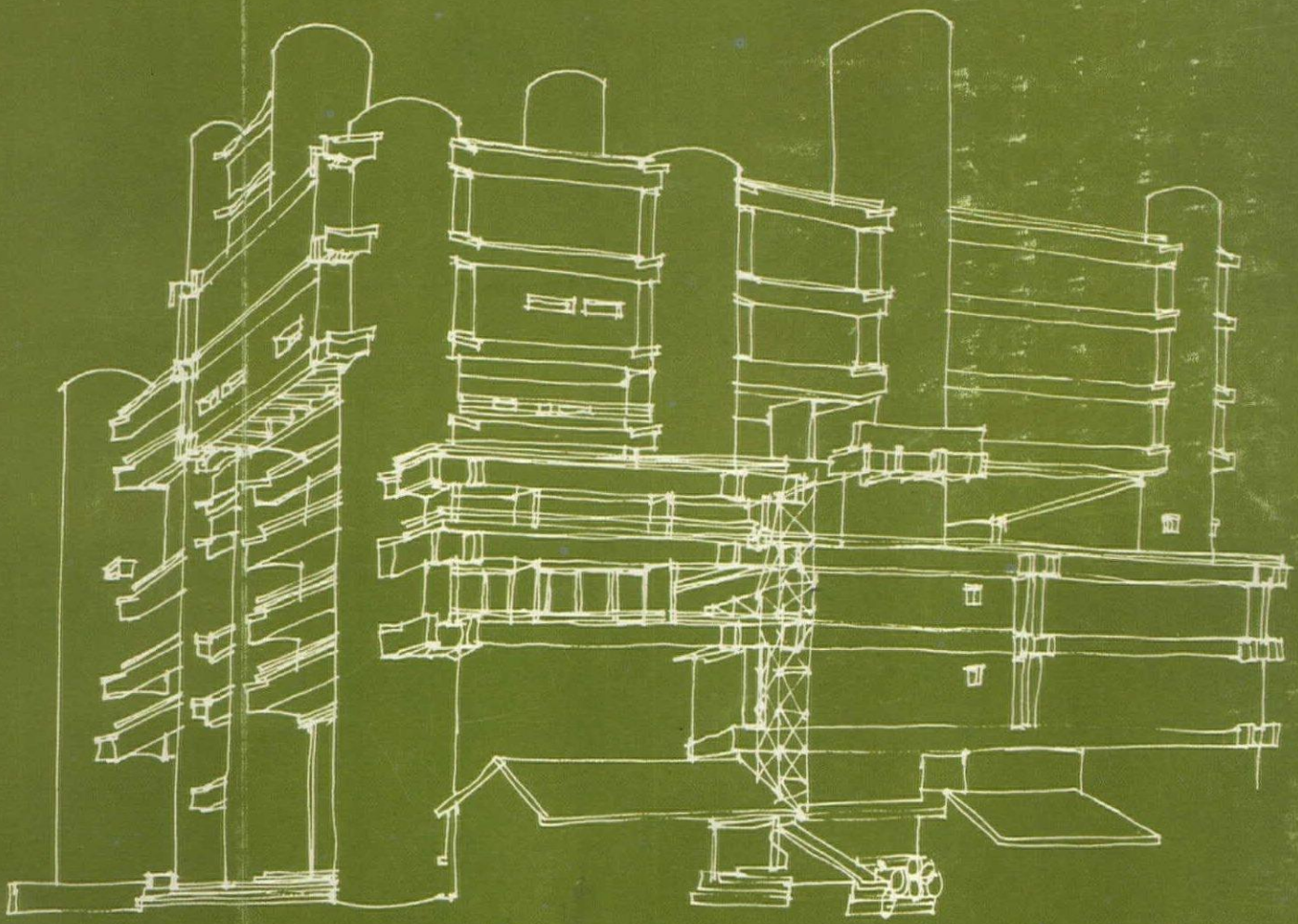
AIA JOURNAL

OCTOBER 1967



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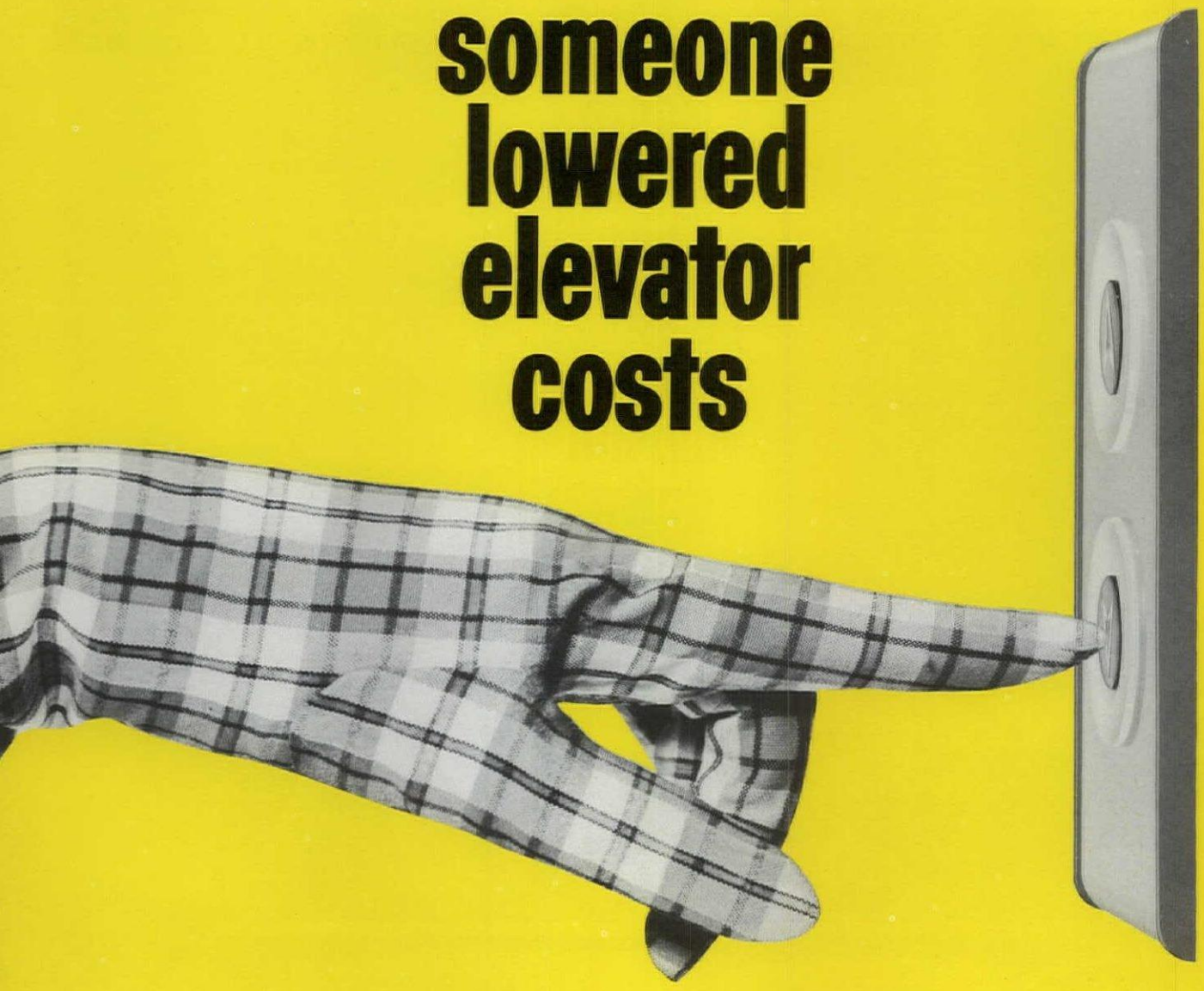

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Comment & Opinion

A Fond Farewell: I did not have the pleasure of knowing Henry Hodgman Saylor very long nor very well, and yet I am convinced that he would prefer that any tribute paid to him—he would, of course, argue that such a gesture is sheer nonsense in the first place—should appear in the editor's column.

For Mr. Saylor, as undoubtedly a good many of our readers are aware, was the initial editor of the AIA JOURNAL (then known as the *Journal of The American Institute of Architects* in a pocket-size format), serving in that post from 1944 to 1957.

So Well Remembered: Despite our brief acquaintance, I vividly recall, looking out into the garden court, the figure of the kindly old man as he would stoop to inspect a bush or caress a budding flower—and how we all would delight on those days he chose to wear his cape! Mr. Saylor, who also was unofficial guardian of the Octagon House, helped in the planning of the present garden and for many years devoted much of his leisure time to its upkeep and beautification.

In addition, he was deeply involved in researching and writing about the history of the Institute, the Octagon in particular.

Today, however, we remember Mr. Saylor not as an editor, a gardener nor a historian but as a gentleman, and so I have turned to one of his contemporaries, Edwin Bateman Morris, FAIA, to make a few personal observations.

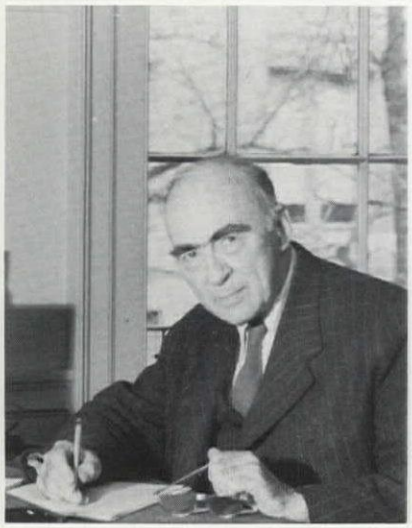
A Great Roman: "Upon the occasion of Mr. Saylor's passing in August, at the age of 87, someone said emotionally, 'There departs from us a great Roman.' That was a sweet, pleasant thought, a garland for his brow. But it was more than he would have liked said about him.

"He strove for perfection in the

achievement of the goals that his soul desired. He was a writer, a smoother-outer of writings and an artist in the loveliness of the printed page.

"His lifelong was spent in expressing in type his own fine thoughts and those of others, always imprinting them upon the page with beauty and care.

"His friends enjoyed and profited by his learning and his exacting knowledge, perhaps admiring him most for his courage. His bravest time may have come when, sitting easily as the successful editor of what could properly be described as the most distinguished magazine in his field, *Architecture*, suddenly the tor-



nado of the Depression swept over all business and in a night destroyed the publication.

"In an hour he was thrown out, completely depleted of high seat and wonderful livelihood. Perfectly destitute, he laughed, telling his friends and contributors of the tragedy in calm, lighthearted words. I was writing a column for *Architecture* at the time called the 'Reflecting Pool,' and he informed me that it had just become a 'Mud Puddle.'

"He lived his life in happiness, approving of the world, seizing and holding contentment, perhaps actually deserving the title of great Roman among them all."

A Last Goodbye: It would be superfluous for me to try to add to the words of Mr. Morris, and so to Henry Hodgman Saylor, FAIA, a faithful member of the Institute for more than 40 years and a servant for half of those, all of us at the JOURNAL say adieu.

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Newslines

Potomac Planning Report Urges Unified Approach To Basin Development

Never in the history of the nation has there been a report of such compass and focus, said Interior Secretary Stewart Udall of the report of the AIA-assembled Potomac Planning Task Force.

The report, based on a 28-month task force study, recommends the creation of a Potomac Development Foundation as a conduit through which federal funds—a quarter billion dollars over five years—along with knowledge, experience and incentive could be "brought to bear on the development of the basin."

It urges that the basin which spreads into four states and embraces the District of Columbia be treated as a "unified, indivisible whole."

Udall, who called the Potomac River basin "a microcosm of America," was designated by President Johnson in 1965 to prepare a program that would make the Potomac "a model of scenic and recreation values for the entire country." Udall, in turn, called on the AIA to put together the study group.

The 11-member, interdisciplinary task force, headed by former Institute president Arthur Gould Odell Jr., FAIA, came up with a comprehensive concept for river valley planning and not, as Udall noted, a detailed plan.

"We endeavored," Odell said at a press conference announcing the report, "to present an ounce of creativity."

The 100-page report, entitled *The Potomac*, does, however, include principles ranging from pollution control and river basin recreation to highly urbanized waterfront and new town development.

Institute President Robert L. Durham, FAIA, urged immediate adoption of these principles.

"What is said and illustrated of the Potomac is applicable to at least 20 other major basins in America," Durham said. This wider application, Udall added, "may be one of the most important values of the report."

Indeed, Udall saw the adoption of these principles by other river basins as one of "two tests" of the report's effective significance. The other: whether governmentally fragmented river basins can reorganize themselves politically and put up the cost to "get the job done."

The foundation envisaged by the report would aid the development of high quality regional resources, acquire lands for subsequent lease or sale and make grants for research, planning and special studies.

Headed by an administrator to be appointed by the President, the foundation would be responsible for functions ranging from participation in water resource planning to sharing the review of architectural designs. The entire river basin would be its purview.

It would not, however, be a construction, operating or management agency but would provide "a unified view of the means of conservational development in the basin," the report states. It would work with existing federal agencies, the states, local governments and private organizations.

The Potomac report, basis of a general article in next month's AIA JOURNAL, is available through the Superintendent of Documents, Washington, D. C. 20402, at $5 a copy.

Madison Library Likened To Third Reich Stuff

"The design of such building . . . shall be in keeping with the prevailing architecture of the Federal buildings on Capitol Hill."

So prescribed enabling legislation for the Library of Congress' $75 million Madison Memorial Library.

The Congress-ordained AIA Madison Memorial Library Committee said in its report that this phraseology implied "a degree of literal adherence to the classicism of Capitol Hill which is unnecessary and unfortunate."

It should be possible, the report added, to design a building that is "respectful to the adjoining structures but which still has its own distinctive character; in short, a vital and imaginative architectural creation rather than a 'modernized' imitation of more vigorous precedents."

The question was: What would the associated architects finally come up with under such a restraint? The answer came with the unveiling of the library model, a presentation to which the AIA, in spite of its official consultative capacity, was neither invited nor told about.

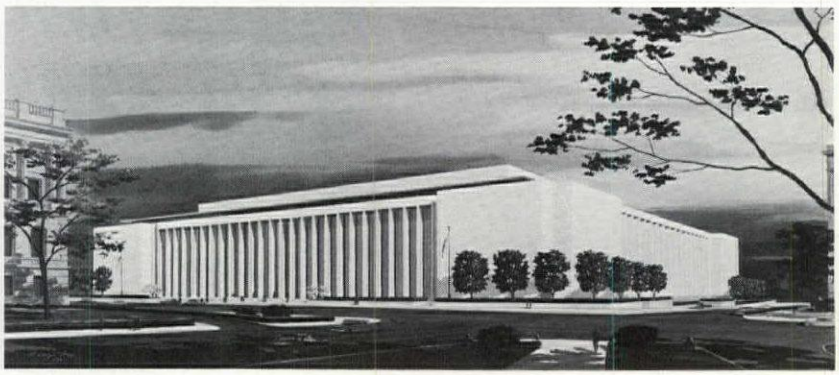
The library is to be severe, formal, symmetrical, columned, white-clad.

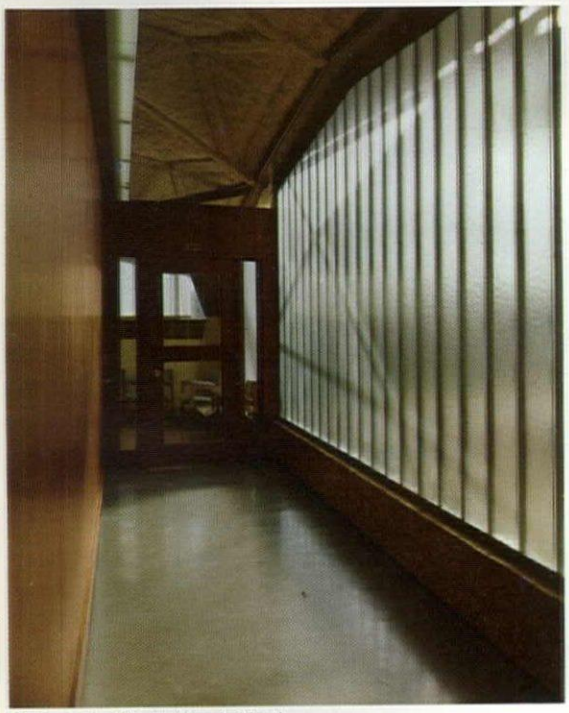
A story by the *Washington Post*'s Paul Richard, headlined "Nazi Architecture Thrives on the Hill," said: "The design of the new building has nothing in common with classical architecture nor with mid-20th century architecture nor with the older monuments of Capitol Hill. It is compatible only with the Rayburn Building and with the other pseudo-classical uglies that Architect of the Capitol J. George Stewart has been adding to Capitol Hill for the past 10 years."

The AIA committee had found deficiencies in the building venture

Continued on page 18

Model of the proposed Madison Memorial Library, a branch of the Library of Congress. An AIA committee regarded the design as "visually unsatisfying."





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Imaginative use of PROFILITE GLASS in geodesic dome complex

Five gold anodized aluminum geodesic domes comprise the new Placer County Administration Center, Auburn, Calif., in which daylighting walls of PROFILITE, translucent trough-shaped glass, contribute beauty, strength and utility (see partial installation at left).

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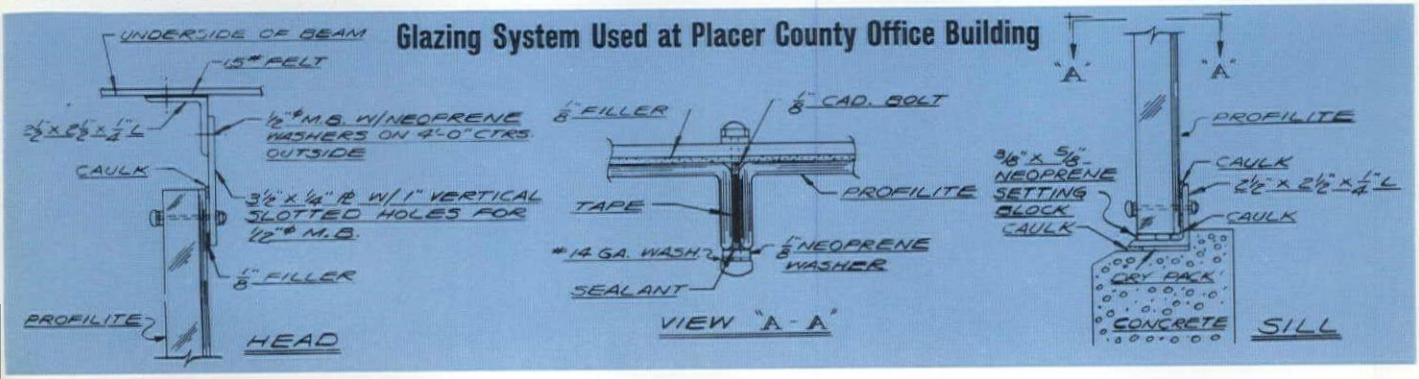
Glazing System Used at Placer County Office Building



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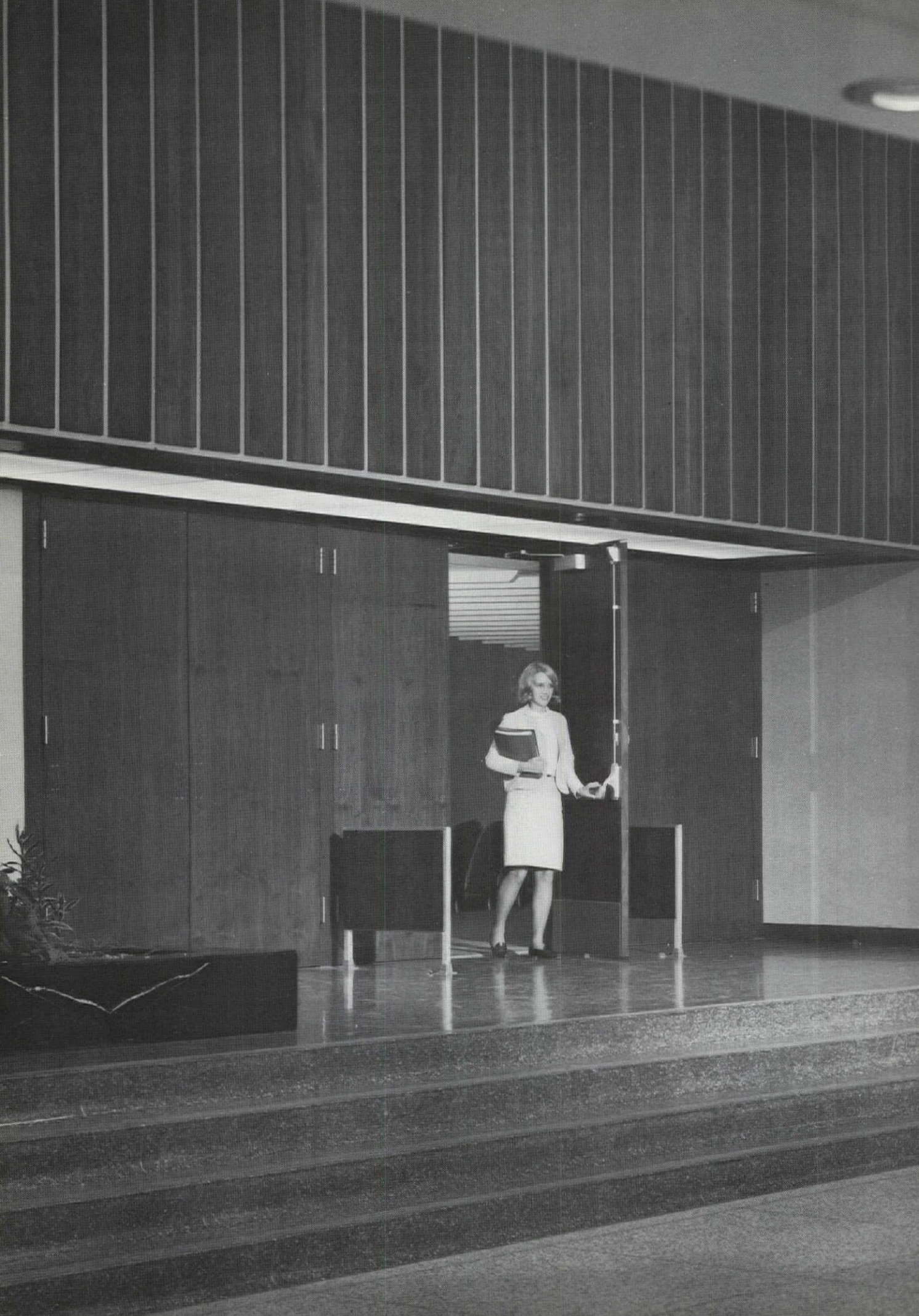

Newslines *from page 18*

Congressman Would Create National Housing Goals

The question of their impact or lack of impact aside, efforts to increase the supply of decent housing for low-income Americans were considerable in number as fall approached. What also needed tackling was the supply of housing in general.

This was the view of one Congressman at least. Decisions made by the Federal Reserve Board, the Bureau of the Budget, the Department of Treasury, the Department of Housing and Urban Development and the Federal Home Loan Bank Board can turn the volume of homebuilding "up full blast or reduce it to a mere trickle," said Rep. Richard L. Ottinger (D-N.Y.)

"But the Congress never debates those decisions until it is too late—until savings banks and saving and loan associations are teetering on the brink of insolvency, construction workers are laid off their jobs, and would-be homeowners are unable to find credit," added Ottinger.

So Ottinger introduced a joint House-Senate Resolution (HJR 757) which would require the President to submit to the House and Senate at the beginning of each year a report indicating the minimum number of housing starts needed, how Federal fiscal and monetary policies will be administered to dovetail with these goals, and what legislative recommendations the President might have to achieve them.

(Another member of Congress, Rep. Henry S. Reuss, introduced a bill to replace 10 million deteriorated housing units over the next 20 years, 500,000 per year. The bill would also widen home ownership, the Wisconsin Democrat said.)

Ottinger wants to see stability in the "vital area" of homebuilding. "Had this legislation been in effect a year ago, Congress would not have been faced with taking emergency measures to bring the homebuilding industry out of a depression," he said.

That the industry is not immune to additional setbacks was underscored by Ottinger's warning to "all those who may have been lulled into a false sense of security by the relatively easy money situation of the past few months; last year's experience may well be repeated."

The Ottinger resolution came as indexes of the nation's housing

supply showed something to be concerned about. Both home ownership and rental vacancy rates for the year's second quarter were down, the latter to 6.3 percent, lowest in eight years.

As summer wore on, however, the number of starts made a comeback and Leon N. Weiner, president of the National Association of Home Builders, said there was good reason to believe this year's production will "surpass" that of 1966 —a very bad year for homebuilding.

NCARB Executive Wood Leaves Post for Practice

Charles A. Wood Jr., AIA, made known last month that he is leaving the executive directorship of the National Council of Architectural Registration Boards.

Wood said some weeks before the Oct. 1 expiration of his term that he would not seek reappointment.

During his three-year tenure with NCARB, he said, he had "excellent cooperation with the state boards, diligent work of the staff, fine assistance from the Board of Directors and appreciation of the profession using the services of NCARB."

Wood plans to return to his Ridgefield, N. J., family home and the architectural practice he has retained there since 1934.

Defense, GSA, Take New Approach in A-E Fees; Proxmire Bill Criticized

The General Services Administration and the Department of Defense, together responsible for easily half of all Federal construction, have swung over to the detailed analysis method of negotiating contracts with architects and engineers.

Under the method the government estimates the types of services and manhour requirements for each phase of the construction project. Hourly rates are applied and allowances are made for the professional's overhead and profit in arriving at a fee estimate which is then used as the basis for negotiating with the selected architect or engineer.

But as a memorandum by Paul R. Ignatius, Assistant Secretary of Defense for installations and logistics, put it, "Fees must still be in compliance with the existing 6 percent

Continued on page 24

statutory limitation on A-E fees for the preparation of project designs, plans, drawings and specifications."

A bill to repeal the 6-percent-of-construction-cost ceiling was introduced by Sen. William Proxmire (D-Wis.), who, at the same time, spoke in advocacy of competitive bidding.

This the Joint Committee on Federal Procurement of A-E Services (made up of representatives of architect and engineer organizations) found unpalatable. The committee was "appalled," it said, "at any suggestion that professionals be secured on the basis of competitive or negotiated bids."

The General Accounting Office in a report to the Congress earlier this year said current laws require competitive negotiations, upsetting a long-standing government interpretation permitting "professional negotiations" in which a selected professional hashes out a fee agreement with the agency free from any vying on the part of another professional.

With the percentage-of-estimated-construction-cost method cast off by two important Federal agencies—and additional agencies expected to follow suit—the question of protecting the taxpayer's dollar pales somewhat.

For under the detailed analysis method both the A-E and contracting office use the same procedure in arriving at a figure for negotiating purposes. As a practical matter, the agency through this method has a fair idea of what services—and what costs—are involved.

On top of this there was the recommendation in the GAO report to Congress that all building agencies operate under something like Defense's truth-in-negotiations provision.

Should an architect give greater emphasis to an aspect of the project than did the government—to acoustics, say, providing for extensive consultative services—the disparity can be worked out with the agency during negotiation.

"The estimated costs may be adjusted during negotiations to the extent that discussion of the scope of work and analysis of the estimated costs indicate a need for revision," says a GSA directive in part.

The downgraded percentage-of-construction-cost method involves a fee curve that architects have regarded as objectionable for both its

Continued on page 26

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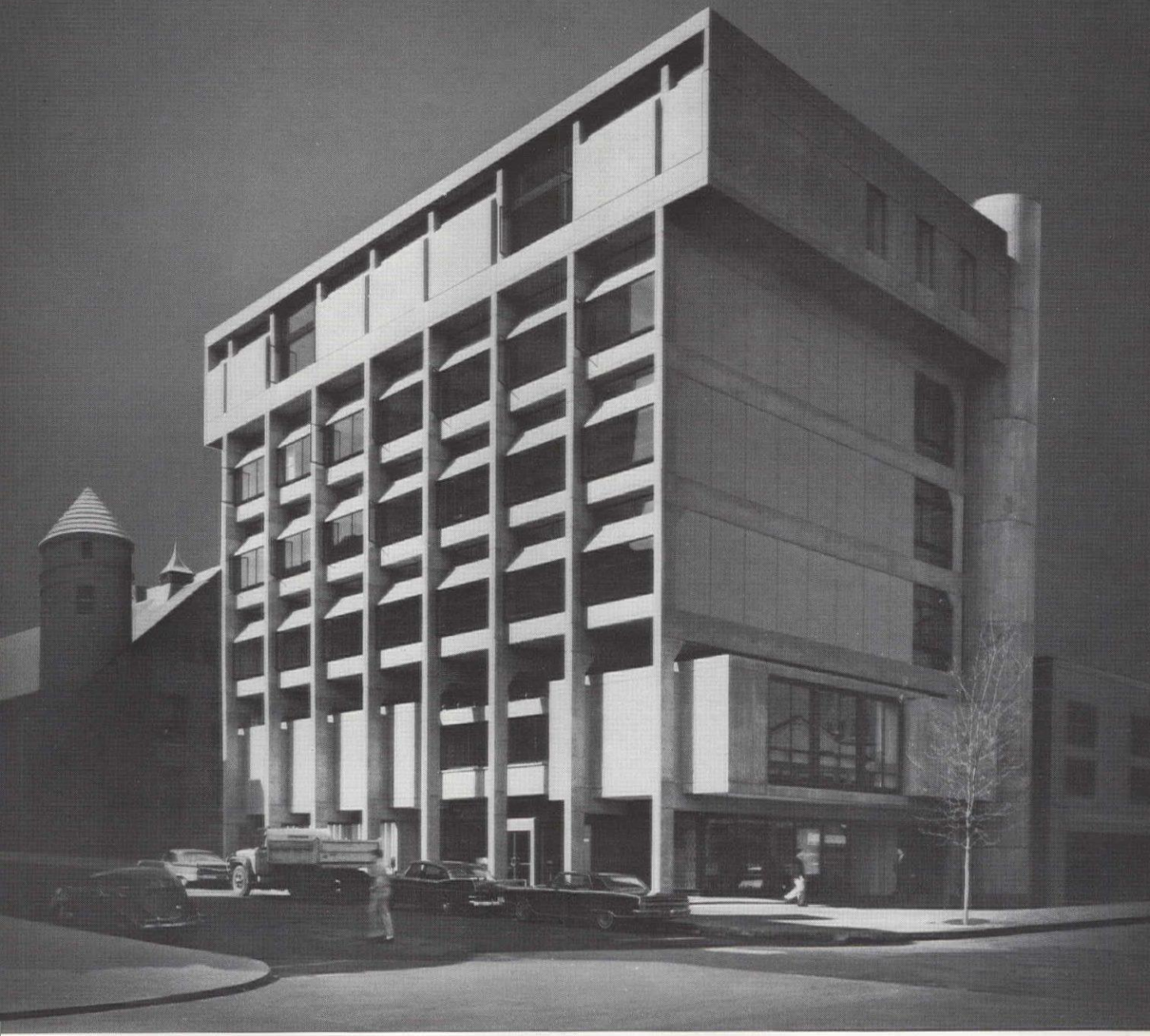

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Newslines *from page 24*

secrecy and its penalizing effect in complex projects. The curve, representing the professional fee, goes down as the estimated construction cost goes up.

Architects of projects requiring considerable professional services are remunerated under the curve on the same basis as architects of projects less complex but equal in sheer construction cost.

The fee curve, along with the fee limitation, is viewed by many as an impediment to good design and comprehensive services.

Quarter Ton of Glue Used in Big Laminated Beams

How large the laminated beam? Supporting the roof of a new physical education building at Hampton Institute in Virginia are five beams in which the glue alone weighs 500 pounds per beam.

Laminated and surfaced at the plant of Timber Structures, Inc., in Portland, Ore., the beams weigh 35,000 pounds each and measure 123 feet long, 6¼ feet deep and 16½ inches thick.

Each contains 200 board feet of lumber, more than enough to build two large houses.

Stained and wrapped, the five beams and two lesser timbers were shipped by rail. Five flatcars were needed. The building measures 125 by 168 feet and contains no interior posts.

'Plan for Better Cities' Is New Stamp's Theme

"Plan for better cities," says a new 5-cent stamp issued earlier this month. It pictures a bird's-eye view of what suggests a modern, planned American city.

The urban planning stamp was issued during the Washington conference of the 50-year-old American Institute of Planners. Theme of the meeting was "The Next Fifty Years 1967/2017, The Future Environment of a Democracy."

The stamp was designed by Francis Ferguson, instructor in the School of Architecture, Division of Urban Planning, Columbia University.

Celotex Enters Renewal With Atlanta Project

Housing the urban poor is a challenge without parallel, one being met by legislation and resources and "countless men and women giving their minds and their hearts to this fight," said the president of the Celotex Corporation.

But the "one essential element missing in all this," added Eugene R. Katz, the company president, "has been big private capital."

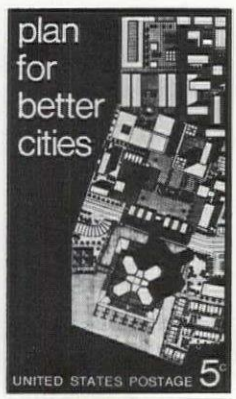
True, a few big companies have been involved, but most of their efforts have been in rehabilitation, Katz said. But what of the buildings unfit for rehabilitation?

"Despite the human problems created by neighborhood displacement, these dwellings must be torn down and the area cleared to make way for new and decent housing," Katz said.

"Urban renewal, financed under the Federal Housing Administration's 221 (d) (3) program, is one of the most effective ways to provide low- and moderate-income families good housing and yet it is precisely here that big capital, as a whole, has been notable by its absence."

Celotex, believing major private industry should become involved in urban renewal, bought 13½ acres in the University Center area of Atlanta from the city's Housing Authority. *Continued on page 31*

Planning stamp being released this month is in black and two shades of blue. Right, Celotex's low-income apartment project for 13½-acre Atlanta site.



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Newslines *from page 34*

sing, and George B. Savage, AIA, of Grand Rapids, are serving as vice president and secretary, respectively, of the Michigan Association of the Professions. Manson was elected, Savage re-elected.

London Association Offers US Architects Membership

The Architectural Association, London, says American architects are eligible for overseas membership.

Privileges of membership include the association's journal, published 10 times a year and use of club facilities in London.

Application forms are available from the Director of Programme, Architectural Association, 36 Bedford Square, London WC1. The entrance fee is $6 and the annual subscription, $7.50.

