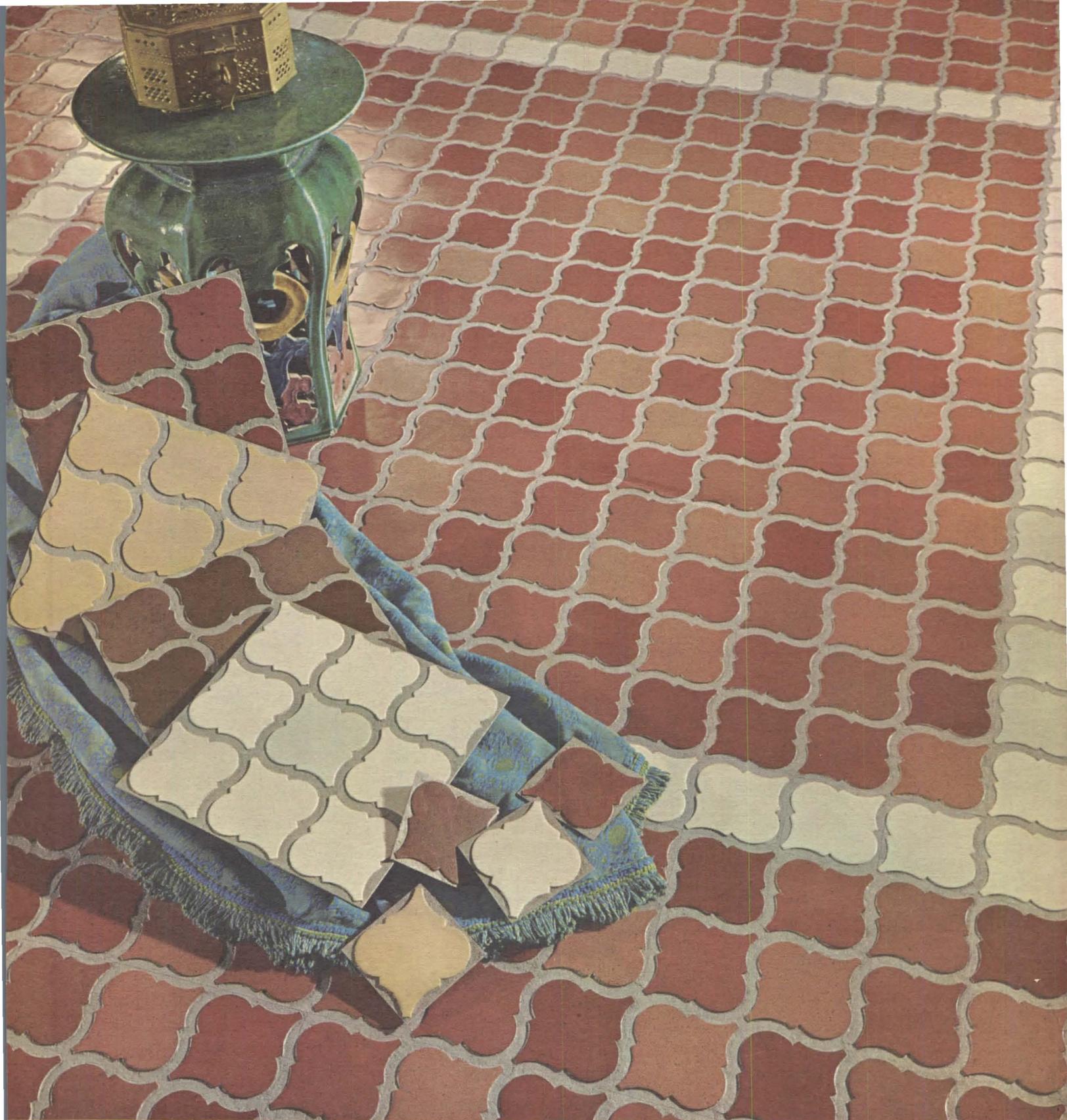




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A monthly review of events and ideas.

KEYHOLE SHOP 33
Viennese Architect Hans Hollein's first commission wins a prize bigger than its construction budget.

BART'S BILLION-DOLLAR RIDE 38
The Bay Area is currently building the nation's first new rapid transit system in half a century. An evaluation of the process by which the system is being planned and designed, and of its potential impact on the region and the cities that it serves.

FOCUS 62
A monthly review of notable buildings.

CHANGE AND A CHURCH 66
An angular sanctuary by Architect Edward Dart has brought reassurance to a neighborhood in transition.

BOOKS 72
Robin Boyd on the phases of modernism.

BUCKY'S BIGGEST BUBBLE 74
The first detailed look at the U. S. pavilion for Expo 67—a Fuller dome that will rise 20 stories high.

THE HAPPY HALENERS 80
Housing expert Roger Schafer revisits, on Forum's behalf, a remarkable micro-community near Bern, Switzerland.

LETTERS 96



The BART tracks (page 38) run above twisting lines of auto traffic. Design by Peter Bradford.

THE ARCHITECTURAL FORUM
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PUBLISHER'S NOTE

Senior Editor Jim Bailey has many friends in the San Francisco Bay Area, where he lived for 13 years before migrating east to join first the national AIA staff and then the new FORUM. He hopes he still has them after they read his 24-page story on the Bay Area Rapid Transit System, this issue's major feature.

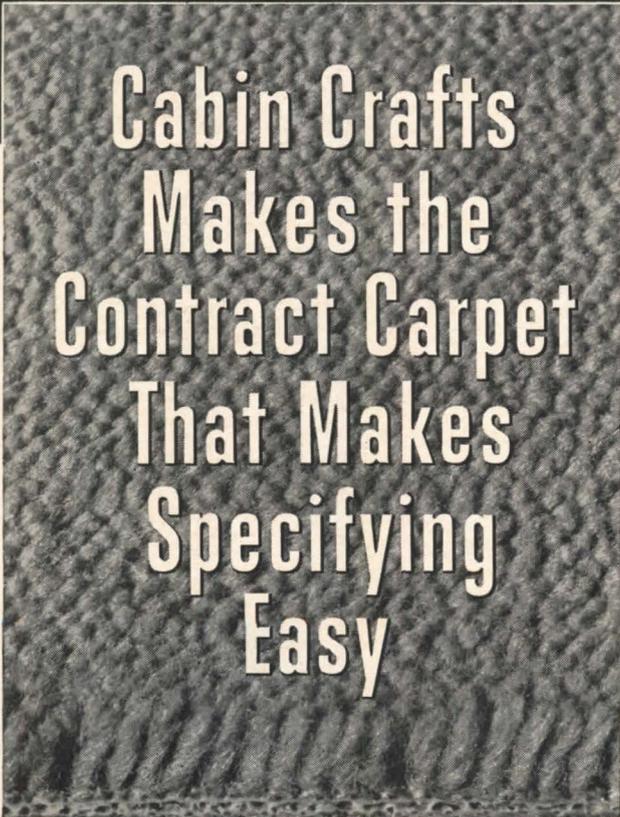
Bailey's acquaintance with the region and its architects was one reason he was put on the story three months ago. He talked to most of those involved with the planning and design of the BART system, and got a consistently ambivalent reaction. Many were critical of the way BART is being put together, but virtually all wanted to believe that it would be, in the end, a Good Thing. While Bailey was in San Francisco, doing his research, the *Chronicle* published a series of articles criticizing BART. The architects he talked to conceded that the series was, on the whole, factual, but resented the idea of the *Chronicle* being so negative.

Bailey's story has turned out to be a bit on the negative side too—not regarding BART's real accomplishments as transportation planning, but rather its shortcomings as a gigantic act of urban design. To get him off the hook with his professional friends, let it be said that he went West with an open mind, and that he was encouraged to be critical where criticism could be instructive—and, we hope, helpful in prodding BART to fulfill its great potential.

* * *

Ann Wilson (her title is assistant to the editor, but in reality she runs the editorial department), just returned from a European vacation, reports that the editorial index is now up to date, i. e., complete through 1965.

Art Director Paul Grotz also was in Europe during preparation of this issue. It was designed, and well, by Peter Bradford. L.W.M.



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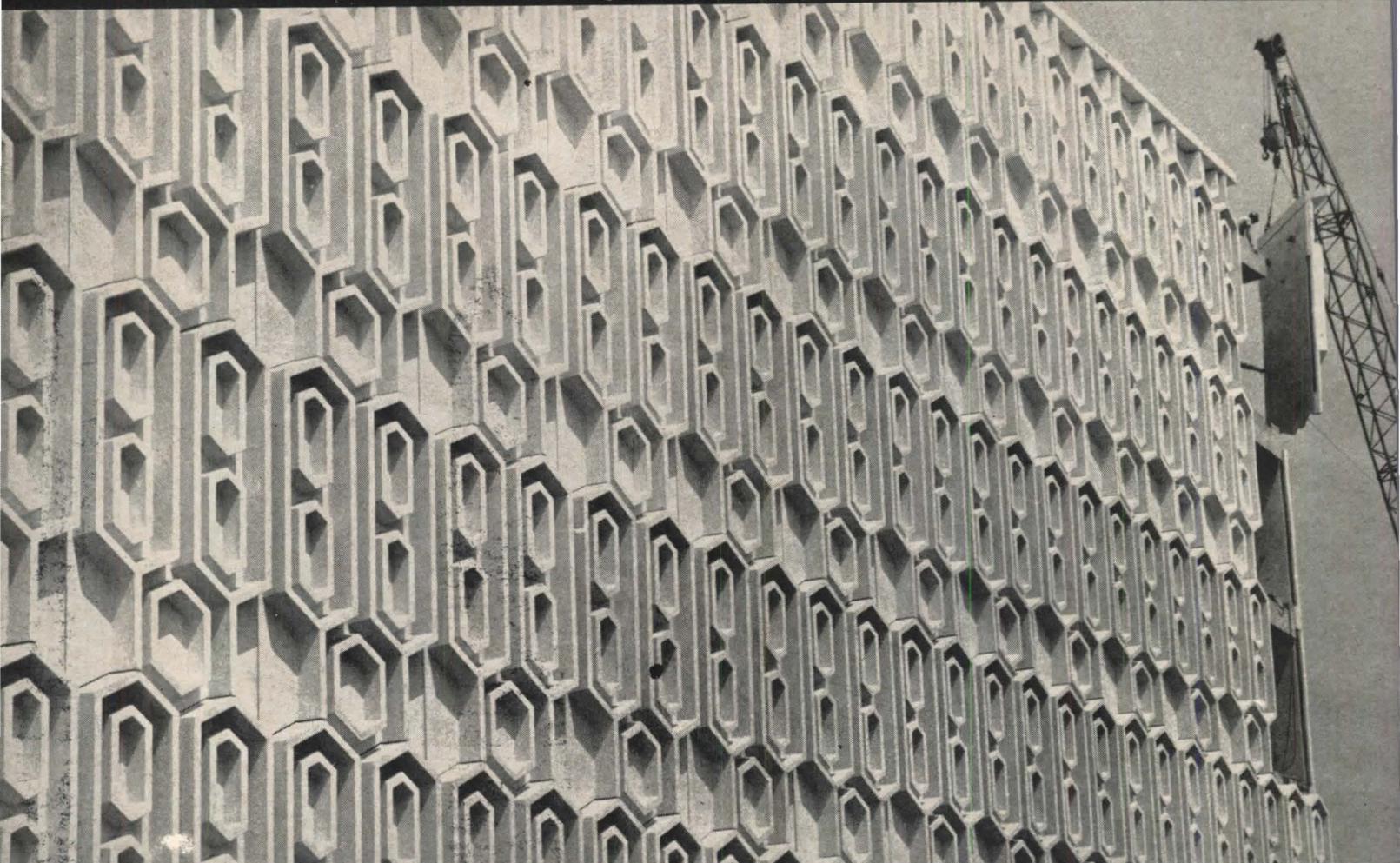
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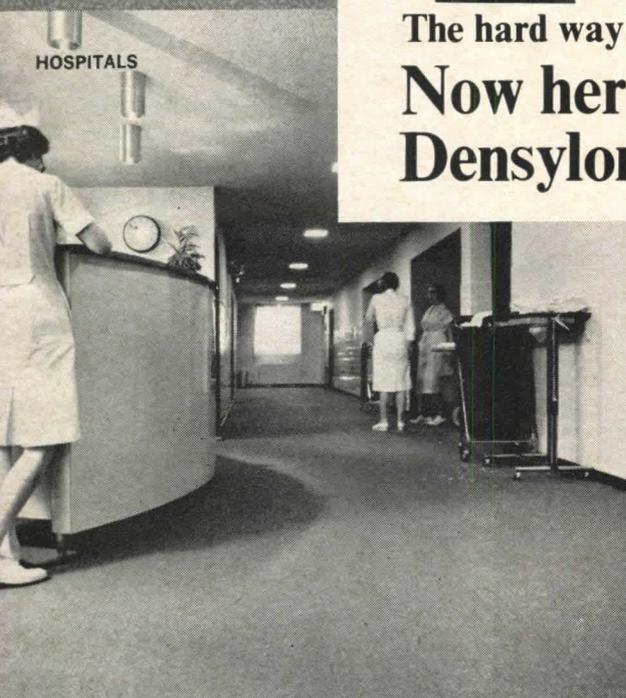
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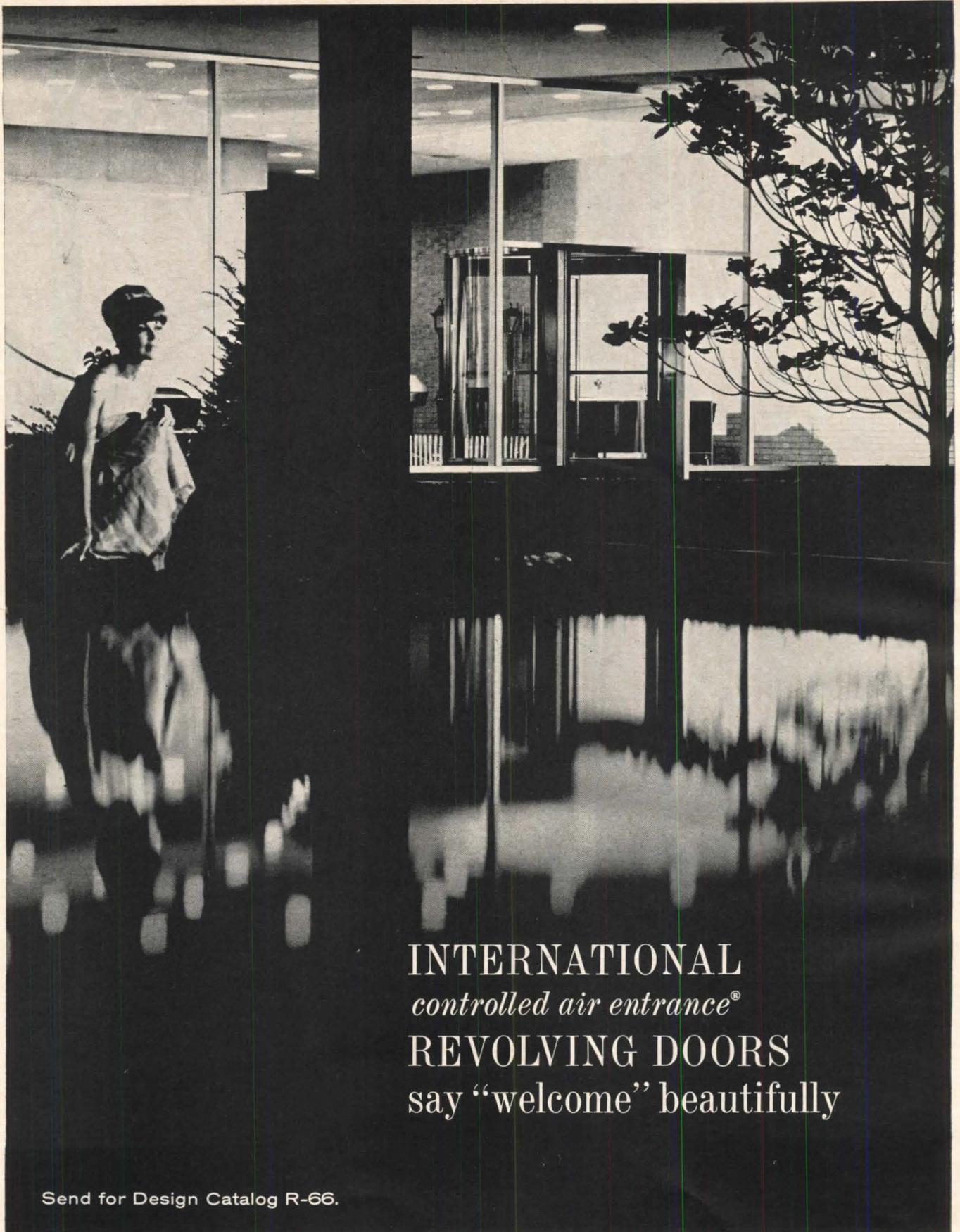
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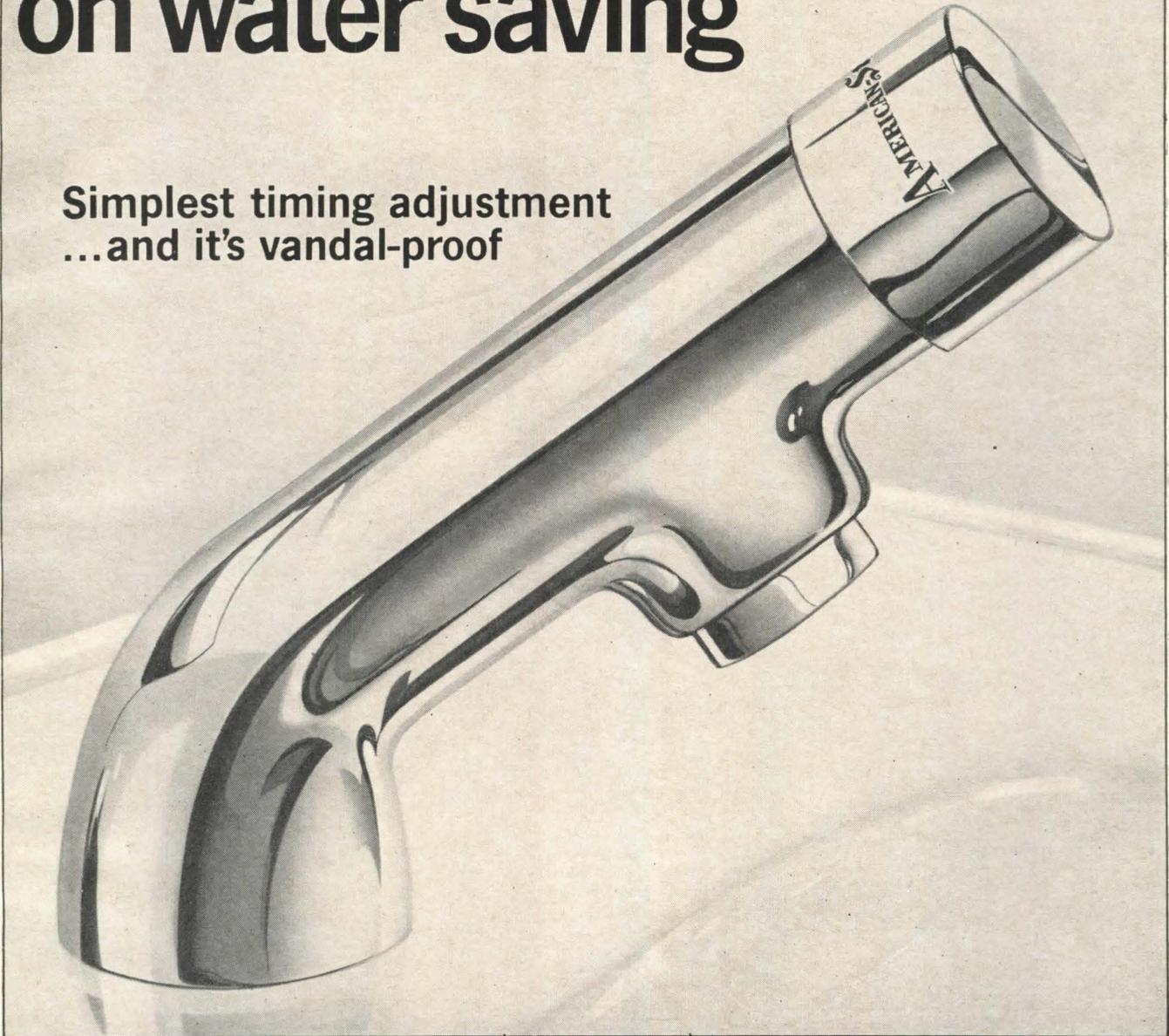
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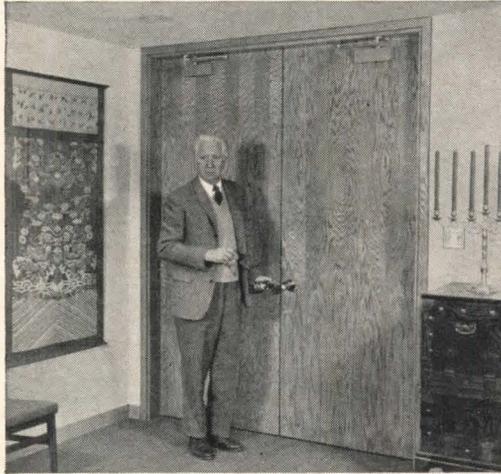
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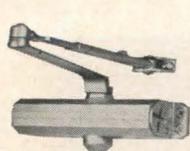
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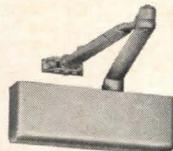
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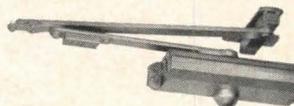


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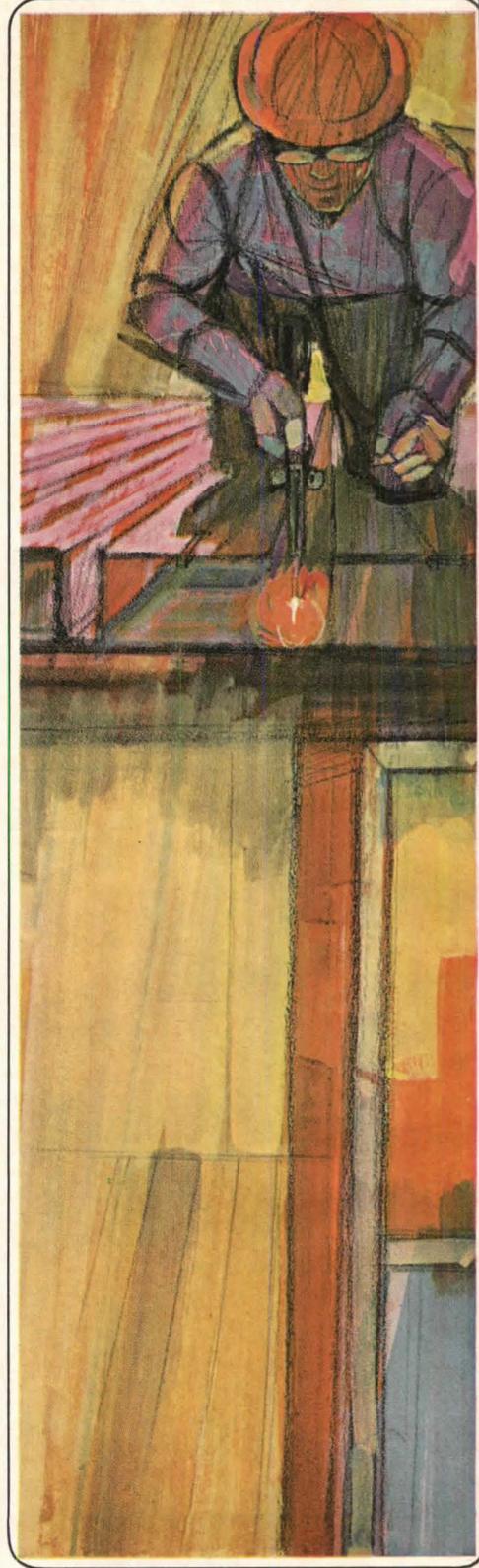
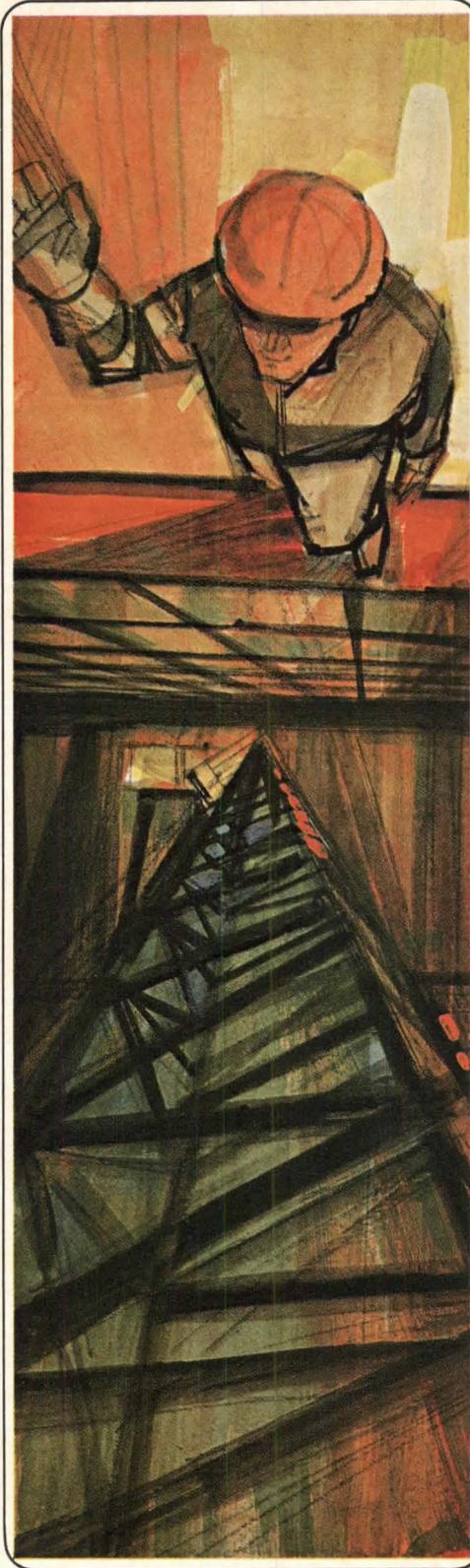
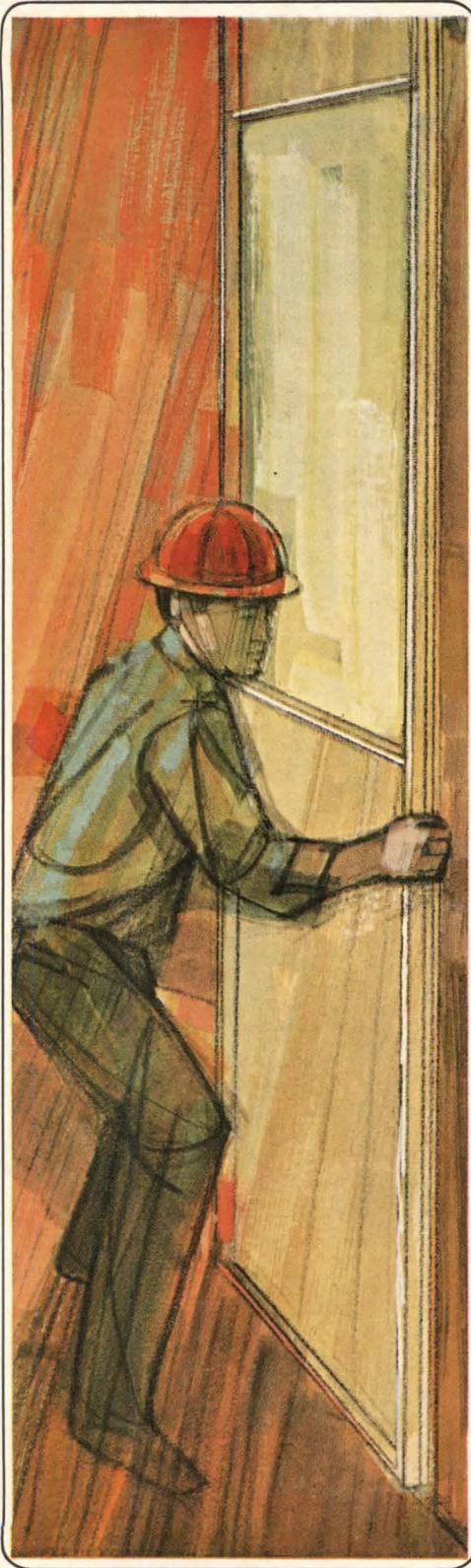
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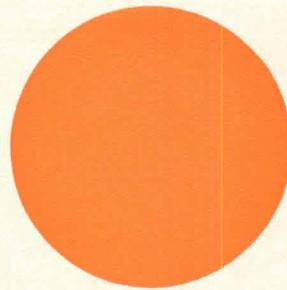
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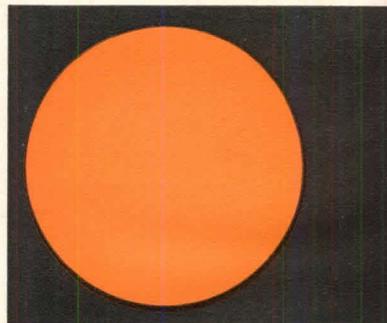
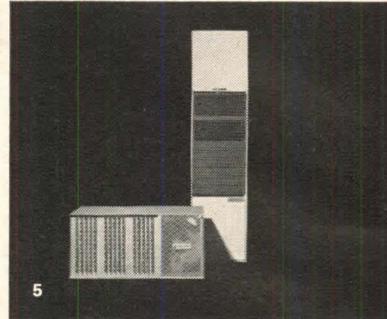
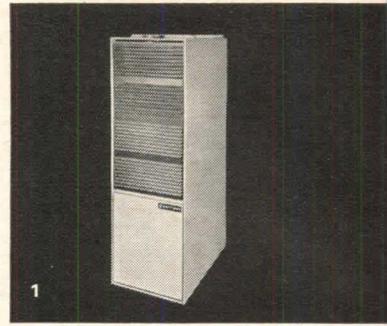
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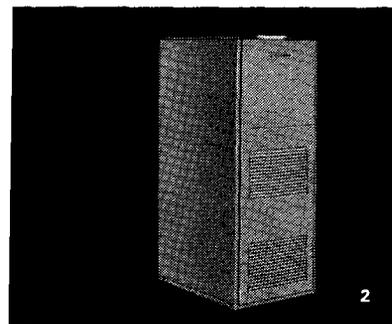
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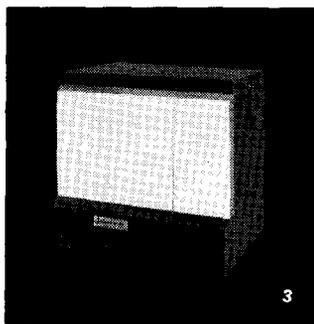


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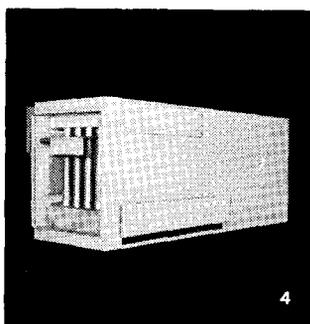




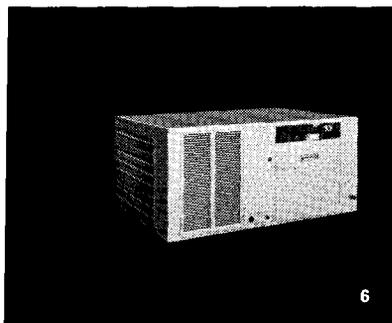
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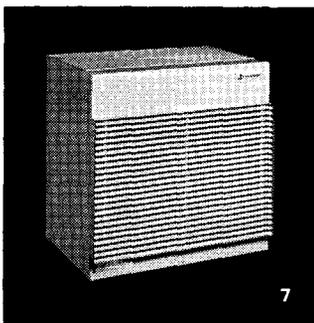
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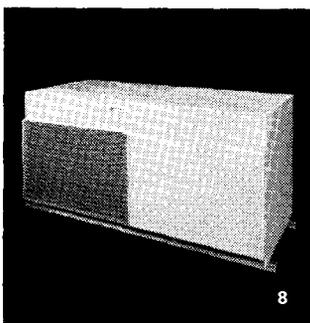
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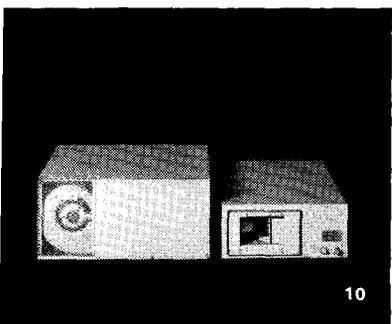
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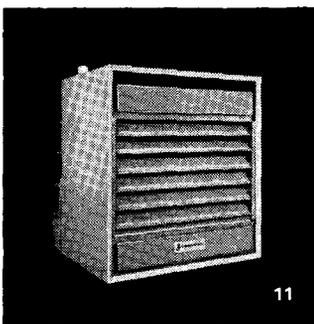
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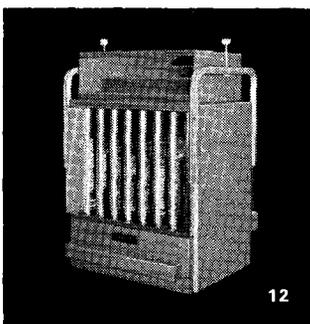
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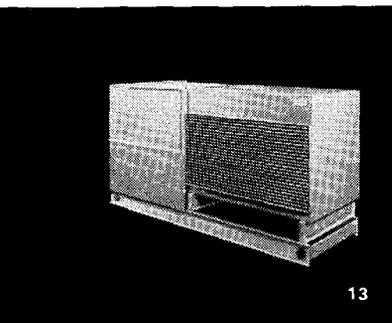
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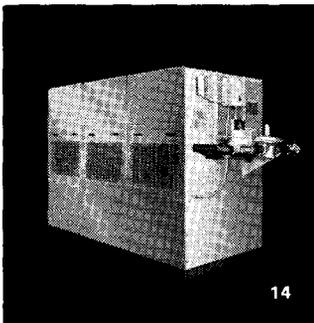
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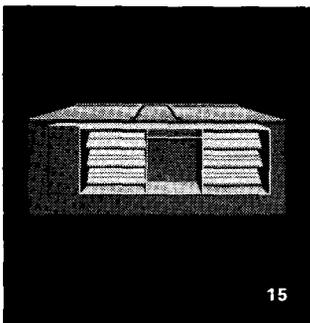
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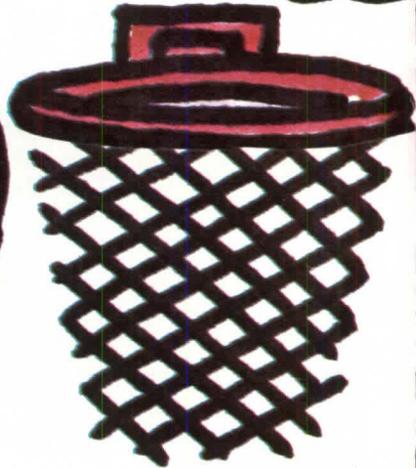
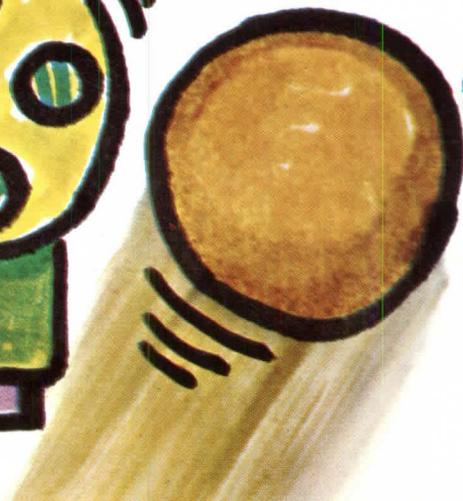
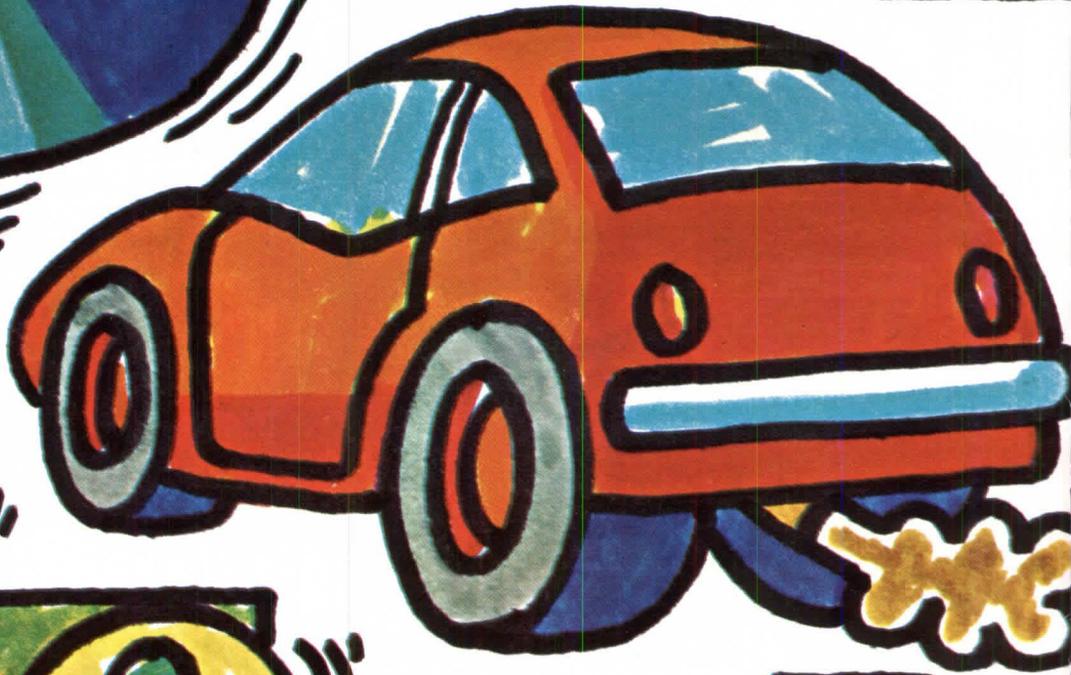
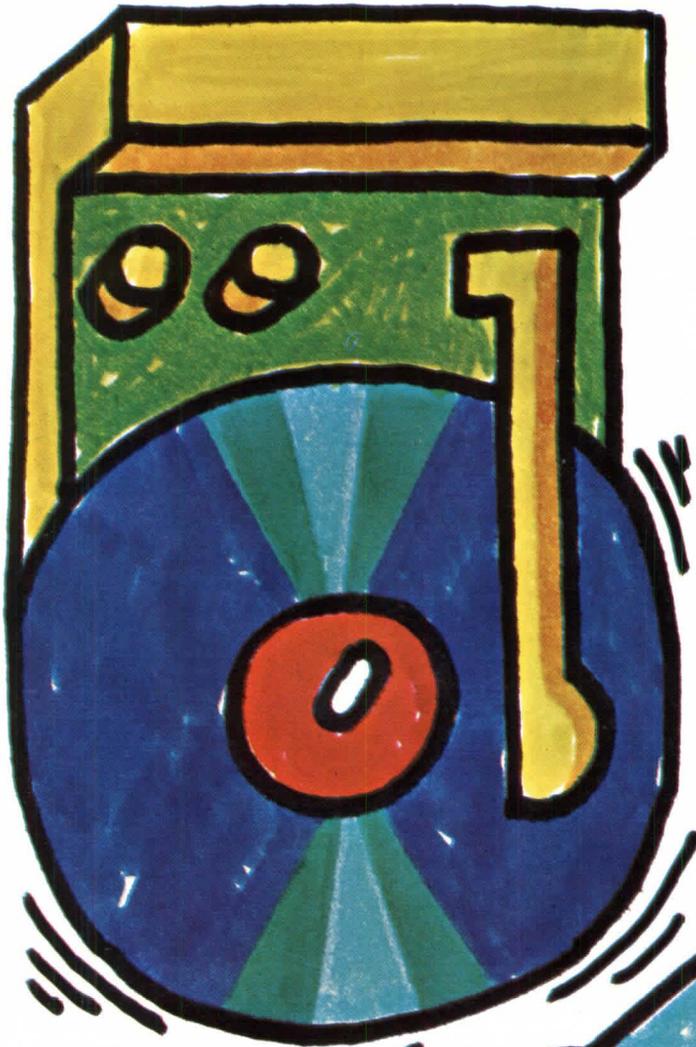
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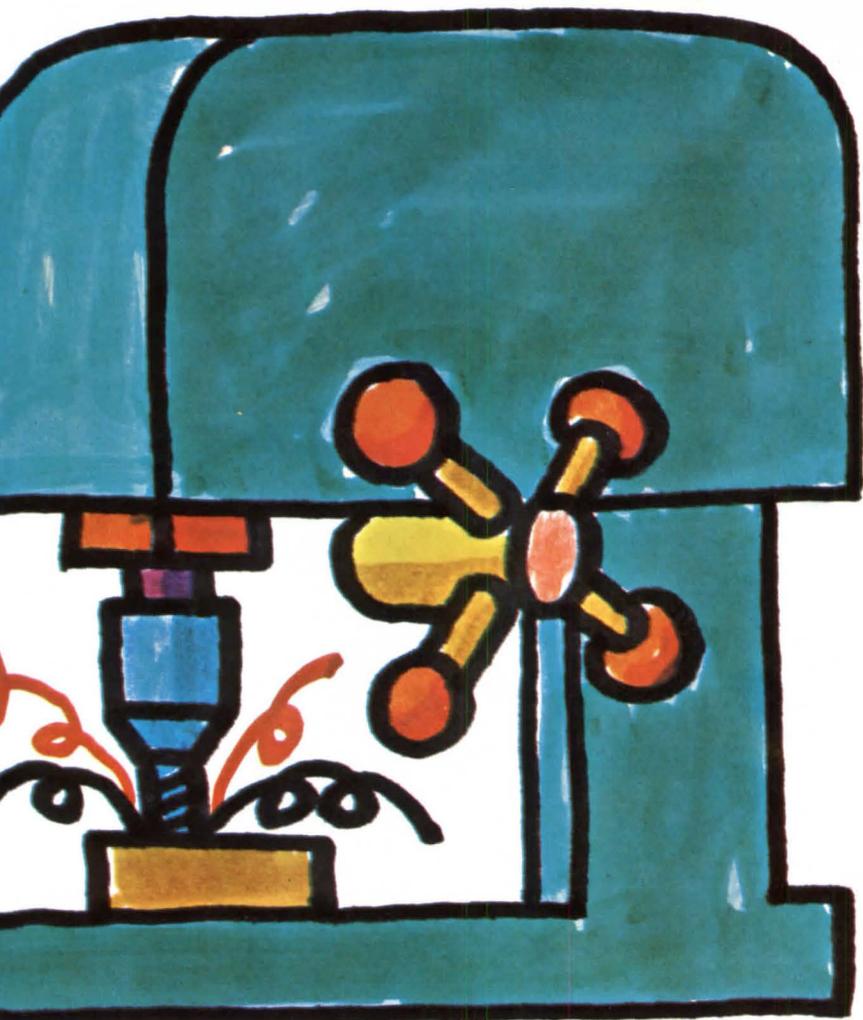
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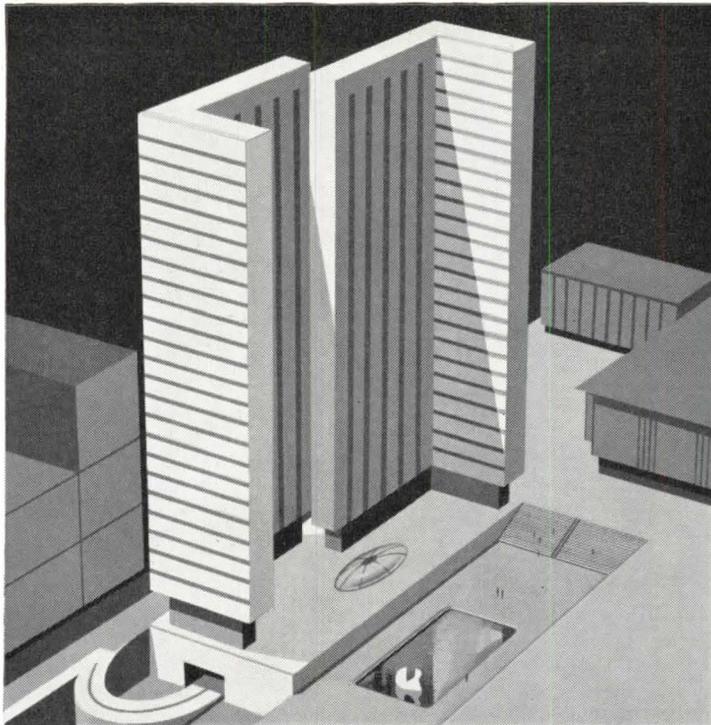




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**See the Bell System exhibit, Booths 208-210,
AIA Convention, Denver, June 26-July 1.**

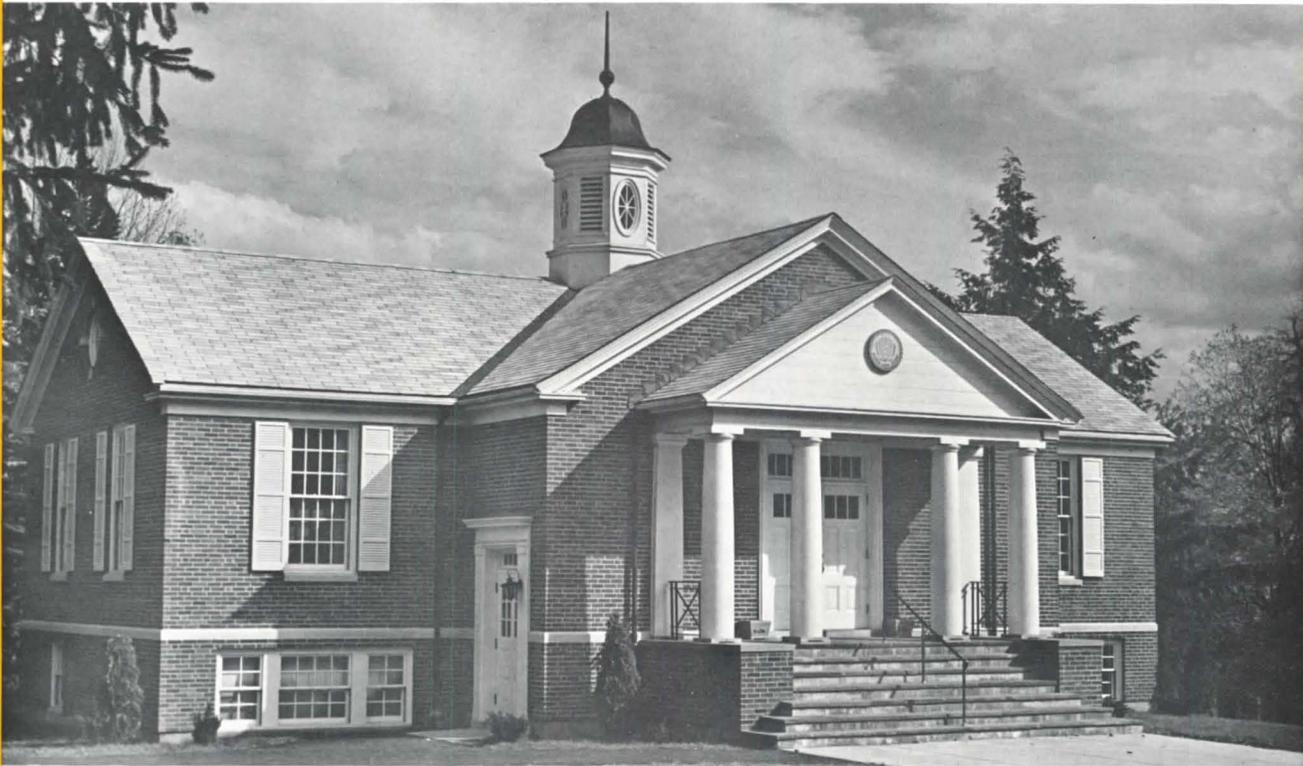
For further information on communications planning,
see Sweet's Architectural File 33a/Be
and Sweet's Industrial Construction File 19f/Be.



