

ARCHITECTURAL FORUM / SEPTEMBER 1969

The background of the cover is a complex, abstract pattern in shades of red and black. It features a series of wavy, parallel lines that create a sense of movement and depth. Interspersed among these lines are various organic, rounded shapes, some resembling stylized figures or architectural elements. The overall effect is a dense, rhythmic composition that draws the eye across the page.

# FORUM

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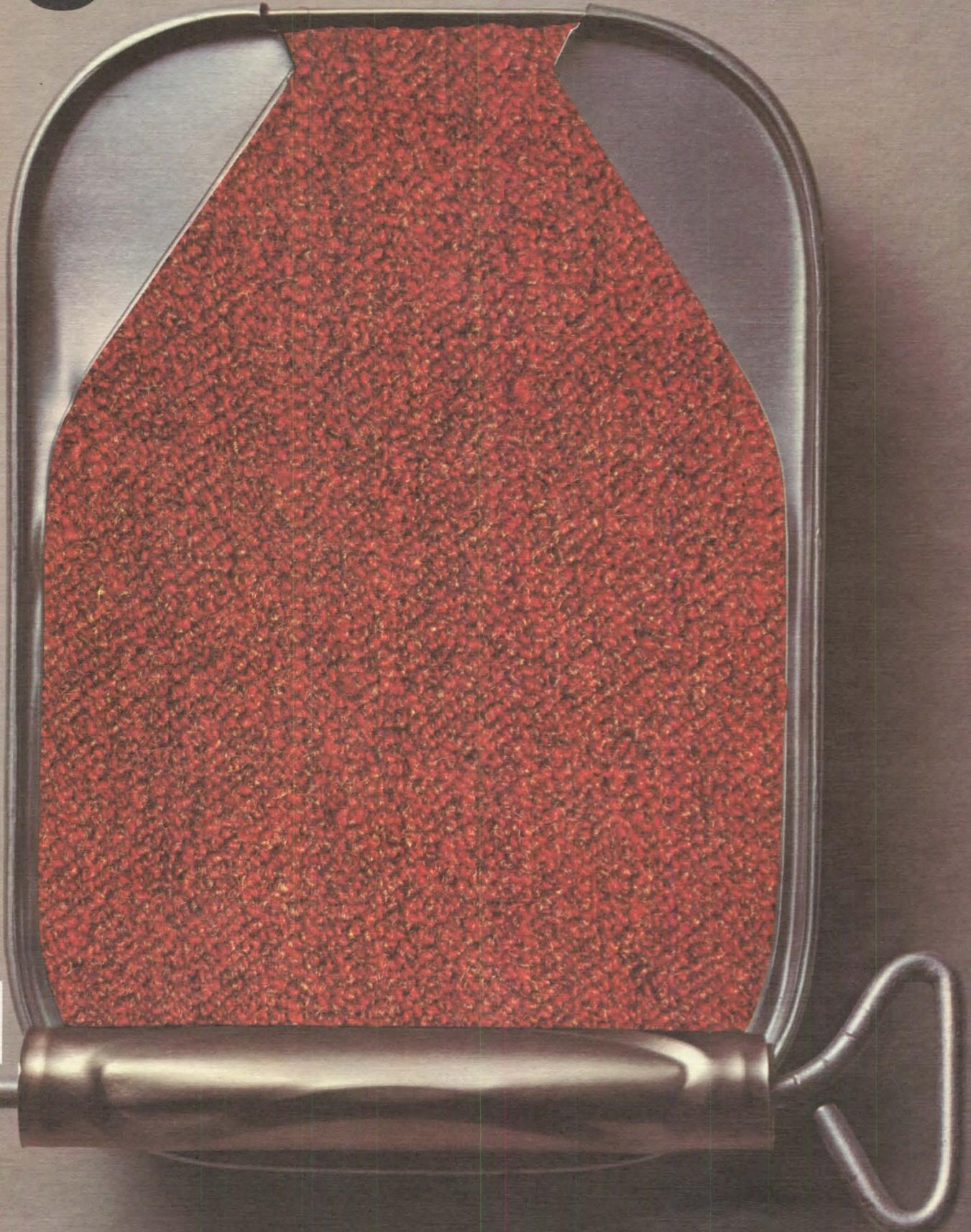
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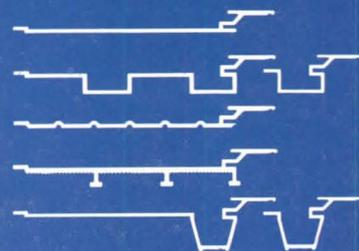
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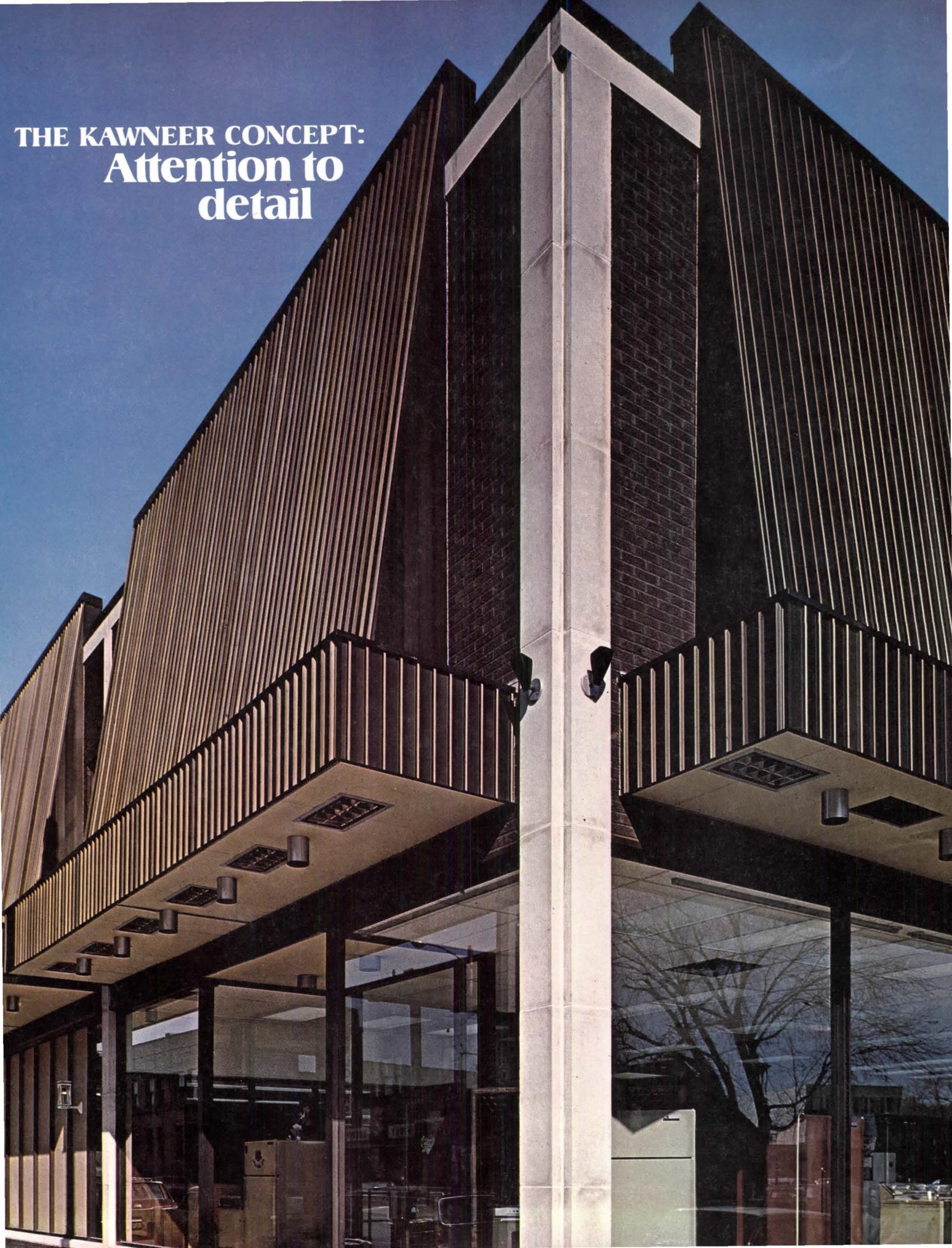
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Other factors influenced the selection of *Solarban Bronze Twindow*. Its excellent insulating capabilities permit higher, more comfortable humidity levels to be maintained without condensation. This heat-strengthened glass also

meets strength requirements, and its color complements the bronze tone of the exterior metals.

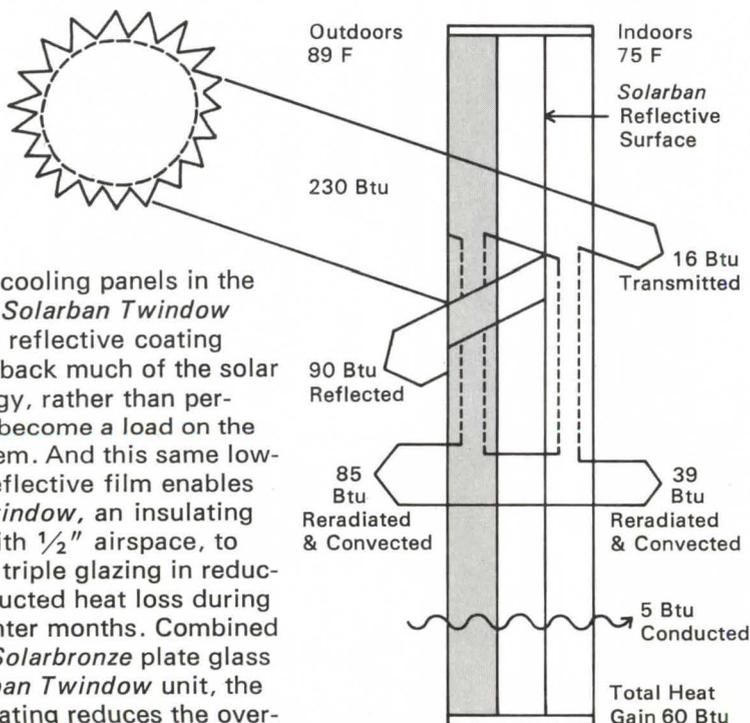
The new structure has eight floors with over 93,000 square feet of space. Building costs were \$27.22 a square foot. Usable floor area is 80% of the total square footage.

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**PPG is Chemicals, Minerals, Fiber Glass, Paints and Glass. So far.**

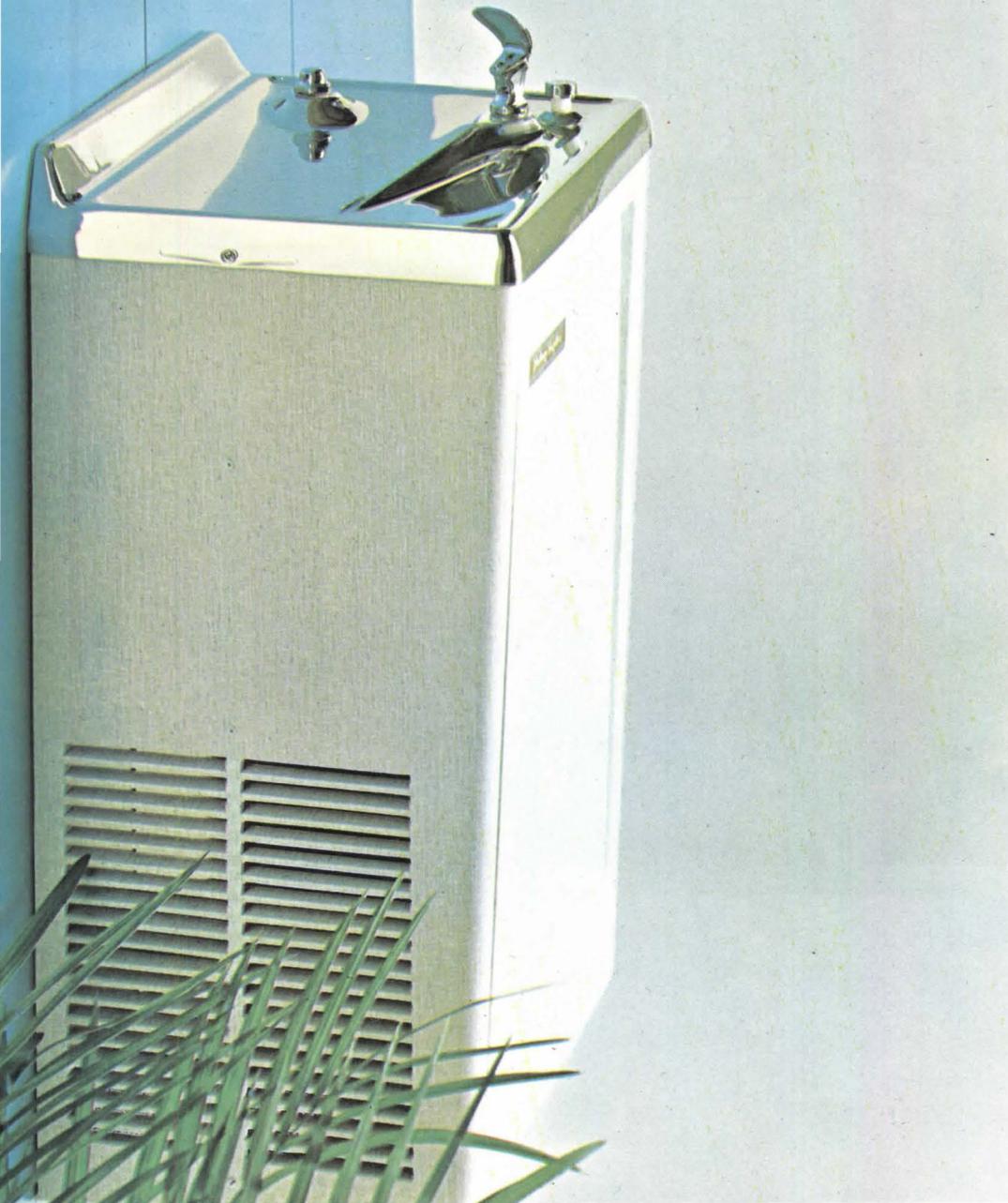
heating and cooling panels in the ceiling. The *Solarban Twindow* units offer a reflective coating which turns back much of the solar radiant energy, rather than permitting it to become a load on the cooling system. And this same low-emissivity reflective film enables *Solarban Twindow*, an insulating glass unit with 1/2" airspace, to perform like triple glazing in reducing the conducted heat loss during Florida's winter months. Combined with PPG's *Solarbronze* plate glass in the *Solarban Twindow* unit, the reflective coating reduces the overall light transmission to 12%, thus much of the outdoor brightness is



This diagram is illustrative of relationships for a given specialized set of conditions.



# NICE and COLD



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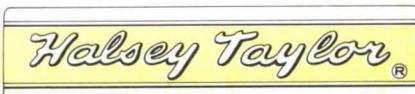
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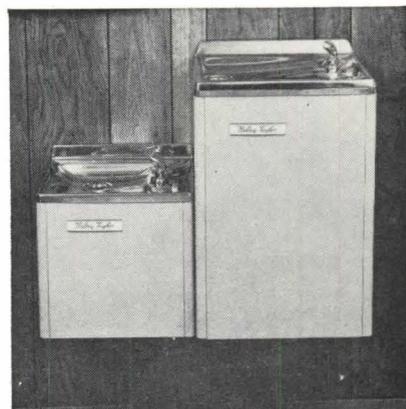
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## LETTERS

### ENVIRONMENTAL EDUCATION

Forum: Your article, "Environmental Education From Kindergarten On Up" [June], is absolutely excellent. I read many educational journals and it is seldom that an article of this quality and excitement appears even in our own journals.

DR. WAYNE JENNINGS

*Assistant Director*

*City Center for*

*Learning Project*

*St. Paul, Minn. The St. Paul Public Schools*

Forum: Someone pour a bottle of champagne over Ellen Berkeley and launch her to continue her excellent sleuthing on a most timely subject; the profession badly needs a clearing house of information on projects developing in environmental awareness in the schools. As she so rightly says: the AIA has not yet seen fit to put money into this subject, and someone must both interest the profession and provide a communication vehicle. Don't stop with one shot; you've got the ball for at least two or three years until lots of these seeds get established and others will carry on.

JAMES PRATT

*Dallas, Tex.*

*Architect*

Forum: Thanks for the spread on the educational efforts underway across the country. The article demonstrated nicely the wide diversity being attempted, and served the important function of collecting us all together and reminding us of our common roots and objectives.

In the article, Mrs. Berkeley conjectures about the fate of such programs, reminding us that an earlier similar interest in the '40s faded out without a trace. It would seem to me that the key to lasting success lies in whether, and if so how, these programs are evaluated. It is easy to respond positively and emotionally to the evident enthusiasm exhibited by children at last allowed to get out of their chairs. It is easy to emphasize with that enthusiasm and bemoan the lack of such fun when we were in school. But it is not easy to face a local school board whose last referendum

was defeated for the sixth straight time and convince them that these programs are not frivolous, but essential. Yet, in my opinion, it is at the local school board level where the key to acceptance lies.

I urge all those working in this area to be as concerned with evaluation as they evidently are with innovation. When the experimental funds run out (and you know they will), the local boards will have to be convinced, 1) that your educational objectives are sound and essential, i.e., that there is some critical skill you are trying to train, or critical knowledge you are trying to pass, and 2) that your particular program is in fact training that skill or transferring that knowledge. At that point, we either prove our case, or give way once again to the three R's.

CHARLES W. RUSCH

*Fellow*

*Center for Advanced Study,*

*Urbana, Ill.*

*University of Illinois*

### CONSTRUCTIVE ADVICE

Forum: I would like to comment on your June item concerning the high cost of construction. I suggest a direct and logical approach to the problem: abolish construction trade unions and their affiliations as they exist today.

The current differences in hourly wage rates for various trades make no sense whatsoever. By what reasoning is it established that a plumber is worth more than an electrician, or a carpenter, etc.? Or that any difference between the trades should exist at all? This situation of rising rates seems to be the result of competition between union leaders to gain status, prestige and power—political and otherwise.

So, why not establish, by mutual agreement between employers and employees, a standard basic wage rate for skilled workers (plumbers, carpenters, etc.), one for unskilled workers (laborers, helpers, etc.), one for hazardous trades (highrise structural frame erectors, tunnelers, etc.), and other categories as agreed upon. These rates should reflect consideration of and relationship to the rates of everyone involved in the total activity of creation of a project—design-

*(continued on page 15)*

# HUD's own new home

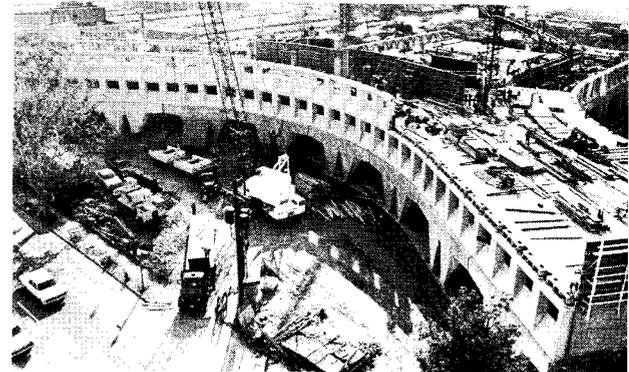
Dept. of Housing  
and Urban  
Development  
uses  
precast panels  
made with  
Incor® cement



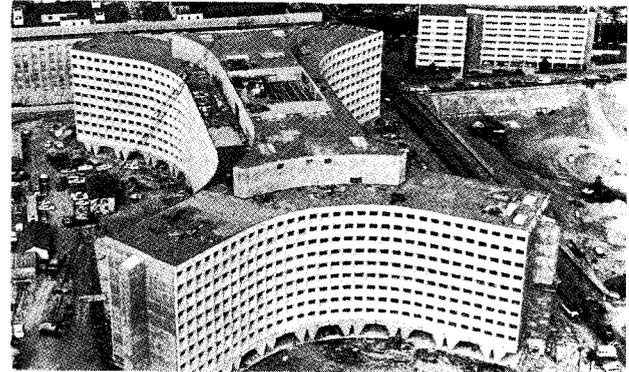
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, Washington, D.C.; Owner: GENERAL SERVICES ADMINISTRATION; Architects: MARCEL BREUER AND HERBERT BECKHARD, New York, and NOLEN-SWINBURNE AND ASSOCIATES, Philadelphia; Structural Engineer: PAUL WEIDLINGER, New York, N.Y.; General Contractor: JOHN McSHAIN, INC., Philadelphia and Washington; Precast Units Furnished and Erected by: FORMIGLI CORP., Berlin, N.J.; Precast Subcontractor for Double-T Planks: CONCRETE STRUCTURES, INC., Richmond, Va.

The 10-story, \$26-million, all-concrete building that houses the new U.S. Department of Housing and Urban Development is a worthy symbol of HUD's role in encouraging architectural excellence throughout the country. □ Designed in the shape of a giant letter "X," its curved walls contain some 1600 load-bearing precast concrete window panels, made with "Incor" 24-hour portland cement. Its floors are made of prestressed double-T planks. And the entire structure seems to float on 44 pairs of pointed concrete "feet"—which actually frame a 15-foot-wide open arcade around

the ground floor. □ Lone Star is honored by its role in this pace-setting structure, called "a forecast of what is both possible and practical for a better urban future." Lone Star Cement Corporation, 100 Park Avenue, New York, N.Y. 10017.



Prestressed double-T floor slabs, many tapered for curves, contributed to economical wintertime construction.



New headquarters is the first Federal building of precast concrete and the first to avoid the box- or wingtype layout.



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Stonehenge provides uniform strength without extra thickness. Stonehenge can be used in panels up to 4' x 8'

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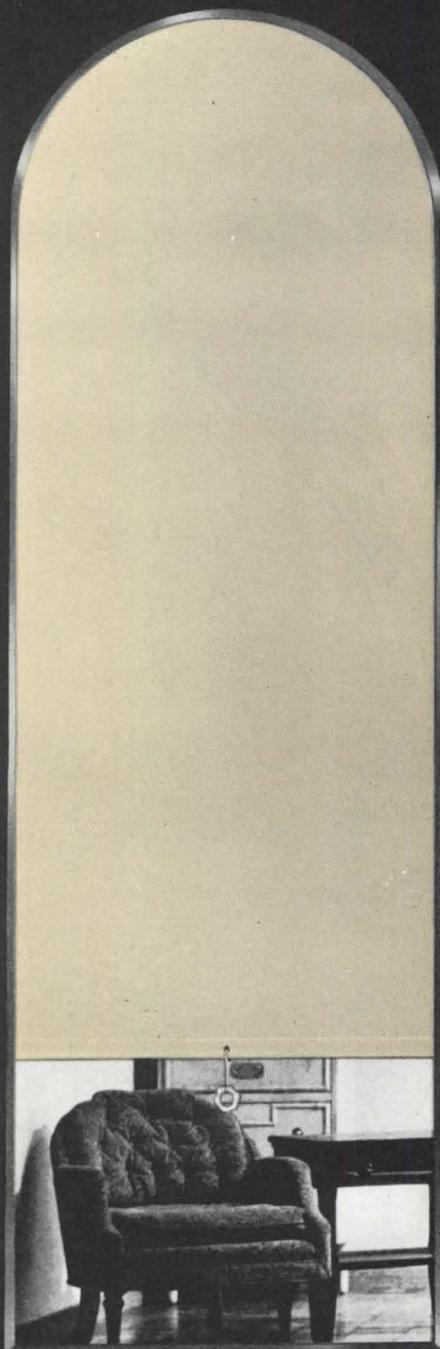
Use Stonehenge for facings, spandrels, lobbies, accent panels—anywhere—indoors or out—where you would use natural stone. And many places where natural stone's weight makes it impractical.

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(and the new solution)



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Your carpets, drapes, furniture and other expensive furnishings can now be protected from harmful ultraviolet rays by Amerada's new FADE-SAFE glass.

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FADE-SAFE is now available in a full range of sizes and will fit most standard window frames. Write for details on how FADE-SAFE is the solution to your UV fading problem.

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# LETTERS

(continued from page 10)

ers, draftsmen, factory workers producing materials, transportation people, etc. Provisions should be made for general increases based upon legitimate cost of living rise, and for individual merit. Provision should also be made for promotion, based on ability and leadership qualities or as a result of personal effort towards advancement, such as attending night school, etc. There should be no discrimination concerning race, creed or national origin.

A general organization should be established to monitor, and improve when necessary, the working conditions and fringe benefits of the employees. Dues should be kept to a minimum, to avoid purchase of political power by the leaders; political activity should be prohibited, though individual political belief should remain unhampered.

This proposal is undoubtedly impossible to implement under existing conditions, and it may, at this time, be considered reactionary. But in my opinion, until "individual responsibility" becomes a part of the current vocabulary, we will continue to head downhill.

JEROME D. GOLDIS  
Washington, D.C. Architect

## HOW VIABLE THE CITY?

Forum: Much as I derive pleasure and instruction from your magazine, I accept the risk of incurring your displeasure by challenging your most basic assumption: the viability of the city.

My observations suggest to me that our cities are moribund, that our technological capabilities have rendered their erstwhile virtues of human concentration unnecessary and, indeed, increasingly distasteful. I agree with your views that our cities should be saved, but I see no practical likelihood that this will be done, and, further, almost no reason for doing so.

A few years back, it seemed that the word "mainstream" enjoyed great currency. I suggest that the mainstream of American urban life is moving, in en-

vironmental terms, away from concentrations toward more decentralized area (sprawl, if you will) development, and that the abandoned cores are without utility and, therefore, without need for redemption. I don't like suburbia any more than you do, but I do recognize that it represents a real improvement for the former city-dweller.

I further suggest that this is basically a middle-class country, with a healthy Darwinist streak. We have little use for, or patience with, the obsolete, the non-participating, the non-contributor. Spokesmen for cherished development patterns or societal groups, it seems, will have to do more than simply announce their indispensability; they will have to demonstrate it, or alternatively, find themselves in an ox-bow off the mainstream. . . .

If the polls recently published are right, that most people don't live in cities by choice, don't you think you might do some articles on the why of urban design, rather than the how?

Perhaps Urbane America should stand in lieu of Urban America.

MARTIN S. HARRIS JR.  
Educational Consulting Services  
Brandon, Vt.

## SO MUCH FOR PLANTS

Forum: I want to take this opportunity to congratulate you on the fine coverage that you gave to the Nagashima Tropical Garden in Japan [May]. This building is certainly worthy of our attention.

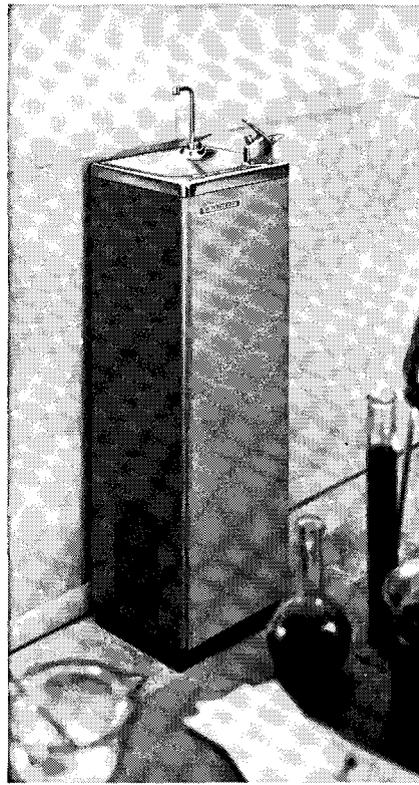
The flexible greenhouse as a problem is not an easy one to solve. This designer, however, has produced not only an exciting building from the outside (one could not pass into this building without going in), but a most engaging modular plan which provides an ever-changing sequence of volumes and ways in which to view plants.

So much for people, I think the plants will like it too. . . .

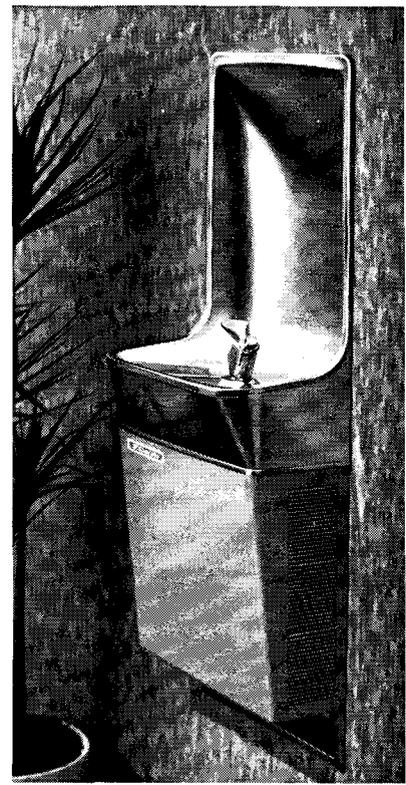
EUGENE J. MACKAY III  
Saint Louis, Mo. Architect

## ERRATUM

In our May issue we credited the design of the Industrial Valley Banking space in Philadelphia to Richard Saul Wurman; the credit should go to the firm Murphy Levy Wurman.

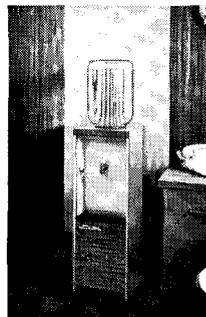


Cordley "Compact"—just 12" square and priced to please.

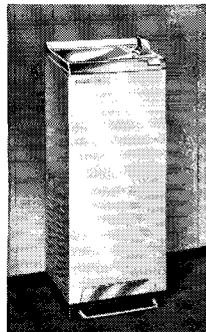


Cordley Semi-Recessed—styled to enhance any wall area.

Plain or fancy interiors . . .  
there's a Cordley Cooler that fits.



Cordley Bottle Cooler—all they require is an electrical outlet.

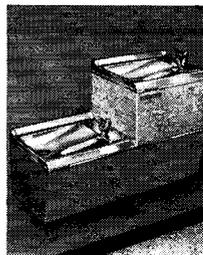


Cordley Wall-Flush—designed and built for years of service.

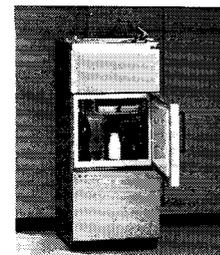
When it comes to cooling drinking water, better come to Cordley. Here you'll find a host of advanced design and engineering features. Plus a complete selection of types, styles, models and capacities to meet every requirement!

Flush mounted and semi-recessed wall-hung water coolers for neat and clean off-the-floor installations. Standard and compact floor style units in your choice of bottle or pressure types. Convenient compartment coolers that incorporate over one cubic foot of refrigerated storage space, dispense either hot and cold or cold water only. Plus packaged water chillers that can be installed in any remote location to service one or more fountains or supply fresh cold water for a range of commercial and industrial processing applications.

The point to remember is this: Whatever your needs may be, there's a Cordley quality cooler that fits—*exactly!*



Cordley Wall-Hung—trim and neat and remarkably versatile.



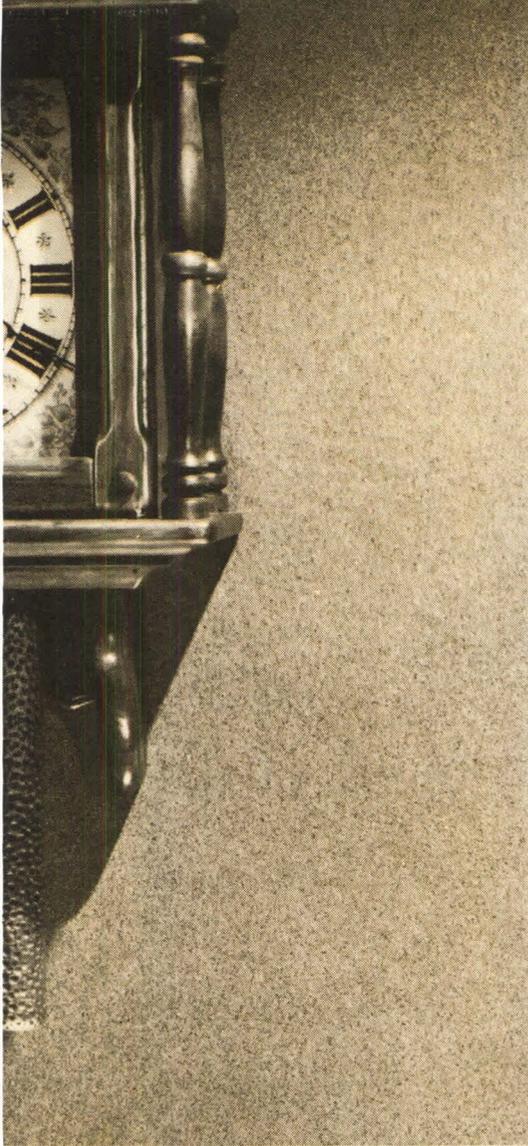
Cordley "Hot & Cold"—instant choice, ice and storage space.

• Consult Sweet's Architectural File or write for copy of Cordley Catalog C-161 today!

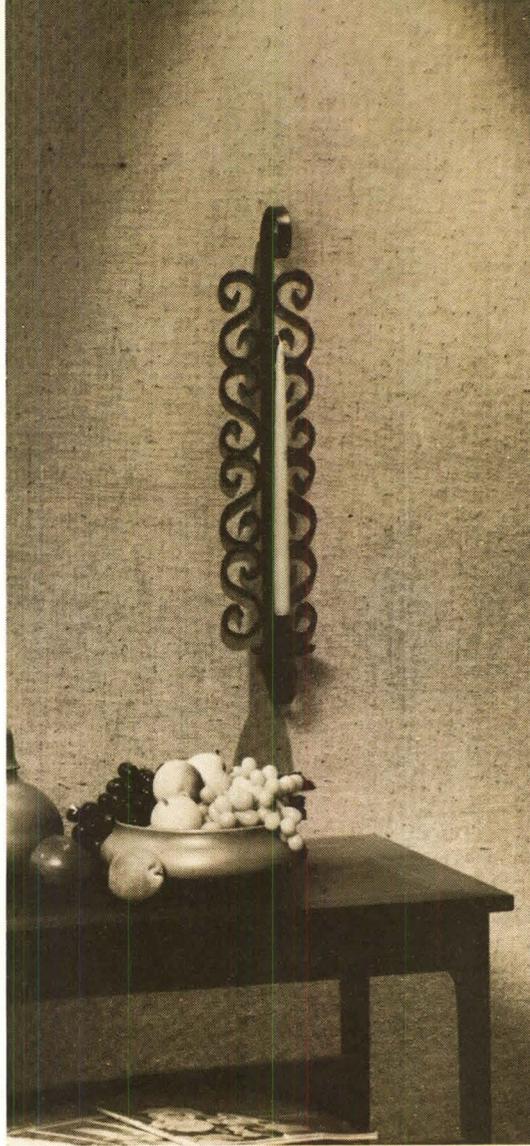


**CORDLEY**

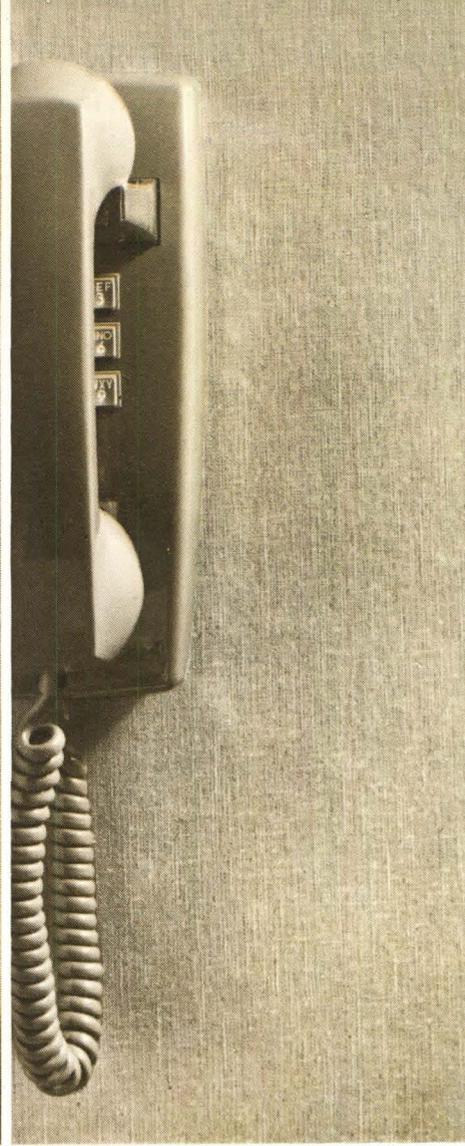
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GLEN ELLYN, ILLINOIS, 60137



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High Fashion Wall Paneling—Genuine Burlap



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**homasote** Company

TRENTON, N. J. 08603

# Ronson Foodmatic

Ronson introduces the one appliance that does the work of dozens...does it better, in less space, and at lower cost.



# New Ronson Foodmatic mixes, blends, grates, sharpens knives, squeezes

**BEATER CLUTCH AND ARM RELEASE BUTTON** stops beater while bowl continues to rotate. Also releases arm to adjust to any of three positions.

**AUTOMATIC TIMER** sets the Foodmatic for automatic use. Also can be set for manual use.

**SPEED SELECTOR GUIDE** imprinted on mixing arm.

**HYDRAULIC LIFT-LOWER MECHANISM** module raises and lowers in and out of counter. Closes flush with counter top.

**SOLID STATE SPEED CONTROL** provides infinite choice of speeds. Solid-state circuitry assures no stall power.



**LATCHES** hold each attachment firmly in place.

**CIRCUIT BREAKER** protects motor and electrical circuit against overloads.

**CONVENIENT ELECTRIC OUTLET** for many other small kitchen appliances.

**BUTTON** to raise or lower unit.

**1/3 HP MOTOR** extra power to operate more than a dozen attachments, will not stall at any speed.

**3-POSITION MIXER ARM**  
 (1) locks in horizontal position for mixing, (2) raises higher and locks in place to drip-clean beater, and (3) folds out of the way when not in use.



**BEATER RELEASE LATCH** releases beater from power socket.

**LATCH RELEASE KNOB** retracts two latches located inside attachment well to unlock and release attachments.

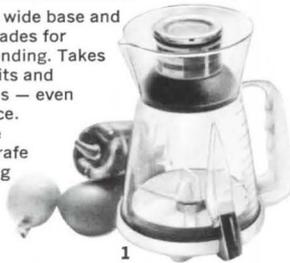
**PROFESSIONAL TWO-WAY MIXING ACTION**  
 bowl and beater are powered by separate drives —bowl rotates one way, beater the other— for smoother beating and mixing.

# slices, shreds, grinds meat and coffee, oranges, crushes ice...it even cooks.

## Foodmatic comes with 16 standard attachments:

### Wide-Base Blender.

Exclusive wide base and largest blades for better blending. Takes whole fruits and vegetables — even crushes ice. Attractive 48 oz. carafe for serving at table.



### Two Beaters, Two Bowls, Dough Hook, Turntable.

Turntable and heat resistant glass bowls interlock to keep bowls firmly in place. Dough hook kneads smoothly.



### Knife and Scissors Sharpener.

Hones knives and scissors to original sharpness in seconds.



### Juicer.

For orange, lemon or grapefruit juice. Operates with small size mixer bowl.



### Recipe Booklet.

Over 100 pages featuring recipes and illustrations for hundreds of drinks and dishes — to help you cook like a professional chef.

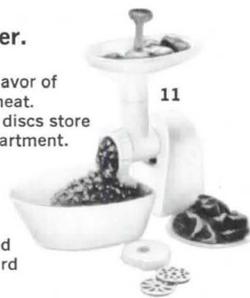


### Salad Slicer-Shredder.

Three types of discs shred or slice lettuce, cabbage, onions, carrots, peppers, even grate cheese.

### Meat Grinder.

Get the extra nutrition and flavor of fresh-ground meat. Three grinding discs store in handy compartment.



### Note:

One catcher bowl is included with 16 standard attachments.

### Two Custom-Molded Trays.

Contoured to hold standard and optional attachments.

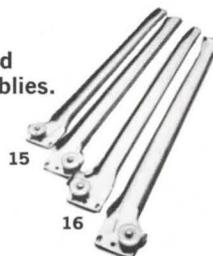


### Mount Organizer.

Holds beaters, turntable, blender key on cabinet door or wall.

### Set of brackets and metal slide assemblies.

Allows trays to roll out for quick, easy access to any attachment.

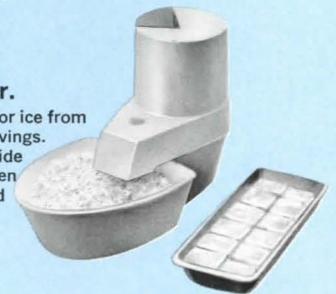


## Optional attachments:



### Coffee Mill.

Superb coffee mill grinds beans for fresh coffee flavor; for drip, percolator or vacuum coffee makers.



### Ice Crusher.

Dial settings for ice from chunks to shavings. Useful for a wide variety of frozen appetizers and desserts.



### Deluxe Juicer.

Comes with two interchangeable ceramic reamers . . . small for lemons and limes . . . large for oranges and grapefruits.

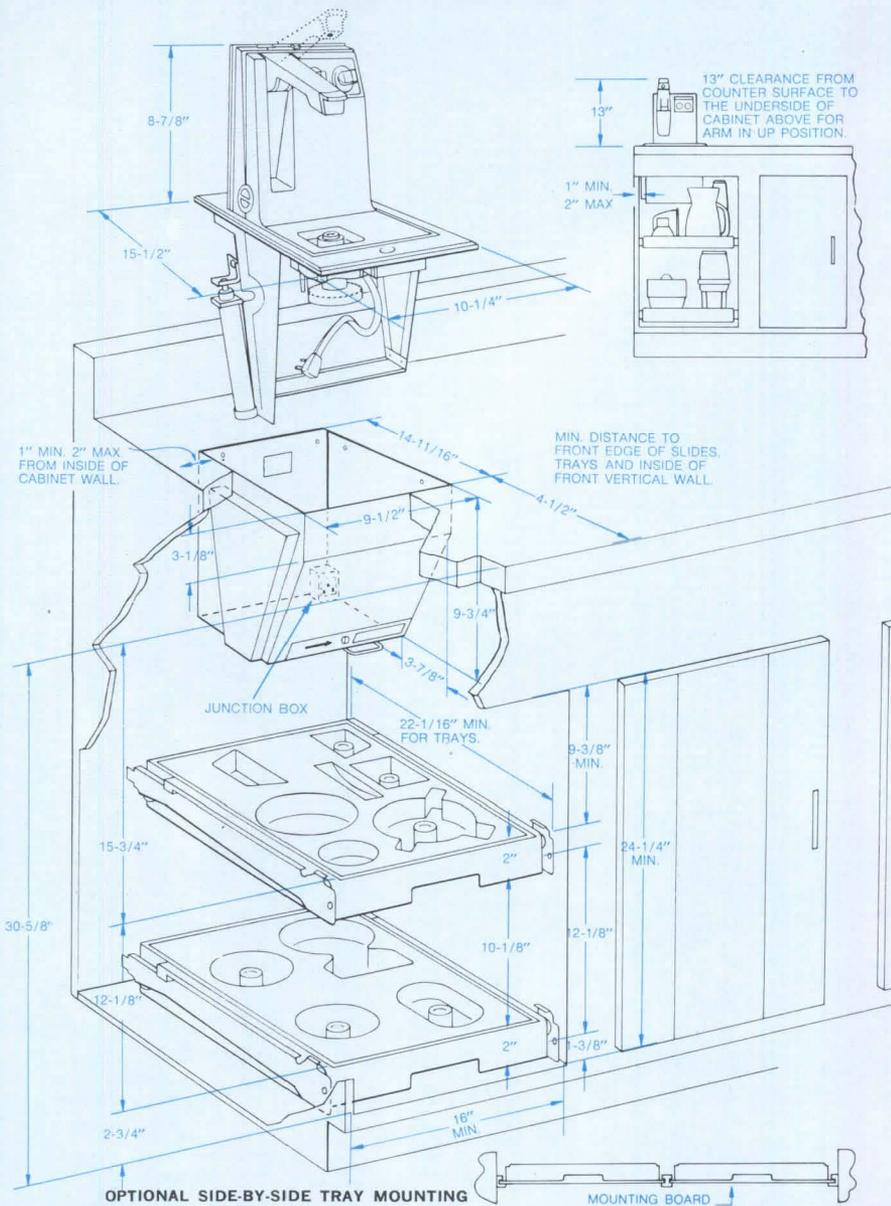


### Cooking Stirrer.

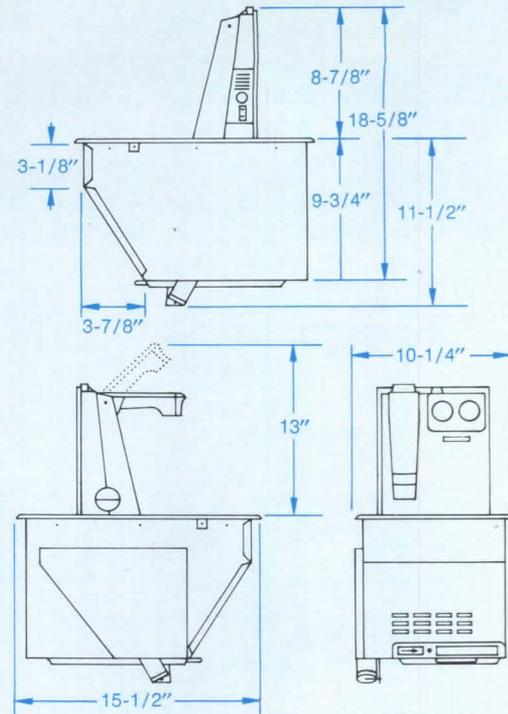
Cooks to a temperature of 400° and stirs as it cooks, automatically. Dial settings of 100° to 400°. Teflon®-coated blades and interior. (Available early 1970)

# Ronson Built-In Foodmatic Installation/Specifications

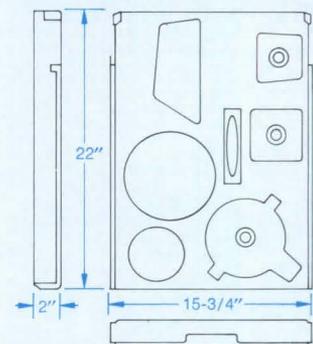
THE RONSON BUILT-IN FOODMATIC can be installed in any cabinet or counter-top which provides adequate clearances of over counter cabinets (see drawings). Simply use the template furnished with each unit to locate the cut-out position in the counter-top. Install the metal under-counter enclosure with junction box to which permanent electrical connections are made. Lower the power module into the metal under-counter enclosure — secure from the top with two screws — and plug in the 110 Volt line cord.