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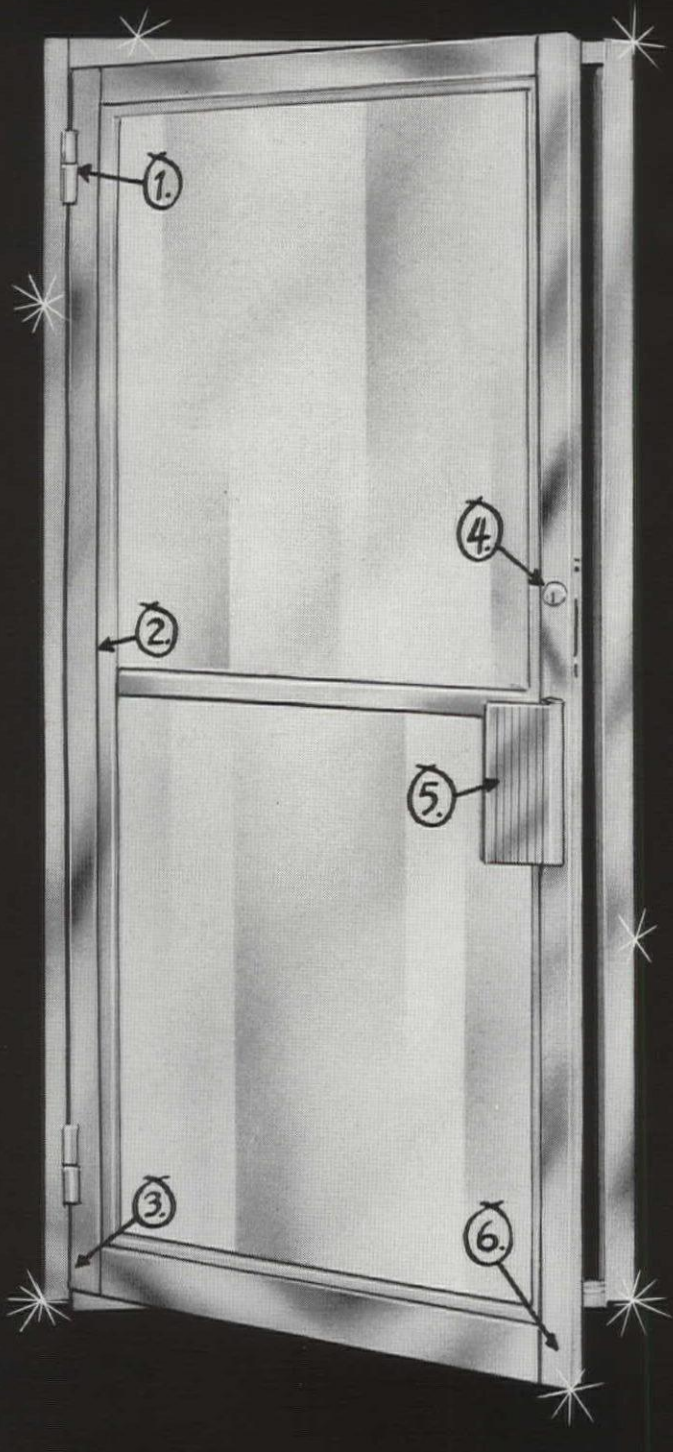

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UNFINISHED BUSINESS

BY WILLIAM H. SCHEICK, FAIA
Executive Director

The Last Time I Saw Paris

They had just closed the doors at Notre Dame. It was only 6 o'clock and quite a while till dinner so I said let's go over to my old stamping ground on the Left Bank and have a vermouth cassis at the Deux Magots.

My wife humors me on rare occasions so she said okay, but why do they call it the Left Bank?

That's an easy one I said because .... You know, I had never thought of it before but Louie the something, or maybe Francis the first must have been facing down river when he decided which was left and right.

Well, anyway, it was a nice evening for a walk though rather hot for Paris in June. All we had to do was cross the river and stroll over into the Latin Quarter till we came to Boulevard St. Germain and keep on to St. Germain des Prés and there would be the cafe.

It was almost 35 years to the day since I had been initiated into the philosophical arts of outdoor cafe-sitting at the Deux Magots. That name means "two sticks" and is really a nickname for two Chinese statues, the cafe's trademark.

Back in June 1932 I showed up there fresh from winning a scholarship which was the stylish way in those days to pick up some European culture while looking at architecture and trying to make a sketch or two good enough to be printed in *Pencil Points*. The boys who were spending time at the Ecole des Beaux-Arts, as required by their scholarships, sort of looked after newcomers by exchanging veteran advice for a bit of refreshment.

The course in philosophy at Deux Magots was *de rigueur* for all in this happy situation. If you sat there long enough, which most everybody did, you would see the likes of Carl Guenther, Caleb Hornbostel, Dick Bennett, Max Abramovitz, Len Hunter, Andy Anderson, Herschel Elarth, Harry Seckel, *et al.* in some stage of their education. To make matters better we were all refugees from the Volsted Act discovering the wonderful world of things to drink that tasted good. This must have been roughly comparable to Balboa's discovery of the Pacific. I feel sure the good Lord waited to create mankind until after He perfected fermentation.

Naturally, I had given my wife all this past history which she unerringly recognized as a buildup. I feared something had gone wrong with my memory after we had walked umpteen blocks along the boulevard with no sign of St. Germain. The French have taken to distorting their maps of Paris in a sneaky way that makes distances longer than they used to be. And they have filled that fair city with traffic that makes New York rush hour look like Sunday a.m. in Manhattan.

Suddenly, just as we were about to perish from thirst, there was the cafe filled to the curb with beatniks, hippies and psychedelics. I strode among them but no one got up. Not one sign of recognition or respect for the return of a hero from the Fitzgerald era. Bob Durham is right when he says never go back.

On a kinder day we found ourselves on one of those boats on the Seine that is actually a floating cafe and restaurant. It starts across from the tower, runs down the river a short distance, then up past the cathedral and back again.

A couple from South Africa was at the next table and naturally we were soon into conversation. He turned out to be a building quantity cost surveyor who said that we ought to have that profession in the US so architects wouldn't have trouble with bids running over the estimates. That solved world problem No. 1.

We couldn't avoid comparing apartheid with our civil rights problems and the best we could do with that was to agree that our respective homelands are in the international doghouse, even where the world's worst caste systems are still in effect.

We weren't paying much attention to the impressive scenery that Paris has been developing over the centuries. We had gone around several bends in the river and there was the Eiffel Tower again. My wife asked me if they had two of them. I never will know how her mind works so I just nodded and said they did.

In our review of mutually interesting modern subjects we came to traffic and thence to auto safety. I have a thing about auto safety that bugs me because the public wants Congress to tell the auto makers to be sure to make cars safe enough to hit an immovable object at 80 mph without hurting the occupants. This requires only the repeal of several laws of physics. So I gave my friend my solution for auto safety.

Every city with any self-respect has a beltway. Right? So every Fourth of July the beltway is closed to make way for an annual Grand Prix (French for big race). Cafes are set up at all interchanges, with food, drink, fireworks and pari mutuel betting for the citizens. The races (run in several heats) are open to every kook with a local driving license who thinks he can beat everything else on wheels around the beltway.

The total results are all for driving safety. To start with, the populace stays off the highways on the Fourth. Next a lot of the boys who daily terrorize the traffic go to that great speedway in the sky in the course of the day's racing events. The proceeds of the mutuels provide a fund for enforcing the speed limits the rest of the year.

I still say outdoor cafes are a great mental stimulant but pick one that suits your age. □

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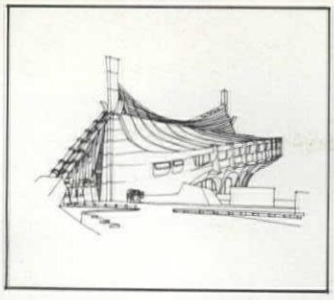

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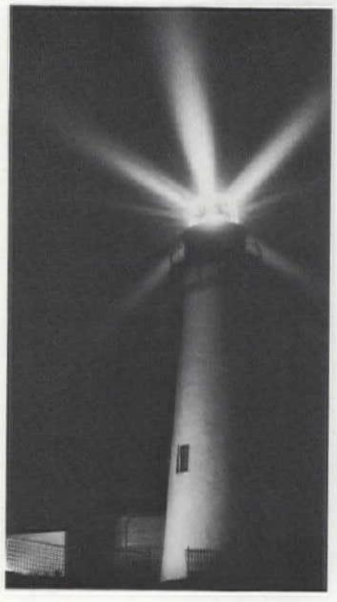
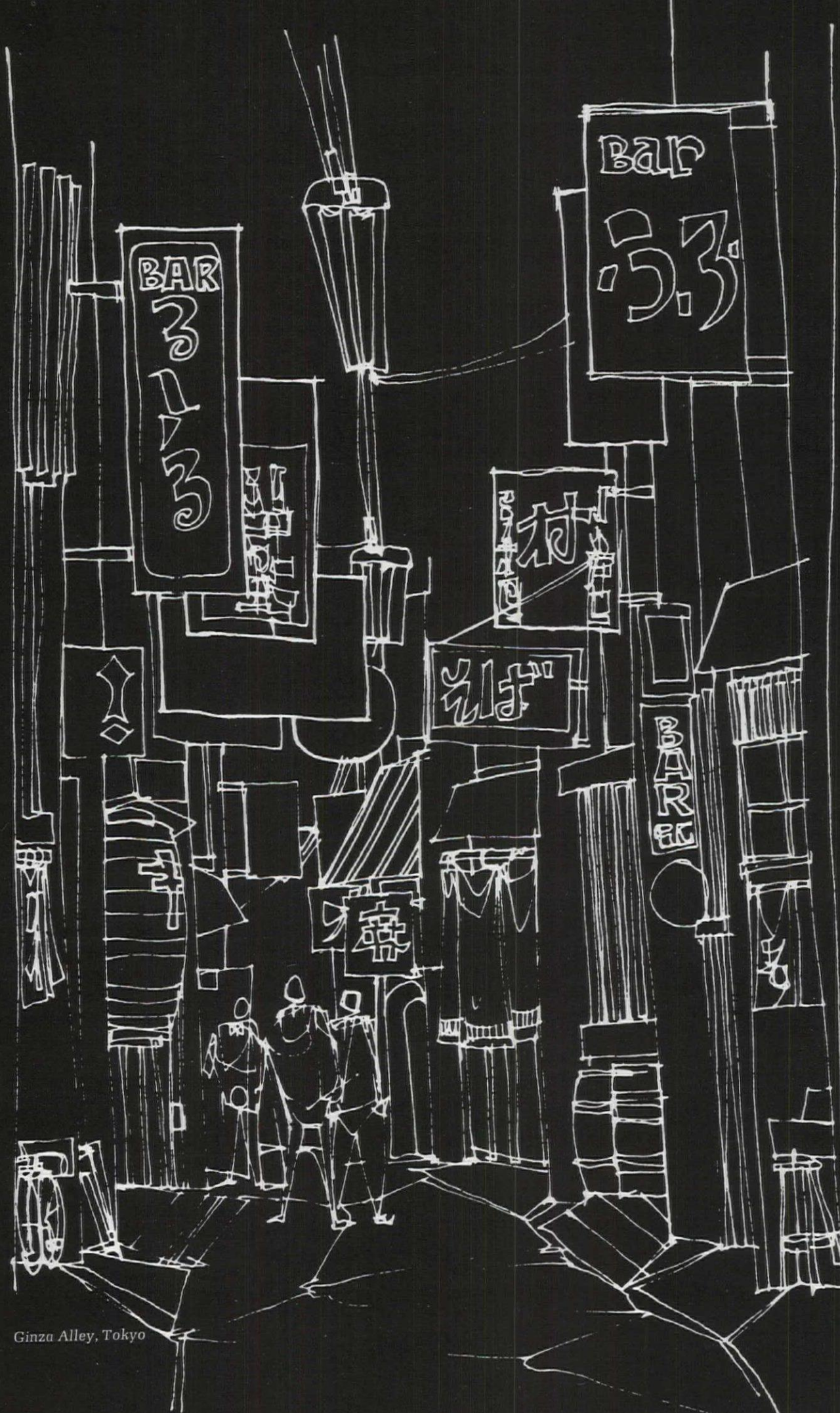




Ginza Alley, Tokyo

The 1966 AIA Gold Medalist and his buildings—Olympic Stadia, Tokyo Cathedral and Communications Center in Kofu reviewed here—are setting the pace for an urbanized Japan.

Interestingly enough, Tange now is involved in two (and his initial) projects in the United States.

The first is the Sports Park at Flushing Meadows, site of the New York World's Fair, where two firms—Kenzo Tange & Urtec and Marcel Breuer & Associates—each independently is planning several buildings.

The second commission is for the design of a $25 million luxury hotel and apartment complex to be built on the present Nob Hill site of Stanford Court Apartments in San Francisco.

Kenzo Tange Observed
An American Appraisal

BY TED A. NIEDERMAN, AIA

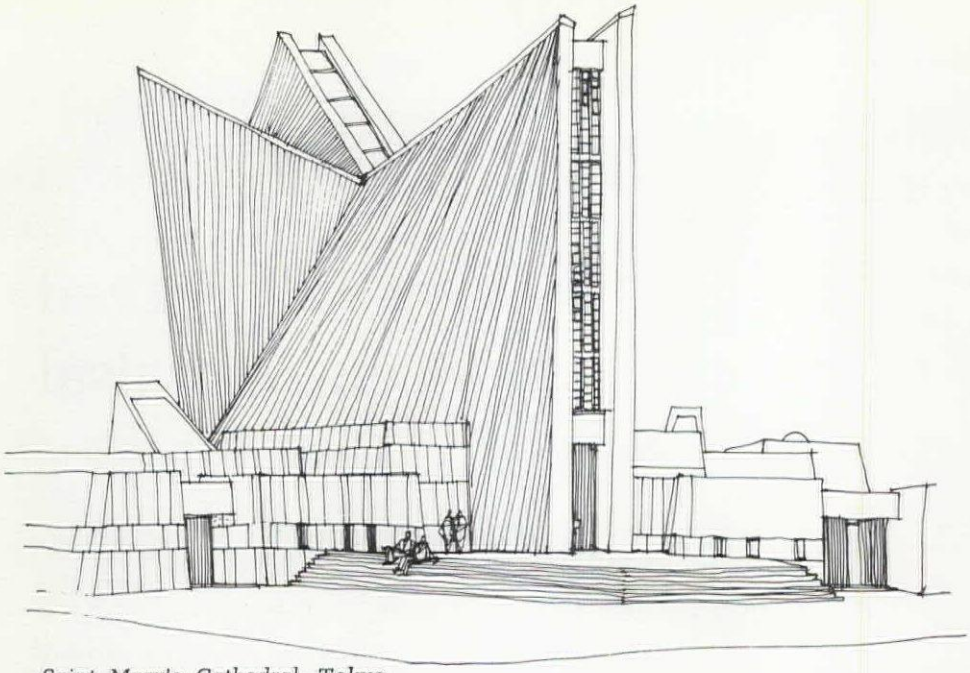
The first-time visitor to Japan anticipates its capital city with feelings of excitement and curiosity and is met by the late summer smog and humidity already familiar to residents of New York and Baltimore.

When he arrives, via parallel monorail and expressways, into the snarl of traffic and congestion known otherwise as central Tokyo, his senses are everywhere assailed by the roar of thousands of autos, trucks, motorcycles and loudspeakers blaring rock and roll. His eyes are saturated with outrageous neon displays of gigantic characters advertising balloons; with perpetual construction of overhead highways, apartment buildings, office towers, amusement centers; and with endless streams of the slim, black-haired, neatly attired Japanese.

Where, the visitor wonders, are the meticulously detailed dwellings, the precious gardens and courts, the streets of screened wooden shops, the orderly landscape and natural materials so widely publicized in architectural books? Obviously, he assumes, more photographs and text have been devoted to the traditional idiom than to the contemporary urban scene. Tokyo appears to be a bursting example of the modern world invading and overrunning the traditional sense of order. The result is a maddening disorder: a potentially exciting, but as yet staggering, concentration of noise, color, movement and human density.

Reference to a street map and transit plan on the subway reveals nothing more about the structure of Tokyo than the fact that the city has in its burgeoning growth incorporated many surrounding villages, each of which continues oddly enough to maintain its own identity through clusters of commerical, entertainment and transportation facilities. One such area known as Harajuku is proudly referred to by one Japanese as Tokyo's Via Veneto. It is a cosmopolitan district rapidly filling with foreign restaurants and shops and, in true Italian style, is the evening gathering spot for Tokyo's young mod set. It also boasts an elegant new office structure bearing the English title "Green Fantasia Building," the top floor of which contains the office of Kenzo Tange.

While waiting to meet Tange, his secretary, Miss Kato, appears with the inevitable cup of tea. The



Saint Mary's Cathedral, Tokyo

drafting room is filled with study models of many projects in various stages of design; yet it is occupied by only a handful of young men and women, a fact which Miss Kato explains is due to the demands of site supervision and a constant exchange of personnel between this office and the one maintained as a studio at the University of Tokyo.

With Tange's arrival, the discussion immediately turns to the first impressions of Tokyo and the nation. In both a humorous and serious vein, he admits to the problems of urban Japan. City planning does not in actuality exist here today, he states. It is a bureaucratic function lost in a thousand city and national offices. As an architect and planner, he feels deeply the obligation to advance the urbanization process.

While the office at Harajuku concerns itself with the purely architectural commissions, Tange concurrently stimulates, among staff members and graduate students at the university studio, planning studies, research and competitions such as the Skopje, Yugoslavia, redevelopment. His position at the university offers a unique opportunity to pursue the urban design and planning research so vital to the survival of urbanized Japan.

The author: Mr. Niederman, who also did the sketches, is employed by Rogers, Taliaferro, Kostritsky, Lamb, Baltimore architects-planners, under whose auspices he made his Japanese visit.

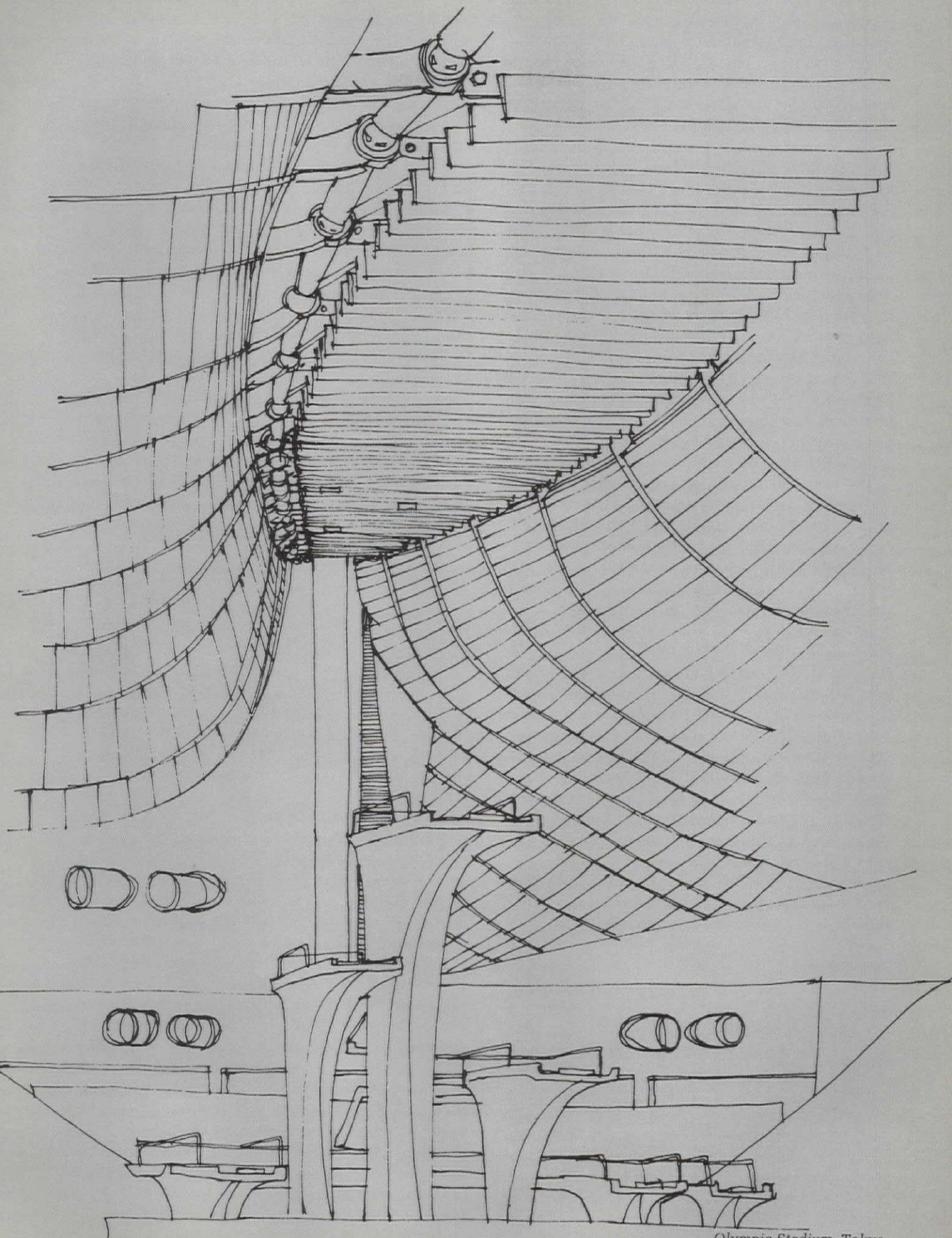
Tange cites the 1960 Tokyo Plan, a study for the development of Tokyo Harbor and structural reorganization of the city, as an example of positive accomplishment. This remarkable plan, although purely theoretical and done without financial assistance at the university, has generated discussion and publicity on an international as well as national scale. The plan, along with the work of the visionary "Metabolism" group, has stimulated the thinking of Japanese politicians and official planners—men who can ultimately direct the growth of Japan's cities.

After visiting Tange, the first stop is only a three-minute walk from the Green Fantasia Building. Directly opposite the dense green park which houses the Meiji Shrine—a Shinto temple in the classic style—rise the National Indoor Stadia. More than any previously completed project, this sports complex erected for the 1964 Olympics marks the emergence of Tange as a mature architect, confident in his ability to fashion modern materials and techniques into the space requirements of our age.

The massive suspended roof and masts of the swimming stadium dominate the complex. The smaller, more contorted and visually less successful basketball stadium forms a vertical counterpoint to the horizontal sweeping roof form of the swimming stadium. Stairs, ramps and promenades, decked with rough granite slabs reputedly coming from demolished streetcar lines, form angling approaches to the sculptured stadia.

Upon entering the main swimming stadium, one finds the brilliance of the spatial conception and technical accomplishment of the structure at once overwhelming. An interior enclosed volume of this generosity and freedom have perhaps never been so dramatically achieved in the history of architecture. The great central truss spreading between twin suspension cables allows a flood of natural light to enter the interior of the stadium. The curving roof and seating planes comfortably surround the pool area (which in winter is an ice-skating rink).

Many analogies have been drawn between the



Olympic Stadium, Tokyo

sweeping stadium roof form and the traditional Japanese temple room. It is apparent, however, that the stadium, spatially and technologically, is truly modern; the building becomes all the more distinguished for its sympathy with the past. It is a national achievement of which the Japanese are justly proud.

The trip across Tokyo on the elevated National Railway Line and the jumbled view of densely packed tin and tile rooftops leaves one ill-prepared for the first sight of Tange's recently completed Tokyo Cathedral. Gleaming stainless steel wings rise from a massive base of concrete blocks, and the unexplained juxtaposition of materials and forms is at once unsettling. The entry into the sanctuary is through the darkened base; light enters only from hidden skylights. As in the swimming stadium, the central space is bathed in light, in this case entering from skylights set at the crossing of the concrete hyperbolic paraboloid roof segments high above the sanctuary floor. Vertical, exposed board forms in the concrete accentuate the rising roof shapes.

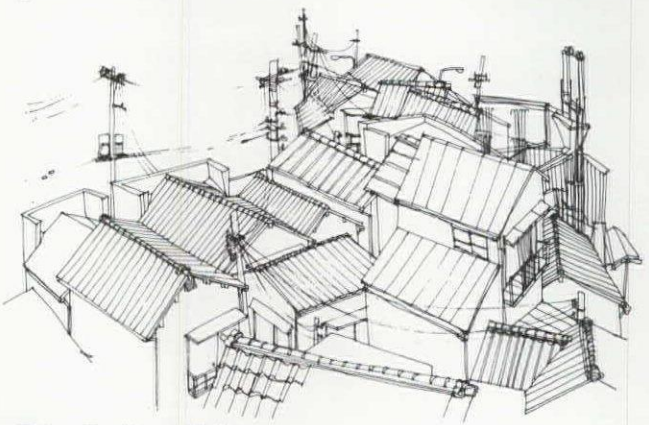
The total effect of lighting, spatial sequence and limited use of materials is profoundly spiritual—a remarkable achievement not only for the fact that an architect has created a suitable environment for worship but that a Japanese has found a fitting expression for the church of a religion still quite foreign to his country.

In both the cathedral and Olympic Stadia, one is aware of the searching of a fertile mind for form so reminiscent of the works of Eero Saarinen. The buildings achieve a sculptural beauty that sets them apart and unfortunately alienates them from the surrounding city. Perhaps, then, the most potentially significant Tange work to date in terms of an overall urban context, implementing for the first time the planning principles stated in the 1960 Tokyo Plan, is to be found in the town of Kofu, 75 miles from the capital.

In full view of Mt. Fuji stand the fortress-like, cylindrical towers of the Communications Center: a complex growth of related yet independent facilities—a radio station, television studios, newspaper printing plant and offices (cover sketch). Although the structure has been constructed for a single client on a finite site, it achieves something more than the solution of the immediate architectural requirements. It is a statement of a system built for growth, expansion and change, capable of forming the long-time span framework of a city complex.

Great voids forming outdoor terraces, decks and platforms penetrate the building as spanning elements bridge between cores. As stated in the Tokyo Plan, the cylindrical towers are cores "in which vertical traffic in buildings as well as the service arteries are gathered in single shafts forming the nuclei of buildings." The blocks spanning between cores in this case each contain one particular function of the communications network. The cores feed, interconnect or separate the functions as required. The voids between elements provide expansion potential for the growth of any functions housed within the system.

The unfortunate choice of precast concrete panels as an infill material between the cast-in-place structural elements of the spanning blocks gives the overall building a more rigidly permanent appearance than the desire for flexibility of growth would suggest. Perhaps the actual details can be argued, but the implications of the building for the structuring and growth of a larger urban form are indisputable.



Ebisu Rooftops, Tokyo

Returning on the evening train from Kofu into the suburbs of Tokyo, which now blazes with neon lights, one can only speculate on the problem of bringing order to the urban environment. Already Tange has another building embodying the "core" philosophy under construction: an office tower in the Ginza district, heart of commercial Tokyo. One wonders if thinking such as this can redirect the dynamic forces at work in the largest city in the world or, for that matter, in any city. The emergence of concerned individuals and teams such as Kenzo Tange lend encouragement to that possibility. □

View of Tokyo

A Foursome on Education

Without question, education is an "in" subject for discussion these days, and no less so in architectural circles, be they town or gown. Much is yet to be said and written about the AIA Education Research Project, initially presented to the New York convention. As spelled out in a progress report in the August AIA JOURNAL, it establishes the structuring for an environmental design curriculum and as such is bound to produce some interesting and varied points of view. The articles grouped under the educational umbrella in this issue pursue a somewhat different course. A succinct statement concerning the basics of an architect's preparation is followed by three specific aspects which contribute vitally to the overall process: research, student involvement and, finally, the much-debated student competition.

1 2 3 4

Objectives Affirmed

In relating the role of the practitioner to his formal training, four basic points emerge.

BY RICHARD G. STEIN, AIA

In order to establish educational procedures for the practice of architecture, it is essential to state what an architect is and what he should be, what work he performs and what he should perform.

As a preface it can be said without contradiction that although building skills and environmental control techniques have improved phenomenally in the last quarter century, man's total physical ambience has not improved. It has, in fact, retrogressed. We look back with admiration to the appearance of the Renaissance city, the medieval hilltown, the African village. For a period in which there was a wide enjoyment of cities, culturally and educationally, we must look back some 40 or 50 years.

Today, neither our cities nor our countryside provides safety. The world we are producing is not satisfactory either to its producers or to its users. While the reasons for the present unbalanced emphasis on technology rather than total visual and esthetic excellence can be pointed out, it is sufficient to know that the imbalance exists and that it is unsatisfactory.

We should expect our architects to produce spaces, buildings, groups of buildings and communities that satisfy the human spirit as well as meeting the demands of physical safety and proper mechanical functioning. Each piece of construction must be appropriate

for its use and compatible with its neighbors.

What is it in the average architect's make-up or training that fails in these areas? First, only a small percentage of those educated and licensed as architects is involved in this fundamental area of decision making. The rest work not as principals, making and defending basic decisions, but as highly skilled technicians with a responsibility that is primarily technical. They may have a delegated mandate to concern themselves with the building in its setting, although this is often purely a matter of chance.

The author: Mr. Stein maintains an architectural office in New York City, which happens to be one of his current clients.

Historically, we are well into a period in architecture's development where the appearance of our new construction is not only a recognition of the changed technology but where the very vocabulary of the esthetic is developed from the new techniques and materials available. In previous cultures the available materials were limited, certainly within each geographic area. As a result, the appearance of each of the various regions had an underlying consistency. The absence of mechanical equipment imposed a height limitation on occupied spaces that immediately resulted in a discipline still admired today in most communities built before the mid-19th century.

But now, with the proliferation of choices, a different kind of judgment, a greater self-consciousness, is required of our architects. The visual and planning errors that destroy our cities and towns can bear the names of well-publicized architects as readily as the names of the inept or the unconcerned. In most cases they will be built adequately, detailed to keep out the weather, supplied with functioning mechanical systems and will probably provide space that can be used for its designated purpose.

Although there may have been periods of crisis between architects, owners and builders, in general this was probably not the underlying cause of the socially unsatisfying end product. In other words, a person can possess all the skills required for a license to practice architecture, and, without violating any strictures he accepts for practice, he is free to contribute to the visual deterioration.

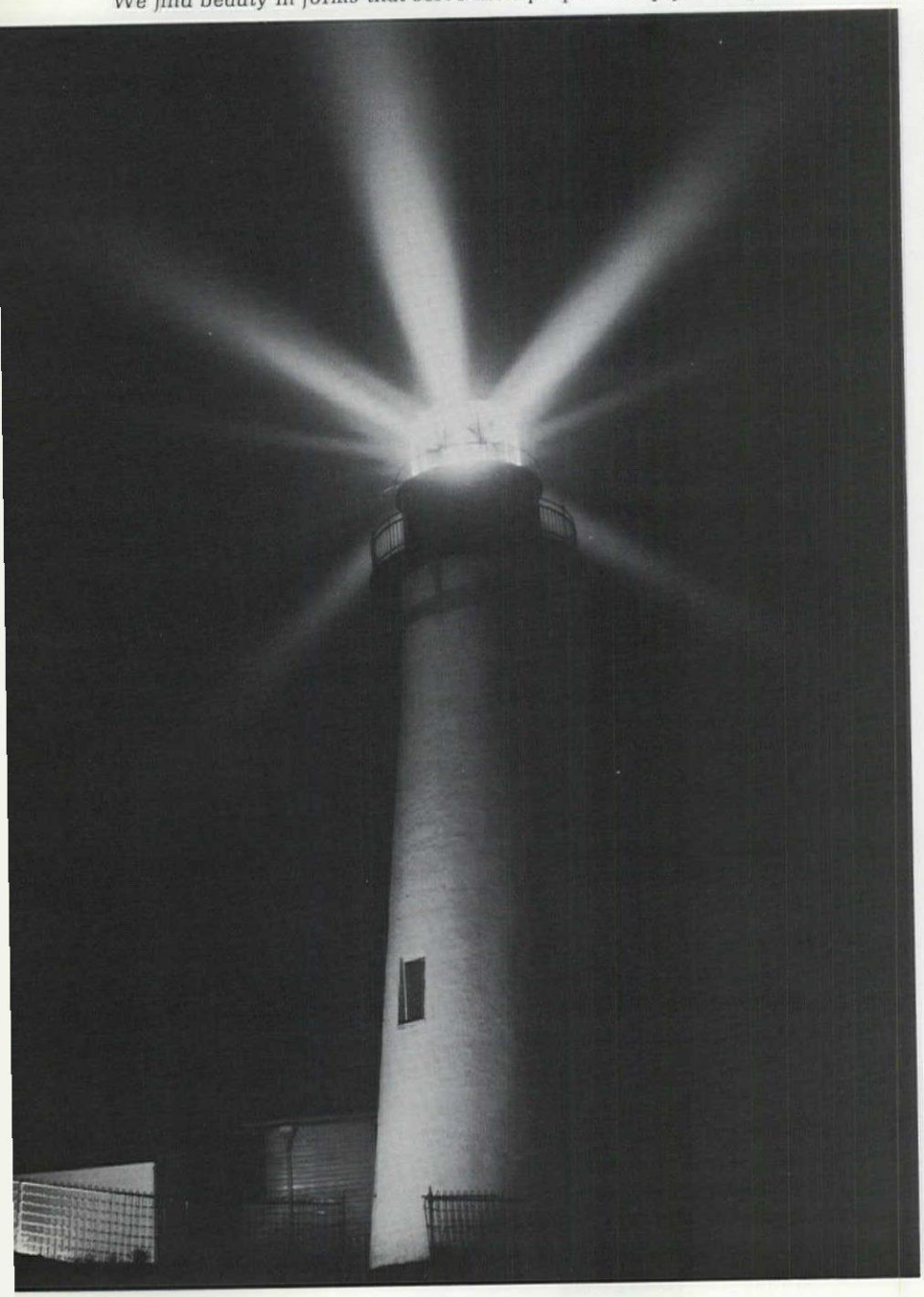
There is no doubt that the architect does not singlehandedly produce an environment. All the social, economic, moral, esthetic and political factors combine in each decision. However, if the architect abets the shortsighted decision or produces a gross or strident building, his part in the process can be isolated for judgment.

What is the deficiency in the architect's training, decision-making process or point of view that we have exposed? Fundamentally, it is that he accepts no large framework, no social responsibility as the underlying reality for decisions. His work is usually no differently motivated than that of the speculative house builder who destroys acres of land with mediocrities or than that of the daily press where novelty is mistaken for progress.

The architect must be a deeply humanistic practitioner who relates every decision to its effect on the structure itself, the setting in which the structure is located and the lives of the people who see or use the structure. His new role and function must combine superficially contradictory qualities.

