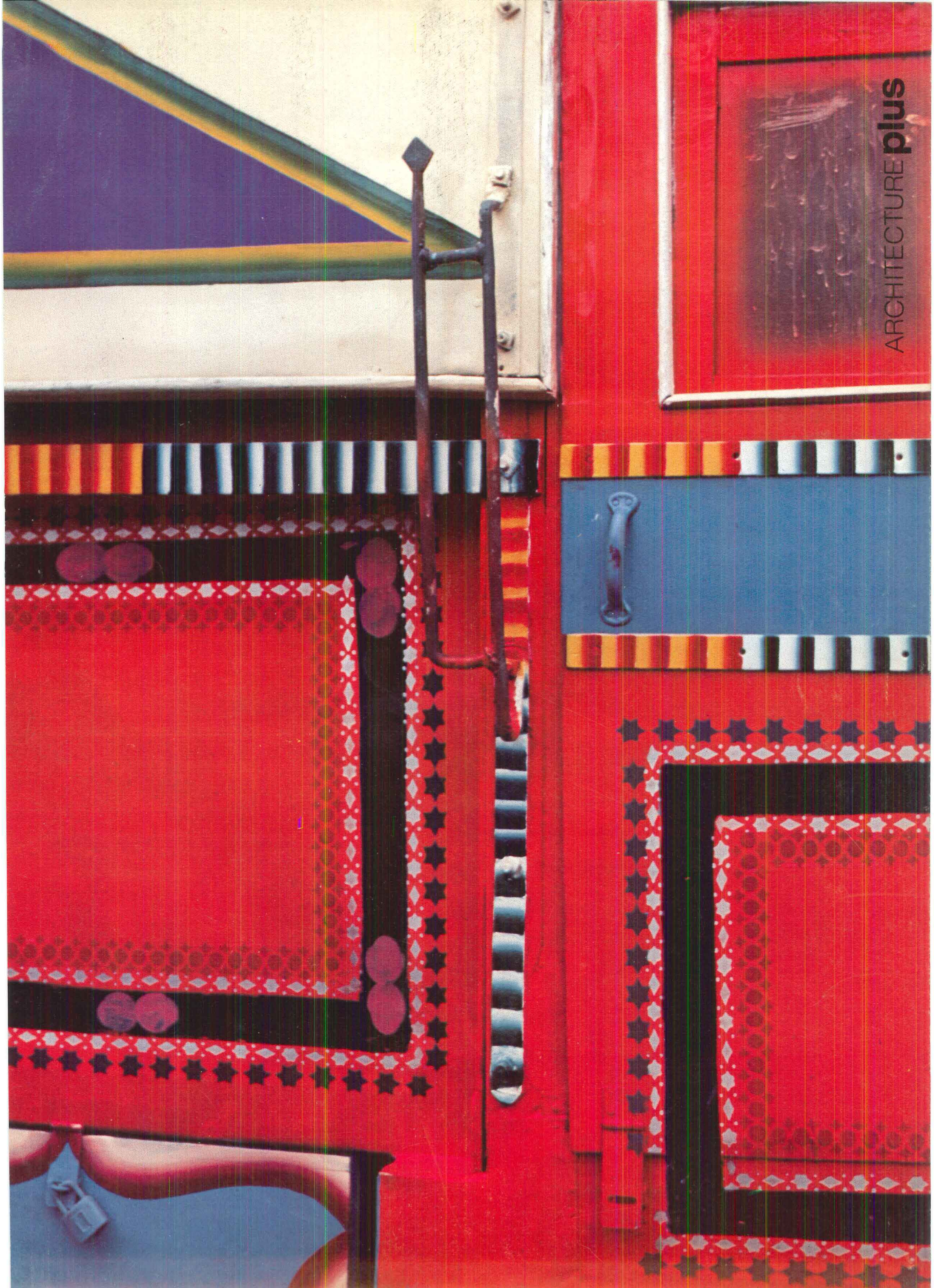
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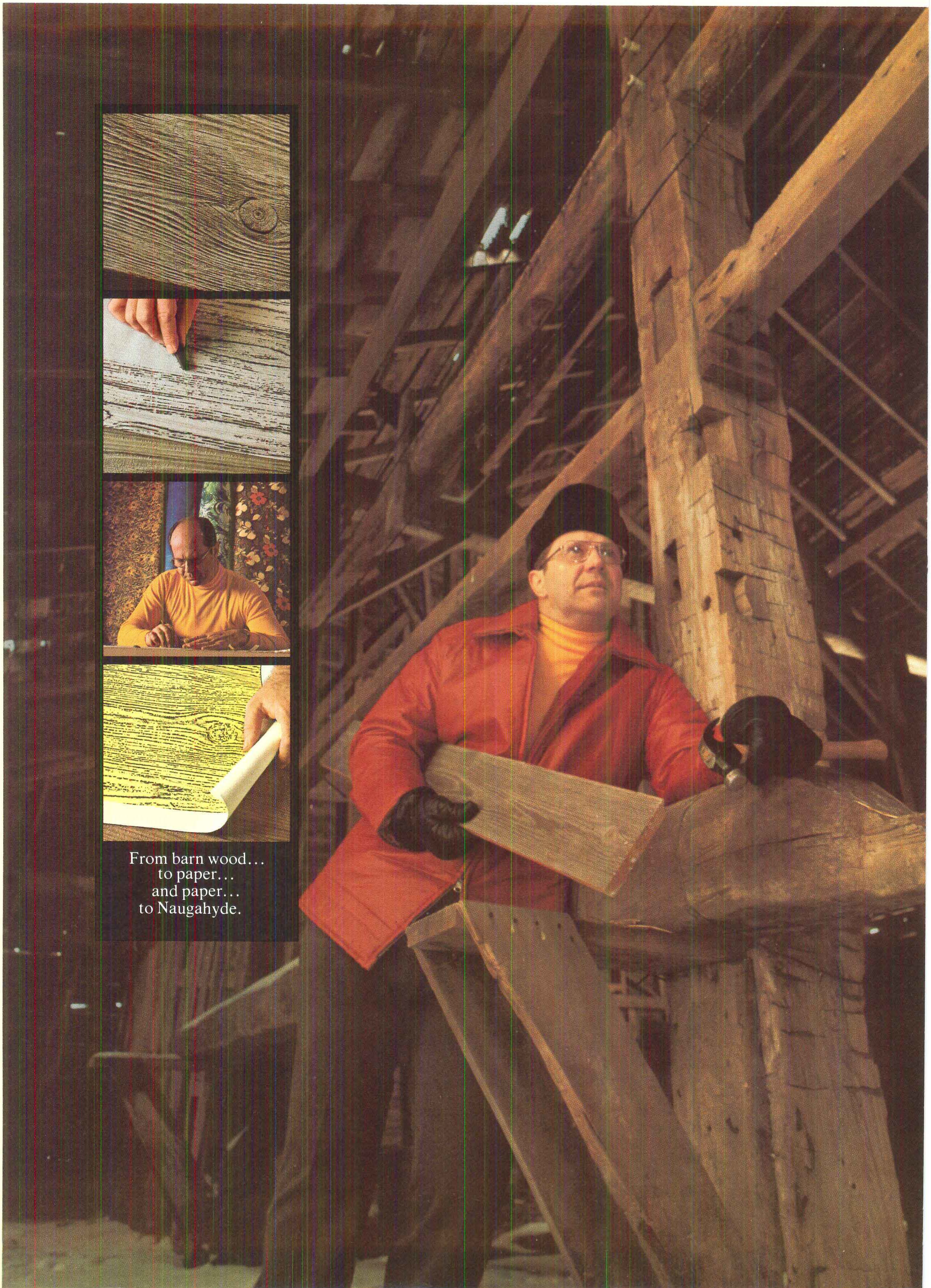

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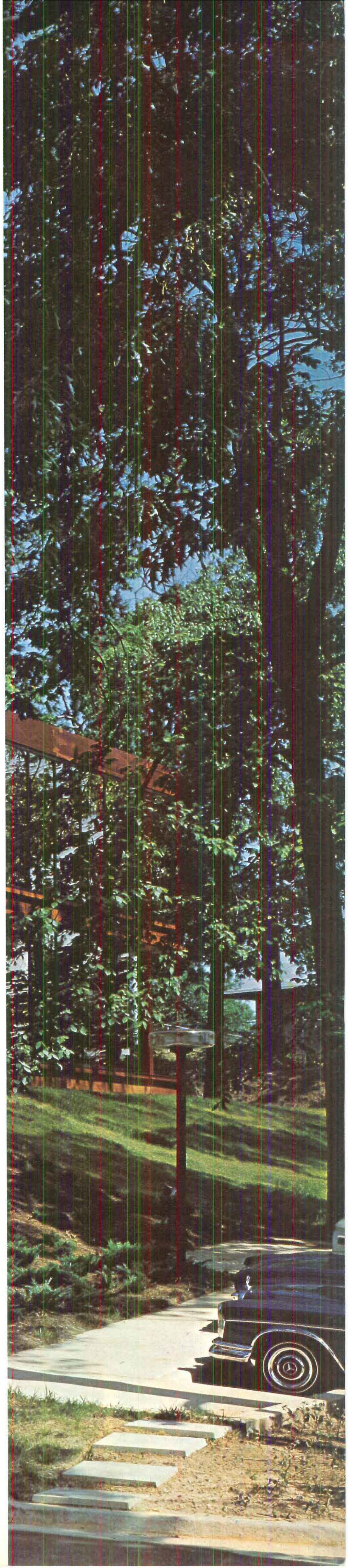

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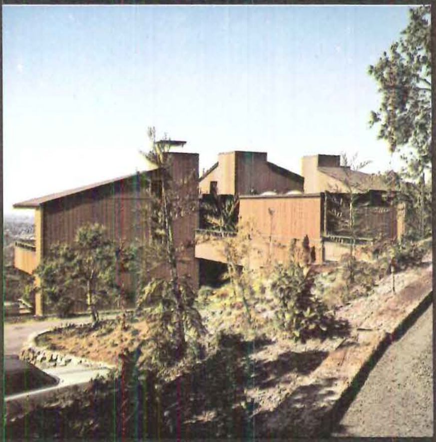

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ARCHITECTURE plus

The International Magazine of Architecture July 1973

Cover design based on a detail from one of the Afghanistan trucks.

ARCHITECTURE PLUS JULY 1973 VOLUME 1 NUMBER 6.

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Letters

Plus Quiz

Our April issue, on its Footnote Page, contained this photograph with an invitation to our readers to supply the identification. Here are some of the more entertaining replies:

I resent your obvious attempt to obfuscate and distract your readers; this is simply a grain silo which meets OSHA regulations for emergency exits.
BOB CLENDENNEN
Tyler, Texas

A Mexican torta stand or a bugging device attached to the Watergate.
BRIAN CLARK
Architect, San Diego

The picture represents an apartment building or living quarters and the appendages are water storage tanks.
J. P. NICELY
Vice president, sales
Gold Bond Building Products
Buffalo

A tree trunk with fungus growth.
WILLIAM W. DARRIN
Architect, Meadville, Pa.

The answer to your identity crisis is a baked potato stand. Being that I am from thereabouts I could spot one from as far as the crow flies.
ROBERT ZEMAN
Toledo, Ohio

The vertical elements of the structure are downspouts which lead to a central cistern.
MICHAEL J. BRUMER
Tampa

None of the things you suggest. It is either 1) a bristle cone pine, here shown bristling 2) a hat rack in an Italian Army barracks 3) the last thing an ant sees before being run over by a motorcycle 4) a pregnant yucca 5) an ice cream dredge 6) an elephant with 42 toes 7) a slip-form structure in which the form slipped 8) a mistake.
WILLIAM R. BROCKWAY
Architect, Baton Rouge

A coat rack for giant kangaroo pouches.
JERRIE W. WOLFE
Boise

Roy Coleman, our head production man, says he thinks it is an apartment house with lifeboats waiting for the flood. As secretary for the firm, my entry is—a giant pine cone, as that is exactly what it looks like to me.
LINDA WILSON
Culver City, Calif.

I'll bet this is a joke just to see who's stupid enough to respond to your quiz. Well, I'm stupid and also anxious for a free subscription to PLUS. I'm also broke, so perhaps this will add to my qualifications. It's a prize ear of corn.
JOE PREVITERA
Architect, TVA, Knoxville

A giant pine cone. Is this correct?
LYDA BASSINGTHWAIGHTE
Dallas

Obviously, a statue of Diana of Ephesus.
ROBERT B. PILS
Architect, Washington, D. C.

A Yucca plant flower. These strange plants thrive in dry dusty desert areas in some areas of the world, and bloom in the springtime. In Texas, a plant of the size shown would be considered a dwarf Yucca and might be found in some of the smaller solariums usually found in the more modest Texas cottages.
M. WAYLAND BROWN
Architect, Dallas

A structure made of a new inexpensive building material; namely, elephant turd! Do I win a prize?
TETSUO TAKAYANAGI
Architect, Cambridge, Mass.

Could you please let me know who the architect is so I can send him a nasty letter.
BARBARA LAMPLE
Los Angeles

A baked potato stand! (Form follows function.)
PATRICIA HERRON
San Jacinto, Calif.

Each apartment has a concrete balcony. The formwork is in the form of a boat. The balconies are then raised into place. Howzzat.
GITA DEV
Houston

An apartment building. Now do I get a free subscription? I sure hope so because us college students cannot afford to buy this magazine or any magazine.
LARRY LOUSEN
La Crescenta, Calif.

A fertility totem.
SCOTT MCFARREN
Chico, Calif.

This is not the world's largest artichoke, unfortunately. An artichoke's central core must be easier to use than that. If you know of any curved trapezoidal furniture for the back wall, please send the address to the architect.
JEAN MARIE SCHIMPFF
Architect, Paris

I must select #8 (a giant pine cone) with some clarification: the photo should be turned upside down and then one should squint. You can leave the photo in an upright position, but it requires more squinting.

The true answer is a highrise hog feeder.
JAMES R. FILLERUP
Billings, Montana

Correct Answer: A tower in the "City of the 21st Century" designed by Architect Gerard Grandval, and built in the Paris suburb of Creteil. Many readers identified the construction correctly; as promised, the first ten will receive free subscriptions for one year to Architecture PLUS. The runners-up will receive a free copy of this issue.

Your initial issues have begun to unite the profession of architecture by exhibiting the work of fellow professionals around the world. You have begun to pursue one of the prime objectives of our task—"communication."
DOUGLAS L. SHUCK
Architect, Findlay, Ohio

PLUS is the best architectural magazine that has come on the scene for many a year. I congratulate you on your article concerning the pedestrian walkways in Europe and the United States. I am asking our Downtown Denver Improvement, Inc. to obtain copies for its entire Planning Committee, as it is so broad.
JAMES S. SUDLER
Architect, Denver, Col.

Your first two issues were outstanding, but your April issue featuring "City Streets For People" is a real inspiration! I hope you will continue to keep your focus on quality design in architecture, landscape architecture, and planning. It is a welcome change from the usual fare of the most recent monument or the latest fad.
DANIEL ALAN DAY
Architect, Indianapolis, Ind.

We were looking forward for an international publication in Architecture and Urbanization . . .
NOW WE GOT IT.
We send you all our best wishes for Architecture PLUS. Get Going.
DANIEL LANSKI
Architect, Rishon-Le-Zion, Israel

Even though you gave credit to Harry Weese and Associates for Helena Hernmarck's tapestry at the First National Bank in Dayton, Ohio, when Granzow and Guss, Architects of Columbus, Ohio, is responsible for the bank's tenant space and the acquisition of Helena's tapestry for that space, I would still like to subscribe to Architecture PLUS, if only to crit your future articles.
PAUL F. SCHEIDERER
Architect, Columbus, Ohio

Apologies for the omission; and we'll welcome your crits.—ED

I read your report on the First Federal Design Assembly and thought it was not only completely accurate and true, but brilliantly funny.
SAUL BASS
Designer & Film Maker
Los Angeles and London

I read your articles in the March issue on "The Federal Design Assembly" and "The Spirit of '76" and turned sick. They are unabashed editorializing which is by no means "news." What makes me sick is that a magazine with your potential should stoop so low . . . I'll try not to let your obvious political orientation disturb my enjoyment of your architectural matter.
JAMES W. DIXON
Architect, Wilmington, Ohio

The reason we call our news section NEWS+ is that we want it to contain comment as well as news reports from around the world. If the bias shows, it was meant to.—ED.

Many thanks for your kind words . . . in your extremely perceptive article describing the First Federal Design Assembly.
M. PAUL FRIEDBERG
Landscape Architect and
Urban Designer
New York, N.Y.

Your article on Gwathmey and Siegel's nice-looking Purchase dormitory (May issue) said that "its conception of dormitory planning . . . is now considered outmoded." Dormitories for undergraduates or any college student were outmoded ten years ago and not working very well some time before that. Students want and need what other adults in our society want and need: self-catering housing units with access to shopping areas, restaurants, etc.; privacy and responsibility to control and choose his social life, his sex life, finances and diet. For the University it means less catering and a smaller maintenance staff (a huge headache in places like Purchase).

In this dormitory for 800 people, because of its "conception," squalid lives will be led and the sounds of misery and disorder will travel through the walls right along with those electrical and telephone conduits. It is a handsome solution to an architect's problem: how to get a swell shape for a price. The students' problem remains not only unanswered but worsened. It is so unnecessary.
ELIZABETH MOYNAHAN
Architect, Princeton, N. J.

I am sorry not to have written sooner to thank you for your sincere effort on our behalf (May issue). I think it is a terrific article and we are most appreciative.

I personally have one rather serious concern with regard to the quotations relating to the *Five Architects* book. I feel initially that you broke the faith in talking about the book at all, for the article is about Gwathmey Siegel, not Gwathmey and his extra-curricular endeavors. Secondly, one-line answers, out of context, put me in a different reference from the stance that I have assumed. I never said "nothing" in response to the last question. I said "nothing" in response to the question, "What do you think about the criticism of the book?," and meant that I would not respond to low-level, vindictive, slanderous and panicked verbal attacks. The fact that I am a part of the book states a position of allegiance with regard to Architecture as art, manifested in the building object. We, Bob and I and the others, all believe in buildings and state such a position. That is the reason for the book in my mind, and, whatever my personal indications may be, I am one of a group of architects who seriously oppose the Venturi alternative. I respect and endorse Mr. Colin Rowe, Mr. Peter Eisenman, Mr. Michael Graves, Mr. John Hejduk, Mr. Richard Meier and Mr. Kenneth Frampton and will not reject that association.
CHARLES GWATHMEY
Gwathmey Siegel Architects

The question to which Mr. Gwathmey refers was, "What is your reaction to the book?," and we quoted his answer as "Disinterest." We apologise for our unintended misrepresentation of Mr. Gwathmey's position.

Book Review

On Adam's House in Paradise: The Idea of the Primitive Hut in Architectural History by Joseph Rykwert. Published by The Museum of Modern Art, New York, in association with The Graham Foundation for Advanced Studies in the Fine Arts, Chicago; distributed by New York Graphic Society Ltd., Greenwich, Conn. 224 Pages. Illustrated. Clothbound $8.95; paperbound $4.95.

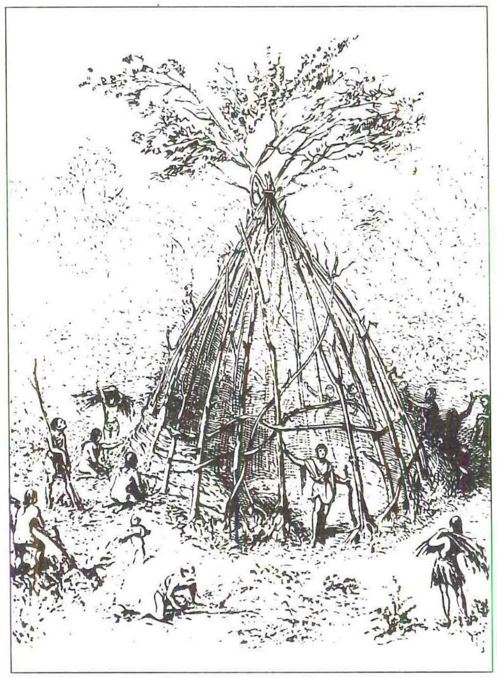
Reviewed by Kenneth Frampton

What, other than the titular reference to Adam's house in paradise, could so readily evoke Parsifal's quest for the Holy Grail or Cabalistic speculations as to the format of the tabernacle in the wilderness? This text, as the author declares with his opening quote from René Daumal, *"Pour en revenir aux sources, on devait aller en sens inverse,"* is history written backwards. Proustian associations aside, to write history backwards is to fly in the face of our cherished notion of progress. To travel *en sens inverse* is, by definition, to challenge a complacent modern teleology, that paradoxically has no particular end in mind. With Adam's house we are no longer afloat amid the lacunae of our supposedly value-free society. On the contrary, we are returned to that end of our exploring which, to paraphrase T. S. Eliot, is to arrive where we started and "to know the place for the first time."

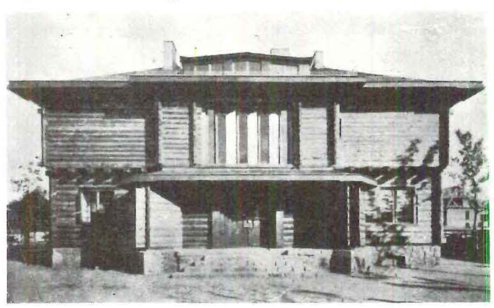
Subtitling his book, *The Idea of the Primitive Hut in Architectural History,* Joseph Rykwert dispenses rapidly with the theoretical delta of the 19th and 20th centuries, passing achronologically in his first two chapters from Le Corbusier's aphorism of 1922—"There is no such thing as primitive man, only primitive means"—to Frank Lloyd Wright's idealized tent-building nomad whose habitat was unconsciously celebrated, according to Rykwert, in Wright's habitual use of floating roof planes. Alternatively, already in pursuit of the autochthonous wooden style, we pass from Walter Gropius's *Kunstgewerbisches Blockhaus Sommerfeld* built in Berlin in 1921, to the successive mausolea built twice in wood and once in stone, to enshrine Lenin's corpse in Moscow's Red Square.

In these initial chapters, three paradigms are presented as evidence of an ever-present concern for the aboriginality of building. Firstly, the nationalist and ultimately positivistic view that all building was originally executed in timber and that this technique constitutes the natural basis for all native style. A view to be shared by men as diverse and as far apart in time as John Ruskin and Konrad Wachsmann. A thesis to be taken literally by Schusev in his Lenin Mausoleum built in 1924 after the style of some ancient Tartar tomb. Secondly, the related *Heimatstil* notion subscribed to by even a sophisticate like Adolf Loos that peasant building as such, like ornamented peasant art, is of necessity virtuous because, to quote Loos, "the architect like practically every townsman has no culture. He lacks the security of the peasant who does have a culture . . ;" and thirdly, through the theoretical work of Gottfried Semper, upon which both Wright and Loos were to lean heavily, the notion that the initial artifact was the knot and thus (through its extension into weaving) Semper's deduction of the early 1860's that the tent was the inevitable form of the first house. This thesis, as Rykwert points out, was to be superficially paralleled by Viollet-le-Duc in his popular *Histoire de l'habitation humaine,* in which man was seen as arriving at his first hut through bonding of tree tops into a knot.

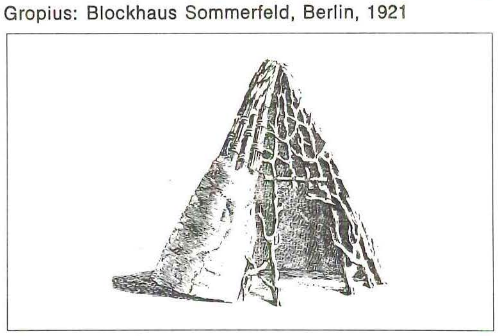
Kenneth Frampton, architect and writer on 20th century architecture, is an Associate Professor at Columbia's School of Architecture and a Fellow of the Institute for Architecture and Urban Studies.



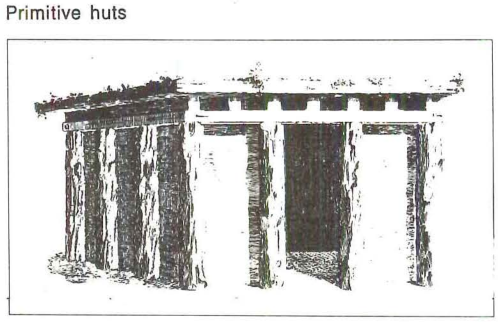
"The First Building," after Viollet-le-Duc



Gropius: Blockhaus Sommerfeld, Berlin, 1921



Primitive huts



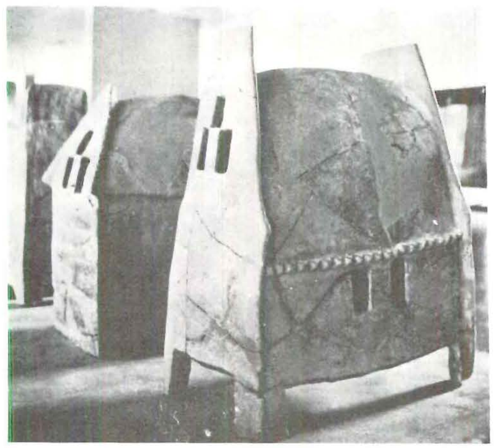
All these naturalistic-cum-materialistic theses, that mutually converged in finding unconscious folk craft to be the essential underpinning of all applied art and architecture, were to contrast strongly with the priority accorded to psychological impulse in the related esthetic theories of Theodore Lipps and Alois Riegl, postulated in the last decade of the 19th century. With these men a certain inner 'will to form' rather than outer materialist circumstance was seen as the source of artistic creation.

By now Rykwert's time machine has been prepared for reentry into the relatively untroubled waters of the Neo-Classical. After a brief salutation at the eclectic classicism of Quatremère de Quincy, who held that the virtues of Greek masonry architecture lay in its imitation of wood and an equally brief sally in passing at J. L. N. Durand and his normative architectural typology, as set out in his reductive *Préçis des leçons* of 1802, we are back safely in the arms of the Enlightenment, able to assess, at the very opening of the third chapter, the nature of Durand's attack of the theories of the Abbé Laugier as embodied in the latter's *Essai sur l'architecture* of 1753.

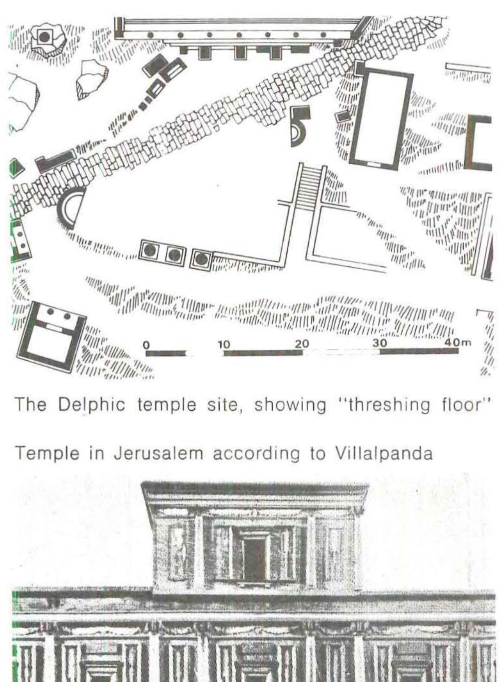
Despite Durand's criticism of Laugier, for his assertion that true architecture could only be based on the model of a framed and trabeated primitive hut, capped by a pitched roof, Laugier may still be regarded as being part and parcel of that same reductive Neo-Classical drive as had led to the formulations of Durand. As Rykwert writes; "There are no arches, arcades, pedestals, attics, doors or even windows in Laugier's cabin. Only the column, the entablature and the pediment are essential to it, and consequently to all architecture." Laugier relegated walls, windows, doors, etc. to the role of mere necessary elements. Rykwert argues that in Laugier's theory these "contributed nothing to the essential beauty of the building; they were *licences,* a term which in earlier architectural theory had been reserved for ornamental elements beyond any antique sanction." Reasonably enough Rykwert places Laugier in the company of Rousseau; both men subscribing to an image of natural man that was not the inarticulate primitive savage of Viollet-le-Duc's Romanticism but rather the natural man of enlightened Neo-Classicism. The primitive hut of such a man is not posited by Laugier as an archaeological fact nor is it intended as an image of a Romantic return to nature. On the contrary it asserts itself as a metaphor for building in accordance with natural and hence rational law.

Laugier's architectural theory was predicated nonetheless on an inexplicable contradiction, namely, if the hut was built of wood, then why should man have continued to replicate timber forms when building in stone. This perennial paradox emanates from Laugier's theory both forwards and backwards in time. Forwards to Auguste Choisy and Memmo writing in 1899 and 1833 respectively; backwards to Claude Perrault editing Vitruvius in 1684. Memmo faces this contradiction squarely and, critical of Vitruvius, argues like Durand that architecture can never have been an imitative art and least of all imitative of a primitive wooden hut. For him the first building material was the stone of the Egyptians; a position that is also taken up by Piranesi in his anti-Laugierian text of 1765. All of this, brings Rykwert to Perrault's conception of "positive and arbitrary" beauty; the title of chapter three. Yet apart from anticipating Laugier, in his antipathy to the pilaster, Perrault contributed little to the primitive hut issue, save for his materialistic theory concerning the derivation of the orders, wherein he argued that they were originally proportioned in order to utilize trees of different sizes.

At this juncture, Rykwert's erudition seems to become gratuitously recondite. The structure becomes diffuse and the reader is projected into an anecdotal morass of facts, the relative relevance of each to the discourse at hand being left inexplicit. We learn in short order of Lord Monboddo's orangoutang, the primitive Piltdown man to be illustrated by J. M. Gandy, as building the first hut amid strata of prismatic rock; an outcrop archly suggestive of those fluted columns he will acceed to in his classical future. We pass from this to acknowledge the primitivism of Defoe's *Robinson Crusoe,* and to expatiate at length on Villalpanda's reconstruction of Solomon's temple, elaborately postulated for the purposes of establishing the preordained divinity of Philip II's Escorial. Precociously, we turn our attention to the seventeenth century nationalistic invention of the so-called 'French-order,' fortunately little used, and last, but not least, we learn of Sir James Hall's naive thesis

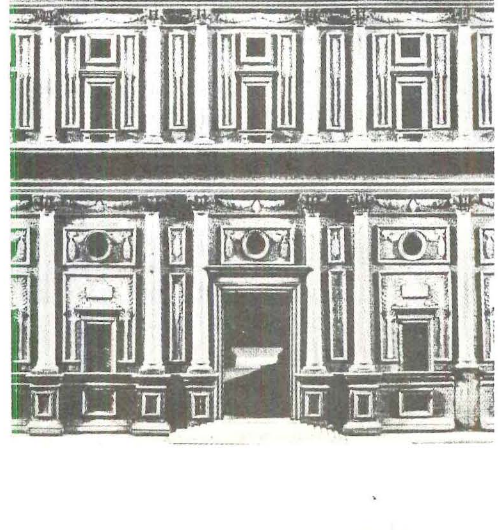


Chalcolithic house urns, from Kusdeirah, 3400 B.C.



The Delphic temple site, showing "threshing floor"

Temple in Jerusalem according to Villalpanda



as to the 'horticultural' origins of the Gothic published in 1813. Much to Friedrich von Schlegel's disgust, Hall apparently tried to prove his point by growing his Gothic as one might cultivate a climbing pear.

With Vitruvius, in a chapter entitled "Reason and Grace," Rykwert finally returns us to our grass roots, for there is no architectural text in the West prior to this Augustinian work and there is little after that that did not take Vitruvius in some form or another as its ultimate point of departure. Palladio, Perrault, Milizia, Laugier, Alberti, etc. all take Vitruvius as the essential armature of their arguments. As in the Promethean legend, natural catastrophe provides Vitruvian humanity with its civilizing trauma. In apocryphal lore the sequence runs: men witness the spontaneous eruption of fire as a consequence of branches abrasing each other during a storm. They feed the fire and this brings about their natural congress, an event that leads in turn first to speech and then to the building of huts. As civilization naturally advances, men learn to build in more durable materials, but in so doing they continue to render in stone forms that they had first fashioned and refined in wood. Vitruvius is the ultimate source for the mimetic theory of creation, wherein men first imitate the natural nest building instincts of animals and birds and later proceed to mimic their own first architectural achievements. With Vitruvius for whom the notion of origins had cardinal importance, the quest for Adam's house as the paradigm comes to a dead end, since "no earlier architectural writings survive." Beyond Vitruvius lies the primitive hut as a ritualistic enactment of the myth of renewal and with this we abandon the world of exegesis for the underworld of etiology.

In the prehistoric world we face once again the questions of history. Why do men build? Why do men make images? Why do they write? Why do they invent language and speech? What is it that forces them into these elaborate formulations beyond the call of nature? Last, but not least, why should the primitive hut become an integral element in an overall myth of renewal? The answer to all these rhetorical questions seems to point to one end; to the need in the face of nature to establish and maintain a human world; to concretise the projections of the human mind, to appropriate space, against the infinite void, as a realm of human appearance.

This much Rykwert points to but fails to make explicit. The indications are there, but the reader is largely left to draw his own conclusions. Thus we are informed of certain aboriginal tribes, who live without the act of building; whose prime ritual object is a flat, rectangular woven hierogram of human hair mounted on a stick. For Rykwert this object, aside from being a taxonomic key to an entire aboriginal universe

continued on page 73

2 New Products from NuTone

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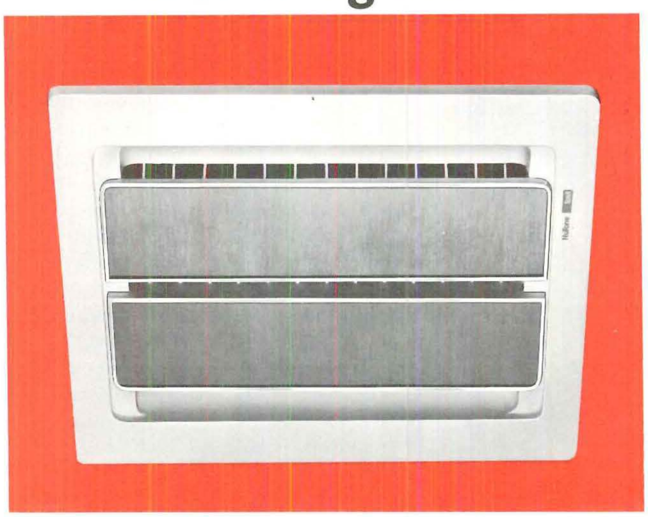

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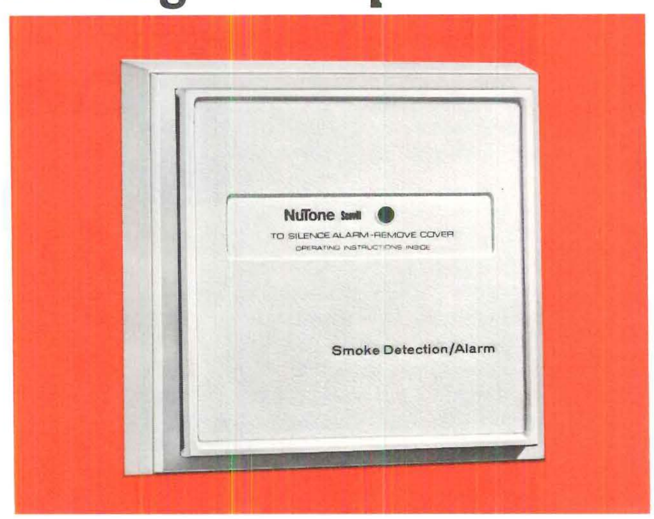

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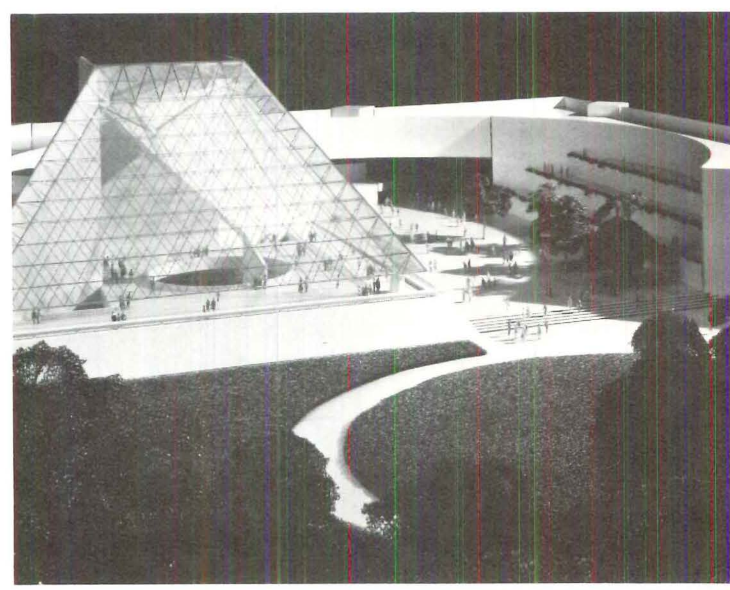
news+

The other day, Amory B. Lovins, British Representative of the Friends of the Earth, Inc., had this to say (in discussing the safety of nuclear power plants): "Are the safety problems of fission too difficult to solve? If they are, then one cannot claim that they are solved by pointing to all the efforts made to solve them . . . In assessing the risks of a complex technology in which 'no acts of God can be permitted,' we can only rely on analogies with other highly engineered systems that have far smaller risks . . . Nuclear safety is . . . a wholly new type of problem that can be solved only by infallible people. Infallible people," Mr. Lovins went on to say, "are not now observable in the nuclear or any other industry."

This issue of Architecture PLUS happens to deal, in part, with the world's "energy crisis." But the kind of reasoning offered by Mr. Lovins and his Friends of the Earth might be usefully applied to other areas of environmental concern as well, where "infallible people are not now observable."—PETER BLAKE.



JFK by I. M. Pei

On May 29 the long-awaited proposal for the John F. Kennedy Library was unveiled in Boston. The complex was designed by I. M. Pei & Partners to house the memorabilia of the late president. It will also house Harvard's Institute of Politics for Study in Government and Public Affairs, which was established in 1966 within Harvard's JFK School of Government.

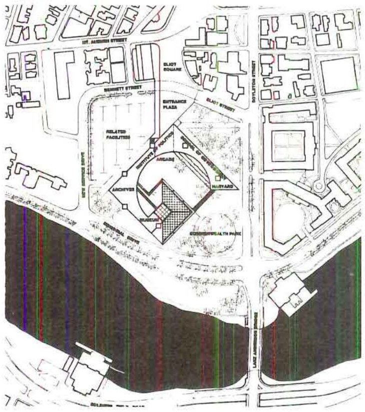
Basically, the plan consists of two buildings, one a seven-story, truncated pyramid 85-ft. high, containing the major public spaces, and the other a long, low, five-story building that wraps around three sides of the pyramid. A 125-ft.-dia. multilevel plaza in the middle faces a small park and the Charles River.

JFK went to school at Harvard University across the street from the site of the $27-million library that will bear his name.

The library will be built with private funds, and later will be placed under the administration of the U. S. General Services Administration. The 12-acre land parcel was donated by the State of Massachusetts.

About eight years ago, the Kennedy family asked a group of architects (among them, Alvar Aalto, Mies van der Rohe, Louis Kahn and John Carl Warnecke) to act as a committee of advisers on the subject of the JFK memorial. The group selected I. M. Pei as the architect. The intended site at that

Many of the news reports and comments are from our regular field editors: John Donat (London), Gilles de Bure (Paris), Detlef Schreiber (Munich), Vanna Becciani (Milan), Charles Correa (Bombay), Neil Clerehan (Melbourne), Yasuo Uesaka (Tokyo), and Leonardo Aizenberg (Buenos Aires). Plus correspondents are identified by their initials; other contributors by their full names. The remainder is contributed by our New York staff.



JFK library site on Charles River

time was on the southern bank of the Charles River, across the water from Harvard. Pei eventually decided, after commissioning a major traffic study, that that site was inappropriate, because of the congested traffic in the area, and the present site in Harvard Square was chosen instead.

Construction will begin next year, with the official opening scheduled for May 1976.

Re-run in San Francisco

Any profession that decides to hold its annual convention in San Francisco can't be *all* bad; and so it was encouraging to find the American Institute of Architects once again convened in the Bay Area. The architects did not make the earth quake, exactly, nor did they light any noticeable fires. There were, however, some memorable moments. Specifically:

• The delegates voted, by about three to two, that women were just as equal as men—a really deplorable piece of news (if true) in a society much too egalitarian already.

• The Architects Collaborative (it was announced) won the hotly contested (closed) competition for the new Johns-Manville World Headquarters, to be built on a spectacular Rocky Mountain site southwest of Denver. Representatives of the eight defeated firms thereupon departed for Las Vegas to recoup their losses. TAC's many well-wishers felt that these architects, having won the competition, should now start to redesign the building (bottom right).

• A manufacturer of electronically-controlled flagpoles that automatically unfurl flags stashed away inside the hollow pole as the sun rises, and lower (and furl, and stash away) same, just as automatically, at sunset, informed our reporter, confidentially, that he was dickering with the Feds to have the 50 old-fashioned flagpoles ringing the Washington Monument replaced with his automatic gadgets. "Won't it be grand to see all 50 flags unfurl at the same time?" he asked. Our reporter wondered about overcast days, since the flagpoles are activated by the sun (via a photo-electric cell). "In that case, they can just push a button inside the White House," he said. (OK, so long as they push the right button, our reporter noted.)

• The Hyatt Regency House, the latest one of John Portman's many spectacular efforts, opened in downtown San Francisco, and was hailed by local dignitaries as the greatest thing since the Golden Gate Bridge. It wasn't quite—but almost. There were certainly more AIA delegates in the Hyatt's fantastic lobby (below) than there were in the Civic Auditorium listening to, for example, the annual Report of the AIA's Credentials Committee.

• The Oakland Museum, designed by Roche & Dinkeloo, was the scene of a great "cultural event" (Californese for bash)—and the bash (which later moved to the Berkeley Museum) and the Oakland Museum demonstrated that what the world needed most was a lot of invisible, underground buildings. (The O.M. is, of course, a multi-level park on top, with some galleries below.) In any event, the Museum was quite clearly one of the best, recent buildings in the U.S.

Hyatt Regency lobby, with Charles Perry's four-story aluminum sphere

• The predictable comments were made about the pin-pointed TransAmerica Tower designed by Bill Pereira which—while medium-awful—was at least in the nice, kookie San Francisco tradition. (The really awful new S.F. buildings were those transplanted cubages of nothing apparently plonked down in the Bay Area by Uris Brothers helicopters.)

• Some people were elected, some were re-elected, and many honors were bestowed upon many nice and still other people. (See the AIA's handouts for details.) Among our favorite honors: the Architecture Critics' Medal, which was awarded posthumously to our late, lamented friend, Robin Boyd, and accepted by his widow Patricia who came all the way from Melbourne to receive it; the Craftsmanship Medal, which was awarded to Swedish weaver Helena Hernmarck (see our April issue) who came all the way from London to accept it; the Industrial Arts Medal, which went to Italian designers Lella and Massimo Vignelli, who practice in New York; and an honor award to Australia's John Andrews (and his associates Robert Anderson and Edward Baldwin) for Harvard's Gund Hall, the university's new school of architecture. Andrews, too, came all the way from Australia to accept the honor, but Harvard's Dean somehow couldn't make it. Too bad.

There were also a number of predictable non-events, the most mysterious of which was captured by a local photographer (below). The

An unscheduled non-event

convention finally adjourned itself—with a number of tireless delegates proceeding to Hawaii where, dedicated to the very last to the glory of their profession, they would reconvene to ponder once again whatever it was they had been pondering in San Francisco. Next year: another re-run, this time in Washington.

Mission impossible

The Nixon library surely will be a few years abuilding. At latest count, four of the seven executive trustees of the Richard M. Nixon Foundation are involved in the Watergate mess—H. R. Haldeman, John D. Ehrlichman, John N. Mitchell and Herbert W. Kalmbach. The president of the foundation, Leonard K. Firestone, indicated late in May that the museum-library project was "on the back burner" because of Watergate, but within a few days he refuted any implication that the Watergate investigation had changed the foundation's activities. (If this confuses you, be assured you are not alone.)

Anyway, the architectural style of the museum-library will probably be "early California Mission," says Firestone. On the principle that it's never too early to begin planning such a monumental work, we'd like to offer a few suggestions to the foundation:

- A large section of the building should be whitewashed.
- At least one area should be perfectly clear.
- All electronic outlets should be exposed.
- The area dealing with Mr. Nixon's replies on the Watergate affair should be in the form of a rotunda, perhaps engagingly to be called "the Nixon run-around."
- The area dealing with the relationship between Mr. Nixon and some of his appointees should be in the form of a double cross (this is a recurring political motif, rarely an architectural one).
- And the overall shape of the building should somehow project the shape of post-Nixon America, whatever that might be . . .

It might be a little difficult to fit all this into "early California Mission" style, but the architects of the world are surely up to the task. Readers of Architecture PLUS are hereby invited to send us sketches for an appropriate building, designed to the above program, or to any other reasonable program, or no program at all.

In fact, this invitation launches our first annual "Architecture Minus" competition. We haven't got a professional adviser, and we can't return entries. Let us hear from you.

Expo 75

The Okinawa Expo staff, presently numbering 160, is working hard to get Expo '75 moving. The master plan is being finalized by Eika Takayama, who was active in planning the Tokyo Olympics and Sapporo Olympics. In Okinawa he will in addition be in charge of Aquapolis, a pavilion on the sea.

There will be four major sub-theme areas: "Fish" under the supervision of Fumihiko Maki who designed the Washington University Library; "Ships" will be under the direction of Koichi Sone also of Expo '70 planning; "Science and Technology" under Koji Kamiya, former partner of Tange; and "People and History" will be under Takeji Tsukamoto of Nikken Sekkei, one of Japan's largest architectural firms. Each sub-theme area will have a cluster of pavilions with the space to be rented out to exhibitors.

Ten of these pavilions at 2,500 sq.m. each will be reserved for foreign participants. This time, instead of each country building its own pavilion, individual countries will bring their exhibition into a structure which is already designed. The deadline for applications is March 1, 1974.—Y. U.

