THE ARCHITECTURAL FORUM / JUNE 1971

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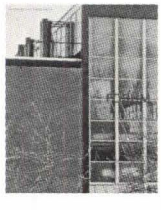
# THE ARCHITECTURAL FORUM / JUNE 1971





*Cover design: a photograph by Richard Nickel of the General Motors Technical Center (p. 21).*

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CUYAHOGA COMMUNITY COLLEGE, Cleveland, Ohio. Honor award winner in the 1970 Community and Junior College Design program. The complex was honored for "outstanding handling of a very limited site in an urban renewal area of the highly industrialized city of Cleveland." Architects: Outcalt-Rode-Kaplan-Curtis. General Contractor: Turner Construction Co. Twelve Dover Oildraulic and Electric elevators installed in seven buildings on the campus by Dover Elevator Co.

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DUKE NUCLEAR LABORATORY, Duke University, Durham, N. C. Cited as one of 16 outstanding examples of campus design for the 1970s by College & University Business magazine. The massive solidity of its design evokes a feeling of security appropriate to its function. Architect: A. G. Odell Jr. & Associates. General Contractor: F. N. Thompson, Inc. Dover Oildraulic elevator installed by Dover Elevator Co.

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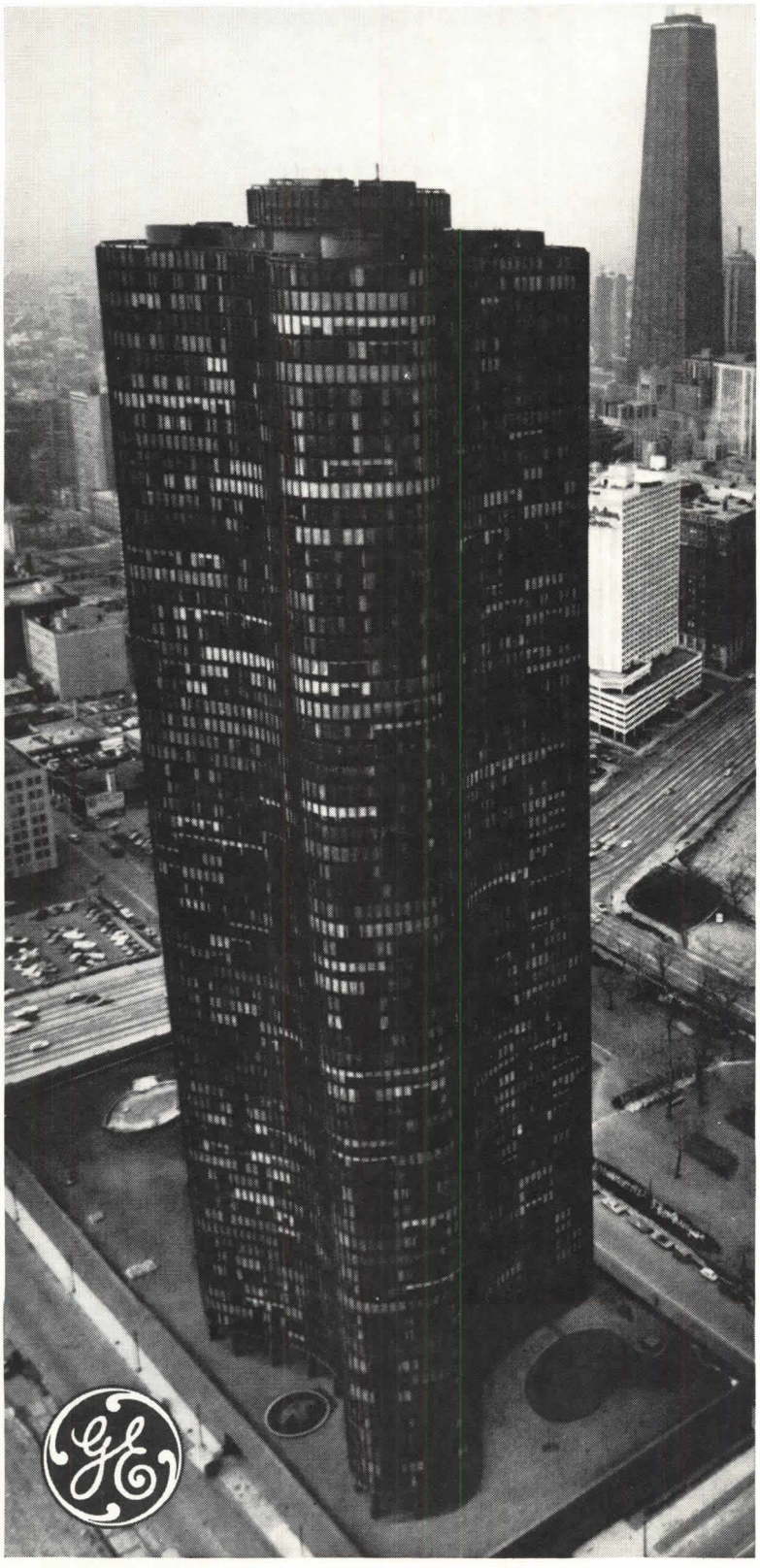

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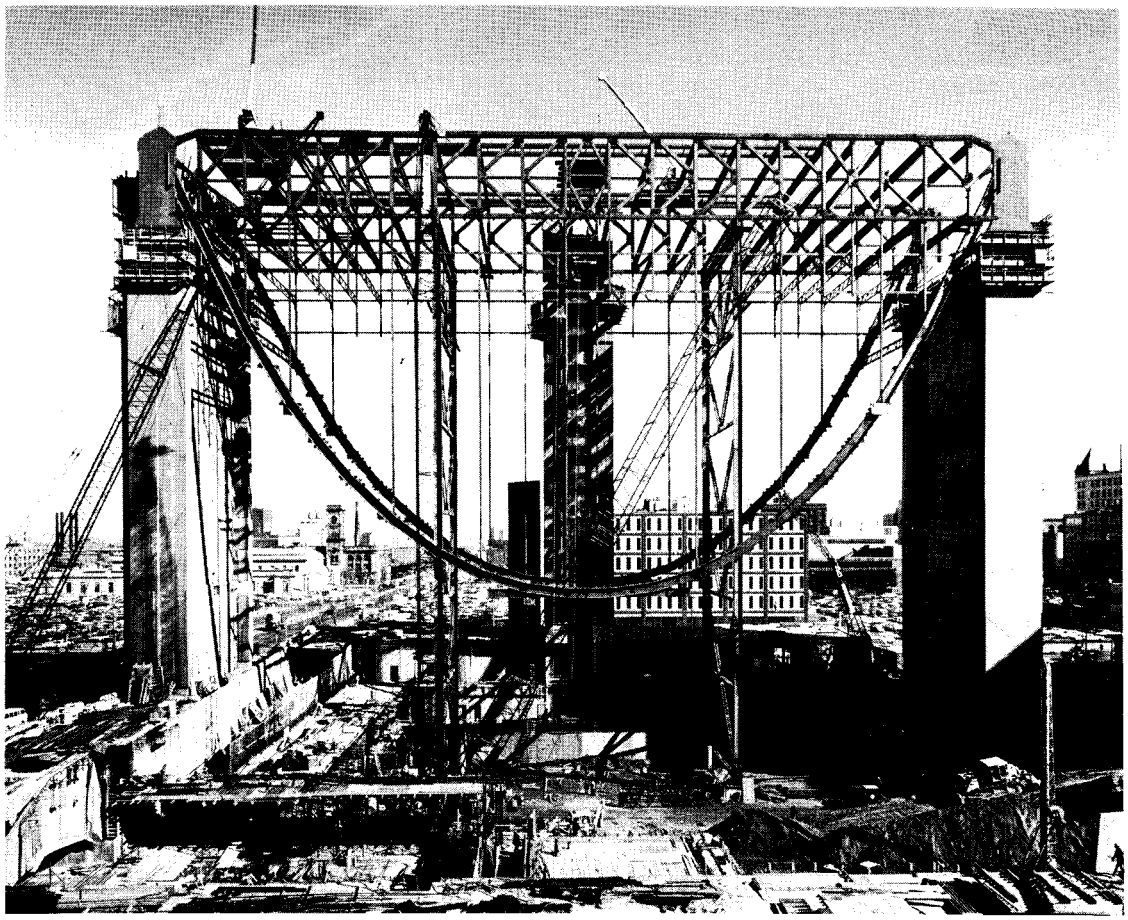
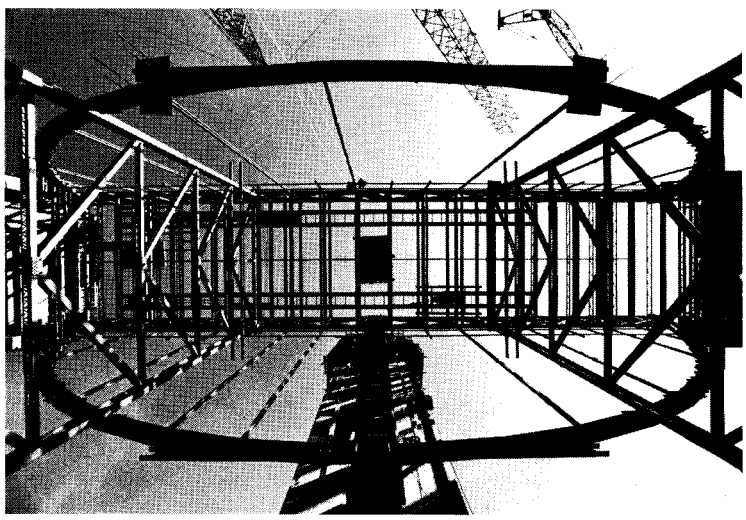
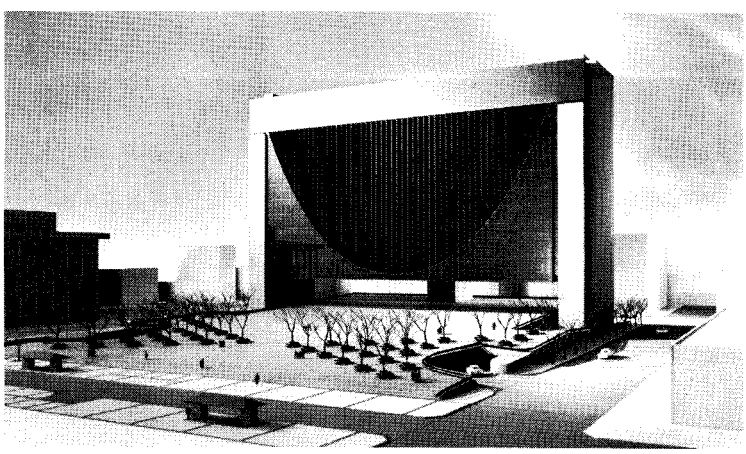
Lake Point Tower, Chicago
Developers: Hartnett-Shaw & Associates
Architects: Schipporeit-Heinrich, Inc.
Structural Engineer: William Schmidt & Associates
General Contractor: Crane Construction Company, Inc.
Mechanical Engineer: William Goodman

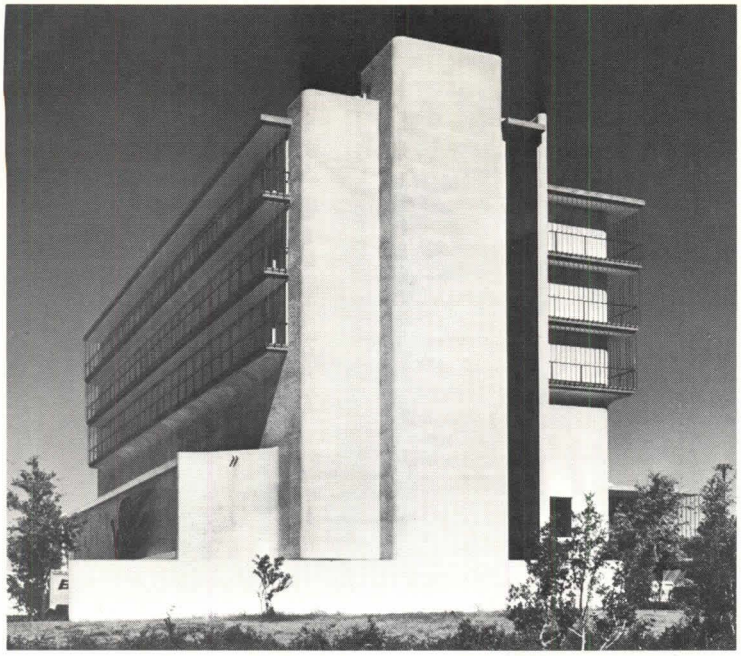


**BRIDGE FOR A BANK**

Construction of the Federal Reserve Bank in Minneapolis (Jan./Feb. '69 issue) is now well under way, with the hammock-like suspension frame and its supporting H-towers already completed. Designed by Architects Gunnar Birkerts & Associates, the unusual structure separates administrative and security operations of the bank and provides clear-span floor spaces of 60 ft. by 275 ft. (almost the width of the site) above and below grade. The braced catenary structural system, which uses the major facades as rigid frames, was designed by Engineers Skilling, Helle, Christiansen, Robertson. The plan calls for 11 stories of administrative office space to be suspended above a plaza; six stories may be added to the building by constructing an arch that will span between the tops of the two towers and transfer the weight of the additional floors to them. The granite-paved plaza will be landscaped and used by the community for concerts and other public gatherings. Beneath the plaza are two levels for security operations and vaults plus one level of parking and truck ramps.

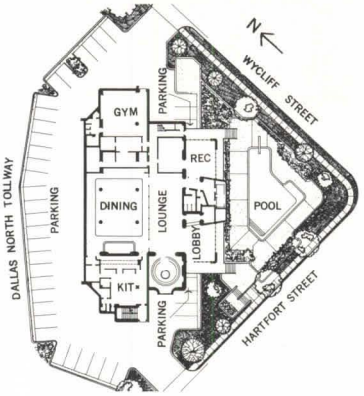






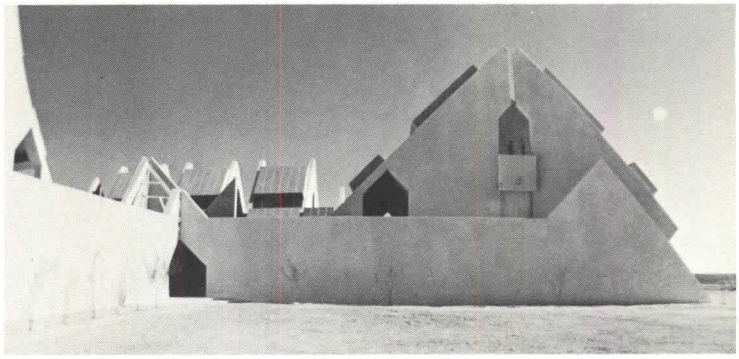
**HOSTESS HOME**

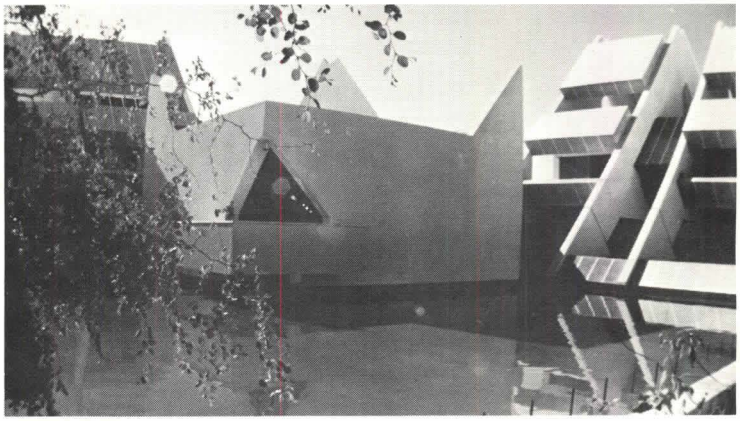
Located in Dallas, the Braniff International Hostess College is designed as a mini-community for 140 girls. Designed by Pierce, Lacey Partnership, with Braniff consultant Chuck Ax, the seven-story structure contains living and dining facilities, dormitory rooms, aircraft mock-ups for training, a beauty salon and a gym. Scattered throughout the interior are artifacts representing all parts of the Braniff route system.




**ISLAND ESTATE**

This "Winter Palace," now under construction in the Persian Gulf, is planned for a large family with children and governesses, plus lots of house guests (and a special wing for them). Located on an island with rocks and sand, but little shadow or water, the villa is built around an interior plaza that effects an oasis of shaded glass and concrete, with water that runs from the entrance to the court and exits by the sea. The island villa's architect: William Mileto, with the Interplan Group.



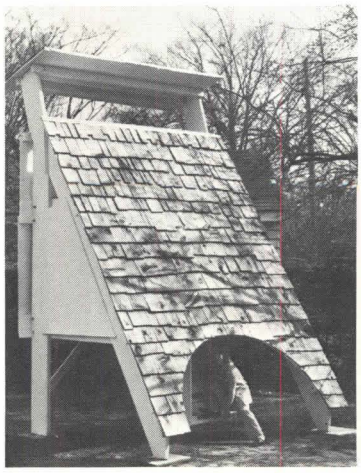


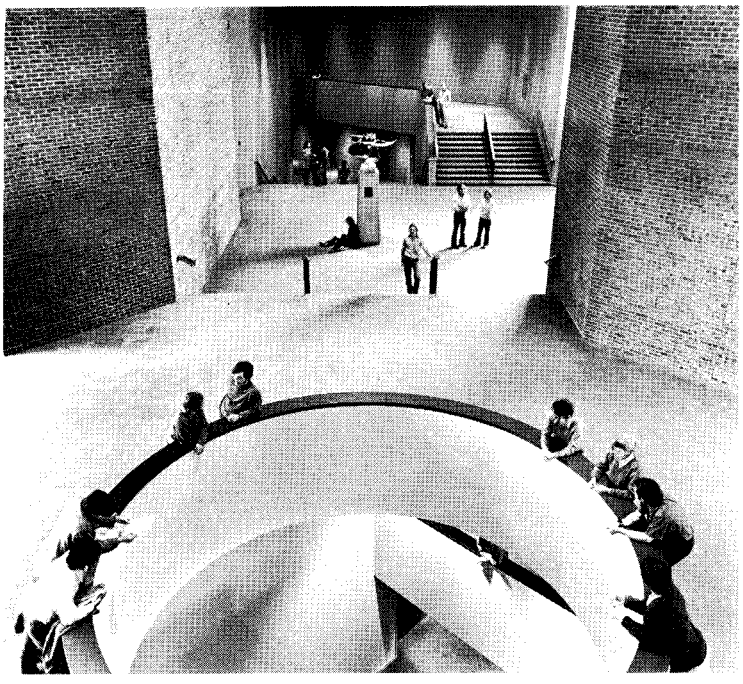
**LIBRARY LIKE A MUSHROOM**

Southern California's predilection for far-out design has come to the fore with completion of the new library for the University of California's San Diego campus. Designed by William L. Pereira Associates, the five-level spheroid rests on a colonnade of concrete columns and rises 100 ft. for a view of the countryside. The five main library floors are somewhat circular in plan and have carrels and study facilities for 1,250 students, plus stacks for 700,000 volumes. The two-story podium supporting the library is open, with the main administrative floor below.

**A-FRAME FOR FUN**

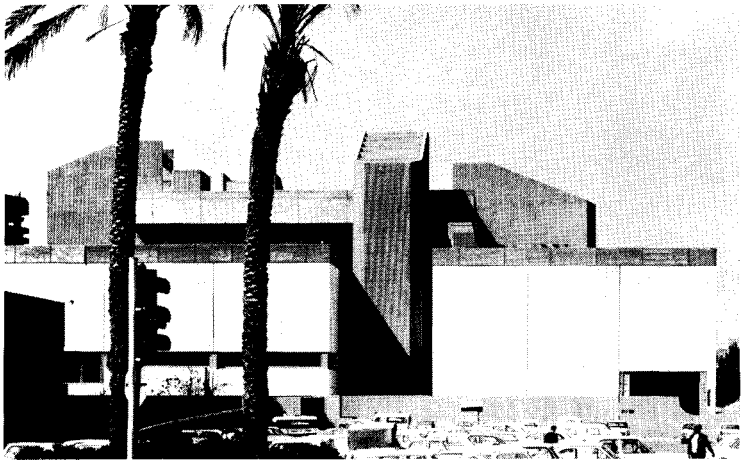
Designed for his daughter by John E. Lawrence (of the firm of F. Carter Williams), this playhouse is designed for fun and has a variety of spaces, views and lighting. The first level is a play area, which measures 4 ft. 6 in. by 7 ft. 5 in. and is reached through a ground-level semi-circular opening, stairs and a trap door. The second level is a lookout, accessible by a ladder. The house is white—a concession to conservative neighbors — but could easily be done in brightly colored panels, which was Lawrence's original plan. The structure of the house is reflected in penetrations of light at each plane junction. Circular openings form the entrance, windows and space below the handrail.





**FOR ART'S SAKE**

The Annenberg Center for Communications Arts and Sciences, designed by Vincent G. Kling & Partners, brings to the University of Pennsylvania three new theaters and supporting facilities (some underground) for film, speech and music. The theaters include a 900-seat proscenium auditorium, an open-space design for theater-in-the-round and other special presentations, and a small theater.



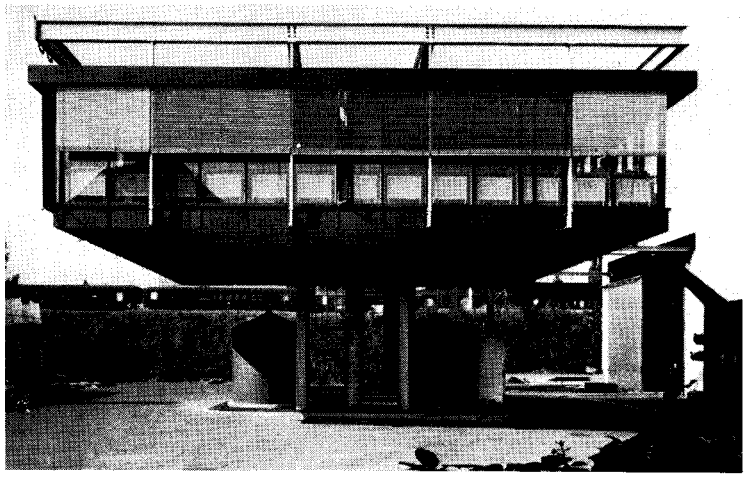
**ISRAELI ARTS**

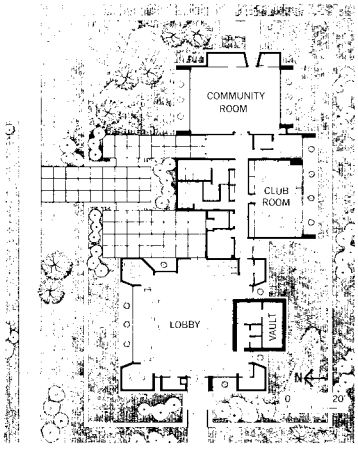
Four pavilions built around a central art library and a 30-ft.-high great hall comprise the newly completed Museum for Contemporary Arts, in Tel Aviv. Designed by competition-winning Israeli architects Itzhak Yashar and Dan Eitan, the center is a place where all kinds of art and artists can communicate, and includes a sculpture garden, 550-seat auditorium, a smaller lecture hall, and classrooms. There is underground parking for 300 cars. The building is only the first in a major cultural complex planned for the city.

PHOTOGRAPHS: Page 5 Balthazar Korab; Page 6 (lower left) and Page 7 (lower right) Wayne Thom; Page 7 (upper left) Lawrence S. Williams, Inc.; (upper left) **Werk** March 1971.

**AN OFFICE ON STILTS**

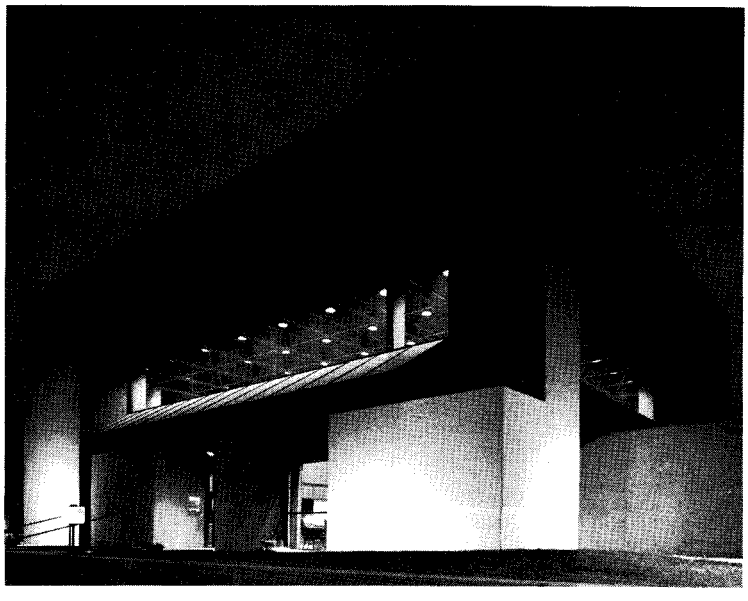
A new office building for the Hanggi Co., near Bern, Switzerland, is built like a tree. It stands on four steel columns at its core that support two sets of transverse trusses. Steel beams, attached to the ends of the trusses, form the perimeter of a 40-ft. square. The elevated office space hangs from these perimeter beams. The suspension system was chosen because factory site requirements dictated that the ground level be kept open; a staircase, two silos and the columns are the only ground structures. The plan includes a coatroom, lunchroom and one large office area. The architect for the project was Urs Hettich of Bern, in association with A. Zimmerman and J. Mauerhofer.






**BRANCH BANK**

The massive Orange, Calif., branch of the Western Federal Savings & Loan Bank is an exposed light steel space frame design with an integrated lighting system that spans the 60-ft.-square main banking area. The exterior walls are bush-hammered concrete, wood and terne. Cedar is used for the interior paneling, desks and teller counters. The building, which also contains space for community and employee facilities, was designed by Architects Dorman/Munselle Associates.



# BOOKS

**EQUIPOTENTIAL SPACE: FREEDOM IN ARCHITECTURE. By Dr. Renato Severino. Published by Praeger Publishers, Inc., New York. 153 pp. Illustrated. $12.50 cloth, $4.50 paperback.**

**REVIEWED BY MICHAEL BRILL**

I really hate this book. Which is unfortunate because a few years ago, at an A.I.A. Researchers Conference in Wisconsin, I was the critic/respondent to Professor Severino's work and I felt it was promising. What he presented then was an interesting concept for a physical building system. The book he's written is still about this building system, but is presented as a Manifesto of an incredible kind of architectural determinism . . . you know, if only the world adopted this system of building, Equipotential Space, *everything* would be all right. We'd be free! His last chapter is in fact called THE FORMS OF FREEDOM ON AN URBAN SCALE.

The book is schizoid. The text and pictures don't match. You riffle through the pages of nice drawings and photographs of the building system, with its Function Objects (bathrooms, kitchens, and bedrooms) and its Frame Components and you think it'll be a nice book about a well-designed, highly flexible industrialized building system. But no. The text talks about the emergence of a "mass culture" (questionable), the growth of technology (true), the lack of clear vision or image in our society (one clear vision?), and the desirability of one international standard for the quality of life (one standard?), and many other large scale philosophical and spiritual concerns. Professor Severino conjures up a Brave New World . . . to go alongside all the other utopian visions we are presented with in the Sunday supplements. The problem with these visions is that they are seldom accompanied by the concepts, techniques, and processes necessary to get us there from here. This book is no exception. It simply describes what's wrong and what would be "right" . . . And "right" turns out to be Equipotential Space.

How does the author equate the two? Through the text, which really says things like "together, architecture and technology can give us the means to solve the problems of the city, not only in functional terms but also in realizing new and more meaningful ways of living" and "technological products . . . provide a universal standard: All men relate to technology and, through it, to each other". Given these attitudes it is no wonder that the book sees solutions in terms of technological products and is replete with their pictures. The problems of our cities are seen as solvable utilizing Equipotential Space. Such thinking does not even begin to approach alienation and disillusionment, anomie, rootlessness, fear and existential dread. These are the problems of our cities.

I think it *is* possible to link the large scale philosophical concerns of our age to some designed environmental system to help solve some of our problems. But the development of spatial enclosures is only one subset of our Urban Systems and cannot alone solve problems. A comprehensive effort in all of our urban systems is necessary for any one of them to achieve success. If we have learned anything from the study of complex systems, it is that they are highly interactive in counter-intuitive ways —they don't act alone and not the way you think they will.

Further, the linking mechanism is not technology or industrialization, as the book maintains, but simply a change of vision, a shift of paradigm to one which is man-centered from one which is product centered. To relate environmental products to philosophy requires a systematic method of analysis not normally applied today. It should ask questions like "what do users need?" or "how can we create a supportive fit between human behavior and the performance of physical environments?" Severino asks something like how can we design products which can be industrialized? It's the wrong question. It promises no greater possibility of fit than we have now. Let me offer some examples from the book.

The physical system proposed is one which separates out the biologically linked or determined functions like sleeping, making love, body washing, excreting, food preparation, and places them in carefully designed, autonomous, minimal spaces called Function Objects which are movable throughout the space. The total volume is defined by Frame Components, normally a two-story volume. This means that those spaces in which man socializes, trades abstractions, acts out his life with others is really leftover space . . . the space left over from the deployment of the Function Objects. The critical spaces, our family life's stage, is a kind of spatial hash. Is this a response to users' needs?

We are proudly informed that "Function Objects can be designed and produced in any form —even a completely spherical one". We are then shown a spherical kitchen "adopting the diagrams of the most rapid and efficient use of utilities and storage space". You wouldn't believe the sections through the storage cabinets. Or that the refrigerator sticks out as a lump. Look, if you want a spherical form in your house, design one, but don't then attempt to justify it as the best form for the job. The spherical kitchen is really terrible. The author almost acknowledges it by saying "Other operable parts, hinged to the main structure of the object, can be conceived to make its service more efficient". Is this a response to users' needs?

The author's cost analysis of Equipotential Space projects the costs of electric boilers, washing machines, cars, bulk carriers, passenger ships and tankers on a per pound basis to come up with a probable cost. The problem here, of course, is that none of these are conceived of as long-term habitation, but are primarily for getting somewhere or washing clothes and dishes. Are there not user requirements which might affect this economic analysis? Or marketing problems? Or image problems? These are just not dealt with.

The book also states that "the present methods of reconstructing cities cannot be carried on any longer. The substitution of parts in old buildings becomes prohibitive, due to the necessity of reproducing them by hand". That is the same analysis that HUD has made. Both refuse to place any value on disrupting

(*continued on page* 12)

**Mr. Brill** is chairman of the department of architectural and urban systems, School of Architecture and Environmental Design, State University of New York at Buffalo.

Avco Financial Center, Newport Beach, California • Owner: Balboa Insurance Company
Architect: Welton Becket and Associates • Glazing Contractor: Golden State Glass Company, Los Angeles

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**Result: lower construction costs, lower cost of operation.**

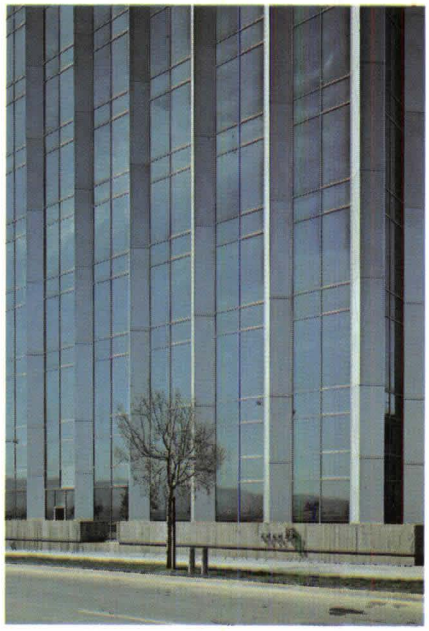
## How Vari-Tran reduced the cost per rentable square foot.

James A. Knowles and Associates, Consulting Mechanical Engineers, of Los Angeles, made a glass cost analysis of glazing this building with Thermopane® insulating glass with an outboard light of Vari-Tran 114 coating versus conventional ¼" Parallel-O-Grey® plate. They compared the glass in terms of heat loss and gain, initial glass costs, total building cost, effects on taxes and insurance, annual operating costs, etc. (See summary.)

## Vari-Tran justified on construction cost savings, alone.

The study definitely proved that Thermopane/Vari-Tran would save the owners money on initial and long-range investment. With Vari-Tran's superior heat-reflecting qualities, it was economically feasible to design an all-electric building, eliminating space requirements for boilers.

The reflective glass increased rentable area on the upper 15 stories due to smaller fan-coil machinery on each floor. The estimated rental area gained was 3% of total on these floors, representing rental income of $46,656 per year. The additional rental income, and owning and operating cost savings, total $66,478 per year. If this amount were capitalized at 10%, an initial investment of $664,780 could be justified.



The improved 'U' value of the double glazed glass had a significant effect on reducing the size — and cost — of the heat recovery cycle required by all-electric concept.

As to the aesthetics, the silvery Vari-Tran 114 blends with the aluminum exterior columns and the spandrels of Tuf-flex® tempered glass, also Vari-Tran coated. (Vari-Tran is available in golden as well as silvery coatings in light transmittances of 8, 14 and 20 percent. Each provides significant reduction in solar heat and glare.)

If you would like a computerized cost analysis of the glass wall of a building you're planning, contact your L-O-F Architectural Representative, or Architectural Dept., Libbey-Owens-Ford Company, Toledo, Ohio 43624.

## Here's what Vari-Tran, the glass that cuts building costs, will save.

### ECONOMIC GLASS COST ANALYSIS

by James A. Knowles and Associates, Los Angeles

A differential 'Annual Cost of Owning and Operating' between the larger capacity air conditioning plant required for the conventional heat absorbing glass as opposed to the plant capacity required by the Vari-Tran 114 is as follows:

**1. Additional Investment —**

| | |
|---|---|
| **A.** Added A.C. Machinery Cost | $56,300 |
| **B.** Larger Roof Machinery Space | $ 6,320 |
| **C.** Larger Gas, Electrical Services | $ 7,100 |
| Total Additional Investment | $69,720 |

**2. Additional Annual Owning Cost —**

| | |
|---|---|
| **A.** Amortization and Depreciation for 20 years at 10% (CRF-0.11746) | $ 8,200 |
| **B.** Taxes and Insurance | $ 3,140 |
| Total Added Annual Owning Cost | $11,340 |

**3. Additional Annual Operating Cost —**

| | |
|---|---|
| **A.** Preventive Maintenance | $ 719 |
| **B.** Repairs and Replacement | $ 992 |
| **C.** Gas, Water and Electricity | $ 6,771 |
| Total Added Annual Operating Cost | $ 8,482 |

**4. Summary —**

| | |
|---|---|
| **A.** Additional Annual Owning Cost | $11,340 |
| **B.** Additional Annual Operating Cost | $ 8,482 |
| Total Added Owning and Operating Cost for conventional heat absorbing glass | $19,822 |

**Hi-Performance Glass**
*The glass that cuts building costs*

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# BOOKS

(*continued from page* 8)

people's lives or maintaining socially stable places. Cost-Benefit analysis which cannot value social benefits is doomed to measuring only costs and therefore the only goal can be in reducing them. Is this a response to users' needs?

Further on, there is a sketch showing Equipotential Space and a normative apartment layout with (horrors) rooms. The caption speaks of "a dwelling-unit environment conceived as a continuous internal space as opposed to the traditional apartment layout made up of a labyrinth of rooms". So you shouldn't make any mistake as to which is the good one, the apartment is crossed out. Obviously, visual and acoustic privacy is one of the things which must be given up to achieve Equipotential Space. If you want to be alone, you've got to retreat to a Function Object to eat, shit, or sleep. Is this a response to users' needs?

On the positive side, the author does have a keen, even innovative grasp of some of the critical issues in industrialization. Technically it is a very sound book. The research conducted by the author and his students at Columbia is to be commended. The physical system seems well worked out, in many areas downright elegant.

In every review it is important to know where the reviewer stands. If this appears to be a negative review (and it is) it is not because I am opposed to the concept of systems and industrialization and utilization of "high tech" methods in Architecture. I am firmly committed to those concepts. This is not a cranky review of a technical concept by a reviewer who is a form-giver, worried about where all the creativity has gone. Rather, I am concerned that the concept of the application of systematic techniques to the problems of the built environment should not exclude the primary generator of built form—man's needs. Tools (like hammers and industrialization and computers) must respond to these needs and be subservient to them. This book claims that it does so, but its text and pictures refute this claim and would deny man (on again) the potential for a li lived with grace, surrounded systems responsive to his nee

**OTTO WAGNER 1841-1918, The panding City, The Beginning of M ern Architecture. By Heinz Gerets ger and Max Peintner. Published Praeger Publishers, New York, 19 276 pp., 294 illustrations, $25.00**

**Reviewed By EDGAR KAUFMANN,**

Wagner and the Vienna Sece sion which he fathered ha been extolled and exhibited i creasingly of late, most recent in London on an ample sca Rightly so: Otto Wagner po sessed one of the towering i tellects that directed mode architecture along its mo widely meaningful route — u banistic, technological, ration His work was solidly based in tradition established by Schin el's practice and doctrine; it l to the flowering of principl architecture exemplified by Mi and his international heritors.

All the more surprising that yet there is no adequate mon graph devoted to Wagner, not ing to equal the great new vo umes on Horta and Gaudi. T present book (passably tran lated from a German text 1964) is a superficial hotc potch. Pretentious padding a needless repetition frustrate a attempt to comprehend Wa ner's development. No compa sons are drawn between h and other progressive city pla ners and architects of his tim A foreword by Richard Neut and a few strong quotatio from Wagner are the best the printed matter. The illustr tions, coarsened when tak from earlier books and din when taken from photos of t '60s, are nevertheless intere ing. But they cannot reve much, yoked as they are to a bitrary categories that zigz through time. These sections the buildings and projects a preceded by a short biograp and a long expostulation, th followed by a chronology, not and a maddeningly agglutinat bibliography. Wagner who w rigorously lucid and considera could not have suffered a mo perverse fate.

**Mr. Kaufmann** is adjunct professor architecture at Columbia's School Architecture, and a lecturer a author.

*The fact that it* folds, stacks and hangs is incidental. Plia by Giancarlo Piretti. Produced by Castelli of Italy. Distribution solely by Krueger/Green Bay, Wisconsin. Chromium plated steel and Cellidor® in colors of: blue, rose, yellow, smoke, clear.

# PPG Solarban® Twindow® Glass

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### PPG: a Concern for the Future

Owner: Ohio Medical Products, a division of Air Reduction, Inc., Madison, Wis.

Project Engineers: Mead and Hunt, Inc., Madison, Wis.

Architect: Strang Partners, Inc., Madison, Wis.

PPG INDUSTRIES

# LETTERS

**TOO SOON**

Forum: Reporting on the Mummers Theater and others (Apr. '71 issue), you write: "It is a month later now and I have some embarrassing news; two out of those four theaters are on the brink of disaster." ". . . and Mack Scism's Mummers Theater in Oklahoma City is $462,000 in the hole and sinking rapidly."