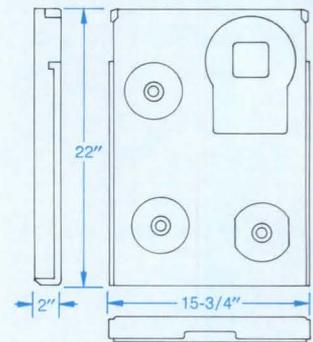
## FOODMATIC BUILT-IN POWER MODULE



### UPPER TRAY



### LOWER TRAY



**NOTE:** A minimum of 32" of horizontal spacing, exclusive of mounting board, is required for side-by-side in-counter mounting. Be sure that the tallest attachment in either tray will clear the bottom of the metal under-counter enclosure.

**POWER UNIT SPACE REQUIREMENTS** Maximum counter thickness: 2" Minimum above-counter clearance 13".

Minimum below-counter clearances: 11 1/2" in depth. Measured from the top surface of the counter. 13" in width — in order to place the left bezel of the Foodmatic about 2" away from any cabinet wall to the left. 15 1/8" front-to-rear clearance, but 19 3/8" or more is recommended — so that the front bezel of the Foodmatic is positioned 4" or more from the front edge of the counter.

**ELECTRICAL REQUIREMENT** The power line to the junction box should be #14 wire (recommended) BX, Romex, or Conduit as required by local electrical codes. The maximum load for wiring is 15 Amps at 110 Volts. Connect power line directly to the junction box located at the right rear of the under-counter metal enclosure. This will hook up the female socket built into the junction box and allow for the quick-connect-disconnect of the power module.

Rated at 960 watts, 60 cycles, AC only.

AF S

For additional information on Ronson Built-In Foodmatic, please fill out and mail to:

Ronson Corporation  
Built-In  
Major Appliance  
Department  
One Ronson Road,  
Woodridge,  
New Jersey 07095

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Please send me information on the Ronson **BUILT-IN FOODMATIC**. I am a:

Homeowner  Architect  Builder

Dealer  Distributor  Other \_\_\_\_\_

Advise me where I may purchase the Ronson **BUILT-IN FOODMATIC**.

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The Saarinen chair designed for Knoll by the late Eero Saarinen • Knoll Associates, Furniture and Textiles, 320 Park Avenue, New York, New York. Knoll International operates in 30 countries.





# The First National Bank of Chicago specifies York for the city's largest air conditioning job!

The First National Bank of Chicago, in the heart of Chicago's loop. A 10,000-ton York centrifugal refrigeration system provides cooling for the entire building. Architects and Engineers, C. F. Murphy Associates and The Perkins and Will Partnership (a joint venture); General Contractor, Gust K. Newberg Construction Company; Mechanical Contractor, Great Lakes Plumbing & Heating Company.

60 stories high, with over 2 million square feet of floor space—this modern building has enough cooling capacity for over 3,000 homes!

Located in the geographical center of Chicago's loop, the First National Bank Building is the tallest building in downtown Chicago . . . the world's tallest bank building . . . and the sixth tallest building in the world!

Architecturally, the building is a credit to the city and to those who planned it. From an engineering point of view, the building presented some challenges. But, four York giant centrifugal compressors — with a total capacity of 10,000 tons —

met the cooling requirements. These York machines are factory-assembled "packages" with all the major components matched-built together to work together. And they're economical to operate because they pace themselves from part load to full load conditions automatically, smoothly. And that reduces power costs, of course.

Backed by over eighty years of leadership in the design of superior high side and low side equipment for comfort conditioning, York has units like these at work in buildings and plants all over the world. Their wide acceptance by Architects, Engineers and owners attests to their superb performance under all operating con-

ditions. When you design a comfort system for any building, contact your nearby York Sales Office for Specification Data on York centrifugal compressors — and other York equipment. Or write York Division of Borg-Warner Corporation, York, Pennsylvania 17405.

**YORK**  
DIVISION OF BORG-WARNER CORPORATION  
**BORG WARNER**

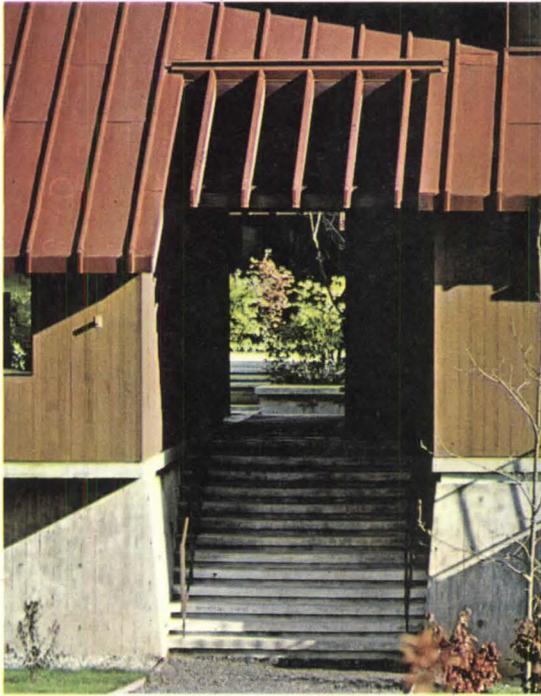


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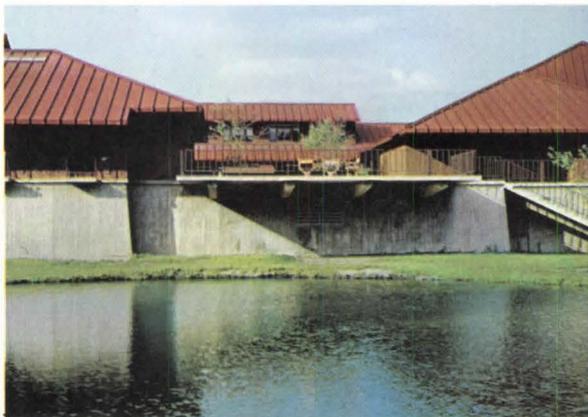




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*American Seating's new Sundberg shell is shown above on a stacking chair. Made from a new static-free material, cast nylon, the highly styled Sundberg line contains 9 different designs.*

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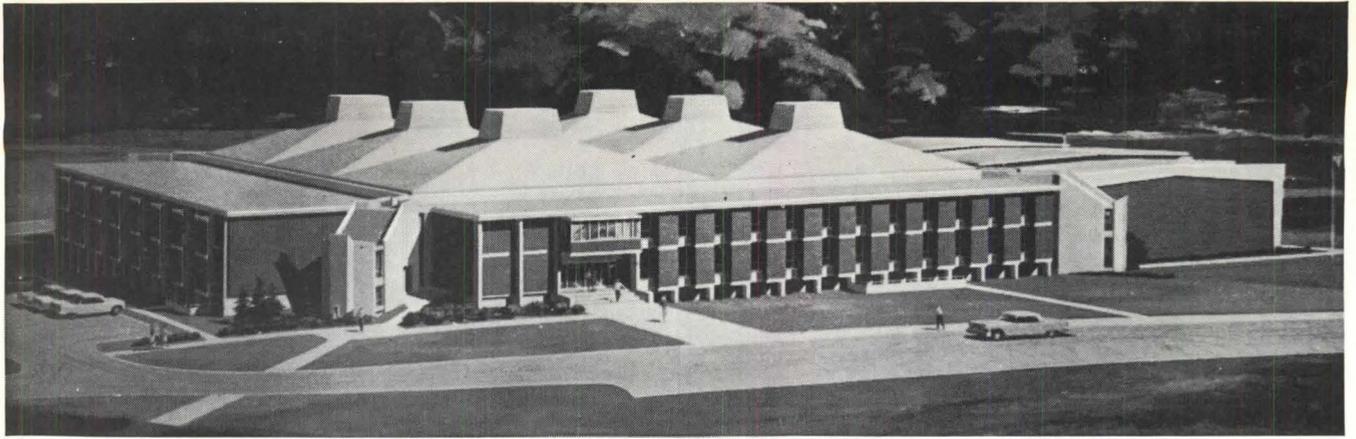
Choices that are *best for the student* may sometimes be quite surprising, but they are based on factual studies." So says Faber Birren, American Seating's educational furniture consultant and founder of Color Trends, Inc.

In a new booklet, "How Color Can Create an Environment of Excellence in the Classroom", Birren reveals some eye-opening facts about the effects of color on the learning process — why certain color combinations are more compatible in the classroom. For your copy, write **American Seating Co., Box NS-683, Grand Rapids, Mich. 49502**. In Canada, our Subsidiary — **Ebena Lasalle Inc., Montreal**.

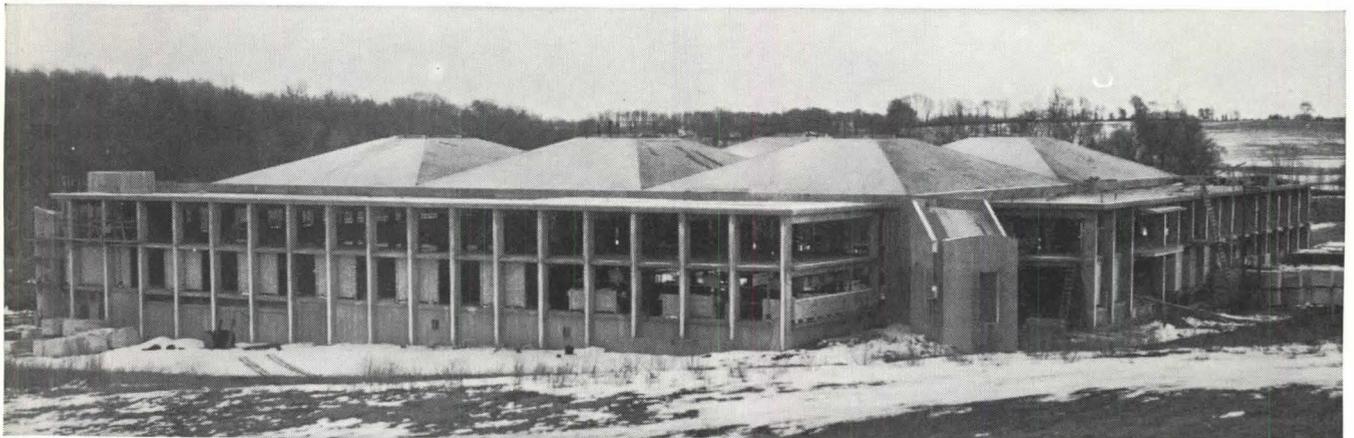
for the Environment of Excellence



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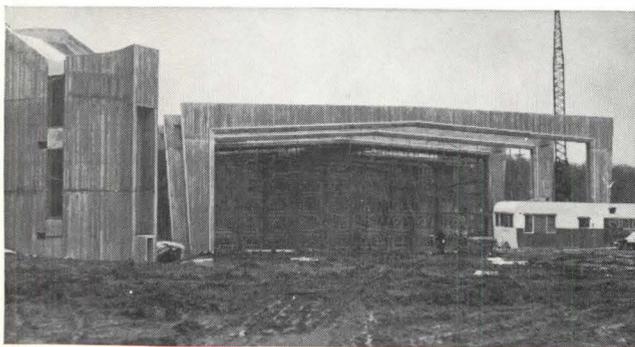


## The great college expansion— concrete helps make it happen.



Concrete plays an important part in the exterior design treatment of the new fieldhouse at West Chester State College. Stair wells at the four corners of the fieldhouse feature exposed ribbed surfaces. Floors and certain columns extend through the masonry walls. The gymnasium is surrounded by a three-story structure that will

house a variety of smaller activity areas, dressing room facilities, classrooms and offices. Walls are concrete masonry with brick veneer to blend with older campus buildings. Precast units provide the roof for the gymnasium. Roof of perimeter section is cast-in-place lightweight concrete.



Structural arches for natatorium rise 36' above the ground. They are 2' thick, with the greatest width, 6'6", at the top of the columns. Exposed concrete of the arches complements the exposed concrete stair wells. Precast concrete is used in the roof structures.

A new fieldhouse. And a new natatorium. Designed in concrete for an interesting graceful look that blends harmoniously with the remainder of the campus. Designed in concrete for fire safety, durability and maximum service. Lehigh Cements helped make it happen at West Chester State as they've done in important construction projects all around the country. With quality materials. And on-time delivery to the ready-mix producers so they can keep the projects on schedule. Lehigh Portland Cement Company, Allentown, Pa.

*Owner:*  
West Chester State College, West Chester, Pa.

*Architect:*  
Smith, Chatman-Royce Associates, Paoli, Pa.

*Contractor:*  
Cubic Construction Co., Cherry Hill, N.J.

*Ready Mixed Concrete:*  
Trans-Materials Co., West Chester, Pa.

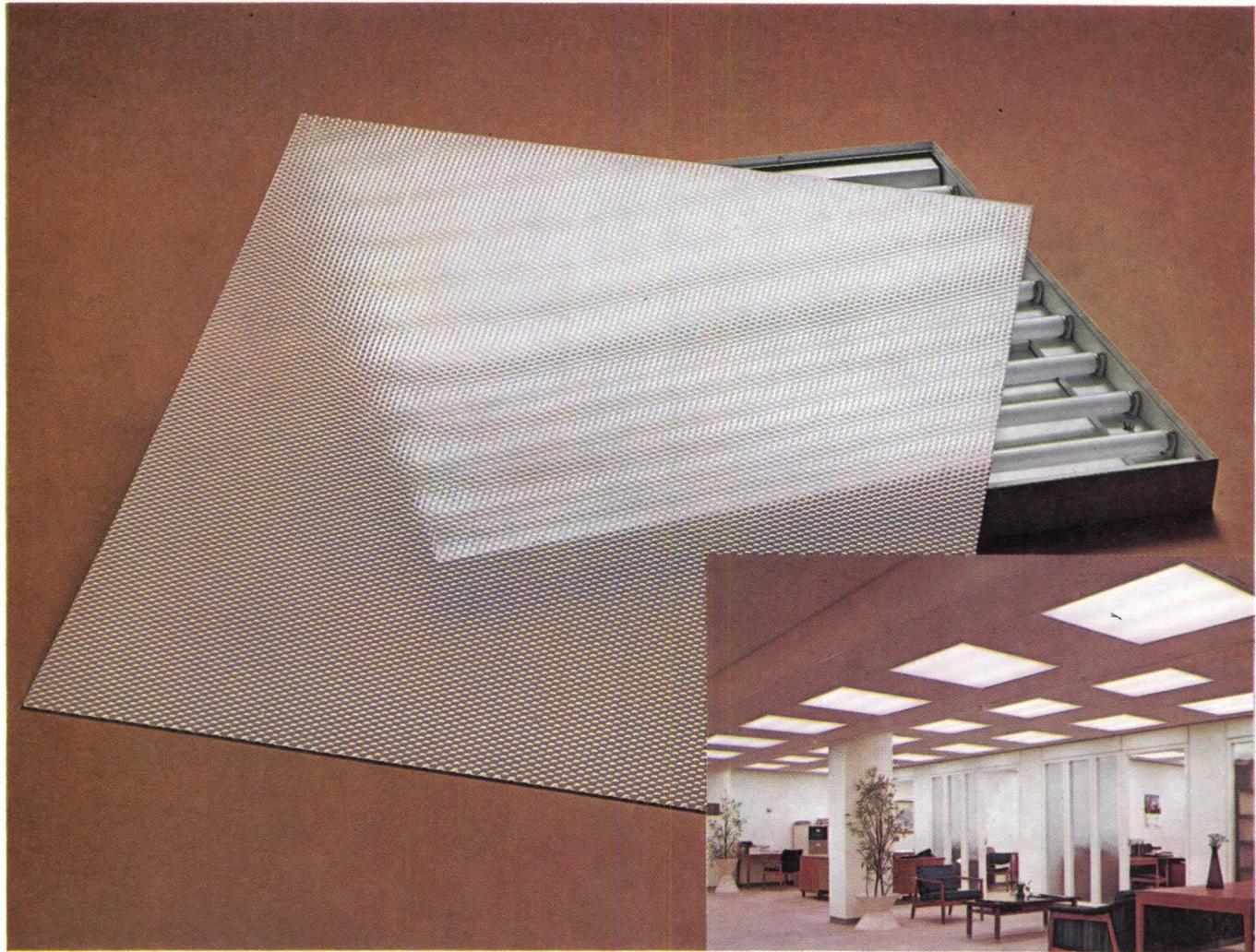
*Precast Roof Units for Natatorium:*  
Formigli Corp., Philadelphia, Pa.

*Precast Roof Units for Gymnasium:*  
Concrete Plank Co., Inc., North Arlington, N.J.

*Concrete Block & Specialties:*  
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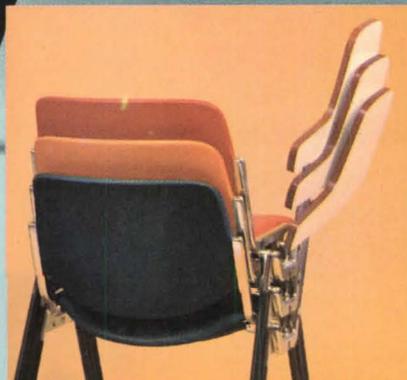
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# FORUM

Commenting that "getting down to earth" is a meaningless expression—we are already on a space ship of our own—Bucky Fuller made a flying visit to New York City late this summer to conclude the initial run of his World Game, which had been in progress for six weeks at the Studio School of Drawing, Painting and Sculpture.

The "players" were 22 students from a broad range of studies (anthropology, architecture, biology, physics, etc.). Bucky had started them off, then left things in charge of Edwin Schlossberg, research assistant at the Institute for the Study of Science in Human Affairs at Columbia University, and returned to find to his delight that, for the first time in his life, a group had discovered the same principles he has espoused for the past 40 years.

The World Game offers a comprehensive picture of "how man is doing" on the whole earth, in terms of vital resources and human factors. While war games are geared to zero-sum accounting—one person's gain means another's loss—the World Game demonstrates the advantages of practical cooperation.

The game is Fuller's own in many ways. He began playing it in 1927. It utilizes his patented projection of the world—a map that enables the globe to be seen whole, one world-island and one

world-ocean (below). The game is based on Fuller's unshakable conviction that the Malthusian doctrine—of insufficient resources for an increasing world population—is erroneous. "We don't provide for more than 44 per cent of humanity today," said Fuller at the Studio School. "The rest are doomed to an early death, with plenty of suffering along the way, because we utilize our resources at only 44 per cent. A design revolution must take place. We must do more with less."

The World Game, with its vast inventory of information (assembled on wall grids and map overlays), gives an immediate picture of relationships between, say, food production, population, steel output, power potential. Because energy is crucial to development, it is an early scenario in the game. The students this summer had made a map of the world's existing power grid (a unique undertaking; there wasn't one in existence), then proceeded to prove that a minimum standard could be provided to everyone on earth. The surplus areas of Africa, North and South America would supply power to deficit areas, primarily Asia. The students emphasized that they are not saying it *must* be done this way, but that at least it *could* be done.

The game will now be computerized at Southern Illinois University, the full-scaled game bringing together world experts to devise world strategies. The game is without end because it



keeps reflecting change.

The real problem in making the world work, said Fuller, is not physical but educational. Only man's inertia and ignorance stand in the way. The world is not used to thinking in terms of synergy—the behavior of the whole, unpredicted by the behavior of the parts. He looked around him at this group of young people, who have discovered what it is like to be World Men—to be "comprehensivists," not specialists—and exulted: "The awareness in this group cannot be eradicated."

## TECHNOLOGY

### THE MHD MACHINE

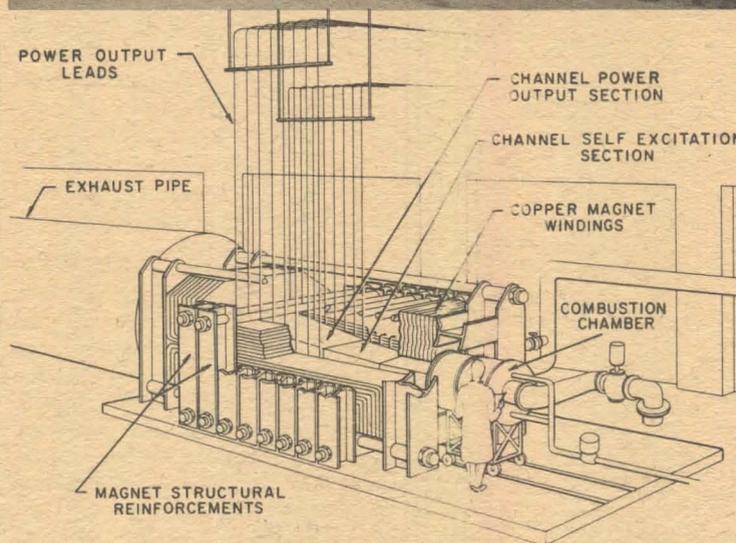
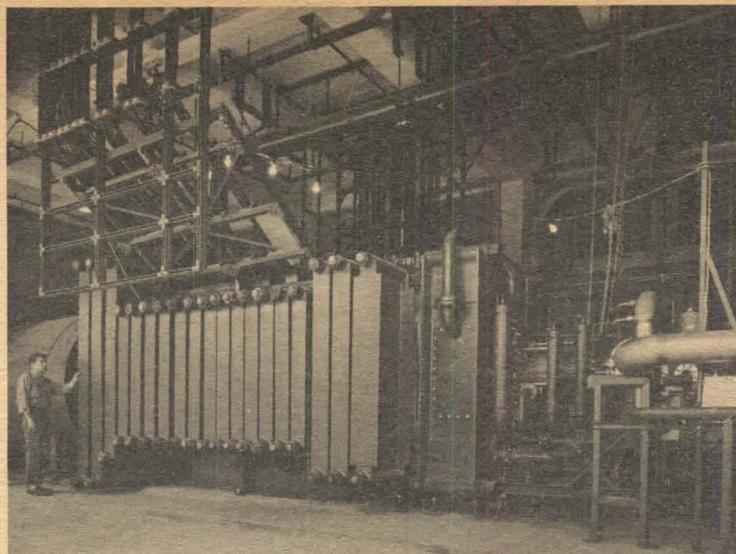
Bucky Fuller's World Game (see above) is, unfortunately, not played by governments. Where it operates on the principle of practical cooperation, the Cold War Game operates on the principle of impractical competition. One case in point is magnetohydrodynamics, a way of generating power—that from which all else springs.

A spinoff from space, magnetohydrodynamics, says its developers, "makes it possible to produce electricity 50 per cent more efficiently, at low cost, and with a drastic reduction in the pollution of air and water." Russia expects to have a 75,000 kilowatt working plant in operation next year. Ever mindful of the Soviets' timetable, our developers, Avco-Everett, are urging Washington to close the gap.

MHD—a 150-year-old principle—could not be tested prior to the experience gained from heat-transfer problems of space capsule re-entry. In essence, MHD captures electric power from the white-hot tail of a rocket.

The experimental Mark V (above) consists of four major parts: combustion chamber (at right), magnet (center), power output (above magnet), and exhaust (far left). Oxygen and fuel are ignited in the burner to create a 5,000°F. ionized gas. Forced into a chamber resembling a rocket nozzle, which is surrounded by a magnetic field, the gas, flowing at high velocity, cuts the magnet's lines of force, generating an electric current.

A coal-fired MHD plant, says Avco, would be able to remove, economically, the sulfur and



oxides of nitrogen which are the chief sources of air pollution. In the "first-generation" plants the process would include a steam turbine cycle and would require four times less cooling water than nuclear-fueled generators. Advanced MHD plants, in eliminating the steam cycle, would produce no thermal water pollution at all.

### SPINOFFS FOR THE HOME

Soon to be marketed commercially as a result of space and military research, pending patent:

● A furnace the size of a 2-lb. coffee can. Developed by the Raytheon Co. from research into the cooling of radar tubes, the units high efficiency is said to result in fuel savings of up to 25 per cent; and the relatively cool exhausts can be vented out the side of a building through small-diameter, uninsulated pipe. Inventor William R. Hapgood (with heater, right), who is mum on most essential details

until the patent is granted, says his prototype heated Raytheon's Massachusetts lab—about the size of a nine-room house—all last winter.

● A wall paint that conducts electricity and serves as a heating element. NASA's experiments with silicates and other inorganic materials as binders in coatings for space satellites supplied the groundwork. Scientists at the Paint Research Sta-



tion at Teddington, England, say it will brush, roll, or spray on and its fully tested, high-radiation efficiency will warm rooms rapidly. It is non-toxic and will produce no electric shock because it can operate at under 40 volts of alternating current. In this country, a step-down transformer would be needed and additional capacity, circuitry, and distribution panels would have to be installed. Dark in color, it can be covered with a decorative paint without affecting its ability to radiate heat.

## SEQUELS

### NEW TOWNS FOR NEW YORK

Sixteen months ago, New York's Governor Nelson Rockefeller pushed through, despite much controversy and criticism (May '68 issue, p. 37, June '68, p. 29), what he has called one of his most important achievements—the formation of the Urban Development Corp., a public corporation designed to promote renewal of substandard areas throughout the state, with or without local consent. UDC is headed up by Edward F. Logue, mastermind of much of the renewal in New Haven, Conn., and Boston.

UDC has been appropriated \$40 million by the state, and may float \$1 billion in bonds which should generate about \$5 billion in private investment. Projects initiated by the corporation can be bought and carried out by private investors, or brought to completion by UDC.

Last month two new plans were proposed—for two new towns, one outside Buffalo, in Amherst, and one in Lysander, near Syracuse. These two are the result of a conference on new towns sponsored jointly, last June, by UDC and Urban America Inc.; the program is the first new community development plan in the U.S. undertaken by a public agency.

Both new towns will incorporate housing and business and industry. The Amherst project will grow along with a \$650-million, 1,000-acre campus being built by the State University there. This campus will accommodate 40,000 students and 40,000 faculty (including families); the whole town should support a population of 200,000 within 15 years. A plan for

Amherst is expected to be submitted in six months, and will be led by British Planning Consultant Lord Llewellyn Davies. The corporation has set up an office in Amherst which is meeting with local officials.

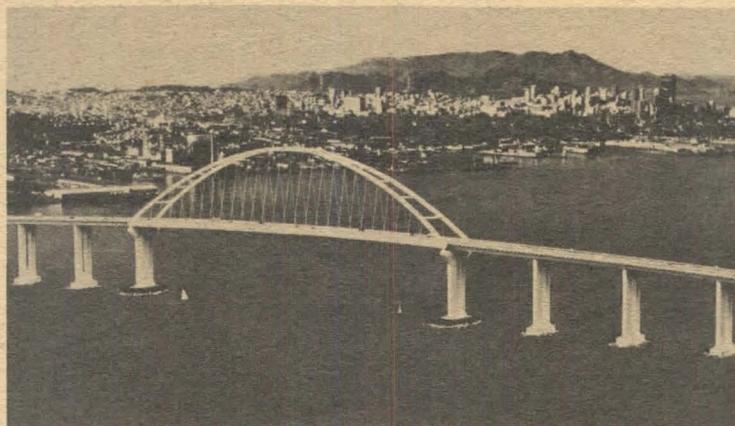
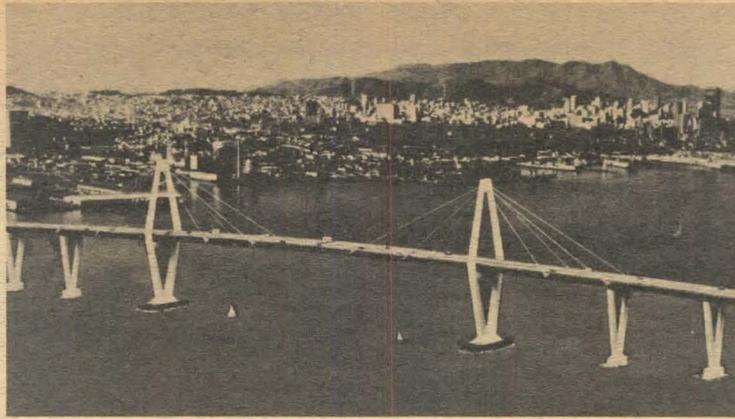
The Syracuse project will also be a mixed development, and is to be planned by the Philadelphia firm of David Crane. The land was empty when UDC bought it for \$240 million and will be able to accommodate a community of 16,000 persons without relocating anyone. Construction is expected to begin next spring, first on an industrial park, later on the residential area which will be 70 per cent for moderate-income families, 20 per cent for low-income families and 10 per cent for the elderly.

## UPS & DOWNS

### EXERCISE IN GRAVITY

Yo-Yo 2—the largest plywood yo-yo in the world—measures 15 in. in diameter, weighs 4 lbs., and was successfully test-launched (see below) from an upper-floor window at Manhattan's "progressive" Dalton School. Yo-Yo 1 was a flop.

For its builder, Tony Cahan (eighth grade), there is, of course, nowhere to go but up. Architects, unfortunately, have stopped designing highrise buildings with windows that open. If



there is anything to lure the corporation president from his Executive's Sandbox, this is it.

### BAY BRIDGE BALLOT

Above are two designs of the shipping-channel span for the proposed "Southern Crossing" for San Francisco Bay. The remaining, and major, portion of the six-mile bridge will be an eight-lane causeway. The "Cable Stayed Girder with Diamond Tower and Double Stays" (top) has supporters as long as its name: four local AIA chapters, two local engineers organizations, the Board of Supervisors of the City and County of San Francisco (unanimous), the *Examiner*, the *Chronicle*, the Potrero Merchants and Boosters Association, and, most significantly, the State Toll Bridge Authority's chief engineer and its architectural consultant, Stephen Allen. The only known opponents are one local chamber of commerce and two members of the bridge authority, which has built all the bay bridges.

Why then was the "Single Span Tied Arch" (bottom) the bridge authority's first choice? You may need a score card.

Three of the five-member Authority (a bare quorum) voted for the tied arch. All those

groups listed above denounced them for it. So they met and voted again. This time a fourth member was present. He voted for the diamond towers and one of the former three switched. That made two for each, which, in effect, canceled out the second vote leaving the first standing. The *fifth* member—ah hah!—Governor Ronald Reagan, called a third meeting, having missed the first two. Versed in Hollywood heroics and parliamentary procedure, he cast aside the tied vote *and* the tied arch. "San Francisco is the queen city of the West," said Raymond Bright, a Potrero Booster. "Now she has another diamond in her crown, not an arch support."

## REJECTS

### NO MONEY, NO DICE

What with the moon and Mars and Vietnam and other unearthly pressures on the federal budget, there just doesn't seem to be any cash around for the arts anymore. Under the leadership of Roger L. Stevens, the National Council on the Arts, in 1968, was able to give over \$27 million in grants—even though the federal allotment was only \$4.5 million. But Stev-

ens had charismatic powers of persuasion, and was able to raise money from private sources.

In March of this year, however, the Nixon Administration "new-broomed" Stevens from office, and since then the National Council has been not only without money but without a leader. Since the '69 arts budget allows for only \$3.7 million, the post is decidedly unattractive to would-be cultural messiahs. Various luminaries in the arts, and otherwise, have been mentioned, including Shirley Temple Black, Thomas P. F. Hoving of New York's Metropolitan Museum, Morton D. May of May Co. department stores, and, most recently, Author Michael Straight. So far, no go for anyone. Which means that struggling young (and old) artists will simply have to struggle some more, or else switch to the sciences—the National Science Foundation gets a yearly stipend from Congress (i.e. all of us) of \$500-million.

### JUDGMENT IN CHICAGO

The U.S. District Court ruling in Chicago, in which Judge Richard B. Austin laid out a detailed plan to redress the racial imbalance in Chicago's public housing projects, could have an extraordinary nationwide impact. He ordered the Chicago Housing Authority to build 75 per cent of all future projects in white neighborhoods.

"A disaster," said Congressman Roman Pucinski (Dem., Ill.) whose Northwest Side constituency is predominantly white. "I think this kills public housing."

Jay Miller, executive director of the American Civil Liberties Union, which brought the suit, said the decree would provide the kind of public housing that, "if we had the foresight, we would have started in 1950." (All but about 300 of the 19,000 public housing units built by the CHA since 1950 have been located in predominantly black neighborhoods.)

Judge Austin also directed the CHA to reserve 50 per cent of the new developments for neighborhood residents; fully integrate four existing projects that are mostly white; and deny aldermen the right to veto public housing in their bailiwicks.

Where the judge obviously got way out of his own bailiwick was when he tackled the subject

of design. Perhaps haunted by Chicago's Robert Taylor Homes—28,000 persons, 99 per cent black, in 28 buildings, each 16 stories high—he specified that future projects house no families with children above the third floor (!) and accommodate no more than 120 persons.

And while the CHA has decided not to appeal, hoping to keep the furor Judge Austin's ruling has aroused at a local level, the ACLU is going for much bigger game. They have filed—in Judge Austin's court—a suit against HUD for, in effect, aiding and abetting the CHA by funding their discriminatory practices.

## TRANSPORT

### ADDRESSING A CRISIS

On August 8, New York's Governor Rockefeller, pressured by rebellious Long Island commuters, announced that the Long Island would be the best railroad in the nation—in two months. The commuters, feeling once again that they had been headed off at Credibility Gap, set their stop watches.

Elsewhere in the news that day, President Nixon unveiled his mass transportation proposals. Under Secretary of Transportation James E. Beggs, in discussing them, was a bit more cautious than the governor: "We think we can do a great deal in helping the Long Island. It's not going to come real quick, but in a few years we hope to produce a modern, fast, efficient and good transportation system in New York."

The President had scrapped the "trust fund" scheme for financing mass transit, which Beggs's boss, DOT Secretary Volpe, had urged upon him. This was said to be a victory for Presidential Adviser Arthur F. Burns. The President decided, instead, to trust what Senator Clifford P. Case (Rep., N.J.) described as "the uncertainties of the congressional appropriation process." Senator Case, for one, was not persuaded: "This is the shoals on which many an excellent federal project has foundered. . . . The trust fund approach, which has been so successfully used in funding the construction of our nation's highways, can provide the reliable level of funding that will

be needed. . . . I hope the Congress will return to it."

Trust fund proposals (several are on the congressional docket) have called either for diversion of highway funds to mass transit—anathema of the highwaymen—or for ear-marking of automobile excise taxes from general revenues—an idea the highway lobby was coming around to.

Whatever the method, harried rail commuters, who live by the clock, must look to Washington to redress the transportation imbalance. There is a particular irony in that: the D.C. Metropolitan Rapid Transit System has been held up for four years by one man, Representative William H. Natcher (Dem., Ky.), whose House Appropriations Subcommittee has refused to proceed with it until the stalled and highly controversial freeway program is renewed "beyond recall."

### END OF THE ROAD

New Orleans' Riverfront Expressway and New York's Lower Manhattan Expressway (LOMEX) had more in common than the fact that they were both first pencilled onto maps by Robert Moses in the same year—1946. Both roads endangered landmarks—New Orleans' historic Vieux Carre (March '67 and June '69 issues) and Manhattan's cast-iron facades (April and June '65 issues). Both were originally elevated, then reduced to "cut-and-cover," then killed altogether in July as a result of public pressure. And, finally, the timing of their abandonment was, to put it euphemistically, politically astute.

William M. Blair, in the *New York Times*, pointed out that DOT Secretary Volpe's cancellation of the New Orleans' road was a plum for Representative Hale Boggs who had played a key role in steering through passage of the Administration's surtax extension. Boggs, who leaked the news to his Louisiana constituents days before the official announcement, won a promise from Volpe to reallocate the funds withheld from the Riverfront Expressway to a highway in Boggs's district, a 48-mile-long beltway skirting New Orleans. Killing the road was, in any case, an idea whose time had come. "We need not, after all," eulogized the *Times*, "ac-

(continued on page 91)

## WALTER GROPIUS 1883-1969

"He involved himself in all the disciplines and in all the opportunities he considered to be within the range of his vision. He has been one of the leading architects of the century; he has been, almost, the inventor of modern industrial design; and he has been, quite simply, the most influential educator in architecture, city planning and design of the past 50 years."

From an article by the editor of *THE ARCHITECTURAL FORUM*, published in *LIFE* magazine a little over a year ago.

In thinking back over Walter Gropius' long and extraordinarily productive life, we remembered a day, half a dozen years ago, when we went to a little town near Hannover, in West Germany, to look at Gropius' first, entirely independent work: the Fagus Shoe Last Factory and Administration Building in Alfeld-an-der-Leine, done in 1911, and still in full operation.

Modern architecture has not been quite the same since the Fagus complex was built. And so we are republishing the Fagus building this month in tribute to its designer.





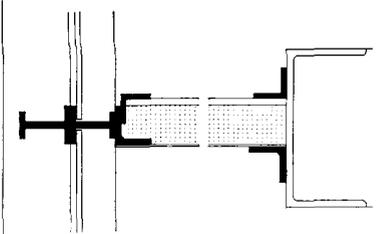
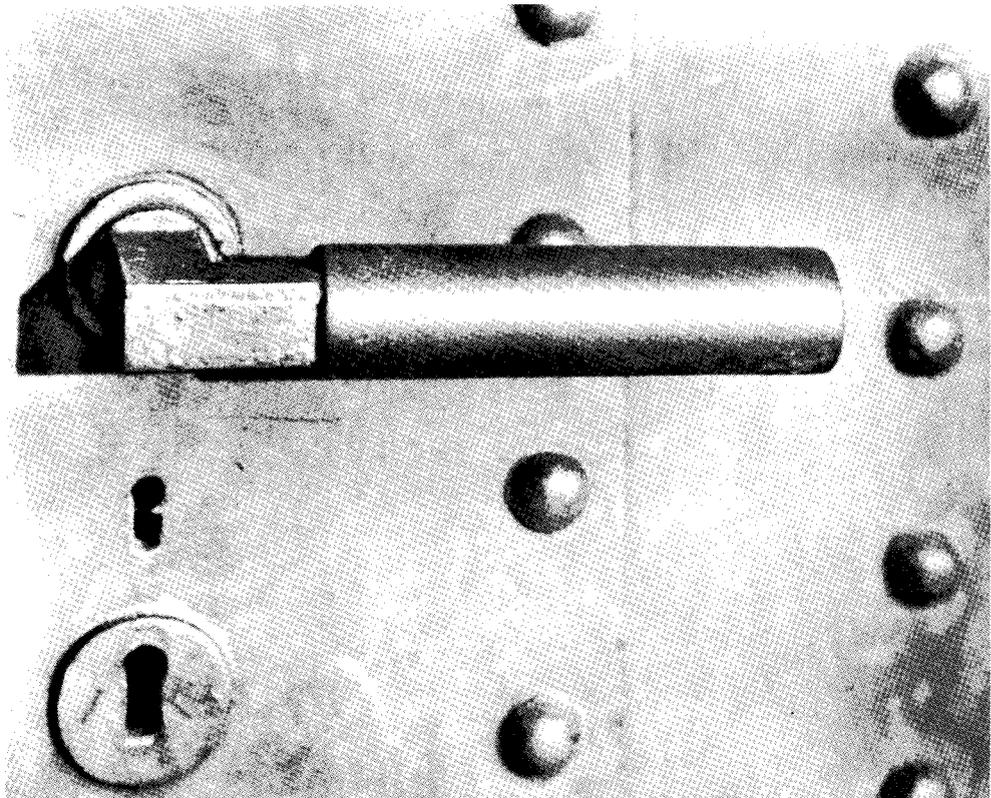


On December 7, 1910, Walter Gropius, who was then 27 years old, and who had been working for the architect Peter Behrens, decided to branch out for himself. He wrote a letter to an industrialist called Carl Benscheidt who was about to build himself a shoe-last factory in the small town of Alfeld. In his letter Gropius suggested that his experience in Behrens' office qualified him to carry out Benscheidt's project in a manner that was "both artistic and practical."

The young Gropius had written hundreds of letters of this sort to hundreds of German industrialists but this was the first one to elicit a positive response. The resulting *Faguswerk* ("Fagus" is the Latin for beechwood—the wood used in those shoe lasts) is officially credited to Gropius and his then partner, Adolf Meyer. However, surviving records make it quite clear that Gropius was the partner in complete charge of the project.

In 1945, U.S. troops entered Alfeld; Benscheidt's son recalls that an American officer walked up to Gropius' steel-and-glass building and said that it looked pretty neat and up-to-date. Benscheidt Jr. said something like "not quite—vintage 1911," and the officer retorted "you've got to be kidding!"

It is, of course, an extraordinary building for its or any other time: the administration block shown here had daringly cantilevered corners, and the structure—a hybrid of brick, concrete, and steel—carried a steel-and-glass curtain wall suspended in front of it, a curtain wall as "modern" as any attached to U.S. skyscrapers today. Just as amazing, of course, are the sophisticated details developed by Gropius to carry office partitions up to the steel mullions of the curtain wall (below).



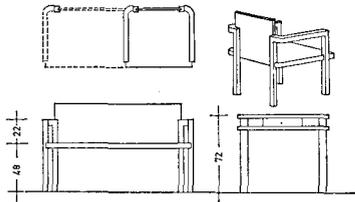
Opposite: corner of the main building, containing administrative offices and some manufacturing spaces. The curtain wall was prefabricated. Top: freestanding staircase next to the main entrance. Bottom: Gropius-designed door handle at main entrance.

The *Faguswerk* is much larger than this photograph suggests: the principal manufacturing spaces are located in buildings to the rear, and they—largely brick with glass inserts—are no mean achievements either. To architects in the 1960s, some of the nicest aspects of those brick buildings are the powerfully articulated pipes and ducts that connect the blocks.

But those manufacturing structures could have been designed by Gropius' teacher Peter Behrens, too. It is the glass-and-steel administration building, which stands out in the *Faguswerk* complex, that excites us most today.

A young German architect, Helmut Weber, has discovered and recorded the lengthy correspondence between the elder Benseidit and Gropius, concerning that glass-and-steel curtain wall. Benseidit was concerned about sun-protection (rightly so—the building now sports very handsome awnings during the summer), but he still went along with his architect. The correspondence continued for twenty years, and, except for the matter of sun-control, Gropius was completely vindicated.