The AA at the ICA

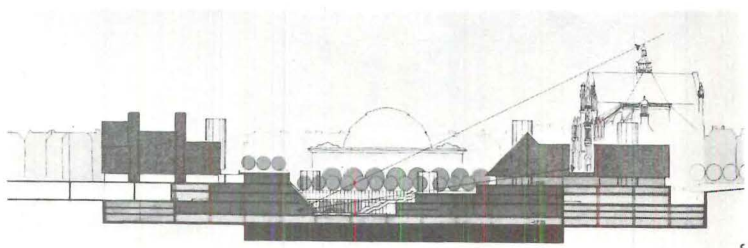
One of the most interesting exhibitions on architecture held in Britain in several years opened at London's Institute of Contemporary Arts gallery a couple of months ago. The occasion was the 125th birthday of the justly famous School of the Architectural Association (better known as "the AA"); the exhibit was designed by Archigram Archts. whose charter member, Peter Cook, heads the ICA.

The drawings and slides shown were student projects produced at the AA over the past 125 years; and except for the fact that the exhibition was hung to read from right to left, the impact was impressive to non-Hebrew scholars as well.

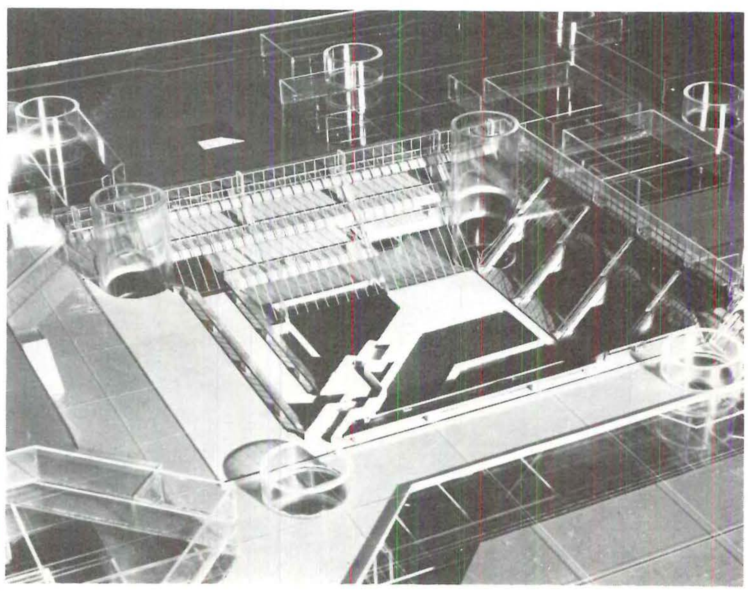
In documenting the show, AA-graduate and teacher James Gowan decided to concentrate on the student work of the most recent 25 years, which was understandable but a little unfortunate: the pre-Gowan years were rather remarkable for the presence of such then or later luminaries as Jim Richards, Clough Williams Ellis, and others.

Still, the students of the 40's, 50's, and 60's were no slouches, and the exhibition—while predictably reflecting all the fashionable trends of those years, from Le Corbusier to Archigram—suggests that Britain's man-made environment might have turned out a trifle better if it had been designed by AA-students rather than AA-teachers.

Among those represented in the later portions of the exhibition were then-students Fello Atkinson, Paul Koralek, Cedric Price, Brian Smith, and others who have not exactly gone to seed since. One possible reason: the AA taught them a thing or two, including how to draw—a skill no longer fashionable at established schools in the U.S. and elsewhere.



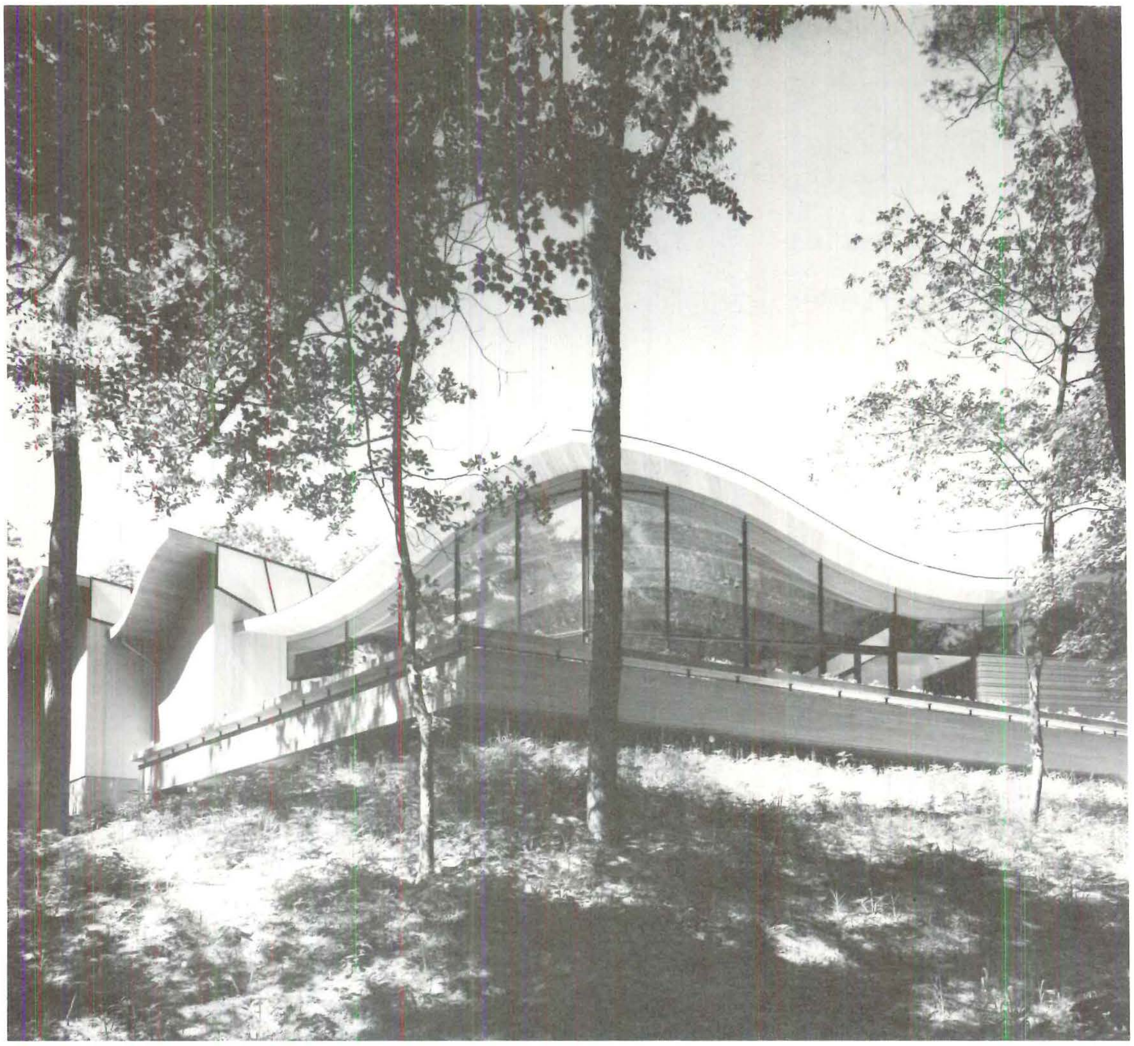
Spire is visible from the pit. Below, model of Les Halles' replacement



The crater of Paris

The citizens of Paris have been informed by the government that an inverted pyramid of space is to be the replacement for beloved Les Halles, the cast iron market whose death throes caused a flood of demonstrations and indignant letters from all over the world. The man in the Paris street is angry, but apparently unable to influence the powers that mutilate his city.

The five levels of the pyramid are to be tucked between the ceiling of the RER Metro station and the street level. The commercial floor space to be created by this crater is estimated at 48,000 sq. m. The official announcement describes how natural light will penetrate from terrace to terrace through acres of glass to an open-air court; and how the many flower shops cause the forum at the bottom to lose its underground character. It is carefully pointed out how a person standing in the lower court is oriented at all times to the streets around him because the spire of St. Eustache Church is visible. The five levels will be able to accommodate hundreds of shops, boutiques, bowling alleys, discotheques, seven cinemas, audio-visual projects, and flat places where potential travel agent tenants can project color slides of exotic places through the night for ecstatic strollers—on the probably accurate assumption that, with Paris going down the drain, most people would prefer to think of being someplace else.— G. de B.



Duxbury, Mass.

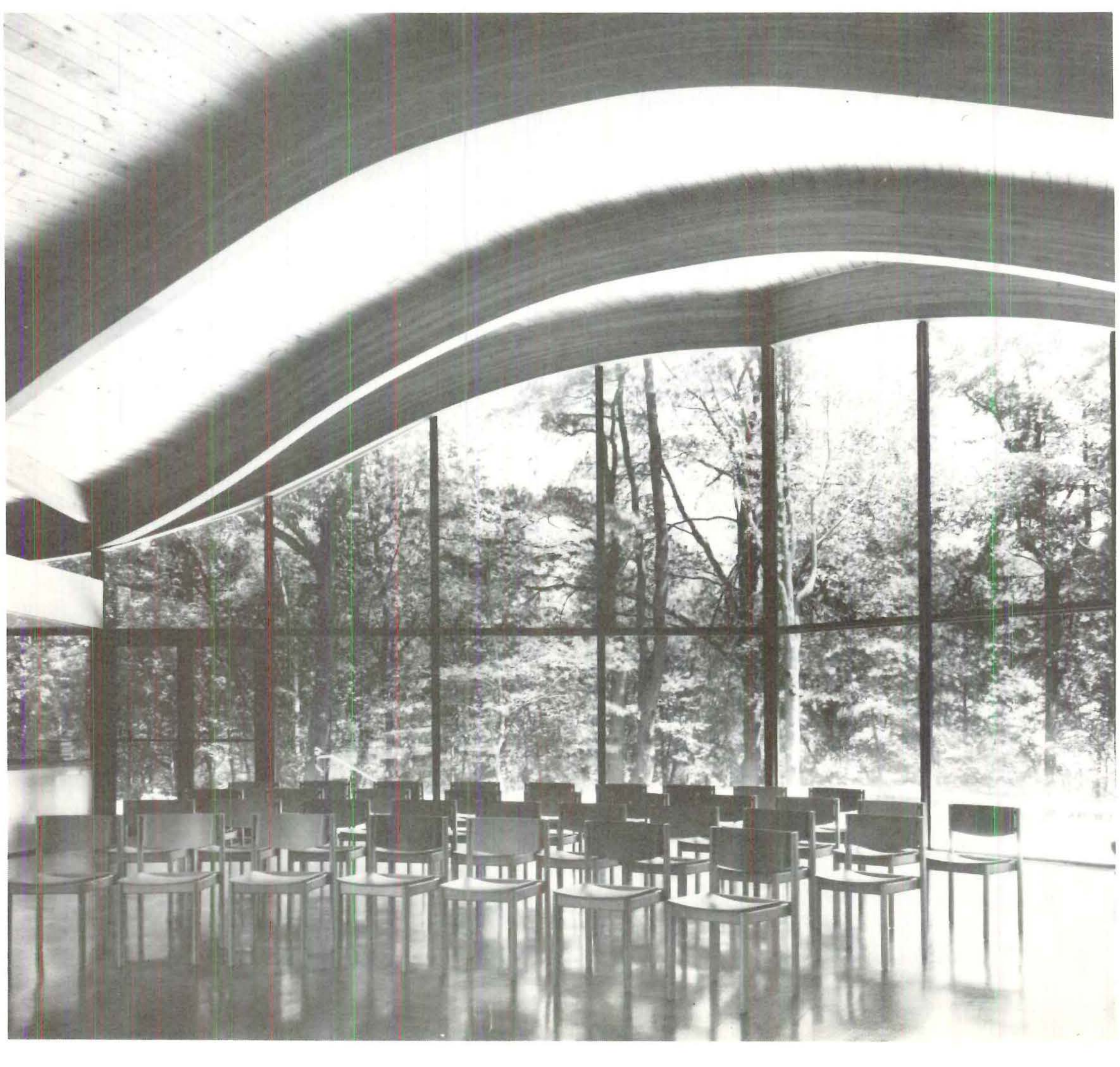
This Art Complex was designed as a sensitive response to its site, and to "evoke a mood of quiet peace." The building is located at an existing turn of a ridge deep in a forest. The gallery faces true north to avoid critical sunlight on the objects inside. Opaque glass skylights provide a non-institutional ambience.

The complex includes a sculpture terrace which doubles as a lookout into the woods beyond. An outdoor stage area for evening performances, with the audience sitting on the slopes nearby, is to be included later.

A footpath connects the building entrance with the Judah Alden House (son of John Alden, of "Speak for yourself, John" lore).

The building will house permanent collections, traveling exhibitions, concerts, lectures and special events—a small museum (16,000 sq. ft.) yet very flexible and most complete.

The wood and glass building, whose prominent feature is the undulating curve of its wooden roof, was designed by Richard Owen Abbott of Boston. The museum is the gift of the Carl A. Weyerhaeuser family.



International conference

August 29-31, 1973 there will be a conference in London called "The Design Activity," the second international conference on design research, design methodology and design practice. Co-sponsored by The Design Research Society of the United Kingdom and The Design Methods Group of the U.S., it will take place at the Polytechnic of Central London.

There will be four main themes: Design morphologies, Design processes, techniques and algorithms, Design objectives, and Case studies.

The conference size will be limited to 300 people. Accommodation fees and details are available from The Secretariat, Design Activity Conference, c/o Polytechnic of Central London, 35 Marylebone Road, London NW 1. In the U.S., write Design Methods Group, School of Architecture, California State Polytechnic University, San Luis Obispo, Calif. 93401.

Kyoto Conference

The eighth ICSID Congress will meet in Kyoto October 11-13, 1973 in the Kyoto International Conference Hall. ICSID is a worldwide association of national industrial design organizations established to advance the study, practice and application of industrial design. Its membership includes 57 societies from 35 countries.

The theme this year is "Soul and Material Things." Write Kenji Ekuan, Executive Chairman, P. O. Box 200 Trade Center, Tokyo 105.

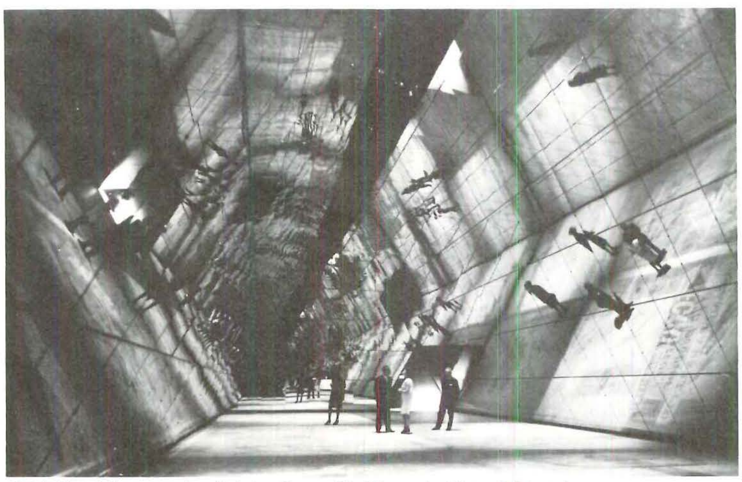
All eyes on the Chile skies

Astronomers agree that the best spot in the world for star gazing is in La Serena, Chile, 300 miles north of Santiago, and thirty degrees south of the Equator. It hardly ever rains, and lightning is unheard of. The sky is clear 300 nights a year.

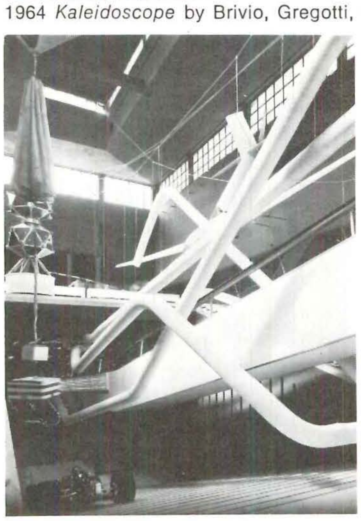
An association of 12 American universities began building the Inter-American Observatory in La Serena on the top of Mt. Tololo six years ago. A $10-million, 158-in. giant telescope has just been installed. (The only larger one is on Mt. Palomar in California.)

Mt. Tololo, 7,000 ft., is an uninhabited region at the southern boundary of the world's driest desert, the Atacama—Tololo means "edge of the abyss" in the local dialect.

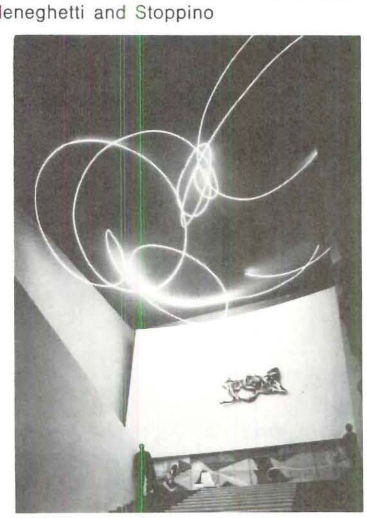
It won't be lonely up there for long. A European consortium is building a 136-in. telescope, on a peak not far away, and Carnegie Institute of Washington will arrive on yet another nearby peak. The Russians are coming to occupy another vantage point up there soon, so on those few nights each year when the sky isn't clear they can all watch each other.



1964 *Kaleidoscope* by Brivio, Gregotti, Meneghetti and Stoppino



1968 *Grande Numero*



1951 *Space Light,* Lucio Fontana

Italian happening

The 15th Triennale of Milan will open exactly 50 years after the first one, on September 20 and will close on November 20, 1973. The Triennale invites all nations to participate in the exhibitions, through proposals and achievements in better uses of habitable space, and through new structures capable of enriching the life of contemporary man.

Three architects are running this year's show: Aldo Rossi, Ettore Sottsass Jr. and Eduardo Vittoria.

A major feature will be very wide use of films and video-tapes on design-related subjects from all over the world to be shown on many T.V. screens simultaneously.

One of the exhibits planned is a history of the Triennale showing its effect on the artistic world of half a century.

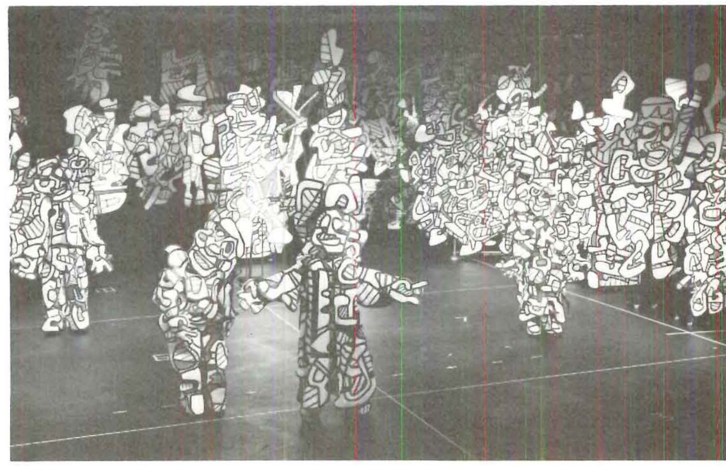
Basically the Triennale will be divided into three sections: International, National and Italian; with smaller, short-duration exhibits on architecture, industrial design and applied arts.—V. B.

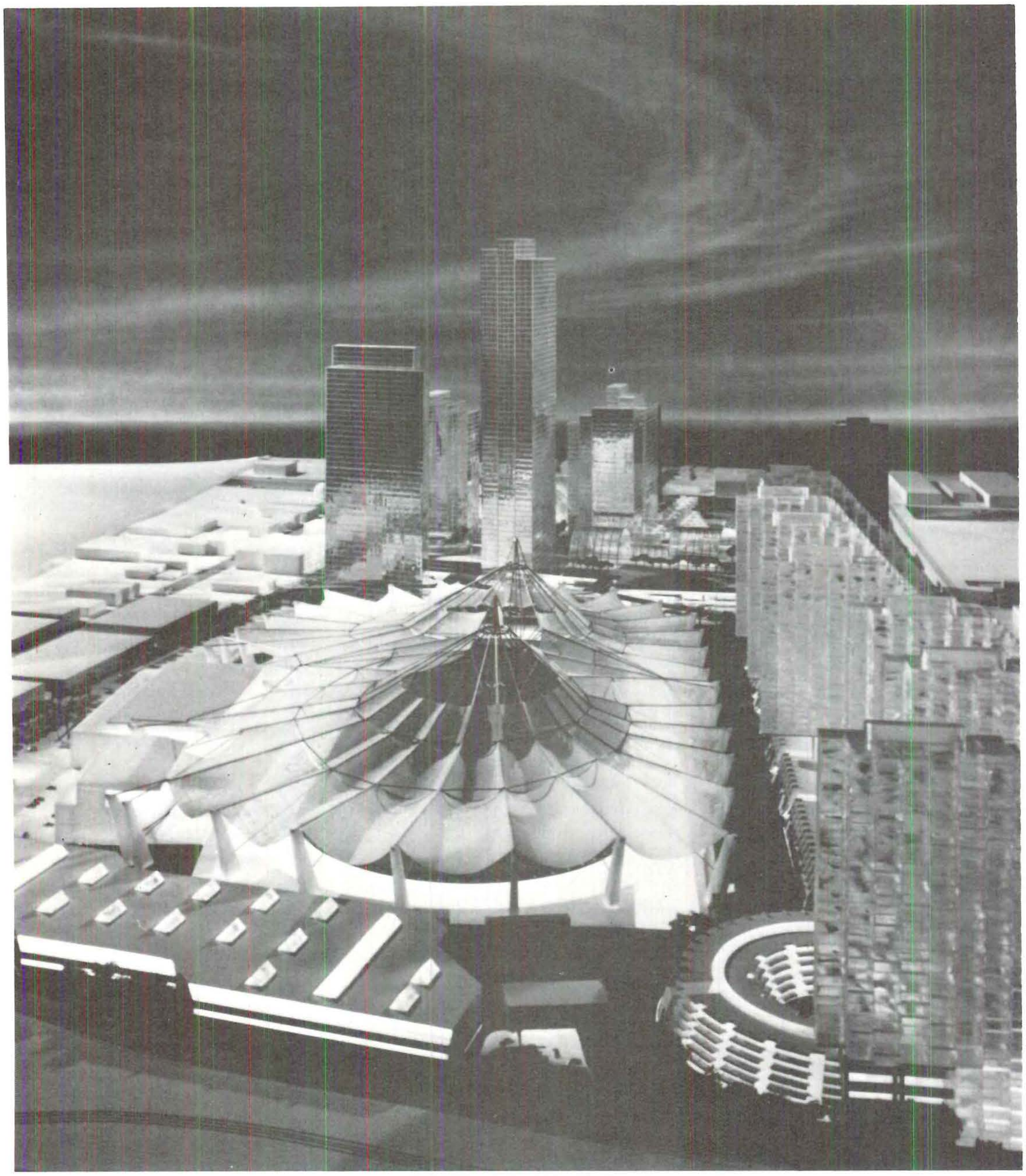
Dubuffet has a ball

As a four-dimensional extension of the paintings and sculptures of his *Hourloupe* cycle of the last decade, Jean Dubuffet has prepared a theatrical event called *Coucou Bazar* or *le Bal de l'Hourloupe*. As an out-of-town tryout for its presentation at Paris' Grand Palais in September, *le Bal* is now being performed (until July 29) in the basement auditorium of Frank Lloyd Wright's Guggenheim Museum in New York, while a retrospective of more static Dubuffet work is shown on the spiral ramp above.

The work is performed by nine densely costumed actors as well as by about 50 set pieces, many of them set in motion by various means. The distinction between art and life is intentionally obscure, as is the one-hour "plot": a tree becomes a harlequin, then turns upside down; a dog sniffs at the red, white, and blue tail of another dog, then both disappear; an object and/or character either does or does not mount a bicycle.

The musical accompaniment by Turkish composer Ilhan Mimaroglu does not send one from the theater humming, but its cacophony of electronic sounds, curiously human at times, seems a perfect accompaniment to the ambiguities on stage, as does the erratic lighting of Bruce Bassman. Brooke Lappin was Managing Director, and Jean McFaddin, Artistic Director.





Everything's better with Blue Bonnets on it

An ambitious multi-use development (with the ambitious price tag of three-quarters of a billion dollars) is planned for the site of Montreal's Blue Bonnets Racetrack. Architects are Gruen Associates of New York, and their client is the Campeau Corporation, one of Canada's largest developers.

Horses will continue racing at Blue Bonnets throughout construction, and at the end their new surroundings will include a 60-floor office building, several 30-to-40 floor buildings, 8000 residential units, a 3-level shopping mall with 6 department stores, hotel rooms for 1750, parking for 20,000 cars, and a 400,000 sq. ft. convention center.

In addition to its staggering scope, the Blue Bonnets project seems distinguished by four characteristics, two admirable and two doubtful.

The doubts first: concentration of 8,000 new housing units on one site can affect living patterns and neighborhood characteristics of all Montreal. Either exclusively high-income or exclusively low-income housing here, for example, could seriously disrupt the city's fabric. An enlightened step, which may prevent such results, is Campeau's decision to build the first 1,000 units in a wide variety of sizes and prices, accomplishing as great a mix of family sizes and income levels as possible. These first 1,000 will be used to test market reaction, and later stages of building will reflect the results.

A second doubtful aspect is that at this (admittedly early) stage of design, there is a confusion of architectural vocabularies: the residential blocks look handsome and interesting; so do the office blocks; so do the shopping areas—but none of these elements seems to have much to say to the others. Beda Zwicker, partner in charge for the Gruen firm, points out that the present model is meant to indicate only basic relationships between functions, not the final design of any individual parts. In other words, the qualities of the Blue Bonnets development as an architectural design cannot yet be judged.

Now the praise: considerable attention has apparently been given to the connections between this behemoth and the rest of Montreal. The existing road network will be altered to accommodate it, and the Montreal Metro system will be extended to the site, with a station directly under the central shopping concourse.

Best of all, Blue Bonnets promises to be not just another big development but one with a real personality, due primarily to the racetrack's being not only retained but also celebrated with a festive tensile covering which visually dominates the whole project. Such a facility offers an unusual opportunity, and Gruen Associates has happily made the most of it.—S. A.

University in Syria

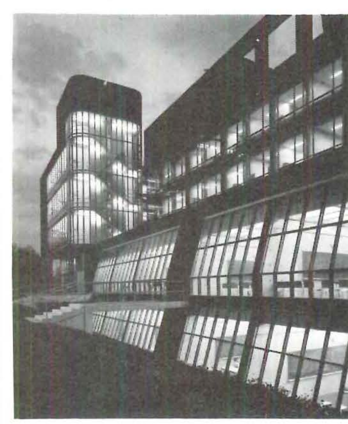
Frankfurt Architect Rambald von Steinbuechel has won the international design competition to build a university in Lattaquia, a port city in Syria. The facility will accommodate 20,000 students, and it will have a medical building, with a hospital containing 500 beds and an outpatient clinic, and buildings for agricultural science, philosophy and engineering.

Other entrants in the competition were: the French Architect Georges Candilis, Hans Zwimpfer from Basel, Switzerland, Massimo Pica Ciamara from Naples, and Jean Dubuisson from France.

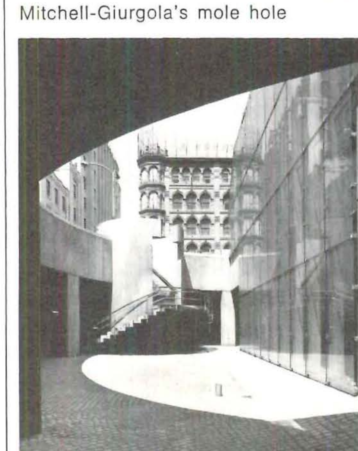
Best mole hole

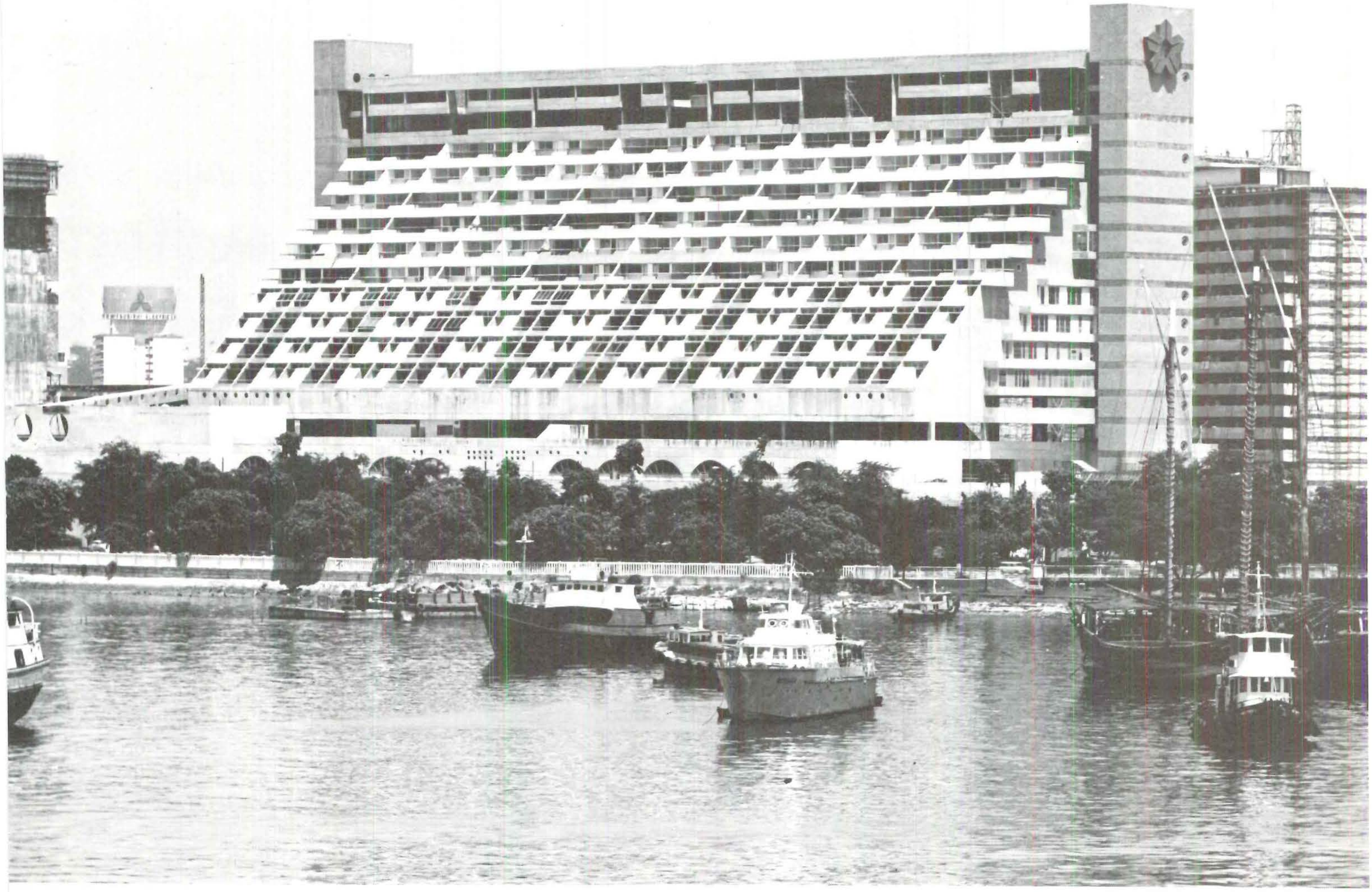
The Philadelphia chapter of the American Institute of Architects can usually be depended upon to produce some interesting prizewinners in its annual awards programs, and this year's list of the best was no exception: in addition to some neat above-grade buildings by firms like Bower & Fradley (who won Philadelphia's Gold Medal with their Vance Hall for Penn's Wharton School—see below), there was an Honor Award for (to quote) "excellence in design of low-rise construction"—an under- (or over-) statement, since the honor went to a hole in the ground: Mitchell-Giurgola's subway entrance of tempered glass, steel, and granite pavers. The photo (below) explains why the jury liked it.

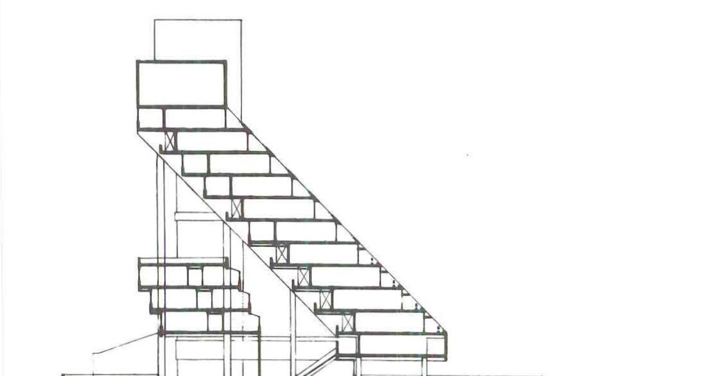
Vance Hall, Wharton School



Mitchell-Giurgola's mole hole







Singapore

A mile-long stretch of coastal land lying east of the center of the island of Singapore, an area previously occupied by squatters and fish markets, is being converted into a "Golden Mile," a massive project consisting of commercial buildings and luxury hotels. "Golden Mile" is part of a major development effort under the Urban Renewal Program, where prime land is sold to the private sector with agreements between the government and the purchaser as to how the site will ultimately be developed.

This 15-story shopping center/office building on the Kallang River is the first to be built in the complex. The architects, Design Partnership of Singapore, placed great emphasis on the creation of a homogenous internal pedestrian environment. A series of links to adjoining sites and walkways protects the shopper from the hazards of the two highways which flank the site. The structure is stepped-back to take maximum advantage of the river view.

Adequate flexibility for pedestrian links for future neighboring buildings has been built in. The three lower floors are conceived as an expandable space with the internal public areas opening at each end: at some future date, a line of these internal concourses connecting each other will form a continuous pedestrian environment through the entire length of the "Golden Mile"—a shopper's paradise in that Republic's tropical climate.

The first three floors are public areas, with 360 shops or kiosks; the fourth floor is an entertainment deck that includes restaurants and an art gallery. Above that are offices and, at the top, luxury apartments. Below grade are 460 parking spaces.

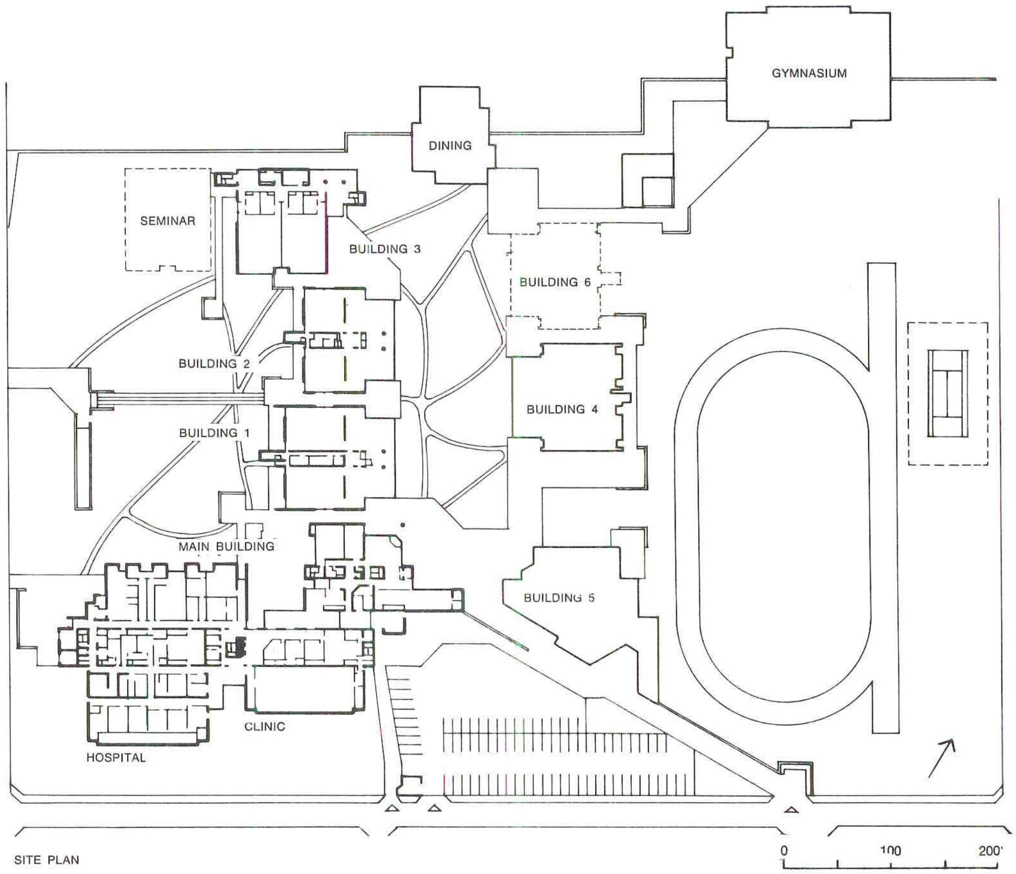
The three shopping floors have voids—all shops can easily be seen from any of the other floors.

continued on page 66


病院受付

Unity and Complexity

Japanese college campus is a vigorous expression of many diverse functions



SITE PLAN

Site plan (showing ground floor disposition of spaces in the first five buildings completed) also indicates location and configuration of additional buildings now under construction. To the north of the property are the dunes and Japan's Northern Sea. At upper levels, the separate buildings are connected in response to the complex building program. The entrance shown on the opposite page is located at the south-east corner of the campus.

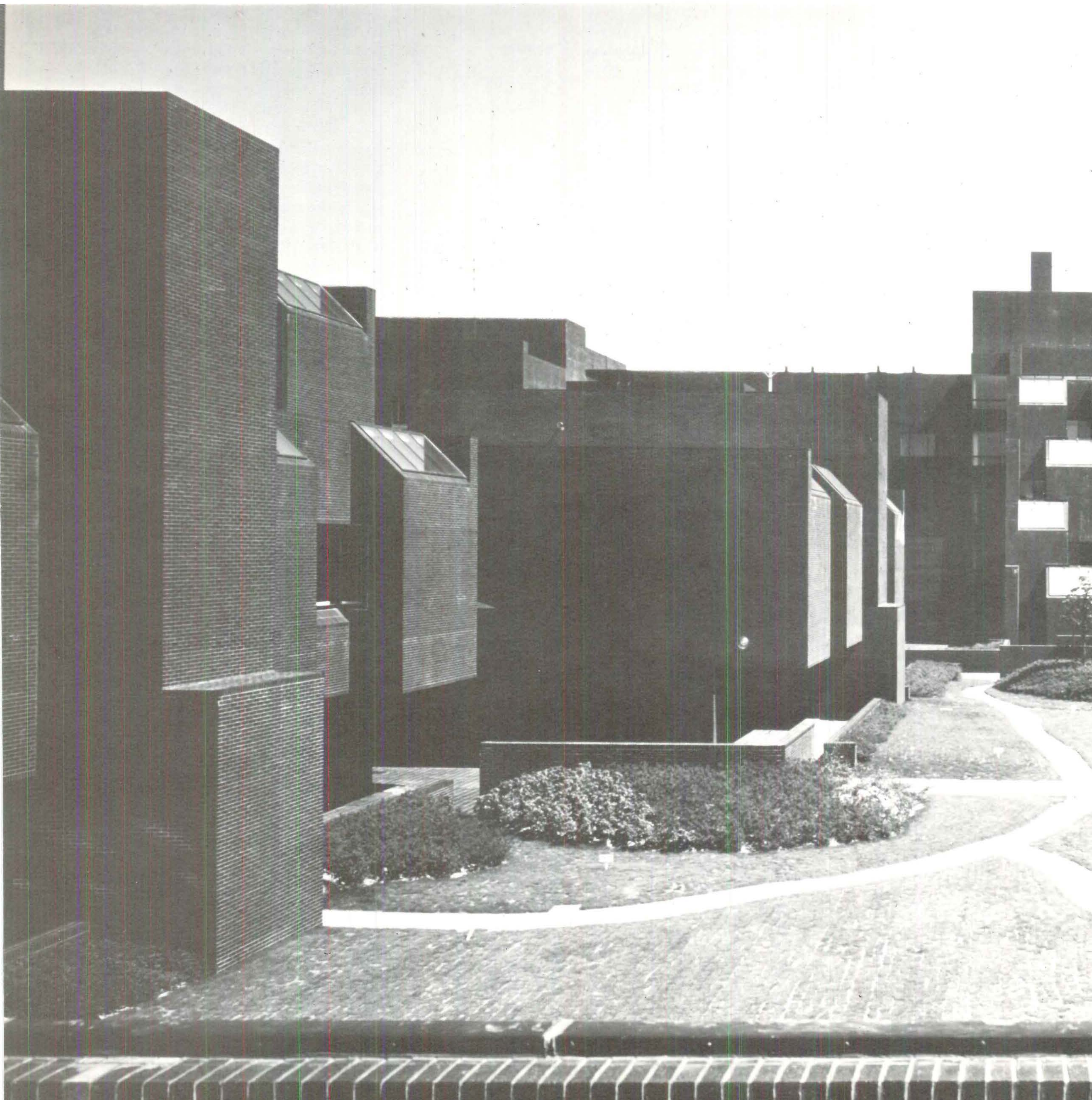
The view at left shows the main entrance to the hospital wing of the new Nippon Dental College, a complex of buildings at Niigata, Japan. Niigata is located 150 miles north of Tokyo, on the other side of the island of Honshu. The site of the College faces the dunes and pine trees along Japan's Northern Sea. "On a clear day," says architect Shin'ichi Okada, "one can see Sado Island in the distance. Throughout the design of this group of buildings," Okada continued, "this natural setting and the color of the sea—varying with the season from gray to lapis lazuli—remained always in my mind's eye."

Okada, an architect now in his mid-forties, came to the U.S. after a stint at Tokyo University and some work with the Kajima Corp. (see our May issue). He continued his studies at Yale, went to work for Skidmore, Owings & Merrill in Manhattan, then returned to Kajima in Tokyo, and finally opened his own office about four years ago. Judging by this group of buildings alone, Okada is now one of Japan's most interesting architects.

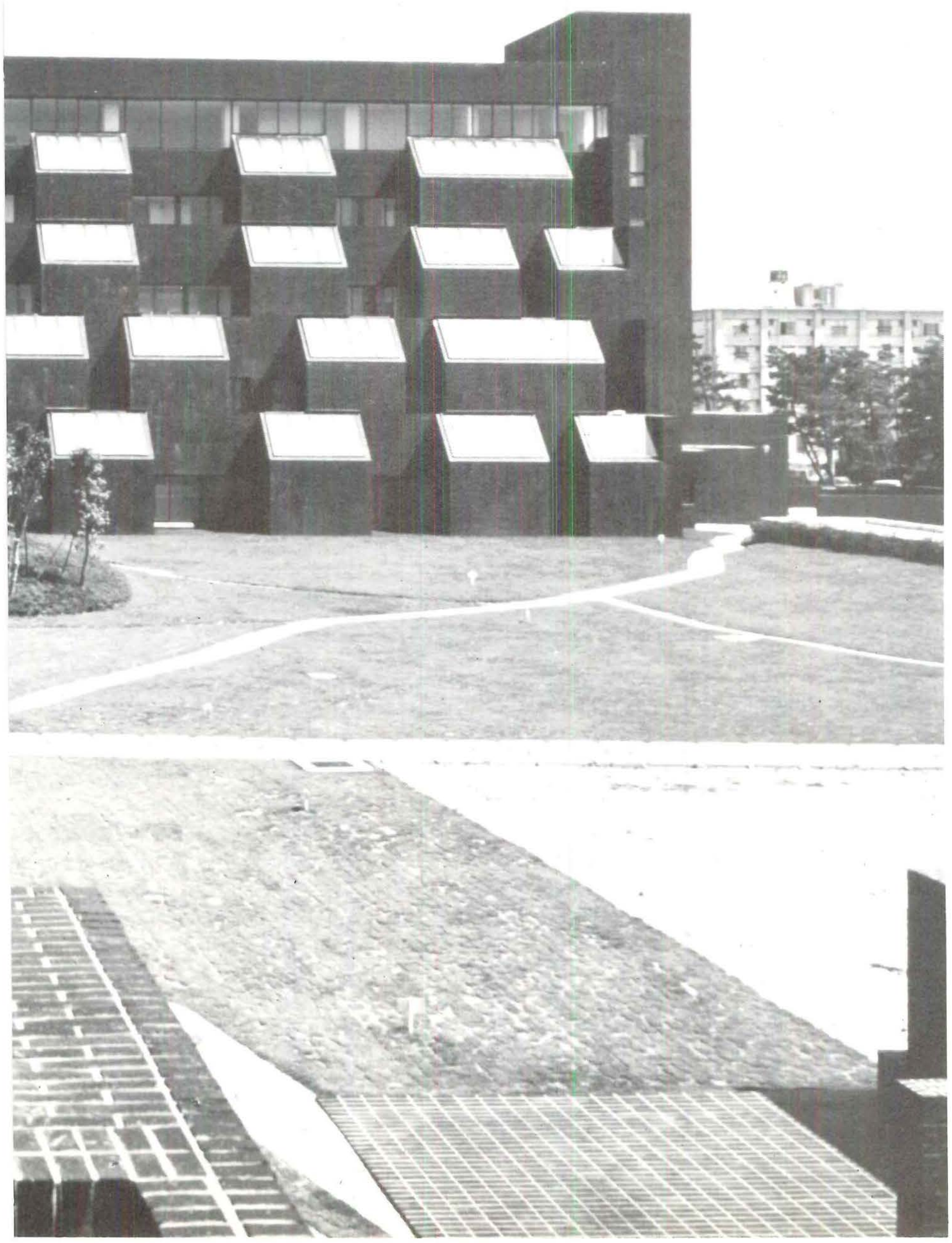
What is shown on the plan at left, and on the following six pages, is the initial group of five buildings: the main building, the hospital, two classroom buildings, and the seminar building. Additional buildings are under construction to the east.

