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Journal

April 1965

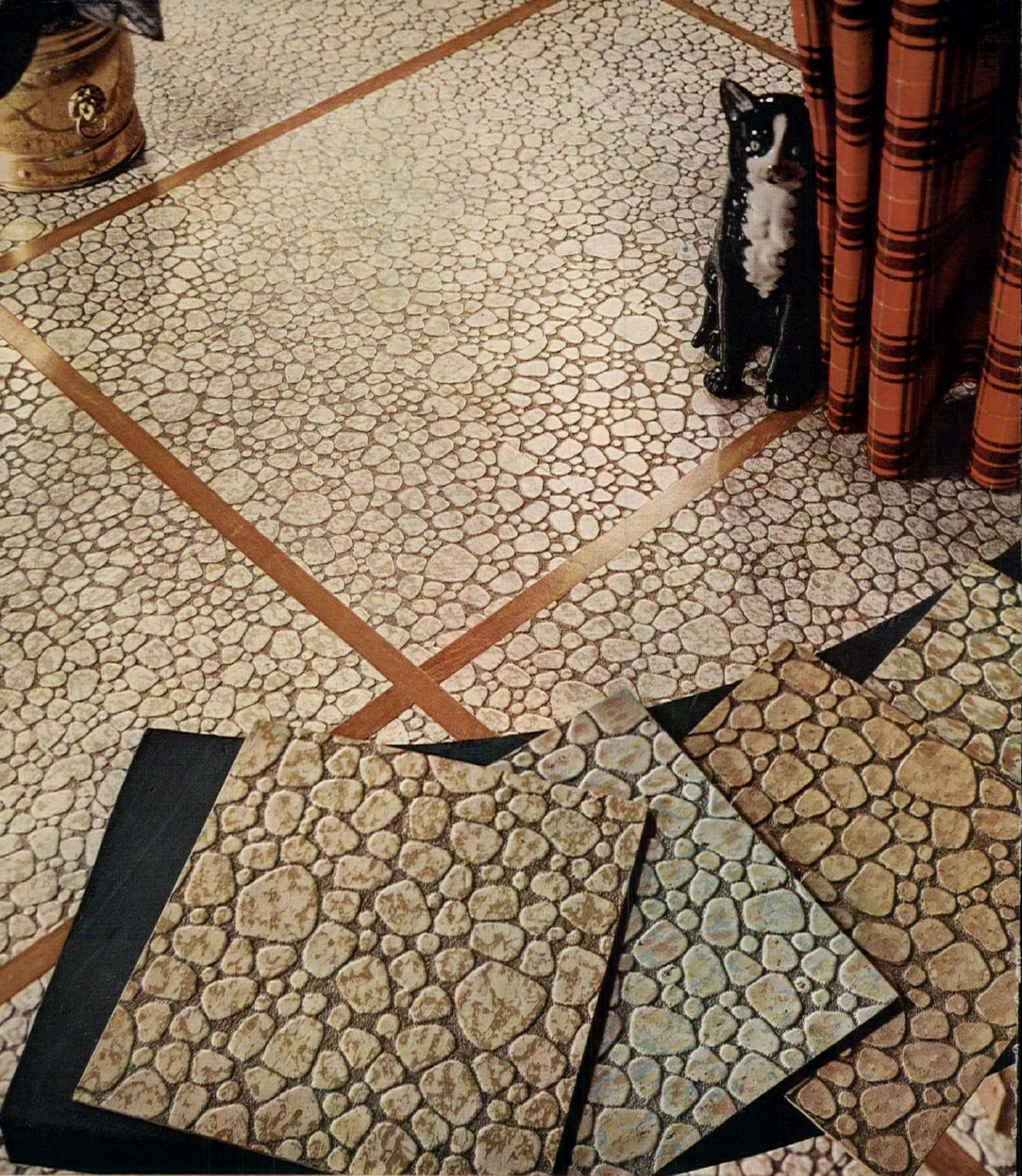


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- Cover:** Festival of Britain sketched by Arthur Cotton Moore AIA (p 38)

LOOKING AHEAD TO MAY

The Federal City as a Client

As Washington, DC, finalizes preparations to host the world's largest gathering of architects in just another two months, it is timely indeed to study the responsibilities of the Federal government in the planning of its own home. A practitioner in the nation's capital, Francis D. Lethbridge AIA, gives meaning to the past by discussing four fairly distinct phases of design and holds promise for the future—if the President explores the "great untapped reservoir of ability . . . latent in the ranks of architects, sculptors and artists who have not yet been called upon to do their share in its creation"

A Lesson in What Psychology Can Bring to Architecture

When architects know a great deal more about what makes men tick, they will be much better equipped to design buildings and cities. Dr Robert Somner supports this contention by sharing the results of an experiment conducted on two university campuses

San Juan Bautista: An Architect's Treasure Island

What the author calls "a puzzling combination of Latin temperament and North American impatience" exists on the tight little island that is the capital of Puerto Rico, separated from the rest of the Commonwealth by the Bay of San Juan, and a little more than an hour away from the continental US. F. Blair Reeves AIA illustrates his saddleback survey of significant buildings with ink sketches on charcoal paper

The College and University Library as a Building Type

Even before the dedication ceremonies have taken place, a good many library buildings find themselves a step behind the times. And ever-increasing demands, including those brought about by new mechanical and electronic aids, are speeding up the obsolescence. In examining why this is so, library director Ralph E. Ellsworth establishes some guideposts

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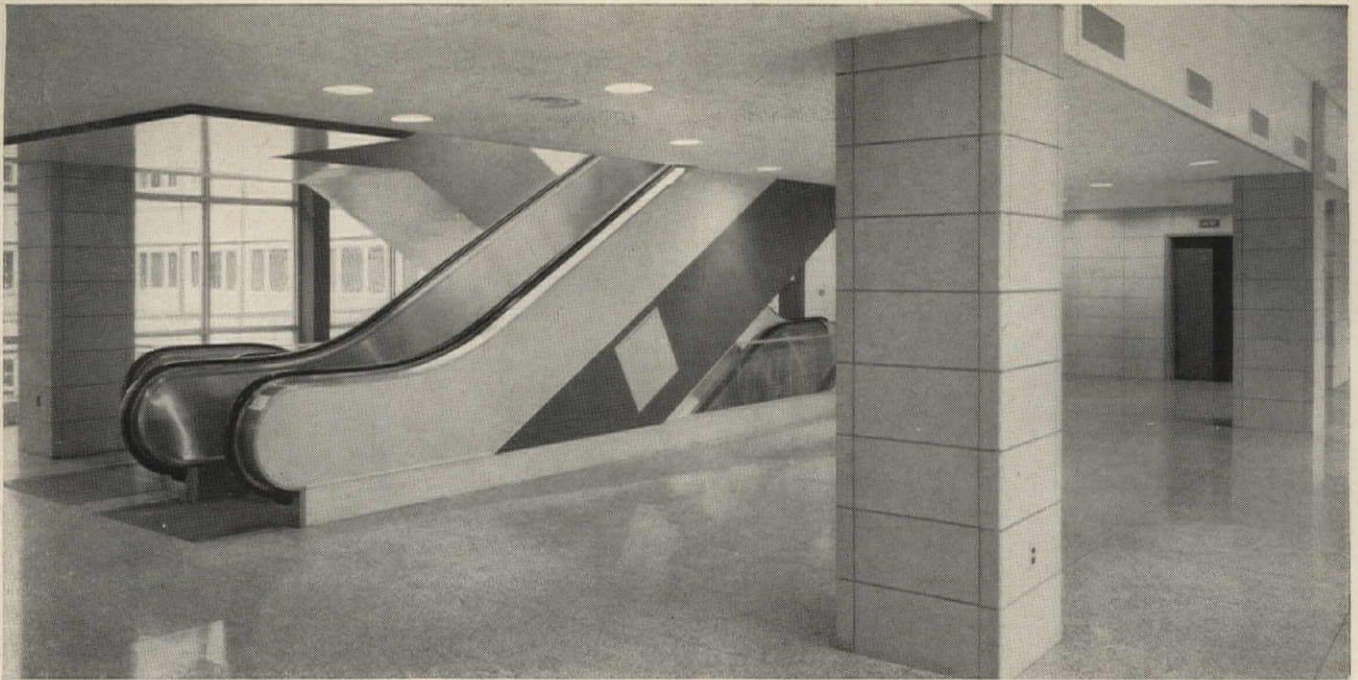
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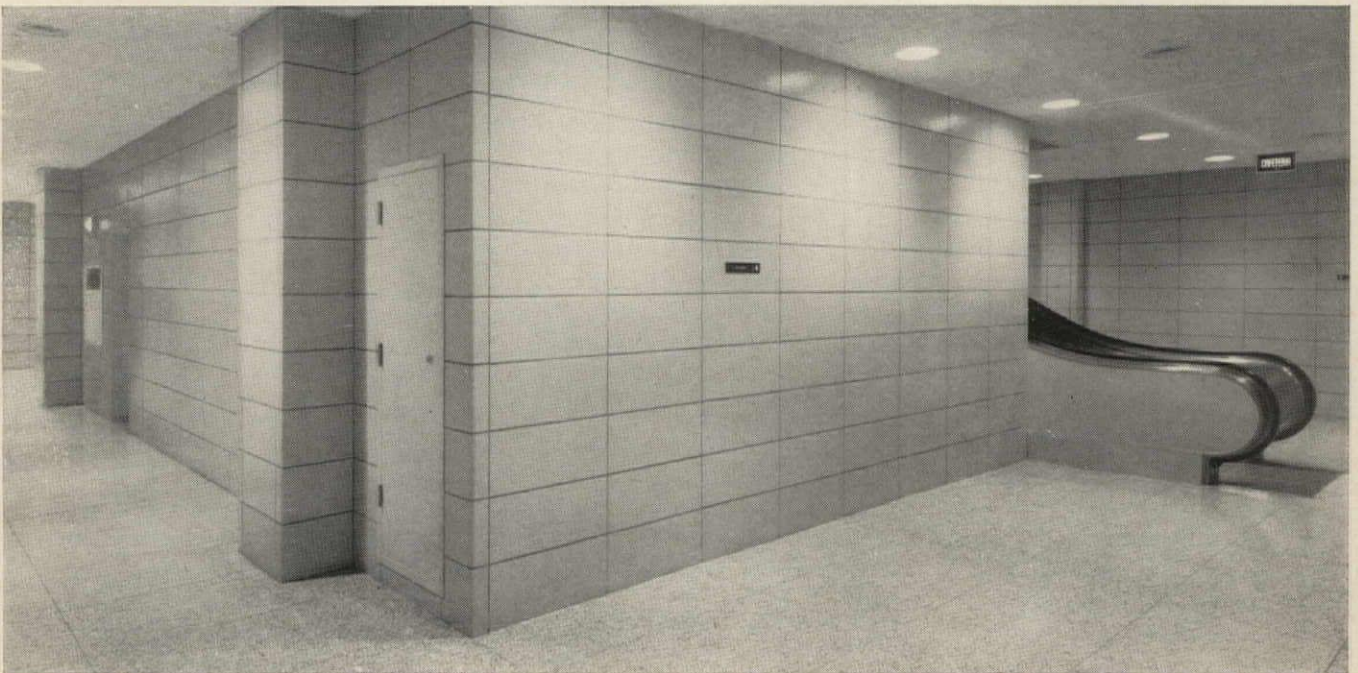
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Re: Integrity

ACCORDING to Webster's Third International Dictionary, "integrity" means "an uncompromising adherence to a code of moral, artistic or other values; utter sincerity, honesty and candor; avoidance of deception, expediency, artificiality or shallowness of any kind." It sounds like the definition of a good architect.

Integrity, like happiness, is a lot of things—a lot of simple things. It can be talked about only by using generalities and aphorisms—corn, if you like. So forgive me for what follows, as I try to apply the word integrity to the practice of architecture.

Integrity is turning a job down in the first place, if in your honest judgment you really believe it shouldn't be built—or built on the proposed site. Integrity is having the guts to try to talk your client out of doing something you know he really shouldn't be doing—no matter how much you want the job.

Integrity is telling your client outright that he can't possibly get the building he wants for the figure he has named—instead of going along with him, hoping he will dig up some extra money to pay for the building he has fallen in love with after you have made your sketches.

Integrity is a good, hard, satisfied feeling inside after you've explained to your client that he's biting off more than he can chew and you've arrived at a program that he can afford and that you can really start to work on. Integrity is giving your client your most careful cost estimates, based on studies which give him the maximum for his money.

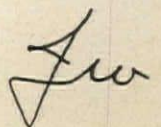
Integrity is designing his project from the inside out, without looking at the latest cliché-ridden buildings in the architectural magazines to get ideas. Integrity is letting the building be itself, without the application of irrelevant elements to put it in the current mode. Integrity is using the

best possible materials permissible within the budget and insisting upon the best workmanship obtainable in our prefabricated-component, craftsmanship-starved age. Integrity is being thorough and straightforward in details and specifications, telling the contractor the honest truth about what you really want and how he can give it to you. Integrity is standing back of your own little errors and omissions, if you make them, rather than trying to get the contractor to absorb them somewhere along the line.

Integrity is designing a building which does not present a false image to the world and which when subjected to criticism cannot be accused of merely tripping after lady fashion, either toward an unsuitable airy elegance or toward an inappropriate heavy mask of precast "sculptural" modeling. Integrity is using these fashions only if they are inherently suitable to your building, not just for effect.

Integrity is thinking of your building as a good neighbor in its environment; designing it to live its long life (longer than yours, remember) in harmony with its neighbors—not striving to out-shout them. Integrity is giving thoughtful consideration not only to the people who will live or work in your building but also to the many more people who have to live with it and look at it for many years to come, giving them a moment of pleasure or even of esthetic satisfaction—to say nothing of a bit of greenery, a bench to sit on or the tinkle of a jet of water.

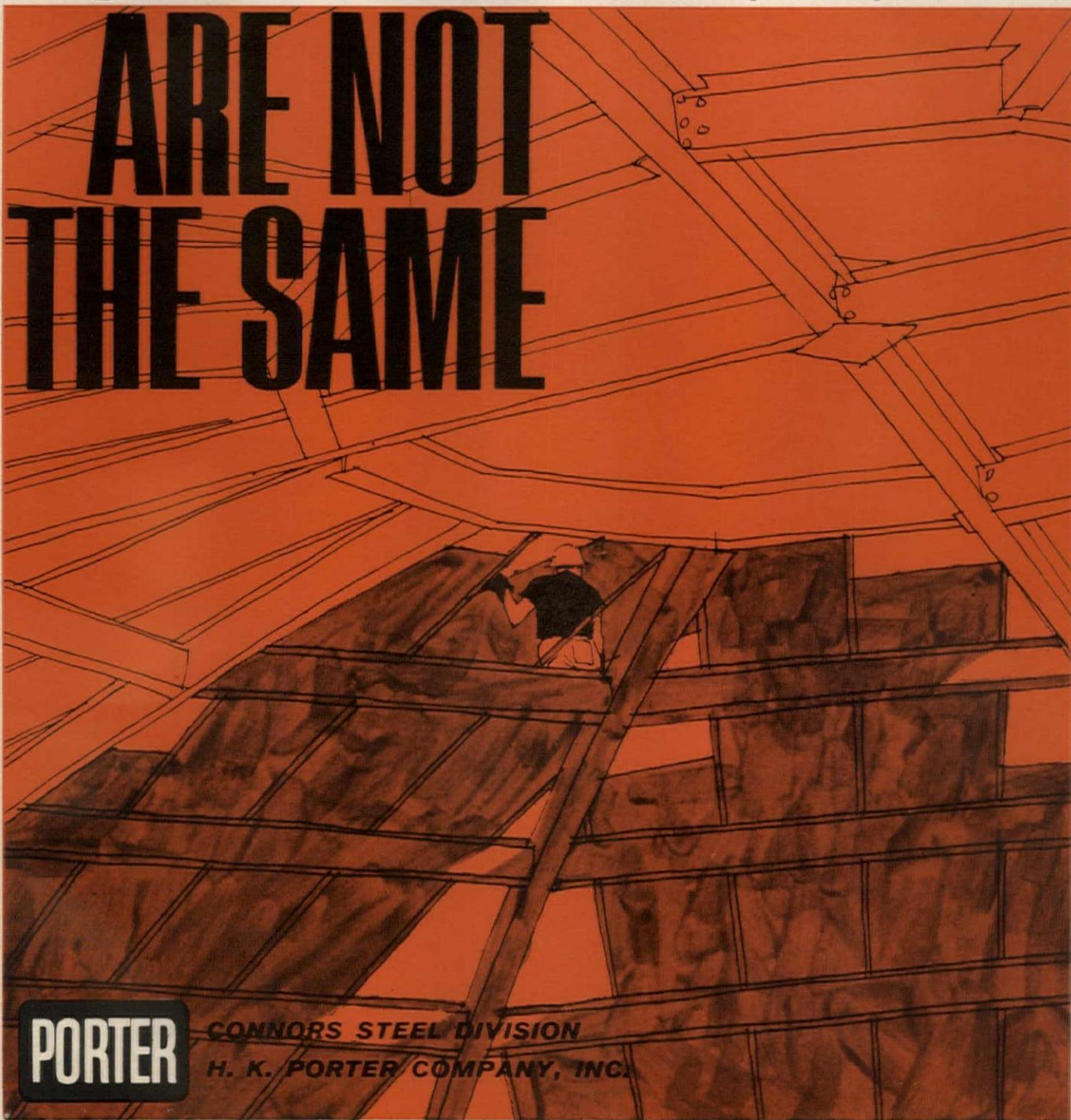
Integrity is a heck of a lot of things to an architect who takes his art seriously, and it is not trite to say that integrity is the good, the true and the beautiful.



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AIA HEADQUARTERS COMPETITION / Conclusion of Three-Installment Report

With the presentation of the designs and excerpted statements of the two remaining finalists—Charles R. Colbert FAIA, New Orleans, and C. Julian Oberwarth & Associates, Frankfort, Ky—the AIA JOURNAL concludes its three-part coverage of

the AIA Headquarters Building competition. The seventh finalist—Donald Barthelme FAIA, Houston—did not complete the final stage.

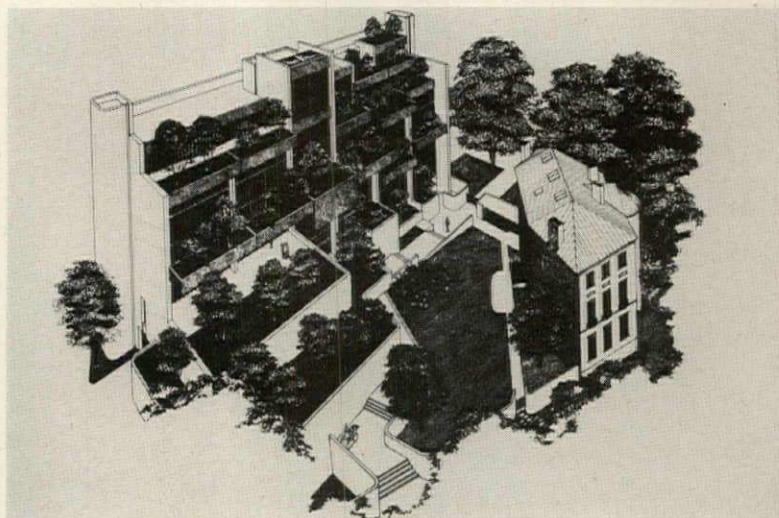
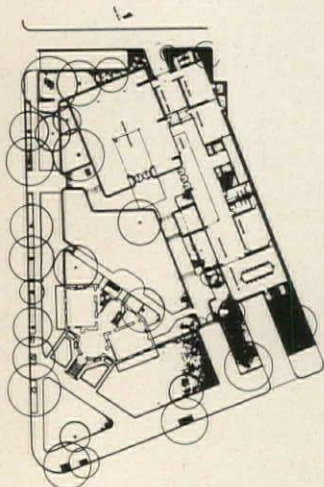
The winning design of Mitchell/Giurgola, Associates, Philadelphia, was introduced in the January issue

and repeated in February, along with three other finalists: I. M. Pei & Associates, New York; the Perkins & Will Partnership, Chicago; and Jean Labatut FAIA and Carr Bolton Abernethy, Princeton, NJ (design credits across page).

Charles R. Colbert FAIA

"Recently our civilization has changed from a predominantly rural and agricultural setting to one that will soon be almost entirely urban and industrially oriented.

"Slick glass boxes and concrete stage sets equally ignore the deep-rooted necessity of recognizing



human reliance on natural phenomena and the rhythmic dependability of organic plant growth.

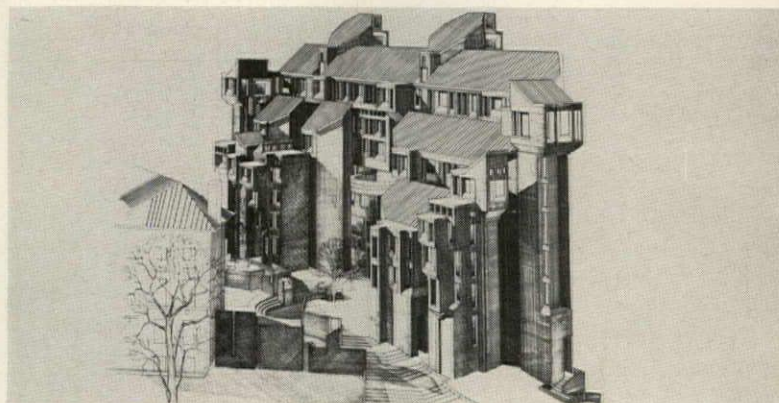
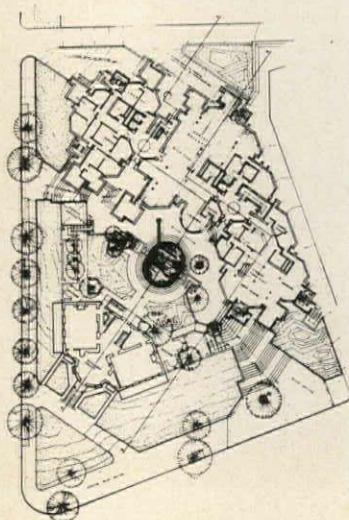
"The architectural profession's obligation to stimulate a public demand for beauty and a calmer natural order in our cities is unmet everywhere. It was a conviction of

this obligation which motivated this proposal for the extensive use of trees at this important Washington street intersection.

"Our first objective . . . was to reintroduce the possibility of using burgeoning plant life in our urban concentrations."

C. Julian Oberwarth & Associates

"Our design proposes to build around and away from the Octagon House with a sculptural mass in which the Octagon form is envel-



oped. The garden is the physical link between the new and existing buildings.

"We have sought to blend and synchronize rather than to achieve mere compatibility or acceptable 'co-existence.' The brick will match

the Octagon in color and texture. The standing seam copper roofings will contribute to visual unity.

"In scale and design, our effort has been to achieve an emotional involvement between the Octagon, the garden and the new building."

COMPETITION / Design Credits

Design credits for the seven finalists, in addition to the principals when designated in full in the firm names, should read as follows:

• Mitchell/Giurgola, Associates—Ehrman B. Mitchell Jr AIA and Romaldo Giurgola AIA

• I. M. Pei & Associates—Henry N. Cobb AIA, Araldo A. Cossutta AIA, James I. Freed AIA and Theodore J. Musho

• The Perkins & Will Partnership—John Holton, Mozhan Khadem, Saul Klibanow and Phillip A. Kupritz, designers

• Jean Labatut FAIA and Carr Bolton Abernethy

• Charles R. Colbert FAIA—Jack Cosner, senior associate; Gerrard Raymond, Dale Byrd, Robert Price, Charles Moroney and Easily Hamner, associates

• C. Julian Oberwarth & Associates—Milton Thompson, associate in charge of design; John Meyers, James Burris, Thomas Thompson, Norman Berry and Robert Kingsley, participating associates.

FOOTNOTES / Seeing the Light

Prompted by the article on "Natural Light and the Museum of the Future" appearing in the January AIA JOURNAL, a letter from Walter Gropius FAIA in this issue (p 58) has, in turn, brought an interesting observation from the author. Dr Wilcomb E. Washburn of the Smithsonian Institution comments:

"A significant new study entitled 'Concerning Natural Light in Byzantine Museums,' by John D. Triantaphyllidis, was published in Athens in August 1964 as Bulletin No 3 of the Archeological and Restoration Service of the Greek Government. The book, published in Greek though containing a French summary, is based on an extended series of measurements of the intensity of natural light throughout the interiors of many Byzantine churches, mostly in Greece, but including San Vitale in Ravenna and, of course, St Sophia in Constantinople. The measurements are taken with the most scientific care and precision. Architects without a knowledge of Greek will profit from the floor plans and elevations."

Cont'd on p 14

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can have
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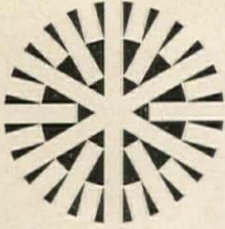
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PAN AM '65 / AIA Board Votes Seven Awards



Among the individuals, a firm and an organization named to receive the Institute's seven annual awards in 1965 is Joseph Watterson FAIA, who has served as editor of the AIA JOURNAL since January 1957. He will be given the Edward C. Kemper Award for significant contributions to the society and the architectural profession during the Pan American Congress of Architects and the AIA annual convention in Washington, DC, June 14-18.

Through his efforts, the citation points out, "the JOURNAL has become one of the best architectural magazines in the country and one of the greatest assets of the Institute."

The son of a Cleveland architect, Watterson practiced his profession for more than 30 years after attending the School of Architecture at the University of Pennsylvania. The family heritage continues: one of his three sons, Stephen, is an architect.

Others who will be honored at the Congress-Convention:

- Architectural Firm Award to Wurster, Bernardi & Emmons of San Francisco, on the basis of "this firm's great and continuing body of finely conceived and beautifully detailed work on the Pacific Coast—work which is simple, direct and always modest, work which has never wavered from these principles since the early thirties and has served as an example of direct, sane, successful architecture to the younger generation through all these years."

- Fine Arts Medal to Roberto Burle Marx of Brazil, "known throughout the world for magnificence of his tropical gardens. He is also a great muralist, sculptor, designer of jewelry and, in fact, a 'total artist' of high degree." (His work will be shown in the May JOURNAL.)

- Allied Professions Medal to Dr Leonardo Zeevaert, professor of soil mechanics and foundation engineering at the University of Mexico and "widely recognized as the outstanding structural engineer in Mexico. He has developed structural systems which withstand severe seismic shocks, despite a difficult subsoil condition in Mexico City."

- Industrial Arts Medal to Eliot Noyes FAIA of New Canaan, Conn, for "the purity of his industrial design. Although a very fine architect, he shows a complete understanding of the machine and its potential as a means of creating works of art which are outstandingly pure expressions of the machine techniques."

- Architectural Photography Medal to Robert Damora AIA of Bedford Village, NY, for his "long record of great creative photography through several generations."

- Citation of an Organization to the Architectural League of New York for "its long and distinguished record of achievements in the cause of art and architecture."

Cont'd on p 92

Construction Details

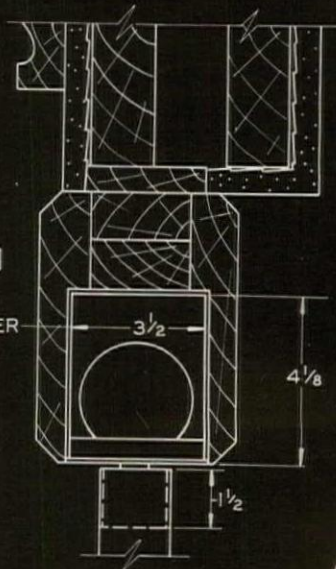
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LETTERS

Untangling the Urban Mess

EDITOR:

I recently attended another seminar meeting on our urban problem entitled "Who Cares for the City?" It was sponsored by the Cincinnati Chapter AIA and held in that city.

Several non-architects at that meeting, speaking in panel discussions, succeeded in heaping a heavy burden of guilt on the collective shoulders of the architectural profession for its laxity in coming to grips with this problem. The charge was made that when major decisions affecting redevelopment in Cincinnati were being resolved, the architects were not around. The architects were asked by the non-architects to go down to city hall and tell the administrators what should be done.

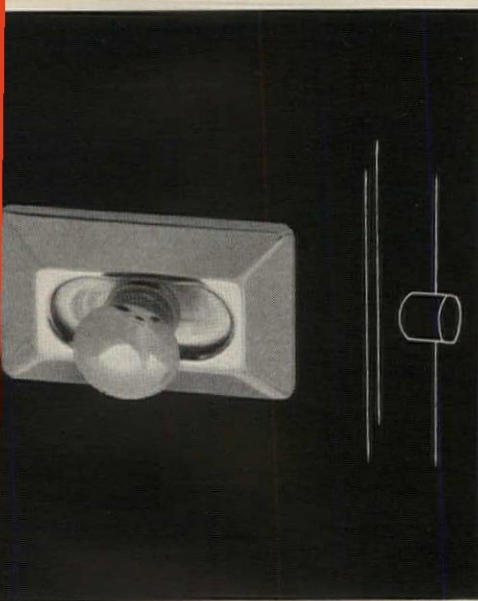
Have we not all realized by now that this is an awesome problem, extremely complex in nature and with implications affecting the whole future of mankind? It does not yield to easy, off-the-cuff solutions. Where some successes have been claimed, eg, Philadelphia, they are the result of long and careful study by dedicated professionals.

That architects are perhaps the best-equipped professionals to wrestle with the physical problems of the city may be undebatable. Most architects, however, are hard-working guys who probably average closer to 50 hours per week than they do to 35, and for the average, the rewards are modest. They do not have a lot of spare time to give to the job of untangling the urban mess of America—and the job cannot be done on a spare-time basis anyway.

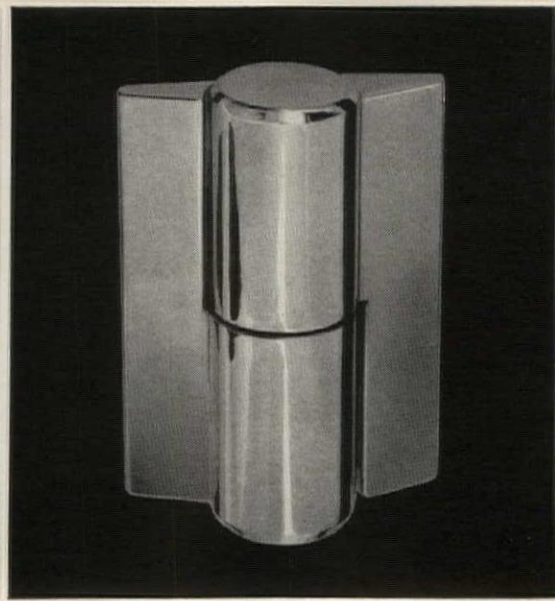
I believe that some method of putting more architects of ability to work on the urban problems in each community must be found. But I believe that some way of paying them for their efforts must also be found. Never have so few been asked to do so much for so little.

RICHARD G. MILLMAN AIA
*Assistant Professor
of Architecture
Ohio University, Athens*
Cont'd on p 80

BRASS



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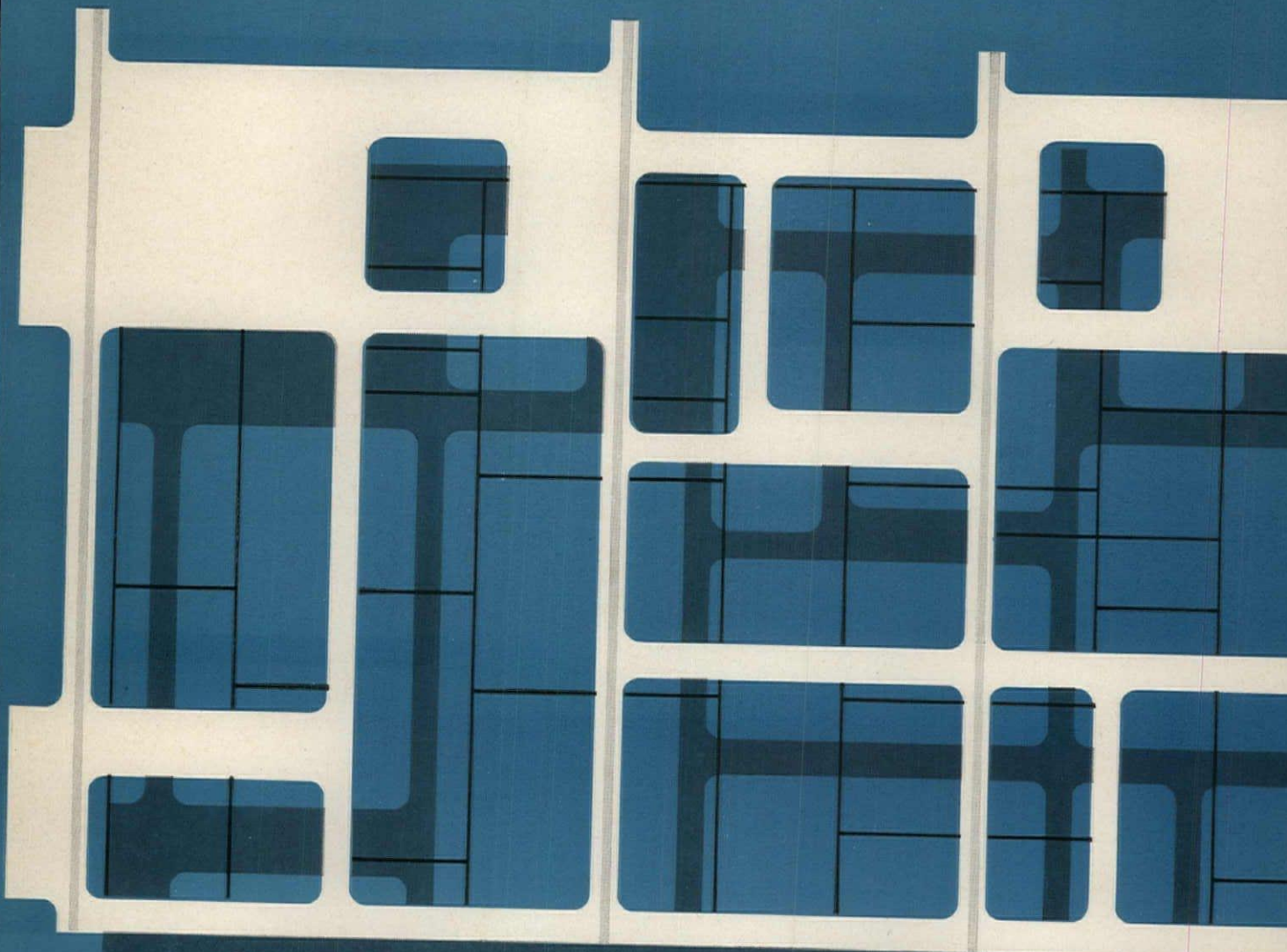
Another long-life feature for Weis Toilet Compartments: *solid brass hardware.* Solid brass plus the added protection and beauty of brilliant chromium plate. The latch, which continues to feature lift-free emergency access, is now recessed within the door. The stainless steel

bolt automatically retracts if the door is slammed against the new wrap-around keeper and rubber tipped bumper. Handsome surface mounted hinges, proven through long service, give either 180° outswing or inswing action. *Solid*, these compartments by Weis with solid brass hardware.