There are many details in the *Faguswerk* that are still visible today and that continue to amaze the visitor. Among them, the furniture designed by Gropius for this building (below) is

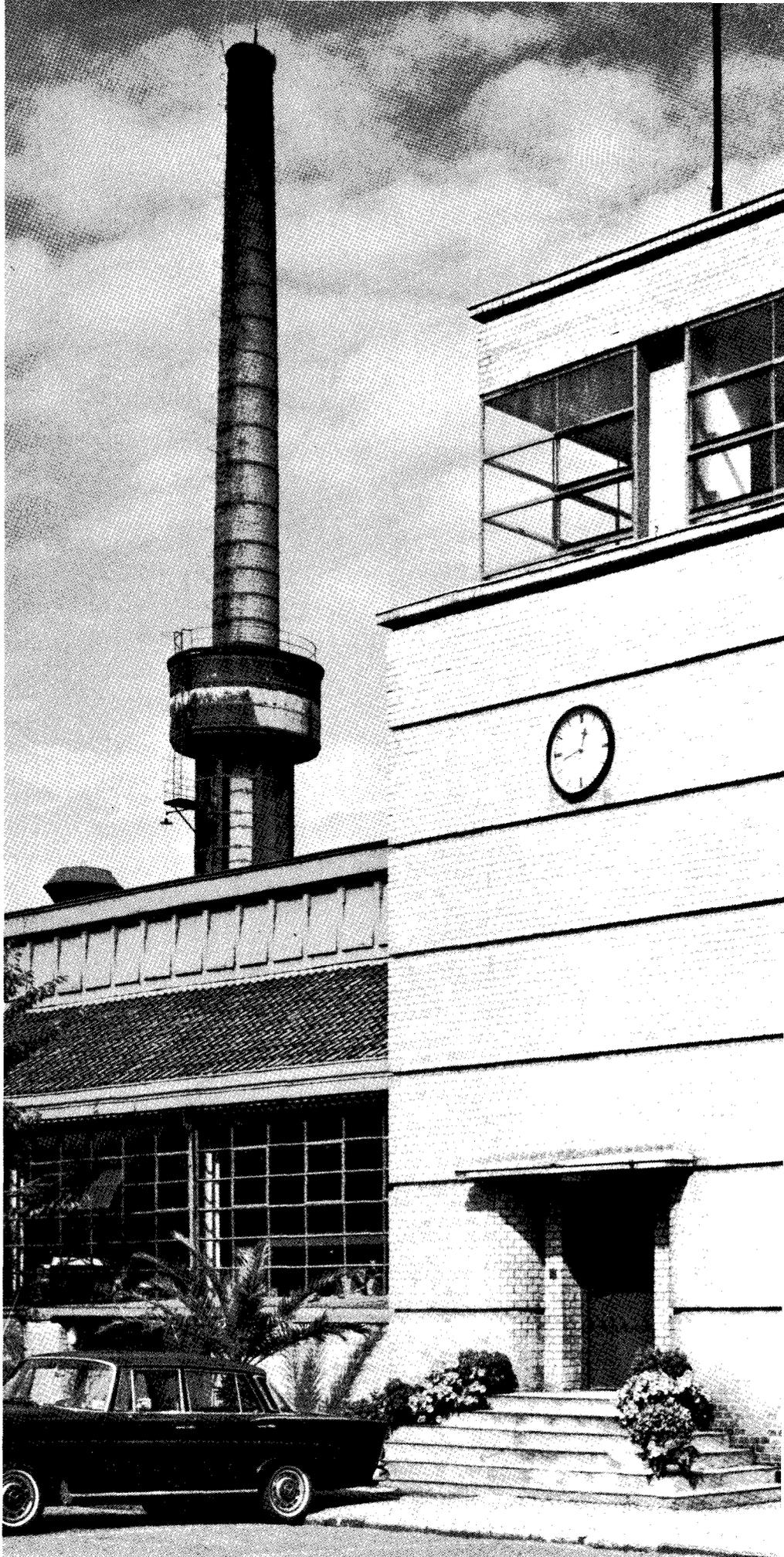


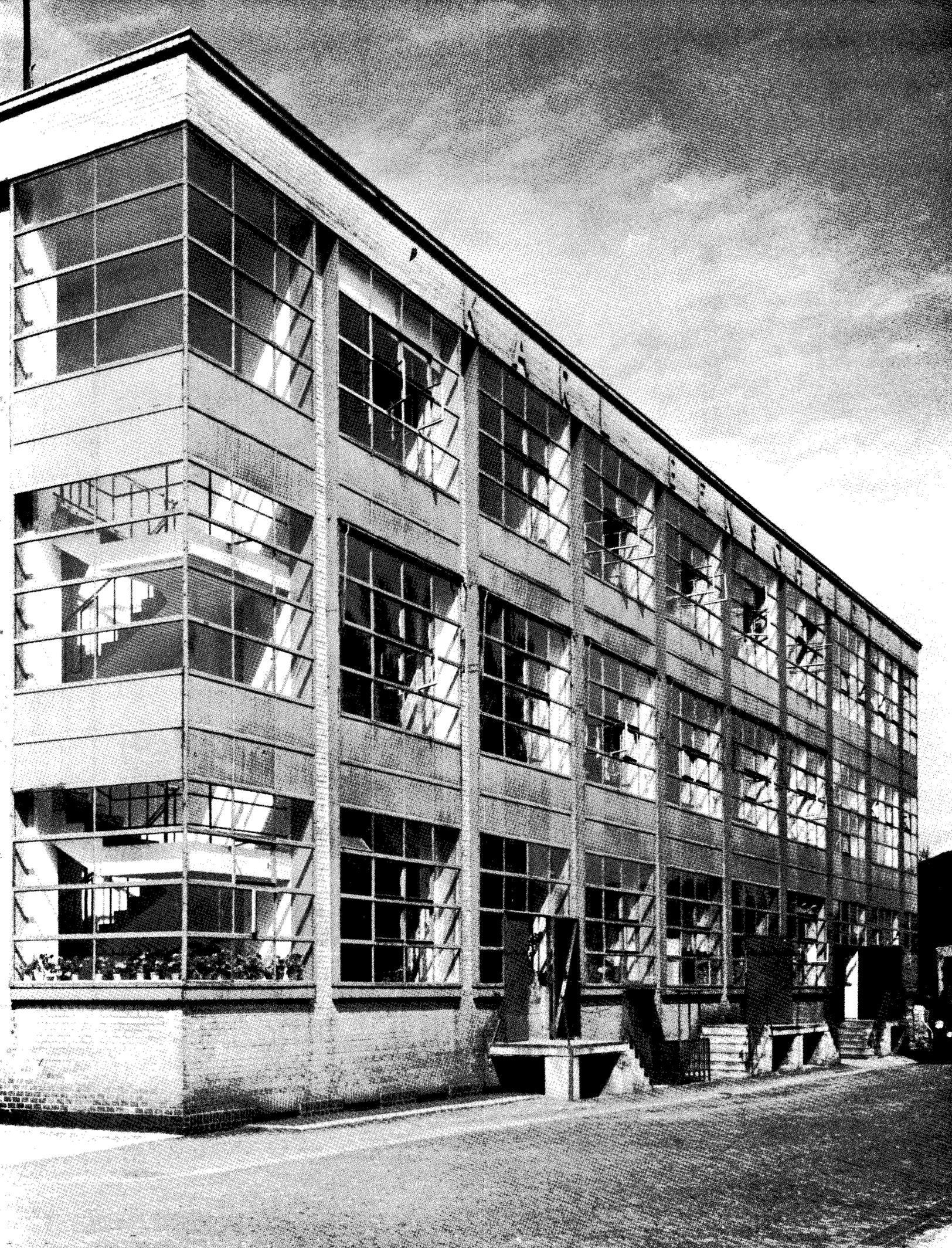
still in fine condition almost 60 years later. These chairs and benches were designed ten years before the Bauhaus produced similar designs.

The *Faguswerk* is now a national landmark in West Germany. And Gropius, who died on July 5th, did much, much more in his lifetime—in architecture, city planning, education, industrial design.

Still, it seemed as if this first, independent work of his might as well stand as his memorial. With the *Faguswerk*, Walter Gropius, at the age of 27, had really won the decisive battle.

PHOTOS: Hans Namuth, page 35; Erich Muller-Kostel, page 36; Cerwin Robinson, pages 38, 39.







John Johansen's remarkable Goddard Library at Clark University is, according to him, the result of a process of growth, improvisation, and change. Here a distinguished critic examines the building and the philosophy that produced it.

# ARCHITECTURE THROUGH IMPROVISATION?

BY SIBYL MOHOLY-NAGY

Like most highly designed poured-in-place buildings today, John Johansen's Goddard Library on the Clark University campus in Worcester, Mass., is based on Le Corbusier's basic concepts. But he goes further than most disciples in transforming lifted, moulded, penetrated volumes into a vocabulary of his own. His most successful genesis is a multiple road-ramp system turning the ground floor into a communication space open on three sides and connecting the first two levels with sinuous curves, animated by ascending and descending figures. A noble portico of Palladian proportions emphasizes the pivotal function of the library in the center of the campus, and reveals the unity of the structural system inside and out.

There could be no more adequate entry to an interior whose spaces are lucidly organized and whose impact on the user is intellectually predetermined. The rare books section and exhibition hall on the entrance court level offer no visual surprises until one steps onto an adjacent terrace. Structural elements, carried outside the wall enclosure, mix with the dense foliage of surrounding trees as reflections on large glass doors, projected on a background of fine book-bindings.

On the second level administrative areas are zoned by structural elements whose raw concrete shows an almost Doric striation. Circulation is lauded by the staff as serviceable and pleasant. Here, as in the rest of the building, the central block is orthogonally subdivided in contrast to the irregular trapezoidal spaces of the perimeter. Faculty consultation rooms and special reading areas for periodicals and reference are set off

from the circulation floor by lowered horizontal beams and varying ceiling heights.

Above this service floor rise three levels whose core is a "bookbox" containing the library stacks. It is connected by bridges to a perimeter of reading carrels and stair lobbies. Desk and chair sets stand in absolute uniformity throughout these floors and are arranged in what one might call serried formations. Somehow the arrangement recalls the open cell-block plan where every inmate is visible from all points. Here, as in the symmetrically arranged furnishings of the lounges, there arises a sort of fear that littered desks, dislodged chairs, and the challenge to throw paper missiles from level to level, would do damage to the architect's intentions. There are, however, other design features whose emotional appeal counteracts this rigid use pattern. Carpeting and upholstery in the asymmetrical areas are of well-blended vivid colors. Structural elements break up the cubic enclosures from time to time.

But the most successful counterpoint to the institutional look is the commitment to daylight, today so often callously excluded from public spaces. The entire library is a celebration of the window in all its variability. Tilted panes in square hoods exclude glare, narrow vertical light slits articulate the walls, and floor to ceiling "picture windows" are accentuated by elegant linear mullions. They bring the entire environment into the building—the old brick piles of the campus, trees which

Mrs. Moholy-Nagy is visiting professor at Columbia University's School of Architecture and a frequent contributor to this magazine.

Reading rooms extend far over the west facade (facing page), their windows angled to the north. Photo right shows the east facade.



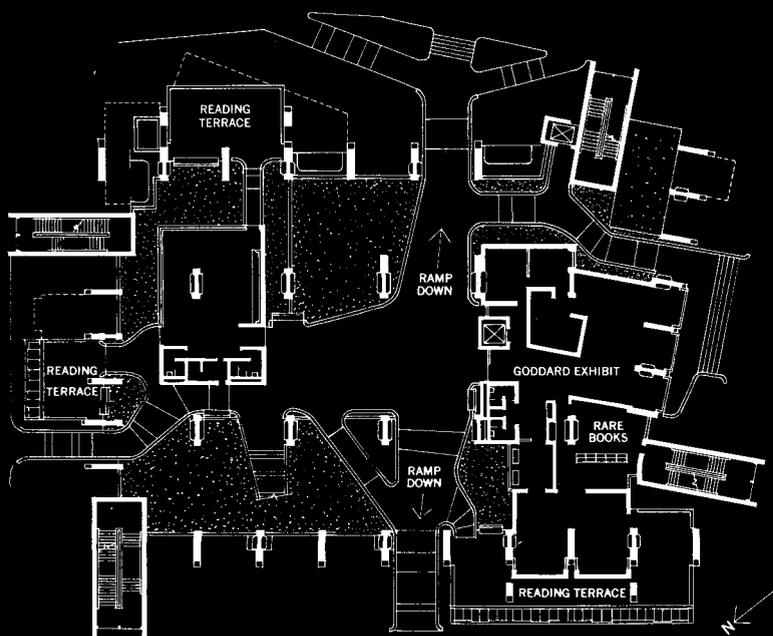


must be the most varied and lovingly tended of any university, and the Massachusetts countryside with farm silos and church steeples. A slanting skylight, linking the bookbox in the center with the reading and circulation areas, filters an agreeably diffused light along the brick walls. Above the second level this skylight is reflected in its counterpart around the service floor. The mirror effect of reflecting glass gives a sensation of luminous depth when viewed from above through which passing figures are seen as mere apparitions. The sparing use of this reflective glazing, which threatens to become a fad among designers, is Johansen's only concession to experimental building materials. Even the conduits for mechanical equipment are perfectly camouflaged in smooth black steel enclosures that blend with the sculptured vertical forms.

There is no surfeit of thinking architects. John Johansen has worked more seriously than any of his colleagues to understand the implications of science, philosophy and sociology of the late 20th century for architecture. Like Le Corbusier, who liberated design from its academic isolation, he deserves to be judged on his own terms. If the result is somewhat schizophrenic, perhaps this too is symptomatic for "the end of architecture as we knew it." The dual experience of approaching and leaving the Clark University Library makes it clear that there are not only two buildings but also two architects who designed it. The harmonious, almost classical interior with its carefully balanced horizontal-vertical approach system and its declared purpose to serve the ancient pursuit of booklearning, is obliterated by the building exterior. "The symbol of academic wealth," as Johansen himself has characterized the building, in all its discreet opulence, is swallowed by a wild attempt to symbolize "not the passing of the mechanical age, but the electronic age." The publication of the library in the planning stage (Jan./Feb. '66 issue) was accompanied by five columns of John Johansen's architectural philosophy, augmented in his analysis of *The Mummer's Theatre* in Oklahoma City (May '68).

The opening paragraph read: "This is my first modern build-

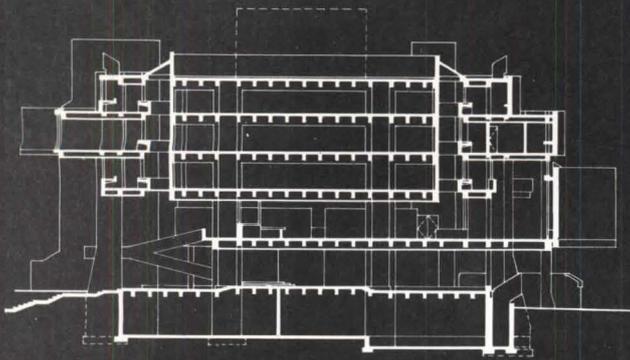
From the west entrance (photo top left) there is an unobstructed view through the building. The ramp to the service level, which straddles the walkway, begins at left. Right: west entrance is at lower left in top photo; at right in bottom photo. The light well (top) extends through the building to the roof.



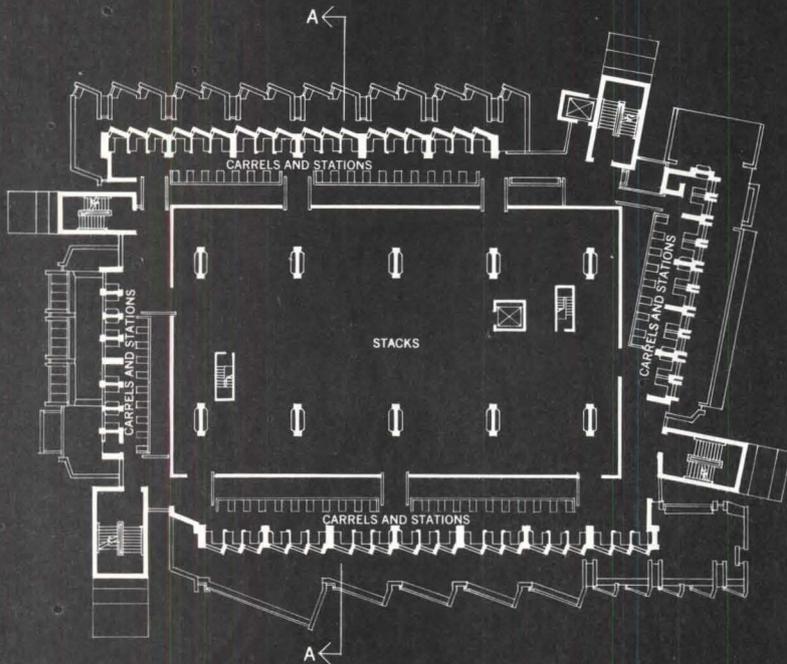
PLAZA LEVEL

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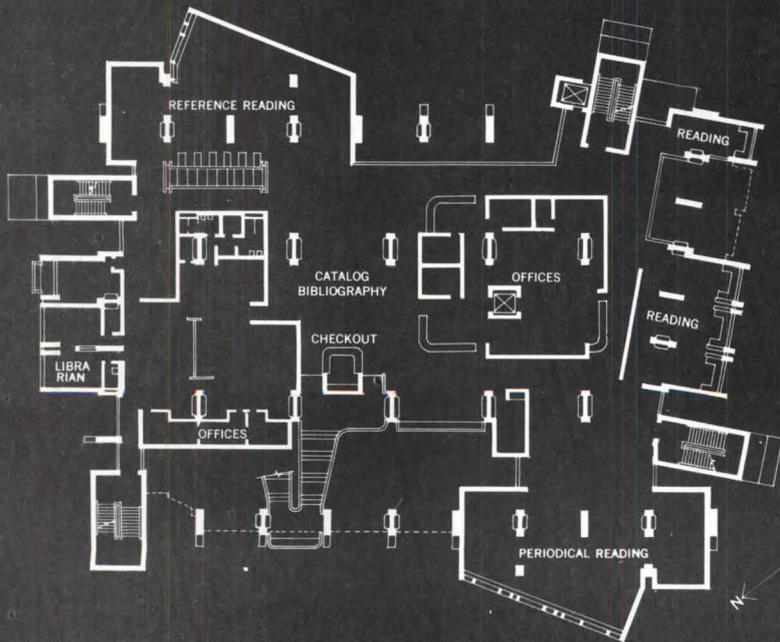




SECTION LOOKING NORTH A-A



READING LEVEL 3



SERVICE LEVEL

ing. By that I mean it is the first that is attuned to contemporary thinking in science, in philosophy, in the arts. I regard my earlier works as Renaissance buildings by comparison." The gist is a passionate identification of the design process with the most avant-garde "conditions and experiences of the time" in physics, mathematics, psychology, existentialism, music, choreography, electronic systems, and McLuhanism. The three-dimensional configurations of these influences are to be "anti-perfection, antimasterwork, without pretensions to architecture" because, he added later, "the demands that urban problems are now making upon the profession" can only be met by a new scale of open-ended urban design, based on "indeterminacy, in which structures may not look the same from year to year. . . . In fact there will be no need to compose once we shift to the idea of free, life-generating assemblages rigged on an ordering device which may be structural, transportational, distributional, or any combination of these."

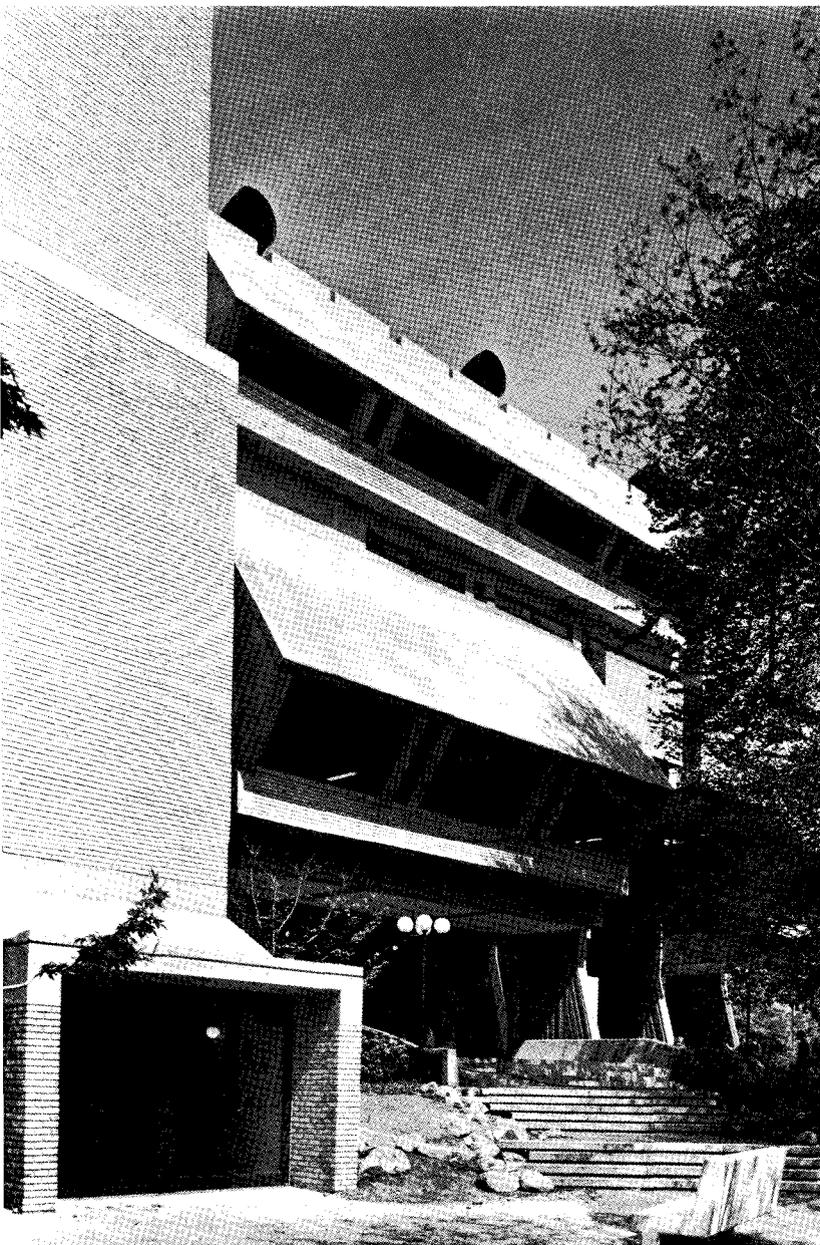
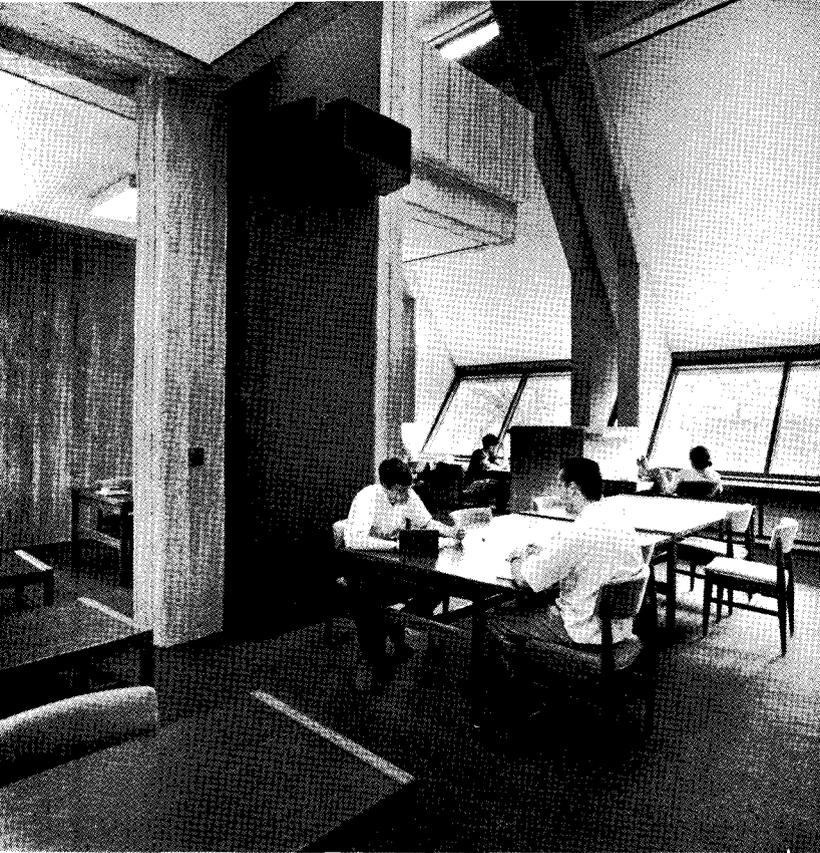
Yet, the exterior of the library building is "composed" to the point of contrivance. Every formal element is an ideological proclamation. This is convincing on the north and east elevations which are invisible to the campus and the passing public. The functional demand of "space come through" works well only if the spaces expressed are "organic," meaning continuous and proportionate, as the "space boxes" and "space ribbons" on the rear elevations of the library are.

There are some intruding petty details: the clumsy stair-tower entrances, and the solid brick window-inserts whose chalky tone fails to provide here and throughout the building any textural contrast. But there is in these exteriors a true dynamism in the original meaning of "a universe constituted by immanent forces" which is particularly effective at night. There is nothing "accidental, haphazard, unresolved" in these side-views. They are simply excellent design.

It would be easy to dismiss the south and west elevations which define the building in the public environment as unsuccessful collages, pasted together from La Tourette and its American deri-

Right: A light well surrounds the three-level, brick-walled book stacks (top right). The stacks are connected to the reading levels by bridges. View is from the reference reading area on the service level.





vations. But the issue goes much deeper. In his own guidelines for the design of the building Johansen has claimed inspiration from "an assemblage of components or subassemblies, plugged into an armature as in electronic devices . . . the rear, not the tidy front of a Xerox Copier," a configuration of *Gestalt* psychology. The three-dimensional realization proves the fallacy of architecture by extra-professional analogy.

To build shelter is an *a priori* urge of the species which knows by instinct what holds a structure up and together. It is the limitation and the glory of the builder that his creations must be statically determinate and "fully at rest" (denied by Johansen), or they would not be there at all. The irrevocable dependence on gravity and cohesion of these "haphazardly hung space boxes" cannot be minimized. Their artfully contrived "barnacle look" with an underlined "tolerance for error" does not differ in concept from the disguising barge-boards and stucco cornices of a Victorian *cottage orné*. The parapeted balconies on the library's west elevations are as old as Egypt and as ornamental as those on the elevation of the Palazzo Farnese.

If the triumph of science over other human values, which Johansen so eloquently celebrates, has any paradigmatic value at all, it is the obligation to objective truth. The truth of Johansen's south and west elevations is their static, decorative, and inflexible composition. One wishes that an almost hidden feature, a glassboxed elevator, moving in a visible glass shaft, had been expanded to break up this throw-back to early Cubism.

It is the success and the failure of the Goddard Library that confirms architecture as a catalyst that separates and defines life. Rather than posing as a laboratory technician and an inferiority-ridden member of the scientific club, the architect emerges unchanged from his historical role as interpreter of man's desire for duration in time. It will remain the greatness of John Johnson that he had the intelligence and the courage to test his contribution against the dominant forces of contemporary society. If the result is as ambiguous as our role in history, we gratefully accept its clarifying function.

The reading room (photo top left) on the service level shows air ducts and pipes enclosed in steel plates along columns. The room is shaded by a large hood on the south end of the building (photo left). Opposite: A variety of angles and forms surround the south entrance whose walkway connects to the "road-ramp system" to upper levels. A reading room with a hooded window cantilevers out beside the entrance.

#### FACTS AND FIGURES

Robert Hutchings Goddard Library, Worcester, Mass. Owner: Clark University. Architect: John M. Johansen (John Robie, job captain). Landscape architect: Corrier Anderson Guida. Engineers: Rudolph Besier (structural); John L. Altieri (mechanical). Furnishings: Martin Van Buren. General contractor: Granger Contracting Co. Building area: 135,000 sq. ft. Cost (including furnishings, excluding land costs, fees): \$4,175,000.

PHOTOGRAPHS: George Cserna.



# WHY ARE BUILDING COSTS GOING UP UP UP

BY DONALD E. WOLF

**W**hen the floodgates for new construction were thrown open at the end of the Second World War, a new variable was added to the equations of architectural planning. After years of more or less stable (and occasionally receding) price levels, the cost of construction began to soar. Budgets which were fixed early in the design stage were obsolete by bid time. In the 17 years after the war's end, construction costs doubled, while the consumer cost index increased by less than 25 per cent.

In the late 1960s the pace of cost escalation began to quicken, eroding away blocks of housing and schools and jeopardizing large volumes of building essential to national programs. By the early part of this year, the thrust of this escalation had become so massive that a traditionally designed structure in the Northeast can be realistically expected to double in cost within the next six years.

Until now, the architect has been wholly absorbed by the dominant urgency of the design problem itself. He has been inclined to see the rate at which building cost increased as part of a natural economic process, beyond his control. He is now being denied the luxury of that view by the disturbing frequency with which his projects are being returned to the drawing board for redesign, or simply cancelled, for reasons of cost. Those failures are causing economic hardship for him and political and social upheaval for the community.

The emerging imperative is architecture which directly resists this cost escalation. Materials and systems which survive traditional economic tests may

fail when examined for escalation vulnerability. In making this distinction the architect can play a positive role in resisting escalation.

The dominant escalating force is, of course, field construction labor. During 1968 the average wage of the skilled building mechanic increased almost 10 per cent, and recent agreements point to an average increase approaching 15 per cent this year. A more realistic evaluation of the increase in field labor cost would probably be even higher, reflecting the decline in productivity associated with periods of great activity, when marginal workers join the labor force.

But with it all, there has been no significant change in the number of man-hours of labor required to complete equivalent units of construction.

Normally, architecture evolves to meet changing economic conditions, through a sort of natural selection process that favors less expensive solutions. But now a volume of new building demanded by fierce social and political pressures has created a kind of economic hothouse, forcing construction wages to a prematurely advanced level for which the evolution of architecture is not quite ready.

Although the architect may not be fully ready, neither is he totally defenseless. He can begin an effective holding action by simply discriminating against materials and systems which generate large amounts of field labor.

The casualty list of major projects whose costs have prevented their construction during the past year is dominated by cast-in-place concrete buildings, so rich in field labor that they were doomed even before their working drawings had been started. In many cases, the alternative steel frame solution (with permanent metal forms)

represented one fourth the number of field labor hours, and correspondingly lower vulnerability to escalation. Even in the diminishing number of areas where those two types of construction can still be considered equal in current cost, another year or two can be expected to separate them decisively.

Most building systems already offer the chance to resist escalation by displacement of field labor, but many (like the steel frame) may demand that the architect reorganize his techniques of achieving the shapes and surfaces he wants. The factory-assembled wall panel, the oversized brick or tile unit, the ceiling tile in place of plaster and the fiberglass duct in place of insulated sheet metal all fit a pattern which slows the rate at which the total cost of the building will increase by displacing field work with shop work.

But the effectiveness of such a holding action is limited. Reducing the field labor component sufficiently to accommodate continuing generous wage increases is going to require widespread acceptance and bold application of prefabricated components and integrated building systems.

It is at this level that a plan for resisting the escalation meets its first aggressive opposition. For the working architect, a bidding contractor's conservative position in pricing a new material or system deprives it of an effective test. Organized labor's understandable hostility to anything which threatens job security has been translated into a refusal to handle some of the shop processed components, and the courts have supported labor's right of refusal. The evidence suggests, then, that the technologies may in fact be evolving satisfactorily, but the complex forces which influence their acceptance and implementation must be dealt with. Problems which are politi-

Mr. Wolf is president of Wolf & Company, Engineers and Construction Cost Consultants, Pleasantville, N.Y.

cal and economic are emerging in place of the expected technologic ones.

It is not realistic to expect a carpenter to welcome the use of pre-fitted doors. It might be realistic, though to expect him to consider a working agreement which provided a bonus to him for each one he installed. If such an agreement provided for the eventual reduction of the bonus (or if it at least provided that it would not increase), it would probably be objectionable to the younger carpenters or to those with sons coming along in the trade. But the fact is that the increasing reluctance of young men to enter the crafts has raised the average carpenter's age to almost 50, so resistance to eventual withdrawal of a transitional economic cushion might not necessarily be rigid.

Extra wages for the installation of labor-displacing units would effectively pay out the early dividends of technologic progress to the craftsmen whose livelihood they directly threaten. Short-run cost savings would probably be minimal, but vulnerability to escalation would be sharply reduced. Equally important, an attractive marketplace would be established for these vital products, inducing industry to address itself aggressively to their design and development, increasing their manufacturing base and reducing their cost.

**B**ut the real market value of a new product or system is not determined by the union or by the mechanic but rather by the contractor who estimates its probable cost and provides for it in his bid. His risk is usually high in relation to return, so his course is necessarily conservative. Often, when confronted by new materials, the prudent contractor is inclined to use the cost of the product which is being replaced

as a safe guide for estimating the cost of the new one.

The manufacturer of new products or systems, on the other hand, may be seeking to develop vast new markets. He can normally justify short term risks and losses in the context of large-scale development and extended return on his investment. His willingness to assume the economic risks of introducing new ideas is essential to their application in the marketplace—and the architect is ideally qualified to induce him to accept those risks. To assume his role, the manufacturer would have to guarantee the installed cost of his work early in the schematic phase of design, following along at bid time with corresponding lump sum bids to each bidding contractor. By subcontracting installation to local firms, the manufacturer would then begin developing local capability.

There appears to be a variety of ways, then, in which the field labor component of construction cost escalation can be resisted—none of them concerned directly with wages, some involving existing materials and systems, most demanding the architect's direct involvement or support.

Escalation of the shop's costs cannot be entirely ignored, of course, but its labor component is so small and its technology is advancing so effectively that it does not present a problem of significant proportions. Materials and equipment, which traditionally represent about the same fraction of total first cost as field labor, account for less than half as much escalation. Products which are rich in shop labor tend to escalate more rapidly than those which are not, while some products of highly automated shop systems (resilient floor coverings) have actually declined in cost during recent years. In most cases of severe escalation in costs of ma-

terials, factors external to the industry have appeared, as in timber and copper, and those stresses have tended to be transient. An occasional instance of significant escalation in material costs is artificially generated by restrictions against imported products, stubbornly maintained by public agencies in the midst of their own struggles against the rising cost of construction.

If the direct costs of labor and materials were the sole determinants of building costs, the problems of predicting and controlling them would be simpler. But the fact is that the condition of the marketplace itself is a significant variable, influencing almost all building costs but imposing an excessive escalating force on the large projects which are at the heart of national and urban building programs.

The increase in the very size of the projects has generated extra costs. Orthodox economic concepts about large-scale purchasing notwithstanding, the cost of vast new buildings has increased disproportionately. Small, closely supervised work crews have yielded to larger ones, then to subcontracting. Very large projects filter out aggressive bidders who cannot qualify financially, eliminating competing subcontractors and material suppliers in the bargain and leaving the determination of the cost of the project to a few.

The growth of subcontracting, itself an evolutionary response to a changing marketplace, has strained the traditional contracting structure and in some cases contributed escalating thrust. As the jobs have enlarged, subcontractors in major trades have increasingly sought to protect their (sizable) estimating investments by demanding prior commitments from selected general contractors as the price of a favored bid. In such a (common) arrangement, the award price of

the total project often fails to represent an accumulation of all the lowest possible bids but is the best combination available to a single general contractor.

**A**n effective defense against the escalative impact of very large projects is their simple separation into smaller, concurrently built ones. Much of the escalation which has accompanied the increase in project size can be recovered in such an approach, and construction durations can be shortened.

Some major urban building agencies, immobilized by massive escalation on very large projects, have boldly abandoned existing single contract bidding procedures in favor of separate bids for major trades and supervision by well qualified manager-contractor firms. By hiring the manager-contractor on a low-fee, no-risk basis, they retain the supervision and field plant functions of the general contractor but they avoid the restrictive influence he imposed on large jobs. In addition, they are awarding phases of the work as drawings are completed, shortening overall duration of the design and construction period and reducing cost escalation besides.

The architect will have to implement his plan for resisting escalation in his own drafting room, at the factory, and in the marketplace. In a natural balance of the society's resources, a share evolves for each of its basic needs, including its buildings. As new needs emerge, adjustments in the old distribution of resources seem likely to constrict the share allotted to construction, challenging the architect to make sure that this share is used effectively. Only by analyzing the nature of building cost escalation and developing potent techniques of resistance can he accomplish this.



# BUILDINGS FOR COMPUTERS

When SDS (Scientific Data Systems) asked Craig Ellwood to design the company's 350,000-sq.-ft. administration building a couple of years ago, the management was a little worried: Ellwood had never done anything of that size before—and his office, then staffed by only six draftsmen/designers, might not be able to cope with such a large structure.

Granted, Ellwood had done the first SDS computer plant a couple of years earlier, at a staggeringly low unit cost of \$9.50 per sq. ft. (see Nov. '66 issue); moreover, that building had won two prestigious West Coast awards. Still, the administration building was likely to present some very different and more complex problems.

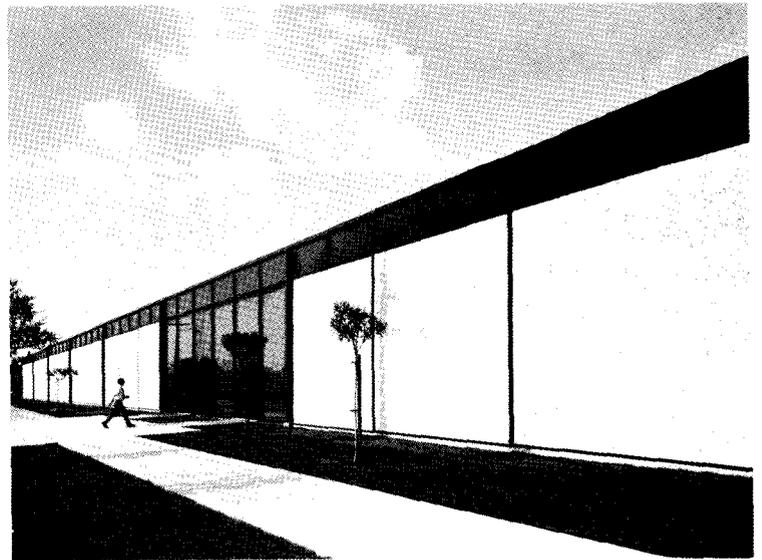
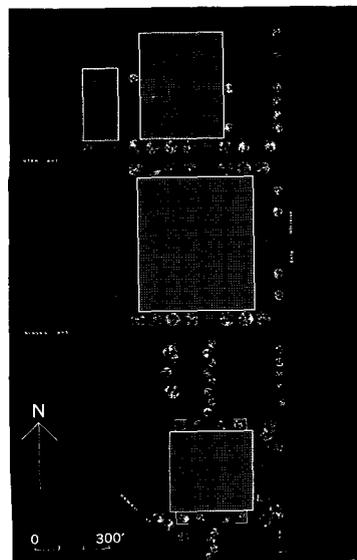
Now that the building is complete and occupied (opposite

and immediately below), SDS is no longer worried: its new headquarters has all the polish of the company's neatest computers—a meticulous glass-and-steel curtain wall (see p. 55); a sleek, modular office layout; bright color accents, excellent furniture, handsome graphics, and last, but not least, a colorful, painted steel sculpture outside the main entrance by George Sugarman (opposite). What is more, the budget for the building was \$18 per sq. ft.—but it actually cost only a little more than \$16 (including all furnishings in executive offices, all landscaping, sculpture and a travertine wall in the main lobby)!

The administration building just completed is, in fact, the fourth structure in this complex for SDS. Located in an industrial park in El Segundo, 2½ miles south of Los Angeles Interna-

tional Airport, the SDS complex now consists of the original computer plant (260,000 sq. ft.), a manufacturing and service building (148,000 sq. ft., and shown at bottom of this page), a smaller (43,000-sq.-ft.) structure housing so-called "peripheral equipment", and the new, three-story administrative headquarters mentioned above. A three-story parking structure is planned for a site to the south of this initial complex.

Although the buildings vary in height and in detail, there is a certain unity of idiom to be found throughout: the steel framing is always expressed and, where possible, exposed—its color a kind of charcoal brown. The glass is bronze-tinted, and the tilt-up wall panels are of concrete with an exposed, pebbly aggregate.



Sculpture by George Sugarman guards formal entrance to SDS administration building. The four separate pieces are of brightly painted steel plate. Right: the administration building is seen at the top, and the new manufacturing and services building below. The latter has walls of exposed aggregate, tilt-up concrete panels framed in steel. Site plan shows the four buildings completed to date. A fifth, the parking garage, will be built to the south of the administration building.



The floor plan of the administration building is a square measuring 336 by 336 ft. The "real" entrances (used by employees) are located at the north and south ends of the square: here are the parking lots, and employees enter through courts formed by precast concrete walls. The visitors' entrance (with the sculpture) is located in the center of the east facade of the building, and it leads into a formal lobby (bottom right). A fourth entrance which is used for freight is located in the center of the west facade.

This four-sided approach to the building is reflected in the cruciform floor plans (see below). Systems of corridors separate service areas from interior computer or filing spaces, and the latter from a ring of exterior offices. At the center of this

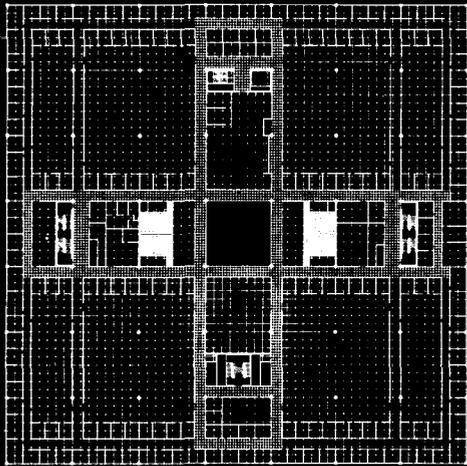
cruciform circulation pattern is a 48-ft.-square, three-story-high interior court, roofed over and skylit (left and below). This court is the reference point within the building, and a handsome space for employees to congregate during lunch hours.

The planning module is a 6 ft. square, which produces minimum outside offices measuring 12 by 12 ft.—rather larger than what would be considered adequate in downtown office towers in more crowded metropolitan areas. This generosity of space is evident throughout the building, and more than makes up for the economical finishes and fixtures in some areas. (A more "experienced" office architect might very well have started with a much smaller module—possibly as little as 4 ft. 6 in.—and then squandered all his sav-

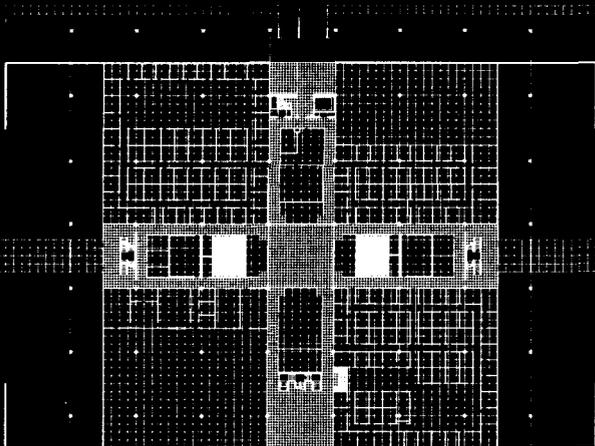
ings on elaborate finishes; Ellwood felt that the greatest luxury in any modern building is space itself, and so he concentrated on that instead.)

The floor plan of the administration building is different from routine office plans in several other ways as well. For example, the square configuration of the building encloses about the maximum amount of floor space for the minimum length of perimeter wall—thus reducing the cost of the curtain wall and of the needed air conditioning system. And the division of the more than 110,000 gross sq. ft. per floor into four equal quadrants produces four self-contained office areas of manageable size, and of dimensions considered just about right for an autonomous department in a company such as this one.

Central court in SDS administration building measures 48 ft. square and passes through all three floors. Tall clerestories light it from above. Railings are steel-framed with tinted glass inserts. Eventually this court will have another sculpture. Below: typical floor plans showing flexibility of modular system, and division of floors by cruciform circulation pattern. Below right: views of interior court and of main entrance lobby.



SECOND FLOOR PLAN



FIRST FLOOR PLAN

0 20 40 60



The detailing of the administration building is neat but not at all expensive: the steel-framed stair from the main entrance lobby (below) is an adaptation of an earlier and elegant detail by Mies van der Rohe; the ceiling-high doors along office corridors avoid the usual patchwork quilt found along those passages (the doors are coded in bright colors, as are certain key walls); and the few areas in which expensive materials have been used—for example, the wood paneling in the executive offices—make the most of such luxurious touches. (The acoustic ceiling, by the way, is an inexpensive system adapted by Ellwood to emphasize the modular character of the interiors.)