Bell System

American Telephone & Telegraph
and Associated Companies

Safety-Conscious College Installs Electric Heat in New Library and New Dormitory-Dining Hall



LEICESTER, MASSACHUSETTS— When Leicester Junior College here was planning to build a new library, the school's trustees were very much concerned about safety because two of the school's library buildings had previously burned to the ground. The cause of the fires was never satisfactorily determined but the trustees were determined about one thing: they didn't want the incident repeated. After carefully studying various types of heating systems using combustion fuels as well as electricity, the trustees decided on an electric heating system and the new library was completed in 1962. When a new dormitory/dining hall was being planned, the trustees again selected an electric heating system and the new 40,000 sq ft building is now under construction.

In keeping with the design of other buildings on the campus, architect G. Adolph Johnson designed the library to be built of Colonial brick veneer with white columns, shutters and trim. The

entire first floor of the two-story building is given over to the library. On the floor below are two classrooms each accommodating 30 students. The classrooms are divided by a moveable partition so that they can be made into one large room for social functions.

The library's electric heating system consists of resistance down-flow wall units in the library area and 24 kw unit ventilators in the classrooms. The building is used six days a week from 9 a.m. to 10 p.m., September through June. Operating costs have been lower than originally estimated and a rate reduction of about 6 percent that went into effect in January 1966 will mean even lower operating costs in the years to come. The economy and satisfactory performance of the library's electric heating system over the last four years, coupled with its safety, comfort and convenience features, led to the selection of electric heat for the college's newest building, the dormitory/dining hall.

1 CATEGORY OF STRUCTURE:
College Library

2 GENERAL DESCRIPTION:
Area: 6,915 sq ft
Volume: 70,000 cu ft
Number of floors: two
Number of occupants: 100
Types of rooms: library area and 2 classrooms

3 CONSTRUCTION DETAILS:
Glass: double
Exterior walls: Colonial brick veneer, 2" styro-foam (R/7). U-factor: .084
Roof or ceilings: pitched roof with hung ceiling, mineral wool (R/22). U-factor: .042
Floors: wood
Gross exposed wall area: 4150 sq ft
Glass area: 550 sq ft

4 ENVIRONMENTAL DESIGN CONDITIONS:
Heating:
Heat loss Btuh: 123,000
Normal degree days: 6,800
Ventilation requirements: 13cfm/student
Design conditions: -10F outdoors; 70F indoors
Cooling:
None

5 LIGHTING:
Levels in footcandles: 100
Levels in watts/sq ft: 2.5
Type: fluorescent

6 HEATING SYSTEM:
Electric resistance down-flow wall units in library area and unit ventilators in the classrooms.

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

8 CONNECTED LOADS:

Heating	95 kw
Lighting	17 kw
Water Heating	5 kw
Other	2 kw
TOTAL	119 kw

9 INSTALLED COST:*

General Work	\$113,210	\$16.40/sq ft
Plumbing	4,950	.71/sq ft
Electrical	14,280	2.06/sq ft
Heating	9,560	1.38/sq ft
TOTAL	\$142,000	\$20.55/sq ft

*Building was completed September 1962

10 HOURS AND METHODS OF OPERATION:
9 a.m. to 10 p.m., six days a week, September through June.

11 OPERATING COST:
Period: April 1965 through March 1966
Actual degree days: 6,982
Actual kwh: 109,620*
Actual cost: \$1,877.84*
Ave. cost per kwh: 1.71 cents*
*For total electrical usage

Month	kwh	Amount
4/65	11,880	\$ 207.72
5/65	5,760	102.72
6/65	1,980	38.43
7/65	480	11.44
8/65	420	10.36
9/65	2,940	64.76
10/65	7,920	139.39
11/65	12,300	213.90
12/65	15,240	263.88
1/66	16,980	276.21
2/66	18,900	306.66
3/66	14,820	242.37
TOTAL	109,620	\$1,877.84

12 UNUSUAL FEATURES:
The library's heating system has zone control and night setback with central over-riding control, locked thermostats and low voltage.

13 REASONS FOR INSTALLING ELECTRIC HEAT:
Trustees of the college were extremely concerned about safety because two library buildings had been destroyed by fire. After studying various types of heating systems, they selected electric heat and the library became the first electrically heated building on the campus. Low operating costs and satisfactory performance led to the selection of electric heat for the college's newest building, a dormitory/dining hall now under construction.

14 PERSONNEL:
Owner: Leicester Junior College
Architect: G. Adolph Johnson, AIA
Consulting Engineers:
 Mechanical: Richard Burke
 Electrical: Francis Shepard
General Contractor: F. W. Madigan Co.
Electrical Contractor: Mutual Electric Co.
Utility: Massachusetts Electric Company

15 PREPARED BY:
John S. Stobierski, Commercial Sales Department, Massachusetts Electric Company

16 VERIFIED BY:

G. Adolph Johnson, AIA

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

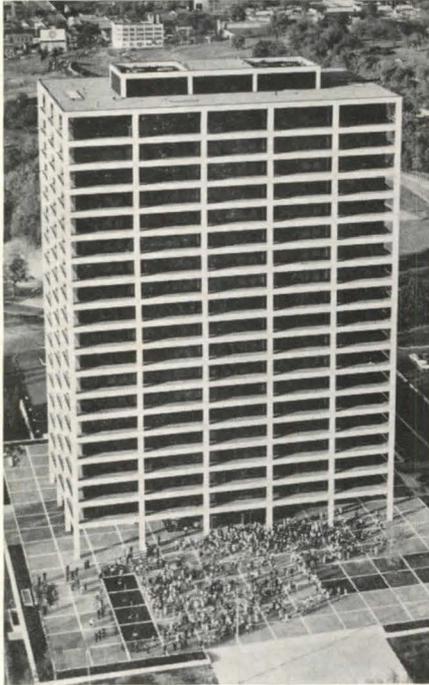
NOTICE: This is one of a series of case histories of buildings in all structural categories. If you are an architect or consulting engineer; an architectural or engineering student; an educator; a government employee in the struc-

tural field; a builder or owner, you may receive the complete series free by filling out the strip coupon at the left and mailing it to EHA. If you are not in one of the above categories, you may receive the series at nominal cost.

Name and Profession: _____
Firm, University or other affiliation: _____
Address: _____

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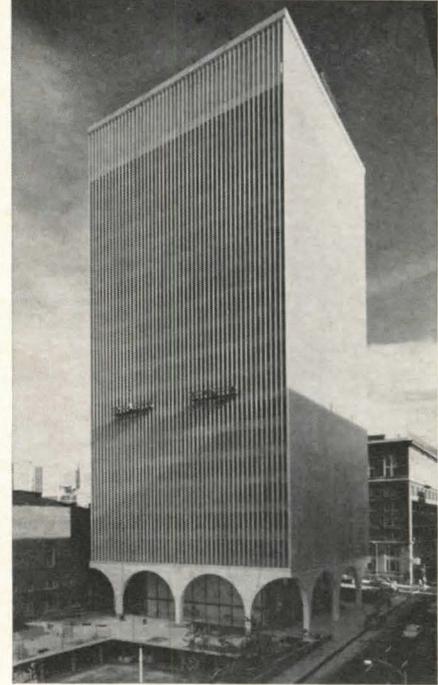
Top Honor Awards of 1965



The only honor award made this last year by the American Institute of Architects went to the B.M.A. tower in Kansas City, Missouri. Built of white marble it rises an impressive 771 feet above a bricked plaza. Window walls of heat reducing glass are inset 6 feet from the marble facade to provide ease of window maintenance and weather conditioning economies. Off the plaza is the lobby, the walls of which are of Italian Tuscan and Travertine marble. Entering the elevators through stainless steel doors one is attracted by the pure white Consoweld wainscot trimmed with stainless steel and contrasting with a charcoal colored ceiling. Lighting is obtained through numerous 2" diameter down lights resulting in a very handsome appearance. The architect is Skidmore, Owings & Merrill. The elevator cars are, of course, by Globe Van Doorn.



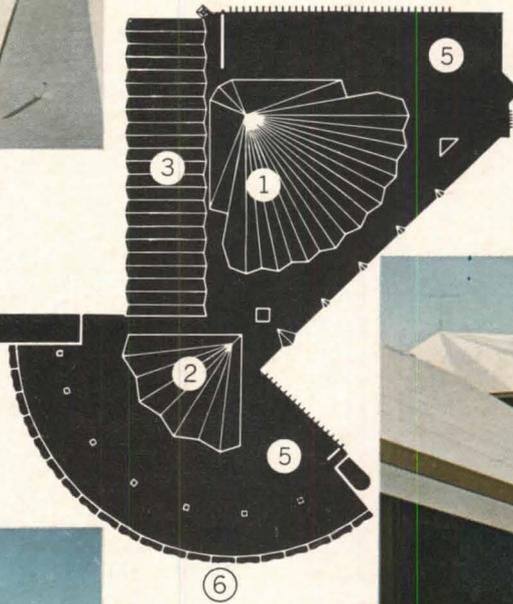
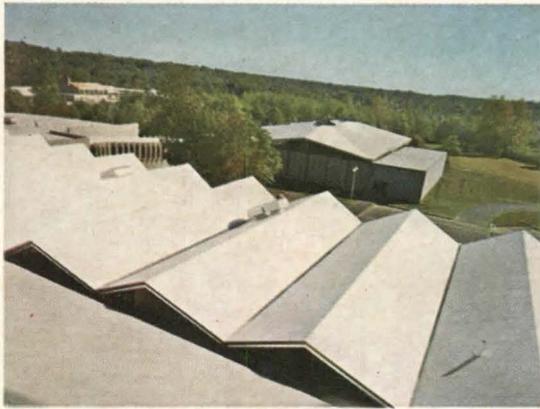
Just 3 times in the last decade has the Municipal Arts Society of New York awarded its bronze plaque to any building. To the only skyscraper that the late Eero Saarinen ever designed was awarded this distinct honor with the inscription "An Outstanding Example of Architecture Befitting the City of New York." This is the new 38 story black granite CBS Building on the Avenue of the Americas. The plan is like a rectangular doughnut, the center core housing all elevators and service facilities. There are sixteen high speed electronically controlled elevator cars. Interesting is the elevator decor. A feature is the removable panels covered with specially imported leathers edged with oxidized bronze — the whole set off by a softly lighted ceiling. Eero Saarinen and Associates are the architects and the elevator cars are, of course, by Globe Van Doorn.



The American Iron & Steel Institute top award for 1964-1965 went to the IBM Building in Seattle for both the "Best Design" and "Best Engineering" class in the high rise category. The finned appearance of the facade was achieved by covering the exterior columns of steel pipe and tubing with precast concrete covers. Steel arch girders support the base leading into the lobby. The elevators of this interesting building are perfectly custom-styled to this monumental structure, the interior of the cars being most attractive with applied panels of Regency Walnut Formica and set off with stainless steel reveals. The ceiling is of suspended aluminum eggcrating sandwiched between plexiglass, thereby giving a soft yet luminous lighting effect. The architect is Minoru Yamasaki & Associates. The elevator cars are, of course, by Globe Van Doorn.

Let your new buildings join the rapidly growing list of prestige structures like these award winners and look to Globe Van Doorn of Milwaukee for the best in elevator cars.

Roof design declared in



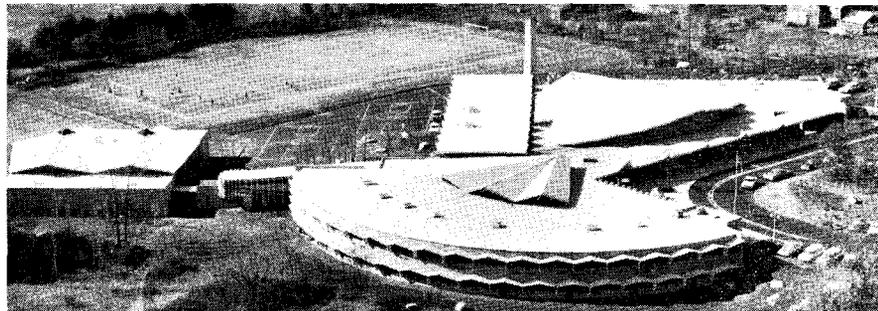
independence Connecticut

Johns-Manville roofing materials meet unique needs of Coleytown Junior High School—Joseph Salerno, Architect.

The Coleytown school in Westport, Connecticut, illustrates the new freedom in roof design—with the new generation of built-up roofing materials from Johns-Manville. Here's how advanced J-M roofing products were used with imagination in this functional modern design:

J-M Last-O-Roof® was the choice for the fan-shaped folded plates over the auditorium (1) and the library (2); for the roofs of the arts and crafts rooms (3); and the octagon roofs (4) of the detached gymnasium. Last-O-Roof is a single-membrane plastic elastomer roof. It adapts to practically any roof configuration and can be used on practically any slope. Application is fast because the membrane and cements arrive ready to use, require no on-site preparation. The roof is finished with a reflective coating of Last-O-Lume®—white here, but also available in colors.

J-M Gravel-Surface Roofing was used on the flat roof area (5). It's built up with Johns-Manville base and finishing felts, plus a flood coating of the J-M bitumen, Aquadam®, and a white gravel topping. Here the gravel surface contrasts attractively with the



gleaming Last-O-Roof surfaces that rise from the flat areas.

J-M No. 80 Flexstone® Roofing covers the "eyebrow" sunshades (6) over classroom windows. The top ply in this asbestos roof specification is No. 80 Flexstone cap sheet. Its felts are 85% asbestos fiber, so they are actually flexible coverings of stone. These asbestos felts are asphalt-saturated, then asphalt-covered, then firmly embedded with a layer of ceramic granules. No. 80 Flexstone can be furnished in white or in a variety of colors.

J-M Last-O-Flash® was specified for all of the flashings. This is a heavy polyisobutylene film embedded with woven glass fiber for extra toughness. Developed as a component for Last-O-Roof, it can also be used with other

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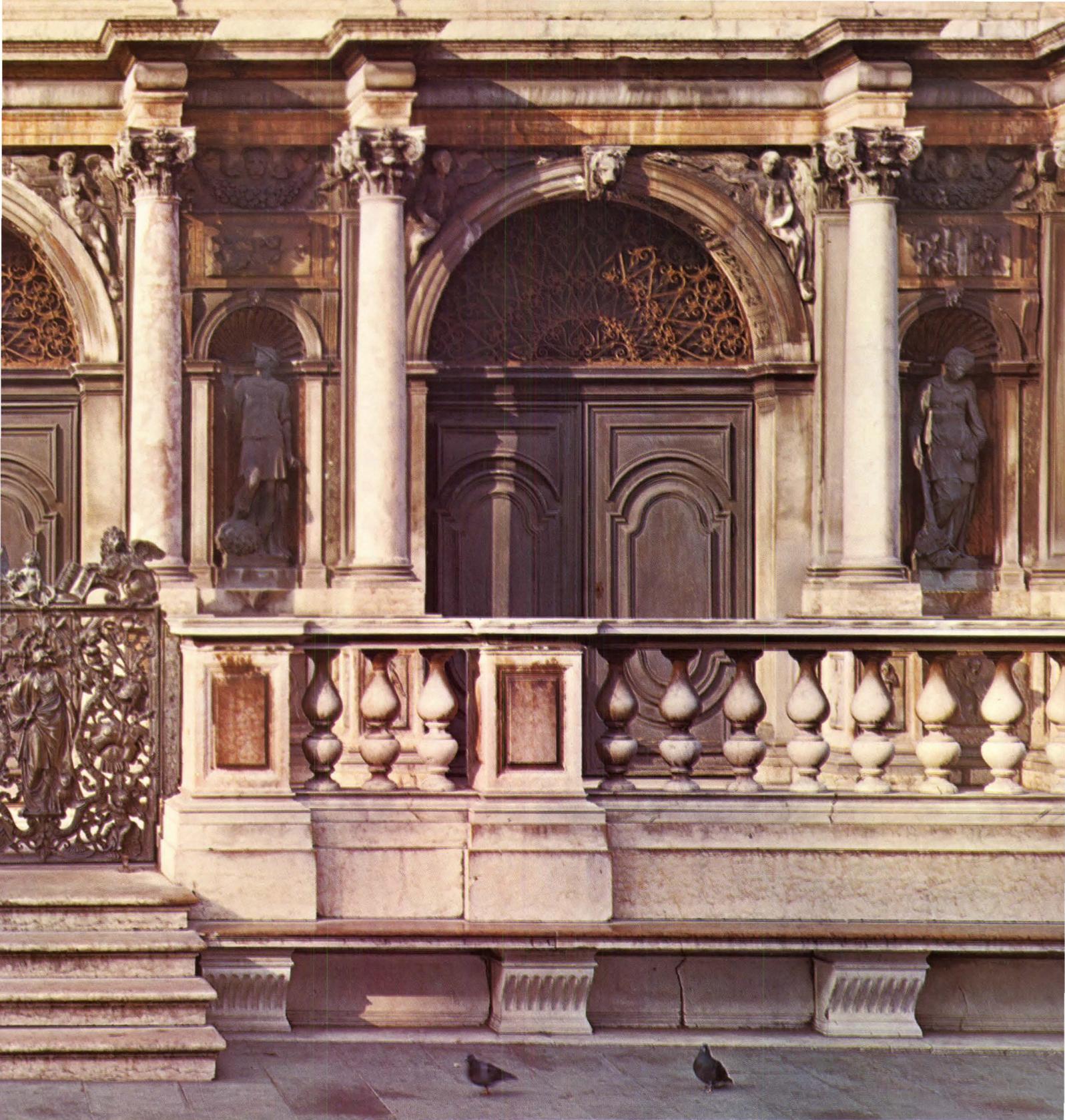
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Timeless beauty of Renaissance style is seen in the doorways of Sansovino's loggetta of the Campanile, on St. Mark's Square in Venice. If you would like a specially prepared reproduction, made from this photograph, write to Schlage Lock Company, Box 3324, San Francisco.

feel a lock should have a long trouble-free life. Hence, we start with materials for which we pay a premium — special strip steel, for example, rolled to our precise specifications. We machine these materials to extremely close tolerances, and maintain quality control through our unique system of rigid inspection. The re-

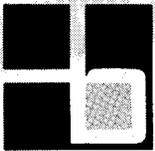
sult is a superior lock. A lock that, in terms of maintenance and longevity, makes economic sense. 🌿 We make this kind of lock in 101 handsome designs and 23 finishes. Making them takes ingenuity, skill and experience. But who should know more about making cylindrical locks than the people who invented them?

Bayley windows daylight the school

Manalifeid Elementary School, Port Murray, N.J.
Architect—Jules Gregory, Lambertville, N.J.
Contractor—Louis Hajdu, Inc., Alpha, N.J.

Architect Jules Gregory created an environment to make learning a joy. This vital school focuses attention on the interplay of children to the world around them. The architect chose Bayley steel classroom windows because section strength avoided sight line clutter while permitting use of large gray glass lights. Permanent steel windows are economical, initially and through time. For steel or aluminum windows and curtain walls, application assistance, and responsible performance contact

The William Bayley Company,
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BAYLEY





#10 South Riverside Plaza, Chicago, Illinois. Owner and General Contractor: a subsidiary of Tishman Realty & Construction Co., Inc. Architects and Engineers: Chicago office of Skidmore, Owings & Merrill.

exposed steel: beauty and economy

This building turned out so well the owners are building a second just like it. A 5/16" steel plate and wide flange mullion facade encloses 650,000 square feet of usable area. The wall is free of expansion joints and serves to stiffen the building through composite action

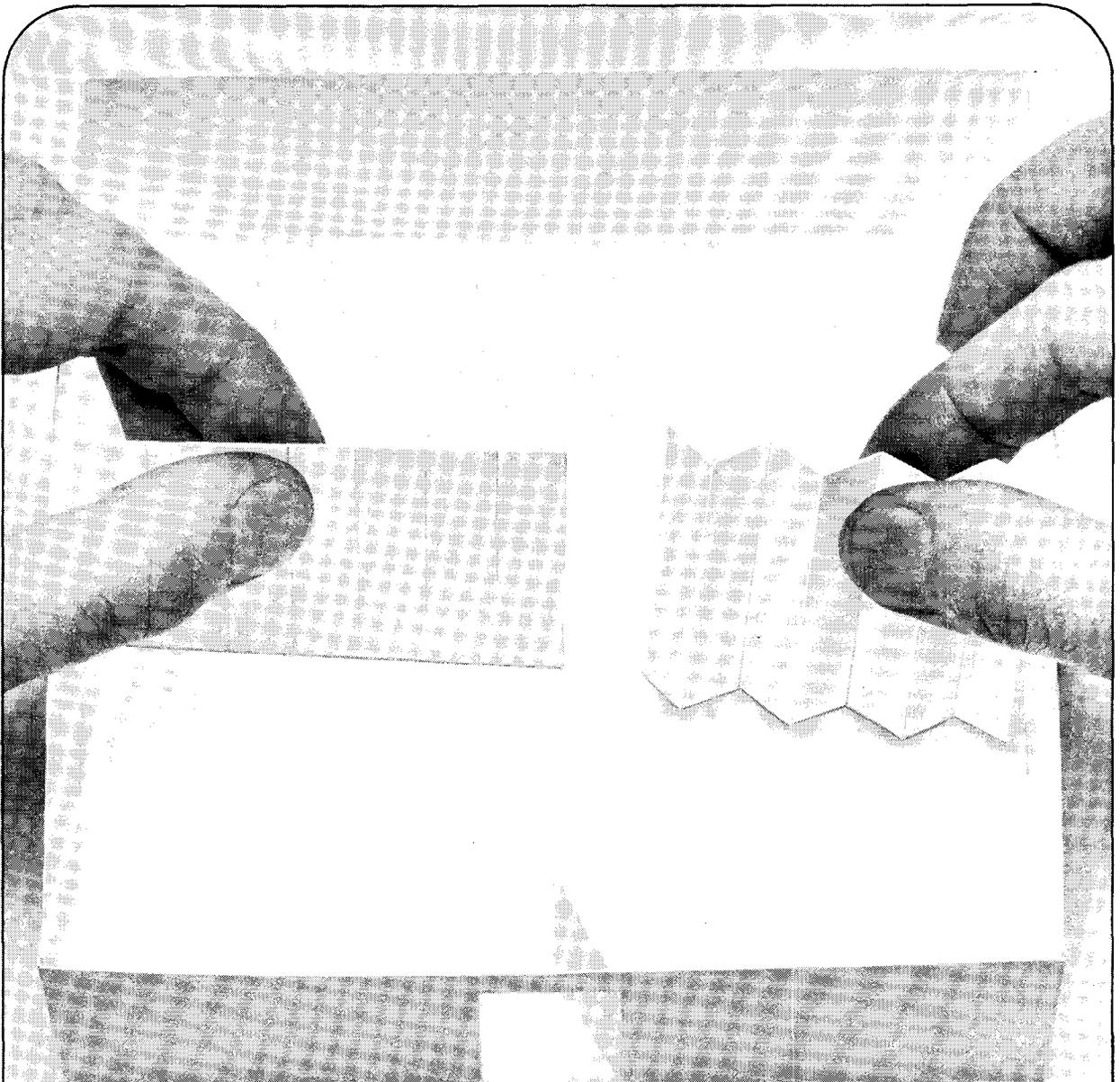
of the steel plate with concrete fire protection and the steel beams and columns. The steel facade is painted graphite black. The owners calculate that even with periodic painting the exposed steel wall offers great economy. The original paint job is expected to last for at

least ten years. The building's classic simplicity presents an honest statement of the function and beauty of steel. For more information about this building or constructional steels, contact a USS Construction Marketing Representative at our nearest sales office.



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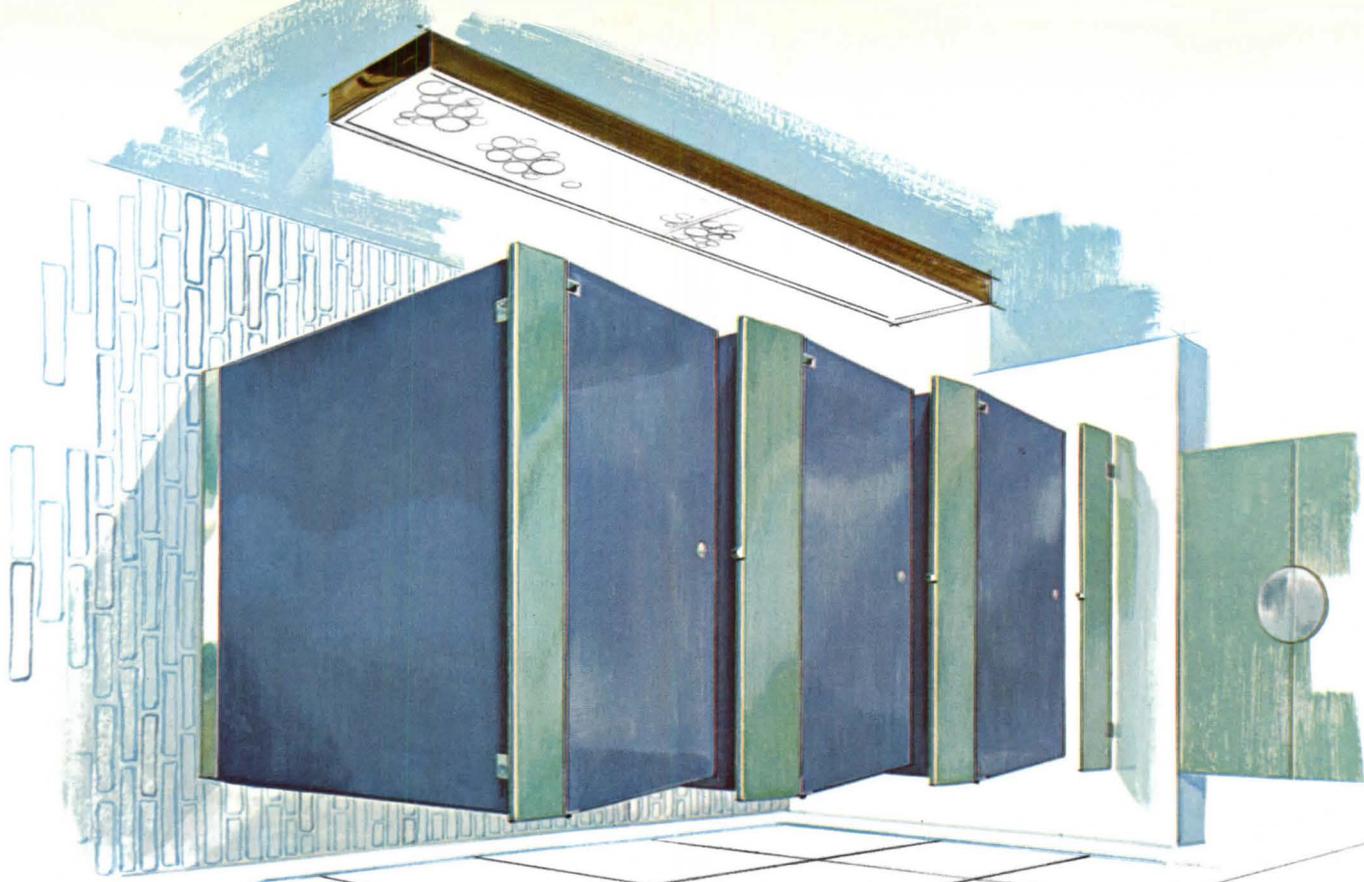
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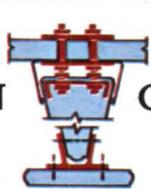
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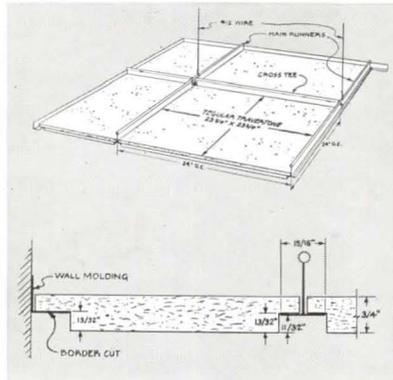
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This distinctive ceiling adds a new dimension: dimension.



We rabbeted all four sides of our new Armstrong Tegular Travertone™ ceiling panels. When you lay them in, they extend 11/32" below the exposed grid, creating a bold, dimensional effect that's enhanced by the fissured Travertone design. And note how the dimensional effect can be attractively accentuated by painting the grid, as seen above.

The panels are finished with a washable vinyl latex paint. They clean quickly and easily with a moist cloth or sponge. If desired, they can be repainted without noticeable effect in acoustical efficiency. Made of non-combustible mineral fiber, Tegular Travertone carries the UL label with a Class I Flame Spread rating. Tegular Travertone Fire Guard is available with a 2-hour UL

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FORUM

Out in Texas, where cowboys are not in the least embarrassed to use motorized transportation to round up cattle, driver education recently faced a critical test. The occasion was the April 28 completion of the final section of the Dallas Thornton Freeway (below), a 12-lane complex with 11 entrances and exits for six expressways intersecting the 1.8-mile link.

All during April, newspapers, billboards, television and radio stations dunned away offering freeway instructions in a campaign "cast in a positive vein to avoid alarming drivers before they even got on the road." General Motors, in recognition of what it called "the pivotal significance" of the Thornton Freeway, picked up the



\$6,000 tab for the driver education operation.

Nevertheless, there was little assurance that Texans would be happy about Thornton's many left-hand turnoffs for right-hand exits—even knowing they were traveling what is, to the Texas Highway Department, "the most sophisticated piece of highway engineering ever done."

INS & OUTS

LANDSLIDE BOB

Inch-by-inch, HUD Secretary Weaver has dragged the rent supplement program out of a grudging Congress. With the assistance of the Administration—and, at one point, of the Alaskan Eskimos—Weaver brought the program through a series of hair-raisingly

close votes until, by late May, it faced only one further obstacle. This was the sequence of events:

Last year, the House and Senate both approved the rent supplement program, but the House killed a \$12 million appropriation to get it started. This year the program seemed well on its way after the House, by a 198-190 vote, approved \$12 million for the balance of fiscal 1966 (the Administration had asked \$30 million, without really expecting to get it all).

But on April 25, Republicans and Southern Democrats on the Senate Appropriations Committee ganged up to knock out the \$12 million by a 15-12 vote. Two days later the Senate overrode the committee and restored the funds. The key man was Senator E. L. Bartlett of Alaska, who had been among the nay-sayers in the committee. After the Administration reversed its opposition to a Bartlett bill providing \$10 million in housing assistance to the Eskimos, the Senator reversed his to rent supplements and cast the tie-breaking vote.

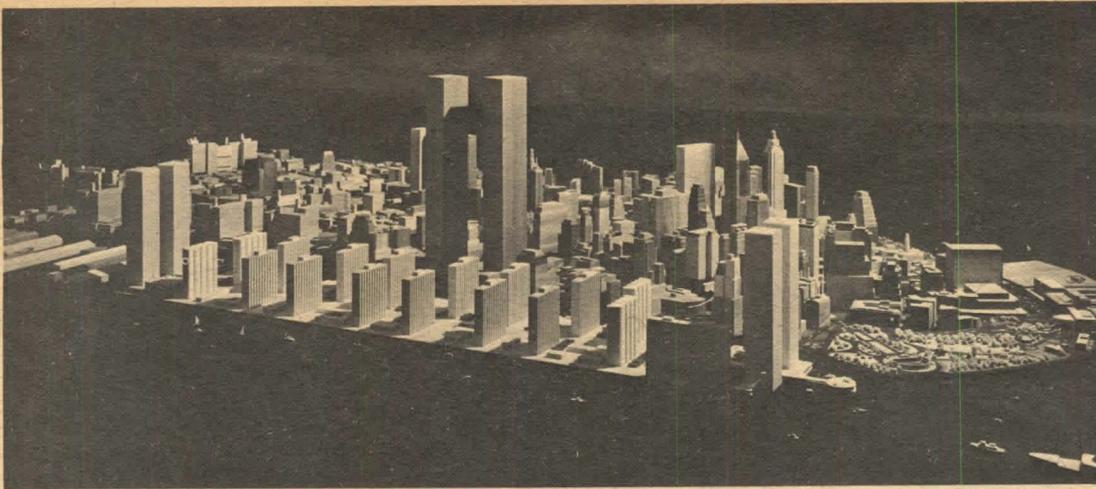
There still remained the matter of appropriations for fiscal 1967, however. The Administration was asking \$38 million. On May 5, the House Appropriations Committee rejected a subcommittee recommendation of \$22 million. The vote was 25-21.

On May 10, with no aid from the Eskimos, the House restored the \$22 million. The margin this time was four votes: 192-188. "They still call me 'Landslide' Weaver," quipped the secretary. One last landslide still was required—passage of the fiscal 1967 funds by the Senate—but HUD officials were optimistic.

WHY THE ROADBLOCKS?

The rent supplement program, one Senator observed last month, would have had the wholehearted support of the late Robert A. Taft. It did, in fact, have the backing of such staunchly conservative groups as the National Association of Real Estate Boards, who saw in it a private-enterprise alternative to public housing.

Why did it run into so much trouble in Congress? One reason is the present Congressional mood in respect to all new domestic programs, which is compounded of rebellion against LBJ, anticipation of the coming elections and nervousness about the high level of spending forced by Viet Nam.



\$600 million office-residential complex (above) built on 98 acres of filled land along the Hudson. It would accommodate 14,000 families in all income ranges, without displacing a single resident—only a few old piers and ferry terminals.

The model he presented at the press announcement might have done much to divert criticism of the Trade Center design. But Wallace Harrison, who produced it, was quick to point out that it did not represent a *design* for the project, just a preliminary study.

RUINS

CONSTRUCTIVE DEMOLITION

It's been a long wait, but the New York World's Fair is at last making a positive contribution to building design. The Building Research Advisory Board is conducting measurements on three Fair pavilions in the throes of demolition to see if the complete structures have a stiffness stronger than tests of their separate parts would indicate.

Engineers Wiss, Janney, Elstner & Associates, acting for BRAB, wrapped part of the Bourbon Street pavilion in polyethylene sheeting, then pumped air out until the resulting vacuum collapsed the roof and floor. The technique, never before used on a full-size building, promises the most uniform loading of any testing method.

The engineers used 208 hydraulic jacks to demolish the concrete waffle-slab roof of the Belgian Village Rathskeller, largest test of this kind to date. Four big vibrators were put to work shaking the Belgian Chimes Tower like a tuning fork at "earthquake rate." At the end of May, the 87-foot structure was still standing.

It was the first time since demolition of the San Francisco exposition of 1939-40 that engineers had been given the chance to measure the resistance of entire buildings to weight and vibration. BRAB, which received government and foundation support in the testing program, will report on the results next spring.

PICKING UP THE PIECES

Amid the rubble that announces "progress" in our older cities, there is often a lot of anonymous sculpture—some of it touching, some of it grotesque, some of it merely pretentious, but most of it as little noticed before demolition as during.

A few years ago a group of New Yorkers who had been spiring away choice pieces of this wreckage decided to organize as the Anonymous Arts Recovery Society. They soon got together with the venerable Brooklyn Museum across the river, which had a memorial fund set aside for a sculpture garden.

The result, opened this spring,

is the Frieda Schiff Warburg Memorial Sculpture Garden, the country's first Happy Hunting Ground for terra cotta fauns. Here, among 200 nameless columns, keystones, and cartouches—the sources of many of them left unrecorded by A.A.R.S. enthusiasts on the run—are such big-name items as capitals from Louis Sullivan's Bayard Building (still standing, without them) and one of the ladies who used to hold up the clock in Penn Station (below left).

Money was limited, so many of the pieces are merely strewn about on ivy-planted banks (below). They may not show off too



well that way, says Marvin Schwartz, the museum's curator of decorative arts, "but that may convince people that the buildings themselves must be saved, not just the ruins."