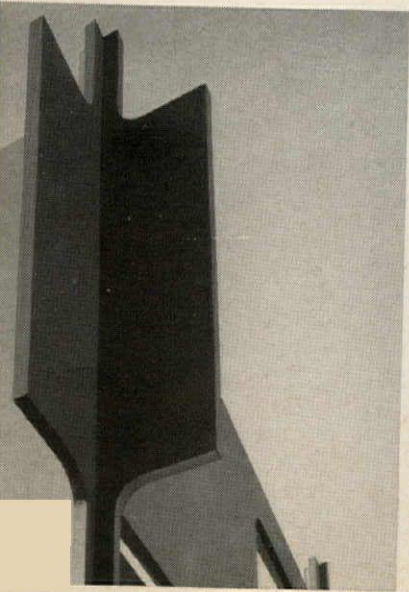
Write for Catalog No. 36 See Weis in Sweet's

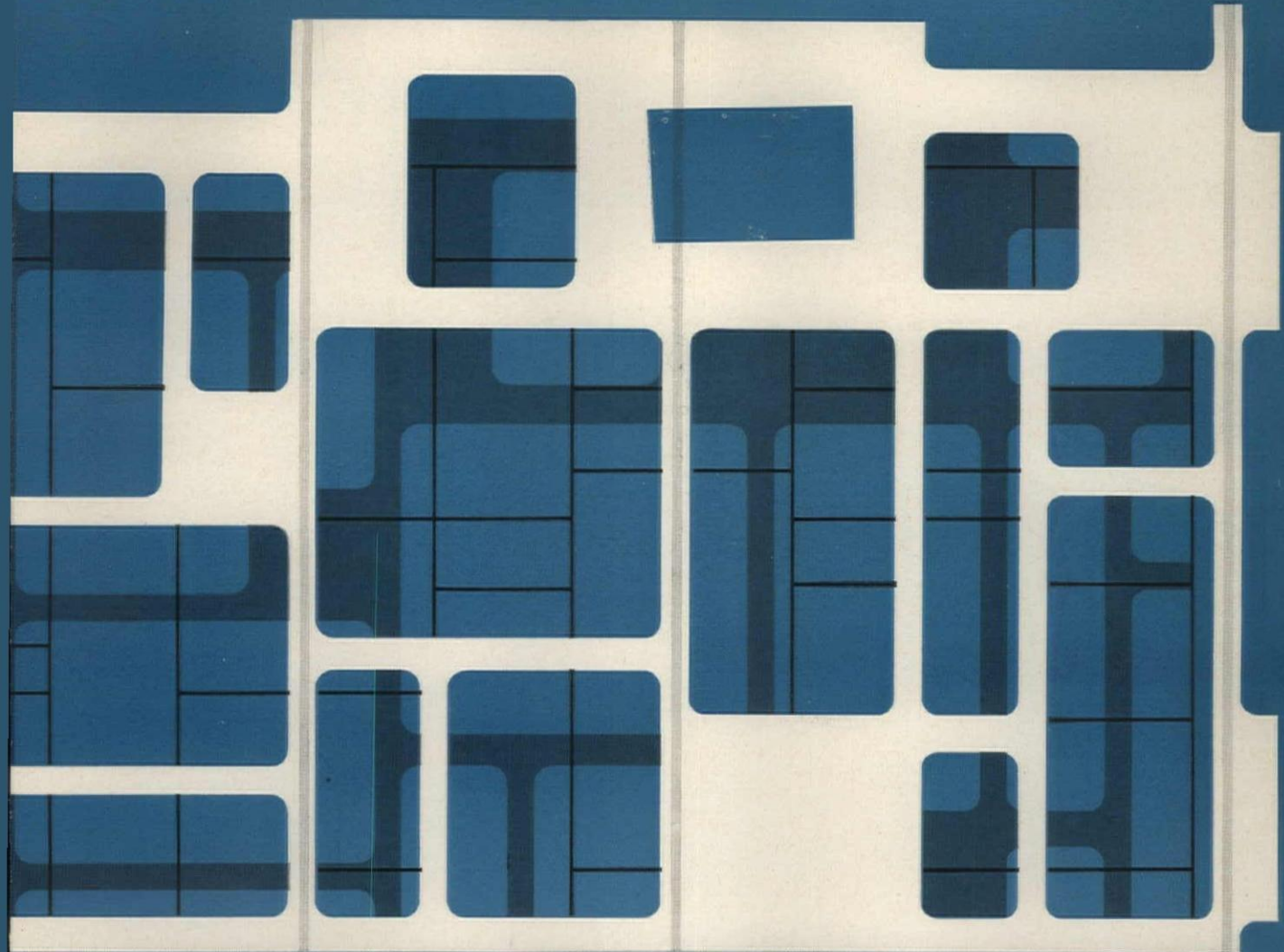


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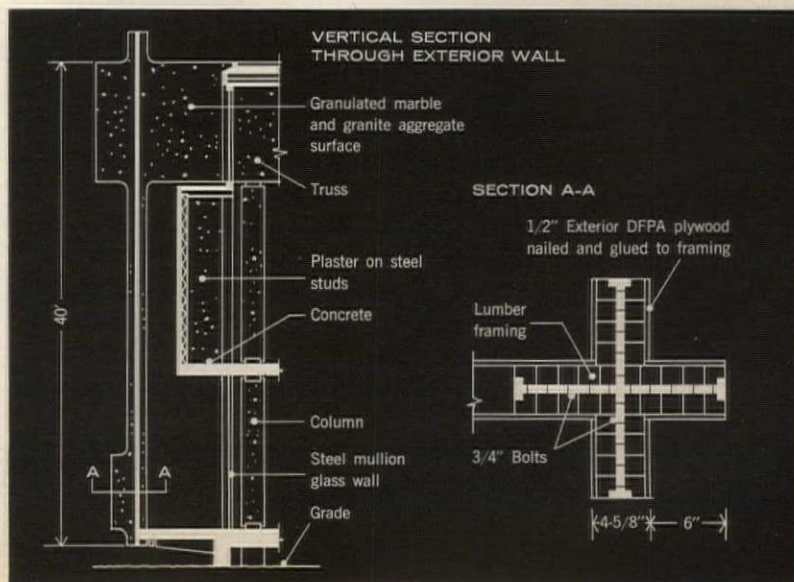




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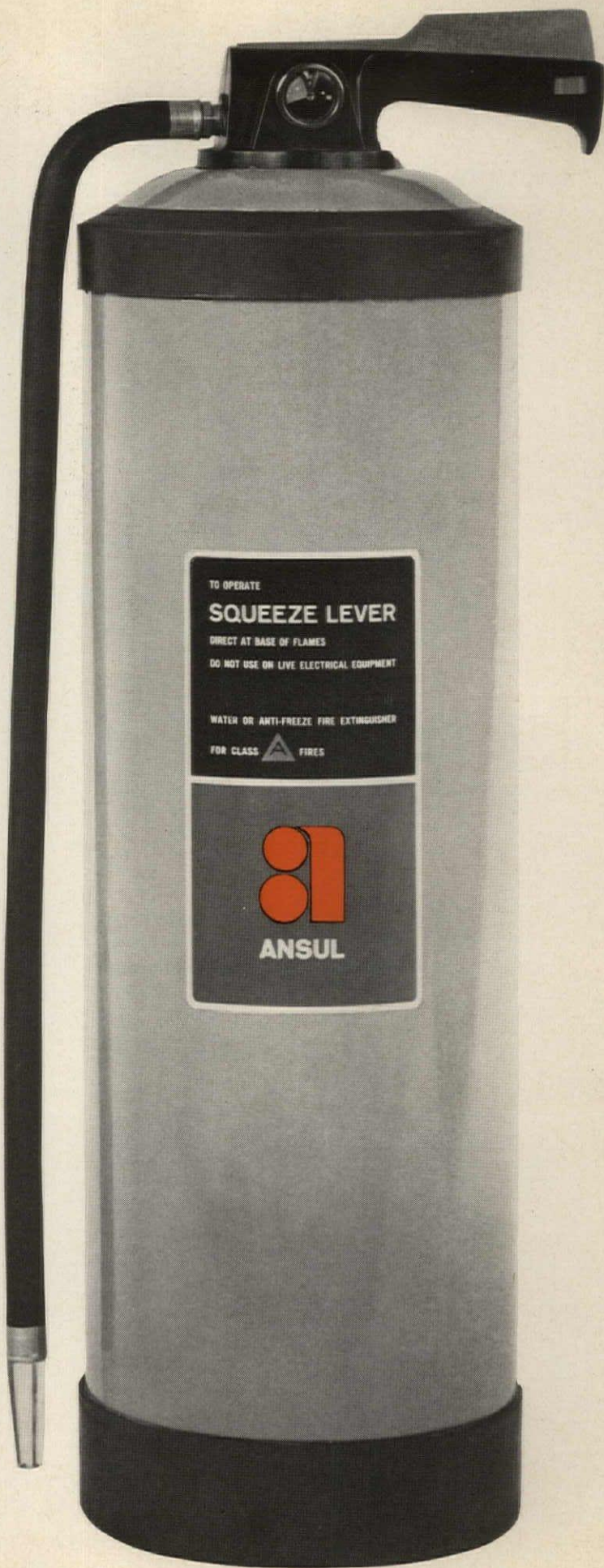
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In his memorable address to the convention of the Texas Society of Architects AIA in November, Dr Burchard touched on practically every point that contributes to the beauty—or the ugliness—of a city. Copies of this paper should be laid on the desk of every municipal official in the country who cares about the appearance of his city



Some Antidotes for Ugliness

BY JOHN ELY BURCHARD

*Dean Emeritus of the School of Humanities
and Social Science, MIT*

It is all right to say that people get the architecture they deserve, but it is hard for most people to prize and therefore to deserve great architecture if they have never experienced it; or to want to pay for the pleasures of a beautiful city if they have never had a chance to enjoy these pleasures.

Were anyone in Berlin today to try to mark down the great civic subsidy that Berlin makes to its opera, nearly \$6 a seat per performance, he would be rebuked politically; but this would not have been so before Berliners had become used to the experience of great civic opera. The people of Stuttgart would rise in wrath to prevent the taking over of any part of their Stadtwald for a throughway—as the people of San Francisco did not long ago, but the vote would not be as close as 6 to 5. But the people of Stuttgart would not have voted for a Stadtwald before they knew what it was. In our country, we have offered our people fewer such urban experiences and, moreover, seem to need to be more vigilant to protect the things we have, especially if they lie in the path of the highway engineer and his bulldozer.

Leadership is essential to give the people of a community examples of what they may come to enjoy and be willing to pay for. This requires political risk-taking and considerable courage, since it would be more of a liability than an asset for a politician to be accused of being a card-carrying beauty-lover or of being "soft on art." And after the demonstration, it will still require patience to let the new beauties sink in, and vigilance to preserve what one already has.

In any such effort, it is a great advantage to a city to have a Joe Clark or a Richardson Dilworth supporting an Ed Bacon, but the result can not be achieved simply by the efforts of a contempo-

USUALLY we talk only about the physical ugliness or beauties of cities. This, of course, is not enough. Cities are like ladies. Despite her snaky and venomous hair, Medusa was generally regarded as a beauty, the sight of whom was worth the chance of being turned to stone. There have been beautiful, well-turned, courteous ladies all through history whose enchantments concealed their vices and poisons, and plain, dumpy, badly dressed ladies whose lives were full of grace.

So it may be with cities: The handsome and gay may be vicious and full of snarling, unfriendly, covetous, ungenerous people; and a dreary town may abound in important elements of the good life. But we cannot solve all the problems of cities in a few pages. There is no reason why an otherwise amiable city should not also have a handsome face and be the more amiable thereby. So after this short bow to the importance of good political, social, economic and civil conduct, let me be unabashedly hedonistic.

We need first to remember that beauty and joy are more than the absence of ugliness, just as positive health is more than merely not being sick.

To speak of the aspirations of a city is to speak vaguely. It is easy enough to make truthful but not very useful generalizations such as Eliel Saarinen did when he wrote that a people gets the architecture it deserves; or as John Ruskin did when he paraphrased the old saw "where thy heart is, there will thy purse be also," to state the truth that people never get great art and architecture until they are ready to pay for it. So far, so good. But when we speak of a city as an entity with a genuinely collective voice, when we assume that great ideas will simply sprout somehow from the grass roots without even any seed or fertilizer, we are speaking nonsense.

Urban beauty can come only two ways. In totalitarian societies which have produced most of it in the occasional moments of divine dictatorship, it is done by decree; in democratic societies it can be achieved only by example, and there is always the risk that the example will be rejected. But without the example, nothing will happen at all, because for most voters the democratic process is one of voting vetoes and not of voting instructions for something as yet undone. The absence of veto is the greatest praise to which most democratic statesmen can aspire.

rary Pericles. The leadership, the patience, the vigilance need to be exercised at a great many levels and not alone at the top. Indeed, the top can seldom accomplish much without positive support, even pressure, from below; if not exactly from the grass roots at least from many kinds of people and several kinds of neighborhoods. We have been effective at times in our country in marshalling groups *against* something bad; the present ground swell against indiscriminate urban freeways is a case in point. But it is harder to muster such groups to be *for* something.

It is even harder to keep them mustered. You meet in City Hall and vote down the freeway, but the engineers go back and figure out how to win tomorrow. Too many gains can be lost in the lulls. Boss Flynn used to say that the machine could always afford to lose an election, because after the victory the reformers would relax while his men would go right back to work the day after the votes were counted.

Civic beauty does *not* come free, and it is hard-pressed by such decisions as that of the New York Courts upholding penalty taxes on the Seagram Building because its beauty made it cost more per square foot than a minimally acceptable office building would have. Such decisions are serious deterrents to private corporations who might be thinking of contributing to civic beauty by building unusual or even extravagant buildings for their corporate purposes. Had New Yorkers cared much, they would have given Seagram tax relief, not tax burden.

But even if municipal attitudes toward beauty were more generous than they are, private goodwill can carry a city only so far, and we are relying on it too much. The reason that Boston is struggling so to maintain its earlier cultural history is that its ordinary people have been too much the beneficiaries of private generosity so that the symphony, the opera, the Museum of Fine Arts and, even to a considerable extent, the public library are largely or wholly financed by private endowments. The people are simply not used to paying for any of their cultural boons. And even this lulling effect is not the only reason for leaving it all to somebody else. Private goodwill may be limitless but private funds are not; and the generosity of local people is not always proportional to their capacity to give. Private goodwill can build some beautiful buildings; it can dedicate some of its land to public purposes; it can endow or help to endow various public cultural enterprises (although in the world as it now is such a donor should demand matching funds from the city, and if he cannot get them at home take them somewhere where he can); rarely there may be a local Maecenas who like

the most admired Athenians gives most of his wealth to the general adornment of his city.

But after this has all been done, much will still remain to be paid for from the public purse, and here is where the steadfast and unrelenting leadership, large and small, is essential. This will be the test by which, in the end, the people of your city, wherever it is, get the city they deserve. If they have no chance to understand what their city might be, you cannot say they got the ugly city they deserved. If, after they have experienced the benefits of a beautiful city, they reject it at the polls, either because they do not like it, do not want to pay for it, or had rather ride the freeway eating barbecued shrimp and chicken-in-the-rough as they go, then you can say they got what they deserved. But not until then. The role of leadership is to make sure the public has a chance to make an informed choice.

We tend to think of beautiful cities in overly dramatic terms, tying our memories to a spectacular cityscape such as that of Italian Urbino or Spanish Toledo or a notable landmark such as the Eiffel Tower or the Golden Gate Bridge or St Peter's or the Piazza San Marco. These spectacular associations are by no means trivial, and every one of the greatest cities of the world evokes not one but several; but they do not begin to account for all of urban delight.

I have deliberately shifted now to the word "delight" to remind you that the street noises or silences, the street smells, the street costumes, the design of the street vehicles including the shape and color of the public transport, the flow of pedestrians, all these also affect the total pleasure or displeasure that a city provides and go far to define its character and personality. Only a few of these are open, at least overtly, to design. But design can influence them.

It has occurred to me that I might be most useful if I were to produce a quite unimaginative checklist of the various elements of urban beauty, some of which may be available to your city, some not—without trying to elaborate them since you can do that as well as I; and certainly not trying to provide the local applications:

1) It is not to be denied that the weather and the sky are important assets or liabilities for a city. Up to now, anyway, our technology has not made it possible to effect massive improvements in the local weather. Some of its applications have produced massive deterioration of once good local weather such as smog and soot. Everybody talks about the weather, but nobody does much about it, to be sure. What design can do about it is to make sure that nobody is allowed to make the local weather *worse*; and it could and ought to see to it that a city does reflect the weather it

has, exploiting it and defending against it; weather is not something that should be unimaginatively bribed simply by buying enough tons of airconditioning. I had rather hear Texans boast of their arcades than of their airconditioning systems.

2) Some cities are the beneficiaries of magnificent coastal or estuarial sites which they have then contrived to enhance or at least not to spoil. The classic examples are Lisbon, Rio de Janeiro, Istanbul and San Francisco. Not all cities have done so well, and we might cite Sydney and Wellington. Some have thrown away the opportunity as Seattle and to some extent Boston would show. Most such sites are on seacoasts but not all. There are, for example, Caracas, Bogota, Mexico City, Toledo in Spain, Urbino and Florence. But a dramatic site cannot really be made by a bulldozer where it does not exist as a gift from nature.

3) Others have river banks which they have kept for urban joy, and here there have been more opportunities. The Thames at London, the Seine at Paris, the Tiber at Rome, the Spree at Berlin, the Danube at Budapest and Vienna, the Yarra at Melbourne, the Limmat at Zurich, all show what has been possible. Few of these rivers are large; only some have present commercial significance—which goes to make the realization of amenity more difficult though it has been achieved on the Seine and the Danube and the Thames and on some parts of the Rhine and even the Ruhr. Americans have not, on the whole, done well with their rivers in this sense. Even after chances were

thrown away, reclamation has been possible as we can see on the Schuylkill in Philadelphia and the Chicago River of recent years. Most of the cities on the Mississippi and its tributaries have essentially turned their backs to the rivers as sources of urban amenity. They are in sharp contrast to Leningrad and the Neva.

4) Then there are the lakes. There are few Genevas in America, the most notable example surely being Chicago, which has indulged in enormous amounts of land-making to create an even greater lake shore. But Erie, Buffalo, Cleveland and Toledo have dissipated their opportunity as has Milwaukee, while even Detroit's achievement is far from what might have been. It is hard to create rivers, but tiny ones can be exploited as the dammed Charles River of Boston shows. And in the modern world it would be technically quite easy to create a great urban lake if there is any reasonable source of water.

5) Rarer are the cities of the great canal systems, man-made for the most part, or man-improved as Venice did with her islands. The great canal cities aside from Venice are Stockholm, Amsterdam, Bangkok and Srinagar in Kashmir. Some of these canals were natural, all were improved; all started with commercial significance and most grew readily from existing seas or lakes. But it is not beyond imagination to dream of entirely artificial, noncommercial, mosquito-free canal or lake systems producing such marvelous effects as those achieved at Hamburg. When we

1—Kampen, Holland: "Rarer are the cities of the great canal system, man-made for the most part, or man-improved"



realize how much how many cities owe to the banks of rivers, lakes, oceans or canals, we can have little doubt that abundant water and abundant trees are of great importance in adding to the comfort and convenience and beauty of a city. We might be tempted to think in big terms about the water we can create as we cannot create seacoast.

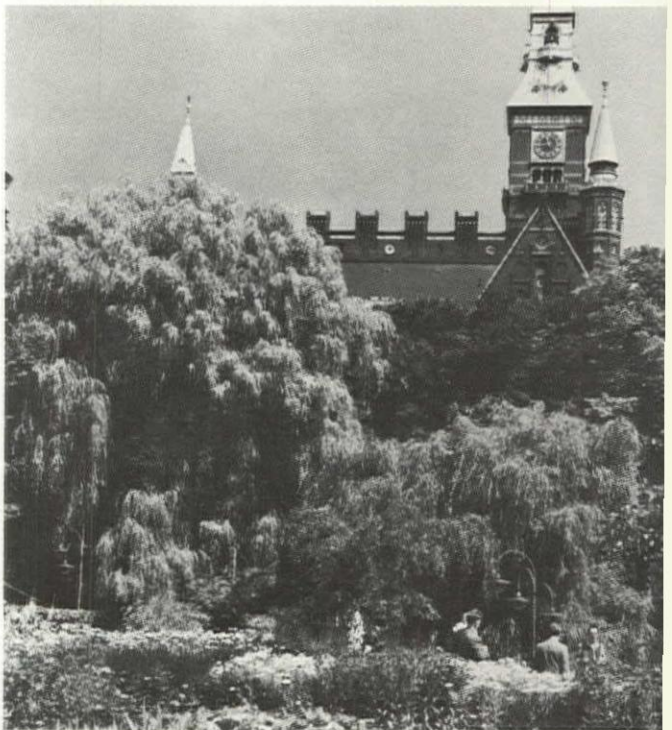
6) Other cities owe much of their delight to even more clearly man-made things, usually though not necessarily historic. We think of the Spanish steps, the Campidoglio and St Peter's Square in Rome, the Piazza San Marco in Venice, the Place Vendôme, Place de la Concorde and Place des Vosges in Paris, the linked squares of Verona, the Maidan in Esfahan and, with less enthusiasm, of our own prime examples, Rockefeller Center in New York, the Boston Common and Garden, and smaller things such as the Golden Triangle and Mellon Square of Pittsburgh or Union Square in San Francisco. Such creations have appealed to American designers as a positive element of civic design, but our designers have generally forgotten one thing. Except for the Campidoglio and the Place de la Concorde, almost every important European square is a natural place of public congregation, day and night, and therefore alive. A good many of our largest civic centers have not achieved this, and we can think of numerous examples from Springfield, Massachusetts, and Cleveland to Detroit and Denver and San Francisco. It is not enough for such a place to be alive only in the daytime—which is one of the difficulties with the Place Ville Marie in Montreal—or alive only at night or perhaps never alive at all, which is the trouble with Pittsburgh's Golden Triangle.

If a square is too specialized with governmental activities or with office buildings, it can not succeed in this sense. Rockefeller Center is our national great example and it is important for anyone who is trying to develop a great contemporary American square to try to find out why.

Many observers, including such shrewd ones as Steen Eiler Rasmussen, have suggested that the great square or plaza can no longer really serve as the focus of life in a modern metropolis. Certainly it is true that one and only one place will not do, and we have always to remember that great squares need numerous lesser islands of refuge. The conclusion that the square is obsolete is unproved. But, in addition to the necessity that the square shall serve multiple urban needs, it is also certain that it cannot succeed if automobiles are allowed in it at all—either parked in the middle as has happened at the once-elegant Place Stanislas at Nancy, or rolling around it incessantly as at the Ernst Reuter Platz in Berlin. The squares simply must be isolated and left for the people on foot;

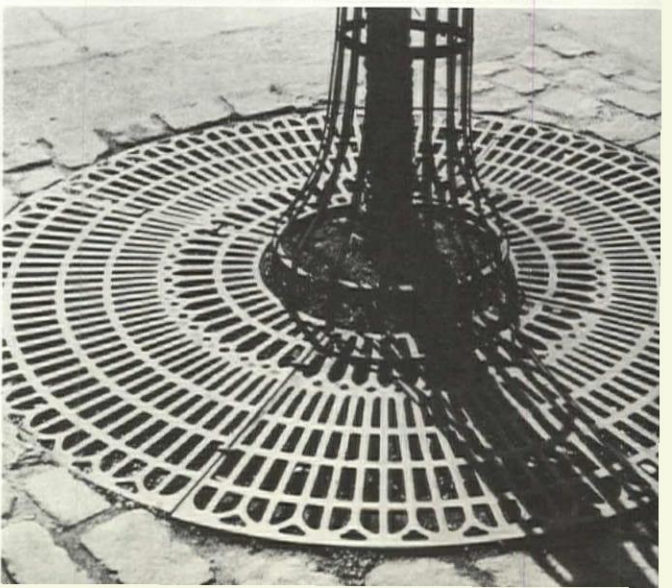


2—Piazzetta San Marco, Venice: "Other cities owe much of their delight to even more clearly man-made things"



3—Tivoli Gardens, Copenhagen: "Great cities have great parks. The best ones are downtown"

4—Tree grate, Paris: "Then there are the street details"



they cannot be too large nor too empty nor too big for human sense, and the only crowding they should ever seek is the crowding of people happily engaged in many activities so that they do, in fact, become the places of urban rendezvous.

7) Never forget the little squares like Rittenhouse in Philadelphia, Gramercy Park in New York, the numerous backwaters of Georgian London. Even the small plot of ground at the corner of Fifth Avenue and 59th Street in New York next to the Plaza has remained an oasis despite the heavy traffic on the two streets, but it is almost certain to lose its character when the new General Motors Building rises, even if this is much better designed than such urban desecrators as Pan-Am. Stockholm is a place to visit to see what these can be like even when very small, what a few benches, a little grass, a mosaic painting, a small pool or fountain, a little mural or piece of sculpture, can do to provide a pause that refreshes. We are afraid of vandalism and crime in secluded spots in America, but the way to stop it is not by eliminating these important ganglia of urban delight.

8) After the squares there are the great avenues and boulevards: the Champs Elysées, the Mall in London, the Ringstrasse, Commonwealth Avenue. We have made too much fun of the grand plans of the nineties and early years of the twentieth century, for it is these which have given a few American cities a start toward urban amenity. But avenues and boulevards must go somewhere, and they are sterile if they become mere courses for automobiles. They need trees, ample sidewalks, things to look at, reasons for walking or sitting, producing a wish to promenade or saunter rather than to run; they lose their grace when they are too long like the one in Brasilia or when they become accidental and not very efficient freeways.

The freeway is, of course, a kind of boulevard solely for those in moving automobiles and it can attain its own particular beauty, if it leads from one interesting stopping place to another. But the freeway damages a city when it cuts it apart, when its exits are ugly or congested. Even when it provides a moment of monumental beauty, which is not as often as it could be, a freeway cannot become a major aspect of a beautiful city and is more likely to be a blight than an asset, unless it relieves the boulevards for better purposes or unless it does indeed serve as the connector of important ganglia. But the general advice has to be never to have one downtown if it can possibly be avoided.

Returning to the boulevards, even the corrupted ones might be saved if they were wide enough, given a rich enough program of tree planting, other embellishment and good maintenance. We must face the fact that if a city is to be pleasurable,

we must find ways to separate the pedestrians from the rivers of cars, which are ugly, noisy and smelly—a wall of verdure will hide them, mute them, even filter some of the fumes. If horizontal separation is impossible, then levels are clearly indicated—and here the clear principle is that the air and the sun and the sky are the prerogative of the pedestrian who should always be given priority over the automobile. We do not want walkers on the freeways, and we do not want automobiles in the pedestrian places. Our pedestrian ways in America are mostly dreary, the sidewalks too narrow, the sidewalk experience too frustrating and too dull, even ugly. In classic Rome you could walk almost from one end of the city to the other in arcades designed to shield from the sun when it was too hot, the wind when it blew too hard, the rain when it was too wet. They were also designed to permit freedom of sky and air when the weather was pleasant. Despite all our affluence, no American city has managed this except in very small areas such as the Paseo in Santa Barbara or a little of Santa Fe. Even Dodge City could offer a lesson here.

9) Great cities have great parks. The best ones are downtown, like Tivoli in Copenhagen, the Tuileries in Paris, the Zoo in Berlin—and not out by the airport like Disneyland. You can still ride with pleasure in the Bois de Boulogne or the Borghese, saunter in London's Green Park or by the Serpentine, sail toy boats in the Tuileries, enjoy an amazing array of flowers in Hamburg's Planten un Blomen, go to good band concerts every noon in Göteborg, or watch the dusk fall from the Pincio and perhaps even hear a nightingale sing in a place the pigeons have not yet fully appropriated—the pigeon, that durable and obscene urban bird. Or you can go farther out for an afternoon in the autumnal peace of Fontainebleau or the spring of Hampton Court, or the baroque repose of the Nymphenburg on the outskirts of Munich, or the Cloisters in New York. We do have American examples but they are less well-kept, less used, less convincing. All these later things are possibilities in the complex of urban redevelopment, but they are almost always left out.

10) Urban joy is augmented by some brilliant architectural showpieces, of course, and unhappy the city with none. We immediately associate Istanbul not only with the Bosphorus but also with Suleiman's Mosque and Hagia Sophia; Moscow with the many-towered Kremlin; Paris with Notre Dame, the Madeleine, Sacré Coeur and the Invalides; London with the Houses of Parliament, Westminster Abbey and St Paul's; Rome with the Pantheon and St Peter's. These are historic examples, as indeed most of the good ones are, but not

all. There are the buildings of Brasilia, lower Manhattan, Le Corbusier's *Unite d'Habitation* and the complex of the Hansaviertel in Berlin, Aalto's buildings in Helsinki or his new *Hochhaus* in Bremen—and I could, of course, cite current American examples, but I do not want to single out individual American architects. It is tempting for American cities which do not have Philadelphia's Independence Hall or Boston's State House or the White House or the *Vieux Carré* to conclude that nothing can be done. But, of course, that is nonsense. One should strive to keep one's old and distinguished historical monuments and to add new and exciting ones. But it is not a one-shot bootstrap operation. A highly localized and expensive face-lifting in the form of a distinguished building will do a great deal but not nearly enough.

So by all means a wonderful city should achieve some well-placed pieces of wonderful architecture even if it already has some, but this is really not even much of a start. One needs to try to maximize the indigenous character of the sites, the exploitation—even the manufacture—of urban bodies of water, the redevelopment or invention of squares, boulevards, parks and the sparing use of freeways.

But these remain big things. It may even be a mistake to think that these herculean efforts are essential though some are needed for any great city. So let me conclude with a few words about smaller things which also add enormously to the urban character and joy.

11) I have already spoken of small parks. There are small opportunities to play with water which adds coolness and the sense of it, which makes pleasant sounds when it runs and which enhances the landscape of almost every city we really admire.

12) Then there are the street details. The Italian cities teach us that sculpture is more effective in the streets than in the museums, and it need not be classic sculpture. Lisbon shows how much mosaic sidewalk pavements can add to urban grace. Flower boxes add to the gayety and sightliness of many German and Spanish cities. The University of Caracas and its outdoor murals by Lèger show what painting can do in the street. Neon is beautiful on Tokyo's Ginza and not only because one cannot read Japanese; it is also beautiful as sparsely reflected on the dark surfaces of Boston's Charles River Basin. The people of Sion in Switzerland have demonstrated that street signs, including advertising, can be as harmonious today as they were in the middle ages. Philadelphia has shown that wonderful little quiet allées are possible very near to downtown. Henry Dreyfus and many north European designers have shown what can be done with the design of trash baskets, tele-

phone booths, street light fixtures and every other element of street furniture. All of these are well within the resources of any American city that wants them, and there are plenty of examples by now of what to emulate if not of what to copy.

Naturally to provide them is not enough. They must be tended and policed. The water needs to be kept clean and running, the sculptures protected from vandals and pigeons, the sidewalks swept, the flowers watered and cut, the dead lamps replaced, the squares cleared of litter; and special vigilance is needed with the street furniture because a handsome design for a filling station or a news kiosk can quickly be despoiled by an insensitive operator. But all this care and vigilance *is* possible and it has been demonstrated in many cities throughout the world if not often in the US.

The positive beauty of a city is then a complex, even a subtle thing. The chief point I want to make is that it is a diversity; that it cannot be achieved by a single *tour de force* like a great new building or plaza. Just as the success of a central transportation system depends upon the effectiveness of its feeders so the total urban pleasure depends on attention to little things as well as big. This is, in fact, a good thing because it makes it possible for many more people, big and little, to participate.

We should never forget that even if our urban exit strips were better-looking than they are they might become monotonously alike—as they are now. It is in diverse neighborhoods as well as in characteristic main squares that an urbanite finds a sense of place. There is no such sense of place in an exit strip. Most of the little things I have mentioned, including the planting and tending of trees and flowers, the street furniture, the little fountains and pieces of art, are within reach of the people of an individual neighborhood. Neighborhood competition and emulation might become a powerful force for urban beauty, especially if it were encouraged by praise, prizes and even funds for good projects. It was this neighborhood character which Sansovino admired so much when he came to Venice. He did not rest his eyes only in the Piazza San Marco. But the great square of St Mark's and the Grand Canal, the freeway of its day, were necessary to hold the neighborhoods together. Perhaps a great modern city of the motor age will consist of concentrations of excellent neighborhoods, connected by freeway systems. But to be a success the neighborhoods must be substantial and not sprawling, and the whole must somehow achieve a pleasant and comprehensible cohesiveness. This, you will appreciate, will demand more planning, not less. ■

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Questions Posed in the Harvard Yard

A Practitioner Turned Educator Asks from Whence the Answers Will Come

BY BENJAMIN THOMPSON AIA

Chairman, Department of Architecture

Harvard University

THESE comments come from Harvard University, an ancient and struggling institution across the Charles. Even the very large houses of education have their own special problems, and Harvard's are no exception. We, too, have physical crowding, too little space and no money. But right now I'd like to raise some other questions of a less crass nature: How we teach architecture and where we're going with architectural education in the twentieth century. And finally I ask you the question: What is the point of going anywhere unless we schools know whence we're heading?

Educational method is a bothersome subject, and I've truly worried about it this year because I came to Harvard fresh and new, although a bit tainted from my past twenty years of architectural practice. I found quickly enough that my architectural warfare had dulled my verbalness for the School's firing line. I had learned in the years of practice to listen tolerantly to clients. But I found my listening reflex a limitation. I had developed a deft adroitness at cross-debate with the super-janitors of various institutions where my own buildings were being built. Thus, I thought, this facility might carry me happily through, and my natural reaction to silly questions was yeah, yeah, yeah—borrowed from the Beatles. Most modern architectural practitioners learn to fence with super-janitors in the battle for supremacy of the asphalt-covered environment, but I soon found it didn't work with the students and was considered possibly undignified behavior for the new chairman at Harvard. Long silences did not describe the empty spaces between the buildings, to say nothing of the buildings themselves. So I went to the Berlitz School to cultivate a language barrier to improve my effectiveness in drafting rooms and

juries. Communication be damned! Let's develop a fuzzy abstract image.

Yet the whole problem of architectural education continued to bother me now. What was it all about—all those questions by the professors? It's the Socratic method, I was told—a good question is worth a thousand answers—but good heavens, some of those questions could actually be answered. Should I dare? Would it hurt the students? And the answers by the students were never quite complete. They were being trained to live with their frustrations. God bless Socrates's soul; he made us teachers invulnerable. But how could any system of education raise so many impossible questions and provide so few answers? When would the house fall on our heads?

Outside the doors the sycamores were falling in Cambridge, Kennedy's war on poverty was beginning, problems of integration plagued the cities, and the battle for Asia and Africa was being fought. Inside the school, our students fought the system and cried for reality, more experience, and true inspiration. Yet the student vs critic pingpong game went on. I suddenly felt we were back in the fifteenth century of architectural education—in a kind of Alice in Wonderland world. So now I went into the Harvard Yard and sat under a towering elm tree. I posed questions to myself, and I tried to answer them. The meandering of my mind confessed that none of our particular architectural educations were right or perfect at any of the various schools we attended. Consider my own education: it made no particular sense, it was an unstructured, unsystematic kind of madness, a will-o-the-wisp. And so was yours confusing, and yours nonsensical. Experience should teach us to laugh at the dogma of systems and to respect the thousand roads of arrival given the freedom of search. That schools

An address given by Mr Thompson before the Boston Architectural Center upon assuming his new duties at Harvard last year

Questions Posed in the Harvard Yard

should provide this freedom is the only sure role. So let us honor search and the magic of man's variety. Now let me continue with the questions. Do not expect answers. Socrates would not allow it; he already warned of that.

First, I wonder about the enormous wall between the architectural schools and the architectural profession. It is amazing how one feels the remoteness in just a few geographic blocks. What causes this unnatural division when both sides deplore it? What could be done to bring about more natural interaction and rapport? And how can we build bridges between the schools and other university departments, between the profession and real life? Who has made such an island of the schools? Should we raise the river or lower the dam? With the best of intentions, why has so little been done to break down the walls?

Next, I wonder about the details of curriculum. Why are mechanical and acoustical engineering not taught until the third year? Why are the engineering and building disciplines not unified in a more imaginative way? Modern building attempts unification through combining mechanical and structural systems, giving new form to the architecture. The skeleton of the functions and materials are at the roots; they become a new esthetic. Should not architects have a comprehensive grasp of not only the separate parts of construction, but of a technique of integrating the parts; it becomes architecture. How can we expect results unless the various disciplines work together toward common answers?

I also wonder about studio criticism. Nobody has devised a better system, but face-to-face therapy between teacher and student is expensive in teaching time and psychologically exhausting. One questions whether an active practitioner (creator) should write or speak too often, if in so doing he becomes pedantic. Isn't it important to redefine what the schools expect from their teachers over the years? If creative teaching is the ultimate aim, then verbalization may become a substitute for direct creative action. Can you get hot and cold water out of the same faucet? Does the system of criticizing eventually destroy the teacher? Can the teacher be creative without creating? What is the best time schedule for a teacher to allow both active professional and teaching responsibility?

I wonder about the new technical methods of

teaching architecture. What could be done to save teacher time and to animate certain courses? Jerome Weisner has charged that the whole field of education is the most backward in our society. He claims that startling discoveries have been made regarding the capabilities of the young, but that they are not being applied on a broad enough scale and that because of low level teaching methods the public is condemned to ignorance of the forces that shape its destiny. We in the architectural teaching world seem to be on such a primitive level: paper, pencil, stools and drafting boards; reading, writing and arithmetic. We act as though we're frightened of new devices, yet we specify them freely for our real world clients. What about team teaching? What about audio-visual techniques? What about computers? Architectural education is not even up to the normal high school level in those areas. Why retain the old-fashioned attitudes?

Next, I wonder why industrial processes and modern technology are not taught in school. Industry has been so successful in prefabricating component parts to buildings. Windows, doors, walls, hardware, etc, now are broadly standardized by the manufacturers. Present-day architects specify the major proportion of their buildings from manufacturers' catalogues, sometimes too much, I admit. Less and less special design goes into a modern building as each year passes. The schools make no effort to meet this reality by teaching courses in the industrial design of the so-called "parts." Yet it is the parts to the building that must form the architect's vocabulary—and give ultimate control. Why not recognize the fact?

I wonder about integration between architecture, planning and landscape architecture. The lack exists in both the profession and the schools. Heaven knows there is enough work for all, but clear definition should be given to the relative roles to be played.

And then what about psychology, sociology, economics and government? How can we utilize the great resources of the university in solving our complex modern problems? The people and knowledge are all around us, but how do we bring them together? Each is too busy in his own separate world. Where do they connect?