This issue goes on to bemoan operational budgets, lack of architect interest in operational budgets, etc., etc. as being, possibly, a prime source of trouble relative to successful, ongoing building activity following construction. You ask for suggestions relative to this repetitive problem of seemingly exciting buildings somehow failing in the over-all picture.

I would like to suggest a different approach that might afford a more comprehensive method of evaluating the overall aspects of building projects and thereby more favorably preclude "follow-up embarrassing" statements. To wit: wait one or two years after building (or project) completion before presenting it in the Forum. By doing this, an evaluation could be presented that was not dominated by the "novelty" aspect, an aspect so continually and dreadfully perpetuated by all architectural magazines. The architectural publisher's obsession with "novelty" (new shapes, etc.) at the expense of many other basic (human and building) needs is one of the real trouble spots in our profession. You instigate, perpetuate and—ultimately—castigate "fads." Concomitantly, most of the professional publications, cynically and hypocritically, ascribe this notion of "the latest" to the architecturally uninformed laymen. Novelty seems to be a basic human need, but an overemphasis of this (or any) single concept can create a serious, skewed presentation. Atypically, your article "Center of Action" (Apr. '70) is an example of a review of a project after a passage of time. Granted, the review time element pertinent to this article was lengthy, but it is the "review after a period of time" that is germane to my suggestion for in-depth and subsequent meaningful and relevant presentations.

There may be a possibility that a lot of architecture isn't doing the job, even though it's the latest from a novelty standpoint.

ARTHUR K. OLSEN
*Salt Lake City, Utah* *Architect*

**OTHER PEOPLE**

Forum: I was amused at your "Changes at Yale" . . . "and MIT" blurb ("People," March '71 issue). I wonder if your editors know that there are changes at other schools also: all 84 of them (plus or minus) in this country.

I feel safe to assure you that many of your readers could care less that Charles W. Moore is no longer Yale Dean or that Moshe Safdie "will teach a special seminar in urban housing this Spring term."

W. GERALD GAST
*Design and Planning Consultant*
*Champaign, Ill.*

**LIFE STYLE**

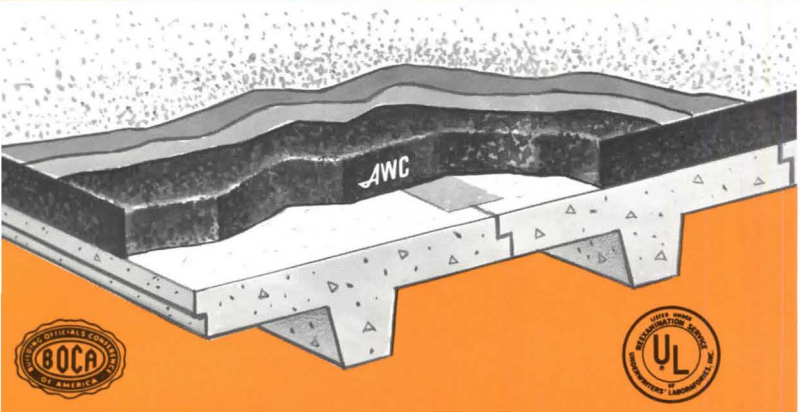
Forum: Your article "Something New in Barracks" (March issue) has some disappointing shortcomings. The article dealt only with the building, and completely neglected the program. Presently the Army is considering changes in its basic housing. The old *World War II* barracks are being partitioned to provide privacy, where funds are available. Where funds are not available, wall lockers are being positioned to provide a degree of privacy. The concept of providing the individual with some of the basic amenities he is accustomed to as a civilian has been completely left out of the article. Presently all the services are undergoing change. This is particularly true in the Navy which has some connections with the Coast Guard. However, the building is not designed for change, when change is at the crux of the problem of housing in the armed services.

PETER JOSEPH BROWN
*Alexandria, Va.*

**CREDIT DUE**

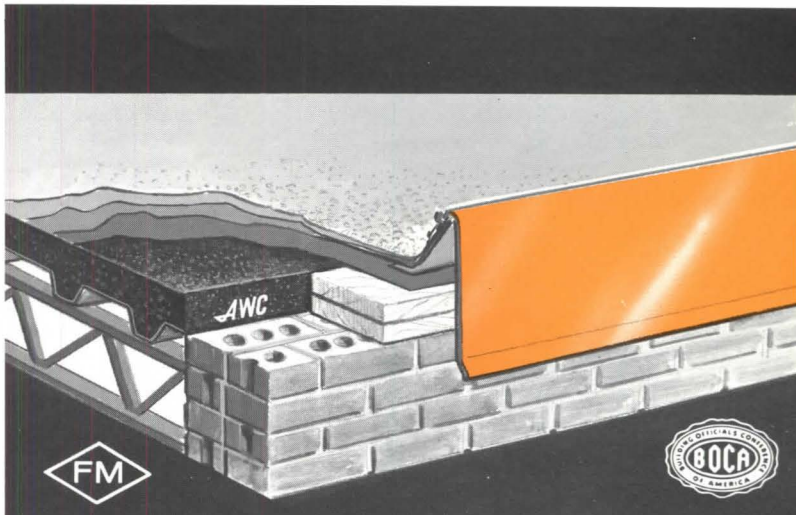
Re the technology article (Jan./Feb. '71 issue), the credits are in error. Perry Green should be listed as project architect for the hangar projects.

# Four typical insulation systems that demonstrate All-weather Crete's multi-functional capabilities.



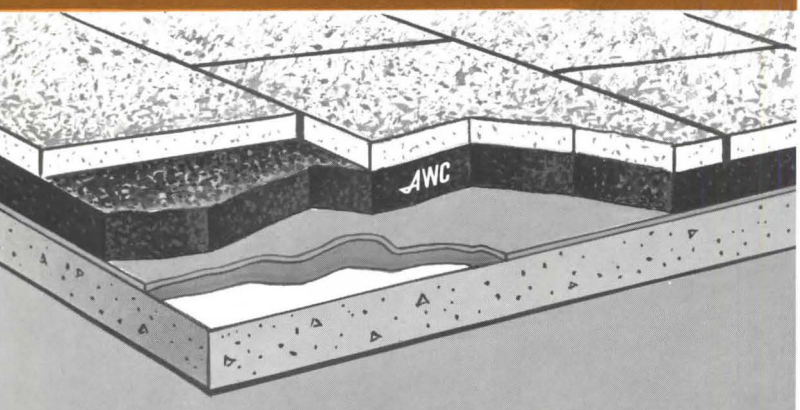

## 2 HOUR FIRE RATED ROOF DECK

All-weather Crete seamless insulation (K factor .40) is applied over pre-tensioned concrete units. U/L Design No. RC19. It can be sloped to drains, eliminates camber and uneven joints. This provides a smooth even surface for immediate conventional built-up roofing.



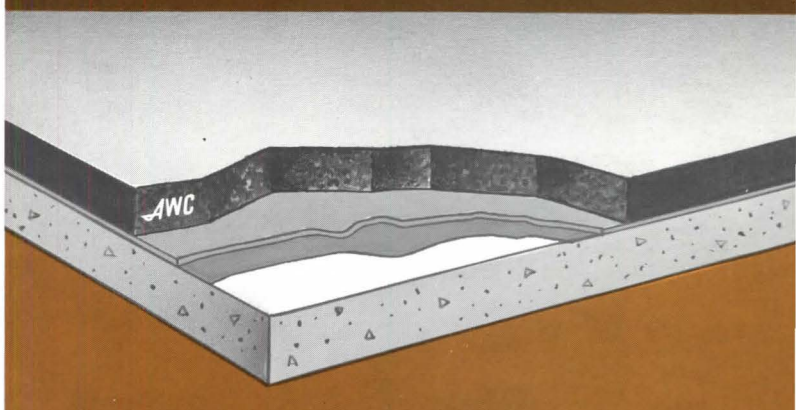

## CLASS 1 METAL DECK CONSTRUCTION

This tested roof deck insulation system meets Factory Mutual requirements for fire hazard and wind resistance. With special Silbrico adhesive, it is an approved U/L deck (No. 360 R 13.15) The Silbrico Fascia System shown above also meets Factory Mutual roof perimeter flashing requirements of Data Sheet 1-49 to resist wind uplift of 60/Lin. Ft. of wall. The perfect combination for maximum protection.




## PLAZA DECK

There are eight widely used All-weather Crete plaza systems. Not only does AWC provide the most effective available insulation, but it protects the water proofing membrane keeping it ductile and active for the life of the system.




## ROOF DECK OF THE FUTURE

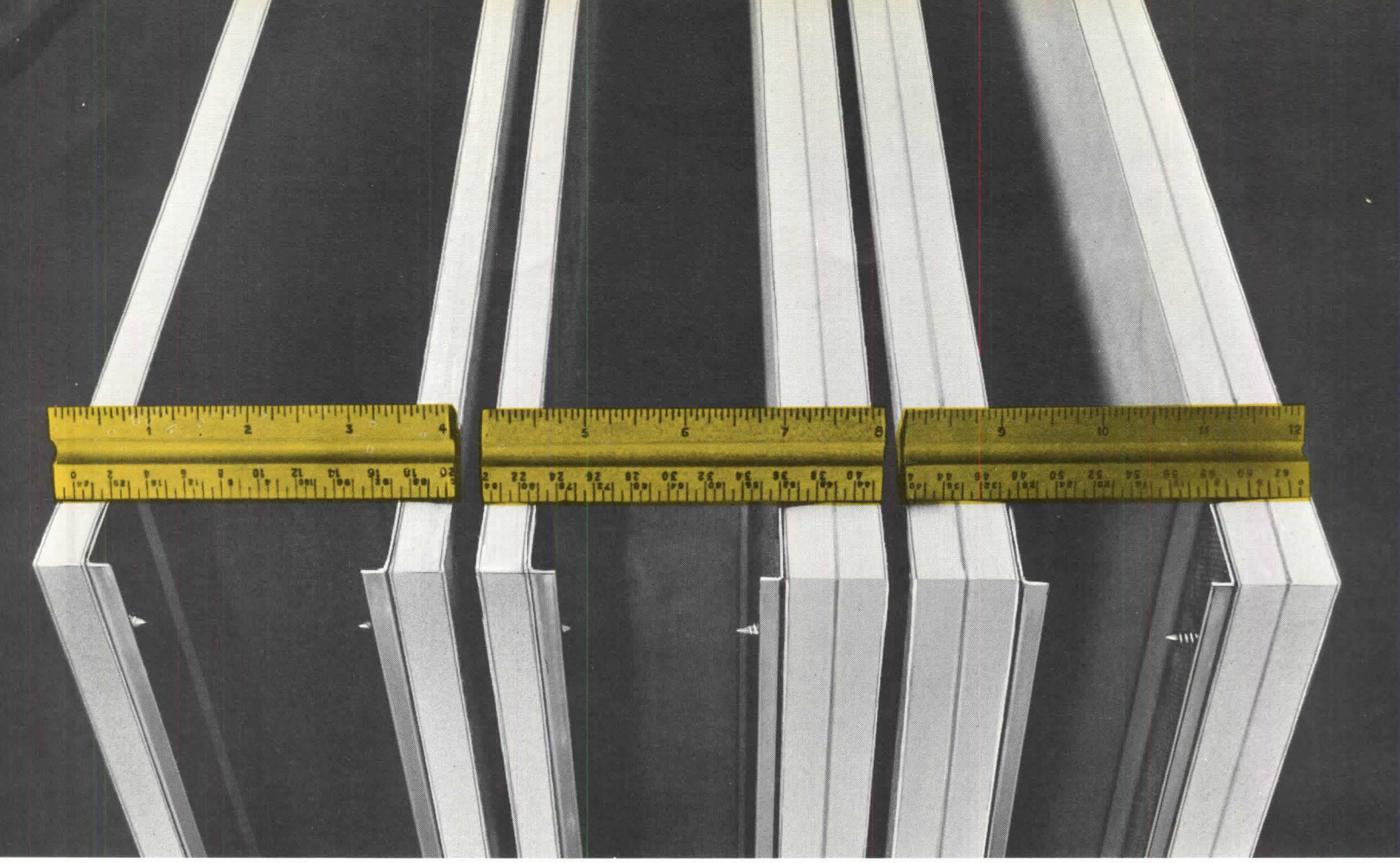
Over a decade of designing, testing and practical application have produced this new Silbrico system. All-weather Crete is placed over the water proofing membrane protecting it from severe thermal change and climatic elements which are the major causes of roof failure. All-weather Crete insulation has the properties of being unaffected by these severe conditions. Consult Silbrico Corporation regarding this new concept.

For complete information, specifications and detail diagrams regarding these and many other successful AWC systems, write Silbrico Corporation, 6300 River Road, Hodgkins, Illinois 60525. References: Sweets catalog and Spec Data.

SILBRICO

All-weather Crete®

On Readers Service Card, Circle 308



# SERIES "4" cuts your need to one 4-inch wall.

You can plan or build interior partitions with one system—the USG® Metal Stud Drywall Partition System. With one 4-inch out-to-out dimension and simple design, you fill a variety of requirements including 1-and-2-hour fire ratings. You specify the system with studs in three widths and single or multiple layers of ½" SHEETROCK* SW FIRECODE* "C" Gypsum Panels. You add THERMAFIBER* Sound Attenuation Blankets for higher sound ratings.

Lightweight SERIES "4" builds all non-load bearing interior walls, saves floor space. One throat size for all door frames. Openings in studs provide plumbing and electrical chaseways. SHEETROCK SW minimizes ridging and other joint imperfections. System speeds layout, materials handling and installation; cuts costs.

| PARTITION THICKNESS | STUD SIZE | ½" WALLBOARD LAYERS | 1½" SOUND BLANKET | FIRE RATING** | SOUND RATING STC | RELATIVE COST INDEX |
|---|---|---|---|---|---|---|
| 4" | 3" | 2 | — | — | 37 | 155 |
| 4" | 3" | 2 | Yes | 1 hr. | 43 | 155 |
| 4" | 2½" | 3 | — | — | 41 | 133 |
| 4" | 2½" | 3 | Yes | 1 hr. | 49 | 133 |
| 4" | 2" | 4 | — | 2 hr. | 45 | 173 |
| 4" | 2" | 4 | Yes | 2 hr. | 52 | 173 |

**Estimate based on engineering analysis of tested assemblies with similar construction.

½-in. gypsum panels are screw-attached in single or multiple layers to metal studs in three different widths, 24 in. o.c.; 1½-in. sound blanket may be added. Components specified depend on functional requirements of partition (see table). 4-in. thickness is maintained. Ask our Architect Service Man for details, or write us at 101 S. Wacker Dr., Chicago, Ill. 60606, Dept. AF-61.

**UNITED STATES GYPSUM**
*BUILDING AMERICA*

On Readers Service Card, Circle 309

U.S. Patent No. 3,435,582 for SHEETROCK SW Panels

# FORUM

On May 10th, Father Theodore Hesburgh (who is, among many other things, the Chairman of the U. S. Commission on Civil Rights) told a Washington audience that "the dinosaur finally opened one eye." Father Hesburgh's "dinosaur" is the Federal Government which, according to the Commission's earlier reports, had just about abandoned its efforts in the area of civil rights enforcement. Now, Father Hesburgh suggested, there was a faint glimmer of hope.

He may be right; but as we stand on the threshold of another hot and humid summer—in places like Newark and Detroit and Cleveland and the South Bronx—I am terribly afraid that "opening one eye" isn't really quite enough. The terrible summer riots in 1967 opened hundreds of millions of eyes to the horrors of U.S. ghetto life, and commissions convened and programs were initiated and resolutions were firmly resolved; and nothing much happened, except that hopes were raised and promptly dashed.

One of the key problems, of course, is housing—second only to jobs. The job situation in this impending summer of our maximum discontent—especially among blacks and other minorities (like, for example, architects)—is bleak indeed. The present administration, which decided long ago that the votes were in the suburbs and in the South, has all but decimated the timid programs it inherited from its predecessors to keep unemployed ghetto youngsters from running wild for want of having something better to do. So the unemployment rate in some of our most volatile urban areas will be 25 per cent and higher.

And housing: well, the present administration appears to be sitting on several hundred million dollars for housing and related programs that were voted and appropriated by the Congress—but which this administration refuses to spend because spending money on housing is supposedly inflationary —while spending billions on saving Lockheed, say, or Marshal Ky, is not.

Nobody knows what will be happening in Newark and elsewhere this summer, and one hopes and prays that that remarkable man, Mayor Kenneth Gibson, will be able to keep the lid on things for another year. In any event, perhaps the time has come for all of us, regardless of where we happen to live, to make it clear to this administration that there are people in this country (outside as well as inside our cities) who care very much about the survival of those cities, and the survival of those who inhabit them.

Because if we don't make it clear that we care, and that we will still be caring in November of 1972, our cities may not survive. And neither may the dinosaur. —PETER BLAKE

## COURTS

### NO REDRESS FOR THE POOR?

The Supreme Court has upheld the constitutionality of a California law that requires a majority of the voters in a community to approve all construction of Federally-assisted, low-rent public housing for the poor. Since "poor" was the key word, the majority opinion by Justice Hugo Black claimed that there was no evidence that the law was aimed at racial minorities, and that the thrust of the "equal protection" clause of the 14th Amendment, under which the case was being appealed, was to outlaw legal distinctions based on race.

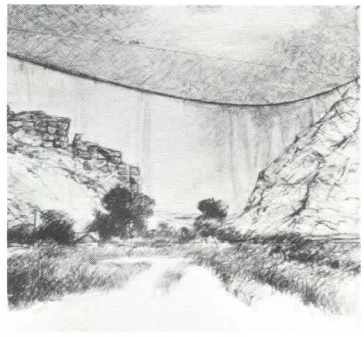
True enough as far as it goes, but the law, in fact, has prevented construction of about half the low-rent housing proposed for California in the last 20 years. Given the proportion of blacks, Chicanos and other racial minorities among those eligible for low-rent housing, the effect seems to be that state laws can create racially segregated communities even though they cannot be shown to be racially discriminatory in intent.

Exclusion of low-income developments by the suburbs is certain to be the main target of civil rights activity in the 70s. Clearly, the Court is not anxious to get on with it.

"It is far too late in the day," said Justice Thurgood Marshall's dissenting opinion, "to contend that the 14th Amendment prohibits only racial discrimination. . . . Singling out the poor to bear a burden not placed on any other class of citizens tramples the values that the 14th Amendment was designed to protect." Justices Brennan and Blackmun joined Marshall in the dissent.

## ARTS

### CULTURE GAP



*Hogback hanging*

The artist, Christo, master of packaged art, has formerly concentrated on wrapping up buildings—as at the Spoleto Festival (Jul./Aug. '68 issue, page 110). But on June 30, Christo will hang, from three steel cables, an 8,000 lb. curtain between two mountain slopes 1,250 ft. apart in the Grand Hogback area of the Colorado Rockies.


*Iolani package*

State Highway 325 through Rifle Gap, however, will be kept unobstructed by means of a 100-ft.-wide, 20-ft.-high arched opening in the curtain. Made of industrial nylon polyamide, dyed orange, the curtain will come down in mid-September.

The hanging is sponsored by the Museum of Fine Arts, Houston, and some 30 other museums, galleries and private collectors in Europe and the U. S.

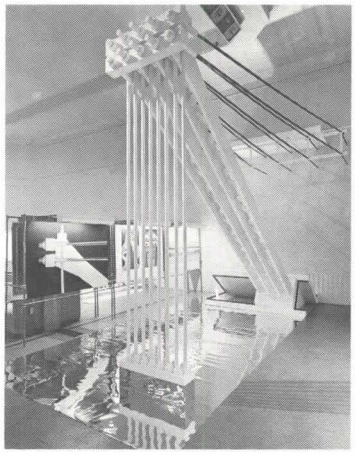
Meanwhile, we thought we knew a Christo original when we saw it recently in a publication of the National Trust for Historic Preservation. There was the Iolani Palace in Honolulu, wrapped in a festive candy-striped canvas. We were wrong. The packaged palace was sponsored by the Shell Chemical Co.'s American Heritage program, which donates insecticide for termite control of historic buildings. The artist: a local exterminator.

### WACHSMANN RETROSPECTIVE

The Graham Foundation for Advanced Studies in the Fine Arts is the principal sponsor of the first major exhibition of the works of Konrad Wachsmann in this country. It is entitled "50 Years of Life and Work Toward Industrialization of Building." The exhibition was conceived and handsomely mounted by the University of Southern California's department of architecture where it was shown in February and March. Wachsmann has been director of USC's Building Research Institute since 1964.

Nearly 80 panels, 4 ft. by 6 ft. in size, of enlarged photographs with accompanying text, are suspended in floor-standing, metal tube frames. Various other three-dimensional materials include scale models and a "Location Orientation Manipulator Machine," built by two doctoral candidates at USC—under Wachsmann's guidance—that performs motion studies in space and time.

Projects include the Mobilar structure—a cantilevered roof on four columns with removable, motorized wall-enclosure units; the General Panel prefab building system designed by Wachsmann and Walter Gropius in the 40s; a space-frame airplane hangar commissioned by the U.S. Air Force; various



*Wachsmann, cable structure*

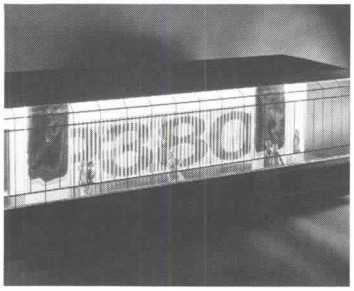
studies and student projects from USC and from Wachsmann's years at the Institute of Design at IIT; and a high-tension cable structure commissioned for the California City Civic Center (see photo).

The exhibition may be coming to New York City in the fall. Museums or colleges interested in exhibiting the show please contact Crombie Taylor, associate dean, Department of Architecture, USC, University Park, Los Angeles, Calif. 90007.

### ART AS IDENTITY GAME

The New York City firm of Propper/Elman, environmental designers and graphic artists, has designed a large "participatory" art work for an elementary school (P380) which will soon be built in Brooklyn.

*Op-art corridor*




Architects for the school are Richard Dattner & Assocs.

The Propper/Elman Op-Art/game is a ceramic and stainless steel "Identity Wall-Environment." The wall, 6 ft. 8 in. high and 32 ft. 8 in. long, will be located in the main corridor of the school.

Made of narrow vertical strips of ceramic tile set alternately at 90° angles to each other, the wall will spell out "P380," in eight vivid colors. As one approaches, the lettering is visible in four of the colors, different from each end; as he reaches the middle of the wall and views it straight on, the eight colors merge into an abstract pattern. Mirror-finished stainless steel columns and a strip along the ceiling will further intensify the changing aspect of the corridor. Propper/Elman hope it will instill in the child ". . . the sense that his own perspective changes [his environment], that his actions can have some effect on it."

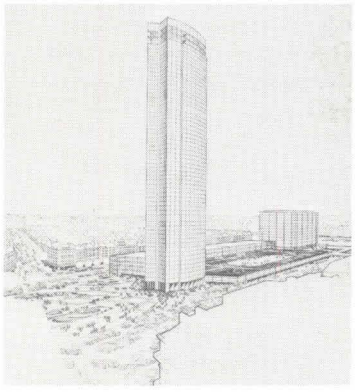
## PROJECTS

### AN AMERICAN IN PARIS

If you have not seen Paris, hurry. It may soon look like Sixth Ave.

"Tour Maine Montparnasse" may sound French, but it is American. It is to be an office skyscraper—Europe's highest at 700 ft.—with a bank on the

*Tour Maine Montparnasse*



ground floor and a fancy restaurant on the roof, an enclosed shopping center and an ice skating rink outdoors.

The tower's seven sub-basements are already complete and construction of the 58 above-ground floors is progressing at the rate of three per week. Of the eventual 53 office floors, 32 have already been sold on a condominium basis, mostly to insurance companies and pension funds.

"An immense financial success . . . far exceeding our profit expectations," begins the press release from the project's entrepreneur, who is an American. Wylie F. L. Tuttle, president of Collins, Tuttle and Co., Inc. of New York City, and his associate, Jean Claude Aaron, of la Societe d'Etudes Financieres et de Realisations Immobilieres, see the tower as a kind of Champs Elysee turned up on its end. We are told that the building's 3 million sq. ft. of office space exceeds the total now contained in all the office buildings along that great avenue.

A consortium of four architects called AOM (Anonymous of Montparnasse?) designed the complex, and two American companies are consultants—Chicago Architect A. Epstein & Sons and general contractor Diesel Construction Div. of Carl A. Morse, Inc.

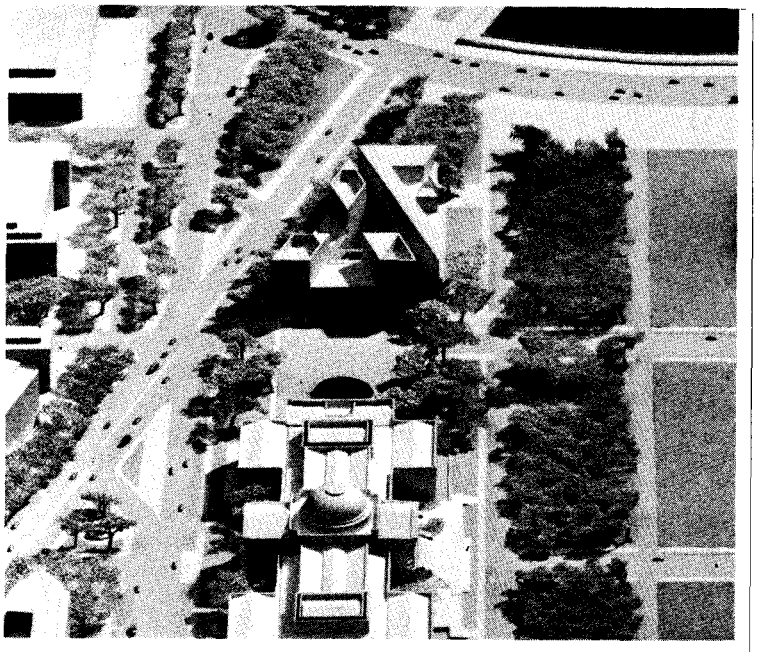
Parisian protests have been somewhat less vocal than when the project began. Perhaps in no small part due to inclusion in the plans of 120,000 sq. ft. for use as a social center by the people of the historic quarter.

### PEI ADDITION TO MALL

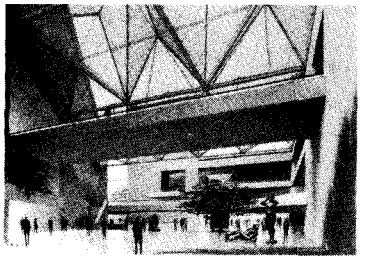
On May 6th, the National Gallery of Art held a ground-breaking ceremony for the new East Building designed by I. M. Pei, and linked, underground, to the stately 1937 structure designed by the equally stately John Russell Pope. Chief Justice Warren Burger and others officiated at the ceremonies.

Pei's East Building will, in fact, be two buildings: the first is a gallery complex, consisting of a large, triangular sculpture court topped with a glazed space-frame roof, and surrounded, more or less, by three distinct "house museums"; and the second is the new Center for Advanced Study in the Visual Arts, which will contain offices and study areas for selected scholars.

In scale, finishes, and general massing Pei's building will relate gracefully and respectfully to the original National Gallery and to the other, important structures on the east end of the Mall. Yet the design is, of course, in no way neo-classical;



*East Building in relation to National Gallery*



*East Building interior*

it reflects concern with the surrounding townscape as well as with its own identity and purpose. The two "wings"—the gallery and the center—are in effect separated by a street that bisects the building at an angle, and links the open spaces of the Mall to those at this end of Pennsylvania Avenue. The roughly trapezoidal plan of the building aligns its major facades with the directions of the Mall, of Pennsylvania Avenue, and of Fourth Street. In short, the design is a very subtle and sensitive answer to the difficult problem of fitting an entirely modern structure onto one of the most prominent remaining sites facing the Capitol.

# PRESERVATION

## ERASING AN ERA

Whether or not Amtrak will provide a renaissance or a requiem for rail travel in America, one thing is certain. It is hastening the demise of much of the great architecture that accompanied the rise of railroading in the last half of the 19th century.

As of last month, the B&O—barring last minute legal difficulties—planned to discontinue all passenger trains to Cumberland, Md., a major division point since 1842 linking Washington, D. C. with lines to Cincinnati and Chicago. Before these lines were extended west, Cumberland had been the western terminus of the C&O Canal as well.

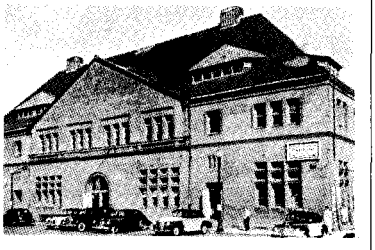
The whole story is told in the now shabby elegance of Cumberland's Queen City Hotel (1871-72), which stands virtually in the shadows of an elevated concrete freeway. Once the active social hub of a good part of the Potomac Valley, the Queen City served as both hotel and railroad station. The B&O maintained division offices and a ticket booth in the hotel until the end. It is scheduled for demolition.

The State of New York, meantime, will sell at auction the 70-year-old Union Station in Albany by the famous Boston firm of Shepley, Rutan & Coolidge. It was abandoned in 1959 by the New York Central, now a part of the bankrupt Penn Central. The offer to sell specifically permits the purchaser to demolish the building. Commissioner of General Services, Almerin C. O'Hara, regretted selling the state's "known historical and architectural heritage," but cited the tight fiscal situation and high cost of renovation.

*Queen City Hotel*

*Albany station*

*New London station*



Elsewhere, Robert P. Turk, director of the New London, Conn. Redevelopment Agency, calls "sheer academic nonsense" an 11th-hour campaign by architectural historians and preservationists to save H. H. Richardson's 1885 New London station. Henry - Russell Hitchcock, a Richardson authority, calls it the last and best of its type. Turk's urban renewal plan would demolish the station to provide a river view.

## DISAPPEARING ACT

Preservationists in Montpelier, Vermont, were very fond of the Pavilion Hotel (circa 1875). But the State Government, building a new state capitol complex nearby, simply could not leave the old High Victorian dowager in the condition she was.

The building could be renovated and restored to provide more office space for the State of Vermont—a principal tenant—for an estimated cost of from $2.7 to $3 million, a figure which would have doubled over the required 25-year lease period. (*continued on page 63*)

# GENERAL MOTORS REVISITED

**A special report by Charles Eames**

**The first phase of Eero Saarinen's plan for the General Motors Technical Center was completed in 1951, and subsequently published in this magazine.**
**This month, Charles Eames, one of Saarinen's closest friends, revisits GMTC.**
**His text is illustrated with Richard Nickel's photographs taken a few weeks ago.**

Twenty-five years ago, the electronic computer was just emerging as the tool we know today; the systematic problem-solving strategies developed in World War II were being reapplied in peacetime science and production; and — for these and other reasons—large-scale industry was beginning to shed its brute-force, Industrial Revolution image in favor of a more sophisticated and responsive one.

A major industrial company, for the first time, was setting out to build a campus-type complex of technical buildings whose high architectural quality was to express a promise about the company's role in the future.

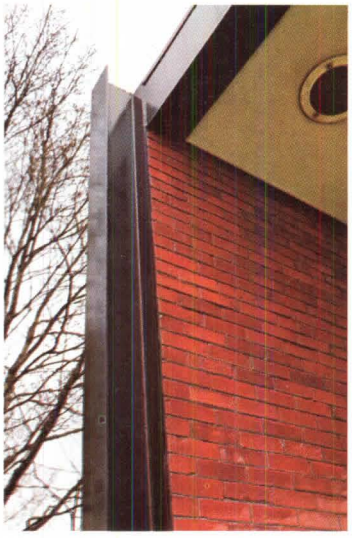
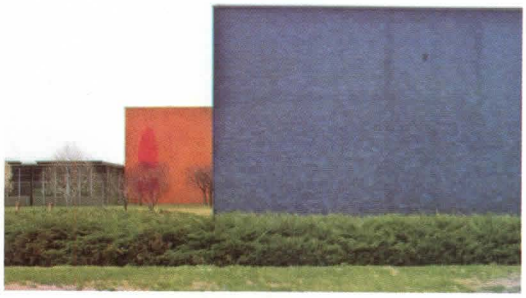
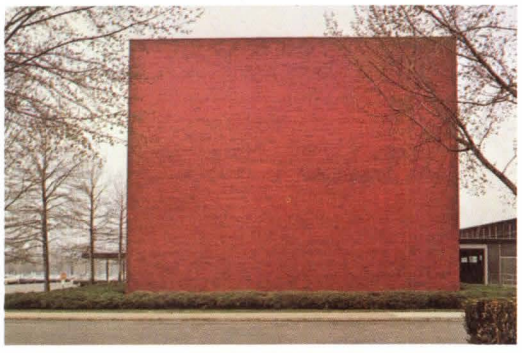
Alfred P. Sloane was Chairman of the Board, Charles Kettering was Director Emeritus of Research, and Harley Earle was Director of Styling, when General Motors commissioned Eliel Saarinen as architect of its Technical Center. Eliel, in association with his son Eero, did design a first version; but the second version—three years later—and its subsequent development were the work of Eero, with the critical support and stringent conscience of his father.

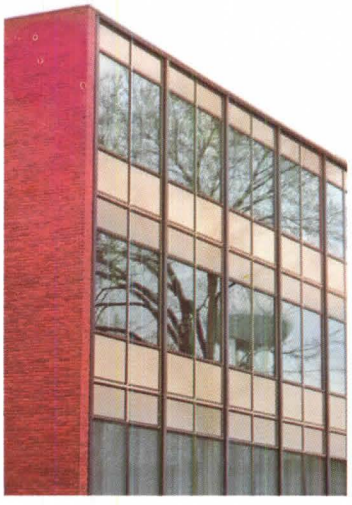
In the course of the General Motors job, Eero learned to smoke cigars, but he learned a great deal more besides. He had already a practical instinct for problem-solving methods of a kind which in a formal version would be called operations research. He had an intuitive grasp of the branching structure of alternative strategies; if instinct or evidence suggested, he wouldn't hesitate to go back down the tree and start along another route—keeping the effort invested up to that point only as background and experience.

Much of this can be traced back to the fact that he was perhaps the most natural architectural *competitor* that ever lived; he spent his childhood in an atmosphere of disciplined architectural competition, he was educated in competitions. He formalized his competition-winning methods to the point of inventing his own matrix schema, based on exhaustive lists of variables, which he would apply to decisions in all departments of life; the desire to carry off







the prize was giving way to a passion for finding the best of all possible solutions.

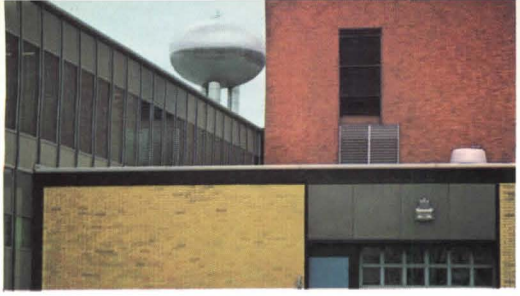
In this intense optimizing mode, Eero's interaction with a generous mix of systems-oriented engineers produced a remarkable architectural result, and had a lasting effect on the work of the Saarinen office.

Industrial research vocabulary and procedures accorded in many ways with Eero's fondness for testing by models, both abstract and concrete; innovative building elements were tested at full scale, in real conditions, over time. Energy and experience from each stage of construction were fed back to the successive ones, to upgrade the details and materials. Surface finishes were changed and changed again; aluminum glazing strips gave way to precisely detailed neoprene gaskets, as the same new techniques were incorporated in GM's assembly lines. From the beginning, the 5′ grid governed not only the plan and structure but the mechanical services, lighting and movable fittings as well; the

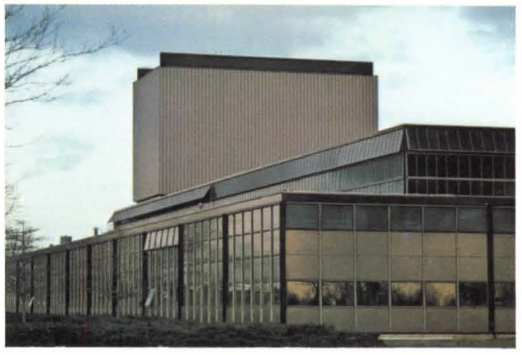
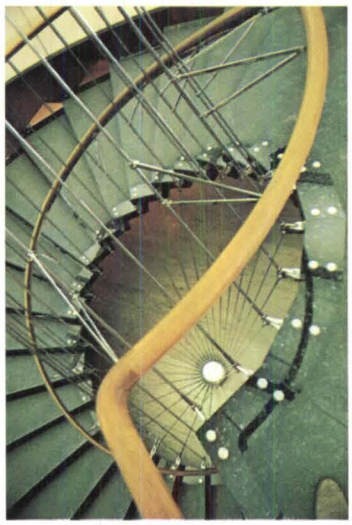
modular principle, so often taken only as an esthetic guideline, was applied with unprecedented operational thoroughness.

By the time the center was completed, Eero had become a master of the feedback principle; he had found confirmation of his natural commitment to systems, but he didn't narrow it to technical applications. He retained from then on the capacity to sit down and really communicate with engineers and businessmen.

In the work that followed, Eero intensified his pursuit of the concept and the structure peculiarly appropriate to each particular problem. It is this consistent attitude that gives continuity to Eero's architecture; each building is in effect a model of the particular problem it seeks to answer. Both Kevin Roche and John Dinkeloo joined the Saarinen office just at the time that the first of the GM buildings was going into construction. They have succeeded in carrying on this continuity—perhaps because it is a legacy of concept and procedure, rather than of form.





