects where we met Mrs. Iraida Shishkina, vice president of this official professional organization. Two other architects and an interpreter joined us, and we talked together for the next three hours, interrupted only by tea. Like the Irish, Russians like to talk with friends.

Through the courtesy of Mrs. Shishkina, I had the opportunity to compare notes with architects of Moscow and Leningrad about two subjects of interest to me and, I believe, to my fellow professionals. These topics are the design and planning of Russia's vastly expanding cities, with particular emphasis on housing, and the preservation of their historic buildings.

A pleasant prelude to the conversations were kind remembrances of the visit of a group of American architects to the Soviet Union last May following the AIA convention and the visit of S. Scott Ferebee Jr., FAIA, then president of the AIA, and a small delegation of AIA members to Moscow and Leningrad last year.

Also pleasantly remembered by Mrs. Shishkina was her visit to the US with three other Russian architects two years ago. She expressed the group's pleasure with this trip, recalling particularly San Francisco and St. Louis and the friendliness of AIA members. She made special mention of Bess Balchen, managing editor of the AIA JOURNAL, who toured the US with the Russians and wrote about it in the January '72 issue.

The Russians' needs for housing have been and remain urgent—so urgent that a certain regimentation and, in some cases, even monotony have resulted. The needs can be imagined from the fact that the population of Moscow grew from approximately 4 million persons in 1920 to 8 million in 1970. Assuming the average family of four, we know that over a million dwelling units have been required for only the expanded population. This, and the cycles of normal replacement, indicate why tens of thousands of dwelling units have been designed and constructed yearly for this city alone, in addition to those of Leningrad, Kiev and other major cities.

I was curious about how the goals and priorities are established and how the programs are drawn up. I was told that

the central administration of the city, in consultation with the departments involved with housing, prepares a careful program of the scope of and requirements for a particular project. Obviously, these are serious discussions often involving strong differences of opinion in both the programming and design phases of a project, but final decisions are expeditiously arrived at and promptly carried out by those in authority.

Dwelling units are built in a variety of sizes to provide apartments of approximately 400 to 1,000 square feet. Present plans indicate many refinements in design, noticeably in the form, proportions, conveniences and suggested materials, finishes and furnishings of the dwelling units.

In Moscow, new construction infiltrates the old city and expands spokewise into the outskirts with permanent greenbelts of forests, parks and truck gardens filling the voids between the spokes. Only highrise apartment buildings, in general 10 to 16 floors, are built in Moscow and other large Russian cities. The architects said that this was to preserve open space and to provide close proximity to work and public transportation. Of special interest to me was the skillful and sympathetic integration of small and large, secular and religious, historic buildings into the planning of the new. I was impressed as well with the preservation of open spaces such as forests and farms which thread into and connect with the parks and palace grounds of the old city.

Later, I went on to Leningrad and visited the handsome old palace which is now the offices of the Association of Architects of Leningrad. Through an interpreter, Alimov Alexander Ivanovich and I discussed architectural education and the profession in Russia. I understand that there are some 40 architectural schools there and that the education of the architect is essentially the same as ours in general content, time and division of emphasis.

Plans are now in progress for the design of a completely new university plant for 20,000 students. This involves the partial reuse and new uses for the distinguished buildings from about 1710, built under Peter the Great, to the Revolution.

My inquiries were directed as well to the spectacular and well-known achievements of the preservation, rehabilitation and constructive use of the entire historic city, old St. Petersburg, and of historic towns, palaces and estates surrounding the city. Our cordial host made it possible for us to visit with Rotach Alexander Lukich, who has had major responsibility in the restoration work of Leningrad, particularly the Palace of Pavlosk. With a driver and an interpreter, he took us for a special visit to this simple and elegant structure, designed about 1770 by Charles Cameron for Paul I, son of Catherine the Great.

From the comments of our professional colleagues in Russia, I sensed their keen interest in the architecture of our country. Undoubtedly, the cordial reception and frank discussions which we enjoyed were largely due to the efforts of the AIA over many years to exchange ideas with the architects of other lands. The Russians seem to be just as eager to talk with us. We have much to learn from each other. *Joseph D. Murphy, FAIA*
St. Louis

Start a Dialogue: I am a Finnish architect, and I have tried to start my own office. So far, I have had bad luck—perhaps due to the smallness of Finland. Also, I think that here we have only one architectural direction in power, and it takes time to improve the situation. Usually, a little country does not have as many different architectural styles as a larger one.

I have tried to contact some young American architect for dialogue. I would like some good instructions on how to start an architectural office. I know that I have professional abilities, but the demand these days is for American business methods.

I'd like to contact some young American architects for correspondence. In order for prospective correspondents to understand my architectural style, I mention that I like the "soft line," the organic, romantic style that is represented in Finland by the work of Reima Pietila and in the US by Paul Rudolph, for example.

I hope that some of your readers will be willing to write to me. *Lasse Geelnard*
Architect
Tuomiojärvenranta 6 B 27
40740 Jyväskylä 74, Finland

Talking Back to the Doctor: The emotional letter of Dr. John W. Williams in the October issue captioned "The Doctor and the Architect" merits careful consideration despite the "sillygisms" with which it is replete. A high school debater can easily demolish such thoughts as, "How can an architect build a facility for surgery when he's never removed an appendix," or the oldest shoe of them all, "Architects want to build palaces rather than efficient hospitals."