Then more about the teacher. How do we keep him creative and vital? We must have creative teachers, but how do we keep them creative over

the years? Let's verse them in both theory and practice, and fully wake them to their own generation. Architect-teachers must be directly involved in the building process and that process changes drastically each day. Mustn't teachers broaden their experience to communicate to the students? So you have a summer to build, how many buildings have you built in a summer off? Part-time is no formula for great acts. Could the practice of teaching architecture and practice be interwoven? Universities are no places for teaching and practice of architecture if they suspect the ingredients. Teachers in the university are stuck with inflexible day schedules, and so are the students. The present curriculums are as unsympathetic to creative enterprise as if they had been wickedly contrived. And unless we offer the teachers a creative solution to a creative life, how will we ever have a creative school?

And what about acceleration? When our world turns into a junkyard before our eyes, where should the emphasis be placed? On monuments or on the broader environment? Why has no school taken that bold new step to face the popularized destruction of our planet? Everyone knows the need. Each day new books pour off the press by such people as Stewart Udall, Rachel Carson, Peter Blake, Jane Jacobs. They warn of the growing menace of declining resources, they prophesy the dire physical, social and cultural implications to cities and civilizations.

In the next twenty years more buildings and highways will be built in this country than in the whole previous 400 years. Each day this continent's resources are more rawly exposed. At the same time we participate in the groundbreaking of Africa and vast areas of South America.

Mustn't we recognize that this is a crisis of extraordinary dimensions? What are we doing on an action level in the schools? Just quiet talk in the drafting rooms. Mustn't we find a new solution that will be effective immediately during the time span of five to ten years? Half the physical damage will be done by then. If we wait, who but the devil will design the new environment?

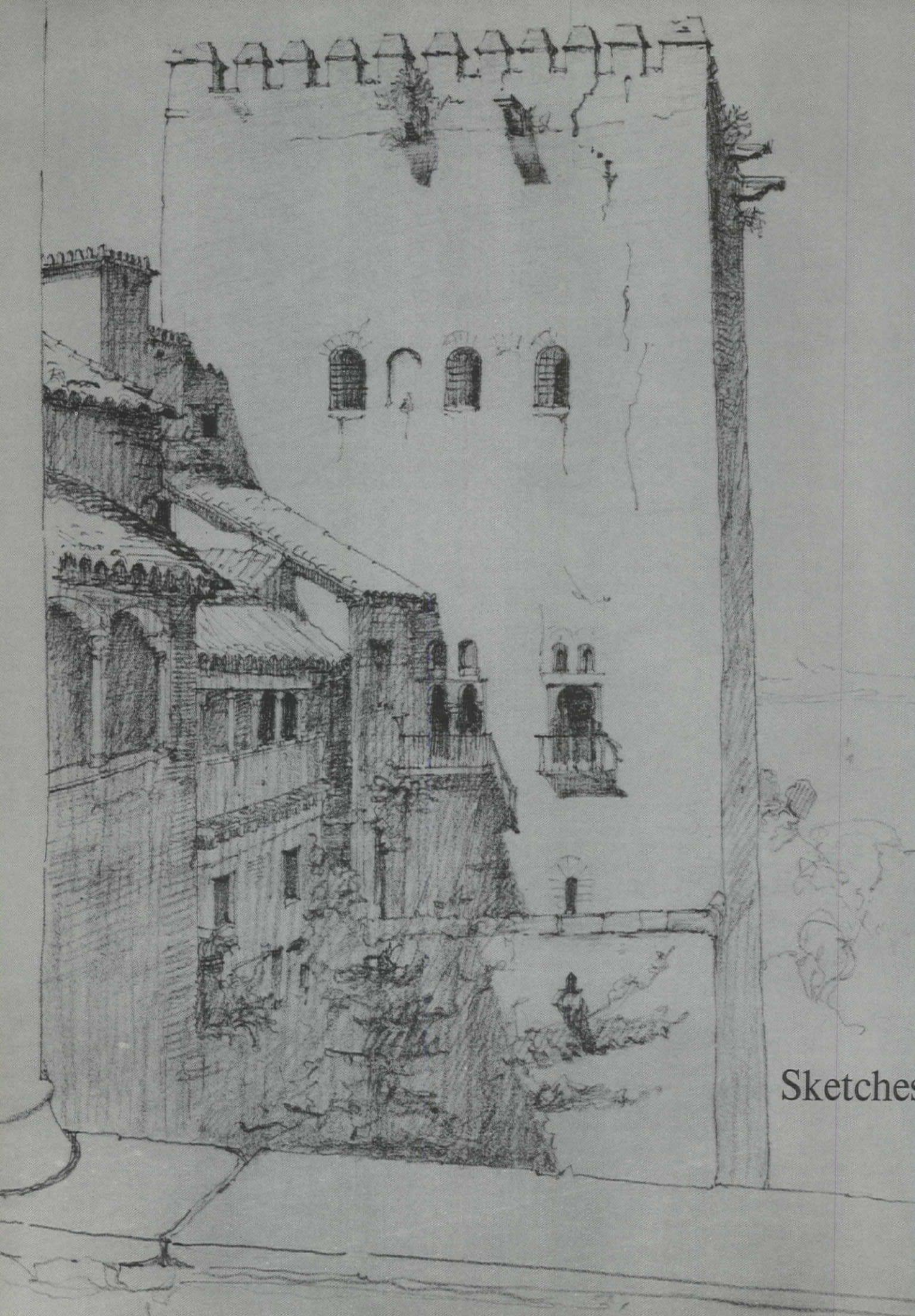
This question-and-answer period in the Yard continued through the fall, winter and spring. Possibly you'd like to hear a few of the new things we're planning for next year at Harvard. First, we are starting a continuous workshop. It will be

involved with building processes, materials and structures, and mechanics and acoustics. These will be introduced in first year at the beginning of the curriculum. We will be involved in the workshop with the creating, testing and doing of architecture at both practical and theoretical levels. The continuous workshop will run over the three-year period and be coordinated with the design studios. We hope it will unify the engineers and the architects through their continuous concern with the building act. We look forward to a new attitude on the part of the designing student: a less theoretical and more sane approach, a pursuit in greater depth of design in models, larger scales and new materials. Our workshop consists of 12,000 feet of space in the basement of Memorial Hall.

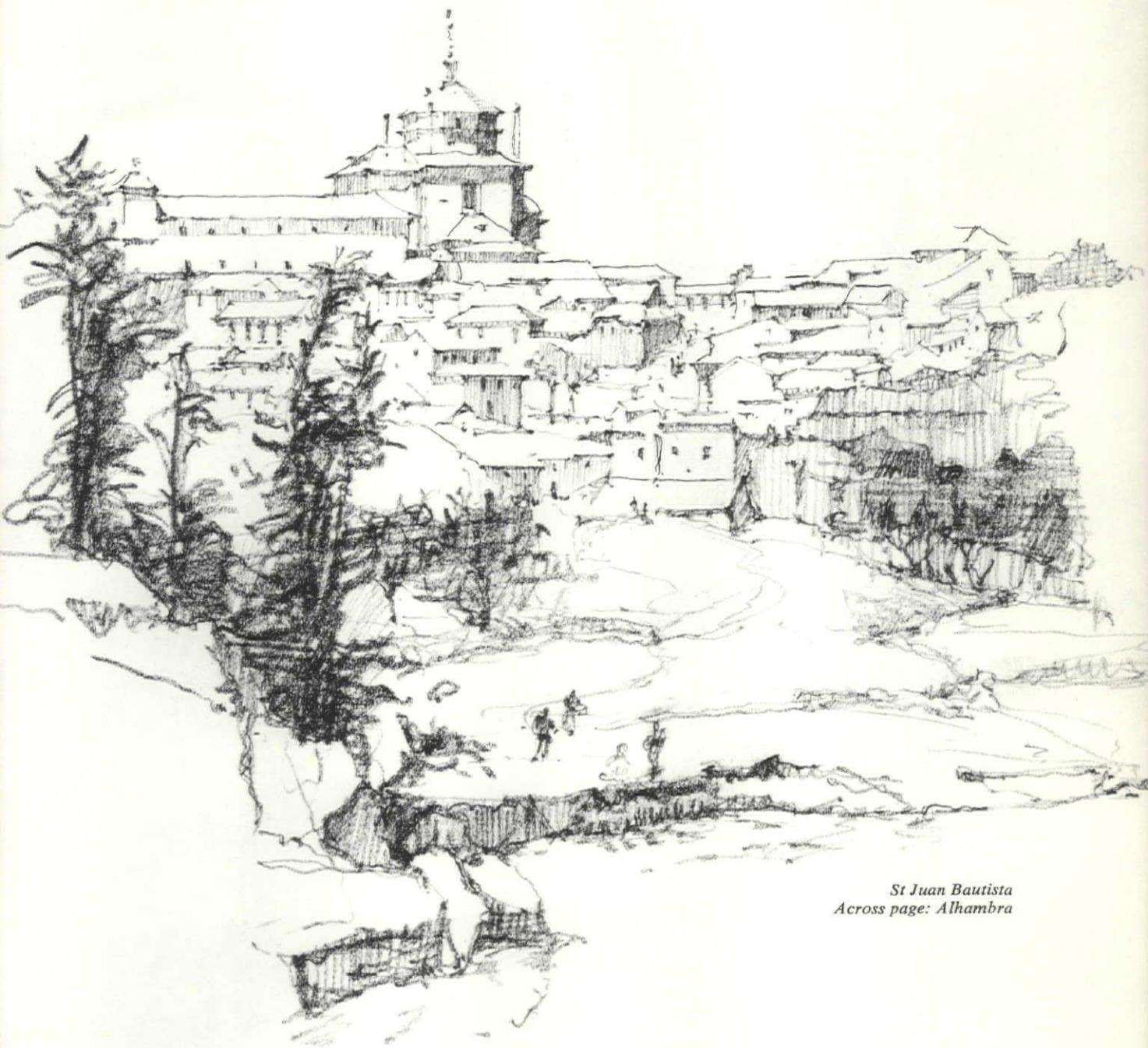
We are also starting a student fellowship and assistants program in architecture. Under this plan, students will conduct review sessions in classes, gain teaching experience in the studios and work as research and administrative assistants in the School.

As a major development in our program, we are proposing that research be brought into the School as a recognized part of the curriculum. Students in third year, in thesis and in the master's program will eventually be involved in research projects. True research does not presently exist in architectural offices and happens only sporadically in the building industry. There is a tremendous need for basic and applied research in architecture, and the university could be the natural place for this research to happen. A research program brought into the heart of the School's program would stimulate the teachers with live, direct problems and produce university-wide collaboration. Departments like government and law, sociology and economics, anthropology could participate. Advanced projects on subjects like urban schools, replanning of cities, developing nations, vanishing resources could be undertaken with private and public grants. Projects concerned with the urgent problems of our day could motivate our schools and stimulate a new pattern of architectural education.

Finally, at Harvard we are launching a fresh study of architectural education in the twentieth century. This will be an action study and we are prepared to implement and test ideas as we develop them. I hope you agree the need exists. ■



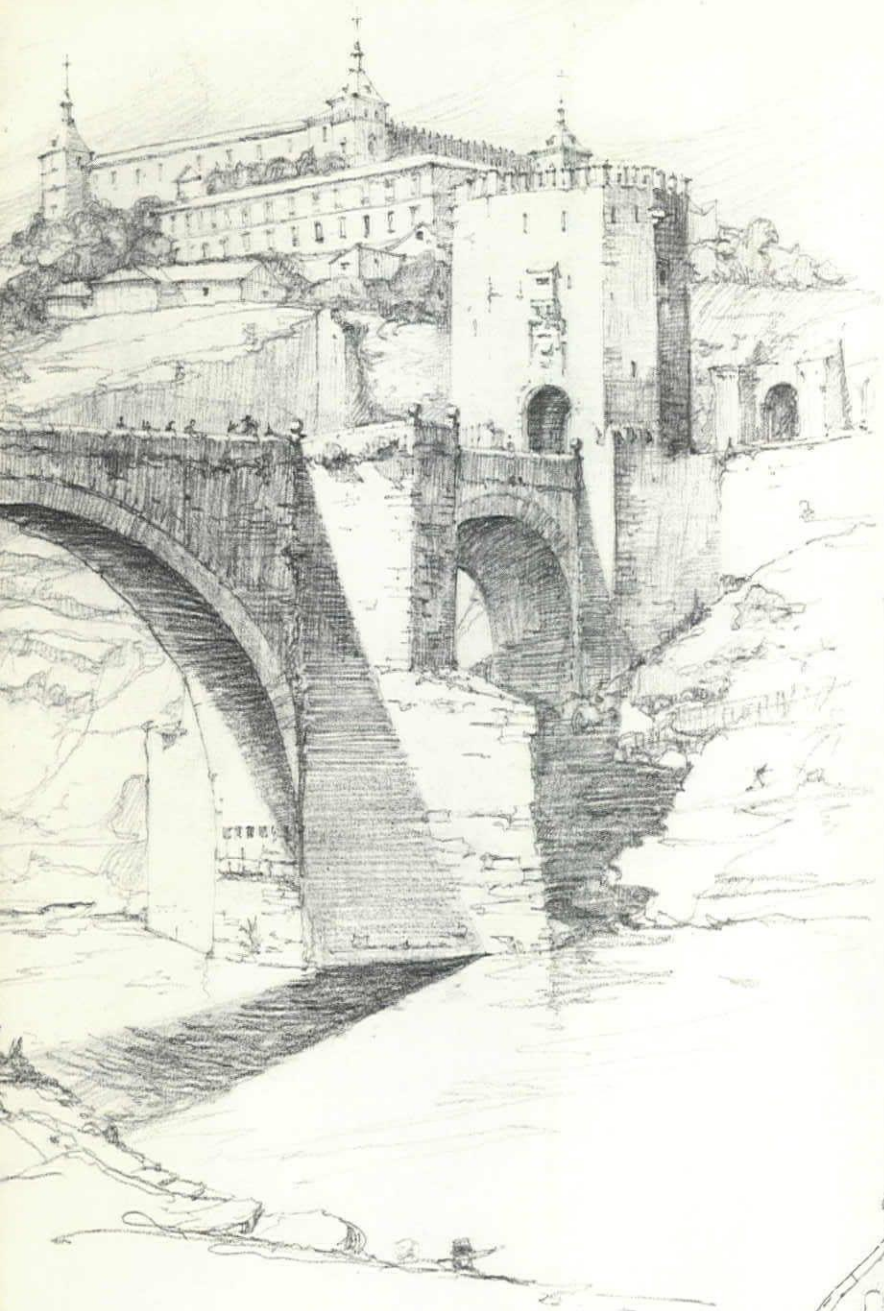
Sketches



*St Juan Bautista
Across page: Alhambra*

by Edmund Randolph Purves FAIA

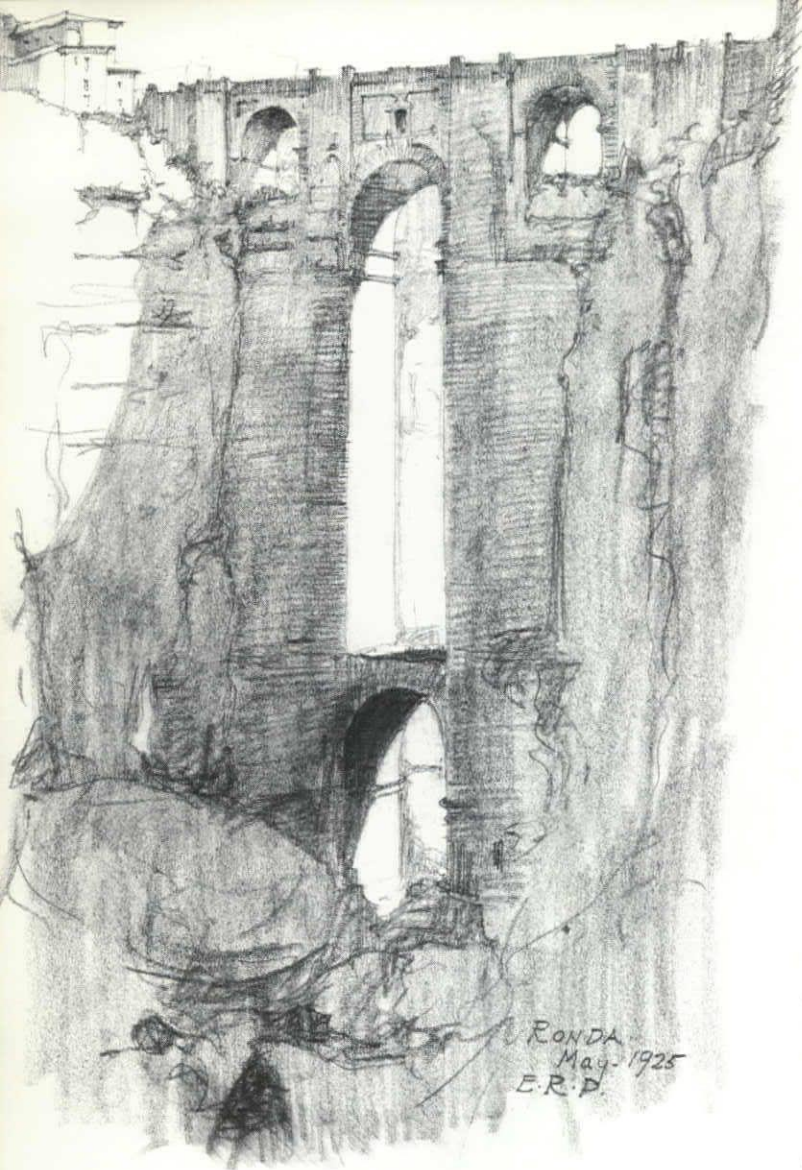
The late Executive Director of the Institute from 1949-60, who will be honored in a continuing lecture, the first to be delivered at the 1965 AIA convention



*All the sketches in this portfolio
were drawn in the spring and summer of 1925*

*Top: Puente Alcantara, Toledo
Right: Englebrekt Church, Stockholm
Across page: Cathedral, Segovia*





A Convention First: The Purves Memorial Lecture



THE Edmund R. Purves Memorial Lecture, which will be initiated this June when Lewis Mumford takes the podium at the 97th annual convention of The American Institute of Architects, is envisioned by its sponsors as a kind of "State of the Union" message in terms of our visual environment. Established by the Board of Directors in honor of the Institute's late Executive Director (1949-60) who died a year ago April at the age of 66, this annual lecture is conceived as the intellectual high point of the AIA year—a major statement that will be quoted in public and pri-

vate context wherever environment is being discussed.

In selecting a speaker who could live up to such lofty standards, the Board turned to a world-renowned critic and scholar on the subject of cities, a man who already has been twice honored by the Institute. Mr Mumford was elected an honorary member in 1959 "for distinguished service to the profession of architecture" and received a Special Citation in 1962 for his book, "The City in History."

Other books by the lecturer, in addition to scores of articles he has written for such publications as the AIA JOURNAL, include "The Highway and the City," 1962; "In the Name of Sanity," 1954; "The Culture of Cities," 1938; and "Sticks and Stones," 1924. The latter was the first survey of the development of American architecture, and a year later the author offered the initial course on this subject at the New School for Social Research. He served as secretary to the AIA's Committee on Community Planning from 1924-26, working under Clarence Stein and Henry Wright.

Currently president of the American Academy of Arts and Letters, Mr Mumford has received a host of other honors, among them the Gold Medals of the Royal Institute of British Architects in 1961 and the Town Planning Institute of Great Britain in 1957.

Last July, Mr Mumford was one of thirty distinguished Americans to receive the Presidential Medal of Freedom, the nation's highest civilian honor to those who represent creative excellence in the fields of public affairs, the arts and science. His citation read: "In the name of sanity, he has constantly worked to rescue and extend the qualities of urban life that will preserve and stimulate the humane spirit of Western civilization."

The initial Purves Lecture, to be delivered at the June 18 luncheon on the closing day of the convention, will have added significance in that the Pan American Congress of Architects will be held in conjunction with the AIA sessions. Mr Mumford also will address the annual student forum on the previous evening.

In its move to honor Mr Purves, the Board sought to create a "living" memorial, for Mr Purves, in the words of the resolution passed by the Directors at the 1964 meeting, "guided and administered the affairs of the Institute during the period of its greatest growth in membership and into a new era of ever-expanding services to its members and to the public."

Landmark for the Living

BY GEORGE McCUE HON AIA

With an assist

BY GERHARDT KRAMER AIA

Faced with the threat of losing the Old Post Office, the architects and other civic-minded citizens of St Louis are not taking it lying down. We heard something about it at the last convention and took appropriate action. Here is the story up to date

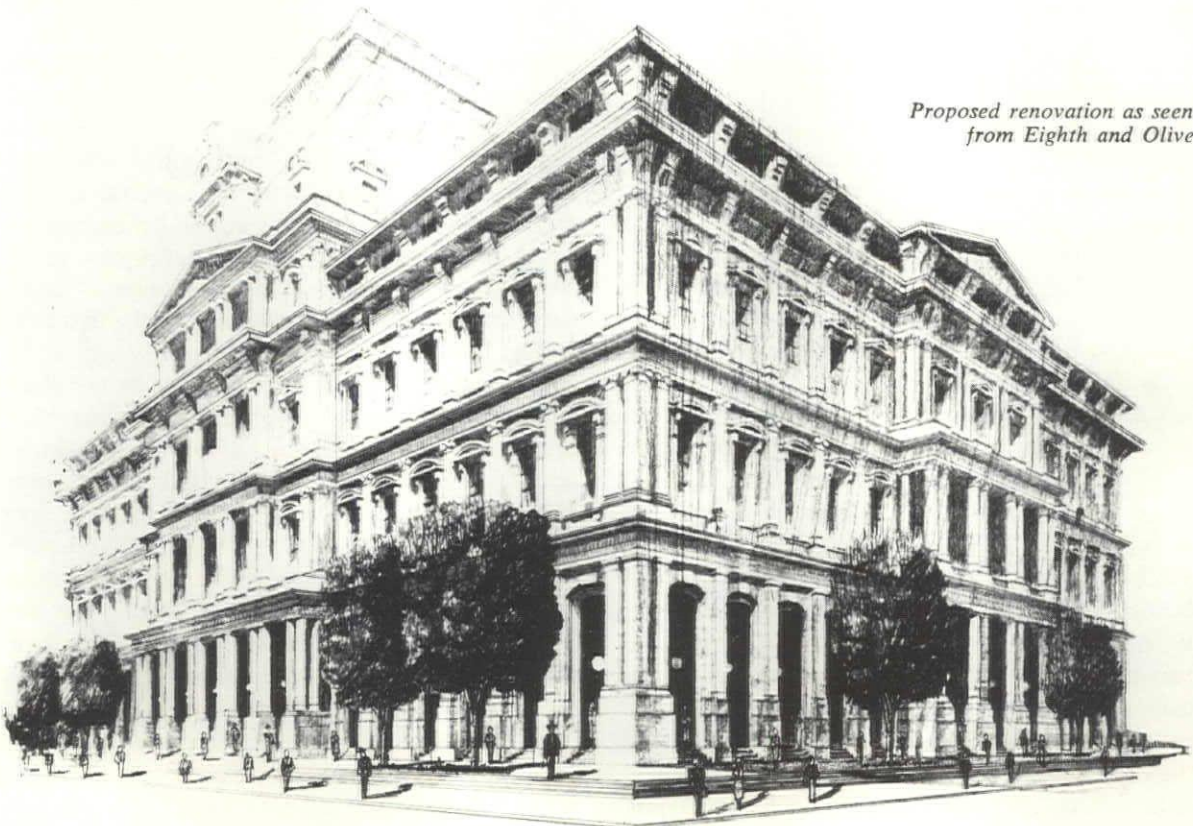
THE DECISION by the General Services Administration to demolish the St Louis Old Post Office building and to erect a Federal office tower on its block-square site in the downtown core was received with cheers by the business establishment and with dismay by a group that had labored valiantly to preserve the robust relic of the Grant era.

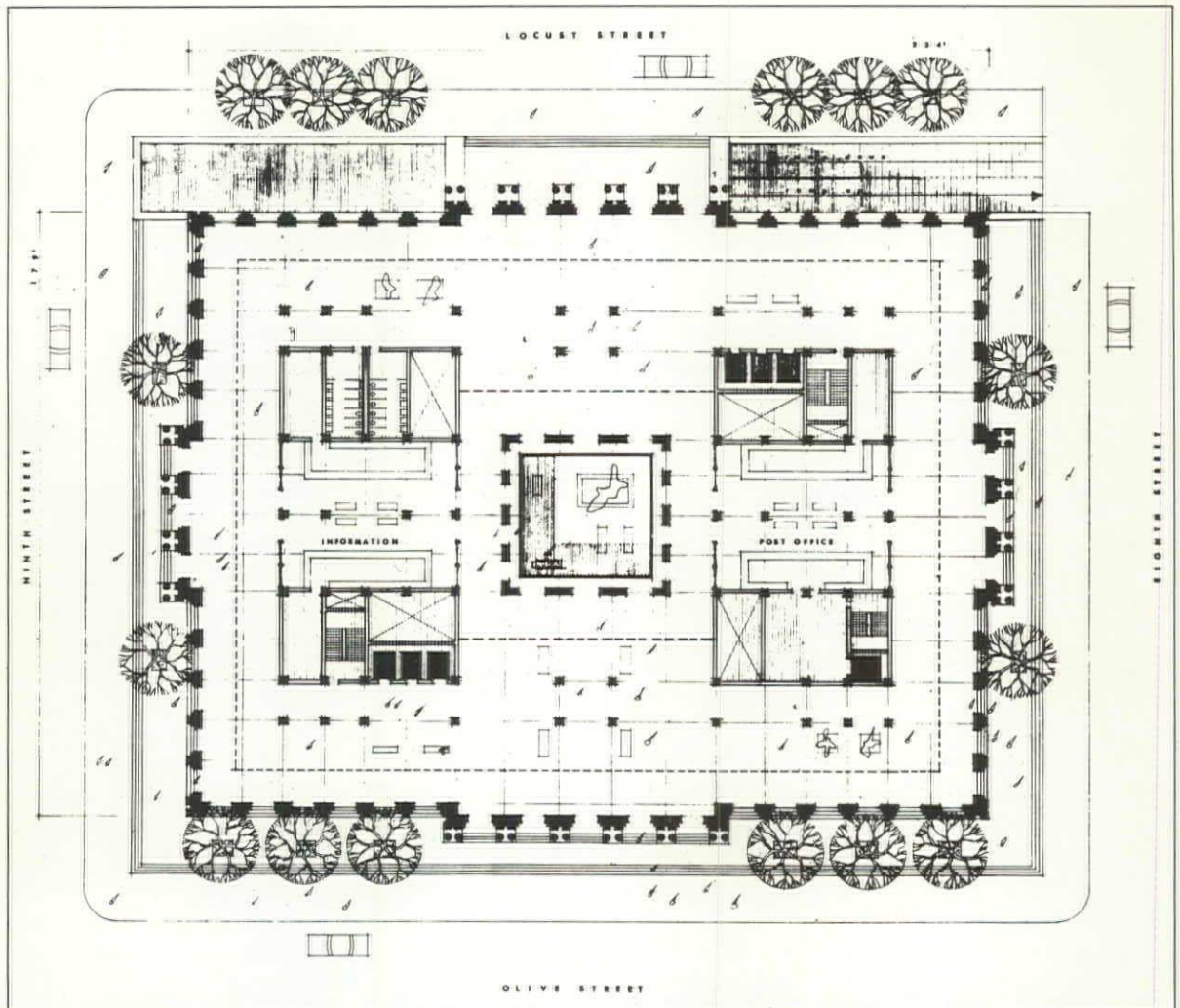
The GSA said that a proposal supported by the St Louis Chapter AIA for remodeling the interior to more than double its floor space fell short of Federal requirements. It also looked askance at the proposal as not meeting "the challenge of authentic historic preservation." The plan called for complete reconstruction of the interior to replace the present four floors with eight stories, and

to add three more setback stories beyond the street-level sight-line. First-floor wooden windows and spandrels would be removed to convert the high openings into arcaded entrances to an interior plaza. The entire present first floor was seen in this concept as a sheltered open space, with glass-enclosed islands for a post office branch, visitor center and similar service facilities.

The decision to destroy A. B. Mullett's moated landmark, with its quadrangular dome ornamented with heroic sculptures by the young Daniel Chester French, came at a time which indeed seemed to be on the side of preservation. Public opinion—slow to manifest itself in St Louis—appeared, on the basis of newspaper letter columns and of a still-

Proposed renovation as seen from Eighth and Olive





First floor could be used as an open, but covered, public plaza, devoted to Post Office sales and a visitor's center. Core near each corner of the building could accommodate elevators and utility shafts

growing pile of petitions to save the building, to be strongly in favor of adaptive use.

The Committee to Save the Old Post Office, organized last spring, came into being with a half-dozen members and has grown to around thirty. It was formed after the St Louis Chapter adopted a resolution for "preserving the St Louis Old Post Office building, its interior remodeled to gain space and install efficient facilities, its exterior to remain substantially in its historic character in keeping with enlightened practices of adaptive uses of historic structures." Several civic organizations passed similar resolutions, and the preservation movement gained vigorous strength after the AIA, in national convention at St Louis last June, resolved that the building should be saved.

The Committee to Save the Old Post Office is headed by Austin P. Leland, trustee of the National Trust for Historic Preservation (which also has endorsed the campaign). Its membership includes architects, historians, businessmen and businesswomen and an attorney. It commissioned the re-use proposal, prepared by William D. Peckham, professional associate of the Chapter, under

the immediate supervision of Joseph Murphy FAIA and George E. Kassabaum, Chapter head.

This solution called for gutting of the interior above the main floor and replacing it with light-weight construction built directly upon the existing foundation. Space would be gained by introducing a new floor between present floor levels, by making all floors continuous over a broad light well that now extends through the building to the first floor ceiling, and by the three new stories.

The main floor would be opened to the street on all four sides by covering the existing moat and changing the existing windows into an open arcade to provide a year-around sheltered plaza. Branch post office facilities on the main floor would be limited to sales, while sorting and other nonpublic operations would be assigned to underground levels.

Although a Senate-House Conference Committee had already authorized funds for preliminary work on a proposed new building, GSA withheld action until the preservation plan could be studied. A delegation of architects, engineers and laymen presented it to the GSA's Public Building Service

last October. The preservation committee has now announced that its campaign will be continued in Congress.

Originally the United States Court and Customs House, the four-story "opera house baroque" structure of Maine and Missouri granite was completed about 1882.

The Old Post Office is the last and most distinguished of a series of five such Federal court and post office buildings designed by Mullett. The others, in New York, Boston, Philadelphia and Cincinnati, were torn down between 1936 and 1942. The San Francisco Mint, the Old Pioneer Post Office in Portland, Ore, and the Executive Office Building (Old State, War and Navy) in Washington remain of Mullett's more monumental special-purpose buildings.

Remembering that Missouri Secessionists had nearly captured the Federal arsenal in St Louis a few years before and that the times were still turbulent, the architect designed his St Louis building as a fortress for the security of gold bullion to be kept there. A dry moat 30 feet deep surrounds it. All windows and doors have sliding iron shutters with ports for rifle barrels. Huge ice boxes and a basement well were provided for a besieged force.

In 1935, the Federal courts moved to another building. Other government agencies were transferred until the post office branch was the only Federal facility remaining. It now shares first floor space with the St Louis Visitor Center; upper floors are vacant.

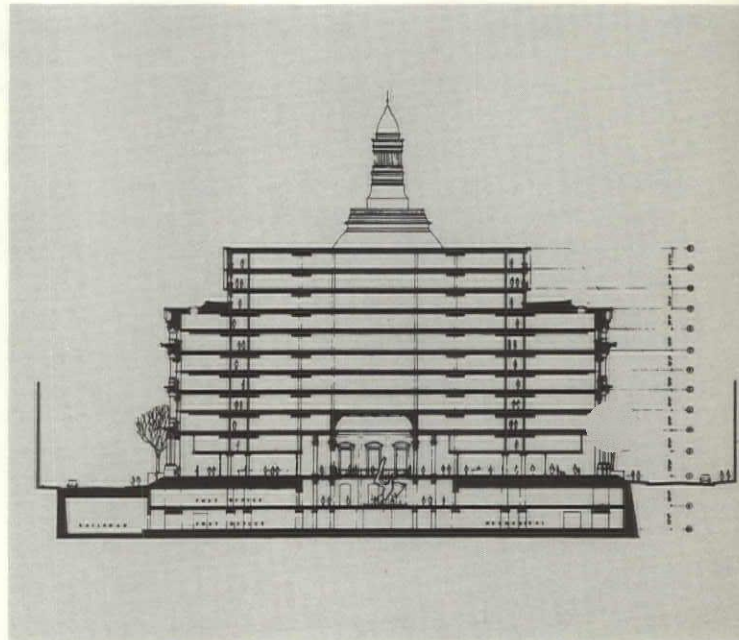
In many respects, the issue of the Old Post Office has followed the classic pattern of Preservation vs Progress. It began several years ago, when GSA announced that it planned to put up a new Federal office building, after which it would declare the Old Post Office surplus. The prospect of a full block in one parcel in the heart of downtown, perhaps at a windfall price, immediately interested several entrepreneurs.

Downtown St Louis Inc, an organization of core business interests "devoted to developing and promoting the new downtown," commissioned a plan for a tower and plaza concept which, it was hoped, a redeveloper would follow. This imaginative scheme, developed by George Anselevicius, generated widespread enthusiasm, but at the same time a few voices were raised to call attention to the landmark character of the old building.

The New Federal Building, by Murphy & Mackey and William B. Ittner, facing Market Street just west of Kiel Auditorium, was unequal to Federal needs on the day it was completed in 1962. GSA, which had rejected a proposal by the architects that this structure be beefed up so additional stories could be added, found itself still hav-

ing to lease some 600,000 square feet. It then decided to put another building on the Old Post Office site, and in its recent announcement of intentions to proceed said it would follow approximately the original tower and plaza concept, with the building larger and the plaza smaller than the original scheme.

Some of the frustration experienced by the preservationists is owed to the fact that its opponents argue both that the building is an ugly Victorian relic and not worth saving, and that the proposal to remodel the interior would do violence to the architecture. To modernize the interior while keeping the exterior essentially intact follows the widely applauded precedent of College Hill, Providence, Rhode Island, where the character of a colonial neighborhood was maintained by adapting the interiors to contemporary use. Similar procedures have saved a historic neighborhood at Mobile, Alabama, and Lafayette Square in Washington, and have been used in Europe for years.



Present generous ceilings would allow 11 feet floor to floor in the new construction above the 13-foot first floor. Floors would continue over the existing light well

"The Old Post Office," said Kassabaum, "is one of five structures in the downtown area that give St Louis its personality. The other four—Eads Bridge, the Old Courthouse, the Union Station and the Wainwright Building—are on the perimeter of our vital core. The Station and the Wainwright are privately owned.

"The Old Post Office, in the very center of our highly developed commercial area and surrounded by anonymous buildings with no vitality or spirit, is an essential link with a glorious past and, on this basis alone, justifies every effort to save it." ■



Politics, Architecture and World's Fairs

BY ARTHUR COTTON MOORE AIA

A brief discussion of the role of the architecture of fairs as a propaganda tool, either political or commercial. Drawings, including the cover of this issue, are by the author

NATIONAL and World's Fairs present for the architectural historian a unique situation in which the art of architecture becomes almost exclusively the servant of national ambitions and political ideologies. Nations construct pavilions at fairgrounds to accomplish what they normally hope to achieve through propaganda, diplomacy or war; consequently, the architectural program for these pavilions is primarily to persuade by means of exhibits that the energies, attractions, national character, system or government of one exhibitor is better than competing alternatives.

Through an examination of some former national and world expositions, it is possible to assay the extent of this influence and to see how specifically governments and the political climate

have affected design. In order to obtain a comparison of widely differing examples, this discussion will cover two national and two international expositions alike in size, scope and time of occurrence, but originating in societies with contrasting political systems.