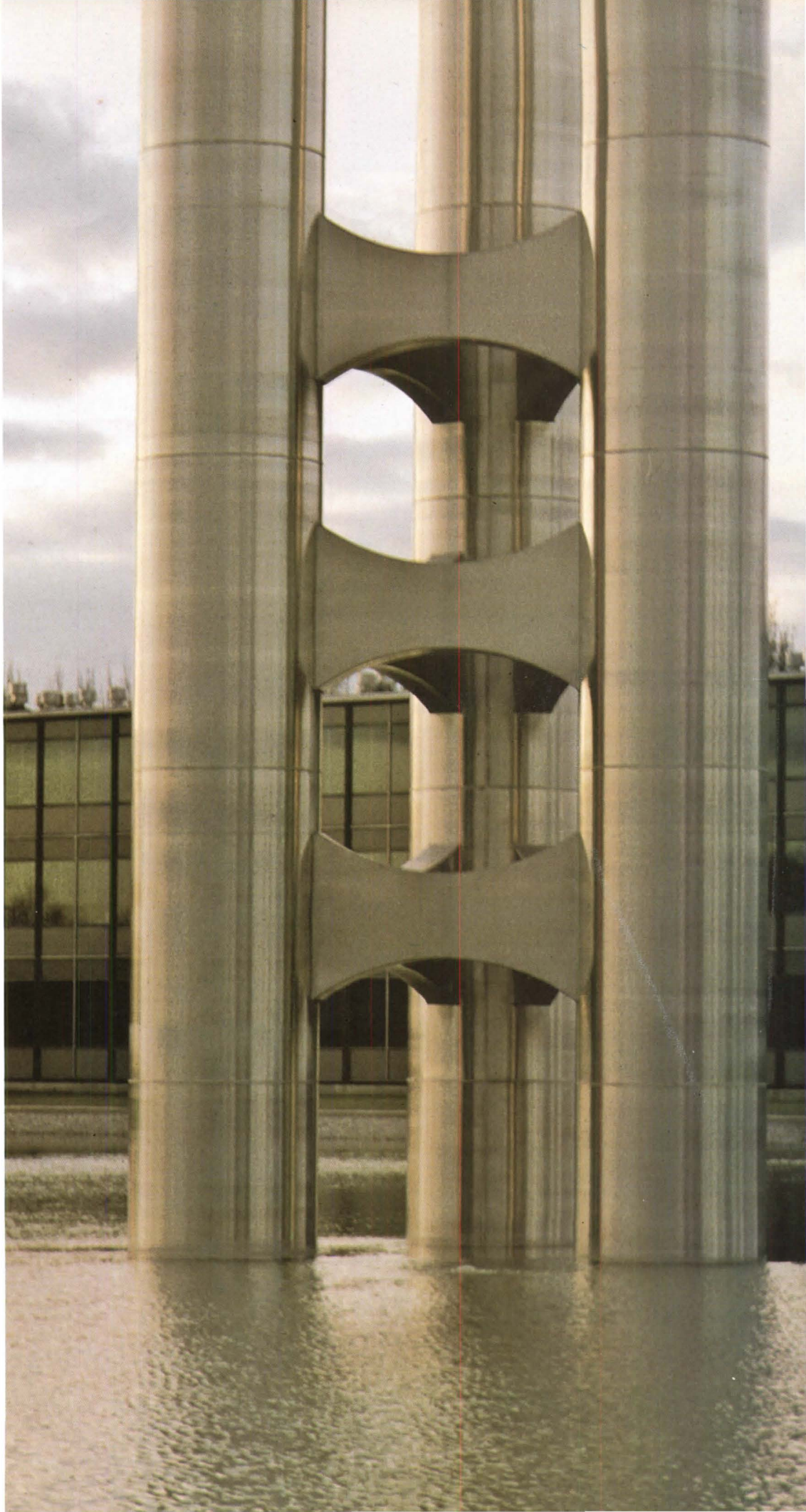



If you consider the buildings together—

| | |
|---|---|
| GM Technical Center | Bell Telephone Laboratories |
| Kresge Auditorium at M.I.T. | C.B.S. Building |
| St. Louis Gateway Arch | Oakland Museum |
| TWA Terminal | Ford Foundation |
| Dulles Airport | Knights of Columbus |
| John Deere & Co. Center | New Haven Coliseum |

—what they have in common becomes apparent. Each building is a model of its special problem; and Eero's "shortcut" to the model was simply that he put more energy and time into clarifying the unique nature of each problem than anyone else had even thought of doing. And the process was remarkably free from preconceptions; he was always open to new concepts, yet constantly on guard to protect existing concepts from erosion.

It isn't an approach that makes the practice of architecture any easier; but in a time when the latitude of choice threatens to overwhelm us, it seems to be our best bet for improving the state of things.



# SIBYL MOHOLY-NAGY

as our readers know, died on January 8th of this year. We have asked Paul Rudolph, who was one of her closest friends, to write some words in Sibyl's memory.

Sibyl Moholy-Nagy seemed so indestructible with her well-nurtured passions and prejudices, devotion to work, organizational ability, and outpouring of energy. These characteristics were often transmuted so that passions and prejudices became a vehicle for growth for everyone who came in contact with her, since they always demanded a reaction, and served as a measure for one's own idiosyncrasies.

Her devotion to work resulted at mid-century in an outpouring of books, lectures, essays, and commentary which is possibly unequalled in the architectural world, even though she had no formal training as an architectural historian or critic.

Her organizational ability and insights helped to hold together more than one institution, sparked fruitful alliances between unlikely types, and established sensible priorities for many.

Her outpouring of energy to the very end allowed her to research, to travel, to investigate worlds beyond the consciousness of most of us, to search for inter-connections, and to pursue an idea long beyond the point that everyone else had given up. Simone de Beauvoir's statement "There is no happiness without work" was true for her. In spite of her rather hard life she never lost the love for living.

These characteristics often made her contradictory. She could be imperiously impatient, but touchingly vulnerable; passionately obstinate, but ruthlessly objective; exhaustive in her research, but conveying her unique feelings, which rendered her critics defenseless.

The transformation for me of Sibyl Moholy-Nagy from a "formidable lady" to the most lively of friends began in the late 1950s. Our paths crossed many times and my respect and admiration steadily grew. It was Philip Johnson who pointed out that she was an extremely different person when you were lucky enough to be with her alone. If there was more than one person in her presence then the "show girl", which she had been in her late teens, came to the fore. She felt it her responsibility to entertain, to dazzle, to be the catalyst, to be outrageous, to be the center, to attack, to prod, to try out new theories, to regale her audience with her impressions of the famous and near famous. Proust, reflecting on the qualities which marked a very great actress like Sarah Bernhardt, noted how the supreme actress could make mediocre plays seem like masterpieces of theatricality. In fact, lesser plays gave the great actress free range to express her own magic and dominate audiences with her sheer power and magnetism, whereas master works demanded submission to the role and to the art which transcended her personality. These situations were usually rewarding, but she was even more exciting when one was alone with her. Then there was a true exchange of ideas, and her ability to look at many subjects from an original point of view came clearly into focus.

She could be exasperating in her criticisms and comments, but could also be very positive. She was particularly sensitive to students and her splendid relationship to them testifies to her compassion.

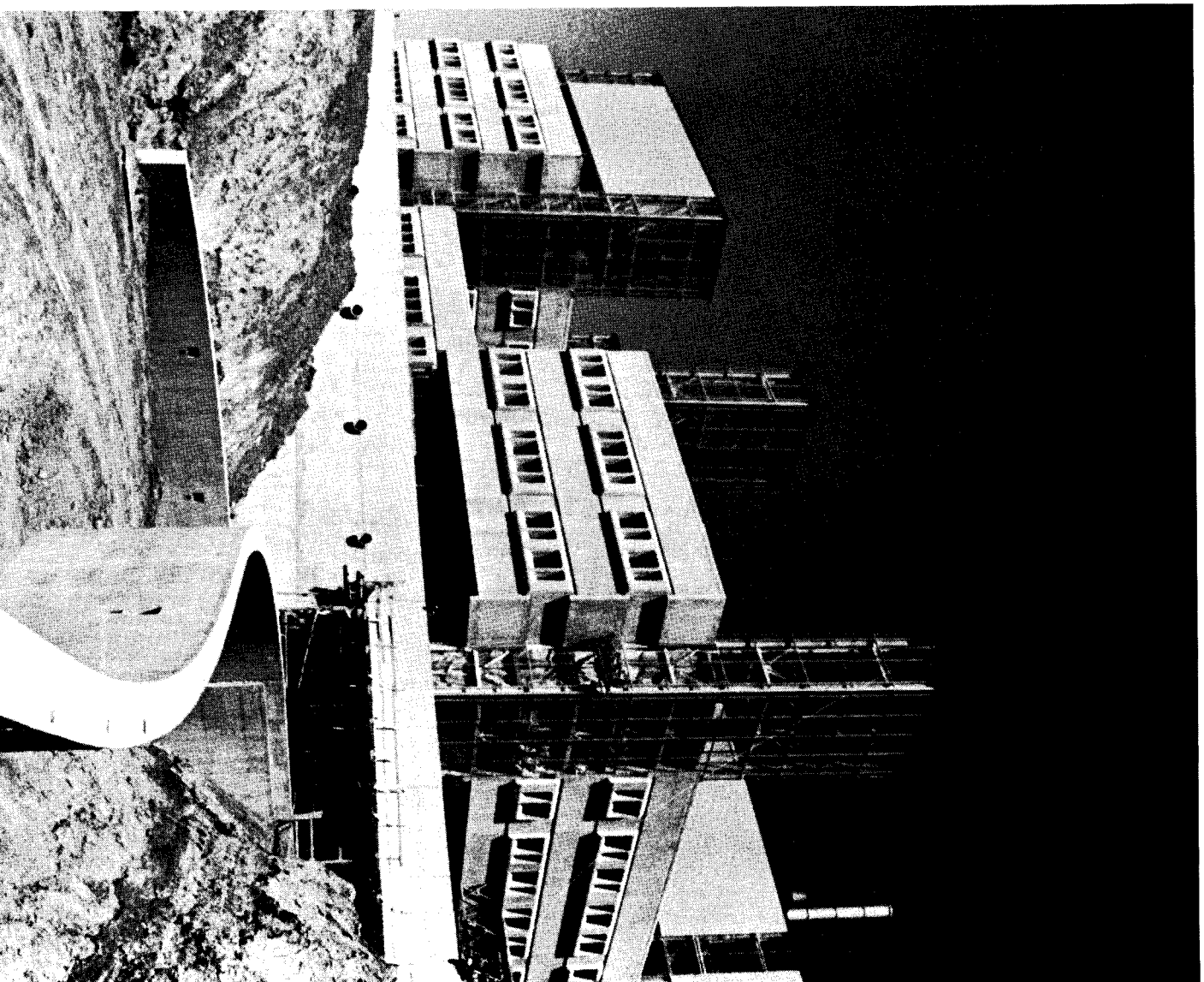
Her enthusiasm for architecture as an art grew with the years and she focused in the most stimulating and exciting manner on this aspect of her all-consuming passion. Her enthusiasm was then at its peak. When viewing a proposal for a new project she managed to put her finger on the essence of a given scheme, to sense the untrue, to make helpful suggestions without destroying, or damaging, human relationships. She grew and grew in her understanding of the creative process. There is no one to take her place.

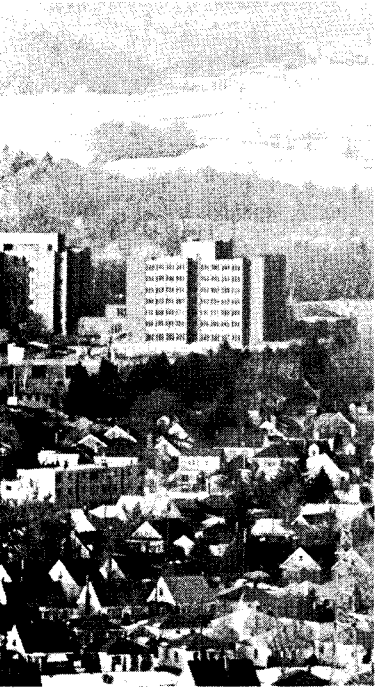
Her students loved her, partially because she demanded their best, but also because they sensed that all her life Sibyl Moholy-Nagy grew, becoming ever more aware, ever more committed and passionate in her prejudices, giving of herself to students, friends and, above all, to architecture.

—Architecture has lost a key figure.

# HEALTH FACILITIES

An 18-page portfolio of new buildings and concepts for patient care, medical training, and research





# HAMILTON, ONTARIO

## McMaster University Health Sciences Centre will house teaching, research, and patient care in a structural-mechanical superframe

A prototype for the future of architecture may be taking shape on the quiet campus of Canada's McMaster University.

The salient characteristics of McMaster's Health Sciences Centre are apparent even as you approach the campus. From the moment the service towers appear in the distance—evenly spaced and varied in detail—it is clear that you are seeing a regular spatial matrix with a variety of infilling elements. After examining the building, you come away convinced that Architects Craig, Zeidler & Strong have produced the most thorough-going demonstration of the plug-in vision yet seen in the real world.

The first phase of the Centre, nearing completion, will have 1,335,433 sq. ft. of usable space, but it looks even larger. Its scale is expanded by the four mechanical floors — "interstitial spaces" 8 ft. 6 in. deep—between its four occupied floors. And the 73-ft. floor spans between the glass-enclosed structural-mechanical towers are boldly expressed in the exterior walls. Looming above the roof, vast boxes of air-handling equipment bridge between towers.

The existing campus is somewhat dwarfed by its new offspring. This might be a serious conflict if the campus were not already dominated by Precast Gothic curtain walls facing oversized open spaces.

All the diverse functions of the Health Sciences Centre are housed in the same kind of long-span bays, and could literally switch positions within the building. The columns of the steel structural frame are actually hollow shafts, 10 ft. 6 in. by 21 ft., usable for either mechanical risers or emergency stairs. The floor trusses, 8 ft. 6 in. deep, have a clear span of 73 ft. 6 in. between shafts (making the center-to-center bay dimensions 84 ft. by 94 ft. 6 in.).

This concept of long-span, interchangeable space was adopted to allow for unpredictable changes in the Centre's program—both in the long range and in the four-year period of design and construction. Not only may new activities be added, while others wither away, but expansion to more than double the initial size may call for reshuffling of functions.

The overriding goal of the design was *retention* of as much as possible of the initial investment after any kind of change. The architects' studies of change in existing medical centers (conversion of obsolete nursing units or oversized central kitchens to other uses, for instance) showed that only 10 per cent of original building investment was usually retained. The re-use of space in such instances is little more than an illusion; in effect the building is thrown away.

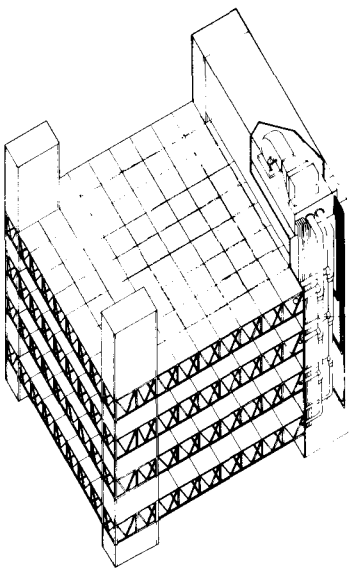
A structural frame adaptable to all purposes can raise this "retention factor" somewhat, but structure accounts for only about 15 per cent of the cost of such buildings. The mechanical system, which accounts for 30 per cent of building cost (and is often completely scrapped), must somehow be made re-usable as well. The architects did this by dividing the mechanical system here into two distinct parts: permanent installations (primary air-handling units, etc.), which can remain in use no matter what changes are made, and non-permanent components, which can be relocated as needed at little cost. Architect E. H. Zeidler estimates—taking into account wall and ceiling systems and other re-usable components —that 60 per cent of the value of this building could be retained in even the most radical rearrangement of functions.

Of course, the interstitial mechanical spaces were a critical part of the concept—making it possible to shift mechanical equipment without interrupting activities on occupied floors. It was also essential to remove mechanical *risers* from usable spaces — concentrating them in accessible shafts—so that working spaces could be laid out efficiently and rearranged easily.

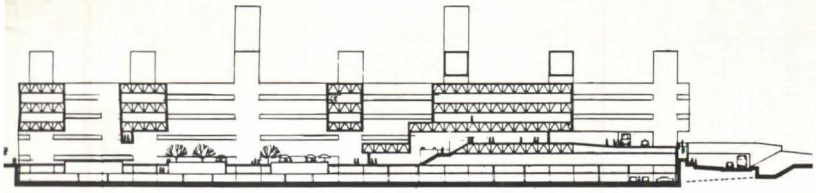
### Decentralized education

The unconventional teaching program at McMaster was a major influence on the design. The medical students will be exposed, from practically the first day of their training, to actual health care functions. Small groups of students will be assigned to staff instructors, most of whom will divide their own time between patient care and research. Even therapists and administrators will be assigned students in their fields.

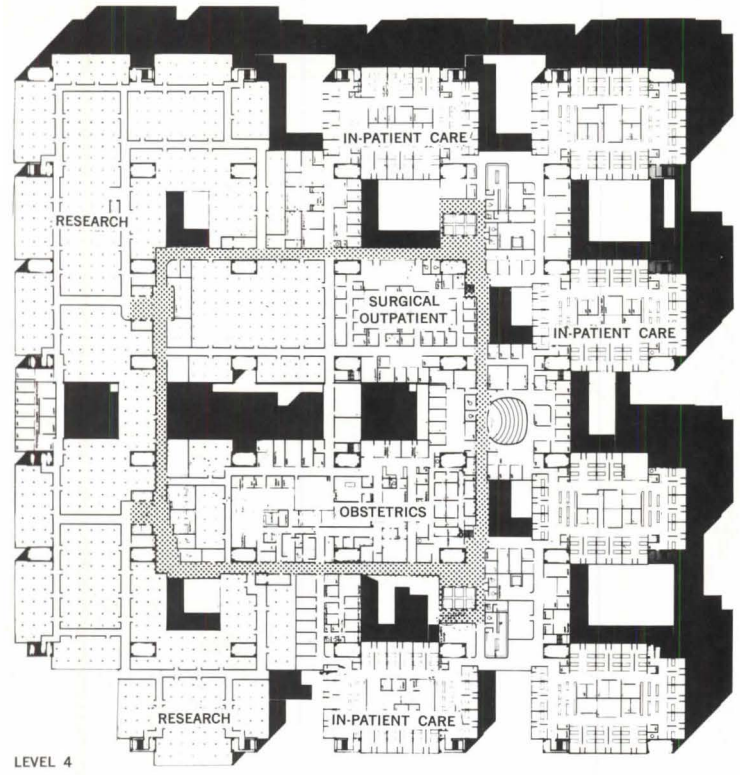
The effect of this program on the building plans is evident. Patient care and research facili-



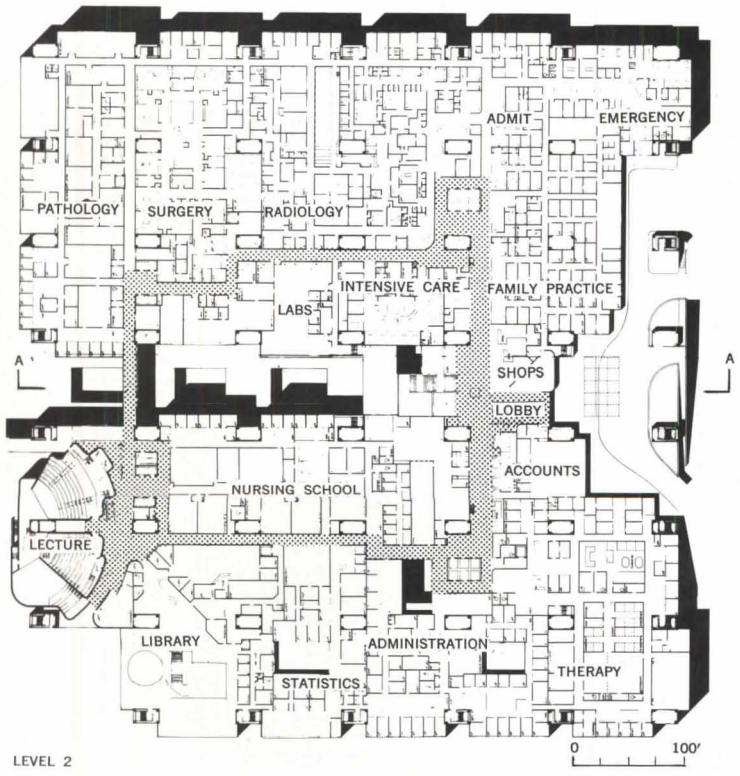
The 55 glass-enclosed towers of the Centre are its mechanical shafts, its emergency stairways, and the sole support of its long-span structural system (schematic drawing, above). Steel framing of the towers, covered with cementitious fireproofing, will remain visible; pipes, ducts, and stairs inside them will be painted in a different family of colors (blue, red, yellow, purple) for each quadrant of the 600-ft.-square structure. The center's four occupied floors and tall mechanical penthouses will rest on a 1,000-car basement garage.



SECTION A-A




LEVEL 4




LEVEL 2

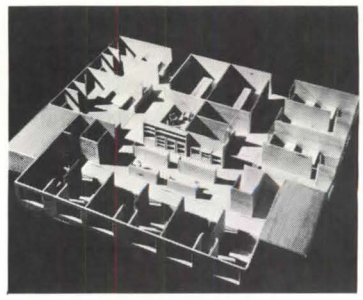
ties share the same floors—with offices for teaching physicians generally between them. Every area—from nursing unit to bookkeeping department—has space for student groups within it. Strictly academic facilities, such as lecture theaters and library (model photos, right) are concentrated in one corner of the building, where they are accessible to other university departments.

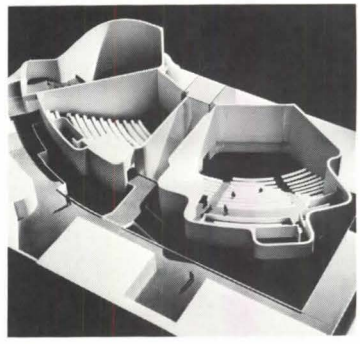
Circulation and orientation on floors roughly 600 ft. square obviously presented a challenge. The solution is a "ring corridor," following a more or less square path, with elevator banks at each corner of the square—two on the south connecting the public lobby with patient-care units, two on the north used mainly by students and staff (all four reaching down to basement parking).

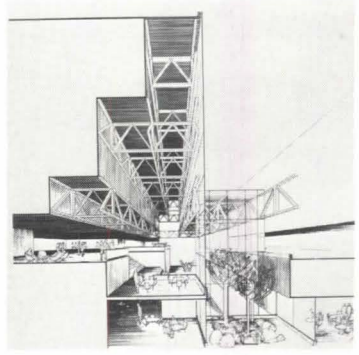
In-patient facilities are divided into four more or less self-contained subhospitals—two on the third floor and two on the fourth—each comprising three nursing bays, plus a treatment bay, surrounding a public elevator bank. Each nursing bay contains two 18-bed units, arranged around central many-purpose spaces. Low counters informally separate the nurses' station from circulation space, which is large enough for student-teacher groups to meet in. High cabinets (some actually alcoves for supply carts) screen off a space for heavier work, such as "reconstituting" prepackaged meals (to be served on demand, not on schedule).

Some features of the nursing unit plan seem to reverse current trends—the high proportion of double rooms, for instance, and the sharing of lavatories. Double rooms make possible the tight-knit, visually unified layout (average nurses' station to bed distance: 35 ft.); they also allow space for student groups and special monitoring equipment of a teaching hospital, which called for extra-large single rooms. Shared lavatories between rooms save both money and space; the problem of privacy has been solved with special hardware that locks both doors when either is closed.

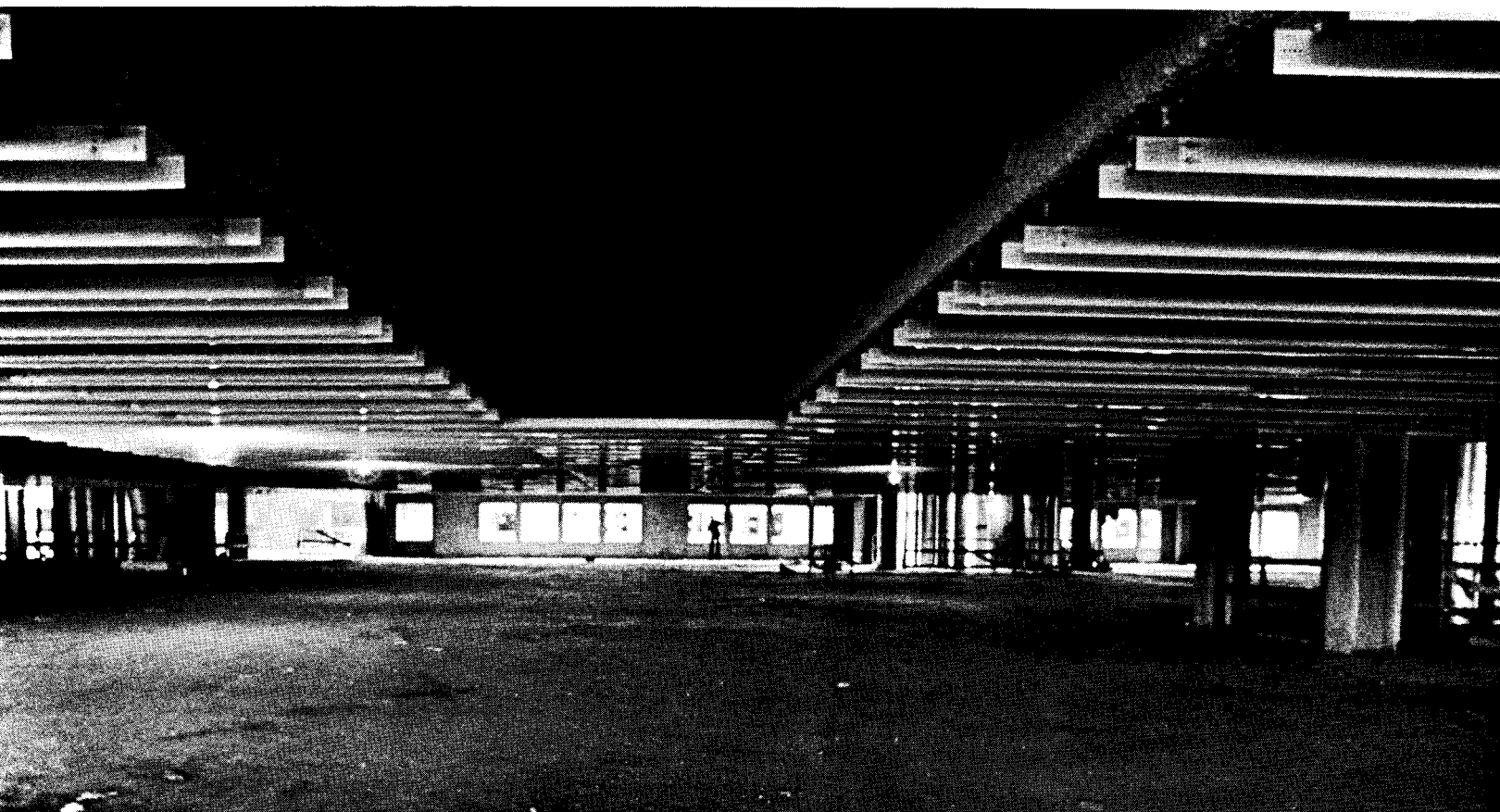
Laboratory furniture was designed from scratch by the architects. It is based on factory-fabricated "energy modules," vertical panels with connections for gas, water, vacuum, which







The four occupied floors of the Health Centre alternate with four mechanical spaces (section, top left). The first level includes services such as receiving and cafeteria, plus student facilities. The fourth level is similar to the third (plan, left). At each level a "ring corridor" links four elevator banks. Trusses in the mechanical spaces (top right), 8 ft. 6 in. deep, make possible column-free bays 84 ft. by 94 ft. 6 in. (right). The variety of arrangements within these bays includes (above, from top) a ½-bay, 18-bed nursing unit; a cluster of two-story lecture halls; a freely planned library; a three-story lightwell in the main lobby.



are plugged into the floor. Tables, cabinets, and shelves can be assembled around the energy unit and rearranged by the *users* of the laboratories. Partitions can be erected in the gap between back-to-back lab tables.

Materials handling for the Centre was the subject of extensive study. Conveyor systems were ruled out, explains Consultant Architect Robert H. Jacobs, because they work well only for moving large quantities of similar things over simple routes. A system of manned trucks, in this case, requires less manpower than the terminals of a conveyor system; it is also instantly adaptable to change and is not impaired by routine breakdowns.

The battery-powered truck developed for this building lifts three carts onto its flat bed. Once dropped off at a department, the cart remains as a movable storage rack until emptied or refilled with return material. The trucks use the regular corridors but have four elevators of their own.

Small items such as mail, records, and small quantities of medicine are distributed by a different, small-scaled system—using self-propelled containers "slightly larger than a briefcase," running on a network of tracks in the interstitial space.

### Design during construction

In the construction of the building, a 3½-year period of design and a 3½-year period of construction have been telescoped into four years. Construction started in early 1968, only six months after the design concept was established. Fully 60 per cent of the building (in dollar value) was in place before any interior contracts were let. This fast-track method allowed an additional 18 months for detailed interior planning after construction started. In fact, substantial revisions can still be made: a few months ago, lavatories in most nursing units were shifted from locations along the corridor to outside wall locations—at no extra cost.

The architects first planned to have major repetitive components, such as ceilings and exterior walls, developed by manufacturers on the basis of performance specifications (issued with a suggested design by the architects, which contractors could simply bid on if they preferred). The bid request for the window walls allowed for concrete, steel, or plastic. A solution in concrete yielded the lowest bid, but Zeidler warns that in other circumstances relative costs might differ.

The ceilings were required to meet an unusual set of criteria: self-support over 10 ft. 6 in. spans; two-hour fire rating (since mechanical spaces are technically occupied); acoustically tight connections above partitions; washable, acoustically absorptive surfaces; recessed lighting. All bids on this package came in too high.

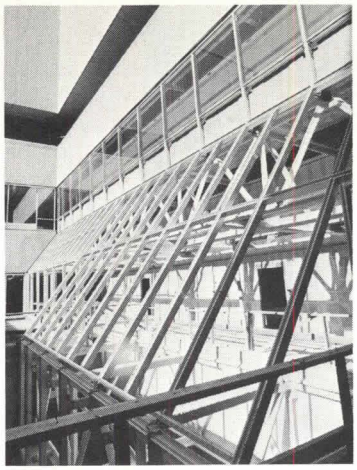
The architects then developed a ceiling system, and carried it through several prototype versions, and it was eventually installed under several separate contracts, at a favorable price. The resulting design seems simple: a double layer of heavy gypsum board supported on enameled steel channels, which are spaced 3 ft. 6 in. apart on center. The channels accommodate lighting, carry supply and return air, and support panels of acoustic tile, which can be cut and patched easily as partitions are moved.

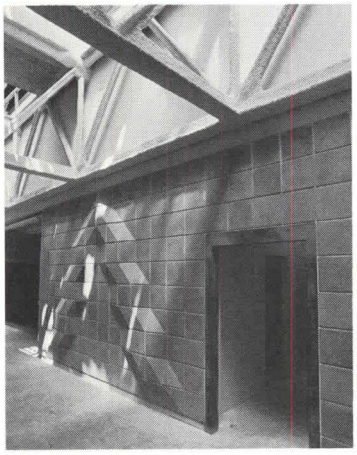
The remarkable achievement of the Health Sciences Centre design is that—for all this attention to technical problems—its interiors will not seem like parts of a vast, impersonal system. All the spaces one moves through—starting with clearly expressed, sheltered entrances—will be comfortable in scale and full of unexpected spatial incidents. It is as if every part of the structure were a distinct building in a community of related buildings—each one designed to maintain human comfort and human awareness.

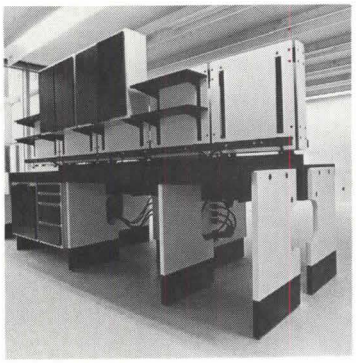
—JOHN MORRIS DIXON

**FACTS AND FIGURES**

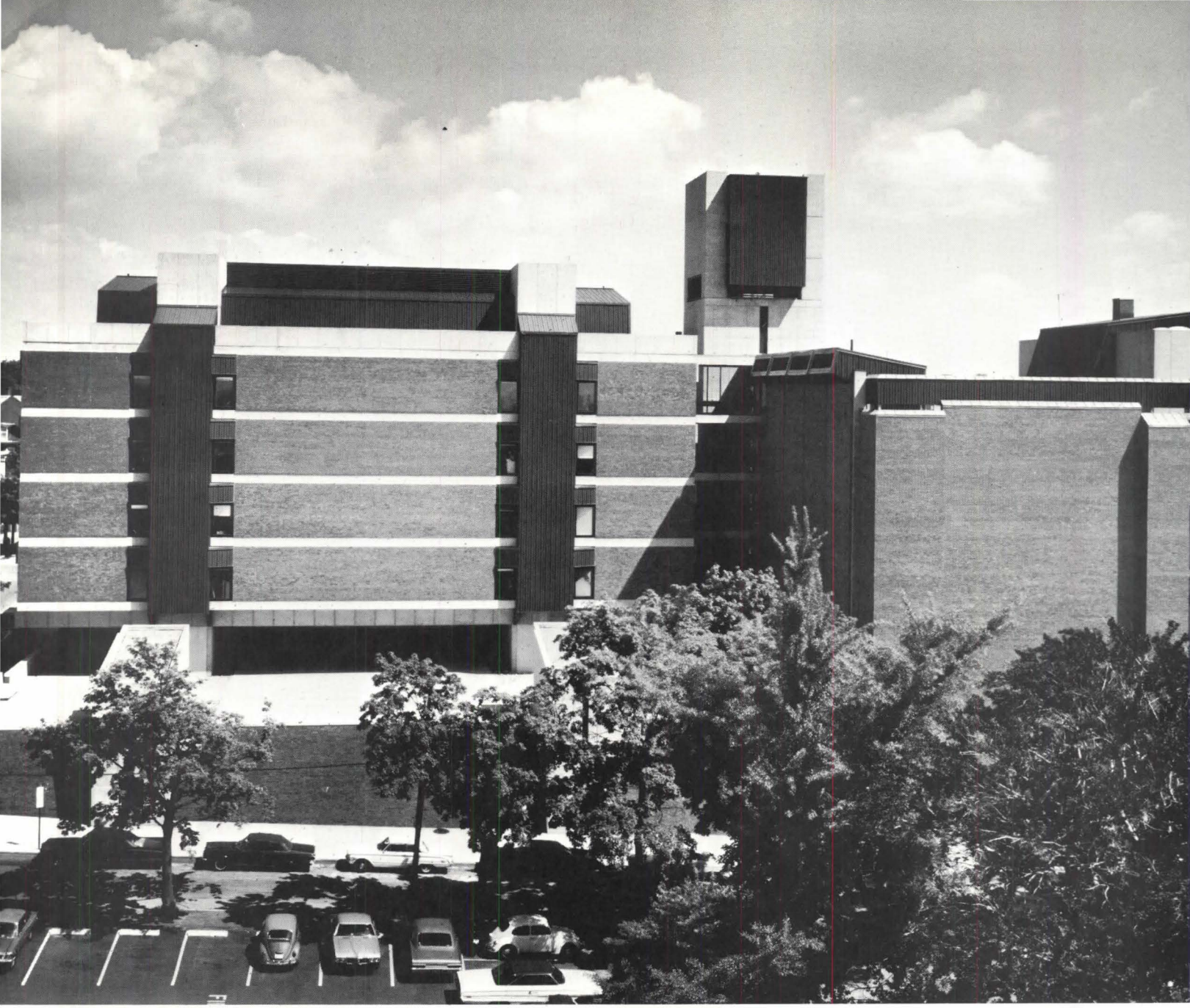
McMaster University Health Sciences Centre, Hamilton, Ontario. Architects: Craig, Zeidler & Strong (E. H. Zeidler, partner in charge; A. Banelis, R. H. Jacobs, Jr., F. Kulcsar, E. LaRiviere, project architects; D. Areansen Hein, T. Gunn, M. Rao, D. Vetere, area planners; F. D. Grierson, specifications). Project manager: Doyle-Hinton. Engineers: J. Maryon & Partners (structural), G. Granek & Associates (mechanical), J. Chisvin & Associates (electrical). Landscape architects: Strong, Moorehead, Sigsby. Building area: 1,335,433 sq. ft. (occupied floors); 1,716,000 sq. ft. (with allowance for parking). Construction cost: $56,918,000 (furnishings and equipment, $10,850,000; fees, including construction manager, $4,800,000). (For a listing of key products used in this building, see p. 74.)

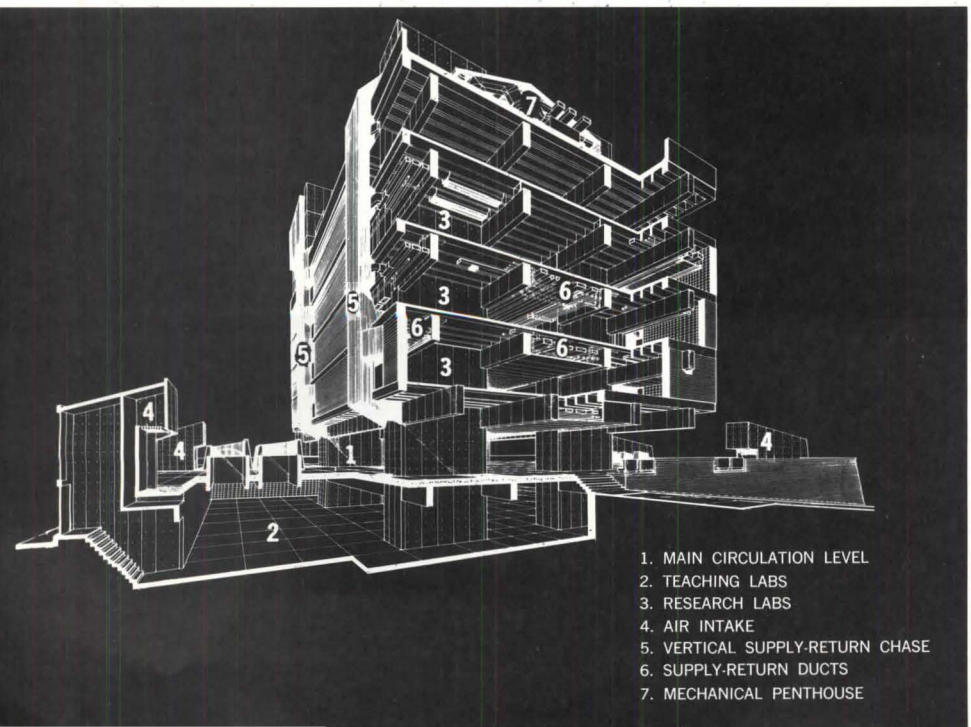


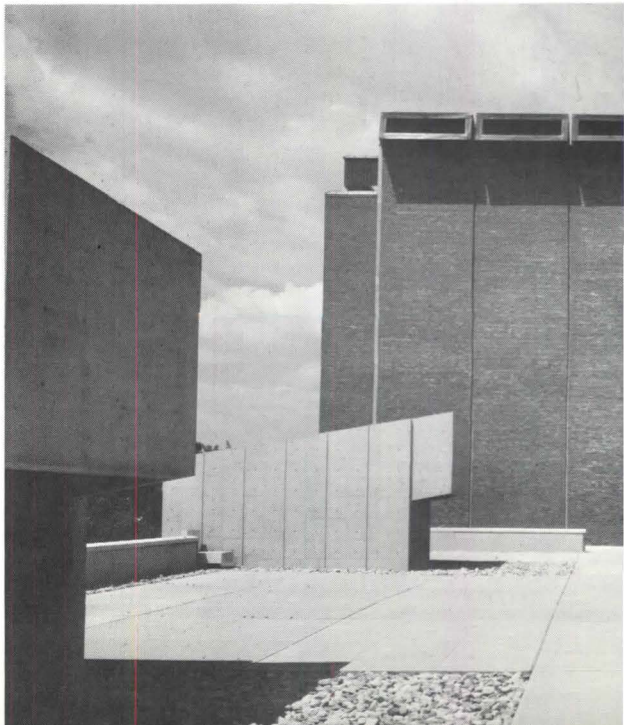




The "ring corridor" passes several light courts (top), sometimes broadening into top-lit lounges. A wall of special blocks, forming varied relief patterns (second from top) distinguishes this corridor from others. Special equipment designed for the complex includes a self-supporting laboratory bench system (third from top) and an all-purpose cart-carrying truck (above), which will ride the corridors. A linear courtyard (right) will lead students deep into the building.