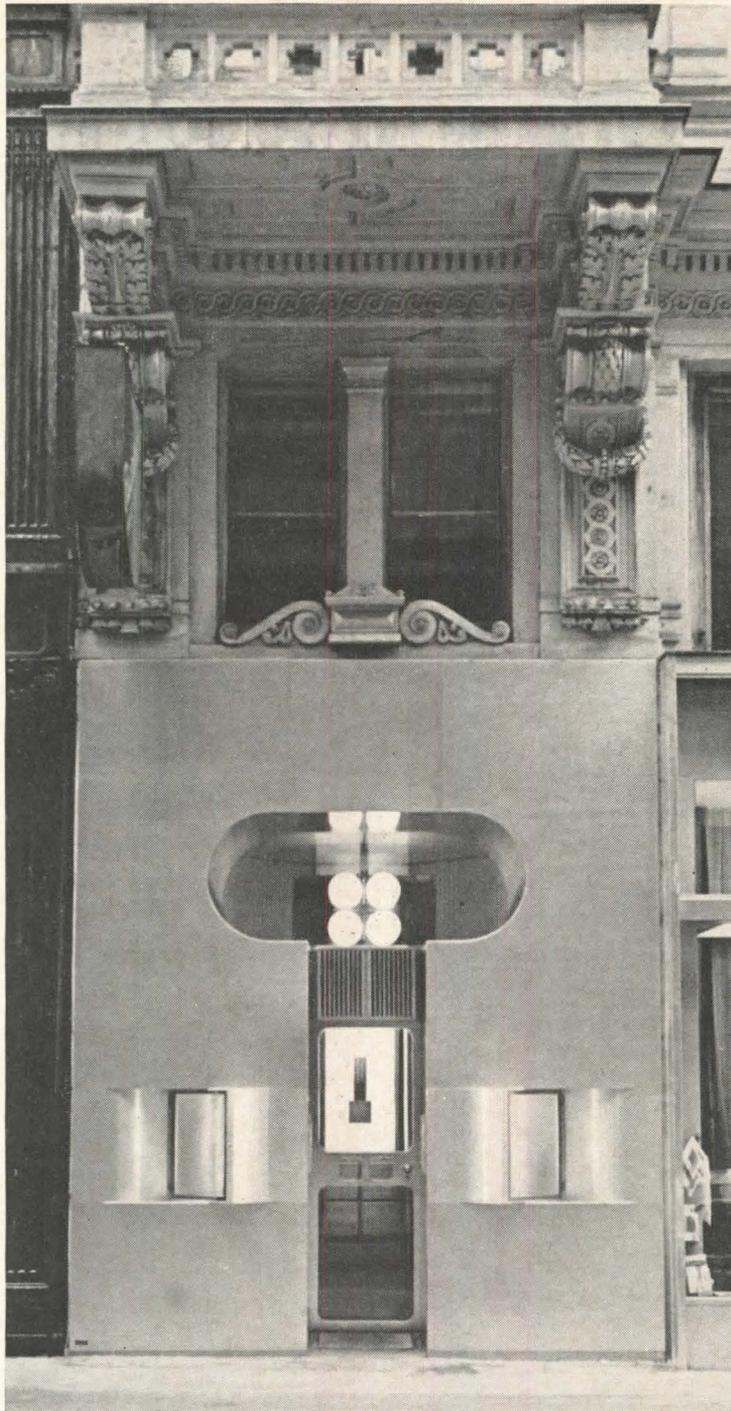


BIG PLANS

MOLECULES ON THE PLAINS

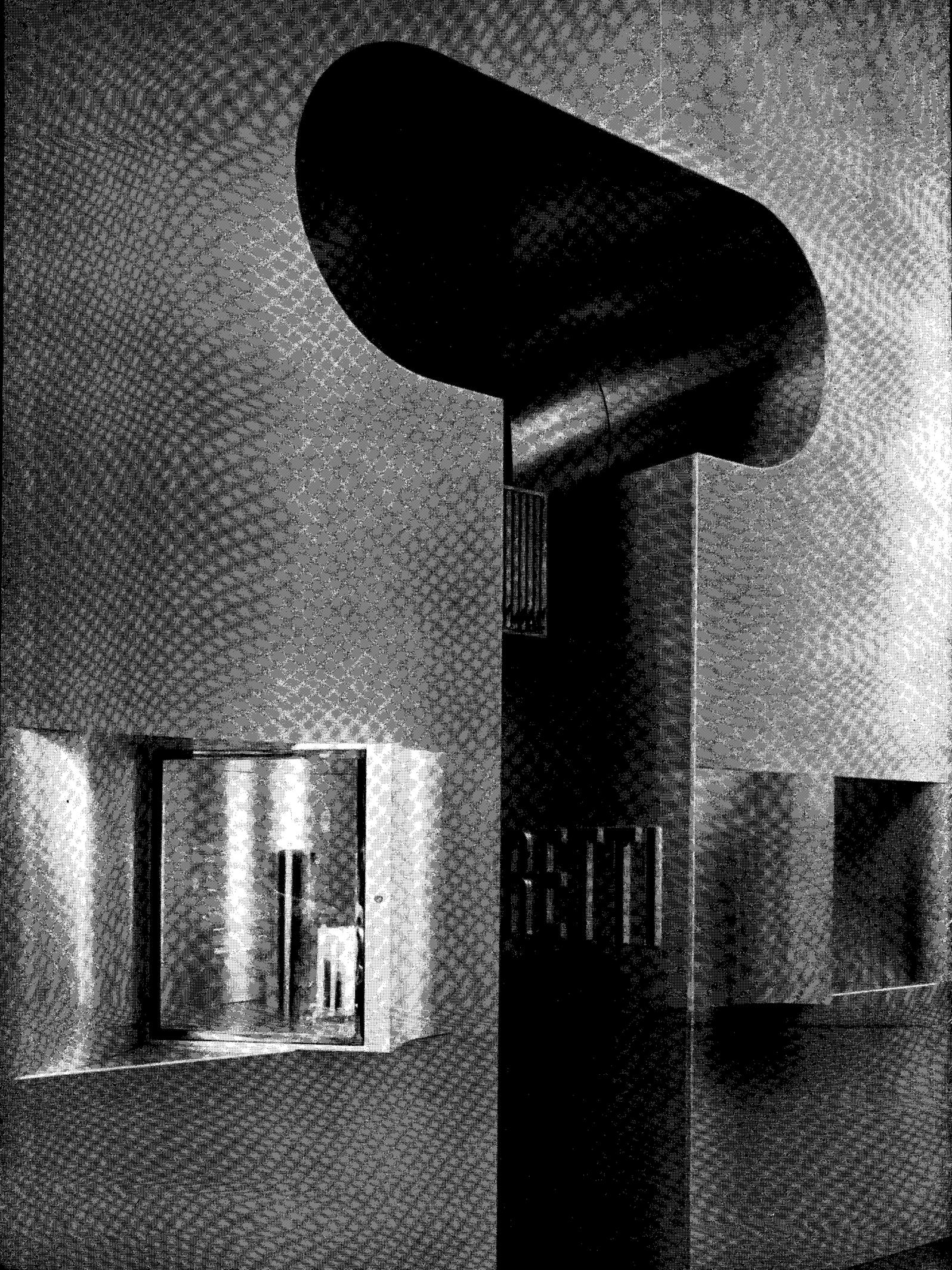
The Committee for National Land Development Policy last month proposed construction of 25 new, preplanned "molecular cities" in America by 1995. Describing the present U. S. city as "an almost hopeless tangle," the committee said its problems could be solved "only by transferring basic

(continued on page 87)



KEYHOLE SHOP

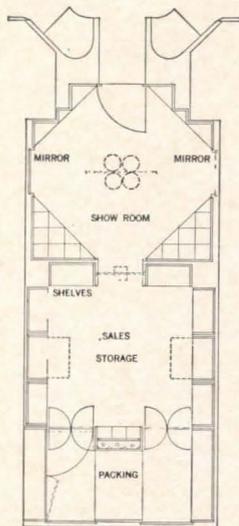
Hans Hollein's first commission was even smaller than most first commissions: a shop and showroom 12 feet wide for a candle maker. But it brought him an enthusiastic client and a prominent location on a fashionable Vienna shopping street. That was all Hollein needed to shake Vienna's architectural complacency. His shop confronts the city with a cool, precise plane of polished aluminum, interrupted by a keyhole-shaped opening to arouse the curiosity of the passerby and two angled showcases to give him a hint of what is inside as he approaches. But the name of the shop is not revealed until he walks into the keyhole (overleaf).





Passing between two enameled aluminum signs, close by at eye level (see previous page), the customer enters a shop no larger than a commodious dressing room. The polished aluminum of the front follows him inside, but here it picks up reflections of the reddish carpet and the orange shantung which lines the display niches. But the most important added material is the clear mirror in floor-to-ceiling panels that produce endless reflections, and thus make the shop look much more spacious.

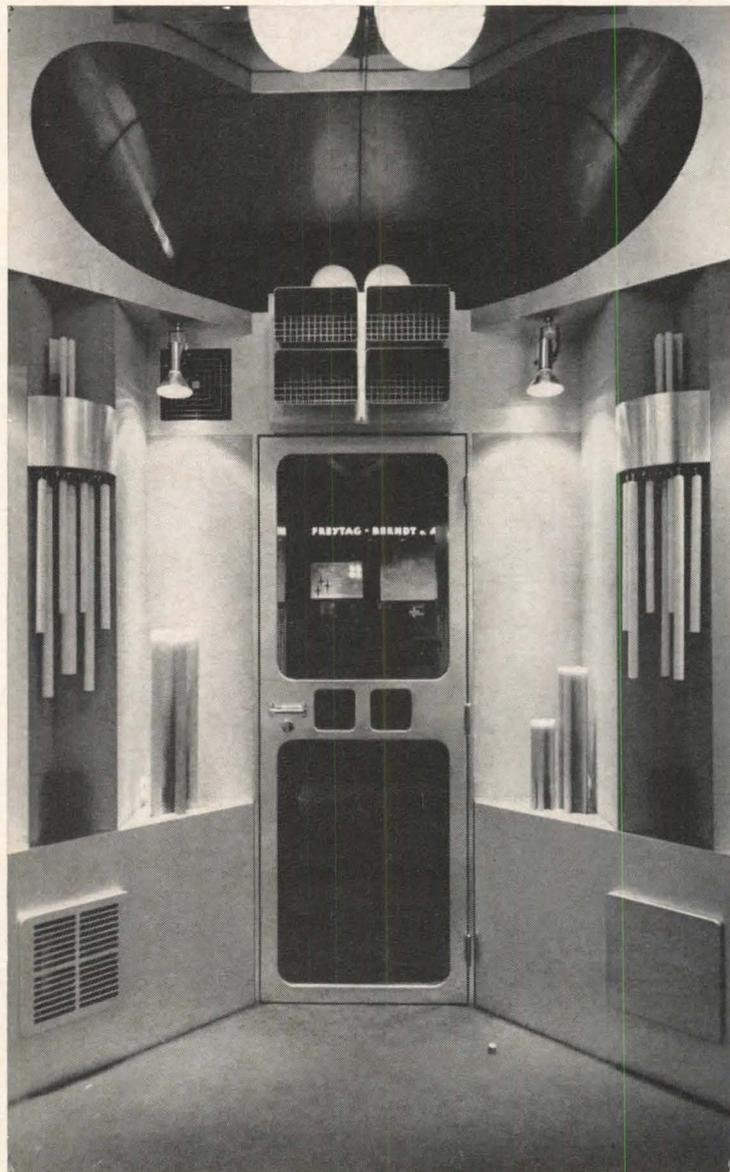
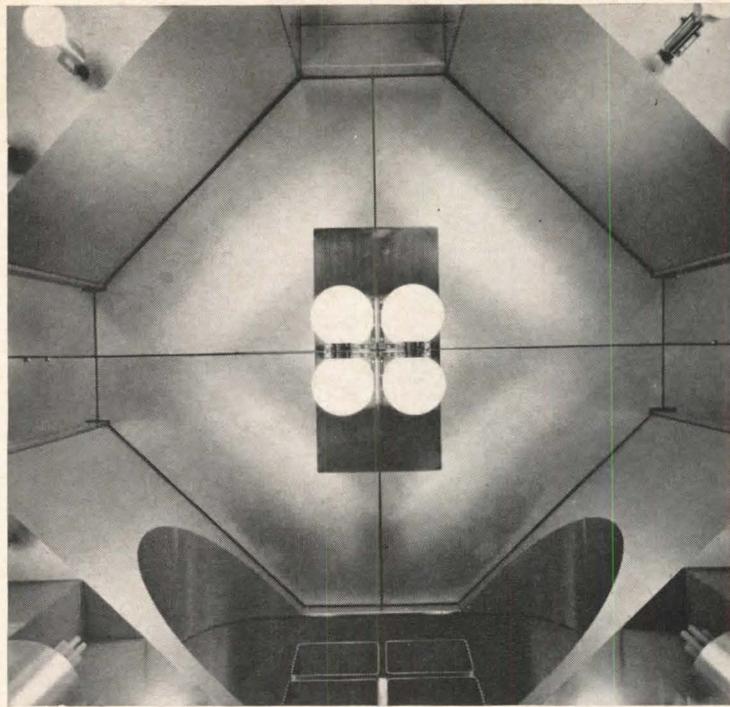
The candles themselves add polychrome detail to the disciplined composition. The custom-



designed candles could not be displayed burning, but the warm colors reflected in metal and glass compensate visually for the missing flames and candlesticks.

To dramatize the displays of candles in the niches, Hollein has designed a set of prismatic aluminum blocks that can be stacked in innumerable arrangements (opposite). Denser arrays of candles are presented in the back room of the shop, on shelves and sliding trays that line the walls. All surfaces in the back room are of light gray plastic laminate, except for the aluminum cabinet doors and gates in the rear wall, which are visible from the entrance (previous page). A display niche on the axis of the entrance uses back lighting to show the internal structure of special candles made of differently colored layers of wax.

The character of the shop is



set by the jewel-like precision with which Hollein has handled the metal details. To keep the aluminum sheet unbroken by screws, it was attached to supporting brackets with epoxy glue, except where panels had to be removable. Wherever possible the sheet has been folded over rather than joined at corners, to make joints less conspicuous. The silky texture of the polished aluminum has been complemented by brighter metals at some points: chromium plated brass in the show window frames, chromium plated steel in the door hardware (specially designed for the specially designed aluminum door), and stainless steel in the central light fixture.

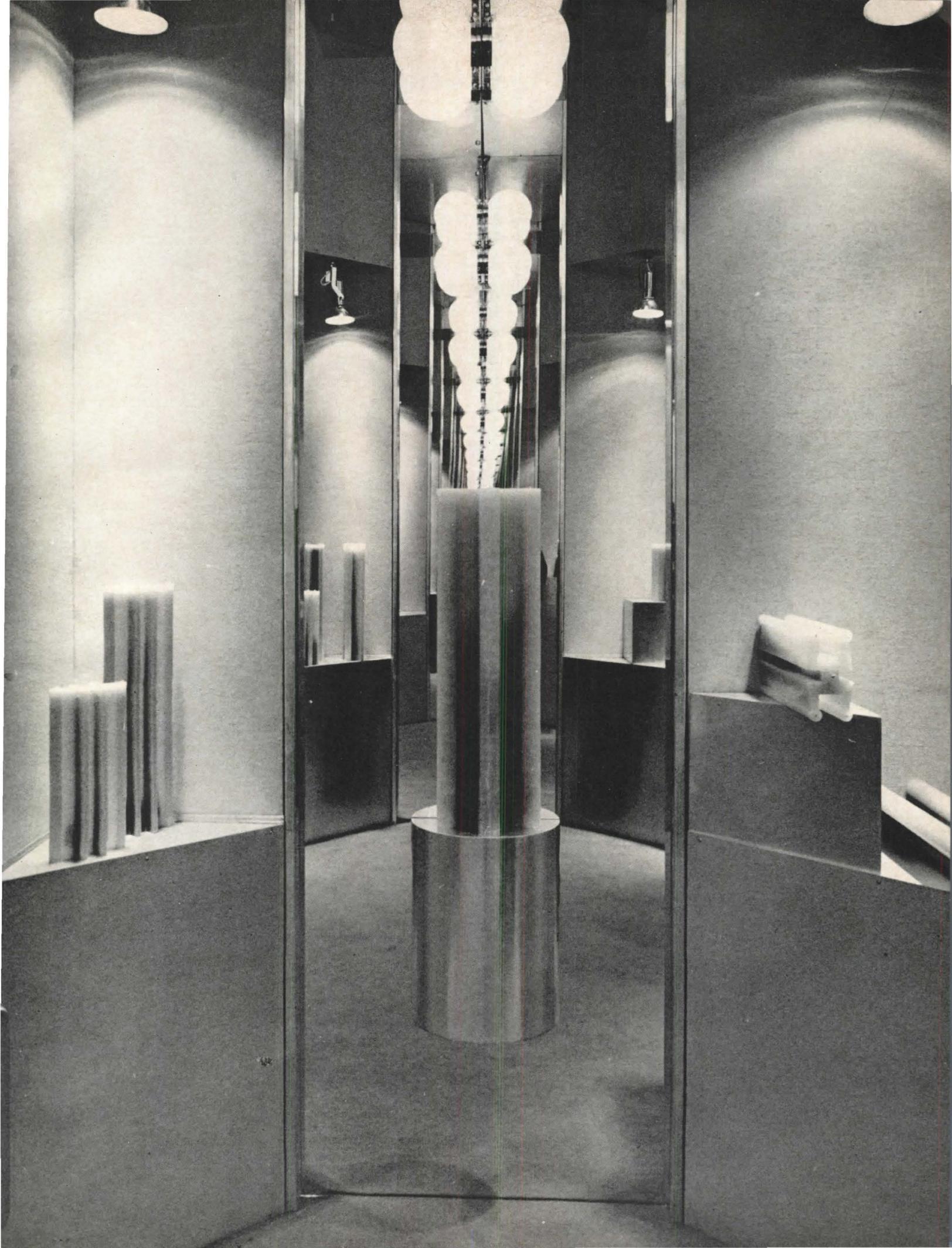
Heating and cooling equipment, all of it quite ordinary has been left exposed. The overhead air conditioner has been given a new aluminum mask on the interior, but the warm air intake and grille to the left of the door are undisguised. An almost whimsical suspended fan distributes conditioned air to the back room (see previous page).

Most of the lighting is equally simple. The architect-designed stainless steel fixture at the center of the shop provides general illumination and is visible from outside through the "key hole." Spotlights over the candle displays, which look rather industrial, are actually custom-made of chromium-plated steel.

Hollein's remarkable development of a minor commission, and his meticulous metal detailing won him the \$25,000 R. S. Reynolds Memorial Award, to be presented at the A.I.A. Convention in Denver this month. It is the first time in the ten years of the Reynolds program that the award has gone to a work that cost less than the prize.

FACTS AND FIGURES

Retti Candle-Specialty Shop, Vienna, Austria. Owner: Marius Retti Wachswarenwerk. Architect: Hans Hollein. Lighting consultant: Rudolph Gschnitzer. Mechanical consultant: Ede Dulosy. Building contractor: Konrad Mandahus. Metal fabricator: Anton Schwarz. Building area (gross): 248 sq. ft. Cost: approximately \$16,000, excluding fees and cost of space. PHOTOGRAPHS: Franz Hubmann.



BART: The Bay Area Takes a Billion-Dollar Ride

One weekday morning in December, 1969, if all goes according to plan, a suburban commuter in the San Francisco Bay Area will enter a handsome new building not far from his house, purchase a ticket from an automatic machine, walk through a computerized turnstile, and take a fast escalator to a canopy-sheltered platform. Not more than two minutes later, he will board a sleek, shiny train, walk down a carpet-covered aisle, and sit in a wide, upholstered seat. Riding in quiet, air-conditioned comfort, he will be whisked away on clickless tracks at speeds reaching 80 miles an hour. He will gain his destination in a fraction of the time it would have taken by car or bus.

He, and hopefully some 100,000 others like him, will be riding BART (for Bay Area Rapid Transit), the first totally new mass transit system to be built in the U.S. in more than 50 years, and the first to openly challenge the dominance of the automobile.

A lot more than the future of the Bay Area will be riding on BART's billion-dollar attempt to rescue the area from traffic strangulation and drastic decentralization of its urban centers. The outcome will be watched closely by officials in scores of other cities who want to know, without having to find out the hard way, whether a modern version of the traditional fixed-rail rapid transit system is an answer to their own problems, or merely a false hope.

Luring the commuter

To win its gamble, BART is banking on a simple, but untried, formula: provide a system so fast, so convenient, so economical, and so plush that at least half of the commuters in the three-county district served by BART will gladly leave their cars at home. BART's planners exude confidence that they will carry it off, and they point to the fact that voters in the district embraced the concept of rapid transit in 1962 when they passed a \$792-million bond issue—the largest of its kind in history—to finance construction of the system. (An additional \$180 million in surplus Bay Bridge

tolls, \$71 million in revenue bonds, and \$8 million in Federal grants will make up the remainder.)

BART will link the urban core of San Francisco-Oakland with more than a dozen suburban communities in the East Bay. Its 75-mile route will have 12½ miles of subways in downtown San Francisco, Oakland, and Berkeley; 31 miles of elevated lines (BART, for obvious reasons, prefers to call them "aerial lines"); 24 miles of surface lines; a 3½-mile twin tunnel through the Berkeley hills; and a 4-mile tube—the world's longest—under the Bay. Twenty-three of its 37 architect-designed stations will have free parking lots, ranging in capacity from 300 to 1,500 cars.

BART's lightweight aluminum trains, riding on a wider-than-normal track gauge for greater stability, will maintain an average speed of 50 miles an hour, including stations stops. (Other U.S. systems have trouble exceeding an average of 20 m.p.h.) The transbay trip from downtown San Francisco to downtown Oakland will take eight minutes; the same trip by car can take at least 30 minutes during rush hours. The trip from Walnut Creek to San Francisco now requires 45 to 55 minutes; BART's schedule is 28.

BART's trains, to be automatically operated from a single control center, will initially be scheduled at two-minute intervals at peak hours, with a maximum of 15 to 20 minutes at slack periods. Eventually, as patronage picks up, BART aims to reduce the peak-hour headway to 75 seconds.

Fares, ranging from 25 cents to \$1 for a single trip, will be high by conventional transit standards, but easily competitive with the cost of commuting by car. Passengers will be checked in and out of the system by magnetically coded tickets purchased from automatic, self-service fare collection machines. The tickets, with values as high as \$20, will be read by electronic exit and entry gates, the trip amount deducted, and a new entry made on the back to tell the rider how much value he has left. BART may also issue credit cards and bill regular patrons monthly.

BART is even thinking of providing "train screen"

barrier walls between the station platforms and the train to shield passengers from noise and air blasts. The screens would be balustrade height in the 22 above-ground stations, and full height in the 15 subway stations. Automatically controlled gates would open in unison with the train doors.

Voices of dissent

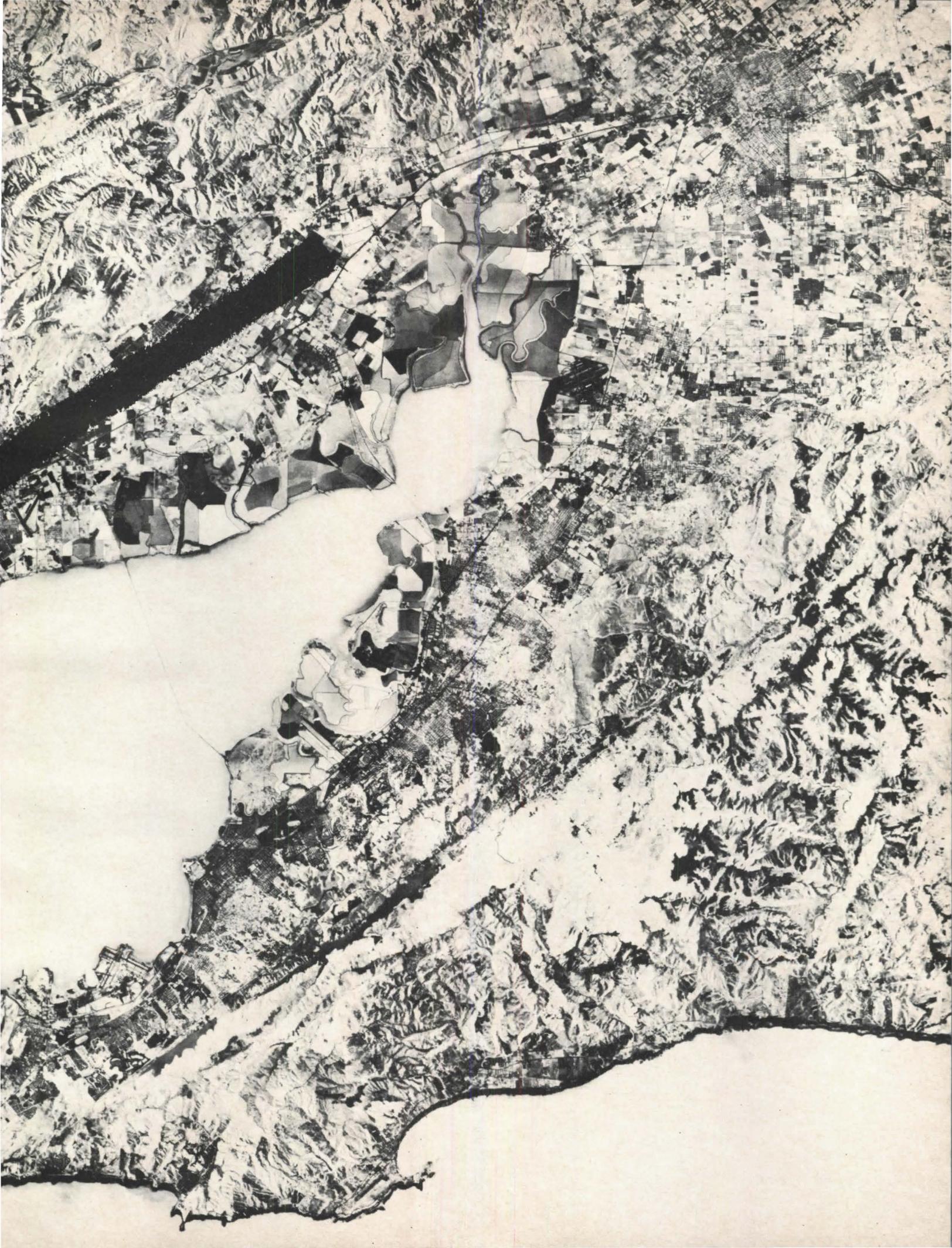
Despite BART's space-age trappings, some look upon its prospects with less than enthusiasm. Martin Wohl, former director of Harvard's Transport Research Program and now a National Science Foundation fellow at Berkeley, claims that "San Francisco has been sold a 19th-century system with a few modern-day embellishments to make it appear futuristic." In choosing electric, fixed-rail transit, says Wohl, BART has tied itself to an "unchanging, immobile and inflexible system that will be in stark contrast to the highly mobile society it will serve."

Noting that more than 80 per cent of the area's downtown workers live within 12 miles of their jobs, Wohl predicts that BART, with its system of widely spaced stations averaging two miles apart, will be too inconvenient to be used by enough of the close-in workers, and will have too few potential customers from the outlying regions.

John W. Dyckman, chairman of Berkeley's Center for Planning and Development Research, shares these views. "As an answer to the problem of urban transportation," he wrote in *Scientific American*, "BART has great shortcomings to match its great promise."

It is too early to tell whether BART or the critics are right about these basic transportation planning decisions, and too late to change them. But BART is more than transportation—it is the largest single act of urban design currently underway in the U.S. On the following pages is an analysis of the processes by which the design phase of BART is being carried out, of the results to date, and of the impact which the system will have on the cities it serves.





The men who shaped BART were, first an engineer, then a publicist, and finally an architect

The three men who have played perhaps the most important individual roles in BART's planning and design entered the process at significantly spaced intervals. One, an engineer, was in from the system's first conception in 1953. Another, a newspaperman turned publicist, came in just before the November, 1962, bond election and stayed on to become BART's general manager. The third, an architect, was engaged less than three years ago.

The engineer was Walter O. Douglas, partner in the giant firm of Parsons, Brinckerhoff, Hall & MacDonald, the first professional consultants hired by the San Francisco Bay Area Rapid Transit Commission. The commission, established by the State Legislature in 1951, asked Parsons, Brinckerhoff for answers to four basic questions: Is an interurban rapid transit system needed for the Bay Area? If so, what communities should rapid transit serve and along what routes? What type of transit would best meet the Bay Area's needs? And finally, is the cost justified?

In 1953, after two years of study, the engineers produced a far-ranging report that answered the first and fourth questions with a resounding "yes." "We do not doubt that the Bay Area citizens can afford rapid transit," they said. "We question seriously whether they can afford *not* to have it." The system they proposed joined San Francisco and Oakland by a transbay tube, and extended into Marin County, north and



south along the East Bay shore, through the East Bay hills into residential Contra Costa County, and down the Peninsula. A later stage was to loop the bay, going as far as San Jose to the south, Napa and Santa Rosa to the north, and Livermore to the east.

The report was more than a system diagram: it constituted the first land-use master plan ever developed for the Bay Area,

and to this day it remains the only one. It went far beyond engineering considerations, incorporating the research and conclusions of planners Adams, Howard & Greeley of Boston and Lawrence Livingston Jr. of San Francisco, plus assorted experts in population, economics, real estate, industrial land planning, traffic and transportation—as well as a planning staff employed by the engineers. A

large committee of city planners throughout the area also participated in its development.

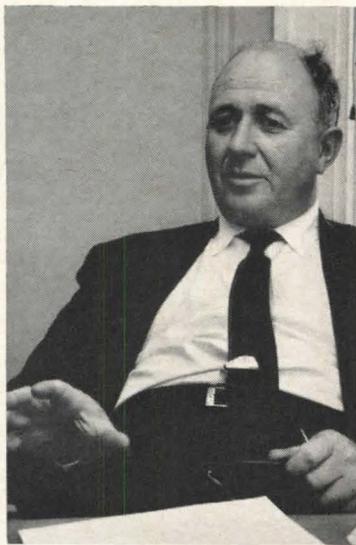
"The report," says Walter Douglas, who headed the project and is often called the father of Bay Area transit, "was a bona fide regional expression of the planning profession of the area. We acted more as a catalyst than anything else. Nobody can deny that many of the finest minds in the country in

the regional planning field participated in the report."

In 1957, the Legislature transformed the commission into the Bay Area Rapid Transit District, covering the five innerbay counties affected by the plan's first stage. The district was composed of directors officially appointed by county boards of supervisors and committees of mayors, and was given authority to levy taxes to support a general obligation bond issue—if approved by the voters.

The BART District's first task was to produce a more detailed plan, complete with alignments, station locations, performance standards, and cost estimates, on which to base the bond issue. Again it called on its original consultants (now called Parsons, Brinckerhoff, Quade & Douglas) who formed a joint venture with Tudor Engineering Co. and Bechtel Corp. The plan proposed by the joint venture (Parsons Brinckerhoff-Tudor-Bechtel) looked substantially like the final route map at upper left—but with a few significant differences.

The 1957 legislation required approval of county supervisors before the bond election. BART suffered its first major setback when the supervisors of San Mateo County, just south of San Francisco in the neck of the peninsula, pulled out. They felt that the county would pay too much and gain too little. Then Marin County, to the north, was forced out when an engineering review panel ruled that the olden Gate Bridge could not safely carry transit facilities.



Walter Douglas: The Engineer

The solid lines on the original map in two major directions of commutation, representing first-stage construction, became dotted lines representing a later extension of the system.

BART then turned to the job of selling rail transit to the auto-minded residents of the remaining three counties (one of which, Contra Costa, had come within a single supervisor's vote of dropping out too). As chief salesman, it hired B. R. Stokes, political reporter for the Knowland family's *Oakland Tribune*. Stokes and the BART directors—including Adrien J. Falk, the dynamic 81-year-old president of the board—embarked on a continuous round of speechmaking. "We didn't turn down a single request," recalls Stokes. "We talked to groups of all sizes and types."

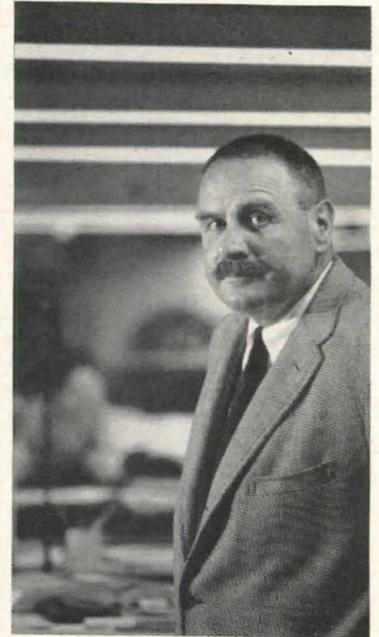
The law required a 60 per cent majority for approval of the



B. R. Stokes: The Manager

\$792 million bond issue. BART got 61.2 per cent. BART also won a taxpayers' suit that followed the election (and caused a six-month delay). Stokes was appointed general manager of the operation, and, to no one's surprise, the joint venture of Parsons Brinckerhoff-Tudor-Bechtel was retained to carry their plan through design and construction.

The budget upon which the bond issue was based had not contained any money for landscaping or architectural services.



Donn Emmons: The Architect

But BART "wanted the system to be esthetically pleasing," says Stokes, so decided to engage architects and landscape architects to work under the engineers.

Thus it was that, in the fall of 1963, Donn E. Emmons of Wurster, Bernardi & Emmons became consulting architect, not to BART but to the joint venture. (He was not quite the first architect on the scene: in the spring, the engineers had hired a young practitioner named Sprague Thresher on a staff basis to advise on procedures.) BART also named Lawrence W. Halprin as chief landscape architect, and Emmons called upon Ernest Born to be a sub-consultant on design of subway stations. BART was getting ready to build.

BART: The trains and tracks

"It'll knock your eyes out," predicted BART Director H. L. Cummings early last year. He had just returned from the offices of Sundberg-Ferar in Southfield, Mich., a suburb of Detroit, where he got a preview look at the prototype passenger car which the firm had designed and built, working with the St. Louis Car division of General Steel Industries. Cummings described what he saw as "fabulous, something way beyond our dreams."

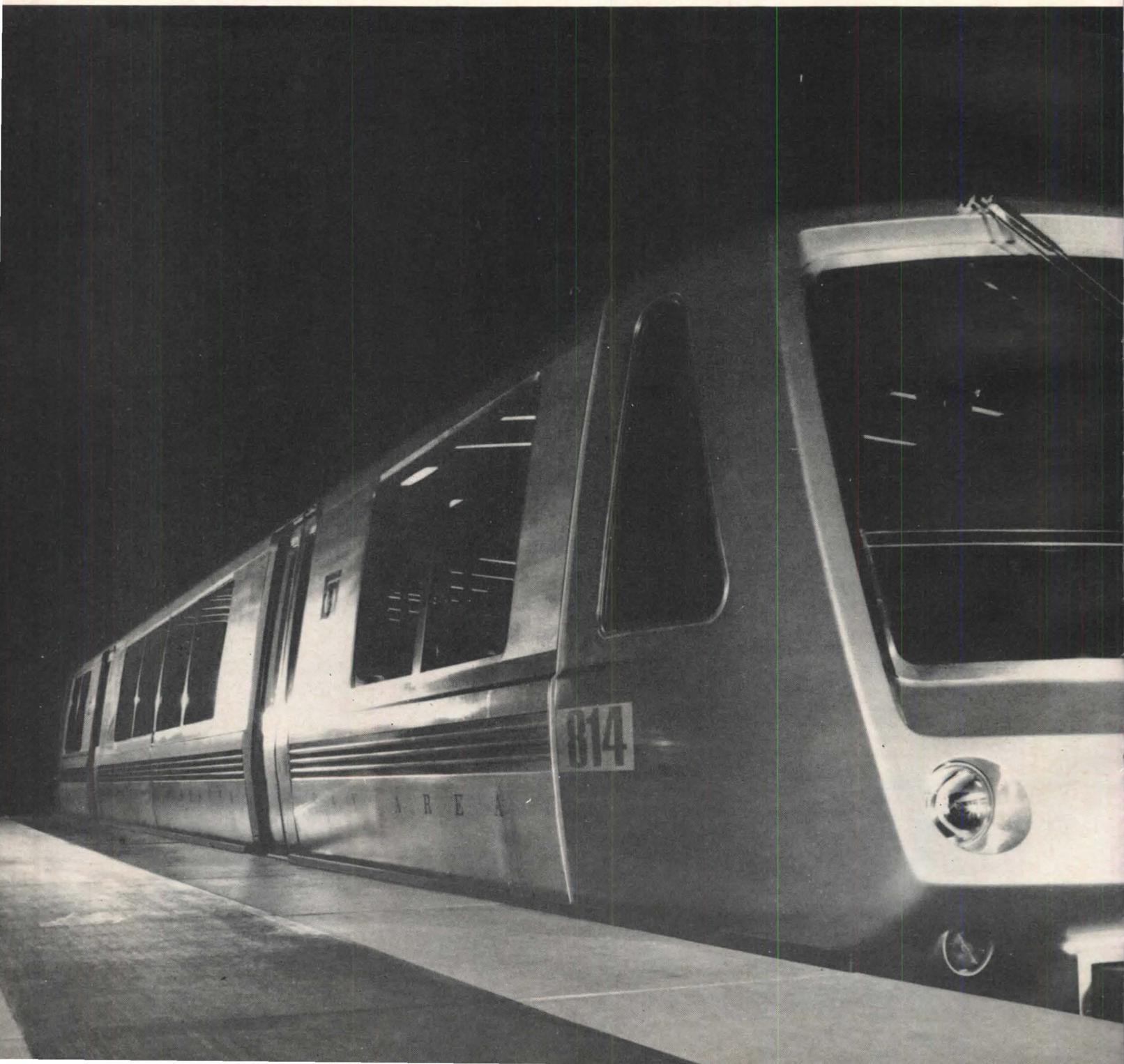
Later, after the prototype was trucked to the Bay Area and

unveiled last June, Cummings' raves were taken up by his fellow directors and the BART staff. Falk praised its "jet liner luxury." Stokes said it "epitomizes, more than any words can do, our entire philosophy."

BART had been expecting great things from Sundberg-Ferar, who won the contract after BART had interviewed four industrial design firms. The other candidates, so the widely circulated story goes, made rather quiet, sober presentations, while Sundberg-Ferar put on a

spectacle that tremendously impressed the board and staff.

The prototype design is "simple, straight-forward, logical, easy to accept," says Carl W. Sundberg, who with Montgomery Ferar, an architect, founded the firm in 1933 after both had worked as designers in the styling section of General Motors. "We gave the nose a sophisticated, sculptured look, yet we kept it simple; we used no gimmicks or clichés strictly for the sake of appearance. We wanted the car to appeal to all ages and



alks of life, so we gave it a
et look to reach the younger
eneration, yet a solid, practical,
en dignified look to appeal to
ults."

Some fear that the luxurious
terior will be an irresistible
mptation to vandals. Falk dis-
rees: "You don't decide not to
ild a new house just because
meone might throw a rock
rough the picture window. We
ied to make the car so attrac-
ve it will discourage malice of
is sort." Others find the car's
esign too slickly "Detroit." Ar-

chitect Edward C. Bassett of
SOM feels it should have had a
"timeless quality, in the tradi-
tion of true industrial design."

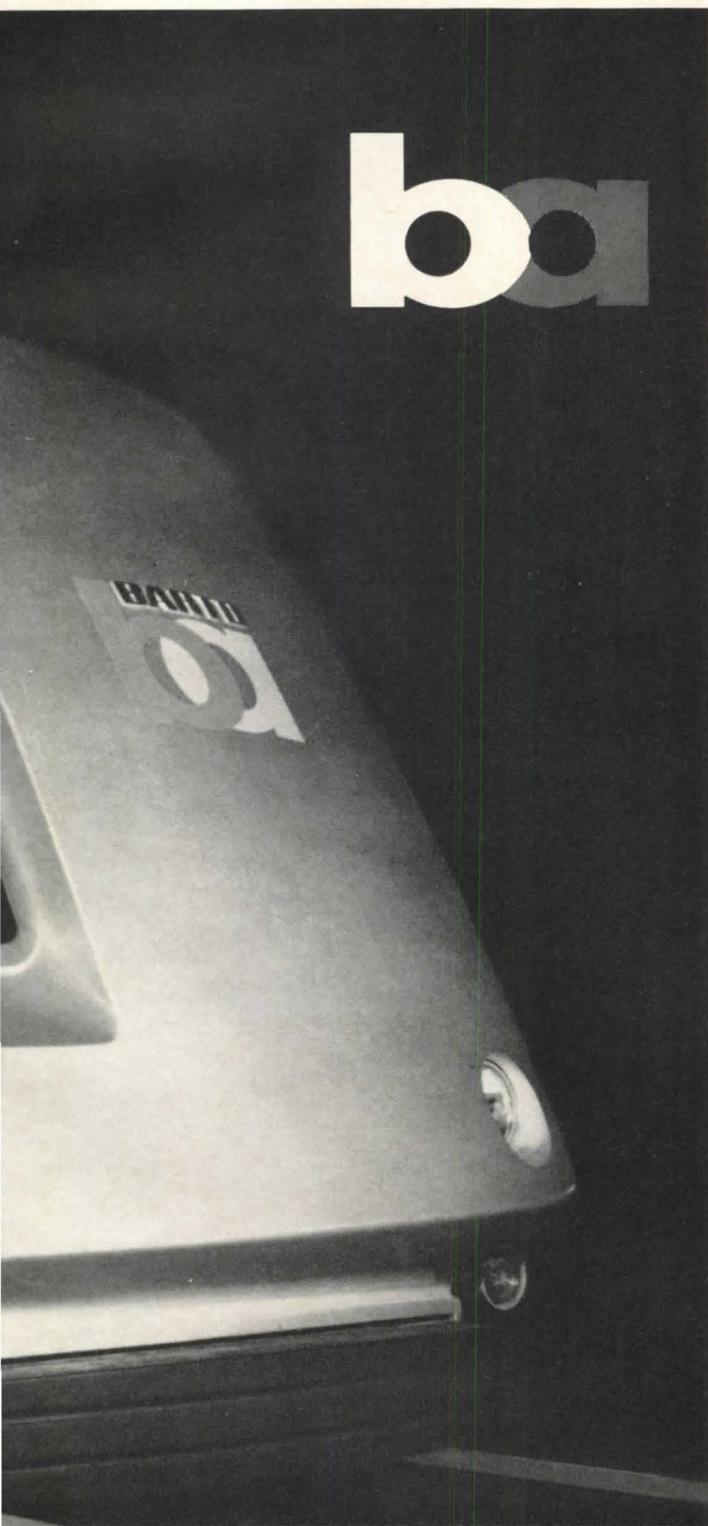
The prototype's most contro-
versial feature is the control
"pod"—the detachable section at
the front that gives the car its
sculpted profile. The pod houses
all the automatic control equip-
ment for each train (plus a
manual control panel which the
operator will use only in emer-
gencies), eliminating the need
for expensive, space-consuming
control cabins in each car. But

the BART trains are shuttles
(there are no loops), which
means that the wheelless pod
must be hoisted and attached to
both ends, thus greatly compli-
cating the frequent procedure of
changing the length of trains.