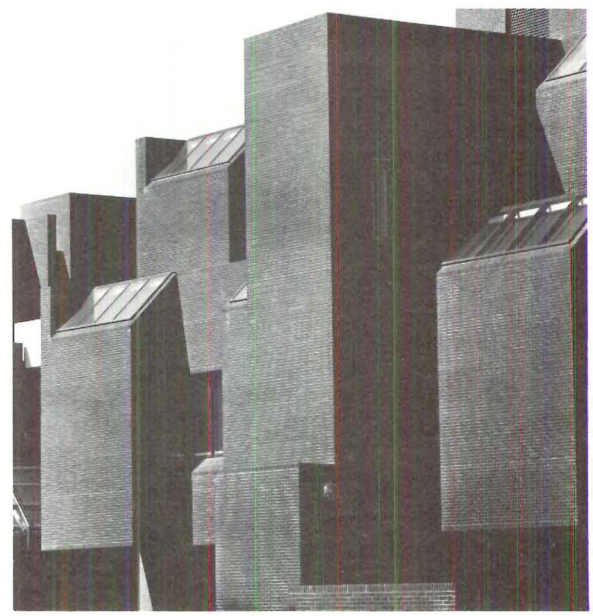
The first five buildings, while more or less separate at ground floor level, are connected at various upper levels in response to a complicated program. Indeed, the buildings seem to be a very direct translation of that program into three dimensions —a busily articulated complex of brick, glass and steel that expresses internal functions on every level.

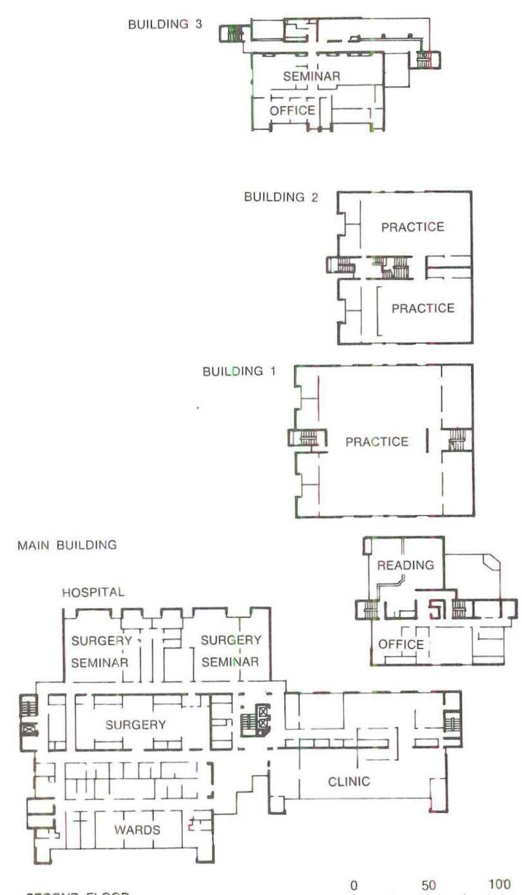
Yet, in spite of this busy articulation, Okada has been able to make his Niigata Faculty a cohesive and unified construction. One reason: there is no external expression of the reinforced concrete structure—everything is clad in dark brick and glass. Another reason for the buildings' unity is that they are almost entirely windowless: with a very few exceptions, the spaces inside are lit through skylights that, according to Okada, admit the sun even on gloomy winter days. And there are "extensive, glazed openings to provide views of the leaden sky, which forecasts conditions of the Northern Sea." The views on the next two pages document the resulting vocabulary.



View at left was photographed from the north-west corner of the site. The staggered, skylit building in the distance is the hospital, and the skylit rooms house various seminars intimately related to actual, dental operations. The structures to the left of the hospital block contain classrooms and are similarly skylit. The picture below is of a typical stair tower surrounded by skylit preparation and practice rooms. The plans on this page show the second floors of the first five buildings.





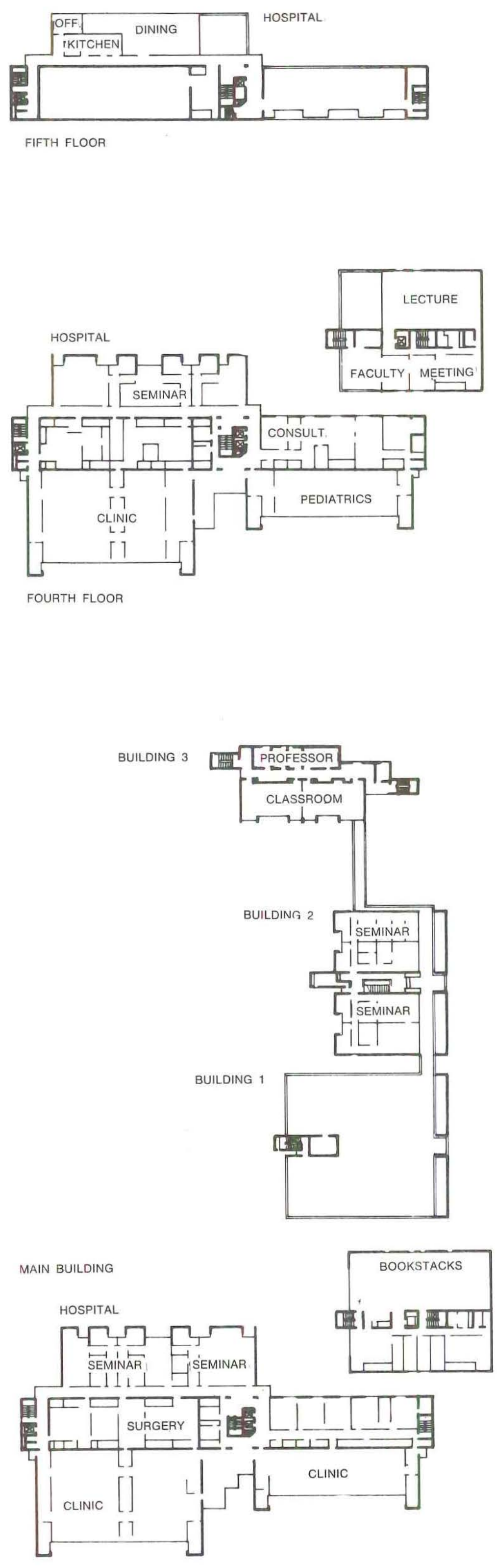


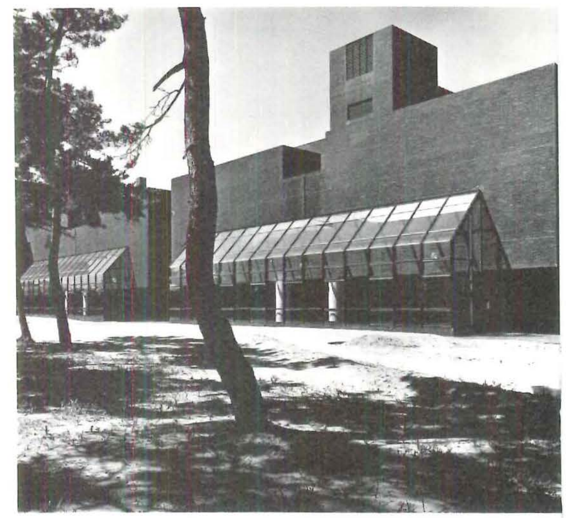
"Although the shrieking winds in this cold climate are never pleasant," Okada says, "the students long to see the gray sky in order to search out signs of spring and better weather." To give them a chance to do so, Okada has created a series of spaces that he calls "self-study rooms," and that are, in effect, circulation areas which have been expanded into glass-walled lounges.

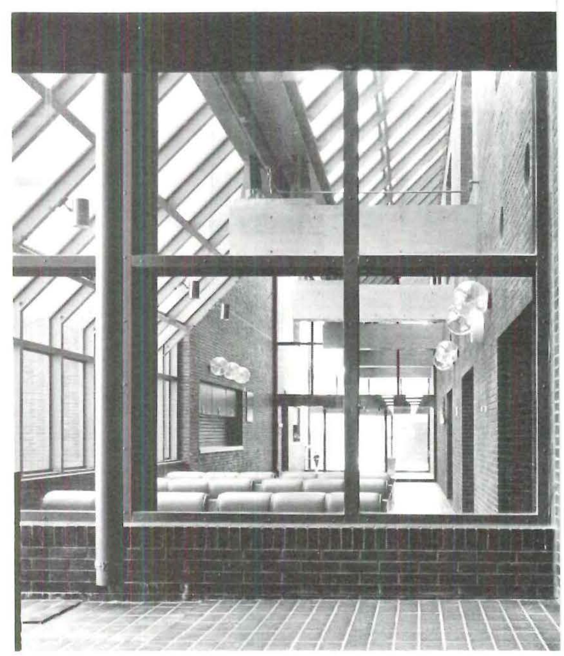
These lounges are located next to the classrooms, like large and inviting foyers that may be found outside a theater auditorium. "Large living space in which students spend much of their time has been neglected in the past," Okada says. When such spaces were, in fact, provided, they rarely consisted of more than a slightly widened corridor, he says. "In the Niigata plan, we decided to bring all these vague, inadequate spaces together into large home-rooms." The home-rooms or "self-study lounges" face a handsomely landscaped garden; any open plazas or terraces in which students might congregate would have been useless for a good part of the year in this harsh climate.

Okada speaks of his buildings almost exclusively in terms of the natural and man-made landscape that surrounds them. Even the slanted surfaces of glass were conceived not only in terms of offering views of the pine trees and gardens beyond, but also as reflectors of the sun and the shifting clouds. (The slanting glass roofs, incidentally, were double-glazed partly to protect students in the event that some of the bricks or tiles might be dislodged to come crashing down from one of the wall surfaces above.)

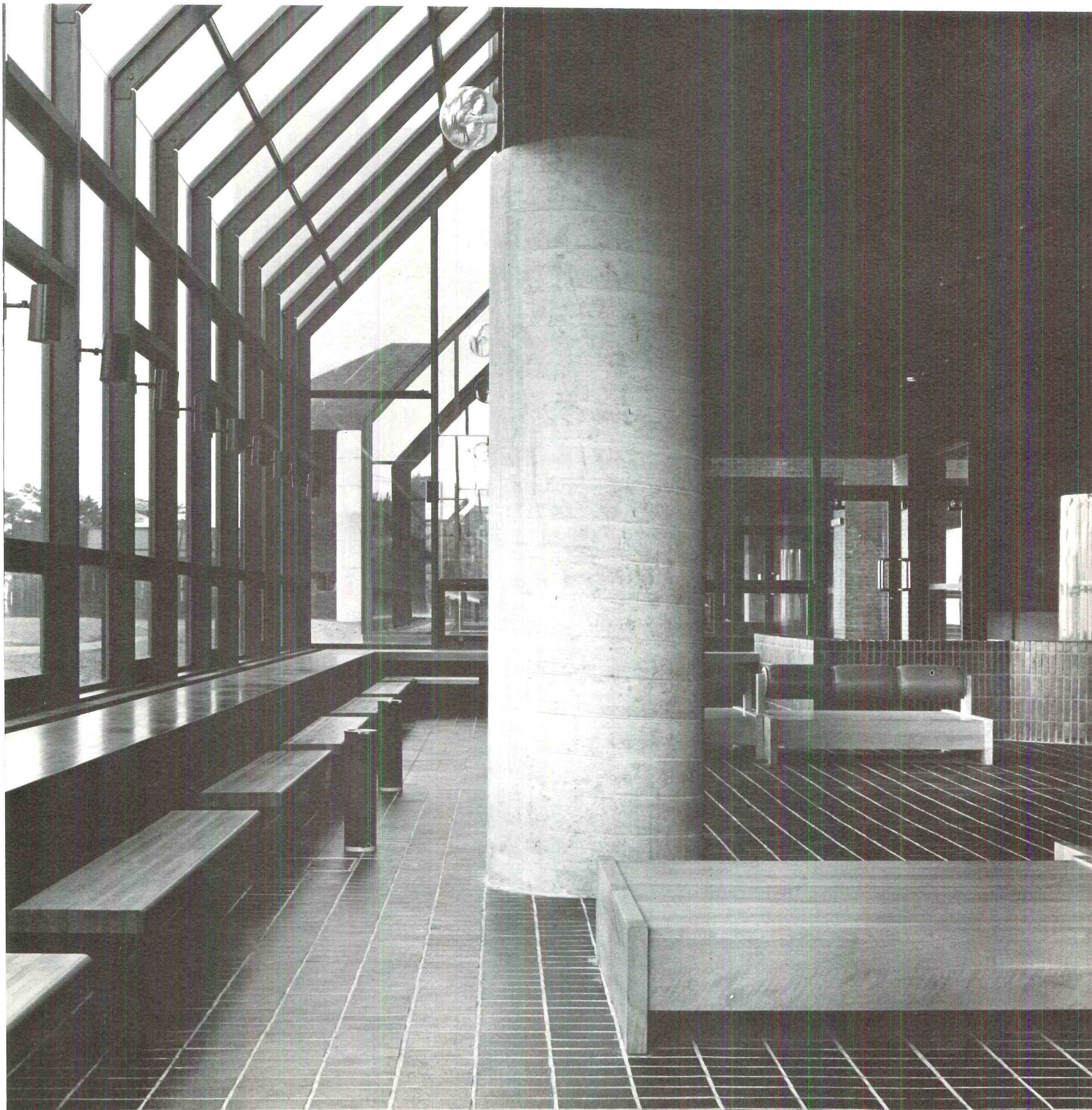
In several respects, Okada's Nippon Dental College is clearly influenced by the work of Louis Kahn, whom he greatly admires—though probably by way of the work of Aldo Giurgola. The articulation of service towers, the clear differentiation between opaque wall and light-giving glass surfaces is reminiscent of the "Philadelphia School"—and of some of James Stirling's work in Britain as well. But the preoccupation with nature is entirely Japanese. "On this campus," Okada says, "the classroom buildings, when completed, will surround a quiet courtyard garden, which is centered on a handsome grove of pine trees. This grove is the axis of the entire layout."



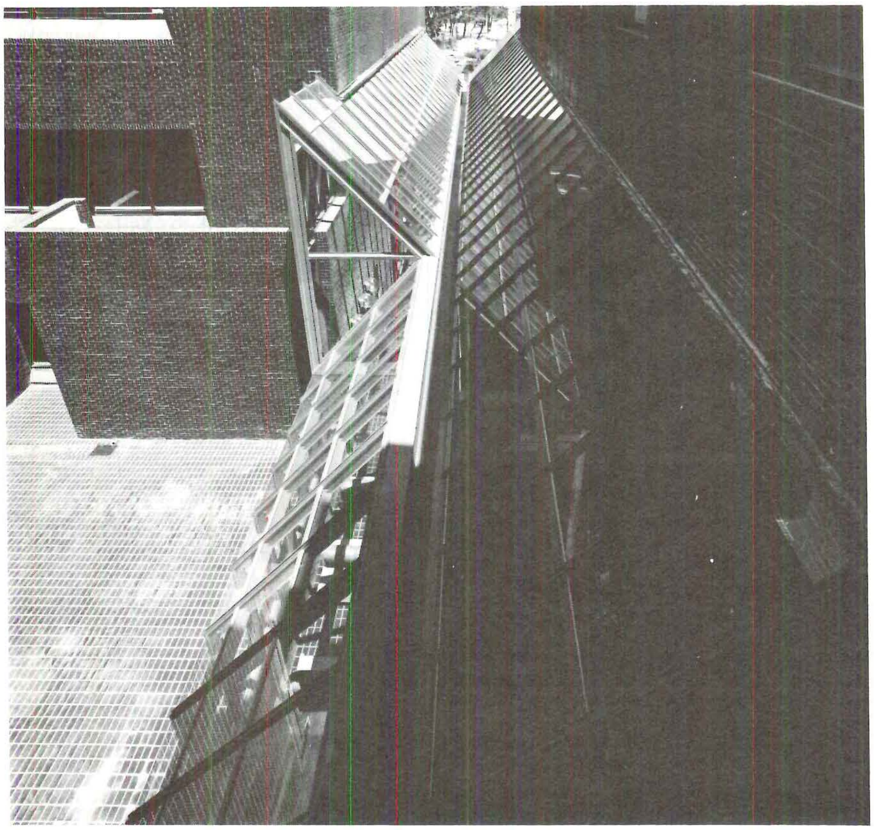




The "self-study lounges" shown here are among the few areas in the college complex in which massive concrete columns have been exposed. Floors are surfaced with stoneware tiles, and the glass canopies are double-glazed in the slanted roof areas for extra protection. These spaces are part of the classroom buildings, and they are among the few rooms that overlook the landscaped gardens.



The main entrance to the college complex is a skylit "galleria" that connects the hospital and the administration block. It is more than a lobby or a corridor; it is a street, protected from the harsh elements, and leading into the control areas of the campus. The walls are brick and glass, and the floors are of the same stoneware tiles used throughout the paved areas of the campus.



"The narrow space between the administration building and the hospital is a gate to the latter," Okada says. It is both a connection between buildings, and a passageway for people entering the college. It is a small-scale "galleria," Italian-style, but very Japanese in the way it captures the natural environment. The bright-red steel, inside and out, combined with dark brick and dark (and matching) ceramic tile, is part of a color vocabulary not adequately appreciated in the west. (There is also a bright red, steel-cylinder bulletin board that is the focal point of attention and information.)

When looking at this elegant building, one suddenly realizes that it is the public rather than the special teaching spaces that make the college as good as it is.

Conceivably, the entire complex might have been shrunk by 10 or 20 percent if the public circulation spaces had been contracted. And this would have turned the college into just another big box filled with little boxes strung along narrow corridors.

Instead, Shin'ichi Okada made the public spaces—the indoor streets—into something special: some of them indoor plazas, protected from the elements; others "gallerias," lit from above. All of them public spaces in which there would and could be communication and, thus, exchange of ideas.

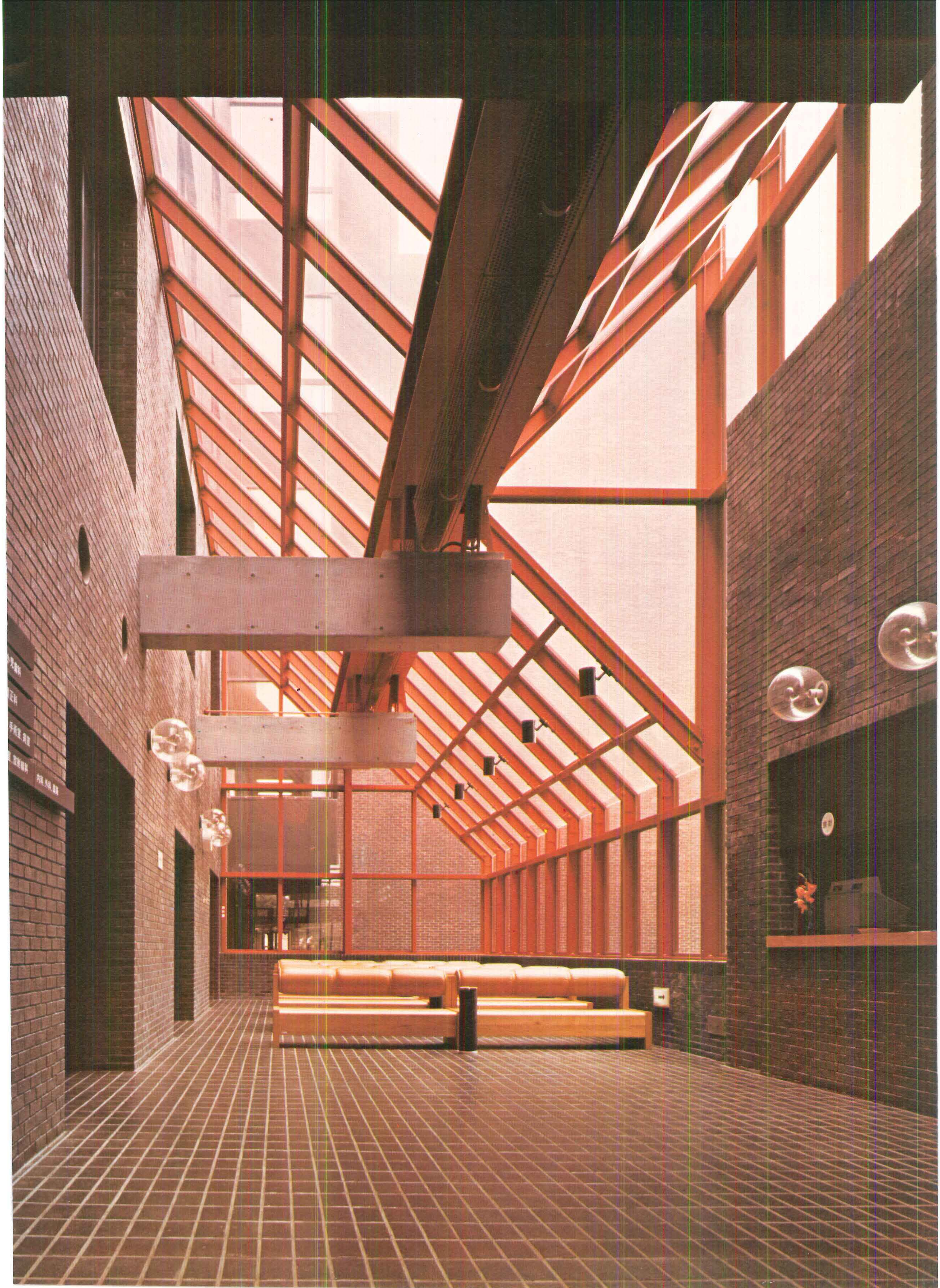
It will take several years to discover if Okada's "streets"—with little plazas along the way, and classrooms and offices strung out along those streets and plazas—will really work.

But chances are that they will work a great deal better than some of the dreary patterns of the past. And, in any event, Okada's campus will clear the way to more imaginative solutions that would not have been conceivable without the likes of him.

Facts and Figures

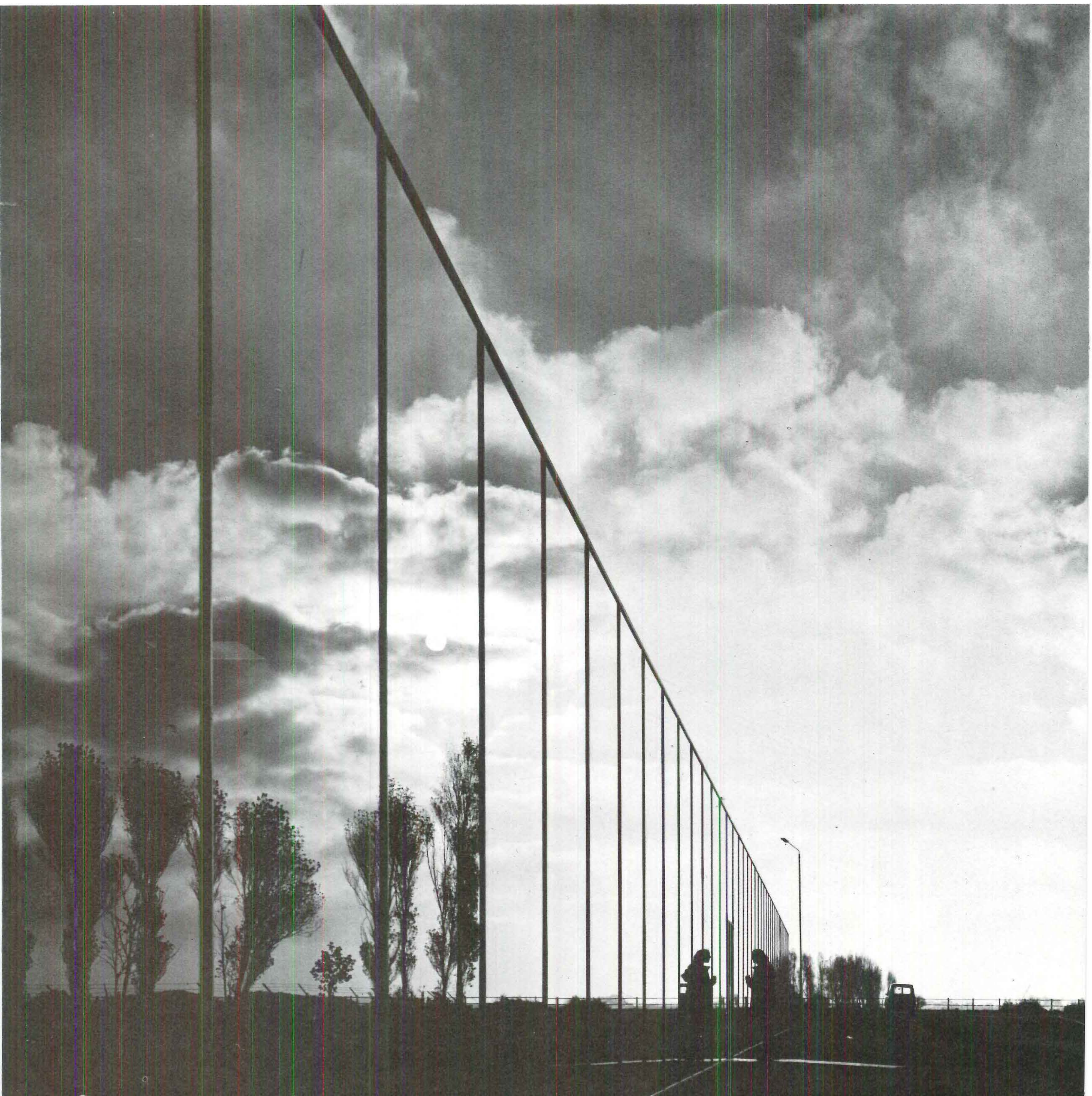
Niigata Faculty, Nippon Dental College, Niigata, Japan. Architect: Shin'ichi Okada and Associates. Contractors: Hospital and exterior work: Kajima Corporation; Main building: Fukuda-Gumi Co., Ltd.; Building One: Kagata-Gumi Co., Ltd.; Building Two: Honma-Gumi Co., Ltd.; Building Three: Toda Construction Co., Ltd.

Photographs: Yasuhiro Ishimoto, except pages 18, 20, 25 by Taisuke Ogawa, © The Japan Architect.

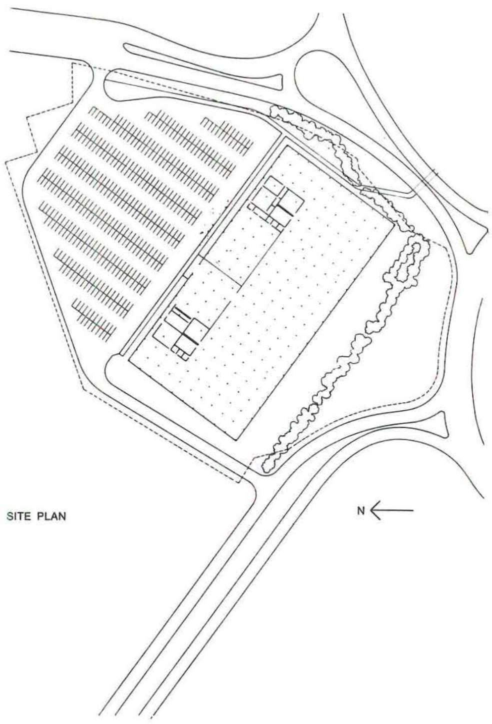


LEAST IS MOST

British IBM is the understatement of the year



The 117,000 sq. ft. building is completely sheathed in solar glass stiffened with aluminum mullions. A neoprene gasket is pressed into the extruded aluminum section to hold the glass in place, and this is the only dividing strip visible from the outside. The building thus acts as a huge mirror reflecting the landscape. The window module is 6 ft. Site plan is shown in drawing below.



SITE PLAN

The first thing that strikes a visitor to IBM's new Pilot Head Offices at Cosham, Hampshire (just north of Portsmouth) is how unlike a "building" this is! It has no top and no bottom and nothing very much in between—at least in the conventional sense. It is much more like a super-refined piece of very sleek industrial design—a glass package containing 1.4 million cubic feet of very elegant space, cooled, heated, lit, furnished, and otherwise equipped with a sure professionalism not always found in run-of-the-mill architecture.

It is, in short, just about the finest piece of industrial design to be found, this year, in IBM's inventory of exceedingly well-designed products—and that is high praise indeed.

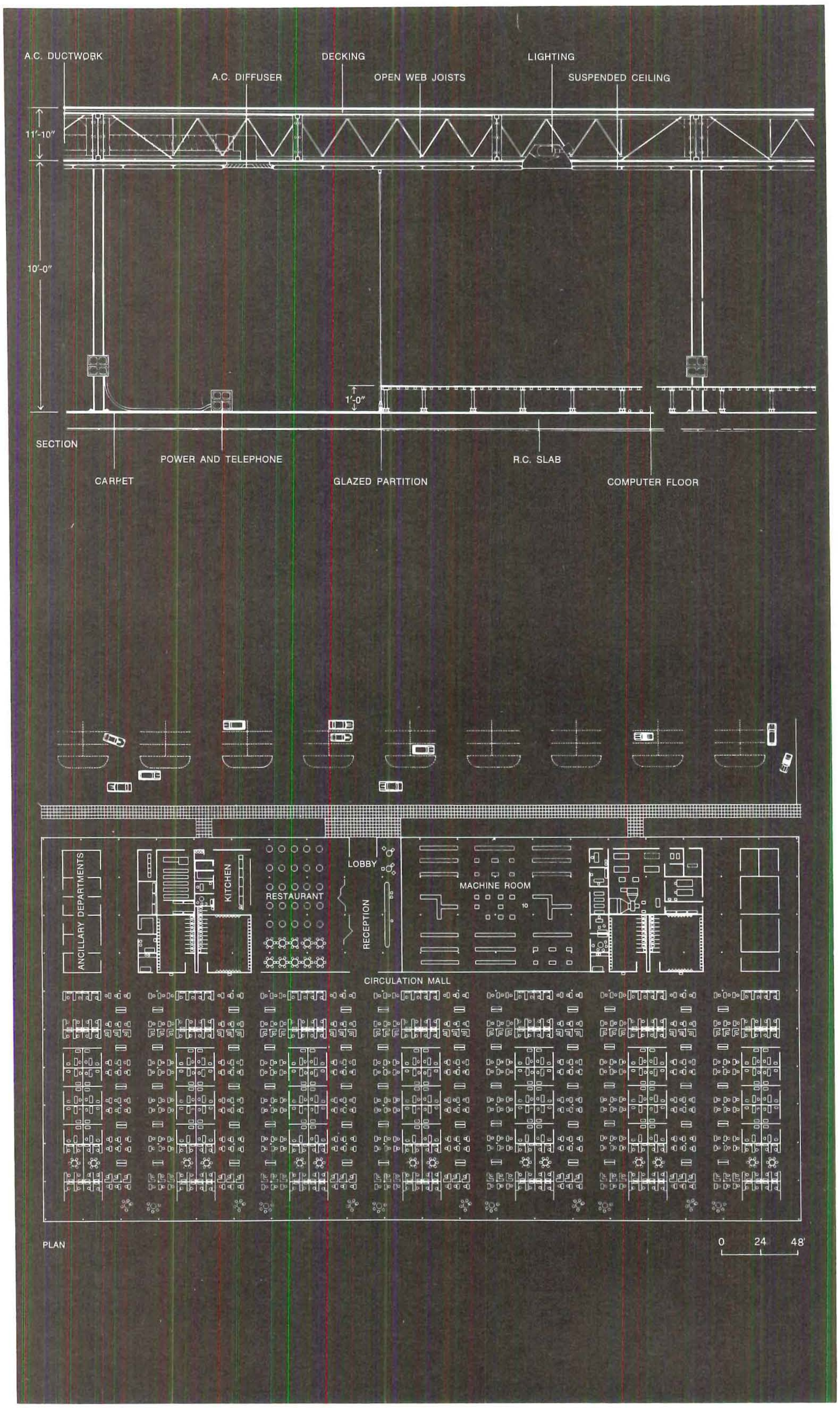
IBM's Cosham building was designed by Foster Associates, a London-based firm of architects and related functionaries that is rapidly making a name for itself as one of the neatest shops in Europe. Foster Associates do not fool around; they analyze a problem, consider alternative solutions, try to pick the best (and often, as in this case, the most economical), develop a rapid construction sequence, get the building built, move the client in, and submit their bill. In going through this step-by-step process, Norman Foster and his associates also tend to produce what the critics would call a Work of Art. Here, at Cosham, they have done just that.

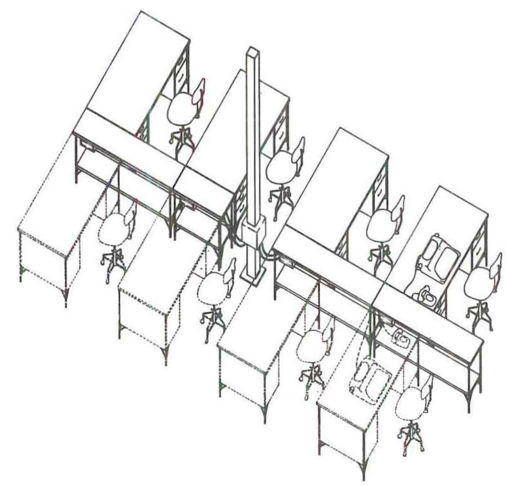
What makes this building so disarming is its great simplicity and cohesiveness; what makes it a Work of Art is its detailing.

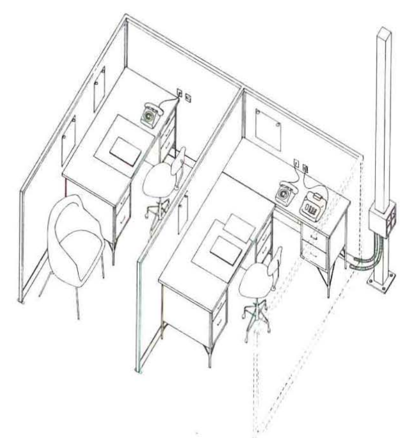
First, the building as a Work of Professionalism: it is a single-story structure, based upon a 24 ft. square grid, using open-webbed lattice steel joists, 22 in. deep. The columns are 5 in. square steel tubes. The floor area is 117,000 sq. ft., designed to accommodate an initial 750 employees, with expansion (now under way) to house another 250. The space is fully airconditioned, with roof-mounted plant rooms providing multi-zone control and utilizing the ceiling void as a return air duct system.

Power and telephone distribution is within the ceiling voids, and cables drop down inside the tubular columns to outlets at desk levels and below. Distribution to enclosed offices takes place through the hollow steel partitions designed by the architects.

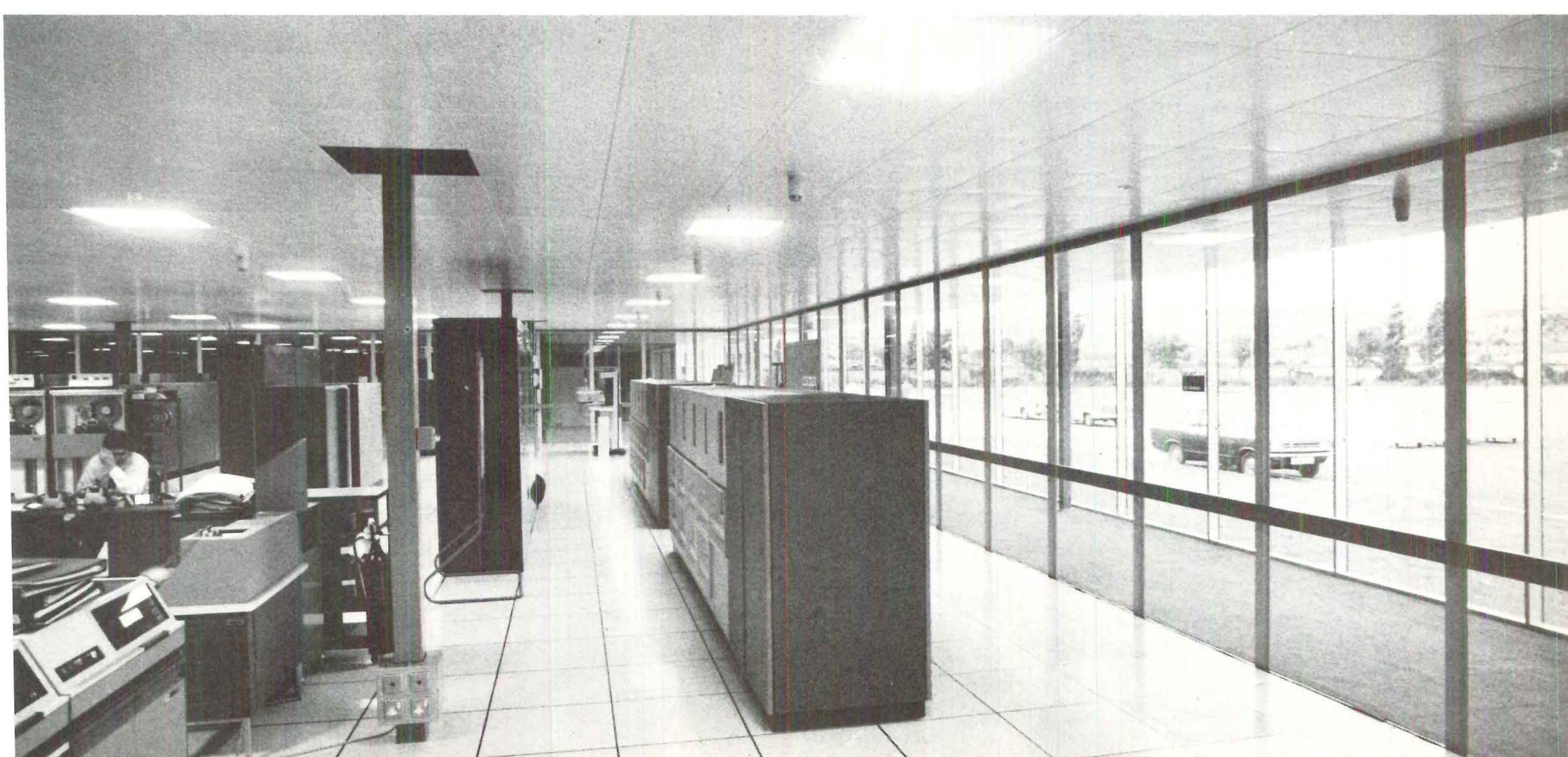
The floor is a concrete slab on grade, covered with carpeting—except for some areas, Interior is a vast loft space divided by partitions and cabinets to serve different functions. The computer room has a raised floor to provide space for supporting services below. Section, isometrics and plans explain the basic organization of the spaces. Square, tubular columns contain cables to serve different spaces at desk levels. Typical office space, and computer room, are shown in photos opposite.








Reception



such as the computer room, which have a raised, vinyl-finished floor to accommodate services below.

Much of the above, matter-of-fact wording is taken from the architects' description. It tells the story. Supporting evidence explains why the structural steel system was selected over a timber structure initially preferred by the client; how the site was developed; how the raft-type concrete slab (with columns bolted to it) solved the problems created by poor soil conditions; and much more. It doesn't tell why the building looks as spectacular as it does.

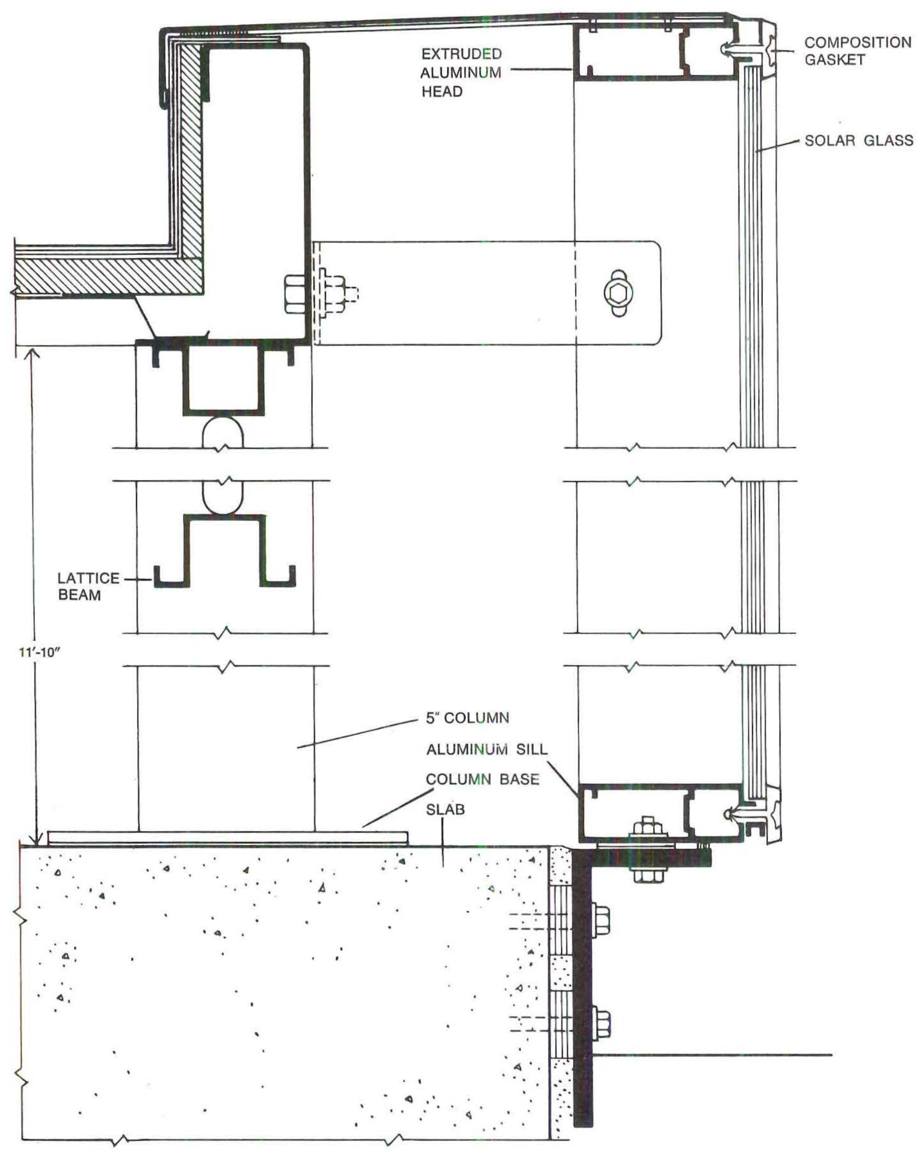
For, secondly but really most importantly, this 480 ft. by 240 ft. package is a Work of Art. The neatness of the exterior packaging—bronze solar glass, neoprene, black-painted steel—reduces architectural detailing to a currently irreducible minimum. The glass screen sits on a steel angle bolted to the edge of the slab; and it is held in place at the roof line by a Z-section attached to the thin edge of the roof. Not until somebody invents a structural and invisible adhesive can this kind of detail be further simplified.

It is a "temporary building," which is what IBM wanted—and this is too bad. Few buildings built in recent years deserve to be temporary less than this one. It is also, one suspects, a humane building—the site, almost 9 acres in size, has a belt of mature trees along two of its sides, and additional landscaping will make the outward views even more pleasant than they are now. It is also, to repeat, a non-building—a scientifically accomplished enclosure of great serenity, in which those who work here count for more than the man-made container.

"Building operations commenced September 1970," the architects report in their typically laconic fashion, "with phased handovers culminating in the handover of the building for 750 personnel ahead of schedule on September 30, 1971." Judging by the current state of architecture around the world, this particular "handover" came not a day too soon.

Facts and Figures

Pilot Head Offices, IBM (United Kingdom) Ltd., Cosham, England. Architect: Foster Associates. Engineers: Anthony Hunt Associates (structural); R. S. Willcox Associates (mechanical and electrical). Quantity Surveyors: G. A. Hanscomb Partnership. Acoustic consultants: Engineering Design Consultants. Building area: 115,200 sq. ft.
Photograph: Richard Einzig page 26.



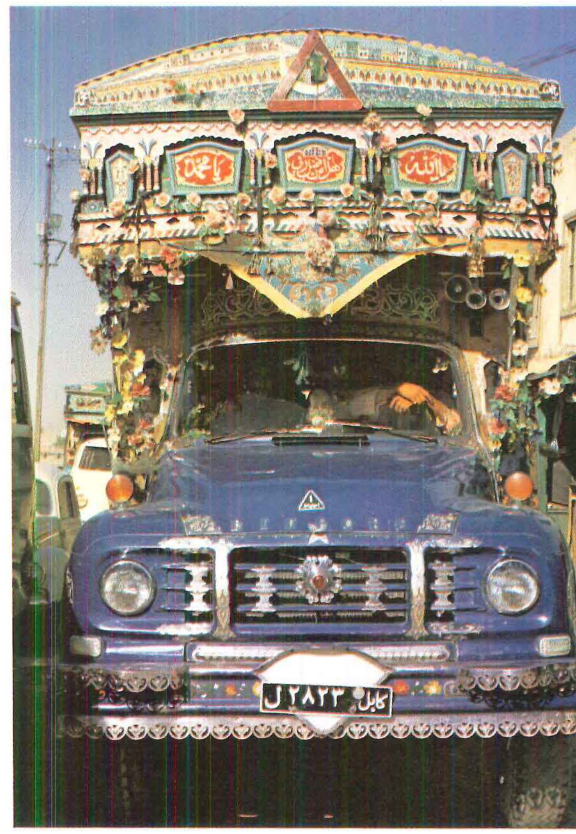
EAVES DETAIL

Detail of wall construction explains how the neat, minimal skin was created. Neoprene gasket holds bronze solar glass in place. Rain water runs off the glass skin into a continuous, gravel-filled trench that surrounds the building. At the corners, the glass is butt-jointed, and the joint is sealed with silicone. At night, the entire structure is transformed into a graceful lantern.