In order to reintroduce scale and dimension in our lives we can and must find the economic means to have all structures, large and small, properly designed. The high level

"We find beauty in forms that serve their purpose simply and effectively."



of abundance, the great national wealth and productivity make such an objective completely feasible. On the other hand, the esthetic basis of the modern architectural movement, i.e., that we find beauty in forms that serve their purpose simply and effectively, furnishes the discipline and spareness that is not present in an abundant economy but was formerly elemental through necessity in periods of far lower productivity.

The usual failures of buildings lie in two areas: first, in excesses (overusing materials, resorting to intricate solutions where problems could better be solved with simple ones, etc.) and second, in inadequacies (failing to understand the true involvements and demands of both construction and use).

If the architect has an understanding of the broad principles of mechanical behavior of a particular building, he may face completely unprecedented situations in which no amount of school-indoctrinated information would serve his purpose. Also, it can be accepted axiomatically that the special technical information the student learns at school and reviews in refresher courses is fractional at the time of learning and obsolete shortly thereafter. General knowledge of systems and approaches to research are of far deeper value.

A conference was held at Bowdoin College last year to oppose a tendency in the various sciences toward what they termed reductionism—a pseudo-scientific approach that eliminates many operative factors, reducing the element under study to a point where mathematical analysis can be applied, thereby facilitating research techniques and computer procedures. The conference maintained that such a result was the devitalizing and eventual destruction of science.

There is a relevance in this for architecture. The complexity of the generative factors and the various modifications necessary to accommodate real situations comprise the source of the richness of life. When man's prerogatives are surrendered even for the advancement of professional skill and educational efficiency, there is an ominous implication.

It becomes increasingly obvious that a consistent point of view toward the use of these technological innovations and potentialities must be systematically sought and nurtured in all areas of our lives. Our schools and registration procedures must concentrate on producing architects who not only understand the technological resources of our times but who also have a sense of cultural commitment that will ensure that these resources are being used for the social and visual enhancement of the world in which we live.

At this point we can make certain general observations:

1. The philosophical preparation of the architect is a responsibility of the school. Along with a knowledge of technical means, he must develop a sense of how and why he will produce architecture. His approach ought to be within the cultural direction that is producing the best in other fields—poetry, literature, drama, music, etc.—and must be in the cultural development that includes the thoughts of consequence that our whole heritage has produced. Examinations should ascertain that such a point of view has been achieved.

2. The candidate must understand mechanical and structural systems so that he can use them to achieve architectural objectives. It is more important to know what can be achieved mechanically and at what cost to an architectural system than it is to know what size duct is needed to deliver 500 cubic feet per minute. Structural and mechanical courses and examinations should both ascertain that judgment based on knowledge of systems and exercised through philosophical determinations is an attribute of the candidate.

3. Literacy has relevance not only as a cultural manifestation in its own right but as the primary method in our civilization for the exchange of ideas and the development of rationality. It is the necessary means of communication between the architect and the varied kinds of people with whom he deals. It is an index of the complete dimension of the architect as an individual supplementing the technical capabilities most usually expected of him.

4. Training and competence in design are interwoven today with basic attitudes, esthetic considerations and demands for responsibility. The feeling for a larger order in the placing of new objects in existing settings is of paramount importance. Whether one talks of a shop in a building, a building and its neighbors or a new neighborhood in a city, there is a requirement for total environment that becomes more important than demonstrations of originality. □

1 2 3 4

Research Reassessed

Society is on the threshold of a whole new and exciting era in the development of the physical environment, and the basis for architecture likewise is due for a drastic change.

BY BENJAMIN H. EVANS, AIA

Architectural development in the past grew out of the slow orderly development of buildings, with a minor amount of experiment generally limited to minor deviations from a traditional norm. The cultural values which architecture expressed and served changed at a comparatively slow pace, and technology was relatively static. What experimentation there was could happen as buildings were built; an unsuccessful experiment was simply not repeated, and since it represented a minor deviation from tradition, it was not a catastrophe.

When bright architects came along, they improved on architecture; when lesser ones came along, architecture suffered setbacks. The teaching process was slow and meticulous and depended on each new student starting almost from point zero to try to develop his own sense of architecture. There was no rush, and if mistakes were made, people were adaptable enough to live with the mistakes.

But our generation is witnessing violent explosions of change in the forces of society and in the subsequent forces that create architecture. The traditional processes are slow and cumbersome, and the magnitude of the problems are much too great to be solved by them. In order to solve these big problems of the future, a new procedure is going to have to be conceived. A much more systematic and logical process will have to be developed.

When the decision was made to put a man on the moon, a few short

years ago, society didn't turn to the old transportation industry for a solution. There evolved a new unit now called the aerospace industry, and into it were put the best brains, the finest facilities and the most money that could be found. It was structured in such a way that it combined the best parts of private industry, the universities, the federal and local governments, the military services, science and even international governments. A whole new approach was developed: the "systems" approach. The operation was structured in such a way that it called into play every facet of the national effort. Such a successful organization was built that it has now become *the* pattern. It is so big and powerful and rich that one sometimes wonders if it has not become the Frankenstein of the USA.

The author: Mr. Evans is the Institute's director of Education and Research programs.

Recently, the Defense Department realized the need for a new kind of ship that could deliver goods from this country to Vietnam in a few short days instead of the several weeks usually necessary. One would logically expect that it would go to the shipbuilding industry to find the most experienced shipbuilders and designers for this new thrust. But this was not the case. The job was given to the aerospace industry. Was it because the aerospace industry also deals with the science of hydraulics? No, because the aerospace industry represents the way to get things done in a hurry in today's society.

And what about the shipbuilding industry? Everyone knows that shipbuilding is almost a lost art in this country. It is bound by tradition, by labor problems and by high wage prices. With one of the largest, if not the largest, merchant and military fleets in the world, the United States doesn't even rank among the leading shipbuilders of the world, not even among the top 10. There are few doubts as to the ability of the aerospace group to solve this shipping problem, and the politicians have decreed that it have its chance.

One only has to look ahead a little to see what's coming. When the Vietnam war is over, society is going to return to the problem of housing the world's exploding population. There are studies already under way—back in Washington's dark, sacred halls—to determine how we will sustain the thousands of people who are now involved in the production of goods and materials for the war effort. You can be pretty sure the housing market specifically and the building industry in general are going to be among the central thrusts.

Will society turn to the building industry, including architects, engineers, builders, materials manufacturers, etc., for this effort or will it turn to that omnipotent aerospace industry? Is the building industry ready for this kind of an all out assault on the built environment? Are we geared to the design and production of multibillions of dollars of building per year? I'm afraid not.

But we have the ability to rise to the occasion if we decide to apply our energies that way. We have the brains and the technical capabilities to do it. We must, however, become less self-centered and egotistical about the sacred art of architecture. Architecture is art, to be sure, but it is also to a great extent science and technology, and unless we can master the science we won't have much chance to use the art.

It seems very probable that the problems of the total industry are almost directly related to the architect's leadership capability or lack of it. Leadership will come more readily when the profession puts more logic, systematization, science and research into practice. This comes through a much greater emphasis on research: the development and application of new knowledge in new ways. The responsibility rests with the architectural offices, but more emphatically, at this point in history, it rests with the universities.

Research has not traditionally been considered by architects as part of their responsibility. Even today, when it is accepted only by, shall we say, the more "progressive" segment of the profession, there are differences of opinion about what such research should be. Many fruitless hours have been spent trying to define it.

But defining architectural research is not important. Research is a general term which is reasonably well understood by most of us. Our problem is usually one of trying to understand where and how it can best be applied. Inquisitive people will then find the areas that need study. The problem in architecture is to get architects into the mood for thinking about something besides just the *application* of existing knowledge. The development of new knowledge is important too. And this is accomplished through research.

Any talk of research, however, leads logically to a discussion of the university, for it is in the academic atmosphere that this activity is most likely to prosper. It is on the campus that all of the resources that make research-in-depth feasible and the inquisitive minds that make research valuable are brought together. It is in the development of these inquisitive minds that the future of the profession lies.

Education is concerned with the growth of the student's capacity to think constructively and creatively. If this process is successful, the student eventually emerges with a way of thinking that enables him to move continuously from the present into the future, restructuring his personal knowledge as his own experience increases. It is essential that he should develop and retain the desire to keep abreast of the frontiers of knowledge, to be inquisitive and to want to find answers to perplexing problems.

Unfortunately, most of our students nowadays are not being stimulated to this kind of an attitude. They are, for the most part, taught in the traditional manner; once they have mastered the pencil and paper and the architectural library, they have reached the apex. Their teachers are likely to convey the attitude that after five years of architectural study and a few years' experience, they are ready to solve any or all worldly problems. The serious search for new knowledge is often not only lacking but looked upon with disdain!

The problem is further compounded by the fact that our architectural teachers are seldom accepted by their learned fellow faculty members as scholars and scientists and thus are seldom influential in university affairs. While our teachers may be as well, or even more thoroughly, educated than some of their co-teachers, their education is not of the variety most often accepted for scholarly recognition.

Granted, our teachers are spending a great deal of time in outside practice, which we architects consider essential, or at least valuable, to the maintaining of freshness in the creative area and currentness in the technological area. But this is not generally recognized by the other faculty members as a scholarly endeavor or a process for de-

velopment of new knowledge. Even with the current enigma of "publish or perish," about all that the average architect-teacher can show in the way of a publication is a photo of his latest building in one of the professional magazines.

Among the world's great educators, the need for university research in all disciplines is a question not usually debated; it is an accepted fact. If a faculty doesn't add anything to what is known, it is recognized as a relatively weak university. If it adds much to what is known, it is strong, other things being equal.

Faculty research is the best index we have to faculty learning. Where faculty research is low, faculty and student scholarship is likely to be low. Learning inspires learning. Scholarship is contagious. So, unfortunately, is the absence of scholarship or research! The value of faculty and student research is double: It adds to our total knowledge and understanding, and it conditions the intellectual atmosphere on the campus. A really vibrant intellectual atmosphere is one of the most valuable assets a university can have.

This does no imply that all architectural teachers and all students should do research. Not at all. Some are not cut out for it and will have little interest in it. Some will have other intellectual pursuits that will be equally as valuable. But every school should have a component of its faculty and student body involved in research in order to stimulate the academic atmosphere. There should be the proper atmosphere for stimulating inquiry and individual research. The need for practitioners and the experience of practice is also important, just as is the representation by faculty on committees of technical and professional societies and just as travel and exchange of ideas are important. All of these are parts of the intellectual atmosphere on the campus.

When we reach the point where the university is providing this kind of stimulating atmosphere and turning out students who have an exposure to research and who have inquisitive, perceptive minds about the whole range of society problems as well as professional problems, who think and work in logical, systematic ways as well as intuitive and artistic ways, the profession will be in a much better position to exert its leadership and to solve the complex problems of the future. □

1 2 3 4

Academia Sparked

How strange it seems that education, in practice, so often means suppression that instead of leading the mind outward to the light of day it crowds things in upon it that darken and weary it.—Louis Sullivan, 1895

BY HERMAN G. PUNDT

Unless a swift and drastic change of heart and mind will move the profession of architectural education toward action, architecture will die or simply fade away.

Long before the student of our schools today will have been given a chance to make a single contribution to a time-honored profession in the service of mankind, he will be rendered obsolete. The computer of tomorrow will be satisfied with numbers, statistics and average norms. The individual creative architect, on the other hand, will have "fallen by the board," as Wright once said. Why, one may ask, does there appear such urgency for this statement of crisis? Why, after 5,000 years of apparent bliss and glory, such currency of dissent? Have we not already experienced, from the time of Blondel to Gropius and Zevi, enough discomfort from drastic revisions and manifestos demanding change? Why now, again? The answer is simple: right now or never.

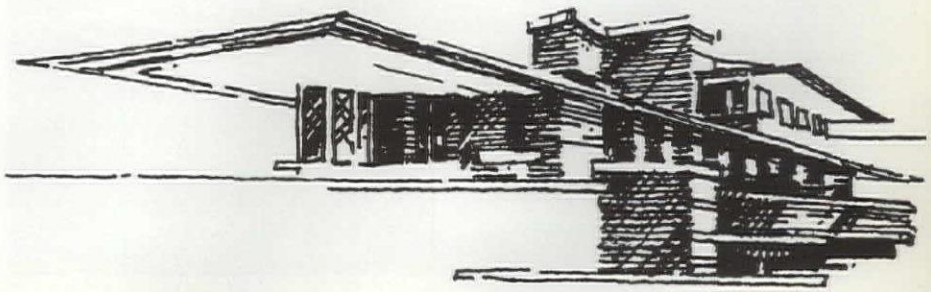
As there still remains time to save our cities, there is yet a chance to improve education. Architects may still be saved if someone were willing to endorse, sponsor and support a revolution. A revolution in architectural education must occur right now! It must, however, go beyond new clichés or imitations of worn systems or schools. It must be vital, up to date, realistic and thorough. Gone are the days of the Ecole des Beaux-Arts, gone is the Bauhaus—gone forever. If Gropius had the courage and wisdom to reshape the principles of America's architectural education in the 1930s, it is high time to repeat the act, if not the method. What change and why?

The change which is needed today pertains neither to building technology, structural systems nor improved computer techniques. It pertains to man, to the student in particular. It centers on the student's education, the ultimate tool of his progress and the only guarantee of his ability to function as a responsible architect of tomorrow. It is totally irrelevant whether curriculum A, B or C is composed to train the neophyte—what is important is that the curriculum is carried out by men responsive to human needs and, moreover, by those dedicated to the humanistically oriented training.

Whether the architectural educator is a follower of Miesian simplicity or an admirer of Corbusian formalism makes little difference. His interest in education and, primarily, in the youthful minds that he instructs should be the criterion for evaluating his worth. Honors, awards, exposure in national publications may give some indication of his professional value, but do these make him a good teacher?

In the areas of technology and history, we cherish the "specialist" who has published widely and built a reputation as an expert in his field. But the time has passed (or has it?) when specialists became teachers solely because they loved the subject they taught. Today, no such man should teach. He should do research. And in his place should step the one who dares to search. To search the mind and heart, to respond to the needs and to challenge the potential of youth is by far more important than to compose lists or initiate systems, administrative or otherwise.

In short, the change is one of humanism. One which takes into account that nothing is perfect, hardly anything complete. But it must be a change which drives



forcefully toward improvement, one which takes excellence as a sacred goal. This change in the education of young architects would eliminate grades, averages and curves. It would demand the chance of error; it would aim toward experience and never insist upon the polished product at the end of the term.

Unless we decide, therefore, to change from material to human excellence, from quantity to quality and from daydreaming to reality, architecture will be lost. Our students of today will be but the draftsmen of tomorrow, nonperforming, irresponsible vegetables thereafter, forever devoid of self-respect and inner strength. Such a change in our attitudes toward education can occur; proof has already been rendered to show its effect—a beginning has been made.

This splendid beginning is a human story indeed. In the educational terms of today, it is a radical one: no grades, no averages, not even any "credit." The story concerns a group of about a dozen young people, students of architecture at the University of Illinois, Urbana, and their desire to learn.

It all began about Christmastime, 1964. I do remember, during a course of lectures on American architecture, that I did curse a bit in class concerning the neglect of our architectural heritage. As a matter of fact, I had just discussed the heroic efforts of the Spaniards in continuing Antonio Gaudi's work at the Sagrada Familia, when I began to damn our own apathy toward monuments of distinction. Sullivan's Garrick Theater in Chicago had vanished and now Wright's famous Robie House was in distress once more. How in the world are we ever to retain our culture unless we begin right now to save our treasures, to mend their fabrics and proclaim their worth? This must have been basically the tune I trumpeted into the class.

At this point, I did not have the vaguest idea of any specific consequences or reaction from my students. I had not known until then what students were really like. They had been important to me, yes; a stimulation, yes; a challenge —not yet. All this would change quickly. Within two hours or so, four seniors appeared in my office. All of them seemed serious, looked surprisingly well-groomed and came, so they said, for a special purpose. I immediately feared the standard requests: extension of due date for papers or reduction of workload. No — for once, something totally different, the spokesman said. "We came here to save the Robie House." I was shocked about my own challenge to them—how can students save the Robie House? Immediately, figures began to appear in my mind; someone had mentioned that nearly $200,000 was still needed to achieve its total restoration. How could students attempt such a task? Architects had tried for years. Famous men, scholars, politicians and socialites had joined forces, with only limited success. And now, students?

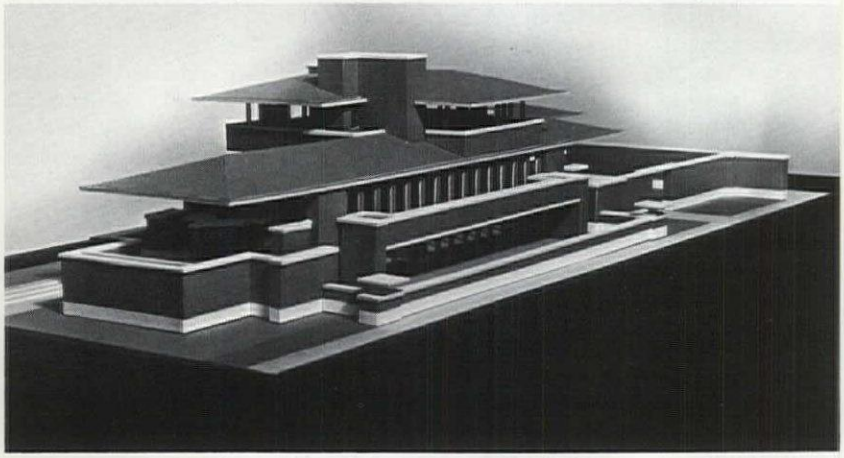
Somehow, I tried to convince the group that I thought they had a "great idea" and that we should meet again. And so we did. Next time, we were eight. All of us pitched in to buy the beer and someone summoned the meeting to order. Suddenly it all sounded very professional, parliamentary and official. Perhaps none of the group knew exactly what was to happen next, but, before the evening had ended, a certain direction became clear, a sense of commitment was born. First, we knew that we had exactly $0 in our newly established treasury. But we had a treasurer, and a chairman and a secretary. We had agreed on the choice of Robert Selby to lead our infant organization. With his personal charm, organizing abilities and sense of humor, we felt that Bob would make a good chairman for the group; and our decision was to be justified in the coming months. Things were moving. As yet we were lacking a title, credentials of any sort and trust by anyone but ourselves. We felt tremendous, however. Everyone had made a little speech or spoken a toast and everyone had committed himself to *work*. Yes, we would save the Robie House!

At week's end the official request for departmental recognition of our group had been filed. Professor Alan K. Laing had baptized us "Committee of Architectural Heritage," and someone had decided that a business card should be designed and printed. Also, we needed a project — something which would attract attention and elicit donations to the restoration fund, something which would "stir men's minds," as Daniel Burnham once said.

Then, suddenly, our vague ideas were given shape. It happened one morning, when one of my students shuffled into my office and plunked himself into a chair. I shall never forget it. John Smart was his name, but his manner did not reflect its colloquial connotation. John is far from being a cocky "smart aleck"; he is one of the rare genuine idealists I know. Undoing the cumbersome army gunnysack which he wore (and in which he carried books), and cocking his head to one side, John proceeded to make a

The author: Mr. Pundt is faculty adviser to the Committee of Architectural Heritage, University of Illinois, which expects to contribute at least $2,000 to the restoration of the Robie House through donations at its exhibition and the sale of the catalog. This sum could be increased by continued distribution of the latter, "Frank Lloyd Wright: Vision and Legacy," which may be purchased from the committee at the Department of Architecture in Urbana or from the Prairie School Press, 117 Fir St., Park Forest, Ill.

Learning to manipulate space, planes and volumes, the student reacts to the solutions of master architects and interprets them in three-dimensional form. Scale model of the Frederick C. Robie House by D. Spindler.



proposal—one could almost say a "deal." He proposed an interesting trade: the design of an exhibition for a term paper.

"Yes," said John, "I shall design an exhibition for you." An exhibition of what? "Well," he continued, "a great exhibition on Frank Lloyd Wright, Louis Sullivan and all the rest," borrowing one of my pet phrases at the end. I had adopted this phrase a long time ago from Professor Ernest A. Connally, my favorite teacher. It is a good device to use when one is about to run out of words. And John had done just that. He said no more. I, in turn, had been studying him carefully, especially his clear and sparkling eyes. The "rule" for the course was a term paper, a standard requirement for all students. But I sensed that if I took a chance with this young man, I would receive instead something far richer and more rewarding for both of us—a shared experience of learning. "Yes, John Smart," I said, "you will do it." John smiled and walked out, seemingly happier than when he walked in.

It is a good thing in life that there are dreamers and friends of dreamers. One of our friends was Robert Ford, the greatest unpublished architectural educator I have ever met. Bob was on the design faculty in Urbana at the time, and John Smart had been his student. For our good fortune, he was also chairman of the department's exhibition committee, just when John Smart and I were beginning to have dreams. Now, it was Bob who stepped in as the first encouraging supporter. As a matter of fact, he stepped into my office just moments after John Smart had left. While the professor reinforced my trust in the student with the gunnysack and the sparkling eyes, he also mentioned that certain limited funds could be allocated for our exhibition when we were ready to begin. "When do you want the gallery?" For some administrative reason, he needed the date right away, of course. "How about the opening of the new school year, say, September 15?" Sure, why not?

It must have been April by then, with no single exhibition item in sight. And, for that matter, no money either. The second problem was solved in a wonderful way: Students gave us money. Not too much, to be sure, but enough to print official stationery and the business cards.

In order to raise a more substantial sum, we decided to give a public lecture in Chicago, the city which possessed the Robie House. Donald Hanson offered us the use of the largest lecture hall at the new Chicago campus of the University of Illinois and introduced us to a full house. All of us were surprised that nearly as many people came to hear about us "unknowns" as had come to listen to the saviour of cities, Doxiadis, a month before. After two regular course lectures that morning and a three-hour drive from Urbana, I was tired and nervous. But I was about to talk on my favorite subject: the work and principles of Frank Lloyd Wright. I wanted to tell the people of Chicago what great treasures they had, how much we need them for the future and how our students wanted to help to preserve this wonderful architectural heritage. Somehow, I believe we did succeed in getting the message across. We even received some contributions—enough, as I recall, to pay for the truck rental fees to haul furniture during our next campaign.

The student's actual experience of the building and his reaction to it as expressed in graphic terms are essential aspects of the study of the history of architecture. The Susan Lawrence Dana House, Springfield, Illinois, sketched by Michael J. Plautz, who also drew the Robie House.

This next campaign was to prepare the exhibition in earnest. First, we selected a title: "Frank Lloyd Wright: Vision and Legacy." Then we prepared a general list of items to be exhibited and, finally, went to work. Our intention was to exhibit as many actual objects designed by Wright as possible, rather than depending solely on photographs or other graphic representations of his buildings. Consequently our list included furniture, fabrics, lamps, leaded windows, ornaments—anything movable, excellent and educational; anything representative of the spirit of Wright and his Prairie School contemporaries.

And then the search began. Days were spent by individuals or all of us as a group in visiting owners of Wright houses, in begging for their support and ultimately for their chairs, tables and windows. We traveled to the impressive Bradley House in Kankakee, made a special trip to Taliesin in Wisconsin and stopped to see Sullivan's once splendid Bradley House in Madison. Experiencing these structures firsthand and viewing the architectural setting of the objects we were gathering was more important to the learning process than studying their qualities from poor reproductions in books. We were able to enter such closed shrines as the Susan Lawrence Dana House in Springfield, whose present owner allowed us to cart off several well-preserved pieces of furniture, including the complete dining room set. Another famous dining table and chairs, from the Robie House itself, had been neglected for years and were rediscovered in a dark and dusty attic in Chicago. On arrival in Urbana, they were entrusted to wives and girl friends, who spent many hours scrubbing and polishing in an attempt to restore the pieces to their former glory.

The campaign continued through the late summer. Trucks were rented for major hauling jobs, other means were used for smaller pieces or those acquired unexpectedly. Two high-backed chairs designed by Elmslie arrived in the back of a Volkswagen. Windows were loaned by owners who had remodeled their houses, ornaments by souvenir hunters who had scavenged at the site of demolished buildings.

Meanwhile, John Smart had settled down at home base and began to transform ordinary sheets of 4x8′ plywood and simple 2x4 studs into a splendid architectonic setting. Hammers, nails and paint (black, white and red) and the active hands of many volunteers enlivened the Georgian exhibition

hall at the architecture building in Urbana. Gradually, partitions, overhead grills and platforms were erected: "The site was ready for the architect to appear."

And now he did appear. Not in person, of course, since the master had long since passed away. But a portrait of Wright arrived, a splendid centerpiece to be hung above the entire assembly. Mrs. Wright had personally endorsed its loan, and we were sure she would have liked its placement.

The Robie House dining room set, polished and assembled for the first time in many years, became the focal point of the exhibition. But other pieces were its rivals for attention: a folding table from the Dana House, a wood and glass cabinet from the same residence, the Elmslie chairs from the Bradley House in Madison and many, many more. An exquisite scale model of the Robie House, executed by David Spindler, was exhibited along with plans of the building and photographs showing its present condition.

While the furniture was in our possession, measured drawings of the most important items were made and will remain as a permanent record (copies were obtained by the Historic American Buildings Survey and deposited in the Library of Congress). It was further decided to publish a small catalog in which some of the drawings would be reproduced as well as photographs of the pieces exhibited. Many more hours of labor went into its preparation in the hope that the proceeds from its sale would increase our contribution to the restoration fund.

In the end, when all was finished, the furniture returned and the trucks once more unloaded, we knew that our dream had come true. We had planned and worked, earned only a little and certainly *not* saved the Robie House. But we had the joy of human experience which leads from dreams to reality, from the study of the mundane to the realm of excellence. Is that not in itself a splendid beginning?

This human story, which I have recounted in a personal way because there is no other way to tell it, should not be taken as the only application of humanism in architectural education. It should be regarded as simply an example, one of many which could be cited, which reflects the final, human dimension so needed today to fulfill the promise of a better world tomorrow. □

1 2 3 4

Students Judged

Discussing on-campus competitions is like walking into a lion's den, but here is one thing that seems to work, as seen from the sidelines by the AIA JOURNAL.

"In the past, nursing homes were too often thought of as being human warehouses, places where the patients could do nothing more than spend their last days. But these student designs provide for the dynamic care of the elderly; they are aimed at rehabilitating and reorienting the patients and getting them back into the community."

In making that statement, Dr. Francis J. O'Neill, director of Central Islip (N.Y.) State Hospital, was referring to the 1967 special competition co-sponsored by Pittsburgh Plate Glass Industries and the National Institute for Architectural Education.

The project—to design a nursing home 10 minutes from a general hospital—was intended as a major school problem, which in terms of academic practice means four to eight weeks; therefore, no exact time limit was designated. It was issued to permit scheduling in the fall or spring term and open to third-, fourth-, fifth-year, graduate and postgraduate students under 30 years of age.

The program was written by Caleb Hornbostel, AIA, a New York practitioner who serves as NIAE's director of education, with the help of three advisory consultants, including Dr. O'Neill.

It should be noted at the outset that there are differing opinions about the merits of student competitions on campuses across the land. There is a feeling in some circles that the programs, which can be time consuming and create certain pressures, interfere with the normal educational process and, furthermore, that in the past there have simply been too many.

But PPG's Elmer A. Lundberg, director of architectural liaison, comes to their defense with this comment:

"No human institution is perfect, and that includes design competitions for students and young architects. We do feel, however, that anything which encourages them to handle conceptual design, and do so in a medium where the presentation must speak for itself, is a worthwhile enterprise for a company to sponsor.

"Throughout his professional life, an architect's work will often be reviewed and assessed by prospective clients, and often the architect will not be present to explain or defend his concept. The neatness of his visuals, his rendering skill, the relationship of the drawings to each other are always important. In sending out his student work to be judged in these competitions, the young architect is beginning a discipline he will be following all his life."

The PPG program is unique in that the entrants are given freedom to design in whatever materials seem best for the subject, and the use of glass has no bearing whatsoever in the selection of winning designs. In fact, as Lundberg puts it:

"We're finding these competitions to be just as valuable to us as we hope they are to students and schools. Very often, for example, the student architect will overdo or overdesign in his effort to get an effect or a particular service from glass. But he is unconsciously telling us what he hopes glass will, or can, do—and this gives us valuable direction in our new product thinking and development."

This year's competition was judged in Miami Beach where the jury spent an intensive day in reviewing the work of 92 students from 11 schools, which in each case forwarded the top submissions.

Each entrant was required to submit either three (30x40 in.) or six (20x30 in.) boards showing, in addition to the building plans themselves, a site plan, two sections, a main elevation and a perspective in color.

What, then, did the entries say? What do they mean in terms of fu-

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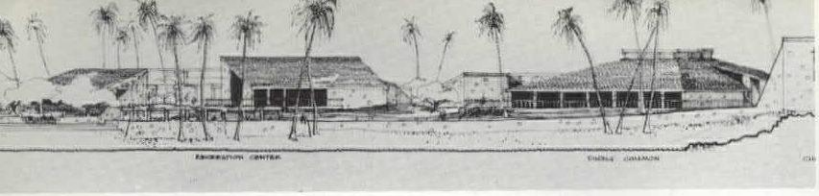
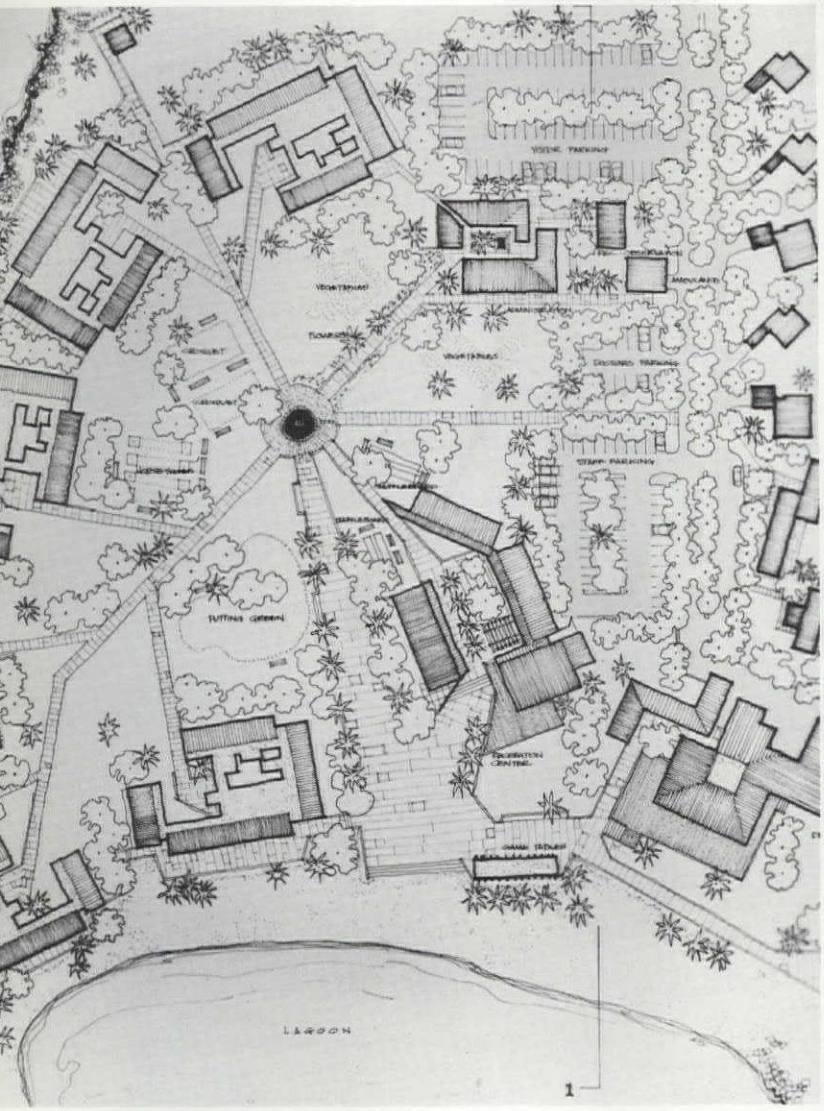
First prize—Thomas E. Fanning, Honolulu: "a collection of separate, one-story tropical cottages, organized as a retirement club with care given to living amenities, all disposed in a radial plan and cooled by the Hawaiian winds." Second—Gary F. Rogowski, California State Polytechnic College, San Luis Obispo: "an extremely intricate and personal arrangement in plan that expresses an awareness of the needs of the elderly." Third—Robert H. Morin, University of Notre Dame: "a brilliant multistory design in which the arrangements of voids and solids of the individual living units create a delightful sense of light and shadow on the exterior."