Nevertheless, BART is so deli-
ghted with Sundberg-Ferar's
work that it has hired the firm
to design all the station hard-
ware (ticket booths, turnstiles,
vending machines, housing for
the automatic fare collection sys-
tem) and all the graphics
(the BART symbol, route maps,

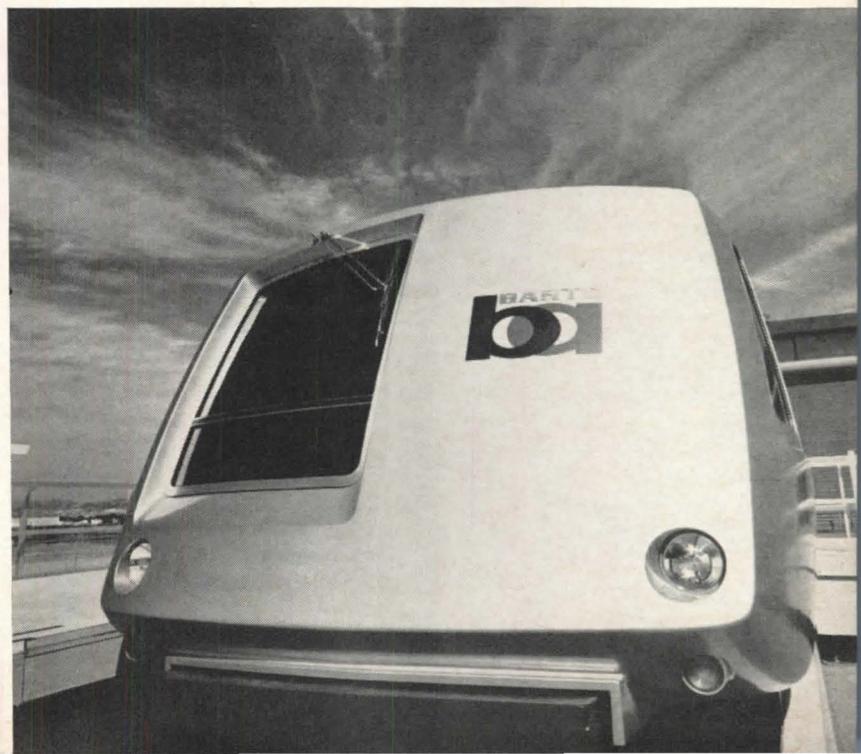
and directional and information-
al signs in all stations). It would
be surprising if Donn Emmons
did not feel that he should have
been given an active role in the
work turned over to Sundberg-
Ferar. Instead, he can do little
more than express his opinions,
along with members of BART's
and the engineers' staffs.

At the time Sundberg-Ferar
was given the graphics contract,
Emmons already had put to-
gether a set of criteria and
standards for station signing
and had proposed that Saul



BART found its prototype car so
"fabulous" that it gave the design-
ers, Sundberg-Ferar, the system's
graphics to do too. The first result:
the "ba" symbol, inset at left. The
car's interior (above) has wide,

overstuffed seats, carpeting—and
no straps, because BART claims
everybody will sit. The detachable
control "pod" in front of each car
(below) may have to be scrapped
because of coupling problems.



Thirty miles of burly elevated track structures will be run through both countryside and city

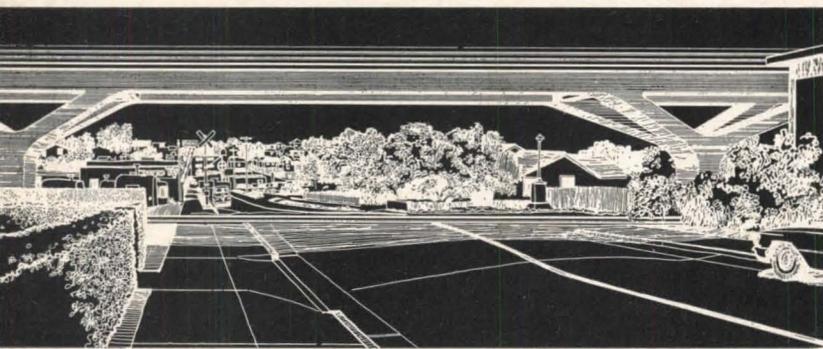
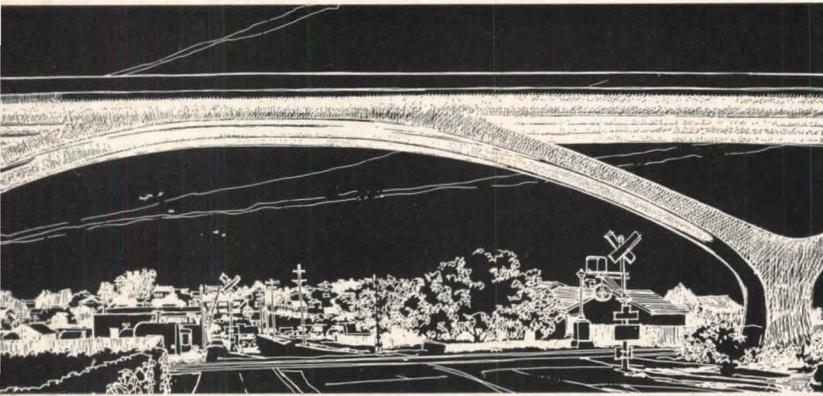
Bass be hired to execute the designs. The proposal, according to Emmons, was vetoed by Stokes, and his preliminary work was turned over to Sundberg-Ferar. So far, the fat, interlocking "ba" symbol is the only phase of the graphics to reach final board approval. It is not an entirely promising beginning.

While Emmons has been generally bypassed on the development of the system's hardware, he is directly responsible for the design of BART's most important single visual element: the

elevated track structure that will cut through cities, towns, suburbs and countryside along some 30 miles of the route. Emmons' basic design, which will be used for all but special long-span and switch structures, employs a hexagonal concrete column with transverse pier beams supporting slender, overhanging girders. Each of the trapezoidal girders is notched at the end to enclose the tops of the piers, lessening the apparent bulk of the structure. Each track rests upon a separate girder, making

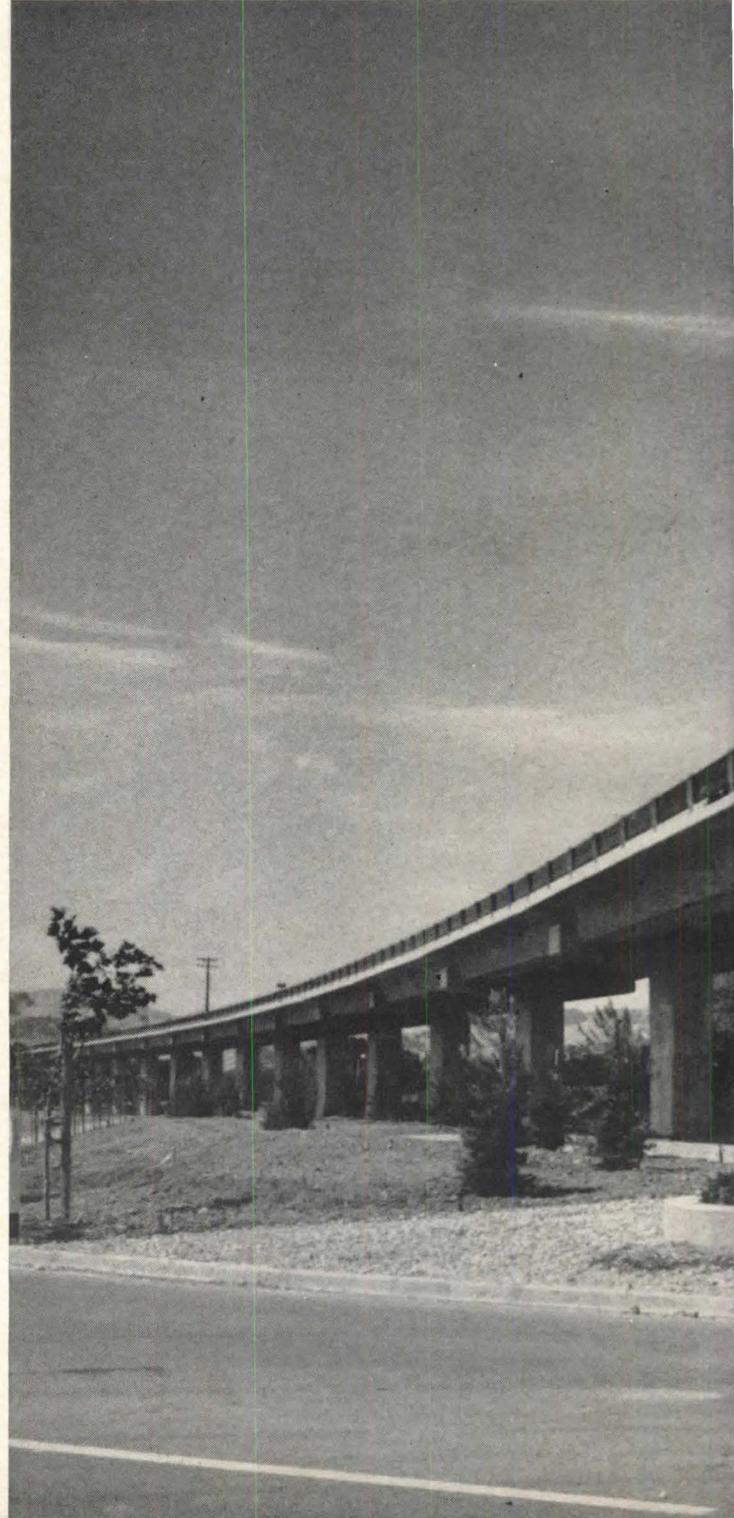
it possible to bank the track separately on curves and sharply reduce the required rise.

When Emmons presented the design to the board for approval, he brought along sketches of several alternate schemes which his office had worked up. Most of the other schemes, Emmons says, were done "tongue in cheek," but the board took them seriously. An internal hassle developed over which design was the best. It reached such proportions that, in desperation, the board decided to call in an out-



The design of BART's elevated track structure (a test section is shown at right) became the subject of unexpected controversy. When Architect Emmons presented it, he also showed a few alternatives for con-

trast (including the two above). Some of the directors like them better. Below: a long-span section in Daly City, for which the basic structure was modified by Architects Gerald M. McCue and Associates.



vide authority to referee the debate. It picked John E. Burchard, former dean of humanities and social science at MIT, who at the time was in residence at the University of California in Berkeley as a visiting lecturer in architecture and urban design.

Burchard studied all the designs and issued a philosophical report on elevated structures in general and Emmons' several schemes in particular. "The first aesthetic question," Burchard said, "is whether to state [the track structure's] presence very

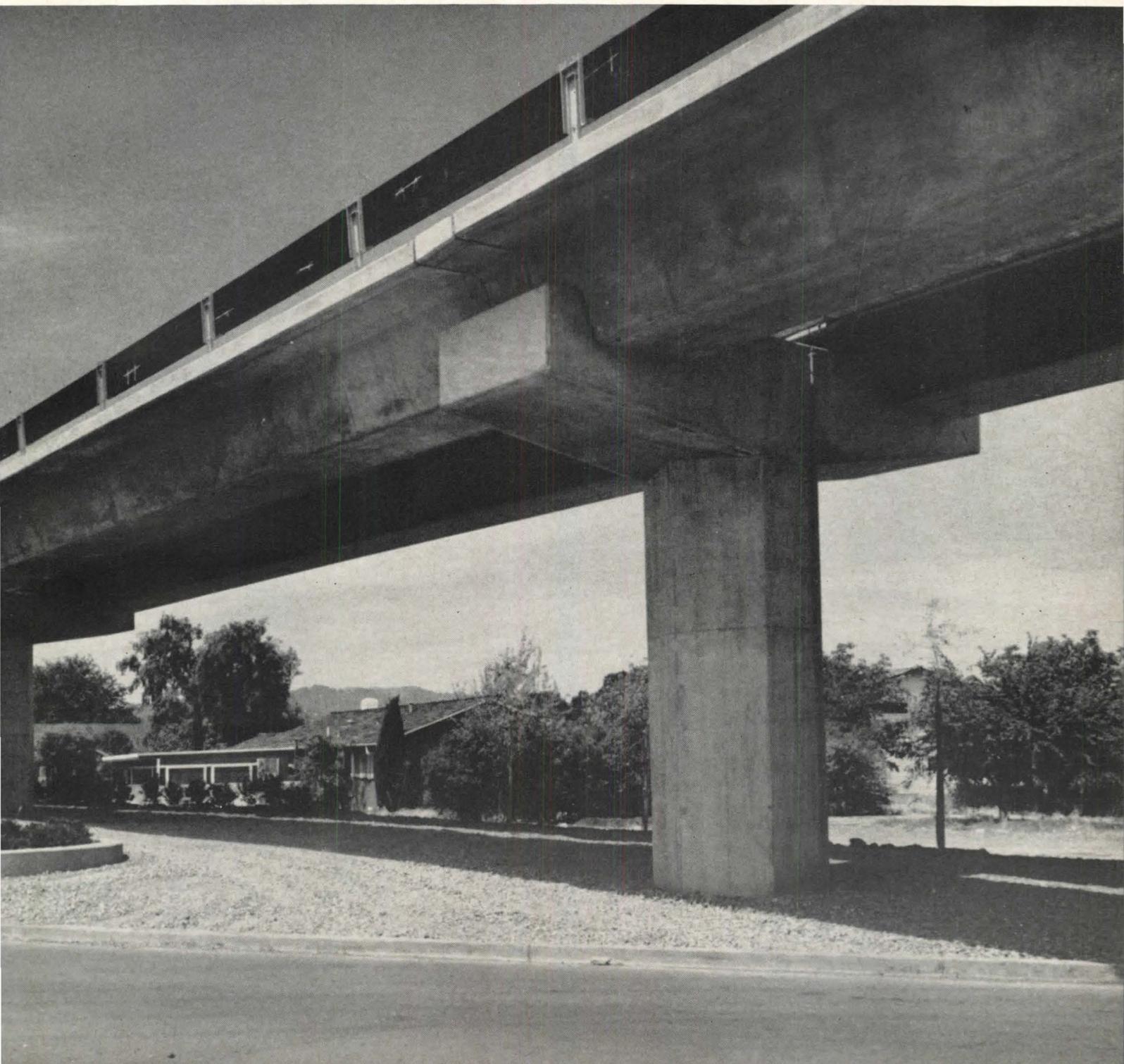
strongly, even brutally, or to let it be as modest an element as possible. Were we speaking of a viaduct spanning a chasm or a bridge crossing a bay we might make a good case for a bold, almost dominant statement. But in our case the structure goes on and on. In such circumstances the dramatic solution is not really acceptable and we are left with the necessity to find a design which is modest and compatible but not a piece of camouflage."

Burchard concluded that the

scheme originally proposed by Emmons was the best, calling it "far more direct and positive and good looking, while at the same time free of any affectation." He also advised the board to be "influenced most" by Emmons' opinions: "Not only are his qualifications high, but it is essential that the person involved in these decisions be close to the process by which they are subsequently implemented."

Emmons says he was assured that he would be involved in the design of structures for special

situations where the basic structure would not serve, but Stokes apparently has never said one was special. For the design of one such structure, however—a 230-foot bridge spanning an intersection in Daly City—the engineers have brought in Gerald M. McCue & Associates as consulting architects. The design, employing a rigid-frame center span on V-shaped columns, is "one of the most happy results of collaboration between architects and engineers I have ever seen," says Walter Douglas.



BART: Architecture along the line

BART has become easily the largest single employer of architects in the San Francisco Bay Area. A total of 14 firms have been commissioned to design—or, as some would have it, refine—the system's 37 stations.

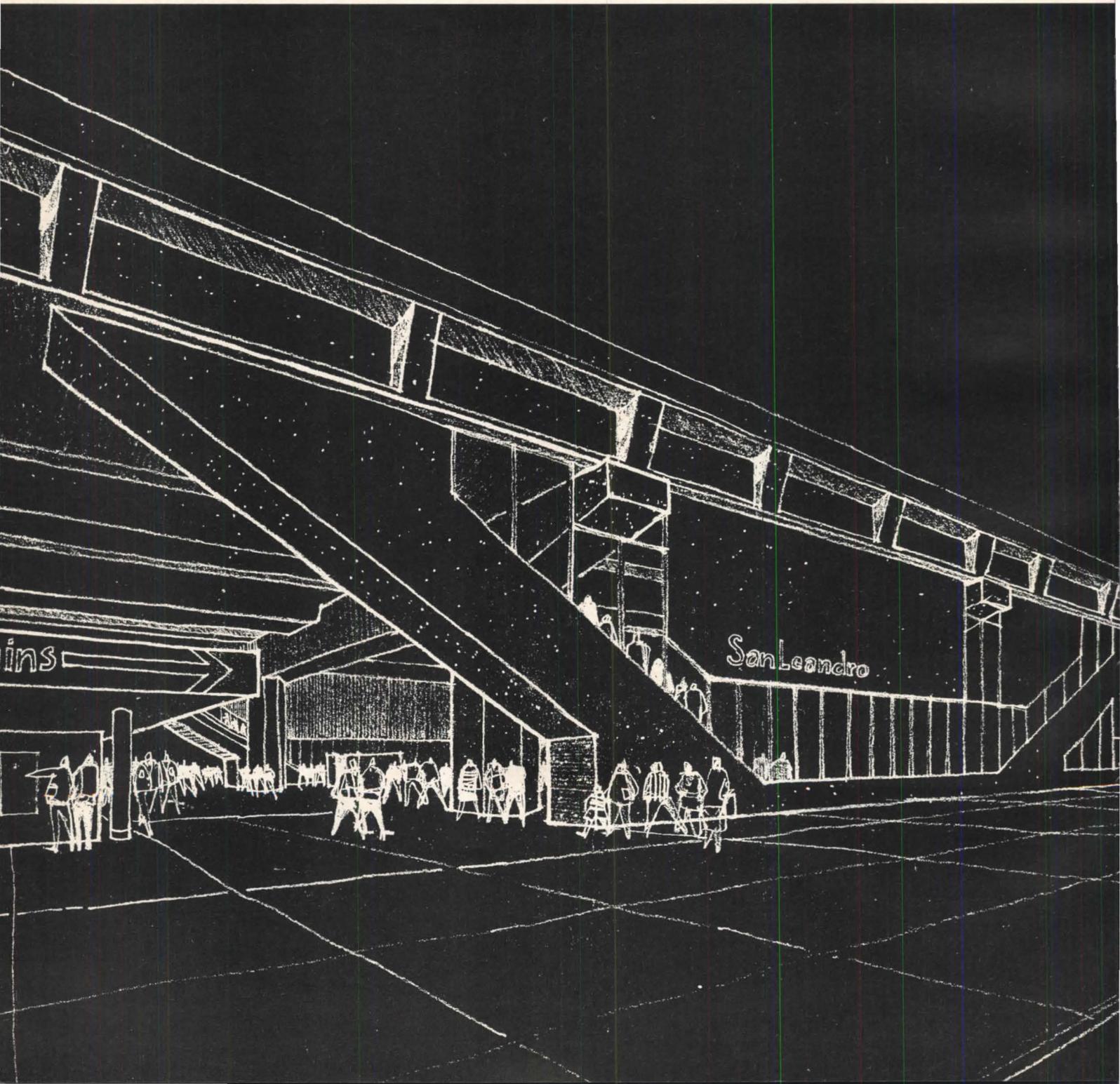
The involvement of so many firms was the direct result of a decision made shortly after Emmons and Thresher were brought in. The two architects toured the rapid transit systems of Europe. Thresher recalls that they were struck by the differences between the "sterile" stations of Berlin,

designed by the city architects, and the "delightful" stations of Stockholm, designed by a variety of private architects working from schematics furnished by the engineers.

They returned, says Thresher, convinced "that we must deliberately avoid monotony" by use of a multitude of architects, "even though we knew it would be a lot tougher that way." This philosophy was accepted by BART and the engineers, and Emmons drew up a list of what he considered to be the best of the Bay

Area architectural firms. BART reserved the right to make the final selections. Of the chosen 14, only one firm, Maher & Martens (which was given four stations), was not on the Emmons list. The process of station design is now at midpoint, and the widely varying results to date (samples below) have as much to do with procedures as with the talents of the architects involved.

The beginning was promising. Immediately after his appointment, Emmons began putting together a research staff to help



velop design criteria for the entire system. "Nobody had any idea of what the architecture of rapid transit should be," he says. It was like trying to determine what a modern office building should be if the last one were the Woolworth Building."

Emmons made what seems, at least in retrospect, a daring choice of a leader for his research team: Christopher Alexander, the young British architect-mathematician, then just arrived at Berkeley, who has since become a leader in the

attempt to bring the design process into line with the cybernetic revolution (see "A City Is Not a Tree," April and May 1965). Alexander and his group studied the transit systems of New York, Chicago, Philadelphia and Toronto; talked with a cross section of those involved in transit, from administrators to janitors to passengers; consulted a number of behavioral scientists; and fed their findings through computers.

The output was a list of some 500 root requirements for transit

design — neither specifications nor performance standards, but what Alexander called "relational characteristics." Examples: people should not have to sit touching strangers; a passenger should encounter as few obstacles as possible between the time he enters the system and the time he reaches his seat in the train; there should be no dead-end station corridors where a woman could be trapped.

The research had been underway about a year, and had cost nearly \$100,000, when it was

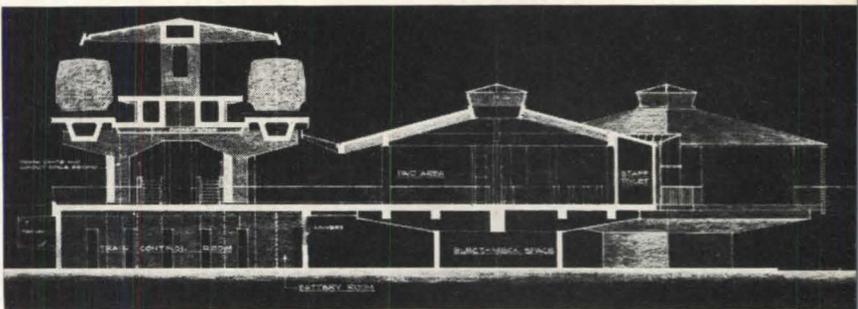
abruptly halted by BART and the engineers. They had seen Alexander's list of requirements, and had dismissed it as a "joke book."

According to Alexander, the engineers rejected his work because it dealt with basic relationships, rather than numbers. The relationships were so basic, in fact, and so simple to talk about, that BART couldn't believe they had any value, in Alexander's view. Alexander feels BART and the engineers were not interested in anything except



In preliminary station designs, sampled on these pages, BART has drawn a wide variety of responses from its multitude of architects. For midtown San Leandro, Masten & Hurd and Joseph Esherick & Associates sought to match the strength and scale of the elevated line structure. The ground-level concourse is encased in glass on two sides and left open at the ends, where patrons enter under the tracks. Escalators to the platform above are exposed and exploited in the design.

For the North Berkeley station (right), Architects Kitchen & Hunt stayed in scale with the surrounding bungalows, rather than with the track. The concourse is split into two separate hexagonal buildings, corresponding with the split in function specified by BART: one is the "free area" that anyone may enter without charge, the other the "paid area" for paid-up patrons. They are joined by skylit turnstiles.



The name of the game is engineering, and the rules for design are fixed well in advance

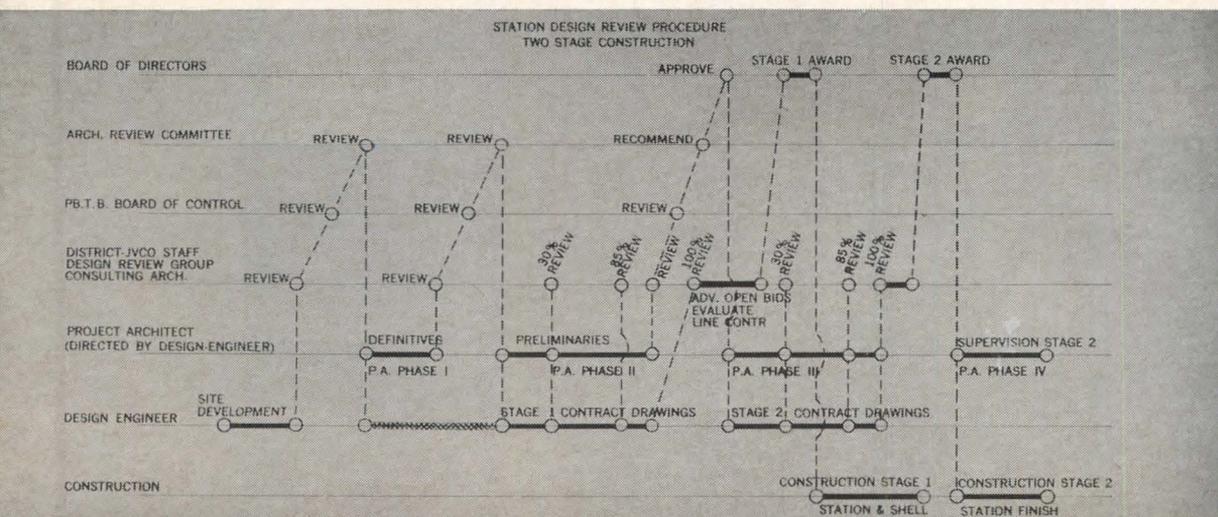
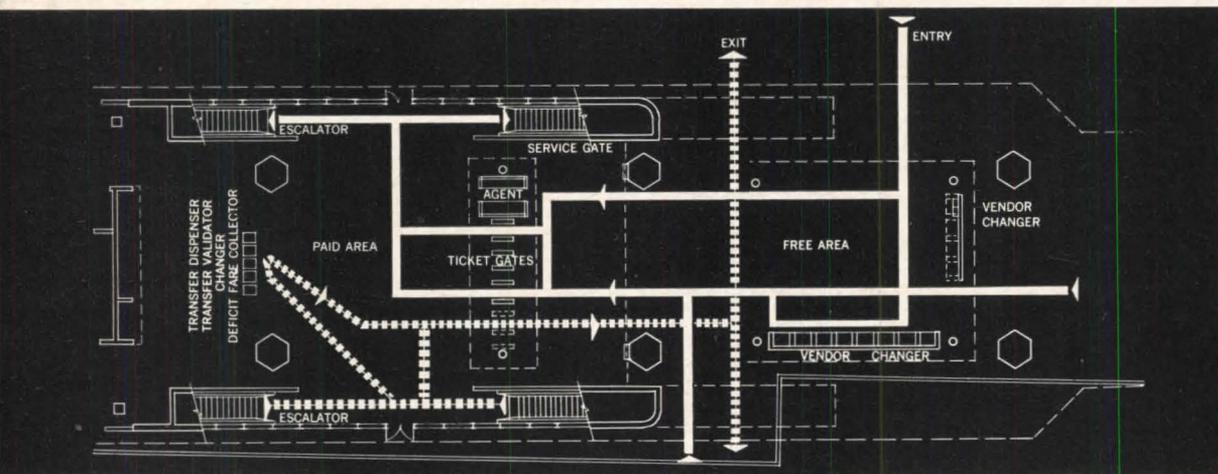
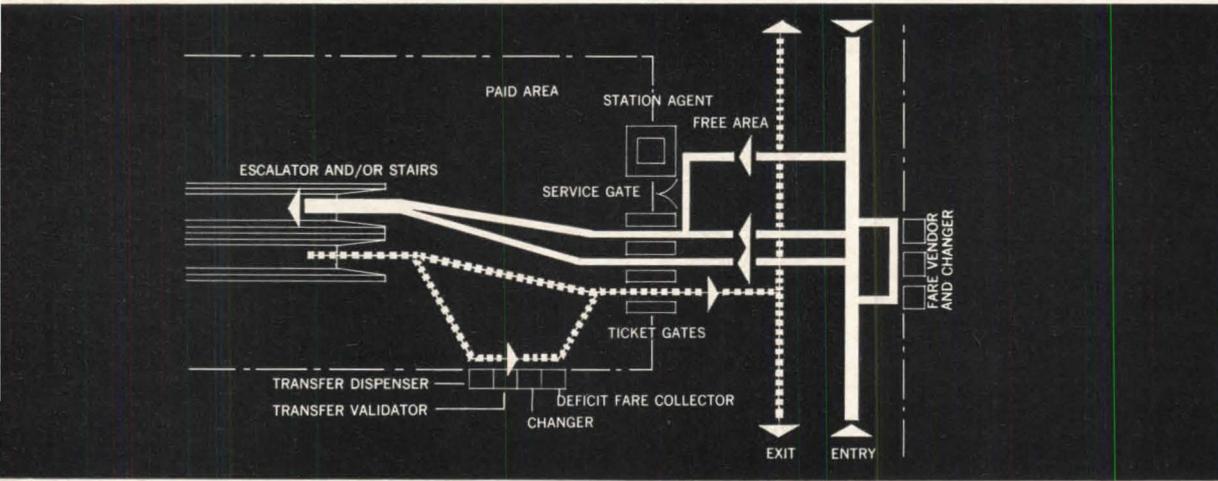
expediency and cost estimates. According to the joint venture's Walter Douglas, Alexander's work was rejected because "it couldn't be focused into the decision making process." Says Douglas, "We were never enthusiastic about what could be accomplished by sociologists and psychologists and people of that nature. We have always been enthusiastic about what could be accomplished by such people as lighting consultants and acoustical consultants."

As these words indicate, the

wedding between Alexander and the hard-headed engineers of BART was far from an ideal match. Emmons, the man in the middle, says that "a lot of good information came from the research, and that most of it was incorporated into the *Manual of Architectural Standards*, a 201-page document developed by Emmons' office as a guide for the architects designing the individual stations.

But many of the station architects interviewed by the FORUM interpret the incident as the

decisive encounter in a struggle over basic design philosophy, from which the engineers emerged the winners. At issue, they feel, was the question of whether BART's architects would be permitted to engage in truly conceptual design, or merely serve as cosmeticians for concepts already established by the engineers. "The name of our game is engineering," Stokes answers flatly. "Engineers have to be in the lead. Ours is a systems approach that brings architecture into all the other con-



Right, two further variations: For a light industrial area in El Cerrito (top), DeMars and Reay have bowed out the platform area to accommodate the escalators, freeing space in the ground-level concourse. For the Ashby station in Berkeley (bottom), where height was a problem, Wurster, Bernardi & Emmons made the entrances understreet tunnels and sunk the lofty, glazed concourse below grade.

Left, Emmons' office supplies architects with the diagrams such as the one at top, showing all of the essential station elements and desirable circulation paths. This one is for a suburban station in the morning; thus, the major flow is to the trains and the minor (dotted lines) from them. The center diagram shows how such a program was interpreted in the plan of the San Leandro station. The bouncing balls in the bottom diagram represents the steps a two-stage station design must go through.

pts. Architects are involved in the projects almost from the beginning."

The rules of Stokes's game—the official design procedure for the BART stations—is a complex, lengthy process that, according to discussions with the station architects, is breached more often than it is followed. The procedure involves seven stages, with each stage subject to full review by the Design Review Group (composed of Emmons and key staff members of both the joint venture and

BART), the Board of Control of the joint venture (composed of principals of each of the three engineering firms), officials of the cities involved, the architectural review committee of BART's Board of Directors and, finally, the full board.

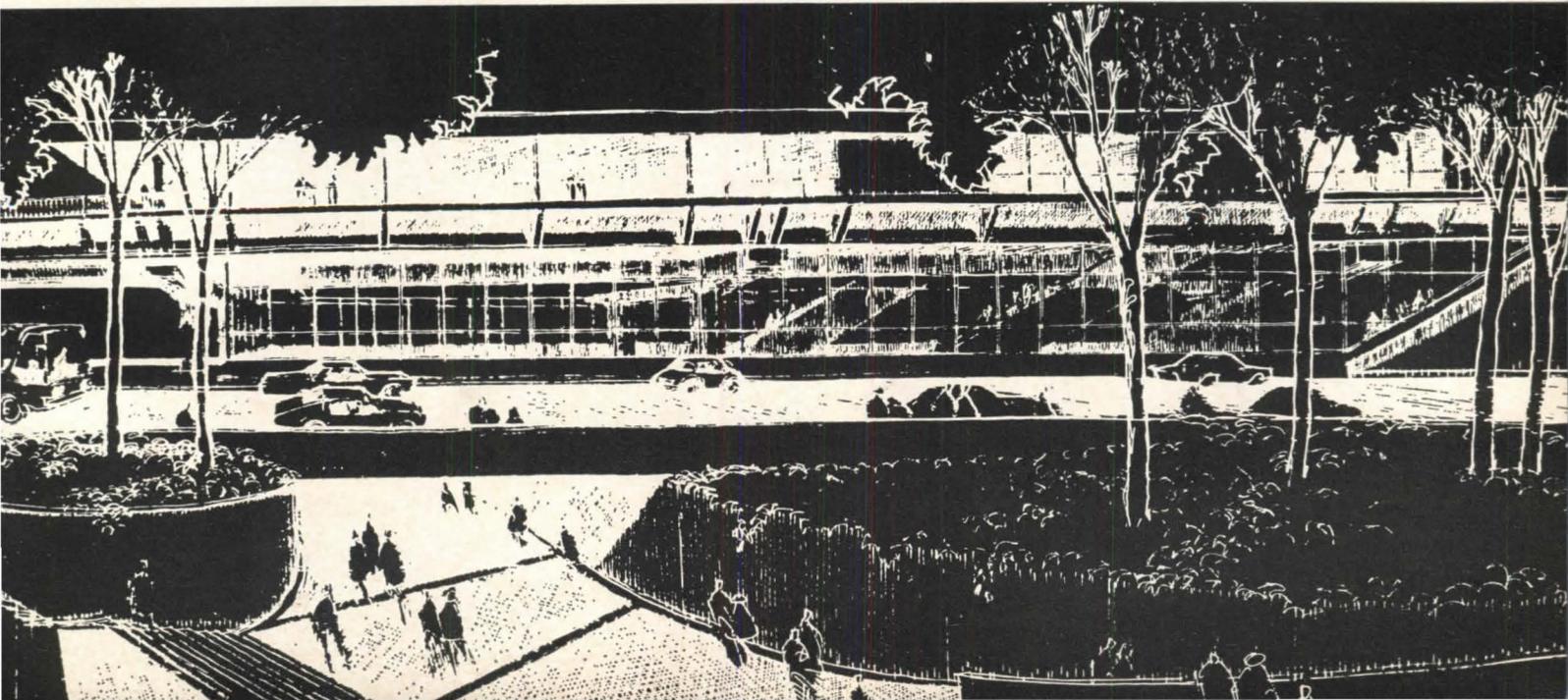
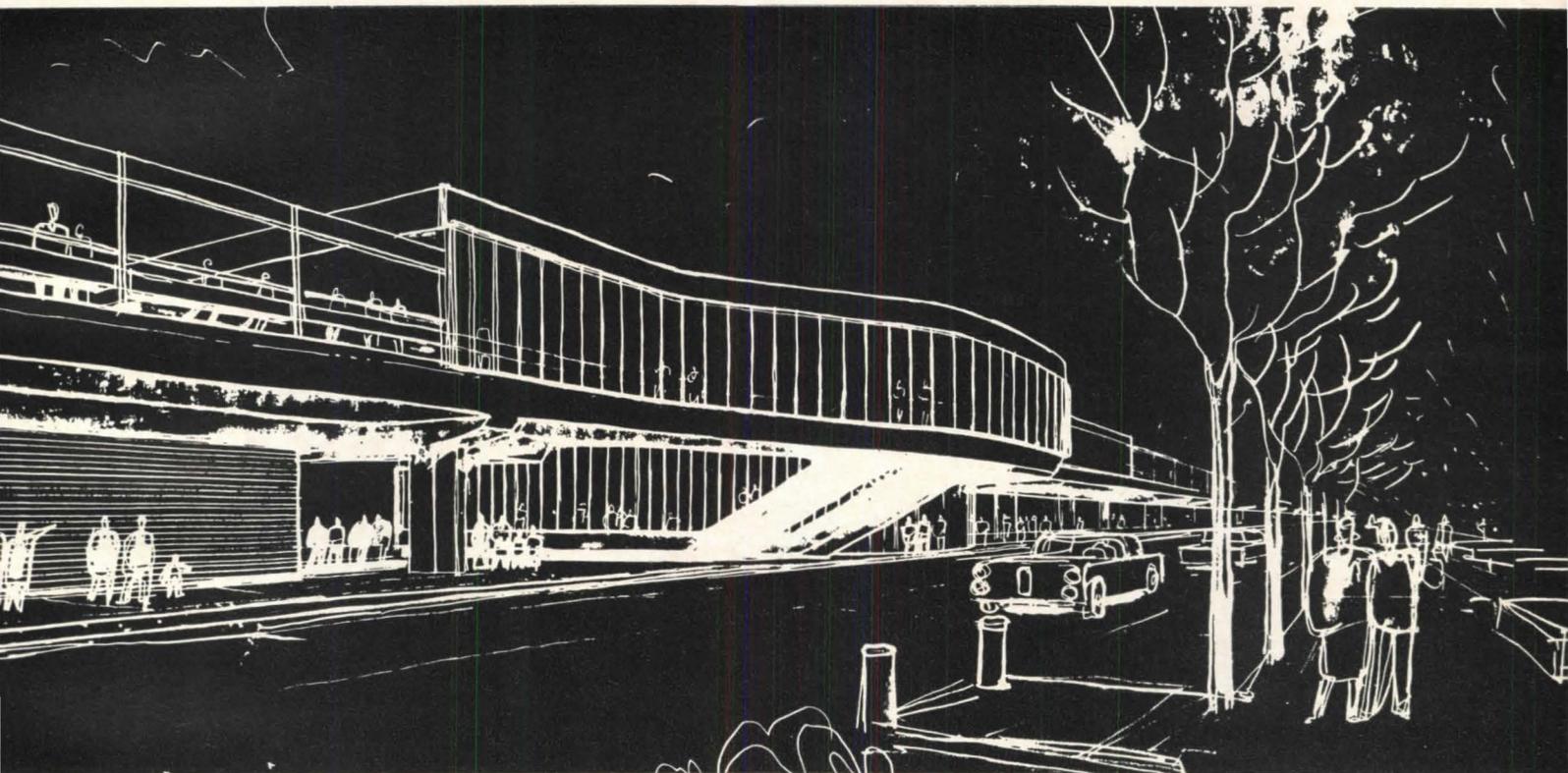
First, a "station locator," who is usually a design engineer but never an architect, prepares a rough site development plan for the station area, puts it through the review process, and polishes it into a "design approval map." Then a design engineer from one

of the joint-venture firms works with Emmons' office in preparing a detailed site development plan. The station architect then begins his work under the direction of the design engineer, and it is put through the full review process at five points: definitive station layout, architectural preliminaries, and three times during preparation of the contract documents.

A great deal of the station design, as this indicates, is fixed before the station architect comes along. The site plan tells

him the precise location of the station on its site, and the layout of parking lots and external circulation. And the manual tells him a great deal more about its internal organization.

All stations, the manual specifies, must contain the following: a Free Area, entered without paying a fare, where patrons buy tickets; a Paid Area inside the collection gates; a Concourse between the entrance and the tracks, which always must be at mezzanine level in the subway stations; a Platform, always 700



BART was able to squelch an architects' revolt, but it has yet to master its budget problems

feet long; a Canopy sheltering the platform, always 280 feet long; a Station Core near the covered portion of the platform, which must be in operation at all times while other areas are closed off during slack hours; and service spaces for electrical and mechanical equipment.

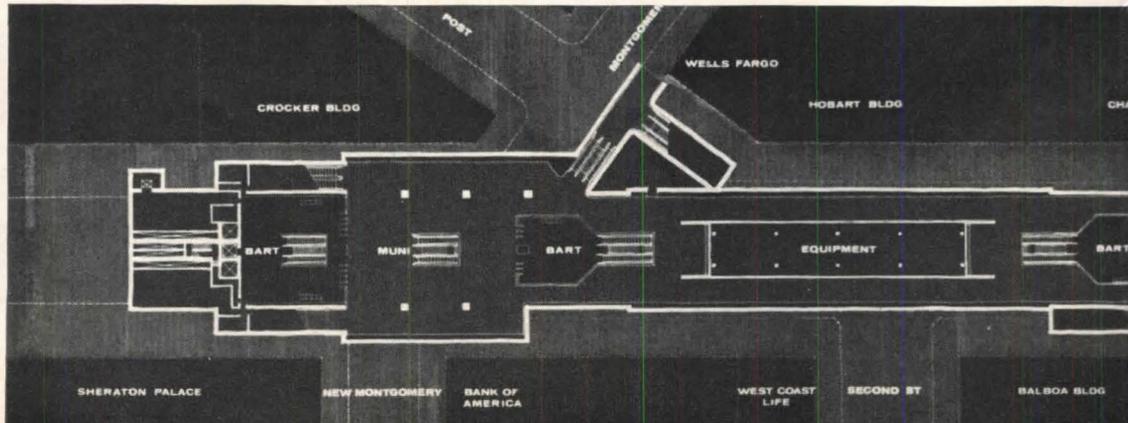
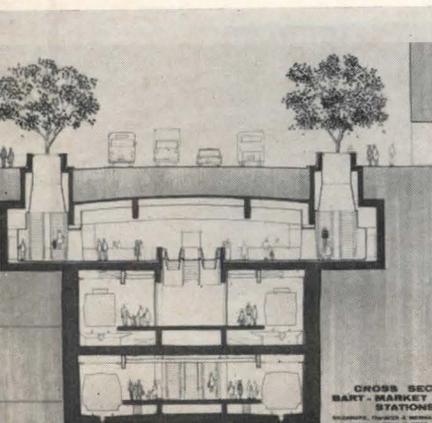
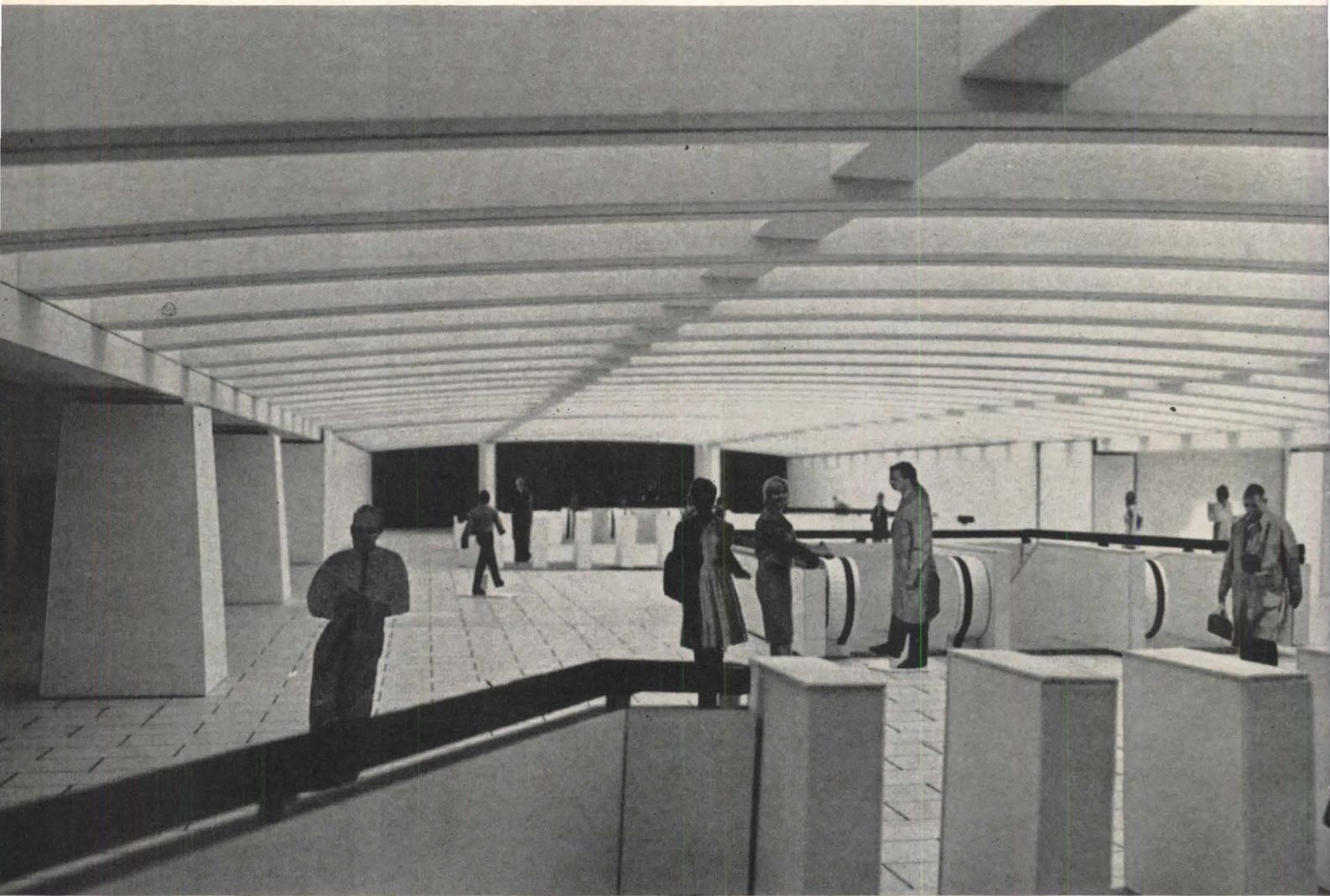
The manual further specifies certain standard items, such as a station agent's booth and the canopy, that must be incorporated in the station design. It also tells the architect exactly what materials he can and can-

not employ on the interiors.