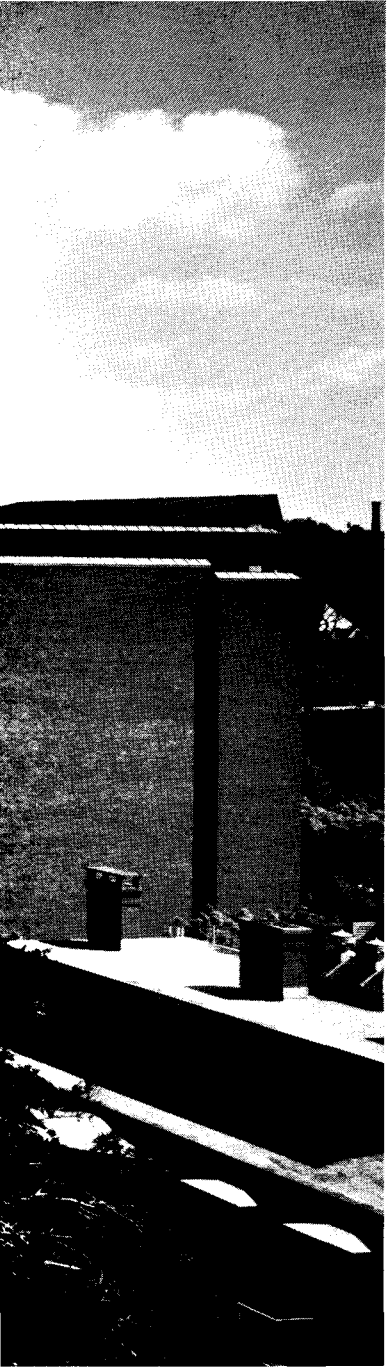


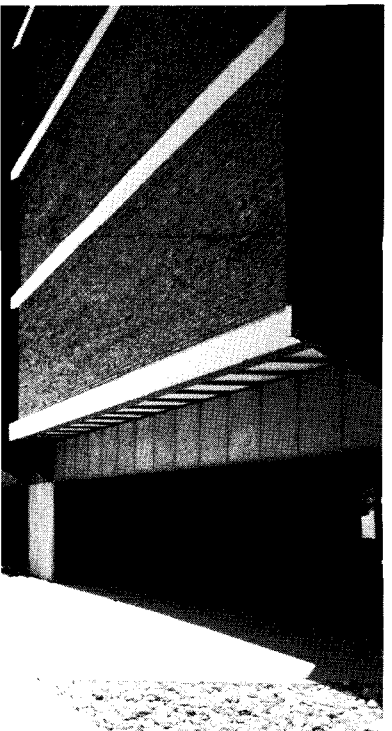

1. MAIN CIRCULATION LEVEL
2. TEACHING LABS
3. RESEARCH LABS
4. AIR INTAKE
5. VERTICAL SUPPLY-RETURN CHASE
6. SUPPLY-RETURN DUCTS
7. MECHANICAL PENTHOUSE



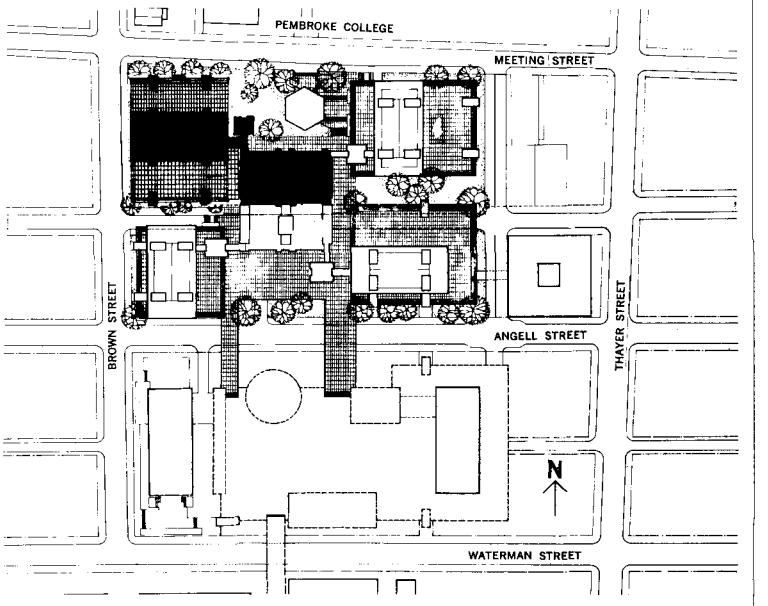
# PROVIDENCE, R. I.

## First increment of a new kind of medical school is a well-reasoned piece of urban design





Top: Research labs are at left, animal care at right, and teaching labs beneath the plaza. Ultimately, there will be three more teaching podiums with research buildings above them, arranged in a pinwheel around the expanded central building. Left: Air intakes are at the podium edge; air goes up to the roof and is fed downward through copper-covered chases on the exterior of the building. The huge post-tensioned beams give ample space for pipes and ducts which are left exposed in the 4-ft. beam depth. Near left: The podium will not function fully as circulation space until all the bio-medical facilities are built; this complex will then connect Pembroke and Brown.



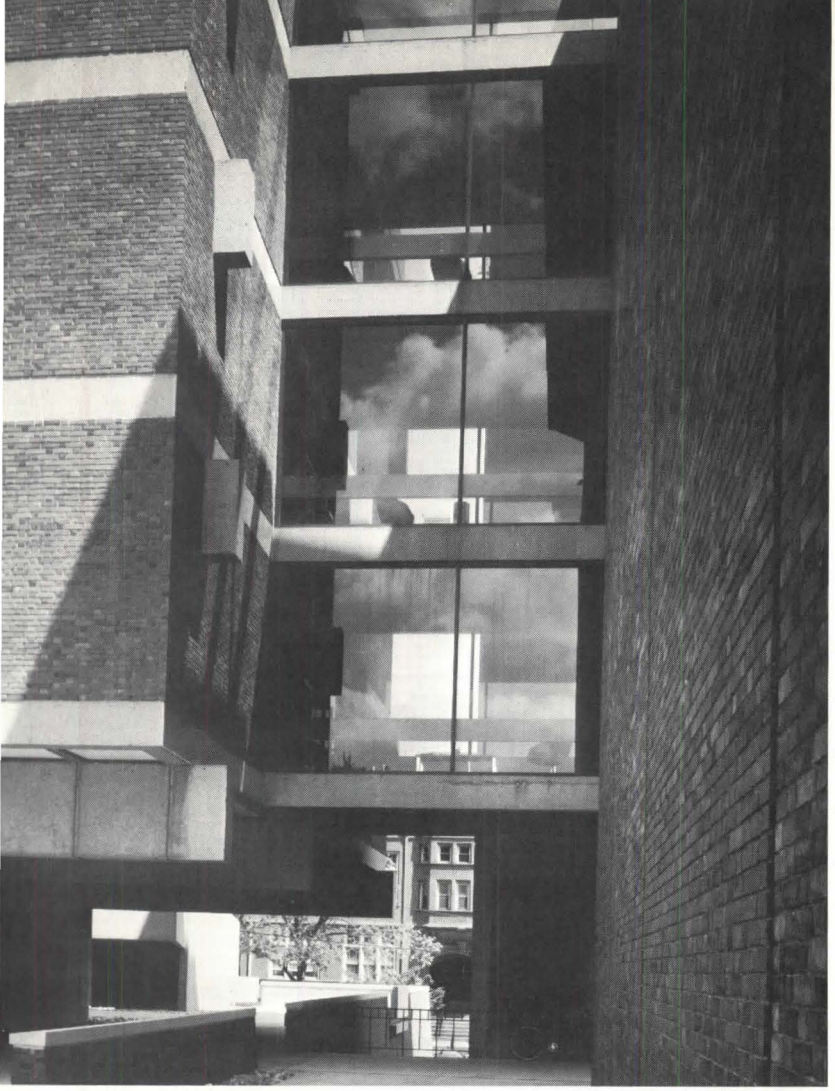

When Brown University established a medical education program in 1963, it picked up a tradition that began in 1811 and foundered in 1827. But the new program challenges the traditional pattern of medical education "by demonstrating the advantages of keeping the largest part of professional education integrated within the university." Humanities and social sciences are required for the full six years of the Master of Medical Sciences degree; an additional two years—elsewhere—are required for an M.D. degree.

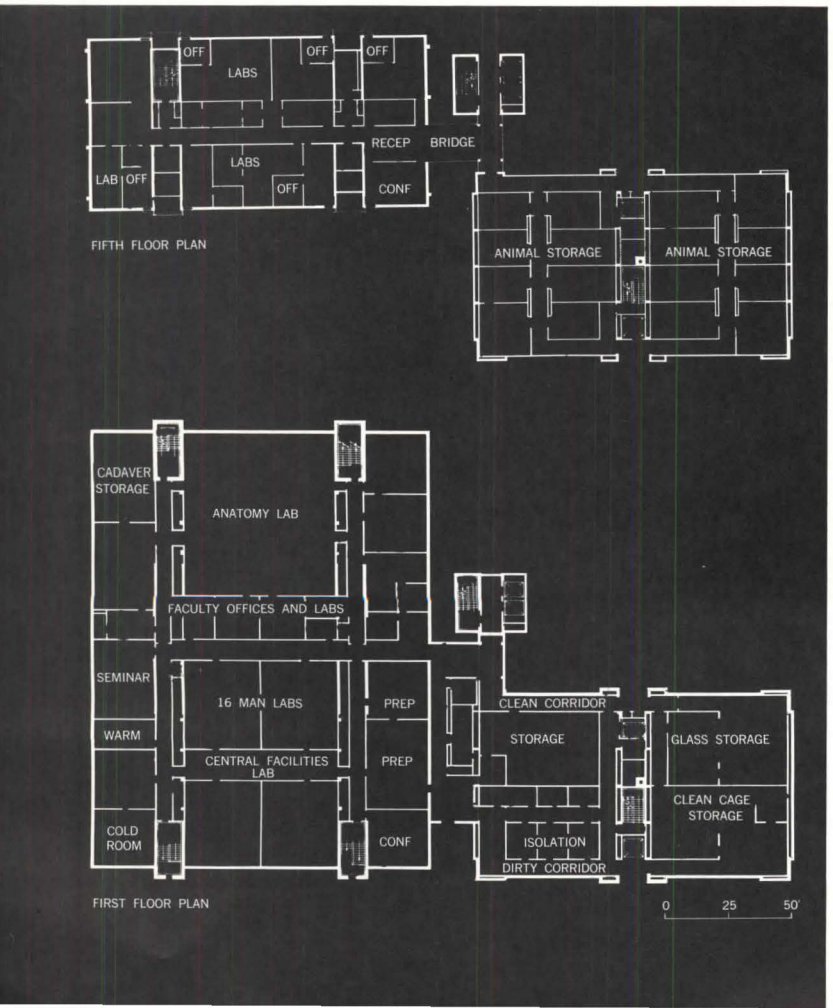
The new Bio-Medical Center by Shepley Bulfinch Richardson & Abbott is the first element in a two-block bio-medical campus. The building is actually three separate structures, providing facilities for teaching, research and animal care. Each element is planned for orderly enlargement. And although the building itself is interesting—in its disposition of facilities, and in its structural and mechanical systems—it is most exceptional as a piece of urban design. The hope that the Bio-Medical subcampus will ultimately be integrated with the rest of the university, physically as well as educationally, has been—and continues to be—a key concern of the architects.

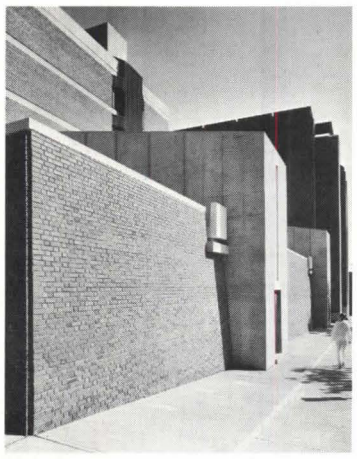
A master plan for the university's next decade had been finished in 1963 by Sasaki, Walker & Associates, and the Bio-Medical Center was set for the area bounded by Angell, Waterman, Brown and Thayer Streets. (Angell and Brown are residential campus streets, Thayer is the location of campus-town business properties, and Waterman is a major arterial.) Future expansion would fill the block to the north.

The Sasaki, Walker plan proposed a plaza level to cover the first block, with parking, servicing and a bus tunnel beneath it. The plan further suggested that tall buildings be kept to the interior of the development, toward Thayer Street, with low buildings along Brown Street to maintain the residential scale there. A pedestrian overpass across Waterman would link Bio-Medical with the rest of Brown to the south.

The site is special in several ways: it slopes downward 20 ft. from the high northwest corner (highest point of the Brown campus), and it makes a solid





Left: The bridge between the research labs and the animal care facility has a small lounge on each floor. Its floor-to-ceiling glass has a visual barrier in the form of a horizontal heating strip. Above: The southernmost part of the first Bio-Medical increment terminates rather abruptly. Eventually the podium will bridge this intermediate street in two places. Right: An atmosphere of "security and privacy" was wanted, yet the architects have tried to keep these buildings from becoming a forbidden enclave or a barrier between Pembroke and Brown. Even before the podium is completed, students are already using it to cut cater-corner through the complex.

barrier between Pembroke College, immediately to the north, and Brown to the south.

Shepley Bulfinch Richardson & Abbott were favorable to the master plan and sought to give it "a good start." Their center begins with the upper block, while the master plan would have begun with the lower block, but otherwise there are many similarities in intent; the architects took the early ideas and only improved upon them.

The plaza has become an extensive podium, leading Pembroke students in among the now and future buildings, over two streets and into the older campus. Teaching labs are *within* the podium; putting these high population areas only one flight down reduces elevator traffic. Research labs are in the four-story tower, and animal care facilities in the windowless five-story tower. The three separate structures are served by a common elevator shaft. Because of the site's proximity to the residential area, the architects chose to design "in reasonably small building components." In addition, the highest part of the site has the lowest and least massive building.

The surrounding university buildings are masonry; the Bio-Medical Center is reinforced concrete, with panel exterior walls brick faced. Interiors are large column-free spaces. Most interior walls are white concrete block with black trim, a crisp background for the chaos of a working lab.

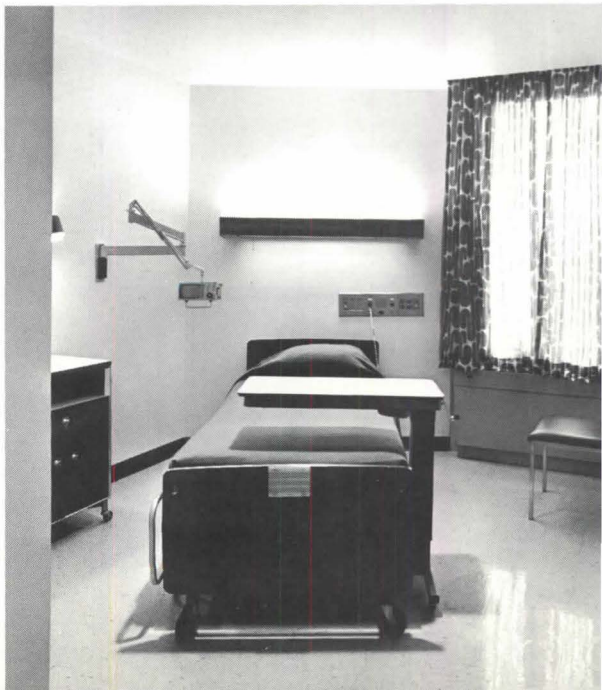
The Bio-Medical Center is well begun. Its major contribution, the podium, cannot yet be judged as circulation device or gathering place since the Center is only partly built. Eight huge skylights would have enlivened the terrace with spots of light and places to sit, but were arbitrarily rejected by a new administration *even though already fabricated.* It would be too bad if the completion of the Center were similarly deflected from the original concept.

**FACTS AND FIGURES**

Bio-Medical Center, Brown University, Providence, R. I. Architect: Shepley, Bulfinch, Richardson & Abbott. Engineers: Nichols, Norton & Zaldastani (structural); Buerkel & Co. (mechanical); Thompson Engineering Co. (electrical). Building area: 162,000 sq. ft. Construction cost: $5,739,000 (excluding land, furnishings and fees).

(For a listing of key products used in this building, see p. 74.)

PHOTOGRAPHS: Phokion Karas



# CINCINNATI, OHIO

## Suburban offshoot of a city hospital makes a bold start toward development in stages

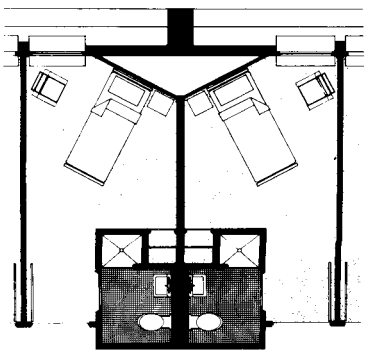
A boldly framed block of nursing floors, held aloft on tall concrete pilotis, marks the first step in the development of Bethesda Hospital North, on an 88-acre site outside Cincinnati. The gap between this cellular upper block and the irregular mass of treatment facilities below it suggests — quite accurately — that each of these two parts can expand independently.

Ultimately, the new unit is expected to grow to at least five times its initial 150-bed capacity. Most of this growth will be accomplished by extending the low portions along the edge of a ravine and adding new nursing blocks above. But some adjustment can also take place in the space between the pilotis.

As the hospital expands, it is likely to need a larger proportion of auxiliary facilities. For the present, the branch relies on the parent hospital — only 15 minutes away by expressway — for services such as bookkeeping, food preparation, laundry, and most laboratory work.

The preponderance of single-patient rooms (70 per cent of the total) responds both to suburban preferences and to the need for flexible room assignment in a small hospital. The unorthodox plan of the typical single room—only 10 ft. wide instead of the usual 12 ft.—allowed the architects to fit 50 beds on one nursing floor.

Besides allowing a more compact overall plan, the unusual room layout solves several other problems. It leaves space for a generous utility chase containing oxygen supply, communication, and electrical lines, as well as ducts and pipes for the under-window air-handling units. The angular placement of the bed makes it easy for the patient to be observed from the corridor. And the patient himself is given an excellent vantage point: from his bed, he can look into the corridor or out the window—without facing into the sun.



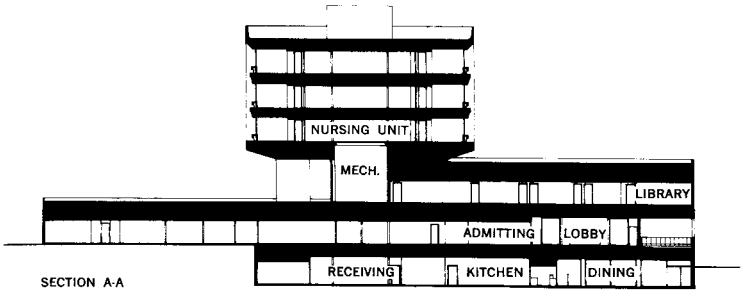
A view from the ravine to the east (top left) shows three levels of treatment and support facilities—with service entrance at basement level—beneath the elevated nursing block. A partial second floor above the main entrance (far left) houses a library and a staff lounge. Behind the bed in the typical single room (left) is an angular utility chase, which serves the two rooms in a 21-ft. structural bay. (plan above).

**FACTS AND FIGURES**

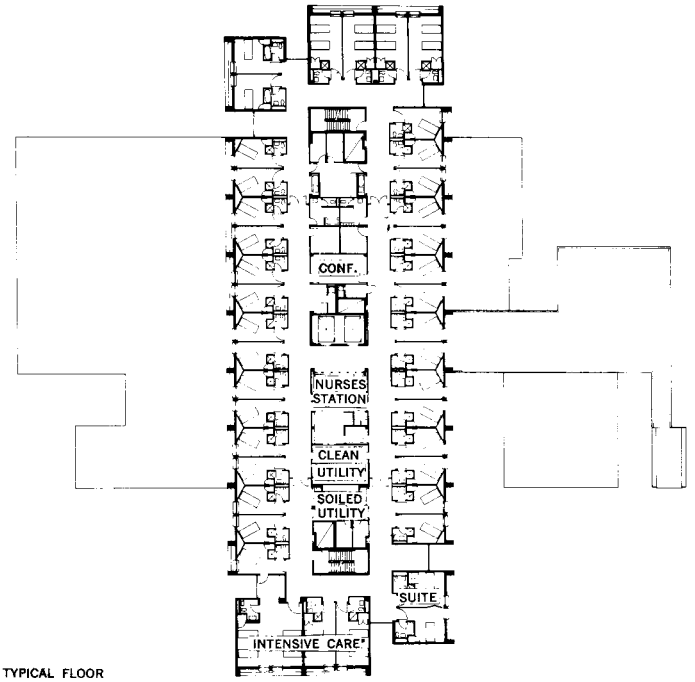
Bethesda Hospital North, Montgomery, Ohio. Architects and engineers: Smith, Hinchman & Grylls (John V. Sheoris, associate in charge of design). Associated architects and engineers: Sullivan, Isaacs & Sullivan. General contractor: Dugan & Meyers Construction Co. Building area: 116,623 sq. ft. Cost: $4,692,000 (construction); $730,000 (furnishings and equipment).

(For a listing of key products used in this building, see p. 74.)

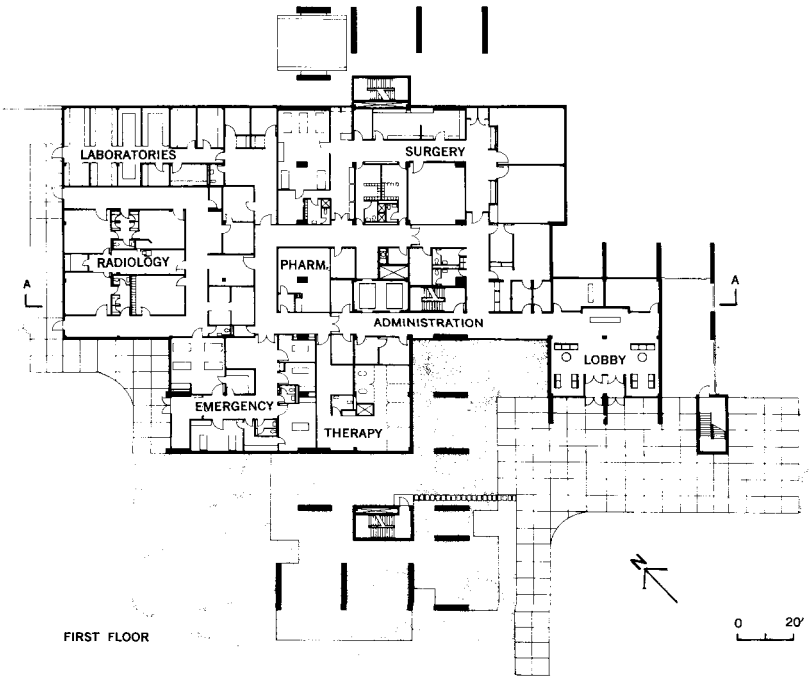
PHOTOGRAPHS: Balthazar Korab.



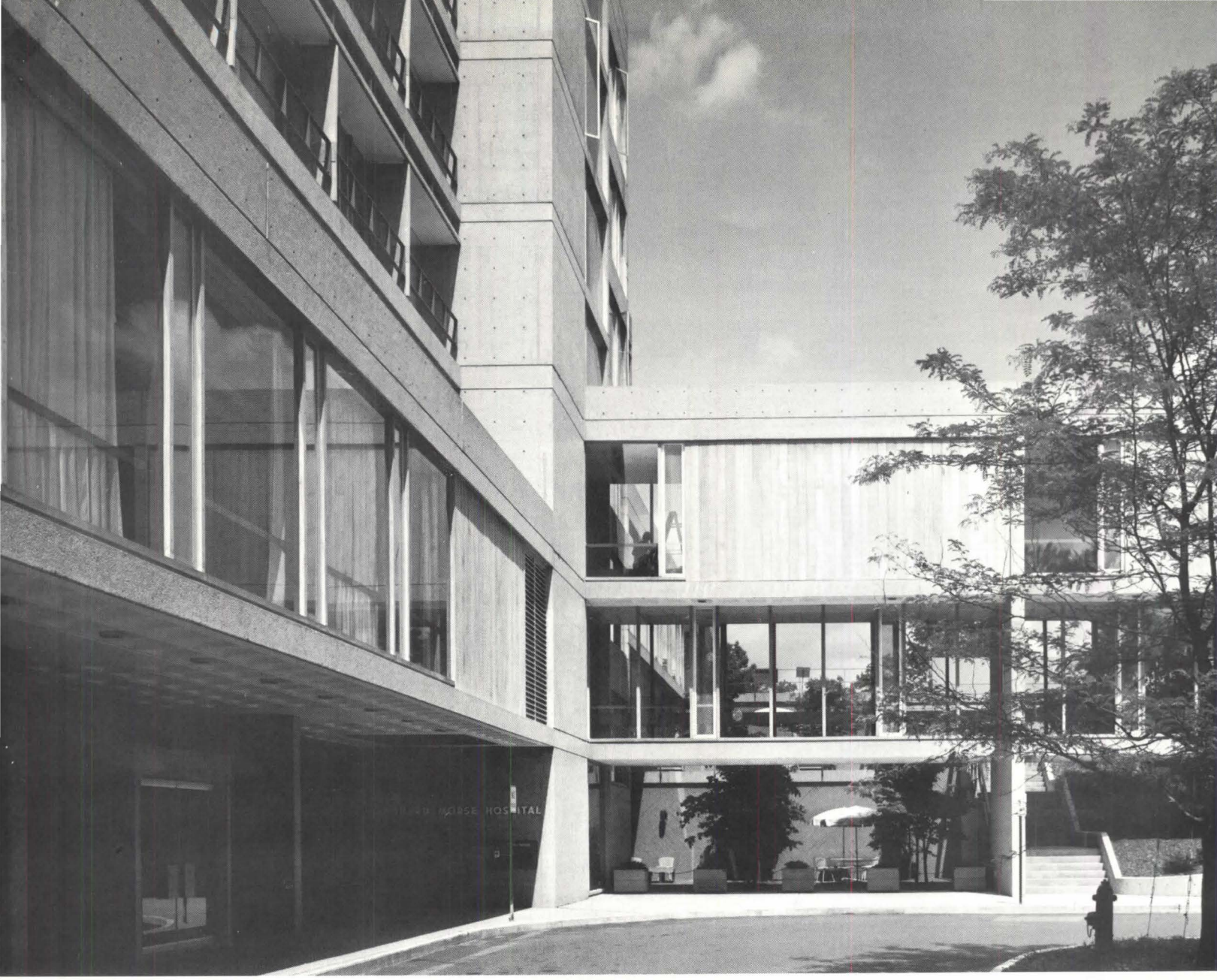

SECTION A-A

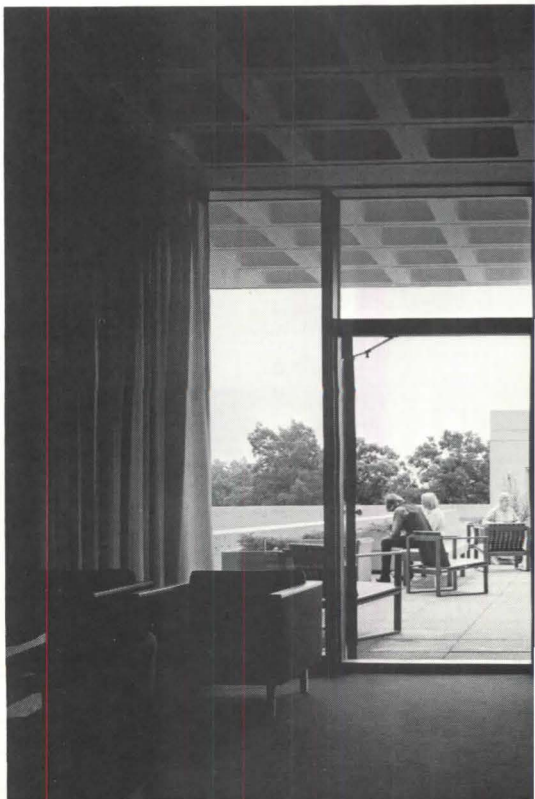



TYPICAL FLOOR



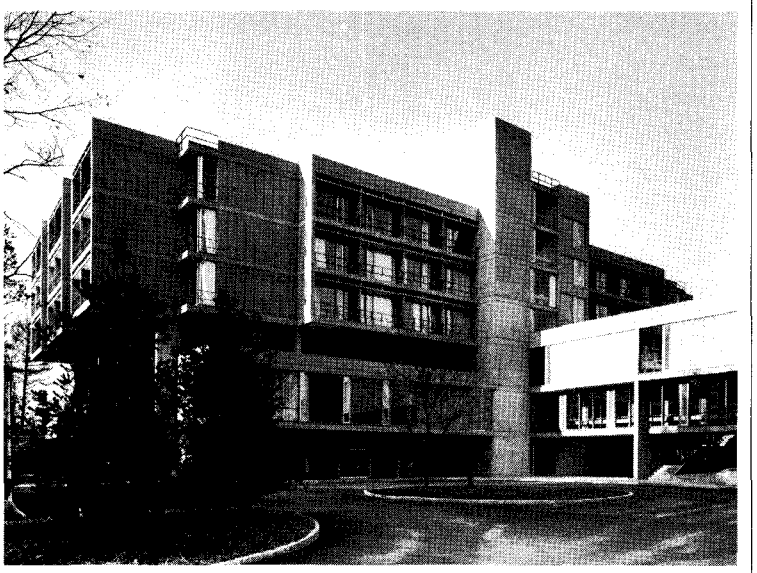

FIRST FLOOR

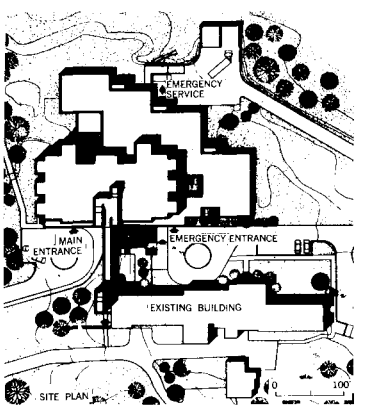




# NATICK, MASS.

## General hospital shows that efficiency and environmental quality are quite compatible






From the entrance turnaround (top left and above) the view under an enclosed bridge reveals two dining terraces (far left), with walls of board-textured concrete, painted red-orange. A treetop-level deck (near left), opening from the lowest nursing floor, is on the roof of the broader treatment and services block. The new building has entrances on three levels of the slope that runs up to the existing complex (site plan, left).

In the entrance court to Leonard Morse Hospital, Architects Markus, Nocka & Payette have provided a capsule preview of their remarkably rational and comfortable building. A matter-of-fact concrete frame — neither sleek nor abrasive — articulates its functional layers and the vertical core that joins them. Infill walls of glass and African mahogany (with occasional red-painted panels) vary in proportion to suit the varied spaces behind them.

At entrance level, the building has an inviting character, with a deep entrance loggia and glass-walled lobby to one side, and colorful dining terraces visible under a bridge connection on another side.

The new building is actually an addition to a smaller existing complex—an old Georgian-style mansion with patchwork extensions—at the top of a small hill (site plan, left). The new structure stands on the slope, with two levels below the first floor of the old buildings.

The architects have divided the functions of these lower levels into neat layers, with related entrances and parking areas for each one. The main entrance is at the lowest level, where public services and administration are located; the service entrance is at the second level, which houses storage, laundry, kitchen, etc.; emergency and outpatient entrances are at the third level, leading directly into treatment and diagnostic facilities.

A variety of courtyards is formed by the meandering walls of the lower floors—with a little help from the terrain. These courts are not just light shafts but usable spaces—dining terraces adjoining both cafeterias, a quiet court outside the administration area, a play terrace outside the pediatric unit—all sunny and protected from winds. A tiny walled garden is the visual focus of the meditation chapel.

There are usable balconies off the staff library, the conference rooms, the physical therapy department, and the solariums on each nursing floor. (Shallow balconies off the typical patient room serve only as sunshades and window-washing platforms.) Broad roof decks extend out around the lowest nursing floor.

All floors are laid out around a single circulation spine, which extends over a two-level, enclosed bridge to reach facilities

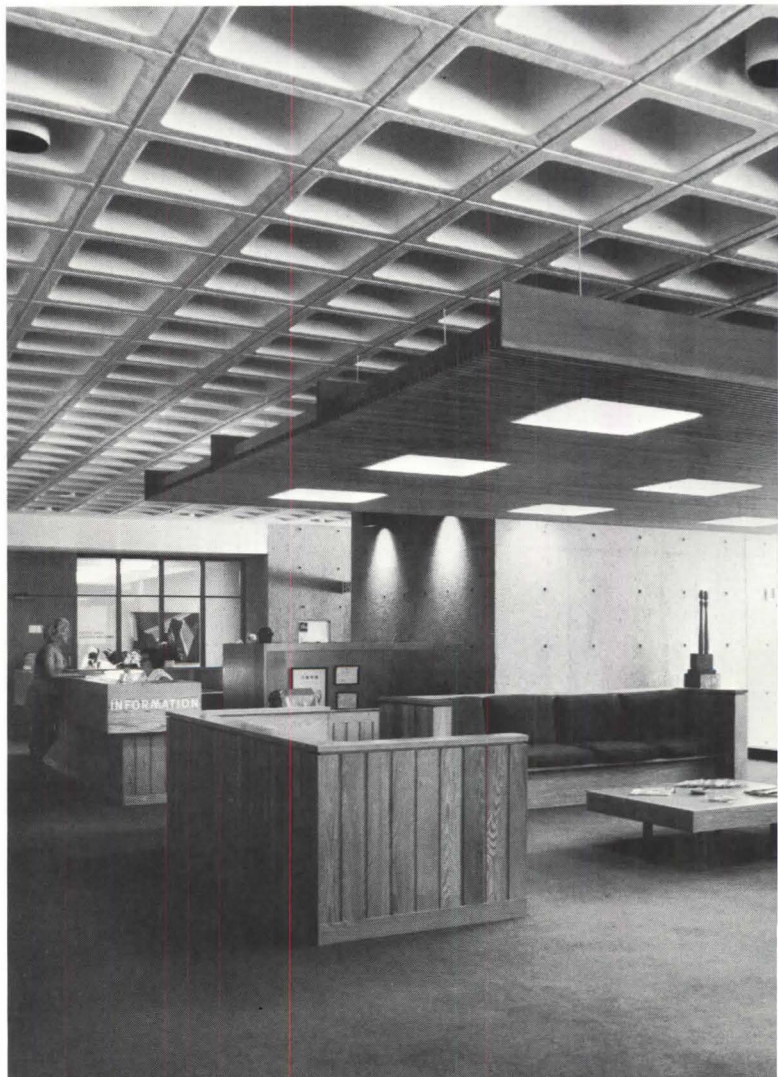
in remodeled portions of the old buildings (extended-care and maternity units, plus personnel lockers). Every part of the hospital has been designed for expansion. The sawtooth arrangement of the second-level radiology, surgery, and laboratory areas allows each of them to extend either to the northwest or the southwest. Administration, conference, therapy, and outpatient areas have unassigned space built into them for expansion. Nursing units are designed to be *repeated,* if greater capacity is needed.

The intensive care unit, adjoining treatment facilities on the second level, has a simple but ingenious layout that places eight beds close around a nurses' station, yet gives all patients privacy from one another and allows anxious visitors to enter without obstructing patient care. Visitors come in through a glass-walled "ambulatory" — a waiting area around the units which also serves as a thermal buffer zone.

The typical nursing floor has two 32-bed units, one on each side of the central spine. Beds are clustered around a central service space, with hardly any corridor, as such. To keep circulation patterns as tight as possible, single rooms are cantilevered out to form a partial second ring. When doors to the rooms are open, they swing back against partitions so that the whole unit seems like one space, divided by baffles. A lounge area in the center is in close contact with the nurses' station.

The patient's room has vinyl sheet flooring and a metal tile ceiling, used for radiant heating and cooling — with heated and chilled water. The ceiling system (in conjunction with central air conditioning) is effective in offsetting the thermal effect of large glass areas in small rooms.

Other interior spaces have been made to look non-clinical, without being impractical. All corridors and gathering places are carpeted; corridors have suspended acoustical ceilings, but larger common spaces extend up to the exposed waffle slab. The patient who leaves his room (and most patients today are urged to) finds himself in freely laid out spaces—with carpet, natural wood (fire-retardant, of course), and carefully modulated lighting. More than one patient has reported that his recovery was like "getting better in a fine hotel."



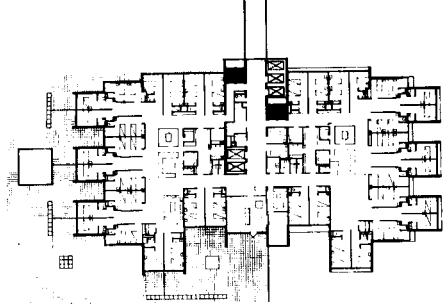

At the center of each 32-bed nursing unit (top right) is a large open working and lounge area, with oak counters and a glass-enclosed conference room. The wood-slat canopy, which provides lighting and acoustical absorption, is also used below the waffle-slab ceiling of the main lobby (near right). African mahogany sun baffles (far right, top) shade the visitors' "ambulatory" around the intensive care unit (see 3rd-level plan). The view from the main parking area (far right, bottom) shows the three nursing floors projecting out above the service floors.

**FACTS AND FIGURES**

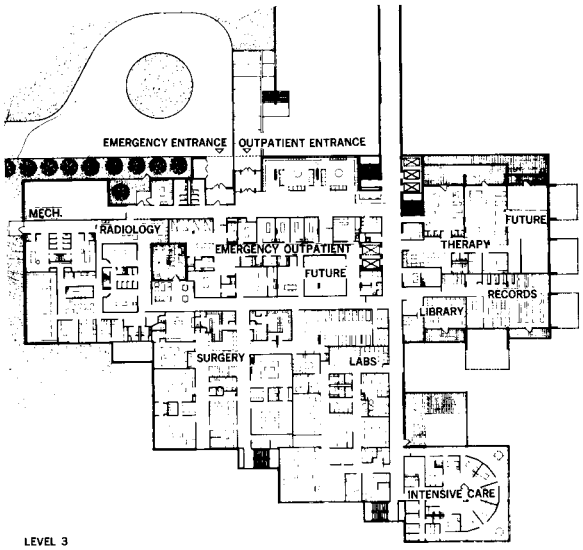
Leonard Morse Hospital, Natick, Mass. Architects: Markus, Nocka, Payette & Associates, Inc. (Thomas M. Payette, partner in charge; John Wilson, assistant designer; David Rowan, project manager; John A. Dellea, mechanical and electrical engineer). Structural engineers: Arthur Choo Associates. Landscape architect: Carol Johnson. General contractor: Franchi Construction Co. Building area: 185,000 sq. ft. Cost: $5,267,247. (construction); $300,000 (site development); $400,000 (furnishings and equipment); $368,707 (fees).