The letter, and its profound concern over skyrocketing cost which is suggested rather than expressed, should not be dismissed by us because of the careless form of the writing nor the fact that the increase in hospital construction cost has had a miniscule effect on a day's hospital stay cost by comparison with the rise in operating, maintenance and medical costs.

We architects have contributed to the rise in the cost of hospital construction which has, by far, outpaced the rise in costs generally. This has not been because we didn't listen to those who work in the hospitals, but perhaps because we have listened too much and unquestioningly.

To help increase the rate of utilization (bed occupancy), we have been making hospital structures, especially patient rooms, more and more decorative and attractive. We have been providing bathing facilities in each room and more and more of the features and comforts found not so much in the home as in a hotel.

We do not adequately examine the space demands of department heads. We keep increasing the dimensions of patient rooms to accommodate beds which keep getting longer and longer. These, and other space demands posed not by architects but by the hospital staffs, result in the structures getting larger and bulkier. Area per bed has been increasing as steadily as the increase of the dollar cost per square foot.

An attack upon the cost trend is overdue. By all means let all concerned be consulted—all "factions," as Dr. Williams characterized them. But let all be cognizant of the issue. What can each member of the team contribute to reducing the hospital's complexity, gadgetry and bulk, hence cost? *Isaiah Ehrlich, AIA*
New York City

More Wanted on Taut: The article by H. H. Waechter, AIA, in the September issue titled "Prophets of Future Environments" was outstanding and enlightening. I am now curious to know more of these visionary men—Taut and Scheerbart—so I shall purchase Dennis Sharp's combined volumes to which Waechter refers and will spend some leisure moments in reading more about these two giants.

Someday, however, I think that someone should take the time to write about Waechter himself. Maybe I will since I was a former student of his and was influenced by him. *V. Portuese Jr., AIA*
Santa Monica, Calif.

I was pleased to see the article by Waechter. I hope that this will lead to further articles or another look on Taut and related architects.

Marion D. Ross, AIA
Eugene, Ore.

The article by Waechter is excellent. I wish that he would write more on Taut and those around him in the '20s and early '30s. He could add much to our understanding of the man and his work.

David Gebhard
Director, The Art Galleries
University of California
Santa Barbara, Calif.

'Forceful': I enjoyed the article by Ewing H. Miller, FAIA, titled "The Difference That Method Makes" in the October issue. I hope that it will be read by every

member of any board of education considering design/build bidding. The next to the last paragraph which indicates when this method is most useful to the owner is perhaps the most forceful argument against the use of design/build bidding that I have read.

Bradley R. Storrer, AIA
Columbia, S. C.

The AIA's National Ad: Perhaps I am wrong in thinking that, indeed, a majority of the profession is anxious to gain a "piece of the action" from any spinoff resulting from increased environmental awareness in this country. I wonder, however, if the profession won't be better known now for the kind of "byproduct" mentioned in the AIA advertisement on page 1 of the September issue.

Is it necessary for an official advertisement from the Institute to place the profession on one side of an issue in such a fashion as to alienate agencies of government ("pussy cats" versus "tigers"); senators and representatives ("the *spirit* of the enforcers often matters more than the letter of the laws they enforce"); and local conservation clubs ("pet worries")?

The corporate client, to whom the ad is aimed, apparently, must surely feel some sense of insult at having his "baser instincts" appealed to. Let's hope that future ads from the AIA will be formulated within a concept of promoting the positive aspects of man's character.

Christopher C. Morgan, AIA
Bainbridge Island, Wash.

Prison Design: I am 68 years old and half of that time has been spent in correctional institutions, at federal and state levels, both as a juvenile and as an adult offender. My training in juvenile institutions fitted me for the role of a criminal offender, at which I became quite adept.

The institutions and facilities in which I've served time made sure that when I was discharged I was good for little except resuming my criminal ways.

I've never accepted the blame for my criminal career, for I've always felt that the blame belongs to those in authority who fail to establish a self-correcting mechanism to rid the United States prison system of its ills and injustices. The penal system at federal, state, county and municipal levels is still using the same crude techniques of an authority that has been a failure for over 200 years. I can say with little comfort that society has committed greater crimes against me than I have ever committed against it.

One of the primary needs of those in charge of the prison world is to maintain their authority over the unfortunates in their care. When new design of prisons is brought up with those in charge, they feel that they are being threatened; so the old concept of prison whorehouses goes on and on. Most "badness" comes from boredom; so the conclusion must be drawn from the fact that those in charge of prisons and juvenile facilities are bored with their role in our society. They must be replaced in some manner if crime is to be reduced. Law and order are a fortress for power, which must be replaced by a more intelligent concept, if we are to have a better society.

The crudeness of prison design is well known to the architectural community, and it is architects who will have to make the changes in prison design of the future. Design of prisons since the year 1676 has been and still is the villain. The inflexible mold which shapes the lives of offenders can only be changed by new designs by the architectural community.