Afghanistan's Hot Rods

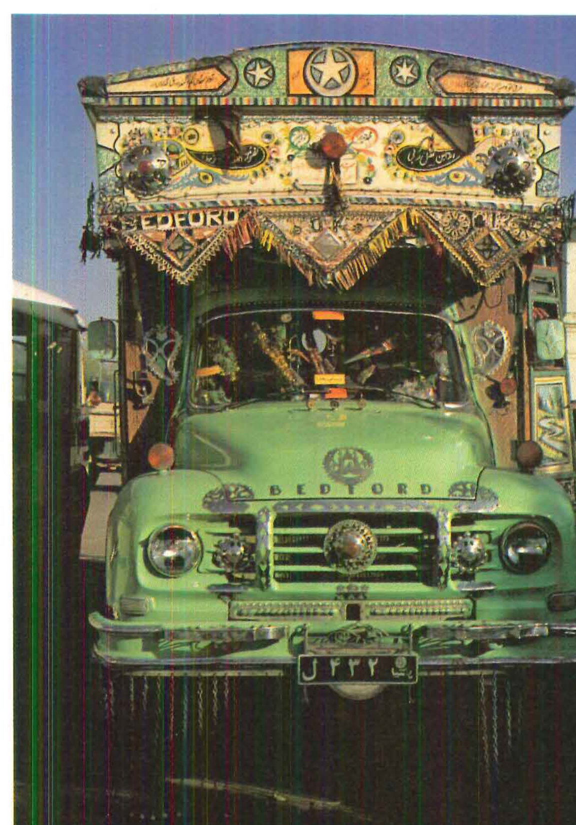
Text and photos: Stanley Ira Hallet

During 1971-1972 Stanley Hallet, Associate Professor of Architecture at the University of Utah, was the Fulbright Lecturer in Architecture to the University of Kabul in Afghanistan. With his wife, Judith Hallet, and Sebastian Schroeder, architect/filmmaker from Zurich, they made a film on Afghan trucking called "The Painted Truck" (distributed by Radim Films Inc., 1034 Lake St., Oak Park, Ill. 60301). This 16mm. color film covers the complete painting of a truck and takes a typical trip into the center of Afghanistan. During the voyage the characters in the truck trip are developed. We see the driver, the apprentice assistant, and the owner in relationship to their truck. Based on an apprentice system the assistant, or "cleanar," does all the dirty work until he becomes driver or "motarwan." For several years he lives and sleeps with the truck, cleaning the engine, jacking up the body at night to save the tires, collecting fares and loading and unloading both people and goods. The driver or "motarwan" just drives, while the owner or "malik" is out finding the next load, or counting money.



Until recently the only way to get around Afghanistan was by camel caravan. The landlocked country is barren, rugged and mountainous. There are no navigable rivers and fewer boats—not even a train system. The only way to get goods from the urban centers to the hinterland has been to contract the nomads.

But even in Afghanistan times are changing. Central to the issue is the geographic fact that Afghanistan lies between Iran, West Pakistan, the Soviet Union and a tip of China. This means that everyone who is someone wants a piece of Afghanistan, and today's way of making friends is foreign aid. The latest war game has been road building. The Russians build in the north close to their own border, the Americans build in the south, and the roads meet somewhere in between on neutral ground. Everyone seems to be delighted with the roads except the "kochis" who are losing their jobs. But with the roads finally tying the country together, enterprising "kochis" are exchanging their highly decorated camel trains for those more powerful animals imported from the West. For many Afghans, trucking represents a big jump into the future. If the truck is to become a part of the Afghan folk scene, it will have to adapt.

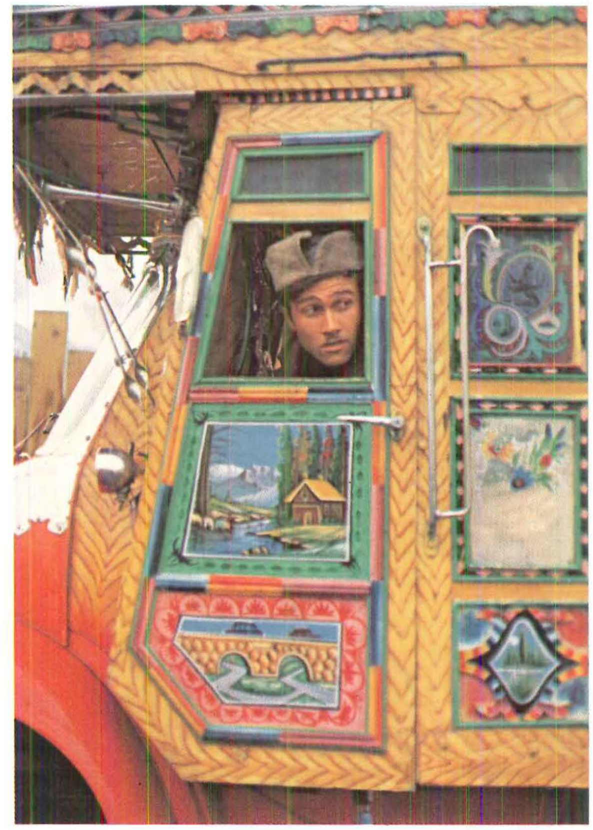


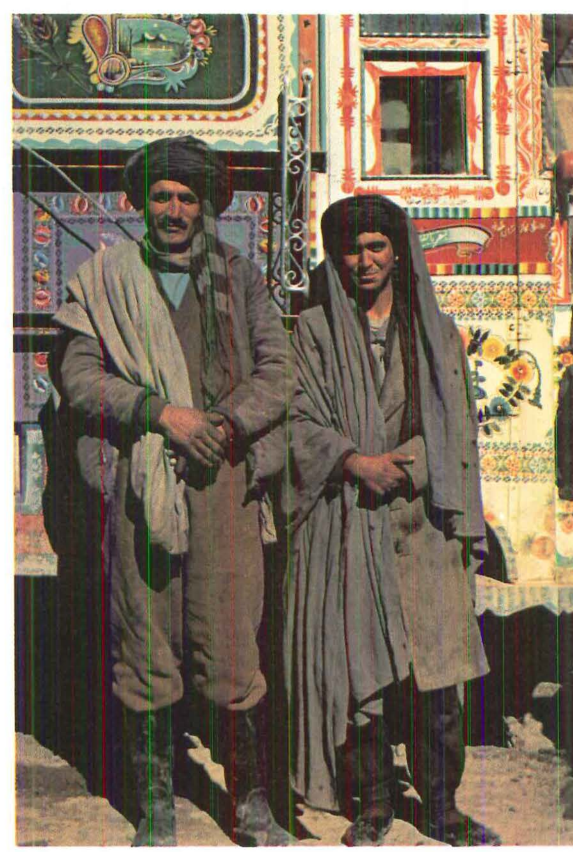
The trucks are built either in England or America, and shipped to Pakistan by boat, stripped down to a motor mounted on a chassis to save transportation costs, and finally carried overland to Kabul. In the Kabul truck yards, called "serais," a big wooden box is built upon the chassis and a grand cab is built around the steering wheel. The cab sits six across with the driver to the left and passengers on both sides.

The trucks come in two basic shapes. The most popular is the four-cylinder English Bedford, called a "rocket" in Farsi. The Bedford dresses up well with an Afghan paint job, but she is mainly a tar road vehicle. Take her off those imported strips of asphalt and she will quickly fall apart on Afghanistan's infamous secondary road system. With a growing need to get into the inaccessible center of the country, a new model truck is just beginning to be imported. It is the International Harvester, a bully of a truck with all of six cylinders, thus giving her the nickname "shash"—six, in Farsi. She can easily take mountain passes that climb to 12,000 feet and is able to withstand a typical Afghan beating.

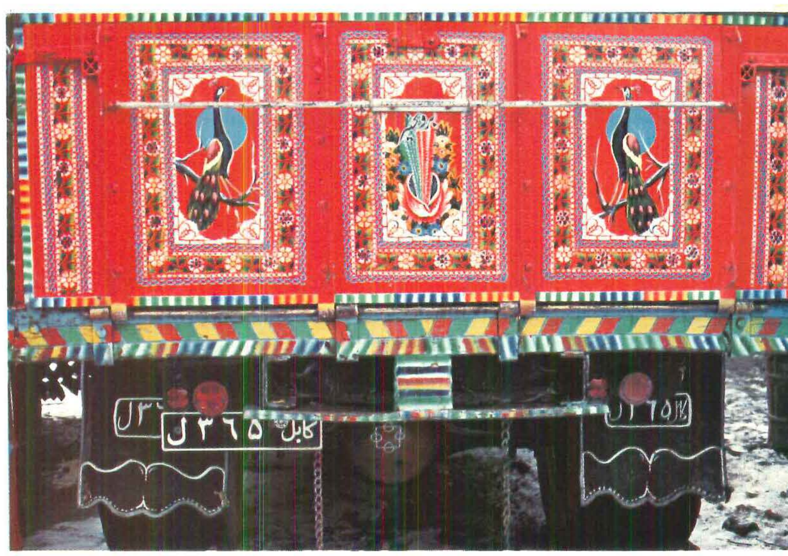
One of the first major alterations is done to the emergency brake. It is taken out. According to good Afghan logic, there is no choice. In Afghanistan the trucks are always beefed up and

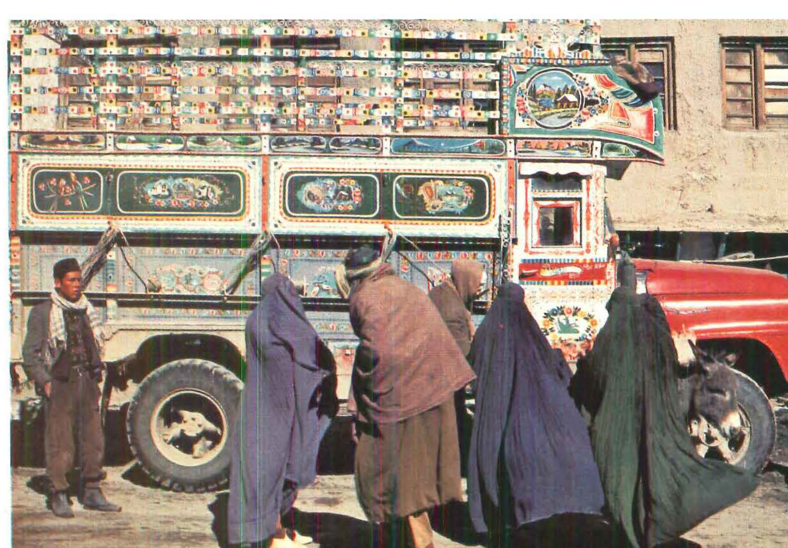
Opposite and below left, English Bedford trucks transformed by the Afghans into altogether new vehicles seating six across. Tassels over the cab and chains from the bumper add lively flourishes. Below, a proud *malik* (owner) and *motarwan* (driver) stand beside their truck.





Typical panels on the truck sides and backs, each framing its own painted design or scene. Opposite, lions, ships, airplanes, fish, birds, traditional architecture and acts of courage provide subject matter.





reinforced to carry loads that no one in Detroit ever anticipated. Obviously the emergency brake would not work under these conditions; therefore, rather than depend upon it, they take it out. In its place is an apprentice driver called a "cleanar," who hangs out the back of the truck and throws a wooden wedge or "danda panj," behind the rear wheel to prevent the truck from rolling backwards.

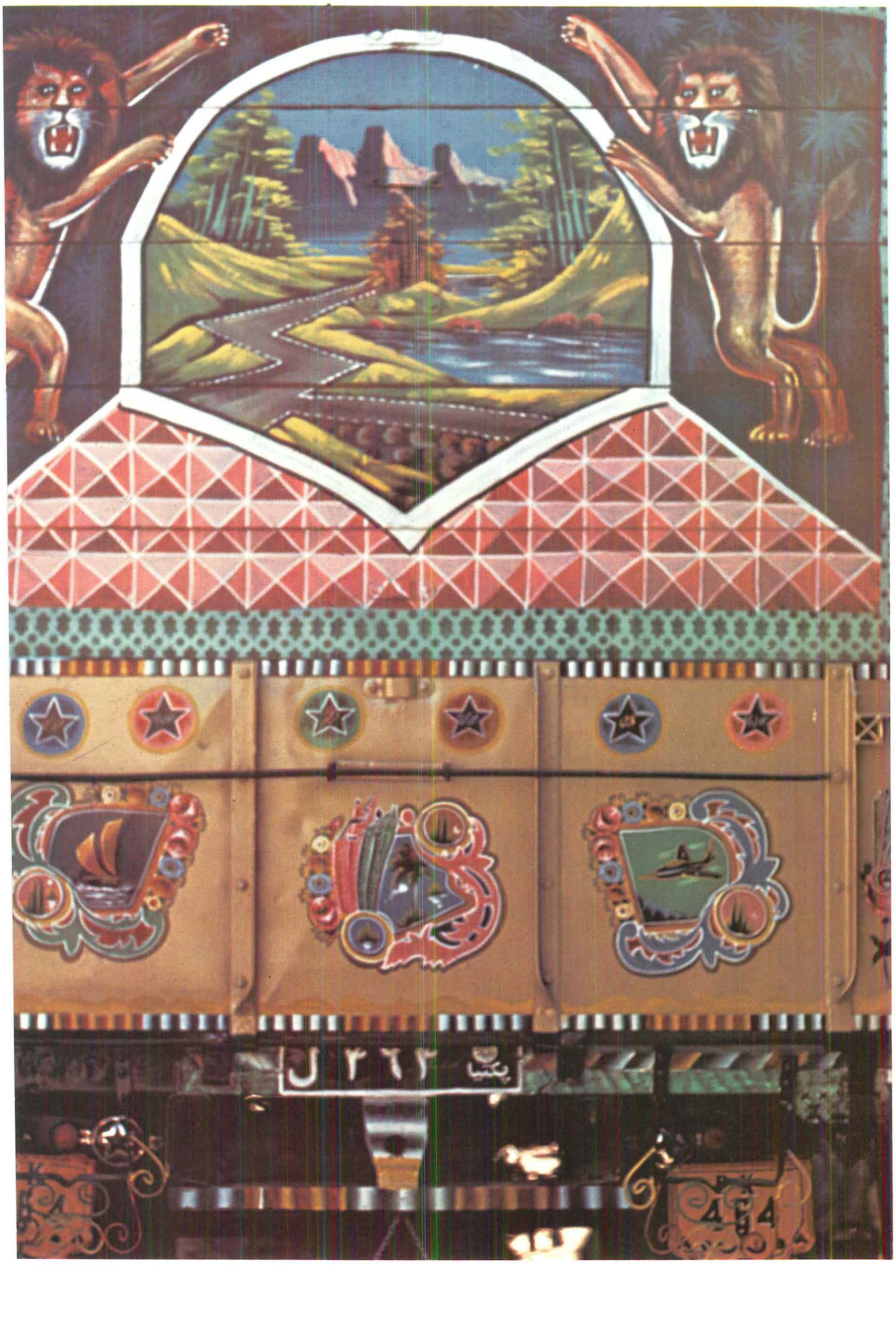
A big plain wooden box of a truck is too impersonal for the highly colored and embroidered Afghan people. Obviously, a few touches are needed to make the new owners feel more comfortable with the truck. Chains hanging from the front bumper, tassels around the cab, mirrors to chase away the evil eye and banners to call upon Allah for protection are just a beginning. The wooden frame is first painted in vivid, often clashing, swatches of color. Purples are easily played against oranges and the outlined structural parts of the truck become part of an elaborate color scheme.

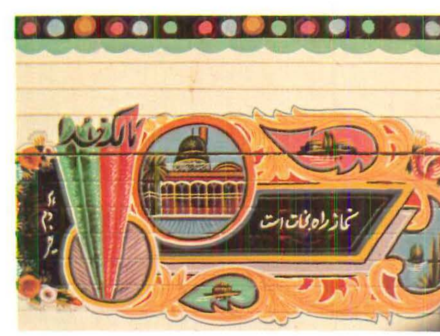
Although the best painters are supposed to be in Peshawar, Pakistan, Kabul has many of its own masters. Mohemmad Jahanzeb Niazi, a "rangmal" or painter, is a good example. He is one of the best in Kabul and he should be. His brothers have shops in Jallalabad, Afghanistan, and Peshawar, Pakistan, where he himself spent an apprenticeship in very much the same way that Western artists flock to the big cities. He now has eight or nine assistants who quickly scamper over the truck after the master lays out the basic designs and selects the ever-important color scheme. It takes ten days to paint a truck and it can cost the owner $100, the equivalent of a driver's salary for four months.

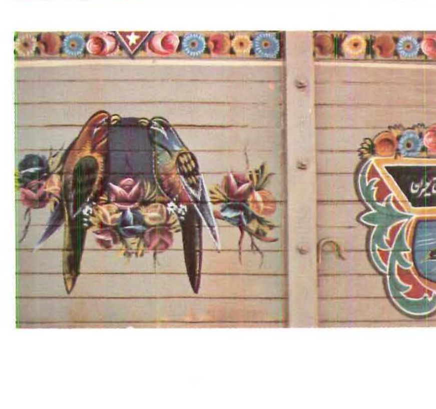
They paint everything—that is, everything they don't have. Understandably, highly sophisticated religious symbols are the major theme. There is the flying Barak, half horse, half woman. This is the horse of Ali, son-in-law of Mohammed, who rode up to heaven. The Taj Mahal in India, Mecca and other holy Islamic shrines are also added with due respect.

In a dry mountainous country, water becomes the number two theme. To remind Afghans of their Muslim paradise just around the corner, the sides of the truck are decorated with pastures, rivers and mountains full of green trees and grazing animals. The entrance to the back of the truck often consists of five horizontal panels which are carefully numbered, so that when they are lowered into place after loading the truck, panels depicting a glorious mountain scene will not be installed out of sequence. What could be more refreshing than driving along a dusty dirt road and pulling up to the back of a truck that offers a tantalizing view of the road that could be just ahead?

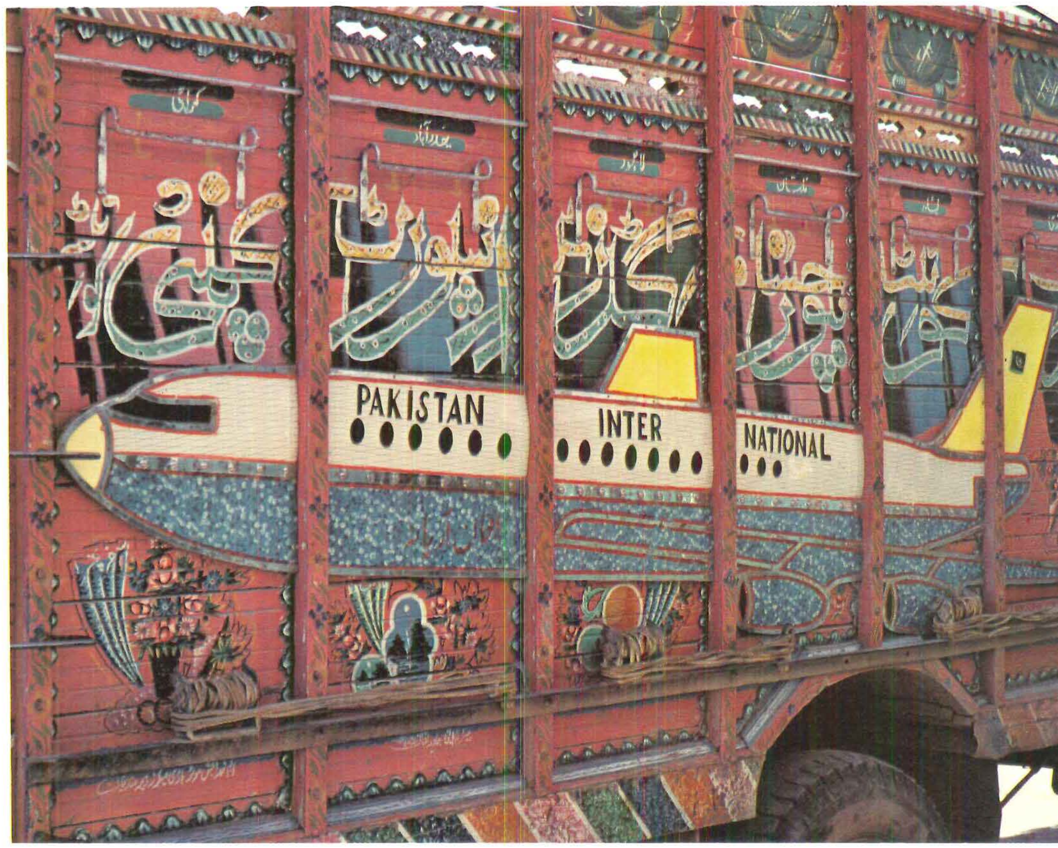
Right down the middle of this painted green valley lies theme number three: a winding Russian-American highway with cloverleafs and overpasses and long-tailed Moscovite Cadillacs out for a Sunday drive. Other typical panels contain a black telephone with a lacquer-tipped feminine finger reaching for the dial—an anomaly in a strict Muslim country where women are still covered in a full-length veil called a "chadri." Today, in search of new subjects, the painters go to the few movie houses in Afghanistan and from the movie billboards they paint leading Pakistani ladies clad in scanty rags, beaten and in chains. Our own truck-painting master expressed a desire for some plain-wrapped issues of *Playboy*, illegal in Afghanistan. We left him a centerfold. Who knows what the next Afghan trucks will look like?

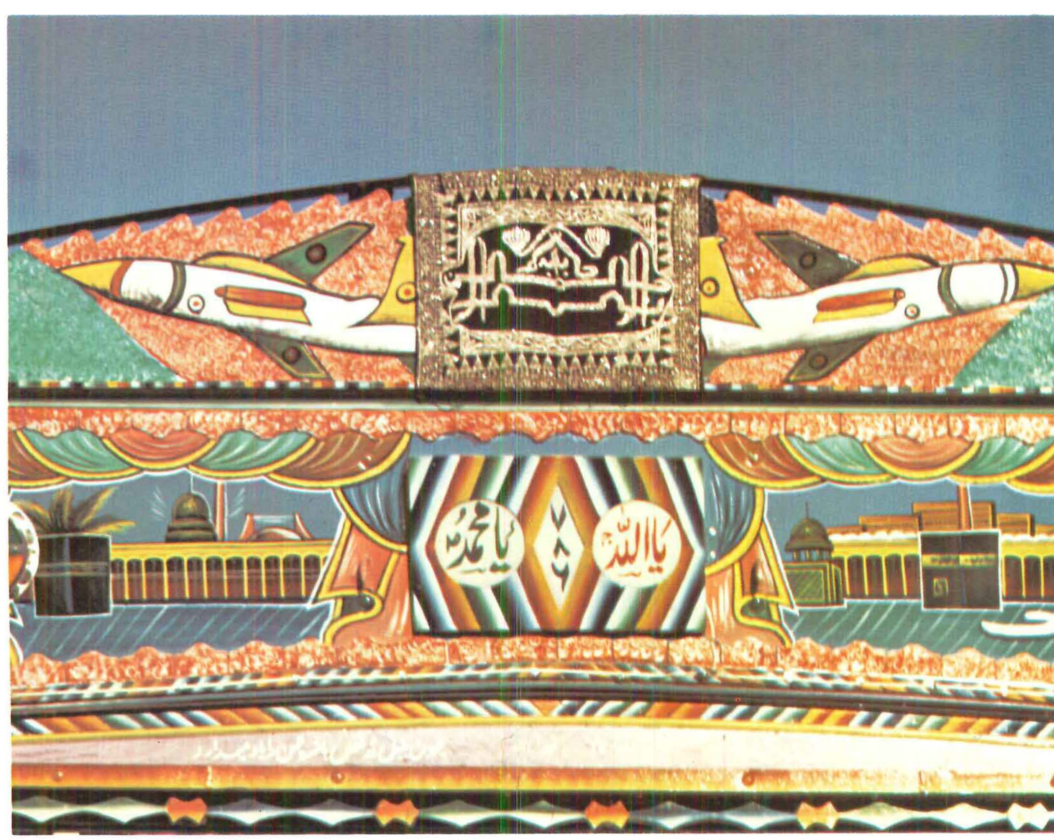


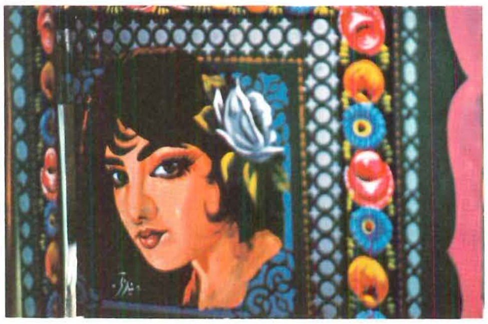


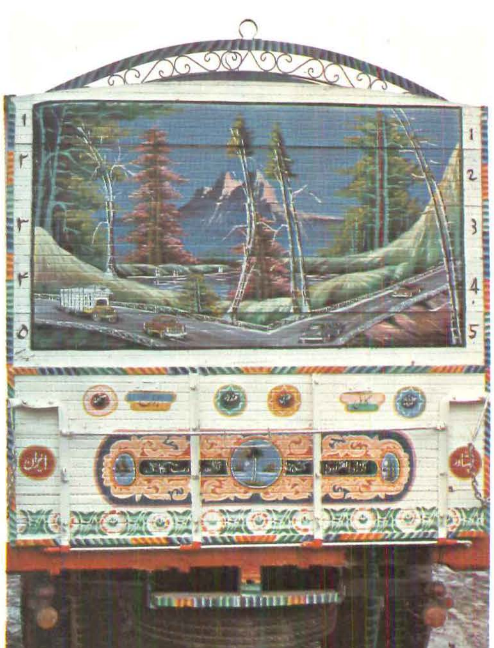


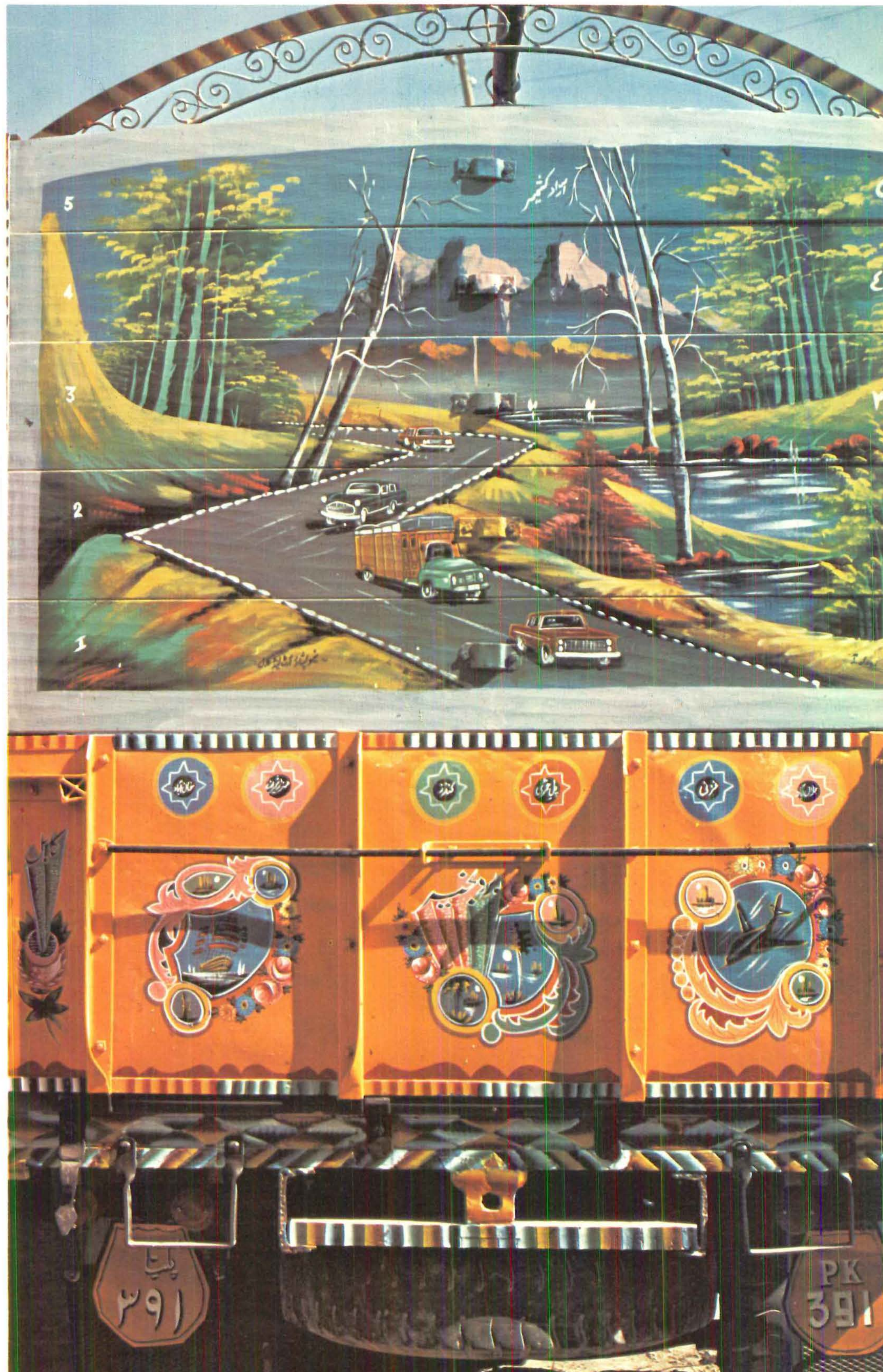
Left, a *rangmal* (master painter) at work. A particularly prize example, below, features a *bas-relief* of a jet liner. Rocket ships, also, are frequently represented. Opposite, seductive adventuresses without veils are seen more often on painted trucks than in real life in this strict Muslim country. Typical scenes for the backs of trucks are technological fantasies of abruptly winding highways through pastoral idylls.











Fred Dubin gets very excited when he starts to talk about energy conservation in building design and how much we can accomplish in this direction right now. The facts and figures roll off his tongue like a favorite limerick, punctuated only by an occasional exclamation: "It's so obvious, so logical!"

What seems so logical to Dubin, who (with Harold Mindell and Selwyn Bloome) is a principal of Dubin-Mindell-Bloome Associates, consulting engineers, is that we can save 15 to 25 percent of energy consumption of existing buildings (there are 68 million of these in the U.S.) and 35 to 50 percent on any new construction through measures that do not sacrifice needed services or important amenities. On new construction, he says that about 20 percent of the savings do not entail any extra first costs and that the rest may raise first costs, but will result in lower life cycle costs. (Life cycle costs are the sum of the yearly owning and operating costs for the period of life expectancy of the building or system. The owning and operating costs consist of the amortization and interest, based on the initial costs; taxes; insurance; labor and material for operating and maintenance; plus energy and fuel costs. To compare the life cycle costs of two systems or buildings, only the differences of initial cost and the operating and maintenance costs need be calculated and compared.)

Dubin is not an alarmist about the energy predicament of this country. He even denies there is an energy crisis now, although he admits there is a financial crisis and production shortage affecting energy. But he sees energy conservation as a preventive measure that can at least buy time, that, like a good maintenance food diet, is really good practice under any conditions. (It has been said that the U.S. wastes more energy than Japan, a highly industrialized nation, uses.) And he does think that we will have an energy crisis within the next ten years and that now is the time to prepare for it by adopting sound design and costing practices and by doing research and experiments so that we will have new technologies when we do need them.

There is not yet any good study of the national aggregate flow of energy in relation to building types; there is no correlation established between energy flow and types of systems or systems performance or building construction. So there is no control model to use as a standard for measuring the effectiveness of each proposed energy conservation method. (A total systems approach makes it difficult to separate one system from another anyway.) Dubin notes that it would require about $5 million to produce a computer model for different building types in relation to all the combinations of systems that supply or affect energy consumption, waste management, and all the other systems that should affect building design today.

The private practitioner cannot afford to pay for this, so it is up to government to take the lead. "Government, industry and utility companies must lead in setting the standards for energy demand and management in each type of building. If the private sector does not follow, new codes will be necessary to limit energy consumption and pollution emission. Proper testing and experimenting is an absolute requirement for setting such standards and must be seriously undertaken now," says Dubin.

Once the standards are understood and their rationale accepted, Dubin notes that it is the architect more than the engineer who can most effect energy conservation in a building. "If an architect designs an all glass building, the engineer has to work from there." Dubin's interest now is to help spread the technical words about energy and its relation to buildings so that architects will assert themselves in the conservation process. "It takes technical skills to make decisions in an increasingly technical world. The goal is to make a building, like a person, adapt to its environment with a minimum of mechanical aids, but such ultimate simplicity requires comprehensive understanding and a respect for the total system in which a building functions."

If all buildings constructed in the U.S. during the next 12 months used sound energy conservation measures, 600 billion cu. ft. of gas, or 4 billion gallons of oil, or their heat equivalent in other fuels could be saved. If 15 percent of the energy consumed by existing U.S. buildings could be saved, the amount of oil conserved would exceed 12 billion gallons per year.

Dubin points out that the U.S. is certainly not alone in either its problems or goals in terms of energy conservation. Some examples of international concern include the Canadian government's promotion of heat recovery systems, especially in office buildings, and studies by England's Building Research Institute on how to conserve energy in mechanical and electrical systems. Battersee, England, has a huge power plant that uses waste heat on a community scale and Sweden runs waste heat under some sidewalks to melt snow. Farsta, Sweden, has a central heating plant that uses nuclear power to generate heat and it has an underground hot water distribution system.

But the economic situation is such that other countries do not use as much energy per capita as the U.S.—not so much because they are trying to save energy as they are trying to save money. Also, people in other countries have generally accepted living with less lighting, climate control, etc. than Americans have come to expect. In the last five years, American architecture has become more and more an international standard. Perhaps the 1976 U.S. Bicentennial will be able to demonstrate positive ways of conserving energy, so that developing countries, entering their own industrial revolutions, can avoid some of our mistakes in this area.

Several practices discussed here will require institutional changes before they become practical. For example, it is difficult if not impossible to persuade a speculative builder to invest any more first costs in a building than he has to, unless there are incentives in the mortgage or insurance rates to encourage him. But most of the practices do not fall in this category and many can be done now. For example, multi-use buildings, incorporating housing, office and commercial facilities would help reduce the peak energy loads created by office buildings, which operate entirely for an 8-hour day.

Almost 40 percent of the energy consumed in the U.S. falls into the professional jurisdiction of the architect or engineer. It is time that our accounting practices included long-term social consequences and that design takes on the esthetic of such real concerns as energy conservation. The Gross National Product must now give way to Gross National Benefits.

What follows is necessarily too brief on some subjects and may include "more than you may want to know" about others, but the principles and systems Fred Dubin discusses could lead to a new kind of design program and professional practice.

Energy for architects

By Fred Dubin
as reported by Margot Villecco

Site orientation

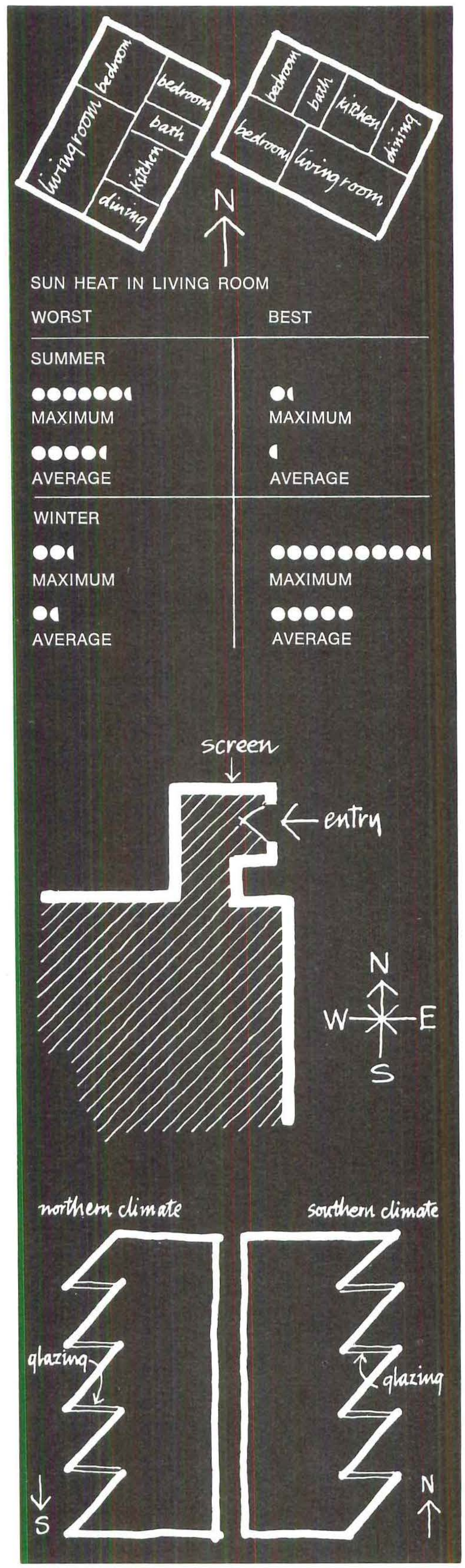
In the U.S., modern buildings tend to look very much the same whether they are in northern or southern climates and regardless of their orientation on a particular site. This is because buildings have been designed largely to keep natural phenomena outside, to separate conditions inside from the outdoors as much as possible, relying on mechanical systems to do much of the work. Not only is this wasteful in terms of energy consumption, but it also seems quite boring in terms of regional esthetics.

The fact is that there are distinct and important characteristics to site and direction. A building cannot optimize its energy requirements unless it is designed to take advantage of natural elements, to respond to its different environments, which may mean different forms for each face or side of the structure. Color, texture, glazing, thermal wall and roof characteristics, reflective or absorptive surfaces and exposure patterns are just a few of the relevant considerations. A basic design principle should be to complement, not ignore, the natural environment.

In the northern hemisphere, the north and west sides of a building are most exposed to wind. Therefore buildings should be oriented away from the prevailing winds or have screens to avoid atmospheric leakage around doors, windows and any other openings. If there has to be an entrance on the north or west, it should be screened.

In the northern hemisphere, sunlight is most important on the southern side of a building, then the eastern, western and northern portions (in that order). Therefore, in a cold climate, glass should be concentrated on the south wall so that the sun can help to heat the space. There should be a minimum amount of glass on the north wall in particular because a building suffers the greatest heat loss here. In fact, energy consumption would diminish if there were no glass on the north wall; architects should try to locate corridors, lobbies and other non-essential, task-oriented spaces in this area.

In a warm climate, however, the situation is quite different. In Louisiana, for example, the north wall is the ideal place to put the greatest amount of glazing. Energy conservation in the north calls for reducing heat loss, but in the south, efforts must go toward preventing heat gain. Windows on the north can still provide daylight and a view, but receive minimal solar radiation.



The sides of a building may also be manipulated to face either north or south. An example is the sawtooth pattern illustrated at bottom left.

Heating, ventilating and air-conditioning

Ventilation in buildings is necessary for breathing and has a diluting effect on odors and impurities. But the codes that have often determined what and how much ventilation shall occur tend to specify cu. ft. per person, or a fixed cfm per cu. ft. of space; such absolute standards often result in overdesign in some portions of many buildings.

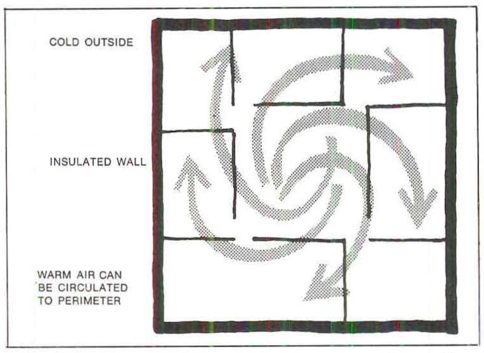
If there is to be a ventilation code, it should consider infiltration as part of its requirements. It is preferable to control air coming into a building and not just let it infiltrate, but where infiltration does occur, that air becomes part of the circulated air system and puts a load on heating and cooling equipment. The codes should also provide for varying activity levels in different kinds of areas. For example, a sports activity will require more breathing space than sleeping.

Air is a consumer of energy. One must clean, cool, heat and move it, so it is best to minimize intake. Outdoor air must be supplied in greater amounts than exhaust requirements and so recycling—perhaps through activated charcoal—is wise.

Outdoor air should be brought in in minimum amounts. If one cannot reduce this amount, it would be advisable to examine transfer devices to transfer energy from the exhaust air to the intake system— such a system is 60 percent to 75 percent efficient. Afterwards, the exhaust air can supply heat to the heat pumps (see middle column next page), etc., to raise their efficiency.

Natural ventilation through window or wall openings has limitations: of location and height in relation to other buildings, wind exposure, condition of the outside air, interior layout, season and climate. And often large amounts of infiltration occur that must be heated or cooled.

A forced air system, on the other hand, goes where it is needed in the building and it can be cleaned. However, it depends on the temperature differential in and out-



doors for effectiveness as a natural cooling system. It is particularly useful in flushing out the accumulated heat of buildings during summer nights and so cutting air conditioning loads.

In big buildings, there is permanently heat in the interior areas of the floor that must be dissipated. One method is to use a refrigerant to cool the interior and when it is cooled, throw off rejected heat to a cooling tower. By recapturing it for storage or use in a heat pump, energy can be saved. If the outdoor air is below 60 deg., it can be used to cool the interior. Another consideration, however, is that in colder climates, the outdoor air becomes heated in space and energy is then required to humidify it.

If the outdoor air normally is above 75 deg., then it must be cooled, but most places or many months of the year have temperatures in the 60 deg. to 70 deg. range, with the wet bulb temperatures 15 to 20 deg. lower. Here an evaporative cooling unit, which uses fresh air, is acceptable and saves energy.

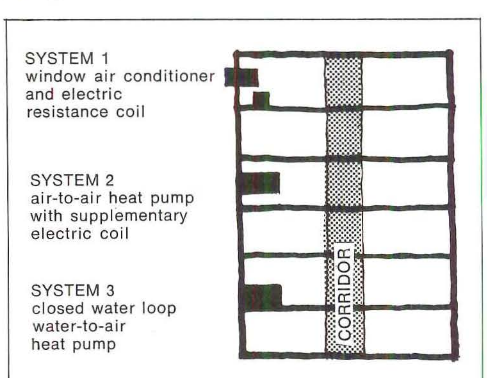
When heat is required, a heat pump consumes two or three times less energy than electric resistance heating and may be combined with the waste heat cycles. Radiant heating systems are generally not effective because they have temperature lags that then cause the units to overcompensate. If properly designed and insulated, a building may not need any perimeter heating at all, but may instead be served by warm air from the interior areas.

Both heating and cooling systems can be controlled selectively. Corridors need not be as warm as work areas; some machine rooms may be cooler than office areas. Each building has to be studied for the tradeoffs available to it and the HVAC systems calculated accordingly. Perhaps the standard should not be HVAC designed for 97.5 percent tolerances, but for 95 percent. This might mean closing the building in extreme cases or, more likely, wearing a sweater a few extra days. Savings in energy can also come from installing modular equipment where loads vary considerably; when a large system is operating at only 20 percent capacity, efficiencies go down and both money and energy are wasted. Turning off two of three units would save both. In some cases, large units are much more efficient than small ones. When this is the case, they should be equipped with sophisticated control devices to achieve flexibility of operation. Heating and cooling storage systems can also help reduce power peaks and so minimize equipment requirements.

Stacking "clean" and "dirty" areas, the way plumbing facilities are often stacked, or grouping such areas in one area of a floor, can result in more efficient HVAC systems. For example, if smoking areas, machine rooms, bathrooms and other areas requiring thorough ventilation are close to each other, they can be treated as a unit and the rest of the floor would then need a smaller ventilation system. Recirculating "grey" air (air already circulated into general office areas, for example) into storage, utility and other areas not requiring the highest levels of air freshness also saves energy.

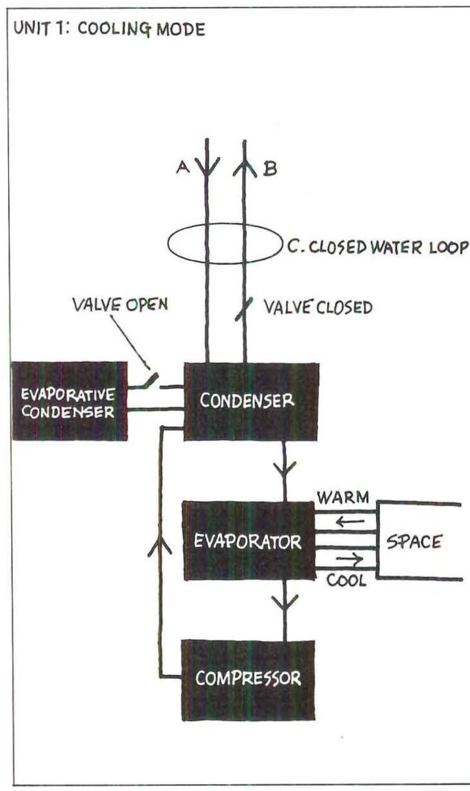
A heat pump is basically a refrigeration system for heating and cooling. When it is operating to cool an area, the compressor pumps refrigerant gas at high temperature and pressure through the condensing tubes. An air-to-air heat pump uses an air-cooled condenser.

A water-to-air heat pump proves to be the most efficient heating and cooling system for the apartment illustrated below, given that each room requires 15,000 Btu per hour of heating and 12,000 Btu per hour of cooling. Systems 1 & 2 are equally efficient in the cooling cycle, while system 3 (water-air-heat pump) uses one-third less power. For heating, system 1 must rely on central generating plant for electricity and since these operate at only 30 percent efficiency, will require 50,000 Btu per hour of raw source energy. System 2, which uses an air-to-air heat pump, requires 25,000 Btu per hour of raw source energy, while system 3 requires only 14,000 Btu per hour. The diagram at right illustrates system 3.



APARTMENT HOUSE SECTION

Closed water loop water-to-air heat pump: The diagram below shows this system in both the cooling mode (left) and heating mode (right), called units 1 and 2, respectively. Unit 1 cools space and the rejected heat is returned to the closed water loop. When heating (unit 2), the system's closed water loop receives heat from any or combinations of sources 1-4, or from a solar collector, ground coils, a well or a pond. It is this system that proved most efficient in the example of the apartment house cited at left.