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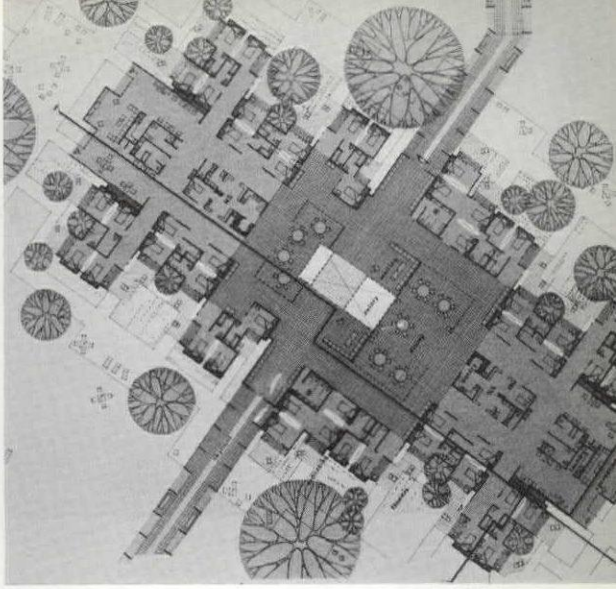

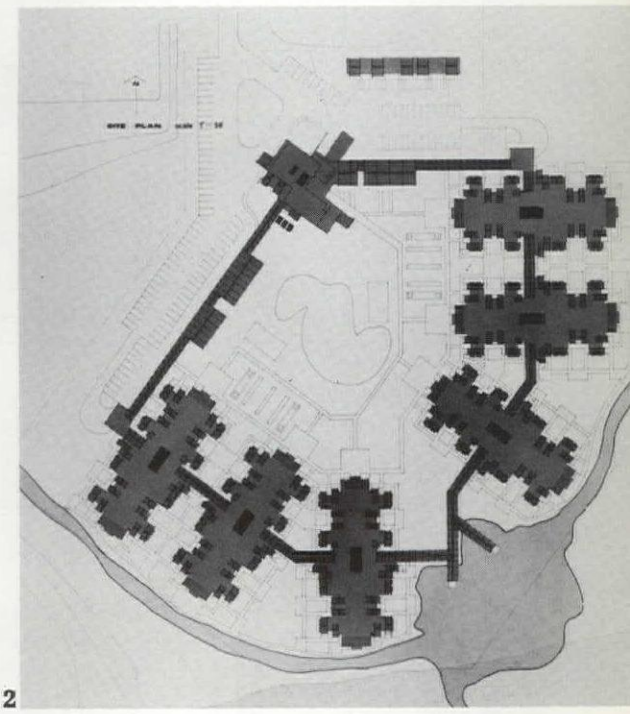

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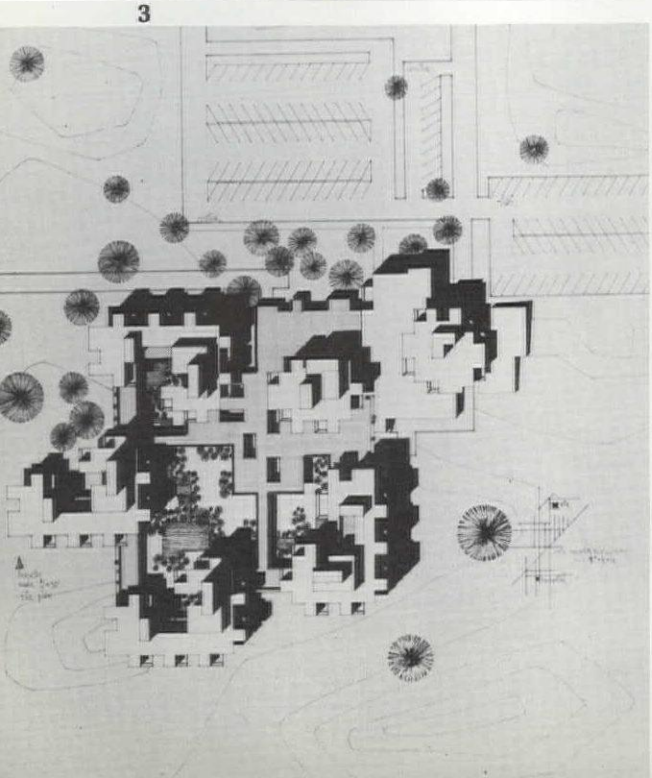
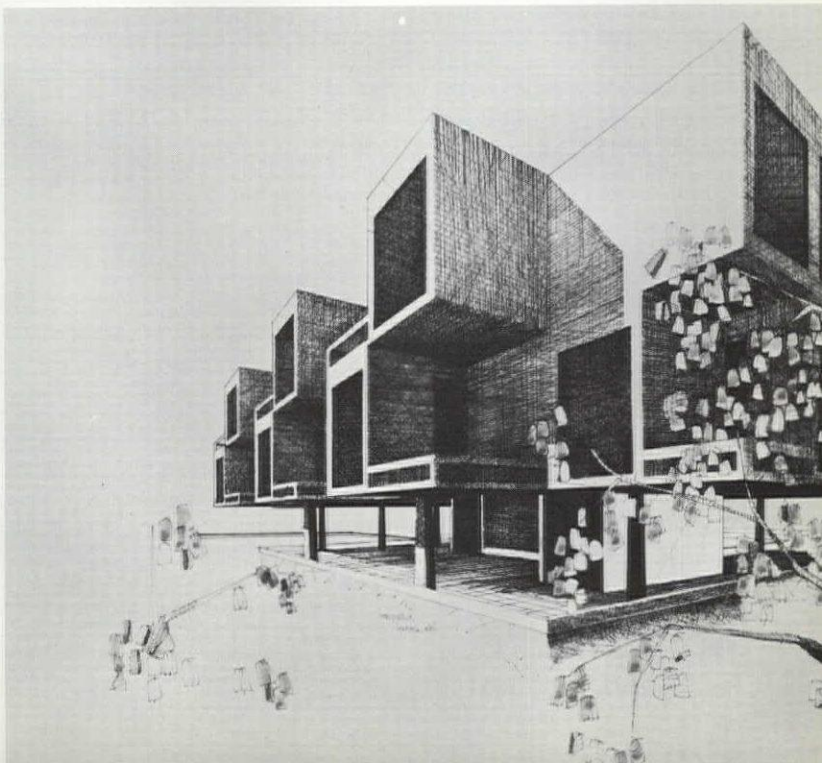




ture architects? Dr. O'Neill, who doubled as a juror, summed it up:

"It is true some of the designs were overelaborate, in terms of initial construction costs and future maintenance, and such nursing homes could have been afforded only the wealthy. But the majority, and all the prize-winning designs, appeared to be quite practical. We also were pleased to note the absence of 'far-out' esthetics."

Dr. O'Neill further commented that he believed the entries represent the coming trend in nursing homes—a trend being spurred by federal legislation such as Medicare and by complementary state programs such as New York's Medicaid.

"With the stress these programs place on the rehabilitation of the patient, the old 'warehouse' concept of the nursing home must be a thing of the past," he added.

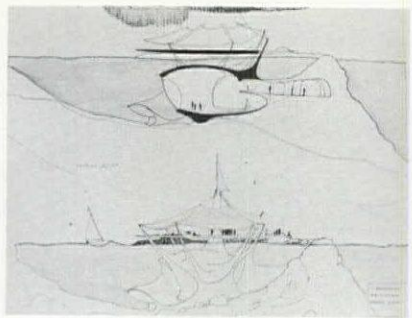
Another program adviser and jury member, Henrietta Harney, senior architect for the hospitals division, New York Department of Public Works, likewise was impressed by the "generally high level of technical competence exhibited.

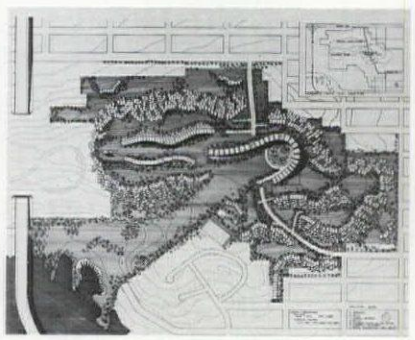
"In examining the entries," she explained, "we judges asked one basic question: Is this a good place for people to live? There was not much time to consider such matters as economics of construction, staff operations, etc. However, most of the designs did indeed provide good places for people to live."

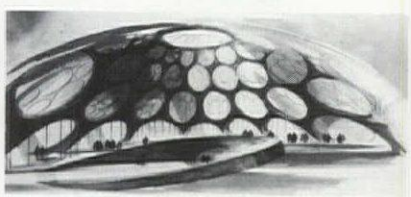
NIAE's Board Chairman Sidney Katz, FAIA, pointed out that most of the projects "recognized that the elderly are not only capable of enjoying life but of contributing to it as useful, productive human beings; that as individuals they need not stagnate but have the potentials for continued personal development. Thus, where the site permitted, the buildings were designed specifically to encourage patients to mingle with the outside world, to meet in small, informal groups and to engage in a variety of meaningful activities.

"The contestants," the New York architect continued, "were asked to design an environment that was 'of a residential rather than institutional character.' By and large, this requirement was met admirably. In fact, the designs expressed many kinds of residences, from small bungalows to multistory apartment houses."

Katz observed that some definite architectural trends were in evidence, "especially in the consistent delineation and articulation of the individual room, or 'home,' as living area. This was in contrast to the anonymous, institutional structures so familiar and so drab in the nursing home field today."







First prizes, 1964-66.

As for the judging itself, Paul Robin John, AIA, representing the dozen Miami area architects who served on the jury, made some general observations regarding the mechanics, which in any competition entail certain steps due to the sheer volume of entries.

"The first few hours are spent in getting rid of the 'dead wood,' so to speak, and as you may have guessed in this procedure, the entry to survive depends heavily on its presentation quality. I don't mean that flamboyant renderings win competitions, but an entry must at least be read clearly at a glance and have, for lack of a better word, 'punch.' Interestingly enough, in the final analysis, these entries are invariably well-executed designs as well.

"Next," the Pompano Beach architect continued, "the jury seeks out entries which obviously have *not* captured the essence of the program criteria. This may appear to be a negative approach, but a number of entries seem to disregard or ignore completely the clearly stated, or at least heavily implied, design requirements.

"It would also seem that since the program stated *a 15-acre site is required,* the size of the property would obviate the need for a multistory solution in general," Robin explained. (This point caused a heated discussion among the jurors who did premiate several entries of this type.—Ed.)

"Finally, I detected, especially in the last hectic hour of judging, an almost 'antiarchitecture' feeling develop among the jurors. We eagerly sought a clean, simple solution after pouring over myriads of unnecessarily overcomplicated schemes. I feel we finally found what we were searching for and, incidentally, what the program asked for: a comfortable, crisp, friendly structure for the rehabilitation of people with problems."

Speaking on behalf of the NIAE, Katz said it was the most successful of all PPG competitions. Previous themes have been devoted to the following:

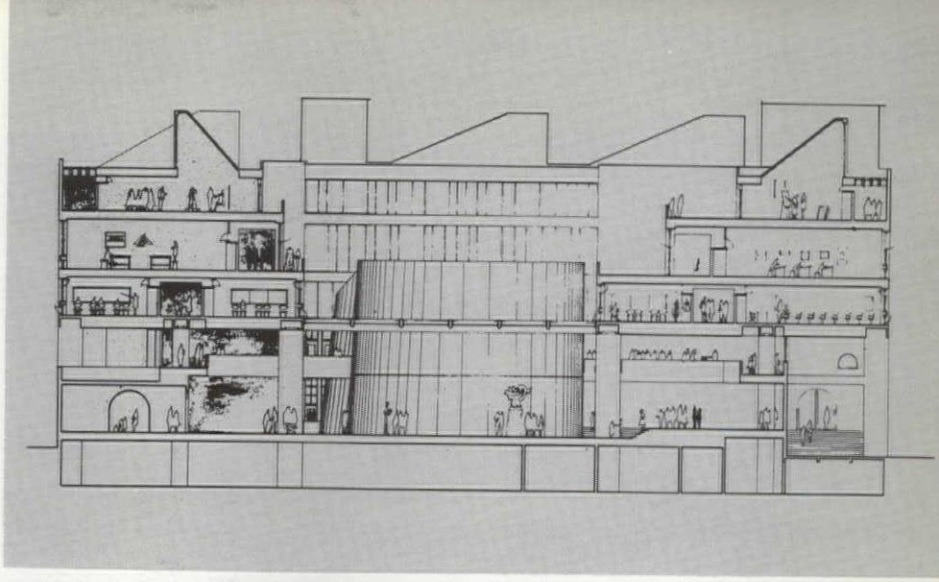
- 1964, a restaurant in a lagoon—a rather free and imaginative problem, with few restrictions imposed (winner: L. Rosenwinkel, University of Illinois).
- 1965, Hunters Point area redevelopment study—a blighted section in San Francisco calling for the design of a living-shopping-recreation complex and its integration with the surrounding neighborhood (Terry Ernst and Charles Miller, University of Illinois).
- 1966, a hospitality center on a turnpike—a place where eastbound travelers could stop and rest, learn about Pennsylvania and its attractions and visit exhibits, both permanent and temporary (Robert A. Eason, Georgia Institute of Technology).

The PPG program is one of the special competitions sponsored by the NIAE. Its other main activities are the Lloyd Warren Fellowship (Paris Prize in Architecture), Thesis Award (Paris Prize Traveling Scholarship), and publication of the NIAE Yearbook, which incorporates the award winners.

And getting back to the 1967 program, the best accolade of all was given by Dr. O'Neill when he declared: "As president of the Long Island Regional Hospital Planning Council, these are the kinds of designs that I would hope for and approve when plans for new buildings were being submitted."

It would be difficult to earn a better endorsement than that.

ROBERT E. KOEHLER



1967 Rome Prize

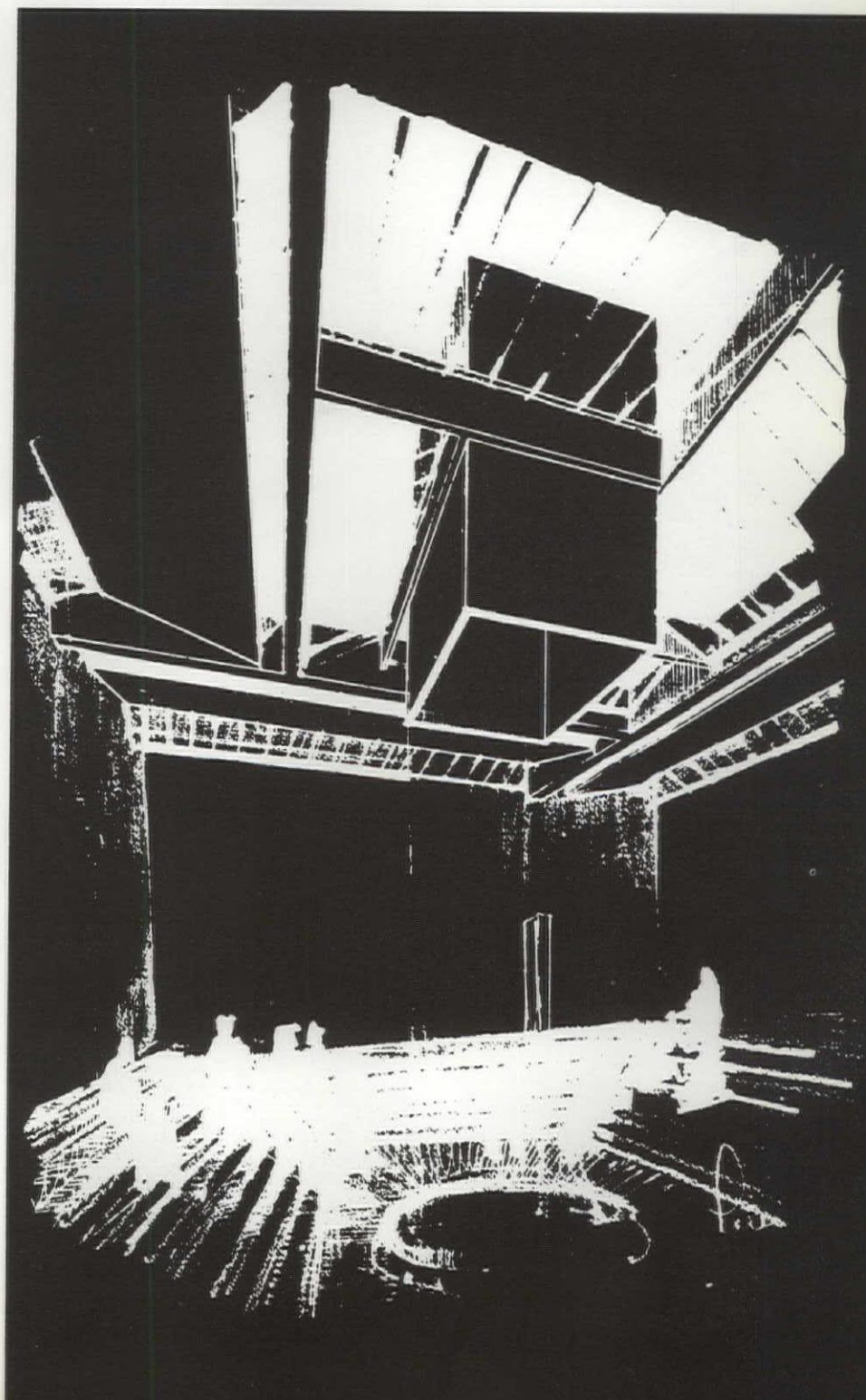
THOMAS L. SCHUMACHER

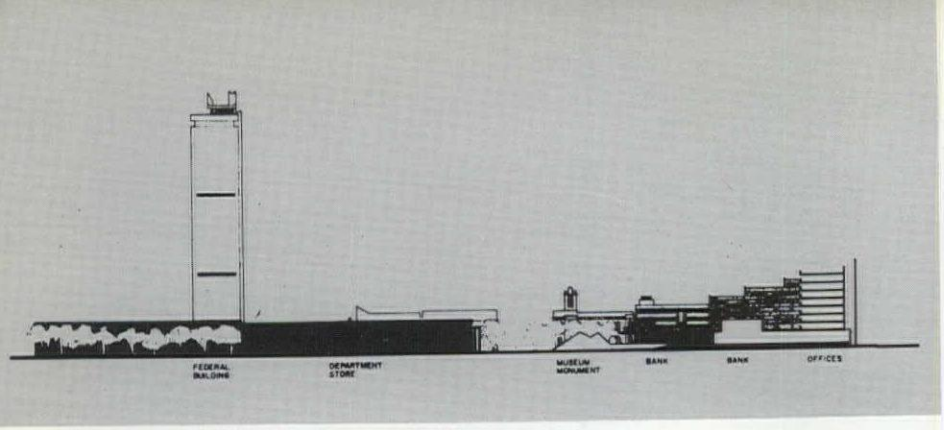
PETER F. SMITH

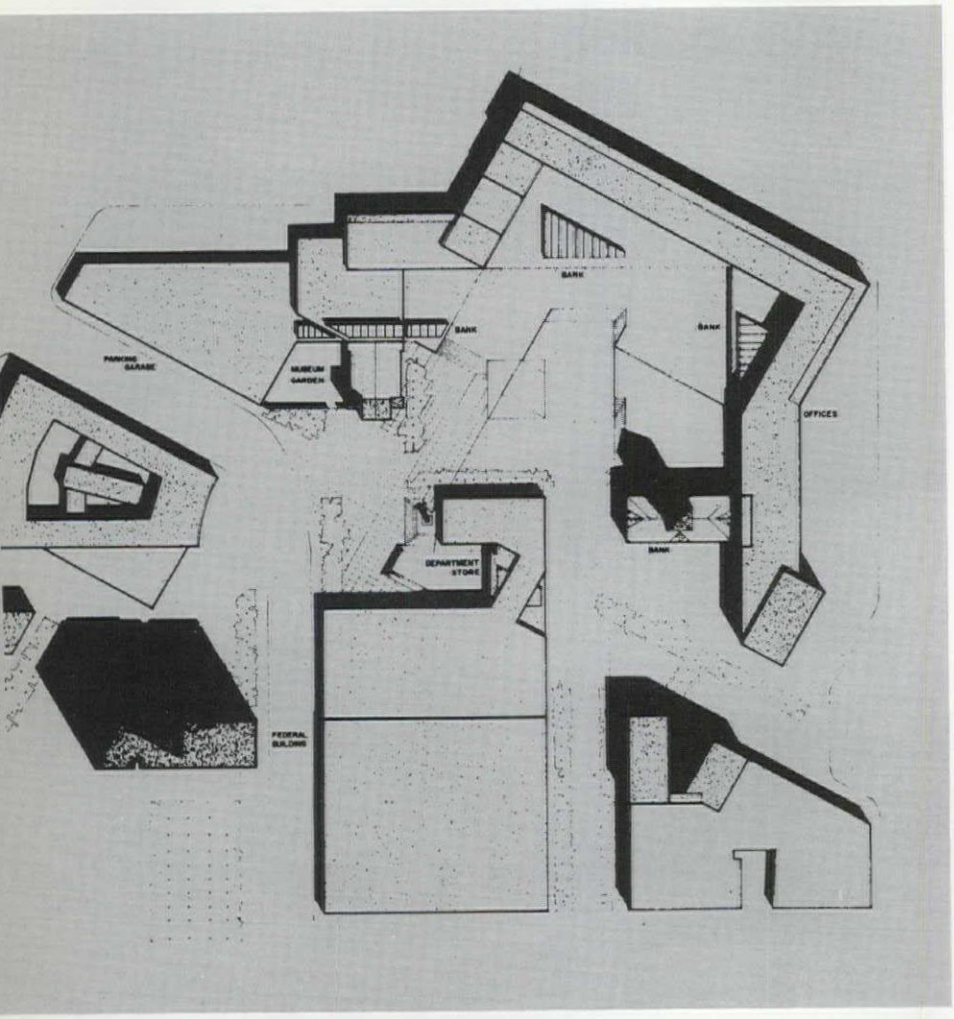
The two 1967 Rome Prize winners in the field of architecture, here represented by samples from their portfolios, were granted the fellowships which are awarded annually to promising young American students of the fine arts and which enable the students to pursue their interests independently in Rome.

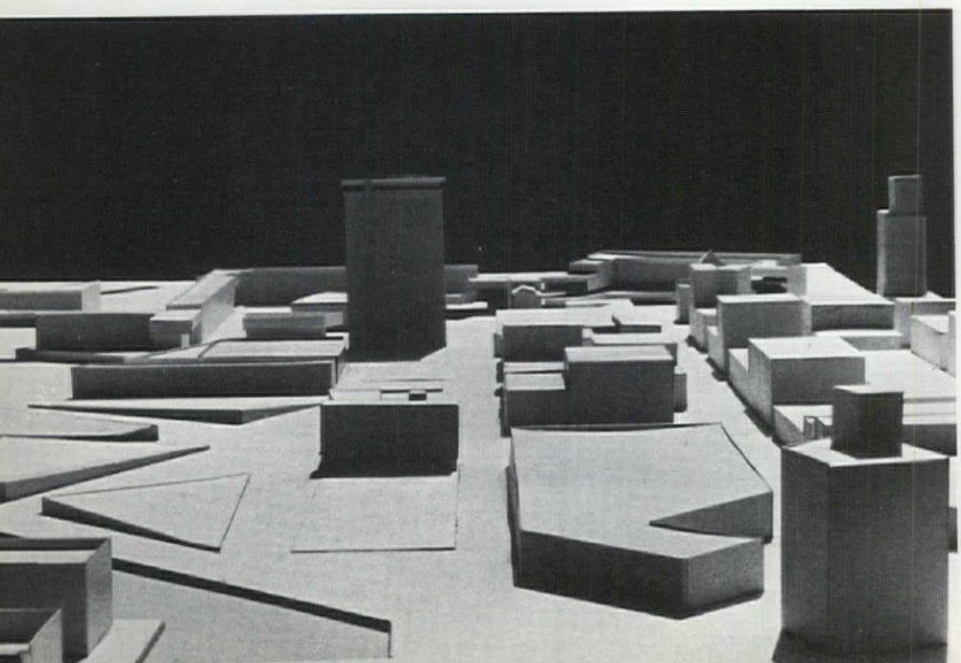
Schumacher, who most recently worked in Ithaca with the architectural firm of Wells and Koetter, received his Bachelor of Architecture from Cornell in 1963 and a Master of Architecture in 1966. Smith was awarded the degree of Bachelor of Architecture from Pratt Institute in June 1967.

To the right appear Schumacher's 1963 design (top) for Fiorello La Guardia High School, a New York school for the visual arts, and Smith's plan (bottom) for a Unitarian church, an entry for the Illuminating Engineering Society 1966 competition. The church emphasizes space by natural and artificial light, and the pieces of structure are fused into an indivisible symbolic unity.

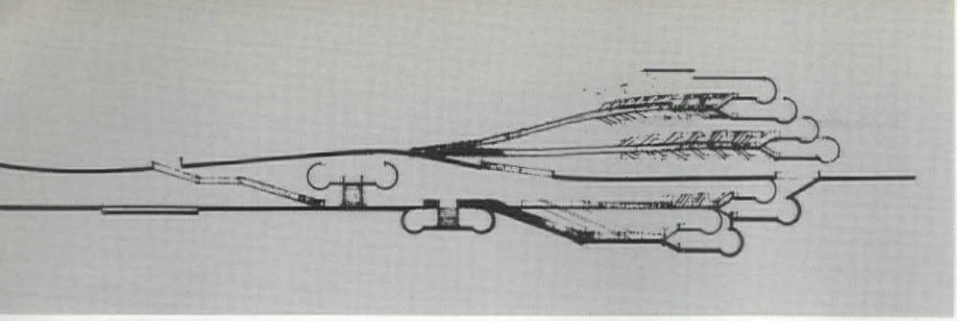


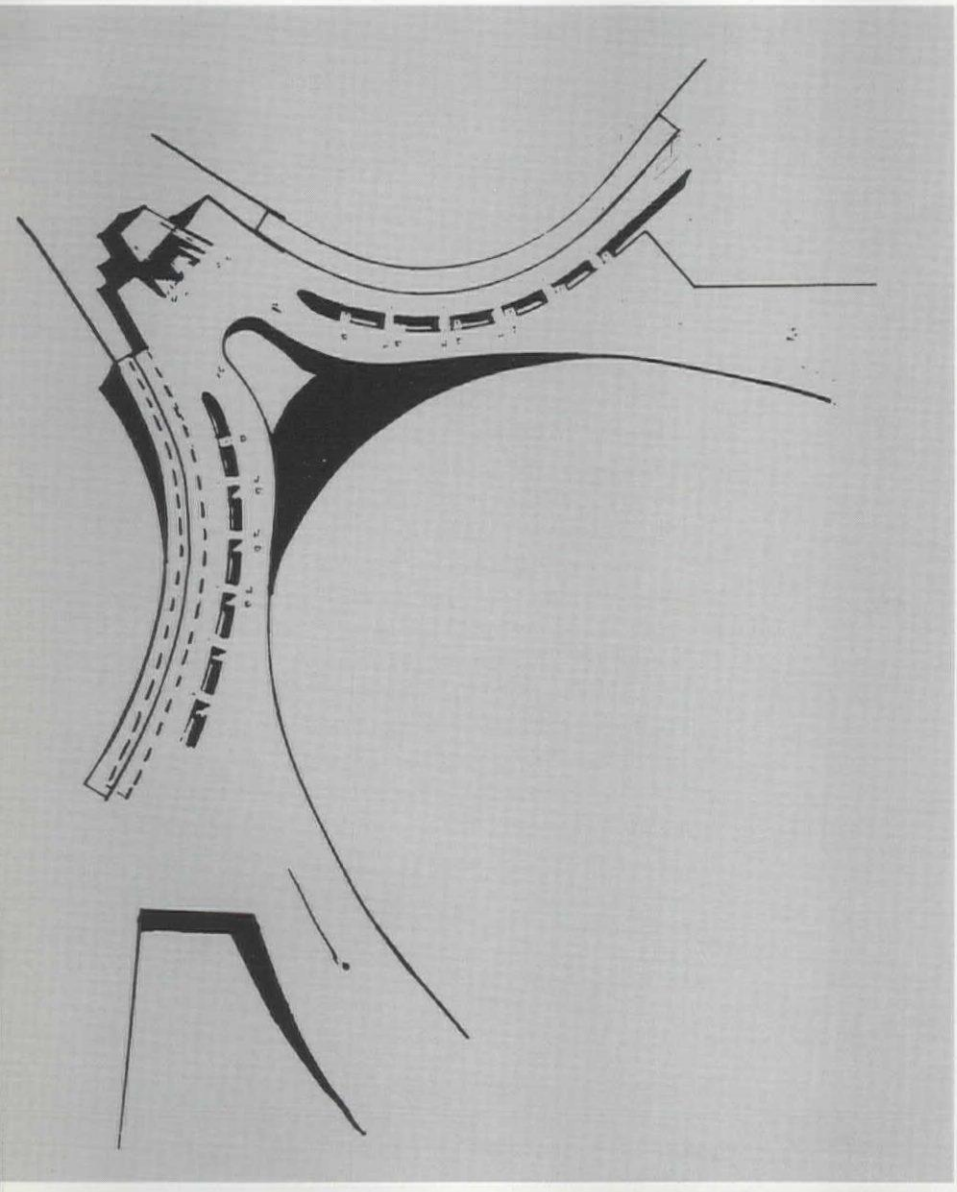


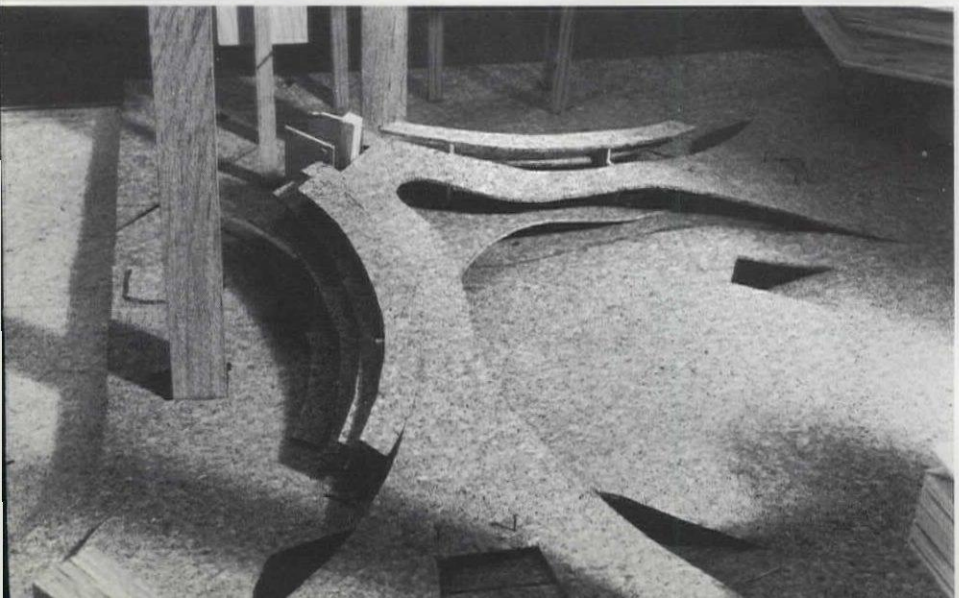




Included in Schumacher's 1964 design for Syracuse, N. Y., CBD Redevelopment is Clinton Square, a commercial complex. The site section looking west and the roof plan are shown at left, as well as a photographic view of the model.







A portion of Smith's recent project for a commuter railroad station at the foot of Wall and Water Streets in lower Manhattan is shown in both sectional and plan views. The model at bottom more clearly materializes the station's unusual design, which is a direct function of the dual movement which occurs. The activity, in other words, generates its own form.

A Warning From Scandinavia

"Tomorrow's buildings will be sold as commodities. The businessman-engineer-builder will be the leader in the architectural construction of the future; the architect will have lost his traditional role as overall designer and coodinator and will have become just a member of the team."

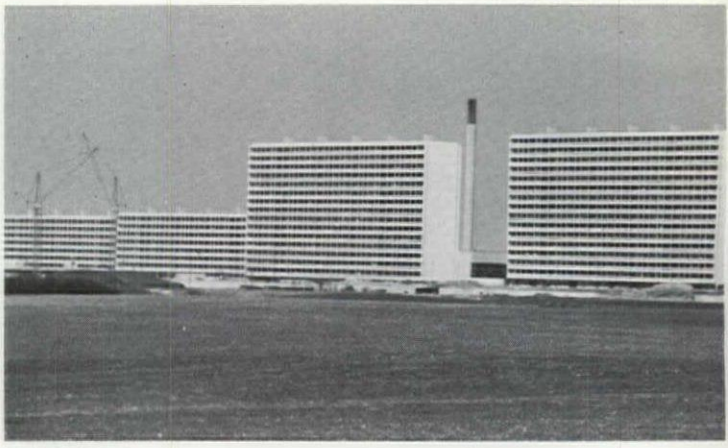


Photo above:
Wonderful Copenhagen was not like this before.
The Høje Gladsaxe high-risers are raising many a Danish eyebrow at the way things are shaping up.

BY KINGSBURY MARZOLF, AIA

Industrialization of the building process has been accelerating in the countries of Scandinavia during the last 15 years. The resulting technological problems and their solutions have been of interest to architects, engineers and builders in the United States for some time. But another factor that may eventually be of even more concern, particularly to American architects as we move towards further industrialization of building in this country, is the relationship of the Scandinavian architect to the changing building process.

The importance of this aspect has been growing in northern Europe as the amount and scale of industrialized building increases and as the problems of technique are gradually overcome. One leading engineer and producer of prefabricated concrete elements said four years ago that the technical problems had been solved, that it was all a matter of economics now. This perhaps oversimplified the matter; there are those who feel that the problems of joints in prefabricated buildings are yet to be solved. Nevertheless, the statement did at least indicate that the emphasis was shifting, and it continues to shift.

The author: Mr. Marzolf is assistant professor of architecture at the University of Michigan, from which he received a Horace H. Rackham faculty grant for a four-month study in Scandinavia on the subject about which he writes.

To the architect of Scandinavia, whose point of view is not the same as that of the producer, there is still another problem. That is how he, the architect, is to cope with, and control, a building evolution that by and large has been brought about and developed by forces and individuals other than himself and that shows signs of radically changing, and perhaps reducing, his role in his profession.

The building trades in Scandinavia have tradi-

tionally done work of high quality. Wood has been used for all types of buildings in these countries since the beginning of their history, especially in Finland, Norway and central and northern Sweden where the sensitive handling of this material can be seen today. From the stave churches of the 12th and 13th centuries to the present, the northern carpenters and cabinet makers have been masters of their art. Northern European masons have been erecting handsome brick buildings ever since this material was introduced from Lombardy in Italy over eight centuries ago, and it remains, along with wood, one of the most important building materials in Scandinavia, particularly in the southern parts where there has long been a shortage of wood.

The role of the architect (which in Scandinavia has always been more prestigious than that of his counterpart in the US) in perpetuating this quality has been substantial. He has been trained in his architectural schools to be both craftsman and designer. His knowledge of building materials and techniques and his artistic training have combined with an almost innate feeling about beauty and order, which seems to be a part of the Scandinavian character, to produce an architecture that even in the past, when continental styles from the south were often in vogue, has had a distinctive northern grace and dignity.

The post-World War II years brought new challenges and new opportunities to Scandinavian architects. Many went into allied fields such as the designing of furniture, textiles and household articles. The result has been to bring the design level of almost everything the Scandinavian uses to a very high quality indeed—a fact that can be attested to by anyone who has wandered through the department stores and design shops of the capital cities. Then as the building industry revived, more and more architects were able to obtain work in their own profession. But they were to find that the war had made some significant changes in the building industry.

Money and labor, both often in short supply in these countries, were needed elsewhere, particularly to support the rapid increase in industrialization necessary to compete with goods to trade in the world market. This had a two-pronged effect. On one hand, by bringing workers into the cities from the ever more efficient farms, it created a massive housing shortage; and on the other, the flight of labor to the higher paying factory jobs robbed the building industry of those skilled building tradesmen necessary to meet the housing shortage.

The scale of this housing shortage is beyond anything we in the US have experienced. One quarter of Denmark's 4½ million citizens live in Copenhagen, its capital. Of Scandinavia's total population of some 20 million, about one-fifth live in five cities—Copenhagen, Stockholm, Oslo, Helsinki and Gothenburg—and this percentage is increasing. Add this to the already extant prewar housing shortage. Even today, fantastic as it may seem, it can take up to six or seven years for a young Swedish couple to find an apartment in Stockholm or Gothenburg.