Britain 1951

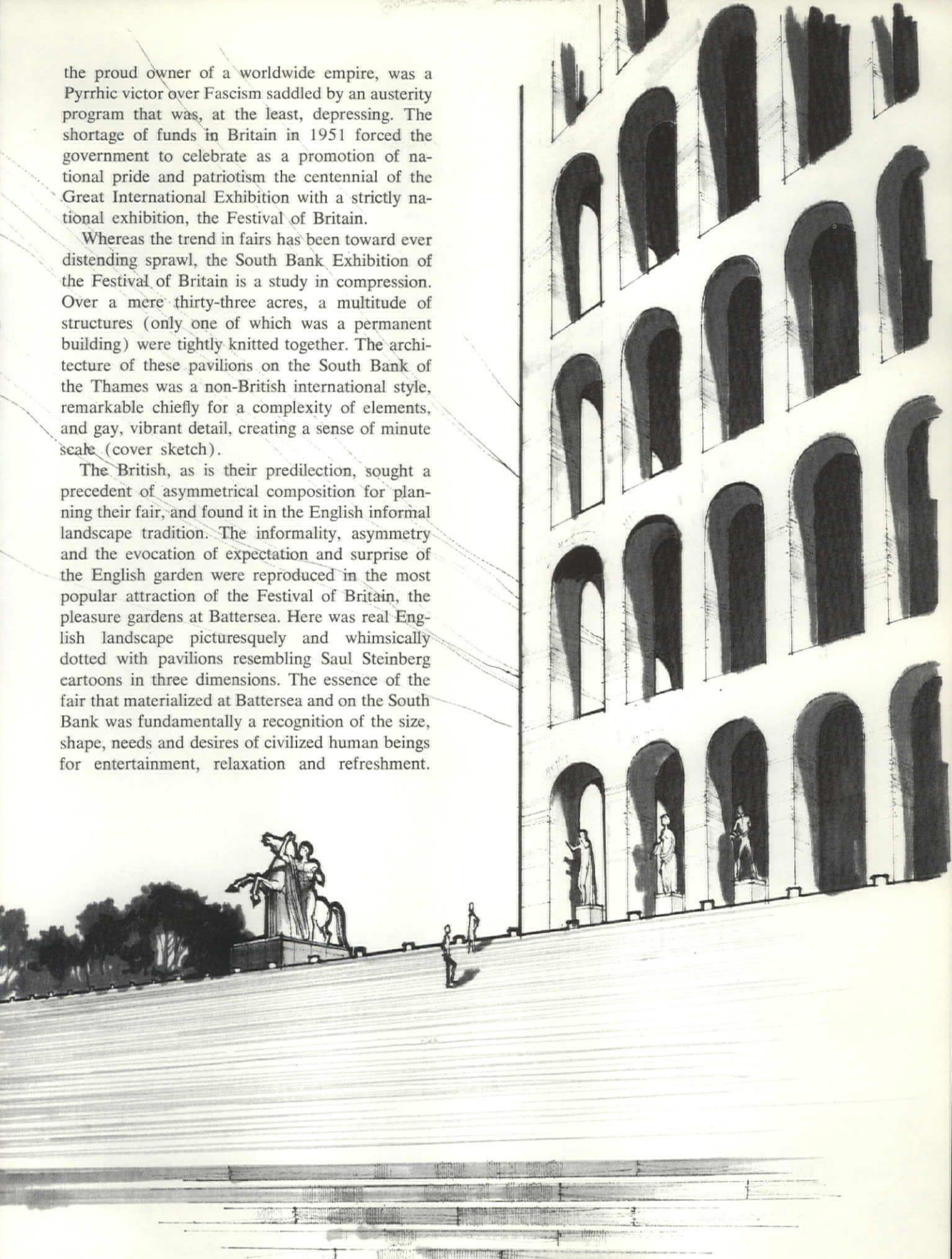
The phenomenon of world expositions, excluding a few celebrated fairs in ancient times,* is a modern invention born of such nineteenth century ideas as laissez-faire world trade and the notion of progress, complicated by the twentieth century's preoccupation with competing "isms." The first of these fairs was the Great Exhibition at London in 1851, signaling the high tide of Victorian England. One hundred years later, the host nation, no longer

* In the book of Esther there is a passage chronicling one of the first international exhibitions held by King Ahasuerus of Persia. This exposition ran for the customary six months and contained decorations which were not unlike those used at the Century of Progress Exhibition in 1933. Unlike Chicago, however, an attempt to introduce an ancient version of the popular fan dance by Queen Vashti was unsuccessful.

the proud owner of a worldwide empire, was a Pyrrhic victor over Fascism saddled by an austerity program that was, at the least, depressing. The shortage of funds in Britain in 1951 forced the government to celebrate as a promotion of national pride and patriotism the centennial of the Great International Exhibition with a strictly national exhibition, the Festival of Britain.

Whereas the trend in fairs has been toward ever distending sprawl, the South Bank Exhibition of the Festival of Britain is a study in compression. Over a mere thirty-three acres, a multitude of structures (only one of which was a permanent building) were tightly knitted together. The architecture of these pavilions on the South Bank of the Thames was a non-British international style, remarkable chiefly for a complexity of elements, and gay, vibrant detail, creating a sense of minute scale (cover sketch).

The British, as is their predilection, sought a precedent of asymmetrical composition for planning their fair, and found it in the English informal landscape tradition. The informality, asymmetry and the evocation of expectation and surprise of the English garden were reproduced in the most popular attraction of the Festival of Britain, the pleasure gardens at Battersea. Here was real English landscape picturesquely and whimsically dotted with pavilions resembling Saul Steinberg cartoons in three dimensions. The essence of the fair that materialized at Battersea and on the South Bank was fundamentally a recognition of the size, shape, needs and desires of civilized human beings for entertainment, relaxation and refreshment.



Rome 1942: Belittling mankind

ARTHUR MACKEY

Architecturally, this exhibition seemed in a sense, a "trapping of humanity."

Moscow 1954

In comparison, the Moscow Agricultural Exhibition, and later the Industrial Exhibition, set in the heart of the city on a permanent basis in 1954, was a national fair of parallel purpose and scope to the Festival of Britain. The Russian and British architects were confronted with the same problems, ie, the exhibition and promotion of the economies and morale of their respective countries, and the expression of intangibles—political orientation and national character. Only three years separated these two fairs whose programs were so parallel, yet in a world of increasing similarities, they stand out as indeed centuries apart. At a glance, the greatest schism seemed to be one of style. The Russians made a marriage of political convenience between native peasant ornament and the classical tradition of architecture. The use of the classic apparently was an attempt to show roots in the past, to identify with the former power of the czars and with the Greek ideal, whereas the recourse to diverse native peasant ornament revealed an underlying polymorphic nationalism in the Soviet Union. The planners, however, controlled the diversely budding chauvinism by placing at the end of the symmetrical mall scheme a stupendous wedding-cake tower, symbolic of the omnipresent control of the Communist party.

Unlike the British fair where each pavilion clamored for attention, in Moscow the hierarchial order of the exhibits canonized the Hall of Mechanization, which, in architectural conception, is startlingly similar to the halls of machines in the Paris expositions of a century ago. The similarity suggests the somewhat retarded state of, and hence nineteenth century fascination with, mechanization in Russia in the early 1950's. The tenor of the exhibition, organized like large adult-education classrooms, was didactic.

Newspapers in Moscow constantly exhorted visitors to "have a look at everything, learn whatever you can and ask advice." The *Moscow News* called the exhibition an academy of advanced methods and an arsenal of modern technique. Throughout the exhibition there was a conscious attempt to be weighty and impressive through the use of an enormous size and scale. (Although the hall of machines at the Moscow Agricultural Fair and the main exhibition building at the American Exhibition in Moscow in 1959 were different structurally, a comparison of sizes is illuminating. The American dome, which rested on the ground and was the largest geodesic dome ever built at that time, was 78 feet to the crown. The Russian dome over the hall of machines, approximately

180 feet high itself, sat on a building already 210 feet high.) Neither revolution nor evolution was implied in the solidity of these elephantine and platitudinous structures. The fair was the product of a regime which, above everything else, sought to perpetuate itself.

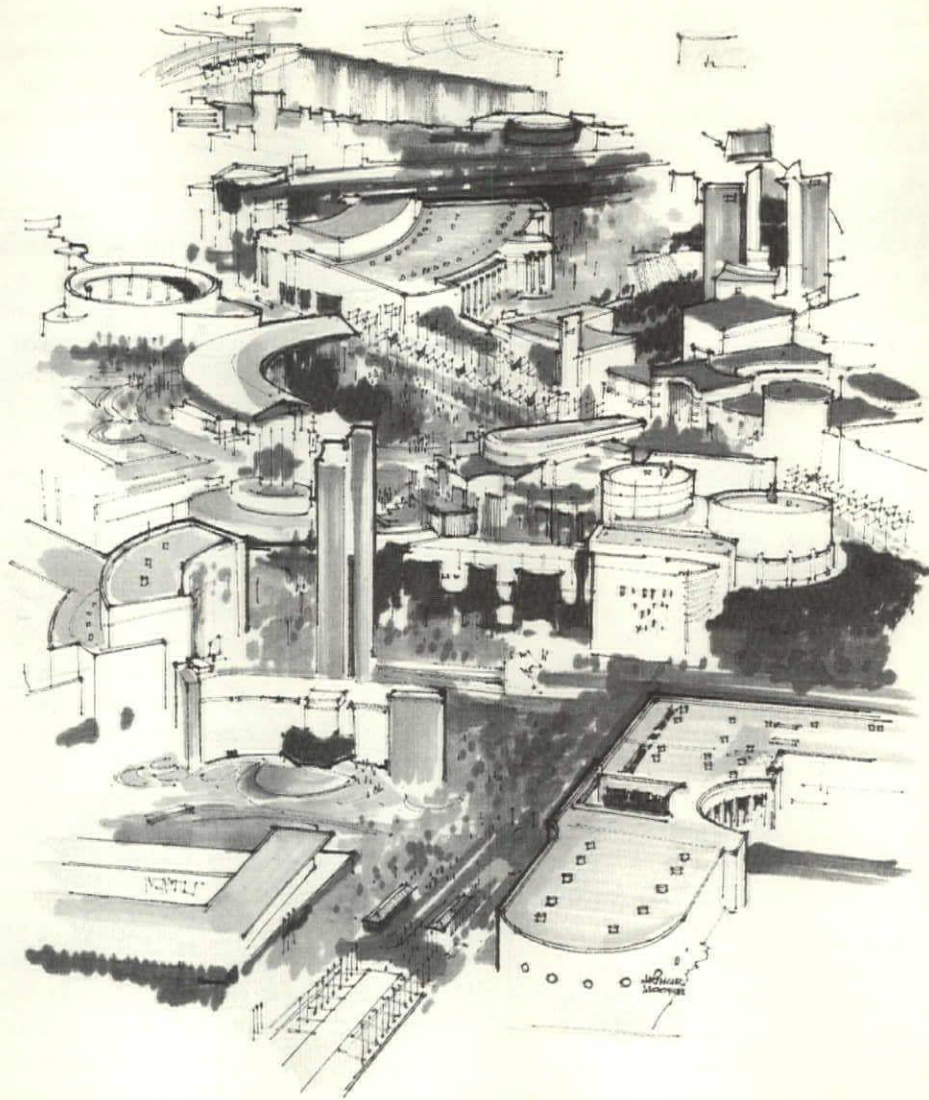
New York 1939

An example particularly pertinent to the problems of the present New York World's Fair is, of course, its predecessor of 1939; and relevant to the 1939 exhibition was its immediate proposed successor, the Universal Exposition of Rome of 1942.

In 1939, America was recovering from the severest depression in its history. The United States, with 13 million unemployed, needed a morale boost; therefore, the theme for the New York World's Fair that year was the "World of Tomorrow." In many ways the environs of the Trylon and Perisphere foretold a rosy future, which diverted contemplation of a dingy present. Under the dictum, "be futuristic at all costs," the architects produced an expensive, avant-garde, international style with overtones of Eric Mendelsohn and Buck Rogers.

Looking back at this fair, the architecture seems mere gimmickery—not because the pavilions were foolish, although indeed several were, and several were pretentiously serious, but because the majority of pavilions were designed as human playthings. Some instructed, some sold products or philosophies, but practically all entertained. A jarring note in all this froth and fancy was the plan—a rigid, radial scheme to make the theme effective through the architectural subordination of the rest of the fair. Despite restrictions and soul-searching effort to articulate the theme, what finally filtered through was a vague message that things were going to get better, but not how or why. Toward further confusion, the layout caused an immediate constriction and impediment to the growth of the thematic zone areas, which finally spilled over their confining avenues and formed their own organic pools.

Out of all this supposedly wild experimentation, there were bound to be some results, and they are significant. The ambulatory stage, a device on which an exhibit was carried along with the circulation of people; the extensive use of mirrors, an endless source of amusement for the crowd; and the popular telephone exhibit, where free long-distance telephone calls could be made while hundreds of strangers listened in, were all innovations in 1939. These devices had one common denominator: they exploited the very life's blood of every fair—the crowd. People were the great discovery in 1939, not technology nor worlds of the



*New York 1939:
Chaotic and carefree*

future, but people. In retrospect it was said that the use of the crowd was "an influence toward democracy more powerful than many a columned public building." *

Rome 1942

In contrast to the New York World's Fair of 1939, the Universal Exposition of Rome was one of the most fantastic projects of the twentieth century. An international fair was to be the immediate realization of a project ultimately designed to be a world capital of Fascism. The site, technically to be known as the Third Rome, was outside Rome, and the opening was set for 1942. The style of the Universal Exposition, which never opened due to the war, was a sort of mesomorphic classic, constructed at an enormous scale. If one can imagine the architectonic paintings of the Italian surrealist Giorgio de Chirico made three-dimensional and inflated to an overpowering size, the resulting image will be a good first impression of the Third Rome. As the dictator of his canvas, de Chirico could depict a private vision of mystical, peopleless, architectural spaces, just as the

dictator Mussolini later dreamed of spreading his own similar fantasy over a thousand acres. The gaunt Palace of Civilization and the Palace of Forestry are superb examples of how architectural scale can belittle man.

Both de Chirico and Piacentini, Mussolini's architect, achieved a degree of timelessness by the use of abstracted and simplified traditional forms at a heroic scale. In verbalizing his architectural vision, Il Duce declared that "the Italian part in the 1942 Exposition [was] destined to remain throughout centuries in buildings which [would] have the proportions of St Peter's and the Colosseum."

In Fascism, nationalism is the center motive force. The appeal to nationalism in the Third Rome lay in recalling past glories by using not only ancient Roman forms but even ancient Roman methods of construction. As a result, prior to their rehabilitation for the Olympics, the half-built and half-dilapidated structures of the EUR were ironically reminiscent of authentic Roman

* Douglas Haskell, "Tomorrow and the World's Fair," *Architectural Record*, LXXXVIII (Aug 1940) p 65-72.

Ruins. The siting of this project was loosely termed from Rome to the sea. The new Appian Way, extending from Rome to the fair, was called Via Imperiale by the Italians and "Highway Ad Absurdum" in a *New York Times* editorial, in which the editor said "Signor Mussolini's road, as Mr Robert Moses and also the parkway authorities of Westchester County, Connecticut, and New Jersey will be interested to learn, will be 109 yards wide. Democracy, he says, has never produced anything quite like that."

As presented, the fairs are divided vertically into a pair of national and a pair of multinational expositions. Since each is not only a reflection of its particular origin but also of ideological commitments, it can also be divided horizontally into projects of open and closed societies or, in other words, a juxtaposition of representative democracy and totalitarianism.

How, and to what degree, has individual freedom, or the lack of it, influenced these designs? Fairs in an open society generally favor informal and asymmetrical planning and more organic or picturesque layouts. Recent examples of such informality have been the parklike setting at Brussels in 1958 and the asymmetrical plan for Seattle's Century 21 Exhibition in 1962, as well as the given examples of the landscape layout in London and the developed plan for the 1939 New York World's Fair. The closed society prefers monumental, clear axes, symmetry, extreme formalism—all elements that pile up to a great feeling of power. Rome, Moscow and recent fairs in Peking have all been inexorably symmetrical. Open societies are usually subject to fads and fashions. They generally employ light, experimental and ephemeral designs, which consequently are rarely monumental. New York's ultramodern curvilinear of 1939 and the folded panels and pleated roofs present both at the Festival of Britain and the American Exhibition in Moscow in 1959 represented the avant-garde of their day. The closed society tends to stress tradition, permanence, historical associations with past powerful governments (through eclectic styles) and strives for monumentality. The open societies have incorporated people, their participation and comfort, as an integral part of exhibition design. In closed societies, individuals tend to be made irrelevant, the state being all important. Hence, there is a predetermined plan or specific way of life and therefore a dictated and rigid way of exhibition. In open societies, entertainment is always present; we encounter the midway or its equivalent, featuring the timeless attractions of Ferris wheels, aquacades and a Sally Rand. The sell, if any, is the soft sell. The emphasis is on hedonistic appeal, and the concern is with consumer goods. In the

totalitarian society, entertainment is slight, and the whole project assumes an educational purpose. The tenor of the exhibition is dogmatic and didactic. It is the use of raw power to impress, the use of machines and the construction of monuments.

If the styles within both societies were identical and a common vocabulary of forms existed throughout the world as is the present tendency, the difference would exist in the handling of open spaces, of massing, distances, sizes, above all, of scale. (While the columns on the pompously traditional and absurdly monumental American Radiator Exhibit, an exceptional building at the New York World's Fair, were 25 feet high, the columns on the Hall of Forestry for the EUR are over 40 feet high.) In brief, these expositions we have cursorily examined are quasi-condensations of their societies, reflecting individual freedom and national character.

What, then, are these flamboyant, enormously expensive and apparently nonutilitarian projects, World's Fairs? A world exposition is an amalgam and condensation of all societies, expressing intangibles of global scope. Such fairs are analogous to large marketplaces where the booths and pavilions of industries, nations and philosophies stand in face-to-face competition. The adjective "world" gains force from the extent of representation.

A southern California public relations man once described a World's Fair as the place where architects go on a binge, and to a certain extent he is correct. When we consider past fairs and their often frantic gesticulations toward a "World of Tomorrow," we can see that they were only exhibiting already blossoming ideas and desires in their conceptions of the future. New designs of spaceports, of cities and of ways of life will come about in the actual designing of these projects, not in fantasies about them. Innovations in a World's Fair will take place in the technique of exhibition and in the uninhibited design of architectural forms and shapes for the various pavilions.

Although it is an overstatement to say that past World's Fairs have been inventories of our civilization at a particular point in history, they do have this potential if they can become as responsive to the cultural and noncompetitive realm as they already are to the economic and political realm. Perhaps, then, what is needed is a conscious expression of what was formerly an unconscious assessment of our time—its successes and failures, its conceits, its politics and its hopes—even then remarkably dramatized for all who care to see it. ■

AUTHOR'S NOTE: It must be emphasized that this discussion points up general tendencies to which there are known exceptions, and deals exclusively with recent exhibitions in the twentieth century in which competitive propaganda between nations and ideologies have stressed differences. Although the author believes that a brief can also be made for nineteenth century fairs, the arguments would be a great deal more lengthy and involved and are precluded by lack of space.

Industrialized Architecture

By HENRY J. COWAN

*Head of the Department of Architectural Science
University of Sydney, Australia*

Professor Cowan believes that the highly industrialized state of today's construction industry requires a new approach by the architect—and a new approach to architectural education

THE Industrial Revolution started almost two hundred years ago. Architecture had no place in it: the design of the early factory buildings was the work of engineers, and the new materials and methods were not used by architects to any appreciable extent before the middle of the nineteenth century (Fig 1, next page).

However, the scientific and technical advances of the last two centuries wrought far more important changes than the invention of new production methods and structural materials. The negative side is too well known to require mention. It is sometimes forgotten that before the eighteenth century few people could read, medical care was primitive and commerce limited to the exchange of a few handmade articles and some tropical produce. Without universal literacy and medical care, there would be no problems in the design of schools and hospitals. The greater part of the modern architect's practice would not exist without changes produced by industrialization.

New problems create new solutions; the first industrialized buildings were unconventional and an important British contribution to the birth of modern architecture. The Crystal Palace was the first of the new buildings which commanded general attention. Paxton's background as a designer of conservatories was important; but the industrial experience of Fox, Henderson & Co probably made a bigger contribution to the design, which was modular, based on three standardized truss lengths and on prefabrication of the entire structure. Even erection procedures were mechanized.¹

Compared with the style then prevalent, this building appears remote from the architectural spirit of its age. It was not designed by an architect, and for another half-century most architects could see no esthetic merit in the new technology, although they gradually used it for structural support hidden behind a facade.

The Bauhaus and Architectural Problems of 1960s

The resistance of the architectural orthodoxy to the inevitable changes was unfortunate, because it led to a revolution of architectural thinking instead of a gradual absorption of scientific ideas. The revolution of yesterday has now become the new orthodoxy, and many of our difficulties stem from the fact that the problems of today are no longer those of the Bauhaus. The impact of industrialization on architectural practice was uppermost in the minds of the pioneers of the early years of this century. The new age was dominated by the machine, and the new architect was conceived as a creative artist, who understood machine-made materials and the potentialities of mass production. It was not a basic part of this concept that the architect should be equally at home designing stainless steel spoons and stainless steel curtain walls; but this aspect has often been strongly emphasized.

The ideas of the 1920's no longer suffice in the 1960's. Buildings conceived merely in terms of structure and finishes, combining surfaces to divide and envelop space, do not satisfy even in their material aspects the requirements of our time. Technology has reached the stage where buildings no longer fall down, but they are often exceedingly uncomfortable and inconvenient. These aspects, in particular, urgently demand the attention of architects if they wish to remain the leaders of the design team.

In recent years, there has been extensive discussion in America, England and Australia on the future of the architectural profession. Should the architect consider himself primarily as a designer of buildings, or primarily as a creative artist; in other words, should he modify his interests and

¹ "The Turning Point of Building—Structure and Design," Konrad Wachsmann. Reinhold, New York, 1961

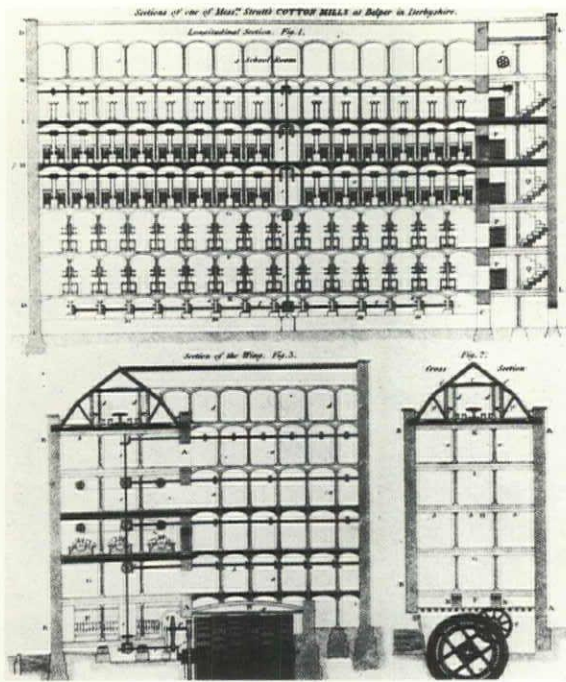


Fig 1—Sections of Belper North Mill, designed by William Strutt, 1803. From "William Strutt's Cotton Mills," 1793-1812, by H. R. Johnson and A. W. Skempton. *Transactions of the Newcomen Society, Vol XXX (1956)*

experience to encompass all aspects which enter into the preliminary design of successful industrialized buildings, or should he be prepared to relinquish the design of industrialized buildings if clients come to prefer professional advisers with a more scientific approach? The latter alternative would presumably lead to the emergence of a new professional group, because such persons are not trained at present by schools of architecture or engineering, nor do the architectural or engineering associations encourage them by their current membership qualifications.

The RIBA report on "The Architect and his Office"² and the preliminary report of the Special Committee on Education to the AIA³ both favor the first approach. On a recent tour of America and Europe, it was evident that most of the younger architects and architectural students did not wish to see the contraction of architectural practice which would result from the emergence of a scientific designer of buildings outside the architectural profession, and would prefer to learn a new approach to design. The engineering associations generally regarded the problem as concerning too few of their members; however, many consulting engineers expressed the opinion that the industrial client would be served better by a suitably trained engineer, retaining where necessary an architect in a consulting capacity.

² A survey of organization, staffing, quality of service and productivity presented to the Council of the RIBA, February 1962.

³ A study to isolate and identify the relationships required of the design process for man's environment, and to correlate its conclusions with the educational process.

One of the difficulties lies in the complexity of the technical design problem, which crosses the boundaries within the engineering professions.

Structure has been a prime preoccupation of architects and of connoisseurs of architecture throughout the ages, and many clients, or their architects, have been unable to resist the temptation to span a little bigger than the Joneses, because it was a difficult thing to do.

Since the completion of the CNIT Exhibition Hall in Paris with a span of 720 feet, we have reached a reasonable limit. Its span is more than five times that of St Peter's in Rome, and its unit weight less than a twentieth. This building is a brilliant engineering achievement, but so huge that it is impossible to get a satisfactory view of the exterior except from the air. A larger structure would cover an urban area rather than a building, and would thus be the legitimate interest of the town planner rather than the architect!

Complex structural shapes also no longer present insurmountable problems, and the structure of the future building may be distinguished by the elegantly restrained use of the appropriate system, rather than by the flamboyance of some of the early modern buildings.

It seems likely that perfection of the environment will replace structural ingenuity as the primary technical interest of the avant-garde architects, because in this field we need dramatic developments. The mechanical and electrical services commonly absorb more than a third of the cost of multistory buildings at the present time, or three times as much as the structure. This is largely because few architects consider the problem seriously at the initial design stage, and the consulting engineer has no alternative but to remedy the deficiencies of the architectural concept with excessive hardware.

Glass walls show up the lightness of the structure, but they seriously complicate the creation of satisfactory lighting and thermal conditions, particularly in Australia.

Great height dramatically demonstrates the structural potential of the skeleton, but the better utilization of the land does not compensate for the greater vertical transportation cost beyond a certain height.

These contradictions between structural virtuosity and the creation of a perfect environment are now generally recognized; however, there are still only a few architects and engineers capable of exercising proper environmental control over the design of buildings. The use of massive airconditioning plants to correct an ill-conceived environment does not differ in principle from the use of a masonry facade to hide an unnecessarily ugly concrete structure.

The Concept of Progress in Architecture

The design of the mid-century building is therefore vastly more complex than that of fifty years ago, and its architect must absorb a wider knowledge of science. His basic values also may have to be reviewed in the light of a changing clientele. The traditional architectural philosophy is stated by Gio Ponti in "In Praise of Architecture":⁴

"Engineering is eclectic; architecture is not. Engineering accepts, experiments with and incorporates, naturally and legitimately, the best available solutions offered by technology and industry, whereby it discharges its whole duty. Engineering creates technical works which are repeatable, multipliable and surpassable. Its works continuously outdo their predecessors. Architecture, being art, is not progressive and tends to create only perpetual unities, expressions which stand by themselves, irrepeatable. It creates works of art that cannot be surpassed, because its expression is an end in itself and therefore perpetual. It is ridiculous to think of progress in music, painting and poetry. . . . There is a history of painting or music or poetry, but there is no progress in painting, music and poetry."

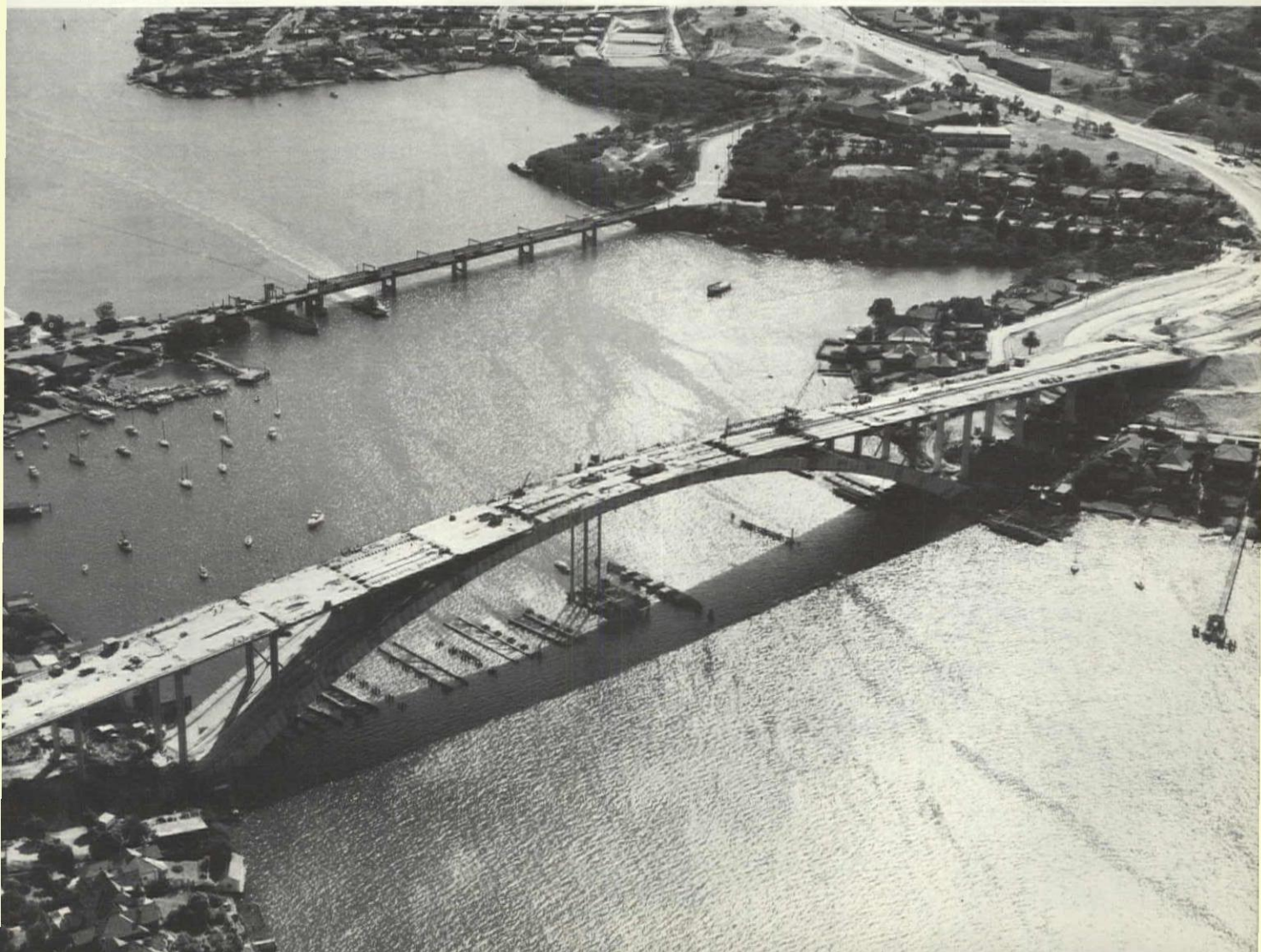
The client who wishes to build a factory or an office building is entitled to ask for progress. He must have a building conceived in accordance with the latest engineering concepts to be competitive. He will almost certainly demolish it when it no longer fulfills its purpose. If he has to choose between commodity and delight, he must choose commodity. However, it is difficult to see why he should be confronted with such a choice.

We have long accepted that good design is not necessarily the result of emotional experience. The beauty of a bridge must emerge from its structural concept, and superimposed decoration cannot turn a bad design into a good one. Bridge designers have not, as a rule, any artistic training (Fig 2).

Architects are usually quick to point out that buildings are different because they accommodate people. However, in the majority of buildings the human problems are basically rational. The layout of a factory is largely determined by the production process, and the human reaction to environment is essentially a matter for physiological study. It is doubtful if the creative artist could do much to improve on the work of a good scientist,

⁴ Translated by Giuseppina and Mario Salvadori. F. W. Dodge, New York, 1960, p 45

Fig 2—Gladesville Bridge over the Parramatta River in Sydney, now under construction. With a clear span of 1000 feet, this is the largest concrete bridge in the world; with a contract price of £A2,560,000, it is also economical



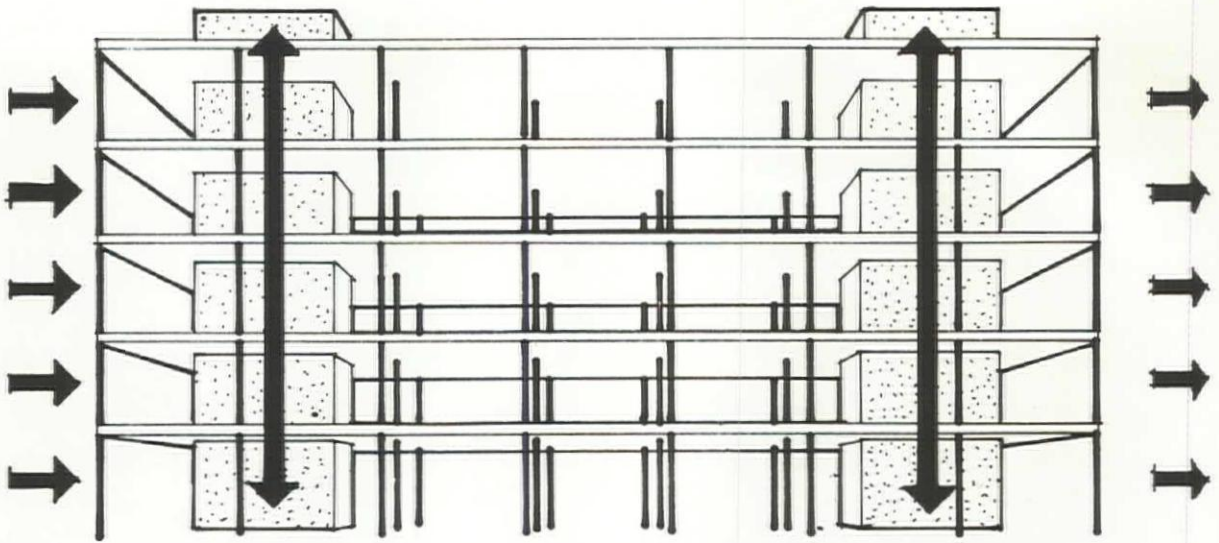


Fig 3—The lift shafts and other vertical services should be utilized in tall buildings for transverse rigidity

including in this term the social as well as the physical scientist, in regard to the basic design of most industrial and commercial buildings.

Esthetic and Modular Considerations

The division of persons with intellectual interests into artists and scientists is much too simple. British and Australian universities are largely to blame for the "two cultures" because of their rigid faculty divisions. American universities are more relaxed in this regard.

The possibility of integrating modern technology and artistic design is demonstrated by the structural work of many post-war designers, both architects and engineers.

The use of structure as part of creative design requires a combination of the approach traditionally adopted by the structural engineer, viz, the logical development of a mathematical theory from experimental data, without regard to historical sequence and authorship, with that of the architect who primarily studies the work of great masters—even though in the last two decades the examples have been contemporary or recent rather than classical.

Structural mechanics imposes on the industrialized building the same discipline which the classical rules of proportion exercised in the Renaissance. Structural simplicity and economy in the use of material take the place of the Golden Rule. Mies van der Rohe is credited with the dictum, "Make it as simple as possible, however much it costs," and economy in the use of structural material may not save money. However, when so-called "simplicity" increases the cost, the result is liable to be precious.

Once we accept structure as part of the visual concept, the proportions of the elevation are largely imposed by it. The basic structural deci-

sions must be made by the designer of the building, whether he be architect or engineer. The choice of the column grid is particularly important because it determines the planning of the building and the design of the cladding.

In a curtain wall with a wide structural grid, the column spacing is the same outside and inside, and some of the window mullions are lighter in appearance because they are not main structural members. With a narrow structural grid, the column spacing on the outside wall may be three times as close as in the interior of the building, which results in much smaller columns on the elevation.

At this stage it is usually necessary to consider the location of the vertical services, which should logically be utilized in tall buildings for transverse rigidity (Fig 3).

The interrelation between the appearance of the building, the planning of its accommodation, the structural grid and the services layout must be accepted in the modern high-rise building, and in time discriminating clients will detect errors of judgment as surely as in the days when the rules of classical architecture were understood.

A common faux pas is made at the first floor, where the span is often increased for the sake of more open planning at ground-floor level. If the span is greater than in the upper floors, the size of the spandrels must be increased. Architects sometimes overlook this fact in the design of the elevation, or they may consciously make the first-floor spandrel the same size as the others for the sake of uniformity. The structural engineer can solve this problem at a small extra cost; but even a layman with a sense for structure will detect an appearance of weakness, which is removed by correct expression of the structural depth (Fig 4).

The effect of the services on the esthetics of buildings has been explored much less than that

of the structure. Many architects find the subject tedious. Mechanical and electrical consultants are relative newcomers to the building industry, whereas the structural engineers have cooperated with the architects for almost a century.

It is often overlooked that the building itself performs an important role in the creation of a suitable environment. Insulation against heat and sound is properly a function of the fabric of the building. It cannot always be added later. In London or New York, mechanical consultants will usually detect serious errors in the architect's initial design and correct them by additional equipment. The architect's failure is more easily noticed in Sydney, where many buildings have neither heating nor airconditioning; consequently the advice of a mechanical engineer may not be sought. There are several buildings with originally well-conceived facades which have been ruined because sun louvers had to be superimposed, after the client found some of the accommodation unoccupiable in hot weather (Fig 5).

A Comprehensive Design Concept

It is therefore evident that the design of the modern building requires consideration of a number of matters which have hitherto been included in the realm of engineering and physical science. I submit that the designer should concentrate on the basic concept and leave the details to specialist consultants. The more he can leave to others, the more attention he can devote to design criteria.

The detailed structural design is normally left to a structural engineer, to the satisfaction of both parties. Many architects are less happy with the advice given by mechanical and electrical consultants. However, this can be remedied by education, eg, a suitable postgraduate course to acquaint engineering consultants with the architects' problems.

I doubt that it is possible to educate an architect, or that an architect could educate himself by experience, to master all the problems of the design of industrialized buildings. We are therefore moving toward a considerable measure of specialization. The architect of the industrialized building must choose between personally designing the cutlery for the directors' dining room and personally designing the basic structural and environmental concepts of the building.

Designer of Mass-Produced Components

The detailed design of the building components is as important an activity as the work of the structural consultant, or the architect who originated the design. The industrialization of the building process implies the use of factory-produced components on a much wider scale than for an individual building. The design of the building then be-

comes an assembly of modular mass-produced floor, wall and roof units.

This is the only basis on which the present high labor content of buildings can be reduced, and it should be remembered that much labor is employed on the drawing board if every building is individually detailed with components which are purposely made.