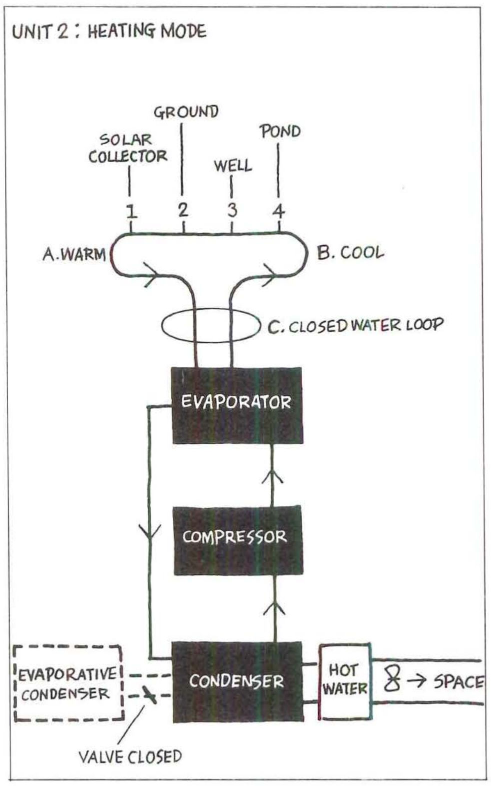
Outdoor air circulating over the condensing tubes, converts the refrigerant gas to a high-pressure liquid, which then flows to the evaporator. Heated air is rejected into the atmosphere.

This (rejected) air is the combined heat of compression from the refrigeration unit and the heat removed from the evaporator. (The refrigerant expands as it enters the evaporator tubes, absorbing heat in the process. Air passing over the evaporator tubes gives up heat to expanding refrigerant and is cooled.)

The cooled air is supplied to the building spaces; the refrigerant flows back to the compressor.

When a heat pump operates in the heating mode, control valves reverse the refrigerant flow. The evaporator cools outdoor air and rejects it. Heat extracted from the outdoor air, plus the heat of compression, raises the temperature of room air passing over condenser tubes and is delivered to space for heating.

Refrigerating systems, including heat pumps, also use water as a condensing media in the cooling mode and hot water for space or domestic hot water heating, either directly in radiation or in coils with fan systems.



Buildings requiring both heat and cooling can best use a heat pump. Large office buildings in colder climates can use the exhaust air in winter as a heat source for an air-to-air or air-to-water heat pump for space heating.

Water-to-air or to-water heat pumps can also be used to transfer heat of lights, people and machinery in interior office spaces to a closed water loop, which then becomes a heat source for other heat pumps that are operating in the heating mode. These units cool the water in the closed loop and deliver the heat rejected by their condensers to areas requiring heating. See illustrations for an example of how these systems work in cooling and heating modes and a comparison of their efficiency with other systems.

By now almost everyone has experienced or heard about the shortages of electrical energy that have occurred, especially in the urban areas of the U.S. Not as many people know, however, that existing central generating and distribution systems generally work at only about 30 percent efficiency—and that usually less than one-third of their raw source energy ever reaches their customers as electrical power.

Some of the energy losses occur during electrical generation, with almost 65 percent of the source energy being discharged as waste heat into the atmosphere or nearby water courses. Another 10 percent may be lost in transmission and distribution: the farther away a customer is, the greater the inefficiencies. Some utility plants sell some recovered waste heat as steam, but distribution of steam is highly inefficient over any distance—almost 15 percent may be lost and, in any case, steam distribution is not as efficient as high-temperature hot water.

An alternative to the central generating plant is a Total Energy System. It uses about half the fossil fuel to deliver the same amount of energy as a central utility and supplementary cooling and heating systems. It also emits proportionately less pollutants; and because it recovers and uses its waste heat efficiently, it can operate at as high as 75 percent efficiency. The average is 60 percent in present Total Energy plants.

A typical total energy plant is located at or very near its customer's site and is powered either by gas turbines burning natural gas or by fuel oil or by reciprocating engines burning oil, gas or both. It has a recovery system that reclaims heat produced by the turbines or by engines in the form of hot water or steam. The two prime mover types handle the recovered heat differently. The turbine passes the exhaust gases through waste heat boilers, converting the energy into hot water or steam at low or medium steam pressures (up to 150 psi). The reciprocating engine (which is more efficient unless there is a continuous use of waste heat) heats the water in the engine jacket and passes hot exhaust gases through heat exchangers to obtain hot water or low-pressure steam.

Because a decentralized Total Energy System is located close to its customer, it does not suffer the transmission losses of a central power plant. It does cost more initially than buying service from a utility company, but Total Energy provides lower operating costs. And, when the recovered heat is not needed immediately, the system can include facilities that store hot water until required at a later date. Where there is not enough waste heat, the system must be supplemented by gas or oil-fired boilers or by electric heat—most efficiently supplied by a heat pump.

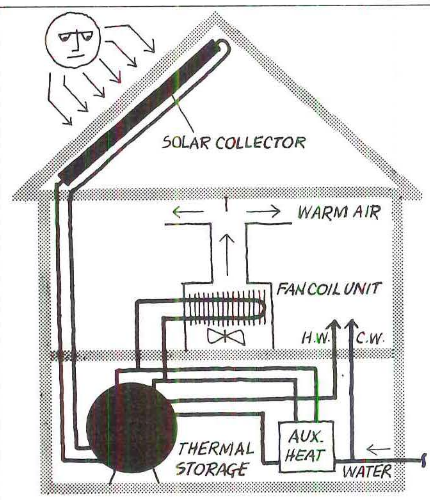
A Total Energy System is not applicable everywhere, but the technology and hardware are available and more and more projects are considering using it. So far, it has been used in mass housing projects: these include the 5,680-unit Rochdale Village, in N.Y.; the 2,000-unit, 24-story Wabasse Housing Complex, in Brooklyn; the Mission Valley and Kennilworth apartments, in Mo.; and the 1,200-unit Wingate Village garden apartments, in Indianapolis. In the U.S., even the state agencies are now willing to make higher initial investments for Total Energy systems. A Total Energy plant is now operating in the Kings County, N.Y., project built by the State's Mental Hygiene Facilities Corp. Dubin-Mindell-Bloome has also designed a Total Energy plant for a new campus planned in Brooklyn, N.Y.

Solar energy is becoming more and more important as an inexhaustible energy source. It can reduce the use of conventional fuels for heating and cooling by 40 percent to 75 percent (although supplementary systems must nonetheless have the capacity to assume a full load if necessary).

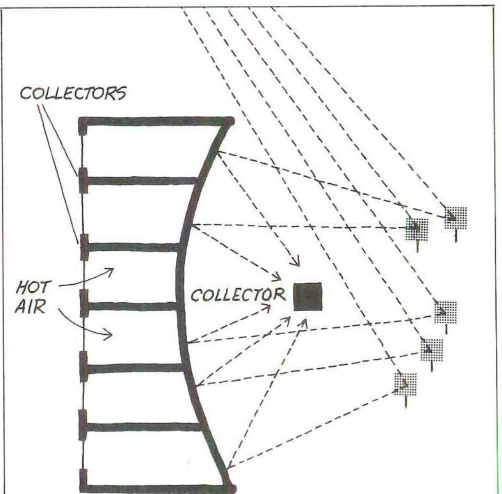
The system uses a flat plate solar collector or a collector that focuses direct solar radiation to heat hot water for the building's heating and heat-operated refrigeration plant and for domestic hot water requirements. Or the heat may be stored for future use. The hot water from the collector can also be used in an absorption refrigeration unit to chill either air or water for air conditioning, or the solar heat could aid sludge digestion at sewage treatment plants.

Contrary to many opinions, solar collectors need not be ugly, but can become a new design element for a building project. While some studies call for collectors that sit on a site like a billboard, there are subtler ways to design collectors. Recently a man put a solar collector on his home's property and designed the collector to serve as a fence around his terrace. An architect can choose to see the solar collector as a design constraint, or he can see it as a new architectural element that can be used effectively and attractively. The collector can be on the roof of a building or designed as part of its roof, its wall, or as a solar shading device. It can also be constructed over parking lots and service buildings.

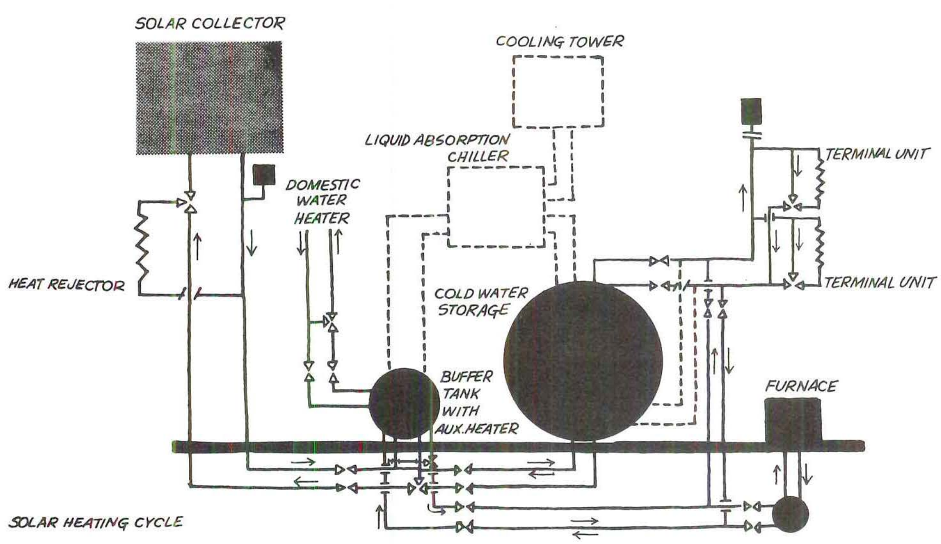
A solar system may complement operation of a heat pump by supplying warm



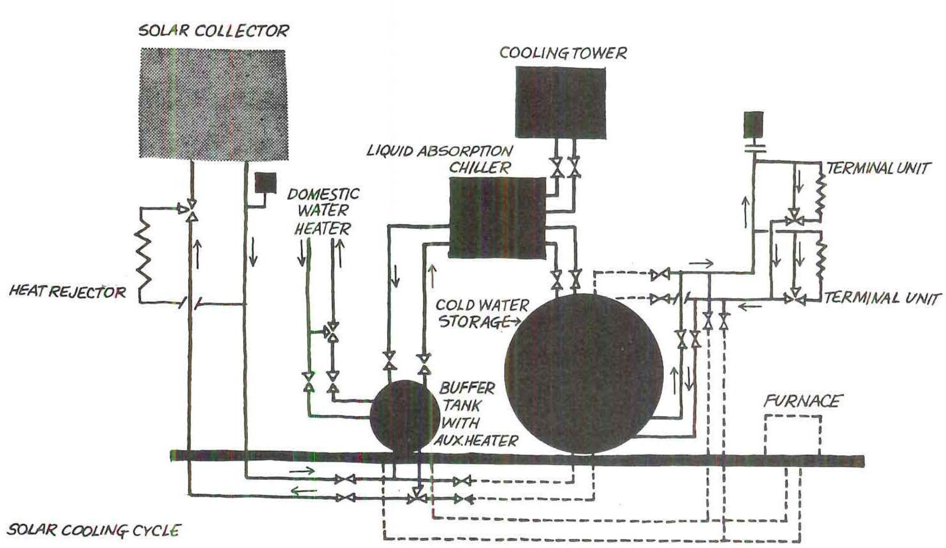
SOLAR HEATED HOUSE



OFFICE BUILDING-PYRENEES, FRANCE



SOLAR HEATING CYCLE



SOLAR COOLING CYCLE

water as a heat source for a closed loop water-to-air heat pump system instead of providing hot water for space heating. Used this way, the size of the collector can be smaller and the system can be more efficient.

Solar collectors generally promise to become more and more efficient in the next few years. They can be smaller and cost less and will have better selective surfaces to increase absorption and reduce losses; improved glass or plastic coverings; honeycomb devices to reduce collector losses; and better storage systems. They will also work better if we clean up our urban atmospheres; the air pollution in such cities as New York and Los Angeles can cut collector efficiency by 10 percent.

Systems using solar energy for both heating and cooling are considerably more economical than heating alone. Today, solar systems are more economical on a life-cycle cost basis than electric resistance heating. With fossil fuel costs rising dramatically, solar systems will be competitive with gas and electricity soon—maybe in five years. Dubin-Mindell-Bloome is doing several demonstration projects that use solar energy systems. It did a preliminary feasibility study in solar heating for the U.S. General Services Administration on a six-story office building in Manchester, N.H. (see p. 47). Analysis so far indicates that a 15,000-sq. ft. solar collector on the roof will provide more than 70 percent of the yearly heating energy for three floors (each between 14,000 and 18,000 sq. ft. each) and more than 90 percent of the cooling energy. The system will cost less than straight electric resistance heating and cooling and will be within 20 percent of the heating and cooling costs of fossil fuel systems. In another seven or eight years it could be economically competitive. Even now, however, it can save over 2.4 billion Btus of raw source energy per year in the U.S.

These studies look so promising that the firm has since worked with the Grumman Aerospace Corp. to submit a proposal to the U.S. National Science Foundation for a detailed economic feasibility study of a solar system in the GSA building. It has also proposed a research project with Lockheed's Palo Alto Laboratory.

Other real projects include developing new mechanical, electrical and other energy systems for a new building at the Carey Arboretum, a part of the New York Botanical Gardens and located in Millbrook, N.Y. Dubin is considering a solar heating and cooling system to supplement more conventional systems. And, in Vermont (right), a developer has called on the firm to integrate a solar energy system with a liquid waste system for a cluster of 10 condominium units.

Outside the U.S., Australia, Japan and Israel are already using solar energy widely for domestic hot water supplies. And Australia is experimenting with using solar energy systems for space heating and cooling in buildings.

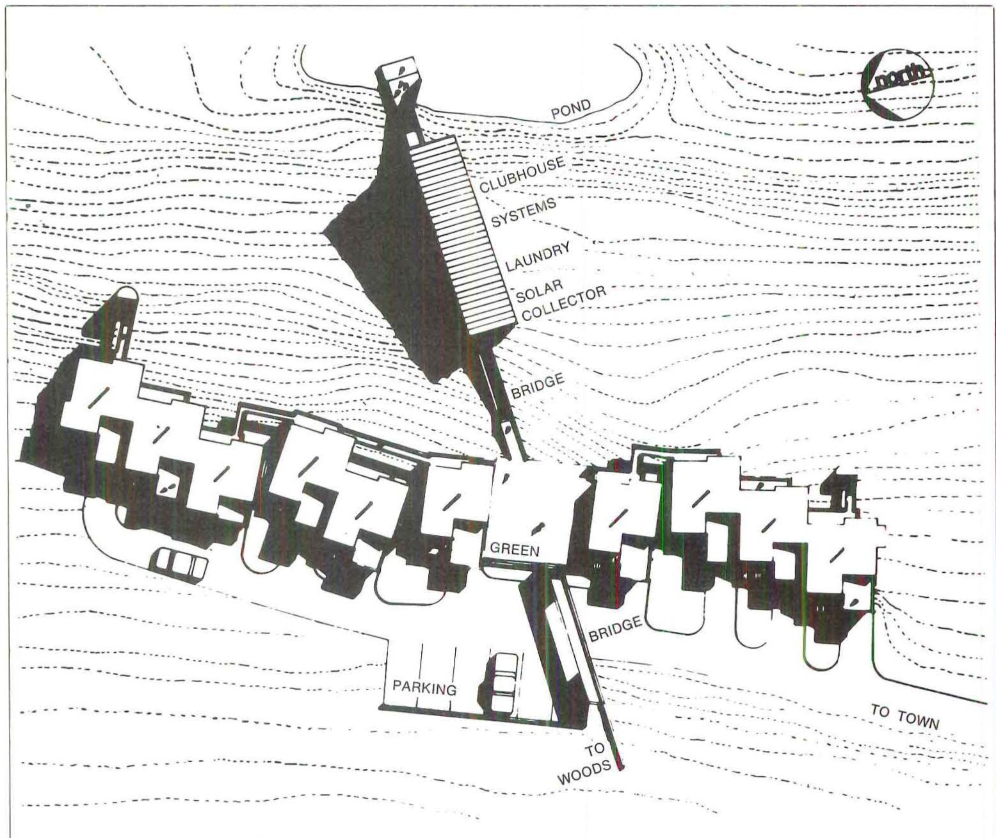
The sense of urgency resulting from diminishing fuel reserves may be fortunate. Given an accelerated rate of development, solar energy systems will be able to serve 10 percent of U.S. building requirements by the year 1980. This conclusion is based on the assumption that the traditional fuel sources will not only become more scarce, but that they will continue to become 5 percent more expensive each year. Other assumptions are that collecting solar energy will become relatively more efficient, that there may be new devices to absorb the solar heat and perhaps move the collector so that it can follow the sun. There should also be better storage systems, good coordination between solar and other HVAC systems in building, and further development of absorption refrigeration units so that they can operate at lower temperatures and therefore lower solar collector costs. Energy conservation is important in a building because it will allow a solar system to assume a much larger percentage of the heating and cooling loads, so that supplementary systems can then be cheaper.

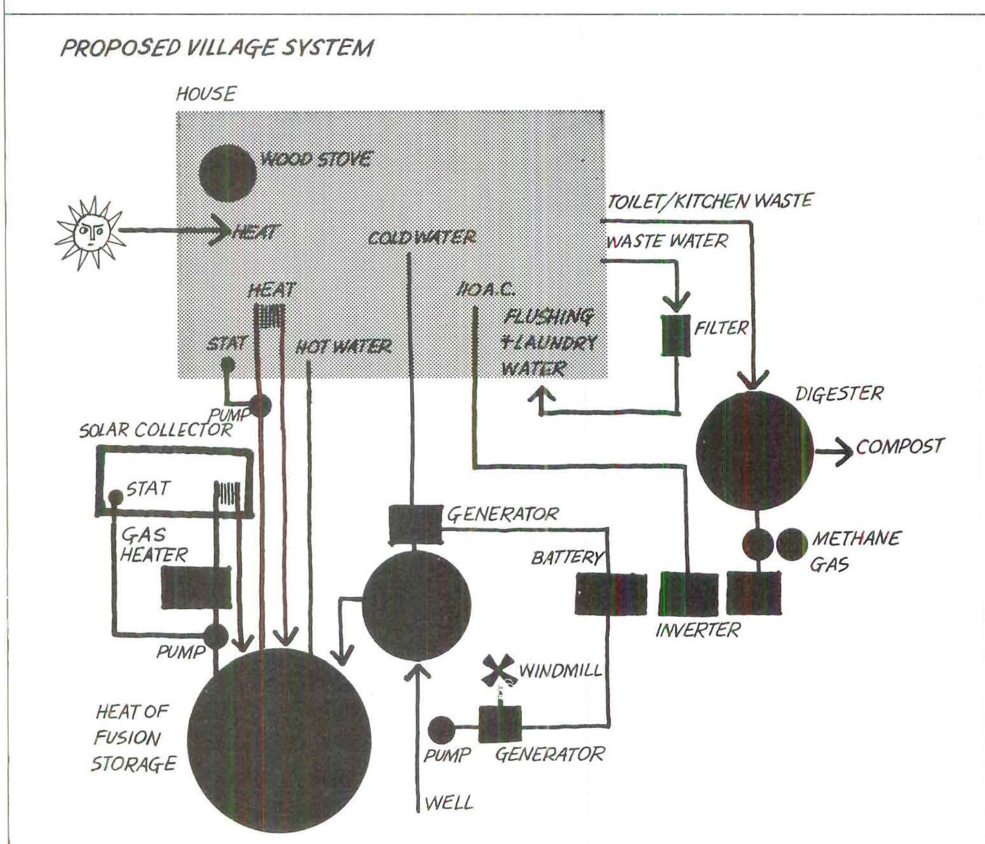
Waste management

Processing waste is an expensive undertaking. The crudest primary sewage treatment costs about $5 per person per year. Next in sophistication is activated sludge, or secondary treatment, which costs about $10 per person per year. To produce potable water costs $18 per person. Leasing schemes for facilities can increase their intensity of use and help economize a bit. Incineration costs $8 per ton for solid waste.

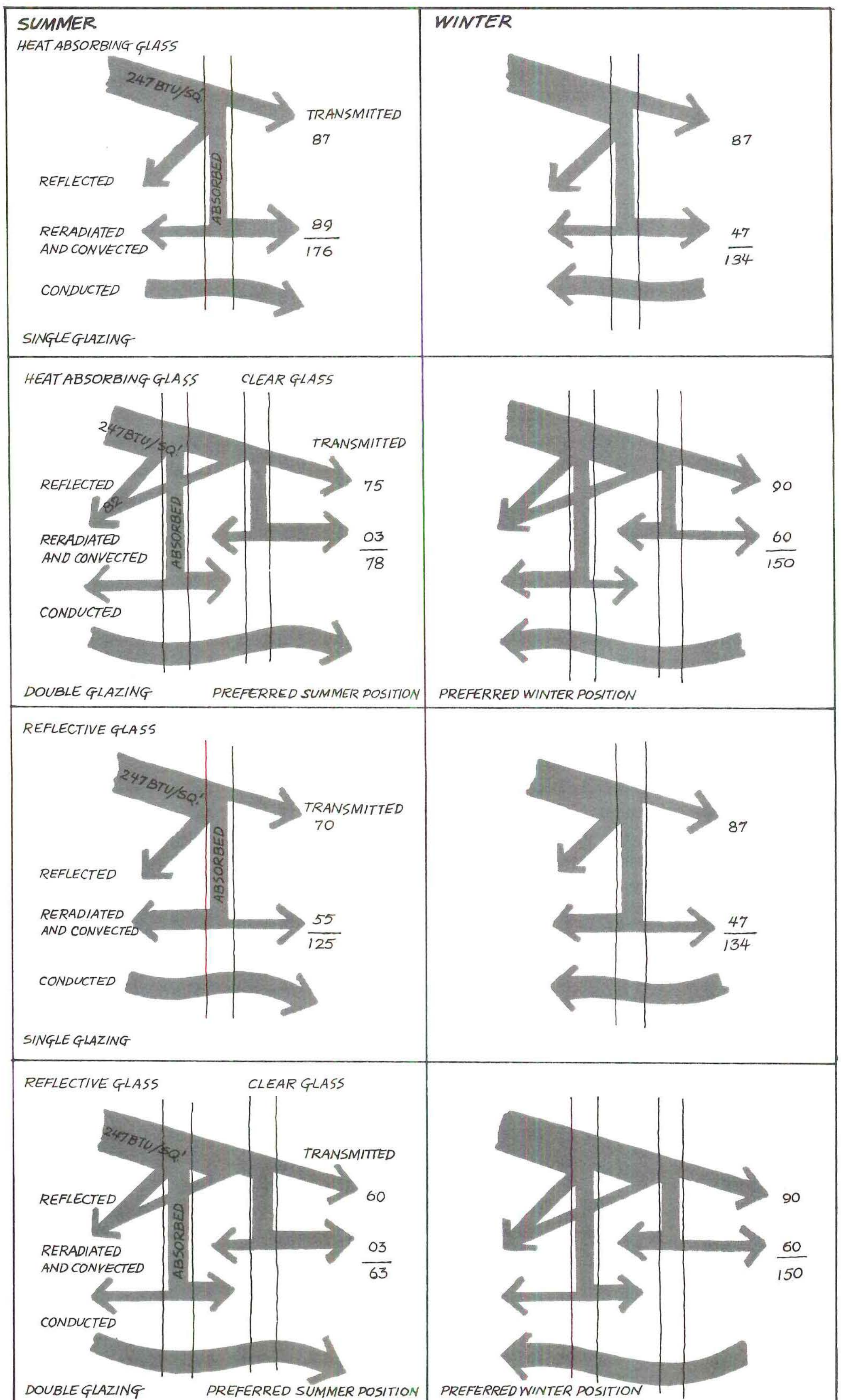
Combining energy and waste systems promises some savings both in energy and financial costs. Some heat may be recovered from burning waste and producing usable water from liquid wastes can reduce new

Grassy Brook Village is a new condominium community proposed for southern Vermont, where it will combine waste management and solar energy systems to become an almost wholly self-sustaining habitat. The developer is Richard Blazej and the architects (of Boston) are the People/Space Co. Space heating and domestic hot water are provided by a solar collector, which will heat and then store hot water for the ten initial condominium units. The windows will be largest on the south side of the houses, where they can soak up winter sun; a thermal barrier will cover them at night to prevent heat loss. Secondary heating systems will include gas heaters and wood-burning stoves. Human and kitchen wastes will be removed through a vacuum system to a central digester that will produce fertilizer and methane gas; wash water will be recycled through a sand filter for flushing and laundering. Additional electricity can be provided by methane-powered fuel cells and by a windmill.





The diagrams below illustrate the reactions of single and double-glazed, reflective and heat-absorptive glazing on a typical summer and winter day in the northeast of the United States. Note how the positions of the double glazed panes change in winter and summer—this is not usually possible to do in a building, but a building should be designed according to the prevailing weather conditions it will encounter. The calculations are hypothetical and should be taken for their relative values only. Also, note how even reflective glass can be installed to allow solar heat into the building during the winter through proper double glazing.



water requirements 70 to 80 percent. In space vehicles there is only a 12- to 15-min. recycle time between supply and demand reuse of liquids.

Waste heat from nearby power plants can be used for liquid waste treatment. The sludge from liquid waste treatment can be dried and used as fuel to generate electricity. Treated effluent can be used to provide cooling water for power plants and recovered heat from refuse incinerators can be used for central heating or cooling, or for generating electricity.

Most of the components of solid waste can be reclaimed for industrial use, which suggests the idea of creating industrial parks that include reclamation centers and the industries they supply. Half of solid waste is paper and cardboard. This, along with wood, ferrous metal, aluminum, glass, tar, naphtha, textiles, oil, ash, and plastics may be recycled.

U.S. projects demonstrating new waste management techniques include the federal government's MIUS (Modular-sized Integrated Utility System) project, which is described on p. 48. Nashville, Tenn., is planning a $17 million plant that will convert community refuse into energy for heating and cooling. In Emmonak and Wainwright, two Eskimo villages in Alaska, there are systems for modularized central water intake and treatment, sewage disposal, solid waste incineration, laundromats and community shower and toilet facilities. Except for electrical power, the system is virtually self sustaining, with one process supplying the next.

While it has not been national policy in any country, there are also some examples of waste management outside the U.S. In Rome, for example, the private company that holds the city's franchise for garbage collection, takes the waste to the countryside and processess it for cattle feed, etc. It also separates plastic refuse by an air vacuum method and stores it, pending a decision about what to do with it.

Glazing

Windows are the largest single factor affecting building energy consumption and therefore they have the greatest potential for energy conservation. The first windows ever constructed were devised to let daylight into structural interiors. Then views became important and more and more the overrid-

The illustrations below are the kinds of variations an architect should consider in building design. At right, the top two photos illustrate Beadwall, a new product by the Zomeworks Corp. Beadwall operates by filling or emptying the cavity between two panes of glass with styrofoam beads. An ordinary vaccuum cleaner provides the power. When the beads are. drawn, they can cut heat loss by a factor of 10. The third photo down illustrates Skylid, another Zomeworks product. Skylid is a set of insulated rotating louvers that fit below a skylight and open automatically when the sun shines and close when the sun doesn't shine. Freon is used to operate the automatic system and there is a manual override for exceptional conditions.

ing determinant of window specifications. Today, windows are often used as an architectural feature and are frequently in gross excess of visual requirements or even of comfort. There has been little research on how much and what kind of glazing is most comfortable, but we all know how unpleasant it is to sit in front of a window with the sun's heat on our bodies and surface glare in our eyes.

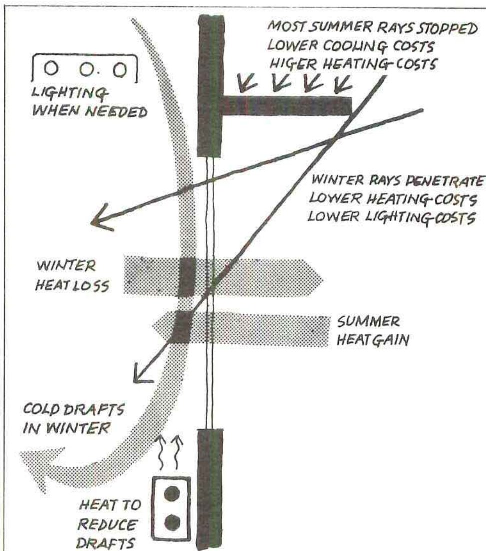
No one seriously advocates removing windows from building design, but the amount of glazing can be reduced and its form and placement guided by an awareness of its impact on energy consumption.

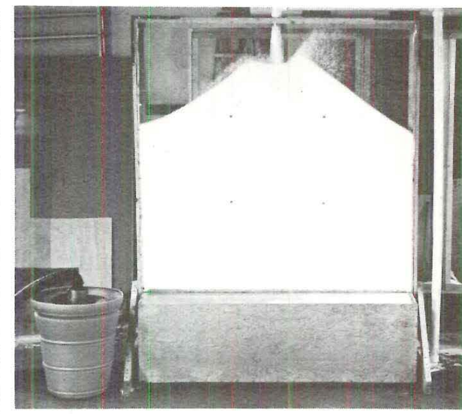
The shape of a window area is important even where the area remains a constant. For example (diagram, next page), a vertical window every other building module versus a nearly continuous band of the same area offers advantages in conserving energy. A wide expanse of wall means there is less glare for the same surface brightness per sq. ft. than there would be with very small areas of wall space standing between large windows. Since furniture may be placed on the solid portion of the wall, there is also greater freedom in interior layout.

Reducing the area of window space does not cut available natural light equally. If the amount of glass planned for a building is cut by one-third, the natural illumination is cut by only one fourth; the result in a heated building would be proportionately more light and less heat loss.

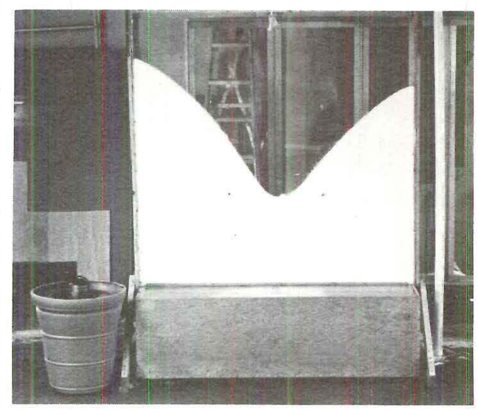
As the areas of glass become smaller, placement becomes very important. In cold climates of the northern hemisphere, windows could be excluded from the north wall and concentrated on the south wall for maximum sunlight and minimal heat loss. If the diffuse light of the north is desired, solar controls on the south facade of the building can simulate the same quality without the heat loss intrinsic to glazing on the north wall. In warm climates, this pattern would be reversed to prevent heat gain. Corridors, elevators and other utility or service functions could be placed onto windowless walls.

Not only do we install more windows than we need in many cases, but there have been few attempts to distinguish between daytime and nighttime behavior of glazed areas. A thermal barrier that would operate automatically at night to reduce heat loss or gain when the building is empty could considerably cut down on mechanical

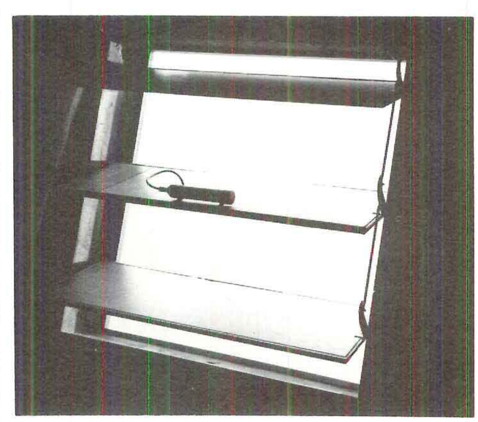


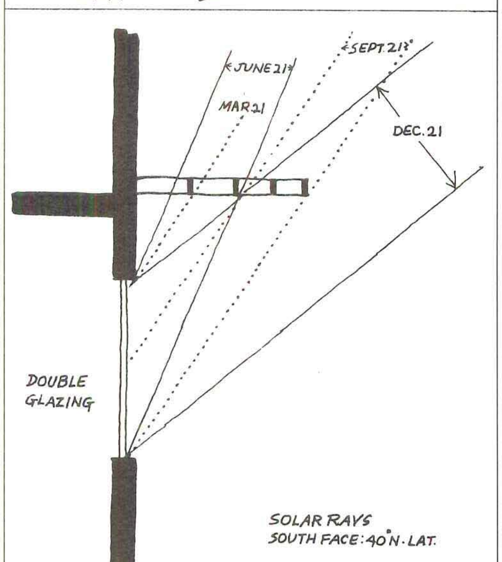


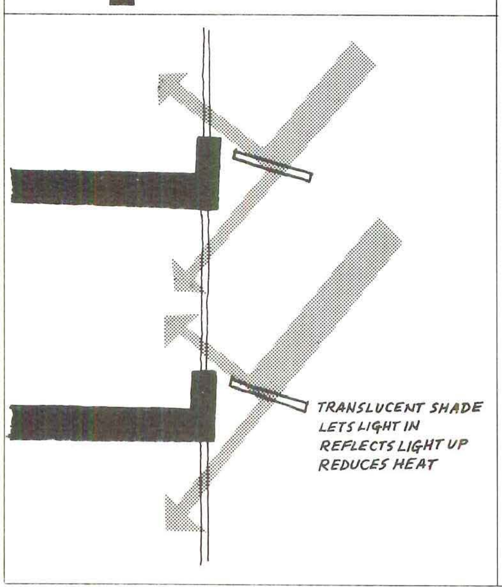
Beadwall—filling, above, emptying, below.

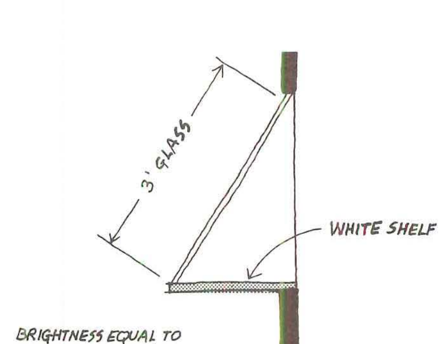


Open Skylid, below.







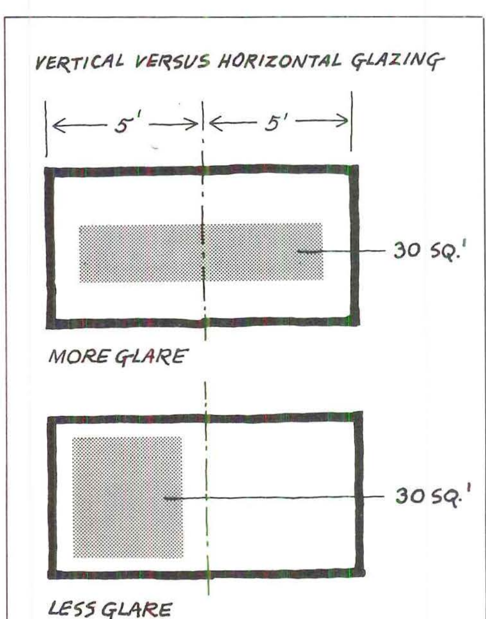


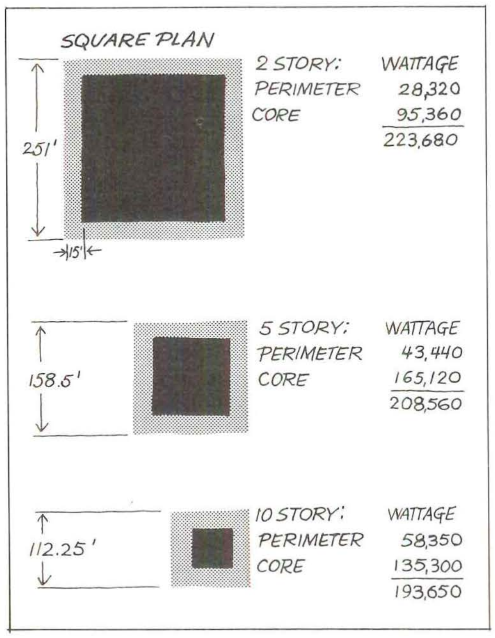
The shape of a building and the relation of perimeter to interior space can greatly affect artificial lighting requirements. In general, a rectangular plan uses less wattage than a square plan because the rectangle offers proportionately greater perimeter space. The plans below illustrate how much wattage can be saved in varying the height of a 126,000-sq.-ft. building with a square plan, using 1 watt per sq. ft. of perimeter space and 2 watts per sq. ft. of interior space. The same relative differences apply to other than square shapes, for each will require less wattage as the building gets taller.

loads and, perhaps, allow building owners to turn on heating and cooling units later than they do now (especially if the buildings were flushed out in warm climates with fresh air the night before) and shut them down sooner. (See the illustrations on p. 44 for how different kinds of glazing can affect energy requirements in a building.)

Natural light is an important corollary of glazing and in the northern hemisphere, the further south a building site is located, the greater is its energy saving potential in using natural light (windows) if the skin does not permit direct penetration of solar heat. (Russia is also investigating the advantages of natural light and has made a comprehensive survey of the whole country to determine the amount of light available in all places.)

Measuring a building's glazing standards by climate is not easy. The most common measure is the number of "degree days" in a certain area—a rough measure of heat loss and consumption. But degree days only recognize U factors and tend to overstate energy needs; they are not accurate enough to guide decisions in energy conservation or in sizing equipment, etc. Degree days do not account for solar heat, construction type, wind factors, insulation, mass, color, exposure or amount of glass and all of these are important to comfort and determining peak loads and energy consumption. There is obviously a need for new standards of measurement.





Lighting

Natural light is more effective than artificial light, but artificial light is a fact of life. Not including heating and cooling, over half of the electrical energy consumed in a modern office building goes for lighting. In trying to reduce this rate of energy consumption, both the wattage used by the lights and the heat gain they cause in the building are important.

Selective lighting is one approach. This calls for sufficient switching devices to control where and how much light is wanted at a particular time. Some areas naturally require more light: the work surfaces of desks, for example. But hallways, storage rooms, lounge areas and wastebaskets require much less light. Perimeter offices often have adequate natural light; those systems should be on a separate switch, perhaps activated by a photo cell that turns off when artificial light is not required. . . . And why do some office buildings leave lights on all night?

Sophisticated switching systems do raise initial costs and slightly darker corridors may require some psychological adjustments, but both promise long-term savings in money and energy. Lighting standards generally need review; because they are not task-oriented, they frequently lead to over-illumination.

The physical equipment for lighting may be chosen with energy conservation in mind. Four 4 ft. tubes give 40 percent more light (lumens) than eight 2 ft. tubes of the same total wattage and U-tubes are more efficient than linear tubes because lamps lose power at their extremities. Generally, there is more gain of lumens per watt as the fixtures get longer.

Some lamps offer more lumens per watt than others: Halide lamps, high pressure sodium lamps, and fluorescent lamps are more efficient energy users than incandescent. Luminaires that are integral with furniture for task lighting can be more efficient than ceiling fixtures. Wet or dry heat-of-light systems, which prolong lamp life, provide more lumens per watt and reduce the burden on the air conditioning system.

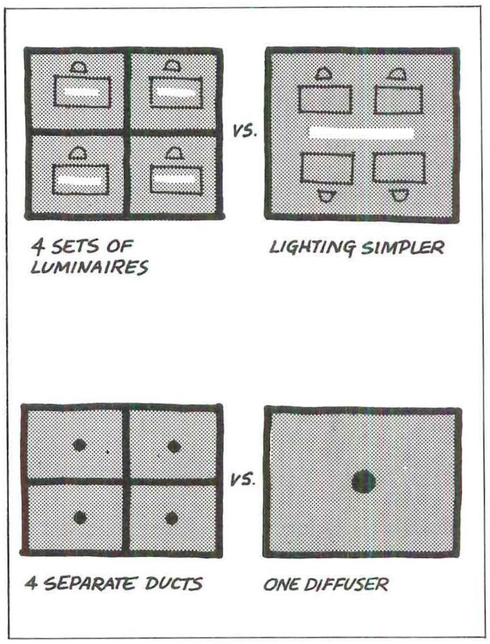
(A wet or dry heat-of-light system works as follows: Dry air in a room is extracted through a light fixture so that heat from the light system, which would normally go into space, is picked up by the air passing through the lighting fixture. Wet heat consists of special light fixtures equipped with passages through which water flows and the water takes up the heat from the lights. The water then flows to a cooling tower, is cooled, and then recirculated to the light. Normally, the wet air is used together with a dry system. Dry systems alone are much more common and have fewer mechanical problems, but are not as efficient.)

Interior landscape planning

From an architectural point of view the office landscape offers many advantages. It provides an opportunity for an environment and mood that is impossible to achieve with partitioned floors and, far from being a monotonous space, can be very lively with bookcases, plants and furniture providing privacy where required. Background lighting and tone can be provided by lighting the plants and furniture directly. The office landscape is also complementary to energy conservation.

Studies by Dubin-Mindell-Bloome have shown that for a given amount of illumination on work surfaces, an office landscape consumes 25 percent less energy in lighting than a partitioned floor. The two most obvious reasons are that fewer light fixtures can serve a larger space and that wall partitions in conventional offices not only reflect light, but absorb it, depending on color and texture, etc.

Ventilation is considerably simpler and



more efficient in an open plan. All of the floor's fresh air requirements can be supplied to the interior portion of the floor. From here, it naturally (not mechanically) will infiltrate to the perimeter areas, especially if the system is designed to take air from the interior to the exterior portions of the floor through ceiling grilles. This kind of system requires far less duct and control equipment, is cheaper in operating and capital costs and will require little maintenance.

When heat is required for the exterior areas, the natural tendency for the interior floorspace to become warm from the concentration of people, lights, and machines can be used to advantage. An open plan permits warm air to migrate to the exterior walls, while a partitioned floor area must use mechanical means to dissipate this heat gain from the center. In northern climates, heat losses at the perimeter (and probably glazed) areas can be met almost entirely by the interior heat buildup in daytime. In some cases, excess heat in daytime from one interior can be stored and used for night and early morning use. Heat pumps are an effective way to do this.

Demonstration office building by the U.S. General Services Administration

The U.S. is making some progress in developing and studying new criteria for energy consumption in buildings and communities. Following are profiles of three projects now underway.

Dubin-Mindell-Bloome was recently hired by the U.S. General Services Administration of the federal government to design and analyze energy conservation systems for a new 7-story office building planned for Manchester, N.H. The building itself is currently under design and when completed may become a model for other building projects with energy conservation goals.

Much of the work up to this time has consisted of computer calculations, which are still in progress. In the course of over 30 runs (some of which are illustrated on the next page), the engineers have been able to calculate the relative advantages and disadvantages of such systems as total energy, solar heating and cooling, etc. Since there has not yet been a serious study done elsewhere of the interface of many of the systems considered for the Manchester project, these calculations and monitored performances may become reference standards.

In the computer studies, the firm found that a 126,000 sq. ft. project using conventional purchased electrical, gas, or oil power for heating, cooling, hot water and lighting would have a heat loss of 4 million Btus per hr., a peak cooling load of 260 tons, and a lighting system requiring 3½ watts per sq. ft. for occupied areas. This would require an energy input of 116,000 Btus per sq. ft. at the building, or 216,000 Btus per sq. ft. per year of primary source energy. The firm found that many office buildings of similar size consume as much as 600,000 Btus per sq. ft. per year of primary source energy.

By a computer program provided by the U.S. National Bureau of Standards, a series of system combinations such as the implications of changing story heights, shape and orientation of the building, wall mass, insulation type and location, wall, roof and floor thermal factors, amount and type of glazing and solar controls, and more were analyzed. The conclusion was that even without varying the type and amount of illumination and without using more efficient HVAC systems, the yearly energy consumption can be reduced by 48,000 Btus per sq. ft. per year at the building, with a corresponding reduction of prime source energy.

The systems recommended so far include a unitary water-to-air closed loop heat pump with heat storage facilities using water tanks for the lower three floors of the building. A gas-driven emergency generating system driving a heat pump was selected to serve the upper four floors.

Waste heat from the engine will provide domestic hot water, space heating and heat for absorption refrigeration to supplement the heat pump. Ventilation air will be reduced by odor control equipment. The operating cycle will use economizer cooling, with outdoor air, evaporative cooling in mid seasons, heat recovery from exhaust air and many other energy conserving subsystems. The heat pumps with thermal storage provide a way to capture excess heat from lights, people, machines and sun during the day and then use it at night. Cooling storage permits the use of a smaller engine and compressor and conserves energy by night time operation when condensing temperatures are lower.

If all the mechanical and electrical options are installed, yearly energy consumption can be further reduced to about 56,000 Btus per sq. ft. per year at the building—a gross reduction of more than 48 percent—and a 38 percent reduction of primary source energy.

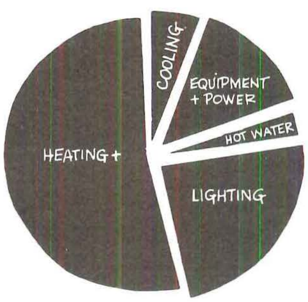
There will be experiments to study the relative benefits of natural light in relation to heating and cooling loads. Preliminary analysis indicates that energy conservation benefits would accrue with natural light if the windows are protected by thermal barriers at night and winter weekends and if the artificial illumination and the natural illumination are integrated with photocell control and window glare and solar radiation are properly handled.

A preliminary analysis of a solar energy system to supplement the heating, hot water and cooling system indicated that 50 to 75 percent of the energy required for heating and 95 percent of the energy required for cooling could be done with the solar collector and storage system. More detailed analysis and refinement of the collector and other subsystems is needed to determine the true life cycle costs.

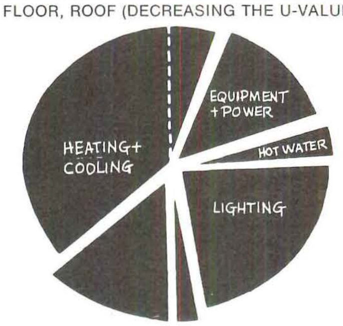
Dubin-Mindell-Bloome has also recommended that there be only 8 percent glazing on the building, primarily on the south side. Windows on the east and west sides may be formed so that they are not facing either of these directions, but primarily south. A sawtooth sidewall pattern may be a solution, but the architects must specify the wall, perimeter area, and glazing according to the principles of energy conservation.

The first diagram represents the original breakdown of the total amount of energy used in the GSA demonstration office building in Manchester, N. H. The building is planned for 126,000 square feet, (six stories), and is expected to consume 13,150 x 10^6 Btu per yr. The givens include walls, floors and roof with U values between .3 and .2, single glazing, 50 percent wall/window ratio, a year-round shading coefficient of .5, a 2:1 length to width ratio with the long axis running north/south. The following pie charts show how changing one factor of this building program affects total energy requirements in the building.