(For a listing of key products used in this building, see p. 74.)

PHOTOGRAPHS: George Zimberg (pages 42 and 44); Wayne Soverns, Jr. (page 43, center; page 45, right).



LEVEL 4

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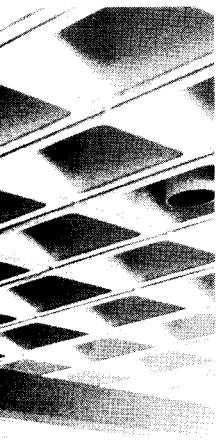

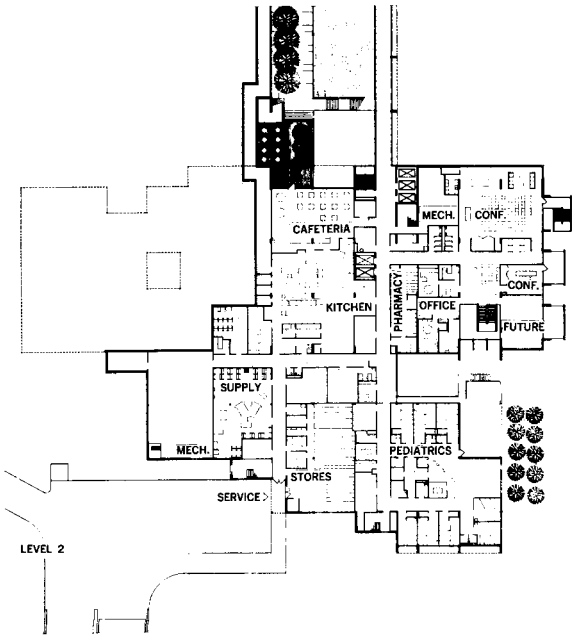


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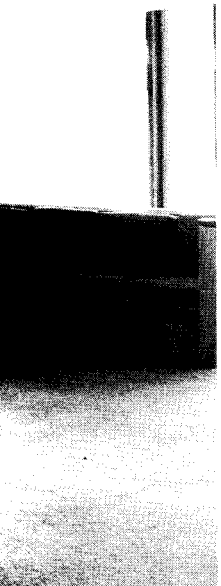
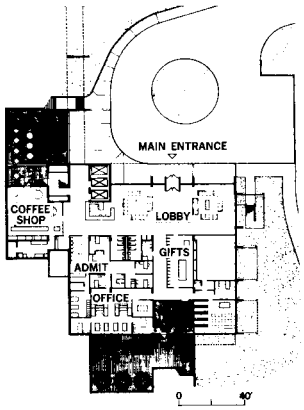
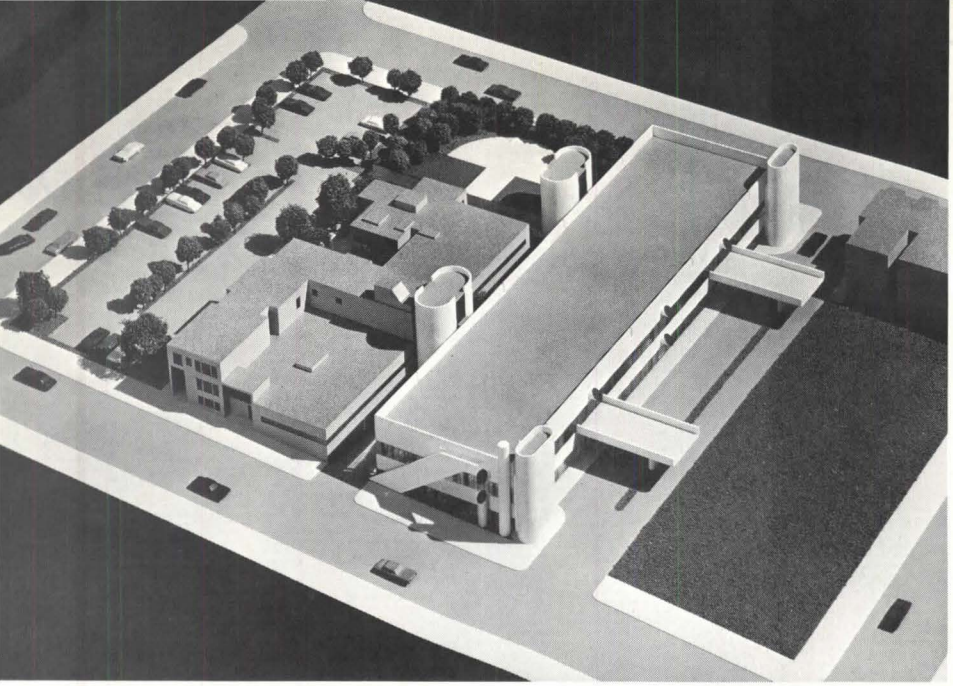
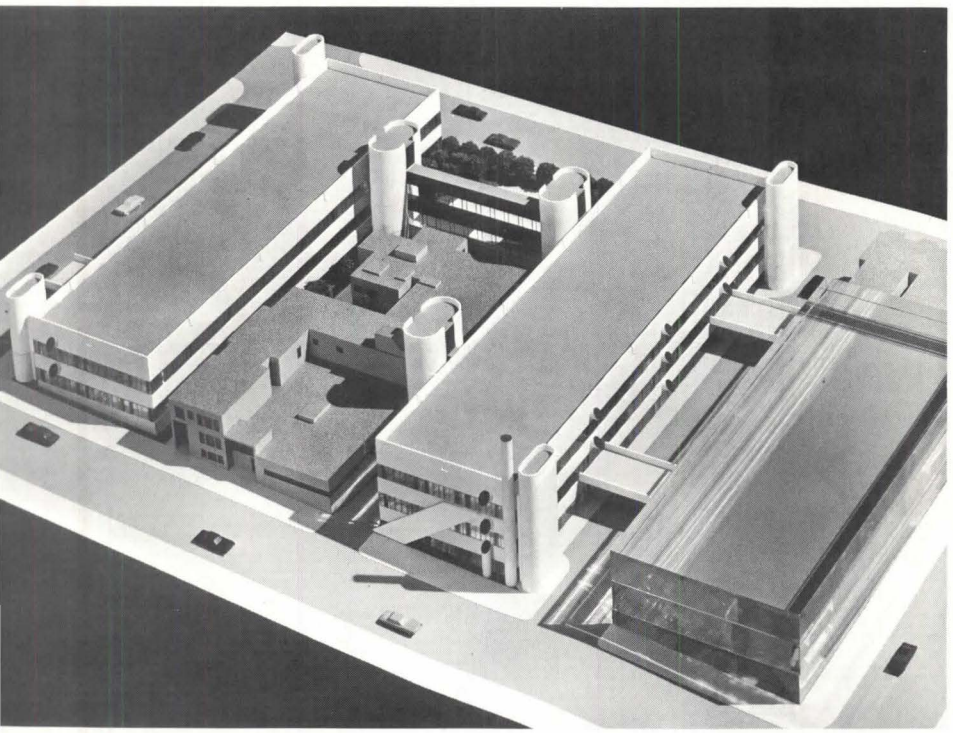
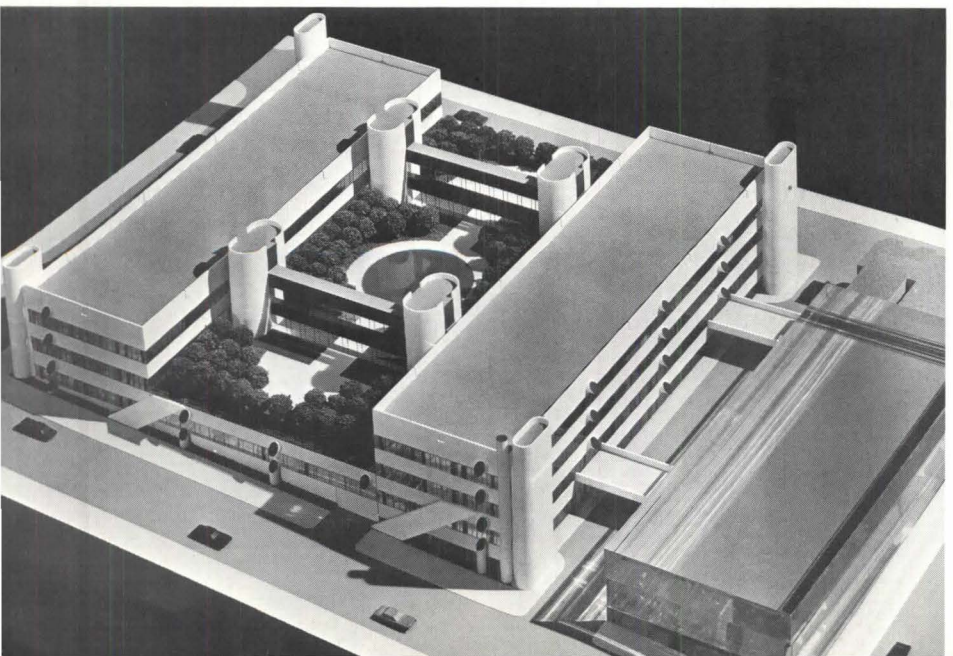





LEVEL 1

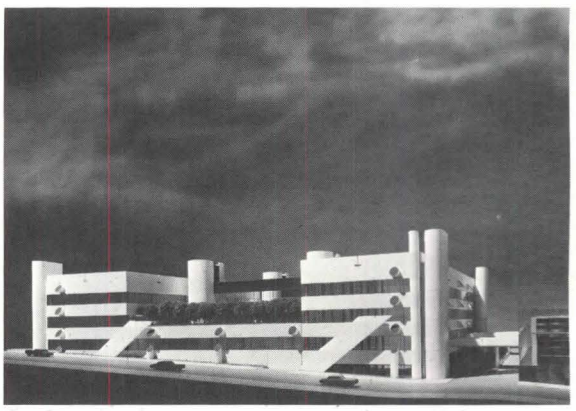






# SAN FRANCISCO, CALIF.

The master plan for expanding the California College of Podiatric Medicine leaves room for maximum change with each increment—and afterward



Top left: The *Phase I building* has two "occupied" levels (clinic on 1st, student labs on 3rd) and two "interstitial" spaces for mechanical equipment on 2nd and 4th. Middle: Phase II will add a three-story building, and another level to the Phase I building. The new building, like the earlier one, will also have interstitial mechanical spaces and will also be capable of vertical expansion. Its facilities will supplement the existing hospital and add further space for teaching. The parking structure adjacent to the main building could be built before or after Phase II. Some other occupancy (such as residential) may share this structure. Bottom: Ultimately all existing buildings will be removed. By 1973 the college will have a 60-bed hospital, private practice suites, and complete teaching and outpatient facilities.

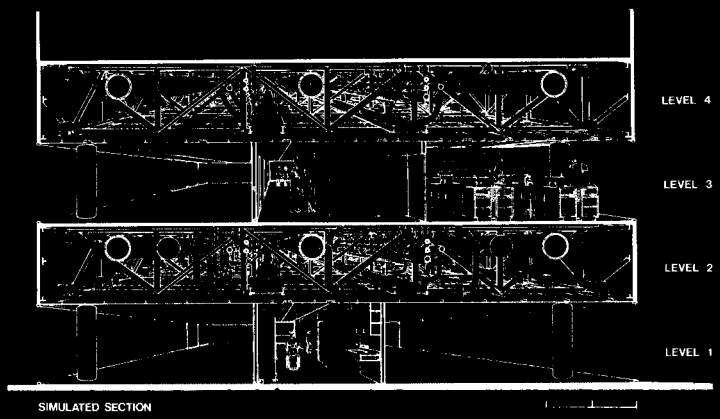
*The smallest* of the specialized medical schools—the California College of Podiatric Medicine, for example—will share the same unknown future with the largest of the teaching hospitals. This small school is determined to meet the unforeseeable needs of the future with minimal compromise; the master plan by Architects Rex Whitaker Allen & Associates provides "a framework of organized construction" that will adapt easily to changes in the use of existing space, changes in the demand for new space, and changes in the phasing of new construction.

Model photos at far left show three stages in the vertical and horizontal expansion of the college around its existing buildings. (The site is a 2.5-acre block in San Francisco's Western Addition redevelopment area.) The initial structure will allow the addition of at least two stories vertically, and the nonloadbearing exterior walls are easily removed to allow expansion horizontally. Then too, remodeling will be as simple as new construction, because the modular organization of initial spaces and systems makes possible the easy reassignment of space (and because the space is in large uncluttered expanses).

The schematic section (top right) explains these principles. Structure is a long-span steel frame, with its deep truss providing space for mechanical/electrical systems. (The structural depth also makes it possible, of course, to span the distances with few columns.) Between each two occupied floors is an "interstitial systems space" for the mechanical and electrical lines (fan rooms and electrical switchgear rooms are also here). Because of the depth of the truss, there is adequate headroom here for maintenance and remodeling, without disturbing the activities below.

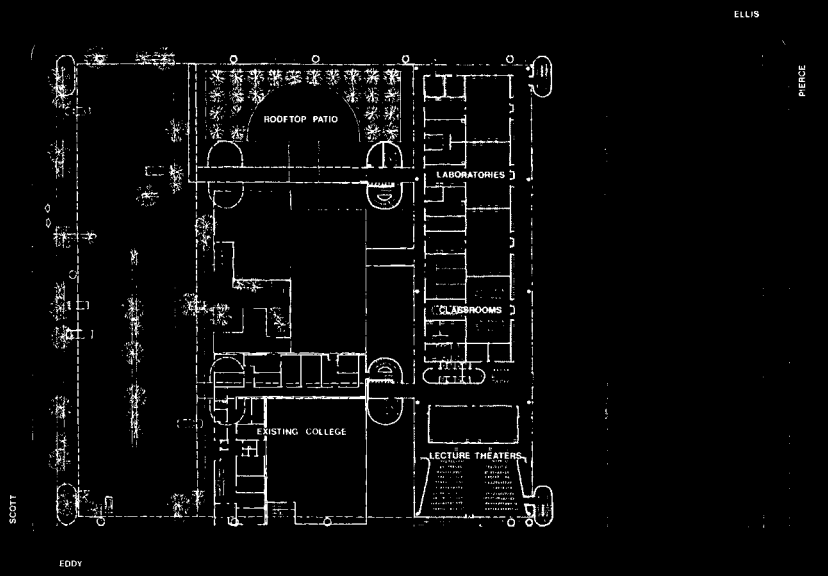
**FACTS AND FIGURES**

California College of Podiatric Medicine, San Francisco, Calif. Architects: Rex Whitaker Allen & Associates (G. Michael Goldsworthy, project architect; Mark A. Lechowski, chief of design; Dennis M. Brown, designer). Engineers: Pregnoff, Matheu, Kellam, Beebe (structural); Chamberlain & Painter (mechanical/electrical). Other consultants: Lester Gorsline Associates (programming); The Koch Co. (cost estimator). Construction cost: $3,462,500 (Phase I); $4,000,000 (Phase II). Cost per sq. ft.: $86 (Phase I); $52 (Phase II).
PHOTOGRAPHS: Gerald Ratto

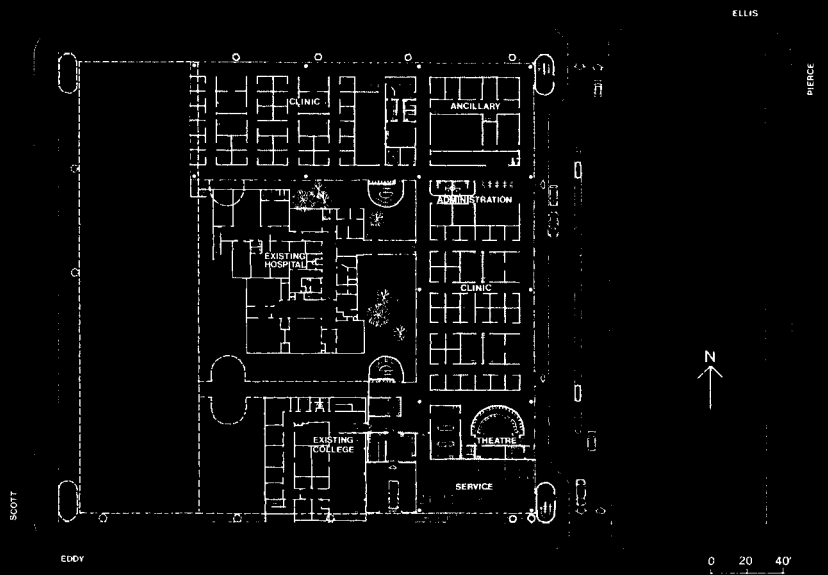


SIMULATED SECTION

Left: the "interstitial systems spaces" carry all mechanical/electrical equipment within the depth of the steel truss. In this schematic section, applicable to buildings in Phase I and II alike, an "interstitial" space serves every "occupied" space. Below: the two occupied levels of the Phase I building. Clinic patients enter directly from the street to the 1st level; students and faculty also enter directly from the street (a higher street) to the teaching areas on the 3rd level. Hospital patients and their visitors will be isolated on the future 5th level of this Phase I building.



LEVEL 2



LEVEL 1

# THE ARCHITECTURE OF URBAN SPACE

BY KENNETH R. SCHNEIDER

Four theorems of urban geometry and a plea to use the third dimension as a new medium of urban design

American society, already shaken by the enormities of pollution and vexed by the dismal struggles against utter disarray and conflict in cities, must soon awaken to more disturbing realizations.

An ironic and tragic paradox has appeared in American cities: congestion *and* dispersion. It arises from a basic fallacy of urban development and points to other hard revelations to come, leagues beyond the problems we now call "crises." We can already see that the human environment is rapidly becoming functionally unworkable, economically consumptive and destructive, socially barren, emotionally heartless and, needless to say, visually repugnant.

The real crisis is fundamental, arising from the very nature of our response to the human environment, and is not merely an excess or aberration. The tragic irony that cannot escape us is that the wealthiest and technologically most advanced country in the world (and one with a low population density) has somehow used its wealth, technology and great expanses of land to defeat a quality of life in cities, destroy nature and exhaust the elements.

In this, the first metropolitan age, we still build cities as if we were neolithic farmers making the first hesitant moves toward town life. We don't quite trust cities and don't make a full commitment to them. But we do invite massive numbers of machines to despoil their urbanity, then use those same machines to escape to the outer suburbs, despoiling the countryside as well.

Technology's limitless requirements force us to enlarge the city's area, compounding our primitive grasping for millions of consumptive minispaces. The endless miles of homogeneous scattering then present us with an unprecedented transport hurdle. Together, the undifferentiated population masses, the insubordinate technologies, and the infinite scale of the metropolis put an impossible burden on rationalizing the urban environment, especially for human beings.

The chief irony is that all three factors contributing to metropolitan formlessness—limitless expansion of population, area and technology—are idealized and formalized in plans and zoning statutes. Yet, as the city's primary foundation of orderliness, zoning does not integrate development but segregates activities. Segregated zones compel long distance movement in enormous masses.

The mass movement not only requires its own vast spaces. It is a force more despoiling than the "conflicting land uses" prevented by zoning: The dangers, noises, disruptions, ugliness and fumes of trains, buses and legions of automobiles have degenerated almost every part of the metropolis. The industrial and commercial backstopping, the parking wastelands, add their toll. A conspiracy couldn't have worked better.

Something closer to conspiracy is found in the motorcar's defeat of public transit; with costly subsidies the auto claims up to two-thirds of the most important parts of cities. Unlike transit, which focusses movement on strong urban centers, the automobile bleeds urban centers outward along strip-commercial boulevards, dispersing movement both radially and circumferentially. The Beltway around Washington, D. C. and Route 128 around Boston make those cities gigantic interchanges, more important for what goes on around them than within them.

But it is zoning, supported by subdivision controls, that sanctifies the degeneration. Residential zones overwhelmingly favor the largest possible consumption of land, a peculiar bid for "high standards" of amenity and privacy that denies both of *these* qualities in real human terms. An anti-zone amendment, planned unit development, amounts to a basic admission of failure. "High standards" of development based on land consumption systematically destroy the large open spaces people seek in moving to the suburbs, and simultaneously destroy the urbane qualities of life a city

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**Mr. Schneider,** an urban planner and consultant to the United Nations, wrote **Autokind vs. Mankind: An Analysis of Tyranny, A Proposal for Rebellion, A Plan for Reconstruction,** published in April 1971. He is also the author of **Destiny of Change: How Relevant Is Man in the Age of Development.**

should sustain. And this endless grasping for private minispaces pushes the outer reaches of one metropolis into those of another.

But today the crunch has become more profound. While zoning has sought to prevent a conflict of *land use* through rigid segregation, the very structure of the urban form produces a severe conflict of *urban processes* through a lack of functional integration.

A reckoning must come, of course. If the 70 million people who may inhabit the Eastern Megalopolis 50 years from now consume land at present rates (2,500 persons or less per square mile), they will occupy a solid block of land 400 miles long and 70 miles wide between Boston and Washington. And if present random patterns of development prevail, those 28,000 square miles—equal to 900 Manhattans—will become an unimaginable quagmire of human chaos.

It is frightening to contemplate this future. The lack of sufficient concentration in strong urban centers will produce wild patterns of movement in all directions, denying orderly transit and congesting even 12-lane turnpikes. Unclear municipal boundaries and irrational growth (even with stringent zoning) will make a nightmare of civic management. Even small urban-scale open spaces will be precious, and regional-scale open spaces will be virtually nonexistent.

The simplistic and very erroneous answer is that there are too many people for too little land. Here is one of the most dangerous myths of modernism, for there is a fatal self-fulfilling truth to it.

Even the environmentalists have not fully discovered that the central question is neither population nor land, but the consumptive relationship between them. If the population of Megalopolis were to grow very modestly to only 50 million, but if the average density dropped to 1,800 persons per square mile (already a fact in many developments), the consumption of land would virtually equal that projected for 70 million people. Paul Ehrlich at Stanford estimates that 75 million Americans make up an ecosystem equivalent to 3,700 million Indians, or nearly 50 *times more* burden on the environment.

It is the human capacity to exploit and disrupt the physical setting of life that is at issue, not the population as such. With present technologies, an American population of 50 million can be far more environmentally destructive than an enlightened population of 500 million. Canada, with one-tenth of the U.S. population, even now has nearly identical environmental problems.

No question is more pressing than the raw consumption of land. Fortunately we have many clues suggesting that the benefits of the environment increase precisely as the human intervention in nature is selective and concentrated. A modest intervention in nature is not only better ecologically, as the conservationists argue. It is also better functionally, as mass production and micro-miniaturization reveal. And the evidence indicates that it will be better socially. Therefore, provisionally at least, we may dismiss as a myth the "disease of high density," and put a stop to the environmental bloodletting occurring through the bleak tenement calculations that rule dense central development and the barrack formations that press the endless peripheral expansion.

**Principle of Urbanity and Open Space** Nowhere are the generous possibilities of the environment better demonstrated than in a principle which maximizes both urbanity and open space, probably the two most vital physical values of the urban environment. But today open spaces, especially large and varied natural areas, are all but lost under our traditional, consumptive approach to *land development*. Similarly, urbanity (defined here as a large variety of services, activities and interests close at hand) fails to appear—all the more, it seems, as cities have grown and their districts have become specialized and isolated.

Urbanity and open space are highly interdependent. Each may contribute substantially to the other, or may destroy or disrupt the other. Where urban development is dispersed at a low density, and urbanity is dissipated, meaningful open spaces are chopped up and therefore lost. A tyrrany of minispaces is the result. This is where modern man gets into his deepest trouble with the environment.

However, enlarging urbanity by compactly linking urban activities that can be designed to work together also improves the prospects of preserving open spaces more easily. Preserving large natural areas in the city encourages in return a high degree of urbanity. Quite simply, this means a concentration of the man-made urban environment. The high degree of urbanity widely credited to New York and San Francisco is very largely due to the limited amount of land available in those two cities. What occured accidentally should now be raised to a principle and improved by conscious design, even in small towns.

Furthermore, the homogeneous, thin spreading of dwellings clearly means insufferable dependence on the automobile. Commercial and public services are then located at concentrations of traffic, since there are no concentrations of people. The car's insatiable demand for urban space assures that the only trace of "urbanity" will be a five-acre shopping mall surrounded by 25 acres of blacktop, an "urbanity" further restricted only to buying and selling, and revealing the same consumptiveness as land "development".

By contrast, when urban development is concentrated, as even in small European towns, a strong urbanity appears—even though the town centers are often within a few hundred yards of open fields. Where the same population is spread onto five or ten times as much land, however, as in American agricultural towns, urbanity all but disappears. Although the lost land is unimportant in land-plentiful America, that land is debilitating when shaping the form of cities.

European towns thus demonstrate the vital mutuality between urbanity and open space—a first theorem of urban geometry.

**Principle of Efficiency** Another lesson, given by Henry Ford in his factory, is quite contrary to what his cars did in the cities. Originally, Ford's factory was zoned, like cities, according to the kind of function, i.e., the machines. Movement was interminable, taking 40 per cent of a worker's time and valuable building space. The road to mass production was a radical reduction of movement. In reality, the assembly line was but one of a number of steps intended to *reduce* movement in the factory and to integrate the whole production process.

Machines were first placed close together in a precise sequence of production and assembly. Each part was transferred effortlessly by slides and simple conveyors to the next step of production, ultimately to the main assembly line, creating an integrity of the whole production process, not each particular function. The distance a cylinder casting traveled was reduced from 4,000 feet to little more than 300 feet. The Model T was soon assembled in one-tenth the time, and despite more than a doubling of wages and a soaring of profits, its price was reduced from $950 to $360 in seven years.

Ford's principle illustrates the vital necessity of creating an organic process for cities—raising urban efficiency by articulating concentrations of activity and by radically reducing the need to move. Like Ford's factory, a city can perform enormously better than the sum of its parts.

Let no one think the possibilities are marginal. Quite aside from environmental and social benefits—the savings in dollars, resources, and in man's time (the scarcest resource) can well exceed $100,000,000,000 annually, ten per cent of the gross national product. Excess automobility alone might account for as much, since the motor vehicle now commands more than 20 per cent of the labor force.

Here, in the efficiency principle, lies the second theorem of urban geometry.

We should be careful, of course, that our purpose is not merely to reduce the cost of a unit of production or service. The essential objective is the convenience and leisure attainable for the individual. The principle cannot be applied to

people as if they were factory workers. Exactly the reverse will be true where the basic efficiency of the human environment permits a person to do his chores of life in short order.

**Principle of Community** One of the most burdensome chores today is commuting, not only to work, but to scattered shops, offices, schools, parks, clubs, theaters, churches and even to visit friends. Yet what is lost even more tellingly than time, money and space is any semblance of social coherence.

If the great size and complexity of the modern metropolis are to be differentiated with a social validity, it is the living, interpersonal behavior of the individual that cries out most woefully for coherence. His daily activities are the most significant in the city, for he is the central and sole object of the city's existence. These activities must establish a unified whole for him, being interwoven with familiar faces, friendly chats, casual diversions, and a sense of meaningful participation in an ongoing community life.

The environment is the context of life, and only man is its measure. That context—its area, population, institutions, services—is necessarily local, respecting man's finite nature. All social and functional elements close to him must be relevant to him and constitute a whole for him, scaled and formed to respect him as a socially sensitive creature, organized to broaden his opportunities, and set to stimulate his social advancement. Without restricting a cosmopolitan role for him, a social focus and a foundation for personal identity can only be sustained within a setting having a high degree of urbanity close to home.

The third theorem of urban geometry is therefore the finite scale and social relevance to the individual of the man-made environment, a principle we may designate as community.

**Principle of Metropolitan Form** Fortunately, the three principles of urbanity and open space, efficiency and community can be united in a single physical design, establishing a unified locality as well as a functional unit of the metropolis. Being highly clustered at a scale to foster social integrity, these urban units may be called concentrated communities. Reston, Virginia and Vallingby near Stockholm approximate some of these features, including population limits of 10,000. Further evolution of the physical design, and institutional innovation, could make headway against the sullen dissociation and defensive privatism affecting modern man.

Moreover, as metropolitan building blocks, the concentrated communities are highly useful modular elements that can simultaneously expand variety in living styles and yet achieve more essential unity in metropolitan development. Perhaps the best demonstration is in transport. Each community itself is compact enough to avoid large formal means of internal transport. A distinctly human environment not plagued by machines is encouraged. Then on a metropolitan scale the communities make possible a rational pattern that can greatly improve the efficiency, flexibility and versatility of public transport (virtues we now attribute only to the automobile).

Indeed, a well-planned pattern of discrete communities makes possible a true "system" of transport. Service along one line is far more efficient than service along many lines over an extensive area. Service to a few strong points on a line is more efficient than service to many points.

A metropolis of concentrated communities has a pattern of prominent focal points accenting man's self-built environment while the broad expanses of open spaces between them emphasize man's respectful harmony with the natural environment. (Since distance is only a secondary consideration of modern urban transport, these open spaces do not weaken the basic urban cohesiveness.)

The fourth theorem of urban geometry, rounding out a set, is therefore the spatial form of metropolitan development providing a strong network of vigorous communities to maximize functional and environmental possibilities.

The thread running through all four principles is a multifaceted clustering, compact at the community level, and carefully spaced at the metropolitan level. Clustering man-made development also clusters open space. The essence of such clustering is that it simultaneously achieves a *high net density* and a *low gross density* of urban development. Against our tradition of urban dispersion, this is having the cake *and* eating it.

Today's most intensive form of clustering, however—the multistoried structure—is an anomaly. Built superbly with steel and concrete, swift elevators, excellent lighting, plumbing and air conditioning, the modern highrise nevertheless remains an abominably barren monument to the Establishment, planned by isolated initiative and calculated only for profit by the square foot. A broad public purpose is utterly impossible.

The basic failure of today's highrise structure is the failure *to use the third dimension as a principle to integrate urban activities.* While we now stack offices 100 levels in a single structure, we continue to put the burden of integrating urban activities on one level, the street.

We are now where Henry Ford was before he began to integrate the functional performance of many machines and processes. We have the technical capability but not the concepts or organization to improve both urban efficiency and environmental amenity.

Ironically, while the environment of productivity (the factory) has improved its efficiency by gargantuan leaps, an environment of wasteful consumption has been built which effectively nullifies much of the technological advance. Micro-efficiency is lost through macro-inefficiency. Technology has been the main culprit in that, too, first by establishing the increased capacities for man to consume excessively, then injecting into the setting of life a powerful factor of incompatibility, pollution and disorder, thus finally providing the incentive for individuals to escape and repeat the process elsewhere.

Therefore, no longer can we dwell on incompatible *land* uses produced by industry when a great part of the chaotic urban disarray is generated *precisely* by the distances and the very consumptiveness of the zoned and over-mobilized city. The argument for segregation of urban activities is patently invalid when three feet of wall or floor can be a better insulator, for all but the most dangerous industries, than 500 or 1,000 feet of zoning.

What stands before man today is the unheralded potential of a simple feature of existence: three-dimensional space. Although Henard, Wright and Le Corbusier pointed to some features of its potential, little came of their particular demonstrations. Moshe Safdie's Habitat in Montreal now widens the technical repertoire of urban space development. So do the engineering designs of Bucky Fuller (punctuated by his hearty comment: "Vertical is to live; horizontal is to die"). Air rights, underground plazas and factories, overwater structures and a wide range of transport proposals add considerable interest. The "access tree" analysis of the Regional Plan Association describes some specific principles.

Only one man, however, Paolo Soleri, has raised three-dimensional space to a central position of urban design. He is right—although not by the conventional wisdom—when he asserts, "In the three-dimensional city, man defines the human ecology. In it he is a country dweller and metropolitan man in one."

Soleri's insight highlights space as a major entity completely distinct from land. This distinction is fundamental if we are to build a more congenial earthly environment for man.

Historically, land has been conceived as the "resource" for the development of cities. This is only partly true, but it is reflected in the dispersed approach to *land* development. As long as the city remained small and uncomplicated it really did not matter greatly. But in the metropolis today the distinction between land and space is becoming critical. When land is conceived as the resource for urban development it is also

conceived as the medium that shapes urban form. Two-dimensional values then dominate, as do the block and street pattern. These features enforce a barracks-like organization of urban space, vertically as well as horizontally.

Land is two-dimensional, by and large, and it is useful mainly when it is flat and wholly exposed to the sun. Cities, however, only occupy land. What is important is the cubic space the land affords for the dynamic anatomy and physiology of urban life, not the land as such. Organic integration becomes possible only when the flat plain of land becomes a three-dimensional form of functional elements, each related to the others by numerous, clear and short connections, a reflection of what Ford did in his factory.

Before we can fully appreciate the difference between land and space, we must distinguish the unique features of space and assess its particular potential in citybuilding. The best way to describe the possibilities is through what might be called a monetary theory of urban space. To illustrate, a series of propositions based on an analogy to money and the economic system is set forth:

A. Urban Space is a created resource based on land—a natural resource—comparable to money, another created resource, which is based on property, goods, and services.

B. Space is the most common and inclusive medium of urban development—just as money is the most common and inclusive medium of economic development.

C. Three-dimensional space injects many possibilities into the static attributes of land to convert it into a dynamic urban system—just as money injects possibilities into inert property, goods and services to mobilize them into a highly productive system.

D. Numerous highly articulate institutional devices are required to promote the effective use of the third dimension of space in urban development — just as there are many elaborate and articulate institutions and techniques to maximize the use of money in economic development.

E. Special design techniques are required for the development of urban space—just as special financial methods are utilized for economic development.

F. Interlocking levels of initiative, design, and control are necessary to assure best overall urban space development—just as interlocking levels of control and initiative assure maximum economic development.

Although analogies cannot be pressed too far, there are further interesting parallels—"inflation," for example. As with money, inflation in urban space occurs when its supply increases out of proportion to its use *as a sound medium of development.* Similarly, as we see in cities as well as in the economy, inflation feeds upon itself and easily gets out of control. A reasonable public policy would control the supply of urban space to maintain the best use or value of the space. The quantity of space that should be available at any one time is directly related to specific needs according to carefully defined criteria. Merely increasing the supply endangers the value (or quality of development). Grady Clay used a similar term in a recent Forum article, suggesting that there has been a "run on the environment."

When our vision of citybuilding shifts from land to space and we apply the four principles described earlier, the superbuilding immediately comes to mind. Although there are only a few fragmentary and imperfect models of the superbuilding (also megastructure or omnibuilding), such as La Defense outside Paris and Rockefeller Center, the possibilities inherent in multi-use integration of urban activities at numerous levels hold an irresistible attractiveness.

The superbuilding is, of course, the epitome of clustering, and magnifies one of the most interesting and important possibilities of cities: The variety of possibilities in urban life increases as the clustering or compactness of population increases, at least *when the organization of the urban environment is highly sophisticated.*

The comparison some have made between the superbuilding and a great passenger liner would seem to reinforce the sense of claustrophobia many people experience in today's apartment dwellings. But while functionally the comparison may be valid, the superbuilding would be many times more spacious and have none of the confinement associated with a ship's hull. Indeed, unlike the real spacelessness and sterility of suburbia, the superbuilding would contain large and lively interior plazas and promenades linked directly with a wide range of large outdoor spaces.

Since the central objective of the superbuilding is to establish the man-made environment for the individual, I prefer to describe it as a *community space frame.* The principles of urbanity and open space, efficiency and community, each helping to create a social context for the individual, are the themes and the basis of organizing the space frame. Despite its being multi-use and serving as an important functional unit of the metropolis, its primary role is as a congenial and efficient social framework for most activities of the individual.

Although the community space frame may take many forms, we may consider the castle complex of St. Michel on an island by the coast of France as an appropriate image. Portions would extend into gardens, parks and playgrounds. Golf courses, lakes, woods, and probably some "farms" would lie close beyond. Large private and community verandas, verdant with planting, would look out to the open countryside or inward to the lively plazas or quiet squares. People would live above the "public functions"; the visceral functions would go below.

In regions without natural elevations, the space frames can both highlight and relieve the flatness. In mountains, they can settle into uninteresting depressions, creating small, level areas for public activities at mid-elevations, and either accent or mold into the higher terrain. Interestingly, they are well suited to occupy less desirable sites in quarries, gravel pits and swamps, thus preserving the "better" locations for human enjoyment.

What will make the community space frame both urbane and a good living environment is that more services and activities will be available to all people right in their home setting. More choices assure more freedom, especially when some seemingly contradictory things such as urbanity and open space can only be achieved by one and the same means: compact clustering of human activities shaped by creative design (not unlike the successful intensity and interaction of activities at Disneyland).

The chief hurdle in describing the space frame is purging shibboleths about apartment-house living and provoking new perspectives of old approaches to such matters as access, privacy, ownership, and even the idea of building. The space frame, for example, may be considered as two quite separate things, either of which can be modified over time: the frame itself, which may be publicly owned, and the interior buildable spaces, which may be privately owned and built to suit individual and family desires. Private ownership, as inviolate as ever, merely shifts from land to space, the proper medium of urban development.

In its organization, the community space frame will likely have three general tiers of activity—the public transport station, garage, utilities and industries at the bottom, not necessarily claiming any amenities of the natural environment; the most complex and important functions in the mid-tier, built as close to the external ground level as possible and with a selective claim to external sun; and the upper or residential tier claiming the optimum sun, light, air and view.

The central plaza, probably large enough to hold the community's entire population, will be the likely focal point of design. One or two grand promenades and a few interior streets will provide for horizontal movement. Five to ten banks of elevators will unify the entire space frame, as well as serve the transit station in the basement.

A community of about 7,500 persons is large enough to be functionally viable and socially

(*continued on page* 68)

# PINGUSSON'S LEGACY

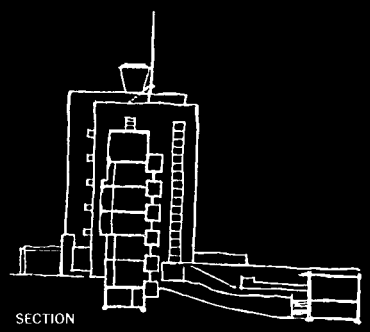
## The genius of a little-known French Modernist is revealed in his two key works

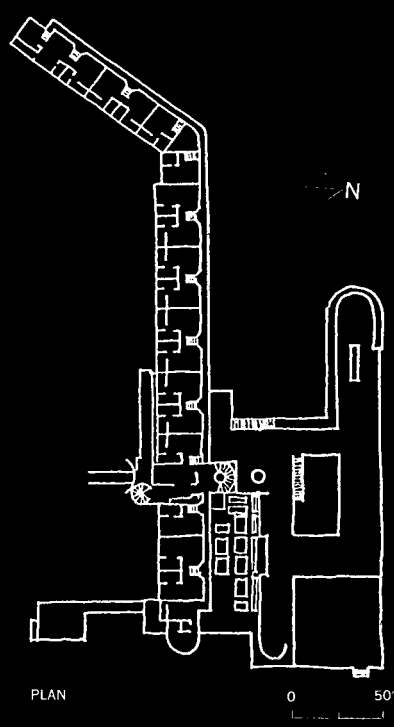
BY NORMAN PRESSMAN

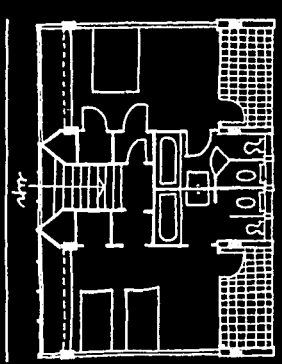
The history of modern architecture in France has often been characterized by a tenacious resistance to new ideas put up by reactionary forces. In spite of this tendency, France has produced a number of personalities who have greatly influenced architectural thought to this very day. Little need be said about such leading figures as Lurcat, Mallet-Stevens, Beaudouin, Lods, and Le Corbusier. But one man of comparable importance, Georges-Henri Pingusson, remains to be singled out.