The entire building is steel framed, with the framing members fireproofed and their pres-

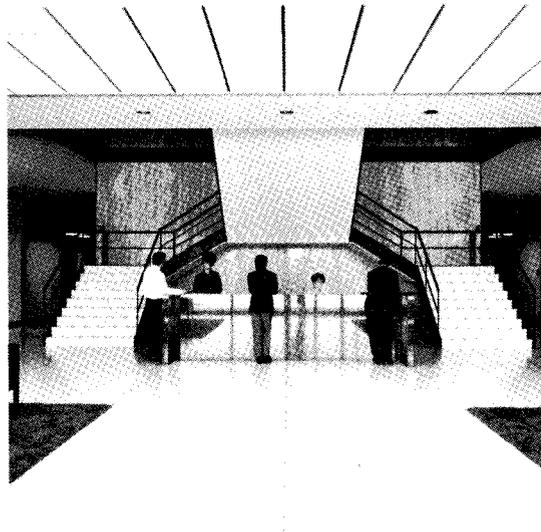
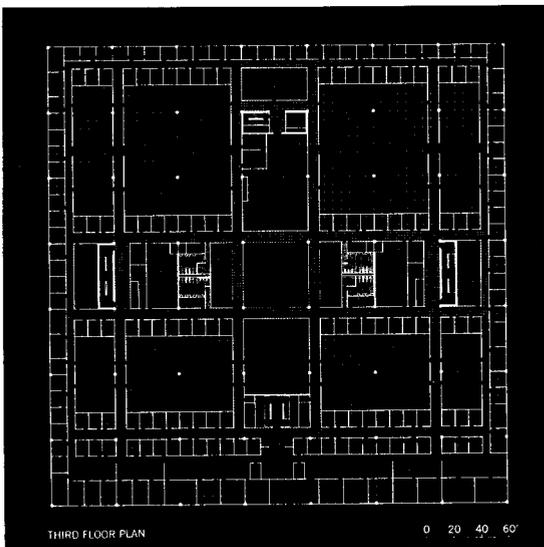
ence “expressed” in the configuration of the steel-and-glass curtain wall (opposite). The I-beam mullions, 6 ft. on centers, hold the bronze-tinted glass with neoprene gaskets; and interior sills and window heads have been designed with integral track to hold vertical blinds.

To some, the resulting vernacular may seem cold. In this setting and for this building it seems entirely appropriate: an industrially produced container, set in an industrial park, and designed to serve a sophisticated computer operation. There are other industrial buildings nearby trying to look pseudo-Spanish with their stucco-covered steel frames, and succeeding only in looking shabby or absurd. Ellwood’s SDS complex, instead, is just as elegant as his client’s products—and that is high praise.

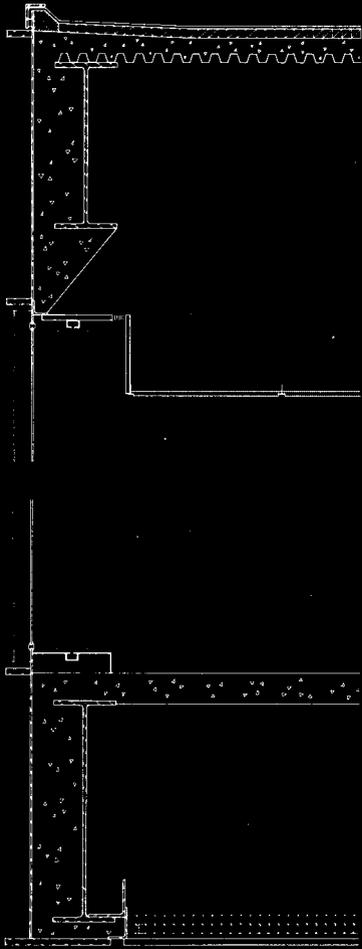
#### FACTS AND FIGURES

Administration/Engineering Building, Scientific Data Systems, a Xerox division, El Segundo, Calif. Architects: Craig Ellwood Associates (associates: James Tyler and Robert E. Bacon). Consulting architect: Daniel Dworsky. Landscape architect: Robert Clark, Engineers; Erkel & Greenfield (structural); Ayres & Hayakawa (mechanical); Starnel Engineers (HVAC); Sarvasy & Associates (electrical). General contractor: C. L. Peck Construction. Building area: 350,000 sq. ft. Cost (including construction, site development, and landscaping): \$5,700,000.

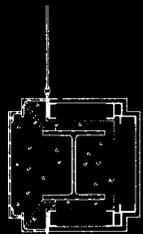
Manufacturing and services building. Architects: Craig Ellwood Associates (associates: James Tyler and Robert E. Bacon). Landscape architect: Robert Clark. Engineers: Norman Epstein (structural); Starnel Engineers (mechanical); Sarvasy & Associates (electrical); Paul Bennett (plumbing). General contractor: C. L. Peck Construction. Building area: 148,000 sq. ft. Cost (including construction, site development, landscaping): \$1,700,000. PHOTOGRAPHS: Marvin Rand.



Plan of third floor (top left) shows special layout of executive offices along the east side of the building: offices are 18 ft. deep, and reached through an 18-ft.-wide interior passage that doubles as secretarial/reception area. Other illustrations show typical corridor, executive office, and main stair. (The building also contains a freight elevator near the loading dock.) Right: close-up and details of curtain wall.



SECTION



PLAN

EXTERIOR WALL DETAILS



# ONE BILLION DOLLAR SUBSIDY FOR SLUMS

Last month, we published a proposal by John M. Bailey Jr. and Henry Schubart Jr., of the Community Design Center at the University of California Extension in San Francisco. The gist of that proposal was to use the (approximately) \$1 billion spent each year in rents by welfare recipients to create new, low-cost housing—rather than to subsidize slums.

Because we felt this was one of the most imaginative ideas generated in this area recently, we circulated Messrs. Bailey's and Schubart's proposal among a number of concerned people in and outside government. These are the first returns; next month we will report on further responses, and supply an analysis of the proposal by our regular contributor, Roger Schafer.

**JOHN SPARKMAN**  
U. S. Senator, Dem., Ala. Chairman,  
Committee on Banking and Currency

A bill was introduced at one time which would have denied federal assistance to states unless the states made it mandatory that welfare beneficiaries live only in standard housing. The bill got nowhere, primarily because the theme of public assistance has been generally to place responsibility upon the family for the purchasing of necessary food, clothing, and housing. In fact the current thinking is to move even more in this direction and to place even further responsibility upon the poor with the hope that with this responsibility, the poor will be able to improve themselves and eventually get off public assistance rolls.

**MAX R. BLOOM**  
Professor of Urban Land Economics,  
Syracuse University, N.Y.

Among the questions which require answers are the following: 1. What financial provisions are operative during a transition period when the existing supply of poor housing is still needed?

2. Can the funds diverted to the proposal support financing charges as well as other expenses? 3. Have the authors prepared a feasibility analysis? 4. Can the proposal be viewed *narrowly* as a means of achieving an improvement in housing supply?

Although the authors do not illustrate or consider the ramifications of a transitional period during which the supply of decent housing is being expanded with alternative sources of funds (welfare, or other), a number of proposals have been made over the years which merit consideration—whether their solution or an alternative is pursued. These include some form of rent control for structures containing housing units legally *designated* as in serious violation of appropriate codes.

Some years ago, then State Rent Commissioner Charles Abrams reduced rents in substandard structures slated for clearance in redevelopment areas. He could undoubtedly testify as to the feasibility of this type of administrative device and suggest whether it would be legally valid in any

part of a community.

However, it might be well to consider, also, that there are owner-occupant-landlords of inadequate housing who themselves are poor or near-poor and would require a variety of financial and other aids either to improve their properties or obtain relocation. Not all owners of substandard properties are "slumlords."

Whether the funds diverted would provide the necessary support to be financially sound is not at all clear. I would not wish to be too optimistic as to the trend of housing costs for subsidized housing even where public funds are used to bolster nonprofit groups. Nor is it certain that it would be possible or desirable (aside from legal considerations) to switch to a system of payment in kind.

The principal difficulty with the proposal (aside from lack of a feasibility analysis) is that it introduces yet another approach to solving the housing paradox. For the objective of formulating a rational and comprehensive housing strategy, this proposal should be considered as one element in a total context. I do not subscribe to the view that the Housing and Urban Development Act of 1968 represents the *optimum* in solutions. I firmly believe, however, that we ought to accept it as the basis from which a significant *short-run* effort may be mounted.

Our best bet for a *short-run* improvement in housing supply is to obtain better funding of those existing programs considered most feasible. If we reach a point when the supply of decent housing for low-income families and individuals begins to improve significantly, then a more vigorous attack on the "subsidization" of slums may be in order, as well as more sophisti-

cated cost-revenue analysis of alternative contributions to the total elimination of slums. At that point it should be possible to attempt to reduce support of slum occupancy.

In view of the continued inflation in housing costs, budgetary retrenchment in federal assistance to housing, and the failure to mount a meaningful expansion of housing production at all levels, I suspect my restrained hopes for the achievement of the ten-year housing goal must be viewed as overly optimistic for the near term. The achievement of a higher rate of housing output by mass production efforts may not result before the situation has deteriorated. It is important, therefore, to devote our energies to achieving the thrust needed for an interim effort.

**EDWARD W. BROOKE**  
U.S. Senator, Rep., Mass. Member,  
Committee on Banking and Currency

I commend your publication and the authors of the article for seeking a constructive solution to the housing problems of the poor. While direct payments to welfare recipients for housing seemingly give them bargaining power in the private market, that power is largely illusory since rental allowances are inadequate to cover the costs of decent housing. Rental allowances must be increased; however, increased payments represent only a temporary solution to the problem since increased allowances will not produce an adequate supply of decent housing. The authors state, however, that "any increase in welfare rent allowances will be quickly absorbed by corresponding increases in private market rents." While this might be true to a

certain extent, I have received information that the correlation is not as great as one might expect. As anti-inflationary measures begin to produce results, I am hopeful that the pressures on the rental market will ease.

The authors correctly point out that the housing needs of low-income families cannot be met without direct or indirect government subsidies and that the prospect for increased subsidies is not overly encouraging at the present time because of anti-inflationary efforts underway. Assuming that the \$1.1 billion spent annually by welfare recipients for housing could support \$10 billion in low-cost housing on 221d3 terms, adequate housing would only be available for a portion of the 4 million families in the United States who are receiving public assistance. If individual welfare recipients were able to elect to participate in this program or not, it is questionable whether sufficient funds could be generated to provide the housing contemplated. The authors acknowledge the fact that rents charged under a voluntary program "could not be as low as public housing rents," and therefore a large segment of low-income families would be precluded from the program.

Despite the foregoing considerations, the authors have struck a resilient chord by re-emphasizing the need for a national commitment to decent housing for the poor.

**GEORGE ROMNEY**  
The Secretary of Housing and Urban  
Development

The proposal that welfare funds used by recipients to pay for substandard housing should instead be used to finance develop-

ment of decent housing does not come to grips with the basic problem—which is that public welfare allowances for rent do not meet the cost of decent housing. Welfare payments have not kept pace with housing costs.

Despite our conclusion that the scheme is not feasible, we are collaborating with HEW and local welfare and housing authorities in the Atlanta area to stimulate a demonstration to assure decent instead of substandard housing for recipients of old age assistance. The demonstration would be carried out with the full range of HUD housing subsidy programs.

*In response to our article, Secretary Romney asked HUD's Office of Economic and Market Analysis to study the Bailey-Schubart proposal. This is the result of that study:*

The authors note that the approximately 4 million families now receiving public assistance spent about \$1.1 billion for housing, over 60 per cent of which is substandard. Hence, they conclude that the owners of these slum properties are receiving a subsidy amounting to \$600 million per year. They propose that the \$1.1 billion per year be used to support the financing of new low-cost decent housing.

They would have appropriate state or local public agencies acquire and improve existing housing or construct new housing, using funds raised through the sale of tax-exempt state or municipal revenue bonds. Alternatively, they would have private nonprofit corporations formed to finance the acquisition and improvement of housing properties. Under either alternative they would use the \$1.1 billion to pay the annual costs of this improved or newly constructed housing, that is, the

annual debt service on the funds borrowed to finance the capital cost of the housing plus annual maintenance and operation expenses.

Our experience with low-cost, newly constructed housing is that, at today's costs, even with 4¾ per cent financing, the required monthly rental will be about \$150, or \$1,800 per year. Annual housing payments of \$1,800 per dwelling unit means that \$1.1 billion will cover the annual operating and capital costs for about 610,000 units. If the \$1.1 billion now used to pay for housing for 4 million families were used instead to pay for the annual housing costs for 610,000 families, the other 3.4 million families on public assistance would have proportionately less funds available for their housing expenditures. . . .

With respect to the financing mechanism proposed by the authors, it should be noted that, owing to the limited volume of investment funds that are attracted to the tax exemption now accorded to the interest income on state and local government bonds, the interest rates on such municipal bonds are at historically high levels. In view of the tremendous borrowing requirements anticipated by state and local governments to finance needed public facilities, urban renewal and public housing under existing programs, that were enlarged by the 1968 Housing and Urban Development Act, the availability of funds in the tax-exempt municipal securities market is expected to continue to be limited, even after the current credit restraints are relaxed.

Turning to the less costly alternative proposed—sponsorship by private nonprofit organizations—it should be noted that this approach is already being used under several HUD pro-

grams which are designed to provide housing for low- and moderate-income families. Assuming that future reduction of inflationary pressures could bring about lower interest rates, such lower rates, in themselves, will not reduce rents to levels which can meet the payment abilities of welfare recipients. The average rent achieved under HUD's Section 221d3 below-market interest rate BMIR projects in 1967 (latest year for which data are tabulated) was almost \$115 a month; the average unit size was 4½ rooms. The average mortgage amount was about \$13,700 per unit, and the estimated average unit cost was about \$15,000. It is doubtful whether a public agency today could build new units, purchase standard existing units, or acquire and rehabilitate existing units at costs significantly less than \$15,000, especially in those major urban centers which contain large numbers of welfare recipients.

The second alternative approach does not appear to contain any element for rent reduction other than absence of profit via nonprofit ownership. This clearly is insufficient for achieving lower rents.

Our previous analyses of the problem of housing low-income families have pointed out that assistance over and above the benefits of below-market rate of financing is necessary to meet their very limited payment abilities. The Congress has recognized this as well. Public housing, occupied by very large numbers of welfare recipients, must obtain subsidy benefits from (a) lower interest rate financing obtainable from tax-exempt bonds and federal repayment guarantee, (b) very substantial abatement of local real estate tax payment, (c) an annual

contribution payment which can be high enough to cover total project debt service requirements, and (d) special payments to local housing authorities to cover the extra cost of housing the elderly and very large families. In private rent supplement housing, up to 70 per cent of total economic rent can be paid by the HUD rent supplement contribution. In Section 236 rental housing, Congress has authorized that up to 20 per cent of the units can be occupied by rent supplement recipients. In this last mentioned condition, the rents are, first reduced by a substantial interest rate subsidy (permitting 1 per cent interest rate), and then HUD may pay up to 70 per cent of remaining rent in order to meet the needs of low-income families.

**EDMUND S. MUSKIE**  
U.S. Senator, Dem., Me.

Mr. Bailey's and Mr. Schubart's proposal to divert money presently being used by welfare recipients on private housing to finance a new publicly controlled housing development program is an intriguing one, although I could foresee some practical political problems in implementing such a proposal.

**EDWARD J. LOGUE**  
President and Chief Executive Officer  
Urban Development Corp.

The notion of funneling that portion of welfare payments allocable to housing into a special fund for the repair of that housing is one which has been made many times. In some communities where the scale of the problem is large enough, it could well be appropriate to condemn such blighted housing

and operate it on a minimum maintenance basis channeling the thereby surplus welfare funds into new construction and mandating the demolition of one unit of welfare occupied substandard housing for every unit of new construction.

However, the basic problem is not so much one of abstract policy as the Parkinsonian separation of the do-good bureaucracies.

I hope the discussions will continue.

**HORTENSE W. GABEL**  
Vice President, Center for Community Change

The authors point rightly to a potential housing asset—the billion dollars in shelter payments which are paid for shelter by welfare families.

Their proposed solutions—public housing financed by local revenue bonds, “secured by guaranteed income from public assistance payments”; and non-profit housing, privately financed and “secured by long term leases with the welfare agency”—would require either amendment of the statutory prohibition against vendor payments or congressional action permitting the guarantee of such payments by the local agencies. The latter step would, in effect, create a special public assistance FHA with all of the drawbacks of a separate bureaucracy and the necessity of congressional authorization and appropriation. Furthermore, the proposals would almost inevitably result in creating new centers of segregation for welfare families, which would respect neither the desire of some people to stay in the neighborhoods in which they now live nor the desire of others for integration.

In many cities the use of revenue bonds for “public assistance public housing” will require state and local legislative authorization and, often, local referendum. The prospect of such authorization is not great.

Finally, private financing and even revenue bond financing will mandate considerably higher shelter costs than 3 per cent mortgages provided under Section 221d3 of the Housing Act of 1961 and 1 per cent mortgage interest subsidies provided in Sections 235 and 236 of the Housing Act of 1968.

Realistic answers to this extremely hard question lie in accelerated production of subsidized housing, acceptance of a far higher percentage of public assistance families in the non-profit and limited profit projects that are being built, authorization for the use of welfare shelter payments to buy homes or co-operative apartments, increased job opportunities, and a guaranteed income for those where there is no actual or potential breadwinner.

**JACOB K. JAVITS**  
U. S. Senator, Rep., N.Y.

I agree with the authors that welfare payments should not be used to propagate the very conditions we are trying to alleviate, but I question the validity of directly taking funds from the welfare pool to build adequate housing. It seems to me that there are better ways to accomplish these goals. We have begun to demonstrate that government and private industry can work together in a coordinated manner through the provisions of Sections 235 and 236 of the Housing Act of 1968. This approach seems to me to be a better way of insuring our low

income citizens decent living conditions without subtracting money from already too limited welfare funds.

**SHIRLEY CHISHOLM**  
Congresswoman, Dem., N.Y.

I want to commend you for your attention to the housing crisis facing the poor in this country. This interest on the part of architects, so long in coming, holds great promise for the solution to the problem.

**JANE JACOBS**  
Author

Actually, the use of welfare rent funds for new, low-rent and rehabilitated housing is not a new approach—so far as the idea itself is concerned. It was one of the suggestions included, for example, in the report made to Mayor Lindsay by his Task Force on Housing in Jan. '66, and it was not a new idea then.

I say this, not to minimize the Bailey and Schubart article, which seems to me excellent and important, but, rather, to bring up the question of why this eminently constructive and practical idea has not been acted upon already. City administrations bemoan the meagerness of public housing appropriations—and, at the same time, do nothing to use welfare rents for housing, other than to subsidize landlords of some of the worst and most exploitative housing that exists. Why? Why hasn't the Lindsay administration acted on this suggestion of its Task Force?

It's an important question because unless it is answered, and whatever is blocking the reform is countered, we may expect that this thoughtful Forum presentation of the possibilities will probably have no effect either.





# SOFT LANDING IN HOUSTON

Unit terminals ease the  
air-to-ground transition

This July, while the world was watching two men from Houston make a successful landing on the moon, the folks back in Houston were putting the city's own new landing apparatus through its paces. Like the Lunar module, the \$110-million piece of equipment known as Houston Intercontinental Airport is designed to allow the traveler to land and take off without intolerable physical or psychological strain.

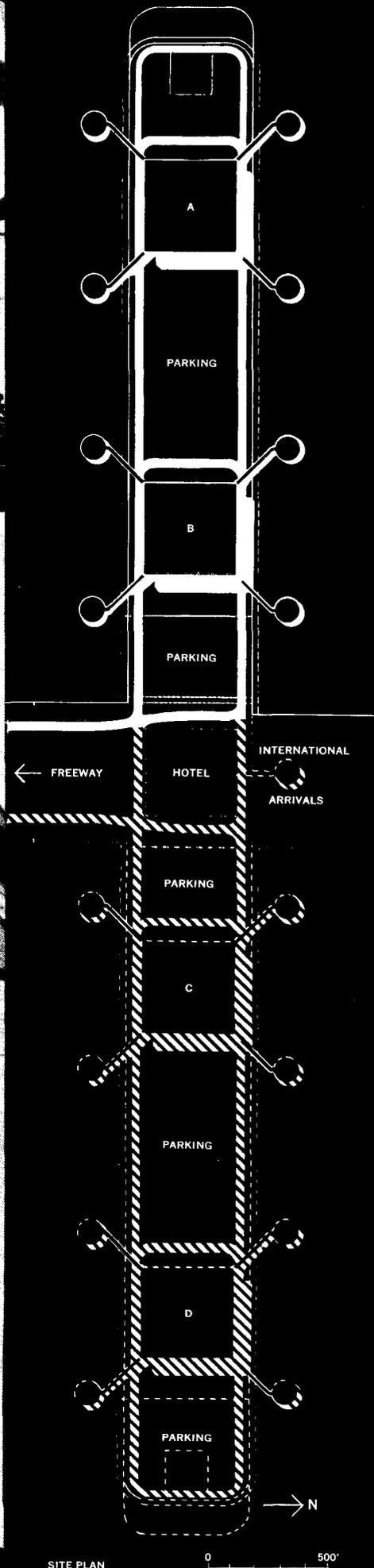
Architects Golemon & Rolfe and Pierce & Pierce knew—as all of us do—that the first step in making the airport experience more bearable was to shorten walking distances. So they established a maximum permissible walking distance of 600 ft.—not just from the main entrance to the plane, but from the *parked car* to the plane as well.

The found that the largest terminal that would meet this criterion would accommodate 20 boarding gates for present-day jets. Greater capacity could then be obtained by duplicating this basic "unit terminal." For the passenger who parks his own car, two levels of parking (expandable to three) were placed on top of these unit terminals.

Mechanical systems for reducing passenger walking distances were, of course, considered before the unit terminal scheme was adopted (which was, incidentally, back in 1963). The mobile lounge scheme used at Dulles Airport (July/Aug. '65 issue) and a system of minitrains to boarding satellites were both ruled out because they interrupt passenger flow.

A major advantage of the unit terminal scheme is that the airport can be expanded in stages without affecting operations in the completed parts. The two unit terminals now completed are more than adequate for Houston's current traffic load of 4.5 million passengers per year. The other two projected unit terminals should be constructed in time to serve the 10 million travelers of 1975.

The architects of the Houston airport have overcome the one serious drawback of previous multiterminal airports (such as New York's Kennedy Airport): the problem of getting the transferring passenger from one terminal to another. They lined up the terminals, then linked them with a simple, inexpensive minisubway line.



SITE PLAN

Two of the four "unit terminals" planned for Houston Intercontinental Airport (A and B on plan) have been completed. Each terminal is connected by bridge-like concourses over the access roads to four circular flight stations, each with boarding gates for five present-day jets. The central structure of the terminal complex, a 350-room hotel, is scheduled for completion early in 1971, and the other two unit terminals should be completed by the mid-1970s. A prominent, already completed structure at the airport is the control tower, one of the standard type designed by I. M. Pei & Partners for the FAA.

Each of Houston's two unit terminals is a building shaped around a circulation system. The four "concourses" that bridge the 300-ft. gap between the circular "flight stations" and the core of the terminal converge on a square central space that functions as a mixing chamber. The way these concourses meet the main hall diagonally at its corners allows traffic to funnel into them and disperse from them in a smooth stream.

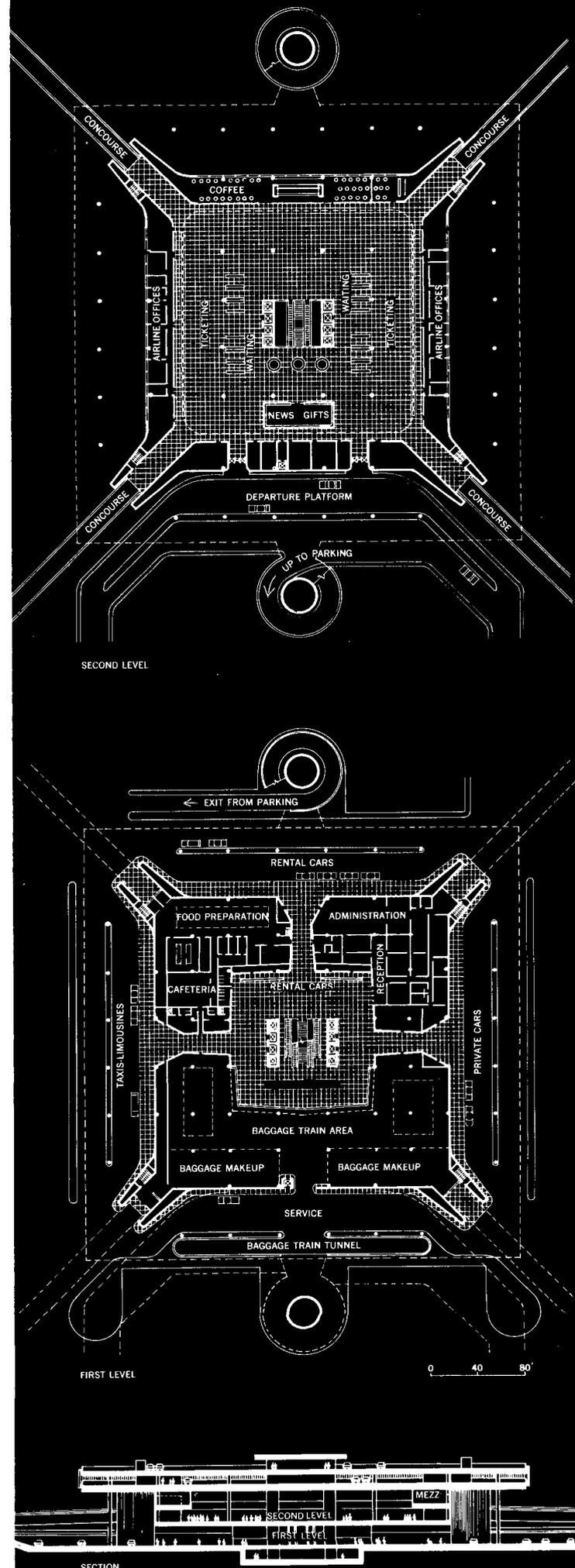
Departing passengers can reach the check-in counters in this main hall from an elevated automobile platform on one side of the terminal, similar to those at most major airports. But most other airports offer no other convenient way to enter; anyone who is not lucky enough to be dropped off at the departure platform usually has to walk through a stream of cars. At Houston the person who parks his own car, or drops off a rental car, or transfers from another unit terminal can easily reach the center of the check-in area by some combination of elevator, escalator, and underground minitrain.

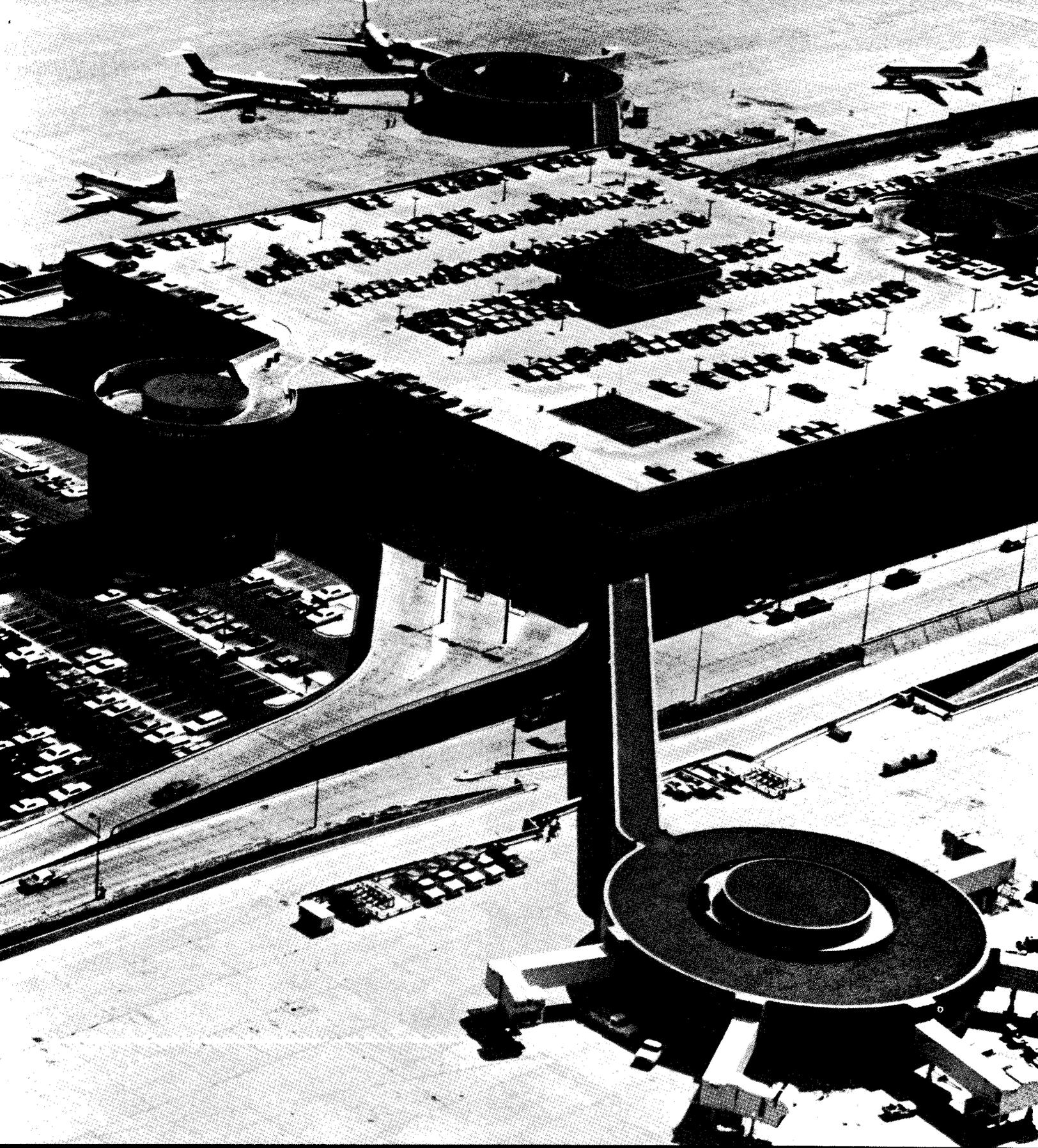
Once the departing passenger has checked in, he is not required to proceed to a "hold room" at the boarding gate, as in most airports. Since the boarding gate is a mere two-minute walk from the main hall, he can stay there until the flight is actually boarding. If a friend is seeing him off, for instance, they can spend the time before actual departure over a cup of coffee, rather than talking across a barricade between a crowded hold room and a crowded corridor.

Passengers arriving at Houston proceed down (by escalator or elevator) to the baggage claim area, where they are offered several clearcut alternatives. Exits in three directions at this level lead to three different platforms—one for private cars, one for taxis and limousines, and one for rental cars. (No need to fight through a tangle of mixed cars and taxis, or walk 500 ft. to a limousine stop, or perhaps 1,000 ft. to a rental car.) Some arriving passengers take the elevator up to their cars on the upper-level parking decks; others go down one more level to the minitrains that lead to the surface parking areas or, if they are in transit, to the other unit terminal for connecting flights.

## The unit terminal is a traffic interchange for people

The two unit terminals are virtually identical in plan (except that one has a customs area where the other has administrative offices). On the departure level (upper plan), airline counters and concessions around the edges of the main hall are directly along the passenger's route to the plane but do not obstruct traffic flow. Mezzanines around this hall are used for airline offices (above the ticket counters) and for restaurants (above the coffee shops). At the first level, exit platforms on three sides of the terminal bring three different kinds of car traffic within 100 ft. of the baggage claim area. Planning of the flight stations and the operations areas at ground level was left to the airline tenants. The two completed levels of parking on top of each terminal can take 773 cars; a third level can be added.





The efficiency of the circulation inside Houston's unit terminals is lost unless the traveler can find the route he is supposed to follow. Certain features of the layout are remarkably easy to grasp; the arriving passenger, for instance, can see immediately that one main concourse leads from the flight station to all destinations. But other required information—which level to go to, what exit to take, etc.—can hardly be grasped without relying on signs.

Architectural Graphics, the consultant firm for all of the airport's signs, has used its own highly legible variation of the Standard alphabet. Signs throughout the terminal have been rigidly controlled, with terse ones identifying airlines (by brief form of name) and concessions (by type only).

Signs giving the traveler directions, however, are not so terse. Many follow a full-sentence format ("Take escalator down for baggage claim"). Instructions in this imperative form, say the designers, draw a more positive response than mere identifications.

There are a few apparent lapses in the sequence of directions. At the central escalator well, for instance, there is no way to tell which escalator actually goes down except by observing the escalators themselves (and if you approach the wrong one, it is a long walk to the one you want).

The signs are seen against a rather austere terminal interior that ranges in color from off-white to dark bronze. None of the spaces are monumental, but merely large enough for the activities they serve and enclosed in unpretentious surfaces.

An effort toward visual excitement is apparent in the sleek, tubular interiors of the concourses, which unfortunately make the short walk to the flight station seem longer. The main hall is dominated visually by the exposed concrete columns and the deep waffle slab it supports. The voids in this slab work well in distributing lighting and in directing sound from speakers mounted in them. But their shapes—determined in part by the process of casting with reusable fiberglass forms—are not quite logical structurally and make this exposed structural system look strangely like applied decoration.

## How travelers move through the unit terminal



The passenger arriving in Houston proceeds from the circular flight station (top right) through a tubular concourse (middle right), where detailed signs direct him to the baggage claim area (bottom right) and other destinations. After picking up his baggage from a gently moving flat conveyor, he can leave by any of three clearly marked exits, depending on his means of transportation. All passengers—arriving or departing—pass through the main hall at the second level (center photo), the core of which is a cluster of stairs, escalators, and elevators. The departing passenger checks in at a chastely designed counter (top, far right), then proceeds to the adjacent concourse (middle, far right) to the flight station (bottom, far right). Total distance from counter to boarding gate: 475 ft.



Follow the central escalators in either terminal down to the very bottom and you will find a station of what may be the world's smallest and least expensive transit system (about \$380,000 for the entire system, installed). The subway is designed to offer free, frequent service—comparable to elevator service—to the relatively small proportion of Houston passengers who must transfer between terminals or return to a car parked at another part of the airport.

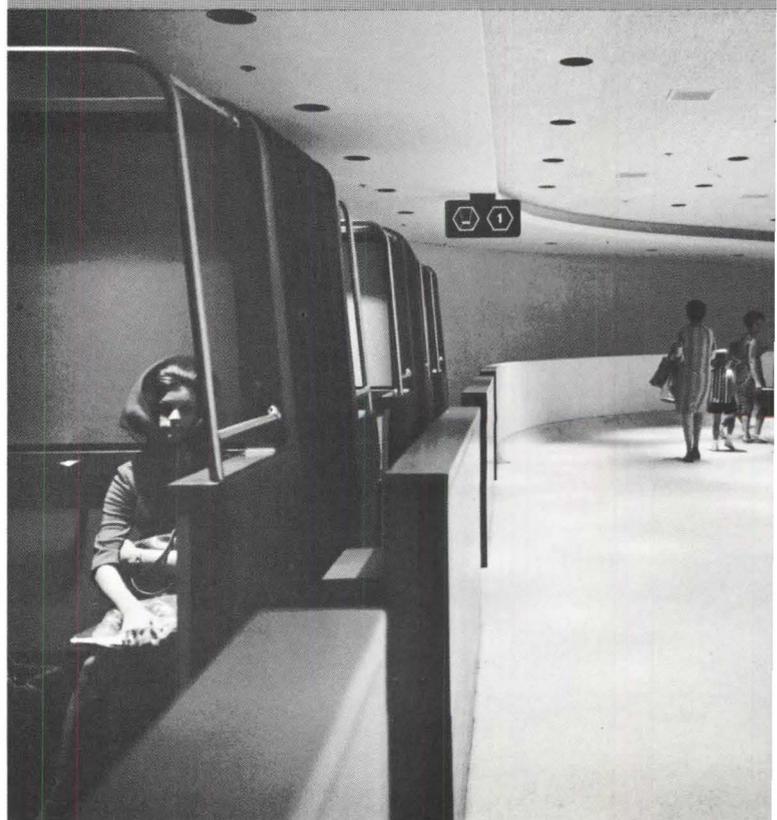
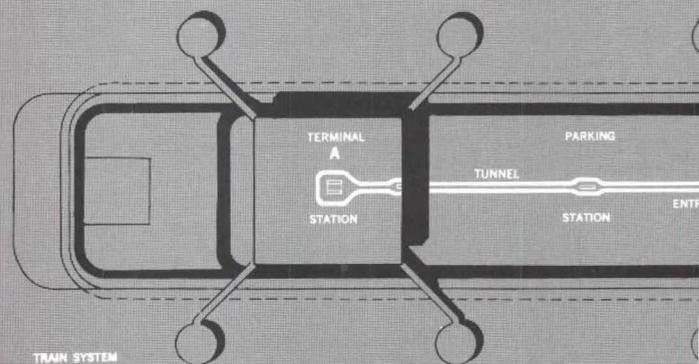
The trains, produced by Barrett Electronics Corporation to meet performance specifications drawn up by the architects, are built of aluminum and fiberglass and run on solid rubber tires. Each train has a battery-powered traction unit towing three cars, each of which has seats for seven people, plus a floor area about 3 by 6 ft. for their baggage (and, in a pinch, a few standees). The trains run entirely automatically, guided by magnetic equipment buried in the tunnel floor. They make the trip of roughly one-third mile between terminals in about four minutes, including an intermediate parking lot stop.

When all four trains are in service, a train arrives at each station every two minutes. At full capacity, the system can carry 630 passengers (plus a few standees) per hour between terminals.

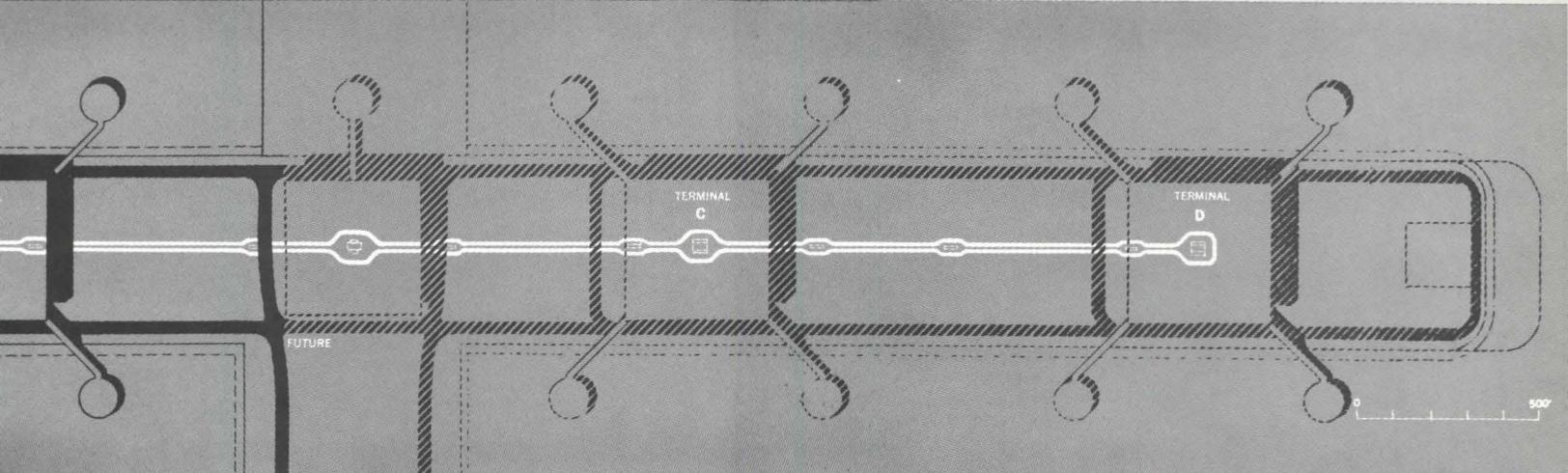
One of several initial problems in operating the system is that sightseers (including literally busloads of children) crowd the trains, forcing actual travelers to walk through the train tunnel with their baggage. (The tunnel walkway is actually not unpleasant, and the 1400-ft. distance between terminals is no longer than concourses at Chicago or Miami airports, for instance.) Some parts of the traction system have proved unequal to the unexpected traffic loads (and are being modified) and the control system is not yet 100 per cent accurate.

Even though the system is simple, with only three stops at present, diagram-type signs giving the traveler detailed directions will be backed up by taped reminders delivered by an automated audio system. Since neither the signs nor the tapes were completed at the time the airport was open, there were many confused travelers during the first weeks of operation.

## A quiet little subway shuttles between terminals



At the base of the central escalator-stair well in each unit terminal is a station for the airport's automated, battery-powered minitrain system (top photos). At present, the trains run between the two completed terminals, making an intermediate stop at the long-term surface parking lot (see plan). When the train reaches the station (bottom photos), synchronized gates in the three cars of the train and in the barrier that separates it from the pedestrian area open to let passengers board.



Houston Airport is linked to the city's freeway system (about 20 miles from downtown) by a system of roadways that wrap around the core of each unit terminal and swoop up to second level departure platforms. Helical ramps lead from there up to the two parking decks at the tops of the buildings.

Roads throughout the terminal area follow a consistent counter-clockwise pattern of movement which is easy to comprehend. All of the turn-offs are on the inner side of the main road circuit and lead toward visible objectives. There is literally no point in the entire complex where a traveler on foot has to cross a roadway.

The helical ramps up to the parking levels are no challenge to experienced drivers. The screens of vertical aluminum members around the ramps keep the sun out of drivers' eyes and eliminate sudden sequences of light and shadow.

These ramps, right on the fronts of the terminals (if they can be said to have fronts), are characteristic of the exterior architecture of the buildings. For the most part, there is no more than exposed concrete, with areas of bronze-colored aluminum curtain walls or sun screen over major openings.

Here and there this direct approach is distorted a bit in the name of Architecture. The bridges to the flight stations, for instance, have a tubular shape that is more expressionistic than structural (reminiscent of Saarinen's even more sculptural handling of similar bridges at the TWA terminal in New York). And the deep porticos at all of the automobile platforms—sensible as they are in Houston's hot and rainy climate—betray the influence of Neoclassicism (a vogue that was stronger back in 1965, when these buildings were designed).

The most striking characteristic of the terminal architecture, however, is the way the several inherently different parts of the buildings—the parking decks, the ramps, the bridges, the flight stations—are clearly differentiated. This sharp articulation of parts gives the terminal the look—and a very appropriate look—of a huge apparatus poised on the landscape, ready to move people efficiently between cars and airplanes.

—JOHN MORRIS DIXON

## The airport's roadways merge with its buildings



Signs along the main road that loops around the terminal area (right) indicate several approaches to each terminal—for departing passengers, rental car return, etc. The roadway up to the departure platform (top, near right) also leads to the parking ramp. These ramps (top, middle) are easy to maneuver on and are screened from direct sun. Passengers bound for Houston leave the terminal through one of three tall exit porticos (far right).

### FACTS AND FIGURES

Houston Intercontinental Airport, Terminals A and B, Houston, Tex. Owner: City of Houston. Architects: Golemon & Rolfe and Pierce & Pierce. Engineers: Engineers of the Southwest (Lockwood, Andrews & Newman; Bovay Engineers; Turner, Collie & Braden). Consultants: Evans-Monical (interiors); Seymour Evans (lighting); Architectural Graphics (graphics); Mulhauser, Holmes & Riggs (kitchens). Landscape architects: Bishop & Walker and Fred Buxton. General contractor: R. F. Ball Construction Co. Building area (terminal buildings, including parking areas and train tunnel): 1,260,000 sq. ft. Construction cost (Terminals A & B, not including land, fees, furnishings, or tenant improvements, based on the 1965 contract bid): \$19,476,330. Total cost of airport to date (including land and all improvements): \$110 million. PHOTOGRAPHS: Orlando Cabanban; aerials, Eastern Airlines (Lee Bright).





**NEW SCHOOLS FOR NEW TOWNS.** Published by Educational Facilities Laboratories and Rice University School of Architecture, Houston, Tex., 77001. 60 pp. 5 7/8 by 7 3/8 in. Illustrated. Free.

BY MELVIN CHARNEY

This little paperback volume is a report of the fourth annual Design Fete sponsored by Rice University School of Architecture. The Fete consisted of a two-week design marathon conducted by six architects, each directing a team of students. Included were such well-known architects as Charles Colbert, Robert Venturi, and Thomas Vreeland of the U.S., Cedric Price of London, and Hans Morganthaler of Atelier 5 in Switzerland. They were backed up by a group of research participants representing some of the most interesting names in the R&D of educational facilities, and received the support of Educational Facilities Laboratories.

The explicit purpose of each architectural team was to translate into design a program for a "new town" and its educational system in order to "develop new concepts." But, since new urban areas and new educational systems do not readily lend themselves to singular design visions, the episode of this Fete as a whole has less direct bearing on the concepts of "New Schools for New Towns" than on architecture itself as a system of concepts dealing with environmental problems.

In order to look at the work of the Fete one has to distinguish between the world of design and the "real" world. Design operates on its own level of vested reality removed from the problems of urban schools, and the real drama of an event that sets out to "develop new design concepts" lies in the resolution of seemingly incompatible realities.