The manufacture of building components capable of multiple use requires designers of the highest quality. The design of curtain walls in particular, whether they be of metal or concrete, needs both technical knowledge and artistic experience. If architects wish to retain control of the production process within their profession, they must become the chief designers or managing directors of the manufacturing organizations. In the engineering industry, a close professional link between

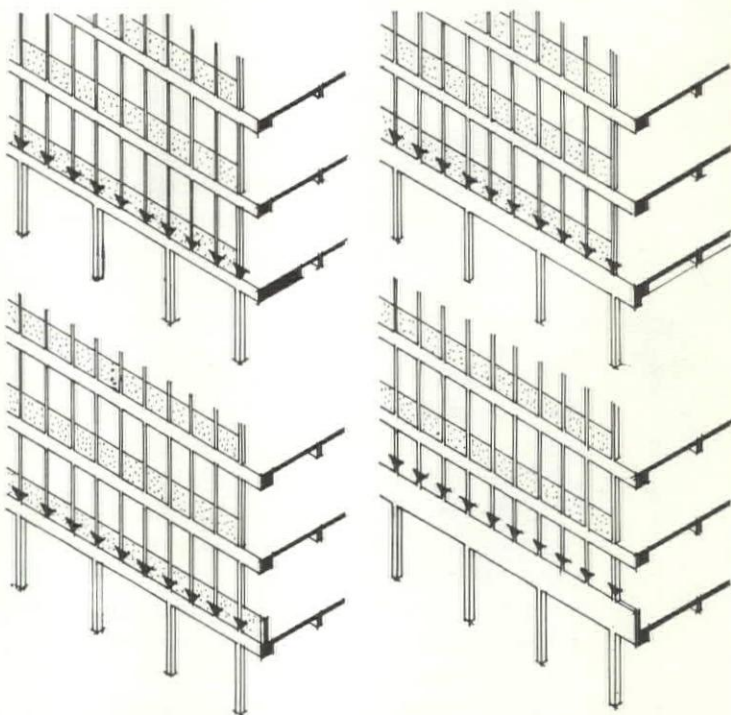


Fig 4—If the column spacing at first-floor level is greater than the upper-floor grid, a bigger spandrel is needed. This can be hidden by using greater width, or an upstand beam behind the curtain wall. However, the effect is distracting, and it is better to indicate the bigger structural member on the elevation.

those engaged in consulting and manufacturing is regarded as normal practice.

We might then hope to solve the elusive problem of the prefabricated house. The private home is far too dear in relation to other commodities, and its real cost cannot fall so long as it is built entirely on the site from small units. While it retains a high labor content, its price rises with the basic wage.

Patent specifications for prefabricated houses go back over a hundred years,⁵ and the methods of the automobile industry have from time to time

been employed, as for example in the manufacture of precast concrete panels on a conveyor belt in a factory of the Victorian Housing Commission.

If architects accepted responsibility for the manufacture of prefabricated houses and worked inside the industry, instead of merely acting in a consulting capacity, we might produce prefabricated houses which are esthetically satisfying and not merely technically adequate.

Specialization of Architectural Education

It seems, therefore, that the architect must specialize if he is to remain a master builder and not merely an artist hovering on the edge of a building industry which is becoming increasingly industrialized.

We need architects with a much sounder technical training for the design of industrialized buildings and the design of factory-produced building components. In addition, many large design offices require partners or senior assistants who have made a special study of structure, lighting, acoustics, etc.

I do not subscribe to the view expressed in the earlier cited AIA report that architects should specialize in structural design and in the design of building services to the extent of being able to dispense with consulting engineers, and thus operate as architect-engineers over the entire field of building design. It has been suggested that this could be achieved by specialization in the higher years of the ordinary architecture course.

However, the proponents of all these schemes are too sanguine about the possibility of training technical specialists in architectural science without a firm basis of mathematics and physics. The gap between the amount of time at present devoted to these subjects in architecture and engineering curricula is practically insurmountable. It would perhaps be possible to train architects, possibly at the risk of seriously weakening their education in planning and visual design, to perform the routine calculations which are at the *present* time required for the design calculations of structures and equipment. However, if these graduates as architects took over the consulting services normally provided by engineers, they would eliminate the specialists with an adequate fundamental training who alone could introduce new ideas and initiate new theories in the technical field. I therefore visualize that the consulting engineer will remain as adviser to the technically trained architect.

Whether he should work in the same office as the architect is a matter of opinion. There is a danger in an architect-engineer partnership that the engineer will never become the senior partner,



so that only a second-rate man is attracted; this is even more likely when the engineer is an employee. The architect requires a first-class consultant, not a competent yes-man, and he will get him more readily in an independent office.

Science, Like Art, Must Be Experienced

The changing problems of architecture are reflected in the gradual reform of education for the profession. The early years of most architecture courses now include a reasonable amount of mathematics and physics. These are studies which, like the training in art and drawing, cannot be introduced into the later years long after the student has left school.

In recent years we have gained much experience in teaching structure as physical concept which can be explained by means of a model (Fig 6).

Although most experienced teachers are now agreed that the mathematical treatment of structures appropriate in an engineering course is unsuitable for architecture students, mathematics should not be treated as a necessary evil. It is an important intellectual discipline, and no branch of architectural science can be discussed without it. The level of mathematics may be much lower than in engineering, but this level must be maintained.

Most architecture schools give good, if sometime excessively detailed, courses in elementary structural design, although integration with studio work is often lacking. Many stop when structures get complicated. This is a mistake, because the architect cannot get far in his professional career without meeting such structures (Fig 7).

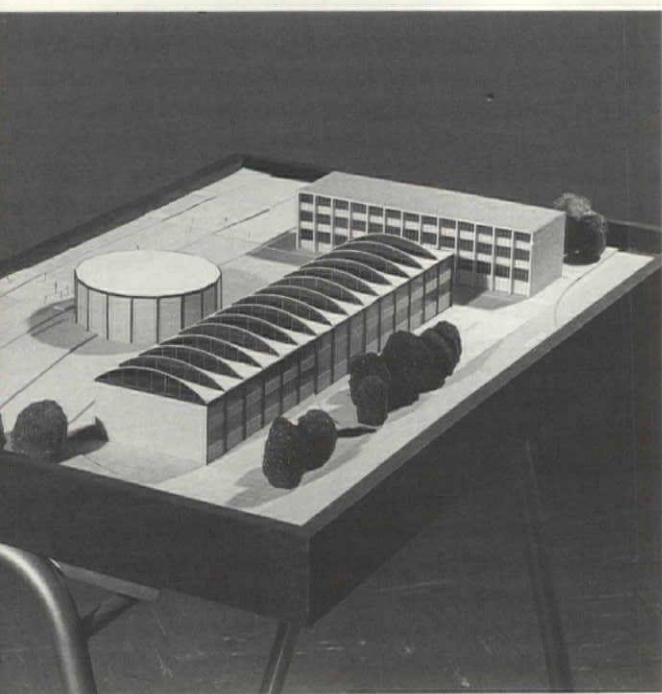
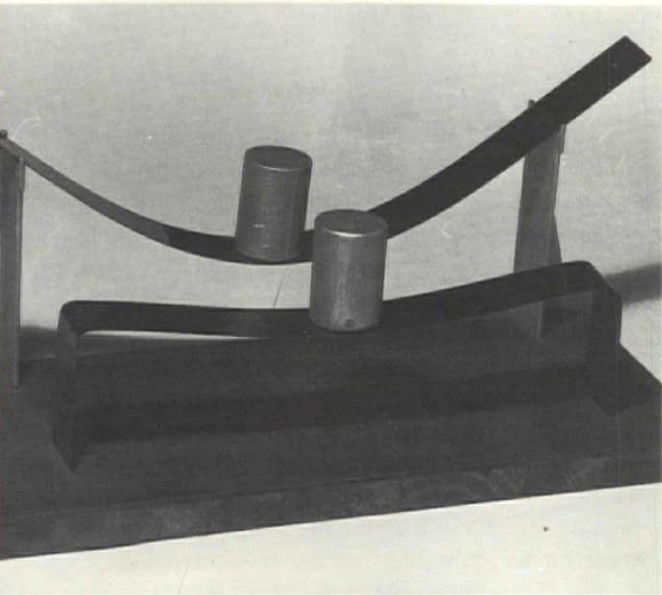
It may not be possible to go into details, which in any case are not required by the architect; but the principles can be explained in scientific terms within the framework of an architectural course. We should encourage students to undertake simple

⁵ "The Contemporary Curtain Wall," Wm. Dudley Hunt Jr. F. W. Dodge, New York, 1958

Fig 5 (left)—Chemistry School, University of Sydney, designed by the NSW Government Architect, 1958. The architect originally included integral sun louvers in his design, which were deleted as a cost-saving measure. These now used were installed several months after completion when the temperature in some rooms rose above 100 degrees F; they completely altered the appearance of the building's elevation

Fig 6 (below, top)—Simply supported beam and rigid frame, made of the same material, carrying identical loads over equal spans. This model is used by lecturers in the University of Sydney for demonstration purposes. More complex models are employed by the students themselves

Fig 7 (bottom)—Investigation of the structure and the lighting of a conoid roof for a factory, undertaken in the University of Sydney for the master's degree



model analyses of their structure as part of their final thesis design.

Some schools have good courses on materials, but few deal adequately with environmental design. The teaching of building services is often no more than a description of the available equipment. This is not important to the architect, because its selection is the responsibility of the consulting mechanical engineer. These applications of architectural physics are as essential to modern architecture as the structural teaching, and they should be adequately presented in the early years of the course.

We should attach particular importance to the integration of structural and environmental studies in the senior years and at postgraduate level, and encourage it at every opportunity.

The Importance of Post-Graduate Study

A more scientific undergraduate course with specialization in the senior years will not solve all the problems presented by industrialized building. The cream of the graduating class should be encouraged, preferably after a few years of practical experience, to undertake formal postgraduate study.

At this stage, the cross-fertilization of the various professions engaged in the design of buildings is of the greatest help to all. This concept has already proved its worth in many town-planning courses, and it is embodied in the bylaws for the new degree of Master of Building Science of the University of Sydney.

It may be appropriate to conclude with a few words on research, which is needed both for the sake of the results obtained and as a means of training personnel in research methods. The architectural profession would obtain greater help from building research organizations if there were more architects working within them, and design offices would have a better appreciation of the potentialities of research and the utilization of existing knowledge if they had on their staff architects with the necessary experience.

So far all our architectural research students have, in fact, become designers. We now encourage students to work three years full-time for the doctorate, because we find that original contributions need more time than the master's degree requires. However, the lack of prestige of the PhD in Architecture at present discourages many of our best graduates. The architectural profession could help by making graduates with higher degrees welcome and offering better opportunities for promotion.

The leadership of the building industry will ultimately rest with those who create the new knowledge which it needs to adapt itself to the problems of industrialization. ■

Museum Lighting

A LETTER FROM WALTER GROPIUS FAIA

In the January issue of the AIA JOURNAL there appeared an article entitled "Natural Light and the Museum of the Future," by Dr Wilcomb E. Washburn, of the Smithsonian Institution. It elicited a letter from Dr Walter Gropius, expressing interest and stating that some years ago he gave a lecture before the Museum Directors Association of New England in which he particularly went into the problem of daylight vs artificial light for museum spaces. The following excerpt from this lecture should be of interest to those who read Dr Washburn's article

. . . So much about scale and flexibility of spaces. The further problem to decide on proper lighting will give the museum program committee even greater headaches. Should they use windows or the various forms of skylights, or should they do away altogether with natural light and aim at the windowless museum, artificially illuminated only? Or should they insist on a combination of all these potential methods of illumination?

Last year (1945) a "Report of the Committee on Art Gallery Lighting" of the Illuminating Engineering Society was published. It is an important piece of up-to-date scientific advice, trying to bring order into the many lighting problems a museum is faced with. It will be a helpful guide for designers of museums as well as for their directors responsible for the display. In one basic point, however, I would like to challenge the conclusions of this report. I quote the Committee: "Today any interior gallery can be artificially lighted to better effect than is possible by daylight; and, in addition, it can always reveal each item in its best aspect, which is only a *fleeting occurrence* under natural lighting. . . ." A *fleeting occurrence*! Here, I believe, is the hitch: for the best available artificial light trying to bring out all the advantages of an exhibit is, nevertheless, *static*. It does not change; natural light, however, is dynamic, it is alive as it changes continuously. The *fleeting occurrence* caused by the change of light is just what we need. For instance, one of the secrets of good architecture is to make use of light and shadow by letting parts of the building protrude or recede and create a relief effect of shadows which move with the sun. The motion of sunlight and of shadows keeps architecture alive.

I remember a vivid experience I once had in

the Pergamon Museum in Berlin. To me the light on the temple walls coming from skylights seemed to be confusing and tiresome. But one night I happened to pass by when a photographer with a large spotlight wandered by to find a position for a shot. I was electrified by the effect of the moving light. The reliefs came to life all of a sudden, and I discovered a new beauty of the sculptures which I had never observed before.

Then remember, please, the wondrous surprise when in a cathedral, a sunbeam, coming from a window, slowly wandering through the twilight of the nave, suddenly hits the altar-piece. What an elation for the beholder in spite of his experiencing only a "fleeting occurrence." Isn't this just the kind of deep impression we should like to offer to our visitor?

Two factors then seem to be of importance for effective lighting. First, *changeability of light* on an exhibit regarding its direction, its intensity and its color would appeal to our natural functions of adaptation and would relieve the deadening effect of any ever-so-perfect but *static* light.

Second, if the general light in an exhibition space is kept very dim, and strong light is concentrated on the exhibits only, avoiding direct glare, the visitor's mind—free from distraction—will be receptive and concentrated.

Science and industry are not yet advanced enough to fulfill these lighting requirements, particularly that of motion. But one day we may have at our disposal moving man-made sunlight to be used at will, varying in quantity and quality. As long as artificial light, however, cannot yet fully comply with our requirements, I believe that we have to seek an appropriate combination of artificial and natural light. ■

LIBRARY NOTES

Gifts to the Library, 1964

AMERICAN ACADEMY OF ARTS AND LETTERS
Its "Proceedings"

AMERICAN BATTLE MONUMENTS COMMISSION
Its "Honolulu Memorial"

LEOPOLD ARNAUD FAIA
Five pamphlets and magazines

J. SANGER ATTWILL
Roll of old drawings

HARRY HOWE BENTLEY
Four books

MRS UHLER BRIGGS
Medal and other mementoes of Glenn Brown, Secretary and Treasurer, AIA, 1898-1913

BUND DEUTSCHER BAUMEISTER
Its "Frankfurt Baut"

JOHN H. BUVENS
Twenty-seven magazines

CALIFORNIA, STATE DEPT OF PARKS AND RECREATION
Its "Old Sacramento Inventory of Historical Buildings"

GERSHON CANAAN AIA
His "Rebuilding the Land of Israel"

CATHOLIC UNIVERSITY OF AMERICA, DEPT OF ARCHITECTURE
Its "Alexandria Waterfront"

WILLIAM W. CAUDILL FAIA
His "Investigations"

CLEVELAND DEVELOPMENT FOUNDATION
Its "Open Space in Urban Design"

COLONIAL WILLIAMSBURG
Its president's report

COLUMBIA UNIVERSITY, SCHOOL OF ARCHITECTURE
Its "Four Great Makers of Modern Architecture"

CORNELL UNIVERSITY, SCHOOL OF HOTEL ADMINISTRATION
Its bibliography on hotel administration 1963

MISS MARGARET DAVIS
Her article on "Public Architecture in the Classical Tradition"

MRS ROBERT W. DAVIS
Nine magazines

THEODORE DOMINICK AIA
A magazine

EDUCATIONAL FACILITIES LABORATORIES, INC
Various publications

FAR EAST SOCIETY OF ARCHITECTS AND ENGINEERS
Its "FESAE Handbook"

PHIL H. FEDDERSEN AIA
Several of his brochures

FEDERAL RESERVE SYSTEM BOARD OF GOVERNORS
One volume

CARL FEISS FAIA
Pamphlets on planning in Israel

E. J. GAMBARO FAIA
Three books, and records on AIA Centennial observance

GENERAL SERVICES ADMINISTRATION, PUBLIC BUILDINGS SERVICE
Three issues of "Historical Study"

HARMON H. GOLDSTONE AIA
His "Lafayette A. Goldstone"

ANDRÉ GUTTON, HON FAIA
His "L'Urbanisme du Service de l'Homme"

MURRY HARRIS AIA
A cash gift

ARTHUR C. HOLDEN FAIA
Photostat copy of letter from Louis Sullivan to Walt Whitman

HOUSING AND HOME FINANCE AGENCY LIBRARY
Four magazines

BERTIL HULTEN
One volume

WILLIAM DUDLEY HUNT JR, AIA
Five volumes of his works

HUGH JOHNSON AIA
Album of photographs of Octagon House and headquarters site

WALK C. JONES JR, FAIA
Volumes in memory of Mrs Charles Cellarius and Edmund R. Purves FAIA

MRS HUGH LATIMER
Four magazines

MARTIN LOWENFISH AIA
Thirty-three slides

A. STANLEY MCGAUGHAN AIA
Three magazines

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, SCHOOL OF ARCHITECTURE AND PLANNING
Its "Signs in the City"

MIT PRESS
Its "Appearances 1929-1964 John Burchard"

ROGER C. MELLEME AIA
Two volumes on hospitals

EDWARD MOK AIA
His "New Towns in Europe"

MOUNT VERNON LADIES' ASSOCIATION
Its annual report

NATIONAL INSTITUTE FOR ARCHITECTURAL EDUCATION
Its "Yearbook"

NATIONAL PARK SERVICE
Two pamphlets

NEW YORK STATE COUNCIL OF THE ARTS
Its "Architecture Worth Saving in Onondaga County"

NEW YORK STATE DEPARTMENT OF COMMERCE
One pamphlet

MR AND MRS JOHN OSMAN
Volume in memory of Walk C.

Jones Sr, and two other volumes

JAMES C PALMES
Photocopy of letter pertaining to American Institution of Architects

RICHARD W. E. PERRIN FAIA
Four magazines with his articles

PHILADELPHIA HISTORICAL COMMISSION
Pamphlet on Philadelphia

PITTSBURGH, DEPT OF CITY PLANNING
Its subdivision regulations

PRODUCERS' COUNCIL
One volume

PROGRESSIVE ARCHITECTURE
Two volumes

MRS EDMUND R. PURVES through RICHARD H. HOWLAND
Photocopy of paper on "The Old Houses of Orford Ridge"

ROTCH TRAVELING SCHOLARSHIP
Its history, 1883-1963

MAURICE R. ROBINSON
Memorial volume on F. Bigger

SOIEDAD COLOMBIANA DE ARQUITECTOS
Book on Colombian architecture

SOUTHERN PINE ASSOCIATION
Two of its publications

PAUL SPREIREGEN AIA
One volume

SUFFOLK CO, NY, DEPT OF PLANNING
Its "Planning for Open Space in Suffolk County"

SUPER MARKET INSTITUTE, INC
Two of its publications

WALTER A. TAYLOR FAIA
By bequest thirty-three volumes

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US DEPT OF AGRICULTURE, AGRICULTURAL RESEARCH SERVICE
Its "Housing for the Elderly"

UNIVERSIDAD DE MADRID, ESCUELA DE LA ARQUITECTURA
"España, Pueblos y Paisajes" by José Ortiz Eschagüe

UPPER MIDWEST ECONOMIC STUDY
Its Urban Report No 4

VICTOR VILA
Various items on Mario Pani

WOLF VON ECKARDT, HON AIA
Fourteen volumes

WILLIAM J. WAGNER AIA
His "Sketches of Iowa Landmarks" 1964

RALPH WALKER
"The Decadent," by Ralph Adams Cram

JOSEPH WATTERSON FAIA
A Bible

ARCH R. WINTER AIA
His "The Vidalia Plan"

LEO S. WOU AIA
His "Master Plan for Downtown Honolulu"

TOSHIROW YAMASHITA
Publications on Japanese contract documents

Planning and Urban Design

EDITOR'S NOTE: During the past two or three years we have received so many planning reports, urban renewal studies, brochures on preservation, urban esthetics and street furniture, and many other such interesting items, that we felt our readers should be told about them. With more and more architects undertaking planning and urban design, there is a very great need for a greater dissemination of this kind of information.

We list four or five dozen of these booklets and brochures below. We are sorry that time forbids studying them all as carefully as they obviously deserve, so we cannot really review or evaluate them—but here they are; if they interest you, send for them. We have tried to include only those published within the past couple of years, so they should still be available. We have included also all the information we have as to price and where they may be obtained—but sometimes it was scanty. *Please* don't write the AIA JOURNAL and ask for them. We're just *telling* you about them! (An asterisk means, of course, "of particular interest.") J.W.

PLANNING IN GENERAL

* **Proceedings of the 1964 Annual Conference, American Institute of Planners.** Just received, this 300-page paperbound book contains about fifty papers read at the last AIP annual conference. Among the many distinguished speakers are many names well-known to architects, such as Grady Clay (who was not a speaker, but who reported the conference in his newspaper; the report is included), Leon Keyserling, William L. Slayton (two papers), Robert B. Mitchell, Richard L. Steiner, Albert Mayer FAIA, Dieter Hammerschlag, Morton Hoppenfeld, William F. R. Ballard AIA, Vincent G. Kling FAIA, William E. Finley, Justin Herman, Henry Fagin, Stanley B. Tankel and Samuel Ratensky. Copies may be

ordered for \$4 postpaid from the AIP at 917 15th St NW, Washington, DC 20005.

Land for New Towns. The Intelligent Voter's Guide to Town and Country Planning. Town & Country Planning Association, Planning Centre, 28 King St, Covent Garden, London WC2. The first of these booklets, written by Robin H. Best, is a study of the land densities in Britain's new towns, comparing them with the older cities. Dr Best comes up with the conclusion that new town densities are too high and unsuitable to the needs of new town families. Price: 7s 6d, plus postage. The other book is a series of statements and policies on planning aims, the development of land, new towns and regional expansion, urban renewal, traffic and transportation, and green belts and parks. For each set of policies, there are statements from prominent men in both the Liberal and Conservative parties. It's available for 2s 6d, plus postage.

Land Development Control in Hillside & Mountain Areas. Planning Study of a Hillside Subdivision. Two booklets prepared by the Urban Design Committee of the Southern California Chapter AIA, 1964. The development of hillsides presents special problems which, if not properly studied and controlled, can result in such scarred and terraced slopes as one sees around Los Angeles today—the natural form of the hill destroyed forever, and the slope mutilated and subject to erosion. These two little booklets contain the result of a year's study and definite recommendations for procedures which will maintain the hills in their natural and wooded form, preserve many acres for recreation and green space, and still give a higher density of settlement. Copies are said to be scarce, but you might try writing to the Chapter office at 3723 Wilshire Blvd, Suite 9, Los Angeles 5.

Urban Aesthetics—Theory and Application of Physical Design Control Within the Urban Renewal Program. Kent Irvin Drew. Theses by graduate students are becoming sources of a great deal of researched information and sometimes surprising bits of reflective insight. This thesis, from the Department of Architecture at Kansas State University, may not be quite the handbook on urban esthetics its title suggests, but at the same time it is a good report on recent urban renewal competitions and a discussion of the design administration of urban renewal programs. The author carried on a correspondence with a large number of urban renewal officials and developers and architects who have engaged in such programs. Their discussions and comments are enlightening. Copies of the report may be obtained from the author for \$2.50, at Parkview Gardens, 14158 Dale, Detroit.

Designing Neighborhood Commons. James G. Stockard Jr. Washington Center for Metropolitan Studies, 1726 Pennsylvania Ave NW, Washington 20006. 1964 \$2. "Neighborhood commons" is a concept conceived by Karl Linn, Philadelphia landscape architect, and tried out by a group in Washington. The commons are small open spaces within a city meant to serve as recreational areas and meeting places. The concept includes the self-help principle, in that people build the commons themselves, on vacant or otherwise neglected plots in their area. Of the four started in Washington three years ago, none is finished—primarily because the self-help principle just doesn't seem to work. Their sponsors are now of the belief that such commons must be built by public agencies—but that they must remain commons, not parks.

This 87-page study was prepared by a former minister, turned city planner, and includes a thorough discussion of the pros and cons of the concept, with working drawings

and photographs of those which have been attempted. It is very much worth study, from the sociologist's point of view as well as the planner's.

Urban Planning—Development Series No 3. This is one of a monograph series issued by the Department of Urban Planning of the College of Architecture and Urban Planning at the University of Washington. This issue is devoted to three studies of Japan—of aspects of Japanese culture which bear direct relation to the environmental studies which we are making today in connection with planning work. "Movement in Japanese Environmental Representation" is by Philip Thiel, associate professor in the Department of Architecture; "An Architectural Report on the Nanzen-Ji, a Buddhist Temple in Kyoto" is by Victor Steinbrueck FAIA, professor and acting chairman of the Department of Architecture; and "The Physical Structure of Preindustrial Edo" is by Thomas J. Norton, assistant professor in the Department of Urban Planning. The book is illustrated by delightful pen-and-ink sketches, plans and maps. Copies may be obtained for \$3.75 from the University of Washington Press, Seattle 98105.

Regulation of Outdoor Advertising Along the Interstate System, by Louis C. Wagner and Virgil E. Harder. **Criteria for the Establishment of Additional Scenic Areas**, by Myer R. Wolfe, Thomas J. Norton and Sidney Cohn. These two studies, in one volume, were originally published by the Joint Fact-Finding Committee on Highways, Streets and Bridges of the Washington State Legislature. When that printing was exhausted, the College of Business Administration of the University of Washington republished it because of the great demand for it. The titles of these studies are sufficiently descriptive of their contents—it will suffice to say here that they are thorough and authoritative, and although based upon Washington state, as well as Federal, law, they should be of value and use anywhere. Copies may be obtained for \$3 from B.A. Faculty Publications, 105 Mackenzie Hall, University of Washington, Seattle 5.

The Environment—Whose Responsibility? California Chapter, American Institute of Planners. In February 1964 the California Chapter AIP held its annual meeting in

Sacramento, with a blue-ribbon list of speakers starting off with Governor Edmund G. Brown and including Marion Clawson of Resources for the Future, Dr Robert Anderson, US Assistant Surgeon General, Jesse M. Unruh, Speaker of the California State Legislature and others from Federal, state and local governments.

The foreword says the purpose of the conference was to investigate governmental responsibility for the environment and its development. Participants were asked to relate their observations to six subject matter areas: natural resources, transportation, open space, economic development, environmental health and fiscal and tax policy. An almost comprehensive coverage of the area—almost, because, as this architect-reviewer sadly notes, there is no mention of esthetics, no room for the visual aspects of the environment, no time for the physical design of the environment.

Granted that one big empty spot in the program, this 160-page book, printed by offset from typewritten pages and containing twenty-four papers, should be of considerable value to those actively engaged in planning. Copies may be obtained for \$2 (plus 8¢ tax in California) from Conference Proceedings, 1111 43rd St, Sacramento 95819.

Our Urban Plant. Herman G. Berkman. University of Wisconsin Extension Division, Madison 53706 \$1. Six scholarly essays on urban affairs, clarifying and illuminating the tensions and conflicts as well as the rewards that face American cities. The author is a professor of planning at New York University. The essays include "The Megalopolis in the United States," "The Architect, Town Planning and the Urbanist" and "Training the Urbanist for the 60's." The book has 66 pages and is paperbound.

A Town Called Alcan. A series of "broadsheets" put out by Alcan Industries Limited, of England, for which Gordon Cullen and Richard Matthews ARIBA have planned a theoretical linear town named Alcan. When completed, the series will be made available in booklet form. Write Alcan Industries Limited, Banbury, Oxon, England.

Commonwealth and Community. This 58-page booklet is a report summarizing the methods and procedures used by a state government to provide technical guidance and leadership to local communities in

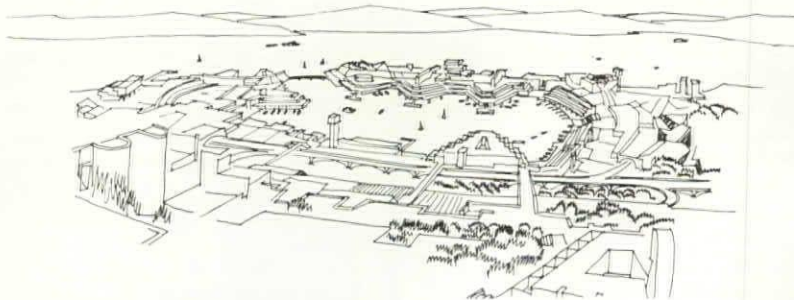
preparing and carrying out their own Workable Program for Community Improvement. It evaluates the ability of a state agency to supplement local efforts in the Workable Program elements: codes, planning, neighborhood analysis, administration, organization, finance, housing and citizen participation.

The material in the booklet is well organized, well put together and well illustrated. It should be very helpful in its field. Copies may be obtained by writing the Division of Planning, Department of Commerce, 319 Ann St, Frankfort, Ky 40601.

A Bank Looks at Community Development. This report spells out the techniques used by a large banking institution in evaluating community needs, resources and potential; formulating a community development program; and stimulating individuals and local groups to make decisions and take action to resolve community problems. The city of Wilkes-Barre, Pennsylvania, was selected for this demonstration study.

Effective community development programs, which improve the attractiveness of the community as a place in which to live and work, are an essential foundation for economic development programs. Private decisions to invest funds in new or improved residences and commercial or industrial establishments are significantly influenced by community appearance, livability and the services provided. The report describes the findings of a project made possible by a Demonstration Grant under the Federal Housing Act of 1954. Copies may be obtained from the Bureau of Community Development, Pennsylvania Department of Commerce, 402 South Office Building, Harrisburg.

World Design Science Decade 1965-1975. Phase I (1963) Inventory of World Resources, Human Trends and Needs. This report originated with the proposal made by R. Buckminster Fuller to the 1961 Congress of the UIA that the schools of architecture of the world begin a survey of the total resources now available to man on a global scale, so as to make them serve 100 per cent of humanity through competent design. This first beginning was made by a research team under Bucky Fuller's direction at Southern Illinois University, from which it can be obtained at Carbondale.



Break-through to the Hudson River: "One of the best works of its kind"

The Japanese National Railway System and Its New Tokaido Line. A Report of the Division of Railroad Transportation of the New Jersey State Highway Department. The similarity of the 430-mile coastal area lying between Boston and Washington to the 320-mile coastal area between Tokyo and Osaka (which supports 40 million people!), led to a UN-sponsored study of Japan's far-sighted railroad plan for high-speed service based upon new engineering principles in railroad design. This exceedingly interesting report was prepared by H. A. Thomas, the one state government (NJ) representative among the eleven delegates from the US who participated in this study week in Japan. Write the Bureau of Public Information, New Jersey State Highway Department, 1035 Parkway Ave, Trenton 25.

STATES AND REGIONS

*** The Vanishing Land**—Proposals for Open Space Preservation, Fairfax County, Virginia. By no means just another survey, this handsome 84-page brochure is almost militant in its approach to its job in hand—it says firmly that "The future will hold one of two things, a continuation of urban sprawl on the one hand, as opposed to the satellite-corridor plan recommended by the National Capital Regional Planning Council. Regardless of debate, one of these two must be followed." Since Fairfax County, across the Potomac from Washington, is one of the sprawlingest sections of the country, remaining open space is of the utmost importance. The chapters include: "Competition for Open Space," "How Much Open Space Is Needed?" "Financing the Open Space Program," "Legal and Fiscal Tools for Preserving Open Space" and "Metropolitan and County Action." This study should be a useful tool to all who are active in similar planning in any part of the country. Copies may be obtained for \$3 from

the Fairfax County Master Plan Office, County Courthouse, Fairfax, Va.

A Legacy for the Future—A Plan for Open Space in Greene-Montgomery Counties. The two counties surrounding Dayton, Ohio, set up an Open Space Study Committee to make a study and report on land in urban areas that is undeveloped and having potential use for parks, conservation, recreation, scenic or historic purposes. Of the 80,000 acres of still unused open space—or lightly used—it was the goal of the study to enlist every means to convert as much land as possible to permanent open space. So the survey not only surveys but sets up guidelines for action. Copies may be obtained for \$3 from the Committee at 16 N Ludlow, Dayton 45402.

*** Recreation-Vacation-Tourism in Northern Berkshire, Massachusetts.** This is a fat (158 pages) and thorough study of a 190 square-mile region in northwestern Massachusetts. Since the area lies wholly within the Berkshire mountains, and includes Mount Greylock, Williamstown and Williams College, the famed Mohawk trail, tens of thousands of acres of forested mountain land in both state and private ownership, and countless struggling rural communities—all of this immediately adjacent to thriving tourist and skiing resorts and summer culture colonies such as Tanglewood and the Berkshire Playhouse on the south and Bennington and Manchester, Vermont, on the north—it truly presents a potential for careful planning for an expanding future. This study considers its relationship and competition with other tourist areas, its skiing potential, its gorgeous autumn scenery, its miles of undeveloped scenic highways, its dilapidated villages and its lack of local industry—and makes suggestions and recommendations. It is an excellent study, prepared by Technical Planning As-

sociates, 37 Whitney Ave, New Haven, Conn 06510, and can be obtained from them for \$5 postpaid.

*** Break-through to the Hudson River**—A Plan for Yonkers to Peekskill. Prepared by a group of students in the School of Architecture at Columbia University, under the direction of Professors Percival Goodman FAIA and Alexander Kouzmanoff, this study of the possible reclamation for human use of the long-lost riverfront of the lower east shore of the Hudson is one of the best works of its kind and can serve as a model for other such studies the country over. It is particularly appropriate at this time, since the threat of the Consolidated Edison Co to deface Storm King Mountain, across the river, with a giant power generating plant. Copies may be obtained from the School of Architecture at Columbia, New York 27.

*** Plan for the Valleys.** The Valleys is a 70-square-mile area near Baltimore, containing great sweeping valleys, wooded ridges and plateaus and a pattern of farms, rural roads and woods, which has recently been made available for development—or exploitation—by the completion of new expressways. The citizens of the area, with the blessing of the county government, formed a planning council, which has assumed the responsibility for preparing a plan to ensure the preservation of the highest level of amenity with maximum development. This report contains an analysis of the landscape and its constituent natural processes, and proposals for the development of the area in such a manner as to preserve its best qualities. Write to the Green Spring and Worthington Valley Planning Council Inc, 212 Washington Ave, Towson, Md 21204.

The Northeastern New Jersey Regional Urban Renewal Survey—A Guide to Urban Renewal. The area concerned in this survey is that portion of New Jersey closest to New York City, lying in the very heart of Megalopolis. This big, handsome 80-page report on the survey provides a body of regional development data for the use of local public agencies engaged in formulating and designing renewal programs. It also demonstrates new methods and techniques for the elimination and prevention of slums and blight, and will serve as a guide for renewal programs in other communities. Copies may be ordered from the

Department of Conservation and Economic Development, Division of State and Regional Planning, PO Box 1978, Trenton, 08625.

The New Jersey Pinelands Region.

South central New Jersey is the state's one remaining "frontier." This is the first of two major reports on studies leading to the development of a master plan for the future development of this valuable area. It contains a tremendous amount of background data and information. The second report will contain detailed recommendations for desirable planning alternatives and suggestions for an action program. Copies may be obtained from the planning consultants, Herbert H. Smith Associates, 1241 Parkway Ave, West Trenton, NJ.

Tucker-Stone Mountain Area;

Tucker; Stone Mountain (all in DeKalb County, Georgia). These three brochures were prepared for the DeKalb County Planning Commission by the County Planning Department and Robert & Company Associates of Atlanta. Two small cities immediately adjoining a great tourist attraction have very special problems. These planning studies for the development of the entire area start very literally from the ground up: physiography, population and economy, land-use, highways and streets, sewer and water supply, visual survey and over-all design. Copies may be obtained from the Department of Planning, DeKalb County, Decatur, Ga.

Landscape Analysis of the Lake Superior South Shore Area. Prepared by the Recreation Division of the Wisconsin Department of Resource Development. The concepts offered in this report are novel yet practical, since they involve the preservation of corridors of land areas which can be identified as having multiple values of scenic beauty. The report shows how these values can be discovered, identified, mapped and used to prepare a broad plan of land preservation. Write to the Department of Resource Development at Madison.

*** Change — Challenge — Response, A Development Policy for New York State.** Prepared by the Office for Regional Development of New York State, this proposal for a sixty-year development policy is a thorough and far-reaching plan. By no means a master plan, it is rather a survey of the future growth of the world, the nation and the state. In order to set up proper controls for

this inevitable growth, the policy divides the state into ten regions, that each may be developed according to its own needs and at the right time. Governor Rockefeller has announced that detailed work will be started immediately on three of the regions—the Long Island region, the Lake Champlain-Lake George region and the Western region—where municipalities are already facing problems which extend far beyond their jurisdictions. This seems to represent a first and very important step toward planning on a regional basis.

The book is a mine of valuable information, useful to all northeastern states; and it is a masterpiece of design and production such as this reviewer has never seen before—obviously very expensive! Perhaps that is why the state seems rather reluctant to tell the reader where and how additional copies may be obtained. However, if one were to write to Harold A. Jerry Jr, Director, Office for Regional Development, Executive Office Building, Albany, I imagine one would at least get some information on how to acquire a copy of the report. It is very much worth studying.