As one who knows, I have some suggestions:

1. The single sound-proofed cell with shower would be one of the greatest improvements in prison design. First, this eliminates the loud-mouthed troublemaker from enforcing his will on others. Second, the shower in each cell would eliminate assaults, rapes and murders of inmates, which now occur in large shower rooms.
2. The dormitory-type of confinement cell is self-defeating because it is here that prison criminal gangs operate from. This must be eliminated in new prisons.
3. Television viewing areas in American prisons are fraught with danger. It is here that prison bullies get in their most depraved actions.
4. Prison mess halls should be abandoned and replaced with a conveyor feeding system to each cell. This is where prison gangs dominate both the inmates and prison personnel.

These are all suggestions that will prevent prison inmates from sinking into a bottomless quagmire of suffering. There is no reason for this condition to be built into new prisons.

If one has never experienced confinement, how can one know what confinement is really like? In this respect, the use of ex-offenders is recommended in helping to plan new prisons.

Although my real name is known to the editor of this magazine, I am signing my letter with a pseudonym. *Von Heselton*

A Student Speaks: Upon receiving my initial copy of the AIA JOURNAL, I was pleased to see the interest that the magazine takes in architectural students and their relationship to the profession. I am on the verge of graduation from the University of Cincinnati, and I found the articles in the November issue most reflective of the present educational scene.

The dollar discount offered to students on the regular subscription rate indicates to me that there is further concern for the student situation. *Bruce C. Anderson*
Cincinnati

EVENTS

Jan. 25-26: Planning for the Past Conference, University of California, Berkeley, Calif.

Jan. 31: Challenge of Professional Practice Workshop, Portland, Ore. (Feb. 1: Los Angeles; Feb. 15: Washington, D.C.; Mar. 29: Honolulu; Apr. 19: Memphis.) Contact: National Society of Professional Engineers, 2029 K St. N.W., Washington, D.C. 20006.

Feb. 1: Entries postmarked: Homes for Better Living Awards Program. Contact: Maria Murray, AIA Headquarters, 1735 New York Ave. N.W., Washington, D.C. 20006.

Feb. 4-7: International Air-Conditioning, Heating, Refrigerating Exposition, Convention Center, Los Angeles.

Feb. 8-9: AIA Development Team Conference, Marriott Hotel, New Orleans.

Feb. 20-21: National Conference on Standards for Environmental Improvement, Marriott Twin Bridges Motel, Washington, D.C.

Feb. 21-23: South Carolina Chapter AIA Winter Meeting, Landmark Inn, Myrtle Beach, S.C.

Mar. 13-15: Michigan Society of Architects Annual Convention, Saginaw, Mich.

Mar. 19-20: Design of Parking Ramps Institute, University of Wisconsin-Madison, Madison, Wis.

Mar. 21-22: Integrated Environment in Building Design Conference, University of Nottingham, Nottingham, England.

Mar. 27-29: Building Early America Symposium, Carpenters' Company of the City and County of Philadelphia, Philadelphia.

Apr. 3-8: Society of Architectural Historians Annual Meeting, Marriott Hotel, New Orleans.

Apr. 7-10: Construction Industry National Conference, Washington Hilton Hotel, Washington, D.C.

Apr. 23-25: National Interfaith Conference on Religion and Architecture, Stouffer Inn, Cincinnati.

May 3-8: National Council of Architectural Registration Boards International Conference, Aalborg, Denmark.

May 5-15: International Union of Architects Seminar on Permanent Education of Architects, Belgrade, Yugoslavia.

May 8: Pan American Federation of Architects Regional Conference, Montevideo, Uruguay.

May 8-10: International Symposium on Plastics in Building, Rotterdam, Holland.

May 19-23: AIA National Convention and Exposition, Sheraton Park & Motor Inn, Washington, D.C. (Reconvened session, May 27-30, Madrid.)

May 26-June 1: Congress of the International Federation of Prestressed Concrete, New York Hilton and Waldorf-Astoria Hotels, New York City. □

What if you had to submit competitive bids for federal work?

It could happen if proposals now being considered in the U.S. Congress are passed.

You owe it to yourself and your practice to know about these proposals and about other legislation that affects you—on building standards, energy conservation, or pension reform, for example.

The Architects-Engineers Public Affairs Conference helps keep you informed because the lawmakers and public officials most involved discuss the issues directly with you.

And the conference gives you the chance to make your views known directly to your Congressmen—in personal visits to Capitol Hill, at a reception which is a traditional highlight of the conference.

Brochures about the conference are being sent to you; sign up immediately to stay abreast of fast-moving federal legislation.

ARCHITECTS-ENGINEERS PUBLIC AFFAIRS CONFERENCE MARCH 18 -19, WASHINGTON, D.C.

GOING ON

going on from page 15

Philadelphia. He has been active in the Special Libraries Association and is a frequent contributor to local history publications. He has a keen and inquiring interest in railroads and has traveled extensively on every train that's going where he also wants to go.

The Institute's new librarian is Susan Cosgrove, who came to the AIA as assistant librarian in January 1973. She holds a BFA degree from Newcomb College, New Orleans, a MA in art history from Tulane University and a MS in library science from Simmons College's School of Library Science.