The rhetorical language and the format of the report adds to the distortion. The projects of the individual teams are cut up into a pastiche of sections on "underlying themes." The educational programs on which the work is based are only vaguely suggested. However, the design work speaks for itself, and if one

**Mr. Charney** is an architect and associate professor in charge of the Program of Graduate Studies in Architecture at the University of Montreal.

can disregard the static a reasonable coherence emerges.

In this light the resulting projects are both interesting and discouraging at the same time: interesting because they do present an excellent sample of current design attitudes; discouraging because of the evidently primitive state of design and educational planning vis-a-vis the complexity of urban educational problems.

Paul Kennon's program involved a "university town" in which all distinctions between "town and gown" were to be eliminated, creating instead a "gown-town" down-town. The design integrates all community and educational facilities in a "Giant Educational Concourse" so located that the town residents can "encounter learning in their daily lives" and be "included and invited to join classes." The rationale here is that "educators and planners would do well to apply the same criteria of accessibility to facilities for learning as shopping center developers apply to facilities for commerce." So, along the downtown spine of this town are found a supermarket, a physics department, and a shoe shop.

What emerges is a beautiful example of a grand parti of a finite town manifest in the current "with-it" regalia of building design. All the familiar bits are there: a "tree" organization; a central activity spine; the sweeping, sinuous lines of residential branches fitted into the cardboard contours of a sloping, nonexistent site; eight-story drums at the node points; a carefully arranged haphazard composition; a lineup of Vierendeel trusses and battered, stepped-up walls of linear masonry, mesmerized in concrete.

If Kennon's project can be cited as an example of the styling of containers conceived in the image of architecturally designed things, and trapped in its media, the project of Charles Colbert represents the professional styling of buildings and gadgets in the image of the corporate establishment. Colbert proposes that educational facilities "be given equal stature with those of business." By "stature" he seems to mean building size and building style. Accordingly, SOM-like towers are shown in zoom-perspective sketches. A concern with the facade grid, the

corners, and the bases of the towers is expressed with neo-classic remnants typical of the current styling of corporation buildings. This poor man's semiotic speaks of the poverty of environmental design rather than of the basis of environmental communication.

With the work of Thomas Vreeland and Cedric Price, the vacuous antics of the above projects are left behind. A photograph from Vreeland's project, of two children listening to a transistorized, hand-held receiving unit, clearly articulates the difference. With a readily available device these children are "in school," in direct contact with the world around them, without a building or an architect between them and an accessible educational environment.

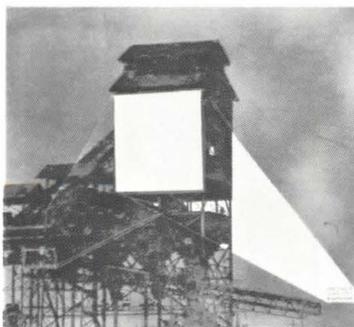
The program of Vreeland's project involved a depressed area of 50,000 inhabitants living within a large urban region. He develops an educational environment from bits of hardware presently on the market to supplement and upgrade existing educational structures. He uses these bits as the elements of a system that can generate many plans. The types, quantities, and costs of the components are set out: decal graphics, transistor radios, street-corner "telephone booth" study units, a convoy of VW traveling "schoolrooms," mobile-home child day-care centers, SCSD prefab learning centers, a Roux-Dorlot incremental multistory building system for adult learning centers, and "Mes-Tex" prebuilt vocational shops. These are distributed throughout the community, and are connected to a central "Town Brain" which transmits educational messages. Rather than buildings for education, facilities are provided in the form of equipment for education. This equipment is industrially mass-produced, and totally interchangeable. The mobility of the system, conceived as a function of the environment, goes beyond the idea of flexibility of buildings.

Many of the ideas on which Vreeland based this work were developed by Cedric Price in such well-known projects as the "Fun Palace" and the "Potteries Thinkbelt." In the Fete, Price handles these ideas with facile enterprise. He goes farther than Vreeland in engaging the total matrix of the community in his design. In Vreeland's project, the

educational components are type objects placed in the community, and, as such, are separate from it; they are identified with the symbol of an open hand. In Price's work, the attempt is made to extend the physical structure of the community.

The program (prepared by John Tirrell and Albert Canfield) projects a new town for the year 1990. As previously, Price's strategy begins with a totally decentralized kit of parts whose nomenclature reads like some multistage NASA system. It begins with the TB, the "Town Brain" that transmits data to a series of devices throughout the town and to the town itself. The IESC and the CESC are the Industrial and Commercial Educational Showcases that spell out to the passing public the processes and products of industry, displaying foods and information not normally available for inspection, and dispensing educational services in self-service machinery. The AL is an Auto-Link, and the RTS is a Rapid Transit Service—both provide media for commuter education; for example, the back seats of buses become miniature, electronically telemetered study carrels. The major element is the HSS, the Home Study Station, a self-contained cubicle filled with electronic media placed within existing homes or added to them, to replace the schoolhouse for most educational communication. The ITT, an Infant Teach Toy, resembles a traveling circus with several trailers and lightweight extensible enclosures easily relocated to serve a shifting age group. If, somehow, the educational messages does not come through, there is an LC, a Life Conditioner drive-in education theque which straddles the expressways leading to and from major areas of the community, in which programs for "inquiry, tutorials, group instruction, and investigation" are provided for all age groups. Education is, effectively, everywhere; it is not simply accessible, it is there, so to speak. It pervades the very nature of the physical setting.

Even though this design is projected 20 years into the future, it is entirely structured out of familiar hardware and existing systems; for example, the RTS has been in use for a number of years in Montreal. The design explains well the idea



Photos above depict a variety of direct-contact devices to make the "educational environment" accessible: from top, a transistorized hand-held receiving unit, ear-phones and screens on buses, a traveling schoolroom, and an educational billboard.

that it is not mainly the sophistication of a proposed technology that determines innovative potential, but the way in which technology is applied that constitutes a difference. It says, moreover, that it is in the nature of design to seek out in the existing environment the conditions of possible futures, not only because of changing life needs and life styles, and the spin-off from related technologies, but also because of responses to future environments that have developed outside the defined limits of design.

An exercise in design based on the iconography of the urban environment is found in Robert Venturi's project. Typical to his design work, he seeks in the setting of Main Street indigenous architectural devices. Education as a service facility becomes in his project a drive-in educational "Service Station," without gas pumps but with a billboard that says *Learn* rather than *Shell*. This says an accessible educational environment does exist around us, and suggests that architecture tends to deny the indigenous physical setting of our urban culture.

The program for Venturi's project was based on a new town to accommodate 120,000 residents. The town of his scheme is composed of 11 townships, of equal populations, and each connected by a loop freeway system that runs directly through its center. Along this central strip, Venturi places a mix of educational buildings and commercial establishments. All the paraphernalia of the suburban main drag is there: the billboards, supergraphics, drive-in vending machines, minitown shopping centers, etc. If Colbert's position was to imbue education with the style of big business, Venturi finds his appropriate setting in the structures of small business.

This project was proposed for the year 1970. It is then, supposedly, beyond the planning stage and well into construction. Venturi, accordingly, develops his design as a piece of current history. He knows well the problems and risks involved in the design of a town, and he avoids them in a parody not only of suburban "new town" design—Columbia New Town—but also of historical influence on town design and current design devices. This has less to do with the

design of urban educational facilities than with the architectural edification of the designer. To this end, Venturi also parodies himself, his work, the Fete, and its program. However, given that this problem is real enough, his exercise in architectural gamesmanship is interesting, but, ultimately, redundant.

The problem common to all the projects of the Fete is the design of "accessible" education. It is one thing to say in a program that education should be accessible, and another to try to translate this into viable physical form. The former is a statement of intention, the latter a plan of action. An educator may say that learning should be readily available, but for a designer to put up a sign of an open hand or a billboard with the word *Learn*, is to play with analogues rather than to postulate plans. Similarly, to apply the criteria of shopping centers to places of learning questions cognitive processes rather than design procedure. One known factor is that accessibility does involve the freeing of education from the rigidity of existing institutions.

If anything of design value emerges from the project of the Fete, it lies perhaps in the demonstration of the intrinsic relationship between the form of the physical environment and communication processes. The designs that assume physical form as defined by the tradition of cities, streets, buildings, and masonry assume that people come to education. In the designs that shift the commitment of architecture from these traditions to a concept of education itself as the function of a physically responsive environment, education is brought to people with the ease of available media. This important change directly transfers the question of access from a physical design issue to a social and political issue where it belongs in the first place: How much and what kind of knowledge is available, or accessible, to people?

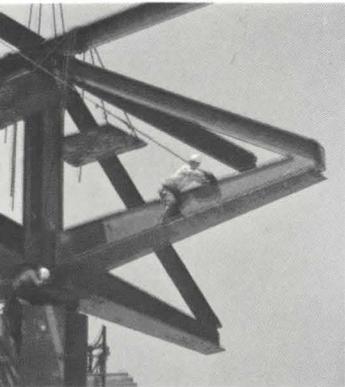
Moreover, the idea of a designer's commitment to environmental structures that do not necessarily involve buildings confirms the most generic purpose of architecture itself. It advocates its potential, and demands that architecture have its own technology. Perhaps one of the first technologies to develop is a systematic method of conducting explorative design studies.

**GO FOR McCORMICK**

When McCormick Place, on Chicago's lakefront, burned down in January 1967, controversy was already red-hot over proposed expansion of the huge exposition-convention facility (Nov. '66 issue). Conservationists fought, to no avail, to protect the lakefront. Now, two and one-half years and three plans later, a new McCor-

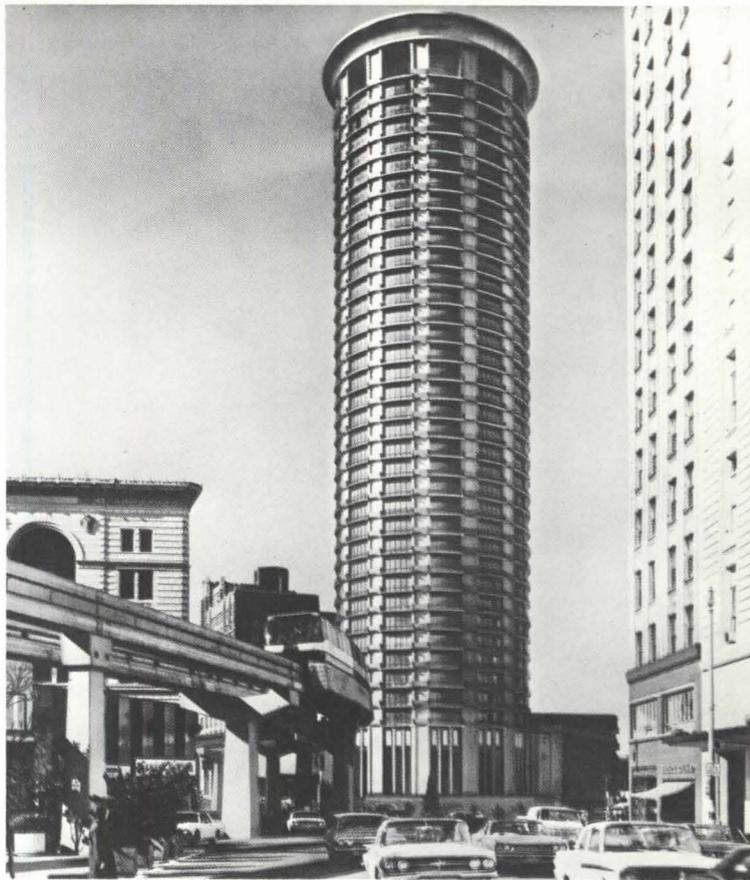
mick Place is under construction, with twice the original space. The final design, by Gene Summers of C. F. Murphy Associates, calls for two buildings linked by a skylit plaza. Over both will be an enormous (20 acres) roof, supported by a two-way truss system (under construction above and right), with 75-ft. overhangs on all four sides. The exposition

building will be 114 ft. high, with two "show" levels, and parking for 2,000 cars beneath. The other building will house the 4,451 seat Arie Crown Theater with small meeting rooms grouped around it. Pyrophobes will be assured protection by a complete sprinkler system—20,000 sprinklers and 225 hose cabinets. Cost: \$75 million.



#### ALUMINUM RISES HIGH

The 450-room Washington Plaza hotel in Seattle is a "showcase" example of what can be done with aluminum in highrise architecture. Built in partnership by the Aluminum Company of America (Alcoa) and Western International Hotels Inc., the 40-story structure was designed by John Graham and Company. Over 400,000 lbs. of aluminum in gold and bronze finish were used for exterior columns, window panels and frames, balcony rails and store fronts, and also extensively on the interior. At night the building is lit indirectly by floodlights enclosed behind reflecting aluminum shields. Another Seattle "first", the monorail left over from the 1963 World's Fair, sweeps by the hotel (left in photo right).

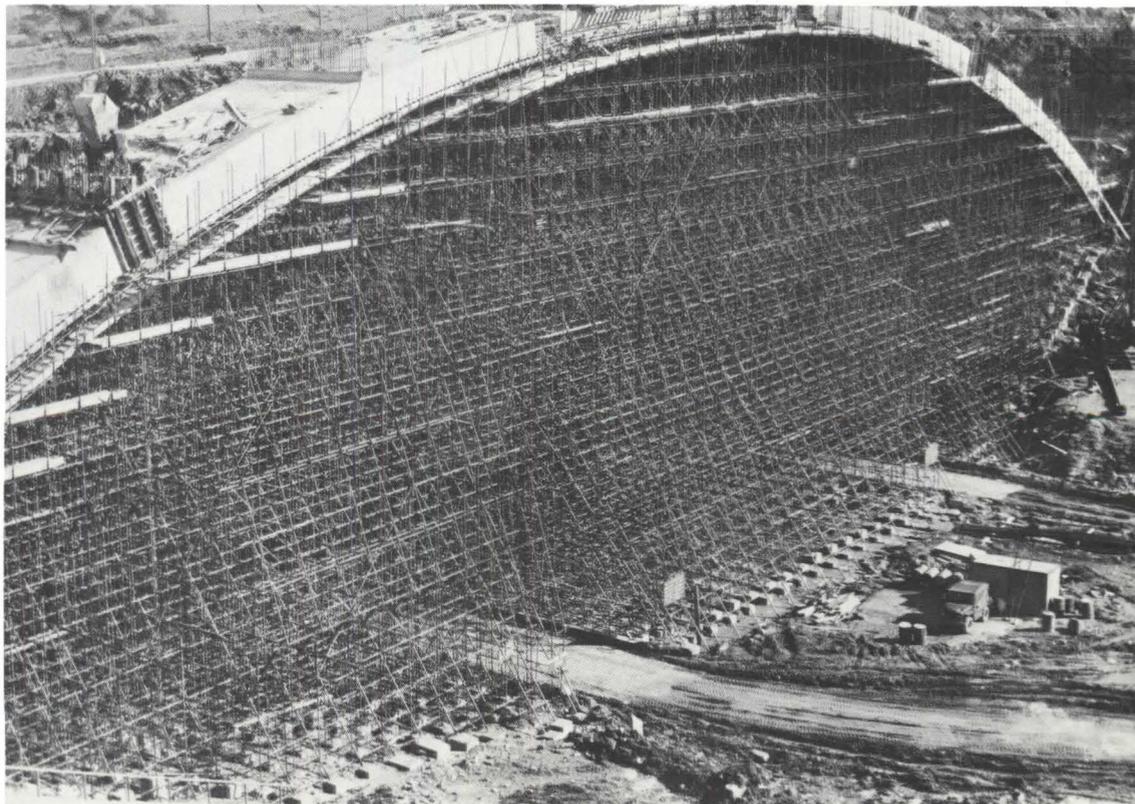


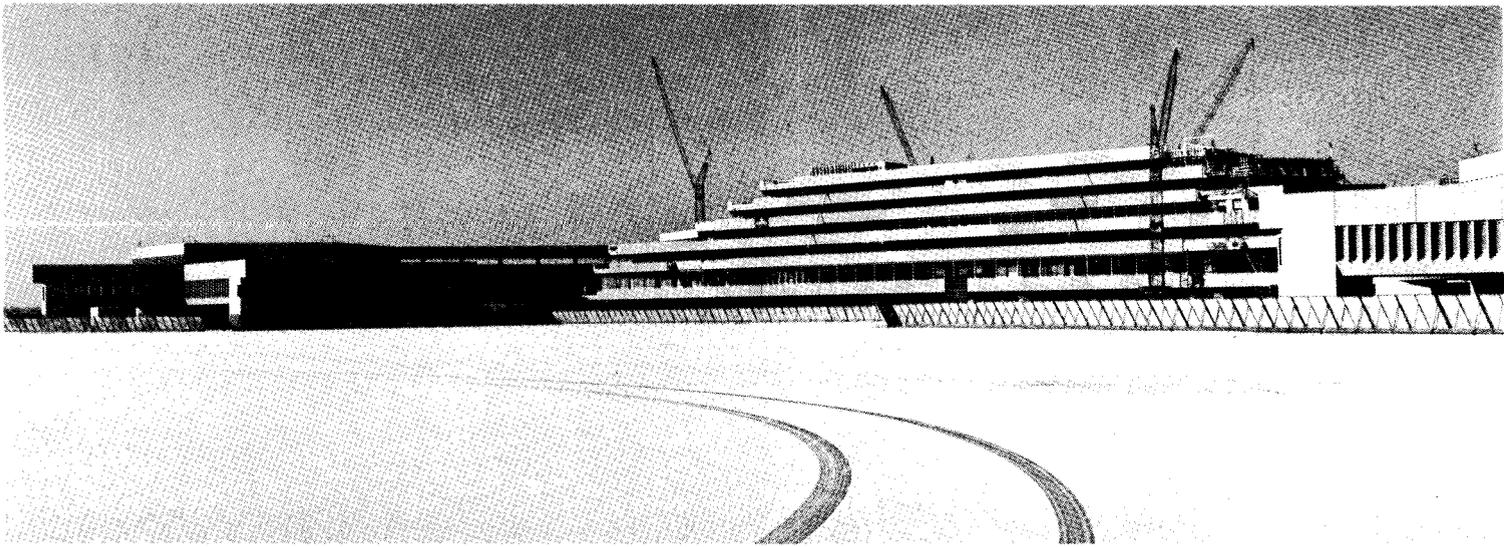
#### BRIDGE HARP

A bridge, now under construction near the town of Scammenden near Ruttersfield in Yorkshire, England, is believed to be one of the largest single concrete

spans in Europe. It connects part of a roadway that is just one section of a rapidly expanding highway system in England. Scammendeners prefer to think of their bridge as a harp,

for the miles of steel scaffolding that currently support the span while it vibrates in the rough Yorkshire winds, creating a hum and proving that architecture is more than just "frozen music."

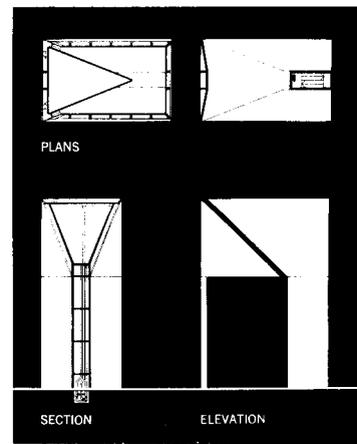
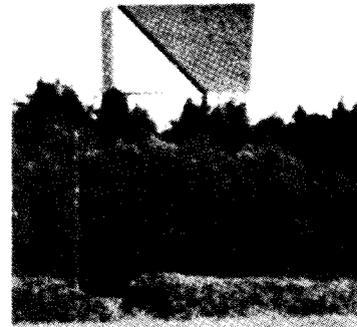
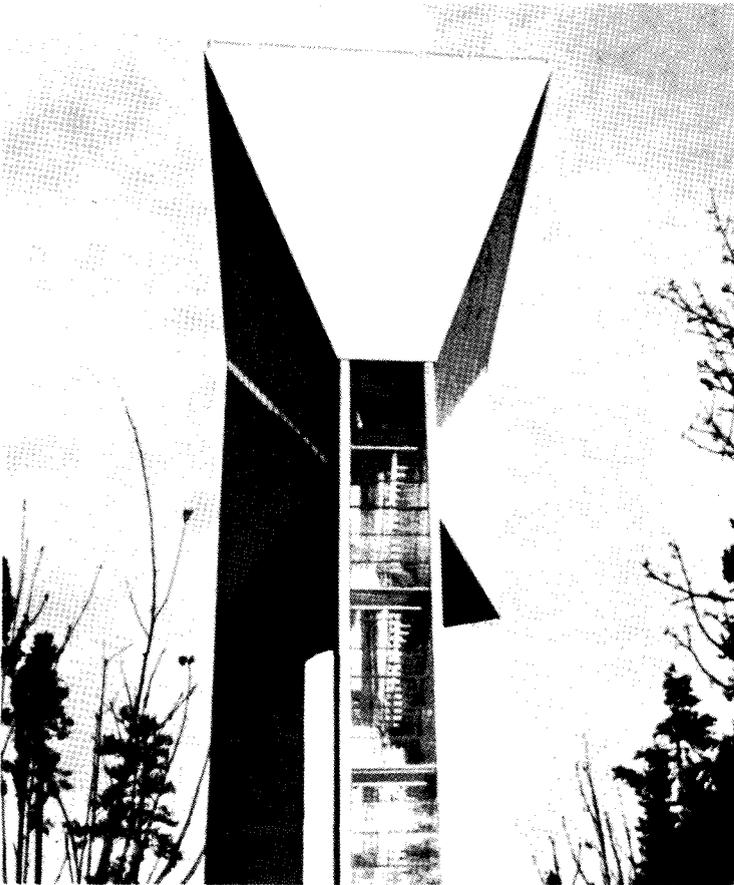
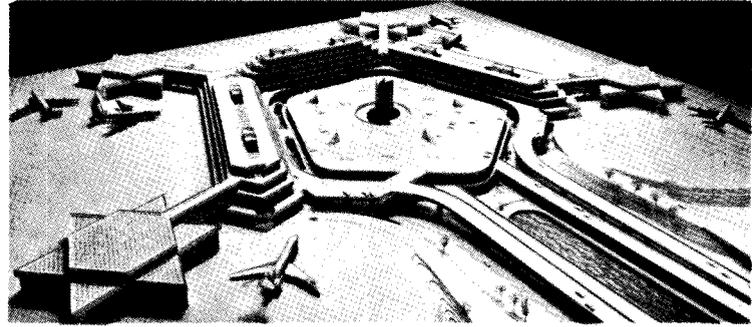




#### FOUR-STAR AIRPORT

The Bonn-Cologne airport, to be open by November, will connect to Germany's new highway system, so that it will be only 15 minutes from either city. The airport itself, designed by Paul Schneider-Esleben, consists of a six-level, horseshoe-shaped main building of reinforced concrete, with four star-shaped satellite structures attached (gates will be

located on each point of each star). The horseshoe encloses a two-level, 2,000 car garage. Arrivals and departures are separated on different levels, arrivals below (on field level) and departures above (plane level). The airport will be able to accommodate the jumbo and supersonic jets of the future, as well as up to 4.5 million passengers expected by 1977.

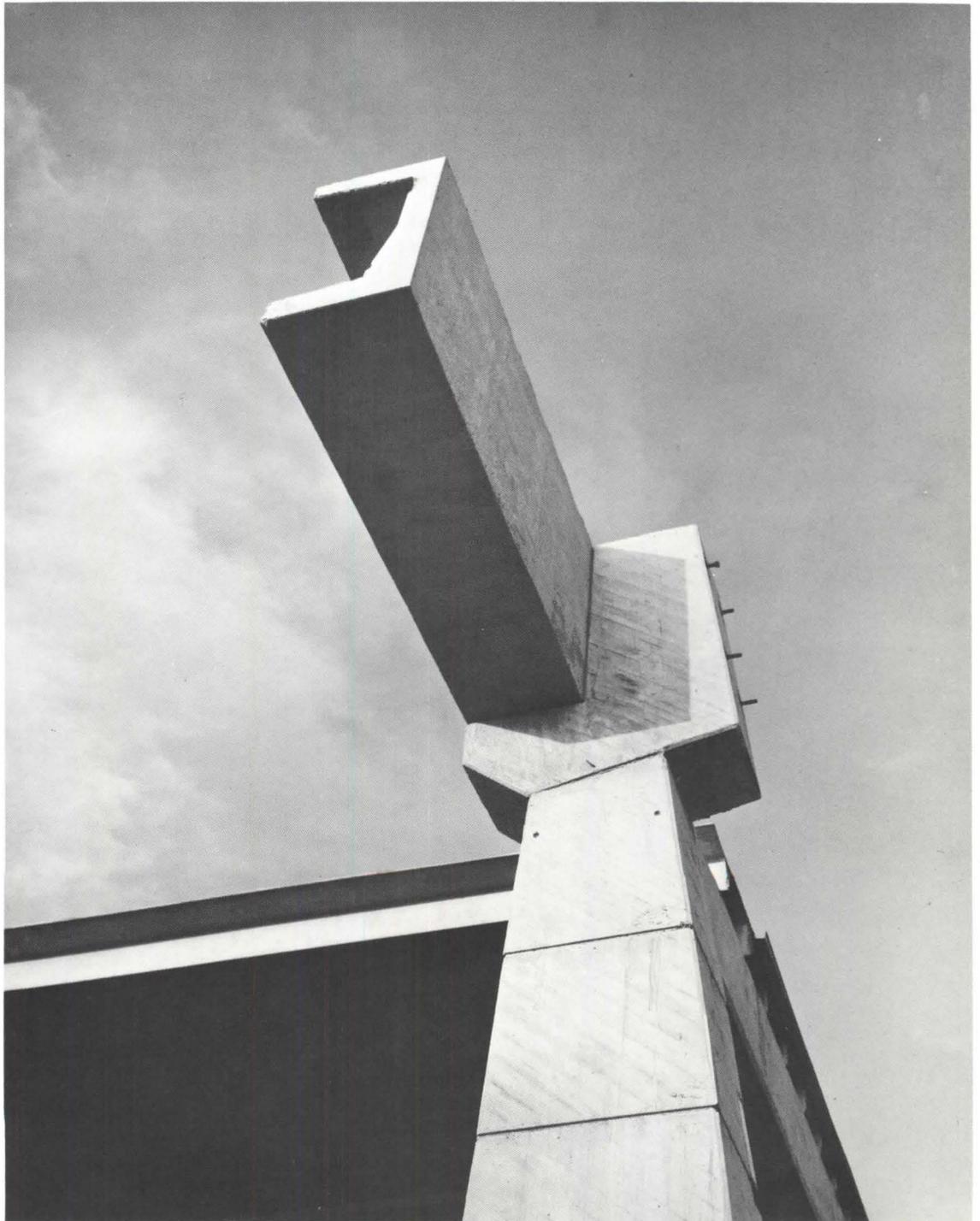


#### HIGH WATER MARK

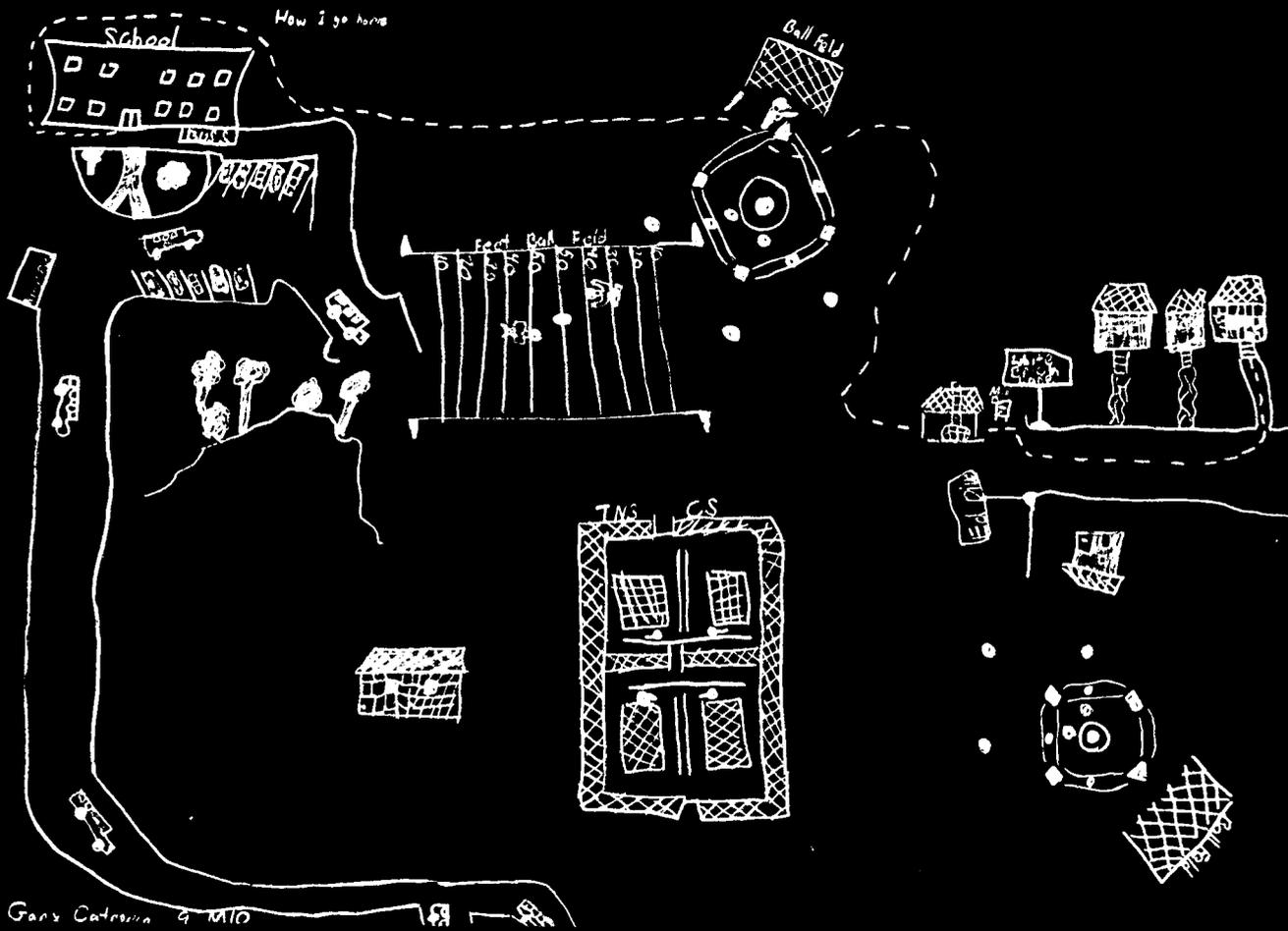
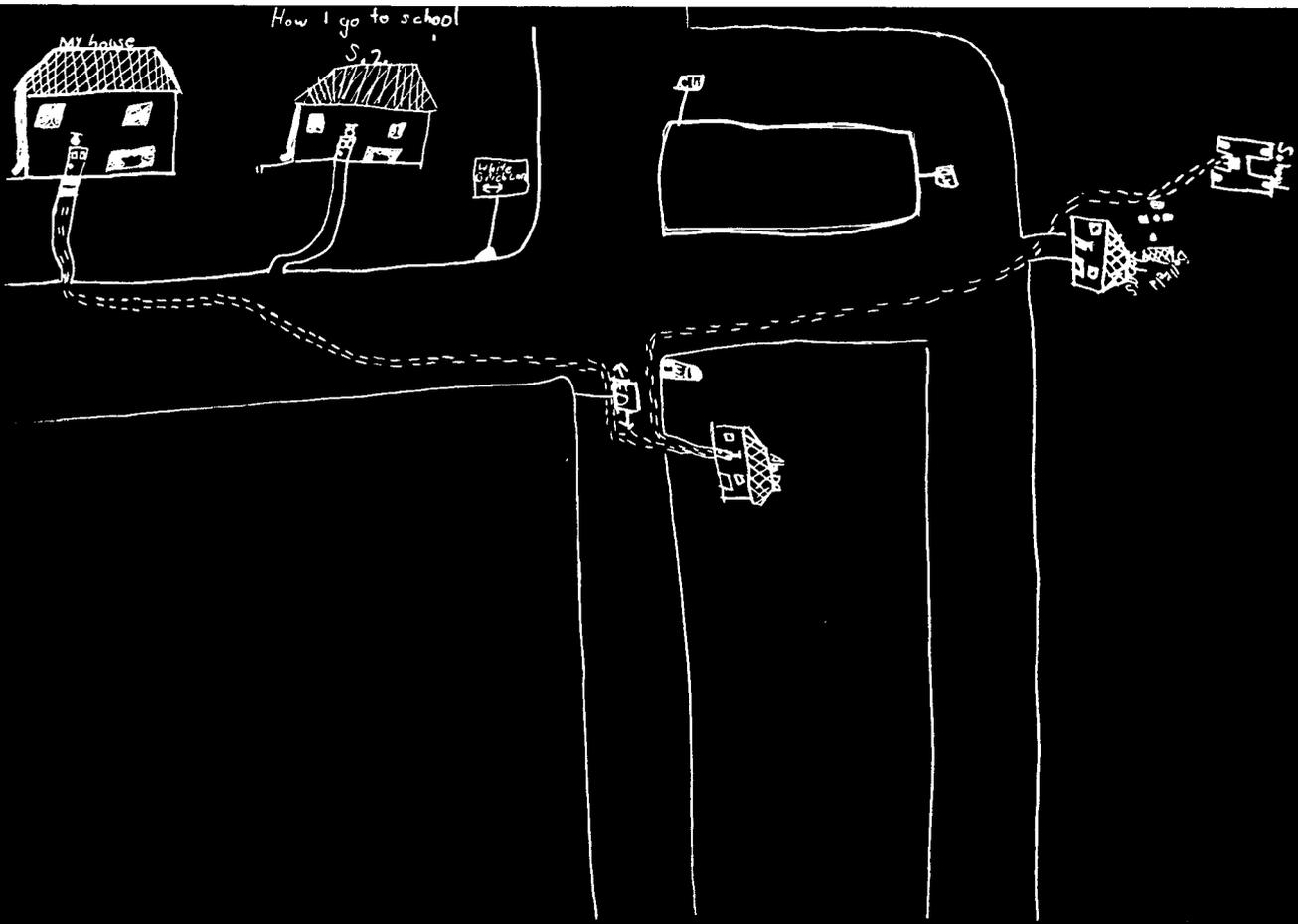
Dominating the forest landscape of Järvenpää, Finland, is a competition-winning water tower, by Arvi Ilonen, which departs radically from the usual cylindrical solution. Water from this tower serves 35,000 people, and is contained in two reservoirs resting on two supporting legs, one a narrow wall, and one a column containing the stairs and conducting pipes (see large photo, and plan [2] and elevation [4], left). From the side (smaller photo), the reservoir part of the tower appears to be flat and boxlike, but the sides actually slope inward towards a glass diagonal band. The reservoir is constructed of reinforced concrete; the entire tower is sheathed in wood.

### STRESSING THE CONCRETE

One of the winners of the Prestressed Concrete Institute Awards for 1969 is a prestressed concrete manufacturing plant in Forest Park, Ga. A 35-ft-wide service area containing office space and a working floor (and a balcony overlooking this floor) is flanked by two crane bays, each measuring 70 by 662 ft. The crane rails rest on the lower flange (below right) of a precast, post-tensioned girder which spans 64 ft. between supporting columns. Both the bays and the service area are roofed over by 8-ft-wide prestressed double tees. Architects: Graves & Toy; S. Porter Graves, partner-in-charge and Harry C. Wolf, designer.



**PHOTOGRAPHS:** Page 72 and 73 (left), Richard Nickel; page 73 (bottom), Pictorial Parade; page 74 (top), Gunter Abend; (bottom), courtesy of Bauen + Wohnen; page 75, Gordon H. Schenk Jr.



# PRE-COPERNICAN VIEWS OF THE CITY

BY GEORGE RAND

Man's greatest problem in the days ahead may not be the hydrogen bomb, nor the population explosion, as frighteningly involved as the successful negotiation of these crises will be. The problem is, rather, whether we can adopt a view of life in which "process or change" is perceived as the stable state of affairs. Can we surrender those static guidelines and expectations which have dominated history? Can we keep pace with changes occasioned by the technological explosion, by developing the psychological tools necessary to reap its benefits?

In recent history there seems to be an increasing gap between the scientific world-view, and the practical intuition of the common man, who painfully and hopelessly attempts to keep up with revolution upon revolution in technology. The gap is exemplified by the plethora of devices we accept as ordinary, even though they defy simple logic. Surprisingly, few men on this earth can look at the moon and see it as a reflecting sphere, sensing from it the location of the sun. Still fewer have had their intuitions stretched to the point where they can comprehend the scale of hundreds of millions of miles, or the microscopic dimensions of the gene, without assimilating these measures to an everyday human scale. And yet somehow all of us can unhesitatingly accept the idea of space travel as if it involved a mere extension of our skills as drivers of automobiles.

Despite the pre-eminence of science, the world of modern man remains populated by the heated imagination and exists as a personally defined web of "known" places and paths. Our ability to explore outer space has not yet created an equal thirst for the astronomical scale of events on earth, and has effected relatively small changes in the way men view their immediate terrain.

Part of the payoff of mass technology and urbanization has been an almost complete detachment from the biological and natural cycles that once served to differentiate space and time

**Dr. Rand** is associate professor of psychology at Columbia University Teachers College. The study was performed jointly with Dr. S. Wapner under National Institute of Mental Health Grant #MH00348. The investigations were carried out by John Gittens and Paulette Lebensfeld.

in the mythic consciousness. For the modern urban-dweller the mythic significance of birth and decline becomes increasingly secularized as this process is detached from the planting and harvesting cycle. Directions in space no longer have personal and totemic meanings—the East was the origin of life and the source of light, the West was the place of the setting sun, filled with the terrors of death. If we have become detached from this mode of awareness, this heritage, the question remains whether our vision has been replenished by scientific thought.

In the modern city, the externalized metric system relieves us of having to create personal units, estimate distances, establish spatial relationships between places visited in separate contexts and on separate occasions.

Virtually unnecessary are the mind's acts of inner representation and its methods of establishing location and orientation. Reference systems, concepts of "east" and "west," have become needless abstractions. In New York City, "north" and "south" are used synonymously with "uptown" and "downtown." They are no longer directions of the compass, nor do they bear any relation to the "land." They are mere designations of the grain of the city.

## Relieved of responsibility

In other words, society has relieved us of the individual responsibility for planning our spatial adventures. Few of us need the vision of Magellan, and yet all of us can live in a world setting arranged with the ideality of the functional space of pure mathematics. What matter whether we fly over the North pole to head "east." We let the airline pilot set the course, and concern ourselves less with the fear of getting lost than with the joy of getting down.

Given this differential social environment, and the plethora of experts who lead us around, over, and through unknown spaces, one might ponder where we would be if left to our own intuition. To what extent have the discoveries of science become part of our intuitive experience of the world around us?

The danger exists that, without any intervening comprehension, all but scientists are likely to pass directly from romance with

our space-odysseys to ennui or alienation. With the inability to understand the innovations of fission and fusion, the discoveries of genetics, the exploration of the universe, we may create a generation of people who assimilate these far-flung explorations of science to an inappropriately pedestrian, personal, *idiocentric* scale. One might ponder whether the larger sense of alienation we feel in our society is not in part due to the sin of *hubris*, the sin of men who dare to be more than men, who go beyond the point where they are at home in the fixed and cognizable order of things.

## Knowledge of a city

It should be clear that different modes of adaptation are required as the scale on which one lives changes and grows. The small town is ideal for the child. Interviews with rather sophisticated nine- to eleven-year-olds in New York City indicate they have very little "knowledge" of the lay of the land. Most of their notions of the city are organized as routes which are used ritualistically. Trips and excursions to far-away places are remembered but not thought of as connected with, or of the same world as, their immediate habitat. It might be said that children range from "home base" on an increasingly flexible "elastic band" that allows for longer and longer excursions as they get older. Many trips, however, are conceived of as travel to another domain; the child may recall being in many areas and yet have no notion of their spatial relationship to one another.

In other words, wherever the child lives, he is in a "small-town" filled with countless riches. His world is "infolded," undiscovered; he is embedded in, fascinated with, the immediate scene. Urban children have little knowledge of, or interest in, the larger units of the urban environment. Any room is a mere container, a hollow in which he can run and shout; stairs are mountainous ledges to be climbed on and jumped from. Adaptation to a particular environment is very rapid and early, and a deep sense of familiarity with a home-area is necessary as a basis for further exploration. "Home" begins as a sacred space, a sanctuary, from which one can make brief excursions into the profane world.

Through contact with the profane, unknown, mysterious void surrounding "home," the child begins to sanctify larger and larger segments of the world. The circle of sacred space gradually expands and takes shape. Eventually, the child's safe "habitat" includes areas that are spatially discontinuous with his "home" area, connected only by subway or bus rides. He becomes familiar with places that are spatially separate from home but nonetheless viewed as if they were a spatial extension of that well-known and familiar realm.

This point is made graphic by comparison of maps drawn by ten-year-old children. One map shown is the route from home to school; the other back from school. Needless to say, the maps should be identical. Comparison shows the child's tendency to fail to differentiate his mood, intention and goal from his total perception. For the child, there is no clear distinction between emotional meaning and intellectual grasp of his surroundings.

### Grasping an environment

Clearly, emotional aspects of one's relation to the environment (the need for a sense of place, neighborhood, territory) overlap with one's intellectual grasp of the same problems (knowledge of where one is, what space one occupies in relation to the neighboring spaces, knowledge that one can find a way home, and that the adage "you can't get there from here" is not in operation).

It is assumed that adaptation to any environment involves both an emotional attachment to and immersion in the specific "space" in which one lives, and at the same time, the apprehension of general rules of functioning that are applicable to other remote spaces and places.

Although they overlap, intellectual knowledge of the environment is separate from emotional attachment to (and acquaintance with) particular environments. One may abstractly know where one is (as in emerging from a subway exit at 42nd Street) without having a "sense of place," and, likewise, one may have a feeling of "being where one belongs" while scarcely being concerned with where it is in relation to other places (as in a church).

At no point in animal evolu-

tion does intellectual incomprehension prevent animals from getting around, and from having a highly differentiated ecology, based largely on tropisms, reflexes, internal reaction mechanisms, and the like. This "knowledge by acquaintance" that animals have of their habitat is, however, very frail, based on tightly patterned sequences of responses, and involves no ability to stand above the environment, and thereby to represent it as a whole. It is possible, then, to live in an environment of diminished scale, without ever coming to terms with its topography as an intellectual problem.

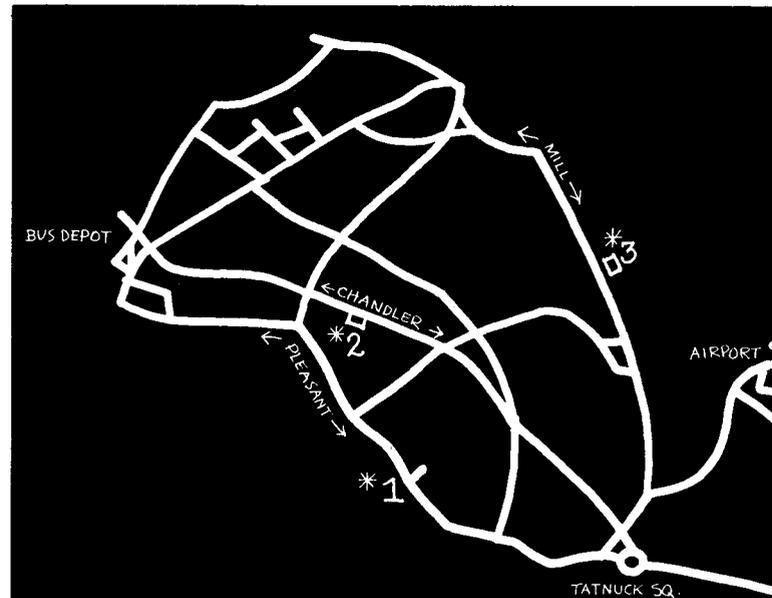
### A study in coming to terms

The major study reported below concerns just this issue: namely, how people of different life-styles may live in the same environment with equal proficiency, although their conceptual comprehension differs radically in quantity and quality.

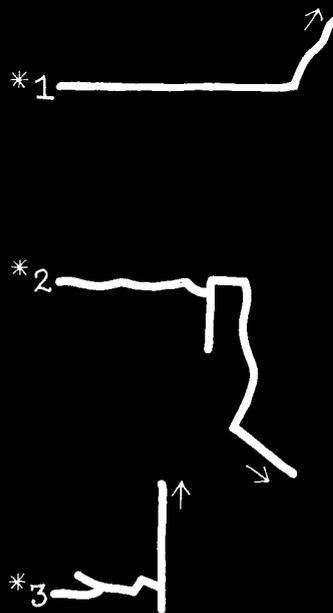
*Taxi-drivers* are professionals at getting from one place to another within the city, and yet as we shall see, have only fleeting impressions of the relationships among major features of the topography; *student pilots*, on the other hand, are forced to justify and reconcile contradictions between map, visual appearance from the sky, and impression of the terrain from the ground level.