"Working within the framework of these standards," says the manual, "each project architect will be free to use his imagination and skill to design the best possible station." Some of the architects have been quite willing to accept the limitations of the manual and the complex design procedures as necessary, and make the best of them. Others find them more a strait-jacket than a framework.

A common complaint has it that too much depends on the

design engineer. As one of the architects put it, "If the design engineer is knowledgeable and understanding—and many of them are—he can do a lot to get things approved. But if he isn't, he can block everything you're trying to do." Others go even further. "There is no one in the organization with an understanding or real interest in architecture," says one architect. "They talk about having the best architects they could find, but they have no real conviction." Says another, "They



...a "pinched and mean con-
of what stations should be."
Emmons, for his part, can
er little help when problems
velop. The station architects
not allowed to consult
ectly with him, but must first
through proper channels at
joint venture. In an attempt
force a change, one of the
hitects drew up a petition
manding that Emmons be
en more authority and that
architects be allowed more
sign freedom. The petition
d received several signatures

when BART found out about it
and squelched the revolt. The
firm that instigated the plot, so
the story goes, had been prom-
ised another station commission,
but when the plot was uncov-
ered, the station went to some-
one else. "We didn't want it
anyway," says the architect.

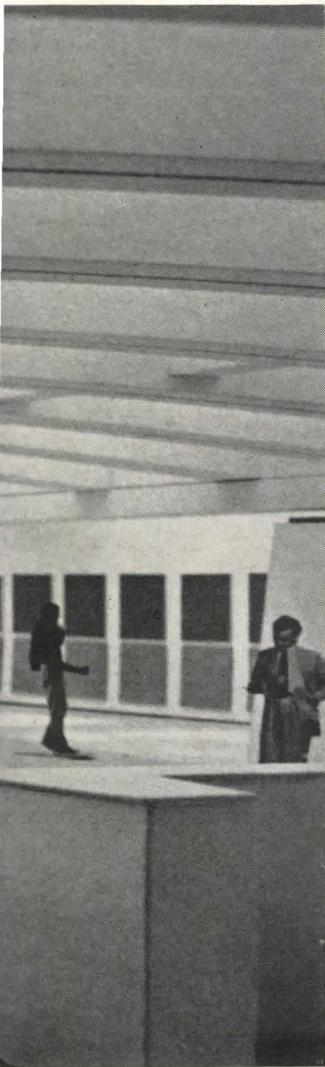
Trouble of another kind, de-
veloping for months, came to a
climax in February. The low bid
for the downtown Oakland sub-
way was \$61.5 million—28 per
cent over estimates. A major-
ity of the BART board, which

had been watching inflation take
its toll of the budget, wanted to
admit the necessity of finding
more money. But a two-thirds
vote was needed, so instead
BART cut back and called for
new bids. Stringent economy has
been the watchword of BART
and its engineers ever since.

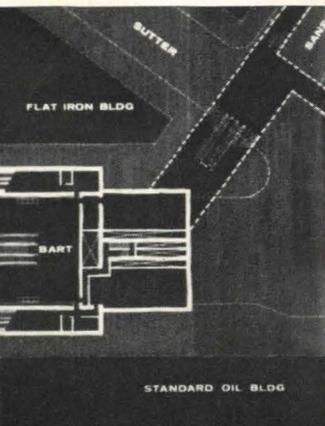
"The budget heroes have got
control of the situation," charges
one architect. "The engineers do
all the estimating, and the only
way we can argue with them is
for us to privately do our own
estimating. If they can get a

5 per cent gain in economy, it
doesn't matter that we have 50
per cent loss in quality."

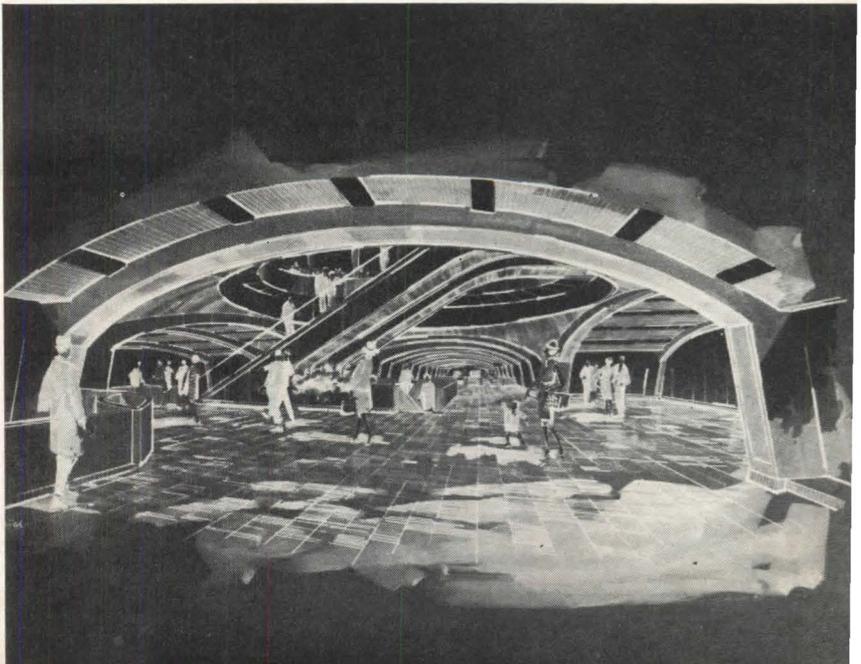
Around the offices of BART
and the joint venture, there is
a stock answer for such charges.
Says David G. Hammond, the
district's director of develop-
ment: "The architects often go
off in directions that were never
intended. They want to build the
best monument possible, but we
have to strike a balance between
a Taj Mahal and the budget."
The balance hasn't been struck
in favor of the Taj Mahal.



The principal problem of the sub-
way station architects has been to
give some spatial quality to the
mezzanines, despite low ceiling
heights specified by the engineers.
For two under Market Street (left),
SOM slightly arched the ceilings,
recessed the lights between ex-
posed structural members—and
proposed to take out two rows of
columns to leave the clear span
shown in the model photo (loads
would have been taken by the side-
walls to the slab beneath). BART
first accepted the scheme, then
rejected it on grounds of cost. The
Market Street subways contain both
BART and municipal trolleys.



For two especially constricted sub-
way stations on Broadway in Oak-
land (top right), Gerald M. McCue
& Associates have opened the plat-
form level to the mezzanine, mak-
ing the mezzanine appear a bal-
cony. For the downtown station in
Berkeley (bottom right), Maher &
Martens had it easier. The main
entrance emerges into a landscaped
plaza, so the architects created
what they call a "jewel box" to
bring light into the mezzanine.



BART: Planning and persuasion

"We are designing a transit system, not the Bay Area," says George L. McDonald, BART's director of public relations. The remark goes far to explain the approach employed by BART in carrying out the largest planning operation in the history of the Bay Area. There are no physical planners or urban designers on BART's staff. Instead, BART depends on transit engineers, public relations men, and sometimes its station architects to work out the details of location and design with the 17

communities astride its route.

As for the tremendous developmental impact that BART will have on areas outside its narrow property lines, BART's attitude is one of sympathetic non-involvement. "We are a catalyst that can make a lot of things happen," says B. R. Stokes. "But we have to limit ourselves to our facilities. We have no business usurping the role of planning commissions, city councils, supervisors, and the business community."

But the system and its sur-

roundings are inextricably bound together, and BART often finds itself deeply embroiled in what goes on beyond its boundaries. A classic case history is the seven-year struggle among BART, the city, and private business interests over Market Street. BART will run a subway under Market from the waterfront to Civic Center, offering a dramatic opportunity to transform the wide, strewn street into the grand boulevard it has always hoped to be. The opportunity is a long way from realization.



the struggle began over station locations. BART wanted to use Montgomery Street (San Francisco's Wall Street) the stop, then swing down to Market. It was following the old transportation theory of putting stations where the passengers are. But the city is planning the revitalization of the Market area on the other side of the street, and wanted to put stations where they would do most help. BART agreed to move the stop to the intersection of Market and Montgomery.

Next, the city asked that BART extend its service through the Twin Peaks streetcar tunnel at the upper end of Market to the residential neighborhoods beyond. BART balked at this, but offered to incorporate the streetcar lines down Market in its subway, a level above its own tracks. The resulting reduction in traffic and trolley wires may be BART's most visible contribution to the character of the street. It was not entirely a selfless gesture, however: BART expects that some day it will

need four tracks on Market, at which time the streetcar level will come in handy.

When it came to design of the subway, BART became firm. The city wanted BART to consolidate the utility lines under Market, which, among other beneficial results, would have allowed the station mezzanines to be built closer to street level and the basements of adjoining stores. BART rejected the idea when it decided to build the subway by tunneling between stations rather than digging up the

street. (A plan to join the mezzanines into a continuous underground concourse was a casualty of the same decision.) As it is, the mezzanine floors will be about 23 feet below the street surface, far beneath the level of the store basements.

BART originally planned to have entrances to the subway on only one side of Market's major intersections. The city, pointing out that the result would be to greatly increase pedestrian-vehicle conflicts on the wide street, is asking for Federal

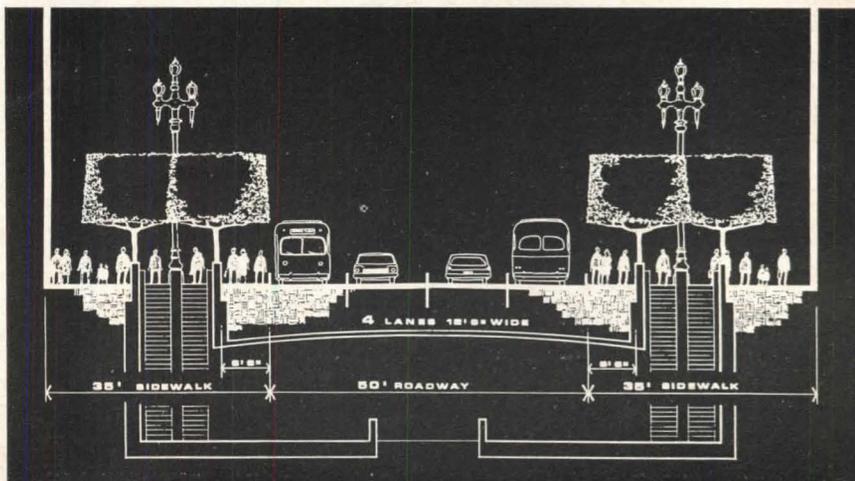


Left, San Francisco's Market Street is the Bay Area's major thoroughfare, as well as one of its major eyesores. San Franciscans have long dreamed of turning it into a grand boulevard, and the coming of BART, which will have four stations beneath the street, may provide the needed impetus.

Right, the street will be relieved of its jumble of overhead wires and some of its traffic problems by consolidating the city's municipal trolley line underground with BART, whose retouched publicity photo gives some idea of what the change could mean. The subway cutout in the photo is misleading, however: the station mezzanines will not be close to the street surface, as the drawing indicates, but some 28 feet below ground.



Below, Mario Ciampi & Associates and John Carl Warnecke & Associates are now doing a master plan for Market Street's visual rejuvenation. Their first step was to take most of the space vacated by the trolleys and put it into sidewalks, which will be widened to 35 feet. The section drawing shows the relationships of the sidewalks and traffic lanes to the entrances of BART's subway stations.



With subways, cities can make the most of a good thing; with aerial lines, it's not that easy

funds to extend the mezzanines under the intersections and have entrances on both sides. BART is willing to go along.

Through most of the horse trading with BART, the city has acted only after insistent prodding by a number of private organizations. Chief gadfly has been the Market Street Development Project, set up by the San Francisco Planning and Urban Renewal Association and headed by Architect-Planner Gerald J. McLindon, who has proposed many of the changes

made to date. It was only last year that Mayor John F. Shelley set up an official Transit Task Force under T. J. Kent Jr., his coordinator of planning, housing, and development.

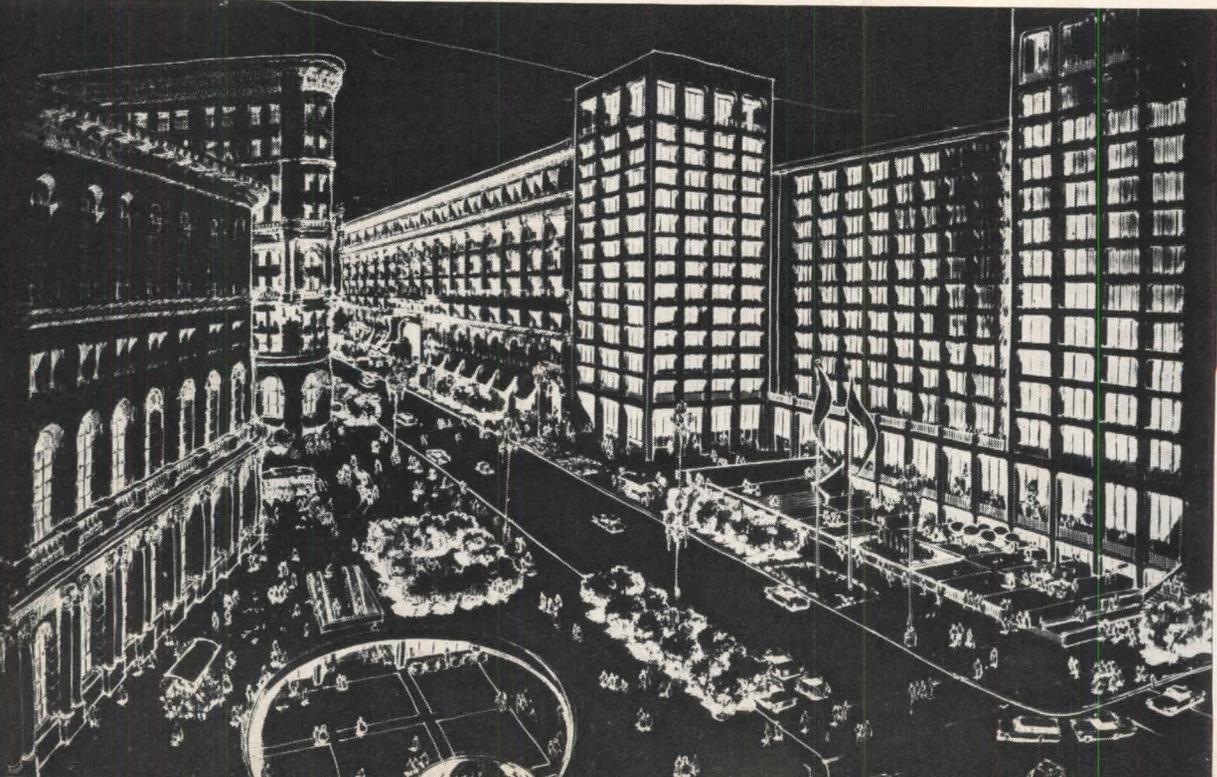
The Task Force, through its architectural and planning consultants, Mario J. Ciampi & Associates and John Carl Warnecke & Associates, is now developing a Market Street master plan to make the most of the opportunities presented by BART's construction. Ciampi and Warnecke last month proposed that

the street be narrowed to four lanes and the sidewalks be widened from the present 22 feet to 35. The city's supervisors approved this first step, and the architects are now at work on the rest of the plan.

Apart from the prospect of widened sidewalks, only a single piece of open space has been planned along Market as a result of BART: a sunken municipal plaza connecting with the Powell Street station mezzanine. BART certainly cannot be blamed for the fact that there



Left, BART's subway entrance at Market and Powell streets in San Francisco will come up in a sunken, landscaped plaza—one of the few generous open spaces thus far planned to tie in with the system. It was BART's idea, but the city will buy the site (top photo) and develop the plaza. The scheme below is not a final design; it was drawn for BART by its consulting architect to get the city interested. There are no plans, however, to develop a plaza across the street, as suggested in BART's rendering.



Right, a city-sponsored urban design study of the Richmond station area by Okamoto/Liskamm was critical of BART's proposed grade-level alignment next to existing railroad tracks. They recommended elevated tracks, which were estimated to cost no more than the additional street underpasses required by BART's scheme. But assuming that the alignment could not be changed, they went on to recommend that BART's proposed pedestrian tunnel be replaced by a bridge (section, above), which could include commercial facilities and form a link in a pedestrian spine along Nevin Street, reaching from the civic center to the commercial core of Richmond (right). They also proposed layouts for the surrounding parking fields to facilitate construction of air-rights housing.

ave not been more. In 1964, ART took some 60 government and business leaders from San Francisco and Oakland to Philadelphia, which center in Philadelphia, which tokens described as "an outstanding example of what coordination between public and private sectors of a metropolitan area can do with transit as a long planning spur." Later ART had Architects Emmons, Horn, and McCue do design studies on integration of subway entrances with new commercial buildings and plazas. So far

there have been no takers among private developers.

The controversies over BART's subway lines are basically matters of making the best of a good thing. The same cannot be said of the system's aerial segments. Aside from the historically blighting effect of elevated tracks, no matter how well designed, each aerial station will be served by acres of open parking. BART is building only one garage structure (at the station near its Oakland headquarters). Because of BART's budget

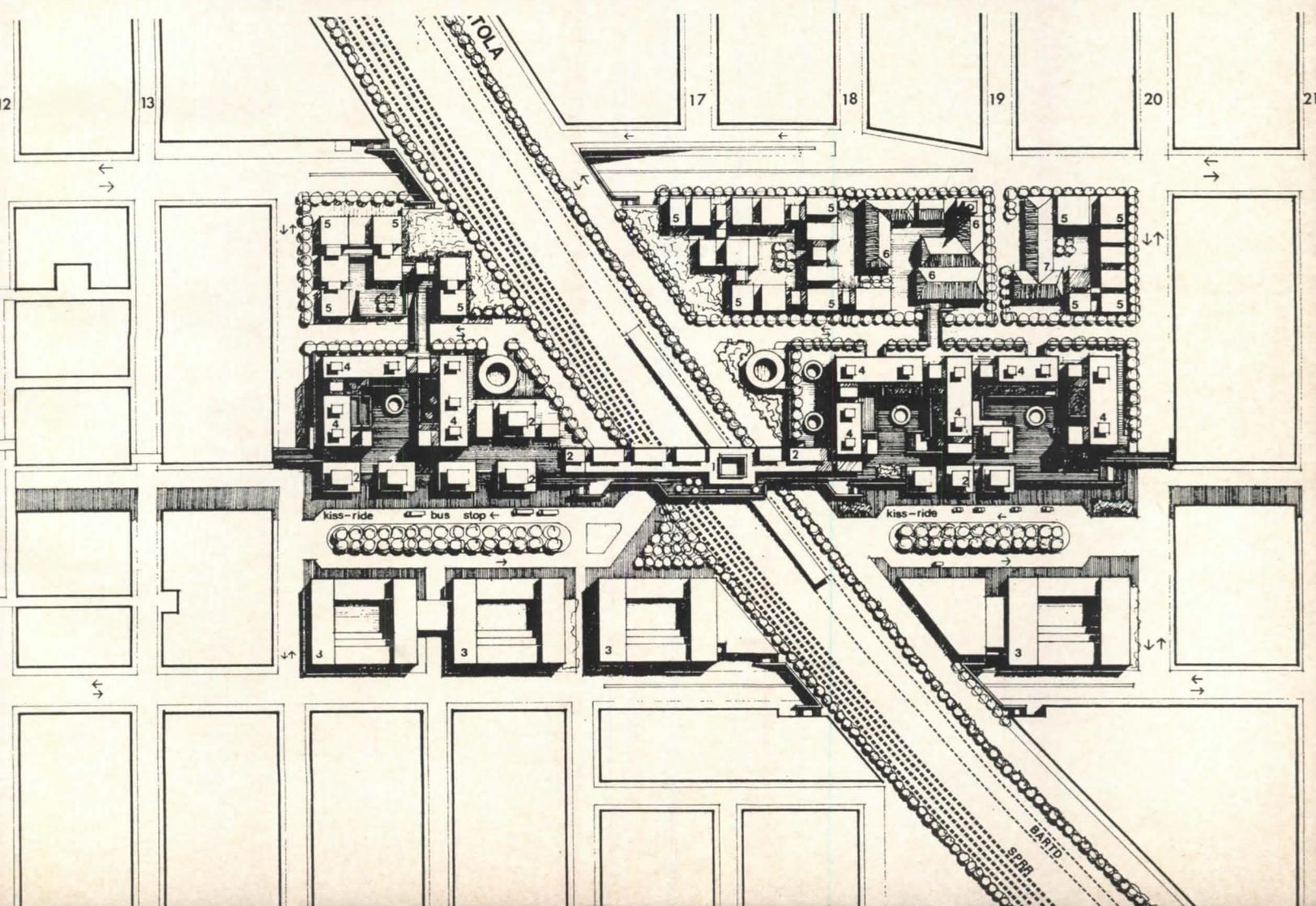
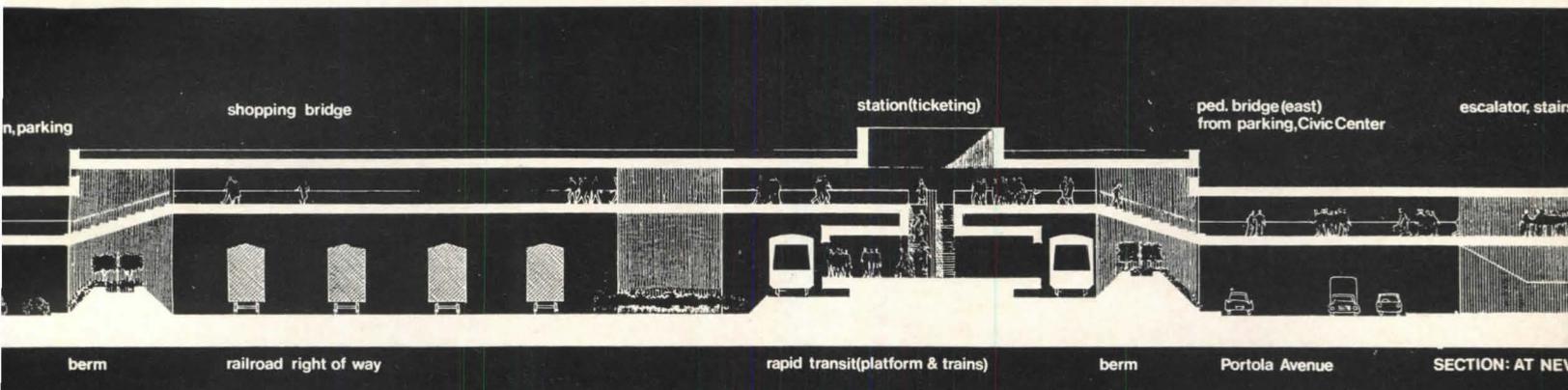
problems, moreover, the landscaping of parking lots has been cut back, and some will be left undeveloped for years to come as raw and vacant land.

As they see land being cleared, the cities and suburbs along the aerial lines are awakening to what, in physical terms, BART will mean to them. Berkeley awakened early. For seven years it has been fighting BART's plans to run elevated tracks down the middle of three of its major streets.

BART defends the aerial lines

on two grounds: they are more pleasant for the riders than subways, and they are cheap. Subways in cities, Walter Douglas says, cost between \$25 and \$30 million per mile, elevated lines \$5 to \$6 million. BART, Douglas pledges, will not run elevated structures on city streets unless there is 100 feet between building lines, and will buy property to meet this standard.

BART and Berkeley finally reached an informal compromise: When bids are taken for the elevated lines, BART will



BART and the cities are having a tug of war. The likelihood is that neither side will win

include an alternate for putting about two thirds of them underground. Berkeley will pay the extra \$150,000 in engineering costs required to include the alternate, and will then have 75 days to decide whether to pay the extra construction costs of a subway. Neither side is completely happy with the arrangement—BART faces the delay, if not the cost, of a change in its plans, and Berkeley faces a whopping bond issue.

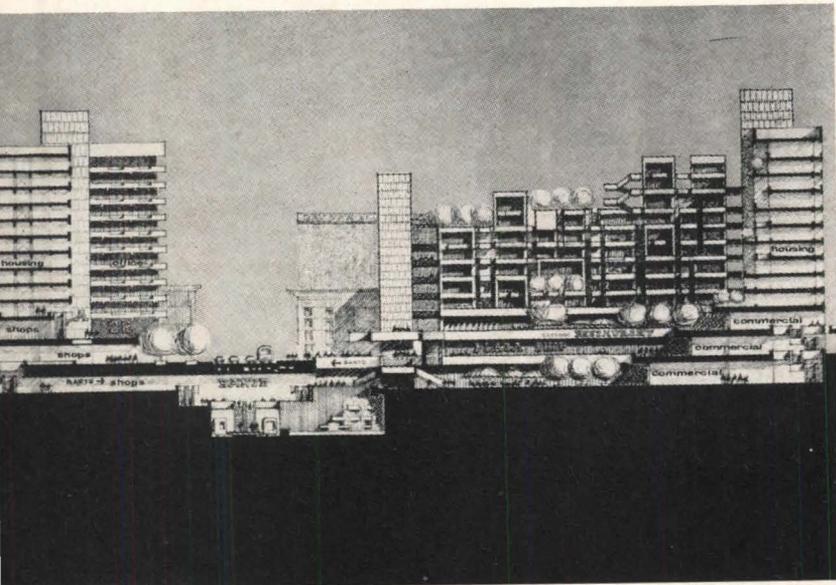
Because of such city-system conflicts all along the line,

BART still has to sign route and station agreements with seven of the 17 communities it will pass through. The fault is by no means all BART's. Only a handful of the cities have made any attempt to plan for the impact the system will have on them. Most have been too content to sit back and watch speculators buy up property around the stations.

"A pet theme of local communities," says Ernest Born, "is to cash in on BART by getting it to build new sewers, put in new paving and curbs, and make

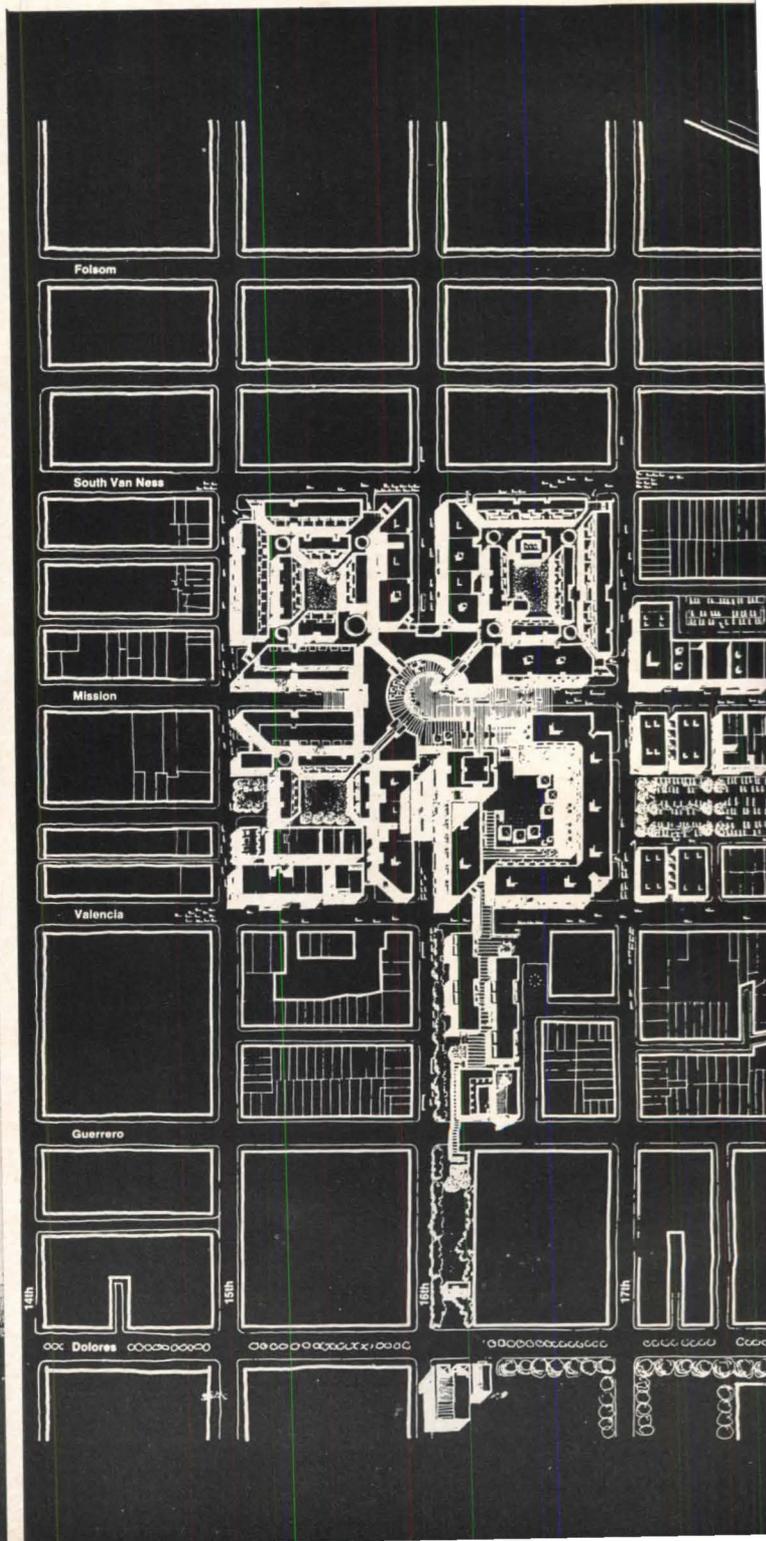
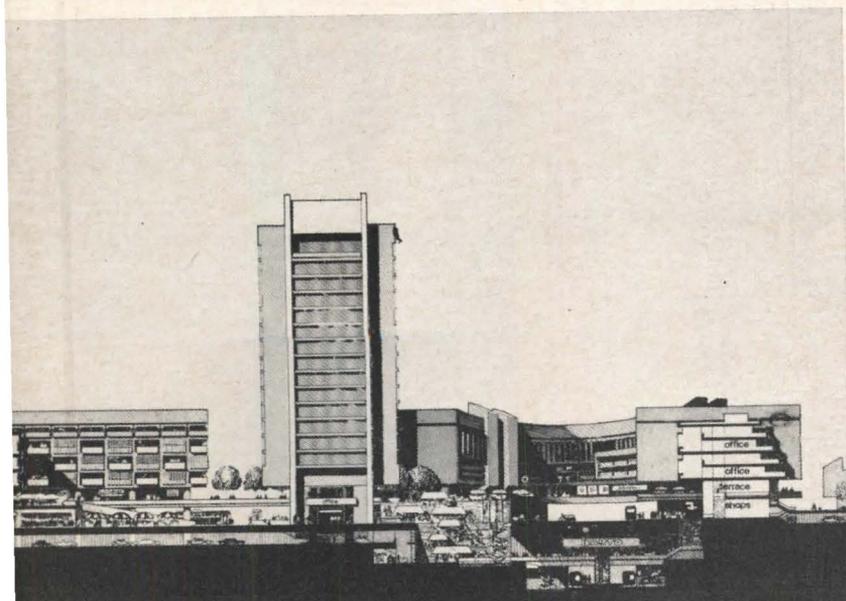
other improvements that they should pay for themselves." If anything, says Born, BART "tries too hard to keep people happy. It has spent millions of dollars on asinine investigations to satisfy stupid politicians."

"No one can say that the Bay Area has not had an opportunity to fully explore and evaluate the impact and potential which rapid transit will have on its communities," says McLindon. "Its failure to make the most of this chance can only be attributed to lack of initiative on



The most promising effort to date to integrate BART into urban planning is a scheme for San Francisco's Mission District, a proposed urban renewal area, drawn up by Okamoto/Liskamm. The present

commercial strip along Mission would be polarized into two dense clusters at the 24th Street (above) and 16th Street (below) stations. A medium-density spine between would be housing and commercial.



a part of communities, and lack of imagination during the detailed study period." The detailed study period, of course, was BART's responsibility, and McLindon and others aim that many of BART's—current shortcomings can be traced to the absence of any regional, city or neighborhood planning at this point. "Of course these aspects go beyond the comprehension and control of the transit engineer," says McLindon. "From the very outset, the team should

have been made up of planners, architects and landscape architects, as well as engineers. This team should have been prodding local communities into action, and requesting definitive plans with which the system could have been integrated."

BART feels that its planning obligations were taken care of with its first rapid transit plan completed in 1956, in which a number of planners participated. "When the District studies began," says Walter Douglas, "we did not try to redo that original

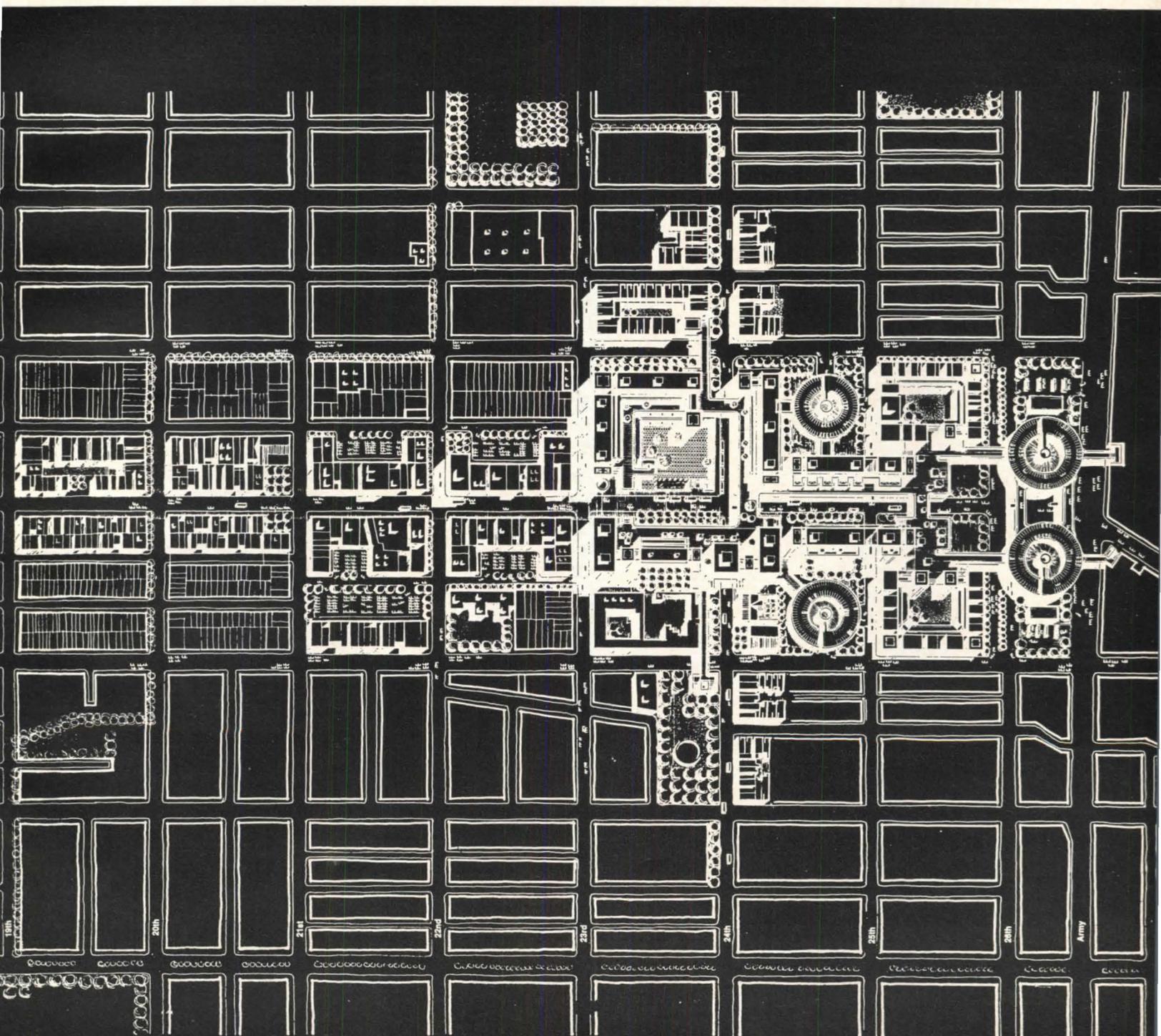
report. We knew of no reason to redo it, and I still don't."

That early plan, points out Architect-Planner Rai Y. Okamoto, was only "a regional framework to identify the needs and specify solutions in general terms. The Bay Area has continued to grow with no reference to the plan."

BART erred, says Okamoto, in not building "mechanics for continuous planning" into the process. "At the District level, there are keen and aware people," he says. "But when it gets

down to hard rock, the engineers take over. They are reluctant to accept more new variables that might arise from somebody's making an impact study."

Okamoto speaks from direct experience. He and his partner, William H. Liskamm, have conducted such studies in downtown Berkeley and Richmond and in San Francisco's Mission District. The firm's Mission plan (see below) illustrates more than anything that has yet been done the system's great potential as a shaper of cities.



BART: Ready or not, here it comes

"Now under construction, RAPID TRANSIT for the Bay Area," exults the cover of a promotional brochure distributed by BART. "A congestion-free, 75-mile network of SUBWAYS-AERIAL LINES-SURFACE LINES comprising the world's fastest, safest and most modern urban transportation system." BART's circus-poster claims are essentially true. The system will be a feat of transportation engineering to match San Francisco's famed bridges.

If engineering were the beginning and end of transit, in fact, there would be little about BART to question. But transit is much more. It is a force of unmatched power for shaping the growth of a metropolis. BART, whether it likes to admit the fact or not, is indeed designing the Bay Area, as the experience of other metropolitan areas proves. In booming Toronto, two thirds of the city's major building construction in the last five years has been within walking distance of the stations on its 11-year-old transit line.

BART presents certain paradoxes. It will be the first truly modern transit system in the U. S., yet it is being planned according to 19th century concepts of the relationship between transportation and metropolitan form. "The system is not evolving, it is just happening," Lawrence Halprin says. "We have tried to build cities this way. It doesn't work."

A second paradox is presented by BART's use of planning and architectural talent. On the one hand, it engaged city planners in the earliest stage of the system's development, then dropped them when it got to the point where detailed planning decisions had to be made. On the other hand, it excluded architects from the early, conceptual phase, then brought them in too late to take full advantage of their abilities.

Several of BART's architects recently gathered for a luncheon discussion of the system's problems and prospects. They were asked what they thought should be done to bring BART to its full potential. There were many detailed suggestions about procedures, but in the end all agreed that it was basically a question

of leadership. As one put it, "I would get the best man in the world and put him in full charge. BART has lost the breadth of vision that it had in the early years. It needs a great leader."

Throughout the process of BART's planning and design, the leadership has come from two directions: the engineers and the publicists. One side of this curious partnership has been primarily concerned with moving people, the other with convincing people. Money has been spent willingly for these two purposes—but grudgingly for the kind of substantive urban planning and design that could make BART the agent of the region's transformation.

It is not too late for BART to change direction, but the problem is complicated by the fact that money is now in short supply. BART has a lengthy list of items which have pushed costs to date far beyond estimates. The chief item is inflation, but others include changes requested by communities, landscaping, and "architectural features" that should have been budgeted for in the beginning.

So far BART has continued to hope against hope that somehow it can bring the system in with the funds at hand—and without going back to the voters for more. BART is currently engaged in making a series of sweeping cutbacks. Many of them affect design, as might be expected, but others even affect the system's safety. Pedestrian passages over and under railroad tracks near BART stations, for example, have been eliminated in the economy wave.

BART is on its way, but the closer it gets the less of a bargain it becomes. Unless changes are made in its procedures, BART's shiny trains will pass through an environment that is worse, not better, for its presence. BART should bring urban planners and designers (including Emmons) into the heart of its decision-making process—not as consultants, or consultants to consultants, but as full participants. BART needs to find the money, and the broad-gauged leadership, to do the job right.