In Denmark, where industrialization of building really got underway in the early 1950s, there are a number of surprisingly large and quite successful contracting firms. These companies build not only at home, where they have traditionally constructed the large buildings and industrial plants but overseas, where they build dams, bridges, railroads, highways and port facilities as well as other more architectural projects. These are usually engineering companies as well as builders, and they maintain large professional staffs. They saw early that to produce at a higher rate they must keep their labor costs down. Their businesses were competing for workmen with industries that could guarantee their employees stable indoor work, in contrast to the seasonal and often unstable outdoor work of the building industry of northern Europe with its cold, wet winters.

These firms had to develop new approaches to building. They not only had the professional men on their staffs who investigated these new approaches but they had the strong financial base necessary to invest in new tools and equipment. They reasoned that if they could industrially construct more of the building indoors, they could better control quality, reduce man-hours per project and make the industry more attractive to the semiskilled laborers who were in somewhat greater supply than the skilled workmen upon which the industry had traditionally relied. The skilled carpenters could still be used to construct forms, act as foremen and fill other supervisory jobs.

So these companies, along with some individual consulting engineers and architects (rather few of the latter), began the development of industrialized building. Apartment housing was the first, and remains even today the major, target of their efforts. The obvious need for this type of building was conveniently coupled with the fact that apartment housing, with its relatively standard requirements, was a natural for the use of prefabricated building units produced in quantity. The material chosen was concrete since cement was in good supply in these countries, and steel was expensive. The labor unions have been generally cooperative because they prefer industrialization to the importing of foreign labor, which might threaten their jobs if a downturn in the national economies were to occur.

The new industry in Denmark was successful and led the way for others. Sweden came second in this development with a somewhat uneven growth starting in the mid and late 1950s. A number of Swedish companies of varying size, noting the success of their Danish neighbors, jumped into the business; some did not survive. This was due to a number of circumstances, including size, lack of investment, poor coordination and a proliferation of different systems.

In fact, the use of industrialized building systems in Sweden is just now in a gradual upturn after a four-year period of decline which bottomed out in 1962. Norway and Finland have been behind Sweden and Denmark for a variety of reasons, including a lack of capital, a more adequate labor supply, and transportation problems. In Norway, for instance, the lack (until quite recently) of good roads has hampered this development because the factories and building sites are located on the fringes of the cities, and the heavy concrete elements need large trucks and firm roadbeds to be transported. Finland's architecture tends to be more individual in style than that of the other countries and has so far made relatively less use of industrialized building methods, though the industry is growing quite fast now

Nesting pens is their colloquial name in Scandinavia. Top and center, complexes on the Swedish west coast; bottom, high-riser by "Building for Youth, Inc.", Oslo.

with about 20 percent of Finnish apartments being built with at least some use of prefabricated elements.

The early buildings done by industrialized building techniques tend today to look a little drab and are often badly weathered, with flat surfaces streaked from water. The gain in technical know-how and the increasing involvement of the architect in the design of prefabricated elements as well as the buildings themselves are beginning to produce a noticeable change. Examples from the last two or three years show a greater attempt to design the elements with both initial and long-term appearances taken into account. The surface materials are varied, including exposed aggregates in white, gray and intermediate colors. The colored panels, resulting from the architect's understandable desire to banish dullness, are often too colorful. Still, most surfaces are white or light gray, and the most notable recent changes have been in the configuration of the surfaces, with recessed and protruding patterns or ridges to divert and channel the water which tends to streak these structures. These later designs control the streaks and use them to emphasize surface depth.

Despite what one might call "surface appearances," the architect still plays a smaller role in all this than one might imagine. One is impressed by how many architects working in this field comment on "having to learn about" this type of building. The real innovations and the technical developments still come from the engineering-building companies, some of which employ architects to design the prefabricated elements and the buildings in which they will be used. Nearly all buildings for industry in Denmark today, for instance, are constructed of prefabricated elements, many of these brought straight from the manufacturer without further design consultation. About one-fifth of Denmark's apartments are built entirely of prefabricated elements, and an additional large percentage make use of some industrialized building methods.

The types of prefabricated elements used in apartment construction can be divided into two major categories. One is the so-called "open" system, which consists of standardized wall and floor panels that can literally be ordered from a catalog from a number of companies. These are based on a standard 120-centimeter (4-ft.) width for floor and interior bearing panels.

In the second, or "closed," system, components are altered or adapted for each job within the limits of the particular method developed by that individual manufacturer. Firms using the closed system do work that is more custom-designed in character, tend to use larger elements such as room-size floor and wall panels and have been developers of the more spectacular aspects of this industry, such as completely prefabricated bathroom units. At one time these two systems were a source of much argument and disagreement over their relative merits. Today, it is pretty well recognized that each has a part to play and that they will continue to coexist.

With the use of either system, it is easily seen how the architect's responsibility can be, and in fact is, reduced. The architects for a job often are practically (if not literally) working for the building-engineering company. Many times the arrangements are made directly between the builder and the client, with the architect not-so-gently moved aside from his position of coordinator of the overall project, or at least being in the position of not knowing the answers to the problems which come up during planning and construction.

Paradoxically, in many ways his main task is like that of the 19th century architect working in a revival style: He designs the exterior. The elements for the exterior, usually not load-bearing, are more flexible in design and, as long as they fit the basic system being used, may very well be made by a firm other than the one constructing the floor and interior wall panels. A number of firms produce all the elements for an apartment building; others just specific items.

In designing a building using one of these systems, even the plan cannot be changed very much. Using the open system, a control is imposed by the cost of the elements themselves. Whereas the floor panels can be obtained in one-foot (30-cm.) increments up to about 16 feet in length, the standard 4-foot width for both inside partitions and floors is cheapest; widening or narrowing the panel by one foot adds about 25 percent to the cost of the element. Many architects find this new modular development restricting. They argue that it is not a 1-foot module but in effect (because of cost) a 4-foot module and that it wastes space. Others feel that it is increasing the size of the dwelling units (which by American standards are still small).

In Denmark, since April 1, 1964, the law requires that all rental housing (and that is most of it) must be designed on a 30-centimeter module. This was done ostensibly to help standardize building in general, but it has had the additional effect of encouraging the development of industrialized building and, of course, its standardization. This means that the open and closed systems tend to differ now more in construction techniques than in final product.

Other countries are working with the modular system, too. Sweden, for example, uses the 30-centimeter module in all its government buildings now and produces much with the 4-foot-wide

A cursory look at construction methods in Scandinavia. Uppermost photo offers glance at the Allbeton Method in which the cross walls are cast on a finished floor slab. The wall forms are stripped and the room-size floor forms are inserted. The latter are mounted on special carriages to permit quick placing in each wall-defined space. Then a new slab is cast. Note in photo directly above the precast spiral staircase, and in other photos the handling of premade components —and the storage frames used in both the transport of the units and their safe keeping at the construction site.

panels but watches the Danish experiment of legislating design modules with some skepticism, and at this time has no plans to follow suit.

It must be noted, however, that the governments of the Scandinavian countries play a much larger part in the control of building activity than we are probably willing to accept in the US. Despite what some may think, the governments do not control esthetic design; such control as does exist stems from local covenants or regulations in certain residential areas, much as we do here.

But the governments do have control over building permits when the labor market has been particularly tight. Denmark, for instance, has suspended all or some types of building construction simply by holding up the building permits for new starts until things ease off. There are those in Denmark who feel that the government is frankly controlling the economy by controlling building, which is one of the biggest industries in any of these countries. However, this situation should be seen in the light of the fact that the largest of these countries has only some 7 million people, and their economies are tightly bound to their international trade standing. They cannot, as easily as a larger country, absorb radical variations in their internal economic situation.

The architects of Scandinavia tend to be a bit wary about the implications of these developments in the building industry. They appreciate the fact that the housing shortage must be met and that this is one way to work towards solving it. In trying to learn about this new technique and gain responsibility in it, some perhaps seem to feel as if they have a tiger by the tail; it is difficult holding on, but it would be worse if they let go.

As the projects become larger in quantity and in scale, the problems become more apparent. An occasional group of precast concrete buildings in a city of from 400,000 to 1.5 million (the size of Scandinavia's five largest) was easily absorbed. But now they are blossoming everywhere, and are changing the faces of these cities, particularly the suburbs which not long ago were open farm land or forest. The architect has a natural interest in the planning of the buildings. He is also interested in the planning of the whole project, the number, size and positioning of the buildings on the site.

The nature of this industrialized building system requires that an element be used in quantity in order to be economical. The more used the better; 400-500 living units in a project are considered minimum to make the use of prefabricated elements feasible. This has led, particularly over the last three to four years, to ever more ambitious and extensive projects, where more and larger buildings are built in one location using the same building system.

The leading example of this today is at Høje Gladsaxe, in a suburb north of Copenhagen, where five 16-story and two 9-story long, thin apartment buildings, containing some 1,900 living units in all, march in a nearly straight line across the skyline. It is an impressive sight from afar, as seen from the large meadowlike park it overlooks, and up close the construction details are fine, but seen at a middle distance, while wandering around through its vast parking lots, one is depressed by its ponderous and unfriendly countenance.

Apparently many Danish citizens react in the same way, accustomed as they are to a far more intimate and human scale in their architecture. They are beginning to wonder if this is to be the answer to their housing problems, and if so, is it the right answer? Perhaps their reaction partly explains the phenomenon that, although there is a shortage of land in Denmark and what is available is very expensive, single-family houses make up 60 percent of all housing built in Denmark, and the percentage is increasing. One is not easily aware of this latter point because the imposing size and number of the new apartment buildings are far more noticeable.

Left to his own devices, the builder will construct as many of these projects as the market will absorb, and it seems quite obvious—in some cases by their own admission—that many builders are not particularly concerned about the esthetic and psychological aspects of all this but are clearly in business to make a profit. In one case, an architect in Sweden working as the chief designer for a consulting firm, which is controlled by municipally owned building companies in a large city, noted the pressure. He explained that a particular apartment house which he had designed for the parent building company had turned out to be very popular. The building company wanted his permission to build more than the original dozen or so; in fact, he felt, they would have built them all over the place. Surprisingly, as designer—though an employee of theirs in a sense—he had the right to refuse, and not so surprisingly, he did.

This example serves to illustrate the dilemma of the architect in practice today. Even where he has a position of authority and responsibility, he is continually faced with the fact that the builders and engineers are the real leaders in industrialized building. This same Swedish practitioner made the strongest case for the necessity for architects to become educated in these new techniques, which use labor and materials in new ways, so that architecture would not completely lose its artistic side and become purely engineering. Many of his Scandinavian colleagues agreed and wondered if the schools of architec-

ture were doing their share in this educational process.

Upon visiting the 10 schools in Scandinavia which have programs in architecture and civil engineering, or both, one is struck by the difference in emphasis each places on teaching this new building technology. The schools of architecture fall into two general types: those which are part of a fine arts academy and those which are connected with a technical university. All the civil engineering schools are under the latter. The type of affiliation of the architectural school does not seem to bear any relation to the emphasis placed on industrialized building. Generally, the curriculum in the civil engineering schools offers more about this subject than that of the architectural schools. And, by and large, the schools of those countries doing the most construction by means of these methods have concentrated most on the subject in their courses.

Of all the schools visited, the one which seemed to be attacking the problem with the most vigor was Denmark's Engineering Academy (Danmarks Ingeniørakademi). This school is a recent (1957) offshoot from Denmark's much older, and more traditional, Technical University (Danmarks Tekniske Højskole). It grants degrees in engineering in $3^1/_2$ years, instead of the Technical University's $4^1/_2$, and tends to stress the more practical aspects of engineering, with less emphasis on the theoretical. The graduate of the Engineering Academy is still a civil engineer, although there is a difference in status from that of the graduate of the Technical University which, in the complexities of Scandinavian degrees and titles, may be a little difficult for a foreigner to discern.

The vigor of the relatively young staff of the Engineering Academy is impressive, as it projects an enthusiasm and breadth of outlook which was not found in quite this degree in other schools visited in northern Europe. In fact, one staff member commented that the faculty trying to base their teaching approach on American methods, with emphasis on tight schedules, small classes and close teacher-student contact, in contrast to the more typically European system of large lecture classes, little contact between students and teachers, and a somewhat more flexible or casual approach to class attendance and specific scheduling.

Denmark's school of architecture, the Royal Academy of Fine Arts (Det Kongelige Akademi for de Skønne Kunster), has made strides in meeting the challenge of the industrial movement in building but by its own admission needs more time to cover this problem. The third-year design problem has for a long time been concerned with multifamily dwelling, built traditionally until recently.

Now, however, the second semester investigates more experimental approaches to the building of apartments. The professor in charge of teaching about structures, Poul Kjaergaard, has introduced much material about industrialized building during the last decade, but he seems to be hampered, as in most American schools of architecture, by a lack of understanding of the need for knowledge in this area on the part of the school as a whole; consequently, the subject suffers from a lack of scheduled time. The assistant to the head of the architecture department said, "We would like to have more time for technology."

Other schools of architecture and engineering generally show less time being devoted to the study of industrialized building technology than in the Danish schools mentioned. In Sweden at the Stockholm Technical University (there are also technical universities at Gothenburg and Lund), some emphasis is being placed upon this subject by some of the young faculty within the framework of the existing courses in architecture. Here, much like Denmark's Engineering Academy, the teachers enjoy a degree of independence not found in other architectural institutions, having moved away from the professor-and-atelier approach. The Royal Academy in Stockholm serves a somewhat different purpose from the one in Copenhagen, in that it acts as a sort of graduate school for the architectural students of the technical universities. But it is considered by many Swedish architects to be too much buried in the past, thus of questionable value in the education of architects for today's problems.

In the Swedish schools of architecture and engineering, and to a lesser extent in those of Norway and Finland, there seems to be a general feeling that the amount of material being presented about industrialized building techniques is inadequate, and attempts are under way to increase it by augmenting existing courses. Norway's Technical University in Trondheim (teaching both architecture and engineering) touches on the subject of precast concrete work in its present courses, and in addition is probably doing more research in the role of prefabricated wood building elements than any other Scandinavian school. But the overall view is that the schools lag behind practice in each country, with the architectural schools lagging in turn behind the engineering schools.

The overwhelming impression one receives from architects and engineers in Scandinavia who are engaged in practice or education, or like many of them in both, is that this problem challenges (or threatens) the entire structure of these professions. The architect is usually quick to admit that his education and experience put him at

a disadvantage in working with industrialized building techniques. He no longer learns the "craft" of building with these methods, nor are there any longer the artisans who can be depended upon to save a job from that poor detailing which can come from the less experienced architect.

Someone must completely and accurately detail these buildings before construction ever starts, and this job falls to the building firm and his staff of engineers. Even the engineer apparently gains a great part of his knowledge on this subject after he gets into practice, but at least he gets into a situation where he can and does learn about it.

The architect in his office, who produces a set of drawings complete with details for a traditional building and puts it out for bids, finds himself 1) up against a constantly rising inflation in the building industry that he cannot always accurately gauge and 2) confronted by the feeling of some members of the public that he is too expensive. The attitude of the public is aggravated, no doubt, by the client who receives a firm price from a builder-engineer, who—on the basis of preliminary drawings done by an architect (the builder's or the client's)—uses the company's particular system and comes up with the complete package. The architect need not draw details; there are no shop drawings. Often the architect just "does" the architecture in its narrowest sense, perhaps just the façades, or in the case of apartments, the floor plans within the limits described.

The Scandinavian architect clearly wants to get on top of this problem. He feels that he has a definite role to play in the design of the building elements, the building layouts and in the overall planning of large building projects. He feels that the engineer lacks the sensitivity and breadth of outlook necessary to produce good architecture as well as just properly constructed buildings.

The architect's problem, according to Professor Kjaergaard, is to transfer the quality of handicraft to industrialized building at a reasonable price. He cites the furniture industry as an example of success in this approach. In an interview just before his death, the late Kay Fisker, one of Denmark's greatest architects, although affirming his continuing affection for brick (which he used perhaps better than any other contemporary Scandinavian designer) recognized that it was being priced out of use by labor costs. He approved of the attempts to rationalize and industrialize the manufacturing and erection of this material but felt that concrete was certainly winning out now. He was convinced that the architect must help find a more human scale in the use of these concrete building elements.

In Finland, architect Aarne Ervi, creator of Tapiola and now city planner of Helsinki, felt that the use of industrialized building methods, though rather limited now in his country, was on the increase and he stressed the need for cooperation between the architect and engineer. This was stressed by many other architects as well.

Scandinavian engineers tend to have more variety in their approach to this relationship with the architect. They have traditionally worked as consultants for architects, and it is easy to understand the appeal they see in the new relative re-

Finns, Norwegians and Swedes have hills and evergreen forests that can help soften stark look of high-risers. Flat Denmark is handicapped. Below, suburban Stockholm. Eight-and four-story "blocks" with 1,100 apartments.

sponsibilities resulting from these new building techniques. On some projects in industrialized building, the architect's fee is half that of the engineer. Some engineers, with more than average insight into the workings of the architect's temperament and peculiar abilities, feel that the architect should be playing a stronger role. One of these engineers, Owe Eriksson, who was closely involved in the structural design of Høje Gladsaxe's high-rise apartments, commented that the "machine shows" in many of these projects.

There are, however, a disconcerting number of engineers and builders who feel that the future lies in another direction. Engineer Vagn Ussing, co-owner and developer of an important Danish company producing prefabricated concrete factory buildings and single-family houses, states quite unequivocally that in the future architects will either be employees or consultants of companies such as his. His staff today already includes architects who have helped him develop his highly sophisticated industrial building components, all designed to an 8-foot width but with a great variety in height and opening treatment, as well as his single-family house designs. The houses, which are detached but have an enclosed court with a wall that abuts the next house, are to be sold complete with land and serviced by his company, like an automobile! This is the future as he sees it, and to him the outlook is quite clear.

Tomorrow's buildings will be sold as commodities. The businessman-engineer-builder will be the leader in the architectural construction of the future; the architect will have lost his traditional role as overall designer and coordinator and will have become just a member of the team, and not the leading member at that. This day that he envisions may not be just around the corner, but there is evidence that things are moving in this direction in northern Europe.

Although, in general, most prefabricated building systems have not saved money over traditional methods, they have saved time and labor, which is what they were meant to do. The long-term view is that as these systems become better organized and further rationalized, as more workmen are trained to work with them, and as the technical problems are worked out, they will in time save money also. There seems to be no hope that this tide will be reversed, and in fact no one, not even the greatest critics of the system, really expects nor even wants it to be. The building firms have invested a great deal in this development and the governments are becoming increasingly involved, particularly in Denmark.

The trend is definitely toward larger projects, and the extensive control of urban and suburban land use by the municipal governments of Scandinavia makes this type of project easier to realize than it usually would be in American cities. The prospect is, therefore, even more white concrete blocks on the horizon, gradually changing the scale of the urban environment. To the Scandinavian, who has become accustomed to living in some of the world's most attractive urban milieus, this will come as a shock, as witnessed by some of the reaction to Høje Gladsaxe. The architect, in his struggle to maintain a human scale, may find the public on his side; but the press of labor shortage, housing shortage and mushrooming technology will more than offset that.

The urban scale he has known is falling victim to a need resulting from the economic and social changes taking place in his country which, fortunately or unfortunately, is being fulfilled by the revolution in building technology. Circumstances in the US, while differing in degree and in stage of development, show every sign of drawing its people eventually along this same path.

To the architect of the industrialized nation, the challenge is clear. He will not be able to "beat" this revolution. He must, therefore, be prepared to "join" it, in the sense that he must learn about it and master it. If he really wants to be in a commanding position in this field, the architect must acquire a good knowledge of how the elements are made and erected. Only then can he become involved in the design of the systems themselves and perhaps exert a meaningful influence on their development. It would also be an advantage for him to gain an understanding of the economic aspects of these systems and how they affect the business of building. But the very least he can get by with is to learn how to use the existing systems, how they alter the building sequence and how they affect coordination with mechanical services.

The Scandinavian architect is making progress in learning about these things. He is involved in many types of research, directly and indirectly, on industrialized building. There are several groups, private and governmental, studying building planning, modular design and coordination, rationalization of existing and new building methods, uses of the computer (including completely computerized specification writing) and generally looking into ways of speeding up and simplifying the building process.

The architect not involved in such research receives reports through his fine and comprehensive professional and technical journals. But the question which he still faces (and which we will one day face) is whether, in view of his education and experience, his natural tendency to rely on his present method of doing things and his traditional approach to his role, he is learning fast enough. □

"By aiming toward perfection,

the architect has missed and misunderstood the life

for which his building was designed."

An Architecture of Purpose

BY JOHN WADE, AIA

Those of us who are architects devote ourselves to architecture with some passion. Architecture, we have learned, is the perfecting of building; the building must have its own integrity; the architect must have his.

In order to approach such perfection, we spend a great part of our professional lives trying to decide what is particularly right and good for a particular building. We spend, if we are thoughtful, an equal part of our lives worrying about the bases for our decisions. Many decisions must be made before we have designed a building. What is involved in each decision? What enables us to decide? What makes each decision viable? How do we know when something is *good*?

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The simplest answer to these questions is that long practice in deciding is the basis for good decisions. Experience provides a richness of exposure to the materials of architecture; it provides a wealth of systems by which those materials can be ordered. Practice in deciding makes a habitual sensitivity of eye and mind essential to good decisions.

When the architect is working with diagrammatic thumbnail-size sketches, experience can clothe them with the fabric of a hundred possibilities, suggesting here in diagram that one sketch will lead to a well-cut building where another will not. Deciding, constantly deciding, drives firm into memory those choices that were successful and those that failed. The architect is thus shaped by his choices just as surely as his choices shape his architecture.

As simple as this answer is, it has not been adequate for many architects. The hard-held tough ideologies of various schools of architectural thought, both now and in the recent past, attest to the inadequacy of experience as a basis for decision. Experience must be propped and underpinned by belief. If a "way" can be found, more right than other ways, and if the architect can accept the overwhelming rightness of that way, then decision is simplified. Rightness justifies itself.

Neo-classicism, functionalism, organicism, internationalism and New Brutalism have all had their times when their adherents knew what was right and correct. Such ideologies come and go. Edward T. Hall suggests in *The Silent Language* that every cultural development moves through three stages: the informal, the technical and the formal. In the informal stage, a new thing is discovered and is found by experience to satisfy a need. In the technical stage, this new discovery is explained and rationalized. In the formal stage, the discovery is adopted within the culture as "the way" and is taught by command. Let us follow the development of such an ideology in architecture.

Frank Lloyd Wright developed a particular manner of using materials that best served his purpose of relating the building closely to its site (informal stage). This usage is explained as being in the nature of materials, e.g., since stone occurs in horizontal strata in nature, its strata should be laid horizontally in the building's wall in order to relate the structure to its site (technical stage). Finally, the young architect is taught or commanded, "Be true to the nature of materials!" without explanation (formal stage). Wright's system of ordering was, by this sequence, converted into an ideology.

If a culture were dominated by a single ideology, there would be no reason within the culture to object. Since all architects would be following "the way," ideology would not even be evident.

Today, unfortunately, we cannot be so happy nor so innocent. We have experienced many conflicting and contradictory ideologies.

As with revealed religions, where there are different ways to heaven, each claiming to be the only true way, and doubt is raised by the counterclaims whether any one be true, so with ideology in architecture. When there exist a multitude of "right" ways and no criterion exists for choice, the very system of ideological thought is placed in doubt. So went the battle of the styles. So, too, must go any present-day claim to rightness. Two wrongs, as the saying goes, don't make a right; by contrast, two ideological rights *do* make a wrong!

By arguing against the ideological bases for decision, I am not, by this, damning any system of order that ideology supports. Ordering systems are essential tools of the architect; my argument is that ideology tends to limit the number of such systems that the architect has available for use. The architect must be free to choose any ordering system that will best serve his and his client's purposes.

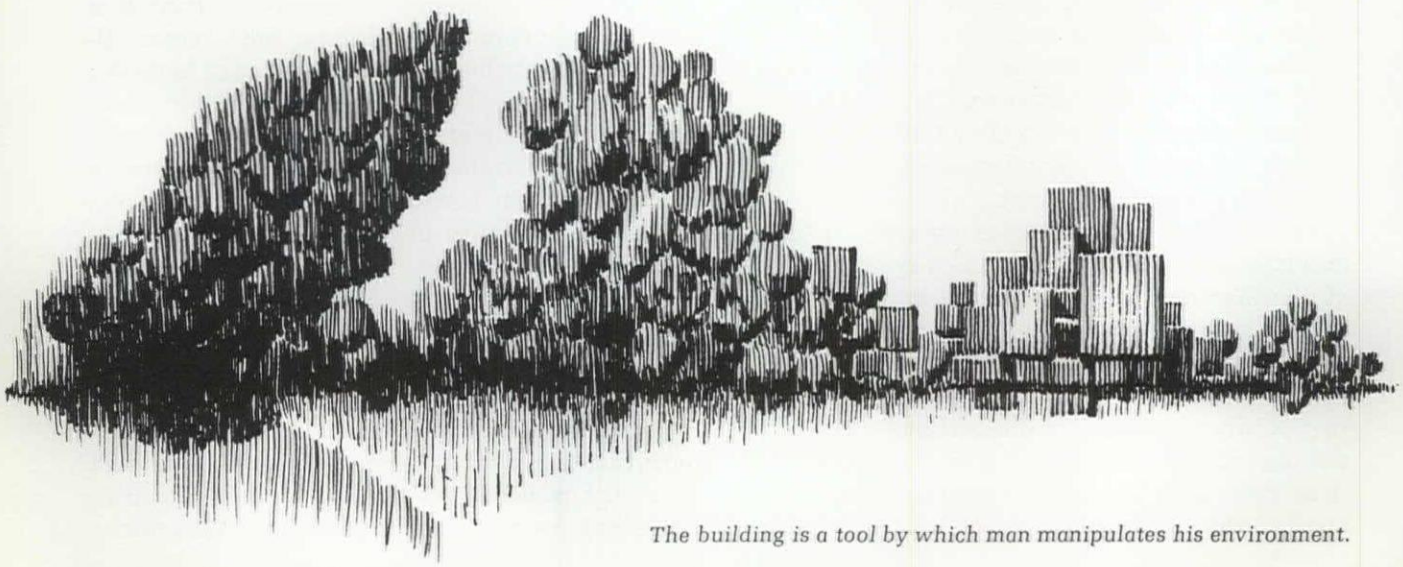
When such freedom is denied by ideology, we will also find that the architect has isolated his building, treating it as an abstract entity. By aiming toward perfection, according to the command of ideology, he has missed and misunderstood the life for which his building was supposedly designed. Human life is imperfect; it undergoes continuous change. Perfection for life is stasis, crystallization, death. I believe that we must take take C. Northcote Parkinson quite seriously when he writes, "It is now known that a perfection of planned layout is achieved only by institutions on the point of collapse." If we are to escape barrenness, we must aim toward completeness, not toward perfection.

Only in use is the building complete. The play, not the stage set, is the thing! In use, the building acquires a life and significance that our imaginations could not have provided. Whatever ever-changing play is performed on its boards charges those very boards with a significance that the isolated idea of that building could never have had. If any person is not persuaded of this, let him wander alone through a shopping center on a Sunday morning or through a college campus during vacation. So pervasive is the usual hum of human events that we require their absence to remind us of their importance to architecture.

The building's occupants and their purposes are, as we shall see presently, vital to architecture. We shall discuss purposes in some detail, but first we must make a discrimination. Function and functionalism have been so important to architectural thought since the mid-19th century that the hurried reader might mistake our discussion of purpose for a discussion of function or functionalism in a new disguise. Certainly, function is related to purpose, but function is more abstract, more general, and seems to leave out the wholeness of the human being. Purpose includes functions in its meaning, but function, considered alone, fragments man and omits purpose.

In discussing purpose, we are not discussing functionalism at all. As David Pye has so beautifully shown in *The Nature of Design,* functionalism is an efficiency concept. "It seems to be invariably true," he says, "that those characteristics which lead people to call a design functional are derived from the requirements of economy and not of use." We might very well *choose* to include functionalism as one of our ordering concepts (most of us nowadays do), but a discussion of purpose in architecture turns its attention to what should be done—not how well or cheaply it is accomplished.

We have described the building as a setting for man's purposes and as a background for his



The building is a tool by which man manipulates his environment.

activities. We have said that man completes the building. The reverse of this statement is also true: The building completes man; it is a tool by which he manipulates his environment, altering the environment to his purposes. In Marshall McLuhan's sense, "Housing as shelter is an extension of our bodily heat-control mechanism—a collective skin or garment." And "clothing and housing . . . are media of communication, first of all, in the sense that they shape and rearrange the patterns of human association and community." The building is also an extension of man's sensory and manipulative apparatus, enabling man to better perform actions toward the fulfillment of his purposes.

Every such extension, every such tool, whether as complex as a building or as uncomplicated as a hammer, must meet three criteria. To my best knowledge, they were first stated by Isaac Asimov in writing about that most complicated tool of the future: a robot. Asimov's work *I, Robot* is fiction, and perhaps because of that fact, the criteria have not been taken seriously, nor applied explicitly to tools today. But they are simple enough and basic; they exist in a hierarchy of precedence.

Here they are freely restated to better apply to today's nonanimate and nonconscious tools:

1. Each must maintain and, where possible, positively support human life.

2. Each must serve the human purposes for which it is designed unless doing so conflicts with the first criterion.

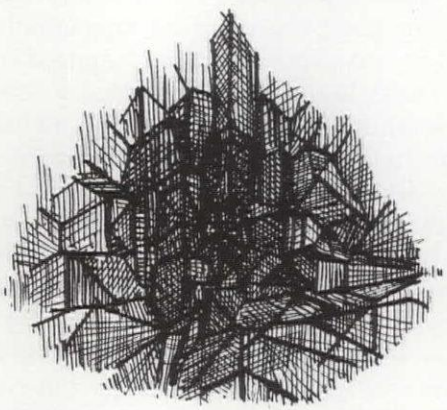
3. Each must maintain itself ready for use, unless doing so conflicts with the first or second criterion.

These form a simple sequence: Maintain the existence of man, the purposer; maintain his purposes; maintain the tool as the means to the accomplishment of his purposes.

The sequence assumes first that any individual purpose is subordinate and secondary in importance to the continued live existence of the man or group of men holding that purpose. Death destroys purpose as well as purposer. In addition, the continued live existence of each and every member of society is a stronger consideration than the accomplishment of any single purpose within the society. Both of these statements obviously require modification and the noting of exceptions and circumstances wherein the truth of the statement is denied, but in general we accept the validity of these assumptions.

The first part of the first criterion, then, can be restated in one word: safety. It is the negative part of the criterion; where possible, the latter also includes positive correlatives of safety such as health, sanity and the promoting of the active life of the purposer.

Next, the tool must serve the purposes of man. This is simple to say but, in a tool at the level of complexity of a building, difficult to accomplish adequately. Purposes are multifold; they are not easily articulated; and where they exist in a hierarchical structure or as part of an elaborate purpose complex, they are nearly impossible even to describe. For example, a building might need to serve the purposes implied by the following terms: a shelter, a meeting place and social instrument, an economic commodity, a symbol of accomplishment or affluence and a work of art. Since a complete list of purposes is so hard to construct, the architect's design process must function to elicit as many as possible. Insofar as purposes are known, any tool is a crystallization of the purposes of its user at the time of its design and construction.



Where purposes exist as part of an elaborate complex they are nearly impossible to describe.

Last, the tool must be ready to serve these purposes. It must be strong and hard enough to withstand use; it must resist rust and rot; it must be specialized enough to serve the several uses for which it is intended.

The tool's availability is affected by change. Change can take place in the user, in his purposes, in the tool and in the environment of use. Any such change away from the designed-in condition contains the chance of reducing the tool's availability or effectiveness. Insofar as possible, the tool's design must anticipate possible change over the expected span of its use.

Now let us turn to examine the criteria in more detail. As we do so, we shall discover that each is rich in its implications for design. Since our primary concern here is with building design, let us begin to speak of the building instead of the more general tool.

The First Criterion (negative): The Maintenance of Human Life—As we noted earlier, the negative part can be summarized by the word safety. What, then, is implied by safety? It will be apparent that to achieve safety for a building's users, we must guard against five conditions:

1. The ordinary use of the building must not create hazard for the user. He must be protected from falls, cuts and crushing, as the building exists in its ordinary usable condition. Because the working of structures and mechanisms is not understood by many building users, the architect has the further obligation to protect the user from structural or mechanical failure. The architect cannot assume that a user will recognize danger signs in time to render himself safe.

2. The human being is limited in his ability to perceive simultaneous sensations and to sort out appropriate simultaneous courses of action. For example, opening a door might so engage the user's attention that being required to step downward at the same instant could easily cause a fall. Design must therefore be concerned with simultaneity of stimuli and of required action and limit both in accord with human tolerances.

3. Design should be such that the individual using the building is, without conscious effort, continuously aware of himself in relation to his surroundings and constantly aware of the degree of security in which he exists at any moment. Need for awareness, of course, varies from minimum awareness under maximum security (e.g., asleep in bed) to maximum awareness under minimum security (e.g., crossing a busy street against traffic).

Design must also anticipate times of stress or environmental extremes when the building user's awareness or clarity of perception is reduced. The entrance walk to a building is best designed for safety by imagining it at night in a blinding thunderstorm with the building user running pell-mell from his automobile toward the protection of the building.

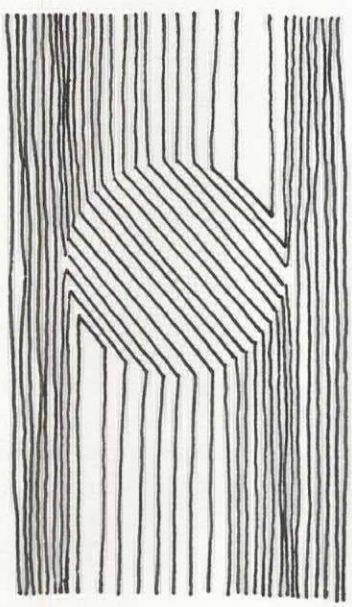
4. The building user must be able to predict the consequence of his actions, but without those actions becoming so repetitive or their consequence so sure that reduction of awareness takes place. Ordinary usage within the entire culture leads each individual toward certain expectations in building use. He is led to expect that doors will swing *into* a room, that their knobs will be at a typical height, that a certain degree of push is required for their operation. Insensitive design can give cues leading to inappropriate expectation and hazard to the user. The building user is trained by his use of the building to expect sequences of events. Repetitive motions lead to the expectation that the same rhythm will be repeated. Break such a rhythm by an imperceptible degree, and kill a building user.