Incidentally, taxi-drivers hardly ever use city maps to find a street which they do not know. Instead, they utilize street directories that are organized like a telephone book. After finding a known street that intersects the unknown, they orient themselves by finding the house number closest to this point of connection, and then follow the gradient to the destination.

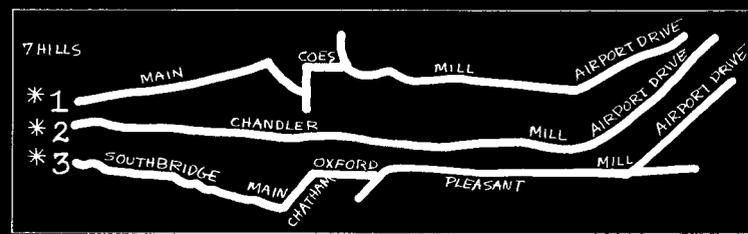
Twenty taxi drivers employed by the Arrow Cab Co., in Worcester, Mass., and 10 student pilots at the Atlantic Aviation Co. in Worcester were tested in the summer of 1967. All taxi drivers were residents of Worcester and had lived in the city for at least 25 years; the two oldest had driven for 28 years. The pilots were a more heterogeneous group: occupations ranged from truck driver and trade school student to lawyer. Individual flight times accumulated by the pilots ranged from two hours to more than 20 solo



- \*1 CHAMBERLAIN PKWY.
- \*2 WHITMAN'S SUPERMKT.
- \*3 ELK'S CLUB



Taxi drivers and pilots were asked to draw the three routes they would take traveling between airport and bus terminal. Top: actual map. Left: the three routes drawn by a taxi driver. Bottom: his composite map, showing difficulty coordinating the three routes into a single organization. Opposite: the journey along Route #3. Perhaps it matters less that a "place" can be objectively defined in Euclidean terms than what the place is near and what sequence has been followed in getting from one "place" to another.





hours necessary for a private license.

Half the taxi drivers were interviewed at the local bus terminal and the remaining half, as well as the pilots, at the airport (1). Subjects were asked the following: Draw a map of the route you would take from here to the airport (bus terminal), 1) if you wanted to stop at Whitman's Supermarket on Chandler Street, 2) if you wanted to stop at the Elks Club on Mill Street, and 3) if you wanted to stop at the intersection of Pleasant Street and Chamberlain Parkway (2).

For a fourth map subjects were told: Draw a map of Worcester which includes the airport, the bus terminal, and the three routes you've just drawn (3).

After they had completed the four maps, an additional task was presented. They were shown a list of six places in Worcester (the airport, Webster Square, Clark University, the art museum, Lincoln Square, City Hall, and Worcester State Hospital) and then were told to plot the locations of the points as they would appear if the locations were seen from above.

#### The failure to coordinate

The most striking result in the study was found on the fourth (integration) map. Ten of the 20 taxi drivers, when asked to draw a general map of Worcester including all three routes on the same page, constructed maps with multiple representations of the point of origin, point of destination, or both. In doing so they showed a marked failure to coordinate the three routes and their ingredient landmarks and streets into a single encompassing organization. Those who appeared to have some idea of what a "survey map" looked like often struggled at length with the problem of getting the streets to go together, without achieving any resolution. Others seemed only vaguely aware of the difficulty. None of the maps constructed by the pilots manifested this characteristic. Data are presented on the four maps drawn by a single and fairly representative taxi driver, with further examples of the integration maps presented for reference.

It came as something of a shock in this study to see that none of the taxi drivers included Tatnuck Square in their integration maps. This topo-

graphic feature is not only a major concentration of shopping facilities and services for the outlying regions of the city (and a major intersection formed by the meeting of Chandler and Pleasant Streets), it is also the key to relations between all the major routes running from the Northwest to the Southeast; it "explains" the relationship of the city to the airport.

In Worcester, incidentally, it is not at all unusual for newcomers to think there are three roads going up the hill to the airport, corresponding to each of the major streets taken to reach the access roadways (Chandler, Mill, Pleasant). There are, of course, only two such routes.

Only the student pilots began their maps by setting down limits of the furthest points to be included. Tatnuck Square was drawn as an outer limit in a number of their maps. It seems reasonable to speculate that the taxi drivers would include Tatnuck Square only if it represented the destination of a drive; not as an abstract intersection of major lines or surfaces through the city. In this sense, it does not serve a Euclidean function for them as an abstract "site" in space which can be located independently of the businesses or buildings visible at that place, independently of whether the path to this site is empty or filled. In short, Tatnuck Square is a *place*, a *center*, a *node*, a known *quantity*, it has "thing-ness," it can be *passed through*, *gone around*, it can be *lived near*, *met at*, and *shopped in*, but Tatnuck Square remains a fiction for most of Worcester's residents. Even though there is an identifiable spot which can be ascertained as the "center" of the square (a commemorative plaque) this is certainly not perceived as "the square" itself. Nor does the square serve the same function as Dupont Circle in Washington, a set of coordinates in New York or Chicago, an alphabetical street name in Boston; that is, it does not occupy a fixed location on the psychological topography in relation to other sites. In some sense it is as much a section of town ("West Tatnuck") as a specific place. Its function as an intersection of major arteries is at best a *theoretical abstraction* about the city-form. And it does not exist for the taxi drivers unless it is

part of a route, or they are going to it as a destination. Just as suburban tract developments are completely frustrating to a visitor trying to find a home, so also, Tatnuck Square, Webster Square and other nodes in the city of Worcester can be glided through very easily without the unwitting tourist ever raising an eyebrow, unless he is told to expect a major intersection, or guided in terms of obvious landmarks. Interestingly, Worcester residents so take for granted the perceptual clarity of these amorphously defined squares that they often give directions including places—"turn right at Webster Square"—for which there is no perceptible counterpart.

### Routes, not relationships

Despite their seeming inability to cope with these relationships between places visited on separate routes, taxi drivers are able to reverse routes, interrupt and continue them, overcome detours, all of which would imply an understanding of spatial relations. And yet they appear to be limited to a route-concept of the city. That is, they seem to know only where and when one street crosses the other. This consistently allows them to locate a point in space by its closeness to a given intersection, without ever being forced to resolve certain blatant contradictions in their understanding of the relative position of places in the city space.

Is it not interesting that one can have such expert ability to navigate through the larger urban environment while having scarcely any conceptual knowledge of the topography—where places are *in relation to* one another? Such knowledge of the environment would be best conceived as a set of principles, a set of rules or transition, a "grammar," a syntax governing movements through space and time.

As we discover the uses of these topological principles of organization of space based on the relationship of "neighboringness" (as opposed to Euclidean concepts of distance, angle, curvature), perhaps it will not matter whether a "place" can be objectively located at a site defined by coordinate axes in a Euclidean container. Rather, what the place is near and what sequence has been followed in the transition from one "place" to another,

are the important facts. This idea is especially relevant to the organization of future cities and for the accommodation of high-speed, long-distance travel. Routes based on iterated units of distance and time will not be able to accommodate the rapid changes between one rate of travel and another, for example, inter-city travel combined with far slower airport-to-city travel. Imagine traveling over still larger distances with increased frequency (it may be common, within 20 years, to travel to Europe and back in the same day). Here, objective time and distance become very *imperfect measures of location*, and thus subject to great illusional variation.

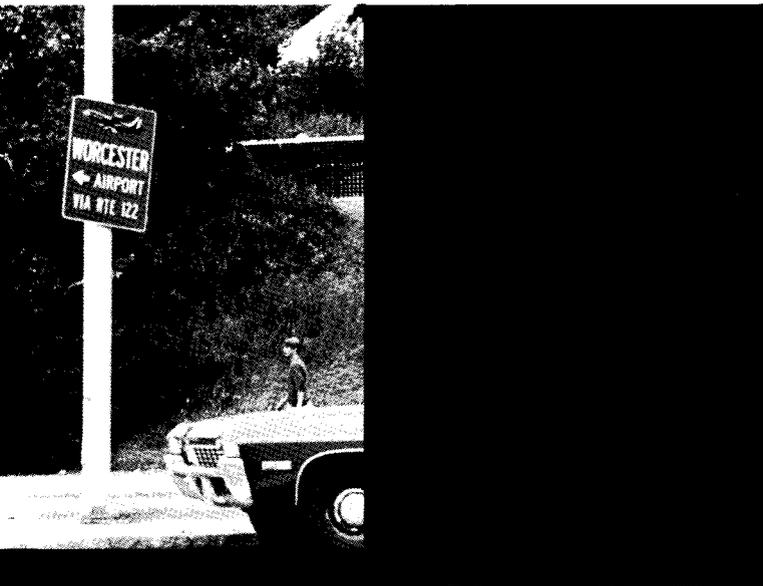
As distance and time undergo their own technological explosion, they will become increasingly imperfect indices of "places," and possibly only sequence will remain as a means of organizing one's experience of the terrain. There is no reason why cities need be *restricted* to a Euclidean metric pattern in order to accommodate expansion over greater distances than they now span. Considerably greater flexibility may be achieved in overall organization, if (topologically speaking) transportation routes, and other as yet undiscovered means of circulation are employed to create a *hierarchy of routes* which reincarnate the existing functional arrangement while *rearranging the actual and relative Euclidean locations in space among nodes or locations in the city*.

### Rethinking Euclidean space

For example, do we have the technology to build a "suburb" or new town that is physically further from the central city, and yet psychologically closer than areas in the intermediate zone? Can the center of the city be arranged as if it were located on the periphery, so that one would travel "out" in a Euclidean sense, to "get in" to the functional center of the city? Or where the current center would be the "periphery"?

This would be contrary to the present tradition and passion for unveiling or revealing spatial relationships between places in space. It would hide or conceal distant objects, convert all travel into a kind of "subterranean" system, exposing only those views that create a sense of sequence,





continuity, neighboringness, disguising any indication of "location" unless it serves these ends. The advantage of this approach is that it is more suited to existing needs and trends within the city; it opens up new sources of flexibility.

This is not the whole story, of course, since one would have to insure that the person does not feel isolated, unable to reverse directions, caught on a treadmill.

This hypothetical premise is meaningful only if we recognize that when traveling, particularly at high speeds, or under conditions of anxiety or danger, preoccupation, or fantasy (as a child), and along overlearned and often new routes, *distance, time, effort, feeling, anticipation, judgment, and will* are not differentiated from one another. The environment is more like an "Ur-raum," a primordial space, than like a container which maintains its intrinsic distances between points, and maintains its overall shape independent of the activities that take place within it.

To some extent our knowledge gets in the way of maintaining the "illusion" of instantaneous levitation from one point to the next. Such illusions would be easy to sustain if we had no information about location or change of position in space. (Do people want to know what floor they are on when riding in an elevator, or how close they are to the end of their trip, how far they are from landing at *any* floor and not a particular floor?)

Certainly, one would have to be sensitive to the possibility of extreme experiences of disorientation under these circumstances. Need one then assume that the only suitable means of orientation requires finding one's place on a grid? Do failures in previous attempts at this kind of topological design of buildings and transportation systems indicate an inability of adaptation to these circumstances by human occupants, or a failure in having worked through the problem by sufficient number and generations of designers?

From a psychological point of view, a sense of place means to be near to one's center of the universe, close to home or church or mother. It must be at least hypothetically possible to provide this without reinforcing intellectual knowledge of one's

location in space.

Second, disorientation means just what it says: the experience of momentarily forgetting where one is going and from whence one came. It can occur under the best locational conditions, and it is by no means strictly a lack of awareness of the coordinates that define one's location in a Euclidean network. Disorientation in space is, in a diminished form, the same as disorientation in life: a blockage of the future, a breakdown of the past, a loss of identity, and a state of anxiety reminiscent of separation and ultimately death itself.

#### Sufficient inner resources

To carry the Copernican analogy to a fitting conclusion, one might ask whether as a civilization we will ultimately establish identity and security based on "what one is" rather than "where one is," or "what one owns"—whether in the years to come we will be able to rely on sufficient inner resources of people to create suitable microspaces for human use, with less concern for clarity and logic of the megastructure in which they exist. In short, whether it will be possible to make cities which fulfill the requirements of science (the need for precision, order and freedom from contradiction) while relying on articulate and educated intuitions of people like our taxi drivers to master its complexity.

This is the way it is for most people living in smaller urban areas. The future will tell whether we can have the same pleasures on the larger urban scale.

As we move into the age of space-exploration, we begin to sense our own parochialism and rigidity. Travel at 18,000 mph? 240,000 miles? Are these numbers related to life on earth? Or is our conception of life on earth, our way of orienting ourselves in space and time, hopelessly restricted and about to undergo a revolution? How long can we persist in accepting the traditional distinction between illusion and reality? Or *in fact*, is the "center of the United States on its two coasts"? Are the suburbs *in fact* the city? From a Euclidean point of view these are stupid questions. The center is the geographical center. But the miracle of space-travel may make such questions more credible.



In Montreal, the traditional Miesian clarity unifies a nontraditional mixture of offices, apartments, shops and parking.

# WESTMOUNT SQUARE

On August 17, as this issue was going to press, Ludwig Mies van der Rohe died at the age of 83 in his adopted city, Chicago. Our presentation of this complex is—it happens—a fitting way to recognize his greatness as we mourn his passing.

Montreal has been building towers, over platforms, and tying the whole thing into subway stations, for several years now. The latest effort is a 3½-acre development called Westmount Square, some two miles west of downtown Montreal in the city of Westmount. The development is connected to Montreal's justly renowned new subway, at the initiative and expense of the developer. There are no municipal requirements for this connection; common sense and business sense have compelled it.

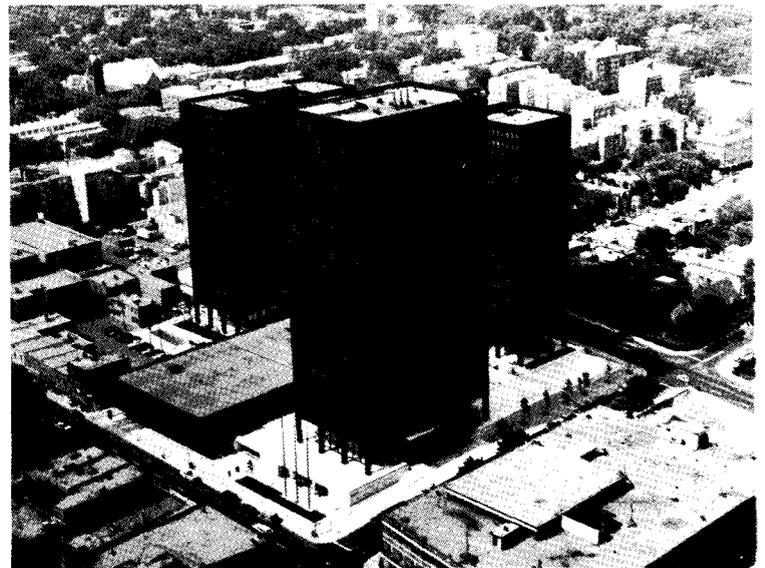
Westmount Square is remarkable in several ways. It contains a mixture of uses (residential, commercial, offices, parking) hitherto not attempted at such small scale. Two of the development's three towers have 20 floors each of luxury apartments, in one to four bedroom units—in duplexes, penthouses, "minipenthouses," and standard layouts. The third tower has 19 floors of unimpeded office space, with 10,000 sq. ft. to a floor. A fourth building, that is only two stories in height, contains additional office space, much of it now occupied by Eastern Airlines' main headquarters in Canada. A T-shaped concourse under the entire site contains 50 expensive boutiques and quality service establishments (and a cinema); and underneath it all are two levels of parking space for a total of 650 cars.

To combine so many different pieces, and have them work with each other in terms of circulation—their connection to each other and to the world outside—is one of the excellences of this

project. The complexity is hidden, though; a first glance suggests a project of utmost simplicity. A first glance also does not reveal that a single structural system and dimensional module—with interesting adaptations—is used throughout the project to coordinate the spatial needs of all functions.

What is immediately obvious, however, is that the elegance of the design—its proportions, relationships, materials, details, graphics—marks it as the work of a master. The master in this case is Mies van der Rohe, who was consulting architect to the Montreal firm of Greenspoon, Freedlander, Plachta & Kryton. (Until recently, this firm was Greenspoon, Freedlander & Dunne. The coordinator for the project, Joseph Dunne, is now with MonDev, developer of Westmount Square. Joseph Fujikawa was the architect in charge of the project for the Mies office.)

Most striking, at first view, is the unusual contrast that Westmount Square makes with its surroundings. It is startling to see this group of magnificent towers precisely placed on their travertine base and surrounded by the real-world melange of untidy dwellings and shops—a greengrocer, a Chinese restaurant, and the typical Quebec stairways that wind upward to second-story entrances. It depends on the direction of view, though, as to whether the Mies project is the real world and everything beyond the podium is off the face of the earth, or whether the homely surroundings are real, and the towers only a mirage.





**M**onDev Corporation was committed to a project that would be, as they put it, "commercially and esthetically viable." They fought for a development that was not suggested, or permitted, under existing regulations.

The developer assembled 45 parcels of land, falling slightly short of the full two blocks; many of the existing buildings had been rat-infested rooming houses. Westmount is a wealthy community, without industry, and—until now—without high-rise. The maximum allowable height had been six stories. Opposition to Westmount Square was probably inevitable. The city was sued, by citizens who charged (correctly) that a technicality in timing made approval of the project illegal. The city lost the case, then proceeded to pass the project correctly.

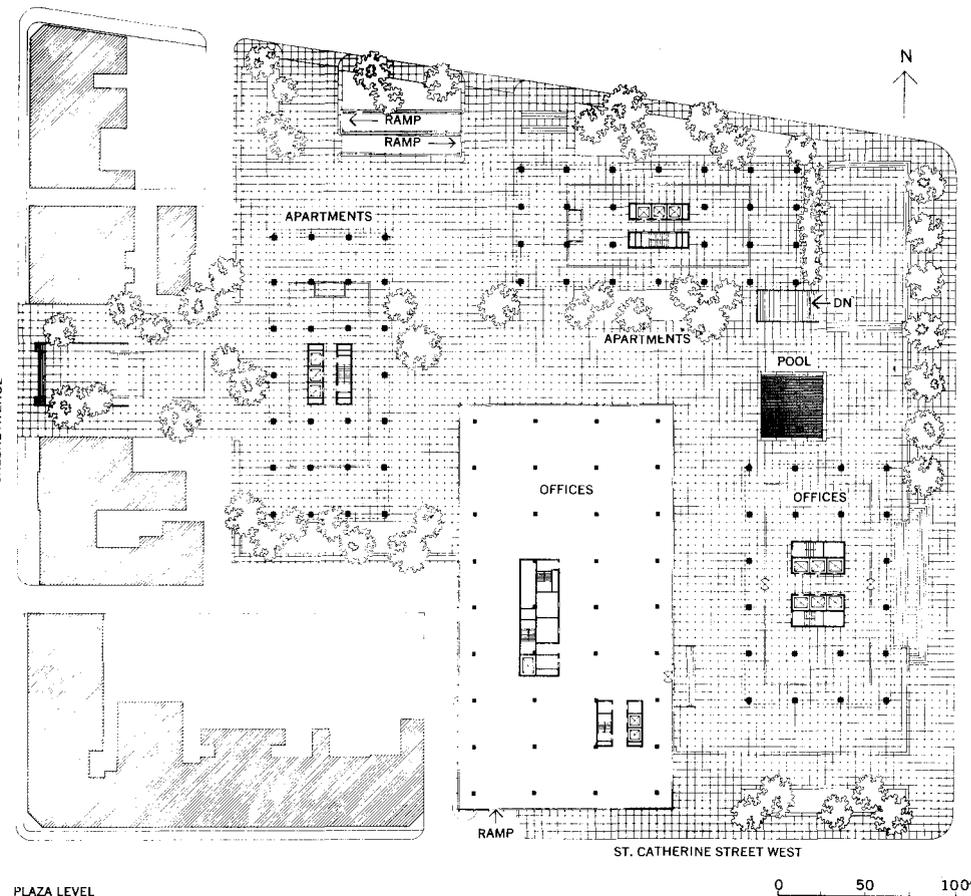
The floor area ratio allowed buildings as high as 21 stories, with site coverage not over 35 per cent. Market research established the amount of office space and the types of apartments.

Commercial areas border the project on the south and west, but the developers wanted to create something unique—a collection of foreign boutiques and specialty shops (no chain stores) catering exclusively to the "carriage trade." Apartment tenants were also chosen carefully. Groups of young singles, who might have been attracted by the swimming pool and sauna at the top of each apartment block, have been screened out.

Access to these diverse buildings has been planned with care. Apartment tenants—108 in one block, 118 in the other—enter their buildings by a loop driveway indented into the northwest corner of the site. The drive swings up to each entrance, and around the pair of ramps to and from the garage levels.

A second access to the garage is at the south, under the two-story office building. This low building was originally to have been a department store, but no store wanted to relocate only two miles from downtown. The building remains—partly for economic, partly for visual, reasons.

The tall office tower has its main entrance from a broad flight of stairs off the street to the east. All elements of the project connect at the plaza level beneath the plaza (see plan and section overleaf).



PLAZA LEVEL

Opposite: one of the two apartment buildings is seen at rear; office tower is at right. Lobby height is one element unifying the diverse structures; the ceiling height of the tower lobbies corresponds to the second-floor finished ceiling of the low building. Another unifying element is travertine—it covers the entire plaza, lobby floors and cores; beneath the plaza, it covers the concourse floor and a number of storefronts. The site was originally two blocks—the road between them is now closed.

Just beneath the plaza and accessible directly from it, is the shopping concourse. There are two other access points to the concourse—both at grade—one from the west, along the broad, travertine-topped walkway from Greene Avenue (over the cinema), and the other from the south, along the existing sidewalk.

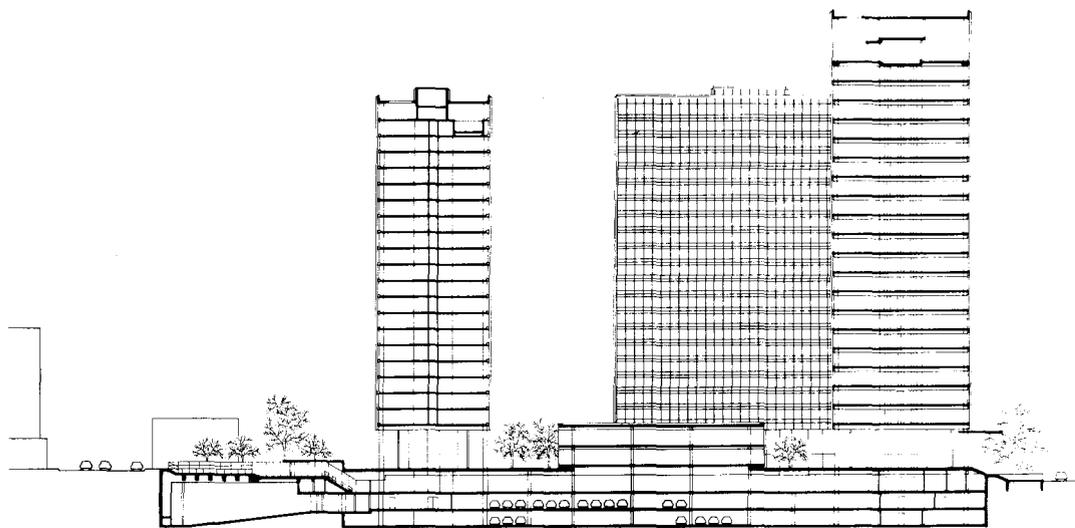
Only three of the 50 shops are visible from the outside (from the south: opposite, above). The entry from Greene Avenue, in contrast, simply has a poster announcing the current film in the 700-seat cinema, and the unobtrusive entry from the plaza has a quiet strip of lettering—"Westmount Square Boutiques"—that is visible only from the front of the stairwell as one descends.

Greater visibility for the stores is apparently unnecessary; all are thriving. The concourse level is a central receiving point for all people coming to the center by bus or subway; and the center's two levels of parking are directly below. (Each building can be entered directly from outside, of course, or from garages.)

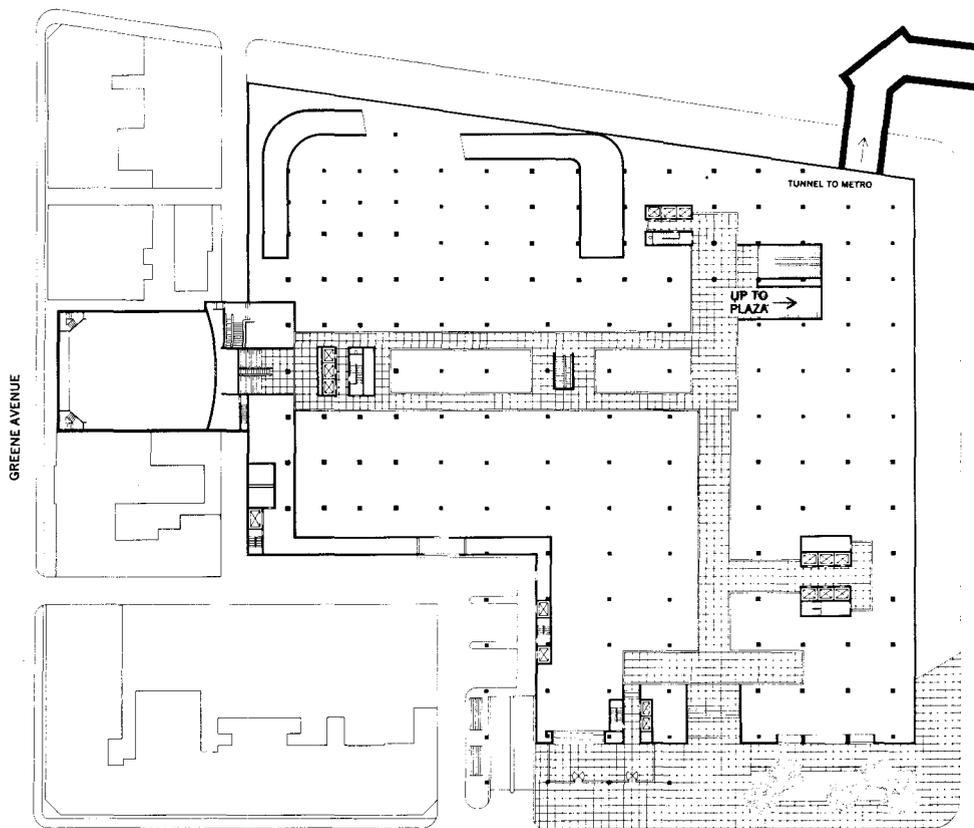
The block-long tunnel eastward to the Metro was neither suggested nor required by any municipal agency. (The tunnel passes under parts of two cities, Westmount and Montreal, thus complicating an already unusual negotiation.) The city of Westmount actually owns the tunnel, but granted MonDev a "servitude in perpetuity" on its land. MonDev built the tunnel at a cost of almost \$400,000, maintains it, and advertises "direct Metro entrance" as one of the project's major amenities.

The tunnel is interesting in design; at one point near the entrance to the shopping concourse, a mirror is turned to a 45-degree angle to give a clear view of anyone approaching along the right-angled tunnel (right, bottom).

Shops on the concourse are individually designed; only the store names, in a narrow horizontal band at the ceiling, are uniform. The T-shaped concourse makes for added liveliness, as does the double aisle along one leg of the T. A tobacconist occupies the round freestanding shop at the important crossing of the T. At the head of this crossing, a sidewalk cafe juts forward under an awning—old world charm in the midst of New World severity.



SECTION



CONCOURSE LEVEL



The shopping concourse under the plaza has space for almost 50 boutiques, service shops, restaurants, etc. Each is designed uniquely, observing only a common system of graphics. Entry to the apartment elevator lobbies at the concourse level is key-controlled so that nonresident shoppers cannot gain access to the apartment floors above. All elements of the center tie into this concourse, which draws a crowd even with low visibility from the street. Right: Link between concourse and Metro.



**S**patial needs of the four different functions—offices, apartments, shops and parking—are met by a single module of 5 ft. 3 in., and a standard bay (five modules) of 26 ft. 3 in.

The office tower has square bays, 26 ft. 3 in. on a side; but the apartments, requiring less depth, have rectangular bays—26 ft. 3 in. on the long side and 21 ft. (or four modules) on the short side. (The office tower is three bays wide, five bays long; the apartment towers are three bays by six.) The two-story office building also has a rectangular bay—the same 26 ft. 3 in. on one side, but 35 ft. on the other (three bays equal 20 modules). The actual module here is 8 ft. 9 in. The standard bay also works for parking; three cars fit into the 26 ft. 3 in. width.

Although mullion spacing is the same in all towers, the curtain walls differ. The apartment windows are double-glazed—a new detail in the Mies repertoire—and the wall, too, is new, with the use of aluminum and plastic to create a thermal break. The offices, presenting drier conditions than the apartments, are single-glazed. Solar grey glass is used everywhere except in protected lobbies.

Offices and apartments are heated differently, too. The offices have a dual-duct system; the apartments have fan-coil units. A central heating and chilling plant for the entire development is located atop the office tower.

The structural system is similar but not identical throughout—a reinforced-concrete waffle slab with ribs 24 in. on center. The depth of the slab varies, however, from 11 in. in the apartment blocks to 13 in. in the office tower. Interior columns vary too—in the office tower, they are 2 ft. 5 in. square; in the apartments, 2 ft. 3 in. square; in the low building, 18 in. square.

The low building is a foil in all respects—with its 10 ft. cantilever on all four sides, and its mullion spacing nearly twice that of the highrise curtain walls. This small building, and the other small-scale features like the plaza's fountain pool, serve to mediate between the pedestrian and the unusual vertical space that is demarcated by the 21-story towers. Nothing in Westmount Square, of whatever scale, mars the development's consistent clarity of mass and detail.

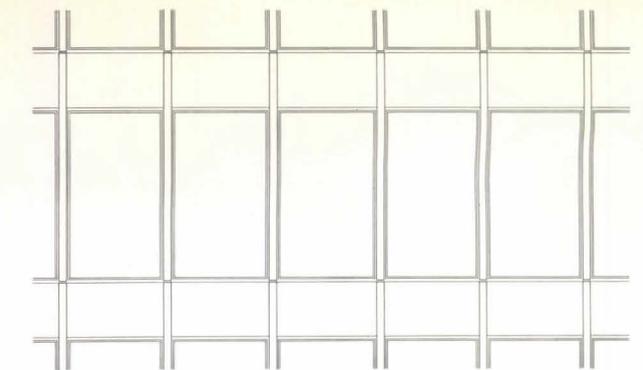
—ELLEN PERRY BERKELEY

The different treatment of the window wall in the two types of highrise buildings is visible at right and in the detail drawings. The offices have fixed sash, while the small lower portion of the apartment windows is operable. Mullion spacing is the same in both buildings. Opposite: Entry to the office tower from east; an apartment building is at right.

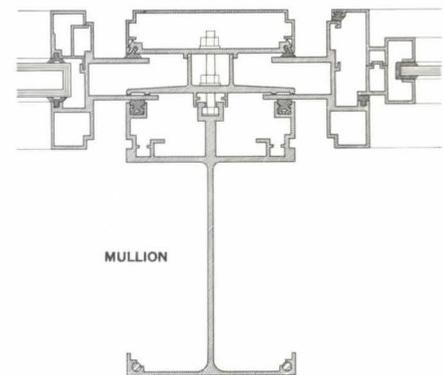
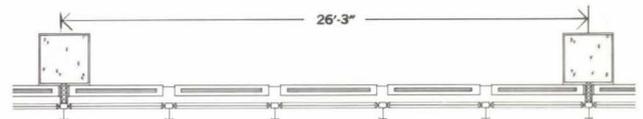
#### FACTS AND FIGURES

Westmount Square, Westmount, Ont., Canada. Developer: MonDev Corporation, Ltd. Architects: Greenspoon, Freedlander, Plachta & Kryton. Consulting architect: Mies van der Rohe. Engineers: I. S. Backler (structural); I. A. Semenic & Associates (mechanical and electrical). Building area: 1,103,473 sq. ft. (offices: 238,370 in highrise, 57,500 in lowrise; apartments: 222,325 in each tower; shopping: 125,830; parking: 211,897). Floor area ratio: 7:1. Construction cost: \$35 million.

PHOTOGRAPHS: Hedrich - Blessing, except page 83, Armour Landry, and page 86, Ellen Perry Berkeley.

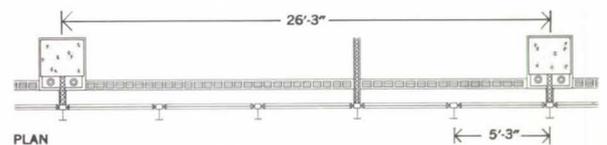


ELEVATION

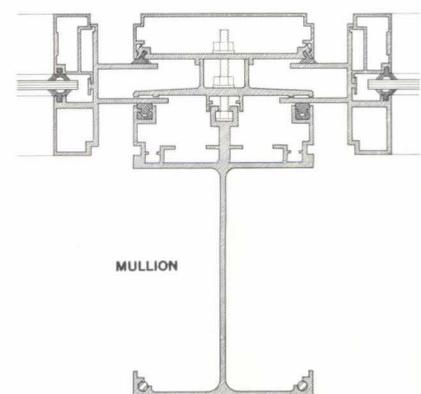


MULLION

CURTAIN WALL DETAILS FOR OFFICE BUILDING



PLAN



MULLION

CURTAIN WALL DETAILS APARTMENT BUILDING





cept the concrete cloverleaf as the national flower."

The LOMEX, on the other hand, was widely understood to be Mayor Lindsay's payment for needed Democratic support in forging a coalition to recapture the mayoralty. But many who had followed its on-again-off-again history—or had ever been caught in the truck traffic on Lower Manhattan—doubted that they had heard the last of it yet.

## VENERABILIA

### STAMP OF APPROVAL

In discussing the philatelic esthetic, one tends to make small distinctions. The Netherlands has issued a series of five stamps commemorating its modern architecture—a small, but welcome distinction among governments. The restraint shown in simply picturing the buildings with



## FOOTNOTE

**WISH YOU WERE HERE!**—The two postcards shown on the opposite page were received by us last month from our roving correspondent, Prof. Sibyl Moholy-Nagy. The printed inscriptions on the back of the postcards identify the top picture as "un salon," and the one below as "bar-salon." These model room settings are located, of course, in a rather famous building: the postcard refers to the building as "The Crossroads of the World"—i.e. Le Corbusier's *Unité d'Habitation* in Marseilles, France! Any questions? PHOTO: Société Editions de France.

their names and those of the architects is a small thing too. (One recalls the U.S. stamp in which the Guggenheim Museum was all but obscured by the face of Frank Lloyd Wright.)

The stamps go back not to H. P. Berlage, with whom it all began, but to the De Stijl movement, Functionalism, and a leader of both, J. J. P. Oud. (Curiously, Oud is represented by his last—and, perhaps, least impressive—work, the Palace of Congresses in The Hague, completed in 1969, six years after his death.) Other buildings from those early groups are (continuing down): Robert van't Hoff's Villa Huis ter Heide 1915; Gerrit Rietveld's Schröder House, Utrecht, 1924; and J. Duiker's open-air school in Amsterdam, built after years of delay, in 1930. The young post-World War II modernists are represented by Aldo van Eyck's Municipal Orphanage in Amsterdam, from 1960.

One last small distinction: Willem Dudok, whose buildings in the provinces never placed him in any "group" in his lifetime, would have been a good addition to this one.

### AD IMPOSSIBILIA?

"It is simply not that kind of enduring structural monument," said the Denver and Rio Grande Western Railroad about Aspen, Colorado's Old Railroad Station (circa 1880, top right). We don't know what "kind" they had in mind. It is certainly not Grand Central. But since the D & RGW have pulled all their trains out of Aspen, and the station sits on property the railroad men want to sell to developers, Aspenians find it most endearing, if not "enduring."

The present owners, Bethune & Moore, a firm of interior decorators, have no lease and have been told by the railroaders to move it by March, 1970, or it will be destroyed. B & M want to move it, and the neighboring Jerome Hotel has offered its parking lot for a temporary home, but they do not want to move it twice, either to a permanent home or back from whence it came. (Several prospective developers of the railroad property have indicated they may want to incorporate it in their plans).

Meanwhile, B&M, cognizant of Aspen's fierce winters, have



asked the railroad for an "Act of God" clause in the eviction agreement, otherwise known as "Vis Major," OR "lex neminem cogit ad impossibilia" (the law does not take cognizance of the impossible). To this the railroad has, in effect, replied that if B&M are afraid of a snow storm, they can get out and take the station with them before winter.

The railroads may be dying but their lovers survive them. Eliot Noyes, president of the International Design Conference held each summer in Aspen, said: "When any town has a magnificent old structure, and boy I love railroad stations, this is the kind of thing that should be hung on to and used in some way." For now, the lovers are still hoping for an act of God, if not a "Vis Major" clause.

## ENVIRONMENT

### THIS LAND IS YOUR LAND . . .

goes the song . . . "this land is my land/From California to the New York island/From the red-wood forests to the gulf stream waters. . . ." And so:

- Folk singer Pete Seeger last month turned his persuasive talents to ecology, "a word I only learned of recently." On the sloop "Clearwater," a nostalgic platform for a minstrel with a banjo, Seeger is singing out in anger to publicize the need for, and enlist help in, cleaning up the Hudson River.

- The Georgia-Pacific Corp. last month deeded to California for park purposes the Van Duzen Groves, 390 acres of red-woods, including many 400 to 800 years old. G-P measures the value of the Van Duzen Groves—in board feet of merchantable lumber—at \$6 million. It was the largest conservation gift ever given by a U.S. business firm.

- TIME magazine last month inaugurated a permanent edi-



torial department on the environment (with ex-FORUM Associate Editor Philip M. Herrera on the staff). The first story was about Cleveland's Cuyahoga River, an artery blocked with polysaturated oils that caught fire recently, doing damage estimated at \$50,000 (above).

● Architect George McCue commissioned to design student housing for the "People's Park" site in Berkeley (July/Aug. issue), announced that he would not take the job unless a "user-developed park" is included in the plans. "If the Regents won't buy that," said an associate in McCue's firm, "the university will just have to hire another architect for this one." The Regents already rejected the idea once.

● And the Aug. 13 edition of the *New York Times* carried the following:

#### Commercial Notices

### Simulated Moon Dust

A Commemorative of man on the moon  
1 oz. \$1.00 Post Paid  
EL DORADO CO.  
8631 FOLSOM BLVD.  
SACRAMENTO, CALIF. 95826

Appearing on the same day that Manhattan welcomed the astronauts back to recontamina-

tion, the ad came too late for jubilant New Yorkers to have some of the stuff with which to strew the heroes' path. They got the old-fashioned treatment instead: ticker tape, sulphur ash, and shredded copies of the *Times*.

#### BAY SAVED

The seesawing fate of legislation to end the unrestricted dredging and filling of San Francisco Bay (bottom) began in Sacramento in January and was only resolved last month. The plot got very thick. There was the Marks Bill, the Dills Bill, the Dolwig Bill, the Knox-Petris Bill, and, eventually, the Knox-Petris-Dolwig-Marks Bill (called simply "the Knox"), and amendments so profuse that at one point a senator confessed he hadn't kept them straight and had voted for the wrong thing.

The legislation that emerged, after the last merger and the final compromise, was, surprisingly, rather strong. It provides for the indefinite continuation of the Bay Conservation and Development Commission (BCDC—see June '65 issue), an agency whose mandate to approve or veto filling of submerged and tidal lands would otherwise have expired at year's end.

The issue most fiercely contested—and ultimately the conservationists' chief victory—was extension of the BCDC's control to a strip of land 100 ft. back from the shoreline along the 276-mile perimeter of the bay.

Also added to its jurisdiction are salt ponds and managed wetlands—areas diked off for salt production, game preserves, or agriculture. Apart from regulating landfill, the bill charges the BCDC to complete final development of a master plan to guide the bay's future.

The major concession made to opponents of the bill was to permit two fill projects to continue that are already underway.

The losers, of course, were some ambitious private developers, less kindly referred to in the heat of battle by the bill's authors as "profiteers." Principal among these were Westbay Community Associates (a combine of corporations that includes David Rockefeller—brother of Conservationist Lawrence Rockefeller—Ideal Cement, and Lazard Frères); Leslie Salt Co.; and the Santa Fe Railroad. Westbay alone had planned to fill 4,753 acres along 27 miles near San Mateo.

It was an opponent of the bill, Senator John G. Schmitz, the legislature's only avowed John Bircher, who unwittingly hung the best tag on the bill. He said that the BCDC's strengthened hand would turn the bay into "a legalized People's Park."

## YOUTH

#### MEETING THE CHALLENGE

In 1968, at the AIA convention in Portland, Ore., Whitney M. Young, executive director of the Urban League, urged the architectural profession to commit itself to "an improvement of the urban environment." Now, in response to his challenge, the Urban League and the AIA have set up a national program to

train disadvantaged young people so that they may become technically qualified for professions in the architectural field. The program will provide on-the-job training for 44 weeks, in selected architectural firms in ten or more cities across the country.

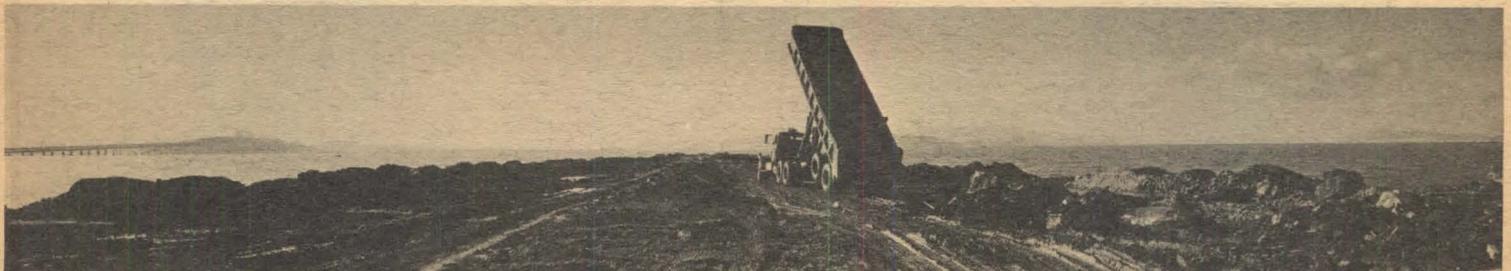
The Urban Design and Development Corp. (established by the AIA last February) will locate the training places, and will assist in preparation of training guidelines and obtain the endorsement and support of the profession. The Urban League will pay part of the training cost as well.

After 22 weeks the trainees would receive a salary increase, and, if they complete the program, they would be guaranteed a full-time job. The National Urban League will recruit and screen the young applicants, and will act as advisors throughout the program. The architectural firms will select from amongst the candidates. Though placement of only 50 trainees is the immediate goal, the Urban League and the AIA hope that the program will expand.

#### BOOLA BOOLA

For the third summer in a row, some architecture students at Yale have decided to work in the field as part of their class project requirement for their degree. During the year they had decided where they wanted to work, what they wanted to build, and then enlisted community support for their projects, and approached local businesses for most materials they would need. They donated their design and construction efforts free. Altogether, 32 students participated in the various different projects.

● A "model community park" near Whitesburg, Ky.—a conversion of an unusable swimming hole into a sorely needed recreation area, complete with winding dock, dressing rooms, diving platform, and foam-and-fiberglass floats;





● A "play machine" (above), which is located at Camp Cedarcrest, just outside New Haven, and could be the ultimate in jungle gyms. It is a pyramid of tubes, girders, and rope netting, with a slide, and a crow's nest, all in bright colors.

● A day care center for the Long River Village apartment development in Middletown, Conn., which was followed by the construction of a pre-designed, more comprehensive community center.

In questioning the validity of architectural education today, students point out they are challenging the process, not the product. Yale's summer program speaks very well for both.

## BIG PLANS

### REGAINING A RIVERFRONT

The Camden (N.J.) City Centre Corp. will undertake a renewal of the deteriorating downtown core of Camden with \$100 million in private and institutional capital. The 160-acre site is adjacent to City Hill and sits like an L on the Delaware River opposite Philadelphia's Penn's Landing (marked by dotted lines in aerial photo, right).