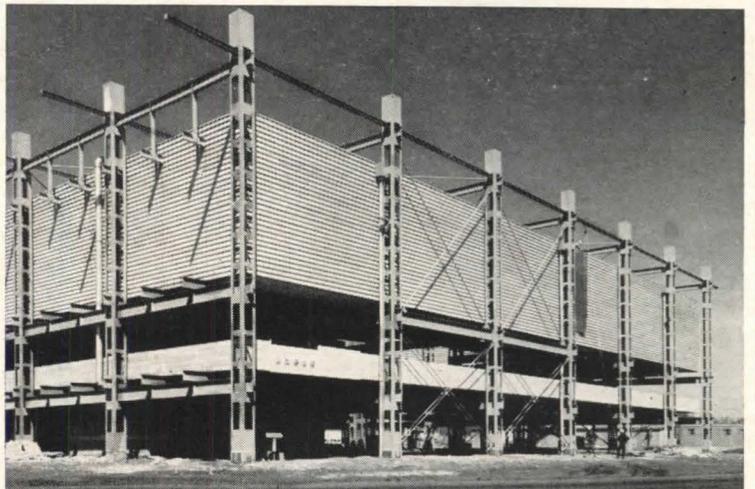
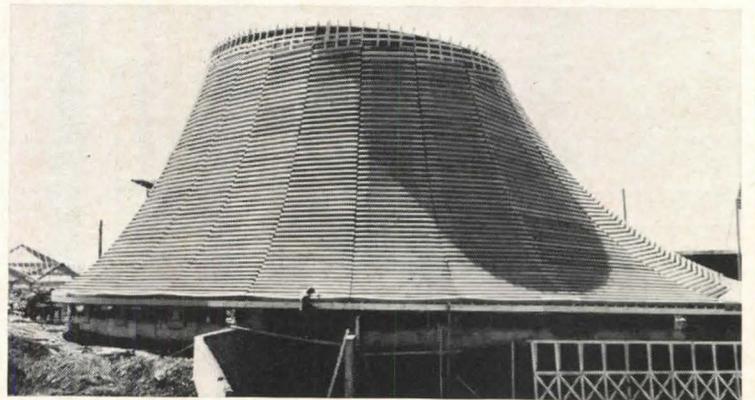
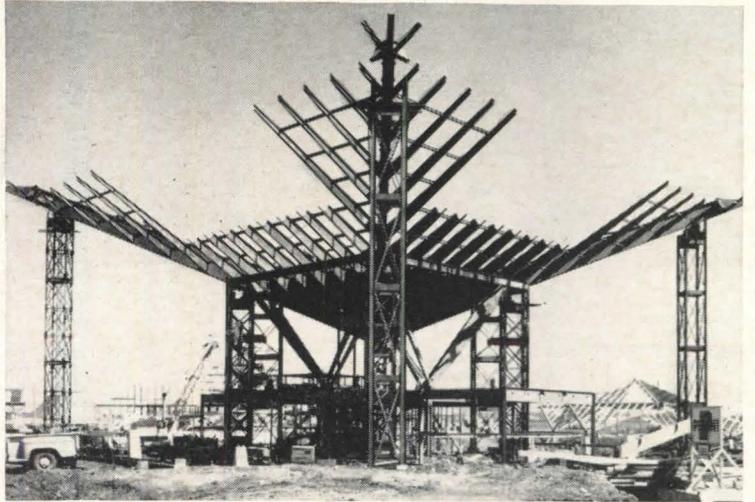
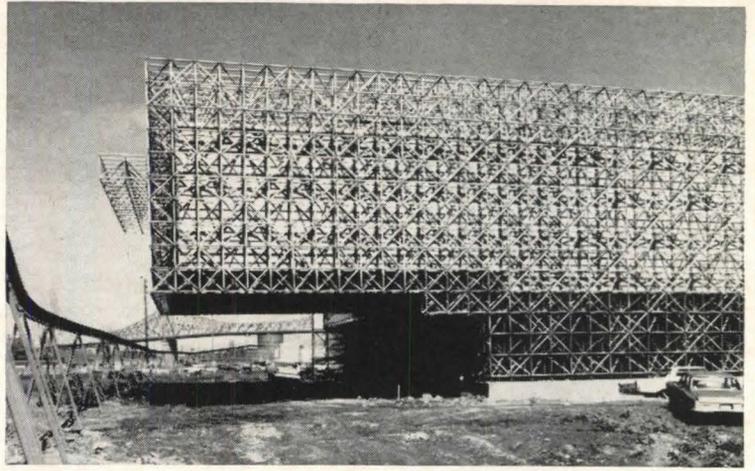
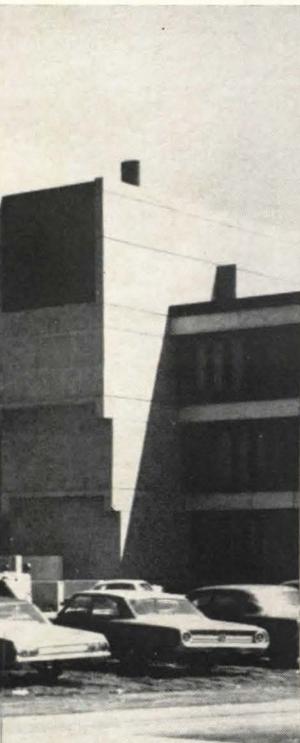
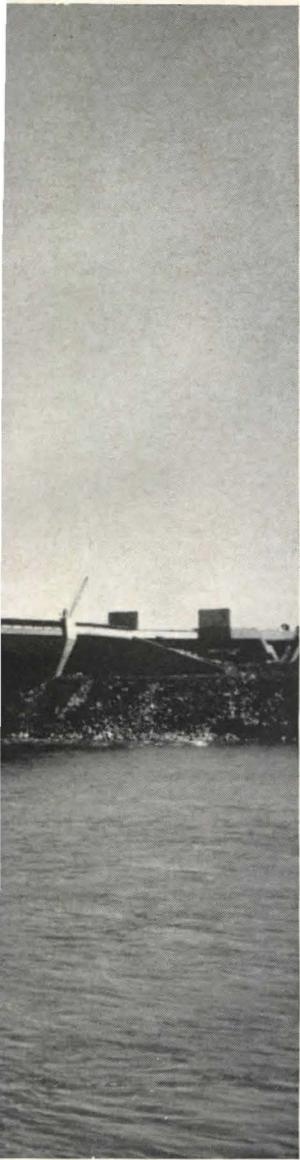
—JAMES BAILEY





EXPO SHAPES UP

Until recently, selling Montreal's Expo 67 has seemed an uphill task. The 1,000-acre site looked like two islands of mud in the St. Lawrence, and the New York World's Fair had left a bad taste in the mouths of public and exhibitors alike. But suddenly things are looking up: \$11 million in advance tickets have been sold in just two months, and the Expo pavilions are taking shapes that already promise more architectural interest than Flushing Meadows ever offered. Expo's own constructions to date include the 1,500 ft. Bridge of the Isles, with a sturdily handsome suspension section over the Le-Moyne Channel (top left); and the permanent Administration and News Building (lower left), with its projecting floors and hooded entries. At right, a sampling of the exhibit pavilions under construction (from top): 1. The Netherlands' tubular aluminum space frame, which cantilevers one of its three exhibit spaces out 45 ft.; 2. the flaring centerpiece of the Canadian Government pavilion, which will eventually take the form of an inverted pyramid 108 ft. high; 3. the conical, cedar-shake-clad Western Provinces pavilion, which will have giant fir trees growing out of its top; 4. the Scandanavian pavilion, raised on steel stilts over what will be a sculpture garden and open-air restaurant. (For a preview of the U.S. entry, see page 72.) Credits: Bridge, J. Miller, project architect; S. K. Mathur, engineer. Administration building, Arthur Lau, architect. Netherlands, Walter Eykelenboom. Canadian Government, Ashworth, Robbie, Vaughan & Williams; Scholer & Barhkham; Z. Matthew Stankiewicz. Western Provinces, Beatson Stevens Associates. Scandinavian, Erick Herlow & Tormod Olesen, Denmark; Jaakko Paatela, Finland; Skarphedin Johansson, Iceland; Otto Torgersen, Norway; Gustaf Letterstron, Sweden.



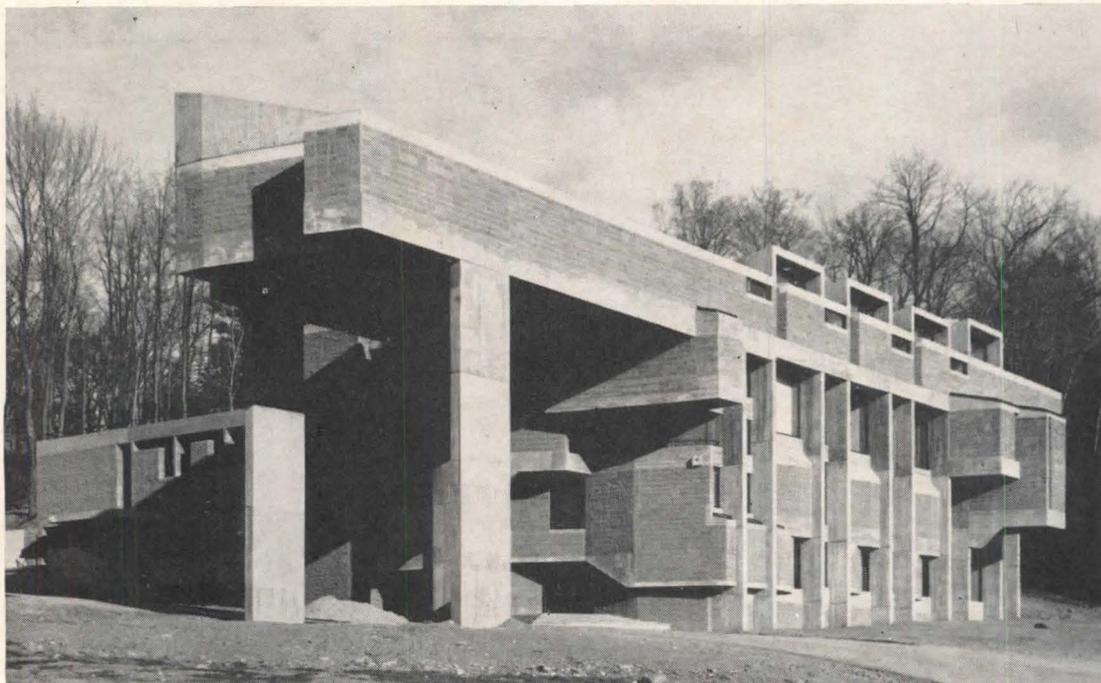


MALTESE MISCELLANY

Scalloped roofs, latticed balconies, and multi-paned windows are tossed together on the exterior of Richard England's Paradise Bay Hotel at Cirkewwa, Malta (photo above). Composed of a curved and a rectangular block, it is set neatly into two levels of an abandoned quarry. The upper section houses 32 of the hotel's 40 bedrooms. The lower, curved unit, which looks out on irregularly shaped swimming and wading pools, includes kitchen, dining hall, bar, lounge and remaining guest rooms. The blue and white trimmed concrete block exterior hides bearing walls of local stone.

BROADWAY BIBLE HOUSE

The beefed-up bearing wall building is clearly becoming the new vernacular of SOM-New York. This one houses the column-free offices of the American Bible Society, and is located on upper Broadway in Manhattan, in the changing precinct between Columbus Circle and Lincoln Center. The first story is cast in place concrete, and from there up the structure is made of burly precast pieces. Called "Bible House," the building contains offices, an auditorium, and a large library.



CAMPUS PORTE COCHERE

Paul Rudolph's latest, the \$1.5 million Charles A. Dana Creative Arts Center at Colgate University, sends its heavy fascia outward to become a porte cochere over an entryway to the campus. The rhythmic facade reflects the multitude of facilities housed in the building, including a 400-seat auditorium. At least two changes have been made in the design since it was unveiled to the not entirely enthusiastic comments of Philanthropist Dana: the fascia, which was to extend in the other direction too as a bridge to the hillside, doesn't; and the walls, instead of being corduroy concrete in the Yale manner, are plain concrete and striated block.

TON BISECTION

26-story tower that is the major element of the John Fitzgerald Kennedy Federal Office Building, dedicated last month in Boston, is split into two slabs, joined by a service core and staggered to bring more sunlight into the interior. It and the attached 12-story structure were designed by The Architects Collaborative. A noncommittal curtain wall of quartz-studded precast panels covers both the steel frame of the tower and the concrete frame of the low wing. The tower's windows, set in a parapet around corner windows, reminiscent of the 1930's, are checked on the interior by hefty perimeter columns. This is the first major landmark completed in the still largely empty Government Center. The crane at the right in the lower photo, incidentally, is hoisting pieces of the new City Hall.



PHOTOGRAPHS: Pages 60-61, 62 (left), George Cserna. Page 63, Lois Green.

GOOD NEWS ON RACINE AVENUE

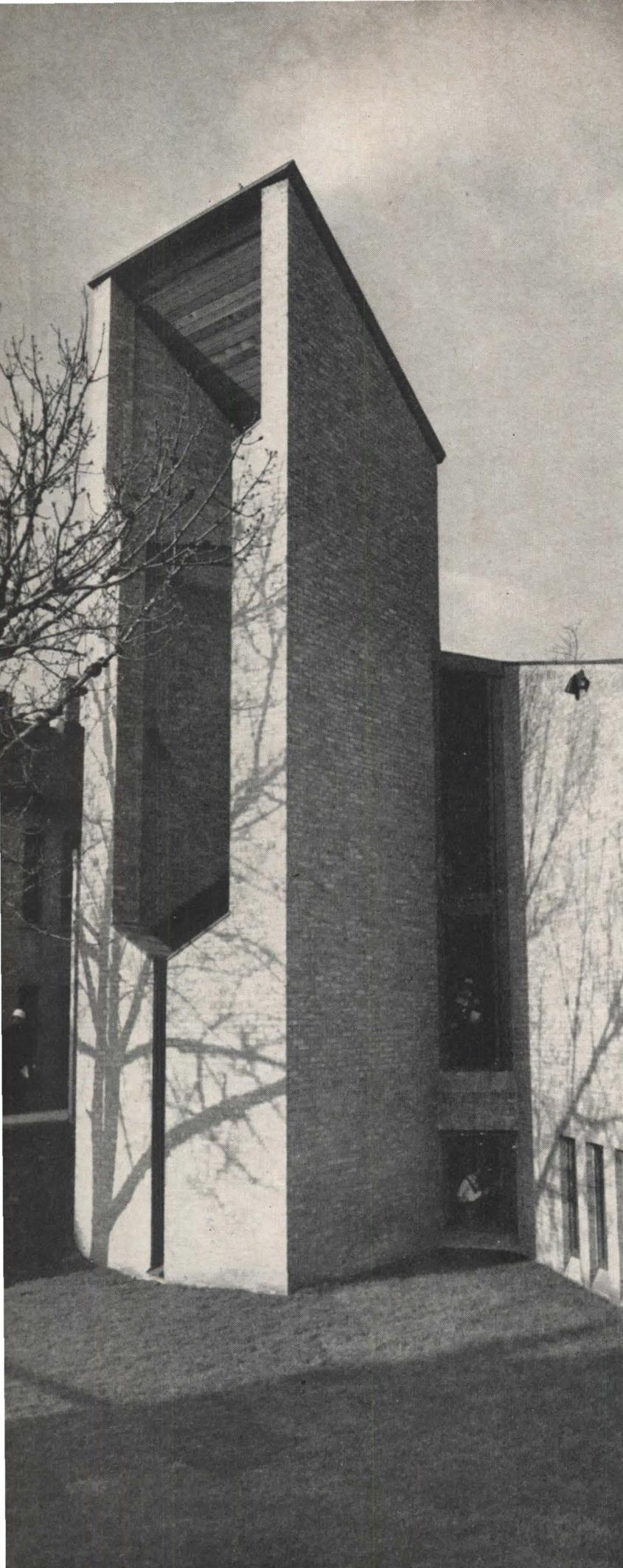
Dovetailed into an old block in the Pilsen neighborhood of Chicago, the Emmanuel Presbyterian Church says clearly that something new is happening. Using blade-like wall planes set at regular angles, Architect Edward Dart has given the church perplexing forms unlike anything else in the endless grid around

The site is in the midst of a poor but respectable area on the Loop—an area that has been absorbing new minority groups, mostly Negroes and Mexicans, in recent years. The church is meant to serve as an anchor for the remaining English-speaking whites and a place of welcome for the newcomers.

As much as it differs in form from all that is around it, Dart's church fits snugly into its allotted space, even relies on adjoining buildings in its design. It offers the neighborhood reassurance that change is not something to be feared.



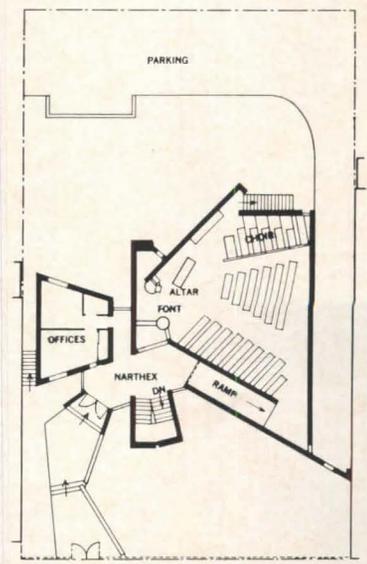
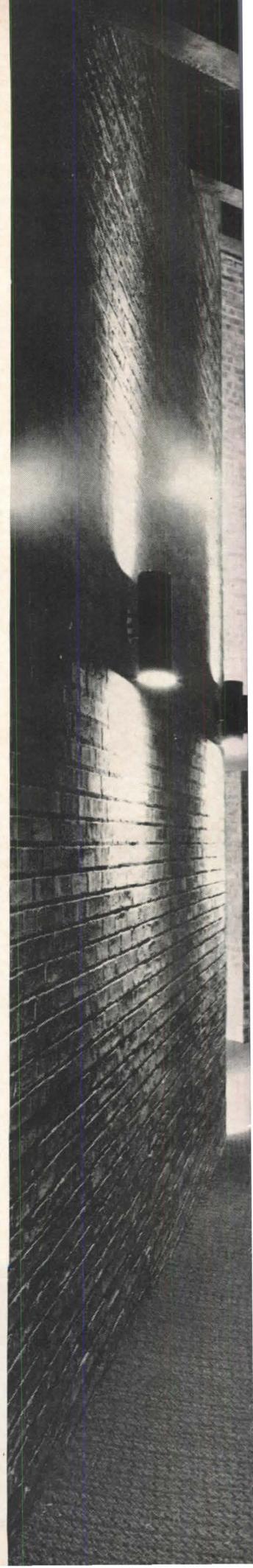




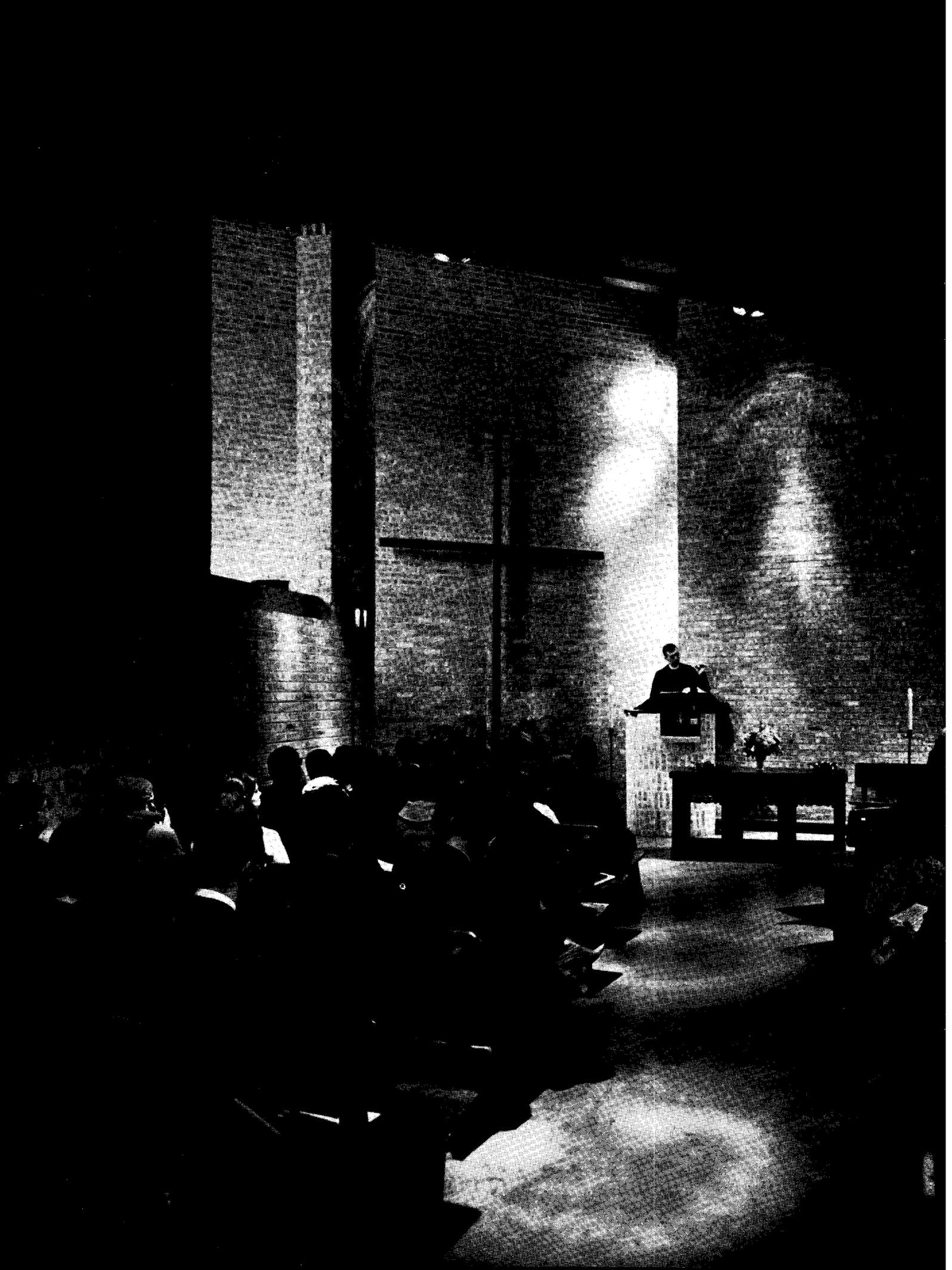
The line of building fronts is broken at the church by an open space shaped like a shallow funnel, as if to encourage the congregation to gather and enter. At the point of the funnel, where it seems the entrance ought to be, stands a small belfry (left), made more prominent by slight distortions from the expected rectangular plan (below).

The actual entrance is tucked away in a corner of the forecourt, playing its part in a roundabout process of entry that leads the worshiper almost 90 ft. from the church's gate to the point—actually only 30 ft. from the sidewalk—where he comes into the sanctuary (right).

To reach this point he has gone up a front walk that turns twice and rises once (an awkward budget version of the ascending terraces originally planned); passed through a polygonal narthex (which offers an unexpected back-stage view of the chancel through glass doors); turned again, and climbed up a ramp that rises between blank brick walls toward an acute blind corner. Only at the last moment does the left-hand wall fall away, revealing the entire sanctuary in one wide view.





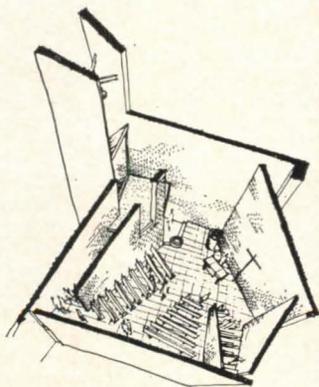


The sanctuary is a fan-shaped space, defined by free standing planes with light coming in between them from hidden sources. Only the obvious heaviness of the brick keeps them from looking like flats on a stage.

A tilted ceiling plane intersecting these planes at odd angles makes the spatial geometry almost impossible to grasp. (Actually, the relation of the roof to front and back walls is much simpler than it looks, as the sketch below shows.)

The congregation is spread out in a wide arc, facing several focal points—cross, pulpit, communion table—so that everyone seems to be directly in front of something. The farthest section of the fan is occupied by the choir (right), tilted up behind a low brick wall, but still clearly part of the congregation. The round brick pulpit and the black granite baptistery (below right) are handsome as objects and perfectly at home in this space.

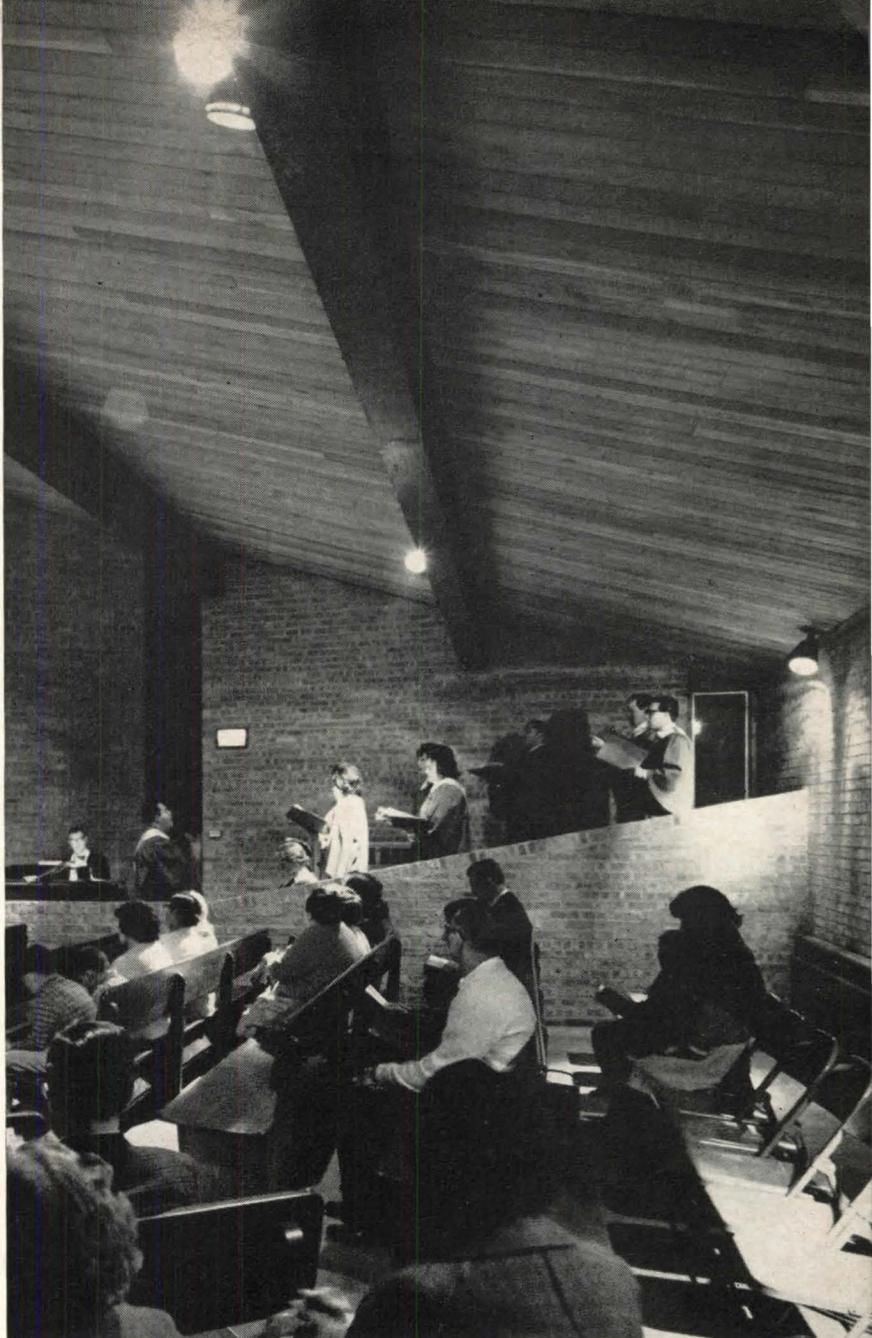
The church as a whole has much in common with Victor Lundy's Church of The Resurrection in New York (Jan./Feb. issue). But Lundy's church had to be a powerful, unified sign of hope in a neighborhood of doomed buildings, Dart's building is subtler in form, smaller in scale—shaped to fit, not to resist, the environment around it. —JOHN MORRIS DIXON



FACTS AND FIGURES

Emmanuel Presbyterian Church, Chicago, Ill. Architect: Edward D. Dart of Loeb, Schlossman Bennett & Dart. Engineers: Samartano & Robinson (structural); Frank Riederer (mechanical). General contractor: R. H. Roberts Construction Company. Building area: 4,850 sq. ft. Construction cost: \$99,529.65, not including land, fees or furnishings.

PHOTOGRAPHS: Orlando Cabanban.



THE PUZZLE OF ARCHITECTURE. By Robin Boyd. Published by Cambridge University Press, New York, N.Y. 187 pp. Illustrated. 8 by 9 3/4 in. \$12.50.

REVIEWED BY PHILIP JOHNSON

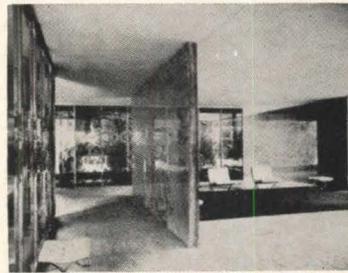
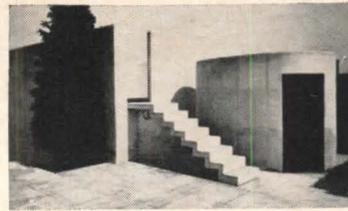
In reading Robin Boyd I cannot help thinking of the time, a generation ago now, when Henry-Russell Hitchcock was similarly engaged in writing contemporary architectural history in his monumental *Modern Architecture* of 1929 and the picture book, *The International Style: Architecture 1922-1932*.

Like Robin Boyd, Hitchcock was writing history about buildings barely off the drawing board and, like Boyd, trying to find good and great architecture in the maze of contemporary work. I cannot help but think Hitchcock's task was a simpler one. In the early 30's we could see the triumph of the International Style. The dominance of Le Corbusier (1) was already complete. The Barcelona Pavilion (2) had already established Mies, and the Bauhaus building, Gropius. The continuation of that triumph seemed assured. And indeed it was.

But today, and I wonder if the fact that I am sixty has anything to do with it, the picture does not look as clear, the lines so well drawn. Indeed, my own sense of lack of direction is quoted against me by Boyd. Apparently I said somewhere, "Why can we not wander aimlessly?" I was all for a principle of lack of principles, as it were. Boyd will have none of this, and his description of the situation today in the world of architectural design is completely convincing. At least to me.

Since I must recommend that every architect read every word, it may seem unnecessary for me to paraphrase the main thesis; but since Boyd does dress up his main points with discursions and, especially at the end, with a moral appeal for Realism,

Mr. Johnson hardly requires identification. He is, of course, one of the best known architects and architectural critics in the world today. Although he is too modest to say so himself, he is the coauthor of *The International Style: Architecture 1922-1932*, to which he refers in the first paragraph of this review.



1. De Beistegui penthouse, Le Corbusier (1930). 2. Barcelona Pavilion, Mies van der Rohe (1929). 3. Kurashiki Town Hall, Tange (1960). 4. N.Y. State Theater, Johnson (1964). 5. TWA Terminal, Saarinen (1962). 6. Married Students' Housing, Harvard, Sert, Jackson & Gourley (1964).

Functionalism, and even Truth (values I find too elusive to be satisfactorily invoked), it might not be out of place to give my impressions of his history.

A word of warning: The following resumé may differ from Boyd's in many ways. He himself is quite accommodatingly liberal, not to say loose, in his terminology. For example, he labels the Kurashiki Town Hall (3) by Tange as Third Phase, when quite obviously it is Second Phase. We can afford in these murky waters to be slightly indistinct.

It seems then there are three phases of modern architecture of the last generation. By using the word "phase," the author reduces the dangers of the brickbats that Hitchcock received for the nasty words International Style. (It is amusing to note, that no matter how much vilification we received for using the words International Style, the term is still used, even by the present author, and still means exactly what we meant it to mean 35 years ago when Alfred Barr first coined it.)

The First Phase then includes the International Style, all the work from the 1920's revolution to the present. This phase is based on the now old ideas: structural honesty; repetitive, modular rhythms; clarity, expressed by oceans of glass; the flat roof; the box as the perfect container; no ornament. Today Mies is the lone giant still sensitively producing works of art of the First Phase. Many fine SOM skyscrapers and much lesser work by lesser architects continue the tradition. Fortunately or unfortunately, the First Phase principles were easily adaptable by commercial and industrial builders, and the rallying cry of the intellectuals of the twenties and thirties became the slogans of the speculative builders of the fifties and sixties.

Came the reaction and the Second Phase. All over the world we were bored. The fifties were groping. On the one hand, decoration came back; on the other, historical reminiscence. We have only to think of Paul Rudolph's Wellesley Gothic, Edward

tone's Venetian Huntington Hartford, my own Classical Lincoln Center (4), or Yamasaki's Gothic tracery. Although Louis Kahn belongs to a later story, his love of castles and San Gimignano. One of Boyd's words for the main tenets of the Second Phase is the jaw-breaking word "monolithicism." That is, we stuffed our functions in those days into preconceived geometric volumes. The cube, the cylinder, the rectangular solid. Or even into warped shapes or bunch of rape clusters; my Dumbarton Oaks being one example. The rape was primary. We even went in for vaults, hyperbolic paraboloids, gables, even for symbolic shapes (consciously or unconsciously) like the winged bird of Saarinen's TWA (5).

The special story of Kenzo Tange is illustrative. Starting with pure International Style (First Phase) at Hiroshima, Tange quickly went Second Phase with his famous town halls. Two features stand out: his love of Japanese architecture and the fitting of function into shapes, shapes, shapes. The best of these is Kurashiki. The plain rectangular block is made of precast concrete "logs" that lap at the corners like a log cabin. The building is lifted off the ground, clearly recalling the Shosoin at Nara. The windows are cut in at arbitrary but effective spots.

The Third Phase, what is happening out front in architecture in the sixties, is naturally hard to explain. In art, labels are better attached after a long wait. I think of "Gothic" and "Baroque," both pejorative terms when they were invented. So Boyd is in a spot and I am, too, since it is obvious from the book that I am essentially Second Phase.

My description, therefore, of the Third Phase may be (1) pre-judiced (age envies youth); (2) sympathetic but inaccurate (papa never understands junior); (3) absurd (old goat pretending to yowling); (4) fair (I have seen everything). (A footnote to this talk of "age." It is meant only as a bridge between Second and Third Phase architecture. Both Louis Kahn and José Luis Sert are, in

years, older than I.)

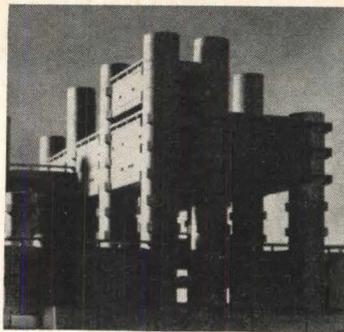
Anyhow, easier than talking principles, let us quote buildings included in the canon of the Third Phase today and deduce a few basic threads of consistency. Boyd lists specifically Kahn's Richards Laboratories, Rudolph's Arts and Architecture Building, Sert's Married Student Housing (6), Tange's Yamanashi Press Building (7), and Johansen's Taylor House.

Why he omits the key English building, Leicester University Engineering Building by Stirling & Gowan, I can't imagine. It beautifully illustrates the Third Phase and is perhaps the strongest of the lot. Consider it included (8).

What have these buildings in common that makes them a group? What identifies the Third Phase? Since what something is *not* is easier to make precise than what that something *is*, these buildings are *not* rectangular skin-interesting boxes like the First Phase, they are *not* arbitrary shapes like the Second. They are *not* all glass with even bay systems poised on pilotis above the ground like the First Phase, or carefully smooth-materialized monolithic "significant" forms like the Second.

On the contrary, within the general modern movement with its emphasis on functionalism, structuralism, anti-axiality and anti-ornamentation (all these modernisms are scrupulously present), the Third Phase has found a new way toward the synthesis of unity and diversity, clarity and complexity.

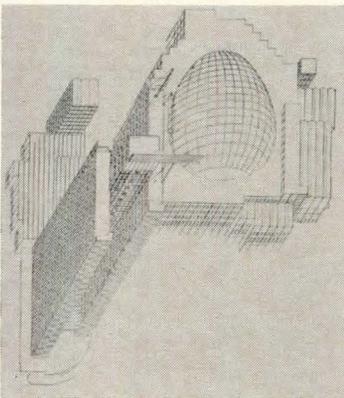
In many cases a functional element has been picked out and exaggerated to make breaks and strength of intent, viz., the exhaust pylons of Kahn's Richards Laboratories, the vertical communications of Tange's Yamanashi Press Building, or the toilets in Paul Rudolph's Government Center. Sometimes a single element is repeated but at various scales, like the sun boxes of Rudolph's Milan House or Johansen's Taylor House. Sometimes great gashes are introduced in tall rectangular masses to emphasize depth and make an impression of strength, viz., Sert's



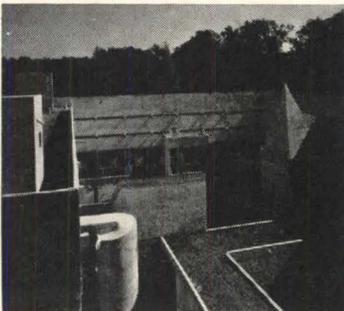
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7. Yamanashi Press Building, Tange (1966). 8. Leicester Engineering Labs, Stirling & Gowan (1964). 9. League of Nations Headquarters Project, Meyer (1927). 10. La Tourette Monastery, Le Corbusier (1957). 11. Boyd-version of elevation of Glass House, Johnson (1949).

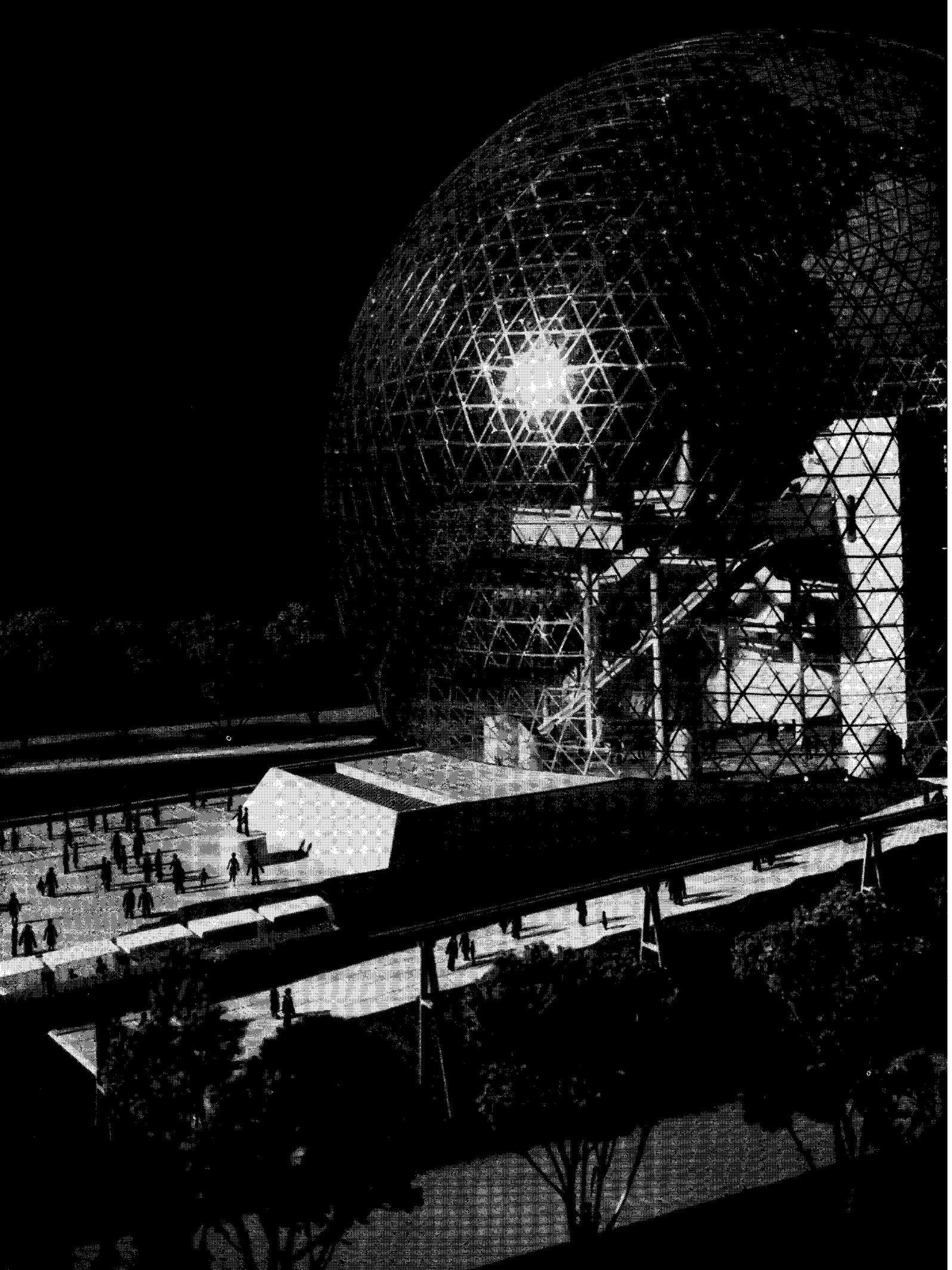
Boston University and Stirling & Gowan's Leicester University. In some buildings like Kahn's and Tange's, even Johansen's and Stirling's, the Second Phase enclosed volumes seem turned inside out. The great spaces are *outside* the buildings, not in. The change from Kurashiki to the Yamanashi Press Building is a case in point. The Second Phase clothed great rooms with a single significant shape. The Third in a play of external space semi-enclosed by functional elements strongly expressed.

Often the Third Phase, unlike the First, but like the Second, reaches back into history but is more apt to pick more recent models. Stirling's Leicester reminds me of Hannes Meyer's drawings for his entry in the League of Nations competition of 1927 (9). Haering's Garkau and Tatlin's Utopian schemes are special favorites. Wright's "looseness" as in the Robie and Kaufmann house designs is analogous to the play of space in the Third Phase.

The Third Phase is contemptuous of careful finishes. Coming from Le Corbusier and his English Brutalist followers, the "toughness" of raw concrete, unpointed brick work is favored. It seems to the sixties more honest (handicraft is gone forever, anyhow), more of our era.

Functionalism has taken a new turn. Every architect realizes that function is not the sole maker of form, but the functional parts are made the *basis* of form much more than in the Second Phase. "What the building wants to be," in Kahn's phrase. Johansen's proposed library for Clark University expresses separately almost every varying function in the building. Big rooms hang out big, small rooms small.

Perhaps the most "far out" building actually to be realized yet in the Third Phase is Tange's Yamanashi Press Building in Kofu City, Japan, now nearing completion. At first it strikes the observer like an AA student's design made into a big instead of a small model, since so much of the "plug in" quality seems already to be there. It seems



BUCKY'S BIGGEST BUBBLE

a little less than a year from now, on the island of St. Hélène in the St. Lawrence River where flows past Montreal, a 20-story-high Crystal Palace will officially present the U.S. at Canada's Expo 67. This Crystal Palace will be the biggest dome ever built by Buckminster Fuller, and it will dramatize the theme of the U.S. pavilion even more strikingly than the exhibits inside it.

That theme is "Creative America;" and in picking Bucky Fuller to dramatize it, the U.S. Government (which has not always been very imaginative in such matters) did itself proud.

General descriptions of Bucky's biggest bubble (and of the exhibits it will house) have appeared in earlier issues of the FORUM. This is the first detailed account of how this building was commis-

sioned; of how the dome will be constructed, shaded, and ventilated; and of how the exhibits will be displayed inside it.