Even under a condition of failure, predictive ability should remain high; the "fail-safe" principle states that a failure should be toward the direction of continuity of state and least required action by the user, rather than toward a radical change of state and the requirement of violent action. The failure of an automobile throttle should cause the engine to stop rather than speed. The failure of a braking system should permit the automobile to coast rather than cause a violent stop.

5. Finally, the building must not so efficiently perform actions for its user that his ability to act for himself is quite impaired. Habitual and exclusive use of powered transportation can result in loss of muscular strength and endurance if other exercise is not obtained. That impairment can occur with such long use is not in question; our concern here is not with the fact but with the degree.

The First Criterion (positive): The Active Support of Life—Having examined the negative part of the first criterion, let us turn to its positive part. Human life is a continuity of conscious interaction between a human organism and its environment. If we can describe this interaction in some detail, we will know better how to support it. We shall limit our discussion to thoughtful action responsive to the organism's total purposes; we will omit consideration of reflex action and action that seeks only immediate gratification.

There are three mental activities that are preparatory to action. Talcott Parsons lists them as cognition, cathexis and evaluation; in nontechnical language we can refer to them as knowing, desiring and judging value. The individual becomes aware of his need and of need-filling elements in his environment. He imagines a future condition, different from the present reality, wherein need is filled. He also predicts that a particular action will lead to the imagined condi-



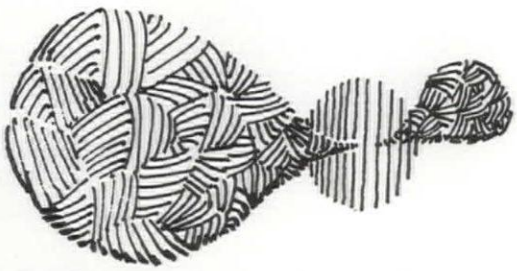
Human life is a continuity of conscious interaction between a human organism and its environment.

tion. He considers whether such fulfillment is consonant with his entire purpose set. If it is, he acts to test his prediction. Successful action brings fulfillment.

Such action is an expression of his original need. His imagining of a future condition is a mode of concept formation. Susanne Langer in *Philosophy in a New Key* considers that both concept formation and expression are themselves human needs. If this is so, then fulfillment of the original need must lead directly to a formation of new needs. The cycle begins anew:

- knowing: recognition of needs
- imagining: concept formation
- predicting: anticipating result of action
- evaluating: consonance with purpose set
- expressing: action to test predictions
- fulfillment: need reduction
- need formation: leading again to the start.

It seems that being between an action and its consequences and between that consequence and the choice of a next action is the very condition



Being held between an action and its consequence is the very condition of being alive.

of being alive. The essence of the cycle that we have described is its purposive nature. Our definition of human life can be restated: It is the condition of holding purposes.

Anything, then, that improves an individual's knowledge of himself or his environment, anything that promotes his ability to formulate concepts, anything that aids him in prediction or that permits free expression of his purposes leading to their fulfillment, actively supports human life. Anything that helps the individual to be aware of his entire set of purposes and aids his evaluation supports life. Anything, further, that stimulates need-development, leading away from boredom, which is stasis, stands above all else in supporting life. "Life is an end in itself and the only question whether it is worth living is whether you have enough of it," as Oliver Wendell Holmes wrote.

A building cannot affect all parts of this cycle equally. Only very indirectly can it provide the individual with knowledge about himself and his needs. At first appearance, the building can help very little in concept formation; concept formation, however, depends on richness of stimuli and richness of stimuli can be helped by the building. All other parts of the cycle can be helped directly by the building. The building can actively support life when it stimulates the operation of the entire cycle. It supports life when it evokes purposes.

A final thought in connection with the first criterion, which for this essay must remain only suggestive: The action cycle can be recast in societal terms describing cooperative action. The building can be supportive of that cycle in the same way we have described for the individual action cycle. We should find ourselves associating with a societal cycle such values as freedom, equality, rationality, security and progress. The building is as much an instrument for social purposes as for individual purposes.

The Second Criterion: The Support of Purposes —In the tale of the Sorcerer's Apprentice, the apprentice, by magic, sets a broom to carrying water but cannot stop it before it has flooded the sorcerer's house. From this tale to the literal-minded computer and its future child, the robot, is a long span. Yet this span carries a single theme: Tools however magical, complex or sophisticated have no purposes of their own—functions, yes, but not purposes. Function is mindless and after the fact of purpose. Only purpose is human.

If we are to discuss the manner in which buildings can serve purposes, we must try to have some idea of the relation that can exist between man and the building. From a logical expansion of the two terms in the relation, there appear to be four general areas.

1. *Man affects building* by designing it to serve particular physical functions.

2. *Building affects man* by demonstrating its functions. By giving information about the society in which it exists and the social institution it serves, the building affects man's behavior and his responses to the building environment. The building can evoke ideas, emotions and purposes in its users. Physical shapes, colors, textures and size all have their emotional influence and suggestive importance. An empathy exists between man and building.

3. *Man affects man* by using the building as a communication device. When we spoke of the building affecting man, we were concerned with its direct effect. Here we are concerned with its intentional use in communicating from one man to another. The building becomes a symbol for some other thing. It can be:

A) A social symbol
   - Evidence of social purpose
   - Instigator of social change
   - Resultant of social change

B) An economic symbol
   - Evidence of economic demand
   - Resultant of economic decision

- Resultant of economic supply
- Evidence of economic value

C) A religious symbol
- Evidence of world view
- Of aspiration and values

D) A political symbol
- Of power or affluence
- Of patriotism, cultural level ,continuity
- Of freedom, of justice

E) A personal symbol
- Of personal aggrandizement
- Of wealth
- Of intention
- Of concern
- Of aspiration and value.

4. *Building affects building* by being in physical relationship with other buildings, the several together become compositional elements that affect each other visually.

We described purpose earlier as being characteristic of the action cycle. Purpose is the effort to reduce need or tension and to bring imagination and reality into harmony. Human life, according to John Dewey, consists of a constant fluctuation between tension and tension reduction; the individual moves back and forth between harmony and disharmony in relation to his environment. On the rare occasion, the harmony is especially intense and is accompanied by emotion. Such a rare moment is the experience of art. The final and supreme purpose that the building can serve is to evoke such moments of harmony for its users.

The Third Criterion: To Maintain Itself for Use—The building must maintain itself ready to serve the purposes of the user. The utility of an object depends not only on its being suited to the purpose for which it is designed but also on its being always available for use.

Because we live in a world of continuous process, every physical object is subject to change by reason of various physical, chemical and biological interactions with its environment. Maintaining the relative permanence of the building depends upon identifying those interactions and selecting materials that are closest to being inert in the presence of those processes for the expected period of use. The building can be unavailable to serve its purpose through such deterioration or by reason of downtime for repairs.

Except for its deterioration, the building remains constant. The degree to which we wish to maintain the building in its original form (rather than changing or replacing it) depends on the degree to which the building's users, their purposes and the environment remain unchanged.

When we consider how changes in purpose affect the usefulness of the building, one thing stands out clearly. It is apparent that the more unitary and simple (and therefore universal) the design of the building, the smaller is the likelihood that a change of purpose will destroy its usefulness. The greater the complexity and particularity of its design, the greater the probability that change in purpose will be destructive. (These are statements of fact, not of ideology.) A hammer with its single function will serve many purposes; a printing press with its many integrated functions will serve only one.

Man is indeed fortunate to be so adaptable. If he depended on the perfect setting for each purpose, I fear that he would accomplish few purposes. With so much experience in deciding, why have so few architects made really superb decisions? Our answer, I believe, lies in the constraints that ideologies impose. Modern architecture won its battle against the arbitrary forms of historic style only to fall again into ideology and develop its own arbitrary forms. For the full range of human purposes it substituted the single purpose of structural integrity or the single purpose of truth to materials or the single purpose of geometric form. Systems of order, which should have been the architect's servants, became his master.

In this age with its massive social problems, creative ability must concern itself with values, goals and the morality of human purposes. Only by thus directing his creative ability can the architect free himself from the constraints of ideology. Only through intense concern and constant personal choice will he avoid the automatic solutions that ideology provides.

This essay has discussed the three criteria relating to human purposes in the belief that a close concern with human purposes can suggest a nonideological approach to today's problems in architecture. Where the three criteria have been satisfied as fully as possible, the architect has produced a need-filling and satisfying building.

I do not suggest that a concern with purpose will produce a more rational architecture, nor do I believe that extreme rationality is essential to good architecture. Human purposes are not rational; they are acts of will. They might be based in rationality but essentially they are willful acts to test predictions. It is possible that whatever the imagination can formulate, sooner or later the will will try. Every prophecy is to some degree self-fulfilling. Architecture must be rational only to the degree that it serves the user's purposes for it to be so.

Concern with purpose must be supreme. Where in the present ideology destroys human purposes, in the future purpose must destroy ideology. The architect can serve human purpose by concerning himself with the three criteria of purpose. I challenge the reader to engage their use. □

CREATIVE COST CONTROL

Architectural Facts of Life During Construction

BY NORMAN FOSTER

There is more to cost control in the building phase itself than the matter of change orders, as the general manager of Robert Miller Construction, Inc., Lockpoint, New York, so clearly explains. This article is adapted from "Creative Control of Building Costs," the McGraw-Hill book.

The ultimate cost of a building is part of an architect's responsibility to the owner. To design a structure, the initial bid cost of which is within the budget allowance is not enough. The architect must also control the changes and revisions which are common to most construction contracts.

Under conditions of all-around perfection there would be no change orders, no extras and the owner would get the building and appurtenances he expected. Almost as satisfactory would be the job which had only beneficial change orders giving a tangible change in scope equal to the dollar cost or saving.

Such ideal conditions are seldom found in construction. They would require complete understanding, coordination and skillful cooperation first between the owner and architect, then between the architect and contractor. The contracting parties have different viewpoints and aims. The owner is likely to view with suspicion extra work claims submitted by the contractor, who cannot understand why anyone would doubt such fair and reasonable requests. In the middle stands the architect, who, although he is the agent of the owner, must render impartial judgment.

If cost control during construction amounted to no more than authorizing beneficial change orders, the responsibility would not be very great. There are, however, many other factors that can increase the basic cost of a construction job: errors in the drawings, misunderstandings of scope between architect and owner, delays, unsatisfactory performance by the contractor, indecision by the architect or the owner—the list is long.

Many of the steps toward cost control must be taken before the bidding stage. These should be touched upon before beginning a decision of what happens during construction scope of the work.

There should be absolute understanding between the architect and the owner as to the owner's requirements, the limit of the contract, design criteria, inclusions, exclusions, quality of material, etc. Complete understanding means just that—no gray areas, no guesswork, nothing left to chance. Much of the misunderstanding and disagreement which follows a claim by the contractor would have been avoided if there had been agreement on the scope of the work between the architect and the owner. This scope of the work, in writing, should be a summary of what the contract will cover, what is not included and what are variable items within the contract (such as work below ground).

Drawings and Specifications

The drawings and specifications should be complete, clear and complementary. It should always be remembered that the contractor is bound by the contract documents. He only agrees to produce the buildings and appurtenances depicted on the drawings and described in the specifications. He is not clairvoyant and cannot afford to be altruistic. In the highly competitive field in which he operates, the contractor makes his only contribution to the owner when he submits a favorable bid. Beyond that, all that can be expected of him is satisfactory performance within the scope of the contract. Precise language is the secret of good specifications. Brief, declarative sentences are the sign of a good specification writer.

Coordination of Bid Documents

All contract documents should be coordinated to ensure coverage but to eliminate contradictions. Special care should be taken to coordinate the architectural drawings and specifications with the structural, mechanical and electrical drawings and specifications. Duplication of such items as excavation for utilities, temporary services, concrete for the mechanical trades, could mean duplication in the bid figures and thus a hidden increase in the bid price. Errors between the architectural and engineering drawings can result in extras during construction.

The general conditions should be clear and complete. When standard general conditions are augmented by supplementary general conditions, care should be taken that one does not contradict the other.

Cost "Problem" Items

Cost "problem" items should be carefully specified. There are a number of such items, and they often result in major extras. The limitations of the work below ground should be spelled out. Rock excavation should be defined if it is to be extra over the contract price. Such items as dewatering, temporary heat, temporary light and power and utility work by others should be clearly defined.

Unit and Alternate Prices

Unit prices should be requested with the bid for all items which are subject to variation in quantity. The method of measurement for unit price items should be clearly defined; also the fact that all unit

prices are gross prices and include overhead and profit.

Alternate Prices

Alternate prices can be valuable to the owner in helping him to decide whether certain variations in scope are worthwhile or can be afforded. However, a great number of complicated alternates present a real problem to the bidders. There just is not time to give each proper attention so the bidder errs on the side of caution: Deductive alternates are bid tight (if not low) and additive items are bid high. When there is a public opening of bids, alternates should not be so extensive that they create bidding problems for the contractors. In the case of private openings, it may be to the owner's advantage to give the bidders 24 hours after bid time to submit alternates and unit prices.

Beneficial Changes Initiated by the Owner

There should be no problem in resolving change orders which are straightforward additions to the contract and which give the owner the tangible benefits he requests. The architect should act promptly to obtain a price from the contractor and authorize the change before the work advances to a point which will prevent the required change from being incorporated "as bid." After it has been ordered, the owner will get little or no credit for deducting the asphalt tile and adding ceramic tile; in fact, he may have to pay for both materials. Contractors take the benefits of bulk quantity purchasing; a few hundred square feet deducted from the contract just leave them with material they may have to keep in stock for years. Almost all colored material not used is a complete loss; slight changes in the color of different runs make it almost impossible to incorporate surplus stock into future jobs.

All other things being equal, the only question is that of ensuring that the contractor's price is fair and reasonable. The architect is entitled to, and should insist on, a detailed estimate with quantities, unit prices, etc. He should take off the quantities so as to check the estimator's figures; he must satisfy himself that the unit prices are fair and that the extraneous cost items such as overhead, insurance, bonds and profit are fair and in accordance with the contract. Unit prices embodied in the contract should be used wherever they apply. Quantities should be net (adds less deducts) for each item. Unless stated otherwise in the contract, it is reasonable to allow the contractor to exclude overhead and profit from purely deductive change orders.

Beneficial Changes Initiated by the Architect

During the construction, the architect may recommend beneficial changes in the work. Before submitting this type of recommendation to the owner, the architect should make sure that there is still time to incorporate the change without extraneous expense. If time is a vital factor, he should warn the owner and see that prompt decisions are made. Delays in processing change orders usually have unpleasant consequences: legitimate claims by the contractor, delay in final completion, dissatisfaction and dissension between the owner and the contractor. The architect will be in a particularly uncomfortable position if delays, claims or disagreements stem from changes which he originated.

The checking and certification of this type of change is the same as for all change orders: Take off the quantities to check the contractor's estimate check unit prices, extensions and additions and ensure that the change order request is compiled in strict accordance with the contract specifications.

Partially Beneficial Change Orders

Changes in interior layout, finishes, doors, etc., which involve alterations to completed work may cost considerably more than the face value of the tangible benefit which the owner seeks. This is all right as long as 1) the architect and the owner know what work the contractor must do in order to achieve the extra work and 2) the owner will approve the cost. Experience has shown, however, that architects and owners frequently express astonishment at the cost of simple extras. Sometimes they do so with good reason: Contractors can be ingenious when preparing change order requests. A good architect interested in cost control should know what is fair and what is not. An extra interior door and frame may be worth $125 if authorized early in the contract. The same door and frame could cost the contractor $500 if he has to go back to a finished wall, cut the opening, pin the lintel, patch the masonry and plaster, rework the baseboard, finish the floor and repaint the entire wall.

Almost any change which is authorized after the participating trades have completed their work will cost more than the face value of the improvement. Delivery alone may be a vital factor in the cost of a simple change order. A late decision to change the type and color of the glass in the window walls could bring the whole job virtually to a standstill for weeks. One could give hundreds of examples, but it is enough to say that the longer a change is delayed the more it will cost.

Changes Below Ground

In lump-sum contracts, the cost of work below ground is usually subject to change should job conditions require variations from the design or foundation grades shown on the drawings. It is also common for the contract to be based on earth excavation, with rock excavation being paid for as an extra cost. Such agreements in which the owner accepts financial responsibility for actual conditions below ground should not limit the care taken by the architect to design a structure suited to the site conditions. Site investigations, such as taking borings and digging test pits, should be made. All of the information relating to below -ground conditions should be available to bidders.

Failure to include below-ground information in the contract documents or the inclusion of inaccurate information can lead to costly extra work claims. The contractor is entitled to rely on the adequacy of the contract documents. The inclusion of such phrases as "the conditions below ground as depicted are not guaranteed" does not relieve the owner of financial responsibility for changes resulting from actual ground conditions.

Changes in the bottom grade of concrete foundations, or in the dimensions of walls, piers, etc., should be easy to resolve. When the contract includes a unit price for each class of concrete and excavation below ground, the change order will be simply a matter of computation. The unit prices should be adequate but not inflated. The

measurement limits of excavation should be described for each unit price item. The unit prices for excavation should include all necessary sheeting, shoring and dewatering (or specifically exclude these items if they are not to be included). The important thing is that the unit price item must be described exactly and fully. If the item is simply described as "concrete in foundation walls," that is what will probably be received, regardless of what the unit price might seem to cover. Forms and reinforcing steel will be charged for separately. What may have looked like a cheap unit price could become an embarrassment, all because the architect was not explicit when he described the item.

Disagreement on quantities for changes below ground can be avoided if the contractor and the architect (or their on-site representatives) *both* keep running records of the changes. These records should be in exact agreement and should be dated and signed by both parties at least once a week.

Rock excavation can be a costly extra in a contract. If a considerable quantity of rock excavation is expected, the architect should ensure that the unit price agreed to is reasonable. It may be necessary to consider the rock unit prices when evaluating the contract bids. As in all excavation units, the payment limits for rock excavation should be clearly defined in the description of the unit price item in the specifications. Should the owner or the architect decide that all excavation in the contract is unclassified and there will be no extra payment for rock, the drawings should include extensive below-ground investigation data. If the contractor must assume the risk, he is entitled to an excellent set of site drawings with rock elevations plotted and extensive boring information; and he should be given the opportunity to make such additional investigations as he wishes during the bidding period. To withhold below-ground information from the bidders is to invite trouble. A good estimator will raise his price for earthwork to take the gamble out of his bid. Regardless of whether the cost has been adequately covered, the contractor is going to make a claim against the owner if the conditions below ground are radically worse than the contract documents depicted. And if it is revealed that vital information, known to the architect or the owner, was withheld from the bidders, the contractor will be even more unhappy, and rightly so. In such a case, deterioration of the relationship between the contracting parties is inevitable.

In his handling of below-ground conditions then, the cost-conscious architect can best serve the owner by:

- carefully studying the actual below ground conditions and designing the foundations to suit those factors
- incorporating into the contract fair unit prices for extra work below ground
- ensuring that proper records are kept of the actual foundations as installed
- checking the accuracy of the contractor's change order requests regarding both quantities and unit prices
- ensuring that the bidders have access to all the data they require to evaluate the cost of work below ground.

Changes Due to Architect's Errors or Omissions

A change order which is needed to correct an error by the architect may still give the owner some degree of value for his money. Although it may be embarrassing for an architect to admit that he has made a mistake, the owner should realize that if the change adds something of benefit to him, he should pay for it. Nevertheless, a conscientious architect will do everything in his power to ensure that the job, as designed and specified, is exactly what the owner has requested. Careful coordination with structural, mechanical engineers and other consultants will go a long way toward preventing this type of change order. However, we all make mistakes—owners, contractors and architects. So long as the architect is satisfied that the amount of the change order request is fair, he should approve it and submit it to the owner.

Changes to Satisfy Local Authorities

In an attempt to circumvent claims by the contractor or to control the cost of the work, some architects use a general conditions clause which, at its face value, makes the contractor responsible for complying with all state and local ordinances, laws and building codes. Such a clause usually goes on to say that no extra payment will be permitted for claims arising from work required to meet such codes. This, of course, is blatantly unfair and legally difficult to uphold. Legal factors aside, every architect should design structures which comply with the applicable building codes. This is one of his basic responsibilities. The basic responsibility of the contractor is to construct the project in strict accordance with the drawings and specifications. If there is any doubt of compliance, or if the design incorporates ideas or material not covered by the codes, the questionable factors should be cleared with the local authorities during design stage. Many items in local building codes are vague or seem to cover only broad and general factors. Clarifications by building authorities or their acceptance of new designs not covered by existing codes should be written decisions. It is neither prudent nor safe to accept only the verbal approval of a public official in this type of finding. Policy changes, staff changes, even honest disagreements on "who said exactly what" can have unhappy consequences.

Failure to meet the local building codes or to obtain written agreement from the local authorities for special design factors can have extremely expensive repercussions. Many costly cases come to mind: an entire storm drainage system which had to be replaced because the codes did not allow the type of pipe specified; a verbal decision on the meaning of "fireproofed doors and millwork," which was later denied; 20 flights of concrete stairs with 3 inches less headroom than the code allowed; dozens of stairwell walls which had to be plastered on both sides to meet the code because the architect thought 6-inch concrete block was acceptable, etc.

If, during construction, some doubt should arise over compliance with local codes, the architect should act promptly. First, he should instruct the contractor to suspend work on the phase of the job which is questioned. Next, he should meet with the local building department and press for an immediate decision. The contractor should be invited to this conference if he can help in any way. Should the architect receive only a verbal decision, he should write to the local authorities (copy to the contractors) confirming the fact that he is proceeding with the work in accordance with their verbal instructions. This letter must be explicit and complete; it is less satisfactory than written authority but

better than merely accepting the verbal decision.

Extra Costs of No Benefit to the Owner

Change orders which give the owner no value for his money are most unsatisfactory to everyone concerned and are usually the result of carelessness and lack of foresight by someone. The most common of such extraneous costs for which the architect is responsible are those caused by errors in the drawings or from inadequate specifications. Poor coordination of the structural, mechanical and architectural drawings often cause trouble on the job and frequently result in extra costs which benefit no one. Errors in dimensions, inadequate structural design, ductwork oversized for the available space, openings placed without regard to masonry coursing, catch basins in the wrong places—these are examples of improper design which eventually cost the owner extra money. A good contractor will do all that can reasonably be expected of him to adjust things, correct errors and help solve minor problems. Contractors cannot be expected, at their own expense, to pull the job out of a mess caused by the architect.

Cost control during construction starts with a good set of drawings and clear, complete specifications. Contractors can afford to, and will, tighten their bids when they have confidence in the architect. The bidding documents tell the contractor a great deal about the architect. When the extent and limits of the contract are clean out, the contractors will react favorably. Every contractor wants a straightforward set of contract documents. He wants a job which gives him a fair chance. He wants to "get in and get out." Delays awaiting changes in design or caused by errors in the documents cost money. Few change orders are beneficial to the contractor. Most of them are a nuisance and cost more to process than they are worth. An extra of $1,000 probably gives the contractor only about $100 profit margin but will cost him hours of estimating and clerical work and will hold up the job.

When an architect finds that he has trouble getting contractors to bid his jobs, he may be sure that there is something wrong with either his contract documents or his attitude toward contractors, or both. Maximum effort by the architect in both areas will go far toward ensuring minimum cost.

Sometimes it becomes necessary or prudent to authorize a change order simply to keep the job moving. Delay in the receipt of specified materials can hold up the entire job. Such delays may not be the fault of anyone directly responsible for the project. It could be a strike in a factory, a breakdown in transportation systems, a shortage of raw materials or any of a dozen factors beyond the control of the contractor or the architect.

Having satisfied himself that the project faces a delay which the owner cannot afford, the architect should promptly examine the available alternatives. It may be possible to substitute stock items, or authorize another make or model. The extent to which the architect and the owner go in relaxing the specifications should depend on the importance of the time that would be saved in completing the project. The one item or material under question may not be the key to the problem. There is no advantage in changing one item only to find that another has the whole job stymied anyway. So before making the change, the architect should be reasonably sure that nothing else is going to slow down the job. Are all of the shop drawings coming along and being processed with ample time left for fabrication and delivery? Is the contractor dragging out the job anyway? Is the owner taking care of the purchase of furniture, etc.? Will the owner be ready to occupy the building on the anticipated completion date? Is the change going to cost more than the time saving is worth?

Many change orders of this nature can be circumvented before they occur. The architect can make sure that he is using current information when he specifies proprietary items. He can remind the contractor when shop drawings and material samples are vital and are due to be submitted. He can process shop drawings expeditiously. He can insist that the contractor give him an equipment report every month, showing the order number, date of order and promised delivery dates for all major items of equipment and material vital to job progress.

Change Orders Requested by the Contractor

Change order requests initiated by the contractor are generally with respect to work which the contractor claims to be over and beyond the contract requirements. They may be for work which the contractor claims was necessary through no fault of his, or they may be for work ordered by the architect or his representative. When the contractor initiates a request for a change order, it usually means that the architect did not recognize a bonafide extra in the first instance. Sometimes an architect will, without realizing the consequences, order certain work or procedures. Every time the architect or his representative renders a decision, he should be certain of his ground. If the work or procedure is within the contract requirements, he must be sure that the contractor knows this and understands the authority or basis on which the decision rests. If the work is not within the contract requirements, the architect should proceed in accordance with the extra work paragraph of the specifications.

If there is an honest difference of opinion between the architect and the contractor, the architect may exercise whatever power is vested in him by the contract documents. If the contract allows it, the contractor may elect to carry out the work while reserving his rights to arbitration or legal action. In most cases, it should be possible for an architect and a contractor to reach an agreement on extra work claims. It requires good faith and mutual trust and may even call for a measure of compromise, but a little give and take is much better than a costly legal action.

Claims Arising from the Contractor's Rights

The contractor has certain rights. Some are embodied in the written contract; some have been established by precedent-setting court decisions. These rights give rise to thousands of claims every year; in fact, one or more crops up on almost every project. The architect should know what these rights are and guard against impinging upon them. Whether covered by the contract, there are some basic and common rights for which many contractors have fought successful legal actions. Some of these are described in the following:

1. *Right to access to the site of the work*—Limited only by restric-

tions or terms specifically covered by the contract documents, the contractor has a right to unimpeded access to the site. If, through the actions or negligence of the owner or the owner's representative, the contractor is denied free access to the site, he may have a right to claim against the owner. This may happen for such reasons as right of way not obtained, land purchase not completed, demolition not completed, work by other contractors insufficiently advanced. The architect should do everything within his power to prevent such situations. When the contractor is unable to get his job started, relations become strained and the project is off to a bad start. In such cases, there are contractors who are experts at preparing the maximum claim their ingenuity can devise.

2. *Failure to obtain the building permit*—This could take one of two forms: Either the owner failed to obtain the building permit or, having specified that the contractor is to obtain it, the authorities refuse to grant the contractor a permit on the grounds that the project does not comply with their regulations. In either case, since the delay is not his fault, the contractor may claim damages. The architect can guard against this type of claim by ensuring that his drawings comply with the local codes and that a permit will be granted.

Time will be saved if the owner obtains the building permit before the contractor is ready to start work, although, of course, this is not always possible. In some communities the contractor is required to apply for the building permit. Regardless of how, or by whom, there is no excuse for circumstances which leave the contractor high and dry for weeks while the architect submits design criteria to the local building department or argues about the permit.

3. *Suspension of work by the owner*—When all work is stopped by the owner, the contractor usually has a right to a damages claim. This may be no problem if the suspension is temporary, but can become one if the stoppage lasts for several weeks. If the job is to be abandoned entirely, the architect may become involved in a complex evaluation of the work completed and in an assessment of the settlement due to the contractor. In these cases, it may be advisable to use the services of a professional construction estimator to make an independent survey. Regardless of the nature of a pending suspension of work, the architect should forewarn the owner of possible action by the contractor. It may be prudent to suggest that the owner obtain legal advice since breach of contract might be involved.

4. *Failure to make payments*—Most construction contracts clearly define the way in which the contractor will receive payment. Failure of the owner to make a payment when it becomes due can constitute cause for a claim by the contractor. The architect can do his part towards preventing such a situation by acting promptly to agree upon the amount of the requisition with the contractor and by forwarding the certified request for payment to the owner.

Receipt of his payments promptly is very important to the contractor. Prompt payment is also the one most vital factor which is guaranteed to consolidate contractor-owner relations. Conversely, delays in making payments to the contractor will definitely cause a deterioration in relations. When the architect finds it necessary to cut the contractor's requisition, he should explain his reasons to the contractor. This is more than a matter of courtesy; the contractor is entitled to know how his requisition has been changed and why.

5. *Failure of the architect to render decisions*—Financial claims by the contractor arising from time delays allegedly caused by the architect are not common, but they do occur. At their worst, such claims can be costly to the architect; at the least, they do his reputation no good. As a cost control factor, such claims may successfully support extension of time claims and so offset liquidated damage claims against the contractor. Either way, such claims may cost the owner money, and the possibility of the architect becoming personally involved must not be discounted. These types of claims can easily be avoided by not delaying decisions. Check and return shop drawings promptly; render all opinions and decisions expeditiously. If there are complications which delay things, the architect should keep the contractor informed and help him to keep the job moving.

6. *Delays caused by "owner awarded" contracts*—The award of separate contracts by the owner (i.e., contracts not controlled by the general contractor) imposes upon the owner and the architect additional responsibilities. If the contractor's work is held up because the separate contracts have not been awarded or because of unsatisfactory progress by the separate contractors, the general contractor may have just cause for a claim against the owner. Basically, no one has the right to impede the contractor in the execution of his contract. It is therefore important that the architect do all he can toward seeing that this does not happen.

The case for separate contracts is debatable, to say the least. If there are good reasons for the award of separate contracts, the overall job progress may best be served by giving the general contractor control of the separate contracts. This may cost the owner an agreed fixed fee or a percentage of the contract amounts. A general contractor is likely to ask from 1 to 5 percent for administering and coordinating separate contracts. An efficient general contractor will earn the extra fee. When this is done, there can be no question of the general contractor claiming damages because the owner-managed contracts are impeding his progress.

Third-Party Claims Against the Owner

Efficient cost control should include protection of the owner from situations which could leave him open to third-party claims against him. Such claims could arise from infringement upon adjoining property or might involve a third-party claim in which the owner is enjoined with the contractor.

To take the second case first, the owner will be protected against being drawn into claims against the contractor if the public liability insurance section of the general conditions requires that the contractor take out contractual liability, including "hold harmless," insurance. The actual wording in the general conditions need only require that the contractor "indemnify the owner against all suits and actions arising out of the contract and hold the owner harmless from all claims due to the contractor's operations within the contract." The question of the owner's involvement in third-party claims should be even more seriously considered when, as is becoming quite common, an owner takes over all of the insurance of his project.

Damage to adjoining property may take any of several forms. Sometimes the architect will show a wall right on the property line

without having given any consideration to the rights of the adjoining property owners. Many jobs have become bogged down in lawsuits because the excavations or work on foundation walls enroached on adjoining land. It just is not possible to build right up to the property line without affecting the other owner's land to some degree. Even if sheet piling is driven, it should be a few inches inside one's own boundary line if there is to be due regard for the other land owner.

Every aspect must be explored before building anything right up to the property line. If approached in advance, most land owners are amenable, and if it is absolutely necessary to build right up to their line, they will usually make some satisfactory arrangements.

There are other ways in which an owner can become involved in claims by adjoining property owners: failure to provide right of way; allowing debris to spill over onto another person's land, blocking the access to adjoining property, disregard of zoning laws or codes. If the architect should fail to do everything within his power to safeguard the owner against infringement of the rights of other property owners, he is certain to expose the owner to extra costs.

Failure of the Contractor to Complete the Contract

When the contractor fails to complete the contract, the owner faces what is probably the most costly loss that can arise out of a construction contract. Even if the contractor has been bonded, the time loss and the administrative work just to get the job moving again cost money. Not even a 100 percent performance and payment bond will give the owner complete financial protection. If a surety company can show that the contractor has been overpaid or that the owner had failed to obtain proof of "payment of obligations" as required by the contract, the surety company will probably have a case against the owner.

There is an abundance of legal precedent in support of the right of the surety company to reasonable protection against losses which are caused by the owner's negligence. If the job has not been bonded, the owner usually winds up paying heavily. Protecting the owner against "contractor failure" is part of the architect's job and is a cost control matter. With rare exceptions, a contractor does not go bankrupt because of his latest job; generally such a condition has been building up for months or even years. If a contractor is solvent when he starts a job and goes bankrupt due to factors on that job, his price was too low or he badly mishandled the job.

The precautions are simple to implement, but the right decision is not so easy. It is not sufficient to accept a contractor at face value. Some of the largest and most respected contractors in the country have gone bankrupt. Every week, somewhere in the USA, a contractor with a good reputation in his community goes bankrupt, to the surprise of his friends, neighbors and clients. In 1965, over 1,000 general contractors failed, leaving liabilities that averaged almost $200,000 per contractor. So it is proper and prudent to be absolutely sure that the contractor has the financial ability, the technical skill and the integrity to perform the contract.

Investigation of a proposed contractor should start by obtaining his current financial statement. It should be noted that the moment the architect begins asking for information, some contractors will try to brush him off. A good contractor who is solvent and who wants the job will cooperate with the architect. The only financial statement worth anything is one prepared by a certified public accountant. When a CPA signs the statement, he stakes his professional reputation that to the best of his knowledge and belief, the information is accurate and complete. This does not guarantee the accuracy of the financial statement, but only the most dishonest contractors would juggle their books so as to hide debts from a CPA.

Not all architects are qualified to assess a financial statement, but every architect knows someone who can. He may be the owner's accountant, the architect's accountant or a banker. There are a few important things to look for. What is the net worth? What is the earned surplus? How much of the net worth is in liquid assets? How much of the net worth is tied up in fixed assets such as buildings and fixtures?