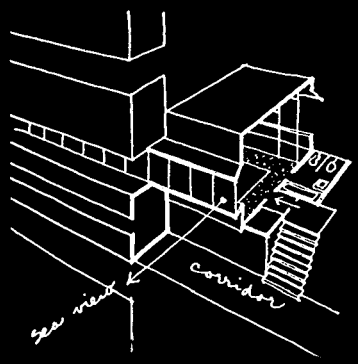
Pingusson was born at Clermont-Ferrand in 1894, and in 1913 received his engineering diploma from the Ecole Superieure de Mecanique et d'Electricite. After being active in the campaigns of the First World War, he returned to Paris, entered the Ecole des Beaux-Arts, and graduated from it in 1925. Only two years after leaving the school, he completed his first two architectural commissions: the Ghiberta Golf Club at Biarritz and the Casino-Hotel at Grau-au-Roi. He was an associate of Mallet-Stevens in 1938 when they worked together on the competitions for the Museum of Modern Art and the Bourget Airport, and he collaborated with Le Corbusier in 1952 on the master plan for Briey-en-Foret. He has been awarded many honors, including the gold medal of the "Cercle d'Etudes Architecturales", and was chief consulting architect and planner to the Ministry of Construction from 1946 until 1963, during which period he undertook the reconstruction of the Moselle region and the town of Sarre-

**Mr. Pressman** holds architectural degrees from McGill and Cornell. He has worked in England, France, Israel, and Canada, and is an assistant professor at Syracuse University.






TYPICAL ROOM PLANS

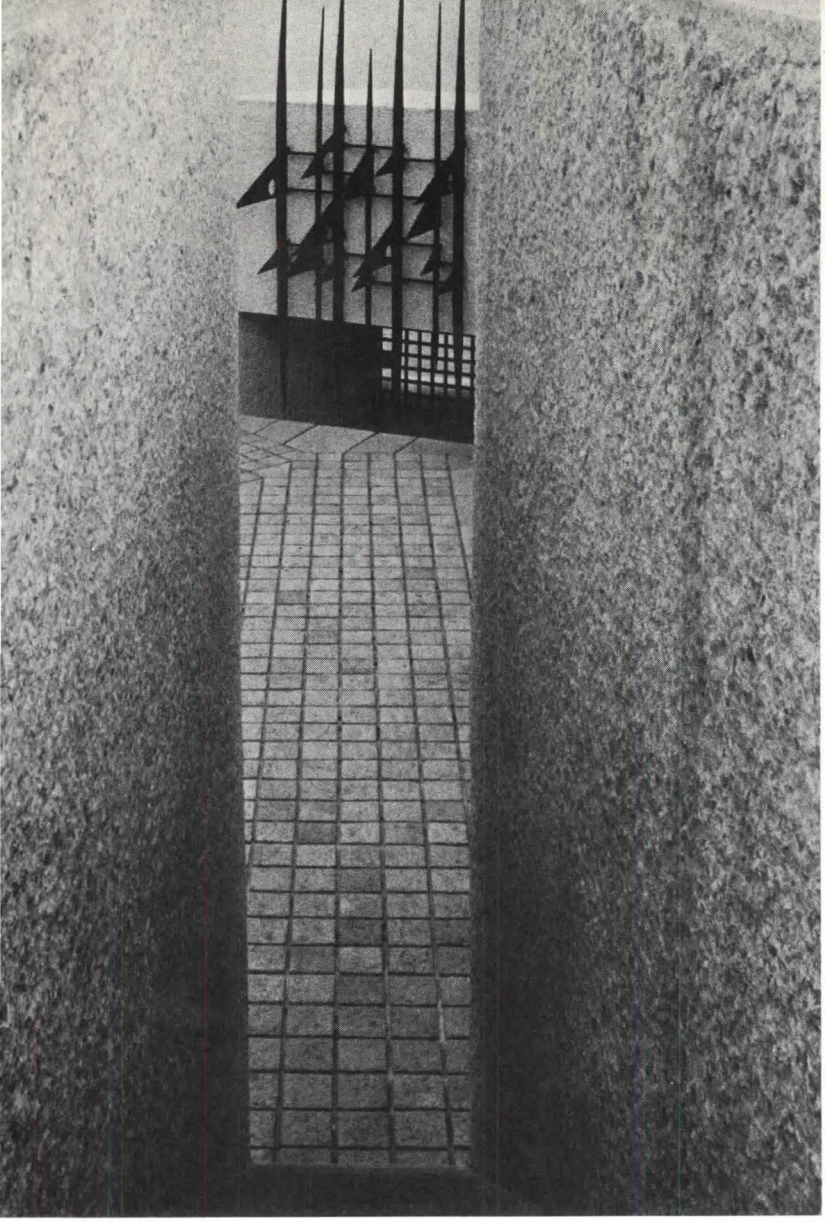
bruck. He is at present Professor and Chef d'Atelier at the Ecole des Beaux-Arts in Paris where he has taught since 1949. He has been on the editorial board of "l'Architecture d'Aujourd'hui" and has designed numerous cinemas, schools, churches and agricultural communes in addition to much recent large scale housing and urban work.

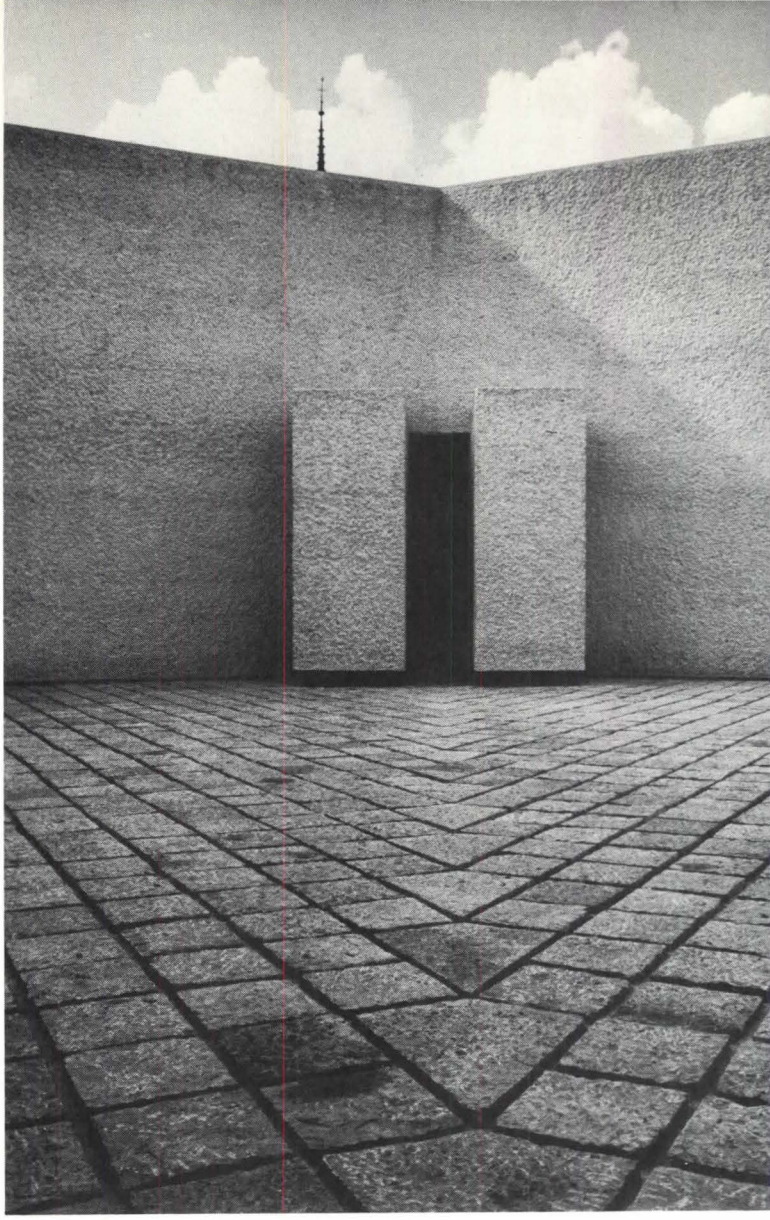
However, the two works for which he is probably best known are the Hotel Latitude 43 at St. Tropez on the Cote d'Azur, and his War Memorial to the French victims of Nazi concentration camps in Paris.

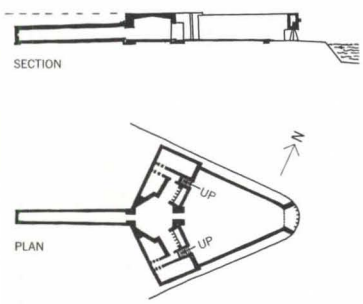
In 1933, in order to meet the increasing demand for accommodations on the French Riviera, Hotel Latitude 43 was completed at St. Tropez. It was to comprise 110 rooms, 90 of them with bath; a restaurant for 300 persons—200 inside and 100 on an outdoor patio; six bungalows; sports grounds; two seawater swimming pools; cabanas; eight boutiques; a bar-casino ballroom; three tennis courts, a reservoir, laundry, garage, chauffeurs' accommodations, farm and outbuildings. The architectural solution which was adopted owes its unique quality to the fact that St. Tropez is the only part of the French Mediterranean coast which faces north. All the mountain ranges may be seen across the bay — the Maures, the Esterel and the Alpes-Maritimes, while the lovely village of Ste. Maxime is reflected in the waters of the bay. Since these magnificent views are the principal attraction of the area, it was absolutely essential that the greatest possible number of rooms be exposed to them. On the other hand, the rooms and terraces also had to face south in order to benefit from the coastal sunshine. It was therefore decided that, as far as possible, each room should have both sun and view, as well as total privacy. Very few good solutions have been proposed for this baffling problem, the most remarkable probably being that offered by Pingusson in his hotel.

His scheme has since inspired many, but he was probably the first to have conceived a plan with an access corridor on a split-level to apartments or rooms facing in two opposite directions. The structure is of reinforced concrete, two rooms occupying three bays; one bay for each room, and an insulator bay with adjoining bathrooms, a staircase and two wardrobes. Such an arrangement has the advantage of forming an entrance sequence with two turns, giving the rooms unusual visual and acoustical privacy. The public areas are situated at the eastern end, to the north of, and under the main building, and under part of the terraces. The 45-degree crank in the plan at its western end forms an effective screen against the prevailing north-west mistral winds, so that the bungalow area and the main entrance on the southerly side are well protected.

Today the hotel has been remodelled into apartments. The site of the swimming pool and cabanas has been taken over by another building, thus having considerably weakened the original intention. Nevertheless, the solution of Hotel Latitude 43 will never lose its unique architectural quality. It is an imposing structure, and Pingusson has considered in every detail all of man's needs as dictated by the original program—rest, relaxation, visual stimulation and total enjoyment.







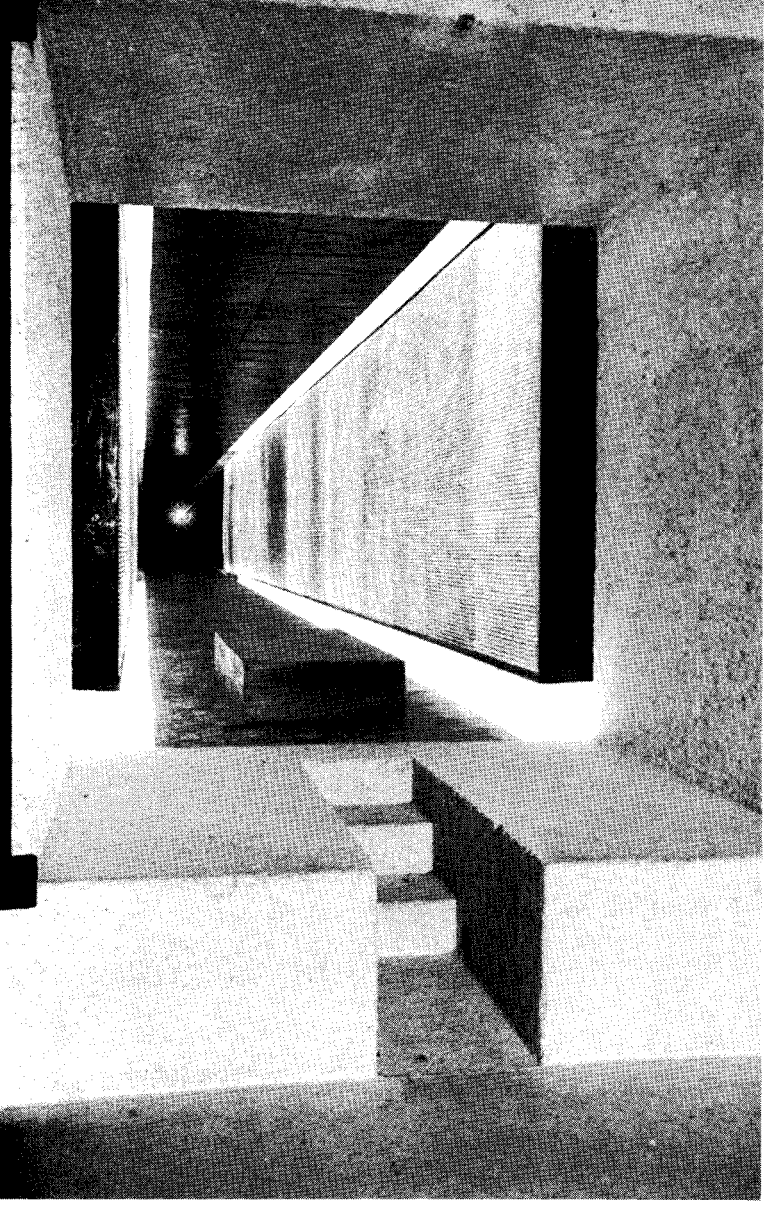

The second of Pingusson's two most significant works is of more recent vintage. It is his War Memorial in Paris, a monument dedicated in 1962 to the French victims of Nazi concentration camps. It exemplifies the ability of architecture not only to arouse but also to stir one's emotions dramatically. It is not a monument in the conventional sense of the word, but rather a crypt, a tomb, intended to evoke meditation and hommage. It does not really address itself to the collectivity but rather to the conscience of the individual. The site chosen was the eastern tip of the Ile de la Cite, directly behind the gardens of Notre-Dame. The problem was to design a "monument" adjacent to one of the great monuments of architectural history. The site was made available on condition that there be no structure visible above ground. The memorial was given the form of a sunken enclosure and then, leading from it, a crypt. The intentions of the designer are achieved in three stages:

*THE APPROACH* (Silence)—in which the walk through the gardens enables one to remove himself from the rhythm and bustle of the city and to experience serenity both within as well as around himself.

*THE DESCENT* (Alienation)—in which the descent into the sunken enclosure is accomplished by two flights of narrow, high-walled stairs, conveying an impression both of confinement in space and of isolation in time. During the course of the descent, the familiar cityscape of Paris slowly begins to disappear as one is hemmed-in by towering monolithic walls and one's eyes are drawn to the flowing Seine (seen only through the iron spikes of a sculptured portcullis). At the bottom of the stairs, one can see only water and sky. The city has entirely disappeared and an atmosphere of solitude and complete enclosure predominates.

*THE ARRIVAL* (Presence)—in which one perceives a narrow doorway leading into the hexagonal crypt, which is further emphasized by an illuminated gallery containing the Tomb of the Unknown Prisoner. At the end of the perspectived gallery shines a small light—a light which the 200,000 martyrs were never to see again, yet one that symbolized hope. One has arrived and has become witness to the events.

On each side of the rotunda-like crypt are lateral wings



forming cells in which urns containing the ashes of victims, brought from fifteen of the most notorious camps, are sealed into the walls. In each wing, one cell is left empty as a reminder of the brevity of each prisoner's passage through the cells of the camp. The concrete used is of a very dense, non-porous type, off-white in color. The walls are monolithic with non-visible joints to accentuate the prison-like quality. In this remembrance one is trapped in meditation and silence.

Through the means of architecture, Pingusson has essentially recreated for us the scene with which the martyrs were confronted. The emotional message which has been conveyed through the language of architecture is overpowering: the sunken paved area, like a prison yard, shut in by walls beyond which nothing can be seen but sky and a glimpse of river beyond a fearsome iron grille; and the narrow doorway into the crypt, whose reveals are shaped and surfaced like millstones to suggest their crushing power. Textures of stone and concrete, patterns of paving, transitions from light to dark, perspectives down the passages of the crypt adding to the emotional intensity and claustrophobic effect. In its brilliant exploitation of a most revered and difficult site, this memorial is perhaps the most dramatic and sensitive one the Second World War has produced to date.

Today, there is a great tendency to apply scientific methods to almost everything we do, and to attempt to put most matter into quantifiable terms. Yet, with respect to the architectural "act", this seems to call for some reservations. The move toward scientification perhaps implies a fundamental misunderstanding of the peculiar character of architecture's contribution, which derives essentially from a sensitive and personal decision, total and spontaneous, to which rational causes, however clear-cut, hardly ever provide a complete answer. Andre Wogensky* once said that, "Whatever the variety, diversity and precision of scientific knowledge which will one day be attained on the effect of environment upon man, the creative artist will alone be able to interpret and translate it into magnificent architecture. For it is only the creative artist who 'finds' the solution and ultimately 'knows' what has to be done."

Georges-Henri Pingusson is such a man. His ability to interpret human needs and to express them in architectural terms has not only moved us deeply, but also provided for our total joy, comfort, and understanding of life as experienced through the forms and spaces of architecture. His architecture is one of enchantment, one which leads to a deeper blossoming forth of the spirit, toward a richer conception of life; an architecture that can help us attain the realm of the poetic—the area which this art can bring to our lives and which is the most precious and wanting substance of our times.

*Andre Wogensky was the architect in charge of building the Unites d'Habitation when he was head of Le Corbusier's office.*

PHOTOGRAPHS: Pages 54-55, Richard Bouwens.

# TECHNOLOGY

## Multiple contracts, fastrack schedules and quick-step drawings change design and speed construction

Similar projects have stayed on the architect's drafting boards for as long as the $50-million North Central Bronx Hospital (NCBH) will take to build. If it remains on schedule, the 21-story city facility will be completed on budget and in only four years, from design contracts to occupancy in mid 1973.

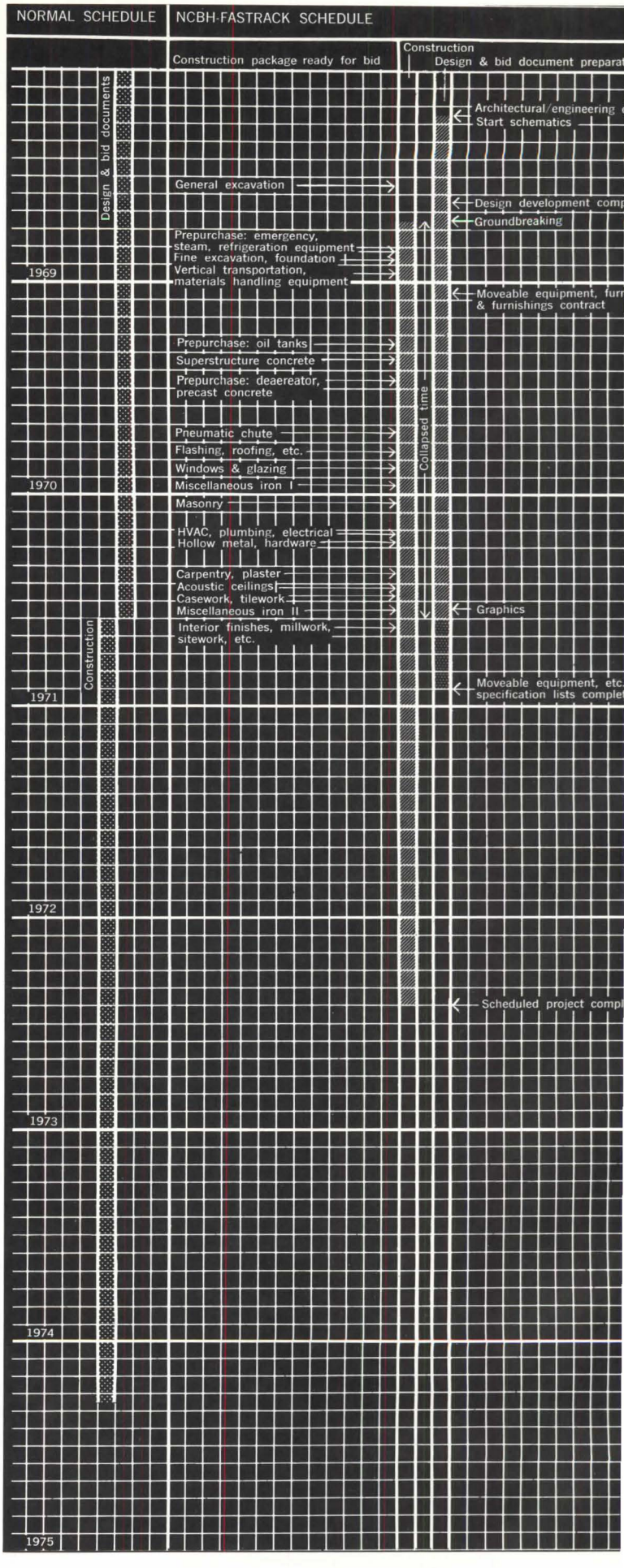
Behind this schedule is a system called multiple contracting; it isn't a new concept, but the time and money it promises to save assures that it will be used more and more often. The basic idea is to get in the ground and build — even before design is completed.

On NCBH, for example, the architects and engineers had to complete working drawings for the excavation before they had designed the building. They had to position columns before they had floor plans. In some cases, design development was abandoned temporarily while special bid documents were prepared, indicating quantity if not exact locations or details. All parties found themselves simultaneously working on early and late stages of varying parts of the project. Some subsystems were let as much as 18 months before conventional schedules.

The agency responsible for the fastrack scheduling and multiple contracting is New York State's Health and Mental Hygiene Facilities Improvement Corp. It is using the method on other projects, but NCBH is one of the earliest and largest.

The North Central Bronx Hospital will be a general hospital with 412 patient beds, plus extensive outpatient, clinic and mental health facilities. After construction, the city will reimburse the state and assume administration of the hospital. (The city now plans to affiliate with adjacent Montefiore Hospital—a voluntary institution—for medical and technical staffing, but NCBH is also designed to operate independently should the affiliation be terminated.)

To get a project of this scale moving, on budget and on schedule, the Corporation and its designers and builders have been constantly involved in meetings and learning on the job. The associated architects are Westermann / Miller / Associates, P.C.; Carl Pancaldo; and Schuman, Lichtenstein & Claman, with W/M's Peter Da Silva as project designer. The structural engi-



neer is Robert Rosenwasser and the mechanical and electrical engineer is Caretsky & Associates. The project manager is W. J. Barney Corp.

### The system

Multiple contracting replaces the conventional system of having a general contractor and multiple subcontractors. It calls for a construction manager, who is paid a fixed fee and who is brought onto the job early to head off trouble before it starts. He works with the architects, advising them on labor, material and construction decisions. He also coordinates the building trade contractors, who are all prime, not sub, contractors.

Under state law, the Corporation must let at least four contracts for any project it builds: general construction; plumbing; electrical; and heating, ventilating and air conditioning. With multiple contracting, as many prime contracts as there are trades on a job may be let—often 30 or 40 for a single project.

NCBH combines multiple contracting with fastrack scheduling. The design schedule is based on the order in which material and construction contracts can be awarded, so the architects simultaneously work on preliminary design, working drawings, construction supervision, furnishings, equipment and more—first preparing bid documents, then completing design details.

The process requires terrific coordination and, often, team organization; one man cannot oversee everything at once. Overtime may be required and additional staff. The architects at times found they were working an extra week per month in overtime. At one time they had 30 people assigned to the project; the mechanical engineers had 24; the structural engineer had 10.

This system also means that many decisions are made on the basis of time. Concrete required a shorter lead time than steel, so the hospital is concrete. Air rights take a long time to negotiate, so the architects did without. Drywall construction means that more trades can work in an area sooner, so the hospital has drywall interiors. "Construction costs go up one per cent each month or, on this project, $16,000 per day. If a decision to save $16,000 takes more than one day to make, it isn't worth it," says one of the project's architects.

Nor does fastrack scheduling leave time for lengthy dialogue between an owner and consultant. In this case, the city's Health and Hospital Corp. often had to cut through red tape and make a decision immediately, then go back and formulate the policy basis for it.

In scheduling, it is important to foresee contingencies such as trade vacation periods. Market activity can affect bid estimates. The architect must be involved more than ever in specifying and the total construction process.

### The project

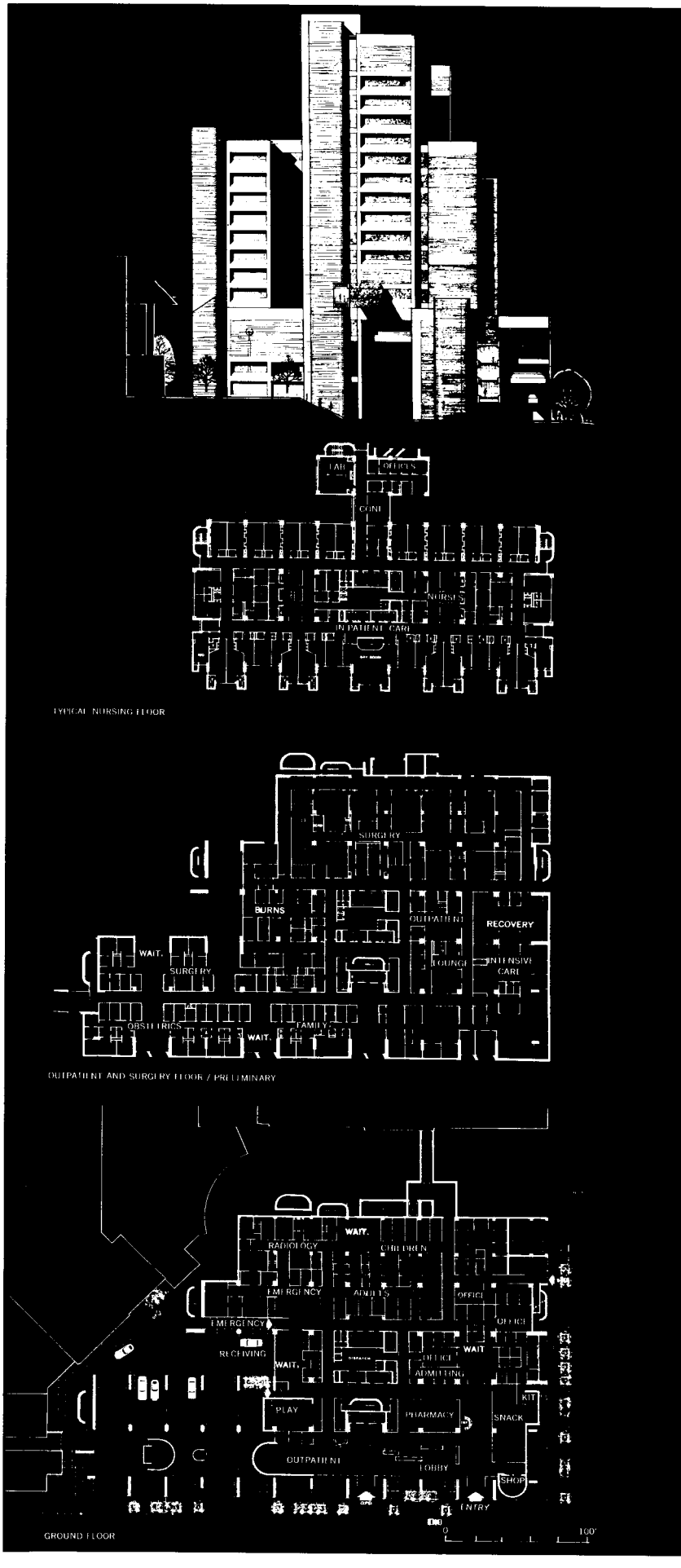
Space was at a premium in designing NCBH. The original site selected became too small when the building program was enlarged, so the architects sought to increase it. Buildings surround the site, air rights take too long to obtain, so the final solution calls for a buffer zone between Montefiore and NCBH. Portions of this land will be used for the new unit, but the unused portions revert to Montefiore. This also made the two related structures into a kind of superblock, which meant that setback regulations between the buildings could be eased. The architects were already into preliminary design and excavation drawings before the technicalities had been worked out.

Now almost one quarter completed in construction, NCBH has just topped out at 21 stories, with 18 of these above grade. Three underground floors house services, mechanical equipment and a kitchen. The first five levels above grade occupy the full site and contain a lobby, three floors of clinics (and surgery on the fourth level) and a mechanical floor, which serves the patient care areas on the next seven levels.

The top floors contain laboratories, classrooms, intern residences, a restaurant and, on top, a mechanical floor to handle these areas.

To the rear of the main building is a T-shaped office tower. Space was so tight on the nursing floors that the architects removed all peripheral functions to the tower, including doctor's offices.

The tower is connected to the



main building continuously. In addition, NCBH has bridge connections to Montefiore at several levels. (Plans call for the contractors to build these up to, but not into, Montefiore because it would be illegal actually to put state money into a private facility.)

Structurally, the new hospital is designed as a concrete building with brick infill. On the exterior, the precast concrete reflects the building's structural elements; the brick delineates stair towers, utility shafts, etc.

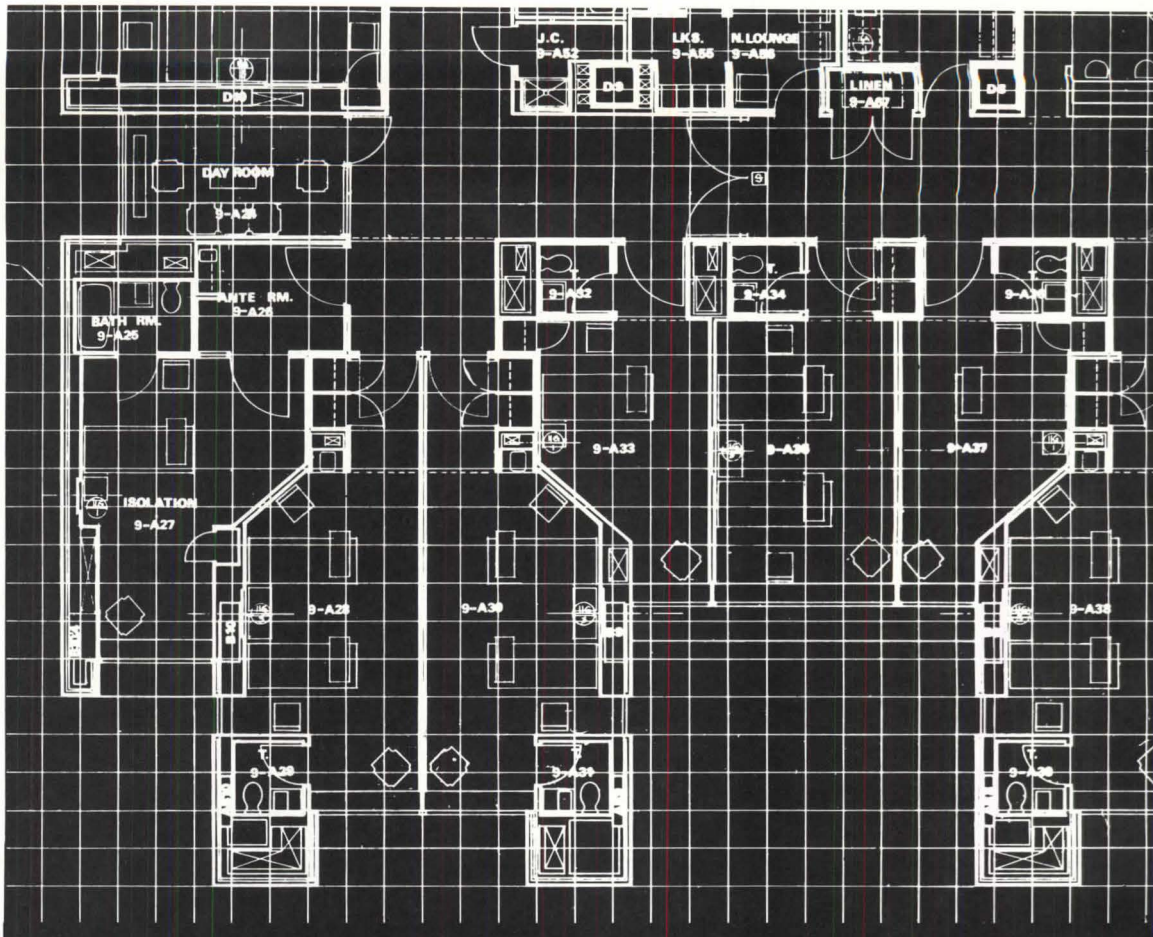
The building is of waffle-slab construction, with the pan sizes corresponding to 30-in. planning module, which is used throughout the building. The pans are deeper than normal to compensate for a wide-span column plan, which the architects wanted so that bathroom, core and other areas could be free of column interruptions. The columns are placed 25 ft. on centers the length of the building and range up to 37 ft. 6 in. on centers in the other direction.

### Modular discipline

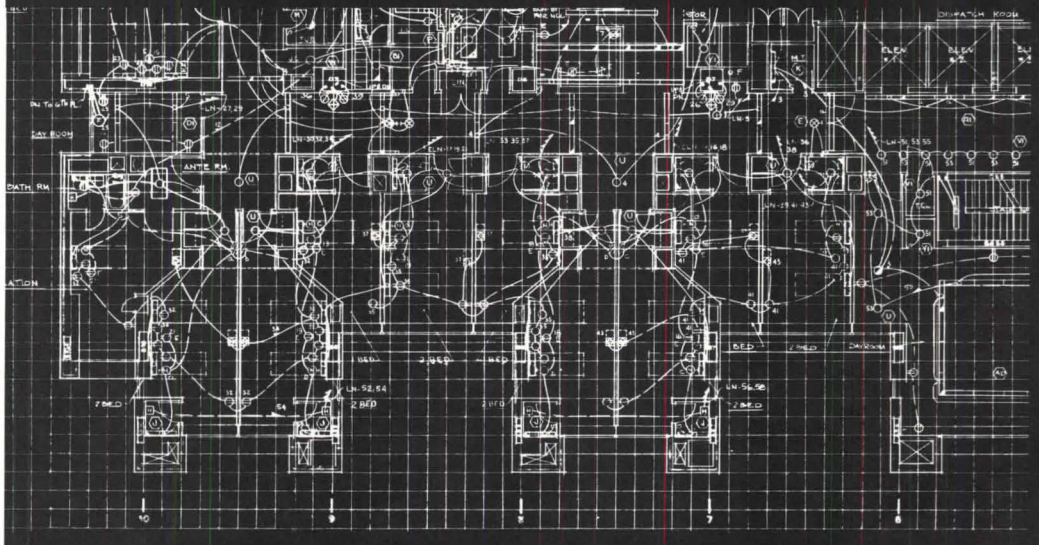
The architects chose the 30-in. module as the basis for the hospital plan, after using the same size grid successfully on an earlier medical project for Yale University. Specialists in hospital design, they have found this size grid particularly suitable for the dimensional requirements of hospital spaces. For example, an examination room measures about three by five modules (see plan); a doctor's office in the clinic measures four square, or four by six modules.

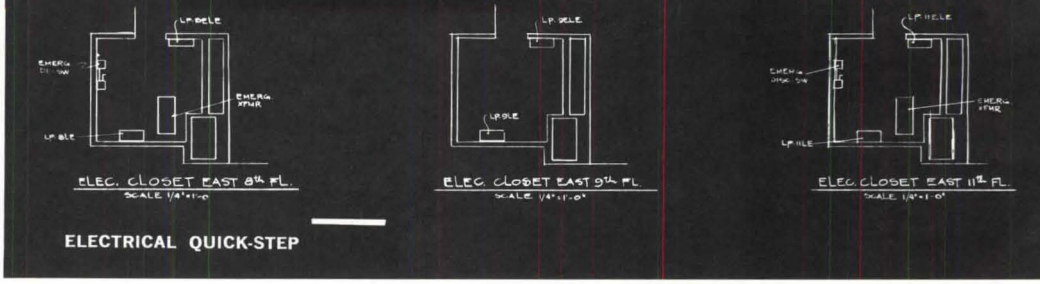
The modular approach enabled the architects to integrate structural and interior design throughout the design development process. It simplified room placement and size by imposing a strict geometric discipline on the architects: "The module made the compressed time schedule feasible for us," says Rich Miller. "As long as we maintained that structural discipline, we knew we could solve any architectural problem."

The grid also proved a drawing aid. Sheets were preprinted with the modular grid at ¼-in. scale, sepias were pulled and the architects were able to draw design development and equipment plans. By reprinting such drawings, the architects were able to save drawing times and




WORKING DRAWING






ELECTRICAL QUICK-STEP

*superimpose* more detailed plans on earlier drawings. Sepias of the equipment plans were also duplicated in sepia and used for the reflected lighting ceiling plans. These were reprinted on mylar for the final drawings.

Such drawing economies saved staff, time and money, plus printing bills, which nonetheless ran about ten times the normal cost because of the successive stages of development that had to be documented and integrated. Also, government requirements on bid documents call for many copies of each sheet.

In early 1970, after the column plans were finished, the architects started on final working drawings of the project, using the preprinted sheets. The first set of these drawings was issued for the precast concrete bids and then for each successive construction package.

### Bid packages

All prime contracts were publicly bid and all have come in close to, or on, estimate. The mechanical package came in at close to $29 million, less than 10 per cent over estimates made by the architects nine months ago. This was a significant test of the bid system, so the results were encouraging. The total of all bids is well within the established project budget.

The schedule calls for the architects to submit their estimates to the client in stages. Once the estimate is approved, the architects and engineers must prepare the proper bid documents, often before final design is complete. (As an example, the superstructure was under construction before either lighting or mechanical requirements were final.)

The system of preprinting, reprinting and overlaying successive drawings allowed the architects, engineers and contractors to adopt what they call "Quick-Step Drawings," which cut months from a conventional bid schedule. Normally, bids could not be taken without completed working drawings and specifications; Quick-Step drawings are reasonably accurate in terms of quantity, but not exact locations or details.

The mechanical engineers first developed the system. When bid time approached, they stopped their design work and pulled sepias of their most current drawings and freehanded on enough additional information for the contractor to bid. These drawings could be produced in weeks instead of months; then the engineers could return to their original drawings and design work. Minor contract adjustments are made after final drawings are completed.