Owens-Corning Spurs Conservation Of Energy Through Awards Program

The success or failure of the nation's efforts to conserve energy "may ultimately rest upon the shoulders of our architects, engineers and building owners," according to William W. Boeschenstein, president and chief executive officer of Owens-Corning Fiberglas Corp. His firm, in order to stimulate architects and engineers to come up with new concepts to save power resources and to lessen environmental pollution, in 1972 initiated an energy conservation awards program. This, by the way, won an award for Owens-Corning itself from *Esquire* in that magazine's first annual Corporate Social Responsibility Advertising awards program.

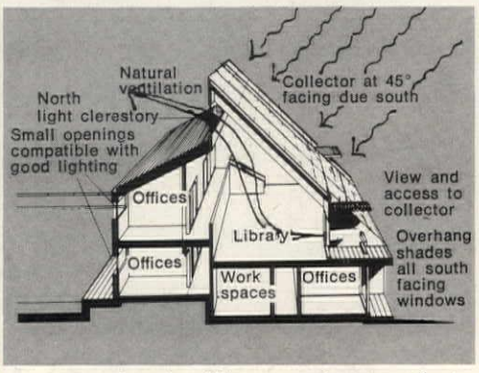
The jury of Owens-Corning's second annual Energy Conservation Awards concluded that the first effort of any designer who is seriously concerned with energy conservation should be to investigate whether his project needs an artificial environment, or at least if it may be only partially relied upon. Some considerations jury members listed for future projects: building orientation and window-to-wall ratio; task lighting instead of uniform lighting; heat recovery equipment; dual-level lighting systems with central control for cleaning functions; automatic occupancy sensors; lower makeup air quantities through use of charcoal filters; use of berming; wider use of solar energy.

Awards were given in three categories:

Commercial. Top honor: Weyerhaeuser World Headquarters Building, Tacoma, Wash., by the San Francisco office of Skidmore Owings & Merrill, for energy conserving features which result in an average energy cost 39 percent lower than the nine other new buildings in the area. Honorable mention: Massachusetts Audubon Society's office facility, Lincoln, Mass., by Cambridge Seven Associates, Inc., and Arthur D. Little, Inc., for its solar heating and cooling system.

Industrial. Top honor: General Electric Company's Lynn Utilities Operation, Lynn, Mass., by GE's construction and engineering section at Lynn, for its combined-cycle generation system which provides an annual saving of $240,000 and 2 million gallons of fuel over the previous system. Honorable mention: Thomas Glass Factory, Amberg, Germany, by The Architects Collaborative Inc., for its natural and scientific way of solving the ventilation problem created by the intense heat of liquid glass.

Institutional. Top honor: Boca Raton Community Hospital, Boca Raton, Fla., by Smith, Korach, Hayet, Haynie Partnership (second-time winners), for its use of Unitized Air Conditioning Modules which save $24,000 a year in heating and electricity costs. Honorable mention: Oregon State Board of Higher Education's tennis and handball facilities, Eugene, Ore., by Unthank, Seder, Poticha, for its use of direct sunlight for heating and light, and natural ventilation for cooling.



Cutaway drawing illustrates features that earned Audubon Society project an award.

Jury members were Professor Gifford Albright, Department of Architectural Engineering, Pennsylvania State University; Ronald E. Aspgren, AIA, chief corporate architect, Montgomery Ward; Robert B. Hollister, vice president and general manager, Turner Construction Co.; Frank M. Lebman, president, Synergo Co.; Walter A. Meisen, AIA, assistant commissioner for Construction Management, Public Buildings Service, General Services Administration; Jack Vincent, mechanical project engineer, VTN Consolidated; and James E. Wheeler, AIA, of Wheeler & Stefoniak, Inc.

Research Shows Only 14 Percent Changes In Building Products Specifications

A recent research study by Sweet's Division of McGraw-Hill Information Systems Co., indicates that when architects specify building products, the great majority of these products end up in the completed construction projects. "Building product manufacturers cannot assume that the contractor or someone else will break a spec to accept their products," says Richard C. Crabtree, vice president of marketing for Sweet's.

Researchers from the marketing consultant firm of Smith, Stanley & Co., of New York City found that the substitution rate is only 13.7 percent. They covered specified brand products in 169 projects totaling $175 million in construction value and representing 32 types of structures in 37 states. They checked 6,594 specifications mentioning 13,952 brands. Only 906 product substitutions occurred. Among the specs, 41 percent singled out one brand, 26 percent mentioned more than one product and 33 percent allowed products equal to those identified by name.

The study shows that a lower price was the leading reason for substitution. Other reasons involved availability, past experience with a preferred product, the preference of the installer, matters of esthetics, the desire of the owner or tenant or a combination of these reasons.

The research indicates that the contractor makes 47 percent of the substitutions, the architect 22 percent, the subcontractor 7 percent, the engineer 6 percent and the owner 5 percent. Those questioned could not recall the title of the responsible person in 13 percent of the substitutions.

The researchers found that even when the architect does not make the substitution, he usually reviews the action and approves changes. This was true in 70 percent of the substitutions.