RUN 1: TYPICAL OFFICE BUILDING



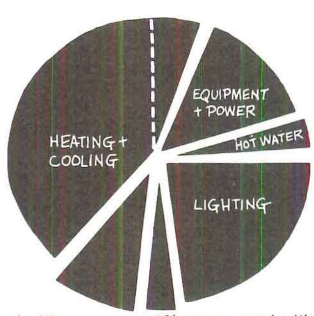
RUNS 2-7: INCREASING THERMAL RESISTANCE OF WALLS, FLOOR, ROOF (DECREASING THE U-VALUE)



21½% saved in heating and cooling by reducing the U-value to 0.1

6½% saved in heating and cooling by reducing the U-value from 0.1 to 0.06

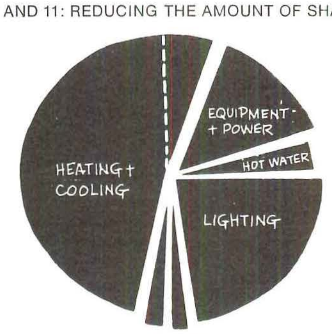
RUNS 8 AND 9: USING DOUBLE AND TRIPLE GLAZING



15% saved with double glazing

6% more saved with triple glazing

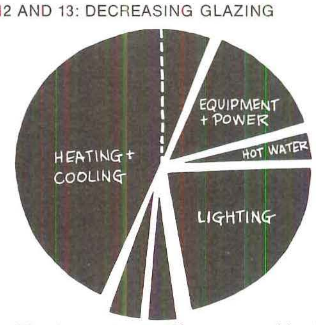
RUNS 10 AND 11: REDUCING THE AMOUNT OF SHADING



2½% saved by increasing shading coefficient from 0.05 to 0.75

2% more saved by increasing shading coefficient from 0.75 to 1.0 (no shading)

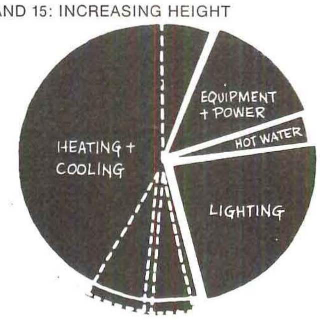
RUNS 12 AND 13: DECREASING GLAZING



8% saved by decreasing window/wall ratio from 50% to 30%

8% more saved by decreasing window/wall area to 10%

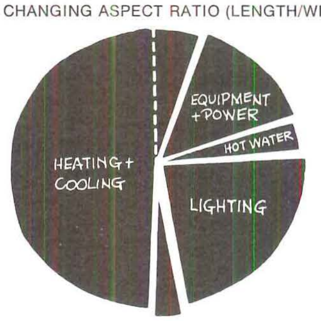
RUNS 14 AND 15: INCREASING HEIGHT



8% extra energy needed to heighten building to 8 floors

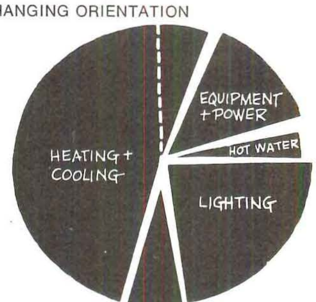
7% extra energy needed at 10 floors high

RUN 16: CHANGING ASPECT RATIO (LENGTH/WIDTH)



3½% saved by changing from 2:1 (north/south longitudinal axis) to 1:1

RUN 18: CHANGING ORIENTATION



9½% saved by orienting the longitudinal axis east/west

Modular Integrated Utility Systems

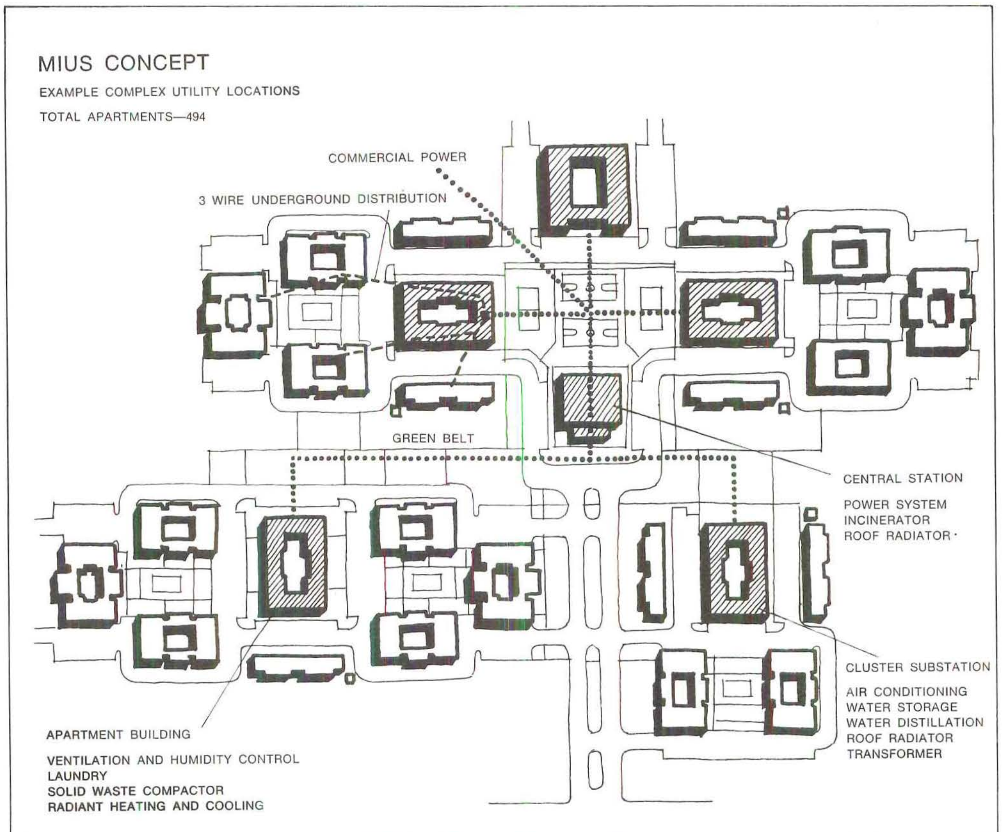
The U.S. Department of Housing and Urban Development is directing a research and demonstration project called MIUS (Modular-sized Integrated Utility Systems) that will combine energy, water, solid waste disposal, and sanitation services into a single utility. The program will use a total systems approach and attempt to maintain environmental quality, conserve resources and lower total costs; the final demonstration program is expected to serve a community of 100 to 3,000 dwelling units.

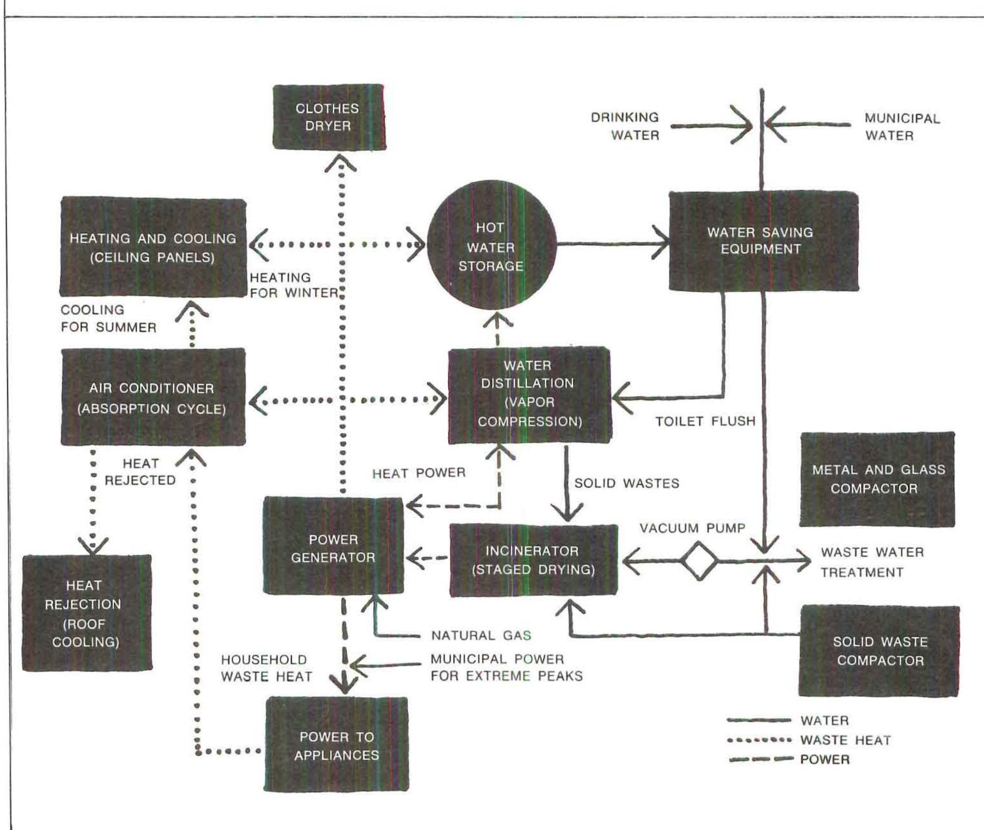
The goal of the program is to achieve a 50 percent reduction in energy wasted by electric power generation; an 80 percent reduction in liquid waste; and an 85 percent reduction in solid waste volume. One of the models for the concept is the life-support system used in NASA (National Aeronautics & Space Administration) spacecraft. It recovers over half of waste energy for the heating, ventilating and cooling systems and for liquid waste treatment. Thermal energy goes into electrical power, reducing fuel consumption and combustion and therefore cutting thermal pollution.

NASA is, in fact, one of the program participants, as are the Atomic Energy Commission, the National Bureau of Standards, and the Environmental Protection Agency. A group of 13 experts (including Fred Dubin) has been appointed by the National Academy of Engineers under a HUD contract. Called the Integrated Utilities Board, these men meet at least eight times a year and make recommendations about the MIUS. They will ultimately decide if the integrated systems concept is economically, socially and technologically feasible and submit a report this August.

MIUS has three stages: planning and technology assessment; demonstration; and commercialization. The last may be the most crucial if MIUS is ever to have broad scale application. In addition there will be a test version built, not as a prototype, but as a demonstration of hardware and software concepts and as an educational experience for a wide variety of professional participants, including architects, engineers and aerospace systems men.

The MIUS program may be an important factor in determining future community and regional planning, with the integration of mechanical and social systems combining for optimum efficiency, functions, and improved quality of life.





After about five years of planning, the Minnesota Experimental City has yet to be funded, or have a site approved. When the project was in its early stages it was most often discussed as a city that would put 250,000 inhabitants under one giant dome as conceived by Buckminster Fuller. Today the dome is questionable, but the planning process has produced some sophisticated thinking about energy conservation, waste management and the synthesis of physical and social systems.

The project started at the University of Minnesota, with professionals from a wide range of backgrounds participating. (Fred Dubin and Jerome Collins, a waste management consultant and systems analyst, have studied and proposed the energy and waste management concepts and plans.) It has enjoyed sporadic non-profit support, but its financial prospects, at best, are unsettled. It is now estimated that the project would need \$6 million in preplanning funds, \$50 million for comprehensive planning and a minimum of \$6 billion to implement. Physically, the concept envisions a community for 250,000 persons to be built in stages, with an urban center megastructure and residential areas of varying densities. Industrial and commercial facilities for that number of people are included.

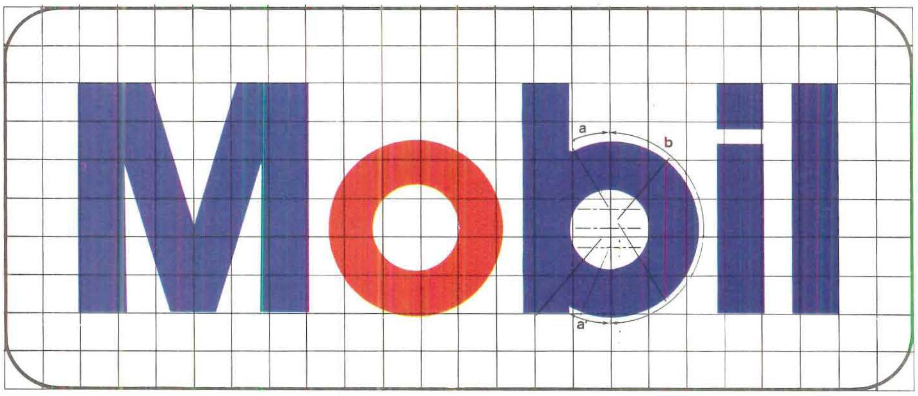
The goals are to establish and nurture a new energy and waste ethic and to plan according to a system of social accounting that includes not only financial considerations, but long-term social consequences as well.

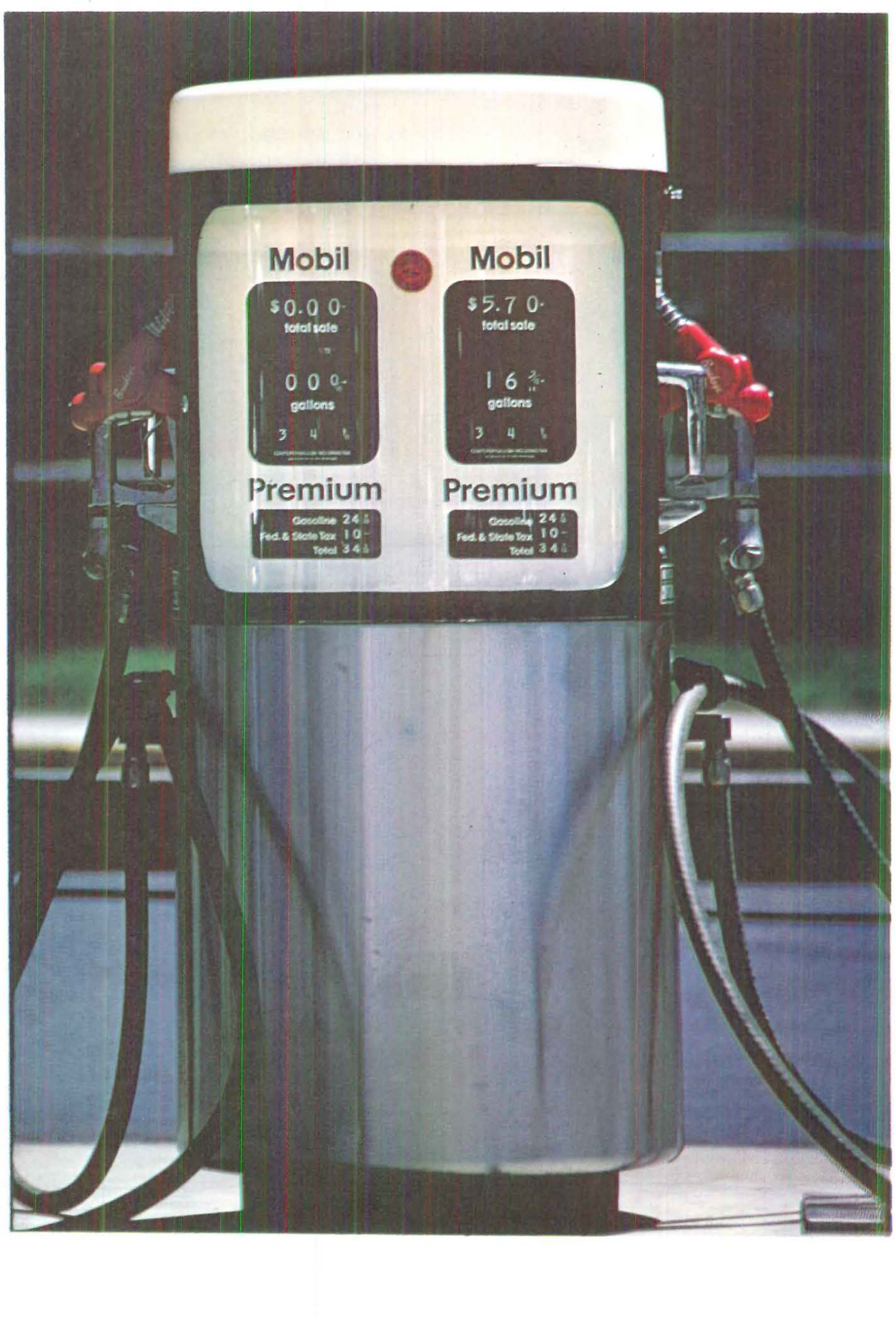
The stated goals include challenges to conventional building code standards, including more realistic illumination standards in the form of selective lighting systems, and HVAC systems designed for 95 percent tolerances instead of the traditionally specified 97.5 percent. Ventilation standards would also be challenged with systems that rely as much as possible on natural phenomena and that are flexible and planned according to specific needs and functions.

The project would try to cut power requirements with high-frequency lighting, capacitors, high-voltage distribution, demand limiters and other electrical devices with similar savings. Heat-of-light systems, heat pumps, dual circuited condensers, modular boilers, pumps, refrigeration and fans and low-pressure circulation systems

continued on page 74

Gas stations are among the most visible eyesores along the world's highways—most of the time, that is. Now Mobil Oil, in a sweeping re-design program, is trying to change all that for the better. So far, the new program has affected some 19,000 gas stations on every continent. Here are the results (along with a few questions raised by such programs):





Nine years ago, when the Mobil Oil Corporation commissioned Eliot Noyes to prepare a comprehensive design program for its world-wide operations, everyone in the design field cheered it as an exemplary act. The program in fact was especially lauded because it was to combine graphic and industrial design with architecture, based on Noyes' earlier success with IBM. And gas stations, a ubiquitous element in the roadscape, badly needed improvement.

For the institutional client the comprehensive design program is still a worthwhile and productive endeavor. Addressing the First Federal Design Assembly recently, Rawleigh Warner, Jr., Mobil's chairman of the board and the man who was initially responsible for asking Noyes to help his company and who has given him whole-hearted support ever since, spoke of the Mobil commitment to good design: "We have kept that commitment; and, in fact, we are perhaps more enthusiastic about the value of design in terms of practical performance right now than ever before." And well he should be, judging from the quality of work that the Noyes office has produced.

It is tempting therefore to show the results and say nothing more because they truly satisfy the classic arguments for such sweeping application of design: The corporation has benefited economically (always an important justification); the facilities are in most cases substantially more efficient, and (as always in third place) the results *are* handsome. And yet, in those nine years, the efficiencies attributable to design—especially in the petroleum industry—have become a problem if not a liability. At this very moment, the Mobil people are claiming they cannot produce enough petroleum products to satisfy their dealer demand (at least in the U.S.)—demand heightened, they will proudly say in another context, by their corporate design program.

The real dilemma, of course, is the one the designer himself faces. Now that the design professions have had a chance to examine the long-range effect of total programs accomplished by such leaders as Eliot Noyes, they are not so sure their goals do not need substantial overhauling.

The first matter at hand is the necessity to examine carefully the potential consequences of the design act, both in the general and the particular case. Where once anyone who allowed the designer some free-

The basic Mobil logotype, with its now famous red letter O, was designed by Chermayeff & Geismar. The circular design motif of the letter is echoed in the elegant, cylindrical gas pumps and in the new, circular canopies that stand outside Mobil's new stations. It was the phony-Colonial stations like the one below (in New England) that convinced Mobil to seek a new image. Bottom of page: new station in Kuala-Lumpur.

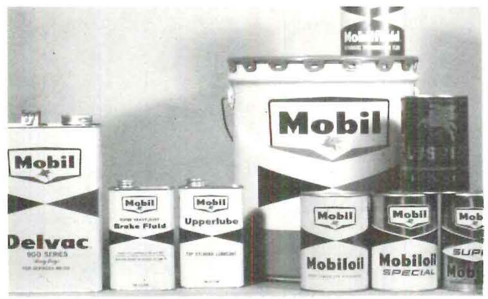
dom and who paid his bills on time was a "good client", today the ecological and social effects of design sponsored by institutions are being questioned by a growing segment of the design professions. Whether designers will be able to foresee such problems as the "energy crisis" and thus act in a more intelligent manner seems only slightly possible. Still, in some cases, architects and designers have refused commissions which seemed to them counter-productive.

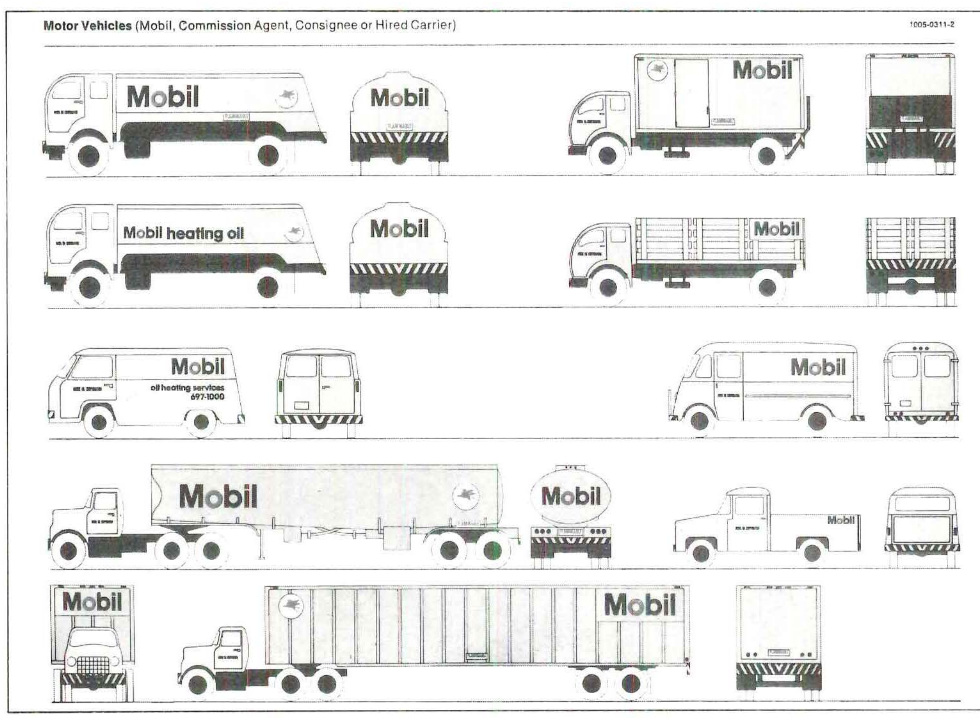
Secondly, the concept of designing systems that can be used to solve every problem in every place is considered much less solid than it once was. One of the proudest claims of those associated with the Mobil program is that the identity of their corporation is clearer now than ever before, and to people all over the world. Many of the stations shown on these pages are built far from Southwestern Connecticut where Noyes first conceived them (as an antidote to the "Colonial" gas stations then in vogue around New Canaan) and where the prototypes were built. Yet, despite their geographic dispersion, there is a powerful similarity in all of the new stations, based on steel framing details—even though in-fill wall materials vary with locality. It is an imposition of visual form that surely benefits the client. It seems also to stimulate the consumer because, as Mr. Warner puts it, "business at new stations is usually brisk."

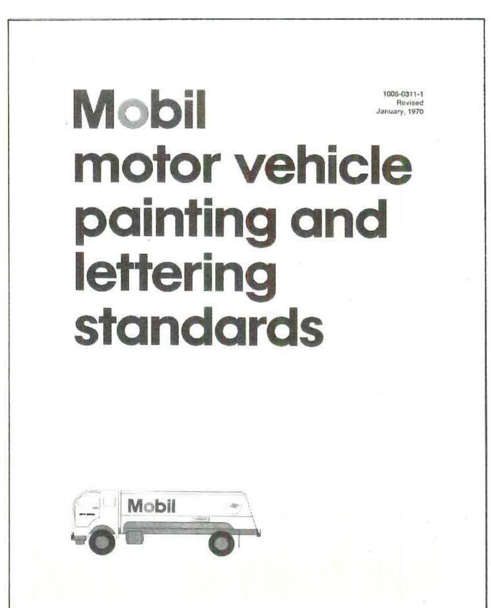
But it is now clear to almost everyone that a well-designed gas station, set in a suburban "strip" of other less well-designed stations, supermarkets and motels, does not in itself improve very much. The visual environment rarely benefits from the isolated act of good design (unless it is an underground building).

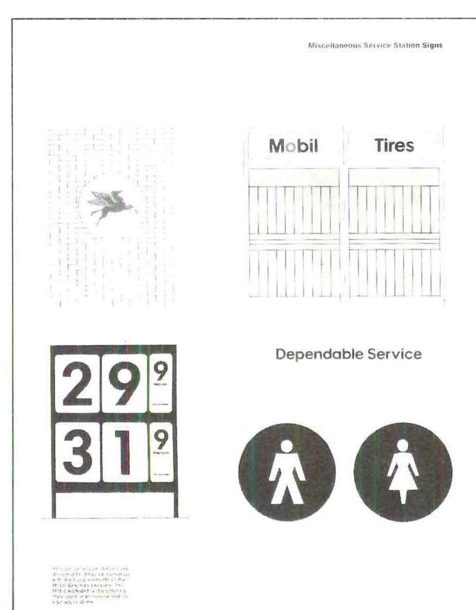
Finally there is Mr. Warner's contention that, to be effective, a corporate design program must be continually monitored. In his words (and emphasis): "We continue to *police* our graphics program today just as persistently as we did at the beginning." Yes, it is an innocent use of the word that signifies nothing most architects would not endorse by reflex. Yet today, there is some sense that individual rights may be abridged by such procedures. As supplier of products to their dealers, the Mobil organization can insist that only certain "well-designed" posters be displayed in certain well-regulated places; that there be no multi-colored banners; that there be no roadside signs giv-

Comprehensive design manual covered everything from lettering on Mobil's vehicles, to washroom symbols at gas stations. Canned Mobil products were also re-designed. Stations shown on opposite page are located in Melbourne and Los Angeles, respectively. Circular canopies underwent careful evolution: from "mushrooms" lit with fluorescent tubes mounted like spokes in the soffits, to indirectly lit canopies like the one in Melbourne.










SUPER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SHOES

Mobil stations shown below are located in Sydney, Turin, and Columbia, South Carolina, respectively. The last of these incorporates a "mini-market" of the sort very popular in Italian gas stations. Materials of service buildings vary, but pumps, logo, and circular canopies recur everywhere. In Japan, where gas stations tend to be located on very small sites, Noyes developed a two-story service building. (See Osaka station, opposite.)

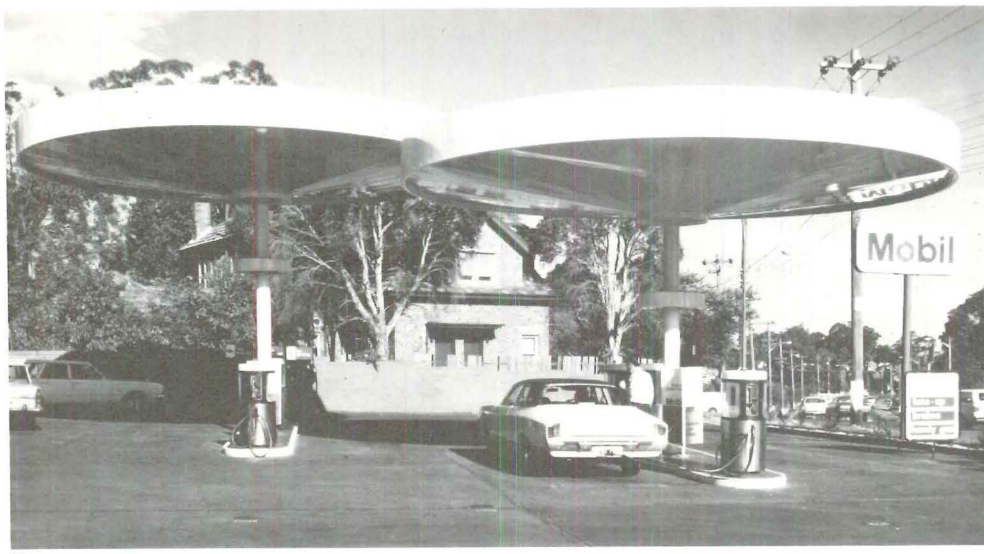
ing gasoline prices in gigantic type—in short that there be no individuality of any sort—and all in the name of "good design".

Admittedly, these are not the most essential individual rights currently threatened. Still, what is the designer supposed to do about it? After all, the first thing Eliot Noyes discovered when he began looking closely at the ugly, cluttered Mobil stations of 1964 was this: there was often so much visual distraction for the driver as he turned onto the station apron that he could only find his way to the pumps by following arrows on the ground. That does not happen now. Furthermore, now that few U.S. stations wish to push sales by offers of drinking glasses or steak knives, the quiet and subdued forms of Noyes' design are especially appropriate. Based on his original premises, the Noyes office has continued to refine and up-date the basic concept of the flat, circular umbrella floating above the disparate elements, sheltering and unifying them.

In addition, Noyes has worked with William Bidwell, who is manager of Corporate Design and Graphics for Mobil, to orient the more recent stations away from the exclusive sale of petroleum and other automotive products toward broader services.

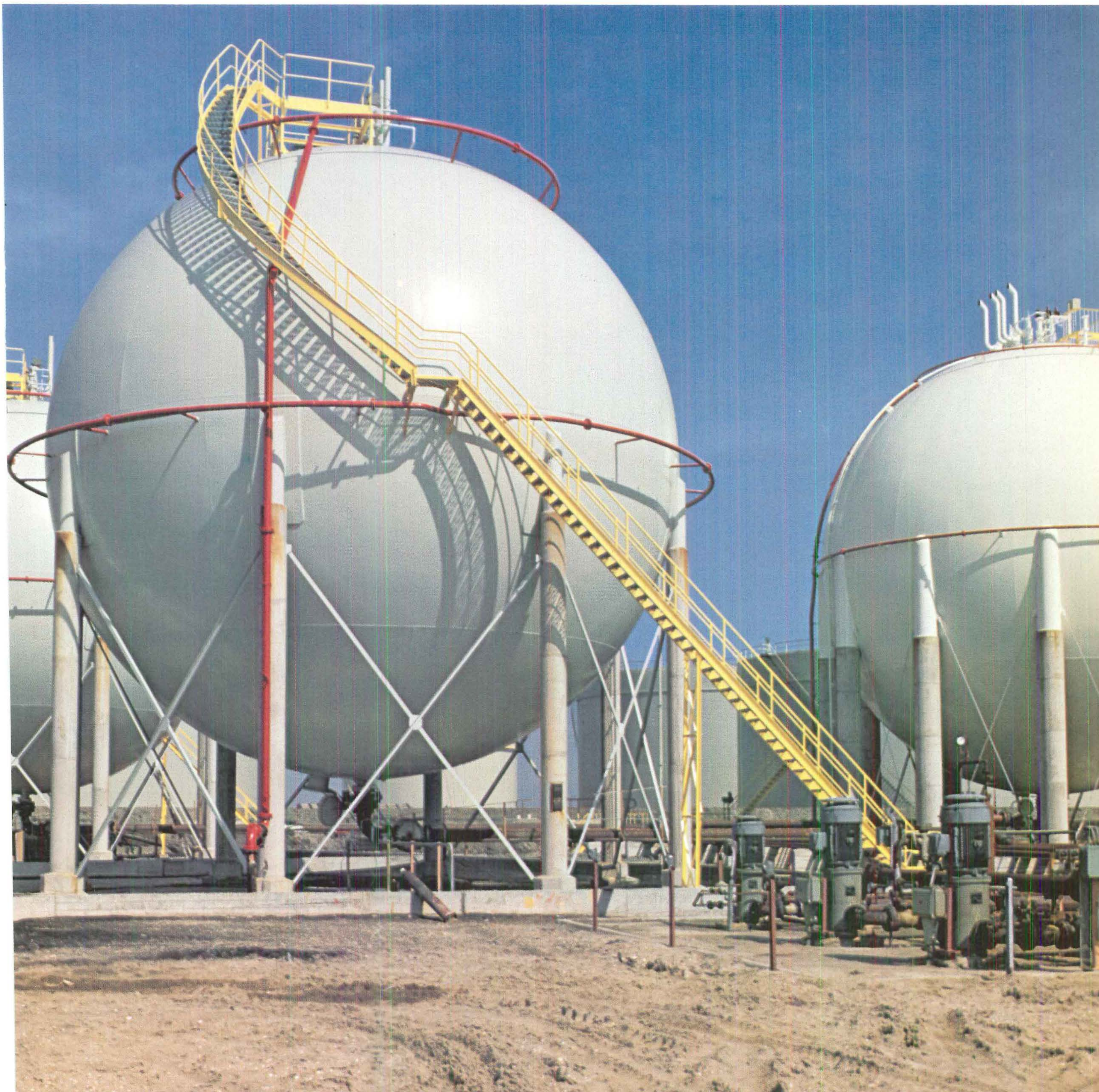
Although the repair and lubrication functions associated with gas stations in the past have been largely phased out of the Mobil program (obviously not as profitable as straight sales), the company is now building complexes that incorporate "mini-markets" and auto-washing service. In many of the stations, especially outside the U.S., self-services pumps have been installed. In Japan, for example, some intriguing variations have been developed, usually because of extremely cramped sites. In one case, the hoses are coiled up inside the overhead canopy and drop down to the customer.

Obviously, Eliot Noyes' effort for Mobil was no in-and-out affair, with flashy press releases and few results. Noyes has remained in productive contact with his client, studying the results of his work all over the world. But if there is one aspect of such corporate design programs that may be questioned it is the assumption that clarity of corporate identity is paramount in all situations. Might it not be to respond more sympathetically to local conditions and needs? Interestingly enough, much of Noyes' most recent work for Mobil seems to be going in just that direction.—JIM MORGAN




Mobil Service

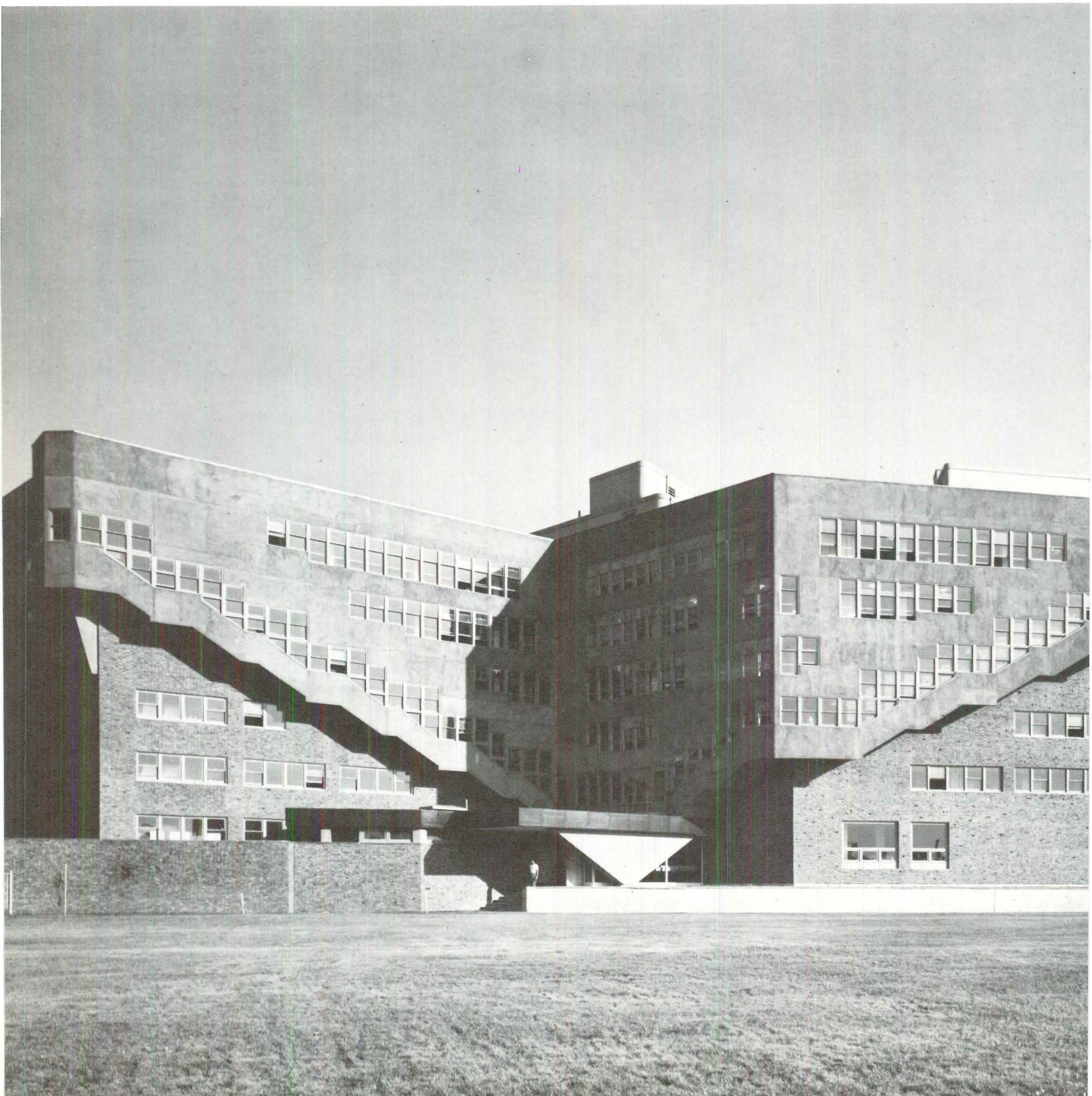
In his comprehensive re-design for Mobil, Eliot Noyes also saw to it that administrative and industrial structures would meet highest design standards. Below is the new administration building for Mobil in Joliet, Ill., and the precast concrete engineering center at Stonybrook, Long Island, both designed by Noyes. Even refineries, like the one near Amsterdam (opposite), were given a new spirit with touches of color.



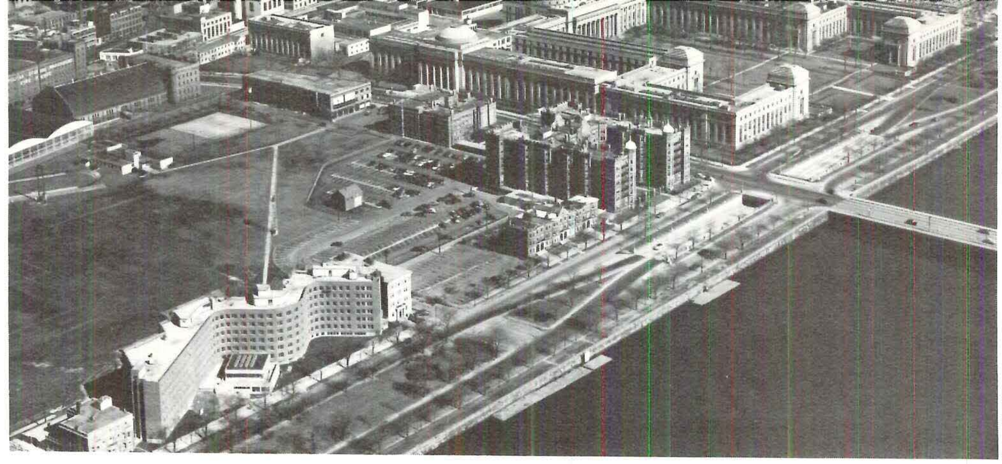
Happy Anniversary, Baker House

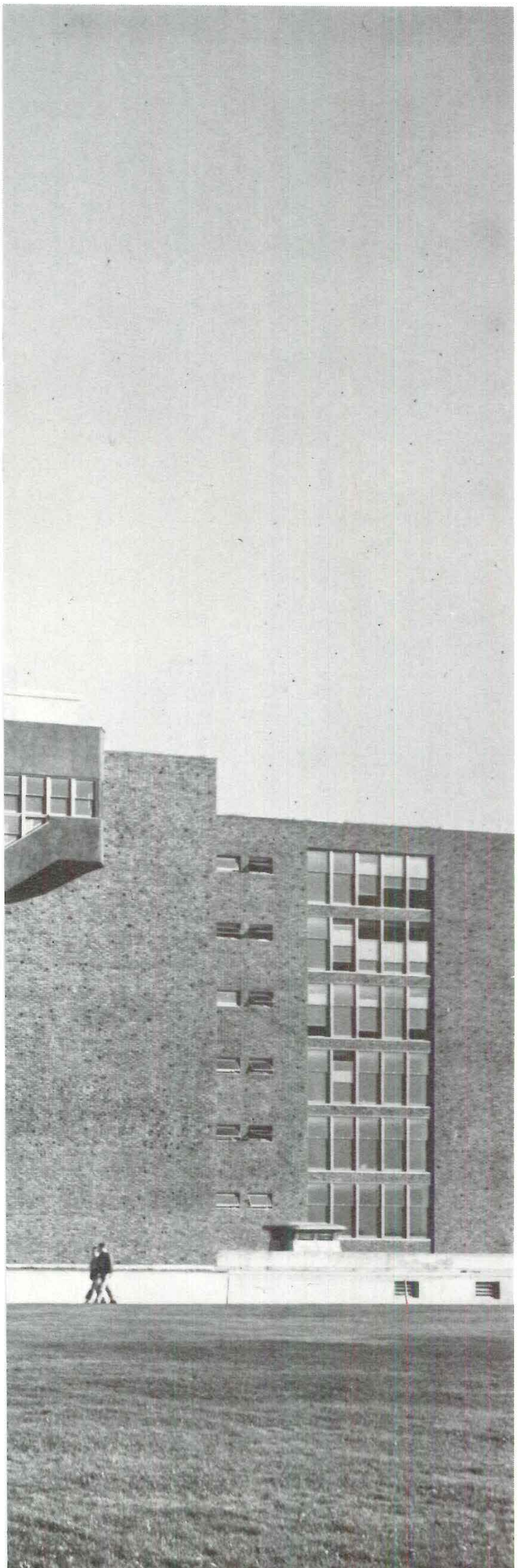
Aalto's MIT dormitory is 25 years old

By Stanley Abercrombie



Below, the north wall with its hanging double stair. Right, an aerial view taken shortly after construction, showing the diagonal pedestrian path from Baker House to MIT's main building.





"Oh, you're an *architect*," the cocktail chatter goes. "Who is the best architect working these days?"

You might reply, "It is meaningless to select heroes in a nonheroic age." You could say, "You misunderstood; I'm an *osteopath*." But many of us, I think, would name Finland's Alvar Aalto.

Next question, inevitably: "What has he done that I should know?" Viipuri, Säynätsalo, and Vuoksenniska would sound snobbishly obscure, even if, after a martini, you could say them. In the U.S., Aalto has built only the library at Mount Angel, Oregon, the conference rooms provided by Edgar Kaufmann for New York's Institute of International Education, and M.I.T.'s Baker House dormitory in Cambridge, Mass. Fewer people visit Mount Angel than visit Finland, and the Kaufmann rooms, although beautiful, are not a building. So we might choose for an evening's conversation, almost by default, that sinuous curiosity by the Charles. It seems, reconsidering it now, a key building of our time.

That wasn't always so. It was much easier, in the 'fifties, to admire Baker House's next door neighbors, Eero Saarinen's Kresge Auditorium and cylindrical chapel. Except for some poetic rusticity in the chapel, the pair of buildings on their broad paved plaza seemed so clean, so modern, so *swell*. Seeing them now, like coming across those narrow neckties in the back of the closet, is a bit embarrassing.

But now we understand some of the things Aalto did at Baker House. Or, rather, what he did not do.

First of all, Baker House wasn't white. The International Style was still the "look" of the time, and the International Style, whatever else it might be, was white. Aalto's own previous work had modified the style with some idiosyncratic curves and angles in the Paimio Sanatorium, an undulating wood ceiling in the Viipuri Library, and a whole wing of natural wood at Villa Mairea, but, despite these modifications (an architect in Finland might be forgiven some regional eccentricities), most of Aalto's work before Baker House was just as respectably white as everyone else's. The dormitory's heavily textured New England brick was not what his American fans had been expecting at all.

It was recently suggested in another magazine that Aalto's recent buildings, including the cultural center in Wolfsburg and the new North Jutland Museum in Aalborg, mark a return to white architecture. Not so. Wolfsburg's striped facades and Aalborg's carefully panelled Carrara marble, just as much as the brick of Baker House, are exterior materials demanding attention and proclaiming their textural qualities, their color, their visual interest. International Style white aspired to be jointless and blank—a smooth anonymous material that plastics manufacturers may someday devise for us, but which, so far, exists only in the imagination.

Secondly, Baker House wasn't symmetrical or monumental. Aren't big, important buildings supposed to be entered on axis or, at least, on a path perpendicular to their mass? Baker House responds to its site; it is entered not only from the "back" but also at an angle.

Thirdly, it wasn't an entity. It wasn't even made of several entities put together. It had a curious curved shape on the river side, a curious angled shape on the campus side, and looking at one side gave you no clue to the character of the other. Comparing these two main elevations, you couldn't even tell, God forbid, that they belonged to the same building. Aalto realized in 1946 what most of us realized quite a bit later: that the tendency of the time to package all functions into discrete geometric bundles was simplistic and forced.

Freed from the packaging habit, Aalto had the opportunity to make his building "read": it did just what it needed to do, and it told you about it. There is no mistaking that, cantilevered from the building's main bulk, there is a great continuous double stair spreading from the entrance and connecting all levels. There is no mistaking that, above this stair, between its two diverging arms, there is a series of other spaces separate from the circulation. (These were originally lounges, the lounge area on each floor increasing in proportion to that floor's removal from the main lounge at grade.)

There is no mistaking, either, that the river side of the building is a continuous curved fabric of dormitory rooms, with one special element, the dining hall, nestled in one of the curves. Considerable romanticizing about this building has told us that the undulating wall responds to the rippling waters of the Charles. Don't believe it.

Aalto himself wrote in 1950 that the form

Below, the undulating wall facing the river. Opposite top, an early elevation study showing the hanging stair with different fenestration and faced with copper panels. The top plan is Aalto's design for a roof garden never built. The central plan is of the top floor. Some original corridor lounges have now been appropriated for other uses. The lowest plan is of the ground floor, with the square dining pavilion projecting opposite the entrance.