The architects also learned the Quick-Step, freehanding some new design information or detailing only one of a series of identical rooms or spaces. The architects, engineers and contractors also learned to measure by the preprinted modules, eliminating the need to calculate exact dimensions for each drawing.

Although still on the job, the architects are beginning to have some hindsight on the NCBH experience. While a bit breathless, they are confident they are now in the forefront of what will be a "revolution" in the practice of architecture. In their own practice, they plan to become more involved in research into construction methods and material availability, so this can be fed back into the design process early.

The past months have been filled with trial and error, but most of the changes the architects would make are refinements. They will advise clients carefully before agreeing to a fastrack schedule. In this case, they had a highly skilled client, often represented by architects, and this can make the difference between success and failure on this kind of project. "This method of construction is not for the timid or ignorant client," says Rich Miller knowingly. "Courage and understanding of the building process are necessary."

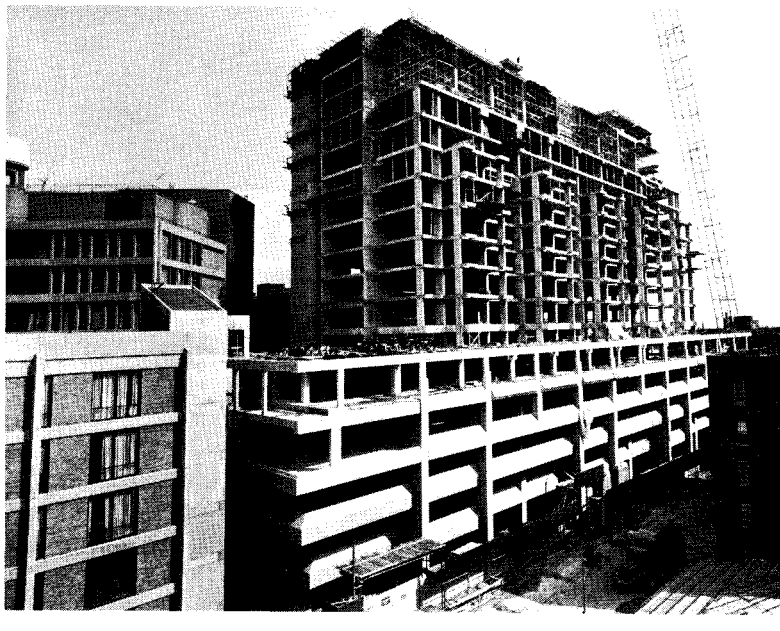
**FACTS AND FIGURES**

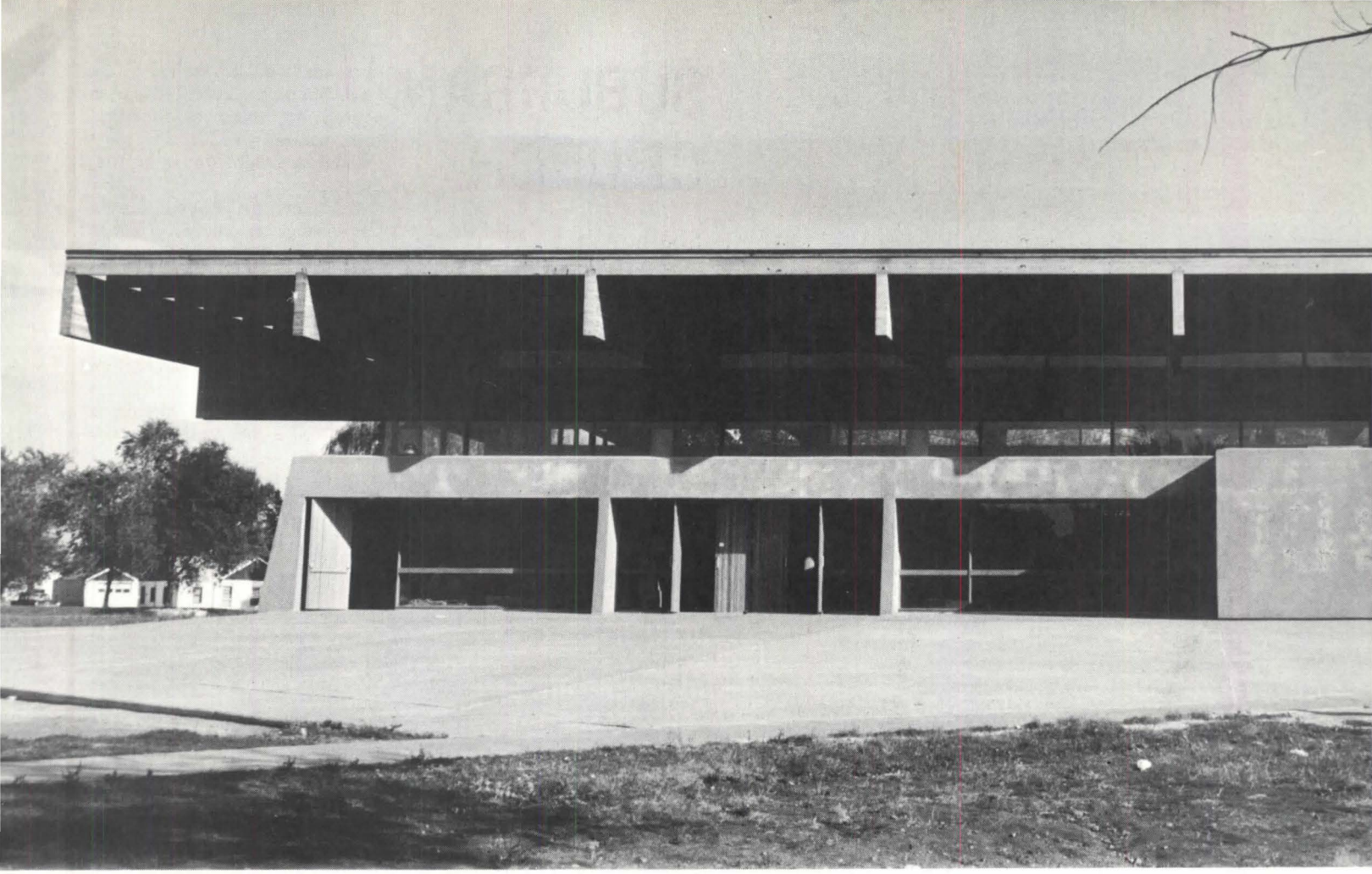
North Central Bronx Hospital, Bronx, N. Y. Owner: Health Services Administration, City of New York. Design and construction agency: Health and Mental Hygiene Facilities Improvement Corp. for H.F.A., State of New York. Associated architects: Westermann/Miller/Associates, P.C.; Carl Pancaldo; Schuman, Lichtenstein & Claman (project designer: W/M's Peter Da Silva). Engineers: Robert Rosenwasser (structural); Caretsky & Associates (mechanical and electrical). Construction manager: W. J. Barney Corp. Estimators: Amos Construction Co. Building area: 705,000 sq. ft. Construction budget: $50.7 million (including furnishings and equipment).
PHOTOGRAPHS: H. Bernstein

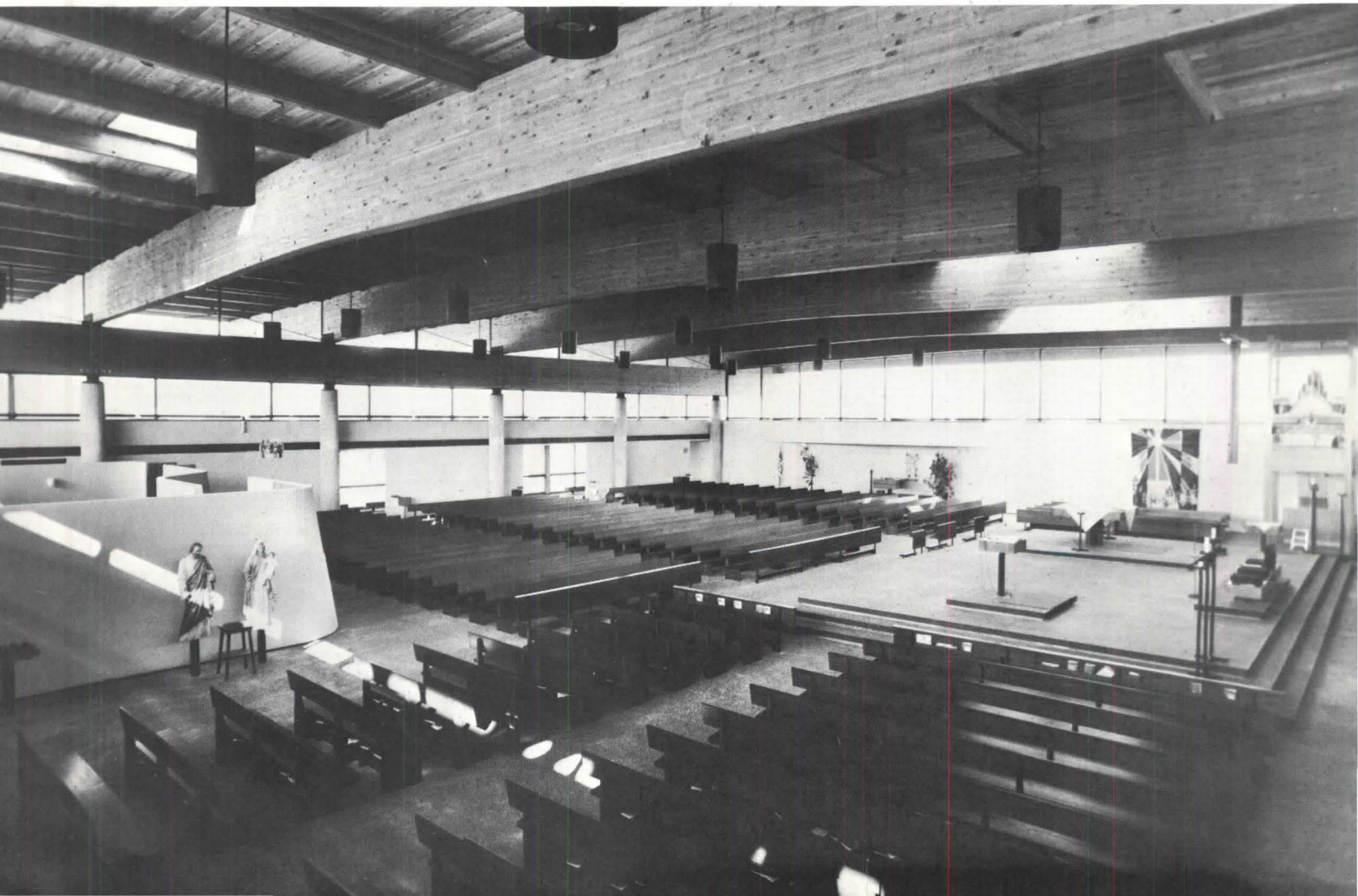
MAY 1970

SEPTEMBER 1970

MAY 1971



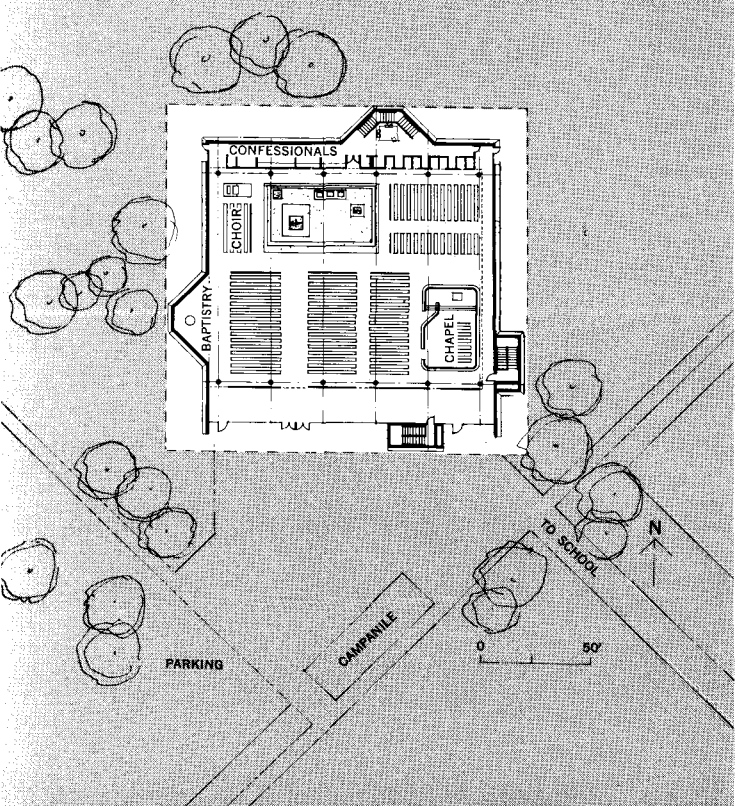




# SUBURBAN CHURCH

## Sparing in architectural means and in budget, this church brings strong form to its suburban neighborhood

The small Catholic parish church in St. Paul Park, Minn., has asymmetric seating for 1,000 around a skylit altar. A small chapel to the right of the main entrance is partially enclosed by the same kind of low wall that encloses the larger space. The independent roof unifies the space.




In a small suburb south of St. Paul, Minn., a flat-roofed parish church of strong architectural form has been added to a quiet residential neighborhood of Middle America.

Designed by Ralph Rapson and Associates, the St. Thomas Aquinas Church relies for architectural effect on its vast interior space, and on the direct expression of its structural system. Departing from the usual soaring form that is the stereotyped image for a religious building, the Rapson church is architecture of directness and simplicity—and economy.

The architect was charged with providing the maximum space for the least amount of money. More specifically, the church wanted 1,000 seats, plus a small chapel, confessionals, working sacristy, priest and choir sacristies, and a small office. The site is a flat corner lot adjacent to the existing church school, priest's residence and nun's residence.

Because of a limitation against heavy loading on an existing basement foundation, the design employs an independent roof structure supported on concrete columns 23 ft. on center. These support two double transverse laminated wood beams, upon which rest secondary beams (also of laminated wood) 155 ft. long. Wood purlins and wood decking complete the framing. The exterior wall is nonloadbearing, and is an economical steel stud cavity construction covered on all exposed surfaces with a rough stucco. Above the stucco is a continuous glazed surface separating the low wall structure from the high roof structure. Viewed from the exterior (left top) the facade thus reads as a low building with solid walls; the scale is inoffensive to the surrounding neighborhood of single-family homes. Viewed from the interior (left bottom), the space is impressive with the massive roof unifying all elements within the space.

"An attempt has been made," says the architect, "to make evident the separate elements of worship within the unity of the nave space." Because visual privacy and serenity were desired in the sacramental chapel, it is enclosed by a stucco wall of the same height and construction as the wall enclosing the entire main floor.

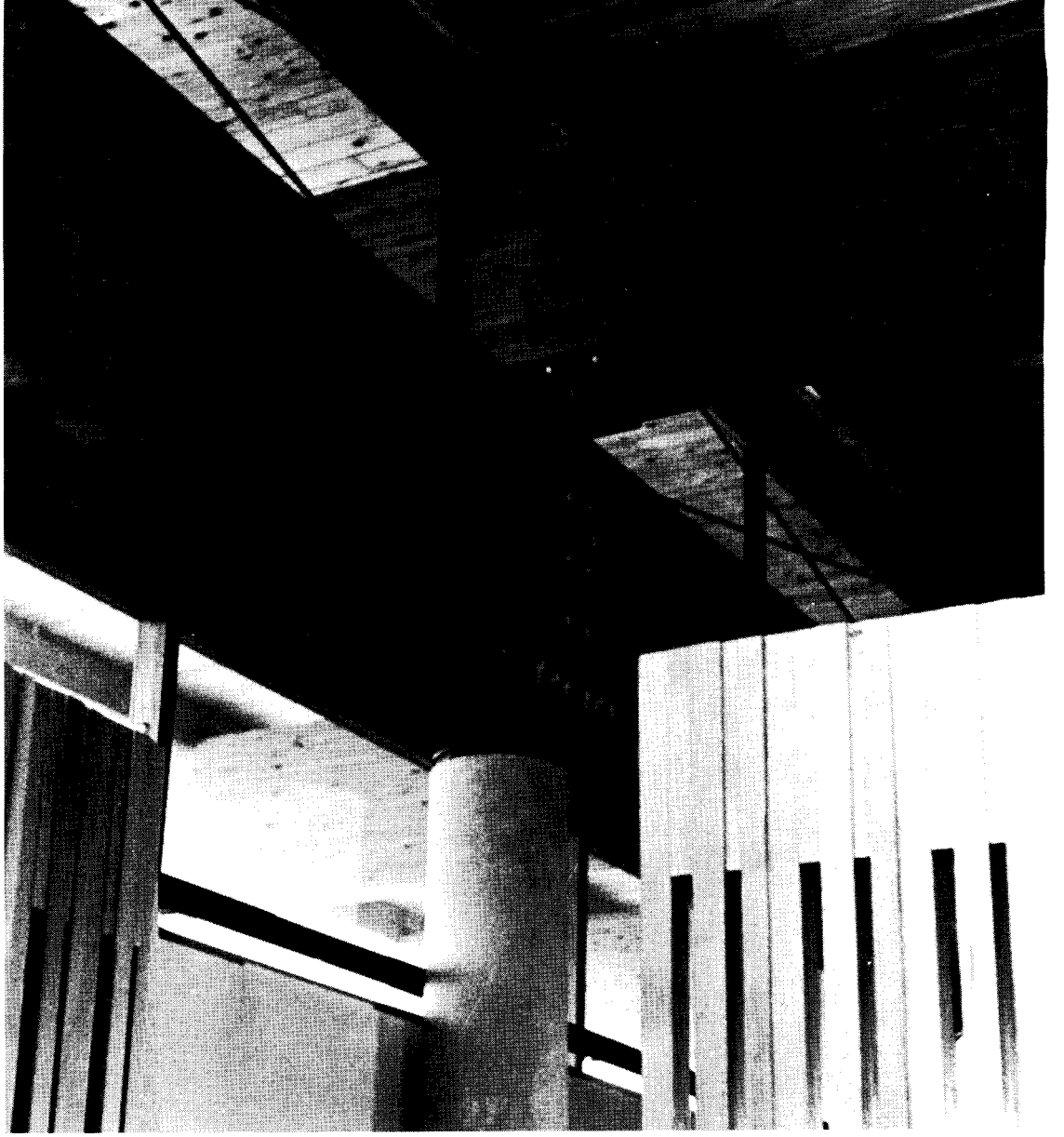
Top: The massive roof floats over everything. The roof system rests on two rows of columns, 23 ft. on center and 24 in. in diameter. Two double transverse beams are supported on these, and in turn support secondary beams 155 ft. long. The framing is completed by wood purlins and wood decking. Bottom: A small chapel is carved out of the large nave. The chapel is enclosed by the same kind of economical wall that surrounds the building—stucco over a steel cavity wall frame.

**FACTS AND FIGURES**

St. Thomas Aquinas Church, St. Paul Park, Minn. Architect: Ralph Rapson and Associates, Inc. (Richard B. Morrill, associate in charge; James C. Oliver, job captain). Engineers: Levin and Bredow, Inc. (structural); Environmental Engineers, Inc. (mechanical/electrical). Other consultants: Robert F. Lambert (acoustical engineer). Building area: 17,316 sq. ft. (main floor) 34,632 sq. ft. (total). Construction cost: $380,000 (excluding land, furnishings and fees).

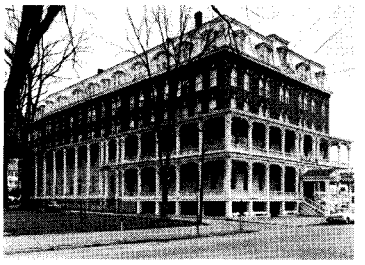
(For a listing of key products used in this building, see p. 74.)

PHOTOGRAPHS: Richard A. Riggle.

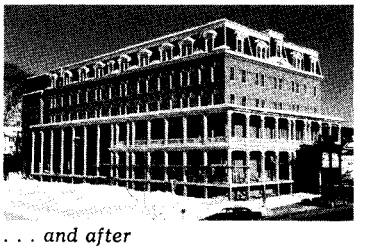


# FORUM

(*continued from page 21*)



*Pavilion, before . . .*



*. . . and after*

But, said the Pizzagalli Construction Co., it was cheaper to tear it down and build it over again, just as before, except for a new steel frame. This would result in a saving of $870,000 over the lease period. That sounded good to the politicians. The contract was signed, and demolition was begun.

Then, the legislature had a better idea. They would buy the new building, thus eliminating all that high-cost lease money. Purchase price: $2.7 million, or, what it would have cost them to restore it.

So that no one would later be confused by what they'd done, the Pizzagalli people positioned a specially-designed camera in a window across the street. It was programmed to take, automatically, four pictures of the action each day. The whole sleight-of-hand took a little over a year, and the new-old Pavilion was completed eight months ahead of schedule.

One copy of the film now resides with the Vermont Historical Society in their offices in the new Pavilion; another copy is available to schools, church and civic groups with a high tolerance for life-like replicas, a la Madame Tussaud's.

# ENVIRONMENT

### LICENSES TO POLLUTE?

In April, the U. S. Army Corps of Engineers began implementing the new Refuse Act Permit Program of the Environmental Protection Agency (EPA).

The Refuse Act was passed in 1899 and forbids discharges into any navigable waters and their tributaries without a permit from the Corps. The act, recently rediscovered, is the private citizen's strongest weapon against polluters. It provides financing for enforcement by granting one-half the fines imposed to the individual or group bringing an action resulting in conviction.

The Refuse Act Permit Program is the government's attempt to regulate the procedure by which the Corps grants permits. About 40,000 facilities throughout the U. S. must file applications with state environmental agencies by July 1, describing the effluent they are discharging into rivers, lakes and streams. After review by the state agency, the EPA and the Corps, the Corps would issue permits if the effluents meet current water-quality standards.

Not good enough, say a number of environmental action groups. Richard L. Ottinger, former U. S. Representative from New York and an organizer of Grassroots, Inc.: "There should be no governmental licensing of polluters at all—ever—for any reason."

Businessmen for the Public Interest, a Chicago-based urban-affairs action group, has brought suit against the EPA and the Corps seeking to enjoin them from issuing permits to industries discharging wastes into Lake Michigan. The suit asserts that state water quality standards are not uniform nor strict enough in many cases and that no enforceable standards exist for many wastes. They would require polluters to install at the earliest date "the best available technology" to reduce or eliminate pollution before a permit could be granted.

One fear of environmentalists is that the agencies involved cannot be trusted to talk to one another. Example: the EPA, which has been trying to stop waste disposal into Long Island Sound, held an "enforcement conference" in April in New Haven, Conn. During the hearings, they were "dismayed" to learn that the Corps had been routinely issuing a permit every three months for 18 years to the Charles Pfizer Chemical Co. to dump "fermentation liquors"—a residue from the production of penicillin—into the Sound. And in those years the Corps had not checked to determine if the waste was toxic. And would they have known if they had checked?

# SCULPTURE

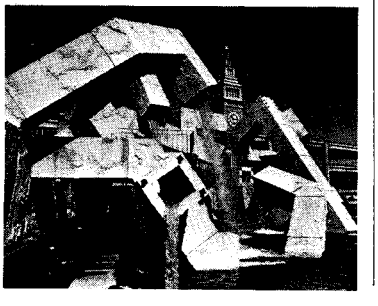
### FOUNTAIN HEATS UP

"Not everybody will understand my work, but no one will be indifferent," said Sculptor Armand Vaillancourt of Montreal about his newly christened Embarcadero Plaza Fountain in San Francisco:

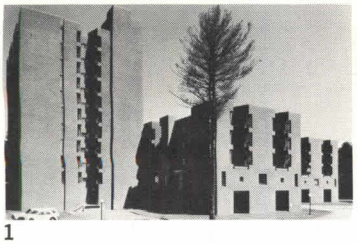
"Please get into it, dig it or despise it. . . . We dedicate it to the people," was the invocation of Landscape Architect Lawrence Halprin, a member of the jury which selected the Vaillancourt design, and chairman of Joint Venture Architects (designers of the plaza); ". . . a most impressive piece of urban statuary" said Robert Hughes in *Time* magazine; "A fountain deposited by a concrete dog with square intestines," said one anonymous viewer; "leprous . . . phantasmagorially frightful . . . a dishonest lie," said the never indifferent Allan Temko, architecture critic, in *San Francisco* magazine; and one speechless local simply drove his pick-up truck into it, knocking off chunks of concrete.

"It's when good works are launched without the hissing and booing of the little ones that I grow uneasy," said M. Justin Herman, executive director of the San Francisco Redevelopment Agency, who was master of the christening ceremonies. The "big ones" who joined him that day in praise of the fountain included the rock group Funky Fusion (formerly AUM); the International Longshoremen's and Warehousemen's Union Drill Team; The Villains, a barbershop quartet; the Hot Tuna; and Thomas P. F. Hoving, director of New York's Metropolitan Museum of Art.

*Vaillancourt fountain*



PHOTOGRAPHS: Page 20, courtesy National Trust for Historic Preservation (top left); Allan Dean Walker (left center). Page 21, Historic American Engineering Record photo by William Edmund Barrett (left center); Ed Nowak (right center, above). Page 63, Jeremiah O. Bragstad (bottom right). Page 64, David Attie (bottom center).



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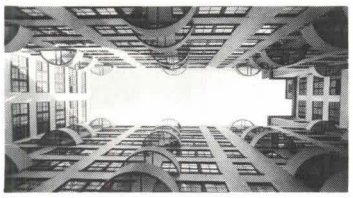

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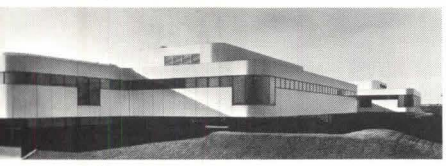

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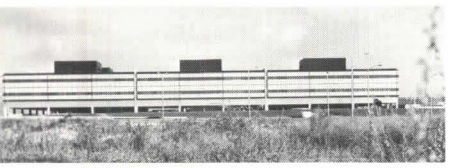

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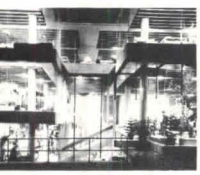

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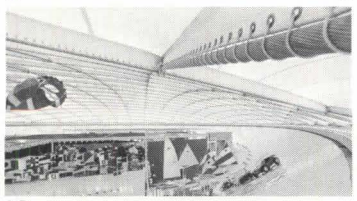


10 Crow Island School

# AWARDS

**BEST IN THE U. S.**

The AIA Honor Awards, the nation's highest establishment recognition of architectural excellence, were announced last month.

The jury was struck by the lack of quantity and quality in the fields of education, housing and urban design. They commented that the elimination of constraints such as antiquated bureaucratic procedures, codes, etc. would enable architects to produce vastly better work in housing design.

One parting shot: "This year 1971, in China, is the year of the 'Pig'; the year 1971, in American Architecture, is still the year of the '45-Degree Shed Gable.'"

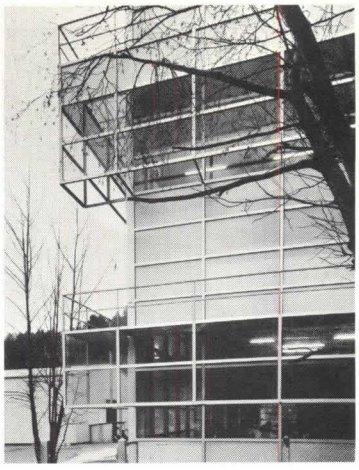
The winners are:

1. Christensen Hall, Univ. of N. H., Ulrich Franzen, architect.
2. Florence Hollis Hand Chapel, Mount Vernon College, Wash., D. C., Hartman-Cox, architects. (Mar. '71 issue)
3. Church of Our Divine Savior, Chico, California; Quinn & Oda, architects.
4. The Children's Hospital Medical Center, Boston, Mass.; The Architects Collaborative Inc. (May '68 issue)
5. Westbeth Artists Housing, New York, N. Y.; Richard Meier, architect. (Oct. '70 issue)
6. Estee Lauder Laboratories, Melville, N. Y.; Davis, Brody & Associates and Richard Dattner & Assocs., architects. (Apr. '70 and Mar. '71 issues)
7. Avco Everett Research Laboratory, Everett, Mass.; Peirce & Pierce, architects. (June '70 issue)
8. Design/Research Building, Cambridge, Mass.; Benjamin Thompson & Associates, Inc., architects. (Mar. '70 issue)
9. North Carolina National Bank Branch, Charlotte, N. C.; Wolf Associates, architects.
10. U. S. Pavilion, Japan World Exposition, Osaka, Japan; Davis, Brody, Chermayeff, Geismar, DeHarak Associates, architects. (Dec. '69, Oct. '68, Apr. '70, Sept. '70 issues)

The AIA 25 Year Award (given in recognition of architectural design of enduring significance, and restricted to structures at least 25 years old) will be given to Crow Island School, Winnetka, Ill. (May '43 issue). The architects were Perkins, Wheeler & Will (now Perkins and Will Corp.) and Eliel and Eero Saarinen. This award has been presented only once previously (to Rockefeller Center).

**REYNOLDS . . .**

The 1971 R. S. Reynolds Memorial Award, which carries with it a prize of $25,000, was won last month by Prof. Walter W. Custer of Zurich and his partners, Fred Hochstrasser and Hans Bleiker, both of Ulm, West



*Reynolds Award Winner*

Germany, for their machine factory in the Swiss village of Wattwil, near Zurich. The factory is part of a planned complex of buildings being constructed for Heberlein & Co. AG.

The Reynolds Award has been given each year since 1957 for "distinguished design in which significant use is made of aluminum." The Heberlein factory is a glass and anodized aluminum curtain wall building. Aluminum sandwich panels are used at the corners and the lowest segments of the curtain wall. A cantilevered sunscreen, which doubles as a maintenance platform and fire exit, is of shaded glass and aluminum.

# PEOPLE

**DIED**

Alexey Brodovitch was, quite possibly, one of the most influential American graphic artists and art directors of the past 50 years or so. When he died on April 15th, near Avignon, in France, at the age of 76, only those who were fortunate to have known and admired him recalled his name and recorded the event. Yet he had been

*Alexey Brodovitch*

the teacher of the best American photographers working today; the inspired art director of Harper's Bazaar when Carmel Snow was its editor; the author/photographer of the best book on the ballet published in a very long time; the art director of the short-lived magazine, PORTFOLIO, which, in the 1950's, developed almost all the new graphic techniques off which today's *avant garde* magazines continue to feed; and a brilliant designer of everything from furniture to type faces. He was a slight and seemingly gentle man; but he had once been a cavalry officer in the Czarist Guards, and the toughness that he required in those years stood him in fairly good stead when he had to confront the American publishing and advertising jungle. He was a dear friend to some of us on this magazine—a man whose nobility and integrity will not be easy to match.

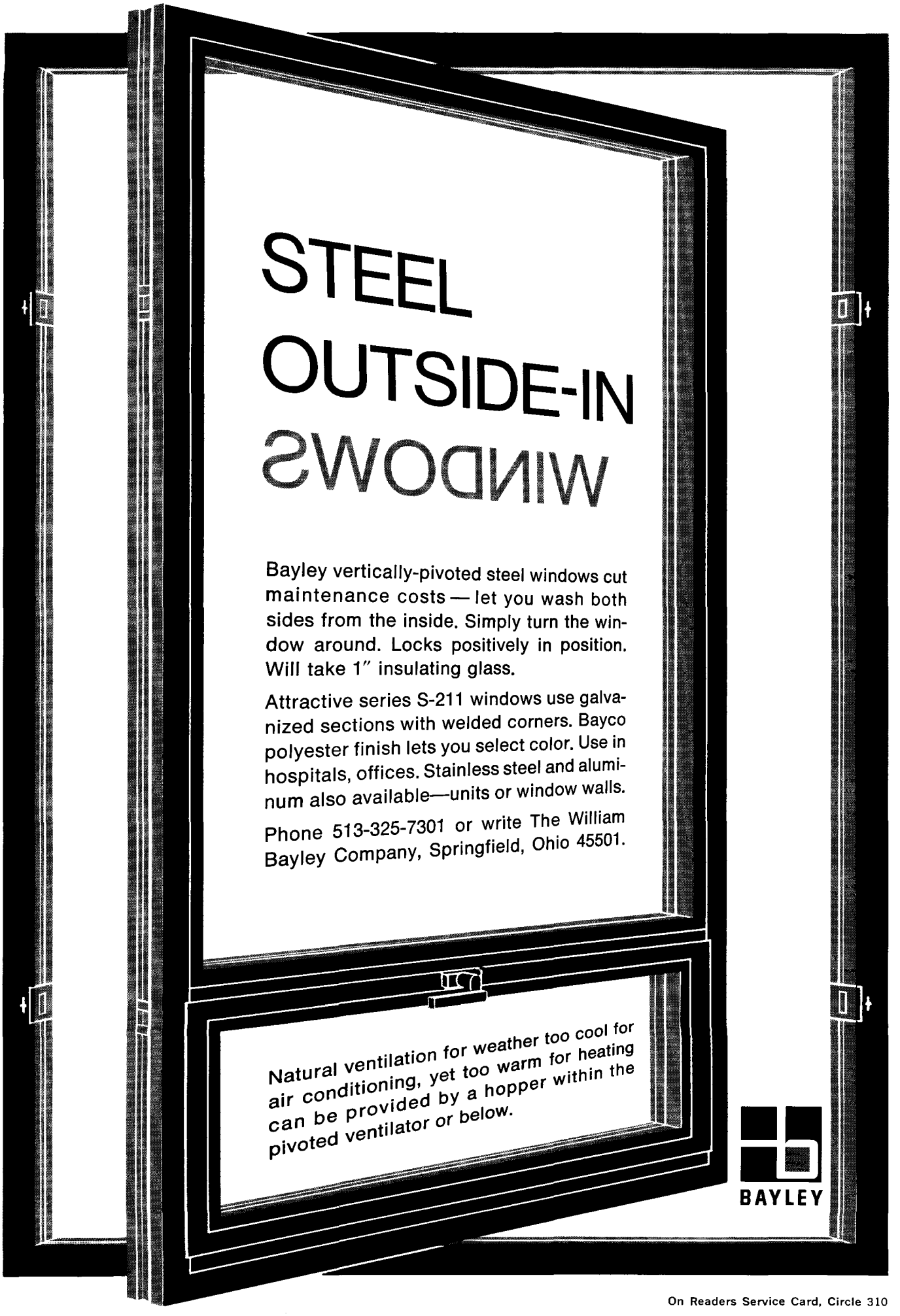
- Architect Ben Schlanger, a specialist in theater design, died last month in Manhattan.

Many major theater projects called in Schlanger to consult on seating and sight lines, a specialty he had elevated to a science. These included the General Assembly Building of the U. N. and Lincoln Center for the Performing Arts in Manhattan, the Place des Arts in Montreal, the John F. Kennedy Center in Washington, and the Sydney Opera House.

His design—with Abraham W. Geller—of Cinema I and Cinema II, two movie theaters in one building in New York (Sept. '62 issue) won him a citation of the city's Municipal Art Society. Among the notable theater restorations for which he was largely responsible was the conversion of a baroque movie palace into Powell Hall for the St. Louis Symphony Orchestra (May '68 issue).

- John W. Lawrence, FAIA, dean of the Tulane University School of Architecture, died April 20 in New Orleans.

A partner in the firm of Lawrence and Saunders, he was an urban planning specialist and consultant on projects around the world. And in his work on the Vieux Carre Commission and for many years as principal investigator and administrator for the Vieux Carre Survey, he was an outspoken advocate for the preservation of the historic character of his own city.

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# URBAN SPACE

(*continued from page* 51)

varied, yet not anonymous. Size may vary, of course. Although we may allocate, say, only one square mile to the community, or one-third of the average amount of land now going into suburban development for such a population, the community space frame itself may occupy only about 30 acres, or less than five per cent of the land.

This allocation is based on liberal urban space calculations indicating a net cubic demand of 18 acres built ten stories high. Adding 12 acres and building some portions of the space frame to 20 stories assure ample space for interior plazas, squares and flexible design. Available land easily permits a lower, wider structure, but internal distances and access between the main internal and external activities begin to be stretched if the most efficient form of movement—walking—is to remain primary within the space frame.

The enormous possibilities of the space frame become evident if the population density were to approach that of Manhattan, or up to about 75,000 per square mile. Conceivably (although hardly recommended without concrete experience at lower densities) a single space frame housing ten communities, rising to an average of 20 stories, and incorporating a large volume of offices, would occupy only about 150 acres. Even at such a high concentration, something like three-fourths of the land could be retained in large and varied open spaces.

**COMMUNITY SPACE ALLOCATION**
A magnificence of openness

| | acres |
|---|---|
| Community space frame | 30 |
| Transit lines and roads | 20 |
| Playfields | 40 |
| Parks | 75 |
| Golf course | 150 |
| Play forest | 40 |
| Natural forest | 60 |
| Lakes | 25 |
| "Farms" | 200 |
| Total | 640 |

A brief presentation does not permit a consideration of the wide possibilities in the immediate environment of the dwelling or a review of the institutions which may complement the new kind of urban environment and be part of the overall plan and design. Suggestions have been made and implications drawn without proper substantiation. Nor has the future role of the imperious auto been mentioned: here it is enough to say that no one need have one; anyone may own as many as he wishes; few persons are likely to want even one; renting will probably become more popular as the overall necessity to drive diminishes.

Despite the brief description, what seems plain are the vast functional, economic and cultural opportunities of designing together the many things that need to be together and near the individual—that is, of creating both community and urbanity. The compact environment makes feasible an automated delivery and transport system and encourages the optimum use of the legs, public transit, and the automobile. Simultaneously, large open spaces are near everyone's door, and private minispaces are retained judiciously.

The utilization of urban space as the medium of urban design will break the shackles of building on postage stamp sites within small blocks and restricted by rigid zoning. New technical, functional and esthetic possibilities of architecture will then arise.

But what we are talking about most ardently is a human relevance of both architecture and urban planning. Unlike the vague references to a "human *scale*" in design, human relevance must be based on a wide range of sound principles, definite working practices and precise standards.

Squarely upon such incisive measures a new foundation for urban living must be established. The internecine form of environment that man now builds cannot long continue.