The most frequently substituted products were for conveying systems, with 29 percent of those installed representing changes from the original specifications. The least frequently substituted products involved site work, 3 percent; masonry, 4 percent; concrete, 9 percent; furnishings, and woods and plastics, 10 percent each; and thermal and moisture protection, 11 percent.

Crabtree summarizes that the study shows that "over four out of five specs stick." He says that there has been increasing confusion and doubt over the last several years about their role, but "there should no longer be any doubt about the importance of specs."

Official Says That Mass-Produced Energy Systems Are Within Reach

"We believe that there exists today the technology, research and manufacturing capability to make solar energy systems an integral part of the overall fuel resources of this country," said John P. Bologna, director of new products development of PPG Industries' Glass Division, in recent testimony before the House of Representatives' Subcommittee on Energy. He testified that mass-produced solar energy systems to heat, cool and generate electricity for homes and other buildings could be available within five years with federal assistance.

Bologna declared that a crash program

could produce results even sooner but that solar energy development requires federal funding as did aerospace research. He said that his firm is currently involved as a consultant or subcontractor in a number of solar energy studies and projects for solar-powered buildings. A proposed home, now in the design stage, features sloping glass roofs covering a solar energy collection device.

Proposed legislation (H.R. 10952) would establish a federal program to demonstrate the practicality of using solar energy systems to heat and cool structures. The bill calls for installation of 4,000 mass-produced solar energy units in residential dwellings within the next five years and provides for a five-year demonstration program of solar heating and cooling of commercial and industrial buildings. Bologna declared that PPG's position represents that of many other companies which could supply components for solar energy systems.

Reconvened AIA Convention in Madrid; Tour of Other Cities Is Planned

Members and their families who attend the 106th annual convention of the AIA in Washington, D.C., on May 19-24 may want to travel on to Madrid for a reconvened session on May 27-30. There will be a stopover in Lisbon before going to Madrid where highlights will include meetings with Spanish architects and visits to projects.

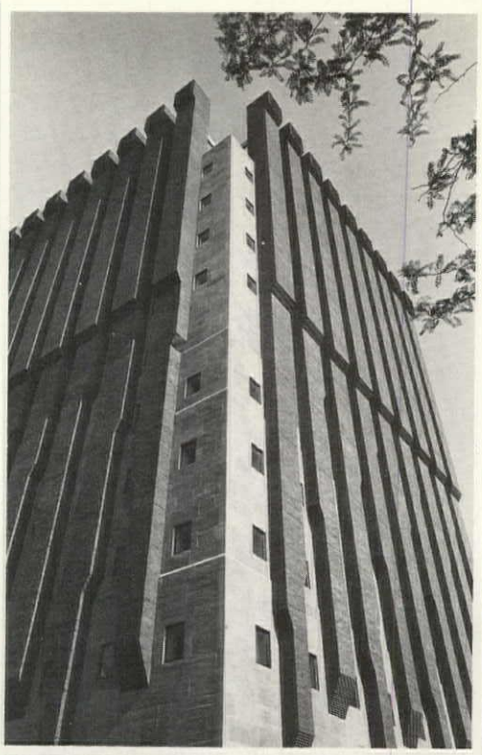
After Madrid, travelers will go on to Athens to see its treasures and to enjoy a one-day islands cruise. Then they will go to Dubrovnik, Yugoslavia, to tour that famed walled city and to the unparalleled city of Rome. The tour will end on June 8. The cost is $1,372 per person based on double occupancy of rooms. Brochures about the tour will be ready this month.

Chimneys Add Gothic Element to Campus, Function as Exhaust Towers for Labs

There are 40 chimneys on the recently constructed Cummings Life Science Center at the University of Chicago. The chimneys jut from a first or second floor base and increase in size along the exterior to well above the building.

The $12 million structure, designed by I. W. Colburn & Associates, Inc., and Schmidt, Garden & Erickson, provides laboratories for the study of molecular biology. The chimneys serve as exhaust towers. Each lab is equipped with one fume hood which continuously exhausts air from the room. The layout is on a module which makes for flexibility and allows a fume hood connection every 10 feet. There is an average of 20 fume hoods per floor.

I. W. Colburn, AIA, explains that the building is "purely utilitarian with its elements broken into the texture, light and shadow patterns of Gothic buildings."



Forty chimneys serve as exhaust towers on the University of Chicago's Life Science Center. Sculpture adorning the front entrance is by Antoine Poncet.

Since the edifice is one of the tallest on the campus, there was a great concern for its profile against the sky, Colburn remarks. Thus, he continues, it is a broken profile related in scale to the Gothic turrets of the university's old quadrangle.

The main entrance to the center is adorned by a 9-foot sculpture called "Aileronde," the work of Antoine Poncet. It rests on a raised platform to the right of a large stone and brick tiered porch. A similar entrance on the north has a 5-ton bronze sculpture approximately 12 feet in diameter. It is titled "Grande Disco" and is by Arnaldo Pomodoro.

Methods of Professional Compensation Viewed in New York State Publication

The New York State Council on Architecture, the New York State Association of Architects and the New York State Consulting Engineers Council have just published a booklet titled *Cost Base Compensation Guidelines for Architectural and Engineering Services*. The publication is the result of discussions initiated in 1970 to provide guidance to state agencies on securing professional services by means other than the percentage or fixed fee methods of professional compensation. The aim is to protect the architect from responsibility for costs arising from delays in construction which are beyond his control.