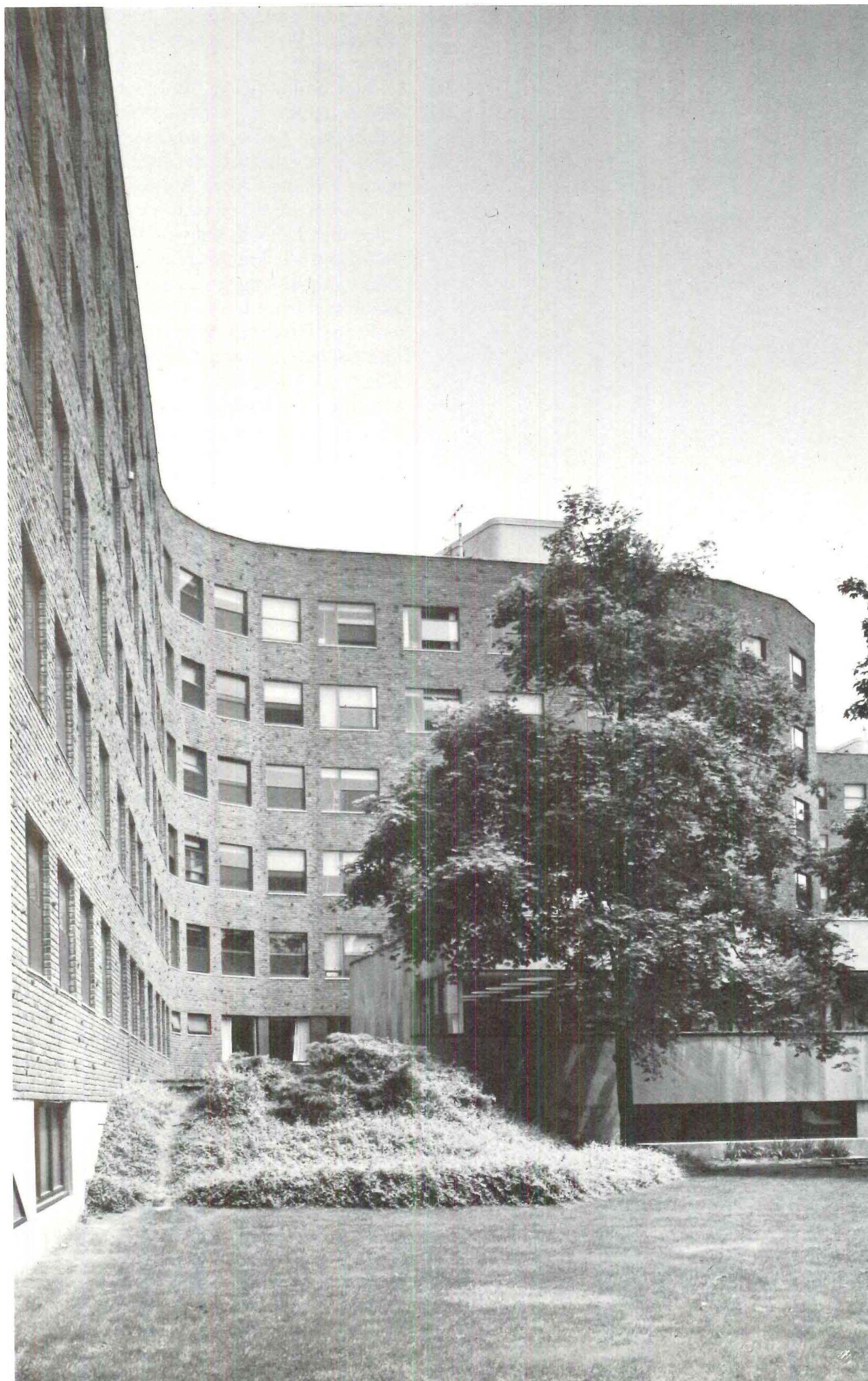
had the more practical advantage of giving rooms views *down* or *up* the river, which he much preferred to views directly *at* the river. He also said that "the general solution through curved lines gave a considerably greater number of rooms bearing towards the sun than any other system" and that "about 30 different groupings of the buildings were examined to this end." Aalto mentioned a third determinant of the serpentine form, his desire to break from "the powerful and inhuman monotony" of "the ground-plan of a normal American city with its checkerboard netting."

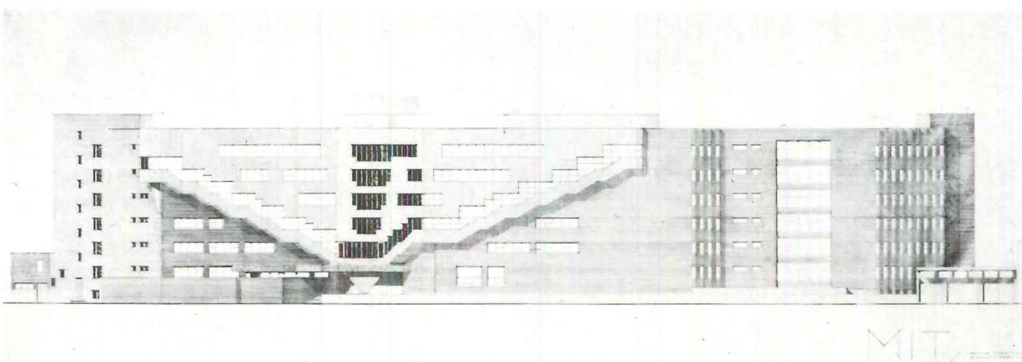
Aerial photographs of the time suggest also some inflection of building form in response to the path of students from M.I.T.'s main building, a path now interrupted by Kresge Auditorium but still partly marked by a row of willows. We must remember, of course, that undulations are a recurring motif in Aalto's buildings, some of them far from either street grids or rivers.

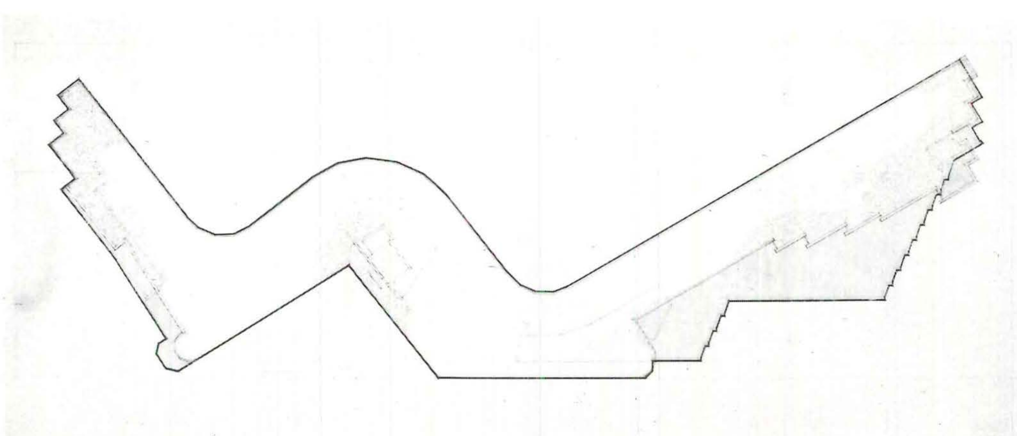
Design difficulties

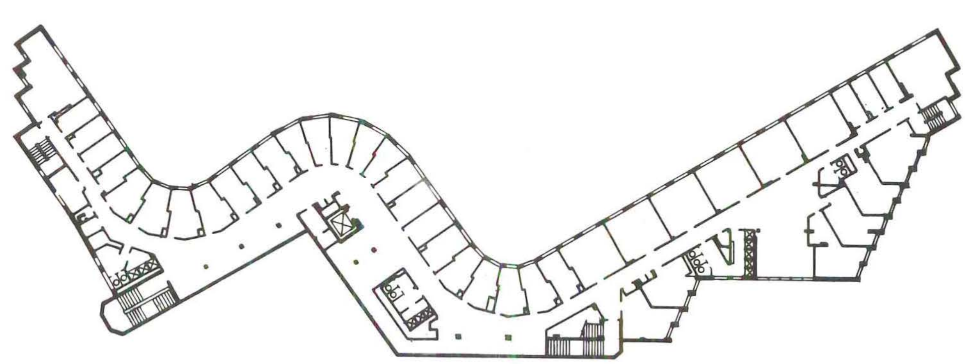
Aalto had first come to the United States in 1939 for the completion of his Finnish Pavilion at the New York World's Fair. He returned the next year as a visiting professor at M.I.T.'s School of Architecture, and during that visit the school's Dean, William Wilson Wurster, with the help of James Killian (later to be President of M.I.T.), obtained the dormitory commission for him. In 1946, three young designers, Veli Paatela, his wife Kaija, and Olav Hammarstrom, were brought from Finland to assist Aalto, and they were given space in the Boston office of Perry, Shaw, Hepburn and Dean (now Perry, Dean and Stewart), a large firm whose major earlier work had been the restoration of Colonial Williamsburg. The Perry firm also furnished a chief draftsman whom Aalto came to greatly admire, James Norton. It was agreed that the Perry firm would prepare the construction documents.

Aalto had personal difficulties at the time. Aino, his first wife and a working partner in all his previous work, was ill in Finland (she died in 1949). There were difficulties also in subjugating the dormitory's flexible, flowing spaces to the requirements of the Cambridge, Massachusetts, building code. And there were difficulties with the client: M.I.T. demanded more rooms and less expense. The first de-

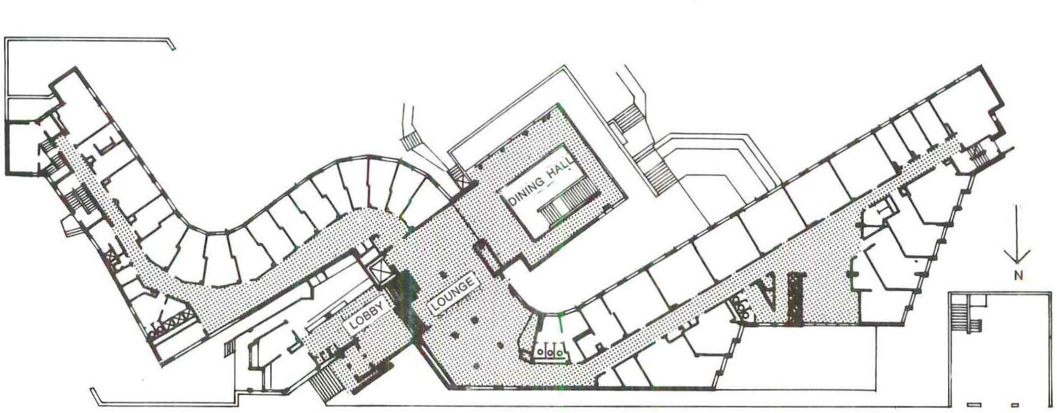








SIXTH FLOOR



GROUND FLOOR

mand resulted in the addition, during the development of the design, of several rooms without river views, facing east and west (but not north—every room has sunlight at some time of day). The second demand shaved from the design several of Aalto's original intentions: the south wall was to have been partly covered with full-height metal trellises, on which vines were to have been trained for summer shade; one scheme had called for a roof garden, another for a second roof two feet above the existing one, acting as a sunshade; the great stair on the building's north side, now faced with brownish-pink stucco, was originally to have been faced with copper; and the rough brick of the exterior walls was to have been used inside as well (in most of the interior, hollow clay tile was substituted). Budget problems also dictated that cement plaster be used, rather than ceramic tile, for some walls of the dining room, and that the window frames be wood. These wood frames have recently been replaced, under the careful direction of the M.I.T. Planning Office, by anodized aluminum ones.

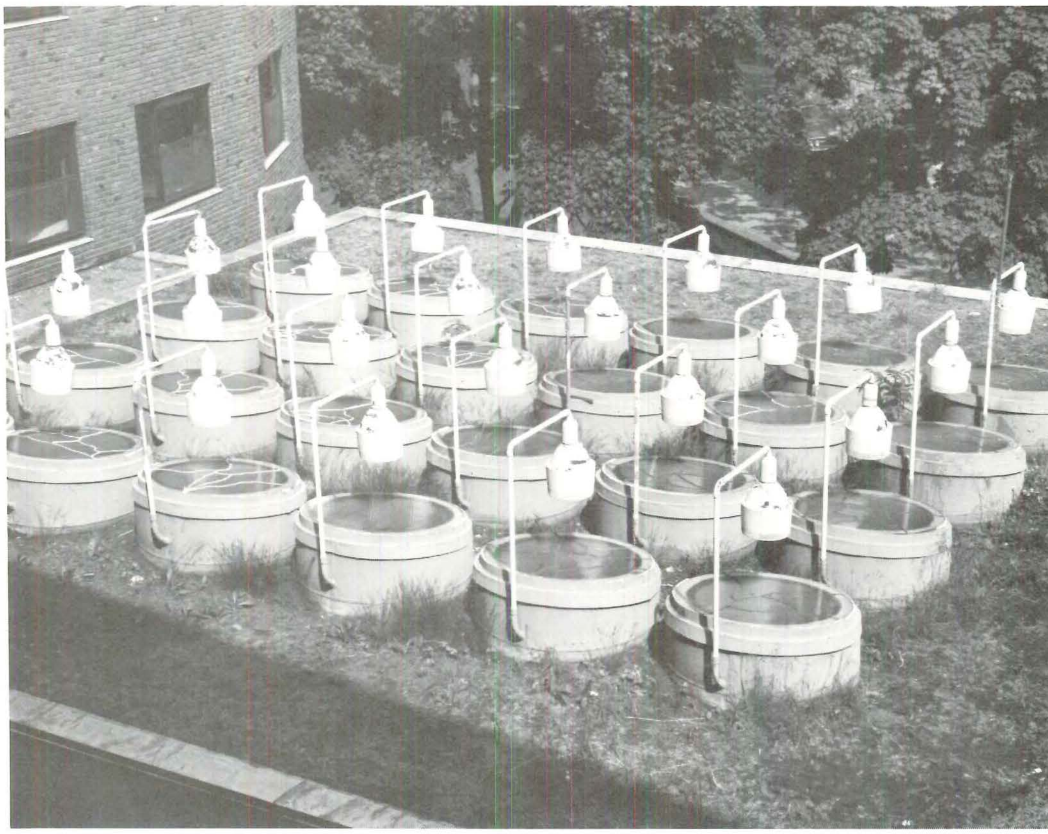
Aino's illness necessitated Aalto's return to Finland before the drawings were finished. Robert Dean of the Perry firm and William Wilson Wurster were designated to make design decisions in Aalto's absence. Their only major decision which Dean remembers involved the possible redesign of the great stair: Dean wanted to face it, as completely as possible, with glass; Wurster wanted to keep the pink stucco which Aalto had approved; Wurster won.

Construction was begun in 1947 and basically finished in 1948 for a cost of $4500 per bed, or less than $12 per sq. ft. Students first occupied it in 1949, and in 1950 it was named for M.I.T.'s Dean of Students, Everett Moore Baker, killed that year in a plane crash in Egypt.

Use and abuse

Baker House has room for 350; assuming a change of occupants twice a year, that means 17,000 students have lived there. Some of them, naturally, have been pigs, and, in 25 years, some changes in use have been inevitable. Aalto provided, for example, a bicycle parking area behind a brick wall near the entrance, not foreseeing that bicycle theft would become a major campus sport (or, with M.I.T. expertise, a science. The most sophisticated tech-

The sod roof and the interior of the dining hall in their present condition. Exterior fixtures make the cylindrical skylights an important light source both day and night.



nique: a drop of sulphuric acid in the keyhole of the padlock; wait one minute; pull the lock open), and that, for security reasons, students would keep their bikes in the corridors outside their rooms.

For the most part, however, it is surprising that the building looks as good as it does, and the examples of defacement that most sicken a visitor today seem to be the results not of abuse by the students but of abuse by M.I.T.'s own Physical Plant department. (The Planning Office is responsible for major alterations to M.I.T. buildings as well as for new ones; Physical Plant for upkeep and minor changes.) In part, this abuse is in the form of shoddy maintenance: a slate panel missing on the fascia of the entrance canopy, many broken window panes, long-neglected planting on the sod roof of the dining hall, exterior wood doors that sorely need to be sanded and sealed.

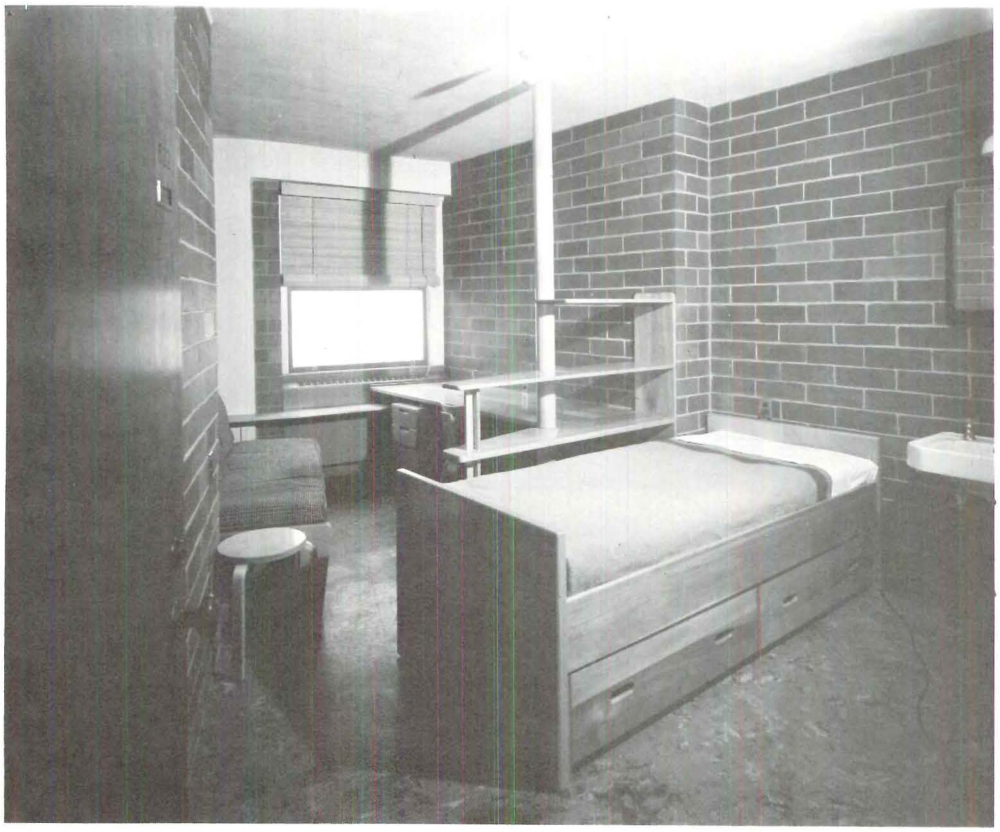
Even worse, M.I.T.'s mistreatment of the building is in the form of built "improvements": the lounge areas appropriated for additional rooms, originally natural wood grilles painted white, original pine cabinetwork replaced by inappropriate rubbish of mahogany veneer and plastic laminate.

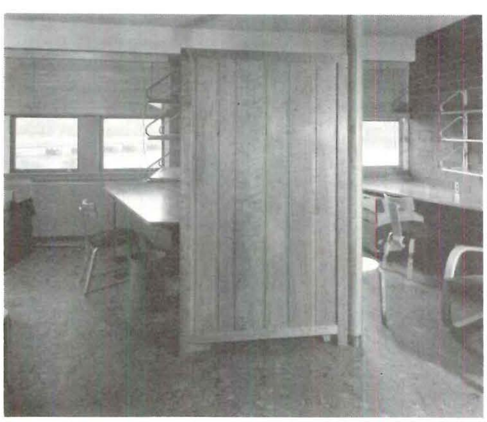
Changes, of course, will continue. Several other dormitories near Baker have recently closed their dining halls, for example, because of a change in student eating habits. Baker House's skylight-roofed dining hall, surrounded by a balcony lounge area, is the building's most beautiful and significant space (in Aalto's own words, "the principal architectural element"). It is still in use, but, should students begin eating elsewhere, it could well be the victim of further insensitive modifications.

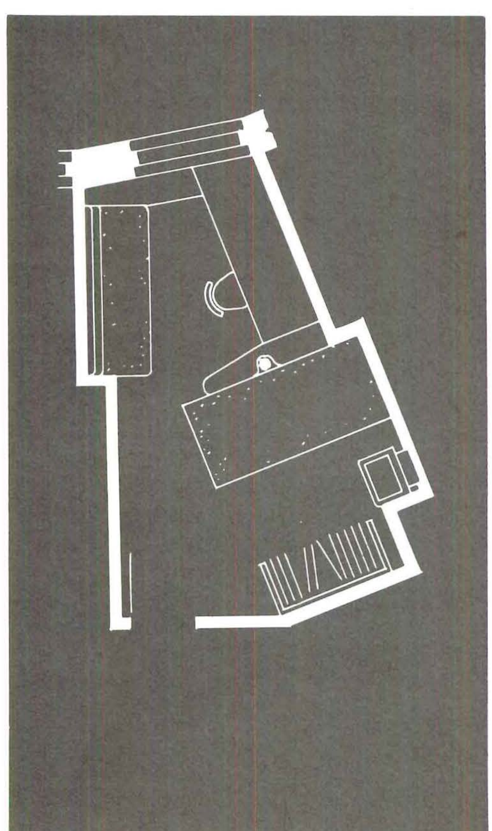
Elephants and armadillos

Once inside a room, however, the defacements can be forgotten. Aalto was as carefully involved with the design of interior spaces and furnishings as he was with the building as a whole. The original Aalto chairs are almost all gone (perhaps it is true, as Robert Dean suggests, that their screwed-together construction was too fragile for continued student use), and they have been replaced with a grab-bag assortment, no two alike and mostly ugly. But except for the chairs, the original room furnishings are intact, and they are delightful. They are all of natural woods, and, as

A small single room (plan below) divided into two areas by a central wood pole and cabinetwork. Bamboo blinds replaced the usual curtains. Below left, two views of one of the double rooms, the upper taken in 1949, the lower one this year. Except for chairs, the original furnishings are intact.







might be expected, they don't look brand new. (They don't look 25 years old, either.) More important, they work. To begin with, they *move;* how prescient of Aalto to know that every student, upon entering a room assigned to him, would want to push everything about! There are two basic pieces of storage furniture common to every room, both movable: a spacious and complicated wardrobe for hanging and storing clothing (the students call it an "elephant"), and a small 3-drawer cabinet for files and papers which can roll under a desk top or serve as a bedside table (an "armadillo").

The shapes of the rooms are as thoughtful as their furnishings. Many of the clay tile partitions between rooms are not straight but are angled and broken in plan, providing even the smallest of rooms with a sense of being divided into two areas, one for dressing and sleeping, the other for working and sitting.

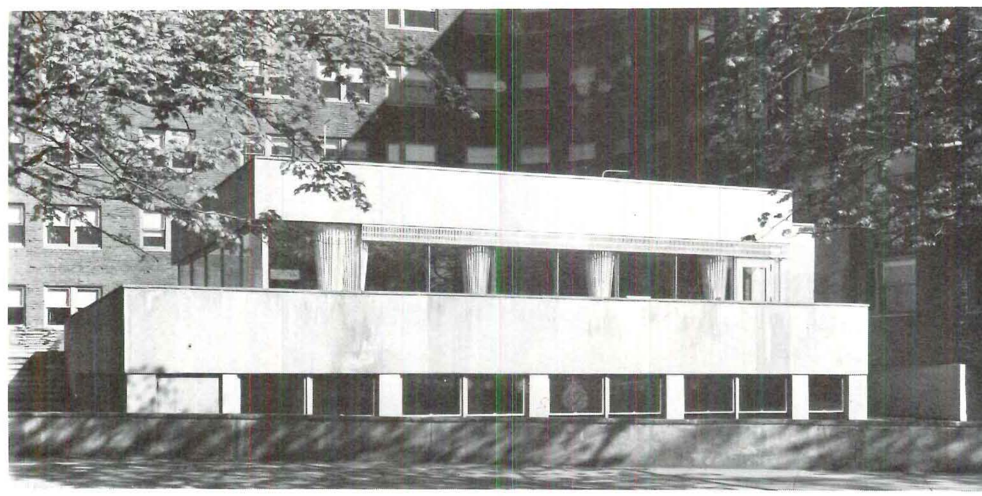
Consumer satisfaction

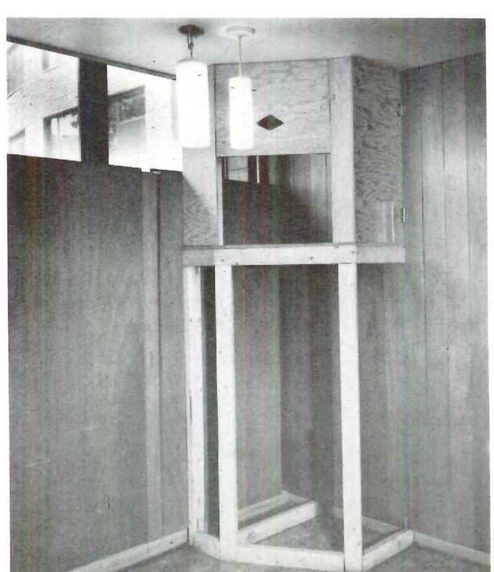
Without exception, Baker House residents I talked to said they liked it. ("Because it's beautiful," I kept hoping to hear someone say, but no-one did.) "Because it has spirit," some said. Its "spirit" is probably largely due to the nature of its student government (a town meeting type, rather than the typical one-representative-from-each-floor), but there may be architectural contributions to its "spirit" as well. There is a minimum of regimentation in Baker House. Most of the other M.I.T. dorms have a great predominance of single rooms and, in some cases, a few double rooms. Baker was originally designed to provide rooms for 1, for 2, and for 3; recent demands for space have prompted M.I.T. to shove additional beds in the largest rooms, so that now there are rooms for 1, for 2, and for 4.

Ken Browning, M.I.T.'s Assistant Dean for Student Affairs, says that, for almost its entire history, Baker House has been the most popular dorm on campus, its popularity having slipped a bit in the last two years only because two new dormitories have been built and because Baker is *not* one of the dorms so far allowed to have become co-ed.

A more subtle architectural factor affecting "spirit," perhaps not consciously appreciated by the students and obviously unappreciated by M.I.T., is Aalto's ability to elaborate on the formula dormitory plan

Top, an early view of the limestone dining pavilion. The flaring wood capitals around the interior columns have since been removed. Center left, a corridor lounge as originally furnished. Center right, the same space today. At bottom left, a plywood television cabinet and new lighting fixtures added to one of the lounges. At bottom right, a corridor phone booth shows the effects of both institutional neglect and student humor. Opposite, the top of one wing of the hanging stair. The entrance canopy is at the right; bike storage behind the brick wall in the foreground.



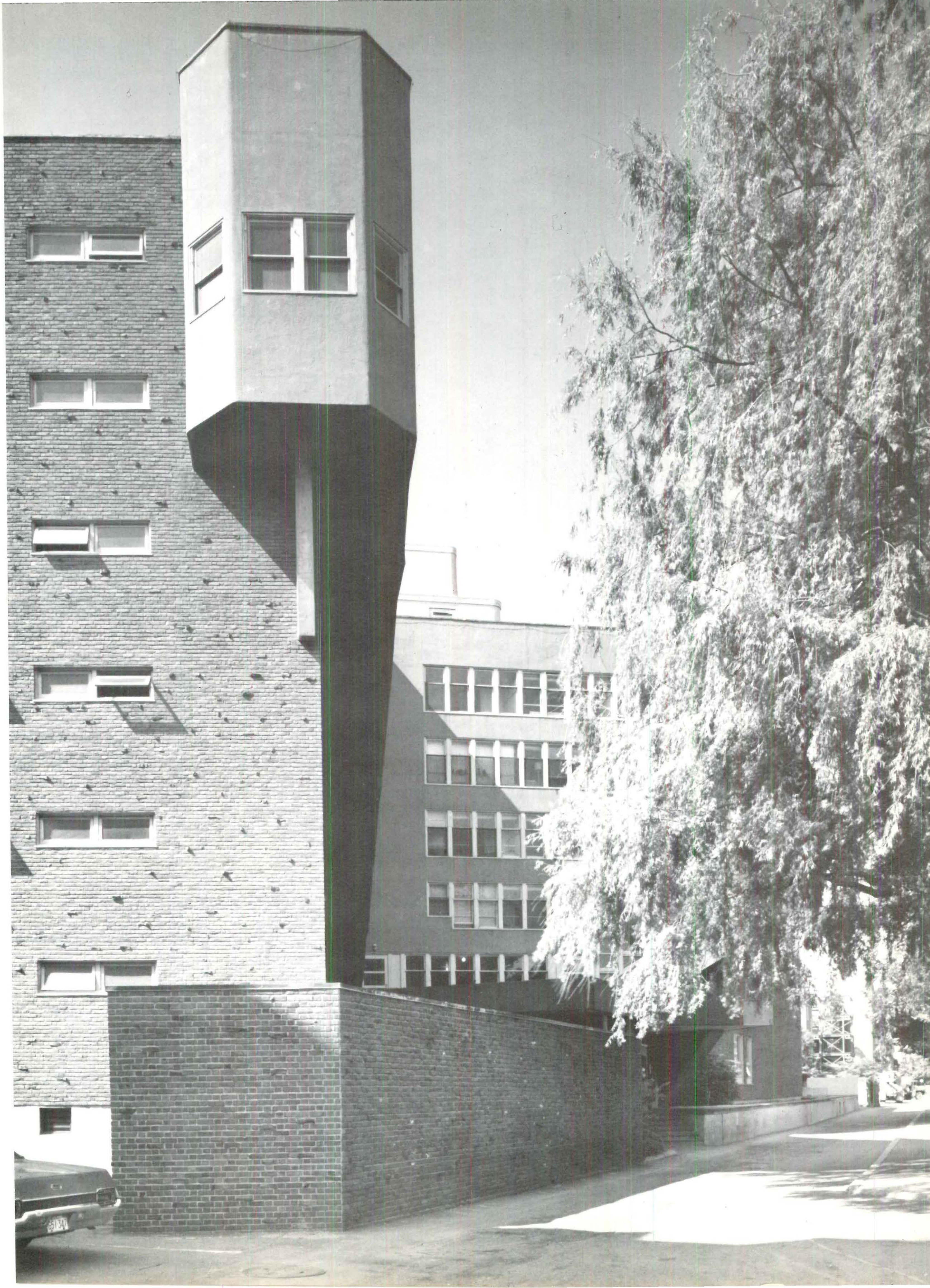


current at the time and, indeed, current until the last few years. Even army barracks are now being planned with sitting areas and with semi-private baths for three or four, but Baker House was built when the model was a double-loaded corridor of identical rooms, with one mammoth common toilet on each floor. Aalto broke the toilet/shower facilities into several small rooms on each floor, with lavatories inside each room. His plan provided, in the 43 rooms of a typical floor, 22 different room shapes. Also, he sought to overcome the traditional but offensively abrupt relationship of private room to public corridor by making the corridor itself a semi-public living space. In his original plan, the corridor often widened into lounge areas. Some of these have been separated from the corridor by new plywood partitions; some, still open to the corridor, have been visually separated by a change in floor covering; some have been closed off entirely and converted into rooms.

M.I.T., in short, has a fine and useful building without fully appreciating it; the students living there seem to like it without quite knowing why. It told the architecture profession, years before most of us were listening, what was wrong with the International Style and what alternative paths architecture might take. The things Baker House is not—not white, not symmetrical, not composed of geometric elements—may carry the seeds of a dangerous disorderliness in the hands of lesser designers, but they also point to something positive: an architecture beyond formula, responding freely to the various determinants of given building situations.

Baker House is a representative work of an architect concerned with the most minute functions of his building and its occupants (Where will the boys store their books? Their shoes? Where will they gather to talk? How will their fingers grasp a handrail? What will they see from their windows?). Not only does Baker House now seem to have been stylistically precocious, but it also demonstrates—and this is of much more lasting importance—how very good a building can be when its architect cares.

Current photographs: Phokion Karas.
Photograph page 58, Ezra Stoller; page 59, Frank Conant.



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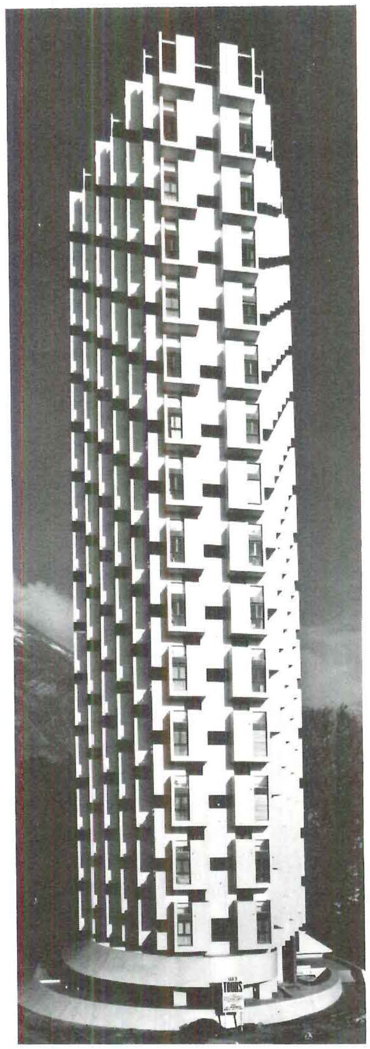
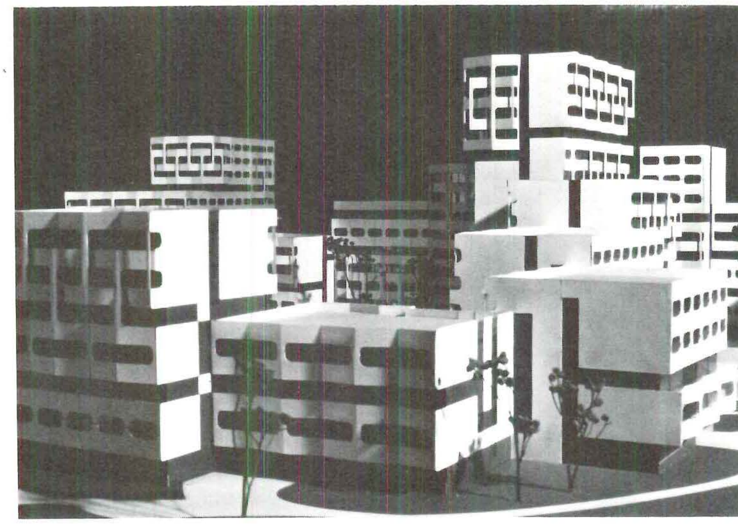
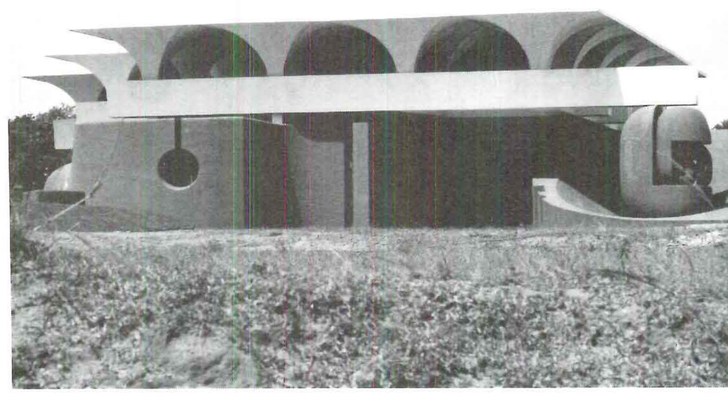




Woven balconies for that no-wall feeling



Tower on a spiral, Grenoble

A building turned inward, for the teaching of meditation

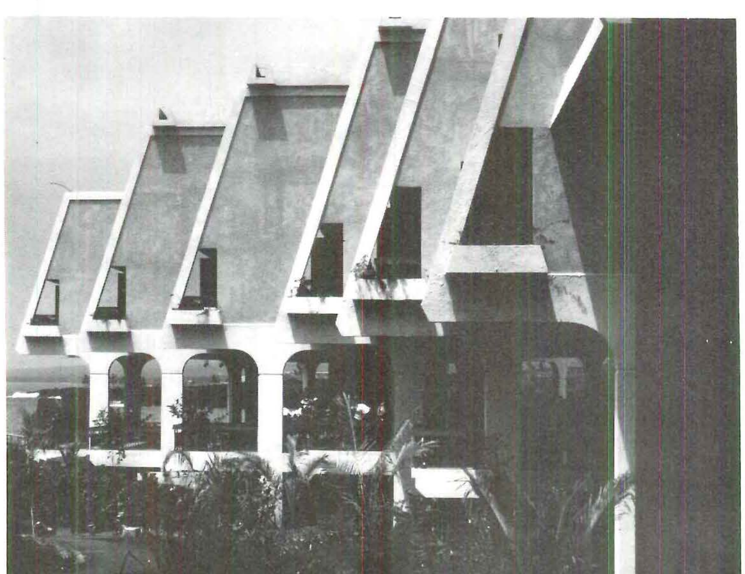
Three French projects

A glimpse at three projects from the work of an architecture firm in Paris reveals a grand diversity of spirit. The first, a school for students of meditation in the new town of Pondichery in India, translates the will of the educators into a design that closes out the outside world. On the interior walls there are many small openings to avoid claustrophobia. The outside walls are painted with a special insulating emulsion, and are of an "earth color" to blend in with the environment.

The second project is "a play on balconies" in an apartment house in Champvert near Lyon on the Road of Two Lovers. This group of 350 apartment units is the first part of a complex which will eventually hold 700 units. Any impression that there are any walls has been carefully avoided. Prefabricated panels have been used in seemingly endless combinations to create a very interesting facade.

The third project is a 28-story tower in Grenoble; part of the master plan of the town. Because of the "active climate" in that part of France, the building doesn't open to the north. The lobby of the building is very much like the entrance to a palace; about one-third of the vast entrance floor is devoted to pools and fountains.

Architects are Anger-Heymann of Paris; for the Grenoble project, the architects are Anger-Heymann & Puccinelli.



Jagged over the crags

Hawaii has a new hotel. The 550-room Kona Surf Resort at Keauhou Bay is built on a site of almost solid coal-black lava flow brightened by patches of palms and bougainvillea. Generally, the lava formations have been preserved intact under raised four-story wings of the building, and these guest wings' staggered silhouettes recall (with only a bit of imagination) the rough outcroppings beneath them. Lemmon, Freeth, Haines, Jones & Farrell of Honolulu are the architects, and their decision, following the precedent of Skidmore, Owings & Merrill's Mauna Kea Hotel, to shun the typical highrise hotel slab shows an admirable sympathy for a rugged site.

The judge said tear it down

Melbourne had an apartment construction boom between 1965 and 1970. It ended abruptly: a mini-depression, a linked stock market collapse, and a wave of complaints from citizens. A new breed of developers appeared—all young (25 to 35) and without qualifications.

One particular firm was run by two young men—one a dropout architecture student and one a real estate agent. They put up a block of apartments a week, all distinguished by varying window details and all made possible by flouting regulations. A recent venture of theirs are these two $200,000 (each) blocks of flats in South Yarra, a suburb of Melbourne.

A group of seven citizens, irate because the apartments violated neighborhood zoning regulations, finally brought the firm to court and won a Supreme Court decision which orders that one of these buildings must be removed (left). This may be the first time any court anywhere has ordered such a demolition.

The building is coming down for the wrong reasons—not because it is a horror to its occupants, passersby and neighbors, but because the builders neglected to acquire a Planning Permit.

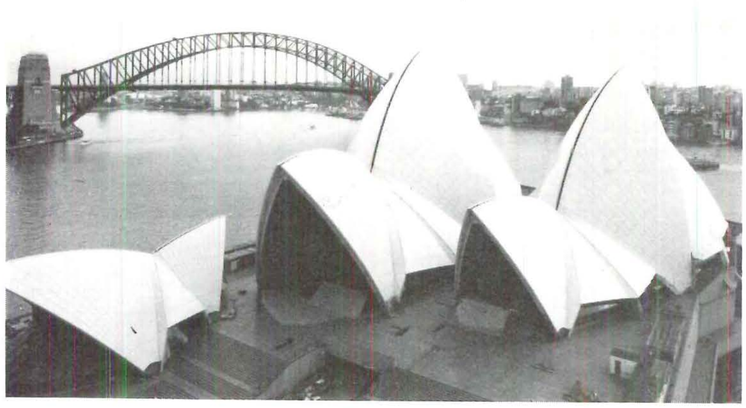
According to the citizen group, the builders kept right on with their construction in the face of warnings from them that it was unlawful to build without a permit.

The Melbourne City Council has been encouraged by this precedent-setting decision, and is going to try to bring suit to have the second block demolished as well because of building regulation breaches. The second block did acquire a Planning Permit, however.

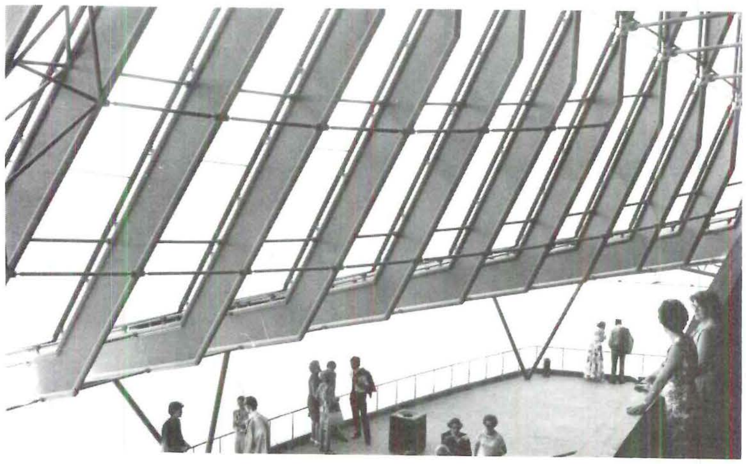
The court order provides that the block of 12 apartments shall be demolished and replaced with a house, not to be more than two stories high.

Melbourne architects describe the court outcome as a significant milestone. The Federal President of the Royal Australian Institute of Architects, Peter McIntyre, said, "I expect it will have a fair spin-off in the industry and make people more cautious about building."

I was called as a witness at the hearing but "architectural shortcomings" according to the judge, were "not relevant."—N. C.



Like some great winged birds watching over the harbor



Strollers inspecting the foyer of the Sydney Opera House

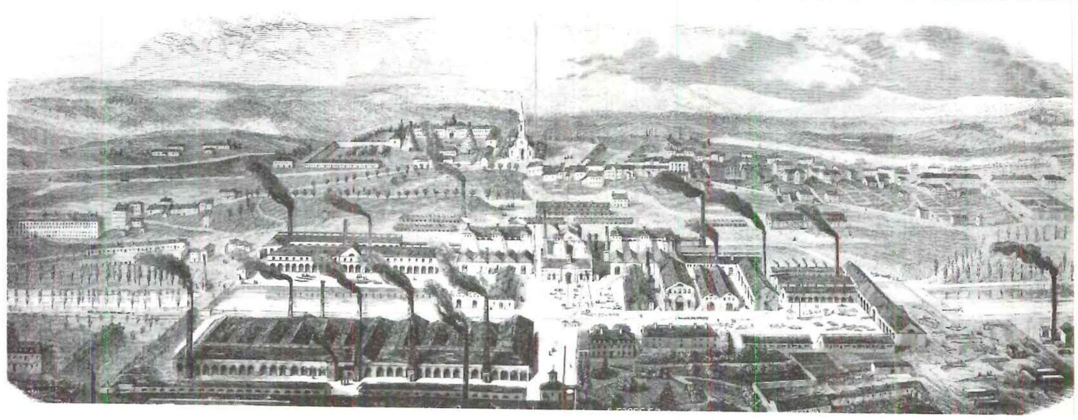
Art and the Sydney Opera

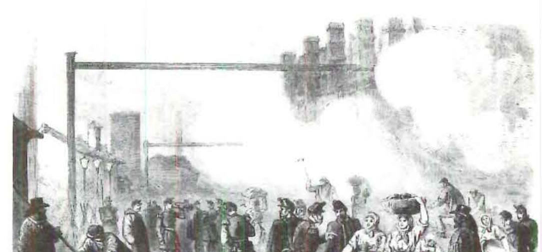
Australia's first international art biennale will open at the $100,000,000, trouble-plagued Sydney Opera House on November 23, less than two months after the official inauguration of the building by Queen Elizabeth in October.

Paintings and sculptures from 14 countries will be mounted in the main lounge which overlooks Sydney Harbour. Thirty artists will exhibit in this first biennale (which is modeled after the Venice and Sao Paulo biennales)—half of them Australian and the rest from the nations invited to send works.

Transfield Proprietary Ltd, the engineering and contracting firm well known for patronage of the arts in Australia, is sponsoring the show. This first one will feature art from Asia and the Pacific, "areas which have been in need of a cultural focus for some time," said Mr. Franco Belgiorno-Nettis, managing director of Transfield. No prizes will be awarded.

The Opera House recently passed the traditional acoustics test—shotguns were fired from the stage. We are pleased to report that no one was hurt.





The architecture of labor

The factory, its labor force and its architecture, is the subject of a current exhibition of photographs (24 May-15 September) in the Industrial Design Center of the Musée des Arts Decoratifs in the Louvre, "L'Usine Travail et Architecture."

The pictures comprehensively document the rich history of the industrial development of France; industry which created not only its particular forms but also gave to the world models for the architecture of a new urbanism.

A new and more liberated labor force caused the birth of a labor-oriented architecture, where the factory is designed to include consideration of the needs of the worker, as, for example, in the factories that manufacture Volvos.

The exhibition was sponsored by Professors Jean Prouvé, Jean-Baptiste Ache, and Jean-Daniel Raynaud of the National Conservatory of Arts and Crafts; and by Professors Lassus and Saddy from the École Nationale Supérieure des Beaux Arts. Installation designed by Vincent Grenier.—G. de B.

One IBM Plaza, Mies and Murphy

Monadnock, above; Reliance below

Europe looks at Chicago architecture . . .

The State Museum for the Applied Arts, Munich, will open an exhibit "100 Years of Architecture in Chicago—Continuity of Structure and Form," July 23, 1973. The exhibit surveys the Chicago School of Architecture and shows its influence on modern architecture around the world. Mies van der Rohe, teacher and architect, provided the stimulation and inspiration to a coherent architectural idiom of extraordinary vitality. His work is generally recognized as the beginning of the Second Chicago School of Architecture.