CITIES AND TOWNS

*** Annapolis, Maryland—Comprehensive Master Plan. 1962.** The Planning Council of the Greater Baltimore Committee, Inc. An-

napolis is unique among American cities, and its uniqueness must be preserved. We call it a "city" because it is a state capital; but it is really a town—and not a very big one. Its baroque plan was laid out early in the eighteenth century; it was built up largely during that century, and an amazing number of the original buildings are still standing and in use—including, of course, the fine old Capitol. From its busy harbor, teeming with fishing boats and yachts, one sees through the pattern of masts of the oyster boats the silhouette of an eighteenth century city, pretty much as it always was—a rising hill of red-brick buildings on narrow streets, crowned by the white dome of the Capitol and the spire of the church. Local commercial interests are trying to "modernize" the town, unable to understand that in so doing they will destroy the very qualities that now attract dozens of residents and thousands of tourists every year. Currently, there is a zoning battle over the proposed erection of a high-rise hotel-motel on the waterfront, among the old two- and three-story buildings and the fish markets.

This is, of course, a tragic problem that other cities are facing too. The master plan is a heroic attempt to plan the future growth of the city so as to preserve its character and appearance, and still give the local boys the "growth" that they

Annapolis: "Its baroque plan was laid out early in the eighteenth century"



think essential. It should be of great interest and value to other cities facing similar problems. It's a rather large and handsome book, and possibly out of print by now, but it might be worth trying. As far as I can tell, one should write James J. O'Donnell, Director, the Maryland State Planning Department, State Office Building, Baltimore 1; or to William J. Martin, Chairman, Annapolis Planning and Zoning Commission, Municipal Building, Annapolis. For other information on local efforts to "save Annapolis," write Historic Annapolis, Inc, 18 Pinkney St, Annapolis.

Image. A Student Publication of the School of Architecture at the University of Texas, May 1964. This issue of *Image* contains an excellent account of the development of the Paseo del Rio, the River Walk through the center of San Antonio. Neglected for years, as are nearly all rivers in our American cities, the city fathers twice threatened to drain and fill the riverbed and convert it to expressway and parking. Local opposition—chiefly from architects—finally saved it and has led to its conversion to a charming asset to the city. The San Antonio Chapter AIA played a large part in the restoration of the riverbanks and the remodelling of the buildings that face them. Copies are presumably obtainable from the School of Architecture in Austin.

Historic San Antonio. Prepared by the San Antonio Chapter AIA. A very attractive 32-page book of photographs and drawings of the old buildings of San Antonio—"a charming hodge-podge of a city and its cultural antecedents are as scrambled as its streets." Write Vernon Lloyd Helmke, Secretary, San Antonio Chapter AIA, E-111 Petroleum Center, San Antonio, 78209.

* **Reconnaissance Report**—Waterfront Historic Area, New Bedford, Mass. Prepared for the Waterfront Historic Area LEague of New Bedford, which calls itself WHALE, this study is meant primarily for pro-

motional purposes, to arouse local interest in, and to show the great possibilities of, the conservation and reuse of many of the old buildings in the old waterfront area of this ancient whaling town. It sketches the area's history and architectural traditions, suggests uses for the buildings and an over-all design plan, and points out methods for implementation of the plan for conservation. Copies may be obtained for \$1.50 from the authors of the survey, the Corinthian Conservation Company, Inc, 801 Melvin Ave, Annapolis, Md.

1965/1975 General Plan for the City of Boston and the Regional Core. A preliminary printing of the report prepared by the Boston Redevelopment Authority, without the maps, charts, photographs, etc, which will accompany the final printing when the general plan is finally approved. Can be obtained from the Boston Redevelopment Authority, City Hall Annex, Boston 8.

Environs Study and Plan—Detroit Metropolitan Wayne County Airport. A demonstration grant project to develop a set of principles and standards for the planning of the land-use of areas surrounding jet airports, featuring the scientific determination of noise effects of jet aircraft operation on adjacent land uses. For a copy, write the Detroit Metropolitan Area Regional Planning Commission, 800 Cadillac Square Building, Detroit 48226.

Design Resources in the Oakland Central District. This is an introductory report prepared by the Oakland City Planning Department, preliminary to the full Central District Study which is in preparation. It focuses on the design resources of the city, involving the over-all visual form and a detailed survey of existing design resources. It would serve as an excellent procedural guide to other communities. Copies may be obtained from the Oakland City Planning Department, Oakland, Calif.

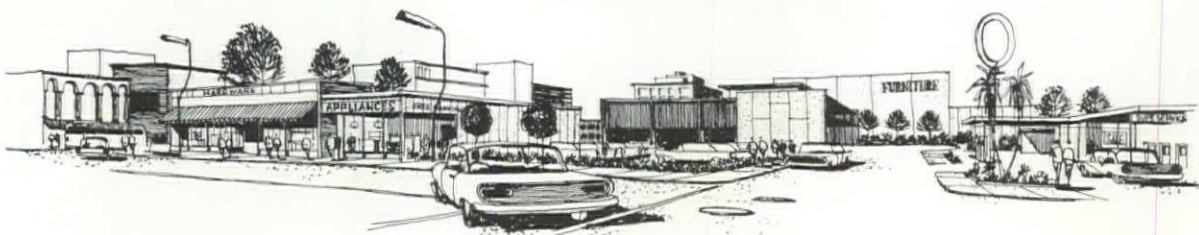
* **Central Area, Fresno, California**—Vol 2, The Plan and Its Implementation. One of the most interesting, and most recent, downtown redevelopment schemes is the Fresno Mall. This brochure was prepared by the architects and planners for the project, Victor Gruen Associates, for the City of Fresno and the Redevelopment Agency of the City of Fresno. Copies can, I presume, be obtained from the Gruen office at 135 S Doheny Drive, Beverly Hills, Calif. The brochure illustrates not only the mall plan but also the entire downtown redevelopment area, plus complete notes on means of implementation, etc.

Plan for Downtown Toronto. Inspired by its new City Hall and Square, the City of Toronto Planning Board has put forth a series of proposals to add interest to the downtown area, provide open space, variety and points of interest, relieve congestion and restore contact with the lakeshore. Toronto faces all the problems all great cities do, and these bold proposals are worth study. Copies of the Report can presumably be obtained from the City of Toronto Planning Board.

Metropolitan Toronto 1953-1963. As the above report deals with downtown Toronto, this one includes the entire metropolitan area, reviewing the progress during the past ten years in urban development, planning, conservation, parks, transportation, highways and traffic, harbor development, pollution control, etc. Write to the Metropolitan Toronto Planning Board.

The Core of the Central Waterfront. Like many American cities, Toronto for many years dumped its sewage into the lake and turned its back on the waterfront. In recent years, measures were carried out to create parks, beaches and recreational areas along the waterfront and to eliminate pollution. However, the central downtown waterfront was not improved. This report presents a plan to provide for park-

Central Area, Fresno: "One of the most interesting, and recent, downtown redevelopment schemes"



ing, expressway and port facilities, and at the same time offer an opportunity for public access to and enjoyment of the downtown waterfront area. Copies may be obtained from the City of Toronto Planning Board.

Park & Recreation Master Plan for Independence, Missouri. Prepared by Runnells & Winholtz, planning consultants. Cities large and small across the country are aware of the changes taking place in urban life, and are planning improvements all the way from new curbs and gutters to urban renewal and parks. This 60-page booklet is typical of the studies and reports which are being made in many towns. Copies may be obtained from Runnells & Winholtz, Kansas City 6, Mo.

Visual Survey and Design Plan. A companion book to "Improving the Mess We Live In," it is a survey of the Buckhead area of Atlanta, prepared by the Urban Design Committees of the Georgia Chapter AIA and the Georgia Section AIP. The Buckhead area is pretty bad—but typical Americana. This study makes an analysis of it and proposals for its improvement. Copies can be obtained from the North Georgia Chapter AIA, 230 Spring St, Atlanta 3.

Aspects of Environmental Design. A report prepared by Jack Meltzer and Associates on environmental design aspects of the Community Renewal Program of Chicago. It includes descriptions and analyses of older sections of the city and of recent private and public developments there. It can be obtained from the Community Renewal Program, Room 1400, 211 W Wacker Drive, Chicago 60606.

EDUCATIONAL AND INSTITUTIONAL SITES AND BUILDINGS

The University of Adelaide at Bedford Park—Site Planning Report. Gordon Stephenson and G. J. Harrison. Facing expansion from its existing downtown site, the University of Adelaide acquired a 370-acre site about six miles south of the center city. This booklet is the site-planners' report, made in cooperation with the staff architect and the private architects commissioned to make preliminary designs for the buildings. Copies may be obtained from the Bedford Park Planning Office, 199-200 N Terrace, Adelaide, South Australia.

Saint Paul's College 1964—Comprehensive Master Plan Report. Saint Paul's is a small college in southern Virginia, facing expansion from 400 to 700 students. This master plan study shows the consideration given to the various functions and areas of the college plant, and explains the rather drastic determination to demolish many existing buildings to prepare for the new. Copies may be obtained from the architects, Oliver & Smith, 333 W Freemason St, Norfolk 10, Va.

Guide for Planning Community College Facilities. Frank P. Merlo and W. Donald Walling. Division of Field Studies and Research, Graduate School of Education, Rutgers University, New Brunswick, NJ. \$2.90. This is a condensed report of a research study done to determine community college needs. It is based upon the findings of the project, and is designed for use by educators, architects and community college planning committees. It is intended only to provide suggestions based upon research findings, and not in any way to preclude the need for local planning based upon each community college's distinct program. It recognizes that there are basic needs and problems common to all community colleges which do not exist in the planning of high schools and four-year colleges. It takes up such topics as environment, site, planning the buildings, planning general and special purpose instructional areas, planning for the drama department, the student center, administrative facilities, faculty areas, health facilities, bookstore and library. In a pocket in the back of this 40-page paperback book is a smaller one which contains a 356-item checklist for planning such college facilities. All told, it looks like a very useful volume for those looking forward to a community college project.

Planning and Operating College Union Building. By Porter Butts, published by the Association of College Unions—International 1963. This useful little book has gone through six editions since it was first published in 1948, updated each time. It takes up the nature and purpose of a college union, its planning requirements, its organization and activities, and its financial policies. Copies may be ordered for \$2 from Edgar A. Whiting, Secretary-Treasurer, Willard Straight Hall, Cornell University, Ithaca, NY.

Cultural Centers—Some Facts and Figures. This booklet contains materials of general interest drawn from William A. Brigg's original "Night and Day Study," prepared for the Richmond, Virginia, Civic Center Commission. Copies are available for \$2 each from the National Recreation Association, 8 West Eighth St, New York 10011.

SIGNS, POLES, FURNITURE

* **Street Furniture—1963.** Council of Industrial Design, the Design Centre, 28 Haymarket, London SW1. Price 10s 6d. This is an exceedingly useful little book full of good examples of light poles, lanterns, trash baskets (litter bins in England), bus shelters, benches, etc.

* **Signs in the City.** A study by six graduate students of urban design in the Department of City and Regional Planning at MIT, with a faculty "mop-up" by Kevin Lynch and Donald Appleyard. Signs are an important means of communication in the city, but their thoughtless proliferation usually defeats their purpose and visually destroys the street. There are many practical proposals in this 84-page book which all urban designers would do well to study. Write the Department of City and Regional Planning at MIT, Cambridge, Mass.

* **Signs Out of Control.** Prepared by the California Roadside Council, this little booklet is most useful. It discusses how sign controls may be set up, through zoning and districting, and how signs may be banned completely, giving court decisions to back it up. Copies may be obtained from the Council at 12 Garces Drive, San Francisco 94132; 75 cents per copy, 10 for \$7.15, 25 for \$17.25, 100 for \$48.75.

* **Improving the Mess We Live In.** This very useful study is the result of two years of work by the combined Urban Design Committees of the Georgia Chapter AIA, the Georgia Chapter ASLA and the Atlanta Section AIP. It does much more than merely show horrendous examples of civic ugliness, it spells out what can be done about it—utility poles and wires, signs and billboards, service stations and commercial areas, and how to make the best use of landscaping, sculpture and ceramics. A very valuable publication; it can be obtained from the North Georgia Chapter AIA, 230 Spring St, Atlanta 3.

(More next month)

How HIGH to Rise

CHARLES THOMSEN
*Caudill, Rowlett & Scott
Architects*

AS ARCHITECTS, we like to think of ourselves as designers. But the hard fact is that we design for people who care as much—or more—about economics as esthetics. Occasionally it seems to us that we must withdraw to an ivory tower and work only for “patron” clients, or sacrifice our principles to the ax of economic interest.

But this is nonsense. Architecture must respond to its purpose, and the purpose of many buildings is to make money. As we gain a better understanding of the economic conditions our designs must face, we improve our opportunity to create good architecture.

This is a case history of an analysis to determine the optimum economic height of a high-rise office building. It was done on a computer, but it depended on design studies accomplished and conducted by the architects. When it was finished, we found that—far from inhibiting the design—the coldly practical computer had increased design freedom. And, in the process, the study destroyed many old wives’ tales of economic return in office building architecture.

The analysis was born of inexperience. Caudill, Rowlett & Scott received a commission to design a high-rise, multi-tenant office building in downtown Houston. The client’s basic request was simple:

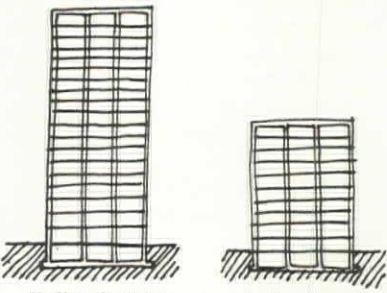
“Design a building for our site. We want to receive the maximum return on our investment. Tell us what size building will provide that return, so that we will have optimum economic conditions for a home-office building demonstrating high quality.”

The request wasn’t as simple as it looked. In the first place, there

were few rules of thumb to follow. We were forced to start from scratch to determine what sort of building would satisfy the client’s request. In the end, our initial inexperience became an advantage. We had developed a fresh approach that produced extremely precise results.

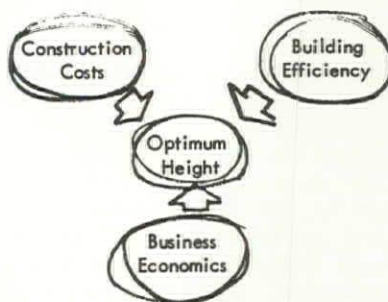
The Study

There were whole worlds of information we had to explore before we could decide how high the building should be. And various



Taller building spreads land cost over more square feet

factors elicited conflicting answers. For example, taller buildings spread high land costs over more square footage of construction. On the other hand, lower buildings cost



less per square foot to build, and the building efficiency (net rentable-to-gross area) usually is greater.

We divided our study into three categories — business economics, construction costs and building efficiency. We intended to graph each

of these categories to show how tall the building should be for each category. Then all three graphs could be totaled to determine the optimum building size.

Of course, even after we gathered the necessary information, it would take thousands of man-hours to fit it all together and arrive at the proper answers. “This thing should be done on a computer,” we thought. And then, “Why not?” Since information that can be expressed in a graph can also be written in an algebraic formula, the computer approach seemed feasible. We decided to try it.

But first, we had to collect the data in each of our categories.

Business Economics

In this study, we had a team of excellent advisers—our clients (the officers of Benjamin Franklin Savings Association, Warren S. Bellows Jr and Earnest Cockrell Jr). We also asked for (and got) some thoughtful advice from an experienced and able group representing the Building Owners’ and Managers’ Association. These two groups supplied us with the economic framework.

To determine the optimum building size, the computer would have to analyze many building sizes. Before it could function, we needed two sets of vital statistics for each size:

- How much the whole project would cost (land, construction, professional fees, rental campaign, etc)
- How much it would cost to operate (maintenance, staff, utilities, interest on borrowed money, taxes, insurance, etc)

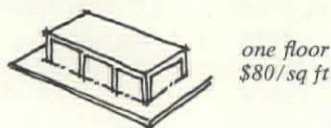
Many of these total costs varied strictly with the number of square feet in the building—so much per square foot, no matter how tall it was. But some did not. And it was

| | |
|-----------------|--|
| Project costs | Land Construction Rental campaign Professional fees Etc |
| Operating costs | Utilities Maintenance Interest Staff salaries Taxes Etc |

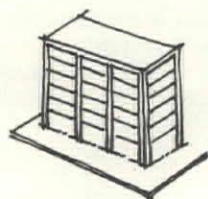
with those costs that tended to hold the building down or push it up that we were most concerned.

The economic forces that tended to increase building height were:

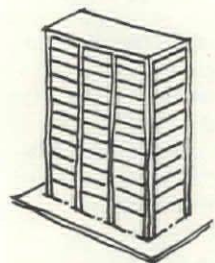
High land cost. If land costs for one story were \$60 per square foot and building costs were \$20 per



one floor
\$80/sq ft



six floors
\$30/sq ft



twelve floors
\$25/sq ft

square foot, that project would cost \$80 per square foot. If the land costs were divided evenly through six stories and building costs remained the same, the project cost would drop to \$30 per square foot—obviously good business. But if, under the same conditions, we added another six stories, the cost per square foot of the project would drop to \$25 per square foot—still good business, though not so great a jump.

Building management costs. It costs less (per square foot) to staff and run a large building than a small one.

Income potential. Higher floors of tall buildings rent for more (per square foot) than lower floors.

However, there also was a force tending to decrease height.

Construction financing costs. To-

tal costs are greater for taller buildings and they take longer to build. It is necessary to pay interest on more money for a longer period of time.

Finally, formulas were developed for all the expenses of running a building. Among other factors we analyzed were interest on financing, annual mortgage payments, income tax on potential profits, yearly net cash returns and cash flow. (In each case, the percentage of return on investment was brought back to present-day values.)

Construction Costs

This was CRS's first high-rise office building, but one of their clients, Bellows Construction Company, had built many. The whole process depended on their collaboration. The construction cost information came from their estimators and from their cost files. Their computer, normally used for critical path scheduling, was enlisted for the final study.

When we—along with the Bellows staff—first began to analyze construction costs, we went through a period of utter confusion. We kept getting conflicting answers.

For example, one electrical contractor told us that the cost of hauling materials up to the thirtieth floor of a building just offset the price break from buying in larger quantities. Another contractor said it didn't. Soon we stopped asking people for opinions and started looking at facts—cost records and case histories. From these, we were able to make close approximations for a number of basic construction costs that were directly affected by the height of the building. Again, there were both favorable and unfavorable conditions for the construction of taller buildings. Favorable conditions were:

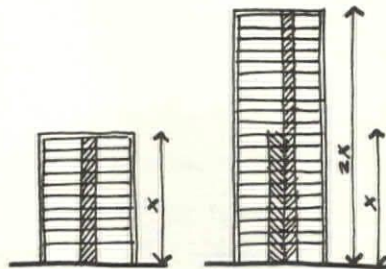
Foundation costs. While it certainly costs more to support a high-rise building than a one-story structure, foundations under a twenty-story building don't cost twice as much as those under a ten-story building. Not in Houston soil.

Window wall costs. As the building gets taller, the core containing the mechanical equipment must get larger. Thus, it makes sense also to expand the area surrounding that core—the "doughnut around the hole." However, the amount of skin surrounding that "doughnut" does not increase proportionately. Thus skin costs per square foot of building are reduced as the building gets taller.

Unfavorable conditions were:

Mechanical costs. Such mechanical costs as heating, airconditioning and electrical equipment tend to rise disproportionately as the building gets taller.

Elevator costs. The cost of good elevator service per square foot went up rapidly as the building got taller.



When height doubles,
elevator space may triple

Indirect contractor costs. Construction of a taller building requires more complicated construction equipment (elevators, cranes, etc), greater scheduling and storage problems, etc. These costs increase disproportionately.

With Bellows' help, we were able to devise formulas for all factors related to construction costs.

Building Efficiency

This is the strongest factor limiting the height of a building. The only source of income for a commercial building is its rentable space. We measured its efficiency (there are many ways) by the percentage of rentable office space divided by the total enclosed area of the building. As height increases, it is necessary to utilize more and more space for structural support, elevators and mechanical equipment for every square foot of rental space. Thus, a building's efficiency decreases as it gets taller.

For a somewhat oversimplified example, if a building were ten stories tall, it would require a bank of X number of elevators. If it were twenty stories tall, it would require at least that many more elevators. But the second bank of elevators for the top ten stories must travel through the bottom ten floors. In doubling the size of the building, then, the space required for elevators is tripled.

It is possible, however, to increase the apparent efficiency of the building without really increasing the percentage of truly usable space: by introducing what we began to call "paper efficiency." One of the most obvious ways is to increase the depth of the space that

| Floors | Building Cost | Sq Ft Cost | Project Cost | Cash Equity | .Net Income | Return |
|--------|---------------|------------|--------------|-------------|-------------|--------|
| 15 | 7357314. | 26.07 | 9975052. | 2992515. | 666201. | 3.5 |
| 16 | 7815397. | 25.91 | 10489361. | 3146808. | 710499. | 3.7 |
| 17 | 8283609. | 25.77 | 11015989. | 3304796. | 755351. | 3.8 |
| 18 | 8762487. | 25.66 | 11555543. | 3466662. | 800797. | 4.0 |
| 19 | 9252582. | 25.56 | 12108638. | 3632591. | 846881. | 4.1 |
| 20 | 9754454. | 25.49 | 12675908. | 3802772. | 893641. | 4.2 |
| 21 | 10268675. | 25.42 | 13257997. | 3977399. | 941120. | 4.3 |
| 22 | 10795836. | 25.37 | 13855574. | 4156672. | 989355. | 4.3 |
| 23 | 11336540. | 25.33 | 14469321. | 4340796. | 1038387. | 4.4 |
| 24 | 11891408. | 25.30 | 15099942. | 4529982. | 1088254. | 4.5 |
| 25 | 12461081. | 25.28 | 15748165. | 4724449. | 1138993. | 4.5 |
| 26 | 13046224. | 25.27 | 16414747. | 4924424. | 1190642. | 4.6 |
| 27 | 13647524. | 25.26 | 17100465. | 5130139. | 1243237. | 4.6 |
| 28 | 14265694. | 25.26 | 17806133. | 5341839. | 1296813. | 4.6 |
| 29 | 14901481. | 25.26 | 18532601. | 5559780. | 1351405. | 4.6 |
| 30 | 15555664. | 25.27 | 19280754. | 5784226. | 1407046. | 4.7 |
| 31 | 16241438. | 25.31 | 20065366. | 6019609. | 1463532. | 4.7 |
| 32 | 16948363. | 25.35 | 20874806. | 6262441. | 1521111. | 4.7 |
| 33 | 17677392. | 25.40 | 21710165. | 6513049. | 1579812. | 4.7 |
| 34 | 18429527. | 25.45 | 22572583. | 6771774. | 1639663. | 4.7 |
| 35 | 19205844. | 25.51 | 23463289. | 7038986. | 1700691. | 4.6 |
| 36 | 19992301. | 25.56 | 24366525. | 7309957. | 1763211. | 4.6 |
| 37 | 20804105. | 25.61 | 25299364. | 7589809. | 1826978. | 4.6 |
| 38 | 21642534. | 25.66 | 26263264. | 7878979. | 1892014. | 4.6 |
| 39 | 22508978. | 25.72 | 27259804. | 8177941. | 1958339. | 4.6 |
| 40 | 23404936. | 25.79 | 28290694. | 8487208. | 2025968. | 4.6 |
| 41 | 24332054. | 25.86 | 29357805. | 8807341. | 2094915. | 4.5 |
| 42 | 25292131. | 25.94 | 30463185. | 9138955. | 2165192. | 4.5 |
| 43 | 26287142. | 26.03 | 31609084. | 9482725. | 2236804. | 4.5 |
| 44 | 27319270. | 26.13 | 32797986. | 9839395. | 2309755. | 4.4 |
| 45 | 28390930. | 26.23 | 34032640. | 10209792. | 2384041. | 4.4 |
| 46 | 29504804. | 26.35 | 35316103. | 10594831. | 2459655. | 4.3 |
| 47 | 30663882. | 26.48 | 36651777. | 10995533. | 2536584. | 4.3 |
| 48 | 31871492. | 26.61 | 38043457. | 11413037. | 2614805. | 4.2 |
| 49 | 33131382. | 26.76 | 39495410. | 11848623. | 2694291. | 4.2 |
| 50 | 34447743. | 26.93 | 41012415. | 12303725. | 2775004. | 4.1 |

a major corridor serves. But this also can be overdone. If the office space gets too deep, the tenant will have to build more corridors for himself. Moreover, less space will be accessible to windows and a view. And, of course, the office with the greatest view commands the highest rent.

Therefore, in investigating the building efficiency, we had to decide on the optimum corridor-to-skin dimension. We finally put that figure at thirty feet—two reasonably good-sized offices deep. Then, we had to select the best core location. For our situation, the center core was best, a "hole" surrounded by the "doughnut" of rentable office space. Having made these two decisions, we could proceed with our investigation of how efficiency is affected by height.

The only way we could do this was to design buildings of different sizes using uniform conditions.

We began with a building of six elevators. We designed a core large enough to house this number of elevators, plus stairs, mechanical and electrical equipment, etc. Then we surrounded the core with rent-

able office space—30 feet deep on the sides and 40 feet deep at the ends. And we made the building as tall as six elevators could serve. Then we did the same thing with buildings of eight, ten, twelve, sixteen, twenty and twenty-four elevators.

After designing these imaginary buildings, we computed percentage of efficiency for each one. Then we plotted the total areas and efficiency of each building on a graph and interpolated for those buildings we hadn't actually figured.

The result was a curve showing the exact percentage of decline in efficiency as the buildings got taller.

Finally, the day came when we had completed our investigations—business economics, construction, costs and building efficiency. The facts were translated into algebraic formulas and then into computer language. The computer had even greeted its mathematician operator. (He had "taught" it to type out "Good morning, Bill," each day.)

Very little computer time was required—only about one hour—and we have nothing but praise for the results. The computer digested

the facts and printed out the following information (see table) for buildings from fifteen to fifty stories. The columns from left to right are:

- The total cost of each building
- The construction cost per square foot of each building
- The total project cost—land plus building costs, all fees, interest on construction financing, rental costs, etc
- Cash equity required to secure a mortgage
- Net income
- The percentage of return on the investment (The low figure is a result of returning this figure to present-day values.)

Since, in many cases, our "facts" were really assumptions, we ran the information through many times, changing certain factors as they might vary in actual design and construction. And we were able to get separate read-outs based on each change.

The computer "recommended" thirty-two floors for the highest percentage of return on investment, but there was a close range from thirty to thirty-four floors which would have similar returns.

Results

These figures aren't important, however, since they apply only to this building on this site at this time. Another set of facts would have given another answer.

What is important is that the computer proved a useful tool in programming architecture. And—even more essential—it did so without straitjacketing design.

In fact, the reverse is true. Our computer process created freedom for those of us who would design the building. Our analysis showed that the best economic return came from a building that:

- Was not the most efficient
- Was not the cheapest per square foot
- Did not cover the entire site.

Three of the axioms of economic return in architecture were broken. We learned that these three considerations are only a part of a very complex picture and that a great number of inherent flexibilities are possible.

The computer was an enormous help, but it didn't make law. It gave a thoroughly analyzed answer, based on many small approximations and estimations. It provided information, but it did not produce architecture. That's still a job for men. ■

The Blind

Space Needs for Rehabilitation

BY F. CUTHBERT SALMON AIA
and
CHRISTINE F. SALMON AIA
*School of Architecture
Oklahoma State University*

The material which follows has been excerpted from an 82-page guide to architects and administrators of rehabilitation centers for the blind. Obviously, this brief article can do little more than present a sampling of the excellent material contained in the book.

In determining which material to present on these pages, we eventually reached the decision to emphasize the statements which deal with specific problems of the blind, and suggestions for handling them. However, it should be noted that many of the design considerations discussed by the authors are applicable to facilities for the sighted equally as well as for the blind.

THE TOTAL environment, as distinguished from any specific element of it, is the stage setting of a rehabilitation process. This is just as true with a blind individual, as with a sighted one. Yet there is a basic difference in the way in which environment acts upon the person without sight, as compared with the effect upon someone who can see.

The sighted individual, in his struggle for mastery of his rehabilitation, is constantly perceiving through his eyes pictures of his surroundings, which under the circumstances of extreme emotional tension may remain etched in his consciousness as long as he lives.

The blind individual, though his eyesight is gone, retains that basic resource called the mind, and through it he also perceives his surroundings, but filtered through senses other than sight. It is therefore of the greatest importance that his environment exert a continuously constructive influence upon him, through maximum use of other-than-visual stimuli.

The environmental factors of a center for the rehabilitation of the

blind must have nonvisual stimuli. Visual aspects of the center are transmitted to the blind through communication with the sighted person, and such vicarious knowledge is inevitable for blind people, but it is seldom so truly satisfying as firsthand experience. Reliance should never be placed on it when some more direct contact with environment is feasible.

Climate and Geography

Geographical location, the sun, temperature and wind are all direct stimuli to blind people. Imaginative use of such elements suggests some of the possibilities of a creative approach to planning a center for the rehabilitation of the blind.

The light and warmth of the sun can be extremely enjoyable and beneficial, but it can be uncomfortable if there is too much of it. Large glass areas, when excessive or located improperly, can be a disadvantage. Large, unprotected panels of glass can take away privacy, as important to the blind as to the sighted.

Indirect effects caused by local temperatures are apparent in the center's program of activities. Swimming can be an important recreational feature in the South, while ice skating is a possibility for the North. Mobility training may need to include walking in snow in northern climates, or seeking out shade in the South.

Precipitation has advantages and disadvantages. Snow has the quality of insulating, but this can be a disadvantage when one is dependent upon sound reflection for mobility and orientation. A center may need to consider snow-melting equipment and covered walks. Surfaces which are slippery when wet should not be used.

Community Features

Fortunately, even in great population centers, blindness is relatively atypical. An entire geographical region is sometimes served by one rehabilitation center for the blind. Different regions will determine different kinds of planning requirements. The types of communities from which the blind people come often dictate the kinds of work situations to which they want to return. The center must help the trainee master experiences similar to those he will return to. Only the community, rural or urban, can provide these opportunities.

Ideally, a community should provide the individual with sources

of inspiration, stimulation, refreshment, beauty, security and interest. Usually a community provides parks, playgrounds, gardens, foliage, breezes, open spaces, good water, clean air and sunshine—as important to the blind as to the seeing, and sometimes even more important.

In addition to general amenity, community factors requiring consideration are:

- *commerce and industry*—with cooperative effort, the center and the community may establish the working environment best suited for training and future employment of the trainee
- *schools*—vocational and academic
- *health and welfare facilities*
- *housing*—for staff, for clients not actually residing in the center, and transient-type housing for relatives of clients
- *recreational facilities*
- *churches*
- *availability of volunteers*
- *transportation*

A pattern of segregation of blind persons from the sighted should be avoided. The needs of the blind are basically those of all people. Not every blind person can be helped to the point of being a person completely at home with his community—but then neither can every sighted person. The goals of both are the same—ability to live in and contribute to the community.

The Rehabilitation Center

The building itself should have all the esthetic qualities of a building designed for sighted persons. Ample natural lighting and electric lighting illumination levels recommended for the sighted should be maintained. For the partially sighted, general illumination is important. Even for the totally blind person, rooms should be cheerful and bright, as he responds to some extent through the sighted person's reactions to environment.

A proper setting for the building can be achieved only with appropriate landscaping. Certain trees and plants which appeal to the blind as well as to the sighted may be considered. However, the creation of a formal or organized "fragrance garden" tends to emphasize the limitations of blind persons and should be avoided.

The total building design should avoid the use of features which might tend to protect the blind too much.

Corridors must be safe. Any projections into a corridor can con-

stitute a hazard. However, it should be realized that obstacles can be landmarks to the blind, and ways of using them constructively should be considered.

Changes in elevation can also be useful to the blind in finding their way. They can be used imaginatively to give the environment character underfoot. This is especially true of slopes and ramps, although they should not be used to the exclusion of stairs, which blind people need to use constantly during any period of basic rehabilitation.

Changes in materials can be helpful if there is a real purpose behind them. For example, moving from a wooden floor in the hall to a ceramic tile entryway not only provides interest and defines the entrance, but ceramic tile can better withstand the harder traffic and the elements near the entrance.

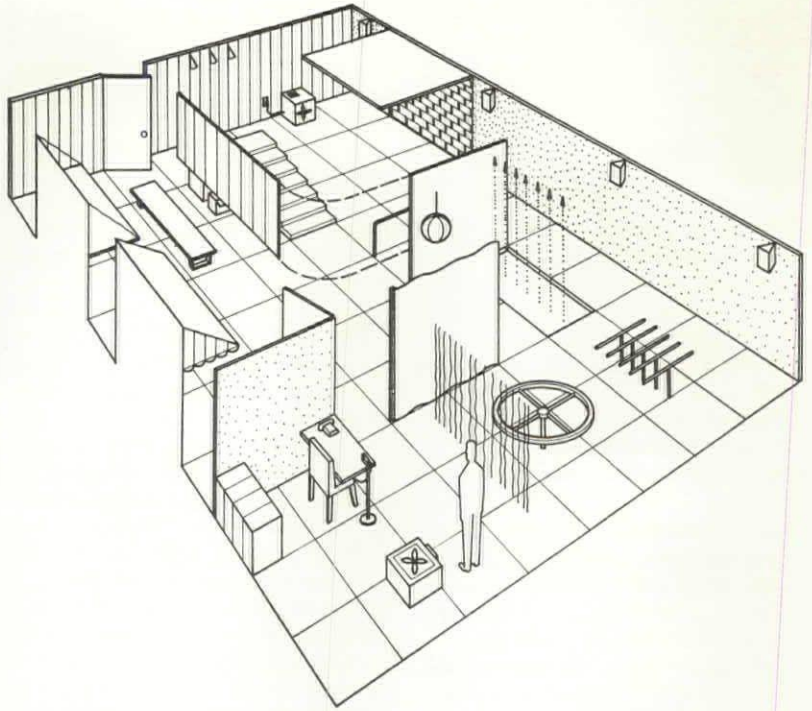
Furniture and equipment should be arranged to help define circulation, not obstruct it. Doorways should be so located that they permit the most useful furniture grouping. Halls should be a minimum of 8 feet wide, as straight as possible and free of hazardous projections. An obstacle—not with extremely sharp or treacherous corners, but a decent, friendly obstacle—might serve as a landmark. Floors should be slip-proof and trip-proof.

Out-of-doors safety rules follow the same principles as those considered indoors. Special attention should be given to outdoor walks and steps, porches and terraces, pits, pools and driveways. Remember that fire alarms should be located to give acoustic directions to fire exits.

Although rehabilitation centers for blind persons house facilities especially designed for the use of the blind, no special architectural "isms" should be incorporated with the intent of aiding the blind. The entire building complex may form a challenging environment for the blind trainee, wherein he meets and learns to cope with everyday situations.

Rounded corners are not standard, and angular rooms and curved walls are misleading orientation devices. Floors that slope upward at the approach to the top of a flight of stairs, and stairways that have protective gates are somewhat questionable and should be used sparingly. Only by exposure to standard situations does the trainee learn to be alert and cautious.

Variations in floor texture, other than situations found normally



Mobility and orientation training

should be avoided. The blind person should be discouraged from shuffling his feet and should orient himself by other means.

Space Organization in the Center

Logical interrelationships of areas of activity are particularly important in a center for the blind. These areas include medical, psychological and social, mobility and orientation, physical conditioning, communication, occupational therapy, techniques of daily living, vocational evaluation, recreation, residential and administrative. (Not all centers will have all of these; some may have more.)

Medical

In addition to a thorough physical examination upon admission to the center, the client will be given special ophthalmological examinations. For those persons who are legally "blind" but have some residual vision, an optical-aids clinic can help to develop to the fullest potential any remaining sight. [A full discussion of equipment and space needs for the ophthalmological and optical aids departments is given in the book—Ed.]

On admission, most centers require that a client be given a battery of psychological tests to evaluate his intelligence, interests, abilities and attitudes. If psychiatric evaluation is advisable, he is referred to a consulting psychiatrist.

In addition to office space for the

psychologist, a separate room for psychological tests is recommended, with desk or work surface and shelves for storage of tests and kits.

Another function of the center is to provide social case work, focused on the potentialities of the client—the person who is blind, rather than on the limitations imposed by blindness. The social case worker's office should be intimate in character and designed to assure privacy during interviews (also an important design consideration in the psychologist's office). The center's lounge and recreational facilities are often used for social group work, rather than specially designated space. However, emphasis should be placed on giving privacy for group discussions.

Mobility and Orientation

With the sighted person, the sense of sight provides a broad range of information at any one instant. Other senses are more selective and are used to support what has been seen. The blinded person, therefore, must use and develop all remaining senses, as there is no single substitute for sight. Sensory training is an important phase of rehabilitation.

The client must be taught to use hearing, smell and touch for orientation and relate the spatial arrangements of objects to form a mental map or image.

A major objective of a rehabilitation program is restoring mobility.

A human guide is used by the blind person in the initial stages; however, the ultimate aim is independent travel. Rehabilitation centers do not give formal training in the use of dog guides. This training is available from special institutions.

The blind person uses his cane as an extension of his sense of touch, and is trained to follow special techniques for indoor and outdoor travel, ascending and descending steps, etc.