As a result, the publication is designed to establish a uniform basis for the development of cost-plus-fixed-fee contracts and gives methods of converting these contracts into multiplier agreements. It provides a checklist of job responsibilities, a summary of cost estimates and a record to compare projected and actual costs. The New York State Council on Architecture is of the opinion that the guidelines constitute a "significant step toward the improvement of methods of compensation for professional services." Additional information may be obtained from the council, 810 Seventh Ave., New York, N.Y. 10019.

Major Architectural Traveling Display Is Available from the AIA's Octagon

The Octagon House in Washington, D.C., owned by the AIA Foundation, will house permanently a major display from the Historic American Buildings Survey. Titled "Preservation Through Documentation," the exhibit was assembled in 1968 by the Library of Congress with the cooperation of HABS.

Over the past 40 years, HABS has preserved details of thousands of buildings in this country through photographs, measured drawings and written documentation. The exhibit contains some of the most representative and finest of the records.

The exhibit, which will be made available to the public on a traveling basis, contains a sweeping view of buildings and their interiors in the US, Puerto Rico and the Virgin Islands. Numerous mat enlargements show the architectural history from pre-colonial Indian sites to the work of modern architects and engineers.

HABS was established in 1933 and is administered by a staff under the office of Archaeology and Historic Preservation in the National Park Service. The AIA has assisted HABS in an advisory capacity since the program's inception.

Information about the exhibit may be obtained from the Octagon, 1799 New York Ave. N.W., Washington, D.C. 20006.

Caption of PCI Winners Is Clarified
Among the 17 premiated entries in the 1973 Prestressed Concrete Institute awards program were Operation Breakthrough, Macon, Ga., by Keyes, Lethbridge & Condon, architects, and Sulton & Campbell, associated architects; and the Law Building, Greeley, Colo., by

PCI winners Operation Breakthrough (top) and the Law Building (bottom).

Larry E. Steel, AIA. The former project was erroneously labeled as the latter in the November AIA JOURNAL (p. 55).

Body-Heated Underground Structure May Be Answer to the Energy Crisis
The occupants of at least one federal building were unconcerned regarding their personal comfort when President Nixon recently called upon the nation to lower thermostats to 68 degrees. Located on 50 acres of land in Maynard, Mass., the two-story underground structure is headquarters for Region 1, Defense Civil Preparedness Agency. There are about 57 permanent occupants augmented by staffs of 22 federal agencies with emergency functions and civilian executive and military reservists amounting to about 317 people.

The 33,600-square-foot center is so well insulated that the body heat of the occupants is sufficient to maintain a year-round temperature of 70 degrees. Additional heat can be obtained by routing circulating air over light tubes in the ceilings. Interior temperatures can be cooled by intake of outside air passed over finned water pipes that carry cool well water or by reducing the number of lights turned on.

A humidity index of about 44 percent is maintained in nonwinter months by normal body aspiration. During dry winter days, a fine mist of water is sprayed in the path of incoming outside air and is automatically regulated.

The structure, built at a cost of about $1.4 million and occupied in 1968, was the first of its kind in the nation. Architects/engineers were Praeger, Kavanagh & Waterbury and Metcalf & Eddy. The personnel at the center expect to get many inquiries now from industries, state agencies and municipalities who want to save energy.

Connecticut City Given Work of Art To Beautify Mall on Main Street
A major work by the sculptor Alexander Calder now adorns the Burr Mall on Main Street in Hartford, Conn. The work of art is painted a brilliant red and stands 50 feet high on its five legs to dominate the tree-lined plaza.

The 40-ton sculpture of heavy steel plate is called "Stegosaurus" for the dinosaur that once roamed Wyoming and Colorado about 150 million years ago. It is a gift to the city, having been commissioned by the Burr McManus Fund.

Temporary Home on Hospital Grounds Helps Families Manage the Handicapped
People who have to cope with a long-term handicap or disability are being helped by

House is a classroom for families and interns from physical therapy program.

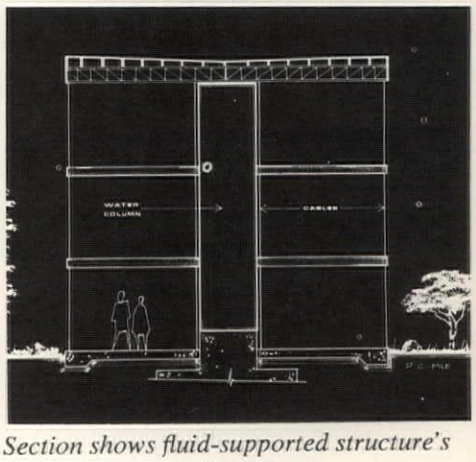
the Stanford, Calif., University Hospital. A small fully furnished house located on the hospital grounds is used as a temporary residence where the patient's family is trained to perform nursing and physical therapy tasks. Interns in the Division of Physical Therapy at Stanford Medical School teach the family to perform such tasks as getting the patient into a wheelchair, turning him in bed and bathing him.