Photographs, plans, models and working drawings will be displayed, documenting the influence of Mies' office, as well as Skidmore, Owings & Merrill, C. F. Murphy Assocs., the David Haid Assocs. office and others.

The show was put together by architect/author Oswald W. Grube and Wend Fischer, director of the State Museum. The introduction to the comprehensive catalog was written by Carl W. Condit, Professor of Art, History and Urban Affairs at Northwestern University, and one of the leading experts on the Chicago School. The catalog will establish the relationship between the projects shown and the forces that shaped them.

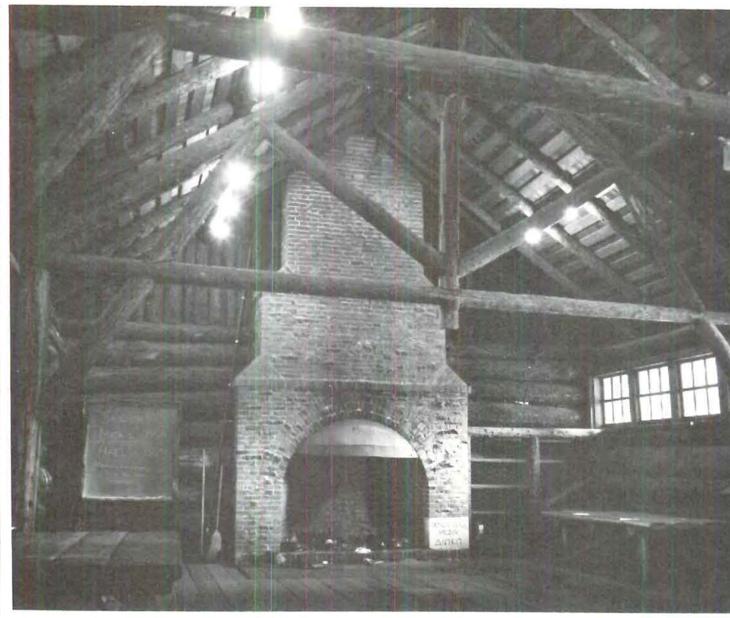
The show will travel to seven as yet undisclosed European countries, after it is shown in Munich. —D. S.

. . . more Chicago . . .

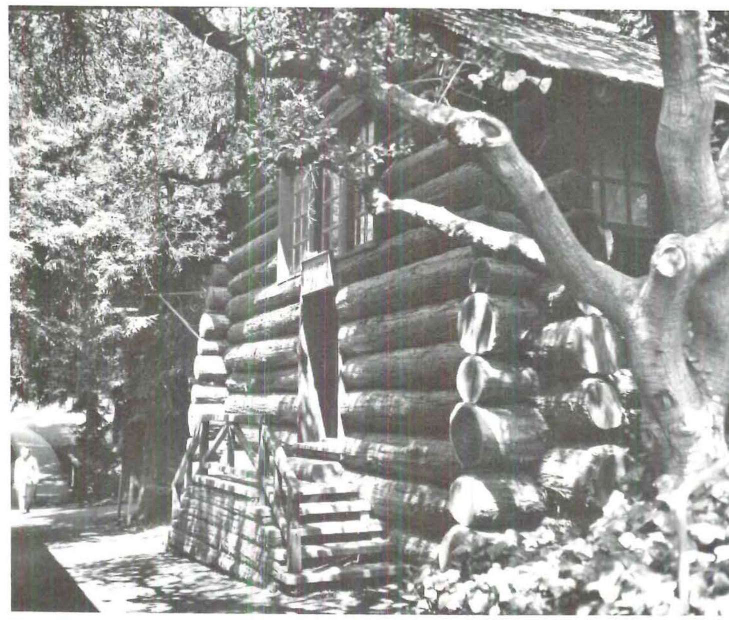
A small exhibit at the America House, Munich, consists of photographs of a steel office building designed by the Chicago office of SOM for the Boots Company in England. Lectures on certain aspects of Chicago Architecture are being given by three Munich architects, Peter von Seidlein, Detlef Schreiber (who is PLUS' Munich Field Editor) and by Oswald W. Grube, author of the book "Industrial Buildings and Factories."

. . . and more Chicago

Another show currently traveling through European cities is "The Evolution of the Chicago Highrise Building." This one first opened last summer at the College of Architecture in Stockholm and was arranged under a grant from the Graham Foundation for Advanced Studies in the Arts and the U.S. Cultural Center in Sweden. All of the photographs in the exhibition were taken by Chicago Architect Harold A. Nelson, a Chicago School of Architecture enthusiast.



John Galen Howard's legacy; the university doesn't want it



Help is needed here

A log cabin, known on the Berkeley campus of the University of California as "Senior Men's Hall" is about to be torn down, unless there is some fast action.

The lodge was designed by John Galen Howard, who worked for both H. H. Richardson and McKim, Mead & White, and who was chosen after an international competition to be the supervising architect for the University of California at Berkeley in 1901. He founded the Department of Architecture there and designed a major portion of the University campus.

Built at a cost of $3,300 in 1905 —it survived the famed 1906 San Francisco earthquake and yet, ironically, does not meet present state requirements for seismic safety—the house is pioneer rustic, yet has the mark of a distinguished architect, with its carefully graduated logs, sensitive proportions, and dramatic patterns of cross-beam supports. The logs are now-rare California redwood, with the bark still remaining. The 70-year-old lodge has a brick fireplace two stories high, and a plank floor half-a-foot thick, bound by iron bars.

Students and local architects are horrified at the impending loss. The planned demolition was a well-kept secret revealed by the university administration only in February of this year. Bids for demolition and construction of the new Men's Faculty Club to be built in its place have already been received and reviewed. Zero hour is fast approaching.

John Galen Howard is just now beginning to be recognized as a great innovator in the architecture of the Bay Region. For a cultural institution to tear down what in effect is a historic landmark might be compared to the burning of books. Would the University of Chicago tear down Robie House?

Moral support will be greatly appreciated and should be directed to Friends of the Campus for Senior Hall, c/o Richard Ehrenberger, 3121 Claremont Avenue, Berkeley, Calif. 94705.

Kansas City

In 1955 Joyce Hall, founder of Hallmark Cards, decided to transform an 85-acre eyesore into a "town within a town" on the rim of downtown Kansas City. As a result, that land has been changed from a billboard-studded mound of urban blight into Crown Center—a complex with one million sq. ft. of office space, 2,200 apartments, hotel, theaters, planetarium, skating rink, and separate power plant—the largest privately-financed real estate venture to date in Middle America. When completed the project will have added 50 buildings to the city.

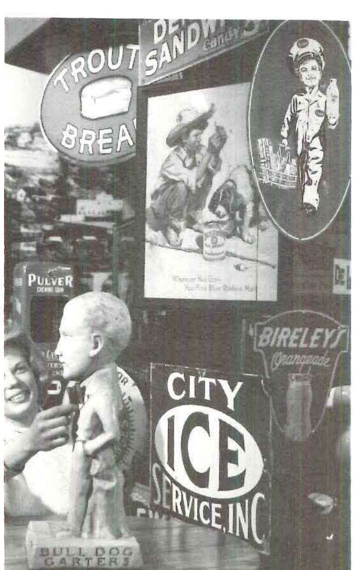
Two distinct but connected buildings form the 730-room Crown Center Hotel, a 15-story, L-shaped guest tower built on top of a 70-ft. hill, and a five-level lobby wing, carved into the side of the hill. The hotel was designed by Harry Weese of Chicago.

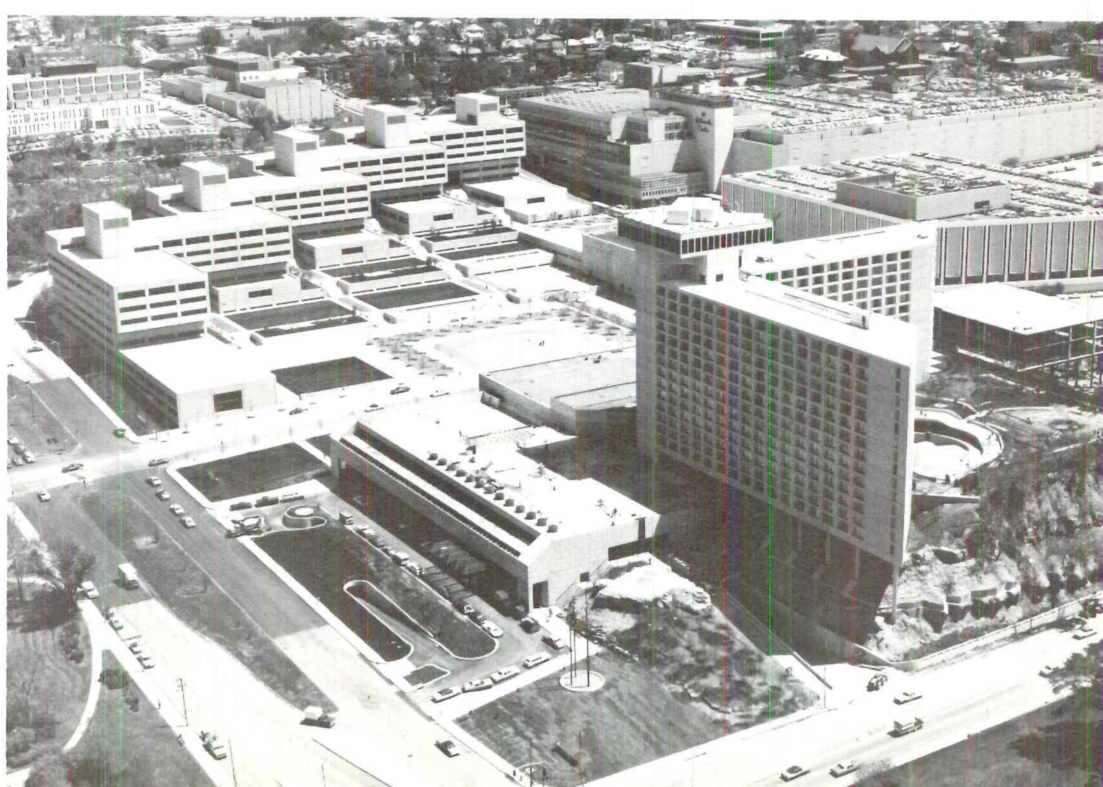
Limestone outcroppings are a strong visual element in the hotel lobby, contributing the background for a tropical garden of waterfalls and lush foliage, including 14 mature weeping fig trees, rising to 60 ft. from the floor in the enormous (12,000 sq. ft.) space. From two "springs" at the top, water streams down, dropping into a pool of Egyptian papyrus and water iris. The garden was designed by Landscape Assoc. of Little Rock, Ark.

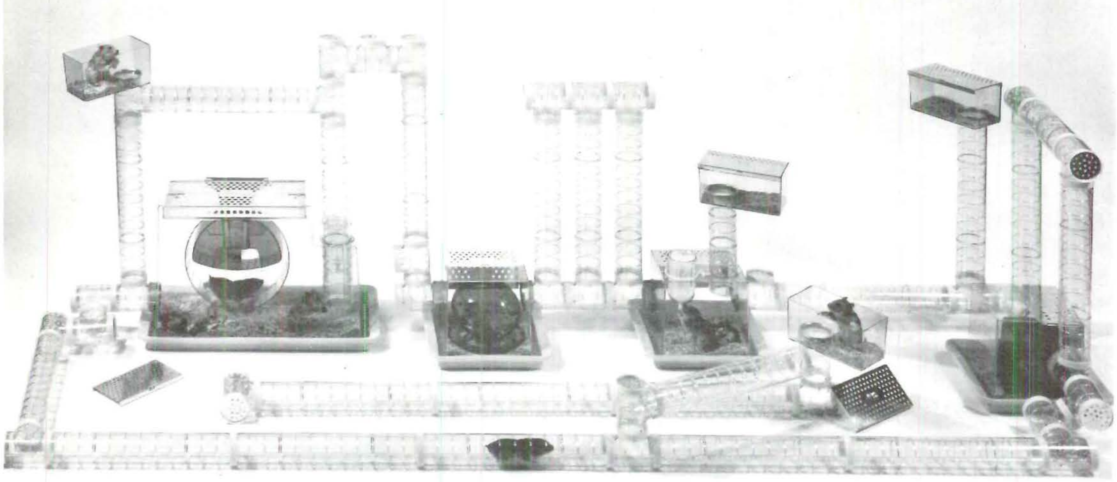
The Signboard Bar, a saloon of Americana decor featuring weatherworn trade signs was designed by PBNL Architects Inc. of Kansas City.

The stepped-back office building (to the left in photo) as well as the bank and shopping center, were designed by Edward Larrabee Barnes of New York, who is the master planner for the entire development.

The international headquarters of Hallmark Cards, owner-developer of Crown Center, can be seen in the background (right).







A dream of a mouse house

Hamster heaven

Habitrail, a totally planned environment for hamsters or gerbils (very much in a style of architecture reminiscent of Britain's Archigram or the Japanese Metabolist Group) was one year in the design stage. Certain requirements created special design parameters. For one thing, the walls of the unit had to be inviolable to gnawing, or "hamster-gnaw-proof." And for another, and perhaps more important thing, the mothers of those little children who were begging for hamsters had to feel very sure that the wee animals would not get out to roam at will. This mansion is secure—there are double locks on the stainless steel door/roof of the "petting loft."

In nature, the hamster lives by tunneling underground, so the "corridors" are constructed of rigid polystyrene, tinted yellow-orange, to give the little fellow a feeling of privacy; he doesn't feel so looked-at as he burrows. Two full-grown hamsters can pass each other in the corridors without difficulty.

When a hamster does feel the need of human companionship he climbs up the vertical tube to the "petting loft" and sits up. The smooth sides of the vertical tubes present no climbing problem because hamsters burrow by "peristaltic motion," instinctively. When hamsters who have spent their entire lives in a box are put into the Habitrail, they start skooting up and down and all around with visible glee within five minutes.

The clear cube units have a wire mesh bottom and the unit sits on a soft plastic tray of polyethylene. Thus cleaning can be accomplished by removing the tray. It isn't necessary to remove the hamster. (Mothers, please note.)

The coupling rings are polyethylene, and all components fit into all other components for any combination of chambers the imagination may dream up.

The center cube unit has a tilted revolving exercise saucer. Slightly to the right is the spillproof drinking station: a blow-molded, inverted polyethylene bottle with a stainless steel nipple. (There is always one drop of water waiting.)

The hamster was "discovered" in Syria by two visiting professors from the University of Jerusalem in the 1930's. They brought out with them one pair who are credited with the parenthood of the zillions of hamsters in the Western Hemisphere. The female goes into heat every *three or four days*, the gestation period is 21 days, and the usual litter is 9 to 12. And, it might be mentioned, the hamster is not monogamous.

Allan Willinger, the designer, has 40 patents on pet-related designs, but is most fascinated by hamsters. Habitrail is made by the Metaframe Corporation, East Paterson, N.J., a division of the Mattel Toy Company.

Pornography by geography

The poster on the left advertising an art exhibit at the Royal Academy was designed by the artist, Anthony Green, to bring "a spirit of summery love and happiness" to commuters in London's hundreds of Underground stations. The London Transport Authority, fearful for the lady's virtue, or perhaps envisioning a graffiti free-for-all, raised objections to the nudity, and asked the painter to dress her up.

Mr. Green grudgingly sketched on a ballgown. Said he, "When you are doing a work of art you don't consider the graffiti potential. I am not a poster artist and nobody warned me about the tube problem. But, good grief, some of the things you see on the tubes these days—and they object to a portrait of my lovely wife."

At those stations where the platforms are open-air and present fewer graffiti opportunities, the ungowned original will be permitted.

A reminder of Mies

Architect Alfred Browning Parker of Miami, Florida, recently visited the USSR and took photographs of the former German Embassy in what used to be St. Petersburg, which was designed by Peter Behrens in 1908. Behrens was present at the birth of modern architecture in Germany and exerted a leading influence between 1900 and 1914.

Mies van der Rohe worked for Behrens as a draftsman from 1908 to 1911, and was assigned to supervise the construction of this Embassy. He was at the time in his early twenties.

The building is presently being used by Intourist and is closed to the public. Mr. Parker reports that it is obvious no special care is being taken in the maintenance of the building, although some pointing of masonry joints could be seen.

The red granite exterior has apparently withstood 60 years of Leningrad's harsh climate.

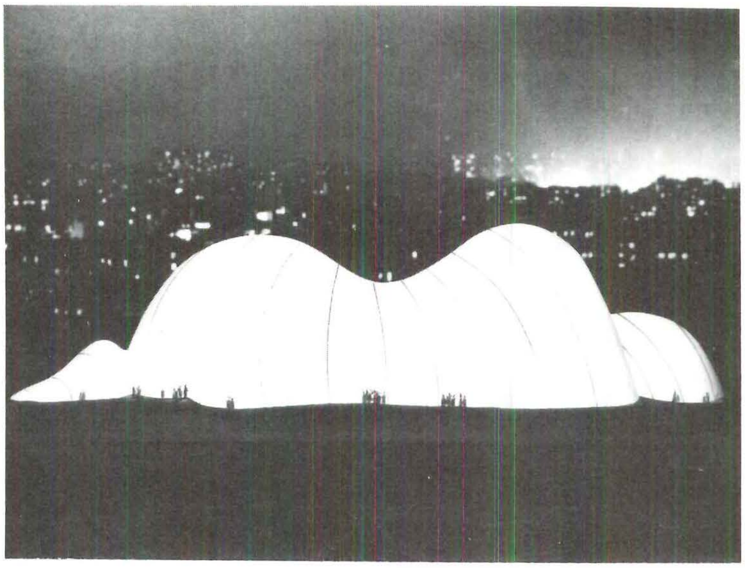
Mies in the USSR

The birth of Venus

"In Xanadu did Khubla Khan a stately pleasure dome decree . . ." With these words Patrick Henry of the Illinois Arts Council began to describe the reasons why the Council is going to build "The Venus of Chicago," a mammoth inflated structure designed by the French artist and designer, Bernard Quentin.

Venus (the model) was unveiled on Friday the 13th (April 1973) at the American Center in Paris. Venus is designed to accommodate a theater, a concert hall, multimedia environments, a cinema, an art gallery, and working studios for artists. There is room inside for 3,000 people. Her outside shell can become ten giant video screens.

Big mama herself weighs four tons; complete with furniture and structural equipment, she's 25 tons. Her dimensions: 300 ft. long, 100 ft. wide, and 80 ft. high. The sponsors hope that the good word will spread across the American con-



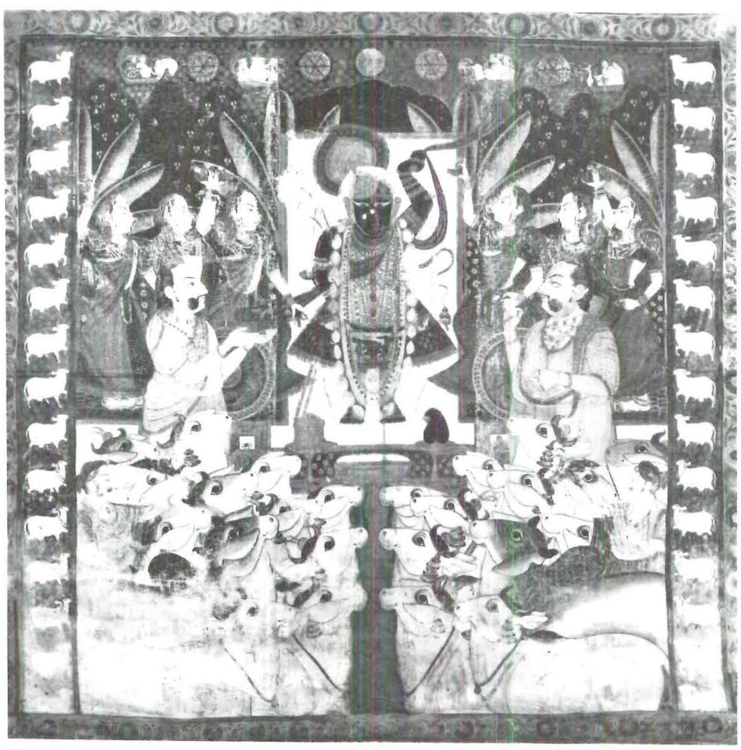
Venus of Chicago—an inflatable pleasure dome

tinent quickly and that Venus will be in demand for circuses, county fairs, revival meetings (not likely) and who knows what. Her rental rates are reasonable, and she comes with a permanent crew to assure smooth operation.

We are informed that transport of Venus (complete) from place to place is simple logistics: the job will require "five containers of five tons each in three trucks, or one dirigible of 60 m. length."

"The arts," says Mr. Henry, "have remained too long in the rarified environs of the esoteric, excluding all but the *cognoscenti:* a privileged few who have promoted the idea for their sake. This project provides a fabulous space in which fantasy and reality are intermingled, a kaleidoscopic environment —ever changing, ever stimulating, ever provocative . . ."

Well, yes, provocative it may be. —G. de B.



Mysteries from India

The American Federation of Arts is sponsoring a traveling exhibition in the U.S. of the Rajasthani Temple Hangings of the Krishna Cult, from the Karl Mann Collection. These weavings depict scenes from the Krishna legend. They have been created for use in temple worship; some of them in the 18th century, most of them in the 19th or 20th centuries.

The whole tenor of worship in the Krishna sect is directed toward the development of esthetic enjoyment. This concentration on visual display resulted in large and spectacular cloth hangings for their religious ceremonies. The visual appeal of these tapestries is immediate and obvious; their deeper meanings require some study into the cult.

The show has been at the University of Alabama until now. The present schedule is: University of Florida, Gainesville (July 8 to Sept. 2, 1973); Meadowbrook Art Gallery, Oakland University, Rochester, Michigan (February and March 1974); Asia House, New York City (April, May and June 1974). Intermediate dates are not released yet by the AFA.

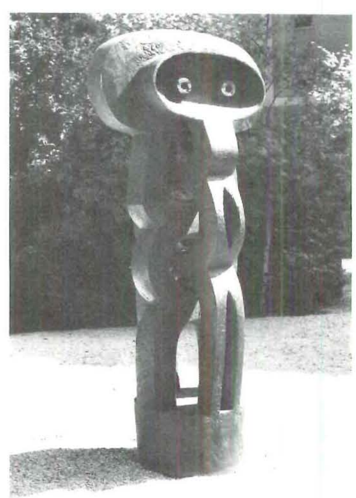
Obit

Jacques Lipchitz, expressionist sculptor, died in Capri May 27 at the age of 81, and was buried in Israel. Most of his work was done in France and the U.S., his adopted countries. He studied in France at the Ecole des Beaux Arts, the Academie Julian and the Academie Colarossi, and became one of the first to apply the principles of cubism to sculpture.

In 1924 he asked Le Corbusier to design a house for him in Boulogne-sur-Seine.

The Lithuanian expatriate was fascinated by the myth of Prometheus, and in 1937 he created the massive "Prometheus Strangling the Vulture" for the International Exhibition in Paris. In 1961 he bequeathed 300 of his original creations to the Jerusalem Museum of Art, then under construction.

In 1952, Lipchitz was commissioned to create a statue, "Our Lady of Joy" for a church in the French Alps, Nôtre Dame de Liesse in Assy. His studio in New York burned while he was working on the statue, and much of the work he had created in the U.S. was destroyed. He recreated the statue for the church and inscribed it, "Jakob Lipchitz, Jew, faithful to the religion of his ancestors, has made this Virgin to foster understanding between men on earth, that the life of the spirit may prevail".



Figure, Lipchitz (1926)

Mother and Child, Lipchitz (1941)

Arvin Shaw, III, 57, a widely known architect who retired last year from the firm of Carson, Lundin & Shaw in New York City, died of cancer on May 29th at Roosevelt Hospital in New York after a short illness. His home was in Sagaponack, Long Island, but he had spent this past winter in Southern France.

Arvin Shaw was an inspired and dedicated designer. The smallest detail was as important as the overall concept. His designs ranged from the city skyscraper to small corporate interiors. His own house in Sagaponack had received wide recognition. He was a man with vision who thought of architecture on a total scale and gave his energies to see his visions become realities.

His wife, the former Belva J. Barnes, also an architect, died of cancer in 1967.

Photographs: Page 12 (bottom r.) Wm. D. Glanslen. Page 13 (top) Peter Blake; (model) Photo Haphong. Page 15 (Triennale) Erminio Bottura; (top r.) Cerro Tololo; (bottom r.) Guggenheim Museum. Page 16 (top r.) Lawrence S. Williams, Inc.; (bottom r.) Rollin R. La France. Page 17 (top) Liang's Photo Ser. Page 66 (top l.) Michel Moch; (top r.) Hughues Jirou; (middle r.) Dominique Darr; (bottom l.) Julius Shulman. Page 67 (top) Australian Infor. Ser.; (bottom l.) *Herald-Sun.* Page 68 (top l.) Harr, Hedrich-Blessing; (middle, bottom l.) Harold A. Nelson. Page 70 (middle r.) Alfred Browning Parker. Page 71 (sculptures) Museum of Modern Art; (r.) Katherine Young.

THE WATERGATE GAME

Any number can play! All that's needed is a pair of dice and you too can be a little bugger. The object of the game is to stay out of jail as long as possible. The game ends when only one player is left out of jail . . . this player is the winner (relatively speaking).

The "Game Plan" . . . The game begins with one player being elected Commander-in-Chief. The Commander-in-Chief then selects the order in which all players take their turn. All players assemble their "markers" at the start position. Markers have been provided below and may be cut out with scissors. Elephants were selected to symbolize the players because they Gorge On Peanuts. Each player rolls the dice in turn, moves his marker the corresponding number of spaces and follows the instructions printed in that space. NOTE: Cheating is permitted if it is not seen by the Commander-in-Chief, OR, if the Commander-in-Chief *says* he didn't see it. Participants may wish to identify their playing pieces with a name. A list of suggestions follows: Jed Marauder, James 'mCaught, Z. Harold Kuntz, Fred Bugwin, B. Warden Bippy, Don Zigliar, Spiral Igloo*, Don M. Snitchwell, Hermie Wombat, Nick Dixxon, Morris Plans, Don U.U. Bean the Last, Hans Rosenkrantz & Fritz Gildenstern, Don B. Blind-Dense, L. Matchstick Rey.

NOTE: If you or any member(s) of your group are caught playing this game, all materials including this poster should immediately be given to L. Matchstick Rey.

***Spiral Igloo cannot actively participate like the other players. He must be positioned outside the playing circle and look better . . . and better . . . and better.**

Footnote

The Watergate Game, reprinted above, evolved from a complex of buildings in Washington, D. C. currently featured prominently in the news. The Watergate, or as the Washington Post recently called it, "The H_2Ogate," was created by the Italian real estate firm, Immobiliare. The poster is published by The Karma Group, New York City. The Watergate apartments were designed by Luigi Moretti, with Associate Architects Fischer & Elmore.

Book Review

continued from page 9

(c.f. Roheim), displays much the same cosmogonic features as an initiatory hut. All this would suggest that the primitive hut far from being mere archetypical shelter, has its ultimate origins in a religious hierarchization of space. It finds its *raison d'être* in the projection of an animistic universe, where the hut becomes analogous to the sacred beast or cosmic monster through the bowels of which all men are destined to be reborn. This induced consciousness of birth, assimiable to the cycle of the seasons, particularly to seed time and harvest, projects the hierarchization of space into other renewal rituals besides that of maturation. In Judaism harvest finds its celebration in the feast of the tabernacles; in the building of primitive huts or *succoth* out of palm leaves in accordance with Mosaic command. A similar primitive differentiation of space is evident in the Judaic wedding ceremony wherein the couple are ritually united in the open air under an awning of fabric; the *huppah* of the traditional Judaic rite. That the *huppah* may on occasion be a trellis of flowers brings one to consider what may well be the most interesting speculation of Rykwert's whole thesis; one that is barely formulated within this argosy of erudition. For a nomadic desert people a *succoth* of fronds could hardly have been the natural form of ritualistic hut, so its subsequent transposition into a hut of palm leaves proffers the model by which one may tentatively begin to explain the maintenance of wooden forms in the stone temples of classical Greece; namely that a form ordained by archaic ritual is merely transposed into a different technique when the techno-economic capacity of the culture radically changes.

Rykwert's search for Adam's house thus leads us back quite literally to the Holy Grail, to the quintessential fact that architecture in the last analysis is neither function nor form, neither shelter nor irreducible technique, but rather a cryptic sign, the first articulation of language, a metaphor, unconsciously formulated as a propitious act of renewal through which all human power is deemed to stem. This idea, significant enough to qualify and even clarify our present notions about built form, is hardly well served by Rykwert's labyrinthine procedure. The history of Western architectural theory cannot be significantly advanced by an approach which inadequately examines the full socio-economic and cultural context within which the theories have been developed. Theoretical transpositions are surely ultimately qualified by semantic development and this in turn must depend on changes in material circumstances and epistemology. These issues tend to be displaced in Rykwert's pursuit of Adam's house by literal fact and mythical allusion, and although these constitute the well established province of architectural erudition, one feels unavoidably disappointed by a text, which however informative, does not address itself to the essential nature of knowledge in relation to built form. Important and original, this text has one serious weakness; namely that it does not clearly declare itself.

The Architecture Of Middle Georgia: The Oconee Area by John Linley. University of Georgia Press, 1972. 194 pp. $17.50.

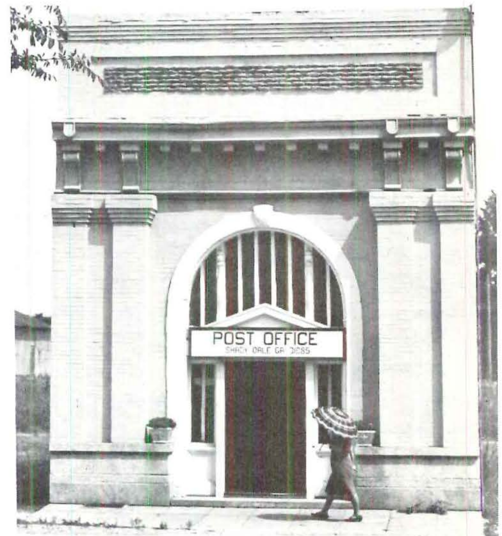
Reviewed by Stanley Abercrombie

No one has yet been brave enough to begin for the United States the kind of project Sir Nikolaus Pevsner has already largely accomplished for England: a survey, county by county, of all important existing buildings. Writing the required shelf of guidebooks would be a monumental task but, if the preservation effort in this country is ever to be seriously undertaken, a necessary one. How can we know what we should save until we know what we have?

A model for what such a guidebook might be is provided by a handsome new book cataloguing the handsome old buildings in seven of the 159 counties in the state of Georgia. At the center of this area is architecture-rich Milledgeville, Georgia's capital 30 years before the first settling at Terminus, the railroad terminal which became Atlanta. Among the area's treasures, in addition to the expected array of white-columned ante-bellum houses, are some pre-Columbian Indian monuments and the State House of 1807, one of the country's earliest adventures in the Gothic Revival.

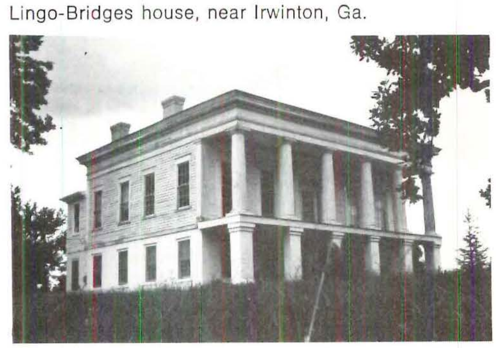
Prof. Linley first tells us something of the region—its weather, soils, topography and other factors that have influenced its buildings. He surveys the buildings chronologically and, at the end of the book, gives us a recapitulation for each county. A collection of street and highway maps serves as an appendix, and all the buildings shown (over 200) are keyed to these maps. For as many of the buildings as possible, Linley gives us at least one illustration, the building's location, date of construction, architect, names of original and present owners, orientation to the sun, key dimensions and other information—certainly an exemplary collection of data. Some floor plans are shown, and most of the buildings have been placed in one of five categories of value, from "Worthy of Mention" to "Nationally Important."

There are a few minor errors and vaguenesses and, Linley admits, some regretted omissions in the text. Most regrettable of all is the unnecessary inclusion of recent work in a chapter called "Toward a New Architecture." We hope not: it is all excruciatingly banal. Nevertheless, the book is a valuable, close study of an admittedly small area. The job remains before us to extend such study to Georgia's other counties and to all our other states.



Post Office, Shady Dale, Ga.

Lingo-Bridges house, near Irwinton, Ga.



Glen Mary, Hancock County, Ga.

Trawick house, Hancock County, Ga.

Energy for architects

continued from page 49

are being considered to make the HVAC system more efficient. Waste heat would be used wherever possible and a giant Total Energy System would be considered.

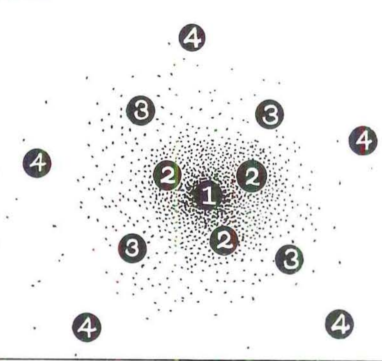
Buildings would be designed with efficient surface-to-volume building exteriors, high thermal value materials, solar controls, thermal glazing; vegetation and other site advantages would be maintained. Underground buildings, solar collectors, rain collectors and planning oriented to solar position are also being considered. Preventive maintenance would be practiced in all cases and all systems analyzed in their totality.

Technologies being studied range from the most complex concepts to the simplest. The planners, for example, are strongly considering using windmills as generators for dispersed housing. Windmills require no non-renewable resources, contribute no air or thermal pollution and eliminate wiring. Configurations vary from airfoils that turn wheels to conventional impellers. The windmills can include storage systems for the energy they generate that is not needed right away. The direct current they supply can easily be converted to alternating current by an inverter and transistorized equipment can easily convert to direct current power; the direct current may also be used for electrolysis of water hydrogen and oxygen—the hydrogen may then be used or stored for combustion or to generate electricity in fuel cells. (Europe is generally ahead of the U.S. in using wind for power generation.)

The project's proponents have not given up on seeing their proposals come to life. But even if Minnesota Experimental City as such never gets built, the planning and research that has and is going into it will undoubtedly influence other projects.

Planning with energy at community scale.

1. Central energy generating and distribution facilities for electricity, process steam and hot water, plus waste management systems, including treatment and recycling.
2. Intense energy users: especially of process steam and hot water, which is distributed for space heating and cooling and as domestic hot water. All garbage and waste is centrally processed. The residents and businesses largely share solar collector and windmill facilities.
3. Intermediate consumers: use central electric facilities, but not any waste heat facilities; use garbage and waste systems, solar systems, windmills, composting and gardens, some on shared basis and others on individual basis.
4. Self-sufficient power consumers: may use central electrical power, but primarily use individual systems.



Sample conservation checklist

I. To make an existing building more efficient

1. Analyze the fuel and electrical bills in terms of consumption patterns and equipment needs.

2. Analyze the potential ways to conserve energy, given existing lifestyles and working patterns.

3. Use a computer program (Similar to one offered by the U.S. National Bureau of Standards) to establish an energy profile of the building—hour by hour, day by day, month by month, etc., separating the energy requirements of each building system.

4. Analyze where energy is going in the building and the relative effects of exposure, infiltration, ventilation, etc.

II. To make a new building more efficient

1. Reduce environmental requirements:

Maintain lower temperatures in winter, except in such special facilities as those for health care of the elderly.

Design for 95%, not 97.5% minimum standards.

Do not heat, cool or illuminate unoccupied spaces to the same degree as occupied spaces. Passages, lobbies and other non-work areas are included.

Provide lower level, but better quality illumination (with less glare and contrast) than current standards. Maintain lower levels in non-seeing task zones.

Limit the flow of cold and hot water at each tap in lavatories, showers and sinks.

Prepare energy/benefit, as well as cost/benefit analyses for all mechanical and electrical systems and for all building materials, such as insulation, windows, etc.

2. Make energy conservation integral to design and construction:

Reduce glazing to vision strips where extensive exterior views are not required.

Use double and triple glazing, heat-absorbing glass and reflecting glass on east and west exposures.

Insulate walls and ceilings to a U factor of .06 or less in cold climates.

Employ external solar control devices, such as fins, eyebrows, awnings, special blinds in double sash, movable louvers, trees, and site to take advantage of surrounding buildings for shade.

Use an operable sash where outdoor air quality permits and infiltration does not excessively raise heat loads.

Specify thicker walls and roofs so that mass can provide insulation and noise reduction qualities.

Build all or partially below grade and employ berms to reduce solar loads and transmission losses.

Consider multi-use panels that integrate thermal, acoustical, power and structural functions to reduce energy requirements and capital costs.

Use light-reflecting wall finishes.

Construct models and make wind-tunnel tests on all new buildings with objectionable emissions.

3. Refine calculations to prevent oversizing mechanical equipment:

Use computer programs for load calculations and for energy load profiles to prevent overdesign.

Make realistic heating and cooling calculations, taking advantage of lights, people and storage effects.

Do not use excessive safety factors.

4. Practice heat conservation in specifying heating, cooling and illumination systems:

Employ heat-recovery devices, i.e., thermal wheels, heat pipes and coil-to-coil transfer devices, to transfer energy from exhaust air to outdoor air, and within sections of the building, interior to perimeter.

Employ heat-of-light systems when light requirements are necessarily high anyway.

Use rejected heat of compression from refrigeration units for terminal reheat and for space heating or process.

Recover heat from solid and liquid waste disposal plants.

Use large heat pump systems.

Use electrical demand limiters with load-shedding devices.

Make wide use of Total Energy and energy storage systems.

5. Select efficient mechanical and electrical systems:

Use low-resistance filters, ducts (material and size), registers, grilles and coils to reduce air horsepower.

Avoid large supply fans with high static electric pressure power requirements—use separate air handlers and wet-media energy transmitters in central systems.

Avoid large terminal reheating systems and make more extensive use of variable volume. Avoid absorption refrigeration, except when using waste heat—use gas engine drive, centrifugal and reciprocating compressors.

Employ modular design on boilers, cooling towers, pumps, etc.

Provide sufficient zones of temperature control so areas are not overheated or overcooled.

Use more central HVAC systems to increase diversity and use more efficient large-scale equipment. Use district heating and cooling systems where available.

Use higher voltage distribution outside and inside buildings.

Install capacitors where necessary to correct power factor.

Use more sensitive and heat-anticipating temperature controls and computerized systems to avoid wide temperature swings.

Limit the kwh per Btu output for window units and all incremental units. In general, do not use window air conditioners.

6. Recycle water, sewage and solid wastes:

Pipe hot water discharge from kitchens, laundries and lavatories through heat exchangers to preheat service hot water.

Use effluent from the sewage system for irrigation and flushing purposes, reducing water requirements and sewage and water treatment plant requirements.

Recycle water within buildings, using "grey" water for flushing.

7. Locate buildings with high energy requirements near power plants and heat-generating waste-disposal systems to increase Total Energy efficiency.

8. Use building materials that require less energy to produce. For example, it takes six times more energy to produce a ton of aluminum than it does a ton of steel. However, it takes only 5% as much energy to produce recycled aluminum as it does virgin aluminum.

9. Avoid non-bio-degradable products.

10. Choose materials and components with long useful lives; obsolescence can no longer be tolerated.

11. Practice preventive maintenance:

Install a preventive maintenance program, using a detailed maintenance and operations manual prepared by the design engineers.

Use a data control center for maintenance and operation to indicate operating hours and conditions of filters, pumps and other equipment.

Instrument each mechanical, electrical and hydraulic system for both the maintenance program and to gather data of operating and energy costs. This can be valuable for future building designs, as well as for maintenance.

12. Operate and integrate building facilities and systems for maximum efficiency:

Precool buildings—start the system later and turn off cooling earlier.

III. To improve outlook

1. Provide incentives to the owners and designers of energy-conserving buildings and systems.

2. Create educational programs, and disseminate environmental data to the public, engineers, architects and maintenance personnel.

The AIA is like a smorgasbord. Once you've paid, you might as well eat everything.

1 Attend AIA's Architectural Training Laboratories to learn the bread-and-butter skills they didn't teach you in school. Specialists conduct 1 to 3 day sessions on marketing, land development, computers, financial management and dozens of other skills you need for staying alive in this profession.

2 Subscribe to the Review of Architectural Periodicals (RAP), a monthly series of audio tape cassettes chock full of practical data condensed from journals, news releases and other sources.

3 Enlist in some of the best group insurance plans in the country: comprehensive life, disability and accident coverage at rates much lower than those available to individuals or most firms.

Product Literature

ACRYLICS

Swedcast Division, Swedlow, Inc. has prepared folder including data sheets on their commercial acrylic sheet.
Reader Service Number 200.

BUILDING SYSTEMS

Scientific Construction Techniques introduces the Batimetal System in four-page pamphlet now available.
Reader Service Number 201.

CARPETING

Hercules Incorporated offers 24-page brochure providing performance characteristics, construction, installation, and specification information for Herculon® fiber.
Reader Service Number 202.

A unique lighting system in the Wool Bureau's Contract Carpet Center, designed to help specifiers in the selection of commercial carpet, is explained in color catalog now offered.
Reader Service Number 203.

CERAMIC TILE

An eight-page color brochure showing crystalline ceramic tile in both residential and non-residential applications has been issued by American Olean Tile Company.
Reader Service Number 204.

Summitville Tiles, Inc. announces the availability of its new decorator ceramic tiles—Summitstyles.
Reader Service Number 205.

CHALKBOARDS

A new brochure is being offered by the AllianceWall Corporation which contains a color chart of all the firm's standard chalkboard colors.
Reader Service Number 206.

CLADDING

Qasal cladding, a flat, integrally colored white panel composed of incombustible mineral fibers and cement, is announced by Champion International's U.S. Plywood Div.
Reader Service Number 207.

COATINGS

Pennwalt Corporation provides color brochures on Kynar 500® based coatings for metal-walled structures.
Reader Service Number 208.

DOORS

Amarlite, the architectural products division of Anaconda Aluminum, presents the new Safetyline concept of aluminum framed glass entrances in literature now available.
Reader Service Number 209.

DRAFTING EQUIPMENT

Stacor Corporation has available their current catalog and price list for drafting furniture and equipment.
Reader Service Number 210.

DRAWINGS

A booklet of drawing shortcuts designed specifically for architects is offered by Eastman Kodak Co.
Reader Service Number 211.

FENCING

An entirely new, 12-page color booklet, "Redwood Fences," is now available from the California Redwood Association.
Reader Service Number 212.

FIREPLACES

The latest built-in fireplace offerings are presented in color catalog available from The Majestic Company.
Reader Service Number 213.

FIRE PROTECTION

"Construction for Fire Protection," a newly revised 32-page American Plywood Association booklet, offers information on wood and plywood systems to meet code and insurance requirements.
Reader Service Number 214.

FLOORING

Acrylic/wood flooring is being used more extensively in offices and public areas because of its visual appeal and superior wearability, reports an ARCO Chemical Company study on the market applications for Perma-Grain® acrylic/wood flooring.
Reader Service Number 215.

GLASS

A comprehensive guide to architectural glass products for windows and doors is available from PPG Industries.
Reader Service Number 216.

HANDRAILING

Carlstadt acrylic/wood handrailing combines the natural beauty of fine hardwood with the hardness of reinforced plastic, explains a new brochure from Julius Blum & Co., Inc.
Reader Service Number 217.

HVAC SYSTEMS

The Electric Energy Association offers a 14-page pamphlet discussing design concepts for optimum energy use in HVAC systems.
Reader Service Number 218.

LIGHTING

Wide-Lite Corporation's new Elliptra III floodlight offers modernistic ellipsoid styling plus proven floodlight performance.
Reader Service Number 219.

PANELING

Application and specification data for flexible fire panel is given in a 10-page brochure recently issued by BASF.
Reader Service Number 220.

The new "Marlite Guide to Beautiful Interiors," which contains complete information on this versatile line of decorative hardboard paneling, now is available.
Reader Service Number 221.

ROOFING

The first designs on a long-range program aimed at developing basic new concepts in roof design are presented by Certain-Teed Products Corporation.
Reader Service Number 222.

SEATING

JG Furniture Co., Inc. has prepared a specifications catalog for their auditorium seating.
Reader Service Number 223.

SLIDE CALCULATORS

A handy slide calculator designed to assist in determining preliminary sizes of glulam beams is now available from the American Institute of Timber Construction.
Reader Service Number 224.

STANDARDS

Copper Development Association, Inc. offers a newly updated edition of their application data sheet giving standard designations for copper and copper alloys.
Reader Service Number 225.

The American National Standards Institute has prepared their 1973 catalog including prices for all available standards.
Reader Service Number 226.

SWIMMING POOLS

Chester Products, Inc. has recently released color brochure describing and showing installations of their all aluminum swimming pools.
Reader Service Number 227.

TENNIS COURTS

Beauguard® color coating systems for attractive all-weather tennis courts are detailed in literature now available from Maintenance, Inc.
Reader Service Number 228.

VINYL

The advantage of rigid vinyl as a low maintenance material for building products is discussed in a new 16-page illustrated bulletin from B.F. Goodrich Chemical Company.
Reader Service Number 229.

WALL COVERINGS

James Seeman Studios, Inc. has prepared sample book containing specification data for textured fabric-backed vinyl wall coverings.
Reader Service Number 230.

WALL SYSTEMS

U-Forms International, Inc. makes available information on a new structural wall system that cuts heating and cooling energy requirements while increasing investment return.
Reader Service Number 231.

A 12-page brochure containing specification, performance, and test data on Inryco wall systems is offered by Inland-Ryerson Construction Products Company.
Reader Service Number 232.

The Acordial-Group, Europe's largest wall manufacturer, offers color brochure on the Planacord mobile wall system with maximum sound insulation.
Reader Service Number 233.

WASHROOM EQUIPMENT

A toilet compartment catalog for 1973, including additions to their laminated plastic product line, has been released by Bobrick Washroom Equipment, Inc.
Reader Service Number 234.

WATER TREATMENT

A new line of low priced reverse osmosis water treatment plants are announced by Ajax International Corporation.
Reader Service Number 235.

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