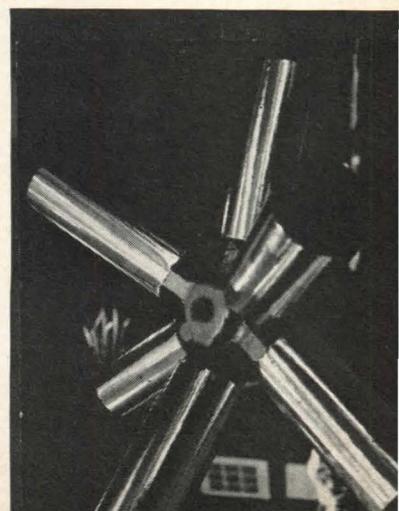
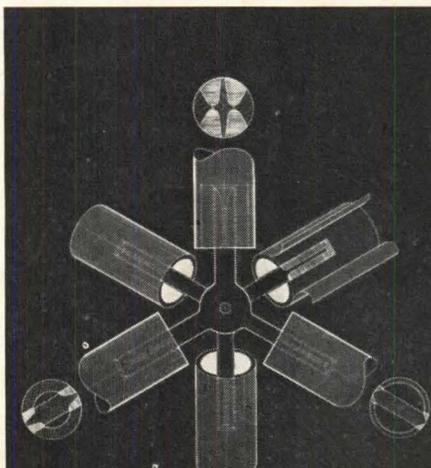
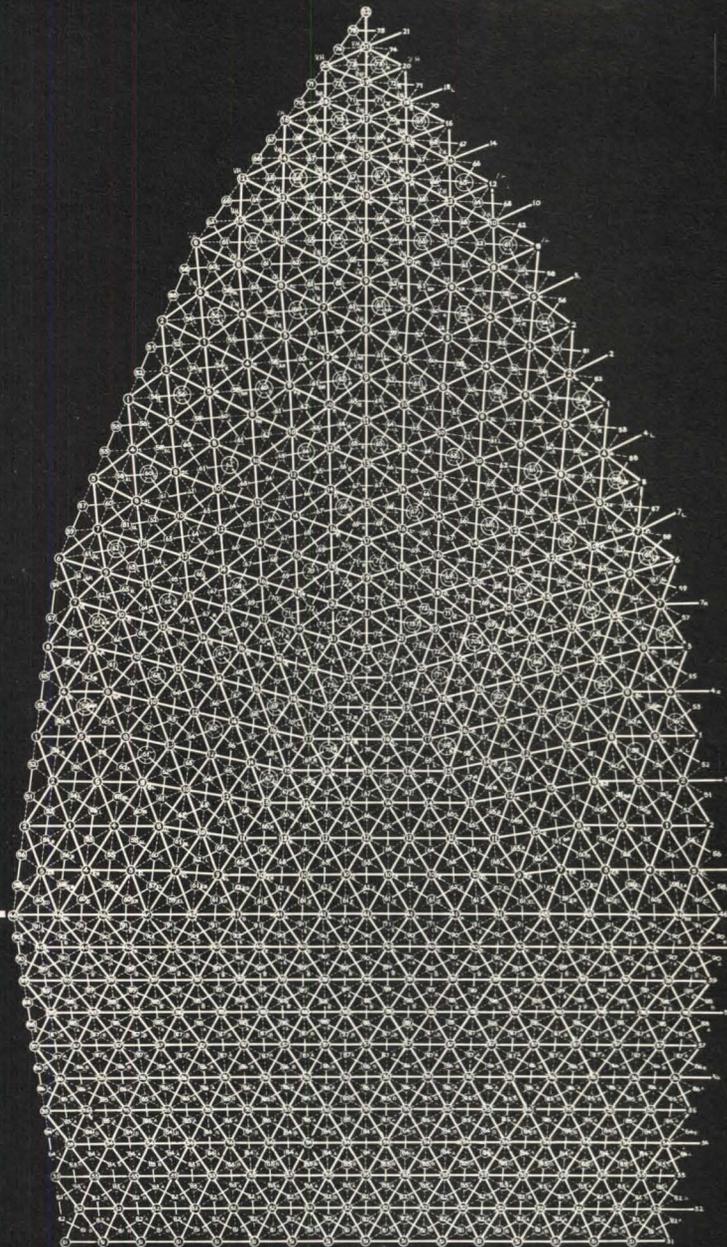
Why Bucky?

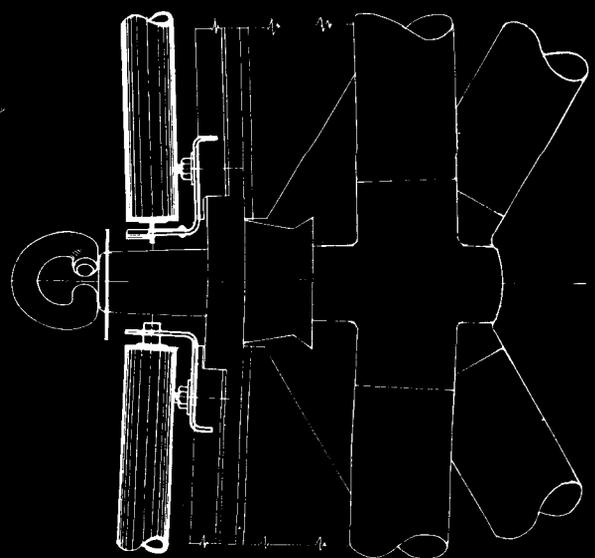
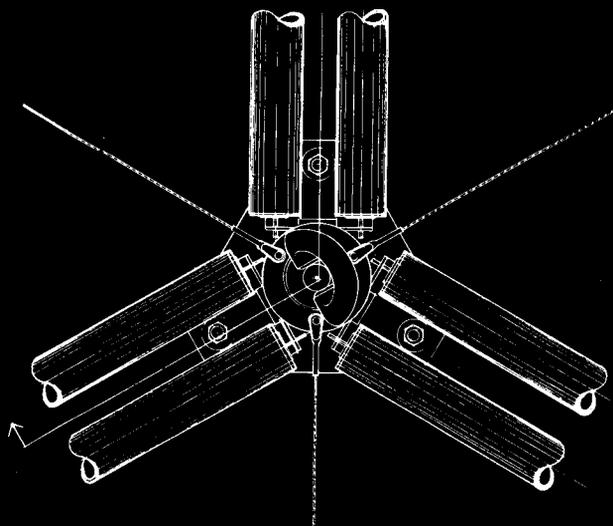
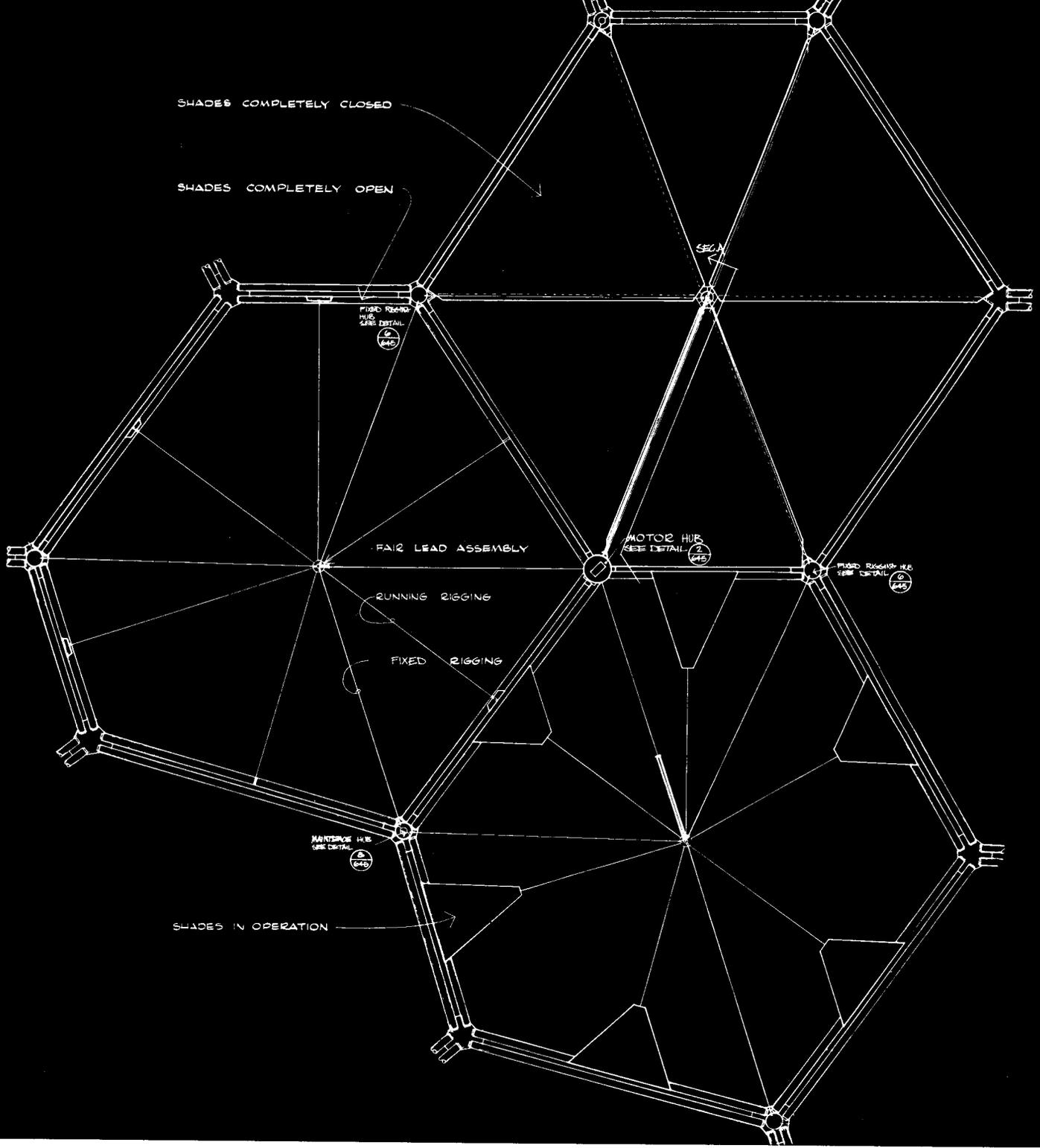
The job of producing the official U.S. exhibit for Expo 67 fell to the U.S. Information Agency and its director, Leonard H. Marks. But at the operational level, where—in the end—the quality of any such enterprise is determined, the key decisions were made by relatively unknown officials and, in particular, by Jack Masey, a graduate of Yale's school of arts and architecture, who had been appointed chief of design.

Masey had worked with Bucky and his domes before: in Kabul, Afghanistan, in 1956 (that dome was reused elsewhere about a dozen times); and in Moscow in 1959. He had not only found Bucky's domes easy to ship, easy to put up, easy to fill with exhibits, and easy to take down and reassemble elsewhere; he had also discovered that the domes, almost invariably, filled foreign spectators with awe at U.S. technical virtuosity, and with delight at U.S. esthetic sensibility. So, when USIA asked for a great, big enclosure to house proof of American Creativity, Masey asked Fuller for the biggest dome yet.

The model seen at left shows what USIA (and Montreal) will get; and the details described on these and the next pages suggest that the dome may, just possibly, steal the show at Expo 67. If so, this will be a tribute to a small number of very atypical U.S. Government officials who were willing to take a big chance. But if Bucky triumphs, his success will not be an unmixed compliment to Creative America for, after all, Masey and his associates had to go to a man in his seventies for the best example of design creativity in the U.S.—and where does that leave everyone else?

opposite page: Model photo showing "minirail" train that will traverse Expo grounds, and travel right through geodesic dome. Right: Key drawing of one fifth of Montreal dome. Heavy lines represent exterior cords which carry most loads in a triangulated grid; lighter lines represent interior cords arranged in a parallel, hexagonal grid; dotted lines represent web members that connect exterior and interior grids and thus transform them into spherical space frame. Horizontal line is the "equator" of the bubble, located 50 ft. above ground level. Two thousand hexagonal, tinted acrylic domes will be mounted on the interior cords, and the domes will be shaded by automatically operated blinds described in the next two pages. Photo shows typical hub connection between interior cords and web members. The struts have a constant diameter but vary in wall thickness with loads (see detail drawing). They will be wrapped in metallized plastic indistinguishable from chromium.





Montreal dome
mechanized chameleon

The pavilion can be regarded as a prototype 'environmental valve,' says Buckminster Fuller. It will enclose sufficient space for whole communities to live in a benign physical microcosm."

One reason Bucky's bubble will be climatically benign inside is that the skin carried by the spherical space frame has been designed to act like the skin of some sort of animal. A number of the hexagonal acrylic domes will have exhaust vents in the center to permit the interior to "breathe"; and each of the acrylic domes will be shaded by a device straight out of science fiction: a system, in Bucky's words, of "mechanically actuated, triangular, metallized plastic sun shades that will provide dynamic modulation of the interior climate."

The device functions as follows: a motor will be mounted over the center hub of each group of three interior, hexagonal frames. This motor is activated by the rays of the sun, and each of the 600-odd motors has been programmed to go into action when those rays strike it at a predetermined angle.

When the motor goes into action, it starts to pull at three sets of cables (six cables per set). These cables, in turn, begin to unwind the metallized plastic shades that are normally wrapped around window-shade-type rollers. The rollers are overlaid on the interior hexagons. The drawings at left show how the triangular plastic shades are gradually and automatically unrolled.

The first of these fantastic gadgets was assembled and tested in the manufacturing plant a couple of weeks ago, and the pictures at right show a typical, tri-hex shade assembly in operation.

"Garden of Eden"

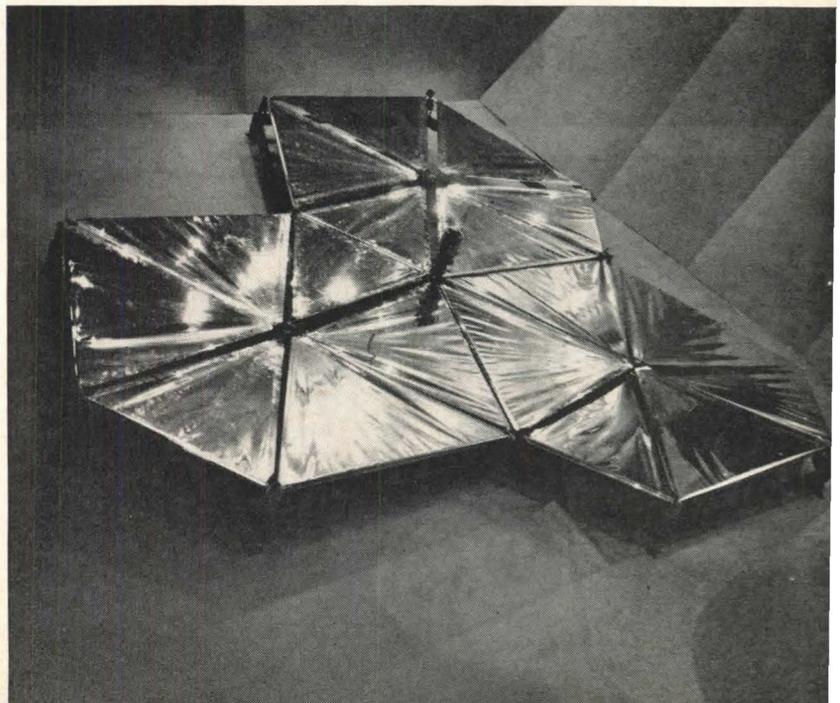
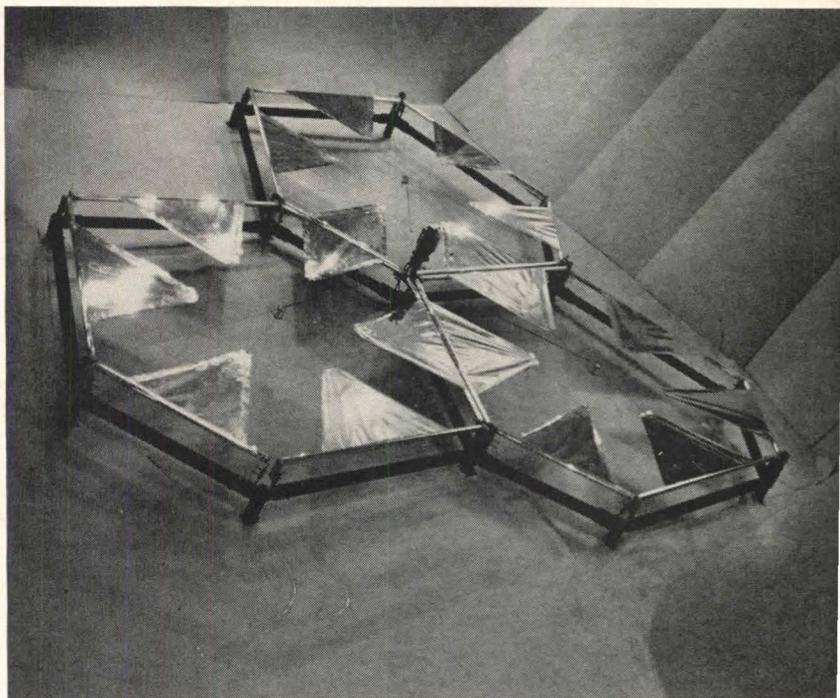
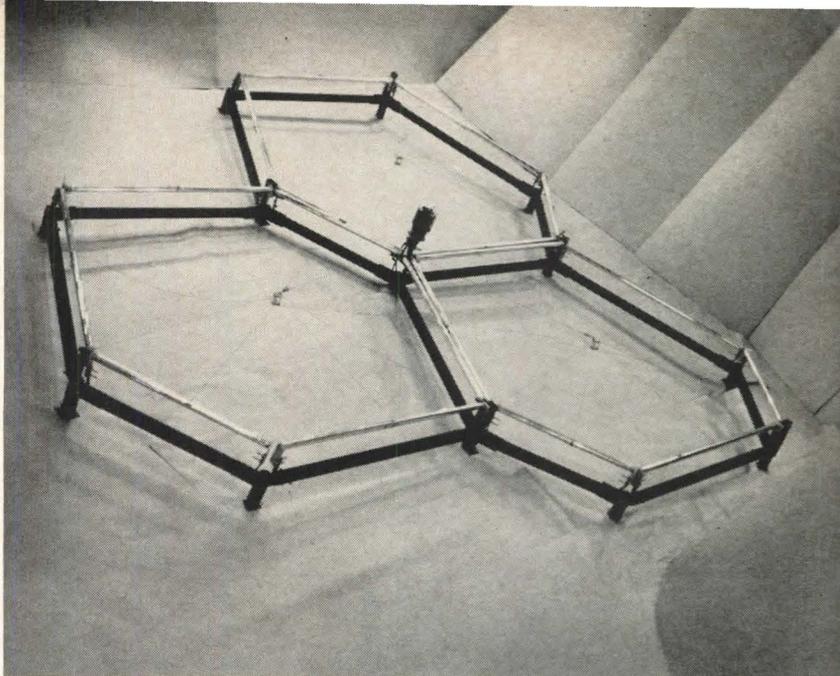
Skeptics may ask whether it makes sense to use a skin that requires such complex shading and ventilating devices. (Although all the acrylic domes will be hexagonal, there will be 45 differently shaped hexagonal domes in all.)

The answer is that the Montreal dome is not meant to be a "building" designed simply to house and enclose; it is meant to be a demonstration of an ultimate "controlled environment," protected but not cut off from the outside world. "From the inside there will be uninterrupted visual contact with the exterior world," Bucky says. "The sun and moon will shine in, the landscape and sky will be completely visible, but the unpleasant effects of climate, heat, dust, bugs, glare, etc. will be modulated by the skin to provide a 'Garden of Eden' interior." The interior will contain 6.7 million cubic feet of space—about the cubage of the Seagram tower!

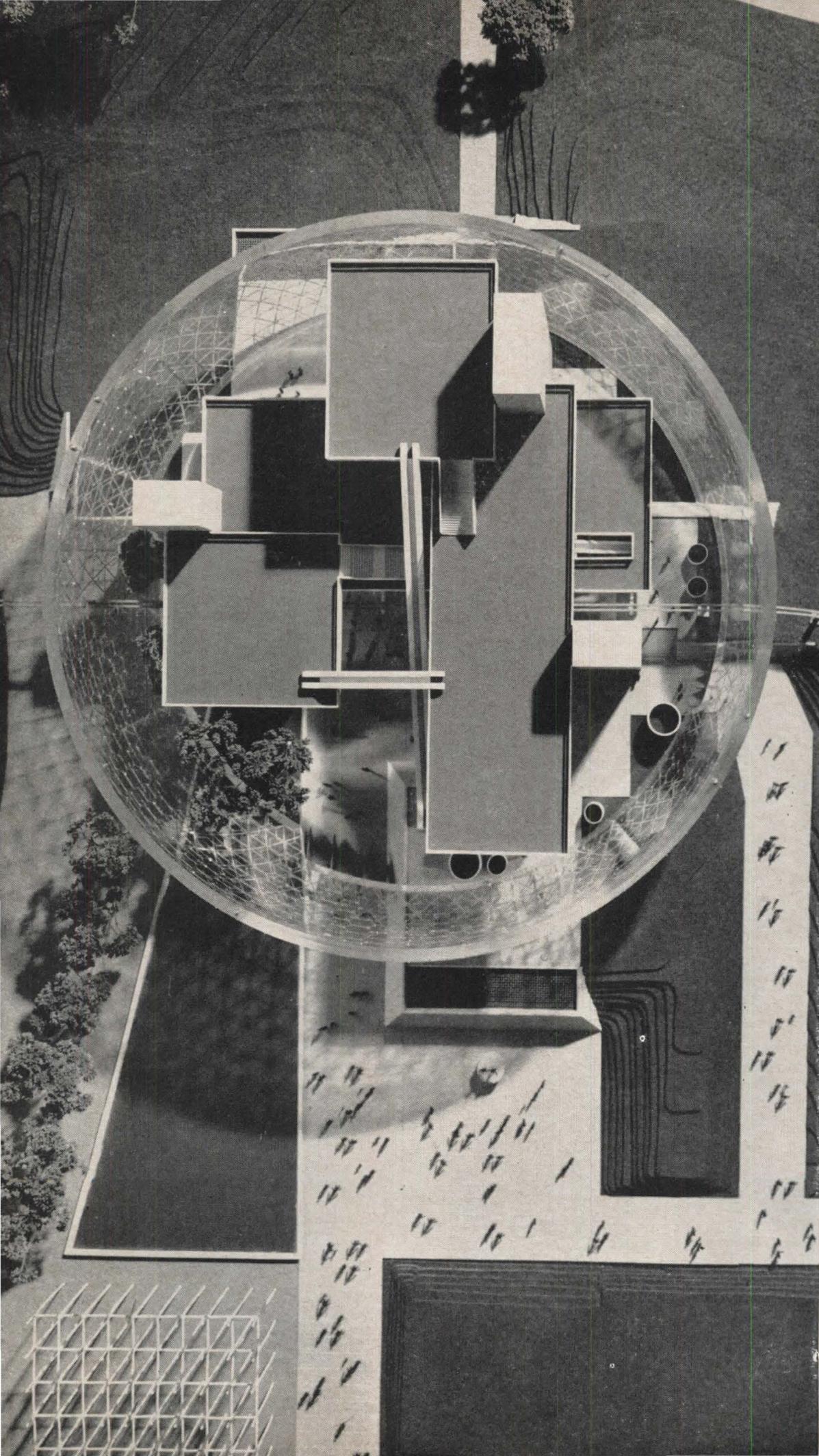
Animated surface

When the dome and its shading devices are in place and in operation, the effect should be little short of fantastic. For in the course of each day, as the rays of the sun light up the dome from different angles, the plastic skin will slowly change from complete transparency to polished "chrome!"

Even without these mechanical effects, the dome should be quite a sight: Bucky describes it as a "Geodesic skybreak bubble," and explains that it has a spherical diameter of 250 feet, an actual height of 200 feet, and a surface area of 141,000 square feet. "There will be 27 miles of pipe weighing 600 tons, and 5,900 hubs weighing 120 tons," he adds. This means that, not counting the weight of the plastic domes or the shades, Bucky's dome will utilize only about 4 ounces of material to enclose 1 cubic foot of space.



Opposite page: Drawings showing details of mechanically actuated sun-shade assemblies. At the top, a typical assembly of three hexagons with a motor in the center hub, and metallized plastic roller shades in various positions as they are pulled out on cables. Below, a detail of one of the hubs in the roller shade assembly. Right: Photos of tri-hex assembly in three stages of operation.



Montreal dome
Inside the bubble

Any exhibits designed to fill such a spectacular enclosure would appear doomed to obscurity. Yet the exhibit structure (left), designed by the Cambridge Seven may turn out to be almost as spectacular as the dome that will house it.

The structure will be a series of platforms on different levels, connected by escalators, bridges and elevators, and containing exhibits of American creativity in the arts, sciences and technology. The arrangement of the platforms will make possible some highly dramatic exhibition techniques: objects will be visible not only at eye level, but also from above and below, while the visitor is standing or in motion.

The Cambridge Seven—another rather far-out group not usually commissioned by bureaucrats to do important work for the U.S. Government—will draw upon other Creative Americans to help select material for their show. Much of that material, especially in the arts, is likely to be controversial, and some Members of Congress, undoubtedly, would prefer a Hallmark-type exhibit.

But those who selected the designers of the official U.S. Pavilion at Expo 67, and of the exhibits it will contain, understood one all-important fact: that next year, in Montreal, "Creative America" will be on view before an international audience that knows a great deal about where the action is in U.S. art, design, science and technology. To trot out mediocrity before such people would be an insult.

Left: Air view, with top of bubble removed, showing overlapping platforms of exhibit structure within the dome. Opposite page: Most recent model of the U.S. Pavilion with its gleaming space frame.

FACTS AND FIGURES

U.S. Pavilion for the Canadian Universal and International Exhibition, Montreal, 1967.

Organizing Agency: U.S. Information Agency. Pavilion Architecture: R. Buckminster Fuller, Shoji Sadao, Peter Filloyd, Geometrics Inc. Interior Platforms, Landscaping and Exhibit Architects: Cambridge Seven Associates Inc. (Ivan Chermayeff, Terry Rankine, and others). Engineers: Simpson, Gumpertz & Heger Inc. (structural); Paul Londe & Associates (mechanical and electrical). Canadian Associate Architects: John B. & John C. Parkin (Hugh F. McMillan). General Contractor: George A. Fuller Co., Inc. Appropriation for Pavilion and Exhibits: \$9.3 million.



FEEDBACK:

The Happy Householder Of Halen

BY ROGER SCHAFFER



The image of the structure on these pages, clean white in its open bed of forest, has been shifting in and out of the interstitial architectural consciousness for the past five years like one recurrent formal vision. It is shown up periodically in various European professional magazines, in the proliferating manuals of architecture, and even, just a few months ago, in *House Beautiful*, where it contrasted strikingly with the full-or-decorators' palaces elsewhere in the issue.

This checkerboard structure is a housing colony of Halen, near Bern, Switzerland, built in 1951 by "Atelier 5" (E. Fritz,

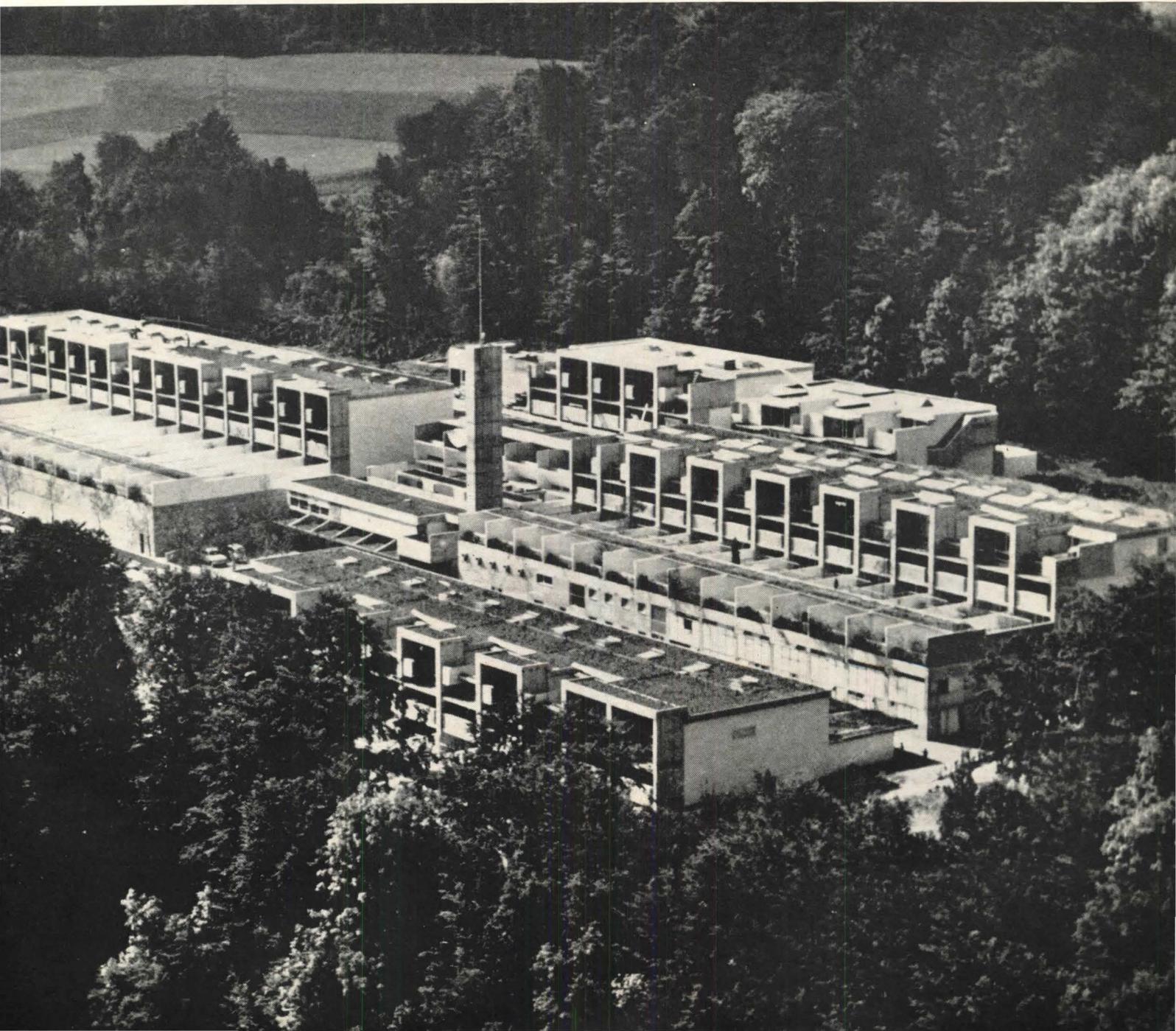
S. Gerber, R. Hesterberg, H. Hostettler, N. Morgenthaler, A. Pini, F. Thormann). It could be described as an 80-unit condominium, in U. S. housing terms; or as a microcommunity, isolated and containing within itself all the appurtenances of a small village (except, of course, a school or church).

I choose to call it a colony because of the nature of Halen's residents. I visited Halen in early spring, not so much to see at first hand its jutting forms, which I was predisposed to like, but to see how well it worked as human habitation.

I was struck immediately by the fact that this is not only a

special place; it is inhabited by special people. They are the kind of people one might find in a middle-income Manhattan cooperative—bright, liberal, culture-conscious people—but in Halen perhaps a little richer and a little farther out. Halen is not an alternative to the Levitt-like villas favored by the sub-burgers of Bern. It is more of a single-structure Greenwich village set among the trees.

This article is one of our periodic revisits to notable buildings to see how they have stood the test of use—hence the term "feedback." Mr. Schaffer is an urban renewal consultant to commercial and nonprofit groups whose experience with U. S. cooperatives dates back to 1937.





Halen's cooperative householders are unmistakably fond of the place. In five years, only six families have left (four for unrelated reasons, two because they simply didn't like it). On the other hand, the waiting list is nominal. Few move out of Halen, but it appears that few others want in.

What keeps the crowds from Halen's gates is the compactness of its dwelling units (sample plans at right) in relation to their cost. Residents have a choice of several types of row houses, most two or three stories, containing from three to six rooms. Each has a little something extra: a terrace, an entry

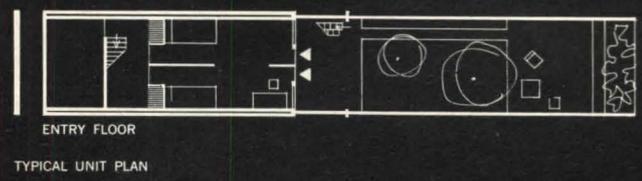
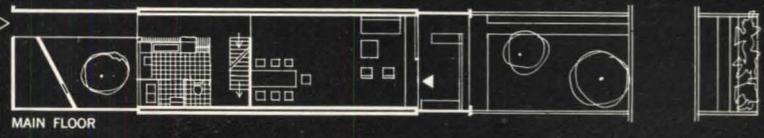
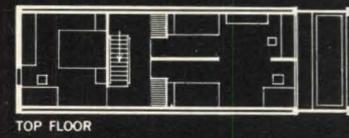
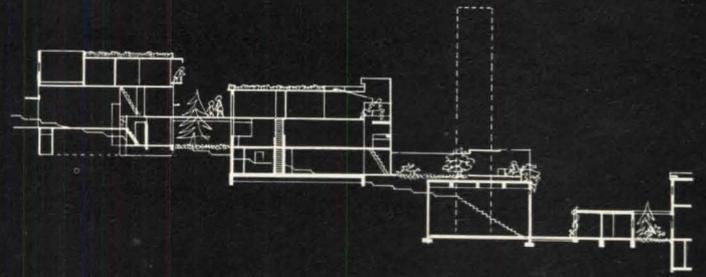
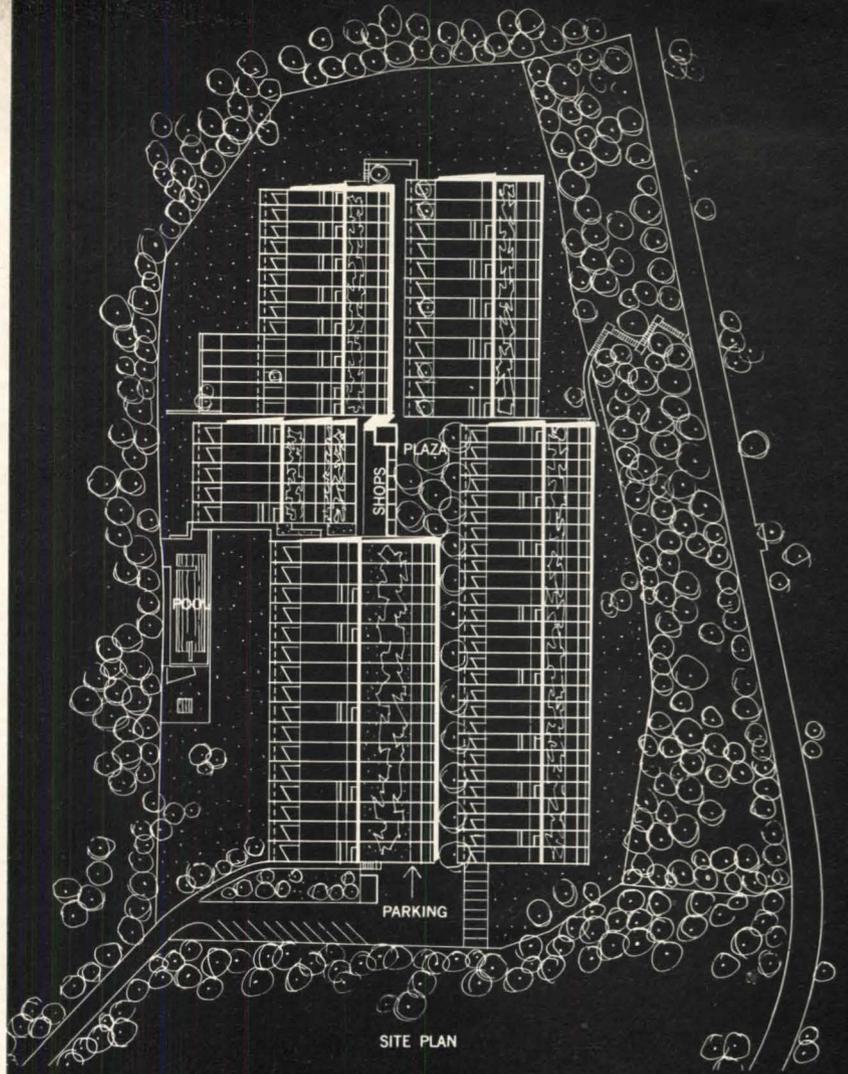
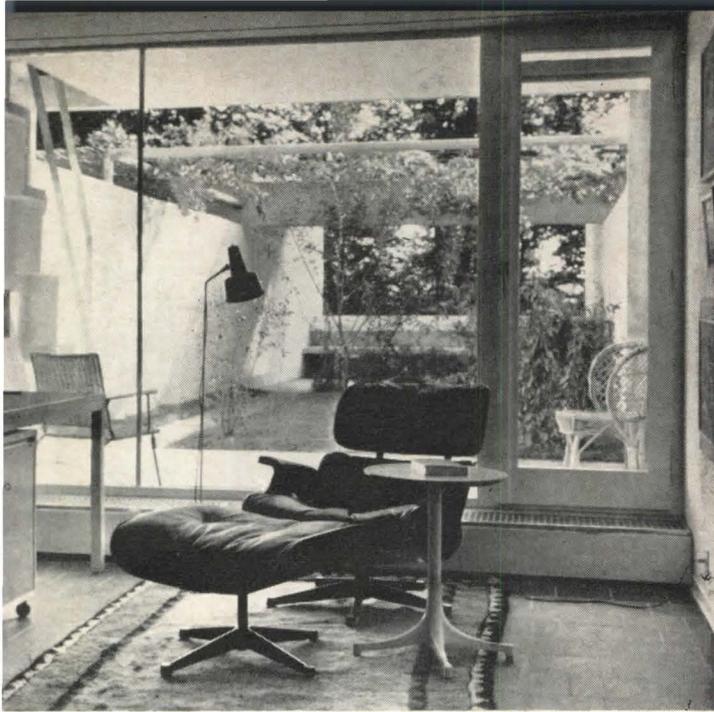
garden, a tall living room with balcony gallery. But each is somewhat narrow, and provides a quantity of space that, while well arranged, is below Swiss standards and far below what Americans expect at a comparable price.

In the view of those who live in Halen and like it, this shortage of private space is made up in shared amenities. There is, first of all, the surrounding forest preserve, criss-crossed by paths. There is a community swimming pool and large playground. There is a laundry, a large parking garage where cars are kept from sight, a service station, and, on the central

plaza, a gemütlich general store and a coffee house. (In case of a squeeze on living quarters get too tight, there is also a row of spare rooms or studios to let.)

All of these elements are linked in what is, in essence, a large building—a continuous rather unyielding environment. The structural elements are concrete, either left exposed or stuccoed and painted white. The public spaces are paved. But the hardness of what has been built is ameliorated by the green that has grown around it. There is scarcely an unpaved square meter that has been left unplanted—whether terrace, rooftop or open hillside.







Among the Haleners, at one time or another, have been several members of Atelier 5 and the families. The architects had designed it as an experiment and they wanted to see first hand how it worked. Personally, I consider this an enormous step: should be an AIA regulation that architects live with the buildings for a time after completion.

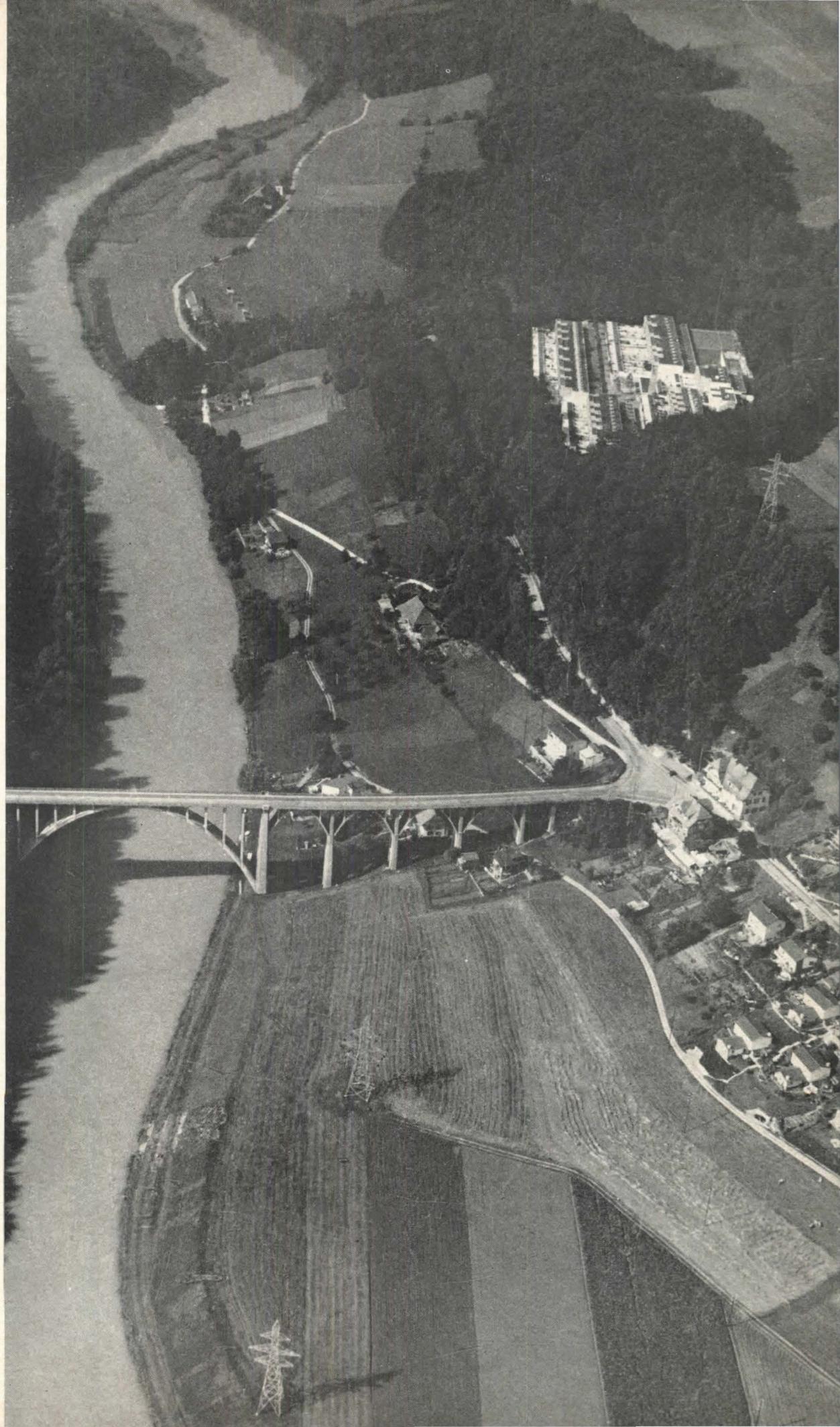
Halen was an experiment, but Atelier 5 denies that it was intended as a model. "Take heed the architects warned in the British annual, *World Architecture*. "We had no intention of putting forward a prototype."