Prior to his discharge from the hospital, the patient and his family move into the house for a transitional period of two to five days. The program, called "Family Focus," is said to be the only one of its kind in the country. To date, more than 27 families have used the house. A large number of the patients are elderly persons, some suffering from cancer and others learning to walk after total hip replacements. But the program has included also a four-month-old baby with a damaged respiratory system.

The house consists of a living room, family room with dining area, kitchen, bedroom, bath and a second bedroom which is used by first-year interns to observe treatment and training sessions, with a family's permission. Within a three-month period after the patient is discharged, three follow-up visits are made to the patient's home by an intern and his instructor.

The program also includes psychologists who provide consultation in helping patients and families adjust to the handicap. The program indicates that stays in institutions can be shortened. "In some instances," says program coordinator Kay Shepard, "physicians referred cases here to demonstrate to family members that they could not handle the patient and shouldn't take him home. But in each instance, the families proved much more capable than expected."

Experimental House on College Campus Uses Unusual Construction Techniques
An unconventional hydraulic house is being built on the campus of California Polytechnic State University, San Luis Obispo. The experimental multistory structure will use a central water column for support and will have a thin continuous plastic skin. Apart from its plastic enclosure, the building will be fabricated



Section shows fluid-supported structure's two main means of support.

of steel, plastic and wood components. The central column, made from 1/16-inch-thick sheet metal and sealed at both ends, will be supported on a reinforced concrete pedestal and footing. The column will be filled with water and pressurized to an internal pressure of 30 pounds per square inch.

The structure is the brain child of Dr.

Jens Pohl, a member of the faculty of the School of Architecture and Environmental Design. He says that hydraulic building is important to the future of the construction industry because "with the energy crisis and the population explosion, we will not be able to use concrete as much as we do now. It takes too long and uses too much material."

The hydraulic house will join other experimental structures on the campus such as a freeform concrete "mushroom" house, a glass and steel "bridge" house and a post-stressed concrete sundial. George Hasslein, FAIA, dean of the school, says that through the projects developed in the 15-acre canyon on the campus "students learn to work together, to contact sources of construction materials and to explain, defend and sometimes modify their projects."

Scheduled for completion late this year, the hydraulic structure requires unusual construction techniques, but existing building codes are met.

Recording for Loan to AIA Chapters

A recording of the haunting music produced by Harry Bertoia's "Sounding Sculptures" is available to AIA chapters for loan on a first-come, first-served basis. The Institute has received a limited number of copies of the recording through the courtesy of the sculptor and Don Hatch, AIA, of San Francisco. Called "Sonambient," the recording is of the strangely melodic sounds given off by the rectangular formations of slender metal rods. For further information, write Kathy Kalt, AIA Library, Audio-Visual Department, 1735 New York Ave. N.W., Washington, D.C. 20006.

National Trust Makes Major New Policy; Acts to Save Urban Commercial Building

The National Trust for Historic Preservation, headquartered in the nation's capital, has taken an option to buy the Wainwright Building in St. Louis. During the period of the option, ways will be sought to rehabilitate the structure and to put it to contemporary use.

This is the first time that the preservation organization has been involved in saving a major urban commercial structure and finding an economically suitable use for it, although it has been active in saving other historic structures, sites and districts.

This major new policy development is directed toward the celebration of the organization's 25th anniversary this year. An extensive study on the renovation of the Wainwright Building, prepared by a task force of the St. Louis Chapter AIA, was a key influence in the action.

Designed by Louis Sullivan in 1890-92, the St. Louis landmark set the pattern for modern highrise office buildings. James Biddle, president of the Trust, calls the structure the "first true architectural expression of the steel frame skyscraper."

Biddle comments, "Obviously, you can't turn a large office building into a museum, and that's the last thing that we want to do. We want to see it revitalized . . . and returned to what it was meant to be: a thriving office building and an ornament to downtown St. Louis. The success of this effort will contribute significantly to the renaissance of the area, which is one of the goals of historic preservation."

Trust's president calls the Wainwright "a great American architectural statement."

Retired Partner of Manhattan Firm, Leader in Urban Planning Circles

Perry Coke Smith, FAIA, was a major influence in the adoption of New York City's 1961 zoning resolution, his firm having been appointed consultant to the city in the development of the code in 1958. He retired in 1968 as senior partner of Smith, Haines, Lundberg & Waechler, an architectural firm in Manhattan which was established in 1855 by Cyrus L. W. Eidlitz.

He died in Sarasota, Fla., on November 10 at the age of 74. Smith was active in the area of urban planning, having been former director and member of the executive committee of New York City's Regional Plan Association from 1960 to 1968. He also was a member and chairman of the AIA Urban Planning and Housing Committee in 1949-50 and president of the New York Chapter AIA in 1945-47.

He received his architectural education at Columbia University, having previously attended Newberry College in South Carolina and the University of Wisconsin. He served in World War I with the First Gas Regiment, 30th Engineers, American Expeditionary Force and won the Croix de Guerre with Star.

Among the many buildings that he designed are the home office of the Irving Trust Co., and the Bank of New York building in New York City; the Mudd Engineering Building, Columbia University; the home office of Proctor & Gamble, Cincinnati; the DuPont Experimental Station Expansion, Wilmington, Del.; and the Atomic Energy Commission Headquarters, Germantown, Md.