At this initial stage, the most unconventional aspect of the plan is not in its buildings, but in its builders. The buildings first: an air conditioned shopping mall, a 15-to-20-story office building, highrise housing

for the elderly, a community services complex, and about 800 units of low- and middle-income housing in the first, \$30-million phase. Planners are Raymond, May, Parish & Pine.

The builders range from giant corporations to a black-owned-and-operated general contracting firm—Winston A. Burnett Construction Co.—that will hire 300 unskilled people under a trainee-program grant from the Department of Labor. In the past, the building trades unions have agreed to this but not to the next obvious step, elevation to union membership.

The City Centre Corp. is made up of two of Camden's principal employers—the RCA Corp. and the Campbell Soup Co.—and two of the nation's leading hous-

ing producers—Boise Cascade Corp. and Leon N. Weiner & Associates. Mr. Weiner is a member of the President's Committee on Urban Housing (Kaiser Committee), and an incorporator of the National Corporation for Housing Partnerships. R. V. Hansberger, president of Boise Cascade, is a member of the Kaiser Committee, the Urban Coalition, and the board of Urban America.

## PEOPLE

### GSD PROMOTION

Maurice D. Kilbridge, former professor of business administration at Harvard has been appointed acting dean of the Harvard Graduate School of Design. Kilbridge served on President Nathan M. Pusey's Wilson Committee, which reported this year on Harvard's relations with the cities of Boston and Cambridge. He will teach a course this fall at the GSD in which a computer program will simulate the activities of a city of half a million people (Boston's population: 570,000). Students will play roles in the urban systems game.

Two books by Kilbridge will be published this fall: *An Economic Analysis of the Housing and Urban Development Act of 1968*, the first study to use computer models to project the economic consequences of housing legislation; and *Urban Analysis*, a course he taught in the Harvard Business School.

### THE OVERALL VIEW

Lowell K. Bridwell, whose rulings as former Federal Highway Administrator won him the

praise of conservationists and total-design advocates, announced the formation last month of System Design Concepts Inc. SDC will "plan, design, and implement multipurpose, joint-development programs in the atmosphere of comprehensive environmental improvement," said Bridwell (below).



Four firms will participate in the multidisciplinary consulting organization: Architects Skidmore, Owings & Merrill; Civil Engineers E. S. Preston & Associates; Marcou, O'Leary & Associates, urban development consultants who, with Bridwell, contributed greatly to the welcome demise of New Orleans's Riverfront Expressway (page 34); and CLM Systems Inc., systems engineering consultants. Also associated in the firm will be Paul L. Sitton, former Federal Mass Transit Administrator.

SDC's first job: assisting a task force on the planning for a state department of transportation in Maryland.

### URBAN ARBITER

Saul Wallen, president of the New York Urban Coalition died August 6 in New York. When he assumed that post in January, 1968, he turned his years of experience in labor-management arbitration to "maintaining a continuing dialogue between blacks and Puerto Ricans, business and labor," which he termed one of the group's "major accomplishments." The coalition has helped blacks set up their own businesses, opened street academies for high school dropouts, and begun park, job-training and housing projects. Under his leadership the coalition raised \$4 million in its first year through a memorable advertising campaign that urged New Yorkers to "Give A Damn."



## WALTER McQUADE



### AFTER MANY A SUMMER DIES THE MOTOR

A few months back somebody got caught below the high tide on our beach in a beach buggy which would not start. The salt water came in and claimed it, and it is still there, desolate, weathering away. At low tide (above) it is evident that the beach is well along in the slow process of taking back what is its own. Everything, in the end, of course, does belong to the beach. At high tide (below) the beach buggy's roll bar is like a melancholy mooring, all its former jauntiness subsided to just a sigh. Sometimes seagulls sit on it. It is a pity; somebody loved that machine. But what would Lady Bird Johnson think of this scene? Should it be hidden by snow fencing until it finally sinks down below the surface of the sand?

There are two other mechanical illustrations I meant to run this month, but have misplaced. They have been in my clip file for several years and will perhaps churn up out of that morass of paper sometime. But meanwhile, let me attempt a description.

Both were advertisements for "getting away" from the over-civilized crowd; both, I think, were taken from issues of *SPORTS ILLUSTRATED* magazine.

One shows a fiberglass-hulled outboard motorboat pulled up on a sandy beach. On its stern is one of those immense outboard motors, about 85 HP, tilted back, resting. On the top

of the advertisement the catch-line is something like: "Find yourself a crowded shore with your Evinrude."

There is no human being in the picture, nor is there any other boat. But doesn't anyone else have a boat? Is there not a battalion of waterskiers speeding in formation just offshore, carrying transistor radios, ready to wheel and take the beach? Find yourself a crowded shore with your Evinrude.

The other advertisement was put in the magazine by the manufacturer of a popular chain saw. It shows a car pulled into a wooded area off the road, the trunk open, and a confident-looking man cutting up a tree

with the saw. The headline was "All the firewood you want—free." But whose trees were they?

In my part of the country it is coming on autumn, and the motorboats and the chain saws are being packed away. The people are going back to the city, the children back to school. The chipmunks are wondering why there aren't cookie crumbs on the back porch every day after lunch time. The field mice are moving back into the house for the winter. The deer and foxes are coming out of the deep woods. And perhaps one of the weasels has stolen those two pages from my clip file to line his nest with.



PHOTOGRAPHS: Page 31, Ellen Perry Berkeley. Page 32, Avco-Everett Research Lab (top). Page 33, State of California, Department of Public Works (top). Page 92, The Plain Dealer (top), Rondal Patridge (bottom). Page 93, Alberto Lau (top left), United Press International (top right), Skyphotos (bottom).



soft pad group by charles eames  herman miller inc., zeeland michigan

# PREVIEW

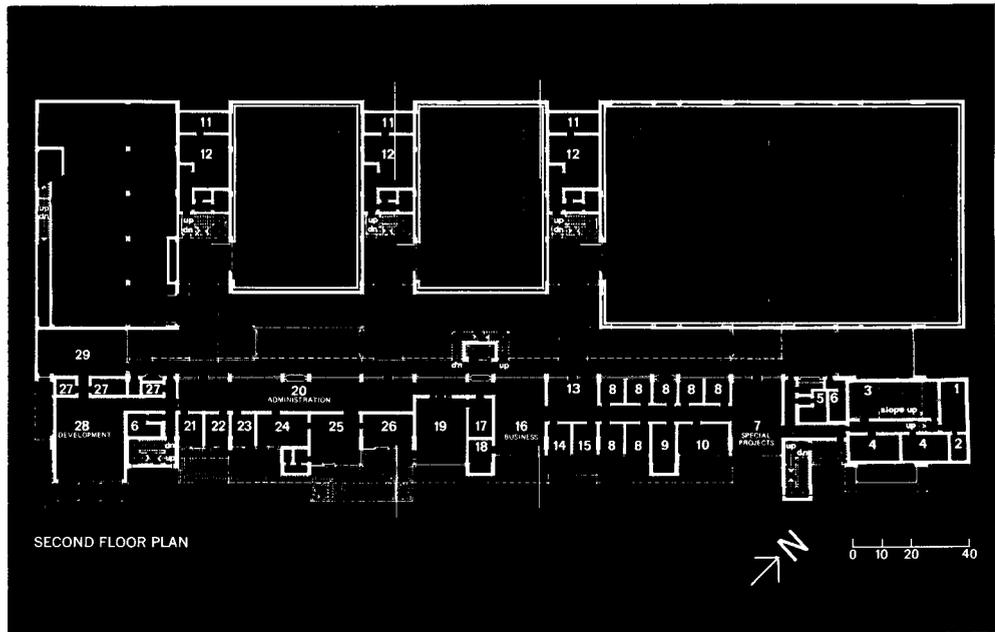
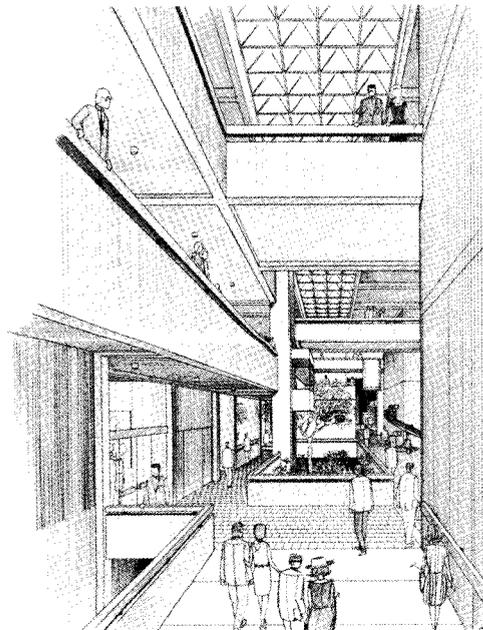
KQED, San Francisco's publicly owned educational television station will have all its facilities under one roof, but an "activity street" will separate the production studios from the office space in the new building designed by George T. Rockrise & Associates in collaboration with John M. Johansen (see also pp. 40-47). The 250-ft.-long street, skylighted and four stories high, separates the offices (which need

sunlight) on the south side, from the studios, which are windowless, on the north. Four studios, totalling 16,500 sq. ft., as well as a radio broadcasting facility and the necessary storage, art, staging, and electronics areas, will be housed in the building, located at the corner of Harrison and Second Street.

The ground floor contains the mechanical broadcasting equipment and a parking garage.

Behind glass roll-up doors will be the station's two mobile TV trucks—their visibility an indication of the station's involvement in the community. The offices on the first floor open directly onto the street. The second floor has a balcony while the third floor is linked by bridges. The exterior of the first and second floors is shaded by the cantilever of the third which has large overhanging hoods.

## NEW QUARTERS FOR KQED-TV



(continued on page 99)



Foreground: Construction of Nassif Office Building, Washington, D.C.  
2,000,000 sq ft of Ceco Steeldome Services  
David Nassif Associates, owner / Edward Durell Stone, architect  
Universal Engineering Corp., engineers  
John A. Volpe Construction Co., Inc., contractors  
Kirk Lindsey, Inc., concrete contractors  
(Background—National headquarters building of HUD also utilized  
Ceco's experience in forming reinforced  
concrete joist construction for central core.)

## Economy and speed: good reasons for choosing Ceco's Steelform experience

Why specify monolithic reinforced concrete construction for the largest privately-owned office building in Washington, D.C.? Two big reasons:

—Construction cost advantages for poured-in-place reinforced concrete were far better than other methods.

—Ceco Steelform Service assured *speed of construction*. Delays could not be tolerated because of on-going interest obligations. Prompt rental income was required. So Ceco formed a floor every five days—a rate of 130,000 sq ft a week.

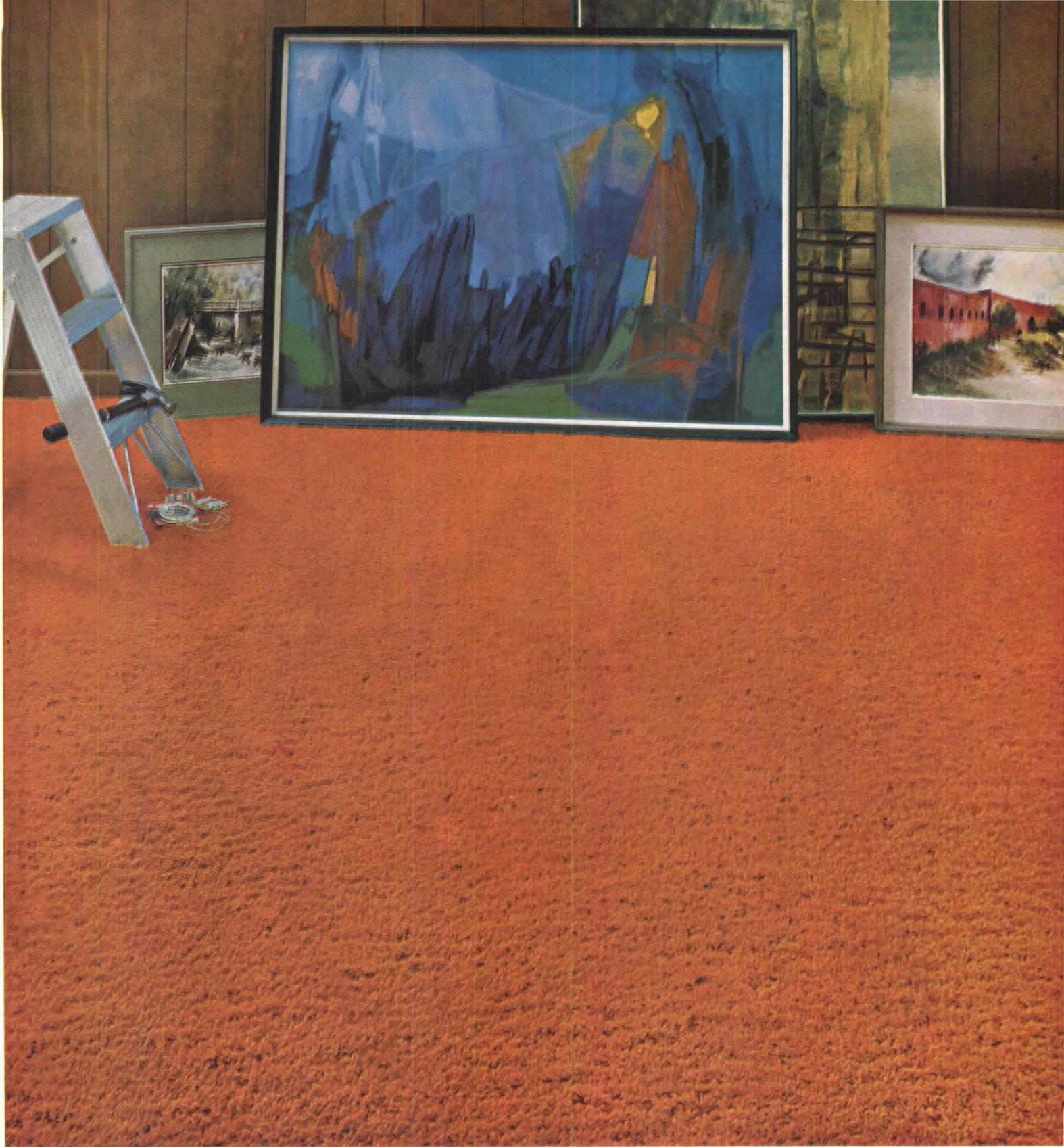
Beyond speed of construction, the Ceco Steelform system offers an avenue for creative expression in buildings of any size. You combine beauty

with the strength and rigidity of monolithic reinforced concrete.

Ceco's experience results in service you will appreciate. A firm quotation is the beginning. Ceco furnishes guaranteed in-place cost figures for forming reinforced concrete floor joist construction. You do not have to guess about the variables—labor, forms, lumber costs, insurance.

Ceco service crews and supervision are available nationwide. So, too, are all materials and equipment. Your building gets an early start, progresses rapidly, is ready for occupancy at an early date. Let Ceco bring your floor framing ideas to life with dependable Steelform Service. The Ceco Corporation, general offices: 5601 West 26th Street, Chicago, Illinois 60650. Sales offices and plants in principal cities.





A brand new home ready to hold your starting collection of treasures . . . or a mellow, lived-in home of many years . . . both demand the same basic formula for beauty—the *right carpet!* Shown here is “CLOUDREAM,” Patcraft’s plush shag carpet made with AVLIN® polyester fiber in 18 magical colors. There’s a color to enhance any painting . . . furniture . . . or decor . . . and “CLOUDREAM” assures you of many, many years of long wear and easy care! Here, in the making, is a room of warmth and beauty . . . a room where beautiful things will look their best and guests and family will feel relaxed and happy.

See “CLOUDREAM” and other fine carpets by Patcraft at your dealer’s, soon. Fashion-First colors . . . newest fibers . . . and Patcraft quality are an integral part of every Patcraft carpet. If you’re proud of your home . . . you’ll choose carpet by Patcraft! PATCRAFT MILLS, INC., Dalton, Georgia.

A beautiful room begins...  
with carpet  
by



CARPETS OF DISTINCTION  
On Readers' Service Card, Circle 223

# PREVIEW

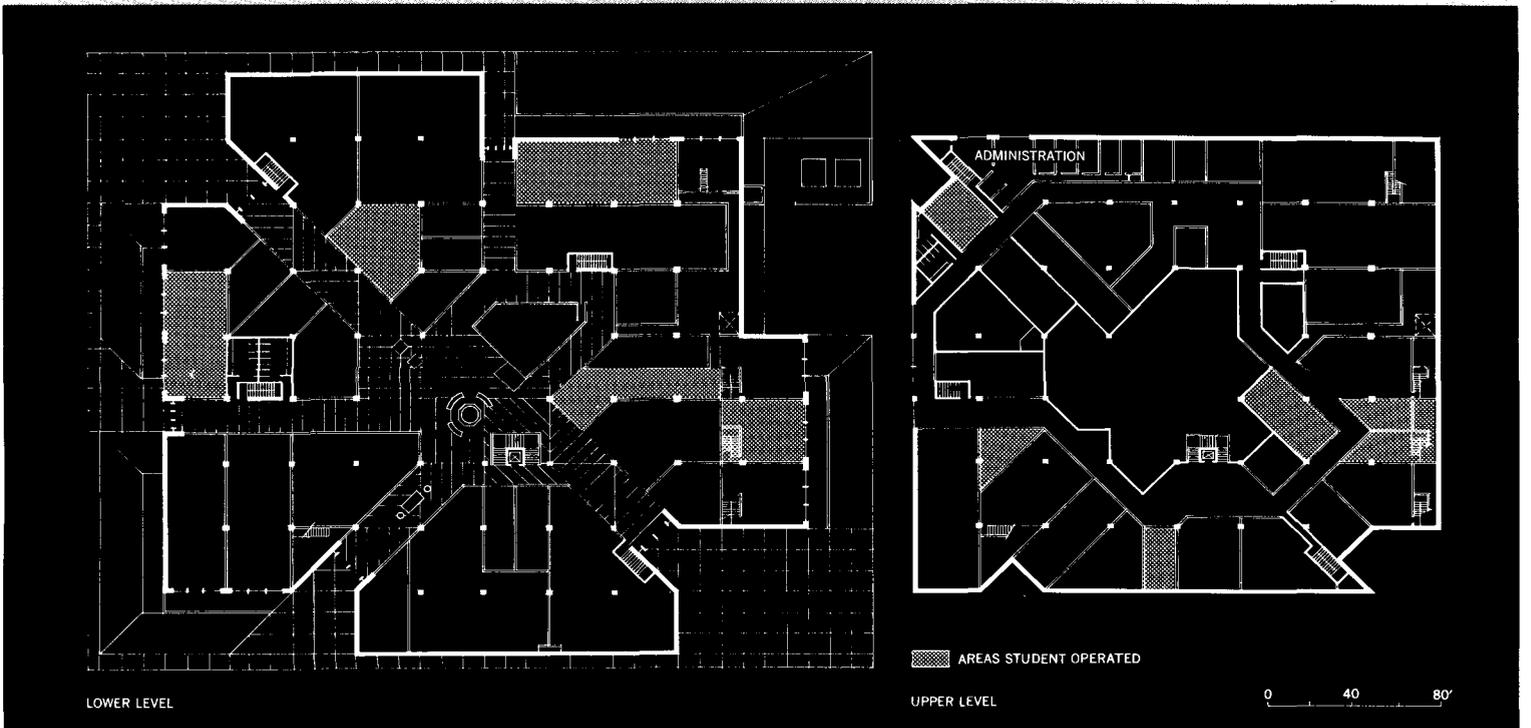
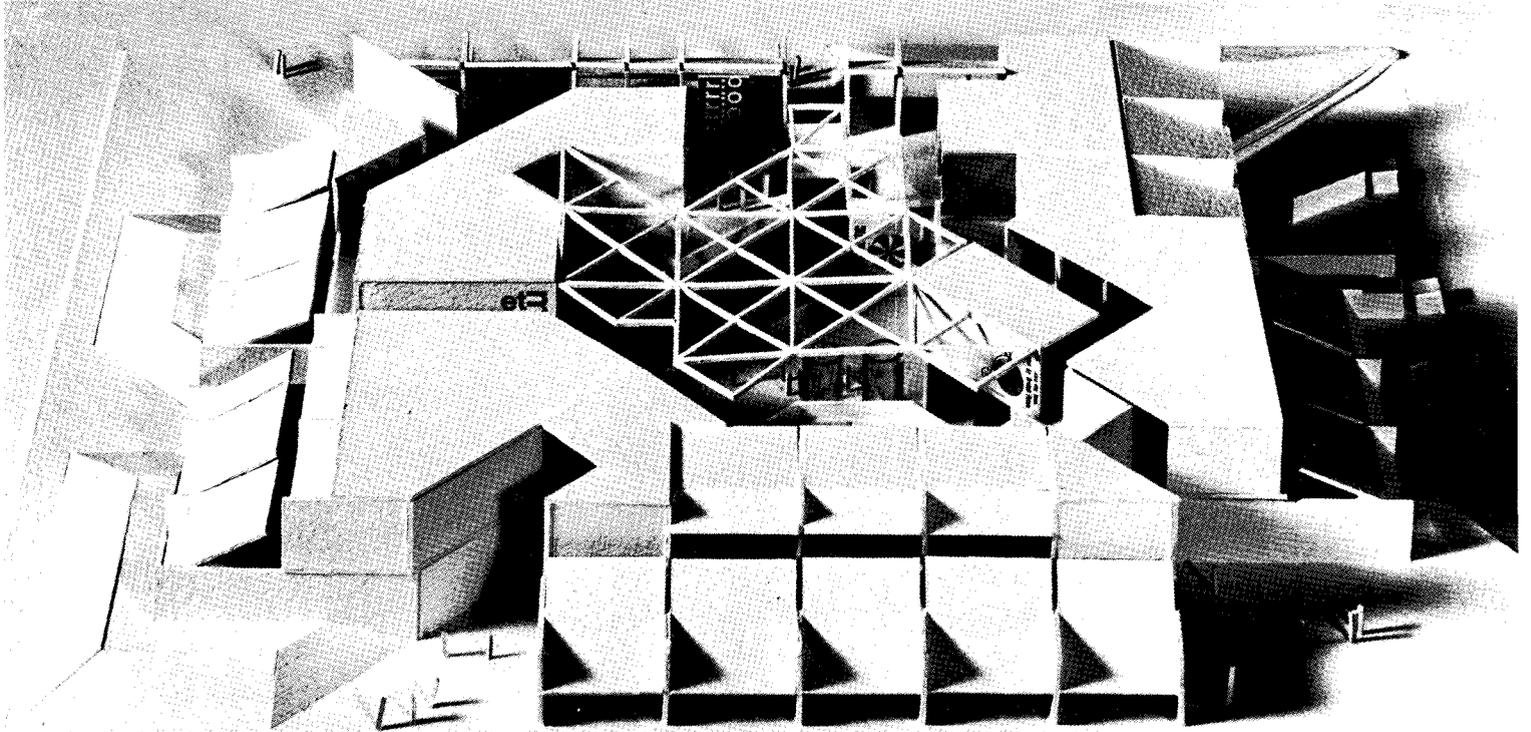
Teenage retail marketing students in high school and junior college are going to get a piece of the action through a new shopping center concept in Texas. James A. Bishop & Associates have designed a prototype of 100,000 sq. ft. Approximately 10 per cent will be stores owned and operated by students. It is an attempt to give them a deeper insight into the free enterprise system and how it works.

The imaginative center designed by Bishop is on two levels with a skylighted central court. There is to be an ice rink and activity areas in the mall. Five main entrances lead to shops inside while other shops will open directly from the exterior of the square building. No signs will be allowed on the outside; inside, however, there will be extensive use of color and supergraphics, all designed and con-

trolled by the architect.

The first students to benefit from this new educational experience will be in Pasadena, Tex., a Houston suburb. Decor Developers Inc., developer of the project with Unit Inc., expect to build 200 centers within ten years. The first six are scheduled for completion by fall 1970. DECA (Distributive Education Clubs of America Inc.) has endorsed the project.

TEENAGE SHOPPING CENTER



# Who's responsible for all this?

**Embarcadero Center  
Office Building  
California**  
Hi-Bond® steel floor deck.

**Wayne County Hospital  
North Carolina**  
Milcor® structural and  
non-bearing studs;  
metal lath products.  
Steel access doors.

**PPG Industries  
Manufacturing Facility,  
Pennsylvania**  
Building systems including  
structural framing system,  
steel roof and wall panels.





**Scientific Data Systems  
Manufacturing Plant  
California**

Structural steel  
framing system.  
Steel Roof Deck.  
Sidewalk gutter doors.

**Quincy-Adams Parking Facility  
Illinois**

Post tensioning assemblies  
for prestressed concrete.  
Concrete reinforcing bars.

**Western Airlines Hangar  
and Offices  
California**

Duofinish® steel wall panels.  
Steel roof deck.

**Chicago Transit Authority  
Station Platform  
Illinois**

Fabricated structural steel.

**Inland-Ryerson** — the one national organization equipped to offer local service, with construction systems and skills for most every type of project. A unique combination of construction products and construction oriented people to help you design and build more effectively.

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**INLAND**   
**RYERSON**

A member of the  steel family

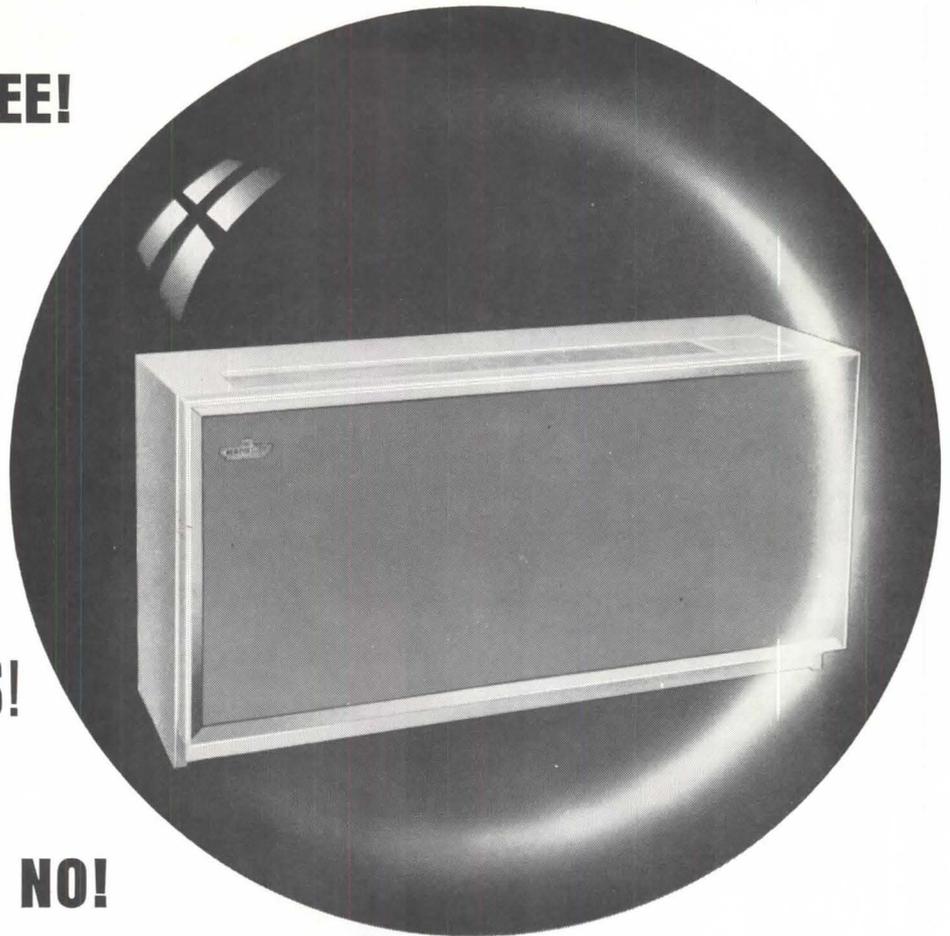
On Readers' Service Card, Circle 224

for any air condition . . .

it's

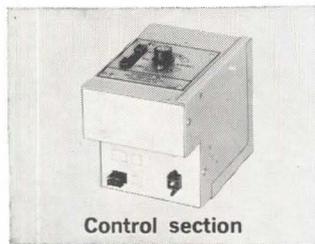
## NEWPORT III — SEE!

**HEATS? YES!**  
**COOLS? YES!**  
**SAVES SPACE? YES!**  
**SAVES MONEY? YES!**

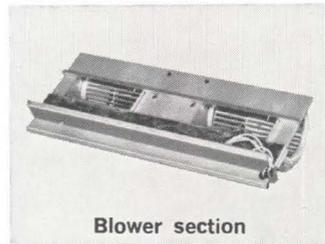


Available  
from everybody? **NO!**

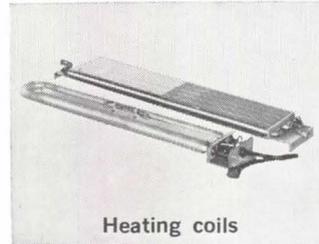
. . . but it is from **DUNHAM-BUSH.**



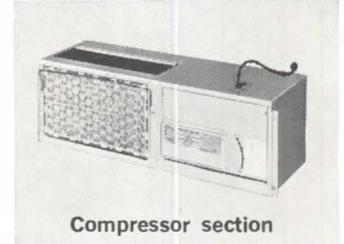
Control section



Blower section



Heating coils



Compressor section

**YES!** The totally self-contained NEWPORT III system truly does multiple duty by effectively, economically, and gracefully giving any room an all-climate center that can be individually controlled. Besides heating and cooling, it dehumidifies, filters, ventilates, and circulates air. And it saves money in installation costs because it requires no equipment room; and in servicing costs, because of its modular construction,

which facilitates immediate component replacement and keeps it constantly on the job. NEWPORT III is easy to get along with, too, working equally well with hot water (up to 24.6 MBH), steam (up to 26.8 MBH), or electric heating (up to 5.0 KW.). In 9,000, 12,500, 16,500 BTU/HR cooling capacities.

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# FORMICA® movable walls for the changing environment.



In colors and patterns that work wonders in any location,  
executive or clerical.

Wear takers and maintenance minimizers, FORMICA® movable walls  
go in—and out—of storage as fresh as their first day up on the job.

Designed for both progressive and non-progressive wall systems down to  
hardware and electrical detail.

Years from now, you'll be happy your movables came from Formica.

Want to discuss surfacing?  
We make a strong case for  
seeing your Formica man.

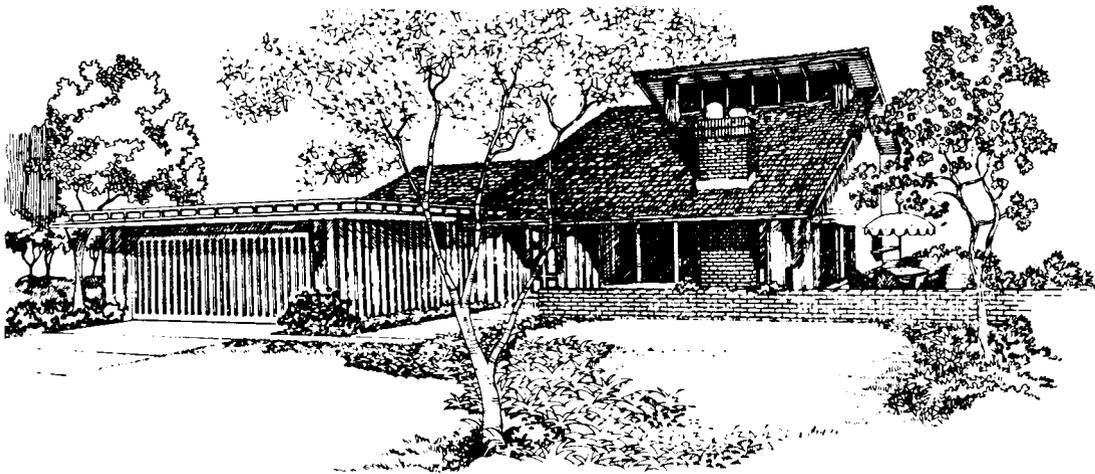


## Leadership by design



© 1969 Formica Corporation • Cincinnati, Ohio 45232, subsidiary of

On Readers' Service Card, Circle 226



## California builder Stanley Swartz knows where people want to live. And how.

He built University Park with all the conveniences—right down to Moenique® accessory centers in the baths.

That's a unique sales point. No other bath accessory offers all this: grab bar, single-dial shower control, soap-shampoo tray, diverter and tub filler.

Moenique keeps costs down too. It's virtually service-free, thanks to a replaceable

cartridge inside. (The same cartridge that fits all Moen kitchen and lavatory faucets.)

The Stanley C. Swartz Company built this community on a 132-acre park. You may not have that going for you—but you can specify Moenique.

Learn more about Moen in SWEET'S Files or write Moen, division of Standard Screw Co., Elyria, Ohio 44035.

**MOEN** the faucet that turns people on.





Wearing surfaces may be precast or precast units laid on setting bed.

Membrane is conventional asphalt or coal tar saturated felts plus 1/4" protection board.


**All-weather Crete** Insulation  
 applied below and above the membrane system.

# plaza one

Tomorrow's plaza system is in use today! There are seven other systems to complement number one—all developed for different purposes—all designed with All-weather Crete insulation. "System One" has wearing slabs sloped to drain.

These systems are being used today by leading architects throughout the nation. Why? Because no other type of insulation offers so many advantages in plaza construction. Heavy density All-weather Crete acts as an insulating cushion to protect the waterproof membrane, thus solving a failure problem often encountered in other systems. The K Factor is .46; it has excellent load bearing capabilities and can be sloped or applied level. There's other advantages too.

Check out "Plaza One"—Two—Three—all Eight! Write for a full color brochure complete with diagrams and specifications. (You may want to design "AWC Plaza Nine" yourself.)



**SILBRICO**  
CORPORATION

6300 RIVER ROAD • HODGKINS, ILLINOIS 60525

CHICAGO PHONE (312) 735-3322

# OUTSIDE-IN WINDOWS

Bayley vertically-pivoted windows cut maintenance costs—let you wash both sides from the inside. Simply turn the window around. Locks positively in position. Windows also offer natural ventilation hoppers for weather too cool for air conditioning yet too warm for heating.

Attractive design, 2" aluminum construction, optional Bayco finish for color control make these windows ideal for hospitals and important buildings. Write The William Bayley Company, Springfield, Ohio 45501.



# Lawrence E. Bray & Associates, Inc.

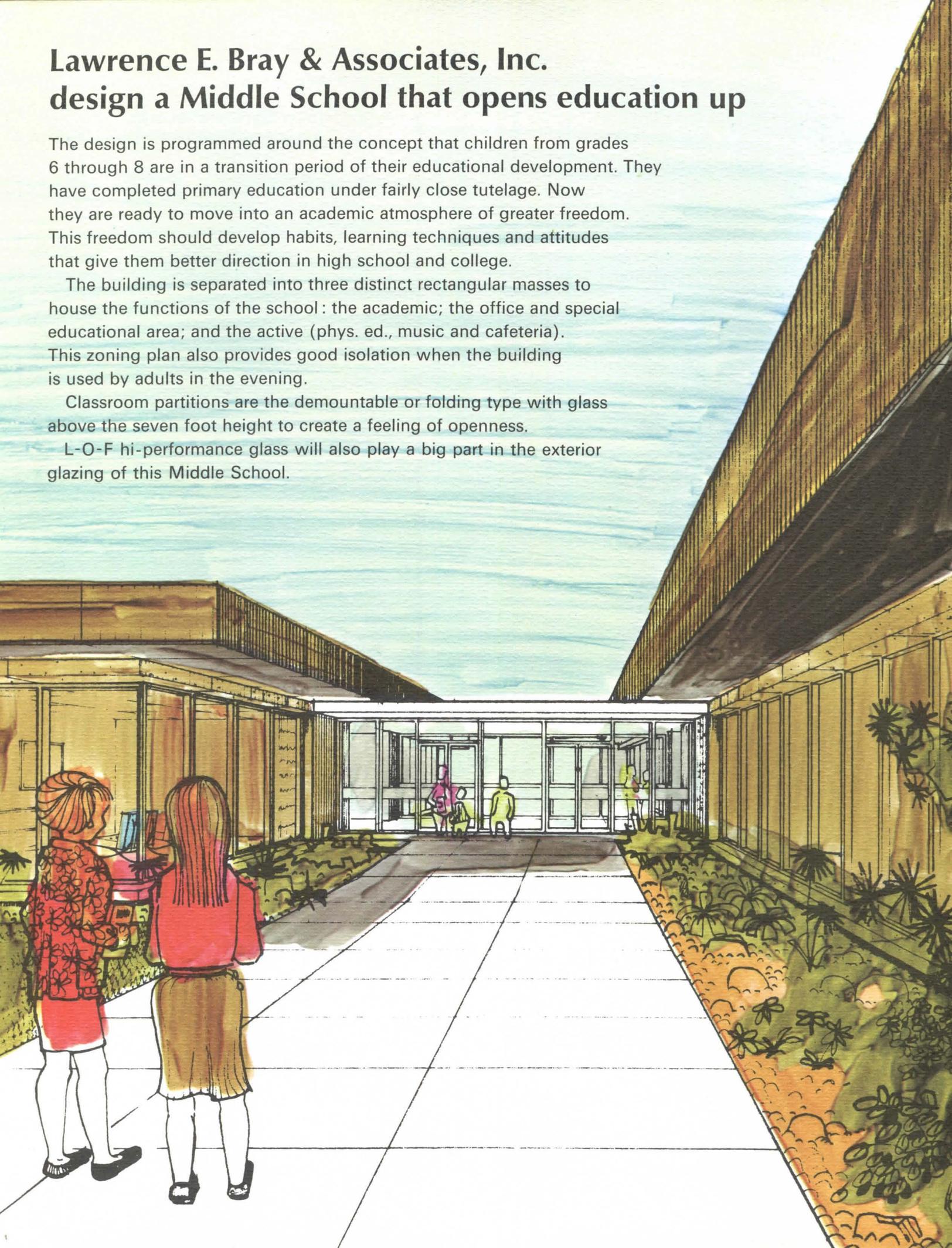
## design a Middle School that opens education up

The design is programmed around the concept that children from grades 6 through 8 are in a transition period of their educational development. They have completed primary education under fairly close tutelage. Now they are ready to move into an academic atmosphere of greater freedom. This freedom should develop habits, learning techniques and attitudes that give them better direction in high school and college.

The building is separated into three distinct rectangular masses to house the functions of the school: the academic; the office and special educational area; and the active (phys. ed., music and cafeteria). This zoning plan also provides good isolation when the building is used by adults in the evening.

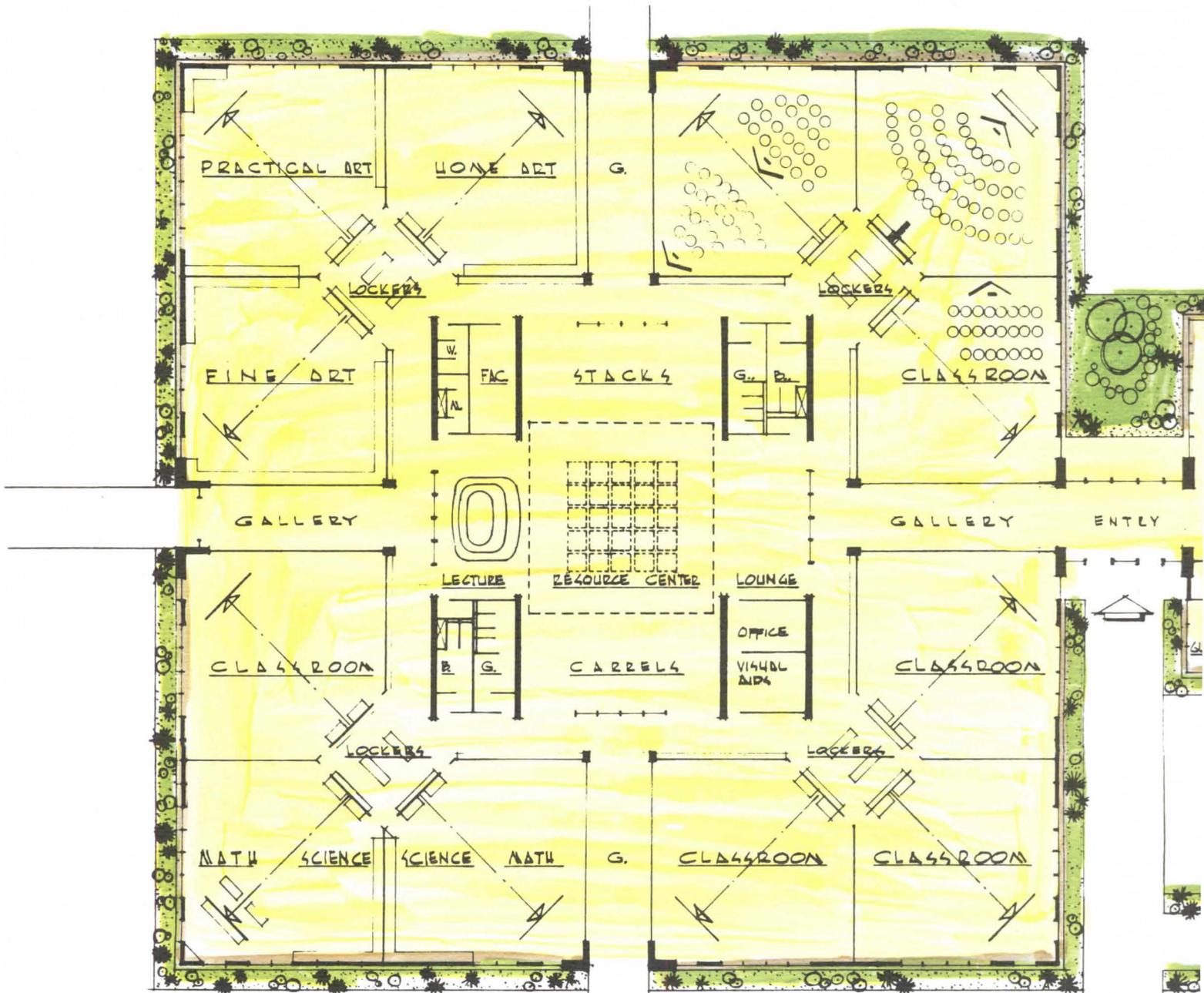
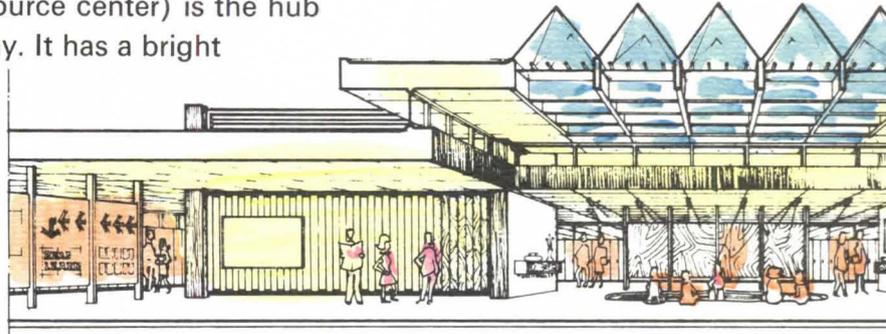
Classroom partitions are the demountable or folding type with glass above the seven foot height to create a feeling of openness.