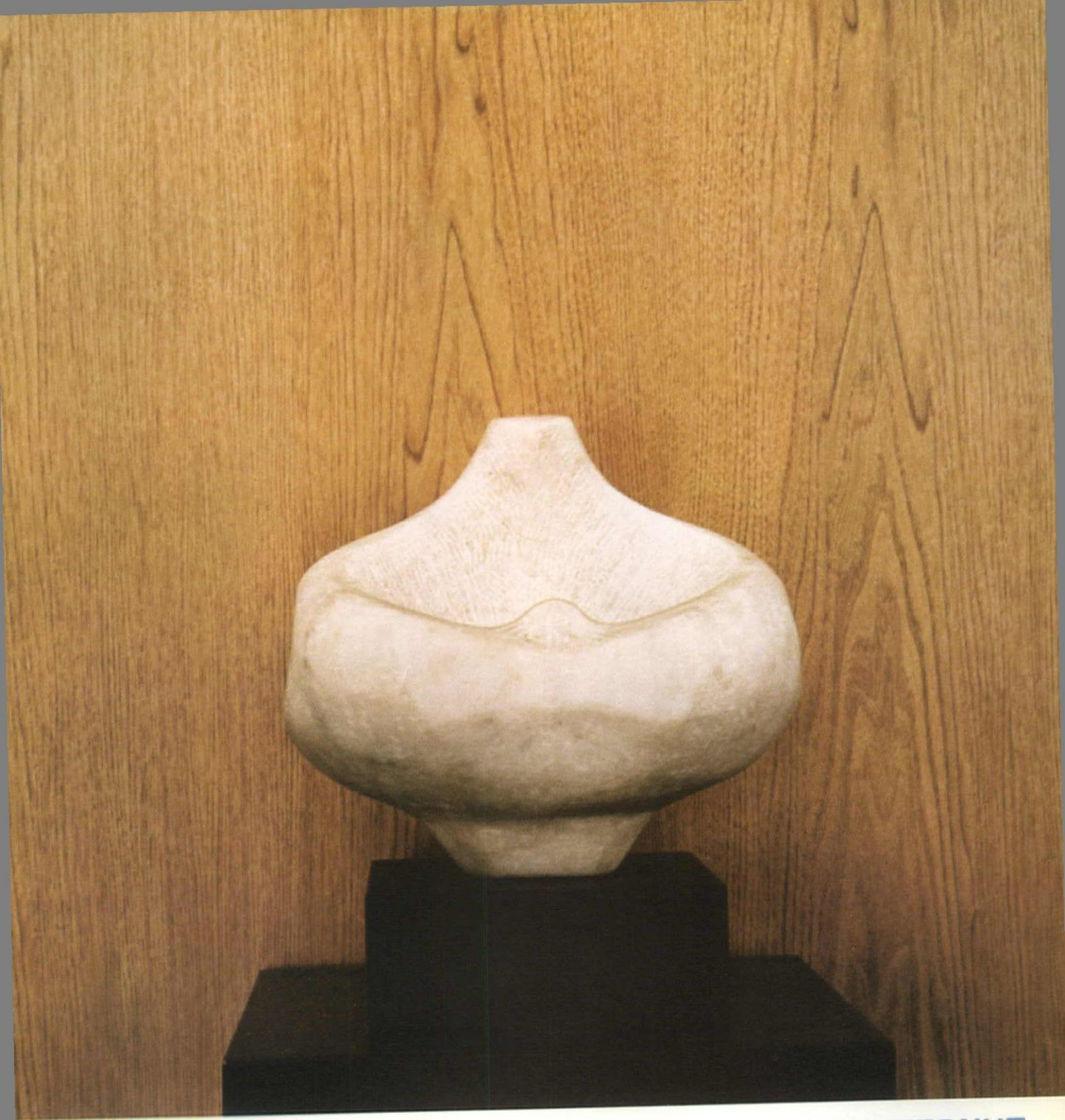
Having established the contractor's financial status, the architect should check some other important factors. By checking the contractor's previous work, and the owners and architects he has worked with, the architect may satisfy himself on the quality of the work done by the contractor, his ability to finish his jobs on time and his general reputation. A contractor may be somewhat shaky financially, yet have such a well-earned reputation for integrity and performance that he is a good risk. Another contractor may be financially strong but have a history of poor performance, unethical practice and trouble-strewn jobs.

Of course, one of the most important factors in deciding upon a contractor is the amount of his bid and its relationship to the other bids. Even in public construction, discretionary power is vested in the awarding authorities. The commonly used term "lowest responsible bidder" must not be assumed to mean "the lowest bidder." The awarding authority may request the assistance of the architect in investigating the apparent low bidder. Providing that the awarding authorities act in good faith, without malice, dishonesty or collusion, their decision regarding what is the lowest *responsible* bid will stand up against a legal test.

Therefore, public or private bids can be examined in basically the same way. A very low bid should always be suspected. If this bid is that of a reputable contractor who is financially sound and who can be expected to perform even if his bid is too tight, there is no problem. If, however, the bid comes from another sort of contractor, and especially if the job is larger than he normally tackles, he should be investigated thoroughly; he might be desperate for a "fast buck." Often, the tabulation of all bids received serves as a warning. If a contractor whose ability is doubtful is very low, and he is followed by two or three good bidders grouped closely together, there is probably something wrong with the low bid.

Having decided on the contractor, in the case of private work, it may be necessary to decide whether to bond him. In passing, it should be noted that the ability to obtain a bond does not testify to the contractor's strength or integrity. Bonding companies can be wrong, a fact witnessed by the losses some of them have incurred. If a thorough investigation has satisfied the owner and the architect

Continued on page 92



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Churches, Cities and Hippies

"The shape of the city, not the shape of the sanctuary, is today's most pressing theological problem," Prof. Harvey G. Cox of Harvard University's Divinity School told the 1967 International Congress on Religion, Architecture and the Visual Arts.

What to do with the city and the churches' role in today's rapidly changing world were the main concerns at the first such international, interfaith and interdisciplinary meeting.

Pervading the Aug. 27-Sept. 1 congress in the New York Hilton was the question: Just how do we reshape our cities, our society?

Ribicoff Leads Off—In a speech leading off the congress, Sen. Abraham Ribicoff (D-Conn.) urged a return to solving big-city problems on the neighborhood level.

He castigated the churches because "the people (in the inner city) who need your ministry most are not getting it."

But the city must be "looked at as a whole," contended Francois Houtart of Belgium, a sociologist, city planner and priest.

He agreed that "we must reach people where they are, doing this at the neighborhood level," but argued against a return to neighborhoods as closed entities since, he said, modern man is a mobile creature in a pluralistic society.

Thus, he said, mobility must be extended to those in the ghetto.

Urban Marionettes—Dr. Cox said that although man has been able to tame nature, "urban man often feels himself to be the marionette of uncontrollable social forces."

To counteract this, he pleaded for a new vision in dealing with the city. "Thinking we can solve the cities' problems technically, we have made them worse."

Not all the speakers despaired over the role of technology. Buckminster Fuller compared man to a chick just now pecking his way out of the egg.

Religious structures are playing a direct role in the building of cities of Thailand and Sumet Jumsai, a city planner, told how: Old temples are being dismantled to provide materials and building sites.

A less self-consuming approach was recommended to the churches by Patwant Singh, editor of India's *Design* magazine. "It is my conviction that unless the churches are prepared to give equal time to the hard, cold, brutal struggle for survival which takes millions in its crunch, religion's spiritual appeal alone will not be enough to influence the minds of men," he said.

Housing Research Urged—Singh proposed that the churches of the world sponsor a research institute to find ways to provide shelter for homeless millions.

The hippie movement also was extensively treated. The Rev. Joseph Stiller, a professor at the University of Chicago Divinity School, suggested that the straight society could learn from hippies.

"Our generation prepared for a rich career and has turned out to be a shambles," he said. "The Bible says, 'Be not anxious,' but our generation raised educational anxiety to a virtue."

Rabbi Richard L. Rubenstein, director of B'nai B'rith Hillel Foundation at the University of Pittsburgh, sympathized with hippie art—"a reaction against the sterile lifelessness of modern buildings."

Not There, But There—Marshall McLuhan was, at the last minute, unable to attend, but his ideas were very much present. McLuhan's new boss, the Rev. John M. Culkin, director of the communications department at Fordham University, told conferees the usual gap between generations has widened.

"Most of us are pobs (print-oriented bastards) while in the post-literate world of today there are things beyond books," he said.

Not all the pobs (rhymes with lobes) heard Father Culkin. Some left the room earlier for a film presentation by Stan Vanderbeek, a post-literate exploration of symbols.

Going Through Ordeals—The title was "Ordeals" and in this happening at the Judson Memorial Church the audience was forced to undergo simulations of much that is unpleasant in our society, including a police lineup, kindergarten, deprivation, a final exam and advances from (pretend) homosexuals.

The happening triggered talk. In general, younger participants favored it; an older man was annoyed that a "sensitive Stanford White edifice should be used by Huns for orgies."

In addition to the general meetings to hear authorities from around the world, conferees met daily for luncheon seminars.

Early in the week, Mr. Sittler asked, "Is religious art or architecture possible in a world of changing values, in a world where a doubt about the existence of God is the primary spiritual fact of our time?" His answer: "We won't know unless we try."

Ecclesiastical Hippies—But how and what shall we try? Said Dom Frédéric Debuyst, editor of Belgium's *Art D'Eglise:* "We are ecclesiastical hippies in search of meaning." He suggested that churches provide "a kind of great living room in which people meet the Lord and meet each other in the Lord."

The Rev. J. Gordon Davies, director of England's Institute for the Study of Worship and Religious Architecture, said the church "should be a place of dialog, of encounter."

Most conferees seemed to agree with Debuyst that we should return to the small gatherings of the early Christians and even, perhaps, meet in homes.

Philip C. Johnson, FAIA, did not agree. He called for a revolution that would "put religion back into the center of men's hearts and minds, so that we architects can build great spaces again."

Johnson and the Priest—In a dialog with a priest, Johnson asked whether, if it's not the building that is holy but the people, "you really need me? I think that rules me out to design your church."

Said the priest: "You're right."

Several luncheon seminar groups advocated that we stop building churches and synagogues for, say, the next 10 years until we understand the nature of the revolutions we are passing through and thus avoid anachronistic churches.

Mr. Davies suggested making the kind of spaces that will accommodate change. □

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This Weis feature is especially important in hospital, school, and other institutional locations.

Compact demonstration kit shows action... display brought to your office upon request.

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Circle 242 on information card

The astonishing new

Electrac®

by Kirsch

brings the electronic age to traverse drapery fixtures.

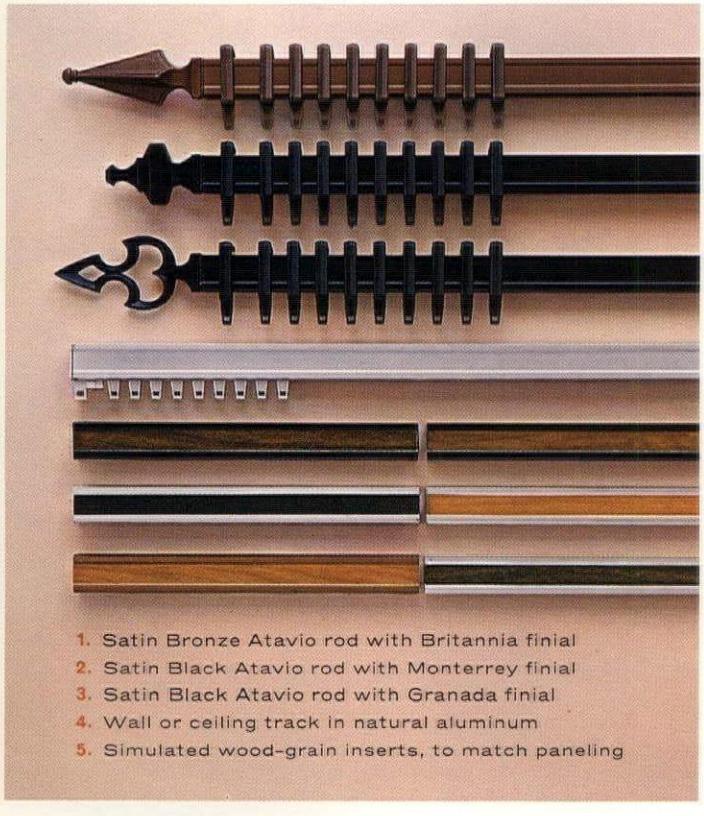
The object you see in the back of the traverse rod is a power capsule. It has no moving parts. At the touch of a switch, magnetic power moves it silently along the rod, to open or close the draperies. The control switch can be located in any convenient place.

This is the actual size of the revolutionary Electrac capsule. It requires no cords or pulleys; has no wheels or other moving parts to go wrong. It needs no maintenance of any kind!

There's nothing in the world like Electrac®

Amazingly simple and convenient, decorative and adaptable to any window situation.

Electrac, Kirsch's new powered traverse rod, is the world's first practical consumer-market application of the linear motor principle, which scientists have been trying to perfect for years. The power capsule and the power rails in the rod, together, form the motor. Everything is self-contained. No special motor installation is required. There are no moving parts — other than the power capsule gliding along the rod. No cords to tangle or break. Electrac uses ordinary 110 v. household current — can be plugged into any convenient socket. It is completely safe, is *guaranteed for 5 years* and costs far less than previous electric powered traverse systems.



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2. Satin Black Atavio rod with Monterrey finial
3. Satin Black Atavio rod with Granada finial
4. Wall or ceiling track in natural aluminum
5. Simulated wood-grain inserts, to match paneling

Electrac by Kirsch combines convenience and utility with beauty and economy—wherever there are windows.

Electrac switch can be located in *any* convenient place, such as a bedside table.

Electrac is adaptable to any combination of windows — including varying widths.

Electrac is suited to any length of traverse, from narrow to building-wide window treatments. Permits never-before-possible control of complex drapery systems.

Electrac can be quietly unobtrusive or add a harmonious accent to the style of the room.

Electrac is versatile, too. For contemporary treatments, aluminum track or aluminum, with simulated wood-grain inserts are available. And you have a choice of bronze or black Atavio style rods and rings, with any of three finials, for traditional interiors. Rods may be ceiling or wall mounted, with plain or decorative clips. Brackets and supports are concealed from the front and can be mounted anywhere along the rod.

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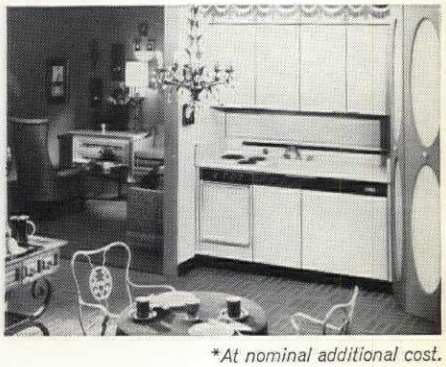

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'I Hope that Someday...'

Thirty-four students were awarded scholarships by The American Institute of Architects and American Institute of Architects Foundation Scholarship Program to continue their undergraduate studies during the 1967-68 school year. And 13 others receiving awards can go on to graduate schools of architecture.

The awards ranged from $200 to $2,000, based on the need and scholastic abilities of the applicants. The scholarship division of the Educational Testing Service in Princeton and a private "need" analyst helped the Institute evaluate each applicant.

This year also, a professor will be off to Peru where he will study planning problems in the arid regions; a graduate student from Edinburgh, Scotland, will travel through Europe to collect photographs for his thesis, and, here at home, an architect will edit an American edition of a Swedish book on the design of pedestrian zones. This is all thanks to the Scholarship Program, which offers aid of from $750 to $3,000 to graduate students, educators and professional architects to encourage research at higher levels.

It was 47 years ago that Dan Everett Waid, a past president of the AIA, made the first bequest to an Educational Fund for the Institute. He then started a trend that has developed into a full-time program of scholarship aid to encourage research and study in architecture.

Since that time, the market value of funds donated to the Institute for this purpose has grown to over $2 million. More than $50,000 is applied to the program each year, and more than 50 students, educators and professional architects receive awards from 14 different funds yearly. Each year, more than 300 persons look to the Institute for financial assistance with their education or research.

The purpose for which funds are allocated is usually left to the Scholarship Committee, but some funds are granted for a particular program of research and study. The AIA, with the American Hospital Association, sponsors two fellowships for research in hospital planning, and the Delano and Aldrich-William Emerson Fund sponsors a visit to the United States by a French architect each year.

Certain funds may also be used to support a variety of educational programs, including student forums, teachers' seminars, and school medals to architectural students.

Funds for undergraduates go toward expenses at an accredited school, and this often frees their personal savings for summer study. Three of the 1967-68 winners reported that their grants made it possible for them to make educational trips during their vacations. One went to Japan, one to Central and South America, and one to Mexico.

"I hope that someday I will be in the position to display my gratitude by helping some young architecture student with his education," one of the many grateful recipients commented in a letter to the donor of his scholarship.

The gifts, endowments and donations to the Scholarship Program come from architects, friends and families of architects who have contributed funds from estates and from royalties on the sale of such books as Henry Adams' *Mont Saint Michel* and Louis Sullivan's *Autobiography of an Idea.*

Private industry has been generous in donating funds on a year-to-year basis for special fellowships for research and study. The Pittsburgh Plate Glass Foundation, the Desco International Association, Blumcraft of Pittsburgh, Syska and Hennessy Inc., and the Lock and Hardware Group of Eaton Yale & Towne Inc. support a total of 20 students of architecture each year.

AIA's office of Education & Research Programs is administratively responsible for the scholarship and fellowship programs. It keeps in close touch with industry and provides a synopsis of student and educational needs, evaluates the reactions of educators and the worth to industry of various types of programs, and serves on scholarship juries to select the recipients of fellowship awards.

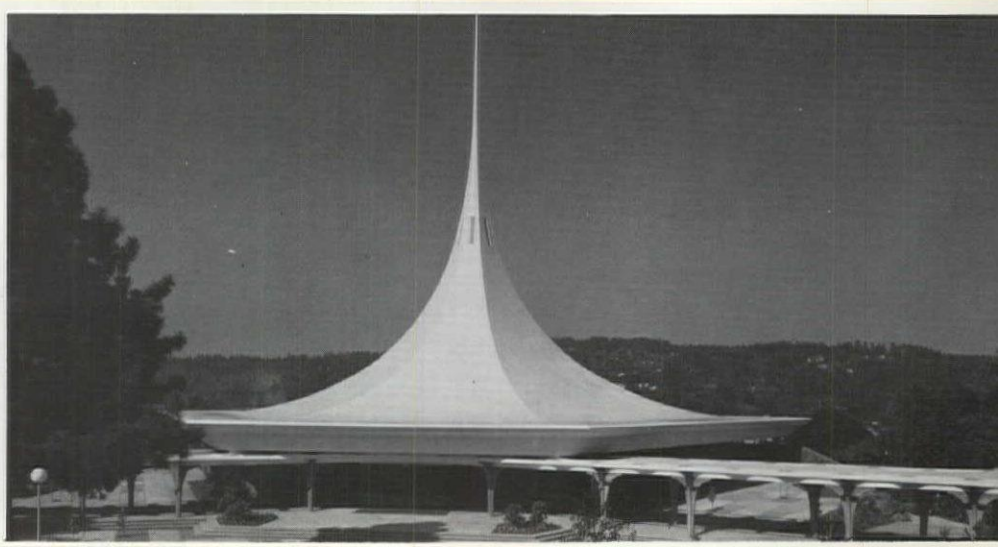
Industry is recognizing an increasing responsibility to encourage architectural study. Said Leo J. Pantas of Eaton Yale & Towne Inc.: "The purpose---is to help permit the most highly qualified architectural graduates to equip themselves for the immense environmental tasks with which our society is now confronted."

"With increasing enrollments and increasing educational costs, its importance becomes even greater in the future," said Devon Carlson of the AIA-AIAF Scholarship Program. Carlson is dean of the School of Architecture at the University of Colorado and a corresponding member of the AIA Scholarship Committee.

The 1968-69 AIA-AIAF Scholarship Program opens on Nov. 1. At that time, undergraduates and graduates may obtain applications from the dean or department head of their schools.

Professionals and educators apply directly to the AIA scholarship secretary at the Octagon. The scholarship committee meets early in 1968 to decide the awards, which are announced in the spring. Donors and recipients will meet at award ceremonies at over 30 schools of architecture. □

the most exciting ideas take shape in plywood



St. John the Baptist Catholic Church, Milwaukie, Oregon/Stearns, Mention & Morris, A.I.A., Eugene, Architects

This soaring roof could have been executed in concrete, steel or plywood. All were considered. Plywood was the architects' choice, on the basis of cost and design flexibility. It acts as a structural diaphragm over lumber decking and laminated timbers, and serves as base for Neoprene-Hypalon roofing. The final structure not only cost less than any alternative—it is just as strong, and was easier to build. For more information about plywood roof systems, write us at Dept. AJ, Tacoma, Washington 98401. (USA only.)

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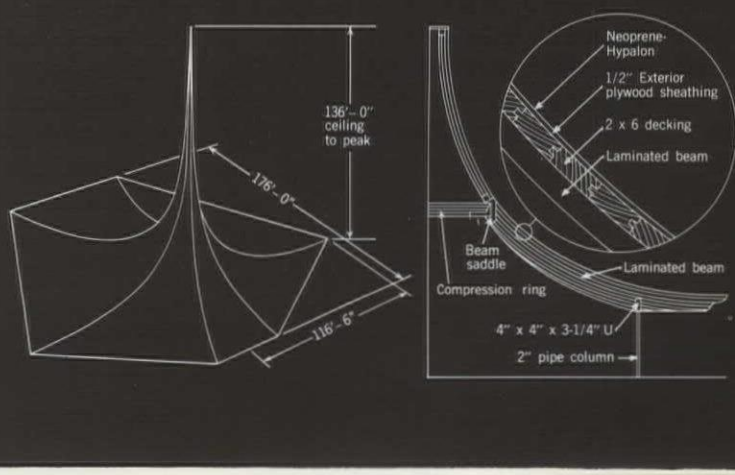


Construction *from page 82*

that they have the right contractor but his financial status is a little shaky, it probably would be wise to bond him. The cost of the bond may be considerably less than the extra cost of going to the next lowest acceptable bidder.

With the award of the contract, the architect's responsibility for cost control includes *disbursement* of the owner's money. This often means holding down a contractor who is determined to get his hands on as much money as possible as soon as possible. The first essential is to obtain from the contractor a "Contract Breakdown for Payment Purposes." Contractors have most of the human failings, including that of seeking a personal advantage. They will unbalance their breakdowns so as to draw as much from the job as possible in the first few payments. They will claim (and not without an element of truth) that with a 10 or 15 percent retention clause, plus the delay in receiving payments, they can never get ahead of the owner.

It is true that there is a leveling-off point after which the contractor will not be ahead, but this may not be reached until somewhere beyond the halfway mark in the construction. It comes when most of the balance of work to be done is by the subtrades and the accumulated retainage is a substantial amount. In the early stages, the contractor could get well ahead of the owner if he grossly inflated the value of such items as excavations, foundations and structural concrete or steel. It is up to the architect to see that the breakdown is fair and reasonable.

Requisitions for periodic payments should be checked carefully. Some architects like to have the total quantities for the major items with the initial breakdown and the quantities completed with each request for payment. Thus, for example, with a total of 1,550 cubic yards of foundation concrete for a total cost of $83,700 on the initial breakdown, it can be seen that this work averages $54 per cubic yard. Each requisition will give the yardage completed and the value of foundation concrete in place is computed at $54 per cubic yard. Whatever method is used, the architect should protect the owner against loss due to overpayment. If the job is going well, a wise architect will not begrudge the contractor every penny to which he is entitled and will, if necessary, press the owner to make the payments promptly. This is the best inducement for the contractor to keep up the good work.

If the contractor is in financial difficulties, there will be obvious danger signals. The job will drag; to keep the payroll down, he will cut the crew; subcontractors will probably be checking with the architect or the owner to see what happened to their previous month's requisitions; liens will be filed by suppliers or subcontractors; the contractor will almost beg for payment of the current requisition. If, in the face of this kind of evidence, the architect does not seek an early showdown with the contractor, he is failing his responsibility to the owner.

Architects, owners and bonding companies sometimes show an amazing degree of trust in contractors. A factual case will illustrate this. One job was about $300,000; the low bidder was $12,000 below the second bidder. Within the industry, it was well known that the low bidder was in a shaky position. He was awarded the job and went bankrupt, and the architect turned to the second bidder to finish the job. It was then revealed that no one had even thought of asking the first contractor for a financial statement. "I'll never do that again," said the architect—and then proceeded to negotiate with the new contractor and award him the job, *without asking him for a financial statement.* Nor did the owners question the integrity or status of their new contractor.

Illegal Contracts

When a contract is declared to be illegal and is voided by the courts, the owner, the contractor and the architect all stand to lose. The courts have tended to show no sympathy toward any party who faces heavy losses in such a case; parties who arrange or enter into contractual agreements are presumed to know the law. Although not a party to the contract, the architect usually recommends the contractor or advises the owner in some degree. Therefore, an architect should know the law or obtain good counsel.

Public contracts, in particular, must comply strictly with the applicable laws. In states which have complex bidding laws, it can require a legal mind just to determine which is the lowest bid. If there is the slightest doubt surrounding the legality of a proposed contract award, the architect should not hesitate to bring in lawyers to settle the point.

"Wrap-up" Insurance by the Owner

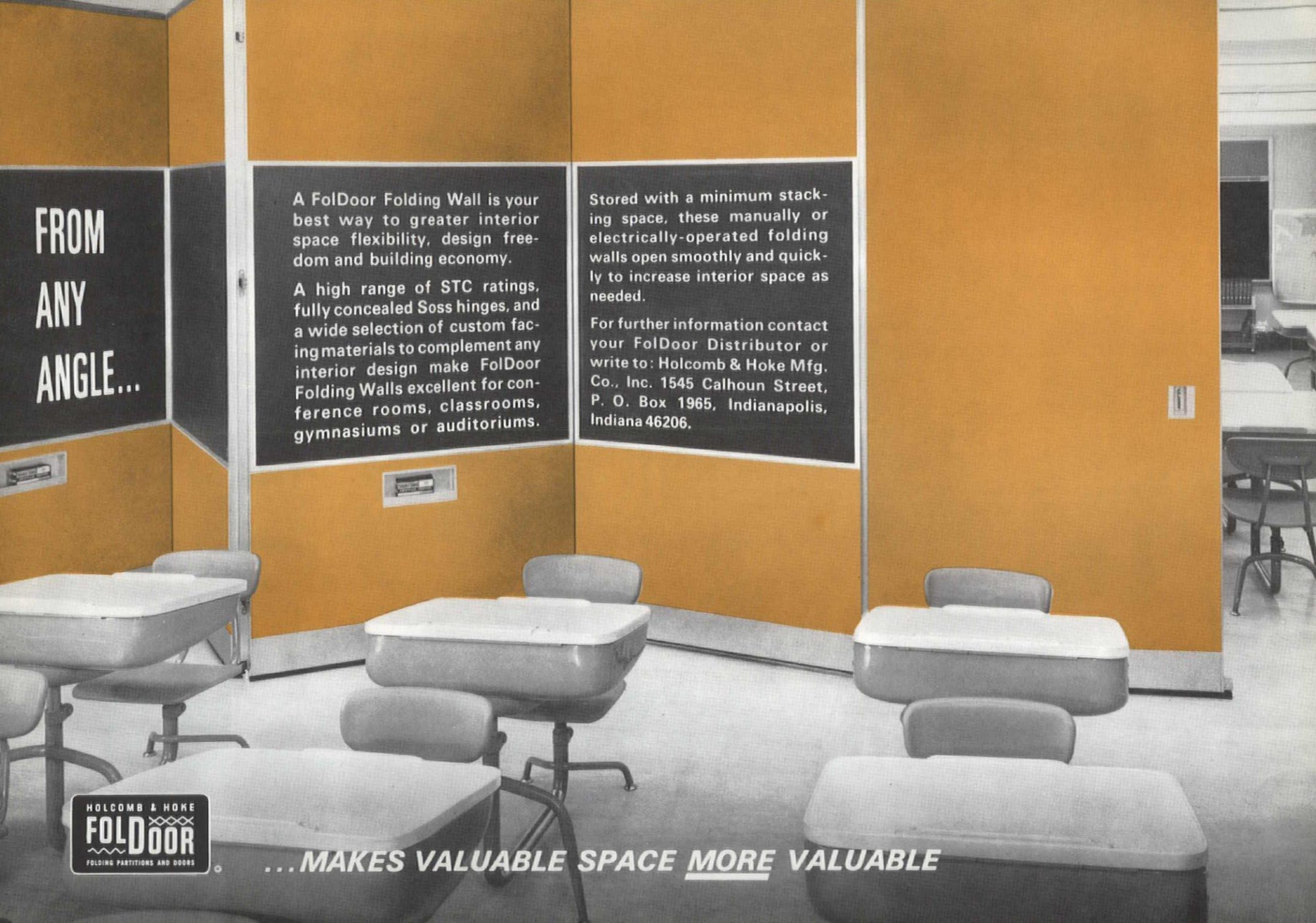
Many owners have, in recent years, bought blanket insurance as a cost reduction factor on their construction projects. The owner hopes, and expects, that the blanket coverage will cost him less than the combined cost of the insurance bought by each of the contractors on the job. There is no doubt that on a cost-plus job, on which all of the trades are working "time and material," the owner can probably save by insuring the job himself. But in all other contracts, the owner is going to pay for some of the insurance twice.

Most general contractors will understand what is meant by the bidding condition that the price is to exclude the cost of workmen's compensation, public liability and property damages insurance. Many subbidders simply ignore this kind of condition; many of them don't even know what their insurance costs them; some of them believe that they are legally obligated to insure their men, no matter what anyone says. What is more, their insurance agents often encourage such thinking. It is also true that if a contractor or a subcontractor has a substantial labor force on a job for which he does not carry the insurance, he may lose experience credits or rate benefits. Because of these factors, the amount deducted by contractors from the bids when the owner carries the insurance will invariably be less than the real value of the applicable insurance. Many subs will price the job with insurance included, then deduct a nominal amount.

Value Engineering

"Value Engineering" is the name given to a cost-saving idea which was originated by the Bureau of Yards and Docks. Now used by many owners, both public and private, value engineering is a new name and a new set of rules for an old idea. The idea is to give the owner the benefit of the contractor's practical knowledge when he comes up with changes that save

Continued on page 94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Construction *from page 92*

money without adversely affecting either the scope or quality of the project. As an incentive, the contractor receives a fair share of the savings, usually 50 percent.

Confronted with value engineering suggestions, some architects have shown themselves to be extremely sensitive to what they consider to be implied criticism of their designs or documents. Owners have been known to view their architects with suspicion when a contractor came up with a sound idea which saved a substantial amount of money. In these respective reactions, both owner and architect are shortsighted. None of us knows it all. Savings suggested by the contractor may be the accumulated ideas of mechanical subs, electrical subs, job superintendent and trained estimators. Taking advantage of their knowledge of conditions on the job or their flair for comparative costs as applied to the project, these construction men are uniquely capable of knowing where savings are possible.

There are some aspects of value engineering that are important to the architect and that he should impress upon the owner. It should be understood that the architect will examine and render an opinion on all items which involve design factors. It is also usually agreed that his fees will not be reduced as a result of value engineering deductions. Thus assured, the architect should be able to participate in value engineering with enthusiasm and with the interest of his client in mind.

The architect should check the accuracy of the quantities and the unit prices used in the contractor's suggested value engineering changes. It must *not* be presumed that because he receives a large share of the savings, the contractor will take pains to show the maximum credit amount. For example, if the contractor's private computations show that he anticipates a saving of $200, submitted strictly as computed, a 50 percent participation would give him $1,000. However, if he can juggle the quantities and unit prices so as to submit a saving of $1,800, he stands to make $900 plus the $200 he shaved off—$1,100 in all. Not all contractors are that devious, but the architect should do everything within his power to ensure that the owner receives the proper credit.

Cost-Plus-Fee Contracts

The award of a construction contract on a cost-plus-fee basis will usually cost the owner more money than he would pay if the job were put out to competitive bidders. The cost-plus contract has certain advantages: the contractor can be handpicked; the contractor can be drawn into a team along with the owner and the architect to develop an economic project; the job can be started without waiting for complete drawings and specifications, with every possibility that the completion date will be advanced as a result. These benefits may more than offset the probable increase in initial cost, particularly if early occupation of the building has a monetary significance.

The choice of the contractor is not a matter about which anyone can be dogmatic. Much depends upon what the owner considers to be most important to him. Does he want a cheap job? A good job? A fast job? A trouble free job? A mixture of all four? Called upon to advise the owner or to supervise the contract, the architect must evaluate certain factors. Does the contractor run an efficient job? Does he operate economically? Does he take pride in doing a good job? Does he have a top quality supervisory and engineering staff? Is the job office overstaffed? Is the job overloaded with dormant equipment? Is the contractor using his purchasing powers for the maximum benefit to the owner? Is the job progress satisfactory?

On cost-plus jobs, the amount of the fee is not nearly as important as the choice of the contractor. The right contractor may well earn a fee of 4 or 5 percent, while another contractor could be expensive at a 2 percent fee. The most economical fee-type contract for an owner is the "Guaranteed Maximum Contract" with an incentive clause. The drawings and specifications must be reasonably complete, if the contractor is to give the owner a guaranteed maximum cost plus a fixed fee. In his case, the owner's costs cannot exceed the guaranteed maximum plus the fee as adjusted by approved change orders. The incentive clause gives the contractor part of the savings should the final

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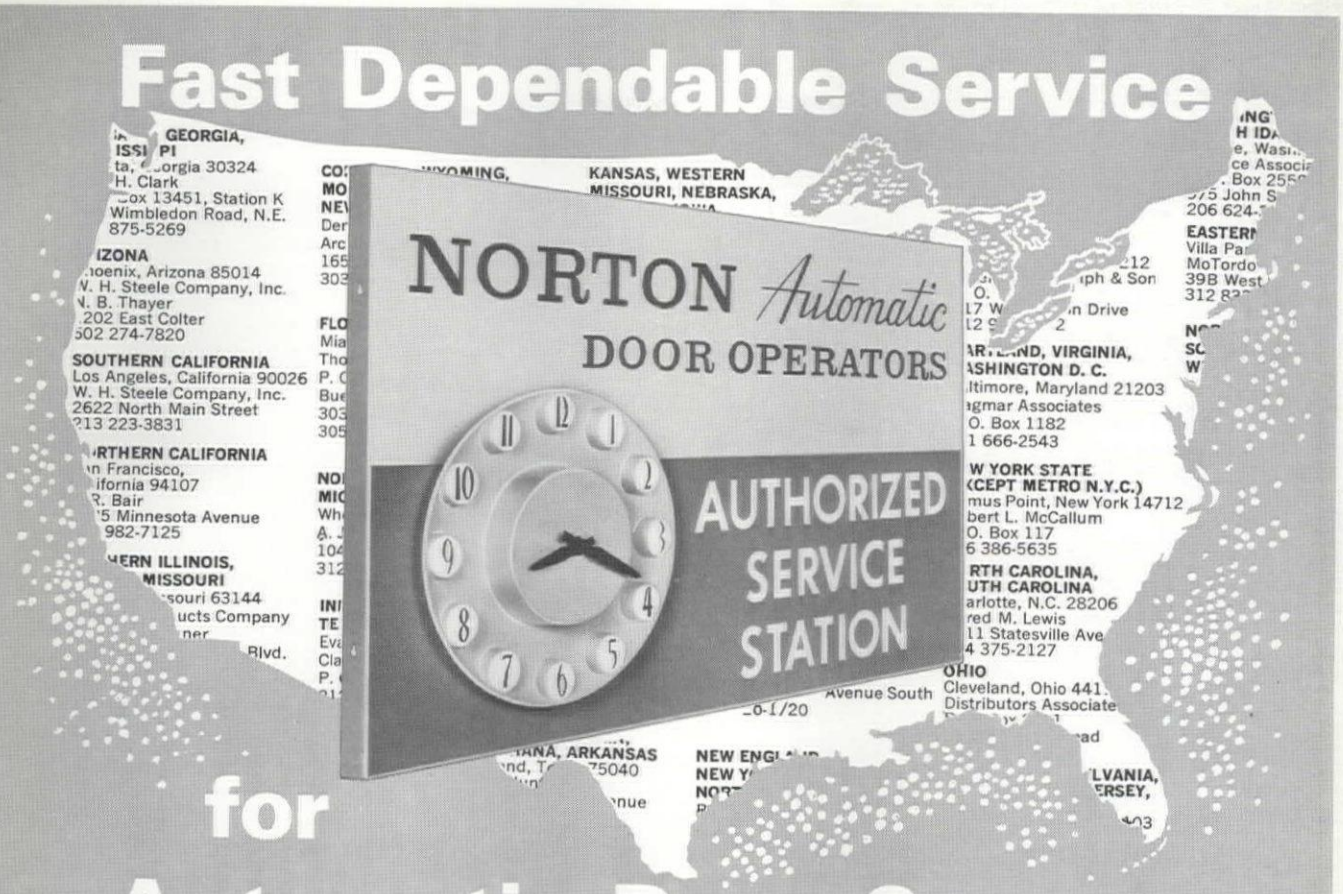

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Construction *from page 94*

cost be less than the guaranteed maximum. The contractor's participation in the savings is sometimes 50 percent but seldom less than 25. Change orders must be handled separately at an agreed fee. With a good contractor — one who has worked with the architect to effect all acceptable economies before the contract is made—this is a very satisfactory type of contract to the owner.