A mobility and orientation room would require about 1200 square feet of floor space, equipped with certain obstacles not readily detectable through conventional cane technique. (It should be said that such experimentation is very new, and these suggestions represent the most basic observation.)

Typical obstacles, as shown opposite, might include hanging and projecting shelves, furniture, bars, movable walls, steps, etc. In addition, there might be devices requiring the use of the client's remaining senses, such as air blowers, heat lamps and dropping water.

Physical Conditioning

The physical conditioning program is designed to improve the general physical condition of the client and increase his capacity for physical activity. The physical education instructor or therapist may use outdoor facilities in addition to space provided in the building.

The physical conditioning room need not be large, but should contain such pieces of equipment as scales, punching bag, health walker, stationary bicycle, wall pulleys, mats and stall bars.

This facility is related to a number of other activities in the center, and may adjoin the mobility and orientation room, the shop or the recreation room.

Communications

A number of devices are available to the blind in restoring communications through the medium of writing. These are braille, typing and handwriting. In addition, braille, talking books and sighted readers provide means of communication as substitutes for sight reading.

Braille and handwriting rooms should provide space for six flat-top desks plus instructor's desk, storage for braille books, paper, braille writers and other equipment. Should be so located that distracting noises are kept at a minimum.

Typing rooms should provide work space for four to six students plus instructor; electrical outlets, paper storage, etc.

Library—for talking books and braille books. Ample shelving and storage for talking-book machines needed; individual, acoustically treated listening cubicles recommended.

The "sighted reader" is usually a volunteer. The center need not provide a special room for the use of clients and sighted readers.

Occupational Therapy

Occupational therapy and crafts courses are designed to develop basic skills and manual dexterity. Activities may include weaving, sewing, leather work, simple or complicated basketmaking and other handicrafts.

Rehabilitation centers for the blind with active crafts programs usually place less emphasis on the vocational aspects of rehabilitation. A current trend is to offer activities with more motivation and evaluation potential for the client, and to consider a traditional crafts program unsuited to the modern concept of rehabilitation.

Techniques of Daily Living

Restoration of daily living techniques is a most important phase of the blind person's readjustment. Self-care or personal hygiene (shaving, applying cosmetics, dressing, caring for clothing, table etiquette, etc), homemaking and household mechanics are the primary skills needed.

Homemaking instruction is required by both men and women. An arrangement of space simulating a small house is required. It should include a living room, bedroom, bath, laundry, kitchen and dining room area, furnished with equipment which is standard for the region served by the center.

A "gadget board" should be located in the area, with such devices as telephone dials, light switches, thermometers, carpenter's rules, needle-threaders, etc.

In household mechanics instruction, the client is taught to make simple repairs and take care of routine maintenance—replacing light bulbs, faucet washers, repairing electrical appliances, performing simple carpentry and the like.

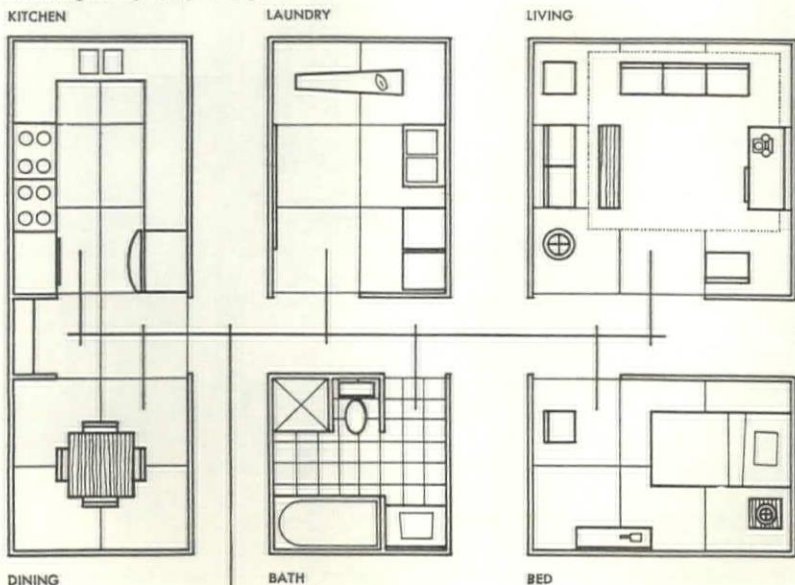
Vocational Evaluation

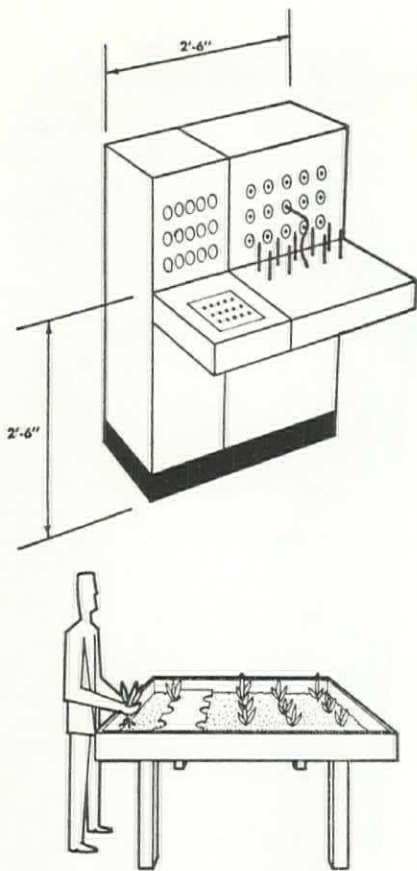
The primary objectives of a pre-vocational program are to develop in the client bimanual skills, coordination, finger dexterity, tactual perception, memory for sequence of operations, reaction and adaptability to power machinery and timing.

The evaluation period develops the client's confidence, and gives the evaluator an estimate of the client's work habits, work tolerance and ability to work in actual job situations. This activity is exploratory in nature, and is preparatory to additional specialized training which the client should receive in regular programs offered by industry or commerce, special training schools or higher education.

Some job experiences can be made available to the client by the use of special devices (next page): a special type of telephone switchboard available for blind operators, or a template for guidance in setting seedlings in a plant frame.

Techniques of daily living





In the unit, the shopwork should be separated from less noisy areas. Facilities might include a wood-working shop, a typing and tran-

scribing area, a distribution and repair center for talking-book machines or facilities for training in vending-machine operation.

Recreation

Many center directors believe recreational activity to be a vital part of the blind person's rehabilitation. Some differ over the extent to which recreation should be within the confines of the center or outside in the community; most agree that both have a place.

Activities can include card playing (using cards with braille markings), dramatics, social dancing, instrumental music and many active sports as well as more sedentary activities such as reading, radio and television listening.

The center's lounge will serve as the social meeting place for many activities such as card playing, listening and piano playing. For indoor group activities, a large column-free space is strongly recommended.

It is doubtful if expensive installations such as bowling alleys and swimming pools can be justified. Use of community facilities along with sighted persons might ultimately result in greater benefits for the client in his program of total rehabilitation.

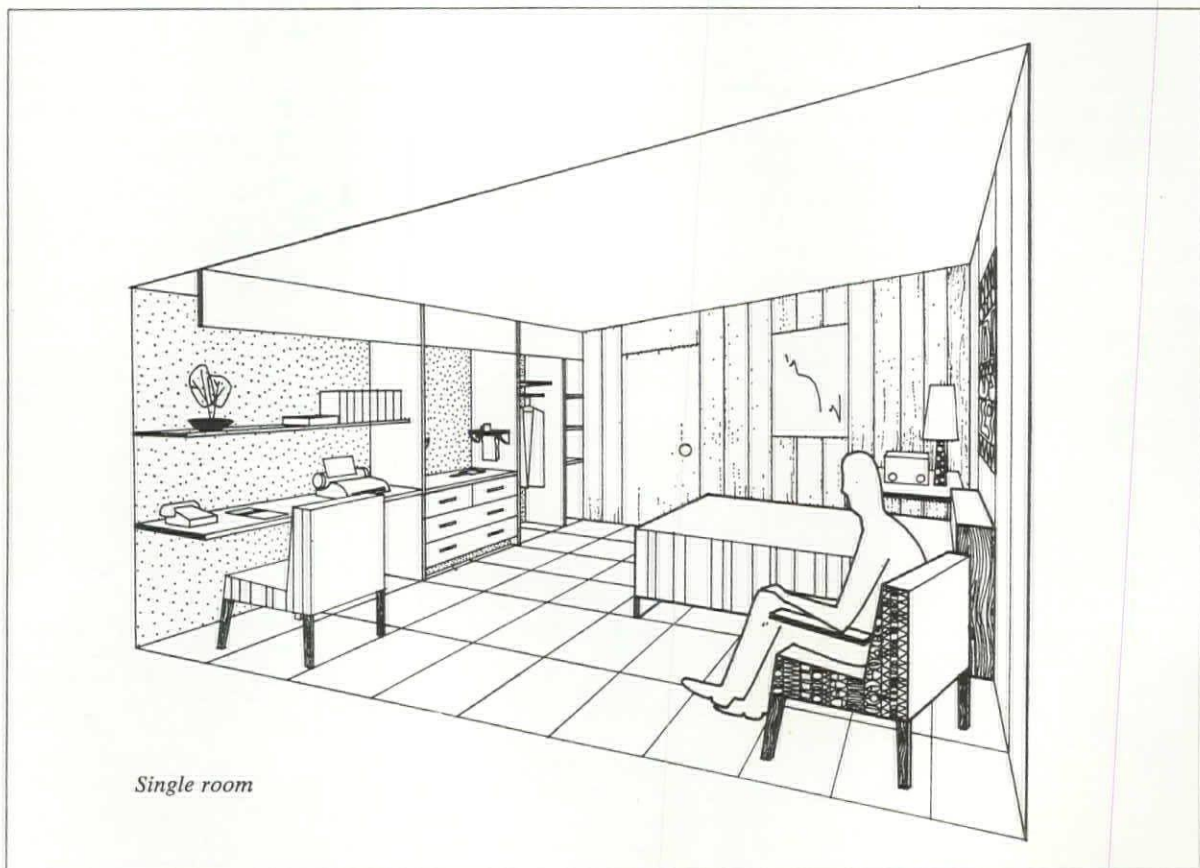
Residential

In residential centers, it is recommended that the housing unit be convenient to but physically separated from the training unit. Not only is such an arrangement psychologically more satisfactory, but it provides a situation with inherent possibilities for mobility and orientation training.

The dormitory should offer privacy for each individual. If single rooms are not available, care should be taken that a blind person does not rely on a partially sighted roommate.

A typical single room is shown in the sketch. Note that a desk and chair for writing and studying must be provided.

The total environment of the center consists of all its parts, plus the feeling, the impression, the emotions that are felt by everyone who comes there. This is what matters most in the design of the center. The best center is that which provides the blind person with the best environment for the experience for which the center was established—adjustment, evaluation and training. The center provides the environment for the experience of learning and the experience of living. ■



Single room

Recommended Practice for Insulated Built-up Roofs

BY PROFESSOR C. E. LUND
*Department of Mechanical
Engineering
University of Minnesota*

THE SHARP increase in built-up roof area constructed during the past five years has been accompanied by an increase in the number of premature roof failures. While these failures may constitute a decreasing percentage of new roofs being installed, they are attracting the growing attention of the roofing industry. The rising cost of maintaining or replacing a faulty roof lends a new importance to satisfactory performance of the roof system.

Such performance may be attained through the coordinated effort of everyone participating in the design or construction of the roof system—building owner, architect, general contractor, deck applicator, roof components producer and roofing contractor—and through their adherence to accepted standards of design, product usage and application. Each has a responsibility that influences the over-all quality of the installation.

The building owner must recognize the false economies of reducing the cost of the roof system through use of substandard materials or acceptance of shoddy workmanship.

The architect is responsible for selection of the type of deck, the type and thickness of insulation, the type of roofing membrane and the installation procedures to be used. He must determine whether a vapor barrier is to be provided and, if one is to be used, select the most suitable type. The architect also has a responsibility to design and select deck and other building components that minimize movement resulting from deflection, racking or variations in temperature.

The general contractor is responsible for coordinating the activities of those involved in the installation

of roofing system components. Strict adherence to the architect's specifications will reduce the likelihood of premature failure. Workmen on the roof must at all times take every precaution to prevent damage to deck, vapor barrier, insulation, bitumen or felts. The general contractor should allow the roofer sufficient time for the proper completion of his work and should not expect application of insulation or roofing under unsatisfactory weather conditions. Many premature roof failures are initiated by application during inclement weather. If roofing must be installed under unfavorable conditions, a temporary roof should be applied directly to the deck. The additional expense is often justified solely on the basis of providing a dry building for uninterrupted completion of interior work by other trades. More important, the use of a temporary roof permits application of the permanent roof to be delayed until conditions are more favorable, perhaps preventing the need for early repair or replacement at a cost exceeding that of the temporary roof.

The deck applicator is responsible for providing a deck surface free of open joints, cracks and abrupt changes in elevation. The deck surface must permit the application of insulation without excessive distortion in order to provide a sound, uninterrupted base for the roofing.

The manufacturers of insulation and roofing materials are responsible for producing products in compliance with accepted specifications. They are also responsible for making sure that materials are dry when delivered to the roofer's warehouse or the project site.

The roofing contractor is responsible for installing vapor barrier, insulation and roofing in accordance with the specifications. He must take every precaution to protect insulation and roofing material against moisture prior to and during application.

Exclusion of moisture from the roofing system is of primary importance. Speaking to the 1951 convention of the National Association of Roofers, the writer stated:¹

Of . . . serious consequence are conditions which arise when . . . quantities of free moisture (in the form of condensation, mist or rain) become trapped in a roof structure. . . . Of almost equal importance is the requirement that roofs be constructed with dry materials under dry weather conditions.

Investigators have found that organic roofing felts can absorb moisture equal to 80 per cent of their weight and can expand as much as 15 per cent as a result. K. C. Martin makes the following statement based on his studies:²

Shrinkages of up to 15 per cent have been observed across bitumen-saturated organic fiber felts on roofs in the Melbourne area. If felts are well protected by an impermeable surfacing, the shrinkage problem is not serious; but in many cases the surfaces become permeable within a few months of application and remain without maintenance for many years, allowing moisture to penetrate the felts. They then tend to swell and subsequently shrink upon drying out. Some roofing felts show greater movement than others and various reasons have been given for this. Organic felts with all voids full of bitumen will still absorb and swell, and poorly saturated felts are therefore likely to swell to a greater extent. The degree of saturation is consequently a factor which may influence the moisture movement of the material.

E. R. Ballantyne concluded from his studies that:³

The saturated felts are relatively

¹"Factors Affecting Built-up Roofing," C. E. Lund and R. M. Grannum, University of Minnesota, Institute of Technology, *National Roofer*, March and April 1951

²"Changes in Bituminous Roofing Felts with Changes in Moisture Content," Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia, Technical Paper No 8, 1959

³"Flat Roofs and Leaks," Commonwealth Scientific and Industrial Research Organization, *Building and Decorating Materials*, Vol 1, Nov-Dec 1959

Professor Lund and R. M. Grannum co-authored "Principles Affecting Insulated Built-up Roofs," Bulletin No 34, Institute of Technology, University of Minnesota, May 1952, considered the roofing industry bible

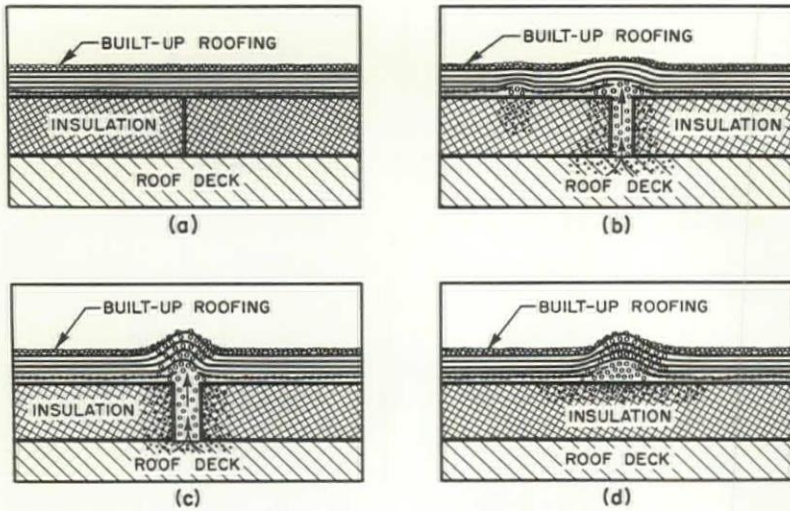


Fig 1—Proper mopping, joint sealing (a); failure due to poor mopping, joint sealing (b); poor mopping of succeeding layers (c); poor mopping of first ply (d)

permeable to water, but coated felts are relatively impermeable.

Organic fiber felts show much greater changes in dimensions than asbestos fiber felts, and this leads to more puckering, wrinkling and progressive shrinking.

Moisture trapped below a membrane is likely to vaporize and form blisters in the membrane when heated by the sun.

Professors Thorkel M. Haaland and Robert P. Darlington have found in their studies of built-up roofs that "if care is not taken to use dry felts and to keep moisture out of the roofing during the construction, the moisture will haunt the building, its occupants, and those responsible for its maintenance for the rest of the roof's life."⁴ Professor D. E. Brotherson found that moisture and moisture vapor beneath the roof membrane play an important role in failure of the roof system.⁵ William C. Cullen, in studying the effect of thermal movement on built-up roofing, found that temperature variations contribute to the growth of blisters beneath or between roofing plies, "especially if moisture is present in some component of the roof."⁶

Moisture trapped in a built-up roof system can usually be attributed to one or more of the following:

1) Wetting of roofing felts due to improper storage.

2) Wetting or other damage of insulation due to improper storage or handling

3) Application of insulation or roofing membrane during inclement weather

4) Migration of building moisture into the roof system through failure to provide an adequate vapor barrier

5) Absorption of moisture from newly poured or inadequately ventilated concrete or gypsum decks through failure to provide an adequate vapor barrier.

A basic familiarity with the thermodynamics of air and water vapor will help everyone involved in roof construction to avoid the problems caused by entrapped moisture. It is a fundamental fact that water vapor movement through building materials is dependent on differing vapor pressures between one surface of the material and another. The resistance of materials to vapor movement must be considered, and so must the time factor by which is determined the quantity of moisture that accumulates under a given set of conditions.

The use of a vapor barrier in the roof system is determined by many factors, and while it may not always be required, it is good policy to specify a vapor barrier whenever there is any uncertainty about humidity levels to be expected from construction operations or future occupancies. Factors contributing to the selection of a vapor barrier are geographical location, seasons encompassed by the construction period, projected building occupancy, degree of artificial humidification to be provided and type of roofing selected.

A building completed during warm weather can normally be supplied with ventilation adequate to remove construction moisture given off by poured concrete, mortar and plaster, and will not have condensation problems from that source. However, a building completed during cold weather is normally not supplied with adequate ventilation, and large quantities of construction moisture remain within the building resulting in extremely high relative humidities indoors.

The accompanying increase in interior vapor pressure causes a rapid accumulation of water vapor within the roof system unless an adequate vapor barrier is provided, and the presence of sub-freezing outdoor air temperatures rapidly turns vapor into frost below the roof membrane. When outdoor temperatures later rise above freezing, the accumulated frost melts and invariably finds its way to the building interior, where the resultant drips are often mistaken for roof leaks.

Such a roof installation will usually dry out during the following summer, when roof surfaces exposed to solar radiation may attain temperatures of 170 to 180 degrees F. Unfortunately, the insulation, the built-up roofing and portions of the interior finish may already have suffered permanent damage.

It may be preferable, under certain circumstances, to omit a vapor barrier over metal decks to allow escape of small quantities of water vapor that may have been sealed into the roofing system. Such procedure is acceptable only where it can be ascertained that the roof will at no time during construction or occupancy of the building be subjected to indoor atmospheres of high relative humidity. Joints in a metal deck and the occasional holes created by tackwelding provide for an unrestricted flow of water vapor, and it is prudent in the majority of cases to include a vapor barrier in the original roofing specification. Use of a vapor barrier may also afford increased protection against excessive rusting of steel deck surfaces.

Many commercially available membranes are suitable for use as vapor barriers in a built-up roof system. Synthetic rubber or plastic sheets have been designed to serve as vapor barriers, generally by application to the deck as a single ply using specific adhesives as recommended by the manufacturer.

⁴ "Built-up Roofs in the State of Washington," Bulletin 233, Washington State Institute of Technology, 1956

⁵ "An Investigation into the Causes of Built-up Roofing Failures," University of Illinois, Small Homes Council, Research Council, Research Report 61-2, Oct 1961

⁶ "Solar Heating, Radiative Cooling and Thermal Movement—Their Effects on Built-up Roofing," National Bureau of Standards, Technical Note 231, US Department of Commerce, Dec 1963

Care must be exercised in the application of proprietary vapor barriers to insure the sealing of all joints and protection of the membrane from puncture.

Vapor barriers may also be prepared by the roofer's application to the deck of two overlapping plies of 15-pound felt, each embedded in a continuous and uniform coating of bitumen. Satisfactory performance of such a vapor barrier depends primarily on uniform coverage of all felt surfaces with bitumen, one ply of felt with both surfaces fully coated being preferable to two plies spot- or strip-mopped.

The roof is frequently the largest uninterrupted surface of the building and is an area where insulation is most effective. From an economic standpoint, return on initial investment is greater for insulation than perhaps for any other single building material.

Many types of insulation have been developed for use in roof systems and are being manufactured under conditions of strict quality control to assure compliance with prevailing standards set by such authorities as the US Department of Commerce, Federal Specifications and the American Society for Testing and Materials. These standards impose, on approved insulation materials, certain limitations in moisture absorption and other factors that must be met under prescribed test conditions and retained after installation.

In addition to its obvious role in reducing heat flow, roof insulation serves another important function by preventing moisture condensation on roof surfaces exposed to the building interior. It may be impossible to prevent condensation on uninsulated roof surfaces cooled by winter temperatures, especially where indoor humidity is high and ventilation inadequate.

Insulation also provides a thermal stability to deck components by reducing temperature variations and the resultant expansion and contraction that would otherwise occur from exposure of these components to the extreme temperature variations of the roof surface.

Roof insulation should be installed in accordance with the manufacturer's recommendations over a deck that is reasonably smooth and true. Insulation units with broken corners or other damage must be trimmed or discarded in order that a continuous and sound support be provided for the roofing. Where multiple layers of insulation are in-



Fig 2—Typical premature failure showing wrinkles, alligator ridges, buckling and blistering of roof membrane as moisture becomes entrapped

stalled, joints of succeeding layers should be offset from those in layers previously applied.

Insulation should be laid with the tightest possible joints to minimize infiltration of hot bitumen applied to the insulation for embedment of the first ply of roofing felts. Unless special care is taken in the first mopping to ensure the filling of all insulation joints, the flow of bitumen into the joints may so reduce the coating of the underside of the felts that complete protection against moisture entering from below is no longer provided. It may prove desirable to tape all insulation joints before applying any bituminous material, although this is often more costly than the filling of the joints.

Saturated felts, unless also heavily coated with bitumen, are neither waterproof nor vaporproof, having a high rate of moisture absorption⁷ and a permeance of 20 to 30 perms.⁸ When 15-pound saturated felt is used as the first roofing ply, special effort should be made to provide its uniform coating with bitumen of thickness sufficient to prevent absorption of moisture. Spot-mopping, strip-mopping, and solid mopping with insufficient material, all leave uncoated felt surfaces and should be avoided in installing roofing felts.

When succeeding plies of felt are applied with inadequate moppings, areas occur where dry felt touches

dry felt. Moisture will be transmitted from ply to ply through these uncoated areas by capillarity. The resulting wrinkling, alligatoring, buckling and blistering are primary causes of premature roof failures.

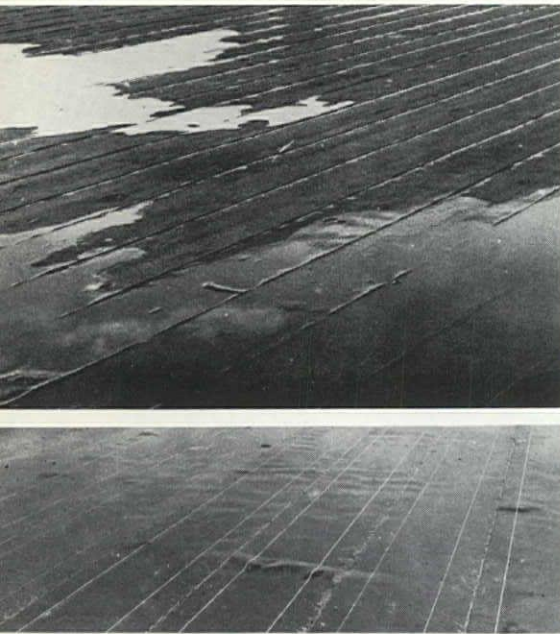
Figure 1 illustrates the effect of moisture on saturated felt under four different conditions. Figure 1A shows how tight joints and solid moppings of bitumen provide a continuous moisture-protective coating for the first ply of felt.

The effect of moisture on felts left exposed over insulation joints is illustrated by Figure 1B. The uncoated underside of the first ply of 15-pound felt is absorbing moisture from below, and the resulting expansion effects the succeeding plies also. If the upper layers of felt are also inadequately coated, the moisture will continue to migrate upward and to aggravate the expansion at this point as shown by Figure 1C. As illustrated by Figure 1D, a similar condition can also occur between insulation joints where inadequate mopping is used in applying the first ply of 15-pound saturated felt to the insulation itself.

Professor Brotherson recommends use of a 45-pound saturated and coated felt in place of the first ply of 15-pound saturated felt. This heavier felt is often called a base sheet and may vary in weight from 40 to 45 pounds per square. Its heavily coated surfaces make it both waterproof and vaporproof. In contrast to a 15-pound saturated felt, a 45-pound coated and saturated base sheet has a permeance to water vapor of 0.03 to 0.37 perms and is considered a good vapor barrier.

⁷ "Premature Failure of Built-up Roofing," Frank A. Joy, Pennsylvania State University, Engineering Experiment Station, Better Building Report No 5, Sept 1963

⁸ "Survey and Analysis of the Vapor Transmission of Building Materials," H. M. Whippo and B. T. Arnberg, Engineering Experiment Station, University of Colorado, Jan 1955



Figs 3, 4—Felts expand when left exposed to rain during the construction period, with wrinkling and buckling

The coated base sheet protects succeeding plies of 15-pound saturated felts from moisture that may have been sealed into the insulation during application of the roof. Its use will help the roofer attain a positive moisture seal where it is vitally needed, and assures a fully coated first ply of felt next to the insulation. Adequate quantities of bitumen should nevertheless be uniformly applied to the insulation to provide good adhesion of the base ply and uplifting resistance.

Base sheet, saturated felts and bitumen must be composed of compatible material. The roofing industry has held asphalt and coal-tar pitch to be incompatible and has avoided mopping with bitumen of one type those felts that are saturated with the other type.

Figure 2 provides graphic illustration of entrapped moisture's effect on a built-up roof. Wrinkles, alligator ridges, buckling and blistering indicate a premature roof failure that could have been avoided by following good roofing practice.

Figures 3 and 4 show one of the sources of moisture sealed into the roof during its construction. Uncoated roofing felts exposed to rain absorb moisture, and consequent expansion of the felts results in their wrinkling and buckling. Transmission of the moisture by capillary action into underlying felts has permanently damaged this roof. The danger of underlying felts being wetted can be reduced by carefully isolating each successive layer of felts with bitumen mopping.

Once wetted, underlying felts can virtually never be dried sufficiently to allow proper application of the top coating. Vagaries of the weather and the frequent presence of nighttime moisture condensation contribute to incomplete drying.

Exposed end laps as shown in Figure 5 are additional sources of unwanted moisture. Moisture will be absorbed by the exposed felt and, if underlying felts are incompletely sealed with bitumen, will be transmitted into each succeeding ply. The consequent expansion of the felts leads to their weakening through wrinkling and buckling, and subsequent contraction through partial drying may cause permanent deformation or splitting of the felt through elongation beyond the elastic limit.

Under exposure to strong solar radiation and high outdoor air temperatures, moisture trapped in the roof vaporizes and seeks escape to the exterior. However, the moisture is not readily released due to the resistance of intervening plies of felt and bitumen. Under such conditions, vapor pressures build up within the roof and create blisters at points of weakness where adhesion between plies has been lost through wrinkling and buckling of wetted felts.

Delamination of roofing felts indicates the use of insufficient amounts of coal tar pitch or asphalt between felts, improper embedment of the felts through inadequate brooming- or mopping-down, or both. The objective of the roofing specification is the construction of a roof essentially homogeneous throughout, composed of dry felts laid without voids or air pockets

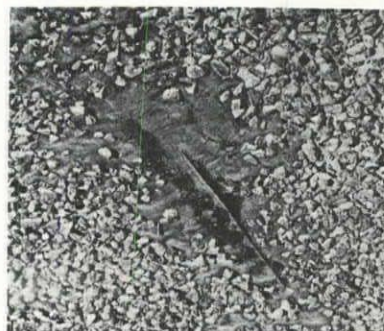


Fig 5—Exposed felt absorbs moisture, transmitting it to the felts below and causing premature roof failure

and firmly embedded in uniform layers of bitumen to form a waterproof membrane.

Roofing felts act to stabilize the layers of bitumen and to increase the roof's resistance to puncture,

but in order to perform properly they must be protected from moisture. This requirement places great importance on careful application of the top surface coating. During the life of the roof, this coating, which should be at least twice as thick as coatings between plies, is exposed to the drying and oxidizing effects of sun and weather. Its resistance to the effects of weathering must be adequate to provide continued protection of underlying felts.

Gravel or other aggregates are embedded in the top coating to reduce a tendency of the heavy top coat to flow when heated by the sun. Roofing aggregates also reduce oxidation of the bituminous coating by providing partial protection from direct solar radiation.

Adherence to recommendations summarized below will minimize the chance of premature failure.

1) Roof deck and supporting structure should be designed to minimize movement due to temperature variation or deflection.

2) Vapor barriers should be specified wherever there is possibility of excessive moisture migration into the insulation. All poured concrete or poured gypsum decks should be covered with a positive vapor barrier before insulation is applied. Where differences between indoor and outdoor vapor pressures are slight, as in an unheated warehouse for example, a vapor barrier may not be required.

3) Care should be exercised to provide the most even deck surface possible for proper application of the insulation.

4) Roofing components must be kept dry at all times, the recommended maximum moisture content for insulation being 10 per cent by weight.

5) Roofing felts must be uniformly and adequately coated with bitumen to prevent their absorption of moisture. This is particularly important in application of the first ply and, unless insulation joints are carefully taped or filled with bitumen, a 40- to 45-pound coated base sheet should be used.

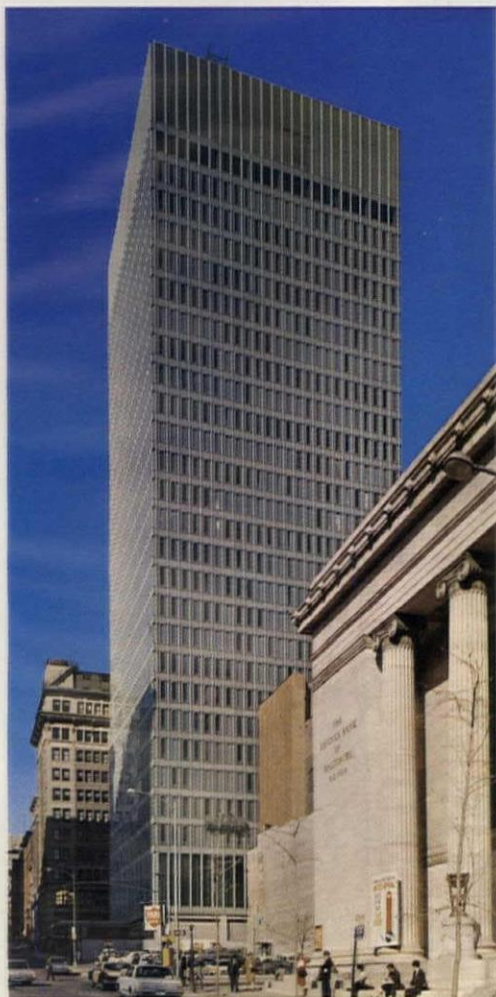
6) The uppermost roofing felt must be surfaced with a bituminous pour coat of thickness sufficient to prevent exposure of felts to moisture at edge or end laps.

7) Roofing application should be avoided during inclement weather or a temporary roof should be used.

8) Rigid control should be exercised over materials and workmanship, including bitumen temperatures and coverage. ■



Color and Form in architectural porcelain enamel create "building of many moods"



Formed porcelain enamel panels in richly muted hue with non-reflective surface give The Blaustein Building an aura of high quality and permanence. Combined with sharply defined mullions and solar grey tinted glass, they produce a striking pattern of light, shadow, and color.

"This will be a building of many moods," said Architect Vincent G. Kling, FAIA, of The Blaustein Building in downtown Baltimore. "The matte-finished sepia porcelain enamel panels provide exciting differences in color and value as changing sun and shadow conditions play on the building face.

"Recessed panels between the windows, sharply defined mullions in natural metal, and projecting spandrel panels give the facade a striking texture to produce rich light and shadow patterns. Solar grey tinted glass reflects the sky and surrounding environment."

Largest and tallest structure faced in porcelain enamel, the 30-story Blaustein Building utilizes formed porcelain enamel panels in one of the new richly toned muted colors and a matte finish. Mr. Kling describes the color as a combination of sepia brown blended with bottle-green and normandy grey. The non-reflective surface combined with design-coordinated color create an aura of high quality and permanence.

Recently-created colors and non-reflective finishes in architectural porcelain enamel on Armco Enameling Iron offer new dimensions for creative design of truly distinctive structures . . . high rise or low rise. Armco Enameling Iron is the most widely used base metal for finest quality porcelain enameling. Perhaps you would like to see a few of these unique color possibilities or learn more about Armco Enameling Iron. Write **Armco Steel Corporation, Steel Division, Dept. E-1675, P. O. Box 600, Middletown, Ohio 45042.**

Architect: Vincent G. Kling, FAIA
Porcelain Enameler: Ingram-Richardson Manufacturing Company
Builder and Half-owner: McCloskey & Co.
Curtain Wall Contractor: Gridwall Company, Division of Aluminum Extrusion Co.

ARMCO STEEL



Letters Cont'd from p 16

Mr Carver and the Dunes

EDITOR:

We commend the four AIA chapters for recognizing the need for comprehensive planning and for their leadership in forming the Lake Michigan Regional Planning Council to stimulate such activity in the Indiana Dunes region. An urgent need exists in northwest Indiana, as well as in many other

areas of the United States, for comprehensive regional plans developed by competent planners primarily concerned with seeking solutions beneficial to the long-range interests of the public.

As you may know, the Bureau of the Budget views both the Burns Waterway Harbor and the national lakeshore proposal as integral elements for balanced development of the Indiana Dunes region. We are aware of the need for balancing

plans for preservation of the clear waters of Lake Michigan and the clean beaches and picturesque dunes of northwestern Indiana with development of the region's commercial and industrial potentials. We applaud recognition of the fact that noneconomic needs can be just as important as economic needs—sometimes more so.

JOHN A. CARVER JR

*Under Secretary of the Interior
Washington, DC*

EDITOR:

The December issue carried an article which I believe to be a very sound proposal for an alternate to the desecration of the Indiana Dunes. It is obvious that much planning, time and effort went into this scheme; I would then assume that these men of the Lake Michigan Region Planning Council do care about what is to happen to this area.

The editor's note that follows the article is perhaps the most appalling thing I have ever read. Does this Council feel that simply by drawing up such a plan the dunes will be preserved? It sounds as if the Council doesn't want to dirty its hand with "the involvement in politics and arguments" that just might preserve this area. Why the apathy?

If only these same planners, with the support of the area's AIA chapters, could speak up for what they obviously believe in, they might find the support that is necessary. I sincerely believe that nothing can or will be done until there is "involvement" in the issue.

MICHAEL M. IMLAY
*Architect
Highland Park, Ill*

ED NOTE: Bills have been reintroduced in both Houses which link the Indiana Dunes National Lakeshore with authorization of a public harbor. Chances of passage seem better than in the 88th Congress.