Smith served as governor of the New York State Building Congress, as chairman of the Advisory Council of the School of Architecture at Princeton University and as a member of the Advisory Council of the School of Engineering at Columbia University.

One of Three Generations of Architects; Chicago Associate of Frank Lloyd Wright

There have been three generations of architects in the family of John Graveley, AIA. He worked with his father, Frank J. Graveley, FAIA, on many structures in New Orleans. In 1938 he opened his own office in Jacksonville, Fla., and in 1956 his son, John Richard Graveley, AIA, joined him in the formation of the Jacksonville architectural firm of Graveley & Graveley.

John Graveley, who died on November 4 at the age of 89, left his native city of New Orleans in 1907 and did not return until 1926 when he assisted Emil Weil with the design and construction of the Canal Bank Building, then the largest office building south of the Mason-Dixon line.

While away, Graveley worked with a number of architects. He designed the structural engineering and made most of the drawings of Frank Lloyd Wright's Midway Gardens in Chicago. He also was in the employ of Smith, Hinchman & Grylls and worked on the structural design of the Penobscot and Union Trust Buildings in Detroit.

After his office was established in Jacksonville, Graveley designed many types of buildings such as schools, banks, churches, offices and other commercial structures.

Deaths

LAWRENCE E. BEYER, Jamestown, N.Y.
RICHARD E. BISHOP, Indianapolis
HERMAN BROOKMAN, FAIA, Larkspur, Calif.
EARL F. CLELAND, Columbus, Ohio
JOHN E. DYE, Winter Park, Fla.
MURRAY EPSTEIN, Silver Spring, Md.
BAYARD K. GIBSON, Chicago
CHARLES R. HAAS, Coopersburg, Pa.
CHARLES B. MARSHALL, Houston
ROBERT A. METZ, Essex Junction, Vt.
FON J. MONTGOMERY, Silver Spring, Md.
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C. J. VAHLBERG, Oklahoma City
EDMUND JAY WHITING, Rome
PAUL P. WIANT, Cincinnati

Newslines

The International Lead Zinc Research Organization, spokesman for 27 of the world's largest mining companies, has awarded a $50,000 contract for the fourth consecutive year to the Rhode Island School of Design. The contract is to complete a demonstration building now being constructed in Foster, R.I., by RISD faculty and students which develops an industrialized housing system capable of worldwide use. ILZRO also made a $2,500 grant to the school for its educational program in modern industrial materials and processes.

Kurt W. Meyer, FAIA, who heads his own firm in Los Angeles, has been appointed to the Community Redevelopment Agency of the City of Los Angeles. He is the only architect in the agency.

The American Concrete Institute will send its latest catalog publications at no charge to those who request it. The ACI also is taking subscriptions at $70 per year for a bimonthly publication called *Concrete Abstracts*. Write to ACI, P.O. Box 19150, Detroit, Mich. 48219.

Shortages of building materials are "increasing at an alarming rate," creating a problem which has "international implications," states the Material Shortages Committee of the Associated General Contractors of America. The committee urges all contractors to write their Congressmen about the critical nature of the problem and urges AGC chapters to establish liaison committees with suppliers to identify and report on local shortages.

Ben Graves, Hon. AIA, project director of Educational Facilities Laboratories, Inc., has been elected president of the Council of Educational Facility Planners, International.

A new brochure, "Single Glazed Reflective Glass," is now available free from PPG Industries, 10 North, 1 Gateway Center, Pittsburgh, Pa. 15222. The booklet contains product descriptions, recommendations and maintenance, cutting and glazing procedures for reflective glasses.

James V. Rice of the Pease Co., Hamilton, Ohio, has been elected president of the Producers' Council Inc.

The American Institute of Steel Construction recently presented its Special Citation to William J. LeMessurier, president of LeMessurier Associates/SCI, a consulting engineering firm headquartered in Cambridge, Mass. LeMessurier is one of the originators of the staggered truss system for steel framed buildings. He was praised for "his innovative and superbly qualified work as a structural engineer" and for his "new methods and improved economy of steel framed construction on a national level."

Austin Mather, FAIA, a partner in the architectural firm of Lyons & Mather, Bridgeport, Conn., has been awarded the Alumni Medal, the highest honor given by Pratt Institute's Alumni Society.

Useful information for design evaluation and planning of fire-resistive steel structures is contained in a 60-page publication titled "Fire-Resistant Steel-Frame Construction." It may be obtained without charge from the American Iron and Steel Institute, Engineering Division, 150 E. 42 St., New York, N.Y. 10017.

The American Society for Testing and Materials recently issued its *1973-1974 List of ASTM Publications*. The book is revised annually, and the current issue lists more than 600 publications. A single copy, requested on company letterhead, will be sent free of charge. Write ASTM, 1916 Race St., Philadelphia, Pa. 19103.

Information on Indiana limestone is presented in "Indiana Limestone Handbook," distributed by the Indiana Limestone Institute of America, Inc., Stone City National Bank Building, Bedford, Ind. 47421. The institute will send a free copy to those who request it. □

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