Project Representative

The job project representative, or clerk of the works, is often under the jurisdiction of the architect. This job representative can be of great help, but quite often he is a hindrance to the whole project. Cost control will suffer if his work is unsatisfactory. Too many of these people lack depth of construction knowledge and the administrative ability demanded of them if they are to do their job properly. The fact is that owners or architects don't often pay the amount of money that attracts good men. On most jobs, the contractor's superintendent will get at least 50 percent more pay than the clerk of the works — and any ordinary tradesman who knows only his own craft can earn more.

A really good project representative is worth as much to the owner and architect as a good superintendent is to the contractor. He will safeguard the owner's interests, see that the contractor conforms to the contract, ensure that the workmanship is the best possible within the scope of the contract. He will also be an extra pair of eyes, working with the superintendent to their mutual benefit. There is no more miserable individual to work with than the project representative who deliberately waits until a particular item of work is finished, then says, "Tear it out, it's not right." He should bring up his objections or ideas immediately as they occur to him. He should aid in the progress of the project. Inept project representatives usually fit one of two categories: Either they are easygoing and stay out of the way or they spend all their time complaining about petty things.

An architect who is interested in cost control should not tolerate an inept project representative, nor should he expect to get a good one cheaply. If the project cannot afford a good man, save the money; it would be better not to put anyone on the job.

Time Schedules

The completion date is an important item in most construction contracts. Occupancy of his new building is vital to an owner. Whether a matter of earning power, vacating rented property, selling property to be vacated, an urgently needed school or hospital, every new building is badly needed, or the owner would not be investing in it. Satisfactory progress toward completion of the project is therefore an important factor in cost control. The architect and the owner are sometimes more responsible for job delays than they realize. A good contractor knows that time is money and hates to waste it. A poor contractor, whose jobs drag endlessly, probably shouldn't have been given the contract.

It is normal to request that the contractor submit a time schedule within a few days of being awarded a contract. It is important to impress upon the contractor that his time schedule must be realistic. A responsible contractor realizes that, having agreed to do a certain job by a fixed date, it is up to him to plan the work so as to meet that completion date. His time schedule may be anything from a simple bar chart to a detailed critical path schedule.

Critical path scheduling is generally believed to be a real breakthrough in time scheduling. Prepared by the contractor, CPM does make him think through the job step by step and should help him to pinpoint probable bottlenecks. However, there are a lot of "CPM specialists" who know little or nothing about construction and therefore have to rely on production factors given to them by the contractor. A really good contractor knows the critical items with—or without—a CPM chart. This is not meant as a criticism of critical path, but only as a warning that it can be no better than the judgment of the people who establish the productivity figures.

Regardless of the type of time schedule used and regardless of what a critical path shows, there are certain operations on a building project that are always critical. They are the deliveries or trades which can always tie up the job: reinforcing steel for foundations; the structural frame (whether steel or concrete); the exterior skin of the building; interior partitions; door bucks; wet finish trades such as plastering, terrazzo and ceramic

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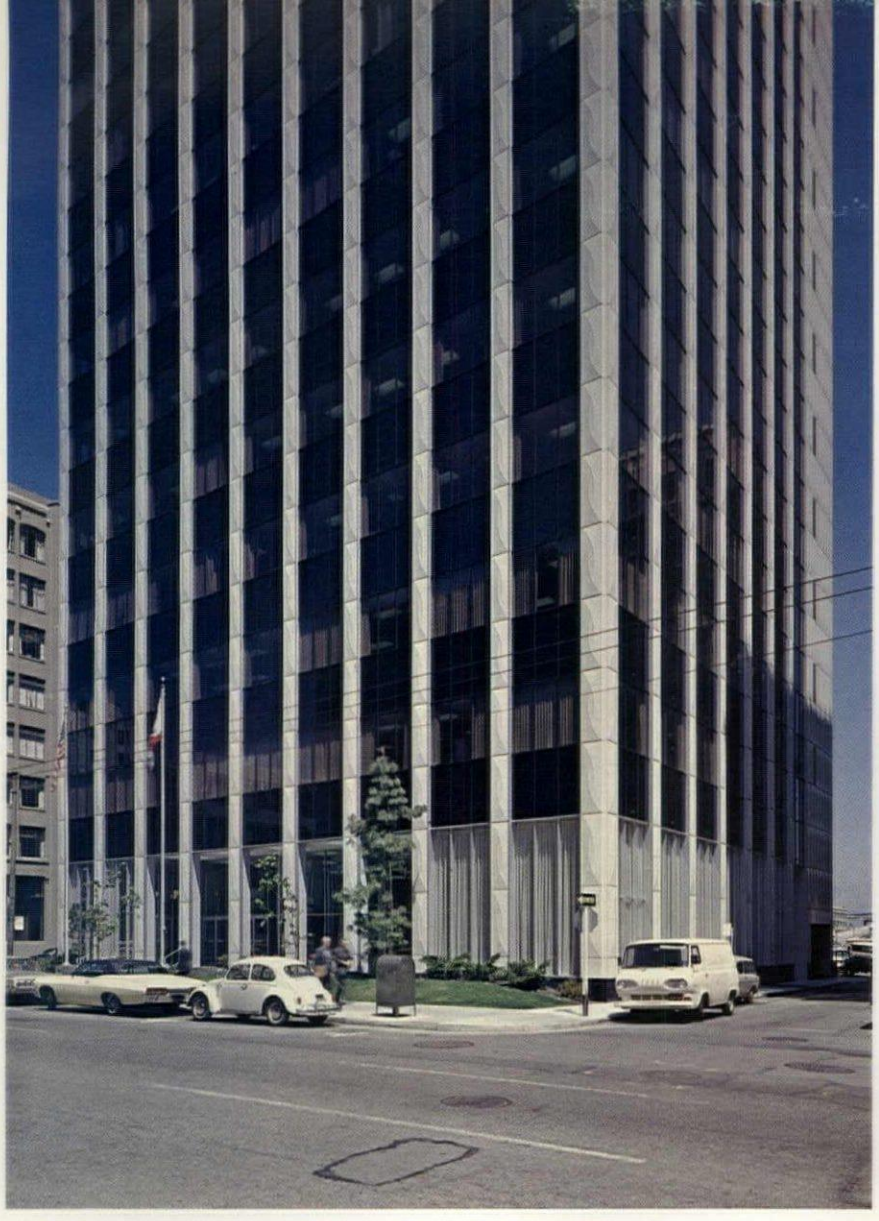
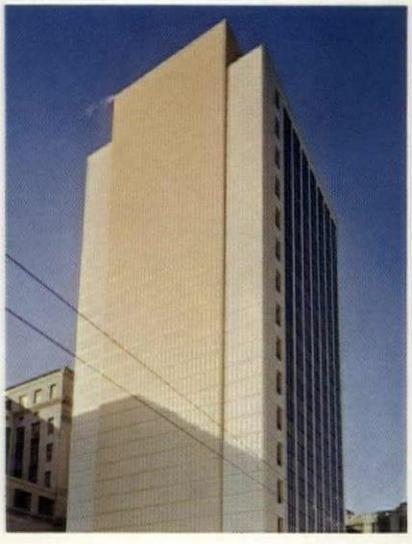


Steel makes products better for you

LEFT: Embossed porcelain enamel column covers on three sides accent the vertical dimensions of the Insurance Center tower in San Francisco.

BELOW: Two matte finish NatureTone colors in porcelain enamel give visual definition to the service module.



Porcelain enamel contributes color and form to San Francisco's Insurance Center

Distinctively designed porcelain enamel panels in light, matte finish, NatureTone hues accent the slender columns on three sides of the 16-story Insurance Center tower recently completed in San Francisco. Deep bronze spandrels and tinted glass define the floor levels as the eye travels up the columns. The fourth wall is solid porcelain enamel in two tones.

Color selectivity plus the three-dimensional form possible with porcelain enamel facilitated the design of a distinctively modern structure and the achievement of compatibility in an environment of older buildings.

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Owner, Engineer, and Builder: Richard Hadley, Seattle, Washington

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Construction *from page 96*

tile; any equipment or specialty items that need a very long lead time for delivery.

Time schedules may be basically the contractor's problem, but the architect can also aid or impede completion of the project. One thing is certain: A day lost is gone, and there is no such thing as making it up. If the job stands still awaiting a decision by the architect or the owner, time will be lost. Extensive change orders will delay completion of any project. A seemingly innocuous change in a pump can delay all of the heating work. A delay in awarding the finish hardware (when carried as an allowance) will delay fabrication of the metal door bucks, and that could slow the whole job down.

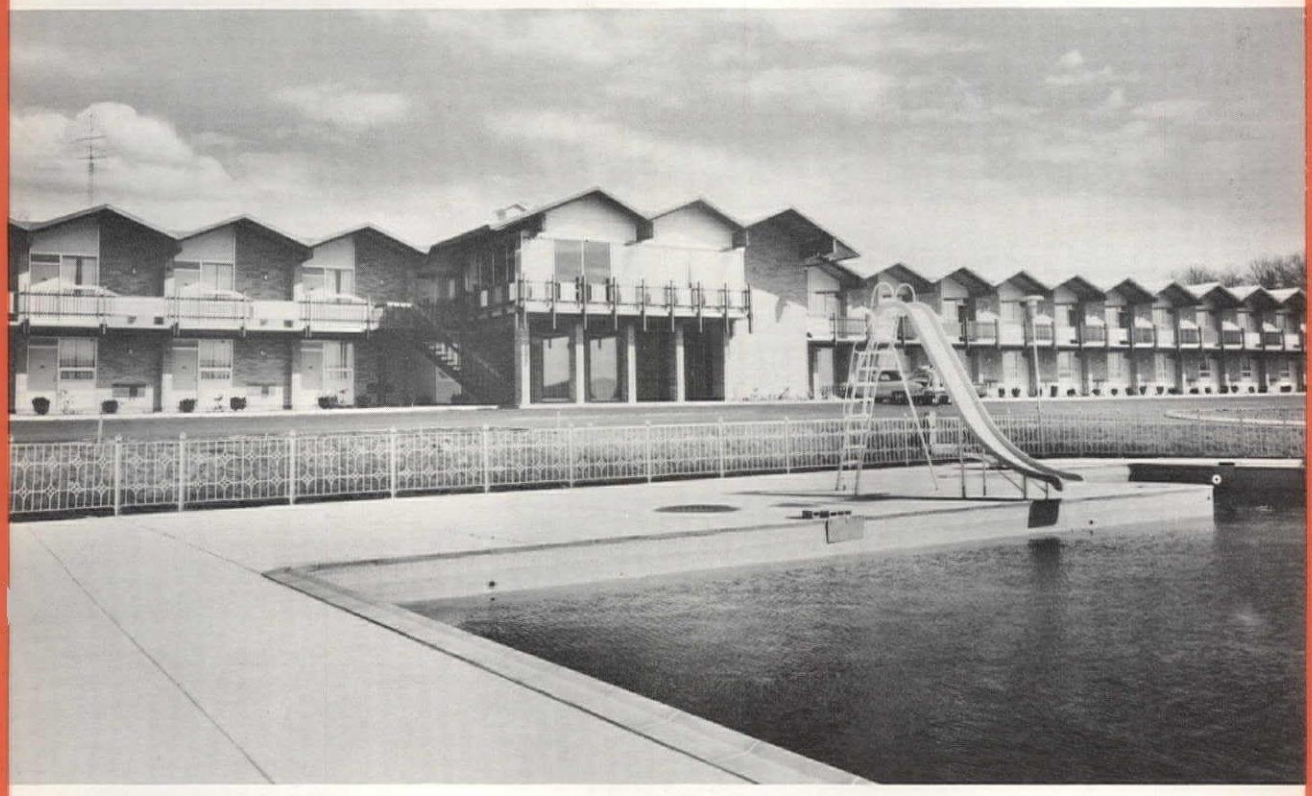
The important point is that if the architect or owner slows down the contractor, completion of the job will be delayed. This has nothing to do with whether the contractor is pushing the job to the best of his ability. An efficient architect will aid in the progress of the project while a less efficient architect combined with a slack contractor will cause the owner to be the greatest sufferer.

Thirteen Steps: A Summation to Cost Control During Construction

1. The scope of the contract between the owner and the architect should be clear, precise and in writing.
2. Drawings and specifications should be complete, clear and precise.
3. Important unit prices should be incorporated into the contract.
4. The financial status and responsibility of proposed contractor should be investigated.
5. Contract breakdown for payment should not be unbalanced.
6. Overpaying the contractor should be guarded against.
7. Time schedules and progress should be satisfactory.
8. *All* decisions should be rendered promptly.
9. The laws relating to contractual relationships should be understood and observed.
10. The rights of *both* owner and contractor should be understood and observed.
11. All quantities and prices in the contractor's change estimates should be carefully checked.
12. Only a first-class construction man should be accepted as project representative (clerk of the works).
13. It takes prompt action to save a job that begins to "go sour." ☐

Circle 245 on information card ►

Distinctive Architecture and Electric Space Conditioning Build Repeat Patronage for Connecticut Motor Lodge



THE CASE — The architects' design for the Niantic Motor Lodge at Niantic, Conn., accomplishes two objectives vital to the operation of a motel: it captures the attention of passing motorists and—once they are stopped—offers such attractive conveniences the travelers come back again and again.

The first objective was achieved in the Niantic development through a happy combination of site and architecture. The motel is situated atop a rolling hill and is visible for a considerable distance in each direction from Exit 74 on the Connecticut Turnpike. At night, extensive exterior illumination helps catch the road-weary eyes of high-speed drivers.

The distinctive zigzag roof line and contrasting buff-colored brick with pastel curtain wall panels and redwood trim on the exterior make the two-story building appealing in its natural setting.

As for the second objective—comfort and convenience—the architects and the motel owners incorporated several features. A core building, flanked by two guest wings, houses a first-floor restaurant, coffee shop, and manager's apartment. A terraced cocktail lounge is located on the second floor.

Guest rooms on the second floor have wood-beamed "cathedral" ceilings, following the zigzag roof line. For each of the 100 guest units, self-contained, through-the-wall electric heating-cooling units with individual room controls were selected. The public rooms are conditioned by electric air conditioners and duct heaters.

THE HISTORY—Niantic's manager, Robert Gramitt, says: "Comparing electricity with oil and gas, I find that electricity is cleaner and more efficient, requires less maintenance, and is flexible and convenient. The combination units with individual controls are particularly convenient for both guests and employees. Guests seem to like the fact that they can have either heating or cooling at the push of a button. Perhaps this is one of the reasons why the same people stay with us time and time again."

SEE REVERSE SIDE FOR DETAIL INFORMATION

1 CATEGORY OF STRUCTURE:
Motel and Restaurant

2 GENERAL DESCRIPTION:
Area: 34,000 sq ft
Volume: 280,000 cu ft
Number of floors: two
Number of occupants: 35 plus guests
Types of rooms: 100 guest rooms, cocktail lounge, restaurant, coffee shop, kitchen, manager's apartment, offices

3 CONSTRUCTION DETAILS:
Glass: double in guest rooms, single elsewhere
Exterior walls: 4″ brick, 8″ block, 1½″ rigid insulation (R/5), ½″ gypsum board. U-factor: .15; curtain wall with rigid insulation (R/8). U-factor: .10
Roof or ceilings: built-up roof over 2″ rigid insulation (R/6), 2″ wood deck. U-factor: .11
Floors: concrete slab; perimeter insulation
Gross exposed wall area: 9,000 sq ft
Glass area: 3,500 sq ft

4 ENVIRONMENTAL DESIGN CONDITIONS:
Heating:
Heat loss Btuh: 886,000
Normal degree days: 6,000
Ventilation requirements: 10-15 cfm/person
Design conditions: 0° F outdoors; 70F indoors
Cooling:
Heat gain Btuh: 900,000
Ventilation requirements: 10-15 cfm/person
Design conditions: 95F dbt, 75F wbt outdoors; 75F, 50% rh indoors

5 LIGHTING:
Levels in footcandles: 20-50
Levels in watts/sq ft: 1-2.5
Type: fluorescent and incandescent

6 HEATING AND COOLING SYSTEM:
Guest rooms have self-contained, through-the-wall electric heating-cooling units with individual room controls. Guests can have heating or cooling or fresh air as desired. Public rooms are conditioned by one seven-and-a-half-ton electric air conditioner and one four-ton electric air conditioner and duct heaters.

7 ELECTRICAL SERVICE:
Type: underground
Voltage: 120/208v, 3 phase, 4 wire
Metering: secondary

8 CONNECTED LOADS:

Heating & Cooling (82.5 tons)	350 kw
Lighting	65 kw
Water Heating	120 kw
Cooking	96 kw
Other	20 kw
TOTAL	651 kw

9 INSTALLED COST:*

General Work	$354,500	$10.45/sq ft
Plumbing & Mech.	120,000	3.55/sq ft
Electrical	76,500	2.25/sq ft
Sitework	85,000	2.50/sq ft
TOTALS	$636,000	$18.75/sq ft

*Building was completed 7/64

10 HOURS AND METHODS OF OPERATION:
24 hours a day, seven days a week.

11 OPERATING COST:
Period: 7/2/65 to 7/1/66
Actual degree days: 6,038
Actual kwh: 869,040*
Actual cost: $14,175.71*
Avg. cost per kwh: 1.63 cents*
*For total electrical usage

Billing Date	Degree Days	Demand	kwh	Amount
8/3/65		225	76,320	$ 1,291.15
9/3/65		216	78,720	1,280.80
10/4/65	110	181	45,120	868.06
11/4/65	426	147	47,040	825.85
12/3/65	753	320	64,320	1,326.16
1/3/66	961	220	108,000	1,513.00
2/3/66	1186	294	138,720	1,903.14
3/3/66	1008	229	88,320	1,393.75
4/4/66	792	164	77,040	1,070.08
5/3/66	534	168	50,400	917.20
6/3/66	268	194	46,800	909.40
7/1/66		160	48,240	877.12
TOTALS	6038		869,040	$14,175.71

12 UNUSUAL FEATURES:
Individual controls in guest rooms. Public areas split into two independent zones, each served by a separate unit.

13 REASONS FOR INSTALLING ELECTRIC HEAT:
A study revealed that an electric space conditioning system would be economically feasible. The owners chose an electric system over flame fuel systems because they felt that the electric system offered these important advantages: it would permit individual room control; it would enable guests to have either heating or cooling at the push of a button; it would be clean, safe and dependable; and it would require less maintenance. The system has been in use for almost three years now and has lived up to every expectation.

14 PERSONNEL:
Owners: Shoreline Motor Lodge, Inc.
Architects: Professional Associates
Consulting Engineers:
Mechanical: Burton & Van Houton
Electrical: V. P. Juselis
General Contractor: Ernest F. Carlson
Electrical Contractor: Associated Electric Co.
Utility: The Connecticut Light & Power Company

15 PREPARED BY:
Ralph Marrone, Manager of Sales Technical Services, The Connecticut Light & Power Company.

16 VERIFIED BY:
W. J. Otorowski, Architect

Robert L. Van Houton, P.E.

The Consulting Engineers Council USA, has confirmed the above categories of information as being adequate to provide a comprehensive evaluation of the building project reviewed.

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Books

The New Brutalism: Ethic or Aesthetic? Reyner Banham. New York: Reinhold, 1966. 196 pp. $15.

This book makes a significant contribution to the growing body of literature on the philosophy of 20th century architecture. Here Banham has carefully documented an architectural movement about which he is undoubtedly well informed and deeply involved. It was he who wrote what many regard as the "manifesto" of the movement ("The New Brutalism," *Architectural Review*, Dec. '55, p. 355-361).

Banham states that his book has a "built-in" bias toward Great Britain's contribution to Brutalism. This is as it should be, surely, since the origins of the movement were in postwar Britain, and British architects have made singular contributions to the movement.

Banham's analysis is scholarly, and there are ample illustrative materials to underscore his comments. His critical comments are provocative. Now as a "survivor" of the movement, Banham advises us to take his 1955 manifesto with a grain of salt, if one is looking for a description of the New Brutalism today. He does concede, however, that the article demonstrates something of the excitement about the architectural discussions which took place in certain London circles at the time.

"But," he writes, "the process of watching a movement in gestation and growth was also a disappointment in the end. For all its brave talk of 'an ethic, not an aesthetic," Brutalism never quite broke out of the aesthetic frame of reference." Banham says it has never been possible to break through the preconceptions and prejudices of architects. He concludes: "I make no pretense that I was not seduced by the aesthetic of Brutalism, but the lingering tradition of its ethical stand, the persistence of an idea that the relationships of the parts and materials of a building are a working morality—this, for me, is the continuing validity of the New Brutalism."

Metropolis on the Move: Geographers Look at Urban Sprawl. Edited by Jean Gottmann and Robert A. Harper. New York: Wiley, 1967. 203 pp. $6.50 hardbound, $3.45 paperbound.

Two distinguished scholars have edited this book which presents the essence of a conference held in 1964 at Southern Illinois University. The focus of the conference was on urban sprawl, not on the central city. Among the contributors are such well-known urbanists and geographers as Harold Mayer, Edward Higbee and Robert Dickinson.

Greater London; An Industrial Geography. J. E. Martin. Chicago: University of Chicago Press, 1966. 292 pp. $6.

Industrial geography is becoming an increasingly crucial topic in today's urban society. This detailed and extremely thorough study of the structure of London industry is of use to the American scholar because it presents a method of research applicable to the economic geography of any urban complex.

Architecture: Design, Engineering, Drawing. William P. Spence. Bloomington, Ill.: McKnight & McKnight, 1967. 582 pp. $9.40; school price, $7.05.

This is a textbook aimed at help-

ing the student understand the principles involved in the design and planning of residences and small commercial buildings. The author states that the book "is not designed to prepare architects or engineers but to provide an introductory experience in the complexities of the building construction industry."

Suggested class activities and additional readings are noted at the end of chapters and serve to supplement the text. There is an apparent abundance of illustrations, diagrams and tables.

Industrialized Building and the Structural Engineer. London: Institution of Structural Engineers, 1967. 332 pp. 8 gns.

This is the published record of the proceedings of a conference organized by the Institution of Structural Engineers and held in London in 1966. It contains the papers prepared by authorities for the conference, introductory statements by the reporters, the discussion at each of the five working sessions and the authors' replies.

The book is well illustrated with photographs and diagrams, and it will be of considerable use to the structural designer. The president of the institution, D. A. G. Reid, comments that architects and engineers "are only too well aware of the dangers of assumptions when it comes to transferring factory methods to construction sites." Industrialized methods result in unusual problems, and the aim of the conference was to review the problems, to set forth authoritative statements and to emphasize the structural engineering implications of industrialization.

The major sessions of the conference were concerned with steel; concrete; other materials (timber, structural chipboard, aluminum, plastics, ceramics); performance of future developments; and the role of the structural engineer.

Modern Prestressed Concrete. H. Kent Preston and Norman J. Sollenberger. New York: McGraw-Hill, 1967. 337 pp. $13.50.

This book is aimed at the structural engineer with the expectation that he will be able to use it for self-study. It gives him complete and recent data on the design of safe and economical prestressed concrete structures. Among the topics covered in 15 chapters are design procedure, materials, specifications, and typical structures and their components. All prestressing methods in current use in this country are described and illustrated.

Materials and Labor Estimator for the Entire Building Industry. Edited by Robert Taylor. New York: William Dogan Annual Publications Associates, 1967. 366 pp. $25.

The book basically is a reference with practical design data and information in the form of tables and graphic presentations. Combined with the various sections are definitions and symbols which enable the user to have access to pertinent information at his fingertips.

Of particular interest is the section on labor. In a comparatively easy-to-use tabular form, the editor has presented labor hours, skilled and unskilled, for estimating construction tasks. By inserting local wages, labor costs per square foot or per cubic foot may be developed. (This method can be adapted to an individual's normal take-off work.) Used with the incorporated coordination chart for materials and estimating units, a rapid estimate can be achieved. □

Calendar

National

Oct. 18-20: Architectural Woodwork Institute Annual Convention, Drake Hotel, Chicago
Oct. 19-22: National Trust for Historic Preservation Annual Meeting and Preservation Conference, Chase-Park Plaza Hotel, St. Louis
Oct. 23-24: Second Annual Conference on Product Literature and Advertising in the Construction Industry, Drake Hotel, Chicago
Oct. 30-Nov. 3: American Concrete Institute Fall Convention, Hotel Fort Des Moines, Des Moines, Iowa
Nov. 12-15: Community Junior College Facilities Planning Conference, Michigan State University, East Lansing
Nov. 14-16: Building Research Institute Fall Conference, Mayflower Hotel, Washington, D.C.
Nov. 15-17: Consulting Engineers Council of the United States Eleventh Semiannual Meeting, Olympic Hotel, Seattle
Nov. 30-Dec. 1: Seminar on Metallic Materials in Architectural and Structural Applications, Polytechnic Institute of Brooklyn

AIA Regional and State Conventions

Oct. 11-14: East Central States Region, Hammond, Ind.
Oct. 12-14: Ohio Region, Nationwide Inn, Columbus
Oct. 18-20: Texas Region, Houston
Oct. 19-21: Pennsylvania Region, Hotel Hershey, Hershey
Oct. 26-28: Illinois Council, Sheraton-Rock Island Motor Inn, Rock Island
Nov. 2-4: Central States Region, Mayo Hotel, Tulsa, Okla.
Nov. 5-8: Western Mountain Region, Broadmoor Hotel, Colorado Springs, Colo.

AIA Committees and Related Meetings
(At the Octagon unless otherwise noted)

Oct. 7-8: Esthetics
Oct. 9-10: Education & Urbanization Workshop/Housing
Oct. 13-14: Historic Buildings
Oct. 16: Office Procedures
Oct. 19: Institute Honors
Oct. 27: Research for Architecture, Gatlinburg, Tenn.
Nov. 2-3: State Executives Meeting, San Francisco
Nov. 6-8: Council of Commissioners
Nov. 13: National Association of Real Estate Editors
Nov. 19-22: Student Forum

International

Nov. 7-9: International Symposium of Esthetics and Design in Wood, State University of Forestry, Syracuse, N. Y.
Nov. 16-17: International Commission on Environmental Design Interprofessional Conference, Education Center, University of Maryland

Awards Program

• R. S. Reynolds Memorial Award. Applications available from AIA. Registration closes Feb. 1.

Tour

• Around South America Architectural Trek, 21 days, departing Oct. 24. Repeated Jan. 30 and March 26, 1968. Arranged for AIA members with special group fares by United Travel Agency, Inc., 807 15th St. N.W., Washington, D.C. 20005. □

Letters

The Subject Is Fees

EDITOR:

I have just recently established my own practice. As a result, I am becoming increasingly aware of the problems in our percentage fee system.

So I read with much interest the article "Our Uncommon Profession" by Charles Luckman, FAIA, in the August issue. I fully agree when he says, "I think I am being reasonably nice when I say that the fee system which is based on a percentage of the construction cost is archaic, impractical and immoral." As a new practitioner, I would like to see more on this subject.

The four architectural firms in this city of 35,000 are probably as ethical as any similar group in the nation. But when I venture out into the surrounding areas where others operate, I find competition in such forms as:

- an architect donating 1 percent of his 6 percent fee back to a nonprofit organization
- an out-of-state firm quoting a figure as low as 4½ percent for a public school project.

Prospective clients ask me why I cannot quote a lower-than-usual fee percentage since it is obvious that I need the project, and it is also obvious that my overhead and costs should be lower than the older and larger competitors. They say that I will probably make a larger profit than the established firm, which may be true.

I guess that an office could charge 3 percent as long as it complies with the Standards of Professional Practice, especially Section 2.6, and is not aware of the fees being quoted by other firms interested in a particular project.

JAMES (BOB) GRESHAM, AIA
Paducah, Ky.

"A Freudian Slip"

EDITOR:

Regarding my review on windowless classrooms in July, there is a somewhat distorting typographical error in the bottom paragraph on page 88. The printer made a Freudian slip and set "monetary" instead of "momentary."

H. H. WAECHTER, AIA
Creswell, Ore.

Esthetics in Building Products

EDITOR:

Your Comment & Opinion columns in April and May devoted to building products and their uses reminded me of some remarks I made before a joint meeting of Producers' Council and the Architects League in Hackensack, N.J., earlier this year.

Manufacturers now perform many of the functions not only of the artisan on the site but also of the architect. This is called progress, but there have been some unhappy results.

With prefabricated products replacing those which used to be made by hand, the job of the working man on the site is merely to put units in place. The result of this lack of craftsmanship is a frequent deterioration of quality.

The appreciation of beauty in design, too, is still not ultimately cultivated. Architects and producers are not, for the most part, working in conformance with the best standards of their respective trades. The layman is afflicted with a visual illiteracy, which is due to a materialistic society and a nonesthetically oriented education.

To begin to remedy this syn-

drome, I think building products should first reflect more of the intention of producing something beneficial and better for society. I honestly think that financial success would follow naturally. Many products reflect, instead, either an insensibility to the esthetic qualities which these products could and should have or an inept program to make them more "attractive" for sales purposes, with the disastrous result that many of them are horrible.

I am not making a pitch for the use of architects in the design of these (although that would be a great improvement); there are people in the business, called industrial or product designers, who are designated to this task. It is because I have had experience in both of these fields that I have the temerity to make these observations. Any mild criticism, therefore, is all in the family.

It must be said that there are certain basic established principles of good design, but they are violated daily by manufacturers of building products and, unfortunately, by architects. For example, I have been surprised in the past, upon inspecting one of our completed buildings, by the enormous size, number and disparity of roof fans completely and repulsively exposed to view. I began to talk to manufacturers to get them to improve their designs. Recently a couple of manufacturers have come out with roof fans which have a good, simplified silhouette, a dull finish which is not aluminum and is obtainable in several colors, including black and white.

Similar criticisms could be applied to such products as aluminum windows, classroom chalk-boards, lighting fixtures, acoustical ceiling systems, lockers and even brick.

On the other hand, let me add that there are many products that do a good, consistent job esthetically. I might cite, among many, ceramic tile, resilient floor-covering (carpeting included), hardware, wall coverings and paint. The manufacturers of the latter, particularly, now understand that color is a very important element for their product and that many architects select paint purely on that basis.

In conclusion, I would suggest to architects that they carefully evaluate the esthetics of all the products which they use because these can make or break the architectural design of their buildings. I would recommend to producers that they encourage comments and criticism from architects concerning the appearance or esthetic value of their products. Producers and architects working together, trying harder to improve the visual aspects of building products, have it in their power to make a more esthetic America.

ARTHUR RIGOLO, FAIA
Clifton, N.J.

School Planning Praised

EDITOR:

I have just gotten around to reading the School Plant Study (July) on "Expressing Educational Requirements." I would like to compliment Peter D. Paul on an article well thought out.

I particularly agree that the participants in the school planning process must include the community. I would also suggest that on major jobs there must be a preliminary draft of the educational program followed by a study of the architectural and environmental considerations followed by a final draft. MARIO C. CELLI, FAIA
State Board of Education
Harrisburg, Pa.

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Next Month

The Great Profit Chase: The architect's concentration on good design and professional ethics leads him to ignore effective management of the business side of his practice, often resulting in client reactions ranging from confusion to serious misunderstanding. Also, the scope of architectural services, contracting procedures and business practices varies widely from one firm to another, further confusing clients.

Under such circumstances, establishment of equitable compensation for professional services is difficult and complex. The first step in assisting the architect with the business management aspects of his practice is the compilation of accurate cost information. Some of this pertinent data from the AIA "Comprehensive Study of the Cost of Architectural Services" is presented and interpreted in an abbreviated format as an appetizer to the soon-to-be-published complete report.

Preservation at Work: In last May's AIA JOURNAL, George B. Hartzog Jr., director of the National Park Service, described the "new preservation" as he sees it in the US today. He talked about giving "much greater emphasis to architecture, design and environmental esthetics" and devoting landmarks and significant areas "to compatible up-to-date uses."

How that theory is being put into practice is demonstrated by several projects across the land; and just for good measure, an American architect makes a last-minute plea, with several specific recommendations, for Wright's Imperial Hotel, which seems doomed to death by year's end.

Practice Pains: For the past four years a California architect has been making an in-depth, in-breadth and in-length study of the Building Committee. He presents the results in an easy-to-digest fashion and makes the piece even more palpable with his own sketches.

PHOTO & ART CREDITS: P. 12—Architect of the Capitol's Office; 50—US Coast Guard; 54—Calvin Kowal; 55—Peter Amft; 62 & 63—Palle Hestbech; 64—H. T. Bild (top); Carl Mejer (center); 66—Gösta Nordin (top); Kingsbury Marzolf, AIA (center left and middle; bottom left); Press & Bild (bottom right); 69—Royal Reklamefoto; 72-75—John W. Wade, AIA.