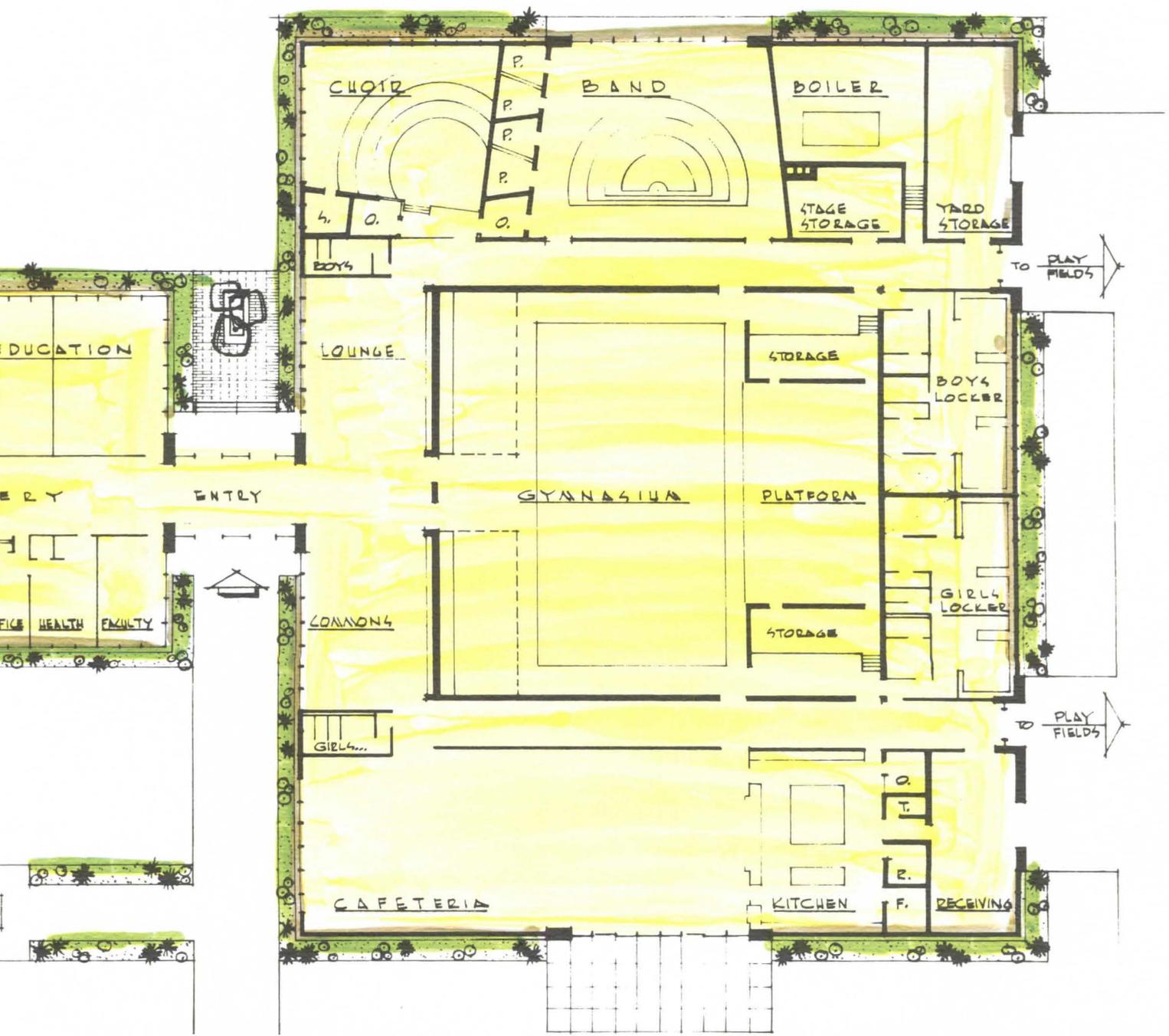
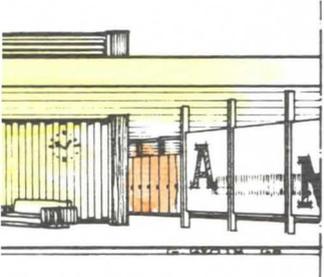
L-O-F hi-performance glass will also play a big part in the exterior glazing of this Middle School.



Generous use of Thermopane® insulating glass with Parallel-O-Bronze® as the outboard pane is used in exterior classroom windows. The hi-performance glass frames pleasant views while reducing the entrance of solar heat to contribute to air-conditioning economies. Functional controls for audio-visual privacy are also provided. Exterior wall surfaces adjacent to windows are Vitrolux® spandrel glass with a backup of insulated wall covered with chalk and tack board.

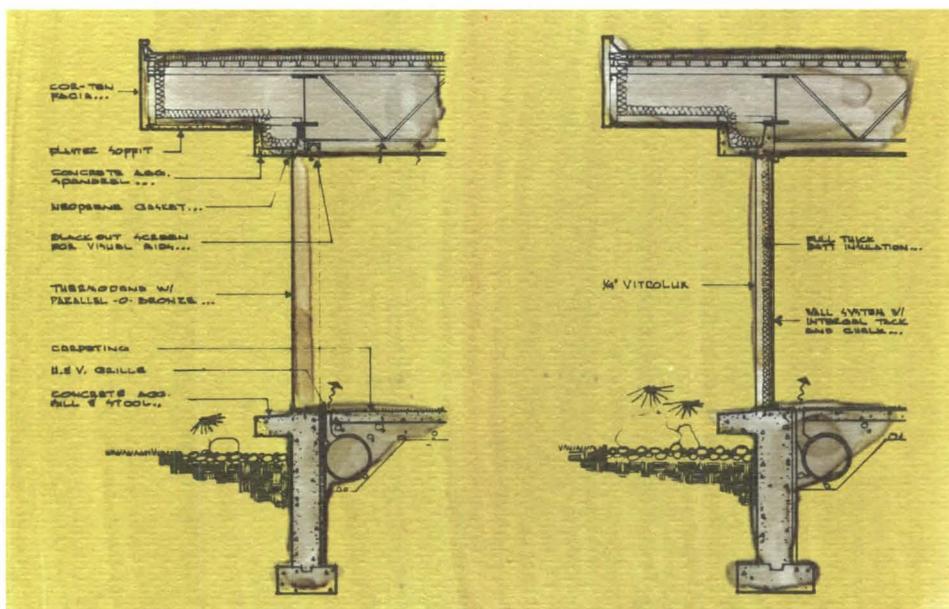
The centrally located library (resource center) is the hub of the academic freedom philosophy. It has a bright clerestoried high ceiling area of Parallel-O-Plate® glass. Skylights of Crossweld® wired glass





with diffusers of Tuf-flex® tempered Patterned glass below them bring daylight into five pleasant activity areas: the control desk with conventional library furniture; stacks for material storage; study carrels for individual audio-visual, television or reading; lecture area with carpet; lounge area for casual reading.

Thus, Lawrence E. Bray & Associates, Inc., of Sheboygan, Wisc., have created a school design that truly reflects its educational philosophy. Glass made it possible. Libbey-Owens-Ford hi-performance glass made it practical. Why not get in touch with an L-O-F Architectural Construction Specialist? Or call your L-O-F Glass Distributor or Dealer listed under "Glass" in the Yellow Pages. Libbey-Owens-Ford Company, 811 Madison Avenue, Toledo, Ohio 43624.



**POLISHED PLATE GLASS**

- Parallel-O-Plate®, 1/4"
- Parallel-O-Grey®, 13/64", 1/4"
- Parallel-O-Bronze®, 1/4"

**HEAVY-DUTY PLATE GLASS**

- Parallel-O-Plate®, 5/16" to 7/8"
- Parallel-O-Grey®, 3/8", 1/2"
- Parallel-O-Bronze®, 3/8", 1/2"

**LAMINATED SAFETY PLATE GLASS  
with Vari-Tran™ Coating**

HEAT ABSORBING FLOAT, 1/4"

**INSULATING GLASS—Thermopane®**

Regular, tinted or with Vari-Tran Coating

**VIGILPANE™—Safety Plate Glass**

ROUGH PLATE, Regular or Tinted  
(Rough 2 Surfaces)  
(Polished 1 Surface, Rough 1 Surface)

**SPANDREL GLASS—Vitrolux®**

Vitreous colors fused to back of heat-strengthened glass

**HEAT-TEMPERED GLASS—Tuf-flex®**  
Windows, Doors and Sidelights

**WINDOW GLASS**

**PATTERNED & WIRED GLASS**

**MIRROPANE®**

One-way vision glass



**L-O-F HI-PERFORMANCE GLASS**



## Fort Pitt vs. the kids from Soho

Fort Pitt. Strategically located in frontier days at "The Point" where the Monongahela and Allegheny meet to form the Ohio River. Today, it's Pittsburgh.

In its stormy history, Fort Pitt was burned to the ground by the French, promptly rebuilt by the British. When the U.S. got it back, we destroyed it in a different way. Neglect. Then after almost a century, it was rehabilitated and the original structure preserved as a historical landmark. A beautiful, meticulously planned, even more meticulously tended park enhances its primitive solidity.

A lot of people have spent a lot of time, thought, talent, energy, and money to keep Fort Pitt beautiful as a tribute

to the past. Wouldn't it be nice if this same kind of action could be leveled at the future? The future of kids like the kids from Soho.

For Soho is a slum, just minutes away from Point Park. Not many tourists go there. Not many flowers bloom. Unemployment is rampant. Crime and narcotics a constant threat. Kids growing up in Soho—or in the "gray" area around it where Herb and Chuckie Shore live—have little hope of overcoming their environment unless somebody does something. Somebody like you, perhaps.

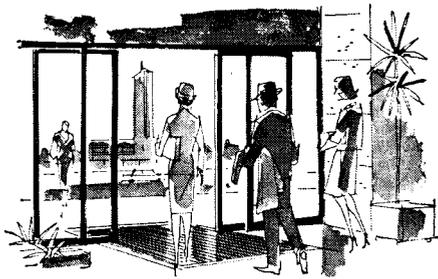
Fact is, we're trying to stimulate some thinking among architects—who must be concerned about the future—about kids

like the kids from Soho. So we've established the Eaton Yale & Towne Urban Design Fellowship. The award, administered by the A.I.A., provides for one year of graduate study in urban design at an American university and a follow-up tour of urban developments abroad.

It's only natural that historical landmarks as important as Fort Pitt should be preserved. But as long as we're saving the past, shouldn't we save the future? Like Herb and Chuckie. Like the kids from Soho.

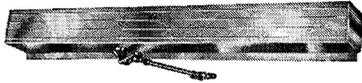
**YALE**<sup>®</sup> **EATON**  
THE FINEST NAME IN YALE & TOWNE  
LOCKS AND HARDWARE

# 3 beautiful ways to SPEED TRAFFIC



## WITH NORTON® AUTOMATIC OPERATORS

Automated doors offer you many advantages in the control and general improvement of high traffic flow. Regardless of the type of building and its unique traffic problems, there's a choice of Norton automatic operator with a full variety of controls to solve these problems.



### SURFACE MOUNTED

for easy installation on existing or standard doors. Just mount operator on the header and attach arm to the door, install controls and plug into a standard outlet. Makes an attractive installation.



### OVERHEAD CONCEALED

for new construction or major remodeling. Operator completely concealed in the overhead header in an attractive package.



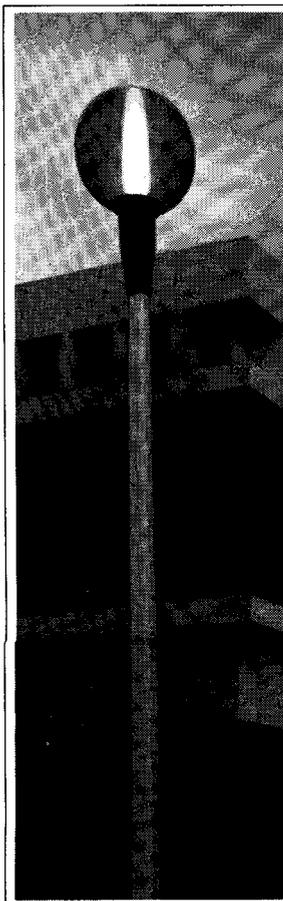
### SLIDEAWAY OPERATOR

Surface or concealed mounting, for a saving in space, with no door swing. And the added precaution of doors sliding sideways out of the way of traffic. For new construction, major remodeling or possibly use with existing doors.

SEE YOUR NORTON AUTOMATIC REPRESENTATIVE



**NORTON** *Automatic* DOOR OPERATORS  
NORTON DOOR CLOSER DIVISION  
372 Meyer Road, Bensenville, Illinois, 60106



## exciting lighting

*This is Fire on the job. At Corporate Square Office Park in Georgia. Everyone loves the magical torchlight effect. Would you like to see the elegance of Fire in action? The sparkling glitter of Crystal? We'll be happy to arrange a private showing.*

**KEENE**  
CORPORATION  
**STONCO LIGHTING**

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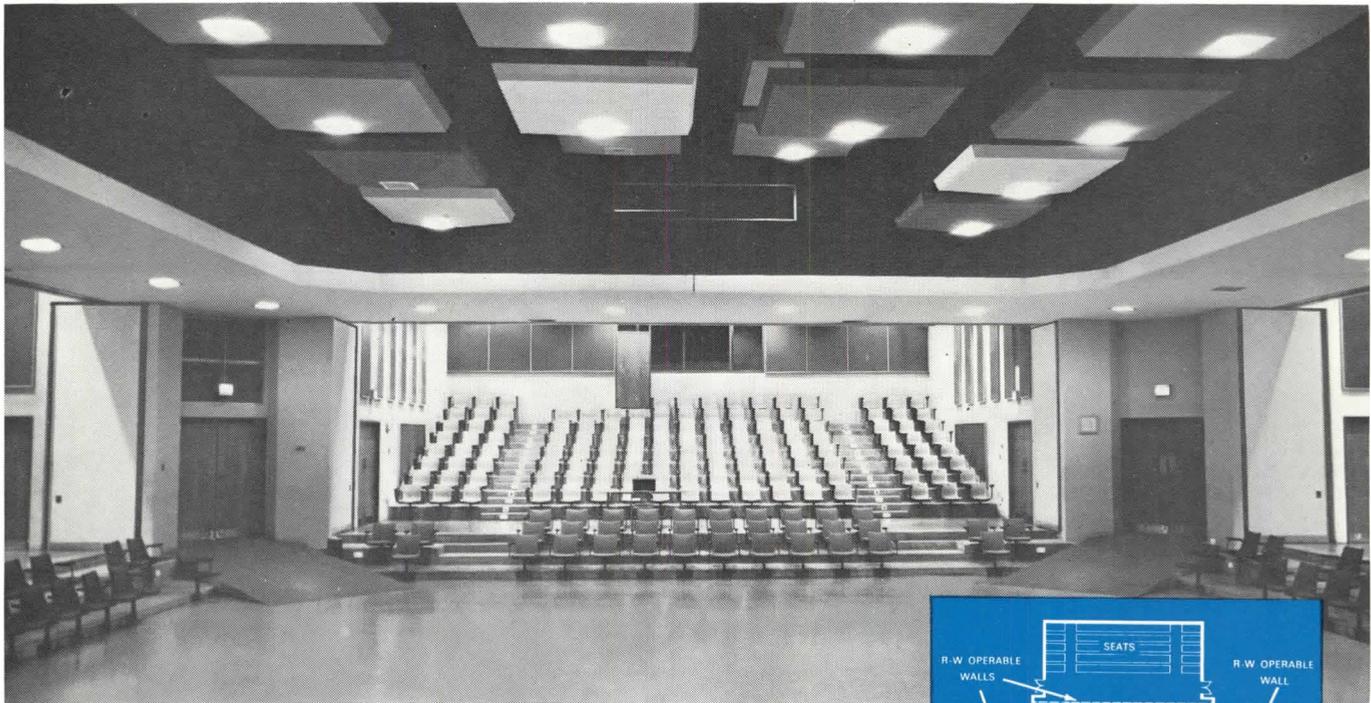
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On The College Scene Across The Country...



# R-W Operable Walls for TOTAL Room Flexibility and Versatility

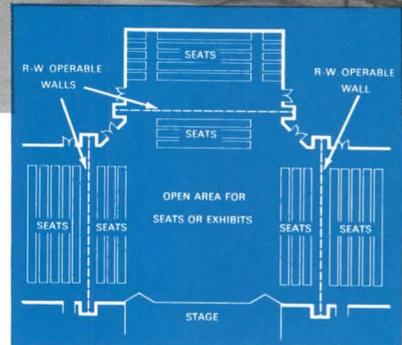
Colleges everywhere are finding a partial answer to rising construction costs with Richards-Wilcox Operable Walls. Net result: classrooms, lecture halls, gyms, auditoriums and other open areas all become more functional at less cost. And since R-W walls are "custom" partitions constructed of standard components, you get the exact job for your needs.

Little or no maintenance becomes another economy. The R-W wall rides free and clear with no sagging or binding. Just smooth, easy operation year 'round.

So, for added room flexibility and economy plus control of traffic and sound ask your architect to investigate R-W Operable Walls. And write for Bulletin A-600 on Room Functional Flexibility.

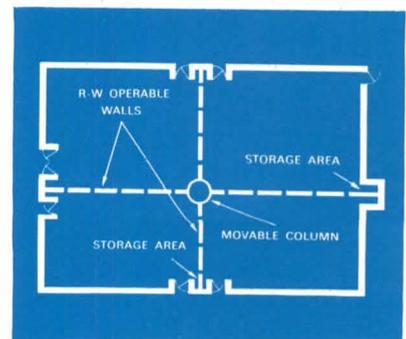
**R-W**  
T.M.

**Richards-Wilcox**  
MANUFACTURING COMPANY  
110 THIRD STREET • AURORA, ILL, 60507



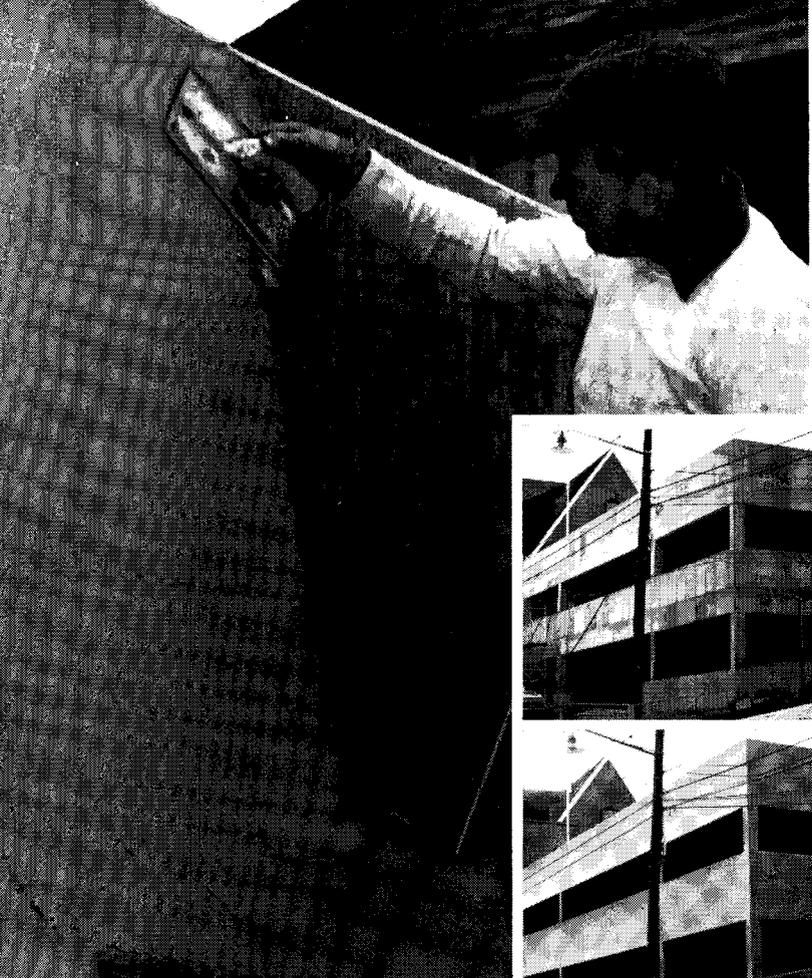
Three R-W Operable Walls in this auditorium at Montgomery County Junior College, Rockville, Maryland, provide unusual flexibility. Varying sized groups can easily be accommodated for activities ranging from plays to meetings, lectures, and exhibits.

ARCHITECT: McLeod, Ferrara & Ensign, Washington, D. C.



With four R-W Operable Walls and a movable column, a large classroom at this Northern Virginia Community College, Fairfax, Virginia, can be easily split into one, two, three or four rooms, as needs and availability dictate, with no interference and interruptions.

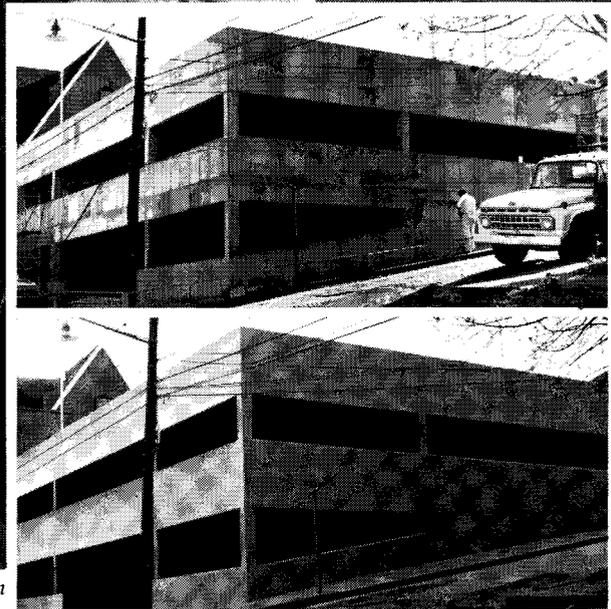
ARCHITECT: Lyles, Bissett, Carlisle & Wolff, Washington, D. C.



*trowel application*



*float finish*

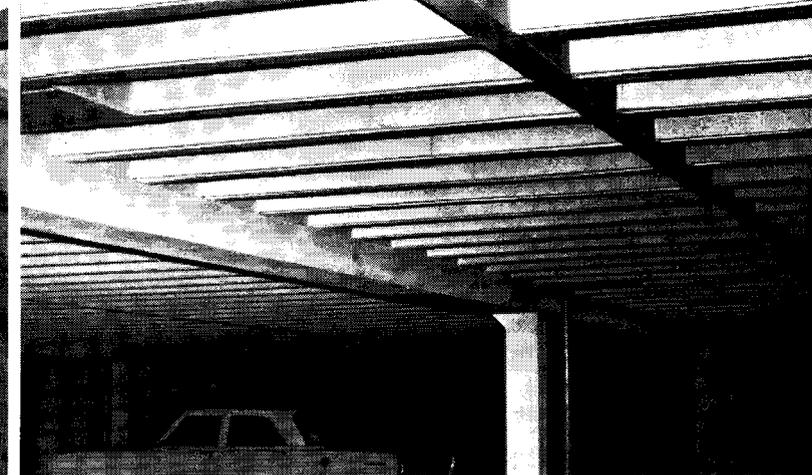
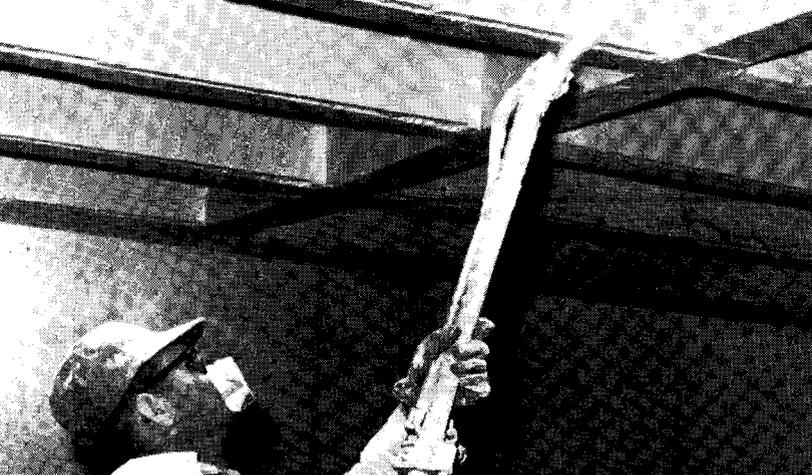


Here's an example of an attractively finished, completely waterproofed garage in a beautiful texture. (above) Exterior concrete surfaces were first treated with a trowel and float application of THOROSEAL PLASTER MIX—plus—ACRYL 60 for a super-strong bond, then finished with THOROSHEEN Exterior acrylic paint. (below) All interior overhead concrete beams, columns and block were finished with White THOROSEAL PLASTER MIX sprayed on in two applications.

# STOP RUBBING CONCRETE!

*Finish and waterproof concrete economically with THORO SYSTEM PRODUCTS.*

*Methodist Church Parking Garage, Charleroi, Pa. Arch: C. C. Compton, Donora, Pa. Gen'l Cont: Monongahela Building Maintenance, Monongahela, Pa.*



STANDARD DRY WALL PRODUCTS, INC.

DEPT. 69-AF-5 • 7800 N.W. 38TH ST., MIAMI, FLA. 33166

*And now — an overhead concealed closer without peer*

707

*another Century 2000 product from RIXSON*

**An all weather exterior/interior closer, with adjustable hydraulic back check, absorbs uncommon abuse and requires only standard preparation.**

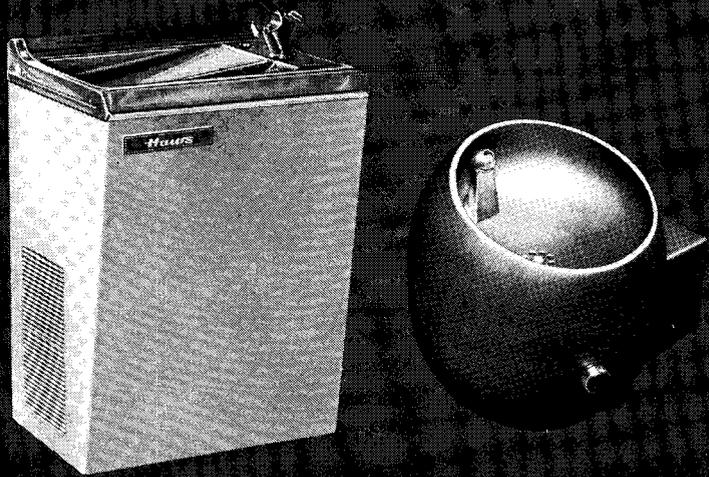


*Details?*

**RIXSON CLOSERS**  
A DIVISION OF RIXSON INC.  
FRANKLIN PARK, ILLINOIS  
In Canada: Rixson of Canada, Ltd.

CENTURY 2000

# Haws makes a better-looking drink of water.



*...write for our catalog  
and we'll prove it!*

**Yes**, send me your colorful catalog illustrating Haws drinking fountains and water coolers of distinction.

Name \_\_\_\_\_ Title \_\_\_\_\_

Firm \_\_\_\_\_

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City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_



**DRINKING FOUNTAINS**  
**WATER COOLERS**

**HAWS DRINKING FAUCET COMPANY**  
1441 Fourth Street • Berkeley, California 94710

Also manufacturers of emergency decontamination showers, eye/face-wash fountains, and laboratory faucets

On Readers' Service Card, Circle 237

## To better serve the Forum reader

This month the AIDS section of FORUM becomes the Reader's Service File—reorganized to make it easier for you to order what you want; expanded to provide greater service. RSF is arranged in three parts:

**PART I** lists and describes product literature which you can order by circling the appropriate number on the self-addressed, stamped Reader Service Card (facing page 118).

**PART II** includes the Advertiser's Index (page numbers of current advertising messages), and the Advertiser's Information Service, an exclusive FORUM feature which makes information materials available either from individual advertisers or from groups of advertisers organized by product categories. If you want the material offered by an individual advertiser, circle the advertiser's number on the Reader Service Card. If you prefer all the information available in a product classification, circle the category number.

**PART III** is a streamlined subscription service for qualified readers who wish to be included on FORUM's regular subscription list.

We think the new Reader's Service File is a significant innovation in our continuing efforts to make FORUM the most functional publication in the architectural field.

We hope you will find it useful.

# READERS SERVICE FILE

## PRODUCT LITERATURE

To order material described, circle indicated number on self-addressed Reader Service Card, facing page 118.

### DOORS/WINDOWS 601

12-pg brochure, designed as guide to laminated architectural glass products, contains comparative charts and graphs. Amerada Glass Co. On Reader's Service Card, circle 101.

35-pg color catalog on steel, aluminum and stainless steel windows & curtain wall. Complete drawings, specs for the architect and engineer. Wm. Bayley Co. On Reader's Service Card, circle 102.

Catalog includes technical information on LOF glass; includes Vari-Tran® and Vigilpane® SA 68. Libbey-Owens-Ford Co. On Reader's Service Card, circle 103.

Plexiglas in Architecture—24-pg full color catalog shows full range of architectural uses for acrylic sheet: glazing, fascia, sunscreens, domes. Rohm & Haas Co. On Reader's Service Card, circle 104.

### FLOORING 603

Weberfloor. Unique access flooring being used in many jobs with few, if any, special-purpose requirements. 12-pg illustrated brochure details construction and economic benefits. Weber Architectural Products division of Kidde. On Reader's Service Card, circle 105.

### FLOOR COVERINGS 604

Powerhouse by World Carpets. A  $\frac{3}{64}$  gauge, level loop quality with 100% solution dyed Acrilan acrylic pile. 10 heather colorations. Sample swatch, descriptive information. World Carpets. On Reader's Service Card, circle 106.

### FURNISHINGS 605

New Sundberg Chair. Full line. Durable Cast nylon. Many colors, mounting options. American Seating Co. On Reader's Service Card, circle 107.

Action Office II. Modular components for open planning. Complete literature. Herman Miller, Inc. On Reader's Service Card, circle 108.

### HARDWARE 606

12-pg booklet on Architectural Hardware for Schools and Colleges covers wide variety of hardware items; shows many unusual designs, includes info re Corbin's Master Key-

ing Systems Form No. K-873. P. & F. Corbin Div. Emhart Corp. On Reader's Service Card, circle 109.

24-pg fully illustrated booklet gives information on choosing correct hardware for every type of entrance. Kawneer/Amaz Co. On Reader's Service Card, circle 110.

Fire control door devices—8-pg brochure contains illustrations and diagrams of complete line of fire control equipment for doors. Norton Door Closer Div. Eaton Yale & Towne, Inc. On Reader's Service Card, circle 111.

"Backcheck + Brawn," technical details and specifiers' guide for Rixson Closers' new 707 Series. Heavy-duty, all weather overhead concealed closer with Backcheck. Rixson Closers. On Reader's Service Card, circle 112.

### HEATING/ AIR CONDITIONING 607

16-pg brochure on unit heaters, vertical and horizontal, complete performance ratings and piping systems. Dunham-Bush Inc., Space Conditioning Div. On Reader's Service Card, circle 113.

4-pg 2-color condensed catalog. Dimensions and specs on all models of Perfection Infra-Red Heaters. Hupp Inc. On Reader's Service Card, circle 114.

Spec data hermetic and open Turbo-pak chiller, 670 to 1030-ton capacity range. York Corp. Div. of Borg Warner Corp. On Reader's Service Card, circle 115.

### INSULATION 608

8-pg booklet contains technical data, suggested specs, recommended uses for masonry fill insulation, polystyrene foam, glass fiber insulation. W. R. Grace & Co. On Reader's Service Card, circle 116.

4-pg 2-color folder on "Weather Chamber Windows" weatherproofing system combining Neoprene striping with pressure equalization. Republic Steel Corp. Mfg. Div. On Reader's Service Card, circle 117.

All-weather Crete Plaza Insulation systems. 10-pg full color technical brochure with specifications and cut-

a-way diagrams of 8 different systems. Silbrico Corp. On Reader's Service Card, circle 118.

### KITCHEN EQUIPMENT 609

32-pg book contains information on and important features of Bally Prefab Walk-In Cooler/Freezer. Bally Case & Cooler Co., Inc. On Reader's Service Card, circle 119.

New 24-pg catalog contains general design information and detailed architectural specifications all types walk-in coolers, freezers, refrigerated warehouses. C. M. Lingle Co. On Reader's Service Card, circle 120.

Food Preparation Center—Specification sheets on built-in, console, and on-counter models of this kitchen multi-appliance. Ronson Corporation. On Reader's Service Card, circle 121.

### LIGHTING 610

12-pg 2-color brochure features new Prism-pack II, a ballasted, second-generation, prismatic-glass mercury luminaire. Holophane Co., Inc. On Reader's Service Card, circle 122.

New folder of prismatic lighting design elements for interior illumination now available to architects and specifiers. Complete set of photometric and mechanical design data. Plaskolite, Inc. On Reader's Service Card, circle 123.

AREALUME CATALOG: Ball-light post-tops, pendants, brackets for plazas, malls, parking areas. Stonco Lighting. On Reader's Service Card, circle 124.

### MASONRY 611

Stonehenge architectural panels; cultured stone material for inside or outside. 6-pg brochure has pertinent data, full size color sample to show deep-relief surface. Johns-Manville Sales Corp. On Reader's Service Card, circle 125.

### OPERABLE WALLS 613

Catalogue A-600; 16-pg 4-color detailing maximum room flexibility for schools, colleges, churches and institutions. Richards-Wilcox Mfg. Co. On Reader's Service Card, circle 126.

### PLUMBING 615

12-pg 2-color catalog shows Ameri-

can's complete line of laundry machinery. American Laundry Machinery Industries. On Reader's Service Card, circle 127.

Form C 150. 12-pg color catalog of water coolers. Architect illustrations. Cordley & Hayes. On Reader's Service Card, circle 128.

32-pg color catalog #168; drinking fountains, water coolers — includes specs, drawings. Haws Drinking Faucet Co. On Reader's Service Card, circle 129.

"The faucet that turns people on, with style, Moen." 12-pg catalog full line single lever kitchen bath valves. Moen Div. of Standard Screw Co. On Reader's Service Card, circle 130.

New 1969 32-pg color catalog illustrates electric water coolers, drink-fountains, accessories; incorporates drawings for units. The Halsey W. Taylor Co. On Reader's Service Card, circle 131.

### STRUCTURAL 617

Roof Decking. For bulb-T framing, insulating, structural deck for various roof configurations and finishes. Complete technical information in Bulletin 9-148. Homasote Co. On Reader's Service Card, circle 132.

Exterior wall systems employing lightweight framing members and cementitious membranes. 8-pg 4-color brochure. Inland-Ryerson Construction Products Co. On Reader's Service Card, circle 133.

New 8-pg catalog gives basic data on Pozzolith®; Masterplate® and Embeco®. Graphs and charts give performance info, estimating data and suggested specifications. Master Builders. On Reader's Service Card, circle 134.

### WALLS/LAMINATES 618

1968 laminated solid color series. Easily filed product sampler features '68 solid shades. Formica Corp. On Reader's Service Card, circle 135.

New Romany-Spartan full line 20-pg color catalog contains ideas and applications for ceramic tile; includes range of special glazes expressly for architect and designer. Technical data, specs. U.S. Ceramic Tile Co. On Reader's Service Card, circle 136.

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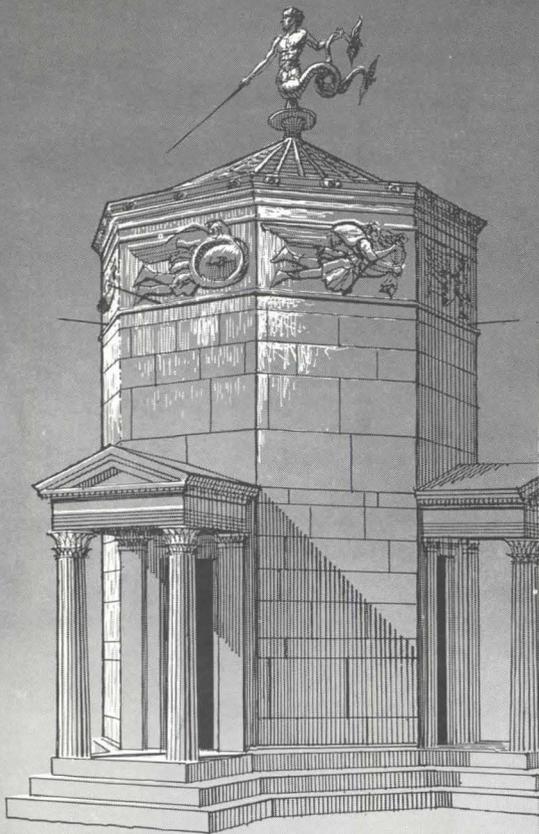
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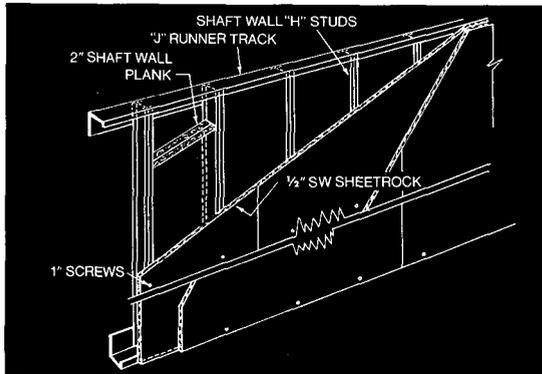
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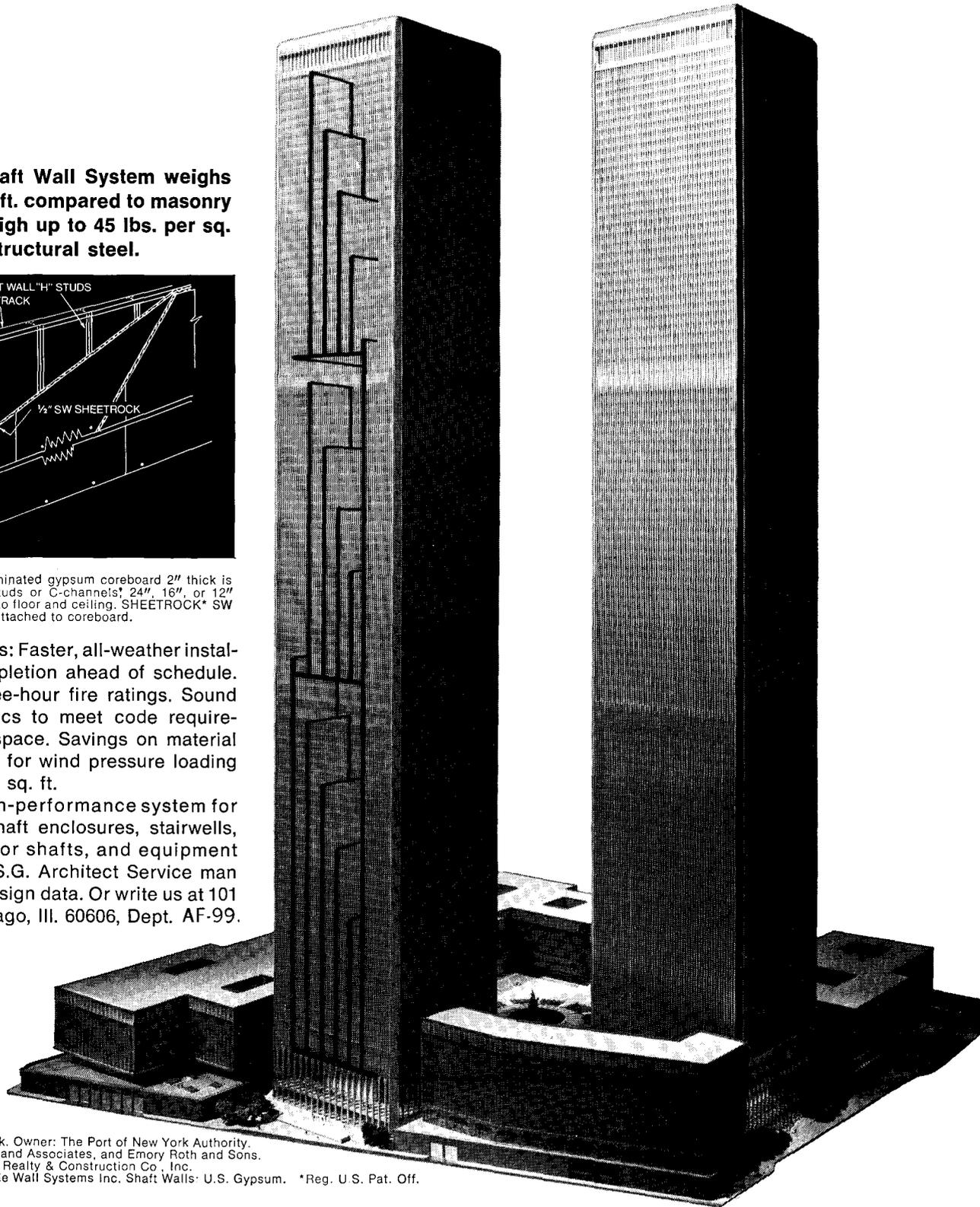
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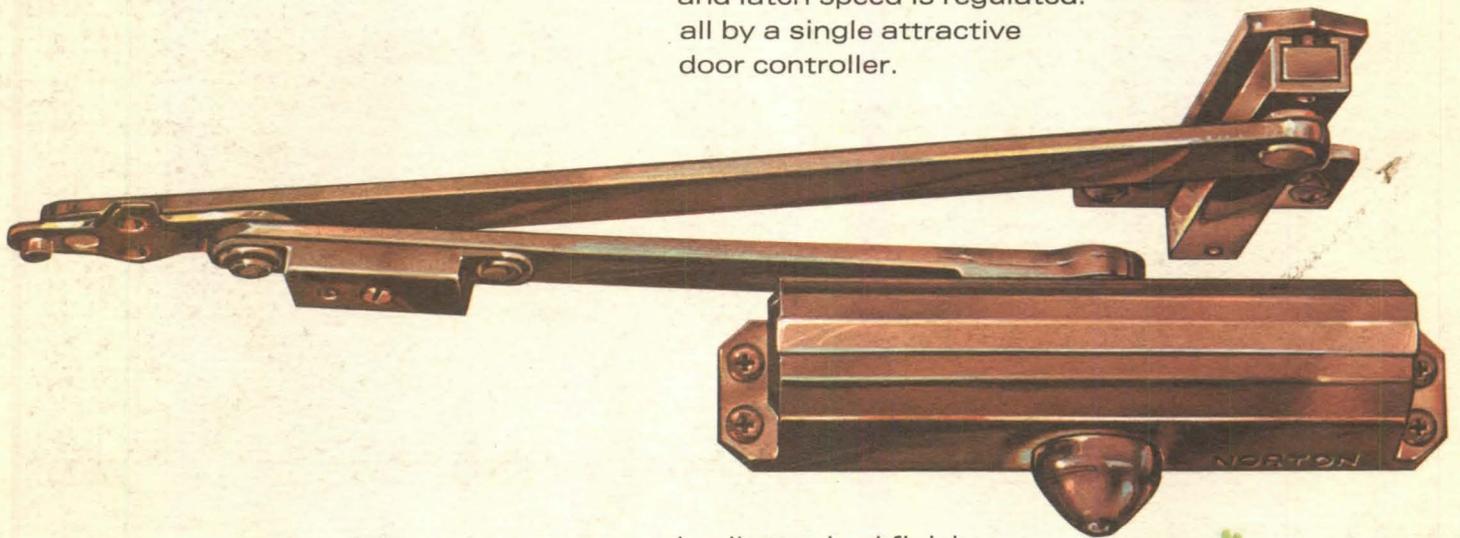
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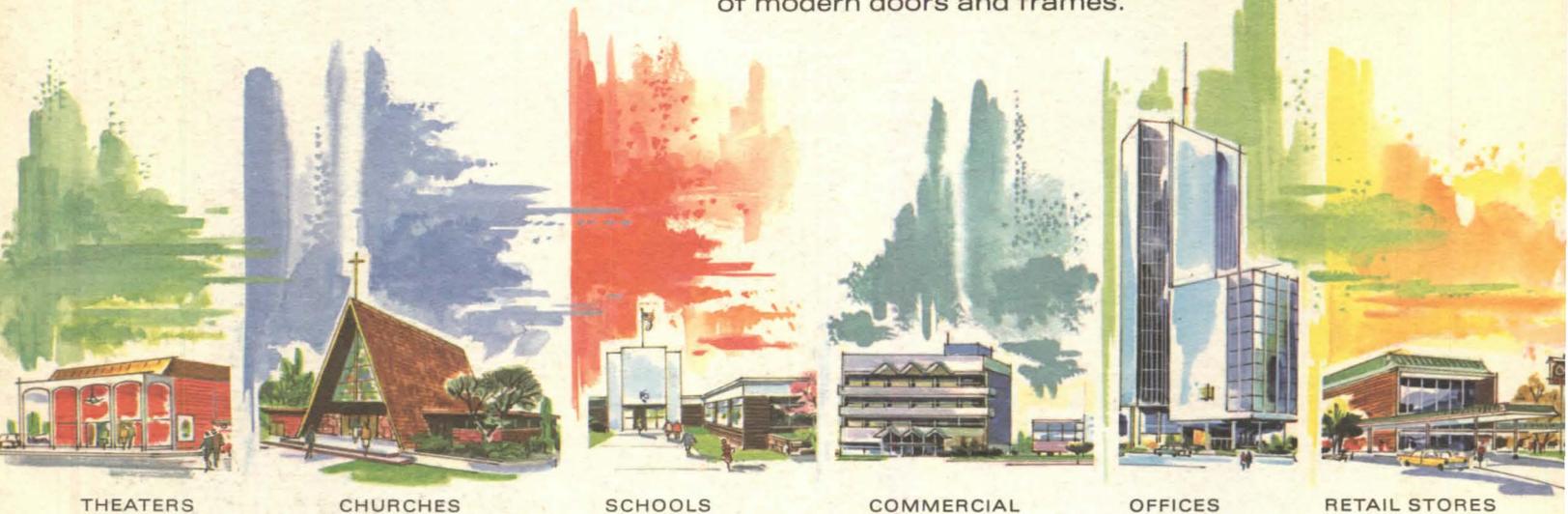
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