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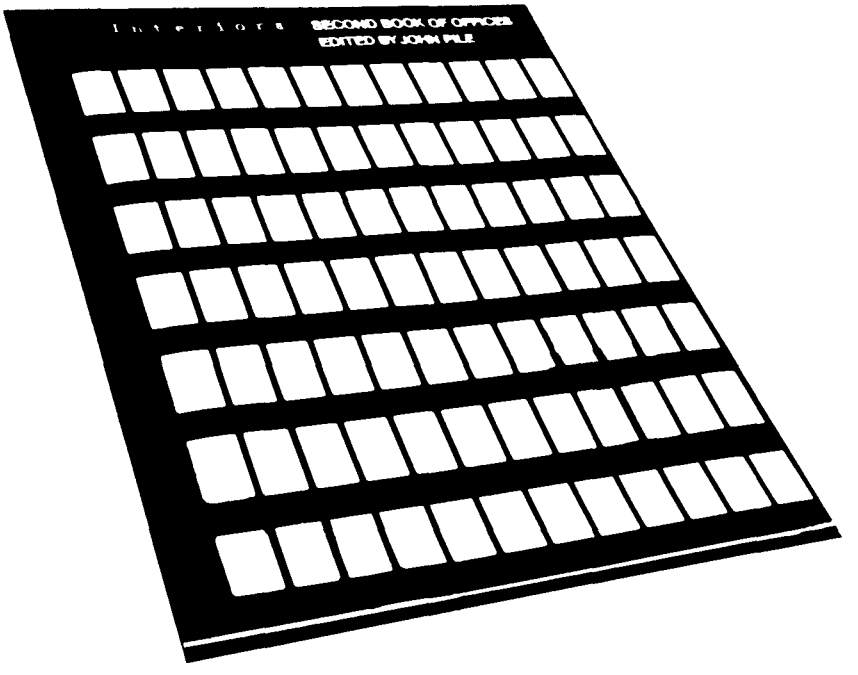


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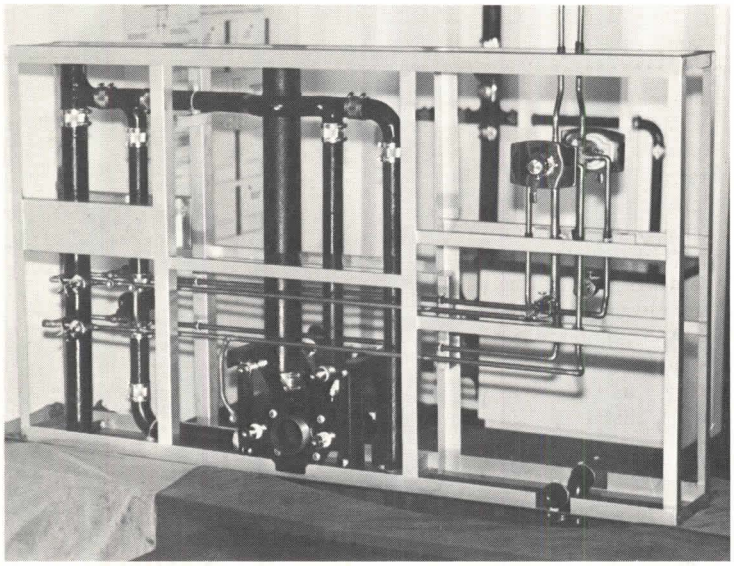
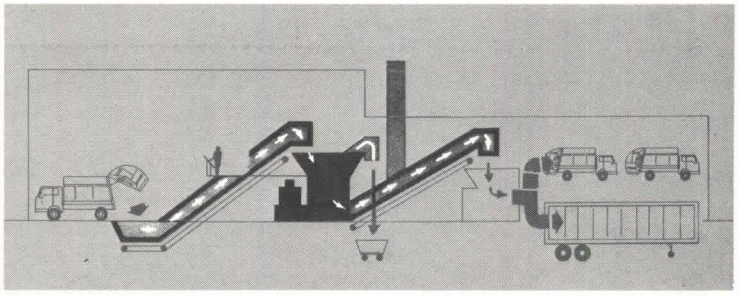
# PRODUCT REVIEW

**This month's Product Review concentrates on compactors, incinerators, air control and plumbing systems.**



**MODULAR PLUMBING**
A new modular plumbing system, called "Tyler WetWall," has been manufactured by Tyler Pipe, with American Standard. The system is composed of a self-supporting wall, and includes all necessary piping and outlets to connect bathroom and kitchen areas of almost any residential or highrise structure.
*On Readers Service Card, Circle* 103.



**REFUSE SYSTEM**
Manufactured by Heil Co., this pulverizer refuse system consists of a feeder, hopper, pulverizer, output conveyor, and has automatic controls. In addition, Heil offers a refuse transfer station that includes packers, containers and trailers for easy handling and transportation to a sanitary landfill site. The heart of the system is the pulverizer, of which a 200-hp version is treating refuse for the 62,500-population city of Columbus, Indiana. The pulverizer features a top conical prebreaking section, where milling starts. The narrowest part of the machine is the rejection section; here garbage is either reduced or thrown up and out of the machine. The grinding section of the pulverizer completely surrounds the hammer areas, so all material is milled (to adjustable size). The exit section, at the bottom of the unit, feeds onto a conveyor; all milling is completed before the garbage reaches the exit point.
*On Readers Service Card, circle* 104.

**SEWER FITTING**
A new fiberglass-reinforced resin sewer fitting, by Johns-Manville, is lighter than those presently used for 8-in. asbestos-cement sewer pipe. The new fitting resists breakage and is easy to handle; it weighs only 11 lbs. and incorporates a 6-in., 90-deg. sweep bend outlet. It also features a thrust clamp and can do the job of either the T or W branch with elbow.
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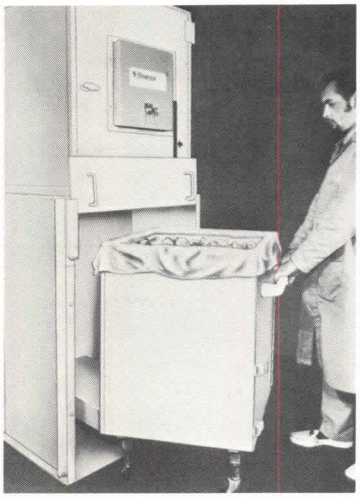
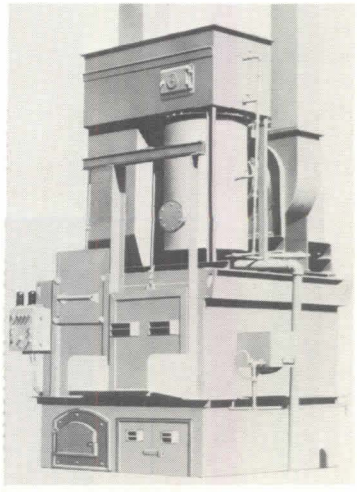
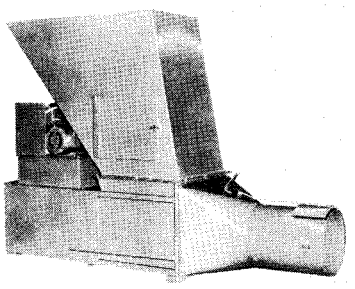


**WASTE COMPACTOR**
The new Roll-N-Pak compactor by the Environmental Pollution Research Corp. is designed for buildings with limited space for incineration or disposal systems, or where large systems are not required. The unit takes up less floor space than a refrigerator, says its maker. One compaction station can service more than one waste chute because of mobile containers; two bags can handle refuse from 24 to 30 apartments.
*On Readers Service Card, circle* 106.

**ONE-PIPE PLUMBING SYSTEM**
Sovent, a one-pipe, self-aerating copper plumbing system, eliminates the need for a separate vent stack, and therefore cuts costs in highrise building installations. An innovation of the Copper Development Association and manufactured by a dozen copper companies, Sovent system includes a copper DWV stack, an aerator fitting for each floor level, copper DWV horizontal branches, and a deaerator fitting at the base of the stack. CDA says the system has been thoroughly tested and does not anticipate problems with code officials.
*On Readers Service Card, circle* 107.

**AIR POLLUTION CONTROL**
The SCR-450 multiple chamber incinerator with S-500 gas scrubber will meet almost all waste-burning needs, while conforming to all state and federal pollution regulations. The system is available in models with waste-destructing capacities from 50 to 1,000 lbs. of Type 0 through Type 2 waste per hour. It may be installed inside or outside buildings. The manufacturer is Besser-Wasteco Corp.
*On Readers Service Card, circle* 108.





**COMPACTOR**

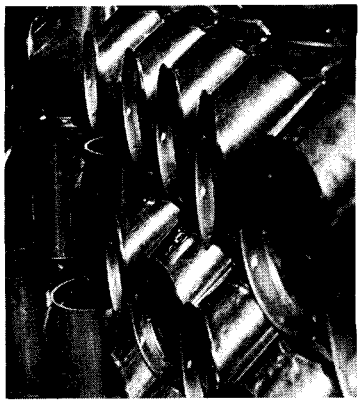
The Radpactor compactor is a self-contained unit that reduces household garbage to 30 per cent of its original volume. It accepts wet or dry solid waste, metal, glass, paper, plastic, and wood. Manufactured by Midland-Ross Corp., the unit packs 20 cu. ft. per minute and can handle about 180 apartment units. Operation is automatic; compaction starts as soon as trash is in the feed chute and ceases when the discharge end is filled with compacted trash. Maintenance is minimal and the 1500-lb. machine requires no special mounting pad.

*On Readers Service Card, circle* 109.

**STAINLESS STEEL CHIMNEYS**

Stainless steel chimneys, manufactured by Wallace-Murray Corp., reduce size and weight requirements, compared with masonry versions. The stainless steel remains stable in any atmosphere and the chimneys are light enough to be supported by the building structure, so they do not require heavy footings. Double-walled and insulated, the units come in six diameters, and lengths from 18 to 30 in.; sections are joined quickly with a twist lock system. Called Metalbestos, the chimneys are designed for heating and incineration units of residential buildings; for fireplaces; and for commercial and light industrial applications.

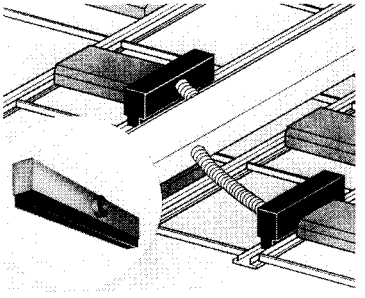
*On Readers Service Card, circle* 110.

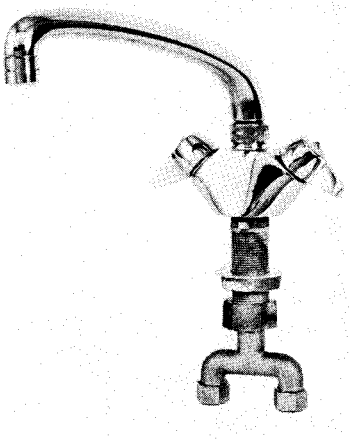


**AIR CHANNEL DIFFUSERS**

The Allied Thermal Corp. is offering Type PD air channel supply diffusers for integrated air-handling systems that feature flexible design and 180-deg. pattern adjustment. The diffuser fits between parallel tee bars, on extruded or slotted ceiling runners on flat or coffered ceilings. Modular in design, the diffusers are easily installed and relocated. The units maintain constant air flow in any pattern without changing static pressure. Sizes and models are available for a variety of needs; units are painted flat black to be invisible; insulation is optional.

*On Readers Service Card, circle* 111.

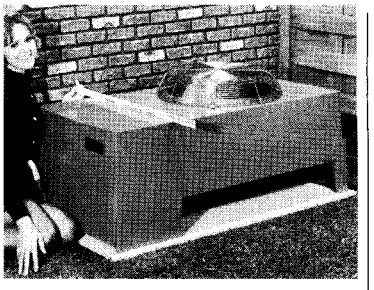




**ONE-HOLE FAUCET**

Only one hole of a kitchen or bar sink is required to install a new faucet manufactured by Royal Brass Manufacturing Co. Called model 4680.6, the faucet may be mounted in a conventional three- or four-hole sink, releasing the extra holes for soap, hand lotion, dishwasher and other functions. The hot- and cold-water connections of the new unit are concealed beneath the mounting deck, with a separate connection available for each. The swing spout will rotate 360 deg.; the exposed body and handles are triple-plated with copper, nickel and chrome.

*On Readers Service Card, circle* 112.



**AIR CONDITIONING SYSTEM**

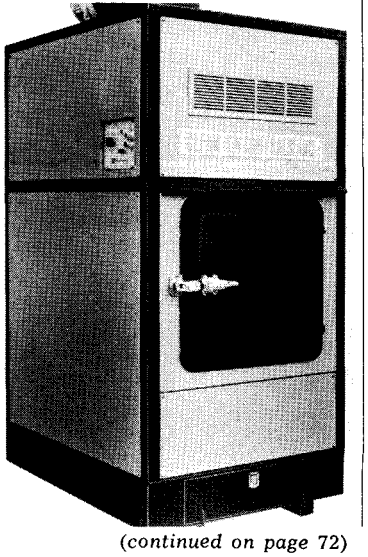
A new line of air-conditioning systems, designed to cool an entire house, has been introduced by Borg-Warner Corp. Called Champion III, the new line features refrigerant line connectors that eliminate precharged tubing; new condenser design that exposes more cooling surface; internal compressor heat and overload reset; double-duty capacitors; single-speed condenser fan (two-speed is optional); and a blue finish for the condenser unit. Most of the units are only 18 in. high, feature upward air discharge and may be installed as close as 6 in. to a home; they are available in 1½ to 5-hp sizes.

*On Readers Service Card, circle* 113.

**INCINERATOR**

A commercially practical accelerated incineration unit has been introduced by Clean Air Controls, Inc. The unit is small and economical for commercial, industrial and residential buildings and is modular for easy installation and maintenance. It features an afterburner chamber that can dispose of up to 300 lbs. of refuse per hour without smoke, odor or pollutants. The combustion chambers are fully insulated. The unit operates on fuel oil or gas and is available in three sizes.

*On Readers Service Card, circle* 114.



*(continued on page 72)*

# PRODUCT REVIEW

(*continued from page* 71)

**FIREPLACE UNITS**

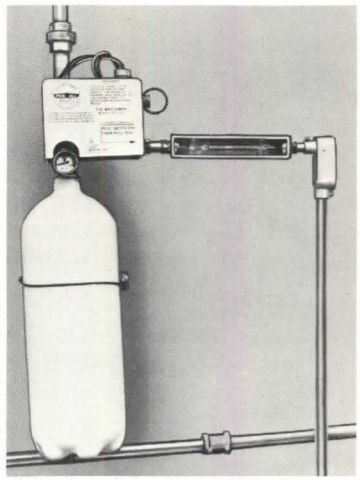
A series of fireplaces has been introduced by the Heatilator division of Vega Industries, which has been producing gas-fired and wood-burning fireplaces for over 40 years. Pictured are two of the new models—both wood-burning, one freestanding and the other built-in. The Heatilator Mark 1406 is conical in shape, will burn 20-in. logs and is finished in flat black paint. A removable firescreen, damper, two sections of smokepipe and fold-away gate are included; a barbecue is optional. The built-in Mark 123 is designed for single-family or multi-family units and may be converted to gas. The fireplace hood, screen and trim are removable, and the screen and trim may be adjusted to hearth size variations.
*On Readers Service Card, circle* 115.

**SCRUB STATION**

A new scrub station, series SS10-C of Market Forge, is designed for no-touch, no-splash surgical scrubs. A knee-controlled water switch turns on a preset flow and temperature of water. The unit's top shelf is conveniently located for storage and permits full view over the top of the unit in the Operating Room. A knee-operated soap dispenser handles all kinds of commercial liquid soap.
*On Readers Service Card, circle* 116.

**FIRE EXTINGUISHER**

The Pem-All Manufacturing Co. is producing a new fire extinguisher system, custom-designed to meet any industrial or institutional requirement. The system uses DuPont's Freon 1301, a colorless, electrically nonconductive vapor that works chemically to stop the combustion process itself. Harmless to both life and property, the system leaves enough oxygen in the air for people to breathe as they leave the scene of the fire.
*On Readers Service Card, circle* 117.

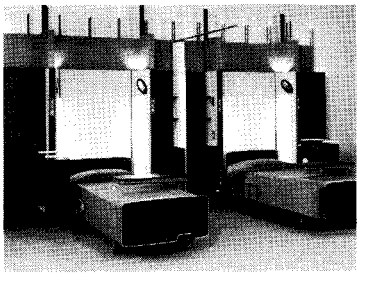


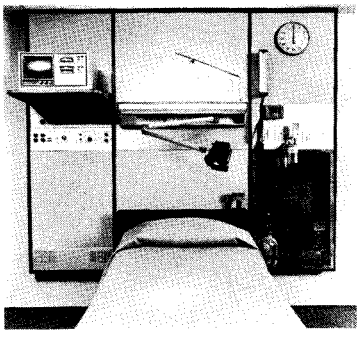
# PRODUCT REVIEW

**PATIENT ROOM SYSTEM**

The new Enviro-Care system, by Hill-Rom Co., Inc., helps to automate patient care. The system includes a 750 Core Module, which clears the headwall of all mechanical services and concentrates them on this core, conveniently, for patient and nurse. Prewired, the core module provides a common ground point for all electrical outlets, plus a grounding bar for portable equipment. Also provided are: mechanical raceways; lighting for patient and nursing care use; medical gas outlets; and eight electrical outlets with individual circuit breakers. The adjacent bedside table provides fingertip control of nurse call, radio and television.

*On Readers Service Card, circle* 118.





**PATIENT SERVICE WALL**

The Centron-Wall System, manufactured by the Sunbeam Lighting Co., Inc., is prefabricated to include such hospital equipment as: luminaires for patient and staff; a time-lapse clock; intravenous support arms; isolated voltage distribution systems; a monitor shelf; vacuum bottle storage units and more. Facilities such as sinks and cabinets may also be ordered. The panels and trim are available in a wide range of colors and materials; wiring and piping may be preordered according to individual specifications.

*On Readers Service Card, circle* 119.

*(continued on page 74)*

# PRODUCT REVIEW

(continued from page 73)

**The following is a listing of the key products incorporated in some of the buildings featured in this issue:**

McMASTER UNIVERSITY HEALTH SCIENCES CENTRE. ARCHITECTS: Craig, Zeidler and Strong. (Materials & Manufacturers as submitted by the architects). METAL DECK: Robertson-Irwin Limited. ELEVATORS: Otis Elevators Co. Ltd. AUTOMATIC CONTROLS: Honeywell Controls Ltd. FIREPROOFING: Pyrotech Products Ltd. HARDWARE: D. M. Hardware Ltd. FLUORESCENT FIXTURES: C.E.B. Ltd. DIFFUSERS: Barber Colman of Canada. ACOUSTIC & GYPSUM TILE: Canadian Johns Manville Ltd. LABORATORY EQUIP: Valley City Mfg. Co. Ltd. RES. FLOOR: Terrazzo Mosaic Co. Ltd. CERAMIC TILE: Kent Tile Co. Ltd. GLASS: Pilkington Glass Ltd. TOILET PARTITIONS: G.S.W. Ltd.

BIO-MEDICAL CENTER, BROWN UNIVERSITY. ARCHITECTS: Shepley, Bulfinch, Richardson & Abbott. (Materials & Manufacturers as submitted by the architects). WATERPROOFING: Webtex Trowel Mastic. BRICK, BLOCK & STONE: S. B. Green Co. STRUCTURAL STEEL: Rumford Steel. CURTAIN-WALL: E. G. Smith. ACOUSTICAL MATERIALS: Celotex Corp., U.S. Gypsum. FENESTRATION: Samson Window. GLASS: PPG. ELEVATORS: F. S. Payne. DOORS: County Fire Door Corp. HARDWARE: Von Duprin. UNIT VENTILATORS: Shemenauer. AIR CONDITIONING COMPRESSOR, FAN UNIT: Honeywell, Westinghouse. SPRINKLER SYSTEM: Grinnell Co., Simplex. LABORATORY EQUIP: Duralab. INCINERATOR: Lambert-Sawyer Co. STERILIZERS: American Sterilizers. HOODS: Kewaunee.

BETHESDA HOSPITAL NORTH. ARCHITECTS: Smith, Hinchman & Grylls, Assoc. Inc. (Materials & Manufacturers as submitted by the architects). PILING: Caissons. CONCRETE & CEMENT: Alpha Cement, American Materials Corp. BRICK, BLOCK & STONE: Binghamton Brick Co., Cambridge Colonial Brick. STRUCTURAL STEEL: U.S. Steel, Bethlehem. CURTAIN-WALL: Alumiline. FLOOR & DECK SYSTEMS: Ceco. ROOF MATERIALS: Owens-Corning, G.A.F. Corp. (Ruberoid Div.) THERMAL INSULATION: Owens-Corning Fiberglas Corp. ACOUSTICAL MATERIALS: Armstrong Cork Co. FENESTRATION: Ceco. GLASS: American St. Gobain. INTERIOR PARTITIONS: U.S. Gypsum. ELEVATORS: Dover Elevator Co., Watson Mfg. Cab. EXTERIOR DOORS: Stanley. HARDWARE: Corbin, LCN Closers, Stanley. TILE: Flintkote, Cambridge, Dex-o-Tex. PANELING: Spliced Wood Corp. PAINT: Lowe Bros. ELECTRICAL DUCTS: I.T.E. ELECTRIC EQUIP: S & C. STANDBY EMERGENCY POWER: Caterpillar. LIGHTING FIXTURES: Wakefield, Custom Lighting, Inc. PLUMBING FIXTURES: American Standard, Beneke Seats. HEATING BOILERS: Sellers Engineering. UNIT HEATERS & VENTILATORS: Dunham-Bush. HEATING VALVES: Honeywell. AIR-CONDITIONING COMPRESSOR: Dunham-Bush. UNIT AIR CONDITIONERS: Remington. DIFFUSERS & PUMPS: Dunham-Bush, Tuttle & Bailey. INTERCOM SYSTEM: Executone. RADIO & TV SYSTEMS: Bell Hospital Systems, Inc. PNEUMATIC TUBES: Standard Conveyor. SPRINKLER SYSTEM: Cinti Sprinkler, Inc. CEILING MATERIALS: Armstrong Cork Co. WATER COOLERS: Halsey Taylor. KITCHEN, LAUNDRY, LAB EQUIP: Ruslander & Sons, Watson Mfg., Acme Visible-Chart Racks. FINISH FLOORING: Gullistan. FURNITURE: Knoll, Curtiss, Herman Miller, Cartwright Art Metal. FABRICS: Herman Miller. DRAPERY HARDWARE: Kirsch. HOSPITAL BEDS: Hill-Rom.

LEONARD MORSE HOSPITAL. ARCHITECTS: Markus Nocka Payette & Associates, Inc. (Materials & Manufacturers as submitted by the architects). WATERPROOFING: Nervastral. CONCRETE & CEMENT: Atlas Type I. STRUCTURAL STEEL: Bethlehem Re-Bars. ROOF MATERIALS: Burgess Manning. FENESTRATION: Alpana. ELEVATORS: Payne. HARDWARE: Corbin, Russwin, Rixson. PAINT: Martin Senour, Pratt-Lambert. ELECTRICAL DUCTS & WIRING: EMT. ELECTRICAL EQUIP: Westinghouse. STANDBY EMERGENCY POWER: Waukesha. LIGHTING FIXTURES: Trylux. PLUMBING FIXTURES: T&S Brass, Eljer. HEATING BOILERS: O&S Powermaster. HEATING VALVES: Powers Regulator. AIR CONDITIONING COMPRESSOR: Carrier, American Air Filter. DIFFUSERS: Barber Colman. SPECIAL FANS: Penn Ventilator Co. WATER COOLERS: Halsey Taylor. KITCHEN, LAUNDRY, LAB EQUIP: Hobart, Garland, Blodgett, Traulsen, Wright. FINISH FLOORING: Armstrong Vinyl, Alexander Smith Carpet Co. FURNITURE: Knoll, C. I. DRAPERY HARDWARE: Kirsch.

ST. THOMAS AQUINAS CHURCH. ARCHITECTS: Ralph Rapson & Associates, Inc. (Materials & Manufacturers as submitted by the architects). FLOOR & DECK SYSTEMS: Structural Wood Corp., Weyerhauser. ROOF MATERIALS: Barrett Built-up Roofing. THERMAL INSULATION: Johns-Manville Fesco Board. GLASS: PPG. DOORS: Lake Street Industries, Roddis, Weyerhauser. HARDWARE: Stanley, Rixson, Hiawatha, Yale. PAINT: Pratt & Lambert. UNIT VENTILATORS & DIFFUSERS: Owens-Corning Fiberglas Duct.

# READERS SERVICE FILE

## PRODUCT LITERATURE

To order material described, circle indicated number on self-addressed Reader Service Card, facing page 68.

### COATINGS/SEALANTS
Handsomely illustrated full-color booklet is a guide to stains and staining. Answers basic questions on types of stains, interior & exterior. Application techniques, hints for better results. Concise, easy to read and well illustrated. Samuel Cabot Inc. On Readers Service Card, circle 200.

### CONCRETE
A brochure detailing the special insulating cushion properties of all-weather concrete is available from Silbrico. On Readers Service Card, circle 201.

Leak-free decking is claimed by the Tremco Systems Co. A descriptive booklet showing many applications of this system is available. On Readers Service Card, circle 202.

### DOORS
Metal doors and frames for commercial, residential and special purpose installations are described in a new 12-page brochure from Steelcraft. On Readers Service Card, circle 203.

Architectural doors featuring high pressure laminate surfacing are shown in a brochure from Simpson. Interior door construction with special purposes are detailed in a cutaway illustration. On Readers Service Card, circle 204.

A new Stanley catalog with descriptions of all their automatic swinging, sliding and folding doors; and the new industrial Auto-Slide door. On Readers Service Card, circle 205.

Doors and more doors . . . a new catalog is available from the Pease Ever Strait Door Co. On Readers Service Card, circle 206.

### DOORS
Shock-absorbing, silent, safety-cushioned, double-acting, commercial doors are described in a new leaflet from Rubbair Door Div. Eckel Inds. On Readers Service Card, circle 207.

Catalog includes technical information on LOF glass: includes Varitran and Vigilpane SA68. Libbey-Owens-Ford Co. On Readers Service Card, circle 208.

### DRINKING FOUNTAINS
A 24-page catalog illustrates drinking fountains, plumbing fixtures and trim. Includes drawings, special application data from the Halsey W. Taylor Co. On Readers Service Card, circle 209.

A new catalog from the Haws Drinking Faucet Co. Their complete line is illustrated and diagramed in an informative 32-page color brochure. On Readers Service Card, circle 210.

### ELEVATORS
Illustrated color brochure featuring elevator doors, entrances. Ty-Weave. Architectural components take on a new dimension of design and decor with many combinations of lustrous woven metal. W. S. Tyler Co. On Readers Service Card, circle 211.

Series of six color brochures showing elevators for many different building types. Cab designs, dimensions, freight elevator information are all part of the package. Dover Elevator Division. On Readers Service Card, circle 212.

### FLOOR COVERINGS
Hi-Stress decking is described in a brochure from Flexicore Manufacturing Assn. Greater load carrying performance is claimed. On Readers Service Card, circle 213.

Design World: a collection of Printed Carpets. Package includes beautiful color examples and details special features of these attractive patterns. World Carpet. On Readers Service Card, circle 214.

Complete catalog file in true color reproduction is available for LATCO featuring specialty and popular mosaic tile such as: Venezico, Valencia, Granada, Candysticks, many others. Latco Products. On Readers Service Card, circle 215.

### FURNITURE
The new Openscape office is attractively described in a 32-page color booklet from Interroyal. A selection of landscaped office arrangements and possibilities within given areas are shown. On Readers Service Card, circle 216.

Krueger Metal Products offers catalogs of chairs designed by G. C. Piretti. Full-color catalogs introduce a new modular dimension for wherever people come together. On Readers Service Card, circle 217.

### HEATING/COOLING
Airmaster Div., Hayes-Albion Corp. offers a new 20-page catalog covering their line of industrial, commercial and residential air-moving equipment. The sectionalized catalog is easy to use, with simplified charts that make it easy to select the proper fan. On Readers Service Card, circle 218.

Brochures showing design flexibility of zoneline individual heating/cooling system in residential highrise with comparison of gas and electric systems. General Electric Co. On Readers Service Card, circle 219.

### LIGHTING
A new 96-page catalog featuring "Calculite," a coordinated line of recessed incandescent lighting fixtures, available from Lightolier. On Readers Service Card, circle 220.

### LOCKS
A folder of descriptive material explaining their new breakthrough in computerized security systems from Eaton Yale & Towne. On Readers Service Card, circle 221.

A useful guide to the installation of a security control system through a series of master keys is available from the Russwin Co. On Readers Service Card, circle 222.

### METALS IN BUILDINGS
Recent installations from Butler Commercial Building Systems are illustrated in a 16-page brochure. On Readers Service Card, circle 223.

### PANELING
A unique bronze decorative screen system is colorfully illustrated in a brochure from Ultra Bronze, div. of Contemporary Research Bronze. Variations of this process may be used in flooring, wall tiles and other applications. On Readers Service Card, circle 224.

### POLLUTION CONTROL
A new four-color brochure from Aqua-Chem describes and illustrates some immediate commercial advantages of pollution control along with an explanation of their pollution control processes. On Reader Service Card, circle 225.

### ROOFING
Multizone Roof Top System is described in a 60-page illustrated, detailed booklet from the Modine Co. On Readers Service Card, circle 226.

### WALLS/LAMINATES
"Panel Systems 1971" eight-page, four-color illustrated booklet gives installation, application and maintenance data on panels for high-moisture areas and large commercial applications. Formica Corp. On Readers Service Card, circle 227.

A four-page brochure lists performance of 15 typical sound-barrier systems using thermafiber sound attenuation. Included with description of dry wall and plaster assemblies are fire rating tests, and relative cost index. Four systems are illustrated. FHA standards for partition forms are listed. U.S. Gypsum Co. On Readers Service Card, circle 228.

### WASHROOM DATA
Many different methods of installation of toilet compartments are shown in a colorful brochure from SanyMetals. New surfaces and color finishes are available. On Readers Service Card, circle 229.

"Sixteen-page illustrated color brochure on steel lockers, mesh baskets, benches. Ideal for gymnasium locker rooms in schools, colleges, clubs. Complete specs available in 80 color combinations. Interior Steel Equipment Co." On Readers Service Card, circle 230.

A new 24-page condensed catalog of its complete line of design-coordinated washroom accessories including all new products introduced in the past year has been published by Bradley Washfountain Co. On Readers Service Card, circle 231.

### WINDOWS
A wide variety of window shapes and frame profiles in both steel and aluminum are described in a brochure from the William Bayley Co. Special detention and institutional windows are also shown. On Readers Service Card, circle 232.

Solar Heat and Glare control is claimed by KoolShade for their louver deflection system. It is described in a helpful brochure. On Readers Service Card, circle 233.

Substantial savings in initial installation and operating costs are claimed for "Solar Ban 550 Twindo" from PPG. Data sheets are available. On Readers Service Card, circle 234.

A noise-controlling glass, "Acousta-Pane" is described in new literature from Amerada Glass. On Readers Service Card, circle 235.

### WOOD IN BUILDINGS
Remarkable properties of laminated wood beams are shown in chart form in a new brochure from Weyerhaeuser Co., along with colorful laminated wood beam installations. On Readers Service Card, circle 236.

### MISCELLANEOUS
Music in every room . . . an illustrated brochure describing the Nu-Tone components is available from the NuTone Co. On Readers Service Card, circle 237.

On Readers Service Card, Circle 318





On Readers Service Card, Circle 319

# ADVERTISING INDEX




## ADVERTISING SALES STAFF

WM. B. REMINGTON, Ad Manager
BEN P. MARCHETTO, Production Mgr.

EASTERN TERRITORY

GUY VOYCE, Eastern Manager
130 East 59th Street
New York, N.Y. 10022
212-751-2626

MIDWESTERN TERRITORY

WM. K. MURRAY, Midwest Manager
JOHN MURRAY
410 N. Michigan Avenue
Chicago, Illinois 60611
312-644-6763

CHARLES S. GLASS
32 West Orange Street
Chagrin Falls, Ohio 44022
216-247-4485

WEST COAST TERRITORY

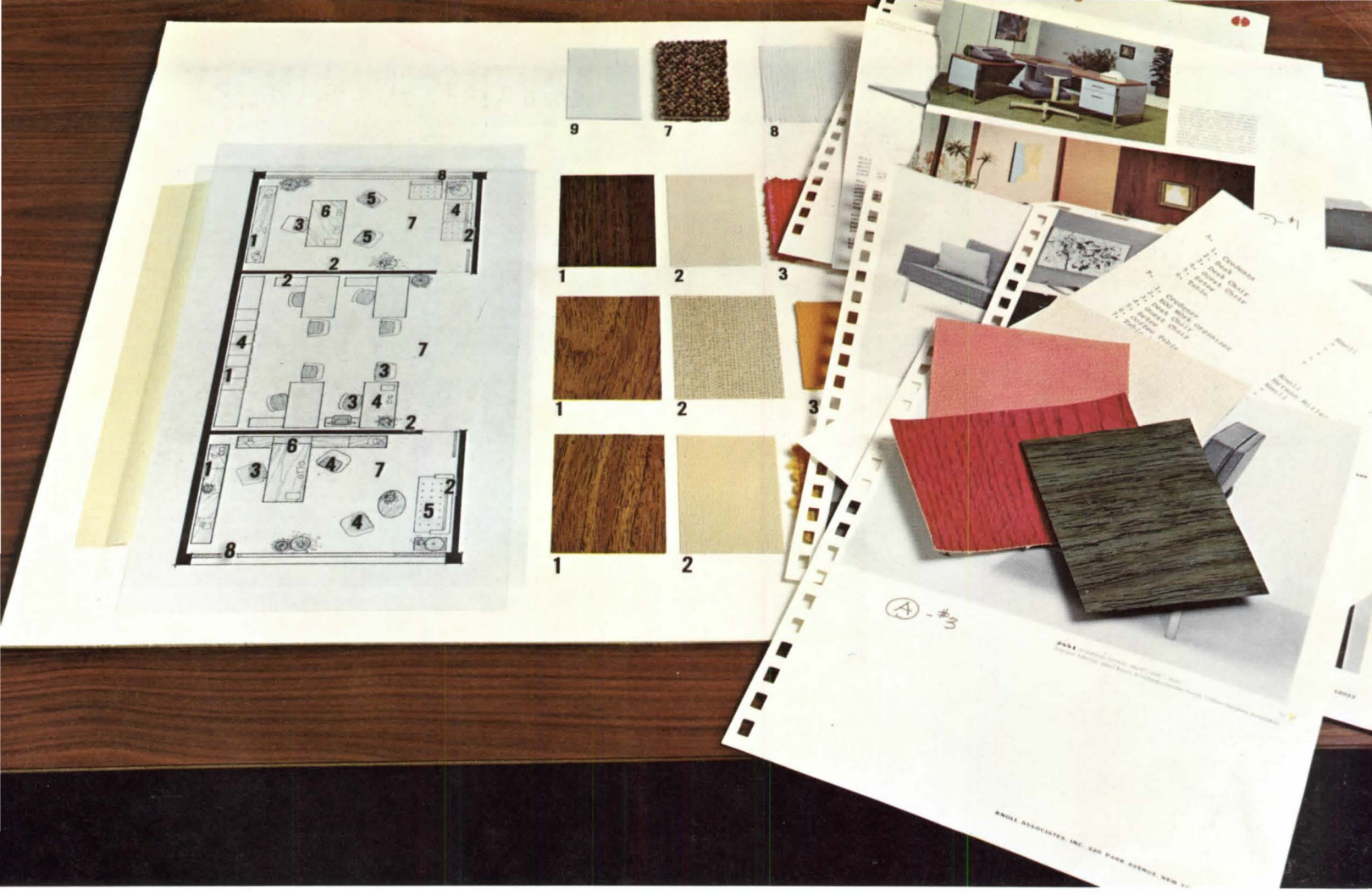
Cole, Sweeney & Anthony
1830 West 8th Street
Los Angeles, Calif. 90057
213-388-0521

Cole, Sweeney & Anthony
582 Market Street
San Francisco, Calif. 94104
415-986-6342

SOUTHERN TERRITORY

The Dawson Co.
3009 Lookout Place, N.E.
Box 11957
Atlanta, Georgia 30305
404-261-6002

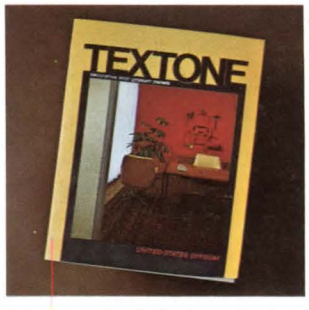
The Dawson Co.
5995 S.W. 71st St.
Miami, Fla. 33143
305-666-4684



# TEXTONE* Gypsum Panels. Create colorful decorator walls with new deep-textured vinyl surfaces.

When it comes to designing walls, TEXTONE Vinyl-Surfaced Gypsum Panels provide the freedom you need to create distinctive contemporary interiors. Our new TEXTONE collection includes patterns ranging from deep-textured rough fabrics and wood-like surfaces to light stipples and classic woodgrains. In 27 exciting standard colors to stimulate your imagination and help you capture the decorative effects you want. Matching moldings available. TEXTONE features durable vinyls pre-laminated to SHEETROCK* gypsum panels. And it works perfectly with U.S.G. wall systems, including USG® Demountable Partitions.

*Reg. U.S. Pat. Off.




New, colorful descriptive literature amplifies the exciting TEXTONE story. For your copy, contact your U.S.G. Representative; or write to us on your letterhead for sample swatches. 101 S. Wacker Dr., Chicago, Illinois 60606, Dept, AF-61.

**UNITED STATES GYPSUM**
*BUILDING AMERICA*

On Readers Service Card, Circle 320

# All systems are go when they're from Formica.

## Go up easy. Go easy on maintenance. Go thru wear without showing it. FORMICA® brand panel systems.

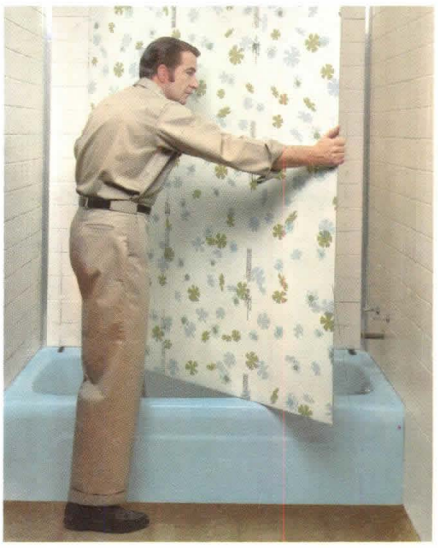
Whatever your needs, there's a Formica® panel system that's ready to go. And all have a bright, tough surface that shrugs off kicks and scrapes, wipes clean with a damp cloth. Keeps that new look for years and years. For more details, see Sweets Architectural File 6.13/Fo and 10.1/Fo or contact your Formica representative.

AF-6.

Panel System 101. Meets all Class I fire ratings for hospitals, schools, theaters, office buildings and other places of assembly. Over 100 decorator colors, designs and patterns. And you get Formica® brand laminated plastic durability, beauty and low maintenance.

Panel System 404/505. Beautiful wood-paneled walls? You'd think so to look at them. But these are tough, long-lasting Formica® brand panel systems. Will never peel, chip, crack or craze. Never need painting or refinishing.

Movable Walls. The prefabricated wall system that goes up easy, comes down fast with no special skills or tools required. Never needs re-painting like painted metal systems. Panels have built-in raceways; engineered electrical and telephone fittings available.



Panel System 202. The perfect solution for tub surrounds, showers, washroom walls and utility areas. And for fast, easy installation, wide panels go right up over your old wall surface — even cracked tile!

**Leadership by design**



FORMICA® BRAND wall paneling

On Readers Service Card, Circle 321