Switzerland seems to have



taken them at their word, for no compact colonies quite like Halen have appeared there since. In Bern, it is regarded as a curiosity, not as a serious alternative to suburban sprawl.

What about the construction of Halens in America? Each of our major metropolitan centers could use a few, if only for the same kind of specialized clientele that Halen has attracted. But given the American predilection for private space, open and enclosed, my guess is that the market could not absorb a great many such developments. I find this fact a sad one, because life in Halen struck me as a very pleasant kind of life indeed.





FORUM CONT'D

causes of urban sprawl to brand new metropolitan centers."

The committee, which includes Architect Richard Neutra and a covey of large land developers, proposed that the new cities, with populations upwards of a million each, be built on "huge tracts" away from older metropolitan areas. A map suggesting possible sites (below) put them near places



like Moscow, Ida.; Needles, Calif.; Casper, Wyo.; Glasgow, Mont.; Pierre, S. Dak.; and Stuttgart, Ark.

The committee said it had surveyed 400 industrial firms, and had found that future decisions on plant locations were likely to be made on the basis of availability of natural resources, "without regard to whether such sites now have populations of potential employees."

The committee proposed putting industry underground, in "modules" of sub-cities that would gradually grow around a central core (rendering below). Transportation between the modules and



the core would be along underground and surface highways of up to 30 or 40 lanes. There was no mention of nonautomotive transit.

Joseph Timan, president of Horizon Land Corp. and chairman of the committee, called for Federal assistance in launching the plan. The committee, he reported, is "in contact" with HUD.

VISION OF A PARK

The Pennsylvania Railroad last month announced that it planned a 148-acre apartment and office building development along the Allegheny River northeast of Pittsburgh's Golden Triangle. First step will be the clearance and landscaping of the entire site as a "land bank" for subsequent staged development.

Planning consultant for the project, called Penn Park, is Chairman Robert W. Dowling of City Investing Co. Dowling released

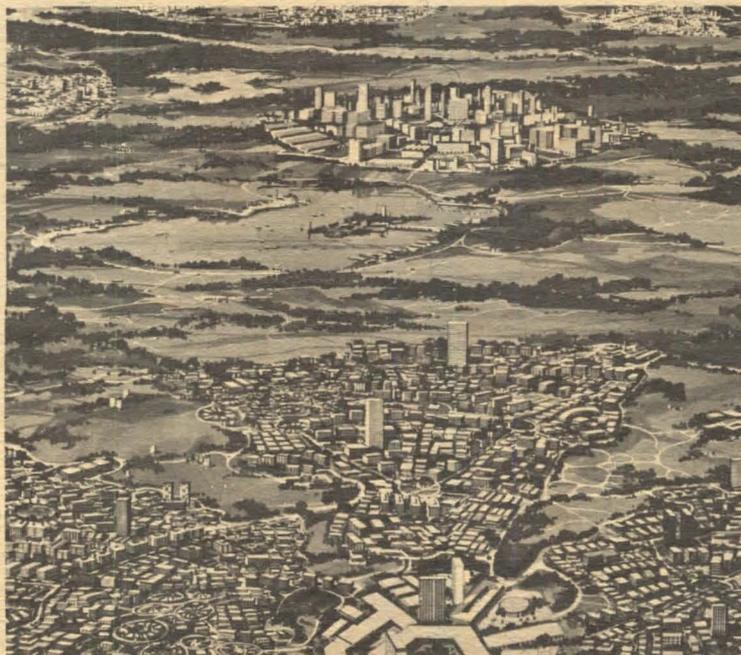
the rendering above. Asked who the architect was, a railroad spokesman mentioned "Rudolph," which didn't seem to fit the image Dowling showed. It turned out that he was speaking of Rudolph Associates, renderers, rather than Paul. Penn Park's architects have yet to be chosen.

PLAN FOR 30 MILLION

In 1929, the Regional Plan Association produced the first comprehensive plan for the New York Metropolitan Region (22 counties spread over three states, and containing 551 separate municipalities.) To RPA's surprise, many of the 1929 recommendations have become reality — most for better, some not quite.

Last month, RPA got ready to produce its Second Regional Plan, so as to guide the growth of the metropolitan region (now enlarged to an assumed 31 counties) through the remaining years of the century. To help prepare that plan, RPA nominated a committee of 125 top architects, planners, educators and labor, civic, business and religious leaders. The first half of this imposing group met for three days late last month in Princeton, N.J., (part of the newly annexed area) discussed the premises upon which RPA proposed to base its new plan, suggested alternatives, and advised some shifts in emphasis.

According to RPA's projections, the New York Region will contain more than 30 million people by the year 2000. This population will be very differently constituted, in terms of employment, income, age-levels, etc., from the region's present 18.9 million. How to cope with the increase and the changes in make-up were the principal objectives of this first meeting. The completed Second Regional Plan will be published next year.



FOOTNOTE

Design Continuity—San Franciscans and New Yorkers who are of Chinese origin (or who happen to be addicted to Chinese food) are thoroughly familiar with the little red pagoda shown at left: It is, of course, one of the more thoughtful contributions to the field of gracious "street furniture" visible in the US streetscape, and it hurts to see a fine architectural firm like Kelly & Gruzen pay so little attention or respect to the deal of "continuity." For the New Brutalist apartment building seen directly behind this Bell Telephone pagoda is one of the two new Chatham Towers on Worth Street, next door to Manhattan's Chinatown, and designed by these architects. Shame on them! As the late W.C. Fields once put it in another context: "It's guys like them that give the West a bad name!"

Photo: George Cserna.

UPS & DOWNS

ADMIRABLE DEDICATION

The architects of Boston have done something that their organized brethren in other cities might well envy. They have just dedicated a new six-story building (below) conceived by and built for architects, devoted entirely to the needs of the profession.

Even before its new headquarters in Back Bay was built, the 77-year-old Boston Architectural Center was quite an institution. Besides maintaining a steady program of lectures, conferences, refresher courses, and the like, the center provided something unique: a low-tuition evening school of architecture to which local architects donated their time.

When construction of the new Government Center forced the B.A.C. out of its musty old converted quarters on Beacon Hill, the directors decided to build a new building with public exhibition space and offices for the Boston Society of Architects as well as bigger, better teaching space. They went about it the proper way, too: held a competition and built the winning scheme, by Ashley & Myer, quickly and with few discernible changes.

Last month they christened the almost-completed building with days of meetings and parties. The intellectual high-point was a two-

day conference on the Future of Architecture. Hardly a new subject, but they covered it well, giving most of the platform time to technologists, developers, anthropologists and other non-designers who (for the most part) had something pertinent to say to architects. What they said, in various ways, was that the architect better get with it if he wants to even exist in the future.

If attendance and attention are an indication, Boston architects are willing to face the challenge. The new center gives them a clear head-start.

CONSTRUCTIVE CONTRIBUTION

Just when Boston architects should have been patting themselves on the back over their new Architectural Center (below), they got punched in the nose by a front-page scandal. Architects have generally managed to stay out of the more or less perpetual political scrapping that goes on in Massachusetts, but this time they were right in the thick of it.

Ironically, things had been looking up lately in the area of state-sponsored architecture. The University of Massachusetts, for instance, had been making careful, enlightened choices of architects for its vast expansion program with the support of Governor John Volpe.

When the time came to choose an architect for the \$39 million university medical school to be

built in Worcester, the board of trustees went through a year-long process, screening hundreds of applicants with the help of Pietro Belluschi, former dean of the M.I.T. school of architecture. Last September they submitted a list of five firms or teams in order of preference to Governor Volpe. He accepted it with such apparent satisfaction that the trustees leaked word to the press that the school would be designed by their first-choice team, The Architects Collaborative of Cambridge with Ellerbe & Co. of St. Paul, Minn.

But the governor's office remained silent for several months. Then, in late January, his commissioner of administration, John J. McCarthy, announced that the job had been awarded to Ritchie Associates of Brookline, a firm not even considered by the trustees (although it has specialized in hospitals, most of them small). Ritchie was teamed with Campbell, Aldrich & Nulty, who had been the trustees' second choice.

When the trustees protested, McCarthy heatedly asserted his official right to appoint architects for state projects and his duty to support Massachusetts architects. But he then decided to bring in Ellerbe & Co. after all as consultants, adding an estimated \$400,000 to fees for the job.

The Democrats in the legislature, scenting an embarrassing situation for Volpe's Republican administration, began to investigate. What they uncovered exceeded their expectations. It turned out that Donald R. Ritchie had made \$1,500 contributions to Volpe's last two campaigns, and that he had been recommended for the job by S. Peter Volpe, the governor's brother and an officer of the prosperous Volpe Construction Co. Not only that, but McCarthy's office had consulted Peter Volpe on the choice of architects for 46 other jobs.

The Volpes have denied any connection between contributions and commissions, but the legislators have heard testimony from another architect (David Shields of Quincy) that he got his first state commission soon after he gave Peter Volpe \$1,000 toward Governor Volpe's campaign. And the familiar ethical problem of campaign contributions was greatly complicated by the question of whether contractors should be consulted on the choice of architects, who are supposed to pass judgment on contractors.

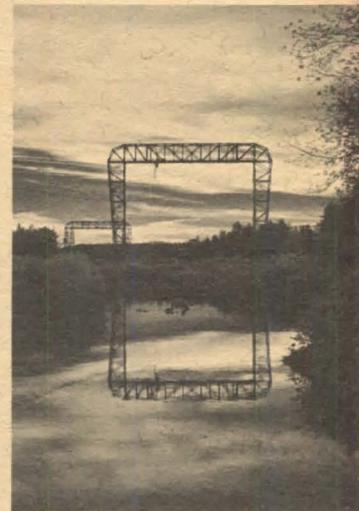
At the end of May, a governor-

appointed "blue-ribbon committee" (including Dean Belluschi) was reviewing the whole process of selecting architects for state jobs; Ritchie Associates was already working on a commission they might not keep; The Architects Collaborative, which had never had a state commission, was feeling well rid of this one; and Governor Volpe was trying to cover a badly bruised image.

BEAUTY

HIGH POWER

Senate hearings were held in early May on three bills, languishing in Congress since last summer, that would encourage the undergrounding of power lines. Indica-



tions were that the legislation would be allowed to languish a little longer.

Representative Richard L. Ottinger of suburban Westchester County, N.Y., author of the bills, complained of the Interior Department's lack of support for them. Two of the bills direct Interior to undertake research into the "economic and other" damage done by overhead lines and into methods of undergrounding, and the third provides tax incentives to utilities who bury their wires.

Utility spokesmen, who speak softly but carry large political sticks, told the Senators that a modest research program wouldn't do much harm, but that undergrounding was awfully costly. Their alternative: a "Beautility" program of improving the appearance of overhead lines, already underway.

General Electric Co., asked for pictorial examples of Beautility, supplied the picture above, show-



overhead transmission towers in Pittsfield, Mass. They would be some structures indeed, if they weren't for those messy wires.

CHANGE

gas stations be beautiful. Recently there were the dingy signs that the power companies' Beauty might be ended soon by oil industry Gas-

at the invitation of Mrs. Johnson, the American Petroleum Association showed 144 colored designs of beautified stations in the Room of the White House. There is a growing emphasis on a tasteful display of merchandise. A spokesman assured the First Lady, who expressed her appreciation at the news.

Mobil unveiled the first results of a new design program, including graphics by Chermayeff & Leff and a handsome steel-plastic pump by Eliot Noyes (see page 10). Also by Noyes: a crisp



prototype station (second from bottom) to be tested in Connecticut.

► Pittsburgh announced the results of what it called the first design competition ever held for gas stations in an urban renewal area. The winner (and only entry): the pleasant, almost sign-free Gulf Oil pavilion shown at bottom, designed by Architect Michael R. Cozza. Two of them will be built in the East Liberty renewal area, coincidentally close to the world's first drive-in gas station (above) built by Gulf in 1913.

BAN THE BOX

The automotive industry has its Ralph Nader, President Johnson has Senator Fulbright, and now the Post Office Department has William H. Qualls.

Mr. Qualls is executive director of the City-County Planning Commission in Lexington, Fayette County, Ky. He recently discovered that the Post Office Department had stopped extension of

front-door mail delivery to new subdivisions on Lexington's fringes, leaving them with rural type curbside boxes. Then he discovered that the move was part of a nationwide policy that would affect some seven million addressees.

Mr. Qualls fired off letters to Mr. Johnson, Mrs. Johnson, the Post Office Department, and the *Forum*. "It's sort of pathetically funny that FHA is instituting a new policy to get developers to eliminate poles by putting all wiring underground in new urban area subdivisions, while another federal agency is instituting another policy to put up mailbox poles in the same subdivisions," he wrote to the *Forum*. "They say the boxes will blend right into their urban surroundings. Yeah, just like our telephone, electric, stop signs, and other poles blend right in!"

Assistant Postmaster General W. M. McMillan replied that the policy was not a new one, and that it was necessary to cut postal deficits. Mr. McMillan noted that "there are on the market several designs of contemporary mailboxes" and forwarded, postpaid, a departmental flier showing some of them (sample below).

Meanwhile, the Department held

"Mailbox Improvement Week" May 16 to 21. Postmaster General Lawrence F. O'Brien proclaimed that mailboxes that look their best "can be an unusual and beneficial contribution to the natural beautification efforts of the President and First Lady." He commended boxholders who had "painted their mail receptacles in decorative colors and provided ornamentation such as iron-work representations of dogs and other animals."

Mr. Qualls, unconvinced and undaunted, sent along some photographs of such spontaneous efforts at beautification in the Lexington area (sample below).



LEADERS

TWO FOR HUD

President Johnson last month filled the last two vacancies in the top management of HUD. Appointed assistant secretary for demonstrations and intergovernmental relations was H. Ralph Taylor, New York urban renewal consultant formerly of the New Haven Redevelopment Authority. Taylor is regarded as a sure-handed urban affairs professional.

The assistant secretaryship for housing and renewal assistance went to Don Hummel, mayor of Tucson from 1955 to 1962 and former president of the National League of Cities. Hummel's credentials are less obvious than Taylor's, aside from the fact that the President wanted a mayor in

the post. Tucson had no urban renewal program during Hummel's term of office; he was preparing to put one before the voters when he left in the wave of Goldwaterism that swept Arizona. Since then he has been a contract developer of tourist facilities in national parks.

Hummel's responsibilities will include most of those once handled by Urban Renewal Commissioner William Slayton, now head of the Urban Policy Center of Urban America Inc., and Public Housing Commissioner Marie McGuire. Mrs. McGuire reportedly has been offered the ambassadorship to Sierra Leone, the former British colony on the west coast of Africa.

VISUAL RIGHTS

The venerable Architectural League of New York, founded in 1881, has been puttering along serenely for some years now—awarding fellowships, conducting exhibits, sponsoring symposia. Last month, the League was literally shaken to its foundations.

Elected to its presidency was Architect Ulrich Franzen. With him came in six new vice presidents: Interior Designer Emily Malino, Engineer Lev Zetlin, Landscape Architect Robert Malkin; Artist Max Spivak; Sculptor Isamu Noguchi; Architect (and Editor) Peter Blake.

Franzen immediately called for the League to become "activist," to undertake design demonstration projects, to arouse the people of New York so they would "demand their visual rights." He and the executive committee, seeking a drastic change in the League's image to match the Franzen program, also agreed to explore ways of leaving its drab little building on East 40th St. for new quarters.

HONORS

THE SEASON

Come spring, awards fall upon the architectural scene like blossoms. The following were announced last month:

► The biggest of them all—AIA's Gold Medal—will go to Kenzo Tange of Japan (shown above, right, at the Japan Arts Festival exhibit he designed for New York's Union Carbide building). It is, in a sense, an award to the strength and vigor of current Japanese architecture, which Tange pioneered, as well as to his own remarkable body of work.

► Other AIA Awards: Citation of



an Organization to the Museum of Modern Art, with special commendation for its new Philip L. Goodwin Galleries of Architecture and Design; the first Henry Bacon Médal for Memorial Architecture to Eero Saarinen & Associates for the Gateway Arch in St. Louis; Honorary Memberships to Boston's Edward J. Logue, Critic-Historian Albert Bush-Brown, Henry F. du Pont, Harold B. Gores of EFL, John G. Flowers of the Texas Society of Architects, and the late James J. Rorimer of the Metropolitan Museum; Honorary Fellowships to Jacob Bakema of the Netherlands, Ralph Erskine of Sweden, Arne Ervi of Finland, Denys Lasdun of England, Alfred Roth of Switzerland, Harry Seidler of Australia, Gerard Venne of Canada and Bernard Henri Zehr-fuss of France.

► Constantinos Doxiadis, architect and city planner, has been named recipient of the third annual Aspen Award, (\$30,000). He was cited for the urban renewal projects he has designed, and for his creation of "ekistics—the science of human settlement."

► Romaldo Giurgola, chairman of the Columbia University department of architecture, was named recipient of the Arnold W. Brunner award by the National Institute of Arts and Letters.

► Benjamin Thompson, chairman of the department of architecture at the Harvard Graduate School of Design, was elected a Fellow of the American Academy of Arts and Sciences.

► The Municipal Art Society of New York awarded its Bronze Plaque to a modern landmark, 375 Park Avenue (the Seagram building), and its architects, Mies van der Rohe and Philip Johnson.

OUTCOME

UTZON: THE END

The following report is by the Australian architect-critic (and author—see page 78) Robin Boyd, a member of the Forum's Board of Contributors.—Ed.

Jorn Utzon has been replaced as architect of the Sydney Opera House by a panel of four appointed by Davis Hughes, New South Wales Minister of Public Works. Hughes also called together all of Utzon's engineering consultants and asked if they would work with the new panel. They said yes.

Chairman of the panel is the government architect, E. H. Farmer. The other members appointed by Hughes were Lionel Todd, 36, who will be in charge of contract documents; D. S. Littlemore, 55, to be in charge of supervision; and Peter Hall, 34, to be in charge of design.

Hall was chief designer in Mr. Farmer's department until his recent resignation to set up in private practice. He has earned an outstanding reputation for a young architect, but he has not exactly proved himself to be a second Utzon—nor suggested in his work that he had any desire to be one.

Meanwhile, Utzon rendered his final professional account. It was for about \$500,000—some for work done on Stage 2, the main building contract now nearing completion, and some for Stage 3, the interior acoustical structures and fittings, which are by no means fully designed yet. The bill was not accompanied by any of the drawings done so far in development of Stage 3. While the new panel was reported to be "familiarizing itself" with the project, it could not get far without them.

For a while it looked as if a nasty dispute might develop over the drawings. But the Government made an "interim payment" of \$150,000 to Utzon's lawyers, and they handed over the plans. On May 17 workmen removed Utzon's name panel from the fence in front of the soaring Opera House.

Walter McQuade

is on vacation. His column will be resumed in the July/August issue.

PHOTOGRAPHS: Page 30: G. Cserná. Page 31: Henry Grosk (Life magazine). Page 32: Checkman (top), John Morris (bottom). Page 88: George Zim. Page 89: Malcolm Smith.



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BOOKS CONT'D

that seven round towers were casually spaced around the site. Suspended among the towers are the various floors. At one major point three whole floors seem to be left out making a vast, impressive void. The effect is staggering in conception. I hope it will be great in reality.

This caveat is necessary because like much early work of a phase, the ideas are apt to out-run execution. I am reminded of the beauty, clarity and slight unbuildability of early Le Corbusier and Mies sketches. There are many problems ahead for the Third Phase. It can disintegrate or it can become, as Boyd profoundly hopes, *the* architecture of the 20th century after the "failures" of the First and Second Phases. To a devout Second Phase man like myself, the danger ahead for it seems alarming!

But there can be no doubt the phase exists. There are too many elements in common. There is too much polemic, moralization and mystique simply to say it does not actually have validity. As a clincher to a doubter like me, too many good architects whom I have admired for more than a decade are leaders of the Third Phase today.

Boyd does not speculate too specifically on the why of this Third Phase, whence it arose. Matthew Nowicki once wrote, "Form does not follow function; it follows form." The Third Phase forms must have come from somewhere. The answer seems to be Le Corbusier. Although Ronchamp is certainly shaggy and additive in its elements, Boyd seems to consider it Second Phase. More of a clean ancestor is the design of the Jaoul houses. The British Brutalists derived an entire manner from these two houses. Their powerful vaulting, their crude in- and- out random fenestration seem to have liberated a whole generation.

The key building, however, is Le Corbusier's Dominican Monastery, La Tourette (10), of 1957-60. Although it is a rectangle, the functional or pseudo

functional divergencies, the casual treatments of the "facades," the top-heavy treatment of the cells, the total lack of conventional base (one might think the building was designed upside down) are presages of the agglomerative style of the sixties. This group impressed every designer in the world. Most of us could not if we would follow Ronchamp, but La Tourette could speak to all, not translatable, but conceptually. The Third Phase was born.

To repeat, every architect must have this book. To narrow my recommendation, read pages 142 to 155 where the characteristics of the Third Phase are outlined. From page 155 to the end of the book, Boyd moralizes. Perhaps this is most important but not to this reviewer. I believe architecture, even present architecture, just happens. Rationalizations are interesting; Mies (less is more), Kahn (servant spaces) have interesting minds and their theories illuminate their work. But architecture will have immortality for different reasons that are hard for contemporaries to fathom. First, Second, Third Phase, all can be good (or bad). History will tell.

There are a few annoying things about Boyd's book. Being a collection of essays, the point of view shifts uncomfortably from section to section. Sometimes Boyd is writing for the general public, sometimes for the initiated critics, historians, and fellow architects. Sometimes he is analytical, sometimes hortatory. Small price, however, to pay for the insights, the appreciative vignettes, the basic rightness of his story.

The drawings accompanying the text are by the author and are intended only to recall the buildings to the educated reader. Unfortunately, in drawing my glass house he omitted the axially symmetrical entrance door (11), which changes the character of the design. Accidents will happen. In all sketches of this kind the sketcher sees what he wants to see. The axially of the glass house was *not* what he wanted. Postage stamp size photographs would surely have done as well.



Honor Roll: MODEL 27

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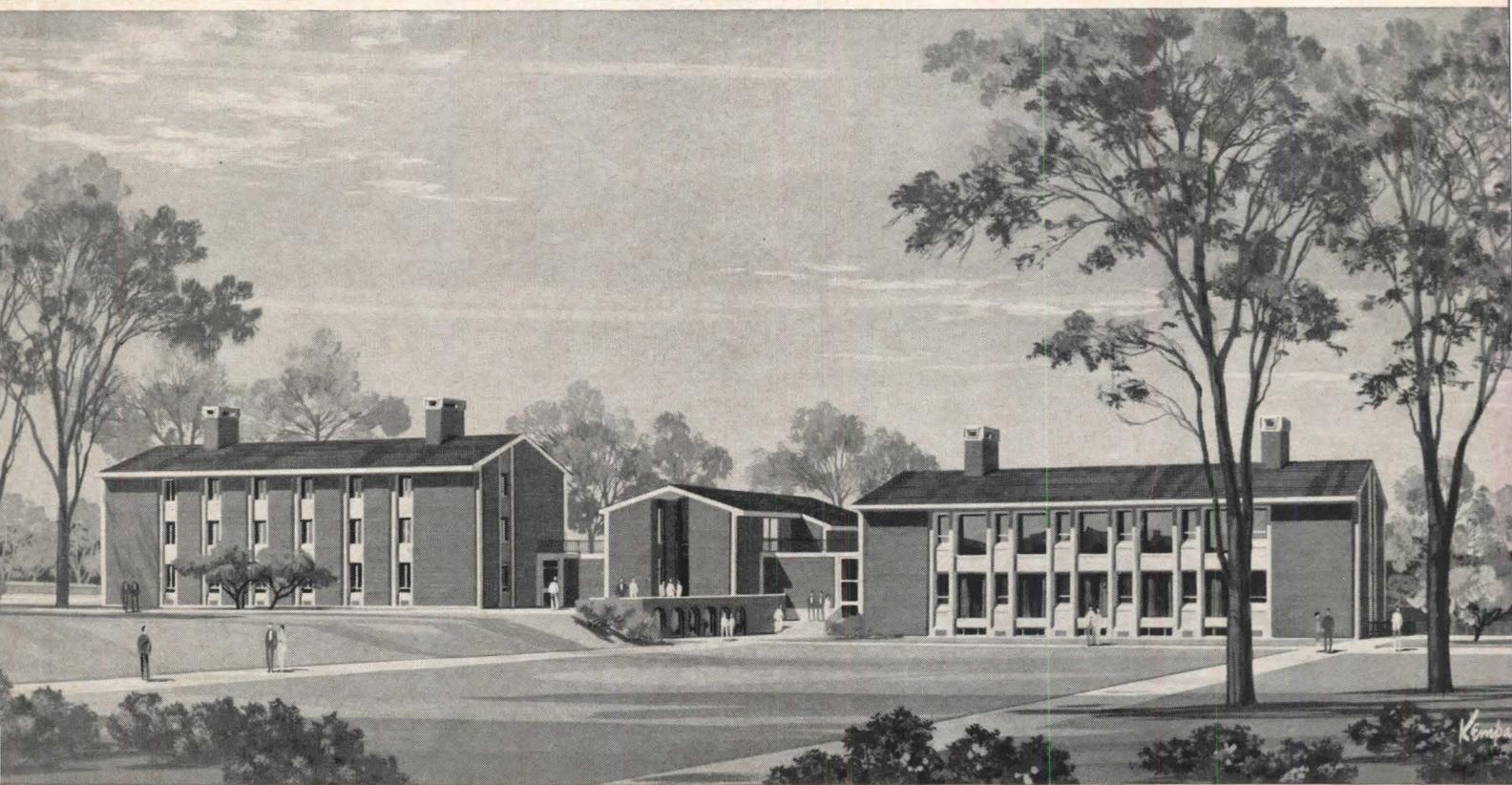
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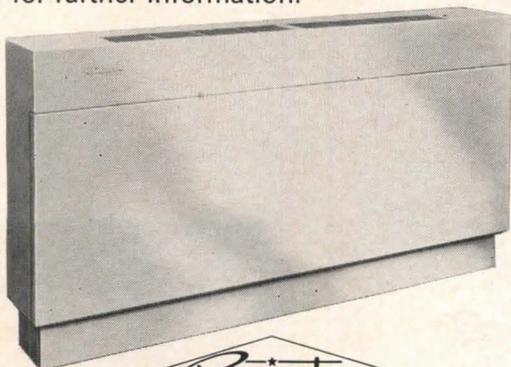
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LETTERS

SET BACK IN SYDNEY

Forum: The Sydney Opera House (April issue) by Jorn Utzon is a complete failure and will set the profession of Architecture back at least 50 years. We architects came a long way to build a respectable profession based on responsible decisions on esthetics, construction methods, and costs. The experiences from this opera house will cause many future projects to go to engineers instead of architects. It is amazing and shows a total lack of construction know-how or responsibility for a project to increase from \$9 million to \$49 million.

Los Angeles
WALLACE D. JEONG
Architect

PLEASED PROPRIETORS

Forum: Your presentation of our new laboratory building in your April issue is especially interesting to us of Chevron Research, and we're happy you considered the building sufficiently noteworthy to publish an article on it. We are proud of it and pleased with it.

I am sure that had you reporter been more familiar with research laboratories, your article would additionally have pointed out how unusually well suited the building is for the safe, efficient and pleasant conduct of chemical research. As an example, for protection of health the air turnover in the laboratories is higher than in any structure with which we are familiar. This large volume of air is conducted into and out of the labs and offices with no disturbing noise and no noticeable draft. Further enhancing this safety and comfort factor is the warm and pleasant appearance of the laboratories.

That all arrangements worked out well can be ascribed to careful study of a detailed full-scale mock-up of a laboratory module, plus close team work of Standard Oil and Chevron Research personnel with Gerald McCue, a gifted architect who understands laboratories and their inhabitants.

As proprietors of this attractive, highly functional new building, we sincerely appreciate the excellent recognition given it in your publication.

San Francisco
A. H. BATCHELDER
President
Chevron Research Co.

CENTER OF CONTROVERSY

Forum: Your commentary on "second unveiling" of the Authority's World Trade Center (April issue) was in itself a second unveiling of alleged "objections" to which your pages carried some of the authoritative answers two years ago.

Modest research would have produced the following answers to the four questions raised anew by the City Planning Commission: 1) the Trade Center has evaluated the Trade Center and found that it "will place undue strain on the (subway) system"; 2) the Planning Commission also found that the street widenings and off-street parking plan for the Trade Center will "adequately accommodate estimated future traffic"; 3) Plaza Building structures modified expressly to harmonize with the City Planning Commission's waterfront plan announced in December and that fact specifically pointed out in press release and picture caption distributed at the "second unveiling"; 4) legislation enacted in New York and New Jersey directing the Port Authority to undertake the World Trade Center retained legislative findings concerning the relationship between the Trade Center and the established functions of the Authority, and the courts have held that legislation as legal and proper.

While the citizens comprising the "emergency committee" apparently did not scent the threat to New York and its environs until January 1966, the question of the Trade Center and its effect on the New York metropolitan area had been thoroughly explored and applauded by many groups and the metropolitan region during the six-year period it was under public discussion. Included among the endorsers are the Citizens Union, Citizens Housing Planning Council, and the Regional Plan Association. The project has also been approved by the governors of New York and New Jersey, former Mayor Wagner, and other members of the administration of the City of New York, and the state and Federal courts up to and including the U.S. Supreme Court.

AUSTIN J. TAYLOR
Executive Director
The Port of New York Authority
New York City

For further news of the Trade Center, see page 31—Ed.

(continued on page 97)

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LETTERS

(continued from page 96)

VO TOWERS

rum: Let me congratulate you on the excellent "Tale of Two Towers" in the April issue. With this story you have entered the old of first-class art analysis—a great advance over the usual journalistic criticism, which is only too often ill-founded. The comparison of two excellent works certainly requires a more subtle approach, too, than the examination of isolated pieces of architecture with pretty obvious faults. Whereas I believe that the method of your analysis wholly responds to such a high standard, I severely doubt your last sentence: "Brunswick is a fine job, but CBS is a great one." This statement is clearly not based on the preceding analysis and appears a curious lapse.

"Greatness," unfortunately, is an undefinable attribute often misused to describe effects that are otherwise unjustifiable. It is an expression beyond scientific scrutiny and therefore allows an endless range of individual interpretations. I believe, for example, that the serious and remarkably honest work done by SOM here, as well as in a surprising number of other cases, is by its consistent high standard a far "greater" achievement in the larger cultural context than all those individual and irrational strivings for effects—fake columns, unnecessarily long sections, etc. Despite the faults that you correctly show up in both buildings, this seems to be the logical conclusion of your own analysis—not just my opinion.

OSWALD W. GRUBE
Munich, Germany
Engineer

HERE CREDIT IS DUE

rum: This letter concerns the article you had in your March issue about IBM architecture. I do not know who did the research for this article but obviously it is very sparse. There are several glaring errors in the article. In the first place, the firm of Burns & McDonnell did not perform the architectural design for the building at Endicott even though they were a member of the group that did. The architects-engineers for this particular building are known as the MESA

group which is made up of Ammann & Whitney in New York, Burns & McDonnell in Kansas City and our firm in Miami. This particular building was designed by myself and my design team with the full cooperation of IBM's staff and their enthusiastic support, including Mr. Eliot Noyes.

In the second place, you are comparing a utilitarian production building with office buildings or laboratories and this is like comparing sheep and goats. This building required or even demanded that there be no windows because of the nature of the manufacturing operation. It also demanded a schedule that was extremely difficult to meet in order to get the product on the market as quickly as possible. This accounts for the so called "package deal" that you mentioned in your article.

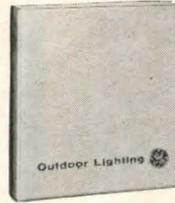
In actual fact, the architect-engineer team was not selected by the contractor and the contractor simply became a normal client after the selection. The solution and design was expressed by the designers without interference by the contractor or client except for scheduling that was critical. Of course, IBM showed all the normal client interest and watched the entire progress of the job very carefully.

All of us in the MESA group feel that this was a very successful job from every standpoint, particularly from the standpoint of satisfaction of the function and also we believe it is a very handsome building. . . . I am enclosing two or three photographs that we have had made [example below]. We do not feel that there has been any diminution of IBM's desire to build better buildings although they may be a little more cost conscious in the face of rising prices.

HERBERT H. JOHNSON
Miami
Architect



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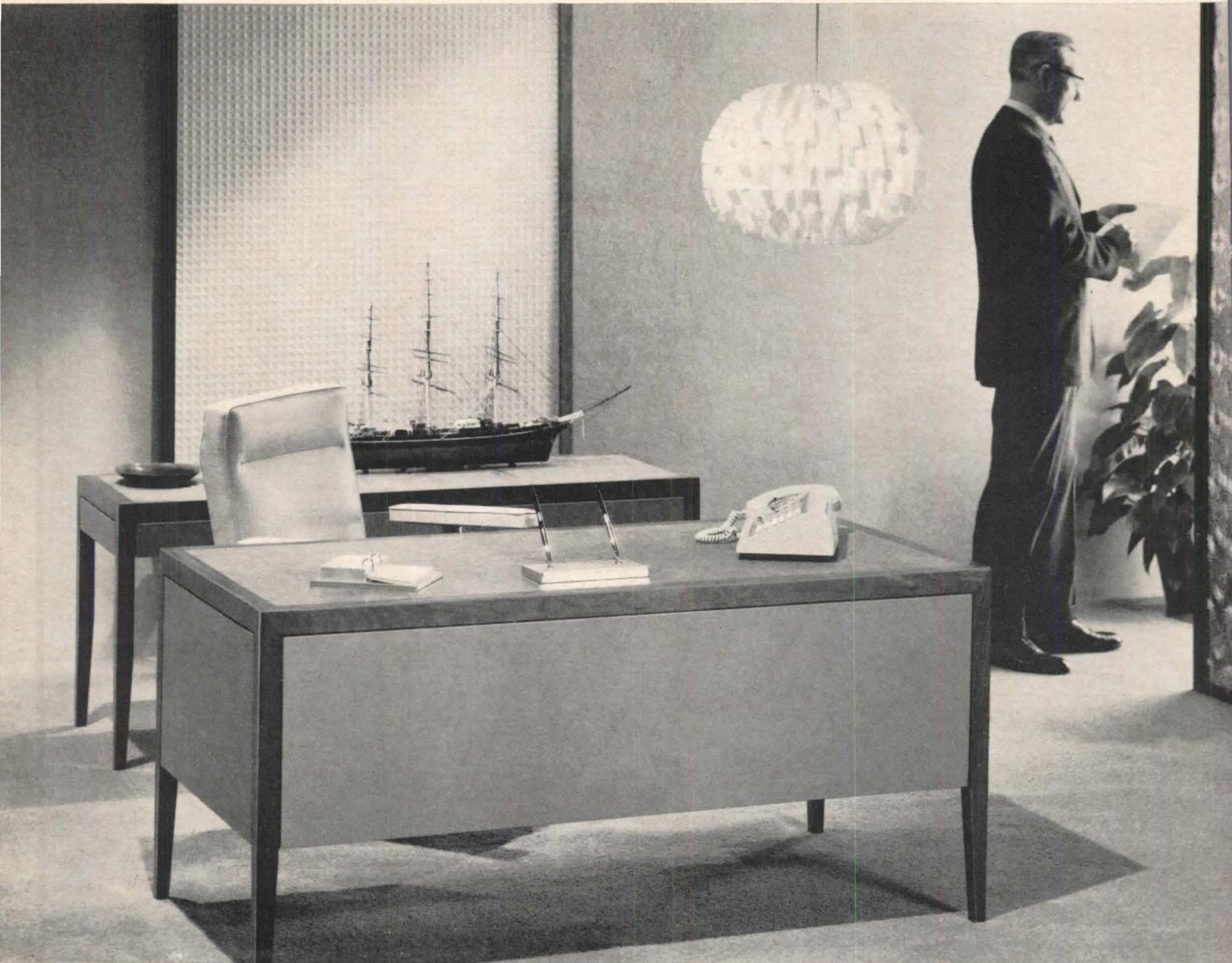
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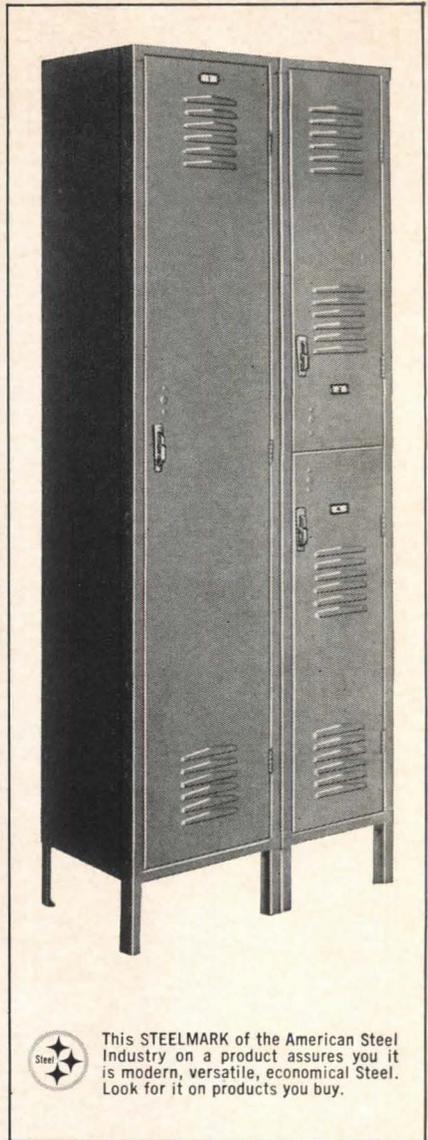
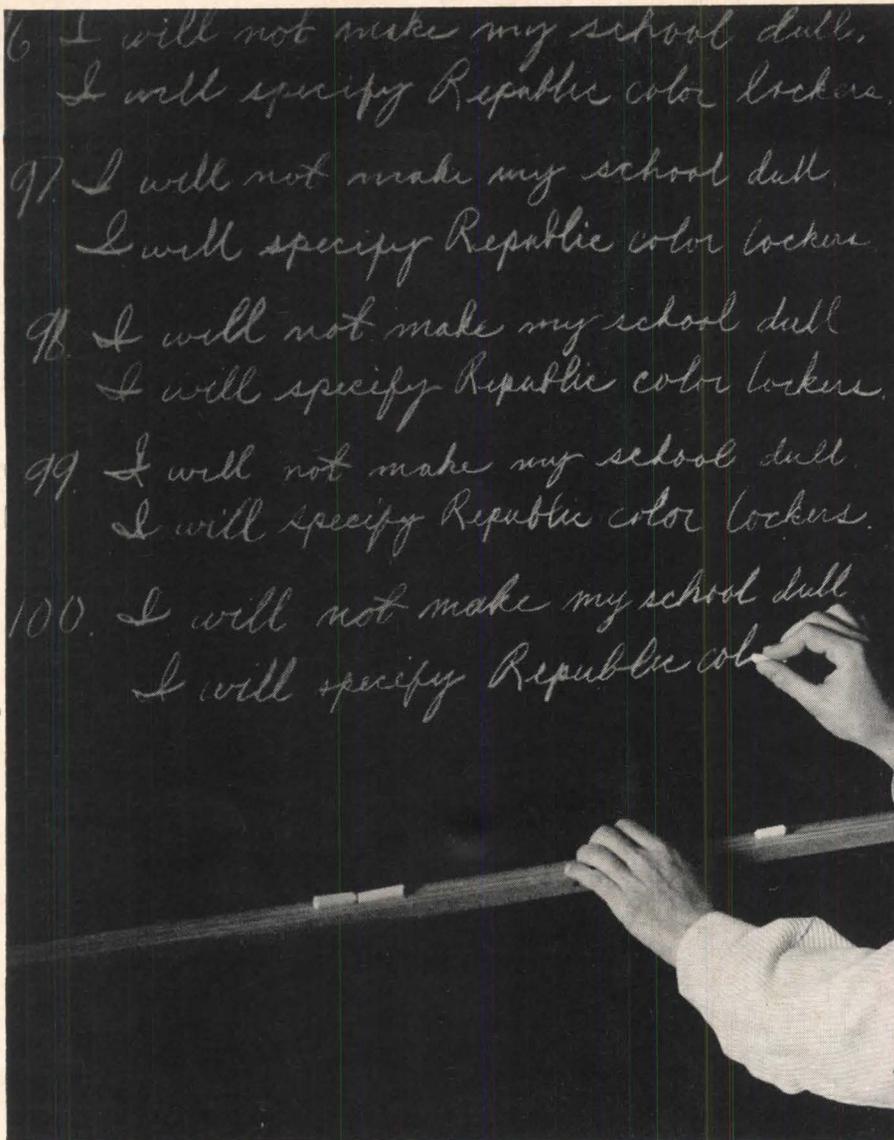
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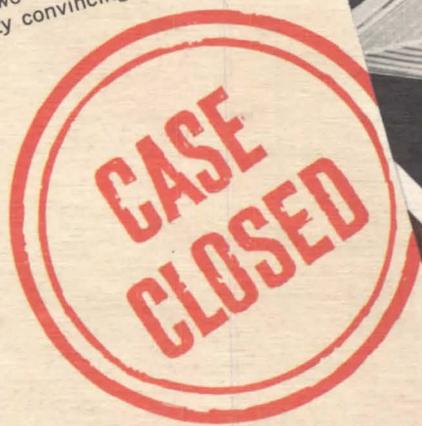


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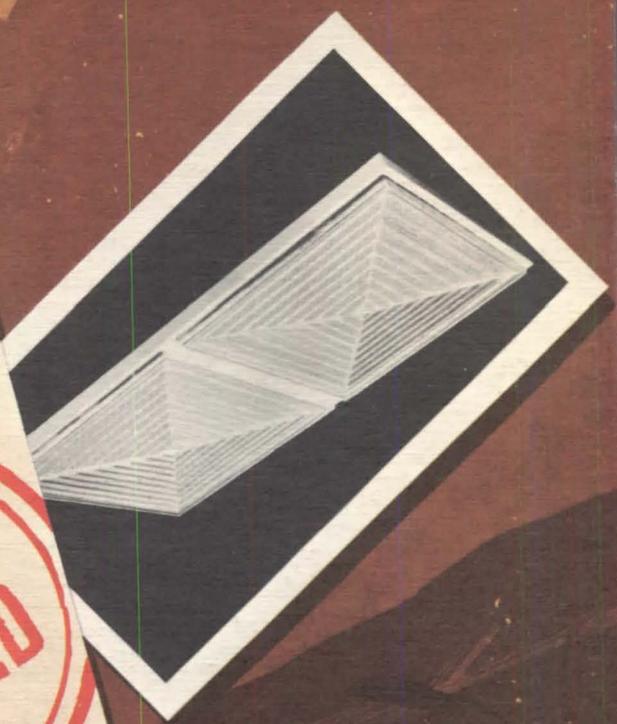
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