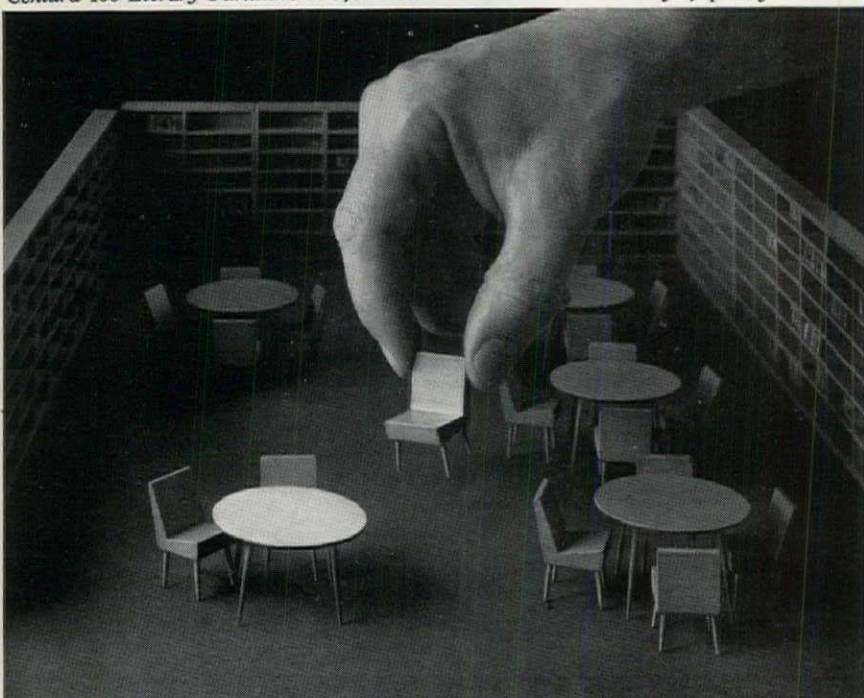
The Wonders of New York

EDITOR:

It did not amaze me in the least to learn that New York City lacks a master plan or a "comprehensive" development plan of any sort of any age whatsoever (Editor's Page, Dec '64). In fact, in January 1965 it has yet to claim a completed "sketch-plan"—whatever that might be—although such an item was scheduled for completion by June 1964 in the city's official "Work-

Cont'd on p 84

Centura 400 Library Furniture . . . for those who believe in the economy of quality



HOW TO BEGIN WITH A "FINISHING TOUCH"

Before construction has even begun, you can set up your complete library, adjust shelving, locate displays, move furniture around at will to get exactly what you want. The designers at Sjöström's dimensional planning service use your floor plans with miniature scale model library furniture to

help you plan in a professional way. Start by taking advantage of this exclusive Sjöström service. Complete your project by installing Centura 400 library furniture for that final touch of quality. Find out for yourself. Request the Alpha III catalog or consult your nearest Sjöström representative today.

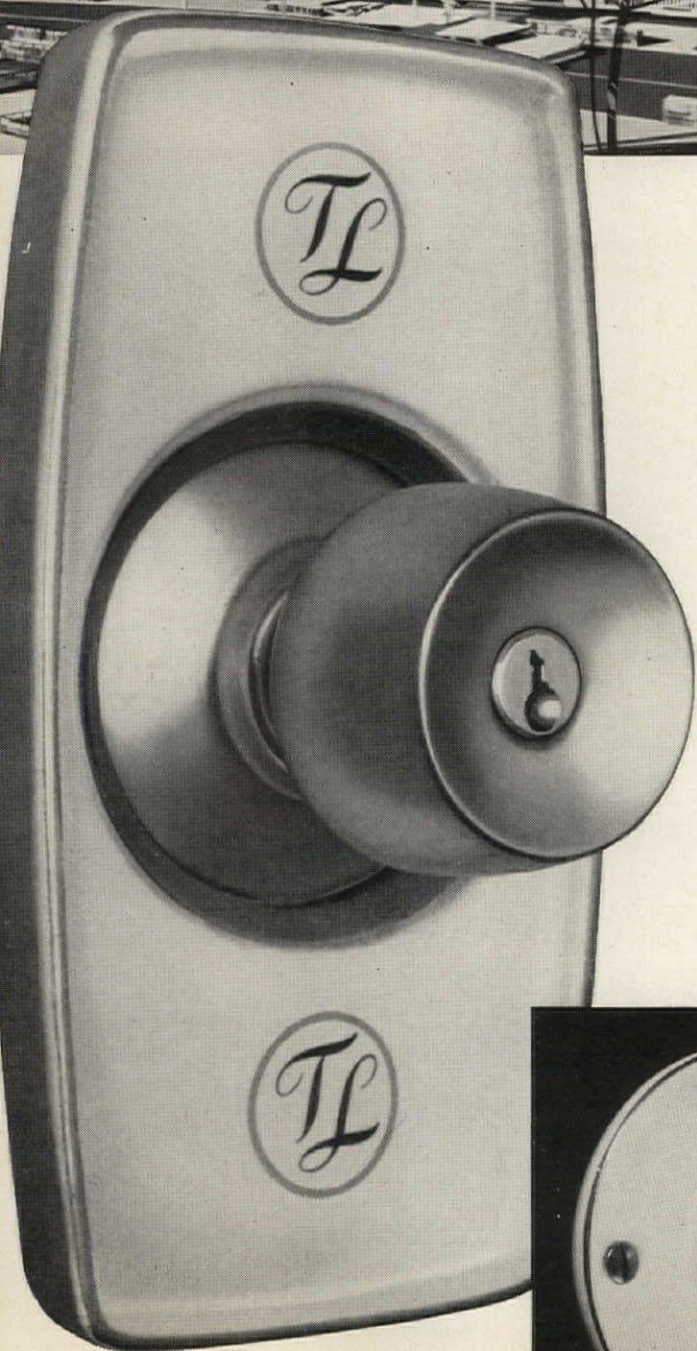


Latest addition to the famous Sjöström line—the new 500 System Study Carrel. Completely versatile, it may be used back to back, side to side, tandem or solo, and your precise needs of functional inner space can be solved. Request new carrel systems brochure.

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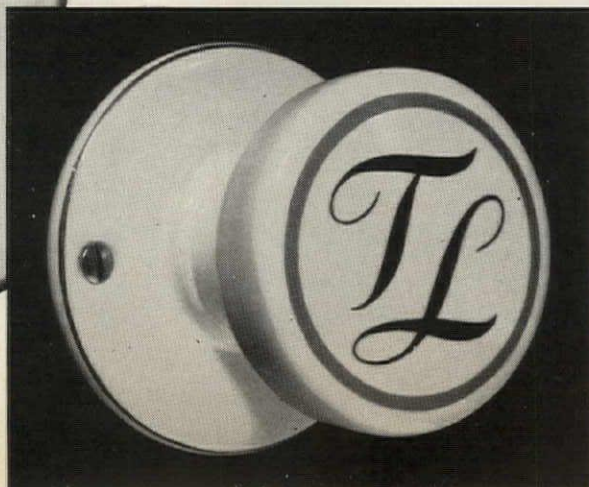
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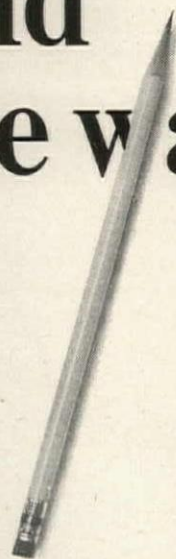
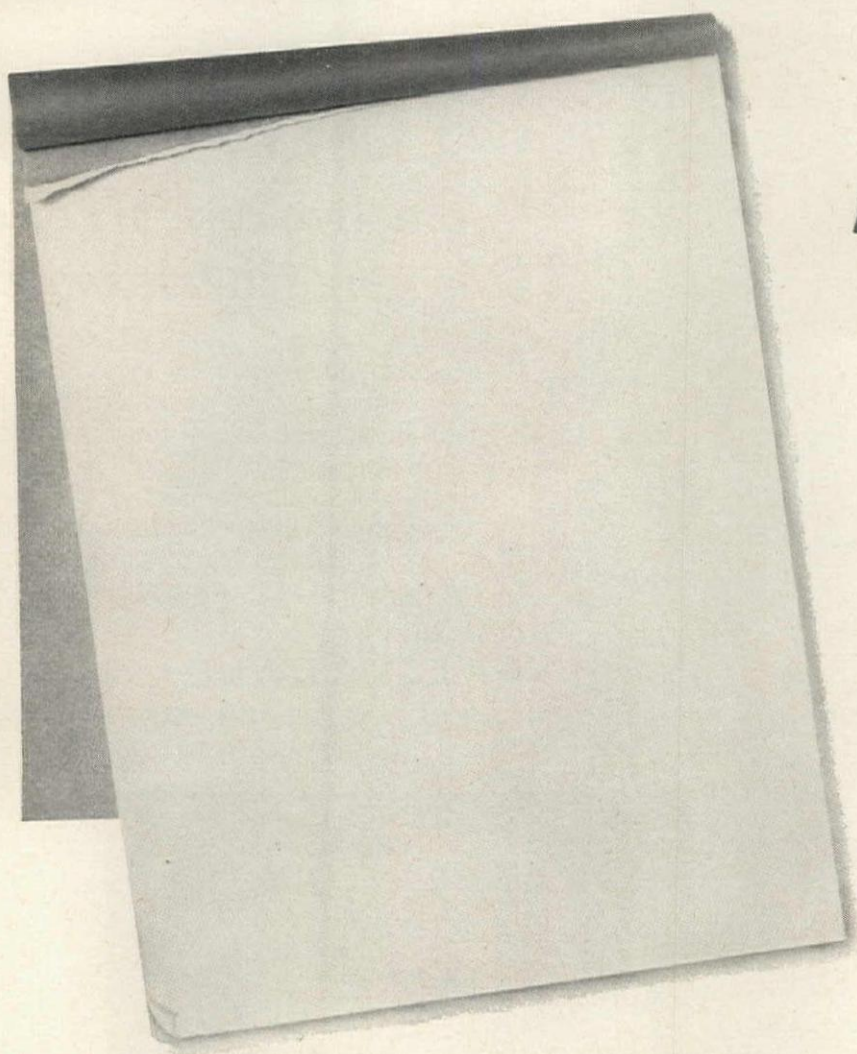
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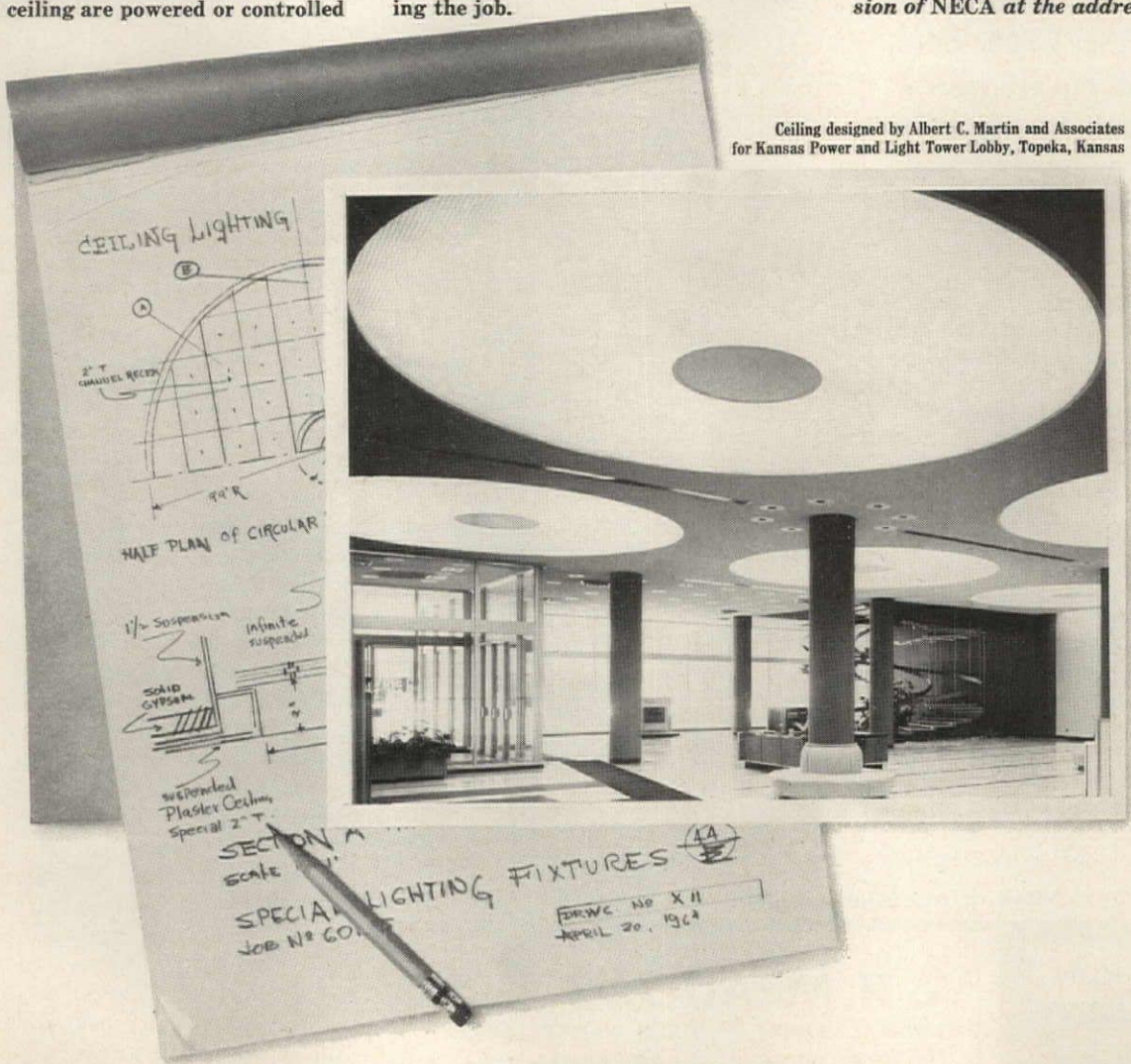
by electricity... and electricity is the electrical contractor's business.

Of course, proper installation will require the services of carpenters, sheet metal men, plasterers, plumbers, heating and refrigeration men. But your qualified electrical contractor has plenty of experience in coordinating the efforts of these specialists—and he has available to him established and recognized procedures through which jurisdictional questions can be settled without delaying the job.

And that's not all. Place the responsibility for your integrated ceiling in the hands of your qualified electrical contractor and he'll guarantee the performance, not only of the electrical functions, but of the entire electrically space-conditioned ceiling system.

NECA has prepared a film on integrated electric ceilings. To arrange a showing, contact the Marketing Division of NECA at the address below.

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able Program" as recertified in the Housing and Home Finance Agency in May of last year.

However, I am not an architect but only a professionally schooled "city planner" who continues to be amazed not so much at the character of the city's plans but at the lack of concern by the public, the HHFA, the Urban Renewal Administration, the American Institute of Planners, the city's planning agency and just about anyone who is aware of what has not been done.

JAMES ROSGOOD
New York, NY

EDITOR:

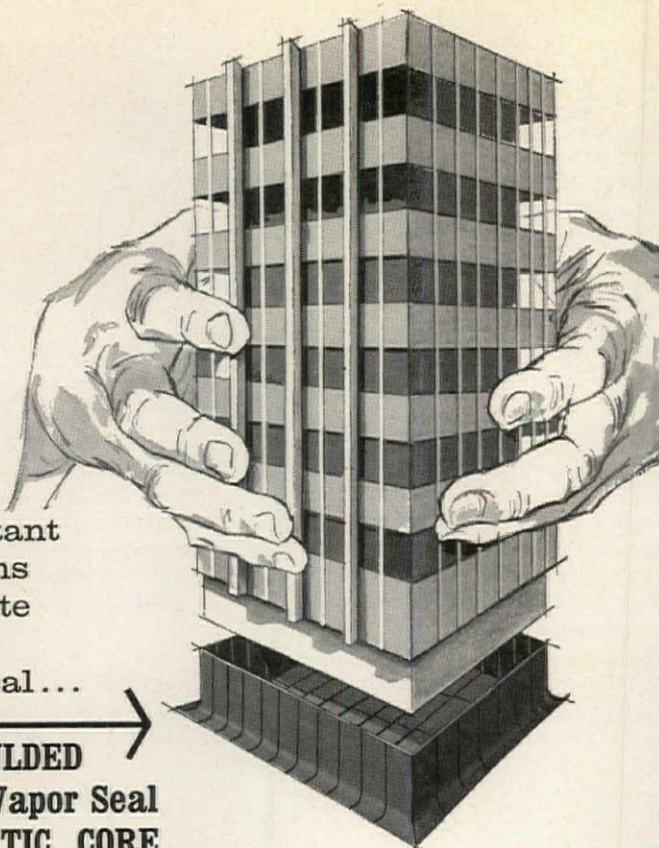
In the beginning of "Justine," the first volume of Lawrence Durrell's Alexandria quartet, there is a passage which bears so extraordinary an analogy to a New York street scene that it is worth quoting:

A camel has collapsed from exhaustion in the street. It is too heavy to transport to the slaughterhouse so the men come with axes to cut it up there and then in the open street, alive. They hack through the white flesh—the poor creature looking ever more pained, more aristocratic, more puzzled as its legs are hacked off. Finally there is the head still alive, the eyes open, looking around. Not a scream of protest, not a struggle. The animal submits like a palm tree. But for days afterward the muddy street is soaked in its blood, and our bare feet are printed by the moisture.*

One cannot help but think of the silent dismemberment of the Pennsylvania Station that the New Yorkers watch these days, driving down Seventh Avenue. One by one the several parts of this patient palace of railroad past are being hacked off. But the station, still very much alive, with the pulsing blood of commuters circulating in its inner arteries, sits there aristocratically and puzzled, as the wreckers attack one section, then another. The clock is still going (the camel's open eye), looking out on the visitors who are invited by large signs to enter one of the gaping wounds in the station's side. Except for that memorable picketing event in which some of us participated in August 1962, there was not a scream of

Cont'd on p 86

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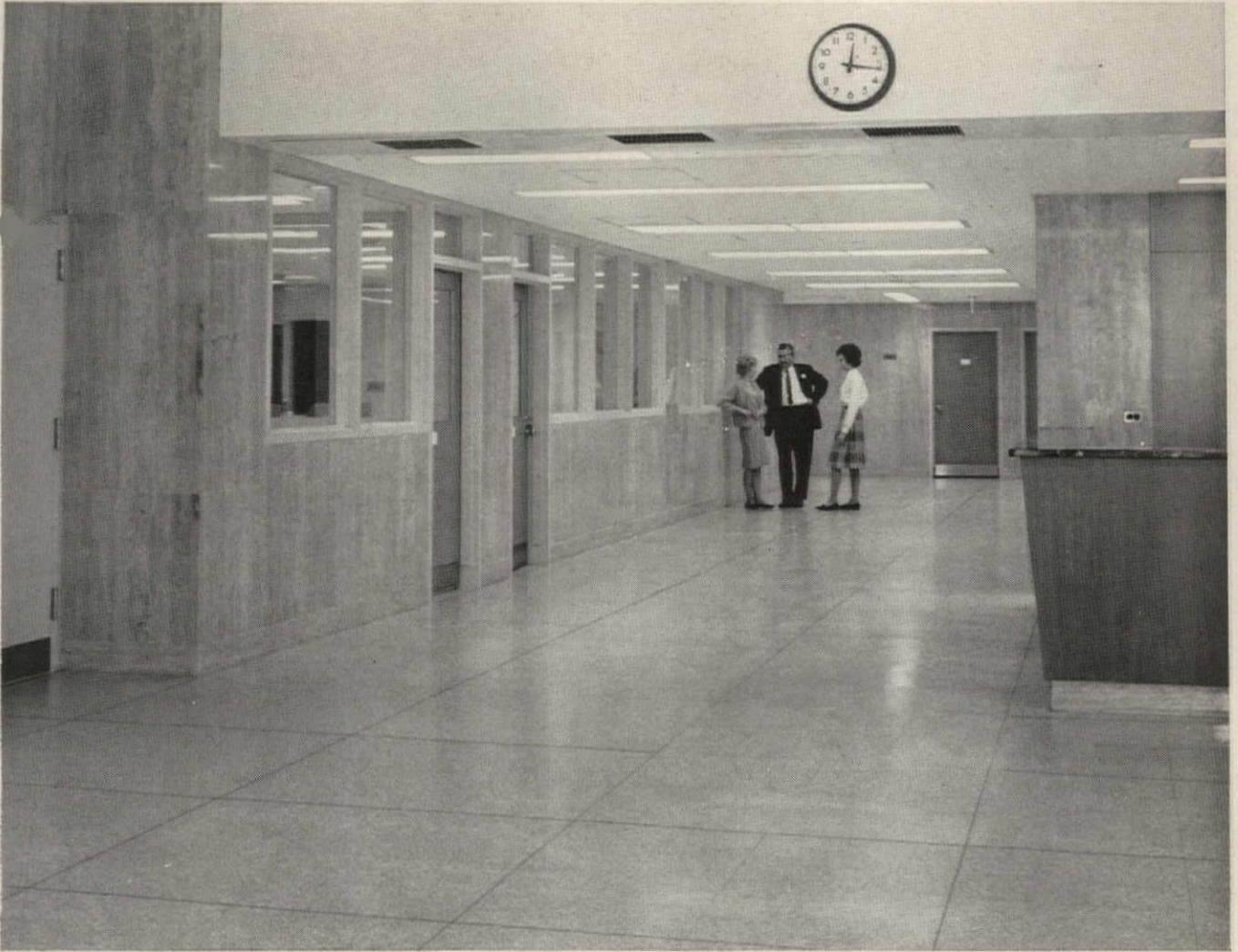
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CREDITS: ARCHITECT: LASHMIT-BROWN-POLLOCK, AIA, WINSTON-SALEM, NORTH CAROLINA. GENERAL CONTRACTOR: REA CONSTRUCTION COMPANY, CHARLOTTE, NORTH CAROLINA. TERRAZZO CONTRACTOR: CAROLINA MARBLE & TILE CO., WINSTON-SALEM, NORTH CAROLINA.



TERRAZZO ... 12:17... sometime in 1975

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PORTLAND CEMENT

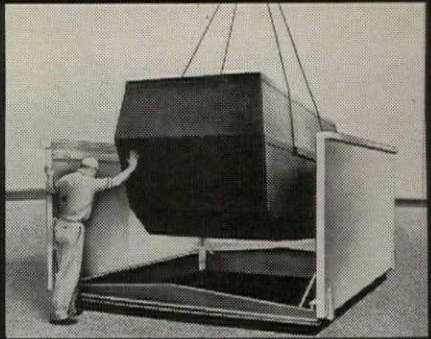
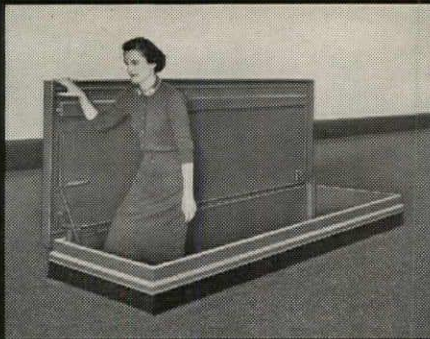
This picture of the terrazzo floors of the new Forsyth General Hospital in Winston-Salem was taken last Spring, just before they started admitting patients. In ten years, even twenty or more years, the floors will look the same ... or better. There will have been tremendous traffic over them, but terrazzo can not only take it ... it actually *improves with age*. Continuous traffic combined with simple basic maintenance have a mellowing effect that heightens terrazzo's basic natural beauty.

As is so frequently the case with fine terrazzo floors, the contractor chose Trinity White Portland Cement for the job.



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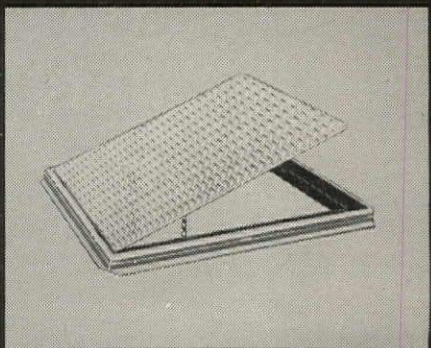


Neat and trim in appearance, Bilco Roof Scuttles remain "out of sightline" when installed, feature full welded corners, integral capflashing and neoprene draft seals — are weathertight, permanent.

Whether for ladder access, shown at left, for steep or normal stairs, as above, the extra-sturdy construction of rugged Bilco Roof Scuttles assures long-lasting, economical service, true dependability.

The double-leaf Type "D" Bilco Roof Scuttle is ideal for the placement and removal of large equipment through the roof. Compression spring operators afford smooth, easy operation.

doors for special services *



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The demands of today's architecture have brought about radical changes in the design and construction of doors for horizontal access. To serve the architect in his practical approach to access problems, the Bilco Company has pioneered the application of built-in springs for effortless operation and the use of new materials for lifelong, trouble-free service. Wherever horizontal access is required, a Bilco product will do the job better.



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A polymer seal-finish for terrazzo, concrete, clay tile, brick, slate and all types of natural stone.

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A water emulsion product with an extra high solids content. Apply in a thin film with mop or lambswool applicator. Seal-Tite requires no buffing after application. Its natural high gloss enhances the natural colors in the floor. Excellent for interior or exterior surfaces and is ideal for light colored floors because of its non-yellowing characteristics.

COVERAGE:

1,000 to 1,500 square feet per gallon depending on the porosity of the floor.

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N.V.M.: 25.0%—26.0%. / Film Properties: Film on black glass—clear. / Drying time at 25° C., 50% R.H.—20 min. maximum. / Leveling—spreads uniformly. / Gloss—high. / Water Resistance—no spotting or whitening or film deterioration. / Tackiness—none. / Odor: non-objectionable at any time.

GUARANTEE:

Controlled uniformity. When floor or surface is properly prepared and when applied according to directions, all claims for the product are guaranteed.

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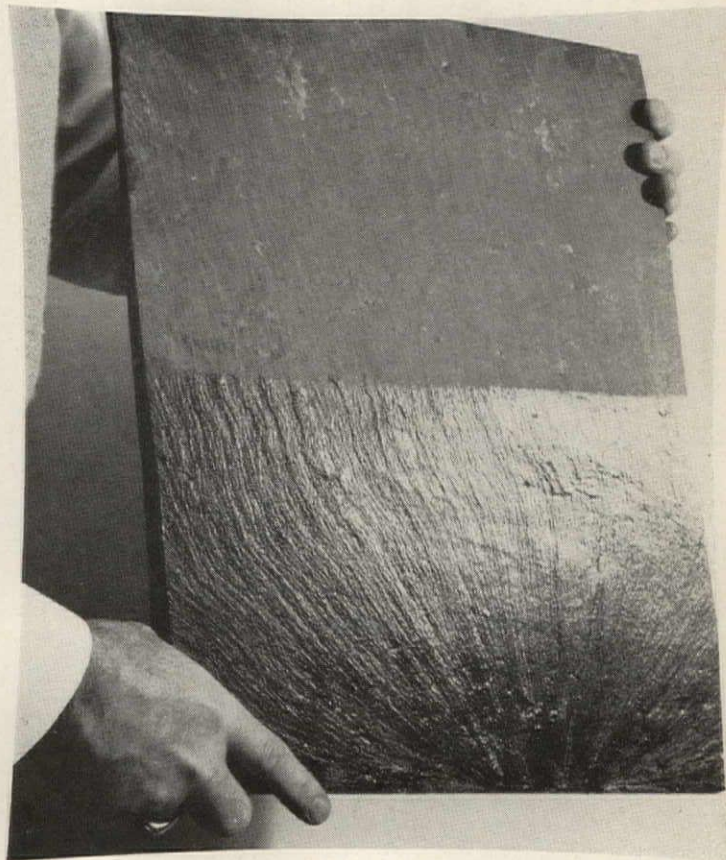
Clean when necessary with a neutral chemical cleaner (Super Shine-All). Regular treatment with Hillyard Super Hil-Tone dressing for conditioning and dust control. Buffing restores appearance when necessary.

APPROVALS:

Listed by Underwriters Laboratories relating to slip resistance.

REFERENCES:

Product informational literature No. 262-55.



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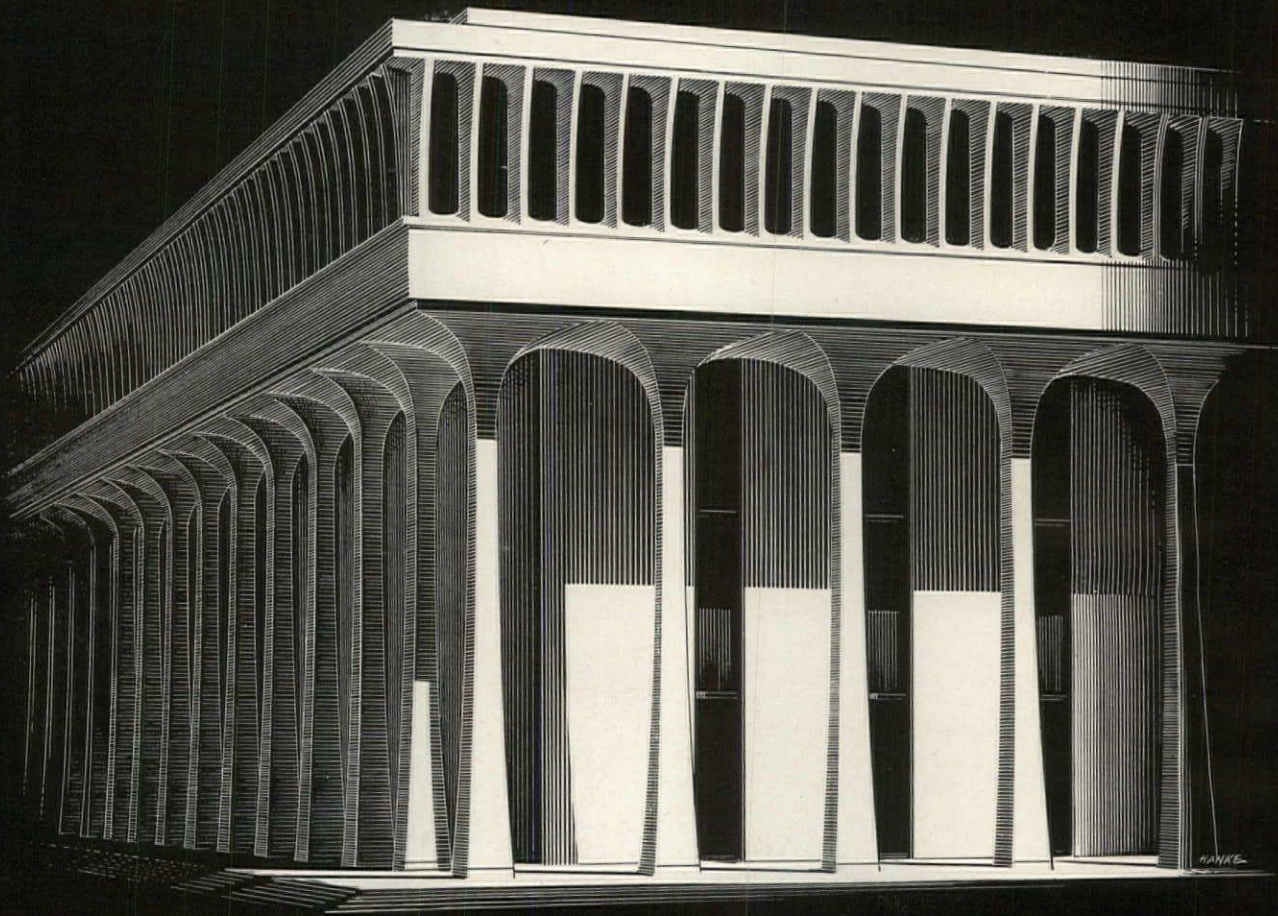
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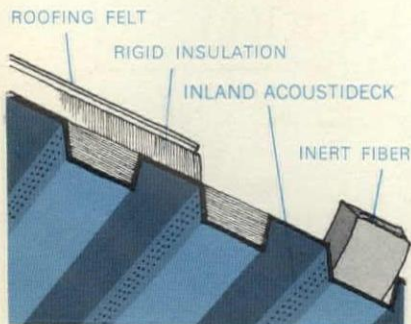
**here,
there's a ceiling
on noise!**

Photograph by: William Wolfen Studios



Turner High School, Beloit, Wisconsin
Architects and Engineers: Durrant,
Deininger, Domer, Kramer, Gordon; Watertown, Wis. and Dubuque, Iowa
General Contractor: Severson-Schlitz, Inc., Janesville, Wis.

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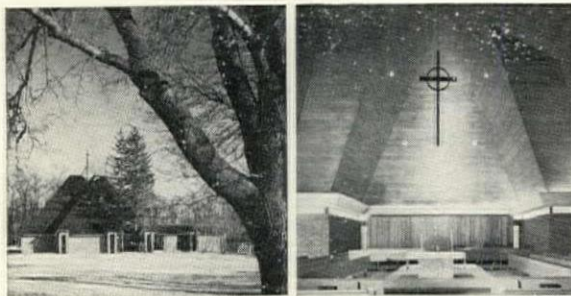
CONFERENCES / Churches & Clients

Addresses by an architect and a theologian will highlight this year's national Conference on Church Architecture, set for April 27-29 in the Pick-Congress Hotel, Chicago.

Philadelphia's Louis Kahn FAIA will be the keynote, discussing "Architecture Which Faces the Struggle for Truth and Justice." Dr Paul Tillich, former Harvard University theology professor, will give the banquet speech, "Honesty and Consecration in Religious Art and Architecture Today."

As usual, there will be an architectural exhibit. Awards will be made by the American Society for Church Architecture and the Church Architectural Guild of America, co-sponsors of the conference with the Department of Church Building and Architecture of the National Council of Churches of Christ.

The jury will consist of Institute Fellows Richard M. Bennett and L. Morgan Yost of Chicago; Dr Martin Marty, University of Chicago; Prof John Replinger, Graduate School of Design, University of Illinois; and Mildred C. Widber, Department of Educational Program, United Church of Christ.



Best in '64 Exhibit: Chapel for the University Presbyterian Church in Rochester, Mich, designed by Linn Smith Associates, Birmingham, "is a good experiment in liturgical arrangement, especially in the union of pulpit and altar with neither competing for attention."

Last year's jury, in its official report, declared: "Most of the projects submitted show relatively little deep probing into what the church does when it gathers for worship. . . . The divided chancel arrangement has been noticeably absent and the concert stage arrangement is represented only by a minority. There is a pronounced tendency to experiment with central plans though only a few examples show awareness of the problems these involve, especially the difficulty in preaching. The uniting of pulpit, altar and font seems also prevalent though in many cases the distinct functions of these is not made clear from the space allocated to each."

SESSIONS IN ST LOUIS: An April 21-23 conference on "Planning for the Quality of Urban Life" will be Washington University's major contribution to the St Louis Bicentennial celebration. It is being made possible through a \$45,000 gift by the St Louis Regional Planning and Construction Foundation. Dean Joseph Passonneau FAIA of the School of Architecture said the sessions will examine and describe the qualities of the St Louis physical environment. ■

CALENDAR

- April 22-23:** AISC National Engineering Conference, Chisca Plaza, Memphis
- April 25-29:** American Society of Planning Officials-Community Planning Association of Canada Joint Conference, Royal York Hotel, Toronto
- April 27-29:** Conference on Church Architecture and Architectural Exhibit, Pick-Congress Hotel, Chicago; BRI Spring Conferences, Mayflower Hotel, Washington, DC
- April 30-May 2:** US Institute for Theater Technology, Indiana University, Bloomington
- May 18-20:** Middle Atlantic Hospital Assembly and Architectural Exhibition, Convention Hall, Atlantic City
- May 24-26:** CSI Convention, El Cortez Hotel, San Diego
- June 7-9:** National Lighting Exposition and World Lighting Forum, New York Coliseum
- June 10-12:** AIA Board of Directors, Washington, DC
- June 11-12:** NCARB Annual Meeting, Sheraton-Park Hotel, Washington, DC
- June 11-13:** ACSA Annual Meeting, Sheraton-Park Hotel, Washington, DC
- June 14-18:** AIA Annual Conference and XI Pan American Congress of Architects, Sheraton-Park Hotel, Washington, DC
- June 27-30:** ASLA Annual Meeting, Statler-Hilton Hotel, Hartford
- July 2-3:** UIA General Assembly, Paris
- July 5-9:** UIA World Congress, Paris

AIA Regional and State Conventions

- Aug 18-21:** Northwest Region, Glacier National Park, Mont
- Sept 9-11:** New Jersey Society of Architects, Essex and Sussex Hotel, Spring Lake
- Oct 6-10:** California Region, Yosemite National Park
- Oct 14-16:** Ohio Region, Atwood Lake Lodge, New Philadelphia
- Oct 21-23:** Pennsylvania Region, Hershey; Western Mountain Region, Mountain Shadows Resort, Scottsdale, Ariz
- Nov 3-5:** Texas Society of Architects, Austin
- Nov 3-6:** Central States Region, Des Moines
- Nov 17-20:** Florida Region, Jack Tar Hotel, Clearwater

AIA Committee and Related Meetings

(At the Octagon unless otherwise specified)

- April 20-21:** Homes for Better Living Awards
- April 29-30:** NAAB
- May 6-7:** School and College Architecture
- June 6-12:** AIA-ACSA Teachers Seminar
- June 27-29:** Second Columbia Conference, New York

NECROLOGY

- CHILDS, FRANK A., FAIA, Chicago, Ill
- LANCE, GASTON C., Tacoma, Wash
- MACDONALD, C. R., Greenville, SC
- MADSEN, CHRISTIAN, Stevens Point, Wis
- MERRELL, ROBERT E., Clovis, NM
- MOISE, HOWARD, Berkeley, Calif
- SHAW, WILLIAM P., Birmingham, Ala
- THOMAS, ARTHUR E., Norwich, Conn
- WEBER, ANDREW, Queens Village, NY
- WOHLBERG, JOHN B., Topeka, Kan
- WORCESTER, WAKEFIELD, Washington Depot, Conn